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Furse earthing & lightning protection UK Shortform

- \oplus
 - Bare, stranded & tinned conductors
 - Hard drawn bar & covered conductors
 - Air termination
 - Conductor network clamps & fixings
 - Earth electrodes & fittings
 - Earth bonds & clamps
 - Earth bars
- FurseWELD
 - Electronic systems protection

With over 125 years of experience Furse provides world leading earthing, lightning and electronic systems protection solutions. 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.

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Introduction Our reach & expertise

Furse was acquired by the ABB Group in 2012, and through the wider distributor network ABB offers, the Furse brand is established as a world leader in earthing and lightning protection, with our products specified and installed in many prestigious projects globally.

01 Conductors

02 Earthing & lightning protection clamps —

03 Earth bars

The combined expertise of Furse and the experience within the electrical sector ABB provides, allows us to share the knowledge we hold in key industry sectors with our customers In turn, this promotes properly informed decision making on the best earthing and lightning protection solutions.

Why use Furse?

Expertise

Specialist advice from our fully qualified technical engineers – focusing on your earthing and lightning protection issues and concerns.



Experience

Providing the optimum solution – one that doesn't use more material than is necessary, saving you money.

Design solutions

Using the latest computer aided design & modelling software we can produce detailed or budgetary earth electrode and lightning protection system designs for any system complexity, in compliance with globally recognised standards. Full earthing analysis uses state-of-the-art software to determine the step and touch voltages, earth potential rise and fall, and hot/cold site classification of the site generated by the initial design.

Our services include:

- Lightning protections solutions
- Soil resistivity surveys
- Analysis & earthing design
- Earth resistance testing

Knowledge

Our knowledge of the latest standards ensures designs and selected products comply with the latest IEC/BS EN/NFPA/UL standards.

Products

Our knowledge of the latest products ensures a tailored design that can be installed using the most appropriate and up-to-date products.

Customer service

Our sales and technical teams are ready to assist with all your earthing and lightning protection needs. Contact Furse on 0115 964 3700 or 0333 999 9900.







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.



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01 Datacentres
02 Trackside substations
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03 Water treatment
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04 Telecommunications
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05 Wind farms
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06 Oil & gas
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07 Healthcare
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08 Substations

Earthing & lightning protection

A real & significant threat

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.

The consequences of lightning can be devastating:

- 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.

Secondary effects of lightning

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

Lightning protection throughout the world is now governed by National and International standards which stress the need for a comprehensive solution. Simply put, a structural lightning protection system cannot and will not protect electronic systems from lightning currents and transient overvoltages, that's





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09 ESP M1 mains power surge protection device

10 Earth rod seal

11 Threaded & unthreaded copperbond earth rod

why we advocate a Total Solution to earthing and lightning protection. This approach to lightning protection is now fully endorsed by the IEC/BS EN 62305, as well as NFPA 780 standards.

Therefore, the Furse approach delivers effective life safety, together with long lasting, reliable protection of a structure and the electronic systems within it. We believe the Furse Total Solution is the best available solution for achieving effective, dependable, long term lightning protection and earthing.

Protecting against the consequences of lightning is now of paramount importance in any building design, so our Total Solution covers a wide range of sectors, for which we have tailored products and services.







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Conductors

Bare conductors, bare stranded & tinned conductors

Bare copper tape Conductor size Part no. (mm) TC005 12.5 x 1.5 12.5 x 3 TC010 HISC CHOULD W TC015 20 x 1.5 TC020 20 x 3 TC020/100 20 x 3 TC025 25 x 1.5 TC026 25 x 2 TC030 25 x 3 TC030/50 25 x 3 TC035 25 x 4 TC040 25 x 6 TC042 30 x 3 TC044 30 x 4 TC043 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 TC069 40 x 6.3 TC070 50 x 3 TC075 50 x 4 TC078 50 x 5 TC080 50 x 6 TC082 50 x 6.3 тс090 50 x 7 50 x 8 TC092 TC094 50 x 10 TC096 60 x 10 TC098 80 x 6 TC099 100 x 6

Bare stranded copper cable

Part no.	Cross sectional area (mm²)
Soft draw	n stranded copper cable
CB006	6
CB016	16
CB025	25
CB035	35
CB050-FU	50
СВ070	70
CB095	95
CB120	120
CB150-FU	150
CB185	185
CB240	240
CB300-FU	300
CB400-FU	400
Hard draw	n stranded copper cable
CB071	70

Bare & tinned solid circular



Tinned copper tape

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

Bare aluminium tape



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
TC100	12.5 x 1.5	Black
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
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 insulated copper tape



LSOH covered copper tape

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

Lead covered copper tape

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

Green & yellow PVC insulated stranded copper cable

Part no.	Cross-sectional area (mm²)
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



PVC covered aluminium solid circular



N.B. All conductor diameters 8 mm.

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	Browr

N.B. All conductor diameters 8 mm.

Anti-vandal down conductor guard



Air termination

Air terminals, bases, brackets & couplings

Air rod

	Part no.	Rod length (mm)	Rod diameter (mm)	Thread size	Conductor material
0	RA215	500	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
ĥ	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

Horizontal or vertical air rod base

	Part no.	Rod diameter (mm)	Thread size	Conductor material
	Vertically	mounted		
0	SD307	Ø 8	M10	Copper
	SD007	Ø 8	M10	Aluminium
	Horizonta	ally mounted		
S AGA	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 conduct	or
-	CG600	Ø 15	Copper
	CG500	Ø 15	Aluminium
	For use with	stranded conduc	tor
	CG705	Ø 15	Copper
-	CG710	Ø 15	Aluminium

Rod brackets

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

Trapezoidal holdfast with air rod base



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Air rod base

	Part no.	Air rod o diameter (mm)	Max. conductor width (mm)	Conductor material
	SD105-H	Ø 15	25	Copper
DIOK	SD003-H	Ø 15	25	Aluminium
	SD120	Ø 15	50mm²	Copper

Flat saddle

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

Conductor material

Copper

Aluminium

Air termination

Multiple point, strike pad & free-standing air termination

Multiple point

Strike pad

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

Part no.

