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PRODUCT SHORTFORM

# **Furse® Earthing & Lightning Protection**

## UK solutions overview



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**Furse® Earthing & Lightning Protection provides a complete solution for safeguarding against lightning risk. From our own designed and manufactured products, through to risk assessment and systems design advice, Furse offers a renowned total solution for earthing and lightning protection.**

# Furse® Earthing & Lightning Protection

Our reach & expertise

Furse® Earthing & Lightning Protection is part of ABB's Installation Products division. With a heritage of over 130 years, the Furse® brand is synonymous with earthing and lightning protection, and is recognised worldwide for its Total Solution.



The **Furse Total Solution** incorporates all customer needs for earthing & lightning protection, including:

- Structural lightning protection systems
- Earthing for lightning protection, power and telecommunications systems
- Transient overvoltage protection
- Customer project consultations, technical guidance and system design

The Total Solution delivers the most complete and effective protection against lightning and earth fault current risk, both safeguarding life and ensuring continuous, normal operation of electrical and electronic systems.

Acquired by the ABB Group in 2012, and benefitting from ABB's wider network, the Furse brand has now become an established world leader in earthing and lightning protection, with products specified and installed in many prestigious projects globally.

## Why choose Furse products and services?

Being an integral part of ABB reinforces our commitment to quality, service and to providing solutions which deliver safety and protection of people, structures and electrical services within the built environment.

Furse products and services aim to deliver customer value in key areas:

### • **Reliability & ease of installation**

Furse products are manufactured from high quality materials within an ISO 9001 environment, to ensure long lasting performance, and are designed for easiest possible installation

### • **Convenience & support**

Furse products are readily available through our distributors worldwide, and our sales are supported both locally and globally by technical guidance and support

### • **Expertise & experience**

Our time served technical engineers provide specific advice on customers' earthing and lightning protection concerns, and can provide drawings and system designs to any recognised standard.



# The value of earthing & lightning protection

Lightning is one of nature's most powerful and destructive phenomena. Lightning strikes present a real and significant threat to life, to the structures in which we live and work, and to the electronic systems which support us in our daily lives.

- 01 Data centres.
- 02 Trainside substations.
- 03 Wind farms.
- 04 Oil & Gas.
- 05 Water treatment.
- 06 Telecommunications.
- 07 Healthcare.
- 08 Substations.

Lightning contains awesome amounts of electrical energy. Lightning discharges have been measured from several thousand to over 200,000 Amps (enough to light half a million 100 Watt bulbs) and even though of a very short duration, can cause tremendous damage and destruction.

Lightning can have devastating consequences:

- **Direct lightning strikes** damage structures, and create fire, explosion and electric shock hazards
- **Indirect lightning** (up to a kilometre away) creates transient overvoltages which degrade electronic systems and disrupt essential services

The effects of a direct strike are obvious and immediately apparent - buildings damaged, trees blown apart, personal injuries and even loss of life.

However, the secondary effects of lightning – the short duration, high voltage spikes called transient overvoltages - can, and do, cause equally catastrophic, if less visually obvious, damage to electronic systems within structures.

## The need for a Total Solution

National and International lightning protection standards now stress the need for a comprehensive solution encompassing both structural lightning and electronic systems protection using Surge Protection Devices (SPDs).

Simply put, a structural lightning protection system cannot and will not protect electronic systems from lightning currents and transient overvoltages.

Earthing standards demand critical safety of the electrical installation and the personnel at site. Both quality of design and product material are paramount.

This is why we advocate our Total Solution to earthing and lightning protection - an approach which delivers effective life safety, together with long lasting, reliable protection of a structure and the electronic systems within.



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### Structural lightning protection

From Furse air termination systems including air rods and strike plates to capture lightning strikes, through to our comprehensive range of down conductors and lightning protection components which channel lightning energy safely to an earth termination network.

This includes:

- Air termination systems
- Lightning protection conductors
- Conductor clips, clamps and holdfasts
- Bimetallic connection components



### Earthing

The combination of Furse earth electrodes, clamps, conductors and equipotential bonding bars which provides lightning with an effective, low resistance route from the lightning protection system to earth.

This includes:

- Earth rods and conductor systems
- Mechanical earth clamps and bonds
- FurseWELD exothermic welding
- Earth bars and equipotential bonding

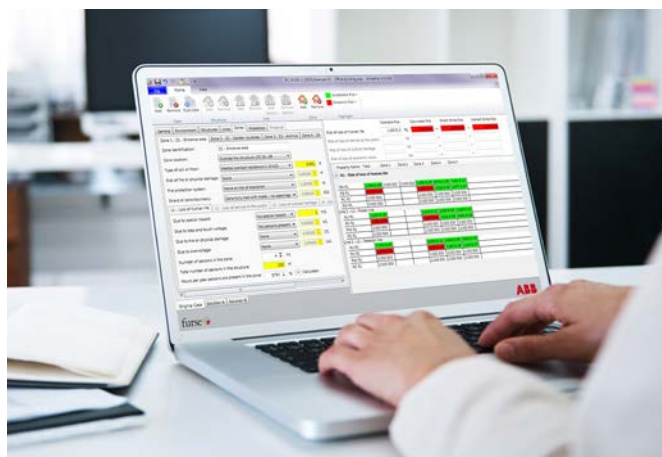


### Electronic systems protection

Our exhaustive range of equipotential bonding and transient overvoltage SPDs providing fully coordinated protection against transient overvoltages on all incoming and outgoing metallic service lines including power data, signal & telecoms.

This includes:

- Lightning equipotential bonding SPDs
- Mains power transient overvoltage SPDs
- Data, signal & telecommunication lines SPDs
- DC power & photovoltaic systems SPDs



### Technical support

Furse technical design teams ensure all designs for lightning protection, earthing and transient overvoltage protection meet relevant national and international standards, whilst our sales engineers provide key updates on lightning protection matters.

Services include:

- Lightning protection system design
- Site surveys & earthing analysis
- Lightning protection seminars & training
- Technical guides & StrikeRisk software

# Technical support, advice & design

## Our services

National and international standards indicate the requirements for design and installation of lightning protection and earthing systems.

Given the complexity of these standards, confusion and misinterpretation can easily lead to project delays, budget overruns and costly extra time on site.

Our aim is to help customers to avoid these risks, by fully supporting our Furse product sales with a range of high quality technical support services.

### Furse technical services

Furse technical services team actively participates in the development of national and international standards, and offers the ideal starting point for customers confronted by the challenges found in complex lightning protection projects.

Our engineers can provide advice and assistance on all aspects of lightning protection, transient overvoltage and earthing systems, including:

- Structural lightning and transient overvoltage protection system design
- Earthing design
- Supply of comprehensive drawings
- Soil resistivity surveys
- Full earth modelling analysis
- Earth resistance measuring
- Bespoke in-house and hosted training seminars

Using the latest computer aided design & draughting software we can produce detailed or budgetary earth electrode and lightning protection systems designs, in compliance with any given standard and whatever the complexity of system required.

### Structural lightning and transient overvoltage protection

In order for us to design a structural and/or transient overvoltage lightning protection system, we need the following information:

- Design standard, e.g. BS EN 62305, NFPA 780, IEC 62305
- A dimensional roof plan & external elevations
- Construction details, e.g. steelwork, reinforced concrete, roofing materials, etc.
- A single line diagram indicating voltage and current for each electrical system, e.g. power, data, telephones, fire alarms, CCTV
- Details of essential equipment, e.g. network servers, PLC controllers

### Power earthing systems

There are a number of recognised national and international standards governing the provision of earthing systems. Our technical experience allows us to provide designs to any of these standards.

To design a power earth electrode system, we need the following information:

- Design standard, e.g. BS 7430, BS 7350, BS 7354, Ansi IEEE Std 80, ENA TS 41-24 etc.
- A dimensional site plan
- Overall electrical single line diagram
- Soil resistivity survey results
- Earth fault current magnitude (due consideration should be given to the proportion of current flowing through cable sheaths or the aerial earth wires of overhead transmission lines)
- Earth fault current duration



Lightning protection solutions.



Soil resistivity surveys.



Analysis & earthing design.



Earth resistance testing.

**Customer site surveys**

Proper site surveys and analysis complement fully our in-house service.

Through collation of all relevant information from site, including soil resistivity measurements and earthing analysis, our engineers can produce bespoke earthing designs complete with drawings, calculations and a detailed report, along with a structural lightning protection system if required.

**Soil resistivity surveys**

A comprehensive soil resistivity survey is key to creating an effective earthing system, as inadequate or erroneous soil resistivity readings are likely in a flawed design.

Furse site surveys take multiple accurate soil resistivity readings at various depths across the site. As these results form the basis of the whole earthing design, the experience of our engineers is critical in ensuring correct implementation of the test data.

**Full earthing analysis**

Full earthing analysis uses state-of-the-art technology to determine the step and touch voltages, earth potential rise and hot/cold site classification of the site generated by the initial design.

**Earth resistance measurement**

Earth resistance measurement is essential to accurately determine that the installed earthing system meets the anticipated criteria laid out in the initial design.

Our technicians ensure all measurements are correctly taken and interpreted, so that the true resistance of the earthing system can be defined precisely.

**The benefits of coming to Furse**

There are many benefits of coming to Furse for earthing, lightning and electronic systems protection design, including:

- Specialist advice from a fully qualified technical team, which focuses solely on lightning protection issues and concerns
- Active contribution to national and harmonised European/ international standards ensures our engineers remain at the forefront of new developments in lightning protection
- Designs that comply with all relevant standards – national and international
- Our responsibility for providing a design that is safe
- Experience and the software to provide an 'optimum' design – one that doesn't use more material than is necessary - saving you money
- Manufacturing experience & expertise – utilising our knowledge of the products available to provide a tailored design that can be installed using the most appropriate and up-to-date products
- In addition to technical support and supply of components, where necessary we can also provide for the installation of earthing and lightning protection systems via our partnerships with specialist installers






## Conductors

Bare conductors, bare stranded & tinned conductors


### Bare copper tape




	Part no.	Conductor size (mm)
	TC015	20 x 1.5
	TC020	20 x 3
	TC020/100	20 x 3
	TC026-FU	25 x 2
	TC030	25 x 3
	TC030/50	25 x 3
	TC030-UL	1" x 1/8"
	TC035	25 x 4
	TC040	25 x 6
	TC042	30 x 3
	TC044	30 x 4
	TC043-FU	30 x 5
	TC045	31 x 3
	TC048	31.5 x 4
	TC050	31 x 6
	TC055	38 x 3
	TC060-FU	38 x 5
	TC065	38 x 6
	TC067	40 x 3
	TC066	40 x 4
	TC071	40 x 5
	TC068	40 x 6
	TC070	50 x 3
	TC075	50 x 4
	TC078	50 x 5
	TC080	50 x 6
	TC090	50 x 7
	TC092	50 x 8
	TC093	75 x 6

\*Certification / Standards: UL 96. Part numbers with UL suffix only.


### Bare aluminium tape

	Part no.	Conductor size (mm)
	TA020	20 x 3
	TA030	25 x 3
	TA040	30 x 3
	TA042	25 x 6
	TA068	40 x 6
	TA080	50 x 6

### Bare stranded copper cable


	Part no.	Cross sectional area (mm²)
	<b>Soft drawn stranded copper cable</b>	
	CB016	16
	CB025	25
	CB035	35
	CB050-FU	50
	CB070	70
	CB095	95
	CB120-FU	120
	CB150-FU	150
	CB185	185
	CB240	240
	CB300-FU	300
	CB400-FU	400
	<b>Hard drawn stranded copper cable</b>	
	CB071	70

### Bare & tinned solid circular

	Part no.	Diameter (mm)
	<b>Copper conductor</b>	
	CD035	Ø 8
	<b>Aluminium conductor</b>	
	CD080	Ø 8
	<b>Tinned copper conductor</b>	
	CD235	Ø 8

### Tinned copper tape




	Part no.	Conductor size (mm)
	TC220	20 x 3
	TC225-FU	12.5 x 1.5
	TC230	25 x 3
	TC230-UL	1" x 1/8"
	TC239	30 x 2
	TC240	25 x 6
	TC245	31 x 3
	TC260	38 x 5
	TC266	40 x 4
	TC280	50 x 6

\*Certification / Standards: UL 96. Part numbers with UL suffix only.


