Data Sheet 7.22
Issue E

Priority Demand Valve
Fig. PDV-02V2

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 valve will automatically close and re-open once the low level tank switch resets itself.

The priority demand valve is available in ball or butterfly type body(depending on connection) attached to a specific actuator (dependant on size) The appropriate PDV control box will need to be ordered separately.

The priority demand valve is available in two different configurations:

- Single PDV - Used in systems designed with a single priority demand valve.

- Multiple PDV - Used in systems designed with multiple priority demand valves. Up to 25 PDVs can be simultaneously activated through a single flow switch/ alarm relay.

Please see DS 7.23

Features

Ball Valve

- Full Bore
- WRAS approved

Butterfly valve

- Stainless steel disc, EPDM liner
- Epoxy coated ductile iron body
- WRAS approved

Actuator

- Failsafe close operation (operated by an internal replaceable lithium-Ion battery)
- End of travel relay switch for valve positioning (BMS connection)
- Visual LED indicator for positional identification
- Maximum Allowable 'Stem Torque' to protect valve
- External GSA Connectors (For RAS actuator, M20 Glands for RAM actuator)
- IP67 Rated Actuator
- Maximum of 5W power consumption (24VDC)

Working Pressure

Max. Working Pressure 16 bar (232 psi)
(Higher pressure range available on request)

Working Temperature Range

0°C to 70°C (14°F to 158°F)

Connections

Ball valve (DN25 to DN50)

- BSP female thread according to ISO 228/1

Butterfly valve (DN65 to DN125)

- Semi lug 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 failsafe to the closed position.

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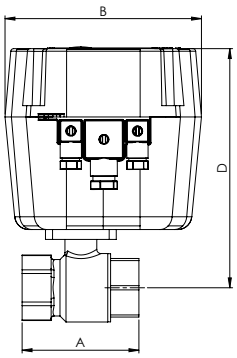
Fig. PDV-02V2

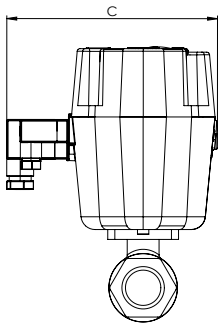
BS9251: 2021

Ball Valve Dimensions

Sizes		Dimensions (mm)				Flow Rate (KV)
mm	Inch	A	B	C	D	
DN25	1"	83	140	150	170	43
DN32	1 1/4"	94	140	150	175	89
DN40	1 1/2"	102	140	150	187	230
DN50	2"	124	140	150	194	265

WRAS approval for valve body owned by Brandoni S.P.A

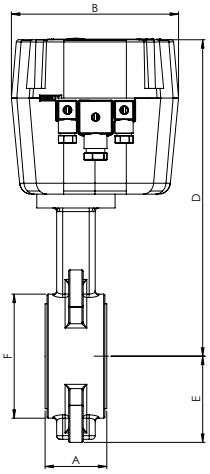


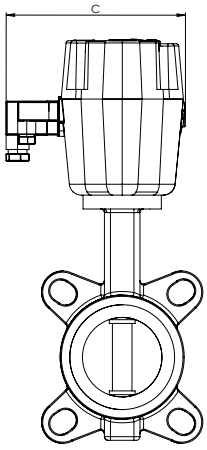


Butterfly Valve Dimensions

Sizes		Dimensions (mm)					
mm	Inch	A	B	C	D	E	F
DN65	2 1/2"	46	203	206	328	69	102
DN80	3"	46	203	206	334	90	118
DN100	4"	52	203	206	354	106	150
DN125	5"	56	203	206	374	119	174

WRAS approval for valve body owned by Brandoni S.P.A
* Contact Rapidrop for dimensions





Single PDV System Ordering Codes

Sizes		Isolation Valve	Actuator Model	Ordering Codes
mm	Inch			
DN25	1"	Ball Valve	RAS	RDPDV-02-025BLV2
DN32	1 1/4"	Ball Valve	RAS	RDPDV-02-032BLV2
DN40	1 1/2"	Ball Valve	RAS	RDPDV-02-040BLV2
DN50	2"	Ball Valve	RAS	RDPDV-02-050BLV2
DN65	2 1/2"	Butterfly Valve	RAM	RDPDV-02-065V2
DN80	3"	Butterfly Valve	RAM	RDPDV-02-080V2
DN100	4"	Butterfly Valve	RAM	RDPDV-02-100V2
DN125	5"	Butterfly Valve	RAM	RDPDV-02-125V2

The above ordering codes include 1x electrically actuated isolation valve only.
Appropriate control box need to be ordered separately see page 5 for details.