PL010

PL005

Base frame

	Part no.	Frame type	Dimension (mm)
	499000-FU	Square base	650 x 650
1	499005-FU	Tripod base	1,350 x 1,350
	499006-FU	Tripod base	1,850 x 1,850
	499007-FU	H shaped base	1,850 x 1,850
		\square	

Dimensions are approximate and include concrete base dimensions.

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		
	103102-FU	Protective polyethyle circular conc	ene tray for rete blocks
	919828-FU	Stainless for connecting 25 x 3 r	steel clamp

tape to 5-19 mm thickness steel

0	SM010 SM005	Coppers	stem for use v Stainless ster use v	vith PL010 el stem for vith PL005
— Free-standing interc	eption pole			
	Part no.	Pole height (m)	Pole diameter (mm)	Pole make up
	912000-EU	3	Ø 10-42	2 niece

Part no.	height (m)	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

Conductor clips

Swing lid tape clip

	Part no.	Conductor size (mm)
	For use wit	h bare copper
D	CP210-H	25 x 3
Caller D	СР220-Н	25 x 6
	For use wit	h bare aluminium
	CP110-H	25 x 3
	СР120-Н	25 x 6
	For use wit	h PVC covered copper
	CP215-H	25 x 3

Tape clip

		Conductor	Conductor		
	Part no.	width (mm)	thickness (mm)		
	For use wit	h bare copper			
-	CP205	20	3		
IL AS a	CP210	25	3-4		
) JIC)	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		
	For use wit	h PVC covered c	opper		
	CP215	25	3-4		
	CP225	25	6		
	CP265	50	6		
	For use wit	h lead covered c	opper		
	CP305	25	3		
	For use with bare aluminium				
	CP105	20	3		
	CP110	25	3-4		
	CP125	50	6		
	For use wit	h PVC covered a	luminium		
	CP115	25	3		
	CP130	50	6		

Adjustable tape clip



One hole cable clip

Part no.	Conductor size (mm)	Conductor material
For use w	ith solid circul	ar conductor
CP905	Ø 8	Copper
CP925	Ø 8	Aluminium
CP915	Ø 10*	Copper
CP935	Ø 10*	Aluminium
For use w	ith stranded o	onductor
CP910	50 mm²	Copper
CP915	70 mm²	Copper
CP920	95 mm²	Copper

*PVC covered Ø8 mm conductor.

Heavy duty cast cable saddle

	Part no.	Conductor size (mm)	Conductor material
	For use w	ith solid circul	ar conductor
CA2	CP805	Ø 8	Copper
193	CP806	Ø 8	Aluminium
	CP815	Ø 10*	Copper
	CP816	Ø 10*	Aluminium
	For use w	vith stranded o	onductor
	CP810	50 mm²	Copper
	CP815	70 mm²	Copper
	CP835	95 mm²	Copper
	CP840	120 mm²	Copper

*PVC covered Ø8 mm conductor.

Non-metallic tape clip

Pressed tape clip

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

	Part no.	Conductor size (mm)	Colour
	For use w	ith bare tape	
	CP005	20 x 3	Brown
1 miles	CP010	20 x 3	Grey
	CP015	25 x 3	Brown
	CP020	25 x 3	Grey
	CP065	50 x 6	Brown
	For use w	ith PVC covered	tape
	CP025	25 x 3	Brown
	CP030	25 x 3	Black
	CP035	25 x 3	Green
	CP040	25 x 3	Grey
	CP045	25 x 3	Stone
	CP050	25 x 3	White

Copper

Conductor clips

Non-metallic push-in clip

	Part no.	Conductor size (mm)	Colour
	For use with	bare solid circular co	onductor
	CP887	Ø 8	Brown
	CP872	Ø 8	Grey
	For use with F	VC covered solid circu	lar conductor
5	CP886	Ø 10*	Brown
	CP861	Ø 10*	Black
	CP871	Ø 10*	Grey
	CP876	Ø 10*	Stone
	CP881	Ø 10*	White

Self adhesive tape clip

	Part no.	Conductor size (mm)	Colour
	For use with b	oare tape	
	CA015-FU	25 x 3	Brown
	CA020-FU	25 x 3	Grey
	For use with F	VC covered tape	
	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

*PVC covered Ø8 mm conductor.

Glue down tape clip

Part no.	Conductor size (mm)	Colour
For use with	bare tape	
GD015	25 x 3	Brown
GD020	25 x 3	Grey
For use with	PVC covered tape	
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
0.05	For use with	bare solid circular co	onductor
	CA872	Ø 8	Brown
	CA887	Ø 8	Grey
	For use with F	VC covered solid circu	lar conductor
	CA886	Ø 10*	Brown
and a second	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
	For use with	bare solid circular co	nductor
.6.	GD887	Ø 8	Brown
	GD872	Ø 8	Grey
	For use with F	VC covered solid circul	ar conductor
Contraction of	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
	For use with b	are tape	
	CW015-FU	25 x 3	Brown
	CW020-FU	25 x 3	Grey
	For use with P	VC covered tape	
	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 clips & accessories

Heat weldable clip for PVC roofing

	Part no.	Conductor size (mm)	Colour
	For use with b	are tape	
	HW015-FU	25 x 3	Brown
	HW020-FU	25 x 3	Grey
	For use with P	VC 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.

Heat weldable clip for TPO/FPO roofing

	Part no.	Conductor size (mm)	Colour
	For use with	bare tape	
	HW315	25 x 3	Brown
1 1	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.

