# *ENSTO - Saves your energy*

Ensto Underground offers a comprehensive solution for 1-36kV cable networks.

The products have been developed to endure the most varying and demanding conditions and both their mechanical and electrical properties have been thoroughly type tested. Ensto products exceed the requirements of international and national standards.

The shear bolt connector and cable lug range stocked by JEAN MÜLLER NZ Ltd offer many advantages over other brands available including:

- both LV and MV lugs available
- wider range of LV connectors and lugs
- less tools required
- competitive pricing.

## Low voltage cable connectors & lugs 1KV

### Shear head bolt connectors with barrier 1kV

ESLJ

| Nominal cable size | No. of bolts | Tools required for installation | Part No. |
|---|---|---|---|
| Suitable for solid and stranded, sector and circular shaped cables | | | |
| 6-50mm² | 2 | 14mm Socket | ESLJ6-50 |
| 35-95mm² | 2 | 14mm Socket | ESLJ35-95 |
| 95-240mm² | 4 | 21mm Socket | ESLJ95-240 |
| 150-300mm² | 4 | 21mm Socket | ESLJ150-300 |

### Fillers

SLJT*

| Nominal cable size | Part No. |
|---|---|
| Used with ESLJ connectors when the cable to be joined is smaller | |
| 16-35mm² for ESLJ35-95 | SLJT2 |
| 50-70mm² for ESLJ95-240 | SLJT3 |
| 95-120mm² for ESLJ150-300 | SLJT4 |

### Shear head bolt cable lugs 1kV

ESAL

| Nominal cable size | No. of bolts | Tools required for installation | Part No. |
|---|---|---|---|
| Suitable for solid and stranded, sector and circular shaped cables | | | |
| 6-50mm² | 2 | 14mm Socket | ESAL6-50 |
| 50-95mm² | 2 | 14mm Socket | ESAL50-95 |
| 95-185mm² | 2 | 21mm Socket | ESAL95-185 |
| 150-300mm² | 2 | 24mm Socket | ESAL150-300 |

# Medium voltage cable connectors & lugs 36kV

ESMJ

## Shear head bolt connectors with barrier 36kV

| Nominal cable size | No. of bolts | Tools required for installation | Part No. |
|---|---|---|---|
| Suitable for solid and stranded, sector and circular shaped cables | | | |
| 10-95mm² | 2 | 17mm Socket | ESMJ10-95 |
| 70-240mm² | 4 | 24mm Socket | ESMJ70-240 |
| 120-300mm² | 6 | 24mm Socket | ESMJ120-300 |
| 185-400mm² | 6 | 22mm Socket | ESMJ185-400 |
| 400-630mm² | 6 | 24mm Socket | ESMJ400-630 |

ESML

## Shear head bolt cable lugs 36kV

| Nominal cable size | No. of bolts | Tools required for installation | Part No. |
|---|---|---|---|
| With 13mm palm hole | | | |
| 10-95mm² | 2 | 17mm Socket | ESML10-95 |
| 70-240mm² | 2 | 24mm Socket | ESML70-240 |
| 120-300mm² | 2 | 28mm Socket | ESML120-300 |
| 185-400mm² | 3 | 22mm Socket | ESML185-400 |
| 400-630mm² | 3 | 22mm Socket | ESML400-630 |

KE69, KE64, KE63

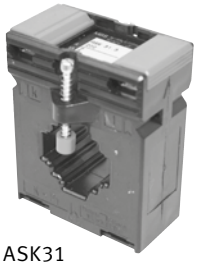
## Clampo Pro Bi-Metalic Terminals

| Nominal cable size | Screw size | No. of poles & colour | Part No. |
|---|---|---|---|
| Suitable for copper and aluminium cables | | | |
| 16-95mm² | 5mm Allen Key | 1 pole, grey | KE62 |
| 35-150mm² | 8mm Allen Key | 1 pole, grey | KE63 |
| 35-240mm² | 8mm Allen Key | 1 pole, grey | KE64 |
| 35-240mm² | 8mm Allen Key | 2 pole, grey | KE69 |

