



Caledonian

OUTDOOR TELEPHONE CABLES

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

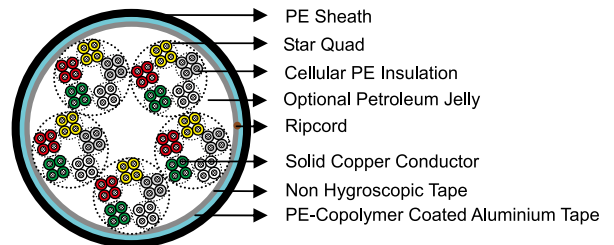
APPLICATION

The cables are designed for use as connection between central offices. The cables are suitable for installation in ducts, direct burial in the ground and also for 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. A figure-8 self support option is offered for aerial installation.



STANDARDS

- DIN VDE 0816

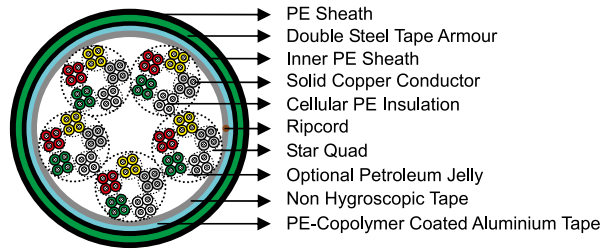


CONSTRUCTION

- **Conductors:** Solid annealed bare copper 0.4/0.6/0.8mm, as per class 1 of DIN VDE 0295/ BS 6360/IEC 60228.
- **Insulation:** Cellular polyethylene 2Y12 type as per 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 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 is applied longitudinally with overlap over the cable core to provide 100% electrical shielding coverage and ensures a barrier against water vapor.
- **Sheath:** Black low or medium density polyethylene 2YM2 type as per 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
- 02Y Cellular Polyethylene (FOAM 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 ²	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 Mutual Capacitance @800Hz	95% of all values	nF/km	40	40
	100% of all values	nF/km	42	42
Capacitance Unbalance @800Hz pair-to-pair				
K1 100% of values max	pF/500m	980	800	800
	pF/500m	420	400	400
K9-12 100% of values max	pF/500m	800	300	300
	pF/500m	200	100	100
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	1.45	0.91	0.68
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	225	225
Nominal Insulation Thickness (Air Core)	mm	0.20	0.25	0.3
	(Jelly Filled)	mm	0.26	0.36
Nominal Insulated Conductor Diameter (Air Core)	mm	0.8	1.1	1.4
	(Jelly Filled)	mm	0.92	1.32



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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

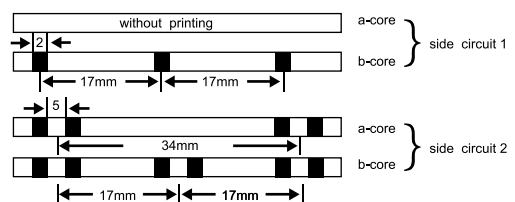
Minimum bending radius: 10 x Overall Diameter (unarmoured cables); 15 x Overall Diameter (armoured cables)

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 of 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

