



Glasgow fuse-switch-disconnectors & switch-disconnectors

For many years, the Glasgow product name has been synonymous with quality, trust and reliability and as part of our long standing commitment to its tried and tested design we've reinvested for the future by re-tooling the whole range. All units are supplied with fuselinks or switchlinks fitted. Glasgow fuse switch disconnectors and switch disconnectors meet the constructional requirements for isolation of and are type tested to BS EN 60947-3. Conditional short circuit current rating tests at a value of 80kA rms Ue 415V have been carried out with Eaton HRC fuses fitted. Five frame sizes are available to provide a range from 63A to 800A, with utilisation category AC22A and AC23A Ue 415V ratings. Switch-disconnectors fitted with copper links give assigned AC20A Ui 660V and AC21A Ue 415V ratings. All units have retractable operating handles which drive overcentre mechanisms incorporating powerful operating springs. Opening and closing of the switches is thus independent of the action of the operator. Moving contact assemblies can be removed to facilitate installation or for contact inspection or renewal. Flag "on-off" indication is provided and terminal cover shields prevent contact with live metal. TPSN indicates triple-pole and switched neutral, the neutral pole making first and breaking last. Rated Insulation Voltage Ui 660V.

Enclosures

Surface-mounting enclosures comprise heavy gauge steel body plates incorporating cast iron frame members and are rustprotected, with a light grey paint finish (RAL7004). Front access doors, which are detachable, are fitted with dust-excluding gaskets and are interlocked to prevent opening when the switch is 'on'. The interlock can be defeated by a competent person for maintenance purposes. Operating handles may be locked in both the 'on' and 'off' positions. Castell type interlocks can be supplied to special order. Internal fixing holes allow units to be mounted closely side by side and all models have removable top and bottom end plates. These are pierced for connections, divided into front and rear (fixed) portions to simplify cabling using Eaton's MEM split-type cable boxes, and provided with undrilled cover plates.

Fuses

Glasgow units are designed for use with HRC cartridge fuse links to BS88: Part 2. 63A and 100A units employ off-set contact fuse links. Details of suitable types of HRC cartridge fuse links are listed on page 33. All performance tests have been carried out using Eaton BS88 fuselinks.

Motor ratings

The motor ratings assigned to TPN switch-disconnector units are utilisation category AC23A (frequent operation) to BS EN 60947-3, which calls for make and break testing at 10 and 8 times rated current respectively for units having a motor rating up to and including 100 Amps. Ratings for switch-disconnector-fuses are dependent on suitable HRC fuses being fitted.

Auxiliary equipment

A comprehensive range of extension boxes and spreader boxes is available. Units are fitted with HRC Fuselinks of maximum rating but will accept fuselinks of a lower rating, refer to the Paramount HRC Fuselinks section on page 33. SPSN and TPSN indicate switched neutral. Neutral makes first and breaks last. If DP fuse-switch-disconnectors are required, use SPSN and replace the supplied switch link with a compatible fuselink.

Definitions of utilisation category

AC20a – Connecting and disconnecting under no load condition.

AC21a – Switching of resistive loads including moderate overloads.

AC22a – Switching of mixed resistive and inductive loads including moderate overloads.

AC23a – Switching of motor, or other high inductive loads.

Cable extension boxes

Fabricated sheet steel boxes can be fitted top/bottom of Glasgow switch units to provide additional space for spreading multi-core PVC insulated cables with solid aluminium conductors and for some larger cables with stranded copper conductors. For 1–3PCB, a plain flame retardant plywood plate is provided for fitting between the box and switch unit, the steel endplate supplied fitted to the switch unit being used on the box's cable entry side. For 4PCB, a plain steel plate is provided for cable entry on box. The switch enclosure has 8mm thick insulated endplates fitted both ends. For 5–6PCB, a 10mm thick insulated plate is provided for cable entry on box. The switch enclosure has 10mm thick insulated endplates fitted both ends, 5PCB includes a flame-retardant plywood packer for fitting between PCB and switch unit's endplate to provide lid flange clearance.

Spreader boxes

Cast metal split pattern, supplied with fixing bolts and plain bushes. Two types are available, suitable for straight or angled entry. They permit conductor spreading of larger PVC cables and fit directly on to Glasgow fuse-switch-disconnectors and switch-disconnectors.

Glasgow busbar chamber system

Eaton's MEM busbar chamber system is designed to provide either compact, wall-mounting installations or – by using optional pedestal sets – easily assembled switchboards. Every facility is provided to enable Eaton's MEM switchgear and distribution gear to be mounted easily and economically to busbar chambers which can be applied either to a suitable load-bearing vertical surface; or, by means of a pedestal set, affixed to a vertical surface which need not be load-bearing.



Busbar chambers

These are produced in 100, 200, 400, 630 and 800 Amp. ratings and in four nominal lengths. 100, 200 and 400 Amp units are available in all four sizes; 630 and 800 Amp ratings are offered in the three longest units only. All units in the range share the same height and depth dimensions. Similarly the twin busbars are located in precisely the same positions throughout the range and vary in size only in their front-to-back dimensions according to rating. Detachable end plates enable all units to be extended by coupling to a second busbar chamber using extension sets. Both top and bottom plates are also readily detachable so that marking out and machining can be carried out conveniently on a bench to accommodate Eaton's MEM switchgear either above or below the chamber. Complete mounting kits, including templates, are available for mounting all Exel and Glasgow switchgear. Eaton chambers are fabricated from rust-protected sheet steel with a light grey paint finish. They have been type tested to BS EN 60439-1 with a rated conditional short circuit current rating of 63kA at Ue 550V and a rated short-time withstand current I_{cw} 20 times nominal rated current for one second. They are designed for use in factory-built assemblies to BS EN 60439-1. All chambers are subjected to an on-line dielectric test unit which provides a high voltage test between poles; and from poles to earth. Earth continuity is also tested. Rated insulation voltage 660V.

