

CABLE CONNECTIONS

Compression Cable Lugs and Joints

Document No.: PSE-09-100-R622

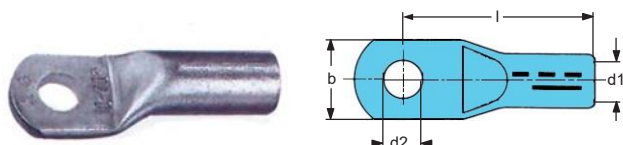
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Tubular compression cable lugs DIN 46235

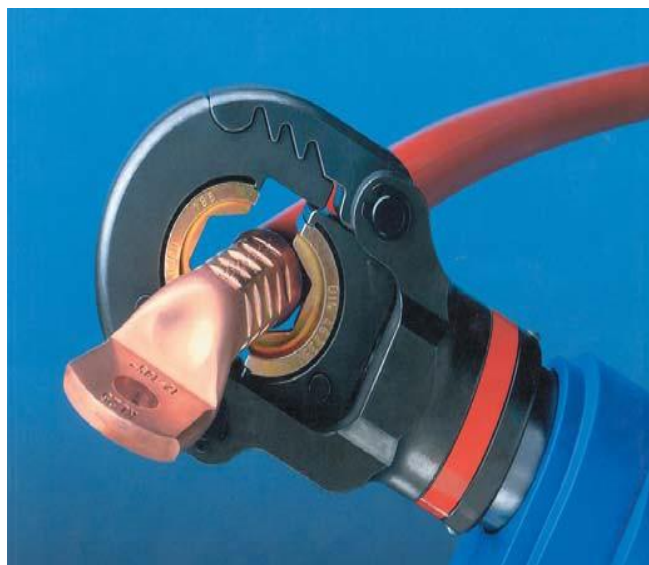
for circular stranded copper conductors and circular stranded/sector shaped copper conductors.

Material: E-copper

Surface: tin plated, optional copper finished



Conductor mm ²	Bolt size	Dimensions (mm)				Type No.
		b	d1	d2	l	
6	M6	8.5	3.8	6.4	24	KL101/R6
10	M6	9	4.5	6.4	27	KL102/R6
16	M6	13	5.5	6.4	36	KL103/R6
16	M8	13	5.5	8.4	36	KL103/R8
16	M10	17	5.5	10.5	36	KL103/R10
25	M8	16	7	8.4	38	KL104/R8
25	M10	17	7	10.5	38	KL104/R10
25	M12	19	7	13	38	KL104/R12
35	M8	17	8.2	8.4	42	KL105/R8
35	M10	19	8.2	10.5	42	KL105/R10
35	M12	21	8.2	13	42	KL105/R12
50	M8	20	10	8.4	52	KL106/R8
50	M10	22	10	10.5	52	KL106/R10
50	M12	24	10	13	52	KL106/R12
50	M16	28	10	17	52	KL106/R16
70	M8	24	11.5	8.4	55	KL107/R8
70	M10	24	11.5	10.5	55	KL107/R10
70	M12	24	11.5	13	55	KL107/R12
70	M16	30	11.5	17	55	KL107/R16
95	M10	28	13.5	10.5	65	KL108/R10
95	M12	28	13.5	13	65	KL108/R12
95	M16	32	13.5	17	65	KL108/R16
120	M10	32	15.5	10.5	70	KL109/R10
120	M12	32	15.5	13	70	KL109/R12
120	M16	32	15.5	17	70	KL109/R16
150	M10	34	17	10.5	78	KL110/R10
150	M12	34	17	13	78	KL110/R12
150	M16	34	17	17	78	KL110/R16
150	M20	40	17	21	78	KL110/R20
185	M10	37	19	10.5	82	KL111/R10
185	M12	37	19	13	82	KL111/R12
185	M16	37	19	17	82	KL111/R16
185	M20	40	19	21	82	KL111/R20
240	M12	42	21.5	13	92	KL112/R12
240	M16	42	21.5	17	92	KL112/R16
240	M20	45	21.5	21	92	KL112/R20



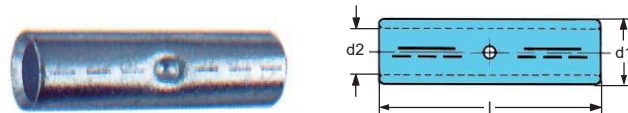
Compression joints DIN 46267 Part 1

for non-tension connections

for circular stranded copper conductors and circular stranded/sector shaped copper conductors.

