Instruction manual

EV-100
Damper Interface Control Panel

SCS BA EV-100 EN 1.0

The supplementary sheet “Safety instructions and Warranty conditions” contains general and product-specific warnings and the intended use.

This document is invalid without the supplement!

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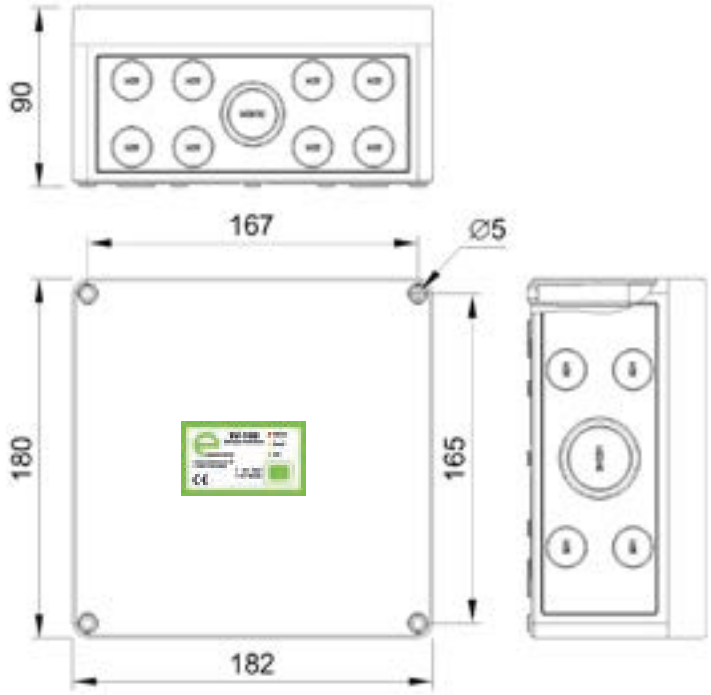
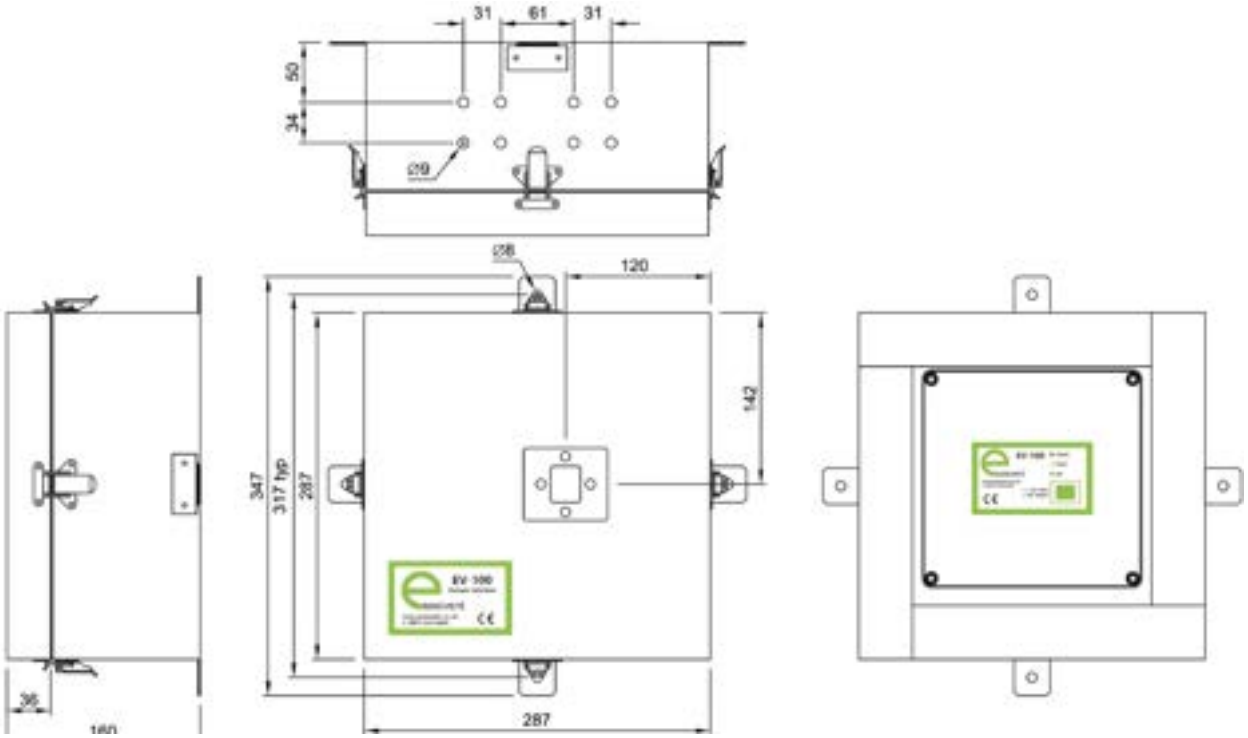
1. Dimensions

