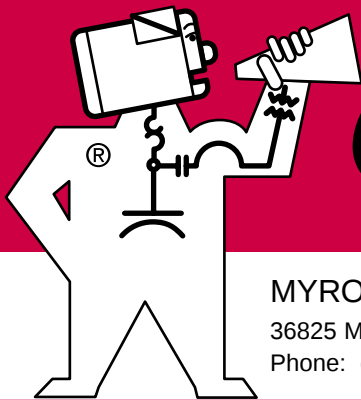




CAPACITALK™

MYRON ZUCKER INC.

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No. 105

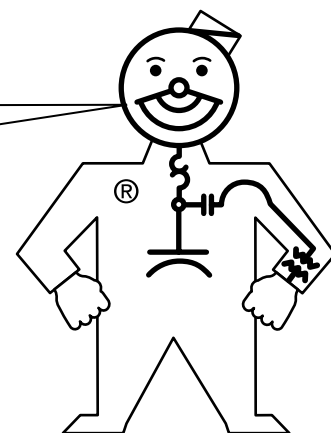
A Letter to CAL (Sizing Contactors for Capacitor Switching)

Dear CAL,

Since there are different types of starters out there, and I need to use a contactor with my capacitor, how do I size the contactor for my capacitor?

Signed,
"Perplexed
in Pittsburgh"

I can help!



Dear "Perplexed,"

Most of the major contactor manufacturers spend a lot of time testing and retesting their contactors for all types of applications, capacitors being one of them. So if you call the manufacturer of the contactor you are using, they should be able to guide you in finding the right size contactor for the size of capacitor you are using.

Also, there is a "rule of thumb" you can use to size the contactor for the capacitor you are using. In today's factory environment, we must not only consider the nominal current of the capacitor, but also some harmonic

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currents. So for this reason, and because the capacitor tolerance allows it, we will use a factor of 10% times nominal current ($1.1I_n$, where I_n = nominal current). Then we will take into account the usual 135% rating used for wiring and disconnect sizing ($1.35I_n$).

Therefore, it would be best (as a rule of thumb) to size the contactor used for switching the capacitor to be rated to carry a thermal current (I_{th}) of 1.49 (1.1×1.35) times the nominal current of the capacitor, as shown in the formula below.

$$I_{th} = 1.49 \times I_n$$

Example:

What size contactor would we need for a 10-KVAR, 480 volt capacitor?

$$10 \text{ KVAR} \times 1.2 \text{ amps per KVAR} = 12 \text{ amps}$$

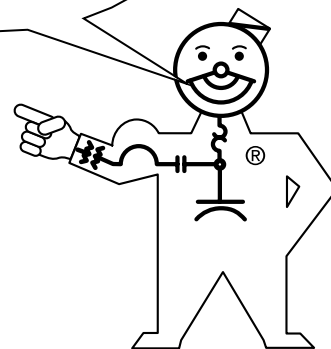
$$12 \text{ amps} \times 1.49 = 17.9$$

Using the formula above, we would need a contactor that has a thermal current of at least 17.9 amps.

Also, you may have to take into consideration other factors such as:

- transition peaks
- circuit inductance
- other switching capacitors
- temperature

You can use this rule of thumb to help in sizing your contactor, but it would be best to start with your contactor manufacturer.



If you have any questions for CAL, simply write to Myron Zucker, Inc. or e-mail us at info@myronzucker.com

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