TEST REPORT

EN 60034-1
Rotating electrical machines
Part 1:Rating and performance

Report Number.....	OViS202405010L-R1
Date of Issue.....	May 17, 2024
Update date.....	Jun. 11, 2024(More details refer to page 7)
number of pages.....	38
Testing Laboratory.....	OViS Testing Technology (Zhejiang) Co.,Ltd.
Address.....	Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China
Testing location/procedure.....	The same as above
Applicant's Name.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Manufacturer.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Factory.....	Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Address.....	Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul
Test specification:	
Standard.....	EN 60034-1:2010+AC:2010, BS EN 60034-1:2010+AC:2010
Test procedure.....	CE approval
Non-standard test method.....	N/A
Test Report Form No.....	EN 60034-1
Test Report Form(s) Originator.....	EU
Master TRF.....	Dated 2013-04
Test item description.....	Motor Unit
Trade Mark.....	DUCA®
Model/Type reference.....	GEX-MSS 15-75(Cover models see models list)
Ratings.....	220-240,50/60Hz

Testing procedure and testing location:			
☐	**Testing Laboratory:**	OViS Testing Technology (Zhejiang) Co.,Ltd.	
Testing Location/address		Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China	
☐	**Associated Laboratory:**	N/A	
Testing Location/address			
☒	**Tested by(name+signature):**	Juliet Hong	
☒	**Approved by(name+signature):**	Tyler Luo	
☐	**Testing procedure:TMP**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:WMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Witnessed by(+signature)..:**	N/A	
☐	**Approved by(+signature)....:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:SMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
☐	**Supervised by(+signature).:**	N/A	
Testing Location/address.....		N/A	
☐	**Testing procedure:RMT**	N/A	
☐	**Tested by(name+signature):**	N/A	
☐	**Approved by(+signature)....:**	N/A	
☐	**Supervised by(+signature).:**	N/A	

List of Attachments (including a total number of pages in each attachment):
Appendix I – Photo documentation – attachment 4 pages.

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
The provided samples were tested and found to meet the below standards: EN 60034-1:2010+AC:2010, BS EN 60034-1:2010+AC:2010	OViS Testing Technology (Zhejiang) Co.,Ltd. Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China

Summary of compliance with National Differences:
The requirements of national differences of The Europe Union were taken into account.

The product fulfils the requirements of
EN 60034-1:2010+AC:2010,BS EN 60034-1:2010+AC:2010
(insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)

Copy of marking plate:
The artwork below may be only a draft.

Motor Unit
IEC 60034-1
CE

Type	GEX-MSS 15-75	Nr.		Tem. 95
Isol. F		IP 42		S1
V	W	A	Hz	r/min
220-240	60	0.53	50/60	6250

Worimex Iklimlendirme Sistemleri Sanayi ve Ticaret A.s.
Zafer Mahallesi 146.sokak No: 13A Esenyurt/istanbul

Possible test case verdicts:

- test case does not apply to the test object .....: N/A
- test object does meet the requirement .....: P(Pass)
- test object does not meet the requirement .....: F(Fail)

Testing:

Date of receipt of test item.....:	Apr. 25, 2024
Date(s) of performance of test.....:	Apr. 26, 2024 to May 16, 2024
Sample appearance and function are in normal condition, yes or no.....:	Yes
Ambient temperature.....:	20-26℃
Ambient humidity.....:	50-65%

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

The samples under test are in good condition.
The test items comply with the requirements of the standard.

General product information:

The test results presented in this report relate only to the object tested.

For detail,see relrbant information on General product information
BS standards are identical with EN standards

These models listed in this report, them shared the very similar construction/appearance and most critical components,them shared the same working principle.
All models:220-240V,50/60Hz,I.C.F,IP42

Model	Input Power (W)	Rated current (A)	Speed. (r/min)
GEX-MSS 15-40	40	0.33	6250
GEX-MSS 15-50	45	0.37	6250
GEX-MSS 15-60	50	0.45	6250
GEX-MSS 15-65	55	0.48	6250
GEX-MSS 15-70	55	0.5	6250
GEX-MSS 15-75	60	0.53	6250

GEX-MSS 15-80	65	0.55	6250
GEX-FCI 15-50	45	0.37	6250
GEX 15-50	45	0.37	6250
GEX-FCI 15-60	50	0.45	6250
GEX 15-60	50	0.45	6250
GEX-FCI 15-65	55	0.48	6250
GEX 15-65	55	0.48	6250
GEX-FCI 15-70	55	0.5	6250
GEX 15-70	55	0.5	6250
GEX-FCI 15-75	60	0.53	6250
GEX 15-75	60	0.53	6250
GEX 15-40	40	0.33	6250
GEX-FCI 15-80	65	0.55	6250
GEX 15-80	65	0.55	6250
TEX 15-50	45	0.37	4950
BPE-W 15-50	45	0.37	4950
TEX 15-60	50	0.45	4950
BPE-W 15-60	50	0.45	4950
TEX 15-65	55	0.48	4950
BPE-W 15-65	55	0.48	4950
TEX 15-70	55	0.5	4950
BPE-W 15-70	55	0.5	4950
TEX 15-75	60	0.58	4950
BPE-W 15-75	60	0.58	4950
TEX 15-80	65	0.55	6250
BPE-W 15-80	65	0.55	6250
WEX-INT 15-50	45	0.37	4950
WEX-FCI 15-50	45	0.37	4950
WEX 15-50	45	0.37	4950
WEX-INT 15-60	50	0.45	4950
WEX-FCI 15-60	50	0.45	4950
WEX 15-60	50	0.45	4950

WEX-INT 15-65	55	0.48	4950
WEX-FCI 15-65	55	0.48	4950
WEX 15-65	55	0.48	4950
WEX-INT 15-70	55	0.5	4950
WEX-FCI 15-70	55	0.5	4950
WEX 15-70	55	0.5	4950
WEX-INT 15-75	60	0.5	4950
WEX-FCI 15-75	60	0.53	4950
WEX 15-75	60	0.53	4950
WEX-INT 15-80	60	0.55	4950
WEX-FCI 15-80	60	0.55	4950
WEX 15-80	65	0.55	4950

Modification on the appliances:

The original Test Report No. OViS202405010L issued on May 17, 2024 was modified on Jun. 11, 2024 to include the following changes :

1.The manufacturer and factory information was modified.

2.The trademark was added.

After construction review and verification of electrical spacing, no additional tests were considered necessary.

The added contents Report No. is OViS202405010L-R1.

