SEC_4811
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OS2 230 V AC Controller

Technical Information & Operating Instructions

Introduction

The OS2 230 V 6A ac Controller forms the basis of the SE Controls mains voltage solutions.

The panel is for single zone applications and is fully CE marked. Environmental Ventilation control panel capable of receiving thermostatic inputs and BMS signals.

These modular building blocks can also be networked across buildings using SE Controls OSlink technology to deliver targeted, intelligent systems.

Expandible through OSlink.

Application

The OS2 AC Controller is a 230 V ac control unit designed for use with 4 wire 230 V ac actuators in a natural ventilation system.

The controller can either be mounted locally to the device to be operated or as part of a centralised group in a plant room.

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Please keep these operating instructions for future reference and maintenance.
Subject to technical modifications. Diagram is not binding.

Contents

Important Notices

- The equipment has no mains on/off switch and is intended for permanent connection only.
- Do NOT allow abuse or mishandling of the device.
- Do NOT adjust or alter the device or its enclosure including labelling/marking.
- Do NOT use this controller for any other purpose other than that intended by the manufacturer.
- Do NOT allow installation of this equipment by persons not electrically qualified.
- Damage to the equipment due to failure to test the electrical integrity of external wiring will invalidate any warranties.
- Failure to install the device in accordance with the manufacturer's instructions will invalidate any warranties.
- Failure to follow current electrical regulations governing the installation of fixed equipment can lead to prosecution and may invalidate any warranties.
- Unless otherwise indicated, you must not adjust or remove existing manufacturers cabling or use terminal outputs or inputs for purposes other than their design without written authorization from SE Controls.
- Consumable items e.g. fuses & batteries where replacement is needed must be replaced with parts of equivalent manufacturing standard/ compliance and rating.

SE Controls accepts no liability for failure to comply with these statements or the installation and operation guidance in the following sections of this guide and reserves the right to invalidate the warranty of the controller

SE Controls reserves the right to introduce any modifications and improvements to the contents of this publication without the obligation of giving prior notice.

1. General Information

1.1. General Safety Information

Read and observe the information contained in these instructions.

Please keep these safety instructions for future reference and maintenance. Reliable operation and the prevention of damage and risks are only granted if the equipment is assembled carefully and the settings are carried out according to these instructions and to the operating instructions of the drives.

Please observe the exact terminal assignment, the minimum and maximum power ratings (see technical data) and the installation instructions.

1.2. Health and Safety

Electrical Safety: Warning 230 V ac mains supply can cause death, serious injury or considerable material damage. Disconnect the equipment from the power supply at all poles before opening, assembling or carrying out any work.

Electrical safety of batteries: Short circuiting of the lead acid batteries can cause high currents to flow which can cause rapid heating and a fire risk. Take care to avoid this when transporting and handling batteries. Keep batteries disconnected during installation and modification of the installation.

Competence: This equipment is designed for professional installation only by qualified, trained and safety conscious electricians or skilled and trained staff with considerable knowledge of electrical equipment installation. These instructions must be followed and retained for future reference.

Application: This equipment is designed exclusively for the purposes of controlling automatically opening smoke ventilation equipment.

Personal Protective Equipment: It is recommended that suitable PPE is worn at all times during the installation and connection of actuator products in accordance with a recommended safe system of work.

Handling and storage: This equipment is heavy. Care must be taken in transportation to the installation location and during fitting. The equipment must not be dropped, impacted, allowed to get wet or abused in any other way. Mishandling can result in serious damage to the housing and the components therein.

Risk of crushing: this equipment can automatically close windows and other appliances without warning. Beware risk of serious injury from crushing of hands or fingers.

1.3. Environment.

Redundant electronic products are classified as hazardous waste under the WEEE regulations (Waste Electrical and Electronic Equipment). Electronic parts must be disposed by an authorised and licensed recycler. They must not be disposed of in household waste or 'general waste' skips.

If recycling facilities are not locally available, contact SE Controls who can arrange for recycling and disposal of old electronic products.

