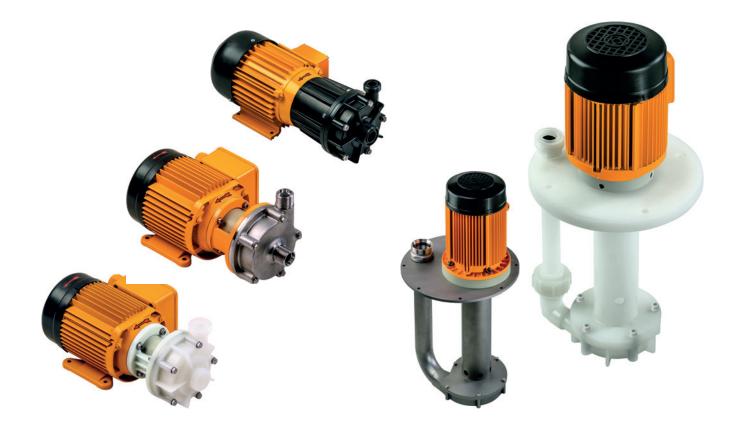


Pumps

ATEX additional instructions Centrifugal pumps



Version 11338/0325 Print-No. SCHMITT-Kreiselpumpen GmbH & Co. KG Einsteinstraße 33 76275 Ettlingen Germany Phone: + 49 (0) 7243 / 54 53 - 0 E-Mail: sales@schmitt-pumpen.de Internet: www.schmitt-pumpen.de

Subject to technical modifications.

Read carefully before use. Save for future use.





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1 About this document

These ATEX supplementary instructions are applicable only in conjunction with the operating instructions for the pump and the applicable documents listed therein.

1.1 Warnings and symbols

Warning sign	Level of risk	Consequences if disregarded	
	immediate acute risk	Death, serious bodily harm	
	potentially acute risk	Death, serious bodily harm	
	potentially hazardous situation	Minor injury	
NOTE	potentially hazardous situation	Material damage	

Tab. 1 Warning signs and consequences if disregarded

Symbol	Meaning
	 Safety warning sign ► Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death.
►	Instruction
1., 2.,	Multiple-step instructions
\checkmark	Precondition
\rightarrow	Cross reference
ĩ	Information, notes

Tab. 2Symbols and their meaning

1.2 Scope of application

Pump type	Pump series
Centrifugal pumps, horizontal	U-EX, UP-EX, UP-DO-EX
Magnetically coupled centrifugal pumps	MPN-EX, NHM
Magnetically coupled impeller-type peripheral pump	P-EX
Submersible pumps	T-EX

Tab. 3 Scope of application

2 Safety

2.1 Intended use

Pumping of permissible liquids (\rightarrow see the data sheet). Compliance with the rated speed (\rightarrow data sheet).

Pump not operated with

- valves closed
- at values deviating from the working range (\rightarrow data sheet)
- · if the maintenance intervals are exceeded

2.2 Obligations of the operating company

- Evaluate and document the operating areas of the system for explosion hazards in accordance with Directive 99/92/ EC, Annex I.
- Ensure compliance with Directive 99/92/EC on the protection of the health and safety of workers in potentially explosive atmospheres.
- Use only pumps that satisfy the Directive 2014/34/EU and carry the appropriate explosion protection categorization mark.
- Ensure the following aspects at all times:
 - The pump is grounded
 - The interior of pump, the sealing chamber, auxiliary systems and suction and discharge lines are always completely filled with the pumped liquid
 - Auxiliary operating systems must always be completely filled with seal medium
 - Comply with the permissible surface temperature of the pump and temperature of the conveyed fluid
 - Valves on suction and pressure side are correctly adjusted
 - The pump is regularly maintained and monitored
 - Dry running of the pump is excluded, for instance by monitoring the levels of fluid and by flow measurement
 - all monitoring and safety devices must be fitted and operational
 - do not permit any deposits of dust to build up on the pump
- Ensure that motors and monitoring devices provided by the customer correspond to the category and temperature class in the respective zone.
- Ensure that maintenance and servicing tasks are performed only by authorized personnel
 - who know the standards and regulations applicable to devices for use in potentially explosive atmospheres
 - who have the necessary knowledge and experience in working with devices for use in potentially explosive atmospheres

After maintenance and repair work, the pump unit may be released into operation by only by authorized personnel, by a person registered with the appropriate authorities or by the pump manufacturer.

