Application Note

FESTO

CDPX-X-B-W-xx
Manual

CDPX-X-B-W-xx

This Application Note describes the main features of the Festo operator panels. The manual refers to the following models CDPX-X-B-W-4, CDPX-X-B-W-7 and CDPX-X-B-W-10. This operational guidelines described below is information which relates to the device, installation, transportation, storage, assembly, use and maintenance.

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1 Components/Software used

1.1 Software Used

Type/Name	Software Version
Festo Designer Studio	V4.5.0.224

Table 1.1: Software used

1.2 Hardware Used

Type/Name	Firmware Version
CDXP-X-B-W-4 CDXP-X-B-W-7 CDXP-X-B-W-10	Config-OS 1.3.638 Main-OS 1.3.638 Bootloader 1.0.11

Table 1.2: Hardware used

2 APPLICATION NOTE DESCRIPTION

The manual contains safety standards that must be respected for the personal safety and to avoid damage. Indications of attention are divided into three levels of severity:

DANGER: indicates a failure to observe safety rules and such failure may cause death or serious injuries.

DANGER

ATTENTION: indicates a failure to observe safety rules and that deficiency may cause damage.

ATTENTION

CAUTION: indicates a failure to observe safety rules and that deficiency may cause defects to the equipment or inconsistencies.

CAUTION

3 Product Overview

Festo CDPX-B-... series HMI products combine state-of-the-art features and top performance in a great design. Products have been designed to offer an outstanding price/performance ratio for challenging applications. They are the ideal choice for HMI applications including factory and building automation
Festo CDPX-X-B-... series products have been designed to run the Designer Studio runtime.

- Compatible with Designer Studio 4.5 or higher.
- Full vector graphic support. Native support of SVG graphic objects, transparency and alpha blending.
- Screen object dynamics: control visibility and transparency, move, resize, rotate any object on screen. Change properties of basic and complex objects.
- Multilanguage applications with TrueType fonts. Easily create, install and maintain applications in multiple
- languages to meet global requirements.
- Data display in numerical, text, bar graph, analog gauges and graphic image formats.
- Rich set of state-of-the-art HMI features: data acquisition and logging, trend presentation, alarm handling, scheduler and timed actions (daily and weekly schedulers, exception dates), recipes, security and user management, email and RSS feeds.
- Selection of communication drivers available with multiple-driver communication capability.
- Remote monitoring and control with Client-Server functionality.
- On-line and Off-line simulation with Designer Studio.
- Powerful scripting language for automating HMI applications. Efficient script debugger improves productivity
- in application development.
- Rich gallery of vector symbols and objects

4 Standards and Approvals

The products have been designed for use in an industrial environment in compliance with the 2014/30/EU EMC Directive.

The products have been designed in compliance with:

EN 61000-6-4	EN 55011 Class A
EN 61000-6-3	EN 55022 Class B
EN 61000-6-2	EN 61000-4-2
EN 61000-6-1	EN 61000-4-3
	EN 61000-4-4
	EN 61000-4-5
	EN 61000-4-6
	EN 61000-4-8

EN 60079-0

EN 60079-7

EN 60079-11

ATEX	DEMKO 16 ATEX 1761X
EN 60079-0: 2012+A11:2013	II 3G Ex ic ec IIC T6 Gc 0≤Tamb≤+50°C
EN 60079-7: 2015	
EN 60079-11: 2012	

The installation of these devices in residential, commercial and light industrial environments may require special measures to ensure compliance with EN 61000-6-3.

The products are in compliance with the Restrictions on Certain Hazardous Substances (RoHS) Directive 2011/65/EU

In compliance with the above regulations the products are CE marked.

Special instruction for use

The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC/EN 60664-1.

The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with IEC/EN 60079-7.

Transient protection shall be provided that is set at a level not exceeding 140 % of the peak rated voltage value at the supply terminals to the equipment.

5 Product Identification

The product may be identified by the indications on the rear cover. You will have to know the type of unit you are using for correct usage of the information contained in the guide.
An example of the information reported is shown below:

product name	CDPX-X-B-W-7
part number	8155214
year/week of production	xx/yy
serial number	AA00012P8000000561AA
approvals	CE / UL / C-Tick / ...