1.4. Maintenance

Ensure that supply voltage and batteries are disconnected before any maintenance work or mechanical/electrical alterations are made.

The system must be protected against unintentional start-up!

After maintenance, modification or repair the system must be functionally retested.

Compatibility; this equipment should only be used to operate with motors and other products approved by SE Controls. No liability will be accepted and neither guarantee nor service is provided if unapproved products are used in conjunction with this equipment.

1.5. Installation and Connection

Installation should be carried out by an authorised, trained and competent electrician.

Ensure correct cable type is used throughout the installation. All low voltage cables are to be routed separately from mains voltage cables and other electrically noisy cables. Flexible cables must not be plastered over and freely suspended cables must be provided with strain relief. Cables must be installed in such a way that they cannot be sheared, twisted, pierced or otherwise damaged during installation or use. Junction boxes should be accessible for inspection and maintenance.

Do not attempt to install or alter the installation of the panel whilst connected to the power supply.

1.7. Fault Finding

In the unlikely event that a problem occurs with the control panel, users are urged to contact SE Controls for assistance.

If the system operates from mains power but when mains power is removed will not operate from batteries, it is possible that the batteries will require replacement.

There are no user repairable parts. Fault rectification must only be carried out by authorised and competent persons.

1.8. Contact Information

For sales, technical support and maintenance please contact:

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Tel: 01543 443060

E-mail: info@secontrols.com

Website: www.secontrols.com

1.9. Certification

SE Controls hereby certify that the parts and services detailed hereon have been manufactured, inspected, tested and supplied in accordance with the conditions and requirements of the procedures as documented in the Company Quality Assurance System to ensure conformance with SE Controls' specifications, and with the contract or order conditions of our BS EN ISO9001:2015 registration.

CE

Our equipment is built and tested in accordance with the requirements of EN12101-10:2005/AC:2007.
Certification may be provided on request.

