



# Caledonian

## OUTDOOR TELEPHONE CABLES

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## Solid PE Insulated & LAP Sheathed Air Core/Jelly Filled Cables to DIN VDE 0816

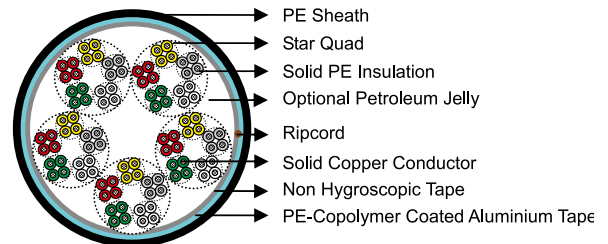
### APPLICATION

The cables are designed for use as connection between central offices. The cables are suitable for installation in ducts and aerial installation with integral suspension strand. Jelly filled option is for subscriber's cables installed underground or along the edge of pavement. An armoured option is offered for direct burial installations.



### STANDARDS

- DIN VDE 0816

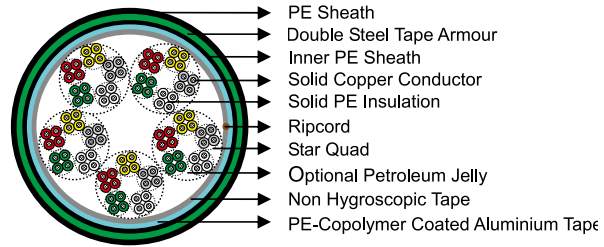


### CONSTRUCTION

- **Conductors:** Solid annealed bare copper 0.4/0.6/0.8mm, as per class 1 of DIN VDE 0295/BS 6360/IEC 60228.
- **Insulation:** Solid polyethylene 2Y12 type as per DIN VDE 0207-2.
- **Twisted Pairs:** Insulated conductors are twisted into pairs with varying lay length to minimize crosstalk.
- **Cabling Element:** Star Quads.
- **Cable Core Assembly:** 4 Cores are twisted into star quad. 5 star quads are stranded into a basic unit. 5 or 10 basic units each are stranded into one main unit. The star quads are grouped in units and stranded in layers to form the cable core. Standard make up is per DIN VDE 0816 in the Cable Make Up Diagram.
- **Core Wrapping:** One or more non-hygroscopic polyester tapes are helically or longitudinally laid with an overlap. These tapes furnish thermal, mechanical as well as high dielectric protection between shielding and individual conductors.
- **Moisture Barrier:** A layer of aluminium tape (0.2mm) coated with PE-copolymer on one or both sides and applied longitudinally with overlap over the cable core to provide electrical shielding coverage and ensures a barrier against water vapor.
- **Sheath:** Black low or medium density polyethylene 2YM2 type as per DIN VDE 0207-3, being able to withstand exposure to sunlight, temperature variations, ground chemicals and other environmental contaminants.
- **Ripcord:** Ripcord may be provided for slitting the sheath longitudinally to facilitate its removal.
- **Spare Pairs (optional):** Spare pairs may be provided for large pair cables.
- **Continuity Wire (optional):** Tinned copper drain wire may be longitudinally laid to ensure electrical continuity of the screen.

### OPTIONAL CONSTRUCTION

- **Jelly Filled Cable:** The cable core interstices are filled with petroleum jelly to avoid longitudinal water penetration within the cable. The water resistant filling compound is applied to the air space between non-hygroscopic tape and shield,



shield and sheath within the cable core.

- **Armoured Cable:** Corrugated steel tape armour is applied over an optional inner polyethylene sheath with an overlap. An outer polyethylene sheath is applied over the armour.

## TYPE CODES

- A- Outdoor Cable
- 2Y Polyethylene (PE) insulation
- F Continuous core filling
- (L)2Y Laminated sheath(copolymer-coated aluminium tape laminated to PE outer sheath)
- SR Corrugated steel tape
- b Armouring
- T Messenger of galvanized steel wires
- StIII Star quad in local cables.
- Bd Unit-type stranding

