

Power supply and transformer sizing

See FSKN24-BAC or FSKN120-BAC data sheets and individual actuator data sheets for power draws. If a relay is used on the output of the FSKN use VA or watts of relay for sizing power supply. See FSKN Application Guide for typical wiring diagrams. The FSKN120 will accept 230V also although in the Americas it is rarely employed..

Safety notes

The FSKN is designed for use with spring return closed containment (compartmentation) applications only per Chapter 7 of the International Building Code (IBC) and International Fire Code (IFC). It is a testing module.

The FSKN is an interface between a BACnet or Modbus control system and an actuated life safety damper. It's purpose is to test the damper per code requirements. It has no safety functions.



WARNING!

The FSKN is not to be used in smoke control systems for any safety function. It is not UL 864 UUKL listed. It is an interface for testing spring return containment dampers per Chapter 7 of the IBC and IFC only. Use the FSKN with spring return closed dampers only.

For Data sheets, BACnet or Modbus programming or application wiring diagrams go to:
[www.belimo.com/us/shop/en_US/Actuators/
 Fire-&Smoke-Actuators/FSKN24-BAC](http://www.belimo.com/us/shop/en_US/Actuators/Fire-&Smoke-Actuators/FSKN24-BAC)

For more information contact Larry Felker, Fire & Smoke Product Manager 775 355-2461

Installation Instructions FSKN120-BAC & FSKN24-BAC

Installation

The enclosure is a standard NEMA 1 electrical box. It is surface mounted remotely or on the damper sleeve. If mounted on the damper sleeve the connected ducts must be free to fall away if necessary. Do not bridge the sleeve and duct. Four mounting holes are inside the enclosure.

Ground all conduits entering the box either using bonding connectors or normal conduit connections per NFPA 70 NEC and local codes. The life safety code requires flex or hard conduit for both 24V and 120V circuits. Only the 120V model requires a grounding screw connection.



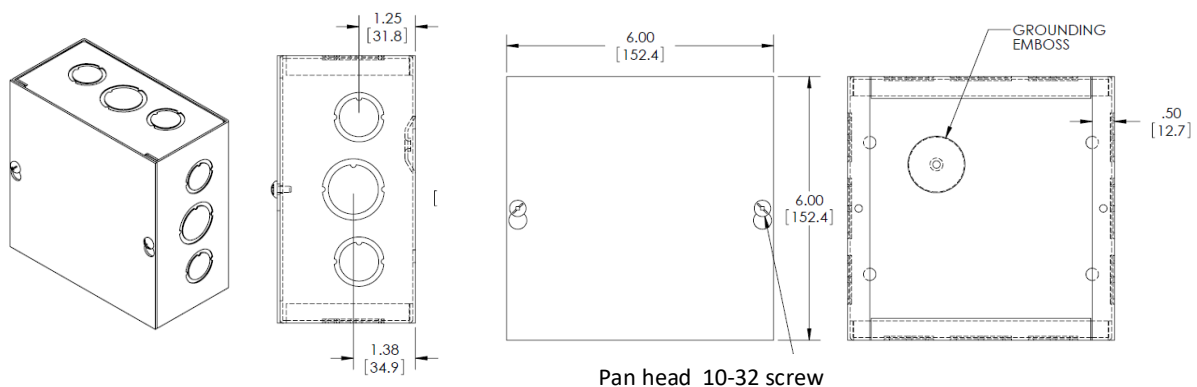
FSKN mounted in its enclosure

Surface mount the FSKNxx-BAC using the 4 holes on the base of the enclosure. Do not drill inside of enclosure. Mark holes, drill, and then mount the enclosure. Use bolts with lock washers inside damper sleeve or on any vibrating surface like ductwork.

The enclosure has a standard screw cover, cULus. 6" x 6" x 3" ANSI 61 polyester finish. 3 lbs. 16 ga. carbon steel. 1/2" and 3/4" KOs. Enclosure: JB-3954-KO (Bud Industries).

Run the BACnet RS485 cable through an approved squeeze connector. The shields are to be grounded at one location only, typically at the originating controller. See the BACnet standard for RS485 wiring options.

