FC400A ■ FC400M

Installation and operating instructions FC400 Laboratory Fume Hood Control

SCHNEIDER

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Table of contents

1. General information

1.1. Information on installation and operating instructions

This assembly and operating manual enables the correct installation as well as the intended, safe and efficient handling of the FC400 fume hood control system.
The installation and operating instructions are aimed at specialists in the electrical and air-conditioning trade, installation companies, in-house technicians as well as technical staff or instructed persons.
The staff is obliged to have read and understood these instructions carefully before starting any work. The basic prerequisite for safe working is compliance with all specified safety instructions and instructions.
In addition, local occupational health and safety regulations and general safety regulations apply.
When the system is handed over, these installation and operating instructions must be handed over to the system operator. The plant operator must attach these instructions to the plant documentation. These instructions must be kept accessible to staff at all times. The illustrations in this manual are for basic understanding and may differ from the actual execution. No claims can be derived from any deviations.

In addition to these assembly and operating instructions, the following documents must be observed:

- Technical Data Sheet Control Body, Measuring Devices and Control Flaps
- General wiring documents
- Project-specific wiring documents, these will be transmitted when the order is placed.

1.2. Safety

In this manual, the safety instructions are marked with symbols. Depending on the extent of the danger, different terms are used in connection with the occurrence of the symbols. Explanatory texts and notes must be observed!

DANGER!	
	This term refers to an imminently dangerous situation which, if not avoided, can lead to death or serious injury.

WARNING!	
	This term refers to a potentially dangerous situation that, if not avoided, can lead to death or serious injury.

CAUTION!	
	This term refers to a potentially dangerous situation that, if not avoided, can result in minor or minor injuries.

HINT!	
	This term refers to a potentially dangerous situation that, if not avoided, can lead to property damage. This also applies to situations that may affect the functionality of the FC400 fume hood control.

ENVIRONMENT!	
	This term refers to a possible danger to the environment.

1.3. Safety markings on the FC400 fume hood control system

The following symbols and signs are located on the FC400 fume hood control system and relate directly to the immediate environment.

	**Warning of electrical voltage!** Before opening, the FC400 device must be de-energized. In the areas marked in this way, only qualified electricians are allowed to work. Unauthorised persons are not allowed to enter or open the areas marked in this way, and they are not allowed to work on the components marked in this way.
	General dangers and warnings
	Before commissioning or opening the housing, the assembly and operating instructions must be read carefully and completely.
	Ground connection

Table 1: Safety signage

1.4. Safety and intended use

Before installing and commissioning the FC400 fume hood control system, carefully read and observe these installation and operating instructions.

DANGER!	SAFETY!

	• The FC400 fume hood control system is intended exclusively for the control and monitoring of volume flows on fume hoods in accordance with DIN EN 14175-6.
	• Foreseeable misapplications are:
	  ○ the use of the FC400 fume hood control system in explosive atmospheres
	  ○ the use of the FC400 laboratory fume hood control system when not installed
	  ○ The use of the FC400 laboratory fume hood control outside confined spaces
	• The FC400 fume hood control system may only be used in a commercial environment, use in a private environment is not permitted.
	• The FC400 fume hood control must not be operated outside the specified protection class. The correct electrical connection must be ensured before commissioning.
	• The FC400 laboratory fume hood control must not be operated outside the specified degree of protection.
	• Installation and wiring may only be carried out by specialists. The relevant regulations on occupational health and safety, as well as the applicable local regulations, must be observed.
	• Never clean electrical equipment with water or similar liquids. To avoid moisture ingress, the FC400 fume hood control system must only be mounted on a flat surface
	• The pressure sensor's measuring hoses may contain toxic substances, so avoid any contact with the open hose ends.
	• Check that the operating voltage indicated on the nameplate corresponds to the local mains voltage.
	• The FC400 fume hood control system must only be operated within the limits specified in the technical data.
	• The fume hood control must not be operated without a protective cover.
	• During assembly, wiring and commissioning, the recognised rules of technology, in particular the safety and accident prevention regulations, must be observed.

WARNING!	SAFETY!
	• The appliance must only be cleaned from the outside with a dry, lint-free cloth. • With all connection cables, care must be taken to ensure that they are neither compressed nor kinked. For the extension of the connecting cables, SCHNEIDER offers the appropriate cables. Only the original SCHNEIDER cables may be used. • For the return shipment in the event of service, the FC400 laboratory fume hood control must be professionally packaged.

1.5. Electrical connector

DANGER!	DEADLY DANGER FROM ELECTRIC SHOCK!	
	Before the start of maintenance and repair work, the power supply for the FC400 fume hood control system and the laboratory fume hood light must be disconnected from the mains by means of the separation device. The "Switching prohibited" sign must be clearly visible on the disconnect device and the mains plug must be disconnected. Before opening the fume hood control, the device must be de-energized. In the areas marked in this way, only qualified electricians are allowed to work. Unauthorised persons are not allowed to enter or open the areas marked in this way, and they are not allowed to work on the components marked in this way.	

The following regulations and regulations must be observed:
Safety rules according to VDE guidelines
Regulations of the local RU
Wiring guidelines and connection diagrams of Hans SCHNEIDER Elektronik GmbH

The FC400 fume hood control system must be fused separately with its own circuit. The device must be secured in such a way that it is not difficult to disconnect from the mains.
If the fume hood light is switched via the FC400 fume hood control system, this must also be separately fused with its own circuit. The protection of the laboratory fume hood light must be carried out in such a way that disconnection from the mains is not made more difficult.

Do not perform any electrical work on the instrument with the FC400 fume hood control power on and the laboratory fume hood light power supply on.
Be sure to follow the safety rules:
Unlock the FC400 fume hood control and also the fume hood light when the equipment needs to be removed and the housing or lid of the instrument needs to be opened, or the housing is damaged.
Secure the devices against being turned on again.
Determine the absence of voltage. Cover live parts.

CAUTION!	RISK OF INJURY WHEN WIRING THE FUME HOOD CONTROL SYSTEM!
	The wiring may only be carried out by specialists. The relevant regulations on occupational health and safety, as well as the applicable local regulations, must be observed.

1.6. Reliability

HINT!	PROPERTY DAMAGE DUE TO LARGE TEMPERATURE DIFFERENCES!
	Do not use the FC400 fume hood control immediately if you move it from an unheated room to a warm one. Condensation formation on the electronics can lead to irreparable damage. The device reaches room temperature after about two hours.

HINT!	NO OPERATION WITH FAILED FUNCTION DISPLAY!
	If the function display fails, the FC400 laboratory fume hood control must not be operated.

HINT!	PROPERTY DAMAGE DUE TO ELECTROSTATIC CHARGING!
	The electronics of the FC400 fume hood control system can be damaged by electrostatic charge. Avoid direct contact with the components and traces on the boards. Before touching, perform equipotential bonding by touching metallic surfaces. The surfaces must be grounded so that equipotential bonding is possible.

HINT!	DANGERS IN AN EMERGENCY!
	Always unplug or unplug the FC400 Laboratory Fume Hood Control if objects or liquids have entered the interior of the instrument, if the power cord is damaged, or if you notice odor or smoke. Have the appliance checked by the manufacturer before recommissioning.

HINT!	POWER FAILURE!
	If the power supply fails, the control flap remains in its current position. After the voltage returns, regular operation is started again. In safety-critical environments, the use of an on-site uninterruptible power supply (UPS) must ensure the uninterrupted operation of the fume hood control.

HINT!	ALARM IN CASE OF TOO LOW VOLUME FLOW OR TOO LOW AIR INFLOW VELOCITY WITH THE FC400 LABORATORY FUME CUPBOARD CONTROL!
	If the ventilation system does not provide a sufficient amount of air to reach the set point of the volume flow or the air inflow velocity, the FC400 laboratory fume hood control system will sound an audible and visual alarm on the unit. In safety-critical environments, it is important to check whether further security measures are required. Either a relay or a Modbus data point can be used to relay the alarm to the building management system.

1.7. Assembly

HINT!	INSTALLATION INSTRUCTIONS!
	After installation, a zero point adjustment of the pressure sensor must be carried out during commissioning.

DANGER!	DANGER DURING ASSEMBLY OR WHEN WORKING ON THE FC400 FUME HOOD CONTROL SYSTEM!
	Only tested climbing aids are to be used during assembly or work on the FC400 laboratory fume hood control system. When working on the fume hood control, the relevant safety regulations (safety shoes and helmet) must be observed.

HINT!	ASSEMBLY OF THE ELECTRONIC HOUSING!
	The electronics housing must be mounted in such a way that no vibrations are transmitted to the housing. During assembly and operation, it is essential to ensure that no chips, dirt or foreign objects get into the differential pressure sensor. Lay air hoses in a loop so that no condensation can penetrate the differential pressure sensor via the measuring system.

HINT!	INSTALLATION OF THE FUNCTION INDICATOR!
	Mount the FC400 fume hood control function indicator at eye level in the pilaster strip. The corresponding cut-out dimensions can be found in the document "Technical Data Sheet Function Indicators". It must be ensured that the noise level in the laboratory does not exceed 55 dB (A) in order to ensure the perception of an acoustic alarm of the FC400 fume hood control system (see DIN EN 457).

1.8. Decommissioning, dismantling and disposal

The following activities must be carried out for decommissioning and dismantling:
Disconnect all supply connections
Separation of all components
Loosening all fastenings
It is important to ensure that there are no residual energies after disconnecting the connections. For this purpose, a waiting time of at least three seconds must be observed.

The following activities must be carried out for disposal:
Removal and destruction of the nameplate
Complete disposal or recycling of the FC400 laboratory fume hood control system including all components.

