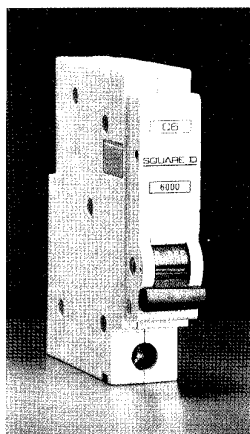


# QOE Circuit Breakers

## QOE CIRCUIT BREAKERS

- Grey in colour.
- Instantaneous trip level types B,C,D.
- Indication of tripped circuit breaker on overload or short circuit is by location of the handle in the OFF position.



QO106EC6

### 6000A SHORT CIRCUIT CAPACITY (Icn)

| CATALOGUE<br>NUMBER<br>SINGLE<br>POLE    | CURRENT<br>RATING In | TERMINAL<br>CAPACITY | MAXIMUM EARTH FAULT<br>LOOP IMPEDANCE Zs<br>OHMS at 240Vac |             |
|------------------------------------------|----------------------|----------------------|------------------------------------------------------------|-------------|
|                                          | A                    | mm <sup>2</sup>      | 5 SECONDS                                                  | 0.4 SECONDS |
| TYPE B INSTANTANEOUS TRIP (3In to 5In)   |                      |                      |                                                            |             |
| QO103EB6                                 | 3                    | 1 – 25               | 20.0                                                       | 16.0        |
| QO106EB6                                 | 6                    | 1 – 25               | 10.0                                                       | 8.0         |
| QO110EB6                                 | 10                   | 1 – 25               | 6.0                                                        | 4.8         |
| QO116EB6                                 | 16                   | 1 – 25               | 3.7                                                        | 3.0         |
| QO120EB6                                 | 20                   | 1 – 25               | 3.0                                                        | 2.4         |
| QO125EB6                                 | 25                   | 1 – 25               | 2.3                                                        | 1.9         |
| QO132EB6                                 | 32                   | 2.5 – 35             | 1.8                                                        | 1.5         |
| QO140EB6                                 | 40                   | 2.5 – 35             | 1.5                                                        | 1.2         |
| QO150EB6                                 | 50                   | 2.5 – 35             | 1.2                                                        | 1.0         |
| QO163EB6                                 | 63                   | 2.5 – 35             | 0.9                                                        | 0.8         |
| TYPE C INSTANTANEOUS TRIP (5In to 10In)  |                      |                      |                                                            |             |
| QO106EC6                                 | 6                    | 1 – 25               | 10.0                                                       | 4.0         |
| QO110EC6                                 | 10                   | 1 – 25               | 6.0                                                        | 2.4         |
| QO116EC6                                 | 16                   | 1 – 25               | 3.7                                                        | 1.5         |
| QO120EC6                                 | 20                   | 1 – 25               | 3.0                                                        | 1.2         |
| QO125EC6                                 | 25                   | 1 – 25               | 2.3                                                        | 1.0         |
| QO132EC6                                 | 32                   | 2.5 – 35             | 1.8                                                        | 0.8         |
| QO140EC6                                 | 40                   | 2.5 – 35             | 1.5                                                        | 0.6         |
| QO150EC6                                 | 50                   | 2.5 – 35             | 1.2                                                        | 0.5         |
| QO163EC6                                 | 63                   | 2.5 – 35             | 0.9                                                        | 0.4         |
| TYPE D INSTANTANEOUS TRIP (10In to 20In) |                      |                      |                                                            |             |
| QO106ED6                                 | 6                    | 1 – 25               | 10.0                                                       | 2.9         |
| QO110ED6                                 | 10                   | 1 – 25               | 6.0                                                        | 1.7         |
| QO116ED6                                 | 16                   | 1 – 25               | 3.7                                                        | 1.1         |
| QO120ED6                                 | 20                   | 1 – 25               | 3.0                                                        | 0.9         |
| QO125ED6                                 | 25                   | 1 – 25               | 2.3                                                        | 0.7         |
| QO132ED6                                 | 32                   | 2.5 – 35             | 1.8                                                        | 0.5         |
| QO140ED6                                 | 40                   | 2.5 – 35             | 1.5                                                        | 0.4         |
| QO150ED6                                 | 50                   | 2.5 – 35             | 1.2                                                        | 0.3         |
| QO163ED6                                 | 63                   | 2.5 – 35             | 0.9                                                        | 0.3         |

# QOE Circuit Breakers

## QOE CIRCUIT BREAKERS

- Grey in colour
- Instantaneous trip level types B,C,D.
- Indication of tripped circuit breaker on overload or short circuit is by location of the handle in the OFF position

### 10000A SHORT CIRCUIT CAPACITY (Icn)

| CATALOGUE<br>NUMBER<br>SINGLE<br>POLE  | CURRENT<br>RATING In | TERMINAL<br>CAPACITY | MAXIMUM EARTH FAULT<br>LOOP IMPEDANCE Zs<br>OHMS at 240Vac |             |
|----------------------------------------|----------------------|----------------------|------------------------------------------------------------|-------------|
|                                        | A                    | mm²                  | 5 SECONDS                                                  | 0.4 SECONDS |
| TYPE B INSTANTANEOUS TRIP (3In to 5In) |                      |                      |                                                            |             |
| QO103EB10                              | 3                    | 1 – 25               | 20.0                                                       | 16.0        |
| QO106EB10                              | 6                    | 1 – 25               | 10.0                                                       | 8.0         |
| QO110EB10                              | 10                   | 1 – 25               | 6.0                                                        | 4.8         |
| QO116EB10                              | 16                   | 1 – 25               | 3.7                                                        | 3.0         |
| QO120EB10                              | 20                   | 1 – 25               | 3.0                                                        | 2.4         |
| QO125EB10                              | 25                   | 1 – 25               | 2.3                                                        | 1.9         |
| QO132EB10                              | 32                   | 2.5 – 35             | 1.8                                                        | 1.5         |
| QO140EB10                              | 40                   | 2.5 – 35             | 1.5                                                        | 1.2         |
| QO150EB10                              | 50                   | 2.5 – 35             | 1.2                                                        | 1.0         |
| QO163EB10                              | 63                   | 2.5 – 35             | 0.9                                                        | 0.8         |

