### Circuit Protection

<table>
<thead>
<tr>
<th>Range</th>
<th>Technical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentry</td>
<td>576-604</td>
</tr>
<tr>
<td>Consumer units and a wide variety of modular protection and control products</td>
<td></td>
</tr>
<tr>
<td>Sentrysocket</td>
<td>606-607</td>
</tr>
<tr>
<td>RCD protected switchsockets with active and passive control circuits</td>
<td></td>
</tr>
</tbody>
</table>

For a full range of corresponding products, see pages 271-286 in the product selector.
Metal Consumer Units and Enclosures

Standards and approvals
All Sentry consumer units are designed to fully comply with the requirements of BS EN 61439-3.

**TECHNICAL SPECIFICATION**

**ELECTRICAL**

**MAXIMUM CURRENT RATING**
All Sentry consumer units have a maximum rating of 100A except the 4 module range which is rated at 63A.

**TERMINAL CAPACITY**
16mm² earth and neutral

**RATED FREQUENCY**
50Hz

**RATED OPERATIONAL VOLTAGE**
Consumer unit: 220-250V

**RATED INSULATION VOLTAGE**
Consumer unit: 300V

**SHORT CIRCUIT WITHSTAND**
16kA rms (based on the use of a BS 1361 Type 2 fuse of rating not exceeding 100A)

**EARTHING SYSTEM**
Suitable for use with TN-S, TN-C-S and TT systems

**SPLIT LOAD**
Split load units are supplied with a pre-fitted switch, RCD(s) and suitable cables

**Description**
Specific consumer unit configurations have been designed to provide flexible solutions in meeting the requirements of the 17th Edition with regards to RCD protection for circuits, cables and socket outlets. MK Sentry Metal Consumer units allow for protected and unprotected ways with the circuits being split across up to 2 RCDs, whilst the labelling sheet allows for full identification of all circuits.

Sentry Metal Consumer units and enclosures are designed on a modular basis, with 4 to 21 module enclosures in the range, to accommodate a wide variety of MK modular protection and control products. Sentry Metal Consumer units provide a housing with facility for earthing the metal box.

The enclosures are provided with ample wiring space and cable entry points.

**Colours / finishes**
All Sentry Metal Consumer units are colored in white (UV protected powder coated paint).

Certain models are provided with a pre-assembled split load arrangement with switch and up to 2 RCDs. The range is complemented by a versatile selection of small four module enclosures suitable for housing RCDs or other combinations of Sentry products.

All Sentry Metal Consumer Units have neutral and earth terminal bars with 16mm² capacity for solid stranded copper cables.

For enquiries where large number of similarly designed consumer units i.e. specified. MK can provide complete pre-assembled factory built units, subject to certain conditions. For further information please contact the MK Electric Technical Services Department (01268 563720).

**FEATURES**

- Attractive styling
- Modular design
- Suitable for most residential, commercial and light industrial applications
- Single, dual and RCD consumer units available for 17th Edition compliance
- Fully comply with British and European Harmonised Standards
- Available as an empty enclosure or prefitted with switch disconnector and up to 2 RCDs
- Custom build options available
**TECHNICAL SPECIFICATION**

**PHYSICAL**
- Ambient Operating Temperature: -5°C to +40°C (not to exceed an average of more than 35°C in any 24 hour period)

**IP RATING**
- IP2XC

**WEIGHTS**
- 4 WAY: 1.9kg
- 8 WAY: 2.8kg
- 12 WAY: 3.4kg
- 16 WAY: 4.0kg
- 21 WAY: 4.7kg

**METAL CONSUMER UNITS**

<table>
<thead>
<tr>
<th>WAYS</th>
<th>A (OVERALL WIDTH)</th>
<th>B (DISTANCE BETWEEN CENTRES OF FIXING HORIZONTAL)</th>
<th>C (DISTANCE BETWEEN FIXING CENTRES VERTICALLY AS ORIENTATED IN THE DIAGRAMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>144</td>
<td>85</td>
<td>116.1</td>
</tr>
<tr>
<td>8</td>
<td>238</td>
<td>168</td>
<td>147</td>
</tr>
<tr>
<td>12</td>
<td>310</td>
<td>240</td>
<td>147</td>
</tr>
<tr>
<td>16</td>
<td>382</td>
<td>308</td>
<td>147</td>
</tr>
<tr>
<td>21</td>
<td>472</td>
<td>400</td>
<td>147</td>
</tr>
</tbody>
</table>

**Knockout**

See Cable Management Section for male bushed flanges to suit all knockouts.
Standards and approvals
All Sentry consumer units are designed to fully comply with the requirements of BS EN 61439-3.

**TECHNICAL SPECIFICATION**

**ELECTRICAL**

**MAXIMUM CURRENT RATING**
All Sentry consumer units have a maximum rating of 100A except K5504s, K5604s, which are rated at 63A.

**TERMINAL CAPACITY**
16mm² earth and neutral

**RATED FREQUENCY**
50Hz

**RATED OPERATIONAL VOLTAGE**
- Consumer unit: 220-250V
- 2 module enclosure: 220-250V
- 4 module enclosure: 220-415V

**RATED INSULATION VOLTAGE**
- Consumer unit: 300V
- 2 module enclosure: 300V
- 4 module enclosure: 660V

**SHORT CIRCUIT WITHSTAND**
16kA rms (based on the use of a BS 1361 Type 2 fuse of rating not exceeding 100A)

**EARTHING SYSTEM**
Suitable for use with TN-S, TN-C-S and TT systems

**SPLIT LOAD**
Split load units are supplied with a pre-fitted switch, RCD and suitable cables.

The following versions are offered:

<table>
<thead>
<tr>
<th>MAIN INCOMER</th>
<th>RCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>K5682s</td>
<td>100A Switch 63A</td>
</tr>
<tr>
<td>K5662s</td>
<td>100A Switch 80A</td>
</tr>
<tr>
<td>K5666s</td>
<td>100A Switch 63A</td>
</tr>
<tr>
<td>K5686s</td>
<td>100A Switch 80A</td>
</tr>
<tr>
<td>K5681s</td>
<td>100A Switch 80A</td>
</tr>
<tr>
<td>K5582s</td>
<td>100A Switch 63A</td>
</tr>
<tr>
<td>K5566s</td>
<td>100A Switch 63A</td>
</tr>
<tr>
<td>K5586s</td>
<td>100A Switch 80A</td>
</tr>
<tr>
<td>K5581s</td>
<td>100A Switch 80A</td>
</tr>
</tbody>
</table>

**Description**
Specific consumer unit configurations have been designed to provide flexible solutions in meeting the requirements of the 17th Edition with regards to RCD protection for circuits, cables and socket outlets. MK Sentry Consumer Units, available in insulated and metal versions, allow for protected and unprotected ways with the circuits being split across up to 3 RCDs, whilst the labelling sheet allows for full identification of all circuits.

Sentry consumer units and enclosures are available in both surface metal and insulated types, designed on a modular basis, with 2 to 21 module enclosures in the range, to accommodate a wide variety of MK modular protection and control products.

Surface insulated units provide an all insulated housing. Metal units provide a housing with facility for earthing the metal box.

The enclosures are provided with ample wiring space and cable entry points.

**Colours / finishes**
All surface insulated consumer units have a textured magnolia cover and lid. The surface metal consumer units are white (powder coated paint). The flush bases are of galvanized steel.

Certain models are provided with a pre-assembled split load arrangement with switch and up to 3 RCDs. The range is complemented by a versatile selection of small, two and four module enclosures suitable for housing RCDs or other combinations of Sentry products. A 2 module enclosure K5592s is suitable for housing the one module RCBO.