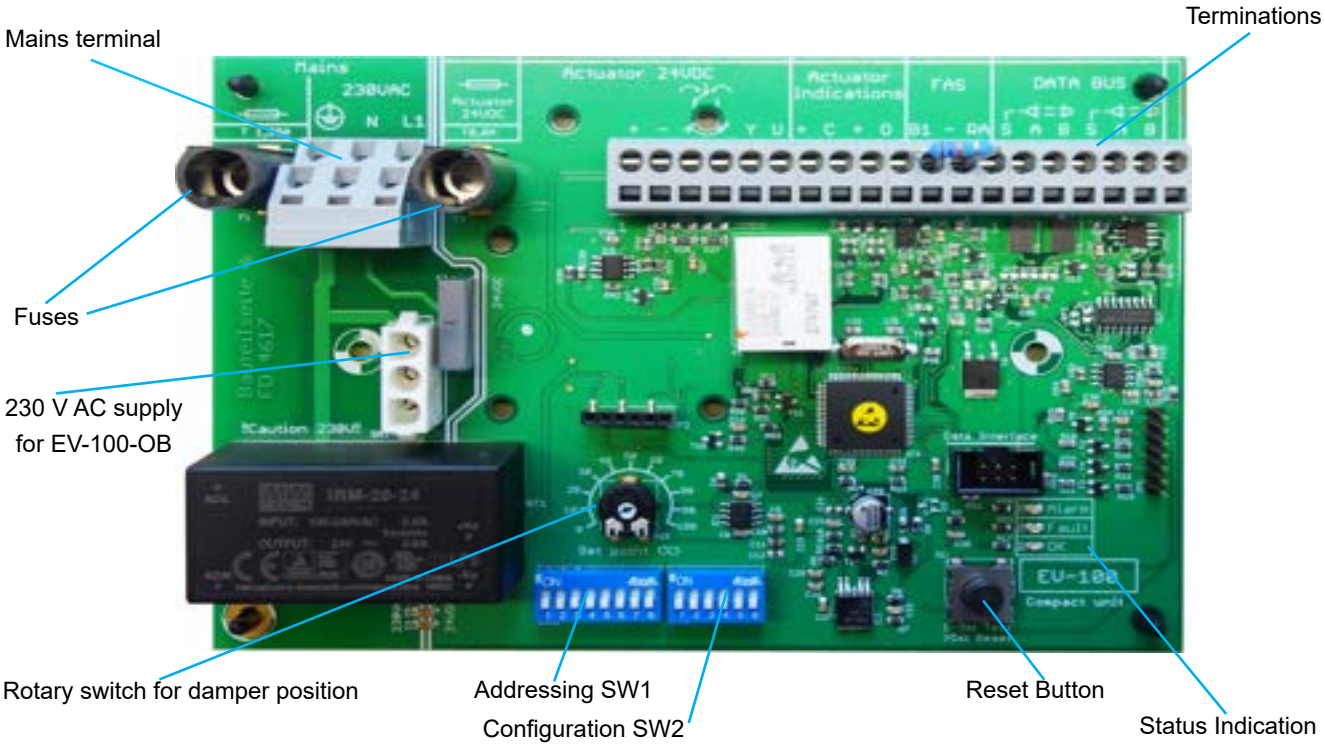
1.1. EV-100 Interface panel



1.2. EV-100 Hot box



1.3. EV-100 Internal arrangement



2. Technical information

2.1. Power supply information

Nominal voltage	230 V AC
Permitted voltage range	85 V AC to 253 V AC
Power consumption (full load)	0.4 A
Min. series fuse (on site)	≥ C 6 A
Connected load	92 VA
Inrush current (cold start)	40 A
Frequency range	47 Hz to 63 Hz
Mains fuse (internal)	Fuse characteristic Type T 1.25 A
Clamp size	0.5 mm² - 2.5 mm²