Cellular PE Insulated and LAP Sheathed Air Core Cable VDE CODE: A-02Y(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-02Y(L)2Y-StIII-Bd-6P04	6	0.2	1.8	9.0	85
TP816A-02Y(L)2Y-StIII-Bd-10P04	10	0.2	1.8	11.0	125
TP816A-02Y(L)2Y-StIII-Bd-20P04	20	0.2	1.8	12.0	150
TP816A-02Y(L)2Y-StIII-Bd-30P04	30	0.2	1.8	13.5	200
TP816A-02Y(L)2Y-StIII-Bd-40P04	40	0.2	1.8	14.5	225
TP816A-02Y(L)2Y-StIII-Bd-50P04	50	0.2	1.8	15.5	275
TP816A-02Y(L)2Y-StIII-Bd-70P04	70	0.2	1.8	17.0	250
TP816A-02Y(L)2Y-StIII-Bd-100P04	100	0.2	1.8	19.5	450
TP816A-02Y(L)2Y-StIII-Bd-120P04	120	0.2	2.0	20.5	525
TP816A-02Y(L)2Y-StIII-Bd-150P04	150	0.2	2.0	22.5	625
TP816A-02Y(L)2Y-StIII-Bd-200P04	200	0.2	2.0	25.5	825
TP816A-02Y(L)2Y-StIII-Bd-250P04	250	0.2	2.0	29.0	1000
TP816A-02Y(L)2Y-StIII-Bd-300P04	300	0.2	2.0	31.0	1175
TP816A-02Y(L)2Y-StIII-Bd-350P04	350	0.2	2.2	33.0	1325
TP816A-02Y(L)2Y-StIII-Bd-400P04	400	0.2	2.2	34.5	1500
TP816A-02Y(L)2Y-StIII-Bd-500P04	500	0.2	2.2	38.5	1875
TP816A-02Y(L)2Y-StIII-Bd-600P04	600	0.2	2.2	41.5	2175
TP816A-02Y(L)2Y-StIII-Bd-700P04	700	0.2	2.6	44.0	2500
TP816A-02Y(L)2Y-StIII-Bd-800P04	800	0.2	2.6	47.5	2875
TP816A-02Y(L)2Y-StIII-Bd-1000P04	1000	0.2	3.0	52.0	3525
TP816A-02Y(L)2Y-StIII-Bd-1200P04	1200	0.2	3.0	57.5	4250
TP816A-02Y(L)2Y-StIII-Bd-1500P04	1500	0.2	3.4	63.0	5225
TP816A-02Y(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-02Y(L)2Y-StIII-Bd-6P06	6	0.25	1.8	10.3	106
TP816A-02Y(L)2Y-StIII-Bd-10P06	10	0.25	1.8	11.3	137
TP816A-02Y(L)2Y-StIII-Bd-20P06	20	0.25	1.8	14.6	221
TP816A-02Y(L)2Y-StIII-Bd-30P06	30	0.25	1.8	16.2	292
TP816A-02Y(L)2Y-StIII-Bd-40P06	40	0.25	1.8	18.0	366
TP816A-02Y(L)2Y-StIII-Bd-50P06	50	0.25	1.8	19.5	436
TP816A-02Y(L)2Y-StIII-Bd-70P06	70	0.25	2.0	22.2	580
TP816A-02Y(L)2Y-StIII-Bd-100P06	100	0.25	2.0	26.0	808
TP816A-02Y(L)2Y-StIII-Bd-120P06	120	0.25	2.2	28.0	951
TP816A-02Y(L)2Y-StIII-Bd-150P06	150	0.25	2.2	30.6	1156
TP816A-02Y(L)2Y-StIII-Bd-200P06	200	0.25	2.2	35.0	1511
TP816A-02Y(L)2Y-StIII-Bd-250P06	250	0.25	2.6	39.9	1890
TP816A-02Y(L)2Y-StIII-Bd-300P06	300	0.25	2.6	43.1	2220
TP816A-02Y(L)2Y-StIII-Bd-350P06	350	0.25	2.8	46.8	2600
TP816A-02Y(L)2Y-StIII-Bd-400P06	400	0.25	3.0	48.0	3025
TP816A-02Y(L)2Y-StIII-Bd-500P06	500	0.25	2.8	50.5	3700
TP816A-02Y(L)2Y-StIII-Bd-600P06	600	0.25	3.4	60.0	4475
TP816A-02Y(L)2Y-StIII-Bd-700P06	700	0.25	3.6	62.0	5175
TP816A-02Y(L)2Y-StIII-Bd-800P06	800	0.25	3.8	65.5	5850
TP816A-02Y(L)2Y-StIII-Bd-1000P06	1000	0.25	3.8	73.5	7300
TP816A-02Y(L)2Y-StIII-Bd-1200P06	1200	0.25	4.0	80.5	8750
0.8mm Conductor, 1.4mm Insulated Wire					
TP816A-02Y(L)2Y-StIII-Bd-6P08	6	0.3	1.8	12.0	141
TP816A-02Y(L)2Y-StIII-Bd-10P08	10	0.3	1.8	13.9	202
TP816A-02Y(L)2Y-StIII-Bd-20P08	20	0.3	1.8	17.1	334
TP816A-02Y(L)2Y-StIII-Bd-30P08	30	0.3	1.8	19.8	464
TP816A-02Y(L)2Y-StIII-Bd-40P08	40	0.3	2.0	22.1	590
TP816A-02Y(L)2Y-StIII-Bd-50P08	50	0.3	2.0	24.6	728
TP816A-02Y(L)2Y-StIII-Bd-70P08	70	0.3	2.0	28.1	971
TP816A-02Y(L)2Y-StIII-Bd-100P08	100	0.3	2.2	32.6	1319
TP816A-02Y(L)2Y-StIII-Bd-120P08	120	0.3	2.4	35.6	1587
TP816A-02Y(L)2Y-StIII-Bd-150P08	150	0.3	2.6	39.1	1920
TP816A-02Y(L)2Y-StIII-Bd-200P08	200	0.3	2.6	44.3	2519
TP816A-02Y(L)2Y-StIII-Bd-250P08	250	0.3	3.0	50.6	3180
TP816A-02Y(L)2Y-StIII-Bd-300P08	300	0.3	3.0	55.7	3840
TP816A-02Y(L)2Y-StIII-Bd-350P08	350	0.3	3.4	60.1	4440
TP816A-02Y(L)2Y-StIII-Bd-400P08	400	0.3	3.4	63.0	5100
TP816A-02Y(L)2Y-StIII-Bd-500P08	500	0.3	3.4	66.0	6250
TP816A-02Y(L)2Y-StIII-Bd-600P08	600	0.3	3.8	72.5	7525
TP816A-02Y(L)2Y-StIII-Bd-700P08	700	0.3	4.0	77.5	8700
TP816A-02Y(L)2Y-StIII-Bd-800P08	800	0.3	4.2	83.0	9950

