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INSPECTION & TEST GUIDELINE
FOR MEDIUM VOLTAGE INDUCTION MOTOR

ENGINEERING TECHNICAL STANDARDS & PROCEDURES
PT KILANG PERTAMINA INTERNASIONAL
DIREKTORAT PROYEK INFRASTRUKTUR

							
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REVISION HISTORY
RIWAYAT REVISI

Page / Section *Hal. / Bagian*	Date *Tanggal*	Description *Deskripsi*	Revision by *Direvisi oleh*

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TABLE OF CONTENTS
DAFTAR ISI

Dokumen sesuai dengan aslinya, dicetak pada tanggal 11/06/2026 17:15:36 oleh

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1. INTRODUCTION

1.1 This procedure covers the OWNER minimum requirements for Inspection & Test Guideline for MV (Medium Voltage) Induction Motor at Manufacturer's shop.

2. SCOPE

2.1 The scope is about Inspection & Test Guideline For MV Induction Motor at Manufacturer's shop.

3. CONFLICTS AND DEVIATIONS

3.1 Any conflicts between this standard and other applicable Engineering Technical Standards & Procedures (ETSP), or OWNER standard, codes, and forms shall be resolved in writing by OWNER.

3.2 All direct requests to deviate from this standard (ETSP) in writing to OWNER, who shall follow internal OWNER procedure and forward such requests to OWNER for approval.

4. ABBREVIATIONS

4.1 Abbreviations used for this specification shall have the following definitions:

AC	Alternating Current
DC	Direct Current
HV	High Voltage
IEC	The International Electrotechnical Commission
IEEE	The Institution of Electrical and Electronic Engineers

1. PENGANTAR

1.1 Prosedur ini mencakup persyaratan minimum PEMILIK untuk Petunjuk Pemeriksaan & Pengujian Motor Induksi MV (Tegangan Menengah) di *workshop* manufaktur.

2. LINGKUP

2.1 Ruang lingkupnya adalah tentang Petunjuk Inspeksi & Pengujian Motor Induksi MV di *workshop* manufaktur.

3. KONFLIK DAN DEVIASI

3.1 Setiap konflik antara standar ini dan *Engineering Technical Standards & Procedures (ETSP)* lain yang berlaku, atau standar, kode, dan formulir PEMILIK harus diselesaikan secara tertulis oleh PEMILIK.

3.2 Semua permintaan langsung yang menyimpang dari standar ini (ETSP) secara tertulis kepada PEMILIK, yang harus mengikuti prosedur internal PEMILIK dan meneruskan permintaan tersebut kepada PEMILIK untuk disetujui.

4. SINGKATAN

4.1 Singkatan yang digunakan pada spesifikasi ini harus memiliki definisi sebagai berikut:

AC	Arus Bolak-Balik
DC	Arus Searah
HV	Tegangan Tinggi
IEC	The International Electrotechnical Commission
IEEE	The Institution of Electrical and Electronic Engineers

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MV	Medium Voltage

5. DEFINITIONS

5.1 The following words shall have these special meanings when used herein:

OWNER	Owner of the Plant is defined as PT Kilang Pertamina Internasional
CONTRACTOR /CONSULTANT	Defined as the Organization to which PT Kilang Pertamina Internasional assign the work
shall	Indicates that the statement is mandatory
should	Indicates a recommendation

6. CODES AND STANDARDS

The following Codes, Standard and Specifications apply to this specification. When an edition date is not indicated for a code or standard or any update in codes and standards in this specification document, the latest edition and addendum in force at the time of purchase shall apply. Material & equipment shall be as a specification or an equal approved by OWNER.

IEC 60034-1	Rotating electrical machines
IEEE 112	Standard Test Procedure for Polyphase Induction Motors and Generators
IEEE 118	Standard Test Code for

MV	Medium Voltage

5. DEFINISI

5.1 Penggunaan kata-kata berikut harus memiliki arti khusus sebagai berikut:

PEMILIK	Pemilik Kilang didefinisikan sebagai PT Kilang Pertamina Internasional
KONTRAKTOR/ KONSULTAN	Didefinisikan sebagai Organisasi yang ditunjuk oleh PT Kilang Pertamina Internasional untuk melakukan suatu pekerjaan
shall	Menunjukkan bahwa pernyataan itu wajib
should	Menunjukkan rekomendasi

6. KODE DAN STANDAR

Kode, standar, dan spesifikasi berikut berlaku untuk spesifikasi ini. Kode dan standar harus menggunakan edisi yang terbaru atau edisi yang berlaku pada saat pembelian. *Material* & peralatan harus sesuai spesifikasi atau setara dengan yang disetujui oleh PEMILIK.