2.2. Actuator output

Output voltage mains operation (nominal)	24 V DC
Maximum output current I_{out}	0.9 A (24 V DC)
Motor output fuse	Type T 0.8 A (24 V DC)
Modulating output	0–10 V DC
Modulating input range	0–10 V DC
Modulating input maximum range	0–30 V DC
Ripple of the output voltage Vpp (0 A < I_{out} < 0.9 A)	≤ 200 mVpp
Clamp size	0.5 mm² - 2.5 mm²

2.3. 230V Module (EV-100-OB) Output

Output voltage (mains nominal)	230 V AC
Output current I_{out}	1.25 A
Output fuse for actuators	Type T 1.25 A (230 V AC)

2.4. Indications (Feedback)

Output voltage (+)	24 V DC
Input voltage range	15 V DC to 30 V DC

2.5. FAS input for smoke detector EV-SD

Maximum number of EV-SD	8
Output voltage range (B1)	17.5 V DC to 18 V DC
Current carrying capacity (B1)	max. 120 mA
Monitoring current (OK range)	100 µA to 5 mA

2.6. Mechanical features

Housing Dimensions	182 × 180 × 90 mm (h × w × d)
Weight (not including batteries)	0.9 kg
Ingress rating	IP66
Housing material	Polystyrene
Colour	Light Grey RAL 7035
Protection class	II

2.7. Mechanical features (Hot Box)

Housing Dimensions	284 × 284 × 160 mm (h × w × d)
Weight (not including batteries)	5.60 kg
Ingress rating	IP55[1]
Housing	Insulating Fab-Bloc
Colour	White RAL 9010
Protection class	II

(1) Rating when correctly installed and sealed as per instructions

2.8. Environmental requirements

Ambient temperature	-5 to 40 °C
Storage temperature	-5 to 70 °C
Suitable for outdoor installation	No

2.9. Standards and certifications

EN compliant	As per EMC directive 2014/30/EU and the low voltage directive 2014/35/EU
UK compliant	As per Electromagnetic Compatibility Regulations 2016 and Electrical Equipment (Safety) Regulations 2016
Additional registrations, certificates[1]	prEN 12101-9 BS ISO 21927-9 BS EN 12101-10
Classification as per EN 12101-9	Class D
Classification as per EN 12101-10	Class A
Environmental class as per EN 12101-10	1

3. Product description

3.1. Functional specifications

The EV-100 functions as a fire damper and smoke control damper interface panel. The panel provides a power supply and control functions for most common types of damper actuators. It can operate as part of an addressable (network) system or as a standalone unit.

The interface panel is compatible with the following damper types:

- Spring close fire dampers
- Spring open smoke control dampers
- Power open power close smoke control dampers
- Spring close modulating dampers
- Spring open modulating dampers

In network mode the panel functions as an addressable interface panel relaying damper status and accepting operation commands from a master damper control panel.

In standalone mode the panel can accept a smoke detector or fire alarm interface signal to operate a fire damper.

The panel monitors the position and status of the damper and indicates its condition. A test function operates the damper in a test sequence and checks and reports any faults.

3.2. Power supply

The interface panel provides a 24 V DC power supply output for the different damper types and configurations. The relay switched outputs can power the damper in both directions and a constant output supply is provided for actuator types that require a permanent supply.

Installation of the AC option module converts the outputs to a 230 V AC actuator supply.

The damper position is monitored by fully open and fully closed feedback switches rated at 24 V.

3.2.1. Modulating control

A 0-10 V output for proportional position control is provided for modulating dampers.

The damper position is monitored by a configurable 0-10 V or 2-10 V feedback signal.

3.3. Transistor switch (on request)

A transistor switched 24 V DC output is available for special applications and is controlled by the master panel.

3.4. FAS Fire Alarm Input

A smoke detector or fire alarm interface can be connected to the FAS input to trigger a FAS alarm condition. An alarm signal is detected by an open or short circuit across the terminating resistor. The alarm is automatically reset when the circuit returns healthy by detecting the resistor value within tolerance.

A reset command switches off the power to the FAS terminals for 3 seconds to reset smoke detectors. An FAS alarm is retriggered if the smoke detector fails to reset and return the FAS input to a healthy condition.

3.5. Status indicators

The status of the panel is indicated by coloured LEDs located on the control board and the front panel mimic.

