Bardac drives

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APPLICATION NOTE

Drive Applications Support Library

Application Note	AN-P2-001
Title	Setting The Motor Nameplate Details
Related Products	P2 Series AC Drives
Level: 1	1 - Fundamental - No previous experience necessary. 2 - Basic - Some basic drives knowledge recommended. 3 - Advanced - Some basic drives knowledge required. 4 - Expert - Good experience in topic of subject matter recommended.

Overview:

P2 Series drives are typically configured by default to run a motor with the minimum of parameter settings required, however some basic setting of some motor parameters will always be required to provide best possible control performance and to provide suitable overload protection to the connected motor.

This document details the few basic motor parameters that are required to be set / checked when installing P2 Series drives in any application.

For the P2, operating in sensor-less Vector mode using its 3rd generation vector control technology (3GV), the performance of the drive will be governed by the accuracy of information provided within the parameters listed herein.

The parameters listed need to be set to the Motor Nameplate Data values (taken from the rating plate of the motor) or to the motor manufacturer specified data (Technical Specification) and entered into the P2 to ensure that the drive is accurately matched to the motor. Completion of this procedure will ensure best performance and avoid the risk of damage to the motor.

Rating plate parameters :

P1-07 Motor rated voltage
The motor rated voltage in Volts should be entered into this parameter.

Most industrial motors have a Star / Delta connection to allow operation at different voltages.

Ensure that the voltage value in this parameter corresponds to the motor terminal winding connection and the mains power supply voltage in use. An incorrect value in this parameter may reduce the motor performance or risk damaging the motor (See motor data plate examples shown in appendix).

When the correct value is entered, the P2 will attempt to adjust the output voltage to maintain the correct value even with fluctuations in the incoming supply voltage. Setting this parameter to zero disables the voltage compensation function, meaning that the output voltage at motor rated speed / frequency will be the same voltage as the incoming supply, with no compensation for fluctuations.

P1-08 Motor rated current

The motor rated current in Amps should be entered into this parameter.

Care should be taken to ensure that the current rating taken from the ratings plate corresponds to the motor voltage rating in use, i.e. the Star / Delta connection configuration.

Typically, this will be displayed as: 220V / 400V 3.3A / 1.9A

See motor data plate examples shown in appendix.

When this parameter has been set, the P2 will monitor the current and determine operation / protection of the motor in an overload condition. Should the motor run in an overload condition for an extended period of time the P2 will trip. This provides one level of protection to prevent the motor from overheating.

The factory default value for this parameter is the rated current of the drive.

P1-09 Motor rated frequency

The motor rated frequency in Hertz should be entered into this parameter. In general, this value will be 50Hz (60Hz if the P2 is horse power rated), so in most cases, no change is required to the factory default setting.

Where high speed or special motors with alternative base frequencies are used, this parameter must be set correctly according to the motor in use, otherwise the motor may be damaged.

P1-10 Motor rated speed in rpm

This parameter only needs to be set if the user requires the speed to be displayed in RPM, or slip compensation is required for the output frequency. Slip compensation provides a small degree of compensation for load changes meaning that the motor speed stays more constant with varying loads in comparison to when P1-10 = 0 (display in Hz, compensation disabled).

The speed regulation is inferior to using sensorless vector speed control (with P4-01 = 0).

When the rated speed has been set, all speed-related parameters (e.g. maximum speed, minimum speed etc.) will be displayed in RPM rather than Hz.

The drive will also display the running speed in RPM in addition to the Current in Amps during normal operation.

In V/F mode (P4-01 = 2), setting P1-10 also activates the speed (slip) compensation.

P4-05 Motor power factor (cosΦ)

