

Signal Isolators

Single Output Type B12-Si2
Dual Output Type B12-Di2

Installation Guide



Document Ref: UDB12-Si2.vp Rev 0



WARNING!

It is important that this guide is read and fully understood before attempting installation or commissioning of the instrument. Instructions appearing in this document, and current safety legislation, must be observed to ensure personal safety and to prevent damage to the instrument or equipment connected to it.

The instrument should be installed, commissioned and operated only by suitably qualified and authorised personnel.

- The specifications for the instrument must not be exceeded. If the instrument is used in a manner not specified, the protection provided by the instrument may be compromised.
- The instrument must be installed in an enclosure that provides adequate protection against electric shock.
- Ensure that power to the instrument is switched off and signal wiring isolated from hazardous voltages before carrying out installation or maintenance.
- The instrument is designed for installation in a clean, dry environment (Pollution degree 1).
- Stroud Instruments Ltd strongly recommends that repairs and re-calibration work are done on a return to factory basis in order that our quality standards, product specifications and safety precautions are not compromised.

The instrument is double insulated

Note: Clean only with a dry soft cloth.

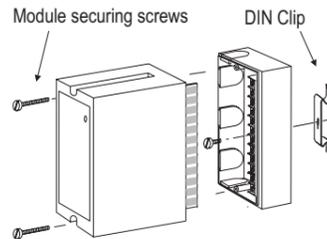
Safety and EMC information

Safety: EN61010 -1
Immunity: EN50082-1
Emissions: EN50081-1
CE certified

Installation

Location

- The instrument is designed for installation in a clean, dry environment, fixed to a flat surface using two 4mm screws, or clipped to a TS35 / TS35D DIN rail using the clip supplied.
- Do not install near to switchgear, motor controllers or other sources of strong magnetic fields.
- Avoid exposure to direct sunlight and ensure the ambient temperature inside the enclosure that the unit is mounted in will not exceed our specification.



Access to fixing points and terminals

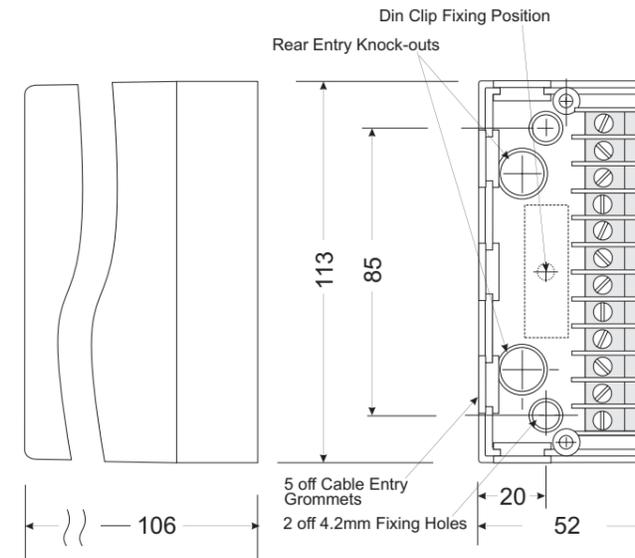
Removal / refitting of plug-in module

To gain access to fixing points, terminals and User adjustments:

- (i) Remove the plug-in module securing screws.
- (ii) Gently pull away the plug-in module from the base section.
- (iii) To refit the module, align the module edge connectors with the socket in the base and carefully press home.

NB To avoid damage to the plug-in module, do not overtighten the securing screws.

Dimensions and fixing positions

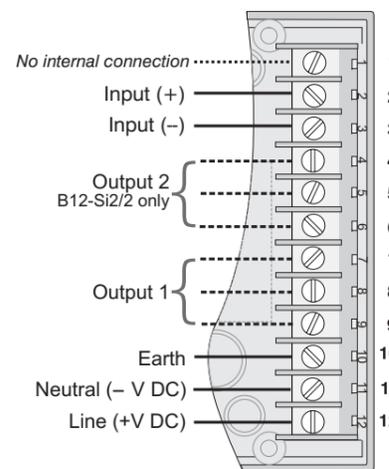


Wiring and connections

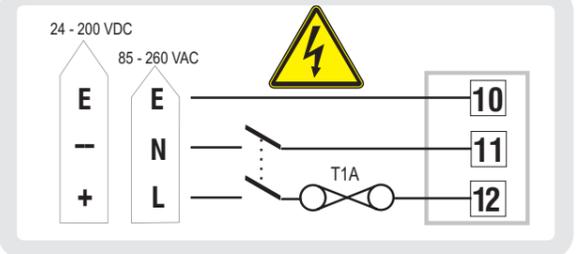
- Segregate power supply and signal wiring.
- Use screened cable for all signal wiring with the screen earthed at one end only.
- All connections should be made using ferrules to avoid short-circuits between adjacent terminals.
- This instrument is equipped with a universal power supply and may be operated from either of the following supply ranges:
DC supplies: 24 VDC to 200 VDC or AC supplies: 85 VAC to 260VAC
- Power supply wiring to the instrument should be protected by a 1A time-delay fuse fuse and double pole switch - *see below*. The switch should be clearly marked as the isolating switch for the instrument.

