



components

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EATON Distributor

Components

a Business Unit of Ultra Electronics Electrics Division



Ultra Group with a turnover of £239 million employs 2,500 people and provides the leadership for 18 Divisions designing and manufacturing and supporting electronic and electro-mechanical systems and products for international defence and aerospace markets.

Electrics Division, formed in 1956, was formerly known as Dowty Electrics Limited and is situated on the outskirts of Cheltenham. Electrics designs and manufactures electronic, electro-mechanical and optical systems and components for defence and aerospace applications. The division specialises in the Human Machine Interface through the provision of ergonomic solutions. The division has a turnover of approx. £22 million per year.

Components Business Unit, a business unit of Electrics, concentrates on electro-mechanical components. i.e. specialist switches, cockpit lighting, indicators and terminal blocks. With a staff of around 65 we have a sales turnover of approx. £8 million per year.

Design and development facilities include state-of-the-art CAD design tools, a well equipped environmental test lab and darkroom.



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INNOVATION THROUGH EXPERIENCE



We are proud of the collective experience we offer and aim to build on this to achieve growth by encouraging innovation in technical developments and manufacturing processes.

We pride ourselves on our speed of response in solving customer problems.

Our Dowty heritage requires that we continue to provide full support to the legacy product range.

Quality

Components Business Unit is committed to providing products and services that consistently satisfy our customer requirements and expectations.

Approved to ISO9001 (1994) with production facilities approved to JAR 21 sub-part G and design approval to BCAR.

Customer And Third Party Approvals	
ISO 9001	Reg. No. FM20222
AS9100(PREN9100)	Accredited
Civil Aviation Authority	Reg. No. DA1 5037-56
Federal Aviation Authority	Reg. No. DQD 5021K
JAR 145 (US Repair)	Reg. No. CAA 00253
Rolls Royce Plc CQC103 Category 1	Reg. No. 03091
GKN-Westland Aircraft	Reg. No. Q-059
British Aerospace Systems	Reg. No. BAe/AG/7041/WFD
Agusta	Reg. No. NA/138

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New Product Development



Ultra Electronics Electrics Division has a policy of continuous development.

This policy has two thrusts:

To create and develop new products thereby further enhancing the already extensive range of high reliability components, and secondly, to modify and improve legacy products to offer existing customers the opportunity for increased performance, higher reliability and lower through life support cost.

Through the use of rapid prototyping procedures our engineering team have the capability to demonstrate functional models within days. This allows customers the opportunity to carry out 'what if' trials before committing to a design specification.

Customers are invited to bring their lighting, signalling, switching and other electro-mechanical engineering problems to the attention of our superb engineers, allowing them the opportunity to demonstrate a practical solution.

Current new products in development, utilising LED technology, are Rooflights for fighting vehicles, Crewstation lighting, and cockpit floodlights. New switched products include a range of multi-way switches for control grips utilising a new switching mechanism exclusively for low current application and exhibiting very high reliability, and also LED based indicators providing exceptional sunlight readability together with NVG compatibility.





Vehicle LED Rooflight

The Vehicle LED Rooflight is designed to provide general area illumination within the vehicle crew space to meet the requirements of ground vehicle environments. It uses multiple LED technology. The unit can provide white and red area lighting, utilising current lock circuitry to maintain fixed brightness under a range of voltage input conditions.



Goose Neck Lights

The Goose Neck Lights are designed to provide spot and flood illumination for the head down cockpit or crew station to meet the requirements of airborne and ground vehicle environments.

The Flexi Light uses filtered LED technology and the Focus light uses multiple LED technology. Once directed, the lights will remain as set by the pilot, allowing hands free use.

An NVG compatible variant is available.

LED Direct View Indicator

Recent developments include direct viewed, sunlight readable LED indicators capable of meeting a range of Night Vision Goggle (NVG) specifications, including NVIS (Night Vision Imaging System) and Eurofighter requirements.



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For more detailed information on the
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Lighting

Ultra Components has recently developed new crew station floodlighting utilising the unique characteristics of white LED.

Products in current manufacture include Maplight, fighting vehicle roof and strip lights, and cockpit floodlighting.

Traditional incandescent illuminated products have been converted to LED lighting to improve reliability, night visibility and NVG compatibility.

Some of these products are fully compatible to Mil-Std-3009 and Mil-L-85762A.

