

GEW RHINO UV SYSTEM INSTALLATION MANUAL

MODULE 4: Power Supply Installation Original Instructions



Contact Details

Address: GEW (EC) Limited,
Crompton Way, Crawley,
West Sussex, RH10 9QR, UK.

Telephone: +44 (0) 1737 824500 – main switchboard
+44 (0) 1737 824510 – service and spares

Email: service@gewuv.com
spares@gewuv.com
sales@gewuv.com

Website: www.gewuv.com

Distributors: www.gewuv.com/contact

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1 About This Manual

1.1 Introduction

This Installation Manual provides Original Instructions, as defined in Machinery Directive 2006-42-EC, for the installation and commissioning of your GEW UV system. Read it carefully before attempting to install or commission the equipment it describes.

Always use trained and competent people for installation, operations, maintenance, repairs or modifications. Each GEW UV system is engineered to meet the requirements of a given installation. Any change in requirements may require re-commissioning or modification of the system.

Do not modify any GEW UV system without the prior written approval of GEW.

1.2 Symbols, Warnings, Cautions and Information

This document, and GEW equipment, use the symbols set out below. They highlight possible dangers where you need to take safety precautions and follow good practice. Failure to follow the Warnings and Cautions may invalidate your warranty.



WARNING: Risk of electric shock.



Caution: a reminder of safety practices, or directs attention to unsafe practices that could result in personal injury or damage to the equipment, or its components, or to the environment.



Caution: Hot surface.



WARNING: Risk of exposure to ultra violet light.



Additional information and/or essential documentation: Read before attempting to install or operate equipment.



Check list: Follow a structured set of checks to install or operate equipment.

Electronic copies of this document contain [underlined links](#) to essential documentation.

1.3 Installation Manual Structure

This installation manual is divided into modules. Each module describes the installation procedures for different types of GEW equipment, as follows:

- Module 1** Provides general and statutory information about installing GEW products, explains how to activate the GEW warranty and includes a glossary of terms.
- Module 2** Applies to the installation of GEW UV lampheads.
- Module 3** Applies to the installation of GEW and RHINO supplied cooling systems, including chillers, fans and ducting.
- Module 4** Applies to the installation of GEW RHINO power supply systems.
- Module 5** Applies to the installation of GEW HMI control panels.
- Module 6** Contains the commissioning checklist.

NOTE: The installation of GEW custom components including inert nitrogen systems may be detailed separately if appropriate.

2 About RHINO Power Supplies

2.1 Description

GEW power supply systems consist of modular RHINO Power Supply Units (RPSU), one per UV lamphead, housed in one or more RHINO Rack (RR) power supply cabinets. Each RPSU supplies power to one lamphead and its associated autodamper. Figure 1 shows a typical RPSU.



Figure 1: GEW RHINO Power Supply Unit

RRs are available in four sizes to house 1, 2, up to 6 and up to 8 RPSUs each and are referred to as 1-way, 2-way, 6-way and 8-way RR. 6-way RRs can be stacked two high if required. Figure 2 and Figure 3 show typical GEW RRs of the 6-way and 1-way variety respectively.



Figure 2: GEW RHINO Rack (6-way)



Figure 3: GEW RHINO Rack (1-way)

3 Installing RHINO Power Supplies



Caution: Only apply electrical power to the system when all connections have been made and tested.

3.1 Environmental Conditions

Environmental conditions for the installation location must be within the parameters set out below:

- Temperature range: +5°C to +40°C
- Relative Humidity (RH): 0 - 90% at +40°C, non-condensing (UV System)
Relative Humidity (RH): 0 - 95% at +40°C, non-condensing (HMI only)
- Altitude: To a maximum of 1000m above mean sea level. De-rate by 2% per additional 100m of altitude

3.2 Locating the RR

- The RR must be sited on level ground, within 5 metres of the host press (depending on lamphead cable lengths) and as close as possible to the mains electricity supply.
- The location must be inside a building and protected against the elements.
- The location must allow sufficient space for access to the cabinet for operations and maintenance.
- The installer should ensure that clearances around the equipment fall within the safety regulations for use of electrical equipment.