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.

Non-metallic clip accessories

	Part no.	Description
	CW905	Universal welding solvent 500 ml
	CW999	Cleaning solution 500 ml
	CA900	Surface primer 250 ml
Harris Ha	DT100	Dressing tool - For use with tape clips

Bitumen felt roof clip



_			
	Part no.	Conductor size (mm)	Colour
	For use wi	ith bare tape	
	FP015	25 x 3	Brown
	FP020	25 x 3	Grey
	For use wi	th PVC covered	d 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



Standing seam roof fixings, puddle flange and holdfasts

Standing seam roof fixing with square tape clamp

Part no.	Conductor size (mm)	Material
SC105-H	25 x 3	Copper
SC005-H	25 x 3	Aluminium

Slate holdfast with non-metallic tape clip

Slate holdfast with non-metallic push-in clip

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

Part no.

HF176

HF191

Conductor

size (mm)

Ø8

Ø 8

DC clip

colour

Brown

Grey

Standing seam roof fixing with tape clip

	Dart no	Conductor	Colour	Material
	Part no.	size (mm)	Colour	Material
-	Non-meta	llic clip for us	e with bare t	ape
130	SC015	25 x 3	Brown	Copper
9/1	SC020	25 x 3	Grey	Aluminium
	Metallic c	lip for use wit	h bare tape	
0	SC210-H	25 x 3	-	Copper
SO 1	SC110-H	25 x 3	-	Aluminium
Metallic clip for use with PVC covered tape				ed tape
	SC215-H	25 x 3	-	Copper
	Non-meta	llic clip for us	e with PVC c	overed tape
	SC025	25 x 3	Brown	Cu / Al
	SC030	25 x 3	Black	Cu / Al
	SC035	25 x 3	Green	Cu / Al
	SC040	25 x 3	Grey	Cu / Al
	SC045	25 x 3	Stone	Cu / Al
	SC050	25 x 3	White	Cu / Al

Glazing bar holdfast

	Part no.	Maximum glazing bar width (mm)	Conductor material
	HF705	12	Copper
A CONTRACT	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

Puddle flange

Part no.	Conductor material
 PF105	Copper
PF005	Aluminium

Trapezoidal holdfasts and conductor clamps

Trapezoidal holdfast with square tape clamp

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

Cable to tape square clamp



Trapezoidal holdfast with conductor clip

	Part no	. Conductor
0	TZ210	25 x 3 mm bare copper tape
	TZ110	25 x 3 mm bare aluminium tape
ALLON O	TZ040	25 x 3 mm grey PVC covered tape
	TZ805	Ø 8 mm bare copper
	TZ806	Ø 8 mm aluminium copper
(and)	TZ815	Ø 8 mm PVC covered copper
$(\circ) $	TZ816	Ø 8 mm PVC covered aluminium
	TZ871	Ø 8 mm grey PVC covered

Cable to cable square clamp

	Part no.	Conductor size (mm²)	Conductor material
	CR810	50	Copper
(B)	CR815	70	Copper
Eause Cer	CR820	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
C LE	СТ005-Н	25 x 3	Aluminium
	СТ010	25 x 6	Aluminium

Square clamp

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

Crossover tape clamp

Part no.	Conductor size (mm)	Conductor materia
CX105-H	25 x 3	Coppe
СХ005-Н	25 x 3	Aluminium

Tee clamp

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



Conductor clamps and accessories

Jointing clamp

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

Test clamp





Test / Junction clamp

	Part no.	Conductor size (mm)	Conductor material
	CN105-H	26 x 8	Copper
Charles Contraction of the second sec	CN005	26 x 8	Aluminium

Square test clamp

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

Plate type test clamp

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

Screwdown test clamp

Part no.	Conductor size (mm)	Conductor material
СТ305	26 x 8 max	Copper

Bimetallic connector

Part no.	Conductor size
CN910	25 x 3 mm aluminium tape to 25 x 3 mm copper tape
CN915	8 mm Ø aluminium conductor to 8 mm Ø copper conductor
CN920	8 mm Ø aluminium conductor to 25 x 3 mm copper tape
CN925	25 x 3 mm aluminium tape to 25 x 3 mm copper tape

Expansion braid bond



Accessories

Countersunk wood screws

	Part no.	Size	Material
	SW105	1 ¹ / ₂ " x No.10	Zinc plated steel
	SW110	1 ¹ / ₂ " x No.12	Zinc plated steel
A summer of the for th	SW005	1½" x No.10	Brass
	SW010	1 ¹ / ₂ " x No.12	Brass

Roundhead wood screws

	Part no.	Size	Material
4	SW405	1 ¹ / ₂ " x No.10	Zinc plated steel
	SW305	1½" x No.10	Brass

Roundhead copper nails

	Part no.	Length (mm)
(minneren. >>>	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

Countersunk set screws

Part no.	Size	Materia
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
	Part no. SS635 SS640 SS650 SS165 SS140 SS145 SS150 SS155 SS235 SS240 SS245	Part no. Size SS635 M10 x 25 SS640 M10 x 35 SS650 M12 x 25 SS655 M12 x 35 SS165 M8 x 16 SS140 M10 x 25 SS145 M10 x 35 SS150 M12 x 25 SS155 M12 x 35 SS155 M12 x 35 SS235 M8 x 20 SS240 M10 x 25 SS245 M10 x 35

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
CA.	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

Hexagon nuts

	Part no.	Size	Material
a second	NU367	M10	Phosphor bronze
	NU370	M12	Phosphor bronze
	NU165	M6	Brass
- B	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
Construction of the local division of the lo	RV110	5 x 20	Copper



