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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.....

Testing Laboratory..... OViS Testing Technology (Zhejiang) Co.,Ltd.

Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Address.....

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:

EN 60034-1:2010+AC:2010, Standard..... BS EN 60034-1:2010+AC:2010

Test procedure..... CE approval

N/A Non-standard test method.....

Test Report Form No..... EN 60034-1

Test Report Form(s) Originator..... EU

Master TRF..... Dated 2013-04

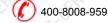
Test item description..... Motor Unit

DUCA Trade Mark.....

GEX-MSS 15-75(Cover models see models list) Model/Type reference.....

220-240,50/60Hz Ratings.....

This Test Report is issued by the Company subject to its Conditions of issuance of Test Reports printed overleaf and is intended for your exclusive use. Attention is drawn to the limitations of liability, indemnification and jurisdictional policies defined therein. This test report includes all of the tests requested by you and the results there of based upon the information that you provided. You have 30 days from date of issuance of this test report to notify us of any error or omission caused by our negligence, Provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. 地址:浙江省台州市椒江区下陈街道飞跃科创园 31.幢 및 www.ovis-lab.com 図 info@ovis-lab.com Add:Building 31, Felyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China





OV	S-CERT P	Page 2 of 38 Report No:OViS202405010L-R1
Tes	ting procedure and testing locatio	
Ę.	Testing Laboratory:	OViS Testing Technology (Zhejiang) Co.,Ltd.
Tes	ting Location/address	Building 31, Feiyue Park, Xiachen Street, Jiaojiang District, Taizhou City, Zhejiang Province, China
, J.	Associated Laboratory:	N/A
Tes	ting Location/address	TECHNOLOGY (
	Tested by(name+signature):	Juliet Hong Juliet Lingy
	Approved by(name+signature):	Tyler Luo
	Testing procedure:TMP	N/A
	Tested by(name+signature):	N/A *
	Approved by(+signature):	N/A
Tes	ting Location/address	N/A
	Testing procedure:WMT	N/A
	Tested by(name+signature):	N/Alis dis dis
	Witnessed by(+signature):	N/A CAT CAT CAT CAT CAT CAT CAT CAT CAT CA
5	Approved by(+signature):	N/A is a list a
Tes	ting Location/address	N/A
Ġ,	Testing procedure:SMT	N/A; Si Nisi Nisi Nisi Nisi Nisi Nisi Nisi N
	Tested by(name+signature):	N/A Á Á
9,	Approved by(+signature):	N/A
	Supervised by(+signature).:	N/A
Tes	ting 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



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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):

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

Testing location:

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 IEC 60034				CE SER
Туре	GEX-MSS 15-75	(A)	Vr.	Tem. 95
5.00	Isol. F	TP NP	42	S1
V	w w	Α	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

400-8008-959

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Possi	ible	test	case	verd	icts:

- 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......

103

Ambient temperature...... 20-26°C

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 \square comma $/ \boxtimes$ 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

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Chil Chil	ge 5 of 38		Report No:OViS2	202405010L-F
is wis wis	gc o or oo	Wis Wi	is Wils	N'iS
GEX-MSS 15-80	65	0.55	6250	
GEX-FCI 15-50	45	0.37	6250	.5.00
GEX 15-50	45	0.37	6250	01/10
GEX-FCI 15-60	50	0.45	6250	A CERT
GEX 15-60	50	0.45	6250	W. 5.10
GEX-FCI 15-65	55	0.48	6250	K
GEX 15-65	55	0.48	6250	c. Clin
GEX-FCI 15-70	55	0.5	6250	OHIS
GEX 15-70	55	0.5	6250	A CURT
GEX-FCI 15-75	60	0.53	6250	11:5:01
GEX 15-75	60	0.53	6250	0,
GEX 15-40	40	0.33	6250	E. CELE.
GEX-FCI 15-80	65	0.55	6250	ONIE
GEX 15-80	65	0.55	6250	193
TEX 15-50	45	0.37	4950	1:50
BPE-W 15-50	45	0.37	4950	00
TEX 15-60	50	0.45	4950	E) CERT
BPE-W 15-60	50	0.45	4950	01/12
TEX 15-65	55	0.48	4950	195
BPE-W 15-65	55	0.48	4950	1.6
TEX 15-70	55	0.5	4950	× 0,,
BPE-W 15-70	55	0.5	4950	r. CERI
TEX 15-75	60	0.58	4950	01/1/2
BPE-W 15-75	60	0.58	4950	海。
TEX 15-80	65	0.55	6250	115
BPE-W 15-80	65	0.55	6250	0,,
WEX-INT 15-50	45	0.37	4950	E CERT
WEX-FCI 15-50	45	0.37	4950	01/15
WEX 15-50	45	0.37	4950	A A
WEX-INT 15-60	50	0.45	4950	.500
VIEX IIVI 10 00				

Wis-Certi This Test Report is issued by the Company subject to its Conditions of issuance of Test Reports printed overleaf and is intended for your exclusive use. Attention is drawn to the limitations of liability indemnification and jurisdictional policies defined therein. This test report includes all of the tests requested by you and the results there of based upon the information that you provided. You have 30 days from date of issuance of this test report to notify us of any error or omission caused by our negligence, Provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



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OVi5-CERT	Oliz Oliz	age 6 of 38	0.48	Report No:OViS202405010	0)
	WEX-INT 15-65	55		4950	
15" WS	WEX-FCI 15-65	55	0.48	4950	
	WEX 15-65 WEX-INT 15-70	55 55	0.48	4950 4950	
	WEX-INT 15-70	55	0.5	4950	
	WEX-PGI 15-70	55	0.5	4950	
	WEX-INT 15-75	60	0.5	4950	
J.S.	WEX-INT 15-75	60	0.53	4950	
	WEX 15-75	60	0.53	4950	
	WEX-INT 15-80	60	0.55	4950	
ONIT	WEX-FCI 15-80	60	0.55	4950	
	WEX 15-80	65	0.55	4950	
Vie	Mig. Mig.	Me	M.E. M.E	Me Me	ó
S.CERT ON'S	ceri overetri overetri	i ovischei	O' O'S	CERT OVIS-CERT OVIS-C	
CERT OVIS	SERT OVIS-CERT OVIS-CER	OVIS CERT	ovisichen ovis	CERT ONIS-CERT ONIS-C	
			OVIS-CEET OVIE		
	SERT ONIS SERT ONIS SER			CERT OVIS-CERT OVIS-C	8°. 6
	at at at		ovisicer ovis	cer ovisient ovisie	





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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.



OViS-CERT Page 8 of 38 Report No: OViS202405010L-R1 EN 60034-1						
Clause	Requirement - Test	Result -	Remark		Verdict	
4	Duty	Ö	659	6,5	<i>C</i> ,,	
4.1	Declaration of duty	- R)	· &	. Q.	P.S	
	Purchasers declaration of duty	S1	.5	.5	. P	
0,110	If duty not declared, S1		07/12	0,110	N/A	
4.2	Duty types	C.P.	-181	200	P	
4.2.1	Duty type S1 – Continuous running duty	.6	.5		· CP	
4.2.2	Duty type S2 – Short-time duty		2,	0,,	N/A	
4.2.3	Duty type S3 – Intermittent periodic duty	CERT	C.E.F.	c (LPA)	N/A	
4.2.4	Duty type S4 – Intermittent periodic duty with starting	5	115	115	N/A	
4.2.5	Duty type S5 – Intermittent periodic duty with electric braking	a Carlo	o.	o.	N/A	
4.2.6	Duty type S6 – Continuous-operation periodic duty	6	115	115	N/A	
4.2.7	Duty type S7 – Continuous-operation periodic duty with electric breaking		0, EKI	0, -EKI	N/A	
4.2.8	Duty type S8 – Continuous-operation periodic duty with related load/speed changes	5.0	04,2,0	01/15:02	N/A	
4.2.9	Duty type S9 – Duty with non-periodic load and speed variations	CERT	CERT	CERT	N/A	
4.2.10	Duty type S10 – Duty with discrete constant loads and speeds	5	OVIS	ONIS	N/A	
5	Rating					
5.1	Assignment of rating	(S)	115	116	J.SP	
	The rating, as defined in 3.2, shall be assigned by the manufacturer.	a ERI	o Liki	C CERT	Р	
ai ovisio	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.	SERI	owis-Criffi	OWIS-CERT	ONI'S	
ONIS	If no designation is stated, rating for continuous running duty applies.	, (D	OVÍ	Ohis	N/A	
Al Wiston	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.	S. CERT	ON'S CERT	OVIS-CEFRI	N/A	
5.2	Classes of rating	9	11,5	Nis	N'iP	
5.2.1	Rating for continuous running duty		V	V) /	P	

