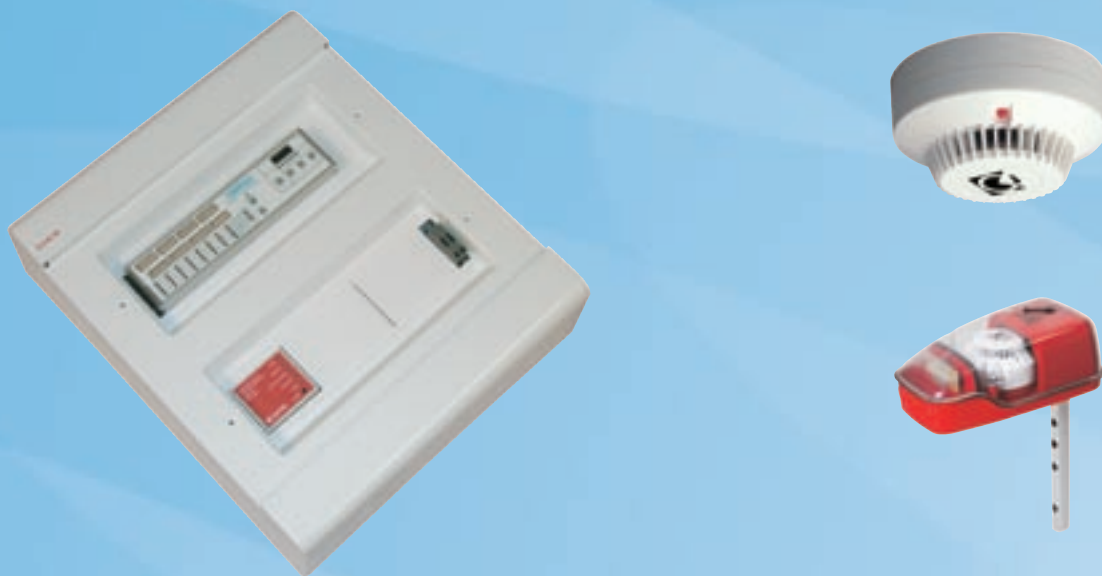


# MSH

## Fire Damper Management System



- Used with motorised fire and smoke dampers FDR, FDC, FDE, FDS, SDE and SDS (operating voltage: 24V)
- Controls the shut-off operation of fire and smoke dampers when a fire breaks out (Based on thermal fuse, smoke detection or external alarm input)
- Enables time-controlled, external or manual testing of fire damper operation
- Shut off the fan during test operation and in fire situation (optional)
- Outputs for remote fire and service alarm indication

- Local alarm indication for fire and service alarm conditions
- Easy implementation
- Equipped with integrated smoke detector interface
- Unit enclosure with transparent, lockable door

### Product Models and Accessories

- Models for eight (8) or sixteen (16) fire dampers
- Smoke detectors for duct or room installation

### MATERIAL AND FINISHING

PART	MATERIAL	FINISHING	NOTE
Enclosure	Plastic	White	IP40
MSH modul	Aluminium		
Transformer 230/24 VAC			150 VA with model MSH/8S 300 VA with MSH/16S



## PRODUCT OPTIONS AND ACCESSORIES

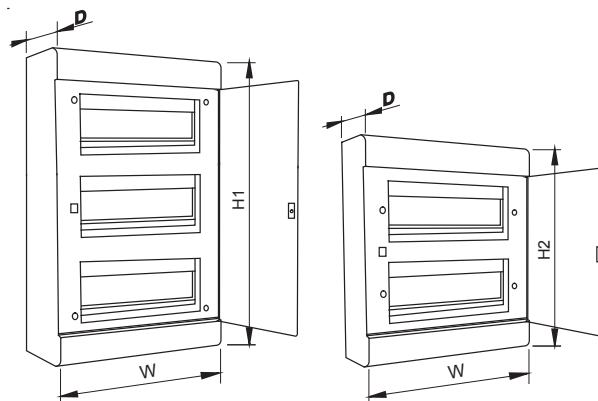
PRODUCT MODEL/ACCESSORY	CODE	DESCRIPTION	NOTE
Control unit MSH	/8S	Control unit for max 8 dampers, possibility to connect maximum 30 smoke detectors	
Control unit MSH	/16S	Control unit for max 16 dampers, possibility to connect maximum 30 smoke detectors	
Optical smoke detector	D	Duct installation	Calectro UG-2-O
Optical smoke detector	R	Room installation	Calectro ST-P-DA
Smoke aerosol	S	Container for smoke tes	Calectro RDP-300

Smoke detector for duct installation is delivered complete with installation base for round and insulated ductwork and with 600mm venturi-tube.

