Data Sheet 7.39
Issue A

WRAS APPROVED PRODUCT

Priority Demand Valve
PDV-DN150

BS9251: 2021

Product Description

Rapidrop's innovative electrically driven Priority Demand valve for use with mains water supply or stored water supply residential sprinkler systems.

Designed to meet BS 9251: 2021 - Valve for isolating domestic supply in the event of sprinkler activation.

Upon activation of a flow switch/alarm relay, the valve will automatically close the domestic supply allowing all water to flow to the sprinkler system and remain closed until manually reset. Upon activation of a low level tank switch (if installed) the control box can be configured to either automatically close and re-open once the low level tank switch resets itself or latch closed until the system is manually reset.

Features

Butterfly valve
- Epoxy coated ductile iron body
- WRAS approved

Actuator
- Failsafe close operation (Battery back-up)
- End of travel relay switch for valve positioning (BMS connection)
- Visual LED indicator for positional identification
- Maximum Allowable 'Stem Torque' to protect valve
- External DIN Connector
- IP67 Rated Actuator
- Manual override
- Over-torque protection
- Brushless motor
- External LED status

Specifications

	Actuator
Working Time 0-90°	34 Seconds
Current	0.97A
Power Supply	24V DC
IP Rating	IP67
End of Travel Relays	240VAC 3A
Ambient Temp Range	-20°C to 70°C
Manual Override	Hand-wheel
Weight	5.4Kg (Actuator)
Cable Entries	DIN Connector

Working Pressure

Max. Working Pressure 16 bar (232 psi)

Working Temperature Range

-20°C to 70°C (-4°F to 158°F)

Connections

Butterfly valve (DN150)
- Lugged wafer pattern to suit PN16 Flange according to BS EN 1092 and Table D/E flanges according to BS 10

Operation

Rapidrop Priority demand valve is a power to open, power to close valve. In the event of power loss the valve will fail-safe to the closed position.

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T: +44 (0) 1733 847 510 F: +44 (0) 1733 553 958
e: rapidrop@rapidrop.com
w: www.rapidrop.com

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Priority Demand Valve
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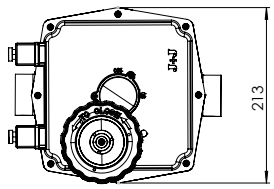
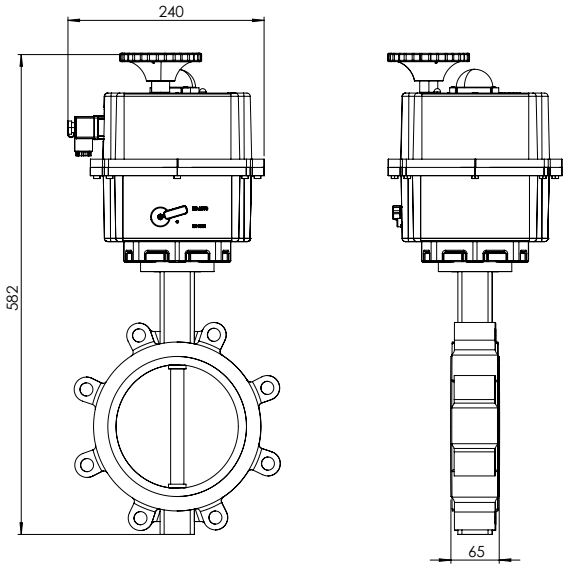
Dimensions





Battery Operation

While external power is supplied the battery is not utilised. Upon mains power failure the circuitry switches to battery and provides enough power to close the valve. The valve will revert to its previous state once mains power is re-applied.

Under normal operation the external control power will trickle charge the battery.

The battery is designed to be only used in fail-safe mode. (e.g. Power outage) Repeated operation under battery power will rapidly drain the battery voltage beyond ability disabling the valve.

