CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 1 of 2 Date: 14/04/2025 Rev: 01

Base Load Power Hub (BLPH)

MANUFACTURERS RECORD BOOK - COMPLETE – EHT

Document Number:

1724001647-QC-DB-00013

Document Class: 2

01	14/04/2025	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
00	12/03/2025	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
Rev.	Date	Description	Prepared	Reviewed	Approved

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 2 of 2 Date: 14/04/2025 Rev: 01

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS DATA BOOK - INDEX - EHT	Sheet 1 of 3 Date: 17/12/2024 Rev: 01

Base Load Power Hub (BLPH)

MANUFACTURERS DATA BOOK - INDEX – EHT

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
	20/12/2024

Document Number:
1724001647-QC-LIS-00012

Document Class: 2

01	17/12/2024	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
00	02/10/2024	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
Rev.	Date	Description	Prepared	Reviewed	Approved

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS DATA BOOK - INDEX - EHT	Sheet 2 of 3 Date: 17/12/2024 Rev: 01

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS DATA BOOK - INDEX - EHT	Sheet 3 of 3 Date: 17/12/2024 Rev: 01

INDEX

Section	Section or SubSection or Document Title	Document Code	Vol. No.	Page
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1.3	EHT ISOMETRICS	1724001647-EL-DD-00004	1/1	18
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1.5	EHT TYPICAL WIRING DETAILS	1724001647-EL-DG-00005	1/1	34
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2.5	INSTALLATION AND OPERATING MANUAL - EHT	1724001647-EL-MAN-00014	1/1	136
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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 6 of 183 Date: 14/04/2025 Rev: 01

1 DESIGN DOSSIER

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 7 of 183 Date: 14/04/2025 Rev: 01

1.1	EHT SUPPLIER MASTER INDEX REGISTER (SMIR)

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SUPPLIER MASTER INFORMATION REGISTER	Sh. 1 of 4 Date: 23/09/2024 Rev. 00

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

SUPPLIER MASTER INFORMATION REGISTER

Document Number:

1724001647-MD-LIS-00001

Document Class: 3

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	30/09/2024

00	23-09-24	Issue for Information (IFI)	L. Gentile	A. Martelli	G. Pupilli
Rev.	Date	Description	Prepared	Reviewed	Approved

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SUPPLIER MASTER INFORMATION REGISTER	Sh. 2 of 4 Date: 23-09-24 Rev. 00

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		00							
1	Cover	X							
2	Table of Contents	X							
3	Revision / Change Log / Hold List	X							
4	References	X							
5	SMIR	X							

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SUPPLIER MASTER INFORMATION REGISTER	Sh. 3 of 4 Date: 23-09-24 Rev. 00

Revision / Change Log

Rev.	Description
00	ISSUE FOR INFORMATION (IFI)

HOLDS LIST

No.	Description
1.	
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SMIR - REGISTRO DOCUMENTI / *SMIR - SUPPLIER MASTER INFORMATION REGISTER*

Ordine n°/*order nr.*	1724001647	Fornitore/*Supplier*:	nVent Italy Srl		
data / *dated:*	09-08-24	Codice F./ *S. Code:*			
Commessa / *Job:*	123A90	Indirizzo/ *address* :	Centro Direzionale Assago Milanofiori, Strada 3, Palazzo B11 - 20090 Assago (MI)		
Descrizione / *Description*	Electrical Heat Tracing	Persona di riferim./ *contact person:*	Gianandrea Pupilli		
Macrofase / *Phase*					

Pos.	Document nr. Client (1)	Doc Client Rev. (1)	Document nr. Internal	Document nr. Internal Rev. (2)	Document nr. Supplier (3)	Doc Supplier Rev. (3)	Titolo Documento / *Document title* PRESSURE VESSEL	Disciplina / *Discipline*	Blocco Classe / *Class Block (6)*	Docum. Format (7)	first issue date (8)	Third Party Approval (I/A)	Design KEY Document	Document Approval (I/A)
							CONTROL DOCUMENTS							
1	1724001647-MD-LIS-00001	00	1724001647-MD-LIS-00001	00	PM02-1001	00	EHT SUPPLIER MASTER INDEX REGISTER (SMIR)	ENG-ELECTRICAL		A0	23-09-24			I
							QUALITY DOCUMENTS							
2	1724001647-QC-PRO-00002	00	1724001647-QC-PRO-00002	00	QD01-1001	00	INSPECTION TEST PLAN (ITP) - EHT	QUA		A4	23-09-24			A
							ENGINEERING DOCUMENTS							
3	1724001647-EL-LIS-00003	00	1724001647-EL-LIS-00003	00	ED01-1001	00	EHT CALCULATION LIST	ENG-ELECTRICAL		A3/A4	26-09-24		X	A
4	1724001647-EL-DD-00004	00	1724001647-EL-DD-00004	00	DD01-1001	00	EHT ISOMETRICS	ENG-ELECTRICAL		A3/A4	26-09-24		X	A
5	1724001647-EL-DG-00005	00	1724001647-EL-DG-00005	00	QD07-2000	00	EHT TYPICAL WIRING DETAILS	ENG-ELECTRICAL		A3/A4	26-09-24		X	A
6	1724001647-EL-DG-00006	00	1724001647-EL-DG-00006	00	DD08-1000	00	EHT SINGLE LINE DIAGRAM (SLD)	ENG-ELECTRICAL		A3/A4	26-09-24		X	A
7	1724001647-EL-DG-00007	00	1724001647-EL-DG-00007	00	ED02-1001	00	EHT BILL OF MATERIALS	ENG-ELECTRICAL		A4	26-09-24		X	A
8	1724001647-EL-DS-00008	00	1724001647-EL-DS-00008	00	QD04-1001	00	EHT TECHNICAL DATA SHEET (HEATING CABLES, JBs, TERMINATION KITS, THERMOSTATS, ACCESSORIES)	ENG-ELECTRICAL		A4	23-09-24		X	A
9	1724001647-EL-PL-00009	00	1724001647-EL-PL-00009	00	DD05-1000	00	EHT PLOT PLAN	ENG-ELECTRICAL		A3/A4	26-09-24		X	A
10	1724001647-IN-HD-00010	00	1724001647-IN-HD-00010	00	DD03-1000	00	EHT INSTRUMENT HOOK-UP	ENG-ELECTRICAL		A4	26-09-24		X	A
							CERTIFICATES							
11	1724001647-EL-LIS-00011	00	1724001647-EL-LIS-00011	00	QD05-1001	00	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT	QUA		A4	26-09-24			A
12	1724001647-QC-LIS-00012	00	1724001647-QC-LIS-00012	00	QD08-1001	00	MANUFACTURERS DATA BOOK - INDEX - EHT	QUA		A4	15-10-24			A
13	1724001647-QC-DB-00013	00	1724001647-QC-DB-00013	00	QD08-1000	00	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	QUA		A3/A4	31-10-24		X	A
							HANDLING, SHIPPING & SITE INSTALLATION							
14	1724001647-EL-MAN-00014	00	1724001647-EL-MAN-00014	00	QD07-0001	00	INSTALLATION AND OPERATING MANUAL - EHT	ENG-ELECTRICAL		A4	26-09-24			I
15	1724001647-COM-LIS-00015	00	1724001647-COM-LIS-00015	00	ED03-1001	00	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT	COM		A3	26-09-24			A
16	1724001647-QC-PRO-00016	00	1724001647-QC-PRO-00016	00	QD06-3001	00	SHIPPING AND HANDLING PROCEDURE - EHT	LOG		A4	23-09-24			I

Notes:

(1) Numero documento Cliente
Document number assigned by final Client
(2) Numero documento interno
Document number internal
(3) Numero documento Fornitore (assegnato dal Fornitore)
Document number assigned by Supplier
(4) Assegnare il Titolo del documento (assegnato dal Fornitore)
Fill in the document title (to be assigned by Vendor)

(5) Specific are la disciplina (compilato da Rosetti)
Process, Piping; Electrical, Expediting, Inspection, Commissioning, Quality, ecc (to be filled by Rosetti)
(6) Blocco Classe: Specifica, Disegno, Report, Data Sheet, etc. (compilato da Rosetti)
Procedure, list, drawing, data sheet, etc. (to be filled by Rosetti)
(7) A4, A3, A1 (compilato dal Fornitore)
A4, A3, A1 (Supplier)
(8) Data prevista per l'emissione del documento (compilato dal Fornitore)
Foreseen date for the first issue (Supplier)

1.2 EHT CALCULATION LIST

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT CALCULATION LIST	Sh. 1 of 5 Date: 29/10/2024 Rev. 01

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT CALCULATION LIST

Document Number:

1724001647-EL-LIS-00003

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	11/12/2024

Rev.	Date	Description	Prepared	Reviewed	Approved
02	09-12-24	Accepted for Construction (AFC)	L. Gentile	A. Martelli	G. Pupilli
01	29-10-24	Issue for Review (IFR)	L. Gentile	A. Martelli	G. Pupilli
00	23-09-24	Issue for Review (IFR)	L. Gentile	A. Martelli	G. Pupilli

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT CALCULATION LIST	Sh. 2 of 5 Date: 09-12-24 Rev. 02

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		00	01	02					
1	Cover	X	X	X					
2	Table of Contents	X	X	X					
3	Revision / Change Log / Hold List	X	X	X					
4	References	X	X	X					
5	EHT CALCULATION LIST	X	X	X					

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT CALCULATION LIST	Sh. 3 of 5 Date: 09-12-24 Rev. 02

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ACCEPTED FOR CONSTRUCTION (AFC)

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EHT CALCULATION LIST

PIT240024_ED01-1001

		ENGINEERING DATA				MECHANICAL & INSULATION DATA						PROCESS DATA				EHT BASIC DESIGN							EHT DETAILED DESIGN							EHT TEMP. CONTROL DATA							
Main EHT Box Number	Item Number	Heater Number	Line, Equipment or Instrument ID	nVent Circuit Number	Plant Area	Pipe Size [DN / IN]	Pipe Length [m]	Support Quantity [pc]	Valve Quantity [pc]	Other Heat Sink Quantity [pc]	Insulation Type	Insulation Thickness [mm]	Maintain Temperature [°C]	Maximum Allow. Process Temperature [°C]	Maximum Operating Temperature [°C]	Maximum Exposure Temperature [°C]	Heatloss [W/m]	Heating Cable Selection	Trace Ratio	Heating Cable Output [W/m]	EHT Cable per Support [m]	EHT Cable per Valve [m]	EHT Cable per Other Heatsink [m]	Total EHT Cable [m]	Max. Allow. EHT Circuit Length [m]	Connection Type	Voltage [V]	Operating Current [A]	Total Operating Load [W]	Start-Up Current [A]	Temp. Control Method	Controller Set Point [°C]	Minimum Controlled Temperature [°C]	Maximum Controlled Temperature [°C]	Maximum Uncontrolled Temperature [°C]	Revision	Remark
																								GRAND TOTAL				**9.69**	**2226**	**14.91**							
ETB-200N1-16-L3-01	1	EHT-1001-A	1"-DM-001-01SS-E	1001	PIPING	1	17.6	5	1	2	RW/MF 1:2015	20	5	100	22	22	3.9	3BTV2-CT	1.0	10.7	0.1	0.8	0.5	22.0	199	Single L-N	230	1.18	271	1.8	Ambient sensing, standard	5	18	29	50	00	
																								TOTAL			**230**	**1.18**	**271**	**1.8**							
ETB-200N1-15-L2-01	1	EHT-1002-A	1"-CI-029-01CP-E	1002	PIPING	1	11.0	4		1	RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	1.0	10.7	0.1		0.5	13.9	199	Single L-N	230	0.73	167	1.1	Ambient sensing, standard	5	18	29	50	00	
	2	EHT-1002-A	1"-CI-029-01CP-E	1002	PIPING	1	0.0				RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	2.0	10.7				0.0	199	Single L-N	230		1	0.0	Ambient sensing, standard	5	28	37	54	00	
	3	EHT-1002-A	1"-CI-032-01CP-E	1002	PIPING	1	3.1		1	1	RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	2.0	10.7		1.6	0.5	8.7	199	Single L-N	230	0.49	112	0.8	Ambient sensing, standard	5	28	37	54	00	
	4	EHT-1002-A	1"-CI-029-01CP-E	1002	PIPING	1	0.0				RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	2.0	10.7				0.0	199	Single L-N	230		1	0.0	Ambient sensing, standard	5	28	37	54	00	
	5	EHT-1002-A	1"-CI-030-01CP-E	1002	PIPING	1	3.1		1	1	RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	2.0	10.7		1.6	0.5	8.7	199	Single L-N	230	0.49	112	0.8	Ambient sensing, standard	5	28	37	54	00	
	6	EHT-1002-A	1"-CI-029-01CP-E	1002	PIPING	0.75	0.5		1		RW/MF 1:2015	20	5	50	25	25	3.4	3BTV2-CT	2.0	10.7		1.5		2.6	199	Single L-N	230	0.15	34	0.2	Ambient sensing, standard	5	30	38	55	00	
	7	EHT-1002-A	1"-CI-029-01CP-E	1002	PIPING	0.5	0.5		1		RW/MF 1:2015	20	5	50	25	25	2.9	3BTV2-CT	2.0	10.7		1.4		2.5	199	Single L-N	230	0.14	32	0.2	Ambient sensing, standard	5	32	40	56	00	
																								TOTAL			**230**	**2.00**	**459**	**3.1**							
ETB-200N1-14-L1-01	1	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	4	0.5				RW/MF 1:2015	20	5	100	25	25	10.2	3BTV2-CT	1.0	10.7				0.6	199	Single L-N	230	0.03	7	0.1	Ambient sensing, standard	5	5	20	46	00	
	2	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	1.5	4.7	1		1	RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	1.0	10.7	0.1		0.5	9.3	199	Single L-N	230	0.47	107	0.7	Ambient sensing, standard	5	14	27	49	00	
	3	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	1.5	1.9				RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7				4.0	199	Single L-N	230	0.22	51	0.3	Ambient sensing, standard	5	24	34	53	00	
	4	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	1.5	7.8	3			RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	1.0	10.7	0.1			8.6	199	Single L-N	230	0.48	111	0.7	Ambient sensing, standard	5	14	27	49	00	
	5	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	1.5	1.9				RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7				4.0	199	Single L-N	230	0.22	51	0.3	Ambient sensing, standard	5	24	34	53	00	
	6	EHT-1003-A	1-1/2"-SWS-033-01SD-E	1003	PIPING	1.5	2.0	1	3		RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7	0.2	1.8		9.8	199	Single L-N	230	0.55	126	0.8	Ambient sensing, standard	5	24	34	53	00	
	7	EHT-1003-A	1-1/2"-SWS-031-01SD-E	1003	PIPING	1.5	1.4	1		2	RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7	0.2		0.5	4.2	199	Single L-N	230	0.23	54	0.4	Ambient sensing, standard	5	24	34	53	00	
	8	EHT-1003-A	1"-SWS-286-01SD-E	1003	PIPING	1.5	0.1				RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7				0.1	199	Single L-N	230	0.01	2	0.0	Ambient sensing, standard	5	24	34	53	00	
	9	EHT-1003-A	1"-SWS-288-01SD-E	1003	PIPING	1.5	0.1				RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7				0.1	199	Single L-N	230	0.01	2	0.0	Ambient sensing, standard	5	24	34	53	00	
	10	EHT-1003-A	1-1/2"-SWS-031-01SD-E	1003	PIPING	1.5	2.0	1	3		RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7	0.2	1.8		9.7	199	Single L-N	230	0.55	126	0.8	Ambient sensing, standard	5	24	34	53	00	
	11	EHT-1003-A	1-1/2"-SWS-033-01SD-E	1003	PIPING	1.5	1.2	1		2	RW/MF 1:2015	20	5	100	25	25	5.1	3BTV2-CT	2.0	10.7	0.2		0.5	3.7	199	Single L-N	230	0.20	47	0.3	Ambient sensing, standard	5	24	34	53	00	
	12	EHT-1003-A	1"-SWS-147-01SD-E	1003	PIPING	1	0.7		1		RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7		1.6		3.2	199	Single L-N	230	0.18	41	0.3	Ambient sensing, standard	5	28	37	54	00	
	13	EHT-1003-A	1-1/2"-SWS-033-01SD-E	1003	PIPING	1	0.2				RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7				0.5	199	Single L-N	230	0.03	6	0.0	Ambient sensing, standard	5	28	37	54	00	
	14	EHT-1003-A	1-1/2"-SWS-033-01SD-E	1003	PIPING	1	0.1			1	RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7			0.5	0.7	199	Single L-N	230	0.04	9	0.1	Ambient sensing, standard	5	28	37	54	00	
	15	EHT-1003-A	1-1/2"-SWS-035-01SD-E	1003	PIPING	1	0.1				RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7				0.1	199	Single L-N	230	0.01	2	0.0	Ambient sensing, standard	5	28	37	54	00	
	16	EHT-1003-A	1"-SWS-288-01SD-E	1003	PIPING	1	0.8		2		RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7		1.6		4.9	199	Single L-N	230	0.28	64	0.4	Ambient sensing, standard	5	28	37	54	00	
	17	EHT-1003-A	1-1/2"-SWS-031-01SD-E	1003	PIPING	1	0.2				RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7				0.5	199	Single L-N	230	0.03	6	0.0	Ambient sensing, standard	5	28	37	54	00	
	18	EHT-1003-A	1"-SWS-146-01SD-E	1003	PIPING	1	0.7		1		RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7		1.6		3.2	199	Single L-N	230	0.18	41	0.3	Ambient sensing, standard	5	28	37	54	00	
	19	EHT-1003-A	1-1/2"-SWS-031-01SD-E	1003	PIPING	1	0.1			1	RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7			0.5	0.7	199	Single L-N	230	0.04	9	0.1	Ambient sensing, standard	5	28	37	54	00	
	20	EHT-1003-A	1"-SWS-290-01SD-E	1003	PIPING	1	1.1	1	2		RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7	0.3	1.6		5.8	199	Single L-N	230	0.33	76	0.5	Ambient sensing, standard	5	28	37	54	00	
	21	EHT-1003-A	1"-SWS-286-01SD-E	1003	PIPING	1	0.8		2		RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	2.0	10.7		1.6		4.9	199	Single L-N	230	0.28	64	0.4	Ambient sensing, standard	5	28	37	54	00	
																								TOTAL			**230**	**4.37**	**1002**	**6.7**							
ETB-200N1-17-L1-04	1	EHT-1004-A	1"-WW-259-01CS-E / V-43001	1004	PIPING	1	0.9		1	1	RW/MF 1:2015	20	5	100	11	11	3.9	3BTV2-CT	1.0	10.7		0.8	0.5	3.2	199	Single L-N	230	0.12	28	0.2	Ambient sensing, standard	5	18	29	50	00	Combined with EHT-1004-B
																								TOTAL			**230**	**0.12**	**28**	**0.2**							
ETB-200N1-17-L1-02	1	EHT-1005-A	1"-WW-260-01CS-E	1005	PIPING	1	1.2	1	2	1	RW/MF 1:2015	20	5	100	11	11	3.9	3BTV2-CT	1.0	10.7	0.1	0.8	0.5	4.6	199	Single L-N	230	0.20	46	0.3	Ambient sensing, standard	5	18	29	50	00	Powered with EHT-1006-A
																								TOTAL			**230**	**0.20**	**46**	**0.3**							
ETB-200N1-17-L1-03	1	EHT-1006-A	1"-WW-202-01CS-H	1006	PIPING	1	1.0			1	RW/MF 1:2015	20	5	100	25	25	3.9	3BTV2-CT	1.0	10.7			0.5	2.5	199	Single L-N	230	0.08	19	0.1	Ambient sensing, standard	5	18	29	50	00	Powered with EHT-1005-A
																								TOTAL			**230**	**0.08**	**19**	**0.1**							
ETB-200N1-15-L2-02	1	EHT-1007-A	1"-CI-043-01CP-E	1007	PIPING	1	15.0	6		4	RW/MF 1:2015	20	5	50	25	25	3.9	3BTV2-CT	1.0	10.7	0.1		0.5	19.5	199	Single L-N	230	1.04	239	1.6	Ambient sensing, standard	5	18	29	50	00	
																								TOTAL			**230**	**1.04**	**239**	**1.6**							
ETB-200N1-17-L1-05	1	EHT-1004-B	43-LT-001	2001	INSTRUMENT	1	3.0				RW/MF 1:2015	20	5	100	11	11	3.9	3BTV2-CT	2.0	10.7				7.3	199	Single L-N	230	0.35	81	0.6	Ambient sensing, standard	5	28	37	54	00	Combined with EHT-1004-A
																								TOTAL			**230**	**0.35**	**81**	**0.6**							
ETB-200N1-17-L1-01	1	EHT-2002-A	43-LT-003	2002	INSTRUMENT	1	3.0				RW/MF 1:2015	20	5	100	11	11	3.9	3BTV2-CT	2.0	10.7				7.3	199	Single L-N	230	0.35	81	0.6	Ambient sensing, standard	5	28	37	54	00	
																								TOTAL			**230**	**0.35**	**81**	**0.6**							

EHT CALCULATION LIST

PIT240024_ED01-1001

		ENGINEERING DATA				MECHANICAL & INSULATION DATA						PROCESS DATA				EHT BASIC DESIGN												EHT TEMP. CONTROL DATA						
Main EHT Box Number	Item Number	Heater Number	Equipment ID	nVent Circuit Number	Plant Area	Heated Area [m²]	Available Area [m²]	Vessel Dry Area [m²]	Vessel Wet Area [m²]	Insulation Type	Insulation Thickness [mm]	Maintain Temperature [°C]	Maximum Allow. Process Temperature [°C]	Maximum Operating Temperature [°C]	Maximum Exposure Temperature [°C]	Heatloss [W/m]	Heating Cable Selection	Heather Spacing [mm]	Fixing Method	Heating Cable Output [W/m]	Total EHT Cable [m]	Max. Allow. EHT Circuit Length [m]	Connection Type	Voltage [V]	Operating Current [A]	Total Operating Load [W]	Start-Up Current [A]	Temp. Control Method	Controller Set Point [°C]	Minimum Controlled Temperature [°C]	Maximum Controlled Temperature [°C]	Maximum Uncontrolled Temperature [°C]	Revision	Remark
																			GRAND TOTAL		**17.3**				**1.19**	**274**	**1.83**							
ETB-200N1-17-L1-04	1	EHT-1004-A	V-43001	3001	EQUIPMENT	2.4	6.9	0.8	6.0	RW/MF 1:2015	20	5	100	11	11	197.8	3BTV2-CT	150.0	ATE-180	13.9	17.3	153	Single L-N	230	1.19	274	1.83	Ambient sensing, standard	5	6	22	47	00	Combined with EHT-1004-B
																			TOTAL		**17.3**			**230**	**1.19**	**274**	**1.83**							

1.3 EHT ISOMETRICS

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT ISOMETRICS	Sh. 1 of 10 Date: 17-02-25 Rev. 03

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT ISOMETRICS

Document Number: 1724001647-EL-DD-00004

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	17/02/2025

03	17-02-25	Accepted for Construction (AFC)	A. Dumitru	A. Martelli	G. Pupilli
02	20-01-25	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
01	29-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
00	23-09-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
Rev.	Date	Description	Prepared	Reviewed	Approved

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Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT ISOMETRICS	Sh. 3 of 10 Date: 17-02-25 Rev. 03

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ISSUE FOR REVIEW (IFR)
03	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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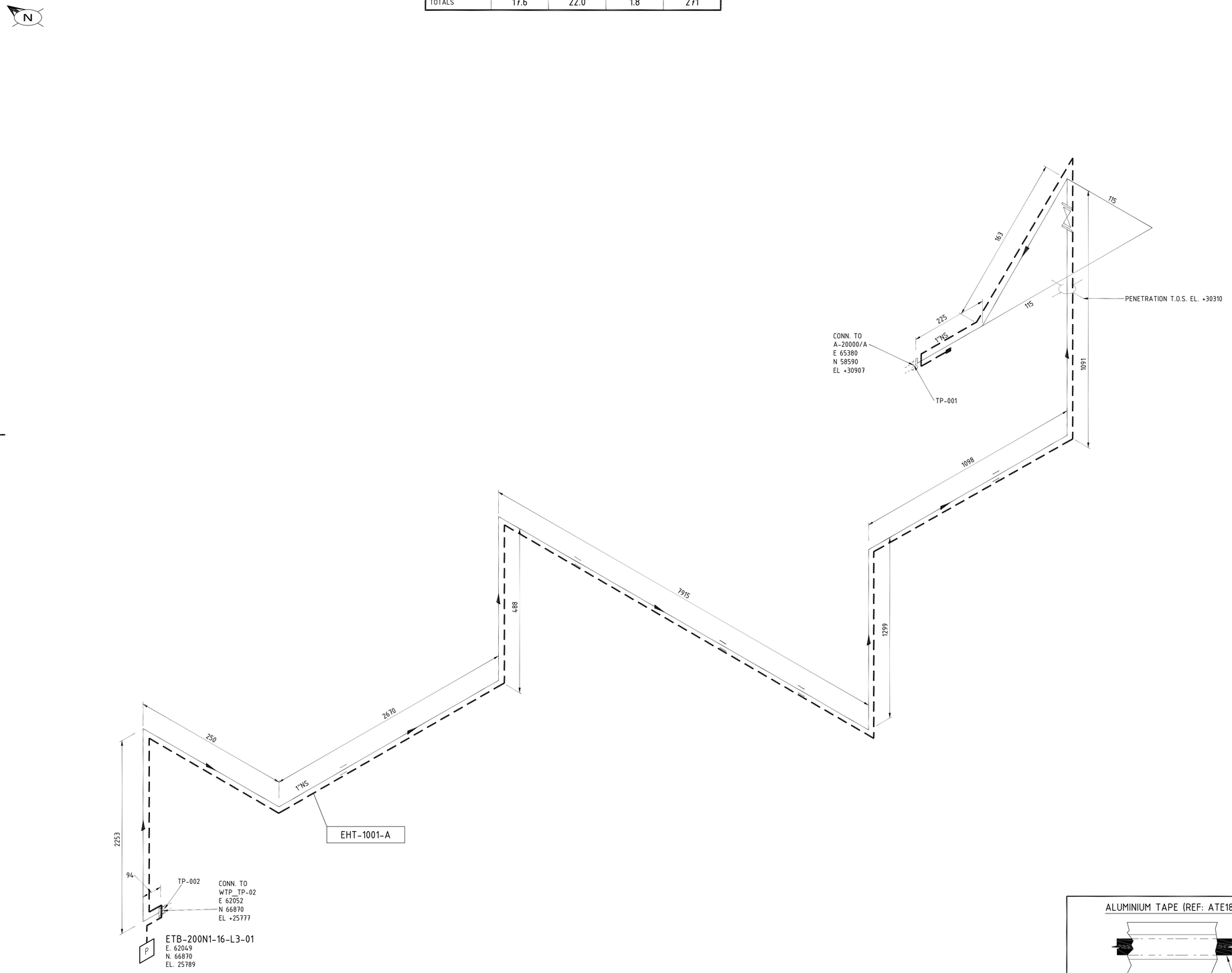
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HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1001-A	PIPING	3BTV2-CT	17.6	22.0	1.8	271	230	3.9	10.7	85
		TOTALS	17.6	22.0	1.8	271				

HEATER ADDER TABLE

PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Flange (fixed adder)	2	0.46	0.92
1	Typical Metal Valve	1	0.82	0.82
1	Typical Pipe Support	5	0.15	0.75



DESIGN PARAMETERS

CIRCUIT NUMBER	1001	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	22°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	22°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	22	m	Raychem Self-Regulating Heating Cable
JBS-100-E	1	each	Single entry power connection, EP, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	0.9	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	7	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBS-SPA	0.2	bag	Small Pipe Adapter for E-100, JBS-100, and JS-100

LINE NUMBERS	REFERENCE DRAWINGS / DOCUMENTS
1"-DM-001-01SS-E	123A90-DDL-PP-DI-71000_001

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)

SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE: N/A

DRAWING NO.: 1724001647-EL-DD-00004

SHEET NO.: 3/10

REVISION: 03

CAD FILENAME: PIT240024_DD01_1002_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1002-A	PIPING	3BTV2-CT	18.0	36.5	3.1	459	230	3.9	10.7	85
		TOTALS	18.0	36.5	3.1	458				

HEATER ADDER TABLE

PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
0.5	Typical Metal Valve	1	1.44	1.44
0.75	Typical Metal Valve	1	1.54	1.54
1	Typical Pipe Support	4	0.15	0.6
1	Typical Flange (fixed adder)	3	0.46	1.38
1	Typical Metal Valve	2	1.64	3.28
N/A	DRAIN	2	0.3	0.6

DESIGN PARAMETERS

CIRCUIT NUMBER	1002	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	25°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	25°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	50°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

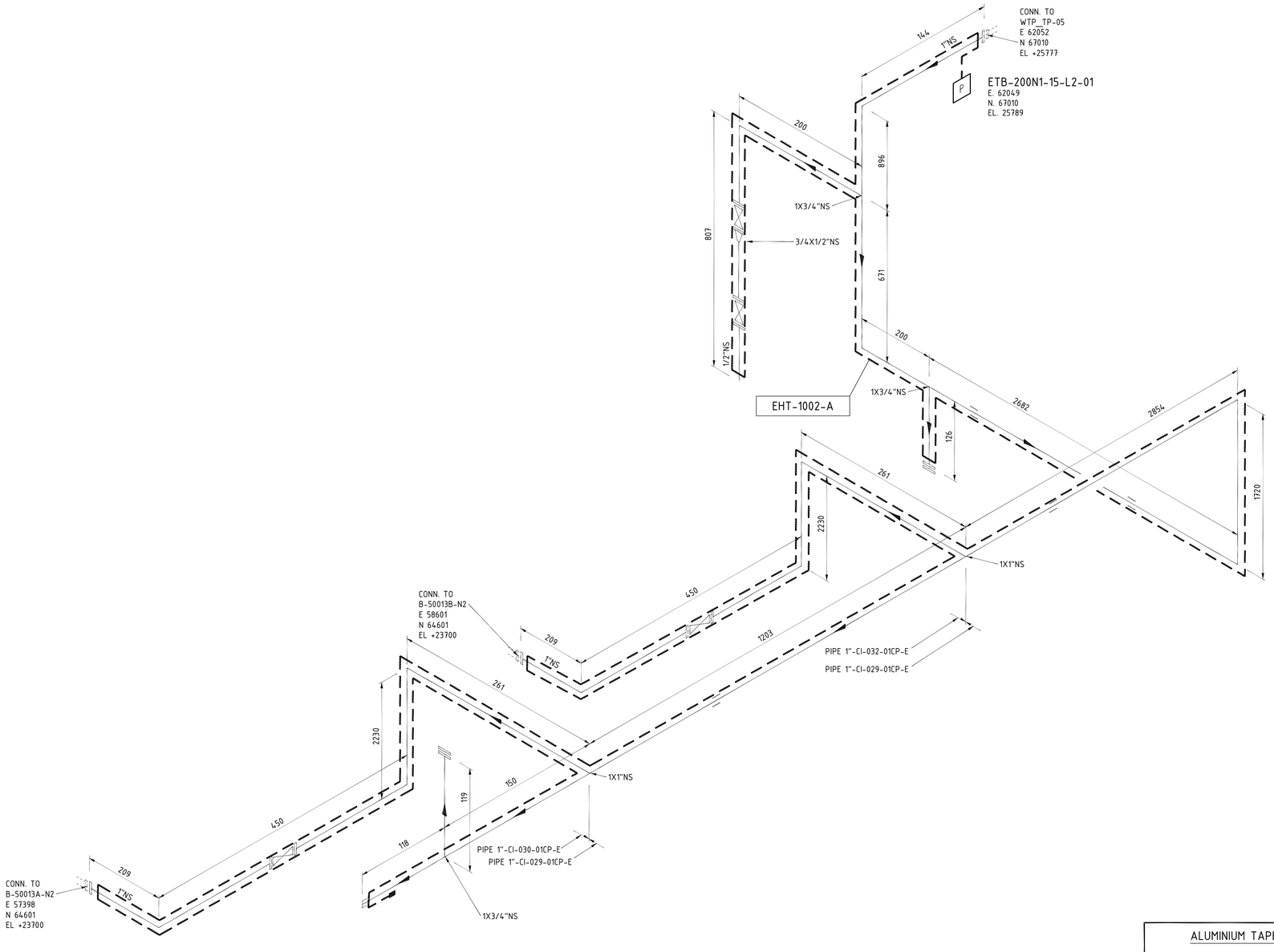
CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	36.5	m	Raychem Self-Regulating Heating Cable
JBS-100-E	1	each	Integrated Junction Box, Multiple-Entry, Cold-Applied, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	1.5	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	7	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBS-SPA	0.2	bag	Small Pipe Adapter for E-100, JBS-100, and JS-100

LINE NUMBERS

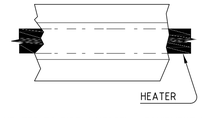
1"-CI-029-01CP-E
1"-CI-030-01CP-E
1"-CI-032-01CP-E

REFERENCE DRAWINGS / DOCUMENTS

123A90-DDL-PP-DI-71000_021
123A90-DDL-PP-DI-71000_022
123A90-DDL-PP-DI-71000_024



ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.:

DOC CODE:

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DD-00004	4/10	03

A1

CAD FILENAME: PIT240024_DD01_1003_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1003-A	PIPING	3BTV2-CT	26.1	78.5	6.7	1002	230	10.2	10.7	85
		TOTALS	26.1	78.5	6.7	1001				