IEC 60034-1	*Rotating electrical machines*
IEEE 112	*Standard Test Procedure for Polyphase Induction Motors and Generators*
IEEE 118	*Standard Test Code*

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	Resistance Measurement		*for Resistance Measurement*
IEC 60034-9	Rotating electrical machines – Part 9: Noise limits	IEC 60034-9	*Rotating electrical machines – Part 9: Noise limits*
IEC 60034-14	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation, and limits of vibration severity	IEC 60034-14	*Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation, and limits of vibration severity*
IEEE 43	Recommended Practice for Testing Insulation Resistance of Rotating Machinery	IEEE 43	*Recommended Practice for Testing Insulation Resistance of Rotating Machinery*

7. PRE-INSPECTION

7.1 Check availability and approval status of Datasheet

7.2 Check availability and approval status of Inspection & Test Plan.

7.3 Check availability and approval of Test procedure.

7.4 Check conformity between the motor type / model and the certificate including Ex Certificate for Ex Motor.

7.5 Check conformity between painting report and specification.

7.6 Check availability and approval status of General Arrangement

7.7 Check validity of measurement tool

7. PRA-INSPEKSI

7.1 Periksa kesesuaian antara tipe/model motor dengan tipe/model yang tercantum dalam sertifikat untuk Ex Motor.

7.2 Periksa ketersediaan dan status persetujuan Inspection & Test Plan.

7.3 Periksa ketersediaan dan persetujuan prosedur Pengujian.

7.4 Periksa kesesuaian antara tipe/model motor dengan sertifikat termasuk Sertifikat Ex untuk Motor Ex.

7.5 Periksa kesesuaian antara laporan pengecatan dan spesifikasi pengecatan.

7.6 Periksa ketersediaan dan status persetujuan General Arrangement (GA)

7.7 Periksa ketersediaan dan

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calibration status.

8. TYPE TEST

8.1 Definition

Type test is a test of one or more machines made to a certain design to show that the design meets certain specifications.

The type test may also be considered valid if it is made on a machine which has minor deviations of rating or other characteristics. These deviations should be subject to agreement by OWNER.

Machines shall be considered identical if they have the same:

- Rating (Voltage & Output Power)
- Frame
- Insulation Class
- Rotor
- Stator
- Cooling arrangement

8.2 Condition

Type tests will not normally be required if evidence of type tests on identical machines is produced at the time of quotation.

In case MANUFACTURERs fail to provide the evidence of type test, type test shall be conducted.

8.3 Items of Type Test

8.3.1. Temperature Rise Test

a) Test Methode Reference

- IEC 60034-1 Rotating electrical machines

persetujuan prosedur pengujian.

8. UJI TIPE

8.1 Definisi

Uji tipe adalah pengujian terhadap satu atau lebih mesin yang dibuat dengan desain tertentu untuk menunjukkan bahwa desain tersebut memenuhi spesifikasi tertentu.

Uji tipe juga dapat dianggap sah jika dilakukan pada mesin yang memiliki sedikit penyimpangan *rating* atau karakteristik lainnya. Penyimpangan ini harus sesuai dengan kesepakatan.

Mesin harus dipertimbangkan identik jika memiliki *rotor, stator*, dan sistem pendinginan yang sama.

- *Rating* (Tegangan dan Daya Output)
- *Frame*
- Kelas Isolasi
- *Rotor*
- *Stator*
- Sistem pendinginan

8.2 Kondisi

Uji tipe biasanya tidak diperlukan jika bukti uji tipe pada mesin yang sama sudah dibuat pada saat penawaran.

Dalam hal Manufaktur gagal memberikan bukti uji tipe, maka harus dilakukan uji tipe.

