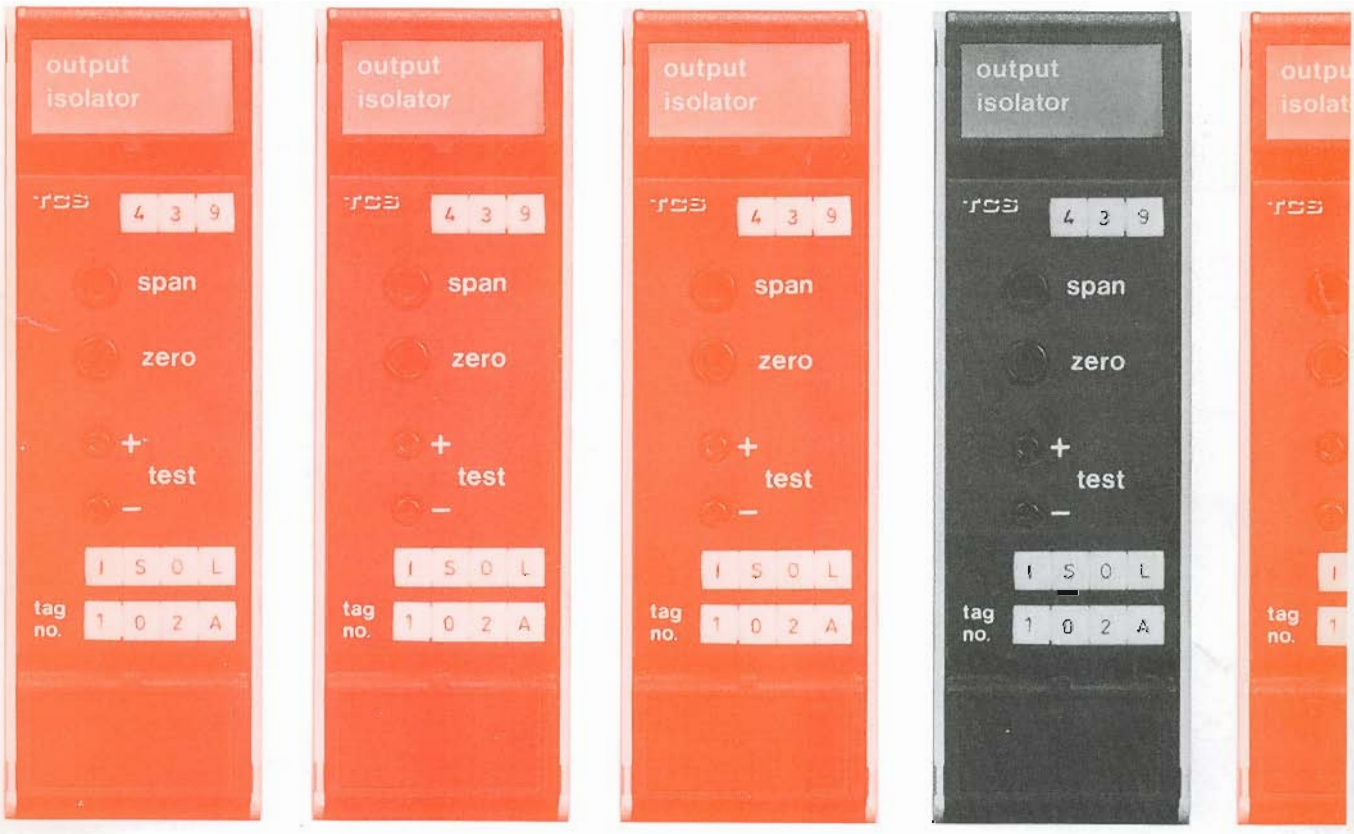
high level output isolator

tcs

system 6000

D511
D522



product specification

Star features

- High output drive
- Low signal loading
- High accuracy and stability
- 3 port galvanic isolation: input/power supply/output
- Standard high level signals: 1–5V, 0–10V or 4–20mA
- Simplifies configuration of larger systems
- Flexible input power supply
- Direct DIN rail mounting
- Clear plant and system labelling

Functional description

The function of this instrument is to take a high level signal (4–20mA, 1–5V or 0–10V), galvanically isolate it and provide a high level buffered output (either 1–5V, 0–10V or 4–20mA. Typical application considerations therefore include:–

Signal translation –
e.g. A 0–10V to 4–20mA converter

Signal buffering –
e.g. The 0–10V output can drive 20mA.

