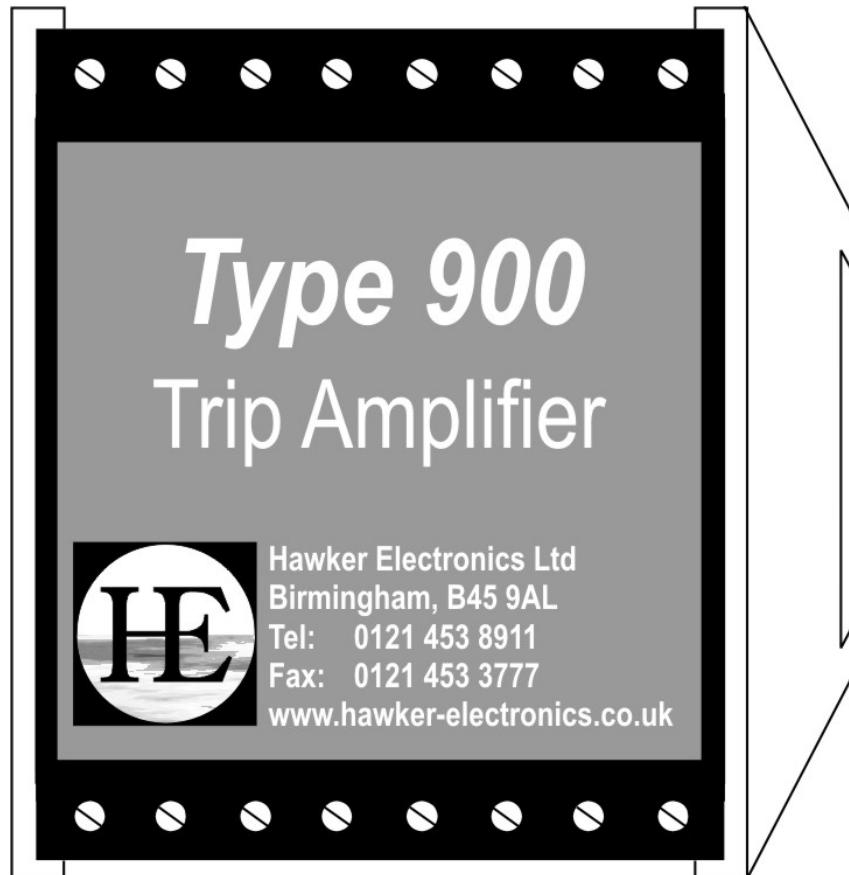


Installation and Setting up Instructions for the Type 900 Dual Channel Trip Amplifier



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1.0 General Description

The Type 900 is a dual channel trip amplifier which accepts a signal from a vessel mounted sensor and operates individual relays anywhere over its input range. When in 'run' mode the 4 digit LCD gives a real time reading of the signal from the transmitter. When in 'Programme' mode the LCD provides the user with a menu system to precisely set the relay ON/OFF points and other parameters. Programming is achieved via 4 facia push buttons.

Applications include Alarm, Control, Pumping IN and Pumping OUT, fail safe HIGH and/or fail safe LOW. The Type 900 provides DC power for the input sensor which is current limited. The input signal is normally a mA current direct from a sensor.

Important Information

This equipment should only be specified, installed and commissioned by suitably qualified persons. This product contains no user serviceable parts, removing the product from its enclosure, modification or using other than outlined in the manufacturers guidelines in any way invalidates the warranty and safety features. The electrical installation should comply with local regulations. Ensure the correct instructions are used for the version fitted.

2.0 Mounting, Electrical Installation and Connection

The Type 900 can be mounted using the snap fastener DIN rail or by a screw fastenings using the hole slots on the lower left and upper right external corners of the enclosure. The product is intended to be mounted with the power terminals at the bottom of the enclosure. An air gap of 10mm minimum should be available around the enclosure perimeter for proper air circulation to prevent overheating.

The Type 900 should not be mounted close to heat sources; electrical noisy apparatus e.g. welding machines and inverter drives; locations subject to strong vibrations or shocks; dusty or corrosive gas environments; outdoors in direct sunlight or high humidity areas.

The crossed out bin symbol placed on the product reminds you of the need to dispose of the product correctly at the of its life.



Maintenance is not required for this product other than periodic testing if demanded by the application. External cleaning can be preformed using a mild detergent care should be taken not to clean the product with aggressive substances they may damage the enclosure, terminals or label. Cleaning should be performed with the power to live connections disconnected by means of isolation.

2.1 Connection

The Type 900 is available as a DC or AC version (factory set). The lower terminal block is for connection of the users power supply input to the product and the Type 900 volt free relay contacts outputs. The upper terminal is the connection to the input sensor.