Caution: The RR must be sited away from busy areas such as walkways, and barred against potential hazards such as forklift trucks. This is the responsibility of the customer.

Loose cables between the power supply cabinet, the host press, and GEW equipment must be protected by suitable cable trays/metal trunking. This is the responsibility of the customer.



Figure 4: RHINO cabinet heights - 1, 2, 6 and 8-way variants

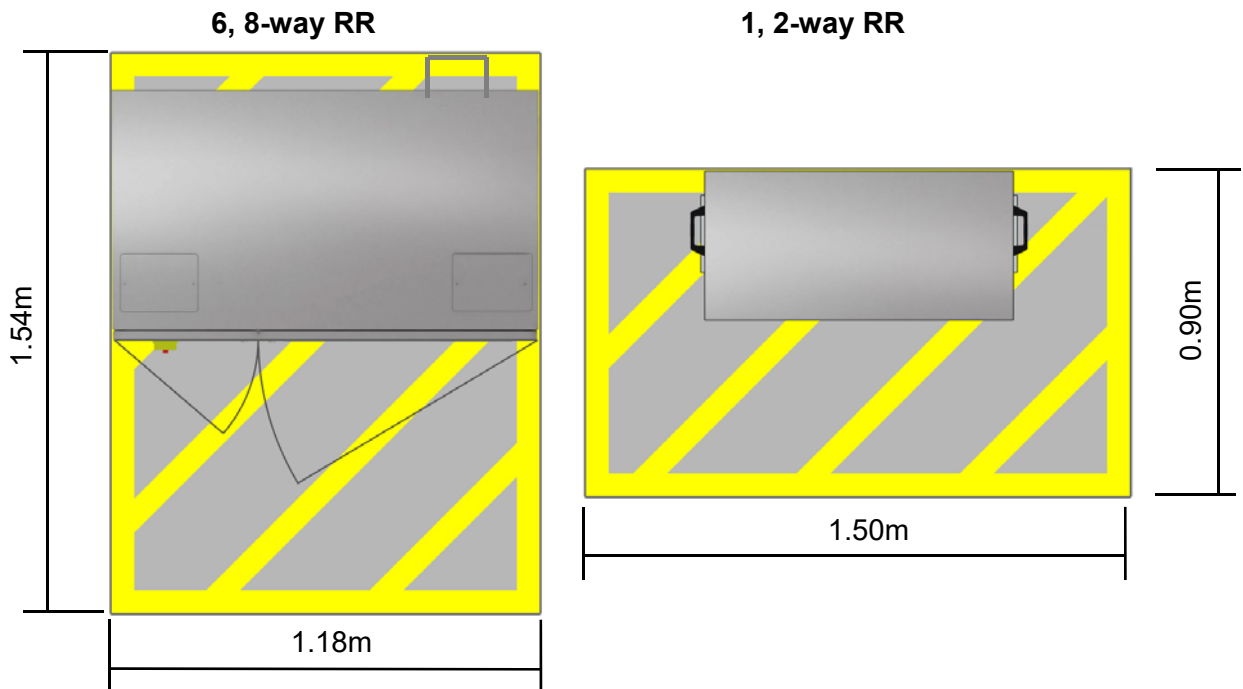


Figure 5: RHINO cabinet maintenance access footprint

3.2.1 Lifting and Moving the RR

1 & 2-way RRs are fitted with two lifting handles, one at each end of the RR. The handles are intended primarily for lifting the RR onto and off a pallet by two persons. The 1 & 2-way RRs should be moved adjacent to the installation site whilst on a pallet and lifted using appropriate lifting gear.

The 6 & 8-way RRs must be moved into position using a forklift, as follows:

1. Remove the lower panel at the base of the RR to accommodate a forklift
 - a. Remove 2 off screws, see Figure 6
 - b. Slide out lower panel, Figure 7 shows the RR with lower panel removed
2. Raise and lower RR slowly. Take care not to jolt or jar cabinet
3. Replace panel and refix screws once RR has been placed in its operating location



Caution: Only two 6-way RRs can be stacked. Do not attempt to stack 8-way RRs.