## Terminal shrouds

| | | | Part No. |
|---|---|---|---|
| Terminal shroud for KE62 | | | KEL62 |
| Terminal shroud for KE63 | | | KEL63 |
| Terminal shroud for KE62 | | | KEL64 |

## Current transformers class 1



ASK31

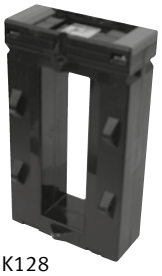
| Max size of primary conductor (mm) | | Primary current | Secondary current (A) | VA | Part No. |
|---|---|---|---|---|---|
| Bar | Cable Dia | | | | |
| Foot or busbar mount<br>Class 1 accuracy | | | | | |
| 30 x 10mm | 26mm | 200A | 5A | 5VA | ASK31.3/200/5 |
| 30 x 10mm | 26mm | 400A | 5A | 5VA | ASK31.3/400/5 |
| 30 x 10mm | 26mm | 600A | 5A | 5VA | ASK31.3/600/5 |

ASK51

| | | | | | |
|---|---|---|---|---|---|
| 50 x 12mm | 44mm | 800A | 5A | 10VA | ASK51.4/800/5 |
| 50 x 12mm | 44mm | 1000A | 5A | 10VA | ASK51.4/1000/5 |
| 50 x 12mm | 44mm | 1200A | 5A | 10VA | ASK51.4/1200/5 |

ASK101

| | | | | | |
|---|---|---|---|---|---|
| 100 x 10mm | 70mm | 600A | 5A | 10VA | ASK101.4/600/5 |
| 100 x 10mm | 70mm | 800A | 5A | 10VA | ASK101.4/800/5 |
| 100 x 10mm | 70mm | 1000A | 5A | 10VA | ASK101.4/1000/5 |
| 100 x 10mm | 70mm | 1200A | 5A | 10VA | ASK101.4/1200/5 |
| 100 x 10mm | 70mm | 1500A | 5A | 10VA | ASK101.4/1500/5 |



ASK128

| | | | | | |
|---|---|---|---|---|---|
| 128 x 38mm | - | 1000A | 5A | 10VA | ASK128.4/1000/5 |
| 128 x 38mm | - | 1200A | 5A | 10VA | ASK128.4/1200/5 |
| 128 x 38mm | - | 1500A | 5A | 15VA | ASK128.4/1500/5 |
| 128 x 38mm | - | 2000A | 5A | 15VA | ASK128.4/2000/5 |
| 128 x 38mm | - | 2500A | 5A | 15VA | ASK128.4/2500/5 |

## Standoff insulators

| Stand off height (mm) | Fixing thread | Part No. |
|---|---|---|
| Colour - red | | |
| 25 | M6 | DB25/PM6 |
| 34 | M8 | DB34/PM8 |
| 34 | M10 | DB34/PM10 |
| 50 | M10 | DB50/PM10 |
| 50 | M12 | DB50/PM12 |
| 65 | M10 | DB65/PM10 |
| 65 | M12 | DB65/PM12 |

## Power distribution blocks


| Incoming cables | | Outgoing cables | | Part No. |
|---|---|---|---|---|
| Qty | Size (mm²) | Qty | Size (mm²) | |
| A space saving and cost saving alternative to DIN-Rail mount terminals.<br>Panel or DIN-Rail mounting<br>IP20 finger proof terminals<br>Plated brass block accepts aluminium or copper cables | | | | |
| 3 | 2.5 - 16 | 4 | 2.5 - 6 | FTG-1/080 |
| 1 | 10 - 35 | 6 | 2.5 - 16 | FTG-1/125 |
| 1 | 6 - 16 | | | |
| 1 | 35 - 120 | 5 | 2.5 - 16 | FTG-1/250 |
| | | 4 | 2.5 - 10 | |
| | | 2 | 6- 35 | |


PDB-500

Compact Power Distribution Block
1x Cu/Al input 500mm² max
2x Cu/Al outputs 300mm² max

## Power distribution block 500mm² - 2x300mm² Cross section

| | Cu/Al | | Rated torque (Nm) | Part No. |
|---|---|---|---|---|
| | Round solid (mm²) | Round stranded (mm²) | | |
| Input | 95-500 | 95-500 | 30-60 | PDB 500 |
| Output (x2) | 50-300 | 50-300 | 25-35 | |

Sector shaped Al-conductors 90mm²-300mm² have to be pre-rounded with a crimping-tool.