Terminal assignments

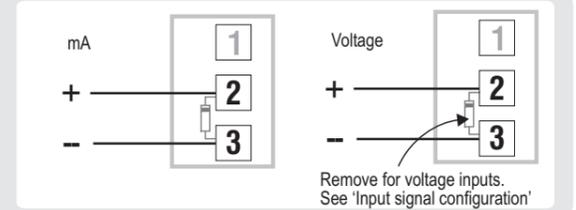
For further details see the following connection details.



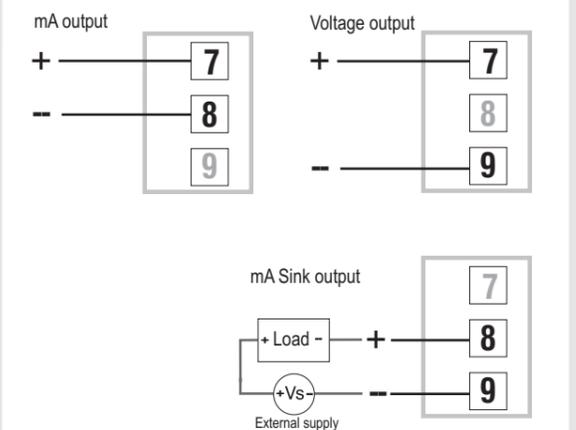
Supply



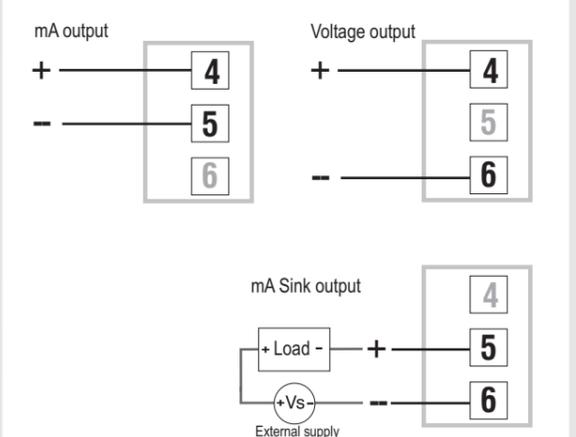
Input



Output 1



Output 2 - (B12-Si2/2 dual output type only)



Configuration

If calibration / configuration data is specified at the time of ordering i.e. a Type B12-Si2 /9 or B12-Di2/9 is ordered, ranges will have been factory set and tested. In this case the relevant details will be given on the data label fixed to the side of the unit. If configuration data is not specified, i.e. Type B12-Si2 or B12-Di2 is ordered, the unit will be supplied set as follows:
Input: 4-20mA, **Output 1:** 4-20mA, **Output 2 (B12-Di2 only):** 4-20mA.

Internal configuration settings

- NOTES:**
- The following procedures require the case to be opened
 - Without trimming, the front panel accessible 'Span' and 'Zero' controls the range change may introduce an error of typically 1%.
 - Other than the jumper links there are no other internal adjustments available to the user. Do not attempt to adjust any trim pots.

WARNING: Isolate from power supply and any potentially hazardous signals before commencing this procedure.

Opening the case

- Turn off all power to the unit and isolate all potentially hazardous signals.
- With the plug-in module removed from the base section (see 'Access to fixing points and terminals, Removal / refitting of plug-in module'), the plate with the terminal connections label can now be removed by easing apart the longer sides of the module to release the interlocking tongue and groove.
- Note the location of the printed circuit board(s) which must be replaced in the same position. Withdraw the board(s) from the module.

Input signal configuration

For **Voltage inputs** remove the component installed between terminals 2 and 3. Alternatively, it may be 'parked' by moving its tag on terminal 2 to terminal 1. This component maintains the loop on mA inputs when the module is removed from its base section.

Main board (applicable to both single and dual output versions)

- Ref. Fig 1, '**Input full scale**', set the jumper link to the full scale range of the input signal e.g. to the '20mA' position for 0-20mA or 4-20mA input signals.
- Ref. Fig 1, '**Input zero type**' set the jumper link to 'True zero' or 'Raised zero' as required.

Sub board (applicable to B12-Di2 dual output version only)

- Ref. Fig 2, '**Input zero type**' set the jumper link to the same position as used in step 2 above.

