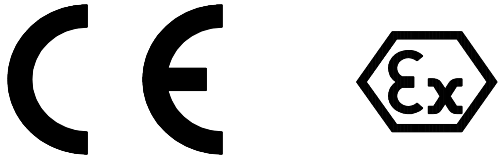
ATEX additional Instructions for 3-Screw Pumps in Gas Explosive Atmospheres



Notes: These additional instructions on Atex are only valid together with installation, operating and maintenance manual (SRM00046) and the individual maintenance instructions manual for the particular pump series.

Operating data, dimensions and other additional information are contained in the order specific section of the documentation.

Keep these additional instructions in the vicinity of pump

Table of Contents:

Manual No. SRM00092	Rev. 01	February, 2018

1. For Your Safety:

Pump is manufactured in accordance with latest state-of- the-art safety regulations. However, danger to life and limb of user and third parties and damages to pump can arise during operation. To ensure optimal and safe operation of pump, maintenance must be carried out by appropriately qualified expert personnel. Work on electrical equipment must be carried out by authorized electricians in accordance with respective national standards and electrical technology guidelines.

1.1 Proper Use:

Never operate with water. Pump is designed for liquids having general characteristics of oil.
It is not suitable for pumping chemically corrosive fluids.

1.2 Operators Obligations

- Evaluate and document the location, where the system is to be operated, and dangers from explosions in accordance with directive. Evaluate and document the operating areas of the system for danger of explosions in accordance with Directive 99/92/EC, Annex I.

- Ensure that directive 99/92/EC, to protect the health and safety of the employee in potentially explosive atmospheres, is maintained.
- Only use the pump as allowed by the explosion protection nameplate.
- Always ensure the following.
    - The pump is grounded.
    - There is no contact between the coupling and coupling guard
    - Pump interior, seal chamber, auxiliary systems, inlet and outlet piping, are always completely filled with the liquid being pumped.
    - The maximum permissible surface temperature of the pump is not exceeded (see 2.3).
    - The maximum permissible fluid medium temperature is not exceeded (see 2.3).
    - Valves on the inlet and outlet of the pump are set correctly.
    - The pump has regular maintenance and monitoring.
    - It is impossible for the pump to run dry i.e., by monitoring tank levels, flow measurements, etc.
- Ensure that the motors, couplings, gears and monitoring equipment supplied on site correspond to the category and temperature class of the associated zone.
- Note the information on order data sheet
- Inform personnel regarding special dangers
  - Danger of explosions through removal of dust buildup

1.3 Materials:

All pump parts and accessories must consist of electrically conductive materials.

With combustible pumped liquids, all pressure bearing parts must be of ductile material for internal pump pressures of 10 bar or greater.

2. Explosion Protection Labeling

2.1 Temperature class and type of explosion protection marking are on nameplate.

 II 2 G c T4

 _____ CE Label

 _____ Symbol for explosion protected equipment

II _____ Equipment group per EEC guidelines in 95/9/EEC
I is underground, II is other than underground

2 _____ Category 2 or 3 (section 2.2 below)

G_____ Explosion Atmosphere (G = Gas, D = Dust)

c _____ Ignition protection Type (see 2.4 below)

Tx_____ Temperature class (x = 1 thru 4 (see 2.3 below))

2.2 Category

Category 2 - The frequency of occurrence of dangerous potentially explosive atmospheres is only occasional (any faults occurring must not become a source of ignition)

Category 3 - The frequency of occurrence of dangerous potentially explosive atmospheres is unlikely and can occur only rarely and for a short time

1. The pump guarantees a normal level of protection.
2. No unacceptable high surface temperatures may become an ignition risk during normal operation.

2.3 Temperature Class – Flammable gases and vapors are divided into temperature classes for their flammability on hot surfaces.

The temperature class of the pump is determined by the application. Please see the Declaration of Conformity for the value as well as the maximum permissible medium temperature.

Surface temperature of pump must always be less than lowest ignition temperature in the temperature class.

