

TYPE TEST REPORT

Report No. : IE3-100L1-4 2.2KW 15051501

| | | | | | |
|-------------------------------------|--------------------------------------------|------------------|--------------|------------------|-------|
| Product Type Name | IE3-100L1-4 Three Phase Asynchronous Motor | | | Ser.No. | 铝 |
| Rated Output | 2.2 kW | Rated Voltage | 415 V | Rated Current | 4.5 A |
| Rated Speed | 1455 r/min | Rated Frequency | 50Hz | Insulation Class | F |
| Duty | S1 | Protection Class | IP55 | Connection | Y |
| Product Standard | IEC60034-1 | Testing Standard | IEC60034-2-1 | Production Date | |
| Test Item | | Test Value | | Test Result | |
| 1. Stator resistance at 20°C | Ω | 3.3154 | | | |
| 2. No load current | A | 2.58 | | | |
| 3. No load current deviation | % | 2.7 | | | |
| 4. No load input power | W | 142.7 | | | |
| 5. Locked rotor current | A | 39.88 | | | |
| 6. Locked current/Rated current | | 8.75 | | | |
| 7. Locked torque | N.m | 41.71 | | | |
| 8. Locked torque/Rated torque | | 2.90 | | | |
| 9. Full load current | A | 4.56 | | | |
| 10. Rated torque | N.m | 14.36 | | | |
| 11. Max. torque | N.m | 53.94 | | | |
| 12. Max. torque/Rated torque | | 3.76 | | | |
| 13. Full load speed ratio | r/min | 1462.5 | | | |
| 14. Iron loss(at Rated voltage) | W | 84.6 | | | |
| 15. Mechanical loss(at Rated speed) | W | 25.2 | | | |
| 16. Stator winding loss | W | 118.5 | | | |
| 17. Rotor winding loss | W | 60.0 | | | |
| 18. Other loss | W | 42.4 | | | |
| 19. Total loss | W | 333.5 | | | |
| 20. Output power | W | 2200 | | | |

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| Test Item | | Test Value | Test Result |
|-------------------------------------------|-------|-------------|-------------|
| 21. Input power | W | 2533.53 | |
| 22. Full load efficiency | % | 86.84 | |
| 23. Full Load power factor | | 0.803 | |
| 24. Stator winding temp.rise | K | 33.0 | |
| 25. Bearing temperature | ℃ | | |
| 26. Coolant temperature | ℃ | 21.2 | |
| 27. Insulation resistance warmly to frame | MΩ | | |
| 28. High voltage test | V min | Pass | Passed |
| 29. Vibration | mm/s | | |
| 30. Noise | dB(A) | | |
| 31. Rotation Direction | | Right | Passed |
| 32. H.V. impulse test between winding | V | Pass | Passed |
| 33. Over speed test 2min 1.2n | | No abnormal | Passed |
| 34. Over Torque test 15s 2.2Tn | | No abnormal | Passed |
| 35. Over current test 2min 1.5In | | No abnormal | Passed |
| Testing Conclusion | | | |
| Remark | | | |
| Tested by | | Checked by | |
| | | Formed | |

