APPLICATION NOTES FOR USE WITH SPELLMAN HIGH VOLTAGE POWER SUPPLIES

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3.5 and 4.5 Digit Meter Displays Explained

Full Digit

Digital meters are typically described as having “half digit” capability. A full digit is a display segment that can render all the numbers from 0-9, that is 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Half Digit

A half digit can display only the number 1. The half digit is always the first digit shown. Because the half digit is basically only a “1” it has limited possible use.

Decimal Point

The decimal point is just a “dot” segment that is manually displayed after the appropriate number segment to show the proper complete number desired. A dot can be displayed after any desired number, typically via a jumper setting. If the jumper is not installed, no dots at all will be displayed.

3.5 Digit Display Example

A 3.5 digit display is actually four segments, one half digit and 3 full digits. Displaying maximum capability it would read 1999. If we wanted to display 30kV on a 3.5 digit meter we would have to “throw out” the leading half digit as we can’t make use of it because it’s only a “1”. We are limited to using the three full digits, so the display would be 300. The decimal point is manually placed via a jumper, so the final display would be 30.0 and the “kV” term would be screened on the front panel overlay.

If we wanted to display 10kV on a 3.5 digit meter we can make use of the leading half digit. In this case we would have four digits of resolution with the meter displaying 1000. Placing the decimal point properly, the final meter reading would be 10.00 with the “kV” term screened on the front panel overlay.

4.5 Digit Display Example

If the DPM4 option is ordered, the standard 3.5 digit meters are upgraded with 4.5 digit meters. A 4.5 digit display is actually five segments, one half digit and 4 full digits. Displaying maximum capability it would read 19999.

Using the examples above, if we wanted to display 30kV on a 4.5 digit meter we would have to “throw out” the leading half digit as we can’t make use of it because it’s only a “1”. We are limited to using the four full digits so the display would be 3000. The decimal point is manually placed via a jumper, so the final

display would be 30.00 and the “kV” term would be screened on the front panel overlay.

If we wanted to display 10kV on a 4.5 digit meter we can make use of the leading half digit. In this case we would have five digits of resolution with the meter displaying 10000. Placing the decimal point properly the final meter reading would be 10.000 with the “kV” term screened on the front panel overlay.

2, 20, 200, 2000 – A Unique Situation

Due to the 2Vdc maximum input requirement of the digital meter used, there’s a unique situation that occurs for, let’s say, a 20kV unit. You could take the 10Vdc full scale signal and divide it down to 200mV and you would get…20.0kV a maximum of 3 digits of resolution. But there’s a way to “sneak” another digit of resolution out of a 20kV unit.

If you divide the 10Vdc full scale voltage monitor signal down to 2Vdc then for the vast majority of the display range you will get four digits of resolution or 19.99kV as a maximum display. The only drawback is when the unit is programmed to over 19.99kV the meter will “overscale” and display the leading “1” digit but all the following digits will be blank. There is nothing wrong with this condition; it is just what happens when more than a 2Vdc signal is inputted into the front panel digital meter.