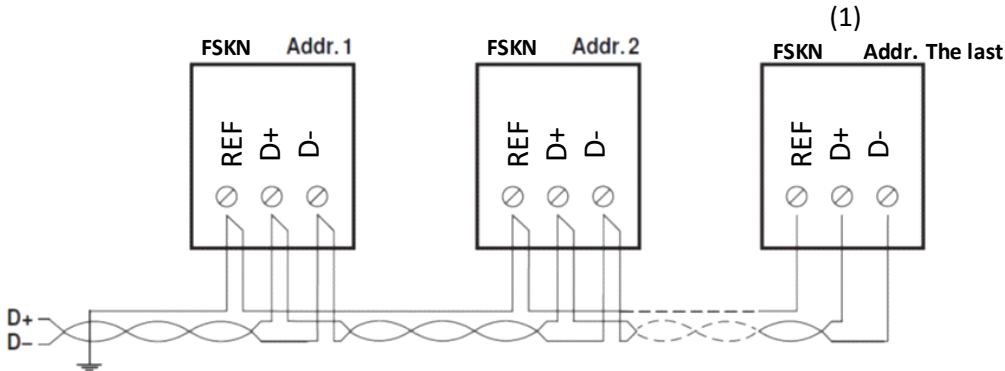
Dimensional drawings



Installation Instructions FSKN120-BAC & FSKN24-BAC

Initial Setup

Network wiring connections



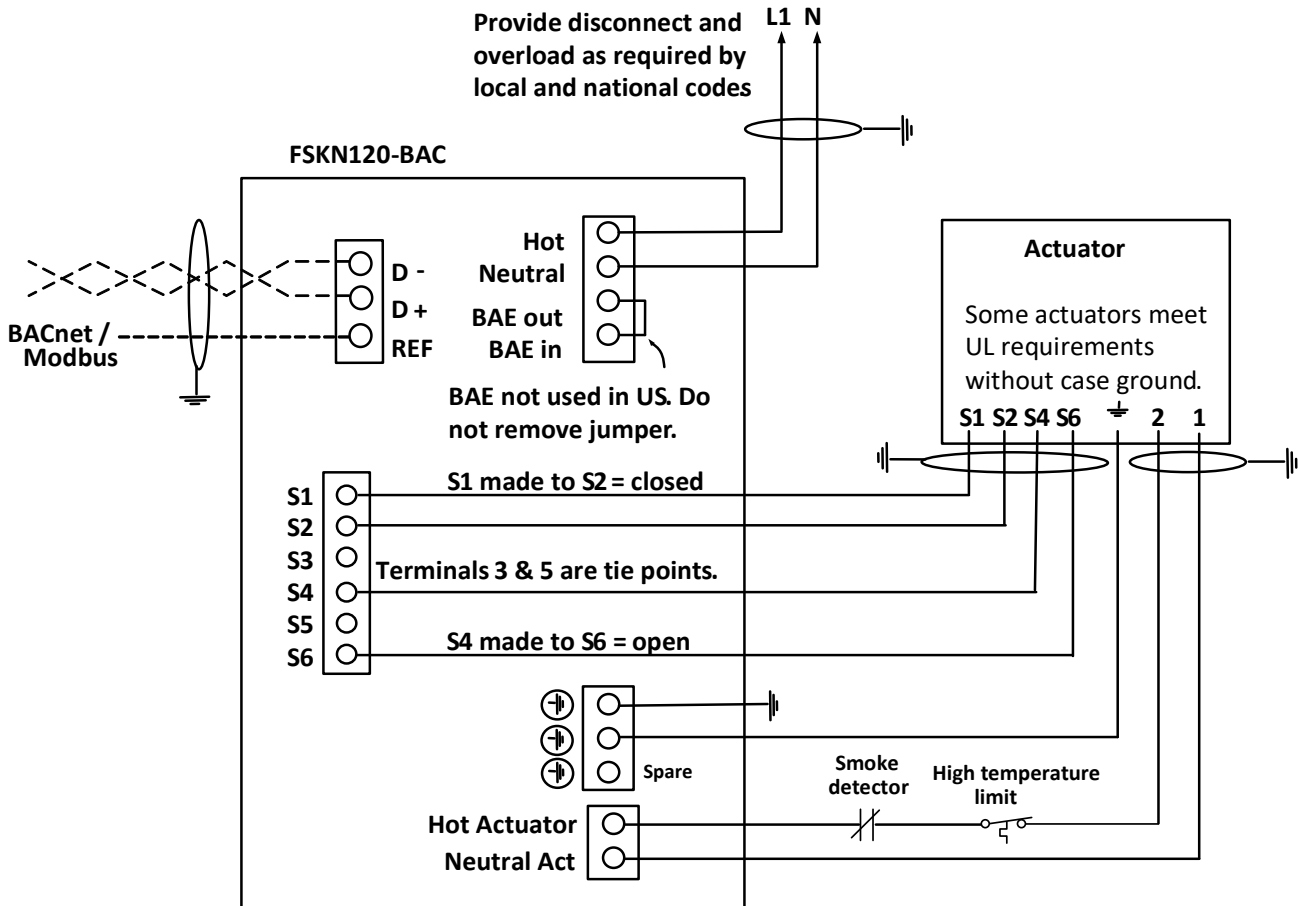
The wiring of the line for BACnet MS/TP or Modbus RTU must be carried out in accordance with applicable RS 485 standards.