3.5.1. Control board indicators

LED	*State*	*Condition*
OK (Green)	Off	Power supply failure or internal panel fault
	On	Panel healthy and operating
	Flashing	Panel in a test sequence
ALARM (Red)	Off	No alarms active and in normal mode
	On	In an alarm condition
	Flashing	In lockout mode
FAULT (Amber)	Off	No fault or warning conditions
	On	A fault condition is active
	Flashing	Test failed result active and unacknowledged

3.5.2. Mimic indicators

LED	*State*	*Condition*
OK (Green)	Off	Power supply failure or internal panel fault
	On	Panel healthy and operating
	Flashing	Panel in a test sequence
ALARM (Red)	Off	No alarms active and in normal mode
	On	In an alarm condition
	Flashing	In lockout mode
FAULT (Amber)	Off	No fault or warning conditions
	On	A fault condition is active
	Flashing	Test failed result active and unacknowledged

3.5.3. Function button

A test/reset button is located on the mimic and the control board and do the same function.

Function	*Action*
Test	Press then release the button between 1 - 3 seconds to start a test sequence.
Reset	Press then release the button for > 5 seconds to trigger a reset command.

3.6. Addressing

The panel address can be set between the range of 1 – 255 by switch SW1 in a binary format.

The address is the sum of the values set to ON position.

SW1	*ON*	*OFF*	*Function*
8	+128	0	Address Value 128
7	+64	0	Address Value 64
6	+32	0	Address Value 32
5	+16	0	Address Value 16
4	+8	0	Address Value 8
3	+4	0	Address Value 4
2	+2	0	Address Value 2
1	+1	0	Address Value 1

3.7. Configuration switches

SW2	*OFF*	*On*	*Function*
1	2..10V	0..10V	Modulating position feedback range Only applicable when SW2-5 is set to modulating.
2	Network	Stand-alone	Operating mode Standalone mode operates as an individual unit. Network mode connects and receives commands from a master panel.
3	Open	Close	Normal damper position / Reset position
4	Hold	Spring	Actuator safety drive type
5	Fixed	Modu-lating	Actuator positioning type
6	No	Yes	Open and close position end switches installed

4. General Functions

4.1. Normal mode

This is the default mode and normal damper position when no alarms, overrides, lockout, or test sequences are active. In normal mode the actuator outputs are switched (energised) to drive the damper to the normal position set by SW2-3.

If the damper type is set to fixed (SW2-5 = OFF) then the normal position is set by SW2-3. The modulating output will default to the normal position of 0V for close or 10V for open.

If the damper type is set to modulating (SW2-5 = ON) then the normal position is set by the setpoint pot.

In a network configuration the position can be overridden by the override setpoint command and setpoint position value. The output responds instantly on a change of value with a filter applied to avoid position hunting with signal noise.

Any position or setpoint change is automatically applied.

4.2. FAS Alarm

On detection of an FAS input alarm the damper switched outputs automatically switch to the de-energised state. Depending on the damper type and configuration the actuator shall drive or spring to their safety position. This should be the opposite position to normal mode set by SW2-3.

The modulating output will default to the alarm position of 0V for close or 10V for open.

An FAS alarm condition in standalone mode (SW2-2 = ON) is automatically reset when the FAS input returns healthy. In network mode an FAS alarm can only by a reset command from a function button or by command from the master panel.

4.3. Alarm override

The alarm position of the damper can be overridden open or close in a network configuration by commands. Alarm overrides take priority over the FAS alarm position and will switch the actuator output to the last override command received.

The modulating output will switch with the override position of 0V for close or 10V for open.

An alarm override condition is reset by a reset command from the function button or by command from the master panel.

4.4. Lockout

Lockout only applies when in a network configuration. Connection to the master panel is monitored and when a disconnection is detected the panel activates lockout mode.
If the panel was in normal mode when lockout is activated the damper defaults to the FAS Alarm condition or damper safety position.
If the panel was in an alarm or override position when lockout is activated the actuator outputs will remain in its last known condition or to the last command received.
On power-up the panel will automatically enter lockout mode until connection to the master panel is alive.

4.5. Test

A test sequence checks the operation of the damper and can only be performed whilst in normal mode. For a valid test the damper position feedback signals need to be connected and configured (SW2-6 = ON) or configured as a modulating type.

The test sequence is started by pressing a function button between 1-3 seconds or by a test command from the master. A test is immediately aborted on an alarm, override or lockout condition or can be cancelled by a reset command.

The correct position feedback signals are checked within the set travel time.

4.5.1. Test mode sequence

Sequence Step	*Damper Output*	*Operation checks*	
		SW2-6 = ON: Feedback switches	*SW2-5 = ON: Modulating type*
1	Open (en-ergised)	Open feedback in-put received within the open time	Modulating position feedback reached =>95% within the open time
2	Close (de-ener-gised)	Closed feedback in-put received within the close time	Modulating position feedback reached =<5% within the open time
3	Normal position	Normal position (SW2-3) feedback input received within the position time	Modulating position feedback reached within 10% of the setpoint value wit-hin the open time

In the event an operation check condition is not met within the given time, the respective test result failure bit is set and a fault is indicated.

