

# PRODUCT INFORMATION PACKET

**marathon®**  
Motors

Model No: TCA2P23A3181GACD01

Catalog No: TCA2P23A3181GACD01

2.2 kW General Purpose Low Voltage IEC Motor, 3 phase, 1000 RPM, 415 V, 112M Frame, TEFC  
Cast Iron IE3 Efficiency Motors



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**REGAL**

### Nameplate Specifications

|                            |        |                        |                             |
|----------------------------|--------|------------------------|-----------------------------|
| Output HP                  | 3 Hp   | Output KW              | 2.2 kW                      |
| Frequency                  | 50 Hz  | Voltage                | 415 V                       |
| Current                    | 5.0 A  | Speed                  | 958 rpm                     |
| Service Factor             | 1      | Phase                  | 3                           |
| Efficiency                 | 84.3 % | Power Factor           | 0.73                        |
| Duty                       | S1     | Insulation Class       | F                           |
| Frame                      | 112M   | Enclosure              | Totally Enclosed Fan Cooled |
| Ambient Temperature        | 50 °C  | Drive End Bearing Size | 6306                        |
| Opp Drive End Bearing Size | 6206   | UL                     | No                          |
| CSA                        | No     | CE                     | Yes                         |
| IP Code                    | 55     |                        |                             |

### Technical Specifications

|                       |               |                       |                |
|-----------------------|---------------|-----------------------|----------------|
| Electrical Type       | Squirrel Cage | Starting Method       | Direct On Line |
| Poles                 | 6             | Rotation              | Bi-Directional |
| Mounting              | B14B          | Motor Orientation     | Shaftdown      |
| Drive End Bearing     | 2z-C3         | Opp Drive End Bearing | 2z-C3          |
| Frame Material        | Cast Iron     | Shaft Type            | Keyed          |
| Overall Length        | 399 mm        | Frame Length          | 174 mm         |
| Shaft Diameter        | 28 mm         | Shaft Extension       | 60 mm          |
| Assembly/Box Mounting | Top           |                       |                |
| Outline Drawing       | 0211200266    | Connection Drawing    | 8442000085     |