The power and relay cables can be either single cores or multi core, this product does not require an earth connection. All cables should be rated electrically suitable (see data specifications) and mechanically robust enough for the application. The input sensor cable will normally be pre-fitted to the sensor itself. If this cable is screened the screen can be connected to the signal 0V terminal if required. The screen should be connected at one end only and if possible at the controller end.

The power supply to the 900 should be via a local external isolator and fuse. This is also applicable to the relay contacts especially when switching hazardous voltages. This enables the 900 to be safely disconnected if required, as well as providing over current protection.

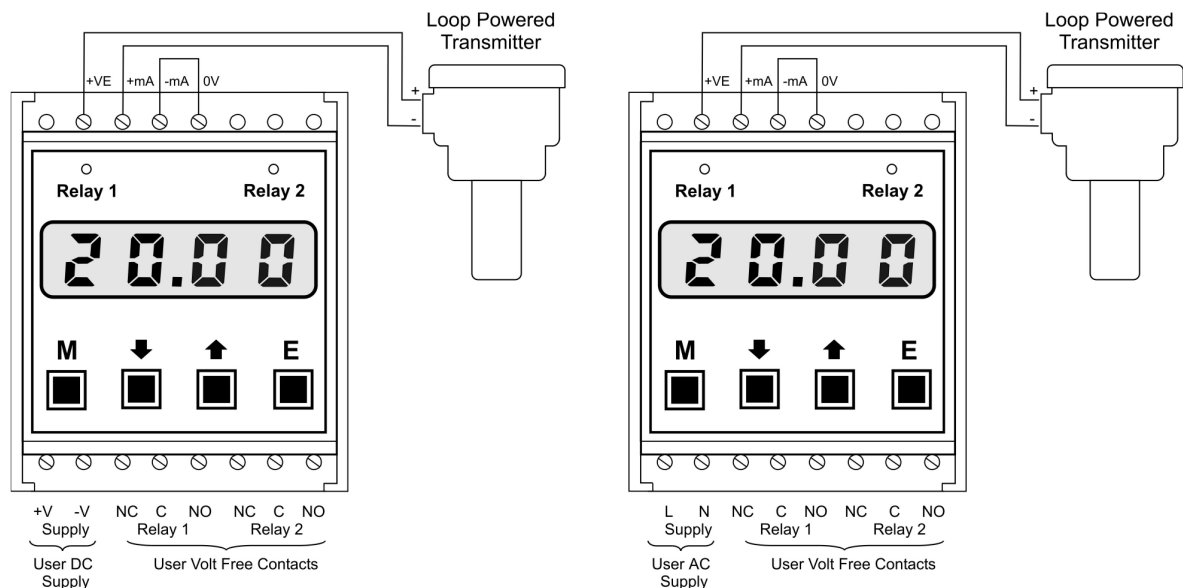


Caution risk of danger symbol. This symbol if shown on the product label indicates the terminals marked 'supply' and 'relay' may contain hazardous voltages, depending on the model and users application. Identify and Isolate before connecting or disconnecting.

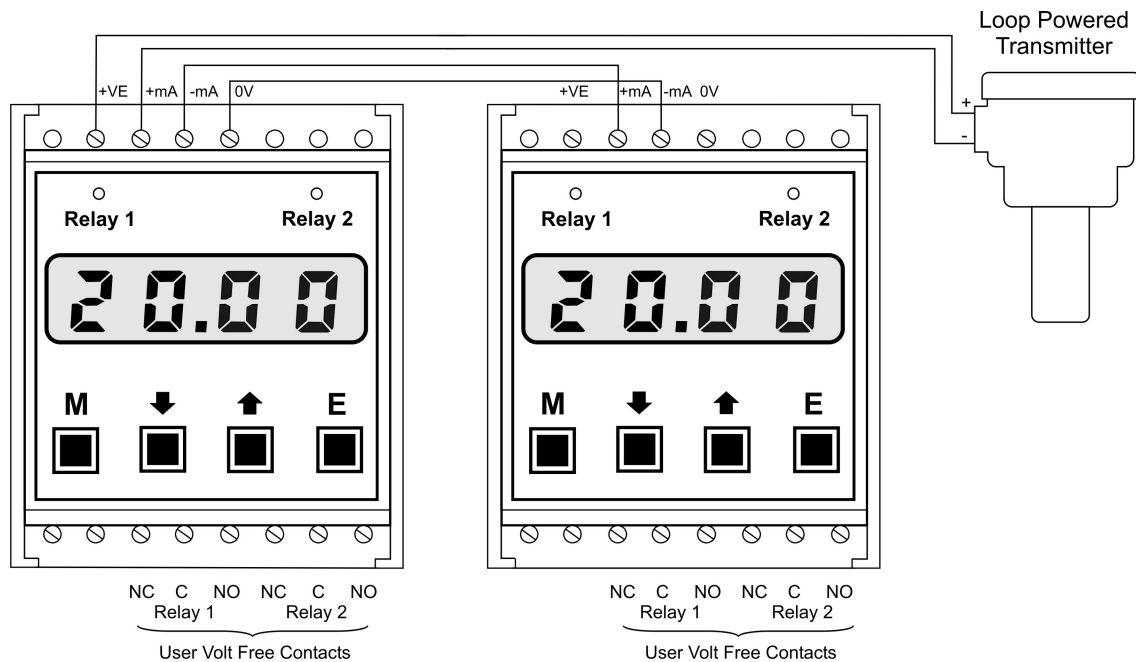
The installation should comply with local regulations.