Using a well-equipped darkroom and the latest filter and LED technologies, Ultra is able to offer a range of cost effective solutions to meet specific lighting requirements for a variety of customers such as BAe Systems, Westlands and Panavia.

Components Division has been involved in several NVG cockpit lighting programs. We have performed product development work and gained knowledge in the field from development installations undertaken in conjunction with various customers.

STRIP LIGHTS

LAP LIGHTS

DIMMERS

Cockpit Striplight

Features

- Simple mounting
- High quality finish
- Lightweight
- Ease of operation



The Cockpit Striplight is designed to provide flood illumination for the head down cockpit and displays to meet the requirements of the military and civil aircraft environment. It uses highly reliable white light LED technology.

The Striplight produces a flood illuminated area in excess of 400mm horizontal x 100mm vertical at a distance of 300mm. Illumination is greater than 15Lux at the centre.

Single axis hinge enables angular setting of flood illumination.



components

Dimmers

Features

- Easily recognised OFF position
- a.c and d.c.



The 28 V d.c. dimmer provides linear voltage increase across 40 mA tungsten bulbs. The resolution of the dimmer is virtually infinite and the dimmer shaft is designed to remain in any operating position under vibration.

Heat is dissipated towards the rear of the unit to provide a thermal barrier at the knob. The dimmer unit is sealed and does not emit toxic vapour under overload or short circuit conditions.

A 115 V a.c. version is available to control electroluminescent panels.

Other dimmers are available from Ultra Electronics for a wide range of applications.



components

PUSH BUTTON
 TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
 LIMIT SWITCH
 SPECIALS



High Integrity Switching

Electrics range of switches are used on a wide variety of applications including fighting vehicle, military aircraft, naval and also rail systems.

Offering a comprehensive range of high integrity switches designed to be used in harsh environments, these include toggle, pushbutton, multi-way, trim, late arm, rocker, limit and other specialised switched mechanisms

Many of the designs incorporate fail-safe contact designs and are used in safety critical systems.



components

PUSH BUTTON

TOGGLE SWITCH

MULTIWAY

TRIM SWITCH

LATE ARM RELEASE

ROCKER SWITCH

LIMIT SWITCH

SPECIALS

Pushbutton switches

**Miniature Push Button switch**

The miniature spring return push button switches are designed to fit into control handles or panels where space is restricted.

The double pole circuits are available in a variety of configurations and each pair of contacts is isolated.

The positive detent action provides good tactile feedback and ensures tack welded contacts cannot occur.

A range of operating forces is available.

Switches are supplied with encapsulated flying leads or solder terminations, for which a rubber boot is available for additional electrical protection.

Features

- Compact design
- Variety of contact arrangements
- Different mounting options
- Various knobs styles available
- Actuation options

Pushbutton and Wander Button switch

The push button and Wander push button switch is designed to meet the need for a fully weatherproofed and flameproof switch for aircraft use. It has a moulded phenolic plastic case which houses double pole contacts made of solid silver and capable of switching 5 Amperes. Its inherent reliability and robustness make it ideal for a wide range of industrial applications.

Flanged or flangeless mountings are available. A safety flap or button shroud, to avoid inadvertent operation, can be supplied separately. There is a range of coloured buttons, with or without engraving.

The Wander button switch consists of a pushbutton switch in a robust neoprene rubber case, which is heavily ribbed for easy operation in gloved hands, at the same time protecting the switch from mechanical damage and accidental operation.

Toggle switches

PUSH BUTTON
TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
 LIMIT SWITCH
 SPECIALS



Miniature Toggle switch

Miniature toggle switches are available in 2, 4 and 8 pole versions.

A full range of 2 and 3 position switches with maintained or spring-return action and lever locking in any position are available.

A variety of guards is available.

The switches has been designed to give good tactile feedback and have self-wiping contacts in all positions.

The switches have many different options including a variety of levers and locking mechanisms.



components

PUSH BUTTON
 TOGGLE SWITCH
MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
 LIMIT SWITCH
 SPECIALS

Multiway switch

The miniature multiway switches are designed primarily for **aerospace and military** applications where space is limited.

Features

- Various knob shapes
- Designed for enhanced tactile feel
- 5 Way, and can be configured for 2, 3 and 4 way
- Variety of mounting options



The operating lever is designed to move through a 0 - 14.5° angle in the X and Y direction and the push button has 2mm maximum travel.

