Plant designation: FMCP Panel

Customer order no.: SAP CUSTOMER ORDER NO

Festo order number

Project no.: CA_CS.2160550

Customer

<table>
<thead>
<tr>
<th>Name</th>
<th>ROBOTIQ INC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of project</td>
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<tr>
<td>Responsible for project</td>
<td>LOP / ZFA</td>
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<td>Project name</td>
<td>CA_CS2160550-Robotic</td>
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<tr>
<td>Created</td>
<td>28.02.2020</td>
</tr>
<tr>
<td>Edit</td>
<td>15.09.2021</td>
</tr>
<tr>
<td>Approved</td>
<td></td>
</tr>
</tbody>
</table>

| Street          | 966 CHEMIN OLIVIER, SUITE #500 |
| Code postal: / location | G7A 2N1    LÉVIS |

Number of pages: 39

FESTO assumes no warranty and liability for any changes to this documentation made by the customer. The circuit diagrams were created on the EPLAN Electric P8 and EPLAN Fluid CAE systems. Changes may only be made using the CAE systems and the original parameters.
### Technical notes

- Voltage and frequency, as well as the setting points for motor protection and time relays must be checked prior to commissioning.

- All terminal screws must be tightened prior to commissioning and during maintenance work.

- Keep doors closed at all times, because dust and moisture may cause malfunctioning.

- The specified cable cross sections are minimum cross section for copper, without taking into account:
  - a.) Cable lengths and the resulting voltage drops. (Permissible voltage drop for motors per VDE 0530 5%* Un )
  - b.) Type of cable installation and permissible ambient temperature (Installation type reduction factor ℃ / amb. temp. ℃)

- In the event that operating voltages deviate from the assumed values listed above, correspondingly larger cross-sections must be selected.

- (e.g. with increased voltage drop, increased ambient temp., unsuitable type of cable installation, high wiring density)

- Sizing of cables is the responsibility of the customer.

### Technical data

<table>
<thead>
<tr>
<th>Reference designation system</th>
<th>=A1+O1</th>
</tr>
</thead>
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<tr>
<td>IP-degree of protection</td>
<td>IPxx</td>
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<tr>
<td>Environment temperature</td>
<td>+5°C - +35°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>max. 50%</td>
</tr>
</tbody>
</table>

**Electric**

- Supply voltage: 100-240 VAC / 50-60Hz
- Supply cable: 3x1,5mm²

**Pneumatics**

- Max. system pressure: xx bar
- Operating pressure: NA
- Air supply: Tube .... mm externally calibrated
- Working ports: according to circuit diagram

**Special feature**

- No single-core marking
- No hose designation

### Wire colours used:

- **Power circuit:**
  - Black (BK)

- **Neutral / Second phase conductor:**
  - Red (RD)

- **Protective conductor:**
  - Green/yellow (GNYE)

- **Control circuit DC (+):**
  - Blue (BU)

- **Control circuit DC (-):**
  - White blue (WBU)

### Standards used:

- C22.1-12: The Canadian Electrical Code, is a standard published by the Canadian Standards Association pertaining to the installation and maintenance of electrical equipment in Canada.

- NFPA 79: Electrical Standard for Industrial Machinery

### Used tube

- PUN-H-......-BL -> Control cabinet
- PUN-H-......-SW -> Control cabinet outside
- PUN-H-......-NT -> Condensate drain
- PUN-......-BL -> MS-Series

### Technical designer

- Date: 28.02.2020
- Name: ca0zfa

### Technical data

<table>
<thead>
<tr>
<th>Supply voltage</th>
<th>100-240 VAC / 50-60Hz</th>
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**Electric**

- Main Voltage: 100-240 VAC / 50-60Hz
- Control Voltage: 24V DC

<table>
<thead>
<tr>
<th>Terminal Block Numbering</th>
</tr>
</thead>
<tbody>
<tr>
<td>X: Terminal Bank number</td>
</tr>
<tr>
<td>Y: Terminal Block number</td>
</tr>
<tr>
<td>Z: Level</td>
</tr>
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</table>

**Pneumatics**

- System pressure: xx bar
- Operating pressure: NA
- Air supply: Tube .... mm externally calibrated
- Working ports: according to circuit diagram

**Special feature**

- No single-core marking
- No hose designation

**Technical designer**

- Date: 28.02.2020
- Name: ca0zfa

**Technical notes**

- Air supply:
  - This controller is designed for a state-of-the-art (ISO 8573-A:2010) compressed air network
  - We require compressed air that is unlubricated, free of residual oil (residual oil from compressors max. 0.1mg/m³ for "HEES fluids, biodegradable oils" or max. 5mg/m³ for mineral oils permissible) and appropriately dried.
  - A filter should remove solid contamination from the compressed air (ISO 8573-A:2010)

- Class:
  - 7-4-4 -> 40µm Filter

### Technical data

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- Class:
  - 7-4-4 -> 40µm Filter
Configuration Switches
- FS1A-C01S
- FS1A-C11S

Logic Switch
- FS1A-C01S

Eight DIP switches are provided for selecting a logic by moving a switch upward. For details, see user’s manual “Chapter 5 Logic.” Only one logic switch can be selected.