HINT!	DISPOSAL OF THE MATERIALS USED!
	Safe and environmentally friendly disposal of the materials used must be ensured. Existing national regulations must be complied with!

1.9. Liability and warranty

All information in this manual is made to the best of our knowledge, taking into account our previous experience and findings. The original version of these instructions was prepared in German and checked by us objectively. The translation into the respective national language was carried out by a recognised translation agency.
The actual scope of delivery may differ from the explanations and illustrations described in this manual for special designs or due to technical changes.
This guide has been compiled with the utmost care. However, if you find any ambiguities and/or errors, please let us know in writing.
These instructions must be read completely and carefully before using the product and must be kept for future reference. The instructions in this instruction must be followed at all costs! A different use of the product excludes liability and warranty on the part of the manufacturer!
The agreements of the supply contract, the general terms and conditions, as well as the manufacturer's terms and conditions of delivery and the legal regulations valid at the time of conclusion of the contract apply.

1.10. CE Note

The FC400 fume hood control system complies with the protection requirements of the EMC Act and the Low Voltage Directive and therefore has a CE marking.

2. Transport, scope of delivery, storage and packaging

2.1. Transport, storage and packaging

Verification of delivery
The delivery must be checked for transport damage and completeness immediately after delivery. In the event of transport damage or incomplete delivery, the carrier and the supplier must be informed immediately. Transport damage must be documented pictorially.
The scope of delivery for the individual components depends on the desired rule type for the fume hood.
(see Table 2: Scope of delivery of the FC400 fume hood control)

Transport on the construction site
The devices must be transported to the place of installation in the shipping packaging. Adjustable flaps, adjustable flaps with measuring device or measuring devices may not be transported on the measuring device, on the control flap or on the actuator drive, but only on both sides at the respective open ends.
Protective packaging may only be removed immediately before installation.

Storage
The FC400 fume hood control system as well as the adjustable flaps, adjustable flaps with measuring devices and measuring devices may only be packed and stored in closed rooms. They must be protected from moisture and direct sunlight. The storage temperature is only permissible in the range of +10 °C to +40 °C with a maximum humidity of 90% (non-condensing).

Packaging
The packaging material must be disposed of properly after unpacking.

2.2. Scope of delivery: FC400 laboratory fume hood control

Illustration 1: FC400 Laboratory Fume Hood Control

The scope of delivery with regard to the sensor technology depends on the desired type of control for the fume hood.

Order key	Rule	Scope of delivery
FC400A-V FC400M-V	Fully variable	Control electronics with differential pressure sensor Function display AFS100 (Air Flow Sensor) SPS100 (Displacement Sensor)
FC400A-F FC400M-F	Air inflow velocity	Control electronics Function display AFS100 (Air Flow Sensor)
FC400A-FW FC400M-FW	Air inflow velocity with displacement sensor and calculation of the opening area of the fume hood (only suitable for fume hoods without transverse valve)	Control electronics with differential pressure sensor Function display SPS100 (Displacement Sensor)
FC400A-FP FC400M-FP	Air inflow velocity with volume flow limitation to $\dot{V}min$ and $\dot{V}max$	Control electronics with differential pressure sensor Function display AFS100 (Air Flow Sensor)
FC400A-W FC400M-W	Displacement sensor (only suitable for fume hoods without transverse sliders)	Control electronics with differential pressure sensor Function display SPS100 (Displacement Sensor)
FC400A-VS FC400M-VS	Fully variable, with on-site switch for transverse slider	Control electronics with differential pressure sensor Function display SPS100 (Displacement Sensor)
FC400A-K FC400M-K	Constant (1/2/3 point), for on-site position switches	Control electronics with differential pressure sensor Function display
FC400A-KW FC400M-KW	Constant (2/3 point)	Control electronics with differential pressure sensor Function display SPS100 (Displacement Sensor)

Table 2: Scope of delivery laboratory fume hood control FC400

2.3. Additional components to be ordered when connected to the central exhaust system

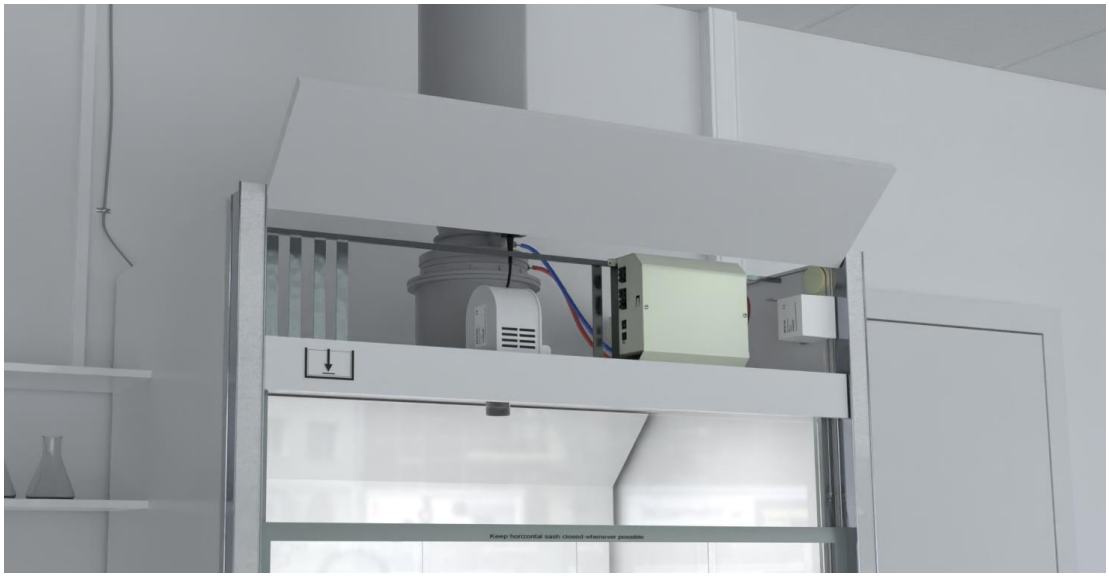


Illustration 2: Overview of FC400 components

You can find more information about actuators with actuators with actuators and without measuring devices, as well as measuring devices, in the document "Technical Data Sheet Control Body, Measuring Devices and Actuating Flaps".

HINT!	CONTROL OF AN ADJUSTING FLAP, WITH ADJUSTING FLAP DRIVE, WITH AND WITHOUT MEASURING DEVICE!
	With the FC400x-F control type, only one adjustable flap with actuator is required. For all other types of rules, a measuring device is required to record the volume flow.

Adjustment flap, with and without measuring device, with adjustable flap drive

01	02	03	04	05	06
Adjustable flap with measuring device	**Size**	**MaterialOuter shell**	**Gasket**	**Insulation shell**	**Connection**

01 – Adjustable flap, with and without measuring device, with adjustable flap drive

DK: Adjustable flap without measuring device (**only for rule type FC400x-F**)
DD: Measuring nozzle with two integrated ring measuring chambers and adjustable flap (only in steel)
VD: Venturi measuring nozzle with two integrated ring measuring chambers and adjustment flap (only in plastic)
UK: Venturi measuring nozzle with two integrated ring measuring chambers and adjustable flap, short design (only available for PPs 200 mm and 250 mm)

02 - Nominal Width

100: only available for plastic
110: only available for steel
125 - 400: 125, 160, 200, 225, 250, 280, 315, 355, 400

03 - Material outer shell

SV:	Steel, galvanized
SP:	Steel, galvanized – PUR coated
V2:	Stainless steel V2A (1.4301)
V4:	Stainless steel V4A (1.4571)
PPS:	Polypropylene, flame retardant
PEL:	Polypropylene, flame retardant, electrically conductive
PVC:	Polyvinyl chloride

04 - Gasket

0:	without gasket	
K:	with flap blade seal	(Standard for steel, optional for plastic)
G:	Rubber lip seal at the pipe ends	(optionally for steel, not available for plastic)

05 - Insulation shell

0:	without insulating shell	
D:	with insulating shell	(Plastic)
D025:	25mm insulation shell	(only available for steel)
D050:	50mm insulation shell	(only steel available)

06 - Connection (inflow / outflow)

MM:	Socket / Socket	(PPS, PEL, PVC only)
FF:	Flange / Flange	
MF:	Socket / Flange	(PPS, PEL, PVC only)
FM:	Flange / Socket	(PPS, PEL, PVC only)
RR:	Pipe / Pipe	

Illustration 3: VD-250

Illustration 4: VK-250

Figure 5: DD-250

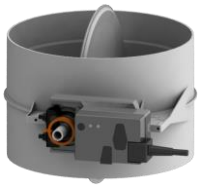


Figure 6: DK-250

If the control flap or the control flap with measuring device is not purchased from SCHNEIDER, the high-speed actuator must be ordered separately and professionally installed by the customer.

Order key	High-speed actuator valve, for flap with and without measuring device
LMQ24A-SR-SCE	4 Nm, 2.5 seconds for 90° flap position, up to DN355

Table 3: Order code for the actuator flap actuator

Figure 7: Actuator LMQ24A-SR-SCE

2.4. Additional components to be ordered for direct control of a frequency converter

Figure 8: FC400 with Variable Frequency Drive

HINT!	DIRECT CONTROL OF A FREQUENCY CONVERTER!
	When a frequency converter is directly controlled, the FC400x-F control type does not require an actuator flap with an actuator actuator. For all other control types, only one measuring device is required to record the volume flow.

