## Application Note Setting up an S100 with a Permanent Magnet Motor

## Purpose

This application note shows the simple steps involved in setting up a permanent magnet (PM) motor on an S100 drive. All S100's with firmware version 2.50 or greater support PM motor control.

### Parameters

Setup the parameters below. Note that some parameter settings are based on the motor nameplate. The nameplate in this document is only an example. It is imperative to have access to the motor nameplate in order to program in the proper values into the drive and perform an auto-tune. It is also recommended to use the LCD keypad for ease of programming.

Code No.	Display	Set Value
DRV-09	Control Mode	6: PM Sensorless
DRV-14	Motor Capacity	Select the kW setting closest to the motor rating. (kW=HPx.746)
DRV-18	Base Freq	Base HZ from nameplate
DRV-20	Max Freq	Maximum frequency from nameplate
BAS-11	Pole Number	Motor poles from nameplate
BAS-13	Rated Curr	Rated amps (FLA) from nameplate
BAS-15	Rated Volt	230V or 460V dependent on drive's voltage class
BAS-19	AC Input Volt	Set to the input power supply's voltage

ODDEL RH   184TPFRB10193AA   W   SER.   WAA 106092     CUST.   P/N RFQ-78910A-ITEM2   ENCL TEFC   FRAME 184TCVZ     DES. PM   P 43   CODE N/A RSE 34 °C   MTG W6   TYPE   TPFR     NS H1   IC 41   PH 3   AMB 40 °C   DUTY CONT   TYPE   TPFR     MTH/YR   MFG 07/2016   WT LBS/KG 95/43   ALTINDE 3300EL /1000M   BRCS DRWE/OPP 6207/6205   POLES 6     PASE   HZ   90   FA 11.7/5.8   PEFCXS   93.9   SF     DLE AMPS 45   MAX SAFE RPM 2250   TEMP SENSORS TSTATS 140 (N/C)   FRAME 250   TEMP SENSORS TSTATS 140 (N/C)     HZ   HP   PO0   14.6   230/460   11.07/58   MS     90   5   25   90   14.6   230/460   11.07/58   MS     108   5   2160   122   230/460   13.4/67   MS   MS     108   5   2160   122   230/460   13.4/67   MS   MS   MS     108   5 <th></th> <th></th> <th></th> <th>A CONTRACTOR OF A CONTRACTOR OF</th> <th>and the second</th> <th></th>				A CONTRACTOR OF	and the second		
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ALTITUDE 3300ET / 1000M BRGS DRVE/OPP 6207/6205   BASE HZ 90 FLA 11.7/5.8 PF(COSP) 85.7(0.8%)   POLES 66 SF 1.0 SF 1.0 SF   DLE AMPS .45 MAX SAFE RPM TQ(FIL LBS) WUS-21/N MAS 2/N   HZ HP RPM TQ(FIL LBS) WUS-21/N MAS 2/N FG   5 .25 90 14.6 0/0 110/55 MA   108 5 .2160 12.2 .230/460 11.7/5.8 MA   108 5 .2160 14.6 0/0 11.7/5.8 MA   108 5 .2160 14.6 13.4/6.0 13.4/6.7 MA   1000 R.08 .08 </td <td>INS H1 K</td> <td>C 41 PH 3</td> <td>AMB 40</td> <td></td> <td></td> <td>The second second</td>	INS H1 K	C 41 PH 3	AMB 40			The second second	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	MIH/TR M	AFG 07/2011	0				
