Nexans

Hannover, 2009-10-23
ESP/Hoyer/Dö

PM.TD.A4.3631.02

Cable Data - Submarine Inter Turbine Cable (nominal values)

1.	Cable type		(F)2XS(FL)2Y+RAA 3x1x185 RM/25 + FO 19/33 kV
	attached drawing no.		PM.ME.A4.2833.02
1.1	Specification		IEC 60502-2: 2005, centrica energy TS, section 3.2 and Nexans Comments
2.	Power cable construction data		
2.1	Conductor thirtyseven (37) copper wires, circular stranded compacted, watertight longitudinally watertight by semi-conductive crosslinked polyolefine elastomere		
	- nominal cross sectional area	mm²	185
	- nominal diameter	mm	16.1
2.2	Conductor screening made of extruded semi-conductive compound		
	- wall thickness	mm	min. 0.3
2.3	Insulation made of XLPE		
	- nominal wall thickness	mm	8.0
2.4	Insulation screening made of extruded semi-conductive compound		
	- wall thickness	mm	min. 0.3
2.5	Screen bedding made of semi-conductive tape(s)		
2.6	Screen made of copper wires and equalizing tape		
	- nominal cross sectional area	mm^2	25
2.7	Longitudinal water blocking made of swelling powder in the screen area		

2.8	Laminated sheath made of aluminium tape		
	- nominal thickness	mm	0.2
	bonded to PE sheath		
	- nominal thickness	mm	2.3
	- min. thickness at any point	mm	1.64
	plus extruded thin electrode		
2.9	Outer Electrode Identification: manufacturer, 1x185/25 19/33 kV, year of manufacture, metre marking, code no. and phase identification [L1, L2 or L3]		
2.10	The three (3) power cores shall be laid-up with the fibre optic cable with polypropylene fillers with a right hand direction of lay		
2.11	Binder made of plastic tapes		
2.12	Armour bedding made of polypropylene strings		
	- wall thickness, approx.	mm	2.5
2.13	Armour made of round steel wires, heavy galvanized		
	- nominal wire diameter	mm	4.0
2.14	Serving made of bituminous compound, hessian tapes and polypropylene strings (with coloured strip)		
	- wall thickness, approx.	mm	4
2.15	Diameter of finished cable	mm	110
2.16	Cable length marking shall be at the outside of the cable by coloured tape at intervals of 500 m in manufacturing direction. The markers shall be applied to show one tape each 500 m, two tapes each 1000 m and three tapes each 5000 m. The tapes shall be approx. 100 mm wide and shall completely encircle the cable.		
	From each cable end up to 250 m the marking shall be every 50 m.		
	Tape colour shall be different to above markings.		

3.	Electrical data Operating voltage 33 kV, 50 Hz		
3.1	Maximum continuous operating voltage	kV	36
3.2	D.c./a.c. conductor resistance - at 20 °C, max.	Ω/km	0.0991 / 0.0999
3.3	A.C. conductor resistance at 90 °C	Ω/km	0.127
3.4	Conductor reactance	Ω/km	0.118
3.5	Working inductance	mH/km	0.375
3.6	Working capacitance (ε = 2,5)	µF/km	0.218
3.7	Charging power of cable	kVA/km	74.7
3.8	Charging current per core	A/km	1.31
3.9	Losses per system *) - rating as per 3.12	kW/km	90.9
3.10	Dielectric losses *)	kW/km	0.3
3.11	Screen and armour losses *) - rating as per 3.12	kW/km	5.7
3.12	Current rating *) - laying depth 2.0 m	A	472
3.13	Current rating in J-tube (PE, Di = 280 mm, Da = 320 mm) in air **) - ambient air temperature 25 °C	A	444
3.14	Permissible conductor operating temperature - continuous - short circuit	°C °C	90 250
3.15	Short circuit current for 1 s / 0.2 s - conductor (90°C - 250°C) - screen (80°C - 200°C)	kA kA	27.0 / 59.8 3.73 / 7.75

4. Technical cable data

4.1	Permissible bending radius		
	- during delivery on drum	mm	800
	- during laying	mm	1650
	- after laying	mm	1100
4.2	Approximate cable weight		
	- in air	kg/km	18300
	- in water	kg/km	12000
4.3	Permissible pulling strength		
	- during laying	kN	33.3
	- in J-tube (safety factor 4.0)	kN	68.4
	- in case of recovery/repair	kN	51.3
4.4	Cable tests and standards followed, Routine tests (Sample tests generally according to IEC 60502)		
4.4.1	On single lengths		
	- conductor resistance/20 °C Standard: IEC 60502	Ω/km	≤ 0.0991
	- A.C. Voltage test/5 min	kV	63
	- Partial discharge test A.C. 30 kV Standard: IEC 60502	pC	≤ 10
4.4.2	After laying (outside of Nexans scope of work)		
	- D.C. Voltage test/15 min Standard: IEC 60502	kV	72
4.4.2.1	Alternative test		
	- A.C. Voltage test 0.1 Hz/60 min Standard: DIN VDE 0276-620	kV	54
4.5	Insulation resistance	MΩ x km	≥ 1012
4.6	Voltage drop		
	- cos φ = 0.9/90 °C	V/A x km	0.30
	- cos φ = 0.9/20 °C	V/A x km	0.25
4.7	Expected life span	years	≥ 40

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*) Continous load, ambient ground temperature 16 °C, soil thermal resistivity 0.7 K x m/W, screens are bonded at both ends.

**) Continious load without additional heating-up by sun rays.