6 Technical Specifications

Touchscreen technology	Resistive
RTC Back-up	Supercapacitor
Fuse	Automatic
Serial Port	RS232, RS 485, RS 422 software configurable
Recipe memory	Flash
Hardware clock	1GB (2GB for CDPX-X-E1-W-15)
Hardware clock	Clock/Calendar with supercapacitor back-up
Accuracy RTC (at 25°C)	‹100ppm

Environmental Conditions		
Operating temperature (surrounding air temperature)	0 - +50°C (vertical installation)	EN-60068-2-14
Storage temperature	-20 - +70°C	EN 60068-2-14
Operating and storage humidity	5 - 85 % RH not-condensing	EN 60068-2-30
Vibrations	9 – 150 Hz, 1 g 5 - 9 Hz, 7 mm $_{p-p}$	EN 60068-2-6
Shock	± 50 g, 11 ms, 3 pulses per axis	EN60068-2-27
Protection class	Front panel IP66 *	EN 60529
Pollution degree environment	2	

* The front face of the FESTO unit, installed in a solid panel, has been tested using conditions equivalent to the standards shown in the “Environmental conditions”. Even though the level of resistance FESTO unit is equivalent to these standards, oils that should have no effect on the CDPX-X-B-series can possibly harm the unit. This can occur in areas where either vaporized oils are present, or where low viscosity cutting oil are allowed to adhere to the unit for long periods of time. If the front face protection sheet on the CDPX-X-B-series becomes peeled off, these conditions can lead to the ingress of oil into the unit and separate protection measures are suggested.

If the installation gasket is used for a long period of time, or if the unit and its gasket are removed from the panel, the original level of the protection cannot be guaranteed

Electromagnetic Compatibility (EMC)

Radiated disturbance test	Class A	EN 55011
Electrostatic discharge immunity test	8 kV (air electrostatic discharge) 4 kV (contact electrostatic discharge)	EN 61000-4-2
Radiated, radio-frequency, electromagnetic field immunity test	80 MHz ffi 1 GHz, 10V/m 1,4 GHz ffi 2 GHz, 3 V/m 2 GHz ffi 2.7 GHz, 1 V/m	EN 61000-4-3
Burst immunity test	± 2 KV dc power port ± 1 KV signal line	EN 61000-4-4
Surge immunity test	± 0,5 KV dc power port (line to earth) ± 0,5 KV dc power port (line to line) ± 1 KV signal line (line to earth)	EN 61000-4-5
Immunity to conducted disturbances inducted by radiofrequency field	0.15 – 80 MHz, 10V	EN 61000-4-6

Voltage dips, short interruptions and voltage variations immunity test	Port: AC mains; Level: 100% duration: 1 cycle and 250 cycles (50Hz); 40% duration: 10 cycles (50Hz); 70% duration: 25 cycles (50Hz); Phase: 0°-180°	
Test executed on the 230Vac side of an Power Supply		EN 61000-4-11

Durability information

Backlight service life (LED type)	**2**0000 Hrs. or more (Time of continuous operation until the brightness of the backlight reaches 50% of the rated value when the surrounding air temperature is 25ºC) - see Note 1
Front foil (without direct exposure to sunlight or UV)	10 years if the surrounding air temperature is 25ºC
UV Resistance	Indoor applications: After 300 hours cycled humidity in QUV accelerated weathering, some yellowing and brittleness may be present.
Touchscreen reliability	› 1 million operations

Note 1: Extended use in environments where the surrounding air temperature is 40°C or higher may degrade backlight quality/reliability/durability.

Solvent resistance

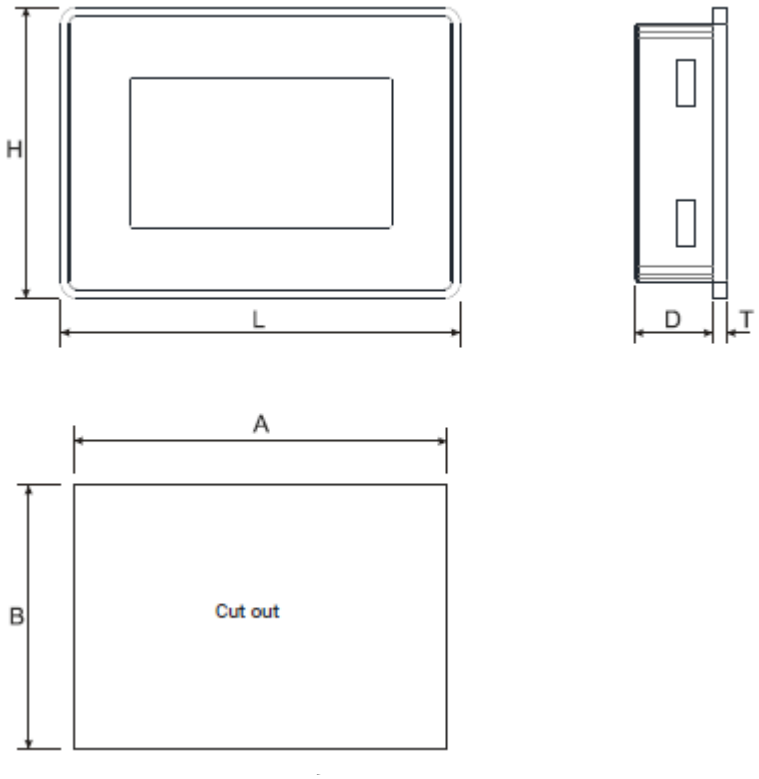
Contact for 1/2 hour at 21ºC, No visible effect: Acetone, Butyl Cellosolve, Cyclohexanone, Ethyl Acetate, Hexane, Isopropyl Alcohol, MEK, Methylene Chloride, Toluene, Xylene

