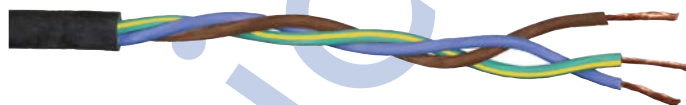




SUBMERSIBLE PUMP CONTROL & INSTRUMENTATION CABLE

450/750V Multi-Conductor

TPE/TPE, H07RN-F



INSULATION: **TPE - Thermoplastic Elastomer**
 OUTER JACKET: **TPE - Thermoplastic Elastomer**



SIZES: **1c 1.5mm² - 24c 2.5mm²**
 -40° - 90°C

Manufactured and tested in accordance with EN 50525-2-21 & IEC 60245

1.0 APPLICATIONS:

1.1 Flexible Submersible Pump Cable designed for use in 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 1000V is accepted in fixed protected assemblies.

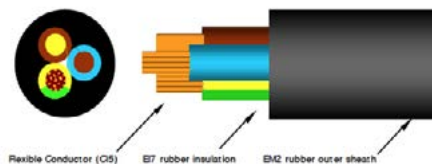
2.0 FEATURES:

- 2.1 Nominal Voltage:**
450/750V
- 2.2 Temperatures:**
- Maximum operating: 90 °C.
 - Minimum operating: -40 °C (static, with protection)
 - Minimum installation
- 2.3 Maximum short-circuit temperature:**
250 °C. (maximum 5 s.)
- 2.4 Minimum bending radius static:**
- 3 x cable Ø (Ø cable < 12 mm)
 - 4 x cable Ø (Ø cable ≥ 12 mm)
- 2.5 No flame propagation:**
60332-1/IEC 60332-1

3.0 CONSTRUCTION:

- 3.1 Conductors:**
Electrolytic annealed copper, class 5 in accordance with EN 50363-1
- 3.2 Insulation:**
Thermosetting rubber insulation, type EI7 according to EN 50363-1.
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
 - 6 or more black numbered + green/yellow.
- 3.3 Assembly:**
Cores are twisted together
- 3.4 Jacket:**
Thermosetting outer jacket Black type EM2 in accordance with EN 50363-2-1
- Color of Jacket:**
Black type EM2 in accordance with EN 50363-2-1

Diagram Representation:



4.0 CURRENT-CARRYING CAPACITIES:

4.1 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 calculated for 60 °C conductor temperature and for $\cos \phi = 1$.

n° 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
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
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

n° x Section (mm ²)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A-km)
3 G x 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 x 2.5	32	20	16.0
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
4 G 120	346	246	0.323
4 G 150	399	282	0.259
5 G 1	17	10	39.2
5 G 1.5	23	16	26.7

n° x Section (mm ²)	Fixed Inst. (A)	Mobil Inst. (A)	Voltaje drop (V/A-km)
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 1.5	26	16	30.9
7 G 2.5	36	25	18.5
7 G 4	49	34	11.5
8 G 1.5	26	16	30.9
8 G 2.5	36	25	18.5
8 G 4	49	34	11.5
10 G 2.5	36	25	18.5
10 G 4	49	34	11.5
12 G 1.5	26	16	30.9
12 G 2.5	36	25	18.5
12 G 4	49	34	11.5
16 G 1.5	26	16	30.9
16 G 2.5	36	25	18.5
18 G 1.5	26	16	30.9
18 G 2.5	36	25	18.5
24 G 1.5	26	16	30.9
24 G 2.5	36	25	18.5

4.2 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/mm ²	452	320	261	202	143	117	101	90	83

4.3 Correction Factors:

The current carrying capacities must be multiplied with the adequate correction factor, when the installation conditions differs from point 4.1.

Correction factors for air temperature other than 30°C

Air T. (°C)	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

5.0 DIMENSIONS: Table 4 shows diameter and weight detailed for every cable:

n° x Section (mm ²)	Diameter (mm)	Weight (kg/km)	n° x Section (mm ²)	Diameter (mm)	Weight (kg/km)	n° x Section (mm ²)	Diameter (mm)	Weight (kg/km)	n° x Section (mm ²)	Diameter (mm)	Weight (kg/km)
1 x 1.5	5.9	48	2 x 4	12.0	220	4 G 4	14.4	343	5 G 70	48.3	4.917
1 x 2.5	6.5	62	2 x 6	13.7	295	4 G 6	16.7	474	5 G 95	55.3	6.448
1 x 4	7.5	88	2 x 10	18.1	522	4 G 10	21.6	822	5 G 120	59.7	7.883
1 x 6	8.3	116	2 x 16	21.6	738	4 G 16	24.6	1.120	7 G 1.5	14.8	307
1 x 10	10.1	182	2 x 25	25.7	1.052	4 G 25	30.7	1.730	7 G 2.5	17.0	434
1 x 16	11.4	250	3 G 1	8.9	111	4 G 35	33.2	2.180	7 G 4	20.1	618
1 x 25	13.4	361	3 G 1.5	9.7	137	4 G 50	39.2	3.060	8 G 1.5	16.3	379
1 x 35	14.7	469	3 G x 2.5	11.4	198	4 G 70	43.4	4.040	8 G 2.5	18.4	525
1 x 50	17.5	671	3 G 4	13.1	276	4 G 95	50.5	5.300	8 G 4	22.2	767
1 x 70	19.6	892	3 G 6	14.8	370	4 G 120	52.6	6.331	10 G 2.5	19.6	565
1 x 95	22.0	1.140	3 G 10	20.1	668	4 G 150	60.1	7.928	10 G 4	25.0	864
1 x 120	24.2	1.420	3 G 16	22.6	906	5 G 1	10.5	162	12 G 1.5	17.5	456
1 x 150	26.6	1.760	3 G 25	27.4	1.360	5 G 1.5	11.6	206	12 G 2.5	20.4	654
1 x 185	28.8	2.090	3 G 35	29.7	1.700	5 G 2.5	14.0	299	12 G 4	25.7	966
1 x 240	32.2	2.710	3 G 50	35.4	2.410	5 G 4	16.3	431	16 G 1.5	19.6	605
1 x 300	34.9	3.310	3 G 70	39.6	3.180	5 G 6	18.4	585	16 G 2.5	23.1	880
1 x 400	39.3	4.270	3 G 95	45.2	4.070	5 G 10	24.2	1.010	18 G 1.5	20.7	646
1 x 500	43.1	5.390	3 G 120	48.7	5.002	5 G 16	27.1	1.380	18 G 2.5	24.3	939
2 x 1	8.3	92	4 G 1	9.7	134	5 G 25	33.3	2.052	24 G 1.5	23.7	830
2 x 1.5	8.7	109	4 G 1.5	10.7	169	5 G 35	36.6	2.677	24 G 2.5	27.7	1.207
2 x 2.5	10.6	162	4 G x 2.5	12.6	244	5 G 50	42.7	3.696			