

# PRODUCT INFORMATION PACKET

**marathon®**  
Motors

Model No: TCA1P51A3181GACD01

Catalog No: TCA1P51A3181GACD01

1.5 kW General Purpose Low Voltage IEC Motor, 3 phase, 3000 RPM, 415 V, 90S Frame, TEFC  
Cast Iron IE3 Efficiency Motors



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**REGAL**

### Nameplate Specifications

|                            |        |                        |                             |
|----------------------------|--------|------------------------|-----------------------------|
| Output HP                  | 2 Hp   | Output KW              | 1.5 kW                      |
| Frequency                  | 50 Hz  | Voltage                | 415 V                       |
| Current                    | 2.8 A  | Speed                  | 2876 rpm                    |
| Service Factor             | 1      | Phase                  | 3                           |
| Efficiency                 | 84.2 % | Power Factor           | 0.89                        |
| Duty                       | S1     | Insulation Class       | F                           |
| Frame                      | 90S    | Enclosure              | Totally Enclosed Fan Cooled |
| Ambient Temperature        | 50 °C  | Drive End Bearing Size | 6205                        |
| Opp Drive End Bearing Size | 6205   | UL                     | No                          |
| CSA                        | No     | CE                     | Yes                         |
| IP Code                    | 55     |                        |                             |

### Technical Specifications

|                       |               |                       |                |
|-----------------------|---------------|-----------------------|----------------|
| Electrical Type       | Squirrel Cage | Starting Method       | Direct On Line |
| Poles                 | 2             | Rotation              | Bi-Directional |
| Mounting              | B14B          | Motor Orientation     | Horizontal     |
| Drive End Bearing     | 2z-C3         | Opp Drive End Bearing | 2z-C3          |
| Frame Material        | Cast Iron     | Shaft Type            | Keyed          |
| Overall Length        | 307 mm        | Frame Length          | 128 mm         |
| Shaft Diameter        | 24 mm         | Shaft Extension       | 50 mm          |
| Assembly/Box Mounting | Top           |                       |                |
| Outline Drawing       | 0209000509    | Connection Drawing    | 8442000085     |

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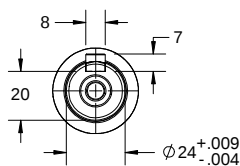
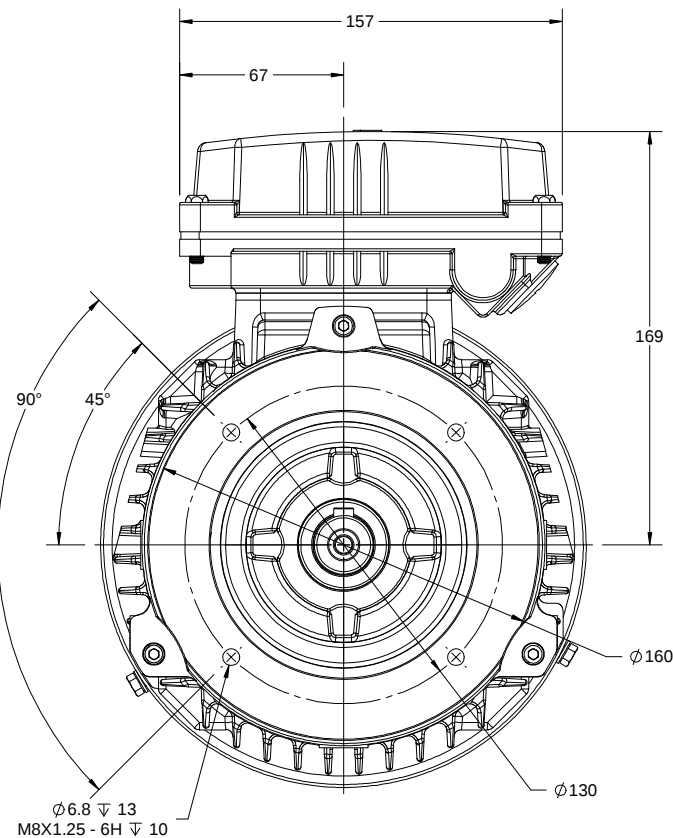
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B

