

TYPE EXAMINATION CERTIFICATE



Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

Type Examination Certificate Number: **DEMKO 11 ATEX 0913172X**

Equipment: **Mark Vle Turbine Programmable Controller System SpeedTronic™ Mark Vle Turbine Control**

Manufacturer: **GE Energy**

Address: **1501 Roanoke Blvd., Salem, VA 24153, USA**

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

UL International Demko A/S certifies that this equipment has been found to comply with the Essential Health and Safety Requirements that relate to the design of **Category 3** equipment, which is intended for use in potentially explosive atmospheres. These Essential Health and Safety Requirements are given in Annex II to the European Union Directive 94/9/EC of 23 March 1994.

The examination and test results are recorded in confidential report no. **09NK13172**

Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to Standards:

EN 60079-0:2006

EN 60079-15:2005

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

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

The marking of the equipment or protective system shall include the following:

Ex II 3 G Ex nA IIC T4

Ex II 3 G Ex nL IIC T4

Certification Manager

Jan-Erik Storgaard

This certificate may only be reproduced in its entirety and without any change, schedule included

Date of issue: 2011-02-15

Certification Body

UL International Demko A/S, Lyskaer 8, P.O. Box 514, DK-2730 Herlev, Denmark, Tel. +45 44 85 65 65, info.dk@dk.ul.com
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[15] Description of Equipment:

The SPEEDTRONIC™ Mark Vle turbine 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 SpeedTronic™ Mark Vle Turbine Control I/O Pack Cat No. IS220UCSAH1A is a communicator. I/O Pack Cat No. IS220UCSAH1A must be used with Distributor Board Cat. No. IS410JPDHG1A or any ATEX certified Distributor Board.

The SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PSCAH1A consists of IS200BPPBH2C processor board, IS400BSCAH1A Serial Communications board and Terminal Board IS200SSCAH2A. I/O Pack System Cat No. IS220PSCAH1A must be used with Terminal Board Cat. No. IS200SSCAH2A.

SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PDIOH1A consists of IS200BPPBH2C processor board, Terminal Relay Board Cat. Nos. IS200TDBSH2A and IS200TDBTH2A. I/O Pack System Cat No. IS220PDIOH1A must be used with Distributor Board Cat. No. IS410JPDHG1A or any ATEX certified Distributor Board and one of the following Terminal Relay Board Cat. Nos. IS200TDBSH2A or IS200TDBTH2A. I/O Pack System Cat No. IS220PDIOH1A must be connected according to Control drawing GEI-100676 for relay output connection.

SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PDOAH1A consists of IS200BPPBH2C processor board, IS200BPPBH2C discrete output board and Terminal Relay Board Cat. No. IS200TRLYH2E. I/O Pack System Cat No. IS220PDOAH1A must be used with Terminal Relay Board Cat. No. IS200TRLYH2E.

The Mark Vle I/O Pack system is supplied entirely by a limited voltage/current input source from Distributor Board Cat. No IS410JPDHG1A or any ATEX certified Distributor Board and power supply by ATEX certified Power Supply. All outputs are considered LVLC except connectors JRS, JSS, or JTS from Distributor Board Cat. No IS410JPDHG1A. These connectors will not be used.

Mark Vle Turbine Programmable Controller System consisting of the following models:

SpeedTronic™ Mark Vle Turbine Control I/O Pack Cat No. IS220UCSAH1A.

SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PDIOH1A. Installation must be per control drawing no. GEI-100676. All product numbers may be followed by one or two letters

SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PSCAH1A

SpeedTronic™ Mark Vle Turbine Control I/O Pack System Cat No. IS220PDOAH1A

Distributor Board Cat. No. IS410JPDHG1A

Accessories to I/O Pack Systems:

Terminal Relay Board Cat. No. IS200TDBSH2A; IS200TDBTH2A, IS200TRLYH2E

Terminal Board Cat. No IS200SSCAH2A;

All product numbers may be followed by one or two letters.

