



Operating and Installation Manual

EASYLAB Expansion module EM-AUTOZERO

for automatic zero point corrections of the
EASYLAB TCU3 controller



TROX[®] TECHNIK

The art of handling air

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1 General information

This manual describes the EM-AUTOZERO expansion module for the automatic zero point correction of an EASYLAB TCU3 controller.

To ensure complete functioning of the expansion module it is essential to read this operating and installation manual before starting any work, and to comply with it. The manual must be given to the facilities manager when handing over the system. The facilities manager must include the manual with the system documentation.

The manufacturer does not accept any liability for any malfunction or damage resulting from non-compliance with these instructions or non-compliance with relevant statutory regulations.

Other applicable documentation

In addition to this manual, the following documents apply:

- Control Systems catalogue
 - EASYLAB EM-AUTOZERO expansion module
 - EASYLAB TCU3 controller
- EASYLAB Configuration Software Operating Manual (M375EV1)
- Project-specific wiring documents

Symbols used in this manual



Danger!

Designates danger to life and limb due to electrical voltage.



Warning!

Designates danger to life and limb.



Important!

Designates danger that can cause minor personal injury or damage to property.

2 Safety and correct use

General information regarding safety

Only skilled qualified personnel are allowed to perform the described work on the expansion module. Only skilled qualified electricians are allowed to work on the electrical system.

For all work performed on EASYLAB components, the following regulations and guidelines must be complied with. This applies in particular to the following German country specific regulations or as appropriate in the country where the installation is taking place:

- Equipment and Product Safety Laws (GPSG)
- Industrial Health and Safety Regulations (BetrSichV)
- Accident Prevention Regulations (BGV A1, BGV A3)

General safety measures

• Large temperature differences

Condensation can damage the electronics beyond repair. If the expansion module has been kept in an unheated area, wait at least two hours before switching on the supply voltage for commissioning.

• Electrostatic charge

Electrostatic charge can damage the electronics. For this reason, first touch an equipotentially bonded metal surface, e.g. a water pipe, for electrical earthing before you remove the expansion module from its protective wrapping.

• Tubing

If the tubing needs to be changed, follow the instructions in this manual precisely. Any mistake will result in malfunction. Avoid kinking the tubes.

• Hollow needles

The tubes of the EASYLAB TCU3 controller contain hollow needles. Do not remove these needles! Wear protective gloves to avoid injuries.

• Foreign matter and liquids

If liquid gets into the expansion module, let the expansion module completely dry before commissioning. Remove foreign matter, if any.

If the device emits a smell or smoke, have it checked by the manufacturer.

Correct use

The EM-AUTOZERO expansion module ensures stable and precise volume flow rate measurements with diaphragm pressure transducers also in the long term. Zero point correction is carried out in regular intervals.

- Connect the expansion module only to an EASYLAB TCU3 controller.
- Connect the expansion module only to the dedicated socket on the main PCB of the TCU3.
- Make electrical and tube connections according to this manual.
- Observe the technical data for the control panel.

Incorrect use

Do not use the expansion module outdoors, in wet areas, or in potentially explosive atmospheres.

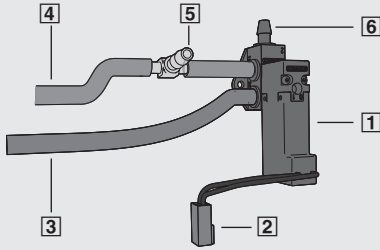
Residual risks

Malfunction of the expansion module increases the inaccuracy of volume flow rate measurements. Controllers with the EM-AUTOZERO expansion module should be included in the yearly inspection of the volume flow control components.

3 Product description

Product overview, functional description, dimensions

Product overview



- 1 Solenoid valve
- 2 Plug
- 3 Differential pressure sensor – plus connection
- 4 Differential pressure sensor – minus connection
- 5 Diaphragm pressure transducer – minus connection
- 6 Diaphragm pressure transducer – plus connection

Functional description

The solenoid valve of the EM-AUTOZERO expansion module is integrated with the tube connection between the diaphragm pressure transducer and the differential pressure sensor of the VAV terminal unit. The TCU3 controller provides the control input signal for regular zero point corrections. For this purpose, the measuring tubes of the diaphragm pressure transducer are temporarily short circuited, then the zero voltage is measured. This measured value is used as a correction value for volume flow rate measurements until the next zero point correction.

Technical data

Supply voltage	24 V DC from the TCU3 controller
Nominal power	1.8 W
Maximum pressure	10 bars
Acceptable temperature range	for storage -10 to +70 °C for operation 0 to +50 °C
Protection level	IP 20

4 Transport, storage and packaging

5 Installation

Delivery check

Check delivered items immediately after arrival for transport damage and completeness. In case of any damage or an incomplete shipment, inform the shipping company and your TROX contact person immediately.

A complete shipment includes:

- EM-AUTOZERO expansion module with connecting cable, plug, and connecting tubes
- Operating and installation manual

Transport on site

- If possible, take the expansion module in its transport packaging up to the installation location.

- Do not remove the protective wrapping until just before installation.

Storage

If you need to store the expansion module temporarily, make sure that the following conditions apply:

- Leave the unit in its packaging and do not expose it to the effects of weather.
- Store the unit in a dry place and away from direct sunlight.
- Temperature: -10°C to $+70^{\circ}\text{C}$
Maximum humidity: 90% (non-condensing)

Packaging

Properly dispose of packaging material.

For installation, wiring, and commissioning observe the recognised technical regulations, especially safety and accident prevention regulations.

