



ELECTRIC DRIVES

FOR EVERY DEMAND



Supplementary installation, Operating and maintenance instructions

Three-phase motors with squirrel cage,
permanent and or reluctance rotor for low voltage
with water cooling

Series:
(IE*-) **K..B / W..B / P..B / R..B**



<p>English</p> <p>Supplementary installation, operating and maintenance instructions Three-phase motors with squirrel cage rotors, permanent magnet and reluctance motors, for low voltage with water cooling</p>	
<p>(Translation from original language german)</p>	

Type designation:
 (IE*-) **K2.B / WE.B / W2.B / W4.B / W6.B / P..B / R..B**

Motors that comply with Directive 2009/125/EC and Regulation (EU) 1781/2019 as well as the Regulation (EU) 2021/341 have the identifier IEx, where x = 1, 2, 3, 4, 5 (according to EN 60034-30-1 or EN 60034-30-2) before the series designation.
 (Example IE3-P62B 450 LX8).

Other languages at www.vem-group.com



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1. General



Attention: Read the installation, operating and maintenance instructions (O&M), terminal diagram, supplementary terminal diagram and safety data sheet prior to transportation, installation, commissioning, maintenance and repair and follow the instructions!

These supplementary operating and maintenance instructions apply together with the operating and maintenance instructions for standard motors, which contain the basic specifications for connection, assembly, operation and maintenance, as well as the spare parts lists and the documents already mentioned.

These O&M instructions are intended to enable the operator to transport, install, commission and maintain the electrical machine safely and properly.

Neither compliance with these instructions nor the conditions and methods used during installation, operation, use and maintenance of the electric motor can be supervised by the manufacturer. Improper execution of the installation may lead to damage to property and consequently endanger human beings. Hence, we do not assume any responsibility or liability for any losses, damage or expenses resulting from or in any way connected with incorrect installation, improper operation and incorrect use and maintenance.

Drawings and Figures are simplified illustrations. Due to improvements and modifications, it is possible that they do not match in detail with the electrical machine supplied. We endeavour to constantly improve our products. Hence, we reserve the right to undertake modifications to the product, the technical specifications or to the installation, operating and maintenance instructions without prior notice. Designs, technical specifications and figures are binding only after certification in writing by the factory delivering the product.

2. Symbols

Two symbols are used in these operating instructions to indicate particularly important passages:



Safety and warranty information, potential personal injury included.



Warns of electrical voltage, danger to life. Indicates that damage to the electrical machine and/or auxiliary equipment may occur.

3. Safety regulations

The safety regulations, accident prevention regulations, guidelines and recognised rules of technology listed in the supplied operating instructions must be observed.

Failure to observe the safety instructions may result in danger to human beings and/or damage to the machine.



4. Design

The motor housings are designed as grey cast iron housings with cast-in cooling pipes up to size 250 and as double-walled welded steel designs from size 280.

Terminal boxes, end shields, winding insulation, protection class and colour correspond to the design of the series. The advantage of water cooling is a reduction in noise emissions compared to surface-cooled three-phase motors of the same power and size. The heat loss of the motors is dissipated without affecting the environment, and the cooling principle allows higher power and optimum vibration damping with a compact motor design.

Axle height	Material for			Foot mounting
	Enclosure	End shields	Feet	
225 - 250	Grey cast iron with cast-in cooling pipes and end ring	Grey cast iron	Grey cast iron	screwed
280 - 450	Welded steel design	Grey cast iron/ steel	Grey cast iron/ steel	welded

Size-power ratio

The available motors are listed in the VEM EKAT with the corresponding size/power ratio at www.vem-group.com.

5. Water cooling

In water-cooled motors, the heat loss generated in the motor is dissipated via the cooling water. The cooling water inlet and outlet are located on the non-driving side (NS) by default. A corrosion inhibitor must always be added to the cooling water and, if there is a risk of the frost limit being exceeded, an antifreeze agent or a combination of the two must also be added.



The motors are designed for operation with closed circulation.

Operation with open circulation is possible from size 280 onwards as a special design. If an open system needs to be used, please consult VEM motors GmbH first.

