Technical Data Sheet FSC-UFC230-2

Universal Field Controller to individually control up to 2 motorized fire dampers. It is the perfect solution for bus (Modbus and BACnet) or conventional integration into a superior system.
To be used for the connection of 230 V actuators.

ATTENTION: 230 V POWER SUPPLY

Content

Technical Data

ATTENTION: 230 V POWER SUPPLY

Electrical Data	Nominal Voltage	230 V AC
	Nominal Voltage Range	-20%... + 20%
	Dimensioning	2 VA + damper actuators (max 24 VA)
	Power Consumption	2 W + damper actuators
	Connections	AMP plug-in connections and quick connections (terminals)
Communication / Modbus	Protocol	Modbus RTU
	Medium	RS-485, not electrically isolated
	Transmission Formats	Specified by Modbus RTU Standards
	Number of Devices per Line	100 (without repeater)
	Baud Rates	9.600, 19.200, 38.400, 76.800 bps
	Address	1..127 (1-10 reserved for FSC-M200) (0 reserved for broadcast)
	Termination	120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if FSC-UFC230-2 is last Modbus device in line, see electrical installation page 7
	Typical Response Time	<200 ms

Communication / BACnet	Protocol	BACnet MS/TP
	Medium	RS-485, not electrically isolated
	Number of Devices per Line	65 (without repeater)
	Baud Rates	9.600, 19.200, 38.400, 76.800 bps (auto detect)
	Address	1..127 (1-10 reserved for FSC-M200) (0 reserved for broadcast)
	Termination	120Ω line termination. Jumper available on extra pin on PCB. Position of jumper if FSC-UFC230-2 is last BACnet device in line, see electrical installation page 7
	Typical Response Time	<100 ms
	Device Instant	Automatically assigned by physical address, writable
Safety*	Protection Class	III
	Protection Degree	IP42, housing of non-flammable polycarbonate
	Electromagnetic Tolerance	CE in accordance with 2004/108/EC
	Low Voltage Directive	CE in accordance with 2006/95/EC
	Mode of Operation	Type 1 (EN 60730-1)
	Rated Impulse Voltage	2.5 kV (EN 60730-1)
	Degree of Pollution of Environment	2 (EN 60730-1)
	Ambient Temperature	-20° C to +50° C
	Storage Temperature	-20° C to +80° C
	Humidity Test	95% RH, non-condensing (EN 60730-1)
	Maintenance	Maintenance free
Mechanical Data (Dimensions / Weight)	Width	120 mm
	Length	153 mm
	Height	57 mm (with bracket)
	Weight	ca 415 g (with bracket)
	See drawings page 5.	

**Tests (CE, EMC etc.) in progress.*

Installation

The FSC-UFC230-2 is directly installed at or close to the fire damper. The bracket can be pre-installed. The FSC-UFC230-2 can be snapped onto the bracket any time (at the damper manufacturer or at the job site).

Electrical Installation

See details page 7.

Safety Notes

The FSC-UFC230-2 is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
The company buying and / or mounting the FSC-UFC230-2 on site bears full responsibility for the proper functioning of the whole system. Only authorized specialist may carry out the installation. All applicable legal or institutional installation regulations must be complied with during installation.
The device contains electrical and electronic components and is not allowed to be disposed of as domestic refuse. All locally valid regulations and requirements must be observed.

Product Features / Application

The FSC-UFC230-2 is used together with one or two fire damper actuators to individually control and monitor one or two fire dampers. This Universal Field Controller has one bus address which offers individual control and status messages for each of the two connected actuators. It provides Modbus, BACnet or conventional connection and is normally mounted at or close to the damper.
Following control modes can be chosen through dip switch terminal:

- Bus protocols: Modbus or BACnet

Conventional: Digital input per damper for conventional application.

This digital input in the FSC-UFC230-2 always overrides the bus commands.

Universal System Link between one or two fire dampers and any Modbus or BACnet system or conventional control.

Power Supply

The FSC-UFC230-2 needs to be powered up with 230 V AC.
It provides the power supply to the actuators. For more details see page 8.

Control

Conventional
The FSC-UFC230-2 offers the option to work without bus communication (Modbus / BACnet) and can be controlled in a conventional way. There is one input to open or close the dampers. It is also possible to monitor the damper position conventional through a digital output signal.

Communication

Serial Communication – RS-485
Through Modbus RTU (RS-485) or BACnet MS/TP (RS-485).