All Sentry Consumer Units have neutral and earth terminal bars with 16mm² capacity for solid stranded copper cables.

For enquiries where large number of similarly designed consumer units i.e. specified. MK can provide complete pre-assembled factory built units, subject to certain conditions. For further information please contact the MK Electric Technical Services Department (01268 563720).

**FEATURES**
- Attractive styling
- Modular design
- Suitable for most residential, commercial and light industrial applications
- Single, dual and triple RCD consumer units available for 17th Edition compliance
- Fully comply with British and European Harmonised Standards
- Available as an empty enclosure or prefitted with switch disconnector and up to 3 RCDs
- Factory built options available

For a full range of corresponding products, see pages 271-291 in the product selector.
### Technical Specification

#### Electrical (Weatherproof Enclosures Only)

**Maximum Current Rating**
- 5702s: 2 pole devices up to 100A
- 5704s: 4 pole devices up to 63A

Note:
- 5702s – Can accept up to 4 module ways with removal of moulded blanks.
- 5704s – Can accept up to 8 module ways with removal of moulded blanks.

**Terminal Capacity**
- 5702s: 4 x 6mm² earth and neutral
- 5704s: 2 x 6mm² and 6 x 4mm² earth and neutral.

**Rated Operational Voltage**
- 220-415V

**Rated Insulation Voltage**
- 660V

### Terminal Capacity

**A**
- 4 x 6mm² earth and neutral

**B**
- 2 x 6mm² and 6 x 4mm² earth and neutral.

**C**
- 230

#### Physical

**Ambient Operating Temperature**
- -5°C to +40°C (not to exceed an average of more than +35°C in any 24 hour period)

**IP Ratings**
- (see also ‘Service Conditions’, below)
  - CONSUMER UNIT IP2X C
  - 2 module enclosure 5502s IP30
  - 2 module enclosure 5702s IP30
  - 2 module enclosure K5592s IP30
  - 4 module enclosure 5504s IP3X
  - 4 module enclosure 5604s IP3X
  - 4 module enclosure 5704s IP65
  - Max. installation altitude 2000m

### Dimensions (mm)

**Consumer unit**

*Note: Knockout details on following page*

**Surface Insulated K5604s / K5686s**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>MODULES</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>140</td>
<td>70</td>
</tr>
<tr>
<td>8</td>
<td>234</td>
<td>164</td>
</tr>
<tr>
<td>12</td>
<td>306</td>
<td>236</td>
</tr>
<tr>
<td>16</td>
<td>378</td>
<td>308</td>
</tr>
<tr>
<td>21</td>
<td>468</td>
<td>398</td>
</tr>
</tbody>
</table>

*For K5504s – 23mm*
Sentry Technical

Switch Disconnectors

Standards and approvals

Sentry switch disconnectors are designed to fully comply with the requirements of BS EN 60947-3.

They all feature positive contact status indication in accordance with the 17th Edition IEE Wiring Regulations (537.2.2.1 and 537.3.2.2).

TECHNICAL SPECIFICATION

ELECTRICAL

CATEGORY OF DUTY
AC22A

LOAD TYPE CAPABILITY
Both resistive and inductive

OPERATING VOLTAGE
240V a.c.

OPERATING FREQUENCY
50Hz

<table>
<thead>
<tr>
<th></th>
<th>5560S</th>
<th>5500S</th>
</tr>
</thead>
<tbody>
<tr>
<td>RATED OPERATIONAL CURRENT LE</td>
<td>63A</td>
<td>100A</td>
</tr>
<tr>
<td>RATED DUTY</td>
<td>Uninterrupted</td>
<td>Uninterrupted</td>
</tr>
<tr>
<td>RATED MAKING CAPACITY LC</td>
<td>189A rms</td>
<td>300 rms</td>
</tr>
<tr>
<td>RATED SHORT TIME WITHSTAND CURRENT LCW</td>
<td>2kA rms for 1 sec</td>
<td>2kA rms for 1 sec</td>
</tr>
<tr>
<td>RATED SHORT CIRCUIT MAKING CAPACITY LCM</td>
<td>3kA peak</td>
<td>3kA peak</td>
</tr>
<tr>
<td>RATED CONDITIONAL SHORT CIRCUIT CURRENT</td>
<td>6kA rms prospective</td>
<td>6kA rms prospective</td>
</tr>
</tbody>
</table>

PHYSICAL

AMBIENT OPERATING TEMPERATURE
-5°C to +40°C

IP RATING
Front face IP3X, screw IP2X

TIGHTENING TORQUE
3Nm

MAX INSTALLATION ALTITUDE
2000 metres

RATING SPECIFICATION

<table>
<thead>
<tr>
<th>SWITCH DISCONNECTOR</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>5560s</td>
<td>100A</td>
</tr>
<tr>
<td>5500s</td>
<td>63A</td>
</tr>
</tbody>
</table>

Description

The Sentry range offers a choice of switch disconnector rated at either 100A or 63A.

The operating dolly is capable of being locked in either the ON or OFF position. When locked in the ON position it will no longer operate as an isolator. Positive indication of the opening of the contacts is only given when the green stripe can be seen on the dolly.

The terminals are of a tunnel design and offer a generous cable capacity of 50mm² for solid stranded conductors and 35mm² for flexible conductors, on both current ratings.

Category of duty

The Sentry switch disconnector is capable of switching both resistive and inductive loads and has a category of duty of AC22A.

FEATURES

- Meet BS EN and IEE Wiring Regulation requirements
- Choice of current ratings
- Tunnel design terminals for ease of wiring
- Generous cable capacity
- Lockable operating dolly
- Make first, break last on neutral

Dimensions (mm)

- LN 5500s 100A
- LN 5560s 63A
- Installation

The Sentry switch disconnector is designed to accept both cable-in/cable-out and direct-to-busbar connections.

The terminal screws are touch-proof to IP2X, captive and feature combination heads.
Miniature Circuit Breakers (MCBs)

Standards and approvals

Sentry switch disconnectors are designed to fully comply with the requirements of BS EN 60947-3.

They all feature positive contact status indication in accordance with the 17th Edition IEE Wiring Regulations (537.2.2.1 and 537.3.2.2).

**TECHNICAL SPECIFICATION**

<table>
<thead>
<tr>
<th>ELECTRICAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE RATING</td>
<td>230V/400V a.c.</td>
</tr>
<tr>
<td>OPERATING FREQUENCY</td>
<td>50Hz</td>
</tr>
<tr>
<td>RATED SHORT CIRCUIT CAPACITY ICN</td>
<td>6000A</td>
</tr>
<tr>
<td>SERVICE SHORT CIRCUIT CAPACITY ICS</td>
<td>6000A</td>
</tr>
<tr>
<td>When backed up by a BS 1361, 100A fuse, then the breaking capacity of the MCB is increased to 16,000A.</td>
<td></td>
</tr>
</tbody>
</table>

Energy limiting class: 3

<table>
<thead>
<tr>
<th>PHYSICAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AMBIENT OPERATING TEMPERATURE</td>
<td>-5°C to +40°C</td>
</tr>
<tr>
<td>CALIBRATION TEMPERATURE</td>
<td>+30°C</td>
</tr>
<tr>
<td>IP RATING</td>
<td>Front face IP4X, screw IP2X</td>
</tr>
<tr>
<td>TERMINAL CAPACITY</td>
<td>35mm²</td>
</tr>
<tr>
<td>TIGHTENING TORQUE</td>
<td>3Nm Max</td>
</tr>
<tr>
<td>MAX. INSTALLATION ALTITUDE</td>
<td>2000 metres</td>
</tr>
</tbody>
</table>

**Description**

Sentry MCBs are of the thermo-magnetic, current limiting type and are available with either Type B or Type C operating characteristics.