2. Specification

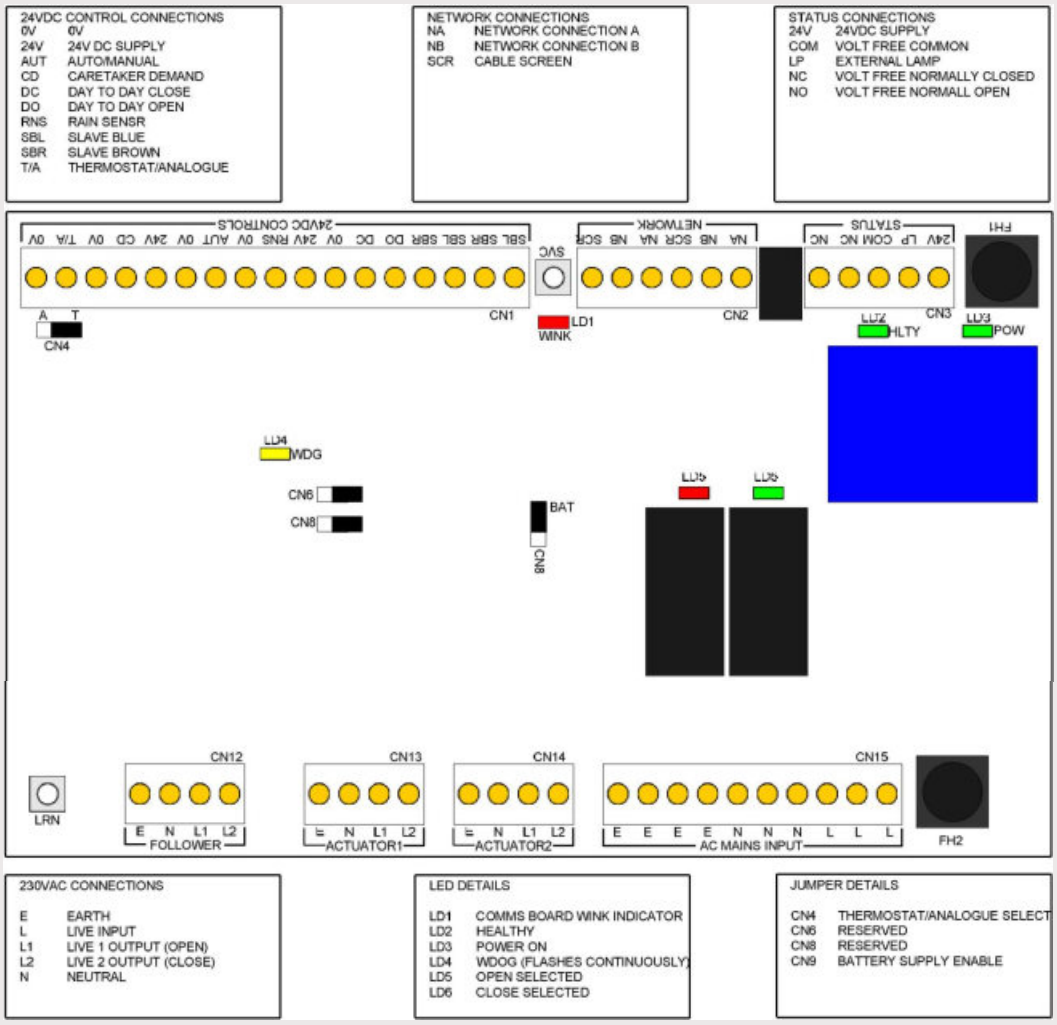
2.1. Device Overview

Part Number	FCS00210001 OS2 230 V 6A ac Controller 1 Zone
Dimensions	220 x 209 x 124 mm (W x D x H)
Power	Class 1
Mass Approx.	2.2 kg (approx)
Supply	230 V ac 50/60Hz from a 6A unswitched spur
Current Rating	6A
Real Time Clock Battery Life	10 Years
IP Rating	IP20
Humidity Range	10% to 90% Non-condensing
Storage	–20°C to + 75°C
Operating Temperature	--10°C to + 50 °C

3. Connections

3.1. Introduction

The following diagram highlights the important features of the OS2 AC controller unit which are covered later in this document.

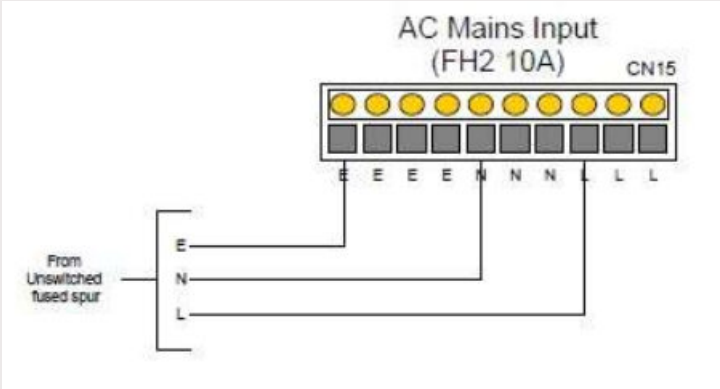


All controller cable terminals have a capacity of 2.5 mm^2 stranded and 4 mm^2 solid core cables.

The installer must not adjust or remove original manufacturers cabling or use terminal outputs or inputs for purposes other than their design purposes without the written authorization from SE Controls.

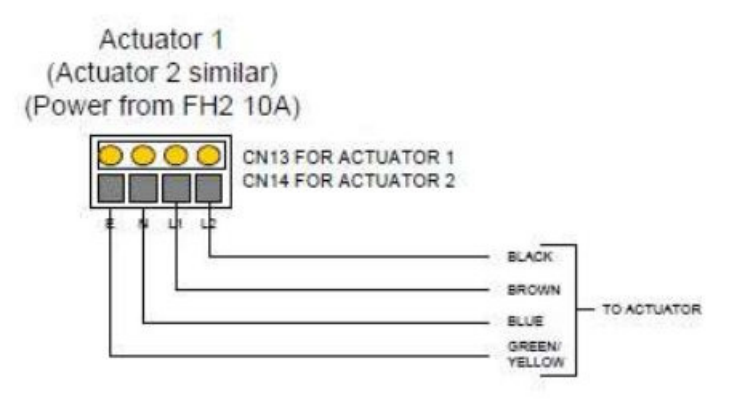
3.2. Mains Power Connection

Connect the 230 V ac supply to the controller using a flexible cable (2 core + earth) of suitable cross section to the L, E and N terminals as shown. This cable should be capable of carrying the actuator load current up to a maximum of 6A @ 230 V ac.



