CAPACITALK™

MYRON **ZUCKER** INC.
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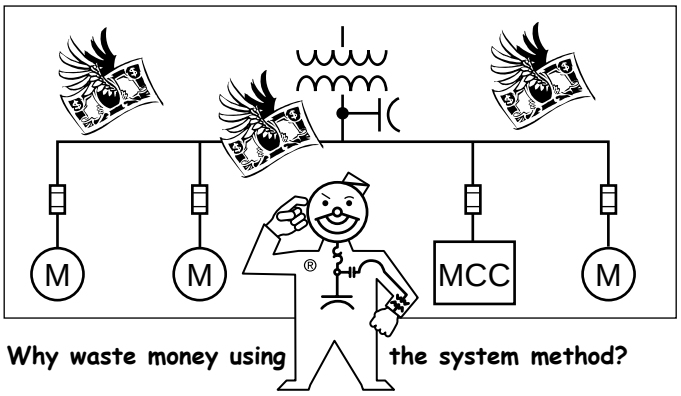
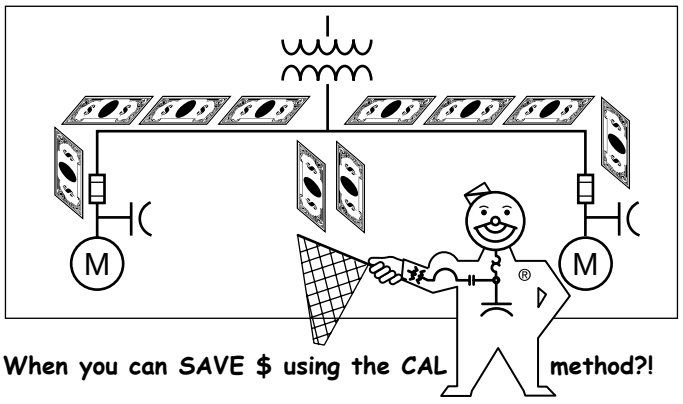
No. 101

Capacitors-At-Load (CAL) Actually DO Reduce KW-Hrs

For years, capacitor users and specifiers have acknowledged that capacitors not only improved the billing power factor, but also reduced the KVA loads by reducing current. Many folks are not aware, however, that this current reduction takes place only from the point of connection in the electrical system back to the utility source. Thus, a bank or automatically controlled capacitor installed on the primary side of a transformer will indicate an improved power factor on the utility primary meter, but **will not** reduce the KVA load on the transformer. On the other hand, capacitors connected at the secondary of the transformer will not only indicate an improved power factor, but also **will** reduce the KVA load on the transformer. The capacitors will not, however, reduce any of the ampere loads downstream from the transformer. Thus, all Feeders, Bus Ducts and Branch Circuits will reflect no current reduction whatsoever.





Recognition of this fact was the main reason Myron Zucker, Inc. (back in the 1950s) developed the ***Calmount***® brand capacitor design, to make it easy to locate capacitors at or near the motor—the chief source of poor power factor. By reducing the ampere draw of all the major motors, more electrical capacity was made available throughout the entire distribution system, and thus, more loads could be safely added. Many large plants adopted the concept and obviously realized its benefits.

Myron Zucker, Inc. knew that the CAL location versus the large bank location had another benefit: it would also reduce losses for in-plant wiring, and thus, reduce the KW-Hrs readings! Yet this idea was always looked on as being quite insignificant and not worthy of any further consideration. However, a reduction in amperes has to reduce the I^2R losses, reflected in both lower KVA and KW readings!

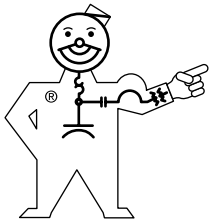
(continued on back)

"Before and After" Case History

Now one of our customers has provided us with an exciting "Before and After" case history to share with you!

A plant engineer at a factory in Garden Grove, California has made a careful analysis of all their power readings with no capacitors in use, and then repeated this analysis after installing capacitors on 14 of their largest HP motors. The savings are most significant! He has enthusiastically expressed the results as follows:

Plant-Wide Readings

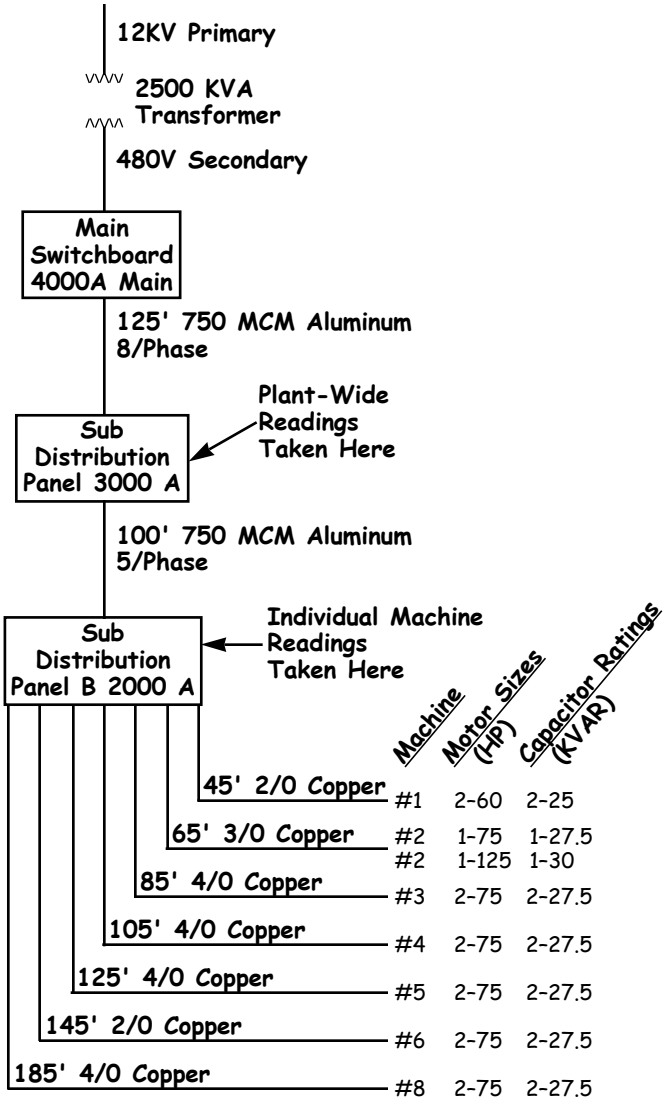


	Before	After
KW:	1643	1601
KVAR:	1295	924
KVA:	2092	1849
Amps:	2516	2223

"The plant-wide reading shows a savings of 42KW, which will result in an annual savings of $21,420.00. This is based on 6,000 hours of operation times a cost of $.085 per KWh. The initial investment cost was $5,801.00. The return on investment is 3.25 months."

Figure 1 shows the layout of the plant's electrical system. By installing ***Calmount***® brand capacitors directly connected to the load side of the starter contactors, the ampere reduction is occurring from that location all the way back to the meters. This reduction results in a smaller I^2R loss (or KW reduction), and thus, the $21,420.00 savings announced by the plant engineer.

Figure 1 — Plant Electrical System



We thought it important to bring this story to your attention in case you are trying to decide whether to install large KVAR banks, next to your substation or switchgear, or to follow the CAL concept in your power factor improvement plan. The significant news is the numbers which confirm the CAL concept, besides improving power factor, provides such large KW-Hr savings year after year.

Think about it, call us, and let's talk about it!

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