Accessories

__ Silfos

	Part no.	Coil size	Thickness
	FS005	50 mm x 8 m	0.12 mm
9			

Insulating tape



Size

Oxide inhibiting compound

	Part no.	Description
2.00	CM005	Plastic 8 oz bottle
Energy All		
Contax		
CAT, HOL CITIN		
A Street and the		

Waterproofing tape

	Part no.	Size
	TD005	50 mm x 10 m
- eletter		
ALSO TOUT		
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Earth electrodes

Earth rods & seal

Threaded copperbond earth rod

Nominal Length Part no. diameter (in) (mm) RB105 Ø 1/2 1,200 RB110 Ø 1/2 1,500 Ø 1/2 1,800 RB115 RB125 Ø 1/2 2,400 RB205-FU Ø 5/8 1,200 RB210 Ø 5/8 1,500 1,800 RB215 Ø 5⁄8 2,100 RB220-FU Ø 5/8 RB225 Ø 5/8 2,400 Ø 5/8 3,000 RB235 Ø ¾ 1,200 RB305 Ø ¾ 1,500 RB310 RB315 Ø ¾ 1,800 RB320-FU Ø 3/4 2,100 RB325 Ø ¾ 2,400 3,000 RB335 Ø ¾ Fittings Туре CG170 ¹⁄₂" Coupling CG270 ⁵⁄s" Coupling CG370 3/4" Coupling ST100 1/2" Driving stud ⁵⁄₃" Driving stud ST200 ST300 3/4" Driving stud

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N	1

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
Fittings		Туре
CG177	12.7 m	m Coupling
CG277	14.2 m	m Coupling
CG377	17.2 m	m Coupling
ST107	12.7 mm D	riving head
ST207	14.2 mm D	riving head
ST307	17.2 mm D	riving head

Earth rod seal

Part no.	Туре
Earth rod	seal assembly
ES300	Earth rod seal and membrane seal
Earth rod	seal pack
ES300-12	Seal pack for ½" (Ø 12.7 mm) Copperbond rod
ES300-58	Seal pack for 5/8" (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
Earth rod	seal tube
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
Accessory	r spanner set
ES320	Membrane seal torque spanner set

Length

(

Earth electrodes

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

Solid copper and stainless steel earth rod

Lightweight inspection pit

Part no.	Description
PT205	Lightweight inspection pit with grey polymer lid
PT110	Lightweight inspection pit with concrete lid
PT004	5 hole earth bar
Accessor	ies for polymer lid
AK005	6 mm Allen key
Accessor	ies for concrete lid
JH100	M8 x 100 mm long mild steel 'J' bolt lifting
AS100	M8 x 60 stainless steel Allen caphead screw (2 per lid)

Part no.	(mm)	(mm)
Solid coppe	r rod	
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
Stainless st	eel rod	
RS005	Ø 16	1,200
RS011	Ø 16	1,500
RS012	Ø 16	3,000
RS016	Ø 20	1,500
RS017	Ø 20	3,000
Fittings		Туре
ST010	15 mm hardened steel dr copper/stain	iving stud for less steel rod
ST015	20 mm hardened steel dr copper/stain	iving stud for less steel rod
CG013	Coupling dowel for 15	mm & 20 mm copper rod
CG005	Coupling dowel for 16 stain	mm & 20 mm less steel rod
SP010	15 mm hardened steel spik stain	e for copper/ less steel rod
SP015	20 mm hardened steel spik stain	e for copper/ less steel rod

Diameter

Concrete inspection pit

	Part no.	Description
	PT005	Concrete earth inspection pit
	PT006	5 hole earth bar
Y	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
Contraction of the	PE020	900 x 900 x 3

Description

FurseCEM 25 kg

FurseCEM® conductive aggregate / Bentonite moisture retaining clay

	Part no.	Length
	CM025	FurseCEM®
A	CM030	FurseCEM® (supplied with cement)
2.3	CM015	Bentonite powder 25kg
N.	CM020	Bentonite granules 25kg

Earth mat (lattice copper)

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



Mechanical clamps

Rod to tape clamp (type A)

	Nominal rod diameter		Max. conductor
Part no.	(in)	(mm)	(mm)
CR105	Ø 1/2	Ø 12.7	26 x 12
CR105	Ø 5/8	Ø 16	26 x 12
CR105	Ø 3/4	Ø 20	26 x 10
CR108	Ø 5/8	Ø 16	30 x 2
CR108	Ø 3/4	Ø 20	30 x 2
CR110	Ø 5/8	Ø 16	40 x 12
CR115	Ø 5/8	Ø 16	51 x 8
CR125	Ø 3/4	Ø 20	51 x 12
CR130	Ø 1/2	Ø 12.7	26 x 20
CR130	Ø 5/8	Ø 16	26 x 18
CR130	Ø 3/4	Ø 20	26 x 10
CR130	Ø 1	Ø 25	26 x 10

Rod to cable clamp (type B)

		Nominal rod	diameter	
	Part no.	(in)	(mm)	Rod type
	CR205	Ø 3/8	Ø 9.5	Copperbond
GP AN	CR215	Ø 5/8	Ø 16	Copperbond
	CR220	Ø 5/8	Ø 15	Solid copper
	CR225	Ø ³ /4	Ø 20	Copperbond
	CR230	Ø 3⁄4	Ø 20	Solid copper

Rebar clamp

Part no.Conductor
size (mm)Rebar
dia. (mm)Conductor
materialBN150Ø 8Ø 8-18CopperBN155Ø 8Ø 18-38Copper

Rod to cable clamp (type G)

	No	minal rod	diameter	Max. conductor
	Part no.	(in)	(mm²)	(mm²)
	CR505	Ø 3/8	Ø 9.5	6-35
-	CR510-FU	Ø 1/2	Ø 12.7	16-50
	G5	Ø ⁵⁄8	Ø 16	5.2-33.6
	CR515	Ø ⁵⁄8	Ø 16	16-70
	G6	Ø 3/4	Ø 20	5.2-33.6
	CR520	Ø 3/4	Ø 20	35-95
	CR525	Ø 1	Ø 25	70-150

'U' bolt rod clamp (type E)

		Nominal rod/re	ebar diameter	Hole centres
	Part no.	(in)	(mm²)	(mm)
	CR305	Ø 5/8	Ø 16	37
	CR310	Ø 3/4	Ø 20	37
	CR315	Ø 1	Ø 25	37
Pm	CR320*	Ø 5/8	Ø 16	37
	CR325	Ø 1½	Ø 38	54
E Car Co	CR326*	Ø 1½	Ø 38	54
Hr .	CR330	Ø 2	Ø 50	64

*CR320 and CR326 include additional plate to allow tape to be clamped without drilling.