Military pilot input has been utilised to enhance tactile feel.



Trim switch

PUSH BUTTON
TOGGLE SWITCH
MULTIWAY
TRIM SWITCH
LATE ARM RELEASE
ROCKER SWITCH
LIMIT SWITCH
SPECIALS

The Trim switches are designed to fit into control handles or panels where weight, **space and reliability** are important.

Features

- Different mounting styles
- Various knob shapes
- Lightweight design



The trim switches are double pole with each pole individually isolated and incorporate spring return to centre off. The knob is split to allow combined operation of both poles together or single operation of one pole. Each pole is double throw.

Military pilot input has been utilised to enhance tactile feel.



components

PUSH BUTTON
 TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
 LIMIT SWITCH
 SPECIALS

Late arm release switch assembly

Features

- Lockable
- Simple mounting
- High quality finish
- Lightweight



The Late Arm Release switch assembly is designed to be fitted to console mounted panels and used to enable the fusing and release of stores.

The switches operate independently with the Late Arm activated by raising a protective spring loaded flap that guards the Release switch. The switches

incorporated are double pole single throw miniature push button switches also made by Ultra Electronics.

The Late Arm is operated at 15 to 20° and can be raised to 90° from the locked position.

Both the Late Arm and the Release Switch are double pole double throw switches.



Rocker switch

PUSH BUTTON
TOGGLE SWITCH
MULTIWAY
TRIM SWITCH
LATE ARM RELEASE
ROCKER SWITCH
LIMIT SWITCH
SPECIALS

The rocker motion has been designed for **good tactile feedback** in a military cockpit environment.



Features

- High quality finish
- Lightweight
- Simple mounting method

The Rocker switch is a three position switch. It is spring return from each direction to the normally central position. Each direction is momentary action, break before make.

The switch top has a serrated finish for ease of use and improved non-slip feel.

The switch has approximately 15° maximum travel in each direction from the centre position.



components

PUSH BUTTON
 TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
LIMIT SWITCH
 SPECIALS

Limit switches



PICASEAL Limit Switch

Hermetic sealing and low operating loads are the main features of this unit which is designed to operate in ambient temperatures ranging from -75°C to +150°C and at altitudes from sea level to 21,500m.

The switch compartment is sealed to 'environment free' standard.

At sea level force on the plunger required to operate the switch is 4.8kgm rising to only 5.2kgm at the full plunger overtravel. The minimum plunger release force from the switch release position is 2.3kgm.



MICROSEAL Limit Switch

The 'environment-free' Microseal switch is designed to operate at altitudes up to 18,000m. (60,000 ft.) in ambient temperatures ranging from -75°C to +70°C.

The switch action provides a heavy duty double-pole changeover contact arrangement with a positive 'snap' action. A unique feature of this design is that contact pressure increases up to the moment of changeover, thus reducing the tendency to arcing.



PUSH BUTTON
 TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
LIMIT SWITCH
 SPECIALS



Dowmic Limit Switch

The Dowmic switch used on many British Aircraft operate efficiently at altitudes up to 60,000 ft and in ambient temperatures from -40°C to +70° (-65°C to +150°C for special applications).

The units provide immunity from normal weather conditions. For extreme operations 'weather-sealed' Dowmics are available.

The switch rocker carries two moving contact blades together with a soft iron armature, which moves between two permanent magnets to give a positive 'snap' action. A unique feature of this design is that contact pressure increases up to the point of break, reducing the possibility of 'arcing'.

To facilitate installation a schematic wiring diagram is shown on the switch case and a range of cable grommets is available to suit individual requirements.



A similar Dowmic Switch is available for industrial applications.



components

PUSH BUTTON
 TOGGLE SWITCH
 MULTIWAY
 TRIM SWITCH
 LATE ARM RELEASE
 ROCKER SWITCH
 LIMIT SWITCH
SPECIALS

Barrier microswitch contact box

Features

- High performance, high reliability & tested over 1 million operations.
- Easy installation.
- IPX4 environmental protection.
- 6 independently adjustable circuits.
- Direct termination using existing cables.
- Simple single screw adjustment.
- Railtrack acceptance certificate PA05/563.