### 10000A SHORT CIRCUIT CAPACITY (Icn)

| CATALOGUE NUMBER                         |                |                | CURRENT<br>RATING In<br><br>A | TERMINAL<br>CAPACITY<br><br>mm² | MAXIMUM EARTH FAULT<br>LOOP IMPEDANCE Zs<br>OHMS at 240Vac |             |
|------------------------------------------|----------------|----------------|-------------------------------|---------------------------------|------------------------------------------------------------|-------------|
| SINGLE<br>POLE                           | DOUBLE<br>POLE | TRIPLE<br>POLE |                               |                                 | 5 SECONDS                                                  | 0.4 SECONDS |
| TYPE C INSTANTANEOUS TRIP (5In to 10In)  |                |                |                               |                                 |                                                            |             |
| QO106EC10                                | QO206EC10      | QO306EC10      | 6                             | 1 – 25                          | 10.0                                                       | 4.0         |
| QO110EC10                                | QO210EC10      | QO310EC10      | 10                            | 1 – 25                          | 6.0                                                        | 2.4         |
| QO116EC10                                | QO216EC10      | QO316EC10      | 16                            | 1 – 25                          | 3.7                                                        | 1.5         |
| QO120EC10                                | QO220EC10      | QO320EC10      | 20                            | 1 – 25                          | 3.0                                                        | 1.2         |
| QO125EC10                                | QO225EC10      | QO325EC10      | 25                            | 1 – 25                          | 2.3                                                        | 1.0         |
| QO132EC10                                | QO232EC10      | QO332EC10      | 32                            | 2.5 – 35                        | 1.8                                                        | 0.8         |
| QO140EC10                                | QO240EC10      | QO340EC10      | 40                            | 2.5 – 35                        | 1.5                                                        | 0.6         |
| QO150EC10                                | QO250EC10      | QO350EC10      | 50                            | 2.5 – 35                        | 1.2                                                        | 0.5         |
| QO163EC10                                | QO263EC10      | QO363EC10      | 63                            | 2.5 – 35                        | 0.9                                                        | 0.4         |
| TYPE D INSTANTANEOUS TRIP (10In to 20In) |                |                |                               |                                 |                                                            |             |
| QO106ED10                                | QO206ED10      | QO306ED10      | 6                             | 1 – 25                          | 10.0                                                       | 2.9         |
| QO110ED10                                | QO210ED10      | QO310ED10      | 10                            | 1 – 25                          | 6.0                                                        | 1.7         |
| QO116ED10                                | QO216ED10      | QO316ED10      | 16                            | 1 – 25                          | 3.7                                                        | 1.1         |
| QO120ED10                                | QO220ED10      | QO320ED10      | 20                            | 1 – 25                          | 3.0                                                        | 0.9         |
| QO125ED10                                | QO225ED10      | QO325ED10      | 25                            | 1 – 25                          | 2.3                                                        | 0.7         |
| QO132ED10                                | QO232ED10      | QO332ED10      | 32                            | 2.5 – 35                        | 1.8                                                        | 0.5         |
| QO140ED10                                | QO240ED10      | QO340ED10      | 40                            | 2.5 – 35                        | 1.5                                                        | 0.4         |
| QO150ED10                                | QO250ED10      | QO350ED10      | 50                            | 2.5 – 35                        | 1.2                                                        | 0.3         |
| QO163ED10                                | QO263ED10      | QO363ED10      | 63                            | 2.5 – 35                        | 0.9                                                        | 0.3         |

# QWIK-GARD Residual Current Circuit Breakers with integral overcurrent protection (RCBOs)



QOE116B03

## QWIK-GARD RESIDUAL CURRENT CIRCUIT BREAKERS WITH INTEGRAL OVERCURRENT PROTECTION (RCBO)

- Used in Qwikline Consumer Units, LoadCentre Distribution Boards and can be retrofitted to existing installations.
- Protection of socket outlets used for outdoor equipment, eg lawn mowers, hedge trimmers.
- One single pole way occupied within a distribution board.
- Trip on loss of neutral.
- Trip on voltage between neutral and earth greater than 50Vac.
- Sensitive to both ac and pulsating dc fault current.
- Passive to insulation resistance test up to 500Vdc between the Live to Earth and Live to Neutral connection.
- Instantaneous trip level type B, C or D.
- Green positive contact position indicator is visible only when circuit breaker contacts have separated.
- Indication of tripped circuit breaker on overload or short circuit is by location of the handle in the OFF position.
- Indication of tripped circuit breaker on a earth fault is by location of the handle in the middle trip position between ON and OFF.
- Rated voltage of 220 to 240Vac 50/60Hz.
- Comply with BS 4293: 1983
- Comply with BSEN 60898.
- Comply with BSEN 60947-3: 1992 Additional Safety Requirements for Disconnectors and Switch Disconnectors as referred to in BS7671.
- Grey in colour.