HEATER ADDER TABLE

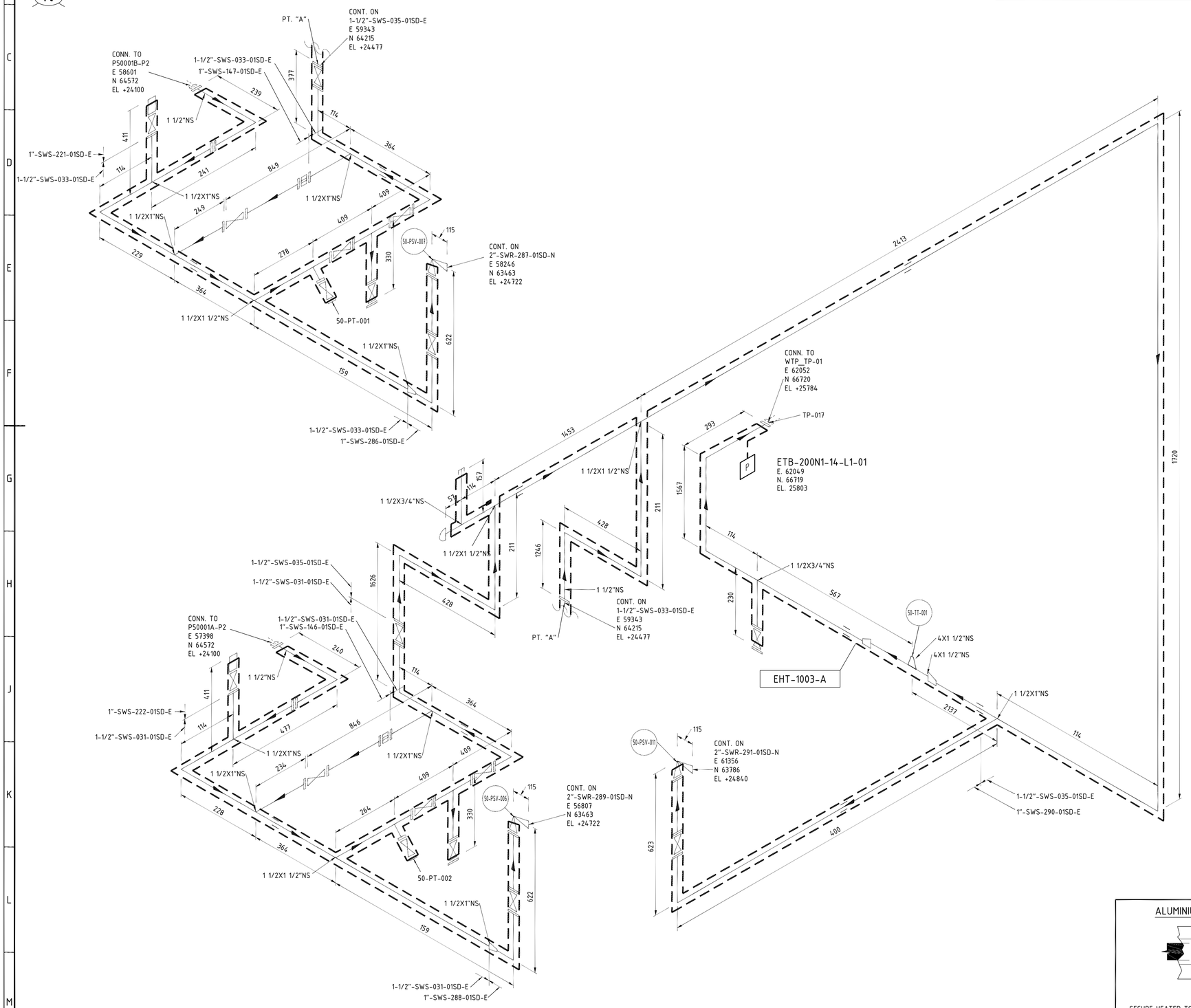
PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Flange (fixed adder)	2	0.46	0.92
1	Typical Pipe Support	1	0.31	0.31
1	Typical Metal Valve	8	1.64	13.12
1.5	Typical Pipe Support	8	0.18	1.44
1.5	Typical Flange (fixed adder)	5	0.46	2.3
1.5	Typical Metal Valve	6	1.77	10.62
N/A	VENT	3	0.7	2.1
N/A	DRAIN	5	0.7	3.4

DESIGN PARAMETERS

CIRCUIT NUMBER	1003	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	25°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	25°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	78.5	m	Raychem Self-Regulating Heating Cable
JBS-100-E	1	each	Integrated Junction Box, Multiple-Entry, Cold-Applied, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	4.4	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	11	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)



LINE NUMBERS

1"-SWS-146-01SD-E
1"-SWS-147-01SD-E
1"-SWS-221-01SD-E
1"-SWS-222-01SD-E
1"-SWS-286-01SD-E
1"-SWS-288-01SD-E
1"-SWS-290-01SD-E
1-1/2"-SWS-031-01SD-E
1-1/2"-SWS-033-01SD-E
1-1/2"-SWS-035-01SD-E

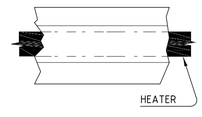
REFERENCE DRAWINGS / DOCUMENTS

123A90-DDL-PP-DI-71000_023
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123A90-DDL-PP-DI-71000_026
123A90-DDL-PP-DI-71000_059
123A90-DDL-PP-DI-71000_060
123A90-DDL-PP-DI-71000_117
123A90-DDL-PP-DI-71000_118
123A90-DDL-PP-DI-71000_150
123A90-DDL-PP-DI-71000_152
123A90-DDL-PP-DI-71000_154

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4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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nVent.com

NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE: N/A

DRAWING NO.: 1724001647-EL-DD-00004

SHEET NO.: 5/10

REVISION: 03

A1

CAD FILENAME: PIT240024_DD01_1004_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1004-A	PIPING	3BTV2-CT	0.9	3.2	0.2	28	230	3.9	10.7	85
		TOTALS	0.9	3.2	0.2	28				

HEATER ADDER TABLE

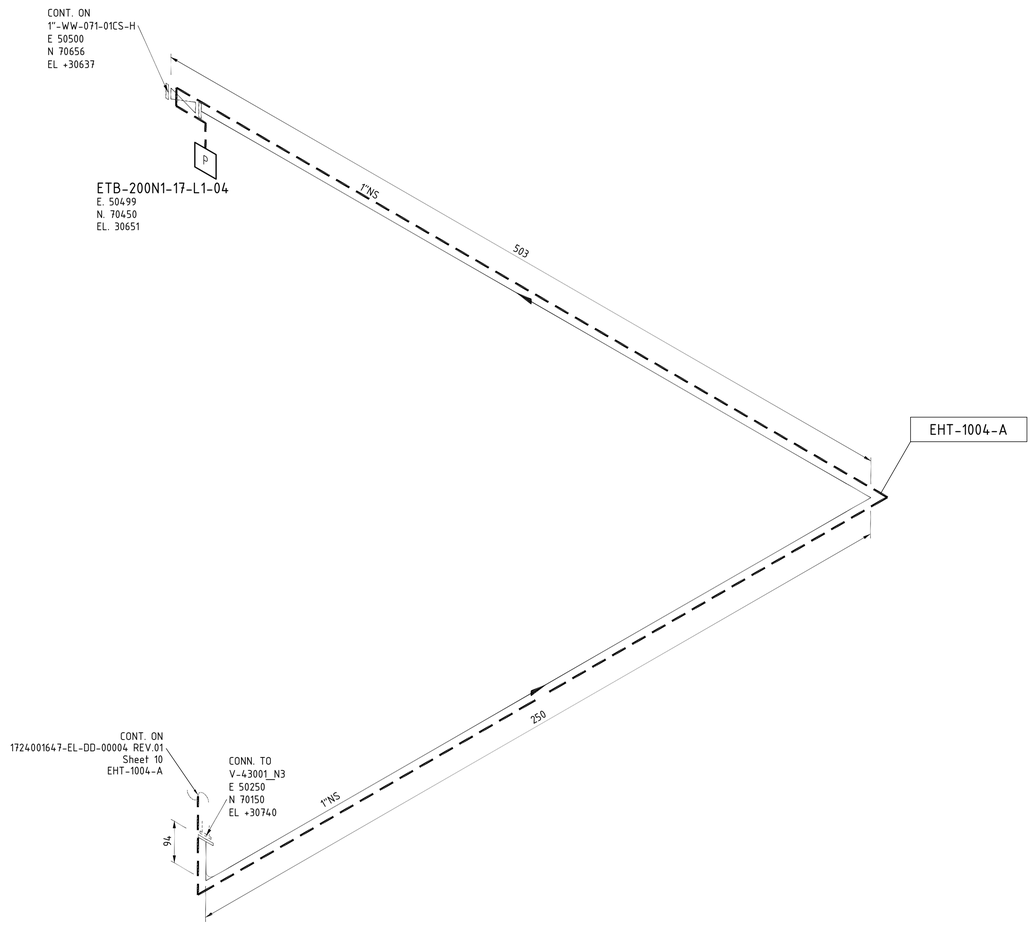
PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Metal Valve	1	0.82	0.82
1	Typical Flange (fixed adder)	1	0.46	0.46

DESIGN PARAMETERS

CIRCUIT NUMBER	1004	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	11°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	11°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	3.2	m	Raychem Self-Regulating Heating Cable
JBM-100-E	1	each	Integrated Junction Box, Multiple-Entry, Cold-Applied, ATEX
PSE-090	2	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	0.1	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	1	each	Warning Label - English
JBM-SPA	0.2	bag	Small Pipe Adapter for JBM-100-E



LINE NUMBERS

1"-WW-259-01CS-E

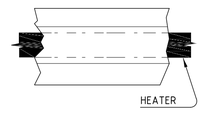
REFERENCE DRAWINGS / DOCUMENTS

123A90-DDL-PP-DI-71000_123

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.:

DOC CODE:

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DD-00004	6/10	03

CAD FILENAME: PIT240024_DD01_1005_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1005-A	PIPING	3BTV2-CT	1.2	4.6	0.3	46	230	3.9	10.7	85
		TOTALS	1.2	4.6	0.3	46				

HEATER ADDER TABLE

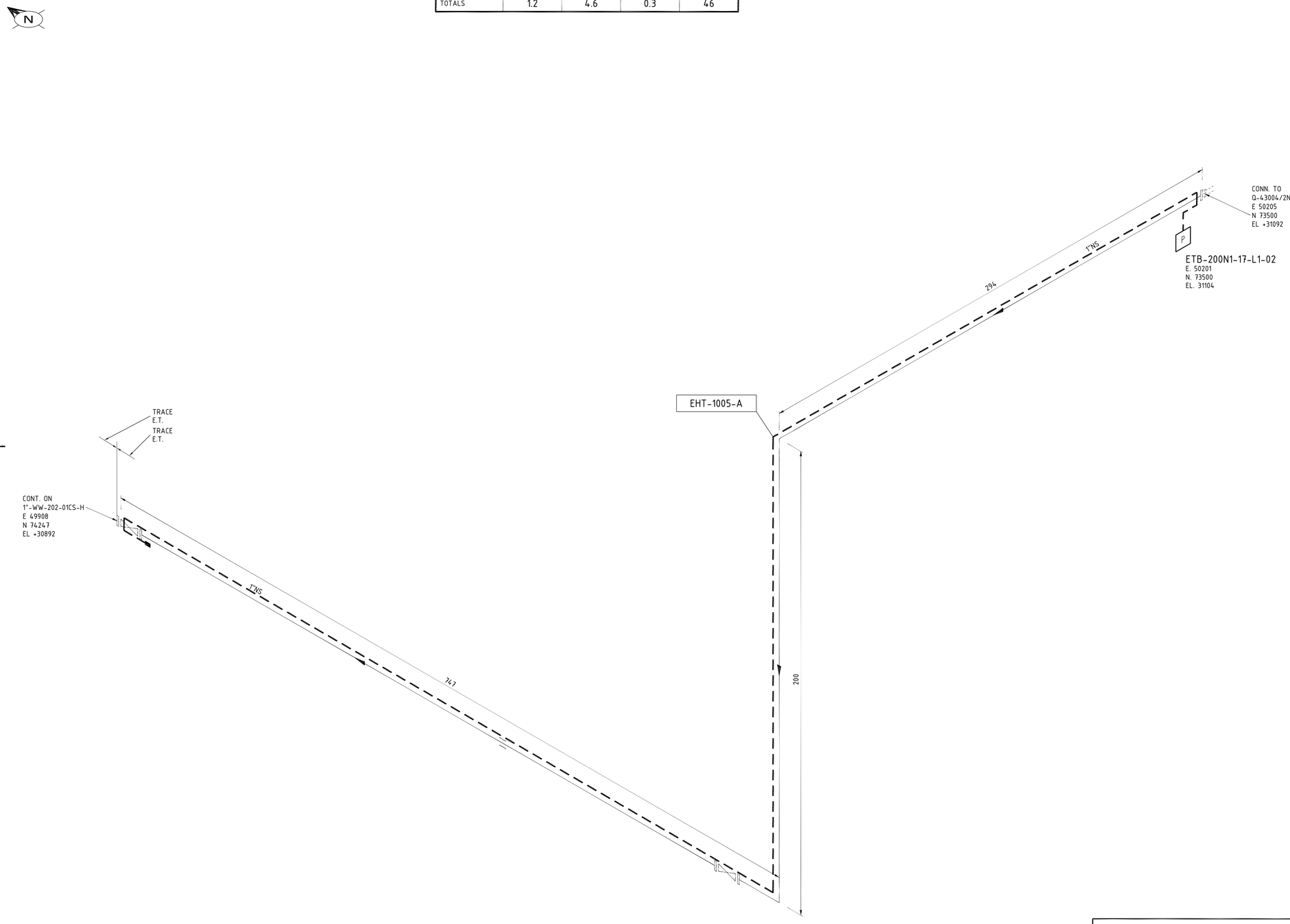
PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Flange (fixed adder)	1	0.46	0.46
1	Typical Metal Valve	2	0.82	1.64
1	Typical Pipe Support	1	0.15	0.15

DESIGN PARAMETERS

CIRCUIT NUMBER	1005	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	11°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	11°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	4.6	m	Raychem Self-Regulating Heating Cable
JBM-100-E	1	each	Integrated Junction Box, Multiple-Entry, Cold-Applied, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	0.2	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	1	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBM-SPA	0.2	bag	Small Pipe Adapter for JBM-100-E

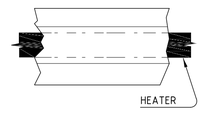


LINE NUMBERS	REFERENCE DRAWINGS / DOCUMENTS
1"-WW-260-01CS-E	123A90-DDL-PP-DI-71000_124

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DD-00004	7/10	03

CAD FILENAME: PIT240024_DD01_1006_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1006-A	PIPING	3BTV2-CT	1.0	2.5	0.1	19	230	3.9	10.7	85
TOTALS			1.0	2.5	0.1	19				

HEATER ADDER TABLE

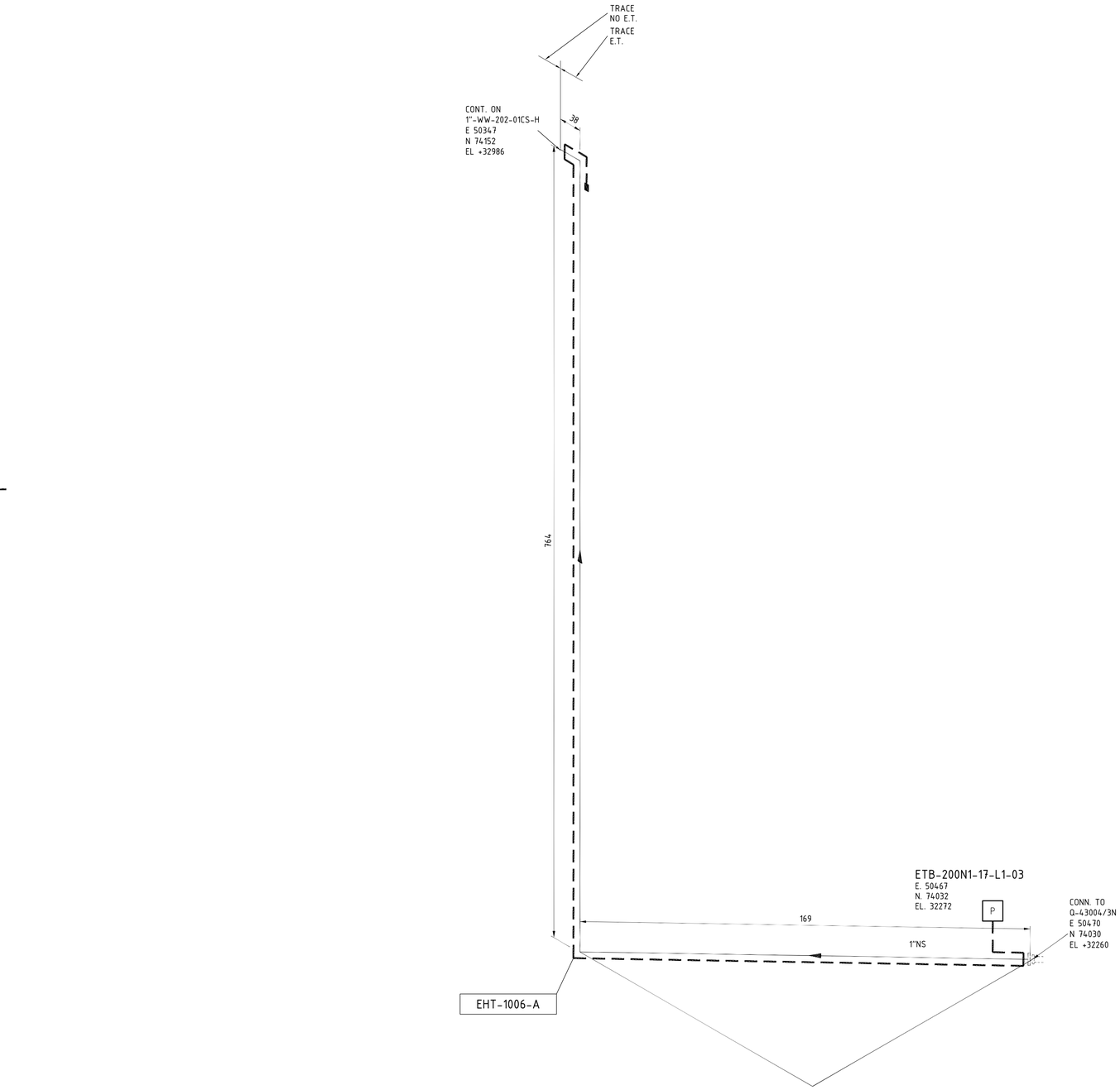
PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Flange (fixed adder)	1	0.46	0.46

DESIGN PARAMETERS

CIRCUIT NUMBER	1006	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	25°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	25°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	2.5	m	Raychem Self-Regulating Heating Cable
JBS-100-E	1	each	Single entry power connection, EP, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4' to 3' (40-90mm)
GS-54	0.1	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	1	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBS-SPA	0.2	bag	Small Pipe Adapter for E-100, JBS-100, and JS-100

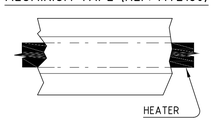


LINE NUMBERS	REFERENCE DRAWINGS / DOCUMENTS
1"-WW-202-01CS-H	123A90-DDL-PP-DI-71000_100

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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nVent.com

NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DD-00004	8/10	03

CAD FILENAME: PIT240024_DD01_1007_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-1007-A	PIPING	3BTV2-CT	15.0	19.5	1.6	239	230	3.9	10.7	85
		TOTALS	15.0	19.5	1.6	239				

HEATER ADDER TABLE

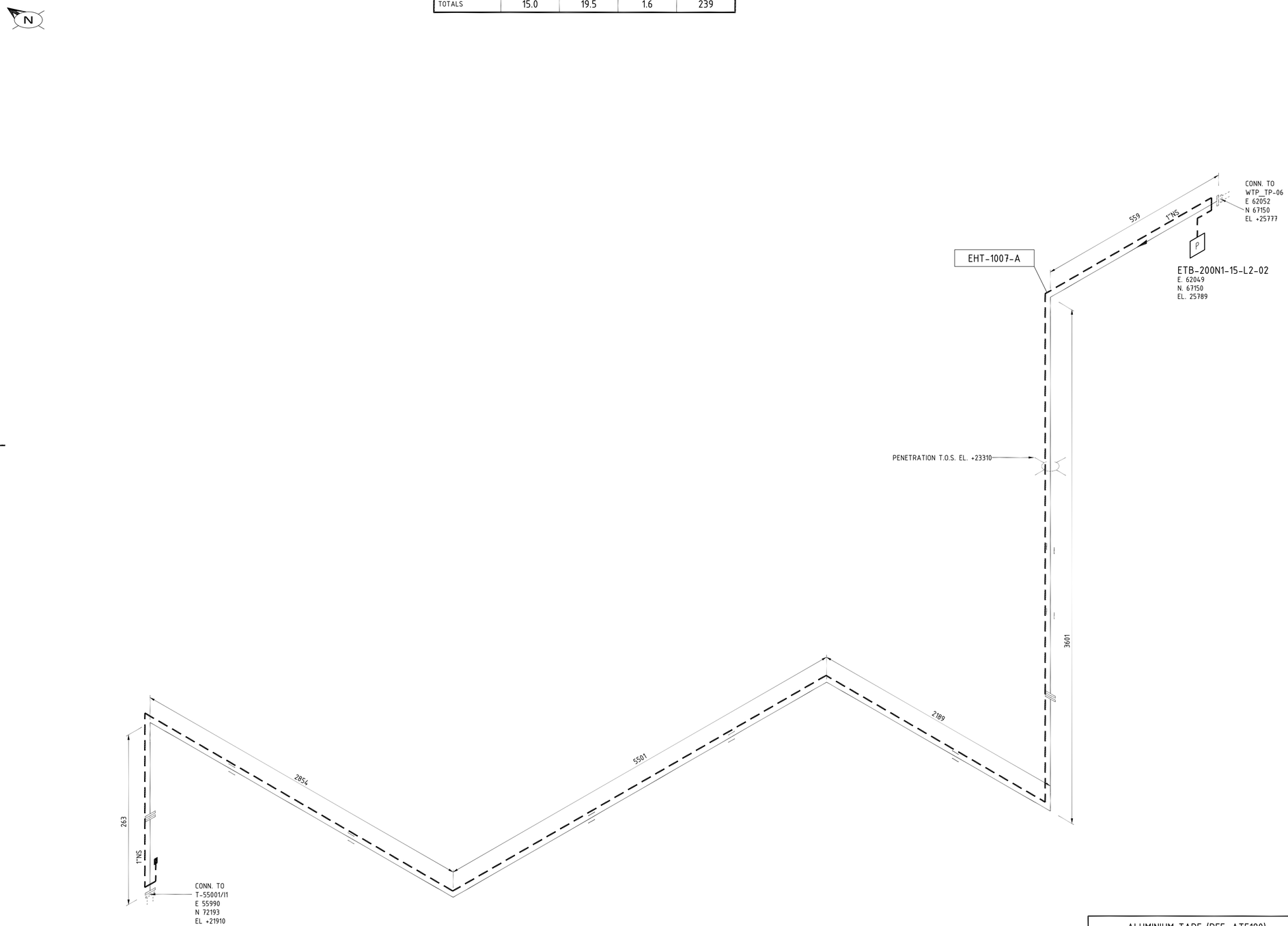
PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)
1	Typical Pipe Support	7	0.15	1.05
1	Typical Flange (fixed adder)	4	0.46	1.84

DESIGN PARAMETERS

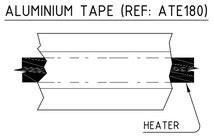
CIRCUIT NUMBER	1007	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	25°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	25°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	50°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	19.5	m	Raychem Self-Regulating Heating Cable
JBS-100-E	1	each	Single entry power connection, EP, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4" to 3" (40-90mm)
GS-54	0.8	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	6	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBS-SPA	0.2	bag	Small Pipe Adapter for E-100, JBS-100, and JS-100



ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

LINE NUMBERS	REFERENCE DRAWINGS / DOCUMENTS
1"-CI-043-01CP-E	123A90-DDL-PP-DI-71000_028

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/02/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/01/2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING ISOMETRIC

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DD-00004	9/10	03

A1

CAD FILENAME: PIT240024_DD02_3001_001_03.dwg

HEAT TRACING DATA

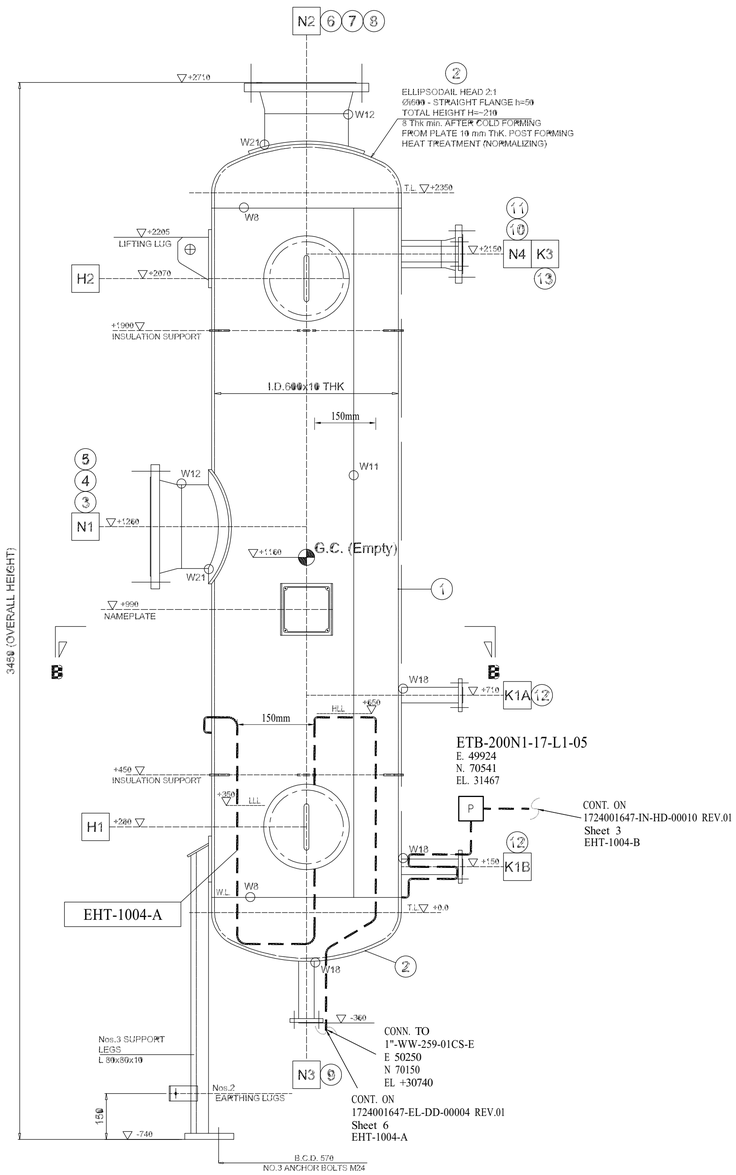
HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	HEATER LENGTH (m)	HEATED AREA (m^2)	HEATER SPACING (mm)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W)	POWER OUTPUT (W/ m)	SHEATH TEMPERATURE (°C)
EHT-3001-A	EQUIPMENT	3BTV2-CT	1x17.3	2.43	150	1.8	274	230	198	13.9	
					TOTALS	1.8	274				

DESIGN PARAMETERS

CIRCUIT NUMBER	3001	AREA CLASSIFICATION	HAZARDOUS/ ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	11°C	INSULATION TYPE	RW/ MF 1:2015
MAX. EXPOSURE TEMP.	11°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	- 9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	17.3	m	Raychem Self-Regulating Heating Cable
PSE-090	2	each	Pipe Strap for 1.1/ 4" to 3" (40-90mm)
JBM-100-E	1	each	Integrated Junction Box, Multiple-Entry, Cold-Applied, ATEX
ATE-180	0.32	roll	Fixing tape (aluminium, 55m/ roll)
LAB-I-01	1	each	Warning Label - English



EQUIPMENT NUMBERS

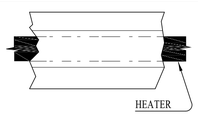
V-43001

REFERENCE DRAWINGS / DOCUMENTS

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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nVent.com

NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	12/ 02/ 2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	20/ 01/ 2025	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/ 09/ 2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING EQUIPMENT

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/ A	1724001647-EL-DD-00004	10 / 10	03

1.4 EHT INSTRUMENT HOOK-UP

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT INSTRUMENT HOOK-UP	Sh. 1 of 4 Date: 13-01-25 Rev. 03

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT INSTRUMENT HOOK-UP

Document Number: 1724001647-IN-HD-00010

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	13/01/2025

03	13-01-25	Accepted for Construction (AFC)	A. Dumitru	A. Martelli	G. Pupilli
02	09-12-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
01	29-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
00	23-09-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
Rev.	Date	Description	Prepared	Reviewed	Approved

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Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT INSTRUMENT HOOK-UP	Sh. 2 of 4 Date: 13-01-25 Rev. 03

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ISSUE FOR REVIEW (IFR)
03	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
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CAD FILENAME: PIT240024_DD03_2001_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-2001-A	INSTRUMENT	3BTV2-CT	3.0	7.3	0.5	81	230	3.9	10.7	85
TOTALS			3.0	7.3	0.5	81				

HEATER ADDER TABLE

PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)

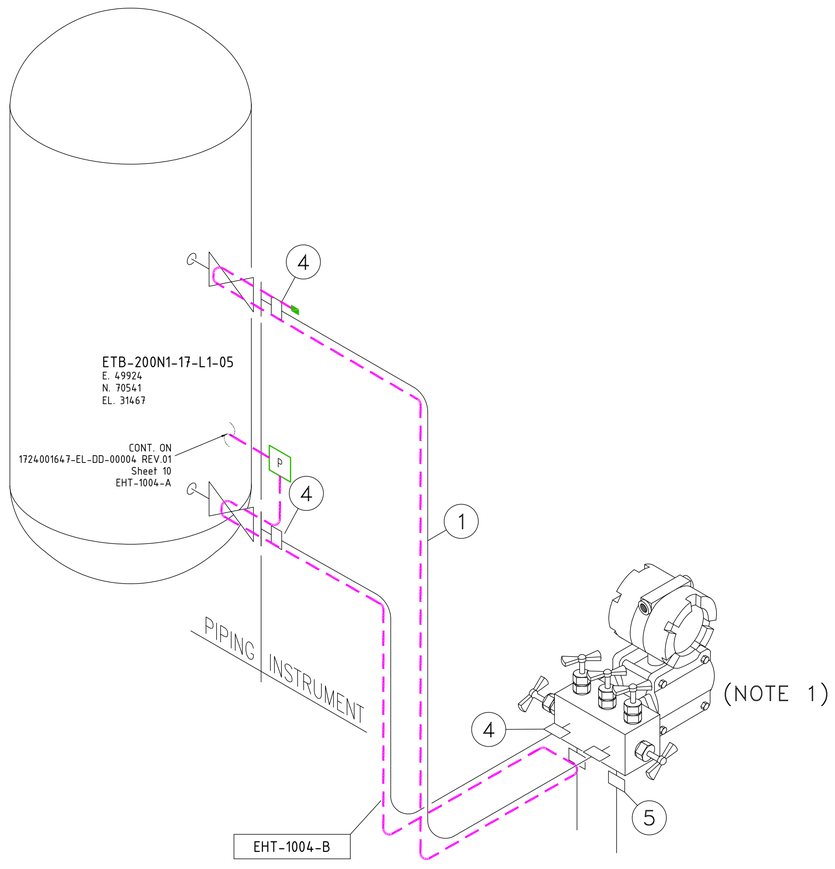
DESIGN PARAMETERS

CIRCUIT NUMBER	2001	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	11°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	11°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	7.3	m	Raychem Self-Regulating Heating Cable
GS-54	0.3	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	2	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)

ELECTRICAL HOOK-UP FOR LEVEL TRANSMITTERS (DP CELL TYPE)



LINE NUMBERS

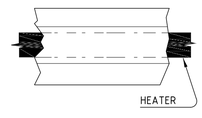
43-LT-001

REFERENCE DRAWINGS / DOCUMENTS

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
3. ELEXANT 5010i WILL BE INSTALLED ON RACKS.
4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	13/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING
INSTRUMENT HOOK-UP

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-IN-HD-00010	3/4	03

CAD FILENAME: PIT240024_DD03_2002_001_03.dwg

HEAT TRACING DATA

HEATER REFERENCE	DESIGN AREA	HEATER CAT. NUMBER	PIPE LENGTH (m)	HEATER LENGTH (m)	CIRCUIT BREAKER CURRENT (A)	OPERATING LOAD (W)	HEATER VOLTAGE (V)	HEAT LOSS (W/m)	POWER OUTPUT (W/m)	SHEATH TEMP. (°C)
EHT-2002-A	INSTRUMENT	3BTV2-CT	3.0	7.3	0.5	81	230	3.9	10.7	85
TOTALS			3.0	7.3	0.5	81				

HEATER ADDER TABLE

PIPE SIZE (Ins)	TYPE	QTY	ALLOWANCE PER ITEM (m)	TOTAL ALLOWANCE (m)

DESIGN PARAMETERS

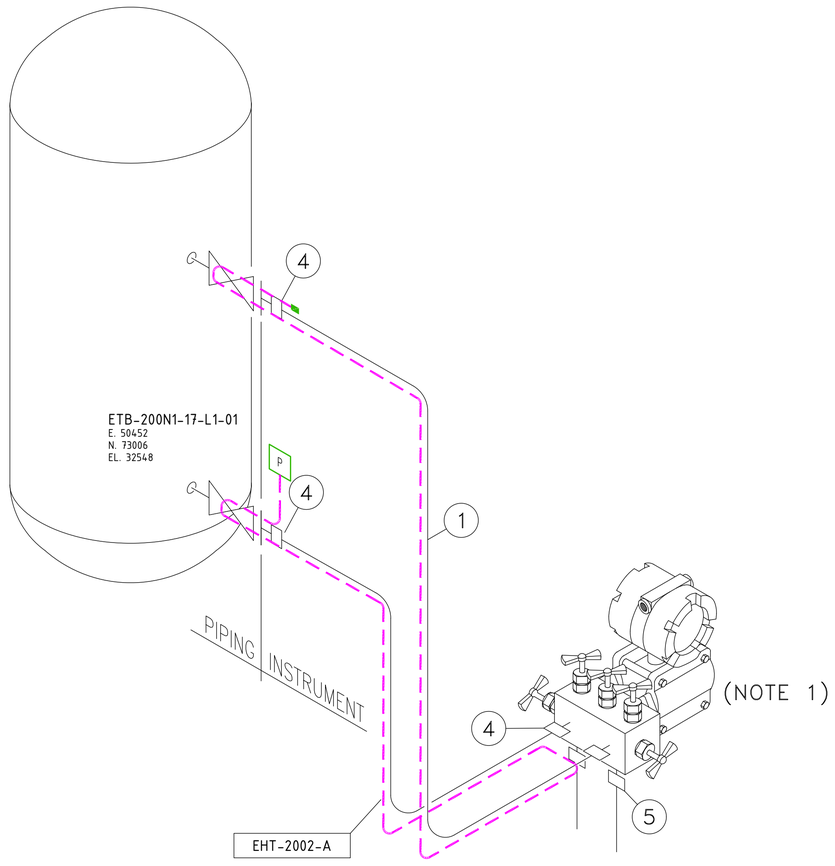
CIRCUIT NUMBER	2002	AREA CLASSIFICATION	HAZARDOUS/ZN.1
		T-RATING	T3
MAINTAIN TEMP.	5°C		
OPERATING TEMP.	11°C	INSULATION TYPE	RW/MF 1:2015
MAX. EXPOSURE TEMP.	11°C	INSULATION THICKNESS	20mm
MAX. ALLOWABLE TEMP.	100°C		
MAX. AMBIENT TEMP.	40°C		
MIN. AMBIENT TEMP.	-9°C		

COMPONENT BILL OF MATERIALS

CAT. NUMBER	QTY	UNIT	PRODUCT DESCRIPTION
3BTV2-CT	7.3	m	Raychem Self-Regulating Heating Cable
JBS-100-EP	1	each	Single entry power connection, EP, ATEX
PSE-090	1	each	Pipe Strap for 1.1/4' to 3' (40-90mm)
GS-54	0.3	each	Glass Tape (16m/roll), suited for SS pipes
LAB-I-01	2	each	Warning Label - English
E-20	1	each	Heat shrink end seal, ATEX (BTV, QTVR)
JBS-SPA	0.2	bag	Small Pipe Adapter for E-100, JBS-100, and JS-100

ELECTRICAL HOOK-UP FOR LEVEL TRANSMITTERS (DP CELL TYPE)

43-LT-003



LINE NUMBERS

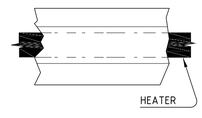
43-LT-003

REFERENCE DRAWINGS / DOCUMENTS

GENERAL NOTES

1. TRACE HEATING PRODUCTS ARE TO BE INSTALLED IN STRICT ACCORDANCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. THE PRECISE LOCATION OF EACH TRACE HEATING COMPONENT TO BE DETERMINED AT SITE.
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4. HEATING CABLE ALLOWANCES PROVIDED IN THE 'EHT ADDER TABLE' FOR FLANGES AND VALVES ARE IN ADDITION TO THEIR LINEAR LENGTHS.

