Electrical Protection & Distribution

Basic Protection

Insulation, Barriers, Enclosures, Placing Out of Reach

Direct Contact

Fault Protection ADS

Earthing
Fuses, MCB's, (RCD's - RCCB's, RCBO's)

Indirect Contact

Electricity at Work Regulations 1989

Regulation 11: Means for protecting from excess of current.

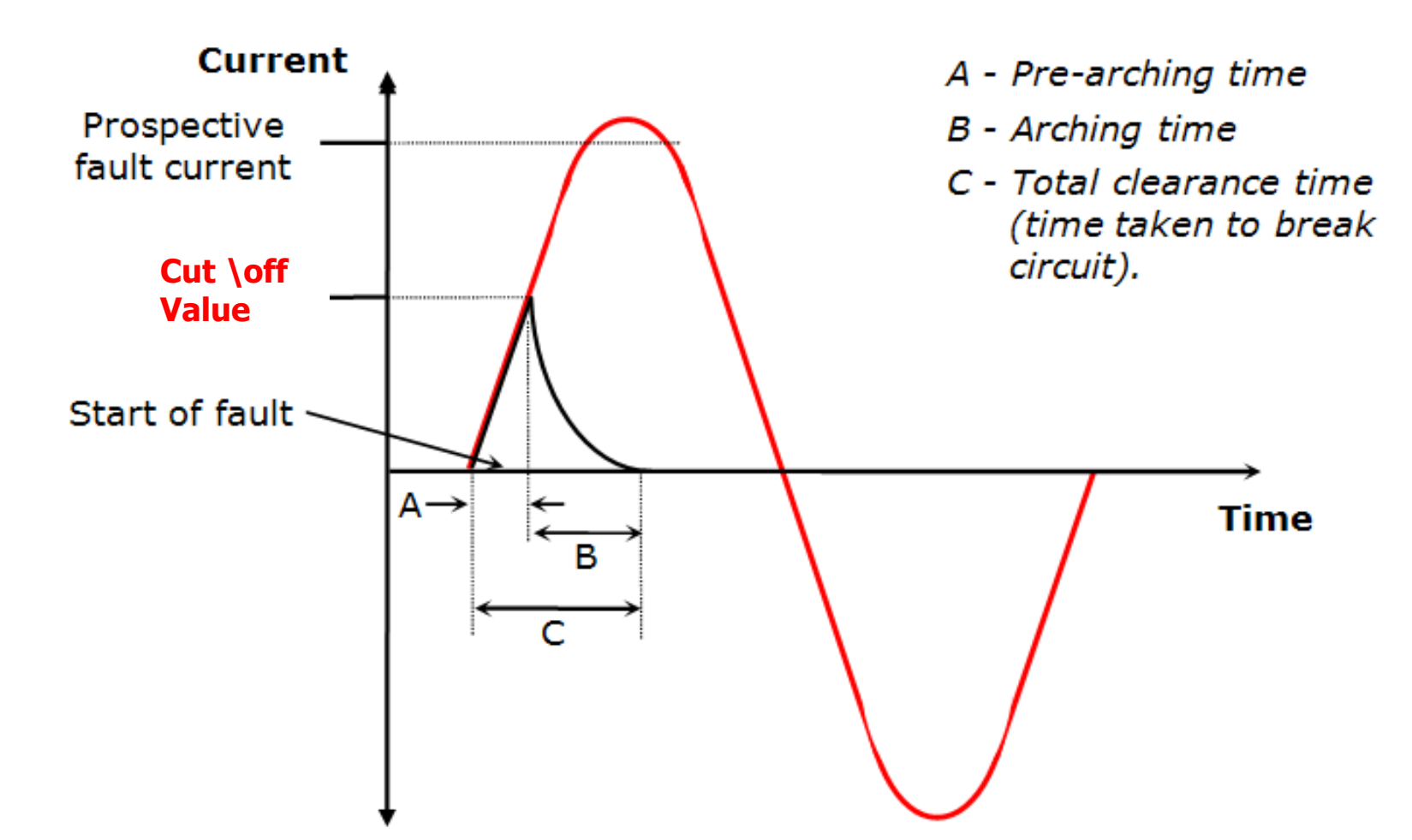
Efficient means, suitably located, shall be provided for protection from excess current in every part of a ***system*** *as may be necessary to prevent danger.*