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Priority Demand Valve
Fig. PDV-02V2

BS9251: 2021

Specifications

Valve Size/ Actuator model	DN25 - DN50 (1" - 2") **RAS Actuator**	DN065 - DN125 (2 1/2" - 5") **RAM Actuator**
Working Time 0-90°	8 Seconds	4 Seconds
Current	0.55A	0.55A
Power Supply	12-30V	12-30V
IP Rating	IP67	IP67
End of Travel Relays	300VAC/900mA - 30VDC	250VAC/5A - 30VDC
Ambient Temp Range	-20°C to 70°C	-20°C to 70°C
Manual Override	Local Buttons (Disabled as standard)	Local Buttons (Disabled as standard)
Bluetooth Control	Via Android App	Via Android App
Cable Entries	External GSA	2 x M20 Cable Glands

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 pipework (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 powertools such as impactdrivers are not recommended as these can distort the rubber faceand impair valve operation.

Firstly hand tight and use an adjustable spanners which will be more suitable to secure the butterfly valve into the system.

Using the tightening sequence will reduce the potential damage to the rubber seating face.

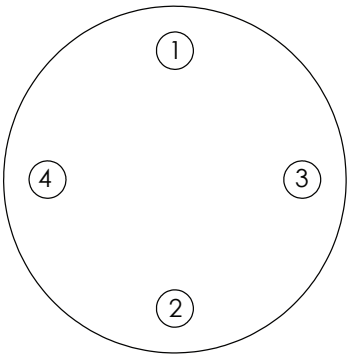
3. Once secure, tighten the flange bolts to the required torque as described on the table.
4. Wire the valve following the below sequence;

Flange Tightening Sequence

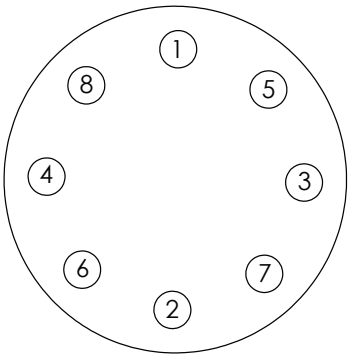
Below are two tightening sequences for 4 and 8 bolt flanges to secure priority demand valves with butterfly valves into the system.

Flange Tightening Torques Nm			
Size		Bolt size	Max
mm	Inches		
65	2 1/2"	M16	60
80	3"	M16	75
100	4"	M16	80
125	5"	M16	120

4 Bolt Flanges



8 Bolt Flanges



The above sequence is intended as a guide for best practise to minimise potential damage to the actuator.

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Fig. PDV-02V2

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RAS - Remove the lid by undoing the 4 bolts using a 3mm allen key. **Connect the battery** within the actuator using the nylon male/female plug. Re-assemble the lid cover. Undo the centre GSA screw using a Phillips or flat-head screwdriver. Wire as per wiring diagram. Re-assemble the GSA plug onto the actuator.

RAM - Remove the lid by undoing the 6 bolts using a 3mm allen key. **Connect the battery** within the actuator using the nylon male/female plug. Disconnect the terminal block and wire as per wiring diagram. Re-assemble the lid.

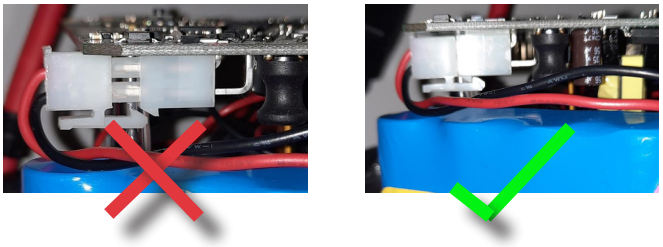
1. Functional test the operation of the valve via the flow switch or relay. The solid green LED will indicate the valve is in the open position. The solid red LED will indicate the valve is in the closed position
2. The internal battery is disconnected for storage/travel and to prevent detriment to the battery. During commissioning or after, if the PDV is going to be unpowered for a prolonged period (Over 1 year RAS & over 1 month RAM) we recommend disconnecting the battery to secure its longevity.