Material: E-copper

Surface: tin plated, optional copper finished



Conductor mm ²	Conductor dia. mm	Dimensions (mm)			Type No.
		d1	d2	l	
6	2.7 - 3.3	5.5	3.8	30	KL121 R
10	3.5 - 4.2	6	4.5	30	KL122 R
16	4.5 - 5.3	8.5	5.5	50	KL123 R
25	5.6 - 6.6	10	7	50	KL124 R
35	6.6 - 7.9	12.5	8.2	50	KL125 R
50	7.7 - 9.1	14.5	10	56	KL126 R
70	9.3 - 11.0	16.5	11.5	56	KL127 R
95	11.0 - 12.9	19	13.5	70	KL128 R
120	12.5 - 14.5	21	15.5	70	KL129 R
150	13.9 - 16.2	23.5	17	80	KL130 R
185	15.5 - 18.0	25.5	19	85	KL131 R
240	17.8 - 20.6	29	21.5	90	KL132 R

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Compression Cable Joints and Tap Connectors

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Split bolt connector Cellp-Cu FK

Usable as branch-off or connection clamp.

Material: Electrolyte copper



Type	Cat. no.	Main cable cross section	Ø mm	Cross section branch-off	Width across flat
FK 10	126 179	10 mm ²	4.1	2.5 - 10 mm ²	13 mm
FK 16	126 180	16 mm ²	5.1	2.5 - 16 mm ²	17 mm
FK 25	126 181	25 mm ²	6.4	4 - 25 mm ²	19 mm
FK 35	126 182	35 mm ²	7.5	4 - 35 mm ²	22 mm
FK 50	126 183	50 mm ²	9.0	10 - 50 mm ²	24 mm
FK 95	126 184	95 mm ²	12.5	10 - 70 mm ²	32 mm

Universal tap connectors

for circular stranded copper conductors and circular stranded/sector shaped copper conductors.

Material: brass, electro tinned

Bolts: steel 8.8, hot galvanized



with 1 cover for single service taps			
Type No.	Main conductor mm ²	Tap conductor mm ²	Bolt size
PF 330 433 433	16 - 95	4 - 25	M8
PF 330 434 434	50 - 120	6 - 50	M8
PF 330 435 435	50 - 185	6 - 50	M8

Universal tap connectors

for circular stranded copper conductors and circular stranded/sector shaped copper conductors.

Material: brass, electro tinned

Bolts: steel 8.8, hot galvanized



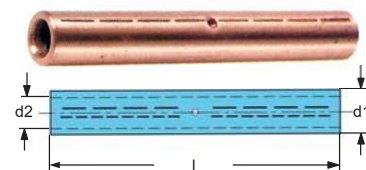
with 2 covers for double service taps			
Type No.	Main conductor mm ²	Tap conductor mm ²	Bolt size
PF 330 824 824	16 - 95	4 - 25	M8
PF 330 437 437	50 - 185	6 - 50	M8

Compression joints DIN 48085 Part 1

for full-tension connections

for circular stranded copper conductors and circular stranded/sector shaped copper conductors.

Material: copper



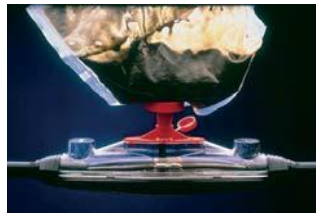
Conductor mm ²	Conductor dia. mm	Dimensions (mm)			Type No.
		d1	d2	l	
6	2.7 - 3.3	6.5	3.5	65	KL181 R
10	3.5 - 4.2	8.5	4.5	80	KL182 R
16	4.5 - 5.3	8.5	5.5	95	KL183 R
25	5.6 - 6.6	10	7.0	95	KL184 R
35	6.6 - 7.9	12.5	8.2	95	KL185 R
50	7.7 - 9.1	14.5	10.0	110	KL186 R
70	9.3 - 11.0	16.5	11.5	110	KL187 R
95	11.0 - 12.9	21	13.5	145	KL188 R
120	12.5 - 14.5	23.5	15.0	160	KL189 R
150	13.9 - 16.2	25.5	16.5	180	KL190 R
185	15.5 - 18.0	31.5	18.5	260	KL191 R
240	17.8 - 20.6	34.5	21.0	310	KL192 R