Types of protective device

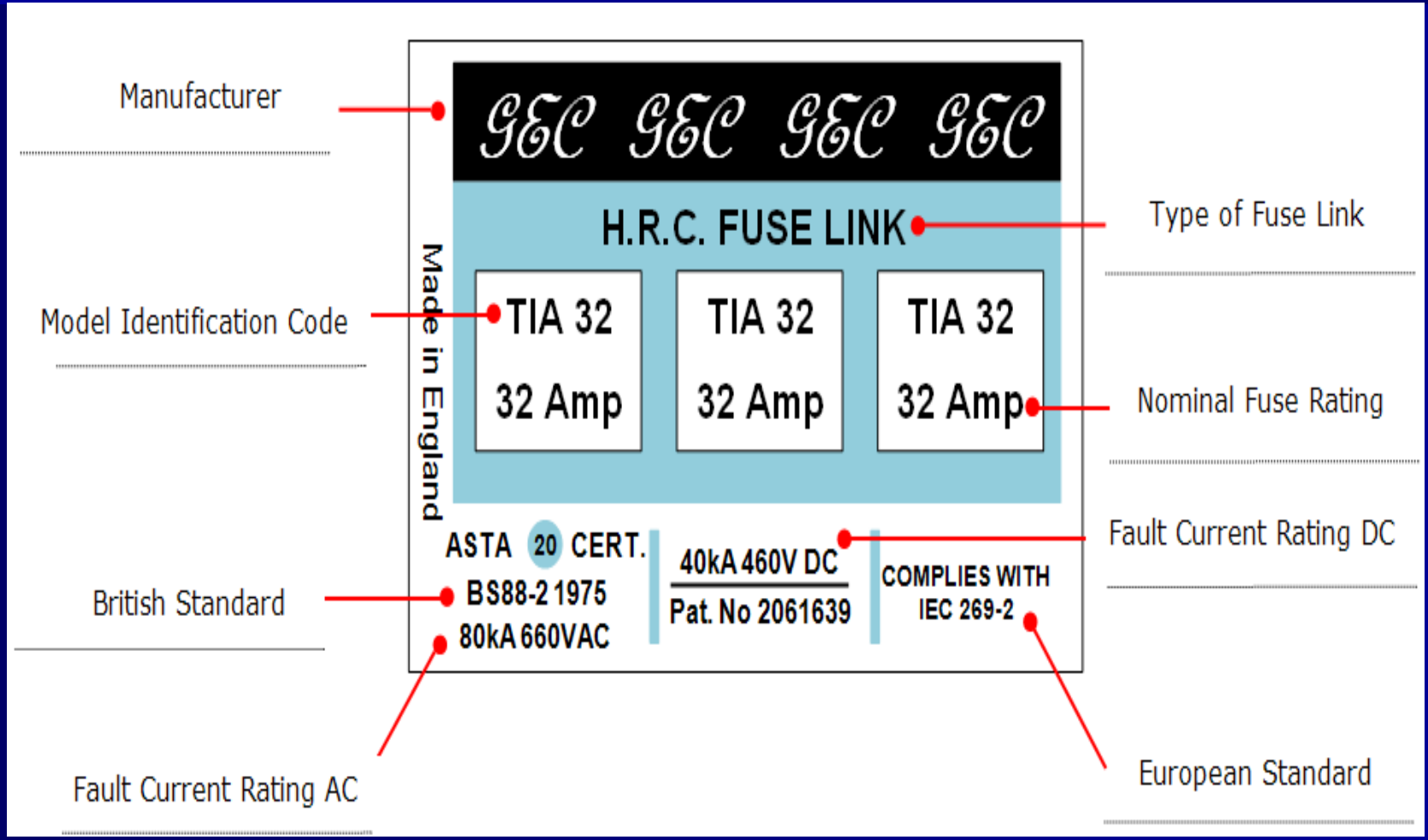
Fuses

BS3036	(Rewireable Domestic 4kA)
BS1361	(Domestic Consumer Units 33kA)
BS1362	(Domestic Plugs/Outlets 6kA)
BS88-1,2,3	(Industrial 80kA)