Contact for 24 hours at 49ºC, No visible effect: Coffee, Ketchup, Lemon Juice, Mustard (slight yellow stain), Tea, Tomato juice.

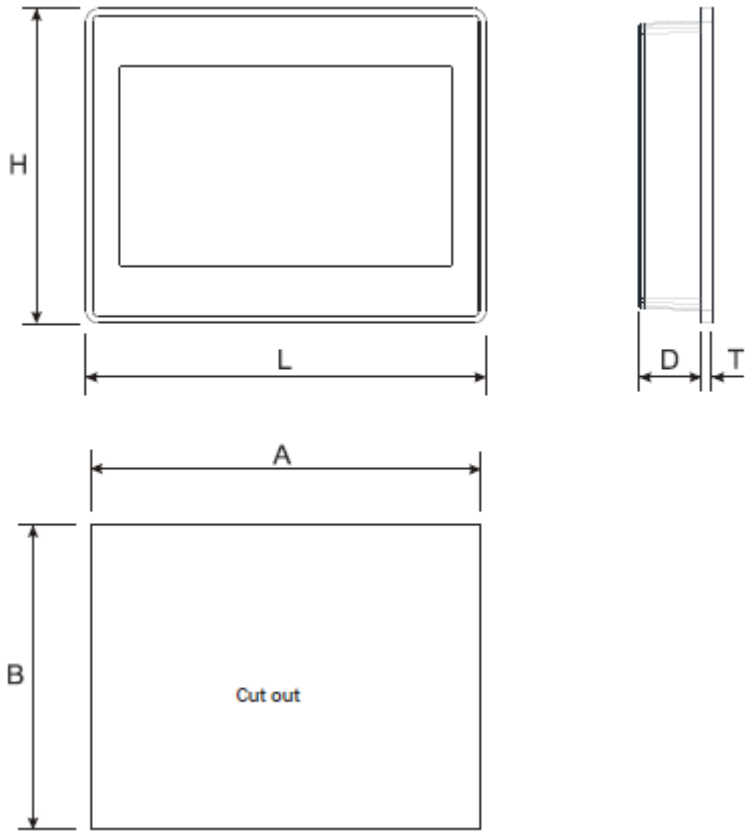
7 Technical Data

Model	CDPX-X-B-W-4	CDPX-X-B-W-7	CDPX-X-B1-W-10
Display / Backlight	TFT Color / LED	TFT Color / LED	TFT Color / LED
Colors	64k	64k	64k
Resolution	480 x 272	800 x 480	1024 x 600
Diagonal (inches)	4.3” widescreen	7” widescreen	10.1” widescreen
Dimming	yes	yes	yes
CPU	ARM Cortex-A8 300 MHz	ARM Cortex-A8 1 GHz	ARM Cortex-A8 1 GHz
Operating System	Linux 3.12	Linux 3.12	Linux 3.12
User Memory (Flash)	60MB	60MB	60MB
RAM	256 MB	256MB	512 MB
Ethernet port	1x 10/100Mb,	1x 10/100Mb,	1x 10/100Mb,
USB port	Host interface V2.0, max. 500mA	Host interface V2.0, max. 500mA	Host interface V2.0, max. 500mA
Reat Time Clock	Yes	Yes	Yes
Serial Port	RS 232, RS 485, RS 422, software configurable	RS 232, RS 485, RS 422, software configurable	RS 232, RS 485, RS 422, software configurable
Voltage	24 Vdc	24 Vdc	24 Vdc
Current rating (at 24 Vdc)	0.25A	0.3A	0.38A
Weight	0.4 Kg	0.6 Kg	1 Kg