## 10000A SHORT CIRCUIT CAPACITY (Icn)

| CATALOGUE<br>NUMBER<br>SINGLE<br>POLE   | CURRENT<br>RATING In | RESIDUAL<br>TRIPPING<br>CURRENT | TERMINAL<br>CAPACITY<br>LOAD L & N | PIGTAIL WIRE CONNECTION<br>COLOUR & LENGTH | MAXIMUM EARTH FAULT<br>LOOP IMPEDANCE Zs<br>OHMS at 50Vac (RCCB) |           |             |
|-----------------------------------------|----------------------|---------------------------------|------------------------------------|--------------------------------------------|------------------------------------------------------------------|-----------|-------------|
|                                         |                      |                                 |                                    | EARTH<br>NEUTRAL                           |                                                                  |           |             |
|                                         | A                    | mA                              | mm <sup>2</sup>                    | YELLOW & GREEN<br>mm                       | BLUE<br>mm                                                       | 5 SECONDS | 0.4 SECONDS |
| TYPE B INSTANTANEOUS TRIP (3In to 5In)  |                      |                                 |                                    |                                            |                                                                  |           |             |
| QOE106B01                               | 6                    | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE110B01                               | 10                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE116B01                               | 16                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE120B01                               | 20                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE132B01                               | 32                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE140B01                               | 40                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
|                                         |                      |                                 |                                    |                                            |                                                                  |           |             |
| QOE106B03                               | 6                    | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE110B03                               | 10                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE116B03                               | 16                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE120B03                               | 20                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE132B03                               | 32                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE140B03                               | 40                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| TYPE C INSTANTANEOUS TRIP (5In to 10In) |                      |                                 |                                    |                                            |                                                                  |           |             |
| QOE106C01                               | 6                    | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE110C01                               | 10                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE116C01                               | 16                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE120C01                               | 20                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
| QOE132C01                               | 32                   | 10                              | 1 – 10                             | 500                                        | 575                                                              | 5000      | 5000        |
|                                         |                      |                                 |                                    |                                            |                                                                  |           |             |
| QOE106C03                               | 6                    | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE110C03                               | 10                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE116C03                               | 16                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE120C03                               | 20                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
| QOE132C03                               | 32                   | 30                              | 1 – 10                             | 500                                        | 575                                                              | 1667      | 1667        |
|                                         |                      |                                 |                                    |                                            |                                                                  |           |             |
| QOE106C10                               | 6                    | 100                             | 1 – 10                             | 500                                        | 575                                                              | 500       | 500         |
| QOE110C10                               | 10                   | 100                             | 1 – 10                             | 500                                        | 575                                                              | 500       | 500         |
| QOE116C10                               | 16                   | 100                             | 1 – 10                             | 500                                        | 575                                                              | 500       | 500         |
| QOE120C10                               | 20                   | 100                             | 1 – 10                             | 500                                        | 575                                                              | 500       | 500         |
| QOE132C10                               | 32                   | 100                             | 1 – 10                             | 500                                        | 575                                                              | 500       | 500         |

# QWIK-GARD Residual Current Circuit Breakers with integral overcurrent protection (RCBOs)

## 6000A SHORT CIRCUIT CAPACITY (I<sub>cn</sub>)

| CATALOGUE<br>NUMBER<br>SINGLE<br>POLE                             | CURRENT<br>RATING I <sub>n</sub> | RESIDUAL<br>TRIPPING<br>CURRENT | TERMINAL<br>CAPACITY<br>LOAD L & N | PIGTAIL WIRE CONNECTION<br>COLOUR & LENGTH |                 | MAXIMUM EARTH FAULT<br>LOOP IMPEDANCE Z <sub>s</sub><br>OHMS at 50Vac (RCCB) |             |
|-------------------------------------------------------------------|----------------------------------|---------------------------------|------------------------------------|--------------------------------------------|-----------------|------------------------------------------------------------------------------|-------------|
|                                                                   |                                  |                                 |                                    | EARTH<br>YELLOW & GREEN                    | NEUTRAL<br>BLUE |                                                                              |             |
|                                                                   | A                                | mA                              | mm <sup>2</sup>                    | mm                                         | mm              | 5 SECONDS                                                                    | 0.4 SECONDS |
| TYPE D INSTANTANEOUS TRIP (10I <sub>n</sub> to 20I <sub>n</sub> ) |                                  |                                 |                                    |                                            |                 |                                                                              |             |
| QOE106D03                                                         | 6                                | 30                              | 1 – 10                             | 500                                        | 5/5             | 1667                                                                         | 1667        |
| QOE110D03                                                         | 10                               | 30                              | 1 – 10                             | 500                                        | 575             | 1667                                                                         | 1667        |
| QOE116D03                                                         | 16                               | 30                              | 1 – 10                             | 500                                        | 575             | 1667                                                                         | 1667        |
| QOE120D03                                                         | 20                               | 30                              | 1 – 10                             | 500                                        | 575             | 1667                                                                         | 1667        |
| QOE132D03                                                         | 32                               | 30                              | 1 – 10                             | 500                                        | 575             | 1667                                                                         | 1667        |
|                                                                   |                                  |                                 |                                    |                                            |                 |                                                                              |             |
| QOE106D10                                                         | 6                                | 100                             | 1 – 10                             | 500                                        | 575             | 500                                                                          | 500         |
| QOE110D10                                                         | 10                               | 100                             | 1 – 10                             | 500                                        | 575             | 500                                                                          | 500         |
| QOE116D10                                                         | 16                               | 100                             | 1 – 10                             | 500                                        | 575             | 500                                                                          | 500         |
| QOE120D10                                                         | 20                               | 100                             | 1 – 10                             | 500                                        | 575             | 500                                                                          | 500         |
| QOE132D10                                                         | 32                               | 100                             | 1 – 10                             | 500                                        | 575             | 500                                                                          | 500         |