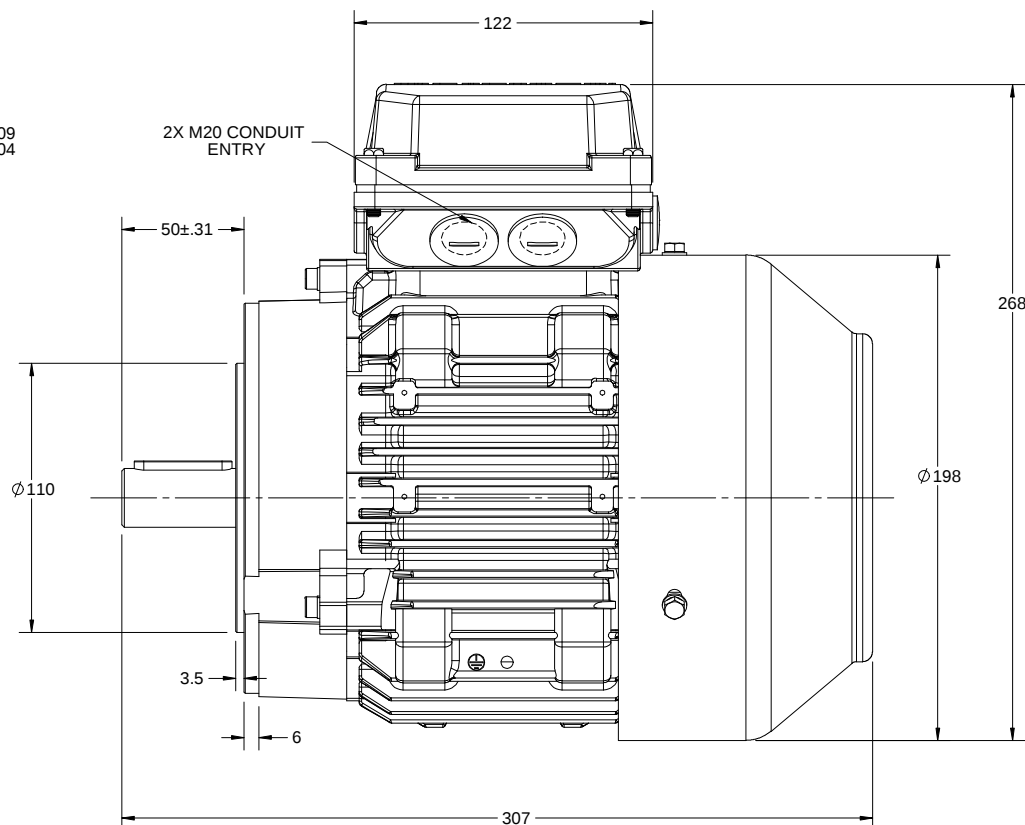
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A

A



2X M20 CONDUIT ENTRY



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                          |                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------|
| DRAWING REVISION<br>C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | REVISION BY<br>I. RAMDAS | DATE<br>02/07/2018 |
| ECO<br>ECO-0147359                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | APPROVED BY<br>JAY       | DATE<br>02/07/2018 |
| ECO DESCRIPTION<br>OUTLINE UPDATED AS PER 3D STRUCTURING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                          |                    |
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|                           |                                                                     |                              |
|---------------------------|---------------------------------------------------------------------|------------------------------|
| DRAWN BY<br>KCS           |                                                                     |                              |
| DATE<br>26/05/2015        |                                                                     |                              |
| APPROVED BY<br>SBD        | DESCRIPTION<br><b>OUTLINE</b><br>90S FR.- B14B MTG. MOTOR TYPE: TCA |                              |
| DATE<br>26/05/2015        |                                                                     |                              |
| REFERENCE                 | MATERIAL                                                            | PROCESS/FINISH               |
| THIRD ANGLE<br>PROJECTION | SIZE<br>B                                                           | DRAWING NUMBER<br>0209000509 |
|                           |                                                                     | SHEET<br>1 OF 1              |