The motor power factor information should be entered into this parameter if the drive is to be operated in sensorless vector control mode (P4-01 = 0 or 1).
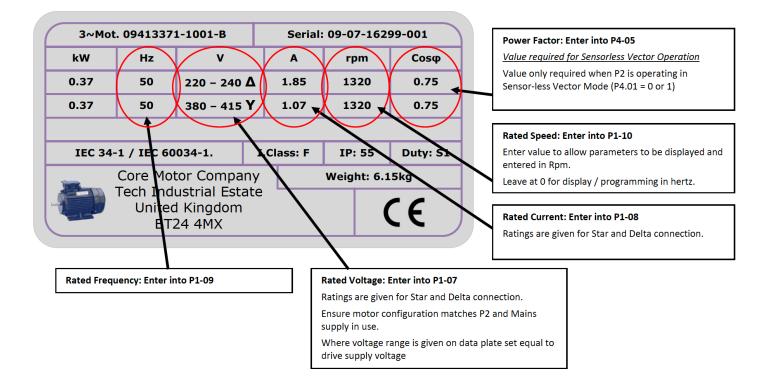
This value is used together with the other nameplate data to calculate additional motor parameters during auto-tune and should be entered from the motor nameplate before the auto-tune is carried out.
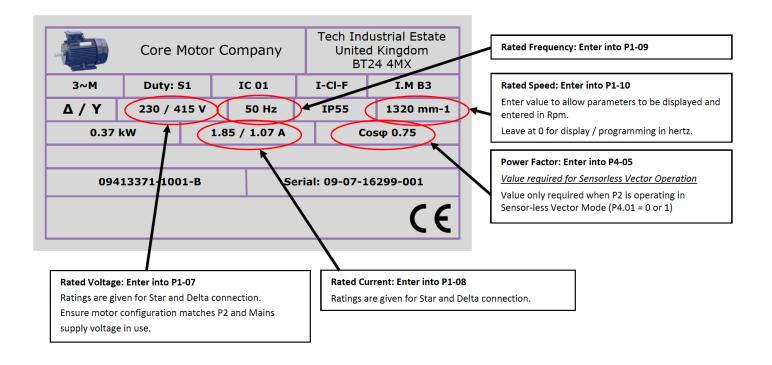
To access parameter P4-05, the correct access code must be entered into parameter P1-14. The default value for the access code in P1-14 is 101.

If the cosΦ value cannot be found on the motor nameplate, and there are no other means to obtain this value then refer to you local drives sales partner for advice. Note that drive performance is not optimized when the value of cosΦ is not entered correctly.

Appendix:

Below are two examples of typical motor data plates showing the format data is presented and how this relates to parameters within the P2.

3~Mot. 09413371-1001-B			Serial: 09-07-16299-001		
kW	Hz	V	A	rpm	Cosφ
0.37	50	220 – 240 Δ	1.85	1320	0.75
0.37	50	380 – 415 Y	1.07	1320	0.75

IEC 34-1 / IEC 60034-1.		Class: F	IP: 55	Duty: S1

Core Motor Company
Tech Industrial Estate
United Kingdom
BT24 4MX

Weight: 6.15kg

C E

Power Factor: Enter into P4-05

Value required for Sensorless Vector Operation

Value only required when P2 is operating in Sensor-less Vector Mode (P4.01 = 0 or 1)

Rated Speed: Enter into P1-10

Enter value to allow parameters to be displayed and entered in Rpm.

Leave at 0 for display / programming in hertz.

Rated Current: Enter into P1-08

Ratings are given for Star and Delta connection.

Rated Frequency: Enter into P1-09

Rated Voltage: Enter into P1-07

Ratings are given for Star and Delta connection.

Ensure motor configuration matches P2 and Mains supply in use.

Where voltage range is given on data plate set equal to drive supply voltage

Core Motor Company			Tech Industrial Estate United Kingdom BT24 4MX	
3~M	Duty: S1	IC 01	I-Cl-F	I.M B3
Δ / Y	230 / 415 V	50 Hz	IP55	1320 mm-1
0.37 kW		1.85 / 1.07 A	Cosφ 0.75	
09413371-1001-B		Serial: 09-07-16299-001		
				CE

Rated Frequency: Enter into P1-09

Rated Speed: Enter into P1-10

Enter value to allow parameters to be displayed and entered in Rpm.

Leave at 0 for display / programming in hertz.

Power Factor: Enter into P4-05

Value required for Sensorless Vector Operation

Value only required when P2 is operating in Sensor-less Vector Mode (P4.01 = 0 or 1)

Rated Voltage: Enter into P1-07

Ratings are given for Star and Delta connection.

Ensure motor configuration matches P2 and Mains supply voltage in use.

Rated Current: Enter into P1-08

Ratings are given for Star and Delta connection.

Revision History

Version	Comments	Author	Date
1	Application Note Creation / Release	JP	07/02/12
2	Error Correct in 2nd Motor Data Plate	JP	16/03/13
3	Revised to new format	KB	02/07/14