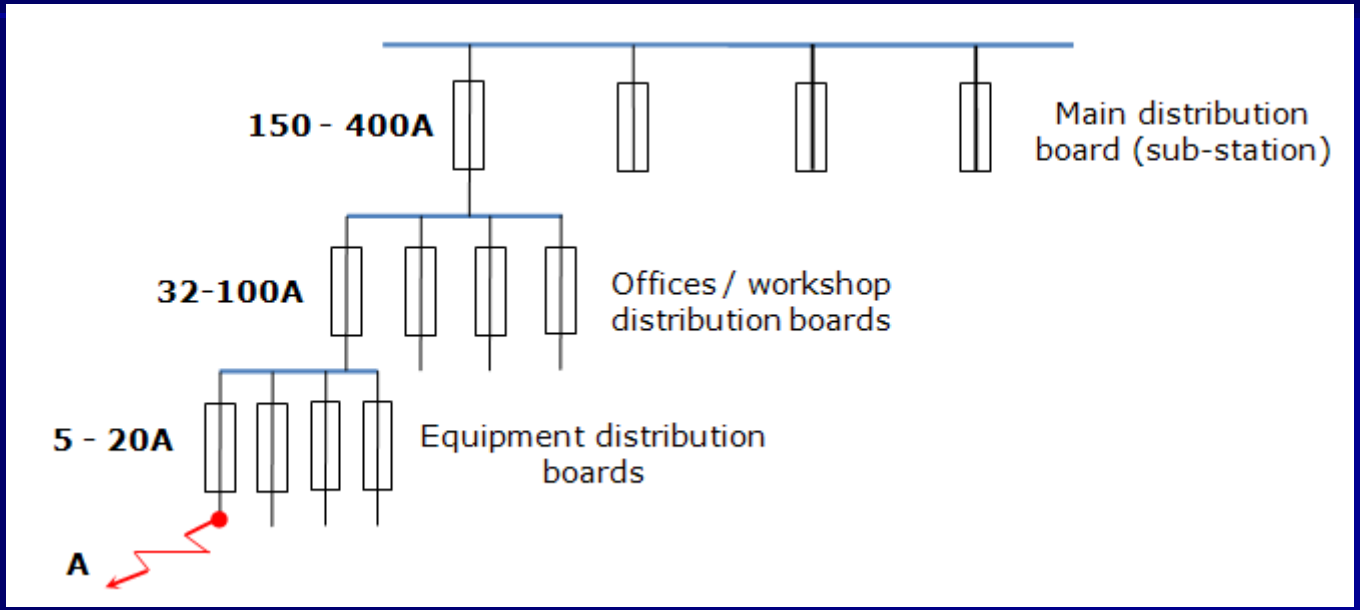
Energy Let Through I^2t



Labelling



Discrimination



In the event of a fault at point “A” the protection device immediately up-stream of the fault should operate only and isolate the faulty circuit, hence leaving the healthy circuits unaffected. This is known as discrimination.

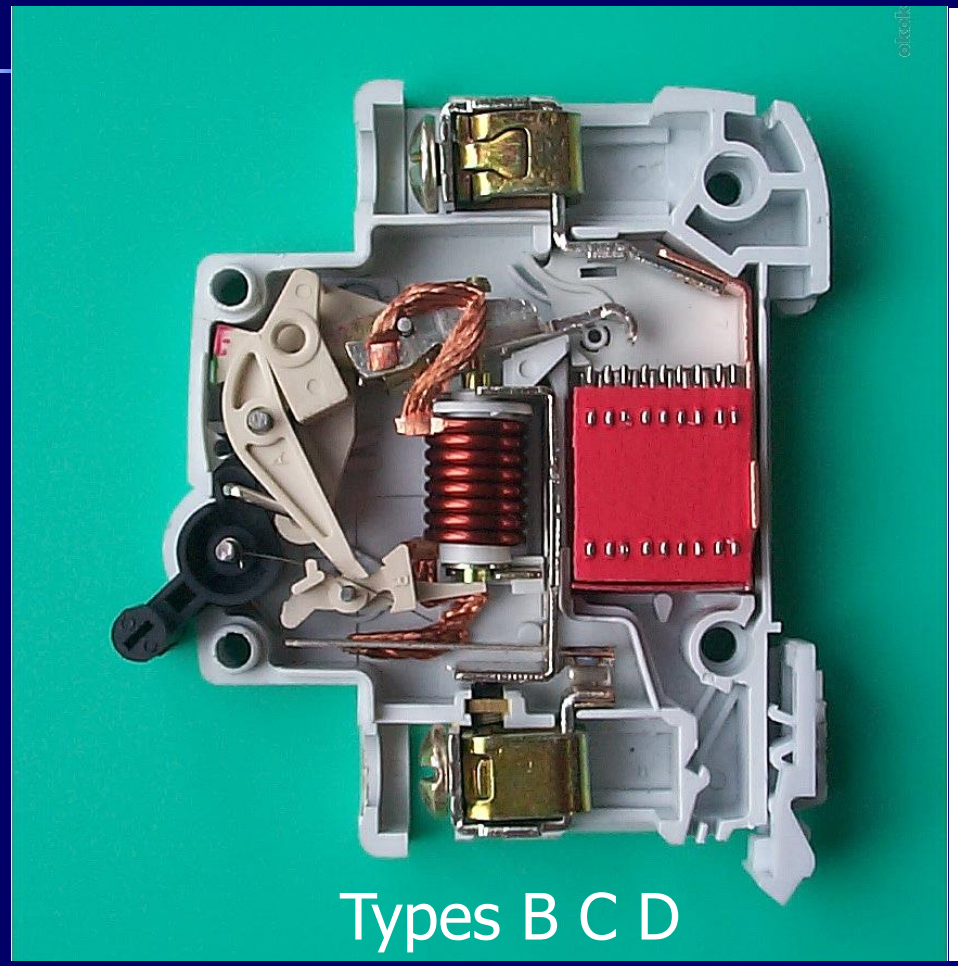
Types of protective device cont'd

Miniature Circuit Breakers (MCB's)

