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A GUIDE TO THE INSTALLATION, OPERATION & MAINTENANCE OF

Flow Switches SPDB 30/90

FLOW SWITCHES IN AUTOMATIC SPRINKLER INSTALLATIONS

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1 Specification & Principle of Operation

1.1 Introduction

The SpinklerSense SPDB type is a water flow alarm switch, approved to EN 12259-5 and for use under the LPCB rules for automatic sprinkler installations.

The SPDB is a thermal dispersion type flow switch for use on wet sprinkler systems approved for use through sizes 2 to 6" (50 to 150mm).

1.2 Construction & Specification

Sensor Probe & Connection:	304 Stainless Steel, R¾ (3/4" BSP Male Taper thread)
Sensor & Relay box:	Painted die cast Aluminium enclosures to IP65
Max Operating Pressure:	20 bar
Operating Temperature Range:	2 to 68°C
Input Voltage:	24V D.C.
Flow Switch Output:	1x DPCO Relay, 30V D.C., 2A
Adjustable Delay:	Type SPDB 30: 0 to 30 seconds Type SPDB 90: 0 to 90 seconds
Flow-rate Sensitivity:	The switch will operate at all flow-rates above 60 L/min The switch will not operate at flow-rates less than 10 L/min

1.3 Principle of Operation

Water flow passing the sensor probe causes a change in relative temperature between the sensor probe legs, which is directly proportional to the flow-rate in the pipe. The sensor circuit measures this flow precisely, comparing it to the set alarm flow-rate. When the measured flow-rate reaches or exceeds the set flow rate, the flow switch output operates immediately or after the set delay period. When the flow-rate reduces below a set point, the switch automatically resets.

2 Installation

2.1 Mechanical

These switches may be mounted in horizontal or vertically up pipe run sections.

The recommended arrangement is that the R ¾ mounting thread is connected to the pipe using suitable approved threaded Mechanical Tees and where required, a threaded reducing socket. This will allow fitting or removal of the switch without disconnecting the electrical connections.

The Table 2.1.a shows the recommended Mechanical Tee sizes and reducing sockets. Alternatively, a welded thread socket may be used. In the case of the 60.3 and 76.1mm pipe sizes a 1" weld socket thread and ¾" reducing socket may be required. When installing in a horizontal pipe run the probe should be inserted into a side or top position. Care should be taken to avoid the possibility of positioning the probe where a permanent air pocket is likely to occur.

Table 2.1.b shows mechanical Tees and adaptors that can be used when replacing a mechanical flow switch in an existing installation.

After applying suitable thread sealant or PTFE tape to the threads the unit should be hand tightened into the Mechanical Tee and then finally tightened using a spanner to form a pressure tight joint, ensuring the units flow direction arrow is pointing along the pipe axis in the direction of flow towards the sprinkler head.