HP 5 VOLTS 230/460   POLES 6 ROTOR WK *.46   EFF % SF   93.9 10     DLE AMPS 45 MAX SAFE RPM 2250   TEMP SENSORS TSTATS 140 (N/C)     HZ   HP   RPM   TQ(F2 LBS)   VOLS 2//II   NMS 7//II   POLS 7/II     HZ   HP   RPM   TQ(F2 LBS)   VOLS 2//II   NMS 7//II   PO     5   .25   .90   14.6   .20//460   .11.0/5.5   M     108   .5   .1800   14.6   .230//460   .11.7/5.8   M     108   .5   .2160   14.6   .200//460   .13.4/6.7   M     108   .5   .2160   14.6   .200//460   .13.4/6.7   M     108   .5   .2160   14.6   .200//460   .13.4/6.7   M	ALIILODE	ALTITUDE 3300EL/1000M BRGS DRVE/OPP 6207/6205					
VOLTS   230/460   ROTOR   WK 246   SF   1.0     DLE AMPS   45   TEMP SENSORS TSTATS   140 (N/C)   PC     HZ   HP   RPM   TQ(FL LBS)   VOUS-21/11   AMPS 27/11   PC     5   .25   .90   14.6   0/0   11.0/55   MC     90   .4.6   .20/460   11.7/5.8   MC   11.7/5.8   MC     108   .5   .2160   12.2   .230/460   13.4/6.7   PV     11000   R.08   .01   1.4/6.7   .230/460   13.4/6.7   PV	HP 5	HZ 90			EFE	85./(0.4)	
DLE AMPS   45 MAX   545 SAFE   TEMP   SENSORS   TSTATS   140   (N/C)     HZ   HP   RPM   TQ(FL   LBS)   VOUS-21/N   MAS 27/N   MAS 27/N   PC     5   .25   .90   14.6   .0/0   .11.0/55   MAS     00   .5   .1800   14.6   .20/460   .13.4/6.7     108   .5   .2160   .12.2'   .230/460   .13.4/6.7     1100   R.08   .01   .12.2'   .230/460   .13.4/6.7	VOLTS	230/460	the second se		SF	10	
HZ HP RPM TQ(FLLBS) VULS-27/11 MAS 27/11 F 5 .25 .90 14.6 0/0 .11.0/55 M 90 5 1800 14.6 230/460 11.7/58 M 108 5 2160 12.2 230/460 13.4/6.7 108 5 2160 12.2 230/460 13.4/6.7	DLE AMPS .45						
HZ HP RPM TQ(FLLBS) VULS-27/11 MAS 27/11 F 5 .25 .90 14.6 0/0 .11.0/55 M 90 5 1800 14.6 230/460 11.7/58 M 108 5 2160 12.2 230/460 13.4/6.7 108 5 2160 12.2 230/460 13.4/6.7	MAX SAFE RPM 2250 TEMP SENSORS TSTATS 140 (N/C)						
5 .25 90 14.6 0/0 110/55 M 90 5 1800 14.6 230/460 11.7/58 M 108 5 2160 12.2 230/460 13.4/6.7 M 108 8 2160 12.2 230/460 13.4/6.7 M	HZ	, HP	RPM			AMPS 71/1Y	
108 5 2160 229 2307450 13.4767 Pv -11-00M R 0.8 olm Lat 172 mH Lat 34.6 mH BECME: 226.0 V/ARPM L - L US	5	.25		14.6	0/0	. 11.0/5.5	
N-CON R 08 ohm Let 172 mH Let 34.6 mH BEMF: 226.0 V/ARPM L - L	90	5	1000	14.6	230/460	11.7/5.8	
27 CONN R: 02 offm Ld: 4.3 mH Lc: 8.55 mH BEMF: 113.0 V/MPM L - L	- M. CONN	P 08 ohm	2160 1# 172 mH	In MA mil	230/460	13.4/6.7	
	2Y CONN	R 0.2 ohm	Ld: 4.3 mH	La: 8.65 mH	BEMF:_113.0	V/kRPM L - L	

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Example motor nameplate with necessary information highlighted.

# Application Note Setting up an S100 with a Permanent Magnet Motor

## Auto-tuning

Once the above parameters are properly set, start an auto-tune by setting **BAS-20= 7 All (PM).** The motor must be connected to the drive for this process. Typically auto-tuning will take about two minutes. Once completed BAS-20 will return to a setting of "None".

#### **Test Operation**

Below are the parameters necessary to run the drive in Local control to test motor operation.

Code No.	Display	Set Value
DRV-01	Cmd Frequency	Desired speed (Hz)
DRV-06	Cmd Source	0: Keypad

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