

Group 8: Duc Nguyen & Hieu Nguyen

1.1.1 Transformer

These Schneider transformers (ABL8REM24030 and ABL8REM24050) from the manufacturer are designed for basic use in industrial applications. They provide a 24VDC power supply with different current (3A and 5A) for multiple purposes, especially when the PLC requires minimum 4A. With the input voltage from 100 to 240 V AC single phase, the transformers supply the output voltage 24VDC. Another advantage of these transformer is integrated fuse for more protection. Despite that advantage, two circuit breakers are also used to protect these transformers.

1.1.2 Protection circuit breaker

The Siemens protection devices (5SJ4108-7HG40) are miniature circuit breaker with current limiting. There are two different tripping mechanisms in these devices, the delayed thermal tripping mechanism for overload protection and the electro mechanic tripping mechanism for short circuit protection. The breaking capacity is up to 14kA at 230/400 VAC and rated currents up to 8A.

1.1.3 PLC CX5010

The PLC are Embedded PCs from the CX5000 series with Intel® Atom™ processors and differ only by the CPU version from Beckhoff manufacturer. With the installed TwinCAT runtime environment, the CX5010 can be programmed for implementation of PLC or Automation projects. With large program memory, the PLC satisfies demanding requirements:

1. For multisector automation tasks in the construction of series machines, special machines and plants.
2. Used as a central controller on production lines with central and distributed I/O.
3. High processing performance in binary and floating-point arithmetic.
4. PROFIBUS DP master/slave interface.
5. For extensive I/O configurations.
6. For setting up distributed I/O structures.
7. Comprehensive integrated system diagnosis.

1.1.4 Digital input EL1808

Manufacturer: Beckhoff

1. Digital input

2. 500V isolation
3. 8 inputs
4. 24VDC
5. Direct plug-in technique
6. IP20 protection class

1.1.5 Digital output EL2808

Manufacturer: Beckhoff

1. Digital output
2. 500V isolation
3. 8 outputs
4. 0.5 A max output current
5. 24VDC
6. Direct plug-in technique
7. IP20 protection class

1.1.6 Analog input EL3058

Manufacturer: Beckhoff

1. Analog input
2. 500V isolation
3. 8 inputs
4. 4...20 mA signal current
5. 24VDC
6. 1.25 ms
7. 12 bits resolution (16 bits including signal)
8. IP20 protection class

1.1.7 Analog Output EL4028

Manufacturer: Beckhoff

1. Analog output
2. 500V isolation
3. 8 outputs
4. 4...20 mA signal current
5. 24VDC
6. 400 μ s
7. IP20 protection class

1.1.8 Motor 1: 3GAA112320-ADJ

Manufacturer: ABB

1. Power: 4kW at 400V/415V/690V 50 Hz
2. In: 8.6 A

3. Speed: 1451 rpm
4. Mounting: IM B3
5. Protection device Schneider: circuit breaker GV2-ME14, contactor LC1D09BD
 - a. 4 kW at 440 V AC 50/60 Hz, 4...5.5 kW at 500 V AC 50/60 Hz, 3...4 kW at 400/415 V AC 50/60 Hz
 - b. Magnetic Protection Adjustment Range (138 A).
 - c. Thermal Protection Adjustment Range (6...10 A).
 - d. Rated Breaking Capacity (I_q 50 kA at 400/415 V conforming to IEC60947-4-1, I_q 6 kA at 500 V conforming to IEC60947-4-1, I_q 15 kA at 440 V conforming to IEC60947-4-1).

1.1.9 Motor 2: 3GAA082614-BSJ

Manufacturer: ABB

1. Power: 0.75kW at 400V/415V/230V 50 Hz
2. In: 1.9 A
3. Speed: 1437 rpm
4. Mounting: IM V1
5. Protection device Schneider: circuit breaker GV2-ME10, contactor LC1D09BL
 - a. 2.2...3 kW at 440 V AC 50/60 Hz, 3 kW at 500 V AC 50/60 Hz, 2.2 kW at 400/415 V AC 50/60 Hz
 - b. Magnetic Protection Adjustment Range (78 A).
 - c. Thermal Protection Adjustment Range (4...6.3 A).
 - d. Rated Breaking Capacity (I_q 50 kA at 400/415 V conforming to IEC60947-4-1, I_q 50 kA at 500 V conforming to IEC60947-4-1, I_q 50 kA at 440 V conforming to IEC60947-4-1).

1.1.10 Motor 2: 3GAA102530-ASJ

Manufacturer: ABB

1. Power: 2.2kW at 400V/415V/230V 50 Hz
2. In: 4.6 A
3. Speed: 1455 rpm
4. Mounting: IM B3
5. Protection device Schneider: circuit breaker GV2-ME10, contactor LC1D09BL
 - a. 2.2...3 kW at 440 V AC 50/60 Hz, 3 kW at 500 V AC 50/60 Hz, 2.2 kW at 400/415 V AC 50/60 Hz
 - b. Magnetic Protection Adjustment Range (78 A).
 - c. Thermal Protection Adjustment Range (4...6.3 A).
 - d. Rated Breaking Capacity (I_q 50 kA at 400/415 V conforming to IEC60947-4-1, I_q 50 kA at 500 V conforming to IEC60947-4-1, I_q 50 kA at 440 V conforming to IEC60947-4-1).

1.1.11 Solenoid valve

NITRA pneumatic directional control solenoid valve, 5-port (4-way), 2-position, spool valve with aluminium body, optional manifold mounting, 1/8-inch NPT female ports, $C_v=0.67$, 24VDC double solenoid, 9.4mm DIN style wiring connector with LED indication