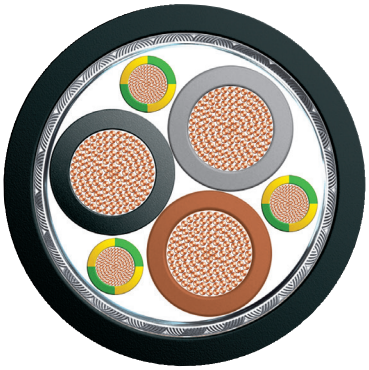
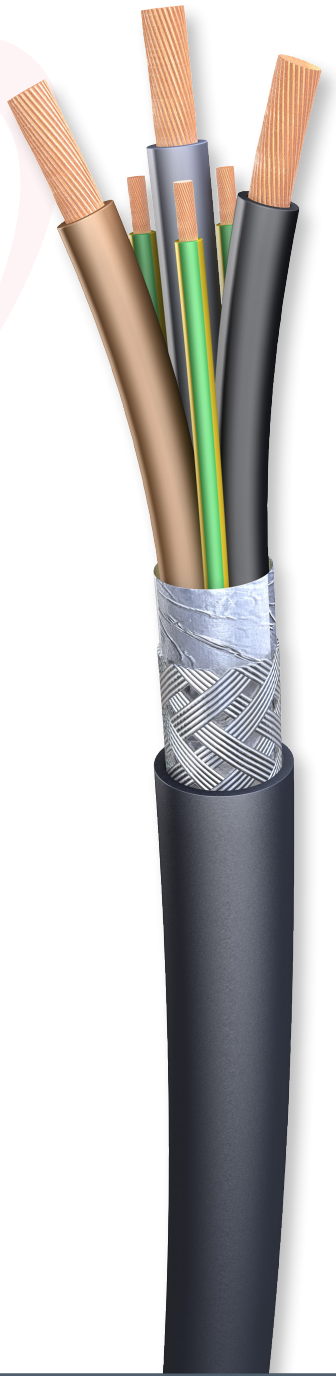
VFD *EMC LSZH screened cable for Variable Frequency Drives (VFD) Dca*



Application

EMC VFD cable has been specially designed for Variable Frequency Drive Motors and installations where it is necessary to limit the effects of electromagnetic interference (EMI).



Cable Design

Conductor	Electrolytic copper, class 5 (flexible), based on EN/IEC 60228
Grounding Conductor	The grounding conductor is divided into three conductors; the equivalent cross section is approximately 50% of the section of the phase conductor.
Insulation 3x + 3G	Cross-linked polyethylene (XLPE) grey + brown + black + Yellow/Green (3G) (from 16 mm^2)
Screen	Aluminium-polyester tape screen, helically placed over the insulated conductors. Over the tape there is an 85% nominal coverage copper braid screen. The tape and the braid act as a double screen to cut out all of the electromagnetic interference. The screen has a cover of 100% and its total section is approximately 10% of one of the conductors.
Outer Jacket	FRNC / LSZH UV resistant Black

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Electrical performance	LOW VOLTAGE 0.6/1 KV
Standard	IEC 60502-1 / IEC 60092-353
Approval	CE RoHS EN50575 Dca, s1a,d2,a1
Thermal performance	Maximum service temperature: 90ºC. Maximum short-circuit temperature: 250ºC (max. 5 s). Minimum service temperature: -40ºC (fixed and protected installations).
Fire performance	
Flame non-propagation	based on UNE-EN 60332-1 and IEC 60332-1.
Fire non-propagation	based on UNE-EN 60332-3 and IEC 60332-3.
LSZH (Low Smoke Zero Halogen)	based on UNE-EN 60754-1 and IEC 60754-1.
Low smoke emission	based on UNE-EN 61034 and IEC 61034.: Light transmittance > 60%
Low corrosive gases emission	based on UNE-EN 60754-2 and IEC 60754-2.
Mechanical performance	
Minimum bending radius:	x10 cable diameter.
Installation conditions	Open Air. Buried. In conduit.
Applications	Industrial use. Variable Frequency Drive (VFD)

