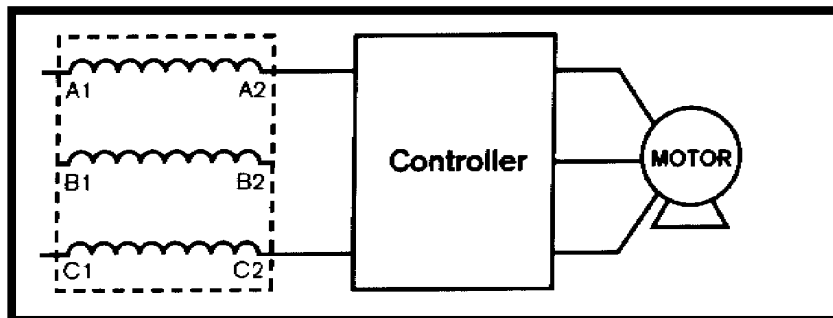


How to use a 3-phase line reactor for a single-phase application!

➔ The illustration below demonstrates how a 3-phase line reactor can be used for a single-phase application. Using the mathematical method below you can calculate the inductance to determine what type of reactor is needed.

Reactors for Single Phase Applications

MTE three-phase Line / Load Reactors can be used for single-phase applications by routing each of the two supply conductors through an outside coil, and leaving the center coil disconnected. For the drive input application shown in (Figure 1.), the incoming supply lines connect to terminals A1, C1, and outgoing lines from A2, C2. The "B" terminals for the center coil are not connected. The sum of the inductance of the two coils is the total inductance applied to the circuit.



(Figure 1.)

As an example, consider a single-phase application of 2HP supplied by 240 Vac. The reactor must carry 12A (fundamental current) according to the NEC table for single-phase motor current. A 5% impedance is desired. For a 60Hz supply, the formula to calculate required inductance is: $L = (ZV) / (377I)$, where L is inductance in Henries, Z is percent impedance, V is supply voltage, and I is full load amps.

For above example: $0.00265 = (0.05 \times 240) / (377 \times 12)$, indicating a total required inductance of 2.65 mH. Based upon this result, MTE part number RL-01201, which has an inductance per coil of 1.25mH, a fundamental current rating of 12A, and a maximum continuous current rating of 18A, will work. When connected for a single-phase application, the sum of the two coils will provide a total inductance of 2.5mH, or an effective impedance of 4.7%, calculated as $Z = (I \times 377 \times L) / V$, or $.047 = (12 \times 377 \times .0025) / 240$. For a 50Hz supply, modify the formulas by substitution of the factor 314 in place of 377.



APPLICATION NOTE

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SELECTION TABLE SINGLE-PHASE MOTOR DRIVE APPLICATIONS

HP	120 V	208 V	240 V	480 V
1/6	RL-00801	RL-00401	RL-00402	RL-00202
1/4	RL-00801	RL-00401	RL-00401	RL-00202
1/3	RL-01201	RL-00401	RL-00401	RL-00201
1/2	RL-01801	RL-00801	RL-00802	RL-00403
3/4	RL-02501	RL-00801	RL-00801	RL-00402
1	RL-02501	RL-01201	RL-00801	RL-00402
1-1/2	RL-03501	RL-01201	RL-01201	RL-00803
2	RL-03501	RL-01801	RL-01201	RL-00803
3	RL-05501	RL-02501	RL-01801	RL-01202
5	RL-10001	RL-03501	RL-03501	RL-01802
7-1/2	RL-13001	RL-04501	RL-04501	RL-02502
10	RL-13001	RL-05501	RL-05501	RL-02502
15		RL-08001	RL-08001	RL-03502
20		RL-10001	RL-10001	RL-04502
25		RL-13001	RL-13001	RL-05502
30				RL-08002
40				RL-10002
50				RL-13002

✱ These selections provide typical percent impedance rating of 5%.