## Conductors

### Hard drawn bar & PVC covered conductors


#### Hard drawn copper bar

	Part no.	Overall nominal size (mm)
	BA205	25 x 3
	BA210	25 x 6
	BA225	38 x 6
	BA230	50 x 6
	BA235	50 x 10
	BA240	75 x 6
	BA250-FU	100 x 6


#### PVC covered aluminium tape

	Part no.	Conductor size (mm)	Colour range
	TA105	25 x 3	Black
	TA110	25 x 3	Green
	TA115	25 x 3	Grey
	TA120	25 x 3	Stone
	TA125	25 x 3	White
	TA130	25 x 3	Brown
	TA140	25 x 6	Green


#### PVC covered copper tape

	Part no.	Conductor size (mm)	Colour range
	TC105-FU	25 x 3	Black
	TC105/50	25 x 3	Black
	TC110	25 x 3	Green
	TC110/50	25 x 3	Green
	TC115-FU	25 x 3	Grey
	TC115/50	25 x 3	Grey
	TC116-FU	25 x 3	Dark grey
	TC116/25	25 x 3	Dark grey
	TC120-FU	25 x 3	Stone
	TC120/50	25 x 3	Stone
	TC125-FU	25 x 3	White
	TC125/50	25 x 3	White
	TC130	25 x 3	Brown
	TC130/50	25 x 3	Brown
	TC140-FU	25 x 6	Green
	TC145	50 x 6	Green

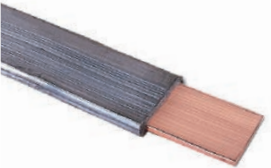
#### Green & yellow PVC covered copper tape

	Part no.	Conductor size (mm)
	TC111-FU	25 x 3
	TC111/50	25 x 3


#### Green LSOH covered copper tape

	Part no.	Conductor size (mm)
	TC910	25 x 3
	TC910/50	25 x 3
	TC940	25 x 6
	TC980	50 x 6

#### Lead covered copper tape

	Part no.	Conductor size (mm)
	TC330	25 x 3

#### Green & yellow PVC insulated stranded copper cable

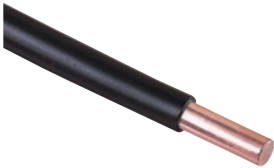





	Part no.	Cross-sectional area (mm <sup>2</sup> )
	CC016	16
	CC025	25
	CC035	35
	CC050	50
	CC070	70
	CC095	95
	CC120-FU	120
	CC150-FU	150
	CC185	185
	CC240	240
	CC300	300
	CC400-FU	400









Conductors

PVC covered conductors & guards




PVC covered copper solid circular

	Part no.	Colour range
	CD036	Black 
	CD038	Grey 
	CD039	Stone 
	CD040	White 
	CD041	Brown 


PVC covered aluminium solid circular

	Part no.	Colour range
	CD081	Black 
	CD083	Grey 
	CD084	Stone 
	CD085	White 
	CD086	Brown 

PVC protective down conductor guard

	Part no.	Length (mm)	Colour range
	GC205	3,000	Black 
	GC215	3,000	Grey 
	GC220	3,000	Stone 
	GC225	3,000	White 
	GC230	3,000	Brown 

Anti-vandal down conductor guard

	Part no.	Length (mm)
	AV005	3,000



## Air termination

Air terminals, bases, brackets & couplings

### Air rod

Part no.	Rod length (mm)	Rod diameter (mm)	Thread size	Conductor material
RA215*	500	Ø 15	M16	Copper
RA215-600	600	Ø 15	M16	Copper
RA225*	1,000	Ø 15	M16	Copper
RA230	1,500	Ø 15	M16	Copper
RA240	2,000	Ø 15	M16	Copper
RA250-FU	3,000	Ø 15	M16	Copper
RA015	500	Ø 15	M16	Aluminium
RA025	1,000	Ø 15	M16	Aluminium
RA030	1,500	Ø 15	M16	Aluminium
RA040	2,000	Ø 15	M16	Aluminium
RA050	3,000	Ø 15	M16	Aluminium
RA400-FU	500	Ø 10	M10	Copper
RA402	1,000	Ø 10	M10	Copper
RA080	500	Ø 10	M10	Aluminium
RA085	1,000	Ø 10	M10	Aluminium

\*Certification / Standards: UL 96.

### Air rod base



Part no.	Air rod diameter (mm)	Max. conductor width (mm)	Conductor material
SD105-H*	Ø 15	25	Copper
SD003-H	Ø 15	25	Aluminium
SD120	Ø 15	50	Copper

\*Certification / Standards: UL 96.

### Flat saddle

Part no.	Rod diameter (mm)	Conductor diameter (mm²)	Conductor material
SD155	Ø 15	50	Copper
SD160	Ø 15	70	Copper
SD165	Ø 15	95	Copper

### Ridge saddle

Part no.	Rod diameter (mm)	Max. conductor width (mm)	Conductor material
SD015	Ø 15	31	Aluminium
SD115	Ø 15	31	Copper

### Horizontal or vertical air rod base

Part no.	Rod diameter (mm)	Thread size	Conductor material
SD307	Ø 8	M10	Copper
SD007	Ø 8	M10	Aluminium
SD305	Ø 8	M10	Copper
SD005	Ø 8	M10	Aluminium



### Rod to conductor coupling

Part no.	Rod diameter (mm)	Rod material
For use with flat tape conductor		
CG600	Ø 15	Copper
CG500	Ø 15	Aluminium
For use with stranded conductor		
CG705	Ø 15	Copper



### Rod brackets

Part no.	Rod diameter (mm)	Rod material
BR105	Ø 15	Copper
BR005	Ø 15	Aluminium



### Multiple point

Part no.	Rod diameter (mm)	Rod material
RA600	Ø 15	Copper
RA500	Ø 15	Aluminium



## Air termination

Multiple point, strike pad & free-standing air termination

### Air rod base for trapezoidal roofs



Part no.	Conductor size (mm)	Material
TZ405	25 x 3 mm / Ø 8	Copper
TZ407	25 x 3 mm / Ø 8	Aluminium

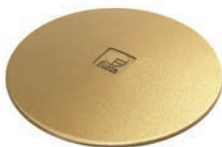
### Free-standing interception pole base frame



Part no.	Frame type	Dimension (mm)
499000-FU	Square base	650 x 650
499005-FU	Tripod base	1350 x 1350
499006-FU	Tripod base	1850 x 1850
499007-FU	H shaped base	1850 x 1850

Dimensions are approximate and include concrete base dimensions.

### Strike pad



Part no.	Conductor material
PL010	Copper
PL005	Aluminium
<b>Accessories</b>	
SM005	Copper stem for use with PL010

### Free-standing interception pole



Part no.	Pole height (m)	Pole diameter (mm)	Pole make up
912000-FU	3	Ø 10-42	2 piece
912001-FU	3.5	Ø 10-42	2 piece
912002-FU	4	Ø 10-42	2 piece
912003-FU	4.5	Ø 10-42	2 piece
912004-FU	5	Ø 10-42	2 piece
912005-FU	5.5	Ø 10-42	2 piece
912006-FU	6	Ø 16-60	3 piece
912007-FU	6.5	Ø 10-60	3 piece
912008-FU	7	Ø 16-60	3 piece
912009-FU	7.5	Ø 10-60	3 piece
912010-FU	8	Ø 16-60	3 piece
912011-FU	9	Ø 10-60	3 piece
912013-FU	10	Ø 10-60	3 piece

### Free-standing interception pole base



Part no.	Description	Weight each (kg)
499100-FU	Square concrete base 300 x 300 x 60 mm	12
499101-FU	Square concrete base 300 x 300 x 80 mm	16
103103-FU	Circular concrete base with M16 insert	12
103101-FU	Circular concrete base with M16 insert	16
103110-FU	Circular concrete base with M16 insert	20
103118-FU	Circular concrete base with M16 insert	25


#### Accessories

103098-FU	Protective PE-EVA tray for circular concrete blocks
919828-FU	Stainless steel clamp for connecting 25 x 3 mm copper tape to 5-19 mm thickness steel


## Conductor network

### Conductor clips


#### Tape clip

	Part no.	Conductor width (mm)	Conductor thickness (mm)
<b>For use with bare copper</b>			
	CP205	20	3
	CP210	25	3-4
	CP220	25	5-6
	CP230	30-32	3-4
	CP235	30-32	5-6.5
	CP240	38-40	3-4
	CP245	38-40	5-6.5
	CP255	50	3-4
	CP260	50	5-6.5
<b>For use with PVC covered copper</b>			
	CP215	25	3-4
	CP225	25	6
	CP265	50	6
<b>For use with lead covered copper</b>			
	CP305	25	3
<b>For use with bare aluminium</b>			
	CP105	20	3
	CP110	25	3-4
	CP125	50	6
<b>For use with PVC covered aluminium</b>			
	CP115	25	3
	CP130	50	6

#### Pressed tape clip


	Part no.	Conductor size (mm)
<b>For use with bare copper</b>		
	CP510	20 x 3
	CP515	25 x 3
	<b>For use with bare aluminium</b>	
	CP405	20 x 3
	CP410	25 x 3
	CP415	25 x 6
<b>For use with PVC covered tape</b>		
	CP517	25 x 3

#### One hole cable clip

	Part no.	Conductor size (mm)	Conductor material
<b>For use with solid circular conductor</b>			
	CP905	Ø 8	Copper
	CP925	Ø 8	Aluminium
	CP915	Ø 10*	Copper
	CP935	Ø 10*	Aluminium
<b>For use with stranded conductor</b>			
	CP910	50 mm <sup>2</sup>	Copper
	CP915	70 mm <sup>2</sup>	Copper
	CP920	95 mm <sup>2</sup>	Copper


\*PVC covered Ø8 mm conductor.

#### Heavy duty cast cable saddle

	Part no.	Conductor size (mm)	Conductor material
<b>For use with solid circular conductor</b>			
	CP805	Ø 8	Copper
	CP806	Ø 8	Aluminium
	CP815	Ø 10*	Copper
	CP816	Ø 10*	Aluminium
<b>For use with stranded conductor</b>			
	CP810	50 mm <sup>2</sup>	Copper
	CP815	70 mm <sup>2</sup>	Copper
	CP835	95 mm <sup>2</sup>	Copper
	CP840	120 mm <sup>2</sup>	Copper

\*PVC covered Ø8 mm conductor.

#### Non-metallic tape clip


	Part no.	Conductor size (mm)	Colour
<b>For use with bare tape</b>			
	CP005	20 x 3	Brown
	CP010	20 x 3	Grey
	CP015	25 x 3	Brown
	CP020	25 x 3	Grey
	CP065	50 x 6	Brown
	<b>For use with PVC covered tape</b>		
	CP025	25 x 3	Brown
	CP030	25 x 3	Black
	CP033	25 x 3	Dark grey
	CP035	25 x 3	Green
	CP040	25 x 3	Grey
	CP045	25 x 3	Stone
	CP050	25 x 3	White



## Conductor network


### Conductor clips

#### Non-metallic push-in clip


	Part no.	Conductor size (mm)	Colour
	<b>For use with bare solid circular conductor</b>		
	CP887	Ø 8	Brown
	CP872	Ø 8	Grey
	<b>For use with PVC covered solid circular conductor</b>		
	CP886	Ø 10*	Brown
	CP861	Ø 10*	Black
	CP871	Ø 10*	Grey
	CP876	Ø 10*	Stone
	CP881	Ø 10*	White

\*PVC covered Ø8 mm conductor.


#### Self adhesive tape clip

	Part no.	Conductor size (mm)	Colour
	<b>For use with bare tape</b>		
	CA015-FU	25 x 3	Brown
	CA020-FU	25 x 3	Grey
	<b>For use with PVC covered tape</b>		
	CA025-FU	25 x 3	Brown
	CA030-FU	25 x 3	Black
	CA040-FU	25 x 3	Grey
	CA045-FU	25 x 3	Stone
	CA050-FU	25 x 3	White

#### Glue down tape clip


	Part no.	Conductor size (mm)	Colour
	<b>For use with bare tape</b>		
	GD015	25 x 3	Brown
	GD020	25 x 3	Grey
	<b>For use with PVC covered tape</b>		
	GD025	25 x 3	Brown
	GD030	25 x 3	Black
	GD040	25 x 3	Grey
	GD045	25 x 3	Stone
	GD050	25 x 3	White

#### Self adhesive push-in clip

	Part no.	Conductor size (mm)	Colour
	<b>For use with bare solid circular conductor</b>		
	CA872	Ø 8	Brown
	CA887	Ø 8	Grey
	<b>For use with PVC covered solid circular conductor</b>		
	CA886	Ø 10*	Brown
	CA861	Ø 10*	Black
	CA871	Ø 10*	Grey
	CA876	Ø 10*	Stone
	CA881	Ø 10*	White


\*PVC covered Ø8 mm conductor.