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chemical resistant pumps

- Ensure that after any significant change to the pump unit (such as changes to the materials of seals, to the design of seals, to secondary seals or hydraulics)
 - a new ignition hazard assessment is performed
 - the pump unit is checked in accordance with the state of the art and the requirements of Directive 2014/34/EU
 - The changes are documented in the explosion protection document of the operator, as required by the Directive

99/92/EC or in the conformity evaluation procedure as required by the Directive 2014/34/EU, with issuing of a Declaration of Conformity

2.3 Materials and media

Ensure that

- all attachment parts are electrically conductive
- for class T-EX the mating flange above the container cut-out is covered with an electrically conductive coating and is grounded
- electrostatic charging is avoided
- the relaxation time before working on the pump is complied with



3 Explosion protection labelling

3.1 Marking

 $\overset{o}{\underline{l}} \mid$ This information on explosion protection labeling is generally applicable.

The temperature class for operation and the ignition protection type are documented on the explosion protection categorization mark on the pump.



- Fig. 1 Explosion protection marking on the pump (example)
- 1 Symbol for explosion-protected equipment
- 2 Device group to Directive 2014/34/EU
- 3 Device category to Directive 2014/34/EU
- 4 Symbol Ex and ignition protection type
- 5 Device group with subgroup
- 6 Temperature class
- 7 EPL equipment protection level

3.2 Temperature class

 $\overset{o}{\underline{1}} | \begin{array}{c} \mbox{Flammable gases and vapors are divided into temperature} \\ \mbox{classes according to their flammability when in contact with} \\ \mbox{hot surfaces.} \end{array} |$

The surface temperature of the pump must always be lower than the lowest ignition temperature of the temperature class.

Temperature class	Lowest ignition temperature of elements of the mixture [°C]	Maximum surface temperature [°C]
T1	450	< 450
T2	300	< 300
Т3	200	< 200
T4	135	< 135

Tab. 4 Temperature class

3.3 Ignition protection category

The **ignition protection category** describes the type of measures taken to prevent the ignition of a surrounding explosive atmosphere.

The marking consists of the symbol Ex (explosion protection) and letters describing the category of protection.

Ignition	Meaning	for area		
protec- tion cat- egory		non-elec- trical devices	electrical equipment	
Ex h	Ignition source monitoring	X	_	
	Design safety	Х	-	
	Liquid encapsulation	X	_	
Ex d	flameproof encapsulation	Х	х	
Ex e	enhanced security	-	x	
Ex I	Intrinsic safety	Х	-	
Ex o	Oil encapsulation	-	х	
Ex p (xb, yb, zc)	Pressurized enclosure	Х	х	
Ex q	Sand encapsulation	-	х	
Ex m	Encapsulation by casting	-	x	
Ex I	Intrinsic safety	-	Х	
Ex t	Protection by housing	-	x	

Tab. 5 Ignition protection category

3.4 Ex-atmosphere

The **Ex-atmosphere** describes the type of explosive atmosphere within a zone.

Ex-atmosphere	Meaning
G	Flammable gases and vapors
D	Combustible dusts

Tab. 6 Ex-atmosphere

3.5 Device group / area of application / zone / category

Pumps are divided into groups or device groups and device protection levels (EPL) or categories according to their area of application.

The zone is based on the probability of an explosive atmosphere occurring and distinguishes between gases (G) and dusts (D). The category or equipment protection level (EPL) describes the design safety of the pump and depends on the zone.