ALUMINIUM TAPE (REF: ATE180)



SECURE HEATER TO PIPE / VESSEL / EQUIPMENT BODY BY APPLYING ALUMINIUM TAPE ALONG THE FULL LENGTH OF HEATER

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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nVent.com

NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	13/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	23/09/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING
INSTRUMENT HOOK-UP

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-IN-HD-00010	4/4	03

1.5 EHT TYPICAL WIRING DETAILS

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT TYPICAL WIRING DETAILS	Sh. 1 of 3 Date: 20-01-25 Rev. 02

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT TYPICAL WIRING DETAILS

Document Number: 1724001647-EL-DG-00005

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	20/01/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
02	20-01-25	Approved for Construction (AFC)	A. Dumitru	A. Martelli	G. Pupilli
01	29-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
00	01-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT TYPICAL WIRING DETAILS	Sh. 2 of 3 Date: 20-01-25 Rev. 02

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	APPROVED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
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2.	
3.	
4.	

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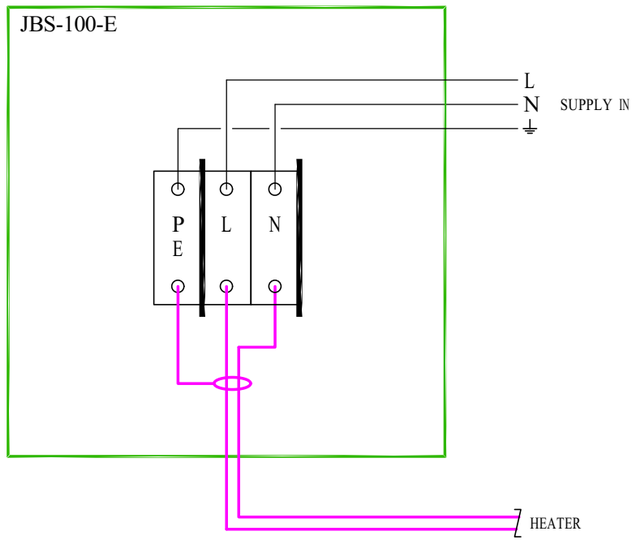
CAD FILENAME: 1724001647-EL-DG-00005 Rev.02.dwg

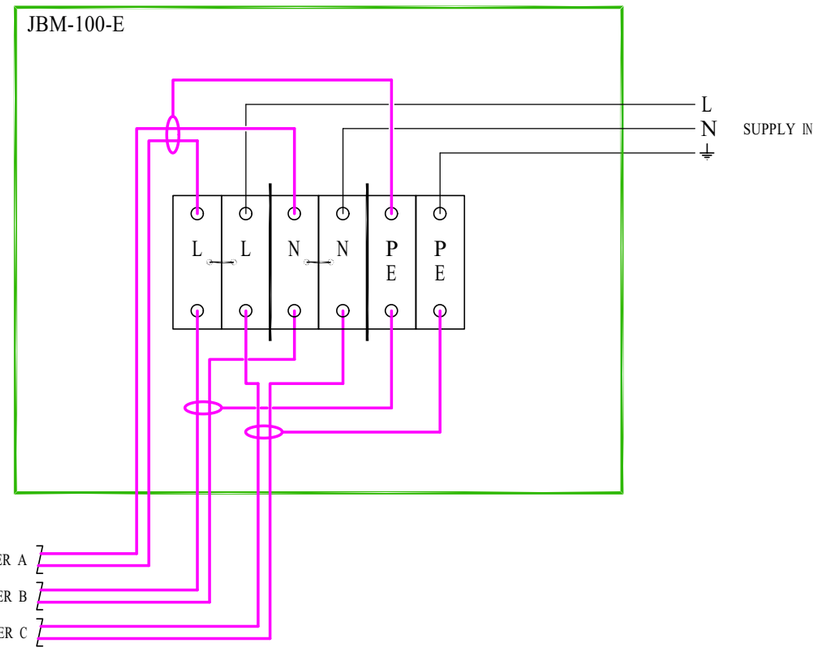
GENERAL INFORMATION:

1. JBS-100-E IS DESIGNED TO CONNECT POWER TO ONE BTV, QTVR, XTV, KTV, HTV OR VPL EHT CABLE.
2. THIS KIT INTEGRATES THE FUNCTIONS OF BOTH CONNECTION KITS AND INSULATION ENTRIES.
3. THE STAND CONNECTED TO THE BOTTOM OF THE BOX PROTECTS THE HEATING CABLE AND ALLOWS FOR UP TO 100mm (4") THERMAL INSULATION.

TECHNICAL BRIEF:

- 2 x M25 THREADED ENTRIES
- 1 x M25 STOPPING PLUGS
- 1 x M25 POWER CABLE GLAND





REV.	DATE	DESCRIPTION	BY	CHK	APP
--	--	--	--	--	--
--	--	--	--	--	--
02	20/ 01/ 2025	APPROVED FOR CONSTRUCTION	ADU	AMI	GPI
01	25/ 10/ 2024	ISSUED FOR CONSTRUCTION	ADU	AMI	GPI
00	08/ 03/ 2024	ISSUED FOR INFORMATION	LJB	E-C	ZS

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TITLE

TYPICAL CONNECTION OF A JBS-100-EP
SINGLE ENTRY JUNCTION BOX

PREPARED BY	-.---	LANG.	SCALE
LEAD ENGINEER	-.---	en	N/ A
PROJECT NO.	DRAWING NO.	SHEET	REVISION
PIT240024	1724001647-EL-DG-00005	3/ 3	02

A3

1.6 EHT ELECTRICAL BLOCK DIAGRAM

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	ELECTRICAL BLOCK DIAGRAM	Sh. 1 of 4 Date: 20-01-25 Rev. 03

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

ELECTRICAL BLOCK DIAGRAM

Document Number: 1724001647-EL-DG-00006

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	20/01/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
03	20-01-25	Accepted for Construction (AFC)	A. Dumitru	A. Martelli	G. Pupilli
02	09-12-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
01	29-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
00	01-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	ELECTRICAL BLOCK DIAGRAM	Sh. 2 of 4 Date: 20-01-25 Rev. 03

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ISSUE FOR REVIEW (IFR)
03	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
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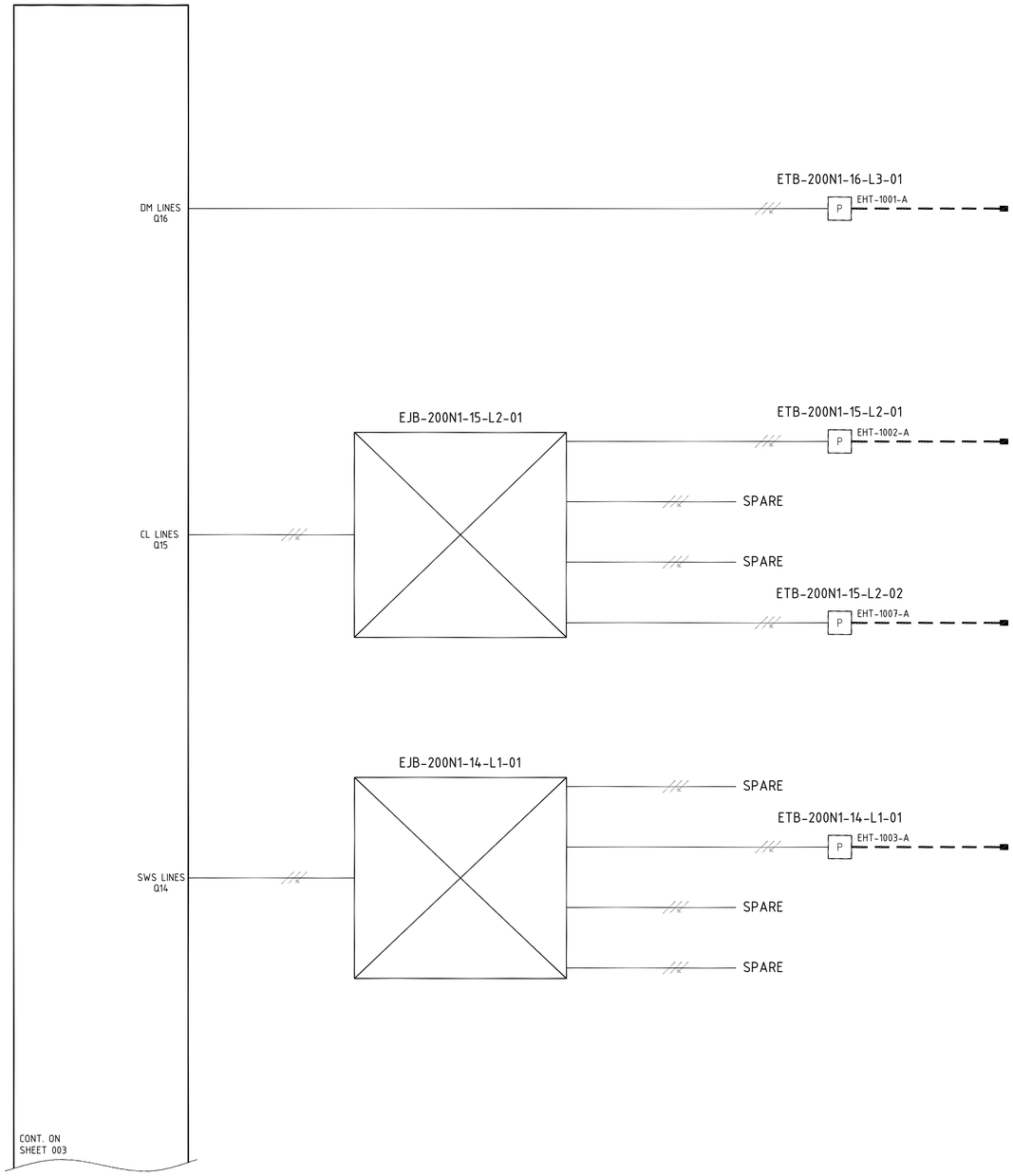
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CAD FILENAME: 1724001647-EL-DG-00006 Rev.03.dwg

CONTROL PANEL REF.:

DP-200N1

MARSHALLING BOX



CIRCUIT NO.	1001	1002, 1007	1003	
C.B. RATING (A)	32	32	32	
START-UP I (A)	1.8	4.7	6.7	
LOAD (W)	271	698	1002	
SERVICE	WINTERIZING	WINTERIZING	WINTERIZING	
NOTES FOR THE CIRCUIT	--	--	--	

GENERAL NOTES

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	20/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	02/10/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING
ELECTRICAL BLOCK DIAGRAM

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DG-00006	3/4	03

CAD FILENAME: 1724001647-EL-DG-00006 Rev.03.dwg

CONTROL PANEL REF.:

Q17

MARSHALLING BOX

EJB-200N1-17-L1-01

ETB-200N1-17-L1-04 — P — EHT-1004-A — ETB-200N1-17-L1-05 — P — EHT-1004-B

ETB-200N1-17-L1-02 — P — EHT-1005-A

ETB-200N1-17-L1-03 — P — EHT-1006-A

ETB-200N1-17-L1-01 — P — EHT-2002-A

SPARE

CIRCUIT NO.	1004	1005, 1006	2002	
C.B. RATING (A)	32	32	32	
START-UP I (A)	2.6	0.4	0.6	
LOAD (W)	383	65	81	
SERVICE	WINTERIZING	WINTERIZING	WINTERIZING	
NOTES FOR THE CIRCUIT	--	--	--	

GENERAL NOTES

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
03	20/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
02	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	02/10/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING
ELECTRICAL BLOCK DIAGRAM

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-DG-00006	4 /4	03

1.7 EHT PLOT PLAN

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT PLOT PLAN	Sh. 1 of 4 Date: 13-01-25 Rev. 02

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT PLOT PLAN

Document Number: 1724001647-EL-PL-00009

Document Class: 2

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
	13/01/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
02	13-01-25	Accepted for Construction (AFC)	A. Dumitru	A. Martelli	G. Pupilli
01	09-12-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli
00	01-10-24	Issue for Review (IFR)	A. Dumitru	A. Martelli	G. Pupilli

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT PLOT PLAN	Sh. 2 of 4 Date: 13-01-25 Rev. 02

Revision / Change Log

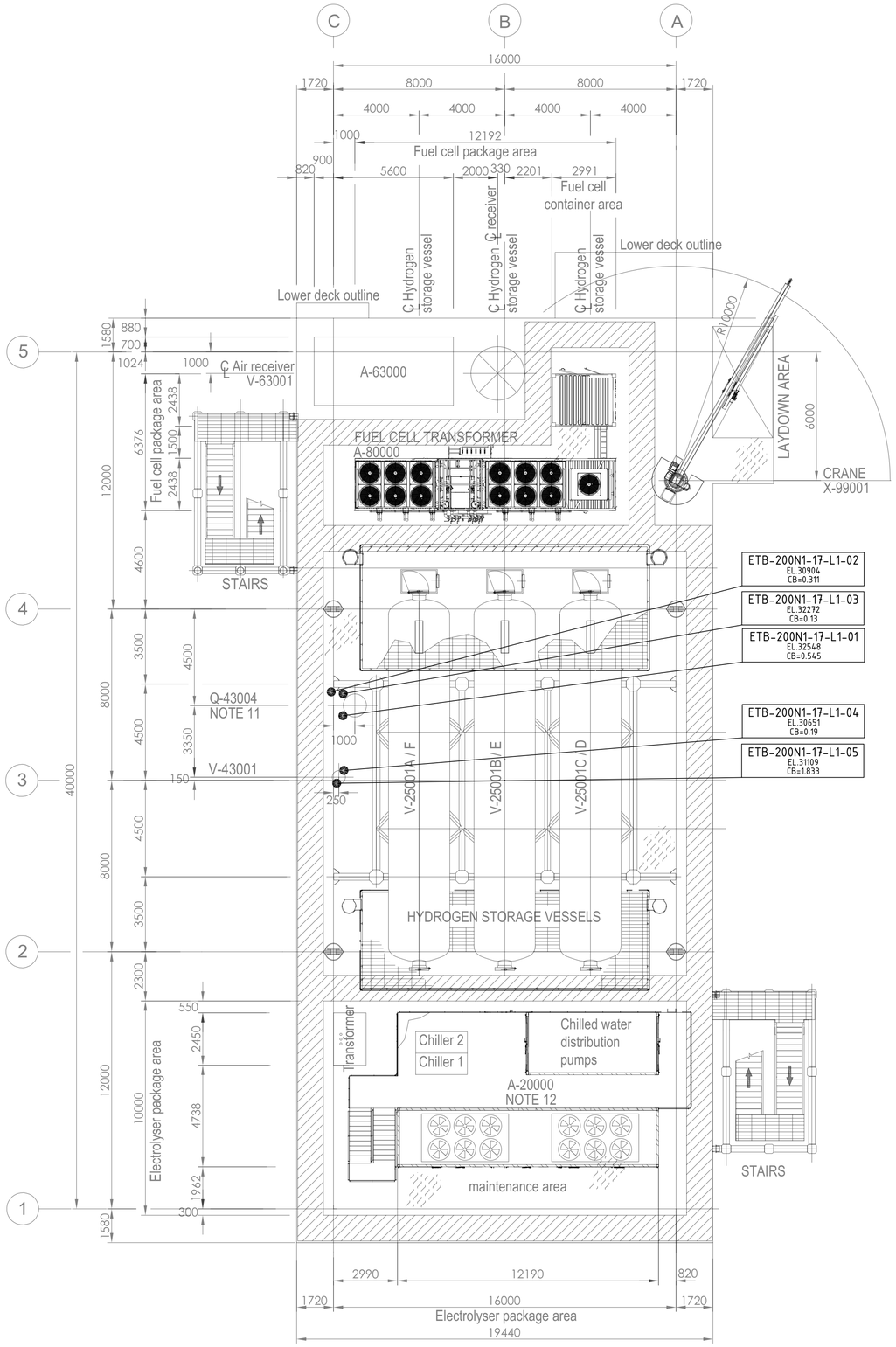
Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

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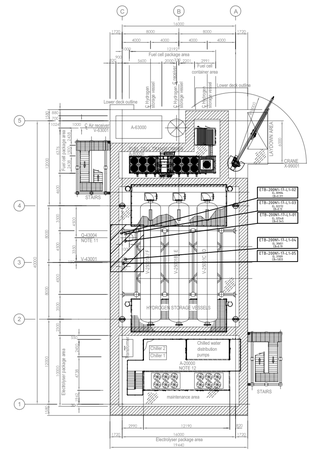
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CAD FILENAME: 1724001647-EL-PL-00009 Rev.02.dwg



PLAN ON UPPER DECK
EL+30.310 T.O.S.

KEY PLAN



PLAN ON UPPER DECK
EL+30.310 T.O.S.

SYMBOLS

- DISTRIBUTION PANEL
- MARSHALLING BOX
- POWERED CONNECTION
- THERMOSTAT

REFERENCE DRAWINGS / DOCUMENTS

GENERAL NOTES

1. THIS DOCUMENT IS ONLY VALID FOR POSITIONING OF HEAT TRACING SYSTEM COMPONENTS.

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
02	13/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
01	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	02/10/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

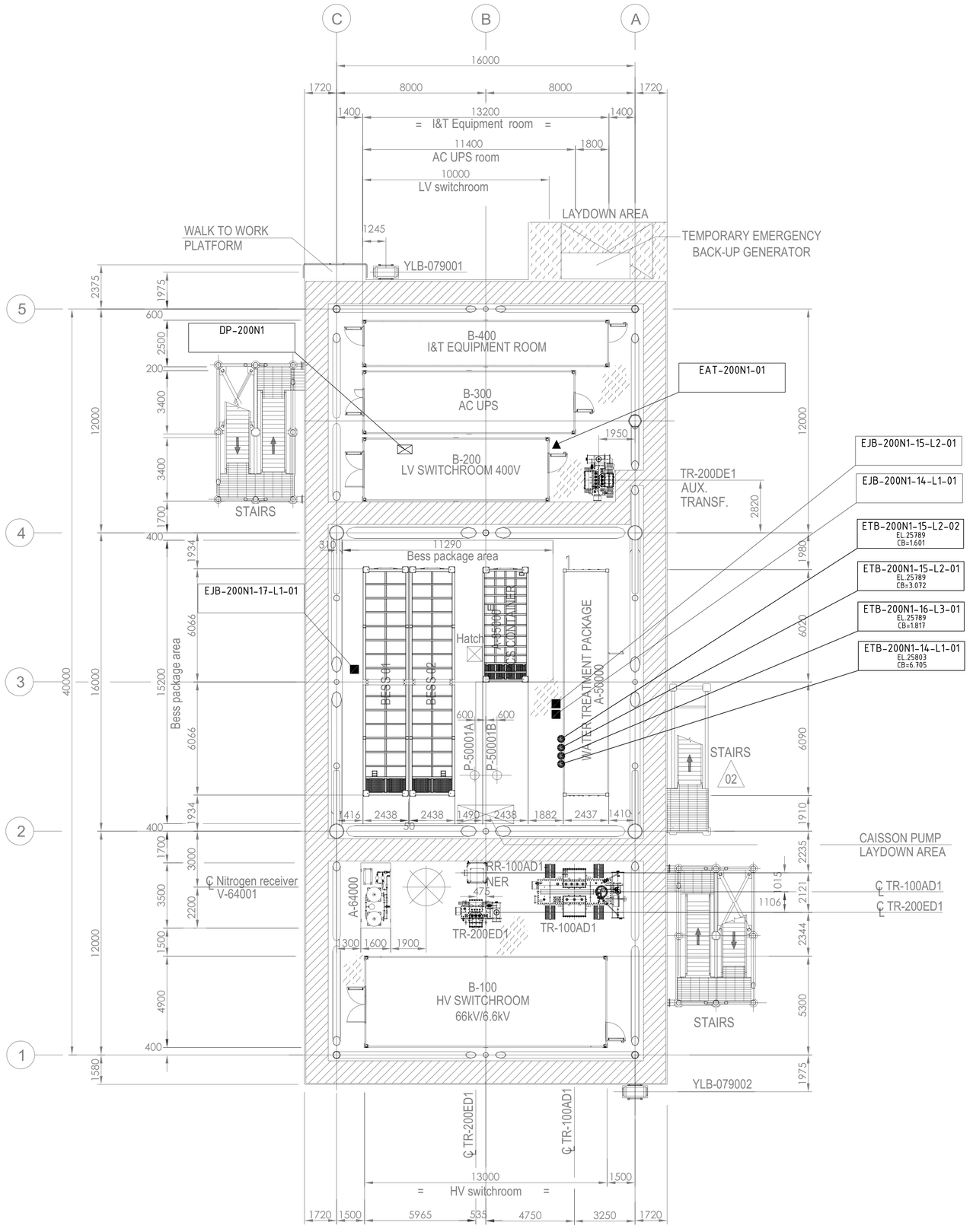
DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING PLOT PLAN

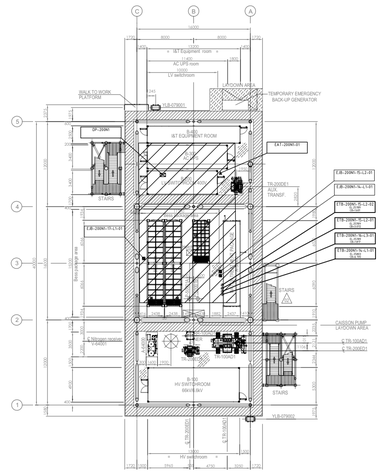
SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-PL-00009	2/3	02

CAD FILENAME: 1724001647-EL-PL-00009 Rev.02.dwg



PLAN ON LOWER DECK
EL+23.310 T.O.S.

KEY PLAN



PLAN ON LOWER DECK
EL+23.310 T.O.S.

SYMBOLS

- DISTRIBUTION PANEL
- MARSHALLING BOX
- POWERED CONNECTION
- THERMOSTAT

REFERENCE DRAWINGS / DOCUMENTS

GENERAL NOTES

1. THIS DOCUMENT IS ONLY VALID FOR POSITIONING OF HEAT TRACING SYSTEM COMPONENTS.

CROSSWIND

ROSETTI MARINO

nVent RAYCHEM TRACER

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NVENT PROJECT NO.: PIT240024

REV.	DATE	DESCRIPTION	BY	CHK	APP
02	13/01/2025	ACCEPTED FOR CONSTRUCTION	ADU	AMI	GPI
01	29/11/2024	ISSUED FOR REVIEW	ADU	AMI	GPI
00	02/10/2024	ISSUED FOR REVIEW	ADU	AMI	GPI

CLIENT PROJECT NO.

DOC CODE

PROJECT TITLE: HOLLANDSE KUST NOORD WIND PARK Project
ELECTRICAL HEAT TRACING SYSTEM

DESIGNER: A. Dumitru

LEAD ENG.: A. Martelli

DRAWING TITLE: ELECTRICAL HEAT TRACING
PLOT PLAN

SCALE	DRAWING NO.	SHEET NO.	REVISION
N/A	1724001647-EL-PL-00009	3/3	02

1.8 EHT BILL OF MATERIALS

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT BILL OF MATERIALS	Sh. 1 of 4 Date: 13/01/2025 Rev. 03

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

EHT BILL OF MATERIALS

Document Number:

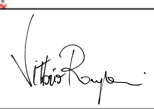
1724001647-EL-DG-00007

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
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3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

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Sign	Date
	13/01/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
03	13-01-25	Accepted for Construction (AFC)	L. Gentile	A. Martelli	G. Pupilli
02	04-11-24	Accepted for Construction (AFC)	L. Gentile	A. Martelli	G. Pupilli
01	23-10-24	Issue for Review (IFR)	L. Gentile	A. Martelli	G. Pupilli
00	23-09-24	Issue for Review (IFR)	L. Gentile	A. Martelli	G. Pupilli

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT BILL OF MATERIALS	Sh. 2 of 4 Date: 13-01-25 Rev. 03

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03				
1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log / Hold List	X	X	X	X				
4	EHT BILL OF MATERIALS	X	X	X	X				

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT BILL OF MATERIALS	Sh. 3 of 4 Date: 13-01-25 Rev. 03

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ACCEPTED FOR CONSTRUCTION (AFC)
03	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
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PIT240024_ED02-1001_03

EHT BILL OF MATERIALS

Item Code	Unit	Description	DESIGN Q.TY	CONTINGENCY
3BTV2-CT	m	Self-Regulating Heating Cable, 230V, 9 W/m at 10°C	199	11
E-20	pc	End Seal, BTV/QTVR, Heat Shrink, ATEX	8	1
JBM-100-E	pc	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold-Applied, ATEX	3	1
JBM-SPA	pack	Small Pipe Adaptor for JBM-, T-100 (5 pieces/ pack)	1	
JBS-100-E	pc	Integrated Junction Box, Single-Entry, Cold-Applied, ATEX	6	1
JBS-SPA	pack	Small Pipe Adaptor for JBS-, E-100 (5 pieces/ pack)	1	
ATE-180	roll	Aluminium Tape for Fixing Heating Cables, Suitable for Stainless Steel, 55 m/roll	4	1
GS-54	roll	Glass Cloth Tape for Fixing Heating Cables, Suitable for Stainless Steel, 16 m/roll	9	1
LAB-I-01	pc	Warning Label, English	39	6
PSE-090	pc	Pipe Strap, SS, Ø 1.25"-3"	12	2
ETS-05-A2-E-A	pc	Electronic Ambient Sensing Thermostat with Alarm Relay, ATEX	1	

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 53 of 183 Date: 14/04/2025 Rev: 01

1.9	EHT TECHNICAL DATA SHEET (HEATING CABLES, JBs, TERMINATION KITS, THERMOSTATS, ACCESSORIES)

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Base Load Power Hub (BLPH)

EHT TECHNICAL DATA SHEET (HEATING CABLES, JBs, TERMINATION KITS, THERMOSTATS, ACCESSORIES)

ROSETTI MARINO

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4	APPROVAL NOT REQUIRED

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Sign	Date
	11/12/2024

Document Number:
1724001647-EL-DS-00008

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
02	09/12/2024	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
01	23/10/2024	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
00	25/09/2024	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT TECHNICAL DATA SHEET (HEATING CABLES, JBs, TERMINATION KITS, THERMOSTATS, ACCESSORIES)	Sheet 2 of 25 Date: 09/12/2024 Rev: 02

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	EHT TECHNICAL DATA SHEET (HEATING CABLES, JBs, TERMINATION KITS, THERMOSTATS, ACCESSORIES)	Sheet 3 of 25 Date: 09/12/2024 Rev: 02

INDEX

Catalogue Number	Description	Page No.
3BTV2-CT	Raychem Self-Regulating Heating Cable	4 - 6
ATE-180	Fixing tape (aluminium, 55m/roll)	7
E-20	Heat shrink end seal, ATEX (BTV, QTVR)	8 - 9
ETS-05-A2-E-A	Electronic Ambient Sensing Thermostat with Alarm Relay, ATEX	10 - 13
GS-54	Glass Tape (16m/roll), suited for SS pipes	14
JBS-100-E	Integrated Junction Box, Single-Entry, Cold-Applied, ATEX	15 - 18
JBS-SPA	Small Pipe Adapter for E-100, JBS-100, and JS-100	19
LAB-I-01	Warning Label - English	20
PSE-090	Pipe Strap for 1 1/4 to 3 (40-90mm)	21
JBM-100-E	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold Applied, ATEX	22

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BTV

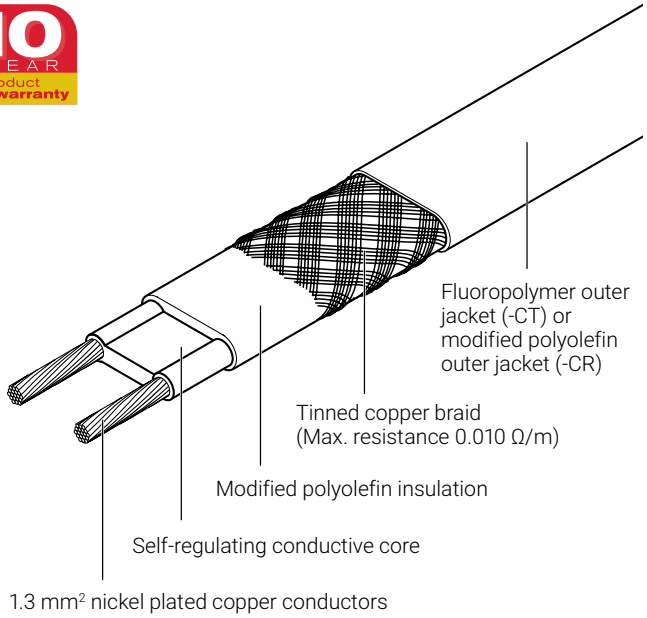
nVent RAYCHEM

CONNECT AND PROTECT

Self-regulating Heating Cable

PRODUCT OVERVIEW

10 YEAR Product warranty



Electrical heat-tracing for frost protection without steam cleaning.
The nVent RAYCHEM BTV-family of self-regulating, parallel circuit heating cables is used for frost protection of pipes and vessels. It can also be used for process temperature maintenance up to 65°C.

Application

Traced surface type	Carbon steel Stainless steel Plastic Painted or unpainted metal
Chemical resistance	For organic corrosives: use -CT (fluoropolymer outer jacket) For mild inorganic solutions: use -CR (modified polyolefin outer jacket) For aggressive organics and corrosives consult your local nVent representative

Supply voltage

230 Vac (Contact your local nVent representative for data on other voltages)

PRODUCT SPECIFICATIONS

Product dimensions and weight

	3BTV2-CR 3BTV2-CT	5BTV2-CR 5BTV2-CT	8BTV-2-CR 8BTV-2-CT	10BTV2-CR 10BTV2-CT
Width x Thickness (nominal) mm	10.5 x 5.5		13.2 x 5.5	
Weight (g/m)	110		150	

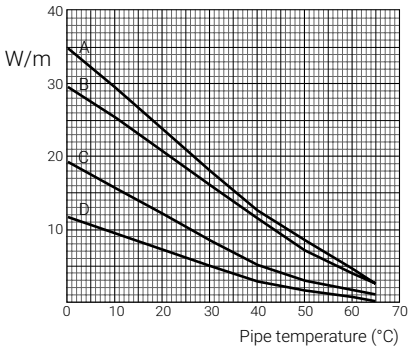
Technical details

Maximum maintain or continuous exposure temperature (power on/off)	65°C
Maximum intermittent exposure temperature (power on/off)	85°C Maximum cumulative exposure 1000 hours
Minimum installation temperature	–60°C
Minimum bend radius	–60°C ≤ T<–20°C: 35 mm –20°C ≤ T<–10°C: 30 mm –10°C ≤ T< 0°C: 25 mm 0°C ≤ T <+10°C: 20 mm T≥ +10°C: 12 mm

Thermal output rating

Nominal power output at 230 Vac on insulated steel pipes

A 10BTV2-CT
10BTV2-CR
B 8BTV-2-CT
8BTV-2-CR
C 5BTV2-CT
5BTV2-CR
D 3BTV2-CT
3BTV2-CR



	3BTV2-CR 3BTV2-CT	5BTV2-CR 5BTV2-CT	8BTV-2-CR 8BTV-2-CT	10BTV2-CR 10BTV2-CT
Nominal power output (W/m at 10°C)	9	16	25	29

Maximum circuit length based on type 'C' circuit breakers according to EN 60898

Electrical protection sizing	Start-up temperature	Maximum heating cable length per circuit (m)			
16 A	–20°C	155	110	70	45
	+10°C	200	160	110	65
20 A	–20°C	195	140	90	55
	+10°C	200	160	125	85
25 A	–20°C	200	160	110	70
	+10°C	200	160	125	105
32 A	–20°C	200	160	125	90
	+10°C	200	160	125	110

The above numbers are for circuit length estimation only. For more detailed information please use the nVent RAYCHEM TraceCalc software or Contact your local nVent representative. nVent requires the use of a 30 mA residual current device to provide maximum safety and protection from fire. Where design results in higher leakage current, the preferred trip level for adjustable devices is 30 mA above any inherent capacitive leakage characteristic of the heater as specified by the trace heater supplier or alternatively, the next common available trip level for non adjustable devices, with a maximum of 300 mA. All safety aspects need to be proven.

APPROVALS

For use ordinary area and hazardous area Zone 1 and Zone 2 (Gas), Zone 21 and Zone 22 (Dust).

Temperature classification
T6

Product certification

More details about product certification, approvals and conditions of safe use are available in the installation manual for Self-regulating and Power limiting heating cable systems at www.nVent.com/RAYCHEM

ORDERING INFORMATION

Part description	3BTV2-CR	5BTV2-CR	8BTV-2-CR	10BTV2-CR
Part No. (*)	914279-000	414809-000	479821-000	677245-000
Part description	3BTV2-CT	5BTV2-CT	8BTV-2-CT	10BTV2-CT
Part No. (*)	469145-000	487509-000	008633-000	567513-000

Components

nVent offers a full range of components for power connections, splices and end seals. These components must be used to ensure proper functioning of the product and compliance with electrical requirements.

(*) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative

North America
Tel +1.800.545.6258
Fax +1.800.527.5703
thermal.info@nVent.com

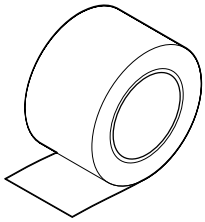
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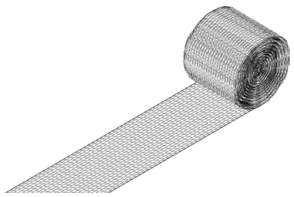
ATE-180

Aluminium tape* for attaching heating cables and thermostat sensors to pipes and tanks. Minimum installation temperature: 0°C. Also suitable for stainless steel pipes.

55 m per roll, 63.5 mm width.

PN: 846243-000 Weight: 0.84 kg

*Power output of selfregulating heating cables might increase when installed with aluminium tape or other heat transfer aids. Please use TraceCalc or contact nVent representative for further details.