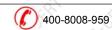


N/A

Rating for short-time duty

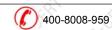
5.2.2

OViS-CERT	Page 9 of 38	Report No: OViS202	-1000102
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
5.2.3	Rating for periodic duty	is only	N/A
5.2.4	Rating for non-periodic duty		N/A
5.2.5	Rating for duty with discrete constant loads and speeds	Sign Misign Misign	N/A
5.2.6	Rating for equivalent loading	6 6 6	N/A
5.3	Selection of a class of rating		P.
E ONES	A machine manufactured for general purpose shall have a rating for continuous running duty and be capable of performing duty type S1.	S1	ON P
el ovis	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
ovi ^s ic	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.	Sign distant distan	N/A
i ovisch	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.	S.CERT ONIS.CERT ONIS.CERT	N/A
AT OVIS-C	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.	S.CERT OVIS-CERT OVIS-CERT	N/A
el ovised	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.	S.CEFFI OVIS-CEFFI OVIS-CEFF	N/A
5.4	Allocation of outputs to class of rating	is Mis Mis	WiP
ris d	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
i on	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.	CERT CERT CERT	N/A
5.5	Rated output	13 Mis Mis	ON P
5.5.1	DC generators	A A A	N/A
· C	The rated output is the output at the terminals and	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	N/A

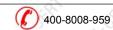


1112	Page 10 of 38 EN 60034-1	, insperior	o:OViS202405010L-
Clause	Requirement - Test	Result - Remark	Verdict
01/2	shall be expressed in watts (W).	12 01/2	Ohio Ohio
5.5.2	AC generators	.d .d.	N/A
ovis r	The rated output is the apparent power at the terminals and shall be expressed in voltamperes (VA) together with the power factor.	Sign Migray	N/A
ONIS,C	The rated power factor for synchronous generators shall be 0,8 lagging (over-excited), unless otherwise specified by the purchaser	P. CELL.	N/A
5.5.3	Motors		P.
ONISI	The rated output is the mechanical power available at the shaft and shall be expressed in watts (W)	60W	Might Mich
5.5.4	AC generators	(A) (A)	N/A
J 0418-C	The rated output is the apparent power at the terminals and shall be expressed in volt-amperes (VA) together with the power factor	eron Mieron	N/A
5.6	Rated voltage	Str. Str.	N/A
5.6.1	DC generators	12 11:12	N/A
KI OVIS-C	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.	5-CERT WIS-CERT	N/A
5.6.2	AC generators	ciki ciki	N/A
ří ovisí	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.	Str Ovisto	N/A
5.7	Co-ordination of voltages and outputs	12 01/13	N/A
	For machines with rated voltages above 1 kV, preferred rated voltages are selected according to rated output as stated in table 1	o cen	N/A
5.8	Machines with more than one rating	0,	N/A
A OVISION	For machines with more than one rating, the machine shall comply with this standard in all respects at each rating.	5.CERI OVIS.CERI	N/A
S c	For multi-speed motors, a rating shall be assigned for each speed.	ctri ctri	N/A
ET ONIST	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

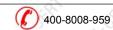
This Test Report is issued by the Company subject to its Conditions of issuance of Test Reports printed overleaf and is intended for your exclusive use. Attention is drawn to the limitations of liability, indemnification and jurisdictional policies defined therein. This test report includes all of the tests requested by you and the results there of based upon the information that you provided. You have 30 days from date of issuance of this test report to notify us of any error or omission caused by our negligence. Provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



-1/10	Page 11 of 38 EN 60034-1	Report No: OViS202	7/1/2
Clause	Requirement - Test	Result - Remark	Verdict
6 Nisot	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. Site conditions	S CERT NIS CERT NIS CERT	ONIS CEL
6.1	General		P
al ovis	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.	SCHALL SCHALL	P
6.2	Altitude	01/1 01/1	O _{JJ} P
	The altitude shall not exceed 1 000 m above sea-level	A. A. A.	Р
6.3	Maximum ambient air temperature	5,01	· SPU
0,,	The ambient air temperature shall not exceed 40℃	, 0,, 0,,	0 P
6.4	Minimum ambient air temperature	agh agh agh	P
A Nisco	The ambient air temperature shall not be less than-15 °C for any machine. The ambient air temperature shall be not less than 0 °C for a machine with any of the following: a) rated output greater than 3 300 kW (or kVA) per 1	S. CERT ONES CERT	P P N/A
<u> </u>	000 min ⁻¹ ;	A A A	
2	b) rated output less than 600 W (or VA);	60W	Ps
01,12	c) a commutator;	12 Mily Mily	N/A
	d) a sleeve bearing;	\$ & & &	N/A
5	e) water as a primary or secondary coolant.	Top. Top. Top.	N/A
6.5	Water coolant temperature	is Mis Mis	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.	s cliff ours cliff	N/A
6.6	Standstill, storage and transport		N/A
A Wist	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.	S.CLERT ON'S CELETY ON'S CELETY	N/A
6.7	Purity of hydrogen coolant	0, 0,	N/A
	Hydrogen cooled machines shall be capable of	A3 (A3 (A3)	N/A



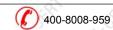
-11/2	Page 12 of 38 EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
OWIS	operating at rated output under rated conditions with a coolant containing not less than 95 % hydrogen by volume. For calculating efficiency in accordance with IEC	S.CERT WIS-CERT WIS-C	ON'S CE
OVISA	60034-2 (all 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	S.CERT ONIS.CERT ONIS.C	at outs of
, C	corresponding density	the the t	\$ 6
1	Electrical operating conditions Electrical supply		Р
OVIS.	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	S. CERT WIS CERT WIS CO	er ours
OVIS.	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	S.CERT OVIS-CERT OVIS-CO	er ovisch
ovis.c	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).	Scient oviscent ovisce	eri ovisoti
Olist	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	SCERT ON'S CERT ON'S CE	P OW'S
OVISIO	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	S.CERT OVIS.CERT OVIS.C	OVIS C
	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	SCERI ONISCERIO ONISCO	iki disa



OVIS-CERT	Page 13 of 38	Report No: OViS202	405010L-F
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
S. ONIEST.	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	S.CERT ON'S CERT ON'S CERT	ovision
7.2	Form and symmetry of voltages and currents	, O _M , O _M ,	0 _{1/1} B
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:	SCEPT OF SCEPT OF SCEPT	ollis Por
i Orisi	 - 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 	S.CERÍ OVIS-CERÍ	N/A
	- 0,03 for design N motors.	ia. ia. ia.	Р
OVIS.	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	SCERI ONISCERI ONISCERI	N/A
,	Should the limiting values of the HVF and of the		N/A
ovis,	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	SCERT OUTS CERT OUTS CERT	ONIS CH
7.2.1.2	AC motors supplied from static converters have to	12 Miles Miles	N/A
	tolerate higher harmonic contents of the supply voltage; see IEC TS 60034-25		
7.2.2	AC generators	100 CO	N/A
Ollin	Three-phase a.c. generators shall be suitable for	In one one	N/A
	supplying circuits which, when supplied by a system of balanced and sinusoidal voltages:	Stri Stri	IV/A



