



ROYCECROSSGROUP



ROYCE CROSS GROUP

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

| | | | |
|---------------------------------------|------------------|--------------------|-------------------|
| NAMEPLATE DATA | | | |
| Y3-160L-2 FRAME | IEC TYPE | 18.5 kW | 2933 r/min |
| 2 POLE | 3 PHASE | 415 VOLTS | 50 Hz |
| ROYCE CROSS GROUP MANUFACTURER | 30.5 AMPS | IP55 IP | |
| | S1 DUTY | F INS.CLASS | CONNECTION |

| MAJOR CONTENTS | UNIT | TEST VALUE |
|--|--------|------------|
| STATOR RESISTANCE OF PHASE | OHM | 0.61367 |
| NO LOAD CURRENT | AMP | 6.87 |
| NO LOAD INPUT | W | 567.9 |
| CORE LOSS(Pfe) | W | 422.5 |
| WINDAGE FRICTION LOSS(Pfw) | W | 117.6 |
| STATOR WINDING LOSS(Pcu1) | W | 555.5 |
| ROTOR WINDING LOSS(Pcu2) | W | 416.1 |
| STRAY LOAD LOSS(Ps) | W | 100.8 |
| FULL LOAD CURRENT | AMP | 30.40 |
| LOCKED ROTOR CURRENT | AMP | 178.64 |
| LOCKED ROTOR CURRENT/FULL LOAD CURRENT | P.U. | 5.86 |
| FULL LOAD TORQUE | N.m | 60.19 |
| LOCKED ROTOR TORQUE | N.m | 126.02 |
| LOCKED ROTOR TORQUE/FULL LOAD TORQUE | P.U. | 2.09 |
| PULL OUT TORQUE | N.m | 145.99 |
| PULL OUT TORQUE/FULL LOAD TORQUE | P.U. | 2.42 |
| INPUT @ FULL LOAD | kW | 20.11 |
| EFFICIENCY @ FULL LOAD | % | 91.98 |
| POWER FACTOR @ FULL LOAD | | 0.92 |
| FULL LOAD SLIP | % | 2.174 |
| FULL LOAD SPEED | r/min | 2934.8 |
| STATOR WINDING TEMPERATURE RISE | K | 62 |
| D.E. BEARINGS TEMPERATURE BY PT100 | Deg. C | 58.0 |
| AMBIENT TEMPERATURE OF TESTING | Deg. C | 25.3 |
| NOISE | dB(A) | 84 |
| VIBRATION | mm/s | 0.9 |

The data above is calculated as per IEC 34-2, all data at nominal Volts.

| | | | | | |
|--|--------------------------|------------|---|--|--------------|
| | ROYCE CROSS GROUP | SERIAL NO. | 1 | | |
| | | | | | |
| | | | | | |
| | | | | | 16106 |

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

ROYCE CROSS GROUP

| | | | | | |
|------------|------------|---------|--------|------------|---------|
| Type | Y3-160L-2 | Poles | 2 | Power | 18.5 kW |
| Voltage | 415 V | Current | 30.5 A | Frequency | 50 Hz |
| Speed | 2933 r/min | Duty | S1 | Connection | △ |
| Ins. class | F | Weight | 0 kg | | IP55 |