Zone	Frequency of occurrence of hazardous explosive atmospheres	Classification to EN 80079-36		Classification to 2014/34/EU		Design safety
		Group	EPL	Application	Cate- gory	
-	-	I	Ma	I / Underground	M1	very high
_	-	I	Mb	I / Underground	M2	high
0	constantly or over long periods of time or frequently	II	Ga	II / Others	1G	very high
1	occasionally (any malfunction that occurs must not become a source of ignition)	II	Gb	II / Others	2G	high
2	unlikely; if so, only rarely and for a short time (surface temperature must not become a source of ignition in normal operation)	11	Gc	II / Others	3G	normal
20	constantly or over long periods of time or frequently	III	Since	II / Others	1D	very high
21	occasionally (any malfunction that occurs must not become a source of ignition)	III	Db	II / Others	2D	high
22	unlikely; if so, only rarely and for a short time (surface temperature must not become a source of ignition in normal operation)	111	Dc	II / Others	3D	normal

Tab. 7 Zone / device group / area of application / category

The pumps are approved exclusively for the temperature ĩ

classes T3 and T4 in the categories 2G and 3G.



4 ATEX measures

4.1 Installation and connection

4.1.1 Check the explosion protection label

Compare the explosion protection categorization mark on the pump with the data on the data sheet and make sure that both data comply with the explosion protection requirements at the installation site.

4.1.2 Perform basic measures

Application

1. Check whether the pump and motor are suitable for use in the selected area

Technical documentation

2. Comply with the operating instructions for the motor and monitoring devices.

Lubricants

3. Use appropriate lubricants.

Heating

4. Agree the electrically powered heating system with the manufacturer.

Avoid foreign bodies

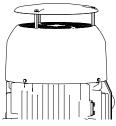
5. Prevent foreign bodies being sucked in (for instance by means of a separator, start-up strainer).

Inverter operation

- 6. Use only motors that are approved for this operating category.
- 7. Ensure compliance with the rated speed of the pump (\rightarrow see the data sheet).
- 8. Comply with the standards and regulations for installation and operation with an inverter.

Motor

- 9. For pumps with flanged motors:
 - Avoid axial thrusts which place an impermissible loading on the motor bearings: Operate the pump only up to the maximum permissible system pressure.



- 10. If installed vertically (submerged pumps)
 - Employ a motor with a protective roof

Earthing and potential equalization

- 11. Ensure potential equalization:
 - Integrate the pump into the lightning protection concept
 - Connect the potential equalization to inner earthing terminal in the motor junction box
 - if necessary, connection additional potential equalization
 - (> 4 mm²) to the outer earthing terminal of the motor
- 12. Earthing and potential equalization of baseplate pumps:
- Ensure potential equalization of the pump unit
 Identify the earthing cable as required by local regula-
- tions
- 13. Earthing and potential equalization of pumps with flanged motors:
 - Ensure that mounting flange of the motor is bright metal
- 14. Establish proof by measurement of effective earthing, and document this in the final acceptance report.

4.1.3 Implement measures for category 2

- 1. If installed vertically: Comply with the minimum depth of submersion of the pump.
- 2. Take measures as shown in the table below to ensure selfheating due to dry running is avoided.

Characteris- tics ¹⁾	Measure		
Constant	 Make provision for appropriate monitoring Characteristics of the pump Pump characteristic curve Information from the motor manufacturer 		
At least one not constant	 Make provision for monitoring and/or measurement of the characteristic values according to Characteristics of the pump Pump characteristic curve necessary level in the tank 		

Tab. 8Control devices to prevent an increased
degree of self-heating

1) e.g. flow rate, delivery height, density, viscosity, rotational speed, delivery quantity, temperature, fill level, pressure, motor current, motor power, torque



3. Take measures as shown in the table below to ensure selfheating due to dry running is avoided.

Condition	Measure
Conveyed fluid Gas content < 1 %	 Ensure compliance with Q > 3 x Qmin. If necessary, install a bypass pipe. Make provision in the pipework for venting.
Conveyed fluid 1 % < gas content < 3 %	 Ensure compliance with Q > 3 x Qmin. If necessary, install a bypass pipe. Use double mechanical seals. For sealing operating mode install a pressure sensor for the seal medium (if necessary). For quenching operating mode: if necessary, retrofit a level gauge for the supply tank if there is a temperature difference between the sealing medium and the temperature class < 15 Kelvin, retrofit a temperature gauge for the sealing medium. Make provision in the pipework for venting.
Vertical installation (submerged pumps)	 Make provision for fill level monitoring. Where there is a switch-on point, comply with the minimum depth of submersion of the pump: (→ see the operating manual). (→ see the data sheet). (→ see the dimension sheet).

