

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Electric Power Cable**

with type designation(s)

**M2XCH VFD 0,6/1kV, M2XCH VFD 1,8/3kV**

Issued to

**Untel Kablolari San. ve Tic. A.S.  
Dilovasi, Turkey**

is found to comply with

**DNV GL rules for classification – Ships and offshore units****Application :****Power cable for Variable Frequency Drives****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL**

Type	Voltage class (kV)	Temp. class (°C)
<b>M2XCH VFD 0,6/1kV</b>	<b>0,6/1</b>	<b>90</b>
<b>M2XCH VFD 1,8/3kV</b>	<b>1,8/3</b>	<b>90</b>

This Certificate is valid until **2021-02-09**.Issued at **Høvik** on **2016-02-10**DNV GL local station: **Istanbul**Approval Engineer: **Ivar Bull**for **DNV GL**

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**Marit Laumann**  
**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.

## Product description

M2XCH VFD 0,6/1kV  
 M2XCH VFD 1,8/3kV

### Construction:

Conductors: Tinned or annealed stranded copper class 2 (or class 5)  
 Earth conductors: 3x distributed earth conductors in interstices (3 core cables)  
 Core insulation: XLPE  
 Bedding/Inner covering/filler: Halogen free compound  
 Screen: CU/PETP Tape (100% coverage)  
 Metal covering: Tinned or annealed copper wire braid  
 Outer sheath: SHF2 or SHF2

No of cores:	Cross sectional area [mm <sup>2</sup> ]
1	10 - 240
3/3xEarth cores	16 - 240 / 6-50

## 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.

## Type Approval documentation

### Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-353	2011-08	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	0,6/1 kV
IEC 60332-3-22	2009-02	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	Bunch test Category A
IEC 60754-1	2011-11	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	2011-11	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 61034-1/2	2013-07	Measurement of smoke density of cables burning under defined conditions - Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%

Job Id: **262.1-018740-1**  
Certificate No: **TAE00000Y1**

### **Marking of product**

Untel – M2XCH VFD 0,6/1kV– size – IEC 60092/353, IEC 60332-1&3 A - Month – Year OR  
Untel –M2XCH VFD 1,8/3kV – size – IEC 60092/353, IEC 60332-1&3 A - Month – Year

### **Periodical assessment**

The scope of the periodical assessment 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 periodical assessment 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.

Periodical assessment to be performed at least every second year.

END OF CERTIFICATE