three-phase induction motor type test report

Amb Temp: 21.2°C

report NO.: IE3-100L1-4 2.2KW 15051501

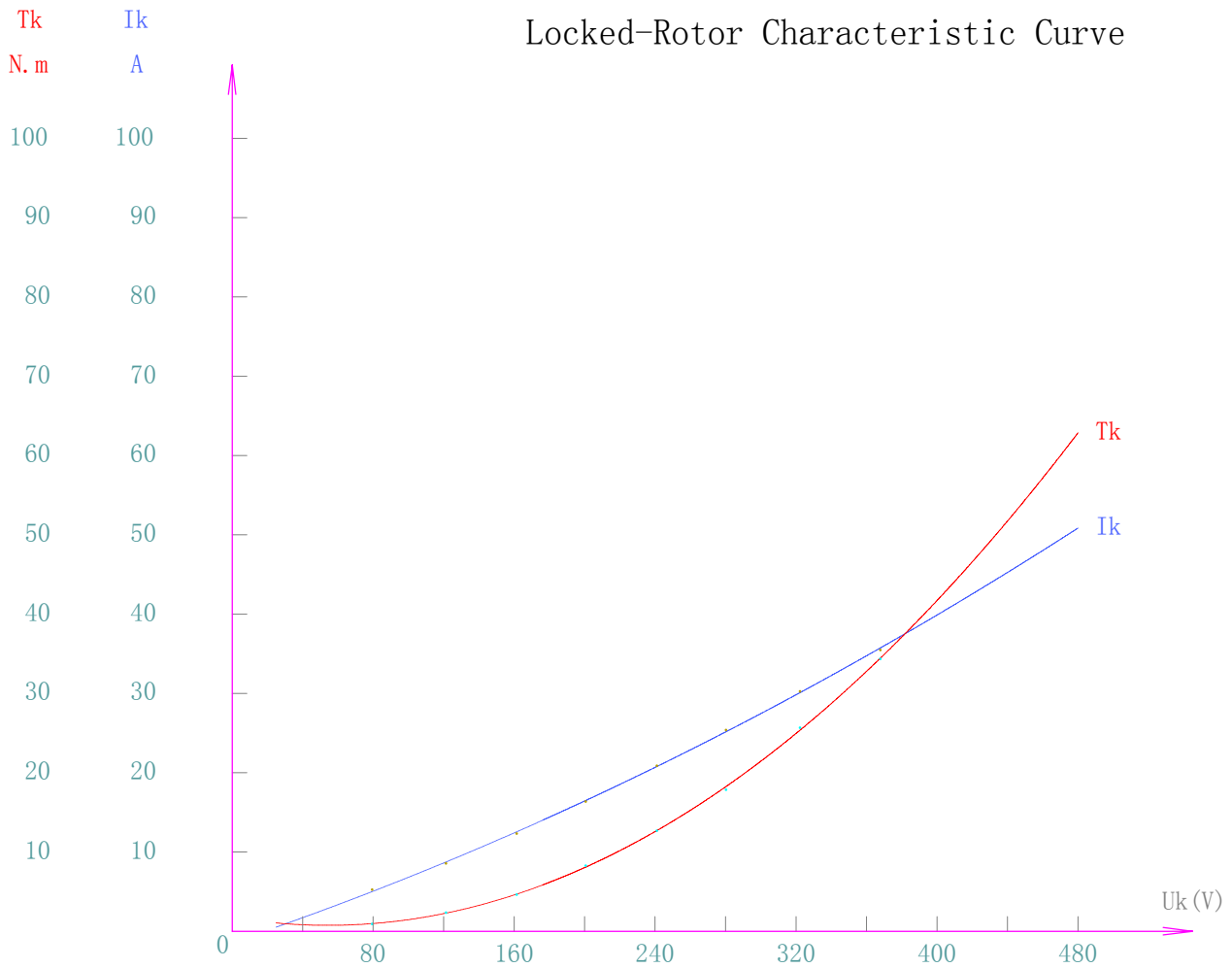
test time:

| | | | |
|--------------------|----------------|------------------------|-------------|
| Modle: IE3-100L1-4 | Rated U: 415V | Rated η : 86.70% | InsClass: F |
| NO.: 铝 | Rated I: 4.5A | Cos ϕ : 0.81 | Connect: Y |
| Rated f: 50Hz | Rated P: 2.2kW | Rated speed: 1455r/min | Poles: 4 |

Locked-rotor Test

| U (V) | I (A) | P1 (KW) | Tor (N. m) |
|-------|-------|---------|------------|
| 367.8 | 35.49 | 13.0300 | 34.36 |
| 322.2 | 30.28 | 9.3100 | 25.69 |
| 280.3 | 25.40 | 6.4800 | 17.86 |
| 241.0 | 20.88 | 4.3800 | 12.68 |
| 200.6 | 16.37 | 2.6990 | 8.28 |
| 161.5 | 12.32 | 1.5410 | 4.63 |
| 121.4 | 8.57 | 0.7530 | 2.37 |
| 79.4 | 5.25 | 0.2870 | 0.92 |

| | |
|------------------|-------------|
| Ik (A): 39.88 | Ik/In: 8.75 |
| Tk (N. m): 41.71 | Tk/Tn: 2.90 |
| Pk (kW): 14.95 | |



test:

check:

three-phase induction motor type test report

Amb Temp: 21.2°C

report NO.: IE3-100L1-4 2.2KW 15051501

test time:

| | | | |
|--------------------|----------------|------------------------|-------------|
| Modle: IE3-100L1-4 | Rated U: 415V | Rated η : 86.70% | InsClass: F |
| NO.: 铝 | Rated I: 4.5A | Cos ϕ : 0.81 | Connect: Y |
| Rated f: 50Hz | Rated P: 2.2kW | Rated speed: 1455r/min | Poles: 4 |