3.3. Actuator Connections

Two terminal blocks are supplied for the connection of actuators to the controller. If connecting to more than two actuators, then external junction boxes will be required.



Connection to the actuators is made using 3 core + earth cable of suitable cross-section to carry the maximum actuator current.

In operation, the actuator power is timed off automatically after a period defined for the mode of operation. For Caretaker, Rain and Thermostat demands this period is 180 seconds (Factory adjustable). For day to day and 0-10 V demands the default period is 18 seconds (Factory adjustable).

The default actuator output mode is for motor open/motor close actuators. Other devices (such as magnetic catches) can be selected at the factory by SE Controls.

3.4. Control Connections

Each controller can operate either as a stand alone unit or as part of a BMS managed control system. To allow for this level of control complexity, 7+1 control inputs are provided in the basic controller.

The following list identifies the 7 controls in their priority order;

Caretaker Demand
Slave Demand & Follower Demand
Rain Sensor Demand
Day to Day & Thermostat & 0-10 V analogue

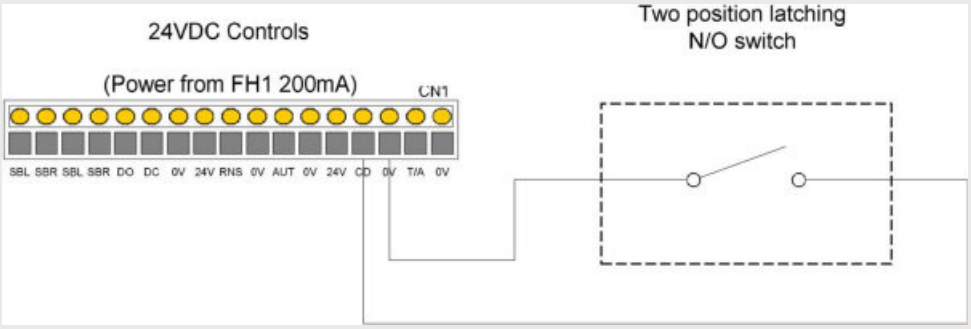
In addition to this further manipulation of the inputs is provided by the Auto/Manual selection input.

All control connection devices must be volt-free and capable of switching 24 V dc at a nominal current of 10mA.

Cable distance is not of any real concern. However, it is recommended that the maximum control cable distance be limited to around 500 M.

3.5. Caretaker Demand

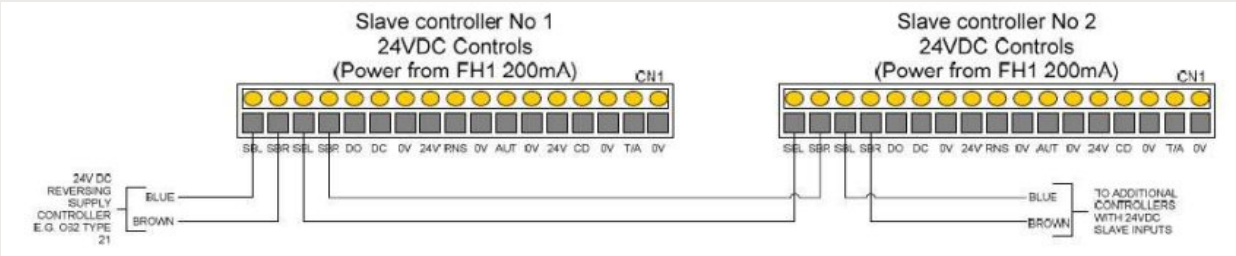
Connecting CD to 0 V will cause the controller to close all attached actuators. The controller will not respond to any other inputs until CD is disconnected.