Pedestal and back-plate sets

Pedestal and back-plate sets are available to accommodate 1800, 1350 and 900mm nominal length busbar chambers in all ratings. These sets enable complete industrial switchboards to be built up easily and at competitive cost to produce a ready-painted unit of pleasing appearance. It is recommended that such switchboards are secured against a wall although this need not be a load-bearing structure. Switchgear of 315A and above must be mounted on the underside of the busbar chamber and fastened to the pedestal backplate. Each set comprises two pedestal sideplates and feet plus a pedestal backplate, all ready drilled; together with all necessary fastenings and spacers for floor-mounting bolts. Components are of rust-protected sheet steel with light grey paint finish.

Busbar chamber extension sets

Each unit can be coupled to any other MEM chamber in the range of the same rating by removing adjacent end plates and using the appropriate busbar chamber extension set. These comprise a set of four copper links complete with all necessary clamps, washers and fasteners plus fitting instructions.

Connection sets for Glasgow fuse-switch-disconnectors & switch-disconnectors

Cable clamps covering all ratings are available for switchgear up to 200A. For connecting Glasgow units of 160A and above, solid copper connection sets are recommended as cost effective and convenient. These comprise pre-formed, insulated links in 4-pole sets supplied with all necessary clamps and fasteners. The appropriate switchgear mounting set (41, 51 or 61 BBMS) must be used with connection sets for 160–800A Glasgow units.

Busbar cable clamps and sockets

Incoming main cable clamps or sockets are not supplied due to the wide range which would be necessary to meet all requirements. Busbar cable clamps comprise plated brass U-clamps and steel slides with all bolts and washers. They are suitable for the connection of small solid or stranded copper conductors and also aluminium conductors using a barrier grease. Busbar cable sockets are plated brass castings complete with clamps and fixings, suitable for the termination of either copper or aluminium conductors. Both clamps and sockets allow for clamping on the busbars without drilling. For cabling direct on to busbars of 630–800A rating a special cable extension is required which can be made to special order.

Switchgear mounting sets

Available for all ratings of Exel switch-disconnectors/switch-disconnector fuses and Glasgow fuse-switch disconnectors and switch-disconnectors enabling these units to be mounted simply and efficiently either above or below the busbar chamber. Each mounting set comprises a template with instructions for machining the top/bottom plate of the busbar chamber; clamping channels, ready pierced for fasteners; all necessary fastenings; and, for Glasgow units, insulated shields and switch filler plates where appropriate.

Exel 2 switch-disconnectors & switch-disconnector fuses

Exel 2 switch disconnectors and switch-disconnector fuses meet the constructional requirements for isolation of and are type tested to BS EN 60947-3. Switches are of the quick make and break type, suitable for use on AC or DC. Units have removable moving contact assemblies to facilitate wiring. Exel 2 surface-mounting enclosures are fabricated from rust-protected sheet steel with a light grey paint finish. Removable blank top and bottom end plates (except for 20 and 32A top end plates which incorporate knockouts) and gasket doors give IP41 protection. Chromium-plated front operated handles, with "ON (I) OFF (O)" indication, and internal fixing enabling units to be mounted closely side by side. Interiors comprise porcelain bases fitted with non-ferrous conducting components.



Fuses and fuse carriers

HRC fuse carriers are designed for offset contact fuse links to BS 88: Part 2. Eaton HRC fuse links fitted to switch-disconnector-fuses are suitable on systems up to 415V AC. Eaton fuses used in these products are also suitable for 250V DC systems. All performance tests have been carried out using Eaton BS88 fuselinks. Units are fitted with HRC Fuselinks of maximum rating but will accept fuselinks of a lower rating, refer to the Paramount HRC Fuselinks section on page 33. HRC pattern switchfuses are fitted with type SCH carriers (20A, 32A, 63A-moulded; 100A, 125A-porcelain).

Motor ratings

The motor ratings assigned to TPN switch-disconnector units are utilisation category AC23A (frequent operation) to BS EN 60947-3, which calls for make and break testing at 10 and 8 times rated current respectively for units having a motor rating up to and including 100 Amps. Ratings for switch-disconnector-fuses are dependent on suitable HRC fuses being fitted.

Cable size

Maximum cable sizes are: 20A–6mm², 32A–10mm², 63A–35mm², 100/125A–70mm².

Type test compliance with standards

This range has been satisfactorily type-tested in accordance with BS EN 60947-3 with Eaton HRC fuselinks fitted.

Glasgow and Exel metering solutions

Some of the toughest energy regulations ever seen in the UK are now in force. Part L2 of the Building Regulations introduced in England and Wales in 2006 addresses the conservation of energy in public, commercial and industrial buildings, setting high standards for architects, engineers and contractors to create a more sustainable built environment.

To extend the existing Metering solutions for MCCB Panelboards and MCB Distribution boards, Eaton now provides an engineered solution for metering the supply to its market leading range of Fuse Disconnectors and Switch Disconnectors.

The Meterpacks provide generous cabling space for incoming cables and bolted lug connections. Meters are pre-installed and ready for use, requiring no setting up or additional electrical connections. Connection cables between the Meterpack and switchgear are also provided to simplify installation.

Principally developed for 100A (Exel)/200A (Glasgow) applications, the units can be used elsewhere to provide a ready to install, wire in, wire out solution for any 100A to 300A application.