Load Test

| P1 (kW) | U (V) | I (A) | s (r/min) | Tor (N.m) | windingT(°C) |
|---------|-------|-------|-----------|-----------|--------------|
| 3.9300 | 400.8 | 6.55 | 1438.0 | 22.330 | 47.02 |
| 3.2100 | 402.1 | 5.46 | 1451.0 | 18.350 | 48.14 |
| 2.5660 | 401.3 | 4.61 | 1462.0 | 14.720 | 48.35 |
| 1.8700 | 401.9 | 3.79 | 1473.0 | 10.740 | 48.14 |
| 1.2740 | 400.1 | 3.15 | 1482.0 | 7.170 | 47.82 |
| 0.7080 | 400.3 | 2.73 | 1490.0 | 3.670 | 47.26 |
| 0.2660 | 401.0 | 2.63 | 1497.0 | 0.920 | 45.94 |
| 0.1370 | 400.3 | 2.60 | 0.0 | 0.000 | 43.60 |

| P2 (kW) | Pcu (kW) | Pal (kW) | Ps (kW) | Ss (%) | η (%) | Cos ϕ |
|---------|----------|----------|---------|--------|------------|------------|
| 3.3193 | 0.2453 | 0.1548 | 0.1008 | 4.30 | 84.46 | 0.864 |
| 2.7620 | 0.1703 | 0.1000 | 0.0679 | 3.38 | 86.04 | 0.845 |
| 2.2290 | 0.1217 | 0.0619 | 0.0436 | 2.62 | 86.87 | 0.800 |
| 1.6233 | 0.0820 | 0.0318 | 0.0231 | 1.86 | 86.81 | 0.709 |
| 1.0832 | 0.0567 | 0.0141 | 0.0102 | 1.24 | 85.02 | 0.584 |
| 0.5490 | 0.0426 | 0.0040 | 0.0026 | 0.69 | 77.55 | 0.374 |
| 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.00 | 0.00 | 0.000 |
| 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.00 | 0.00 | 0.000 |

r; 0.990

A: 0.204

B: -7.627

θ_s (°C): 58.0

150% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 6.50 | P1 (kW): 3.9007 | Ss (%): 4.10 |
| Pcu (kW): 0.2887 | Pal (kW): 0.1447 | Ps (kW): 0.0995 |
| η (%): 84.60 | Cos ϕ : 0.866 | P2 (kW): 3.30 |

125% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 5.46 | P1 (kW): 3.2018 | Ss (%): 3.25 |
| Pcu (kW): 0.2033 | Pal (kW): 0.0947 | Ps (kW): 0.0674 |
| η (%): 85.89 | Cos ϕ : 0.847 | P2 (kW): 2.75 |

100% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 4.56 | P1 (kW): 2.5335 | Ss (%): 2.50 |
| Pcu (kW): 0.1418 | Pal (kW): 0.0576 | Ps (kW): 0.0424 |
| η (%): 86.84 | Cos ϕ : 0.803 | P2 (kW): 2.20 |

75% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 3.80 | P1 (kW): 1.8958 | Ss (%): 1.83 |
| Pcu (kW): 0.0988 | Pal (kW): 0.0313 | Ps (kW): 0.0237 |
| η (%): 87.03 | Cos ϕ : 0.720 | P2 (kW): 1.65 |

50% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 3.19 | P1 (kW): 1.2887 | Ss (%): 1.22 |
| Pcu (kW): 0.0695 | Pal (kW): 0.0139 | Ps (kW): 0.0107 |
| η (%): 85.35 | Cos ϕ : 0.583 | P2 (kW): 1.10 |

