

London Underground - 'Section 12' approved Switch Disconnectors

Introduction

Following the Kings Cross fire of 1987, the resulting Fennell enquiry prompted the introduction of additional fire precautions for 'Sub-surface Railway Stations'. These additional requirements were introduced under section 12 of the Fire Precautions Act 1971, and since then have been known simply as *Section 12 regs*. There are at present around 120 London Underground stations that come under Section 12 requirements.

The forensic report on the fire cited several instances of a 'flash over' effect caused by materials and paint finishes being ignitable. Exacerbating the conditions underground were toxic fumes given off by certain materials being excessively heated.

Although the new regulations dealt with all aspects of fire prevention such as the removal of wooden escalators, the installation of heat detectors, improved staff training etc, as far as actual equipment supplied for underground use, the overriding emphasis was on materials and paint finishes.

With this isolation range, the overall consideration has been to meet, and where possible exceed, the Section 12 requirements. This has been achieved by the careful selection of individual component materials and the use of only recognised and approved paint finishes.

Applicable Regulations/Specifications

- Section 12 of the Fire Precautions Act 1971
- The Fire Precautions (Sub-surface Railway Stations) Regulations 1989
- BS EN 60947-3 Low voltage switchgear and controlgear. Switches, disconnectors, switch-disconnectors and fuse-combination units.
- BS 88-2.2:1988 Cartridge fuses for voltages up to and including 1000 V a.c. and 1500 V d.c.
- BS EN 60439-1 Low -voltage switchgear and controlgear assemblies.
- BS EN 60529 Degrees of protection provided by enclosures (IP code)
- 2-01001-002 A1 Fire safety performance of materials.
- * M-1042-A2 Fire safety of materials used in the Underground.
- 2-1105-006 Low voltage electrical installations.
- * E 4013 General requirements for fixed installation power supplies.

Equipment Description

Switch disconnector assemblies in the range 40A - 400A are all supplied housed in one of five sizes of sheet steel enclosures. The interior assemblies are all supplied in three pole + switched neutral form.

The all metal operating handles are supplied in two sizes across the range, and are lockable in the 'Off' position as standard, with an option to enable locking in the 'On' position.

The IP65 sealed enclosures are generously proportioned to allow simple cable connection, with removable gland plates on both top and bottom faces.

All external surfaces are finished with a 'Copon EA9' approved paint system. Enclosures are finished red or grey and handle assemblies red.

Catalogue Numbers

| Rating | Catalogue Number | | Enclosure Size* |
|--------|------------------|--------------|-----------------|
| | Finished Grey | Finished Red | |
| 40A | DCG0403LUL | DCR0403LUL | 1 |
| 63A | DCG0633LUL | DCR0633LUL | 1 |
| 80A | DCG0803LUL | DCR0803LUL | 2 |
| 100A | DCG1003LUL | DCR1003LUL | 2 |
| 125A | DCG1253LUL | DCR1253LUL | 2A |
| 160A | DCG1603LUL | DCR1603LUL | 2A |
| 200A | DCG2003LUL | DCR2003LUL | 3 |
| 250A | DCG2503LUL | DCR2503LUL | 3 |
| 315A | DCG3153LUL | DCR3153LUL | 4 |
| 400A | DCG4003LUL | DCR4003LUL | 4 |

*See page 2

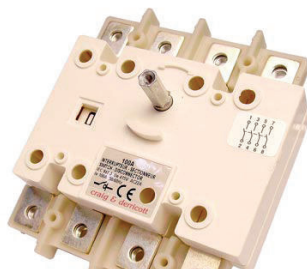
To call for padlocking in both 'Off' & 'On' positions, add suffix '10' to the catalogue numbers as shown above.
- e.g. DCG2003LUL10



Typical Assembly with a grey Copon finished enclosure



Locking system allows several individual padlocks to be inserted



WWW.CABLEJOINTS.CO.UK
THORNE & DERRICK UK
TEL 0044 191 490 1547 FAX 0044 477 5371
TEL 0044 117 977 4647 FAX 0044 977 5582
WWW.THORNEANDDERRICK.CO.UK

