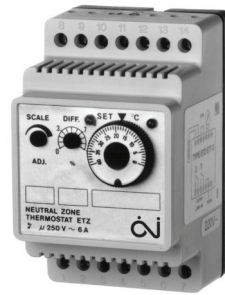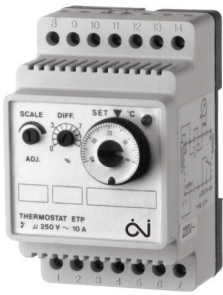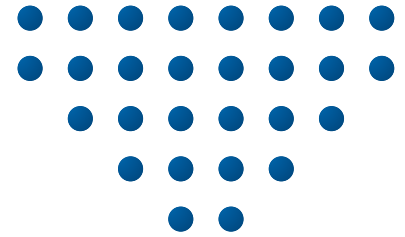Thermostats

Unitemp

H V A C   C O N T R O L S   A N D   P O W E R

Electronics On/off, Neutral Zone and 2-Step Thermostats

- Thermostat series for ON/OFF, neutral zone and 2-step regulation
- PTC sensors for temperature measurement
- Compensation for sensor tolerances and wire resistance
- Zone width and step distance may be varied
- DC output for external regulation by PLC control
- Sensor temperature displayed by external analog or digital meter

APPLICATION

UNITEMP is the designation for a series of electronic thermostats for regulation and monitoring of cooling and heating installations as well as industrial plants where accurate regulation is required.

The UNITEMP units make use of the same types of sensors and accessories. An external control unit may control 1 or 2 thermostats simultaneously, and regulation by external DC signal 0-5.5V is possible, e.g. from a PLC control. The units are installed on DIN-rails.

PRODUCT PROGRAM

ETP ON/OFF THERMOSTAT		
ETP-1951	-30/+30°C	Heating
ETP-1952	+10/+110°C	Heating
ETP-1953	0/+40°C	Heating
ETP-1951-K	-30/+30°C	Cooling

ETZ NEUTRAL ZONE THERMOSTAT		
ETZ-1951	-30/+30°C	Cooling/heating
ETZ-1953	0/+40°C	Cooling/heating

ETT 2-STEP THERMOSTAT		
ETT-2-1952	+10/+110°C	Heating
ETT-2-1953	0/+40°C	Heating

Temp. °C	R_T Ohm	Temp °C	R_T Ohm
-50	1040,51	40	2229,63
-45	1094,70	45	2308,96
-40	1150,29	50	2389,69
-35	1207,27	55	2471,81
-30	1265,65	60	2555,33
-25	1325,43	65	2640,24
-20	1386,61	70	2726,56
-15	1449,18	75	2814,26
-10	1513,14	80	2903,37
-5	1578,51	85	2993,87
0	1645,27	90	3085,77
5	1713,43	95	3179,07
10	1782,98	100	3273,76
15	1853,93	105	3369,85
20	1926,28	110	3467,33
25	2000,02	115	3566,21
30	2075,16	120	3666,49
35	2151,70	125	3768,16

The first thermostat should carry the jumper "STRAP". The jumper is removed from the other thermostat
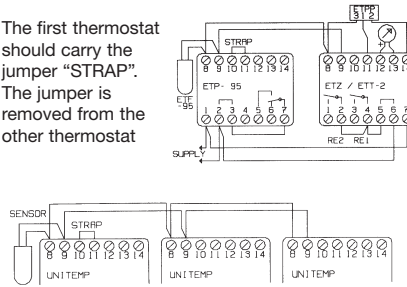
Resistance as a function of sensor temperature | *Interconnection of UNITEMP units* | *Remote control*
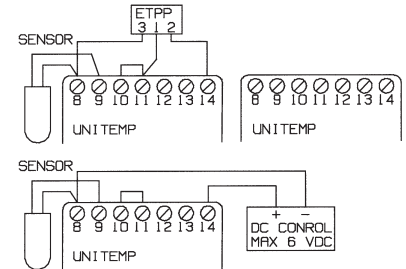
ON/OFF THERMOSTAT TYPE ETP - FUNCTION

Available for heating function. 3 types cover a scale range from -30 to +110°C. Equipped with one SPCO, 10A. Temperature differences may be set with the control knob DIFF.
Heating function: The relay will be activated when sensor temperature is lower than the thermostat setting. A red LED will be lit.

