trip amplifier

system 6000

D420

product specification

Star Features

- Digital readout of input and setpoints
- Single or dual trip
- HI/HI, HI/LO, LO/LO trip configurations
- Choice of relay, 15V logic (TCS) or TTL compatible outputs
- Standard high level input signals, 4–20mA, 1–5V or 0–10V
- 25V transmitter power supply
- High accuracy and stability
- 3 port galvanic isolation: input/power supply/output
- 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 compare it with two user adjusted HI/LO setpoints. If the input exceeds or falls below the HI/LO setpoint the associated LED and output change state. The input signal and setpoint levels are displayed on a 3½ digit display as a value between 0% and 100% of span. The display normally indicates the input signal level, but with either push-button pressed it displays the level of the particular setpoint, which can then be adjusted by means of a front panel potentiometer.

The instruments may be configured as HI/HI, HI/LO or LO/LO devices with a built-in deadband of between 1% and 20% of span. The instrument can also be configured as a single or dual trip, i.e. one or two setpoints.

Three types of output are available: 24V 2A Relays, 15V logic which is compatible with the TCS range of microprocessor based controllers, or 5V logic which is TTL compatible.

Another useful feature of the 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.

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

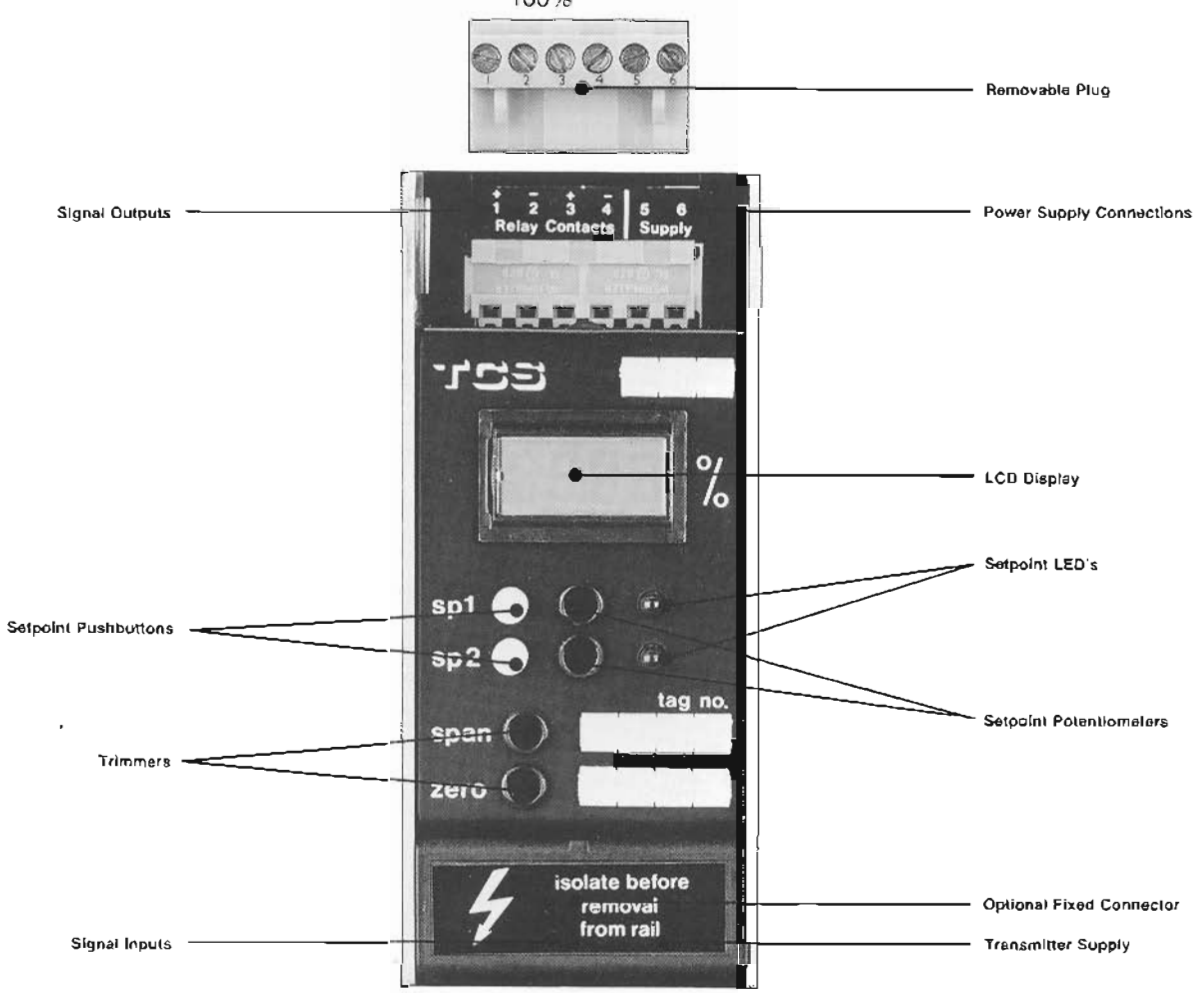
UP – The output is driven above full scale. i.e. 100%