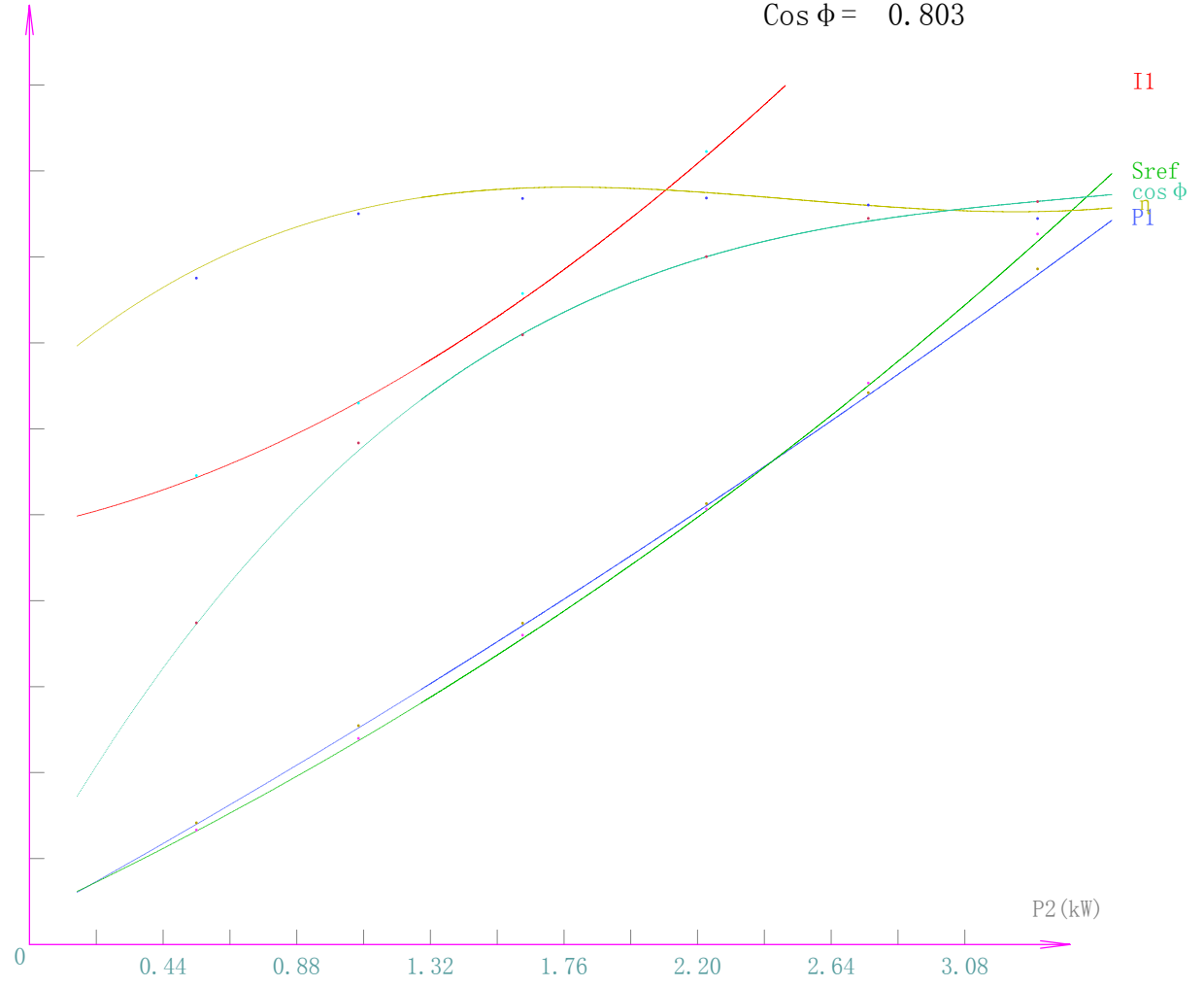
25% rated power:

| | | |
|-------------------|--------------------|-----------------|
| I (A): 2.72 | P1 (kW): 0.7122 | Ss (%): 0.67 |
| Pcu (kW): 0.0505 | Pal (kW): 0.0038 | Ps (kW): 0.0026 |
| η (%): 77.22 | Cos ϕ : 0.378 | P2 (kW): 0.55 |