Battery Specification	
Battery capacity	2200mA
Full Initial Charge Time (100%)	54 Hours
Working operation without recharge	4 Operations
Recharge time per working operation	30 mins

Actuator LED Status

	Actuator LED colour and sequence
No External power being applied	
PDV Fully Open	
PDV Fully Closed	
PDV Opening	
PDV Closing	
Power applied to both open and closed contacts	
Actuator in 'MANUAL' mode	
Actuator in mid position	
FAIL SAFE: activated (stops after 3 mins)	
FAIL SAFE: Low battery	

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Control Box

Upon activation of a flow switch or alarm relay, the PDV will automatically latch in the closed position, it will remain closed until the control box is manually reset (Via the reset button)

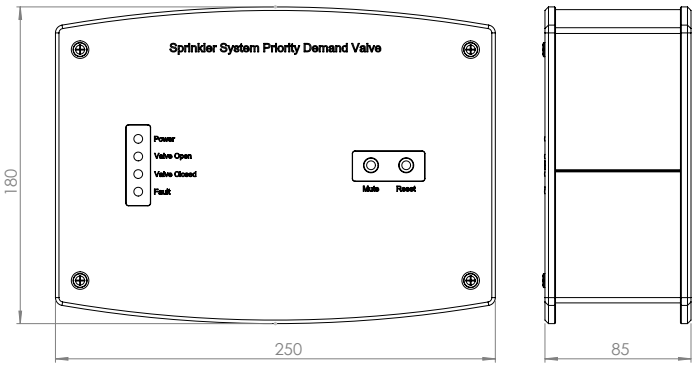
Upon activation of a low tank level switch, the PDV can be configured to close and open automatically **or** remain closed until the control box is manually reset (Via the reset button)

Upon loss of power to the control box the valve will fail-safe to the closed position. It will automatically reopen to the correct state once power is restored.

- Designed to meet the requirements of BS9251: 2021

Features

- Internal terminals for connection of:
  - Power supply to control box
  - Power to PDV
  - End of travel relay to PDV (position)
  - Flow Switch/ Alarm Relay
  - Tank Low Level Switch
  - Output to monitor flow switch state
  - Output to monitor tank low level switch state
  - Output for BMS
- LED to indicate the current position of the valve (Green LED - valve fully open, Red LED - valve fully closed, Amber LED - Any faults)
- Time delay for flow switch and tank low level devices
- Additional flow and tank low level switch outputs
- Configure the flow switch and tank low level as NC or NO contacts
- Internal sounder
- Enclosure tamper switch
- M20 knockout cable glands
- Rear knockout for wire entry
- IP54 Certified



Installation

The valve may be installed in any position and the flow may be from either direction through the valve.

1. Visually inspect the valve, make sure that the connections are clean of debris and any foreign materials.

2. Mount/connect the valve to the pipe work (Valve in the closed position) Note for butterfly valve bodies do not over torque the flange. This may distort the rubber seal. The use of power tools such as impact drivers are not recommended as these can distort the rubber face and impair valve operation. Firstly hand tight and use an adjustable spanners which will be more suitable to secure the butterfly valve into the system. Once secure, tighten the flange bolts to 90Nm

3. Mount the PDV Control box in a suitable location

4. Wire the valve following the wiring diagram on page 4 (Utilise the M20 glands or internal knockout for rear cable entry