Note:

- The PDV should be wired by a qualified electrician.

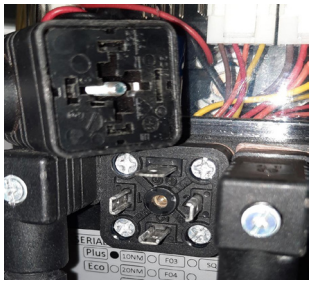
- Follow relevant safety procedures when handling the circuit board.

Connection of battery

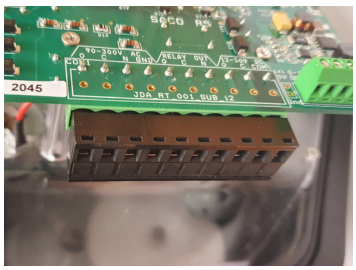


Make sure battery connection is completely in place!

RAS - GSA Connector



RAM terminal block



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Priority Demand Valve
Fig. PDV-02V2

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Control Box - Single PDV Systems

- 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 blue reset button)

- Upon activation of a low tank level switch, the PDV will automatically close, it will automatically open once the low tank level switch resets itself.

- Upon loss of power to the PDV/control box the valve will failsafe to the closed position. It will automatically reopen once power is restored.

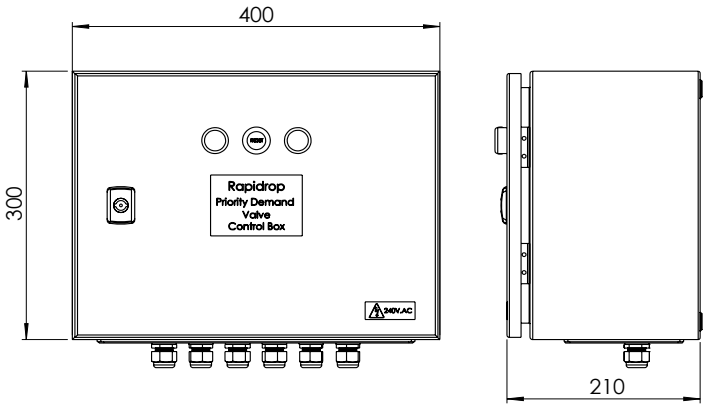
- Designed to meet the requirements of BS9251: 2021

Features

- Metal IP66 wall mounted enclosure
- Internal DIN rail mount terminals for connection of:
  - Flow Switch/ Alarm Relay
  - Tank Low Level Switch
  - Power supply connection to PDV
  - End of travel relay to PDV
  - External Dry Contact for BMS
- LED to indicate the current position of the valve (Green LED - valve fully open, Red LED - valve fully closed)
- Manual momentary reset button
- Power supply requirements: 230V AC connected to a 3A fused spur
- Internal 3A MCB

Description	Ordering Code
Single PDV Control Box	RDPDVBOXLATCH

RDPDVBOXLATCH



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Priority Demand Valve
Fig. PDV-02V2