## ELECTRICAL PROPERTIES

Nominal Conductor Diameter	mm	0.4	0.6	0.8
Conductor Gauge Size	AWG	26	-	20
Conductor Size	mm <sup>2</sup>	0.126	0.283	0.5
Maximum Average Conductor Resistance @20°C	Ω/km	143	63	34.6
Minimum Insulation Resistance @500V DC	MΩ·km	5000	5000	5000
Maximum Average Mutual Capacitance @800Hz (for 95% cases)	nF/km	48	50	53
Maximum Individual Mutual Capacitance @800Hz (for 100% cases)	nF/km	50	52	55
Maximum Individual Capacitance Unbalance @800Hz pair-to-pair				
K1 (100% of all values)	pF/500m	980	980	980
K1 (95% of all values)	pF/500m	420	420	420
K9-K12 (100% of all values)	pF/500m	800	800	800
K9-K12 (90% of all values)	pF/500m	200	200	200
Maximum Conductor Loop Resistance @20°C	Ω/km	300	130	73.2
Impedance @0.8KHz	Ω	994	665	500
Maximum Average Attenuation @0.8KHz	dB/km	1.49	1.04	0.78
Dielectric Strength 50Hz				
Conductor to Conductor (2mins)	V AC	500	500	500
Conductor to Screen (2mins)	V AC	2000	2000	2000
Maximum Operating Voltage Peak Value	V	150	220	220
Nominal Insulation Thickness (Air Core)	mm	0.20	0.25	0.3
(Jelly Filled)	mm	0.26	0.36	0.44
Nominal Insulated Conductor Diameter (Air Core)	mm	0.8	1.1	1.4
(Jelly Filled)	mm	0.92	1.32	1.68



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### MECHANICAL AND THERMAL PROPERTIES

Temperature range during operation (fixed state): -30°C – +70°C

Temperature range during installation (mobile state): -20°C – +50°C

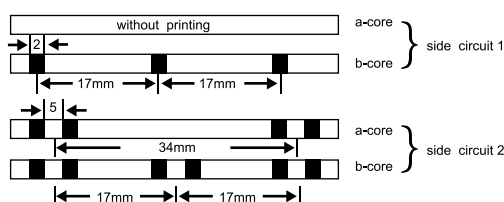
Minimum bending radius: 10 x Overall Diameter (unarmoured cables); 15 x Overall Diameter (armoured cables)

### COLOUR CODE

#### Quads

The single core is identified by black ring markings:

- |                |        |                       |
|----------------|--------|-----------------------|
| Side Circuit 1 | a-wire | without marking       |
|                | b-wire | 1 mark distance 17mm  |
| Side Circuit 2 | a-wire | 2 marks distance 34mm |
|                | b-wire | 2 marks distance 17mm |



#### Subunits

Basic colours for the wire insulation of the 5 star quads of a basic unit:

- |             |               |              |
|-------------|---------------|--------------|
| Quad 1 Red  | Quad 2 Green  |              |
| Quad 3 Grey | Quad 4 Yellow | Quad 5 White |

The tracer units are coded with a red helix, all other units by a white binder.

### DIMENSIONS AND WEIGHT

Solid PE Insulated and LAP Sheathed Air Core Cable to DIN VDE 0816

VDE CODE: A-2Y(L)2Y...x2x0.4/0.6/0.8 StIII Bd

Cable Code	Number of Pairs	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.4mm Conductor, 0.8mm Insulated Wire					
TP816A-2Y(L)2Y-StIII-Bd-6P04	6	0.2	1.8	10.0	85
TP816A-2Y(L)2Y-StIII-Bd-10P04	10	0.2	1.8	11.0	125
TP816A-2Y(L)2Y-StIII-Bd-20P04	20	0.2	1.8	12.0	150
TP816A-2Y(L)2Y-StIII-Bd-30P04	30	0.2	1.8	13.5	200
TP816A-2Y(L)2Y-StIII-Bd-40P04	40	0.2	1.8	14.5	225
TP816A-2Y(L)2Y-StIII-Bd-50P04	50	0.2	1.8	15.5	275
TP816A-2Y(L)2Y-StIII-Bd-70P04	70	0.2	1.8	17.0	250
TP816A-2Y(L)2Y-StIII-Bd-100P04	100	0.2	1.8	19.5	450
TP816A-2Y(L)2Y-StIII-Bd-120P04	120	0.2	2.0	20.5	525
TP816A-2Y(L)2Y-StIII-Bd-150P04	150	0.2	2.0	22.5	625
TP816A-2Y(L)2Y-StIII-Bd-200P04	200	0.2	2.0	25.5	825
TP816A-2Y(L)2Y-StIII-Bd-250P04	250	0.2	2.0	29.0	1000
TP816A-2Y(L)2Y-StIII-Bd-300P04	300	0.2	2.0	31.0	1175
TP816A-2Y(L)2Y-StIII-Bd-350P04	350	0.2	2.2	33.0	1325
TP816A-2Y(L)2Y-StIII-Bd-400P04	400	0.2	2.2	34.5	1500
TP816A-2Y(L)2Y-StIII-Bd-500P04	500	0.2	2.2	38.5	1875
TP816A-2Y(L)2Y-StIII-Bd-600P04	600	0.2	2.2	41.5	2175
TP816A-2Y(L)2Y-StIII-Bd-700P04	700	0.2	2.6	44.0	2500
TP816A-2Y(L)2Y-StIII-Bd-800P04	800	0.2	2.6	47.5	2875
TP816A-2Y(L)2Y-StIII-Bd-1000P04	1000	0.2	3.0	52.0	3525
TP816A-2Y(L)2Y-StIII-Bd-1200P04	1200	0.2	3.0	57.5	4250
TP816A-2Y(L)2Y-StIII-Bd-1500P04	1500	0.2	3.4	63.0	5225
TP816A-2Y(L)2Y-StIII-Bd-2000P04	2000	0.2	3.8	72.5	6925
0.6mm Conductor, 1.1mm Insulated Wire					

