Using Latched Contactors in Medium Voltage Motor Control Centers

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The motor starting contactors used in medium voltage motor control are usually held closed by an operating coil, which is energized to close the contactor. When the coil is deenergized, the contactor opens. Since the contactor's coils is usually energized from a control power transformer connected to the primary circuit of the starter, this design provides automatic undervoltage protection for the motor.

For loads other than motors, however, it is sometimes desirable to maintain the circuit during an undervoltage condition. This is commonly done for transformer feeders originating in the medium voltage MCC. To handle this type of circuit, latched contactors are available. When closed by its operating coil, a latched contactor will remain closed even if the closing coil is deenergized. The latched contactor is opened by energizing a trip coil, something like a circuit breaker is opened. Latched contactors may be equipped with manual closing and/or tripping operators if desired. These may be in addition to or in place of the operating coils, leading to quite a few possible combinations of operators.

Several cautions are in order when latched contactors are used:

- For non-motor loads, such as transformers or capacitors, the motor starting current-limiting fuses should be replaced with general purpose current-limiting fuses. These fuses may stand alone as the overcurrent protection, or they may be supplemented with overcurrent relays for better overload protection.
- Since automatic undervoltage protection disappears when a latched contactor is used, separate undervoltage relays must be provided if undervoltage protection is needed.
- There is a major difference between the control circuit for a latched contactor and the control circuit for a circuit breaker. The latched contactor has no anti-pump feature. If a latched contactor is presented with simultaneous, maintained close and trip signals, it will cycle closed and open until one of the signals is removed or until the contactor destroys itself. A circuit breaker, on the other hand, will close once and open once, then remain open until the closing signal is removed and reestablished. Control and interlocking circuits used with latched contactors should be investigated very carefully to make sure that there is not a circuit that could result in damage to the contactors.

Properly applied latched contactors are useful devices, but they don't work just like circuit breakers. Be sure you understand the differences and take them into account when using latched contactors.

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