## DIMENSIONS

MSH Unit

Model	W (mm)	H (mm)	D (mm)
MSH/ 8S	305	350	95
MSH//16S	305	500	120



## Function

The Halton MSH system monitors, tests and controls the function of motorized fire and smoke dampers. The MSH control unit can have up to 16 motorized dampers with or without thermal fuses and 30 smoke detectors connected to it.

The MSH fire damper management system has three important functions:

- Close the fire dampers and shut off the fan (optional - recommended with fire dampers) when a fire breaks out.
- Regularly test the fire dampers to ensure that they are in operational condition.
- Ensure that the fire dampers are open in normal conditions and that ventilation can operate as planned.

The fire dampers connected to the system shall be equipped with a 24 VAC actuator.

NOTE! MSH is not intended to be used as a fire alarm system. Also, it is not applicable for smoke exhaust system control, in which the damper and fan operation is reversed (damper opening - not closing).

### Operation in Fire situation

MSH system is applicable for both thermal fuse and smoke detector actuated fire or smoke dampers. It is used to control closing of the dampers based on three optional operation modes:

Each fire damper is equipped with a thermal fuse, which closes the damper when the temperature rises above 72 °C. MSH unit can be programmed (with DIP-switch 10) either so that if any of the thermal fuses releases all the fire dampers connected to the MSH unit are immediately closed or so that only damper in question goes close.

If the system is equipped with smoke detectors, all fire or smoke dampers connected to the MSH unit in question are immediately closed to the safety position when a smoke detector indicates an early fire. Alternatively MSH can be activated through external alarm input, for example from fire alarm system. External alarm indication closes all the fire dampers connected to MSH.

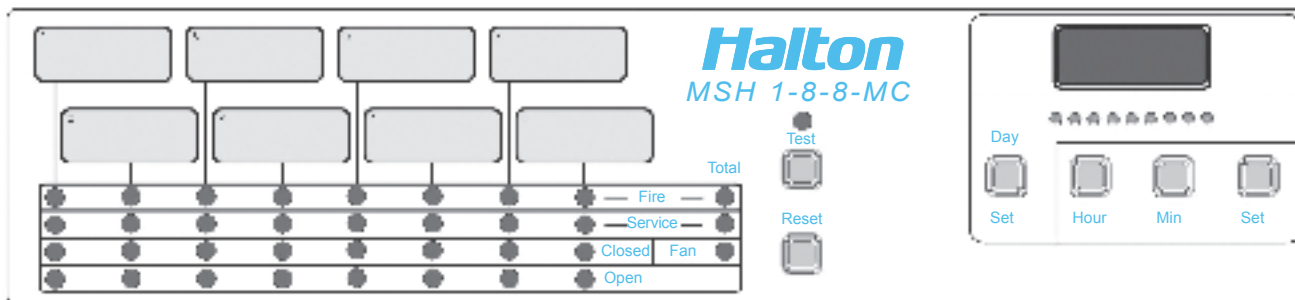
In all modes it can be selected whether the ventilation fans are shut off simultaneously.

The recommended operation is to close all the fire dampers and shut off the ventilation fans in the common service area with the fire zone.

### Testing of fire dampers

The MSH system regularly tests the operation of the fire dampers to ensure that they operate correctly, if a fire breaks out. The testing can be automated and set to take place at desired intervals (1 to 9 days) - for example every other day. The test can be triggered also manually from the MSH control unit or from the external source like BMS system.

To test the system, the MSH unit sends a switch-off command to the air handling unit control system. After the fan stops, the MSH unit closes the fire dampers to the safety position and ensures that all the fire dampers are closed. After that, all dampers are reopened and the fan is released to start again. If an error is detected in the operation of any of the dampers, the MSH system issues a service alarm.



### User interface

The operational status of the fire dampers and any alarms are visible on the MSH unit's operator panel. The operator panel is also used to set the time-controlled testing parameters, start manual testing and acknowledge service notification as well as operation in the event of a fire.

One of four possible operational statuses of a fire damper connected to the MSH management unit is indicated on the panel: Open, Closed, Service or Fire. In addition, the display indicates when the Fan is able to start.

During normal operation the LED light on MSH indicates that dampers are in open position and there is no error. Under test process LED lights change their status from open to close. During drive state both of the LED lights for damper are gone out. If the fire

damper remains in the intermediate position for more than three (3) minutes, it is not functioning correctly and the management unit issues a service alarm.

When the yellow Service light is on, the fire damper does not function correctly and it will not pass the operation test. Service personnel must check the reason for the malfunction. If the Service light is off, the fire damper works correctly.

The red Fire light shows the operational status of the thermal fuse of each fire damper. When the red light is on, the heat has melted the thermal fuse and the fire damper is closed in the safety position.