Temperature Class on Accordance with EN 13463-1	Maximum Permissible Surface Temperature of the Pump
T4	135 °C (275°F)
T3	195 °C (383°F)
T2	290 °C (734°F)
T1	440 °C (824°F)

Special Use Condition- for pumps with Tx code on Label: Maximum Fluid Temperature indicated on Declaration of Conformity must be followed

Note: These temperature values refer to a maximum ambient temperature of 40°C (104°F). System operator is responsible for monitoring the maximum possible temperature values.

2.4 Ignition Protection Type:

Type of Protection for non-electrical equipment	Meaning
b	Ignition source monitoring
c	Safe design
d	Pressure tight encapsulation
fr	Vapor inhibiting safety
g	Intrinsic safety
k	Liquid encapsulation
p	Over pressure encapsulation

3) ATEX Measures

3.1 Installation and connection of pump (Measures depend upon category.)

3.1.1 Category 3

1 Stay within the maximum permissible temperature of the pumped fluid on the Declaration of Conformity.
2 Prevent overheating when operating in a circulating system by routing the return line from the safety valve to the tank, and not into the suction pipe.
3 For couplings with coupling guards:
   a. Couplings must correspond to the requirements in the explosion hazard area (group and category).
   b. Only use guards made from electrically conductive materials
   c. Secure the setscrews to fix the coupling halves to the guards with medium strength loctite.
   d. For aluminum guards, remove swarf and dirt from coupling guard
4 Ignition protection type is c = structural safety. (No additional monitoring equipment is required.)
5 For Pumps with motors supplied by the operator, motors must correspond to the requirements in the explosion hazard area (group and category).
6 Earthing Terminals must be provided for pump units, including baseplate and motor.

3.1.2 Category 2

1 Ensure there is monitoring equipment to prevent dry running. (Tank level switch)
2 Ensure there is monitoring equipment to avoid overheating.
   - If the system controller in not suitable for monitoring, install power monitor.
   - Set monitoring according to:
     The pumping parameters
     The characteristic curve of the pump
     The motor manufacturers' specifications
3 If pumped fluid is contaminated with solid particles:
   a. Install temperature sensor on case surface
   b. Adjust temperature monitoring device according per the manufacturers specifications and to the maximum allowable temperature of the housing surface by its temperature class on the nameplate
4 For pumps with separate relief valves:
   a. Install a pressure relief valve in the pressure line and adjust it accordingly
   b. Provide a return line into the tank

3.2 Operation

3.2.1 Stay within the maximum permissible surface temperature

Pumped liquid

1. Stay within the maximum permissible temperature on the Declaration of Conformity.

Housing surface (Only relevant to category 2)

1. If the pumped liquid is contaminated with solid particles, monitor the temperature of the case surface so that maximum permissible temperature of the housing surface does not go higher than permissible by the temperature class on the nameplate.

3.2.2 Avoid Overheating (Only relevant to category 2)

Overheating results from the impermissible operating conditions of:

a. Dry Running
b. Operating pump while the pressure side valve is closed.
c. Operating pump while inlet side valve is closed
d. Operating outside the pumps design parameters

Monitor motor power to detect the above problems with overheating.

3.2.3 Do not operate in an explosive atmosphere. (Only relevant to category 2)

1. If an explosive atmosphere occurs, switch off pump

3.3 Maintenance (Reduce maintenance intervals for more difficult operating conditions.)

3.3.1 Maintenance to perform

1. Check at appropriate intervals:
   - Motor and pump couplings according to manufacturers operating instructions
   - Deformation of guard around coupling and spacing to rotating parts
   - Functioning of monitoring devices
   - Surface temperature of pump and motor
   - Entire unit for excess vibrations
   - Pump during operation for altered running noises
   -
2. Change at appropriate intervals:
   a. Change seal when leakage exceeds 5 drops per hour
   b. Change ball bearing every 17,500 hours if found to be overheating or noisy

4.1 Additional measures for category 2 or 3D (Dust)

1. Periodically remove dust build up before thickness gets to 5 mm.
2. Remove swarf and dirt from on and below the coupling guards.