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Specification

Part Number	n° x Section (mm^2)	Overall Diameter (mm ± 5%)	Gland Size*	Weight (kg/km)
3E02501D	3 G 2,5 + 3x0,50	11,5	M25	220
3E04001D	3 G 4 + 3x0,75	13,2	M25	280
3E06001D	3 G 6 + 3x1	14,2	M32	350
3E10001D	3 G 10 + 3x1,5	17,0	M32	490
3E16001D	3 x 16 + 3 G 2,5	18,8	M40	695
3E25001D	3 x 25 + 3 G 4	22,25	M40	1020
3E35001D	3 x 35 + 3 G 6	25,5	M50	1360
3E50001D	3 x 50 + 3 G 10	28,5	M50	1950
3E70001D	3 x 70 + 3 G 10	35,0	M50	2550
3E95001D	3 x 95 + 3 G 16	36,2	M50	3400
3E120001D	3 x 120 + 3 G 16	40,0	M63	4200
3E150001D	3 x 150 + 3 G 25	48,0	M63	5420
3E185001D	3 x 185 + 3 G 35	55,0	M75	6830
3E240001D	3 x 240 + 3 G 50	60,0	M75	8820

* please check actual cable batch OD for accurate gland sizing

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Current-carrying capacities

Nominal current-carrying capacities

Table 1 shows the current-carrying capacities and voltage drop detailed for every cable. Current-carrying capacities, in amperes, are calculated according to IEC 60364-5-523 and for the following conditions:

- Open air installation: one cable with adequate ventilation and ambient temperature of 30 °C, supported by cleats and hangers or on perforated tray (reference method E).
- Buried installation: one cable in a duct buried at depth of 0,7 m, with soil thermal resistivity of 2,5 °K·m/W, and 20 °C of ground temperature (reference method D).
- It is supposed a three-phase circuit.

For conditions other than this apply the adequate correction factors (point 6.3). The electrical resistance of conductor is indicated according to IEC 60228 for copper conductor class 5. Voltage drop is the maximum that may occur.
It is calculated for the maximum service

temperature and for cos φ1, supposed a three-phase circuit.

Table 1

n° x Section (mm^2)	Open Air Inst. (A)	Buried Inst. (A)	Conductor Resistant (Ω/Km)	Voltage drop (V/A·km)
3 G 2,5 + 3x0,50	23	22	13,3	29,4
3 G 4 + 3x0.75	42	37	4,95	10,9
3 G 6 + 3x1	54	46	3,30	7,29
3 G 10 + 3x1.5	75	61	1,91	4,22
3 x 16 + 3 G 2,5	100	79	1,21	2,67
3 x 25 + 3 G 4	127	101	0,780	1,72
3 x 35 + 3 G 6	158	122	0,554	1,22
3 x 50 + 3 G 10	192	144	0,386	0,852
3 x 70 + 3 G 10	246	178	0,272	0,601
3 x 95 + 3 G 16	298	211	0,206	0,455

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n° x Section (mm²)	Open Air Inst. (A)	Buried Inst. (A)	Conductor Resistant (Ω/Km)	Voltage drop (V/A·km)
3 x 120 + 3 G 16	346	240	0,161	0,356
3 x 150 + 3 G 25	399	271	0,129	0,285
3 x 185 + 3 G 35	456	304	0,106	0,234
3 x 240 + 3 G 50	538	351	0,0801	0,177

Short-circuit current-carrying capacities

The maximum short-circuit current that a cable can withstand depend on the time of reaction of the protection elements installed in the line. The maximum current-carrying capacity in a shortcircuit accident, for a specific type of cable, is the result of multiplying the cross section of the cable for the values shown in table 2. These values are taken from IEC 949 with initial temperature 90°C and end temperature 250°C.

Table 2

Time (s)	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/mm²	449	318	259	201	142	116	100	90	82

Correction factors

The current-carrying capacities must be multiplied with the adequate correction factor when the installation conditions differs from point 6.1

Correction factors for air temperature other than 30°C.

Table 3

Air T. (ºC)	20	25	30	35	40	45	50	55	60
Factor	1,08	1,04	1	0,96	0,91	0,87	0,82	0,76	0,71

Correction factors for ground temperature other than 20°C.

Table 4

Ground T. (ºC)	10	15	20	25	30	35	40	45	50
Factor	1,07	1,04	1	0,96	0,93	0,89	0,85	0,80	0,76