With meter options of either pulsed output of kWh or Modbus RS485, the meters display useful parameters including kWh, line voltage, current, demand, etc.

Eaton's industrial switchgear metering solution completes a comprehensive range across the full range of Electrical distribution products and addresses the need to measure electricity consumption, whilst Split Metering options for separate small power and lighting circuits have also been added to distribution panels to fully meet the needs of the L2 regulations for every application.



These meter packs can also be directly retro-fitted to existing Glasgow and Exel installations providing a simplified and cost effective solution for upgrading to meet the needs of Part L2 of the Building Regulations.

SPSN surface mounting switchfuse



A surface mounting switch-disconnector-fuse in rust-protected sheet steel with light grey paint finish to BS4800 00A07. End plates incorporate dual concentric knockouts for cable entry. A hinged secondary cover allows access to switch and fuse carrier. Designed for offset contact fuselinks to BS88: Part 2. The moulded fuse unit is shrouded to prevent accidental contact with live parts. Units are supplied as standard with a 80A or 100A fuselink fitted List No. 80SO or 100SO. (2–63A SB3/SB4 fuselinks may be site fitted if required.) A double pole isolating switch is fitted, type tested to BS EN 60947-3 with a utilisation category AC22A having a rated operational current I_e 240V and a conditional short circuit rating of 16kA. A dolly locking device is available List No. **AL1** for use with padlock List No. **PD2**. Maximum cable sizes are:- incoming cables 50mm², outgoing cables 35mm².

Specialist heavy duty switchgear

Local switch-disconnectors standard duty, type RDMP, 20–63A, IP65, 2–8 poles



Complying with BS EN 60947-3 and IEC 408 the RDMP range of rotary cam switches are suitable for on load switching of general distribution a.c. power circuits and infrequent duty motor isolation.

Grey, moulded thermoplastic enclosures provide protection to IP65 making them suitable for most indoor and outdoor environmental conditions.

These compact isolators are fitted with red/yellow operating handles padlockable in the 'OFF' position with up to three padlocks.

Units supplied with an early break auxiliary contact are indicated by a figure 1 in the list number e.g. 2021RDMP.

The enclosure design allows easy access for cabling. Solid neutral and earth termination points are a standard feature.

Local switch-disconnectors standard duty, type PC2, IP55, 2–6 poles



Complying with BS EN 60947-3 and IEC 408 the PC2 range of rotary cam isolating switches are suitable for on load switching of general distribution A.C. power circuits and infrequent duty motor isolation.

Grey, pressed steel enclosures provide protection to IP55.

These compact disconnectors are fitted with black operating handles, padlockable in the 'OFF' position.

The enclosure design allows easy access for cabling by removal of the switch interior.

Switches with additional poles are available on request.

2 pole and 4 pole units have removable neutral links included for SPN (from 2P) or TPN (from 4P) conversions.

Earth terminals provided as standard.

Exel IP local switch-disconnectors heavy duty, IP55, 20–1250A, 3–6 Poles



The IP55 range complies with BS EN 60947-3. It consists of switches mounted in sheet steel enclosures, rust protected and having a powder coat finish.

All enclosures have bolt-on removable front covers with gland plates top and bottom. Cable entries must be site drilled. Switches are base mounted on the enclosure back plate.

Each enclosure has ample wiring space making additional cable boxes unnecessary when using standard copper cable.

Two tone grey operating handles are suitable for padlocking.

The range of disconnectors may be installed indoors or outdoors under sheltered conditions. They are ideally suited to installations where vibration or mechanical shock conditions prevail.

A variety of contact configurations and additional features are available on request.



Exel IP local switch-disconnectors heavy duty, IP65, 20–1250A, 3–6 Poles

The IP65 range complies with BSEN60947. This range has been designed specifically for indoor or outdoor locations where short term exposure to rain or low pressure jets of water may be experienced.

Each switch is mounted in a weatherproof enclosure with a sealed switch spindle and lid mounted handle providing interlocking facility allowing the lid to be removed only when the switch is in the 'OFF' position.

The enclosure is robustly constructed of sheet steel with a durable, corrosion resistant coating of 70 microns (minimum) polyester powder coat providing a degree of protection of IP65.

Switches are supplied with – gland plates fitted to all units. Suitable weatherproof glands should be used during installation and cabling.

Operating handles have facility for padlocking in both 'ON' and 'OFF' positions.

The standard range is available in configurations of up to six main poles up to 160A and 3 or 4 pole for higher ratings.

Automatic changeover contactors – heavy duty, type HL, 40–600A, IP55, TPN

Type HL auto-changeover contactor units are designed to automatically switch from a main to a standby power supply to feed a common load in the event of loss of the selected main supply source. Upon restoration of the mains supply the standby contactor automatically drops out and the mains supply contactor re-closes, restoring the 'mains supply to load' condition.

- Wall mounting heavy duty enclosures (IP55)
- Removable undrilled gland plates.
- Internally mounted components
- Mechanically and electrically interlocked triple pole heavy duty contactors
- Single solid neutral link
- No-volt detection control relay and control circuit protection fuses

Although already offering a multitude of configurations and optional features, for those with particular requirements our Specials facility can cater for a variety of special purpose applications.

Optional facilities

- For use on three phase three wire system (no neutral)
- Four pole contactors to provide switched neutral on generator supplies
- Timer to delay closing of alternative supply contactor to allow stand-by generator to run up to speed
- Timer to provide delay in closing mains contactor on restoration of mains supply
- Three phase and neutral mains supply, single phase alternative supply
- Pilot lamps to indicate which contactor is closed and/or which supply is available
- 230...240V 50Hz rectified DC coils for silent running
- Duty selector switch to interchange lead contactor
- Phase failure/phase reversal relay on mains supply

Items produced on application through Eaton's Specials facilities. Specific terms apply.