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Single PDV Wiring Diagram

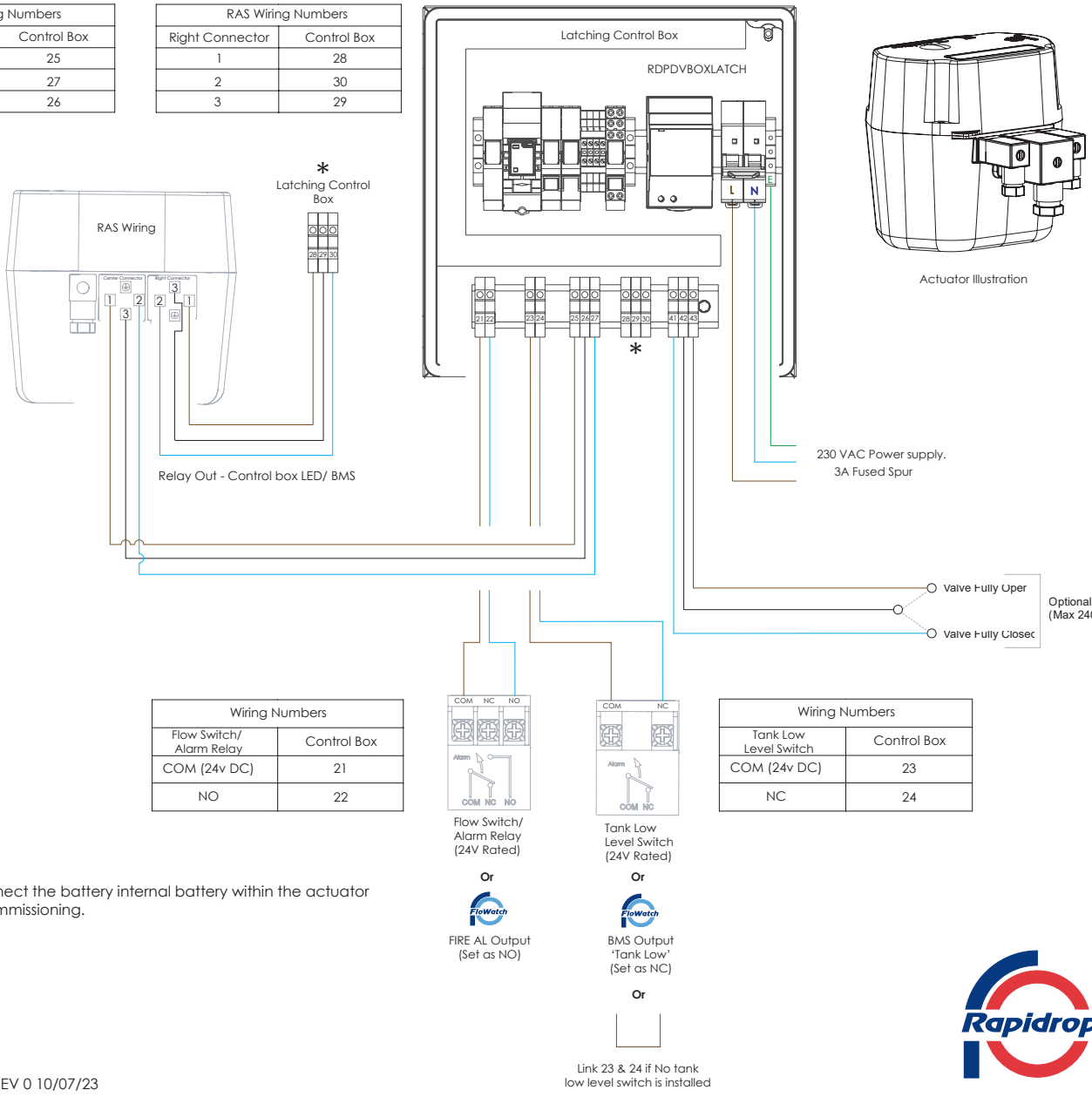
RDPDVBOXLATCH - RAS DN25-DN50 (1- 2")

Power Supply (24V)

RAS Wiring Numbers	
Center Connector	Control Box
1	25
2	27
3	26

Relay Out

RAS Wiring Numbers	
Right Connector	Control Box
1	28
2	30
3	29



Actuator Illustration

Wiring Numbers	
Flow Switch/ Alarm Relay	Control Box
COM (24v DC)	21
NO	22

Flow Switch/
Alarm Relay
(24V Rated)

Or

FIRE AL Output
(Set as NO)

Wiring Numbers	
Tank Low Level Switch	Control Box
COM (24v DC)	23
NC	24

Tank Low
Level Switch
(24V Rated)

Or

BMS Output
'Tank Low'
(Set as NC)

Or

Link 23 & 24 if No tank
low level switch is installed

Note: Connect the battery internal battery within the actuator prior to commissioning.

RAP-MSC-321 REV 0 10/07/23

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Priority Demand Valve
Fig. PDV-02V2

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Single PDV Wiring Diagram

RDPDVBOXLATCH - RAM DN65-DN125 (2 1/2"- 5")

Power Supply (24V)

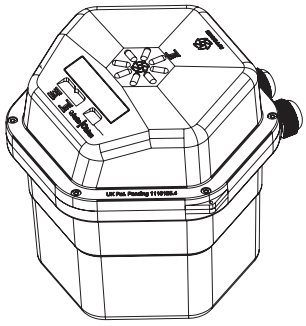
RAM Wiring	
Actuator	Control Box
O	25
C	27
COM	26

