



10550663  
Edition 2  
February 2006

## Solar Corporation Starter Motors - ATEX

 II 3 GD c IIB 71° C X

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# Product Safety Information



Save These Instructions

 **Ingersoll Rand**

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## Solar Corporation Starter Motors

### Intended for use in Potentially Explosive Atmospheres

#### NOTICE

The CE Declaration of Conformity in this manual states that these Starter Motors have been reviewed for compliance to European Community Directive 94/9/EC "Equipment for use in potentially explosive atmospheres", commonly referred to as the ATEX Directive.

These Starter Motors have been reviewed for conformance as defined by ATEX designation:



These ATEX designations define the applications, the type and duration of the potentially explosive atmospheres, the type of protection and the maximum surface temperature.

The X indicates that additional special conditions are required for safe application, operation and/or maintenance of these tools when used in potentially explosive atmospheres.

This Starter Motor has been marked with the above symbols as it is considered equipment. The markings pertain to **Normal Operation** the Starter Motor, and should **NOT** be interpreted as the designation of the entire Solar Turbine machine.

#### NOTICE

- All Special Conditions must be followed for this product to conform to the ATEX Directive and for the ATEX Declaration of Conformity to be valid.
- The Starter Motors listed in this manual have been reviewed as equipment for Solar Corporation and were designed for use in certain potentially explosive atmospheres under the following Special Conditions.

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## Special Conditions for Safe Application, Installation, Operation and Maintenance

#### WARNING

- Non-compliance with any of these Special Conditions could result in ignition of explosive atmospheres.
- Installers of this equipment must ensure the exhaust is vented safely. Steps must be taken to assure exhaust venting of any flammable gas does not create a risk of explosion.
- Rubbing and friction of the Starter Motor shaft or of components driven by the Starter Motor can cause sparks or elevated temperatures that may be a source of ignition of an explosive atmosphere. If any of these conditions exist, discontinue operation until the discrepancy can be corrected.
- Do not install, remove or perform maintenance on the Starter Motor without ensuring that an explosive atmosphere does not, and will not exist. Additional ignition hazards exist during these operations due to the material used for the housing, internal components and fastening, and by the tools that are required. It is recommended that a Work Permit System should be used that ensures that the atmosphere remains non-explosive during these operations.
- Installation of a Starter Motor in a system for use in areas that do not meet the criteria and restrictions identified in this manual will pose a possibility of ignition of an explosive atmosphere.

## Application and Installation

- Starter Motors are not an effective ignition source during their normal operation. Starter Motors are to be used only for starting a Solar Turbine, or as a pre or post-lube pump and wet seal back up pump for a Solar Turbine, and is therefore not in use during the normal operation cycle of the Turbine.
- Solar Corporation and / or the Starter Motor installer are to ensure equipment driven by the Starter Motor does not contribute to an explosive condition.
- Never use this Starter Motor where there is a possibility that a gas in Group C (acetylene, carbon disulfide, and hydrogen, as defined in EN 50014), or hydrogen sulfide, ethylene oxide or carbon monoxide, may be present. These gases cause a high probability of explosion.
- This ATEX designation only applies to the use of this product on Solar Turbines. This product is not to be used in Non-Solar applications.
- Due to the possibility of accumulation of static discharge, care must be taken to ensure the motor is properly grounded at all times to prevent ignition hazards from electrostatic discharge. A resistance to earth of less than 10000 Ohms is required.

## Starter Motor Operating Conditions

- Air pressure above the rated pressure marked on starter serial number plate, located on the Starter Motor housing, may result in a source of ignition caused by premature failure of bearings or other components due to excessive speed, output torque, or force.
- Elevated surface temperature is an indication of overload or potential failure of bearings or other mechanical components that may create an ignition source.
  - Motor maximum surface temperature was measured at 71°C with an ambient temperature of 21°C. This measurement was made with the starter motor running at free speed with 90 psig (6.2 bar/620 kPa) air pressure measured at the inlet.

## Maintenance

- Prior to any maintenance being performed on the starter motor, its removal from the engine is mandatory.
- Do not perform maintenance or repairs when hazardous atmospheres are present.
- Do not clean or lubricate motor with flammable or volatile liquids such as kerosene, gasoline, or jet fuel. A potentially explosive atmosphere may be created.
- Proper lubrication and maintenance are required to prevent premature failure of the starter and its component parts whose failure may create an ignition source.
- Follow the recommendations in the Lubrication and Maintenance sections of the Operation and Maintenance manual supplied with the starter motor. For ATEX certified models the following intervals for complete rebuild of the units (gearing, bearings, etc.) are recommended:

Model	Recommended Interval
1070744-1 (201RM16/VRM-172)	2000 start cycles
1064469-1 (92RMG10)	1000 start cycles
1064470-1 (150RMG14C)	1000 start cycles
1071549-100 (201RM21)	2000 start cycles
1065986-100 (TS1425)	4000 start cycles
1065986-200 (TS1499)	4000 start cycles
1065986-300 (TS1435)	4000 start cycles
1065986-400 (TS1450)	4000 start cycles
1070272-1 (MVA017B/VSM-5842)	2000 start cycles
1070270-100 (SS1600/1329BA)	2000 start cycles
1070745-200 (TS725GBBE-LE)	4000 start cycles
1070745-100 (TS725GBDE-LE)	4000 start cycles
1065986-11 (ST925G-RC350)	4000 start cycles
1065986-15 (ST999G-RC350)	4000 start cycles
1065986-8 (ST935G-RC350)	4000 start cycles
1065986-17 (ST950GS-RC350)	4000 start cycles

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## NOTICE

- It is recommended that these or similar recommendations are included in the Operation and Maintenance Manual of the Solar Turbine into which the Starter Motor is incorporated.
- To safely use this product and conform to the provisions of the Machinery Directive 98/37/EC, all instructions given in the accompanying literature, in addition to all conditions, notices and warnings given herein, must be followed.
- The CE Declaration of Incorporation in this manual states that these models have been reviewed for compliance to European Community Directive 94/9/EC "Equipment for use in potentially explosive atmospheres" for Group II 3 GD c II B 71°C X. Air Starter Motors are intended to be integrated into a Solar Turbine. Ingersoll-Rand Company Limited cannot foresee all of the ways that this component may be applied and therefore is not able to provide all of the safety aspects of the Solar Turbine.

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## Explanation of ATEX Marking and Declaration of Incorporation

The European Directive 94/9/EC, commonly referred to as the ATEX Directive, requires manufacturers of products for use in potentially explosive atmospheres to assess their products to prevent them from creating an explosive atmosphere or from creating a source of ignition of an explosive atmosphere. The manufacturer must certify that when the products are properly installed, maintained and used for their intended purpose, they do not endanger the health and safety of persons, animals or property.

The ATEX Directive recognizes that the probability of a serious event occurring varies with:

- the explosive properties of the atmosphere
- the probability of the atmosphere being present
- the probability of the machinery causing an explosive atmosphere
- the probability of the machinery causing an ignition source

It also recognizes the need for special conditions of installation and operation that must be followed to reduce or eliminate this potential for a serious event.

The ATEX Directive requires that the completed engine / machine be marked to indicate that it has been certified for use in potentially explosive atmospheres and to inform the user of limitation of use and special conditions of use.

An example of ATEX marking on a completed machine is  $\text{Ex} \text{II 3 GD c IIB Tmax X}$ .

$\text{Ex}$  – This symbol indicates certification for use in an explosive atmosphere and is followed by other symbols indicating the details of that certified use.

**II** – This indicates Equipment Group II – Non-Mine use.

**3** – Indicates Equipment Category 3 – Equipment in Category 3 is intended for use in areas in which explosive atmospheres caused by gases, vapors, mists or air/dust mixtures are unlikely to occur or, if they do occur are likely to do so only infrequently or for short periods. Protection is ensured during normal use.

**G** – Indicated evaluation for explosive atmospheres caused by gases, vapors or mists.

**D** – Indicated evaluation for explosive atmospheres caused by dust.

**c** – Indicated evaluation per European Standard EN 13463-5 for Protection by Constructional Safety.

**IIB** – (Optional marking) Gas Group – Gases are grouped by their MESG (maximum experimental safe gap) and MIC (maximum ignition current), with Group A being least explosive and Group C being most explosive. Certification for use in Group B includes Group A and covers gases with MIC ratio > 0.45 and MESG > 0.55 mm.

**Tmax** – The maximum surface temperature in degrees Centigrade calculated from the measured maximum temperature with corrections for ambient and a factor of safety.

**X** – Indicates that there are special conditions for safe application, installation, operation and maintenance all of which MUST be followed for the certification to apply.

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## Safety Symbol Identification



Wear Respiratory  
Protection



Wear Eye  
Protection



Wear Hearing  
Protection



Read Manuals Before  
Operating Product

(Dwg. MHP2598)

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## Safety Information - Explanation of Safety Signal Words



**DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

**NOTICE**

Indicates information or a company policy that relates directly or indirectly to the safety of personnel or protection of property.

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## General Information



**CAUTION**

**Repair should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Service Center.**

Manuals can be downloaded from [www.irtools.com](http://www.irtools.com).

Refer all communications to the nearest **Ingersoll Rand** Office or Distributor.

