

# ROYCE CROSS GROUP

## ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

|                                |            |             |              |
|--------------------------------|------------|-------------|--------------|
| <b>NAMEPLATE DATA</b>          |            |             |              |
| YE2-280M-2 FRAME               | IEC TYPE   | 110 kW      | 2980 r/min   |
| 2 POLE                         | 3 PHASE    | 415 VOLTS   | 50 Hz        |
| ROYCE CROSS GROUP MANUFACTURER | 180.3 AMPS | IP55 IP     |              |
|                                | S1 DUTY    | F INS.CLASS | Δ CONNECTION |

| MAJOR CONTENTS                         | UNIT   | TEST VALUE |
|--|--------|------------|
| STATOR RESISTANCE OF PHASE             | OHM    | 0.03888    |
| NO LOAD CURRENT                        | AMP    | 39.331     |
| NO LOAD INPUT                          | W      | 3150.9     |
| CORE LOSS(Pfe)                         | W      | 998.2      |
| WINDAGE FRICTION LOSS(Pfw)             | W      | 2096.7     |
| STATOR WINDING LOSS(Pcu1)              | W      | 1247.3     |
| ROTOR WINDING LOSS(Pcu2)               | W      | 895.3      |
| STRAY LOAD LOSS(Ps)                    | W      | 1544.8     |
| FULL LOAD CURRENT                      | AMP    | 180.45     |
| LOCKED ROTOR CURRENT                   | AMP    | 1089.78    |
| LOCKED ROTOR CURRENT/FULL LOAD CURRENT | P.U.   | 6.04       |
| FULL LOAD TORQUE                       | N.m    | 352.89     |
| LOCKED ROTOR TORQUE                    | N.m    | 651.38     |
| LOCKED ROTOR TORQUE/FULL LOAD TORQUE   | P.U.   | 1.85       |
| PULL OUT TORQUE                        | N.m    | 980.78     |
| PULL OUT TORQUE/FULL LOAD TORQUE       | P.U.   | 2.78       |
| INPUT @ FULL LOAD                      | kW     | 116.78     |
| EFFICIENCY @ FULL LOAD                 | %      | 94.19      |
| POWER FACTOR @ FULL LOAD               |        | 0.900      |
| FULL LOAD SLIP                         | %      | 0.782      |
| FULL LOAD SPEED                        | r/min  | 2976.6     |
| STATOR WINDING TEMPERATURE RISE        | K      | 64         |
| D.E. BEARINGS TEMPERATURE BY PT100     | Deg. C | 52.6       |
| AMBIENT TEMPERATURE OF TESTING         | Deg. C | 18.3       |
| NOISE                                  | dB(A)  | 90         |
| VIBRATION                              | mm/s   | 1.0        |

|   |            |  |              |
|---|------------|--|--------------|
| <b>ROYCE CROSS GROUP</b><br><br>YE2-280M-2<br>110 kW<br>415 VOLTS 50 Hz | SERIAL NO. |  |              |
|   | DATE       |  | REV          |
|   | DRAWN      |  | DOCUMENT NO. |
|   | APPRVD     |  |              |
|   | CHECKED    |  |              |