Memlok changeover switches



Suitable for on-load control of alternative supplies. Surface mounted, 4 pole on-load changeover switches have a rated voltage of 415V. Higher voltage ratings available, details on request.

Switches comply with BS EN 60947-3, VDE0660. Double break blade & clip wiping action contact system ensures reduced contact bounce and the operator independent spring assisted mechanism ensures a positive and consistent switching action reducing arcing and contact wear. 32–200A units are provided with cable links and 400–800A with solid links suitable for use on either side of the switch. In all cases ample cable space is provided for both incoming and outgoing cables. Each unit is provided with an IP54 black handle and steel operating shaft. All handles are insulated and may be padlocked in the 'OFF' position. Clear 'ON' (I) and 'OFF' (O) indication is provided. Door interlocking is provided by the handle in the 'ON' position.

Enclosures are finished in light grey BS4800 Shade 00A07. Also Memlok changeover switches are available in non-padlockable moulded enclosures to IP65. Four pole two-way rotary cam switches comprise double break silver alloy contacts. Memlok units comply with BS EN 60947-3.

Fireman's emergency switches



DP switches have heavy duty cast iron enclosures finished in red, IP55. Surface and flush mounting versions available. They comply with BS7671: 1992 (17th Edition of IEE Regulations) Clause 537 and 476-03-05 to 476-03-07. Switches are type-tested to BS EN 60947-3 and have Utilisation Category AC22, 250V. They are of the quick make and break type, AC or DC. Pole operated ring handle automatically locks in the 'OFF' position. White vitreous enamel nameplates with red lettering, for compliance with BS7671: 1992 Clause 537-04-06, of size 152mm x 102mm with 4–4.8mm fixing holes are available – List No. **2FNP**. For fire safety signs to BS5499-1 as required for Petrol Filling Stations under Health & Safety Executive Publication HS(G)41 reference should be made to specialist safety sign companies.

Exel – distribution fuseboards



The Exel fuseboard range is available with standard enclosures to IP4X for the complete range of 20A to 200A distribution boards. A variety of extra features have been incorporated in the range including increased cabling space, superior door latches and locking devices (there is a choice of barrel lock or padlocking device), improved lid hinges and a unique safety carrier which effectively blanks off a single fuse-way allowing the circuit to be worked on in safety. Safety carriers have no provision for accepting a fuselink. The Exel distribution fuse boards are designed to comply with the requirements of BS5486: Part 11: 1989. All live parts are fully shrouded so that additional circuits may be wired and connected in safety whilst the existing circuits remain live and on load. The type of enclosure available gives protection to IP4X and is supplied with removable endplates. The range covers a wide variety of ratings from 20–200A; 20A and 32A with up to 12 ways in SPN and TPN configurations; 63A up to 10 ways, 100A up to 8 ways and 200A up to 6 ways in TPN configurations. All ratings available with moulded HRC carriers to BS88: Part 2. Testing has been carried out using Eaton 'S' type HRC fuselinks. Fuse base mouldings are of high quality thermosetting material. The fuse units have skirted fuse carriers to prevent accidental contact with live parts when inserting or withdrawing a carrier. Separate shields are provided for the base contacts to prevent accidental contact when the carrier has been withdrawn. All fuseboards are suitable for systems with a rated insulation voltage Ue 660V AC, 500V DC.

Safety carriers

A range of safety carriers are available for insertion in a fusebase when its normal fuse carrier has been removed for isolation. The safety carriers are marked yellow for identification and have no provision for fuselink fixing.

Enclosures

Rust protected sheet steel IP4X enclosures have a light grey paint finish and are fitted with internal fixing holes. Enclosures have a robust, reliable construction. Enclosures for units from 20A to 100A are of all welded construction, 200A IP4X units have cast corner pieces. Removable top and bottom endplates incorporate knockouts on 20A and 32A units while 63–200A boards have blank endplates. Blank endplates are available on request for 20A and 32A boards. The enclosure allows gasketed access doors to be reversed for left hand or right hand opening. All sides are free from external projections and fuseboards can be mounted in inverted form if required.

Main terminations

32A, 2-way fuseboards have the main phase termination (tunnel type) attached to the fusebanks. All other fuseboards have the main terminations mounted on the back of the enclosure and are intended for use with cable sockets (sweating or crimp type) which are not provided. Busbar and main terminals are fully shrouded. A cable shroud to cover the cable socket is provided.

Earthing and neutral bars

Multi-way earthing bars are fitted with an integral earth bolt and have an outgoing terminal per fuse. They are rail mounted adjacent to the fully rated neutral bars. Neutral bars have main terminals of the same capacity as the phase terminals and have one outgoing terminal per fuse. Earth/neutral bar rails are fitted at the bottom of enclosures on 20A and 32A fuseboards and at the top on all others.

Additional outgoing circuits

All 20A and 32A units except 2-way versions have a main terminal suitable for looping out at full terminal capacity. This facility permits adjacent mounting of two fuseboards to extend outgoing circuits up to 24 way max. Additional shrouds (one per phase) required when using looping facility List No. **SH1539**.



HRC cartridge fuselinks, carriers and bases

Eaton's comprehensive range offers a selection of fuses to cater for many applications: Compact 415V a.c. S type industrial fuselinks complying with BS EN 60269-1 (BS88 – 1) or BS88 – 2 with ratings from 2 to 1250A. Skilful design techniques have meant that power dissipation has frequently been reduced despite the significant reduction in barrel size. Many ratings have also been tested for use in circuits up to 250V d.c.