Actuator Connection

3-pole AMP plug and terminal connection for standard 230 V AC fire damper actuator.
6-pole AMP plug and terminal connection for 2 internal actuator end switches. Identification of the end position switches of the actuators.

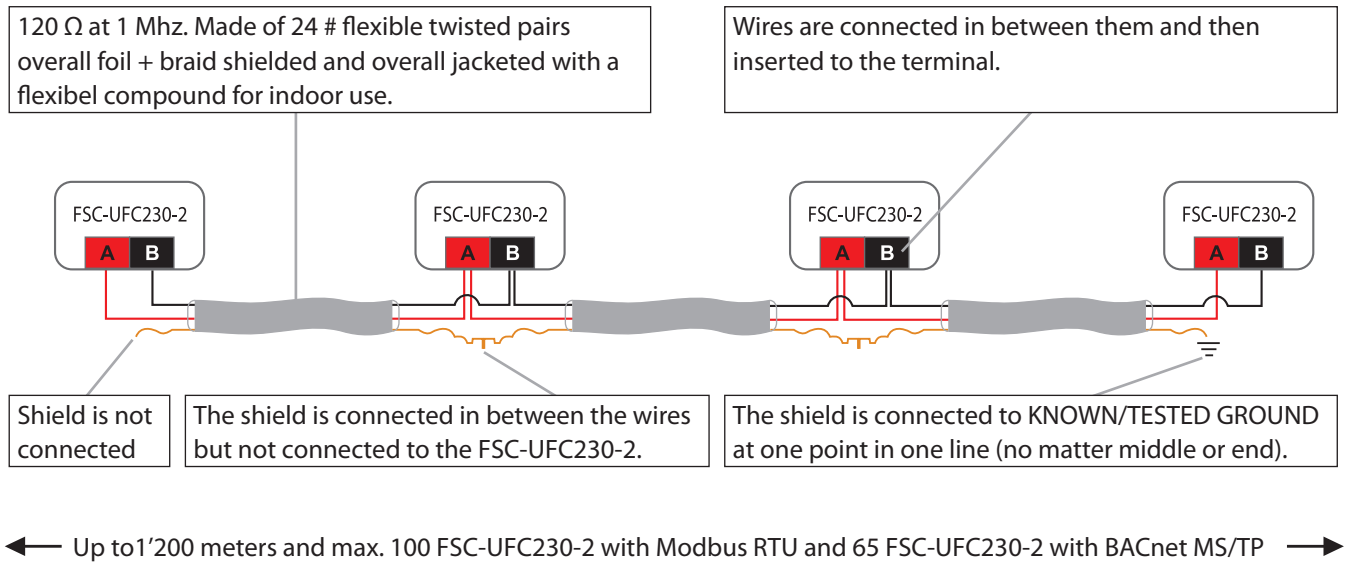
Additional Connections

Digital input for conventional application.

Cable Specification

120Ω with 1 Mhz. Made of 24 # flexible twisted pairs overall foil + braidshielded and overall jacketed with a flexible compound for indoor use, or similar. Cable type: Belden 3105a or equivalent.

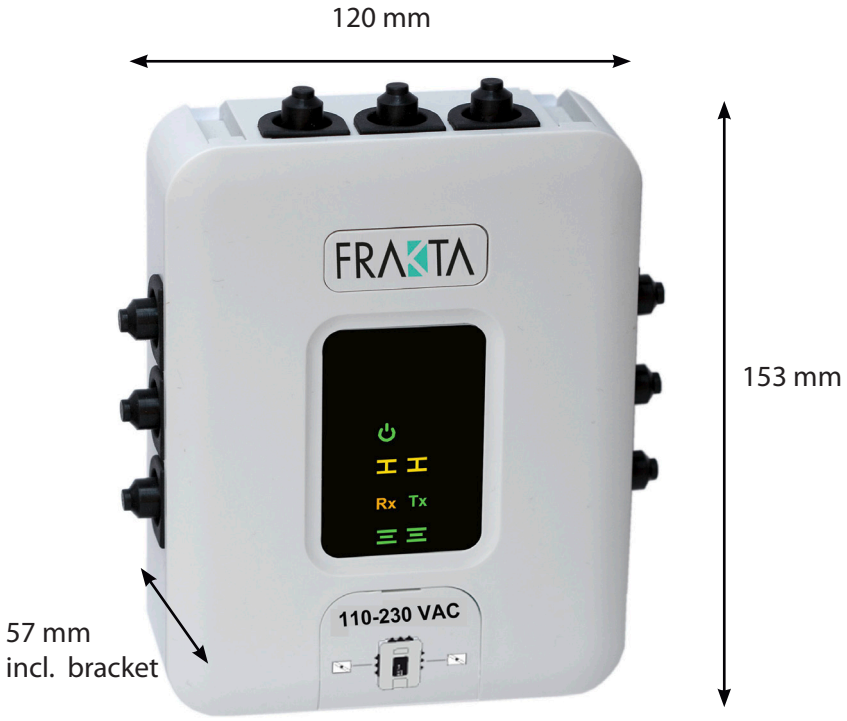
IMPORTANT: SMT takes no responsibility of the functionality of the units/network if a different cable is used to the one specified here.