- FS1A-C11S

Eight DIP switches are provided for selecting a logic by moving one or two switch(es) upward. For details, see user’s manual “Chapter 5 Logic.”

Timer Switch
- FS1A-C01S

Eight DIP switches are provided for selecting an off-delay timer value, by moving a switch upward. Only one timer switch can be selected.

Enter Button
- FS1A-C11S

The enter button is used to activate the configuration of logic and timer switches. Error LED will blink for 1 to 5 seconds after pressing the enter button. Releasing the button during blinking activates the setting. The blinking LED becomes ON if the button is pressed for more than 5 seconds, and the setting becomes invalid even after the button is released. For setting the switches and enter button, use the setting tool supplied with the SafetyOne.
Overview of connection technology

1. PE connection, housing
2. [X9A] mains voltage, DC link voltage and logic voltage
3. [XF2 OUT] RTE interface port 2
4. [XF1 IN] RTE interface port 1
5. [X1C] inputs/outputs for the axis
6. [X6B] motor auxiliary connection
7. [X6A] motor phase connection
8. [X2] encoder connection 1
9. [X3] encoder connection 2
10. [X10] device synchronisation
11. [X18] standard Ethernet
12. [X5] connection for operator unit (behind the blind plate)
13. [X1A] I/O interface
14. [X9B] connection for braking resistor

Connections of the CMMT-AS....-3A
The illustration below shows the layout of electrical interface groups inside the Control Box.

**DANGER:**

1. Never connect safety signals to a PLC which is not a safety PLC with the correct safety level. Failure to follow this warning could result in serious injury or death as the safety functions could be overridden. It is important to keep safety interface signals separated from the normal I/O interface signals.

2. All safety-related signals are constructed redundantly (two independent channels). Keep the two channels separate so that a single fault cannot lead to loss of the safety function.

3. Some I/Os inside the Control Box can be configured for either normal or safety-related I/O. Read and understand the complete section 5.4.

**DANGER:**

1. Make sure all equipment not rated for water exposure remain dry. If water is allowed to enter the product, lockout-layout all power and then contact your local Universal Robots service provider for assistance.

2. Only use the original cables supplied with the robot only. Do not use the robot for applications where the cables are subject to bending. Contact your local Universal Robots service if longer or flexible cables are needed.

3. Negative connections are referred to as Ground (GND) and are connected to the casing of the robot and the Control Box. All mentioned GND connections are only for powering and signalling. For PE (Protective Earth) use the M6-size screw connections marked with earth symbols inside the Control Box. The grounding conductor shall have at least the current rating of the highest current in the system.

4. Use caution when installing interface cables to the robot I/O. The metal plate in the bottom is intended for interface cables and connectors. Remove the plate before drilling holes. Make sure that all shavings are removed before reinstalling the plate. Remember to use correct gland sizes.
### WARNING!

**Risk of injury from electric shock.**
Contact with live parts at the power connections [X6A], [X9A] and [X9B] can result in severe injuries or death.
- Do not pull out power supply plugs while live.
- Before touching, wait at least 5 minutes after switching off the load voltage to allow the intermediate circuit to discharge.

### WARNING!

**Risk of injury from electric shock in the event of incomplete insulation at the power connections [X6A], [X9A] and [X9B].**
Before operating, plugging in or unplugging the operator unit CDS8 or a connector from a hot-plug-capable interface, the following points must be fulfilled:
- The conducting lines at the device are completely insulated.
- The protective earthing (PE) and the shield connection are correctly connected to the device.
- The housing is free of damage.

### WARNING!

**Danger of burns through hot escaping gases and hot surfaces.**
In case of error, incorrect wiring or incorrect polarity of the connections [X9A], [X9B] and [X6A], internal components can be overloaded. High temperatures and can develop and hot gases can be released.
- Have an authorised electrician perform the installation according to the documentation.

