Certificate No:
TAE00004M4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
CJ85/NSC CJ86/NSC CJ96/NSC 0,6/1kV, CJ85/NSC-VFD CJ86/NSC-VFD 0,6/1kV, CJ85/NSC-VFD CJ86/NSC-VFD 1,8/3kV

Issued to
Yangzhou Zhongda Cable Co., Ltd
Yangzhou, **China**

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Type	Rated voltage (kV)	Temp. class (°C)
CJ85/NSC CJ86/NSC CJ96/NSC 0,6/1kV	0,6/1	90
CJ85/NSC-VFD CJ86/NSC-VFD 0,6/1kV	0,6/1	90
CJ85/NSC-VFD CJ86/NSC-VFD 1,8/3kV	1,8/3	90

Issued at **Høvik** on **2022-12-16**
This Certificate is valid until **2027-12-15**.
DNV local unit: **Nanjing NB & CMC**

Approval Engineer: **Carsten Hunsalz**

for **DNV**

Frederik Tore Elter
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Type: CJ85/NSC, CJ86/NSC, CJ96/NSC 0,6/1 kV
CJ85/NSC-VFD, CJ86/NSC-VFD 0,6/1 kV
CJ85/NSC-VFD, CJ86/NSC-VFD 1,8/3 kV

Conductors:	Stranded copper class 2 or class 5
Insulation:	XLPE + mica tape
Inner covering:	Extruded in case of galvanized steel wire braid
Armor:	8 – Tinned copper wire braid 9 – Galvanized steel wire braid
Outer sheath:	5 – SHF2 6 – SHF1

CJ85/NSC, CJ86/NSC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
1x1	6.0
1x1,5	6.3
1x2,5	6.8
1x4	7.4
1x6	8.0
1x10	9.0
1x16	10.1
1x25	12.0
1x35	13.8
1x50	15.3
1x70	17.5
1x95	19.5
1x120	21.5
1x150	23.6
1x185	26.1
1x240	29.1
1x300	31.9
2x1	9.4
2x1,5	9.9
2x2,5	11.0
2x4	12.1
2x6	13.3
2x10	15.3
2x16	17.6
2x25	21.3
2x35	24.0
2x50	27.1
2x70	31.4
2x95	35.5
2x120	39.4
2x150	43.7
2x185	48.7

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3x1	9.9
3x1,5	10.5
3x2,5	11.6
3x4	12.8
3x6	14.2
3x10	16.3
3x16	18.8
3x25	22.8
3x35	25.6
3x50	29.0
3x70	33.7
3x95	38.1
3x120	42.3
3x150	46.9
3x185	52.3
4x1	10.8
4x1,5	11.5
4x2,5	12.8
4x4	14.1
4x6	15.6
4x10	18.0
4x16	20.8
4x25	25.2
4x35	28.4
4x50	32.2
4x70	37.4
4x95	42.4
4x120	47.1
4x150	52.3
4x185	58.3

CJ85/NSC, CJ86/NSC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
5x1	12.6
7x1	14.2
10x1	17.7
12x1	18.2
14x1	19.1
16x1	20.1
19x1	21.2
24x1	24.7
27x1	25.2
30x1	26.1
33x1	27.2
37x1	28.2
5x1,5	13.9
7x1,5	15.1
10x1,5	18.9
12x1,5	19.5
14x1,5	20.4
16x1,5	21.5

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
19x1,5	22.7
24x1,5	26.5
27x1,5	27.1
30x1,5	28.0
33x1,5	29.1
37x1,5	30.3
5x2,5	15.3
7x2,5	16.6
10x2,5	21.0
12x2,5	21.7
14x2,5	22.7
16x2,5	24.0
19x2,5	25.3
24x2,5	29.6
27x2,5	30.3
30x2,5	31.4
33x2,5	32.7
37x2,5	34.0

CJ96/NSC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
1x1	8.0
1x1,5	8.6
1x2,5	9.0
1x4	9.6
1x6	10.1
1x10	11.2
1x16	12.2
1x25	14.5
1x35	15.9
1x50	17.5
1x70	19.6
1x95	21.5
1x120	23.5
1x150	25.6
1x185	28.1
1x240	31.1
1x300	34.0

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
2x1	11.9
2x1,5	12.6
2x2,5	14.2
2x4	15.2
2x6	16.3
2x10	18.3
2x16	20.5
2x25	24.1
2x35	27.1
2x50	30.3
2x70	34.7
2x95	39.3
2x120	43.1
2x150	47.7
2x185	52.7

CJ96/NSC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3x1	12.4
3x1,5	13.2
3x2,5	14.8
3x4	15.9
3x6	17.4
3x10	19.5
3x16	21.6
3x25	25.7
3x35	28.9
3x50	32.1
3x70	37.4
3x95	41.9
3x120	46.6
3x150	50.9
3x185	56.7

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
4x1	13.6
4x1,5	14.7
4x2,5	15.9
4x4	17.3
4x6	18.7
4x10	21.0
4x16	23.6
4x25	28.2
4x35	32.1
4x50	36.3
4x70	41.3
4x95	46.7
4x120	51.3
4x150	56.7
4x185	62.8

