

UDC 3300 APPLICATION NOTE

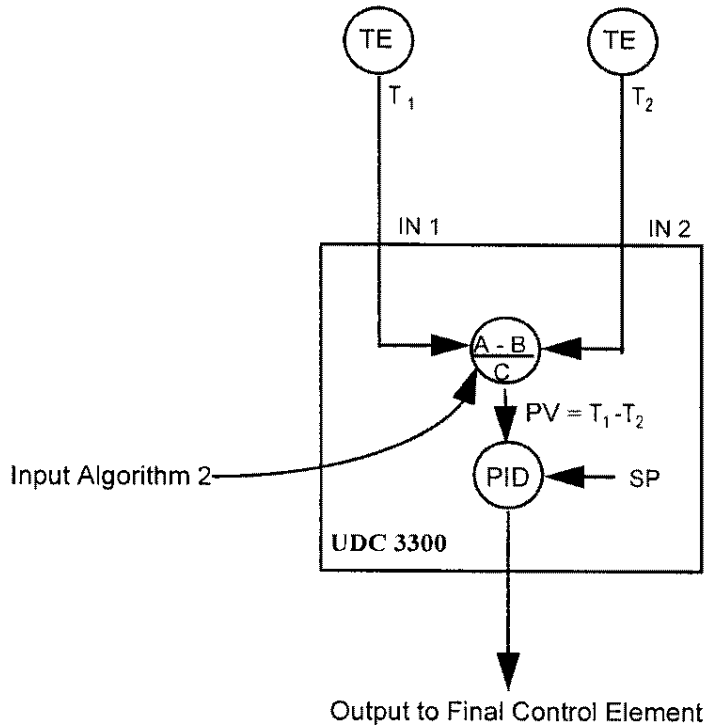
DIFFERENTIAL TEMPERATURE CONTROL

PROBLEM

Provide a controller which allows the user to continuously measure and control the differential temperature between two thermocouples or platinum RTD's without use of any transmitters.

SOLUTION

Specify a UDC 3300 with the optional math algorithm configured to calculate the difference between the two temperatures ($T_1 - T_2$). The result of the math algorithm's calculation is used as the process variable of the control loop. The desired differential temperature value is entered as the local setpoint. The controller's output then modulates the final control element to continuously maintain the actual differential temperature at the setpoint value. The UDC 3300 has the capability of measuring two thermocouples or RTD's directly which maximizes accuracy and saves the cost of supplying separate temperature transmitters. The recommended Model Number is *DC330E - xx - xCx - 11- xxxxx0 - 00*. The application is illustrated below.



CONFIGURATION

The recommended configuration details specific to this application are given below:

CONT ALG = PIDA
INP ALG 1 = NONE
INP ALG 2 = $K [(A - B)+C]+[\text{Calc Hi} - \text{Calc Lo}]$

Where: Alg 2 INA = IN 1
Alg 2 INB = IN 2
Alg 2 INC = None
Calc Hi = maximum positive ΔT expected
Calc Lo = maximum negative ΔT expected, or 0 if T_1 is always $\geq T_2$
 $K = \text{Math } K = 1 \div [\text{Calc Hi} - \text{Calc Lo}]$
i.e., if Calc Hi = 250 and Calc Lo = -250, then $K = 1 \div 500 = 0.002$

PV SOURCE = INP ALG2
SP Hi Lim = Calc Hi (250)
SP Lo Lim = Calc Lo (i.e. -250)
ACTION = Reverse (typically)

All other configuration items are treated as a normal single input PV control loop.