<u>Model Nos.</u>	<u>Protection Method Employed</u>
IS220PDIOH1A	Ex nL IIC T4
IS220UCSAH1A, IS410JPDHG1A, IS220PSCAH1A, IS220PDOAH1A	Ex nA IIC T4

NOMENCLATURE:

IS220 PDIO H 1 C A
I II III IV V VI

I - IS200 – board identification
 IS220 – assembly identification
 IS410 – board identification

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- II – Board name –
 PDIO
 TDBT (Accessory)
 TDBS (Accessory)
 USCA
 JPDH
 PSCA
 PDOA
 SSCA (Accessory)
 TRLY (Accessory)
- III - H – Thru-hole components
 G – Surface mount components
- IV - Group number identifies component List used for bare board
- V - Defines board functional interchangeability
- VI - Revisions indicating change to either schematic or BOM

Temperature range

The relation between ambient temperature and the assigned temperature class is as follows:

Ambient temperature range	Temperature class
-30 °C to +65 °C for all models except for IS220UCSAH1A	T4
0 °C to +65 °C for IS220UCSAH1A	T4

Electrical data

I/O pack System Cat. Nos. IS220PDIOH1A, IS220PSCAH1A and IS220UCSAH1A:

Input: 28 Vdc, 536 mA max (Power supply through Distributor Board Cat. No. IS410JPDHG1A or ATEX certified Distributor Board)

I/O pack System Cat. No. . IS220PDOAH1A:

Input: 28 Vdc, 536 mA max (Power supply through Distributor Board Cat. No. IS410JPDHG1A or ATEX certified Distributor Board)

Output: 28 Vdc, 5A, Resistive Load

Energy Limited Field Wiring Parameters (Relay Output ratings) for I/O pack System Cat. Nos. IS220PDIOH1A:

Vmax = 25.2 Vdc
 Imax = 232 mA
 Ci = 0 uF
 Li = 0 uH

Routine tests

Routine dielectric test is not required.

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Descriptive Documents

Project Report No.: 09NK13172 (Hazardous Location Testing)

Drawings:

For System Cat No. IS220PDIOH1A used with IS200TDBSH2A and IS200TDBTH2A

Description:	Drawing No.:	Rev. Level:	Date:
IS200BPPBH2C BOP Processor Card BOM (9 pages)	IS200BPPBH2C	AA	2010-03-30
IS200BPPBH BOP Processor Card (Schematics and assembly drawing, 16 pages)	IS200BPPBH#CAA		2010-02-10
IS220PDIOH1AG BOM	IS220PDIOH1A	G	2010-07-08
IS200BDIOH#AA (Schematics and assembly drawing, 19 pages)	IS200BDIOH#AA		2006-04-28
IS200BDIOH1ACA Manf ML (BOM, 7 pages)	IS200BDIOH1ACA		2010-12-16
IS200TDBSH#AB (Schematics and assembly drawing) (16 pages)	IS200TDBSH#AB		2008-10-29
IS200TDBSH2AB MANF ML (BOM, 6 pages)	IS200TDBSH2AB-1		2010-12-17



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Description:	Drawing No.:	Rev. Level:	Date:
IS200TDBTH#AB (Schematics and assembly drawing, 22 pages)	IS200TDBTH#AB		2008-10-29
IS200TDBTH2AB MANF ML (BOM, 6 pages)	IS200TDBTH2AB-1		2010-12-17
GEI-100676 ATEX PDIO bv20110211 (Installation Instructions with labels for IS220PDIOH1A, 7 pages)	GEI-100676		2011-02-10

For Control I/O Pack Cat No. IS220UCSAH1A

Description:	Drawing No.:	Rev. Level:	Date:
IS220UCSA1A BoM	IS200UCSAH1A	D	2007-09-12
IS200UCSAH#AC (Schematics and assembly drawing, 47 pages)	IS200UCSAH#AC		2007-11-26
GEI-100800 ATEX UCSA bv20110211 (Installation Instructions with labels, 6 pages)	GEI-100800		2011-02-08

