[1] # TYPE EXAMINATION CERTIFICATE

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

[3] Type Examination Certificate Number: **DEMKO 18 ATEX 2032X Rev. 5**

[4] Product: **Mark VIe Programmable Controller System, I/O Packs**

[5] Manufacturer: **GE Drives & Controls Inc.**

[6] Address: **1501 Roanoke Blvd., Salem, VA, 24153-6422 USA**

[7] This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S 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 Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in confidential report no. **4789946973.4.1**

[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**

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 Type examination certificate relates only to the design of the specified product, and not to specific items of product subsequently manufactured.

[12] The marking of the product shall include the following:

II 3 G Ex ec IIC T4 Gc or

II 3 G Ex ec IIC T3 Gc or

II 3 G Ex ic ec IIC T4 Gc or

II 3 G Ex ec [ic] IIC T4 Gc

Certification Manager
Jan-Erik Storgaard

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2018-04-09

Re-issued: 2021-06-25

Certification Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

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[15] Description of Product:

The Mark Vle control system is an open type microprocessor-based system designed for complete integrated control, protection and monitoring of generator and mechanical drive applications for gas and steam turbines. The devices are field mounted in a suitable electrical enclosure adjacent to the turbine.

The Mark Vle I/O Packs Modules, Cat No IS42yYDOAS1B, IS42yYDIAS1B, IS42yPPDAH1B, IS41yJPDDGzA, IS41yJPDEG1A, IS41yBAPBH1A, IS42yPDASH1A, IS42yYDASS1A are intended to be used with accessory terminal boards, power distribution boards and optional output monitor boards as shown in Table I below. Installation of these I/O packs must be in accordance with the Control Drawing No. GEH-6725.

TABLE I

I/O Pack	Accessory I/O Terminal Boards	Accessory Power Distribution Boards	Accessory Optional Output Monitor Boards	Protection Method Employed
ISx2yYDOAS1B	ISx0yTRLYS1D	-	-	Ex ic ec IIC T4 Gc
	ISx0yTRLYS1B	-	-	
	ISx0yTRLYS1F	-	-	
	ISx0yTRLYS2F	-	-	
	ISx0ySRLYS2A	-	IS40yWROBH1A	
		-	IS40yWROFH1A	
		-	IS40yWROGH1A	
		-	IS40yWROHH1A	
ISx2yYDIAS1B	ISx0ySTCIS4A	-	-	Ex ec IIC T4 Gc
	ISx00STCIS2A	-	-	
	ISx0yTBCIS3C	-	-	
	ISx0ySTCIS1A	-	-	Ex ec [ic] IIC T4 Gc
	ISx0ySTCIS2A	-	-	
	ISx0yTBCIS2C	-	-	
ISx2yPPDAH1B	-	ISx0yJPDGH1A	-	Ex ec IIC T4 Gc
	-	ISx0yJPDSG1A	-	
IS41yJPDDGzA	-	-	-	Ex ec IIC T3 Gc
IS41yJPDEG1A	-	-	-	Ex ec IIC T4 Gc
IS41yBAPBH1A	IS21ySAMBH1A	-	-	Ex ic ec [ic] IIC T4 Gc
IS42yPDASH1A	IS40yTCDMS1A	-	-	Ex ic ec [ic] IIC T4 Gc
IS42yYDASS1A		-	-	

Note - (where x is 2 or 4, y is 0 or 1, and z is 1, 2, 3 or 4)

Nomenclature:

IS	4	2	0	YDOA	H	1	A
	I	II	III	IV	V	VI	VII

I - 2 – not RoHS compliant
4 – RoHS compliant

II – 0 – single circuit board assembly
1 – single circuit board assembly + mechanical assembly
2 – one or more circuit board assemblies + housing

III – 0 – not conformal coated
1 – conformal coated (not required for safety)

Note - coated or non-coated versions of the circuit board assemblies have identical constructions and schematic drawings

IV – Function mnemonic - Any four A-Z characters

V - H – Surface mount components
G – No surface mount components
S – SIL-certified (IEC 61508)

VI – BOM variant – Any number 1-9

VII – Major revision – Single letter

VIII– Minor revision – One or two letters

The optical radiation output of the product with respect to explosion protection, according to Annex II clause 1.3.1 of the Directive 2014/34/EU is covered in this certificate based on Exception 1) to the scope of EN 60079-28:2015.