The actuator power is automatically timed off after a period of 180 seconds (factory adjustable). This is a sufficient length of time to ensure most actuators achieve their fully closed position.

3.6. Slave Inputs

The slave inputs are designed to operate at 24V dc voltage levels. Connecting SBL and SBR to the 1BL and 1BR outputs of an OS2 type 21 controller (see typical arrangement below) will cause the local controller to act as a slave of the type 21 unit. A 2 core cable is required to make this connection.

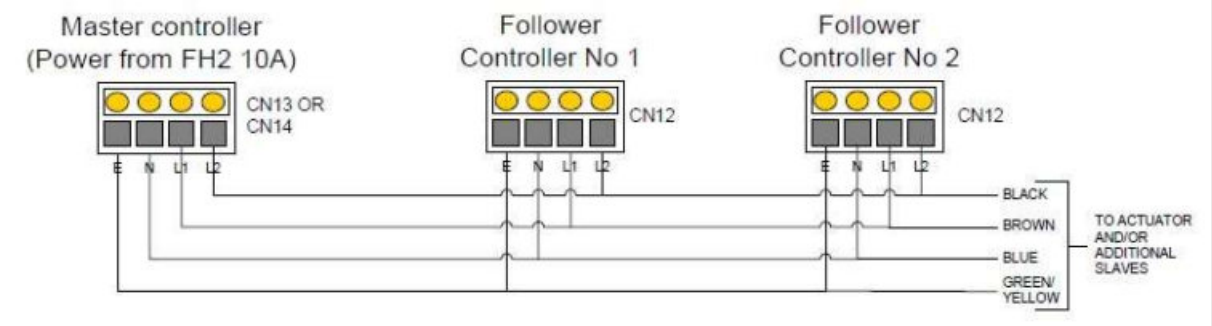


In operation, the controller mimics the input demands as output demands but converts them from a reversing 24 V dc signal to the switching L1 and L2 ac signals required for 230 V ac actuators.

3.7. Follower Inputs

The follower inputs are designed to operate at 230 V ac voltage levels. Connecting E/N/L1/L2 between master and slave controllers (see typical arrangement below) will cause the local controller to act as a slave of the master unit.

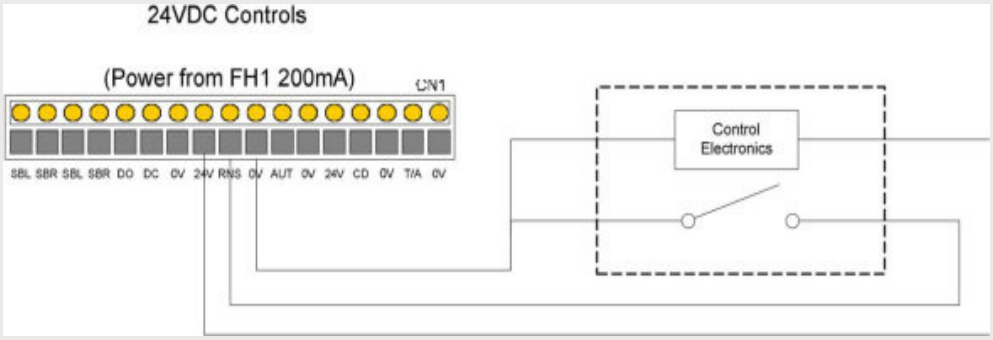
A 3 core + earth cable is required to make this connection



3.8. Rain Sensor

Connecting RNS to 0 V will close all attached actuators. By default, the thermostat, Day to Day and 0-10V inputs are all ignored under this condition. The lockout of the Day to Day input and 0-10 V inputs can be modified at the factory by SE Controls.

By default, breaking the connection between RNS and 0 V will not alter the position of the actuators (factory adjustable).