'U' bolt rod clamp (type GUV)

		Nominal rod/rebar diamete	er	Conductor
	Part no	. (in) (mr	n)	(mm²)
	CR700	Ø 5/8 Ø 1	16	16-95
Para	CR700	Ø ¾ Ø 2	20	16-70
	CR705	Ø 5/8 Ø 1	16	70-185
	CR705	Ø ¾ Ø 2	20	70-150
	CR730	Ø 5/8 Ø 1	16	150-300
	CR730	Ø ¾ Ø 2	20	150-300
	CR710	Ø1 Ø2	25	16-70
	CR740	Ø1 Ø2	25	70-150
	CR750	Ø1 Ø2	25	150-300

Rebar to rebar connecting clip

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

Rebar to conductor connecting clip

	Rebai Part no.	diameter (mm)	Conductor size (mm)
	Rebar to flat tap	e	
1 and 1	RC25-087095	Ø 25	25 x 3mm
	Rebar to strande	d/solid cir	cular conductor
	RC812-0850	Ø 12	50 mm² or Ø 8mm
	RC16-087095	Ø 16	Ø 8 mm dia., 50-70-95 mm²
R. P.	RC20-087095	Ø 20	Ø 8 mm dia., 50-70-95 mm²
	RC25-087095	Ø 25	Ø 8 mm dia., 50-70-95 mm²
	RC32-087095	Ø 32	Ø 8 mm dia., 50-70-95 mm²
BV	RC40-087095	Ø 40	Ø 8 mm dia., 50-70-95 mm²

Earth boss, bonds & clamps

Earth boss

	Part no	Length (mm)	Diameter (mm)	Thread
	FB0111	30	Ø 30	M10
		20	Ø 30	M10
	EBIIII	30	030	MIU
	EB0111-SS	30	Ø 30	M10
aller	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
	EB001	50	Ø 50	M10
	EB1331	50	Ø 50	M10
	EB001-SS	50	Ø 50	M10
	EB1331-SS	50	Ø 50	M10

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

Conductor

Part no.

BN175

BN176

diameter

(mm)

Ø8

Ø 8

Pipe

(mm)

Conductor

Aluminium

material

Copper

diameter

Ø 50-200

Ø 50-200

Pipe bond

Standard earth bosses include	phosphor bronze fixings
Standard cartin bosses merade	

Earth boss part no.s ending '-SS' include stainless steel fixings.

Tower earth clamp

	Part no.	Conductor range (mm²)	Conductor material
	BN125	16-70	Copper
	BN130	70-120	Copper
and the second second	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
1	BN117	50	Copper



Earth points, splitbolt connector, bonds & clamps

Single hole earth point

	Part no.	Hole size (mm)	Length (mm)	
	PC100-FU	M8 x 15	80	
	PC101	M10 x 15	80	
	PC102	M12 x 15	80	
1	PC103	M16 x 15	80	
	Single hole earth point with single pre-welded tail Description			
	PC105	PC100-FU pre-welded 500	earth point with mm earth cable	
	PC106	PC101 o pre-welded 500	earth point with mm earth cable	
	PC107	PC102 o pre-welded 500	earth point with mm earth cable	

Four hole earth point

	Part no.	Hole size (mm)	Length (mm)	
	PC110	M8 x 14	75	
9	Four hole single pre	Four hole earth point with single pre-welded tail Description		
	PC111	PC110-FU pre-welded 50	J earth point with 0 mm earth cable	
	Four hole double pr	earth point with e-welded tail	Description	
	PC211	PC110 pre-welded 2 x 50	0 earth point with 00 mm earth cable	

Two hole earth point

	Part no.	Hole size (mm)	Length (mm)	
	PC115-FU	M8 x 12	80	
	PC120	M8 x 12	80	
	PC125	M8 x 12	80	
alon I	Two hole es single pre-	Two hole earth point with single pre-welded tail Desc		
	PC116	PC115-Fl pre-welded 50	J earth point with 00 mm earth cable	
	PC121	PC120 earth point pre-welded 500 mm earth o		
	PC126-FU	PC12 pre-welded 50	5 earth point with 00 mm earth cable	
	Two hole e double pre	arth point with -welded tail	Description	
	PC216	PC115-Fl pre-welded 2 x 50	J earth point with 00 mm earth cable	
	PC221	PC12 pre-welded 2 x 50	0 earth point with 00 mm earth cable	

PC115-FU supplied with front plate for 70 mm² conductor. PC120 supplied with front plate for Ø 8mm solid circular. PC125 supplied without front plate.

