

FRANKLIN AID



Franklin Electric



Franklin Application/Installation Data *Europe*

No. 2/2015

PT 100 Read-Out with multimeter and usage with VFD

Based on the previous editions FE AID 4/2007 and FE AID 4/2008 we would now like to give practical tips on how to measure the temperature of the PT100 with the help of a standard ohmmeter.

PT100 read out by means of a multimeter:

The PT100 contains a platinum thermo element which changes its resistance depending on the temperature: at 0° C the nominal resistance of the PT100 equals 100 Ω, at 100° C the resistance becomes 138,5 Ω. Thus, one can determine the temperature of the device the PT100 is connected to by measuring its resistance with the help of a multimeter.

1. Measurement:

The measuring leads of the ohmmeter are connected to the cable ends a and b (see drawing). This measurement will render the resistance of the connecting leads, i.e. 0,4 Ω.

2. Measurement:

The measuring leads of the ohmmeter are connected to the cable ends a and c. This measurement represents the resistance values of the PT100 and the connecting lead, i.e. 115,1 Ω.

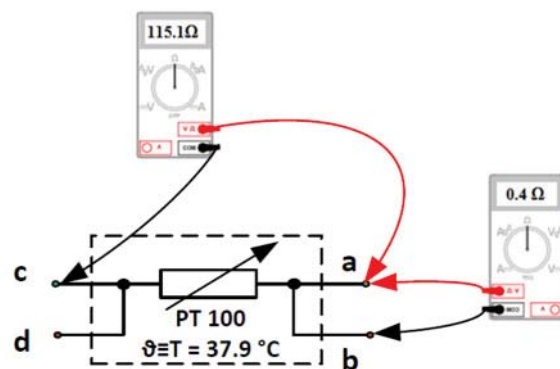
In order to determine the real PT100 resistance, we subtract measurement 1 from measurement 2, i.e. $115,1 - 0,4 = 114,7 \Omega$. In order to "translate" the resistance value to a temperature value, we now subtract the PT100 constant (100 Ω) and divide the result by 0,385 (a constant): $14,7 \Omega / 0,385 = 38,1^\circ \text{C}$

Shielding

Can a PT100 be used together with a frequency converter?

Yes. However, good practice is required when wiring the installation, as currents and voltages of process signals (such as PT100/PT100, level/flow transducers...) are easily disturbed by electromagnetic fields such as generated by VFDs. These interferences can lead to false readings resulting in equipment malfunction. Since current signals (0/4-20mA) are less prone to interference than voltage signals (0/2-10V) these should be the preferred option.

In order to prevent/minimize interference the cables conducting process signals should be routed as far away as practical from power leads conducting motor currents and should cross these only in right angles. Also, process signal cables have to be shielded and this shielding has to be carried out according to high frequency regulations.

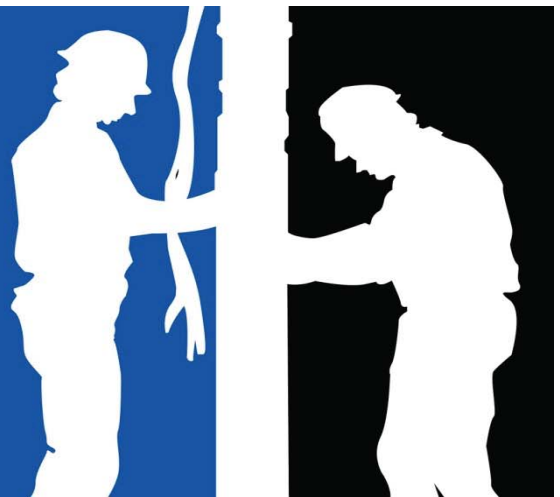


Pic. 1: PT100- Measuring connection with Ohmmeter

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A few words of our Head of Franklin Electric Europa Field Services, Edwin Klein, on the occasion of the generation change in the Field Service Department:

”Since 1997 I have been able to accept the numerous and always new challenges as the Field Service Manager of Franklin Electric. With the help of an excellent Service team internally and externally, it has always been our goal to help with prompt solutions and information.

Having reached my retirement age, I am ready to enter a new stage in my life. I thank you all for the good and pleasant cooperation in the past 18 years. It was an interesting and multifaceted time with many encounters and experiences, which have influenced my life.

Dieter Schuch will succeed me as the new Field Service Manager – I wish him all the best.“

Sincerely,
Edwin Klein



Edwin Klein and Dieter Schuch

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