The operating dolly may be locked in either the ON or OFF position without affecting the ability of the trip mechanism to operate. The contacts themselves are manufactured from carefully chosen materials, selected specifically for their low electrical resistance and low propensity to weld under fault conditions.

**Positive contact status indication**

When the green indicator is visible, then a contact gap of 4mm has been achieved. Sentry MCBs may therefore be used as single pole isolating switches where appropriate.

**Terminals**

The Sentry MCB features tunnel terminals of 35mm² capacity on all ratings. Each terminal has a protective shutter to prevent cable being installed incorrectly. The terminal screws are touch proof to IP2X, captive and feature combination heads.

**Modes of operation**

The mechanism of the Sentry MCB has been carefully designed and engineered using thermal and magnetic elements to detect overcurrents due to both overload and fault currents. The MCB will operate and interrupt the supply to prevent damage to the installation.

The thermal component is a carefully calibrated, thermally operated bi-metal element.

Larger overloads and fault current situations are dealt with using the magnetic tripping mode of the MCB. This acts very quickly, overriding the thermal operation.

BS EN 60898 requires the tripping to occur within 100 milliseconds and the design of the Sentry MCB allows fault currents of up to 6000A (M6) to be safely interrupted well within this time scale.
MINIATURE CIRCUIT BREAKERS (MCBs)

RATING SPECIFICATION

<table>
<thead>
<tr>
<th>TYPE B SINGLE POLE</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>5903s</td>
<td>3A</td>
</tr>
<tr>
<td>5906s</td>
<td>6A</td>
</tr>
<tr>
<td>5910s</td>
<td>10A</td>
</tr>
<tr>
<td>5916s</td>
<td>16A</td>
</tr>
<tr>
<td>5920s</td>
<td>20A</td>
</tr>
<tr>
<td>5925s</td>
<td>25A</td>
</tr>
<tr>
<td>5932s</td>
<td>32A</td>
</tr>
<tr>
<td>5940s</td>
<td>40A</td>
</tr>
<tr>
<td>5945s</td>
<td>45A</td>
</tr>
<tr>
<td>5950s</td>
<td>50A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TYPE C SINGLE POLE</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>8703s</td>
<td>3A</td>
</tr>
<tr>
<td>8706s</td>
<td>6A</td>
</tr>
<tr>
<td>8710s</td>
<td>10A</td>
</tr>
<tr>
<td>8716s</td>
<td>16A</td>
</tr>
<tr>
<td>8720s</td>
<td>20A</td>
</tr>
<tr>
<td>8725s</td>
<td>25A</td>
</tr>
<tr>
<td>8732s</td>
<td>32A</td>
</tr>
<tr>
<td>8740s</td>
<td>40A</td>
</tr>
<tr>
<td>8750s</td>
<td>50A</td>
</tr>
</tbody>
</table>

FEATURES

- Meet BS EN and IEE Wiring Regulation requirements
- Trip-free’ mechanism
- Positive contact status indicator
- Tunnel type, touch-proof, captive terminals
- Generous terminal capacity
- Can be used as single pole isolating switch
- Protective shutter

Description (continued)

Operating characteristics

TYPE B

The magnetic operating limits are between 3 and 5 times the current rating of the MCB. Under these conditions the mechanism of a 10A MCB will operate between 30A and 50A in an overcurrent situation.

TYPE C

In the case of Type C MCBs, the magnetic operating limits are between 5 and 10 times the current rating of the MCB. Under these conditions the mechanism of a 10A MCB will operate between 50A and 100A in an overcurrent situation.

Type C devices are capable of supplying the majority of inductive and capacitive loads such as motors, transformers and tungsten or fluorescent lighting.

Time/Current and Energy let through characteristics of Sentry MCBs are shown graphically on the Time current characteristics chart (See separate document).

TYPE D

The Type D MCB is suitable for applications involving equipment generating very high inrush currents, e.g. x-ray equipment, transmitters and computer power supplies. The magnetic operating limits are between 10 and 50 times the current rating of the MCB.

(FOR MODULAR COMBI USE ONLY)

Installation

Selection of the most suitable MCB should take into account the following considerations:

1. Operating voltage and frequencies

   It is possible to use the Sentry MCB on other voltages than 230/400V a.c. 50Hz, but it should be noted that this takes the MCB outside the scope of BS EN 60898.

2. Type of load

   RESISTIVE

   No derating is required in the case of resistive loads.

   INDUCTIVE

   In the case of inductive loads from direct-on-line motors, the surge on energisation can produce up to 5 times full load current, which may be present for several seconds. It is therefore recommended that Type C MCBs are used for such circuits.

   When using assisted start motors, the usually quoted figures are 2.5 times the full load current, for periods generally longer than those for direct-on-line starters. It is thus important to establish the degree of inrush current in order to select a suitable MCB. In all instances, reference should be made to both the motor manufacturer’s curves and MK’s circuit breaker curves in order to select the compatible miniature circuit breaker.

   CAPACITIVE

   Surges on energisation, for example with discharge lighting, may well reach 25 times the rated current of the device, but only for very short duration. Type B devices will often be adequate, but for more specialised circuits, a Type C may be required. The lighting fitting manufacturer’s recommendations should be observed.
Miniature Circuit Breakers (MCBs)

3. Fault breaking capacity
All Sentry MCBs have a short circuit breaking capacity of 6,000A (M6).

For applications where the prospective fault current is in excess of this, a BS 1361, 100A (maximum) fuse should be used upstream of the MCB to provide a system breaking capacity of 16,000A (in accordance with BS EN 60439-3).

4. Discrimination
A Sentry MCB consumer unit will normally be supplied via an HRC fuse. The HRC in such instances will be the major device and remain unaffected by any fault current which causes the MCB to operate.

The level of fault current up to which this can be assured is determined by comparing the I^2t characteristics of the two devices. Discrimination will theoretically occur up to the level at which the value of the total operating I^2t of the MCB is below the minimum pre-arcing I^2t of the fuse, although in practice, discrimination will be achieved at higher levels than this.

5. Cable protection
The current carrying capacity of the cable should always exceed the current rating of the MCB to prevent damage.

However, should this not be the case, a further calculation may show that the MCB can still interrupt the current in a sufficiently short time to prevent overheating of the cable insulation. Although this will prevent mechanical damage to the cables, further overload protection should be provided by a separate device, e.g. a motor overload relay.

In case of doubt please contact the MK Technical Sales and Service Department.

Dimensions (mm)

![Dimensions Diagram]
Sentry Technical

Tripping Characteristics Curve

Limit specified in BS EN 60898 1: 2003
In: Rated Current
B TYPE: 3A to 50A
C TYPE: 3A to 50A
Reference calib. temp. 30°C

![Diagram of Tripping Characteristics Curve]

- Lower Limit as per Standard
- Upper Limit as per Standard
I$^2$t curves

B Type 6A-10A

C Type 3A-10A

B Type 16A-32A

C Type 16A-20A

B Type 40A-45A

C Type 32A-45A
Residual Current Breakers with Overcurrent Protection (RCBOs)

Standards and approvals

All Sentry RCBOs are designed to fully comply with the relevant requirements of BS EN 61009-1, BS IEC 61 009-2-2, BS 61543 for EMC.

The RCBOs feature positive contact status indication in accordance with 17th edition IEE Wiring Regulations (537.2.2.2 and 537.3.2.2).

### TECHNICAL SPECIFICATION

**ELECTRICAL**

- **OPERATING VOLTAGE**: 230V a.c.
- **OPERATING FREQUENCY**: 50Hz
- **RATED SHORT CIRCUIT CAPACITY ICN**: 6,000A
- **SERVICE SHORT CIRCUIT CAPACITY ICS**: 6,000A

When backed up by a BS 1361, 100A fuse, then the breaking capacity of the RCBO is increased to 16,000A.