Order code measuring device, without adjustment flap

01	02	03	04
Measuring equipment	**Size**	**MaterialOuter shell**	**Connection**

01 – Measuring device without adjustable flap

DM: Measuring nozzle with two integrated ring measuring chambers (only in steel)
VM: Venturi Measuring Nozzle (only in plastic)

02 - Nominal Width

100 - 400: 100, 110 (PPS) 125, 160, 180, 200, 225, 250, 280, 315, 355, 400

03 - Material outer shell

SV: Steel, galvanized
SP: Steel, galvanized – PUR coated
V2: Stainless steel V2A (1.4301)
V4: Stainless steel V4A (1.4571)
PPS: Polypropylene, flame retardant
PEL: Polypropylene, flame retardant, electrically conductive
PVC: Polyvinyl chloride

04 - Connection (inflow / outflow)

MM:	Socket / Socket	PPS, PEL, PVC ONLY
FF:	Flange / Flange	
MF:	Socket / Flange	PPS, PEL, PVC ONLY
FM:	Flange / Socket	PPS, PEL, PVC ONLY
RR:	Pipe / Pipe	

Figure 9: DM-250

Figure 10: VM-250

3. Basic Variants Laboratory Fume Hood Control FC400

		FC400A-INT	FC400A-EXT	FC400M-INT	FC400M-EXT
Supply voltage for laboratory fume hood control and support beam	100 to 120 V AC	✓	-	✓	-
	220 to 240 V AC	✓	-	✓	-
Supply voltage for laboratory fume hood control	23 to 24 V DC	-	✓	-	✓
Supply voltage Laboratory fume hood light	100 to 120 V AC	✓	✓	✓	✓
	220 to 240 V AC	✓	✓	✓	✓
Universal analog output, galvanically isolated	2	✓	✓	-	-
Modbus RTU, galvanically isolated	1	-	-	✓	✓
Connection for displacement sensor SPS100 / SPS200	1	✓	✓	✓	✓
AFS100 Air Flow Sensor Connector	1	✓	✓	✓	✓
Universal digital input, galvanically isolated	Potential-free contact 24 V DC / 24 V AC	✓	✓	✓	✓
Universal relay output, potential-free contact	2	✓	✓	✓	✓
24 V DC supply voltage for external peripherals	1	✓	✓	✓	✓
Relay Output Laboratory fume hood light	100 to 120 V AC	✓	✓	✓	✓
	220 to 240 V AC	✓	✓	✓	✓
Relay Output Support beam	100 to 120 V AC	✓	-	✓	-
	220 to 240 V AC	✓	-	✓	-
Connection for peripheral devices (e.g. function display, configuration adapter UPA100, ...)	2	✓	✓	✓	✓
Connection for adjustable flap actuator	1	✓	✓	✓	✓
Connection for emergency power accumulator	1	✓	✓	✓	✓
Expansion slots for pressure sensors	2	✓	✓	✓	✓
Expansion slots (MC10) for additional functions	2	✓	✓	✓	✓

Table 4: FC400 equipment

DANGER!	**PAY ATTENTION TO THE SUPPLY VOLTAGE!**
	If a supply voltage is used outside the technical specifications, there is a risk of damage to the FC400A and FC400M fume hood control systems.

4. Terminal Diagram Laboratory Fume Hood Control FC400

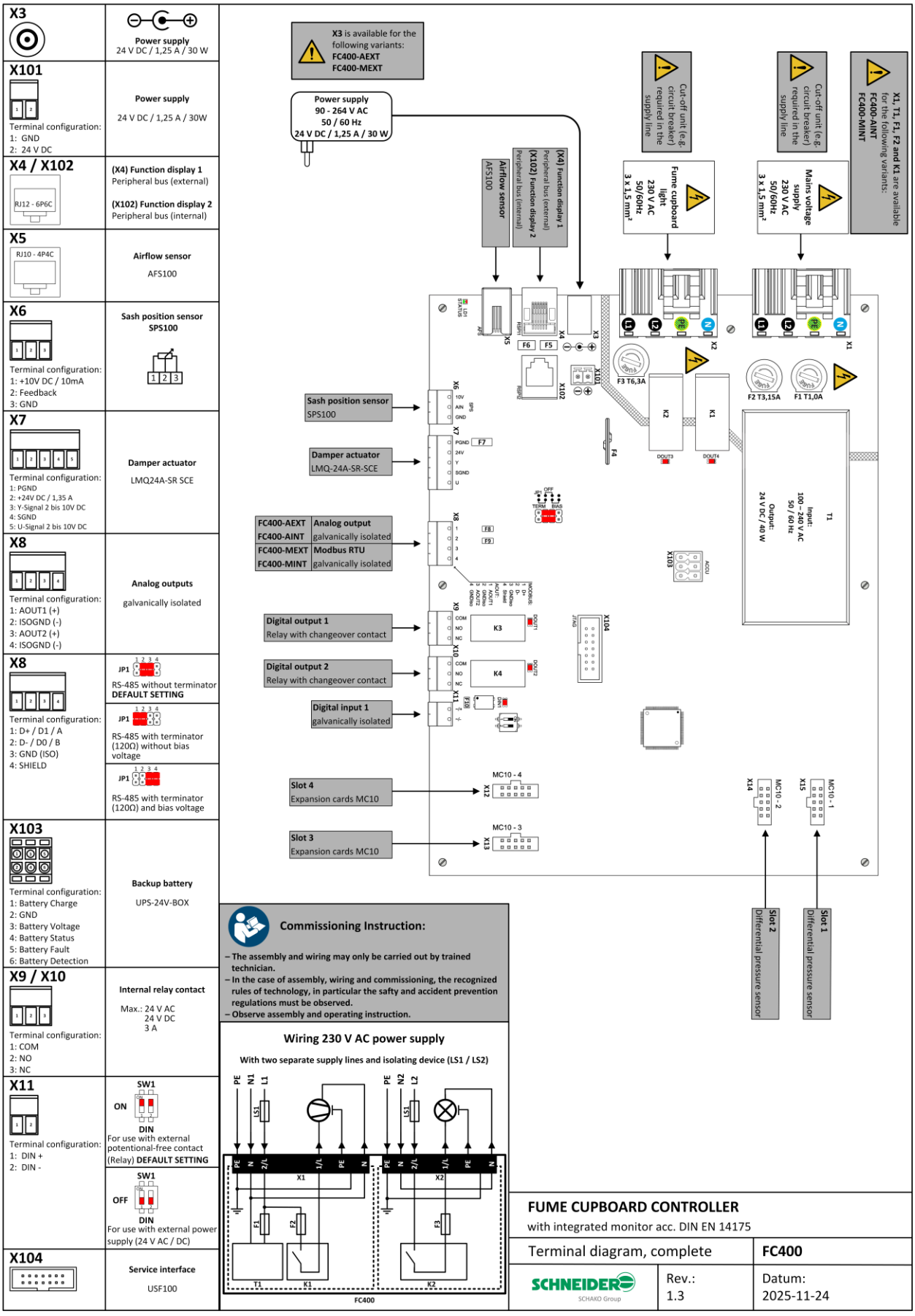


Figure 11: Terminal Diagram Base Board FC400

4.1. Internal connectors, base board FC400

Connection	Internal Connectors - Base Board FC400
X6	SPS100, Displacement Sensor
X7	Actuator Actuator, Steady, 0 to 10 VDC
X8	Analog Output 1 and Analog Output 2 **(Note 1)**
X8	Modbus RTU **(Grade 2)**
X9	Digital Output Relay 3
X10	Digital Output Relay 4
X11	Digital input, one optocoupler input
X101	Power supply 24 V DC
X102	Peripheral devices (function display, UPA100 configuration adapter, ...)
X103	Connection for external emergency power accumulator
X104	Service socket for parameterization via laptop or PC
MC10-1	Slot for expansion card for pressure sensor volume flow
MC10-2	Slot for expansion card for pressure sensor, support jet monitoring or scrubber monitoring
MC10-3	Slot for expansion card for analog and digital signals
MC10-4	Slot for expansion card for analog and digital signals

Table 5: Internal Connectors Base Board FC400

Note:

1. **Variant FC400A-INT and FC400A-EXT**
2. **Variant FC400M-INT and FC400M-EXT**

4.2. External connections, internal power supply

Connection	Exterior Connectors - Rear Enclosure
X1	Power supply 100 V AC to 240 V AC
X2	Power supply Laboratory fume hood light and output fume hood light
X4	Peripheral devices (function display, UPA100 configuration adapter, ...)
X5	AFS100, Air Flow Sensor

Table 6: External connections, powered by internal wide-range power supply

4.3. External connections, external power supply

Connection	Exterior Connectors - Rear Enclosure
X2	Power supply Laboratory fume hood light and output fume hood light
X3	Power supply 24 V DC
X4	Peripheral devices (function display, UPA100 configuration adapter, ...)
X5	AFS100, Air Flow Sensor

Table 7: External connections, external supply 24 V DC

DANGER!	PAY ATTENTION TO THE TERMINAL DIAGRAM!
	Always be sure to use the terminal diagram from this document for all connections. Faulty connections can lead to malfunction, damage or destruction of the FC400 fume cupboard.

5. Installation of FC400 fume hood control and sensors

DANGER!	ELECTRIC SHOCK WHEN TOUCHING LIVE PARTS!
	Unplug both the FC400 fume hood control and the fume hood light and always unplug the mains.