(1) Set dipswitch 5 [Term] of last FSKN to ON to enable EOL 150Ω resistor.

If connected to a network with a mix of 2-wire (non-isolated) and 3-wire (isolated) devices, refer to the ASHRAE BACnet Standard or Modbus controller installation instructions for wiring and grounding information.

3-wire networks are recommended to avoid problems.

Basic FSKN120-BAC wiring



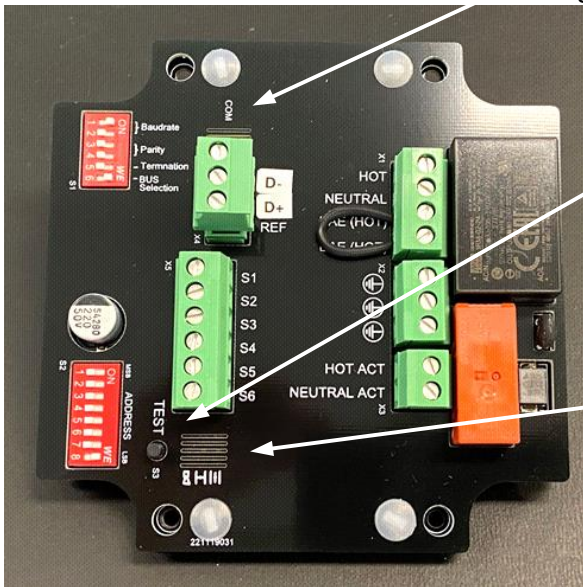
Installation Instructions FSKN120-BAC & FSKN24-BAC