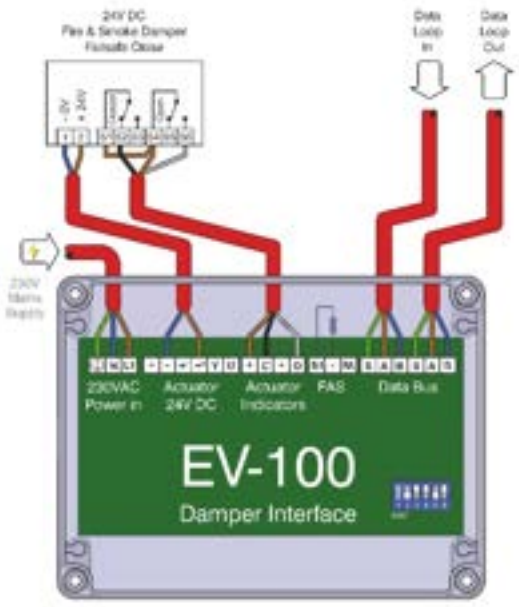
All results are cleared at the start of each test or by a reset command.

5. Installation Instructions

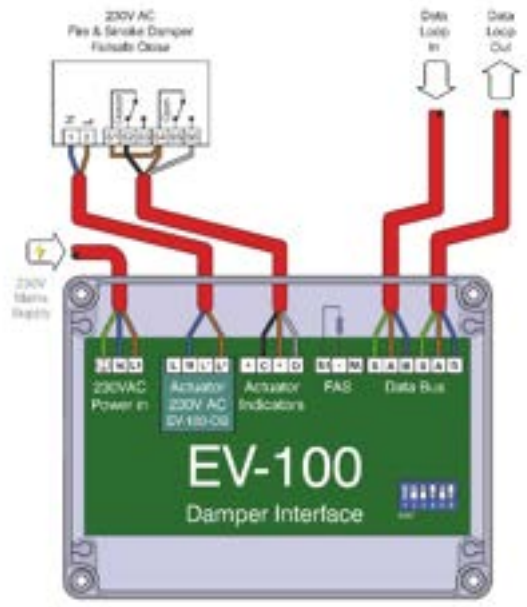
DANGER

Risk of electrocution. Works on this equipment should only be carried out by a qualified and competent electrical person. Observe all electrical safety regulations and safe systems of work. Check power supply has been isolated or disconnected safely before removing equipment covers.

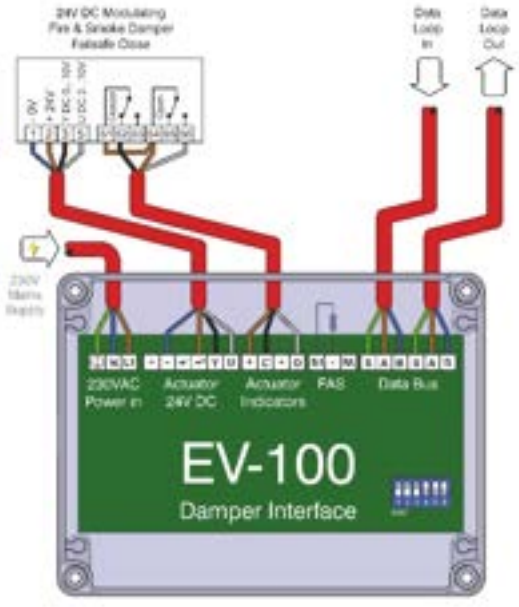
5.1. Addressable Damper System – Fire & Smoke Dampers (Spring Close)