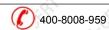
OViS-CERT	Page 14 of 38 EN 60034-1	Report No: OViS20	2405010L-
Clause	Requirement - Test	Result - Remark	Verdict
01/19	a) result in currents not exceeding a harmonic current factor (HCF) of 0,05, and	9 0110 0110	N/A
ovis co	b) result in a system of currents where neither the negative-sequence component nor the zero-sequence component exceed 5 % of the positive-sequence component.	Sicher Mississi	N/A
ovision of	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	STEET ONES ONES ONES	N/A
ovision	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		Nis.C
7.2.3	Synchronous machines	,50 ,50	N/A
i ovis-c	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	Sicher Missister Missister	N/A
ovie c	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	S.CER. OVIS.CER. OVIS.CE	N/A
i Nisco	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.	Sicher Misicher Misich	N/A
7.2.4	DC motors supplied from static power converters		N/A
oviso	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	sicki ovisicki ovisicki	N/A
i ovisor	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	S.CERT ON'S CERT ON'S CE	N/A
011.5	Motors with rated output not exceeding 5 kW, instead	3 119 119	N/A
	of being tied to a specific type of static power converter, may be designed for use with any static	cepti cepti cep	£ 5



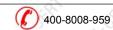
Page 15 of 38 Report No EN 60034-1					
Clause	Requirement - Test	Result	- Remark		Verdict
ar ovisati	power converter, with or without external inductance, provided that the rated form factor for which the motor is designed will not be surpassed and that the insulation level of the motor armature circuit is appropriate for the rated alternating voltage at the input terminals of the static power converter.	S. CERT	OVIS-CERT	OVIS-CERT	OVIS-CEP
i ovisió	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.	S. CERT	OVÍS CÉRÍ	ONIS CERT	N/A
7.3	Voltage and frequency variations during operation	S	Olis	ON'S	Oli P
ri ovisió	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	S.CERT	ON'S CERT	OVISCERT	OVIS-CEP
ovis.C	Figure 11 used for generators and synchronous condensers	S.CC	OVISICIE	ON'S CIT	N/A P
E OVISE	Figure 12 used for motors 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	S.CERÍ S.CERÍ	OVIS-CERT	OVIS-CERT	N/A
i disa	voltage and frequency. 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.	S.CERT	OVIS-CERT	OVIS-CERT	OVIE CER
É OVISA	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	S CHRIS	ONIS-CERT	ON'S CERT	ON P



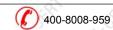
example, a reduction in output. Such action may avoid a reduction in machine life from temperature effects 7.4 Three-phase a.c. machines operating on unearthed systems Three-phase a.c. machines shall be suitable for continuous operation with the neutral at or near earth potential. They shall also be 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 If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer 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 7.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	Result - Remark Verdict Such action may be from temperature erating on unearthed All be suitable for return at or near earth itable for operation on the at earth potential for stion, for example as nee. If it is intended to or for prolonged hine with a level of stition will be required the same insulation at shall be stated by the stated by the stated by the stated without cuturer because of the ponents of currents of the productions and to the windings under the stand levels Cuturer shall declare a ge and for the voltage n, if required by the sive systems (PDS), M/A My/A	7.4 ovisoret	example, a reduction in output. Such action may avoid a reduction in machine life from temperature effects Three-phase a.c. machines operating on unearthed systems 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 If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer	Result - Remark	N/A N/A
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 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 If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer 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 7.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	Such action may be from temperature Perating on unearthed All be suitable for leutral at or near earth litable for operation on e at earth potential for attion, for example as nee. If it is intended to or for prolonged hine with a level of ition will be required e same insulation at chall be stated by the All be stated by the stated	7.4 ovisoret	example, a reduction in output. Such action may avoid a reduction in machine life from temperature effects Three-phase a.c. machines operating on unearthed systems 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. If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer	CERT ON'S CERT O	N/A N/A
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Systems 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. If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer. 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 7.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	all be suitable for leutral at or near earth itable for operation on e at earth potential for attion, for example as noce. If it is intended to or for prolonged hine with a level of attion will be required e same insulation at shall be stated by the of the machine's dertaken without acturer because of the bonents of currents of erating conditions and to the windings under thistand levels N/A cturer shall declare a ge and for the voltage n, if required by the live systems (PDS), mpulse Voltage 60034-18-41 in to operate without n, see also IEC N/A	ON CEE	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. If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer.	Schill outschill outschill	N/A
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. If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer. 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 7.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	neutral at or near earth itable for operation on e at earth potential for attion, for example as ince. If it is intended to or for prolonged hine with a level of ition will be required e same insulation at shall be stated by the sometime of currents of the machine's dertaken without acturer because of the ponents of currents of the windings under the wi	OVIS-CE	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 If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer	SCEPT ON'S CEPT	N/A
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 If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer 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 7.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	nce. If it is intended to or for prolonged hine with a level of ition will be required as same insulation at shall be stated by the shall be stated by the state of the machine's dertaken without acturer because of the monents of currents of the pronounds and to the windings under shall declare a ge and for the voltage not if required by the sive systems (PDS), N/A mpulse Voltage 60034-18-41 in to operate without not see also IEC N/A	OVISCRE	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. If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer.	SCEPT ONISCEPT ONISCEPT SCEPT ONISCEPT ONISCEPT CEPT ONISCEPT ONISCEPT	E C
If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer 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 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	e same insulation at shall be stated by the shall be shall	ON'S CEE	If the winding does not have the same insulation at the line and neutral ends, this shall be stated by the manufacturer	SCEPT WESTERN WISHER	E C
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 2.5 Voltage (peak and gradient) withstand levels 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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	dertaken without acturer because of the ponents of currents of cerating conditions and to the windings under the change and for the voltage now, if required by the tive systems (PDS), In the systems (PDS),	ON'S CE	The earthing or interconnection of the machine's	is with with	NI/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 For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	cturer shall declare a ge and for the voltage n, if required by the live systems (PDS), mpulse Voltage 60034-18-41 in to operate without N/A N/A	CN	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	S.CERT ON'S CERT ON'S CE	N/A
limiting value for the peak voltage and for the voltage gradient in continuous operation, if required by the customer For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	ge and for the voltage n, if required by the ive systems (PDS), M/A mpulse Voltage 60034-18-41 in to operate without N/A	7.5	Voltage (peak and gradient) withstand levels	15" 11:5" 11:5"	N/A
For machines used in power drive systems (PDS), see also IEC TS 60034-25 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	mpulse Voltage 60034-18-41 in to operate without , see also IEC N/A	I Wistell	limiting value for the peak voltage and for the voltage gradient in continuous operation, if required by the	S-CERT ONIS-CERT ONIS-CE	N/A
Insulation Class IVIC, see IEC 60034-18-41 in the case of machines designed to operate without partial discharges	to operate without , see also IEC N/A		For machines used in power drive systems (PDS),	CERT CERT CE	N/A
		ONIS CER	For machines with a specified Impulse Voltage Insulation Class IVIC, see IEC 60034-18-41 in the case of machines designed to operate without	SCEPT SECHT SECTION	N/A
For high-voltage a.c. machines, see also IEC 60034-15	stances of bare live N/A	0,,	For high-voltage a.c. machines, see also IEC	ati ati	N/A
For creepage and clearance distances of bare live copper, see IEC 60664-1	Will all all all all all	10,000		Sign Misign Misign	N/A