Cellular PE Insulated and LAP Sheathed Jelly Filled Cable VDE CODE: A-02YF(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-02YF(L)2Y-StIII-Bd-6P04	6	0.26	1.8	9.6	89
TP816A-02YF(L)2Y-StIII-Bd-10P04	10	0.26	1.8	11.3	133
TP816A-02YF(L)2Y-StIII-Bd-20P04	20	0.26	1.8	13.3	182
TP816A-02YF(L)2Y-StIII-Bd-30P04	30	0.26	1.8	14.9	240
TP816A-02YF(L)2Y-StIII-Bd-40P04	40	0.26	1.8	16.8	303
TP816A-02YF(L)2Y-StIII-Bd-50P04	50	0.26	1.8	17.6	350
TP816A-02YF(L)2Y-StIII-Bd-70P04	70	0.26	1.8	19.9	455
TP816A-02YF(L)2Y-StIII-Bd-100P04	100	0.26	1.8	21.8	568



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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-02YF(L)2Y-StIII-Bd-120P04	120	0.26	2.0	27.1	743
TP816A-02YF(L)2Y-StIII-Bd-150P04	150	0.26	2.0	28.0	906
TP816A-02YF(L)2Y-StIII-Bd-200P04	200	0.26	2.0	31.4	1130
TP816A-02YF(L)2Y-StIII-Bd-250P04	250	0.26	2.2	34.1	1340
TP816A-02YF(L)2Y-StIII-Bd-300P04	300	0.26	2.2	38.3	1690
TP816A-02YF(L)2Y-StIII-Bd-350P04	350	0.26	2.2	40.8	1950
TP816A-02YF(L)2Y-StIII-Bd-400P04	400	0.26	2.2	43.1	2170
TP816A-02YF(L)2Y-StIII-Bd-500P04	500	0.26	2.4	48.2	2720
TP816A-02YF(L)2Y-StIII-Bd-600P04	600	0.26	2.6	50.2	3140
TP816A-02YF(L)2Y-StIII-Bd-700P04	700	0.26	2.8	53.7	3620
TP816A-02YF(L)2Y-StIII-Bd-800P04	800	0.26	3.0	57.7	4160
TP816A-02YF(L)2Y-StIII-Bd-1000P04	1000	0.26	3.0	64.3	5170
TP816A-02YF(L)2Y-StIII-Bd-1200P04	1200	0.26	3.4	70.3	6050
TP816A-02YF(L)2Y-StIII-Bd-1500P04	1500	0.26	3.8	72.5	6900
TP816A-02YF(L)2Y-StIII-Bd-2000P04	2000	0.26	4.0	80.9	10100
0.6mm Conductor, 1.32mm Insulated Wire					
TP816A-02YF(L)2Y-StIII-Bd-6P06	6	0.36	1.8	11.2	130
TP816A-02YF(L)2Y-StIII-Bd-10P06	10	0.36	1.8	12.8	180
TP816A-02YF(L)2Y-StIII-Bd-20P06	20	0.36	1.8	16.8	305
TP816A-02YF(L)2Y-StIII-Bd-30P06	30	0.36	1.8	18.6	410
TP816A-02YF(L)2Y-StIII-Bd-40P06	40	0.36	1.8	19.4	480
TP816A-02YF(L)2Y-StIII-Bd-50P06	50	0.36	1.8	22.7	625
TP816A-02YF(L)2Y-StIII-Bd-70P06	70	0.36	2.0	25.5	820