8.3 Item Uji Tipe

8.3.1. Pengujian Kenaikan Temperatur

a) Referensi Metode Pengujian

- *IEC 60034-1 Rotating electrical machines*

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- IEC 60034-18 Functional Evaluation of Insulation System

b) Acceptance Criteria

- *IEC 60034-18 Functional Evaluation of Insulation System*

b) Kriteria Penerimaan

Table 1.0. Acceptance Criteria of Temperature Rise Test

(Table 1.0 Kriteria Penerimaan Uji Kenaikan Temperatur)

Insulation Class Kelas Isolasi	**Maximum Termpeature Rise** Kenaikan Temperatur maksimum	**Hot spot Temperature Allowance** Temperatur *Hot spot* yang diijinkan	**Maximum Winding Temperature** Temperatur Belitan Maksimum
A	60^{O}C	5^{O}C	105^{O}C
B	80^{O}C	10^{O}C	130^{O}C
F	105^{O}C	10^{O}C	155^{O}C
H	125^{O}C	15^{O}C	180^{O}C

8.3.2. Efficiency

a) Test Methode Reference

IEC 600034-2 Specific test methods for determining losses and efficiency of converter-fed AC motors

b) Acceptance Criteria

- Efficiency η machines above 150kW (or kVA): (-) 10% of (1 – η)

8.3.2. Efisiensi

a) Referensi Metode Pengujian

IEC 600034-2 Specific test methods for determining losses and efficiency of converter-fed AC motors

b) Kriteria Penerimaan

- Efisiensi mesin η diatas 150kW (atau kVA): (-) 10% dari (1 – η)

8.3.3. Determination of characteristics

Test shall be perfom at several load conditions (25%, 50%, 75%, 100%, 125%, and 150% of rated load). Measure current, torque, and speed of every load condition (25%, 50%, 75%, 100%, 125%, and 150% of rated load).

Tolerances in table below are

8.3.3. Penentuan karakteristik

Pengujian harus dilakukan pada beberapa kondisi beban (25%, 50%, 75%, 100%, 125%, dan 150% dari beban rating). Ukur arus, torsi, dan kecepatan setiap kondisi beban (25%, 50%, 75%, 100%, 125%, dan 150% dari beban rating).

Toleransi pada tabel di bawah ini

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applied to the guaranteed values of characteristics of induction motor at rated load. In case where the minimum or maximum value is guaranteed in the specifications, no tolerances shall be applied.

a) Test Methode Reference

IEC 600034-1 Rotating electrical machines

b) Acceptance Criteria

- Power factor at rated current (%): (-) $\frac{1}{6}$% of (100 – Power Factor). Minimum 2% and Maximum 7%
- Slip (%): (±)20% of the guaranted value
- Breakdown torque (%): (±)10% of the guaranted value
- Pull up torque (%) : more than 0.3 rated torque

8.3.4. Momentary excess torque

a) Test Methode Reference

IEC 60034-1 Rotating electrical machines

b) Acceptance Criteria

The motor 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).

diterapkan pada nilai jaminan karakteristik motor induksi pada beban rating. Jika nilai minimum atau maksimum dijamin dalam spesifikasi maka tidak ada besaran toleransinya.

a) Referensi Metode Uji

IEC 600034-1 Rotating electrical machines

b) Kriteria Penerimaan

- Faktor daya pada arus rating (%): (-) 1/6% dari (100 – Faktor Daya). Minimal 2% dan Maksimal 7%
- Slip (%): (±)20% dari nilai yang dijamin
- Torsi *breakdown* (%): (±) 10% dari nilai yang dijamin
- Torsi tarik (%): lebih dari 0,3 torsi terukur

8.3.4. Torsi berlebih sesaat

a) Referensi Metode Pengujian

IEC 600034-1 Rotating electrical machines

b) Kriteria Penerimaan

Motor harus mampu menahan torsi berlebih setidaknya 60% dari torsi ratingnya selama 15 detik tanpa terhenti atau terjadi perubahan kecepatan yang tiba-tiba (peningkatan torsi secara bertahap).

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9. ROUTINE TEST

9.1 Definition

A test to which each individual machine is subjected during or after manufacture to ascertain wheather it complies with certain criteria

9.2 Item of Routine Test

9.2.1. Measurement of winding resistance (Cold)

a) Test Methode Reference

- IEC 600034-1 Rotating electrical machines
- IEEE 118 Standard Test Code for Resistance Measurement

b) Acceptance Criteria

Maximum unbalance of resistance between phase and phase shall not exceed ±1% of mean value.