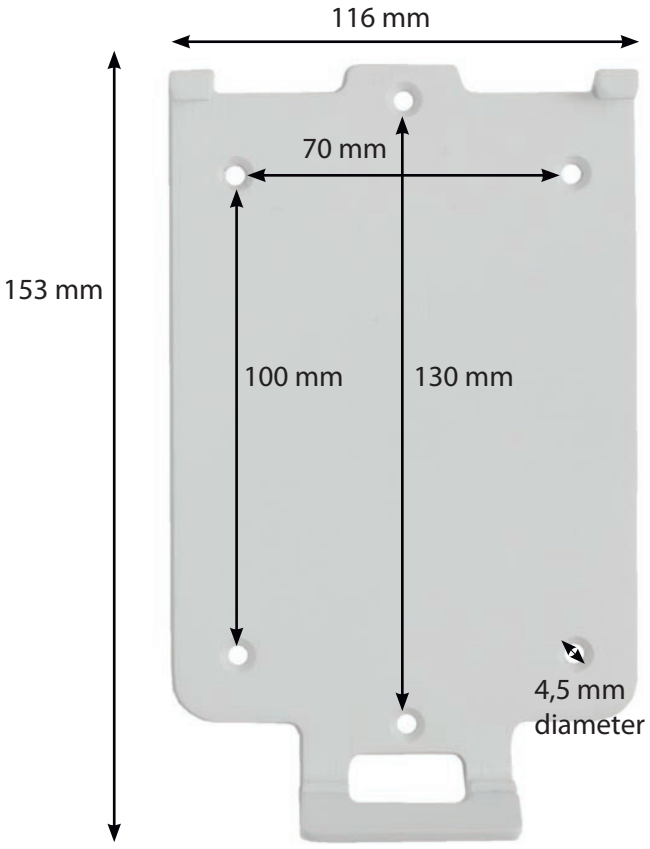
← Up to1'200 meters and max. 100 FSC-UFC230-2 with Modbus RTU and 65 FSC-UFC230-2 with BACnet MS/TP →

