Interrupters

QUICK BREAK WHIPS

There are many factors which govern the interrupting capabilities of a disconnect switch. Some of these factors are: weather conditions, the amount of current, speed of operation, contamination, and the recovery voltage. Very high speeds of contact separation are required to establish the dielectric strength of the air gap ahead of the rise in recovery voltage.

Morpac has taken the speed of operation requirement out of the hands of the switch operator and designed it into the quick break whip, thereby keeping the velocity constant. This device is a whip machined from spring quality stainless steel. The whip is tapered, permitting maximum deflection and high tip speeds, without exceeding the elastic limit of the material.

In the closed position, the whip is engaged in a retaining catch and as the switch is opened, the whip is subjected to a large deflection and, as the switch continues to open, the whip is released and moves with spring action at high speed to the full open position. Through special design the whip is sufficiently dampened so that over-travel does not occur, and rebound is held to a minimum.

The recommended maximum interrupting range of application for the Morpac quick break whip is:

LINE BREAKING CURRENT		TRANSFORMER MAGNETIZING CURRENT		
7.5 - 115 kV	12 amps	7.5 - 69 kV	up to	35,000 KVA
138 kV	10 amps	115 - 161 kV	up to	100,000 KVA
161 kV	8 amps			

Magnetizing current in modern transformers is about 1 to 6 amperes. Where the actual value for a particular transformer is not known, it can be approximated. For units in the area of 5,000 KVA, the magnetizing current is approximately 1.5% of full load. At 10,000 KVA and above, 1.0% is a good approximation. These values are based on single and three phase multiple winding transformers. Autotransformer magnetizing current is normally less than the multiple winding units.

Field experience by utilities has shown that in network/loop/parallel switching up to 100 amperes of load current can be safely interrupted in 69 kV systems and below. This is due to the low recovery voltage across the switch as compared to radial feed/line charging where a high recovery voltage is seen.

The actual system parameters should be verified by the customer before specifying the addition of a quick break whip.