#### Glue down push-in clip

	Part no.	Conductor size (mm)	Colour
	<b>For use with bare solid circular conductor</b>		
	GD887	Ø 8	Brown
	GD872	Ø 8	Grey
	<b>For use with PVC covered solid circular conductor</b>		
	GD886	Ø 10*	Brown
	GD861	Ø 10*	Black
	GD871	Ø 10*	Grey
	GD876	Ø 10*	Stone
	GD881	Ø 10*	White

\*PVC covered Ø8 mm conductor.

#### Solvent weldable tape clip









	Part no.	Conductor size (mm)	Colour
	<b>For use with bare tape</b>		
	CW015-FU	25 x 3	Brown
	CW020-FU	25 x 3	Grey
	<b>For use with PVC covered tape</b>		
	CW025-FU	25 x 3	Brown
	CW030-FU	25 x 3	Black
	CW040-FU	25 x 3	Grey
	CW045-FU	25 x 3	Stone
	CW050-FU	25 x 3	White

Clips for solid circular conductor available to order.

## Conductor network


### Conductor clips & accessories

#### Heat weldable clip for PVC roofing









	Part no.	Conductor size (mm)	Colour
	For use with bare tape		
	HW015-FU	25 x 3	Brown 
	HW020-FU	25 x 3	Grey 
	For use with PVC covered tape		
	HW025-FU	25 x 3	Brown 
	HW030-FU	25 x 3	Black 
	HW040-FU	25 x 3	Grey 
	HW045-FU	25 x 3	Stone 
	HW050-FU	25 x 3	White 

Clips for solid circular conductor available to special order.

#### Non-metallic clip accessories
















	Part no.	Description
	CW905	Universal welding solvent - 500 ml
	CW999	Cleaning solution - 500 ml
	CA900	Surface primer - 250 ml
	DT100	For use with adhesive and weldable tape clips

#### Heat weldable clip for TPO/FPO roofing

	Part no.	Conductor size (mm)	Colour
	For use with bare tape		
	HW315	25 x 3	Brown 
	HW320	25 x 3	Grey 
	For use with PVC covered tape		
	HW325	25 x 3	Brown 
	HW330	25 x 3	Black 
	HW340	25 x 3	Grey 
	HW345	25 x 3	Stone 
	HW350	25 x 3	White 









Clips for solid circular conductor available to special order.

#### Bitumen felt roof clip

	Part no.	Conductor size (mm)	Colour	Felt colour
	For use with bare tape			
	FP015	25 x 3	Brown 	
	FP020	25 x 3	Grey 	
	For use with PVC covered tape			
	FP025	25 x 3	Brown 	
	FP030	25 x 3	Black 	
	FP040	25 x 3	Grey 	
	FP045	25 x 3	Stone 	
	FP050	25 x 3	White 	

Shade of coloured felt may vary

#### Heat weldable clip for polyethylene roofing

	Part no.	Conductor size (mm)	Colour
	For use with bare tape		
	HW415	25 x 3	Brown 
	HW420	25 x 3	Grey 
	For use with PVC covered tape		
	HW425	25 x 3	Brown 
	HW430	25 x 3	Black 
	HW440	25 x 3	Grey 
	HW445	25 x 3	Stone 
	HW450	25 x 3	White 

Clips for solid circular conductor available to special order.

## Conductor network

Circular standing seam holdfasts, puddle flange and holdfasts

### Air rod base



Part no.	Material
SC2405	25 x 3 mm bare copper tape Ø 8 mm bare copper solid circular conductor
SC2407	25 x 3 mm bare aluminium tape Ø 8 mm bare aluminium solid circular conductor

### Conductor fasteners for tape



Part no.	Conductor size (mm)	Material
SC2210	25 x 3	Copper
SC2110	25 x 3	Aluminium

### Junction clamps for tape



Part no.	Conductor size (mm)	Material
SC2105	25 x 3	Copper
SC2005	25 x 3	Aluminium

### Puddle flange



Part no.	Conductor material
PF105	Copper
PF005	Aluminium

### Slate holdfast with non-metallic tape clip



Part no.	Conductor size (mm)	DC clip Colour
<b>For use with bare tape</b>		
HF015	25 x 3	Brown
HF020	25 x 3	Grey
<b>For use with PVC covered tape</b>		
HF025	25 x 3	Brown
HF030	25 x 3	Black
HF040	25 x 3	Grey
HF045	25 x 3	Stone

### Slate holdfast with non-metallic push-in clip



Part no.	Conductor size (mm)	DC clip colour
HF176	Ø 8	Brown
HF191	Ø 8	Grey

### Glazing bar holdfast



Part no.	Maximum glazing bar width (mm)	Conductor material
HF705	12	Copper
HF710	12	Aluminium

### Back plate holdfast stem



Part no.	Conductor material
HF320	Copper
HF325-FU	Aluminium

### Pyramid holdfast




Part no.	Conductor size (mm)
HF975	Ø 8 mm solid circular




## Conductor network

### Trapezoidal holdfasts and conductor clamps


#### Junction clamps for tape

	Part no.	Conductor
	TZ105	25 x 3 mm bare copper tape
	TZ005	25 x 3 mm bare aluminium tape


#### Cable to tape square clamp

	Part no.	Conductor size	Conductor material
	CT125-FU	25 x 3 mm to 50 mm <sup>2</sup>	Copper
	CT130-FU	25 x 3 mm to 70 mm <sup>2</sup>	Copper
	CT135-FU	25 x 3 mm to 95 mm <sup>2</sup>	Copper

#### Conductor fasteners for tape


	Part no.	Conductor
	TZ210	25 x 3 mm bare copper tape
	TZ110	25 x 3 mm bare aluminium tape
	TZ040	25 x 3 mm grey PVC covered tape

#### Cable to cable square clamp


	Part no.	Conductor size (mm <sup>2</sup> )	Conductor material
	CR810-FU	50	Copper
	CR815-FU	70	Copper
	CR820-FU	95	Copper

#### Square tape clamp




	Part no.	Conductor size (mm)	Conductor material
	CT105-H	25 x 3	Copper
	CT110-H	25 x 6	Copper
	CT115-H	50 x 6	Copper
	CT005-H	25 x 3	Aluminium
	CT010	25 x 6	Aluminium

#### Square clamp


	Part no.	Conductor size (mm)	Conductor material
	CS605	Ø 8	Copper
	CS610	Ø 8	Aluminium

\*Certification / Standards: UL 96 (all parts except CT010).

#### Crossover tape clamp

	Part no.	Conductor size (mm)	Conductor material
	CX105-H	25 x 3	Copper
	CX005-H	25 x 3	Aluminium

#### Tee clamp

	Part no.	Conductor size (mm)	Conductor material
	CS505	Ø 8	Copper
	CS510	Ø 8	Aluminium

## Conductor network

### Conductor clamps and accessories

#### Jointing clamp



Part no.	Conductor size (mm)	Conductor material
CS405	Ø 8	Copper
CS410	Ø 8	Aluminium

#### Test clamp



Part no.	Conductor size (mm)	Conductor material
CN305	Ø 8	Copper
CN310	Ø 8	Aluminium

#### Test / Junction clamp



Part no.	Conductor size (mm)	Conductor material
CN105-H*	26 x 8	Copper
CN005	26 x 8	Aluminium

#### Square test clamp



Part no.	Conductor size (mm²)	Conductor material
CR855-FU	50	Copper
CR860-FU	70	Copper
CR865-FU	95	Copper

\*Certification / Standards: UL 96.

#### Plate type test clamp



Part no.	Conductor size (mm)	Conductor material
CT405	26 x 12 max	Copper

#### Stainless steel bimetallic connector



Part no.	Conductor size (mm)	Conductor size (mm)
CN810-FU	25 x 3	25 x 3
CN815-FU	8 dia.	8 dia.
CN820-FU	8 dia.	25 x 3

#### Screwdown test clamp



Part no.	Conductor size (mm)	Conductor material
CT305	26 x 8 max	Copper

#### Expansion braid bond




Part no.	Description	Conductor material
BN101	Single length	Copper
BN001	Single length	Aluminium
BN102	Cross-over	Copper
BN002	Cross-over	Aluminium


## Conductor network

### Accessories

#### Countersunk wood screws

	Part no.	Size	Material
	SW105	1½" x No.10	Zinc plated steel
	SW110	1½" x No.12	Zinc plated steel
	SW005	1½" x No.10	Brass
	SW010	1½" x No.12	Brass


#### Roundhead wood screws

	Part no.	Size	Material
	SW405	1½" x No.10	Zinc plated steel
	SW305	1½" x No.10	Brass


#### Roundhead copper nails

	Part no.	Length (mm)
	NA005	50


#### Plain washers

	Part no.	Size (mm)	Material
	WR365	6	Phosphor bronze
	WR367	10	Phosphor bronze
	WR370	12	Phosphor bronze
	WR165	6	Brass
	WR175	8	Brass
	WR167	10	Brass
	WR170	12	Brass
	WR265	6	Stainless steel 316
	WR266	8	Stainless steel 316
	WR267	10	Stainless steel 316


#### Hexagon nuts

	Part no.	Size	Material
	NU367	M10	Phosphor bronze
	NU370	M12	Phosphor bronze
	NU165	M6	Brass
	NU166	M8	Brass
	NU167	M10	Brass
	NU170	M12	Brass
	NU265	M6	Stainless steel 316
	NU266	M8	Stainless steel 316
	NU267	M10	Stainless steel 316


#### Roundhead rivets

	Part no.	Size (mm)	Material
	RV105	5 x 12	Copper
	RV110	5 x 20	Copper


#### Countersunk set screws

	Part no.	Size	Material
	SS160	M6 x 30	Brass
	SS260	M6 x 30	Stainless steel 316




#### Hexagon head set screws

	Part no.	Size	Material
	SS635	M10 x 25	Phosphor bronze
	SS640	M10 x 35	Phosphor bronze
	SS650	M12 x 25	Phosphor bronze
	SS655	M12 x 35	Phosphor bronze
	SS165	M8 x 16	Brass
	SS140	M10 x 25	Brass
	SS145	M10 x 35	Brass
	SS150	M12 x 25	Brass
	SS155	M12 x 35	Brass
	SS235	M8 x 20	Stainless steel 316
	SS240	M10 x 25	Stainless steel 316
	SS245	M10 x 35	Stainless steel 316

#### Hexagon head set screws


	Part no.	Size (mm)	Material
	WS365	6	Phosphor bronze
	WS367	10	Phosphor bronze
	WS370	12	Phosphor bronze
	WS265	6	Stainless steel 316
	WS266	8	Stainless steel 316
	WS267	10	Stainless steel 316

#### Plastic wall plugs


	Part no.	Size	Material
	PS305	No.10	Red 
	PS310	No.12	Brown 

Conductor network  
Accessories


Silfos

	Part no.	Coil size	Thickness (mm)
	FS005	50 mm x 8 m	0.12

Oxide inhibiting compound

	Part no.	Description
	CM005	Plastic 8 oz bottle

Insulating tape

	Part no.	Size
	TP120-FU	25 mm x 33 m

Waterproofing tape

	Part no.	Size
	TD005	50 mm x 10 m



## Earth electrodes

### Earth rods & seal

#### Threaded copperbond earth rod



Part no.	Nominal diameter (in)	Length (mm)
RB105	Ø ½	1,200
RB110	Ø ½	1,500
RB115	Ø ½	1,800
RB125	Ø ½	2,400
RB205-FU	Ø ⅝	1,200
RB210	Ø ⅝	1,500
RB215	Ø ⅝	1,800
RB220-FU	Ø ⅝	2,100
RB225	Ø ⅝	2,400
RB235	Ø ⅝	3,000
RB305	Ø ¾	1,200
RB310	Ø ¾	1,500
RB315	Ø ¾	1,800
RB320-FU	Ø ¾	2,100
RB325	Ø ¾	2,400
RB335	Ø ¾	3,000

#### Unthreaded copperbond earth rod



Part no.	Diameter (mm)	Length (mm)
RB005	Ø 9.0	1,200
RB107	Ø 12.7	1,500
RB203	Ø 14.2	1,200
RB213	Ø 14.2	1,500
RB236	Ø 14.2	3,000
RB317	Ø 17.2	2,000
RB326	Ø 17.2	2,400
RB336	Ø 17.2	3,000