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## ROYCE CROSS GROUP

|            |            |         |         |            |          |
|------------|------------|---------|---------|------------|----------|
| Type       | YE2-280M-2 | Poles   | 2       | Power      | 110.0 kW |
| Voltage    | 415 V      | Current | 180.3 A | Frequency  | 50 Hz    |
| Speed      | 2980 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. | ℃    |
|-------|------|----|-------|-------|-------|------|--------|-------|------|------|
| 500.1 | 1    | 50 | 3.198 | 3.182 | 3.163 | 20   | -473.6 | 673.6 | 20   | 72.8 |
| 465.8 | 1    | 50 | 2.488 | 2.466 | 2.462 | 20   | -324.7 | 500.1 | 20   | 72.6 |
| 415.2 | 1    | 50 | 1.982 | 1.961 | 1.960 | 20   | -212.3 | 369.9 | 20   | 72.3 |
| 363.7 | 1    | 50 | 3.379 | 3.355 | 3.409 | 10   | -280.1 | 571.1 | 10   | 72.0 |
| 313.1 | 1    | 50 | 2.845 | 2.827 | 2.877 | 10   | -169.0 | 439.3 | 10   | 71.8 |
| 256.5 | 1    | 50 | 2.384 | 2.370 | 2.411 | 10   | -79.2  | 327.2 | 10   | 71.6 |
| 207.1 | 1    | 50 | 2.001 | 1.992 | 2.030 | 10   | -7.6   | 241.8 | 10   | 71.2 |
| 163.5 | 1    | 50 | 1.826 | 1.819 | 1.854 | 10   | 22.8   | 202.5 | 10   | 71.1 |
| 123.6 | 1    | 50 | 1.693 | 1.676 | 1.722 | 10   | 52.5   | 166.4 | 10   | 70.6 |

|                          |                    |               |
|--------------------------|--------------------|---------------|
| <b>ROYCE CROSS GROUP</b> | Manufacturing Date | Serial No     |
|                          |                    |               |
|                          | Test Date          | Report Number |
|                          |                    |               |

# ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

## ROYCE CROSS GROUP

|            |                   |         |                |            |       |           |
|------------|-------------------|---------|----------------|------------|-------|-----------|
| Type       | YE2-280M-2        | Poles   | 2              | Power      | 110.0 | <b>kW</b> |
| Voltage    | 415 <b>V</b>      | Current | 180.3 <b>A</b> | Frequency  | 50.0  | <b>Hz</b> |
| Speed      | 2980 <b>r/min</b> | Duty    | S1             | Connection | Δ     |           |
| Ins. class | F                 | Weight  | 0 <b>kg</b>    |            | IP55  |           |

### LOCKED ROTOR TEST

| VOL   | mul. | Ik1   | Ik2   | Ik3   | mul.  | W1     | W2    | mul. | Torqure<br>N. m |
|-------|------|-------|-------|-------|-------|--------|-------|------|-----------------|
| 288.0 | 1.0  | 3.615 | 3.631 | 3.678 | 200.0 | -152.7 | 738.5 | 200  | 290.84          |
| 252.7 | 1.0  | 3.140 | 3.148 | 3.185 | 200.0 | -121.9 | 560.4 | 200  | 211.20          |
| 216.0 | 1.0  | 2.651 | 2.660 | 2.691 | 200.0 | -89.3  | 401.7 | 200  | 151.48          |
| 183.0 | 1.0  | 2.224 | 2.230 | 2.256 | 200.0 | -64.6  | 284.8 | 200  | 109.06          |
| 149.5 | 1.0  | 3.611 | 3.621 | 3.664 | 100.0 | -87.3  | 376.4 | 100  | 70.98           |
| 117.5 | 1.0  | 2.836 | 2.841 | 2.872 | 100.0 | -55.1  | 232.2 | 100  | 43.28           |
| 84.9  | 1.0  | 2.046 | 2.049 | 2.072 | 100.0 | -28.2  | 121.0 | 100  | 22.51           |

|                          |                    |               |
|--------------------------|--------------------|---------------|
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# ELECTRIC MOTOR TEST REPORT - THREE PHASE INDUCTION MOTOR

## ROYCE CROSS GROUP

|            |            |  |  |         |         |  |            |        |  |
|------------|------------|--|--|---------|---------|--|------------|--------|--|
| Type       | YE2-280M-2 |  |  | Poles   | 2       |  | Power      | 110 kW |  |
| Voltage    | 415 V      |  |  | Current | 180.3 A |  | Frequency  | 50 Hz  |  |
| Speed      | 2980 r/min |  |  | Duty    | S1      |  | Connection | Δ      |  |
| Ins. class | F          |  |  | Weight  | 0 kg    |  |            | IP55   |  |