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Temperature range:

Cat. No.	Ambient Temperature Range	Temperature Class
ISx2yYDOAS1B	-40°C to +55°C -40°C to +70°C	T4
ISx2yYDIAS1B	-40°C to +55°C -40°C to +70°C	T4
ISx2yPPDAH1B	-40°C to +55°C -40°C to +70°C	T4
IS41yJPDDGzA	-40°C to +60°C -40°C to +70°C	T3
IS41yJPDEG1A	-40°C to +55°C -40°C to +70°C	T4
IS41yBAPBH1A	-40°C to +55°C -40°C to +70°C	T4
IS42yPDASH1A	-40°C to +70°C	T4
IS42yYDASS1A	-40°C to +70°C	T4

Electrical data

I/O Pack	With Accessory Board	Ratings
ISx2yYDOAS1B	ISx0yTRLYS1D ISx0yTRLYS1B	'ic' Apparatus Entity Parameters Vmax = 24 Vdc Imax = 261 mA per relay Pi = 6.26 W Ci = 0 uF Li = 0 mH
	ISx0yTRLYS1F ISx0yTRLYS2F	24-48Vdc, 0.71A max, Contact Out (TRLYS1F, 2F): Ui = 30.0 V dc Ii = 152 mA Pi = 4.56 W Ci = 0 µF Li = 0 mH
	ISx0ySRLYS2A	24-48Vdc, 0.71A max, Contact Out (TRLYS1F, 2F): 30 V dc, 5 A dc Ui = 30.0 V dc Ii = 152 mA Pi = 4.56 W Ci = 0 µF Li = 0 mH When used with Optional Output Monitor Boards IS40yWROBH1A, IS40yWROGH1A and IS400WROFH1A, the following additional rating applies: Supply Ratings (Wetting Power): 24/125Vdc/120/240Vac, 13.5A max. (monitors 6 relays fused by 3.15A) Supply Raring (Wetting Power – JG1): 24/125Vdc/120/240Vac, 5A
		When used with Optional Monitor Board IS40yWROHH1A: Supply ratings (Wetting power): J1: 24/48Vdc, 18 A max (provides 3.15A fused power distribution and monitors fuse status) JG1: 24/48Vdc, 5A
ISx2yYDIAS1B	ISx0ySTCIS4A	Wetting Voltage: 48V,0.1A TB: 48V
	ISx0yTBCIS3C	Wetting Voltage: 48V,0.1A TB: 48V
	ISx0ySTCIS1A ISx0ySTCIS2A ISx0yTBCIS2C	Input: 24-28 Vdc, 0.24 A max Contact In: 0 to 32 V dc STCIS1A, 2A, TBCIS2C: Contact Wetting Out: 32 V dc, 110 mA dc Circuits 1-21: Uo = 32.0 V dc Io = 3.3 mA Co = 0.18 µF Lo = 100 mH Po = 0.11 W Circuits 22-24: Uo = 32.0 V dc Io = 13.4 mA Co = 0.18 µF Lo = 100 mH Po = 0.43 W