Figure 6: Removing RR lower panel for transport by forklift



Figure 7: RR with lower panel removed

3.3 RR Distribution Systems and Internal Protection Devices

Each RR requires a single mains feed to be connected directly to the three-pole isolator mounted within the RR. The isolator is operated via a handle situated on the front of the RR. Supply fuses and transient suppressors are incorporated.

The RR distributes power to each RPSU, to the system cooling fan(s), to the HMI cable socket (see Figure 23 and to internal cooling fans. Each RPSU supplies power to and controls its associated lamphead and corresponding autodamper. Suitably rated MCBs individually protect each RPSU, each cooling fan and the HMI; their type and size is displayed alongside. A fan overload protection device protects each cooling fan.

GEW lampheads feature pneumatically operated shutters controlled by solenoids within the lamphead. The lamphead is supplied with compressed air via a tube bundled in with the lamphead power supply cable which in turn is fed from a distribution manifold on 6-way and 8-way RRs.

3.4 Mains Electricity Supply Requirements

The site is to be fed from a dedicated transformer, whose output is used only by the site in which the UV system is installed. It must not be fed from a low voltage feed that is utilised by other industrial users, commercial users, or residential premises.



Refer to the Order Acknowledgement and Installation Drawings to confirm mains supply requirements for this particular installation.

3.4.1 Voltage and Voltage Surveys

It is imperative the voltage be monitored for a period that would cover all typical load variations that would affect the voltage feed to the site. The suggestion is one week unless a public holiday occurs, which should add to the monitoring period such that all load variations are monitored.



Transformers are available from GEW UV that will raise (or, if needed, lower) the voltage to a range suited to the installation and assist it to run at best energy efficiency.

3.4.2 Harmonic Demand

Most GEW systems draw more than 16A per phase thus fall, as defined by EN61000-4-12, into the category of requiring 'planning' to ascertain if the system can be coupled to the mains supply or not.

The harmonic demand of a GEW UV system is approximately <10%. This can impact the supply transformer if the UV system is a significant portion of the load on the transformer. The planning strategy as laid out in EN61000-4-12 must be implemented.



If the harmonic demand is thought to be of concern, please contact GEW UV who will be able to advise on harmonic mitigation techniques to reduce the harmonic demand of the system.

3.5 Connecting the RR to the Mains Electricity Supply



WARNING: A qualified electrician must carry out connection to the mains supply.



Refer to the Order Acknowledgement and Installation Drawings to confirm mains supply earthing requirements for this particular installation.



WARNING: Check the mains electricity supply against specifications before connecting.

3.5.1 Earth Connections

Each RPSU is fitted with a secondary earth connection to the RR. See Figure 8.

All systems require supplementary earthing from cabinet to cabinet and from each cabinet to the press on which the lampheads are mounted. The path is to be the shortest possible and the connection to be done using suitable cable as specified in the electrical drawings supplied with the system.



Refer to the Installation Drawings for this particular installation and make all earthing connections accordingly.



The earth connections must be checked for security of fixture on installation.



RR (6 & 8-way)

RR (1 & 2-way)

Figure 8: Secondary earth connection

3.5.2 Mains Supply Connection, RR (1 & 2-way)

The mains supply connection is located within the distribution shelf. Refer to Figure 9.

**Figure 9: Mains supply connection, RR (1 & 2 way)**

- 1 Cable gland to secure incoming cable
- 2 Connection point for phases L1, L2, L3 and earth

To connect to the mains electricity supply:

1. Remove the 2 off screws located at the outer edges of the distribution shelf and slide out the distribution shelf.
2. See Figure 9. Pass the power supply cable through the gland and connect the phases L1, L2, L3 and earth to terminals as shown. Tighten cable gland, ensuring clamping is sufficient
3. Slide the distribution shelf home and secure with two off screws.

3.5.3 Mains Supply Connection, RR (6 & 8-way)

The mains supply connection is located behind the inner panel and the distribution panel on the left hand side of the RR. Refer to Figure 10.

