IWAKI PUMPS

# Additional Instructions for the ATEX-Certified models of:

# LK Series



The Heart of Industry
IWAKI

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**⚠ Please read through this instruction manual before use.**

This instruction manual describes important precautions and instructions
for the product. Always keep it on hand for quick reference.

**⚠ Export Restrictions**

Technical information contained in this instruction manual might be treated as controlled technology in your countries, due to agreements in international regime for export control.
Please be reminded that export license/permission could be required when this manual is provided, due to export control regulations of your country.

# 1. Overview

These additional instructions describe the particular requirements and measures for installation/operation of our ATEX certified pumps in potentially-explosive environments.
Use this instructions in addition to the standard instruction manual of the pump and any other document which may be related to use in ATEX (atmosphere explosive).

## 1.1 Symbols

### 1.1.1 Cautionary Symbols

**⚠WARNING:**
Indicates mishandling could lead to a fatal or serious injury accident.

**⚠CAUTION:**
Indicates mishandling could lead to personal injury or property damage.

### 1.1.2 Graphic Symbols

indicates an explosive protection and other related information related to use in potentially-explosive environments.

indicates a potentially-hazardous consequences that results from ignoring the warning or caution message.

indicates effective measures must be taken.

indicates specific measures or actions must NOT be taken.

## 1.2 ATEX Certified Pumps

The following metering pumps that are equipped with, or intended to be equipped with, an explosion-proof motor may fall under the ATEX-certified pump:

- Iwaki LK-F/-A/-B TC
- Iwaki LK-F/-A/-B/-C S6/S4

*Do not use these pumps as a self-priming pump.

# 2. Introduction to ATEX

In accordance with Directive 2014/34/EU, an Iwaki ATEX certified pump (non-electrical equipment according to the ATEX 2014/34/EU GUIDELINES, §42) can be used with the electric motor that is also approved for use in potentially-explosive atmospheres by its manufacturer.
The ATEX pump unit (combination of the ATEX pump and motor) must clearly express their intrinsic protection level for use in ATEX (ATEX rating). If the pump and motor have different ATEX ratings, obey the device with the lower rating.
Also, our single ATEX pump may be shipped without motor to a user in the European Union. In such a case, it is the user's responsibility for providing the ATEX motor to the pump for use in ATEX.

## 2.1 ATEX Rating

**(Ex) II 2G Ex h IIB T_ Gb X**
**a b c d e f g**

| | | |
|---|---|---|
| a | Equipment group | I: Underground II: Above ground |
| b | Equipment category*1 | |
| | Protection level | 1: Very high 2: High 3: Enhanced |
| | Explosive gas | D: Combustible dust substances<br>G: Flammable gas/vapour |
| c | Constructional safety | Ex h: Safety device in accordance with the section 10.2 of the EN ISO 80079-37:2016. |
| d | Gas group | IIA: a typical gas is propane<br>IIB: a typical gas is ethylene<br>IIC: a typical gas is hydrogen |
| e | Temperature class*2 (max allowable surface temp.) | T6: 85°C or below<br>T5: 100°C or below<br>T4: 135°C or below<br>T3: 200°C or below<br>T2: 300°C or below<br>T1: 450°C or below (not applicable) |
| f | Equipment protection level (EPL)*1 | Gc: A single system to avoid ignition sources during normal operation<br>Gb: An independent or fail-safe system to avoid ignition sources during normal operation and expected malfunctions<br>Ga: An independent or fail-safe system to avoid ignition sources during normal operation, expected malfunctions and rare malfunctions |
| g | Specific conditions of use | X: Specific condition of use in accordance with the section 11.2 of the EN ISO 80079-36:2016 |

*1 The inside of the pump is not evaluated by the ATEX rating.
*2 The pump is classified as T6, T5, or T4 temperature class depending on the liquid properties to be used.

# 3. ATEX Safety Instructions

## 3.1 Precautions for ATEX Use

To ensure that our ATEX compliant pumps deliver chemical liquids without risk of explosion and the foreseeable ignition source is prevented in a certain level of ATEX, there are some limitations put on wet ends used in the pumps and chemicals to be delivered. See the section 3.3 and 3.4 for detail.

Observe the rated specification of each pump. See the table on page 8 and chose the standard manual of your pump.

Our ATEX pumps can not be used in an environment where a chemical liquid to be transferred can create an explosive atmosphere under normal operating conditions.

Observe the EC directive 2014/34/EU and related standards and rules described on the ATEX Declaration of Conformity.

Do not run the ATEX pump without regular maintenance. See the standard manual of your pump for the authorized maintenance process and intervals.

