

TYPE TEST REPORT

Report No. : IE3-160M-4 11KW 14051501

| Product Type Name | IE3-160M-4 Three Phase Asynchronous Motor | | | Ser.No. | |
|-------------------------------------|---|------------------|-------------|------------------|--------|
| Rated Output | 11 kW | Rated Voltage | 400 V | Rated Current | 20.4 A |
| Rated Speed | 1470 r/min | Rated Frequency | 50Hz | Insulation Class | F |
| Duty | S1 | Protection Class | IP55 | Connection | △ |
| Product Standard | | Testing Standard | GB1032-2012 | Production Date | |
| Test Item | | Test Value | | Test Result | |
| 1. Stator resistance at 20°C | Ω | 0.4306 | | | |
| 2. No load current | A | 7.67 | | | |
| 3. No load current deviation | % | 3.4 | | | |
| 4. No load input power | W | 390.1 | | | |
| 5. Locked rotor current | A | 144.46 | | | |
| 6. Locked current/Rated current | | 7.15 | | | |
| 7. Locked torque | N.m | 120.55 | | | |
| 8. Locked torque/Rated torque | | 1.69 | | | |
| 9. Full load current | A | 20.19 | | | |
| 10. Rated torque | N.m | 71.19 | | | |
| 11. Max. torque | N.m | 218.27 | | | |
| 12. Max. torque/Rated torque | | 3.07 | | | |
| 13. Full load speed ratio | r/min | 1475.6 | | | |
| 14. Iron loss(at Rated voltage) | W | 256.5 | | | |
| 15. Mechanical loss(at Rated speed) | W | 91.5 | | | |
| 16. Stator winding loss | W | 314.2 | | | |
| 17. Rotor winding loss | W | 192.5 | | | |
| 18. Other loss | W | 169.7 | | | |
| 19. Total loss | W | 1029.6 | | | |
| 20. Output power | W | 11000 | | | |

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| Test Item | | Test Value | Test Result |
|---|-------|-------------|-------------|
| 21. Input power | W | 12029.59 | |
| 22. Full load efficiency | % | 91.44 | |
| 23. Full Load power factor | | 0.860 | |
| 24. Stator winding temp.rise | K | 43.7 | |
| 25. Bearing temperature | °C | 54 | |
| 26. Coolant temperature | °C | 21.8 | |
| 27. Insulation resistance warmly to frame | MΩ | 500 | |
| 28. High voltage test | V min | Pass | Passed |
| 29. Vibration | mm/s | 1.0 | |
| 30. Noise | dB(A) | 62 | |
| 31. Rotation Direction | | Right | Passed |
| 32. H.V. inpulse 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: °C

report NO.: IE3-160M-4 11KW 14051501

test time:

Modle: IE3-160M-4
NO.:
Rated f: 50Hz

Rated U: 400V
Rated I: 20.4A
Rated P: 11kW

Rated η : 91.4%
Cos ϕ : 0.86
Rated speed: 1470r/min

InsClass: F
Connect: Δ
Poles: 4

Resistance test

Rac(Ω): 0.4338

Rbc(Ω): 0.4336

Rab(Ω): 0.4334

Ravg(Ω): 0.4336
115°C R (Ω): 0.5910
25°C R (Ω): 0.4390

Shell Temp(°C): 21.8
Amb Temp(°C): 21.80

No load test

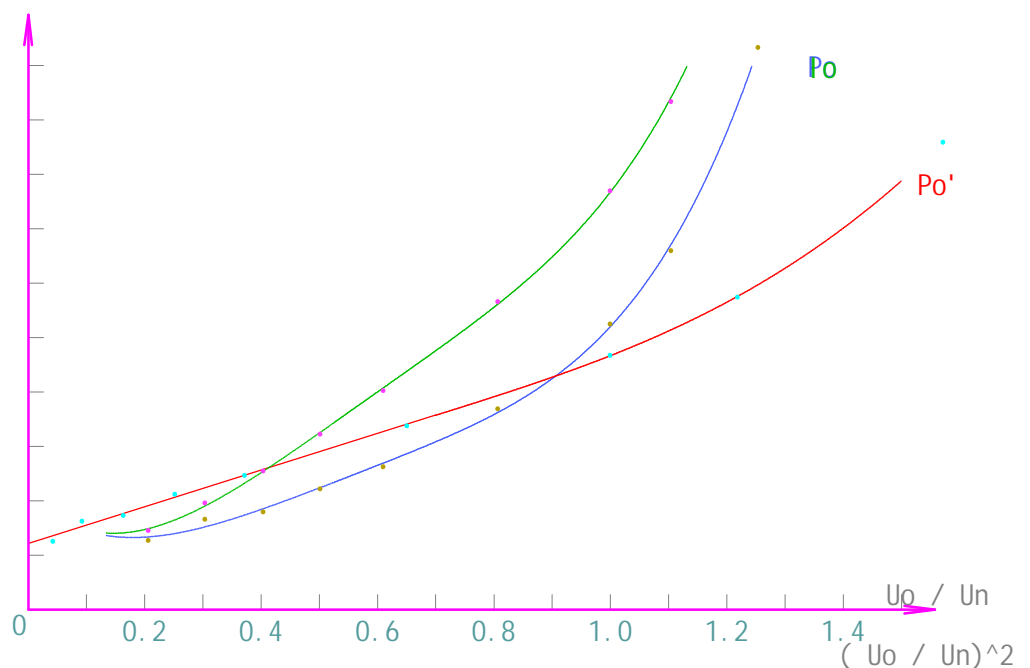
| U* | U (V) | I (A) | Po(kW) | Po' (kW) | Pcu(kW) | WindingT(°C) |
|------|-------|-------|--------|----------|---------|--------------|
| 1.25 | 501.4 | 13.37 | 0.7750 | 0.6444 | 0.1306 | 53.74 |
| 1.10 | 441.4 | 9.34 | 0.4950 | 0.4312 | 0.0638 | 53.74 |
| 1.00 | 399.8 | 7.70 | 0.3940 | 0.3507 | 0.0433 | 53.71 |
| 0.81 | 322.6 | 5.66 | 0.2770 | 0.2535 | 0.0235 | 53.71 |
| 0.61 | 243.8 | 4.03 | 0.1970 | 0.1852 | 0.0118 | 53.68 |
| 0.50 | 200.5 | 3.23 | 0.1670 | 0.1594 | 0.0076 | 53.68 |
| 0.40 | 161.4 | 2.55 | 0.1350 | 0.1302 | 0.0048 | 53.54 |
| 0.30 | 121.3 | 1.96 | 0.1250 | 0.1222 | 0.0028 | 53.54 |
| 0.21 | 82.3 | 1.46 | 0.0960 | 0.0944 | 0.0016 | 53.17 |

Thermal R(Ω): 0.4902
Io(A): 7.67
Pm(kW): 0.0915

Shell Temp(°C): 44.1
Io(kW): 0.3901
Pfe(kW): 0.2565

No Load Characteristic Curve

| Io | Po | Po' |
|----|-------|-------|
| A | kW | kW |
| 10 | 0.750 | 0.750 |
| 9 | 0.675 | 0.675 |
| 8 | 0.600 | 0.600 |
| 7 | 0.525 | 0.525 |
| 6 | 0.450 | 0.450 |
| 5 | 0.375 | 0.375 |
| 4 | 0.300 | 0.300 |
| 3 | 0.225 | 0.225 |
| 2 | 0.150 | 0.150 |
| 1 | 0.075 | 0.075 |



test:

check:

three-phase induction motor type test report

Amb Temp: 21.8°C

report NO.: IE3-160M-4 11KW 14051501

test time:

Model: IE3-160M-4
NO.:
Rated f: 50Hz

Rated U: 400V
Rated I: 20.4A
Rated P: 11kW

Rated η : 91.4%
Cos ϕ : 0.86
Rated speed: 1470r/min

InsClass: F
Connect: Δ
Poles: 4

Locked-rotor Test

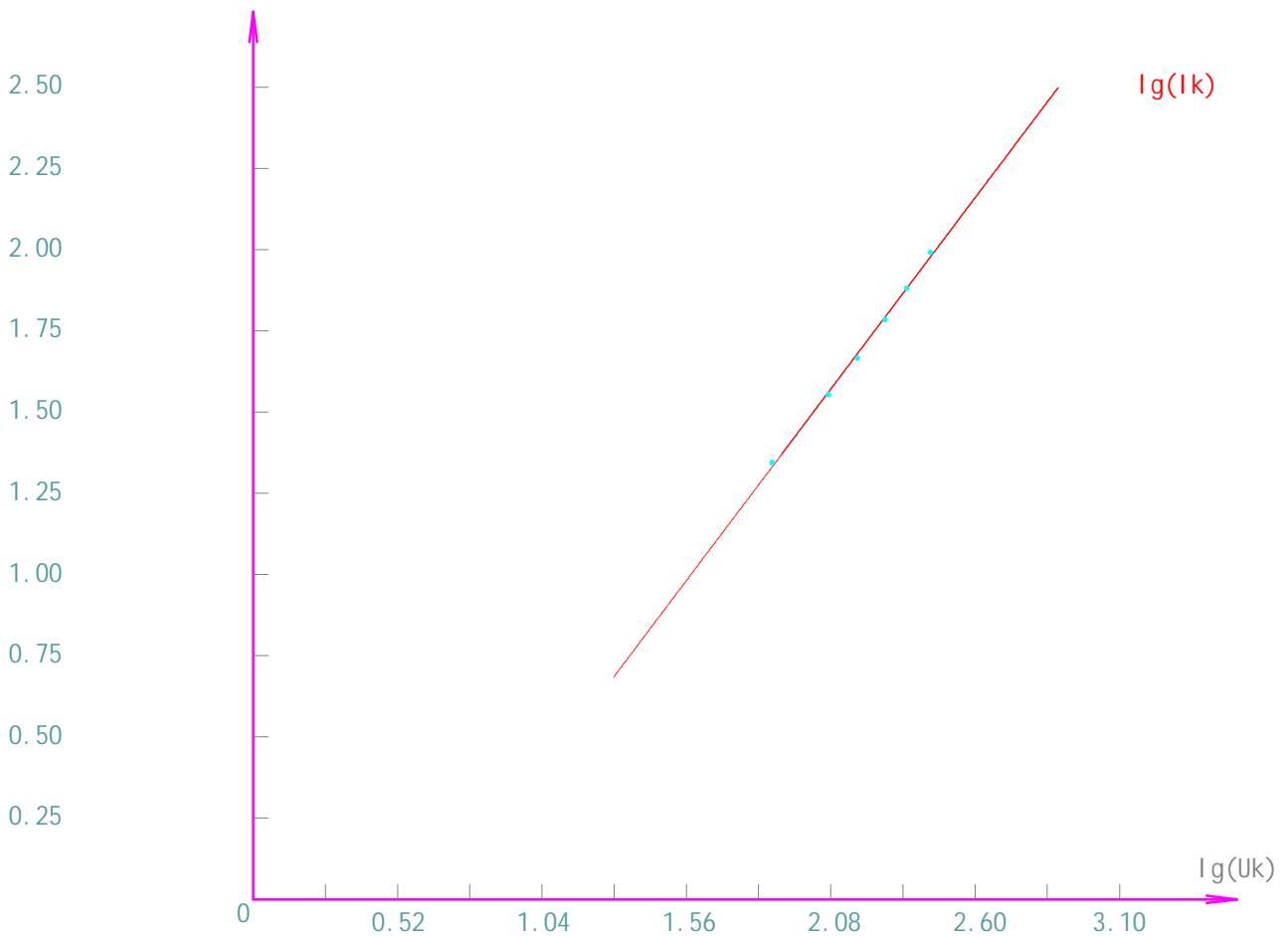
| U(V) | I(A) | P1(KW) | Tor(N.m) |
|-------|-------|---------|----------|
| 275.3 | 98.11 | 16.5100 | 55.60 |
| 227.0 | 76.05 | 9.9760 | 35.00 |
| 189.7 | 60.93 | 6.4160 | 22.90 |
| 150.5 | 46.35 | 3.7350 | 13.50 |
| 118.4 | 35.83 | 2.2330 | 8.10 |
| 74.2 | 22.12 | 0.8550 | 3.10 |

I_k (A): 144.46
T_k(N.m): 120.55
P_k(kW): 34.62

I_k/I_n: 7.15
T_k/T_n: 1.69

I_g(I_k)

Locked-Rotor Characteristic Curve



test:

check:

three-phase induction motor type test report

Amb Temp: 21.8°C

report NO.: IE3-160M-4 11KW 14051501

test time:

| | | | |
|-------------------|----------------|------------------------|-------------------|
| Modle: IE3-160M-4 | Rated U: 400V | Rated η : 91.4% | InsClass: F |
| NO.: | Rated I: 20.4A | Cos ϕ : 0.86 | Connect: Δ |
| Rated f: 50Hz | Rated P: 11kW | Rated speed: 1470r/min | Pol es: 4 |

