Matrix AP Recommendations for Paralleling Filters

This document is intended to serve as a guideline in the application of Matrix AP filters for use in a parallel configuration to increase the current / power rating. This is a guideline only and is to be used along with installation information from the Matrix AP Technical Reference Manual. Information provided here does not supersede local or national electrical codes or the drive manufacturer installation or fusing instructions.

1. Use Matching filter ratings:

   Only exact matching catalog number filters should be paralleled (with the exception of the master / slave configuration shown in 3b below) and limited to no more than 3 parallel units. Never parallel mismatched or unlike voltage, frequency or current ratings. Part numbers should match and preferably be from same manufacturing series or date run.

2. De-rate to 90%:

   To allow for slight variations due to manufacturing tolerance, all filter configurations must run at no more than 90% of the total parallel filter rating sum. Meaning, a de-rating of at least 10% should be applied to the total current rating of the filter system.

   For example: if a system requires 1,270 amps, two MAPP0636D filters would not work:
   (636 * 2) * 0.9 = (yields) only 1,144.8 amps
   Rather two MAPP0786D filters should be used:
   (786 * 2) * 0.9 = 1,414.8 amps

3. Contactor options:

   a. Options 002 and 012, if used, must have the contactors switched simultaneously.

   b. Options 009, if used, may result in an asynchronous pick up and drop out of the capacitor contactor where one closes early and one late. Though this is not a preferred method of operation, overall functionality should not be adversely impacted. The preferred method would be to run a master / slave configuration with only one filter fitted with the 009 current sensor option making it the “master”. The remaining filter(s) fitted with the 012 option are to be “slave” units. The normally open (N.O.) aux contacts from the master 009 main contactor unit should then serve as the control method to activate the slave 012 filter(s). See Figure 1

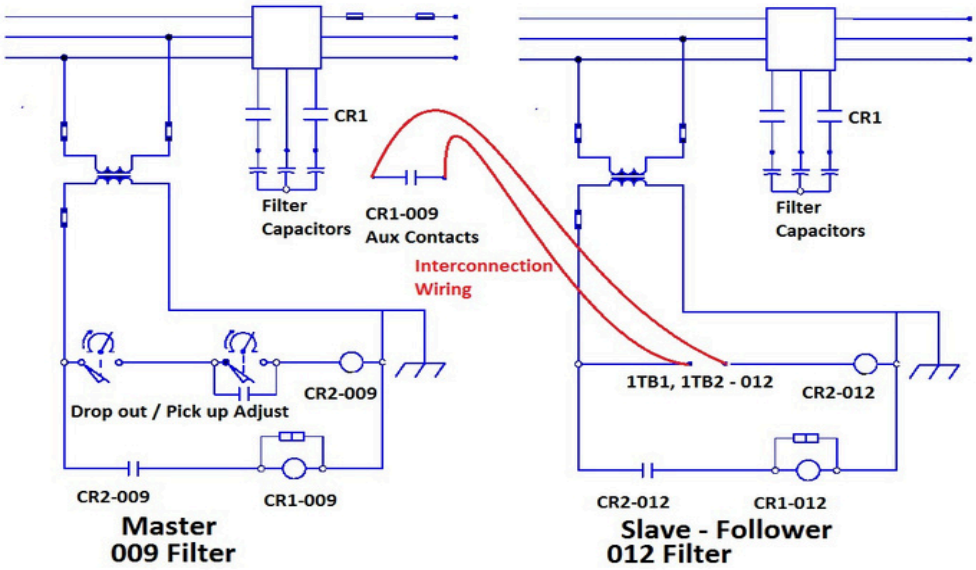
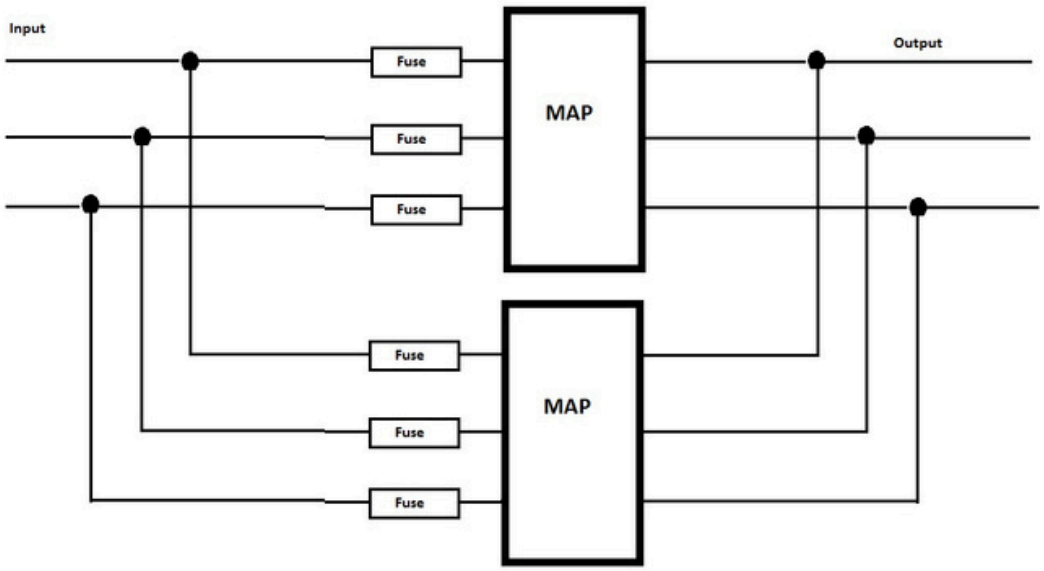


Figure 1

c. Option 013 should not be used for parallel configurations unless the contactors for filter capacitors and more importantly for the bypass circuit can be synchronized to switch at exactly the same time.

4. Fusing:

It is best to fuse the filters individually using the transformer fusing guidelines in NEC Article 450. (Current rating X 1.25) using next size up if an exact fuse rating is not available.



Fuses to each filter are to be the same rating and type. MTE makes no further recommendations on exact fuse sizing except to follow codes.

a. If the required drive input current / fusing is less that the parallel filter combined current, the fuses into the filter can be made smaller (but still equal) such that the sum of the fusing will match the drive requirement.

b. Exception to 4 above: The unit may be treated as a single element with a single set of fusing at the filter input if the following conditions are met:

   i. Panel mount filters are employed
   ii. Each phase terminal is connected with a common buss connection between filters
   iii. Input and output wiring is landed on this buss-work as a terminal
   iv. The parallel configuration is placed in a qualified electrical enclosure

Note: Fusing of any parallel Matrix filter configuration must still satisfy the fusing requirements for the drive in this system. If combine fusing is larger than the drive manufacturer allows, a separate fusing system in front of the drive must be used. Refer to drive manufacturer installation manual for proper drive input fusing.

5. Over-Temperature Protection:
Thermal switches for each filter should be run in series and integrated into the drive control circuit to shut the system down in the event of any single filter over-temperature condition. Refer to Temperature Switch configuration connection in the Matrix AP Technical Reference Manual.
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