

TYPE EXAMINATION CERTIFICATE



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

Type Examination Certificate Number: **DEMKO 10 ATEX 0915487X**

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

Manufacturer: **GE Energy**

Address: **1501 Roanoke Boulevard, 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. **09NK15487**

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:

II 3 G Ex nA nL IIC T4
 II 3 G Ex nA 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: 2010-12-02

Certification Body

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Description of Equipment:

The SPEEDTRONIC™ Mark Vle turbine control system is a 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 system consists of a backplane board containing main controller communication, and a variable number of analog I/O cards, discrete I/O cards, RTD, fuel valve, thermocouple, servo, turbine I/O, 28V monitor, power supply and distribution cards.

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

SpeedTronic™ Mark Vle Turbine Control I/O Pack Model Nos. IS220PCLAH1A, IS220PPRFH1A, IS220PCNOH1A, IS220PPRAH1A, IS220PPRAS1A;

SpeedTronic™ Mark Vle Turbine Control Servo I/O card Model No. IS220PSVOH1A;

SpeedTronic™ Mark Vle Turbine Control Power Distribution I/O Card Model No. IS220PPDAH1A,

SpeedTronic™ Mark Vle Turbine Control Distribution Boards Model No. IS210JPDHG1A 28V.

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

Accessories to I/O Pack:

Terminal Board Model Nos. IS200SCLSH1A, IS200SCLTH1A, IS200SPIDG1A, IS200SPIDG1A, IS200TREAHA1A, IS200TREAS1A, IS200WREAH1A, IS200WREAS1A;

Terminal Backplane board Model No. IS200TSVCH2A;

Distribution Board Model No. IS200JPDSG1A;

Daughter Board Model No. IS200WSVOH1A (screw-in plug-in device).

Models for Ex nA IIC T4:

IS220PPRFH1A I/O Pack, IS220PCNOH1A I/O Pack, IS220PPRAH1A, IS220PPRAS1A I/O Pack, IS220PPDAH1A Power Distribution I/O card, IS210JPDHG1A 28V Distribution Boards.

Models for Ex nA nL IIC T4:

IS220PCLAH1A I/O Pack, IS220PSVOH1A Servo I/O card.

Nomenclature for type Mark Vle Turbine controllers:

$$\frac{\text{IS220}}{\text{I}} \frac{\text{PCNO}}{\text{II}} \frac{\text{H}}{\text{III}} \frac{1}{\text{IV}} \frac{\text{C}}{\text{V}} \frac{\text{A}}{\text{VI}}$$

I - IS200 – board identification
IS210 – board identification
IS220 – assembly identification

II – Board name - Any four A-Z characters

III - H – Surface mount components
G – Thru-hole components
M - Module (Parent board with daughter board)
S – Sil-Certified

IV - Group number identifies component List used for bare board

V - Defines board functional interchangeability

VI - Revisions indicating change to either schematic or BOM

Model Differences:

IS220PCLAH1A I/O Pack, consisting of IS200BPPBH2B processor board and IS200BCLAH1A processor board, used with IS200SCLSH1A terminal board and IS200SCLTH1A terminal board.



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IS220PPRFH1A I/O Pack, consisting of IS200BPPBH2B processor board and IS200BPRFH1A Profibus Communication board, used with IS200SPIDG1A terminal board.

IS220PCNOH1A I/O Pack, consisting of IS200BPPBH2B processor board and IS200BCNOH1A Can-open Interface board, used with IS200SPIDG1A terminal board.

IS220PPRAH1A I/O Pack, consisting of IS200BPPBH2B processor board, IS200BPROH1A Communication board, and IS200KREAH1A Daughter board, used with IS200WREAH1A Terminal board and IS200TREAH1A terminal board.

IS220PPRAS1A I/O Pack, consisting of IS200BPPBH2B processor board, IS200BPROS1A Communication board, and IS200KREAS1A Daughter board, used with IS200WREAS1A Terminal board and IS200TREAS1A terminal board.

IS220PPRAH1A is identical to Model IS220PPRAS1A I/O Pack except for the Model designation. IS200BPROH1A Communication Board used in the IS220PPRAH1A I/O Pack is identical to IS200BPROS1A used in the and IS220PPRAS1A I/O Pack except for Model designation. IS200KREAH1A Daughter Board used in IS220PPRAH1A is identical to IS200KREAS1A Daughter board used in IS220PPRAS1A except for Model designation.

IS220PSVOH1A Servo I/O card consisting of IS200BPPBH2B processor board and IS200BSVOH1A Communications board, used with IS200TSVCH2A Terminal Backplane board and IS200WSVOH1A daughter board.

IS220PPDAH1A Power Distribution I/O card consisting of IS200BPPBH2B processor board and IS200BPDAH1A Communication board used with IS200JPDSG1A Distribution Board.