24 V Fire Damper Spring Close

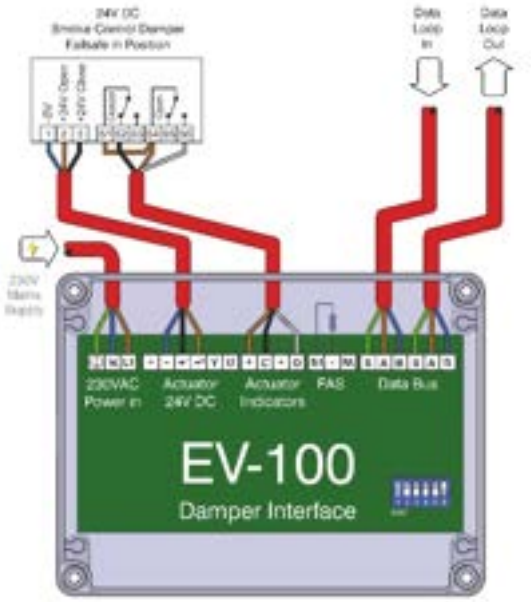


230 V Fire Damper Spring Close

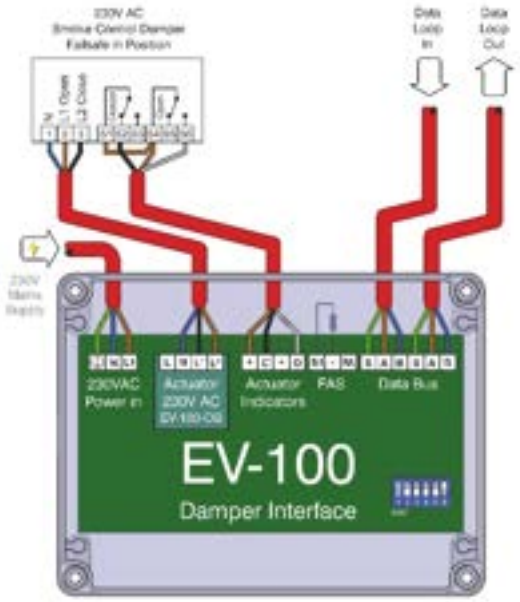


24 V Modulating Fire Damper Spring Close

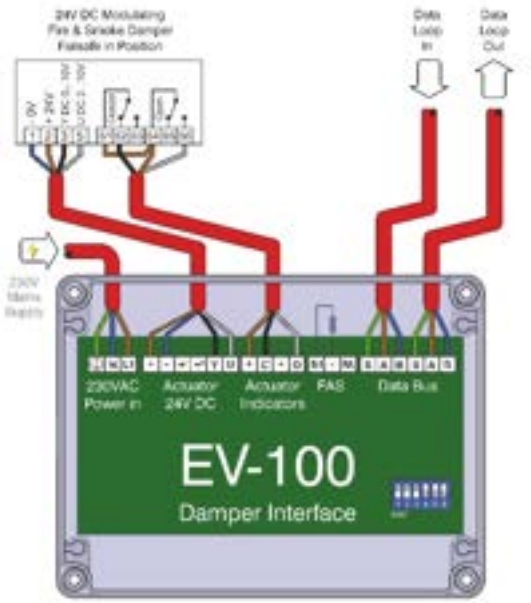
5.2. Addressable Damper System – Smoke Control Dampers (Failsafe in Position)