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
4	**Duty**		
4.1	Declaration of duty		P
	Purchasers declaration of duty	S1	P
	If duty not declared, S1		N/A
4.2	Duty types		P
4.2.1	Duty type S1 – Continuous running duty		P
4.2.2	Duty type S2 – Short-time duty		N/A
4.2.3	Duty type S3 – Intermittent periodic duty		N/A
4.2.4	Duty type S4 – Intermittent periodic duty with starting		N/A
4.2.5	Duty type S5 – Intermittent periodic duty with electric braking		N/A
4.2.6	Duty type S6 – Continuous-operation periodic duty		N/A
4.2.7	Duty type S7 – Continuous-operation periodic duty with electric breaking		N/A
4.2.8	Duty type S8 – Continuous-operation periodic duty with related load/speed changes		N/A
4.2.9	Duty type S9 – Duty with non-periodic load and speed variations		N/A
4.2.10	Duty type S10 – Duty with discrete constant loads and speeds		N/A
5	**Rating**		
5.1	Assignment of rating		P
	The rating, as defined in 3.2, shall be assigned by the manufacturer.		P
	In assigning the rating the manufacturer shall select one of the classes of rating defined in 5.2.1to 5.2.6. The designation of the class of rating shall be written after the rated output.		P
	If no designation is stated, rating for continuous running duty applies.		N/A
	Special considerations are required when assigning ratings to machines fed from or supplying static converters. IEC 60034-17 gives guidance for the case of cage induction motors covered in IEC 60034-12.		N/A
5.2	Classes of rating		P
5.2.1	Rating for continuous running duty		P
5.2.2	Rating for short-time duty		N/A

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
5.2.3	Rating for periodic duty		N/A
5.2.4	Rating for non-periodic duty		N/A
5.2.5	Rating for duty with discrete constant loads and speeds		N/A
5.2.6	Rating for equivalent loading		N/A
5.3	Selection of a class of rating		P
	A machine manufactured for general purpose shall have a rating for continuous running duty and be capable of performing duty type S1.	S1	P
	If the duty has not been specified by the purchaser, duty type S1 applies and the rating assigned shall be a rating for continuous running duty.		N/A
	When a machine is intended to have a rating for short-time duty, the rating shall be based on duty type S2, see 4.2.2.		N/A
	When a machine is intended to supply varying loads or loads including a time of no-load or times where the machine will be in a state of de- energized and at rest, the rating shall be a rating for periodic duty based on a duty type selected from duty types S3 to S8, see 4.2.3 to 4.2.8.		N/A
	When a machine is intended non-periodically to supply variable loads at variable speeds, including overloads, the rating shall be a rating for non-periodic duty based on duty type S9, see 4.2.9.		N/A
	When a machine is intended to supply discrete constant loads including times of overload or times of no-load (or de-energized and at rest) the rating shall be a rating with discrete constant loads based on duty type S10, see 4.2.10.		N/A
5.4	Allocation of outputs to class of rating		P
	For duty types S1 to S8, the specified value(s) of the constant load(s) shall be the rated output(s), see 4.2.1 to 4.2.8.	S1	P
	For duty types S9 and S1 0, the reference value of the load based on duty type S1 shall be taken as the rated output, see 4.2.9 and 4.2.10.		N/A
5.5	Rated output		P
5.5.1	DC generators		N/A
	The rated output is the output at the terminals and		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	shall be expressed in watts (W).		
5.5.2	AC generators		N/A
	The rated output is the apparent power at the terminals and shall be expressed in volt-amperes (VA) together with the power factor.		N/A
	The rated power factor for synchronous generators shall be 0,8 lagging (over-excited), unless otherwise specified by the purchaser		N/A
5.5.3	Motors		P
	The rated output is the mechanical power available at the shaft and shall be expressed in watts (W)	60W	P
5.5.4	AC generators		N/A
	The rated output is the apparent power at the terminals and shall be expressed in volt-amperes (VA) together with the power factor		N/A
5.6	Rated voltage		N/A
5.6.1	DC generators		N/A
	For d.c. generators intended to operate over a relatively small range of voltage, the rated output and current shall apply at the highest voltage of the range, unless otherwise specified,see also 7.3.		N/A
5.6.2	AC generators		N/A
	For a.c. generators intended to operate over a relatively small range of voltage, the rated output and power factor shall apply at any voltage within the range, unless otherwise specified, see also 7.3.		N/A
5.7	Co-ordination of voltages and outputs		N/A
	For machines with rated voltages above 1 kV, preferred rated voltages are selected according to rated output as stated in table 1		N/A
5.8	Machines with more than one rating		N/A
	For machines with more than one rating, the machine shall comply with this standard in all respects at each rating.		N/A
	For multi-speed motors, a rating shall be assigned for each speed.		N/A
	When a rated quantity (output, voltage, speed, etc.) may assume several values or vary continuously within two limits, the rating shall be stated at these		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	values or limits. This provision does not apply to voltage and frequency variations during operation as defined in 7.3 or to star-delta connections intended for starting.		
6	**Site conditions**		
6.1	General		P
	Unless otherwise specified, machines shall be suitable for the following site operation conditions. For site operating conditions deviating from those values, corrections are given in Clause 8.		P
6.2	Altitude		P
	The altitude shall not exceed 1 000 m above sea-level		P
6.3	Maximum ambient air temperature		P
	The ambient air temperature shall not exceed 40℃		P
6.4	Minimum ambient air temperature		P
	The ambient air temperature shall not be less than-15 °C for any machine.		P
	The ambient air temperature shall be not less than 0 °C for a machine with any of the following:		P
	a) rated output greater than 3 300 kW (or kVA) per 1 000 min^{-1};		N/A
	b) rated output less than 600 W (or VA);	60W	P
	c) a commutator;		N/A
	d) a sleeve bearing;		N/A
	e) water as a primary or secondary coolant.		N/A
6.5	Water coolant temperature		N/A
	For the reference water coolant temperature see Table 5. For other water coolant temperatures see Table 1 0. The water coolant temperature shall not be less than +5 °C.		N/A
6.6	Standstill, storage and transport		N/A
	When temperatures lower than specified in 6.4 are expected during transportation, storage, or after installation at standstill, the purchaser shall inform the manufacturer and specify the expected minimum temperature.		N/A
6.7	Purity of hydrogen coolant		N/A
	Hydrogen cooled machines shall be capable of		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	operating at rated output under rated conditions with a coolant containing not less than 95 % hydrogen by volume. For calculating efficiency in accordance with IEC 60034-2 (all parts), the standard composition of the gaseous mixture shall be 98 % hydrogen and 2 % air by volume, at the specified values of pressure and temperature of the re-cooled gas, unless otherwise agreed. Windage losses shall be calculated at the corresponding density		
7	**Electrical operating conditions**		
7.1	Electrical supply		P
	For three-phase a.c. machines, 50 Hz or 60 Hz, intended to be directly connected to distribution or utilisation systems, the rated voltages shall be derived from the nominal voltages given in IEC 60038		P
	For electrical machines with Type I insulation systems according to IEC 60034-18-41 , which are specifically designed for supply by voltage source converters, the manufacturer can assign an impulse voltage insulation class (IVIC) according to IEC 60034-18-41 for the insulation system. In this case, the insulation system should be suitable for IVIC C for phase-to-phase and IVIC B for phase-to-ground or as otherwise agreed to between the user and the manufacturer. The IVIC level shall be given in the documentation and preferably on the nameplate (see 10.2).		P
	Any bus transfer or fast reclosing of an a.c. machine, as it might occur, for example, due to the voltage ride through requirements of grid codes, can lead to very high peak currents endangering the stator winding overhang and to a very high peak torque of up to 20 times rated torque endangering the mechanical structure including the coupling and the driven or driving equipment. Bus transfer or fast reclosing is therefore only allowed if specified and accepted by the manufacturers of electric machine and driven equipment. For ratings≤ 10 MW or MVA, slow reclosing exceeding 1,5 times the open circuit time constant is allowed, if specified and accepted by the		P