Output signal configuration

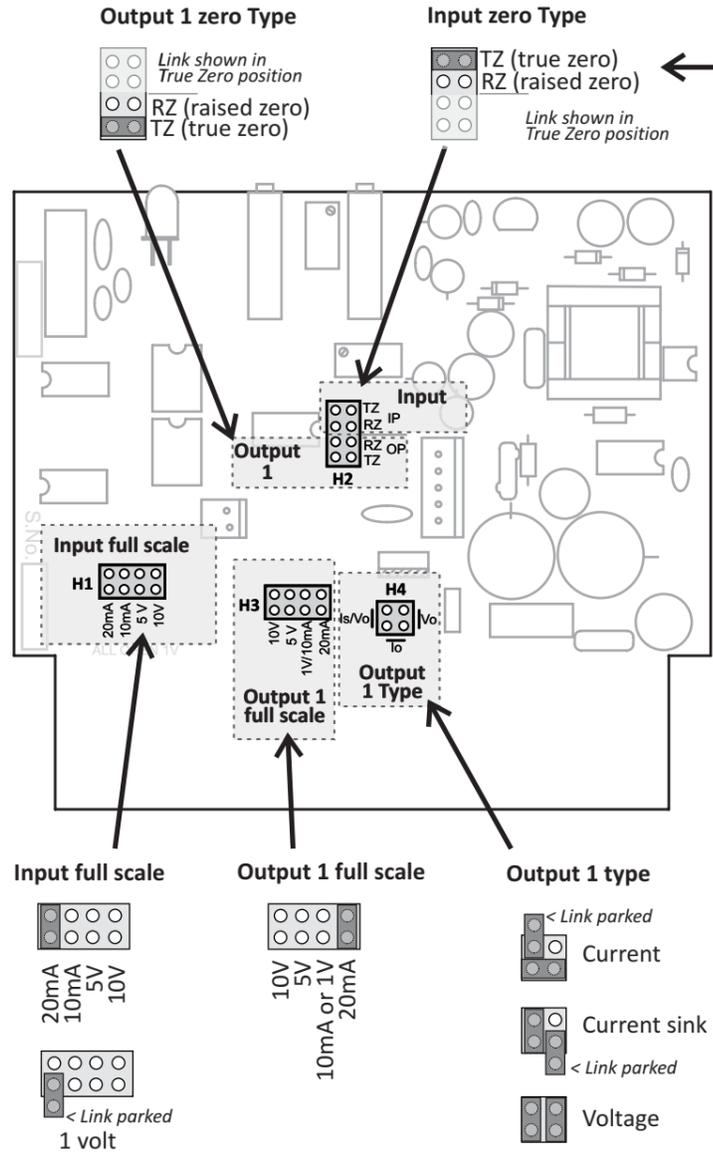
Output 1 - (Main board)

- Ref. Fig 1, '**Output 1 full scale**', set the jumper link to the output full scale range required e.g. to the '20mA' position for 0-20mA or 4-20mA input signals.
- Ref. Fig 1, '**Output 1 zero type**' set the jumper link to 'True zero' or 'Raised zero' as required.
- Ref. Fig 1, '**Output 1 type**' set the jumper link to *current*, *current sink* or *voltage* as required.
- Re-check your link selections and, referring to '**Re-assembly**', replace the PCB(s) into the case.

Output 2 - (Sub-board, B12-Di2 dual output version only)

- Ref. Fig 2, '**Output 2 full scale**', set the jumper link for the output full scale range required e.g. to the '20mA' position for 0-20mA or 4-20mA input signals.
- Ref. Fig 2, '**Output 2 zero type**' set the jumper link to 'True zero' or 'Raised zero' as required.
- Ref. Fig 2, '**Output 2 type**' set the jumper link to *current*, *current sink* or *voltage* as required.
- Re-check your link selections and, referring to '**Re-assembly**', replace the PCB(s) into the case.

Fig 1. Main board configuration settings (single and dual output types)



WARNING - Electric shock hazard
 Do not attempt to adjust the front panel accessible 'Span' and 'Zero' controls with the unit out of its case.

