

# Technical Description

MEW01245

Revision 3

## ***Fan control panel 4593***

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# 1 Introduction

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This document<sup>1</sup> describes the Fan control panel 4593.

The Fan control panel(s) 4593 can be mounted in the General control cabinet 4590.

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<sup>1</sup> Original file name: L:\User documents\EBL\Doc\Eng\MEW01245 (Rev 3).doc

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## **2**                    **Definitions / Explanations**

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Definitions / explanations / abbreviations / etc. frequently used or not explained elsewhere in the document.

**C.i.e.**            Control and indicating equipment = C.U.

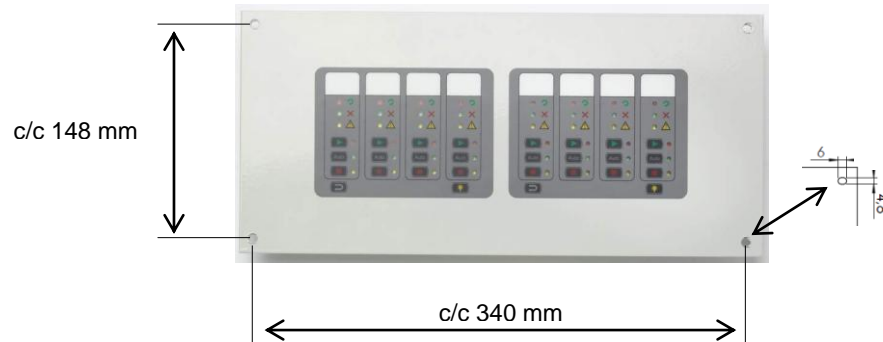
**C.U.**             Control Unit = CU = C.i.e.

**H/W**             Hardware

**FCP**             Fan Control Panel

### 3 General description

The Fan control panel 4593 contains of a light grey Fan control mounting plate (362 x 168 x 3 mm), two Fan control application boards 4594 and two fronts 4595 with LEDs and push buttons for the fan control functions.



*Figure 1. The Fan control panel 4593.*

The panel is intended to be mounted in the General control cabinet 4590, in which three Fan control panels 4593 can be mounted.



*Figure 2. The General control cabinet 4590 with two Fan control panels 4593 and one General mounting plate.*

The panels are visible through the door with Plexiglas. A key is required to open the door.

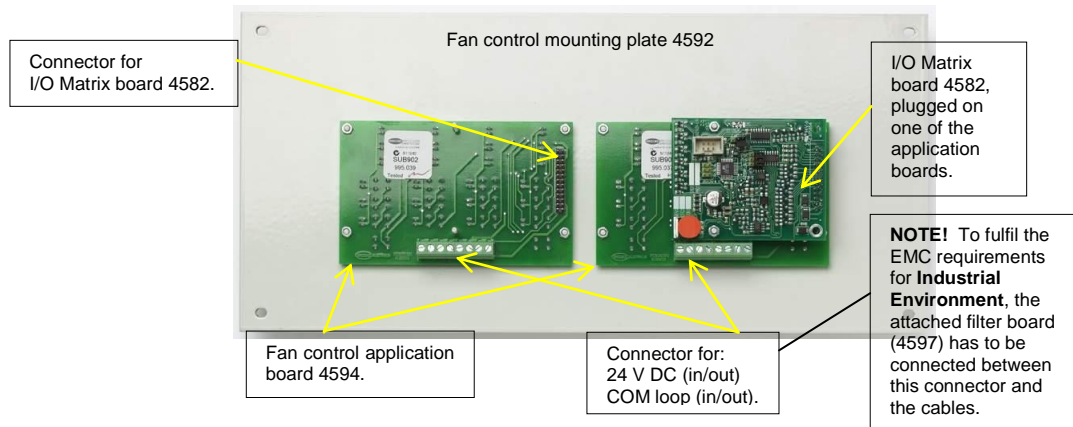
For connection to an EBL fire alarm system is one I/O Matrix board 4582 for each Fan control application board 4594 required.

The panels can be used in the fire alarm systems EBL128 and EBL512, for fan control.

The panels / cabinet can be mounted close to the fire alarm c.i.e. or separately. They are intended for indoor use and in dry premises.