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I/O Pack	With Accessory Board	Ratings
ISx2yPPDAH1B	ISx0yJPDGH1A	Power Supply (PPDA): 24-28 V dc, 0.24 A dc Control Power Inputs (JR, JS): 24-28 V dc, 36 A dc Control Power Outputs (J1-J4): 24-28 V dc, 7 A dc Control Power Outputs (JC1-JC4): 24-28 V dc, 1.5 A dc @ 70C or 2A dc @ 55C ambient. Control Power Outputs (JD1-JD5): 24-28 V dc, 0.5 A dc@ 70C or 0.9A dc @ 55C ambient. Wetting Power Inputs(JPS1, JPS2): 28-48 V dc, 40A dc Wetting Power Outputs (JFA-JFG): 28-48 V dc, 8 A dc@ 70C or 10A dc @ 55C ambient. AC Feedback(JAC1): 120-240 Vac
	ISx0yJPDSG1A	Power Supply (PPDA): 24-28 V dc, 0.24 A dc Power Supply Inputs (JR, JS, JT): 24-28 V dc, 20 A dc Power Supply Outputs (J1-J6): 24-28 V dc, 13 A dc Power Supply Outputs (JAR, JAS, JAT): 24-28 V dc, 0.8 A dc
	IS41yJPDDG1A IS41yJPDDG2A IS41yJPDDG3A	Wetting voltage: 24/48/125/Vdc Output: 6 outputs 7A max each, limited to 20A max total at 60°C; Limited to 18A max total @ 70°C
	IS41yJPDDG4A	Wetting voltage: 24/48/125/Vdc Output: 6 outputs 0.5A on each output
	IS41yJPDEG1A	Wetting Voltage: 24/48Vdc Output: JS1,JS2,JS3 5A each JFA,JFB,JFC 10A each 30A max total when using JD1; 24A max total when using JPS1
I/O Pack IS41yBAPBH1A	IS21ySAMBH1A	Power Supply: 28 V dc, 0.5 A dc Pressure In: 12 to 18.5 V dc Sensor Power Out: 12 to 18.5 V dc, 2.9 to 4.3 mA dc Buffered Out: -10 to +10 V dc, 5 mA dc Surrounding Air Temperature: 70°C Non-incendive Field Wiring Parameters for Controller pack System Cat. No. IS410BAPBH1A: Pressure Inputs Vmax = 25 Vdc Imax = 4.3 mA Pi = 108 mW Ci = 0.011 uF Li = 0 mH Sensor Power Outputs: Voc or Uo = 25 V Isc or Io = 4.3 mA Po = 108 mW Ca or Co = 0.4 uF La or Lo = 100 mH
I/O Pack IS42yPDASH1A and IS42yYDASS1A	IS40yTCDMS1A	Power Supply: 28 V dc, 1.1 A dc Pressure In: -10 to 18.5 V dc Sensor Power Out: 10 to 18.5 V dc, 2.9 to 4.3 mA dc Buffered Out: -10 to +10 V dc, 5 mA dc Surrounding Air Temperature: 70°C Non-incendive Field Wiring Parameters: Pressure Inputs Sensor Power Outputs Vmax = 25 Vdc Imax = 4.3 mA Pi = 108 mW Ci = 0.011 uF Li = 0 mH Sensor Power Outputs: Voc or Uo = 25 V Isc or Io = 4.3 mA Po = 108 mW Ca or Co = 0.4 uF La or Lo = 100 mH

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Routine tests:
Routine tests are not required.

[16] Descriptive Documents
The scheduled drawings are listed in the report no. provided under item no. [8] on page 1 of this Type Examination Certificate.

[17] Specific conditions of use:

- Provision shall be made to limit transient voltages to less than 140% of the peak rated voltage.
- This equipment shall be used in an environment of not more than Pollution Degree 2 (as defined in EN 60664-1).
- The equipment are intended to be installed in an enclosure providing ingress protection not less than IP54 in accordance with EN 60079-7.
- This equipment shall be powered through a power distribution board that is certified for the applicable classified location. This equipment shall be powered by a switched-mode power supply (SMPS) that is certified for the applicable location and has its output current limited to 20 A maximum, and has the features listed for Vendor Manufactured Control Power supplies in GEH-6721_Vol_II, Mark VIe Control, Volume II System Hardware Guide.
- Control Power Input on ISx0yJPDGH1A can be used at 40A up to 55°C ambient and 36A up to 70°C Ambient.

[18] Essential Health and Safety Requirements
The Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9.

Additional information

The trademark GE Energy or will be used as the company identifier on the marking label.

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in Annex III to Directive 2014/34/EU of the European Parliament and the Council of 26 February 2014.