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Supplementary operating instructions for blower types ND, RD, HRD FU in explosion-protected versions conforming to EC directive 94/9/EC (ATEX 95), categories 3G, 3D, 2G, 2D

1.0 Technical Data, Validity

This supplement to the operating instructions refers to the following special explosion-protected blower versions. It is a supplement to the operating instructions; its structure corresponds to that of the operating instructions.

Description of the machine:	Machine type:
Low pressure blower, explosion-protected	**D 0... -Ex**
Medium pressure blower, explosion-protected	**RD ... -Ex**
High pressure blower for inverter operation, explosion-protected	**HRD ... FU ... –Ex**

The frequency converter unit is intended for operation outside areas with potentially explosive atmospheres

This supplement, just as the operating instructions themselves, as well as the nameplate information, refers to the ELEKTROR delivery package specified in our order confirmation.

Blower section and motor may have individual nameplates. The lowest category and temperature class indicated for any component is also applicable for the entire unit.

Example: The nameplate of the motor references T3 and the nameplate of the blower section T4; the unit can only be used for temperature class T3 (see Section 2.2 The same principle applies to the equipment category.

The operation of an explosion-protected Elektror blower, in accordance with the 94/9/EC directive, is only permitted in countries or in economic sectors where this directive is valid or is not restricted, as well as legally recognised.

2.0 Safety

The owner of an installation or machine is required to operate the equipment in accordance with EC directive 99/92/EC (ATEX 137) and the applicable national regulations enforcing the directive; for example, the directive requires that the risks etc. be described in an explosion protection document.

The measures to be taken in the case of an ignition/explosion or any other incident are as follows:

If a fire, deflagration or explosion has occurred in the vicinity of or inside the unit, then the unit must not be operated further regardless of the cause of the explosion. In this case, as in the case of other incidents, the unit must be made accessible to / shipped to ELEKTROR for thorough scrutiny.

2.1 Temperature

In accordance with Section 1.0, the units are divided in classes of maximum permissible surface temperature (temperature classes). Information regarding the temperature class is on the nameplates of the units. The highest permissible surface temperature class indicated is applicable only if the product is used as intended (see Section 2.2).

2.2 Intended Use

The units correspond to the category, type of ignition protection, temperature class, etc. provided on the unit nameplates. In the following, the categories that are provided by Elektror are specified:

Category 3G	Item designed and constructed to prevent ignition sources with the risk of explosion from gas (G) during normal operation
Category 3D	Item designed and constructed to prevent ignition sources with the risk of explosion from dust (D) during normal operation
Category 2G	Item designed and constructed to prevent ignition sources with the risk of explosion from gas (G) even if item malfunctions
Category 2D	Item designed and constructed to prevent ignition sources with the risk of explosion from dust (D) even if item malfunctions

As indicated on the nameplates, the units may be suitable for use in one of the following areas with potentially explosive atmospheres (for an exact definition refer to: EN 1127-1):

Zone 2 / 22 Areas in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour, mist or dust is not likely to occur during normal operation. If it does rarely occur, then it will persist for a short period only.

Zone 1 / 21 Areas in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour, mist or dust is likely to occur occasionally during normal operation.

Explosion group II Electrical equipment intended for areas not endangered by firedamp (other than mining).

Installation type B or C Blower connected on one end only; that is on pressure end or intake end (compare with DIN 24163). The same potentially explosive atmosphere is present inside and outside the blower.

Installation type D Blower connected on intake end and pressure end. For unsealed ELEKTROR units and equipment, this application is limited to cases in which the same potentially explosive atmosphere is present inside and outside the blower.

Ignition temperature subgroups IIA and IIB.

Labelling examples:

⟨Ex⟩ II 3G c – Example of category specification and construction safety in accordance with EN 13463-5

EEx d IIB T4 – Example of a specification for a type of ignition protection

Specific uses and conditions of use can increase potential risk and are to be communicated in advance to ELEKTROR and are to be agreed upon with ELEKTROR.

Intended use includes the following:

- The unit is operated in upright position, that is, the blower section / the impeller with its support disk is oriented normal to the floor.
- The maximum temperature of the flow medium is +40 °C.
- The minimum temperature of the flow medium is –20 °C.
- Equipment categories 2G and 3G: The flow medium and the area surrounding the blower do not contain substances that may corrode the materials, such as acids, alkaline or caustic solutions, solvents, airborne rust, iron oxides, aggressive or abrasive gases, liquids or solid substances. The flow medium is free from substances which may settle, are adhesive or may form condensates, and is free from foreign particles.
- Equipment categories 2D and 3D: The flow medium and the area surrounding the blower do not contain substances that may corrode the materials, such as acids, alkaline or caustic solutions, solvents, airborne rust, iron oxides, aggressive or abrasive gases or liquids. The flow medium is free from substances that are adhesive or may form condensates.
- For reasons of safety, ELEKTROR ATEX blowers must not be operated in the range which is located to the left of the maximum of the pressure increase versus volume flow characteristic. This helps prevent the potential risk of pumping action by the impeller under special operating conditions.

Intended use excludes the following:

- Special ambient conditions such as, for example, ambient temperatures at the installation / operation site of more than +40 °C; dust deposits; vibrations at the installation / operation site of the blower.
- Operation near / in flames or hot gases. The blower must not be used as an ignition or flame arrester.
- Conveying of foreign matter.
- Adiabatic compression and shock waves, lightning, electromagnetic waves, ionising radiation, ultrasound.
- Use in connection with substances belonging in ignition temperature subgroup IIC.