Terminal Boards: IS200TREAH1A terminal board is identical to IS200TREAS1A terminal board except for the Model designation. IS200WREAH1A is identical to IS200WREAS1A except for Model designation.

Temperature range

The ambient temperature range for all Models except for IS220PPRFH1A I/O Pack and IS220PCNOH1A I/O Pack is -30 °C to +65 °C.

The ambient temperature range for IS220PPRFH1A I/O Pack and IS220PCNOH1A I/O Pack is -20 °C to +55 °C.

Electrical data

Supply Input for All I/O packs: 28 Vdc, 1.8A max

IS220PCLAH1A – Thermocouples Input: -16mV - +63mV
Analog Input: 4-20mA, +/-10Vdc or +/-5Vdc
RTD Input: 1mA
Analog Output: 4-20mA

IS220PPRFH1A - RS485 Input: -7V - +12V, 1mA
RS485 Output: -7V+12V, 1mA

IS220PCNOH1A - CAN-bus Input: 0.5V - 4.5V, 18.8 mA
CAN-bus Output: 0.5V - 4.5V, 18.8 mA

IS220PPRAH1A, IS220PPRAS1A - Pulse rate input - 250mV
Digital signal input - 28V, high impedance.
Potential Transformer inputs - 150Vmax, 3mA
Isolated contact inputs - 24V, high impedance
Solid-state relay command outputs - 10A max sync

IS220PSVOH1A - LVDT input: 7V, high impedance
Servo Valve output - 35V max, 120mA max
Excitation source for LVDT - 7Vrms, 20mA

IS220PPDAH1A - analog inputs(33), +/-5V, high impedance

Installation instructions

For ambient temperatures below -30 °C and above +65 °C use field wiring suitable for both minimum and maximum ambient temperature.

Routine tests

Routine dielectric test per clause 34.2.1 of EN 60079-15:2005 required for all I/O packs on Ethernet Board and Distribution Boards Model No. IS210JPDHG1A 28V.



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Descriptive Documents

Project Report No.: 09NK15487 (Hazardous Location Testing)

Drawings:

Description:	Drawing No.:	Rev. Level:	Date:
IS200BPPBH2B Schematics and Layout (16 pages)	IS200BPPBH#CAA	-	2010-02-10
IS200BCLAH1A Schematics and Layout (40 pages)	IS200BCLAH#ABA	-	2009-06-01
IS200SCLSH1A (Terminal Board) Schematics and Layout (19 pages)	IS200SCLSH#AAB	-	2009-03-11
IS200SCLTH1A (Terminal Board) Schematics and Layout (11 pages)	IS200SCLTH#AAB	-	2009-03-02
IS200BPRFH1A Schematics and Layout (6 pages)	IS200BPRFH#AA	-	2005-01-17
IS200SPIDG1A (Terminal Board) Schematics (4 pages)	IS200SPIDG#AA	-	2005-07-08
IS200BCNOH1A Schematics (2 pages)	IS200BCNOH#AA	-	2008-07-21
IS200BPROH1A Schematics and Layout (15 pages)	IS200BPROH#ADD	-	2009-10-27
IS200BPROS1A Schematics (13 pages)	IS200BPROH#ACB	-	2008-12-12
IS200KREAH1A Schematics and Layout (6 pages)	IS200KREAH#AAB	-	2009-02-18
IS200KREAS1A Schematics and Layout (6 pages)	IS200KREAS#AAB	-	2009-07-16
IS200WREAH1A (Terminal Board) Schematics and Layout (16 pages)	IS200WREAH#ABB	-	2009-03-04
IS200WREAS1A (Terminal Board) Schematics and Layout (16 pages)	IS200WREAS#ABB	-	2009-07-16
IS200TREAH1A (Terminal Board) Schematics and Layout (16 pages)	IS200TREAH#AD	-	2008-10-29
IS200TREAS1A (Terminal Board) Schematics and Layout (16 pages)	IS200TREAS#AC	-	2006-06-01
IS200BSVOH1A Schematics and Layout (18 pages)	IS200BSVOH#AB	-	2006-09-29
IS200WSVOH1A Schematics and Layout (10 pages)	IS200WSVOH#AC	-	2003-11-06
IS200TSVCH2A (Terminal Backplane Board) Schematics and Layout (16 pages)	IS200TSVCH#AE	-	2008-10-29
IS200BPDAH1A Schematics and Layout (19 pages)	IS200BPDAH#AB	-	2005-12-05
IS200JPDSG1A (Distribution Board) Schematics and Layout (7 pages)	IS200JPDSG#AD	-	2008-10-29
IS210JPDHG1A Schematics and Layout (5 pages)	IS200JPDHG#AA	-	2006-10-31
IS200BCLAH1A Bill of Material (17 pages)	IS200BCLAH1ABA.rpt	BA	2009-06-02
IS200BPPBH2B Bill of Material (9 pages)	IS200BPPBH2CAA.rpt	AA	2010-03-20
IS200SCLSH1A Bill of Material (7 pages)	IS200SCLSH1AAB.rpt	AB	2009-03-13
IS200SCLTH1A Bill of Material (4 pages)	IS200SCLTH1AAB.rpt	AB	2009-03-11
IS200BPRFH1A Bill of Material (2 pages)	IS200BPRFH1AA.rpt	AA	2007-03-28
IS200SPIDG1A Bill of Material	G1MRPBOM.rpt	AA	2005-06-30
IS200BCNOH1A Bill of Material (2 pages)	IS200BCNOH1AA.rpt	AA	2009-06-02
IS200BPROH1A Bill of Material (8 pages)	IS200BPROH1ADD.rpt	DD	2009-10-28
IS200BPROS1A Bill of Material (11 pages)	IS200BPROH1AC.rpt	CB	2008-12-12
IS200KREAH1A Bill of Material (4 pages)	IS200KREAH1AAB.rpt	AB	2009-02-18
IS200KREAS1A Bill of Material (4 pages)	IS200KREAS1AAB.rpt	AB	2009-07-16
IS200WREAH1A Bill of Material (9 pages)	MAXCASEBOM.rpt	BB	2009-03-04
IS200WREAS1A Bill of Material (9 pages)	IS200WREAS1ABB.rpt	BB	2009-07-16
IS200TREAH1A Bill of Material (6 pages)	MAXCASEBOM.rpt	DD	2008-10-29
IS200TREAS1A Bill of Material (6 pages)	MAXCASEBOM.rpt	CC	2006-06-02



