GOULDS PUMPS

# Industrial Process Pump Safety Manual

## IMPORTANT SAFETY NOTICE

*To: Our Valued Customers*

User safety is a major focus in the design of our products. Following the precautions outlined in this manual will minimize your risk of injury.

ITT Goulds pumps will provide safe, trouble-free service when properly installed, maintained, and operated.

Safe installation, operation, and maintenance of ITT Goulds Pumps equipment are an essential end user responsibility. This *Pump Safety Manual* identifies specific safety risks that must be considered at all times during product life. Understanding and adhering to these safety warnings is mandatory to ensure personnel, property, and/or the environment will not be harmed. Adherence to these warnings alone, however, is not sufficient — it is anticipated that the end user will also comply with industry and corporate safety standards. Identifying and eliminating unsafe installation, operating and maintenance practices is the responsibility of all individuals involved in the installation, operation, and maintenance of industrial equipment.

Please take the time to review and understand the safe installation, operation, and maintenance guidelines outlined in this Pump Safety Manual and the Instruction, Operation, and Maintenance (IOM) manual. Current manuals are available at www.gouldspumps.com/literature_ioms.html or by contacting your nearest Goulds Pumps sales representative.

**These manuals must be read and understood before installation and start-up.**

For additional information, contact your nearest Goulds Pumps sales representative or visit our Web site at www.gouldspumps.com.

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# SAFETY WARNINGS

Specific to pumping equipment, significant risks bear reinforcement above and beyond normal safety precautions.

**⚠ WARNING**

A pump is a pressure vessel with rotating parts that can be hazardous. Any pressure vessel can explode, rupture, or discharge its contents if sufficiently over pressurized causing death, personal injury, property damage, and/or damage to the environment. All necessary measures must be taken to ensure over pressurization does not occur.

**⚠ WARNING**

Operation of any pumping system with a blocked suction and discharge must be avoided in all cases. Operation, even for a brief period under these conditions, can cause superheating of enclosed pumpage and result in a violent explosion. All necessary measures must be taken by the end user to ensure this condition is avoided.

**⚠ WARNING**

The pump may handle hazardous and/or toxic fluids. Care must be taken to identify the contents of the pump and eliminate the possibility of exposure, particularly if hazardous and/or toxic. Potential hazards include, but are not limited to, high temperature, flammable, acidic, caustic, explosive, and other risks.

**⚠ WARNING**

Pumping equipment Instruction, Operation, and Maintenance manuals clearly identify accepted methods for disassembling pumping units. These methods must be adhered to. Specifically, applying heat to impellers and/or impeller retaining devices to aid in their removal is strictly forbidden. Trapped liquid can rapidly expand and result in a violent explosion and injury.

ITT Goulds Pumps will not accept responsibility for physical injury, damage, or delays caused by a failure to observe the instructions for installation, operation, and maintenance contained in this Pump Safety Manual or the current IOM available at www.gouldspumps.com/literature.

# SAFETY

## DEFINITIONS

Throughout this manual the words **WARNING**, **CAUTION**, **ELECTRICAL, and ATEX** are used to indicate where special operator attention is required.

**Observe all Cautions and Warnings highlighted in this Pump Safety Manual and the IOM provided with your equipment.**

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

**Example:** Pump shall never be operated without coupling guard installed correctly.

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⚠ **CAUTION**
Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**Example**: Throttling flow from the suction side may cause cavitation and pump damage.

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**ELECTRICAL HAZARD**

Indicates the possibility of electrical risks if directions are not followed.

**Example:** Lock out driver power to prevent electric shock, accidental start-up, and physical injury.

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When installed in potentially explosive atmospheres, the instructions that follow the Ex symbol must be followed. Personal injury and/or equipment damage may occur if these instructions are not followed. If there is any question regarding these requirements or if the equipment is to be modified, please contact an ITT Goulds Pumps representative before proceeding.

**Example:** Improper impeller adjustment could cause contact between the rotating and stationary parts, resulting in a spark and heat generation.