WIRING NOTES

During installation, the appropriate design of the supply lines must be observed. Voltage losses can be influenced by cable lengths, cable cross-sections or contact resistances.
Consider the connected load of the FC400 fume hood control. The dimensioning of the cables and the selection of the cable types are the responsibility of the electrician. This may only be done by a specialist electrical company.
All SCHNEIDER components are pre-assembled with connecting cables and connectors and must not be modified. For the extension of the connecting cables, SCHNEIDER offers the appropriate cables. Only the original SCHNEIDER cables may be used.
Fix all cables with strain relief.
In safety-critical environments, the uninterruptible operation of the FC400 fume hood control system must be ensured by the use of an on-site uninterruptible power supply (UPS).

WARNING!	PAY ATTENTION TO THE CORRECT CONNECTION OF THE COMPONENTS AND INTERFACES!
	Always make sure to plug the screw terminals of the components and interfaces into the corresponding socket. Plugging into the wrong socket can lead to malfunction and damage to the FC400 fume hood control.

WARNING!	CONNECTION OF DIFFERENT POTENTIALS
	The connection of different potentials (building management system, frequency converter, displacement sensor) can lead to fire, cross currents, faults or damage.

HINT!	CONNECTION OF THE POSITION-INDEPENDENT DIFFERENTIAL PRESSURE SENSOR
	During assembly and operation, it is essential to ensure that no chips, dirt or foreign objects get into the differential pressure sensor. Lay air hoses in a loop so that no condensation can penetrate the differential pressure sensor via the measuring system. When attaching the air hoses to the connection nipples to the FC400 fume hood control system, they must be air-permeable and must not be pressed together. There is a risk of destruction of the differential pressure sensor.

5.1. Installation of the electronics of the laboratory fume hood control

The electronics of the FC400 fume hood control system are mounted on the laboratory fume hood roof lying or hanging. The lid must be able to be opened completely without being obstructed by other installations.

HINT!	ASSEMBLY OF THE COMPONENTS!
	The assembly of the other components depends on the selected control type of the FC400 fume hood control. The following table shows the control type for which the AFS100 air flow sensor, the SPS100 displacement sensor and which type of control valve (with or without measuring device) or frequency converter must be mounted.

RULE	ORDER KEY	SPS100	AFS100	ADJUSTABLE FLAP WITH MEASURING DEVICE	VALVE	FREQUENCY
Constant air inflow velocity	FC400A-F FC400M-F	-	✓	-	✓	✓
Constant air inflow velocity with volume flow limitation to $\dot{V}min$ and $\dot{V}max$	FC400A-FP FC400M-FP	-	✓	✓	-	✓
Constant air inflow velocity with displacement sensor and calculation of the opening area of the fume hood (only suitable for fume hoods without transverse valve)	FC400A-FW FC400M-FW	✓	-	✓	-	✓
Displacement sensor (only suitable for fume hoods without transverse sliders)	FC400A-W FC400M-W	✓	-	✓	-	✓
Fully variable	FC400A-V FC400M-V	✓	✓	✓	-	✓
Fully variable, with on-site switch for transverse slider	FC400A-VS FC400M-VS	✓	-	✓	-	✓
Constant (1/2/3-point), for on-site position switches	FC400A-K FC400M-K	-	-	✓	-	✓
Constant (1/2/3-point), with displacement sensor	FC400A-KW FC400M-KW	✓	-	✓	-	✓

Table 8: Components depending on the rule type

5.2. Installation of the function display

The function display of the FC400 fume hood control system is installed in the pilaster strip of the fume hood in a clearly visible place. This should be installed at eye level for good readability. Please also note the reference in DIN EN 14175-6 to EN 842.

The FC400 fume hood control has two sockets (X4 and X102) for connecting peripherals. Among other things, function displays can be connected to these.

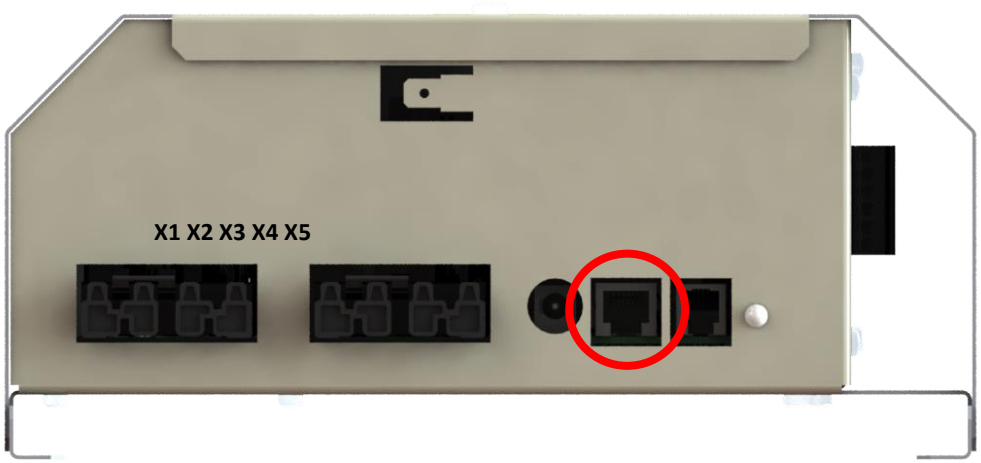


Figure 12: X4 Peripheral 1 Jack

5.3. Electrical connection of the displacement sensor SPS100

The three-core sensor cable, pre-assembled with a connection terminal, is plugged into terminal X6.

WARNING!	INSTALLATION OF THE DISPLACEMENT SENSOR!
⚠	The installation of the displacement sensor must be carried out with the greatest care. The displacement sensor must always be mounted in such a way that the rope is rolled up when the front slide is open. This is the only way to ensure that the laboratory fume hood returns to safe operation in the event of a rope break. Do not overtighten the displacement sensor cable to the stop and do not allow it to snap back, as this could destroy the internal sensor and the mechanical take-up device.

For more information on the SPS100 displacement sensor, please refer to the document "SPS100 / SPS200 Displacement Sensor Technical Data Sheet".

5.4. Electrical connection of the AFS100 air flow sensor

The AFS100 air flow sensor measures the inflow velocity of air into the fume hood and is mainly used for fume hoods with transverse valves and fully variable control.
The sensor cable is plugged into the X5 socket of the FC400 fume hood control system with the pre-assembled plug.

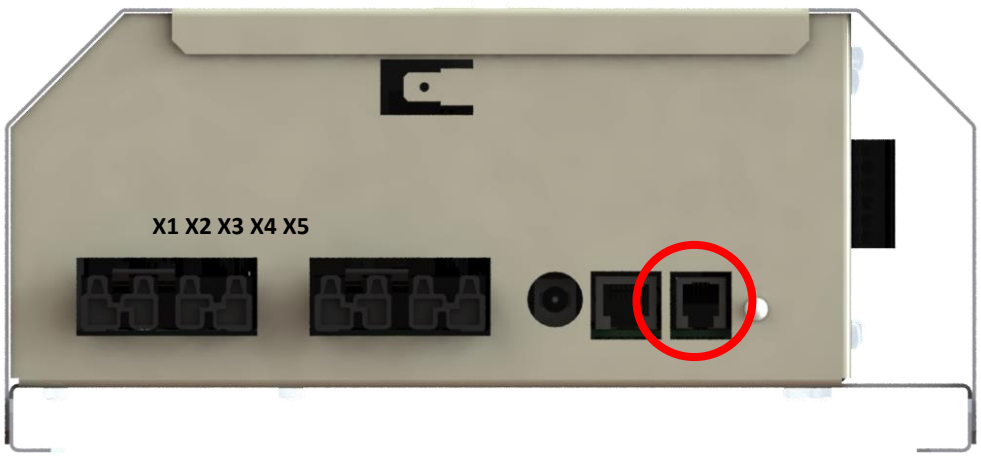


Figure 13: X5 Air Flow Sensor AFS100 Socket

WARNING!	INSTALLATION OF THE AIR FLOW SENSOR!
	The opening of the air flow sensor must be visible inside the fume hood and must not be covered (e.g. behind the baffle or baffle plate). The air flow sensor must not be mounted in the area of air outlets. Make sure that the air can flow freely through the air flow sensor. If the flow tube or the inlet slots are dirty or covered, the measurement result will be falsified.

For more information on the AFS100 air flow sensor, please refer to the document "AFS100 Air Flow Sensor Technical Data Sheet".

6. Installation of adjustable flaps with and without measuring device

When installing adjustable flaps with and without measuring equipment, it is essential to observe the air direction when installing them in the ventilation duct. This is marked with an air direction arrow on each flap with and without measuring device. Incorrect installation leads to unusable measurement results and thus to faulty function of the FC400 fume hood control system.

6.1. Mounting of the adjustable flap with actuator actuator, only control type FC400-F

The control of the constant air inflow velocity (control type FC400-F) requires only one control flap with actuator actuator. The opening flap is mounted directly above the fume hood. For more information, please refer to the document "Technical Data Sheet Control Body, Measuring Devices and Control Flaps".

6.2. Installation of the control flap with measuring device and actuator actuator, for all control types except FC400-F

When installing the control flap with measuring device and actuator actuator, care must be taken to ensure that the flow section is optimised for the flow rate. For more information, please refer to the document "Technical Data Sheet Control Body, Measuring Devices and Opening Flaps" as well as the information on inflow and outlet lines in this document.

WARNING!	USE THE CORRECT APERTURE FACTOR!
	If a measuring device is connected to the FC400 fume hood control system, the corresponding aperture factor must be stored in the laboratory fume hood control. As part of commissioning, the set aperture factor must be checked and documented.

HINT!	USE OF AN ADJUSTABLE FLAP OR AN ADJUSTABLE FLAP WITH MEASURING DEVICE FROM A THIRD-PARTY MANUFACTURER!
	If the control flap or the control flap with measuring device is not purchased from SCHNEIDER, the high-speed actuator must be ordered separately and professionally installed by the customer.

