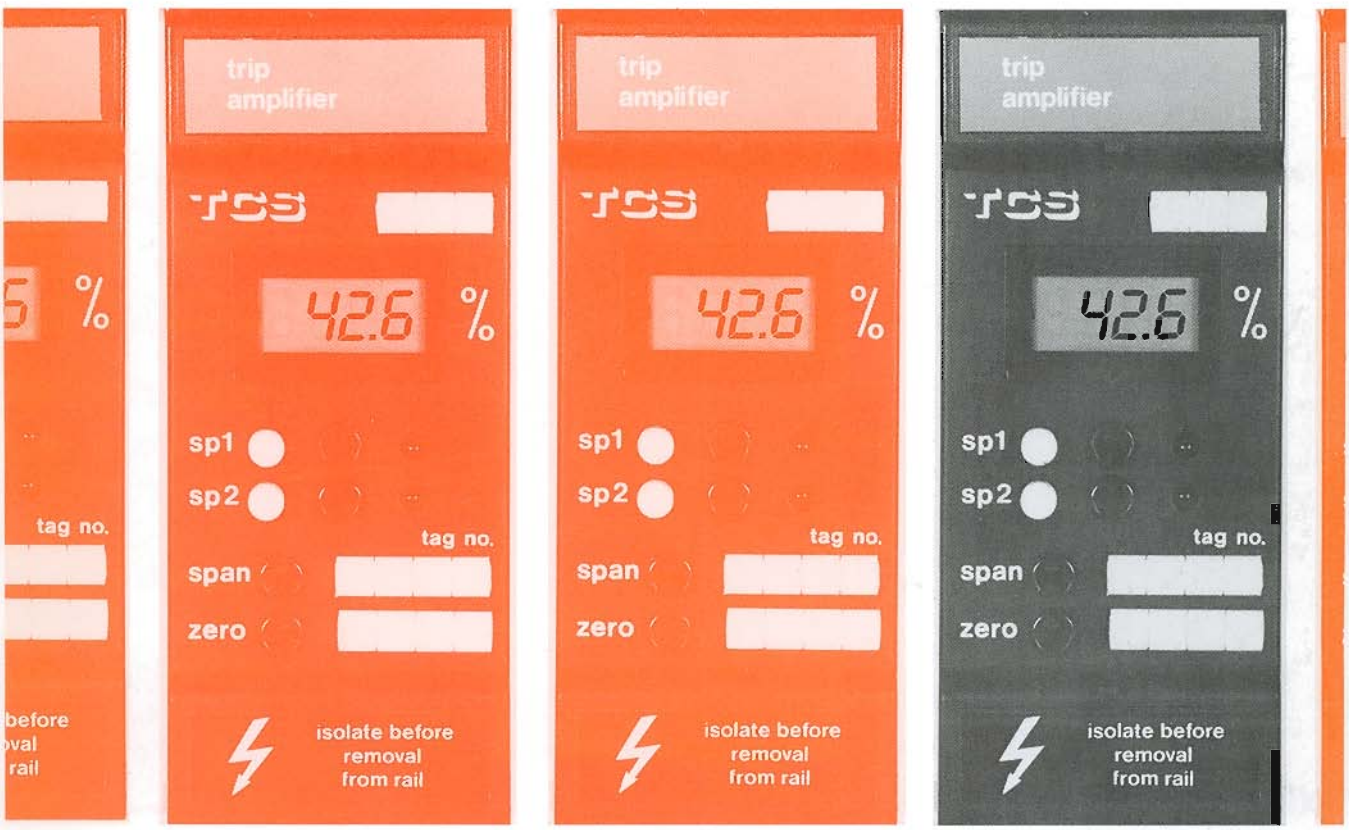
prt
trip amplifier

system 6000

D426



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
- 3 and 4 wire option
- 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 measure the resistance of a 100Ω platinum resistance thermometer (PRT), galvanically isolate the measurement and compare the high level signal generated with 2 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 current used to sense the resistance of the PRT is low (0.5mA) to minimise self heating. The current drive and voltage sense circuits are arranged to give good rejection of lead resistance when connected to 3 and 4 wire PRTs.

The instrument does not attempt to compensate for the non-linear nature of the PRT. It provides linear amplification of the PRT signal over the temperature range specified.