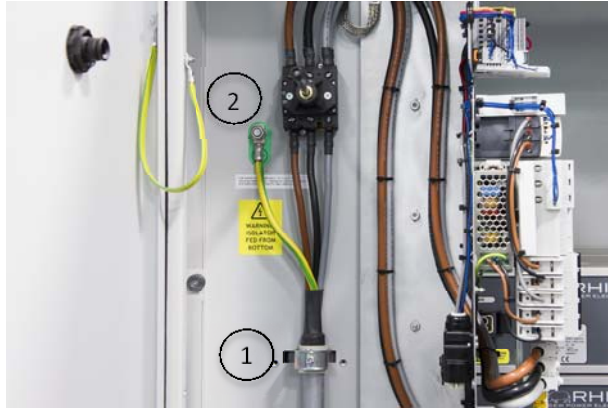


Figure 10: Mains supply connection, RR (6 & 8 way)

- 1 Cable clamp to secure incoming cable
- 2 Connection point for phases L1, L2, L3 and earth

To connect to the mains electricity supply:

1. Remove 2 off screws and remove inner panel. See Figure 11.
2. Remove retaining screw top left of circuit breaker panel.
3. Rotate circuit breaker panel outwards.
4. Fix mains wiring to terminals and secure with clamp.
5. Rotate circuit breaker panel inwards and replace inner panel.



Figure 11: Removing the inner panel

3.6 Transient Suppression

GEW RRs are fitted with transient suppression protection. The status of the transient suppression protection is monitored on 3x surge protective devices which must show green in their display windows. See Figure 12. These are located on the inner panel of the 6 and 8-way RR and on the distribution shelf of the 1 and 2-way RR.



If transient suppression protection has been activated and a display window on a surge protective device is red contact GEW immediately.

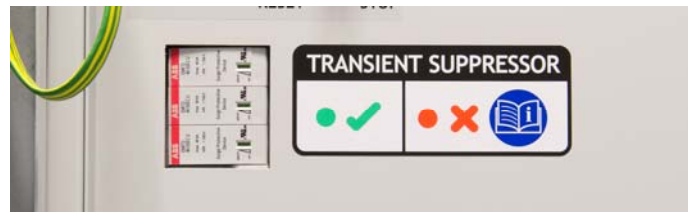


Figure 12: Transient suppressor display

3.7 Connecting the Power Distribution to the RPSUs

The RR distributes power to each RPSUs housed within it via a distribution panel located on the left hand side of the 6 & 8-way RR and on top of the 1 & 2-way RR. The connections are factory set. Each RPSU may be individually isolated via a circuit breaker on the distribution panel/shelf of the RR.

Plug all RPSU power supply cables into the corresponding RPSU connections "P5 POWER" and latch shut. See Figure 13.



Caution: Ensure the correct power supply cable is connected to the correct RPSU, e.g. cable 2 to RPSU 2, by matching the number tags on cables, and RPSUs.



Figure 13: Power cable connection

3.8 Connecting a RPSU to a GEW Lamphead

RPSUs are connected to GEW lampheads using GEW lamp cables with a male connector at the PSU end and a female connector at the lamphead end. The pneumatic supply that activates the shutters on the lampheads is bundled into the connection cables.

On some specialist systems, additional signals may also be present on a lamp connector via a 'break out' cable, for instance a Lamphead Safety Interlock Switch.

1. Connect the cable to the lamphead. See Module 2 of this Installation Manual.
2. Connect the cable to the RPSU as follows (6 and 8-way RR):
 - a. Unscrew 2 off screws and slide out cable entry plate. See Figure 14.
 - b. Feed the connector cables into cabinet
 - c. Connect top cable to top RPSU. Close the latch on the RPSU connector. See Figure 16.
 - d. Fit bracket (1) in position, clamping the cable to the side wall. See Figure 15.
 - e. Repeat steps c. and d. above for cables to subsequent RPSUs.
 - f. Refit cable entry plate.



Caution: Ensure the correct GEW lamphead is connected to the correct RPSU, e.g. lamphead 2 to RPSU 2, by matching the number tags on lampheads, cables, and RPSUs.