Dimensions

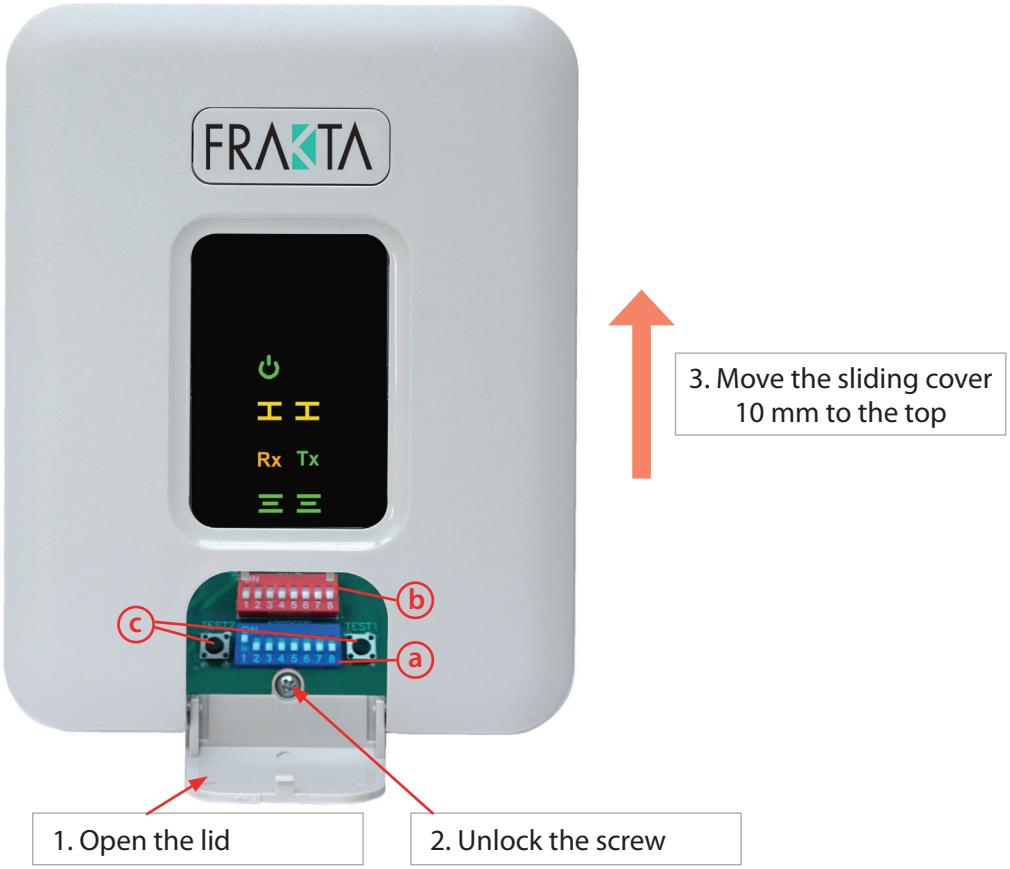
FSC-UFC230-2



Mounting Bracket



Removing the Cover of the Housing



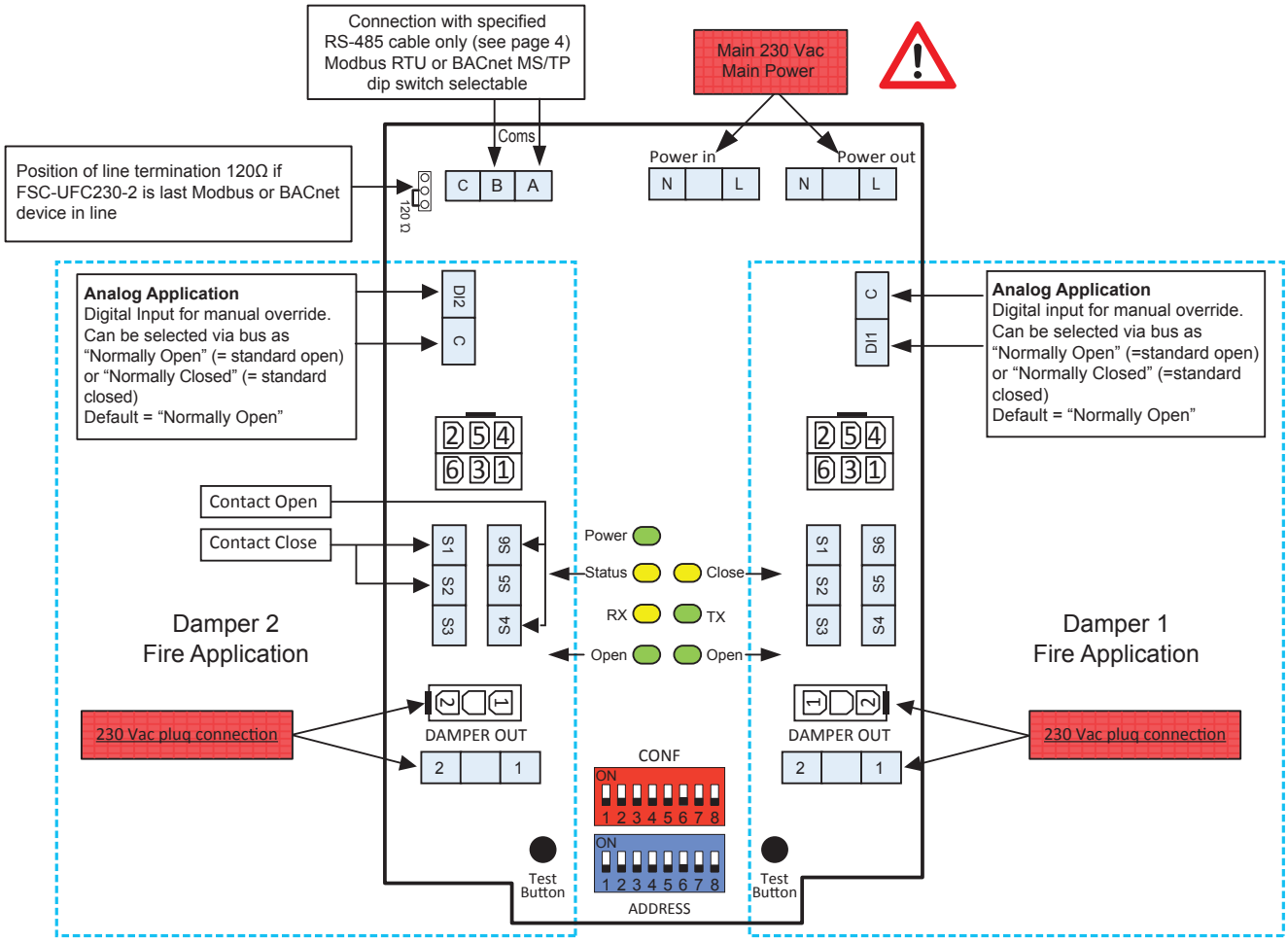
1. Open the small lid on the lower end of the housing by flapping up the cover
2. Unlock the screw which is placed on the lower end in the middle
3. Move the sliding cover 10 mm to the top
4. Remove the cover