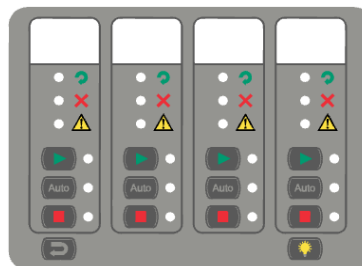
## 4 Fan application board and front

The two Fan control application boards 4594 are mounted on the backside of the mounting plate. Each board has LEDs and push buttons for the front, one connector for the I/O Matrix board and one connector for the COM loop and power supply (24 V DC).



*Figure 3. The Fan control panel 4593, backside view.*




There are two fronts on each Fan control panel 4593, i.e. one front for each Fan control application board 4594. Each front is for a group of four fans, with LEDs and push buttons for fan control. For each fan there is a white label/field for fan information to be written.





For each fan there are the following LEDs indicating the **fan status**:

-  Running
-  Stopped
-  Fault

For each fan there are the following buttons for the **fan operation mode**:

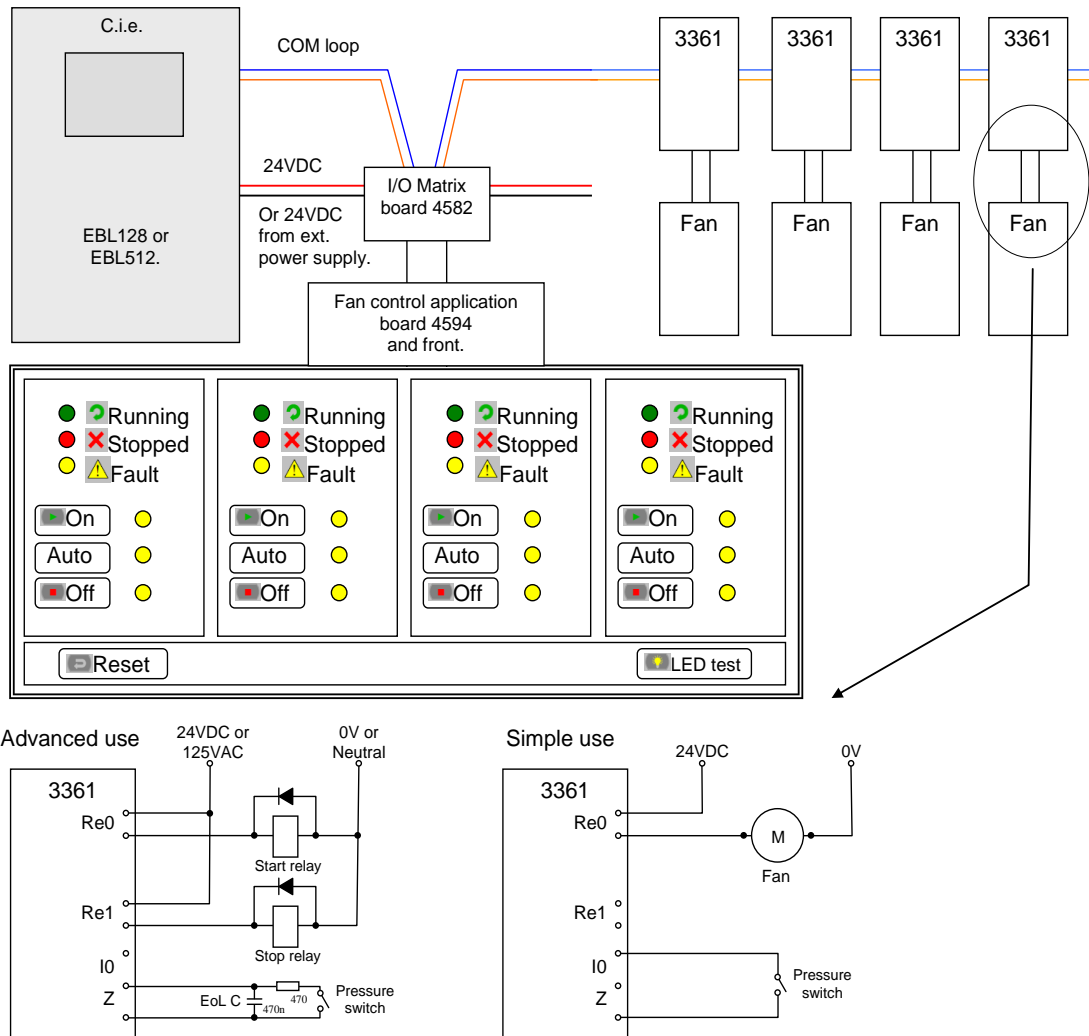
-  On (the LED is on when the mode is selected)
-  Auto (the LED is on when the mode is selected)
-  Off (the LED is on when the mode is selected)

