TOPDRIVE® VFD (EMC)
ROZ1-K (AS) 0,6/1 kV

Flexible LSHF screened cable for Variable Frequency Drive cables (VFD cables).

ACCORDING TO: IEC 60502-1 / IEC 60092-353

C_{ca}

APPLICATION

TOPDRIVE® VFD (EMC) ROZ1-K (AS) cable has been specially designed for Variable Frequency Drive Motors and installations where it is necessary to limit the effects of electromagnetic interference (EMI). This is a flexible cable for fixed installations, for variable speed motors or pumps.

CONSTRUCTION

Conductor
Electrolytic annealed copper, class 5 (flexible), according to EN 60228 and IEC 60228.

Protective Conductor
The ground conductor is divided into three conductors; the equivalent cross-section is approximately 50% of the section of the phase conductor.
For 4G cables, ground conductor has the same cross-section as the phase conductors.

Insulation
Cross-linked polyethylene type XLPE according to IEC 60502-1, type HF XLPE 90°C according to IEC 60092-360.
The standard identification of insulated conductors is the following:
3 x +3 G Grey + Brown + Black + Green/Yellow (3 G) (from 6 mm^2 onwards)
4 G Grey + Brown + Black + Green/Yellow (up to 4 mm^2)

Assembly of cores
For 3x+3G cables, the three phase conductors are cabled helically with the three protective conductors distributed in the interstices.
For 4G cables, the three phase conductors and protection conductor are cabled helically.

Screen
Aluminium-polyester tape screen helically placed over the insulated conductors. Over the tape there is a tinned copper braid screen. The tape and the braid act as a double screen to cut out all of the electromagnetic interference, with a minimum total section of 10% of the phase conductor, ensuring a total shielding coverage.

Outer sheath
Polyolefin type ST8 according to IEC 60502-1 and type SHF1 according to IEC 60092-360.
Black colour.
The ripcord allows you to tear the outer sheath without damaging the screen.

CHARACTERISTICS

Electrical performance
Low voltage: 0,6/1 kV

Thermal performance
Maximum conductor temperature: 90°C.
Maximum short-circuit temperature: 250°C (max. 5 s).
Maximum ambient temperature: 60 °C.
Minimum installation and handling temperature: 0 °C.
Minimum service temperature: -40°C (fixed and protected installations).

Fire performance
Flame non-propagation according to EN 60332-1 / IEC 60332-1.
Fire non-propagation according to EN 60332-3 / IEC 60332-3 and EN 50399.
Reaction to fire CPR: C_{ca}-s1a, d1, a1 according to EN 50575.
Low Smoke Halogen Free according to EN 60754-1 / IEC 60754-1.
Low corrosive gases emission according to EN 60754-2 / IEC 60754-2.
Low smoke emission according to EN 61034 / IEC 61034:
Light transmittance > 80%.

Mechanical performance
Minimum bending radius during installation: 10x cable diameter.
Impact resistance: AG2 Medium severity.

Environmental performance
Chemical & Oil resistance: Acceptable.
UV Resistant according to EN 50618.
Water resistance: AD5 Jets.

Installation conditions
Being very performant cables there are, however, certain precautions that must be taken into account during installation:
- Always respect the bending radius of the cable. Radius below the minimums indicated can cause damage or breakage in the outer sheath.
- Precautions design of the laying. It is necessary that the laying of the cable is done in a careful way, taking care not to damage the outer sheath in irregular areas, sharp edges, etc.
- Fixings/Fastenings. Adapt fastenings so that the cable adopts a natural position in the laying to avoid stress concentration in the outer sheath. Allow a certain degree of freedom of movement in order to absorb possible movements produced by temperature variations. Open Air. Buried. In conduit.