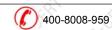
EN 60034-1			
Clause	Requirement - Test	Result - Remark	Verdict
e die	A thermal class in accordance with IEC 60085 shall be assigned to the insulation systems used in machines	Class F	ON P
si ovis	It is the responsibility of the manufacturer of the machine to interpret the results obtained by thermal endurance testing according to the appropriate part of IEC 60034-18	s ouis ouis	N/A
8.2	Reference coolant	, ONLA ONLA	ON P
Ś.,	Primary coolant	Air	Р
2.0	Method of cooling	Indirect	.cP
01/2	Secondary coolant	94, 94,	O P
<u> </u>	Table number	Table 7	P
e die	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.	S.C. Olisich Olisich	N/A
8.3	Conditions for thermal tests	5 5	P.Y
8.3.1	Electrical supply	9 04/2 04/2	ON'P
i ovisit	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 ON S. C.F.
ouis c	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.	S. CERT ONES CERT ONES CERT	ON'S CH
8.3.2	Temperature of machine before test	5 .5 .5	
ST WIS C	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	SCEEPI ONESCEEPI	ON P
a ovisió	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	S.CERT ON'S CERT ON'S CERT	N/A
			_



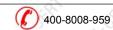
OViS-CERT	Page 18 of 38 EN 60034-1	Report No: OVIS202	202405010L-R	
Clause	Requirement - Test	Result - Remark	Verdict	
ří olis	A machine may be tested at any convenient value of coolant temperature. See Table 12 (for indirect cooled windings) or Table 15 (for direct cooled windings)	CERT CERT CERT	ON P	
8.3.4	Measurement of coolant temperature during test	2 112 112	WI P	
ri ovis-ci	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	S.CEPH ONIS.CEPH ONIS.CEPH	P	
i ovisió	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.		ONI'S CE	
8.3.4.1	Open machines or closed machines without heat exchangers (cooled by surrounding ambient air or gas)		Wicbs.	
i ovision	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.	S.CHRI OVIS-CHRI	Police	
8.3.4.2	Machines cooled by air or gas from a remote source through ventilation ducts and machines with separately mounted heat exchangers	Stri Stri	N/A	
ONIS	The temperature of the primary coolant shall be measured where it enters the machine.	o Onio Onio	N/A	
8.3.4.3	Closed machines with machine-mounted or internal heat exchangers	Sicilly "Sicilly "Sicilly	N/A	
A ON ST	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	S.CERT WIS-CERT	N/A	
8.4	Temperature rise of a part of a machine	\ \ \ \ \ \ \	Р	
i ovision	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	S.CER OVIS.CER OVIS.CER	P.E.	
.,6,7	measured in accordance with 8.3.4.	5,0, 118,0, 118,0,	1.6	
	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	* (ki * (ki * (ki	0 P	



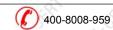
OViS-CERT	Page 19 of 38 EN 60034-1	Report No: OViS2024	405010L-R
Clause	Requirement - Test	Result - Remark	Verdict
ET OUTS	measured immediately before the machine is shut down at the end of the thermal test, as described in 8.7.	CELETY CELETY CELETY	OVÍO CER
El Oliga	When this is not possible, for example, when using the direct measurement of resistance method, see 8.6.2.3.	the the the	WiP ER
di Orien	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).	SCEPT ONISCEPT ONISCEPT	N/A
8.5	Methods of measurement of temperature	A A	P
8.5.1	General Three methods of measuring the temperature of windings and other parts are recognized:	SELL SELL SELL	P
K.	- resistance method;	aght aght aght	P
1:5	- embedded temperature detector (ETD) method;	50 ,50 ,50	,cP
0,	- thermometer method.	0, 0,	N/A
,	Different methods shall not be used as a check upon one another	S.CERI J.S.CERI	N/A
0,	For indirect testing see IEC 60034-29	0, 0,	N/A
8.5.2	Resistance method	CH CH CH	P
04:5	The temperature of the windings is determined from the increase of the resistance of the windings	Copper wiring, resistance method used	ONIE
8.5.3	Embedded temperature detector (ETD) method		P
al ovisa	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	ovis ckl
8.5.4	Thermometer method	(A) (A) (A)	N/A
KI OVIET	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	S.CLERT ONIS-CERT ONIS-CERT	N/A



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Clause	Requirement - Test	Result - Remark	Verdict
01/2	thermometers	3 1/2 1/2	01/2
8.6	Determination of winding temperature	که که که	Р
8.6.1	Choice of method		P
ovis .	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	ON P
5.5.	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.	S.CERT SCERT	N/A
E ON'S.C	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.	S.CERT ON'S CERT ON'S CERT	N/A
i ovisc	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).	SCEPT ONISCEPT ONISCEPT	N/A
ovis.	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	ONIS CH
01/15	The thermometer method is recognized in the following cases:	o olio, olio,	N/A
	a) When it is not practicable to determine temperature rise by resistance method	SCEEP , SCEEP	N/A
01.	b) Single layer windings, rotating or stationary.	0, 0,	N/A
5	c) During routine tests on machines manufactured in large numbers	CERT CERT	N/A
S OVID	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.	Sicilifi Jisicilifi Jisicilifi	N/A
Z) Z,	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.	CERT ON CERT	N/A



-1/12	Page 21 of 38 EN 60034-1	Report No: OViS2024	7/1/2
Clause	Requirement - Test	Result - Remark	Verdict
S ON'S OF	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.	SCERT OUTS CERT OUTS CERT	N/A
3.6.2	Determination by resistance method	500 .500	
3.6.2.1	Measurement	011, 011,	ON P
S 2	One of the following methods shall be used:	्रिया हिंदी हिंदी	P
0115.0	—direct measurement at the beginning and the end of the test, using an instrument having a suitable range;	sich die die die	ONIGE
Olisics S	 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; 	Sicht dissicht dissicht	N/A
OVISIO	 measurement by d.c. current/voltage in a.c. windings by injecting direct current into the winding when de-energized; 	Sid of of of	N/A
OVISOR	Measurement by d.c. current/voltage in a.c. windings, by superposing small amount of d.c. current into the winding, when energized.	S.CET WIS CET WIS CET	N/A
3.6.2.2	Calculation		P
ONIS	Temperature (θ_1) of winding (cold) at moment of initial resistance measurement (°C)	(see appended table)	ONICP
	Temperature (θ_a) of coolant at end of test $(^{\circ}\mathbb{C})$	(see appended table)	P
ONISIO	Resistance (R ₁) of winding (cold) at temperature $\theta_1(\Omega)$	(see appended table)	Olica
	Resistance (R ₂) of winding (hot) at end of test / at temperature θ_2 (Ω)	(see appended table)	P
01,12	Reciprocal of temperature coefficient (k)	235	WiP
	Temperature rise (θ_2 - θ_a) (K)	(see appended table)	Р
-1:5:0	Temperature (θ_1) of winding (cold) at moment of initial resistance measurement (°C)	(see appended table)	P
.6.2.3	Correction for stopping time	0.	Р

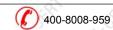


	EN 00004-4		
Clause	EN 60034-1 Requirement - Test	Result - Remark	Verdict
outs Suis-cli	The measurement of temperatures at the end of the thermal test by the direct measurement resistance method requires a quick shutdown. A carefully planned procedure and an adequate number of	Schill Herselfi Herself	ON P
03	people are required	0, 0,	0,
3.6.2.3.2	Short stopping time If the initial resistance reading is obtained within the time interval specified in Table 5, that reading shall be accepted for the temperature measurement	SCEEN ONESCEEN ONESCE	P. P
3.6.2.3.3	Extended stopping time	CONTRACTOR OF	N/A
ovis-ch	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.	SCERT ON'S CERT ON'S C	N/A
OVIS-CH	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.	SCERT ON'S CERT ON'S	JEFT NIESTER
ovis-of	If successive measurements show increasing temperatures after shutdown the highest value shall be taken. If a resistance reading cannot be made until after twice the time interval specified in Table 5,this method	S.CERT OFFICERED OFFICE	N/A N/A
0.0004	of correction shall only be used by agreement.	6,0, 116,0, 116,1) S
.6.2.3.4	Windings with one coil-side per slot 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.	Sictification of the contraction	N/A N/A
. Wisch	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	SCERT OVISCERT OVISC	N/A