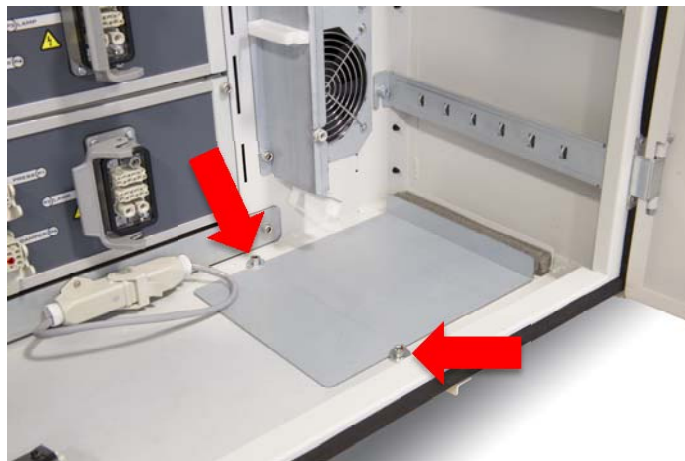


Figure 14: Cable entry plate fixings.



Figure 15: Lamphead cable support bracket



Figure 16: RPSU lamphead connectors open and latched shut

3.9 Connecting a RPSU to a GEW Autodamper

Autodampers are connected to the RPSU using GEW connector cables with male/female connectors at each end.

1. Connect autodamper cable to autodamper. Ensure connector latch is closed. See Figure 17.
2. Connect autodamper cable to RPSU, connector marked “P4 DAMPER”. Ensure connector latch is closed.



Caution: Ensure the correct autodamper is connected to the correct RPSU, e.g. autodamper 2 to PSU 2, by matching the number tags on autodampers, cables, and RPSUs.

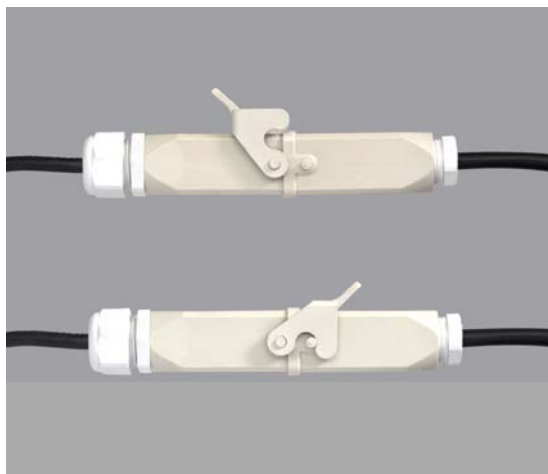


Figure 17: Autodamper electrical connection shown with latch open (top) and closed (bottom)

3.10 Connecting the CAN Bus

The HMI must communicate with all RPSUs in the system in order to control them. This is achieved using a CAN Bus system. The CAN Bus interconnects the RPSUs in a daisy chain arrangement. RPSUs are numbered and inside a RR must be connected in sequence, i.e. 1 to 2, 2 to 3 and so on. Figure 18 shows the CAN Bus daisy-chaining through adjacent RPSUs. A CAN Bus terminator should be fitted as per electrical drawings.



Caution: The CAN Bus system is for use only with GEW approved devices.

RRs and other accessories do not typically require being connected in sequence. This may allow shorter cable runs dependant on the layout of the electrical cabinets. Please see your Installation Drawings for details on the wiring of your system.

For the 6 & 8-way RR:

1. Connect the RRs fixed cable from the HMI cable socket (See Figure 23) to the first RPSU connector “P6 COMMS BUS”.
2. On the same RPSU, connect “P2 COMMS BUS” to “P6 COMMS BUS” on the adjacent RPSU.
3. Repeat step 2 for subsequent RPSUs until all RPSUs within the first RR are interconnected.
4. If there is a further RR, use a long CAN Bus cable to connect between the remaining “P2 COMMS BUS” connector in the first RR to the fixed HMI cable socket in the second RR. Repeat steps 3 and 4 until all RPSUs in the system are interconnected.
5. On the last RPSU, connect a terminator to the “P2 COMMS BUS” connector.