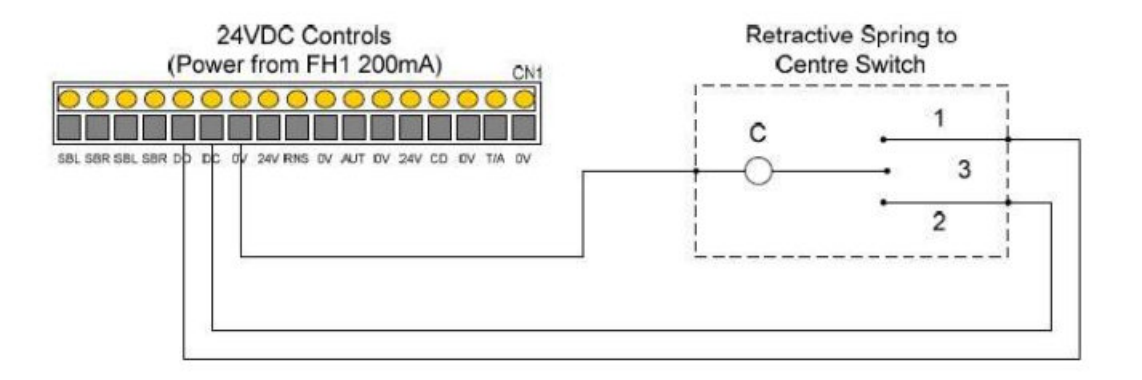


In operation, the actuator power is automatically timed off after a period of 180 seconds (factory adjustable). This is a sufficient length of time to ensure most actuators achieve their fully closed position as required.

To prevent 'machine gun' operation of the actuators, rain sensor movements are also subject to the 180 second (factory adjustable) lockout period, during which period other rain sensor input changes are ignored.

3.9. Day-to-Day Switch

Connecting DO (open) or DC (close) to 0 V will open or close all attached actuators. It is recommended that a retractive 3 position switch having 2 normally open contacts is used.



In operation, power is applied to the actuator only during the period when one of the contacts is closed. This mode of operation is factory adjustable by SE Controls.

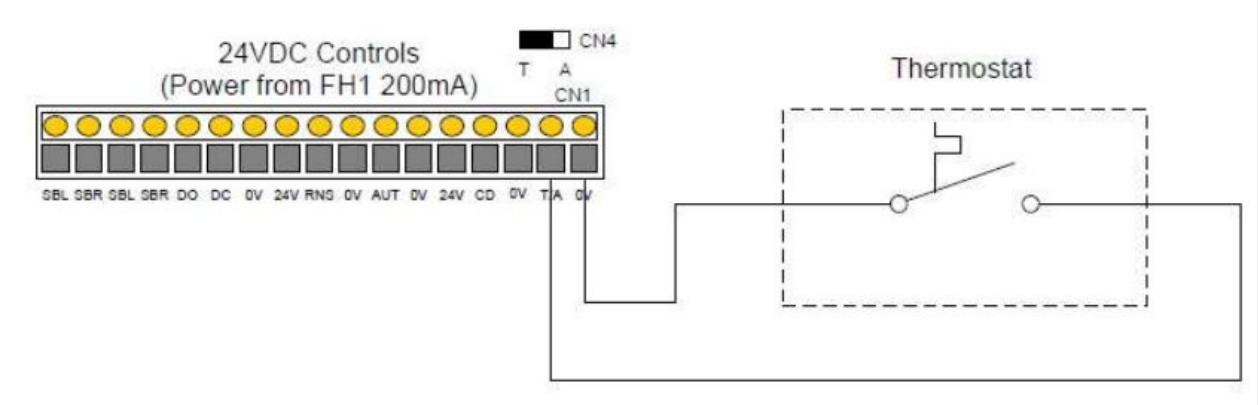
In the open direction, the actuator power is automatically timed off when a total period of 18 seconds (factory adjustable) is exceeded.