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# GENERAL PRECAUTIONS

**⚠ WARNING**

A pump is a pressure vessel with rotating parts that can be hazardous. Hazardous fluids may be contained by the pump including high temperature, flammable, acidic, caustic, explosive, and other risks. Operators and maintenance personnel must realize this and follow safety measures. Personal injuries will result if procedures outlined in this manual are not followed. ITT Goulds Pumps will not accept responsibility for physical injury, damage or delays caused by a failure to observe the instructions in this manual and the IOM provided with your equipment.

| General Precautions | | |
|---|---|---|
| **WARNING** | ⚠ | NEVER APPLY HEAT TO REMOVE IMPELLER. The use of heat may cause an explosion due to trapped fluid, resulting in severe physical injury and property damage. |
| **WARNING** | ⚠ | NEVER use heat to disassemble pump due to risk of explosion from trapped liquid. |
| **WARNING** | ⚠ | NEVER operate pump without coupling guard correctly installed. |
| **WARNING** | ⚠  | NEVER run pump below recommended minimum flow when dry, or without prime. |
| **WARNING** | ⚠  | ALWAYS lock out power to the driver before performing pump maintenance. |
| **WARNING** | ⚠ | NEVER operate pump without safety devices installed. |
| **WARNING** | ⚠  | NEVER operate pump with discharge valve closed. |
| **WARNING** | ⚠  | NEVER operate pump with suction valve closed. |
| **WARNING** | ⚠  | DO NOT change service application without approval of an authorized ITT Goulds Pumps representative. |
| **WARNING** | ⚠ | **Safety Apparel:**<br>• Insulated work gloves when handling hot bearings or using bearing heater<br>• Heavy work gloves when handling parts with sharp edges, especially impellers<br>• Safety glasses (with side shields) for eye protection<br>• Steel-toed shoes for foot protection when handling parts, heavy tools, etc.<br>• Other personal protective equipment to protect against hazardous/toxic fluids |
| **WARNING** | ⚠ | **Receiving:**<br>Assembled pumping units and their components are heavy. Failure to properly lift and support equipment can result in serious physical injury and/or equipment damage. Lift equipment only at specifically identified lifting points or as instructed in the current IOM. Current manuals are available at www.gouldspumps.com/literature_ioms.html or from your local ITT Goulds Pumps sales representative. Note: Lifting devices (eyebolts, slings, spreaders, etc.) must be rated, selected, and used for the entire load being lifted. |

| General Precautions | | |
|---|---|---|
| **WARNING** |  | **Alignment:**<br>Shaft alignment procedures must be followed to prevent catastrophic failure of drive components or unintended contact of rotating parts. Follow coupling manufacturer's coupling installation and operation procedures. |
| **WARNING** |  | Before beginning any alignment procedure, make sure driver power is locked out. Failure to lock out driver power will result in serious physical injury. |
| **CAUTION** |  | **Piping:**<br>Never draw piping into place by forcing at the flanged connections of the pump. This may impose dangerous strains on the unit and cause misalignment between pump and driver. Pipe strain will adversely effect the operation of the pump resulting in physical injury and damage to the equipment. |
| **WARNING** |  | **Flanged Connections:**<br>Use only fasteners of the proper size and material. |
| **WARNING** |  | Replace all corroded fasteners. |
| **WARNING** |  | Ensure all fasteners are properly tightened and there are no missing fasteners. |
| **WARNING** |  | **Startup and Operation:**<br>When installing in a potentially explosive environment, please ensure that the motor is properly certified. |
| **WARNING** |  | Operating pump in reverse rotation may result in contact of metal parts, heat generation, and breach of containment. |
| **WARNING** |  | Lock out driver power to prevent accidental start-up and physical injury. |
| **WARNING** |  | The impeller clearance setting procedure must be followed. Improperly setting the clearance or not following any of the proper procedures can result in sparks, unexpected heat generation and equipment damage. |
| **WARNING** |  | If using a cartridge mechanical seal, the centering clips must be installed and set screws loosened prior to setting impeller clearance. Failure to do so could result in sparks, heat generation, and mechanical seal damage. |
| **WARNING** |  | The coupling used in an ATEX classified environment must be properly certified and must be constructed from a non-sparking material. |
| **WARNING** |  | Never operate a pump without coupling guard properly installed. Personal injury will occur if pump is run without coupling guard. |
| **WARNING** |  | Make sure to properly lubricate the bearings. Failure to do so may result in excess heat generation, sparks, and / or premature failure. |
| **CAUTION** |  | The mechanical seal used in an ATEX classified environment must be properly certified. Prior to start up, ensure all points of potential leakage of process fluid to the work environment are closed. |