Lid for Easy Access to Dip Switch Terminals (Configuration / Addressing) and Test Button

(a) The blue coloured dip switch terminal is for the Modbus or BACnet addressing.
(b) The red one for the configuration.
(c) Test buttons: For detailed explanation of the function of the test button see page 14.

Electrical Installation

General Information



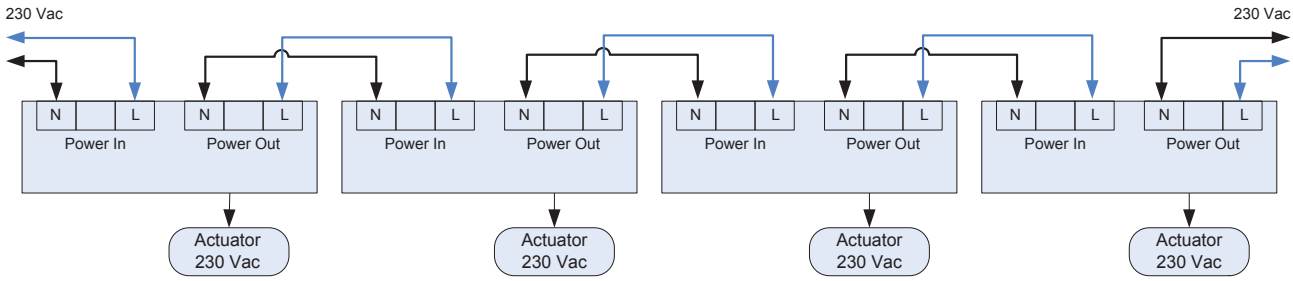
IMPORTANT: If only one actuator is connected to the FSC-UFC230-2 the LEDs of the side where no actuator is connected indicate an alarm. A jumper has to be installed between S4 and S6 in the terminal where there is no actuator connected, to indicate an "opened" position in the LED. If the second connection is not activated via bus, there will be no alarm signal on the bus system.

Power Supply

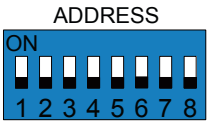
Main Power --- FSC-UFC230-2
The Power supply of the FSC-UFC230-2 is 230V AC.
The actuator has to be 230V AC. There are 2 terminals for the power, in order to make the daisy chain connection for the installer easier.

IMPORTANT:

- **The correct wiring is very important in regards to the 230 V power supply! The polarity, phase to phase and com to com, must be respected when connecting to the power supply network and also when connecting multiple FSC-UFC230-2!**
- The wiring of the actuator must be done in the correct way and according to the manufacturer's instructions. Especially when using actuators without plugs it is important to have a close focus on the polarity of the cable connection that means, to consider the correct allocation of phase and com!
- **All connections have to be fixed before putting power to the devices.**
  Beside the risk of electrical shock, it is also possible to destroy the FSC-UFC230-2 when not proper handled.