NO LOAD TEST

| VOL | mul. | Hz | I01 | I02 | I03 | mul. | W1 | W2 | mul. | Ω |
|-------|------|----|-------|-------|-------|------|---------|--------|------|------------|
| 474.3 | 1 | 50 | 4.833 | 4.778 | 4.868 | 2 | -1234.7 | 1625.5 | 2 | 82.6 0.394 |
| 447.9 | 1 | 50 | 4.042 | 4.022 | 4.168 | 2 | -944.2 | 1278.2 | 2 | 82.3 0.393 |
| 415.6 | 1 | 50 | 3.418 | 3.396 | 3.522 | 2 | -728.4 | 1013.1 | 2 | 82.0 0.393 |
| 366.7 | 1 | 50 | 2.776 | 2.756 | 2.855 | 2 | -508.3 | 738.6 | 2 | 81.8 0.393 |
| 309.5 | 1 | 50 | 2.232 | 2.210 | 2.295 | 2 | -329.3 | 512.0 | 2 | 81.6 0.393 |
| 260.1 | 1 | 50 | 1.830 | 1.808 | 1.877 | 2 | -216.5 | 361.1 | 2 | 81.4 0.392 |
| 206.3 | 1 | 50 | 1.462 | 1.445 | 1.498 | 2 | -125.2 | 238.9 | 2 | 81.1 0.392 |
| 182.3 | 1 | 50 | 1.318 | 1.306 | 1.351 | 2 | -83.5 | 203.3 | 2 | 80.9 0.392 |
| 155.4 | 1 | 50 | 1.109 | 1.099 | 1.137 | 2 | -50.3 | 152.2 | 2 | 80.6 0.391 |
| 98.1 | 1 | 50 | 0.778 | 0.772 | 0.795 | 2 | -7.8 | 75.1 | 2 | 80.2 0.391 |

Initial Resistance immediately before no-load test: 0 Ω ambient temperature: 0.0 °C

Final Resistance immediately later no-load test: 0 Ω ambient temperature: 0.0 °C

| | | |
|--------------------------|--------------------|---------------|
| ROYCE CROSS GROUP | Manufacturing Date | Serial No |
| | 2016.05 | 1 |
| | Test Date | Report Number |
| | 2016.05.25 | 16106 |

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

ROYCE CROSS GROUP

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|------------|-------------------|---------|---------------|------------|------|-----------|
| Type | Y3-160L-2 | Poles | 2 | Power | 18.5 | kW |
| Voltage | 415 V | Current | 30.5 A | Frequency | 50.0 | Hz |
| Speed | 2933 r/min | Duty | S1 | Connection | | |
| Ins. class | F | Weight | 0 kg | | IP55 | |

LOCKED ROTOR TEST

| VOL | mul. | Ik1 | Ik2 | Ik3 | mul. | W1 | W2 | mul. | Torqur N. m |
|-------|------|-------|-------|-------|-------|-------|-------|------|----------------|
| 411.4 | 1.0 | 1.753 | 1.765 | 1.779 | 100.0 | -31.1 | 732.1 | 100 | 123.78 |
| 363.1 | 1.0 | 1.470 | 1.486 | 1.501 | 100.0 | -16.2 | 543.8 | 100 | 93.68 |
| 316.0 | 1.0 | 1.241 | 1.253 | 1.258 | 100.0 | -24.9 | 396.7 | 100 | 66.97 |
| 276.7 | 1.0 | 2.124 | 2.114 | 2.135 | 50.0 | -50.6 | 583.0 | 50 | 48.09 |
| 235.6 | 1.0 | 1.731 | 1.731 | 1.743 | 50.0 | -42.1 | 404.7 | 50 | 33.31 |
| 191.5 | 1.0 | 1.353 | 1.350 | 1.350 | 50.0 | -29.8 | 253.6 | 50 | 19.68 |
| 148.9 | 1.0 | 2.520 | 2.509 | 2.540 | 20.0 | -45.4 | 364.7 | 20 | 11.13 |
| 106.3 | 1.0 | 1.751 | 1.763 | 1.759 | 20.0 | -27.1 | 180.9 | 20 | 5.52 |

| | | |
|--------------------------|-------------------------------|------------------------|
| ROYCE CROSS GROUP | Manufacturing Date 2016.05 | Serial No 1 |
| | Test Date 2016.05.25 | Report Number 16106 |

ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

ROYCE CROSS GROUP

| | | | | | | |
|------------|------------|---------|--------|------------|------|----|
| Type | Y3-160L-2 | Poles | 2 | Power | 18.5 | kW |
| Voltage | 415 V | Current | 30.5 A | Frequency | 50 | Hz |
| Speed | 2933 r/min | Duty | S1 | Connection | | |
| Ins. class | F | Weight | 0 | kg | IP55 | |