## DIMENSIONS mm

| DEVICE                | NUMBER<br>OF POLES | Height | DIMENSIONS mm |       | WEIGHT<br>kg |
|-----------------------|--------------------|--------|---------------|-------|--------------|
|                       |                    |        | Width         | Depth |              |
| QOE                   | 1                  | 82     | 19            | 85    | 0.13         |
| QOE                   | 2                  | 82     | 38            | 85    | 0.26         |
| QOE                   | 3                  | 82     | 57            | 85    | 0.39         |
| QOHX                  | 1                  | 80     | 19            | 83    | 0.13         |
| QOHX                  | 2                  | 80     | 38            | 83    | 0.28         |
| QOHX                  | 3                  | 80     | 57            | 83    | 0.43         |
| QWIK-GARD<br>QOE RCBO | 1                  | 110    | 19            | 85    | 0.20         |

# Circuit Breaker information

## STANDARD CONDITIONS FOR OPERATION IN SERVICE

Circuit breakers complying with BSEN 60898 shall be capable of operating under the following standard conditions:

- The ambient air temperature does not exceed +40°C and its average over a period of 24 hours does not exceed +35°C.
- The lower limit of the ambient air temperature is -15°C.
- Circuit breakers intended to be used in ambient air temperatures above +40°C (particularly in tropical countries) or below -5°C shall either be specially designed or be used according to the information given in the manufacturer's catalogue.

## TEMPERATURE DERATING OF CIRCUIT BREAKERS

Circuit breakers listed in the service current table may be used at temperatures from -30°C to 60°C. The table indicates the maximum current to be used as a function of the ambient temperature. Figures in bold type are the nominal current rating at calibrated temperature.

This avoids the necessity to derate for normal ambient temperatures likely to be encountered when circuit breakers are grouped together in an enclosure.

## CIRCUIT BREAKERS TYPE QOE

| CURRENT RATING A | AMBIENT TEMPERATURE DEG C |    |                                        |      |      |
|------------------|---------------------------|----|----------------------------------------|------|------|
|                  | 20                        | 30 | 40<br>SERVICE CURRENT I <sub>n</sub> A | 50   | 60   |
| <b>3</b>         | 3.2                       | 3  | 2.8                                    | 2.6  | 2.3  |
| <b>6</b>         | 6.3                       | 6  | 5.6                                    | 5.2  | 4.6  |
| <b>10</b>        | 10.5                      | 10 | 9.4                                    | 8.6  | 7.6  |
| <b>16</b>        | 16.8                      | 16 | 15.0                                   | 13.8 | 12.2 |
| <b>20</b>        | 21.0                      | 20 | 18.8                                   | 17.2 | 15.2 |
| <b>25</b>        | 26.3                      | 25 | 23.5                                   | 21.5 | 19.0 |
| <b>32</b>        | 33.6                      | 32 | 30.1                                   | 27.5 | 24.3 |
| <b>40</b>        | 42.0                      | 40 | 37.6                                   | 34.4 | 30.4 |
| <b>50</b>        | 52.5                      | 50 | 46.5                                   | 43.0 | 38.0 |
| <b>63</b>        | 66.2                      | 63 | 58.0                                   | 52.9 | 46.6 |

## CIRCUIT BREAKERS TYPE QOHX

| CURRENT RATING A | AMBIENT TEMPERATURE DEG C |     |                                        |    |    |
|------------------|---------------------------|-----|----------------------------------------|----|----|
|                  | 20                        | 30  | 40<br>SERVICE CURRENT I <sub>n</sub> A | 50 | 60 |
| <b>45</b>        | 49                        | 47  | 45                                     | 43 | 40 |
| <b>63</b>        | 70                        | 67  | 63                                     | 59 | 55 |
| <b>80</b>        | 93                        | 86  | 80                                     | 73 | 67 |
| <b>100</b>       | 116                       | 108 | 100                                    | 90 | 82 |

# Circuit Breaker information

LET-THROUGH ENERGY TABLE

| CIRCUIT<br>BREAKER<br>CATALOGUE<br>NUMBER | LOW POINT                         |                                                  | HIGH POINT                        |                                                  | MINIMUM CROSS<br>SECTIONAL AREA<br>OF 70°C PVC CABLE<br>at max short circuit level mm <sup>2</sup> |
|-------------------------------------------|-----------------------------------|--------------------------------------------------|-----------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------|
|                                           | PROSPECTIVE<br>CURRENT<br>x 1000A | I <sup>2</sup> t LET THROUGH<br>ENERGY<br>x 1000 | PROSPECTIVE<br>CURRENT<br>x 1000A | I <sup>2</sup> t LET THROUGH<br>ENERGY<br>x 1000 |                                                                                                    |
|                                           | also C, D 6 to 63A                |                                                  |                                   |                                                  |                                                                                                    |
| QO103EB6                                  | 2.0                               | 3.0                                              | 6                                 | 8                                                | 1.0                                                                                                |
| QO106EB6                                  | 2.0                               | 3.0                                              | 6                                 | 8                                                | 1.0                                                                                                |
| QO110EB6                                  | 2.0                               | 6.0                                              | 6                                 | 15                                               | 1.5                                                                                                |
| QO116EB6                                  | 2.0                               | 7.0                                              | 6                                 | 20                                               | 1.5                                                                                                |
| QO120EB6                                  | 2.0                               | 7.0                                              | 6                                 | 20                                               | 1.5                                                                                                |
| QO125EB6                                  | 2.0                               | 7.0                                              | 6                                 | 20                                               | 1.5                                                                                                |
| QO132EB6                                  | 2.0                               | 10.0                                             | 6                                 | 33                                               | 2.5                                                                                                |
| QO140EB6                                  | 2.0                               | 10.0                                             | 6                                 | 33                                               | 2.5                                                                                                |
| QO150EB6                                  | 2.0                               | 12.0                                             | 6                                 | 40                                               | 2.5                                                                                                |
| QO163EB6                                  | 2.0                               | 12.0                                             | 6                                 | 40                                               | 2.5                                                                                                |
| also C, D 6 to 63A                        |                                   |                                                  |                                   |                                                  |                                                                                                    |
| QO106EB10                                 | 2.0                               | 3.0                                              | 10                                | 10                                               | 1.0                                                                                                |
| QO110EB10                                 | 2.0                               | 6.0                                              | 10                                | 22                                               | 1.5                                                                                                |
| QO116EB10                                 | 2.0                               | 7.0                                              | 10                                | 35                                               | 2.5                                                                                                |
| QO120EB10                                 | 2.0                               | 7.0                                              | 10                                | 35                                               | 2.5                                                                                                |
| QO125EB10                                 | 2.0                               | 7.0                                              | 10                                | 35                                               | 2.5                                                                                                |
| QO132EB10                                 | 2.0                               | 10.0                                             | 10                                | 50                                               | 2.5                                                                                                |
| QO140EB10                                 | 2.0                               | 10.0                                             | 10                                | 50                                               | 2.5                                                                                                |
| QO150EB10                                 | 2.0                               | 12.0                                             | 10                                | 70                                               | 2.5                                                                                                |
| QO163EB10                                 | 2.0                               | 12.0                                             | 10                                | 70                                               | 2.5                                                                                                |
| QOH145X                                   | 0.5                               | 2.4                                              | 6                                 | 300                                              | 6.0                                                                                                |
| QOH163X                                   | 0.5                               | 3.0                                              | 6                                 | 560                                              | 10.0                                                                                               |
| QOH180X                                   | 0.5                               | 7.0                                              | 6                                 | 560                                              | 10.0                                                                                               |
| QOH1100X                                  | 0.5                               | 7.0                                              | 6                                 | 560                                              | 10.0                                                                                               |