### TEMPERATURE RISE TEST

| TIME<br>(h:min) | V     | I1      | I2    | I3    | mul. | W1       | W2     | mul. | T1<br>°C | T2<br>°C | T3<br>°C | T4<br>°C | T5<br>°C | T6<br>°C | T7<br>°C | T8<br>°C | T9<br>°C | T10<br>°C | T11<br>°C | T12<br>°C | T13<br>°C |      |
|-----------------|-------|---------|-------|-------|------|----------|--------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|------|
| 10:40           | 415.1 | 3.607   | 3.613 | 3.644 | 50   | 858.1    | 1473.2 | 50   | 45.6     | —        | 72.2     | 74.7     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 16.7 |
| 11:10           | 415.1 | 3.605   | 3.613 | 3.642 | 50   | 856.4    | 1472.1 | 50   | 49.1     | —        | 77.2     | 79.8     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 17.1 |
| 11:40           | 414.9 | 3.545   | 3.554 | 3.581 | 50   | 846.9    | 1448.8 | 50   | 51.1     | —        | 79.8     | 82.5     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 17.4 |
| 12:10           | 415.1 | 3.570   | 3.578 | 3.605 | 50   | 850.7    | 1457.7 | 50   | 52.3     | —        | 81.0     | 83.8     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 17.6 |
| 12:40           | 415.2 | 3.570   | 3.576 | 3.605 | 50   | 851.2    | 1458.3 | 50   | 52.5     | —        | 82.0     | 84.8     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 17.9 |
| 13:10           | 415.4 | 3.611   | 3.618 | 3.646 | 50   | 857.5    | 1474.4 | 50   | 52.4     | —        | 82.5     | 85.3     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 18.2 |
| 13:40           | 415.2 | 3.589   | 3.596 | 3.625 | 50   | 854.8    | 1465.6 | 50   | 52.4     | —        | 82.8     | 85.6     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 18.4 |
| 14:10           | 415.2 | 3.565   | 3.572 | 3.602 | 50   | 849.5    | 1455.3 | 50   | 52.6     | —        | 82.9     | 85.7     | —        | —        | —        | —        | —        | —         | —         | —         | —         | 18.3 |
| 最后三点平均值         |       | 180.132 |       |       | A    | 115952.5 |        |      | W        | 52.6     | —        | 82.7     | 85.5     | —        | —        | —        | —        | —         | —         | —         | —         | 18.3 |

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)   | 55      | 85      | 116     | 156     | 195     | 227     | 260     |
| RESISTANCE | 0.02491 | 0.02486 | 0.02481 | 0.02475 | 0.02470 | 0.02466 | 0.02462 |

#### WINDING RESISTANCE(COLD)

|   |         |         |         |         |         |              |
|---|---------|---------|---------|---------|---------|--------------|
| Δ | U1-V1   | U1-W1   | V1-W1   | AVERAGE | MIN     | AMBIENT TEM. |
|   | 0.01969 | 0.01964 | 0.01965 | 0.01966 | 0.01964 | 15.3 °C      |

## ROYCE CROSS GROUP

Manu. Date

Serial No

Test Date

Report Number

**ELECTRIC MOTOR TEST REPORT -  
THREE PHASE INDUCTION MOTOR**

**ROYCE CROSS GROUP**

|            |            |         |         |            |       |           |
|------------|------------|---------|---------|------------|-------|-----------|
| Type       | YE2-280M-2 | Poles   | 2       | Power      | 110.0 | <b>kW</b> |
| Voltage    | 415 V      | Current | 180.3 A | Frequency  | 50.0  | <b>Hz</b> |
| Speed      | 2980 r/min | Duty    | S1      | Connection | Δ     |           |
| Ins. class | F          | Weight  | 0 kg    |            | IP55  |           |