For the group of four fans there are the following buttons:

-  Reset (of fan status after fire alarm reset)
-  LED test



## 5 Fan control function



*Figure 4. Fan control function overview. NOTE! I/O unit 3361 is in Win128 / Win512 / WinG3 programmed for "Fan control".*

### Systems EBL512 and EBL128 and EBL512 G3

Each Fan control application board / front can operate up to four different fans. The fans are connected to the COM loop via an Addressable multi purpose I/O unit 3361 (one 3361 unit per fan).

The fan is activated via the relay output Re0 on the 3361 unit, and the feedback signal "running" (from the pressure switch) is connected to input I0 (Z). Input I0 can be programmed as supervised (screw terminals 6 & 7) or not supervised (screw terminals 5 & 7). The fault detection time can via Win128 / Win512 be set to 30 seconds.

The fault detection time can via WinG3 be set to 30-255 seconds.

Each fan can be operated in 3 different modes (On, Auto and Off). On and Off are manually controlled and operates the fan independently of the c.i.e. status. In the Auto mode the fan is operated by the c.i.e.

The I/O Matrix board is plugged on the Fan control application board.

Power supply (24 V DC) and the COM loop are connected to the Fan control application board.<sup>2</sup>

The Fan control panel is intended to be mounted in the General control cabinet 4590 but can be mounted in any suitable cabinet.

### **Systems EBL512 and EBL128**

Re0 can in Win128 / Win512 be programmed to be latched, i.e. it will not be reset until the "Reset" button on the fan control front is pressed.

If Re0 is activated, then Re1 is deactivated and vice versa (in advanced use).

Normally running / Normally stopped has to be programmed in Win128 / Win512 for correct "Running" and "Stopped" indication in the Fan control panel.

### **System EBL512 G3**

Re0 or Re0 (Start) and Re1 (Stop) can in WinG3 be programmed to be latched, i.e. not reset until the "Reset" button on the fan control front is pressed.

Re0 and Re1 can be programmed as Normally open or Normally closed via WinG3

In "Advanced use" the fan control can be **Enhanced** or **Not enhanced**.

**Not enhanced:** If Re0 is activated, then Re1 is deactivated and vice versa.

**Enhanced fan control:** Re0 and Re1 can be individually activated / deactivated.

The following figure is an example of how the Mechanical Services Switch Board (MSSB) contacts might be connected.

### **NOTE!**

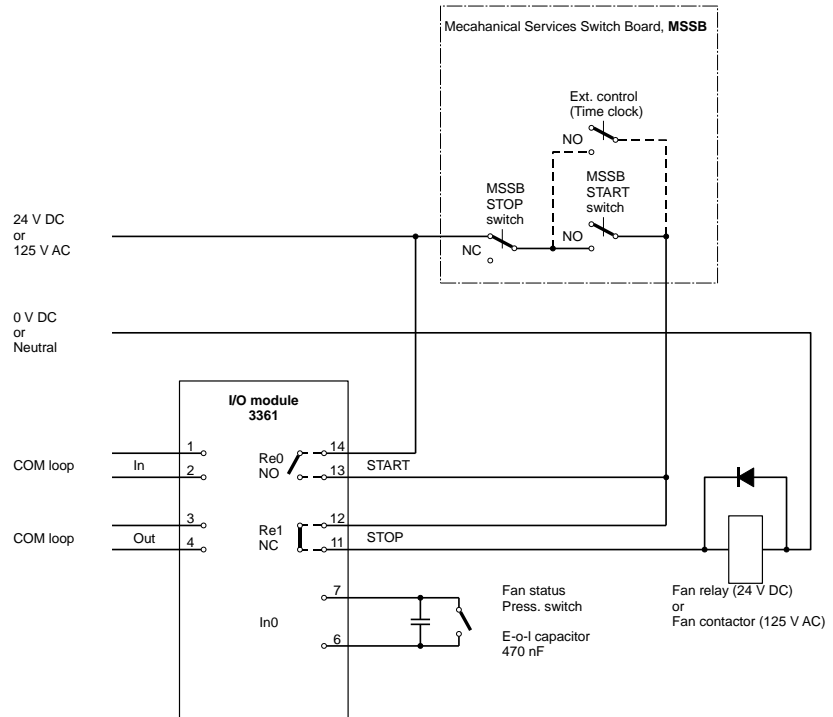
The monitored input "In0" is only in use when START and STOP is operated by the c.i.e. (i.e. the I/O module 3361), **not** when START and STOP is operated by the MSSB.