FSKN120-BAC

LEDs description

Communications status

Yellow flickering = communications established



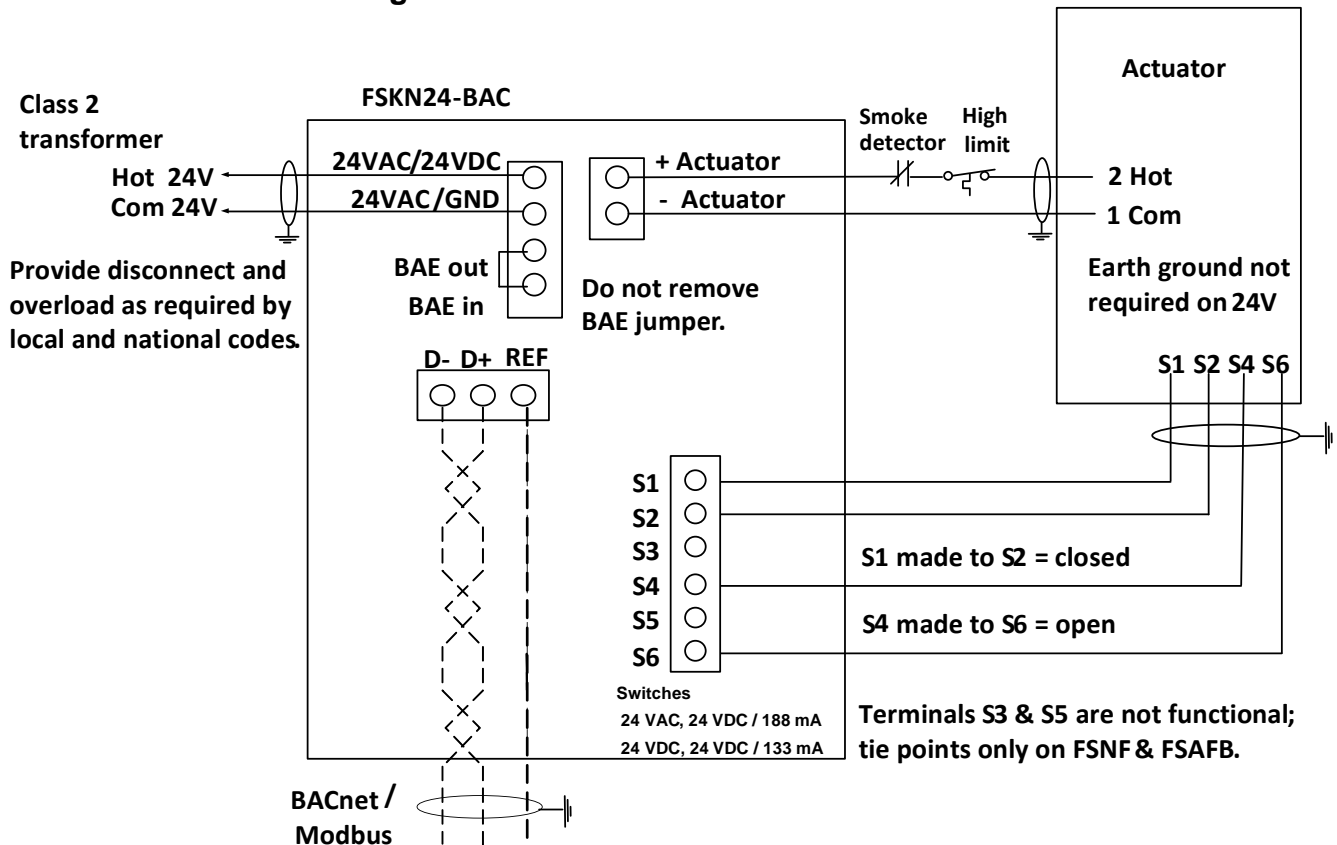
Reset Button

Press the button for longer than one second to reset an error message
Press and hold button until actuator springs closed to perform a manual test

LEDs status signalisation BELIMO damper actuator:

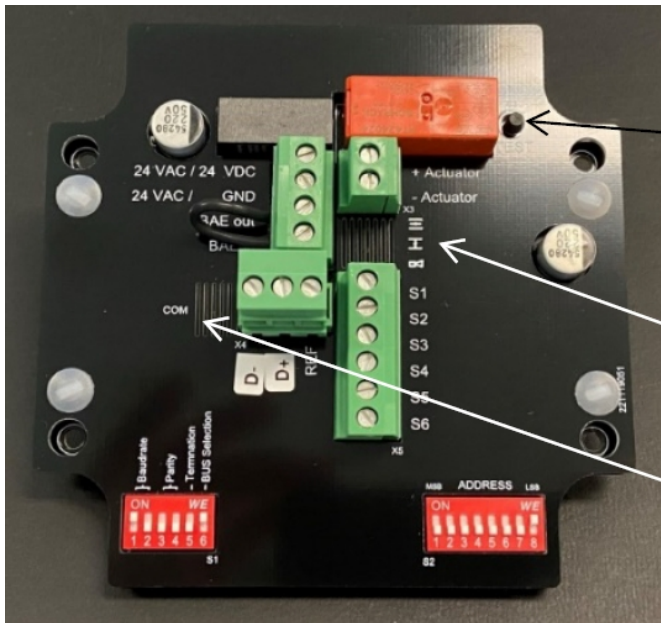
Green	on	Upper limit switch (damper open)
	blinking	Damper opens (motor is actuated)
Yellow	on	Lower limit switch (damper closed)
	blinking	Damper closes (motor is not actuated)
Red	on	Internal device fault (BKN)
	blinking	External fault = smoke detector triggered, nominal position not reached
	flashing	External fault = If an error is stored (i.e. no longer pending, but not yet acknowledged), then this is displayed on the device by a periodic flash of the red LED.

