Technical instruction
ACS250 micro drives, 500-600 V
Setting the motor nameplate details

Overview

ACS250 is 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 technical instruction details the few basic motor parameters that are required to be set or checked when installing ACS250 in any application.

For the ACS250, operating in sensorless vector mode using its 3rd generation vector control technology (3 GV), 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 ACS250 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
9905 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 ACS250 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.

9906 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: 220 V/400 V, 3.3 A/1.9 A. See motor data plate examples shown in appendix.

When this parameter has been set, the ACS250 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 ACS250 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.

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9907 Motor rated frequency

The motor rated frequency in hertz should be entered into this parameter. In general, this value will be 60 Hz, 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.

9908 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 9908=0 (display in Hz, compensation disabled).

The speed regulation is inferior to using sensorless vector speed control (with 9903=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 in addition to the current in amps during normal operation.

In V/F mode (9903=2), setting 9908 also activates the speed (slip) compensation.

9915 Motor power factor (cos(phi))

The motor power factor information should be entered into this parameter if the drive is to be operated in sensorless vector control mode (9903=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.

If the cos(phi) 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 cos(phi) is not entered correctly.

Appendix

Below are two examples of typical motor data plates showing how the format data is presented and how this relates to parameters within the ACS250.

ABB Motors CE

3 ~ motor	M2AA 200 MLA 4					
	IEC 200 M/L 55					
			No			
				Ins.cl.	F	IP 55
V	Hz	kW	r/min	A	cos(φ)	IA/IN ᵗE/s
690 Y	50	30	1475	32.5	0.83	
400 D	50	30	1475	56	0.83	
660 Y	50	30	1470	34	0.83	
380 D	50	30	1470	59	0.83	
415 D	50	30	1475	54	0.83	
440 D	60	35	1770	59	0.83	

Cat. no 3GAA 202 001 - ADA

6312/C3   6210/C3   180 kg

IEC 34-1

Rated voltage: Enter into 9905

Ratings are given for star and delta connection. Ensure motor configuration matches ACS250 and mains supply in use. Where voltage range is given on data plate set equal to drive supply voltage.

Rated speed: Enter into 9908

Enter value to allow parameters to be displayed and entered in rpm. Leave at 0 for display/ programming in hertz.

Rated frequency: Enter into 9907

Power factor: Enter into 9915

Value required for sensorless vector operation. Value only required when ACS250 is operating in sensorless vector mode (9903= 0 or 1).

Rated current: Enter into 9906

Ratings are given for star and delta connection.

Motor data plate 2

3 ~ Mot. 09413371-1001-B				Serial: 09-07-1629-001		
kW	Hz	V	A	rpm	cos(φ)
0.37	50	220-240 D	1.85	1320	0.75
0.37	50	380-415 Y	1.07	1320	0.75

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

Weight: 6.15 kg

XXX MOTOR COMPANY   CE

Rated frequency: Enter into 9907

Rated voltage: Enter into 9905

Ratings are given for star and delta connection. Ensure motor configuration matches ACS250 and mains supply in use. Where voltage range is given on data plate set equal to drive supply voltage.

Rated current: Enter into 9906

Ratings are given for star and delta connection.

Rated speed: Enter into 9908

Enter value to allow parameters to be displayed and entered in rpm. Leave at 0 for display/ programming in hertz.

Power factor: Enter into 9915

Value required for sensorless vector operation. Value only required when ACS250 is operating in sensorless vector mode (9903=0 or 1)

For more information please contact your local ABB representative or visit:

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