24 V Smoke Control Damper
Fail in Position (Non-Spring)

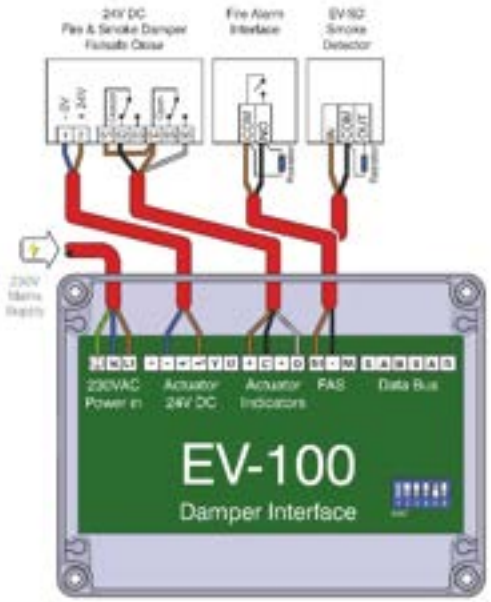


230 V Smoke Control Damper
Fail in Position (Non-Spring)

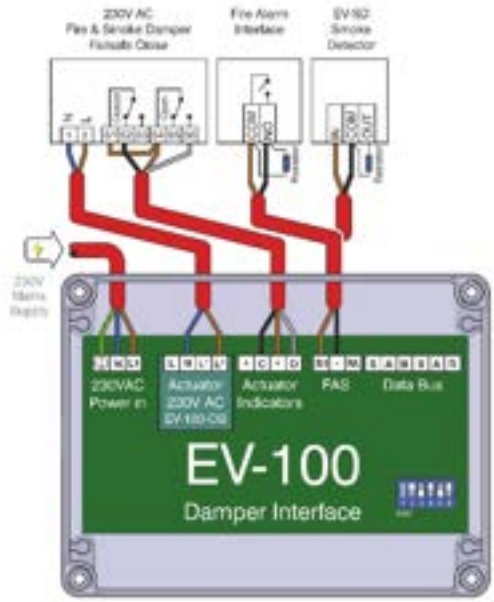


230 V Smoke Control Damper
Fail in Position (Non-Spring)

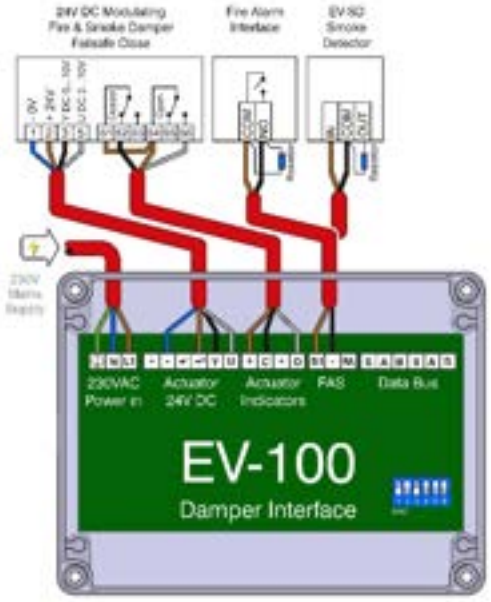
5.3. Standalone Damper Control – Fire & Smoke Dampers (Spring Close)



24 V Fire Damper Spring Close

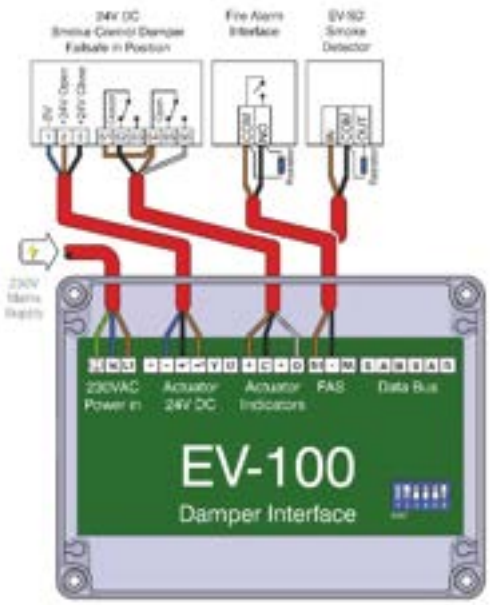


230 V Fire Damper Spring Close

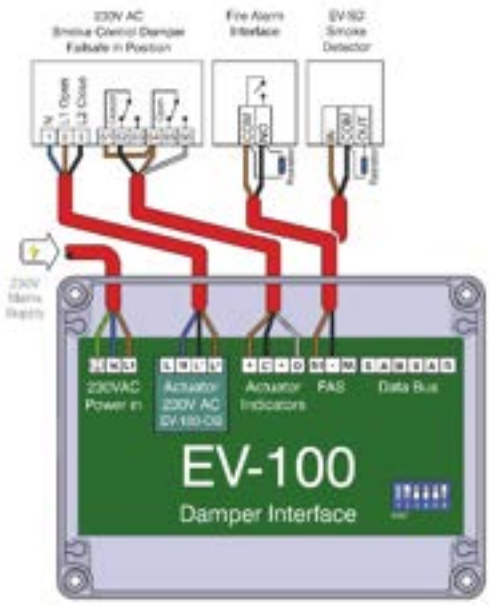


24 V Modulating Fire Damper Spring Close

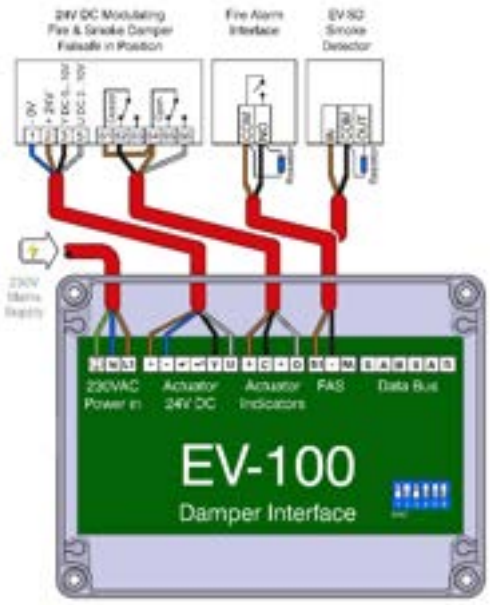
5.4. Standalone Damper Control – Smoke Control Dampers (Failsafe in Position)



24 V Smoke Control Damper
Fail in Position (Non-Spring)



230 V Smoke Control Damper
Fail in Position (Non-Spring)



230 V Smoke Control Damper
Fail in Position (Non-Spring)

6. Commissioning Instructions

DANGER

Disconnect both mains supply poles before connecting any device to the interface panel.