Note: Use the 12-30V DC Connection within the isolation valve

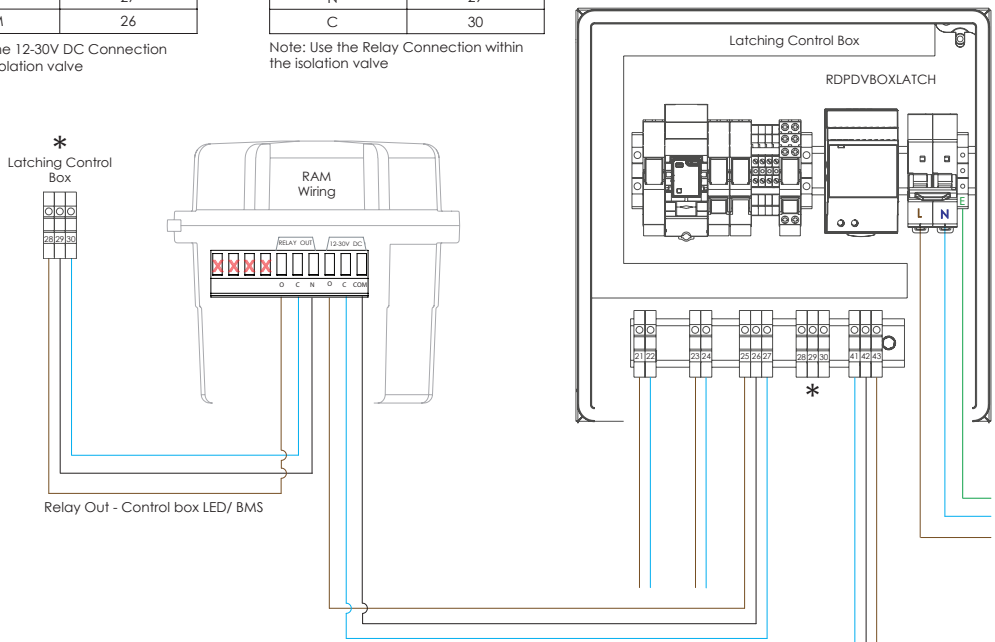
Relay Out

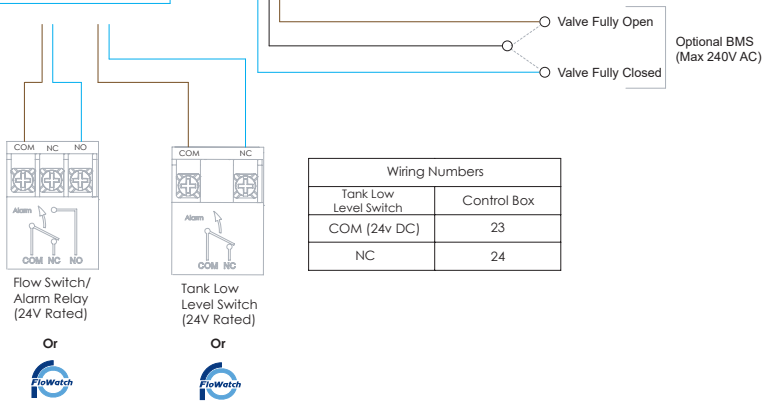
RAM Wiring	
Actuator	Control Box
O	28
N	29
C	30

Note: Use the Relay Connection within the isolation valve



Actuator Illustration





Wiring Numbers	
Flow Switch/ Alarm Relay	Control Box
COM (24v DC)	21
NO	22

Wiring Numbers	
Tank Low Level Switch	Control Box
COM (24v DC)	23
NC	24

Note: Connect the internal battery within the actuator prior to commissioning.