CABLE CONNECTIONS

Cable Splicing Kits

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3M™ Scotchcast™ Cable Joint Kits

Scotchcast™ 82-A, 91 A and 92-A series suitable for armoured PVC, rubber and XLPE insulated cables. The mold body & mold cover made of halogen-free flame-retardant material.

These inline jointing sleeves are used for making reliable and weather-proof joints on solid insulated or mass impregnated paper insulated cables. Designed for those customers whose preference is a resin cold pour jointing system. Each kit can also be used with various cable types and sizes.

The basic kit is rated up to 1 kV and includes:

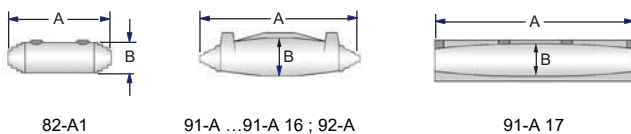
- Pre-shaped moulds
- Tape to seal the mould ends
- Scotchcast resin
- Assembly instruction

Conductor connectors are to be ordered separately.

Scotchcast™ No. 4 resin is an unfilled solvent free two component **epoxy resin** for room temperature curing.

Scotchcast™ No. 1471 resin is an unfilled solvent free two component **polyether urethane** resin for room temperature curing.

Applicable Code/Standards : DIN VDE 0278 Part 623



Type of kit	Cable outside diameter	Max. cable cross section mm²	Resin type no.	Dimensions mm	
				A	B
82-A 1	7-16 mm	4 x 4	4	182	25
82-A 1,5	7-16 mm	4 x 6	4	270	43
91-A 11	8-22 mm	4 x 10	1471	190	36
91-A 11,5	8-22 mm	4 x 16	1471	215	39
91-A 12	14-30 mm	4 x 25	1471	276	49
91-A 13	23-35 mm	4 x 50	1471	360	54
91-A 14	28-47 mm	4 x 95	1471	400	69
91-A 15	33-55 mm	4 x 150	1471	520	100
91-A 16	45-70 mm	4 x 240	1471	700	128
91-A 17	55-77 mm	4 x 400	1471	870	140
92-A 1	8-22 mm	4 x 10	4	190	36
92-A 2	14-30 mm	4 x 25	4	276	49
92-A 3	23-35 mm	4 x 50	4	360	54
92-A 4	28-47 mm	4 x 95	4	400	69



3M™ Scotchcast™ Branch Cable Joint Kits

Scotchcast™ branch joints 91-AB series kits consist of 2 semi-transparent mould bodies which snap easily around the prepared cables. A specially shaped foam fills the gaps at either end of the joint and guarantees seal against resin leakage.

In the 91-AB kits the branch cable is prepared on the top of the main cable, the mould body is then snapped around both cables.

Should a double branch be required, both ends of the mould body are suitable to accept a branch cable.

The 91-AB series can also be used as inline joint.

The full range of sizes of the 91-AB series start from 4 x 1.5 mm² and go up to 4 x 240 mm² for the main cable, and 4 x 1.5 mm² to 4 x 150 mm² for the branch cable.

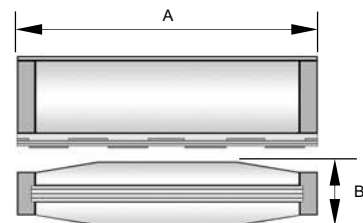
Scotchcast™ No. 1471 resin is utilised to ensure a tough reliable joint.

The basic kit is rated up to 1 kV and includes:

- Pre-shaped moulds
- Tape to seal the mould ends
- Scotchcast resin
- Assembly instruction

Conductor connectors are to be ordered separately.