TEMPERATURE RISE TEST

| TIME (h:min) | V | I1 | I2 | I3 | mul. | W1 | W2 | mul. | T1 °C | T2 °C | T3 °C | T4 °C | T5 °C | T6 °C | T7 °C | T8 °C | T9 °C | T10 °C | T11 °C | T12 °C | T13 °C | |
|-----------------|--------|-------|-------|-------|----------|-------|--------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|------|
| 10:31 | 411.7 | 3.111 | 3.104 | 3.125 | 10 | 751.0 | 1329.5 | 10 | 49.1 | — | 83.8 | 83.1 | — | — | — | — | — | — | — | — | — | 22.9 |
| 11:01 | 415.5 | 3.043 | 3.038 | 3.059 | 10 | 740.5 | 1314.9 | 10 | 55.1 | — | 88.2 | 87.5 | — | — | — | — | — | — | — | — | — | 24.2 |
| 11:30 | 415.2 | 3.058 | 3.053 | 3.073 | 10 | 742.2 | 1321.8 | 10 | 56.1 | — | 90.1 | 89.3 | — | — | — | — | — | — | — | — | — | 23.9 |
| 12:00 | 415.1 | 3.044 | 3.040 | 3.061 | 10 | 748.8 | 1322.7 | 10 | 56.6 | — | 91.2 | 90.6 | — | — | — | — | — | — | — | — | — | 23.9 |
| 12:30 | 415.3 | 3.053 | 3.047 | 3.068 | 10 | 741.8 | 1319.0 | 10 | 56.9 | — | 91.9 | 91.2 | — | — | — | — | — | — | — | — | — | 24.4 |
| 13:00 | 415.1 | 3.034 | 3.030 | 3.050 | 10 | 736.5 | 1311.0 | 10 | 57.3 | — | 92.4 | 91.7 | — | — | — | — | — | — | — | — | — | 25.5 |
| 13:30 | 415.2 | 3.062 | 3.056 | 3.077 | 10 | 749.9 | 1327.1 | 10 | 58.0 | — | 93.0 | 92.2 | — | — | — | — | — | — | — | — | — | 24.5 |
| 14:00 | 415.0 | 3.036 | 3.037 | 3.059 | 10 | 738.6 | 1311.1 | 10 | 58.0 | — | 93.2 | 92.5 | — | — | — | — | — | — | — | — | — | 26.0 |
| 最后三点平均值 | 30.489 | | A | | 20580.67 | | W | | 58.0 | — | 92.9 | 92.1 | — | — | — | — | — | — | — | — | — | 25.3 |

T1 T2: DE BEARING TEMPERATURE
T3~T10: DE WINDING TEMPERATURE

T11: CORE TEMPERATRE
T13: AMBIENT TEMPERATURE

T12: FRAME TEMPERATRE

WINDING RESISTANCE (HOT) AT END OF TEMPERATURE RISE TEST

| | | | | | | | | |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|
| TIME (S) | 63 | 79 | 111 | 135 | 162 | 202 | 231 | 276 |
| RESISTANCE | 0.3993 | 0.3990 | 0.3984 | 0.3979 | 0.3974 | 0.3968 | 0.3964 | 0.3958 |

WINDING RESISTANCE (COLD)

| | | | | | | |
|---|--------|--------|--------|---------|---------|--------------|
| △ | U1-V1 | U1-W1 | V1-W1 | AVERAGE | MIN | AMBIENT TEM. |
| | 0.3189 | 0.3195 | 0.3193 | 0.31923 | 0.31890 | 22.5 °C |
| Y | U1-U2 | V1-V2 | W1-W2 | AVERAGE | MIN | AMBIENT TEM. |
| | 0 | 0 | 0 | 0.000 | 0 | 0 °C |