In the close direction, the actuator power is automatically timed off when the controller believes the actuator is closed. In practice due to start-up/ stopping delays in the actuators mechanics, this may not coincide with the physical fully closed position. If this is the case, closing the DC connection again will apply power in the close direction to the actuator but will time off after a period of 180 seconds (factory adjustable) to guarantee the fully closed position is reached

3.10. Thermostat

For the thermostat input to operate correctly, ensure that the jumper on CN4 is set at 'T'.

Connecting T/A to 0V will open all attached actuators. Breaking the connection between T/A and 0V will close all attached actuators.



In operation, the actuator power is automatically timed off after a period of 180 seconds (factory adjustable). This is a sufficient length of time to ensure most actuators achieve their fully open or closed position as required.

To prevent 'machine gun' operation of the actuators, all thermostat-controlled movements are subject to a 180 second (factory adjustable) lockout period, during which period other thermostat input changes are ignored

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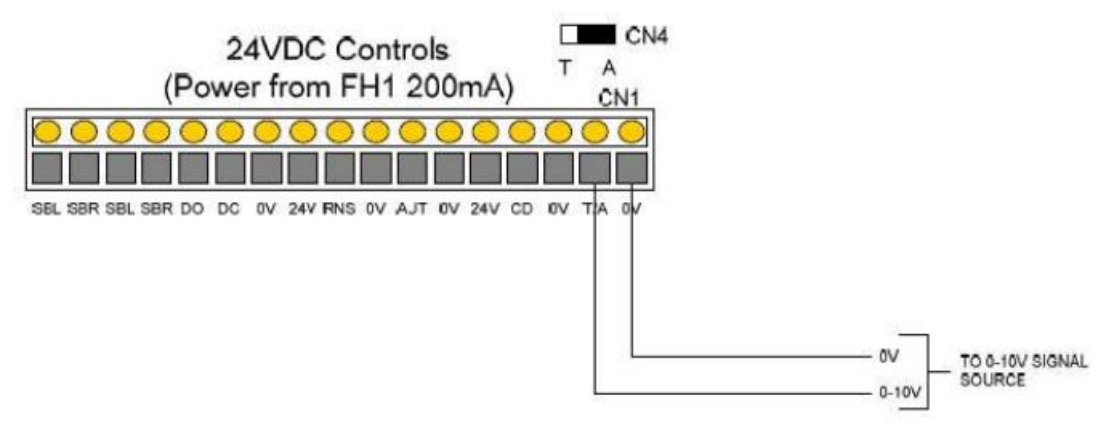
3.11. 0-10V Analogue Input

For the BMS input to operate correctly, ensure that the jumper on CN4 is set at 'A'.

Applying a voltage in the range 0-10 V to the T/A input relative to 0 V will cause the controller to move the actuator to a position which assumes 1V==10% opening.



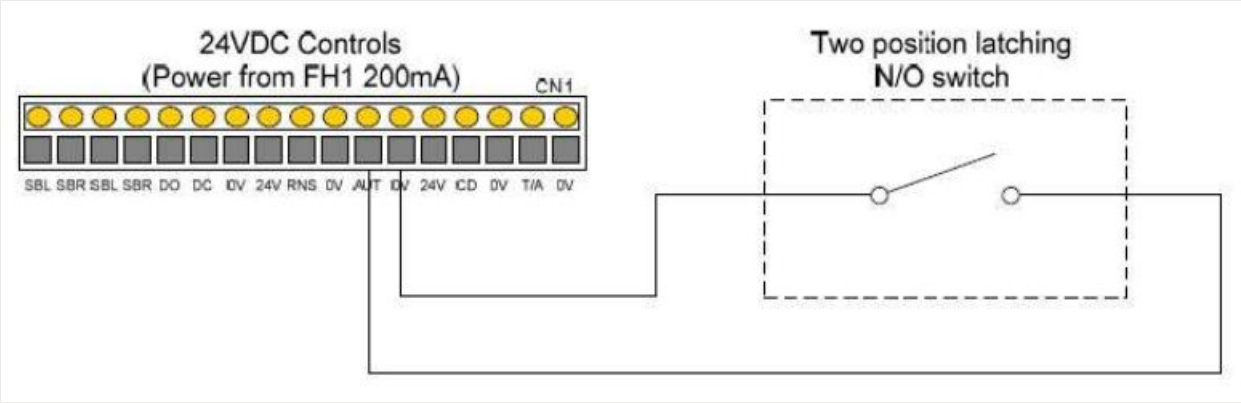
In operation, the controller calculates the required position using the equation (input voltage)/10*18, where the 18 seconds element can be adjusted at the factory be SE Controls.