Basic FSKN24-BAC wiring



Installation Instructions FSKN120-BAC & FSKN24-BAC

FSKN24-BAC



Reset Button
 Press the button for longer than one second to reset an error message. Press and hold button until actuator springs closed to perform a manual test

Red, Yellow, & Green LEDs
 See Signalization

Communications status
 Yellow flickering communications established

Blink = 1/2 second on, 1/2 second off. Flash = 1/2 second off, 1/4 second on.

BACnet dip switch settings



For Modbus dipswitch settings see *FSKN120 & FSKN24 BACnet and Modbus Information* at www.belimo.us/firesmoke/FSKN

A	Baud rate		Parity		Termination		Bus	
	1	2	3	4	5	6		
9'600	OFF	OFF	1-8-N-1	OFF	with 150 Ω	ON	BACnet	ON
19'200	OFF	ON	1-8-N-1	OFF	OFF	OFF	Modbus	OFF
38'400	ON	OFF	1-8-N-1	ON				
76'800	ON	ON	1-8-N-1	ON				

B	BACnet address							
	1	2	3	4	5	6	7	8
0		OFF	OFF	OFF	OFF	OFF	OFF	OFF
1		OFF	OFF	OFF	OFF	OFF	OFF	ON
2		OFF	OFF	OFF	OFF	OFF	ON	OFF
...								
127		ON	ON	ON	ON	ON	ON	ON



ON
 OFF

On

the end of line FSKN Dip Switch 5, Term, is set to ON while others are always set to OFF.

Installation Instructions FSKN120-BAC & FSKN24-BAC

Signalisation	Command OPEN / upper position not reached:	Command CLOSE / lower position not reached:
	LED green blinking	LED green on Damper is in OPEN position
	LED yellow on Damper is in CLOSED position	LED green off Damper blade is between OPEN and CLOSE
	LED yellow off Damper blade is between CLOSE and OPEN	LED yellow blinking
	LED red blinking	LED red blinking
	error message after 180 seconds	error message after 60 seconds

Initial start-up

Token passing by devices on a MSTP network is specified in the BACnet standard. The status indication LEDs are illuminated as soon as power is applied. The FSKN activates the test sequence with the first power on and expects input on the switch terminals, Closed or open in correct sequence. If nothing is connected to a switch terminal, an error will occur with associated blinking patterns. The error message can be removed by connecting the switch wires and then pressing the Test button or using the Command MV120 4 Reset command.

The green LED blinks when power is applied and the actuator is driving open.

The green LED is on continuously after the S2 switch makes.

A blinking red LED indicates a failure.

A blinking yellow LED is a transition indication.

Normal operation

The FSKN relay is closed and the smoke detector and “primary heat responsive device,” manual reset high temperature limit, operate normally.

During normal operation if a test command is issued to an FSKN:

1. The FSKN relay is energized which opens its NC contacts and power is removed from the actuator which then springs the damper closed.
2. The position switch (FSKN terminals S1 & S2, wires S1 & S2 on the actuator) makes (closes) indicating the damper is closed. Damper blade switches may also be employed.
3. After 80 seconds the FSKN relay is de-energized which again powers the actuator and drives the damper open. The switch between terminals S1 & S2 opens. The yellow and green LEDs blink until the damper is reopened fully.
4. When the actuator has driven the damper open either the actuator open switch (wires S4 & S6) or the damper blade open switch again makes and the test is complete.
5. The FSKN then indicates no failure and the information is available to the BACnet controller.
6. If the sequence is incorrect (either the closed switch or the open switch not making or breaking in correct sequence then a Failure message is recorded.
7. Both the Red and Green LEDs will flash while the actuator is opening.
8. After correcting any problem either pressing the Test switch on the FSKN or entering MV120 4 Reset command will change the FSKN Actuator status to normal.

For information contact Larry Felker, Fire & Smoke Product Manager

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