STANDARDS / COMPLIANCE

According to
IEC 60502-1 / IEC 60092-353

Standards and approvals
BUREAU VERITAS / DNV-GL / ABS / LLOYD'S REGISTER / RoHS / CE

CPR (Construction Products Regulation)
C_{ca}-s1a, d1, a1

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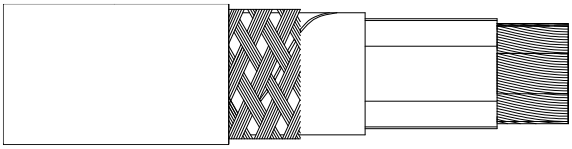
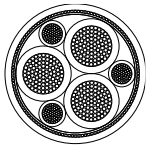
DIMENSIONS & ADMISSIBLE INTENSITIES





Cross-section (mm^2)	Diameter under the braid (mm)	Outer diameter (mm)	Weight (Kg/km)	Open air (A) [1]	Buried (A) [2]	Max. R 20°C (Ω/km)	Voltage drop (V/A · km) [3]
3 x 6 + 3 G 1,5 *	10,5	15,0	390	63	58	3,30	8,41
3 x 10 + 3 G 1,5 *	10,9	15,4	500	86	77	1,91	4,87
3 x 16 + 3 G 2,5 *	14,0	18,5	715	115	100	1,21	3,08
3 x 16 + 3 G 6	16,9	22,3	920	115	100	1,21	3,08
3 x 25 + 3 G 4 *	16,2	21,1	1.060	149	129	0,780	1,98
3 x 25 + 3 G 6	16,9	22,1	1.165	149	129	0,780	1,98
3 x 35 + 3 G 6	19,2	24,5	1.475	185	155	0,554	1,41
3 x 50 + 3 G 10	22,6	28,0	2.040	225	183	0,386	0,984
3 x 70 + 3 G 10 *	26,0	30,8	2.560	289	225	0,272	0,693
3 x 70 + 3 G 16	26,0	31,3	2.790	289	225	0,272	0,693
3 x 95 + 3 G 16	29,3	34,7	3.420	352	270	0,206	0,525
3 x 120 + 3 G 16 *	32,8	38,6	4.205	410	306	0,161	0,410
3 x 120 + 3 G 25	32,8	39,0	4.530	410	306	0,161	0,410
3 x 150 + 3 G 25	38,0	44,3	5.425	473	343	0,129	0,328
3 x 185 + 3 G 35	41,5	48,2	6.655	542	387	0,106	0,270
3 x 240 + 3 G 50	48,1	55,3	8.720	641	448	0,0801	0,204
3 x 300 + 3 G 50	53,9	61,4	10.465	741	502	0,0641	0,163
3 x 400 + 3 G 70	63,3	71,7	14.105	886	592	0,0486	0,123
4 G 1,5	6,9	11,4	185	26	27	13,30	33,9
4 G 2,5	7,7	12,2	230	36	35	7,98	20,3
4 G 4	9,2	13,7	300	49	46	4,95	12,6
4 G 6	10,6	15,1	385	63	58	3,30	8,41
4 G 10	12,5	17,0	555	86	77	1,91	4,87
4 G 16	20,8	20,8	885	115	100	1,21	3,08

* Formations not complying with IEC 60092-352: Choice and installation of electrical cables.

[1] Reference method F for single-core and method E for multicore cables according to IEC 60364-5-52 in open air at 30°C ambient temperature.
[2] Reference method D2 according to IEC 60364-5-52. Directly buried at 0,7 m depth with soil thermal resistivity of 2,5 K·m/W and 20°C of ground temperature.
[3] At maximum conductor temperature and cosφ=1.
In all cases are supposed a single-phase circuit.

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SHORT-CIRCUIT CURRENT-CARRYING CAPACITIES

Time (s)	0,1	0,2	0,3	0,5	1	1,5	2	2,5	3
A/mm²	452	320	261	202	143	117	101	90	83

CORRECTION FACTORS FOR AIR TEMPERATURE

Air T. (°C)	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

Ground T. (°C)	10	15	20	25	30	35	40	45	50
Factor	1,07	1,04	1	0,96	0,93	0,89	0,85	0,8	0,76

CORRECTION FACTORS FOR SOIL THERMAL RESISTIVITY

Moisture degree of soil	Very damp	Slightly damp	Slightly dry	Dry	Very dry
Thermal Resist. (K·m/W)	1	1,5	2	2,5	3
Factor	1,50	1,28	1,12	1	0,90

Other correction factors (for grouping cables, for harmonic currents), that are not in this specification, can be applied. Further information can be found in IEC 60364-5-52.