

## Blackmer Centrifugal Pumps

### Addendum to the IOM for EU & UK Compliance

Directive 2014/34/EU on Equipment and protective Systems Intended For Use in Potentially Explosive Atmospheres (ATEX)

SI 2016 No. 1107 The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016



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## List of Harmonized/Designated Standards and Other Technical Standards Applied

Directive 2014/34/EU on Equipment and protective Systems Intended For Use in Potentially Explosive Atmospheres (ATEX)

SI 2016 No. 1107 The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmosphere Regulations 2016

Directive 2006/42/EC on Machinery (The Machinery Directive)

The Supply of Machinery (Safety) Regulations 2008 No. 1597

EN ISO 14120:2015 Safety of machinery-Guards- General requirements for the design and construction of fixed and movable guards

EN ISO 12100:2010 Safety of machinery-General principles for design-Risk assessment and risk reduction (ISO 12100:2010)

EN 1127-1:2019 Explosive Atmospheres-Explosion prevention and protection-Part 1: Basic concepts and methodology

EN 13445-5:2021 Unfired pressure vessels-Part 5: Inspection and testing

EN ISO 80079-36:2016-1:2009 Non-electrical equipment for use in potentially explosive atmospheres-Part 1: Basic method and requirements

EN ISO 80079-37:2016 Non-electrical equipment for use in potentially explosive atmospheres-Part 5: Protection by constructional safety 'c'

EN 13857:2019 Safety of machinery-Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)

VDI 2440 Emission Control Mineral oil refineries

ASTM A395 Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures

ASTM A536 Standard Specification for Ductile Iron Castings

ASTM A48 Standard Specification for Gray Iron Castings

ASTM A216 Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, For High Temperature Service

ASTM A276 Standard Specification for Stainless Steel Bars and Shapes

ASTM A494 Standard Specification for Castings, Nickel and Nickel Alloy

ASTM A 534 Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes

ASTM A743 Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application

ASTM A890 Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application

ASTM B73.1 Specification for Horizontal End Suction Centrifugal Pumps for Chemical Processes

ASTM B335 Standard Specification for Nickel-Molybdenum Alloy Rod

ASTM B473 Standard Specification for UNS N08020, UNS N08024, and UNS N08026 Nickel Alloy Bar and Wire

ASTM B574 Standard Specification for Low-Carbon Nickel-Chromium-Molybdenum, Low-



Carbon Nickel-Molybdenum-Chromium, Low-Carbon Nickel-Molybdenum-Chromium-Tantalum, Low-Carbon Nickel-Chromium-Molybdenum-Copper, and Low-Carbon Nickel-Chromium-Molybdenum-Tungsten Alloy Rod

**Note:** Any reference to ATEX, ATEX Directive, or EU 2014/34/EU is also a reference to SI 2016 No. 1107.

Any reference to The Machinery Directive, Directive 2006/42/EC, or CE mark is also a reference to The Supply of Machinery (Safety) Regulations 2008 No. 1597, or UKCA marking.

### General Description

The equipment consists of a family of ANSI compliant end suction centrifugal pumps. As such they are, for the most part, in compliance with the ASME B73.1 *Specification for Horizontal End Suction Centrifugal Pumps for Chemical Process*. However the purpose of this document is not to assure compliance to this standard but to assure compliance to the ATEX Directive and the Machinery Directive.

This family consists of 2 basic styles, semi open impeller and tangential discharge semi open impeller pumps. These pumps utilize 5 drive styles; Frame SD, S, A, LD17 and M. Numerous options are available for materials, gaskets, mechanical seals, and flush plans as described in the various pump specification sheets. These pumps can be provided as fully assembled pump units furnished without motors and drive couplings but with mechanical seals (bare shaft pumps). As such they are considered complete machinery and are provided with an ATEX Certificate of Conformity and will be marked with the CE and ATEX markings as required. In some circumstances incomplete pumps are supplied. Such as a wet end only or a unit without a factory installed mechanical seal. These are considered incomplete machinery comprising parts from an ATEX conforming pump and will not be marked with the ATEX string or the CE marking but will be shipped with a Certificate of Incorporation.

All Blackmer Centrifugal pumps have been designed using sound engineering practices and with consideration to the prior listed standards. They are manufactured in ISO certified facilities in the USA.

