Newir 529

$$ab = V_s \frac{R_2 R_3 - R_4 R_1}{(R_2 + R_4)(R_3 + R_1)}$$

1st diff Amp → $V_{ab} = -3.942 \to 4.743$

& assume linearity &

V_o is between $0 \to 4.5$

$\wedge_o T$ 5 due To errors

$$0 = -.3942 m + c \Big]^{m = 0.518}$$
$$4.5 = 4.743 m + c \Big]_{c = 2.042}$$

$$\boxed{V_o = 0.518 V_{in} + 2.042}$$

$$V_o = .518 \left(V_{in} - (-3.942) \right)$$
$$= \frac{R_2'}{R_1'} (V_2 - V_1) \to 2^{nd} \text{diss Amp}$$

$$\Leftarrow \boxed{R_2' = .518 R_1' = 6.18 K_\Omega}$$
$$\hookrightarrow \text{use pot to get it}$$
$$\frac{}{m}$$

$$-3.942 = \frac{+R_2'''}{R_1'''} V_s$$

$$R_2''' = \frac{3.942}{9} R_1''' = \boxed{4.38 K_\Omega}$$
use pot ←

Assumptions & findings

$R_1 = R_2 = \boxed{10 k\Omega}$, $V_s = 9V$

R_3 make The bridge null at $\boxed{11.44 k\Omega}$ → use pot

$R_4 = R_{sensor}$ from data shed

$0.063 K\Omega \to 343.6326 K\Omega$

$200°C \to -40°C$

assume $\boxed{R_1' = 10 k\Omega}$ for 1st diff AMP

$$R_2''/R_1'' = 1, R_2'' = R_1'' = 10k\Omega$$

$$R_1''' = 10 k\Omega$$

NEWUR 529

9v

220 ACV

Heter

11.44kΩ

10kΩ

R₁ₜ (Rt)

10kΩ

10kΩ

4.38kΩ

9v 10kΩ

−.9382V

5.18kΩ

10kΩ

46.69Ω

10kΩ

Vab

Vo

Vo

FAN

Motor

113 bridge bgvamp

6v

Vcc

−Vcc

V1

V2

Vo

SW

MC

LCD

13v

$$\#4 \quad v_0 = \frac{v_{Analog}}{1.23} \times 5$$

$$\# \quad v_{in} = \frac{N_0 - 2.042}{4} = 0.518$$

$$V_{ab} = g\frac{10 \times 11.44 - 10 R_y}{(10 + R_y)(11.44 + 10)}$$

$$(10 + R_y) \times \frac{21.44}{g}V_{ab} = 114.4 - 10R_y$$

$$\frac{21.44}{g}V_{ab}R_y + \frac{10 \times 21.44 V_{ab}}{g} = 114.4 - 10R_y$$

$$R_y\left(\frac{21.44}{g}V_{ab} + 10\right) = 114.4 - \frac{10 \times 21.44}{g}V_{ab}$$

$$\boxed{R_y = \frac{114.4 - 28.82 V_{ab}}{10 + 2.382 V_{ab}}} = R_{T_0}^{\beta\left(\frac{1}{T} - \frac{1}{T_0}\right)}$$

$$\beta = 3950$$

$$T_0 = (25 + 273)k$$

$$R_y = 10 e^{3950\left(\frac{1}{T} - \frac{1}{298}\right)}$$

$$\ln\left(\frac{R_y}{10}\right) = 3950\left(\frac{1}{T} - \frac{1}{298}\right) \Rightarrow \frac{\ln\left(\frac{R_y}{10}\right)}{3950} + \frac{1}{298} = \frac{1}{T}$$

$$T = \frac{1}{\ln\left(\frac{R_y}{10}\right)/3950 + \frac{1}{298}} \text{ kelvin}$$

$$\therefore t = T_k - 273.15 \,°C$$