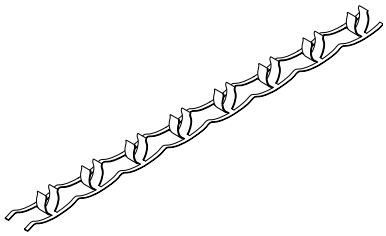


HWA-METAL-MESH-SS-50MM-10M

Stainless steel mesh for fixation of heating cables on valves, pumps or other odd-shaped surfaces. This mesh provides optimum contact and heat transfer between heating cables and heated equipment and can be used for exposure temperatures
up to 400°C.

10 m per roll, 50 mm width.

PN: 1244-005772 Weight: 0.36 kg



HWA-PI-FIX- SS-xMM-10M

Stainless steel clip band to attach Polymer Insulated series heating cables to pipes. Clips at regular distances to allow for even heater spacing. Band available in two sizes for different diameter ranges.

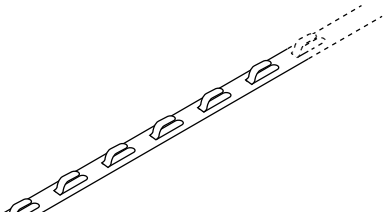
10 m per roll.

For diameters up to 5 mm, HWA-PI-FIX-SS-5MM-10M

PN: 1244-007768 Weight: 0.32 kg

For diameters up to 8 mm, HWA-PI-FIX-SS-8MM-10M

PN: 1244-007769 Weight: 0.52 kg



HARD-SPACER-SS-25MM-25M

Stainless steel spacer for fixing the heating cable on walls, tanks and vessels, etc.

Width spacer: 12.5 mm.

Fixing distance for cables: each 25 mm.

25 m per roll.

PN: 107826-000 Weight: 1.10 kg

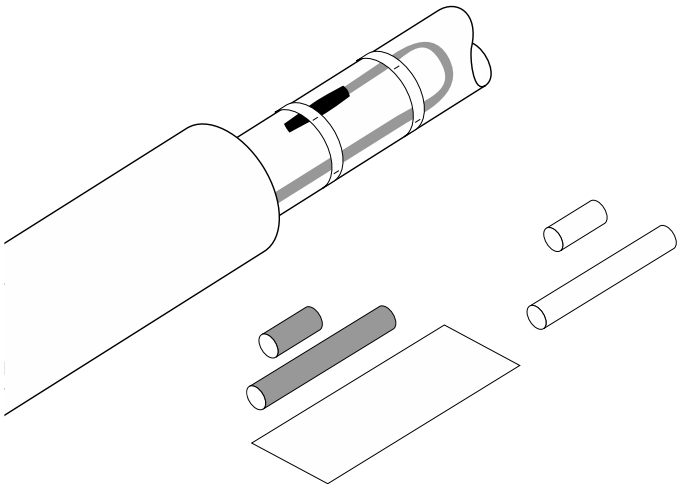
E-20 and E-40

nVent RAYCHEM

CONNECT AND PROTECT

Heat-shrink under insulation end seal kits

PRODUCT OVERVIEW



These end seal kits are designed for the termination of nVent RAYCHEM BTV, QTVR, XTVR, HTV and VPL self-regulating heating cables.

The nVent RAYCHEM E-20 is designed for use with BTV and QTVR heating cables and the nVent RAYCHEM E-40 is designed for use with XTVR, HTV and VPL heating cables. All kits are approved for use in hazardous areas.

The end seal kit E-20 employs easy to use heat-shrinkable tubing with an adhesive, that when heated forms a semi-flexible moisture proof encapsulation. The end seal kit E-40 employs high temperature heat-shrinkable tubing with a plastic melt liner that when heated forms a semi-flexible moisture proof encapsulation. Due to the low profile design, the finished termination can be installed directly on the pipe.

One end seal kit is required for each termination.

Application

	E-20	E-40
	End seal for BTV and QTVR self-regulating heating cables	End seal for XTVR and HTV self-regulating and VPL power-limiting heating cables

Kit contents

	Heat-shrinkable adhesive coated sleeves Installation instruction Aluminum tape	Heat-shrinkable sleeves Installation instruction

PRODUCT SPECIFICATIONS

Technical details

	E-20	E-40
Maximum exposure temperature	110°C (230°F)	260°C (500°F)
Final dimensions	Length approximately 120 mm Diameter approximately 20 mm	Length approximately 120 mm Diameter approximately 20 mm
Minimum ambient temperature	−60°C (−76°F)	−60°C (−76°F)

Installation details

Gas torch or equivalent	Minimum 1460 W hot air gun	Minimum 3000 W hot air gun
Minimum installation temperature	−20°C (−4°F)	−60°C (−76°F)

APPROVALS

For use in ordinary and hazardous area Zone 1 (Gas), Zone 21 (Dust) and Div 2

Temperature classification
Temperature classification is defined by the complete system.

Product certification

For certifications in other regions (FM, CSA, IEx etc.), please refer to the installation manual.
More details about product certification, approvals and conditions of safe use are available in the installation manual at www.nVent.com/RAYCHEM.

ORDERING INFORMATION

Part description	E-20	E-40
PN (Weight)	1244-022489 (0.03 kg)	1244-022491 (0.06 kg)

The installation of the E-40 requires a high power heat gun and an experienced installer.

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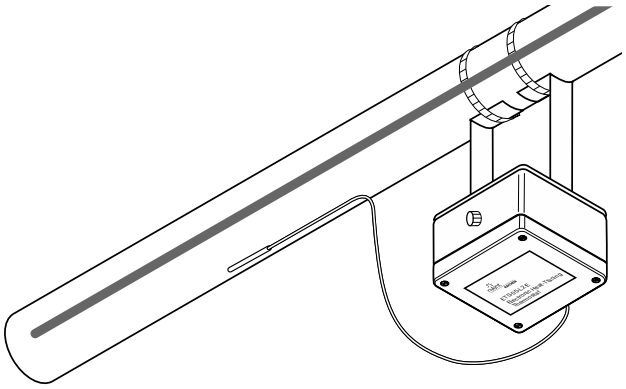
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ETS-05

CONNECT AND PROTECT

Surface and ambient sensing electronic thermostat

PRODUCT OVERVIEW



nVent RAYCHEM ETS-05 electronic surface and ambient sensing thermostat provides accurate temperature control for heating cables.

The ETS-05 is available in many versions. The ETS-05-L2-E is for temperatures up to 199°C, while the ETS-05-H2-E can be used for temperatures up to 499°C. The ETS-05-A2-E is an ambient sensing thermostat with a temperature setpoint in the range of 0°C to +49°C.

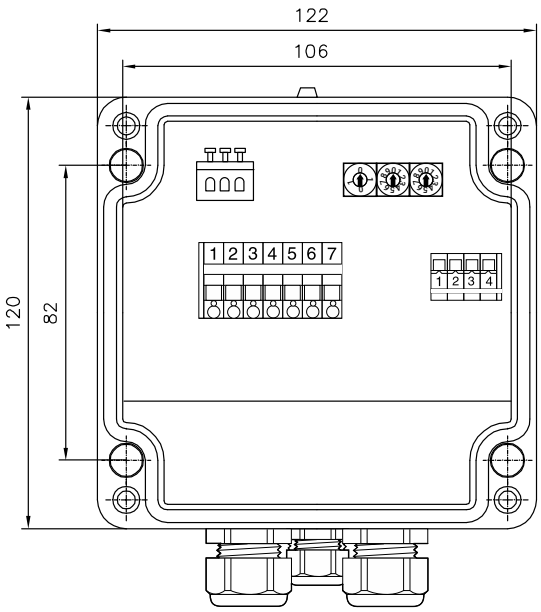
The maximum nominal load is 32 A for the thermostats. Temperature setting is accurate via digital rotary switches inside the enclosure.

The ETS-05 is available with an alarm relay for remote monitoring.

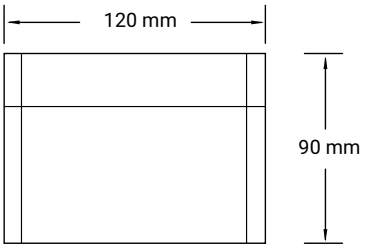
The ETS-05 has a LED indicator which indicates the status of the thermostat (powered on/off), the status of the heat-tracing cable (powered on/off) and the status of the sensor. In case of sensor failure, the thermostat can switch to an on or off state, depending upon the user's requirement.

Dimensions (in mm)

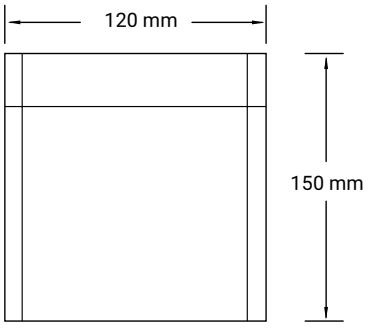
Top view



Side view



ETS-05 versions without alarming, without extended voltage range



ETS-05 versions with extended voltage range and/or alarm relay

PRODUCT SPECIFICATIONS

The following table shows the general information applicable for all versions of the ETS-05.

Maximum sensor lead resistance	20 Ohm
Ingress protection	IP66
Switching accuracy	±1 K at 5°C, 2 K at 499°C
Switching differential (Hysteresis)	≈ 3°C
Output relay	Single pole change over type (SPST)
Switching capacity	32 A resistive load
Ambient temperature range	−40°C to +60°C (ATEX / IECEx) −60°C to +60°C (EAC Ex)
Internal power consumption	3 VA
Terminal size	max. 6 mm^2
Cable gland entries	2 x M25: 1 x M25 gland for power cable in 1 x M25 rain plug for heating cable out 1 x M20 gland for alarm wire (when alarm relay is available in unit)
Sensor	The ETS-05 for ATEX/IECEx countries includes a sensor. The ETS-05 for EAC countries does not include a sensor. The sensor needs to be ordered separately.
Alarm light	Green: ETS-05 powered on, heat-tracing cable off Yellow: ETS-05 powered on, heat-tracing cable on Red flashing: Sensor failure, controller in fail-safe mode
Fail safe	Fail safe “On” and Fail Safe “Off” configurable
Weight	ETS-05 with Alarm Relay 2.38 kg Other versions: 1.64 kg

Versions

The ETS-05 is available in different versions. These are:

ETS-05-AB-CD-E
Letters ABCDE described in table below

Type description ETS-05		
“A”:	Setpoint range	Temperature measurement range
A: Ambient Sensing	0°C to +49°C	−65°C to +260°C
L: Line Sensing, Low Temp.	0°C to +199°C	−65°C to +260°C
H: Line Sensing, High Temp.	0°C to +499°C	−65°C to +585°C
“B”	Voltage range	
1: 110 Vac	99-121 Vac	
1R: 110 Vac	99-132 Vac	
2: 230 Vac	195-230 Vac +10%	
2R: 277 Vac	195-277 Vac +3%	
“C”		
E: ATEX / IECEx approved (IEC countries)		
J: ATEX / IECEx approved (for Japan)		
“D”		
P: Earth Plate		
“E”		
A: Alarm Relay	NO and NC contacts	275 Vac, 3 A resistive load max
(EAC) in the product name indicates that the product has a Russian language label on it for Eurasian Customs Union countries.		
Examples: ETS-05-L2-EP: ETS-05 thermostat, setpoint range 0-199°C, 195-230 Vac, ATEX/IECEx approved, Earth Plate ETS-05-H2R-EP-A: ETS-05 thermostat, setpoint range 0-499°C, 195-277 Vac, ATEX/IECEx, Earth Plate, Alarm Relay		

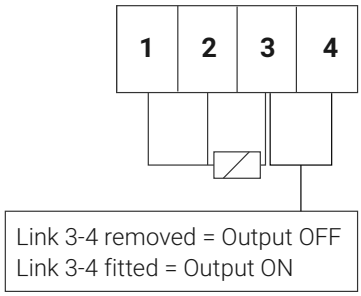
Terminals

Power terminals

1	2	3	4	5	6	7
Line Out	Neutral Out	Neutral Supply	230 V Supply	Earth	Earth	Earth

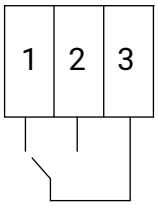
Terminals 2 and 3 are joined electrically
Terminals 5, 6 and 7 are joined electrically

Sensor/Failure mode select terminals



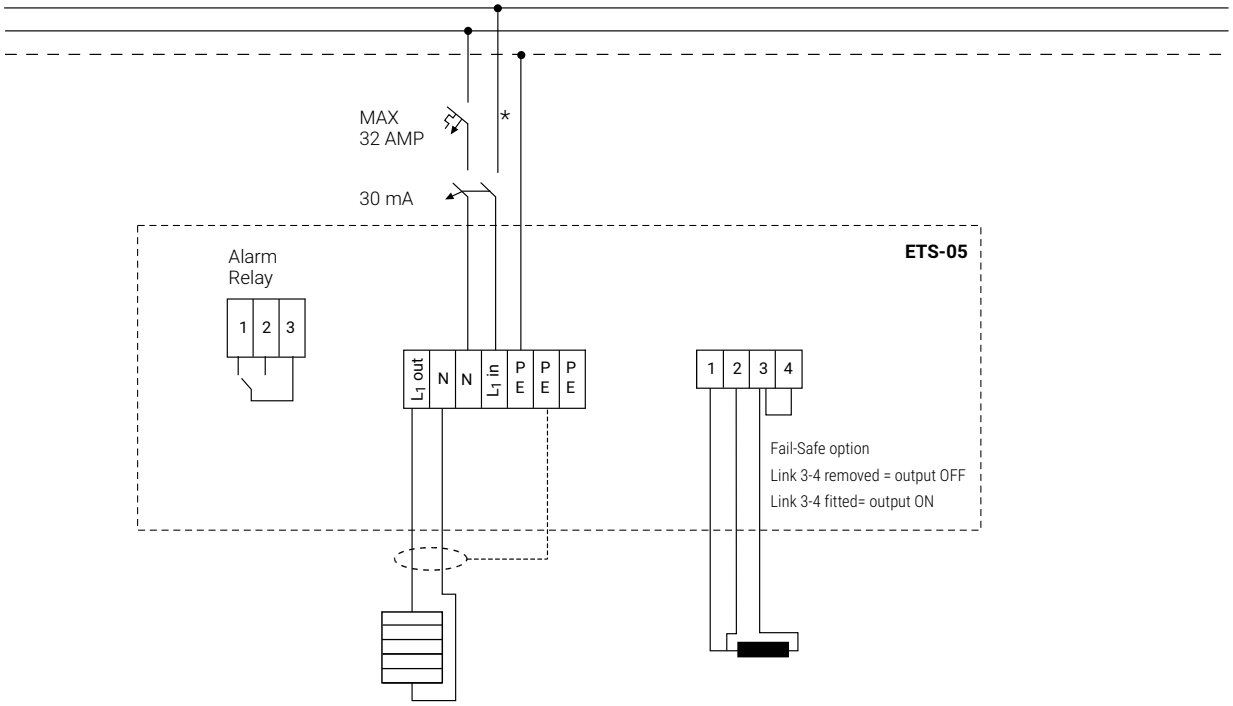
Terminals 1 to 3 allow for the connection of a three wire PT100 sensor.
Terminals 3 to 4 allow the user to select the default heating status on sensor error. Without a link fitted the heating will turn OFF if a sensor error is detected (default). With a link fitted the heating will turn ON if a sensor error is detected

Alarm relay



Healthy situation: 1-3 is closed, 2-3 is open
Alarm situation: 1-3 is open, 2-3 is closed

Typical wiring diagram for direct switching



* Circuit breaker configuration may vary according to local standards / requirements

Mounting method

Support bracket SB-100, SB-101, SB-110, SB-111, SB-130 or surface mounting with 4 fixing holes on 106 x 82 mm centers

APPROVALS

For use in ordinary and hazardous area Zone 1 and Zone 2 (Gas), Zone 21 and Zone 22 (Dust)

Temperature classification
T5

Product certification



More details about product certification, approvals and conditions of safe use are available in the installation manual at www.nVent.com/RAYCHEM.

ORDERING DETAILS

Product Name	Part Number
ETS-05-L2-E	1244-014367
ETS-05-H2-E	1244-014368
ETS-05-A2-E	1244-022311
ETS-05-L2-EP	1244-017508
ETS-05-H2-EP	1244-017509
ETS-05-A2-E-A	1244-022663
ETS-05-L2-EP-A	1244-022669
ETS-05-H2-EP-A	1244-022670
ETS-05-H2R-EP-A	1244-022680

Product Name	Part Number
ETS-05-L2-E (EAC)	1244-022701
ETS-05-H2-E (EAC)	1244-022702
ETS-05-A2-E (EAC)	1244-022700
ETS-05-L2-EP (EAC)	1244-022703
ETS-05-H2-EP (EAC)	1244-022704
ETS-05-A2-E-A (EAC)	1244-022710
ETS-05-L2-EP-A (EAC)	1244-022713
ETS-05-H2-EP-A (EAC)	1244-022714
ETS-05-H2R-EP-A (EAC)	1244-022719

(EAC) in the product name indicates that the product has a Russian language label on it for Eurasian Customs Union countries.

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LAB-EX-XTV-KTV

Aluminum tag plate for XTV and KTV self-regulating heating cables. To be installed if T-class compliance was proven by stabilized design and not by unconditional T-rating.

PN: 1244-011961 Weight: 0.04 kg

LAB-EX-FxT

Aluminum tag plate. To be installed when parallel constant wattage FMT or FHT heating cables are used in hazardous areas.

PN: 1244-006953 Weight: 0.04 kg

PI-LABEL-EX

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used in hazardous areas.

PN: 1244-006940 Weight: 0.04 kg

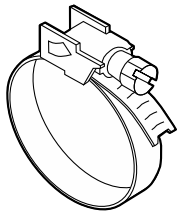
PI-LABEL-NH

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used non hazardous areas.
This label is not mandatory but highly recommended for future reference.

PN: 1244-006941 Weight: 0.04 kg

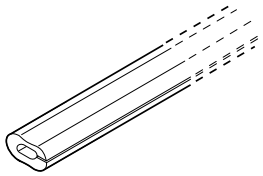
PIPE STRAPS

Metal straps for pipe mounting of integrated power connections, above the insulation tees and end seals as well as support brackets and the tubular insulation entry. Banding: stainless steel



Pipe outer diameter in mm	(inches)	Pipe strap	PN (Weight)
20 - 47	(1/2" - 11/4")	PSE-047	700333-000 (0.017 kg)
40 - 90	(11/4" - 3")	PSE-090	976935-000 (0.024 kg)
60 - 288	(2" - 10")	PSE-280	664775-000 (0.052 kg)
60 - 540	(2" - 20")	PSE-540	364489-000 (0.052 kg)

PIPE STRAPS



G-02

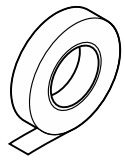
Silicone grommet that protects the heating cable at sharp edges such as endplates of insulation cladding, flanges etc. It can be cut-to-length and resists temperatures up to 215°C.

Sold in pieces of 1 m.

PN: 412549-000 Weight: 0.37 kg/m)

FIXING MATERIALS

Self-adhesive tape for fixing the heating cables on pipes or other equipment.



GT-66

Glass cloth tape for attaching heating cable to pipe.
Not for stainless steel pipes or for installation temperatures below 5°C.

20 m per roll, 12 mm width.

PN: C77220-000 Weight: 0.053 kg

GS-54

Glass cloth tape for attaching heating cable to pipe.

For stainless steel pipes or for any installation below 5°C.

16.5 m per roll, 12 mm width.

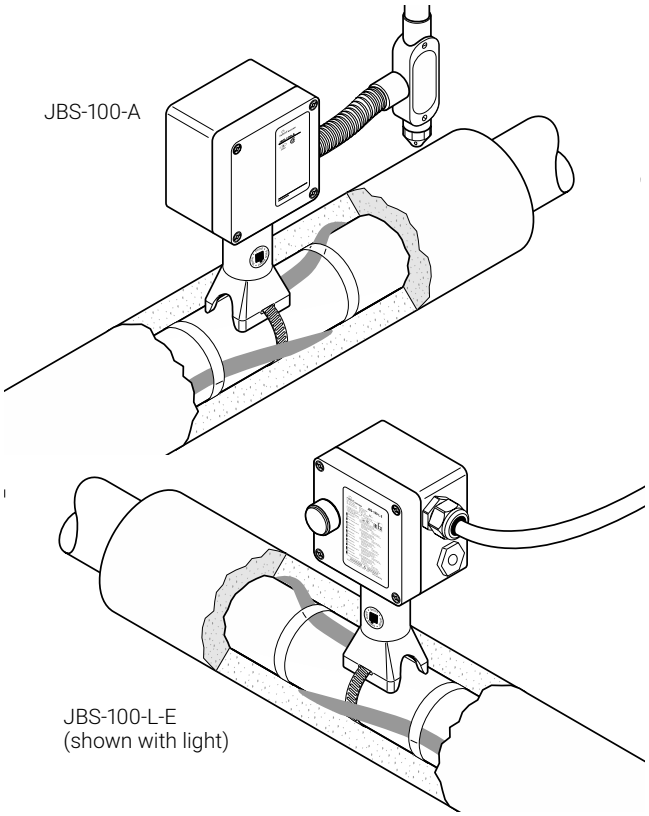
PN: C77221-000 Weight: 0.048 kg

JBS-100

CONNECT AND PROTECT

Single-Entry power connection with junction box

PRODUCT OVERVIEW



The nVent RAYCHEM JBS-100 kit is designed to connect power to a single nVent RAYCHEM BTV, QTVR, XTVR, HTV or VPL industrial parallel heating cable.

The JBS-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) in the boot allows easy installation and facilitates maintenance.

Spring-type terminals provide fast installation and safe, reliable, maintenance-free operation. This connection kit significantly reduces installation time. The kit is offered in three basic versions, customised for local installation practices. All kits are also available as a lighted version. These include a unique light module with a superbright LED that simply plugs into the terminals, and a lens in the lid. This provides indication that power is available in the box. There is also a connection kit with drain plug available.

Description

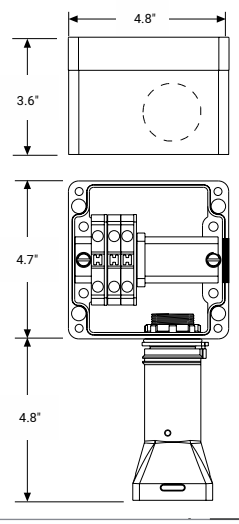
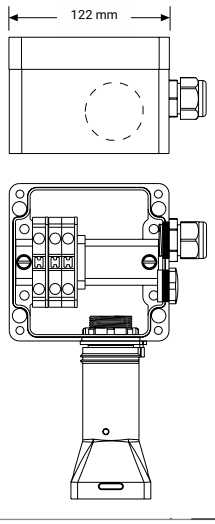
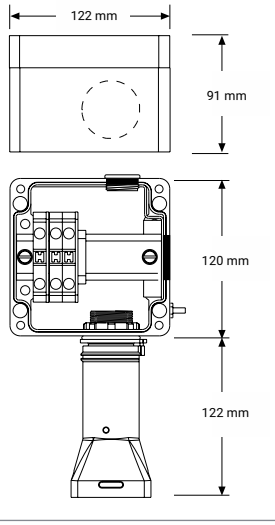
JBS-100-A **JBS-100-L-A**	**JBS-100-E** **JBS-100-L-E** **JBS-100-D-E**	**JBS-100-EP** **JBS-100-L-EP**
This connection system is certified for use in North America and has one through-hole for use with ¾" conduit.	This connection system is certified for use in IEC regions and provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This connection system is certified for use in IEC regions and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.

Kit contents

JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
1 junction box with terminals	1 junction box with terminals	1 junction box with terminals, earth plate, and stud
1 light module (for -L only)	1 light module (for -L only)	1 light module (for -L only)
1 stand	1 stand	1 stand
1 core sealer	1 core sealer	1 core sealer
1 green/yellow earthing sleeve	1 green/yellow earthing sleeve	1 green/yellow earthing sleeve
1 polywater sachet	1 M25 gland for power cable 8-15 mm in diameter (temperature range –55°C / 70°C)	1 M25 stopping plug
1 cable tie	1 M25 stopping plug	1 polywater sachet
	1 polywater sachet	1 cable tie
	1 cable tie	
	1 ATEX/IECEx Certified drainplug (for JBS-100-D-E only)	

PRODUCT SPECIFICATIONS

Dimensions (nominal)

	JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
			

Technical details

	JBS-100-A JBS-100-L-A	JBS-100-E JBS-100-L-E JBS-100-D-E	JBS-100-EP JBS-100-L-EP
Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTVR-CT, HTV-CT, VPL-CT		
Ingress protection	IP66	IP66	IP66
Entries	1 x ¾"	2 x M25	2 x M25
Ambient temperature range	−55°C to +56°C (JBS-100-A) −40°C to +40°C (JBS-100-L-A)	−55°C to +56°C* (JBS-100-E and JBS-100-D-E) −40°C to +40°C (JBS-100-L-E)	−55°C to +56°C* (JBS-100-EP) −40°C to +40°C (JBS-100-L-EP)
	* Extra conditions for safe use apply at ambient temperatures >40°C. Temperature resistant power cable and metal glands must be used. Please refer to the certificate or installation instructions for full details.		
Max. pipe temperature	Refer to heating cable specification		
Terminals	Spring-type terminals 2 line, 1 ground	Spring-type terminals 1 phase, 1 neutral, 1 earth	Spring-type terminals 1 phase, 1 neutral, 1 earth
Max. conductor size	8 AWG stranded	10 mm^2 stranded, 10 mm^2 solid	10 mm^2 stranded, 10 mm^2 solid
Max. operating voltage	480 Vac*	480 Vac*	480 Vac*
	* JBS-100-L-E, JBS-100-L-EP and JBS-100-L-A are limited to 277 Vac. Extra conditions for safe use apply for voltages higher than 277 Vac. Please refer to the certificate or installation instructions for full details.		
Max. continuous operating current (***)	53 A	53 A	53 A

(***) For pipe temperature >150°C and <260°C and XTVR or HTV heating cables, the maximum operating current shall be reduced to maximum 20 A.

Materials of construction

Enclosure, lid, and stand	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and blue chromated

Optional LED indicator light

Colour	Red	Green	Green
Voltage rating	100-277 Vac	100-277 Vac	100-277 Vac
Power consumption	< 1 W	< 1 W	< 1 W

APPROVALS

For use in ordinary and hazardous area Zone 1 and Zone 2 (Gas), Zone 21 and Zone 22 (Dust) (and Class I Div 2).

Temperature classification

Temperature classification is defined by the complete system.

Product certification

For certifications in other regions (FM, CSA, IEx etc.), please refer to the installation manual.

More details about product certification, approvals and conditions of safe use are available in the installation manual at www.nVent.com/RAYCHEM.

ORDERING INFORMATION**

Power connection

Part Description	JBS-100-A	JBS-100-E	JBS-100-EP
PN (Weight)	085947-000 (2.5 lb)	829939-000 (1.2 kg)	158251-000 (1.3 kg)

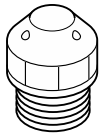
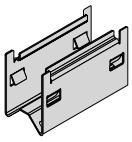
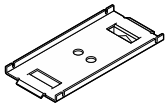
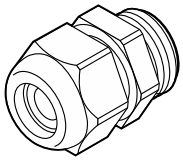
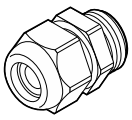
Power connection with light

Part Description	JBS-100-L-A	JBS-100-L-E	JBS-100-L-EP
PN (Weight)	944699-000 (3.5 lb)	054363-000 (1.6 kg)	075249-000 (1.7 kg)

Power connection with drain plug

Part Description		JBS-100-D-E	
PN (Weight)		1244-021057 (1.4 kg)	

Accessories

Conduit Drain ¾"	Prevents condensate from collecting in the box	
Catalog number	JB-DRAIN-PLUG-3/4IN	
Part Number	278621-000	
Weight	0.074 lb / 36 g	
Junction box standoff	For insulation thickness >100 mm & ≤150 mm *	
Catalog number	JBM-100-STANDOFF	
Part Number	P000003408	
Weight	0.279 lb / 135 g	
* Consider extra pipe strap length 6-9" (150-225 mm) for attachment		
Small pipe adapter	Required for stand on pipes ≤ 1"	
Catalog number	JBM-SPA	
Part Number	E90515-000	
Weight	0.408 lb / 185 g (Bag of 5 adaptors)	
Glands for power cables	Hazardous area approved gland for cables 8-15 mm (temperature range –55°C/70°C)	
Catalog number	GL-55-M25	
Part Number	1244-019083	
Weight	0.016 kg	
Glands for power cables	Hazardous area approved gland for cables 8-17.5 mm (temperature range –20°C/70°C)	
Catalog number	GL-36-M25	
Part Number	1244-019082	
Weight	0.016 kg	

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

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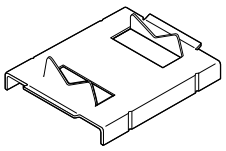
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SMALL PIPE ADAPTORS



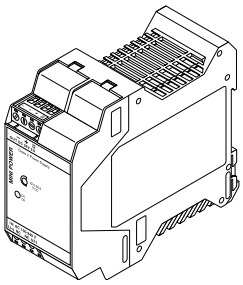
JBS-SPA

Small pipe adaptor required for pipes ≤ 1" (DN25), applicable for JBS-100, E-100, E-100-L
E90515-000 (bag of 5 adaptors) Weight: 0.14 kg

JBM-SPA

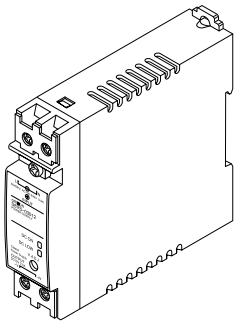
Small pipe adaptor required for pipes ≤ 1" (DN25), applicable for JBM-100, T-100
D55673-000 (bag of 5 adaptors) Weight: 0.40 kg

POWER SUPPLY



MONI-RMC-PS24

24 Vdc stabilized power supply
Wide range input (100 - 240 Vac) power supply to provide
24 Vdc input for MONI- RMC-BASE.
Surface or DIN 35 rail mounted.
PN: 972049-000 Weight: 0.28 kg



MONI-PS12

12 Vdc stabilized power supply
Wide range input (100 - 240 Vac) power supply to provide 12 Vdc input for the nVent RAYCHEM NGC-30-CRM-E and nVent RAYCHEM NGC-30-CRMS-E cards.
DIN 35 rail mountable.
PN: 1244-001505 Weight: 0.18 kg

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LABELS AND TAGS

Warning labels indicate the presence of electrical heat-tracing under the insulation of the pipe or other equipment. (min. of 1 label per 5 m of heat-tracing line). Also suitable for stainless steel pipes.



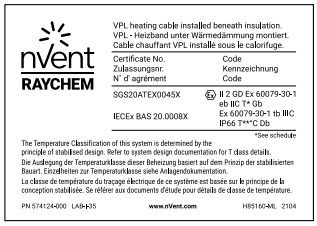
Language	EHT label reference	Product number
Arabian	LAB-ETL-AR	036236-000
Bulgarian	LAB-ETL-BG	1244-002183
Czech	LAB-ETL-CZ	731605-000
Danish	LAB-ETL-DK	C97690-000
Dutch	LAB-ETL-NL	749153-000
English	LAB-I-01	938947-000
Estonian/English	LAB-ETL-EN/EE	1244-001415
Finnish/Swedisch	LAB-ETL-SE/FI	756479-000
French	LAB-I-05	883061-000
German/French/Italian (230V)	LAB-ETL-DE/FR/IT	148648-000
German	LAB-ETL-DE	597779-000
Hungarian	LAB-ETL-HU	623725-000
Italian	LAB-ETL-IT	C97688-000
Kazakh/Russian/English	LAB-ETL-KZ/RU/EN	1244-017393
Latvian	LAB-ETL-LV	841822-000
Lithuanian	LAB-ETL-LT	105300-000
Norwegian	LAB-ETL-NO	C97689-000
Norwegian/English	LAB-ETL-EN/NO	165899-000
Polish	LAB-ETL-PL	258203-000
Portugese	LAB-ETL-PT	945960-000
Romanian	LAB-ETL-RO	902104-000
Russian	LAB-ETL-RU	574738-000
Russian/English	LAB-ETL-EN/RU	1244-001060
Russian/English/Azeri	LAB-ETL-AZ/RU/EN	1244-012283
Russian/English/Uzbek	LAB-ETL-UZ/RU/EN	1244-022143
Spanish	LAB-ETL-ES	C97686-000
Swedish	LAB-ETL-SE	691703-000
Turkish/English	LAB-ETL-EN/TR	1244-014860



Language	Component label reference	Product number
English	LAB-I-02	774499-000
Russian/English	LAB-I-02/E/R LAB-ENDSEAL	1244-001059 146909-000
English	ETL-END-SEAL LAB-SPLICE	103405-000 007063-000

STABILIZED DESIGN LABELS

If compliance to the T-class or A.I.T. cannot be achieved by the unconditional T-rating of the heating cable, the hazardous area regulations require that cable sheath temperature is determined by the rules of stabilized design as per EN 60079-30 and the heating circuit is marked accordingly. The following labels are available for this purpose (min.1 label per heating circuit)



LAB-I-35

Stabilized design sticker. To be installed when power-limiting VPL heating cables are used in hazardous areas.

PN: 574124-000 Weight: 0,0015 kg

LAB-EX-XTV-KTV

Aluminum tag plate for XTV and KTV self-regulating heating cables. To be installed if T-class compliance was proven by stabilized design and not by unconditional T-rating.

PN: 1244-011961 Weight: 0.04 kg

LAB-EX-FxT

Aluminum tag plate. To be installed when parallel constant wattage FMT or FHT heating cables are used in hazardous areas.

PN: 1244-006953 Weight: 0.04 kg

PI-LABEL-EX

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used in hazardous areas.

PN: 1244-006940 Weight: 0.04 kg

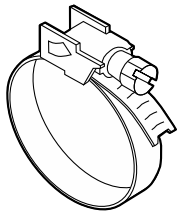
PI-LABEL-NH

Aluminum tag plate. To be installed when series polymer insulated XPI & XPI-S heating cables are used non hazardous areas.
This label is not mandatory but highly recommended for future reference.

PN: 1244-006941 Weight: 0.04 kg

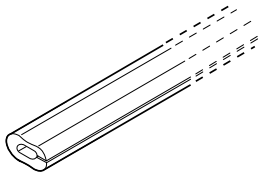
PIPE STRAPS

Metal straps for pipe mounting of integrated power connections, above the insulation tees and end seals as well as support brackets and the tubular insulation entry. Banding: stainless steel



Pipe outer diameter in mm	(inches)	Pipe strap	PN (Weight)
20 - 47	(1/2" - 11/4")	PSE-047	700333-000 (0.017 kg)
40 - 90	(11/4" - 3")	PSE-090	976935-000 (0.024 kg)
60 - 288	(2" - 10")	PSE-280	664775-000 (0.052 kg)
60 - 540	(2" - 20")	PSE-540	364489-000 (0.052 kg)

PIPE STRAPS



G-02

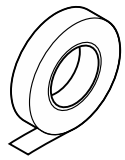
Silicone grommet that protects the heating cable at sharp edges such as endplates of insulation cladding, flanges etc. It can be cut-to-length and resists temperatures up to 215°C.