All Blackmer Centrifugal Pumps regardless of model or configuration are Blackmer self-certified in accordance with Directive 2006/42/EC, The Machinery Directive and The Supply of Machinery (Safety) Regulations 2008 No. 1597 ANNEX VIII. The technical file is held by the manufacturer at the Grand Rapids Michigan USA location.

And in accordance with Directive 2014/34/EU, The ATEX Directive and SI 2016 No. 1107 The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations, Annex VIII, using Internal Control of Production. This file contains the technical information for the ATEX technical file as required by Directive 2014/34/EU, the ATEX Directive and SI 2016 No. 1107 The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations. The conformity assessment is in accordance with Article 13 section 1, point (bii)



and this documentation is provided in accordance with Annex VIII, point 2. This file is held by:

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France  
Notified Body No. 081

United Kingdom  
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Notified Body No. 0891

All complete Blackmer Centrifugal pumps are protected by 'c' constructional safety and are classified Equipment Group II Category 2 & 3 equipment for G gas environment IIB and temperature class between T2 & T5 and are marked

 II 2 G c IIB EX h T30°C-T230°C Gb X. The pump is not intended to act as a safety accessory.

### CE and ATEX Conformity instructions

It is the responsibility for the person installing the Blackmer Centrifugal pumps or the end user to ensure that placarding complies with the ATEX Directive, the Machinery Directive and all local codes and regulations.



#### General Danger Warning

Blackmer Centrifugal pumps are designed for industrial applications. They should only be installed and operated by properly trained personnel.



#### Hot surface warning

Blackmer Centrifugal pumps have surfaces that can approach the maximum allowable gas temperature, such as the discharge flange, casing, or seal. In addition other surfaces, such as the power end, may exceed a temperature that is hazardous to contact.



### Read operators manual

Blackmer Centrifugal pumps must only be installed and operated by properly trained personnel. They should never be started or operated before reading and fully understanding the instructions in the Installation, Operation and Maintenance Manual (IOM) and this addendum that was provided with this equipment. If the IOM is not provided or has been misplaced copies are available on the Blackmer website or the local Blackmer distributor.



### Lifting point warning

Blackmer Centrifugal pumps are heavy. They should only be lifted in accordance with the IOM instructions provided for that machine. Blackmer Centrifugal pumps should never be used as a lifting point for the machinery that they are incorporated into.



### Pump drive warning

All Blackmer Centrifugal pumps require a customer supplied drive system. Blackmer does not provide complete ATEX rated drive systems. Blackmer does not provide ATEX rated couplings. It is the responsibility of the end user to install a properly rated coupling and motor. The rating of the pumping unit cannot exceed that of the lowest rated component. **Proper placarding and protection levels for the customer provided drive equipment is the responsibility of the end user.**

Centrifugal pumps are supplied with ISO 6.2 Grade balancing as standard, therefore these pumps should be free of dangerous vibrations. However pumps that are run off design point, run with insufficient suction head, or are just poorly installed or maintained may exhibit excessive vibrations. It is the end users responsibility to properly anchor the pump to a foundation of sufficient mass and stiffness to accommodate this possibility. The design of the mounting and installation of these pumps must be performed by qualified individuals familiar with centrifugal pumps to ensure ATEX and Machinery Directive compliance. Further Blackmer IOM and Technical Bulletins must be followed whenever they are not in conflict with local codes or regulations.

When installed properly and used within the established limits of design Blackmer Centrifugal pumps should not exceed 85 dBA when measured at 1 meter from the pump or 1.6 meter from the foundation. However, sound and vibration levels can vary greatly based on mounting/foundation design and piping configuration. Proper installation by personnel qualified and experienced in centrifugal pump foundation design is critical to provide operation within limits. **It is the final user's responsibility to ensure that the pump is properly mounted and that the operational limits are not exceeded.**



Blackmer Centrifugal pumps are rotation specific and must be operated only in the proper direction. It is mandatory that prior to initial start-up and after any maintenance that requires removal of power from the installation that a rotational direction check be performed on the motor only with the pump uncoupled.