## 3.2 User's Observations

**WARNING:**
**Users must observe the following precautions at their own risks.**

**<Directive and harmonized standards>**

– According to Directive 2014/34/EU, use the ATEX pump in accordance with the ATEX rating in potentially-explosive environments.
– According to Directive 1999/92/EC, ANNEX I, classify places where explosive atmospheres may occur into the appropriate zone.
– According to Directive 1999/92/EC, ANNEX II, satisfy the minimum requirements for the safety and health protection of operators in potentially-explosive environments.

**<ATEX pump>**

– Make sure that the ATEX pump is not used beyond the limitations of the pump performance (max pressure, flow rate, etc).
– Make sure that:
  • the pump is grounded properly.
  • the pump is mounted below the level of liquid in the supply tank (flooded suction) and not used as a self-priming pump.
  • the pump, plumbing, and any possible flow path in the system must be filled with the liquid to be delivered at any time.
  • the temperature class (max permissible surface temperature of the pump) is observed. See the 2.1 ATEX Rating table.
  • the pump inlet and outlet must be properly connected to your plumbing system.
  • the pump condition is kept suitable for use in an explosive atmosphere through regular inspection and maintenance.
  • any measure must be taken to prevent dry running of the pump (monitoring of the tank level and the flow rate).
– Do not allow dust to build up onto the pump. Use a wet or damp cloth to remove dust from the pump. Do not use dry cloth which can build up static electricity and also be an ignition source in an explosive atmosphere.
– The pump should be handled, operated, and managed by authorized/experienced personnel with a full understanding of the ATEX certified pump/devices and their related standards and regulations.
– After the ATEX pump or device received an authorized repair or overhaul, commissioning must be executed by authorized/experienced personnel so it will run safe in a potentially-explosive environment.

**<ATEX pump unit>**

ATEX pump unit means the ATEX pump and the ATEX motor.

– Every time any engineering change takes place to the pump unit (e.g. different seal materials/grade):
  • the manufacturer must make a reassessment of risk of explosion according to Directive 2014/34/EU and Directive 1999/92/EC, Article 4 Assessment of explosion risks.
  • the manufacturer must add any engineering change to the explosion protection document that has been drawn up according to Directive 1999/92/EC, Article 8, or complete conformity assessment and issue an EU declaration of conformity according to Directive 2014/34/EU.

**<ATEX devices>**

– Use ATEX certified devices of the motor, inverter, and sensors accordingly to the ATEX rating of the pump.

– Observe the installation/operating instructions, specification sheet and proper use of each ATEX device (motor, inverter, and sensor, etc). Use of each device with the ATEX pump must NOT be a new sources of ignition.

**<Plumbing>**

– Make sure plumbing is established properly without risk of a chemical leak. Tighten plumbing bolts at regular intervals.

– Operating conditions including a surrounding atmosphere, fluid velocity in plumbing, or so must be well controlled by users.

– Even when the discharge line has been clogged, the metering pump by nature keeps running and increases pressure dangerously. This may break the pump/plumbing and burn out the motor. Install a relief valve close to the pump and set its opening pressure below the maximum allowable pressure of the pump/discharge line.

– Clogging may result. Provide a strainer in the suction line, so it won't take debris into the pump and plumbing. Clean the strainer periodically.

**<Others>**

– Perform daily inspection (tank liquid level, pressure, noise, etc.).

– Take apart the pump for inspection at regular intervals. See standard manuals for the interval of each pump model.

– Check the oil level in the reduction gear periodically. If it's too low, the reduction gear temperature rises dangerously by friction heat.

– Stop the pump immediately if the oil level is reduced due to a leak problem.

– See our web page and use the latest version manual.

## 3.3 Notes for Electrostatic Discharge

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

Our ATEX certified pumps are designed to have an ATEX motor that is electrically-grounded over the grounding point (see the section 4.1.2).

– According to EN ISO 80079-36:2016, only liquids with a high conductivity (> 1000pS/m) can be used.

NOTE

There exist highly conductive but highly chargeable conductive liquids including organic acetates, ethers and higher ketones (IEC/TS 60079-32-1). Such liquids can not be used with our pumps.

– If the ATEX pump is used in the gas group of IIB, the total thickness of lower and upper coatings must be 2.0 mm or below so the static electricity won't be charged to the meal part of the pump.

– When plumbing is lined by plastics, observe the maximum allowable fluid velocity so it won't be electrostatically-charged. Contact the plumbing supplier for detail.

## 3.4 Notes for Chemical Liquids

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

– It's not the manufacturer's responsibility for any chemical corrosion to wet ends. Make sure that the liquid does not chemically attack or penetrate wet ends of the pump in advance.

