

## Let's talk about analog meter heads

We have all seen the \$10 analog panel meters on the internet for sale. The temptation to buy one for our project and see if we can get it done on the cheap without spending a couple hundred dollars for a nice one is human nature. But save yourself the trouble. I can give you several good reasons why you should buy a very good quality one.

One of the reasons is since the mid 1990s the Vern Juenke Machine's came with a Simpson panel meter. Vern used these meters for a good reason not because he wanted to pay more money for them. They have a vibration dampening capability built into them called Taut band. Taut band is a means of suspending the moving mechanism between two ribbons of metal, obviating the need for pivots, jewels and control springs found in conventional mechanisms. The absence of friction resulting from this permits greater sensitivities and provides more rugged meters. Common failures of conventional meters subjected to shock testing are cracked jewels and/or blunted pivots. Taut band, without pivot and jewels, consequently, will withstand shock in excess of that specified for pivot and jewel meters. For example, ANSI Specifications for panel meters require 50G shock. Taut-band meters will withstand 100G shock. This definition came from the yokogawa web site if anybody wants to read more about it.

There is always someone that wants a digital meter instead of an analog one. Digital meters only take sample of what they are reading about 3 times per second. The Vern Juenke machine if it had a digital meter head would jump all over and make no sense. We need to see real time feedback from an analog meter needle. As the bullet is turning the needle is giving real time feedback, not a sample reading taken three times a second or every 60 degrees of rotation?

The meter head Vern chose for the final design of the ICC machine is the Simpson #1329. This meter head is the standard by all others are judged. It has a resistance of about 960 Ohms. Cheaper meter heads have higher resistance sometimes four times as much.

This is an important reason because the board design use in the Bullet Inspector meters is a very close reproduction of the original Board in the Vern Juenke Machine.

The BulletInspector circuit board can be used in the Vern Juenke's if they were made after 1995. This board design has a bridge of resistance on it that has to be balanced with the pots on the board in order to get the meter to read at all.

If you use the cheaper meter head the needle will not read as much as the taut band meter head. This will make calibrating your meter more difficult; because you can't compare the two meter heads together they will read differently because one is more sensitive than the other.

There is no doubt in my mind that I am going to get an Email that says.

“I can’t get my meter to zero”

My first Question is going to be which meter head are you using?

Next question will be what is the resistance of your meter head?

Have you adjusted the pots on the circuit board to accommodate a meter head with a higher resistance properly?

My advice to those on the fence about spending the extra money on the Simpson 1329 taut band panel meter. I bought the cheaper ones trying to get it to read right. I learned my lesson the hard way spending countless hours trying to adjust it to get better readings to know a vale.

Sometimes learning stuff the hard way is the only way to learn it. Then you really know it.

Try to learn something new every day.

## BulletDoctor