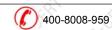
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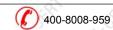
OViS-CERT	Page 23 of 38 EN 60034-1	Report No: OViS202	.403010L-1
Clause	Requirement - Test	Result - Remark	Verdict
8.6.3.1	General	12 Mis Mis	N/A
A SUISE	The detectors shall be suitably distributed throughout the winding and the number of detectors installed shall be not less than six	S. CERT NIS CERT	N/A
il ovisic	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.	S.CERT ON'S CERT ON'S CERT	N/A
, , , , , , , , , , , , , , , , , , ,	The highest reading from the ETD elements shall be	Carlos Carlos Carlos	N/A
E OVIS	used to determine the temperature of the winding 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	S.CERT OUTS-CERT OUTS-CERT	N/A
8.6.3.2	Two or more coil-sides per slot		N/A
OVIS-	The detectors shall be located between the insulated coil-sides within the slot in positions at which the highest temperatures are likely to occur.	E. Co. Miz. Co. Miz. Co.	N/A
8.6.3.3	One coil-side per slot	CERT CERT CERT	N/A
i ovis	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.	. (2)	N/A
8.6.3.4	End windings	0, 0,	N/A
er Original	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	S.CERT OVIS-CERT OVIS-CERT	N/A
04.6	adequately protected against the influence of the coolant, but see also 8.6.1.	Sich Misich Misich	ON'S ON
ovis-r	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	S.CERT ONIS CERT ONIS CERT	N/A
1:5"	problems.	Si yisi yisi	1,5,0
	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	CERT CERT CERT	N/A



EN 60034-1				
Clause	Requirement - Test	Result - Remark	Verdict	
1 01/19	case immediately lead to over voltages on the measuring system.	2 9/2 9/2	Olis	
	Measures have to be taken to prevent consequential damage up to lethal injuries.	e cer die cer die cer	N/A	
8.6.4	Determination by thermometer method	X X	N/A	
ai ovisa	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.	Schi onischen onische	N/A	
£s.r	The highest reading from any thermometer shall be taken to be the temperature of the winding or other part of the machine.	or or or	N/A	
8.7	Duration of thermal tests	0, 0,	O P	
8.7.1	Rating for continuous running duty	refi refi ref	P	
04,5,	The test shall be continued until thermal equilibrium has been reached.	Sin disin disi	ONIGE S	
8.7.2	Rating for short-time duty		N/A	
Wis.	The duration of the test shall be the time given in the rating	E.C. M.E.C. M.E.C.	N/A	
8.7.3	Rating for periodic duty	6 6 6	N/A	
, W.S.	Rated for equivalent loading applied until thermal equilibrium has been reached	SCEL MECEL MECEL	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	Sign Misign Misign	N/A	
	The rating for equivalent loading assigned by the manufacturer (see 5.2.6) shall be applied until thermal equilibrium has been reached	S.CEPÍ NISCEPÍ NISCEPÍ	N/A	
8.8	Determination of the thermal equivalent time constant for machines of duty type S9		N/A	
T OVISA	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	SCEPT OUTSCEPT OUTSCEP	N/A	



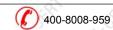
	Page 25 of 38	Report No: OViS202	
Clause	EN 60034-1	Danill Daniel	Mandiat
Clause	Requirement - Test	Result - Remark	Verdict
01/	one-half of the full load temperature rise, after its disconnection from the supply.		011,
8.9	Measurement of bearing temperature	Total Total	P
ONIS	Either the thermometer method or the ETD method may be used.	Thermometer Method	ONIP
8	The measuring point shall be as near as possible to	THE THE THE	P
.5	one of the two locations specified in Table 6.	5 ,5 ,5	.5
0,1	The thermal resistance between the temperature	0,, 0,,	0 P
	detector and the object whose temperature is to be	्रसं सं	
0,20	measured shall be minimized; for example, air gaps	COV. COV.	S.C.
01/12	shall be packed with thermally conducting paste	12 ONL ONL	0/11
8.10	Limits of temperature and of temperature rise	A A A	Р
	Limits are given for operation under site operating	Sept. Sept. Sept.	200
Nie	conditions specified in Clause 6 and at rating for	is The This	Nis
	continuous running duty (reference conditions),	A A A	
	followed by rules for the adjustment of those limits	CHI CHI CHI	P
650	when operating at site under other conditions and on	5 ,5 ,5	.5
011.	other ratings. Further rules give adjustments to the	0, 0,	01,
	limits during thermal testing when conditions at the	b. b. b.	
, ,	test site differ from those at the operating site	Con Con Con	2,08
ONIS	The limits are stated relative to the reference coolant specified in Table 4.	s ones ones	ONISP
	A rule is given to allow for the purity of hydrogen coolant.	CERT CERT CERT	N/A
8.10.1	Indirect cooled windings	8 112 112 -	N/S
0.10.1	0 0 0 0	4 4 4	В
	Temperature rises under reference conditions shall		
	not exceed the limits given in Table 7 (air coolant) or Table 8 (hydrogen coolant) as appropriate.	5 ,5 ,5	.5
-011.	For other operating site conditions, for ratings other	, 0,, 0,,	N/A
	than continuous running duty, and for rated voltages		IN/A
	greater than 1 2 000 V, the limits shall be adjusted	Con Con Con	S.CX
	according to Table 9. (See also Table 1 0 for limit on	in Mis Mis	01,12
	coolant temperature which is assumed in Table 9.)	X X X	
5,	In the case of thermometer readings made in	40° 40° 40°	N/A
11.5	accordance with 8.6.1, the limit of temperature rise	5 115	115
	shall be according to Table 7.	0, 0,	0,,
5	for windings indirectly cooled by air, conditions at the	(A) (A) (A)	P
	test site differ from those at the operating site, the	500 .500	
	adjusted limits given in Table 11 shall apply at the test	a Only Only	01/12
	site.	A A A	
	SILC.		



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01	D : 1 T :	D # D :	
Clause	Requirement - Test	Result - Remark	Verdict
i our	permissible temperatures at the test site which the manufacturer considers to be excessive, the testing procedure and the limits shall be agreed.	CHÍ CHÍ CHÍ	, Only
OVIS	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.	S OVIS OVIS	N/A
3.10.2	Direct cooled windings	In Office Office	N/A
<u> </u>	Temperatures under reference conditions shall not exceed the limits given in Table 12.	Steph Steph Steph	N/A
Ollis	For other operating site conditions the limits shall be adjusted according to Table 13	is one of the	N/A
i' ovis.co	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.	S.CERT OVIS.CERT OVIS.CERT	N/A
i ovisio	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.	S.CERT OVIS-CERT OVIS-CERT	N/A
3.10.3	Adjustments to take account of hydrogen purity on test	S.CERT I.S.CERT I.S.CERT	N/A
Nis.	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 %	S.CERT ON. S.CERT ON.	N/A
3.10.4	Permanently short-circuited windings, magnetic cores and all structural components (other than bearings) whether or not in contact with insulation	Scient is city	N/A
2 00	The temperature rise or the temperature shall not be detrimental to the insulation of that part or to any other part adjacent to it.	CEER CEER OF CEER	N/A
3.10.5	Commutators and sliprings, open or enclosed and their brushes and brushgear	is only only	N/A
ON'S	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	S.CERT ONIS-CERT ONIS-CERT	N/A
OVISIO	The temperature rise or temperature of a commutator or slipring shall not exceed that at which the combination of brush grade and commutator or	S.Cth. Olis.Cth. Olis.Cth	N/A

