



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-8373  
This Certificate consists of 5 pages

*This is to certify that the*  
**Electric Cable, Power Current**  
*with type designation(s)*  
**RFOU P1/P8 0,6/1 kV, RFOU-VFD 0,6/1 kV, RFCU 0,6/1 kV**


*Holder of certificate*  
**Draka Marine, Oil & Gas International**  
Houston, TX 77032, United States

*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards  
IEC 60092-353 (2001-04)  
IEC 60332-3-22 (2000-10)  
IEC 60754-1 (1994-01)  
IEC 60754-2 (1997-04)  
IEC 61034-2 (2005-04)  
NEK 606 (2004) (P types only)

*Application*  
General power and lighting. Control. Halogen free. Low smoke. Mud resistant.

Type	Voltage class (kV)	Temp. class (°C)
RFOU P1/P8 0,6/1 kV	0,6/1	90
RFOU-VFD 0,6/1 kV	0,6/1	90
RFCU 0,6/1 kV	0,6/1	90

*Place and date*  
Høvik, 2007-05-11  
for DET NORSKE VERITAS AS

  
Frode Berntsen  
Head of Section



Local Office  
DNV Oslo

*This Certificate is valid until*  
2011-06-30

  
Ivar Bull  
Surveyor 

Notice: 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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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File No.: 827.10

**Name and place of manufacturer:**

Draka Norsk Kabel AS  
Drammen, Norway

**Product description**

Type: RFOU P1/P8 0,6/1 kV & RFOU-VFD 0,6/1 kV & RFCU 0,6/1 kV

**Construction:**

Conductors: Tinned, stranded copper  
Core insulation: EPR  
Filler: Flame retardant halogen-free thermoset compound  
Metal covering: Tinned, Copper wire braid (O) or Galv. Steel wire braid (C)  
Outer sheath: SHF2, SHF Mud

**RFOU P1/P8 0,6/1 kV**

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
1 x 16	13,0 ± 0,8
1 x 25	14,5 ± 0,8
1 x 35	16,0 ± 0,8
1 x 50	18,0 ± 0,8
1 x 70	20,5 ± 1,0
1 x 95	22,5 ± 1,0
1 x 120	25,0 ± 1,0
1 x 150	26,5 ± 1,0
1 x 185	29,0 ± 1,0
1 x 240	32,0 ± 1,5
1 x 300	35,5 ± 1,5
1 x 400	40,0 ± 2,0
1 x 500	43,5 ± 2,0
1 x 630	47,5 ± 2,0
2 x 1,5/4	12,5 ± 0,8
2 x 2,5/4	13,5 ± 0,8
2 x 4/6	15,0 ± 0,8
2 x 6/6	16,0 ± 0,8
2 x 10/10	18,5 ± 0,8

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
2 x 16/16	21,0 ± 1,0
2 x 25/16	24,5 ± 1,0
3 x 1,5/4	13,0 ± 0,8
3 x 2,5/6	14,5 ± 0,8
3 x 4/6	15,5 ± 0,8
3 x 6/6	17,0 ± 0,8
3 x 10/10	19,0 ± 0,8
3 x 16/16	22,0 ± 1,0
3 x 25/16	26,0 ± 1,0
3 x 35/16	28,5 ± 1,0
3 x 50/25	33,5 ± 1,5
3 x 70/35	38,5 ± 1,5
3 x 95/50	43,0 ± 2,0
3 x 120/60	47,0 ± 2,0
3 x 150/75	53,5 ± 2,5
3 x 150	52,5 ± 2,5
3 x 185/95	59,0 ± 2,5
3 x 240/120	67,0 ± 3,0
3 x 240	64,5 ± 3,0

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
3 x 2,5 + E	15,5 ± 0,8
3 x 4 + E	17,0 ± 0,8
3 x 6 + E	18,5 ± 0,8
3 x 10 + E	21,0 ± 1,0
3 x 16 + E	24,0 ± 1,0
3 x 25 + E	28,5 ± 1,0
3 x 35 + E	31,5 ± 1,5
3 x 50 + E	36,5 ± 1,5
3 x 70 + E	41,5 ± 2,0
3 x 95 + E	47,0 ± 2,0
3 x 120 + E	52,0 ± 2,5
3 x 150 + E	57,0 ± 2,5
3 x 185 + E	64,0 ± 3,0
3 x 240 + E	71,5 ± 3,5
4 x 1,5/4	15,0 ± 0,8
4 x 2,5/6	16,0 ± 0,8
4 x 4/6	17,0 ± 0,8
4 x 6/6	18,5 ± 0,8



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Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
4 x 10/10	21,0 ± 1,0
4 x 16/16	24,5 ± 1,0
4 x 25/16	28,5 ± 1,0
4 x 35/16	31,5 ± 1,5
4 x 50/25	37,0 ± 1,5
4 x 70/35	42,5 ± 2,0
4 x 95/50	47,5 ± 2,0
4 x 95/50	47,5 ± 2,0
4 x 120/60	52,5 ± 2,5
4 x 150/75	59,0 ± 2,5
4 x 185/95	65,5 ± 3,0
4 x 240/120	74,0 ± 3,5
4 x 2,5 + E	17,0 ± 0,8