The LED "Fault" on the fan control panel will be turned on 30 – 255 sec. (programmable) after STOP or START, if the fan's status at that time is not correct (i.e. it has not stopped or not started).

An open circuit fault on the input "In0" wires will always turn on the LED "Fault" on the fan control panel.

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<sup>2</sup> See chapter "Fan control application board 4594 connections", page 14.

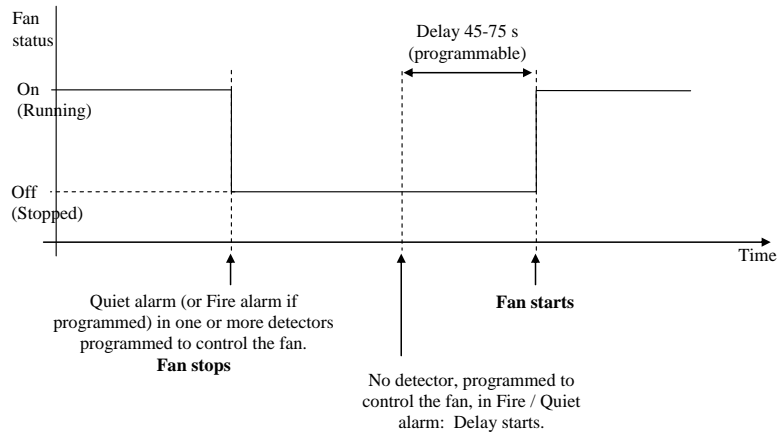


*Figure 5. Enhanced fan control. An example of how the Mechanical Services Switch Board (MSSB) contacts might be connected.*

## 6 Applications

The Fan control panel can be used for **Supply air fans** (that are normally ON) and/or **Smoke exhaust, Smoke spill and Stairs pressurisation fans** (that are normally OFF).

### 6.1 Supply air fan



**NOTE!** : Relay output with delayed de-activation after reset of Fire / Quiet alarm can be used. If any detector, programmed to control the fan, during the delay returns to Fire / Quiet alarm, the fan continues to be off until no detector is in Fire / Quiet alarm and a new delay starts.

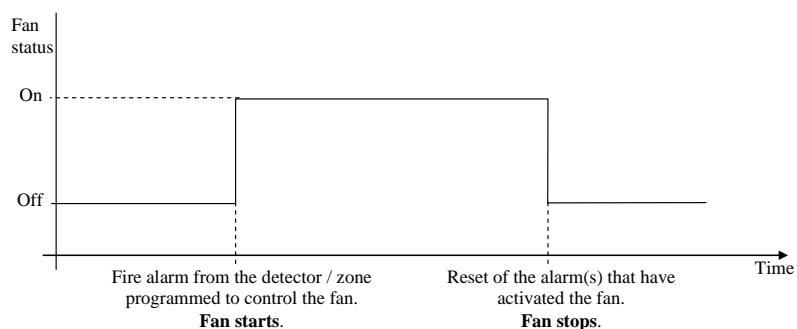
#### 6.1.1 Quiet alarm

Quiet alarm is presented in the c.i.e. as "Quiet alarm", the LEDs "Fire" blinking (0.4 / 0.4s), buzzer sounds (0.8 / 5s) and outputs programmed for Quiet alarm are activated. No other outputs will be activated. Quiet alarm is non-latching (but the relay output can be latched).

#### 6.1.2 Detector type

Only analog smoke detectors can be used for this function. One or several detectors can be programmed to control the fan.

### 6.2 Smoke exhaust, Smoke spill and Stairs pressurisation fans



#### 6.2.1 Detector type



Both analog smoke detectors and conventional zones can be programmed control the fan.