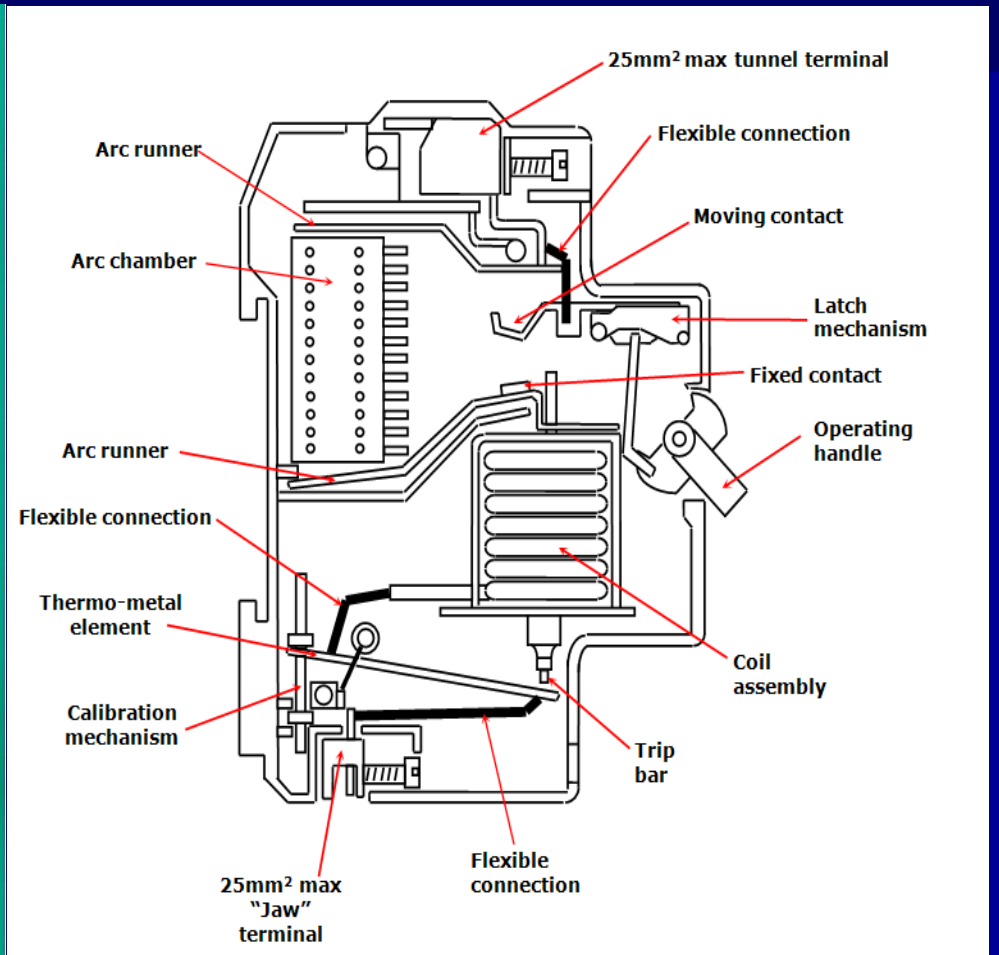
BS60898-1 / 2 (Domestic/Commercial)

BS60947-2 (Industrial)