Sold in pieces of 1 m.

PN: 412549-000 Weight: 0.37 kg/m)

FIXING MATERIALS

Self-adhesive tape for fixing the heating cables on pipes or other equipment.



GT-66

Glass cloth tape for attaching heating cable to pipe.
Not for stainless steel pipes or for installation temperatures below 5°C.

20 m per roll, 12 mm width.

PN: C77220-000 Weight: 0.053 kg

GS-54

Glass cloth tape for attaching heating cable to pipe.

For stainless steel pipes or for any installation below 5°C.

16.5 m per roll, 12 mm width.

PN: C77221-000 Weight: 0.048 kg

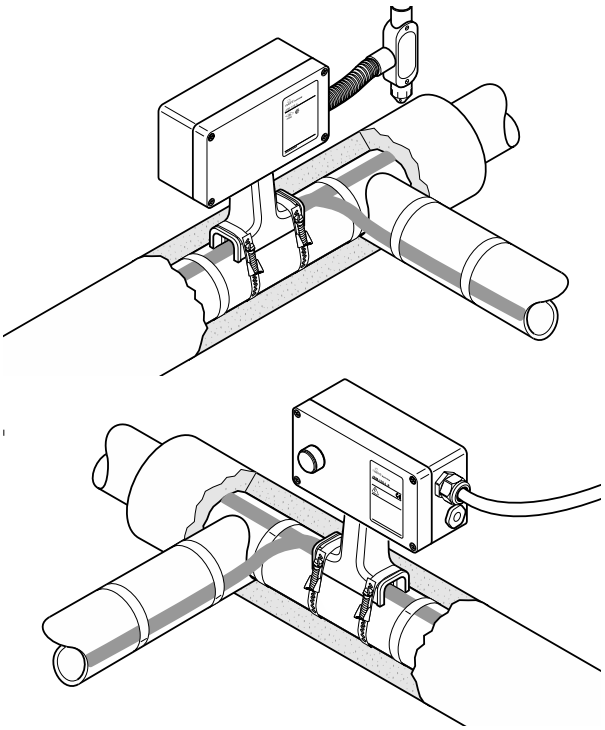
JBM-100

nVent RAYCHEM

CONNECT AND PROTECT

Multiple-Entry Power/Tee Connection with Junction Box

PRODUCT OVERVIEW



The nVent RAYCHEM JBM-100 kit is designed to connect power to up to three nVent RAYCHEM BTV, QTVR, XTVR, HTV, or VPL industrial parallel heating cables.

The JBM-100 integrates the functions of both connection kits and insulation entries. The rugged stand protects the heating cable and allows for up to 100 mm (4") of thermal insulation.

The core sealing boot does not require a heat gun or torch for the installation (no hot work permit necessary). The non-curing sealant (silicone free) in the boot allows easy installation and facilitates maintenance.

Spring-type terminals provide fast installation and safe, reliable, maintenance-free operation. This connection kit significantly reduces installation time.

The kit is offered in three basic versions, customised for local installation practices. All kits are also available as a lighted version. These include a unique light module with a superbright LED that simply plugs into the terminals, and a lens in the lid. This provides indication that power is available in the box. There is also a connection kit with drain plug available.

Description

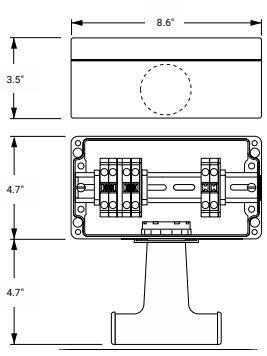
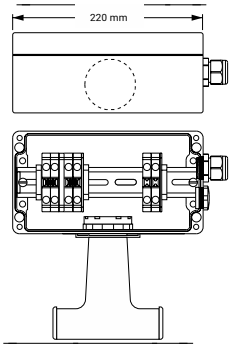
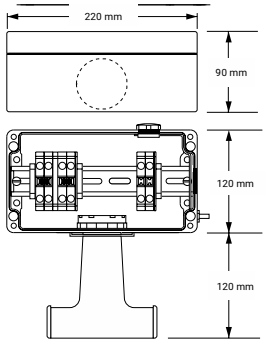
JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-L-E JBM-100-D-E	JBM-100-EP JBM-100-L-EP
This connection system is certified for use in North America and has one ¾" through holes for use with ¾" conduit. One stopping plug is supplied in the kit.	This connection system is certified for use in IEC regions and provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This connection system is certified for use in IEC regions and provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.

Kit contents

1 junction box with terminals 1 light module (for -L only) 1 stand 3 core sealers 3 green/yellow earthing sleeve 1 ¾" stopping plug 1 polywater sachet 1 spanner 1 strain relief assembly 2 grommet plugs	1 junction box with terminals 1 light module (for -L only) 1 stand 3 core sealers 3 green/yellow earthing sleeve 1 M25 gland for power cable 8-15 mm (temperature range –55°C to +70°C) in diameter 1 M25 stopping plug 1 polywater sachet 1 spanner 1 strain relief assembly 2 grommet plugs 1 ATEX/IECEx Certified drainplug (for JBM-100-D-E only)	1 junction box with terminals, earth continuity plate, and stud 1 light module (for -L only) 1 stand 3 core sealers 3 green/yellow earthing sleeve 2 M25 stopping plugs 1 polywater sachet 1 spanner 1 strain relief assembly 2 grommet plugs

PRODUCT SPECIFICATIONS

Dimensions (nominal)

	JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-L-E JBM-100-D-E	JBM-100-EP JBM-100-L-EP
			

Technical details

Heating cable capability	BTV-CR, BTV-CT, QTVR-CT, XTVR-CT, HTV-CT, VPL-CT		
Ingress protection	IP66	IP66	IP66
Entries	1 x ¾"	2 x M25	2 x M25
Ambient temperature range	−55°C to +56°C (JBM-100-A) −40°C to +40°C (JBM-100-L-A)	−55°C to +56°C* (JBM-100-E and JBM-100-D-E) −40°C to +40°C (JBM-100-L-E)	−55°C to +56°C* (JBM-100-EP) −40°C to +40°C (JBM-100-L-EP)
	*Extra conditions for safe use apply at ambient temperatures >40°C. Temperature resistant power cable and metal glands must be used. Please refer to the certificate or installation instructions for full details.		
Max. pipe temperature	Refer to heating cable specification		
Terminals	Spring-type terminals 4 line, 2 ground	Spring-type terminals 2 phase, 2 neutral, 2 earth	Spring-type terminals 2 phase, 2 neutral, 2 earth
Max. conductor size	8 AWG stranded	10 mm^2 stranded, 10 mm^2 solid	10 mm^2 stranded, 10 mm^2 solid
Max. operating voltage	480 Vac*	480 Vac*	480 Vac*
	*JBM-100-L-E, JBM-100-L-EP and JBM-100-L-A are limited to 277 Vac. Extra conditions for safe use apply for voltages higher than 277 Vac. Please refer to the certificate or installation instructions for full details.		
Max. continuous operating current (***)	53 A	53 A	53 A

(***) For pipe temperature > 150°C and <260°C and XTVR or HTV heating cables, the maximum operating current shall be reduced to maximum 20 A.

Materials of construction

Enclosure, lid, and stand	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black	Electrostatic charge-resistant glass-filled engineered polymer, black
Lid screws	Stainless steel	Stainless steel	Stainless steel
Lid gasket	Silicone rubber	Silicone rubber	Silicone rubber
Earth continuity plate	N/A	N/A	Steel, zinc plated, and blue chromated

Optional LED indicator light

	JBM-100-A JBM-100-L-A	JBM-100-E JBM-100-L-E JBM-100-D-E	JBM-100-EP JBM-100-L-EP
Colour	Red	Green	Green
Voltage rating	100-277 Vac	100-277 Vac	100-277 Vac
Power consumption	< 1 W	< 1 W	< 1 W

Ordering details (**)

APPROVALS (**)

For use in ordinary and hazardous area Zone 1 and Zone 2 (Gas), Zone 21 and Zone 22 (Dust) and Class I Div 1 & 2

Temperature classification

Temperature classification is defined by the complete system.

Product certification

For certifications in other regions (FM, CSA, IEx etc.), please refer to the installation manual. More details about product certification, approvals and conditions of safe use are available in the installation manual www.nVent.com/RAYCHEM.

ORDERING INFORMATION

Power connection

Part Description (**)	JBM-100-A	JBM-100-E	JBM-100-EP
PN (Weight)	179935-000 (4.3 lb)	831519-000 (1.9 kg)	986415-000 (2.1 kg)

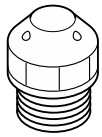
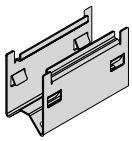
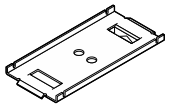
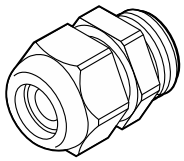
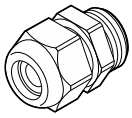
Power connection with light

Part Description	JBM-100-L-A	JBM-100-L-E	JBM-100-L-EP
PN (Weight)	656081-000 (5.3 lb)	395855-000 (2.3 kg)	300273-000 (2.5 kg)

Power connection with drain plug

Part Description		JBM-100-D-E	
PN (Weight)		1244-021056 (2.1 kg)	

Accessories

Conduit Drain ¾"	Prevents condensate from collecting in the box	
Catalog number	JB-DRAIN-PLUG-3/4IN	
Part Number	278621-000	
Weight	0.074 lb / 36 g	
Junction box standoff	For insulation thickness >120 mm & ≤180 mm *	
Catalog number	JBM-100-STANDOFF	
Part Number	P000003624	
Weight	0.599 lb / 272 g	
* Consider extra pipe strap length 6-9" (150-225 mm) for attachment		
Small pipe adapter	Required for stand on pipes ≤ 1"	
Catalog number	JBM-SPA	
Part Number	D55673-000	
Weight	0.930 lb / 422 g (Bag of 5 adaptors)	
Glands for power cables	Hazardous area approved gland for cables 8-15 mm (temperature range –55°C/70°C)	
Catalog number	GL-55-M25	
Part Number	1244-019083	
Weight	0.016 kg	
Glands for power cables	Hazardous area approved gland for cables 8-17.5 mm (temperature range –20°C/70°C)	
Catalog number	GL-36-M25	
Part Number	1244-019082	
Weight	0.016 kg	

(**) Localized versions may exist with limited approvals and different part numbers. Contact your local sales representative.

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Our powerful portfolio of brands:
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nVent reserves the right to change specifications without notice.

2 CERTIFICATION DOSSIER

2.1	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT	Sh. 1 of 32 Date: 17-02-25 Rev. 03

Base Load Power Hub (BLPH)

ATEX REGISTER INCLUDING CERTIFICATIONS - EHT

ELECTRICAL HEAT TRACING

1724001647-EL-LIS-00011

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	17/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
03	17-02-25	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
02	20-01-25	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
01	17-12-24	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
00	26-09-24	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT	Sh. 2 of 32 Date: 17-02-25 Rev. 03

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03				
1	Cover	X	X	X	X				
2	Table of Contents	X	X	X	X				
3	Revision / Change Log	X	X	X	X				
4	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT	X	X	X	X				

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	ATEX REGISTER INCLUDING CERTIFICATIONS - EHT	Sh. 3 of 32 Date: 17-02-25 Rev. 03

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ISSUE FOR REVIEW (IFR)
03	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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No.	Revision	Tag Number	Description	Location	Manufacturer	Model Type Catalogue Number	Serial Number	ATEX Certification Marking	Reference Document	ATEX Certificate Number	Installation Zone	Notes / Comments	P.O.	Vendor	Skid / Package	Barrier Calculation Ref.	Non-Electrical Equipment	Special Conditions of safe use Applicable
1	02	EHT-1001-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000	II 2 GD Ex 60079-30-1 eb IIC T6 Gb or Ex 60079-30-1 eb mb IIC T6 Gb Tmin -60°C Ex 60079-30-1 tb IIIC T80°C Db or Ex 60079-30-1 mb tb IIIC T80°C Db	1724001647-EL-DD-00004	SGS20ATEX0048X	Zone 1	n/a	1724001647	nVent	n/a	n/a	n/a	YES
2	02	EHT-1002-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
3	02	EHT-1003-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
4	02	EHT-1004-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
5	02	EHT-1005-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
6	02	EHT-1006-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
7	02	EHT-1007-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
8	02	EHT-1004-B	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
9	02	EHT-2002-A	Raychem Self-Regulating Heating Cable and accessories	n/a	nVent	3BTV2-CT	469145-000		1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	YES
10	02	n/a	Heat shrink end seal, ATEX (BTV, QTVR)	n/a	nVent	E-20	1244-022489	II 2 GD Ex 60079-30-1 eb IIC T6 Gb or Ex 60079-30-1 eb mb IIC T6 Gb Tmin -60°C Ex 60079-30-1 tb IIIC T80°C Db or Ex 60079-30-1 mb tb IIIC T80°C Db	1724001647-EL-DD-00004	SGS20ATEX0048X	Zone 1	n/a	1724001647	nVent	n/a	n/a	YES	YES
11	02	EAT-200N1-01	Electronic Ambient Sensing Thermostat with Alarm Relay, ATEX	n/a	nVent	ETS-05-A2-E-A	1244-022663	II 2(1)G Ex eb ia mb [ia Ga] IIC T5 Gb -40ºC ≤ Ta ≤ +60ºC II 2D Ex tb IIIC T100ºC Db	1724001647-EL-DD-00004	Baseefa13ATEX0137	Zone 1	n/a	1724001647	nVent	n/a	n/a	n/a	n/a
12	02	ETB-200N1-16-L3-01	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004	PTB 20 ATEX 1008 U	Zone 1	n/a	1724001647	nVent	n/a	n/a	n/a	n/a
13	02	ETB-200N1-17-L1-02	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
14	02	ETB-200N1-17-L1-03	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
15	02	ETB-200N1-15-L2-02	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
16	02	ETB-200N1-17-L1-05	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
17	02	ETB-200N1-17-L1-01	Single entry power connection, EP, ATEX	n/a	nVent	JBS-100-E	829939-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-IN-HD-00010			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
18	02	ETB-200N1-15-L2-01	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold-Applied, ATEX	n/a	nVent	JBM-100-E	831519-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
19	02	ETB-200N1-14-L1-01	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold-Applied, ATEX	n/a	nVent	JBM-100-E	831519-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a
20	02	ETB-200N1-17-L1-04	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold-Applied, ATEX	n/a	nVent	JBM-100-E	831519-000	II2GExebmbIICGb II2DExtbmbMICDb	1724001647-EL-DD-00004			n/a	1724001647	nVent	n/a	n/a	n/a	n/a

Certificate Number
SGS20ATEX0048X
Issue 3

Issued 3 September 2021
Page 1 of 6

1 EU - TYPE EXAMINATION CERTIFICATE

2 Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 EU - Type Examination Certificate Number: **SGS20ATEX0048X – Issue 3**

4 Product: **BTV Range of Self-Regulating Trace Heating Systems**

5 Manufacturer: **nVent Thermal LLC**

6 Address: **899 Broadway Street, CA, 94063-3104, United States of America**

7 This re-issued certificate extends EU Type Examination Certificate No. **SGS20ATEX0048X** to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. See Certificate History

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN IEC 60079-7:2015+A1:2018** **EN 60079-18:2015+A1:2017**
EN 60079-30-1:2017 **EN 60079-31:2014**

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

☐ **II 2 GD Ex 60079-30-1 eb IIC T6 Gb or Ex 60079-30-1 eb mb IIC T6 Gb T_{min} -60°C**
Ex 60079-30-1 tb IIIC T80°C Db or Ex 60079-30-1 mb tb IIIC T80°C Db

SGS Fimko Oy Customer Reference No. **865** Project File No. **21/0455**

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Tuomas Hänninen
SGS Fimko Oy

13 **Schedule**

14 **Certificate Number SGS20ATEX0048X – Issue 3**

15 Description of Product

The BTV Range of Self-Regulating Trace Heating Systems is of the parallel circuit self-regulating type, rated at up to 277V, with power output up to 33W/m (10W/ft). The units have a maximum self-limiting temperature of 80°C.

Each trace heating system comprises:

- the active heating cable.
- an end seal for terminating the remote end of the unit.
- a cable gland for connecting the powered end of the unit to a suitable terminal enclosure, or alternative integrated power connection systems.

The active heating cable comprises two stranded copper conductors around which is extruded a semi-conductive core material. This core material increases in resistance with increasing temperature and gives the cable its self-limiting property. This semi conductive core with embedded conductors forms the active part of the heating cable. An extruded layer of fluoropolymer serves to insulate the semi conductive core from the conductive covering, covering the active heater. A protective anti-corrosion fluoropolymer sheath may be extruded over the conductive covering.

The declared maximum withstand temperature for the range is 85°C and the minimum installation temperature is -60°C.

CABLE ACCESSORIES

END SEALS

The end seals for terminating the remote end of the unit may be the following types:

Types E-100-L or E-100, which are mechanical end seals incorporating an end cap which is filled with silicone grease sealant covered by certificates Sira14ATEX3015X and PTB09ATEX1060U.

Types E-100-L-A or E-100-A, which are mechanical end seals incorporating an end cap which is filled with silicone grease sealant.

A Raychem Type E-20 heat shrink end seal kit.

Type E-150 mechanical end seals, covered by certificate DEKRA20ATEX0011U.

SPLICES AND JOINTS

The following splicing and jointing arrangements are provided:

A Raychem Type S-20 heat shrink splice kit for connecting lengths of active heating cable.

A Raychem T-100 tee connection system, certificate PTB20ATEX1008U, for connecting up to three heater cables.

Type S-150 mechanical splice kit, covered by certificate DEKRA20ATEX0011U.

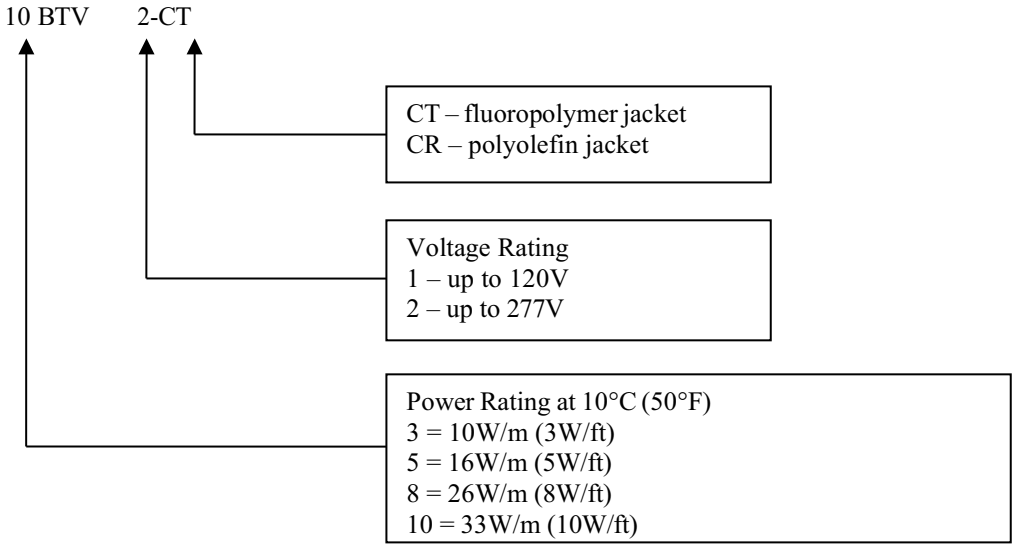
POWER CONNECTIONS

Power connection may be achieved by the following means:

Connection Type	ATEX Certificate
JBM-100	PTB20ATEX1008U
JBS-100	PTB20ATEX1008U
JBU-100	PTB20ATEX1008U
C-150-E	DEKRA20ATEX0011U
C25-21 Connection Kit	Baseefa16ATEX0037U
C25-100 Connection Kit	Baseefa16ATEX0038U
C25-100-Metal / C3/4-100-Metal / C25-100-Metal-NP / C3/4-100-Metal-NP / C25-100-Metal-SS Kits	Baseefa16ATEX0039U

The C25-100-Metal / C3/4-100-Metal / C25-100-Metal-NP / C3/4-100-Metal-NP / C25-100-Metal-SS Kits include M25 or ¾ NPT gland to Sira01ATEX1270X and core sealer to Baseefa15ATEX0194U.

A number of power levels and voltages, up to the maximum specified, are included in the range. They are identified in the following manner:



Any of the products in the range may be considered as part of a stabilised design system. In such a system the design is based upon the use of nVent proprietary software Trace calc Pro. The algorithm defined in this software may be used in additional design software.

The minimum bending radii for BTV trace heating cable at specific temperatures are shown in the table below:

Temperature, T (°C)	**Minimum Bending Radius (mm)**
$-60 \leq T < -20$	35
$-20 \leq T < -10$	30
$-10 \leq T < 0$	25
$0 \leq T < +10$	20
$T \geq +10$	12

16 Report Number

See Certificate History.

17 Specific Conditions of Use

1. The following limiting temperatures for the heat shrink end seals and splices shall not be exceeded:

   +110°C for the S-20 and E-20
   +150°C for the C-150-E, S-150 and E-150

2. The end seals, splices and power connections have the following associated ambient temperatures:

   -60°C to +56°C for the E-20 and S-20
   -55°C to +56°C for the T-100, JBM-100, JBS-100, JBU-100, and E-100
   -40°C to +56°C for the JBS-100-L, JBM-100-L, and JBU-100-L
   -55°C to +55°C for the C-150-E, S-150 and E-150
   -40°C to +40°C for the E-100-L
   -55°C to +110°C for the C25-21 and C25-100
   -60°C to +180°C for the C25-100-Metal / C3/4-100-Metal / C25-100-Metal-NP / C3/4-100-Metal-NP / C25-100-Metal-SS

3. The assembly of glands, splices and end terminations shall be carried out in accordance with the manufacturing instructions

4. The heating element supply circuit must include an electrical protection device in conformity with Clause 4.4 of EN 60079-30-1.

5. The minimum installation temperature is -60°C. The minimum bending radii at specific temperatures for the Type BTV units are shown in the table in the equipment description.

6. The supply to the heating unit must be terminated in a suitably certified terminal enclosure.

7. The minimum installation temperature for E-20 and S-20, end seal and splice is -20°C.

8. The installer is to carry out a dielectric strength test on Ex equipment in which the C25-21, C25-100 and C25-100-Metal / C3/4-100-Metal / C25-100-Metal-NP / C3/4-100-Metal-NP / C25-100-Metal-SS connection kit is fitted. No dielectric breakdown shall occur. (Alternatively, an insulation resistance test may be undertaken in accordance with EN 60079-30-2).

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	LVD type requirements
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
205308-A[i]	1 of 1	Q	05/27/2021	BTV-8BTV-CR & BTV-10BTV-CR
205310-A[i]	1 of 1	R	05/27/2021	BTV-8BTV-CT & BTV-10BTV-CT

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
906567[ii]	1 of 1	P	05/21/21	C25-21, C25-100 and C25-100-METAL-XX, C3/4-100-METAL-XX Connection Kits
906579-A[i]	1 of 1	N	01/15/2021	BTV Heater Units (European System)
205350-A[i]	1 of 1	P	03/31/20	BTV-3BTV-CT & BTV-5BTV-CT
205349-A[i]	1 of 1	J	03/26/20	BTV-3BTV-CR & BTV-5BTV-CR
906794-A[iii]	1 of 1	AA	03/30/20	Generic ATEX and IECEx Print Dwg for BTV-CT, QTVR-CT, XTV-CT, KTV-CT Heating Cables
9242869[iv]	1 & 2	O	12/09/19	LABL JBM-100-L-E
9532687[iv]	1 & 2	Q	12/09/19	LABL JBM-100-L-EP
9621473[iv]	1 & 2	O	12/09/19	LABL JBS-100-L-E
9777523[iv]	1 & 2	P	12/09/19	LABL JBS-100-L-EP
9319676[iv]	1 & 2	O	12/09/19	LABL JBU-100-L-E
9735898[iv]	1 & 2	O	12/09/19	LABL JBU-100-L-EP
908742-A[v]	1 of 1	A	2/19/20	E-20 Heat Shrinkable End Seal Kit Cut Back Dimensions
908743-A[vi]	1 of 1	A	2/19/20	S-20 Heat Shrinkable Splice Joint Kit Cut Back Dimensions

i) These drawings are common to IECEx BAS 20.0011X, SGS20ATEX0048X and are held with IECEx BAS 20.0011X.

ii) This drawing is common to IECEx BAS 16.0040U, IECEx BAS 16.0041U, IECEx 16.0042U, IECEx BAS 20.0008X, IECEx BAS 20.0009X, IECEx BAS 20.0011X, IECEx BAS 20.0012X, IECEx BAS 20.0013X, IECEx BAS 20.0014X, Baseefa16ATEX0037U, Baseefa16ATEX0038U, Baseefa16ATEX0039U, SGS20ATEX0045X, SGS20ATEX0046X, SGS20ATEX0048X, SGS20ATEX0049X, SGS20ATEX0050X, SGS20ATEX0051X and is held with IECEx BAS 16.0040U.

iii) These drawings are common to IECEx BAS 20.0011X, IECEx BAS 20.0012X, IECEx BAS 20.0013X, IECEx BAS 20.0014X, SGS20ATEX0048X, SGS20ATEX0049X, SGS20ATEX0050X, SGS20ATEX0051X and are held with IECEx BAS 20.0011X.

iv) These drawings are common to IECEx BAS 20.0008X, IECEx BAS 20.0011X, IECEx BAS 20.0012X, IECEx BAS 20.0013X, IECEx BAS 20.0014X, SGS20ATEX0045X, SGS20ATEX0048X, SGS20ATEX0049X, SGS20ATEX0050X, SGS20ATEX0051X and are held with IECEx BAS 20.0008X.

v) These drawings are common to IECEx BAS 20.0010X, IECEx BAS 20.0011X, IECEx BAS 20.0013X, SGS20ATEX0047X, SGS20ATEX0048X, SGS20ATEX0050X and are held with IECEx BAS 20.0010X.

vi) These drawings are common to IECEx BAS 20.0011X, IECEx BAS 20.0013X, SGS20ATEX0048X, SGS20ATEX0050X and are held with IECEx BAS 20.0011X.

20 Certificate History

Certificate No.	Date	Comments
SGS20ATEX0048X	23 October 2020	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0:2012+A11:2013, EN IEC 60079-7:2015+A1:2018, EN 60079-18:2015+A1:2017, EN 60079-30-1:2017 and EN 60079-31:2014 is documented in Test Report No. GB/BAS/ExTR20.0030/00.

Certificate No.	Date	Comments
SGS20ATEX0048X Issue 1	11 February 2021	To assess the BTV range of self-regulating trace heating systems against EN IEC 60079-0:2018, introduce the low profile power connection, splice and end seal kits, types C-150-E, S-150 and E-150 afforded DEKRA20ATEX0011U, minor amendments to the product description, to change the product name to "BTV Range of Self-Regulating Trace Heating Systems" and to amend the Specific Conditions of Use. The associated test and assessment is documented in Test Report No. GB/BAS/ExTR21.0005/00.
SGS20ATEX0048X Issue 2	7 July 2021	Minor drawing updates not affecting certification. Baseefa Certification Report GB/BAS/ExTR21.0060/00 refers.
SGS20ATEX0048X Issue 3	3 September 2021	Minor change to the BTV-8BTV-CR, BTV-8BTV-CT, BTV-10BTV-CR and BTV-10BTV-CT heating cable dimensions. Baseefa Certification Report GB/BAS/ExTR21.0104/00 refers.
For drawings applicable to each issue, see original of that issue.		

Certificate Number
Baseefa13ATEX0137
Issue 6

Issued 30 September 2021
Page 1 of 4

1 # EU - TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres**
Directive 2014/34/EU

3 EU - Type Examination Certificate Number: **Baseefa13ATEX0137 Issue 6**

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **ETS-05 Electronic Thermostat**

5 Held by: **nVent Thermal Belgium NV**

6 Address: **Research Park Haasrode - Zone 2, Romeinse straat 14, B-3001 Leuven, Belgium**

7 This re-issued certificate extends EC Type Examination Certificate No. Baseefa13ATEX0137 to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

8.1 The original certificate was issued by SGS Baseefa Ltd (UK Notified Body 1180). It, and any supplements previously issued by SGS Baseefa Ltd have been transferred to the supervision of SGS Fimko Oy (EU Notified Body 0598). The original certificate number is retained.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN IEC 60079-7:2015+A1:2018 EN 60079-11:2012 EN 60079-18: 2015 EN 60079-31:2013

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

See schedule

SGS Fimko Oy Customer Reference No. **5034** Project File No. **20/0458**

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Tuomas Hänninen
SGS Fimko Oy

13 **Schedule**

14 **Certificate Number Baseefa13ATEX0137 – Issue 6**

15 Description of Product

The nVent ETS-05 Electronic Thermostat provides accurate temperature control for heating cables.

It comprises a plastic box with terminals inside for connection to the sensor and to the incoming user connections. Relay contacts are present to allow resistive loads of up to 230V a.c. at 32A to be controlled.

ETS-05-a1-bb-c
The supply range for the equipment is 99 to 121V a.c.
Supply & relay terminal block TB1 U_m = 253V. Rated current = 32A.
Relay terminal block TB3 (if present) U_m = 253V.

ETS-05-a1R-bb-c
The supply range for the equipment is 99 to 132V a.c. U_m = 253V.
Supply & relay terminal block TB1 Um = 253V. Rated current = 32A.
Relay terminal block TB3 (if present) Um = 253V.

ETS-05-a2-bb-c
The supply range for the equipment is 195 to 230V a.c. U_m = 253V.
Supply & relay terminal block TB1 Um = 253V. Rated current = 32A.
Relay terminal block TB3 (if present) Um = 253V.

ETS-05-a2R-bb-c
The supply range for the equipment is 195 to 277V a.c. U_m = 277V.
Supply & relay terminal block TB1 Um = 277V. Rated current = 32A.
Relay terminal block TB3 (if present) Um = 277V.

The options a bb & c affect the operational non-safety aspects:-
a = A (0°C to 49°C model)
H (0°C to 499°C model)
L (0°C to 199°C model)
bb = A (American market version)
= E (European market version)
= J (Japanese market version)
c = A (Alarm output model) Rated alarm output = 275V, 3A resistive.
= not present (Alarm output not present)

Sensor Connections - Terminal Block TB2

U_o = 5.88V
I_o = 29mA
P_o = 43mW
C_i =26nF
L_i = 0
U_i = 0

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected to hazardous area terminals must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
IIC	43	43	843
IIB	1000	172	3373
IIA	1000	345	6746

The above load parameters apply where:

1. The external circuit contains no combined lumped inductance L_i and capacitance C_i greater than 1% of the above values, or
2. The inductance and capacitance are distributed as in a cable, or
3. The external circuit contains either only lumped inductance or lumped capacitance in combination with a cable.

In all other situations e.g. the external circuit contains combined lumped inductance and lumped capacitance, up to 50% of each of the L and C values is allowed.

The equipment is marked:

Ⓔx II 2(1)G Ex eb ia mb [ia Ga] IIC T5 Gb -40ºC ≤ Ta ≤ +60ºC
Ⓔx II 2D Ex tb IIIC T100ºC Db

16 Report Number

See Certificate History.

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product.

Clause	Subject	Compliance
1.2.7	LVD type requirements	Standards require manufacturer's declaration, supplied.
1.2.8	Overloading of equipment (protection relays, etc.)	Covered by installation rules and manufacturer's instructions
1.4.1	External effects	The Purchaser should make the manufacturer aware of such issues. Covered in Instructions
1.4.2	Aggressive substances, etc.	The Purchaser should make the manufacturer aware of such issues. Covered in Instructions

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
RGD 1102-107	1	6	01/05/2021	ETS-05 nVent Certification Label

This drawing is held with IECEx BAS 13.0071 Issue 6.
Other applicable drawings are listed on Baseefa13ATEX0126 Issue 5.

20 Certificate History

Certificate No.	Date	Comments
Baseefa13ATEX0137	26 August 2014	The release of the prime certificate. The associated test and assessment against the requirements of EN60079-0: 2012, EN60079-7: 2007, EN60079-11: 2012, EN60079-18: 2009 & EN60079-31: 2013 is recorded in Report GB/BAS/ExTR14.0185/00 for Project 12/0565
Baseefa13ATEX0137 Issue 1	21 December 2016	This issue reflects the issue of Baseefa13ATEX0126 Issue 1. Report GB/BAS/ExTR16.0395/00, Project 16/0987

Certificate No.	Date	Comments
Baseefa13ATEX0137/2	28 February 2018	To permit the use of an alternative opto-coupler and the correction of the marking code. See report GB/BAS/ExTR18.0099/00 for project 17/0869.
Baseefa13ATEX0137/3	22 January 2019	To confirm the certificate is now held in the name of nVent Thermal Belgium BV, and to permit the label to show name of nVent Thermal Belgium BV. See GB/BAS/ExTR18.0125/00 for project 17/0864.
Baseefa13ATEX0137/4	8 April 2020	To permit the addition of a new variant model ETS-05-x3-x that has an increased voltage range of 195V to 277V, and an increased U_m of 277V. See report GB/BAS/ExTR20.0070/00 for project 20/0005.
Baseefa13ATEX0137 Issue 5	10 August 2020	This issue of the certificate incorporates previously issued primary & supplementary certificates into one certificate, permits the use of an alternative enclosure, and confirms the equipment meets the requirements of EN IEC 60079-0:2018, EN IEC 60079-7: 2015+A1:2018 and EN 60079-18: 2015. See report GB/BAS/ExTR20.0119/00 for project 20/0123.
Baseefa13ATEX0137 Issue 6	30 September 2021	This issue of the certificate permits the addition of models with alarm outputs and permits the introduction of a new model naming convention. See report GB/BAS/ExTR21.0172/00 for project 20/0458.
For drawings applicable to each issue, see original of that issue.		

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

(1) EU-Baumusterprüfbescheinigung

(2) Geräte oder Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 2014/34/EU**

(3) EU-Baumusterprüfbescheinigungsnummer

PTB 20 ATEX 1008 U **Ausgabe: 1**

(4) Produkt: Integriertes Begleitheizungs-Anschlusssystem Typ JBx-100-xx-xx und T-100

(5) Hersteller: nVent Thermal Belgium LLC

(6) Anschrift: Romeinse straat 14, 3001 Leuven, Belgien

(7) Die Bauart dieses Produkts sowie die verschiedenen zulässigen Ausführungen sind in der Anlage und den darin aufgeführten Unterlagen zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Physikalisch-Technische Bundesanstalt, notifizierte Stelle Nr. 0102 gemäß Artikel 17 der Richtlinie 2014/34/EU des Europäischen Parlaments und des Rates vom 26. Februar 2014, bescheinigt, dass dieses Produkt die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Produkten zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllt.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht PTB Ex 21-10134 festgehalten.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN IEC 60079-0:2018; EN IEC 60079-7:2015/A1:2018-01; EN 60079-18:2015; EN 60079-31:2014

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Produkts in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EU-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Prüfung des festgelegten Produkts gemäß Richtlinie 2014/34/EU. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Bereitstellen auf dem Markt. Diese Anforderungen werden nicht durch diese Bescheinigung abgedeckt.