Modbus and BACnet Addressing



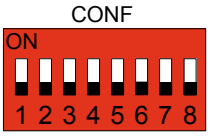
*Attention: If the FSC-UFC230-2 is used in combination with the FSC-M200 controller**, Modbus addresses 1–10 are reserved for the FSC-M200. That means that the Modbus addressing of the FSC-UFC230-2 starts with Modbus address 11. Furthermore, the Baud Rate needs to be changed to 38'400 (PIN 5 to ON). 
If the FSC-UFC230-2 is used in combination with the FSC-M60, the addressing needs to be done in consecutive order. **Integration planned, not yet available.

Address	Switches On	Address	Switches On	Address	Switches On	Address	Switches On
0*	Broadcast-not in use	33	1+6	66	2+7	99	1+2+6+7
1*	1	34	2+6	67	1+2+7	100	3+6+7
2*	2	35	1+2+6	68	3+7	101	1+3+6+7
3*	1+2	36	3+6	69	1+3+7	102	2+3+6+7
4*	3	37	1+3+6	70	2+3+7	103	1+2+3+6+7
5*	1+3	38	2+3+6	71	1+2+3+7	104	4+6+7
6*	2+3	39	1+2+3+6	72	4+7	105	1+4+6+7
7*	1+2+3	40	4+6	73	1+4+7	106	2+4+6+7
8*	4	41	1+4+6	74	2+4+7	107	1+2+4+6+7
9*	1+4	42	2+4+6	75	1+2+4+7	108	3+4+6+7
10*	2+4	43	1+2+4+6	76	3+4+7	109	1+3+4+6+7
11	1+2+4	44	3+4+6	77	1+3+4+7	110	2+3+4+6+7
12	3+4	45	1+3+4+6	78	2+3+4+7	111	1+2+3+4+6+7
13	1+3+4	46	2+3+4+6	79	1+2+3+4+7	112	5+6+7
14	2+3+4	47	1+2+3+4+6	80	5+7	113	1+5+6+7
15	1+2+3+4	48	5+6	81	1+5+7	114	2+5+6+7
16	5	49	1+5+6	82	2+5+7	115	1+2+5+6+7
17	1+5	50	2+5+6	83	1+2+5+7	116	3+5+6+7
18	2+5	51	1+2+5+6	84	3+5+7	117	1+3+5+6+7
19	1+2+5	52	3+5+6	85	1+3+5+7	118	2+3+5+6+7
20	3+5	53	1+3+5+6	86	2+3+5+7	119	1+2+3+5+6+7
21	1+3+5	54	2+3+5+6	87	1+2+3+5+7	120	4+5+6+7
22	2+3+5	55	1+2+3+5+6	88	4+5+7	121	1+4+5+6+7
23	1+2+3+5	56	4+5+6	89	1+4+5+7	122	2+4+5+6+7
24	4+5	57	1+4+5+6	90	2+4+5+7	123	1+2+4+5+6+7
25	1+4+5	58	2+4+5+6	91	1+2+4+5+7	124	3+4+5+6+7
26	2+4+5	59	1+2+4+5+6	92	3+4+5+7	125	1+3+4+5+6+7
27	1+2+4+5	60	3+4+5+6	93	1+3+4+5+7	126	2+3+4+5+6+7
28	3+4+5	61	1+3+4+5+6	94	2+3+4+5+7	127	Reserved factory defaults
29	1+3+4+5	62	2+3+4+5+6	95	1+2+3+4+5+7		
30	2+3+4+5	63	1+2+3+4+5+6	96	6+7		
31	1+2+3+4+5	64	7	97	1+6+7		
32	6	65	1+7	98	2+6+7		

Via each, per dip switch allocated, Modbus or BACnet address, the second actuator can be individually controlled through the software (see Mobus Register or BACnet Object List).

Configuration through Dip Switch

Default Dip Switch Position



Configuration Possibilities

Pin	Off (Default)	On
1	Fire Damper 1	Not in Use
2	Fire Damper 2	Not in Use
3	Modbus RTU	BACnet MS/TP
4	Baud Rate (Off-Default)	
5	Baud Rate (Off-Default)	
6	Not In Use=Off	
7	Not In Use=Off	
8	Not In Use=Off	

Information Pin 3:
If the FSC-UFC230-2 is used in connection with the FSC-M60, Pin 3 has to be on ON (BACnet).

Information Pin 5:
If the FSC-UFC230-2 is used in connection with the FSC-M200*, Pin 5 has to be on ON (Baud Rate 38'400).

*Integration planned.