6.3. Electrical connection of the actuator flap actuator

A continuous actuator with a control signal of 2 to 10 V DC is used to control the control flap.
The continuous actuator is connected to the internal 5-pin connector X7.
The actuator used has a torque of 4 Nm and a running time of 2.5 s at a 90° rotation angle.
Plug the five-wire connection cable of the control flap actuator, pre-assembled with a connection terminal, into terminal X7. The high-speed variable flap actuator (2.5 seconds for 90°) has a feedback potentiometer. The control algorithm of the FC400 laboratory fume hood control system is optimized by the adjustable flap position available in this way. In order to ensure that the FC400 fume hood control system functions properly, only actuators from SCHNEIDER may be installed. For more information, please refer to the document "Technical Data Sheet Control Body, Measuring Devices and Control Flaps".

7. Differential pressure sensor connection – right side of the housing

HINT!	ON-SITE TUBING OF THE DIFFERENTIAL PRESSURE SENSORS!
	With the FC400 fume hood control system, the electronic housing with the connections of the differential pressure sensors and the flap with measuring device or the measuring device are mounted separately and must therefore be hosed on site.

WARNING!	TUBING OF THE DIFFERENTIAL PRESSURE SENSORS!
	Two flexible PVC hoses with an inner diameter of 6 mm are required for the tubing of the differential pressure sensors. Lay the PVC measuring hoses in a loop in such a way that no condensation can penetrate the differential pressure sensor via the measuring system. If this is not observed and condensate collects in the U-tube formed by the hose, the measurement is falsified, so that there is a probability of detecting this impairment. The PVC hoses must be tight and must not be kinked. During assembly and operation, it is essential to ensure that no chips, dirt or foreign objects get into the differential pressure sensor.

DANGER!	AVOID CONTACT WITH OPEN HOSE ENDS!
	The PVC measuring hoses of the pressure sensors may contain toxic substances. therefore, avoid any contact with the open hose ends.

Connect the PLUS connector (RED) of the differential pressure sensor to the PLUS connector of the measuring device and the MINUS connector (BLUE) of the differential pressure sensor to the MINUS connector of the measuring device.

CHECK THE ASSIGNMENT OF THE FUNCTION TO THE AIR CONNECTIONS!

AIR CONNECTION	FUNCTION
MC10-1	Flow
MC10-2	Scrubber monitoring
MC10-2	Support beam

Table 9: Connection differential pressure sensors

Figure 14: Right side of the FC400 case

8. Power Supply - External Connectors - Left Side of the Case

8.1. Power supply FC400 and support beam

The power supply with the internal wide-range power supply is via the left side of the case. The input voltage is in the range of 100 V AC to 240 V AC. The connection is made via a 4-pole. Installation connector WINSTA® MIDI on the X1 socket.

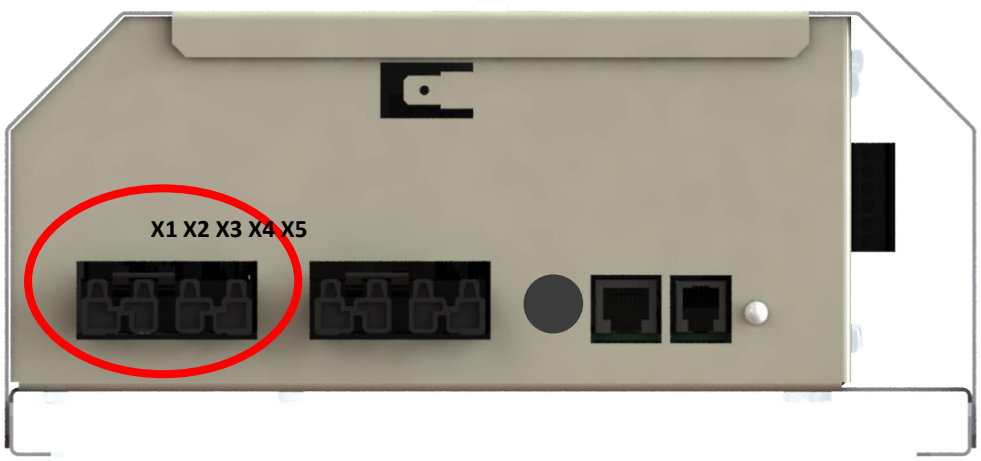


Figure 15: Socket X1 power supply with wide-range power supply

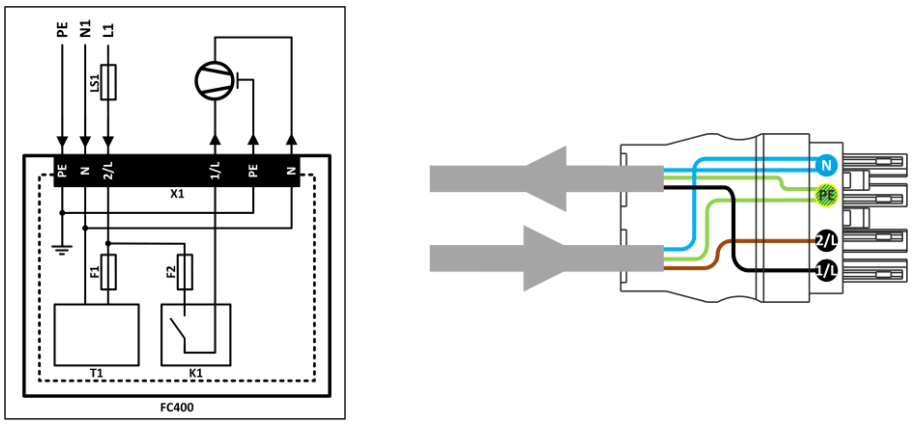


Figure 16 - Wiring the X1 Installation Connector for FC400 and Support Beam

DANGER!	DEADLY DANGER FROM ELECTRIC SHOCK!
	Separation device (e.g. LS switch) in the supply line required! Power supply FC400, power supply laboratory fume hood light and output laboratory fume hood light with cable 3 x 1.5 mm² (e.g. NYM-J 3x1.5 mm² or H05VV-F 3G1.5 mm²) . When working on the device, always pull the plug power supply X1 and the plug power supply laboratory fume hood light / output laboratory fume hood light X2. Determine the absence of tension. The installation work may only be carried out after the voltage has been determined.

8.2. Power supply laboratory fume hood light – output laboratory fume hood light

The power supply for the fume hood light and the output for the fume hood light are via the left side of the housing. The input voltage is in the range of 100 V AC to 240 V AC. The connection is made via a 4-pole. WINSTA® MIDI installation connector on the X2 socket.
The contact load of the relay laboratory fume hood light is a maximum of 6.3 A (230 V AC) at resistive load.

Figure 17: Socket X2 Power Supply Laboratory Fume Hood Light – Output Laboratory Fume Hood Light

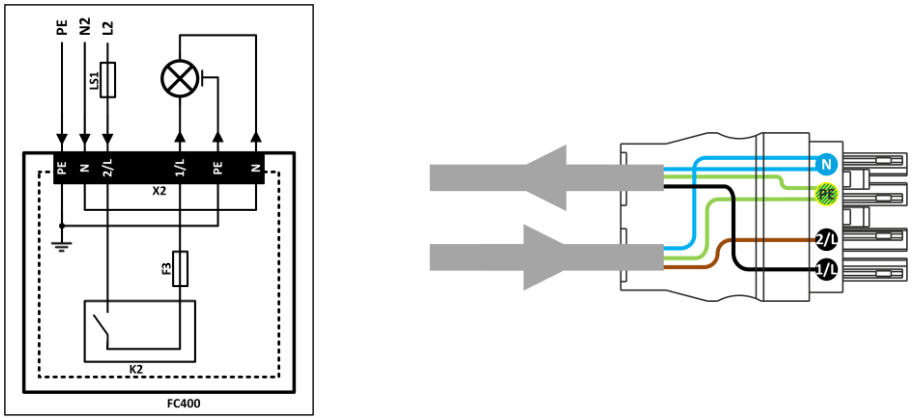


Figure 18: Typical Wiring of the X2 Installation Connector for a Laboratory Fume Hood Light

DANGER!	DEADLY DANGER FROM ELECTRIC SHOCK!
⚠	Separation device (e.g. LS switch) in the supply line required! Connect the FC400 power supply, the power supply to the laboratory fume hood light and the output of the laboratory fume hood light with a cable 3 x 1.5 mm² (e.g. NYM-J 3x1.5 mm² or H05VV-F 3G1.5 mm²). When working on the device, always pull the plug power supply X1 and the plug power supply laboratory fume hood light / output laboratory fume hood light X2. Determine the absence of tension. The installation work may only be carried out after the voltage has been determined.

8.3. Power supply with external supply 24 V DC

Alternatively, the power supply can be provided via an external power supply with 24 V DC via the DC mounting socket X3 or the terminal X101 (internal).