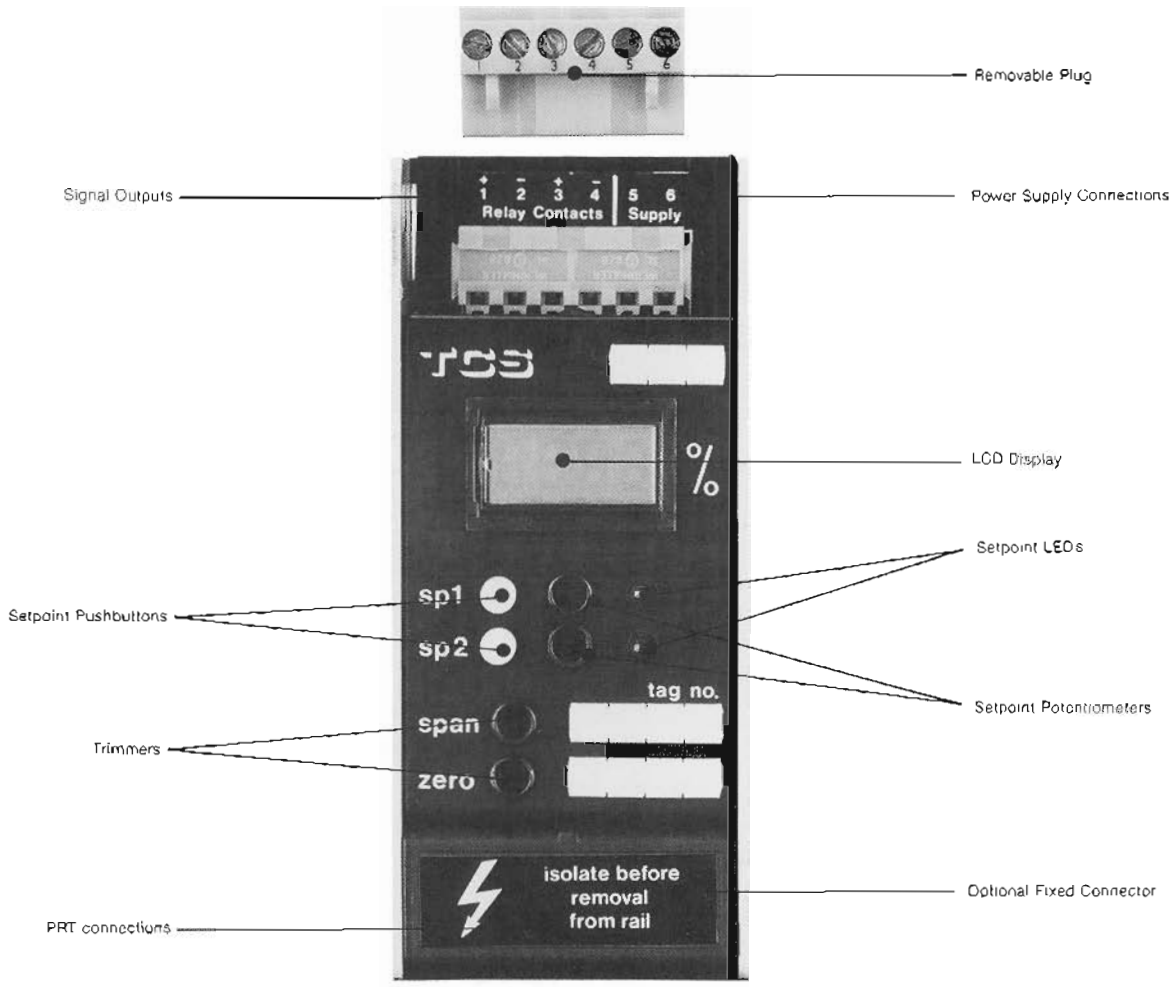
The instruments may be configured as HI/HI, HI/LO or LO/LO devices with a built-in deadband of between 1% and 20% of span. The instrument can also be configured as a single or dual trip, i.e. one or two setpoints.

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.

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).

For routine maintenance, trimmers are accessible 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.

