Algorithms for processing ASW35 data

Raw (input) data are resistance R in ohms and voltage U in volts.

Result is mirror temperature td in °C

U is Voltage measured between LAAP and LAAN

R is Resistance measured between LATH1 and LATH2

Calculation Formulas

1) w=a1 + b1*ln (R/R0) + c1*(ln(R/R0))^3

2) tc=(1/w) - 273

3) uc = a2 + tc*(b2 + tc*(c2 + tc*d2))

4) ud = uc - U*A

5) td = a3 + ud*(b3 + ud*(c3 + ud*d3))

Constants

$A_{ASW35\text{-}2P}$= 1996	R0 = 55330 Ohm	a2 = -.29	a3 = -.014
$A_{ASW35\text{-}2N}$= -1996	a1 = .0038023	b2 = 38.349	b3 = .026056
$A_{ASW35\text{-}1P}$= 3992	b1 = 262.83 E-6	c2 = .042776	c3 = -760.688 E-9
$A_{ASW35\text{-}1N}$= -3992	c1 = -570.51 E-9	d2 = -22.94 E-6	d3 = 96.453 E-12

Examples for testing your calculations:

Resistance R (ohms)	ASW35-2P Voltage U (volts)	ASW35-2N Voltage U (volts)	ASW35-1P Voltage U (volts)	ASW35-1N Voltage U (volts)	Result td (°C)
12490	0	0	0	0	19.98
12490	1.200	-1.200	0.600	-0.600	-44.39
40000	1.400	-1.400	0.700	-0.700	-85.85

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