Inside an MCB



Types B C D



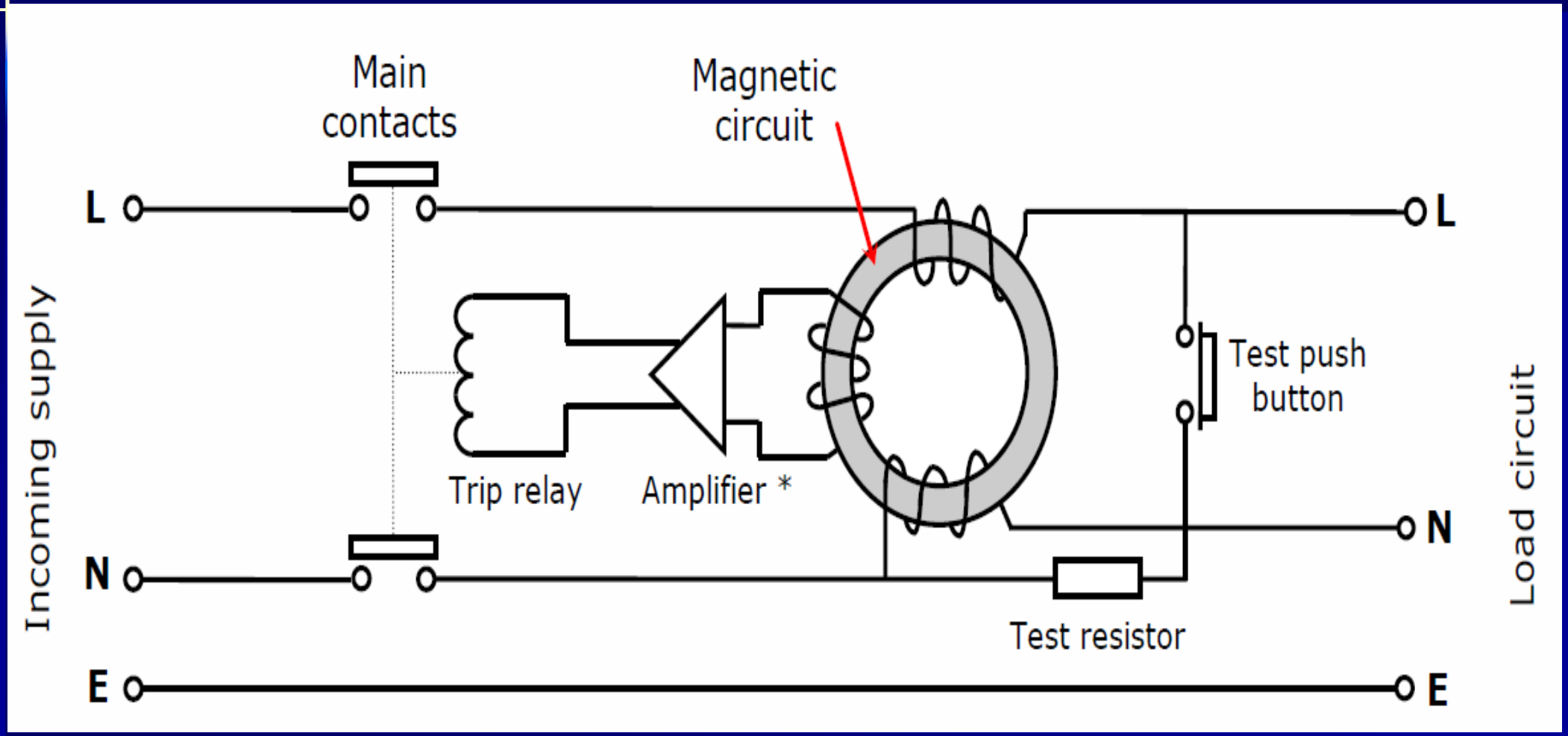
Types of protective device

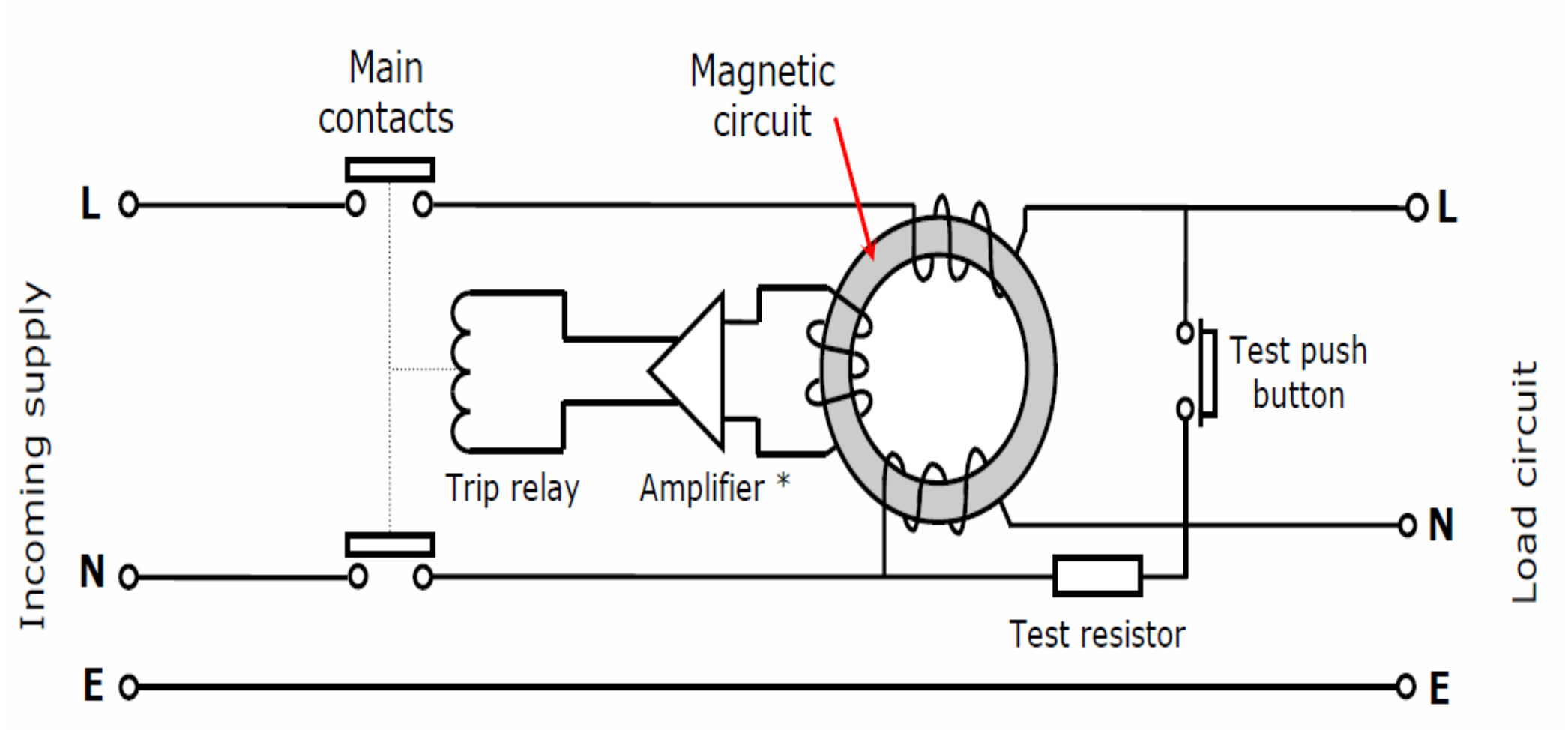
Residual Current Devices (RCD's)