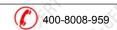
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je C	OViS-CERT		Page 27	of 38		Report N	lo:OViS202	405010L-R1
				EN 60034-1				
3	Clause	Requirement - Test			Result	- Remark		Verdict
	01/1/2	operating range	ONIS	07/2	01/2	01/12	01/12	01/2

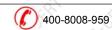
9	Other performance and tests	
9.1	Routine tests	ON P
<u>~</u>	Routine tests are always factory tests.	A PA
	They can only be performed on machines which are assembled at the works of the manufacturer. The machine needs not be completely assembled. It can lack components which are not significant for the testing. Routine tests do not need the machine to be coupled except for the open-circuit test on	HI OVIS-CH
8	synchronous machines.	12 12
	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.	IFI OVIS-CHAI
A Ni	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.	iki ovisecki kii oviseckii
	When a thermal test is carried out, the withstand voltage test shall be carried out immediately after that test.	P. 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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	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
ONIS	Test voltage shall be of power frequency and as near as possible to a sine wave form.		N/A
11.65	Final value of the voltage shall be in accordance with Table 16.	S.CETT. N.S.CETT. NIS.CETT	N/A
0,	Test voltage applied for 1 min	0, 0	Р
C.	Test voltage (V)	1500V No Failure	P
N OVISA	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.	S.CERT ONES ONES	Olisa P
S OVIES	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	S-CERT ON'S CERT ON'S CERT	OWIGE
9.3	Occasional excess current	50 .50 .50	.cP
9.3.1	General	0, 0,	O _A b
Al Wisc	The excess current capability of rotating machines is given for the purpose of co-ordinating these machines with control and protective devices.	S.CERI WESCERI	Nie Poli
9.3.2	Generators	A A A	N/A
Olisic	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	S.CEP ON'S CEPT ON'S CEPT	N/A
RI OHIS C	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	S'CERT ON'S CERT ON'S CERT	N/A
9.3.3	Motors (except commutator motors and permanent magnet motors)	SERT SERT SERT	Psi
EL ONIS	Polyphase motors having rated outputs not exceeding 315 kW and rated voltages not exceeding 1 kV shall be capable of withstanding:	THE LEFT LEFT	P
OVISI	- a current equal to 1,5 times the rated current for not less than 2 min.	S'EV ONIS'EV ONIS'EV	P
9.3.4	Commutator machines		N/A
OViSi	Shall be capable of withstanding 1.5 times rated current for 60 s for specified conditions	S. Ch. M. S. Ch. M. S. Ch.	N/A
	a) speed:	6 6 6	N/A
	1) d.c. motor: highest full-field speed;	Str. Str. Str.	N/A

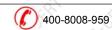
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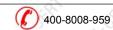
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
0/1/2	2) d.c. generator: rated speed;	12 ON12 ON12	N/A
Ć.	3) a.c. commutator motor: highest full-field speed;	, di	Á N/A
Wis.	b) armature voltage: that corresponding to the specified speed.	Sign Misign Misig	N/A
9.4	Momentary excess torque for motors	A A	Р
9.4.1	Polyphase induction motors and d.c. motors	Str. Str.	P
AT OVISA	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)	S.CERT ON'S CERT ON'S	P. Olifo
£ 25	The voltage and frequency (for induction motors) shall be maintained at their rated values	Cathin Cathin Cat	N/A
žį onis	Motors for duty type S9 shall be capable of withstanding momentarily an excess torque determined according to the duty specified	CELETY CELETY ONLY	N/A
011,5	Higher torques are required for some motors manufactured according to IEC 60034-12.	S' WIS' WIS'	N/A
£	For d.c. motors, the torque shall be expressed in terms of overload current.	Citin Citin Ci	N/A
	Motors for duty type S9 shall be capable of withstanding momentarily an excess torque determined according to the duty specified.	CERT CHAI	N/A
ET ON'S	Motors intended for specific applications that require a high torque (for example for hoisting) shall be the subject of agreement.		N/A
A Jish	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 %.	S.C. OVIS.C. OVIS.C.	N/A
ovis,	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	Stelli Oristelli Oriste	N/A
	agreement.	cept cept of	EN C
6	Rated torque (N.m)	5 ,5 ,5	, SP
011.	Excess torque (N.m)	0, 0,	P
9.4.2	Polyphase synchronous motors	A A	N/A



OViS-CERT	Page 30 of 38	Report No: OViS2	
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
il olisti	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.	Sicilifi ouisici	N/A
8	Rated torque (Nm)	ART ART A	N/A
1.51	Excess torque (Nm)	6, 16, 16,	N/A
9.4.3	Other motors	0, 0,	N/A
al ovision	The momentary excess torque for single-phase, commutator and other motors shall be the subject of agreement.	SCEEN ONISCEEN ONISCE	N/A
	Rated torque (Nm)		N/A
	Excess torque (Nm)	5'CL . 5'CL . 5'CL	N/A
0.5	Pull-up torque	011 011	N/A
r ovisi	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.	S.CERT OVIS-CERT OVIS-CE	N/A
	Rated torque (Nm)	CERT CERT CE	N/A
1,5	Pull-up torque (Nm)	5 415	N/A
9.6	Safe operating speed of cage induction motors	4 4	N/A
i die	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	S-CERT ONIS-CERT ONIS-CE	N/A
	stated on the rating plate.	S 115 115	1.15
0.7	Overspeed	A A	N/A
W.65.C	Machines shall be designed to withstand the speeds specified in Table 19	S.CER WIS.CER WIS.CE	N/A
ST OVISA	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.)	S-CERT OVIS-CERT OVIS-CE	N/A
i ovisi	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	S-CERT OVIS-CERT OVIS-CE	N/A



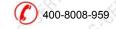
duration of any overspeed test shall be 2 min Due to settling of laminated rotor rims, laminated poles held by wedges or by bolts, etc., a minute permanent increase in the diameter is natural, and not to be considered as an abnormal deformation indicating that the machine is not suitable for normal operation. 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. 9.8 Short-circuit current for synchronous machines 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 Rated current (peak / r.m.s.) (A) Measured / calculated short-circuit current (A) 9.9 Short-circuit withstand test for synchronous machines The three-phase short-circuit test for synchronous machines shall be carried out only at the request of the purchaser The test shall not be carried out with an excitation greater than that corresponding to 1,05 times the	emark Verdict
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machines shall be carried out only at the request of the purchaser The test shall not be carried out with an excitation greater than that corresponding to 1,05 times the	N/A
greater than that corresponding to 1,05 times the	N/A
rated voltage at no load.	N/A
short circuit maintained for 3 s The test is considered satisfactory if no harmful deformation occurs and if the requirements of the	N/A
applied voltage dielectric test (see Table 17) are met after the short-circuit test.	N/A
9.10 Commutation test for commutator machines A d.c. or a.c. commutator machine shall be capable of	N/A



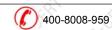
EN 60034-1				
Clause	Requirement - Test	Result - Remark	Verdict	
EL ONES	injurious sparking, the brushes remaining in the same set position. If possible, the commutation test shall be performed in warm conditions.	CERT CERT CE	ON'S CEP	
9.11	Total harmonic distortion (THD) for synchronous machines	is one one	N/A	
9.11.1	General		N/A	
ovisit	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.	St. OHISTER OHISTORY	N/A	
9.11.2	Limits	CERT CERT CE	N/A	
il die	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 %.	Stelli ovistelli ovistelli	N/A	
9.11.3	Tests		N/A	
er ovise	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.	Sicher Misself Misself	N/A	
115	THD limit (%)	5, 1,5, 1,5,	N/A	
00	THD measured (%)	0, 0,	N/A	