9.2.2. Locked rotor test (Measurement to allow calculation of locked rotor current and torque)

a) Test Methode Reference

- IEC 600034-1 Rotating electrical machines
- IEEE 112 Standard Test Procedure for Polyphase Induction Motors and Generators

b) Acceptance Criteria

- Locked rotor current of cage induction motors with any specified starting apparatus: (+) 20% of the current

9. UJI RUTIN

9.1 Definisi

Suatu uji pada masing-masing mesin secara individu dikenakan selama atau setelah fabrikasi untuk memastikan apakah sesuai dengan kriteria yang sudah ditentukan

9.2 Item Uji Rutin

9.2.1. Pengukuran tahanan belitan (tidak bertegangan/cold)

a) Referensi Metode Pengujian

- IEC 600034-1 *Rotating electrical machines*
- IEEE 118 *Standard Test Code for Resistance Measurement*

b) Kriteria Penerimaan

Ketidakseimbangan tahanan maksimum antara fasa tidak boleh melebihi ± 1% dari nilai rata-rata.

9.2.2. Pengujian *locked rotor*(Pengukuran dilakukan untuk mendukung perhitungan arus dan torsi *locked rotor*)

a) Referensi Metode Uji

- IEC 600034-1 *Rotating electrical machines*
- IEEE 112 *Standard Test Procedure for Polyphase Induction Motors and Generators*

b) Kriteria Penerimaan

- Arus *locked rotor*dari motor induksi tipe *cage* dengan peralatan *start* yang ditentukan: (+) 20% dari

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- Locked rotor torque of cage induction motors:
  - (+) 25 % of the torque
  - (-) 15% of the torque
  - (+)25% may be exceeded by agreement

9.2.3. No load test and Direction of rotation (Measurement of no-load losses and current at rated voltage and frequency)

a) Test Methode Reference

IEC 60034-1 Rotating electrical machines

b) Acceptance Criteria

- The difference of no-load current in each line and mean value shall not exceed ±5% of the mean value.
- Measured values of no-load losses shall not exceed the values specified in datasheet.
- Direction of rotation as per datasheet

9.2.3. Measurement of noise level

a) Test Methode Reference

IEC 60034-9 Rotating electrical machines – Part 9: Noise limits

b) Acceptance Criteria

In accordance with datasheet. Unless otherwise specified in datasheet, sound pressure level (No-load & mean value at 1m from motor): maximum 85dB(A)

arus

- Torsi *locked rotor*dari motor induksi tipe *cage:*
  - (+) 25 % torsi
  - (-) 15% torsi
  - (+)25% atau lebih sesuai kesepakatan

9.2.2. Pengujian tanpa beban dan arah putaran (Pengukuran rugi-rugi tanpa beban dan arus pada tegangan dan frekuensi *rating*)

a) Referensi Metode Pengujian

IEC 60034-1 *Rotating electrical machines*

b) Kriteria Penerimaan

- Perbedaan arus tanpa beban pada setiap fasa dan nilai rata-ratanya tidak boleh melebihi 5% di atas atau di bawah nilai rata-rata.
- Rugi rugi tanpa beban yang terukur tidak boleh melebihi nilai yang ditentukan dalam *datasheet*.
- Arah putaran sesuai *datasheet*

9.2.3. Pengukuran level kebisingan

a) Referensi Metode Pengujian

IEC 60034-9 *Rotating electrical machines – Part 9: Noise limits*

b) Kriteria Penerimaan

Sesuai dengan *datasheet*. Kecuali ditentukan lain dalam *datasheet*, tingkat tekanan suara (Tanpa beban & nilai rata-rata pada 1m dari motor):

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maksimum 85dB(A)

9.2.4. Determination of characteristics

Tolerances in table below are applied to the guaranteed values of characteristics of induction motor. In case where the minimum or maximum value is guaranteed in the specifications, no tolerances shall be applied.

a) Test Methode Reference

IEC 600034-1 Rotating electrical machines

a) Acceptance Criteria

- Starting torque (%): (±)10% of the guaranted value

9.2.5. Measurement of vibration

a) Test Methode Reference

IEC 60034-14 Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity.

b) Acceptance Criteria

9.2.4. Penentuan karakteristik

Toleransi pada tabel di bawah ini diterapkan pada nilai yang dijamin pada karakteristik motor induksi. Jika nilai minimum atau maksimum tertulis dalam spesifikasi maka tidak ada toleransi yang diterapkan.

a) Referensi Metode Uji

IEC 600034-1 *Rotating electrical machines*

b) Kriteria Penerimaan

- Torsi starting (%): (±)10% dari nilai yang di garansi.