**PHYSICAL**

- **AMBIENT OPERATING TEMPERATURE**: –25°C to + 40°C
- **IP RATING**: Front face IP4X, screw IP2X
- **TERMINAL CAPACITY**: Line in 25mm², Line and neutral out 25mm²
- **TIGHTENING TORQUE**: 2.5Nm
- **MAX. INSTALLATION ALTITUDE**: 2000 metres

### Description

The Sentry range features solid neutral type single pole RCBOs in one module format.

The one module Sentry RCBOs are a combination of a Type B MCB and a Residual Current Device. This enables both overcurrent protection and earth fault current protection to be provided by a single unit.

This combination allows earth fault protection to be restricted to a single circuit, thus ensuring that only the circuit with the fault is interrupted. (When groups of circuits are protected by an RCD, all circuits would be interrupted under fault conditions, which may cause unnecessary inconvenience).

The operating switch on all Sentry RCBOs may be locked in either the ON or OFF position without affecting the ability of the trip mechanism to operate.

Sentry RCBOs feature tunnel terminals of generous capacity, with 25mm² for live supply for live and neutral load terminals. The neutral supply (blue) and earth supply (white/cream) are provided via flying leads.

### Mode of operation

As the RCBO is a combination of an MCB and RCD, reference should be made to the relevant technical information regarding these devices.

### FEATURES

- Single module
- Meet BS EN and IEE Wiring Regulation requirements
- Allows both overcurrent and earth fault protection and detection
- Available in a range of current ratings
- Tunnel type terminals
- Generous terminal capacity
- Positive contact status indication
Residual Current Breakers with Overcurrent Protection (RCBOs)

### Installation

Sentry RCBOs may be installed anywhere along the length of the busbar and will occupy one outgoing way.

Selection of the most suitable RCBO should take into account the following considerations:

1. **Operating voltage and frequencies**
2. **Fault breaking capacity**
3. **Cable protection**

For applications where the prospective fault current is in excess of this, a BS 1361, 100A (maximum) fuse should be used upstream of the RCBO to provide a system breaking capacity of 16,000A.

**3. Cable protection**

The current carrying capacity of the cable should always exceed the current rating of the RCBO, to prevent damage. However, should this not be the case, a further calculation may show that the RCBO can still interrupt the current in a sufficiently short time to prevent overheating of the cable insulation. Although this will prevent mechanical damage to the cables, further overload protection should be provided by a separate device, e.g., a motor overload relay.

In case of doubt please contact the Technical Sales and Service Department.

### Dimensions (mm)

<table>
<thead>
<tr>
<th>RATING RCBO</th>
<th>TRIPPING CURRENT</th>
<th>LIST NO. TYPE B</th>
<th>LIST NO. TYPE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A, 230V</td>
<td>30mA</td>
<td>7932s</td>
<td>8932s</td>
</tr>
<tr>
<td>10A, 230V</td>
<td>30mA</td>
<td>7933s</td>
<td>8933s</td>
</tr>
<tr>
<td>16A, 230V</td>
<td>30mA</td>
<td>7934s</td>
<td>8934s</td>
</tr>
<tr>
<td>20A, 230V</td>
<td>30mA</td>
<td>7935s</td>
<td>8935s</td>
</tr>
<tr>
<td>32A, 230V</td>
<td>30mA</td>
<td>7936s</td>
<td>8936s</td>
</tr>
<tr>
<td>40A, 230V</td>
<td>30mA</td>
<td>7937s</td>
<td></td>
</tr>
<tr>
<td>45A, 230V</td>
<td>30mA</td>
<td>7938s</td>
<td></td>
</tr>
<tr>
<td>50A, 230V</td>
<td>30mA</td>
<td>7939s</td>
<td></td>
</tr>
</tbody>
</table>
Sentry Technical

Residential 6kA Residual Current Devices (RCDs)

Standards and approvals
All Sentry RCDs are designed to fully comply with the requirements of BS EN 61 008:1995, IEC 1008:1990.
They all feature positive contact status indication in accordance with 17th edition IEE Wiring Regulations (537.2.2.2 and 537.3.2.2).

Technical Specification

Electrical
Rated Making and Breaking Capacity / M
16 - 40A = 500A
63 - 80A = 800A
Type AC
Rated Short-Circuit Current / Inc
16A - 40A = 6,000A (100A Fuse)
Rated residual short-circuit current / IAm: 16 - 100A = 6,000A
Rated Voltages
2 pole devices, 230V
Operating Voltages
2 pole devices, 230V - 100V to 250V
Tripping Time
1 x IAm ~300ms
5 x IAm ~40ms
Physical
Ambient Operating Temperature
-25°C to + 40°C
IP Rating
Front face after installation of enclosure IP40
Terminal Capacity
Solid stranded - 1 x 1.5 - 35mm² Flexible with ferrule
- 1 x 1.5 - 35mm²
Tightening Torque
3Nm
Max. Installation Altitude
2000 metres

Description
The Sentry range of RCDs offer a comprehensive selection of devices designed to meet most residential, commercial and light industrial requirements.
The range is two pole, a.c. fault current sensitive with a selection of current ratings from 16 to 80A and is available in a variety of tripping sensitivities.
When in the OFF position a contact gap of 4mm is present, enabling Sentry RCDs to be used as isolating switches where appropriate.
The operating dolly may be locked in either the ON or OFF position without affecting the ability of the trip mechanism to operate, i.e. the RCD is ‘trip-free’. It is not possible to hold the contacts closed when a fault condition exists.
All Sentry RCDs incorporate a filtering device to provide protection against transient surges in the supply to the unit, thus reducing the occurrence of unwanted tripping.

Features
- Meet BS EN and IEE Wiring Regulation requirements
- Extensive range to suit all specifications
- Protect against unwanted tripping
- Positive contact status indication
- Suitable for most residential, commercial and light industrial applications
- Offer a high degree of protection against electrocution in accidental shock hazard situations
- Two module, double pole units available up to 80A
Residential 6kA Residual Current Devices (RCDs)

Operation
The RCD provides an indication of an earth fault and contact status as detailed below.

The operating dolly provides the following indication:

- **I** = Switched ON
- **O** = Switched OFF

The contact status is shown via dolly markings.

In the event of an Earth Fault in the installation or the operation of the test button, the dolly will move to the OFF position. To re-connect the supply the dolly must be reset by moving it to the ON position.

Testing
If an RCD is installed as additional protection for basic protection, it is a requirement of the IEE Regulations that the effectiveness of the RCD be verified. This must be achieved by a test simulating an appropriate fault condition and be independent of any test facility incorporated in the RCD. The test currents to be applied are as follows:

<table>
<thead>
<tr>
<th>Test current</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 x I Δ n</td>
<td>RCD must not trip</td>
</tr>
<tr>
<td>1.0 x I Δ n</td>
<td>RCD must trip within 300mS</td>
</tr>
<tr>
<td>5.0 x I Δ n</td>
<td>RCD must trip within 40mS</td>
</tr>
</tbody>
</table>

Where I Δ n is the RCD’s rated tripping current in accordance with wiring regulations and product standard BS EN 61008.
Sentry Technical

Industrial 10kA Residual Current Devices (RCDs)

Standards and approvals

All Sentry RCDs are designed to fully comply with the requirements of BS EN 61008:1995.
IEC 1008:1990

They all feature positive contact status indication in accordance with the 17th Edition IEE Wiring Regulations (537.2.2.1 and 537.3.2.2).