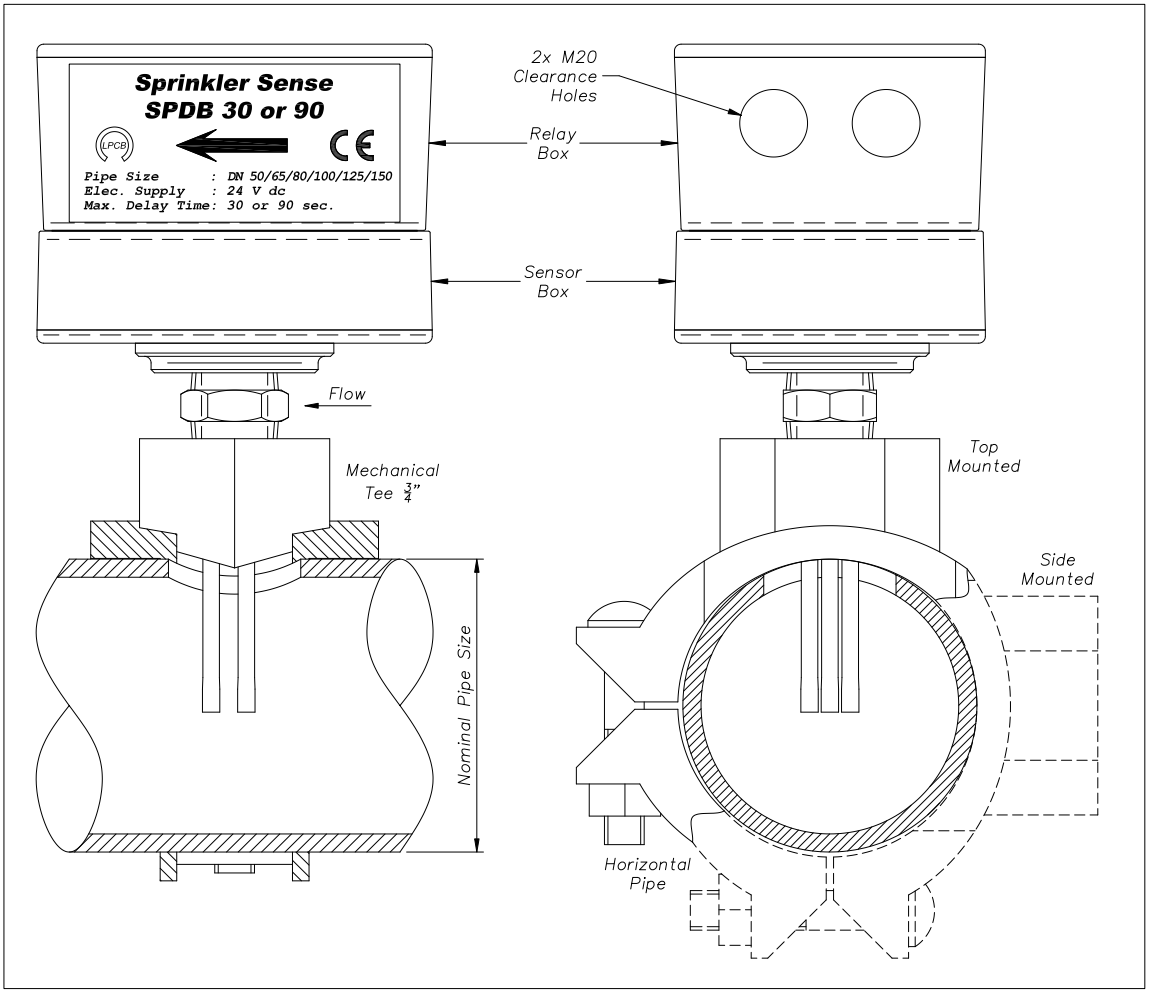
2.1.a. New installation

Pipe OD mm	DN Inches Nominal	Recommended Threaded Mechanical Tee	Reducing Socket M/F
60.3	2"	2 x ¾	n/a
76.1	2½"	76.1mm x ¾	n/a
88.9	3"	3 x ¾	n/a
114.3	4"	4 x ¾	n/a
165.1	6"	165.1mm x 1½	1½ x ¾
168.3	6"	6 x 1½	1½ x ¾

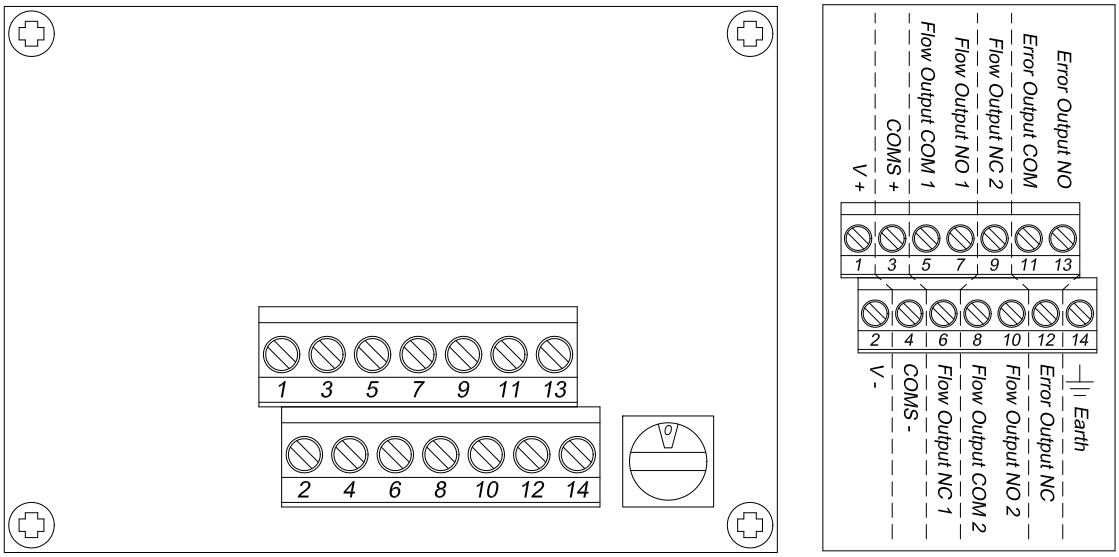
2.1.b If replacing Mechanical Flow Switch