The Level Crossing Microswitch Contact Box was developed in conjunction with GTRM as a direct replacement of the existing Field & Grant Rotary Circuit Controller. Low through-life costs are achieved by the use of corrosion resistant materials and composite bearings resulting in reduced maintenance intervals (Annual inspection only).

The lever arm can be either left or right side mounted with cable entry from top or bottom.



Indicators



Ultra Electronics produces a growing range of indicators for cockpit and crewstation application. Traditional legacy incandescent indicators, many with NVG compatibility, continue to be supported.

Recent developments have seen the introduction of direct view, sunlight readable LED legend and warning indicators capable of meeting a range of Night Vision Goggle (NVG) and Night Vision Imaging (NVIS) specifications including Mil Std 3009 and Mil-L-85762.

High brightness Indicators for ground crew safety warning applications have been of interest to Armament control safety engineers. Providing a clear and unambiguous indication at night, or in bright sunlight conditions, of the weapon status of an aircraft about to be re-armed and re-fuelled. Thereby reducing the risk of harm and injury to crew and aircraft.

components

Electromagnetic indicators

Ultra Magnetic Indicators have replaced standard warning lamps for visual indication of the position of remotely controlled valves, flaps, actuators, etc. **Used for aeronautical and industrial application** they ensure an extremely high level of reliability.



Ultra Electric indicators are available in 2 and 3 position versions. Indicators incorporating integrated lighting or 'transpanel' lighting and/or exported transient voltage suppression are available.

Designed for maximum versatility of display, the indicators give wide viewing angles, and the many standard symbols, numerals, letters and colours available provide patterns suitable for most applications.

The indicators are designed to reduce interference to and from other instruments, such as the radio and compass. Due to this design the indicators can be mounted adjacent to each other, making a compact display panel.

The indicators are illuminated by either lamps or NVG compatible LEDs

Warning lights and indicators

Units can be customised to meet the **specific needs** of the customer.



Lamp indicator

The miniature lampholder is designed to occupy the minimum of space on modern control panels and provide a good indication over a wide viewing angle.

Various colour lenses are available to suit most requirements.

Press to test indicators

Suitable for industrial and aircraft use, this compact warning light incorporates built-in facilities for dimming and lamp filament checking. Installed from the front of the mounting panel, it requires little space.

Variable dimming reduces the amount of light transmitted through the lens to suit ambient lighting conditions. Clear, red, green, amber and blue lenses are available, each designed to spread the light over a wide viewing angle.

Warning lamp

The warning lamps are designed to provide a large illuminated legend in a minimum of space. Character height is normally 3mm, 4mm characters are possible.

A NVGC (Night Vision Goggle Compatibility) version is available.



LED indicators

Our **highly reliable** LED indicators are designed to provide warning, advisory and caution information to the crew.



Recent developments include direct viewed, sunlight readable LED indicators capable of meeting a range of Night Vision Goggle (NVG) specifications, including NVIS (Night Vision Imaging System) and Eurofighter requirements.



Undercarriage position indicator

Ultra Electrics engineering expertise has been applied to a variety of undercarriage position indicators for modern aircraft.



Ultra 12 lamp undercarriage indicator

The Ultra 12 lamp undercarriage indicator is used extensively on modern aircraft. Its compact case carries only one operating control - the night screen switch.

For reliability, indications are illuminated by two lamps connected in parallel and are visible simultaneously.

To ensure a wide viewing angle the indicator windows are optically shaped to bring the lamp filaments close together; this allows filament failure to show up without producing any serious deterioration's in the display. For night use the display can be dimmed by the introduction of a neutral screen.

Our indicators provide a solution for most cockpit environments, capable of meeting a range of Night Vision Goggle (NVG) specifications such as NVG gain and PJND which are specific Eurofighter requirements.



MASS warning indicators

The Master Armament Safety Switch (MASS) is a keyless three position, six poles switch suitable for switching 28V d.c. circuits. The poles are configured to provide duplex functionality for key system requirements. The three positions are Safe, Standby and Live.



MASS Position Indicator

The MASS Position Indicator provides for ground personnel safety with four indications of the Armed state of the aircraft: SAFE, STBY, LIVE, and NO POWER

There are minimum lighting levels for "DAY" and "NIGHT" conditions. The viewing angle is in excess of 40° and the viewing distance is 6m to 9m. The flashing rate for the LIVE indication is 2Hz.