RAP-MSC-322 REV 1

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Priority Demand Valve
Fig. PDV-02V2

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Operation/Function Guide

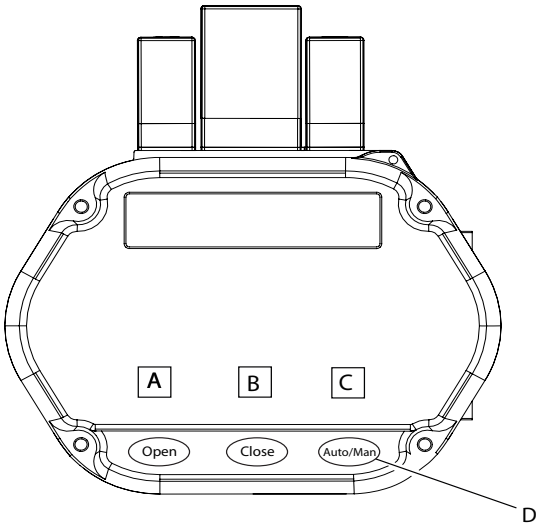
RAS Actuator Model DN25-DN50 (1"- 2")

LED Function Table

LED	LED Colour	LED Function
A - Bluetooth	Solid Blue	Paired
	Off	Asleep
	Flashing Blue	Awake Bluetooth not paired
B - Charging	Solid Blue	Charging
	Off	Charged
C - Direction/ Operation	Green Solid	Open
	Green Flashing	Opening
	Red Solid	Closed
	Red Flashing	Closing
	Slow Orange Flash	Manual Mode
	Rapid Orange Flash	Over Torque

Note : The touchpad button text is not related to the LED function (D)

RAS Actuator
LED Illustration

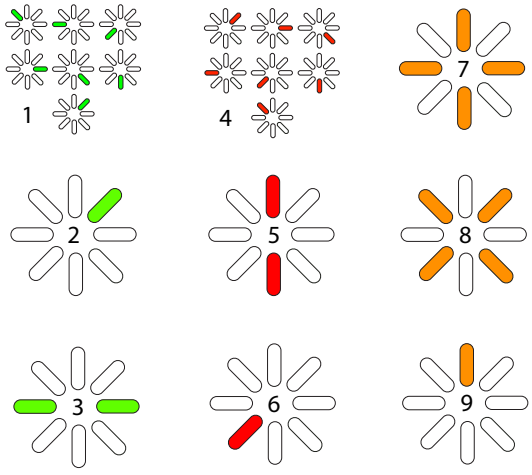


RAM Actuator Model DN65-DN125 (2 1/2" - 5")

LED Function Table

Illustration Number	LED Colour	LED Function
1	Rotating Green	Valve Opening
2	Flashing Green	Connected to Bluetooth
3	Solid Green	Valve Open
4	Rotating Red	Valve Closing
5	Solid Red	Valve Closed
6	Flashing Red	Valve is in Manual Mode
7	Flashing Amber	Valve failed to complete move in time
8	Flashing Amber	Reached Max Torque
9	Flashing Amber	Battery Voltage Low

RAM Actuator
LED Illustration



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Priority Demand Valve
Fig. PDV-02V2

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Troubleshooting guide

Issue	Cause	Corrective Action
PDV Not Powering On	Power Supply/Battery	• Check Battery Connected • Check Battery Voltage (refer to maintenance for correct voltage) • Check Wiring Diagram
Over torque	Over tightened flange causing the valve seat to distort or foreign body within pipe	• Loosen flange bolts to try to rectify valve seat distortion
Battery Low	Battery	• Power the PDV (this will allow the battery to charge) • Replace the battery • Charge the battery for a minimum of 1 hour (Or longer if the battery is very low)
Valve Not Functioning	Potential PCB sensor location	• Ensure the PCB is fixed in place as supplied • Ensure the Actuator lid is fixed in place (RAS)
Valve failed to move in time	Actuator taken longer than the pre-set time to move	• Contact Rapidrop to modify set-tings

The table above is intended as a guide. Please call Rapidrop for any queries

Battery

The actuator is powered through the battery meaning it is 'power to open' and upon activation of the failsafe feature the valve will close.

It is recommended that mains power is connected within 1 month of receiving the PDV.

The battery is supplied fully charged and disconnected from the actuator. Battery connector is push fit located underneath the PCB board this should be attached immediately prior to connection to mains power.

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

Care and Maintenance

The priority demand valve requires very little maintenance.

- Ensure all valve body connecting bolts are securely fastened
- Ensure the battery is fully charged, 8V (RAS), 15.8V (RAM)

An orange flashing LED light indicates the battery requires regenerating or replacing. Rapidrop recommend replacing the battery every 3 years at a minimum to prevent detriment of the system.

General control box considerations including but not limited to;

- Ensure all terminals/wires are secure
- Insulation resistance test
- Ensure all relays are correctly engaged.

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

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.

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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