## Prospective short-circuit current at the point of installation

This is overcurrent resulting from a fault of negligible impedance between live conductors having a difference in potential under normal operating conditions. A protective device must be provided to break any short-circuit current in the conductors and connections before such current could cause damage due to thermal and mechanical effect. However, when considering the use of miniature circuit breakers for short-circuit protection, with interrupting times of less than 0.1 second, BS 7671 requires that the value of K'S' for the cable should be greater than the value of let through energy (I<sup>2</sup>t) of the protective device.

## SERIES RATINGS

| MAIN UPSTREAM CIRCUIT BREAKER FRAME AND CURRENT RATING |                                 |                   |                   |                   |                   |                   |                    |                    |                    |                   |                   |
|--------------------------------------------------------|---------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|-------------------|-------------------|
| DOWNSTREAM CIRCUIT BREAKER                             | INDIVIDUAL CIRCUIT BREAKER      | QOE<br>10 to 100A | SCL<br>32 to 100A | SFA<br>16 to 160A | SFH<br>16 to 100A | SFI<br>20 to 100A | SKA<br>125 to 250A | SKH<br>125 to 250A | SKI<br>125 to 250A | BS88 fuse<br>100A | BS88 fuse<br>200A |
|                                                        | SC*<br>kA                       | 6 or 10           | 10                | 25                | 65                | 150               | 36                 | 50                 | 150                | 80                | 80                |
| DOWNSTREAM CIRCUIT BREAKER                             | QOHX<br>4<br>80, 100A           | 6                 | 10                | 16                | 36                | 100               | 7.5                | 36                 | 36                 | 65                | 65                |
|                                                        | QOE<br>B, C, D<br>6 to 63A      | 6 or 10           | 10                | 16                | 36                | 100               | 10                 | 36                 | 36                 | 65                | 65                |
|                                                        | QOE & RSD<br>RCCB<br>25 to 100A | 3                 | 6 or 10           |                   |                   |                   |                    |                    |                    | 10                |                   |
|                                                        | SCL<br>16, 20A<br>32 to 100A    | 7.5<br>10         |                   | 16                | 36                | 100               |                    | 36                 | 36                 | 50                | 20                |
|                                                        | SFA<br>16 to 160A               | 25                |                   |                   | 65                | 150               | 36                 | 50                 | 150                |                   |                   |

\*Short circuit capacity is represented in kA at 415Vac 50Hz to BSEN 60947-2.

## COMBINED SHORT CIRCUIT RATING OF DOWNSTREAM DEVICE

Used to determine the combined effective rating of the downstream circuit breaker. Cascading is recognised and permitted by BS 7671. The characteristics of each device for overload current protection and fault current protection shall be co-ordinated, so that the energy let through by the fault current protective device, does not exceed that which can be withstood without damage by the overload current protective device.