Figure 18: CAN Bus connections between adjacent RPSUs

For the 1 & 2-way RR:

The CAN Bus connects in a similar manor to the 6 & 8-way RRs (detailed above) except for stage 1, where the first connection is from “P2 COMMS BUS” on the distribution unit to “P6 COMMS BUS” on the first RPSU.

3.11 Connecting the RR to the Pneumatic Supply

All RR systems are fitted with a pneumatic pressure regulation and filtration system. The system consists of a 10 mm inlet (1), a regulator valve (2), a pressure gauge (3), a drip bowl (4) and a drain (5). See Figure 19. The clean regulated air supply is then fed to the lampheads via their power supply cables. A distribution manifold or splitter may be incorporated depending on how many lampheads there are in the system.

1. Connect the pneumatic distribution system to the external supply.
2. Make all pneumatic connections to each lamphead cable as necessary. See Figure 20.



Pneumatic supply pressure must be between 5 and 6 Bar. The pressure may be adjusted using the regulator valve. Air must be clean, dry and oil free.

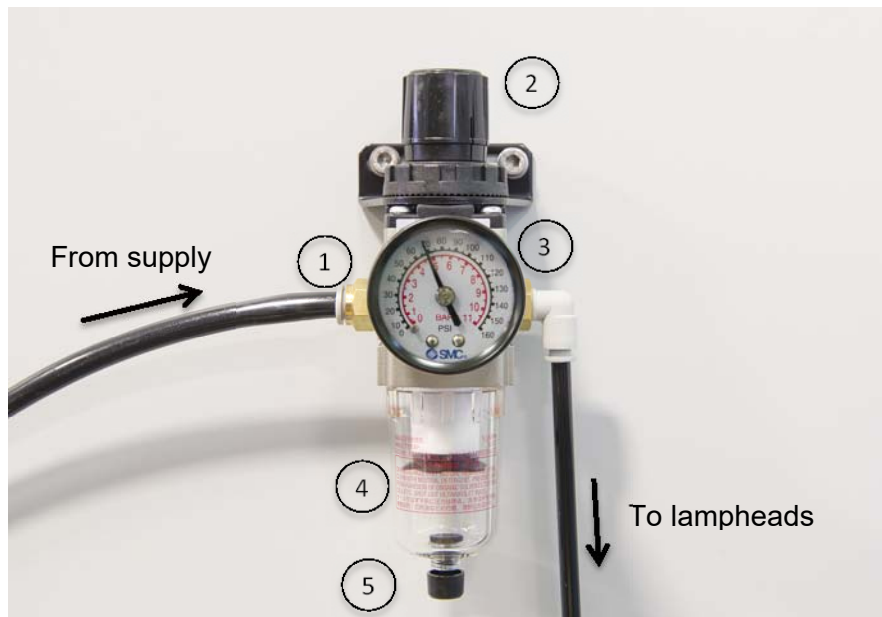


Figure 19: Pneumatic regulator



Figure 20: Pneumatic connections to the lamphead power supply cables

3.12 Connecting the RR to the Cooling Fan(s)

Each GEW cooling fan is connected to the cabinet via a single GEW connector cable that supplies electrical power to the fan. The fan connection cables have male and female connectors at each end that are plugged into the relevant sockets on the fans and the cabinet.

On the 1 & 2-way RR, the fan connector (1) is located on the front face of the distribution unit, marked "FAN".

On the 6 & 8-way RR, the fan connector (1) is located behind the breaker panel, which must be removed in order to connect the fan. See Figure 21.