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
	manufacturers of the electric machine and the driven equipment. For ratings > 10 MW or MVA, the allowed minimum time for slow reclosing should be determined by transient analysis of the complete system by the system integrator and is allowed if accepted by the manufacturers of the electric machine and the driven equipment		
7.2	Form and symmetry of voltages and currents		P
7.2.1	AC motors		P
7.2.1.1	AC motors rated for use on a power supply of fixed frequency, supplied from an a.c. generator (whether local or via a supply network) shall be suitable for operation on a supply voltage having a harmonic voltage factor (HVF) not exceeding:		P
	– 0,02 for single-phase motors and three-phase motors, including synchronous motors but excluding motors of design N (see IEC 60034-12), unless the manufacturer declares otherwise		N/A
	– 0,03 for design N motors.		P
	Three-phase a.c. motors shall be suitable for operation on a three-phase voltage system having a negative-sequence component not exceeding 1 % of the positive-sequence component over a long period, or 1 ,5 % for a short period not exceeding a few minutes, and a zero-sequence component not exceeding 1 % of the positive-sequence component		N/A
	Should the limiting values of the HVF and of the negative-sequence and zero-sequence components occur simultaneously in service at the rated load, this shall not lead to any harmful temperature in the motor and it is recommended that the resulting excess temperature rise related to the limits specified in this document should be not more than approximately 10 K		N/A
7.2.1.2	AC motors supplied from static converters have to tolerate higher harmonic contents of the supply voltage; see IEC TS 60034-25		N/A
7.2.2	AC generators		N/A
	Three-phase a.c. generators shall be suitable for supplying circuits which, when supplied by a system of balanced and sinusoidal voltages:		N/A

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
	a) result in currents not exceeding a harmonic current factor (HCF) of 0,05, and		N/A
	b) result in a system of currents where neither the negative-sequence component nor the zero-sequence component exceed 5 % of the positive-sequence component.		N/A
	Should the limits of deformation and imbalance occur simultaneously in service at the rated load, this shall not lead to any harmful temperature in the generator and it is recommended that the resulting excess temperature rise related to the limits specified in this document should be not more than approximately 10 K		N/A
7.2.3	Synchronous machines		N/A
	Unless otherwise specified, three-phase synchronous machines shall be capable of operating continuously on an unbalanced system in such a way that, with none of the phase currents exceeding the rated current		N/A
	the ratio of the negative-sequence component of current (I_2) to the rated current (I_N) does not exceed the values in Table 2 and		N/A
	Under fault conditions shall be capable of operation with the product of $(I_2/I_N)^2$ and time (t) not exceeding the values in Table 2.		N/A
7.2.4	DC motors supplied from static power converters		N/A
	In the case of a d.c. motor supplied from a static power converter, the pulsating voltage and current affect the performance of the machine. Losses and temperature rise will increase and the commutation is more difficult compared with a d.c. motor supplied from a pure d.c. power source		N/A
	for motors with a rated output exceeding 5 kW, intended for supply from a static power converter, to be designed for operation from a specified supply, and, if considered necessary by the motor manufacturer, for an external inductance to be provided for reducing the undulation		N/A
	Motors with rated output not exceeding 5 kW, instead of being tied to a specific type of static power converter, may be designed for use with any static		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	power converter, with or without external inductance, provided that the rated form factor for which the motor is designed will not be surpassed and that the insulation level of the motor armature circuit is appropriate for the rated alternating voltage at the input terminals of the static power converter.		
	In all cases, the undulation of the static power converter output current is assumed to be so low as to result in a current ripple factor not higher than 0,1 at rated conditions.		N/A
7.3	Voltage and frequency variations during operation		P
	For a.c. machines rated for use on a power supply of fixed frequency supplied from an a.c. generator (whether local or via a supply network), combinations of voltage variation and frequency variation are classified as being either zone A or zone B		P
	Figure 11 used for generators and synchronous condensers		N/A
	Figure 12 used for motors		P
	A machine shall be capable of performing its primary function, as specified in Table 3, continuously within zone A, but need not comply fully with its performance at rated voltage and frequency (see rating point in Figures 11 and 12), and may exhibit some deviations. Temperature rises may be higher than at rated voltage and frequency.		N/A
	A machine shall be capable of performing its primary function within zone B, but may exhibit greater deviations from its performance at rated voltage and frequency than in zone A. Temperature rises may be higher than at rated voltage and frequency and most likely will be higher than those in zone A. Extended operation at the perimeter of zone B is not recommended.		P
	In practical applications and operating conditions, a machine will sometimes be required to operate outside the perimeter of zone A. Such excursions should be limited in value, duration and frequency of occurrence. Corrective measures should be taken, where practical, within a reasonable time, for		P

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Clause	Requirement - Test	Result - Remark	Verdict
	example, a reduction in output. Such action may avoid a reduction in machine life from temperature effects		
7.4	Three-phase a.c. machines operating on unearthed systems		N/A
	Three-phase a.c. machines shall be suitable for continuous operation with the neutral at or near earth potential. They shall also be suitable for operation on unearthed systems with one line at earth potential for infrequent periods of short duration, for example as required for normal fault clearance. If it is intended to run the machine continuously or for prolonged periods in this condition, a machine with a level of insulation suitable for this condition will be required		N/A
	If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer		N/A
	The earthing or interconnection of the machine's neutral points should not be undertaken without consulting the machine manufacturer because of the danger of zero-sequence components of currents of all frequencies under some operating conditions and the risk of mechanical damage to the windings under line-to-neutral fault conditions		N/A
7.5	Voltage (peak and gradient) withstand levels		N/A
	For a.c. machines, the manufacturer shall declare a limiting value for the peak voltage and for the voltage gradient in continuous operation, if required by the customer		N/A
	For machines used in power drive systems (PDS), see also IEC TS 60034-25		N/A
	For machines with a specified Impulse Voltage Insulation Class IVIC, see IEC 60034-18-41 in the case of machines designed to operate without partial discharges		N/A
	For high-voltage a.c. machines, see also IEC 60034-15		N/A
	For creepage and clearance distances of bare live copper, see IEC 60664-1		N/A
8	**Thermal performance and tests**		
8.1	Thermal class		P

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Clause	Requirement - Test	Result - Remark	Verdict
	A thermal class in accordance with IEC 60085 shall be assigned to the insulation systems used in machines	Class F	P
	It is the responsibility of the manufacturer of the machine to interpret the results obtained by thermal endurance testing according to the appropriate part of IEC 60034-18		N/A
8.2	Reference coolant		P
	Primary coolant	Air	P
	Method of cooling	Indirect	P
	Secondary coolant		P
	Table number	Table 7	P
	If a third coolant is used, temperature rise shall be measured above the temperature of the primary or secondary coolant as specified in Table 5.		N/A
8.3	Conditions for thermal tests		P
8.3.1	Electrical supply		P
	During thermal testing of an a.c. machine the HVF of the supply shall not exceed 0,015 and the negative-sequence component of the system of voltages shall be less than 0,5 % of the positive-sequence component, the influence of the zero-sequence component being eliminated	0.013	P
	By agreement, the negative-sequence component of the system of currents may be measured instead of the negative-sequence component of the system of voltages. The negative-sequence component of the system of currents shall not exceed 2,5 % of the positive-sequence component.		P
8.3.2	Temperature of machine before test		P
	If the temperature of a winding is to be determined from the increase of resistance, the initial winding temperature shall not differ from the coolant by more than 2 K		P
	When a machine is to be tested on a short-time rating (duty type S2) its temperature at the beginning of the thermal test shall be within 5 K of the temperature of the coolant		N/A
8.3.3	Temperature of coolant		P