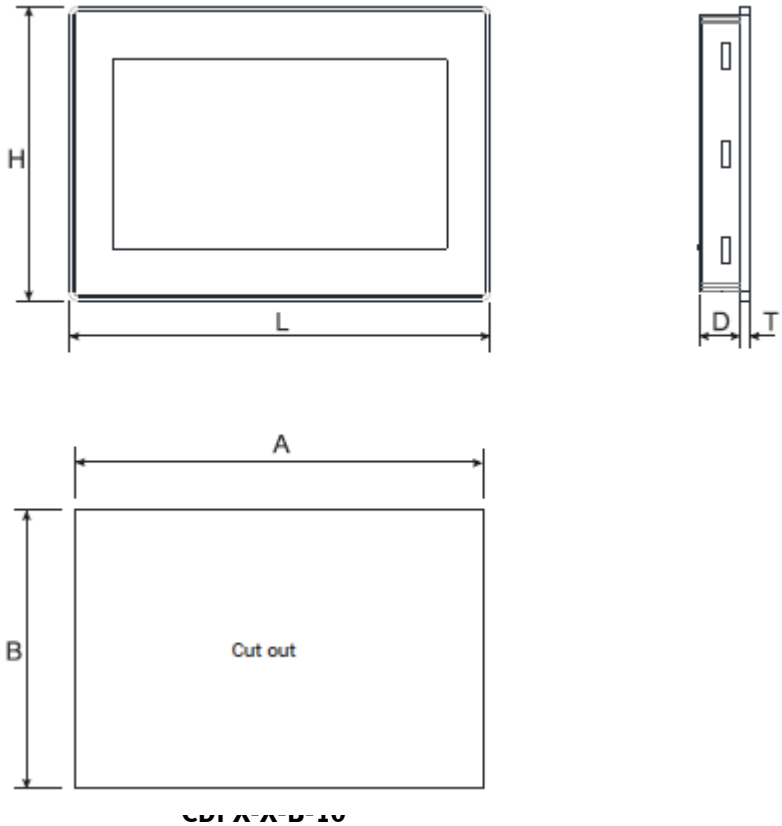
7.1 Dimensions



MODEL	A	B	L	H	D	T
CDPX-X-B-W-4	136mm/5.35”	96mm/3.78”	147mm/5.78”	107mm/4.21”	29mm/1.14”	5mm/0.19”



MODEL	A	B	L	H	D	T
CDPX-X-B-W-7	176mm/6.90”	136mm/5.35”	187mm/7.36”	147mm/5.79”	29mm/1.14”	5mm/0.19”



MODEL	A	B	L	H	D	T
CDPX-X-B-W-10	271mm/10.6”	186mm/7.32”	282mm/11.1”	197mm/7.75”	29mm/1.14”	5mm/0.19”

7.2 Installation Environment and Procedure

In order to meet the front panel protection classifications, proper installation procedure must be followed:

- the borders of the cut out must be flat
- screw up each fixing screw until the plastic bezel corner get in contact with the panel.
- the cut out for the panel must be of the dimensions indicated in this manual.

The equipment is not intended for continuous exposure to direct sunlight.