#### Earth rod seal



Part no.	Type
<b>Earth rod seal assembly</b>	
ES300	Earth rod seal and membrane seal
<b>Earth rod seal pack</b>	
ES300-12	Seal pack for ½" (Ø 12.7 mm) Copperbond rod
ES300-58	Seal pack for ⅝" (Ø 14.2 mm) Copperbond rod
ES300-34	Seal pack for ¾" (Ø 17.2 mm) Copperbond rod
ES300-15	Seal pack for Ø 15 mm solid copper rod
ES300-16	Seal pack for Ø 16 mm stainless steel rod
ES300-20	Seal pack for Ø 20 mm solid copper rod
<b>Earth rod seal tube</b>	
ES310-03	Seal tube, 300 mm length
ES310-05	Seal tube, 500 mm length
ES310-10	Seal tube, 1,000 mm length
ES310-15	Seal tube, 1,500 mm length
ES310-20	Seal tube, 2,000 mm length
ES310-30	Seal tube, 3,000 mm length
<b>Accessory spanner set</b>	
ES320	Membrane seal torque spanner set

#### Fittings (threaded)



Part no.	Type
CG170	½" Coupling
CG270	⅝" Coupling
CG370	¾" Coupling
ST100	½" Driving stud
ST200	⅝" Driving stud
ST300	¾" Driving stud

#### Fittings (unthreaded)



Part no.	Type
CG177	12.7 mm Coupling
CG277	14.2 mm Coupling
CG377	17.2 mm Coupling
ST107	12.7 mm Driving head
ST207	14.2 mm Driving head
ST307	17.2 mm Driving head

## Earth electrodes

Earth rods, inspection pits, plate, lattice & backfill materials

### Solid copper and stainless steel earth rod

Part no.	Diameter (mm)	Length (mm)
<b>Solid copper rod</b>		
RC010	Ø 15	1,200
RC011	Ø 15	1,500
RC012	Ø 15	3,000
RC015	Ø 20	1,200
RC016	Ø 20	1,500
RC017	Ø 20	3,000
<b>Stainless steel rod</b>		
RS005	Ø 16	1,200
RS011	Ø 16	1,500
RS012	Ø 16	3,000
RS015	Ø 20	1,200
RS016	Ø 20	1,500
RS017	Ø 20	3,000
<b>Fittings</b>		<b>Type</b>
ST010	15 mm hardened steel driving stud for copper/stainless steel rod	
ST015	20 mm hardened steel driving stud for copper/stainless steel rod	
CG013	Coupling dowel for 15 mm & 20 mm copper rod	
CG005	Coupling dowel for 16 mm & 20 mm stainless steel rod	
SP010-FU	15 mm hardened steel spike for copper/stainless steel rod	
SP015-FU	20 mm hardened steel spike for copper/stainless steel rod	

### FurseCEM® conductive aggregate / Bentonite moisture retaining clay

Part no.	Description
CM035	FurseCEM®
CM040	FurseCEM® Premix*
CM045	FurseCEM® Low Density
CM050	FurseCEM® Low Density Premix*
CM015	Bentonite powder
CM020	Bentonite granules



\*Conductive earthing mix supplied with cement

### Lightweight inspection pit

Part no.	Description
PT205	Lightweight inspection pit with grey polymer lid
PT004	5 hole earth bar
<b>Accessories for polymer lid</b>	
AK005	6 mm Allen key
<b>Accessories for concrete lid</b>	
JH100	M8 x 100 mm long mild steel 'J' bolt lifting
AS100	M8 x 60 stainless steel Allen caphead screw (2 per lid)



### Concrete inspection pit

Part no.	Description
PT005	Concrete earth inspection pit
PT006	5 hole earth bar
PT007	7 hole earth bar



### Earth plate (solid copper)

Part no.	Size (mm)
PE005	600 x 600 x 1.5
PE015	900 x 900 x 1.5
PE010	600 x 600 x 3
PE020	900 x 900 x 3



### Earth mat (lattice copper)

Part no.	Size (mm)
PE110	600 x 600 x 3
PE120	900 x 900 x 3



## Earth bonds & clamps

### Mechanical clamps

#### Rod to tape clamp (type A)

Part no.	Nominal rod diameter		Max. conductor (mm)
	(in)	(mm)	
CR105	Ø ½	Ø 12.7	26 x 12
	Ø ½	Ø 16	26 x 12
	Ø ¾	Ø 20	26 x 10
CR108	Ø ⅝	Ø 16	30 x 2
	Ø ¾	Ø 20	30 x 2
CR110	Ø ⅝	Ø 16	40 x 12
CR115	Ø ⅝	Ø 16	51 x 8
CR125	Ø ¾	Ø 20	51 x 12
CR130	Ø ½	Ø 12.7	26 x 20
	Ø ⅝	Ø 16	26 x 18
	Ø ¾	Ø 20	26 x 10
	Ø 1	Ø 25	26 x 10



#### Rod to cable clamp (type G)

Part no.	Nominal rod diameter		Max. conductor (mm²)
	(in)	(mm²)	
CR505	Ø ⅝	Ø 9.5	6-35
CR510-FU	Ø ½	Ø 12.7	16-50
CR515	Ø ⅝	Ø 16	16-70
CR520	Ø ¾	Ø 20	35-95
CR525	Ø 1	Ø 25	70-150



#### 'U' bolt rod clamp (type E)

Part no.	Nominal rod/rebar diameter (mm)	Tape width (mm)
CR305	Ø 14 - 25	-
CR320	Ø 14 - 25	25
CR325	Ø 26 - 40	-
CR326	Ø 26 - 40	25
CR330	Ø 41 - 50	-



#### 'U' bolt rod clamp (type GUV)

Part no.	Nominal rod/rebar diameter (mm)	Conductor range (mm²)
CR700	Ø 12 - 20	16-70
CR705	Ø 12 - 20	70-150
CR710	Ø 25	16-70
CR740	Ø 12 - 27	185-300
CR750	Ø 25	70-150
CR750	Ø 25	150-300



#### Rod to cable clamp (type B)

Part no.	Nominal rod diameter		Rod type
	(in)	(mm)	
CR205	Ø ⅜	Ø 9.5	Copperbond
CR215	Ø ⅝	Ø 16	Copperbond
CR220	Ø ⅝	Ø 15	Solid copper
CR225	Ø ¾	Ø 20	Copperbond
CR230	Ø ¾	Ø 20	Solid copper



#### Rebar clamp

Part no.	Conductor size (mm)	Rebar dia. (mm)	Conductor material
BN150	Ø 8	Ø 8-18	Copper
BN155	Ø 8	Ø 18-38	Copper



#### Rebar to rebar connecting clip

Part no.	Rebar diameter A (mm)	Rebar diameter B (mm)
RR812	Ø 8	Ø 12
RR1616	Ø 16	Ø 16
RR2121	Ø 20	Ø 20
RR2626	Ø 25	Ø 25
RR3232	Ø 32	Ø 32
RR3838	Ø 40	Ø 40



#### Rebar to conductor connecting clip





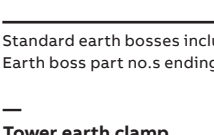
Part no.	Rebar diameter (mm)	Conductor size (mm)
<b>Rebar to flat tape</b>		
RC25-087095	Ø 25	25 x 3mm
<b>Rebar to stranded/solid circular conductor</b>		
RC812-0850	Ø 12	50 mm² or Ø 8mm
RC16-087095	Ø 16	Ø 8 mm, 50-70-95 mm²
RC20-087095	Ø 20	Ø 8 mm, 50-70-95 mm²
RC25-087095	Ø 25	Ø 8 mm, 50-70-95 mm²
RC32-087095	Ø 32	Ø 8 mm, 50-70-95 mm²
RC40-087095	Ø 40	Ø 8 mm, 50-70-95 mm²



## Earth bonds & clamps


### Earth boss, bonds & clamps

#### Earth boss


	Part no.	Length (mm)	Diameter (mm)	Thread size (mm)
	EB0111	30	Ø 30	M10
	EB0111-SS	30	Ø 30	M10
	EB1111	30	Ø 30	M10
	EB1111-SS	30	Ø 30	M10
	EB0121	30	Ø 40	M10
	EB1121	30	Ø 40	M10
	EB0121-SS	30	Ø 40	M10
	EB1121-SS	30	Ø 40	M10
	EB0221	40	Ø 40	M10
	EB1221	40	Ø 40	M10
	EB0221-SS	40	Ø 40	M10
	EB1221-SS	40	Ø 40	M10
	EB0321	50	Ø 40	M10
	EB1321	50	Ø 40	M10
	EB0321-SS	50	Ø 40	M10
	EB1321-SS	50	Ø 40	M10
	EB0001	50	Ø 50	M10
	EB1331	50	Ø 50	M10
	EB0001-SS	50	Ø 50	M10
	EB1331-SS	50	Ø 50	M10

Standard earth bosses include phosphor bronze fixings.  
Earth boss part no.s ending '-SS' include stainless steel fixings.

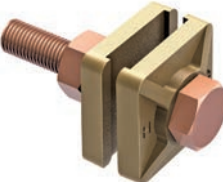
#### Tower earth clamp

	Part no.	Conductor range (mm <sup>2</sup> )	Conductor material
	BN125	16-70	Copper
	BN130	70-120	Copper
	BN300-FU	25-50	Copper
	BN305	25-50	Aluminium
	BN320	120-185	Copper
	BN325	185-240	Copper


#### B bond

	Part no.	Max tape width (mm)	Conductor material
	BN105	26	Copper
	BN005	26	Aluminium
	BN113	31	Copper
	BN114	40	Copper
	BN117	50	Copper


#### RWP bond

	Part no.	Max tape width (mm)	Conductor material
	BN115	26	Copper
	BN010	26	Aluminium


#### Watermain bond

	Part no.	Max tape width (mm)	Conductor material
	BN120	26	Copper

#### Pipe bond

	Part no.	Conductor diameter (mm)	Pipe diameter (mm)	Conductor material
	BN175	Ø 8	Ø 50-200	Copper
	BN176	Ø 8	Ø 50-200	Aluminium

#### Pipe clamp


	Part no.	Pipe diameter (in)	Pipe diameter (mm)
	3902	Ø ½-1	Ø 13-25
	3903	Ø 1¼-2	Ø 32-50
	3904	Ø 2½-3½	Ø 65-90
	3905-TB	Ø 4-5	Ø 100-125
	3906-TB	Ø 6	Ø 150
	3907	Ø 8	Ø 200
	3908	Ø 10	Ø 250



## Earth bonds & clamps

Earth points, splitbolt connector, bonds & clamps

### Single hole earth point

	Part no.	Description
	EP100	Single hole earth point with M8 hole
	EP101	Single hole earth point with M10 hole
	EP102	Single hole earth point with M12 hole
<b>Single hole earth point with single pre-welded tail</b>		
	EP105	EP100 earth point with pre-welded 500 mm earth cable
	EP106	EP101 earth point with pre-welded 500 mm earth cable
	EP107	EP102 earth point with pre-welded 500 mm earth cable

### Single hole earth point




### Two hole earth point



### Four hole earth point



### Four hole earth point


	Part no.	Description	Hole size (mm)
	EP110	Earth point only	M8 x 12
	<b>Four hole earth point with single pre-welded tail</b>		
	EP111	EP110 earth point with pre-welded 500 mm earth cable	
<b>Four hole earth point with double pre-welded tail</b>			
	EP211	EP110 earth point with pre-welded 2 x 500 mm earth cable	

### Straight setscrew cable socket

Part no.	Conductor diameter (mm)	Palm hole diameter (mm)	Conductor material
SX450	Ø 8	12	Copper
SX455	Ø 8	12	Aluminium



### Two hole earth point

	Part no.	Description
	EP115	Supplied c/w front plate for connection of 25 mm x 3 mm copper tape or 70 mm² stranded copper cable
	EP120	Supplied c/w front plate for connection of 25 mm x 3 mm copper tape or 8 mm Ø solid circular copper
	EP125	Supplied without front plate
<b>Two hole earth point with single pre-welded tail</b>		
	EP116	EP115 earth point with pre-welded 500 mm earth cable
	EP121	EP120 earth point with pre-welded 500 mm earth cable
	EP126	EP125 earth point with pre-welded 500 mm earth cable
<b>Two hole earth point with double pre-welded tail</b>		
	EP216	EP115 earth point with pre-welded 2 x 500 mm earth cable
	EP221	EP120 earth point with pre-welded 2 x 500 mm earth cable

### Type H high strength splitbolt connector

	Conductor range (mm²)			
	Main min	Main max	Tap min	Tap max
8H-FU	4	10	2.5	10
4H-FU	10	16	2.5	16
2H-FU	16	25	4	25
1H-FU	25	35	4	35
10H-FU	35	50	4	50
20H-FU	35	70	4	70
30H-FU	50	95	4	95
40H-FU	50	120	6	120
350M-FU	95	185	6	185