ROYCE CROSS GROUP

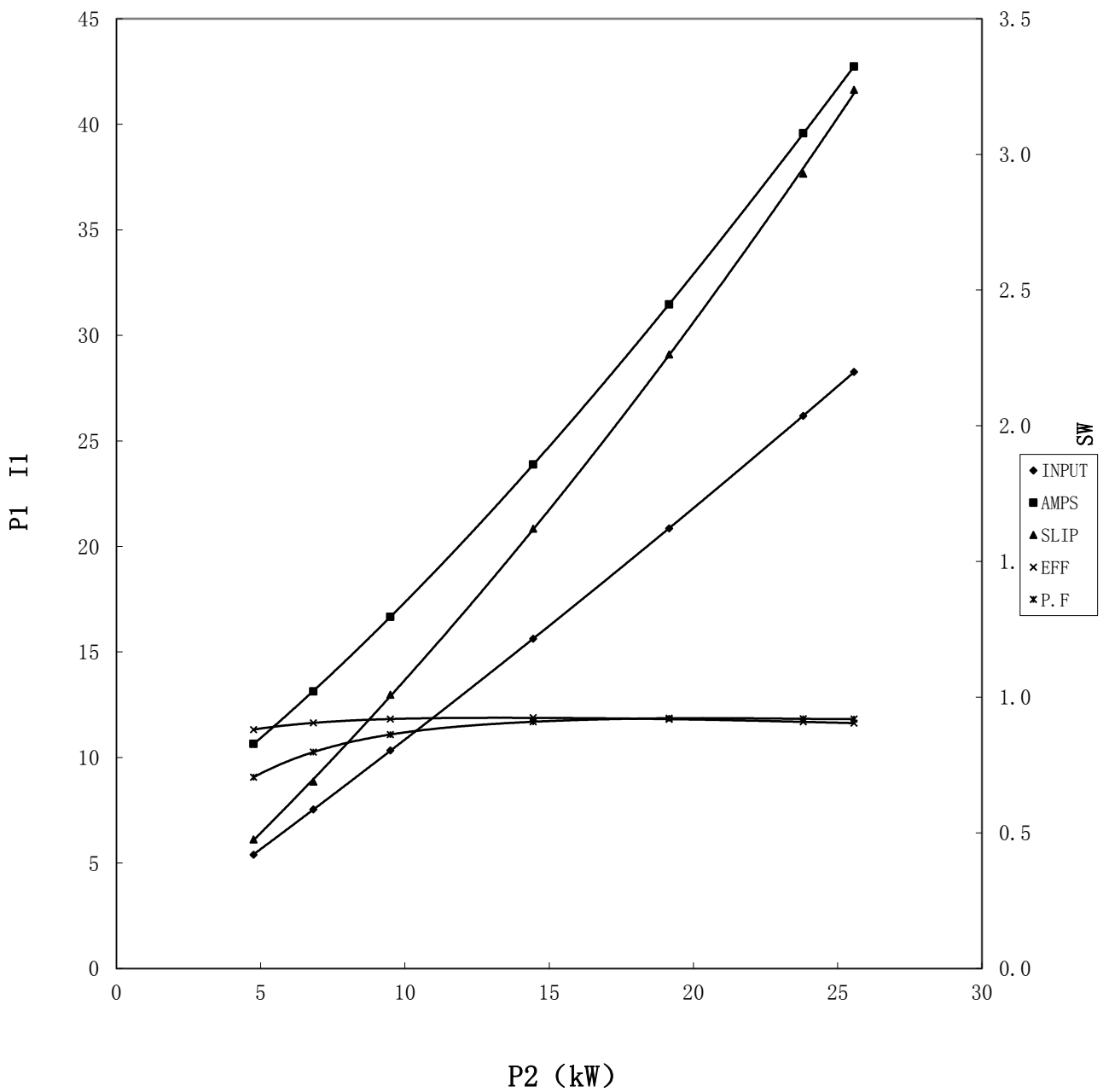
| | |
|------------|---------------|
| Manu. Date | Serial No |
| 2016.05 | 1 |
| Test Date | Report Number |
| 2016.05.25 | 16106 |