For any wiring work follow the national and local regulations and guidelines for electrical installation.



Danger!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage during operation.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.



Important!

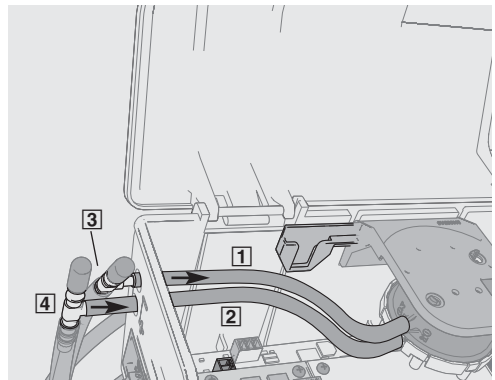
Danger of injury! The tubes of the EASYLAB TCU3 controller contain hollow needles.

Always wear protective gloves.

Step 1

Disconnecting the tubes

1. Interrupt the voltage supply to the TCU3 controller.
2. Open the lid.
3. Slide tube **1** off the T-piece **3**.
4. Slide tube **2** off the T-piece **4**.

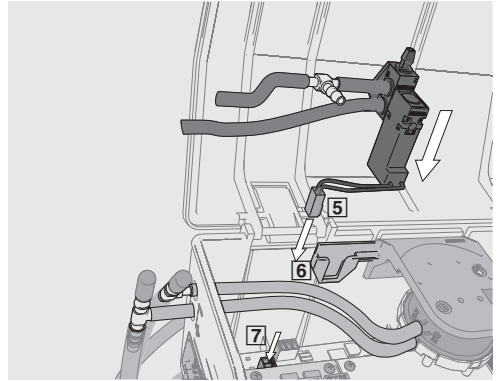


5 Installation

Step 2

Installing the expansion module

1. Insert the plug **5** into the socket marked 'Valve' on the PCB **7**.
2. Insert the expansion module into the recess **6** until it locks into place



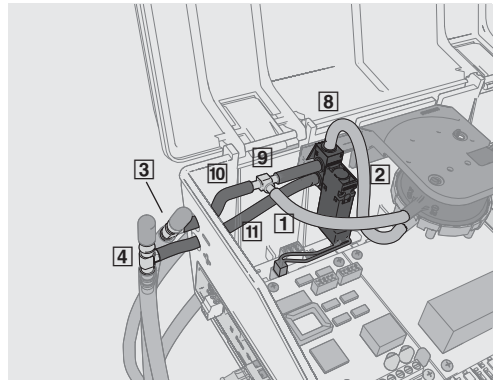
Step 3

Tubing

1. Slide tube **1** onto the T-piece **9**.
2. Slide tube **2** onto the connection **8** of the expansion module.
3. Slide tube **10** onto the T-piece **3**.
4. Slide tube **11** onto the T-piece **4**.
5. Close the lid.
6. Supply voltage.

Note

Avoid kinking the tubes as otherwise the volume flow rate measurement may not work properly.



6 Commissioning

7 Maintenance

Commissioning

The TCU3 controller identifies the expansion module automatically. Entering parameters using the EasyConnect configuration software is not required.

Within 15 seconds of applying supply voltage an automatic zero point correction is carried out (several gentle clicks of the solenoid valve can be heard).

Zero point correction is repeated in regular intervals during operation.

Diagnosis

The EasyConnect configuration software facilitates diagnosis. The 'Diagnosis\Equipment' window shows that the EM-AUTOZERO expansion module has been identified.

The result of the last zero point correction, the zero voltage, is displayed in the 'Diagnosis\I/A' (inputs/outputs) window **[1]**.

It is possible to start zero point correction manually **[2]**.

Diagnosis window of the EasyConnect configuration software

DI	unkonfiguriert	unbeschaltet
DI 1	unkonfiguriert	unbeschaltet
DI 2	2/3 Punkt-Regelung - Schaltkontakt 1	unbeschaltet
DI 3	3 Punkt-Regelung - Schaltkontakt 2	unbeschaltet
DI 4	Betriebsartvorgabe - Absperrung	unbeschaltet
DI 5	Stützstrahltechnologie - Ventilatorausfall	unbeschaltet
DI 6	unkonfiguriert	unbeschaltet

AI	unkonfiguriert	0,52 V
AI 1	Istwert Volumenstrom	0,52 V
	Nullpunkt	0,52 V
AI 2	unkonfiguriert	0,08 V
AI 3	unkonfiguriert	0,12 V
AI 4	unkonfiguriert	0,11 V
AI 5	unkonfiguriert	2,05 V

DO	unkonfiguriert	angezogen
DO 1	Alarmrelais	angezogen
DO 2	unkonfiguriert	abgefallen
DO 3	Stützstrahltechnologie - Ventilatorabschaltung	abgefallen
DO 4	unkonfiguriert	abgefallen
DO 5	unkonfiguriert	abgefallen
DO 6	unkonfiguriert	abgefallen

AO	unkonfiguriert	2,00 V
AO 1	Istwert Volumenstrom	2,00 V
AO 2	Gesamtluft	2,00 V
AO 3	Klappenposition	0 % 2,00 V
AO 4	Stellantrieb	2,00 V

Spannungsversorgung
24V Versorgung aktiv 30,10 V

Testfunktion Stellantrieb
 Ausgangsspannung beibehalten
 Ausgangsspannung durchfahren
 Position anfahren 50 %
Funktion starten
Funktion beenden

Maintenance

The EM-AUTOZERO expansion module is maintenance-free.