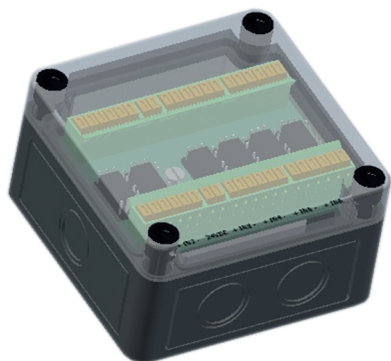


Operating instructions



Sensor-relay-switchboxes

GS01.004

GS01.006

GS01.008

GS01.012

EC Declaration of Conformity

In accordance with the EC Machinery Directive 2006/42/EC of May 17, 2006, Annex II B

We

FIPA GmbH
Freisinger Str. 30
85737 Ismaning

hereby confirm that the products:

GS01.004
GS01.006
GS01.008
GS01.012

do not contain any toxic substances that are specified in the RoHS Directive 2011/65/EU.

Conformity with RoHS Directive 2011/65/EU is confirmed!

Ismaning, January 2018
Place and date



Rainer Mehrer,
CEO

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SYMBOLS



Attention! Please observe without fail!

Failure to comply can cause damage to the component, damage to the connected system/machine or personal injury.

1. INTRODUCTION

The GS01.004, GS01.006, GS01.008 and GS01.012 sensor switchboxes are used for AND-operation of sensor signals to save on digital inputs for robot control systems, for example. They differ only in the number of sensor inputs; the basic structure is identical for all sensor switchboxes.

The connected sensors may be of PNP or NPN type, or they may be potential-free; reversed sensor logic can also be corrected. In addition, various sensor types can be mixed in one AND-operation group. The connected output signals can also be of PNP or NPN type.

The sensor switchbox is supplied pre-assembled and safely packaged.

The operating instructions include a description of the safety regulations, installation and maintenance, together with the technical data. If you have further questions about the sensor switchbox, please contact our Technical Sales department (+49 89 962489-0).

FIPA consistently strives to develop and improve the design and construction of its vacuum components. We therefore reserve the right to make changes to the design and technical features without notice.

All of the information in these operating instructions corresponds to the features at the time of publication. Printing errors are excepted.



Rainer Mehrer,
Managing Director



The design and construction of the sensor switchbox may not be altered under any circumstances without the consent of FIPA GmbH. Only original FIPA accessories and spare parts may be used.

2. SAFETY

Read these operating instructions carefully before initial commissioning and observe the following safety regulations. The sensor switchbox may be operated and maintained only by personnel who have read these operating instructions and fully understood their content. Append these operating instructions to your general operating instructions for the system/machine as a whole.

A visual inspection must be carried out before commissioning. The sensor switchbox must not show any obvious signs of damage. It must be free from moisture, dust and dirt.

2.1. SOURCES OF DANGER

- > The device must not be operated or maintained by personnel who are under the influence of alcohol, medication that impairs perception such as sleeping tablets or strong painkillers, or other drugs. Other conditions such as circulation problems and dizziness are also criteria for prohibiting personnel from operating this system.
- > The device must not be operated or maintained by personnel who have not been trained or have not read and understood this introduction.
- > The operator is responsible for ensuring that no personal injuries can be caused when working with the device.
- > The sensor switchbox must never be tampered with.

3. TRANSPORT INSTRUCTIONS

During transport it must be ensured that the sensor switchbox is protected against temperature and moisture.

3.1. PACKAGING

The sensor switchbox is packed in a cardboard box.

3.2. UNPACKING

Open the cardboard box carefully (do not use sharp objects!). Take the switchbox out of the cardboard box and ensure that none of the small parts that are included in the box is lost.

4. STORAGE

Storage conditions for the sensor switchbox:

- > Room temperature of 0 - 40°C
- > Humidity of 40 - 60%
- > Undamaged packaging

5. DESCRIPTION OF ASSEMBLY

The sensor switchbox must be correctly wired and assembled under de-energized conditions. It must not be assembled underwater or at temperatures above 60°C.