### Metalwork bond

Part no.	Conductor diameter (mm)	Conductor material
CS350	Ø 8	Copper
CS355	Ø 8	Aluminium



## Earth bonds & clamps

Static earth connection points, flexible braid bonds & static earth clamps

### — Eyebolt



Part no.	Nominal copperbond rod diameter (in)
BT150	$\frac{5}{8}$
BT160	$\frac{3}{4}$

### — Stainless steel earthing clamp



Part no.	Description	Jaw opening (mm)
SK010	Medium duty earthing clamp	15
SK020	Heavy duty earthing clamp	35

### — Static earth receptacle



Part no.	Conductor material
RX005	Copper

### — Stainless steel earthing clamp



Part no.	Cable length (m)	Clamp jaw opening (mm)
SK030	6.1	0 - 12
SK040	15.2	0 - 46

### — Flexible flat copper braid

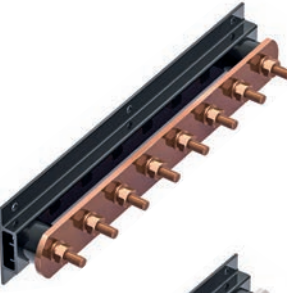
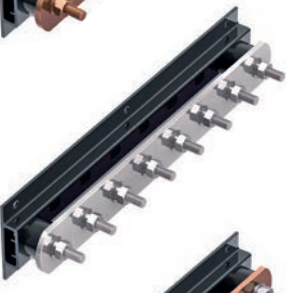
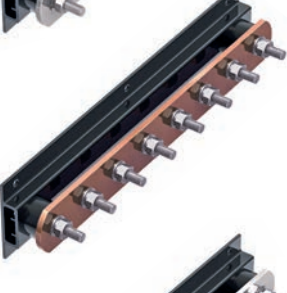


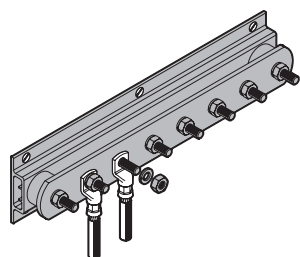
Part no.	Overall braid dimensions (mm)	Length (mm)	Hole diameter (mm)
<b>Copper braid</b>			
FBB-6-200-7	12 x 1	200	Ø 7
FBB-16-200-9	19 x 2.5	200	Ø 9
FBB-25-200-11	25 x 3	200	Ø 11
BN505	25 x 3.5	200	Ø 11
BN510	25 x 3.5	400	Ø 11
FBB-50-200-11	30 x 5	200	Ø 11
FBB-70-200-13	32 x 6	200	Ø 13
FBB-95-200-13	37 x 6	200	Ø 13
FBB-120-200-17	45 x 6	200	Ø 17
<b>Tinned copper braid</b>			
FBB-6-200-7-T	12 x 1	200	Ø 7
FBB-16-200-9-T	19 x 2.5	200	Ø 9
FBB-25-200-11-T	25 x 3	200	Ø 11
BN505-T	25 x 3.5	200	Ø 11
BN510-T	25 x 3.5	400	Ø 11
FBB-50-200-11-T	30 x 5	200	Ø 11
FBB-70-200-13-T	32 x 6	200	Ø 13
FBB-95-200-13-T	37 x 6	200	Ø 13
FBB-120-200-17-T	45 x 6	200	Ø 17

## Earth bars


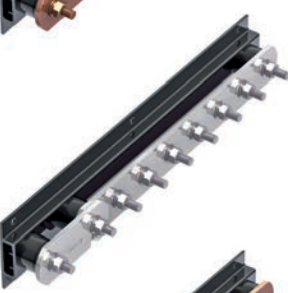

### Earth bar & earth bar with single disconnecting link

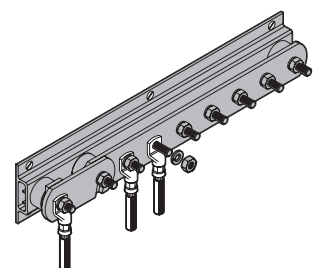
#### Earth bar

	Part no.	Description	Length (mm)
	<b>Copper earth bar</b>		
	LK245-6	6 way	400
	LK245-8	8 way	500
	LK245-10	10 way	650
	LK245-12	12 way	750
	LK245-14	14 way	850
	LK245-16	16 way	950
	LK245-18	18 way	1,050
	LK245-20	20 way	1,200
	LK245-22	22 way	1,300
	LK245-24	24 way	1,400
	LK245-26	26 way	1,500
	<b>Tinned copper earth bar</b>		
	LK245-6-T	6 way	400
	LK245-8-T	8 way	500
	LK245-10-T	10 way	650
	LK245-12-T	12 way	750
	LK245-14-T	14 way	850
	LK245-16-T	16 way	950
	LK245-18-T	18 way	1,050
	LK245-20-T	20 way	1,200
	LK245-22-T	22 way	1,300
	LK245-24-T	24 way	1,400
	LK245-26-T	26 way	1,500
	<b>Earth Bar with stainless steel fixings</b>		
	<b>Copper earth bar</b>		
	LK245-6SS	6 way	400
	LK245-8SS	8 way	500
	LK245-10SS	10 way	650
	LK245-12SS	12 way	750
	<b>Tinned copper earth bar</b>		
	LK245-6TSS	6 way	400
	LK245-8TSS	8 way	500
	LK245-10TSS	10 way	650
	LK245-12TSS	12 way	750



#### Earth bar with single disconnecting link




	Part no.	Description	Length (mm)
	<b>Copper earth bar</b>		
	LK243-6	6 way	475
	LK243-8	8 way	575
	LK243-10	10 way	725
	LK243-12	12 way	825
	LK243-14	14 way	925
	LK243-16	16 way	1,025
	LK243-18	18 way	1,125
	LK243-20	20 way	1,275
	LK243-22	22 way	1,375
	LK243-24	24 way	1,475
	LK243-26	26 way	1,575
	<b>Tinned copper earth bar</b>		
	LK243-6-T	6 way	475
	LK243-8-T	8 way	575
	LK243-10-T	10 way	725
	LK243-12-T	12 way	825
	LK243-14-T	14 way	925
	LK243-16-T	16 way	1,025
	LK243-18-T	18 way	1,125
	LK243-20-T	20 way	1,275
	LK243-22-T	22 way	1,375
	LK243-24-T	24 way	1,475
	LK243-26-T	26 way	1,575
	<b>Earth Bar with stainless steel fixings and single disconnecting link</b>		
	<b>Copper earth bar</b>		
	LK243-6SS	6 way	475
	LK243-8SS	8 way	575
	LK243-10SS	10 way	725
	LK243-12SS	12 way	825
	<b>Tinned copper earth bar</b>		
	LK243-6TSS	6 way	475
	LK243-8TSS	8 way	575
	LK243-10TSS	10 way	725
	LK243-12TSS	12 way	825

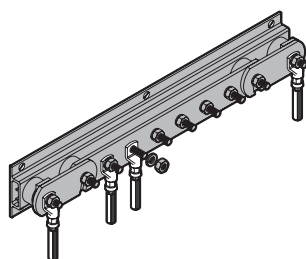


## Earth bars

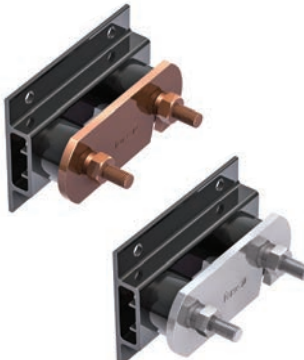
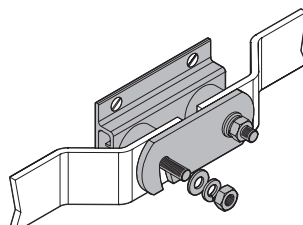
### Earth bar with twin disconnecting link & accessories

#### Earth bar with twin disconnecting link


	Part no.	Description	Length (mm)
	<b>Copper earth bar</b>		
	LK207-6	6 way	550
	LK207-8	8 way	650
	LK207-10	10 way	800
	LK207-12	12 way	900
	LK207-14	14 way	1,000
	LK207-16	16 way	1,100
	LK207-18	18 way	1,200
	LK207-20	20 way	1,350
	LK207-22	22 way	1,450
	LK207-24	24 way	1,550
	LK207-26	26 way	1,650
	LK207-28	28 way	1,800
	LK207-30	30 way	1,900
	<b>Tinned copper earth bar</b>		
	LK207-6-T	6 way	550
	LK207-8-T	8 way	650
	LK207-10-T	10 way	800
	LK207-12-T	12 way	900
	LK207-14-T	14 way	1,000
	LK207-16-T	16 way	1,100
	LK207-18-T	18 way	1,200
	LK207-20-T	20 way	1,350
	LK207-22-T	22 way	1,450
	LK207-24-T	24 way	1,550
	LK207-26-T	26 way	1,650
	LK207-28-T	28 way	1,800
	LK207-30-T	30 way	1,900
	<b>Earth Bar with stainless steel fixings and twin disconnecting links</b>		
	<b>Copper earth bar</b>		
	LK207-6SS	8 way	550
	LK207-8SS	10 way	650
	LK207-10SS	12 way	800
	LK207-12SS	14 way	900
	<b>Tinned copper earth bar</b>		
	LK207-6TSS	6 way	550
	LK207-8TSS	8 way	650
	LK207-10TSS	10 way	800
	LK207-12TSS	12 way	900



#### Earth bar accessories

	Part no.	Description
	<b>Copper earth bar</b>	
	LK004	Swan-neck link
	LK205	Disconnecting link
	<b>Tinned copper earth bar</b>	
	LK004-T	Swan-neck link
	LK205-T	Disconnecting link

#### Insulator

	Part no.	Height (mm)	Insert size
	<b>Insulator</b>		
	IN020	20	M6
	IN030	30	M6
	IN040	40	M8
	IN013	50	M10
	IN060	60	M10
	IN070	70	M12
	<b>Insulator with 2 studs and 3 nuts</b>		
	IN005	50	M10



## FurseWELD

### FurseWELD exothermic welding



Remote ignition kit - FurseWELD

Part no.	Box quantity
<b>Remote ignition kit</b>	
IU100	FurseWELD remote ignition kit, includes carrying case, ignition unit, fob, cable/block, mains charger & UK 3 pin adaptor
<b>Handle clamps</b>	
HCPK1	Single part moulds (Price Key 1)
HCPK2	Single part moulds (Price Key 2)
HCPK3	Two part moulds (Price Key 3)
HCPK3-A	With chain grip, two part moulds (Price Key 3)
HCPK3-B	Sprung, single part moulds (Price Key 3)
HCPK4	Two-part moulds (Price Key 4)
HCPK4-A	With chain grip, multi-part moulds (Price Key 4)
HCPK5	Multi-part moulds (Price Key 5)
HCPK7	Multi-part moulds (Price Key 7)
HCPK8	Multi-part moulds (Price Key 8)
<b>Hoods</b>	
SHPK4	Stainless steel hood (80x80mm)
SHPK5	Stainless steel hood (100x100mm)
<b>Strips</b>	
IS100	FurseWELD ignition strips (5pcs)

Exothermic welding powder FurseWELD

Part no.	Box quantity
15P10	20
25P10	20
32P10	20
45P10	20
65P10	10
90P10	10
115P10	10
150P10	10
200P10	10
250P10	10



FurseWELD high quality graphite moulds are designed to contain the exothermic reaction and to deliver safe, robust welded connections. Each mould is capable of producing up to 50 joints, if not more when properly maintained.