TECHNICAL DATA

Power consumption	3VA
Weight	190 g
Ambient temperature	-20/+50°C
Relay switches	1 SPCO, 10A
	Resistive load max. 250V
Expected lifetime	2×10^5 switch function, max load

Temperature difference	
Scale range -30/+30°C	adjustable 0/+6°C
Scale range +10/+110°C	adjustable 0/+10°C
Scale range 0/+40°C	adjustable 0/+4°C

Power supply	
ETP-195.	230V AC

SENSOR TYPES

UNITEMP units are equipped with identical PTC sensor, designated ETF-.95. The sensor is available in different "mechanical" versions. See ETF data sheet. The sensor lead may be extended for several hundred meters, provided that the wire resistance is under 20 ohm. The lead should be kept away from high power cables, as there is the possibility of "pick up" which may effect the sensor signal. The resistance within the sensor will vary as a function of temperature.

FUNCTION

Interconnection
By connecting more than one thermostat to the same sensor, a master/slave function may be obtained, e.g. as a thermostat with a 4 step function or with combined regulation and monitoring. 4 step applications can be achieved with two 2-step thermostats (ETT-2). Up to 10 thermostats can be interconnected and can be remotely controlled and or display actual temperature.
With an ETZ neutral zone thermostat and an ETP on/off thermostat, plants may be regulated and monitored simultaneously, e.g. EDB rooms or industrial production. The ETZ may be applied as a regulating unit, while the ETP acts as an alarm unit and emits a signal, if the min./max. temperature is exceeded. The thermostat may be equipped with different scale ranges, e.g. a scale range of 0/+40°C and an alarm range of +10/+110°C.

Remote control
Up to two UNITEMP units may be controlled remotely by using an ETPP control unit. If it is situated a long distance from the thermostat, or the connection may be subject to electrical noise, shielded cables are recommended.

Display of temperature
It is possible to connect an analog meter or a digital display unit to terminals 12 and 13. The meter and the thermostat must have the same scale range.

DC-voltage signal
The regulated temperature may also be controlled via an DC voltage from a PLC or similar. A DC voltage proportional to the sensor temperature may be taken from terminals 8 and 12. The voltage varies between 0-5.5V for all scale ranges, but the start value and curve inclination will be different. Voltage signal as a function of sensor temperature is illustrated on next page.
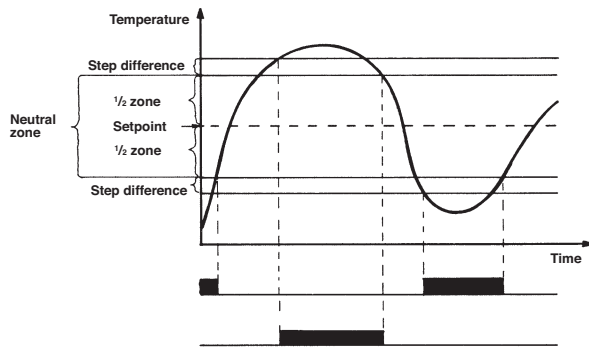
Function diagram neutral zone thermostat - type ETZ
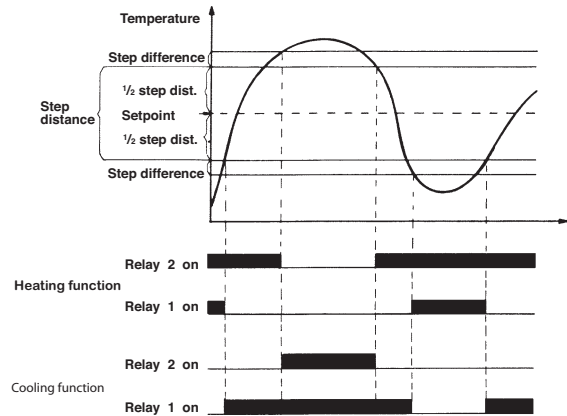
Function diagram of 2-step thermostat - type ETT

NEUTRAL ZONE THERMOSTAT TYPE ETZ - FUNCTION

For regulation of cooling/heating plants. 2 types cover a scale range from -30 to +40°C. Equipped with two SPST, 6A. The neutral zone is situated equally on either side of the set point and may be adjusted from 0 to 10% of the scale range by means of the control knob DIFF.

Function: As long as the temperature measured is within the selected neutral zone, none of the relays will be active. If the temperature falls below the lower zone limit, relay 1 will be activated and a red LED indicates heating function. If the temperature rises above the upper zone limit, relay 2 will be activated and a green LED indicates cooling function.