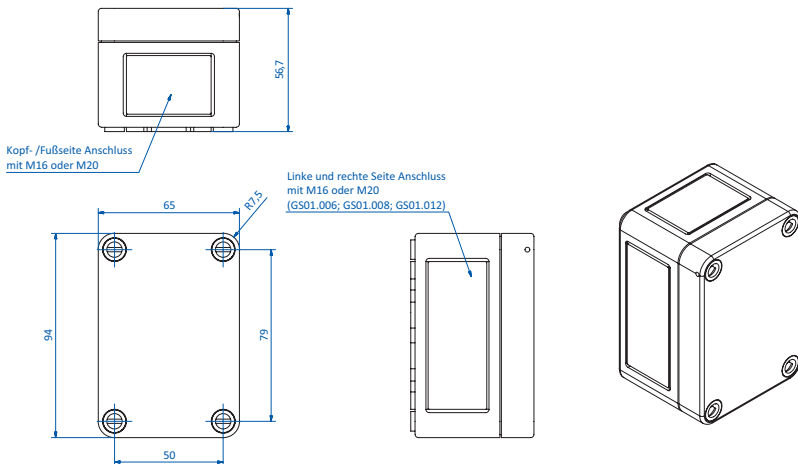
The sensor switchbox is used for AND-connection of sensor signals, to save on inputs for robot control systems, for example. The basic structure is identical for all sensor switchboxes; they differ only in the number of sensor inputs.

Unlike a series circuit, a separate signal is fed through several miniature relays, each of which is activated by a sensor. Each sensor must therefore feed the (small) relay coil, but not all of the following sensors. There are no voltage drops at PN transition points.

- > Additional tool: Screwdriver

5.1. FITTING CABLE GLANDS

With the small GS01.004 switchbox, cable glands can only be fitted on the top and bottom. With the larger GS01.006/GS01.008/GS01.012 switchboxes, all four sides can be connected.

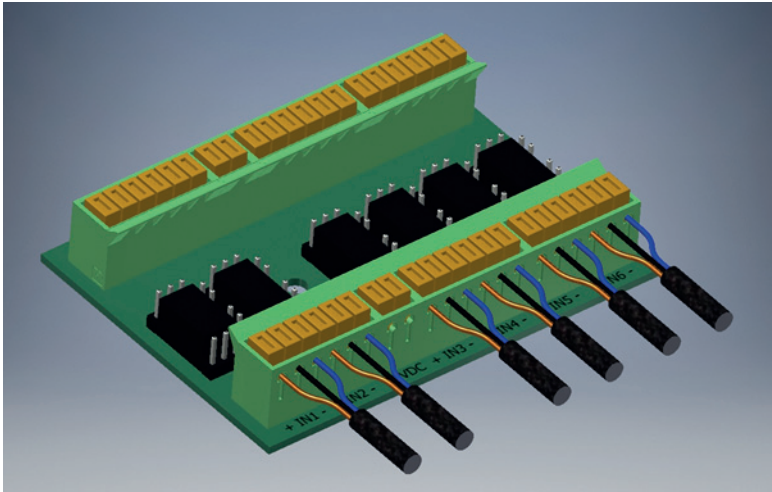


5.2. ATTACHING THE SENSOR CABLES

Note: In the following illustrations, only the circuit board of the sensor switchbox is shown in the

interests of clarity.

First, fit the sensor cables. Each sensor input consists of a terminal for +24 VDC (brown), sensor signal IN (black) and earth (blue).



Important: The circuit board terminals do not require soldering, screwing or insulation stripping.



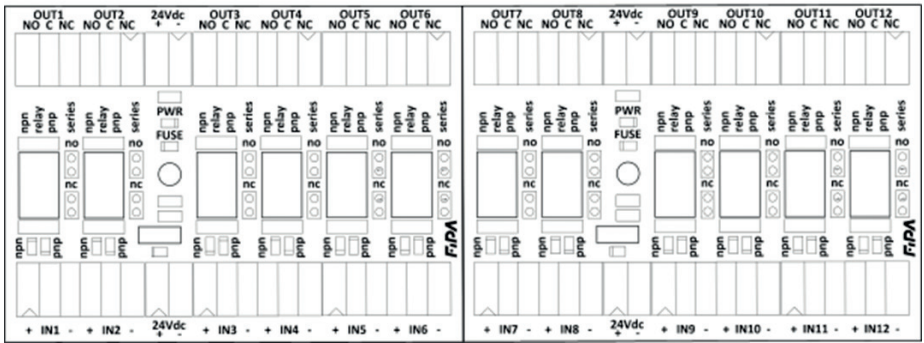
Remove the outer insulation of the sensor cable only!