Fig 1 Wiring Connections

Always confirm the connections with the products terminal block label before connecting as positions may vary depending on model. The Type 900 is available as a DC or AC powered version which is specified on order.



Multi Type 900's can be used for more demanding applications that require additional relay outputs by connecting the transmitter loop in series as follows.



4. Programming the Type 900

On some models when initially powered the LCD may briefly display the software revision number. e.g. **r1.0**

There are two modes of operation

Run Mode This operation identified by the decimal point blinking periodically, ON for approx 4 seconds then OFF for 1 sec.

Prog Mode Programme mode is entered to set the user adjustable options.

Programming is simple with only 5 user configurable options and an exit.

Display	Description
'r1on'	Relay 1 ON point This is the value that relay 1 will energise.
'r1of'	Relay 1 OFF point This is the value that relay 1 will de-energise.
'r2on'	Relay 2 ON point This is the value that relay 2 will energise.
'r2of'	Relay 2 OFF point This is the value that relay 2 will de-energise.
'LSD'	LSD ON or OFF Least significant digit for the LCD only. The default is ON.
'Fin'	Finished programming, press enter, exits programme mode and returns to run mode.

Programming the Type 900

1. Enter programme mode by pressing the 'M' key for approx 5 seconds. Each of the 6 menus can be accessed in the order above by pressing and releasing the 'M' key.

This is an example of setting Relay 1 ON point

Enter programme mode as in (1) above.

The LCD will display 'r1on', press 'E', the current value will be displayed, use the up and down keys to enter the new value, press 'E' when done to enter new value, the LCD will briefly display 'done' then go back to the main menu and display 'r1on'. Press and release 'M' until the LCD reads 'Fin', press 'E' this will exit programme mode and return to 'run' mode.

This can be repeated for each relay as necessary.

The LSD menu option (least significant digit)

The real time input signal display default is 4 digits and when the relay ON/OFF points are programmed it is always 4 digits. This gives the best possible resolution and control of the relays, i.e. their ON/OFF operation will be exactly as programmed to the least significant digit (00.01mA). However sometimes due to application turbulence it may be less of a distraction to display only 3 digits, this is achieved by turning the LSD OFF (UP key toggles in the programme menu). Under these conditions it must be remembered that the relays will operate at the programmed values and not the 3 digit value. This only effects the display and not the relay set points.

Additional Notes on Programming

When adjusting the ON/OFF points the counter rolls from min to max and vice verse this saves time.

The counter use's a speed key function that increases the speed it is counting at if the UP or DOWN button is continually pressed for a few seconds or more. When the counter is getting close to the desired value release the key and then use individual presses and releases for precision adjustment.

User parameters are stored in non volatile memory so will be retained if the Type 900 loses power.

If power is lost during a cycle reapplying power will be treated as an initial power up i.e. the input will be compared with the relay set points and the cycle restarted.

The fail safe of the Type 900 is automatically determined by the relay set points. If the ON point is greater then the OFF point it is failsafe LOW, if the OFF point it is greater than the ON point it is fail safe HIGH.