10	Rating plates		
10.1	General	0, 0,	0, b
SKI ONIS	Every electrical machine shall be provided with a rating plate(s). The plates shall be made of durable material and be securely mounted.	S.CERT ON'S CERT ON'S CERT	Pith
.6.	Rating plate mounted on frame, easily legible	á á á	Р
eri ovisi	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.	S.CO. ONIS.CO. ONIS.CO.	N/A
10.2	Marking	(S) 1.(S) 1.(S)	, P
Seri C	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	O P

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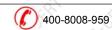
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
71.12	b), l), m), aa) and cc) below as a minimum	5 112 112	71,2
OVISA	For special-purpose and built-in machines with rated outputs up to and including 3 kW (or kVA) items a), b), l) and m) shall be marked as a minimum and item bb) may be provided in another form.	Details refer to markings	ON'S CH
i ovisić	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	S.CEPT ONIS-CEPT ONIS-CEPT	N/A
Nis.	If the manufacturer gives more information, this need not necessarily be marked on the rating plate(s).	reki reki reki	N/A
OVISA	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.	Sich die Gert die Gert	oli e
Office	a)Manufacturer's name or mark	Shimge Pump Industry (Jiangsu) Co.,Ltd.	O _M P
, c	b)Manufacturer's serial number, or identification mark	CEEP CEEP CEEP	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	e di ai di	Oligi P
a.c.	d)Manufacturer's machine code	GEX-MSS 15-75	_P
01/10	e)For a.c. machines, the number of phases	~ 0113	O P
i Nisic	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	Nis Pil
11:50	g)Degree of protection provided by the integral design of the rotating electrical machine (IP code) in accordance with IEC 60034-5	IP42	P
0.	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	Cititi Cititi	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	ONI'S CH



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	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdict
01/2	information shall be given for both stator and rotor (separated by a slash) when their thermal class differ		ONIS
OVISIO	j)Class(es) of rating of the machine if designed for other than rating for continuous running duty S1, see 5.2	S1	oli P
5	k) Rated output(s) or range of rated output:(W orVA)	60W	P
.5	I) Rated voltage(s) or range of rated voltage(V)	220-240V	.cP
T Wist	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	Pili
<u> </u>	n)For synchronous machines excited by permanent magnets the open circuit voltage at rated speed	chi chi	N/A
115	o) Rated current(s) or range of rated current (A)	0.53A	JI'S P
0,3	p) Rated speed(s) or range of rated speed (r/min)	6250r/min	Р
ovis c	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.	S. CERT ONIS CERT ONIS CERT	N/A
Uis.c	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)	Sign Oligical Oligical	N/A
ď	s)For a.c machines, rated power factor(s)	Carlo Carlo	N/A
, ovis	t)For wound-rotor induction machines, the rated open-circuit voltage between slip-rings and the rated slip-ring current	ERI ERI ERI	N/A
ouis.c	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	STO WISTO WISTO	N/A
i ovis	v) Maximum ambient air temperature, if other than 40°C. Maximum water coolant temperature, if other than 25°C	S ONES ONES	N/A
OVISI	w) Minimum ambient air temperature if other than specified in 6.4	S. O. Olis, O. Olis, Ca	N/A
5	x) Altitude for which machine is designed (if exceeding 1000 m above sea level)	CERT CERT CERT	P
Ohis	y) For hydrogen-cooled machines, the hydrogen pressure at rated output	is ones ones	N/A
7	z) When specified, the approximate total mass of	The The The	N/A

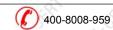
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01	EN 60034-1	Decello Decello	Mandiat
Clause	Requirement - Test	Result - Remark	Verdict
ONL	the machine, if exceeding 30 kg (kg)	in Opposition	01/10
ST OVISION	aa)For machines suitable for operation in only one direction of rotation, the direction of rotation, indicated by an arrow. This arrow needs not be on the rating plate, but it shall be easily visible	S'CERT ON'S CERT ON'S CE	ii NiePo
ONIE C	bb)The connecting instructions in accordance with IEC 60034-8 by means of a diagram or text located near the terminals	S.CERI ONIS.CERI ONIS.CE	Nic Park
i visit	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)	S. CERT NIS CERT NIS CE	N/A
i disc	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	S.CELET ON'S CELET ON'S CE	N/A

11	Miscellaneous requirements								
11.1	Protective earthing of machines	5 5 5	P						
onie	Machines shall be provided with an earthing terminal or another device to permit the connection of a protective conductor or an earthing conducto	S.CET OVISICETY OVISICETY	oli P						
<u> </u>	The symbol or legend shall identify this device	SCERI ISCERI	Pili						
97	However, machines shall neither be earthed nor be provided with an earthing terminal when:		N/A						
C.	a)they are fitted with supplementary insulation, or;		N/A						
0110	b)they are intended for assembly in apparatus having supplementary insulation, or;		N/A						
1,0	c)they have rated voltages up to 50 V a.c. or 120 V d.c. and are intended for use on SELV circuits.	S. CELL M.S. CELL MIS. CELL	N/A						
Hi Orig	Machines with rated voltages greater than a.c 50 V or a.c 120 V, but not exceeding a.c 1000 V or a.c 1500 V terminal for earth conductor situated in vicinity of terminals for line conductors	S.CERT ONIS-CERT ONIS-CERT	N/A						
5	Inside terminal box (if provided);	á á á	P						
V Oligo	Machines having rated outputs exceeding 100 kW provided with in addition, with earth terminal fitted on frame	S.CET ONIS.CET	N/A						

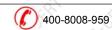
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	EN 60034-1								
Claus	e Requirement - Test	Result - Remark	Verdict						
6	Machines for rated voltages greater than 1000 V a.c. of 1500 V d.c. shall have an earthing terminal on the frame, for example an iron strap, and in addition, a means inside the terminal box for connecting a conducting cable sheath, if any.	IS CLERY ONES CLERY ONES CLERY	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.	Schill Ouis-chail Ouis-chail Schill Ouis-chail Ouis-chail Schill Ouis-chail Ouis-chail	OVIS-CERT						
PAI .	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.	S CERT SECRET	P						
	When an earthing terminal is provided on the frame, the earthing conductor may, by agreement, be made or another metal (for example, steel). In this case, in designing the terminal, proper consideration shall be given to the conductivity of the conductor	f CERT ON'S CERT ON'S CERT	N/A						
3.	Earth terminal designed to accommodate earth conductor of cross-sectional area in accordance with table 20	JiS-CEEN ONIS-CEEN ONIS-CEEN	N/A						
8	Cross-sectional area of live conductors (mm²)	agi agi agi	N/A						
	Cross-sectional area of earth conductor (mm²)	(5) (5)	N/A						
11.2	Shaft-end key(s)	0, 0,	Р						
(R)	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.	is chi	P						
12	Tolerances								
12.1	General	Con Con Con	N/A						

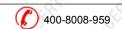
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			02405010L
	EN 60034-1		
Clause	Requirement - Test	Result - Remark	Verdic
RI Wisir	Tolerance is the maximum allowed deviation between the test result of a quantity from Table 21 and the declared value on the rating plate or in the catalogue. As long 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.	SCERT ON'S CERT ON'S C	ON N/A
12.2	Tolerances on values of quantities		N/A

	0,1,	shall be as specified in Table 20	0, 0,	N/A
	14	Safety		- Life
1 04.	er co	Rotating machines in accordance with this standard shall comply with the requirements of IEC 60204-1 or IEC 60204-11	CERT CERT CERT	Putifi
	EL CH	or, in the case of rotating machines incorporated in household and similar electrical appliances, IEC 60335-1,	CERT CHET	N/A
	gri ovisio	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.	SCERT OVIES OVIES	P