## 7 Function

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### 7.1 Operation mode

The buttons / LEDs **On**, **Auto** and **Off** are used to set / indicate the fan's operation mode. The buttons are non-latching and the current mode is indicated by the corresponding LED.




-  **On** This mode means that the fan is on (i.e. the 3361 relay output activated) independent on the c.i.e. status. LED **On** is lit.
- Auto** This mode means that the fan status (i.e. the 3361 relay output state) is dependent on the c.i.e. status described in chapter 6. LED **Auto** is blinking if the 3361 relay output Re0 is activated, otherwise it is continuously lit.
-  **Off** This mode means that the fan is off (i.e. the 3361 relay output is de-activated) independent on the c.i.e. status. LED **Off** is lit.

**NOTE!** The LEDs described above are only indicating the selected mode, i.e. not the actual fan status, which is indicated by the LEDs **Running**, **Stopped** and **Fault**.

Default mode after startup is Auto.

### 7.2 Fan status

The following LEDs are indicating the actual fan status.

-  **Running** Is lit when the fan is running (i.e. the 3361 input is activated)
-  **Stopped** Is lit when the fan is stopped (i.e. the 3361 input is de-activated)
-  **Fault** Is, **in not enhanced mode**, lit when:

The fan has been activated (i.e. the 3361 output is activated) either via the button **On** or by the c.i.e. in **Auto** mode, but the 3361 input has not been activated within 30<sup>3</sup> seconds after the activation of the 3361 output.

or

The fan has been stopped (i.e. the 3361 output is de-activated) either via the button switch **Off** or by the c.i.e. in **Auto** mode, but the 3361 input has not been de-activated within 30<sup>3</sup> seconds after the activation of the 3361 output.

or

If the monitored 3361 input is used and there is an open circuit fault on the input wires.

**Is, in enhanced mode, lit when:**

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<sup>3</sup> Via WinG3 the fault detection time can be set to 30-255 seconds.


Like in not enhanced mode but **not** when operated via the MSSB.

An open circuit fault on the input "In0" wires will, however, turn on the LED "Fault" on the fan control panel.

**NOTE!** The LED **Fault** can be lit in combination with the LED **Running** or the LED **Stopped**.

## 7.3 Reset of fan status after alarm

To each group of four fans there is a **Reset** button (i.e. one per I/O Matrix board).

 The **Reset** button is used to reset a fan status after alarm (if the fan output is selected to be latched). As long as there still is any alarm, which affects the fan status, the button has no function.

It is possible to select either global or local reset. (Not valid for EBL128.)

**Local reset** is reset of the fans connected to the same c.i.e. as the **Reset** button.

**Global reset** is reset of all the fans in the whole EBL system.

## 7.4 LED test

 The **LED test** button is used for LED test.

To each group of four fans there is one **LED test** button.

When the LED test is activated in the c.i.e. also the fan control LEDs will be lit.

## **8                    Addressable multipurpose I/O unit                          3361**

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When the Addressable multipurpose I/O unit 3361 (**I/O module**) shall be used for the fan control function it shall be programmed in Win128 / Win512 / WinG3 as **I/O unit 3361 for fan control**.

## **9 I/O Matrix board 4582**

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The Fan control panel 4593 has two 4594 Fan control application boards. One I/O Matrix board 4582 has to be plugged on each Fan control application board.

Power supply (24 V DC) and the COM loop are connected to the Fan control application board.<sup>4</sup>

The I/O Matrix boards have to be programmed in Win128 / Win512 / WinG3 (type "Fan control") and for each I/O Matrix board can up to four fans be programmed.

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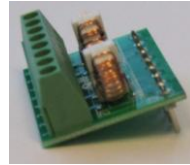
<sup>4</sup> See chapter "Fan control application board 4594 connections", page 14.