5. Configure the system following page 5

6. Commission the system as per page 6

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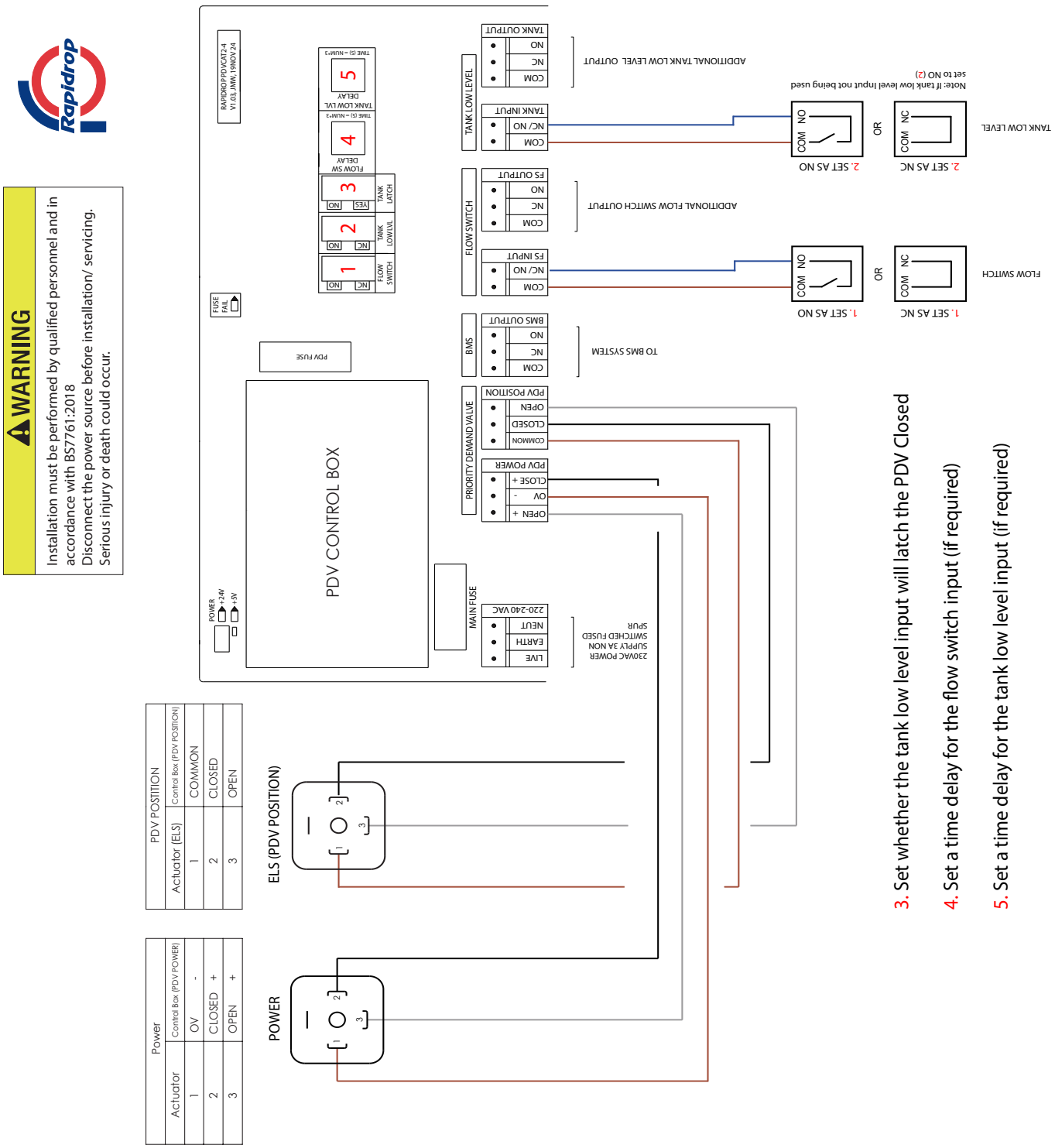
PDV Wiring Diagram



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Configuration

Configuration

1. Depending on wiring, toggle the flow switch as normally open (NO) or normally closed (NC)

2. Depending on wiring, toggle the tank low level switch as normally open (NO) or normally closed (NC)

Note: If no tank low level switch is installed set toggle to NO

3. Toggle the tank low level switch to either latch closed (YES) or not latch closed (NO)

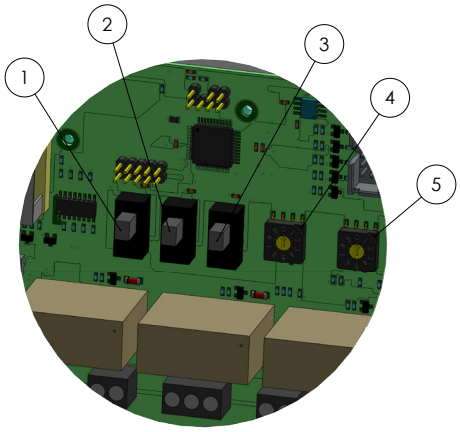
Note: If set to YES, upon activation of the tank low level switch the PDV will remain closed until manually reset.

4. Flow switch time delay - Select a time delay up to 30 seconds to prevent false signals/ delay for activating the PDV

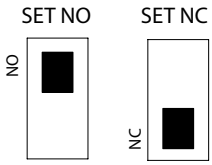
Note: Rotate the switch with a screwdriver, Switch increments in 3 seconds for example if set to 4 this will provide a 12 second delay.