### WARNING!

**Risk of injury due to overheating and electric shock with faulty live components**
Closing the branch-circuit protective device with faulty live components may cause fire or electric shock.
- The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.
<table>
<thead>
<tr>
<th>Project status</th>
<th>Date</th>
<th>Pg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>xxx</td>
<td>28.02.2020</td>
<td>04.02.2020</td>
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<td>EN</td>
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</tr>
</tbody>
</table>

Technical designer: 15.09.2021

Project: CA_CS.2160550

Productionorder: SAP PRODUCTION_ORDER / NETWORK
Main AC Line supplied by the customer

- Enclosure's key to be attached at the handle.
- Put all three AC breakers at ON position.
Power Supply 1.4 / 4L1
1.5 / 4N

Note: Use a 100 mm Mico Pro endless plug-in link Blue (0VDC) and Red (24VDC) to connect between the Power supply and the fuse modules.
Safety Controller DIP Switch configuration next page (3.1)
FS1A-C11S
Logic 11A

The logic for apparatus with openings

Output Line: 2
2 dual safety outputs of different operations

Category 4

DIP Switch Setting:

Logic : Switch No.1+A Up
Timer : Timer value 0.5s Switch No.3 Up

- Wiring Example
- Logic Chart
- DIP Switch and LED Display

Emergency Stop Switch
Interrlock Switch
Light Curtain (PNP type)

Safety Output 1
Safety Output 2

Safety Input 5
Safety Input 6
Safety Input 7
Safety Input 8
Safety Input 9
Safety Input 10
External Device Monitor 1
External Device Monitor 2

Logic 11A

Dual Channel Direct Opening
Dual Channel Direct Opening
Dual Channel Safety
Dual Channel Safety
Dual Channel Safety
Dual Channel Safety

Hold
Self-Hold Function
Trigger

Y0
Y1
Y2

EDM
EDM
EDM
Important before shipping the panel, make sure:
- Update PLC firmware to version 3.6.1-756dd0bc7c28M.20190426.16939.
- Configure IP Address of the CECC-X-M1 to be 172.17.101.10
- Grey wires are not used and should be removed.
- Shorten pallet sensors M12 cable (CBL0402, CBL0404) from 2.5m to 1.3m.
- The outside part of the cables need to be labelled as "Left Side Pallet Sensor" and "Right Side Pallet Sensor" as shown above.
Cables will be fed through the cable entry at the bottom of the panel.

- The outside part of the cables need to be labelled as "Left Side Pallet Stacklight" and "Right Side Pallet Stacklight" as shown above.
This Connector is Not Used
PLC1 Connection : X21, X22

- PLC1-X21
  - 24/48 VDC
  - GND
  - CAN_H
  - CAN_L
  - CAN_GND
  - CAN_SHLD
  - GPIO
  - GND

- PLC1-X22
  - 24/48 VDC
  - GND
  - 24 VDC
  - GND
  - CAN_H
  - CAN_L
  - CAN_GND
  - CAN_SHLD
  - GPIO
  - GND

This Connector is Not Used

24V/48V load voltage supply

Load interface ready for motor controller

This Connector is Not Used

This Connector is Not Used

- X21 1 2

- X22 1 2 3 4 5 6 7 8 9 10

FESTO

ROBOTIQ INC.

FMCP Panel

EN

Project status

Date

Technical designer

Edit by

catch

Production order:

SAP PRODUCTION_ORDER / NETWORK

15.09.2021

24V/48V load voltage supply

Load interface ready for motor controller

This Connector is Not Used

This Connector is Not Used
24/48 VDC GND 24 VDC GND CAN2_H CAN2_L CAN+ CAN- CAN+SHLD GPIO GND
PLC1 Connection: X23, X24, X25

This Connector is Not Used

ROBOTIQ INC.

PLC1 Connection: X23, X24, X25

This Connector is Not Used

This Connector is Not Used
Important before shipping the panel, make sure:

- Update Controller firmware to latest version V018.0.5
- Configure IP Address of the CMMT-AS-C4-3A-EC-S1 to be 172.17.101.11

**Notes**

- Intermediate circuit voltage: 24 V DC
- Control voltage: Power supply
- Control voltage: 5 V DC
- PE: 3 N
- Intermediate circuit voltage: Power supply
- Intermediate circuit voltage: 0 V DC
- PE
- Control voltage: 24 V DC
- PE
- Control voltage: 0 V DC
- PE
Part 7 of 12
Real-time Ethernet (RTE) Port 1
XF1 - EtherCAT

Part 8 of 12
Real-time Ethernet (RTE) Port 2
XF2 - EtherCAT

This Connector is Not Used

CBL0680
6.8
Safety Controller: 2.7 / 0260
0V: 2.7 / 0241

FL SWITCH 1005N

CBL0600: 6.6 PLC Ethernet

CBL2380: 23.8 CMMT ETHERNET

ROBOTIQ INC.

EtherNet Switch Connection

FMCP Panel

ROBOTIQ INC.

Safety Controller: 2.7 / 0260
0V: 2.7 / 0241

FL SWITCH 1005N

CBL0600: 6.6 PLC Ethernet

CBL2380: 23.8 CMMT ETHERNET

ROBOTIQ INC.