## MiniClic System

### Busbar mount and connection

| Connection | No. of outputs | Current rating total & per output | Part No. |
|---|---|---|---|
| Busbar | 10 | 250/50A | MC22001 |

MC22001

### Panel mount with incoming terminal

| Connection | No. of outputs | Current rating total & per output | Part No. |
|---|---|---|---|
| 25-120mm² | 10 | 250/50A | MC22002 |
| 25-120mm² | 50 | 250/50A | MC120021 |

### MiniClic cube

| Connection | No. of outputs | Current rating total & per output | Part No. |
|---|---|---|---|
| 1.5-10mm² | Grey | 50A | MC00001 |
| 1.5-10mm² | Blue | 50A | MC00001N |
| 1.5-10mm² | Green | 50A | MC00001PE |
| 1.5-10mm² | Red | 50A | MC00001R |

MC00001

# TECHNICAL INFORMATION

## Current transformers

| Type | ASK** |
|---|---|
| Standards | VDO 414 Part 1; DIN42600; VBG4; IEC60044-1 |
| Construction | |
| Case | Ultrasonically welded Polycarbonate |
| Flammability | Self-extinguishing to UL94Vo |
| Terminals | Nickel Plated Brass |
| Environment | For dry indoor use. |
| Temperature | -5 ˚C to +40 ˚C |
| Ratings | |
| Voltage maximum | 0.72 kV |
| Frequency | 50/60Hz |
| Nominal Thermal Short Time Current | 60 x In |
| Insulation | Class E |
| Supply | |
| Foot Mountings | 2 |
| Bar Mount Screws | 2 (12 with ASK128) |

## Standoff insulators

| Type | | DB25 | DB34 | DB50 | DB65 |
|---|---|---|---|---|---|
| Operating Temperature | | -40 ˚C to +130 ˚C | | | |
| Flammability | | to UL94VO | | | |
| AC Internal Flashover Voltage | kV | 20 | 30 | 40 | 40 |
| AC Surface Flashover Voltage | kV | 7 | 10 | 12 | 15 |
| Twisting Stress | DN X m | 3 | 5 | 6 | 6 |
| Compressive Stress | DN | 2100 | 6500 | 6800 | 8300 |
| Cantilever Stress | DN | 180 | 450 | 450 | 700 |
| Tensile Stress | DN | 300 | 800 | 850 | 1500 |

## Power distribution blocks

| | | | FTG-1/080 | FTG-1/125 | FTG-1/250 |
|---|---|---|---|---|---|
| Operational Voltage | | VAC | 600 | 600 | 600 |
| Current Rating Cu/Al | | A | 85 / 66 | 130 / 103 | 300 /260 |
| Short Cct Peak - Ipk | | kA | 2.7 | 30 | 51 |
| Short Cct 1 second - Icw | | kA | 1.9 | 4.4 | 21 |
| Input connections | Qty / Size | | 1x 2.5-16mm² | 1x 10-35mm² | 1x 35-120mm² |
| | Tool | | Pozi or flat screwdriver | 4mm Allen Key | 6mm AllenKey |
| | Torque | Nm | 1.5 | 3.5 | 19 |
| Output connections without ferrules | Qty / Size | | 2x 2.5-16mm²<br>4x 2.5-6mm² | 1x 6-16mm²<br>6x 2.5-16mm² | 4x 2.5-10mm²<br>5x 2.5-16mm²<br>2x 6-35mm² |
| | Tool | | Pozi or flat screwdriver | Pozi or flat screwdriver | Flat screwdriver |
| | Torque | Nm | 1.5 / 0.8 | 3.5 / 2.0 | 18 / 18 / 31 |
| Mounting | | | DIN-Rail or base mounting with 2x M5 screws | | |
| Protection | | | IP20 | IP20 | IP20 |
| Dimensions (LxWxH) mm | | | 66 x 27 x 47 | 74 x 27 x 47 | 96 x 45 x 49 |