5. Tank low level switch time delay - Select a time delay up to 30 seconds to prevent false signals/ delay for activating the PDV

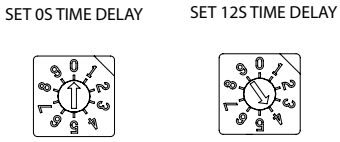
Note: Rotate the switch with a screwdriver, Switch increments in 3 seconds for example if set to 3 this will provide a 9 second delay.



INPUT DEFAULT STATES



INPUT TIME DELAYS



TANK LOW LEVEL LATCH

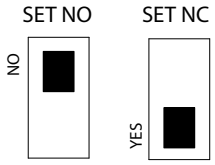


Table of Operation Control Box

	Power LED	Valve Open LED	Valve Closed LED	Fault LED	Sounder	BMS Output	Flow Switch Output Relay	Tank Low Level Output Relay
Power On	X							
PDV Open	X	X						
PDV Closed	X		X		X	X		
Tamper - Enclosure	X			X	X (Beeping)	X		
Flow switch active	X						X	
Tank low level active	X							X
Valve not fully open or fully closed	X			X	X	X		
Reset button pressed when inputs are still active	X	X (Flash)	X (Flash)	X (Flash)	X (Beep)			

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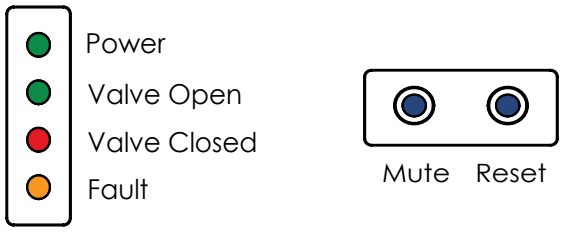
LED Operation - Control box

LED	LED Colour	Status
Power	Green	Mains supply on
Valve Open	Green	PDV fully open
Valve Closed	Red	PDV fully closed
Fault	Orange	Fault



Button Operation - Control box

Button	Function
Mute	Silences internal sounder
Reset	With the PDV latched closed, the reset button will open the PDV providing all input signals are no longer active (Flow switch and tank low level when set to latch)

Important information

- The installation and maintenance of the priority demand valve must only be made by qualified personnel.
- Ensure electrical installation is as per BS 9251: 2021
- Before removing any covers, always make sure the power supply to the control unit is shut off.
- Failure to follow these instructions could cause improper operation, resulting in personal injury and/or property damage.
- For further details and technical support please contact your Rapidrop sales representative.

Commissioning

Verify the operation of the Priority Demand Valve.

1. Activate the flow switch(s) or connected alarm relay (Fire signals) within the system. The PDV will fully close. Remove the fire signal. Ensure the valve remains closed. Press the reset button the valve will fully open.

2. If installed verify the tank low level switch operation

2A. Tank Low Level (Latch set to YES) Activate the tank low level switch. The PDV will fully close. Remove the signal. Ensure the valve remains closed. Press the reset button the PDV will fully open.

2B. Tank Low Level (Latch set to NO) Activate the tank low level switch. The PDV will fully close. Remove the signal, the PDV will fully open.

3. Turn the power supply off to the control box. Verify the PDV fully closes. Refer to the actuator LEDs. Restore the power supply to the control box

4. Verify any connected outputs function as per table of operation (if being utilised)

Note: Follow the table of operation for functionality of sounder and LEDs (Page 5)

Care and Maintenance

The priority demand valve requires very little maintenance.

- Ensure all valve body connecting bolts are securely fastened
- Ensure all electrical components are checked in relation to BS7761:2018

Notes: The actuator requires no specific maintenance.

It is advisable to inspect and verify the operation of the unit annually or in accordance with the authority having jurisdiction.

RESPONSIBLE DISPOSAL

Rapidrop recommend that the product needs to be disposed of correctly when the product reaches the end of its life cycle.

• Disposal of business or commercial waste should be in compliance and accordance with government guidance and regulations

• Disposal of electrical waste should be in compliance and accordance with "Waste Electrical and Electronic Equipment recycling" (WEEE)

RoHS Compliant

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