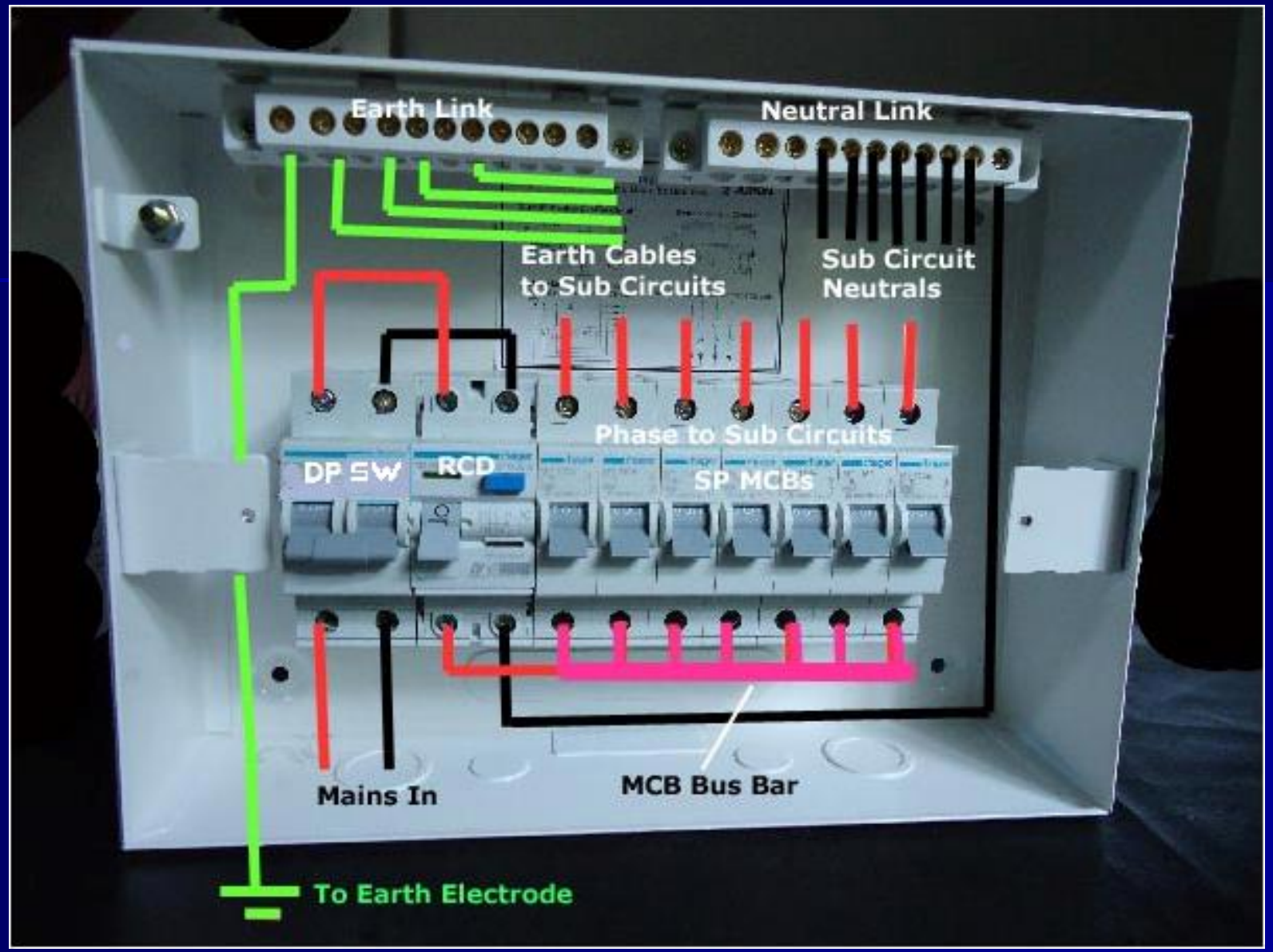
Residual Current Circuit Breakers (RCCB's)
BS EN 61008 -1 (types AC, A, AKV, B, EV, F)