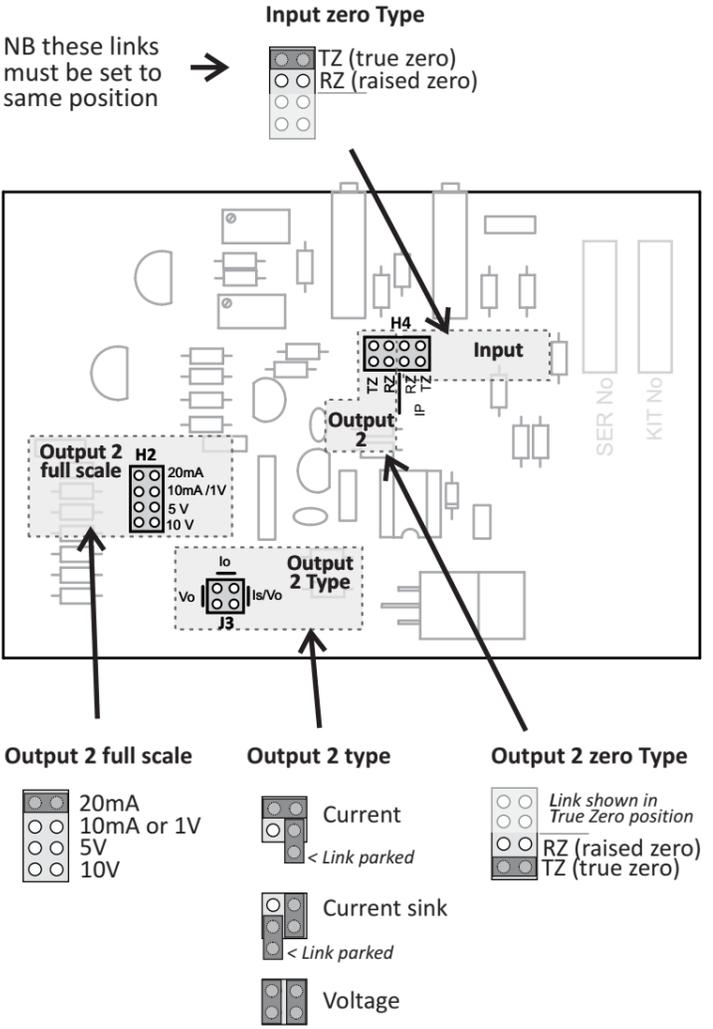
Re-assembly

- Type B12-Si2**, Replace the circuit board into the case ensuring that it is located in the slot under the LED indicator window.
Type B12-Di2, IMPORTANT! the top edges of both PCBs (i.e. those entering the enclosure first) must be aligned and slid into the enclosure together.
- Replace the bottom plate by first engaging the side with the two tongues into the slots in the case and then press the plate home to engage the side with the single tongue.
- Plug the reassembled module into the base section and secure with the two captive screws provided - *do not overtighten.*

Calibration adjustment

- After a warm-up time of 30 minutes:
 - Set the input signal to Zero value and adjust the front panel 'Zero' trim to achieve the required output zero.
 - Set the input signal to Full-scale value and adjust the front panel 'Span' trim to the required output full scale.
 - repeat steps (i) and (ii) as required.

Fig 2. Sub board configuration settings (dual output type only)



WARNING - Electric shock hazard
 Do not attempt to adjust the front panel accessible 'Span' and 'Zero' controls with the unit out of its case.

SPECIFICATIONS

Inputs
 0-10 mA / 2-10mA (100R), 0-20 mA / 4-20mA (50R)
 0-1V, 0-5v / 1-5V, 0-10V /2-10V (>200k)
Input impedances shown in brackets.

Outputs
 0-10 mA / 2-10mA (1200R), 0-20 mA / 4-20mA (600R) *Maximum output impedances in ohms shown in brackets.*
 0-1V, 0-5V, 1-5V, 0-10V, 2-10V (500R minimum)
 Current sink 4-20mA @ 50 volts max.

Isolation
 The input and output(s) are isolated from each other and from the power supply.
 Maximum Voltage 250V RMS or 400V DC
 Resistance between input, output(s) or power supply $\geq 50 \times 10^6$ ohms measured at 1000V DC.

Calibrated accuracy
 Error $\leq \pm 0.2\%$ FSD at 100% when factory calibrated.
 NB Error introduced by user range changes, typically 1% but may be corrected by span & zero controls.

Linearity error
 $\leq \pm 0.1\%$ FSD

Output ripple
 $\leq 0.2\%$ RMS of FSD

Load resistance effect
 $\leq 0.001\%$ of span / 100 ohm change

Stability
 Over 24 hours $\pm 0.1\%$ FSD, Over 1 year $\pm 0.25\%$ FSD

Response time
 Typically 1 second.

Input overrange protection
 Voltage Inputs: 250 volts RMS or DC
 Current Inputs: 50mA

Temperature coefficients
 Zero: $\pm 0.02\%$ span / °C, Span: $\pm 0.02\%$ span / °C

Temperature range
 Operating: -10°C to +60°C; Storage: -20°C to +70°C

Supply voltage rejection
 Span change: <0.02% span / % supply change.

Power supply
 85 - 260 VAC 50/60Hz; 24 - 200 VDC (3W nominal)