# Circuit Breaker application data

| CATALOGUE<br>NUMBER   | CURRENT<br>RATING<br>A | 0.01 | 0.5 | 1   | 2   | 3   | 5    | 7    | DISCONNECTION TIME in seconds (S) |     |      |     |      |     |      |     |      |      |       | Zs EARTH FAULT |          | R2<br>OHMS |
|-----------------------|------------------------|------|-----|-----|-----|-----|------|------|-----------------------------------|-----|------|-----|------|-----|------|-----|------|------|-------|----------------|----------|------------|
|                       |                        |      |     |     |     |     |      |      | 10                                | 20  | 30   | 40  | 60   | 100 | 200  | 500 | 1000 | 2000 | 10000 | IMPEDANCE OHMS |          |            |
|                       |                        |      |     |     |     |     |      |      |                                   |     |      |     |      |     |      |     |      |      |       | fixed          | portable |            |
| QO103EB6              | 3                      | 15   | 15  | 15  | 15  | 15  | 12.3 | 10.7 | 10                                | 7.5 | 6.5  | 6   | 5.4  | 4.8 | 4.3  | 3.9 | 3.8  | 3.7  | 3.6   | 20.0           | 16.0     | 4.1        |
| QO106EB10<br>QO106EB6 | 6                      | 30   | 30  | 30  | 30  | 30  | 25   | 21.5 | 19                                | 15  | 13.1 | 12  | 10.8 | 9.6 | 8.6  | 7.8 | 7.5  | 7.4  | 7.2   | 10.0           | 8.0      | 2.0        |
| QO110EB10<br>QO110EB6 | 10                     | 50   | 50  | 50  | 50  | 50  | 41   | 36   | 32                                | 25  | 22   | 20  | 18   | 16  | 14.3 | 13  | 12.5 | 12.4 | 12    | 6.0            | 4.8      | 1.2        |
| QO116EB10<br>QO116EB6 | 16                     | 80   | 80  | 80  | 80  | 80  | 66   | 57   | 51                                | 40  | 35   | 32  | 29   | 26  | 23   | 21  | 20   | 19.8 | 19    | 3.7            | 3.0      | 0.7        |
| QO120EB10<br>QO120EB6 | 20                     | 100  | 100 | 100 | 100 | 100 | 82   | 72   | 64                                | 50  | 44   | 40  | 36   | 32  | 29   | 26  | 25   | 24.8 | 24    | 3.0            | 2.4      | 0.6        |
| QO125EB10<br>QO125EB6 | 25                     | 125  | 125 | 125 | 125 | 125 | 103  | 90   | 80                                | 63  | 55   | 50  | 45   | 40  | 36   | 33  | 31.3 | 31   | 30    | 2.3            | 1.9      | 0.5        |
| QO132EB10<br>QO132EB6 | 32                     | 160  | 160 | 160 | 160 | 160 | 131  | 115  | 102                               | 80  | 70   | 64  | 58   | 51  | 46   | 42  | 40   | 39.7 | 38    | 1.8            | 1.5      | 0.4        |
| QO140EB10<br>QO140EB6 | 40                     | 200  | 200 | 200 | 200 | 200 | 164  | 143  | 128                               | 100 | 88   | 80  | 72   | 64  | 57   | 52  | 50   | 49.6 | 48    | 1.5            | 1.2      | 0.3        |
| QO150EB10<br>QO150EB6 | 50                     | 250  | 250 | 250 | 250 | 250 | 205  | 179  | 160                               | 125 | 110  | 100 | 90   | 80  | 72   | 65  | 63   | 62   | 60    | 1.2            | 1.0      | 0.2        |
| QO163EB10<br>QO163EB6 | 63                     | 315  | 315 | 315 | 315 | 315 | 258  | 226  | 202                               | 158 | 139  | 126 | 113  | 101 | 90   | 82  | 79   | 78   | 76    | 0.9            | 0.8      | 0.2        |
|                       |                        |      |     |     |     |     |      |      |                                   |     |      |     |      |     |      |     |      |      |       |                |          |            |
| QO106EC10<br>QO106EC6 | 6                      | 60   | 60  | 60  | 39  | 32  | 25   | 21.5 | 19                                | 15  | 13   | 12  | 10.8 | 9.6 | 8.6  | 7.8 | 7.5  | 7.4  | 7.2   | 10.0           | 4.0      | 2.0        |
| QO110EC10<br>QO110EC6 | 10                     | 100  | 100 | 100 | 65  | 53  | 41   | 36   | 32                                | 25  | 22   | 20  | 18   | 16  | 14.3 | 13  | 12.5 | 12.4 | 12    | 6.0            | 2.4      | 1.2        |
| QO116EC10<br>QO116EC6 | 16                     | 160  | 160 | 160 | 104 | 85  | 66   | 57   | 51                                | 40  | 35   | 32  | 29   | 26  | 23   | 21  | 20   | 19.8 | 20    | 3.7            | 1.5      | 0.8        |
| QO120EC10<br>QO120EC6 | 20                     | 200  | 200 | 200 | 130 | 106 | 82   | 72   | 64                                | 50  | 44   | 40  | 36   | 32  | 29   | 26  | 25   | 24.8 | 24    | 3.0            | 1.2      | 0.6        |
| QO125EC10<br>QO125EC6 | 25                     | 250  | 250 | 250 | 163 | 133 | 103  | 90   | 80                                | 63  | 55   | 50  | 45   | 40  | 36   | 33  | 31.3 | 31   | 30    | 2.3            | 1.0      | 0.5        |
| QO132EC10<br>QO132EC6 | 32                     | 320  | 320 | 320 | 208 | 170 | 131  | 115  | 102                               | 80  | 70   | 64  | 58   | 51  | 46   | 42  | 40   | 39.7 | 38    | 1.8            | 0.8      | 0.4        |
| QO140EC10<br>QO140EC6 | 40                     | 400  | 400 | 400 | 260 | 212 | 164  | 143  | 128                               | 100 | 88   | 80  | 72   | 64  | 57   | 52  | 50   | 49.6 | 48    | 1.5            | 0.6      | 0.3        |
| QO150EC10<br>QO150EC6 | 50                     | 500  | 500 | 500 | 325 | 265 | 205  | 179  | 160                               | 125 | 110  | 100 | 90   | 80  | 72   | 65  | 63   | 62   | 60    | 1.2            | 0.5      | 0.2        |
| QO163EC10<br>QO163EC6 | 63                     | 630  | 630 | 630 | 410 | 334 | 258  | 226  | 202                               | 158 | 139  | 126 | 113  | 101 | 90   | 82  | 79   | 78   | 76    | 0.9            | 0.4      | 0.2        |
|                       |                        |      |     |     |     |     |      |      |                                   |     |      |     |      |     |      |     |      |      |       |                |          |            |
| QO106ED10<br>QO106ED6 | 6                      | 84   | 84  | 60  | 39  | 32  | 25   | 21.5 | 19                                | 15  | 13   | 12  | 10.8 | 9.6 | 8.6  | 7.8 | 7.5  | 7.4  | 7.2   | 10.0           | 2.9      | 2.0        |
| QO110ED10<br>QO110ED6 | 10                     | 140  | 140 | 100 | 65  | 53  | 41   | 36   | 32                                | 25  | 22   | 20  | 18   | 16  | 14.3 | 13  | 12.5 | 12.4 | 12    | 6.0            | 1.7      | 1.2        |
| QO116ED10<br>QO116ED6 | 16                     | 224  | 224 | 160 | 104 | 85  | 66   | 57   | 51                                | 40  | 35   | 32  | 29   | 26  | 23   | 21  | 20   | 19.8 | 19    | 3.7            | 1.1      | 0.8        |
| QO120ED10<br>QO120ED6 | 20                     | 280  | 280 | 200 | 130 | 106 | 82   | 71   | 64                                | 50  | 44   | 40  | 36   | 32  | 29   | 26  | 25   | 24.8 | 24    | 3.0            | 0.9      | 0.6        |
| QO125ED10<br>QO125ED6 | 25                     | 350  | 350 | 250 | 163 | 133 | 103  | 90   | 80                                | 63  | 55   | 50  | 45   | 40  | 36   | 33  | 31.3 | 31   | 30    | 2.3            | 0.7      | 0.5        |
| QO132ED10<br>QO132ED6 | 32                     | 448  | 448 | 320 | 208 | 170 | 131  | 115  | 102                               | 80  | 70   | 64  | 58   | 51  | 46   | 42  | 40   | 39.7 | 38    | 1.8            | 0.5      | 0.4        |
| QO140ED10<br>QO140ED6 | 40                     | 560  | 560 | 400 | 260 | 212 | 164  | 143  | 128                               | 100 | 88   | 80  | 72   | 64  | 57   | 52  | 50   | 49.6 | 48    | 1.5            | 0.4      | 0.3        |
| QO150ED10<br>QO150ED6 | 50                     | 700  | 700 | 500 | 325 | 265 | 205  | 179  | 160                               | 125 | 110  | 100 | 90   | 80  | 72   | 65  | 63   | 62   | 60    | 1.2            | 0.3      | 0.2        |
| QO163ED10<br>QO163ED6 | 63                     | 882  | 882 | 630 | 410 | 334 | 258  | 226  | 202                               | 158 | 139  | 126 | 113  | 101 | 90   | 82  | 79   | 78   | 76    | 0.9            | 0.3      | 0.2        |