Load Characteristic Curve

Report No. : IE3-100L1-4 2.2KW 15051501 When P2 = 2.2 kW ,
 Model : IE3-100L1-4 I1 = 4.56 A
 Rated Output: 2.2 kW P1 = 2.5335 kW
 Ser. No. : 铝 Sref = 2.50 %
 η = 86.84 %
 Cos φ = 0.803

| cos φ | η | Sref | P1 | I1 |
|-------|-----|------|-----|-----|
| | % | % | kW | A |
| 1.0 | 100 | 5.0 | 5.0 | 5.0 |
| 0.9 | 90 | 4.5 | 4.5 | 4.5 |
| 0.8 | 80 | 4.0 | 4.0 | 4.0 |
| 0.7 | 70 | 3.5 | 3.5 | 3.5 |
| 0.6 | 60 | 3.0 | 3.0 | 3.0 |
| 0.5 | 50 | 2.5 | 2.5 | 2.5 |
| 0.4 | 40 | 2.0 | 2.0 | 2.0 |
| 0.3 | 30 | 1.5 | 1.5 | 1.5 |
| 0.2 | 20 | 1.0 | 1.0 | 1.0 |
| 0.1 | 10 | 0.5 | 0.5 | 0.5 |



three-phase induction motor type test report

Amb Temp: 22.41°C

report NO.: IE3-100L1-4 2.2KW 15051501

test time:

| | | | |
|--------------------|----------------|------------------------|-------------|
| Modle: IE3-100L1-4 | Rated U: 415V | Rated η : 86.70% | InsClass: F |
| NO.: 铝 | Rated I: 4.5A | Cos ϕ : 0.81 | Connect: Y |
| Rated f: 50Hz | Rated P: 2.2kW | Rated speed: 1455r/min | Poles: 4 |

Resistance test

Rac(Ω): 3.3340

Rbc(Ω): 3.3330

Rab(Ω): 3.3300

Ravg(Ω): 3.3323
 115°C R (Ω): 4.5533
 25°C R (Ω): 3.3824

Shell Temp(°C): 21.3
 Amb Temp(°C): 21.15

No-load test

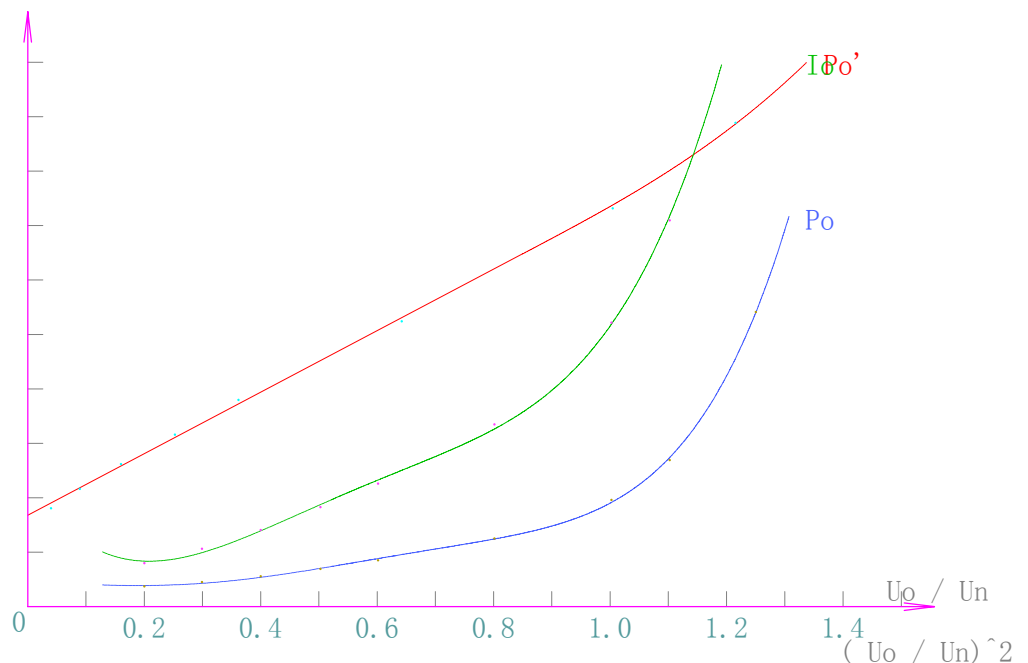
| U* | U (V) | I (A) | Po(kW) | Po' (kW) | Pcu(kW) | WindingT(°C) |
|------|-------|-------|--------|----------|---------|--------------|
| 1.25 | 500.1 | 6.25 | 0.4060 | 0.1933 | 0.2127 | 44.40 |
| 1.10 | 441.0 | 3.55 | 0.2020 | 0.1333 | 0.0687 | 44.40 |
| 1.00 | 400.9 | 2.61 | 0.1470 | 0.1098 | 0.0372 | 45.00 |
| 0.80 | 320.5 | 1.68 | 0.0940 | 0.0787 | 0.0153 | 45.00 |
| 0.60 | 240.6 | 1.13 | 0.0640 | 0.0570 | 0.0070 | 44.80 |
| 0.50 | 201.1 | 0.91 | 0.0520 | 0.0474 | 0.0046 | 44.80 |
| 0.40 | 160.0 | 0.71 | 0.0420 | 0.0393 | 0.0027 | 44.40 |
| 0.30 | 119.7 | 0.53 | 0.0340 | 0.0325 | 0.0015 | 44.40 |
| 0.20 | 80.0 | 0.40 | 0.0280 | 0.0271 | 0.0009 | 43.54 |