Illustration 19: Socket X3 power supply with external supply 24 V DC

CONNECTION	FUNCTION	DESCRIPTION
X1	Nonexistent	With a power supply of 24 V DC, this connection is not available
X2	Power Supply Laboratory Fume Hood Light Output Laboratory Fume Hood Light	4-pole. Installation connector WINSTA® MIDI for separate power supply Laboratory fume hood light 230 V AC and for output Laboratory fume hood light
X3	Power supply 24 V DC	DC mounting socket for power supply 24 V DC
X101	Power supply 24 V DC	Clamp for external on-site power supply 24 V DC

Table 10: 24 V DC Power Supply for Laboratory Fume Hood Control and 230 V AC Laboratory Fume Hood Light

9. Digital inputs and outputs

On the FC400 base board, two relay contacts are available on terminals X9 and X10 and one optocoupler input on terminal X11.
The two freely configurable relay contacts are available as changeover contacts. The contacts must be externally protected against overcurrent.
Additional digital inputs and outputs can be added with expansion cards on the MC10-3 and MC10-4 slots

X9	Digital Output 1 Terminal Assignment
1	Changeover contact relay K3, COM, max. contact load 24 V AC / DC, 3 A
2	Changeover contact relay K3, NO
3	Changeover contact relay K3, NC
X10	**Digital Output 2 Terminal Assignment**
1	Changeover contact relay K4, COM, max. contact load 24 V AC / DC, 3 A
2	Changeover contact relay K4, NO
3	Changeover contact relay K4, NC
X11	**Digital Input Terminal Assignment**
1	Optocoupler Input, Potential-Free Contact, External 24 V AC/DC, < 10 mA
2	Optocoupler input, external GND

Table 11: Digital Inputs and Outputs Terminal Assignment

9.1. Electrical connection Digital output

On the base board of the FC400 fume hood control system, two relays are available for potential-free fault detection as well as feedback to the management control level (MBE).
The contact load of relays 3 and 4 is a maximum of 3 A (24 V AC / DC) at resistive load.
Up to six additional relays are available via expansion cards, the electrical connection is described separately there.

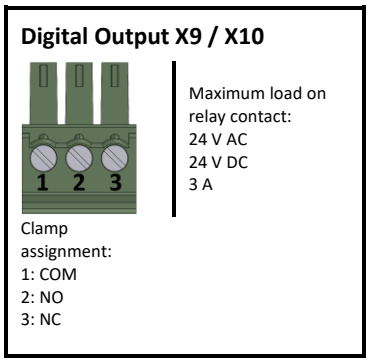


Illustration 20: Terminal assignment Relay 3 and Relay 4

DANGER!	DANGER DUE TO TOO HIGH CURRENTS OR TOO HIGH VOLTAGES!
	If the contact loads of the relays are exceeded, there is a risk of destruction or fire of the FC400 fume hood control system. If higher loads are necessary, these must be connected via external on-site relays with the corresponding contact load.

9.2. Digital Output Function

The relay functions can be freely assigned to the two internal relays designated Relay 1 (terminal X9.1, X9.2 and X9.3) and Relay 2 (terminal X10.1, X10.2 and X10.3).

The digital outputs can be used for the following functions, for example:

Function	Relay active when...
No function	never
Day	FC400 in operating mode day
Night	FC400 in night mode
Override	FC400 in operating mode Override
From	FC400 in Operating Mode Off
Pre-alarm	Control value outside the permissible alarm limit
Alarm	Alerting active
Fume Hood Lighting	Active Laboratory Fume Hood Light
Buzzer	Alarm buzzer active
Balancing Alert	Accounting errors
Emergency power	Power failure
Support beam	Support beam error
Front slider closed	Front slider completely closed
Front slider open	Front slider above working height
Open front slider	Open function button has been pressed (SC500 control signal)
Close front slider	Close function button has been pressed (SC500 control signal)
Active canopy drive	Actuator is running, has not yet regulated the setpoint
Flap actuator blocked	Actuator blockage was detected
Modbus	Modbus data point (setpoint relay 1 to setpoint relay 7) active

Table 12: Exemplary functions of the digital outputs

9.3. Electrical connection Digital input

A digital input is available for the free assignment of functions.
Up to six additional digital inputs are available via expansion cards, the electrical connection is described separately there.

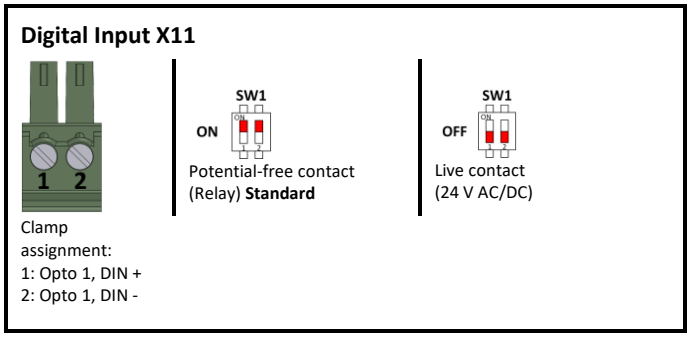


Figure 21: Digital Input 1 Terminal Assignment

9.4. Digital Input Function

The digital inputs can be used for the following functions, for example:

Function	Digital input active means...
No function	No effect
From	Request Operating Mode Off
Night	Requirement operating mode night
Override	Requirement Operating Mode Override
Window closed	Front slider completely closed
Window below working height	Front slider position below working height
Gate valve closed	Transverse valve completely closed
Detector	Person detected before withdrawal
External alarm	An external alarm is pending
Temperature Alarm	An external temperature alarm is pending

Table 13: Exemplary functions of digital inputs

10. Connection Analog Output FC400A

In the FC400A variant, two analog outputs are available on the X8 terminal on the FC400 base board.
Up to six additional analog outputs can be provided via expansion cards in both the FC400A and FC400M variants.
In the FC400A variant, an analog signal in the range of 0 V to 10 V DC is available at the terminals X8.1 (+) and X8.2 (GND) as well as X8.3 (+) and X8.4 (GND). The analogue outputs are galvanically isolated, and the current load may not exceed 10 mA.

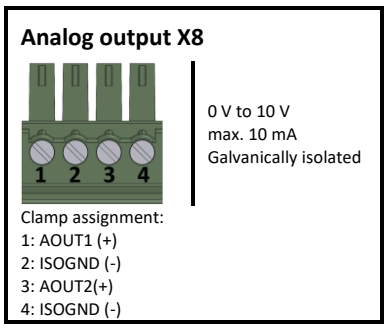


Figure 22: Terminal assignment analog output

10.1. Analog Output Function

The analog outputs can be used for the following functions, for example:

Function	Analog
Deactivated	Constant (adjustable 0 V to 10 V)
Air inflow velocity	scales depending on the current air inflow velocity
Flow	scales depending on the current volume flow
Volume flow setpoint	scales depending on the maximum of the current actual and setpoint volume flow
Pressure	scales depending on the currently measured pressure
Front Slider Position	scales depending on the current front slide position
Flap position	scales depending on the current position of the damper
Modbus	Direct input in mV to Modbus data point
Frequency	Control via frequency converter instead of actuator drive

Table 14: Exemplary Functions of the Analog Output

Output voltage scaling can be done for all functions except Modbus. Both the lower and upper limits of the voltage range as well as the lower and upper limits of the reference value can be freely selected.
The actual volume flow can be used for a room balance or the direct control of a self-sufficient supply air volume flow controller.
The maximum (actual value, setpoint) of the volume flow is used for the balance sheet for an exhaust air frequency converter of the ventilation system. In this case, this signal must be used instead of the Actual Volume Flow signal. When the front slide of the laboratory fume hood is opened, and thus a higher exhaust air requirement, the higher amount of exhaust air is requested from the ventilation system in advance.

11. Connection Modbus RTU FC400M

In the FC400M variant, a galvanically isolated RS-485 interface for the Modbus RTU protocol is available at terminal X8. Via this interface, all relevant data (e.g. actual values, fault messages, operating states) can be received and control commands (e.g. On/Off, Day/Night). A maximum of 64 bus participants can be connected to each other; no more than 32 participants are recommended. The termination of the RS-485 network with 120 ohms is activated via the JP1 jumpers. The start and end of the line must always be scheduled.
For further information on the use of the Modbus interface, please refer to the documents "Technical Data Sheet Network Connection" and "Technical Data Sheet Modbus Connection FC400".