5.1. Handling

If there is a possibility that the motors will be stored or operated at temperatures below the frost limit, the cooling water inside the motor must be prevented from freezing. For this purpose, the cooling water can be drained during storage, or an antifreeze can be added during operation. Please note the following options:

Option 1 - continuous operation with antifreeze

When operated with antifreeze with corrosion protection additive, it ensures continuous protection against corrosion and frost.

Option 2 - Operation with water as coolant and intermittent operation

If motor is operated intermittently, we recommend draining the cooling water. Before draining, the cooling unit must be protected by adding antifreeze with an anti-corrosion additive to the cooling water. The cooling jacket is then protected against corrosion for about 3 months.

Option 3 - after a long downtime (with or without coolant in the cooling unit)

After a long period of downtime, ensure that the cooling water flows freely before commissioning. Any rusty areas should be treated with approx. 10% oxalic acid as follows:

- Empty cooling unit if there is still water in it
- Fill the cooling unit with 10% oxalic acid (approx. 100g/litre) and leave to for about 15 minutes
- Empty the cooling unit and rinse with water - repeat if necessary

If the motor has been non-operational and without water for a long period, make sure that the water can circulate freely during commissioning before operating the motor again.

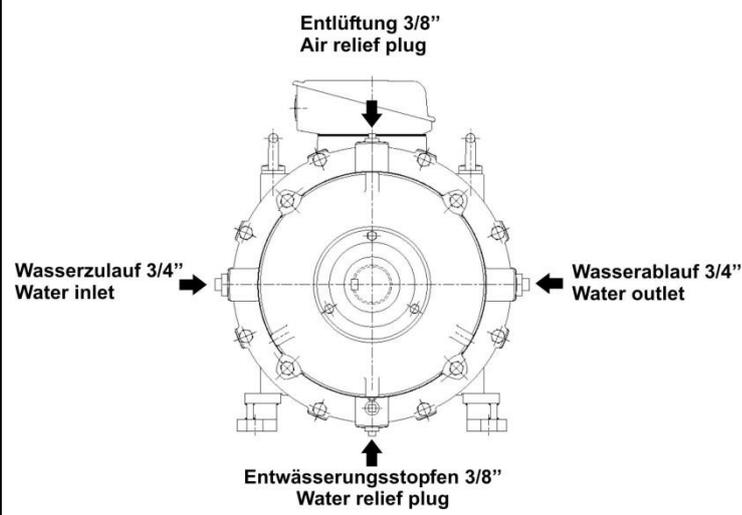
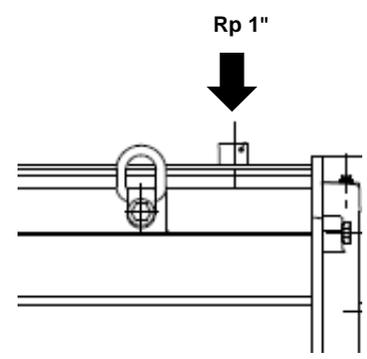
5.2. Water supply to the motor, cooling water requirements

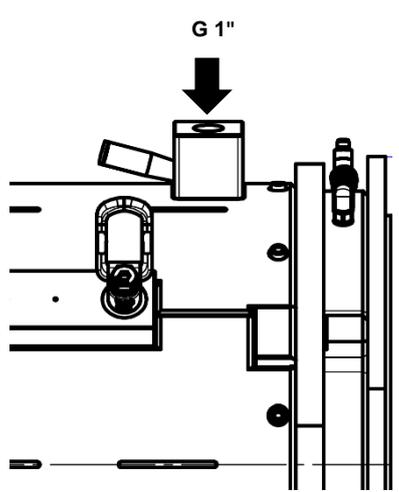
The cooling water must be of drinking water quality. The maximum operating water pressure is 10 bar (grey cast iron = 3.5 bar), and the maximum permissible cooling water inlet temperature is 35°C. Deviations from this must be specified accordingly when placing the order.

The following minimum requirements for the cooling system must be noted:

Size	Cooling water flow rate	Min. water pressure	Cooling water temperature rise
	[l/min]	[bar]	[°C]
225	10	0.5	6
250	16	0.7	7
280	18	1.0	9
315	18	1.5	8
355	20	2.0	10
355MX	30	2.0	10-15
355L	35	2.0	10-15
400	40	2.0	10-15
450	50	2.0	10-15

Suitable sealants must be used at the joints.

Size	graphical representation	Comment
225...250:		
280... 450:	<p>Option A) Pipe connection Rp1":</p> 	<ul style="list-style-type: none"> - Water outlet is located below the housing - Ventilation openings on the side next to the inlet and outlet connection points.

	<p>Option B) with G1":</p> 	<p>The side connections are used to measure temperature at inlet and outlet PT100 (optional option)</p>
<p>Attention: If shut-off valves are installed, they may need to be replaced depending on the intended use.</p> <p>The use of shut-off valves must be avoided at all costs:</p> <ul style="list-style-type: none"> - Unintentional closing during operation! - Pressure on the shut-off valves over 5 bar! <p>The water supply must be ensured at all times when the motor is running.</p>		



Running without cooling water is not permitted.

Each motor has at least one ventilation opening at the highest point and at least one water drain at the lowest point. When filling the cooling circuit, the ventilation opening must be opened. The motor must be filled with cooling water until water comes out of the ventilation opening. Proceed carefully to ensure that there is no air left in the cooling circuit. The ventilation opening must then be closed. Again, a suitable sealant must be used. The sealing of the connections must be checked.

To drain the motor, remove the ventilation and water drain plugs. After draining, replace the plugs. When refilling, check the plugs for leaks.

Caution condensation water

If the temperature difference between the cooling water and the ambient temperature exceeds 5K, water can accumulate inside and on the outside of the motor. This is normal and is regularly drained from the motor compartment using the corresponding drain plug. The functionality of the plug must be checked regularly. The operator must check on a case-by-case basis whether measures need to be taken on the outside of the housing.

5.3. Long-term storage (more than 12 months)

After a maximum of 6 months, the drain plug must be continuously opened and any condensation water should be drained.

The cooling water system must be drained and cleaned.

When delivered, the cooling system of grey cast Iron housing is not filled with cooling water by the manufacturer, unless specified.

Steel welded housing is always filled with a 40% Frostox SF-D12 DI++ coolant upon delivery. This results in a factory-set ice-flocking point of -20°C.



6. Declaration of Conformity

Manufacturer: VEM motors GmbH
Wernigerode factory
Address: Carl-Friedrich-Gauss-Str.1
D-38855 Wernigerode
Product name: Electrical equipment
Three-phase motors with squirrel-cage, permanent and or reluctance rotor for low voltage with water cooling

K2.B / WE.B / W2.B / W4.B / W6.B / P..B / R..B ¹⁾

1) Motors that comply with Directive 2009/125/EC and Regulation (EU) No. 2019/1781 or 2021/341 are prefixed with the designation IEx- before the series designation, where x=1, 2, 3, 4 (according to EN 60034-30-1:2014).

The subject matter of the declaration described above complies with the relevant Union harmonisation legislation:

2014/35/EU

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to making electrical equipment available on the market for use within specific voltage limits, Official Journal of the EU L96, 29 March 2014, p. 357-374

2009/125/EC

Directive of the European Parliament and of the Council of 21 October 2009 establishing a framework for stipulating requirements for the environmentally compatible design of energy-related products, Official Journal of the EU L285, 31 October 2009, p. 10-35

The sole responsibility for issuing this Declaration of Conformity lies with the manufacturers.

Conformity with the provisions of these Directives is demonstrated by compliance with the following standards:

Reference number and date of issue:

EN IEC 61000-6-2:2019, EN IEC 61000-6-4:2019

EN 60038:2011, EN 60204-1:2018

EN 60034-1:2010+Cor.:2010 and all other relevant parts and amendments EN 60034-...

The designated product is intended for installation in another machine. Commissioning is prohibited until conformity of the end product with Directive 2006/42/EC has been established. The safety instructions provided along with the product documentation must be followed.

Affixing the CE mark for the first time: 01.1996
Wernigerode, 24 June 2024

Dr Koch
Managing Director

This declaration certifies conformity with the above-mentioned Directives, but is not a guarantee of properties in terms of product liability.



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