- Tab. 9 Measures to ensure self-heating due to dry running is avoided
- 4. Use only pumped liquids with a dissipation capability ${\rm <10^9~Ohm^*m.}$

4.2 Operation

Explosion hazard due to explosive vapors from the pumped liquid!

 Collect leaking liquid safely and damage fitting in accordance with local regulations.

4.2.1 Commissioning

- 1. Ensure the correct direction of rotation of the drive (\rightarrow see the pump operating instructions).
- 2. Ensure correct venting (\rightarrow see the pump operating instructions).

4.2.2 Perform basic measures

Take special measures for operation in the area subject to explosion hazards

- 1. Comply with the operating instructions for the motor and monitoring devices.
- 2. Agree every aspect of pump operation (including test runs) with the operator.
- 3. After an emergency stop, have the appliance restarted by authorized personnel.
- 4. Ensure protection against dry running in accordance with the ignition protection system b1 to EN80079-37:
 - by monitoring the seal barrier liquid
 - and by monitoring the minimum flow rate
- 5. Ensure evaluation of the monitoring device:
 - according to the operational reliability
 - to DIN EN ISO 13849-1 (for monitoring devices not certified to EN80079-37)



Comply with the maximum permissible temperatures

- O Irrespective of the specified temperatures of the conveyed fluid, comply with the maximum permissible temperature range for the class of equipment.
- For operation without a mechanical seal: Maximum permissible temperature of the pumped fluid for operation with a mechanical seal (→ see the data sheet).
- 7. For operation with a mechanical seal: Comply with the maximum permissible temperature of the conveyed fluid according to the table below.

Temperature class	Class of medium	Maximum permissible temperature of the conveyed fluid ¹⁾ [°C]
T4 (135 °C)	Oils	105
	Hot water or liquids similar to water	115
	liquids not similar to water	110
T3 (200 °C)	Oils	150
	Hot water or liquids similar to water	150
	liquids not similar to water	150

- Tab. 10 Maximum permissible temperature of the conveyed fluid for operation with a mechanical seal
- 1) based on the temperature classes, e.g. for the main stainless steel material of the pump
- For operation with plain bearings: Comply with a maximum permissible temperature of the conveyed fluid 20 °C lower than the specified temperature class: Tmax = temperature class – 20 °C

4.2.3 Implement measures for category 2

Avoid self-heating

- $\bigcap_{n \in \mathbb{N}} |$ Relevant only to operation in category 2.
- Monitor behavior of the system in accordance with the characteristics:

Characteris- tics ¹⁾	Measure
Constant	 Set up appropriate monitoring Characteristics of the pump Pump characteristic curve Information from the motor manufacturer
At least one not constant	 Monitor the characteristics and/or measure and adjust them according to Characteristics of the pump Pump characteristic curve Level in the tank

Tab. 11 Measures to be taken to prevent self-heating

1) e.g. flow rate, delivery height, density, viscosity, rotational speed, delivery quantity, temperature, fill level, pressure, motor current, motor power, torque

Avoid dry running

- $\bigcap_{i=1}^{\circ} |$ Relevant only to operation in category 2.
- ▶ Perform measures by reference to the following table.

Type and design of the mechanical seal	Measure
Single mechanical seal	 If there is a mechanical seal chamber, vent it regularly. If there is a mechanical seal chamber, ensure it is always filled.
Mechanical seal, operation in quench mode	 If the temperature difference between the sealing medium and the temperature class is < 15 Kelvin: Monitor the temperature of the sealing medium. Monitor the fill level in the tank

Tab. 12 Take measures to prevent dry running



4.3 Maintenance

Explosion hazard due to explosive vapors from the pumped liquid!

