Models:
IDC4001   Standard Model

IDC
Differential Controller

Specifications

Power Supply:
Voltage: 24VAC ±10% @ 50/60Hz
Power Consumption: 3VA Max.

Inputs:
Two - two wire current loop temperature detectors. One voltage free contact.

Outputs:
Three temperature outputs 0.1V per °C
0-10VDC control output
One C/O voltage free relay contact (2A max.)

Terminal Identification:
1 & 2	Detector "A" connection
3	Temperature Out Detector "A"
4 & 5	Detector "B" connection
6	Temperature Out Detector "B"
7	Detector "A" minus "B" Temperature Out
8	0-10VDC control output
9	Common and 0VAC supply
10	24VAC Supply
11 & 12	Heating/Cooling change over input

Relay Terminal Identification:
O	N/O Contact
I	N/C Contact
C	Common Contact

Temperature Ratings:
Storage: 0-50°C non-condensing
Operating: 0-40°C non-condensing

Enclosure:
Manufactured from an ignition resistant grade of ABS which meets the requirements of AS2420.
Colour: Grey
DIN rail mounted.

Installation
1. Mount controller is a dry and reasonably clean location free or excessive vibration.
2. Fit to DIN Rail.
3. Wire in accordance with INNOTECH connection diagrams and local bylaws or refer to your local distributor.

Wiring
1. Earth one side of the 24VAC at the transformer.
2. Connect the EARTHED side of the 24VAC to terminal 9.
3. DO NOT connect 24VAC to terminals 1 through 8, 11 or 12.
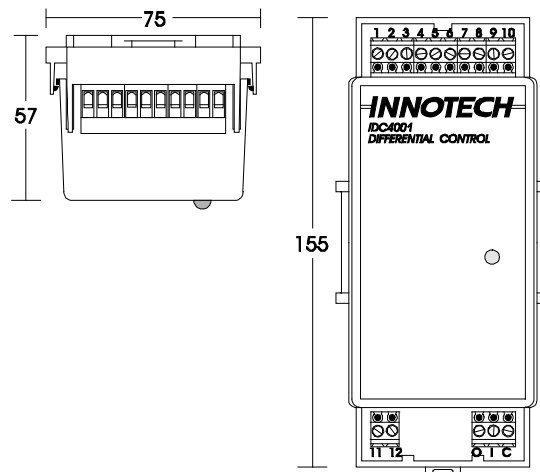
Application
The INNOTECH differential controller is designed for applications requiring either a proportional 0-10VDC control signal or a relay switched output determined by the temperature difference between two detectors.

Applications include solar heating and stream splitter damper control.

The INNOTECH ITD, ITI and ITW series of two wire current loop temperature detectors are designed to operate with the IDC differential controller.

Features:
Proportional Mode:
• Independent adjustment of "PB" and "OFFSET" in proportional mode
• External switch or relay to select reverse operation if proportional 0-10VDC output
• Interface to a wide range of devices using a 0-10VDC control signal

Switching Mode:
• Independent adjustment of "OFFSET" and "RELAY DIFFERENTIAL" temperatures in switching mode
• LED indication of relay status
• The INNOTECH enclosure saves space and reduces installation time.
• Wide range of applications

Approvals
The IDC4001 conforms to the requirements for RCM labelling.

Proportional Mode:

The 0-10VDC control signal output at terminal 8 is the sum of the offset voltage plus a voltage derived from the PB setting and the temperature difference between detectors "A" and "B".

$$V_{out} = V_{offset} + 10 \times (\text{temp "A" minus temp "B"}) / PB$$

The control signal output at terminal 8 will equal the offset setting when the detector temperature are equal.

The control signal output at terminal 8 will vary linearly between 0 and 10VDC as the temperature difference between the detectors varies by an amount equal to the PB setting.

Proportional Band:

The PB setting has a range of 1°C to 11°C and is adjusted via the PB pot. The PB pot adjustment is linear so the PB setting can be estimated from the markings on the pot as each division is approximately equal to 1°C.