**Technical Specification**

**Electrical**
- **Rated Making and Breaking Capacity / M**
  - 16 - 40A = 500A
  - 63 - 80A = 800A
  - 100A = 1000A
  - Type AC

- **Rated Short-Circuit Current / INC**
  - 16A - 40A = 10,000A (63A Fuse)
  - 63A - 80A = 10,000A (100A Fuse)
  - 100A = 10,000A (125A Fuse)

- **Rated Residual Short-Circuit Current / IΔM**
  - 16 - 100A = 10,000A

- **Rated Voltages**
  - 2 pole devices, 110V and 230V
  - 4 pole devices, 230V to 440V

- **Operating Voltages**
  - 2 pole devices, 110V - 100V to 250V
  - 230V - 100V to 250V
  - 4 pole devices, 185V - 440V

- **Tripping Time**
  - 1 x IΔn ≤300ms
  - 5 x IΔn ≤40ms
  - Time delay version
    - 1 x IΔn - 150 - 500ms
    - 5 x IΔn - 50 - 150ms

**Physical**
- **Ambient Operating Temperature**
  - -25°C to +40°C

- **IP Rating**
  - Front face after installation of enclosure IP40

- **Terminal Capacity**
  - Solid stranded - 1 x 1.5 - 50mm²
  - Flexible with ferrule - 1 x 1.5 - 35mm²

- **Tightening Torque**
  - 3Nm

- **Max. Installation Altitude**
  - 2000 metres

**Description**

The Sentry range of RCDs offers a comprehensive selection of devices designed to meet most residential, commercial and light industrial requirements.

The range includes two and four pole, a.c., d.c. fault current sensitive and time delayed models and a selection of current ratings from 16 to 100A is available in a variety of tripping sensitivities.

When in the OFF position a contact gap of 4mm is present, enabling Sentry RCDs to be used as isolating switches where appropriate.

Positive indication of the opening of the contacts is only given when contact status indicator shows green.

The operating dolly may be locked in either the ON or OFF position without affecting the ability of the trip mechanism to operate, i.e. the RCD is ‘trip-free’. It is not possible to hold the contacts closed when a fault condition exists.

All Sentry RCDs incorporate a filtering device to provide protection against transient surges in the supply to the unit, thus reducing the occurrence of unwanted tripping.

**Features**

- Meet BS EN and IEE Wiring Regulation requirements
- Extensive range to suit all specifications
- Protect against unwanted tripping
- Positive contact status indication
- Suitable for most residential, commercial and light industrial applications
- Offer a high degree of protection against electrocution in accidental shock hazard situations
- Two module, double pole units available up to 100A
- Indication of earth fault, via central dolly position
Sentry Technical

Industrial 10kA Residual Current Devices (RCDs)

Application

The choice of the most suitable RCD for a particular application should take into account the following considerations:

1. Sensitivity

10mA RCDs offer a high degree of protection against electrocution in an accidental shock hazard situation. They are of particular value in a high risk area where resistances external to the body are likely to restrict the earth fault current flowing through the body to less than 30mA and where 110V supply is being used.

30mA RCDs offer a high degree of protection in an accidental shock hazard situation and are by far the most popular sensitivity used in the United Kingdom. In a shock situation, the current flowing through the human body at 240V 50Hz could be between 80 and 240mA, depending on the resistance of the body in question. To ensure that there are no harmful physiological effects in such a situation, it is necessary for the RCD to operate within 300mS at 30mA and 40mS at 150mA.

As the Sentry RCD typically operates well below these times, it clearly more than satisfies this requirement.

100mA RCDs may, in some circumstances, provide protection against electrocution in an accidental shock hazard situation. However, it is important to note that there is a likelihood that the earth fault current may be below the sensitivity of the RCD. This becomes increasingly likely if additional resistances to that of the human body are in the current path.

300mA RCDs provide protection against the risk of fire only. They do not provide protection against electrocution in an accidental shock hazard situation. A typical application would be lighting circuits where it is deemed that the risk of electric shock is small.

It is important to note that a current of less than 500mA flowing in a high resistance path is sufficient to bring metallic parts to incandescence and, potentially, initiate a fire.

2. Requirements of the IEE Wiring Regulations BS 7671

RCDs may be used to provide additional protection against both fault protection and basic protection.

Fault Protection

Defined as protection against electric shock under single fault conditions.

Effective earthing in conjunction with automatic disconnection should always be employed to protect against the effects of fault protection. The provision of a low resistance path back to the supply from the fault should ensure that the overcurrent device operates before damage occurs. This is the earth fault loop impedance.

In circumstances where the earth fault loop impedance in the circuit is too high to ensure operation of the overcurrent device, then the IEE Wiring Regulations allow the installation of an RCD. To comply with the Regulations, the earth loop impedance of the circuit (in ohms), multiplied by the rated tripping current of the RCD (in amperes) must not produce a value greater than 50. With this in mind, the maximum values of earth loop impedance permissible when installing an MK Sentry RCD are as follows:

\[ Z_{e} \text{ (max)} = \frac{50}{I_{n}} \leq 50 \times 0.03 = 1667 \text{ Ohms} \]

<table>
<thead>
<tr>
<th>Rated Tripping Current of RCD</th>
<th>Maximum Permissible Earth Fault Loop Impedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10mA</td>
<td>5000 Ohms</td>
</tr>
<tr>
<td>30mA</td>
<td>1667 Ohms</td>
</tr>
<tr>
<td>100mA</td>
<td>500 Ohms</td>
</tr>
<tr>
<td>300mA</td>
<td>166 Ohms</td>
</tr>
</tbody>
</table>

RCD’s are further specified for fault protection on TT systems (Regulation 411.5.2, 411.5.3 apply)

Installation

Sentry RCDs must never be used as the sole method of basic protection, but are invaluable in providing supplementary protection in high risk environments where damage may occur.
Industrial 10kA Residual Current Devices (RCDs)

Application (continued)

Direct Contact
Defined as “contact of persons or livestock with live parts”.

The Regulations recognise four main means of providing protection against direct contact which include enclosures and the use of extra low voltage systems.

However, the use of RCDs is specified by the Regulations in the following instances:

- A socket outlet rated at 32A or less which may reasonably be expected to supply portable equipment for use outdoors shall be protected by an RCD having the characteristics specified in Regulation 412-06-02. (Regulation 471-16-01 applies.)
- Where socket outlets are used to supply caravans on caravan sites, then they must be protected by an RCD having the characteristics specified in Regulation 412-06-02

Regulation 412-06-02 stipulates among other things that where supplementary protection is provided by residual current devices, their rated residual operating current must not exceed 30mA and that they must trip within 40ms at 5 times rated operating current. Although RCDs must never be used as the sole method of direct contact protection, they are invaluable in providing supplementary protection in high risk environments where damage may occur. Typical applications include situations where equipment may be used outside or fed by trailing sockets, equipment accessible to children or equipment used in wet areas.

For these reasons RCDs are commonly found in schools, hospitals and residential installations.

3. Types of fault current
In an installation different types of fault current can occur. MK offer RCDs to suit these conditions.

Sentry Type AC RCDs are suitable for situations where there are residual sinusoidal alternating currents, whether applied suddenly or rising slowly. This is the most commonly used type of RCD in the UK.

Sentry Type A RCDs (i.e. pulsating d.c. fault current sensitive) are suitable for situations where there are residual sinusoidal alternating currents, whether suddenly applied or slowly rising.

These situations can occur with the use of semiconductor devices in modern electrical and electronic equipment, such as computers, printers, plotters, televisions, video cassette recorders and hi-fi equipment, is growing.

Such devices may result in the normal sinusoidal a.c. waveform generated by the mains electrical supply being ‘modified’, for example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped.