# Circuit Breaker application data

| CATALOGUE<br>NUMBER              | CURRENT<br>RATING<br>A | DISCONNECTION TIME in seconds (S) |      |      |      |     |     |     |                           |     |     |     |     |     |     |     |      |      | Zs EARTH FAULT |       | R2<br>OHMS |          |
|----------------------------------|------------------------|-----------------------------------|------|------|------|-----|-----|-----|---------------------------|-----|-----|-----|-----|-----|-----|-----|------|------|----------------|-------|------------|----------|
|                                  |                        | 0.01                              | 0.3  | 0.4  | 0.5  | 1   | 2   | 3   | DISCONNECTION CURRENT (A) |     |     |     |     |     |     |     |      |      | IMPEDANCE OHMS |       |            |          |
|                                  |                        |                                   |      |      |      |     |     |     | 5                         | 10  | 20  | 40  | 60  | 100 | 200 | 500 | 1000 | 2000 | 10000          | fixed |            | portable |
| QOH145X<br>QOH245X<br>QOH345X    | 45                     | 675                               | 675  | 563  | 495  | 304 | 203 | 180 | 146                       | 119 | 99  | 86  | 79  | 73  | 68  | 62  | 59   | 56   | 54             | 1.6   | 0.4        | 0.30     |
| QOH163X<br>QOH263X<br>QOH363X    | 63                     | 693                               | 693  | 641  | 567  | 378 | 284 | 252 | 205                       | 170 | 139 | 120 | 110 | 102 | 95  | 87  | 82   | 79   | 76             | 1.2   | 0.4        | 0.20     |
| QOH180X<br>QOH280X<br>QOH380X    | 80                     | 1200                              | 1200 | 1200 | 1100 | 800 | 560 | 480 | 380                       | 300 | 240 | 192 | 180 | 160 | 136 | 116 | 108  | 100  | 96             | 0.6   | 0.2        | 0.13     |
| QOH1100X<br>QOH2100X<br>QOH3100X | 100                    | 1200                              | 1200 | 1200 | 1200 | 900 | 700 | 600 | 475                       | 375 | 300 | 240 | 225 | 200 | 170 | 145 | 135  | 125  | 120            | 0.5   | 0.2        | 0.11     |