9.2.4. Pengukuran Vibrasi

a) Referensi Metode Pengujian

IEC 60034-14 *Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity.*

b) Kriteria Penerimaan

Table 2.0. Acceptance Criteria of Mechanical Vibration

(Tabel 2.0 Kriteria Penerimaan Vibrasi Mekanik)

Vibration Grade Tingkat Vibrasi	**Mounting** Dudukan	**Shaft Height (mm)** (Ketinggian Shaft (mm))			
		56 ≤ H ≤ 132		H > 132	
		Displac. (µm) Jarak . (µm)	Vel. (mm/s) Kecepatan (mm/s)	Displac. (µm) Jarak . (µm)	Vel. (mm/s) Kecepatan (mm/s)
A	Free Suspension	45	2.8	45	2.8

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	Tanpa Suspensi				
	Rigid Mounting Dudukan Kaku	-	-	37	2.3 / 2.8*
B	Free Suspension Tanpa Suspensi	18	1.1	29	1.8
	Rigid Mounting Dudukan Kaku	-	-	24	1.5 /1.8*

- Grade “A” applies to machines with no special vibration requirements.
- Grade “B” applies to machines with special vibration requirements. Rigid mounting is not considered acceptable for machines with shaft heights less than 132mm.
- Vibration at frequencies above 1000Hz should be filtered out.
- The shaft height of machines without feet, or a machine with raised feet, or any vertical machine is to be taken as the shaft height of machine in the same basic frame, but of the horizontal shaft foot-mounting type.

- Grade “A” digunakan untuk mesin tanpa kebutuhan vibrasi khusus
- Grade “B” digunakan untuk mesin tanpa vibrasi khusus. Tidak dapat dipertimbangkan untuk mesin dengan dudukan yang kaku dengan tinggi *shaft* kurang dari 132mm.
- Vibrasi diatas 1000Hz disarankan untuk dilengkapi dengan filter.
- Tinggi *shaft* mesin tanpa kaki, atau mesin dengan kaki yang dinaikkan, atau mesin vertikal apa pun harus diambil sebagai tinggi *shaft* mesin dalam rangka basis yang sama, dari jenis pemasangan kaki *shaft* horizontal.

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- (*) This level is the limit when the twice line frequency vibration level is dominant. For this case, please refer to the clause 8.2 in IEC 60034-14.

9.2.5. Measurement of insulation resistance

a) Test Methode Reference

IEEE 43 Recommended Practice for Testing Insulation Resistance of Rotating Machinery

b) Acceptance Criteria

Shall be more than 100MΩ, conducted before and after High Voltage Test.

- (*) Tingkat ini menjadi batas ketika tingkat getaran yang dominan adalah dua kali nilai frekuensi vibrasi. Untuk kasus ini, lihat klausul 8.2 dalam IEC 60034-14.

9.2.5. Pengukuran tahanan isolasi

a) Referensi Metode Pengujian

IEEE 43 *Recommended Practice for Testing Insulation Resistance of Rotating Machinery*

b) Kriteria Penerimaan

Harus lebih dari 100MΩ, dilakukan sebelum dan sesudah Uji Tegangan Tinggi.

Table 3.0. Acceptance Criteria of Insulation Resistance

(Table 3.0 Kriteria Penerimaan Tahan Isolasi)

Rated Voltage Tegangan Rating	**Test Voltage** Tegangan Uji	**Insulation Resistance** Tahanan Isolasi
MV AC Stator Stator MV AC 2501–5000 V 5001–12000 V	1000 – 2500VDC 2500 - 5000VDC	100 MΩ (M Ohms) 100 MΩ (M Ohms)

9.2.6. Withstand Voltage Test

a) Test Methode Reference

IEC 60034-1 Rotating electrical machines

9.2.6. Uji Tegangan Withstand

a) Referensi Metode Pengujian

IEC 60034-1 Rotating electrical machines

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Table 4.0. Test Method of Withstand Voltage Test