- During maintenance and repair work, empty the pump and flush it out if necessary.
- Collect leaking liquid safely and damage fitting in accordance with local regulations.
- $\overset{\circ}{\underline{l}} \mid \begin{array}{c} \mbox{Further technical information and advice is available on} \\ \mbox{request from the pump manufacturer. Be ready to quote} \\ \mbox{the item number and provide a description of the fault.} \end{array}$
- $\frac{\circ}{1}$ Reduce the maintenance intervals under difficult operating conditions or when used in aggressive environments.
- 1. Comply with the operating instructions for the motor and monitoring devices.
- 2. Before working on the pump, comply with the relaxation time.
- 3. Replace the motor roller bearings according to the manufacturer's instructions.
- 4. Check at appropriate intervals:
 - Motor according to the manufacturer's operating instructions
 - Ensure operation of the monitoring devices



5 Appendix

5.1 Declaration of conformity to the EC machinery directive

EU-Konformitätserklärung	EU-Declaration of Conformity
gemäß Richtlinie 2014/34/EU (ATEX)	according to directive 2014/34/EU (ATEX)
	• • • •
Der Hersteller	The manufacturer
Einste	umpen GmbH & Co. KG einstraße 33 tlingen, Germany
erklärt hiermit in alleiniger Verantwortung die Übereinstimmung der folgenden Geräte	hereby declares under sole responsibility the compliance of the following devices
Kreiselpumpen der Baureihen	Centrifugal pumps of the series
• MPN-EX	· P-EX
• U-EX	• T-EX
· UP-EX / UP-	DO-EX · NHM
mit der Richtlinie 2014/34/EU (ATEX).	with the directive 2014/34/EU (ATEX).
Die entsprechenden Unterlagen sind bei der benannten Stelle 0408 TÜV AUSTRIA Deutschland hinterlegt.	The relevant documents are deposited with the notified body 0408 TÜV Austria Deutschland.
Kennzeichnung der mechanischen Ausrüstung	Marking of the mechanical equipment
	IIC T4 Gb oder / or
—	IIC T3 Gb oder / or
E	IIB T4 Gc oder / or
	IIB T3 Gc
Die jeweilige Kennzeichnung und die Seriennummer sind auf dem Typenschild angegeben.	The specific identification and serial number is indicated on the nameplate.
Angewandte harmonisierte Normen der EU	Applied EU harmonized legislation
EN 1127-1:2011 Explosionsschutz, Teil 1: Grundlagen und Methodik	EN 1127-1:2011 Explosion prevention and protection, Part 1: Basic concepts and methodology
EN 80079-36:2016 Nichtelektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen,	EN 80079-36:2016 Non-electrical equipment for explosive atmospheres - Basic method and requirements
Grundlagen und Anforderungen EN 80079-37:2016 Nicht-elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären - Schutz durch konstruktive Sicherheit, Zündquellenüber- wachung, Flüssigkeitskapselung	EN 80079-37:2016 Non-electrical type of protection constructional safety, control of ignition sources, liquid immersion
Die Sicherheitshinweise der Betriebsanleitung sind zu beachten.	The safety instructions of the manual must be observed.
Änderungen und Reparaturen an den Geräten sind nicht zulässig, außer mit ausdrücklicher schriftlicher Zustimmung des Herstellers. Werden die genannten Geräte in eine über- geordnete Maschine eingebaut, so müssen die durch den Einbau entstehenden neuen Risiken durch den Hersteller der neuen Maschine beurteilt werden.	Changes and repairs to the equipment are not permitted, except with the written consent of the manufacturer. If the devices are installed into another machine, the new risks arising from the installation must be assessed by the manufacturer of the new machine.
Schmitt-Kreiselpumpen GmbH & Co. KG	
Moritz Klug, Geschäftsführer / General Manager	
Ettlingen, März 2025	
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