(12) Die Kennzeichnung des Produkts muss die folgenden Angaben enthalten:

II 2 G Ex eb mb IIC Gb

II 2 D Ex tb mb IIIC Db

Konformitätsbewertungsstelle, Sektor Explosionsschutz Braunschweig, 22. März 2021
Im Auftrag

Dr.-Ing. D. Markus
Direktor und Professor

ZSEx10100d c

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Physikalisch-Technische Bundesanstalt
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(13) # Anlage

(14) **EU-Baumusterprüfbescheinigung PTB 20 ATEX 1008 U, Ausgabe: 1**

(15) Beschreibung des Produkts

Die JBx-100-xx-xx und T-100 Anschlusskasten-Serie ist ein Anschlusssystem für elektrische Begleitheizungssysteme. Die Anschlusskastenserie JBx-100-xx-xx ist in vier verschiedene Versionen unterteilt (JBS-100-xx-xx, JBM-100-xx-xx und T-100). Diese Anschlusskastenserie ist auf einem integrierten Rohrträger montiert, um elektrische Heizkabel an das Stromnetz anzuschließen oder um eine Verbindung zwischen 2 oder 3 Heizkabeln herzustellen. Die verschiedenen Modelle der Serie umfassen Optionen wie: Kästen mit einer Offshore-Platte (Erdungsplatte) und Kästen mit einem optionalen Lichtmodul. Die vierte Version der Anschlusskasten-Serie ist JBU-100-xx-xx. Diese Version hat die gleichen Eigenschaften, wird jedoch anstelle des Rohrträgers mit einer Halterung direkt an der Rohrleitung montiert.

Typ JBS-100-xx-xx
Der Anschlusskasten ist auf einem integrierten Rohrträger installiert. Im Inneren des Anschlusskastens JBS-100-xx-xx befindet sich eine DIN-Schiene auf der zertifizierte Klemmen installiert sind. Zusätzliche Klemmen können hinzugefügt werden, um den Anschluss eines externen Thermostaten zu ermöglichen. Der Anschlusskasten ist für den Anschluss eines Heizkabels an ein Stromkabel (mit oder ohne Thermostat) ausgelegt. Die Stromkabel werden im Anschlusskasten durch ein Loch in der Seitenwand des Kastens und eine zertifizierte Kabelverschraubung eingeführt.

Typ JBM-100-xx-xx
Der Anschlusskasten ist auf einem integrierten Rohrträger installiert. Der Anschlusskasten JBM-100-xx-xx ist für die Aufnahme von bis zu maximal drei Heizkabeln ausgelegt. Daher sind drei Paare von zertifizierten Klemmen vorgesehen. Gelegentlich können weitere Klemmen installiert werden, um die Verkettung der Stromversorgung zu unterstützen. Das Stromkabel wird über ein Loch in der Seitenwand des Kastens und eine zertifizierte Kabelverschraubung in den Kasten eingeführt. Für die Heizkabel ist eine zusätzliche Zugentlastung vorgesehen. Die Zugentlastung verhindert, dass die Heizkabel beim Ziehen verrutschen.

Typ JBU-100-xx-xx
Die JBU-100-xx-xx ist nicht auf einem integrierten Rohrträger installiert. Der Anschlusskasten kann auf einer stabilen Struktur wie z.B. einem Rohrgestell, einer Wand über die M6-Schrauben oder über eine optionale Halterung direkt auf dem Rohr installiert werden. Der Anschlusskasten ist so ausgelegt, dass bis zu maximal vier Heizkabel an das Stromnetz installiert werden können. Die elektrischen Verbindungen werden mit Hilfe von Klemmen hergestellt, die auf einer DIN-Schiene im Inneren des Anschlusskastens installiert sind.
Alternativ kann JBU-100-xx-xx als Verteilerkasten für Leistungs- und Steuerkabel verwendet werden. Es dürfen nur Leitungseinführungen verwendet werden, die für den Bereich entsprechend zertifiziert sind und die den Abmessungen des Kabels entsprechen.

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Auszüge oder Änderungen bedürfen der Genehmigung der Physikalisch-Technischen Bundesanstalt.

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Physikalisch-Technische Bundesanstalt
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Nationales Metrologieinstitut

Anlage zur EU-Baumusterprüfbescheinigung PTB 20 ATEX 1008 U, Ausgabe: 1

Typ T-100
Der T-100 ist ein Kasten, der als Anschlusskasten (Verbindungskasten) für den Anschluss von bis zu maximal 3 Heizkabeln verwendet wird. Die Box wird auf einem Rohrständer installiert, der die Eingänge und den Schutz für die installierten Heizkabel bietet. Für die Heizkabel ist eine zusätzliche Zugentlastung vorgesehen. Die Zugentlastung verhindert, dass die Heizkabel beim Ziehen verrutschen. Die Verbindung zwischen den Leitern der Heizkabel wird über Aderendhülsen hergestellt. Nach der Installation werden die Leiter mit Schutzkappen aus temperaturbeständigem Silikon elektrisch isoliert.

Änderungen in Bezug auf vorherige Ausgaben

Aufnahme der Verwendung des selbstregulierenden Parallelheizkabels Typ HTV

Typschlüssel

JB	x	-	100	-	xx	-	xx
	1		2		3		4

1	S	JBS – zur Verbindung von einem Heizkabel
	M	JBM – zur Verbindung von bis zu max. drei Heizkabeln
	U	JBU – Universelle Verbindung
2	100	Aufrechte Installation
3	A	Version mit gewindelosen Bohrungen
	L	Version mit optionalem Lichtmodul
	E	Version mit metrischen Gewindebohrungen
	P	Version mit optionaler Offshore-Platte (Erdungsplatte)
	D	Version mit optionalem Belüftungsstopfen
4	E	Version mit metrischen Gewindebohrungen
	A	Version mit gewindelosen Bohrungen
	P	Version mit optionaler Offshore-Platte (Erdungsplatte)

Technische Daten

Umgebungstemperaturbereich	Standard Version	-55°C to +56°C
	Mit Lichtmodul	-40°C to +40°C
Max. Anzahl der Heizbänder	JBS-100-xx-xx	1
	JBM-100-xx-xx	3
	JBU-100-xx-xx	3 (4 ohne Stromkabel)
	T-100	3

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Anlage zur EU-Baumusterprüfbescheinigung PTB 20 ATEX 1008 U, Ausgabe: 1

Anzahl der Anschlussklemmen*	JBS-100-xx-xx	L+N+PE
	JBM-100-xx-xx	2xL + 2xN + 2xPE
	JBU-100-xx-xx	2xL + 2xN + 2xPE
	T-100	-
Max. Kabelquerschnitt	JBS-100-xx-xx	0.5 mm² bis 10 mm²
	JBM-100-xx-xx	0.5 mm² bis 10 mm²
	JBU-100-xx-xx	0.5 mm² bis 10 mm²
	T-100	max. 3,3 mm²
Bemessungsspannung**	Abhängig vom verwendeten Heizkabeltyp	
	BTV1, QTVR1, XTV1, KTV1, HTV1	max. 120 V
	BTV2, QTVR2, XTV2, KTV2, HTV2	max. 277 V
	VPL1	max. 120 V
	VPL2	max. 230 / 254 V
	VPL4 + FHPC	max. 480 V
Bemessungsstrom	JBS-100-xx-xx	Max. 53 A
	JBM-100-xx-xx	Max. 53 A
	JBU-100-xx-xx	Max. 53 A
	T-100	Max. 40 A

* Weitere Klemmen sind zulässig, solange der Gesamtstrom durch das Gehäuse 40 A nicht übersteigt.

** abhängig von Absicherung bzw. max. zulässigem Bemessungsstrom, max. zulässiger Temperatur der zu beheizenden Oberfläche; siehe hierzu Datenblätter bzw. Betriebsanleitung des Herstellers.

Hinweise zur Herstellung

1. Die maximal zulässige Temperatur für die zu beheizende Fläche (Rohrtemperatur) ist auf der Grundlage der spezifischen Leistungsklasse, der max. zulässigen Betriebstemperatur der Heizbänder, der Nennspannung und der max. zulässigen Strombelastbarkeit zu bestimmen.
2. Anwendungen, für die wärmebeständige Zuleitungen inkl. Kabelverschraubungen aus Metall verwendet werden müssen, sind vom Hersteller anzugeben und vom Errichter/Anwender zusammenzustellen.
3. Einschränkungen bezüglich der Verwendung der Typen JBS-100-L-x, JBM-100-L-x und JBU-100-L-x (mit Kontrollleuchte) sind vom Hersteller anzugeben und vom Installateur/Benutzer zu beachten.

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Anlage zur EU-Baumusterprüfbescheinigung PTB 20 ATEX 1008 U, Ausgabe: 1

4. Die Parallelheizbänder vom Typ VPL und FHPC müssen so installiert werden, dass ihre kalten Enden außerhalb des Klemmenkastens beginnen.
5. Wenn JBU-100-xx-x mit Spannungseinspeisung installiert wird, müssen bei 40 °C < Ta < 56 °C eine ausreichende hitzebeständige Einspeisung und Metall-Verschraubungen, inkl. Dichtung, verwendet werden. Für die Metallverschraubungen inkl. Dichtung muss ein separates IECEx-Zertifikat ausgestellt und von nVent Thermal verifiziert worden sein.
6. Für Heizkabel müssen zertifizierte nVent Thermal Verschraubungen vom Typ C25-100-METAL bei 40 °C < Ta < 56 °C verwendet werden.
7. Die Ausführung des Anschlusskastens mit Belüftungsstopfen muss am Rohr aufgehängt werden, um eine einwandfreie Funktion zu gewährleisten.

(16) Prüfbericht PTB Ex 21-10134

(17) Besondere Bedingungen

Die Verwendung von alternativen Heizbändern ohne Freigabe durch den Hersteller ist nicht zulässig.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

Erfüllt durch Übereinstimmung mit den vorgenannten Normen.

Konformitätsbewertungsstelle, Sektor Explosionsschutz — Braunschweig, 22. März 2021
Im Auftrag

Dr.-Ing. D. Markus
Direktor und Professor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT

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(1) EU-TYPE EXAMINATION CERTIFICATE
(Translation)

(2) Equipment or Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 20 ATEX 1008 U **Issue: 1**

(4) Product: Integrated Heat Tracing Connection System
Type JBx-100-xx-xx and T-100

(5) Manufacturer: nVent Thermal Berlgium NV

(6) Address: Romeinse straat 14, 3001 Leuven, Belgium

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential Test Report PTB Ex 21-10134.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018; EN IEC 60079-7:2015/A1:2018-01; EN 60079-18:2015; EN 60079-31:2014

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

II 2 G Ex eb mb IIC Gb

II 2 D Ex tb mb IIIC Db

Konformitätsbewertungsstelle Sektor Explosionsschutz Braunschweig, March 22, 2021
On behalf of PTB:

Dr.-Ing. D. Markus
Direktor und Professor

ZSEx001e c

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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(13) # SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 20 ATEX 1008 U, Issue: 1**

(15) Description of Product

The JBx-100-xx-xx and T-100 Connection box series is a connection system for electrical trace heating systems. The JBx-100-xx-xx Connection box series is subdivided in four different versions (JBS-100-xx-xx, JBM-100-xx-xx and T-100). This junction box series is mounted on an integrated pipe stand for the connection of electrical heating cables to the mains supply or to provide a splice between 2 or 3 heating cables. The different models of the series include options such as: boxes equipped with an offshore plate (earth plate) and boxes with an optional light module and lens. Another part of the Connection box series is JBU-100-xx-xx. This version has the same features, but is mounted directly on the pipeline with a support bracket instead of the pipe stand.

Product type JBS-100-xx-xx
The junction box is installed on an integral pipe support. Inside the JBS-100-xx-xx junction box there is installed one DIN rail on which are installed a number of certified terminals. Additional terminals can be added to allow an external thermostat to be connected. The junction box is designed to connect one heating cable to one power cable (with or without thermostat). Power cables are fed in the junction box by means of a hole in the sidewall of the box and a certified cable gland.

Product type JBM-100-xx-xx
The junction box is installed on an integral pipe support. The JBM-100-xx-xx junction box is designed to accommodate up to a maximum of three heating cables. Therefore, there are three pairs of certified terminals provided. Occasionally more terminals can be installed to support daisy chaining of the power supply. The power cable will be fed in the box via a hole in the sidewall of the box and a certified cable gland. Additional strain relief is provided for the heating cables. The strain relief is avoiding that the heating cables will slip when pulled.

Product type JBU-100-xx-xx
The JBU-100-xx-xx is not installed on an integral pipe support. The junction box can be installed on a stable structure such as a pipe rack; a wall via the M6 screws or can be installed via an optional support bracket directly on the pipe. The junction box is designed to accommodate up to a maximum of four heating cables to the mains supply. The electrical connections are established by means of terminals that are installed on a DIN rail inside the junction box.
Alternatively, the JBU type boxes can be used as a marshalling box for power and control cables. Use glands that are suitably certified for the area and that meet the dimensions of the cable.

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SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 20 ATEX 1008 U, Issue: 1

Product type T-100
The T-100 is a box used as a connection (Splice) box for connecting up to maximum 3 heating cables. The Box is installed on a pipe stand providing the entries and protection for the installed heating cables. Additional strain relief is provided for the heating cables. The strain relief is avoiding that the heating cables will slip when pulled. The connection between the conductors of the heating cables is established via ferrules. Once installed the conductors are electrically isolated using protective caps made out of temperature resistive silicone.

Nomenclature

JB	x	-	100		-	xx	-	xx
	1		2			3		4

1	S	JBS – for connection of one heating cable
	M	JBM – for connection of up to three heating cables.
	U	JBU – universal
2	100	Above installation
3	A	version with unthreaded holes
	L	model with optional Light module
	E	version with threaded metric holes
	P	model with optional off shore plate
	D	model with optional drain plug
4	E	version with threaded metric holes
	A	version with unthreaded holes
	P	model with optional off shore plate

Technical data

Ambient temperature range	Standard version	-55°C to +56°C
	With pilot lamp	-40°C to +40°C
Max. number of heating cables	JBS-100-xx-xx	1
	JBM-100-xx-xx	3
	JBU-100-xx-xx	3 (4 without power cable)
	T-100	3
Standard number of terminals*	JBS-100-xx-xx	L+N+PE
	JBM-100-xx-xx	2xL + 2xN + 2xPE
	JBU-100-xx-xx	2xL + 2xN + 2xPE

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SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 20 ATEX 1008 U, Issue: 1

	T-100	-
Max. wire cross section	JBS-100-xx-xx	0.5 mm² to 10 mm²
	JBM-100-xx-xx	0.5 mm² to 10 mm²
	JBU-100-xx-xx	0.5 mm² to 10 mm²
	T-100	max. 3.3 mm²
Rated voltage**	Depends on the heating cable type used	
	BTV1, QTVR1, XTV1, KTV1, HTV1	max. 120 V
	BTV2, QTVR2, XTV2, KTV2, HTV2	max. 277 V
	VPL1	max. 120 V
	VPL2	max. 230 / 254 V
	VPL4 + FHPC	max. 480 V
Rated current	JBS-100-xx-xx	max. 53 A
	JBM-100-xx-xx	max. 53 A
	JBU-100-xx-xx	max. 53 A
	T-100	max. 40 A

* More terminals are permitted as long as the total current trough the enclosure is not exceeding 40A

**subject to protection and max. permissible rated current, max. permissible temperature of the surface to be heated; see data sheets and operating instructions of the manufacturer.

Notes for manufacturing

1. The temperature accepted as a maximum for the surface to be heated (tube temperature) shall be determined on the basis of the specific performance category, the max. admissible operating temperature of the parallel strip heaters, the voltage rating and the max. admissible current carrying capacity.
2. Applications for which heat-resistant incoming cables incl. cable glands from metal have to be used, have to be specified by the manufacturer and must be compiled with the installer/user.
3. Restrictions regarding the use of type JBS-100-L-x, JBM-100-L-x and JBU-100-L-x (with pilot lamp) have to be specified by the manufacturer and must be complied with the installer/user.
4. The parallel strip heaters, type VPL and FHPC, have to be installed so that their cold ends start outside the terminal box.
5. If JBU-100-xx-xx with voltage infeed is installed, an adequate heat-resistant feeder and screwed metal glands, incl. gasket, must be used at 40 °C < Ta < 56 °C. For the screwed

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SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 20 ATEX 1008 U, Issue: 1

metal glands, incl. gasket a separate IECEx Certificate must have been issued and they must have been verified by nVent Thermal.

6. For heating cables, certified nVent Thermal glands of type C25-100-METAL must be used at 40 °C < Ta < 56 °C.
7. The version of the connection box with a drain plug must be suspended on the pipe to ensure proper function.

(16) Test Report PTB Ex 21-10134

(17) Specific conditions of use

Alternative strip heaters must not be used, unless the manufacturer's approval has been obtained.

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, March 22, 2021

D. Markus

Dr.-Ing. D. Markus
Direktor und Professor

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT

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(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 14 ATEX 1015 X

(4) Equipment: Cable gland, type GHG 960 **** * ****

(5) Manufacturer: COOPER Crouse-Hinds GmbH

(6) Address: Neuer Weg Nord 49, 69412 Eberbach, Germany

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential test report PTB Ex 14-14056.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012, EN 60079-7:2007, EN 60079-31:2009

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

II 2 G Ex e IIC Gb

II 2 D Ex tb IIIC Db

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Dipl.-Phys. U. Völkel

Braunschweig, June 27, 2014

ZSEx10100e.dotm

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(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 14 ATEX 1015 X

(15) Description of equipment

The GHG 960 **** * **** cable gland is made from polyamide and is used for entering permanently laid cables into stationary electrical equipment of Increased Safety "e" and Protection by Enclosure "tb" type of protection. The cable gland consists of adapter glands with two different thread lengths, different types of sealing rings and a cap nut. Accessories are a blanking plug, reducing gland, screwed multiple and expansion gland, and screwed flat-cable gland. To distinguish between Ex-e and Ex-i circuits, the cap nut is optionally provided in black and blue, respectively.

The cable glands are installed in enclosures with through-holes or threaded holes, with our without lock nut.

Technical data
Table 1

Designation	Clamp range dia. in mm Sealing ring 1 / Sealing ring 2		Service temperature	One pc.	Packing set
Cable gland, M12	Ø 5 – 7	---------	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M16	Ø 7 – 10	---------	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M20	Ø 7 – 9	Ø 9.5 – 13	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M20	Ø 7 – 9	Ø 9.5 – 11	-40°C - +70°C	GHG 960 9248 P****	GHG 960 1955 R****
Cable gland, M25	Ø 10 – 13	Ø 13.5 – 17.5	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M25	Ø 10 – 13	Ø 13.5 – 15	-55°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M32	Ø 14 – 17	Ø 17.5 – 21	-55°C - +70°C	GHG 960 9248 P****	GHG 960 1955 R****
Cable gland, M32	Ø 14 – 17	Ø 17.5 – 21	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M40	Ø 19 – 22	Ø 22 – 28	-55°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M50	Ø 24 – 28	Ø 28 – 35	-55°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Cable gland, M63	Ø 29 – 35	Ø 36 – 41 *	-55°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Expansion gland, M16/M20X1.5	Ø 7 – 9	Ø 9.5 – 13	-20°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Expansion gland, M20/M25X1.5	Ø 10 – 13	Ø 13.5 – 17.5	-20°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Expansion gland, M25/M32X1.5	Ø 14 – 17	Ø 17.5 – 21	-55°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Expansion gland, M32/M40X1.5	Ø 19 – 22	Ø 22 – 28	-55°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Expansion gland, M40/M50X1.5	Ø 24 – 28	Ø 28 – 35	-55°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Expansion gland, M50/M63X1.5	Ø 29 – 35	Ø 36 – 41 *	-55°C - +70°C	GHG 960 9244 P****	GHG 960 1956 R****
Reducing gland, M16-M12			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M20-M12			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M20-M16			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M25-M12			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M25-M16			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M25-M20			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M32-M12			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M32-M16			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M32-M20			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M32-M25			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M40-M16			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M40-M20			-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 14 ATEX 1015 X

Reducing gland, M40-M25		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M40-M32		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M50-M20		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M50-M25		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M50-M32		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M50-M40		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M63-M25		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M63-M32		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M63-M40		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Reducing gland, M63-M50		-55°C - +70°C	GHG 960 9237 P****	GHG 960 1946 R****
Multiple gland, M25X1.5 2-fold	Ø 4.5 – 7 ---------	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Multiple gland, M32X1.5 4-fold	Ø 4.5 – 7 ---------	-20°C - +70°C	GHG 960 9235 P****	GHG 960 1955 R****
Flat-cable gland, M25X1.	G18 = 12.2 - 9 x 8 -5 G26 = 14- 11 x 8 - 6	-55°C - +70°C (+110°C)	GHG 960 9242 P****	
Cable gland, PG 16	**	-20°C - +70°C	GHG 960 9243 P****	
Cable gland, PG 16	**	-55°C - +70°C	GHG 960 9243 P****	
Blanking plug for M12	Ø 5	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M16	Ø 6	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M20	Ø 7	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M25	Ø 10	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M32	Ø 13	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M40	Ø 19	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M50	Ø 25	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for M63	Ø 32	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****
Blanking plug for multiple gland	Ø 5	-55°C - +70°C	GHG 960 6107 P****	GHG 960 1944 R****

* An additional seal for clamping range dia. 41mm to dia. 48mm is included
** Identical with M25 cable gland

Cable gland M20x1.5 options with slotted seal for the following cables:

Glass fibre cable	Record	PTB test report	Application
Cable dia. 6.4mm / Breakout inner cable / type: orange *	MI_0657a	PTB Ex 07-17154	-5°C - +45°C
Cable dia. 7.0mm / Ultra-Fox Plus / type: 903 AG 621 02 709*	MI_0657a	PTB Ex 07-17154	-20°C - +70°C
Cable dia. 6.8mm / Ehret / ICS 24 / type : 84 305 .. . . *	MI_0657a1	PTB Ex 07-17154	-20°C - +60°C
Cable dia. 2mm / fibre optic cable *	PTB letter	PTB Ex 07-17154	-20°C - +60°C

For use in Zone 1 and Zone 21

Cable gland with two different thread lengths
short = P/R****
long = P/R****

Cable gland with differently coloured cap nuts
black Ex-e version = P/R****
blue Ex- i version = P/R****

Ambient temperatures:
max. -55 °C to +70°C (110°C)*
see table 1
* 110°C for the sealing ring of the heating cable of the flat-cable gland

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 14 ATEX 1015 X

For use in equipment of group II with the following mechanical hazard levels:	Cable glands: M12 / -20°C = low M16 / -20°C = low M20 / -20°C = high M20 / -40°C = low M25 -M 63 = high PG16 = high Multiple gland: M25 / -20°C = high M32 / -20°C = high Expansion gland: M16/M20 / -20°C = high M16/M20 / -40°C = low M20/M25 - M50/M63 = high
To be installed in equipment with a wall thickness of	at least 1.5 mm
Protection against solid foreign objects, water and contact	IP 66

Nomenclature

GHG 960	****	*	****
1	2	3	4

1) Type
2) Design and versions, see table 1
3) P = single part
   R = packing set
4) Options, e.g. colour, thread length, gland with flameproof fastener, size, etc.

(16) Test Report PTB Ex 14-14056

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 14 ATEX 1015 X

(17) Special conditions for safe use

Only permanently installed cables may be entered through the glands. The operating company must ensure that adequate strain relief is provided.

The degree of protection (IP66) will only be met if seals and cable glands are properly fitted. The manufacturer's instructions must be followed.

The types with low impact energy have to be mounted in the enclosure, so they are mechanically protected against impact energy.

The GHG 960 6107 P*** and GHG 960 1944 R **** blanking plugs may only be used together with GHG 960 92** P**** and GHG 960 19** R**** cable glands.

The EC-Type-Examination Certificate and future supplements thereto shall at the same time be considered as supplements for EC Type Examination Certificates PTB 99 ATEX 3128 X and PTB 99 ATEX 3101 X.

(18) Essential health and safety requirements

Met by compliance with the afore-mentioned Standards.

Zertifizierungssektor Explosionsschutz
On behalf of PTB:

Braunschweig, June 27, 201

Dipl.-Phys. U. Völkel

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(1) # EC-TYPE-EXAMINATION CERTIFICATE

(Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

PTB 98 ATEX 3130

(4) Equipment: Dummy plugs type GHG 960 663.P....

(5) Manufacturer: CEAG Sicherheitstechnik GmbH

(6) Address: Neuer Weg Nord 49, D-69412 Eberbach

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 98-30021.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1992 EN 50019:1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II 2 G EEx e II

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, November 12, 1998

Dr.-Ing. U. [illegible]
Regierungsdirektor

sheet 1/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

(13) # SCHEDULE

(14) ## EC-TYPE-EXAMINATION CERTIFICATE PTB 98 ATEX 3130

(15) Description of equipment

The type GHG 960 663.P... dummy plugs made of polyamide serve to close threaded holes for cable entries in enclosures of the type of protection increased safety "e". Installation in clearance holes is with lock nuts made of brass or polyamide.

Technical data

Nominal size	Installation in encloses of wall thickness
M 16 x 1,5	≥ 3,5 mm
M 20 x 1,5	≥ 3,5 mm
M 25 x 1,5	≥ 3,5 mm
M 32 x 1,5	≥ 3,5 mm
M 40 x 1,5	≥ 3,5 mm
M 50 x 1,5	≥ 3,5 mm
range of temperature of use:	-55 °C to +95 °C
range of temperature of ambient:	-55 °C to +55 °C
Suitability for equipment of group II with a degree of mechanical hazard:	high
Protection against contact, foreign matter and water:	at least IP 54 acc. to EN 60 529:1991

(16) Test report PTB Ex 98-30021 (comprising 3 pages, description and drawing)

(17) Special conditions for safe use

not applicable

(18) Essential health and safety requirements

The degree of protection - at least IP 54 according to EN 60529:1991 - is guaranteed only by appropriate selection of the dummy plugs and proper installation in the equipment.

Zertifizierungsstelle Explosionsschutz
By order:

Dr.-Ing. U. Engel
Regierungsdirektor

Braunschweig, Novermber 12,1998

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

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Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin

1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 98 ATEX 3130

(Translation)

Equipment: Dummy plugs, type GHG 960 663. P.

Marking: Ⓔx **II 2 G EEx e II**

Manufacturer: CEAG Sicherheitstechnik GmbH

Address: Neuer Weg Nord 49
69412 Eberbach, Germany

Description of supplements and modifications

According to EN 50281-1-1:1998 the type GHG 960 663.P... dummy plugs may also be used in areas in which explosive atmospheres with dust/air mixtures have to be expected to occur occasionally.

The marking is therefore changed to read:

Ⓔx **II 2 G/D EEx e II IP66**

Test report: PTB Ex 03-13301

Zertifizierungsstelle Explosionsschutz
By order:

Dipl.-Phys. U. Völker

PHYSIKALISCH-TECHNISCHE BUNDESANSTALT 24

Braunschweig, September 18, 2003

Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

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2.2 CERTIFICATES OF COMPLIANCE AND TEST REPORTS

nVent
Researchpark Haasrode 1730
Romeinse straat 14
Leuven 3001

Delivery No : IT-1755004

Certificate of Compliance and Test Report

Delivery Address : ROSETTI MARINO S.p.a.
Via del Marchesato 37
48122 MARINA DE RAVENNA
Italy

Your Order : 1724001647 123A90A

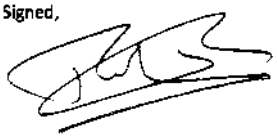
Customer contact : Customer Service Center Tel Fax

Heating Cable Test Results:

Test Parameter	Test Result
Dimensions	PASS
Workmanship	PASS
Dielectric	PASS
Outer Jacket/Sheath integrity	PASS
Wattage/Resistance	PASS

It is hereby certified that all items listed herein, shipping against your Purchase order number (below) were tested and conform to the requirements of nVent acceptance tests. Documentation substantiating this certification is kept on record in accordance with ISO 9001, 7.5.3

Signed,



nVent
Roel Peerlinck – Quality Manager

Date: 11/11/2024

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
10	1244-022489 E-20	9.000	PC	Your Code:		9.000
20	1244-022663 ETS-05-A2-E-A	1.000	PC	Your Code:		1.000
50	829939-000 JBS-100-E	7.000	PC	Your Code:		7.000
60	831519-000 JBM-100-E	4.000	PC	Your Code:		4.000
70	846243-000 ATE-180	5.000	PC	Your Code:		5.000
80	938947-000 LAB-I-01	45.000	PC	Your Code:		45.000

nVent

nVent
Researchpark Haasrode 1730
Romeinse straat 14
Leuven 3001

Delivery No : IT-1755004

Page : 2 of 2

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
100	C77221-000 GS-54	10.000	PC	Your Code:		10.000
110	D55673-000 JBM-SPA	1.000	PC	Your Code:		1.000
120	E90515-000 JBS-SPA	1.000	PC	Your Code:		1.000
90	976935-000 PSE-090	14.000	PC	Your Code:	IT	14.000
40	469145-000 3BTV2-CT	210.000	M	Your Code:	7405595A06	210.000

nVent
Researchpark Haasrode 1730
Romeinse straat 14
Leuven 3001

Delivery No : IT-1755006

Certificate of Compliance and Test Report

Delivery Address : ROSETTI MARINO S.p.a.
Via del Marchesato 37
48122 MARINA DE RAVENNA
Italy

Your Order : 1724001647 123A90A

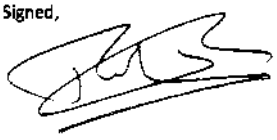
Customer contact : Customer Service Center Tel Fax

Heating Cable Test Results:

Test Parameter	Test Result
Dimensions	PASS
Workmanship	PASS
Dielectric	PASS
Outer Jacket/Sheath integrity	PASS
Wattage/Resistance	PASS

It is hereby certified that all items listed herein, shipping against your Purchase order number (below) were tested and conform to the requirements of nVent acceptance tests. Documentation substantiating this certification is kept on record in accordance with ISO 9001, 7.5.3

Signed,



nVent
Roel Peerlinck – Quality Manager

Date: 11/11/2024

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
10	1244-022489 E-20	1.000	PC	Your Code:		1.000
30	829939-000 JBS-100-E	1.000	PC	Your Code:		1.000
40	831519-000 JBM-100-E	1.000	PC	Your Code:		1.000
50	846243-000 ATE-180	3.000	PC	Your Code:		3.000
60	938947-000 LAB-I-01	3.000	PC	Your Code:		3.000
80	C77221-000 GS-54	1.000	PC	Your Code:		1.000

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Leuven 3001

Delivery No : IT-1755006

Page : 2 of 2

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
70	976935-000 PSE-090	1.000	PC	Your Code:	IT	1.000
20	469145-000 3BTV2-CT	16.000	M	Your Code:	7405596A01	16.000

nVent
Researchpark Haasrode 1730
Romeinse straat 14
Leuven 3001

Delivery No : IT-1755010

Certificate of Compliance and Test Report

Delivery Address : ROSETTI MARINO S.p.a.
Via del Marchesato 37
48122 MARINA DE RAVENNA
Italy

Your Order : 1724001647 123A90A

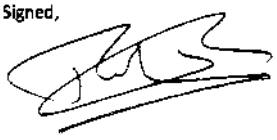
Customer contact : Customer Service Center Tel Fax

Heating Cable Test Results:

Test Parameter	Test Result
Dimensions	PASS
Workmanship	PASS
Dielectric	PASS
Outer Jacket/Sheath integrity	PASS
Wattage/Resistance	PASS

It is hereby certified that all items listed herein, shipping against your Purchase order number (below) were tested and conform to the requirements of nVent acceptance tests. Documentation substantiating this certification is kept on record in accordance with ISO 9001, 7.5.3

Signed,



nVent
Roel Peerlinck – Quality Manager

Date: 11/11/2024

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
10	1244-022489 E-20	1.000	PC	Your Code:		1.000
30	829939-000 JBS-100-E	1.000	PC	Your Code:		1.000
40	831519-000 JBM-100-E	1.000	PC	Your Code:		1.000
50	846243-000 ATE-180	5.000	PC	Your Code:		5.000
60	938947-000 LAB-I-01	10.000	PC	Your Code:		10.000
80	C77221-000 GS-54	5.000	PC	Your Code:		5.000

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Researchpark Haasrode 1730
Romeinse straat 14
Leuven 3001

Delivery No : IT-1755010

Page : 2 of 2

Line	Part No	Shipped Qty	UOM	Supplementary Info	Batch No	Batch Qty
70	976935-000 PSE-090	2.000	PC	Your Code:	IT	2.000
20	469145-000 3BTV2-CT	10.000	M	Your Code:	7405594A08	10.000

2.3 INSPECTION TEST PLAN (ITP) - EHT

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 1 of 9 Date: 14/03/2025 Rev: 02

Base Load Power Hub (BLPH)

INSPECTION TEST PLAN (ITP) – EHT

Document Number: 1724001647-QC-PRO-00002

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
ROSETTI MARINO SpA Stefano Lisgi Quality Control Dept.	27/03/2025

Document Class: 2

Rev.	Date	Description	Prepared	Reviewed	Approved
02	14/03/2025	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
01	13/01/2025	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
00	02/10/2024	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani

nVent

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 2 of 9 Date: 14/03/2025 Rev: 02

Revision / Change Log

Rev.	Description
00	Issue for Review (IFR)
01	Issue for Review (IFR)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

This document undergoes an issuance cycle within EDMS Fusionlive". Its distribution is electronically controlled. Once printed shall be considered as "NOT CONTROLLED" copy

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 3 of 9 Date: 14/03/2025 Rev: 02

Vendor: nVent Italy Srl	Vendor's Job n°: PIT240024
Purchase Order n°: 1724001647 123A90A	Item n°: -
Quality Category Inspection Level (CQ): N/A	Equipment: Electrical Heat Tracing system

Pos.	Quality related activity	reference documents	Report requested (Y/N)	Acceptance criteria/ verifying documents	Involvements					Note
					Sub Vendor	Vendor	Rosetti Marino	Crosswind	TPI	
BEFORE FABRICATION										
1	**Documentation**									
1.1	Contract Review/Project Change Control	QSP 002 (*)	N	Conformance to Contractor Purchase Order	-	H	-	-	-	
1.2	Design review and approval	SOP 023 (*)	N	Conformance to Contractor Specifications	-	R	R			

(*): nVent internal quality procedure

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 4 of 9 Date: 14/03/2025 Rev: 02

BEFORE FABRICATION										
2	**Material manufactured by nVent**									
2.1	Heating cables	QSP 005 (*) Supplier products datasheets (1724001647-EL-DS-00008)	N	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	H	R	R		
2.2	Junction Boxes, Thermostats and Accessories	QSP 005 (*) Technical requirements Supplier products datasheets (1724001647-EL-DS-00008)	N	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	H	R	R		

(*): nVent internal quality procedure

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 5 of 9 Date: 14/03/2025 Rev: 02

Pos.	Quality related activity	reference documents	Report requested (Y/N)	Acceptance criteria/ verifying documents	Involvements					Note
					Sub Vendor	Vendor	Rosetti Marino	Crosswind	TPI	
FABRICATION										
3	**Material manufactured by nVent**									
3.1	Heating cables	Supplier products datasheets (1724001647-EL-DS-00008)	N	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	H	R	R		
3.2	Junction Boxes, Thermostats and Accessories	Technical requirements Supplier products datasheets (1724001647-EL-DS-00008)	N	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	H	R	R		

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 6 of 9 Date: 14/03/2025 Rev: 02

Pos.	Quality related activity	reference documents	Report requested (Y/N)	Acceptance criteria/ verifying documents	Involvements					Note
					Sub Vendor	Vendor	Rosetti Marino	Crosswind	TPI	
FINAL TEST										
4	**Material manufactured by nVent**									
4.1	Heating cables -Visual and Dimensional test -Dielectric test -Wattage/Resistance test	Supplier bill of material (1724001647-EL-DG-00007) Supplier products datasheets (1724001647-EL-DS-00008)	Y	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	R	W	W		
4.2	Junction Boxes, Thermostats and Accessories -Visual and Dimensional test	Supplier bill of material 1724001647-EL-DG-00007) Supplier products datasheets (1724001647-EL-DS-00008)	Y	Conformance to IEEE Std 515-2015 EN 60079-30-1	-	R	W	W		
4.3	Packaging, preservation, marking and packing list check	As per 4.1.1 and 5.1 of Nvent Standard DOC K 0001	Y	As per 4.1.1 and 5.1 of Nvent Standard DOC K 0001	–	R	R	R		
4.4	Final documentation review (Material Certificates)	P.O., MR and relative attachments	Y	Conformance to P.O, MR and relative attachments	-	R	R	R		

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 7 of 9 Date: 14/03/2025 Rev: 02

Note:

1. QUALITY CATEGORY (QC)

Owner has defined the Inspection Levels of the components of all Project Units, based on all applicable codes, standards and project specification by assignment of one "Quality Category Inspection Level".
The Quality Category "CQ" is indicated in the 1st page of each material requisition and defines the class of inspection/test that that will be applied to the item following codes, standards, project specification and procedures requirements, the QC definition is as below:

- CQ1 Most criticality
- CQ2 significant criticality
- CQ3 Medium criticality
- CQ4 Low criticality

2. INTERVENTION POINTS (Involvements)

Hold Point (H)
The SUPPLIER and its SUB-SUPPLIERS cannot carry out and proceed beyond the specified inspections and tests without the marked representative's attendance, except where authorized in writing by CONTRACTOR / OWNER. The SUPPLIER shall notify the inspection activity to CONTRACTOR according to the time frame indicated in the contract Specifications.

