

DIGITAL CLOCK/THERMOMETERS WITH SETPOINTS AND OUTPUTS



FEATURES

- Thermostat function
- Display of 12 hour clock
- Extremely low current consumption
- Display of temperature in °C or °F
- Internal temperature sensor
- Facility for external sensor
- Backlight versions available (-T)

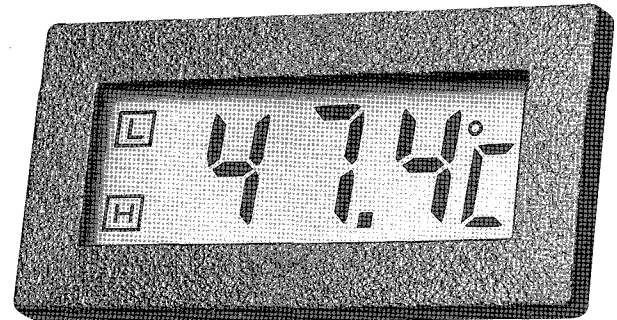
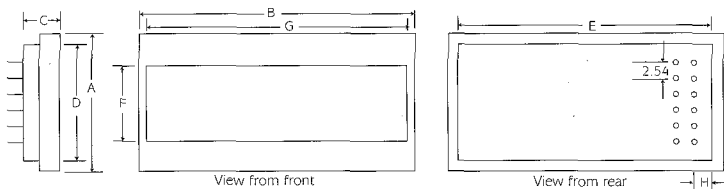
The HED24 range of modules are complete clock/thermometers with high and low temperature setpoints and an output signal which is triggered when a setpoint is reached.

SPECIFICATION

Display	3 1/2 digit black LCD on silver, annunciators and backlight (option -T only)
Supply voltage	1.3 - 1.7v DC for clock/thermometer (VDD) 5.0 v DC for backlight (-T version)
Current consumption	7.0µA (clock) 13.1µA for 10s sampling; 41.2 µA for 1s (thermometer) 80mA (HED041-T backlight) 160mA (HED042-T backlight) 240mA (HED043-T backlight)
Output current for alarm	200µA (maximum)
Accuracy	±1° (°C or °F)
Output current available (pins 3 & 4)	4µA (maximum)
Alarm frequency (pin 9)	4096Hz
External Sensor	TH 103 with 1 metre cable (available as an optional extra)
Environmental protection	IP40/DIN 40 050
Temperature measuring range using external thermistor	-20°C to +70°C
Operating temperature and measuring range using internal sensor	0°C to +50°C
Storage temperature	-20°C to +70°C

Note: This product is ideally suited to battery powered applications. Should the product be used in a circuit where an external power source is used, then the complete system will require separate approval to meet the CE standards.

DIMENSIONS



PIN CONNECTIONS

Pin	Function	Application
1	PB1	In clock mode connect to VDD to adjust hours
2	PB2	In clock mode connect to VDD to adjust minutes In temperature mode connect to VDD to adjust temperature setpoints (see pins 6 and 7)
3	TU	Output goes high (1.5v) at and above the upper temperature setpoint
4	TL	Output goes high (1.5v) at and below the lower temperature setpoint
5	PB5	Sets operating mode. Connect to VDD for display of time; no connection for display of temperature
6	PB6	Connect to VDD to display upper temperature setpoint
7	PB7	Connect to VDD to display lower temperature setpoint
8	VDD	Voltage input (1.5v ±0.2v)
9	BD	Audio output 4096Hz for external Piezo driver
10	LED	LED backlight input (5.0v) optional
11	N.C.	Do not connect
12	VSS	Zero volts
13/14	TH	External temperature sensor (thermistor)



(Rear view)

	HED241	HED242	HED243
A	24mm (0.95")	36mm (1.42")	48mm (1.89")
B	48mm (1.89")	72mm (2.83")	96mm (3.78")
C	14mm (0.55")	14mm (0.55")	15mm (0.59")
D	22mm (0.87")	33mm (1.3")	45mm (1.77")
E	45mm (1.77")	68mm (2.68")	92mm (3.62")
F	13mm (1.77")	18mm (0.71")	27mm (1.06")
G	37mm (1.77")	61mm (2.4")	79mm (3.11")
H	7mm (1.77")	9mm (0.35")	8mm (0.31")
Panel	45x22mm	68x33mm	92x45mm
Cut out	(1.77x.87")	(2.68x1.3")	(3.62x1.77")
Char. height.	10mm (0.4")	14mm (0.55")	24mm (0.95")