Metalwork bond

Part no.	Conductor diameter (mm)	Conductor material
CS350	Ø 8	Copper
C\$355	Ø 8	Aluminium

Type H splitbolt connector

				Conduct	or range
	Part no.	Main min. (mm²)	Main max. (mm²)	Tap min. (mm²)	Tap max. (mm²)
	8H	4	10	2.5	10
	4H	10	16	2.5	16
	2H	16	25	4	25
	1H	25	35	4	35
	10H	35	50	4	50
	20H	35	70	4	70
	30H	50	95	4	95
	40H	50	120	6	120
	350M	95	185	6	185

Straight setscrew cable socket

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



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

Eyebolt

		Nominal
	Part no.	copperbond rod diameter (in)
	BT150	5/8
9	BT160	3/4

Stainless steel earthing clamp

	Part no.	Description	Jaw opening (mm)
0	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.	Description	Jaw opening (mm)
SK030	Medium duty earthing clamp & reel	15
SK040	Heavy duty earthing clamp & reel	35

Flexible flat copper braid

	Part no	Overall braid dimensions (mm)	Length	Hole diameter (mm)
	Copper braid	(1111)	(1111)	()
	EBB-6-200-7	12 x 1	200	Ø 7
Contraction of the second seco	FBB-16-200-9	19x25	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
Here's	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
Contract of the second	FBB-120-200-17	45 x 6	200	Ø 17
	Tinned copper b	raid		
	FBB-6-200-7-T	12 x 1	200	Ø 7
	FBB-16-200-9-T	19 x 2.5	200	Ø9
	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)
Copper eart	th bar	
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
LK245-28	28 way	1,650
LK245-30	30 way	1,750
Tinned copp	oer earth bar	
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
LK245-28-T	28 way	1,650
LK245-30-T	30 way	1,750

Earth bar with single disconnecting link

	Part no.	Description	Length (mm)
	Copper ear	th bar	
2	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
U	LK243-22	22 way	1,375
	LK243-24	24 way	1,475
	LK243-26	26 way	1,575
	LK243-28	28 way	1,725
	LK243-30	30 way	1,825
	Tinned cop	per earth bar	
	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
	LK243-28-T	28 way	1,725
	LK243-30-T	30 way	1,825

Earth bars

Earth bar with twin disconnecting link & accessories

Earth bar with twin disconnecting link







Part no.	Description	Length (mm)
Copper eart	:h bar	
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
Tinned copp	oer earth bar	
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

Earth bar accessories



Insulator



Part no.	Height (mm)	Insert size
Insulator		
IN020	20	M6
IN030	30	M6
IN040	40	M8
IN013	50	M10
IN060	60	M10
IN070	70	M12
Insulator wit	h 2 studs a	nd 3 nuts
IN005	50	M10

FurseWELD

FurseWELD exothermic welding



FurseWELD powders

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

FurseWELD handle clamps

.

	Part no.	Box quantity
	HCPK1	Single part moulds (Price Key 1)
	HCPK2	Single part moulds (Price Key 2)
IIII E	НСРК3	Two part moulds (Price Key 3)
	НСРКЗ-А	With chain grip, two part moulds (Price Key 3)
	НСРКЗ-В	Sprung, single part moulds (Price Key 3)
	НСРК4	Two-part moulds (Price Key 4)
	НСРК4-А	With chain grip, multi-part moulds (Price Key 4)
	НСРК5	Multi-part moulds (Price Key 5)
	НСРК7	Multi-part moulds (Price Key 7)
	НСРК8	Multi-part moulds (Price Key 8)

FurseWELD high quality graphite moulds are and ned.

FurseWELD accessories

	Part no.	Description
	B135	Cable cleaning brush
A.	всм	Mould cleaning brush
	BFC	Tape cleaning brush
	DUXSEAL	Duxseal sealing compound (1 lb)
	FGUN	Flint gun
	FLINTS	Replacement flints (pack of 100)
	PACK-A	Packing
	STM1-FU	Mould cleaning scraper
	TB100-FU	Welding toolbox
	ТК100	Standard toolkit for bar to bar joints. Includes flint gun (FGUN), tape cleaning brush (BFC), mould cleaning brush and scraper (BCM & STM1-FU)
Duxseal	ТК200	Standard toolkit for cable to cable joints. Includes flint gun (FGUN), 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)

Sleeves

Part no.	Description	Conductor size (mm²)
\$102-FU	Copper sleeve	10
S103	Copper sleeve	16
S105	Copper sleeve	2.5 / 4 / 6



designed to contain the exothermic reaction
to deliver safe, robust welded connections.
Each mould is capable of producing up to
75 joints, if not more when properly maintain
For standard connection types, see the
following pages.

FurseWELD

Connection selection guide

_ Bar to bar					
Connection Type	Type BB1	Type BB3	Type BB7	Type BB14	Type BB41
— Bar to steel surface					
Connection Type	Type BS1	Type BS2	Type BS3		
 Bar to earth rod					
Connection Type	Type BR1	Type BR2	Type BR7		
— Cable to bar					
Connection Type	Type CB1	Type CB4	Type CB5		
— Cable to cable		SE			
Connection Type	Type CC1	Type CC2	Туре СС4	Type CC6	Type CC7
— Cable to cable Connection Type	Type CC11	Type CC14			
		//****			

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	Type CS34
	Type RS1	Type FS2			
connection type	турекы	Typersz			

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.

ABB Furse ESP range of SPDs Enhanced solutions to BS EN 62305/BS 7671

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.

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.