Compact 415V a.c. S type motor circuit protection fuselinks complying with BS EN 60269-1 (BS88 – 1) or BS88 – 2 with ratings from 20M25A to 400M500A. This extended range of fuselinks is designed to withstand the inrush current associated with direct on line start motors whilst saving cost on the size of equipment to which they are fitted by virtue of their small dimensions.

Compact 240V and 415V a.c. SS, SN and SP type offset blade contact fuselinks complying with BS EN 60269-1 (BS88 – 1) or BS88 – 6 with ratings from 2 to 63A for use in industrial and commercial installations.

550V a.c. S type industrial fuselinks complying with BS EN 60269-1 (BS88 – 1) or BS88 – 2 with ratings from 2 to 800A are also available in the most commonly used fixing centres. Also rated at 250V d.c.

Compact 415V a.c. J type feeder pillar fuselinks complying with BS88 – 2 (formerly BS88: Part 5) for use by the Electricity Supply Industry in distribution systems. Ratings from 63–400A with 82mm fixing centres and 63–800A with 92mm fixing centres for wedge tightening contacts and 63–250A in ferrule form for single phase pole mounted cut outs.

NH type blade contact 500V a.c. fuselinks complying with IEC 60269-2 fuse system A and DIN VDE 0636 Part 201. Ratings from 2–1600A in size 000 to size 4a. For use in industrial applications where European practice prevails.

Eaton HRC fuselinks are manufactured to exacting standards using precision assembly methods and undergo rigorous quality checking before dispatch including resistance testing all production. This ensures that performance will be consistent and conform with published characteristics within close tolerances. Type tests on Eaton equipment have been performed using Eaton fuselinks.

Eaton industrial and general purpose fuselinks have a breaking range and utilisation category gG which replaces the old class Q1 fusing factor. "g" indicates a full range breaking capacity fuselink and "G" indicates a fuselink for general application.

Eaton motor circuit protection fuselinks have a breaking range and utilisation category gM indicating a full range breaking capacity fuselink for the protection of motor circuits. These fuselinks have a dual current rating separated by the letter "M".

The lower current rating is the maximum continuous rating which also determines the rating and size of equipment to which the fuse is fitted. The higher current rating is the time current characteristic of the fuselink which determines its ability to withstand the motor starting current. Their selection frequently permits the use of lower rated switch and/or fusegear than would be the case using gG fuselinks with a consequent cost saving. Type gG fuselinks however may still be used and are the preferred option for assisted start motors where starting currents are reduced.

Eaton fuselinks are designed and manufactured in accordance with a Quality Management System in accordance with ISO 9001. Most fuselinks are ASTA Certified for a breaking capacity of 80kA at 415V or 550V a.c. and are endorsed ASTA 20 CERT showing compliance with the rules of the ASTA 20 scheme which includes assessment of the Quality Management System to ISO 9002 and detailed auditing of fuselink manufacture.

Eaton have for many years participated in developing and influencing fuse standards through BEAMA and BSI at national level and IEC at international level and therefore are able to produce designs incorporating forthcoming changes to standards.

Fuse carriers and bases – rewirable and HRC types

Types MBA and MBB fuse bases, type MRH rewirable fuse carriers and 100A HRC fuse carriers (List No. 100 SCHF) are manufactured from high grade vitreous porcelain.

HRC fuse carriers up to and including 100A (List Nos. 2 SCHF, 3 SCHF, 6 SCHF, 10 SCHF) comprise black track-resistant mouldings.

HRC and rewirable pattern carriers of the same rating are interchangeable.

Fuse bases are available in two types:

Type A – providing for busbar connection at one end and cable termination at the other.

Type B – providing for cable connection at both ends.

Terminal capacities for Type A and Type B bases:- 20A 6mm², 32A 10mm², 63A 35mm², 100A 70mm².

Rewirable fuse carriers are of the semi-enclosed type, and when fitted in Eaton's MEM enclosures comply with the following 415/250V Categories of duty of BS 3036: 1958.

20, 32 and 63A – Category S2A.

100A – Category S4A.

100A fuse units may be fitted with SB3, SB4 or S0 fuselinks having 73mm fixing centres if used with adaptor List No. 100 MFLK HRC fuse carriers are designed for standard offset contact fuse links to BS88: Part 2 and are suitable for systems up to 660V.

All performance tests have been carried out using Eaton BS 88 Fuselinks.

Specification

A range of moulded HRC fuse units designed to accept bolt-in and clip-in HRC fuselinks.

Each unit is fully shrouded to prevent accidental contact with live parts when inserting or withdrawing a carrier and once the carrier has been removed completely.

The carrier and base mouldings are manufactured from high quality thermosetting material finished in black. Other colours are available.

Units accepting bolt-in HRC fuselinks are available in ratings of 20, 32, 63, 100 and 200A and can be supplied in front connected, front/busbar connected, front/back connected and back connected versions.

They are designed to comply with BS88 – 2 and are suitable for systems up to 660V. Suitable HRC fuselinks are also to BS88 – 2. A full range of neutral links is available.

Those units which accept the clip-in fuselinks are rated at 32A and 63A, 415V. Each in a front connected and front/back connected version, with a 32A back/back type also available. Also suitable for DIN-rail mounting.

They comply with BS88 – 2 and accept clip-in HRC fuselinks to the same standard.

Clip-in type units allow fuselinks to be replaced very simply – no tools are required. Fuselinks are removed from the carrier using side pressure on the fuselink end tags while replacement involves a simple push fit only. Neutral links are available.

Terminal capacities: 20A 6mm², 32A 16mm², 63A 35mm², 100A 70mm², 200A 150mm².