The MASS Position Indicator has two independent channels each controlling the complete display to ensure that a single failure will not cause a reduction in brightness.

Any single failure within a channel has no effect on the other channel. If two different signals are input to each channel the display indicates the highest priority. If two different signals are input to one or both channels the display indicates the LIVE condition.

MASS Repeater Indicator

The MASS Repeater Indicator is fitted externally to the aircraft and indicates to the ground crew that the Armament system MASS is set to LIVE.

The Repeater consists of a split array of red LED connected in two banks, which flash on and off alternately at a combined rate of 2Hz producing a left-right-left flashing effect. The viewing angle is approx. 80° x 20° thus ensuring optimum visibility when viewed from a distance of up to 65 feet in bright sunlight

Each of the channels contains a flasher, a constant current drive, EMC filtering and reverse polarity protection.

No single fault condition on one channel can cause ambiguous indication on the other channel. In the event that the flasher circuit on either channel fails that channel turns 'steady red' when presented with an 'Arm' signal. Flashing of the remaining circuit will remain unaffected.

STUD TYPE
 TAPER PIN
 SCREW CLAMP
 FUSE LINK
 CUSTOMER SPECIALS
 TOOLS



Terminal Block Range

Ultra Electronics Electrics Division's range of electrical termination blocks is specifically designed and approved for use in harsh environments where product integrity is critical.

Their application in aerospace, armoured vehicle, naval, railway and underground systems demonstrates the confidence and quality inherent in the product.

Computerised testing ensures that every terminal block is compliant to its specification.

Exceptional high resistance to all common used fuels, fluids, lubricants and general contaminants is achieved through the choice of rigid materials.

For ease of circuit identification, a choice of six colours is available for our terminal block range.

Our expertise in electrical component design, acquired as a result of a successful track record on many international aerospace, defence and transportation programmes, enables products to be designed or customised to meet the specific needs of the most demanding applications.

components

STUD TYPE

- TAPER PIN
- SCREW CLAMP
- FUSE LINK
- CUSTOMER SPECIALS
- TOOLS

Stud type terminal blocks



Features

- Low toxic fume emission
- Non-flammable with low smoke under fire condition
- Electrical isolation preserved by inter-terminal barriers
- Wide operating temperature -65°C to +210°C

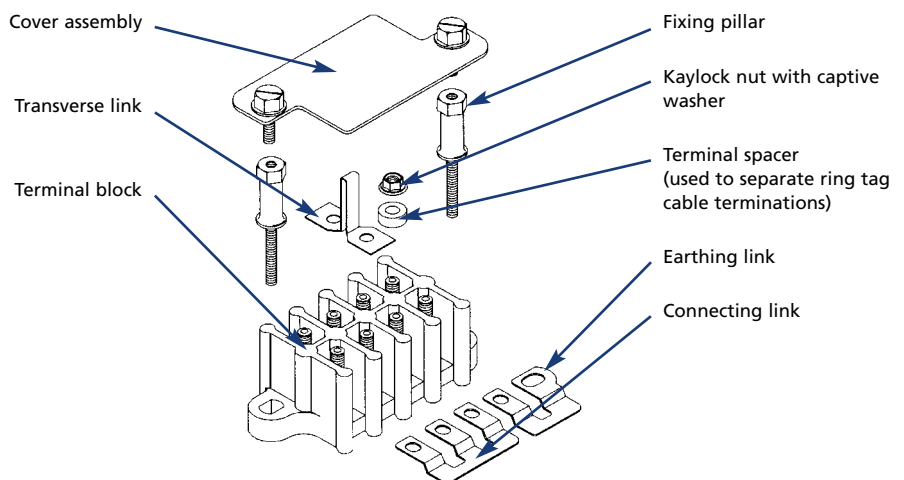
Stud type terminal blocks are available in 1 to 12 way single row or 2 to 24 way double row form. The blocks have a high resistance to most chemicals encountered in an aerospace environment. They are designed for either panel or surface mounting with both single sided or double ended studs.

Threaded terminals enable multiple ring tagged connections to be made using the appropriate spacers. Connecting and earthing links are available where required.

Manufactured with polyethersulphone (PES) or polyetheretherketone (PEEK) body and selected blocks in nylon where applicable.