– It's not the manufacturer's responsibility for any personal injury or property damage that could happen when the pump is used out of it's specifications. Particularly, when the pump is used with a liquid temperature or a liquid pressure that exceeds or falls below pump's limits, wet ends could deteriorate or deform and eventually the pump fails.

– Use the optimal plumbing, valves, and gaskets according to the chemical liquid to be used. Contact each manufacturer for detail.

– The life of pump changes depending on operating conditions (if it's harsh, corrosive, or so). See manuals and make daily and periodic inspections so the pump will be kept in a good condition.
– Before taking apart the pump for maintenance or repair, flush out chemicals thoroughly and clean the inside of the pump until nothing remains.

# 4. ATEX Mounting

## 4.1 Installation/Plumbing

Special cares are needed to install the ATEX certified pumps in a potentially-explosive atmosphere accordingly.

### 4.1.1 Operating Conditions

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

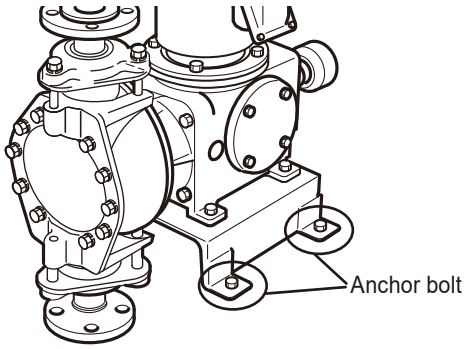
– Do not install the pump where ambient temperature can exceed 0-40°C (32-104°F).
– Operating conditions including an explosive atmosphere and fluid velocity in plumbing must be well managed by users.
– Install the ATEX certified pump in accordance with the ATEX rating.
– Observe the rated rpm of each motor so the pump won't vibrate significantly.

### 4.1.2 Installation Conditions

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

NOTE
See the standard manual of each pump model for general precautions for installation.

– Ground the motor so any conducting metal parts won't be charged differently and dangerously and any electrically-isolated parts won't be an ignition source in an explosive environment.
– If the motor grounding alone is not good enough to prevent ignition source in ATEX, use an anchor bolt as the second grounding point. Use a tooth washer together so the pump unit will be grounded properly, or remove the coating layer from the grounding point in advance.




NOTE
Note the above grounding method is provided to remove the static electricity from the conductive metal part of the pump unit but NOT from electrically-charged liquid.

– Allow sufficient space (1m or more) around the pump for good cooling effect, easy access and maintenance.
– If necessary, guard a conducting metal part of the pump against any other object so they will not hit each other to generate a source of dangerous ignition. A safeguard for a metal part must be grounded properly.
– Only use an ATEX compliant motor (ATEX compliant inverter accordingly).
– Ensure protection and containment of solution in the event of plumbing or pump damage (secondary containment). A leaking chemical can be another risk of explosion. Dispose of any chemicals in accordance with local rules and regulations. If necessary, consult a licensed industrial waste disposal company.
– Use an ATEX compliant sensor, flow meter or any other protective device so you can stop the pump immediately in a case where a chemical leak is detected in a potentially-explosive atmosphere (e.g. diaphragm rupture, loose connection).
– Use a filter or strainer so the pump will not take in scales or debris. Use an proper mesh size for the prevention of clogging in ATEX.

NOTE
Observe manuals of each device for installation or use of them.

### 4.2 Liquid Temperature

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

Observe the allowable temperature range of the liquid to be pumped.

| Series | Wet ends | Liquid temperature range | |
|---|---|---|---|
| | | Min | Max |
| LK-F | TC | 32°F (0°C) | 122°F (50°C) |
| | S6 | 32°F (0°C) | 176°F (80°C) |
| LK-A/-B | TC | 32°F (0°C) | 122°F (50°C) |
| LK-A/-B/-C | S4 | 32°F (0°C) | 176°F (80°C) |

*The maximum allowable liquid temperatures are based on the ambient temperature of 0-40°C and the ambient humidity of 35-85%RH.

– Do not use the ATEX pump with liquid that:
  • can create a potentially-explosive environment when such liquid is delivered in normal operating conditions (at an atmospheric pressure or any permissible process pressure).
  • contains solid particles which can deposit or precipitate.
  • chemically unstable.
  • generates the heat of chemical reaction even after oxygen is removed from the atmosphere.

NOTE
See the standard manual of each pump for general precautions for handling liquid.

## 5. ATEX Operation

### 5.1 Before Operation

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

– Check whether pump and motor are suitable for use in the selected area.
– Make sure the pump and plumbing are filled (primed) with the liquid to be pumped.
– Check for a leak.
– Closed-discharge operation is strictly prohibited.