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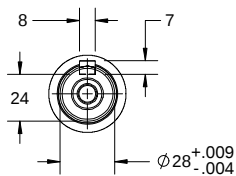
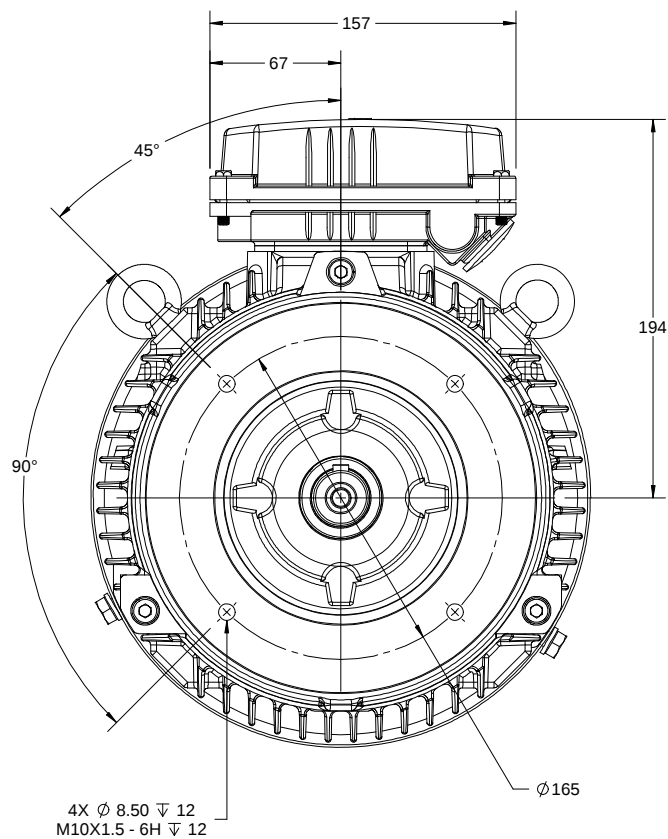
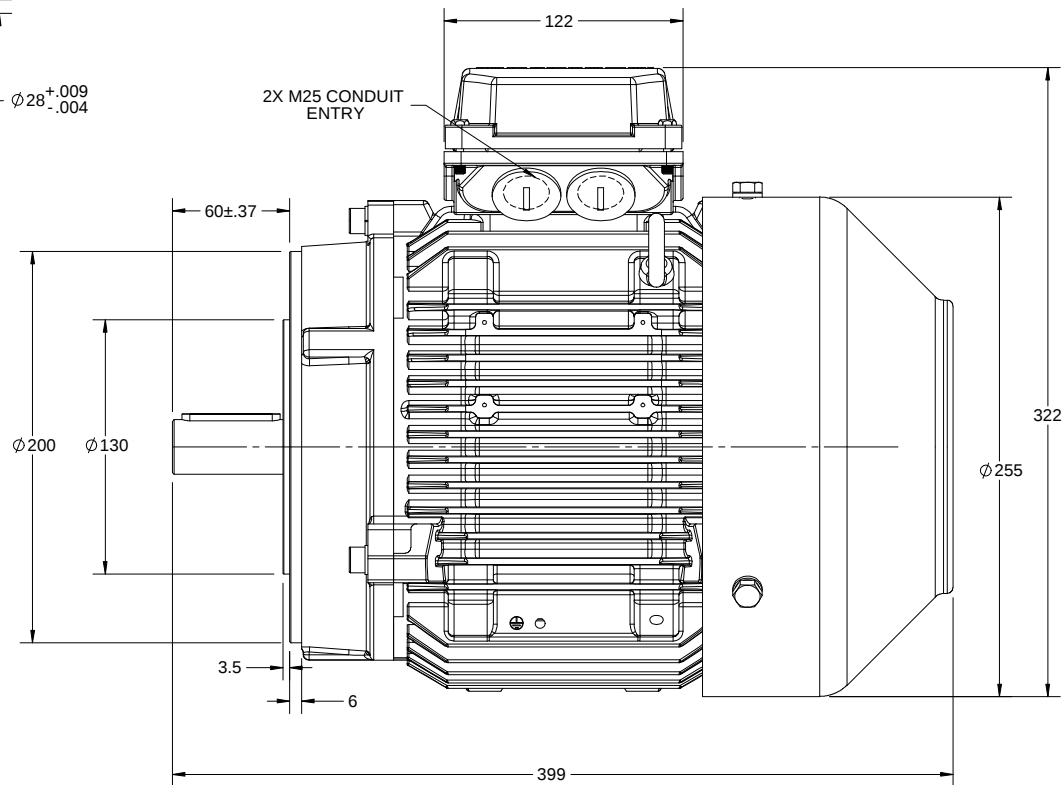
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2

1

B

B

2X M25 CONDUIT  
ENTRY

A

A

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                        |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|
| DRAWING REVISION<br>B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | REVISION BY<br>S.MUDDA | DATE<br>9/7/2018 |
| ECO<br>ECO-0147359                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | APPROVED BY<br>JAY     | DATE<br>9/7/2018 |
| ECO DESCRIPTION<br>OUTLINE UPDATED AS PER NEW 3D STRUCTURING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                        |                  |
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DRAWN BY  
SMAR

DATE  
02/09/13

APPROVED BY  
JAY

DATE  
02/09/13

REFERENCE

THIRD ANGLE  
PROJECTION

**marathon**  
Motors

DESCRIPTION  
112 FR.- B14B MTG. MOTOR TYPE: TCA

MATERIAL

PROCESS/FINISH

SIZE  
B

DRAWING NUMBER  
0211200266

SHEET  
1 OF 1

4

3

2

1

| DRAWING REVISION                       | REVISION BY        | DATE               |
|----------------------------------------|--------------------|--------------------|
| A                                      | SN                 | 13/01/2017         |
| ECO-0116390                            | APPROVED BY<br>SBD | DATE<br>13/01/2017 |
| ECO DESCRIPTION<br>NEW DRAWING RELEASE |                    |                    |

| GEOMETRIC TOLERANCE |      |  |
|---------------------|------|--|
| LINEAR DIM          |      |  |
| >0-6                | ±0.1 |  |
| >6-30               | ±0.2 |  |
| >30-120             | ±0.3 |  |



NOTES:

1. PRESSURE-SENSITIVE ADHESIVE COATED PAPER ON THE BACK OF SELF-ADHESIVE.
2. AT THE END OF YELLOW, WORDS, SYMBOLS, LETTERS ARE BLACK, BORDER IS BLACK.
3. THE TOLERANCE OF THE LINEAR SIZE OF THE TOLERANCE WITHOUT THE TOLERANCE BY THE TABLE.