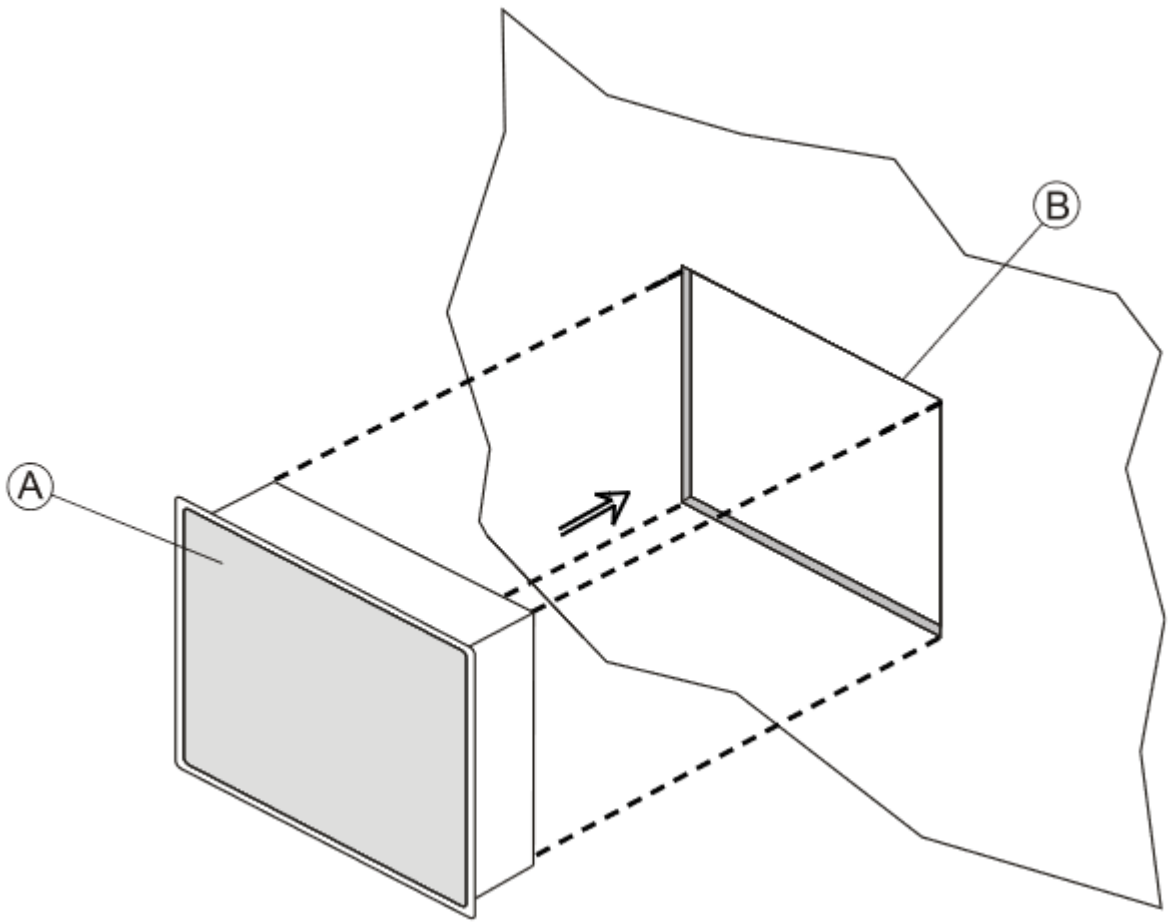
This might accelerate the aging process of the front panel film.

The equipment is not intended for installation in contact with corrosive chemical compounds. Check the resistance of the front panel film to a specific compound before installation.

Do not use tools of any kind (screwdrivers, etc.) to operate the touch screen of the panel.

The IP66 is guaranteed only if:

- max deviation from the plane surface to the cut-out: ‹= 0.5mm
- thickness of the case where is mounted the equipment: from 1,5mm to 6mm
- max surface roughness where the gasket is applied: ‹= 120 um



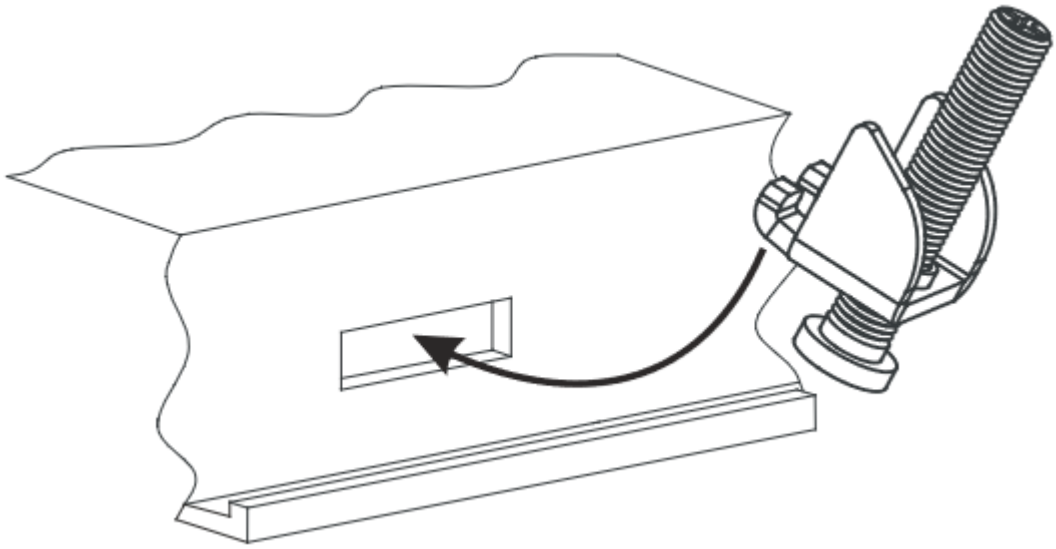
A. CDPX-X-B-W-xx
B. Installation cut-out

7.3 Safety instructions

For all installation notes, please refer to the Installation Guide provided with the product.