Pipe OD mm	DN Inches Nominal	Recommended Threaded Mechanical Tee	Reducing Socket M/F
60.3	2"	2 x ¾	n/a
76.1	2½"	76.1mm x ¾	n/a
88.9	3"	3 x 1½	1½ x ¾
114.3	4"	4 x 1½	1½ x ¾
165.1	6"	165.1mm x 1½	1½ x ¾
168.3	6"	6 x 1½	1½ x ¾

2.1.b Top and side mounting positions on horizontal pipe



2.2 Electrical & Power Supply



Before installing the unit the flow signal delay timer can be set. Remove the top lid and locate the rotary position switch mounted on the PCB. Setting '0' will select the minimum delay and setting '9' the maximum delay. Settings between these will set the delay proportionally. The factory set default position is 9.

Two 20mm holes are provided for cable entry. These should be fitted with appropriate cable glands or conduit depending upon site requirements. There is no requirement to seal the conduit entry holes if conduit is used.

The SprinklerSense unit requires a D.C. power supply connection. This allows it to be supplied using proprietary battery backup systems of 24V DC. The average power consumption of the unit is circa 1Watt.

The Amp Hour (Ah) rating of the batteries required can be calculated using an average current draw of 60mA on a 24V system. This mA figure should be multiplied by the number of hours that the batteries are required to last.

For example, if a 24V backup battery is required to last for 72 hours, 0.06A x 72h = 4.32 Ah.
There-fore a 24V battery supply with a rating of at least 5Ah should be used.
The power supply connections should be connected to the V+ and V- terminals. The Earth terminal should also be connected to electrical earth.

There are two flow output switches. These both activate at the same time but are electrically isolated from each other. Each output switch consists of a common connection (COM1 or COM2), a Normally Open contact (NO1 or NO2) and a Normally Closed contact (NC1 or NC2). The contacts are in their Normal state during non-flow conditions. The output switches should be connected as required, in the same way as traditional flow switch micro-switch outputs. The contact ratings of 24V D.C. and 500mA should not be exceeded.

DO NOT CONNECT THE REMAINING TERMINALS WITHOUT REFERRING TO THE SEPARATE LEAFLET WHICH IS AVAILABLE FOR FURTHER INFORMATION ABOUT THE AUXILIARY CONNECTIONS.

3 Operation

3.1 Flow

The SprinklerSense flow-switch is designed to activate and maintain its switch relay output in the event of detecting a flow of water initiated by a sprinkler head becoming active or through operation of an inspector's valve under test conditions. This switch output is delayed for a set duration based upon the delay time setting chosen at the installation stage.
The switch relay output will automatically reset should the flow-rate reduce to less than 10 L/min.
Following installation, the flow switch function should be tested and checked by flowing water through the pipe ensuring an alarm signal is activated and received. As well as testing the flow switch this will ensure that the sprinkler system valves and alarm connections are operational.

3.2 Auxiliary Relay Output

A further auxiliary relay is provided in the unit, which can be used for other supervisory duties, outside of the scope of EN 12259-5. A separate leaflet is available for further information on additional functions.

4 Maintenance

4.1 Normal

The SprinklerSense flow-switch uses solid state sensing technology, and requires no routine maintenance in normal operating conditions. Ensure any valves controlling the water supply to the sprinkler installation have not been closed, that the water supplies have been verified, that there is no interruption to the power supply, and that output and communication lines are correctly connected. Flow switch function and alarm outputs should be routinely checked as required.

4.2 Fault

Should the switch fail to respond to a water flow greater than the set point, the complete unit should be removed from the pipe-line and inspected for any obvious mechanical damage or excessive pipe-line debris that could cause blocking. In the event that no obvious cause of failure can be identified, the complete unit should be replaced.