8WD.442.2017

|                        |  |                                                                                 |  |                                                                               |  |                |  |        |  |
|------------------------|--|---------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------|--|----------------|--|--------|--|
| <div></div>            |  |                                                                                 |  | DRAWN BY                                                                      |  | SN             |  |        |  |
|                        |  |                                                                                 |  | DATE                                                                          |  | 16/12/2016     |  |        |  |
|                        |  |                                                                                 |  | APPROVED BY                                                                   |  | SBD            |  |        |  |
|                        |  |                                                                                 |  | DATE                                                                          |  | 16/12/2016     |  |        |  |
|                        |  |                                                                                 |  | REFERENCE                                                                     |  |                |  |        |  |
| THIRD ANGLE PROJECTION |  |  |  | SIZE                                                                          |  | DRAWING NUMBER |  | SHEET  |  |
|                        |  |                                                                                 |  | A                                                                             |  | 8442000085     |  | 1 OF 1 |  |
|                        |  |                                                                                 |  | MATERIAL                                                                      |  | PROCESS/FINISH |  |        |  |
|                        |  |                                                                                 |  | DESCRIPTION                                                                   |  |                |  |        |  |
|                        |  |                                                                                 |  | CONN DIAGRAM-NAMEPLATE                                                        |  |                |  |        |  |
|                        |  |                                                                                 |  | <div><div>REGAL<sup>TM</sup></div><div>Regal Beloit America, Inc.</div></div> |  |                |  |        |  |

**Model No.** TCA2P23A3181GACD01

| U<br>(V) | Δ / Y<br>Conn | f<br>(Hz) | P<br>[kW] | P<br>[hp] | I<br>[A] | n<br>[RPM] | T<br>[Nm] | IE<br>Class | % EFF at __ load |    |       |       | PF at __ load |       |       | I <sub>a</sub> /I <sub>N</sub><br>[pu] | T <sub>a</sub> /T <sub>N</sub><br>[pu] | T <sub>b</sub> /T <sub>N</sub><br>[pu] |
|----------|---------------|-----------|-----------|-----------|----------|------------|-----------|-------------|------------------|----|-------|-------|---------------|-------|-------|----------------------------------------|----------------------------------------|----------------------------------------|
| 415      | Y             | 50        | 2.2       | 3.0       | 5.0      | 958        | 22.34     | IE3         | 5/4FL            | FL | 3/4FL | 1/2FL | FL            | 3/4FL | 1/2FL | 5.9                                    | 2.5                                    | 2.8                                    |
|          |               |           |           |           |          |            |           |             |                  |    |       |       |               |       |       |                                        |                                        |                                        |