7.4 Installation Procedure

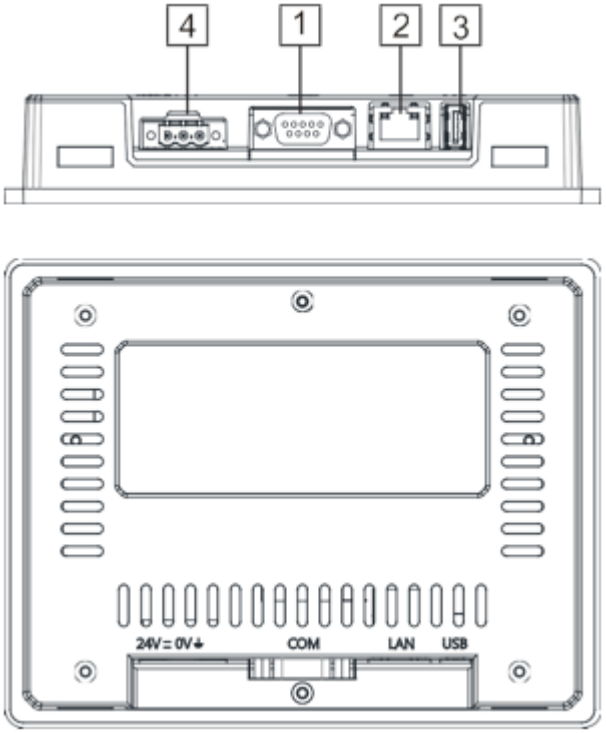
Place the fixing brackets contained in the fixing kit as shown in figure



CAUTION

Tightening torque: 130Ncm or screw each fixing screw until the bezel corner gets in contact with the panel.

8 Connections

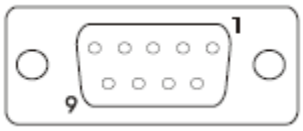


1. Serial Port
2. Ethernet Port (10/100Mb)
3. USB Port V2.0, max. 500 mA
4. Power Supply

8.1 Serial Port

The serial port is used to communicate with the PLC or with another type of controller.
Different electrical standards are available for the signals in the PLC port connector:
RS-232, RS-422, RS-485.
The serial port is software programmable. Make sure you select the appropriate interface in the programming software.

Serial Port **RS 232** **RS 422 / RS 485**



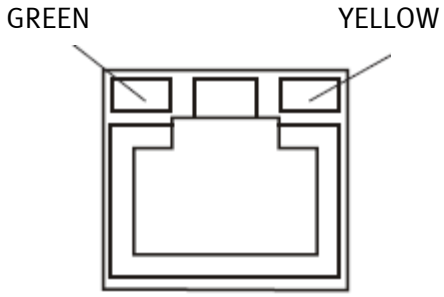
Pin	Description
1	GND
2	
3	TX
4	RX
5	
6	+5V output
7	CTS
8	RTS
9	

Pin	Description
1	GND
2	
3	CHA-
4	CHB-
5	
6	+5V output
7	CHB+
8	CHA+
9	

To operate in RS-485 pins 4-3 and 8-7 must be connected externally

The communication cable must be chosen for the type of device being connected

8.2 Ethernet Port

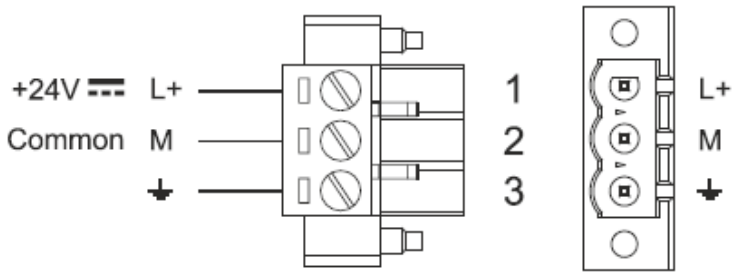


LED indicators

Green	Yellow	
ON	OFF	No LAN cable connected
BLINK (link active)	ON	LAN cable connected with 100MBd link
BLINK (link active)	OFF	LAN cable connected with 10MBd link

9 Power Supply, Grounding and Shielding

The power supply terminal block is shown in the figure below



DC Power Connector - AWG24 wire size - R/C Terminal Blocks (XCFR2), Female pitch 5.08mm, torque 4.5 lb-in.

3 conductor 1,5mm2 wire size minimum, minimum temperature conductor rating 105ºC.