Signal isolation –
e.g. Either for breaking ground loops or where the output drive may become live (250V AC r.m.s.).

Another useful feature of this instrument is the isolation of the power supply from both the signal input and output. This allows the power source to be simply connected between units without any interference with the signal reference levels.

The features so far described might equally well be those of an Input Isolator (D011–22). The difference is not in the function of the instruments but in the geometry.–

1) The plant connection is situated at the foot of the box.
2) Although the instruments have 3-port isolation, only the plant signal isolation is specifically designed to withstand 250V AC r.m.s.

Input break protection is provided. If the input signal becomes open-circuit the action of the output may be defined:–

UP – The output is driven above full scale (> 20mA or > 10V)
DOWN – The output is driven below 'zero' (< 4mA or < 0V).

The break protection circuit works by driving 200nA out of the input. Even with 10 units in parallel being driven from a single Burden resistor the injected total, 2µA, would only contribute 0.0125% of span in a 4–20mA signal. However the option of disabling the break protection is available (option 'NONE').

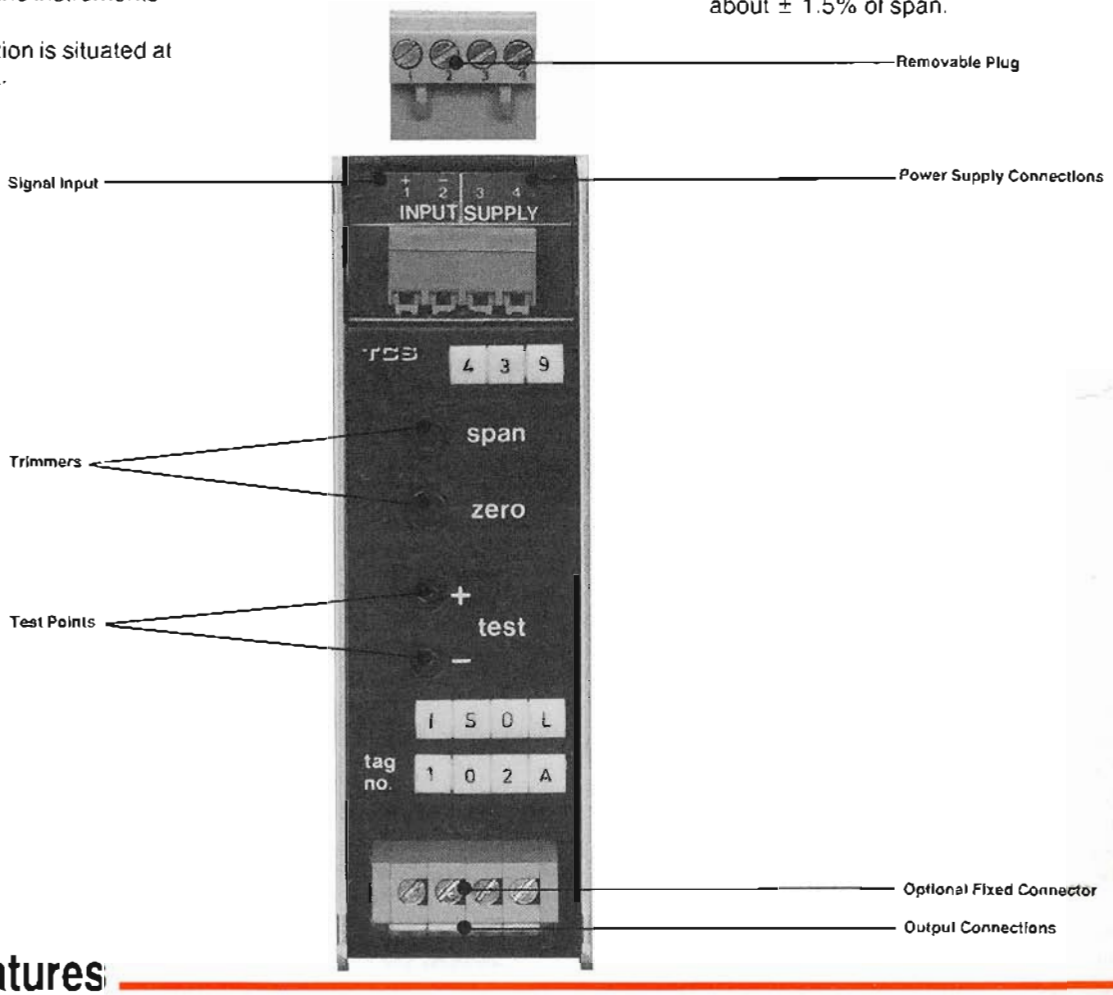
A high stability internal burden resistor (250Ω) may be fitted internally across the input of the D51X (Option B). This is to allow direct measurement of 4–20mA signals. This option excludes the other break protection options as it inherently provides down scale break protection

