



Fire and Smoke Control Systems

Electrical Mechanical

Standard Panel - Modular design for control and monitoring

Premier Panel - Customised design for control and monitoring

Fully Addressable

Fully programmable data wired control and monitoring panel.

Complies with EN54-2/4



Fire and Smoke

Control Systems - Introduction



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. There is also a need for immediate opening of the dampers to evacuate smoke and dangerous gases, which the range of BSB panels achieve through commands received.

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

The **Standard** EM10, EM20, EM30, EM40 and EM50 panels provide individual damper status and zone control in an easy to specify format for the smaller projects.

The **Premier** Control Panel's simplistic use of relay logic allows for ease of manufacture and flexibility to suit site zoning and therefore installation and commissioning.

The **Addressable** System allows for total flexibility through it's industry standard software driven menu which provides for a full range of interface devices sitting on a data network.

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

Which System?

Electro Mechanical or Fully Addressable?

Standard Electro Mechanical:

Ideal for systems with a small number of dampers in a single, two, three, four or five zones maximum. 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 Electro Mechanical:

Ideal for systems with a small, medium or a large number of dampers in single or multiple zones, dependent on client's 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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Standard Electro Mechanical Control and Monitoring System



Example standard panel shown

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 3-4

Premier Electro Mechanical Control and Monitoring System



Example premier panel shown

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 5-6

Fully Addressable Control and Monitoring System



Example fully addressable panel and DID shown

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 7-10

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EM20 standard control panel illustrated

Introduction and Benefits

The standard range of BSB Damper Control Panels are manufactured to offer control and monitoring of dampers in a standard 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, 30, 40 or 50 dampers.

Features

Each control panel includes the following:

- Standard colour grey enclosure to RAL 7035.
Wall mounted to IP55
- Key switch mains isolator
- Reverse engraved facia plate
- Fireman's key switch (test/normal/override)
- Lamp test facility
- Power on LED indicator
- Fire alarm normal LED indicator
- LED indication of damper status
- BMS interface output relay
(any damper closed/power failure)
- Lockable front door with removable key
- Override activated LED indicator

Typical Tender Specification Text

The standard range of panels to be of a uniform format for the control of dampers in groups or zones of up to 10, 20, 30, 40 or 50 with individual damper status indication.

Each panel to include 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.

The panels shall be configured for a single zone operation, with the facility for on-site changes to the EM20 (1-2 zones) and EM30 (1-3 zones), EM40 (1-4 zones) and EM50 (1-5 zones). Zonal changes can be easily implemented on-site by the removal of internal links. Please refer to panel drawings.

Three position test switch to be included on the facia to provide for Normal, Test and Override operations.

Each panel to provide for a volt free contact output to interface with the BMS for fault reporting. This will be 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
- EM40 Maximum 40 FSD dampers
- EM50 Maximum 50 FSD dampers

Note:

Where there is a need to monitor and control more than 50 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.

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 closed, dampers to reset in normal position
- Override - Overrides the alarm input to open all dampers



Commissioning

BSB offers a comprehensive after sales service including pre-commission checks or a complete commissioning service of all our products in line with current CIBSE guidelines as well as planned preventative maintenance.

Actuator Options

Control Options are available in 24V AC/DC or 230V AC. 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 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

Wiring Detail

Refer to schematic of typical BSB electro mechanical system shown on Page 6.

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

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	1-2	1	28 Kg
EM30	1-30	600 x 600 x 210	1-3	1	36 Kg
EM40	1-40	800 x 600 x 210	1-4	1	48 Kg
EM50	1-50	800 x 800 x 210	1-5	1	60 Kg

Power Consumption:

Panel Size	Panel Supply	Supply out to Damper	Max. Panel Load	Actuator
EM10 - 24V	230V	24V	4 amps	PM24-TF*
EM10 - 230V	230V	230V	3 amps	PM230-TF*
EM20 - 24V	230V	24V	6 amps	PM24-TF*
EM20 - 230V	230V	230V	6 amps	PM230-TF*
EM30 - 24V	230V	24V	10 amps	PM24-TF*
EM30 - 230V	230V	230V	7 amps	PM230-TF*
EM40 - 24V	230V	24V	13.5 amps	PM24-TF*
EM40 - 230V	230V	230V	6 amps	PM230-TF*
EM50 - 24V	230V	24V	15.5 amps	PM24-TF*
EM50 - 230V	230V	230V	8.1 amps	PM230-TF*

* TF = Thermal Fuse. All actuators are supplied with a thermal fuse unless specified or advised within a prepared BSB quotation. Actuators can be supplied without a thermal fuse and are denoted by NTF.



Sample premier control panel illustrated

Introduction and Benefits

The premier range of BSB Damper Control Panels are manufactured to control and monitor a number of dampers hard wired individually or in groups/zones to client specifications. The range offers standard features with a number of options to meet clients specific requirements.

The panels can be specifically designed and configured to offer individual or zone control and monitoring of any type of damper fitted with an actuator, providing spring return, on/off or modulating control. This can also include pneumatic operated dampers.

The control panel allows for interfacing with the fire alarm system to control dampers in groups or 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 7035.
- 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

Typical Tender Specification Text

The Control Panel to provide 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 to be via volt-free contacts which are normally closed and to open upon alarm, the Damper Control Panel to then activate the relevant dampers to their alarm status, as per the supplied cause and effect.

Damper Control Panels to be purposely manufactured for the particular project and to provide for any specific project specification 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 (only available in 24v option)

Commissioning

BSB offers a comprehensive after sales service including pre-commission checks or a complete commissioning service of all our products in line with current CIBSE guidelines as well as planned preventative maintenance.

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.

Actuator Options

Actuator 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.

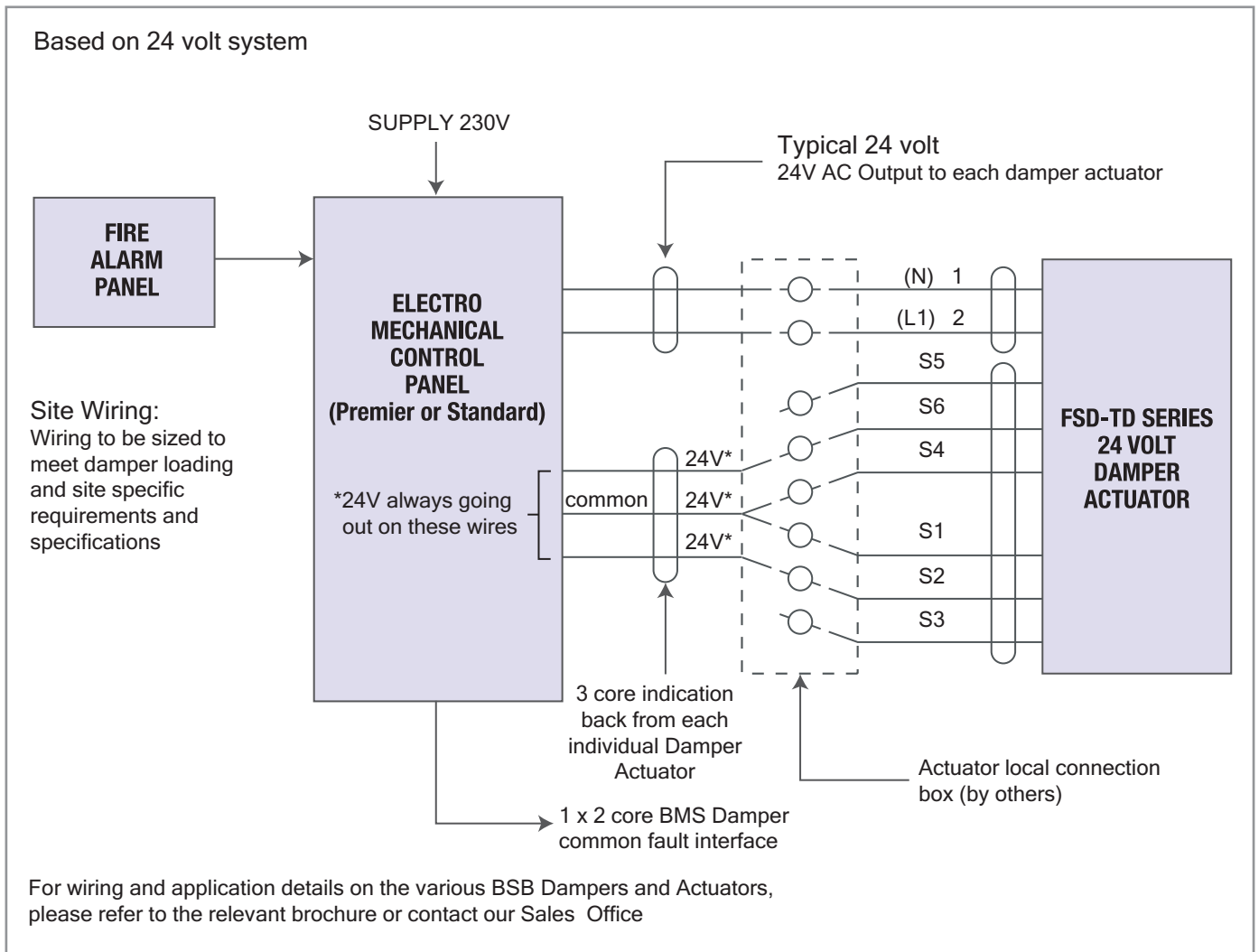
24/230V Option Wiring:

The actuator options are complete with two 1m flying leads. One 2 core 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

Schematic of a typical BSB Electro Mechanical System incorporating FSD-TD Series



Fire and Smoke

Control Systems - Fully Addressable



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

Introduction and Benefits

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

The system provides for simplified installation and commissioning of the range of BSB 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.

Panels may be networked together to provide for greater flexibility and more localised wiring.

Networked panels may share the same cause and effect and therefore enable any damper to be viewed from any of the networked panels.

BSB offer a comprehensive range of associated panels that include I/O, Mimic and Graphic (PC) panels that provide complete flexibility.

Features

- 2 loop version as standard
- Max. 200 devices per panel
- Max. 100 devices per loop
- 8 Inputs as standard
- 4 Outputs as standard
- Complies with EN54-2/4
- Complies with EN 60950-1
- 2 line 40 character LCD display
- Menu functions include:
 - Test: closes all dampers
 - Faults: lists all dampers which are not in their correct state with a reason (damper reference/location - 32 characters max.)

Physical

- Dimensions (max.):
300mm(W) x 400mm(H) x 170mm(D)
- Weight (typical):
9.5kg
- IP Rating:
IP44 (Solids > 1mm & splash proof)
- Materials:
Powder coated mild steel casing polycarbonate control cover
- Climatic:
0°C to 70°C ambient
80% RH non-condensing
- Colours:
Black and grey (RAL 7000) Polycarbonate smoke grey
- Cable entry:
Gland plates top and bottom
- Hinging:
Right as standard, left by request



Fire and Smoke Control Systems - Fully Addressable

Typical Tender/Specification Text

The BSB Fully Addressable Control System complies with EN54-4 and is available with 2 data loops, each capable of control/monitoring 100 damper interface devices. The panel shall use the most advanced microprocessor technology to provide a control system of extremely high integrity.

An LCD display shall ensure that information is presented in plain language.

Principle of Operation

Normal operation: The damper control panel shall monitor zone volt free contacts (normal closed) in the fire alarm panel. The damper panle to be configured to a supplied cause and effect which will energise a control relay within each interface device 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 interface device relay to remove the supply to the damper control option allowing failsafe position to be achieved.

Actuator 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-TD Series product literature.

The damper actuators 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 actuator options are complete with two 1m flying leads. One 2 core for power and one 6 core for indication. Earth connection is not required as the cable is double insulated.

The 6 core are from the auxiliary switch provides 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

For 230 volt options, the power and indication cable should be separate cables.

Typical operation for FSD-TD Series BSB PM24-TF or PM230-TF Actuator

- Power On - Damper open.
- Power Off - Spring closed.
- Opening time = < 60 seconds.
- Closure time = < 30 seconds.

Typical operation for FSD-TD Series BSB PM24-NTF or PM230-NTF Actuator

- Power On - Damper closed.
- Power Off - Spring open.
- Opening time = < 60 seconds.
- Closure time = < 30 seconds.

Technical Specifications

BSB FSD-TD Series Actuators

Running times:

Motor:	approx.< 60 secs.	
Motor (spring return)	approx.< 30 secs.	

Motor power consumption:	24V	230V
Motoring:	10 watt	12 watt
Holding:	2 watt	4 watt

Thermal Fuse Release:

The thermal fuse link fitted to the PM actuators as standard is rated at 72°C.

Motor operating temperature:

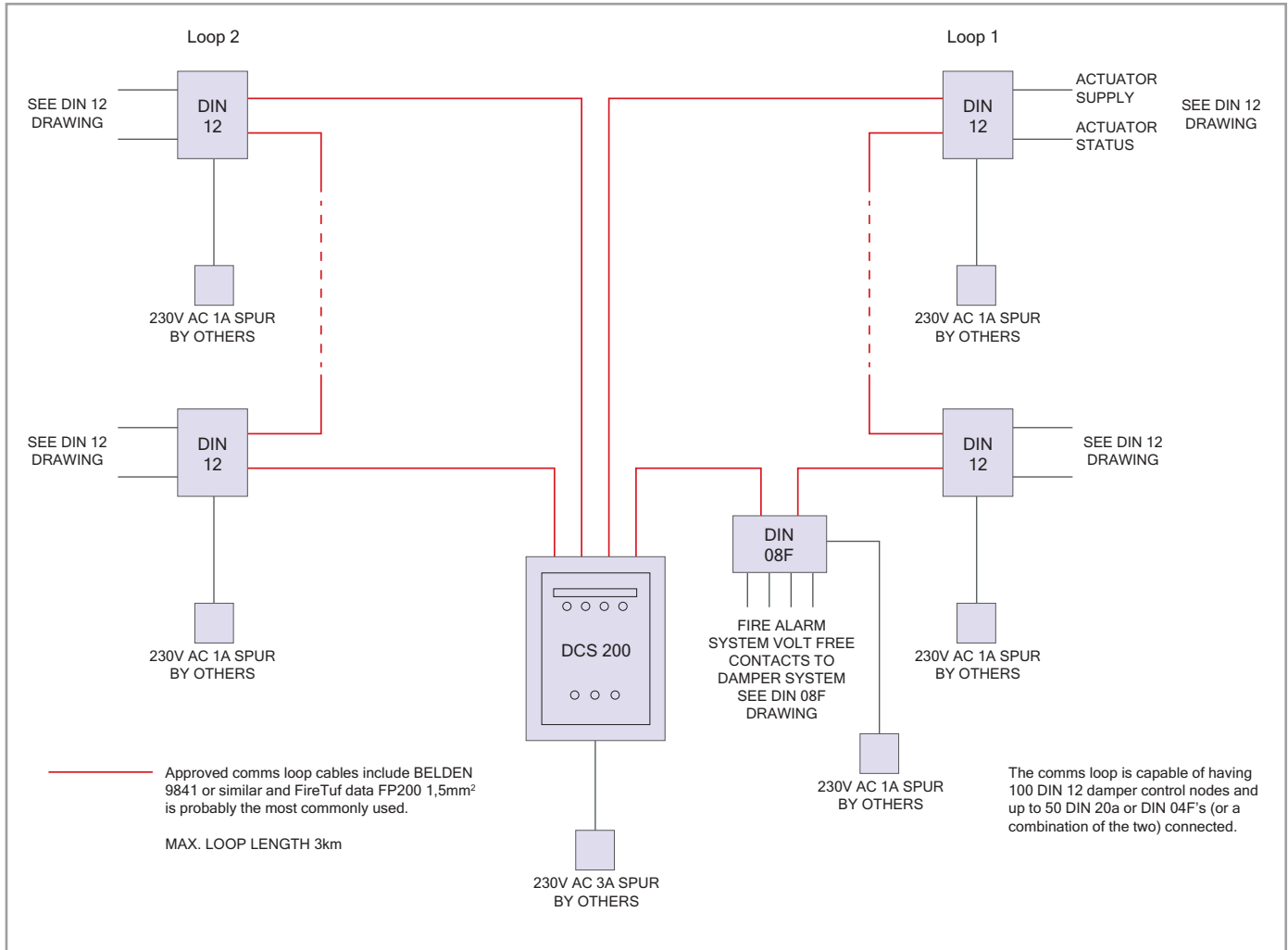
-30°C to +50°C

In general, reference has been made to motor open, fail safe closed actuation.
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.

Fire and Smoke Control Systems - Fully Addressable



Schematic of a typical BSB Addressable System Network



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	3 km
FP 200 Gold (2 core)	1.5	3 km
SWA (2 core)	2.5	3 km
MICC (2 core)	1.5	3 km

1. Maximum number of dampers per loop is 100.
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 Node (DIN)

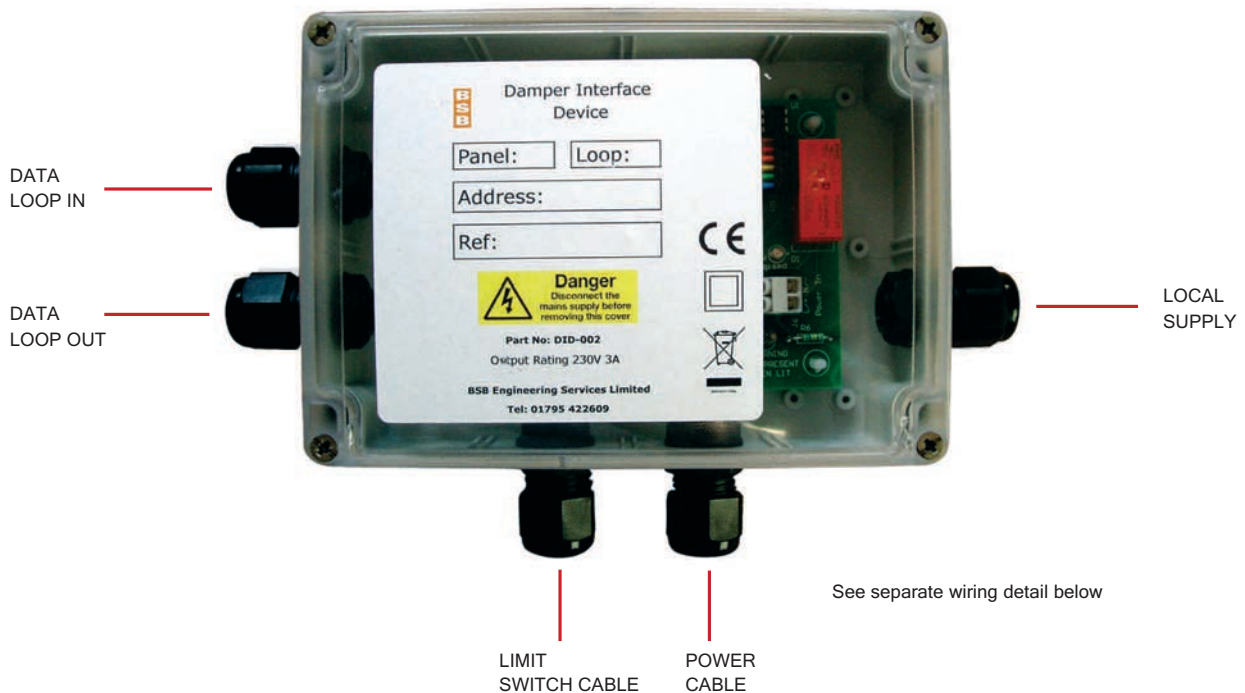
The DIN consists of a pcb mounted within a wall mounted enclosure. The enclosure is provided with the relevant number of glands to accept the control site wiring of data loops, power supply (by others) and actuator flying leads.

The DIN will control and monitor the combination Fire and Smoke Dampers or Smoke Dampers thus providing the correct operation to the advised cause and effect and reporting the status of the damper.

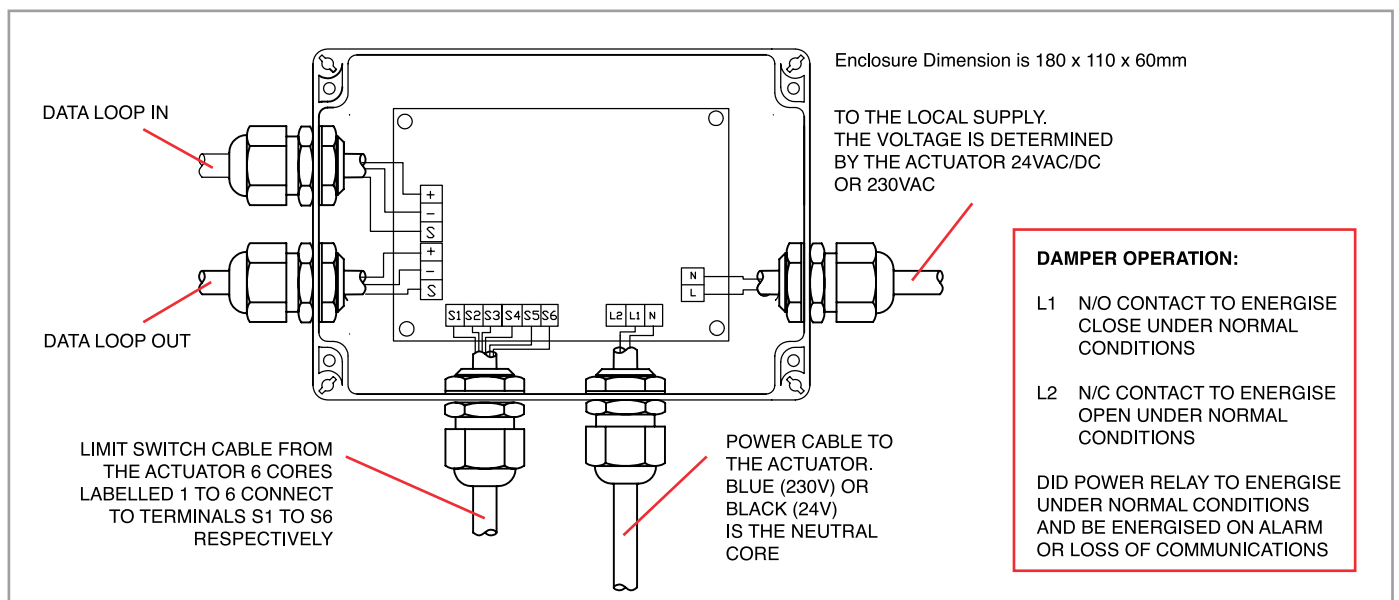
The DIN is normally supplied separately for positioning within 1 metre from the damper actuator to allow direct connections of the actuator flying leads and site wiring by others.

The Damper Interface Device is powered from the data loop with a local supply (by others) being switched through the DIN relay to control the damper operation.

Enclosure Dimension is 180 x 110 x 60mm



Wiring Detail for Damper Interface Node (DIN)



Fire and Smoke Control Systems



Standard Electro Mechanical Control and Monitoring System



Example standard panel shown

Detailed on pages 3-4

Premier Electro Mechanical Control and Monitoring System



Example premier panel shown

Detailed on pages 5-6

Fully Addressable Control and Monitoring System



Example fully addressable panel and DID shown

Detailed on pages 7-10

Other Air, Fire and Smoke Control Products in the BSB Range:

FSD-TD Series Fire/Smoke Dampers



FSD-C Series Circular Fire/Smoke Dampers



A60 Series Marine Fire Dampers



ETD Series Air Volume Control Dampers



FD Series Fire Dampers



FD-C Series Circular Fire Dampers



SS Series SlimSeal Dampers



HD Series Heavy Duty Dampers



BD Series Backdraught Dampers



VC Series Volume Control Dampers



For full details of the complete BSB Product Range, please refer to our individual product brochures, sales office or website.



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