Fuse units are available in four types:

Type A – providing for busbar connection at one end and cable termination at the other.

Type B – providing for cable connection at each end.

Type C – with back connecting studs.

Type D – providing for cable connection at one end with back connecting stud at the other.

Fuse units have been ASTA certified to BS88 – 2 and are suitable for systems up to 660V.

100A fuse units may be fitted with SB3, SB4 or S0 fuselinks having 73mm fixing centres if used with adaptor **100MFLK**.

2.1

Industrial switch & fusegear

Glasgow fuse-switch-disconnectors & switch-disconnectors

See page 52 for technical data and overall dimensions.

103GNL



Glasgow switch-disconnector

- All listed are TPN

Nominal unit rating, Ie (A)	Nominal rating, Ie AC21 (A)	Copper switch links fitted	Suitable fuselinks	Motor rating AC23A kW	Ue 415V HP	Eaton list number
63	125	63MLK	SB3, SB4	22	30	63GNL
100	125	100MLK	SB3, SB4, SO & SD5	22	30	103GNL
160 (use 200A switch-disconnector)	–	–	–	–	–	–
200	315	200MLK	SF3 to SF6	90	125	203GNL
315 (use 400A switch-disconnector)	–	–	–	–	–	–
400	630	400MLK	SF3 to SF8	110	150	403GNL
500 (use 630A switch-disconnector)	–	–	–	–	–	–
630	1000	630MLK	SF3 to SF8	225	300	603GNL
800	1000	800MLK	SH8 to SH10	300	400	803GNL

Stud size: 63/100A = tunnel terminal, 160/200A = M10, 300/400 = M14, 500/800A = see page 53, "copper terminal plate"

203GNC



Glasgow fuse-switch-disconnector

- Units are fitted with HRC Fuselinks of maximum rating but will accept fuselinks of a lower rating, refer to the Paramount HRC Fuselinks section on page 33.
- SPSN and TPSN indicate switched neutral.
- Neutral makes first and breaks last.

Nominal unit rating, Ie (A)	Eaton 415V fuse(s) fitted	Suitable fuselinks	Suitable copper switch links	Poles	Eaton list number
63	63SB4	SB3 & SB4	63MLK	SPSN	61GNC
				DP	¹⁾
				TPN	63GNC
				TPSN	64GC
100	100SD5	SB3, SB4, SO & SD5	100MLK	SPSN	101GNC
				DP	¹⁾
				TPN	103GNC
				TPSN	104GC
160	160SF6	SF3 & SF6	200MLK	SPSN	151GNC
				DP	¹⁾
				TPN	153GNC
				TPSN	154GC
200	200SF6	SF3 & SF6	200MLK	SPSN	201GNC
				DP	¹⁾
				TPN	203GNC
				TPSN	204GC
315	315SF7	SF3 & SF7	400MLK	TPN	303GNC
				TPSN	304GC
400	400SF8	SF3 & SF8	400MLK	TPN	403GNC
				TPSN	404GC
500	500SH9	SH8 & SH9	630MLK	TPN	503GNC
				TPSN	504GC
630	630SH9	–	630MLK	TPN	603GNC
				TPSN	604GC
800	800SH10	SH8 & SH10	800MLK	TPN	803GNC
				TPSN	804GC

¹⁾If DP fuse-switch-disconnectors are required, use SPSN and replace the supplied switch link with a compatible fuselink.

Stud size: 63/100A = tunnel terminal, 160/200A = M10, 300/400 = M14, 500/800A = see page 53, "copper terminal plate"

GNMPCT200



Meterpack assemblies for 200A Glasgow units

- Meterpack suitable for electrical supplies up to 320A
- CT and Meter are pre-installed with voltage protection fuses to the meter
- Generous cabling space to bolted lug connections, with linking cables for associated switchgear are included to speed installation

Description	Meter characteristics	Rating	Eaton list number
Meterpack for any 200A Glasgow fuse switch disconnecter & switch disconnecter	Pulsed	320	GNMPCT200
Meterpack for any 200A Glasgow fuse switch disconnecter & switch disconnecter	Modbus	320	GNMPCT200M

50CSB



Spreader boxes

- Provide additional space for spreading multi-core PVC insulated cables
- Supplied with fixing bolts and plain bushes
- Adapter plates required for each unit, see page 20

Nominal unit rating, Ie (A)	Eaton list number	
	Straight	45° angled
63	50CSB	50CSBA
100	50CSB	50CSBA
160/200	60CSB	60CSBA
315/400	70CSB	70CSBA
500/630	90CSB	90CSBA
800	90CSB	90CSBA

Extension boxes

- For fitting to Glasgow switch units to provide additional space for spreading multi-core PVC insulated cables with solid aluminium conductors and for some larger cables with stranded copper conductors

Nominal unit rating (A)	Fuse switch-disconnector/switch-disconnector	Eaton list number
63	61GNC	1PCB¹⁾
	63GNC/63GNL	2PCB¹⁾
	64GC	
100	101GNC	1PCB²⁾
	103GNC/103GNL	2PCB²⁾
	104GC	
160	151GNC	2PCB³⁾
	153GNC	3PCB³⁾
	154GC	
200	201GNC	2PCB
	203GNC/203GNL (315A AC21)	3PCB
	204GC	
315	303GNC	4PCB
	304GC	
400	403GNC/use 403GNL (630A AC21)	
	404GC	
500	503GNC	5PCB⁴⁾
	504GC	
630	603GNC/use 603GNL (1000A, AC21)	
	604GC	
800	803GNC/use 803GNL (1000A, AC21)	
	804GC	