The resulting waveforms are said to contain a pulsating d.c. component as illustrated below.

3. Types of fault current
In an installation different types of fault current can occur. MK offer RCDs to suit these conditions.

Sentry Type AC RCDs are suitable for situations where there are residual sinusoidal alternating currents, whether applied suddenly or rising slowly. This is the most commonly used type of RCD in the UK.

Sentry Type A RCDs (i.e. pulsating d.c. fault current sensitive) are suitable for situations where there are residual sinusoidal alternating currents, whether suddenly applied or slowly rising.

These situations can occur with the use of semiconductor devices in modern electrical and electronic equipment, such as computers, printers, plotters, televisions, video cassette recorders and hi-fi equipment, is growing.

Such devices may result in the normal sinusoidal a.c. waveform generated by the mains electrical supply being ‘modified’, for example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped.

The resulting waveforms are said to contain a pulsating d.c. component as illustrated below.

3. Types of fault current
In an installation different types of fault current can occur. MK offer RCDs to suit these conditions.

Sentry Type AC RCDs are suitable for situations where there are residual sinusoidal alternating currents, whether applied suddenly or rising slowly. This is the most commonly used type of RCD in the UK.

Sentry Type A RCDs (i.e. pulsating d.c. fault current sensitive) are suitable for situations where there are residual sinusoidal alternating currents, whether suddenly applied or slowly rising.

These situations can occur with the use of semiconductor devices in modern electrical and electronic equipment, such as computers, printers, plotters, televisions, video cassette recorders and hi-fi equipment, is growing.

Such devices may result in the normal sinusoidal a.c. waveform generated by the mains electrical supply being ‘modified’, for example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped.

The resulting waveforms are said to contain a pulsating d.c. component as illustrated below.

3. Types of fault current
In an installation different types of fault current can occur. MK offer RCDs to suit these conditions.

Sentry Type AC RCDs are suitable for situations where there are residual sinusoidal alternating currents, whether applied suddenly or rising slowly. This is the most commonly used type of RCD in the UK.

Sentry Type A RCDs (i.e. pulsating d.c. fault current sensitive) are suitable for situations where there are residual sinusoidal alternating currents, whether suddenly applied or slowly rising.

These situations can occur with the use of semiconductor devices in modern electrical and electronic equipment, such as computers, printers, plotters, televisions, video cassette recorders and hi-fi equipment, is growing.

Such devices may result in the normal sinusoidal a.c. waveform generated by the mains electrical supply being ‘modified’, for example, the waveform may be rectified or, as in asymmetric phase control devices, the waveform may be chopped.

The resulting waveforms are said to contain a pulsating d.c. component as illustrated below.
Industrial 10kA Residual Current Devices (RCDs)

Application (continued)

Pulsating d.c. fault current sensitive RCDs

Should a waveform containing a pulsating d.c. component develop an earth fault, then it is possible that it may not be detected by an “a.c. only” sensitive RCD. For this reason, the Sentry range contains RCDs designed to be sensitive to pulsating d.c. fault currents thus maintaining the intended degree of protection.

Type B RCDs are suitable for situations where there are residual sinusoidal alternating currents, residual pulsating direct currents and smooth d.c. and a.c. residual current of various frequencies, which would not trip Type AC or A RCDs.

These situations can occur in 50Hz a.c. installations with electronic equipment, e.g. frequency converters, UPS installations, power supply unit or high-frequency power converters.

The following symbols are used on the front plate of the device to indicate the type of RCD.

- type AC RCD.
- type A RCD.
- type B RCD.

4. Temperature

All Sentry RCDs are suitable for use in the temperature range –25°C to +40°C. This is indicated on the RCD by the symbol 📊.

5. Time Delayed RCDs △ Type S (or selective)

When two or more Sentry RCDs are installed in series with one another, measures must be taken to ensure that they discriminate properly. In event of an earth fault, only the RCD immediately upstream from the fault should operate.

RCDs do not discriminate on rated tripping current alone, i.e. a 100mA rated RCD situated upstream from a 30mA rated RCD, will not offer inherent discrimination.

In order to ensure that discrimination is achieved, a Sentry Time Delayed RCD should be used. The in-built time delay period ensures that the downstream RCD opens the circuit before the upstream RCD starts to operate.

The maximum tripping time of a Sentry Time Delayed RCD is 500ms.

Please refer to the current edition of the Wiring Regulations BS 7671 for guidance on the use of these products.

6. 3 phase, 3 wire systems

Sentry 4 pole RCDs may be used to provide earth fault protection on 3 phase, 3 wire systems, as the current balance mechanism does not require a neutral to be connected in order to operate effectively.
Sentry Technical

Industrial 10kA Residual Current Devices (RCDs)

Operation
The RCD provides an indication of an earth fault and contact status as detailed below.
The operating dolly provides the following indication:

- **I** = Switched ON
- **+** = Switched OFF due to Earth Fault or test button operation
- **0** = Switched OFF

The contact status is shown through the window.

- **Red** = contact closed
- **Green** = contact open (RCD is switched off)

In the event of an Earth Fault in the installation or the operation of the test button, the dolly will move to the central position (+) and the contact status indicator shows green. To re-connect the supply the dolly must be reset by moving to the off position before switching on.

Testing
If an RCD is installed for additional protection against indirect contact, it is a requirement of the IEE Regulations that the effectiveness of the RCD be verified. This must be achieved by a test simulating an appropriate fault condition and be independent of any test facility incorporated in the RCD. The test currents to be applied are as follows:

<table>
<thead>
<tr>
<th>Test current</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 x IΔn</td>
<td>RCD must not trip</td>
</tr>
<tr>
<td>1.0 x IΔn</td>
<td>RCD must trip within 300mS</td>
</tr>
<tr>
<td>5.0 x IΔn</td>
<td>RCD must trip within 40mS</td>
</tr>
</tbody>
</table>

Where IΔn is the RCD’s rated tripping current in accordance with wiring regulations and product standard BS EN 61008.

For time delay RCD 1.0 x IΔn RCD must trip between 130-500mS.
Sentry Technical

Industrial 10kA Residual Current Devices (RCDs)

Dimensions (mm)
Sentry Technical

Contactors

Standards and approvals
All Sentry contactors in the range are designed to fully comply with BS EN 61095

<table>
<thead>
<tr>
<th>TYPE</th>
<th>WIDTH</th>
<th>LIST NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20A, double pole</td>
<td>1 module</td>
<td>6220s</td>
</tr>
<tr>
<td>20A, four pole</td>
<td>3 module</td>
<td>6420s</td>
</tr>
<tr>
<td>40A, four pole</td>
<td>3 module</td>
<td>7440s</td>
</tr>
<tr>
<td>63A, four pole</td>
<td>3 module</td>
<td>7463s</td>
</tr>
</tbody>
</table>

Description
Sentry contactors provide a method of remotely switching single and three phase loads. In this regard, they are particularly useful for switching heating, lighting and ventilation circuits, in particular when used in conjunction with REC supply off-peak tariffs.

They are suitable for mounting on a standard DIN rail and are therefore fully compatible with all Sentry Consumer Units and small enclosures. (5704s, 5702s.)

Functions
CONTROL
Achieved by energising and de-energising the contactor coil, via an MK Time Switch or REC meter during ‘off peak’ hours as set by supply authorities. A coil status indicator is visible through the small window on the front of the contactor.
**TECHNICAL SPECIFICATION**

All Contactor List Nos. are designed to operate at either 20, 40 or 63 amps continuous current (AC1-AC7b) 50Hz and have a mechanical life of 1,000,000 operations.