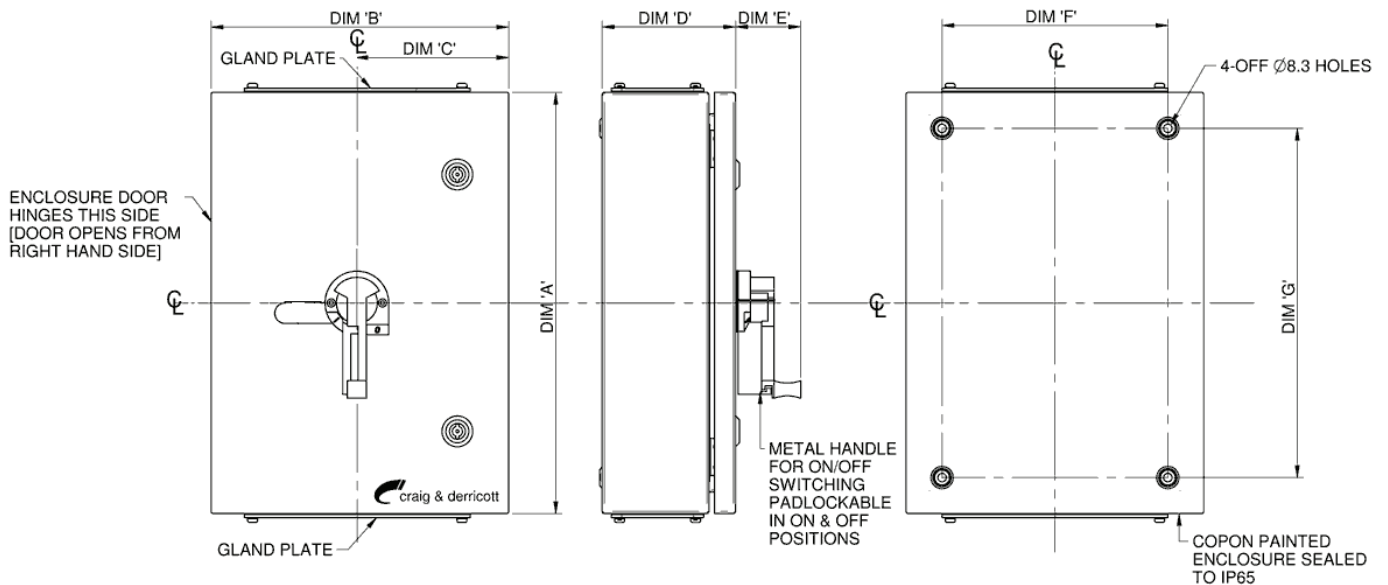
T e c h n i c a l D a t a S h e e t

London Underground - 'Section 12' approved Switch Disconnectors

Technical Specification (To BS EN 60974 - 3)

