Top Cable

Rev.13 9 – February – 2010

Issued: M. Canovas Margarit

Approved: F. Díaz Rubio

XTREM H07RN-F

1. Object

This document defines the design and manufacturing characteristics of the cable type H07RN-F manufactured by Top Cable.

2. Design

This type of cable is designed, manufactured and tested in accordance with HD 22.4, UNE 21027-4 and IEC 60245.

Approvals available:
AENOR <HAR>
SASO (Saudi Arabia)
GOST-R Certificate (Russian)

3. Applications

Flexible cable for mobile service. Suitable for installations where the cable must withstand medium mechanical stress, for machines in industrial and agricultural workshops, for motors and transportable machines on construction sites, for wind mills and for agricultural exploitations. Suitable for submerged installations (AD8)

The use up to 1000 V is accepted in fixed protected assemblies. Not suitable for buried installation.

4. Characteristics

Nominal voltage: 450/ 750 V.

Minimum service temperature: -25 °C.

Maximum conductor temperature: 90 ºC.

Maximum short-circuit temperature: 250 °C. (maximum 5 s.)

Minimum bending radius static:

3 x cable Ø (Ø cable <12 mm).

4 x cable Ø (Ø cable ≥12 mm).

No flame propagation: according EN 60332-1/IEC 60332-1.

XTREM H07RN-F

5. General make-up of the cable

5.1 Conductor

Electrolytic annealed copper conductor, class 5 according to IEC 60228.

5.2 Insulation

Thermosetting rubber insulation, type EI7 according to HD 22.

The standard identification, according to HD 308 and HD 186, is the following:

- 1 x.....natural
- 2 x.....brown + blue
- 3 G.....brown + blue + green/yellow
- 4 G.....brown + black + grey + green/yellow
- 5 G.....brown + black + grey + blue + green/yellow

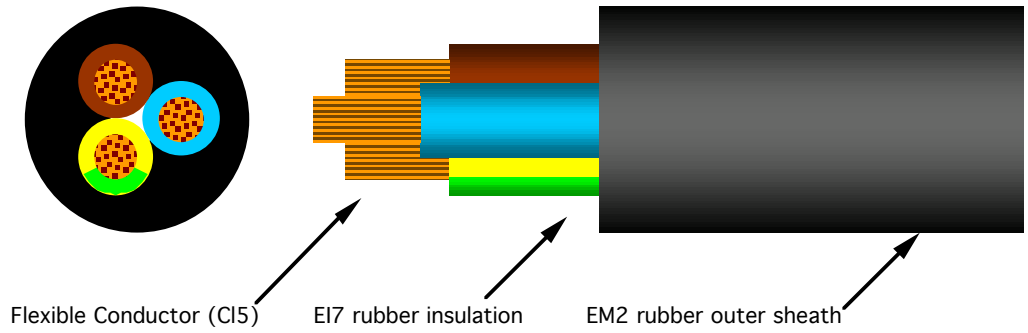
5.3 Assembly of cores

The cores are twisted together.

5.4 Outer sheath

Thermosetting rubber outer sheath, black, type EM2 according to HD 22.

5.5 Diagram representation



XTREM H07RN-F

6. Current-carrying capacities:

6.1 Nominal current-carrying capacities

The table 1 shows the current-carrying capacities and voltage drop detailed for every cable.

Current-carrying capacities, in amperes, are calculated according to HD 516 for mobile service and according to IEC 60364-5-52 for fixed installations, and for the following conditions:

- Mobile service: open air, one cable with adequate ventilation and ambient temperature of 30 °C.
- Fixed installation: open air, one cable with adequate ventilation and ambient temperature of 30 °C, supported by cleats and hangers or on perforated tray (reference method F for single-core and E for multicore cables).
- For cables having 2 or 3 cores, it is supposed a single–phase circuit. For the rest of the cables it is supposed a three-phase circuit.
- For cables having 6 or more conductors, it is supposed that not all conductors are fully charged.

For conditions other than this apply the adequate correction factors (see point 6.3).

Voltage drop is the maximum that may occur. It is calculated for 60 °C conductor temperature and for cos φ = 1.

nº x Section (mm^2)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A·km)
1 x 1,5	21	16	26,7
1 x 2,5	29	20	16,6
1 x 4	40	30	9,95
1 x 6	53	38	6,63
1 x 10	74	53	3,84
1 x 16	101	71	2,43
1 x 25	135	94	1,57
1 x 35	169	117	1,11

nº x Section (mm^2)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A·km)
1 x 50	207	148	0,776
1 x 70	268	185	0,546
1 x 95	328	222	0,414
1 x 120	383	260	0,323
1 x 150	444	300	0,259
1 x 185	510	341	0,213
1 x 240	607	407	0,161
1 x 300	703	468	0,129

Table 1 (continue)