Baud Rate Selection Modbus

This has to be done when choosing Modbus only.

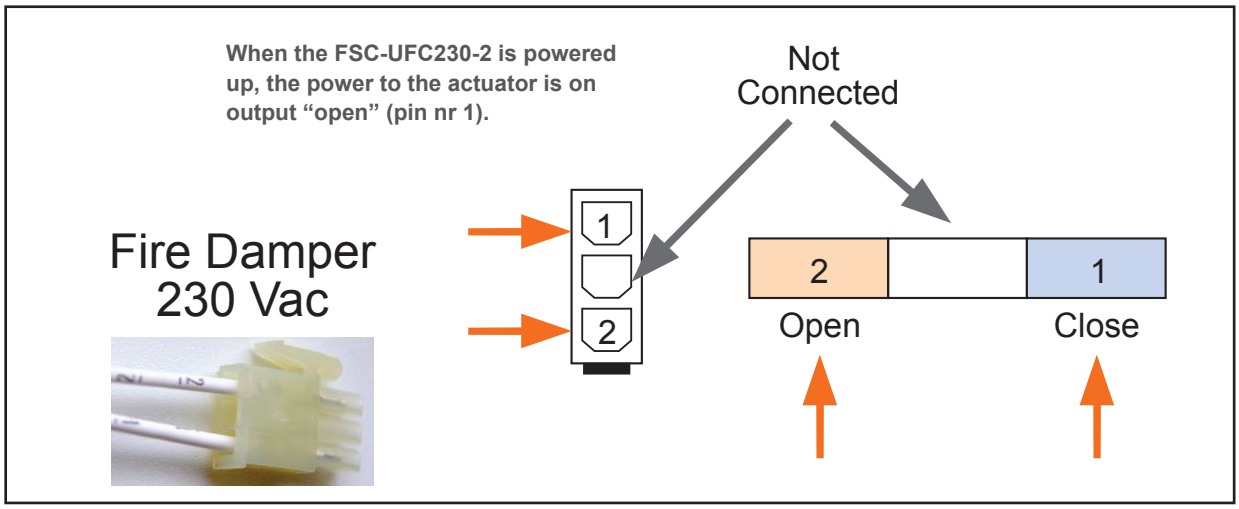
	9 600 (Default)	**19 200**	**38 400**	**76 800**
4	Off	On	Off	On
5	Off	Off	On	On

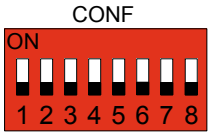
Baud Rate Selection BACnet
Baud rate in BACnet is automatically detected.

Connection Details

Fire Damper Actuator

Fire damper actuator (spring return). When the actuator has power it is open, when there is no power the actuator is closed with the spring.





After Connection --- Power Reset:

- Fire Damper Application will always go to OPEN.

Conventional Application

Conventional connection is the application when the FSC-UFC230-2 is not connected to a bus network. No configuration settings are required. One digital input for conventional application is available for each of the two dampers. This is to open and close the damper. Digital output signals indicating the damper positions are available .

Digital Input: volt free, normally open as default (can be changed on bus).
The digital input allows to control the damper position through an external contact/device.

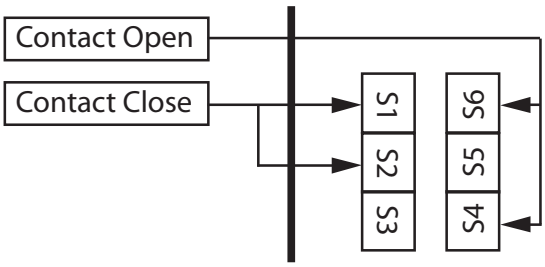
This digital input in the FSC-UFC230-2 always overrides the bus commands.

Digital Output: the feedback signals (on/off) of the actuator can be forwarded via the connections S1 and S2 (actuator/damper closed) and / or S4 and S6 (actuator/damper open) to any control or monitoring device.

These outputs can be connected in parallel between the different FSC-UFC230-2 to monitor their status.

Current output max is 5mA.