Heating/Cooling Changeover:

The "polarity" of the temperature difference signal must be reversed for heating and cooling operation. Terminals 11 and 12 are a switch input to reverse the sense of operation of the linear section of the circuit.

11-12   CLOSED - Output drives from 0-10VDC as temperature of "A" increases above "B".

11-12   OPEN - Output drives from 0-10VDC as temperature of "B" increases above "A".

The IDE is factory supplied with terminals 11 and 12 linked.

Switching Mode:

The relay will energise when the temperature at sensor "A" is higher than the temperature at sensor "B" by the sum of the offset and differential settings.

ON = °C Offset + °C Relay Differential

The relay will de-energise when the temperature at sensor "A" is higher than the temperature at sensor "B" by the offset setting.

OFF = °C Offset

The "OFFSET" and the "RELAY DIFFERENTIAL" can be measured between terminal 9 and the test pins adjacent to their respective pot.

ℹ️ These settings are in °C (1.0V = 1°C) and the OFFSET is common to both the relay and proportional outputs.

Relay Indication:

The status of the relay is indicated by a red LED. The relay is energised and the "C" to "I" contact is closed when the LED is lit. The "C" to "O" contact is closed when the relay is de-energised.
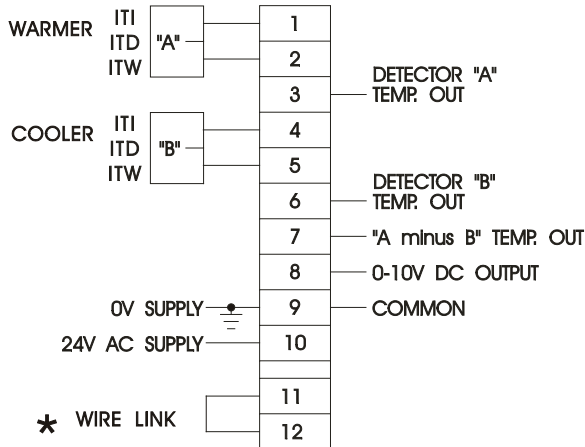
The relay contacts are electrically isolated from the driver circuit.

DIN Rail Mounted Enclosure:

The INNOTECH enclosure is designed to provide tight positive locking to varying thicknesses of DIN rail. When fitting to thick DIN rail, it may be necessary to remove the packing tabs on the back of the base.
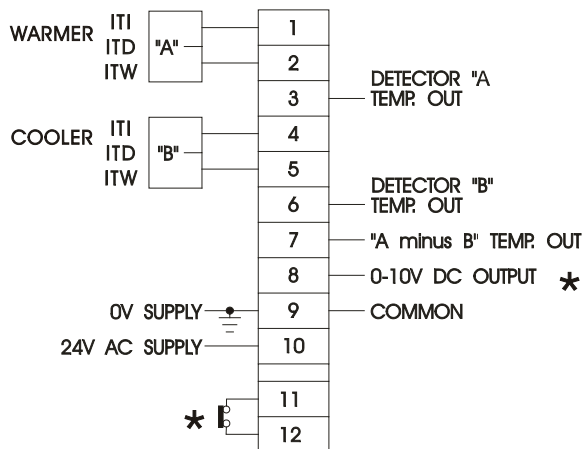
Lugs on each side of the base ensure that correct spacing is maintained between units on the same DIN rail.

PROPORTIONAL MODE
IDC4001

WARMER
ITI
ITD "A"
ITW

COOLER
ITI
ITD "B"
ITW

1
2
3 — DETECTOR "A" TEMP. OUT
4
5
6 — DETECTOR "B" TEMP. OUT
7 — "A minus B" TEMP. OUT
8 — 0-10V DC OUTPUT
9 — COMMON
10

0V SUPPLY — 9
24V AC SUPPLY — 10

11
12

* WIRE LINK

* Factory supplied with wire link fitted.