Load Test

| P1(kW) | U(V) | I (A) | s(r/min) | Tor (N.m) | wi ndi ngT(°C) |
|---------|-------|-------|----------|-----------|----------------|
| 18.8100 | 400.8 | 31.16 | 1458.0 | 109.900 | 55.85 |
| 15.2900 | 402.9 | 25.17 | 1468.0 | 89.800 | 57.08 |
| 12.1700 | 400.9 | 20.63 | 1475.0 | 71.400 | 57.85 |
| 9.0900 | 400.8 | 15.94 | 1482.0 | 53.200 | 57.97 |
| 6.1600 | 401.4 | 12.13 | 1488.0 | 35.400 | 57.54 |
| 3.2100 | 400.3 | 9.06 | 1494.0 | 17.600 | 57.08 |
| 0.4580 | 400.4 | 7.73 | 1500.0 | 0.300 | 56.45 |
| 0.4000 | 400.0 | 7.71 | 0.0 | 0.000 | 53.80 |

| P2(kW) | Pcu(kW) | Pal (kW) | Ps(kW) | Ss(%) | η (%) | Cos ϕ |
|---------|---------|----------|--------|-------|------------|------------|
| 16.7829 | 0.7469 | 0.5214 | 0.4108 | 2.93 | 89.22 | 0.870 |
| 13.8572 | 0.4874 | 0.3231 | 0.2743 | 2.22 | 90.63 | 0.870 |
| 11.1206 | 0.3274 | 0.2005 | 0.1735 | 1.73 | 91.38 | 0.850 |
| 8.3427 | 0.1954 | 0.1076 | 0.0964 | 1.25 | 91.78 | 0.822 |
| 5.6079 | 0.1132 | 0.0482 | 0.0427 | 0.83 | 91.04 | 0.730 |
| 2.7762 | 0.0631 | 0.0120 | 0.0106 | 0.42 | 86.49 | 0.511 |
| 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: 0.979

A: 0.034

B: 67.761

θ s(°C): 68.7

150% rated power:

I (A): 30.56
Pcu(kW): 0.8278
 η (%): 89.39

P1(kW): 18.4592
Pal (kW): 0.4739
Cos ϕ : 0.872

Ss (%): 2.73
Ps(kW): 0.3962
P2(kW): 16.50

125% rated power:

I (A): 25.09
Pcu(kW): 0.5579
 η (%): 90.66

P1(kW): 15.1673
Pal (kW): 0.3055
Cos ϕ : 0.873

Ss (%): 2.13
Ps(kW): 0.2700
P2(kW): 13.75

100% rated power:

I (A): 20.19
Pcu(kW): 0.3614
 η (%): 91.44

P1(kW): 12.0296
Pal (kW): 0.1856
Cos ϕ : 0.860

Ss (%): 1.63
Ps(kW): 0.1697
P2(kW): 11.00

75% rated power:

I (A): 15.87
Pcu(kW): 0.2233
 η (%): 91.72

P1(kW): 8.9949
Pal (kW): 0.1014
Cos ϕ : 0.818

Ss (%): 1.19
Ps(kW): 0.0939
P2(kW): 8.25

50% rated power:

I (A): 12.13
Pcu(kW): 0.1304
 η (%): 91.02

P1(kW): 6.0428
Pal (kW): 0.0447
Cos ϕ : 0.719

Ss (%): 0.79
Ps(kW): 0.0413
P2(kW): 5.50

25% rated power:

I (A): 8.96
Pcu(kW): 0.0711
 η (%): 86.37

P1(kW): 3.1839
Pal (kW): 0.0112
Cos ϕ : 0.513

Ss (%): 0.39
Ps(kW): 0.0103
P2(kW): 2.75

Load Characteristic Curve

Report No. : IE3-160M-4 11KW 14051501
 Model : IE3-160M-4
 Rated Output: 11 kW
 Ser.No. :

When P2 = 11 kW ,
 I1 = 20.19 A
 P1 = 12.0296 kW
 Sref = 1.63 %
 η = 91.44 %
 Cos ϕ = 0.860

| cos ϕ | η % | Sref % | P1 kW | I1 A |
|------------|-------------|-----------|----------|---------|
| 1.0 | 100 | 2.50 | 20 | 25.0 |
| 0.9 | 90 | 2.25 | 18 | 22.5 |
| 0.8 | 80 | 2.00 | 16 | 20.0 |
| 0.7 | 70 | 1.75 | 14 | 17.5 |
| 0.6 | 60 | 1.50 | 12 | 15.0 |
| 0.5 | 50 | 1.25 | 10 | 12.5 |
| 0.4 | 40 | 1.00 | 8 | 10.0 |
| 0.3 | 30 | 0.75 | 6 | 7.5 |
| 0.2 | 20 | 0.50 | 4 | 5.0 |
| 0.1 | 10 | 0.25 | 2 | 2.5 |