The coil voltages are 220/240V 50Hz.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>LIST NO. 6220S</th>
<th>LIST NO. 6420S</th>
<th>LIST NO. 7440S</th>
<th>LIST NO. 7463S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contactor rating (Ith)</td>
<td>20A</td>
<td>20A</td>
<td>40A</td>
<td>63A</td>
</tr>
<tr>
<td>Includes manual override?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>No. of poles (normally open only)</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Width in 18mm modules</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rated Voltage (V)</td>
<td>400</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Insulation (Ui)</td>
<td>250</td>
<td>415</td>
<td>415</td>
<td>415</td>
</tr>
<tr>
<td>Max. operating (Ue)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average consumption of – inrush control circuit coil (VA) – closed</td>
<td>15</td>
<td>34</td>
<td>53</td>
<td>53</td>
</tr>
<tr>
<td>Terminal cable capacity (max.) Controls</td>
<td>2 x 2.5mm² flexible 2 x 2.5mm² rigid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>2 x 2.5mm² flexible 2 x 2.5mm² rigid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque for terminals</td>
<td>1.2Nm</td>
<td>2.0Nm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FEATURES**

- Compatible with all Sentry Consumer Units (single phase only) (excludes 5502s) and the following Sentry enclosures: 5504s, 5604s, 5704s, 5702s (for single and three phase)
- Suitable for heating, lighting and ventilation circuits
- Choice of functions
- Ideal for use with REC supply off-peak tariffs

**Installation**

a) When a contactor is mounted alongside an MCB of greater than 10 amp current rating, or two contactors are mounted alongside an MCB of any current rating, it is advisable to insert a module blank between them. (List No. 5544s.)

b) When mounting more than two contactors side by side, it is necessary to insert a module blank between every two contactors, to give ventilation.

c) When using dual rail consumer units, it is advisable to mount electronic products on the lower rail and contactors on the upper rail. If mounting in a single rail consumer unit, it is advisable to mount electronic products as far away as possible from contactors. As a minimum they should be spaced by a single module width blank.

d) Ensure the load to be controlled is protected against short circuit and overload conditions by a suitable rated Sentry MCB.

e) Contactors are mounted into Sentry Consumer Units and enclosures, by clipping onto the DIN rail mounted in the base by means of the spring clip. If the contactor is required to be removed for any reason, unclip the contactor from the DIN rail by means of the spring clip on the contactor.
Contactors

Terminal Layout

i) Contactor
   a) The coil connections to control energisation should be made between terminals A1 and A2
   b) One normally open main contact is between terminals 1 and 2
   c) A second normally open main contact is between terminals 3 and 4
   d) In the case of four pole contactors, the other main contacts are between terminals 5 and 6, and 7 and 8 respectively

Typical schematic layouts of modular contactors

Without Manual Override

![Schematic Layout Diagram]
Applications and Maximum Ratings

LIGHTING – Maximum number of lamps

Presentation of installations according to type of supply.

The maximum number of lamps which can be operated per phase is equal to the total number of lamps in the “Single-Phase 230V” table.

Single-phase circuit, 230V

3-phase circuit, 400V (with neutral)

<table>
<thead>
<tr>
<th>Type of Lighting Application (AC5A and AC5B Categories)</th>
<th>6220S/6420S/ Maximum No. of Lamps</th>
<th>7440S</th>
<th>Maximum No. of Lamps</th>
<th>7263S</th>
<th>Maximum No. of Lamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent and Halogen Lamps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40W</td>
<td>57</td>
<td>115</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60W</td>
<td>45</td>
<td>85</td>
<td>125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100W</td>
<td>28</td>
<td>70</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen Lamps Used with Transformer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60W</td>
<td>14</td>
<td>27</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80W</td>
<td>12</td>
<td>23</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorescent Lamp with Starter (Single Fitting with Parallel Correction)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15W</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20W</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40W</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorescent Lamp with Starter (Single Fitting Non-Corrected)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15W</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20W</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40W</td>
<td>28</td>
<td>70</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Ballast (Fluorescent Lamp Single Setting)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18W</td>
<td>111</td>
<td>222</td>
<td>333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36W</td>
<td>58</td>
<td>117</td>
<td>176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Compact Lamp (Low Consumption)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7W</td>
<td>200</td>
<td>400</td>
<td>600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11W</td>
<td>120</td>
<td>240</td>
<td>360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15W</td>
<td>88</td>
<td>176</td>
<td>264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20W</td>
<td>66</td>
<td>132</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Motors – Maximum Power Type of Small Motor Application (AC1 – AC7a Categories)

220/240V single phase with capacitor

400V three phase motor

<table>
<thead>
<tr>
<th>Number of Operating Cycles</th>
<th>230V Single PH</th>
<th>400V 3 PH</th>
<th>230V Single PH</th>
<th>400V 3 PH</th>
<th>230V Single PH</th>
<th>400V 3 PH</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000</td>
<td>5.4kW</td>
<td>18kW</td>
<td>8.6kW</td>
<td>26kW</td>
<td>13.6kW</td>
<td>41kW</td>
</tr>
<tr>
<td>150,000</td>
<td>4.6kW</td>
<td>14kW</td>
<td>7.4kW</td>
<td>22kW</td>
<td>11.6kW</td>
<td>35kW</td>
</tr>
<tr>
<td>200,000</td>
<td>3.5kW</td>
<td>10kW</td>
<td>5.6kW</td>
<td>17kW</td>
<td>8.5kW</td>
<td>26.5kW</td>
</tr>
<tr>
<td>500,000</td>
<td>1.6kW</td>
<td>5kW</td>
<td>2.6kW</td>
<td>7.5kW</td>
<td>4kW</td>
<td>12kW</td>
</tr>
<tr>
<td>1,000,000</td>
<td>1.2kW</td>
<td>3.5kW</td>
<td>1.9kW</td>
<td>6kW</td>
<td>3kW</td>
<td>9kW</td>
</tr>
</tbody>
</table>

Heating – Maximum Power Type of Small Heating Application (AC7b Category)

<table>
<thead>
<tr>
<th>Number of Operating Cycles</th>
<th>230V Single PH</th>
<th>400V 3 PH</th>
<th>230V Single PH</th>
<th>400V 3 PH</th>
</tr>
</thead>
<tbody>
<tr>
<td>100,000</td>
<td>5.4kW</td>
<td>18kW</td>
<td>8.6kW</td>
<td>26kW</td>
</tr>
<tr>
<td>150,000</td>
<td>4.6kW</td>
<td>14kW</td>
<td>7.4kW</td>
<td>22kW</td>
</tr>
<tr>
<td>200,000</td>
<td>3.5kW</td>
<td>10kW</td>
<td>5.6kW</td>
<td>17kW</td>
</tr>
<tr>
<td>500,000</td>
<td>1.6kW</td>
<td>5kW</td>
<td>2.6kW</td>
<td>7.5kW</td>
</tr>
<tr>
<td>1,000,000</td>
<td>1.2kW</td>
<td>3.5kW</td>
<td>1.9kW</td>
<td>6kW</td>
</tr>
</tbody>
</table>

Electrical Endurance

AC1 and AC7a categories | 250,000 operations
Sentry Technical

Contactors

Dimensions (mm)

6220s

6420s

7440s/7463s
Bell Transformer

Standards and approvals
The Sentry Bell Transformer is designed to comply fully with the requirements of EN 60558-2-8.