| CATALOGUE<br>NUMBER | CURRENT<br>RATING<br>A | DISCONNECTION TIME in seconds (S) |     |     |     |     |     |     |                           |      |      |       |    |      |    |     |    |      | Zs EARTH FAULT |       | R2<br>OHMS |          |
|---------------------|------------------------|-----------------------------------|-----|-----|-----|-----|-----|-----|---------------------------|------|------|-------|----|------|----|-----|----|------|----------------|-------|------------|----------|
|                     |                        | 0.01                              | 0.5 | 1   | 2   | 3   | 5   | 7   | DISCONNECTION CURRENT (A) |      |      |       |    |      |    |     |    |      | IMPEDANCE OHMS | fixed |            | portable |
|                     |                        | 10                                | 20  | 30  | 40  | 60  | 100 | 200 | 500                       | 1000 | 2000 | 10000 |    |      |    |     |    |      |                |       |            |          |
| QOE106BO3           | 6                      | 30                                | 30  | 30  | 30  | 30  | 30  | 24  | 20                        | 15   | 13   | 12    | 11 | 9.8  | 9  | 8.3 | 8  | 7.5  | 7              | 1667  | 1667       | 1667     |
| QOE110BO3           | 10                     | 50                                | 50  | 50  | 50  | 50  | 42  | 35  | 31                        | 23   | 20.5 | 19    | 18 | 16.3 | 15 | 14  | 13 | 12.5 | 12             | 1667  | 1667       | 1667     |
| QOE116BO3           | 16                     | 80                                | 80  | 80  | 64  | 56  | 48  | 45  | 41                        | 35   | 32   | 30    | 28 | 26   | 24 | 22  | 21 | 20   | 19             | 1667  | 1667       | 1667     |
| QOE120BO3           | 20                     | 100                               | 100 | 100 | 80  | 70  | 60  | 55  | 50                        | 44   | 40   | 38    | 35 | 33   | 30 | 28  | 26 | 25   | 24             | 1667  | 1667       | 1667     |
| QOE132BO3           | 32                     | 160                               | 160 | 160 | 128 | 112 | 96  | 88  | 80                        | 69   | 64   | 61    | 56 | 52   | 48 | 44  | 42 | 40   | 38             | 1667  | 1667       | 1667     |
| QOE140BO3           | 40                     | 200                               | 200 | 200 | 160 | 140 | 120 | 110 | 100                       | 86   | 80   | 76    | 70 | 65   | 60 | 55  | 52 | 50   | 48             | 1667  | 1667       | 1667     |
|                     |                        |                                   |     |     |     |     |     |     |                           |      |      |       |    |      |    |     |    |      |                |       |            |          |
| QOE106CO3           | 6                      | 60                                | 60  | 60  | 60  | 45  | 30  | 24  | 20                        | 15   | 13   | 12    | 11 | 9.8  | 9  | 8.3 | 8  | 7.5  | 7              | 1667  | 1667       | 1667     |
| QOE110CO3           | 10                     | 100                               | 100 | 90  | 65  | 55  | 42  | 35  | 31                        | 23   | 20.5 | 19    | 18 | 16.3 | 15 | 14  | 13 | 12.5 | 12             | 1667  | 1667       | 1667     |
| QOE116CO3           | 16                     | 160                               | 160 | 112 | 72  | 60  | 48  | 45  | 41                        | 35   | 32   | 30    | 28 | 26   | 24 | 22  | 21 | 20   | 19             | 1667  | 1667       | 1667     |
| QOE120CO3           | 20                     | 200                               | 200 | 140 | 88  | 74  | 60  | 55  | 50                        | 44   | 40   | 38    | 35 | 33   | 30 | 28  | 26 | 25   | 24             | 1667  | 1667       | 1667     |
| QOE132CO3           | 32                     | 320                               | 320 | 224 | 139 | 118 | 96  | 88  | 80                        | 69   | 64   | 61    | 56 | 52   | 48 | 44  | 42 | 40   | 38             | 1667  | 1667       | 1667     |

| CATALOGUE<br>NUMBER | CURRENT<br>RATING<br>A | DISCONNECTION TIME in seconds (S) |     |     |     |     |    |    |                           |    |      |    |    |      |     |     |      |      |                |       | Zs EARTH FAULT |      | R2<br>OHMS |
|---------------------|------------------------|-----------------------------------|-----|-----|-----|-----|----|----|---------------------------|----|------|----|----|------|-----|-----|------|------|----------------|-------|----------------|------|------------|
|                     |                        | 0.01                              | 0.3 | 1   | 2   | 3   | 5  | 7  | DISCONNECTION CURRENT (A) |    |      |    |    |      |     |     |      |      | IMPEDANCE OHMS |       |                |      |            |
|                     |                        |                                   |     |     |     |     |    |    | 10                        | 20 | 30   | 40 | 60 | 100  | 200 | 500 | 1000 | 2000 | 10000          | fixed | portable       |      |            |
|                     |                        |                                   |     |     |     |     |    |    |                           |    |      |    |    |      |     |     |      |      |                |       |                |      |            |
| QOE106DO3           | 6                      | 120                               | 120 | 90  | 60  | 45  | 30 | 24 | 20                        | 15 | 13   | 12 | 11 | 9.8  | 9   | 8.3 | 8    | 7.5  | 7              | 1667  | 1667           | 1667 |            |
| QOE110DO3           | 10                     | 200                               | 200 | 100 | 65  | 55  | 42 | 35 | 31                        | 23 | 20.5 | 19 | 18 | 16.3 | 15  | 14  | 13   | 12.5 | 12             | 1667  | 1667           | 1667 |            |
| QOE116DO3           | 16                     | 320                               | 320 | 112 | 72  | 60  | 48 | 45 | 41                        | 35 | 32   | 30 | 28 | 26   | 24  | 22  | 21   | 20   | 19             | 1667  | 1667           | 1667 |            |
| QOE120DO3           | 20                     | 400                               | 400 | 140 | 88  | 74  | 60 | 55 | 50                        | 44 | 40   | 38 | 35 | 33   | 30  | 28  | 26   | 25   | 24             | 1667  | 1667           | 1667 |            |
| QOE132DO3           | 32                     | 640                               | 640 | 224 | 139 | 118 | 96 | 88 | 80                        | 69 | 64   | 61 | 56 | 52   | 48  | 44  | 42   | 40   | 38             | 1667  | 1667           | 1667 |            |