

## TD B116 – Installing large single core MI cables

When installing large single core cables, it should be appreciated that on an ac system losses are likely to occur due to induced currents. Providing that cable runs are carefully designed it is possible to reduce heating effects and minimise voltage drops.

### - 1 – Eddy currents

This problem is not usually encountered until the cable is carrying more than 200 amps. Eddy currents can cause problems where the cables are terminated into steel switchgear or gland plates.

To remedy this in a dry location, slots can be cut between the cable entry holes to break the magnetic circuit (Fig 3) If the location is damp or more than one cable is used per phase, the gland entry plate should be changed for a non-ferrous one (brass).

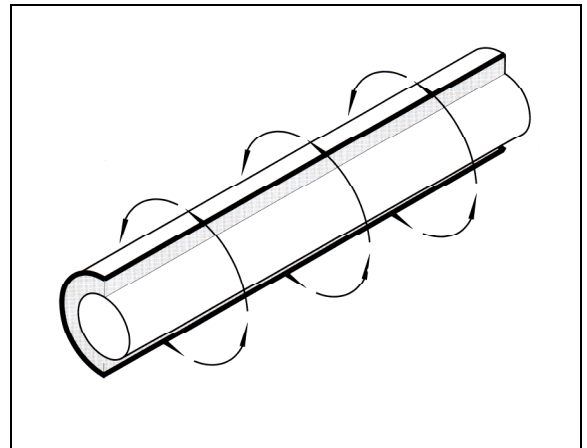
### 2 – Circulating currents.

When single core MI cables with a plastic outer covering are installed with both ends connected to a metal gland plate, circulating currents can flow in the cable sheath. (Fig 2)

These currents can be eliminated by replacing one of the metal gland plates with an insulated one, although this can result in standing voltages appearing on the sheaths of the cables.

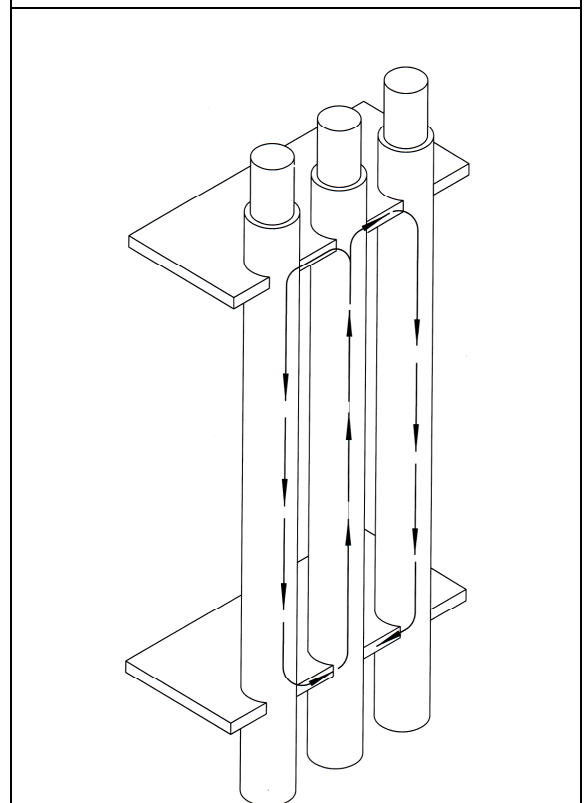
If the cables are installed as shown in Table 1 then the problems will be minimised. Where more than one cable per phase is required they should be run in separated groups of three, such that like phases are not adjacent to each other. The appropriate current rating can then be selected from the IEE Wiring Regulations.

It should be noted that the cable sheaths will not provide the circuit protective conductor unless they are bonded at both ends.



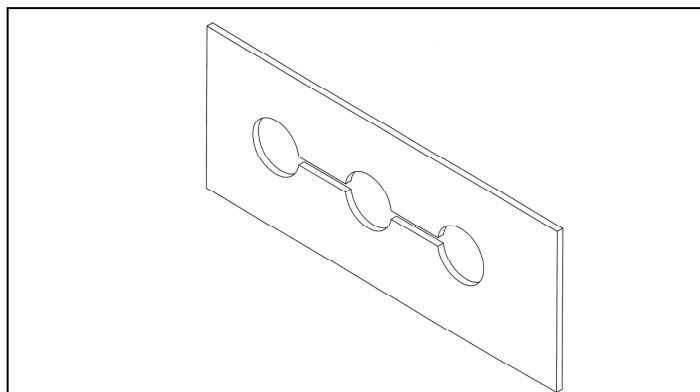
**Figure 1.**

Eddy currents which circulate around the sheath can cause excessive heating.



**Figure 2.**


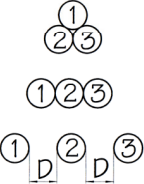
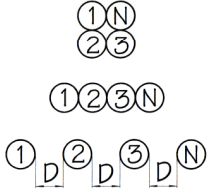
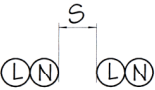
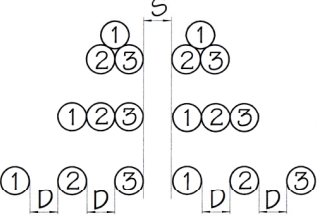
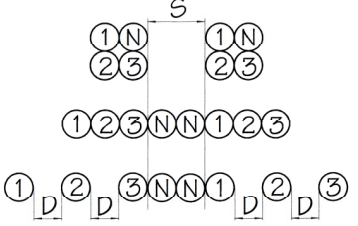
Circulating currents travel through the cable sheath in a longitudinal direction



**Figure 3**

Steel gland plate slotted to reduce the effect of eddy currents

## Cable Configurations

	Single Phase	Three Phase	Three Phase + Neutral
Single circuit			
More than one circuit or more than one cable per phase in parallel			

D = cable sheath diameter

S = clearance between groups of cables. It should be at least 2 x D to avoid derating.

Current ratings and voltage drops will vary with the configuration of the cables. See the current edition of BS 7671 (the IEE Wiring regulations).

In balanced three phase, four wire systems using more than one circuit or more than one cable per phase, the neutrals may be located as shown, or alternatively, outside the cable groups