Accessories - FurseWELD

Part no.	Description
B135	Cable cleaning brush
BCM	Mould cleaning brush
BFC	Tape cleaning brush
DUXSEAL	Duxseal sealing compound (1 lb)
FG100	Flint gun
FLINTS	Replacement flints (pack of 100)
PACK-A	Packing
STM1-FU	Mould cleaning scraper
TB100-FU	Welding toolbox
TK100	Standard toolkit for bar to bar joints. Includes flint gun (FG100), tape cleaning brush (BFC), mould cleaning brush and scraper (BCM & STM1-FU)
TK200	Standard toolkit for cable to cable joints. Includes flint gun (FG100), cable cleaning brush (B135), mould cleaning brush and scraper (BCM & STM1-FU)
TK300	Remote Ignition Unit toolkit for bar to bar joints. Includes tape cleaning brush (BFC), mould cleaning brush and scraper (BCM & STM1-FU)
TK400	Remote Ignition Unit toolkit for cable to cable joints. Includes cable cleaning brush (B135), mould cleaning brush and scraper (BCM & STM1-FU)
MJ4	Mould jacket (Price Key 3 & 4)
MJ5	Mould jacket (Price Key 5)

Copper sleeve accessory - FurseWELD

Part no.	Description	Conductor size (mm <sup>2</sup> )
S102-FU	Copper sleeve	10
S103	Copper sleeve	16
S105	Copper sleeve	2.5 / 4 / 6

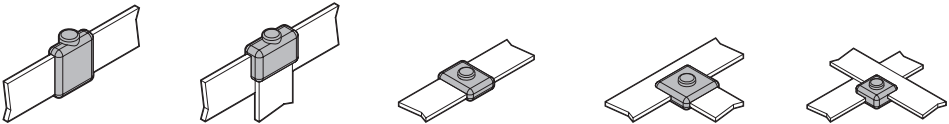




FurseWELD

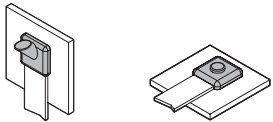
Connection selection guide

—  
Bar to bar



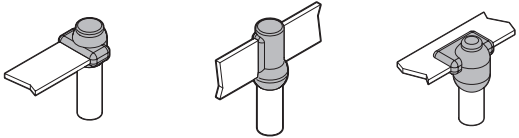
Connection Type	Type BB1	Type BB3	Type BB7	Type BB14	Type BB41
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—  
Bar to steel surface



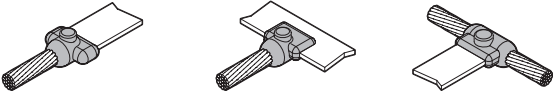
Connection Type	Type BS1	Type BS2
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—  
Bar to earth rod



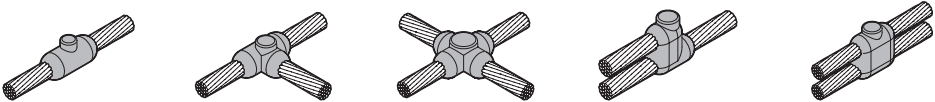
Connection Type	Type BR1	Type BR2	Type BR7
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—  
Cable to bar



Connection Type	Type CB1	Type CB4	Type CB5
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Cable to cable



Connection Type	Type CC1	Type CC2	Type CC4	Type CC6	Type CC7
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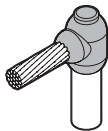
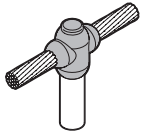
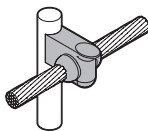
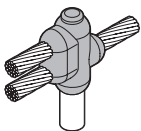
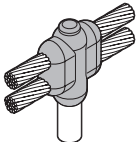
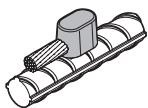
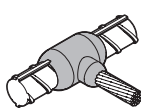
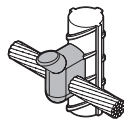
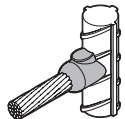
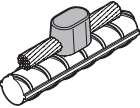
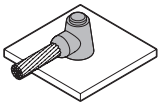
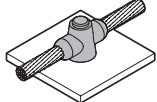
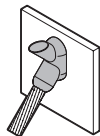
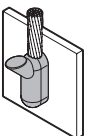
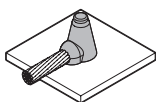
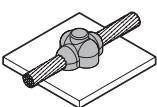
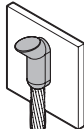
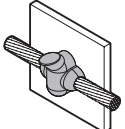
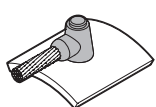
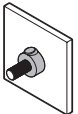
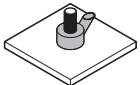
—  
Cable to cable



Connection Type	Type CC11	Type CC14
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## FurseWELD

### Connection selection guide

— Cable to earth rod					
Connection Type	Type CR1	Type CR2	Type CR3	Type CR17	Type CR24
— Cable to reinforcing bar					
Connection Type	Type CRE1	Type CRE2	Type CRE3	Type CRE6	Type CRE17
— Cable to steel surface & pipe					
Connection Type	Type CS1	Type CS2	Type CS3	Type CS7	Type CS8
— Cable to steel surface & pipe					
Connection Type		Type CS9	Type CS25	Type CS27	Type CS32
— Stud to steel surface					
Connection Type				Type RS1	Type RS2

**Conductors must be in the orientation shown to achieve the correct connection**

Furse offers technical support to assist with selection of joint type. If connections shown do not meet your requirements, please contact your local sales office for assistance.

# Mains power protection















## Product selector

The Furse ESP range of SPDs (power, data and telecom) are widely specified in all applications to ensure the continuous operation of critical electronic systems. They form part of a complete lightning protection solution to BS EN 62305.

Furse ESP M and ESP D power SPD products are Type 1+2+3 devices, making them suitable for installation at the service entrance, whilst giving superior voltage protection levels (enhanced to BS EN 62305) between all conductors or modes.



### Protection for 230/400 V TN-S or TN-C-S supplies

Supply type	Example 1	Example 2
	No external lightning protection system fitted	No external lightning protection system fitted
	Underground mains supply feed	Exposed overhead mains supply feed
		
Main distribution board (MDB)	Type 1+2+3	Type 1+2 OR Type 1+2+3
<b>3 Phase 400 V</b> Service entrance, after electricity meter (Main distribution board (MDB)). Type 1+2+3 SPDs such as the ESP M and D series are used where the MDB directly feeds critical electronics	 ESP 415 D1 Series           OR  ESP 415 M1 Series	 ESP 415T1/12.5/TNS           OR  ESP 415MT1/12.5           OR  ESP 415DT1/12.5           OR           to protect critical electronics fed from MDB ESP 415M2 Series
Sub-distribution board (SDB)	Type 1+2+3 - 3 Phase	
Located >10 m from MDB feeding electronic equipment	 ESP 415 D1 Series           OR  ESP 415 M1 Series           OR  ESP 415 CD40 (Type 2+3) Compact Series	
Final circuit equipment	For 13 A sockets (e.g. servers)	Equipment up to 32 A
Located >10 m from SDB	ESP MC ESP MC/TN/RJ11 ESP MC/Cat-5e 	ESP 240D-10A ESP 240D-32A 
Mains protectors for specific systems		
ESP PV series For Photovoltaic (solar panels) up to 1500 VDC 		ESP WT series For 690V Wind Turbines 



The active status indication informs the user of:

- Loss of power
- Loss of phase
- Excessive N-E voltage
- Reduced protection

The SPD and supply status can also be monitored remotely via the volt-free contact.

#### Product selection guide - Mains power protection

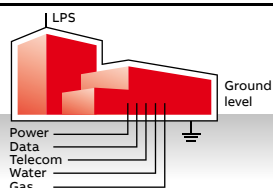
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ESP 415 D1	7TCA085460R0105	ESP 415 CD40	7TCA085460R0303
ESP 415 M1	7TCA085460R0112	ESP 240 D1	7TCA085460R0086
ESP 415 M2	7TCA085460R0119	ESP 240 M1	7TCA085460R0089
ESP 415 M4	7TCA085460R0124	ESP MC	7TCA085430R0003
ESP 415T1/25/TNS	7TCA085460R0499	ESP MC/TN/RJ11	7TCA085430R0005
ESP 415T1/12.5/TNS	7TCA085460R0496	ESP MC/Cat-5e	7TCA085430R0004
ESP 415T2/50/TNS	7TCA085460R0388	ESP 240D-10A	7TCA085460R0328
ESP 240T1/25/TNS	7TCA085400R0499	ESP 240D-32A	7TCA085460R0322
ESP 240T2/50/TNS	7TCA085460R0388	ESP 240T3/SKT	7TCA085450R0069



#### Example 3

External lightning protection system fitted

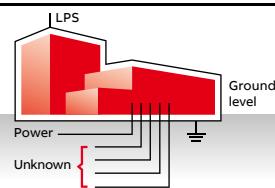
Multiple connected metallic services



#### Example 4

External lightning protection system fitted

No. of services unknown



#### Type 1+2+3



ESP 415 D1 Series

OR



ESP 415 M1 Series

#### Type 1+2 OR Type 1+2+3



For LPL I & II:  
ESP 415T1/25/TNS  
LPL III or IV:  
ESP 415T1/12.5/TNS

OR to protect critical electronics fed from MDB



For LPL I & II:  
ESP 415 M4 Series  
LPL III or IV:  
ESP 415 M2 Series

#### Type 1+2+3 - 1 Phase

ESP 240 D1 Series, or  
ESP 240 M1 Series, or  
ESP 240 CD40  
(Type 2+3)  
Compact Series



OR

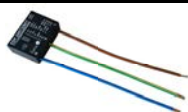
SDB located >10 m  
from MDB not  
directly feeding  
electronic equipment

**For 3 Phase 400 V**  
ESP 415T2/50/TNS  
**For 1 Phase 230 V**  
ESP 240T2/50/TNS



#### Fused spurs or single phase sockets

For single phase  
spurs/socket outlets  
up to 16 A  
ESP 240T3/SKT



ESP DC series  
For DC systems  
up to 48V
























ESP CDT2 series  
for residential  
consumer units  
and space critical  
panel boards

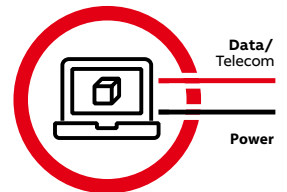


# Data & signal protection

## Product selector - Data line protection



Fieldbus/ PROFIBUS Systems				
HART Systems RS485	Screw terminals: <b>ESP RS485</b> Flat/DIN Mount 7TCA085400R0191	Screw terminals: <b>ESP SL RS485</b> Slim DIN Mount 7TCA085400R0193	Screw/Spring terminals: <b>ESP RS485 or ESP SRS485/PT</b> Multiple Lines 7TCA085400R0191 7TCA085400R0647	Screw/Spring terminals: <b>ESP RS485Q or ESP RS485Q/PT</b> Multiple Lines (DIN Mount) 7TCA085400R0192 7TCA085400R0475 (spring "Push Terminal" PT version)
4 - 20 mA current loops				
	Screw terminals: <b>ESP SL30L/4-20</b> Slim mount 7TCA085400R0070	Screw terminals: <b>ESP SE30/4-20</b> Slim mount 7TCA085400R0648		
Telephone ISDN DSL G.FAST				
	Screw terminals: <b>ESP TN</b> Flat Mount 7TCA085400R0171	Screw terminals: <b>ESP SL TN</b> Slim Mount 7TCA085400R0195	Screw/Spring terminals: <b>ESP SL TNL</b> Slim Mount with LED 7TCA085400R0226	Screw/Spring terminals: <b>ESP STN or ESP STN/PT</b> Slim Mount 7TCA085400R0652 7TCA085400R0653
2 wire systems (30 V)				
	Screw terminals: <b>ESP 30E</b> Flat Mount 7TCA085400R0104	Screw terminals: <b>ESP SL30</b> Slim Mount 7TCA085400R0067	Screw/Spring terminals: <b>ESP 30SD or ESP 30SE</b> Slim Mount 7TCA085400R0099 7TCA085400R0104	Screw/Spring terminals: <b>ESP 30Q or ESP 30Q/PT</b> Multiple Lines 7TCA085400R0107 7TCA085400R0476 (spring "Push Terminal" PT version)
Resistance Temperature Detectors (RTD) 3 wire systems				
	Screw terminals: <b>ESP RTD</b> Flat/DIN Mount 7TCA085460R0157	Screw terminals: <b>ESP SL RTD</b> Slim (DIN Mount) 7TCA085400R0232	Screw/Spring terminals: <b>ESP RTDQ or ESP RTDQ/PT</b> Multiple Lines (DIN Mount) 7TCA085400R0158 7TCA085400R0480 (spring "Push Terminal" PT version)	
3 wire systems (30 V)				
	Screw terminals: <b>ESP SL30/3W</b> Slim Mount 7TCA085400R0268	Protection for different voltages are available		
US regions UL Approved				
	Screw terminals: <b>ESP SL30</b> Slim Mount 7TCA085400R0067	Screw/Spring terminals: <b>ESP 30Q or ESP 30Q/PT</b> Multiple Lines 7TCA085400R0107 7TCA085400R0476 (spring "Push Terminal" PT version)	Protection for different voltages are available	









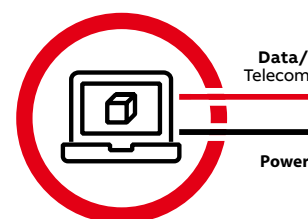
**IMPORTANT:**  
Equipment is ONLY protected against transient overvoltages if all incoming / outgoing mains and data lines have protection fitted.