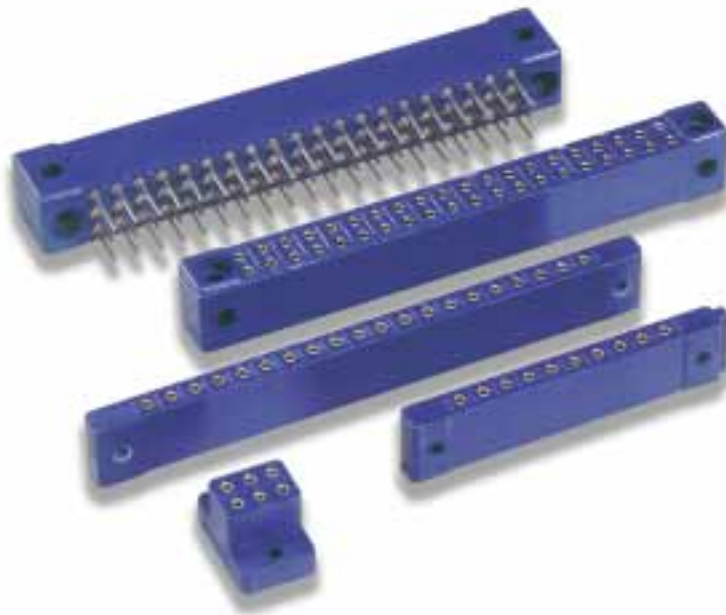


A feature of the Ultra Electronics design is the wide range of accessories available for ensuring a safe and functional installation. These accessories include covers, spacers, bussing links, mounting pillars and socket spanners preset to the correct torque to ensure swift and problem free installation.



Taper pin terminal blocks

Originally designed to meet stringent MoD specifications for use in Naval surface and underwater vessels. The **high contact density configuration** found wider acceptance, particularly in the television and video industries, where rugged installations are a requirement.



Features

- Vibration resistant connection
- Gas tight
- Internal bussing connections

Connections are made via a gold plated taper socket incorporating a quick connect/disconnect design. Available in 6 sizes up to 60 ways, the system provides a reliable, gas tight, vibration resistant connection with internal bussing connections as required.



STUD TYPE

TAPER PIN

SCREW CLAMP

FUSE LINK

CUSTOMER SPECIALS

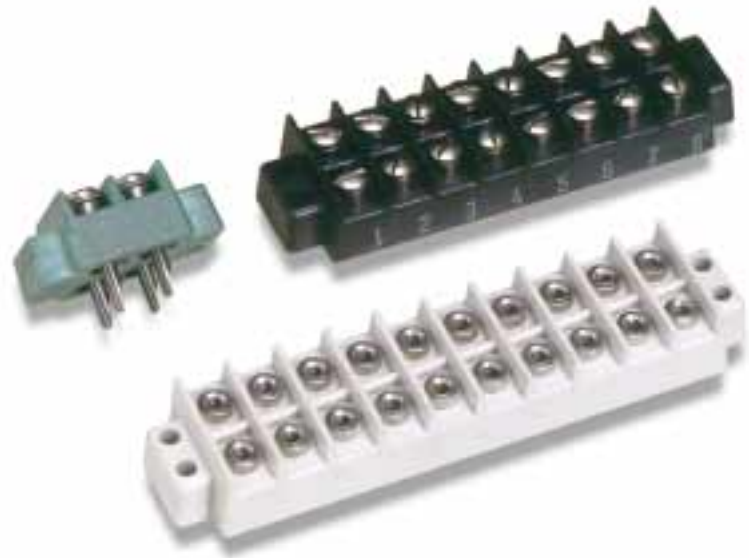
TOOLS

Screw clamp terminal blocks

Originally **designed for and approved** by the MoD for use in fighting vehicles, this style carries its own FV designations.

Features

- Low toxic fume emission
- Non-flammable with low smoke under fire condition
- Choice of six colours
- Wide operating temperature -65°C to +210°C



Available from 4 to 20 ways in pairs, with bussing links if necessary, the blocks can be surface panel mounted or through panel soldered as appropriate to the installation. The blocks have an exceptional resistance to commonly used fuels and hydraulic fluids.

These terminal blocks are approved to M.V.E.E. specification no. 2051 (General Requirement For Electrical Equipments of Fighting Vehicles) Environmental Category 07-55 Parts 1 and 2.