The colored insulation on the individual wires must not be removed, but the uninsulated wires are inserted into the upper, extended part of the slot once the corresponding push-button actuator has been pulled up. Pushing down the orange push-button actuator causes two contact pieces to cut through the wire insulation, creating a conductive connection between the wire and the terminal.

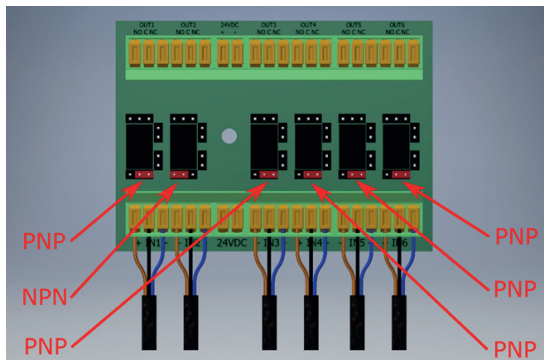
5.3. SETTING THE SENSOR TYPE

Next, set the type of the sensors used by connecting two of the three contact pins behind the connection terminal with a jumper.

The following illustration shows the labelling on the circuit board(s), in particular the labelling on the jumper contacts.



In the following example, six sensors have been connected. The first sensor and the third to the sixth sensor are PNP type, while the second is an NPN sensor:

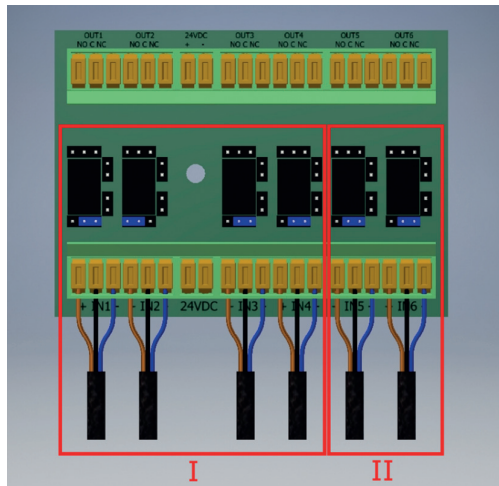


The jumpers are inserted in such a way that the center contact pin is connected with the left (NPN) or the right (PNP) contact pin in each case.

5.4. CREATING GROUPS

The connected sensors can be combined to form one or more groups connected by an AND-operation. The sensor switchboxes allow any group formation.

In the example, the first four and the last two sensors are to be connected by an AND-operation. Groups I and II are formed.



First the type of output signal must be established. This is determined by the design of the digital inputs on the control system to which the switchbox is connected.

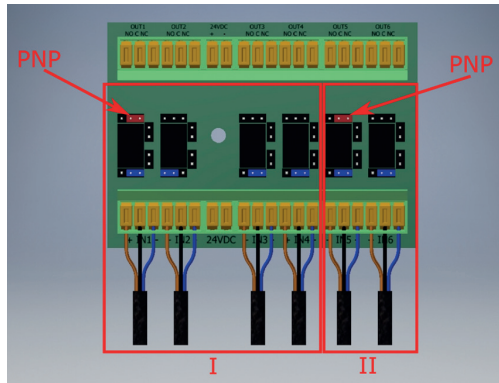


If there are **PNP inputs** (as with most European manufacturers), the **output signal** on the sensor switchbox must be **PNP type**, in other words it must make a conductive connection between +24 VDC and the input.

If there are **NPN inputs** (as with most Asian manufacturers), the **output signal** on the sensor switchbox must be **NPN type**, in other words it must make a conductive connection between the input and earth.

The type must be set for each sensor group, although usually the same sensor type is set, as the same control system is involved.

To do this, a jumper is connected to the first relay of the group:



 **The other contact pins above the relay remain free!**

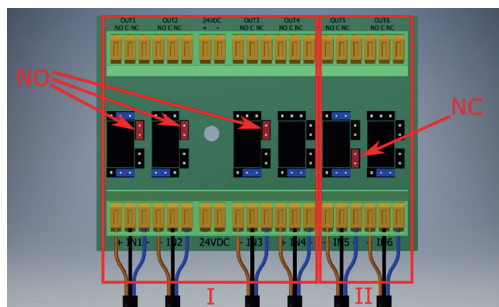
(In the example, the sensor switchbox is connected to a control system with PNP inputs. For a control with NPN inputs, the left and center contact pins would have to be connected.)