TP816A-02YF(L)2Y-StIII-Bd-100P06	100	0.36	2.0	29.6	1120
TP816A-02YF(L)2Y-StIII-Bd-120P06	120	0.36	2.2	33.0	1310
TP816A-02YF(L)2Y-StIII-Bd-150P06	150	0.36	2.2	37.9	1740
TP816A-02YF(L)2Y-StIII-Bd-200P06	200	0.36	2.2	42.6	2240
TP816A-02YF(L)2Y-StIII-Bd-250P06	250	0.36	2.6	47.1	2780
TP816A-02YF(L)2Y-StIII-Bd-300P06	300	0.36	2.6	51.3	3390
TP816A-02YF(L)2Y-StIII-Bd-350P06	350	0.36	2.8	54.3	3760
TP816A-02YF(L)2Y-StIII-Bd-400P06	400	0.36	3.0	58.8	4340
TP816A-02YF(L)2Y-StIII-Bd-500P06	500	0.36	3.2	64.7	5330
TP816A-02YF(L)2Y-StIII-Bd-600P06	600	0.36	3.4	68.3	6180
TP816A-02YF(L)2Y-StIII-Bd-750P06	750	0.36	3.6	73.1	7140
TP816A-02YF(L)2Y-StIII-Bd-800P06	800	0.36	3.8	78.3	8170
TP816A-02YF(L)2Y-StIII-Bd-1000P06	1000	0.36	3.8	86.3	10030
TP816A-02YF(L)2Y-StIII-Bd-1200P06	1200	0.36	4.0	92.3	11030
0.8mm Conductor, 1.68mm Insulated Wire					
TP816A-02YF(L)2Y-StIII-Bd-6P08	6	0.44	1.8	12.9	180
TP816A-02YF(L)2Y-StIII-Bd-10P08	10	0.44	1.8	14.9	260
TP816A-02YF(L)2Y-StIII-Bd-20P08	20	0.44	1.8	19.6	460
TP816A-02YF(L)2Y-StIII-Bd-30P08	30	0.44	1.8	22.2	620
TP816A-02YF(L)2Y-StIII-Bd-40P08	40	0.44	2.0	23.3	745
TP816A-02YF(L)2Y-StIII-Bd-50P08	50	0.44	2.0	27.8	1000
TP816A-02YF(L)2Y-StIII-Bd-70P08	70	0.44	2.0	30.9	1290
TP816A-02YF(L)2Y-StIII-Bd-100P08	100	0.44	2.2	36.4	1830
TP816A-02YF(L)2Y-StIII-Bd-120P08	120	0.44	2.4	38.6	2100
TP816A-02YF(L)2Y-StIII-Bd-150P08	150	0.44	2.6	36.8	2835
TP816A-02YF(L)2Y-StIII-Bd-200P08	200	0.44	2.6	52.8	3675
TP816A-02YF(L)2Y-StIII-Bd-250P08	250	0.44	3.0	58.4	4555
TP816A-02YF(L)2Y-StIII-Bd-300P08	300	0.44	3.0	63.1	5370
TP816A-02YF(L)2Y-StIII-Bd-350P08	350	0.44	3.2	68.3	6280
TP816A-02YF(L)2Y-StIII-Bd-400P08	400	0.44	3.4	72.4	7105
TP816A-02YF(L)2Y-StIII-Bd-500P08	500	0.44	3.4	80.6	8830
TP816A-02YF(L)2Y-StIII-Bd-600P08	600	0.44	3.8	87.3	10490
TP816A-02YF(L)2Y-StIII-Bd-700P08	700	0.44	4.0	102.5	11200
TP816A-02YF(L)2Y-StIII-Bd-800P08	800	0.44	4.0	108.0	11950