Thermal R(Ω): 3.6200
 Io(A): 2.58
 Pm(kW): 0.0252

Shell Temp(°C): 35.8
 Io(kW): 0.1427
 Pfe(kW): 0.0846

No Load Characteristic Curve

| Io | Po | Po' |
|-----|-------|-------|
| A | kW | kW |
| 5.0 | 0.750 | 0.150 |
| 4.5 | 0.675 | 0.135 |
| 4.0 | 0.600 | 0.120 |
| 3.5 | 0.525 | 0.105 |
| 3.0 | 0.450 | 0.090 |
| 2.5 | 0.375 | 0.075 |
| 2.0 | 0.300 | 0.060 |
| 1.5 | 0.225 | 0.045 |
| 1.0 | 0.150 | 0.030 |
| 0.5 | 0.075 | 0.015 |



test:

check:

CERTIFICATE of conformity with the following European Directive:

Registrier-Nr./Registered No.:
861631100024001

Electromagnetic Compatibility Directive 2014/30/EU

| Reference of applicant | Date of application | File reference | Test report No. | Date of issue |
|------------------------|---------------------|----------------|--------------------|---------------|
| - | 08.10.2016 | HZP1610001-01 | TRHZP1610001-01/01 | 21.10.2016 |

It is to certify that the following product(s) comply/complies with the essential requirements (Annex I) of the above mentioned European Directive and the following standard(s):

Applicant: Guanglu Electrical Co., Ltd.
Shanshi Industrial Area, Daxi Town, Wenling City, Zhejiang, China

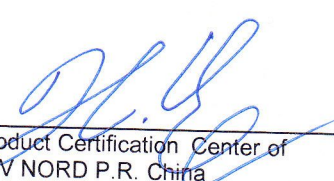
Manufacturer: Guanglu Electrical Co., Ltd.
Shanshi Industrial Area, Daxi Town, Wenling City, Zhejiang, China

Product: Three Phase Induction Motor

Model(s): IE3 series (Details refer to test report No.: TRHZP1610001-01/01)

Standard(s): EN 60034-1:2010

This Certificate of Conformity is based on the evaluation of samples of the product. It does not imply an assessment of the production and it does not permit the use of a mark of conformity or of a safety mark of the TÜV NORD CERT GmbH. The holder of this certificate may use this Certificate together with his EC-Declaration of Conformity.


Product Certification Center of
TÜV NORD P.R. China

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390

Technical report No. TRHZP1610001-01/01
File-No.: HZP1610001-01



Technical report
No. TRHZP1610001/01
about the test of a technical equipment

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Applicant: Guanglu Electrical Co., Ltd.
Shanshi Industrial Area, Daxi Town, Wenling City, Zhejiang,
China