| General Precautions | | |
|---|---|---|
| **CAUTION** |  | Never operate the pump without liquid supplied to mechanical seal. Running a mechanical seal dry, even for a few seconds, can cause seal damage and must be avoided. Physical injury can occur if mechanical seal fails. |
| **WARNING** |  | Never attempt to replace packing until the driver is properly locked out and the coupling spacer is removed. |
| **WARNING** |  | Dynamic seals are not allowed in an ATEX classified environment. |
| **WARNING** |  | DO NOT operate pump below minimum rated flows or with suction and/or discharge valve closed. These conditions may create an explosive hazard due to vaporization of pumpage and can quickly lead to pump failure and physical injury. |
| **WARNING** |  | Ensure pump is isolated from system and pressure is relieved before disassembling pump, removing plugs, opening vent or drain valves, or disconnecting piping. |
| **WARNING** |  | **Shutdown, Disassembly, and Reassembly:**<br>Pump components can be heavy. Proper methods of lifting must be employed to avoid physical injury and/or equipment damage. Steel toed shoes must be worn at all times. |
| **WARNING** |  | The pump may handle hazardous and/or toxic fluids. Observe proper decontamination procedures. Proper personal protective equipment should be worn. Precautions must be taken to prevent physical injury. Pumpage must be handled and disposed of in conformance with applicable environmental regulations. |
| **WARNING** |  | Operator must be aware of pumpage and safety precautions to prevent physical injury. |
| **WARNING** |  | Lock out driver power to prevent accidental startup and physical injury. |
| **CAUTION** |  | Allow all system and pump components to cool before handling them to prevent physical injury. |
| **CAUTION** |  | If pump is a Model NM3171, NM3196, 3198, 3298, V3298, SP3298, 4150, 4550, or 3107, there may be a risk of static electric discharge from plastic parts that are not properly grounded. If pumped fluid is non-conductive, pump should be drained and flushed with a conductive fluid under conditions that will not allow for a spark to be released to the atmosphere. |
| **CAUTION** |  | Wear heavy work gloves when handling impellers as sharp edges may cause physical injury. |
| **CAUTION** |  | Wear insulated gloves when using a bearing heater. Bearings will get hot and can cause physical injury. |

# ATEX CONSIDERATIONS and INTENDED USE

Special care must be taken in potentially explosive environments to ensure that the equipment is properly maintained. This includes but is not limited to:

1. Monitoring the pump frame and liquid end temperature.
2. Maintaining proper bearing lubrication.
3. Ensuring that the pump is operated in the intended hydraulic range.

The ATEX conformance is only applicable when the pump unit is operated within its intended use. Operating, installing or maintaining the pump unit in any way that is not covered in the Instruction, Operation, and Maintenance manual (IOM) can cause serious personal injury or damage to the equipment. This includes any modification to the equipment or use of parts not provided by ITT Goulds Pumps. If there is any question regarding the intended use of the equipment, please contact an ITT Goulds representative before proceeding. Current IOMs are available at www.gouldspumps.com/literature_ioms.html or from your local ITT Goulds Pumps Sales representative.

All pumping unit (pump, seal, coupling, motor and pump accessories) certified for use in an ATEX classified environment, are identified by an ATEX tag secured to the pump or the baseplate on which it is mounted. A typical tag would look like this:


The CE and the Ex designate the ATEX compliance. The code directly below these symbols reads as follows:

II = Group 2
2 = Category 2
G/D = Gas and Dust present
T4 = Temperature class, can be T1 to T6 (see Table 1)

**Table 1**

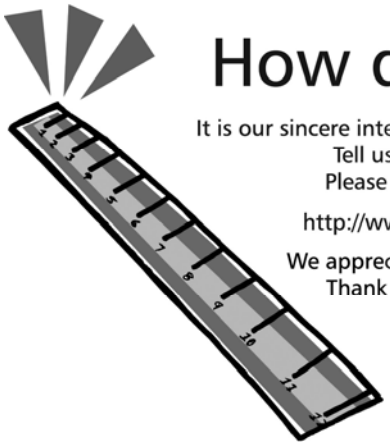
| Code | Max permissible surface temperature °F (°C) | Max permissible liquid temperature °F (°C) |
|---|---|---|
| T1 | 842 (450) | 700 (372) |
| T2 | 572 (300) | 530 (277) |
| T3 | 392 (200) | 350 (177) |
| T4 | 275 (135) | 235 (113) |
| T5 | 212 (100) | Option not available |
| T6 | 185 (85) | Option not available |

The code classification marked on the equipment must be in accordance with the specified area where the equipment will be installed. If it is not, do not operate the equipment and contact your ITT Goulds Pumps sales representative before proceeding.

# PARTS

The use of genuine Goulds parts will provide the safest and most reliable operation of your pump. ITT Goulds Pumps ISO certification and quality control procedures ensure the parts are manufactured to the highest quality and safety levels.

Please contact your local Goulds representative for details on genuine Goulds parts.



## How did we measure up?

It is our sincere intention to exceed our customer's expectations on every order.
Tell us whether we achieved our goal on your order.
Please take our customer satisfaction survey online at:

http://www.ittindustrialproducts.com/feedbacksurvey.html

We appreciate you taking the time to provide your feedback.
Thank you for buying ITT pumps, parts, and controls.

Visit our Web site at www.gouldspumps.com

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