The exception to this is if the input voltage is set to 0 V. In this case, the controller will apply power in the close direction to the actuator but will time off after a period of 180 seconds (factory adjustable) to guarantee the fully closed position is reached.

By default, the 0-10 V input is assumed to be an automatic control but can be adjusted at the factory by SE Controls to be a manual control.

3.12. Auto/Manual Input

Connecting AUT to 0V will place the controller in automatic mode. Breaking the connection will place the controller into manual mode.

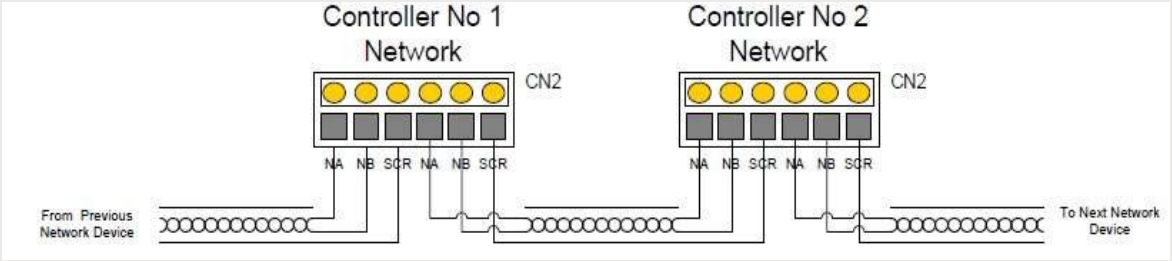


In manual mode, all input controls will operate (thermostat, Day to Day and 0-10 V). In automatic mode only automatic controls will operate (thermostat and 0-10 V). Auto/manual changeover does not effect the operation of the Caretaker and Rain sensor inputs.

To prevent confusion by a user of the Day to Day controls, each time this input is used, a timer with a 1 hour period (factory adjustable) is started. While this timer is running, the auto controls are locked out. If it is necessary for an automatic control to be used whilst the timer is running, the connecting and then breaking the connection between AUT and 0V resets the timer allowing automatic controls to operate once again.

3.13. Network Connection

Connections NA, NB and SCR are used for forming network connections between controllers.



The use of networking requires the installation of an OSLink card and reference to their individual user manuals which are outside the scope of this document.

4. Fault Finding

4.1. Indicators

LED	Colour	Detail
LD1 WINK	Red	Factory use only.
LD2 HLTY	Green	Healthy Lamp - Lit when the controller has not identified any internal faults.
LD3 POW	Green	Lit when Mains supply is connected.
LD4 WDG	Yellow	Watchdog - Flashes to indicate software running in controller OK.
LD5 OPN	Red	Lit when output energized to open
LD6 CLS	Green	Lit when output energized to close

4.2. Volt-Free Status Connections

CN3 Terminal	Description
COM	Healthy Relay Common
NC	Healthy Relay Normally Closed(open when healthy)
NO	Healthy Relay Normally Open(closed when healthy)
24 V	Power supply rail for driving an external indicator or relay
LP	Switch to ground output for driving an external indicator or relay.

4.3. Fuses

Fuse	Function	If Open Circuit
FH1	ELV Auxillary Supply 200 mA	
FH2	AC Supply 10 A	

Note: If a fuse does blow, please check wiring/ external devices for damage and incorrect termination/earth faults.

SE CONTROLS

Creating a healthier & safer environment

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