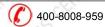
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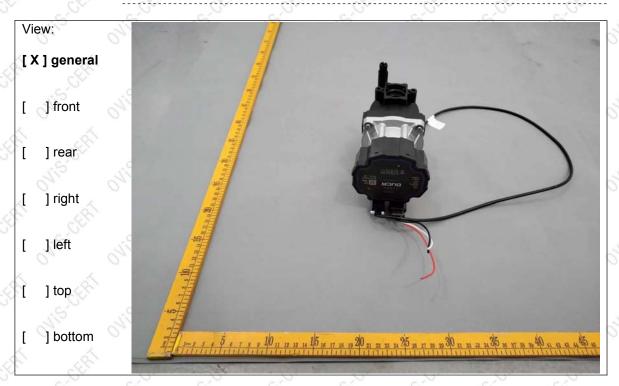
is-cert			Page 38 of 38			Report No:O)ViS202405010L-F
8	TABLE:	Thermal perf	formance and tests			a a	P
C.C.	Test volt	age (V)	.S.O.	·S.C.	230V,5	50Hz	.S
01	Ambient	i, t₁ (°C)	2, 02,	011	20.3	07	0, 0,
CERT .	Ambient	t, t₂ (°C)	CERT CERT	CER	20.6	CERT CERT	CEPE -
Temperatu		R ₁ (Ω)	R ₂ (Ω)	dT (k) Olig	Max. dT (K)	Insulation class
Winding	C. E. S.	10.74	12.88	50.5		110	SE F

8	TABLE: Thermal performance and tests								P		
1:5	Test vo	Test voltage (V)				230V,60Hz			NiS'	16 -16	
	Ambie	Ambient, t₁ (°C)					20.3				
.S.	Ambie	Ambient, t₂ (°C)			.5.00	20.7	20.7			5	
Tempera		R ₁ (Ω)	(A)	R ₂ (Ω)	dT (I	K)	Max. dT	(K)	Insul	ation cla	
Windir	ng C	10.74	5	12.79	48.3	3 .5	110	J. C.	,5	F	
Remark :	7	0,,	0,	04,	0,7	0,1	0,	,	0,	, 0	
JIS-CEPT O	i's CERI	OVIS-CEPT	OVIS-CEPT	OVIS-CER	OVISICE	N'S	CERTON	SCEPT	01.65	jili) O	
NiS-CERT C	JiS-CERT	Wis CHRI	Wis-CERI			i Nis			Wis.		
yi S-CERT		Wis-cliki		Wi5 CER					Wi5"		
					, Wis CEP						
N'S-CERT		W.S.CERT									
N'S-CERT					VIS CEP						
					O'						
This Test Penort is	issued by the Co	mpany subject to its Condi This test report includes al ission caused by our neglig unqualified acceptance of		O11.	97	011.	2	-	an at linkille.		



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

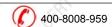
GEX-MSS 15-75 Detail of:



Detail of: **GEX-MSS 15-75**



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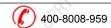
Detail of: GEX-MSS 15-75



Detail of: GEX-MSS 15-75



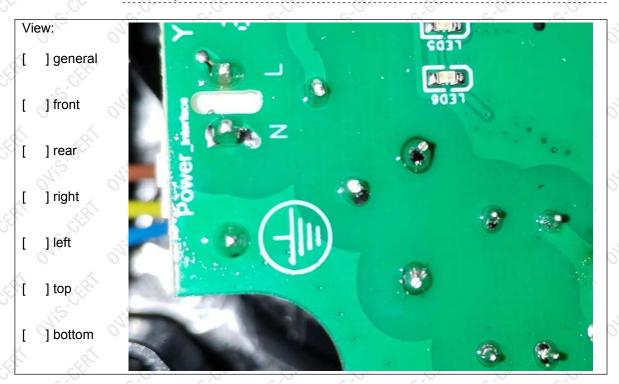
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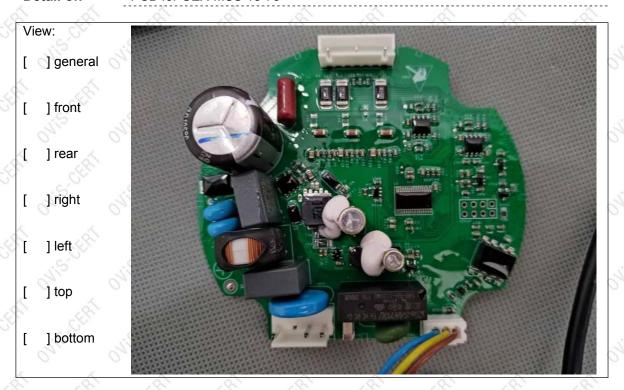
Page 3 of 4

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

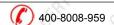
Detail of: Earthing for GEX-MSS 15-75



Detail of: PCB for GEX-MSS 15-75



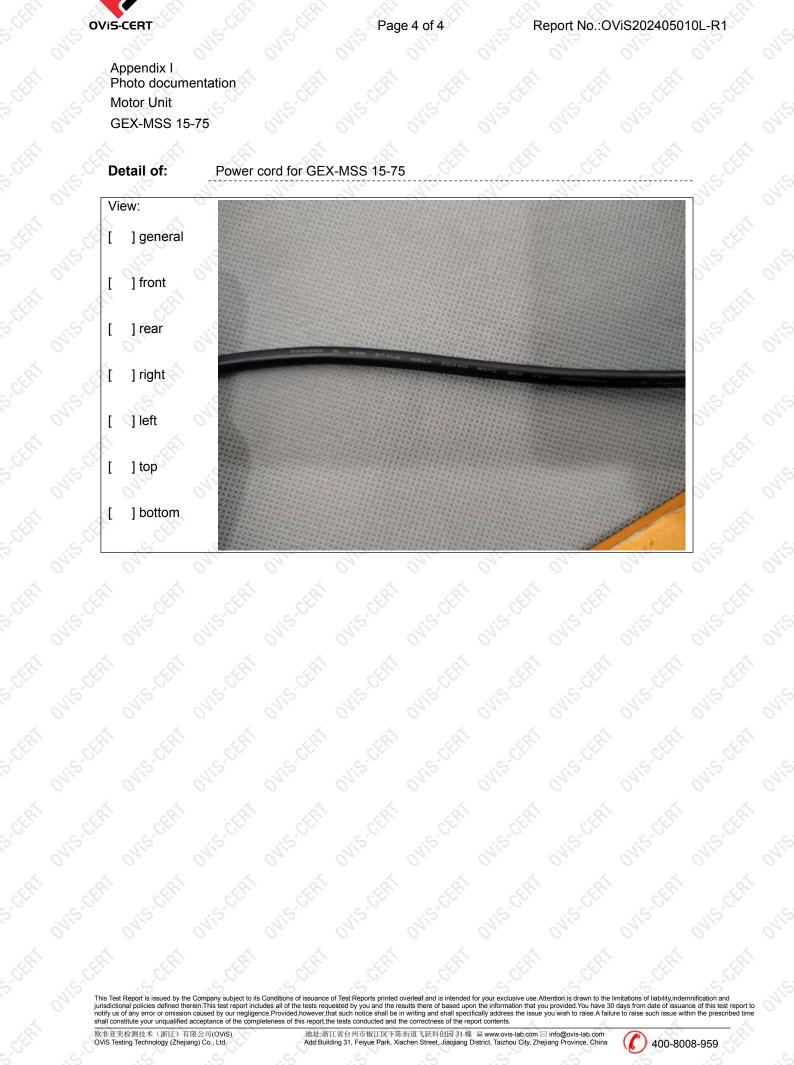
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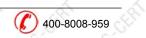
OVIS-CERT Photo documentation **GEX-MSS 15-75**

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



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

and invalid if altered.

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