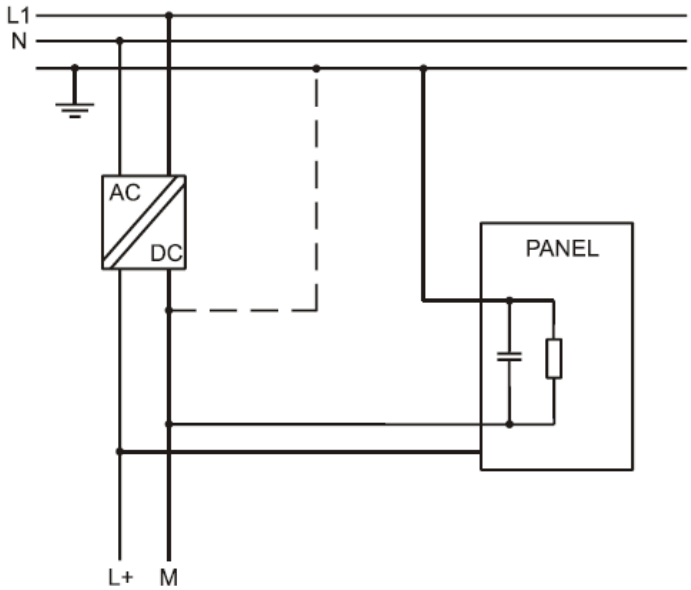
Note: Ensure that the power supply has enough power capacity for the operation of the equipment.

The unit must always be grounded to earth with 1,5mm2 wire size minimum. Grounding helps limit the effects of noise due to electromagnetic interference on the control system.

Earth connection will have to be done using either the screw or the fast on terminal located near the power supply terminal block. A label helps identify the ground connection. Also connect to ground the terminal 3 on the power supply terminal block.

The power supply circuit may be floating or grounded. In the latter case, connect to ground the power source common as shown in figure (see below) with a dashed line.

When using the floating power scheme, note that the panes internally connects the power common to ground with a 1MΩ resistor in parallel with a 4,7nF capacitor. The power supply must have double or reinforced insulation. The suggested wiring for the power supply is shown below.



All the electronic devices in the control system must be properly grounded.
Grounding must be performed according to applicable regulations.

10 Cleaning faceplates

The equipment must be cleaned only with a soft cloth and neutral soap product. Do not use solvents

11 Getting Started

CDPX-X-B-xx series HMI products must be programmed with the software Designer Studio 4.5 or higher.

Designer Studio is a software tool that must be properly installed on a computer running Microsoft Windows.

There are two options to transfer a Designer Studio application project to a HMI device:

Ethernet	Connect the HMI device to the computer with an Ethernet network. In Designer Studio select the command Run/Download to target. You may have to ensure that the proper firewall policy has been configured in the computer to allow Designer Studio to access the network.
USB	Create an Update Package using Designer Studio and copy it to a USB Flash drive.

Updated product documentation is available at www.festo.com.

12 Touchscreen calibration

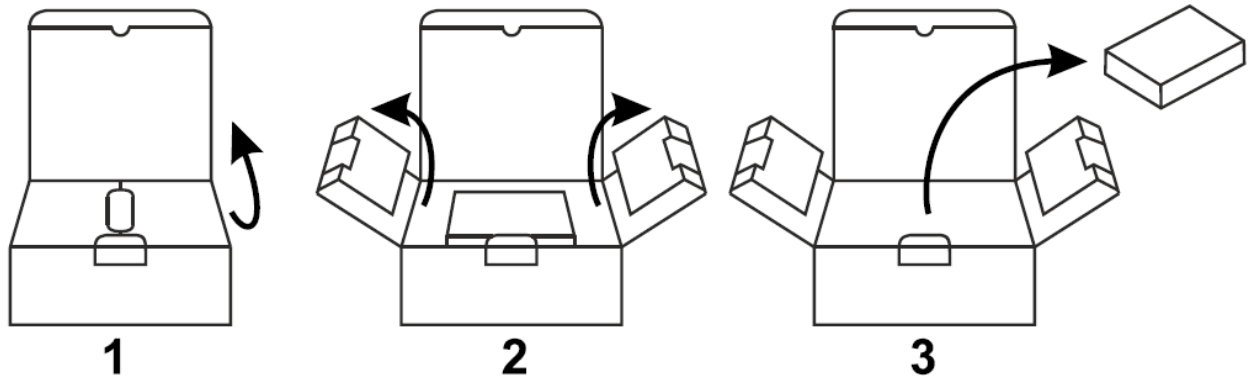
CDPX-X-B-xx series HMI products support calibration of the interface.
To start calibration proceed as follow:

- Use the “tap-tap” procedure at boot (this procedure consists in tapping the surface of the touchscreen during the device power-up phase. Tapping frequency must be high.
  You have to start tapping the touchscreen as soon as power has been applied to the device.
  When the sequence has been recognized, the system shows the message: “TAP-TAP DETECTED”.