**LOAD TEST**

| V     | HZ    | I1    | I2    | I3    | mul. | W1    | W2     | mul. | r/min  | Temperature °C | Torqur N.m |
|-------|-------|-------|-------|-------|------|-------|--------|------|--------|----------------|------------|
| 415.1 | 50.01 | 2.586 | 2.608 | 2.629 | 100  | 563.4 | 1052.5 | 100  | 2968.1 | 82.7           | 484.9      |
| 414.9 | 50.01 | 2.315 | 2.319 | 2.339 | 100  | 527.3 | 944.1  | 100  | 2971.6 | 83.4           | 442.4      |
| 414.8 | 50.01 | 1.824 | 1.829 | 1.843 | 100  | 436.8 | 748.4  | 100  | 2977.4 | 84.0           | 355.0      |
| 414.8 | 50.00 | 2.737 | 2.748 | 2.769 | 50   | 661.0 | 1136.7 | 50   | 2982.9 | 83.4           | 268.9      |
| 415.0 | 50.00 | 1.899 | 1.910 | 1.869 | 50   | 420.7 | 765.3  | 50   | 2988.7 | 82.0           | 175.1      |
| 415.2 | 50.00 | 1.141 | 1.148 | 1.276 | 50   | 166.3 | 441.8  | 50   | 2993.1 | 81.6           | 84.0       |

Final Resistance of load: 0.00000 Ω ambient temperature 0.0 °C

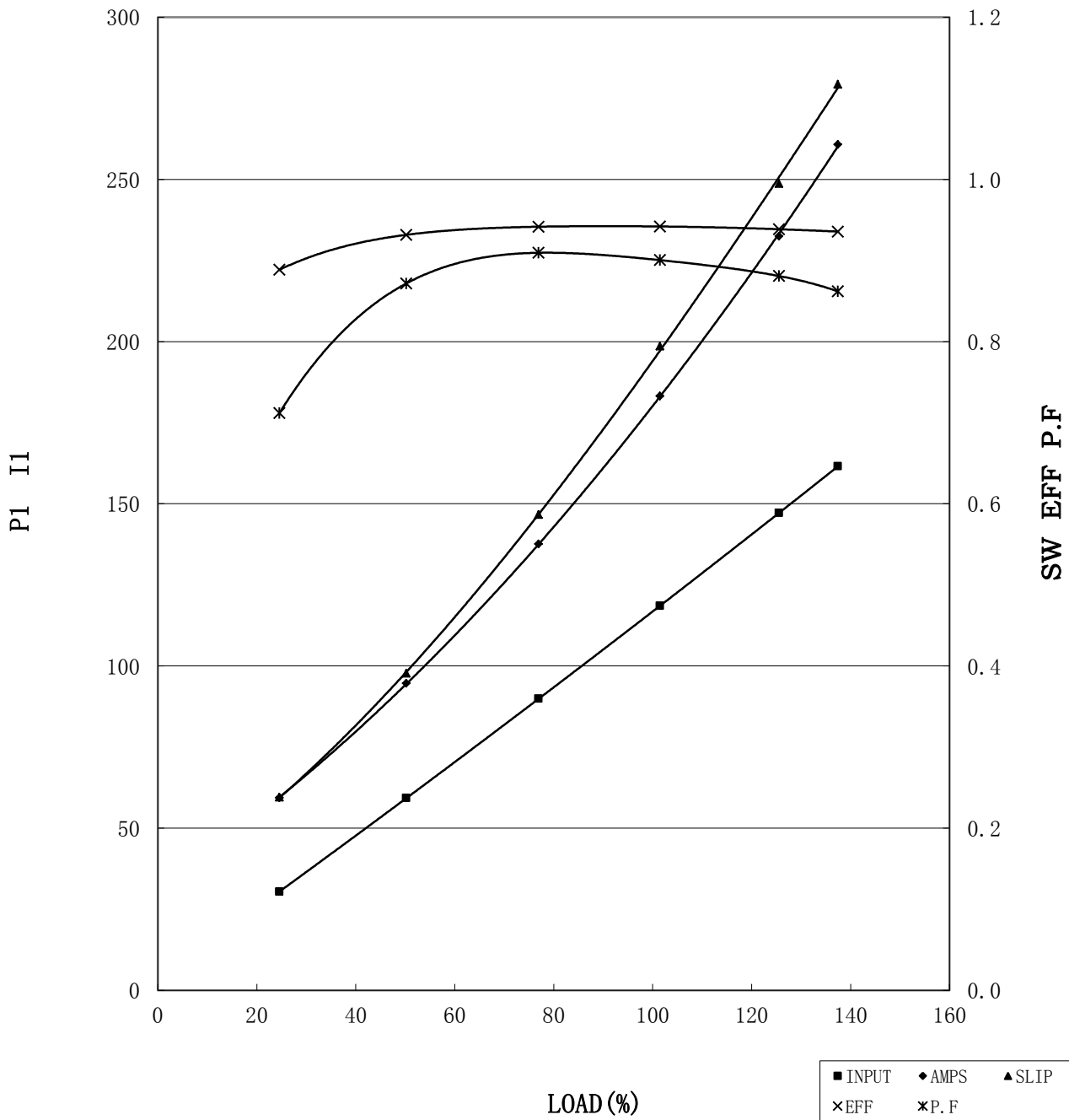
| LOAD % | P2 W   | I A   | P1 W     | Pcu1s W | Ss %  | Pcu2s W | Ps W   | Pfe W | EFF % | P.F   |
|--------|--------|-------|----------|---------|-------|---------|--------|-------|-------|-------|
| 150.0  | 165000 | 290.6 | 176831.9 | 3236.0  | 1.247 | 2151.7  | 3349.3 | 965.1 | 93.31 | 0.846 |
| 125.0  | 137500 | 231.3 | 146493.8 | 2050.2  | 0.990 | 1420.3  | 2428.3 | 968.7 | 93.86 | 0.881 |
| 100.0  | 110000 | 180.4 | 116782.3 | 1247.3  | 0.782 | 895.3   | 1544.8 | 974.0 | 94.19 | 0.900 |
| 75.0   | 82500  | 134.4 | 87658.4  | 692.4   | 0.572 | 492.1   | 879.1  | 979.9 | 94.12 | 0.907 |
| 50.0   | 55000  | 94.3  | 59046.8  | 340.9   | 0.389 | 224.8   | 386.2  | 986.5 | 93.15 | 0.871 |
| 25.0   | 27500  | 60.0  | 30902.5  | 138.0   | 0.241 | 71.7    | 98.0   | 993.1 | 88.99 | 0.716 |