¹⁾Not required for copper cables or al. below 35mm²

²⁾Not required for copper cables or al. below 50mm²

³⁾Not required for copper cables

⁴⁾For parallel cables use 6 PCB + 802 GCC + 2 x 90 CSB or CSBA (see diagram on page 53)

506APL



Adapter plate to fit spreader boxes

- Available for fitting to spreader boxes, tapped to receive Type B compression glands to BS6121-1.
Supplied complete with fixing bolts

Nominal unit rating, Ie (A)	Straight spreader box	45° angled spreader box	Cable mm ²	PVC SWA stranded cables:		Eaton list number			
				2-core	4-core				
63	50CSB	50CSBA	16	2-core	4-core	¹⁾			
			25	2-core	4-core	¹⁾			
			35	2-core	4-core	¹⁾			
100	50CSB	50CSBA	25	2-core	4-core	¹⁾			
			35	2-core	4-core	¹⁾			
			50	2-core	4-core	¹⁾			
160	50CSB	50CSBA	50	2-core	4-core	¹⁾			
				4-core	405 APL				
				70	2-core	4-core	¹⁾		
			60CSB	60CSBA	50	2-core	4-core	¹⁾	
						4-core	406 APL		
						70	2-core	4-core	¹⁾
	200	50CSB	50CSBA	70	2-core	4-core	¹⁾		
					4-core	405 APL			
					95	2-core	4-core	¹⁾	
				60CSB	60CSBA	70	2-core	4-core	¹⁾
							4-core	406 APL	
							95	2-core	4-core
300/400	70CSB	70CSBA	70	2-core	4-core	¹⁾			
				4-core	405 APL				
				95	2-core	4-core	¹⁾		
			60CSB	60CSBA	70	2-core	4-core	¹⁾	
						4-core	406 APL		
						95	2-core	4-core	¹⁾
	500/630	90CSB	90CSBA	70	2-core	4-core	¹⁾		
					4-core	405 APL			
					95	2-core	4-core	¹⁾	
				60CSB	60CSBA	70	2-core	4-core	¹⁾
							4-core	406 APL	
							95	2-core	4-core
800	90CSB	90CSBA	70	2-core	4-core	¹⁾			
				4-core	405 APL				
				95	2-core	4-core	¹⁾		
			60CSB	60CSBA	70	2-core	4-core	¹⁾	
						4-core	406 APL		
						95	2-core	4-core	¹⁾
			Parallel cables ²⁾			2/150	–	4-core	2 x 509 APL ²⁾
						2/185	–	4-core	2 x 639 APL ²⁾
						2/240	–	4-core	2 x 639 APL ²⁾
800	90CSB	90CSBA	2/300	–	4-core	2 x 759 APL ²⁾			

¹⁾ Sufficient spreading space in switch-disconnector units to mount 'B' gland on to enclosure.

²⁾ For 500 / 630 & 800A unit applications where parallel cables are used you need to order; **6PCB + 802GCC** (copper connection piece) + 2x **90CSB** or **90CSBA** see configuration on page 53

EBK110SP



Glasgow spares

Nominal unit rating, I _e (A)	Eaton list number
Moving contact fuse carrier; 1 per pole	
63	EBK110SP
100	0BK103SP
160...200	EBK105SP
315...400	EBK113SP
Fixed contact base complete; 1 per pole	
63...100	102GCEBSP
160...200	202GCEBSP
315...400 (2 per pole)	402GCEBSP

Aerosol spray paint, Light grey to RAL7004. Eaton list number: **2AP**

8LD



Lid locking devices

- Facilities are provided for locking off operating handles and securing doors

Current rating (A)	Eaton list number
Handle locking 63–800	PD1¹⁾
Padlock bracket 63–400	6LD
Padlock bracket 500–800	8LD
Padlock ²⁾	PD1

¹⁾Operating handles of all units can be locked 'ON' or 'OFF' using padlock only.

²⁾Non standard hasps on padlock available to order.

2.2

Industrial switch & fusegear

Glasgow busbar chamber system

See page 54 for technical data and overall dimensions.

142BBC



Busbar chambers

Nominal unit rating, I _e (A)	Nominal length, mm	Eaton list number
100	550	142 BBC
	900	143 BBC
	1350	144 BBC
	1800	146 BBC
200	550	242 BBC
	900	243 BBC
	1350	244 BBC
	1800	246 BBC
400	550	442 BBC
	900	443 BBC
	1350	444 BBC
	1800	446 BBC
630	900	643 BBC
	1350	644 BBC
	1800	646 BBC
800	900	843 BBC
	1350	844 BBC
	1800	846 BBC

Pedestal and back-plate sets

Nominal length of busbar chamber, mm	Eaton list number
900	31 BBPU
1350	41 BBPU
1800	61 BBPU

21BBL



Busbar chamber extension sets

Nominal rating, I _e (A)	Eaton list number
100	21 BBL
200	21 BBL
400	41 BBL
630	81 BBL
800	81 BBL

For busbar supports, see page 55 for details

400FSCS



Connection sets for Glasgow fuse-switch-disconnectors & switch-disconnectors

Nominal rating, I _e (A)	Eaton list number
160, 200	200 FSCS
315, 400	400 FSCS
500, 630, 800	800 FSCS

62BBSK



Busbar clamps and sockets – 100–200A Busbars

Type	Nominal rating, I _e (A)	Bore diameter mm	Capacity mm ²	Eaton list number
U-Clamps	20–63	–	25	2 BBCL
	63–100	–	70	3 BBCL
	100–200	–	120	6 BBCL
Sockets	100–200	16.7	150	62 BBSK