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Cable Code	Number of Pairs	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
TP816A-2Y(L)2Y-StIII-Bd-6P06	6	0.25	1.8	11.5	125
TP816A-2Y(L)2Y-StIII-Bd-10P06	10	0.25	1.8	13.0	157
TP816A-2Y(L)2Y-StIII-Bd-20P06	20	0.25	1.8	14.5	250
TP816A-2Y(L)2Y-StIII-Bd-30P06	30	0.25	1.8	16.5	325
TP816A-2Y(L)2Y-StIII-Bd-40P06	40	0.25	1.8	18.0	400
TP816A-2Y(L)2Y-StIII-Bd-50P06	50	0.25	1.8	19.5	475
TP816A-2Y(L)2Y-StIII-Bd-70P06	70	0.25	2.0	22.0	625
TP816A-2Y(L)2Y-StIII-Bd-100P06	100	0.25	2.0	26.0	850
TP816A-2Y(L)2Y-StIII-Bd-120P06	120	0.25	2.2	27.5	1000
TP816A-2Y(L)2Y-StIII-Bd-150P06	150	0.25	2.2	30.0	1225
TP816A-2Y(L)2Y-StIII-Bd-200P06	200	0.25	2.2	33.5	1575
TP816A-2Y(L)2Y-StIII-Bd-250P06	250	0.25	2.6	37.5	1925
TP816A-2Y(L)2Y-StIII-Bd-300P06	300	0.25	2.6	40.0	2275
TP816A-2Y(L)2Y-StIII-Bd-350P06	350	0.25	2.8	43.0	2625
TP816A-2Y(L)2Y-StIII-Bd-400P06	400	0.25	2.8	46.0	3025
TP816A-2Y(L)2Y-StIII-Bd-500P06	500	0.25	3.0	50.5	3700
TP816A-2Y(L)2Y-StIII-Bd-600P06	600	0.25	3.4	60.0	4475
TP816A-2Y(L)2Y-StIII-Bd-700P06	700	0.25	3.6	62.0	5175
TP816A-2Y(L)2Y-StIII-Bd-800P06	800	0.25	3.8	65.5	5850
TP816A-2Y(L)2Y-StIII-Bd-1000P06	1000	0.25	3.8	73.5	7300
TP816A-2Y(L)2Y-StIII-Bd-1200P06	1200	0.25	4.0	80.5	8750
0.8mm Conductor, 1.4mm Insulated Wire					
TP816A-2Y(L)2Y-StIII-Bd-6P08	6	0.3	1.8	13.0	175
TP816A-2Y(L)2Y-StIII-Bd-10P08	10	0.3	1.8	15.0	225
TP816A-2Y(L)2Y-StIII-Bd-20P08	20	0.3	1.8	17.0	350
TP816A-2Y(L)2Y-StIII-Bd-30P08	30	0.3	1.8	19.5	475
TP816A-2Y(L)2Y-StIII-Bd-40P08	40	0.3	2.0	21.5	600
TP816A-2Y(L)2Y-StIII-Bd-50P08	50	0.3	2.0	23.5	750
TP816A-2Y(L)2Y-StIII-Bd-70P08	70	0.3	2.0	27.5	1000
TP816A-2Y(L)2Y-StIII-Bd-100P08	100	0.3	2.2	31.5	1375
TP816A-2Y(L)2Y-StIII-Bd-120P08	120	0.3	2.4	34.0	1625
TP816A-2Y(L)2Y-StIII-Bd-150P08	150	0.3	2.6	37.5	2000
TP816A-2Y(L)2Y-StIII-Bd-200P08	200	0.3	2.6	42.0	2600
TP816A-2Y(L)2Y-StIII-Bd-250P08	250	0.3	3.0	48.0	3250
TP816A-2Y(L)2Y-StIII-Bd-300P08	300	0.3	3.0	52.0	3825
TP816A-2Y(L)2Y-StIII-Bd-350P08	350	0.3	3.4	55.5	4425
TP816A-2Y(L)2Y-StIII-Bd-400P08	400	0.3	3.4	60.0	5100
TP816A-2Y(L)2Y-StIII-Bd-500P08	500	0.3	3.4	66.0	6250
TP816A-2Y(L)2Y-StIII-Bd-600P08	600	0.3	3.8	72.5	7525
TP816A-2Y(L)2Y-StIII-Bd-700P08	700	0.3	4.0	77.5	8700
TP816A-2Y(L)2Y-StIII-Bd-800P08	800	0.3	4.2	83.0	9950