|                          |                    |               |
|--------------------------|--------------------|---------------|
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|                          | Test Date          | Report Number |

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|            |            |         |         |              |       |    |
|------------|------------|---------|---------|--------------|-------|----|
| Type       | YE2-280M-2 | Poles   | 2       | output Power | 110.0 | kW |
| Voltage    | 415 V      | Current | 180.3 A | Frequency    | 50.0  | Hz |
| Speed      | 2980 r/min | Duty    | S1      | Connection   | Δ     |    |
| Ins. class | F          | Weight  | 0 kg    |              | IP55  |    |

## LOAD CURVE



# ELECTRIC MOTOR TEST REPORT – THREE PHASE INDUCTION MOTOR

|            |            |              |         |              |            |           |      |           |
|------------|------------|--------------|---------|--------------|------------|-----------|------|-----------|
| Type       | YE2-280M-2 | Poles        | 2       | output Power | 110.0      | <b>kW</b> |      |           |
| Voltage    | 415        | <b>V</b>     | Current | 180.3        | <b>A</b>   | Frequency | 50.0 | <b>Hz</b> |
| Speed      | 2980       | <b>r/min</b> | Duty    | S1           | Connection | Δ         |      |           |
| Ins. class | F          | Weight       | 0       | <b>kg</b>    | IP55       |           |      |           |

### TORQUE&CURRENT VS SPEED