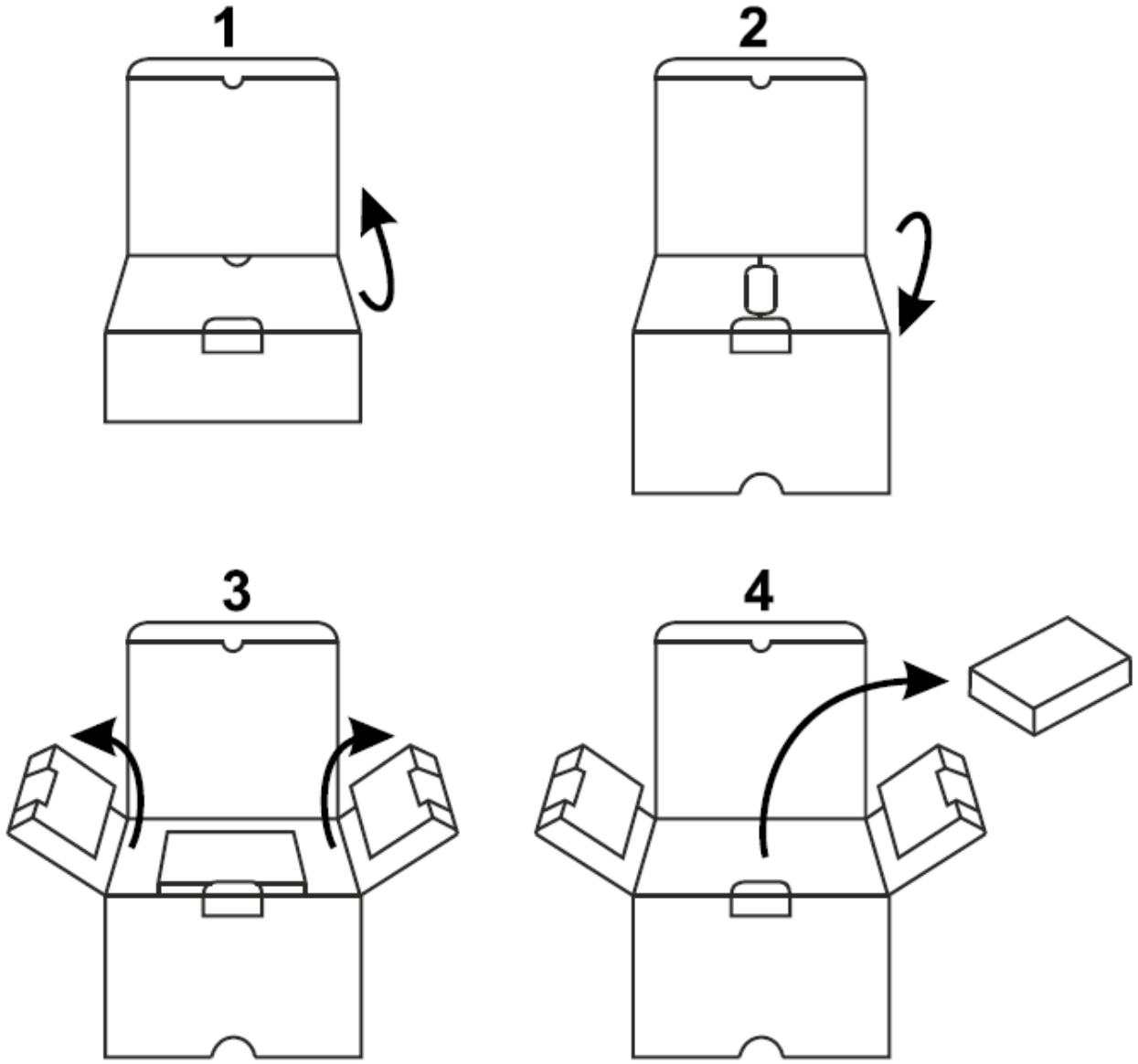
- Release touch and wait few seconds until the message “ENTERING SYSTEM SETTINGS” appears

- Press and hold touch for few seconds for selecting “TOUCHSCREEN CALIBRATION”.

13 Unpacking and Packing instructions



CDPX-X-B-W-4 / CDPX-X-B_W-7



To repack the unit, please follow the instructions backwards