Table 4.0 : Metode Pengujian untuk

Item Nomor	**Machine of Part** Bagian Mesin	**Test Voltage (r.m.s)** Tegangan Uji (r.m.s)
1	Insulated windings of rotating machines or rated output less than 10.000 kW (or kVA) Belitan isolasi dari mesin rotasi atau rating output kurang dari 10.000 kW (atau kVA)	1000 V + twice the rated voltage for 1 minute 1000 V + dua kali rating tegangan selama 1 menit
2	Insulated windings of rotating machines of rated output 10000 kW (or kVA) or more with the exception of those in items 4 to 8 b Rated voltage a: - up to and including 24000 V - above 24000 V Belitan isolasi dari mesin rotasi atau rating output kurang dari 10.000 kW (atau kVA) atau lebih dengan pengecualian pada item 4 sampai 8 b Tegangan rating a: - Sampai dan termasuk 24000 V - Diatas 24000 V	1 000 V + twice the rated voltage for 1 minute Refer to approved specification 1000 V + dua kali rating tegangan selama 1 menit Merujuk kepada spesifikasi yang disetujui
3	Accesorries of Motor RTD Space Heater Aksesori Motor RTD Space Heater	 1500V for 1 minute 1500V for 1 minute 1500V selama 1 menit 1500V selama 1 menit

b) Acceptance Criteria

The motor shall withstand without any breakdown.

b) Kriteria Penerimaan

Motor harus tahan tanpa kerusakan.

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9.2.7. Measurement of insulation resistance of space heater

a) Test Methode Reference

IEEE 43 Recommended Practice for Testing Insulation Resistance of Rotating Machinery

b) Acceptance Criteria

Test voltage: 500V

Insulation resistence shall be more than 5MΩ

9.2.7. Pengukuran tahanan isolasi *Space heater*

a) Referensi Metode Pengujian

IEEE 43 *Recommended Practice for Testing Insulation Resistance of Rotating Machinery*

b) Kriteria Penerimaan

Tegangan Uji: 500V

Tahanan isolasi harus lebih besar dari 5MΩ

9.2.8. Painting Inspection

a) Test Methode Reference

Refer to approved painting specification

b) Acceptance Criteria

Painting and coating shall comply with the approved datasheet.

9.2.8. Inspeksi Pengecatan

a) Referensi Metode Pengujian

Mengacu kepada Spesifikasi Pengecatan yang sudah disetujui

b) Kriteria Penerimaan

Pengecatan dan pelapisan harus sesuai dengan *datasheet* yang disetujui.

9.2.9. Visual Inspection

a) Acceptance Criteria

9.2.9. Inspeksi Visual

a) Kriteria Penerimaan

Table 5.0. Acceptance Criteria of Visual Inspection

(Tabel 5.0 Kriteria Penerimaan dari Inspeksi Visual)

Inspection Inspeksi	**Acceptance** Penerimaan
Dimension Dimensi	As per drawing Sesuai gambar
Accessories Asesoris	As per datasheet Sesuai datasheet
Physical Check Cek fisik	No defect Tanpa cacat
Name Plate	As per drawing and

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Name Plate	datasheet Sesuai gambar dan datasheet
Lube oil / Grease Minyak Pelumas / Gemuk	

9.2.10. Sleeve Bearing Inspection (if applicable)

a) Test methode reference

IEC 60034- Rotating electrical machines

b) Acceptance Criteria

- No crack at Sleeve bearing
- Bearing insulation resistance test: 500V test voltage minimum 500 MOhm

9.2.10. Pemeriksaan *Sleeve Bearing* tipe (jika ada)

a) Referensi metode uji

IEC 60034 – *Rotating electrical machines*

b) Kriteria Penerimaan

- Tidak ada retakan pada *Sleeve bearing*
- Uji tahanan isolasi Bearing: uji tegangan 500V minimum 500 MOhm

10. SPECIAL TEST

10.1 Definition

Special tests can be selected by the OWNER on a case-by-case basis.

10.2 Item of Special Test

10.2.1. Special test for VSDS Motor

The complete assembled stator core of 2 pole high-speed motors shall be ring induction tested at full flux for 15 minutes.

a) Test Methode Reference

IEC 60034 – Rotating electrical machines

b) Acceptance Criteria

10. UJI KHUSUS

10.1 Definisi

Pengujian khusus dapat dipilih oleh PEMILIK berdasarkan kasus per kasus.

10.2 Item Uji Khusus

10.2.2. Pengujian Khusus untuk *VSDS Motor*

Inti stator rakitan lengkap dari motor kecepatan tinggi 2 kutub harus diuji dengan induksi cincin pada fluks penuh selama 15 menit.

a) Referensi Metode Uji

IEC 60034 – *Rotating electrical machines*

b) Kriteria Penerimaan

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The temperature difference between any two locations at the inside shall be less than 10 K.

Perbedaan temperatur antara dua lokasi di bagian dalam harus kurang dari 10 K.

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