

Макрос Подъема: мульти-скорость, векторный режим с энкодером

Схема подключений

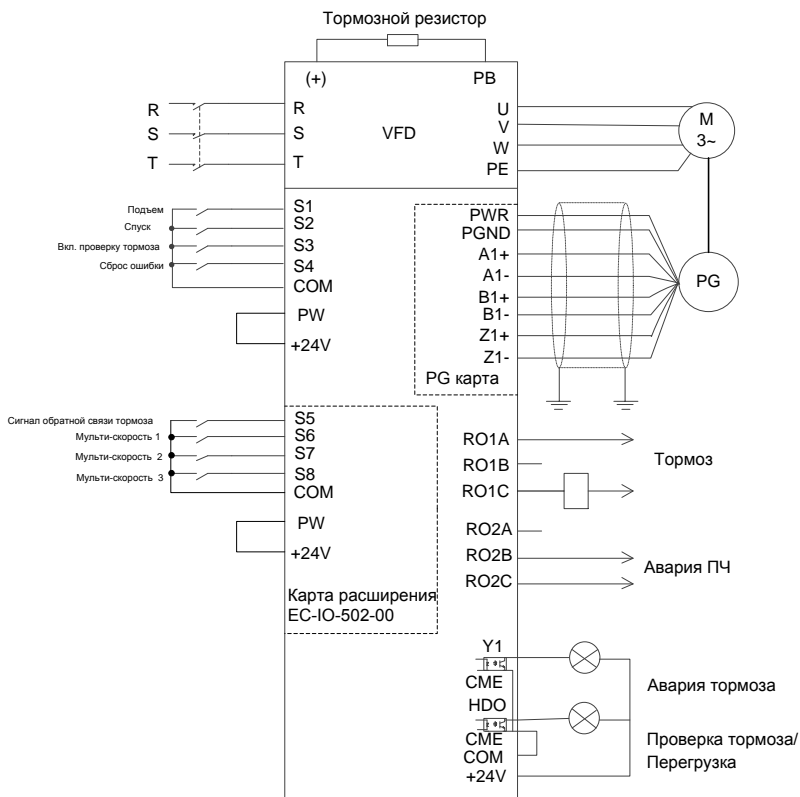


Рис. 1-2 Подключение для подъема при векторном управлении с энкодером

Процедура ввода в эксплуатацию

1. Проверьте проводку и убедитесь, что она исправна.
2. Установите P00.18=1, чтобы восстановить настройки по умолчанию.
- 3.
4. Установите P00.15=2. на индикаторе панели отобразится "-ГUN-". Нажмите кнопку RUN для запуска статической автонастройки параметров двигателя.

5. Установите P90.00=1, выберите тип энкодера в P20.00, установите разрешение энкодера (PPR) в параметре P20.01. Выполните запуск ПЧ на низкой скорости. Проверьте значение в P18.00. Если значение отрицательное, направление энкодера меняется на противоположное. Затем установите P20.02=0x001.
6. Установите P90.00=2 для выбора макроса подъема в векторном режиме с энкодером

Макро параметры (P90.00=2)

Function code	Name	Настройка	Примечание
P00.00	Speed control mode	3	Closed-loop vector control mode
P00.01	Channel of running commands	1	Terminal
P00.03	Max. output frequency	100.00Hz	
P00.04	Upper limit of running frequency	100.00Hz	
P00.06	Setting channel of A frequency command	6	Multi-step speed running
P00.11	ACC time 1	6.0s	
P00.12	DEC time 1	4.0s	
P01.01	Starting frequency of direct start	0.00Hz	
P01.15	Stop speed	0.20Hz	
P01.24	Stop speed delay	1.0s	
P03.00	Speed-loop proportional gain 1	30.0	
P03.01	Speed-loop integral time 1	0.100s	
P03.06	Speed loop output filter	1	
P03.10	Current-loop integral coefficient I	3500	
P05.03	Function of S3	18	Multi-step speed terminal 3
P05.04	Function of S4	7	Fault reset
P06.03	RO1 output	49	Brake output
P08.28	Auto fault reset count	1	
P10.02	Multi-step speed 0	3.0%	
P10.04	Multi-step speed 1	8.0%	
P10.06	Multi-step speed 2	33.0%	
P10.08	Multi-step speed 3	50.0%	
P10.10	Multi-step speed 4	70.0%	