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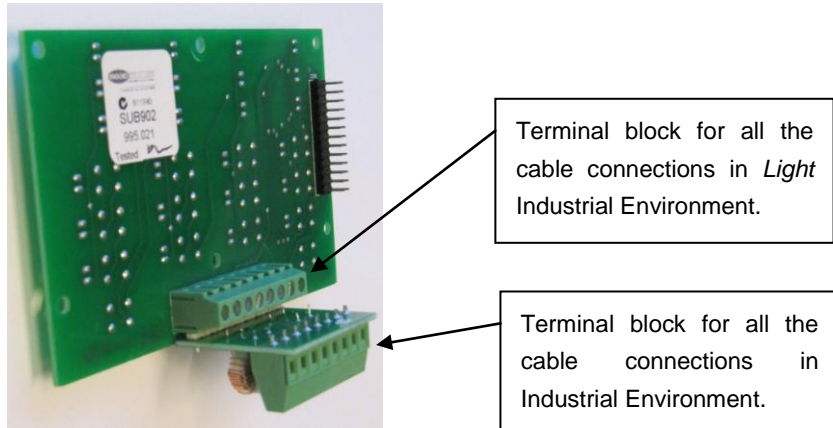
# 10 Fan control application board 4594 connections

With each Fan control application board 4594 is a **Filter board 4597** attached.



The filter board (4597) has to be mounted to fulfil the EMC requirements for **Industrial Environment**. This board is not required for *Light* Industrial Environment.

The filter board shall be connected to the application board terminal block and all the cable connections shall instead be done on the filter board terminal block.



## Screw terminals

Fan control application board 4594	<b>+24 V</b> DC (in)	<b>0 V</b> DC (in)	<b>+24 V</b> DC (out)	<b>0 V</b> DC (out)	<b>SA</b> COM loop (in)	<b>SB</b> COM loop (in)	<b>SA</b> COM loop (out)	<b>SB</b> COM loop (out)
Filter board 4597 (J1)	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>

# 11 Requirements and limitations

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The I/O Matrix board 4582 and the corresponding 3361 units must be connected to the one and same c.i.e.

Maximum number of I/O Matrix boards for Fan control is for:

**EBL128:** 8 per c.i.e.

For each expansion board<sup>5</sup> connected in the c.i.e. the number of I/O Matrix boards 4582 is reduced with one, i.e. if max. number of expansion boards shall be used the max. number of I/O Matrix boards is 4.

**EBL512:** 16 per c.i.e., i.e. 4 per COM loop.

**EBL512 G3:** 24 per c.i.e., i.e. 6 per COM loop.

For each expansion board<sup>5</sup> connected in the c.i.e. the number of I/O Matrix boards 4582 on COM loop 0 is reduced with one, i.e. if max. number of expansion boards shall be used the max. number of I/O Matrix boards on COM loop 0 is 0.

## Industrial Environment requirement

See chapter "Fan control application board 4594 connections", page 15.

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<sup>5</sup> 4580, 4581 and 4583.

## 12 Technical data

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### **Voltage on COM loop (V DC)**

Allowed 12-30  
Normal 24

### **Voltage ext. 24 V DC power supply**

Allowed 18-30  
Normal 24

### **Current consumption at nom. voltage from COM loop (mA)**

4 – 6 (Application board 4594 and I/O Matrix board 4582 together.)

### **Current consumption at nom. voltage from ext. 24 V DC power supply (mA)**

10 – max. 100 (Application board 4594 and I/O Matrix board 4582 together.)

### **Ambient temperature (°C)**

Operating -10 to +55  
Storage -20 to +60

### **Ambient humidity (%RH)**

Max. 95, non condensing.

### **Size W x H x D (mm)**

362 x 168 x 20 (Approx. 32 mm incl. the I/O Matrix board 4582.)

### **Weight (g)**

595 (excl. the I/O Matrix board 4582.)  
46 (Fan control application board 4594 only.)

### **Colour (metal cabinet / door)**

Light grey (NCS S 1500-N, PMS Cool grey 2).

### **Approvals**

CE

## 13 Revision history

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Revision text is typed with **red font colour** when possible.

### Revision 1

- 4 Figure 3 text added.
- 5 Footnote 2 added.
- 6.1 Text added.
- 6.1.1 Text added.
- 7.1 Text revised.
- 7.3 Text added.
- 9 Footnote 4 added.
- 10 Chapter added.
- 11 Text added.
- 12 Text added.

### Revision 2

- 5 Info. added.
- 6 Info. revised and added.
- 7.2 Footnote 3 added.
- 8 Info. added.
- 9 Info. added.
- 11 Info. revised and added. Footnote 5 added.

### Revision 3

- 5 Info. added and revised. Figure 5 added.
- 7.2 Info. added.
- 8 Info. added.

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