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| DRAWING REVISION    | REVISION BY | DATE       |
|---------------------|-------------|------------|
| A                   | SN          | 13/01/2017 |
| ECO-0116390         | APPROVED BY | DATE       |
| ECO DESCRIPTION     | SBD         | 13/01/2017 |
| 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.

|                        |  |            |
|------------------------|--|------------|
| DRAWN BY               |  | SN         |
| DATE                   |  | 16/12/2016 |
| APPROVED BY            |  | SBD        |
| DATE                   |  | 16/12/2016 |
| REFERENCE              |  |            |
| THIRD ANGLE PROJECTION |  |            |
| SIZE                   |  | A          |
| DRAWING NUMBER         |  | 8442000085 |
| SHEET                  |  | 1 OF 1     |

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**REGAL**<sup>TM</sup>  
 Regal Beloit America, Inc.

DESCRIPTION  
CONN DIAGRAM-NAMEPLATE

MATERIAL PROCESS/FINISH

**Model No.** TCA1P51A3181GACD01

| 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        | 1.5       | 2.0       | 2.8      | 2876       | 4.95      | IE3         | 5/4FL            | FL | 3/4FL | 1/2FL | FL            | 3/4FL | 1/2FL | 7                                      | 3.0                                    | 3.1                                    |
|          |               |           |           |           |          |            |           |             |                  |    |       |       |               |       |       |                                        |                                        |                                        |

|                                  |                            |                                           |                                            |
|----------------------------------|----------------------------|-------------------------------------------|--------------------------------------------|
| Motor type                       | TCA                        | Degree of protection                      | IP 55                                      |
| Enclosure                        | TEFC                       | Mounting type                             | IM B14B                                    |
| Frame Material                   | Cast Iron                  | Cooling method                            | IC 411                                     |
| Frame size                       | 90S                        | Motor weight - approx.                    | 26.7 kg                                    |
| Duty                             | S1                         | Gross weight - approx.                    | 27.7 kg                                    |
| Voltage variation *              | ± 10%                      | Motor inertia                             | 0.0025 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) | 63 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)              | 7/15 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                 | 6205-2Z / 6205-2Z          | Terminal box position                     | TOP                                        |
| Lubrication method               | Greased for life           | Maximum cable size/conduit size           | 1R x 3C x 10mm <sup>2</sup> /2 x M20 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 | -      | -      | -          |

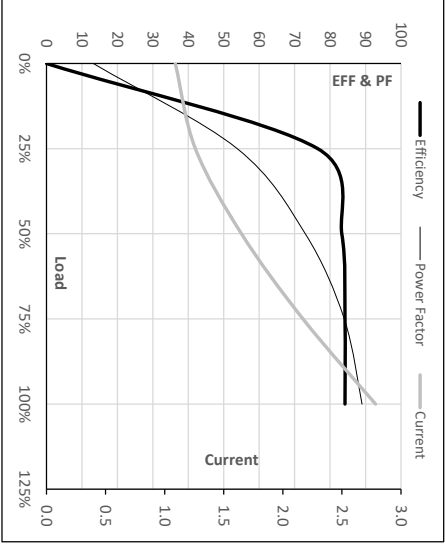
Model No. TCA1P51A3181GACD01

| Enclosure | U   | $\Delta$ / 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]   |
| TEFC      | 415 | Y            | 50   | 1.5  | 2.0  | 2.8 | 2876  | 0.50  | 4.95 | IE3   | 50   | S1   | 1000      | 0.0025               | 26.7   |