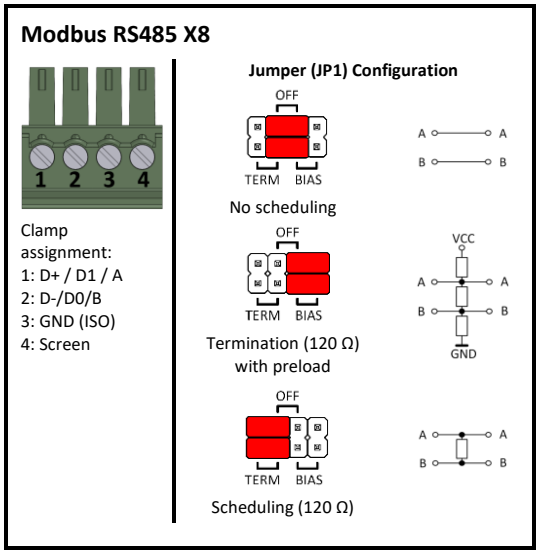


Figure 23: Terminal assignment Modbus RTU FC400M

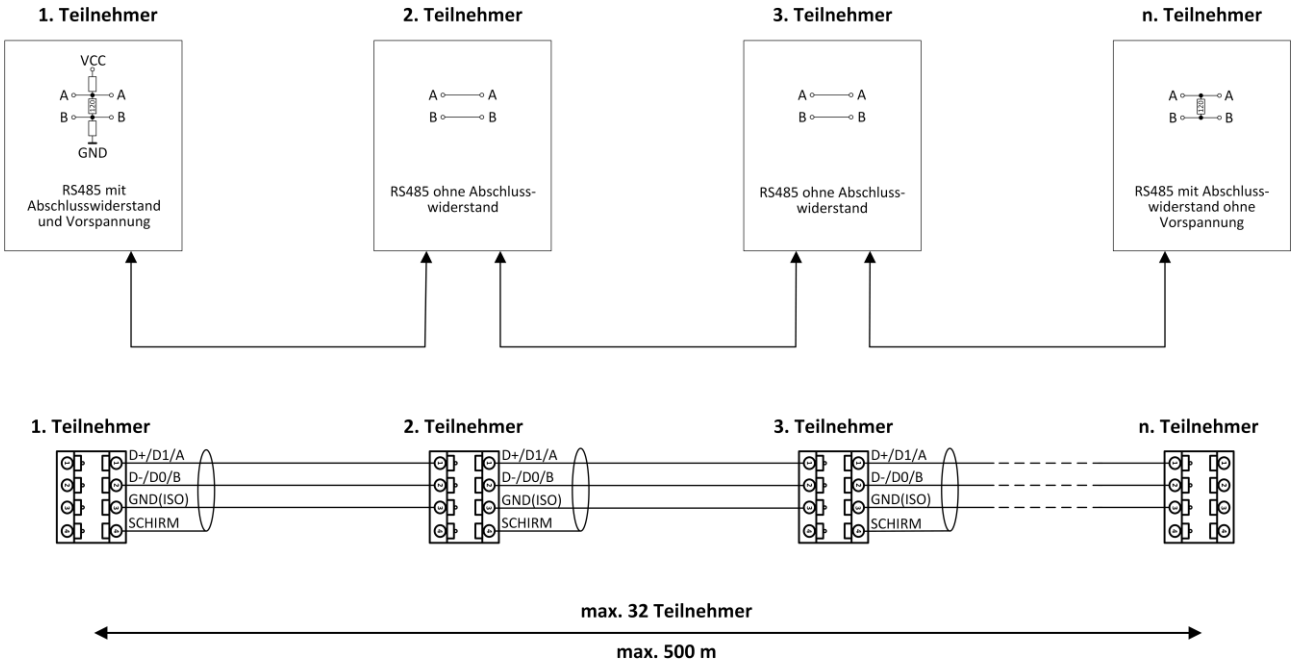
X8	TERMINAL ASSIGNMENT, RS-485, MODBUS RTU
1	RS-485, D+ / D1 / A, galvanically isolated
2	RS-485, D- / D0 / B, galvanically isolated
3	GND (ISO)
4	Umbrella, place on one side

Table 15: Terminal Assignment X8, RS-485, Modbus RTU

JP1	TERMINATION OF THE RS-485 LINE
1, 2	120 Ω termination activated, with bias
2, 3	No scheduling
3, 4	120 Ω termination activated, without preload

Table 16: Termination of the RS-485 line

11.1. Connection example for Modbus RTU



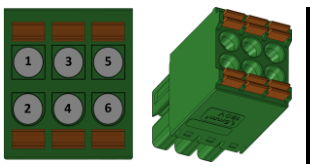
Für die Installation wird ein Kabel mit tiefer Kapazität, verdrillt und abgeschirmt (z.B. Belden 9842) empfohlen.
Ein verdrilltes Adernpaar wird für die Signale A und B verwendet, ein weiteres Adernpaar für GND(ISO).

WARNING!	COMMUNICATION PROBLEMS MODBUS!
⚠	Communication via Modbus can be disrupted by incorrect termination or missing preloading . Errors are not necessarily immediately noticeable here, problems can only occur later. If the Modbus cabling does not require the GND and shield to be attached, this can cause communication problems later on

12. Connection of emergency power accumulator

To supply power to the laboratory fume hood control system in the event of a failure of the mains voltage, an external emergency power accumulator from SCHNEIDER called UPS-24-BOX can be connected. This can be obtained ready-to-plug from SCHNEIDER and is connected to the X103 socket.

Emergency Power Accumulator X103



UPS-24-BOX

Clamp assignment:
1: Battery Charge
2: GND
3: Battery Voltage 24 V DC
4: Battery Status
5: Battery Fault
6: Battery Detection

Figure 24: Terminal assignment of emergency power accumulator

HINT!	ENSURING THE DETECTION OF AN UNDERFUNCTION IN THE EVENT OF A POWER FAILURE!
⚠	It is the responsibility of the operator to keep the FC400 fume hood control system functional by means of an uninterruptible power supply or by connecting a SCHNEIDER UPS-24-BOX emergency power accumulator even in the event of a malfunction of the primary energy. The basis for this is the operator's information in DGUV **Information 213-857 Leaflet T032**: Care must be taken to ensure that an underfunction can be reliably detected even in the event of a power failure. This can be done by buffering the power supply of the control unit.

13. Connection Service

There are two ways to connect the FC400 fume hood control system to parameterization using the PC4500 software and a laptop. With the UPA100 programming adapter, the connection is made via the three-pin socket on the function display or directly on the X3 socket of the FC400 fume hood control system. With the USF100 programming adapter, the connection is made via the X104 service socket. All values can be clearly read out and parameterized with both programming adapters.
The UPA100 and USF100 can also be used to perform firmware updates.

UPA100 offers the following advantages:

- The transmission of all parameters takes place within a few seconds, which is many times faster than when using the USF100.
- The UPA100 can be connected directly to the function display, direct access and opening of the FC400 fume hood control system is not necessary.

13.1. UPA100 connector

The UPA100 is connected to the fume hood control system with the cable (KAB7) for the 3-pin service socket on the function display or directly to X4 with an adapter cable (KAB8).

Figure 25: UPA100

13.2. Connection USF100

When using the USF100, connection to the X104 service socket is only possible when the device is open, see point 1.1 Electrical connection.

WARNING!	RISK OF DAMAGE TO THE FC400 FUME CUPBOARD SYSTEM!
⚠	When connecting the USF100 to the tub pin header, always make sure to plug in the cable both in the correct direction and not offset. Failure to do so may result in damage to the FC400 fume hood control.

14. MC10-PSM - Pressure Sensor Board

The MC10-PSM pressure sensor card is available with a differential pressure sensor - with different measuring ranges depending on the measurement task.
The following measuring ranges are available:

MEASURING RANGE	USE
4 to 300 Pascal	Volume flow measurement
10 to 1000 Pascal	Scrubber monitoring
-150 to +150 Pascal	Support beam monitoring

Table 17: MC10-PSM Measurement Range - Pressure Sensor Board

Possible expansion cards on slots MC10-1 to MC10-2

- Slot MC10-1
  - Expansion card pressure sensor for measuring the volume flow (for all control types except -F)
  - No expansion card (for rule type -F)
- Slot MC10-2
  - Expansion card pressure sensor for monitoring the support beam
  - Expansion card pressure sensor for monitoring the scrubber

SPECIFICATIONS	
Power supply	via the base board slot
Slot	MC10-1 to MC10-2
Number	max. 2 differential pressure sensors
Pressure Ranges	4 to 300 Pascal 10 to 1000 Pascal -150 to +150 Pa
Response time	< 10 ms
Sensor burst pressure	250 mBar

Table 18: Technical Data MC10-PSM – Pressure Sensor Board

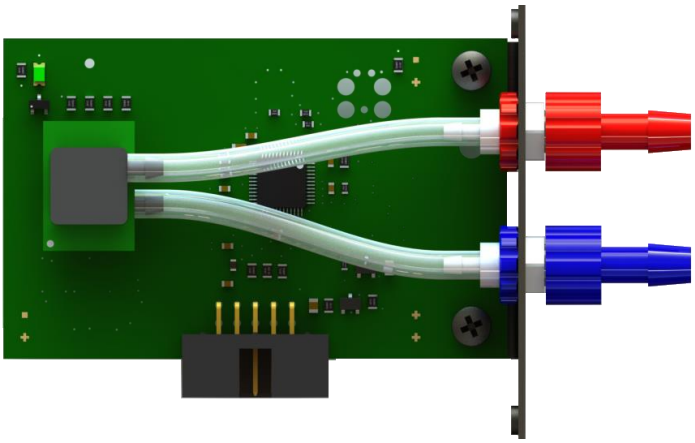


Figure 26: MC10-PSM Pressure Sensor Board

15. Expansion cards for digital and analog signals

Expansion cards for digital and analog signals are installed on the MC10-3 and MC10-4 slots.

Possible expansion cards on slots MC10-3 to MC10-4

Cards	Function
MC10-AO2	2 galvanically isolated analog outputs
MC10-AIO3	3 galvanically isolated analog inputs or analog outputs (voltage + current)
MC10-MOD	Modbus RTU Interface
MC10-PTC	External Resistive Temperature Sensor with Positive Temperature Coefficient (PTC)
MC10-DO2	2 digital outputs with changeover contacts (changeover)
MC10-DO3	3 digital outputs with working contacts (NO contacts)
MC10-DI3	3 galvanically isolated digital inputs

Table 19: Expansion Cards and Function

16. Commissioning and setting of FC400 parameters

The FC400 Laboratory Fume Hood Control comes with a standard factory configuration.

Commissioning must be carried out in accordance with the project-specific specifications and the available project-specific wiring documents.

DANGER!	COMPLETE AND CORRECT COMMISSIONING!
	The specified values of the fume hood manufacturer and the laboratory planning must be observed. Parameterization may only be carried out by trained personnel. As part of the parameterization, the retention capacity must be measured in accordance with DIN 14175 and recorded.

The parameters can be checked and adjusted with a PC or laptop as well as the SCHNEIDER PC4500 commissioning software.

The PC or laptop is connected to the FC400 fume hood control system via one of the two supplied UPA100 or USF100 programming adapters (see chapter 13).

DANGER!	MAINTENANCE AND ADJUSTMENT WORK ON THE FUME CUPBOARD CONTROL!
	Maintenance and adjustment work may only be carried out on empty fume hoods that are not in operation.