3.0 Installation, Start-up and Operation

During the installation and start-up of ELEKTROR blowers in areas where there is a risk of explosion, the following should be noted in addition to the operating instructions for a particular blower:

- Prior to the first start-up and before any other start-up, a careful inspection as to the proper operating status of the unit is to be carried out. Units that, for example, are found to be defective upon delivery or during installation must not be operated.

- Set-up, installation, operation and maintenance must only be performed by properly trained and qualified specialists. Operation after faulty installation or maintenance constitutes unintended use.
- Reliable protection against incursion by foreign matter, rust, airborne rust and other iron oxides is provided.
- Design of the electrical installations in accordance with EN 60079-14.
- A complete equipotential bonding must be activated; that is, sufficient and proper earthing of all electrically conducting parts.
- Accessibility for regular maintenance must be ensured.

4.0 Maintenance / Cleaning, Service and Repair

- At no point during maintenance, cleaning, service or repair may an explosion hazard exist or come up.
- For reasons of safety, the replacement of components, as well as repairs, on ELEKTROR blowers in potentially explosive areas must be carried out only by specially trained and authorized service experts from ELEKTROR. Any deviation from this requirement may void the guarantee and rule out liability by ELEKTROR.
- To maintain safety as well as the stipulated guarantee protection, only original equipment replacement parts from the manufacturer are to be used. Spare parts lists of standard units are not valid for and not applicable to ATEX units.

Measures for maintenance and service, as well as these actions themselves, may only be carried out by properly trained persons. The following are to be observed in addition to the operating instructions for a particular unit, as well as the rules and recommendations in the entire supplement:

Maintenance intervals: The owner of the equipment shall determine the required cleaning and maintenance intervals based on the operating hours, loads and operating conditions. However, maintenance and cleaning shall be performed at least quarterly starting from the date of start-up!

Immediate maintenance: Immediate maintenance is required in case of vibrations and oscillations, or in case of a drop in capacity.

- No agents / tools are to be used for cleaning that may lead to electrostatic charge build-up or may give rise to other risks.
- Cleaning must not lead to any damages or changes in the unit and its components and must not degrade, for example, the balance of the impeller.

To perform maintenance, the following steps, among others, are to be carried out:

- Visual inspection of all movable parts of the blower, such as impeller, blower housing cover / intake nozzle for possible damage, scoring, wear, fissures, cracks, deformation; proper condition of all earthing connections, radial shaft seals etc.
- Inspection of the gap between the impeller nozzle and the intake nozzle at the blower cover.
  Machine type D 09, D 092, RD 8, RD 82, RD 84, RD 92, RD 94: Minimum gap 3.0 mm
  All other maschine types: Minimum gap 2.0 mm
- The condition of the bearings, radial shaft seals and sealing elements must be checked at least every time maintenance is carried out, and these must be in good working order.
- Bearing life: See information provided by the manufacturer of the motor.
- Note: Information concerning the achievable hours of operation refers to the rated speed and intended use, excluding frequent start-up and shutdown. Depending upon performance, earlier replacement of bearings and radial shaft seals may be necessary.
- For reasons of safety, sealing elements shall be replaced at least in conjunction with every maintenance job that requires opening, removing or other altering of sealing elements. The equipotential bonding shall be inspected in conjunction with every maintenance job and shall be in good operating order after the maintenance job is completed. Carried out measures may not lead subsequently to carryover effects of different defined zones.
- Immediately arrange for necessary repairs in a timely manner. Some ATEX unit components have longer delivery times, such as, for example, the explosion-protected motors.
- In case of storage of ELEKTROR ATEX-equipment, e.g. as spare units, limited suitability for storage out of limited lifetime has to be taken into account for certain contained parts. Especially, this affects ball bearings, e.g. regarding lubrication. This differs depending on type of bearing, fan and conditions of storage (e.g. humidity, temperature). Please contact ELEKTROR customer support in need for further information.
- Work carried out in section 4.0 is to be continuously, chronologically and completely documented by those performing the work. In particular, the measures implemented, as well as compliance with all applicable

regulations and the manufacturer's specifications, are to be documented. It is recommended that this documentation be kept in a report book and safely stored.

5.0 Liability

The owner bears responsibility for the intended use of the unit.

ELEKTROR will not accept any liability for use of products and components that goes contrary to the intended use.

This especially applies to use in applications and under operating conditions that have not been expressly agreed to by ELEKTROR.

Furthermore, ELEKTROR does not accept any liability for alterations or modifications to the product or its accessories, especially if such alterations are capable of influencing the explosion protection.

Furthermore, ELEKTROR does not accept any liability for improper, delayed or neglected maintenance or repair work, or for maintenance and repair work not performed by qualified specialists from ELEKTROR and the consequences of such work.

6.0 Manufacturer's Declaration in Accordance with EC Machinery Directive, Appendix IIB

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We declare on our sole responsibility that the product to which this declaration relates conforms to the standards or standardisation documents listed below.

If a modification of the machine is made without our consent, this declaration becomes invalid.

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Medium pressure blower, explosion-protected	**RD...-Ex**
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Applicable EC directives to which this machine conforms:

EC machinery directive 98/37/EC

EC low voltage directive 2006/95/EC

EC directive 94/9/EC (ATEX 95)

Source reference of harmonised standards, especially:

EN 1127-1, EN 13463-1, EN 13463-5, EN 14986:2007

and other standards.

This machine component may not be put into service until the required safety measures have been taken for the equipment into which it is incorporated and such equipment has been declared to be in conformity with the provisions for health and safety set forth in the EC machinery directive.

Esslingen, 01.12.2007

Ulrich Kreher (Managing Director)

Subject to error and change without notice.