PROPORTIONAL MODE
IDC4001

WARMER
ITI
ITD "A"
ITW

COOLER
ITI
ITD "B"
ITW

1
2
3 — DETECTOR "A" TEMP. OUT
4
5
6 — DETECTOR "B" TEMP. OUT
7 — "A minus B" TEMP. OUT
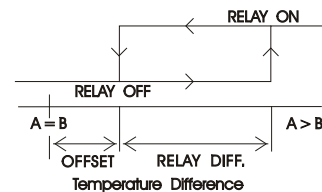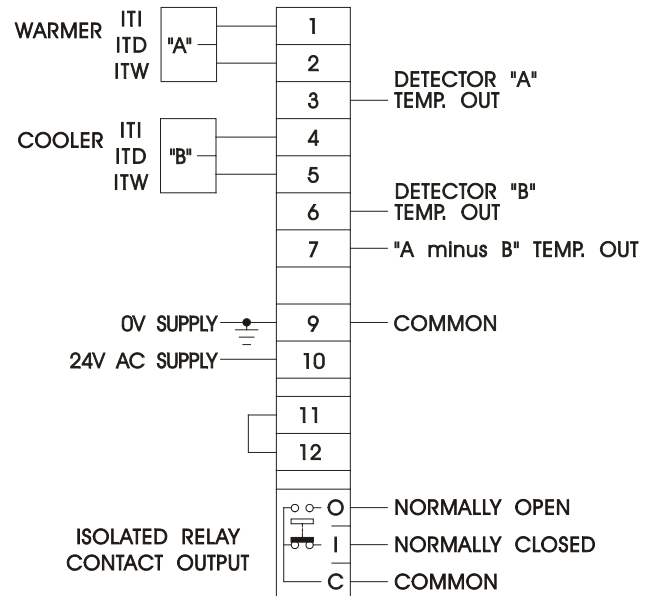8 — 0-10V DC OUTPUT *
9 — COMMON
10

0V SUPPLY — 9
24V AC SUPPLY — 10

11
12

*

11-12 CLOSED
0-10V DC Output increases as temperature "A" increases above "B".

11-12 OPEN
0-10V DC Output increases as temperature "A" decreases below "B".

SWITCHING MODE
IDC4001

WARMER
ITI
ITD "A"
ITW

COOLER
ITI
ITD "B"
ITW

1
2
3 — DETECTOR "A" TEMP. OUT
4
5
6 — DETECTOR "B" TEMP. OUT
7 — "A minus B" TEMP. OUT
9 — COMMON
10

0V SUPPLY — 9
24V AC SUPPLY — 10

11
12

ISOLATED RELAY CONTACT OUTPUT

O — NORMALLY OPEN
I — NORMALLY CLOSED
C — COMMON

RELAY ON
RELAY OFF
A = B   A > B
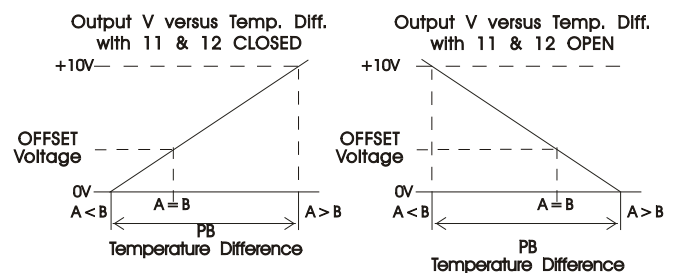OFFSET   RELAY DIFF.
Temperature Difference

The relay energises when the temperature at detector "A" = "B" + OFFSET + RELAY DIFF.

The relay de-energises when the temperature at detector "A" = "B" + OFFSET.

Detector "A" temperature   (0.1V/°C)
Detector "B" temperature   (0.1V/°C)
OFFSET pot setting   (1.0V/°C)
RELAY DIFFERENTIAL setting   (1.0V/°C)

PROPORTIONAL MODE

Output V versus Temp. Diff. with 11 & 12 CLOSED
+10V
OFFSET Voltage
0V
A < B   A = B   A > B
PB
Temperature Difference

Output V versus Temp. Diff. with 11 & 12 OPEN
+10V
OFFSET Voltage
0V
A < B   A = B   A > B
PB
Temperature Difference

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