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Clause	Requirement - Test	Result - Remark	Verdict
	A machine may be tested at any convenient value of coolant temperature. See Table 12 (for indirect cooled windings) or Table 15 (for direct cooled windings)		P
8.3.4	Measurement of coolant temperature during test		P
	The value to be adopted for the temperature of a coolant during a test shall be the mean of the readings of the temperature detectors taken at equal intervals of time during the last quarter of the duration of the test. To reduce errors due to the time lag of the change of temperature of large machines following variations in the temperature of the coolant, all reasonable precautions shall be taken to minimize such variations.		P
8.3.4.1	Open machines or closed machines without heat exchangers (cooled by surrounding ambient air or gas)		P
	The temperature of the ambient air or gas shall be measured by means of several detectors placed at different points around and halfway up the machine at 1 m to 2 m from it. Each detector shall be protected from radiant heat and draughts.		P
8.3.4.2	Machines cooled by air or gas from a remote source through ventilation ducts and machines with separately mounted heat exchangers		N/A
	The temperature of the primary coolant shall be measured where it enters the machine.		N/A
8.3.4.3	Closed machines with machine-mounted or internal heat exchangers		N/A
	The temperature of the primary coolant shall be measured where it enters the machine. The temperature of the secondary coolant shall be measured where it enters the heat exchanger		N/A
8.4	Temperature rise of a part of a machine		P
	The temperature rise, $\Delta\theta$, of a part of a machine is the difference between the temperature of that part measured by the appropriate method in accordance with 8.5, and the temperature of the coolant measured in accordance with 8.3.4.		P
	For comparison with the limits of temperature rise (see Table 7 or Table 8) or of temperature (see Table 12), when possible, the temperature shall be		P

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Clause	Requirement - Test	Result - Remark	Verdict
	measured immediately before the machine is shut down at the end of the thermal test, as described in 8.7.		
	When this is not possible, for example, when using the direct measurement of resistance method, see 8.6.2.3.		P
	For machines tested on actual periodic duty (duty types S3 to S8) the temperature at the end of the test shall be taken as that at the middle of the rise period causing the greatest heating in the last cycle of operation (but see also 8.7.3).		N/A
8.5	Methods of measurement of temperature		P
8.5.1	General		P
	Three methods of measuring the temperature of windings and other parts are recognized:		P
	- resistance method;		P
	- embedded temperature detector (ETD) method;		P
	- thermometer method.		N/A
	Different methods shall not be used as a check upon one another		N/A
	For indirect testing see IEC 60034-29		N/A
8.5.2	Resistance method		P
	The temperature of the windings is determined from the increase of the resistance of the windings	Copper wiring, resistance method used	P
8.5.3	Embedded temperature detector (ETD) method		P
	The temperature is determined by means of temperature detectors (e.g. resistance thermometers, thermocouples or semi-conductor negative coefficient detectors) built into the machine during construction, at points which are inaccessible after the machine is completed	For reference	P
8.5.4	Thermometer method		N/A
	The temperature is determined by thermometers applied to accessible surfaces of the completed machine. The term 'thermometer' includes not only bulb-thermometers, but also non-embedded thermocouples and resistance thermometers. When bulb-thermometers are used in places where there is a strong varying or moving magnetic field, alcohol thermometers shall be used in preference to mercury		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	thermometers		
8.6	Determination of winding temperature		P
8.6.1	Choice of method		P
	In general, for measuring the temperature of the windings of a machine, the resistance method in accordance with 8.5.1 shall be applied(but see also 8.6.2.3.3).	R-method	P
	For a.c. stator windings of machines having a rated output of 5 000 kW (or kVA) or more the ETD method shall be used.		N/A
	For a.c. machines having a rated output less than 5 000 kW (or kVA) but greater than 200 kW (or kVA) the manufacturer shall choose either the resistance or the ETD method, unless otherwise agreed.		N/A
	For a.c. machines having a rated output less than or equal to 200 kW (or kVA) the manufacturer shall choose the direct measurement version or the superposition version of the resistance method (see 8.6.2.1), unless otherwise agreed (but see also below).		N/A
	For machines having a rated output less than or equal to 600 W (or VA), when the windings are non-uniform or severe complications are involved in making the necessary connections, the temperature may be determined by means of thermometers. Temperature rise limits in accordance with Table 8, item 1 d) for resistance method shall apply	Resistance had been measured. ETD method for reference	P
	The thermometer method is recognized in the following cases:		N/A
	a) When it is not practicable to determine temperature rise by resistance method		N/A
	b) Single layer windings, rotating or stationary.		N/A
	c) During routine tests on machines manufactured in large numbers		N/A
	For a.c. stator windings having only one coil-side per slot, the ETD method shall not be used for verifying compliance with this standard: the resistance method shall be used.		N/A
	For other windings having one coil-side per slot and for end windings the ETD method shall not be used for verifying compliance with this standard.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	For windings of armatures having commutators and for field windings the resistance method and the thermometer method are recognized. The resistance method is preferred but for stationary field windings of d.c. machines having more than one layer the ETD method may be used.		N/A
8.6.2	Determination by resistance method		P
8.6.2.1	Measurement		P
	One of the following methods shall be used:		P
	—direct measurement at the beginning and the end of the test, using an instrument having a suitable range;		P
	—measurement by d.c. current/voltage in d.c. windings, by measuring the current in and the voltage across the winding, using instruments having suitable ranges;		N/A
	—measurement by d.c. current/voltage in a.c. windings by injecting direct current into the winding when de-energized;		N/A
	—Measurement by d.c. current/voltage in a.c. windings, by superposing small amount of d.c. current into the winding, when energized.		N/A
8.6.2.2	Calculation		P
	Temperature (θ_1) of winding (cold) at moment of initial resistance measurement (℃)	(see appended table)	P
	Temperature (θ_a) of coolant at end of test (℃)	(see appended table)	P
	Resistance (R_1) of winding (cold) at temperature θ_1(Ω)	(see appended table)	P
	Resistance (R_2) of winding (hot) at end of test / at temperature θ_2 (Ω)	(see appended table)	P
	Reciprocal of temperature coefficient (k)	235	P
	Temperature rise (θ_2 - θ_a) (K)	(see appended table)	P
	Temperature (θ_1) of winding (cold) at moment of initial resistance measurement (℃)	(see appended table)	P
8.6.2.3	Correction for stopping time		P
8.6.2.3.1	General		P