The internal power supply has been designed so that the instrument may be powered from a wide range of low voltage supplies. The supply, nominally 24V, may be either AC or DC.

The test points and trimmers are located on the output circuit This has implications as far as safety is concerned if the instrument's output signal is connected to a hazardous voltage. A version of the instrument, HV, is therefore provided without access to the test points or trimmers There is no internal degradation of the isolation barrier in the 'LV' version, therefore, provided that suitable safety precautions are taken, the 'LV' version may be used with high common mode voltages at its output.

For voltage outputs the test points carry the signal directly but are protected by a 1kΩ series resistor. For current outputs the test points are across a 10Ω resistor in series with the current loop giving 40–200mV.

The sensitivity of the gain trim is about ± 10% of span and that of the offset about ± 1.5% of span.



External features

The power supply and input connections are made with the plug-in terminal block at the top of the instrument. The same connector system is available at the output for the plant connections (option PS). There is also an option available for a fixed terminal block (option TB) as shown in the diagram above. For routine maintenance, test points and trimmers are available through the fascia (option LV). Where this access is undesirable, see above, an option (HV) may be requested causing these to be omitted.

Performance

Power supply

Range	20–35V DC 18–26V AC r.m.s.
Current drain	
D5XX/I	32mA + 1.7mA/mA of output
D5XX/V	40mA + 1.7mA/mA of output

Input

D51X Span	1–5V
D52X Span	0–10V
Input loading due to break protection	200nA
Other input loading	10nA

Output

Span	1–5V
Drive capability	0–10V −0.3V–20mA
Span	4–20mA
Drive capability	0–15V

Isolation

OUTPUT to INPUT and POWER SUPPLY	250V AC r.m.s. 250V DC (2kV TEST)
INPUT to POWER SUPPLY	60V AC r.m.s. 60V DC (500V TEST)

Transfer

Overall accuracy	0.2% of span
Comprising. Stability	0.1%
Linearity	0.05%
Calibration	0.05% (from factory)
Common mode rejection (50Hz–5kHz)	120dB
Frequency response	25Hz
Operating range for specification	0–50°C

Test points

D5X1/I	40–200MV (10Ω)
D5X2/V	0–10V (1kΩ)
D5X1/V	1–5V (1kΩ)

Front adjustments

Span	20% of span
Offset	3% of span

Ordering information

Description		Order code
Output Isolator		D5XX
INPUT	1–5V	D51X
	0–10V	D52X
OUTPUT	1–5V	D5X1/V
	0–10V	D5X2/V
	4–20mA	D5X1/I
FRONT PANEL		
With test points and trimmers (low voltage)		LV
Without test points and trimmers (high voltage)		HV
PLANT CONNECTOR		
Plug and socket		PS
Terminal block		TB
BREAK PROTECTION		UP DOWN NONE
Output drive		
BURDEN RESISTOR		
D51X only 250Ω burden resistor across i/p		B

Example: D521/I/HV/TB/DOWN

Details

Overall dimensions in mm of housings:

Width	:	35
Height	:	110
Depth	:	97

TCS
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