|                                  |                            |                                           |                                            |
|----------------------------------|----------------------------|-------------------------------------------|--------------------------------------------|
| Motor type                       | TCA                        | Degree of protection                      | IP 55                                      |
| Enclosure                        | TEFC                       | Mounting type                             | IM B14B                                    |
| Frame Material                   | Cast Iron                  | Cooling method                            | IC 411                                     |
| Frame size                       | 112M                       | Motor weight - approx.                    | 48 kg                                      |
| Duty                             | S1                         | Gross weight - approx.                    | 51 kg                                      |
| Voltage variation *              | ± 10%                      | Motor inertia                             | 0.0158 kgm <sup>2</sup>                    |
| Frequency variation *            | ± 5%                       | Load inertia                              | Customer to Provide                        |
| Combined variation *             | 10%                        | Vibration level                           | 1.6 mm/s                                   |
| Design                           | N                          | Noise level ( 1meter distance from motor) | 58 dB(A)                                   |
| Service factor                   | 1.0                        | No. of starts hot/cold/Equally spread     | 2/3/4                                      |
| Insulation class                 | F                          | Starting method                           | DOL                                        |
| Ambient temperature              | -20 to +50 °C              | Type of coupling                          | Direct                                     |
| Temperature rise (by resistance) | 70 [ Class B ] K           | LR withstand time (hot/cold)              | 15/30 s                                    |
| Altitude above sea level         | 1000 meter                 | Direction of rotation                     | Bi-directional                             |
| Hazardous area classification    | NA                         | Standard rotation                         | Clockwise form DE                          |
| Zone classification              | NA                         | Paint shade                               | RAL 5014                                   |
| Gas group                        | NA                         | Accessories                               |                                            |
| Temperature class                | NA                         | Accessory - 1                             | -                                          |
| Rotor type                       | Aluminum Die cast          | Accessory - 2                             | -                                          |
| Bearing type                     | Anti-friction ball bearing | Accessory - 3                             | -                                          |
| DE / NDE bearing                 | 6306-2Z / 6206-2Z          | Terminal box position                     | TOP                                        |
| Lubrication method               | Greased for life           | Maximum cable size/conduit size           | 1R x 3C x 16mm <sup>2</sup> /2 x M25 x 1.5 |
| Type of grease                   | NA                         | Auxiliary terminal box                    | NA                                         |

I<sub>a</sub>/I<sub>N</sub> - Locked Rotor Current / Rated CurrentT<sub>b</sub>/T<sub>N</sub> - Breakdown Torque / Rated TorqueT<sub>a</sub>/T<sub>N</sub> - Locked Rotor Torque / Rated Torque
**NOTE**

All performance values at rated voltage and frequency.

All performance parameters are subjected to standard tolerance as per IEC 60034-1

\* Voltage, Frequency and combine variation are as per IEC60034-1

Technical data are subject to change. There may be discrepancies between calculated and name plate values.

| Efficiency Standards | Europe | China | India           | Aus/Nz | Brazil | Global IEC |
|----------------------|--------|-------|-----------------|--------|--------|------------|
|                      | -      | -     | IS 12615 : 2018 | -      | -      | -          |

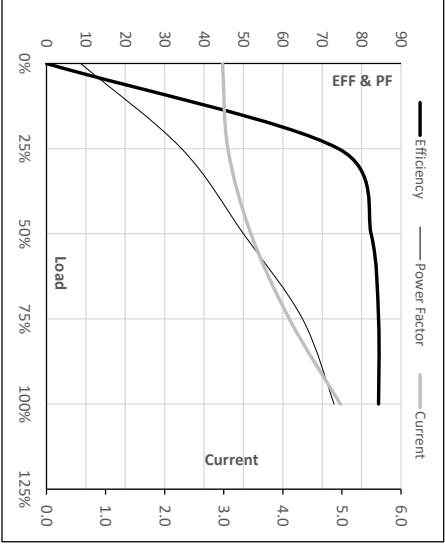
Model No. TCA2P23A3181GACD01

| Enclosure | U   | Δ / Y | f    | P    | P   | I     | n     | T    | T     | IE   | Amb | Duty | Elevation | Inertia              | Weight |
|-----------|-----|-------|------|------|-----|-------|-------|------|-------|------|-----|------|-----------|----------------------|--------|
| (V)       | Com | [Hz]  | [kW] | [hp] | [A] | [RPM] | [kgm] | [Nm] | Class | [°C] |     |      | [m]       | [kg·m <sup>2</sup> ] | [kg]   |
| TFC       | 415 | Y     | 50   | 2.2  | 3.0 | 5.0   | 958   | 2.28 | 22.34 | IE3  | 50  | S1   | 1000      | 0.0158               | 48     |

Motor Load Data

| Load Point   |       | NL   | 1/4FL | 1/2FL | 3/4FL | FL   | 5/4FL |
|--------------|-------|------|-------|-------|-------|------|-------|
| Current      | A     | 3.0  | 3.1   | 3.5   | 4.1   | 5.0  |       |
| Torque       | Nm    | 0.0  | 5.4   | 10.9  | 16.6  | 22.3 |       |
| Speed        | r/min | 1000 | 990   | 981   | 970   | 958  |       |
| Efficiency   | %     | 0.0  | 74.1  | 82.4  | 84.3  | 84.3 |       |
| Power Factor | %     | 8.7  | 34.3  | 50.0  | 65.0  | 73.0 |       |