XTREM H07RN-F

nº x Section (mm^2)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A·km)
1 x 400	823	553	0,0976
1 x 500	946	634	0,0772
2 x 1	21	10	45,2
2 x 1,5	26	16	30,9
2 x 2,5	36	25	18,5
2 x 4	49	34	11,5
2 x 6	63	43	7,66
2 x 10	86	60	4,43
2 x 16	115	79	2,81
2 x 25	149	105	1,81
3 G 1	21	10	45,2
3 G 1,5	26	16	30,9
3 G 2,5	36	25	18,5
3 G 4	49	35	11,5
3 G 6	63	44	7,66
3 G 10	86	62	4,43
3 G 16	115	82	2,81
3 G 25	149	109	1,81
3 G 35	185	135	1,29
3 G 50	225	169	0,896
3 G 70	289	211	0,631
3 G 95	352	250	0,478
3 G 120	410	292	0,373
4 G 1	17	10	39,2
4 G 1,5	23	16	26,7
4 G 2,5	32	20	16,0

nº x Section (mm^2)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A·km)
4 G 4	42	30	9,95
4 G 6	54	37	6,63
4 G 10	75	52	3,84
4 G 16	100	69	2,43
4 G 25	127	92	1,57
4 G 35	158	114	1,11
4 G 50	192	143	0,776
4 G 70	246	178	0,546
4 G 95	298	210	0,414
5 G 1	17	10	39,2
5 G 1,5	23	16	26,7
5 G 2,5	32	20	16,0
5 G 4	42	30	9,95
5 G 6	54	38	6,63
5 G 10	75	54	3,84
5 G 16	100	71	2,43
5 G 25	127	94	1,57
5 G 35	158	114	1,11
5 G 50	192	143	0,776
5 G 70	246	178	0,546
5 G 95	298	210	0,414
5 G 120	346	246	0,323
7 G 2,5	36	25	18,5
7 G 4	49	34	11,5
8 G 2,5	36	25	18,5
16 G 1,5	26	16	30,9

Table 1 (end)

6.2 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 capacity in a short-circuit 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.

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

Table 2

6.3 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.

Air T. (ºC)	30	35	40	45	50	55
Mobil service	1	0,91	0,82	0,71	0,58	0,41
Fixed installation	1	0,96	0,91	0,87	0,82	0,76

Table 3

7. Dimensions

Table 4 shows diameter and weight detailed for every cable.

nº x Section (mm^2)	Diameter (mm)	Weigth (kg/km)
1 x 1,5	5,9	48
1 x 2,5	6,5	62
1 x 4	7,5	88
1 x 6	8,3	116
1 x 10	10,1	182
1 x 16	11,4	250
1 x 25	13,4	361
1 x 35	14,7	469
1 x 50	17,5	671
1 x 70	19,6	892
1 x 95	22,0	1.140

nº x Section (mm^2)	Diameter (mm)	Weigth (kg/km)
1 x 120	24,2	1.420
1 x 150	26,6	1.760
1 x 185	28,8	2.090
1 x 240	32,2	2.710
1 x 300	34,9	3.310
1 x 400	39,3	4.270
1 x 500	43,1	5.390
2 x 1	8,3	92
2 x 1,5	8,7	109
2 x 2,5	10,6	162
2 x 4	12,0	220

Table 4 (continue)

XTREM H07RN-F

nº x Section (mm^2)	Diameter (mm)	Weigth (kg/km)
2 x 6	13,7	295
2 x 10	18,1	522
2 x 16	21,6	738
2 x 25	25,7	1.052
3 G 1	8,9	111
3 G 1,5	9,7	137
3 G 2,5	11,4	198
3 G 4	13,1	276
3 G 6	14,8	370
3 G 10	20,1	668
3 G 16	22,6	906
3 G 25	27,4	1.360
3 G 35	29,7	1.700
3 G 50	35,4	2.410
3 G 70	39,6	3.180
3 G 95	45,2	4.070
3 G 120	48,7	5.002
4 G 1	9,7	134
4 G 1,5	10,7	169
4 G 2,5	12,6	244
4 G 4	14,4	343
4 G 6	16,7	474
4 G 10	21,6	822

nº x Section (mm^2)	Diameter (mm)	Weigth (kg/km)
4 G 16	24,6	1.120
4 G 25	30,7	1.730
4 G 35	33,2	2.180
4 G 50	39,2	3.060
4 G 70	43,4	4.040
4 G 95	50,5	5.300
5 G 1	10,5	162
5 G 1,5	11,6	206
5 G 2,5	14,0	299
5 G 4	16,3	431
5 G 6	18,4	585
5 G 10	24,2	1.010
5 G 16	27,1	1.380
5 G 25	33,6	2.110
5 G 35	36,6	2.677
5 G 50	42,7	3.696
5 G 70	48,3	4.917
5 G 95	55,3	6.448
5 G 120	59,7	7.883
7G 2,5	17,0	434
7 G 4	20,1	618
8 G 2,5	18,4	525
16 G 1,5	20,8	605

Table 4