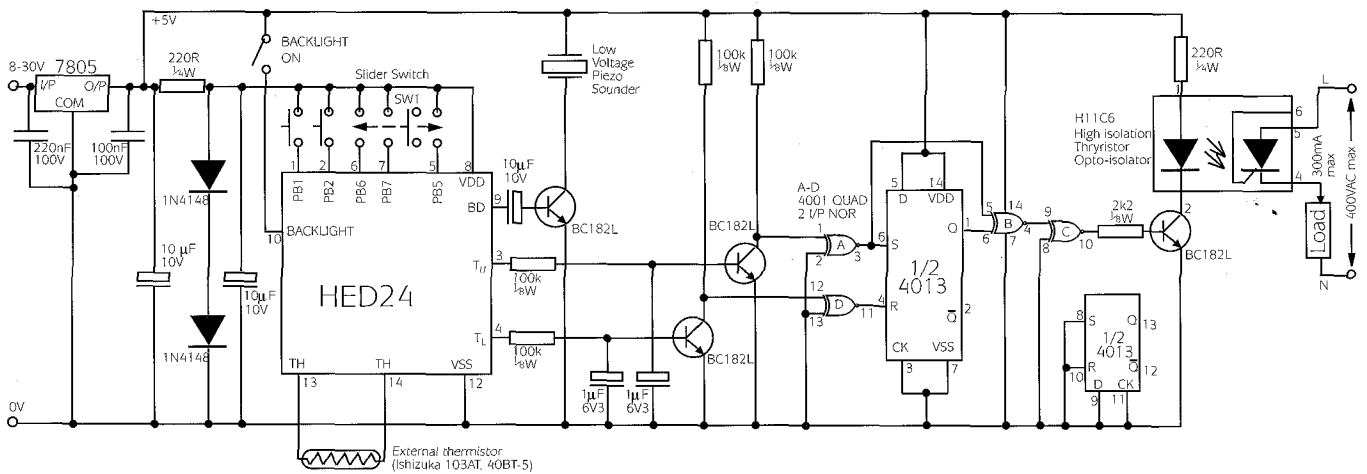
HED241

HED242

HED243

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TYPICAL APPLICATION AS A REFRIGERATION THERMOSTAT



APPLICATION NOTES FOR THERMOSTAT

In the illustration, SW1 is a single pole, 4 position slide switch. The thyristor is turned on if the monitored temperature is greater than the upper and lower setpoints. The temperature is maintained by turning on the thyristor when the monitored temperature is greater than the upper setpoint and turning it off when the temperature reaches the lower setpoint.

SET UP INFORMATION

To set up the instrument in the following ways, you need to make connections across the solder pads illustrated on the drawing of solder pads and connections. To make a semi-permanent installation, make a solder bridge across the required pads or, for a more adaptable installation, wire the pads out to switches. To determine:

whether the internal temperature sensor is to be used or whether the instrument is to read an external sensor	connect between INT or EXT and the solder pad between them. Do not have both connected at the same time.
whether the temperature is to be sampled every second or every 10 seconds	connect the 10s/1s pads for sampling every second or leave them open for sampling every 10 seconds.
whether the temperature is to be displayed in °F or °C	connect the appropriate pads for °F display or leave open for °C

TEMPERATURE SET POINTS

- 1 Ensure that sampling is selected for 10s (solder pads unconnected) because temperature set points cannot be adjusted when 1s sampling is selected.
- 2 Ensure that temperature mode is engaged (that is, that PB5 is not making a connection).
- 3 Connect and hold PB7 and operate PB2 until the required LOWER set point is displayed.
- 4 Connect and hold PB6 and operate PB2 until the required UPPER set point is displayed.
- 5 Set the sampling rate to the required value.

SETTING THE TIME

- 1 Ensure that time mode is engaged (that is, that PB5 is making a connection).
- 2 Operate PB1 to adjust hours and PB2 to adjust minutes.

ORDERING INFORMATION

- HED241-R 24x48mm Clock/Thermometer.
- HED241-T 24x48mm Clock/Thermometer with backlight.
- HED242-R 36x72mm Clock/Thermometer.
- HED242-T 36x72mm Clock/Thermometer with backlight.
- HED243-R 48x96mm Clock/Thermometer.
- HED243-T 48x96mm Clock/Thermometer with backlight.
- HED-TH103 External Thermistor.