

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)

CJ85/SC CJ86/SC CJ96/SC 0,6/1kV, CJ85/SC-VFD CJ86/SC-VFD 0,6/1kV, CJ85/SC-VFD CJ86/SC-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/SC CJ86/SC CJ96/SC 0,6/1kV	0,6/1	90
CJ85/SC-VFD CJ86/SC-VFD 0,6/1kV	0,6/1	90
CJ85/SC-VFD CJ86/SC-VFD 1,8/3kV	1,8/3	90

Issued at **Høvik** on **2022-12-16**

This Certificate is valid until **2027-12-15**.

for **DNV**

DNV local unit: **Nanjing NB & CMC**

Approval Engineer: **Carsten Hunsalz**

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/SC, CJ86/SC, CJ96/SC 0,6/1 kV
CJ85/SC-VFD, CJ86/SC-VFD 0,6/1 kV
CJ85/SC-VFD, CJ86/SC-VFD 1,8/3 kV

Conductors: Stranded copper class 2 or class 5
Insulation: XLPE
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/SC, CJ86/SC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
1x1	5.4
1x1,5	5.7
1x2,5	6.1
1x4	6.8
1x6	7.3
1x10	8.4
1x16	9.5
1x25	11.3
1x35	12.7
1x50	14.7
1x70	16.8
1x95	18.9
1x120	20.8
1x150	23.0
1x185	25.5
1x240	28.5
1x300	31.3
2x1	8.9
2x1,5	9.5
2x2,5	10.6
2x4	11.6
2x6	12.8
2x10	15.3
2x16	17.6
2x25	21.3
2x35	24.0
2x50	27.1
2x70	31.4
2x95	35.9
2x120	39.8
2x150	40.9
2x185	45.4

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x1	9.4
3x1,5	10.0
3x2,5	11.1
3x4	12.3
3x6	14.0
3x10	16.2
3x16	18.7
3x25	22.7
3x35	25.6
3x50	28.9
3x70	33.6
3x95	38.4
3x120	42.6
3x150	47.3
3x185	52.6
4x1	10.1
4x1,5	10.8
4x2,5	12.1
4x4	13.8
4x6	15.3
4x10	17.8
4x16	20.5
4x25	25.0
4x35	28.2
4x50	32.0
4x70	37.6
4x95	42.6
4x120	47.3
4x150	52.5
4x185	58.5

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

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
5x1	11.5
7x1	12.4
10x1	16.0
12x1	16.5
14x1	17.3
16x1	18.2
19x1	19.1
24x1	22.2
27x1	22.7
30x1	23.5
33x1	24.4
37x1	25.3
5x1,5	12.3
7x1,5	13.8
10x1,5	17.2
12x1,5	17.8
14x1,5	18.6
16x1,5	19.6

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
19x1,5	20.6
24x1,5	24.0
27x1,5	24.5
30x1,5	25.4
33x1,5	26.4
37x1,5	27.4
5x2,5	14.2
7x2,5	15.4
10x2,5	19.3
12x2,5	20.0
14x2,5	20.9
16x2,5	22.1
19x2,5	23.2
24x2,5	27.2
27x2,5	27.8
30x2,5	28.8
33x2,5	29.9
37x2,5	31.1

CJ96/SC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
1x1	7.5
1x1,5	7.8
1x2,5	8.2
1x4	9.0
1x6	9.5
1x10	10.5
1x16	11.7
1x25	14.0
1x35	15.4
1x50	16.9
1x70	18.9
1x95	21.0
1x120	23.0
1x150	25.2
1x185	27.6
1x240	30.7
1x300	33.9

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
2x1	10.7
2x1,5	11.4
2x2,5	12.8
2x4	14.0
2x6	15.1
2x10	17.2
2x16	19.5
2x25	23.1
2x35	26.1
2x50	28.9
2x70	33.7
2x95	38.3
2x120	42.1
2x150	46.8
2x185	51.8

CJ96/SC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x1	11.3
3x1,5	11.9
3x2,5	13.3
3x4	14.6
3x6	15.9
3x10	18.1
3x16	20.5
3x25	24.7
3x35	27.8
3x50	30.8
3x70	36.4
3x95	40.9
3x120	45.4
3x150	50.0
3x185	55.7

