BASIC INFORMATION YOU NEED TO MAKE A THERMAL CIRCUIT PROTECTOR SELECTION

1. The maximum voltage of the circuit.

2. The normal operating current for the circuit to be protected.

3. The safety factor you wish to apply to ensure trouble free operation by avoiding nuisance trips.

   NOTE: Generally, most engineers add at least 15 percent to the normal operating current. The actual amount to be added will depend on factors such as anticipated voltage fluctuations or surges, inductive versus resistive loads and manufacturing tolerances, etc.

4. The ambient temperature to which the circuit protector will be exposed.

   NOTE: Most thermal circuit protector selections require to be adjusted for ambient temperatures different than 77°F (25°C).

5. The capacity correction factor for the ambient temperature to which the circuit protector will be exposed. Refer to capacity correction factors shown in manufacturers catalogues.

   NOTE: Trimax NW Series expansion type circuit protectors are ambient temperature insensitive and do not require uprating or derating.

6. The maximum current at which the circuit protector must trip.

7. The duration in seconds the system can withstand the maximum current without damage. (In the case of a motor application, this data may be obtained from the motor manufacturer.)

SELECTION EXAMPLE

GIVEN:

1. Maximum Voltage.....250V AC
2. Normal Operating Current .....8.0 Amps
3. Safety Factor 15%
4. Ambient Temperature .....104°F (40°C)
5. Capacity correction factor .....1.25 from catalogue (see note below)
6. Maximum Trip Current.....48 Amps
7. The time duration the circuit can withstand the maximum trip current of 48 Amps .....10 seconds

CIRCUIT PROTECTOR SELECTION

1. Calculate the suggested circuit protector rating as follows:

Running Current	X	Safety Factor	X	Capacity Correction Factor	=	Suggested Protector Rating
(8.0)	X	1.15	X	1.25	=	11.5 Amps

2. Consulting the appropriate circuit protector catalogue, we find that a circuit protector rating of 11.5 Amps is not available but that the nearest amperage rating of 12 Amps is satisfactory.

3. Perform a check to determine the percentage overload using the following formula:

Overload Current	÷	Selected Amperage Rating	=	Overload
(48 Amps)	÷	(12 Amps)	=	4.00 or 400%

4. Determine whether the trip time meets the specifications for the percentage overload calculated (400% in above example).
   Referring to the trip time vs current data in the circuit protector catalogue, we find that the trip time at 400% overload is 1.6 seconds minimum and 4.5 seconds maximum, well within the 10 second limit stipulated.

   NOTE: Capacity correction factors to compensate for ambient temperature may vary between circuit protector manufacturers and models as well as between different amperage ratings within a given family of breaker models. Please make sure that the derating or uprating factor used to calculate the full load current of the circuit protector ultimately selected matches the factor published by the manufacturer of that circuit protector.