The next step is to make the connection for the AND-operation itself. Either the normally closed contact or the normally open contact of a relay must be connected to the common switching contact of the next relay, with the exception of the last relay in a group.

In the example, all of the sensors in group I are normally open contacts.

The two sensors in group II, on the other hand, are normally closed contacts, i.e. they should detect if the two signals are not present. (This is often the case with through-beam light barriers, for example.)

The jumpers are inserted as follows:

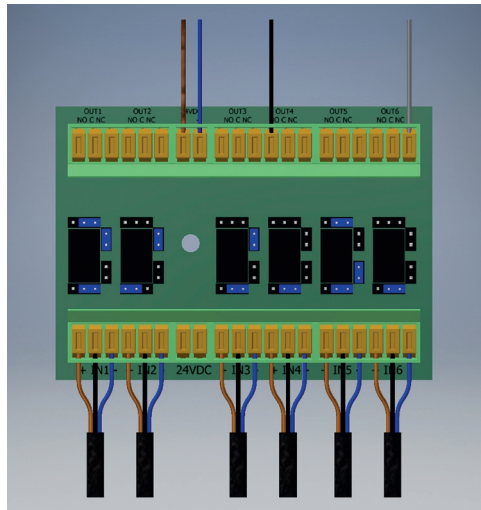




Please note that no jumper is inserted on the 4th and 6th relays. While a jumper on the 6th relay would not have any effect, a jumper on the 4th relay would connect group I to group II! This is not what is required.

5.5. CONNECTION TO THE CONTROL SYSTEM

Finally, the sensor switchbox must be connected to the control system. To do so, the linked signals must be connected to the digital inputs, and the power supply must be connected.



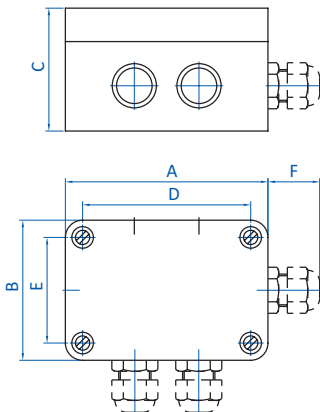
It should be noted that group I is connected via the terminal OUT4-NO, as even the last sensor of this group (4) is a normally open contact, while group II is connected via the OUT6-NC terminal, as the last sensor in group II is a normally closed contact (NC).

The supply voltage is connected to the 24VDC + and – terminals.

6. GENERAL TECHNICAL DATA

Nominal supply voltage:	24 VDC \pm 10%
Output current (max.):	1A per group
Load current per sensor:	6.25 mA, corresponds to 150 mW
Cable cross-section:	0.22..0.34 mm ² (AWG 22..26), wire $\varnothing \leq 1.8$ mm

Dimensions



Item no.	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
GS01.004	94	65	57	79	50	25
GS01.006	94	94	57	79	79	25
GS01.008	130	94	57	115	79	25
GS01.012	180	94	57	165	79	25

Technical data

Item no.	Weight [kg]	Protection category	Protection method
GS01.004	0.177	II – Protective insulation in accordance with VDE 0106	IP66 – in accordance with EN 60529 / DIN VDE 0470-1
GS01.006	0.237	II – Protective insulation in accordance with VDE 0106	IP66 – in accordance with EN 60529 / DIN VDE 0470-1
GS01.008	0.309	II – Protective insulation in accordance with VDE 0106	IP66 – in accordance with EN 60529 / DIN VDE 0470-1
GS01.012	0.422	II – Protective insulation in accordance with VDE 0106	IP66 – in accordance with EN 60529 / DIN VDE 0470-1

7. MAINTENANCE INSTRUCTIONS

The maintenance instructions must be followed precisely to ensure that the system functions safely. If faults are detected in the system, they must be rectified immediately, before the sensor switchbox is put into operation.

- > During service work, the switchbox must be disconnected from the voltage supply and secured to prevent reconnection.

7.1 SCHEDULE (MONTHLY TO ANNUALLY)

The sensor switchbox should undergo a visual inspection once a month to once a year. It must be ensured that the sensor switchbox is free from moisture, dust and dirt and has no obvious signs of damage, such as breaks or cracks in the housing.