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| | | | | | | | | |
|------------|-----------|--------------|---------|--------------|------------|-----------|------|-----------|
| Type | Y3-160L-2 | Poles | 2 | output Power | 18.5 | kW | | |
| Voltage | 415 | V | Current | 30.5 | A | Frequency | 50.0 | Hz |
| Speed | 2933 | r/min | Duty | S1 | Connection | | | |
| Ins. class | F | Weight | 0 | kg | | | IP55 | |

Load Curve



ELECTRIC MOTOR TEST REPORT – THREE PHASE INDUCTION MOTOR

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|------------|-----------|--------------|---------|--------------|------------|-----------|------|-----------|
| Type | Y3-160L-2 | Poles | 2 | output Power | 18.5 | kW | | |
| Voltage | 415 | V | Current | 30.5 | A | Frequency | 50.0 | Hz |
| Speed | 2933 | r/min | Duty | S1 | Connection | | | |
| Ins. class | F | Weight | 0 | kg | | IP55 | | |

LOAD TEST

| V | Hz | A1 (unit) | A2 (unit) | A3 (unit) | mul. | W1 (unit) | W2 (unit) | mul. | r/min |
|-------|-------|--------------|--------------|--------------|------|--------------|---------------|------|--------|
| 415.3 | 50.02 | 4.264 | 4.262 | 4.292 | 10 | 1013.6 | 1812.8 | 10 | 2903.9 |
| 415.0 | 50.01 | 3.951 | 3.946 | 3.975 | 10 | 942.4 | 1675.8 | 10 | 2912.6 |
| 415.0 | 50.02 | 3.143 | 3.137 | 3.158 | 10 | 751.1 | 1333.8 | 10 | 2933.2 |
| 415.3 | 50.01 | 2.388 | 2.381 | 2.395 | 10 | 549.4 | 1013.6 | 10 | 2951.9 |
| 415.2 | 50.01 | 1.669 | 1.662 | 1.670 | 10 | 326.0 | 707.0 | 10 | 2970.3 |
| 415.1 | 50.00 | 1.316 | 1.309 | 1.314 | 10 | 202.6 | 550.9 | 10 | 2979.3 |
| 415.5 | 50.01 | 1.068 | 1.059 | 1.065 | 10 | 107.1 | 432.5 | 10 | 2986.3 |

| % LOAD | OUTPUT W | INPUT W | AMPS A | Pcu1 W | SLIP % | Pcu2 W | Ps W | EFF % | P. F. |
|------------|-------------|------------|-----------|-----------|-----------|-----------|---------|----------|-------|
| 150 | 27750 | 30886.1 | 46.653 | 1308.3 | 3.623 | 1055.1 | 232.7 | 89.85 | 0.921 |
| 125 | 23125 | 25384.5 | 38.355 | 884.3 | 2.810 | 676.5 | 158.8 | 91.10 | 0.921 |
| 100 | 18500 | 20112.4 | 30.399 | 555.5 | 2.174 | 416.1 | 100.8 | 91.98 | 0.920 |
| 75 | 13875 | 15013.9 | 23.051 | 319.4 | 1.551 | 221.4 | 58.1 | 92.41 | 0.906 |
| 50 | 9250 | 10072.6 | 16.343 | 160.6 | 0.979 | 93.0 | 29.0 | 91.83 | 0.857 |
| 25 | 4625 | 5265.1 | 10.485 | 66.1 | 0.463 | 22.1 | 11.9 | 87.84 | 0.699 |

| | | |
|--------------------------|--------------------------------------|------------------------|
| ROYCE CROSS GROUP | Manufacturing Date 2016.05 | Serial No 1 |
| | Test Date 2016.05.25 | Report Number 16106 |