Explanation of the indication lights and control buttons at the user interface – for detailed set-up see installation guide:

Fire	A red led indicates that a thermal fuse of a fire damper has gone off
Service	A yellow led indicates that an error has occurred during the fire damper testing and that damper should be checked.
Closed	A yellow led indicates that fire damper is in fully closed position.
Open	A yellow led indicates that fire damper is in fully open position.
Fan	A green led indicates that the fans connected to MSH are running.
Total/Fire	A red led indicate that a fire alarm has occurred
Total/Service	A yellow led indicate that a damper service alarm has occurred
Test	Button is used to conduct a manual test to the system.
Reset	Button is used to reset system to normal operation after the reason for alarm has been fixed.
Day/Set	Button is used to set the day for the test.
Hour	Button is used to set the system clock and simultaneously with Set button to set time for testing.
Min	Button is used to set the system clock and simultaneously with Set button to set time for testing.
Set	Button is used to set time for testing.



### Smoke detector control unit ABAV-S3

Smoke detectors are connected to a smoke detector unit ABAV-S3, which provides important information about the function and status of smoke sensors.

The LED lights on ABAV-S3 indicates the following operational statuses: Operation, Service, Short circuit, Broken line and Smoke alarm.

The Service status indicates that one or more of the smoke detectors are dirty and require cleaning. Smoke sensor can be vacuum cleaned and wiped with

damp cloth. Call service personnel to clean the smoke detectors. If cleaning does not help, the sensor that is causing the service indication have to be replaced by a new one.

The Short circuit and Broken line statuses are rare if the system has been properly implemented. Contact service to correct the installation error.

The Smoke alarm light indicates that one of the smoke detectors has detected smoke. Check whether this indicates a fire. If the alarm is erroneous, use the Reset button to reset the status.



Room installation



Duct installation

## Installation and commissioning

In order to ensure correct operation, the delivery limits of different contractors shall be clearly defined. A typical arrangement is that:

- The control unit, 24V connections between control unit and fire dampers and system functionality is under responsibility of a HVAC-contractor
- Drawing of electrical cables between the dampers and the control unit as well as 230V electrical connection to the transformer is under responsibility of electrical contractor.
- Connections to higher-level BMS or Fire Alarm systems and ventilation fans are under responsibility of contractor, who is responsible for the functionality of the higher-level automation system.

A skilled person shall carry out the electrical installation of MSH control unit and fire/smoke dampers.

Transformer 230/24 VAC, which is included into the delivery, shall be installed outside the MSH control unit. 24 VAC supply voltage for fire/smoke dampers is delivered from this transformer through MSH control unit. MSH control unit is equipped with 4 Amps fuses for safety purposes.

It is recommended to connect at least "Service" alarm from MSH to official BMS system if available. In that way it is guaranteed that information of possible faults in the fire damper control system is acknowledged by building maintenance.

A detailed guidance for installation and commissioning is given in installation guide that is delivered with the unit. See the documents section.

## Wiring between control unit and dampers

Fire dampers are connected using a cable with at least four (4) wires.

## Maximum connection cable length for dampers

Cable, mm <sup>2</sup>	Maximum distance, m
0,50	50
0,75	80
1,00	120
1,50	180
2,50	300

## Wiring between MSH and smoke detectors

The smoke sensors shall be connected to the ABAV-S3 control module within the MSH unit as explained in the installation guide.

In order to connect smoke alarm from external source (for example BMS system) the smoke detector control device ABAV-S3 shall be overridden and the alarm is wired directly to MSH (smoke in) port as indicated in the installation guide.

## Smoke detectors

For the airflow through the adaptor to be representative of the airflow in the ventilation duct, install the detector at a place where normally flow meters etc. should be mounted, please see installation instructions in "Documents" section as well as installation guide following the detector.

## Service

MSH control unit itself does not need any particular service. Cleaning of smoke detectors is explained in installation & commissioning guide, see documents.

## Suggested specifications

Fire or smoke damper control and management system MSH for maximum 8 or 16 fire dampers. The system shall have facility to connect smoke detectors to system and monitor their function.

The damper test function shall be triggered by automatic function at adjustable intervals, manually or from external system. The system shall be able to shut off the ventilation system for the duration of the test cycle.

In the case of the fire the management system shall be able to close all the fire dampers and shut off the ventilation fans in a common service area. The fire alarm shall be activated either by thermal fuse of a fire damper, smoke sensor alarm or external alarm indication.

Unit shall be constructed into an enclosure, which shall be easy to install on site. The enclosure with lockable door shall be protective class IP40.

Smoke detectors shall be for ductwork or room installation.

## Product code

MSH/S

S = Control Unit/Smoke sensor model

8S	max 8 dampers, with smoke detector
16S	max 16 dampers, with smoke detector
D	Smoke sensor, duct
R	Smoke sensor, room
S	Test smoke aerosol

Code example

MSH/8S