DNV·GL

Certificate No:
TAE00002TR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Heating Cable

with type designation(s)
HPT, FP

Issued to
Thermon, Inc.
San Marcos, TX, USA

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

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Type	Rated voltage (V)	Temp. class (°C)	Power [W/m] @ref. temp.	Suitable for Hazardous areas
HPT	120 - 600	T2-T6 (300 - 85)	16-63	Yes
FP	120-600	T3-T6 (200 - 85)	8-16	Yes

Issued at **Høvik** on **2018-04-27**
This Certificate is valid until **2022-12-31**.
DNV GL local station: **Houston**

Approval Engineer: **Nicolay Horn**

for **DNV GL**

Andreas Kristoffersen
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.

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Product description

Types: HPT – Power - Limiting Heating Cable

Conductor:	3,3 mm² nickel-plated copper bus wire
Conductor insulation:	Fluorpolymer dielectric
Heating element:	Composite metal alloy/fibre
Inner braid:	Fiberglass braid
Primary Jacket/Insulation:	Fluoropolymer dielectric
Braid:	Nickel plated copper
Sheath:	Fluoropolymer

Types: FP - Parallelle Constant Watt Heating Cable

Conductor:	3,3 mm² nickel-plated copper bus wire
Conductor insulation:	Fluorpolymer dielectric
Heating element:	Nichrome
Inner braid:	Fiberglass braid
Primary Jacket/Insulation:	Fluoropolymer dielectric
Braid:	Tinned copper or Nickel-plated copper
Sheath:	Fluoropolymer

Type designation	Ex 60079-30-1 Gb*	Ex 60079-30-1 Db*	P	Un
Ref.	Temp.class	Temp.class	Nominal (W/m)	(V)
HPT 5-5	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIIC T85 °C…T300 °C Db	16	575
HPT 10-5	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	33	575
HPT 15-5	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	49	575
HPT 20-5	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	66	575
HPT 5-4	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	16	480
HPT 10-4	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	33	480
HPT 15-4	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	49	480
HPT 20-4	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	66	480
HPT 5-2	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	16	240
HPT 10-2	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	33	240
HPT 15-2	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	49	240
HPT 20-2	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	66	240
HPT 5-1	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	16	120
HPT 10-1	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	33	120
HPT 15-1	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	49	120
HPT 20-1	Ex 60079-30-1 IIC T6…T2 Gb	Ex 60079-30-1 IIICT85 °C…T300 °C Db	66	120

Type designation	Ex e*	Ex tD*	P	Un
Ref.	Temp.class	Temp.class	Nominal (W/m)	(V)
FP 2.5-1-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	8	120
FP 5-1-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	16	120
FP 8-1-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	26	120
FP 10-1-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	33	120
FP 2.5-2-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	8	240
FP 5-2-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	16	240
FP 8-2-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	26	240
FP 10-2-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	33	240
FP 2.5-4-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	8	480
FP 5-4-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	16	480
FP 8-4-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	26	480
FP 10-4-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	33	480
FP 2.5-5-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	8	575
FP 5-5-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	16	575
FP 8-5-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	26	575
FP 10-5-OJ	Ex e II T3 to T6	Ex tD A21 IP66/IP67 T200°C TO T85°C	33	575

*The T-class and/or maximum surface temperature T-ratings are obtained by stabilized design and/or controlled design of a trace heating system using methods described in EN/IEC 60079-30-2 clause 6.7, made under Thermon's responsibility.

Application/Limitation

The installation has to be done in accordance with the installation instructions. Installation of Ex equipment in DNV GL vessels is subject for approval and shall be submitted in each case.

Heating cables are not to be installed in contact with woodwork or other combustible material. If installed close to such materials, a separation by means of a non-flammable material may be required.

Type Approval documentation

Tests carried out

IECStandard	**Release**	**General description**	**Limi-tation**
IEC/IEEE 60079-30-1	2015	Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements	HPT
IEC 60079-0	2011	Explosive atmospheres - Part 0: General requirement	HPT
IEC 62086 –1	2001	Electrical Apparatus for Explosive Gas Atmospheres - Electrical Resistance Trace Heating - Part 1: General and Testing Requirements	FP
IEC 60079-0	2004	Explosive atmospheres - Part 0: Equipment - General requirement	FP

IEC 60079-7	2001	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"	FP
IEC 60079-30-1	2007	Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements	FP
IEC 61241-0	2004	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements	FP
IEC 61241-1	2004	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"	FP

EN Standard	**Release**	**General description**	**Limi-tation**
EN 60079-30-1	2017	Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements	HPT
IEC 60079-0 + A11	2013	Explosive atmospheres - Part 0: General requirement	HPT
EN 60079-0	2006	Electrical apparatus for explosive gas atmospheres. General requirements	FP
EN 60079-7	2003	Electrical apparatus for explosive gas atmospheres. Increased safety "e"	FP
EN 61241-0	2006	Electrical apparatus for use in the presence of combustible dust. General requirements	FP
EN 61241-1	2004	Electrical apparatus for use in the presence of combustible dust. Protection by enclosures "tD"	FP
EN 62086-1	2005	Electrical apparatuses for explosive gas	FP
EN 60259+A1	2000	Degree of protection provided by enclosures (IP Code)	FP

Marking of product

Thermon – Type designation – Voltage.

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