CJ96/NSC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
5x1	14.3
7x1	15.3
10x1	19.3
12x1	19.8
14x1	20.6
16x1	21.5
19x1	22.7
24x1	26.1
27x1	26.6
30x1	27.6
33x1	28.5
37x1	29.5
5x1,5	15.3
7x1,5	16.6
10x1,5	20.7
12x1,5	21.3
14x1,5	22.4
16x1,5	23.4

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
19x1,5	24.7
24x1,5	28.5
27x1,5	29.0
30x1,5	30.2
33x1,5	31.2
37x1,5	32.2
5x2,5	17.2
7x2,5	18.4
10x2,5	22.9
12x2,5	23.5
14x2,5	24.8
16x2,5	25.9
19x2,5	27.1
24x2,5	31.5
27x2,5	32.2
30x2,5	33.8
33x2,5	35.0
37x2,5	36.4

CJ85/NSC-VFD, CJ86/NSC-VFD 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
1x4	8,3
1x6	9,2
1x10	10,5
1x16	11,4
1x25	13,4
1x35	15,4
1x50	17,5
1x70	19,9
1x95	21,4
1x120	23,5
1x150	25,9
1x185	28,6
1x240	31,9
1x300	32,9

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3x2,5	12,8
3x4	14,8
3x6	16,6
3x10	19,5
3x16	21,3
3x25	25,5
3x35	29,9
3x50	34,3
3x70	39,6
3x95	42,6
3x120	47,2
3x150	52,3
3x185	58,1
3x240	65,3

CJ85/NSC-VFD, CJ86/NSC-VFD 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3×2,5+1×2,5	14,5
3×4+1×4	16,0
3×6+1×6	18,3
3×10+1×10	21,0
3×16+1×16	23,7
3×25+1×16	27,3
3×35+1×25	31,0
3×50+1×25	35,9
3×70+1×35	41,7
3×95+1×50	45,5
3×120+1×70	50,9
3×150+1×95	55,2
3×185+1×95	61,0
3×240+1×120	68,3

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3×4+3×1,5	17,0
3×6+3×2,5	18,2
3×10+3×4	21,8
3×16+3×6	24,1
3×25+3×6	27,1
3×35+3×6	31,4
3×50+3×10	36,6
3×70+3×16	40,3
3×95+3×16	43,7
3×120+3×25	49,9
3×150+3×25	53,4
3×185+3×35	60,6
3×240+3×50	68,7

CJ85/NSC-VFD, CJ86/NSC-VFD 1,8/3 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
1x10	13,4
1x16	14,2
1x25	15,7
1x35	17,8
1x50	19,6
1x70	21,9
1x95	23,3
1x120	25,2
1x150	27,2
1x185	29,5
1x240	32,6
1x300	33,3

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3x10	25,5
3x16	27,3
3x25	30,6
3x35	35,0
3x50	38,9
3x70	43,8
3x95	46,8
3x120	50,9
3x150	55,1
3x185	59,9
3x240	66,6

CJ85/NSC-VFD, CJ86/NSC-VFD 1,8/3 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3×10+1×10	28,0
3×16+1×16	30,6
3×25+1×16	33,3
3×35+1×25	37,0
3×50+1×25	41,3
3×70+1×35	46,6
3×95+1×50	50,3
3×120+1×70	55,2
3×150+1×95	58,7
3×185+1×95	63,7
3×240+1×120	70,6

Number of cores x conductor cross-section	Overall diameter nom.
mm^2	mm
3×10+3×4	29,5
3×16+3×6	32,1
3×25+3×6	34,9
3×35+3×6	39,2
3×50+3×10	44,0
3×70+3×16	47,4
3×95+3×16	50,8
3×120+3×25	56,0
3×150+3×25	58,9
3×185+3×35	65,4
3×240+3×50	72,9

Application/Limitation

General power and lighting. Control.

This type of cable is fire resistant in accordance with IEC Publication 60331.

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

Fire resistant. Flame retardant Cat. A. Halogen free. Low smoke.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2020-01	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable –Procedure for 1 kW pre-mixed flame	
IEC 60332-3-22	2018-07	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.

Standard	Release	General description	Limitation
IEC 60331-1	2018-03	Tests for electric cables under fire conditions - Circuit integrity - Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV	For cables with an overall diameter exceeding 20 mm (120 min.)
IEC 60331-2	2018-03	Tests for electric cables under fire conditions - Circuit integrity - Part 2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV	For cables with an overall diameter not exceeding 20 mm (120 min.)
IEC 60754-1	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2019-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 60684-2	2011-08	Clause 45.2 Methods of determination of low levels of fluorine	Fluorine content < 0,1%
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%

Marking of product

Example:

Yangzhou Zhongda Cable Co., Ltd - CJ86/NC - 0,6/1 kV - size - IEC 60332-3-22 - IEC 60331-1/2 - Lot no.

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE