

Mech-Elec®



Fire and Smoke Control Systems

Electro Mechanical

Hard wired damper
Control Panel

Fully Addressable

Programmable data wired
damper Control Panel

Complies with EN54-2/4

Fire and Smoke Control Systems

Mech-Elec®

Engineering consultants are well aware of the danger to life and potential damage than can be caused by the spread of smoke through buildings, even if confined to a small area.

Fire and smoke protection can reduce the risk to human life and minimise potential damage to property and contents.

In order to ensure maximum safety to any property, either old or new, a wide variety of systems and equipment needs to be carefully integrated. The smoke and fire dampers incorporated into the HVAC system perform a vital role and need to close immediately to contain fire and smoke and prevent their spread. They also need to open immediately to extract smoke.

BSB has put together a full range of damper control systems to offer simplistic single zone standard panels and multizone electro-mechanical panels through to addressable systems where greater numbers of dampers are installed.

For further details of the range of Fire and Smoke Control Dampers, contact our Sales Office.

Which System?

Electro Mechanical or Fully Addressable?

As a guideline:

The break-even point for installed costs of the Electro Mechanical Panel and Addressable Panel is approximately a 30 damper system. This is dependent on the size of the building and should include all hardwire, site wiring and installation costs.

Standard:

Ideal for systems with a small number of dampers in a single zone. Suitable for small to medium sized damper systems or where a number of panels may be used to offer localised control in groups or zones.

Premier:

Ideal for systems with a small to medium number of dampers in single or multiple zones. Suitable for small, medium or large systems as panels are supplied to client requirements. Panels can be configured to provide central or localised control of dampers in multiple groups or zones.

Addressable:

Ideal for systems with a greater number of dampers over a large area within a building, with either simple or complex fire engineering strategies. Systems allow for a greater number of dampers to be individually monitored/controlled utilising reduced installed cable, when compared with hard wired systems.

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Fire and Smoke Control Systems



example standard panel shown

Standard Electro Mechanical Control and Monitoring System

Provides a straight forward control panel offering the most common features called for as standard.

Due to differing site control and monitoring properties, damper actuators will be connected to site wiring when installed by the contractor to provide the relevant functions.

Detailed on pages 2-3



example premier panel shown

Premier Electro Mechanical Control and Monitoring System

Controls and monitors a number of smoke/fire dampers hard wired individually or in groups, in a single or multiple zone arrangement.

Dampers can be individually or collectively controlled and are continuously monitored.

Due to differing site control and monitoring properties, damper actuators will be connected to site wiring when installed by the contractor to provide the relevant functions.

Detailed on pages 4-5



example fully addressable panel and DID shown

Fully Addressable Control and Monitoring System

Software driven offering simplified installation and commissioning. Utilises data wiring in a loop configuration.

Can be configured to suit all types of system. Fully integrated and secure network provides an intelligent interface for building control.

Detailed on pages 6-9

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Standard Electro Mechanical control and monitoring system



EM10 standard control panel illustrated

Introduction

The standard range of Damper Control Panels are an affordable option to the Premier Control Panel.

The panels are manufactured to offer control and monitoring of dampers in a standard yet flexible off-the-shelf format with many features of the Premier Panel.

The Standard Panel has been developed to meet the most common industry requirements.

Panels are offered to control and monitor either 24V or 230V control options in groups/zones of 10, 20 or 30 dampers.

Features

Each control panel includes the following:

- Standard colour grey enclosure to RAL 7032. Wall mounted to IP55
- Key switch mains isolator
- Engraved w/b/w traffolyte facia plate
- Fireman's key switch (test/normal/override)
- Lamp test facility
- Power on LED indicator
- Fire alarm normal LED indicator
- Reset/released LED indicators
- BMS interface output relay (any damper closed/power failure)

Specification

The standard range of panels is of a standard format for the control of dampers in groups or zones of up to 10, 20 or 30, with individual indication.

Each panel provides for a fire alarm interface input via a volt free contact per group of 10 dampers. These contacts should be normally closed and open on alarm.

As standard, the panels are configured for single zone operation. On-site changes to EM20 (1-2 zone) and EM30 (1-3 zone) to effect zonal changes can be implemented by the removal of internal links. Please refer to panel drawings.

A three position test switch is located on the facia to provide for Normal, Test and Override operations.

In addition, each panel provides for a volt free contact output to interface with the BMS. This is a change over contact, going open circuit to indicate either a non-normal or fault condition.

Principle of Operation

Normal operation: The damper control panel to monitor zone volt free contacts (normal closed) in the fire alarm panel, which will energise a control relay to provide a power supply to the dampers.

Alarm condition: On alarm detection, N/C fire alarm contact to open, which will result in de-energising the control relay to remove the supply to the damper control option allowing failsafe position to be achieved.

Panel Ordering Codes

- EM10** Maximum 10 FSD dampers
- EM20** Maximum 20 FSD dampers
- EM30** Maximum 30 FSD dampers

Where there is a need to monitor and control more than 30 dampers, or options are required that are not listed above and/or a greater number of zones are required, please refer to the Premier Control Panel.

Facia Display

EM10

Controls, monitors and indicates up to 10 FSD dampers. The three position test switch is located on the facia to provide:

- Normal – All dampers open and under the dictate of an alarm input
- Test – All dampers close, dampers to reset open in normal position
- Override – Overrides the alarm input to open all dampers



EM20

Controls, monitors and indicates up to 20 FSD dampers. Complete with two blocks of 10 damper indication LED's.



EM30

Controls, monitors and indicates up to 30 FSD dampers. Complete with three blocks of 10 damper indication LED's.



Technical Data:

Type	No.Dampers	Enclosure Size (mm)	Zones	BMS Outputs	Weights
EM10	1-10	500 x 400 x 210	1	1	19 Kg
EM20	1-20	600 x 500 x 210	2	1	28 Kg
EM30	1-30	600 x 600 x 210	3	1	36 Kg

Power Consumption:

Panel Size	Panel Supply	Supply out to Damper	Panel Load	Control Option
EM10 - 24V	230V	24V	4 amps	5a
EM10 - 230V	230V	230V	3 amps	5b
EM20 - 24V	230V	24V	6 amps	5a
EM20 - 230V	230V	230V	6 amps	5b
EM30 - 24V	230V	24V	10 amps	5a
EM30 - 230V	230V	230V	7 amps	5b

Control Options

Control Options are available in 24V AC/DC or 230V AC, 24V 0-10v modulating and pneumatic operation. For further details, please refer to the FSD Series product literature.

The damper control options are powered from the control panel.

24/230V option wiring:

The control options are complete with two 1m flying leads. One 2 core plus earth for power and one 6 core for indication.

The 6 core are from the auxiliary switch to give open/closed indication.

S1 and S4 are the common and are linked

S2 gives closed indication at the point of 5° to fully closed

S6 gives open indication at the point of 80° to fully open

S3 and S5 are not used and thus should be isolated

This will effect a requirement for a 5 core cable.

Wiring Detail

Refer to schematic of typical electro mechanical system shown on Page 5.

Cable and Carrier System Selection to be the responsibility of the electrical contractor, in line with the project specification and site requirements.





Sample premier control panel illustrated

Introduction

The premier range of BSB Damper Control Panels are manufactured to control and monitor client specified numbers of dampers. The range offers standard features with a number of options to meet specific requirements.

The panels can be configured to offer individual or group/zone control and monitoring of control options 5 and 6 - modulating or pneumatic actuators in conjunction with interfacing with the fire alarm system to control dampers in zones. These contacts to be normally closed and open in alarm.

Features

- Dampers can be individually or collectively controlled and continually monitored
- Standard colour grey enclosure to RAL 7032.
- Wall mounted enclosures to IP55
- Custom engraved traffolyte fascia
- LED indication of damper status
- Single or multiple zonal inputs
- Door interlocking isolator
- Miniature circuit breaker protection for outgoing supplies and control wiring

Specification

The Control Panel provides individual or group control, LED indication for status monitoring and all necessary relays to comply with fully or semi-automatic damper operation.

Interface with the fire alarm panel is via volt-free contacts which are normally closed and to open upon alarm, the Damper Control Panel will then activate the relevant dampers to their alarm status, as per the cause and effect.

Damper Control Panels are purposely manufactured for any particular project to suit all actuated dampers and specific customer requirements.

Options

- Single or multiple zones
- Lockable glazed door
- Special paint finish to most British Standard reference numbers
- Flush mounting flanges
- Momentary push buttons
- Latching push buttons
- Fireman's override key switches
- Test switch
- Audible alarm with mute facility
- B.M.S. common fault relay interface
- B.M.S. Output
- Delay timers
- Battery backup

Specialist Panels

- Monitoring only panels
- Mimic only panels
- Fireman's control panels
- Repeater only panels

Principle of Operation

Normal operation: The damper control panel to monitor zone volt free contacts (normal closed) in the fire alarm panel, which will energise a control relay to provide a power supply to the dampers.

Alarm condition: On alarm detection, N/C fire alarm contact to open, which will result in de-energising the control relay to remove the supply to the damper control option allowing failsafe position to be achieved.

Size and Weight Detail:

No. of Dampers	Estimated enclosure size (mm)	Weight
1 - 8	400 x 400 x 200	13 Kg
9 - 16	500 x 500 x 200	18 Kg
17 - 30	600 x 600 x 200	28 Kg
31 - 50	800 x 600 x 250	42 Kg

For a greater number of dampers, please contact our technical sales office.

Control Options

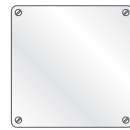
Control Options are available in 24V AC/DC or 230V AC, 24V 0-10v modulating and pneumatic operation. For further details, please refer to the FSD Series product literature. The damper control options are powered from the control panel.

24/230V option wiring:

The control options are complete with two 1m flying leads. One 2 core plus earth for power and one 6 core for indication.

The 6 core are from the auxiliary switch to give open/closed indication.

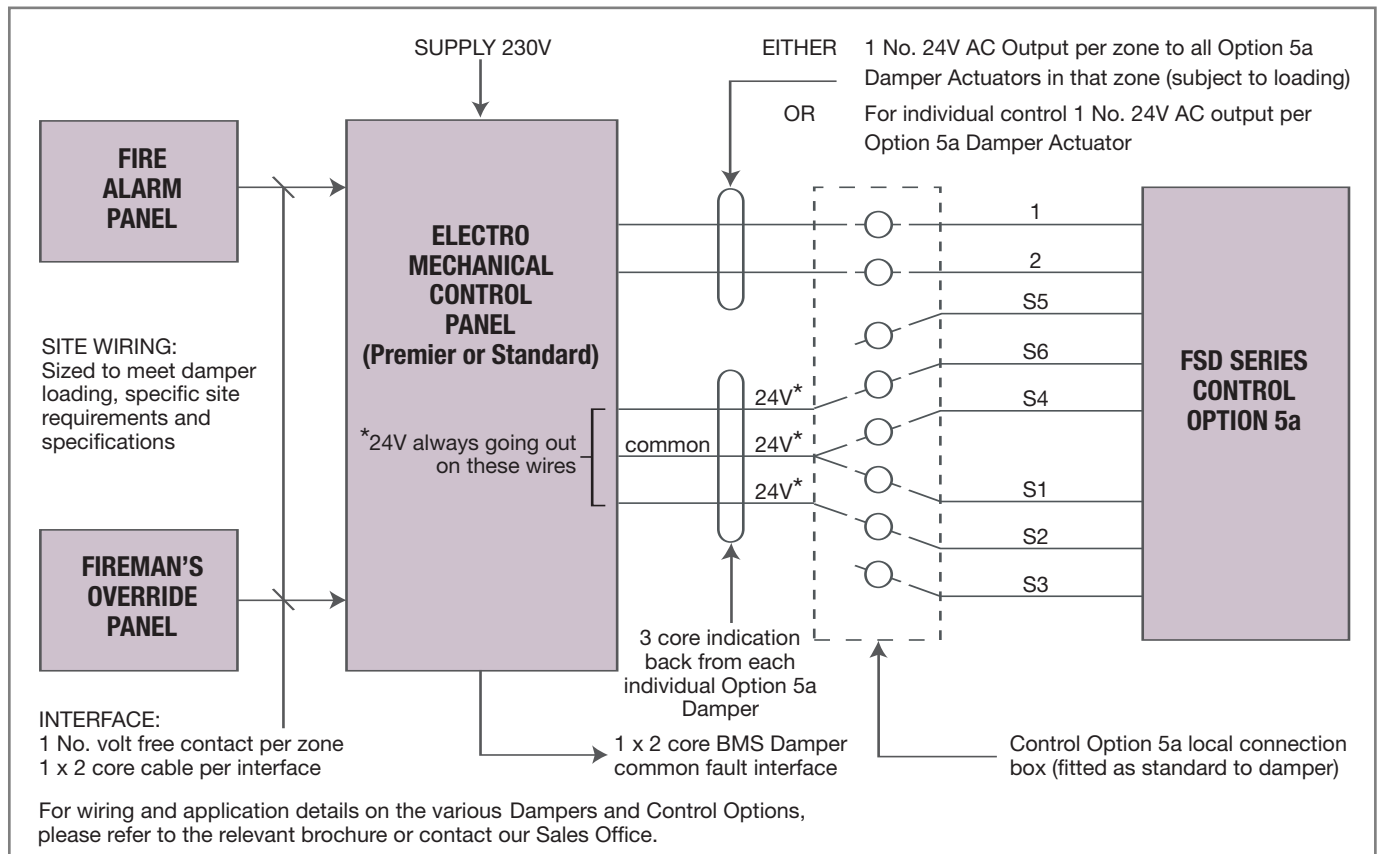
S1 and S4 are the common and are linked
 S2 gives closed indication at the point of 5° to fully closed
 S6 gives open indication at the point of 80° to fully open
 S3 and S5 are not used and thus should be isolated
 This will effect a requirement for a 5 core cable.



Accessories

- Connection box for control option (factory prewired as standard)

Schematic of a typical Electro Mechanical System incorporating FSD Series (Control Option 5a illustrated)



Fully Addressable

intelligent fire and smoke damper control systems

Mech-Elec®



500 x 355 x 117mm addressable panel illustrated. Weight = 12 kg

Introduction

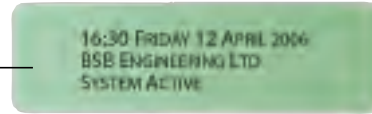
The range of fully addressable control panels are software driven and offer a powerful range of addressable control panels to suit all sizes of system.

The system provides for simplified installation and commissioning of the range of dampers and additional devices by utilising data wiring in a loop configuration.

The panel can be configured to suit all damper building fire engineering strategies, from the most simple to the highly complex. Its fully integrated and secure network provides an intelligent interface for building control using the same network wiring parameters as a fire alarm system.

The ability to allow additional dampers to be added to the system at a later date without disruption to normal working practices makes the addressable panel truly adaptable and should be a consideration when designing new or refurbishing existing systems.

LCD Display



A large area graphic display ensures that information is presented in plain language with detailed extra help available by pressing a “help” button. The screen shown above indicates the panel is in normal operation.

Features

- 4 loop version as standard
- Max. 250 devices per panel
- Max. 125 devices per loop
- Fully supports Hochiki protocols
- 16 Input/Output as standard
- Complies with **EN54-2/4**
- Large graphic display
- 4 amp power supply to EN54 part 4
- In built help and information screens
- Real time clock
- Stylish enclosure design
- Soft-touch buttons
- 2 programmable function buttons
- Up to 512 programmable inputs/outputs per panel via 2 wire RS485 serial link (optional)
- Programmable one touch test mode
- Powerful and versatile cause & effect programming
- Cause and effect wizard including:
 - cause and effect action.
 - disablement configuration.
 - test mode configuration.

Specification

The Fully Addressable Control System complies with EN54-2/4 and is available with 2 or 4 data loops, each capable of control/monitoring 125 damper interface devices (DID). The panel uses the most advanced microprocessor technology to provide a control system of extremely high integrity.

A large area graphic display ensures that information is presented in plain language with detailed extra help available by pressing the “help” menu button.

The panel supports the widely used Hochiki protocol and employs daily calibration routines to ensure that the system is always at optimum performance.

Principle of Operation

Normal operation: The damper control panel to monitor zone volt free contacts (normal closed) in the fire alarm panel, which will energise a control relay to provide a power supply to the dampers.

Alarm condition: On alarm detection, N/C fire alarm contact to open, which will result in de-energising the control relay to remove the supply to the damper control option allowing failsafe position to be achieved.

Control Options

The system will control and monitor any combination of fire and smoke dampers and offers monitoring of any manual reset fire damper. Control Options are available in 24V AC/DC or 230V AC, 24V 0-10v modulating and pneumatic operation. For further details, please refer to the FSD Series product literature.

The damper control options are powered locally to the dampers via a spur.

The ability to allow additional dampers to be added to the system at a later date up to the maximum permitted for the panel and to relocate damper addresses within zones, makes the addressable panel truly adaptable.

24/230V option wiring:

The control options are complete with two 1m flying leads. One 2 core plus earth for power and one 6 core for indication.

The 6 core are from the auxiliary switch to give open/closed indication.

S1 and S4 are the common and are linked

S2 gives closed indication at the point of 5° to fully closed

S6 gives open indication at the point of 80° to fully open

S3 and S5 are not used and thus should be isolated

This will effect a requirement for a 5 core cable.

Typical operation for FSD Series Control Options 5a

- Power On - Damper open.
- Power Off - Spring closed.
- Opening time = 140 seconds.
- Closure time = 16 seconds.

Typical operation for FSD Series Control Options 6a

- Power On - Damper closed.
- Power Off - Spring open.
- Opening time = 140 seconds.
- Closure time = 16 seconds.

Technical Specifications

Options 5 and 6 (a or b)

Running times:

Motor: approx.140 secs.

Motor (spring return) approx.16 secs.

Motor power consumption: **24V** **230V**

Motoring: 7 watt 8 watt

holding: 2 watt 3 watt

Fusible link:

The thermal fuse link fitted to control options as standard is rated at 72°C.

Motor operating temperature:

-30°C to +50°C

Options (externally mounted)

- 16 channel input/output board



- 8 way relay extender board



In general, reference has been made to motor open, fail safe closed actuation (Control Option 5). For dampers with other types of operation such as fail safe open, motor open, motor closed and modulating motors, please refer to the BSB Technical Sales Office.

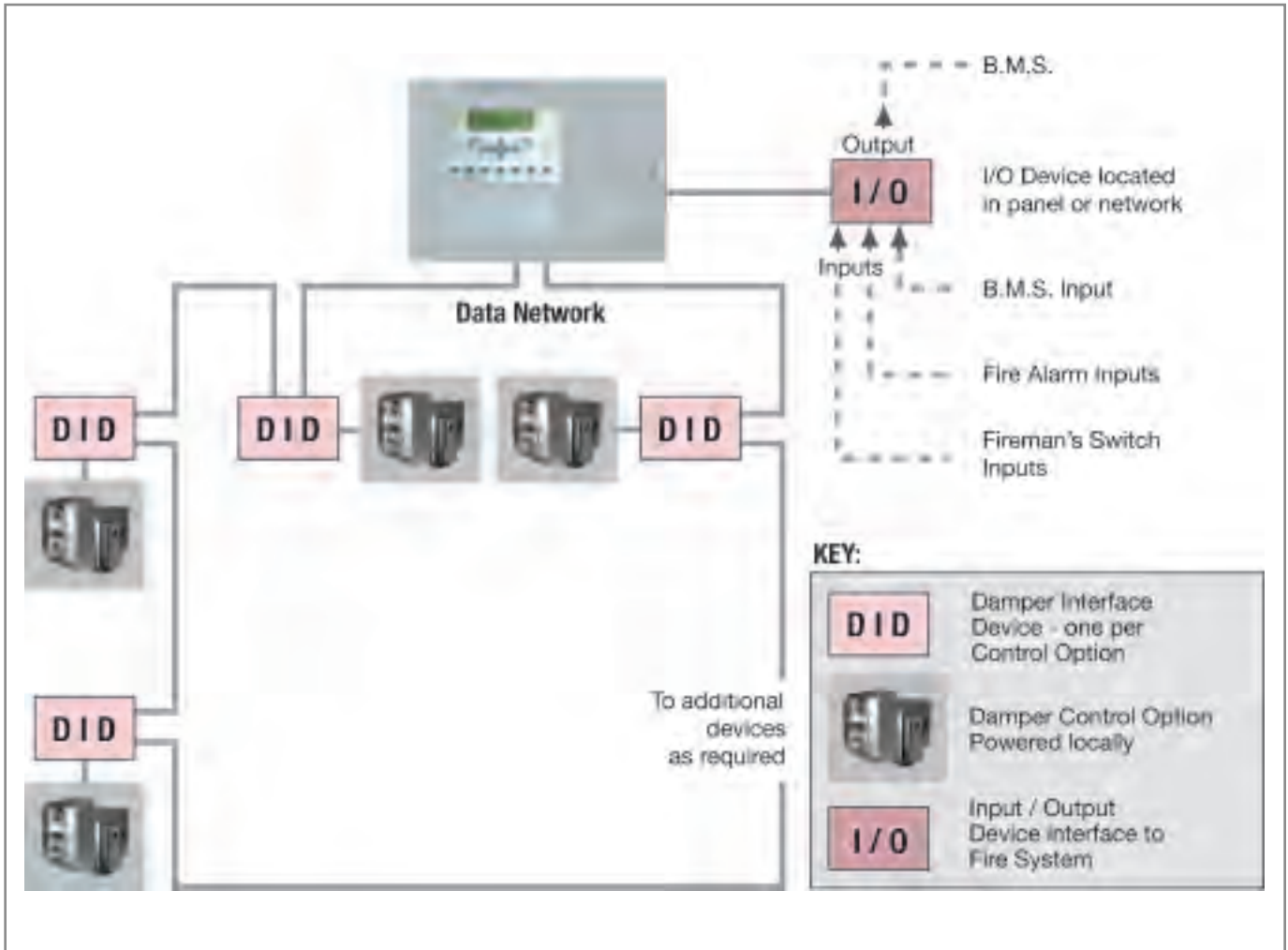
Fully Addressable

intelligent fire and smoke damper control systems



Schematic of a typical Addressable System Network

incorporating FSD Series (Control Option 5a illustrated)



Data Cable Specification

These cable specifications are fundamental to the stable and reliable operating of your fire/smoke control and monitoring system.

Failure to adhere to these specifications will result in unstable and unreliable network communications and will void all warranties.

Cable Type	Core size (mm ²)	Max. Cable Length
Firetuff (2 core)	1.5	1.5 km
Firetuff (3/4 core)	1.5	2.0 km
FP 200 (2 core)	1.5	1.5 km
SWA (2 core)	2.5	1.5 km
MICC (2 core)	1.5	1.5 km

1. Maximum number of dampers per loop is 125.
2. The maximum size of cable which can be terminated is 2.5mm².
3. The screen or drain wires should be bonded to the earth terminals provided.
4. The ESP communications protocol is highly immune to noise but sensible segregation from known noise generating sources such as mains cables is recommended

Damper Interface Device (D I D)

The DID consists of a Hochiki CHQ-SIO device mounted within an enclosure with control option pre-wired and fitted to the damper assembly. The enclosure is provided with the relevant number of glands to accept site wiring loops and supply by others.

The DID will control and monitor the combination Fire and Smoke Dampers and Smoke Control Dampers, providing the correct operation to the advised cause and effect and reporting the status of the damper.

The DID is normally supplied fitted to the damper assembly. However, as an option, it can be supplied separately for positioning within 1 metre from the damper control option to allow direct connections of the flying leads and site wiring by others.

The DID is powered from the data loop with the local supply being switched to control the damper option.

3 Position Damper Interface Device

Damper interface as described opposite with additional Potentiometer mounted on the enclosure to provide for 0-10 volt mid position.

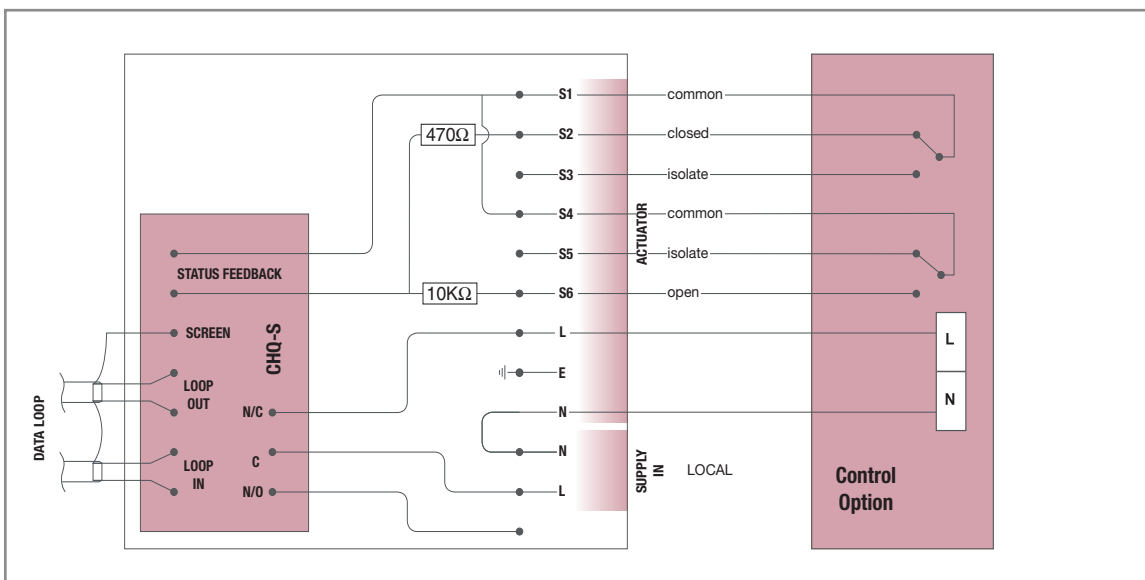
This device allows you to control a modulating actuator to achieve three positions as follows:

- Fully open
- Fully closed
- Mid position 0° - 90° open - fail safe closed in alarm condition



See separate wiring detail below

Wiring Detail for Damper Interface Device (D I D)



Air, Fire and Smoke Control

Mech-Elec®

Air Balance Control



BD Series
Backdraught
Regulating Dampers



DD Series
Duct Regulating
Dampers



HD Series
Heavy Duty Regulating
Dampers



SB Series
Single Blade
Regulating Dampers



SF Series
Slimfit Regulating
Dampers

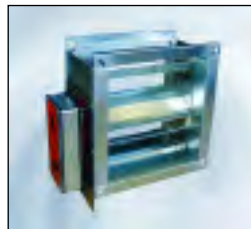
Fire and Smoke Control



FD Series
Fire Control



FSD Series
Fire and Smoke
Control



SC Series
Smoke Control



Control Systems
Electro Mechanical



Control Systems
Fully Addressable