Residual Current Breakers with Overload (RCBO's)
BS EN 61009 -1 (types AC, A, B, F)

RCCB Operation

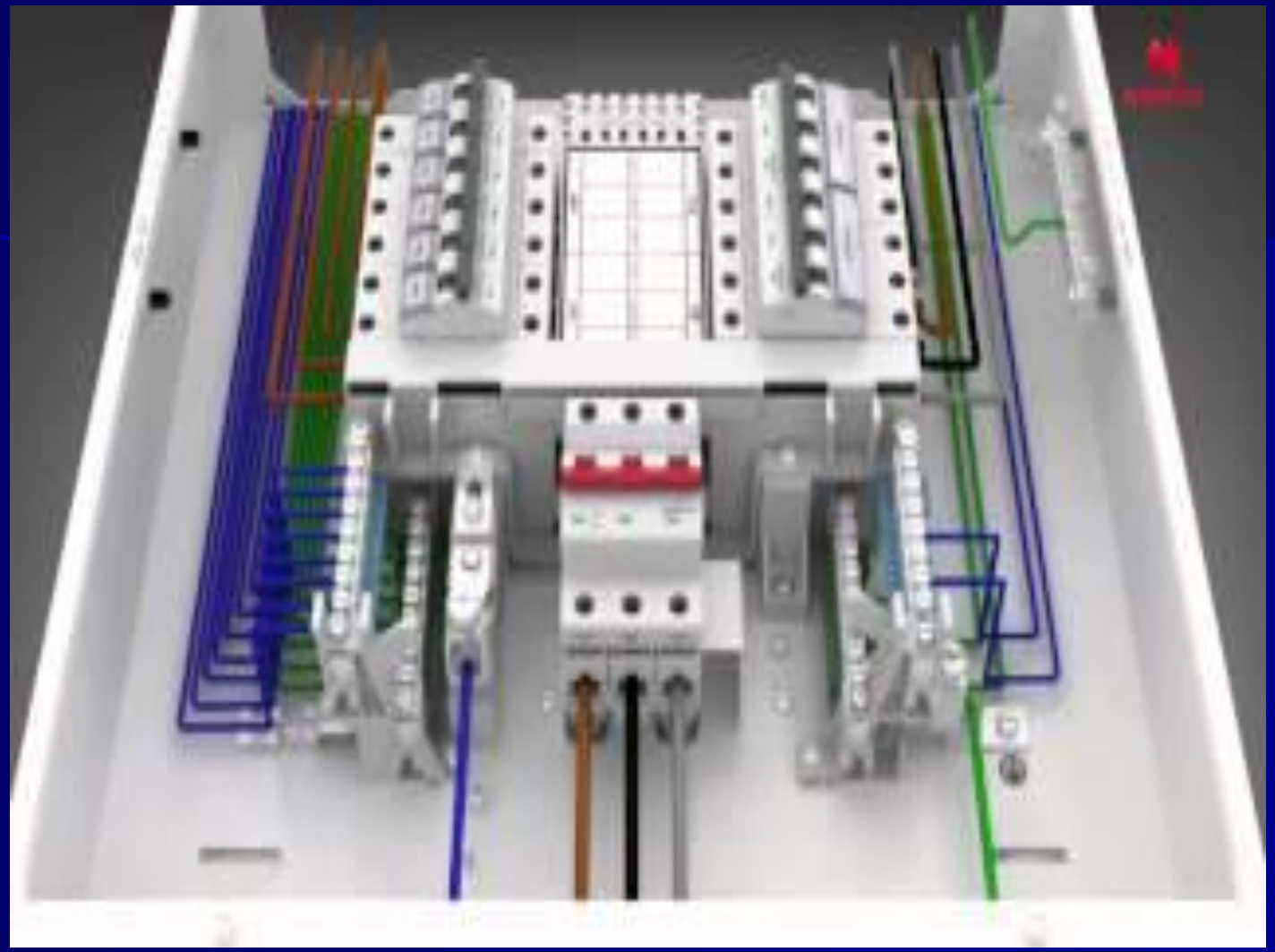



Main
contacts
Magnetic
circuit
L
N
E
L
N
E
Incoming supply
Load circuit
Trip relay
Amplifier *
Test push
button
Test resistor