Applicable Code/Standards : DIN VDE 0278 Part 623



Type of kit	Main cable mm²	Branch cable mm²	Max. Ø main cable	Max. Ø branch cable	Dimensions mm	
					A	B
91-AB 111	4 x 6	4 x 4	15 mm	15 mm	140	40
91-AB 112	4 x 10	4 x 10	22 mm	21 mm	170	58
91-AB 113	4 x 25	4 x 16	29 mm	22 mm	225	75
91-AB 114	4 x 70	4 x 25	35 mm	25 mm	350	95
91-AB 115	4 x 150	4 x 50	50 mm	30 mm	445	112
91-AB 116	4 x 185	4 x 70	58 mm	35 mm	540	125
91-AB 117	4 x 240	4 x 150	65 mm	45 mm	440	145

The Thermit Welding Process

Thermit welding connections are the accepted method of attaching Cathodic Protection leads to pipes (steel or cast iron), tanks and structures.

Thermit welding connections weld the conductors and the structure to be protected so no galvanic corrosion can occur at the interface. The Thermit welding process is specifically formulated to provide minimum heat effect on steel, which is especially important on thin-wall, high-stress pipes.

Thermit welding connections are also used for header cable taps, conductor splices and terminations, and ground rod connections.

A Thermit welding connection ...

- Has current carrying capacity equal to that of the conductor.
- Is permanent with a low resistance connection that cannot loosen or corrode.
- Uses lightweight, inexpensive equipment.
- Requires no external source of power or heat.
- Requires no special skills.
- Can be easily checked for quality.

Thermit welding connections are made with a semi-permanent graphite mold, which holds the conductors to be welded. Weld metal (a mixture of copper oxide and aluminum) is dumped into the top of the mold. The mold is covered and the weld metal ignited. The exothermic reaction produces molten copper, which results in a permanent, high conductivity connection.

Weld powder

Each tube contains a measured quantity of weld-metal powder, together with the correct amount of silver-coloured starting powder. The powder supplied is sufficient to make the appropriate joint.

Graphite mould

The graphite mould comprises a crucible, a tap hole and a weld cavity. The exothermic reaction takes place in the crucible, the molten copper is directed by the tap hole into the weld cavity, which is designed to allow easy removal of the mould from the finished joint.

This design prolongs the mould's life to allow approximately 75 joints, on an average, depending upon the level of care in use.

Mould holder

In most cases the graphite mould is split so it can be clamped around the conductors to be joined. The mould holder can secure different types of moulds and should be ordered separately according to the type and size of joint required.

**Cable cleaner**

Designed for cleaning circular conductors, i.e. rods and cables

**Standard tool kit**

The tool kit comprises:

- File card brush for cleaning conductors.
- Flint igniter for starting the reaction.
- Mould scraper for removing slag left in the crucible after a joint has been made.
- Mould brush for final cleaning of the crucible, tap hole and weld cavity after making the joint.

CABLE CONNECTIONS

Thermit Welding

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		Equipment for copper conductor to steel pipe connections				
		GRAPHITE MOULD	POWDER CARTRIDGE	MOULD HOLDER	MOULD SCRAPER	CONDUCTOR SLEEVE
SOLID CONDUCTOR	Nominal area 2.5 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 4 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 6 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 10 mm ²	221466	PC-32	MH-129	MS-B136A	CS-H102
	Nominal area 16 mm ²	GM-01	PC-15	MH-129	MS-B136A	---
STRANDED CONDUCTOR	Nominal area 2.5 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 4 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 6 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 10 mm ²	GM-02	PC-32	MH-129	MS-B136A	CS-H102
	Nominal area 16 mm ²	GM-01	PC-15	MH-129	MS-B136A	---
	Nominal area 25 mm ²	GM-02	PC-32	MH-129	MS-B136A	---
	Nominal area 35 mm ²	GM-03	PC-32	MH-129	MS-B136A	---
	Nominal area 50 mm ²	GM-04	PC-45	MH-129	MS-B136A	---
	Nominal area 70 mm ²	GM-05	PC-65	MH-129	MS-B136A	---
	Nominal area 95 mm ²	GM-06	PC-115	MH-160	MS-B136B	---
	Nominal area 120 mm ²	GM-07	PC-115	MH-160	MS-B136B	---
	Nominal area 150 mm ²	GM-08	PC-150	MH-160	MS-B136B	---