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
4 x 4 + E	18,5 ± 0,8
4 x 6 + E	20,0 ± 1,0
4 x 10 + E	23,0 ± 1,0
4 x 16 + E	26,0 ± 1,0
4 x 25 + E	31,0 ± 1,5
4 x 35 + E	35,0 ± 1,5
4 x 50 + E	40,5 ± 2,0
4 x 70 + E	45,5 ± 2,0
5 x 1,5/6	15,5 ± 0,8
5 x 2,5/6	17,0 ± 0,8
7 x 1,5/6	17,0 ± 0,8
7 x 2,5/6	18,0 ± 0,8

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
12 x 1,5/10	21,5 ± 1,0
12 x 2,5/10	23,5 ± 1,0
19 x 1,5/10	25,0 ± 1,0
19 x 2,5/10	27,0 ± 1,0
27 x 1,5/10	29,5 ± 1,0
27 x 2,5/16	32,0 ± 1,5
37 x 1,5/16	32,5 ± 1,5
37 x 2,5/16	36,0 ± 1,5

RFOU-VFD 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
3 x 95 + 3 x 16	45,0 ± 2,5

RFCU 0,6/1 kV

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
1 x 16	13,0 ± 1,0
1 x 25	15,0 ± 1,0
1 x 35	16,5 ± 1,0
1 x 50	18,5 ± 1,0
1 x 70	21,5 ± 1,5
1 x 95	23,5 ± 1,5
1 x 120	25,0 ± 1,5
1 x 150	27,5 ± 1,5
1 x 185	29,5 ± 1,5

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
1 x 240	33,5 ± 2,0
1 x 300	36,5 ± 2,0
2 x 1,5	13,0 ± 1,0
2 x 2,5	14,0 ± 1,0
2 x 4	15,5 ± 1,0
2 x 6	17,0 ± 1,0
2 x 10	18,5 ± 1,0
2 x 16	21,5 ± 1,5

Number of cores x conductor cross-section	Overall diameter
mm <sup>2</sup>	mm
3 x 1,5	14,0 ± 1,0
3 x 2,5	15,0 ± 1,0
3 x 4	16,0 ± 1,0
3 x 6	17,5 ± 1,0
3 x 10	19,5 ± 1,0
3 x 16	23,0 ± 1,5
3 x 25	26,5 ± 1,5
3 x 35	29,5 ± 2,0



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Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter mm
3 x 50	34,0 ± 2,0
3 x 70	40,0 ± 2,5
3 x 95	44,0 ± 2,5
3 x 120	48,5 ± 2,5
3 x 150 + E	59,5 ± 3,0
3 x 185 + E	65,0 ± 3,0
3 x 240 + E	73,0 +/-3,0
4 x 1,5	15,0 ± 1,0
4 x 2,5	16,5 ± 1,0
4 x 4	17,5 ± 1,0
4 x 6	19,5 ± 1,0
4 x 10	21,5 ± 1,5

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter mm
4 x 16	25,0 ± 1,5
4 x 25	29,0 ± 1,5
4 x 35	32,5 ± 2,0
4 x 50	38,0 ± 2,0
4 x 70	44,0 ± 2,5
4 x 95	48,5 ± 2,5
5 x 2,5	17,5 ± 1,0
7 x 1,5	17,5 ± 1,0
7 x 2,5	18,5 ± 1,0
12 x 1,5	22,0 ± 1,5
12 x 2,5	24,0 ± 1,5

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter mm
19 x 1,5	25,5 ± 1,5
19 x 2,5	27,5 ± 1,5
27 x 1,5	30,0 ± 2,0
27 x 2,5	32,5 ± 2,0
37 x 1,5	34,0 ± 2,0
37 x 2,5	37,5 ± 2,0

### Application/Limitation

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.

RFOU-VFD is design for variable frequency drives.

### Type Approval documentation

Data sheets: RFOU\_1KV dated 2003-11-11

RFOU\_VFD\_1-3KV\_3x95+3x16 dated 2004-02-06.

-Letter SET/1b, dated 20.6.88 from EB NORSK KABEL

-Test Report on cable bunch test according to IEC 60332-3, Category A, dated 20.10.87

### Tests carried out

Type tested according to:

Standard cable: IEC 60092-350, IEC 60332-3-22, IEC 60754-1/2, IEC 61034-1/2 and NEK 606 (2004).

On special request: Cold bend (-40 °C)/impact (-35 °C) test: CSA C 22.2 No 0.3-M1985



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### Marking of product

To be marked: DRAKA NORSK KABEL or DRAKA 01- RFOU P1/P8 or RFOU-VFD or RFCU - size - 0,6/1 kV

### Certificate retention survey

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

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Survey to be performed at least every second year.

END OF CERTIFICATE