Consumer Unit BSEN 60898-1

BS 88 Fuse Board



Load Center IEC 60947-2

Industrial Consumer Terminals

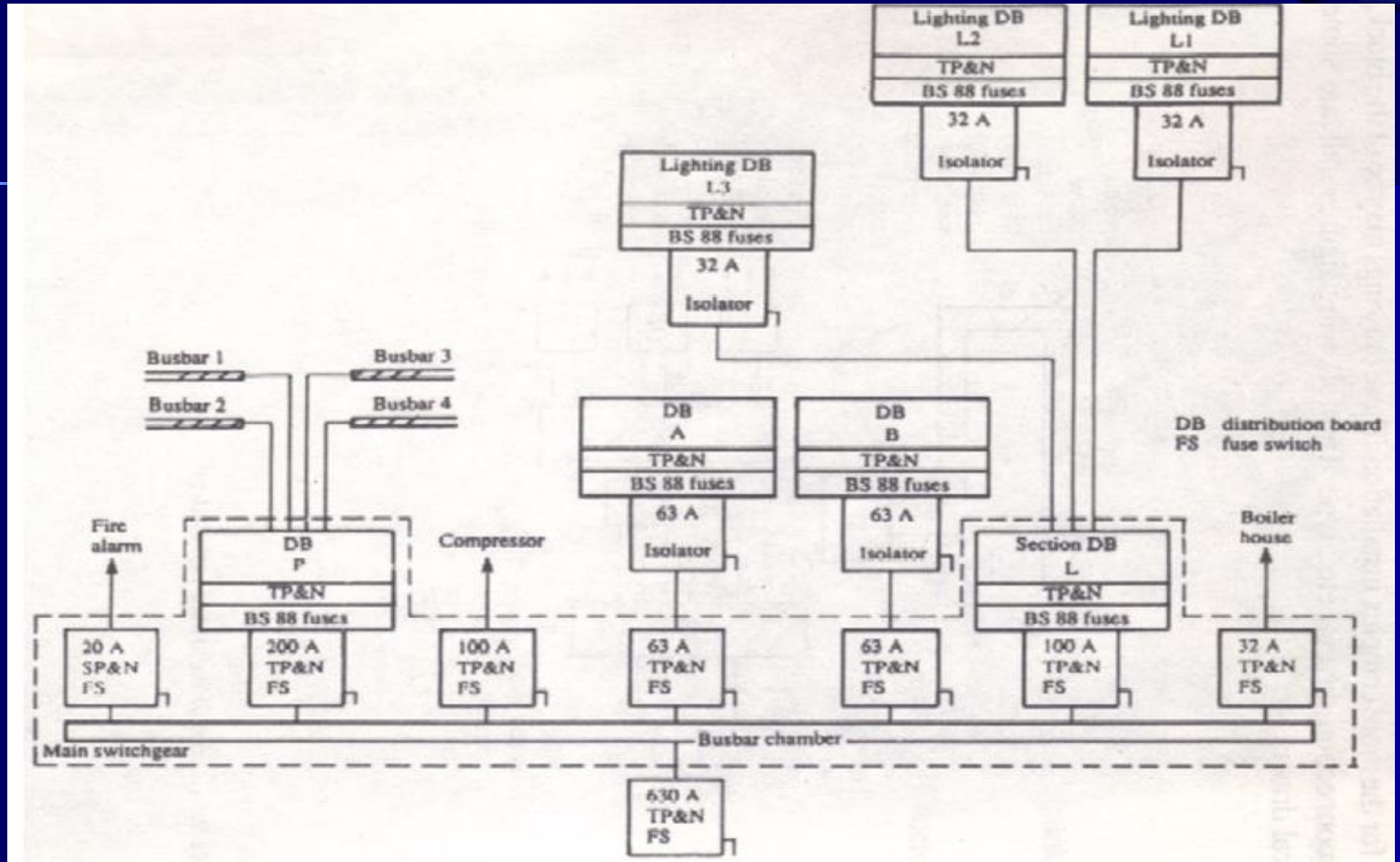


Figure 10 *Distribution system, block type*