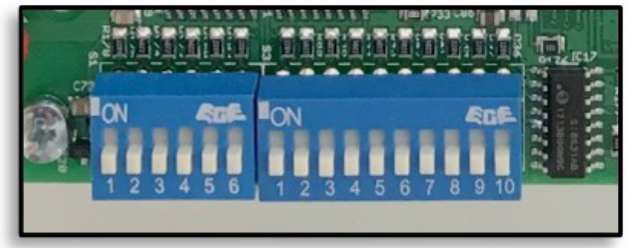
ATTENTION

The control board is sensitive to electrostatic discharge causing damage to components. Do not remove or handle the board, this may invalidate the warranty.

6.1. Installation and wiring inspection

- Confirm that the correct panels are installed for their damper actuator types and the wiring is correct against datasheets.
- What is the damper actuator voltage? EV-100 panels have 24 V output as standard, 230 V output require a conversion module.
- What is the full load current of the dampers connected? EV-100 panels have a maximum current output of 0.8 A.
- Is the damper fixed (2 position) or modulating (3 position) type? Check if the correct wiring for the type of damper and position feedback signals.
- What is the correct operation of the damper? Check if the actuator is mechanically fitted to the damper allowing full OPEN and CLOSE travel and correct fail-safe operation and normal position.
- Check if the power supply is available to all control and interface panels.

6.2. EV-100 Configuration & Test



- Set the EV-100 panel address (switch SW1) starting from 1 up to 60 for each network (see section 3.6).
- Set the damper configuration (switch SW2, see section 3.7).
- To apply any configuration changes press Reset for > 5 seconds.
- Switch on standalone operation mode (switch SW2-2).
- Check if the power to the panel and OK indicator is lit.
- Press the TEST / RESET button for approximately 2 seconds to start the automatic test sequence. The OK indicator will flash during test mode and the damper will start to open and close in sequence.

- Wait until the end of the test when the OK indicator stops flashing. If a FAULT occurs correct the position feedback and actuator wiring. Repeat until the test completes without FAULT.
- Reset standalone operation mode (switch SW2-2) ready to receive commands from EV-DCP master panel.
- For modulating dampers adjust the setpoint dial for the desired balancing position. To apply a setpoint change, press Reset for > 5 seconds.

7. Troubleshooting

ATTENTION

Due to the low loop current, the insulation resistance of the monitored wire (B1) must be checked! The insulation resistance must be = 20 MΩ/km (wire manufacturer specification), otherwise disconnections may be undetected.

INFORMATION

The EV-100 indications are only visible with mains power connected.

For more information about the operational status see 3.5.1.: “Control board indicators” on page 7.

8. Appendix

8.1. Manufacturer‘s declaration EC

We hereby declare that the product complies with the applicable directives. The declaration of conformity can be read at the company‘s premises and will be sent to you upon request. This declaration certifies that the product complies with the mentioned directives, but does not represent any guarantee of the product‘s features. This declaration loses its validity, if the product is modified without seeking our prior authorisation.

8.2. EC manufacturer‘s declaration (distributor)

The installer is responsible for the correct assembly or commissioning, the preparation of the declaration of conformity in accordance with EU regulations and for affixing the CE marking. The CE marking must be positioned where it is visible.

8.3. Manufacturer‘s declaration UK

We hereby declare that the product complies with the applicable regulations. The declaration of conformity can be read at the company‘s premises and will be sent to you upon request. This declaration certifies that the product complies with the mentioned regulations, but does not represent any guarantee of the product‘s features. This declaration loses its validity, if the product is modified without seeking our prior authorisation.

8.4. UK manufacturer‘s declaration (distributor)

The installer is responsible for the correct assembly or commissioning, the preparation of the declaration of conformity in accordance with UK regulations and for affixing the UK marking. The UKCA marking must be positioned where it is visible.

8.5. Company address

8.5.1. System manufacturer (Germany)

SIMON
we create fire safety

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