If a rule type is selected with the use of a displacement sensor, after completion of the parameterization, perform a calibration for this displacement sensor.

WARNING!	FUNCTIONAL TEST OF THE FUME CUPBOARD CONTROL!
	To ensure safe operation, a functional test of the FC400 fume hood control system must be carried out at the end of commissioning in accordance with the project specifications for the selected control type .

The set volume flow setpoints or air inflow velocities must be compared with the actual values achieved. This applies to all operating states and both for the front gate valve positions completely closed, working height and fully open, as well as optionally for existing gate valves in open and closed condition.

The triggering of the alarm state and its signalling must also be tested.

When connecting to a control system, the signals used or the Modbus data points in both directions must be checked, depending on the type of connection.

17. Maintenance

The FC400 fume hood monitoring system must be checked in connection with the cyclical laboratory fume hood maintenance.

According to TRGS 526 Section 7.3:

> "Fume hoods must be maintained regularly and their functionality checked and documented. The examination must be carried out at least once a year by a qualified person. The annual test of the ventilation function may be dispensed with if a self-monitoring function check of the individual fume hood ensures that a fall below the minimum volume flow rate is indicated visually and acoustically. The inspection of the permanent monitoring device shall be carried out at intervals of no more than three years.'

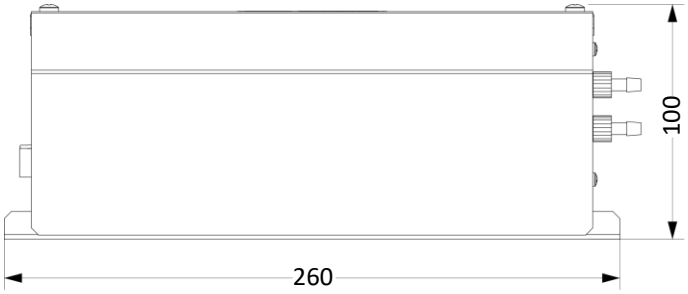
According to DGUV Information 213-857 T032 Section 2.3.3:

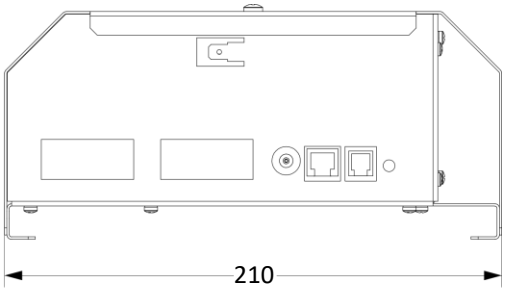
> "The annual inspection is intended to prove the functionality and also to determine deviations from the safe operating condition, which can occur insidiously compared to a correct initial installation.
> ...
> The following (partial) inspections must be carried out at regular intervals, but at least once a year:
> - General visual inspection of the safety condition.
> - Mechanical testing: check of the front slide mechanism and, if necessary, the sliding windows.
> - Determination of the ventilation parameters, e.g. the inflow velocity at the front slide opening and/or the exhaust air volume flow.
> - Testing of the function control unit (overfunction, underfunction, power failure)."

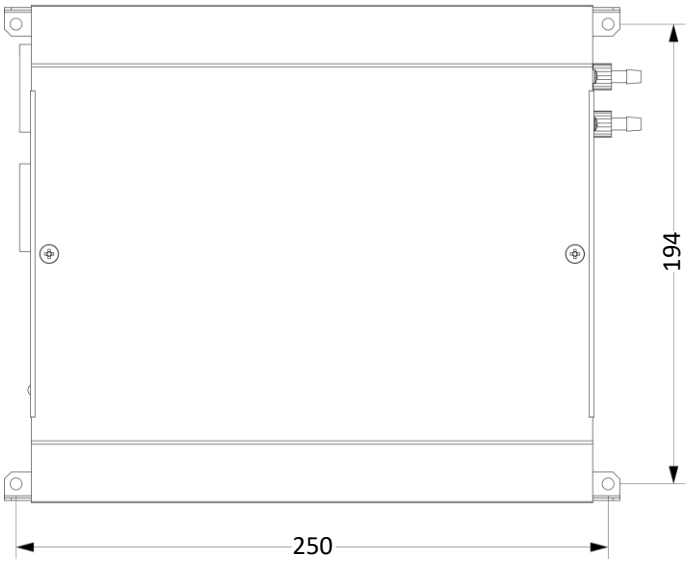
DANGER!	**OBSERVE THE MAINTENANCE INTERVAL!**
	Laboratory fume hoods must be regularly maintained and their functionality checked and documented. The examination must be carried out at least once a year by a qualified person.

18. Housing Dimensions FC400

The housing dimensions apply to both the FC400A and FC400M variants.







19. Specifications

GENERAL	
Power supply	100 to 240 V AC, 50/60 Hz, ±10%
Integrated protection	Fuse 5x20mm 250V/T 1.0 A Short circuit, overload, overvoltage
Power output of the internal power supply	maximum 40 VA @ 24 V DC
Typical power consumption	< 300 mA @ 240 V AC < 600 mA @ 120 V AC
Typical power consumption during operation	10 VA @ 230 V AC
Maximum power consumption	40 VA @ 230 V AC
Recovery time	5 to 10 s
Operating temperature	+15 °C to +40 °C
Storage	-20 °C to +70 °C
Humidity	≤ 80% relative, non-condensing
Surge Category	II
Degree	2
Class	Class I
Protection	IP 10
Application	Inside enclosed spaces
Bet Height	≤ 2000m above sea level
CASE	
Material	Sheet steel, galvanized, coated on one side
Color	Similar to RAL 9002 off-white
Width (B)	260 mm
Height (H)	100 mm
Depth (T)	210 mm
Weight	approx. 2.8 kg
FUME HOOD LIGHT	
Number	1 relay
Contact type	Working contact (NO contact)
Nominal voltage	230 V AC
Rated current	6.3 A
Rated Load	Maximum 1500 W (resistive)
Internal protection	Precision fuse 5x20mm 250V / T 6.3 A
Conductor cross-section rigid / flexible	0.5 to 2.5mm²
SUPPORT BEAM	
Number	1 relay
Contact type	Working contact (NO contact)
Nominal voltage	230 V AC
Rated current	3.15 A
Rated Load	Maximum 750 W (resistive)
Internal protection	Precision fuse 5x20mm 250V / T 3.15 A
Conductor cross-section rigid / flexible	0.5 to 2.5mm²
OUTPUT	
Number	2 relays
Contact type	Changeover contact (changeover)
Nominal voltage	24 V AC / 24 V DC
Rated current	3 A, external fuse required
Rated Load	Maximum 72 W (resistive)
Conductor cross-section rigid / flexible	0.14 to 1.5mm²

INPUT	
Number	1, galvanically isolated
Nominal voltage (external)	24 V AC / 24 V DC
Auxiliary voltage (internal)	24 V DC for external switching contact
Working current	≤ 10 mA
Signal voltage active	1.2 V to 28 V DC
Signal voltage inactive	0 V to 1.2 V DC
Conductor cross-section rigid / flexible	0.14 to 1.5mm²
HIGH-SPEED CONTINUOUS VARIABLE FLAP ACTUATOR	
Target (setpoint)	2 V to 10 V DC
Feedback (actual)	2 V to 10 V DC
Nominal voltage	24 V DC
Rated current	0.54 A
Rated current	1 A
Torque	LMQ24A-SR-SCE 4 Nm NMQ24A-SR-SCE 8 Nm
Runtime	LMQ24A-SR-SCE 2.5 s / 90° NMQ24A-SR-SCE 4.0 s / 90°
DIFFERENTIAL PRESSURE SENSORS	
Number	1 to 2
Print	Standard: 4 Pa to 300 Pa Optional: -150 Pa to +150 Pa Optional: 10 Pa to 1000 Pa
Sensor burst pressure	250 mbar (25,000 Pa)
DISPLACEMENT SENSOR SPS100	
Measuring principle	static, pull-wire potentiometer
Measuring range	0 mm to 1000 mm (SPS100) 0 mm to 2000 mm (SPS200)
Response time	< 10 ms
AIR FLOW SENSOR AFS100	
Measuring principle	dynamic, hot-wire anemometric principle
Measuring range	AFS100: 0 m/s to 1 m/s AFS200: 0 m/s to 2 m/s
Response time	< 100 ms
RS-485 INTERFACE, ONLY FOR FC400M VARIANT	
Interface	RS-485 (ANSI TIA/EIA-485) , galvanically isolated
Number of lines	4 (semi-duplex + GND + Shield)
Velocity	Up to 115 kBit/s
Galvanic isolation	Up to 15 KV
Driver	1/8 Load
Protocol	Modbus RTU
ANALOG OUTPUT, ONLY FOR FC400A VARIANT	
Number	2, galvanically isolated
Voltage range	0 V to 10 V DC, freely programmable
Resolution	10 Bit
Reaction time	< 10 ms
Current load per output	≤ 10 mA
Load resistance	≥ 1 kΩ
Surge and reverse polarity protection	± 30 V AC/DC
Conductor cross-section rigid / flexible	0.14 to 1.5mm²

Table 20: Technical data

20. Related Documents

Technical Data Sheet FC400 Laboratory Fume Hood Control
Technical Data Sheet Expansion Boards MC10
Technical Data Sheet Modbus Connection FC400
AFS100 Air Flow Sensor Technical Data Sheet
Technical Data Sheet Displacement Sensor SPS100
Technical Data Sheet Function Indicators
Technical Data Sheet Control Body, Measuring Devices and Control Flaps
Manual Basics of Commissioning

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Contact

Do you have any questions? We look forward to hearing from you:

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