**TECHNICAL SPECIFICATION**

**ELECTRICAL**
- PRIMARY VOLTAGE: 220V/240V a.c. 50Hz
- SECONDARY VOLTAGE: 8V a.c.
- RATED OUTPUT CURRENT: 1A

**PHYSICAL**
- WIDTH: 2 modules (36mm)
- TERMINAL CAPACITY: 1 x 2.5mm²
- AMBIENT OPERATING TEMP: -5°C to +40°C
- IP RATING: Front face IP4X
- MAX. INSTALLATION ALTITUDE: 2000 metres

**Description**
The Sentry Bell Transformer is of the safety isolating, fail safe type. The construction is all insulated, Class II.

It may be mounted within a Sentry Consumer Unit within 2 or 4 module enclosures alongside MCBs, RCDs and RCBOs or surface mounted.

**Installation**
The Sentry Bell Transformer should always be connected in series with an MCB or other type of protective device of rating not exceeding 6A.

When installed in a 230V environment, i.e. inside a consumer unit, the cables used to connect the bell or chime to the transformer must have a 230V rated voltage. If bell wire is used, suitable sleeving must be provided to increase its insulation rating to 230V.

**Dimensions (mm)**

- Width: 84 mm
- Height: 89 mm
- Depth: 60 mm
- Depth of terminals: 45 mm
- Depth of transformer: 96 mm
- Terminal Covers (supplied fitted)

- Width: 36 mm
- Height: 45 mm
Electromechanical & Digital Timeswitches

Standards and approvals
EN 60730-1, EN 60730-2-7

**FEATURES**
- Ideal for independent programmable control of lighting, heating and other functions
- Can be mounted in Sentry Consumer Units and appropriate Sentry enclosures, or surface mounted
- Integral resistance to normal electrical interference
- Manual override of programmed commands
- Display indication of switch position for each Channel, i.e. ON or OFF (Digital only)
- Simple summer time to winter time (and vice versa) adjustment facility (Digital only)
- Random and holiday setting programme (5733s only)

**Description**
Sentry electromechanical and digital timeswitches enable pre-programmed commands to be executed on a given circuit. The Sentry time delay switches can be installed on circuits to energise suitable equipment for between 1 to 7 minutes.

**Note:** Inductive loads, particularly fluorescent lamps or energy saving lamps, place a heavy stress on the switching contacts. If in doubt about the ability of the timeswitches to directly switch a particular load it is advisable to install the timeswitch in conjunction with a suitable relay or contactor. If in doubt please consult the Technical Sales and Service Department for assistance.

**Electromechanical**
All Sentry electromechanical timeswitches are suitable for DIN rail mounting in Sentry Consumer Units and appropriate Sentry enclosures.

Quartz controlled units (5807s, 5824s) contain a power reserve of 150 hrs for accurate time keeping in the event of a mains failure.

3 module timeswitches have an additional insulated ‘parking’ terminal for earth or other connections.

24 hr units have a minimum switching time of 30 mins and 7 day units 3 hrs.

**Digital**
All Sentry digital timeswitches are suitable for DIN rail mounting in Sentry Consumer Units and 2 and 4 module Sentry enclosures.

Sentry digital timeswitches are available in both 1 and 2 module widths.

The 1 channel 1 module digital timeswitch (5733s) provides 50 programming selections, with random and holiday options. A simple summer to winter time (and vice versa) adjustment facility is provided. The timeswitch contains a power reserve of 150 hrs for accurate time keeping in the event of mains failure.

The two module digital timeswitches are available in both one channel (5731s) and 2 channel (5732s) versions. The units are supplied pre-programmed to UK time, and will automatically change from winter to summer time. The integral battery (with a 3 year power reserve) maintains the settings until the mains supply is connected. This feature will allow programming of switching commands prior to installation, if required.

The 1 channel 2 module digital timeswitch (5731s) provides for 20 programming selections.

The 2 channel 2 module digital timeswitch (5732s) provides a facility for independent control of two circuits. A maximum of 20 switching commands can be programmed for each channel.

All digital timeswitches have a minimum programming time of 1 minute and a manual override. Commands can be programmed for individual days or for groups of days.
## Technical Specification

### Electro-Mechanical

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply Voltage</th>
<th>Maximum Power Consumption</th>
<th>Switching Capacity</th>
<th>Switching Arrangement</th>
<th>No. of Switching Commands</th>
<th>Minimum Programme Time</th>
<th>Operating Temperature Range</th>
<th>Running Reserve</th>
<th>Width of Unit</th>
<th>Terminal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5707S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>56</td>
<td>3hrs</td>
<td>-25°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5724S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>30mins</td>
<td>-25°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5833S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>56</td>
<td>30mins</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5807S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>3hrs</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5824S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>30mins</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
</tbody>
</table>

### Digital and Time Delay

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply Voltage</th>
<th>Maximum Power Consumption</th>
<th>Switching Capacity</th>
<th>Switching Arrangement</th>
<th>No. of Switching Commands</th>
<th>Programme Options</th>
<th>Minimum Programme Time</th>
<th>Operating Temperature Range</th>
<th>Running Reserve</th>
<th>Width of Unit</th>
<th>Terminal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5731S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>1 x c/o</td>
<td>50</td>
<td>R/H</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>36mm (2 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5732S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>2 x c/o</td>
<td>50</td>
<td>–</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>36mm (2 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5733S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>1 x c/o</td>
<td>50</td>
<td>–</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>18mm (1 mod)</td>
<td>2 x 4mm²</td>
</tr>
</tbody>
</table>

R/H = Random/holiday  C/O = Changeover switch N/O = Normally open contact  * = after 140hr charging time

### Dimensions (mm)

- **5707s**
  - 85 x 53.8 x 45
- **5724s**
  - 68 x 44 x 10
- **5807s**
  - 17.8 x 44 x 10
- **5824s**
  - 17.8 x 44 x 10
- **5833s**
  - 60 x 55 x 16

---

CIRCUIT PROTECTION

**Sentry Technical**

Technical Hotline +44 (0)1268 563720

**TECHNICAL SPECIFICATION**

**ELECTROMECHANICAL**

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>Power Consumption</th>
<th>Switching Capacity</th>
<th>Switching Arrangement</th>
<th>No. of Commands</th>
<th>Minimum Programme Time</th>
<th>Temperature Range</th>
<th>Running Reserve</th>
<th>Width</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>5707S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>56</td>
<td>3hrs</td>
<td>-25°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5724S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>30mins</td>
<td>-25°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5833S</td>
<td>220-240V a.c. 50Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>56</td>
<td>30mins</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5807S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>3hrs</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5824S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>1VA</td>
<td>16A 1350W</td>
<td>1 x c/o</td>
<td>48</td>
<td>30mins</td>
<td>-20°C to +55°C</td>
<td>–</td>
<td>54mm (3 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
</tbody>
</table>

**DIGITAL AND TIME DELAY**

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage Range</th>
<th>Power Consumption</th>
<th>Switching Capacity</th>
<th>Switching Arrangement</th>
<th>No. of Commands</th>
<th>Programme Options</th>
<th>Minimum Programme Time</th>
<th>Temperature Range</th>
<th>Running Reserve</th>
<th>Width</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>5731S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>1 x c/o</td>
<td>50</td>
<td>R/H</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>36mm (2 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5732S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>2 x c/o</td>
<td>50</td>
<td>–</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>36mm (2 mods)</td>
<td>2 x 2.5mm²</td>
</tr>
<tr>
<td>5733S</td>
<td>220-240V a.c. 50-60Hz</td>
<td>5VA</td>
<td>16A 1000W</td>
<td>1 x c/o</td>
<td>50</td>
<td>–</td>
<td>1min</td>
<td>-25°C to +55°C</td>
<td>3 years from factory</td>
<td>18mm (1 mod)</td>
<td>2 x 4mm²</td>
</tr>
</tbody>
</table>
Sentry Technical

Dimensions (mm)

5731s/5732s

5733s

Dimensions (mm)