Solid PE Insulated and LAP Sheathed Jelly Filled Cable to DIN VDE 0816

VDE CODE: A-2YF(L)2Y...x2x0.4/0.6/0.8 StIII Bd

Cable Code	Number of Pairs	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
0.4mm Conductor, 0.92mm Insulated Wire					
TP816A-2YF(L)2Y-StIII-Bd-6P04	6	0.26	1.8	10.0	85
TP816A-2YF(L)2Y-StIII-Bd-10P04	10	0.26	1.8	11.0	125
TP816A-2YF(L)2Y-StIII-Bd-20P04	20	0.26	1.8	12.0	150
TP816A-2YF(L)2Y-StIII-Bd-30P04	30	0.26	1.8	13.5	200
TP816A-2YF(L)2Y-StIII-Bd-40P04	40	0.26	1.8	14.5	225
TP816A-2YF(L)2Y-StIII-Bd-50P04	50	0.26	1.8	15.5	250
TP816A-2YF(L)2Y-StIII-Bd-70P04	70	0.26	1.8	17.0	275
TP816A-2YF(L)2Y-StIII-Bd-100P04	100	0.26	1.8	19.5	450



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Cable Code	Number of Pairs	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Nominal Overall Diameter mm	Nominal Weight kg/km
TP816A-2YF(L)2Y-StIII-Bd-120P04	120	0.26	2.0	20.5	525
TP816A-2YF(L)2Y-StIII-Bd-150P04	150	0.26	2.0	22.5	625
TP816A-2YF(L)2Y-StIII-Bd-200P04	200	0.26	2.0	25.5	825
TP816A-2YF(L)2Y-StIII-Bd-250P04	250	0.26	2.2	29.0	1000
TP816A-2YF(L)2Y-StIII-Bd-300P04	300	0.26	2.2	31.0	1175
TP816A-2YF(L)2Y-StIII-Bd-350P04	350	0.26	2.2	33.0	1325
TP816A-2YF(L)2Y-StIII-Bd-400P04	400	0.26	2.2	34.5	1500
TP816A-2YF(L)2Y-StIII-Bd-500P04	500	0.26	2.4	38.5	1875
TP816A-2YF(L)2Y-StIII-Bd-600P04	600	0.26	2.6	41.5	2175
TP816A-2YF(L)2Y-StIII-Bd-700P04	700	0.26	2.8	44.0	2500
TP816A-2YF(L)2Y-StIII-Bd-800P04	800	0.26	3.0	47.5	2875
TP816A-2YF(L)2Y-StIII-Bd-1000P04	1000	0.26	3.0	52.0	3525
TP816A-2YF(L)2Y-StIII-Bd-1200P04	1200	0.26	3.4	57.5	4250
TP816A-2YF(L)2Y-StIII-Bd-1500P04	1500	0.26	3.8	63.0	5225
TP816A-2YF(L)2Y-StIII-Bd-2000P04	2000	0.26	4.0	72.5	6925
0.6mm Conductor, 1.32mm Insulated Wire					
TP816A-2YF(L)2Y-StIII-Bd-6P06	6	0.36	1.8	11.5	125
TP816A-2YF(L)2Y-StIII-Bd-10P06	10	0.36	1.8	13.0	175
TP816A-2YF(L)2Y-StIII-Bd-20P06	20	0.36	1.8	14.5	250
TP816A-2YF(L)2Y-StIII-Bd-30P06	30	0.36	1.8	16.5	325
TP816A-2YF(L)2Y-StIII-Bd-40P06	40	0.36	1.8	18.0	400