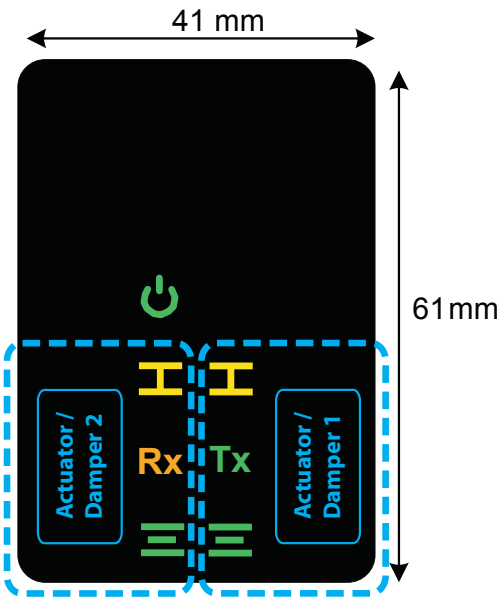
Electrical Installation for Conventional Application



Explanation of LEDs

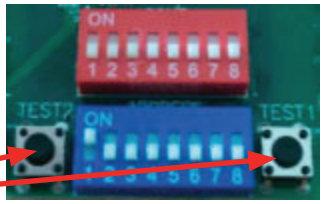
The LEDs are only visible if they are active. If not active the symbols will not appear.

IMPORTANT: If only one actuator is connected to the FSC-UFC230-2 the LEDs of the side where no actuator is connected indicate an alarm. A jumper has to be installed between S4 and S6 in the terminal where there is no actuator connected, to indicate an "opened" position in the LED. If the second connection is not activated via bus, there will be no alarm signal on the bus system.



Led	Color	Action	Description
Power	Green	On	Power is connected
Alarm	Yellow or green per actuator / Dampers blinking alternately	Flash Interval 1 sec	Actuator did not reach end switch position within set time
Alarm	Both LED green (damper open) blinking alternately. Yellow (damper closed) = static	Flash Interval 1 sec	Alarm on 1 or more devices active (minimum 1 actuator in closed position). Bus-Command = open; Alarm = close all actuators
Rx	Yellow	Flash	Receive data
Tx	Green	Flash	Transmit data
Close	Yellow	On	Damper close
Open	Green	On	Damper open
Close + open Flashing	Yellow / Green	Flash	Damper is moving

Functionality of Test Buttons



Two test buttons are available in the FSC-UFC230-2 (damper 1 and damper 2). The test buttons start the allocated test functions per damper.

Fire Application:

- Power on the FSC-UFC230-2: actuator (damper) opening until end position is reached
- Pushing test button will interrupt the power supply to the actuator. Spring is closing the actuator
- As soon as the test button is released the power comes back to the actuator and the damper will open again

Run Time Monitoring of Actuator
The FSC-UFC230-2 is equipped with an actuator run time monitoring function for both actuators independently. This function monitors the time required by the actuator from leaving of the one and reaching of the other end switch. If the actuator does not reach the other end switch in the specified time an error message is sent.

The default value for the actuator run time is 90 seconds. This can be adapted via Modbus or BACnet from 0…360 seconds.

Full Auto Test Application
The FSC-UFC230-2 offers a `Full Auto Test' function. This can be controlled through the Modbus or BACnet controller.

Basis of the Functionality
Basis for this function is the run time monitoring of the actuator.

Fire Damper
To start the full auto test functionality, the corresponding bus-register hast to be activated via bus. By starting the full auto test, the timer of the run time monitoring starts to count the time and the fire damper actuator is closing (spring) and remains in the closed position until the timer of the set running time has reached the set time. Then the actuator will open again automatically until the end switch has been reached. The timer of the run time monitoring starts to count again as soon as the command 'open' has been sent. Once the timer of the set running time has reached the set time, the FSC-UFC230-2 will go back into normal operation mode and a feedback "full auto test ok" is activated. If one of the end switches is not reached within the defined running time, an error message is activated.

Bus Monitoring Application

The FSC-UFC230-2 is equipped with a Bus Monitoring Function. If the bus signal to the unit is interrupted the dampers will move to the safety position after the defined period of time and remain there until the bus functionality is back to normal operation.

Objects
There are 2 objects which can be activated by Modbus or BACnet:
- Logic Alarm Communication
- Delay Alarm Communication

Default settings:
Logic Alarm Communication not active

Activation (via Bus):
- Logic Alarm Communication 1 (on)
- Delay Alarm Communication is activated, default delay time is 120 sec. Option to set the delay time via bus between 0…360 sec

Functionality
Fire Damper
After the defined period of time the fire damper will move to the closed position and remains closed until the bus functionality is back to normal operation.

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