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

Supply type	Example 1	Example 2	Example 3	Example 4
	No external lightning protection system fitted	No external lightning protection system fitted	External lightning protection system fitted	External lightning protection system fitted
	Underground mains supply feed	Exposed overhead mains supply feed	Multiple connected metallic services	No. of services unknown
Ground level	Ground level	Power Groun level	Power Ground Data Telecom	Ground Power
Main distribution board (MDB)	Туре 1+2+3	Type 1+2 OR Type 1+2+3	Type 1+2+3	Type 1+2 OR Type 1+2+3
3 Phase 400 V 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 Sub-distribution board (SDB) Located >10 m from MDB feeding electronic equipment	Type 1+2+3 Type 1+2+3	For 3 Phase 400 V ESP 415 /11 / TNS OR ESP 415 M2 Series for critical electronics	ESP 415 D1 OR ESP 415 M1 Series Series	For LPL I & II: OR for critical ESP 415/I/TNS For LPL I & II: OR for critical ESP 415/III/TNS For LPL I & II: ESP 415/III/TNS ESP 415/III/TNS ESP 415 M4 Series LPL III or IV: ESP 415 M2 Series For 1 Phase 230 V ESP 240 D1 Series, or ESP 240 M1 Series
Final circuit equipment	For 13 A sockets (e.g. server	s) Fused spurs	Consume	r units
Located >10 m from SDB	ESP ESP	MC MC/TN/RJ11 MC/Cat-5e ESP ESP	240D-10A 240D-32A 240T3/SKT	rse MMP 2C275/1+1T
				19 Million State







ESP data SPD range overview

Product selector - Data line protection



Surge protection devices (SPDs) for mains power supplies

Mains supplies - equipotential bonding

		Part no.	Description
		ESP 240/I/TNS	Enhanced Type 1+2 power SPD for Single Phase 240V TNS supplies, 50kA 10/350
	a. (a. (a. (a. (a. (a. (a. (a. (a. (a. (ESP 240/III/TNS	Enhanced Type 1+2 power SPD for Single Phase 240V TNS supplies, 25kA 10/350
	ESP 240 /I/TT Enhanced T	Enhanced Type 1+2 power SPD for Single Phase 240V TT supplies, 50kA 10/350	
	FLUTSC ESP 415/0TNS	ESP 240/III/TT	Enhanced Type 1+2 power SPD for Single Phase 240V TT supplies, 25kA 10/350
	sill and an	ESP 415/I/TNS	Enhanced Type 1+2 power SPD for Three Phase 415V TNS supplies, 25kA 10/350
000	050 080	ESP415/III/TNS	Enhanced Type 1+2 power SPD for Three Phase 415V TNS supplies, 12.5kA 10/350
		ESP415/I/TT	Enhanced Type 1+2 power SPD for Three Phase 415V TT supplies, 25kA 10/350
		ESP415/III/TT	Enhanced Type 1+2 power SPD for Three Phase 415V TT supplies, 12.5kA 10/350

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
	Supplied with re	mote indication display
	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 ADD	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

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	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



Surge protection devices (SPDs) for mains power supplies

Mains supplies - with remote display indication

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

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

	Part no.	Description
	Protectors rated at 10 am	ps or less
	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
	Protectors rated at 32 am	ps or less
	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
	Protectors rated at 5 amp	os or less
I been	ESP 240-5A	Enhanced mains SPD for 240V supplies up to 5A
Contraction of the second seco	ESP 240-5A/BX	Enhanced mains SPD for 240V supplies up to 5A, IP66 enclosure
A CARLES	Protectors rated at 16 am	ips or less
A CONTRACT	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

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
a section	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
A list of the second se	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)	
Func O	Slim line protectors with removable protection module, LED status indication and isolated screen		
	ESP SLO6L/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	
in the second	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	
	Slim line, Intrinsically Safe prot LED status indication and isola	ectors (ATEX approved) with removable protection module, ted screen	
	ESP SL15XL/I	Data SPD for 2-Wire signal lines up to 15V, 750mA	
	ESP SL30XL/I	Data SPD for 2-Wire signal lines up to 30V, 750mA	
	Slim line SPD for 4-20mA current loops with removable protection module, LED status indication and isolated screer		
	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 f	or 4 twisted pair phone lines with a maximum (ringing) voltage of 296 volts

Three wire RTD applications

RS485 & Fieldbus applications

Part no.	Description		Part no.	Description
ESP RTD	Data SPD for three 3-Wire RTD systems		ESP RS485	Data SPD for RS485 signalling systems
ESP SL RTD	Slim Line Data SPD for 3-Wire RTD systems		ESP SL RS485	Slim Line Data SPD for RS485 signal lines
ESP RTDQ	Data SPD for three of 3-Wire		ESP RS485Q	Data SPD for 8-Wire
ESP RTDQ/PT	RTD systems space saving design	- Andrew	ESP RS485Q/PT	(4 pairs) RS485 signal lines space saving design

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

PSTN & ISDN telephone lines with LSA-PLUS connections



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

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
0.0.0.0	ESP 690/12.5/WT	Type 1+2 power SPD for wind turbine systems, 12.5kA 10/350
2 UN	ESP CE7	Connection and earthing bar for use with 3 of ESP 690/12.5/WT protectors for TNC systems
futrice ESP 690/25/WT	ESP CE9	Connection and earthing bar for use with 4 of ESP 690/12.5/WT protectors for TNS systems
Induced Malain Production International States of the Sta	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 DC1000/12.5/PV	Type 1+2 power SPD for 1000Vdc PV supplies, 12.5kA 10/350 surge current rating
ESP DC550/12.5/PV	Type 1+2 power SPD for 550Vdc PV supplies,12.5kA 10/350 surge current rating

Coaxial cable TV (CATV) systems

Closed circuit TV video lines

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

Coaxial RF systems (for frequencies between DC and 2.7 GHz)

	Part no.	Description
	ESP RF 111421	RF Data SPD high performance N Type connection
	ESP RF AA1421	RF Data SPD 350V GDT with 7/16 Din connection
4 mm * *	ESP RF 441421	RF Data SPD 350V GDT with BNC connection

Higher performance coaxial RF systems (for frequencies between 50 MHz and 2.7 GHz)

	Part no.	Description
	ESP RF 111A11	RF Data SPD high performance N Type connectior
furse 0	ESP RF AA1A11	RF Data SPD high performance 7/16 Dir connectior
t C€ Hat +	ESP RF 441A11	RF Data SPD high performance BNC connectior