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Clause	Requirement - Test	Result - Remark	Verdict
	The measurement of temperatures at the end of the thermal test by the direct measurement resistance method requires a quick shutdown. A carefully planned procedure and an adequate number of people are required		P
8.6.2.3.2	Short stopping time		P
	If the initial resistance reading is obtained within the time interval specified in Table 5, that reading shall be accepted for the temperature measurement		P
8.6.2.3.3	Extended stopping time		N/A
	If a resistance reading cannot be made in the time interval specified in Table 5, it shall be made as soon as possible but not after more than twice the interval specified in Table 5, and additional readings shall be taken at intervals of approximately 1 min until these readings have begun a distinct decline from their maximum value.		N/A
	A curve of these readings shall be plotted as a function of time and extrapolated to the appropriate time interval of Table 6 for the rated output of the machine. A semi-logarithmic plot is recommended where temperature or resistance is plotted on the logarithmic scale. The value of temperature thus obtained shall be considered as the temperature at shutdown.		N/A
	If successive measurements show increasing temperatures after shutdown the highest value shall be taken.		N/A
	If a resistance reading cannot be made until after twice the time interval specified in Table 5,this method of correction shall only be used by agreement.		N/A
8.6.2.3.4	Windings with one coil-side per slot		N/A
	For machines with one coil-side per slot, the resistance method by direct measurement may be used if the machine comes to rest within the time interval specified in Table 5.		N/A
	If the machine takes more than 90 s to come to rest after switching off the power, the superposition method (see 8.6.2.1) may be used if previously agreed.		N/A
8.6.3	Determination by ETD method		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
8.6.3.1	General		N/A
	The detectors shall be suitably distributed throughout the winding and the number of detectorsinstalled shall be not less than six		N/A
	All reasonable efforts, consistent with safety, shall be made to place the detectors at the points where the highest temperatures are likely to occur, in such a manner that they are effectively protected against contact with the primary coolant.		N/A
	The highest reading from the ETD elements shall be used to determine the temperature of the winding		N/A
	ETD elements or their connections may fail and give incorrect readings. Therefore, if one or more readings are shown to be erratic, after investigation they should be eliminated		N/A
8.6.3.2	Two or more coil-sides per slot		N/A
	The detectors shall be located between the insulated coil-sides within the slot in positions at which the highest temperatures are likely to occur.		N/A
8.6.3.3	One coil-side per slot		N/A
	The detectors shall be located between the wedge and the outside of the winding insulation in positions at which the highest temperatures are likely to occur, but see also 8.6.1 .		N/A
8.6.3.4	End windings		N/A
	The temperature detectors shall be located between two adjacent coil-sides within the end windings in positions where the highest temperatures are likely to occur. The sensing point of each detector shall be in close contact with the surface of a coil-side and be adequately protected against the influence of the coolant, but see also 8.6.1 .		N/A
	When placing a temperature detector in the end windings of high voltage machines, care shall be taken that the stress grading of the insulation is not compromised and that the difference of potential along the winding overhang does not cause problems.		N/A
	In addition, the ground of the measuring system is thus directly capacitive coupled to the HV-system. Disconnection of the measurement ground will in this		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	case immediately lead to over voltages on the measuring system.		
	Measures have to be taken to prevent consequential damage up to lethal injuries.		N/A
8.6.4	Determination by thermometer method		N/A
	Place thermometers at the point, or points where the highest temperatures are likely to occur in such a manner that they are effectively protected against contact with the primary coolant and are in good thermal contact with the winding or other part of the machine.		N/A
	The highest reading from any thermometer shall be taken to be the temperature of the winding or other part of the machine.		N/A
8.7	Duration of thermal tests		P
8.7.1	Rating for continuous running duty		P
	The test shall be continued until thermal equilibrium has been reached.		P
8.7.2	Rating for short-time duty		N/A
	The duration of the test shall be the time given in the rating		N/A
8.7.3	Rating for periodic duty		N/A
	Rated for equivalent loading applied until thermal equilibrium has been reached		N/A
	Test on actual duty load cycle and continued until practically identical temperature cycles are obtained		N/A
8.7.4	Ratings for non-periodic duty and for duty with discrete constant loads		N/A
	The rating for equivalent loading assigned by the manufacturer (see 5.2.6) shall be applied until thermal equilibrium has been reached		N/A
8.8	Determination of the thermal equivalent time constant for machines of duty type S9		N/A
	The thermal equivalent time constant with ventilation as in normal operating conditions,suitable for approximate determination of the temperature course, can be determined from the cooling curve plotted in the same manner as in 8.6.2.3. The value of the time constant is1,44 times (that is to say, 1 /ln(2) times) the time taken by the machine to cool to		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	one-half of the full load temperature rise, after its disconnection from the supply.		
8.9	Measurement of bearing temperature		P
	Either the thermometer method or the ETD method may be used.	Thermometer Method	P
	The measuring point shall be as near as possible to one of the two locations specified in Table 6.		P
	The thermal resistance between the temperature detector and the object whose temperature is to be measured shall be minimized; for example, air gaps shall be packed with thermally conducting paste		P
8.10	Limits of temperature and of temperature rise		P
	Limits are given for operation under site operating conditions specified in Clause 6 and at rating for continuous running duty (reference conditions), followed by rules for the adjustment of those limits when operating at site under other conditions and on other ratings. Further rules give adjustments to the limits during thermal testing when conditions at the test site differ from those at the operating site		P
	The limits are stated relative to the reference coolant specified in Table 4.		P
	A rule is given to allow for the purity of hydrogen coolant.		N/A
8.10.1	Indirect cooled windings		P
	Temperature rises under reference conditions shall not exceed the limits given in Table 7 (air coolant) or Table 8 (hydrogen coolant) as appropriate.		P
	For other operating site conditions, for ratings other than continuous running duty, and for rated voltages greater than 1 2 000 V, the limits shall be adjusted according to Table 9. (See also Table 1 0 for limit on coolant temperature which is assumed in Table 9.)		N/A
	In the case of thermometer readings made in accordance with 8.6.1, the limit of temperature rise shall be according to Table 7.		N/A
	for windings indirectly cooled by air, conditions at the test site differ from those at the operating site, the adjusted limits given in Table 11 shall apply at the test site.		P
	If the adjusted limits given in Table 11 lead to		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	permissible temperatures at the test site which the manufacturer considers to be excessive, the testing procedure and the limits shall be agreed.		
	No adjustments at the test site are given for windings indirectly cooled by hydrogen, because it is very unlikely that they will be tested at rated load anywhere other than at the operating site.		N/A
8.10.2	Direct cooled windings		N/A
	Temperatures under reference conditions shall not exceed the limits given in Table 12.		N/A
	For other operating site conditions the limits shall be adjusted according to Table 13		N/A
	If conditions at the test site differ from those at the operating site, the adjusted limits given in Table 14 shall apply at the test site.		N/A
	If the adjusted limits given in Table 14 lead to temperatures at the test site which the manufacturer considers to be excessive, the testing procedure and the limits shall be agreed.		N/A
8.10.3	Adjustments to take account of hydrogen purity on test		N/A
	For windings directly or indirectly cooled by hydrogen, no adjustment shall be made to limits of temperature rise or of total temperature if the proportion of hydrogen in the coolant is between 95 % and 100 %		N/A
8.10.4	Permanently short-circuited windings, magnetic cores and all structural components (other than bearings) whether or not in contact with insulation		N/A
	The temperature rise or the temperature shall not be detrimental to the insulation of that part or to any other part adjacent to it.		N/A
8.10.5	Commutators and sliprings, open or enclosed and their brushes and brushgear		N/A
	The temperature rise or temperature of any commutator, slipring, brush or brushgear shall not be detrimental to the insulation of that part or any adjacent part		N/A
	The temperature rise or temperature of a commutator or slipring shall not exceed that at which the combination of brush grade and commutator or slipring material can handle the current over the full		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	operating range		
9	**Other performance and tests**		
9.1	Routine tests		P
	Routine tests are always factory tests.		P