Witness Inspection (W)
The SUPPLIER shall notify the inspection activity to CONTRACTOR by email according to the time frame indicated in the contract Specifications. SUPPLIER may proceed with the Witness point inspection activity in accordance with the notification schedule if CONTRACTOR does not elect to be present in writing, provided inspection and test records are made available to CONTRACTOR for review.

Review of Documentation (R)

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
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Review of documents needed for all process stages. Corresponding stage shall not proceed until said documents are reviewed and approved, where required.
Review of records stating that all contractual requirements are met.
The Inspection and test reports, relevant to the previous stages, shall be available for CONTRACTOR review. The above documents shall be available right after the previous inspection stages which they are relevant to. Delay of this kind of docs shall cause the stop of production and inspection activity.

Monitoring (M) and Operation Surveillance (S)
Random or regular interval CONTRACTOR's inspections to assure and verify that the requirements are met by the SUPPLIER. Random inspections are normally performed on first operation and at intervals commensurate with the production activity and agreed with CONTRACTOR.

Spot Witness (SW)
The SUPPLIER shall notify the inspection activity the inspection activity to CONTRACTOR by email according to the time frame indicated in the contract Specifications. SUPPLIER may proceed with the Spot Witness point inspection activity according to the notification schedule if CONTRACTOR does not elect to be present, provided inspection and test records are made available to CONTRACTOR for review.

Legend:

W	Witness inspection
SW	Spot Witness
H	Hold Point
R	Review Of Documentation
S	Operation surveillance
M	Monitoring
CQ	Criticality Inspection Level

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSPECTION TEST PLAN (ITP) - EHT	Sheet 9 of 9 Date: 14/03/2025 Rev: 02

Terms and definitions

- Vendor Manufacturer (Company / Organization) supplying the equipment or materials
- Sub Vendor Manufacturer (Company / Organization) supplying the equipment and materials to and as specified by Vendor
- Company / Owner Private or Public entity to be specified according to the project
- Contractor Rosetti Marino (Quality Control)
- AI /NB Authorized Inspector (Inspection Authority) / Notified Body

2.4	SHIPPING AND HANDLING PROCEDURE - EHT

CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SHIPPING AND HANDLING PROCEDURE - EHT	Sheet 1 of 5 Date: 26/09/2024 Rev: 0

Base Load Power Hub (BLPH)

SHIPPING AND HANDLING PROCEDURE – EHT

ROSETTI MARINO

1	APPROVED - WORK MAY PROCEED
2N	REVISE AND RE-SUBMIT - DO NOT PROCEED
2Y	REVISE AND RE-SUBMIT - WORK MAY PROCEED
3	REJECTED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	27/09/2024

Document Number:
1724001647-QC-PRO-00016

Document Class: 3

00	26/09/2024	Issue for Information (IFI)	L. Gentile	A. Martelli	P. Padovani
Rev.	Date	Description	Prepared	Reviewed	Approved

nVent

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SHIPPING AND HANDLING PROCEDURE - EHT	Sheet 2 of 5 Date: 26/09/2024 Rev: 0

Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SHIPPING AND HANDLING PROCEDURE - EHT	Sheet 3 of 5 Date: 26/09/2024 Rev: 0

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2. Recommendations for storage.....5

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1 SPECIAL PRECAUTIONS FOR HANDLING AND TRANSPORT

Self regulating heaters

During all storage, transport and handling, crates must be kept in the upright position as shown on the crates.

All heater strip and associated components should be kept sealed in their packing and stored in a dry, preferably heated environment.

All packing should be visually inspected every 6 months for physical damage.

Materials should not be released to the field until they are needed for construction, so as to minimise inadvertent damage.

All self-regulating accessories must be kept in their individual plastic bags until installation.

Handling of the reels must be done manually.

When unpacking the components, cables and other materials included in the electric heat tracing system, a general inspection should be conducted including confirmation of the correct type and quantities of material and corresponding documentation.

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2 RECOMMENDATIONS FOR STORAGE

The storage system must be defined to avoid risks following mechanical, physical or atmospheric damages. Store all materials in a clean and dry place. The ground must be flat and without humidity.

Temperature range :

Self regulating heaters - 40°C/+ 60°C

2.5	INSTALLATION AND OPERATING MANUAL - EHT

Base Load Power Hub (BLPH)

INSTALLATION AND OPERATING MANUAL - EHT

ROSETTI MARINO	
1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED
NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.	
Sign	Date
	10/10/2024

Document Number:

724001647-EL-MAN-00014

Document Class: 3

00	26/09/2024	Issue for Information (IFI)	L. Gentile	A. Martelli	P. Padovani
Rev.	Date	Description	Prepared	Reviewed	Approved

nVent

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	INSTALLATION AND OPERATING MANUAL - EHT	Sheet 2 of 21 Date: 26/09/2024 Rev: 00

Revision / Change Log

Rev.	Description
00	Issue for Information (IFI)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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nVent
RAYCHEM

Self-regulating and power limiting heating cable systems

Installation and Maintenance Manual



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10.	Heating cable damage	30
11.	Troubleshooting guide	30

10 YEAR Product warranty

Register for your extended warranty on nVent.com/RAYCHEM.

ATEX/UKEX

	Certificate No	Code
BTV	SGS20ATEX0048X (BAS21UKEX0497X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T6 Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T80°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T6 Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T80°C Db Tmin –60°C
QTVR	SGS20ATEX0050X (BAS21UKEX0498X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T4 Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T130°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T4 Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T130°C Db Tmin –60°C
XTV(R)	SGS20ATEX0049X (BAS21UKEX0499X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T**°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T**°C Db Tmin –60°C (* ** see schedule)
KTV	SGS20ATEX0051X (BAS21UKEX0500X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T226°C(T2) Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T226°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T226°C(T2) Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T226°C Db Tmin –60°C (* ** see schedule)
HTV	PTB21ATEX1003X (BAS21UKEX0649X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T**°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T**°C Db Tmin –60°C (* ** see schedule)
VPL	SGS20ATEX0045X (BAS21UKEX0503X)	Ⓔx II 2 G Ex 60079-30-1 eb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 tb IIIC T**°C Db or Ⓔx II 2 G Ex 60079-30-1 eb mb IIC T* Gb Ⓔx II 2 D Ex 60079-30-1 mb tb IIIC T**°C Db Tmin –60°C (* ** see schedule)

IECEx

	Certificate No	Code
BTV	IECEx BAS 20.0011X	Ex 60079-30-1 eb IIC T6 Gb Ex 60079-30-1 tb IIIC T80°C Db or Ex 60079-30-1 eb mb IIC T6 Gb Ex 60079-30-1 mb tb IIIC T80°C Db Tmin –60°C
QTVR	IECEx BAS 20.0013X	Ex 60079-30-1 eb IIC T4 Gb Ex 60079-30-1 tb IIIC T130°C Db or Ex 60079-30-1 eb mb IIC T4 Gb Ex 60079-30-1 mb tb IIIC T130°C Db Tmin –60°C
XTV(R)	IECEx BAS 20.0012X	Ex 60079-30-1 eb IIC T* Gb Ex 60079-30-1 tb IIIC T**°C Db or Ex 60079-30-1 eb mb IIC T* Gb Ex 60079-30-1 mb tb IIIC T**°C Db Tmin –60°C (* ** see schedule)

	Certificate No	Code
KTV	IECEx BAS 20.0014X	Ex 60079-30-1 eb IIC T226°C(T2) Gb Ex 60079-30-1 tb IIIC T226°C Db or Ex 60079-30-1 eb mb IIC T226°C(T2) Gb Ex 60079-30-1 mb tb IIIC T226°C Db Tmin –60°C (* ** see schedule)
HTV	IECxPTB21.0007X	Ex 60079-30-1 eb IIC T* Gb Ex 60079-30-1 tb IIIC T**°C Db or Ex 60079-30-1 eb mb IIC T* Gb Ex 60079-30-1 mb tb IIIC T**°C Db Tmin -60°C (* ** see schedule)
VPL	IECEx BAS 20.0008X	"Ex 60079-30-1 eb IIC T* Gb Ex 60079-30-1 tb IIIC T**°C Db or Ex 60079-30-1 eb mb IIC T* Gb Ex 60079-30-1 mb tb IIIC T**°C Db Tmin –60°C (* ** see schedule)"

Product name in SAP	Certificate No	Code
BTV CABLE	TC RU C-BE. МЮ62.B.00054/18	1Ex e IIC T6 Gb X 1Ex e mb II C T6 Gb X Ex tb IIIC T80°C Db X Ex tb mb IIIC T80°C Db X Ta –60°C…+56°C IP66
QTVR CABLE	TC RU C-BE. МЮ62.B.00054/18	1Ex e IIC T4 Gb X 1Ex e mb IIC T4 Gb X Ex tb IIIC T130°C Db X Ex tb mb IIIC T130°C Db X Ta –60°C…+56°C IP66
XTV CABLE	TC RU C-BE. МЮ62.B.00054/18	1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X Ta –60°C…+56°C IP66
KTV CABLE	TC RU C-BE. МЮ62.B.00054/18	1Ex e IIC 226°C (T2) Gb X 1Ex e mb IIC 226°C (T2) Gb X Ex tb IIIC T226°C Db X Ex tb mb IIIC T226°C Db X Ta –60°C…+56°C IP66
HTV CABLE	ЕАЭС RU C-BE. АЖ58.B.01728/21	1Ex e mb 60079-30-1 IIC 180°C (T3)…215°C (T2) Gb X Ex tb 60079-30-1 IIIC 180°C … 215°C Db X
VPL CABLE	TC RU C-BE. МЮ62.B.00054/18	1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X Ta –60°C…+56°C IP66

BSA cables are EAC certified to TR CU 004/2011

WARNING: As with any electrical equipment or wiring installation operating at line voltages, heating cable and component damage or incorrect installation that allows the penetration of moisture or contamination can lead to electrical tracking, arcing and potential fire hazard.

Do not connect heating cable conductors together or this will result in a short circuit.

Any unconnected heating cable end must be sealed with a nVent approved end seal.

To prevent fire or explosion in hazardous areas, verify that the maximum sheath temperature of the heating cable is below the auto-ignition temperature of the gases in the area. For further information, see design documentation.

The purchaser should make the manufacturer aware of any external effects or aggressive substances that the equipment may be exposed to.

Specific conditions of use

The following limiting temperatures for the end seals, splices and power connections shall not be exceeded:
+110°C for the S-20 and E-20
+260°C for the E-40 and S-40
+150°C for the C-150-E, S-150 and E-150
+151°C for the E-100, E-100-L and JBS-100
+155°C for the JBM-100 and T-100
+110°C for the C25-21 and C25-100
+180°C for the C25-100-METAL/C3/4-100-METAL

The E-100, E-100-L, JBM-100, JBM-100-L, JBS-100, JBS-100-L and T-100 have limiting temperatures based on an internal component in these accessories. When located on a pipe or other work piece surface, a maximum pipe temperature of 250°C will not cause the limiting temperatures of 151°C or 155°C to be exceeded

The end seals, splices and power connections have the following associated ambient temperatures:
−60°C to +56°C for the E-20 and S-20
−60°C to +56°C for the E-40 and S-40
−55°C to +56°C for the T-100, JBM-100, JBS-100, JBU-100 and E-100
−40°C to +56°C for the JBS-100-L, JBM-100-L, and JBU-100-L
−55°C to +55°C for the C-150-E, S-150 and E-150
−40°C to +40°C for the E-100-L
−55°C to +110°C for the C25-21 and C25-100
−60°C to +180°C for the C25-100-METAL / C3/4-100-METAL / C25-100-METAL-NP / C3/4-100-METAL-NP / C25-100-METAL-SS

- The assembly of glands, splices and end terminations shall be carried out in accordance with the manufacturing instructions.
- The heating element supply circuit must include an electrical protection device in conformity with Clause 4.4 of IEC 60079-30-1. For the JBM-100-L, JBU-100-L and JBS-100-L this shall be limited to 20 A maximum when used at ambient temperatures above 40°C.
- The minimum installation temperature of the heating cables is −60°C. The minimum bending radii at specific temperatures are shown on the next pages of this document.
- The supply to the heating unit must be terminated in a suitably certified terminal enclosure.
- At ambient temperatures above 40°C temperature resistant power cable suitable for temperatures above 90°C and metal glands must be used.
- The minimum installation temperature for E-20 and S-20 is −20°C.
- The installer is to carry out a dielectric strength test on Ex equipment in which the C25-21, C25-100 and C25-100-METAL / C3/4-100-METAL / C25-100-METAL-NP / C3/4-100-METAL-NP / C25-100-METAL-SS connection kit is fitted. No dielectric breakdown shall occur. (Alternatively, an insulation resistance test may be undertaken in accordance with IEC 60079-30-2)

Rated Voltage

BTV1, QTVR1, KTV1, XTV(R)1, HTV1, VPL1: 110 V, 120 V
BTV2, QTVR2, KTV2, XTV(R)2, HTV2, VPL2: 230 V, 277 V, VPL4: 400 V, 480 V

	BSA	BTV	QTVR	XTV	XTVR	KTV	HTV	VPL
Min. Bending Radius (mm)								
−60°C ≤ T < −20°C	35	35	35	51	51	26	25	19
−20°C ≤ T < −10°C	30	30	30	35	35	20	20	15
−10°C ≤ T < 0°C	25	25	25	25	25	15	15	15
0°C ≤ T < +10°C	20	20	20	20	20	15	15	15
T ≥ +10°C	10	12	12	12	12	12	13	12
Minimum Installation Temperature	−60°C	−60°C	−60°C	−60°C	−60°C	−60°C	−60°C	−60°C

	BSA	BTV	QTVR	XTV	XTVR	KTV	HTV	VPL
Max. continuous operating Temp °C (energized)	65	65	110	121	150	150	205	See table below
Max. intermittent exposure Temp °C (1000 h cumulative, energized/ de-energized)	85	85	110	250	***250	250	**260	–
Max. continuous exposure Temp °C (de-energized)	65	65	110	160	160	160	205	260
Self-limiting Temperature in accordance with IEC/EN 60079-30-1		T6	T4	T3 (T2: 20XTV2, 15/ 20XTV1)	T3 (T2: 20XTVR2, 15/ 20XTVR1)	T2	T3 (T2: 20HTV, 28HTV2)	T*
Power Limiting Temperature (*By design)	–	–	–	–	–	–	–	T*

** 2000 hours for HTV, for durations applicable to other exposure temperatures between 205°C and 260°C, contact nVent.
*** 2000 hours for XTVR

Maximum continuous operating temperature table (heating cable energized)

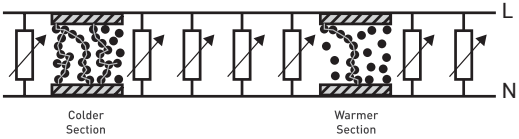
Cable	110 V	230 V	254 V	277 V	400 V	480 V
5VPL1-CT	235°C	–	–	–	–	–
10VPL1-CT	215°C	–	–	–	–	–
15VPL1-CT	190°C	–	–	–	–	–
20VPL1-CT	150°C	–	–	–	–	–
5VPL2-CT	–	230°C	225°C	225°C	–	–
10VPL2-CT	–	210°C	200°C	195°C	–	–
15VPL2-CT	–	180°C	145°C	105°C	–	–
20VPL2-CT	–	150°C	–	–	–	–
5VPL4-CT	–	–	–	–	230°C	230°C
10VPL4-CT	–	–	–	–	215°C	205°C
15VPL4-CT	–	–	–	–	195°C	160°C
20VPL4-CT	–	–	–	–	150°C	150°C

1. GENERAL INFORMATION

Use of the manual

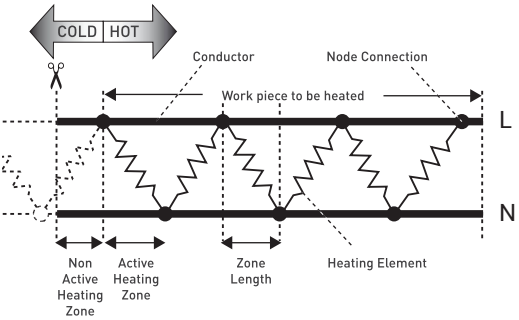
The Installation and Maintenance manual is for nVent RAYCHEM self-regulating and power limiting heating cable systems on thermally insulated pipes and vessels only.
For information regarding other applications contact your nVent representative.

BSA, BTV, QTVR, XTV(R), KTV, HTV self regulating heating cables



- Power output varies with temperature.
  As pipe temperature increases, power output decreases.
- At high temperatures, the polymer expands, reducing the number of the conductive paths, and thus reducing current flow.
- At low temperatures, there are many conductive paths, allowing current to flow between the conductors.

VPL power limiting heating cables



Important

For the nVent warranty to apply, the instructions that are included in this manual and product packages must be followed. The installation must be compatible with local requirements applicable to electric heat- tracing systems.

2. HEATING CABLE SELECTION

The design of electrical resistance heat tracing systems shall be overseen by persons knowledgeable of heat tracing following the design methodology for explosive atmospheres as specified by the manufacturer.

Check the design specification to make sure the proper heating cable is installed on each pipe or vessel. Refer to nVent product literature and the TraceCalc software to select the proper heating cable for each thermal, chemical, electrical and mechanical environment.

Heat tracing system design documentation

The heat tracing system documentation shall be retained for each heat tracing circuit for as long as the system is in use.

3. HEATING CABLE INSTALLATION

Persons involved in the installation and testing of electric heat tracing systems shall be suitably trained in all special techniques required. Installation shall be carried out under the supervision of a qualified person

De-energise all power circuits before installation or servicing

The insulation resistance of the heating cable shall be measured and recorded after installation and shall not be less than 100 Megaohms

3.1 Heating cable storage

- Keep ends of heating cable and kit components dry before and during installation
- Temperature range: –40°C to +60°C
- Protect the heating cable from mechanical damage

3.2 Pre-installation checks

Check materials received:

- Review the heating cable design and compare the list of materials to the catalogue numbers of heating cables and electrical components received to confirm that proper materials are on site. The heating cable type is printed on its outer jacket.
- Temperature exposure must not exceed that specified in nVent product literature. Exceeding these limits will impair product performance. Check that expected exposure is within these limits.
- Ensure that the heating cable voltage rating is suitable for the service voltage available.
- Do not energize cable when it is coiled or on the reel.
- Inspect heating cable and components for in-transit damage. An insulation resistance test (see section 8) on each reel is recommended.

Check piping to be traced:

- Ensure all pressure testing is complete and pipework has final paint coating.
- Walk the system and plan the routing of the heating cable on the pipe.
- Check pipework against specification drawing. If different consult design authority.
- Inspect piping for burrs, rough surfaces, sharp edges etc. which could damage the heating cable. Smooth off or cover with layers of glass cloth tape or aluminium foil.

3.3 Heating cable handling

Heating cable handling tips:

- Paint and pipe coatings must be dry to the touch before heating cable installation.
- When pulling the heating cable, avoid:
  - sharp edges
  - excessive pulling force
  - kinking and crushing
  - walking on it, or running over it with equipment

Heating cable pulling tips:

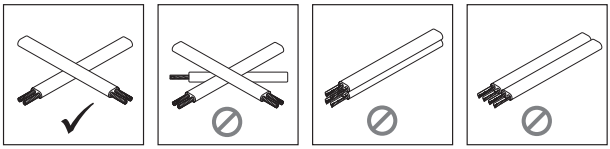
- Use a reel holder that pays out smoothly with little tension.
- Keep heating cable strung loosely but close to the pipe being traced to avoid interference with supports and equipment.
- Pay out designed length and mark (i.e. with fixing tape) on cable while still on reel.

- Leave the appropriate amount of heating cable at all power connection, splice, tee and end seal locations.
  (Refer to component installation instructions)
  - Add additional heating cable to trace the fittings and supports or for spiralling as required by the design specifications, or consult nVent product literature for design.
- Protect all heating cable ends from moisture, contamination and mechanical damage or other interference if left exposed before component installation.

3.4 Heating cable attachment recommendations

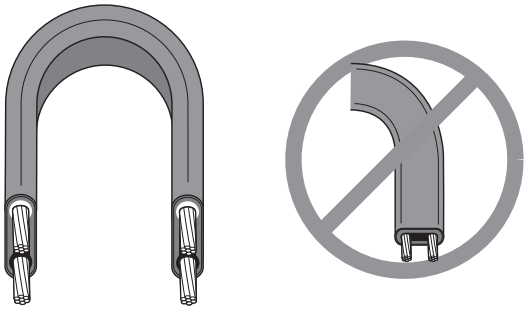
- The heating cable may be installed straight, spiralled or in multiple runs as required by the design specification, nVent product literature or TraceCalc software.
  - Do not use metal attachments, vinyl electrical tape or duct tape as heating cable damage may result.
  - Self-Regulating technology allows for the multiple overlapping of the heating cable on to itself.
- Power Limiting technology dictates that the heating cable can be overlapped only once on to itself. If VPL cables are installed parallel to each other, please allow for minimum 15 mm clearance.

For VPL heating cable only:



- Fix in place with a minimum of two wraps the appropriate self-adhesive glass cloth tape (see figure 1) or plastic cable ties at 300 mm intervals and additionally where necessary.
- Plastic cable ties must have a temperature rating that matches the system exposure temperature.
- The heating cable's minimum bend radius must not be exceeded (refer to p. 6)

Bend the cable only in upright position



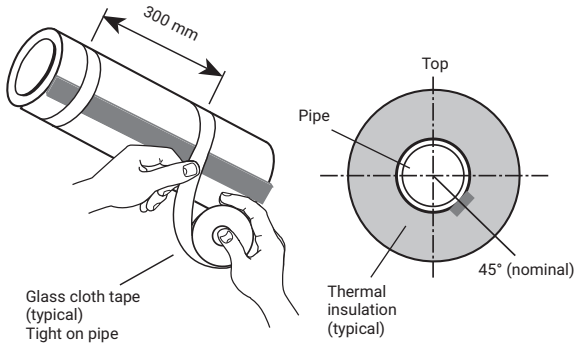
- The heating cable does not bend easily in the flat plane.
  Do not force such a bend, as the heating cable may be damaged.

3.4.1 Straight tracing

- Straight trace the pipe unless the design calls for spiralling (see 3.4.2).
- On horizontal pipes fix on lower quadrant as shown in Figure 1 and not on bottom of pipe.

- To prevent overheating, be sure the location of the power limiting heating cable is planned so that the active heating zone will not extend into the component. Read the kit installation instructions and plan the component location before permanently attaching the cable to the pipe. Ensure that the active heating zones are located where heat is required i.e. on the pipe.
- Thermally insulate and weatherproof to specification.

Figure 1

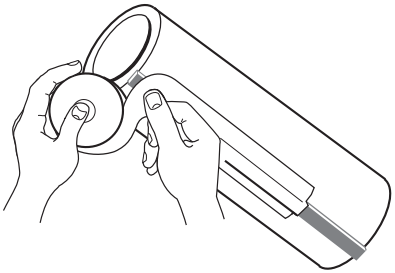


nVent attachment tapes:

GT66 Self-adhesive glass cloth tape
General purpose tape. Not for stainless-steel surfaces or for installation temperatures <4°C.

GS54 Self-adhesive glass cloth tape
Recommended for use on stainless-steel and cupro-nickel surfaces or for installation temperatures <4°C.

Figure 2



ATE-180 Aluminium tape

Use only if the design requires it.

ATE-180 improves the heat transfer and increases the power output of the heating cable.

Attach the heating cable to the pipe as shown in Figure 2.

3.4.2 Spiral tracing

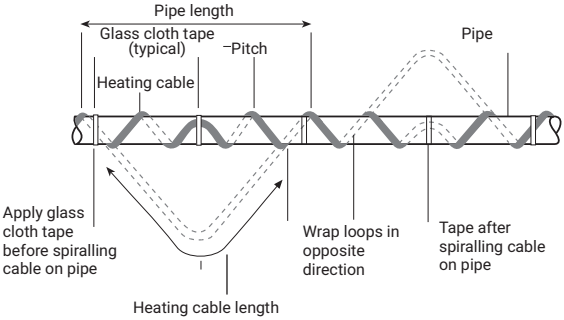
- Alternative spiralling methods are shown in Figures 2a and 2b.
- Only spiral heating cable on pipe when called for by design.
- To prevent overheating, be sure the location of the power limiting heating cable is planned so that the active heating zone will not extend into the component. Read the kit installation instructions and plan the component location before permanently attaching the cable to the pipe. Ensure that the active heating zones are located where heat is required i.e. on the pipe.

Spiral pitch table (mm).

NB	NPS	Spiral Ratio				
(mm)	(inches)	Metres of cable per metre of pipe				
		1.1	1.2	1.3	1.4	1.5
25	1	250	170	140	110	100
32	1¼	310	210	170	140	130
40	1½	350	240	190	160	140
50	2	430	300	240	200	180
65	2½	520	360	290	240	210
80	3	630	430	350	290	260
90	3½	720	490	390	330	290
100	4	800	560	440	370	330
125	5	990	680	550	460	400
150	6	1180	810	650	550	480
200	8	1520	1050	840	710	620

Example:
For pipe of 80 mm NB (3" NPS) requiring 1.3 metres of heating cable per metre of pipe, pitch is 350 mm.

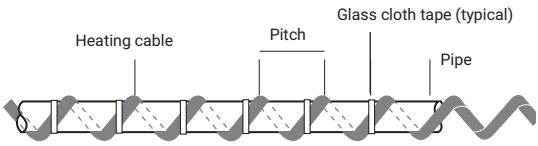
Figure 2a



Heating cable length = pipe length x spiral ratio
Refer to design specification for spiral ratio

Step 1 Make starting loop as shown
Step 2 Grasp loop and wind around pipe
Step 3 Space evenly and attach to pipe.
Thermally insulate and weatherproof to specification

Figure 2b



Refer to design specification for spiral pitch
Mark the pipe at the spiral pitch or use a simple length gauge
Fix the heating cable as installation progresses
Thermally insulate and weatherproof to specification

3.5 Cutting the heating cable

- Cut the heating cable to length after it is attached to the pipe. Before cutting it, confirm the tracing allowance as per Sections 3.3 and 3.6.
- nVent RAYCHEM heating cable can be cut to length without affecting the heat output per metre.

3.6 Typical installation details

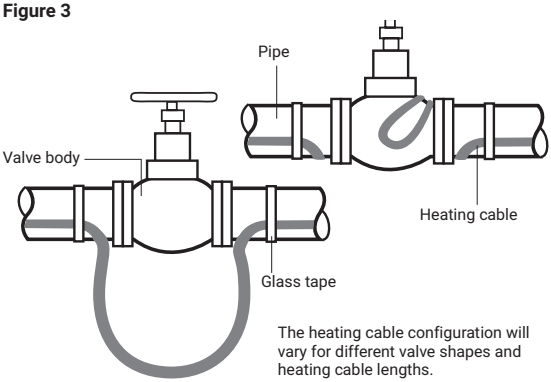
- Typical installation details for fixing heating cable to pipe fittings are shown hereafter.

General notes:

- Trace pipe fittings as shown to allow easy maintenance.
- Consult the design specification or nVent product literature or TraceCalc software for the tracing requirements for fittings and supports.
- Follow the recommendations for cutting and stripping heating cables; they are included in the component installation instructions.

3.6.1 Valve

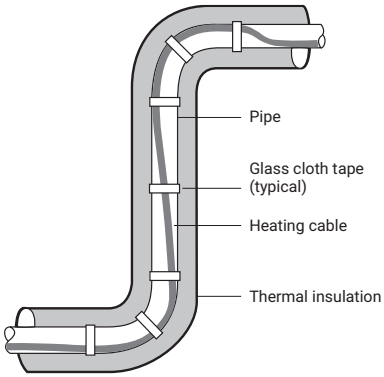
Figure 3



- Refer to design specification for additional heating cable length.
- Fix with self-adhesive glass cloth tape.
- Thermally insulate and weatherproof to specification (including valve stem).

3.6.2 Elbow

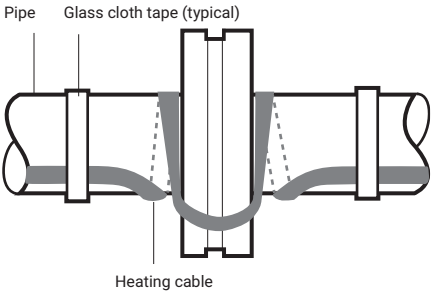
Figure 4



- Fix heating cable to outside (long) radius of elbow
- Fix with self-adhesive glass cloth tape
- Thermally insulate and weatherproof to specification

3.6.3 Flange

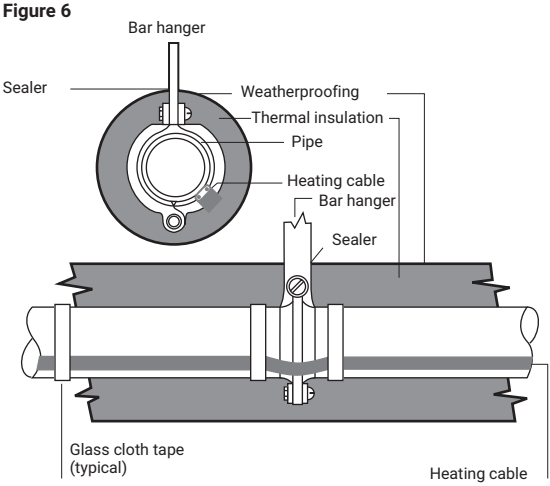
Figure 5



- Additional heating cable is 2-3 times diameter of pipe (typical)
- Fix with self-adhesive glass cloth pipe
- Thermally insulate and weatherproof to specification

3.6.4 Pipe bar hanger

Figure 6

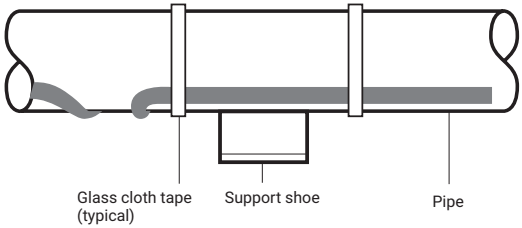


- Do not clamp heating cable with support. Heating cable must be over the support
- No additional heating cable is required for bar or rod pipe hangers unless called for in the design specification, then use loop length specified
- Fix with self-adhesive glass cloth tape
  Thermally insulate and weatherproof to specification

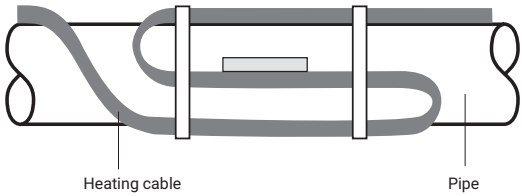
3.6.5 Pipe support shoe

Figure 7

Side view



Bottom view



- Refer to design specification for additional heating cable length
- Fix with self-adhesive glass cloth tape
- Thermally insulate and weatherproof to specification

4. COMPONENTS INSTALLATION

General notes:

Select the required components from nVent product literature or use the TraceCalc software.

nVent RAYCHEM component kits (including power connections, splices and end seals) must be used to satisfy Standards and Approval Body requirements.

Installation instructions included in the kit must be followed, including those for preparation of the heating cable conductors for connections. Before assembly, use the guide given in the instructions to ensure that the kit is correct for the heating cable and environment.

- nVent RAYCHEM self-regulating and power limiting heating cables are parallel circuit design. Do not twist the conductors together as this will result in a short circuit.