Furse data and signal SPD products are Class D+C+B tested (to IEC/BS EN 61643-21), making them suitable for installation at the service entrance, whilst giving superior voltage protection levels (enhanced to BS EN 62305) between all conductors or modes.  
Furse data and signal SPDs come in a variety of formats to allow easy integration within any installation.  
Key variants offer active status indication, screw terminals and UL listing.

# Telecoms & computer line protection

## Product selector

Common applications	Service entrance protectors	Critical terminal equipment - located >20 m from service entrance
Analogue Telecom systems Twisted pair data protection see Furse Application Note AN005) Standard, for twisted pair lines	 <p><b>ESP TN Series</b> 7TCA085400R0171 <b>ESP TN/BX Series</b> 7TCA085400R0175 <b>ESP TN/2BX Series</b> 7TCA085400R0172</p>	<p><b>ESP MC/TN/RJ11 Series</b> e.g. Fax machines / Modems 7TCA085430R0005</p> 
Compact, ideal where space is a premium	 <p><b>ESP SL TN Series</b> 7TCA085400R0195</p>	
Multiple line protection in a single unit	 <p><b>ESP TNQ Series</b> 7TCA085400R0183</p>	
For BT type socket systems	 <p><b>ESP TN/JP Series</b> 7TCA085400R0177</p>	
For PBX systems terminating of LSA-Plus disconnection modules	 <p><b>ESP K10T1</b> 7TCA085400R0130 <b>ESP KT1</b> 7TCA085400R0135 <b>ESP KE10</b> 7TCA085400R0134</p>	



**IMPORTANT:**  
Equipment is ONLY protected against transient overvoltages if all incoming / outgoing mains and data lines have protection fitted.


System	Computer system protector
Computer networks with RJ45 connection	 <p><b>ESP Cat-6 Series</b> 7TCA085400R0023</p>  <p><b>ESP MC/Cat-5 Series</b> 7TCA085430R0004</p>

**Furse telecom and computer line SPD products are Class D+C+B tested** (to IEC/BS EN 61643-21), making them suitable for installation at the service entrance, whilst giving superior voltage protection levels (enhanced to BS EN 62305) between all conductors or modes. Furse SPDs come in a variety of formats to allow easy integration within any installation.


## Electronic systems protection

### Surge protection devices (SPDs) for mains power supplies


#### Mains supplies - equipotential bonding

	Part no.	Description
	ESP 415T1/25/TNS	ESP Type 1 power SPD for 3 Phase 400V, 25kA 10/350, 4 modes
	ESP 415T1/25/TNC	ESP Type 1 power SPD for 3 Phase 400V, 25kA 10/350, 3 modes
	ESP 415T1/25/TT	ESP Type 1 power SPD for 3 Phase 400V, 25kA (L-N) + 100kA (N-E) 10/350, 3+1 modes
	ESP 415T1/12.5/TNS	ESP Type 1 power SPD for 3 Phase 400V, 12.5kA 10/350, 4 modes
	ESP 415T1/12.5/TNC	ESP Type 1 power SPD for 3 Phase 400V, 12.5kA 10/350, 3 modes
	ESP 415T1/12.5/TT	ESP Type 1 power SPD for 3 Phase 400V, 12.5kA (L-N) + 50kA (N-E) 10/350, 3+1 modes
	ESP 240T1/25/TNS	ESP Type 1 power SPD for 1 Phase 240V, 25kA 10/350, 2 modes
	ESP 240T1/25/TNC	ESP Type 1 power SPD for 1 Phase 240V, 25kA 10/350, 1 mode
	ESP 240T1/25/TT	ESP Type 1 power SPD for 1 Phase 240V, 25kA (L-N) + 100kA (N-E) 10/350, 1+1 modes
	ESP 415T2/50/TNS	ESP Type 2 power SPD for 3 Phase 240V, 50kA 8/20, 4 modes
	ESP 415T2/50/TNC	ESP Type 2 power SPD for 3 Phase 240V, 50kA 8/20, 3 modes
	ESP 415T2/50/TT	ESP Type 2 power SPD for 3 Phase 240V, 50kA (L-N) + 65kA (N-E) 8/20, 3+1 modes
	ESP 240T2/50/TNS	ESP Type 2 power SPD for 1 Phase 240V, 50kA 8/20, 2 modes
	ESP 240T2/50/TNC	ESP Type 2 power SPD for 1 Phase 240V, 50kA 8/20, 1 mode
	ESP 240T2/50/TT	ESP Type 2 power SPD for 1 Phase 240V, 50kA (L-N) + 65kA (N-E) 8/20, 1+1 modes


#### Mains supplies - DIN housing

	Part no.	Description
	ESP 240 D1	Enhanced Type 1+2+3 Full Mode power SPD for 240V Single Phase supplies, Din Rail mounted
	ESP 415 D1	Enhanced Type 1+2+3 Full Mode power SPD for 415V 3 Phase supplies, Din Rail mounted
	ESP 415 DT1/12.5	Enhanced Type 1+2+3 Full Mode power SPD for 240V 3 Phase supplies, Din Rail mounted
	<b>Supplied with remote indication display</b>	
	ESP 415 D1R	Enhanced Type 1+2+3 Full Mode power SPD for 3 Phase 415V supplies, LED status indication on remote display, Din Rail mounting
	ESP RLA HD-4	4 Metre display lead for ESP D1R Series

#### Mains supplies (extra high maximum surge currents)

	Part no.	Description
	ESP 415 M2	Enhanced Type 1+2+3 Full Mode power SPD for 3 Phase 415V supplies, high surge current rating
	ESP 415 M4	Enhanced Type 1+2+3 Full Mode power SPD for 3 Phase 415V supplies, very high surge current rating


#### Mains supplies & power distribution system

	Part no.	Description
	ESP 240 M1	Enhanced Type 1+2+3 power SPD for 240V Single Phase supplies
	ESP 415 M1	Enhanced Type 1+2+3 power SPD for 415V 3 Phase supplies
	ESP 415 MT1/12.5	Enhanced Type 1+2+3 power SPD for 240V 3 Phase supplies

#### Sub-distribution board

	Part no.	Description
	ESP 240CD40	Compact Type 2+3 SPD for 240V Single Phase supplies
	ESP 415CD40	Compact Type 2+3 SPD for 415V Single Phase supplies


#### Mains protectors for specific systems

	Part no.	Description
	ESP 240CDT2/40/TT	Compact Type 2 SPD for 240V residential consumer units
	ESP 415CDT2/40/TT	Compact Type 2 SPD for 415V residential consumer units


## Electronic systems protection

### Surge protection devices (SPDs) for mains power supplies


#### Mains supplies - with remote display indication

	Part no.	Description
	ESP 415 M1R	Enhanced Type 1+2+3 power SPD for 3 Phase 415V supplies, with remote indication display
	ESP 415 M2R	Enhanced Type 1+2+3 power SPD for 3 Phase 415V supplies, 12.5KA 10/350, with remote indication display
	ESP 415 M4R	Enhanced Type 1+2+3 power SPD for 3 Phase 415V supplies, 25KA 10/350, with remote indication display
	ESP RLA-4	4 Metre display lead for ESP M1R, M2R and M4R Series


#### Mains supplies & fused connections up to 10 amps or up to 32 amps

	Part no.	Description
	<b>Protectors rated at 10 amps or less</b>	
	ESP 240D-10A	Enhanced mains SPD for 240V supplies up to 10A, with LED status indication
	ESP 240DS-10A	Enhanced mains SPD for 240V supplies up to 10A, with LED status indication and remote signal contact
	<b>Protectors rated at 32 amps or less</b>	
	ESP 240D-32A	Enhanced mains SPD for 240V supplies up to 32A, with LED status indication
	ESP 240DS-32A	Enhanced mains SPD for 240V supplies up to 32A, with LED status indication and remote signal contact

#### Mains supplies & fused connections up to 5 amps or up to 16 amps

	Part no.	Description
	<b>Protectors rated at 5 amps or less</b>	
	ESP 240-5A	Enhanced mains SPD for 240V supplies up to 5A
	ESP 240-5A/BX	Enhanced mains SPD for 240V supplies up to 5A, IP66 enclosure
	<b>Protectors rated at 16 amps or less</b>	
	ESP 240-16A	Enhanced mains SPD for 240V supplies up to 16A
	ESP 240-16A/BX	Enhanced mains SPD for 240V supplies up to 16A, IP66 enclosure
	ESP 240T3/SKT	Type 3 mains SPD for supplies up to 16A for installation behind socket outlets

#### Plug-in SPD for mains power supplies, with telephone and computer line protection options

	Part no.	Description
	ESP MC/19BK	Brackets and fixings for mounting ESP MC SPD Series To 19" racks
	ESP MC	Plug-in power SPD with filtering for 220-240V systems up to 13A with UK plug
	ESP MC/TN/RJ11	Plug-in power SPD with filtering for 220-240V systems up to 13A with UK plug and data SPD for telecom systems with RJ11 connection
	ESP MC/Cat-5e	Plug-in power SPD with filtering for 220-240V systems up to 13A with UK plug and data SPD for Cat-5E computer systems with RJ45 connection



## Electronic systems protection

Surge protection devices (SPDs) for data, signal and telephone lines

Twisted pair data communication & signal lines (lower in-line resistance, higher current and higher bandwidth)



Part no.	Description
ESP 06E	Data SPD for 2-Wire signal lines up to 6V, 1.25A
ESP 15E	Data SPD for 2-Wire signal lines up to 15V, 1.25A
ESP 30E	Data SPD for 2-Wire signal lines up to 30V, 1.25A
ESP 50E	Data SPD for 2-Wire signal lines up to 50V, 1.25A
ESP 110E	Data SPD for 2-Wire signal lines up to 110V, 1.25A

Twisted pair data communication, signal & telecom lines - slim line, with removable protection module



Part no.	Description
ESP SLTN	Data SPD for 2-Wire telephone lines up to 296V (ringing voltage)
<b>Slim line protectors with removable protection module, LED status indication and isolated screen</b>	
ESP SL06L/I	Data SPD for 2-Wire signal lines up to 6V, 750mA
ESP SL15L/I	Data SPD for 2-Wire signal lines up to 15V, 750mA
ESP SL30L/I	Data SPD for 2-Wire signal lines up to 30V, 750mA
ESP SL50L/I	Data SPD for 2-Wire signal lines up to 50V, 750mA
ESP SL110L/I	Data SPD for 2-Wire signal lines up to 110V, 750mA
<b>Slim line SPD for 4-20mA current loops with removable protection module, LED status indication and isolated screen</b>	
ESP SL30L/4-20/I	Data SPD for 4-20mA signal lines up to 30V, 75mA

High density data, signal & telephone lines (/PT fast fit Push Terminal option)



Part no.	Description
ESP 06Q or ESP 06Q/PT	Data SPD for 8-Wire (4 pairs) 6V signal lines space saving design
ESP 15Q or ESP 15Q/PT	Data SPD for 8-Wire (4 pairs) 15V signal lines space saving design
ESP 30Q or ESP 30Q/PT	Data SPD for 8-Wire (4 pairs) 30V signal lines space saving design
ESP 50Q or ESP 50Q/PT	Data SPD for 8-Wire (4 pairs) 50V signal lines space saving design
ESP 110Q or ESP 110Q/PT	Data SPD for 8-Wire (4 pairs) 110V signal lines space saving design
ESP 180Q or ESP 180Q/PT	Data SPD for 8-Wire (4 pairs) 180V signal lines space saving design
ESP TNQ or ESP TNQ/PT	Data SPD for 4 twisted pair phone lines with a maximum (ringing) voltage of 296 volts

Three wire RTD applications



Part no.	Description
ESP RTD	Data SPD for three 3-Wire RTD systems
ESP SL RTD	Slim Line Data SPD for 3-Wire RTD systems
ESP RTDQ	Data SPD for three of 3-Wire RTD systems space saving design

RS485 & Fieldbus applications




Part no.	Description
ESP RS485	Data SPD for RS485 signalling systems
ESP SL RS485	Slim Line Data SPD for RS485 signal lines
ESP RS485Q	Data SPD for 8-Wire (4 pairs) RS485 signal lines space saving design
ESP RS485Q/PT	


## Electronic systems protection

Surge protection devices (SPDs) for computer and telephone lines


### Plug-in protectors for telephone & ISDN lines

	Part no.	Description
	ESP TN/JP	Data SPD for telephone line with BT UK connection
	ESP TN/RJ11-6/6	Data SPD for 6-Wire telephone line with RJ11 connection
	ESP ISDN/RJ45-8/8	Data SPD for 8-Wire ISDN telephone line, RJ45 connector
	ESP MC/TN/RJ11 Series	Power + Data SPD - UK 3 Pin plug sockets and RJ11 connection