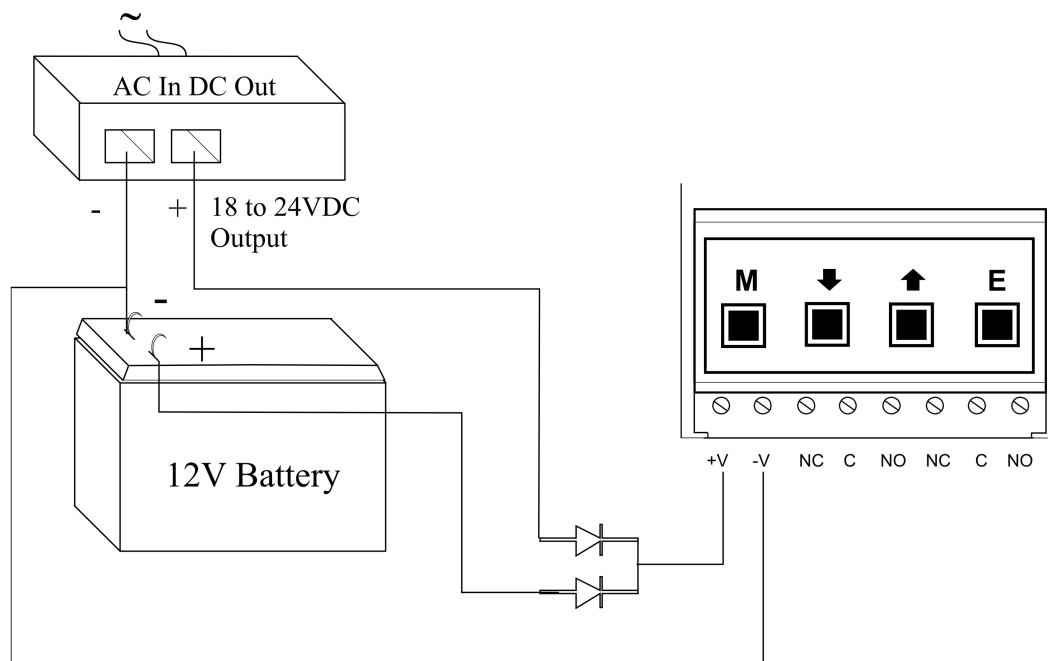
Errors

- ‘Err’** message This is only displayed when in run mode and there is a problem with the relays. The most common cause is one or both of the relays ON and OFF points are the same.
- dp** not blinking If the decimal point is not blinking the unit may have been unintentionally left in program mode. Press the **‘M’** key repeat until **‘Fin’** is displayed the press the **‘E’** key, this will exit programme mode Alternatively momentarily turn the power **OFF** and then back **ON**.

Power Backup System

Uninterrupted systems can be implemented using a backup battery, If a backup system is required it would be normal to specify a DC model. The normal configuration is to use 18VDC to 24VDC derived from an AC power supply and a 12VDC external battery. When mains AC is present the Type 900 operates from the DC output from the mains AC power supply, when the mains AC fails the Type 900 operates from the battery. It is essential to put a diode such as a IN4001 in series with each of the +V supplies to the 900, see diagram below. Optionally a solar panel could be used as well as a recharging system.

NOTE: If power falls then it may be the case where the relay contacts lose their voltage too. Backup systems are useful where supplies are from different sources or the Type 900 relays are used to drive other relays for control and indication.



EU DECLARATION OF CONFORMITY

1. **Product Model:** 900 Trip Amp, 920 Auto Sequencer
2. **Manufacturer:** Hawker Electronics Ltd, 57 The Avenue, Rubery Industrial Estate, Rubery, Birmingham, B45 9AL
3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**
4. **Object of the declaration:**
5. The object of the declaration described above is in conformity with the relevant **Union harmonised legislation:**
 - **Low Voltage Directive (2014/35/EU)**
 - **EMC Directive (2014/30/EU)**
 - **RoHS Directive (2011/65/EU)**
6. Reference to the relevant **harmonised standards** used in relation to which conformity is declared:
 - LVD EN 61010-1:2001, Safety requirements for electrical equipment for measurement, control, and laboratory use, general requirements
 - EMC EN 61326-1:2006, Specification: CISPR 11 Conducted emissions, CISPR 11 Radiated Emissions, EN 61000-3-3 Voltage Fluctuations and Flicker, EN 61000-4-2 Immunity to Electrostatic Discharge, EN 61000-4-3 Immunity to Radiated Fields, EN 61000-4-4 Immunity to Fast Transient Bursts, EN 61000-4-5 Immunity to Surges, EN 61000-4-6 Immunity to Voltage Dips & Interruptions. Results: Radiated Emissions – Class B - Pass, Conducted Emissions - Class B - Pass, Mains Harmonics - Class A - Pass, Voltage Fluctuations and Flicker - Pass, Radiated Immunity- Pass, Fast Transient Bursts - Pass, Conducted Immunity - Pass, Voltage Dips & Interruptions - Pass
7. **Notified Body:** N/A
8. **Additional Information:**

The product named above complies with the parts of the standards listed. The company operates an internal production control system that ensures compliance between the manufactured products and the technical documentation. EMC compliance may be based on similar products or variants that have satisfactory completed full testing. RoHS compliant components are used in the manufacture of the product.

Signed for and on behalf of:

Hawker Electronics Ltd on 20th April 2016



J J Slevin (Managing Director)