DOWN – The output is driven below 'zero'. i.e. 0%

This break protection can be disabled (i.e. option NONE). With the 4–20mA input option a 25V transmitter power supply is included with a high stability 50Ω burden resistor which inherently provides down scale break protection.

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

Gain and offset adjustments are provided on the front panel. The gain trim gives an adjustment of ±10% of span and the offset about ±5% of span.



External features

The power supply and output connections are made with the plug-in terminal block at the top of the instrument. The same connector system is available at the input for 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, trimmers are available through the fascia.

Details

Overall dimensions in mm of housings: Width : 48 Height : 110 Depth : 97

Connection and installation

The pin numbering is 1 to 6, left to right, on the top connector and 7 to 12, left to right on the bottom

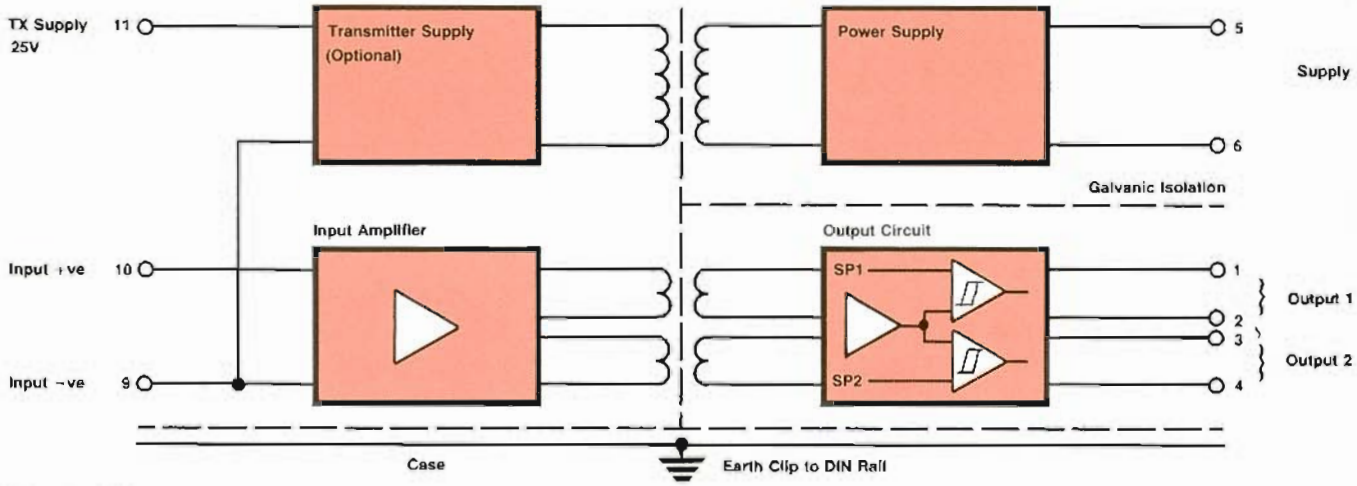
PIN	FUNCTION
1	Output 1 (Logic +)
2	Output 1 (Logic 0V)
3	Output 2 (Logic +)
4	Output 2 (Logic 0V)
5	Supply
6	Supply
7	Not used
8	Not used
9	Input −ve
10	Input +ve
11	TX power supply (if fitted)
12	Not used

The instrument may be powered from either an AC or DC source The DC supply voltage is nominally 24V (20–35V) The AC supply voltage is 18–26V AC r m s Internally the power supply circuit is galvanically isolated from the other circuits This means that the power source may float but it is recommended that the power circuit is earthed at a suitable point in the system, where this is possible.