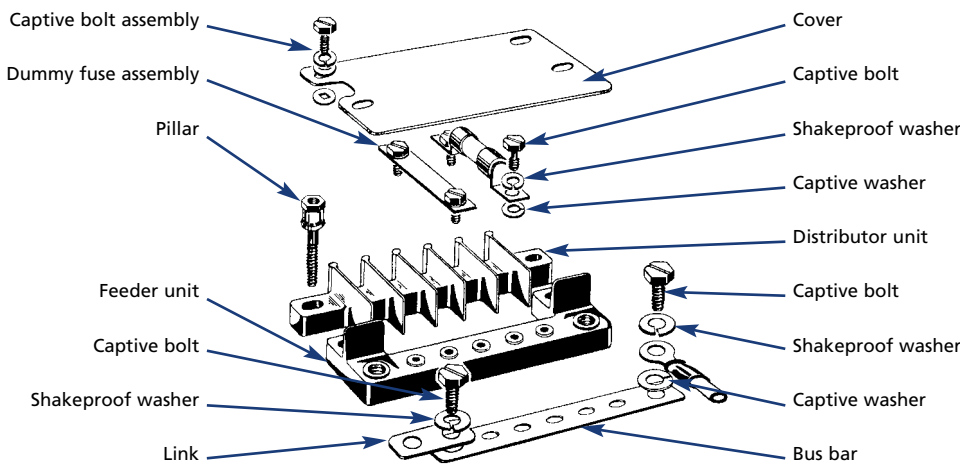
Fuse link systems

Standard fuse link system

Designed for use in avionic and similar high specification applications where exceptional temperature stability and environmental inertness are at premium. Panel mounted fuse systems are available up to 30 ways in various combinations and are manufactured in a variety of colours together with accessories.

Features

- Operating temperature -65°C up to +210°C
- Electrical isolation preserved by inter-terminal barriers
- Intended for use with MoD type "O" or A.S.T. fuses

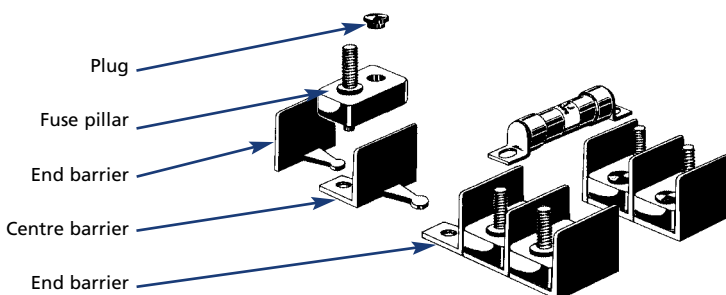


Unitary Fuse Link System

The Unitary Fuse System is a versatile system allowing neat fuse groups to be rapidly assembled using standard components. The system employs individual moulded pillar assemblies used in conjunction with interlocking barriers.

Features

- Operating temperature -65°C to +110°C
- Available in black or red nylon
- Electrical isolation preserved by inter-terminal barriers



components

Customer specials

We are able to manufacture terminal blocks to meet **customer specific requirements**.



Current materials used are Nylon, Polyethersulphone, Polyetheretherketone and high temperature ceramics.

Please discuss your specific requirements with our specialists.



Tools

Pre-set torque spanners

Both spanners and screwdrivers alike are of the audible indicating type and employ a unique mechanism housed in a fluted Nylon handle. The mechanism combines a ball bearing driver shaft and a ratchet system using the consistent friction characteristics of Nylon.

The tools are pre-set to standard loadings and sealed, thereby eliminating the risk of equipment damage due to incorrect tool selection.



Features

- Tough reliable tool under all conditions of handling
- Comfortable and easy to use by both female and male operators

EATON Distributor



Ultra Electronics Electrics Division is the UK Authorised Distributor for the Eaton Aerospace (MSC) range of illuminated pushbutton switches and indicators to MIL-S-22885. These incorporate the latest in lighting and switching technologies using incandescent and LED light sources.

Available in 2 and 4 pole, sealed and unsealed versions and providing a range of switching and termination options including solder, pcb, IWTS and rack mounting. Lens systems include RFI and NVG compatible variants.

Other products in the Eaton Aerospace range are also available from Ultra Electrics; these include toggle and pushbutton switches, relays, contactors and circuit breakers.

For more information contact our sales team on Tel: +44 (0) 1242 221166,

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For more detailed information on the
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