### 5.2 Operation

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

NOTE
See the standard manual of each pump model for general precautions for operation.

– Commissioning is required for expelling entrained air from the pump. Be sure to open the discharge line.
– Always monitor the discharge pressure, amps, flow rate to know the pump runs good in operation, especially for the beginning of operation.
– There may exist an explosive atmosphere in the supply tank. Do not run pump dry so as no to spread that dangerous environment into other sections of the system.
– Once a chemical leak has been detected in an explosive atmosphere and the emergency stop mechanism has been triggered and stopped the system, the system must be fully reviewed, corrected for ensuring safety, and then resumed by an authorized personnel.
– Contact us or your distributor if you have any questions on our pump and its operation.
– Observe the maximum discharge pressure of each pump model.

| Pump | MPa | |
|---|---|---|
| | TC | S6/S4 |
| LK-F11/-F21/-F22/-F31/-F32/-F45 | 1.0 | 1.5 |
| LK-F47 | 0.8 | 0.8 |
| LK-F55 | 0.5 | 0.5 |
| LK-F57 | 0.3 | 0.3 |
| LK-A55 | 1.0 | 1.0 |
| LK-A57 | 0.7 | 0.7 |
| LK-A65 | 0.3 | 0.3 |
| LK-B65 | 0.5 | 0.7 |
| LK-B75 | - | 0.5 |
| LK-C76 | - | 0.5 |
| LK-C86 | - | 0.3 |
| LK-C87 | - | 0.3 |

# 6. ATEX Maintenance

See the standard manual of the pump to perform the daily and periodic maintenance.

## 6.1 Overhaul

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

– Only use tools that have been approved for use in an explosive atmosphere.
– Only use protective wears that have been approved for use in an explosive atmosphere.
– Take suitable measures to ensure that no electrostatic discharges can build up in potentially-explosive environments.
– See the standard manual of the pump to perform the daily and periodic maintenance.
– Take apart the pump for inspection and maintenance at regular intervals. More frequent inspection will be needed in a harsh operating condition.
– Allow the pump to cool down completely before any maintenance and repair work.
– Before taking apart the pump for maintenance or repair, flush out chemicals thoroughly and clean the inside of the pump until nothing remains.
– Before taking apart the pump, always fill the spatial area of the closed tank and plumbing with inert gas such as nitrogen, so static electricity and so the risk of explosion are removed. Then empty and flush the pump and plumbing.
– When the motor is removed from the pump, check for dust accumulation in the motor bracket.
– As necessary, clean the pump surface gently with a damp or anti-static cloth only. Static electricity can build up on parts if rub strong or wipe with dry cloth.
– Replace the oil in the reduction gear at regular intervals. See standard manuals for replacement procedure and the recommended oil brand/ product. Other oil products may require shorter replacement intervals. If you see any problem with the oil, do not keep the pump running. Stop operation and replace as necessary.
– Observe the instruction manual at each pump model.

| Pump | Instruction # |
|---|---|
| LK-F | T1045 |
| LK-A/-B/-C S6/S4 | T1033 |
| LK-A/-B TC | T1034 |

## 6.2 Other devices

**⚠WARNING:**
**Users must observe the following precautions at their own risks.**

– Check the relief valve periodically and make sure it operates properly.
– Clean the strainer periodically and remove debris.
– Check for loose joints on the suction line at regular intervals, so the pump won't take in entrained air. Tighten them as necessary.

# Declaration of Conformity

According to Directive 2014/34/EU

**Iwaki Co., LTD**
**6-6 2-Chome Kanda-Sudacho Chiyoda-Ku Tokyo JAPAN**

Declare under our sole responsibility that the products:

| | | |
|---|---|---|
| **LK-F/-A/-B TC** |  | II -/2G Ex h IIB T6...T4 -/Gb X |
| **LK-F/-A/-B/-C S6/S4** |  | II -/2G Ex h IIB T6...T4 -/Gb X |

are rated as above, and are in conformity with:

**Directive 2014/34/EU**

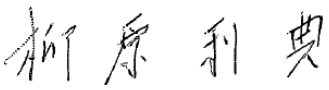
and the following harmonized standards:

**EN ISO 80079-36: 2016**
**EN ISO 80079-37: 2016**

as far as applicable.

All the technical documents required by the directive and harmonized standards are located in:

**NB0637 IBExU Institut für Sicherheitstechnik GmbH**



Tokyo, Jan. 14, 2025

TOSHINORI YANAGIHARA
EXECUTIVE OFFICER SENIOR GENERAL MANAGER,
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DOCUMENT NO.: IS-51K-574-3

NOTE: This is a copy of the original Declaration of Conformity.

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T1075-4 '25/01