Order No.: QTHZP10001/16-01

This report contains 3 text pages

Evaluated: 21.10.2016 by: Yuan Chao

Technic certified: 21.10.2016 by: Carol Zheng



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| | |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant: | Guanglu Electrical Co., Ltd. Shanshi Industrial Area, Daxi Town, Wenling City, Zhejiang, China |
| Manufacturer: | Guanglu Electrical Co., Ltd. Shanshi Industrial Area, Daxi Town, Wenling City, Zhejiang, China |
| Equipment under test: | Three Phase Induction Motor Model No.: IE3 series(Detailed refer to next page) |
| Ratings: | Rated Voltage: 400 V Rated Frequency: 50 Hz Rated Output Power: Refer to next page |
| Type of examination: | Conformity testing to EMC Directive |
| Test regulations: | EN 60034-1:2010 |
| Test location: | TÜV NORD (Hangzhou) Co., Ltd. No.50, Jiu Huan Road, 5th floor, Jiang Gan District, Hangzhou, China |
| Test result: | The referenced units are in compliance with above requirements. |
| Remark: | <p>After a careful examination of the circuit diagram, mode of operation and physical characteristics of the approving three phase induction motors showing that these motors do not have any EMC active electronic components. These motors are squirrel cage induction motors (motor without brushes), where the emission are always so low that emission testing is not needed according to the requirement of clause 13.5.1 of EN 60034-1:2010.</p> <p>Therefore it is concluded that the emission levels of the above mentioned three phase induction motors are far below the limits of the relevant EMC standards and relevant emission tests can be omitted.</p> |

Remark to be continued:

The approving three phase induction motors do not have any electronic control circuitry or EMC sensitive components. Motors not incorporating electronic circuits are not sensitive to electromagnetic emissions under normal service conditions and therefore no immunity tests are required according to the requirement of clause 13.2.1 of EN 60034-1:2010.

Model No. and parameters:

| Model No. | Rated output power (kW) | Model No. | Rated output power (kW) | Model No. | Rated output power (kW) |
|-------------|-------------------------|-------------|-------------------------|-------------|-------------------------|
| IE3-80M1-2 | 0.75 | IE3-80M2-4 | 0.75 | IE3-90S-6 | 0.75 |
| IE3-80M2-2 | 1.1 | IE3-90S-4 | 1.1 | IE3-90L-6 | 1.1 |
| IE3-90S-2 | 1.5 | IE3-90L-4 | 1.5 | IE3-100L1-6 | 1.5 |
| IE3-90L-2 | 2.2 | IE3-100L1-4 | 2.2 | IE3-112M-6 | 2.2 |
| IE3-100L1-2 | 3 | IE3-100L2-4 | 3 | IE3-132S-6 | 3 |
| IE3-112M-2 | 4 | IE3-112M-4 | 4 | IE3-132M1-6 | 4 |
| IE3-132S1-2 | 5.5 | IE3-132S-4 | 5.5 | IE3-132M2-6 | 5.5 |
| IE3-132S2-2 | 7.5 | IE3-132M-4 | 7.5 | IE3-160M-6 | 7.5 |
| IE3-160M1-2 | 11 | IE3-160M-4 | 11 | IE3-160L-6 | 11 |
| IE3-160M2-2 | 15 | IE3-160L-4 | 15 | IE3-180L-6 | 15 |
| IE3-160L-2 | 18.5 | IE3-180M-4 | 18.5 | IE3-200L1-6 | 18.5 |
| IE3-180M-2 | 22 | IE3-180L-4 | 22 | IE3-200L2-6 | 22 |
| IE3-200L1-2 | 30 | IE3-200L-4 | 30 | IE3-225M-6 | 30 |
| IE3-200L2-2 | 37 | IE3-225S-4 | 37 | IE3-250M-6 | 37 |
| IE3-225M-2 | 45 | IE3-225M-4 | 45 | IE3-280S-6 | 45 |
| IE3-250M-2 | 55 | IE3-250M-4 | 55 | IE3-280M-6 | 55 |
| IE3-280S-2 | 75 | IE3-280S-4 | 75 | IE3-315S-6 | 75 |
| IE3-280M-2 | 90 | IE3-280M-4 | 90 | IE3-315M-6 | 90 |
| IE3-315S-2 | 110 | IE3-315S-4 | 110 | IE3-315L1-6 | 110 |
| IE3-315M-2 | 132 | IE3-315M-4 | 132 | IE3-315L2-6 | 132 |
| IE3-315L1-2 | 160 | IE3-315L1-4 | 160 | IE3-355M1-6 | 160 |
| IE3-315L2-2 | 200 | IE3-315L2-4 | 200 | IE3-355M2-6 | 200 |
| IE3-355M-2 | 250 | IE3-355M-4 | 250 | IE3-355L-6 | 250 |
| IE3-355L-2 | 315 | IE3-355L1-4 | 280 | / | / |
| / | / | IE3-355L2-4 | 315 | / | / |
| / | / | IE3-355L3-4 | 355 | / | / |