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
4x1	12.0
4x1,5	12.7
4x2,5	14.4
4x4	15.7
4x6	17.2
4x10	19.7
4x16	22.4
4x25	26.8
4x35	30.5
4x50	34.3
4x70	39.9
4x95	45.3
4x120	50.1
4x150	55.6
4x185	61.5

CJ96/SC 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
5x1	13.2
7x1	14.2
10x1	17.1
12x1	17.5
14x1	18.2
16x1	18.9
19x1	20.0
24x1	22.8
27x1	23.3
30x1	24.0
33x1	24.9
37x1	25.7
5x1,5	14.1
7x1,5	15.0
10x1,5	18.1
12x1,5	18.6
14x1,5	19.6
16x1,5	20.4

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
19x1,5	21.3
24x1,5	24.7
27x1,5	25.1
30x1,5	25.9
33x1,5	26.7
37x1,5	27.8
5x2,5	15.4
7x2,5	16.6
10x2,5	20.3
12x2,5	20.8
14x2,5	21.7
16x2,5	22.9
19x2,5	23.9
24x2,5	27.7
27x2,5	28.3
30x2,5	29.2
33x2,5	30.3
37x2,5	31.4

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

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
1x4	7,4
1x6	8,3
1x10	9,6
1x16	10,5
1x25	12,4
1x35	14,5
1x50	16,6
1x70	19,0
1x95	20,4
1x120	22,6
1x150	25,0
1x185	27,7
1x240	31,0
1x300	32,0

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x2,5	10,8
3x4	12,8
3x6	14,6
3x10	17,5
3x16	19,4
3x25	23,5
3x35	27,9
3x50	32,3
3x70	37,7
3x95	40,7
3x120	45,3
3x150	50,4
3x185	56,2
3x240	63,3

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

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x2,5+1x2,5	12,4
3x4+1x4	14,3
3x6+1x6	16,0
3x10+1x10	19,3
3x16+1x16	22,1
3x25+1x16	25,1
3x35+1x25	28,8
3x50+1x25	33,7
3x70+1x35	39,5
3x95+1x50	43,3
3x120+1x70	48,7
3x150+1x95	53,0
3x185+1x95	58,8
3x240+1x120	66,1

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x4+3x1,5	15,2
3x6+3x2,5	17,2
3x10+3x4	20,2
3x16+3x6	23,1
3x25+3x6	24,4
3x35+3x6	28,7
3x50+3x10	33,9
3x70+3x16	37,6
3x95+3x16	41,0
3x120+3x25	47,2
3x150+3x25	50,7
3x185+3x35	57,8
3x240+3x50	65,9

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

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
1x10	12,4
1x16	13,3
1x25	14,8
1x35	16,9
1x50	18,7
1x70	21,0
1x95	22,4
1x120	24,3
1x150	26,3
1x185	28,5
1x240	31,7
1x300	32,4

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3x10	23,5
3x16	25,4
3x25	28,6
3x35	33,0
3x50	37,0
3x70	41,8
3x95	44,8
3x120	49,0
3x150	53,1
3x185	58,0
3x240	64,7

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

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3×10+1×10	26,0
3×16+1×16	28,8
3×25+1×16	31,1
3×35+1×25	34,8
3×50+1×25	39,1
3×70+1×35	44,5
3×95+1×50	48,1
3×120+1×70	53,0
3×150+1×95	56,5
3×185+1×95	61,5
3×240+1×120	68,4

Number of cores x conductor cross-section	Overall diameter nom.
mm ²	mm
3×10+3×4	28,3
3×16+3×6	30,7
3×25+3×6	32,2
3×35+3×6	36,5
3×50+3×10	41,3
3×70+3×16	44,7
3×95+3×16	48,1
3×120+3×25	53,3
3×150+3×25	56,2
3×185+3×35	62,7
3×240+3×50	70,2

Application/Limitation

General power and lighting. Control.

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

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.
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

Standard	Release	General description	Limitation
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/SC - 0,6/1 kV - size - IEC 60332-3-22 - 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