	They can only be performed on machines which are assembled at the works of the manufacturer. The machine needs not be completely assembled. It can lack components which are not significant for the testing. Routine tests do not need the machine to be coupled except for the open-circuit test on synchronous machines.		P
	The minimum test schedule is listed in Table 15 and is applicable for machines with rated output ≤ 20 MW (MVA). Additional routine tests may be performed especially on machines with ratings above 200 kW (kVA). The term synchronous machines includes permanent magnet machines.		P
	For d.c. machines, depending on size and design, a commutation test under load may be performed as a routine test.		N/A
9.2	Withstand voltage test		P
	A test voltage, as specified below, shall be applied between the windings under test and the frame of the machine, with the core and the windings not under test connected to the frame. It shall be applied only to a new and completed machine with all its parts in place under conditions equivalent to normal working conditions and shall be carried out at the manufacturer's works or after erection on site.		P
	When a thermal test is carried out, the withstand voltage test shall be carried out immediately after that test.		P
	In the case of polyphase machines with rated voltage above 1 kV having both ends of each phase individually accessible, the test voltage shall be applied between each phase and the frame, with the core and the other phases and windings not under test connected to the frame.		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	Test voltage shall be of power frequency and as near as possible to a sine wave form.		N/A
	Final value of the voltage shall be in accordance with Table 16.		N/A
	Test voltage applied for 1 min		P
	Test voltage (V)	1500V No Failure	P
	for machines with a rated voltage 6 kV or greater, when power frequency equipment is not available, then by agreement a d.c. test may be carried out at a voltage 1,7 times the r.m.s. value given in Table 16.		P
	The test shall be commenced at a voltage not exceeding half of the full test voltage. The voltage shall then be increased to the full value, steadily or in steps of not more than 5 % of the full value, the time allowed for the voltage increase from half to full value being not less than 10 s		P
9.3	Occasional excess current		P
9.3.1	General		P
	The excess current capability of rotating machines is given for the purpose of co-ordinating these machines with control and protective devices.		P
9.3.2	Generators		N/A
	A.C generators with output not exceeding 1200 MVA capable of withstanding current of 1.5 times rated current for not less than 30 s		N/A
	A.C generators with output exceeding 1 200 MVA shall be capable of withstanding current of 1.5 times rated current for at least 15 s		N/A
9.3.3	Motors (except commutator motors and permanent magnet motors)		P
	Polyphase motors having rated outputs not exceeding 315 kW and rated voltages not exceeding 1 kV shall be capable of withstanding:		P
	- a current equal to 1,5 times the rated current for not less than 2 min.		P
9.3.4	Commutator machines		N/A
	Shall be capable of withstanding 1.5 times rated current for 60 s for specified conditions		N/A
	a) speed:		N/A
	1) d.c. motor: highest full-field speed;		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	2) d.c. generator: rated speed;		N/A
	3) a.c. commutator motor: highest full-field speed;		N/A
	b) armature voltage: that corresponding to the specified speed.		N/A
9.4	Momentary excess torque for motors		P
9.4.1	Polyphase induction motors and d.c. motors		P
	Motors, whatever their duty and construction, shall be capable of withstanding an excess torque of at least 60 % of their rated torque for 15 s without either stalling or exhibiting an abrupt change of speed (under gradual increase of torque)		P
	The voltage and frequency (for induction motors) shall be maintained at their rated values		N/A
	Motors for duty type S9 shall be capable of withstanding momentarily an excess torque determined according to the duty specified		N/A
	Higher torques are required for some motors manufactured according to IEC 60034-12.		N/A
	For d.c. motors, the torque shall be expressed in terms of overload current.		N/A
	Motors for duty type S9 shall be capable of withstanding momentarily an excess torque determined according to the duty specified.		N/A
	Motors intended for specific applications that require a high torque (for example for hoisting) shall be the subject of agreement.		N/A
	For cage-type induction motors specially designed to ensure a starting current of less than 4,5 times the rated current, the excess torque can be below the value of 60 % given in paragraph 1, but not less than 50 %.		N/A
	In the case of special types of induction motors with special inherent starting properties, for example motors intended for use at variable frequency or induction motors supplied from static converters, the value of the excess torque shall be the subject of agreement.		N/A
	Rated torque (N.m)		P
	Excess torque (N.m)		P
9.4.2	Polyphase synchronous motors		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	a polyphase synchronous motor, irrespective of the duty, shall be capable of withstanding an excess torque as specified below for 15 s without falling out of synchronism, the excitation being maintained at the value corresponding to rated load.		N/A
	Rated torque (Nm)		N/A
	Excess torque (Nm)		N/A
9.4.3	Other motors		N/A
	The momentary excess torque for single-phase, commutator and other motors shall be the subject of agreement.		N/A
	Rated torque (Nm)		N/A
	Excess torque (Nm)		N/A
9.5	Pull-up torque		N/A
	Unless otherwise specified (for example machines according to IEC 60034-12), the pull-up torque of cage induction motors under full voltage shall be not less than 0,3 times the rated torque.		N/A
	Rated torque (Nm)		N/A
	Pull-up torque (Nm)		N/A
9.6	Safe operating speed of cage induction motors		N/A
	All three-phase single-speed cage induction motors of frame number up to and including 315 and for voltages up to and including 1 000 V shall be capable of safe continuous operation at speeds up to the appropriate speed given in Table 18 unless otherwise stated on the rating plate.		N/A
9.7	Overspeed		N/A
	Machines shall be designed to withstand the speeds specified in Table 19		N/A
	An overspeed test is not normally considered necessary but can be performed when this is specified and has been agreed. (For turbine-type a.c. generators, see also IEC 60034-3.)		N/A
	An overspeed test shall be considered as satisfactory if no permanent abnormal deformation is apparent subsequently, and no other weakness is detected which would prevent the machine from operating normally, and provided the rotor windings after the test comply with the required dielectric tests. The		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	duration of any overspeed test shall be 2 min		
	Due to settling of laminated rotor rims, laminated poles held by wedges or by bolts, etc., a minute permanent increase in the diameter is natural, and not to be considered as an abnormal deformation indicating that the machine is not suitable for normal operation.		N/A
	During commissioning of a hydraulic-turbine driven synchronous generator, the machine shall be driven at the speed it can reach with the over speed protection operating, so as to ascertain that the balance is satisfactory up to that speed.		N/A
9.8	Short-circuit current for synchronous machines		N/A
	Unless otherwise specified, the peak value of the short-circuit current for synchronous machines, including turbine-type machines not covered by IEC 60034-3, in the case of short circuit on all phases during operation at rated voltage, shall not exceed 1 5 times the peak value or 21 times the r.m.s. value of the rated current		N/A
	Rated current (peak / r.m.s.) (A)		N/A
	Measured / calculated short-circuit current (A)		N/A
9.9	Short-circuit withstand test for synchronous machines		N/A
	The three-phase short-circuit test for synchronous machines shall be carried out only at the request of the purchaser		N/A
	The test shall not be carried out with an excitation greater than that corresponding to 1,05 times the rated voltage at no load.		N/A
	short circuit maintained for 3 s		N/A
	The test is considered satisfactory if no harmful deformation occurs and if the requirements of the applied voltage dielectric test (see Table 17) are met after the short-circuit test.		N/A
9.10	Commutation test for commutator machines		N/A
	A d.c. or a.c. commutator machine shall be capable of operating from no-load to operation with the excess current or excess torque, specified in 9.3 and 9.4 respectively, without permanent damage to the surface of the commutator or brushes and without		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	injurious sparking, the brushes remaining in the same set position. If possible, the commutation test shall be performed in warm conditions.		
9.11	Total harmonic distortion (THD) for synchronous machines		N/A
9.11.1	General		N/A
	The requirements of this subclause apply only to synchronous machines having rated outputs of 300 kW (or kVA) or more, intended for connection to power networks operating at nominal frequencies of $16^{2/3}$ Hz to 100 Hz inclusive, with a view to minimizing interference caused by the machines.		N/A
9.11.2	Limits		N/A
	When tested on open-circuit and at rated speed and voltage, the total harmonic distortion (THD) of the line-to-line terminal voltage, as measured according to the methods laid down in 9.11.3, shall not exceed 5 %.		N/A
9.11.3	Tests		N/A
	Type tests shall be carried out on a.c. machines to verify compliance with 9.11.2. The range of frequencies measured shall cover all harmonics from rated frequency up to the 100^{th} harmonic.		N/A
	THD limit (%)		N/A
	THD measured (%)		N/A