For Distributor Board Cat. No. IS410JPDHG1A,

Description:	Drawing No.:	Rev. Level:	Date:
IS410JPDHG#AB (Schematics and assembly drawing, 5 pages)	IS400JPDHG#AB		2008-04-09
IS400JPDHG1ABB BOM	IS400JPDHG1A	BB	2008-04-10
GEI-100801 ATEX JPDH bv20110211 (Installation Instructions with labels, 6 pages)	GEI-100801		2011-02-08

For System Cat No. IS220PDOAH1A used with IS200TRLYH2E

Description:	Drawing No.:	Rev. Level:	Date:
IS220PDOAH1A BOM	IS220PDOAH1A	F	2010-03-19
IS200BPOH#AA (Schematics and assembly drawing, 10 pages)	IS200BPDH#AA		2002-12-10
IS200BPPBH2C BOM (9 pages)	IS200BPPBH2C	AA	2010-03-30
IS200BPPBH#CAA (Schematics and assembly drawing, 16 pages)	IS200BPPBH#CAA		2010-03-30
IS200BPDH1AAA Manf ML (BOM, 8 pages)	IS200BPDH1AAA		2010-12-17
IS200TRLYH#EA (Schematics and assembly drawing) (16 pages)	IS200TRLYH#EA		2003-08-08
IS200TRLYH2EA MANF ML (BOM, 6 pages)	IS200TRLYH2EA		2010-12-17
GEI-100643 ATEX PDOA bv 20110211 (Installation Instructions with labels, 6 pages)	GEI-100643		2001-02-08

For System Cat No. IS220PSCAH1A used with IS200SSCAH2A

Description:	Drawing No.:	Rev. Level:	Date:
IS220PSCAH1A BOM	IS220PSCAH1A	J	2010-10-06
IS400BSCAH#ABB (Schematics and assembly drawing, 8 pages)	IS400BSCAH#ABB		2009-08-17
IS200BPPBH2C BOM (9 pages)	IS200BPPBH2C		2010-03-30
IS200BPPBH#CAA (Schematics and assembly drawing, 16 pages)	IS200BPPBH#CAA	AA	2010-03-30
IS400BSCAH1ABB BOM (3 pages)	IS400BSCAH1ABB		2010-12-18
IS200SSCAH#AE (Schematics and assembly drawing) (16 pages)	IS200SSCAH#AE		2009-06-15
IS200SSCAH1AE BOM (2 pages)	IS200SSCAH1AE		2010-12-18
GEI-100667 ATEX PSCA bv 20110211 (Installation Instructions with labels, 6 pages)	GEI-100667		2011-02-08



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Special conditions for safe use:

- Provision shall be made to prevent the rated voltage being exceeded by the transient disturbances of more than 40%.
- The system shall be mounted in an enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC60529 or EN60529 and used in an environment of not more than pollution degree 2.
- All Models covered under this certificate must be supplied by ATEX-Certified Distributor Board.
- All Models covered under this certificate must use with ATEX-Certified Power Supply.
- SpeedTronic™ Mark VIe Turbine Control I/O Pack System Cat No. IS220PDIOH1A consists Terminal Relay Board Cat. Nos. IS200TDBSH2A and IS200TDBTH2A. I/O Pack System Cat No. IS220PDIOH1A must use with Terminal Relay Board Cat. Nos. IS200TDBSH2A or IS200TDBTH2A.
- SpeedTronic™ Mark VIe Turbine Control I/O Pack System Cat No. IS220PDOAH1A must be used with Terminal Relay Board Cat. No. IS200TRLH2E.
- The SpeedTronic™ Mark VIe Turbine Control I/O Pack Cat No. IS220PSCAH1A must be used with Terminal Board Cat. No. IS200SSCAH2A
- The connections on Distributor Board Cat. No. IS410JPDHG1A are all internal connections.

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Essential Health and Safety Requirements

Met by compliance with the standards EN 60079-0:2006 and EN 60079-15:2005.