## Power distribution block 500mm² - 2x300mm²
## Technical data

| Material | | |
|---|---|---|
| Clamping body | Aluminium | Plated |
| Housing | PA66-VO | Grey RAL 7035 |
| Screw | Steel | Nickle plated |
| **General data** | | |
| Heat deflection temperature | | 130°C - UL94-VO |
| CTI value of isolation | | 600 |
| Regulations | | IEC 60947-7-1 |
| **Electrical data** | | |
| Nominal operating current | | 950A |
| Nominal voltage | | AC 1000V/DC1500V |

| Cross section | | | |
|---|---|---|---|
| | Cu/Al | | Rated torque (Nm) |
| | Round solid (mm²) | Round stranded (mm²) | |
| Input | 95-500 | 95-500 | 30-60 |
| Output (x2) | 50-300 | 50-300 | 25-35 |

Sector shaped Al-conductors 90mm²-300mm² have to be pre-rounded with a crimping-tool.
Article numbers on request.

# IP rating

## Degrees of protection provided by enclosures (IP-Code) according to IEC/EN 60529:2000-09 (extract)

| 1st digit | Protection against contact | Protection against ingress of objects | 2nd digit | Protection against harmful ingress of water |
|---|---|---|---|---|
| 0 | No protection | No protection | 0 | No protection |
| 1 | Protected against access to dangerous parts with the back of the hand | Protected against solid foreign object size ›50mm | 1 | Protected against dripping water |
| 2 | Protected against access to dangerous parts with a finger | Protected against solid foreign object size ›12.5mm | 2 | Protected against dripping water when tilted up to 15° |
| 3 | Protected against access to dangerous parts with a tool | Protected against solid foreign object size ›2.5mm | 3 | Protected against spraying water |
| 4 | Protected against access to dangerous parts with a wire | Protected against solid foreign object size ›1mm | 4 | Protected against splashing water |
| 5 | Protected against access to dangerous parts with a wire | Protected against dust | 5 | Protected against water jets |
| 6 | Protected against access to dangerous parts with a wire | Dust tight | 6 | Protected against powerful water jets |
| - | - | - | 7 | Protected against temporary immersion in water |
| - | - | - | 8 | Protected against continuous immersion in water |

**Utilization categories for fuse combination units in accordance with IEC/EN 60947-3:2010-02, VDE 0660 Part 107**

**AC**

| Utilization category | Typical applications | Verification of electrical endurance | | | | | | | Verification of making and breaking capacities | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Make | | | | Break | | | Make | | | | Break | | |
| | | $I_e$ A | $I$ / $I_e$ | $U$ / $U_e$ | cos Φ | $I_c$ / $I_e$ | $U_r$ / $U_e$ | cos Φ | $I_e$ A | $I$ / $I_e$ | $U$ / $U_e$ | cos Φ | $I_c$ / $I_e$ | $U_r$ / $U_e$ | cos Φ |
| AC-20A(B) [1] | Connecting and disconnecting under no-load conditions | [3] | [2] | [2] | [2] | [2] | [2] | [2] | [3] | [2] | 1.05 | [2] | [2] | 1.05 | [2] |
| AC-21A(B) [1] | Switching of resistive loads, including slight overloads | [3] | 1 | 1 | 0.95 | 1 | 1 | 0.95 | [3] | 1.5 | 1.05 | 0.95 | 1.5 | 1.05 | 0.95 |
| AC-22A(B) [1] | Switching of mixed resistive and inductive loads, including slight overloads | [3] | 1 | 1 | 0.8 | 1 | 1 | 0.8 | [3] | 3 | 1.05 | 0.65 | 3 | 1.05 | 0.65 |
| AC-23A(B) [1] | Switching of motor loads and other highly inductive loads | [3] | 1 | 1 | 0.65 | 1 | 1 | 0.65 | [4] | 10 | 1.05 | 0.45 | 8 | 1.05 | 0.45 |
| | | | | | | | | | [5] | 10 | 1.05 | 0.35 | 8 | 1.05 | 0.35 |