10	Rating plates		
10.1	General		P
	Every electrical machine shall be provided with a rating plate(s). The plates shall be made of durable material and be securely mounted.		P
	Rating plate mounted on frame, easily legible		P
	the electrical machine is so enclosed or incorporated in the equipment that its rating plate is not easily legible, the manufacturer shall, on request, supply a second plate to be mounted on the equipment.		N/A
10.2	Marking		P
	Machines with rated outputs up to and including 750 W (or VA) and dimensions not covered by IEC 60072 shall be marked with the information given in items a),	Details refer to markings	P

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Clause	Requirement - Test	Result - Remark	Verdict
	b), l), m), aa) and cc) below as a minimum		
	For special-purpose and built-in machines with rated outputs up to and including 3 kW (or kVA) items a), b), l) and m) shall be marked as a minimum and item bb) may be provided in another form.	Details refer to markings	P
	In all other cases, rating plate(s) shall be durably marked with the items in the following list,as far as they apply. The items need not all be on the same plate. Letter symbols for units and quantities shall be in accordance with IEC 60027-1 and IEC 60027-4		N/A
	If the manufacturer gives more information, this need not necessarily be marked on the rating plate(s).		N/A
	The items are numbered for convenient reference, but the order in which they appear on the rating plate(s) is not standardized. Items may be suitably combined.		P
	a)Manufacturer's name or mark	Shimge Pump Industry (Jiangsu) Co.,Ltd.	P
	b)Manufacturer's serial number, or identification mark		N/A
	c)Information to identify the year of manufacture. This shall be marked on the rating plate or be given on a separate data sheet to be provided with the machine		P
	d)Manufacturer's machine code	GEX-MSS 15-75	P
	e)For a.c. machines, the number of phases	～	P
	f)number(s) of the rating and performance standard(s) which are applicable (IEC 60034-x and/or equivalent national standard(s))	IEC 60034-1	P
	g)Degree of protection provided by the integral design of the rotating electrical machine (IP code) in accordance with IEC 60034-5	IP42	P
	h)For motors within the scope of IEC 60034-30, the efficiency class (IE code) and the rated efficiency as specified in IEC 60034-30		N/A
	i) Thermal class and the limit of temperature or of temperature rise (when lower than that of the thermal class) and, if necessary, the method of measurement, followed in the case of a machine with a water-cooled heat exchanger by 'P' or 'S', depending on whether the temperature rise is measured above the primary or secondary coolant respectively (see 8.2). This	Class F	P

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Clause	Requirement - Test	Result - Remark	Verdict
	information shall be given for both stator and rotor (separated by a slash) when their thermal class differ		
	j)Class(es) of rating of the machine if designed for other than rating for continuous running duty S1, see 5.2	S1	P
	k) Rated output(s) or range of rated output:(W orVA)	60W	P
	l) Rated voltage(s) or range of rated voltage(V)	220-240V	P
	m) For a.c. machines the rated frequency or range of rated frequency;For universal motors, the rated frequency shall be followed by the appropriate symbol (Hz)	50/60Hz	P
	n)For synchronous machines excited by permanent magnets the open circuit voltage at rated speed		N/A
	o) Rated current(s) or range of rated current (A)	0.53A	P
	p) Rated speed(s) or range of rated speed (r/min)	6250r/min	P
	q)The permissible overspeed if other than specified in 9.7. or the maximum safe operating speed if less than in 9.6 or if the machine is designed especially for variable speed operation.		N/A
	r) For d.c machines with separate excitation or with shunt excitation and for synchronous machines, rated field voltage (V) and rated field current (A)		N/A
	s)For a.c machines, rated power factor(s)		N/A
	t)For wound-rotor induction machines, the rated open-circuit voltage between slip-rings and the rated slip-ring current		N/A
	u)The rated form factor and the rated alternating voltage at the input terminals of the static power converter, when this exceeds the rated direct voltage of the motor armature circuit		N/A
	v) Maximum ambient air temperature, if other than 40°C. Maximum water coolant temperature, if other than 25°C		N/A
	w) Minimum ambient air temperature if other than specified in 6.4		N/A
	x) Altitude for which machine is designed (if exceeding 1000 m above sea level)		P
	y) For hydrogen-cooled machines, the hydrogen pressure at rated output		N/A
	z) When specified, the approximate total mass of		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	the machine, if exceeding 30 kg (kg)		
	aa)For machines suitable for operation in only one direction of rotation, the direction of rotation, indicated by an arrow. This arrow needs not be on the rating plate, but it shall be easily visible		P
	bb)The connecting instructions in accordance with IEC 60034-8 by means of a diagram or text located near the terminals		P
	Two different rated values shall be indicated by X/Y and a range of rated values shall be indicated by X–Y (see IEC 61293)		N/A
	Except for normal maintenance, when a machine is repaired or refurbished an additional plate shall be provided to indicate the name of the company undertaking the work, the year of repair and the changes made		N/A
11	**Miscellaneous requirements**		
11.1	Protective earthing of machines		P
	Machines shall be provided with an earthing terminal or another device to permit the connection of a protective conductor or an earthing conducto		P
	The symbol ⏚ or legend shall identify this device		P
	However, machines shall neither be earthed nor be provided with an earthing terminal when:		N/A
	a)they are fitted with supplementary insulation, or;		N/A
	b)they are intended for assembly in apparatus having supplementary insulation, or;		N/A
	c)they have rated voltages up to 50 V a.c. or 120 V d.c. and are intended for use on SELV circuits.		N/A
	Machines with rated voltages greater than a.c 50 V or a.c 120 V, but not exceeding a.c 1 000 V or a.c 1 500 V terminal for earth conductor situated in vicinity of terminals for line conductors		N/A
	Inside terminal box (if provided);		P
	Machines having rated outputs exceeding 100 kW provided with in addition, with earth terminal fitted on frame		N/A

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Machines for rated voltages greater than 1000 V a.c. or 1500 V d.c. shall have an earthing terminal on the frame, for example an iron strap, and in addition, a means inside the terminal box for connecting a conducting cable sheath, if any.		N/A
	The earthing terminal shall be designed to ensure a good connection with the earthing conductor without any damage to the conductor or terminal. Accessible conducting parts which are not part of the operating circuit shall have good electrical contact with each other and with the earthing terminal. When all bearings and the rotor winding of a machine are insulated, the shaft shall be electrically connected to the earthing terminal, unless the manufacturer and the purchaser agree to alternative means of protection.		P
	When an earthing terminal is provided in the terminal box, it shall be assumed that the earthing conductor is made of the same metal as the lead conductors.		P
	When an earthing terminal is provided on the frame, the earthing conductor may, by agreement, be made of another metal (for example, steel). In this case, in designing the terminal, proper consideration shall be given to the conductivity of the conductor		N/A
	Earth terminal designed to accommodate earth conductor of cross-sectional area in accordance with table 20		N/A
	Cross-sectional area of live conductors (mm^2)		N/A
	Cross-sectional area of earth conductor (mm^2)		N/A
11.2	Shaft-end key(s)		P
	When a machine shaft end is provided with one or more keyways, each shall be provided with a full key of normal shape and length.		P
12	**Tolerances**		
12.1	General		N/A

EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Tolerance is the maximum allowed deviation between the test result of a quantity from Table 21 and the declared value on the rating plate or in the catalogue. As long as test procedures and test equipment according to IEC standards are used, the test result shall not exceed the allowed deviation independent of test laboratory or equipment. Tolerance does not cover the uncertainty of a test procedure, i.e. the deviation between the test result and the true value.		N/A
12.2	Tolerances on values of quantities		N/A
	Unless stated otherwise, tolerances on declared values shall be as specified in Table 20		N/A

14	**Safety**		
	Rotating machines in accordance with this standard shall comply with the requirements of IEC 60204-1 or IEC 60204-11		P
	or, in the case of rotating machines incorporated in household and similar electrical appliances, IEC 60335-1,		N/A
	as appropriate unless otherwise specified in this standard, and be designed and constructed as far as possible in accordance with internationally accepted best design practice, appropriate to the application.		P

8	TABLE: Thermal performance and tests					P
	Test voltage (V)			230V,50Hz		-
	Ambient, t_1 (℃)			20.3		-
	Ambient, t_2 (℃)			20.6		-
Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)		Max. dT (K)	Insulation class
Winding	10.74	12.88	50.5		110	F
Remark :	-					

8	TABLE: Thermal performance and tests					P
	Test voltage (V)			230V,60Hz		-
	Ambient, t_1 (℃)			20.3		-
	Ambient, t_2 (℃)			20.7		-
Temperature rise of winding	R_1 (Ω)	R_2 (Ω)	dT (K)		Max. dT (K)	Insulation class
Winding	10.74	12.79	48.3		110	F
Remark :	-					

Appendix I
Photo documentation
Motor Unit
GEX-MSS 15-75

Detail of: GEX-MSS 15-75

View:

[X] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Detail of: GEX-MSS 15-75

View:

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[ ] front

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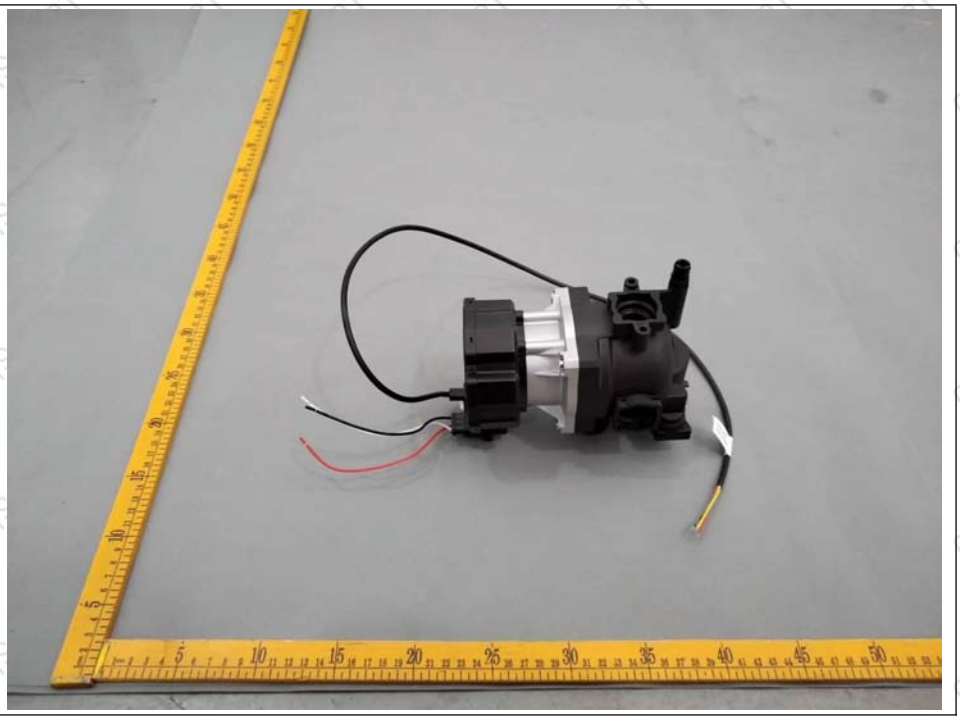

Appendix I
Photo documentation
Motor Unit
GEX-MSS 15-75

Detail of: GEX-MSS 15-75

View:

[ ] general

[ ] front

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[X] right

[ ] left

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Detail of: GEX-MSS 15-75

View:

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Appendix I
Photo documentation
Motor Unit
GEX-MSS 15-75

Detail of: Earthing for GEX-MSS 15-75

View:

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Detail of: PCB for GEX-MSS 15-75

View:

[ ] general

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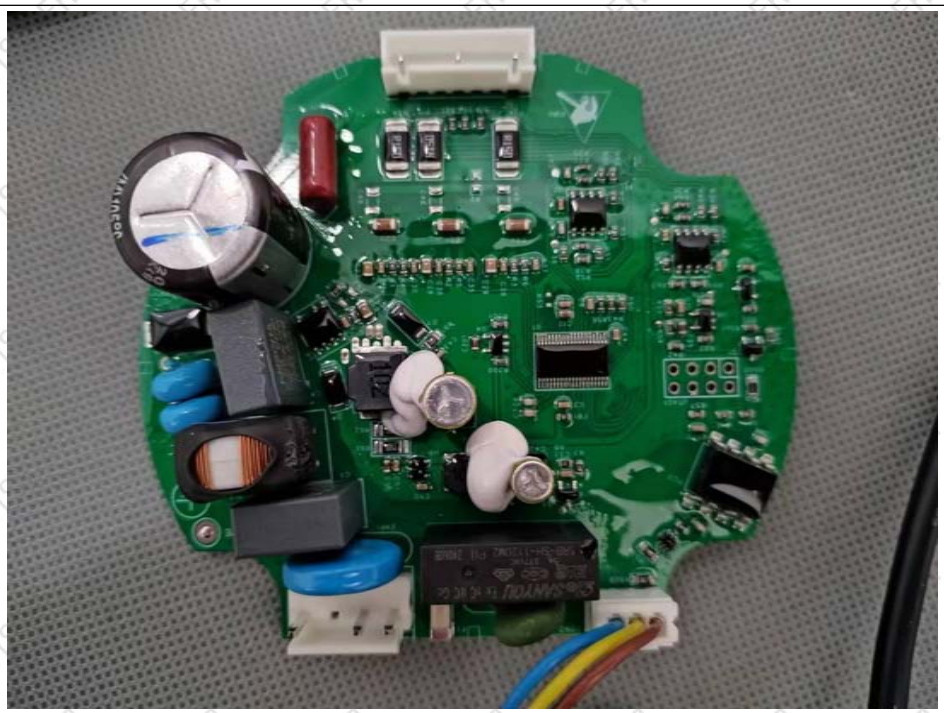

Appendix I
Photo documentation
Motor Unit
GEX-MSS 15-75

Detail of: Power cord for GEX-MSS 15-75

View:

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REMARKS

1. This report is invalid without the seal of special stamp for OViS test report and invalid if altered.

2. The copy of this report is invalid without a new seal of special stamp for OViS test report and invalid if altered.

3. This report is invalid without seals or signatures of Tester,Checker and Approval.

4. If there is no special announcement in this report,the informat ion of producer and samples is not identified by OViS,the customer is responsible for truth of the samples.

5. Objections to the test report must be submitted to OViS within 15 days.

6. The test results shown in this report is only applicable for the samples supplied directly by the customer and accepted by the test organization,the customer shall not propagandize improperly without permission by OViS.

7. “P” means “pass” , “F” means “fail”, “N/A” or “—” means “not applicable” and “ / ”means “not test”.

Address: Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China
Tel: 400-8008-959
Post Code: 318000
E-mail:info@ovis-lab.com
http://www.ovis-lab.com