Function code	Name	Настройка	Примечание
P10.12	Multi-step speed 5	90.0%	
P10.14	Multi-step speed 6	0.6%	Slow speed at 0.6Hz
P10.16	Multi-step speed 7	2.0%	Slow speed at 2.0Hz
P11.08	VFD/motor OL/UL pre-alarm selection	0x021	Enable underload protection to enhance equipment safety.
P11.11	Underload pre-alarm detection threshold	1%	
P11.12	Underload pre-alarm detection time	1.00s	
P11.14	Speed deviation detection value	20.0%	
P23.15	PI separate setup for low-speed start/stop	1	Enable
P25.01	Function of S5	75	Brake feedback signal
P25.02	Function of S6	16	Multi-step speed 1
P25.03	Function of S7	17	Multi-step speed 2
P25.04	Function of S8	85	Brake detection
P25.10	Expansion card input terminal polarity	0x01	
P26.04	RO3 output	57	Brake failure alarm
P90.04	Enabling brake-oriented logic	1	The brake is controlled by the VFD.
P90.14	Forward brake release torque	30.0%	Corresponding to the motor rated torque
P90.15	Reverse brake release torque	20.0%	Corresponding to the motor rated torque
P90.16	Forward brake release frequency	0.40Hz	
P90.17	Reverse brake release frequency	0.40Hz	
P90.18	Forward brake closing frequency	0.20Hz	
P90.19	Reverse brake closing frequency	0.20Hz	
P90.20	Delay before forward brake release	0.100s	
P90.30	Torque verification fault	2.000s	

Function code	Name	Настройка	Примечание
	detection time		
P90.31	Enabling the monitoring on brake status	1	Enable the brake current monitoring (and brake feedback detection).
P91.08	Light load speed boost function selection	3	Stepped speed limit
P91.18	Upward torque limit 1	65.0%	
P91.19	Upward restricted frequency 1	55.00Hz	
P91.20	Upward torque limit 2	40.0%	
P91.21	Upward restricted frequency 2	75.00Hz	
P91.26	Downward torque limit 1	50.0%	
P91.28	Downward torque limit 2	45.0%	
P91.29	Downward restricted frequency 2	70.00Hz	
P93.02	Zero servo protection mode	1	Zero servo input slows down.

Note: The macro parameter table does not contain some parameters that are factory default parameters.

5.2.4 Points for attention

1. If you only want to check whether the VFD runs properly, set P90.00=0 (Common mode).
2. If you perform empty-load commissioning, set P90.00 to 2 (Lifting in closed-loop vector control), set P11.08 to 0x000 to disable underload protection, and set P90.14 and P90.15 to 0 to prevent the torque verification fault reporting caused by empty load. In addition, if no external braking resistor is connected, you need to increase the ACC/DEC time to prevent the bus overvoltage fault reporting caused by too fast stop.
3. If there is a brake feedback signal, set P25.01 to 75, and the macro has set this parameter by default. In addition, set P90.31 to 1. Since the closed-loop mode is used, the brake current monitoring function is automatically enabled after the setting, and you can set P90.34 to set whether the reference speed is used if the brake status is incorrect. If there is no brake feedback signal, set P90.31 to 0 to prevent the misreporting of a brake feedback fault.
4. In closed-loop mode, brake slip verifying is enabled by default. If you need to check the running status of the VFD without a brake, set P93.01 to 0 to disable brake slip verifying.
5. During onsite commissioning, if the VFD terminal signal upward/downward running command is inconsistent with the load lifting/lowering direction, adjust any two phase sequences of VFD output terminals U, V, and W.

6. If PLC control is used, speed signal and other input and output signal functions need to be adjusted according to the actual control logic.
7. This macro can meet the requirements of most lifting application cases, and the performance parameters have been optimized and do not need to be adjusted in most cases. If an exception occurs, see the function parameter chapter for adjustment or contact the technical support.

5.2.5 Switching from lifting in closed-loop vector control to open-loop vector control

In closed-loop vector control mode, if an encoder exception occurs, you can switch to open-loop vector control by setting P90.03=5, the brake timing sequence of which is different from that of closed-loop vector control. To switch the application macro and motor control mode, do as follows:

1. Set P90.00=2 (Lifting in closed-loop vector control), and set P90.01=1 (Lifting in open-loop vector control).
2. Set P90.03=5 (Switch to SVC1 control).
3. Set S terminal function 62 to SVC1.
4. When the S terminal is invalid, the motor uses P90.00=2; when the S terminal is valid, the motor uses P90.01=1.

5.2.6 Snail speed

Certain operating consoles have the snail speed function. If you want to use the snail speed function, perform commissioning as follows:

1. Perform wiring according to the snail speed terminal description of the operating console.
2. Determine the multi-step speed corresponding to the snail speed function, and set the running frequency at this speed.

Note: The snail speed frequency must be higher than the brake release frequency.