TP816A-2YF(L)2Y-StIII-Bd-50P06	50	0.36	1.8	19.5	475
TP816A-2YF(L)2Y-StIII-Bd-70P06	70	0.36	2.0	22.0	625
TP816A-2YF(L)2Y-StIII-Bd-100P06	100	0.36	2.0	26.0	850
TP816A-2YF(L)2Y-StIII-Bd-120P06	120	0.36	2.2	27.5	1000
TP816A-2YF(L)2Y-StIII-Bd-150P06	150	0.36	2.2	30.0	1225
TP816A-2YF(L)2Y-StIII-Bd-200P06	200	0.36	2.2	33.5	1575
TP816A-2YF(L)2Y-StIII-Bd-250P06	250	0.36	2.6	37.5	1925
TP816A-2YF(L)2Y-StIII-Bd-300P06	300	0.36	2.6	40.0	2275
TP816A-2YF(L)2Y-StIII-Bd-350P06	350	0.36	2.8	43.0	2625
TP816A-2YF(L)2Y-StIII-Bd-400P06	400	0.36	3.0	46.0	3025
TP816A-2YF(L)2Y-StIII-Bd-500P06	500	0.36	3.2	50.5	3700
TP816A-2YF(L)2Y-StIII-Bd-600P06	600	0.36	3.4	60.0	4475
TP816A-2YF(L)2Y-StIII-Bd-750P06	750	0.36	3.6	62.0	5175
TP816A-2YF(L)2Y-StIII-Bd-800P06	800	0.36	3.8	65.5	5850
TP816A-2YF(L)2Y-StIII-Bd-1000P06	1000	0.36	3.8	73.5	7300
TP816A-2YF(L)2Y-StIII-Bd-1200P06	1200	0.36	4.0	80.5	8750
0.8mm Conductor, 1.68mm Insulated Wire					
TP816A-2YF(L)2Y-StIII-Bd-6P08	6	0.44	1.8	13.0	175
TP816A-2YF(L)2Y-StIII-Bd-10P08	10	0.44	1.8	15.0	225
TP816A-2YF(L)2Y-StIII-Bd-20P08	20	0.44	1.8	17.0	350
TP816A-2YF(L)2Y-StIII-Bd-30P08	30	0.44	1.8	19.5	475
TP816A-2YF(L)2Y-StIII-Bd-40P08	40	0.44	2.0	21.5	600
TP816A-2YF(L)2Y-StIII-Bd-50P08	50	0.44	2.0	23.5	750
TP816A-2YF(L)2Y-StIII-Bd-70P08	70	0.44	2.0	27.5	1000
TP816A-2YF(L)2Y-StIII-Bd-100P08	100	0.44	2.2	31.5	1375
TP816A-2YF(L)2Y-StIII-Bd-120P08	120	0.44	2.4	34.0	1625
TP816A-2YF(L)2Y-StIII-Bd-150P08	150	0.44	2.6	37.5	2000
TP816A-2YF(L)2Y-StIII-Bd-200P08	200	0.44	2.6	42.0	2600
TP816A-2YF(L)2Y-StIII-Bd-250P08	250	0.44	3.0	48.0	3250
TP816A-2YF(L)2Y-StIII-Bd-300P08	300	0.44	3.0	52.0	3825
TP816A-2YF(L)2Y-StIII-Bd-350P08	350	0.44	3.2	55.5	4425
TP816A-2YF(L)2Y-StIII-Bd-400P08	400	0.44	3.4	60.0	5100
TP816A-2YF(L)2Y-StIII-Bd-500P08	500	0.44	3.4	66.0	6250
TP816A-2YF(L)2Y-StIII-Bd-600P08	600	0.44	3.8	72.5	7525
TP816A-2YF(L)2Y-StIII-Bd-700P08	700	0.44	4.0	77.5	8700
TP816A-2YF(L)2Y-StIII-Bd-800P08	800	0.44	4.0	83.0	9950