1. Connect cable to the RR
2. Connect cable to fan

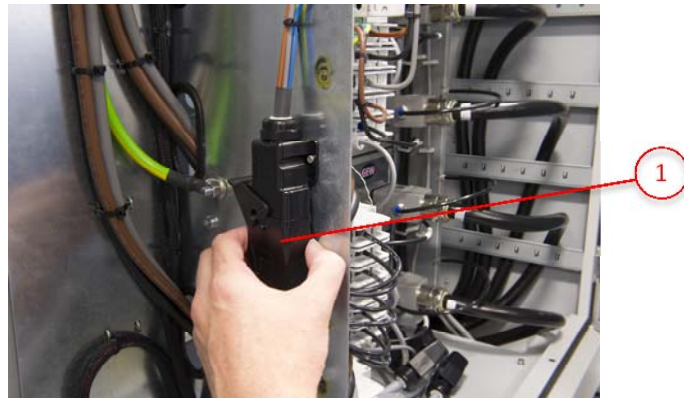


Figure 21: Fan cable connection

Each fan is isolated by a circuit breaker marked "SYSTEM FAN".

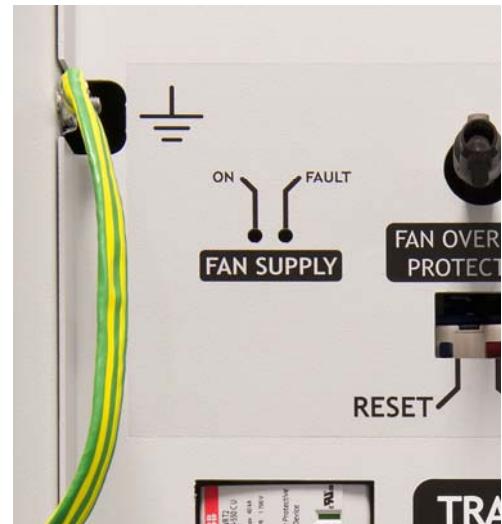
3.12.1 Phase Rotation

If the phase rotation of the power supply to the fan is correct, the ON LED above the FAN SUPPLY indicator will illuminate green and the STATUS LED will illuminate orange. If either fail to illuminate then the phase rotation must be checked by an electrician. See Figure 22.

NOTE: The phase rotation detector LEDs will only be lit when the fan is switched on by the system.



1 & 2-way RR



6 & 8-way RR

Figure 22: Fan supply indicator

3.13 Connecting the RR to the HMI Panel

The HMI panel is connected to the RR via a GEW cable that both powers the HMI and joins it to the CAN Bus. The cable connects to socket "P6 HMI" on the front face of the 1 & 2-way RR. For the 6 & 8-way RR, connection is to the socket shown in Figure 23.

1. Connect cable to RR.
2. Ensure connections are latched shut.

**Figure 23: HMI cable socket on RR (circled)**

The power supply to the HMI may be isolated via the circuit breaker labelled "CONTROL".

3.14 Connecting the RR to the Host Press Interface

GEW UV systems have a standard electrical interface with the host press. Connection is via a GEW custom cable with a connector at one end that plugs into a dedicated socket marked “P1 PRESS” on RPSU number 1. See Figure 24.



Figure 24: Host press interface connection (circled)

3.14.1 Wiring Connection to the Host Press Interface

Connection to the host press must be made in accordance with Figure 25.