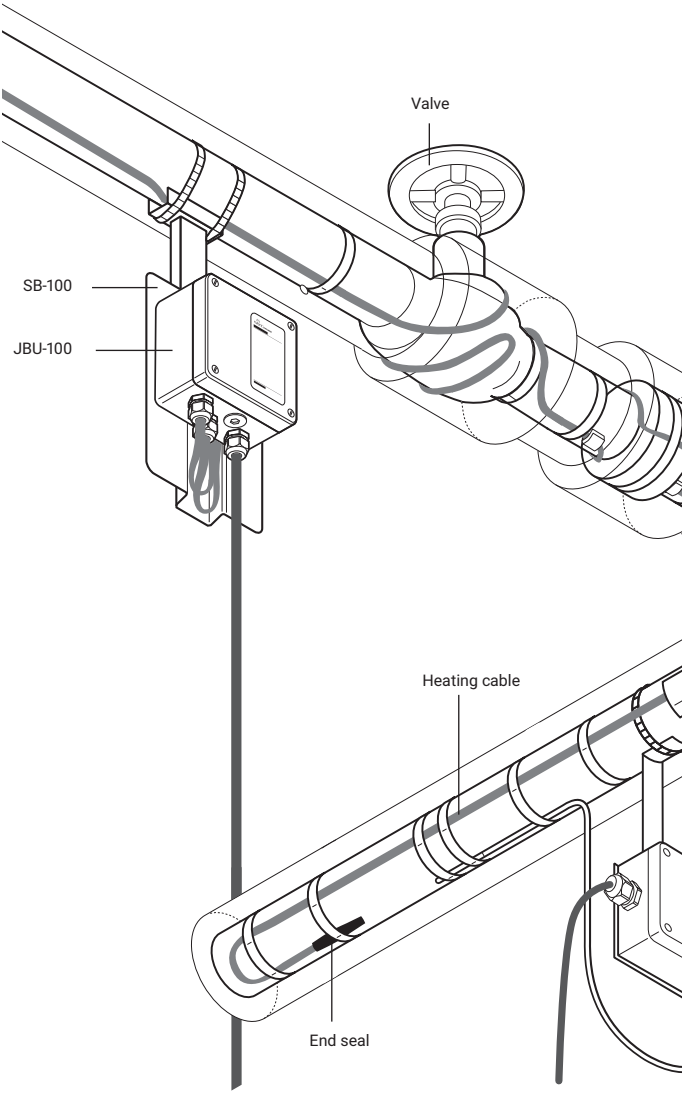
4.1 Components required

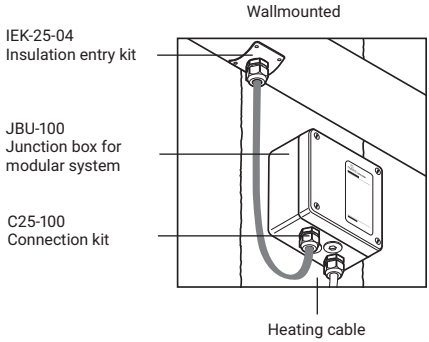
- For the installation of all components refer to the relevant component installation instructions.
- Required for each heating cable run:
  Power connection and insulation entry kit
  End seal.
- As required:
  Splice. Tee-splice. Junction box. Three connection kits and three insulation entry kits. Accessories (pipe straps, fixing tape, support brackets, labels, etc.).

4.2 Typical systems installation

Below components are not suitable for BSA. You can find the solutions for BSA in DOC2210 or contact your local nVent representative.

Figure 8a




Wallmounted
IEK-25-04
Insulation entry kit
JBU-100
Junction box for
modular system
C25-100
Connection kit
Heating cable

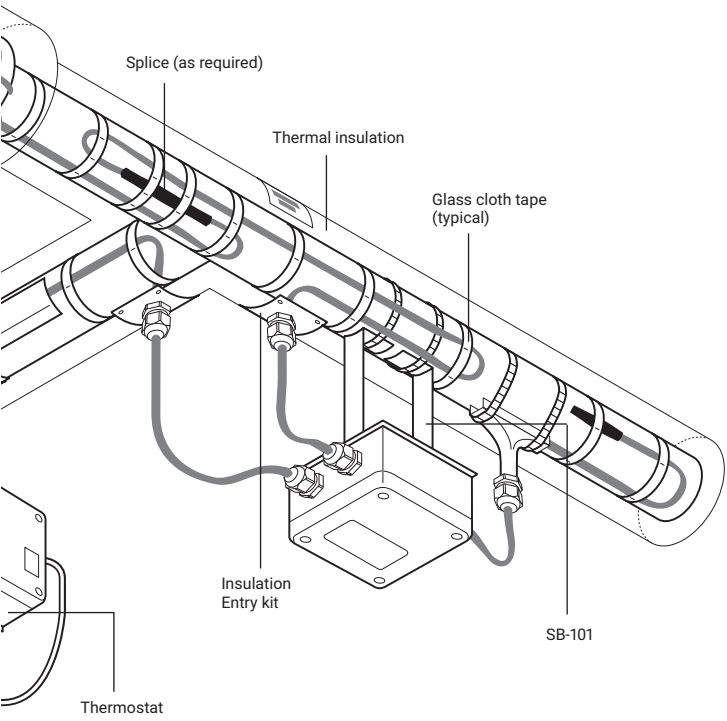
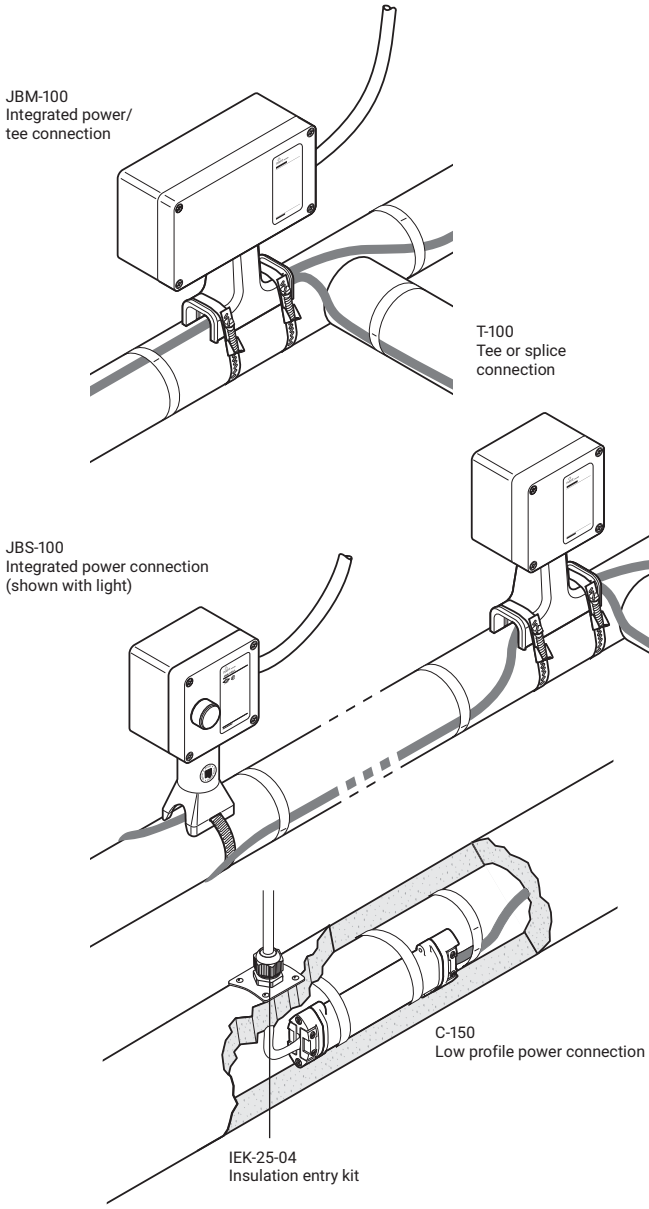
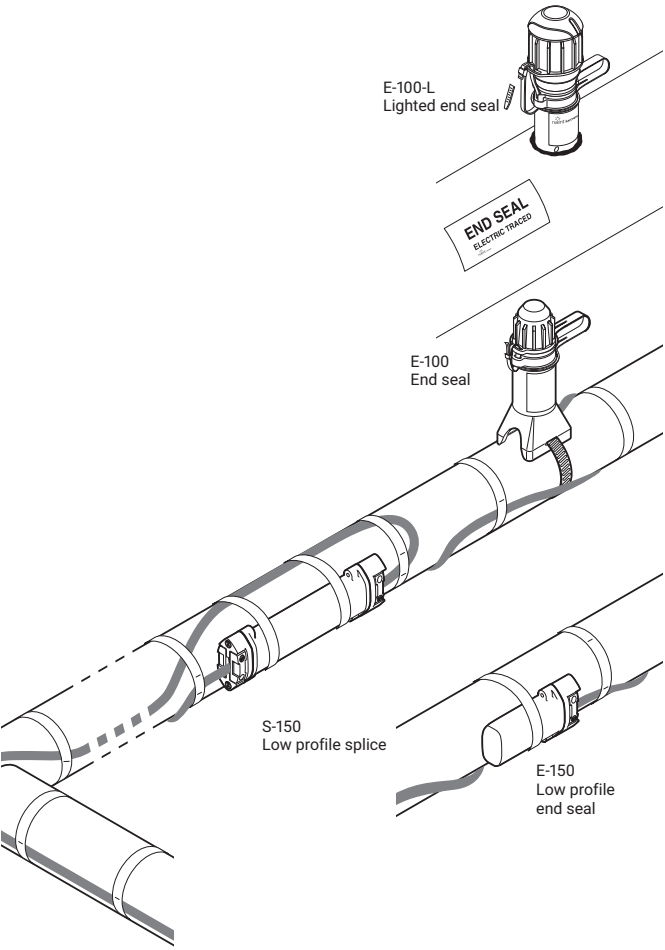

Splice (as required)
Thermal insulation
Glass cloth tape
(typical)
Insulation
Entry kit
SB-101
Thermostat

Figure 8b

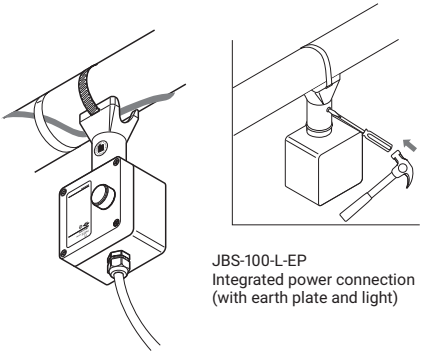

JBM-100
Integrated power/
tee connection
T-100
Tee or splice
connection
JBS-100
Integrated power connection
(shown with light)
C-150
Low profile power connection
IEK-25-04
Insulation entry kit


E-100-L
Lighted end seal
END SEAL
ELECTRIC TRACED
E-100
End seal
S-150
Low profile splice
E-150
Low profile
end seal

4.3 Component installation hints

- On horizontal pipes locate junction boxes below pipe wherever possible. Pinch out drainhole in the stand when installing upside down.
- Locate junction boxes for easy access but not exposed to mechanical abuse.
- Position junction boxes so that power cable and heating cable entries do not point upwards.

Figure 9a



JBS-100-L-EP
Integrated power connection
(with earth plate and light)

- Fix lids in place where access not required.
- Confirm junction box stopping plugs are correct for application and fixed firmly in place.
- Route heating cable from junction box to insulation entry so as to avoid possible mechanical damage.
  - Do not strain heating cable as it exits/enters junction boxes and insulation entries.
- Ensure heating cable is fixed above pipe straps such as used for junction box support brackets.
- Fix all low profile components (e.g. heatshrink end seals) in place with self-adhesive glass cloth tape.

5. THERMOSTATS

- In temperature-sensitive applications, thermostatic control may be necessary. If maximum temperature is a concern, consult your nVent representative for design assistance.
- nVent RAYCHEM control and monitoring products are designed for use with Self-Regulating and Power-Limiting heat-tracing systems. Thermostats, controllers and control and monitoring systems are available. Compare features of these products in the table below. For additional information on each product, refer to product datasheets or contact your nVent representative.
- Follow the installation instructions supplied with the thermostat. Use the proper wiring diagram for the heating cable layout and control method desired.

	Mechanical Thermostats	ETS-05	NGC-20	Elexant 40x0i	NGC-30	NGC-40
Control						
Ambient sensing	X	X	X	X	X	X
Line sensing	X	X	X	X	X	X
Pasc			X	X	X	X
Monitoring						
Ambient temperature		X	X	X	X	X
Pipe Temperature		X	X	X	X	X
Ground Fault			X	X	X	X
Current			X	X	X	X
Voltage			X	X	X	X
Location						
Pipe mount		X	X	X		
Field Mount		X	X	X	X	X
Substation				X	X	X

- Controllers shall meet the requirements from clause 4.5.3 in IEC/IEEE 60079-30-1.

6. THERMAL INSULATION AND MARKING

6.1 Pre-insulation checks

- Visually inspect the heating cable and components for correct installation and damage. (See Section 10 if damaged.)
- Insulation resistance (Megger) testing (as per Section 8) is recommended prior to covering the pipe with thermal insulation.

6.2 Insulation installation hints

- Correct temperature maintenance requires properly installed and dry thermal insulation.
- Thermally insulate and weatherproof to design specification.
- Check insulation type and thickness against the design specification.
- To minimize potential heating cable damage, insulate as soon as possible after tracing.
- Check that all pipework, including fittings, wall penetrations and other areas, have been completely insulated.
- Ensure that heating cable is not damaged during installation of cladding for example by drills, self tapping screws and sharp edges of cladding.
- Check that all insulation entry kits are fitted correctly and sealed.
- Ensure that all places where valve stems, support brackets, thermostat capillaries, etc exit the cladding are sealed.

6.3 Marking

- For power limiting heating cable install label: LAB-I-35 as shown (typical) in figures 10a & 10b

Figure 10a

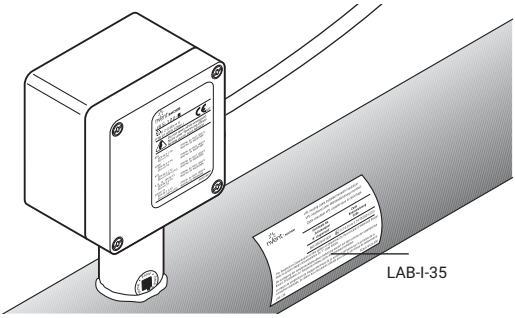
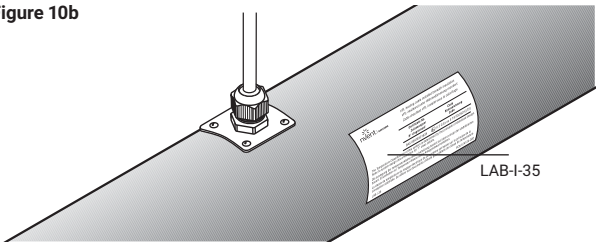
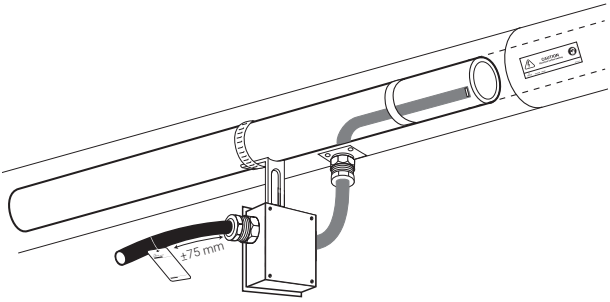


Figure 10b



- The presence of the heating cables shall be made evident by the posting of warning labels or caution labels (“Electric Traced”) on the cladding. Labels are to be applied at maximum 3 meter intervals and on alternate locations along the circuit.
- Install “Electric Traced” signs along piping at suitable intervals (3 m intervals recommended) on alternate sides as a warning.
- Mark on outside of insulation the location of heating cable components.

Figure 10c



7. POWER SUPPLY AND ELECTRICAL PROTECTION

In the event of an earth fault or over current interruption, the device shall not be reset until the cause of the trip has been investigated by qualified personnel

7.1 Electrical loading

Size overcurrent protective devices according to the design specification or applicable nVent product literature. If devices other than those specifically identified are used, consult the nVent representative for the appropriate sizing information.

7.2 Ground fault equipment protection is required for each circuit

The metal sheath/braid of the heating cable must be connected to a suitable earthing terminal

7.3 Residual current (earth fault) protection

nVent insists on the use of a 30 mA residual current device to provide maximum safety and protection. However, where there is a marked increase in nuisance tripping, a maximum 300 mA residual current device may be used.

For heating cables installed in a hazardous area, the use of residual current devices is normally a condition of their approval.

8. HEATING CABLE TESTING

8.1 Recommendations

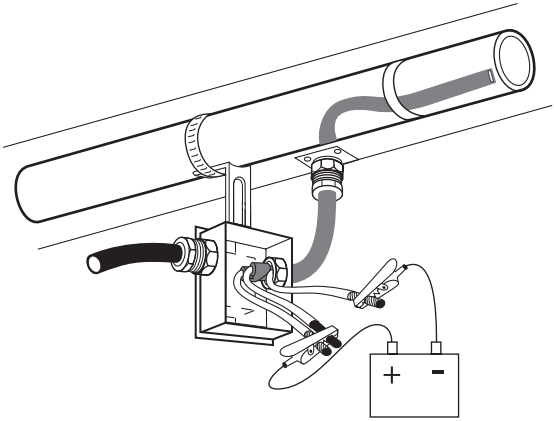
nVent recommends insulation resistance test before installing heating cable; before installing thermal insulation; prior to initial start-up; and as part of the periodic maintenance.
(see Section 9.2).

8.2 Test method

After completing heating cable installation, the insulation resistance between the conductors and the braid should be checked (see Figure 11) using a 2500 VDC megger. Minimum readings should be 100 MegaOhms regardless of the heating cable length. The installer should record the original values for each circuit on the installation record sheet (see page 33). If a thermostat is installed, it should be bypassed.

Figure 11

Test between heating cable and braid



Capacitance test method

This method uses capacitance measurement (nF) to approximate the location of a fault where the heating cable has been severed. It also gives an estimate of total heating cable length in a non-severed circuit. This reading must be taken at the power connection and will only work when the heating cable has passed IR testing. This information is used to calculate the heating cable output per linear metre or to determine if the maximum length has been exceeded.

Record the capacitance reading from one end of the heating cable. The capacitance reading should be measured between both bus wires twisted together (positive lead) and the braid (negative lead).

Multiply the measured capacitance with the heating cable's capacitance factor as listed in the following table.

Example:

20HTV2-CT

Recorded capacitance = 16.9 nF

Capacitance factor = 2.96 m/nF
Fault location = 16.9 nF x 2.96 m/nF
= 50 m from reading location

As an alternative, capacitance values from both the front and back end can be used. The ratio of one capacitance value taken from one end (A) divided by the sum of both A and B (A + B) and then multiplied by 100 yields the distance from the first end, expressed as a percentage of the heating circuit length.

Heating cable capacitance factors (m/nF)

Cable catalog number	Capacitance factor	Cable catalog number	Capacitance factor
3BTV1-CR	2.29	20XTVR2-CT	2.71
3BTV2-CT	2.29	5XTVR1-CT	3.08
5BTV1-CR	2.29	10XTVR1-CT	2.68
5BTV2-CT	2.29	15XTVR1-CT	2.68
8BTV1-CR	1.68	20XTVR1-CT	2.77
8BTV2-CT	1.68	5KTV1-CT	3.29
10BTV1-CR	1.68	5KTV2-CT	3.38
10BTV2-CT	1.68	8KTV1-CT	3.14
10QTVR1-CT	1.43	8KTV2-CT	3.2
10QTVR2-CT	1.43	15KTV1-CT	2.96
15QTVR2-CT	1.01	15KTV2-CT	3.02
15QTVR1-CT	1.01	20KTV1-CT	2.83
20QTVR1-CT	1.01	20KTV2-CT	3.08
20QTVR2-CT	1.01	3HTV1-CT	3.2
4XTV2-CT-T3	3.29	3HTV2-CT	3.51
5XTV1-CT-T3	3.29	5HTV1-CT	3.2
5XTV2-CT-T3	3.38	5HTV2-CT	3.38
8XTV2-CT-T3	3.38	8HTV1-CT	2.80
10XTV1-CT-T3	3.14	8HTV2-CT	3.38
10XTV2-CT-T3	3.26	10HTV1-CT	2.8
12XTV2-CT-T3	3.26	10HTV2-CT	3.2
15XTV1-CT-T3	2.96	12HTV1-CT	2.93
15XTV2-CT-T3	3.02	12HTV2-CT	3.14
20XTV1-CT-T2	2.83	15HTV1-CT	2.83
20XTV2-CT-T2	3.08	15HTV2-CT	2.99
3XTVR2-CT	3.57	20HTV1-CT	2.65
5XTVR2-CT	3.51	20HTV2-CT	2.96
8XTVR2-CT	3.11	28HTV2-CT	2.56
10XTVR2-CT	3.20	All VPL-CT	2.86
12XTVR2-CT	2.99		
15XTVR2-CT	2.87		

9. OPERATION, MAINTENANCE AND PIPE REPAIRS

Caution: Consult the heat tracing system documentation prior to maintenance/repair/modification.

9.1 Heating cable operation

- Temperature exposure must not exceed that specified in nVent product literature. Exceeding those limitations will shorten the service life and may permanently damage the heating cable.
- Pipe insulation must be complete and dry to maintain the correct temperature.

9.2 Inspection and maintenance

- Visual inspection: Exposed heating cable and pipe insulation should be checked periodically to make sure that no physical damage has occurred.
- Upon completion of maintenance/repair/modification, the insulation resistance of the heating cable shall be measured and recorded and shall not be less than 100 Megaohms
- Meggering: The system should be meggered regularly. When meggering the insulation resistance from the main supply panel, it is recommended that the test is performed between L/N (together) and PE. Freeze protection systems should be meggered before the winter months each year (see section 8). Temperature maintenance systems should be tested at least twice a year. Function testing of electrical protection and temperature control systems should be carried out at regular intervals.
- The Periodic Inspection Record on the following pages should be filled out during maintenance of each circuit in your system.

9.3 Piping systems repair and maintenance

- After maintenance/repair/modification, test the operation of the earth-fault device of each affected circuit or equivalent.
- Isolate heating cable circuit.
- Protect the heating cable from mechanical or thermal damage during pipe repair work.
- Check heating cable installation after pipe repairs and restore thermal insulation following the recommendations in Section 6. Check correct functioning of electrical protection systems.

10. HEATING CABLE DAMAGE

- Do not repair damaged heating cable.
  Remove entire damaged section and splice in a new length using the appropriate nVent RAYCHEM splice kits.
- Replace damaged heating cable at once.
  Damage allowing moisture and contamination to enter the heating cable may result in arcing earth faults and potential fire hazards.
- Heating cable exposed to fire or flame may cause further fire damage if powered.
  Remove from service at once and replace before re-use.

11. TROUBLESHOOTING GUIDE

- Refer to the Troubleshooting guide on pages 34-37.
  If the problem persists after following the guide procedures, contact your nVent representative immediately.

INSTALLATION RECORD SHEET

INSTALLATION RECORDS FOR:		CIRCUIT NO.							
Circuit breaker number									
Drawing reference number									
Megger test on pipe before insulating (bypass thermostat if applicable)	Reading								
	Initial								
	Date								
Megger test after insulating (bypass thermostat if applicable)	Reading								
	Initial								
	Date								
Circuit voltage	Panel								
	Connection terminals								
Insulation complete and sealed	Initial								
	Date								
Locations of low profile components are marked on the cladding	Initial								
	Date								

REMARKS & COMMENTS:

INSPECTION AND MAINTENANCE RECORD SHEET

MAINTENANCE CHECKS FOR:		CIRCUIT NO.					MONTH:		YR.:
No signs of overheating, moisture, or corrosion, etc.	Initial								
	Date								
In connection systems Heating cable and cable glands tight Connection terminals tight Earth connection tight Insulation in good condition	Initial								
	Date								
Thermostats set properly and capillaries are protected	Initial								
	Date								

Megger test (bypass thermostat if applicable)	Reading								
	Initial								
	Date								
Circuit voltage	Panel								
	Connection terminals								
All boxes and thermostats have been firmly closed	Initial								
	Date								
Locations of low profile components are marked on the cladding	Initial								
	Date								

REMARKS & COMMENTS:

Troubleshooting guide

A Symptom: Overcurrent protection trips or blows
Probable Causes:

1 Electrical fault at
- a damaged heating cable
- b faulty splices or tees
- c end seal
- d connection

2 Circuit oversized

3 Start-up below design temperature

4 Defective electrical protection

B Symptom: RCD trips
Probable Causes:

1 Earth fault at:
- a damaged heating cable
- b faulty splices or tees
- c end seal
- d connection

2 Excessive moisture in:
- a junction boxes
- b splices and tees
- c end seals

3 High leakage currents due to a combination of excessive lengths of power cable and heating cable.

4 Mains borne disturbances

5 Defective RCD

Corrective Actions

1 Investigate and remedy (see note 1):

2 Resize or redesign within Technical Databook Guidelines. (If larger protection is required, ensure supply cables are compatible).

3 a redesign for lower start-up temperatures
b preheat pipe from alternative heat source to within exposure temperatures given in Product Data Sheets
c Energize part of circuit followed by remainder (e.g. in sequence

4 Replace

Corrective Actions

1 Investigate and remedy (see note 1):

2 Dry out and reseal or remake immediately. Perform insulation resistance test. (10 MΩ minimum)

3 Redesign

4 Redesign distribution, guidance is available from nVent

5 Replace

C Symptom: No power output.
Probable Causes

1 Loss of supply voltage due to:
a overcurrent or residual current protection operating
b loose terminals in junction box
c loss of supply cable continuity (e.g., open circuited from damage)

2 Control thermostat is connected in the normally open position

3 High resistance connection at:
a junction box terminals
b splices and tees

D Symptom: Low pipe temperature.
Probable Causes:

1 Wet thermal insulation

2 Design error

3 Incorrect setting or operation of controls e.g., thermostats.

4 Heating cable has been exposed to excessive temperature beyond rating.

Note:
Locate faults by the following steps:

1. Visually inspect the power connections, splices and end seals for correct installation.
2. Look for signs of damage at:
   a) Valves, pumps, flanges and supports.
   b) Areas where repairs or maintenance work has been carried out.
3. Look for crushed or damaged insulation and cladding along the pipe.

Corrective Actions

1 Restore supply voltage
   a following A and B (page 29)
   b re-tighten terminals
   NB: If excessive heating has occurred due to high resistance, replace terminals or crimps
   c locate damage and repair

2 Reconnect to normally closed position

3 Locate and remedy by:
   a re-tighten
   b repair
   NB: If excessive heating has occurred due to high resistance, replace terminals or crimps

Corrective Actions

1 Remove and replace with dry insulation of correct specification and ensure complete weatherproofing

2 a check with competent authority for design conditions
   b modify to meet nVent recommendations

3 Repair or reset to correct level of operation

4 Replace

4. If after 1, 2 and 3 above the fault has not been located, then either:
   a) Consult nVent for further assistance.
   b) Where local practices and conditions allow (e.g., non hazardous areas) isolate one section of heating cable from another by cutting in half and testing (e.g., Insulation Resistance) both halves until general area of damage is found. Remove insulation and expose fault.

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	MANUFACTURERS RECORD BOOK - COMPLETE - EHT	Sheet 179 of 183 Date: 14/04/2025 Rev: 01

2.6	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT	Sh. 1 of 4 Date: 29/01/2025 Rev. 04

Base Load Power Hub (BLPH)

ELECTRICAL HEAT TRACING

SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT

Document Number:

1724001647-COM-LIS-00015

Document Class: 2

ROSETTI MARINO

1	NO COMMENTS - APPROVED - WORK MAY PROCEED
2	MINOR COMMENTS - REVISE AND RESUBMIT - WORK MAY PROCEED
3	MAJOR COMMENTS – REJECTED – DO NOT PROCEED
4	APPROVAL NOT REQUIRED

NOTE: Approval doesn't relieve the supplier from mandatory compliance with contractual documents and specifications. Comments made do not imply acceptance of any cost or delivery impact.

Sign	Date
	04/02/2025

Rev.	Date	Description	Prepared	Reviewed	Approved
04	29-01-25	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
03	13-01-25	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
02	04-11-24	Accepted for Construction (AFC)	L. Gentile	A. Martelli	P. Padovani
01	23-10-24	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani
00	27-09-24	Issue for Review (IFR)	L. Gentile	A. Martelli	P. Padovani

nVent

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT	Sh. 2 of 4 Date: 29-01-25 Rev. 04

Table of Contents

SH.	DESCRIPTION	REVISIONS							
		00	01	02	03	04			
1	Cover	X	X	X	X	X			
2	Table of Contents	X	X	X	X	X			
3	Revision / Change Log / Hold List	X	X	X	X	X			
4	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT	X	X	X	X	X			

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CROSSWIND	HOLLANDSE KUST NOORD WIND PARK Project Contract No. CW-I-WP4-2023-05	ROSETTI MARINO
Document Title:	SPARE PART INDEX REGISTER (SPIR) (COMMISSIONING, 2-YEAR's OPERATION) - EHT	Sh. 3 of 4 Date: 29-01-25 Rev. 04

Revision / Change Log

Rev.	Description
00	ISSUE FOR REVIEW (IFR)
01	ISSUE FOR REVIEW (IFR)
02	ACCEPTED FOR CONSTRUCTION (AFC)
03	ACCEPTED FOR CONSTRUCTION (AFC)
04	ACCEPTED FOR CONSTRUCTION (AFC)

HOLDS LIST

No.	Description
1.	
2.	
3.	
4.	

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ROSETTI MARINO

SPARE PARTS LIST

CROSSWIND

Document Title	**Commissioning and 2 years spare parts list**
The document relates to	**HOLLANDSE KUST NOORD WIND PARK Project - Base Load Power Hub (BLPH)**
Project ID	**123A90** — Doc. n° **1724001647-COM-LIS-00015** — Rev. **04** — Rev. Date **29-Jan-25** — Status **AFC** — Class **2** — Contract **CW-I-WP4-2023-05**

The equipment consists of the

Supplier: nVent Italy Srl — PO Number: 1721002632 — PO description: ELECTRICAL HEAT TRACING — Contact name: Mr Alessandro Martelli

Address: Centro Direzionale Milanofiori Strada 3 Palazzo B1, 20090 ASSAGO MI, ITALY — Supplier telephone no: +39 02 5776151 — Contact mobile no:

E-mail: alessandro.martelli@nvent.com — WEBSITE https://www.nvent.com/

General Information:

Row	Tag no.	Tag description	Manufacturer model/type no.	Manufacturer serial no.	No. of units	Item Number	Total number of identical spares installed	Description of recommended spare parts	Parts/drawing ref. Project Datasheet no.	Parts/drawing ref. Project Detail dwg. no.	Parts/drawing ref. Item ref.	Material	Certicate Type (if applicable)	Certicate Reference (if applicable)	Shelf life (years)	Weight (net)	Weight (gross)	Volume	HS Code	ECCN Code	% US Content	Country of origin	Supplier part no.	Manufacturer part no.	Manufacturer name	Commissioning spares Quantity ordered	2 Years spares Quantity ordered	Remarks
1	ETB-200N1-16-L3-01	EHT-1001-A	3BTV2-CT	469145-000	22	1	199	Self-Regulating Heating Cable, 230V, 9 W/m at 10°C	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Nickel plated copper conductors with High temperature Fluoropolymer outer jacket	ATEX	SGS20ATEX0048X					8516808000		100	US	3BTV2-CT	469145-000	nVent	16	10	
2	ETB-200N1-15-L2-01	EHT-1002-A	3BTV2-CT	469145-000	36.4		8	End Seal, BTV/QTVR, Heat Shrink, ATEX	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Heat shrinkable plastic sleeves Adhesive liners	ATEX	SGS20ATEX0048X					8536901000			DE	E-20	1244-022489	nVent	1	1	
3	ETB-200N1-14-L1-01	EHT-1003-A	3BTV2-CT	469145-000	78.6		3	Integrated Junction Box, Multiple-Entry, Cold-Applied, Cold-Applied, ATEX	1724001647-EL-DS-00008	1724001647-EL-DS-00008		GRP (glass reinforced polyester)	ATEX	PTB 20 ATEX 1008 U					8536909500			IN	JBM-100-E	831519-000	nVent	1	1	
4	ETB-200N1-17-L1-04	EHT-1004-A	3BTV2-CT	469145-000	3.2		1	Small Pipe Adaptor for JBM-, T-100 (5 pieces/ pack)	1724001647-EL-DS-00008	1724001647-EL-DS-00008		GRP (glass reinforced polyester)	N/A						8536909500			IN	JBM-SPA	DS5673-000	nVent			
5	ETB-200N1-17-L1-02	EHT-1005-A	3BTV2-CT	469145-000	4.6		6	Integrated Junction Box, Single-Entry, Cold-Applied, ATEX	1724001647-EL-DS-00008	1724001647-EL-DS-00008		GRP (glass reinforced polyester)	ATEX	PTB 20 ATEX 1008 U					8536909500			IN	JBS-100-E	829939-000	nVent	1	1	
6	ETB-200N1-17-L1-03	EHT-1006-A	3BTV2-CT	469145-000	2.5		1	Small Pipe Adaptor for JBS-, E-100 (5 pieces/ pack)	1724001647-EL-DS-00008	1724001647-EL-DS-00008		GRP (glass reinforced polyester)	N/A						8536909500			IN	JBS-SPA	E90515-000	nVent			
7	ETB-200N1-17-L1-07	EHT-1007-A	3BTV2-CT	469145-000	19.5		4	Aluminium Tape for Fixing Heating Cables, Suitable for Stainless Steel, 55 m/roll	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Aluminium tape	N/A						7607199096			CN	ATE-180	846243-000	nVent	3	5	
8	ETB-200N1-15-L2-02	EHT-1009-A/ EHT-1008-B	3BTV2-CT	469145-000	24.6		9	Glass Cloth Tape for Fixing Heating Cables, Suitable for Stainless Steel, 16 m/roll	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Glass cloth tape	N/A						7019900085		100	US	GS-54	C77221-000	nVent	1	5	
9	ETB-200N1-17-L1-01/ ETB-200N1-17-L1-04	EHT-1009-A/ EHT-1008-B	3BTV2-CT	469145-000	7.3		39	Warning Label, English	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Plastic adhesive warning labels	N/A						3919908099			BE	LAB-I-01	938947-000	nVent	3	10	
10	ETB-200N1-17-L1-01	EHT-2002-A	3BTV2-CT	469145-000	7.3		12	Pipe Strap, SS, Ø 1.25"-3"	1724001647-EL-DS-00008	1724001647-EL-DS-00008		Stainless steel	N/A						7326909890			IT	PSE-090	976935-000	nVent	1	2	
11	ETB-200N1-16-L3-01	EHT-1001-A	JBT-100-E	829939-000	1		1	Electronic Ambient Sensing Thermostat with Alarm Relay, ATEX	1724001647-EL-DS-00008	1724001647-EL-DS-00008		GRP (glass reinforced polyester)	ATEX	Baseefa13ATEX0137					9032102090			GB	ETS-05-A2-E-A	1244-022663	nVent			
12	ETB-200N1-17-L1-02	EHT-1005-A	JBS-100-E	829939-000	1																							
13	ETB-200N1-17-L1-03	EHT-1006-A	JBS-100-E	829939-000	1																							
14	ETB-200N1-17-L1-07	EHT-1007-A	JBS-100-E	829939-000	1																							
15	ETB-200N1-17-L1-05	EHT-1004-A	JBS-100-E	829939-000	1																							
16	ETB-200N1-17-L1-01	EHT-2002-A	JBS-100-E	829939-000	1																							
17	E47-200N1-01		ETS-05-A2-E-A	1244-012663	1																							
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