Busbar clamps and sockets – 400–800A Busbars

Type	Nominal rating, I _e (A)	Bore diameter mm	Capacity mm ²	Eaton list number
U-Clamps	20–63	–	25	4 BBCL
	63–100	–	70	5 BBCL
	100–200	–	120	6 BBCL
Sockets	100–200	16.7	150	62 BBSK
	200–315	19.0	185	72 BBSK
	315–400	22.5	240	82 BBSK

21BBMS



Switchgear mounting sets

Description	Nominal rating, I _e (A)	Eaton list number
Exel Switch-disconnector-fuses/	20, 32	11 BBMS
Switch-disconnectors	63, 100, 125	21 BBMS
Glasgow Fuse-switch-disconnectors/	63, 100	31 BBMS
Switch-disconnectors	160, 200	41 BBMS
	315, 400	51 BBMS
	500, 630, 800	61 BBMS

2.3

Industrial switch & fusegear

Exel 2 switch-disconnectors & switch-disconnector fuses

See page 56 for technical data and overall dimensions.

15AXTN2



Exel 2 switch-disconnector

Nominal rating, I _e (A)	Utilisation category at U _e 415V to BS EN 60947-3		250V DC rating to BS5419 DC23 (A)	Blank endplate	Eaton HRC fuses fitted	Poles	Eaton list number	
	AC22A (A)	AC23A (A)						
20	20	–	20 ¹⁾	EP 842	20SA2	SPSN	–	
		11				–	DP	15AXD2
		–				–	TPN	15AXTN2
32	32	–	32	–	32SB3	SPSN	–	
		22				–	DP	30AXD2
		–				–	TPN	30AXTN2
63	63	–	63	EP 539	63SB4	SPSN	–	
		39				–	DP	60AXD2
		–				–	TPN	60AXTN2
100	100	–	100	–	100SD5 ²⁾	SPSN	–	
		52				–	DP	100AXD2
		–				–	TPN	100AXTN2
125	125	52	–	–	125SD6 ²⁾	TPN	125AXTN2	

SPSN indicates switched neutral. ¹⁾20A units are DC22. ²⁾These units have dual fixings to accept SB3, SB4 and SO fuselinks. 2x M5 screws required

100KXSC2F



Exel 2 switch-disconnector-fuse

Nominal rating, I _e (A)	Utilisation category at U _e 415V to BS EN 60947-3		250V DC rating to BS5419 (A)	Blank endplate fitted	Eaton HRC fuses DC23	Poles	Eaton list number	
	AC22A (A)	AC23A (A)						
20	20	–	20 ¹⁾	EP 842	20SA2	SPSN	15KXSC2F²⁾	
		11				–	DP	15KXDC2F
		–				–	TPN	15KXTNC2F
32	32	–	32	–	32SB3	SPSN	30KXSC2F	
		22				–	DP	30KXDC2F
		–				–	TPN	30KXTNC2F
63	63	–	63	EP 539	63SB4	SPSN	60KXSC2F	
		39				–	DP	60KXDC2F
		–				–	TPN	60KXTNC2F
100	100	–	100	–	100SD5 ³⁾	SPSN	100KXSC2F	
		52				–	DP	100KXDC2F
		–				–	TPN	100KXTNC2F
125	125	52	–	–	125SD6 ³⁾	TPN	125KXTNC2F	

SPSN indicates switched neutral. ¹⁾20A units are DC22. ²⁾Also available in red paint finish – List No. **15kXSC2FRED**.

³⁾These units have dual fixings to accept SB3, SB4 and SO fuselinks. 2x M5 screws required

XLMPCT100



Meterpack assemblies for 100/125A Exel 2 units

- Meterpack suitable for electrical supplies up to 150A
- CT and Meter are pre-installed with voltage protection fuses to the meter
- Generous cabling space to bolted lug connections, with linking cables for associated switchgear are included to speed installation

Description	Meter characteristics	Rating	Eaton list number
Meterpack for any 100/125A Exel 2 switch disconnector fuse & switch disconnector	Pulsed	150	XLMPCT100
Meterpack for any 100/125A Exel 2 switch disconnector fuse & switch disconnector	Modbus	150	XLMPCT100M

4LD



Lid locking facilities

- All units are supplied with operating handles that provide lock-on, lock-off facilities, using padlock PD4. Door locking facilities, using padlock PD1, are available for fitment on site.

Nominal unit rating, I _e (A)	Type	Eaton list number
20/32	Door locking bracket	4 LD
63/100/125	Door locking bracket	5 LD
—	Padlock for use with above	PD1

Exel 2 Spares

Description	Rating (A)	Quantity required	Eaton list number
Moving contact assembly	20	1	OLV727SP
	32	1	OLV728SP
	63	1	OLV725SP
	100/125	1	OLV726SP
Switch base with arc shroud	32	1 per pole	230AXEBSP¹⁾
	63	1 per pole	260AXEBSP¹⁾
	100/125	1 per pole	2100AXEBSP¹⁾
	100/125	1 per pole	2100AXDEBSP
Combined switch/fusebase with arc shroud	32	1 per pole	230KXEBSP
	63	1 per pole	260KXEBSP
Fusebase only	100/125	1 per pole	100MBDEBSP
Arc shroud only	32	1 per pole	SH265SP
	63	1 per pole	SH754SP
	100/125	1 per pole	CV1109SP

¹⁾ required for switched neutral pole on SPSN switchfuses.

Aerosol spray paint, Light grey to RAL7004. Eaton list number: **2AP**

2.4

Industrial switch & fusegear

SPSN Switchfuse

See page 57 for technical data and overall dimensions.

100ESSCF



SPSN switchfuse

Nominal rating,
 I_e (A)

Eaton list
number

80

80ESSCF

100

100ESSCF