7.2. QUALIFICATIONS REQUIRED OF MAINTENANCE PERSONNEL

The maintenance personnel must be instructed and suitably qualified to carry out the maintenance work. They must also have read and understood these instructions. It must be ensured that the maintenance personnel have access to these instructions at all times.

7.3. INSTRUCTIONS FOR DECOMMISSIONING

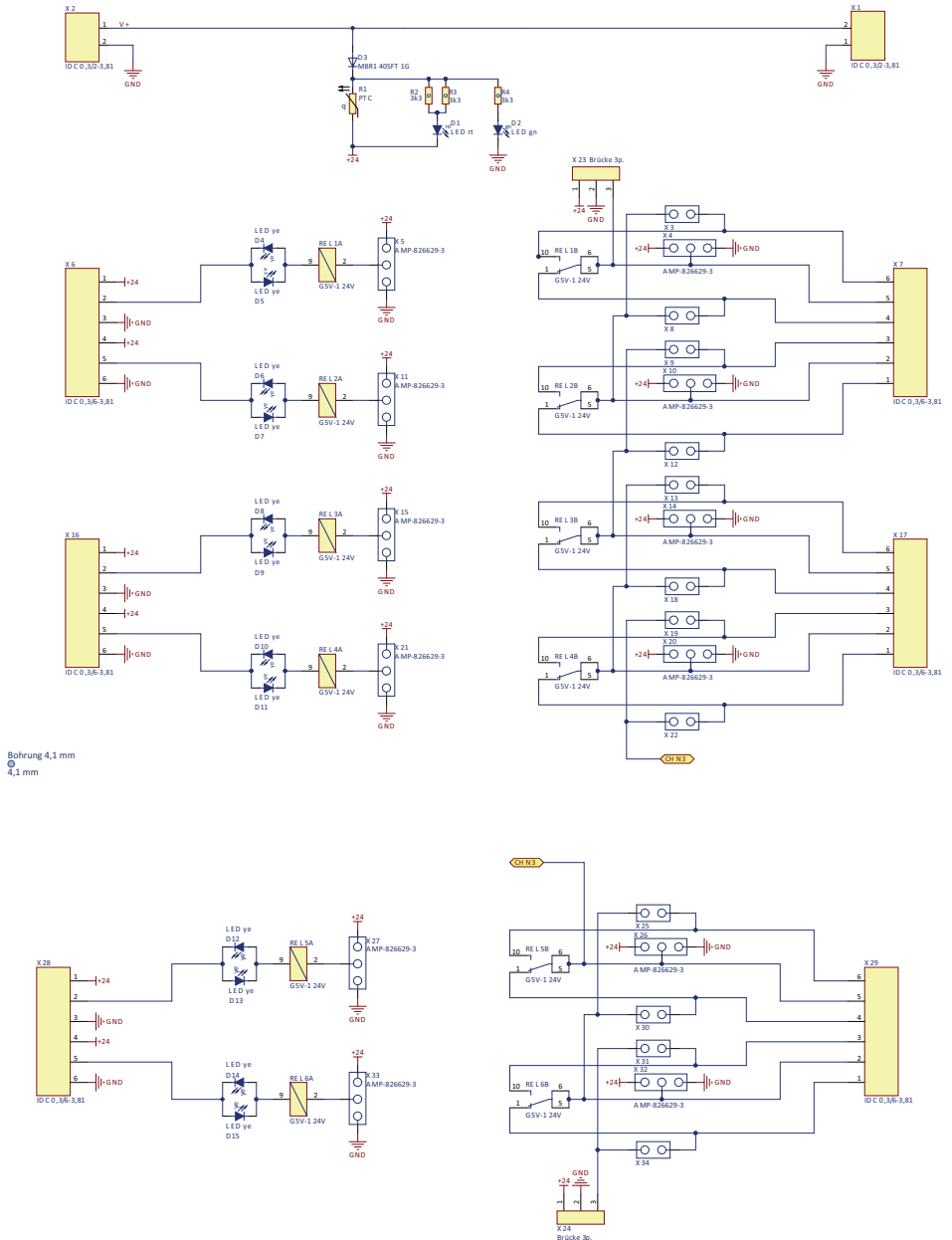
The sensor switchbox must be disconnected from the mains power supply before disassembly.

7.4. DISPOSAL

As this sensor switchbox contains electronic components, it must be disposed of properly.

8. OTHER DOCUMENTS

Circuit diagram:



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