Siemens Sinamics S120 / G120

Blocksize

Please considerr that the standard winding of the motor are compatible with 230VAC or 400VAC servo drives.
Select a model of the blocksize (power module of the drive) considering the motor datasheet values: https://www.ni-lab.online/new_websmart/read_datasheet.php
Rated current of the motor must be fullfilled from the rated current of the drive.

G120 (230 VAC power lines)

Line voltage 200 ... 240 V 1 AC/3 AC		**PM240-2 Power Modules standard variant**				
Without integrated line filter		6SL3210-1PB13-0UL0	6SL3210-1PB13-8UL0	6SL3210-1PB15-5UL0	6SL3210-1PB17-4UL0	6SL3210-1PB21-0UL0
With integrated line filter class A		6SL3210-1PB13-0AL0	6SL3210-1PB13-8AL0	6SL3210-1PB15-5AL0	6SL3210-1PB17-4AL0	6SL3210-1PB21-0AL0
Output current at 50 Hz 230 V 1 AC						
• Rated current I_{rated} 1)	A	3.2	4.2	6	7.4	10.4
• Base-load current I_L 1)	A	3.2	4.2	6	7.4	10.4
• Base-load current I_H 2)	A	2.3	3.2	4.2	6	7.4
• Maximum current I_{max}	A	4.8	6.4	9	12	15.6

S120 (400 VAC power line)

DC link voltage 510 ... 720 V DC		**Single Motor Module in booksize compact format**			
• Internal air cooling/ cold plate cooling		6SL3420-1TE13-0AA1	6SL3420-1TE15-0AA1	6SL3420-1TE21-0AA1	6SL3420-1TE21-8AA1
Output current					
• Rated current I_{rated}	A	3	5	9	18
• Base-load current I_H	A	2.6	4.3	7.7	15.3
• For S6 duty (40 %) I_{S6}	A	3.5	6	10	24
• I_{max}	A	9	15	27	54

Limitation



The pole position identification with S120 and third party motor is possible only using p1980 = 10 ⇒ Motion-based

Motor feedback connection

The motor feedback must be connected using driveCliq converter SMC20 or SME20.

SMC20 6SL3055-0AA00-5BA3	**SME20** 6SL3055-0AA00-5EA0
	

Converter pinout

NILAB cable wire colors	Signal	SMC20 d-sub25 female	SME20 M23 pinout
Yellow	SIN+	3	5
Green	SIN-	4	6
Gray	COS+	6	1
Orange or pink	COS-	7	8
Blue	PTC+	25	9
Violet	PTC-	13	7
Red	+5VDC	1+14	2+12
Black	GND	2+16	10+11
White-Black	–	–	–
Brown	–	–	–

White	–	–	–
Brown-White	–	–	–
Shield	–	5+8+24	–

Parametrization

When creating the drive from scratch, the correct sequence to follow is:

1) Fill the data as in the table below (two example motor are listed in the table)

Parameter	Description	GDI250QS	GD350ES
P305	Nominal current	1.2 A	3.7 A
P311	Nominal speed	100 m/min	100 m/min
P315	Pole pitch	60 mm	60mm
P316	Force constant	52 N/A	72 N/A
P322	Max speed	100 m/min	100 m/min
P323	Max current	4.8 A	16 A
P338	Current limit	4.8 A	16 A
P341	Slider weight	1.5 kg	3 Kg
P350	phase resistance	21.5 ohm	5.03 ohm
P356	phase inductance	35 mH	5.68 mH
P431	commutation angle	to calculate	to calculate

*) Note that the P341 must be calculate using **Pole Position Identification procedure**

2) The equivalent circuit data p350 and p356 will then need to be re-entered after the download. This happens because after the system calculations, these values are overwritten. The calculations must be performed to provide consistent values for the current and speed controllers.

3) After the download, enter the datasheet values for resistance and inductance, and also insert a filter on the encoder p1441=1ms or 2ms. Then, deactivate the commutation angle measurement and/or verification by setting p1982=0.

4) For correct operation, the U and V phases must be swapped.

5) If the data already exists, only P431 and P1982=0 need to be modified, remembering that p431 can only be modified by setting p10=4 and then setting it back to p10=0.

Pole position identification

The drive must be enabled using the inductance-based pole position identification (p1980 = 10 ⇒ Motion-based).

Please set the parameter p0325 ⇒ Motor pole position identification current 1st phase ⇒ Rated Current of the motor and parameter p0329 ⇒ Motor pole position identification current ⇒ Rated current of the motor. See attached Siemens manual section for reference: :green_drive_motors:pole_position_identification.pdf

Detailed procedure

1. Enable the measure of the commutation angle setting P10=4, P1982=1, P1990=1, P1980=10, P1993=50% of the rated current of the motor. P1994=2 sec, p1997=max value.

2. After the movement p431 is shown.

3. Change the parameter p10=0, P1982=0 and P1980=0 that means pole position detection measure disabled.

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