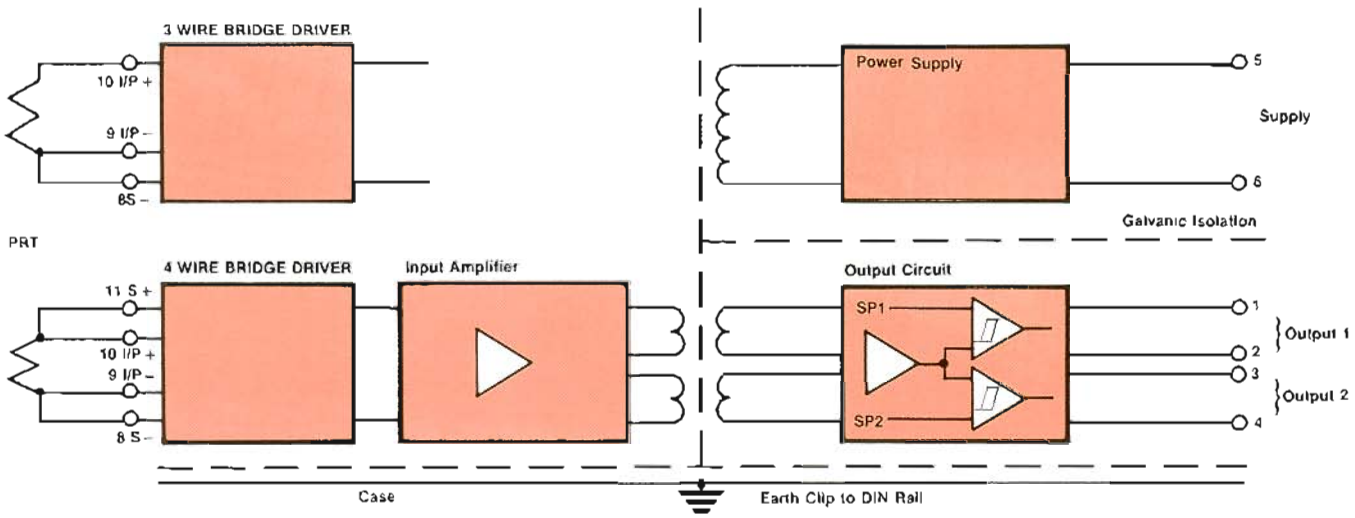
PIN	FUNCTION
1	Output 1 (Logic +)
2	Output 1 (Logic 0V)
3	Output 2 (Logic +)
4	Output 2 (Logic 0V)
5	Supply
6	Supply
7	Not used
8	Current sink (S−)
9	Voltage −ve (I/P−)
10	Voltage +ve (I/P+)
11	Current source (S+)
12	Not used

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. This simplifies system design, by letting the designer freely define the potential of these components of his system.

The internal operating voltages constitute no electric shock hazard. However, if the PRT 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. Although only eight marker positions are provided, two or three digits are available on each marker.

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

Bridge drive

Current source	0.5mA (nominal)
Drive capability	0-1000Ω

Input

Input offset drift	4uV/°C
Other sources of drift	90 ppm of span/°C
Gain stability	240ppm of span/°C
Linearity	0.05% of span
Calibration accuracy	0.05% of span
Common mode rejection (50Hz-5kHz)	120dB
Series mode rejection (50Hz-5k Hz at 10 × span)	100 dB
Frequency response	2Hz

Lead rejection

Lead resistance 20Ω/lead	0.18°C max. offset error
10Ω/lead	0.06°C max. offset error
Operating Temp Range	0-50°C

(For 3-wire configurations lead resistances are assumed to be matched)

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)

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 susceptibility

Conforms to CEGB DN5 and IEC 801.3

Ordering information

Description		Order code
PRODUCT NUMBER		D426
PRODUCT DESCRIPTION	(a) Dual trip (b) Single trip	D S
INPUT TYPE	(a) 3 wire PRT 100 (b) 4 wire PRT 100	3W 4W
INPUT TEMPERATURE RANGE AND UNITS Note: In 4 wire instruments the PRT resistance at the high range temperature must not exceed 5 times the PRT resistance at the low range temperature		XXXX - XXXX
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
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 energised/closed *de-energised/open *de-energised/closed	high N/A *low N/A	low N/A *high N/A	0 1 2 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.			

Example (a) D426/D/3W/0-100°C/RLA/RLA/PS/1%/HH/00/—
(b) D426/S/4W/0-500°C/RLA/TTL/PS/1%/H/00/—
(c) D426/D/3W/100-250°C/LGC/TTL/TB/20%/LL/20/—

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Interface Products

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