### Other warnings and information

1. Blackmer Centrifugal pumps are designed to pump fluids that are below their boiling point. Air mixed with vapor in the housing on the pump can create an explosion hazard. It is the end users reasonability to ensure that any inadvertent (or intentional) mixtures:
  - a. are above the lower explosive limit of concentration
  - b. are below the upper explosive limit of concentration
  - c. that will self-ignite without an addition of an oxidizer or catalyst
  - d. are reactive with the materials of construction.

**Are not allowed to occur.**



2. The end user must take all necessary precautions in the calculation of the LEL, UEL, ignition impact energy and auto ignition point of the process fluid and any explosive gasses in the vicinity of the installation. Consideration must be given to the energy value of any such mixture.
3. The end user is responsible for the necessary precautions regarding the process liquid as it relates to hazards such as but not limited to:
  - Flammability-the upper and lower levels and ease of ignition
  - Toxicity-the acceptable concentration levels
  - Explosive behavior-the upper and lower level and the energy produced
  - Corrosion potential and material compatibility
  - Personal Protective Gear requirement
  - Placarding and signage requirements for compliance with European Standards and local codes
4. Blackmer Centrifugal pumps are designed to operate within an ambient temperature range of -20°C to 40°C.
5. Blackmer Centrifugal pumps are available with a variety of O-ring and gasket materials. Each material has a temperature rating that is unique to that material. Materials must be selected that have a temperature rating that is at minimum 20°C higher than the anticipated operating temperature of the pump. The maximum temperature rating is for a properly equipped pumps, any deviation from this material will result in a lower temperature rating. Blackmer recommends temperature limiting devices be installed to ensure the required temperature rating for the applicable ATEX zone. **The proper selection of O-ring materials is the responsibility of the end user.**



6. Blackmer Centrifugal pumps are heavy. Proper rigging and lifting techniques are needed to avoid personal injury or damage to property. After incorporation the pump must not be used to lift the finished machinery. Since pump configurations can vary please consult the factory for the mass of your machine.

7. Proper mechanical seal selection and installation is essential to meet the ATEX Category 2 rating. Mechanical seals must always be replaced by the same seal as provided originally. If it is necessary to substitute a different seal the installer must perform an assessment if the seal meets the criteria of a like for like replacement. **Failure to comply with this instruction results in a Category 3 machine.**



8. Blackmer Centrifugal pump power ends are supplied without oil. Only Blackmer approved oils have been considered in assessing the ATEX category rating of this equipment. **Any deviation from the Blackmer approved oils without consideration of the risks associated with the lubricating oil will result in a Category 3 rating of this equipment.**

9. Blackmer does not issue recommendations for coolant for use in liquid cooled pumps. Any fluid that is non-reactive to ductile iron, and copper, and has a flash point above 176°C is required for a Category 2 rating. **It is the responsibility of the end user to ensure that the cooling system is properly designed for the required equipment category.**

10. Only trained operators and maintenance personnel should be allowed to work on the system. All maintenance must be performed in accordance with the IOM and this Addendum.



11. Suitable pressure limiting devices must be employed with the system. Pressure control devices should be used if there is a risk of over pressure operation. **Failure to provide pressure control devices may result in a lower ATEX category rating.**

12. Blackmer Centrifugal pumps have pressure ratings based on temperature of the product pumped. Further different seals and gaskets have different temperature limits. **For Category 2 equipment discharge temperature controls are required otherwise Blackmer Centrifugal Pumps are only suitable for Category 3 operation.** Any protection device must be properly rated for the ATEX category and zone of intended use.

13. **Blackmer Centrifugal pumps are not intended for use in a potentially explosive dust atmosphere.** However, dust is naturally occurring in the environment that this equipment will be installed in. Proper care and/or protection



against dust accumulation on the outside of the compressor is crucial to maintaining the pumps ATEX rating. Periodic inspection and cleaning are required to maintain the ATEX rating. **Do not use high temperature steam or high pressure water to clean the outside of the pump.**

**14. The end user is responsible for compliance of the installed pump to all applicable directives and standards. This includes the category rating of the final equipment.**

**Special conditions**

Pump operating temperature is dependent on the operating conditions of the pump and the temperature, viscosity, and density of the fluid that is being pumped. Further the allowable operating temperature of the pump is dependent on how the pump was configured when it was built. Different operating temperatures require different end clearances of the casing to the impeller, consult IOM section 4 for instructions. Different temperatures require that all seals and elastomers are rated for the desired operating temperature. Seal maximum operating temperature is provided by the seal manufacture. The following chart list the temperature limits of Blackmer Centrifugal gasket materials:

**Table 1: Gasket temperature limits**

<b>Gasket Material</b>	<b>Material Temperature Limit (°C)</b>	<b>Fluid Temperature Limit (°C)</b>
CFN	260*	240*
RGO	450*	350*
RPE	250*	230
PTFE	260*	240*
FKM**	200	180

\*Exceeds the pumps ATEX rating for temperature

\*\*Seal Jacket, Throat Bushing O-ring

**Language**

1. The original declaration of conformity/incorporation for the machinery described in this document is in English. Any copy in a language other than English is a copy of the original.
2. All instructions, bulletins and Installation, Operation & Maintenance instructions are in English. Any copy in a language other than English is a copy of the original. Blackmer does provide translation of these documents, however these are not “Official Instructions” any translation of these documents should be considered unofficial documents.



## DECLARATION OF CONFORMITY

Applicable European Directives  
Machinery: 2006/42/EC and The Supply of Machinery (Safety) Regulations 2008 No. 1597 Annex IIA.  
ATEX: 2014/34/EU and SI 2016 No. 1107 The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations.

Herewith we declare that all Blackmer Centrifugal pump models to which this declaration relates are in conformity with the provisions of the applicable European Directives listed above. The equipment is a centrifugal pump designed for liquid transfer and process applications. This device is not intended to act as a safety accessory.

These pumps are in compliance with all applicable harmonized/designated standards and therefore all pumps carry the CE/UKCA marking.

The Technical File is archived with:

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Notified Body 0081 File no. 154087-717415

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Notified Body 0178 File n. 0891-012


Applied Harmonized Standards:  
EN ISO 14120:2015, EN ISO 12100:2010, EN 1127-1:2019, EN 13445-5:2021, EN ISO 80079-36:2016, EN ISO 80079-37:2016, EN 13857:2019

Other applied standards:  
ASME B73.1: VDI 2440

Method of Compliance: Manufacturer's self-declaration.

ATEX Classification: Group II Category 2G Gas Group IIB  
T3 X Protection "c"

⊕ II 2 G IIB EX h T30°C-T230°C Gb X

  
Date: 21 December 2022  
Robert Lauson  
Vice President and General Manager

## DECLARATION OF INCORPORATION

Applicable European Directives  
Machinery: 2006/42/EC and The Supply of Machinery (Safety) Regulations 2008 No. 1597 Annex IIA.  
ATEX: 2014/34/EU and SI 2016 No. 1107 The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations

Herewith we declare that all Blackmer Centrifugal end suction pump components to which this declaration relates are in conformity with the provisions of the applicable European Directives listed above. The above components are parts from an ATEX certified end suction ANSI centrifugal pump designed for liquid transfer and processes. These components are not intended to act as a safety accessory. Blackmer supplied components are not marked with the CE/UKCA mark.

These components must not be placed into service until the machine into which it is incorporated has been declared in conformity with the provision of Directive 2014/34/EU The ATEX Directive and SI 2016 No. 1107 The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations, and 2006/42/EC The Machinery Directive, and The Supply of Machinery (Safety) Regulations 2008 No. 1597

Blackmer further declares that the above listed pumps/components are designed using sound engineering practices and are assembled in ISO registered facilities.

Applied Harmonized Standards:  
EN ISO 14120:2015, EN ISO 12100:2010, EN 1127-1:2019, EN 13445-5:2021, EN ISO 80079-36:2016, EN ISO 80079-37:2016, EN 13857:2019

Other applied standards:  
ASME B73.1: VDI 2440

Method of Compliance: Manufacturer's self-declaration.

File number: 154087-717415

  
Date: 21 December 2022  
Robert Lauson  
Vice President and General Manager

The partially completed machinery described above must not be put into service until the machinery into which it is incorporated has been assessed and determined to be in conformity with the provisions of Directive 2014/34/EU, SI 2016 No. 1107 and 2006/42/EC, The Supply of Machinery (Safety) Regulations 2008 No. 1597. All operating and installation instruction must be read and understood before operation.

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