TECHNICAL DATA

Power consumption	3VA	
Weight	190 g	
Ambient temperature	-20/+50°C	
Relay switches	2 SPST, 6A	
	Resistive load max. 250V	
Expected lifetime	2×10^5 switch functions, max. load	
Zone width		
Scale range -30/+30°C	adjustable zone	0/+6°C
	fixed step diff.	0.5°C
Scale range 0/+40°C	adjustable zone	0/+4°C
	fixed step diff.	0.3°C
Power supply		
ETZ-195.	230V AC	

2 STEP THERMOSTAT TYPE ETT - FUNCTION

For on/off regulation of heating plants in two steps. Available for heating function. 2 types cover a scale range from 0 to +110°C. Equipped with two SPST, 6A. The distance between activation of relay 1 and relay 2 may be adjusted from 0-10% of the scale range with the help of control knob DIFF.

Heating function: At calls for heating, the relays are activated stepwise. Relay 2 is activated first. Red LEDs are lit.

TECHNICAL DATA

Power consumption	3VA	
Weight	190 g	
Ambient temperature	-20/+50°C	
Relay switches	2 SPST, 6A	
	Resistive load max. 250V	
Expected lifetime	2×10^5 switch functions, max load	
Step distance		
Scale range +10/+110°C	adjustable distance 0/+10°C	
	fixed step diff. 0.8°C	
Scale range 0/+40°C	adjustable distance 0/+4°C	
	fixed step diff. 0.3°C	
Power supply		
ETT-195.	230V AC	

OJ ELECTRONICS
taking comfort further
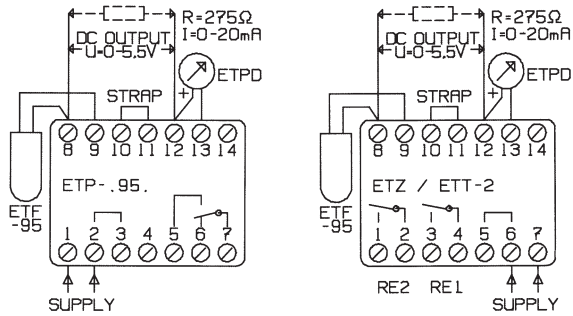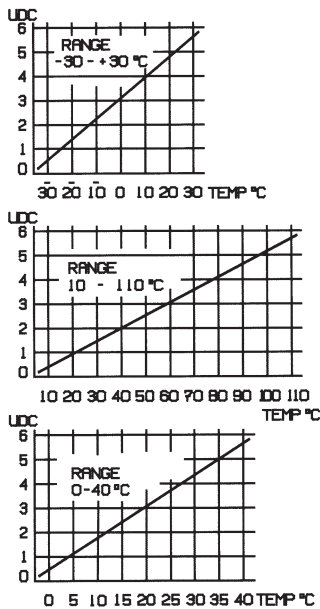

Installation type ETP and ETZ/ETT
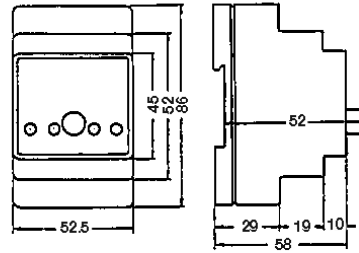
Dimensions

The curves show the relation between temperature and DC output voltage.

The same voltage may be applied when calculating external voltage for set point control.

Calculation of DC voltage is accomplished with the help of the formulas below

T = Actual temperature

Scale range -30/+30C	VDC [mV]	= 3060 + (T x 85)
Scale range 10/+110°C	VDC [mV]	= T x 50
Scale range 0/+40°C	VDC [mV]	= 500 + (T x 125)

DC-voltage signal as a function of the temperature

Example: Calculation of U at -10°C

U = 3060mV + (-10 x 85 mV

U = 3060mV + (-850) mV = 2210 mV

ACCESSORIES FOR THE UNITEMP SERIES

TYPE	DESCRIPTION
ETPP	**Control unit**
	The ETPP is an electronic control unit which emits a 0-5.5V DC voltage signal for remote adjustment of the regulation temperature. The same control is applied irrespective of type of thermostat scale range. It is inserted into a 10.5 mm wide hole
	Scale range
	Loose scale ranges for control unit installed directly onto insert ETPI or board
ETPS-1	Scale -30/+30°C
ETPS-3	Scale 0/+40°C
ETPK	**Control knob** for control unit ETPP
ETNK	**Cover** for wall installation of UNITEMP units