| Application | Sym. | Unit | Category | Rating (A) | | | | | | | | | |
|--|-----------|-----------------|--|------------|--------|--------|---------|---------|---------|---------|---------|---------|---------|
| | | | | 40 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| Rated thermal current | I_{th} | A | | 40 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| Rated Insulation voltage | U_i | V | | 690 | 690 | 690 | 690 | 800 | 800 | 800 | 800 | 1000 | 1000 |
| Rated impulse voltage | U_{imp} | kV | | 6.0 | 6.0 | 6.0 | 6.0 | 8.0 | 8.0 | 8.0 | 8.0 | 12.0 | 12.0 |
| Rated operational current (AC) | I_e | A | 400V - AC22A/AC22B | 40/40 | 63/63 | 80/80 | 100/100 | 125/125 | 160/160 | 200/200 | 250/250 | 315/315 | 400/400 |
| | | | 400V - AC23A/AC23B | 40/40 | 50/63 | 80/80 | 80/100 | 125/125 | 160/160 | 200/200 | 250/250 | 315/315 | 400/400 |
| | | | 690V - AC22A/AC22B | 32/32 | 32/32 | 50/50 | 50/50 | 125/125 | 125/125 | 125/160 | 125/160 | 250/315 | 250/315 |
| | | | 690V - AC23A/AC23B | 25/25 | 25/25 | 40/40 | 40/40 | 63/80 | 63/80 | 80/100 | 100/125 | 160/200 | 160/200 |
| Rated operational power (Frequent operation) | P_e | kW | 3x400V - AC23A | 18.5 | 25 | 40 | 40 | 63 | 80 | 100 | 132 | 160 | 220 |
| | | | 3x690V - AC23A | 22 | 22 | 33 | 33 | 55 | 55 | 75 | 90 | 150 | 150 |
| Fuse protected short-circuit characteristics | | kA (rms) | Prospective short-circuit current | 100 | 100 | 100 | 70 | 100 | 100 | 80 | 50 | 100 | 100 |
| | | A | Associated fuse rating | 40 | 63 | 80 | 100 | 125 | 160 | 200 | 250 | 315 | 400 |
| Overload capacity | I_{cw} | kA (Peak) | Rated peak withstand current | 12 | 12 | 12 | 12 | 20 | 20 | 30 | 30 | 45 | 45 |
| | | kA (rms) | Rated short time withstand current (1S) | 2.5 | 2.5 | 2.5 | 2.5 | 7 | 7 | 9 | 9 | 13 | 13 |
| Mechanical endurance | | | Cycles | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 5,000 | 5,000 |
| Connecting capacity | | | Terminal type | | | | | | | | | | |
| | | mm ² | Cable section (Min/Max) | 4/16 | 10/16 | 16/35 | 25/35 | 35/50 | 50/95 | 70/95 | 95/150 | 150/240 | 185/240 |
| | | mm | Maximum busbar width | - | - | 15 | 15 | 25 | 25 | 32 | 32 | 40 | 40 |
| | | Nm | Min. Tightening torque | 4 | 4 | 5 | 5 | 9 | 9 | 20 | 20 | 20 | 20 |

Dimensions



WWW.CABLEJOINTS.CO.UK
THORNE & DERRICK UK
TEL 0044 191 490 1547 FAX 0044 477 5371
TEL 0044 117 977 4647 FAX 0044 977 5582
WWW.THORNEANDDERRICK.CO.UK

T e c h n i c a l D a t a S h e e t

London Underground - 'Section 12' approved Switch Disconnectors

Dimensions Continued

| RATING | BOX SIZE | DIM 'A' | DIM 'B' | DIM 'C' | DIM 'D' | DIM 'E' | DIM 'F' | DIM 'G' |
|--------|----------|---------|---------|---------|---------|---------|---------|---------|
| 40A | 1 | 270 | 285 | 142.5 | 130 | 64 | 215 | 200 |
| 63A | 1 | 270 | 285 | 142.5 | 130 | 64 | 215 | 200 |
| 80A | 2 | 410 | 290 | 145 | 190 | 64 | 220 | 340 |
| 100A | 2 | 410 | 290 | 145 | 190 | 64 | 220 | 340 |
| 125A | 2A | 550 | 300 | 150 | 190 | 80 | 230 | 480 |
| 160A | 2A | 550 | 300 | 150 | 190 | 80 | 230 | 480 |
| 200A | 3 | 630 | 460 | 230 | 330 | 80 | 390 | 560 |
| 250A | 3 | 630 | 460 | 230 | 330 | 80 | 390 | 560 |
| 315A | 4 | 760 | 550 | 275 | 380 | 80 | 480 | 690 |
| 400A | 4 | 760 | 550 | 275 | 380 | 80 | 480 | 690 |



WWW.CABLEJOINTS.CO.UK
THORNE & DERRICK UK
TEL 0044 191 490 1547 FAX 0044 477 5371
TEL 0044 117 977 4647 FAX 0044 977 5582
WWW.THORNEANDDERRICK.CO.UK