Motor Speed Data

| Load Point   | NL    | 1/4FL | 1/2FL | 3/4FL | FL   | 5/4FL |
|--------------|-------|-------|-------|-------|------|-------|
| Current      | A     | 1.1   | 1.3   | 1.7   | 2.2  | 2.8   |
| Torque       | Nm    | 0.0   | 1.2   | 2.4   | 3.7  | 4.9   |
| Speed        | r/min | 3000  | 2970  | 2942  | 2911 | 2876  |
| Efficiency   | %     | 0.0   | 76.5  | 83.3  | 84.2 | 84.2  |
| Power Factor | %     | 13.2  | 53.8  | 73.0  | 84.0 | 89.0  |

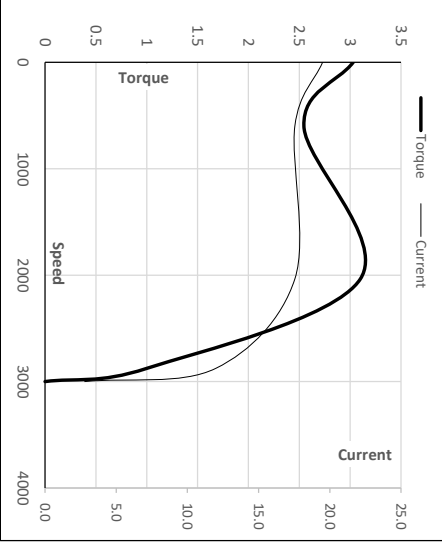
Performance vs Load Chart



Motor Speed Torque Data

| Load Point | LR    | P-Up | BD   | Rated | NL   |      |
|------------|-------|------|------|-------|------|------|
| Speed      | r/min | 0    | 600  | 2036  | 2876 | 3000 |
| Current    | A     | 19.5 | 17.5 | 12.0  | 2.8  | 1.1  |
| Torque     | pu    | 3.0  | 2.5  | 3.1   | 1    | 0    |

Starting Characteristics Chart



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

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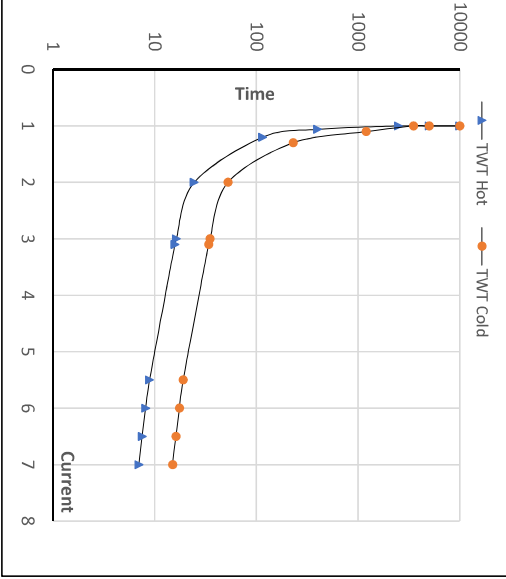
**Model No.** TCA1P51A3181GACD01

| Enclosure | U<br>(V) | Δ / 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        | 1.5       | 2.0       | 2.8      | 2876       | 0.50       | 4.95      | IE3         | 50          | S1   | 1000             | 0.0025                          | 26.7           |

**Motor Speed Torque Data**

| Load     | FL | I <sub>1</sub> | I <sub>2</sub> | I <sub>3</sub> | I <sub>4</sub> | I <sub>5</sub> | LR  |    |
|----------|----|----------------|----------------|----------------|----------------|----------------|-----|----|
| TWT Hot  | s  | 10000          | 25             | 16             | 14             | 11             | 9   | 7  |
| TWT Cold | s  | 10000          | 52             | 35             | 30             | 22             | 19  | 15 |
| Current  | pu | 1              | 2              | 3              | 4              | 5              | 5.5 | 7  |

**Thermal Characteristics Chart**



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

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