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

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
	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

Combined mounting & earthing kits

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9 U 34	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

ABB SPD order code index

Part no.	Order code	Part no.	Order code	Part no.	Order code	Part no.	Order code
CME 16	7TCA085410R0002	ESP 30Q	7TCA085400R0107	ESP DC550/12.5/PV	7TCA085460R0147	ESP SL15XL/I	7TCA085400R0235
CME 32	7TCA085410R0003	ESP 30Q/PT	7TCA085400R0476	ESP ISDN/RJ45-8/8	7TCA085460R0171	ESP SL30L/4-20/I	7TCA085400R0237
CME 4	7TCA085400R0001	ESP 415 D1	7TCA085460R0105	ESP K10T1	7TCA085400R0130	ESP SL30L/I	7TCA085400R0234
CME 8	7TCA085400R0002	ESP 415 D1R	7TCA085460R0107	ESP KE10	7TCA085400R0134	ESP SL30XL/I	7TCA085400R0236
ESP 06E	7TCA085400R0084	ESP 415 M1	7TCA085460R0112	ESP KT1	7TCA085400R0135	ESP SL50L/I	7TCA085400R0201
ESP 06Q	7TCA085400R0087	ESP 415 M2	7TCA085460R0119	ESP MATV/F	7TCA085450R0000	ESP SLTN	7TCA085400R0195
ESP 06Q/PT	7TCA085400R0473	ESP 415 M4	7TCA085460R0124	ESP MC	7TCA085430R0003	ESP SMATV/F	7TCA085450R0026
ESP 110E	7TCA085400R0007	ESP 415/I/TNS	7TCA085460R0101	ESP MC/19BK	7TCA085460R0034	ESP TN/JP	7TCA085400R0177
ESP 110Q	7TCA085400R0088	ESP 415/I/TT	7TCA085460R0102	ESP MC/CAT-5E	7TCA085430R0004	ESP TN/RJ11-6/6	7TCA085400R0180
ESP 110Q/PT	7TCA085400R0478	ESP 415/III/TNS	7TCA085460R0103	ESP MC/TN/RJ11	7TCA085430R0005	ESP TV/EURO	7TCA085450R0027
ESP 15E	7TCA085400R0095	ESP 415/III/TT	7TCA085460R0026	ESP RF 111421	7TCA085450R0005	ESP TV/F	7TCA085450R0028
ESP 15Q	7TCA085400R0098	ESP 415M1R	7TCA085460R0115	ESP RF 111A11	7TCA085450R0007	ESP RTDQ/PT	7TCA085400R0488
ESP 15Q/PT	7TCA085400R0474	ESP 415M2R	7TCA085460R0123	ESP RF 441421	7TCA085450R0058	MMP 2C275/1+1T	7TCA085460R0185
ESP 240 D1	7TCA085460R0086	ESP 415M4R	7TCA085460R0126	ESP RF 441A11	7TCA085450R0014	WBX 16/2/G	7TCA085410R0020
ESP 240 M1	7TCA085460R0089	ESP 50E	7TCA085400R0116	ESP RF AA1421	7TCA085450R0061	WBX 2/G	7TCA085410R0022
ESP 240/I/TNS	7TCA085460R0019	ESP 50Q	7TCA085400R0118	ESP RF AA1A11	7TCA085450R0016	WBX 3	7TCA085410R0023
ESP 240/I/TT	7TCA085460R0020	ESP 50Q/PT	7TCA085400R0477	ESP RLA HD-4	7TCA085460R0156	WBX 3/G	7TCA085410R0024
ESP 240/III/TNS	7TCA085460R0022	ESP 690/12.5/WT	7TCA085460R0308	ESP RLA-4	7TCA085460R0155	WBX 4	7TCA085410R0027
ESP 240/III/TT	7TCA085460R0023	ESP 690/25/WT	7TCA085460R0309	ESP RS485	7TCA085400R0191	WBX 4/GS	7TCA085410R0028
ESP 240-16A	7TCA085460R0080	ESP Cat-6	7TCA085400R0023	ESP RS485Q	7TCA085400R0192	WBX 8	7TCA085410R0030
ESP 240-16A/BX	7TCA085460R0081	ESP Cat-6/PoE	7TCA085400R0024	ESP RS485Q/PT	7TCA085400R0475	WBX 8/GS	7TCA085410R0031
ESP 240-5A	7TCA085460R0083	ESP CATV/F	7TCA085400R0122	ESP RTD	7TCA085460R0157	WBX D4	7TCA085410R0032
ESP 240-5A/BX	7TCA085460R0084	ESP CCTV/B	7TCA085400R0123	ESP RTDQ	7TCA085400R0158	WBX D8	7TCA085410R0033
ESP 240D-10A	7TCA085460R0323	ESP CCTV/T	7TCA085400R0129	ESP RTDQ/PT	7TCA085400R0488	WBX M2	7TCA085410R0034
ESP 240D-32A	7TCA085460R0322	ESP CE10	7TCA085460R0030	ESP SL RS485	7TCA085400R0193	WBX M4	7TCA085410R0035
ESP 240DS-10A	7TCA085460R0317	ESP CE13	7TCA085460R0031	ESP SL RTD	7TCA085400R0232	WBX SLQ	7TCA085410R0037
ESP 240DS-32A	7TCA085460R0318	ESP CE7	7TCA085460R0032	ESP SL06L/I	7TCA085400R0280	WBX SLQ/G	7TCA085410R0036
ESP 240T3/SKT	7TCA085450R0069	ESP CE9	7TCA085460R0033	ESP SL110L/I	7TCA085400R0284		
ESP 30E	7TCA085400R0104	ESP DC1000/12.5/PV	7TCA085460R0146	ESP SL15L/I	7TCA085400R0064		