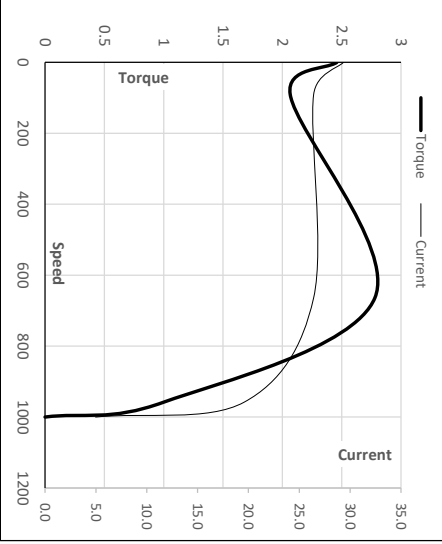
Performance vs Load Chart



Motor Speed Torque Data

| Load Point | LR    | P-Up | BD   | Rated | NL  |      |
|------------|-------|------|------|-------|-----|------|
| Speed      | r/min | 0    | 91   | 664   | 958 | 1000 |
| Current    | A     | 29.3 | 26.4 | 19.6  | 5.0 | 3.0  |
| Torque     | pu    | 2.5  | 2.1  | 2.8   | 1   | 0    |

Starting Characteristics Chart



**NOTE** Refer data sheet for applicable standard and tolerances on performance parameters

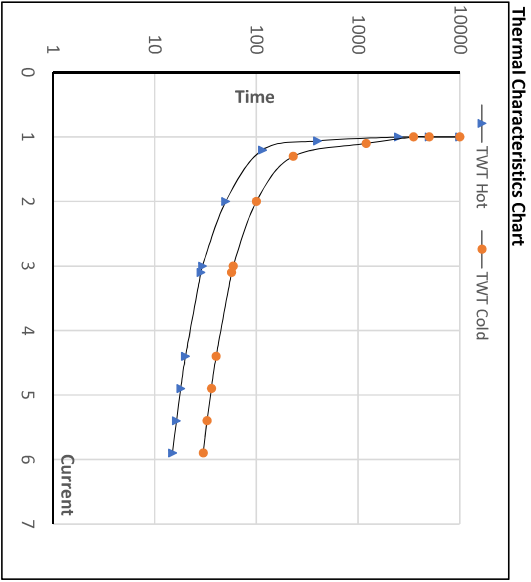
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| Enclosure | U<br>(V) | $\Delta$ / Y<br>Conn | f<br>[Hz] | P<br>[kW] | P<br>[hp] | I<br>[A] | n<br>[rpm] | T<br>[kgm] | T<br>[Nm] | IE<br>Class | Amb<br>[°C] | Duty | Elevation<br>[m] | Inertia<br>[kg·m <sup>2</sup> ] | Weight<br>[kg] |
|-----------|----------|----------------------|-----------|-----------|-----------|----------|------------|------------|-----------|-------------|-------------|------|------------------|---------------------------------|----------------|
| TEFC      | 415      | Y                    | 50        | 2.2       | 3.0       | 5.0      | 958        | 2.28       | 22.34     | IE3         | 50          | S1   | 1000             | 0.0158                          | 48             |

Motor Speed Torque Data

| Load     | FL | $I_1$ | $I_2$ | $I_3$ | $I_4$ | $I_5$ | LR  |     |
|----------|----|-------|-------|-------|-------|-------|-----|-----|
| TWT Hot  | s  | 10000 | 50    | 30    | 25    | 18    | 16  | 15  |
| TWT Cold | s  | 10000 | 100   | 59    | 50    | 35    | 31  | 30  |
| Current  | pu | 1     | 2     | 3     | 4     | 5     | 5.5 | 5.9 |



NOTE Refer data sheet for applicable standard and tolerances on performance parameters

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