The three circuits – power supply, input and output – are electrically isolated from each other and from the case, to simplify system design, by allowing the system designer to choose the points at which he defines the potential of these components of his system.

The internal operating voltages constitute no electric shock hazard. However, if the input is allowed to become live, care must be taken to earth the case. To facilitate this, an earth spring is provided at the back of the box connecting onto the DIN rail. There are parts available which are specifically designed to provide an earth for the rail.

The mounting of the instrument is directly to the 'top hat' cross section DIN rail (type T35) To install, the unit is rolled down until it clips into position To remove, a screwdriver is used to release the spring catch



Labelling

Two labelling areas are provided on the fascia. These labels are made up with Dekafix* markers. The use of this labelling system ensures that the label is legible and may be transferred if the instrument is replaced or the system reconfigured.

The upper label, three markers, is provided for system identification and will normally indicate the position of the instrument within the housing.

The lower label, eight markers, is provided for functional identification or tag number.

These positions will normally be supplied with blank markers but particular labelling may be specified within a system order.

There is a printed label on the side of the box with manufacturing information and the order code.

*Dekafix is a trade name of Klippon Electrical Ltd.

Performance

Power supply

Range 20–35V DC
18–26V AC r.m s.

Power consumption

Typically 1 5W (excluding TX supply)
2.2W (including TX supply)

Input

4–20mA
1–5V
0–10V

Output

Relay (Each) 24V, 2A DC
15V logic
5V TTL logic

Isolation

INPUT to OUTPUT and POWER SUPPLY	250V AC r.m.s.
	250V DC (2kV TEST)
OUTPUT 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 – 1kHz)	120dB
Frequency response	25Hz (logic outputs)
Operating range for specification	0–50°C

Display

3½ digit LCD
Range 0–100% of span

Front adjustments

Span	20% of span
Offset	10% of span

Trip-point accuracy

Typically ±1 least significant digit

RFI Immunity

Less than 0.1% deviation at 10V/M between 200–500MHz

Ordering information

Description		Order code
PRODUCT NUMBER		D420
PRODUCT DESCRIPTION	(a) Dual trip (b) Single trip	D S
INPUT RANGE	(a) 4–20mA (includes 25V transmitter supply) (b) 1–5V (c) 0–10V	4–20mA 1–5V 0–10V
OUTPUT TYPE (OUTPUT 1 AND OUTPUT 2)	(a) Relay (See options) (b) 15V Logic (c) 5V TTL	RLA LGC TTL
Note: The output types can be mixed. e.g. one relay and one logic output.		

OPTIONS: IF THESE ARE NOT INCLUDED IN THE ORDER CODE THE DEFAULT VALUE WILL BE ASSUMED. THE DEFAULT VALUE IS THE FIRST SHOWN UNLESS OTHERWISE STATED.

PLANT CONNECTOR	(a) Plug and socket (b) Terminal block	PS TB
BREAK PROTECTION Note: Current inputs have inherent down scale break protection; hence do not specify this field. Use with voltage inputs only.	(a) Up scale (b) Down scale (c) None	UP DOWN NONE
HYSTERESIS Normally 1% Other: Specify (1–20%)		1% XX%
TRIP CONFIGURATION Dual trip Single trip	(a) Hi/Hi (Default) (b) Hi/Lo (c) Lo/Lo (d) Hi (Default) (e) Lo	HH HL LL H L

OUTPUT 1 AND 2 (IN SAFE STATE) Relay (coil/contact)	15V logic	5V (TTL) logic	1st digit – OUTPUT 1 2nd digit – OUTPUT 2
energised/open	high	low	0
energised/closed	N/A	N/A	1
*de-energised/open	*low	*high	2
*de-energised/closed	N/A	N/A	3

*With these configurations the output will go to 'safe' or 'untripped' state when there is a power failure to the module.
Note. Default value is 00

FASCIA LABELLING	(a) Blank (b) Tags	— T
Note: If tags are required the two fields of 3 and 8 characters must be specified for each module.		

Examples: (a) D420/D/1–5V/RLA/LGC/PS/UP/20%/HH/00/–
(b) D420/S/4–20mA/RLA/RLA/TB/1%/H/01/–
(c) D420/D/0–10V/LGC/TTL/PS/DOWN/5%/HL/00/–

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Interface Products

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