## DECLARATION OF CONFORMITY



(FR) CERTIFICAT DE CONFORMITÉ (DE) KONFORMITÄTSEKTLÄRUNG (IT) DICHIARAZIONE DI CONFORMITÀ (ES) DECLARACIÓN DE CONFORMIDAD (NL) SCHRIFTELIJKE VERKLARING VAN CONFORMITEIT (DA) FABRIKATIONSERKLÆRING (SV) FÖRSÄKRAN OM ÖVERENSSTÄMMELSE (NO) KONFORMITETSERKLÆRING (FI) VAKUUTUS NORMIEN TÄYTTÄMISESTÄ (PT) DECLARAÇÃO DE CONFORMIDADE (EL) ΔΗΛΩΣΗ ΑΝΑΓΝΩΡΙΣΗΣ

Ingersoll Rand

Hindley Green, Wigan WN2 4EZ, UK

**Declare under our sole responsibility that the product: Starter Motor**

(FR) Déclarons sous notre seule responsabilité que le produit: (DE) Erklären hiermit, gemäß unserer alleinigen Verantwortung, daß die Geräte: (IT) Dichiariamo sotto la nostra unica responsabilità che il prodotto: (ES) Declaramos que, bajo nuestra responsabilidad exclusiva, el producto: (NL) Verklaan, onder onze uitsluitende aansprakelijkheid, dat het product: (DA) Erklærer som eneansvarlig, at nedenstående produkt: (SV) Intygat härmed, i enlighet med vårt fullständiga ansvar, att produkten: (NO) Erklærer som eneansvarlig at produktet: (FI) Vakuutamme ja kannamme yksin täyden vastuun siitä, että tuote: (PT) Declaramos sob a nossa exclusiva responsabilidade que o produto: (EL) Δηλώνουμε ότι με δική μας ευθύνη το προϊόν:

**Model: 201RM16/VRM-172, 92RMG10, 150RMG14C, 201RM21, TS1425, TS1499, TS1435, TS1450, MVA017B/VSM5842, SS1600/1329BA, TS725GBBE-LE, TS725GBDE-LE, ST925G-RC350, ST999G-RC350, ST935G-RC350, ST950GS-RC350**

**Serial Number Range: SPO6B → XXXXX**

(FR) Modèle: / No. Serie: (DE) Modell: / Serien-Nr.-Bereich: (IT) Modello: / Numeri di Serie: (ES) Modelo: / Gama de No. de Serie: (NL) Model: / Seriennummers: (DA) Model: / Serienr: (SV) Modell: / Seriennummer, mellan: (NO) Modell: / Serienr: (FI) Mallia: / Sarjanumero: (PT) Modelo: / Gama de Nos de Série: (EL) Μοητελα: / Κλιμααα Αύζοντος Αριθμού:

**To which this declaration relates, is in compliance with provisions of Directive(s): 94/9/EC (ATEX)**

(FR) objet de ce certificat, est conforme aux prescriptions des Directives: (DE) auf die sich diese Erklärung bezieht, den Richtlinien: (IT) a cui si riferisce la presente dichiarazione è conforme alle normative delle direttive: (ES) a los que se refiere la presente declaración, cumplen con todo lo establecido en las directivas: (NL) waarop deze verklaring betrekking heeft overeenkomt met de bepalingen van directieven: (DA) som denne erklæring vedrører, overholder bestemmelserne i følgende direktiver: (SV) som detta intyg avser, uppfyller kraven i Direktiven: (NO) som denne erklæringen gjelder for, oppfyller bestemmelsene i EU-direktivene: (FI) johon tämä vakuutus viittaa, täyttää direktiiveissä: (PT) ao qual se refere a presente declaração, está de acordo com as prescrições das Directivas: (EL) τα οποία αφορά αυτή η δήλωση, είναι σύμφωνα με τις προβλέψεις των Ενστολών:

**By using the following Principle Standards: EN 13463-1, EN 13463-5, EN 1127-1, EN 50014**

(FR) en observant les normes de principe suivantes: (DE) unter Anlehnung an die folgenden Grundnormen entsprechen: (IT) secondo i seguenti standard: (ES) conforme a los siguientes estándares: (NL) overeenkomstig de volgende hoofdstandaards: (DK) ved at være i overensstemmelse med følgende hovedstandard(er): (SV) Genom att använda följande principstandard: (NO) ved å bruke følgende prinsipielle standarder: (FI) esitetty vaatimukset seuraavina perusnormeja käytettäessä: (PT) observando as seguintes Normas Principais: (EL) Χρησιμοποιώντας τις παρακάτω κύρια πρότυπα:

**Date: February, 2006**

(FR) Date: Février, 2006: (DE) Datum: Februar, 2006: (IT) Data: Febbraio, 2006: (ES) Fecha: Febrero, 2006: (NL) Datum: Februari, 2006: (DA) Dato: Februar, 2006: (SV) Datum: Februari, 2006: (NO) Dato: Februar, 2006: (FI) Päiväys: Helmikuu, 2006: (PT) Data: Fevereiro, 2006: (EL) Ημερομηνία: Φεβρουάριος, 2006:

**Approved By:**

(FR) Approuvé par: (DE) Genehmigt von: (IT) Approvato da: (ES) Aprobado por: (NL) Goedgekeurd door: (DA) Godkendt af: (SV) Godkänt av: (NO) Godkjent av: (FI) Hyväksytty: (PT) Aprovado por: (EL) Εγκρίθηκε από:

**David R. Hicks**

Global Engineering Manager - Pneumatic Products

## Notes

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[www.irttools.com](http://www.irttools.com)

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