**DC**

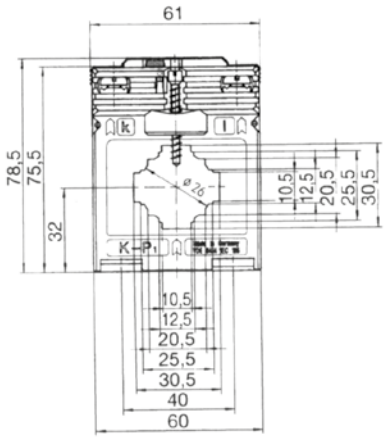
| Utilization category | Typical applications | Verification of electrical endurance | | | | | | | Verification of making and breaking capacities | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Make | | | | Break | | | Make | | | | Break | | |
| | | $I_e$ A | $I$ / $I_e$ | $U$ / $U_e$ | L/R ms | $I_c$ / $I_e$ | $U_r$ / $U_e$ | L/R ms | $I_e$ A | $I$ / $I_e$ | $U$ / $U_e$ | L/R ms | $I_c$ / $I_e$ | $U_r$ / $U_e$ | L/R ms |
| DC-20A(B) [1] | Connecting and disconnecting under no-load conditions | [3] | [2] | [2] | [2] | [2] | [2] | [2] | [3] | [2] | 1.05 | [2] | [2] | 1.05 | [2] |
| DC-21A(B) [1] | Switching of resistive loads, including slight overloads | [3] | 1 | 1 | 1 | 1 | 1 | 1 | [3] | 1.5 | 1.05 | 1 | 1.5 | 1.05 | 1 |
| DC-22A(B) [1] | Switching of mixed resistive and inductive loads, including overloads (e.g. shunt motors) | [3] | 1 | 1 | 2 | 1 | 1 | 2 | [3] | 4 | 1.05 | 2.5 | 4 | 1.05 | 2.5 |
| DC-23A(B) [1] | Switching of highly inductive loads (e.g. series motors) | [3] | 1 | 1 | 0.75 | 1 | 1 | 0.75 | [3] | 4 | 1.05 | 15 | 4 | 1.05 | 15 |

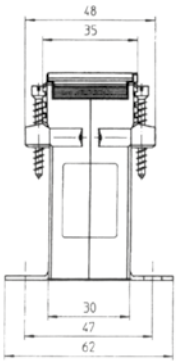
$I$ Making current
$I_c$ Breaking current
$I_e$ Rated operational current
$U$ Voltage
$U_e$ Rated operational voltage

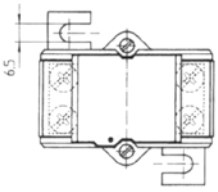
1) A: Frequent actuation, B: Occasional actuation
2) If the switching device has a making and/or breaking capacity, the values for the current and the power factor (time constants) must be stated by the manufacturer.
3) All values
4) $I_e \leq 100A$
5) $I_e > 100A$

# DIMENSIONS

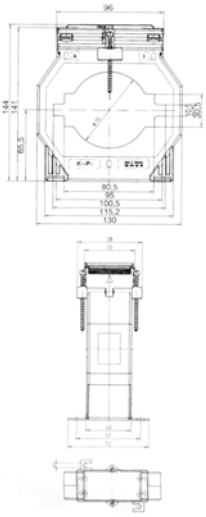
ASK31.3



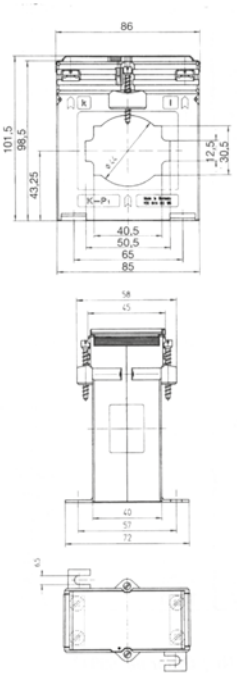



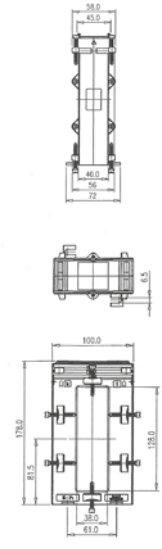

ASK101.4



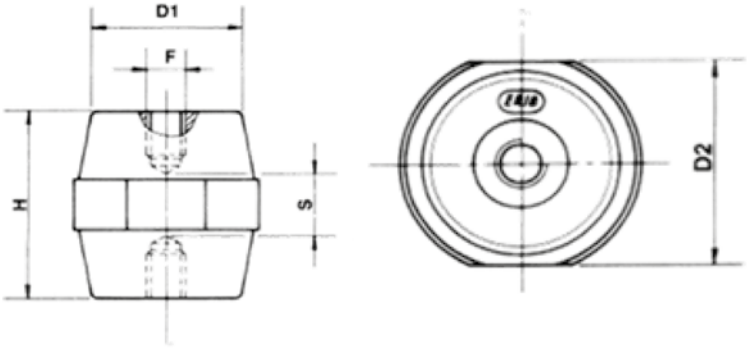
ASK51.4




ASK128.4

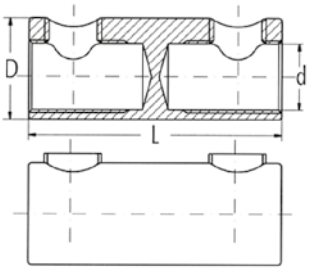


## DB Standoff Insulators

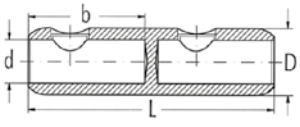



| | F | H | D1 | D2 | S |
|---|---|---|---|---|---|
| **DB25** | M6 | 25.2 | 15 | 19 | 9 |
| **DB34** | M8 | 35 | 28 | 32 | 10 |
| **DB34** | M10 | 35 | 28 | 50 | 10 |
| **DB50** | M10 | 51 | 29 | 36 | 20 |
| **DB65** | M10 | 63.5 | 35 | 41 | 30 |

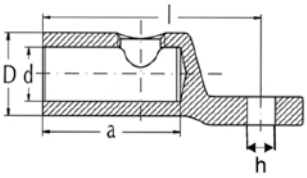
## Shear head bolt connectors & lugs




| | L | D | d |
|---|---|---|---|
| **ESLJ6-50** | 54 | 20 | 11 |
| **ESLJ35-95** | 58 | 31 | 20 |
| **ESLJ95-240** | 119 | 38 | 26 |
| **ESLJ150-300** | 130 | 43 | 29 |




| | L | D | d |
|---|---|---|---|
| **ESMJ10-95** | 70 | 25 | 14 |
| **ESMJ95-240** | 120 | 34 | 20.5 |




| | L | D | d | h | Palm Width |
|---|---|---|---|---|---|
| **ESAL6-50** | 50 | 20 | 10 | 10.3 | 20 |
| **ESAL50-95** | 74 | 25 | 15 | 10.5 | 25 |
| **ESAL95-185** | 85 | 30 | 19 | 12.5 | 30 |
| **ESAL150-300** | 114 | 42 | 29 | 12.5 | 42 |
| | | | | | |
| **ESML10-95** | 60 | 26 | 14 | 13 | 26 |
| **ESML95-240** | 103 | 34 | 20 | 17 | 34 |