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Description:	Drawing No.:	Rev. Level:	Date:
IS200BSVOH1A Bill of Material (9 pages)	IS200BSVOH1AB.rpt	BB	2006-11-03
IS200WSVOH1A Bill of Material (8 pages)	BOM.rpt	CD	2010-10-29
IS200TSVCH2A Bill of Material (9 pages)	IS200TSVCH2AE.rpt	ED	2008-10-29
IS200BPDAH1A Bill of Material (7 pages)	IS200BPDAH1AB.rpt	BB	2005-12-06
IS200JPDSG1A Bill of Material (4 pages)	IS200JPDSG1AD.rpt	DC	2008-10-29
IS210JPDHG1A Bill of Material	IS200JPDHG1AA.rpt	AA	2006-10-30
IS220PCLAH1A Label	336A4940FFP90	4	2010-11-22
IS220PPRFH1A Label	336A4940FFP20	4	2010-11-22
IS220PCNOH1A Label	336A4940FFP29	4	2010-11-22
IS220PPRAH1A Label	336A4940FFP28	4	2010-11-22
IS220PPRAS1A Label	336A4940FFP95	4	2010-11-22
IS220PSVOH1A Label	336A4940FFP15	4	2010-11-22
IS220PPDAH1A Label	336A4940FFP10	4	2010-11-22
IS210JPDHG1A Label	336A4940FFP93	4	2010-11-22
Accessories Label	336A4940FFP80	4	2010-11-22
Pack Label for Serial Number	336A4940CZ	-	2008-04-02
IS220PCLAH1A Installation Instructions	GEI-100672	-	2010-11-23
IS220PPRFH1A Installation Instructions	GEI-100673	-	2010-11-23
IS220PCNOH1A Installation Instructions	GEI-100674	-	2010-11-23
IS220PPRAH1A and IS220PPRAS1A Installation Instructions	GEI-100671	-	2010-11-16
IS220PSVOH1A Installation Instructions	GEI-100649	-	2010-11-23
IS220PPDAH1A, Installation Instruction	GEI-100668	-	2010-11-29
IS210JPDHG1A 28V Installation Instruction	GEI-100675	-	2010-11-29

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Special conditions for safe use:

- Subject devices are to be installed in an IP54 enclosure.
- Subject devices are for use in an area of not more than pollution degree 2 in accordance with IEC 60664-1.
- All Models covered under this type certificate must use with ATEX-Certified Power Supply.
- IS200SCLSH1A terminal board and IS200SCLTH1A terminal board to be used with IS220PCLAH1A I/O Pack.
- IS200SPIDG1A terminal board to be used with IS220PPRFH1A I/O Pack and IS220PCNOH1A I/O Pack.
- IS200TREA1A terminal board and IS200WREA1A terminal board to be used with IS220PPRAH1A I/O Pack.
- IS200TREAS1A terminal board and IS200WREAS1A terminal board to be used with IS220PPRAS1A I/O Pack.
- IS200TSVCH2A terminal backplane board and IS200WSVOH1A daughter board to be used with IS220PSVOH1A I/O Pack.
- IS200JPDSG1A distribution board to be used with IS220PPDAH1A I/O Pack.

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Essential Health and Safety Requirements

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



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