### PSTN & ISDN telephone lines with LSA-PLUS connections

	Part no.	Description
	ESP KE10	Earth connection bar for up to 10 of ESP KT1 data SPDs for LSA-PLUS PBX systems
	ESP KT1	Data SPD for one LSA-PLUS PBX phone line, use with ESP KE10 earth bar
	ESP K10T1	Data SPD for 10 LSA-PLUS PBX telephone lines


### Computer networks up to Cat-6 cabling & PoE+

	Part no.	Description
	ESP Cat-6	Data SPD for Cat-6 1000 Base T computer networks, RJ45 connector
	ESP Cat-6/PoE	Data SPD for Cat-6 1000 Base T computer networks with Power over Ethernet, RJ45 connector
	ESP MC/Cat-5 Series	Power + Data SPD - UK 3 Pin plug sockets and RJ45 connection


## Electronic systems protection

### Surge protection devices (SPDs) for specific systems


#### Mains supplies - wind turbine (WT) power distribution systems

	Part no.	Description
	ESP 690/25/WT	Type 1+2 power SPD for wind turbine systems, 25kA 10/350
	ESP 690/12.5/WT	Type 1+2 power SPD for wind turbine systems, 12.5kA 10/350
	ESP CE7	Connection and earthing bar for use with 3 of ESP 690/12.5/WT protectors for TNC systems
	ESP CE9	Connection and earthing bar for use with 4 of ESP 690/12.5/WT protectors for TNS systems
	ESP CE10	Connection and earthing bar for use with 3 of ESP 690/25/WT protectors for TNC systems
	ESP CE13	Connection and earthing bar for use with 4 of ESP 690/25/WT protectors for TNS systems


#### DC photo-voltaic (PV) power distribution systems

	Part no.	Description
	ESP DC1100T1/12.5	Type 1+2 power SPD for 1100Vdc PV supplies, 12.5kA 10/350 surge current rating
	ESP DC1500T1/12.5	Type 1+2 power SPD for 1500Vdc PV supplies, 12.5kA 10/350 surge current rating
	ESP DC1100T2/40	Type 2 power SPD for 1100Vdc PV supplies, 40kA 8/20 surge current rating
	ESP DC1500T2/30	Type 2 power SPD for 1500Vdc PV supplies, 30kA 8/20 surge current rating


#### Coaxial cable TV (CATV) systems

	Part no.	Description
	ESP CATV/F	Data SPD for Cable TV 5-860Mhz with F Type connector
	ESP TV/F	Data SPD for TV 5-860Mhz with F Type connector
	ESP TV/EURO	Data SPD for TV 5-860Mhz with Euro-TV connector
	ESP MATV/F	Data SPD for main antenna TV MATV 5-2450Mhz with F Type connector
	ESP SMATV/F	Data SPD for satellite main antenna TV SMATV 860-2450Mhz with F Type connector

#### Closed circuit TV video lines

	Part no.	Description
	ESP CCTV/B	Data SPD for CCTV systems with BNC connection for Coax cable
	ESP CCTV/T	Data SPD for CCTV systems with twisted pair cables


#### Coaxial RF systems (for frequencies between DC and up to 3.5 GHz)

	Part no.	Description
	ESP RF/N	ESP RF Series data SPD, N bulkhead female (LINE) / N male (CLEAN) connectors
	ESP RF/DIN	ESP RF Series data SPD, 7/16 DIN bulkhead female (LINE) / 7/16 DIN male (CLEAN) connectors
	ESP RF/BNC	ESP RF Series data SPD, BNC bulkhead female (LINE) / BNC male (CLEAN) connectors
	ESP RF/TNC	ESP RF Series Data SPD, TNC bulkhead female (LINE) / TNC male (CLEAN) connectors
	ESP RF/SMA	ESP RF Series Data SPD, SMA bulkhead female (LINE) / SMA male (CLEAN) connectors


## Electronic systems protection

### Accessories


#### Weatherproof enclosures

	Part no.	Description
	WBX 2/G	IP66 Enclosure for 2 single stud ESP D/E/H data SPDs or ESP TN telecom SPD, grey lid
	WBX 3	IP67 Enclosure for 3 single stud data SPDs or ESP Single Phase M1 mains SPD, clear lid
	WBX 3/G	IP67 Enclosure for 3 single stud data SPDs, grey lid
	WBX 4	IP66 Enclosure for ESP 415 M1, ESP 208 M1 or ESP 480 M1 or 4 single stud ESP data/telecom
	WBX 4/GS	IP66 Enclosure for 4 single stud ESP data/telecom SPDs using CME4 earth bar, grey lid, security screws
	WBX 8	IP66 Enclosure for 8 single stud ESP data/telecom SPDs using CME8 earth bar, grey lid
	WBX 8/GS	IP66 Enclosure for 8 single stud ESP data/telecom SPDs using CME8 earth bar, grey lid, security screws
	WBX 16/2/G	IP56 Enclosure for 1 or 2 CME16 earth bars for mounting and enclosing up to 32 of ESP single stud data/telecom SPDs, grey lid
	WBX D4	IP65 Enclosure for 72mm DIN (4TE)
	WBX D8	IP65 Enclosure for 144mm DIN (8TE)
	WBX M2	IP67 Enclosure for ESP 415 M2 or ESP 480 M2, clear lid
	WBX M4	IP67 Enclosure for ESP 415 M2 or ESP 480 M2, clear lid
	WBX SLQ	IP66 Enclosure for up to 15 of ESP SL Series, or up to 6 of ESP Q Series, clear lid
	WBX SLQ/G	IP66 Enclosure for up to 15 of ESP SL Series, or up to 6 of ESP Q Series, grey lid

#### Metallic enclosures

	Part no.	MBX D4	MBX D8
	<b>Dimensions (mm)</b>		
	Length: – External	268	268
	Width: – External	134	208
	Depth: – External	104	104
	Fixing centres (mm):	201 x 66.5 (3 holes)	201 x 137
	IP Rating:	IP20	IP20
	Temperature range:	-40 to +80°C	-40 to +80°C
	Product available width:	73.5mm (4TE)	146mm (8TE)

#### Combined mounting & earthing kits

	Part no.	Description
	CME 4	4 Hole combined mounting earthing kit
	CME 8	8 Hole combined mounting earthing kit
	CME 16	16 Hole combined mounting earthing kit
	CME 32	32 Hole combined mounting earthing kit

## Electronic systems protection

### ABB SPD order code index

Part No.	GID No.
CME 16	7TCA085410R0002
CME 32	7TCA085410R0003
CME 4	7TCA085400R0001
CME 8	7TCA085400R0002
ESP 06E	7TCA085400R0084
ESP 06Q	7TCA085400R0087
ESP 06Q/PT	7TCA085400R0473
ESP 110E	7TCA085400R0007
ESP 110Q	7TCA085400R0088
ESP 110Q/PT	7TCA085400R0478
ESP 15E	7TCA085400R0095
ESP 15Q	7TCA085400R0098
ESP 15Q/PT	7TCA085400R0474
ESP 240 D1	7TCA085460R0086
ESP 240 M1	7TCA085460R0089
ESP 240-16A	7TCA085460R0080
ESP 240-16A/BX	7TCA085460R0081
ESP 240-5A	7TCA085460R0083
ESP 240-5A/BX	7TCA085460R0084
ESP 240CD40	7TCA085460R0378
ESP 240CDT2/40/TT	7TCA085460R0423
ESP 240D-10A	7TCA085460R0323
ESP 240D-32A	7TCA085460R0322
ESP 240DS-10A	7TCA085460R0317
ESP 240DS-32A	7TCA085460R0318
ESP 240T2/50/TNC	7TCA085460R0383
ESP 240T2/50/TNS	7TCA085460R0388
ESP 240T2/50/TT	7TCA085460R0404
ESP 240T3/SKT	7TCA085450R0069
ESP 30E	7TCA085400R0104
ESP 30Q	7TCA085400R0107
ESP 30Q/PT	7TCA085400R0476
ESP 240T1/25/TNS	7TCA085400R0499
ESP 240T1/25/TNC	7TCA085400R0500
ESP 240T1/25/TT	7TCA085460R0370
ESP 415CD40	7TCA085460R0303
ESP 415CDT2/40/TT	7TCA085460R0420
ESP 415 D1	7TCA085460R0105
ESP 415 D1R	7TCA085460R0107
ESP 415 DT1/12.5	7TCA085465R0002
ESP 415 M1	7TCA085460R0112
ESP 415 M2	7TCA085460R0119

Part No.	GID No.
ESP 415 M4	7TCA085460R0124
ESP 415M1R	7TCA085460R0115
ESP 415M2R	7TCA085460R0123
ESP 415M4R	7TCA085460R0126
ESP 415 MT1/12.5	7TCA085465R0003
ESP 415T1/12.5/TNS	7TCA085400R0496
ESP 415T1/12.5/TNC	7TCA085460R0371
ESP 415T1/12.5/TT	7TCA085460R0372
ESP 415T1/25/TNS	7TCA085460R0369
ESP 415T1/25/TNC	7TCA085400R0497
ESP 415T1/25/TT	7TCA085400R0498
ESP 415T2/50/TNC	7TCA085460R0390
ESP 415T2/50/TNS	7TCA085460R0391
ESP 415T2/50/TT	7TCA085460R0380
ESP 50E	7TCA085400R0116
ESP 50Q	7TCA085400R0118
ESP 50Q/PT	7TCA085400R0477
ESP 690/12.5/WT	7TCA085460R0308
ESP 690/25/WT	7TCA085460R0309
ESP Cat-6	7TCA085400R0023
ESP Cat-6/PoE	7TCA085400R0024
ESP CATV/F	7TCA085400R0122
ESP CCTV/B	7TCA085400R0123
ESP CCTV/T	7TCA085400R0129
ESP CE10	7TCA085460R0030
ESP CE13	7TCA085460R0031
ESP CE7	7TCA085460R0032
ESP CE9	7TCA085460R0033
ESP DC1100T1/12.5	7TCA085460R0406
ESP DC1500T1/12.5	7TCA085460R0413
ESP DC1100T2/40	7TCA085460R0415
ESP DC1500T2/30	7TCA085460R0411
ESP ISDN/RJ45-8/8	7TCA085460R0171
ESP K10T1	7TCA085400R0130
ESP KE10	7TCA085400R0134
ESP KT1	7TCA085400R0135
ESP MATV/F	7TCA085450R0000
ESP MC	7TCA085430R0003
ESP MC/19BK	7TCA085460R0034
ESP MC/CAT-5E	7TCA085430R0004
ESP MC/TN/RJ11	7TCA085430R0005
ESP RF AA1421	7TCA085450R0061

Part. No.	GID No.
ESP RF AA1A11	7TCA085450R0016
ESP RF/BNC	7TCA085450R0072
ESP RF/DIN	7TCA085450R0071
ESP RF/N	7TCA085450R0070
ESP RF/SMA	7TCA085450R0068
ESP RF/TNC	7TCA085450R0073
ESP RLA HD-4	7TCA085460R0156
ESP RLA-4	7TCA085460R0155
ESP RS485	7TCA085400R0191
ESP RS485Q	7TCA085400R0192
ESP RS485Q/PT	7TCA085400R0475
ESP RTD	7TCA085460R0157
ESP RTDQ	7TCA085400R0158
ESP RTDQ/PT	7TCA085400R0488
ESP SL RS485	7TCA085400R0193
ESP SL RTD	7TCA085400R0232
ESP SL06L/I	7TCA085400R0280
ESP SL110L/I	7TCA085400R0284
ESP SL15L/I	7TCA085400R0064
ESP SL15XL/I	7TCA085400R0235
ESP SL30L/4-20/I	7TCA085400R0237
ESP SL30L/I	7TCA085400R0234
ESP SL30XL/I	7TCA085400R0236
ESP SL50L/I	7TCA085400R0201
ESP SLTN	7TCA085400R0195
ESP SMATV/F	7TCA085450R0026
ESP TN/JP	7TCA085400R0177
ESP TN/RJ11-6/6	7TCA085400R0180
ESP TV/EURO	7TCA085450R0027
ESP TV/F	7TCA085450R0028
ESP RTDQ/PT	7TCA085400R0488
MBX D4	7TCA085400R0649
MBX D8	7TCA085400R0650
WBX 16/2/G	7TCA085410R0020
WBX 2/G	7TCA085410R0022
WBX 3	7TCA085410R0023
WBX 3/G	7TCA085410R0024
WBX 4	7TCA085410R0027
WBX 4/GS	7TCA085410R0028
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