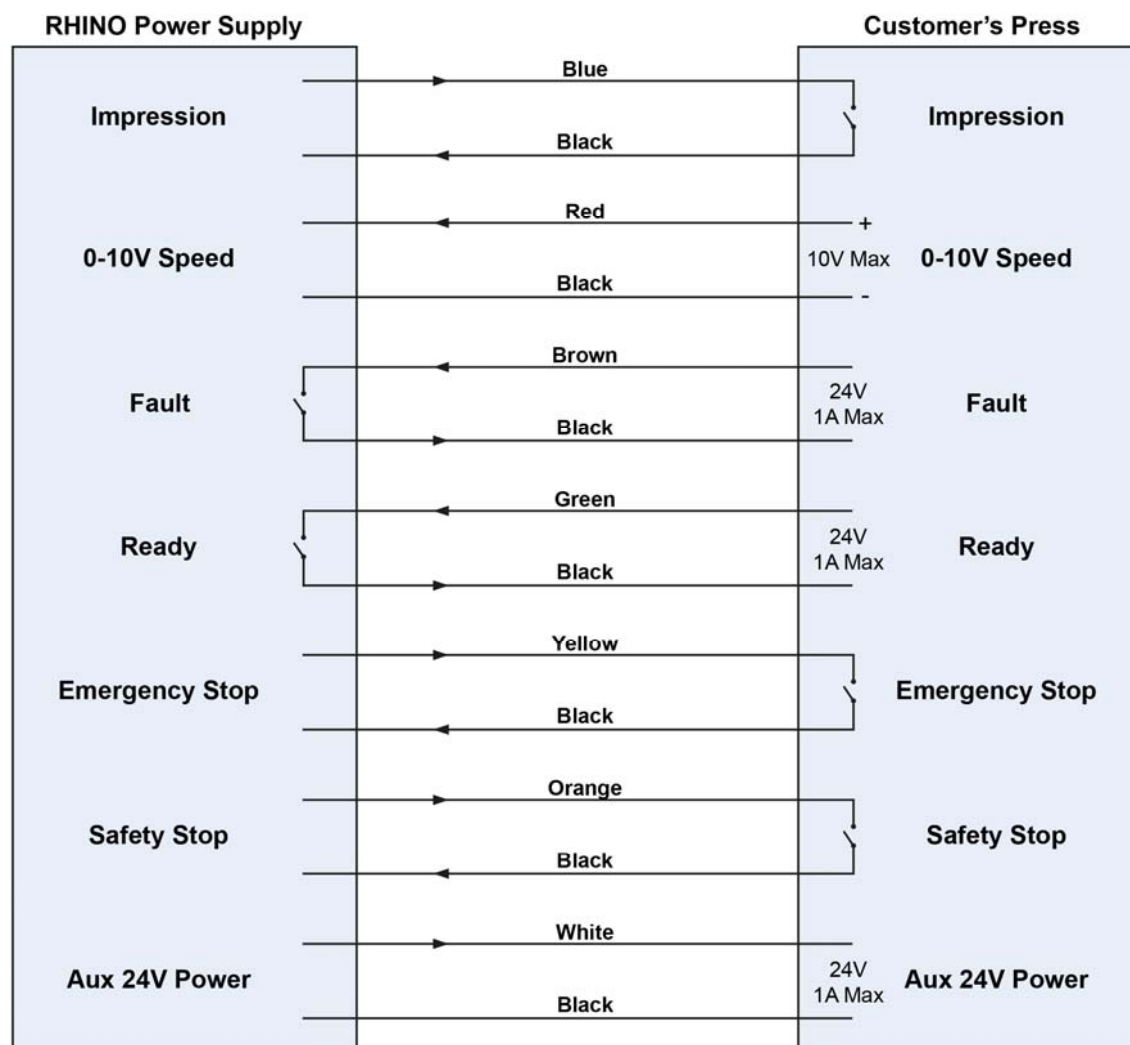


Figure 25: Host press interface electrical connections

1. The 'Press Speed' signal must be within the range of 0-10V DC. Ensure the polarity is correct to prevent damage to the UV system.
2. The 'Fault' and 'Ready' relay contacts in the Rhino are rated to **1A 24VDC max**.
3. To avoid problems with different signal levels and ground connections, volt free or 'dry' relay contacts are used to interface the 'Impression', 'Emergency Stop' and 'Safety Stop' signals from the press, and for the 'Ready' and 'Fault' signals from the GEW UV system.



Caution: Check volt free contacts with a meter to ensure a zero voltage reading prior to making a connection.

3.15 Connecting the RR to a Chiller Interlock

On water cooled systems a chiller interlock connection is made which prevents use of the UV lamps when the chiller is not running. Connection details and functionality vary from system to system.



Refer to the Installation Drawings for this particular installation and make connections as appropriate.

3.16 Post Installation Checks

Ensure loose cabling is secured to cable trays with cable ties.

Coil up any slack in cables and stow so that it does not present a trip hazard. Do not stow cables close to moving parts of the press or sources of heat.

3.17 Completion Checklist



When the power supply system installation is complete fill out the relevant section of the Commissioning Checklist in Module 6 of this manual.

NOTES: