

Reduced Pressure Zone (RPZ) Valves

BA Devices - Applications and Installation Guidance Overview – Datasheet Page 1 of 4

Description

Mechanical backflow preventer approved for protection against backpressure and back siphonage for Fluid Categories 1 – 4. RPZ Valves (BA devices) are acceptable to all water companies in the U.K. - when installed and used in accordance with the Water Regulations.

Applications

Many applications that are Fluid Category 3 in a house become Category 4 in non-house (commercial) situations. Subjective applications (e.g. hose union taps) are to be "risk assessed" by water supplier. Category 4 examples include -

- Quick fill heating systems non-house >45 KW (see [Autofill](#))
- Hose union taps – commercial, not cat. 5. (see [SPBA](#))
- Clothes washing machines - commercial use, see IGN 9-04-01
- Dishwashers - commercial use, see IGN 9-04-01
- Sealed heating systems - non-house >45 KW (see [Autofill](#))
- Chilled water circuits and run around coils (see [Autofill](#))
- Storage cisterns - without suitable air gap
- Swimming pools & adjacent taps
- Mini-irrigation systems with porous hoses
- Wash-down hoses – not cat. 5.
- Water treatment plant – commercial
- Vehicle washing plant / degreasing
- Water softening – non ion exchange
- Fire sprinklers with anti-freeze solutions
- Food processing
- Bottle washing
- Brewery & distillation plant
- Refrigerating equipment
- Cooling water / foundries
- Printing / photographic equipment
- Carcinogenic substances / chemicals
- Pesticides / insecticides / herbicides
- Underfloor heating
- Dyeing equipment
- Any application approved by water supplier

Connection Pipes & Sizes

Copper – 15, 22, 28 & 35 mm compression as standard
 Steel – Female BSPP ½" – 2". PN16 flange from DN65+
 Plastic – Fittings available for most systems

Specification

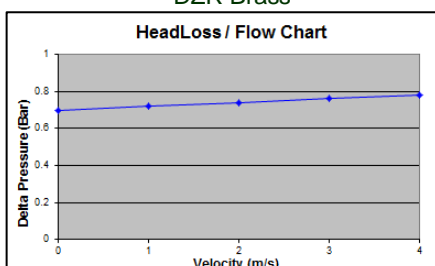
Pressure Supply 1 bar min. – 10 bar max.
 Temperature 1 - 65° C
 Strainer 100 µm DN15 – 32
 200 µm DN40 – 50
 800 µm DN65
 1250 µm DN80 – 150

Water Regulations

Approval 1303033, 1209343

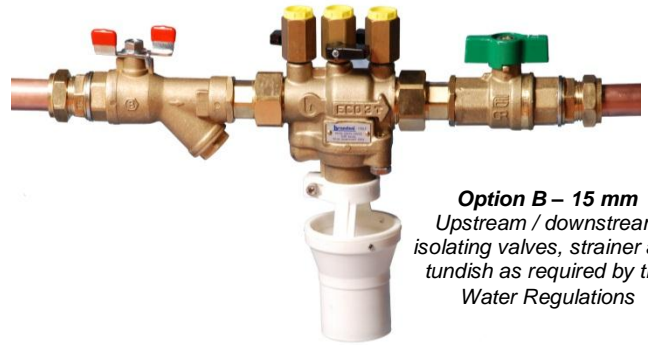
Materials

Body DZR Brass or Bronze DN40+
 Relief Valve Seat 316 Stainless Steel
 Relief Valve Shaft DZR Brass
 Seals and O-rings Nitrile
 Isolating Valves DZR Brass
 Tundish DZR Brass



Notes

Velocity based on flow through copper tube, table X. Data for DN25 valve, other sizes have similar characteristics. All BA devices require about 0.7 bar to open - Regulator's specification determines this for all BA devices.



Option B – 15 mm
 Upstream / downstream
 isolating valves, strainer and
 tundish as required by the
 Water Regulations

Pre-Installation Guidance

Ensure there is at least 1 bar pressure – this is rarely available from a distributing pipe (down service). Proposed installation for Fluid Category 4 or 5 applications by non-approved contractors should be notified to the local water company.

Installation Guidance

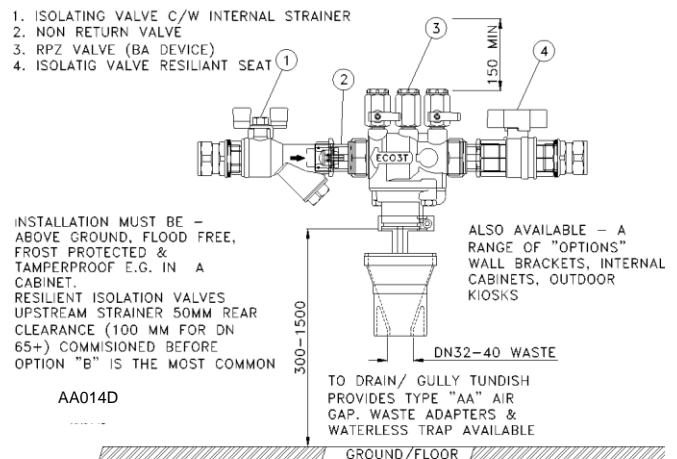
RPZ valves must be installed in accordance with the WRAS Water Suppliers' Approved Installation Method [AIM 08-01 Issue 1](#). Copies (pdf) are available from Arrow Valves www.arrowvalves.co.uk

RPZ assemblies **must** have upstream & downstream isolating valves with resilient seats, strainer and tundish to waste. All Arrow Valves Options have these fittings as standard.

The installation **must** be –

- Horizontal, with tundish below valve
- 300 – 1500 mm **above** the ground or floor
- 150 mm min. access above assembly
- Tamperproof – see [BACAB2](#) for sizes 15 & 22 mm

OPTION "B" ILLUSTRATED



Commissioning & Annual Testing

Once installed, the assembly **must** be commissioned by an "Accredited Tester". A test report must be sent to the local water company. The assembly must be at least annually tested. Arrow Services has Testers throughout mainland U.K. and can offer commissioning and annual testing of BA devices on behalf of Arrow Valves Ltd (see our website for contact details).

Arrow Valves Ltd

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Reduced Pressure Zone (RPZ) Valves

BA Devices — Assemblies Options A – H — Datasheet Page 2 of 4

Isolating Valves

DN15 – 25 valves are ¼ turn Ball Valves with tee. The integral fine strainer is cleaned by removing the end cap and internal strainer basket. DN32 – 50 valves have a lever in place of tee and the strainer is not integral. Assemblies DN65+ are supplied with resilient seat gate valves.

Strainers

The strainer, whether integral in the isolating valve or separately should be cleaned annually. DN15, 20 & 25 assemblies are fitted with 100 µm (0.10 mm) strainer, which is suitable for clean water or where the annual water consumption is low. **Excessive debris in the water can either block the strainer or cause the RPZ to drip** (debris becomes lodged in the RPZ check valve). Where the water is likely to contain particles and/or the annual volume of water demand is high, e.g. zone or whole site applications, a **large capacity strainer must be used e.g. Options F, H**. These strainers have a semi-automatic or electrical fully automatic self-cleaning facility.

Pressure Regulating Valves

An industrial PRV Model 525 DN50 with stainless steel seat is used for Option E (see *PRV535 data sheet*). This is recommended for quick filling heating / cooling circuits, where the pressure needs to be limited to avoid damage. *For quick fill and pressurising see "Autofill" data sheet.*

Non-Return Valve

To reduce the possibility of "Operational Discharge" when the supply pressure drops more than 0.3 bar with no flow, a non-return valve (NRV) or Pressure Reducing Valve (PRV) is recommended upstream of the RPZ. E.g. Options B, D, E.

Options

The table below lists the fittings used in the assemblies.

Option A – this is the most basic and is suitable where the valve is isolated on the upstream when not in use.

Option B – check valve reduces operational discharge.

Option E – features a PRV. Ideal for filling heating and chilled water circuits where mains pressure allows. Note - the RPZ drops the pressure by 0.7 bar (7 m). See *"Autofill" data sheet*

Option F – large capacity fine strainer ensures reliable operation, strongly recommended.

Option H – as Option F with an automatic electrical actuator.

Option Code	Size Range DN mm	Upstream Isolating Valve	Semi Automatic Strainer 100 µm	Fully Automatic Strainer 100 µm	Non Return Valve	Pressure Regulating Valve	RPZ Valve	Isolating Valve
A	15-150	✓					✓	✓
B	15-200	✓			✓		✓	✓
E	15-150	✓				✓	✓	✓
F	15-100	✓	✓		✓		✓	✓
H	15-100	✓		✓	✓		✓	✓

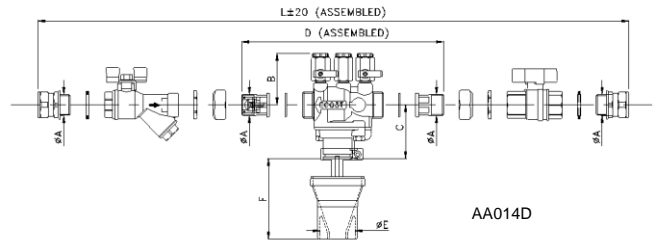
Sizes

15 - 35 mm have compression ends
 40 - 50 female BSP (compression optional)
 65 - 150 PN16 flange

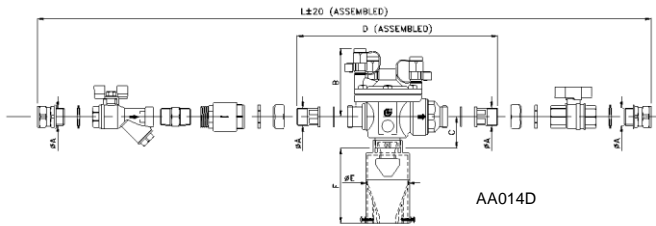
Order Codes of Options

Size	B	E	F	G	H
15mm	BA15B3T	BA15E3T	BA15F3T	BA15G3T	BA15H3T
22mm	BA22B3T	BA22E3T	BA22F3T	BA22G3T	BA22H3T
28mm	BA28B	BA28E	BA28F	BA28G	BA28H
35mm	BA35B	BA35E	BA35F	BA35G	BA35H
DN40	BA40B	BA40E	BA40F	BA40G	BA40H
DN50	BA50B	BA50E	BA50F	BA50G	BA50H

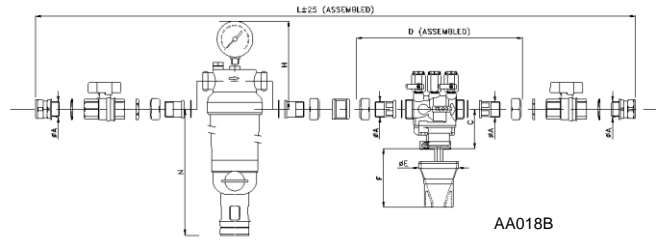
Option B (compact)



Option B (DN25-50)



Option F



Dimensions common to Options B-H

Size	A	B	C	D	E	F	J	K
15 (compact)	½"	65	78	159	DN32-40	101	27	27
20 (compact)	¾"	65	93	159	DN32-40	101	27	27
25	1"	104	112	198	61	64	64	47
32	1¼"	100	203	280	61	122	76	47
40	1½"	130	203	387	112	154	86	86
50	2"	130	261	395	112	154	86	86

Dimension "L" (Length) of Options

Size	B	E	F	G	H
15	345	501	504	513	489
20	375	577	538	543	523
25	565	646	670	682	670
32	690	659	815	824	815
40	742	874	860	889	860
50	801	939	936	949	936

Weight (Kg) of Options

Size	B	E	F	G	H
15	2.0	4.9	6.2	7.6	7.7
20	2.3	6.0	6.9	8.1	8.2
25	6.7	7.8	9.0	11.6	10.2
32	7.8	9.8	9.9	12.9	10.9
40	17.5	19.2	19.5	23.6	20.5
50	20.9	27.8	22.2	27.4	23.2

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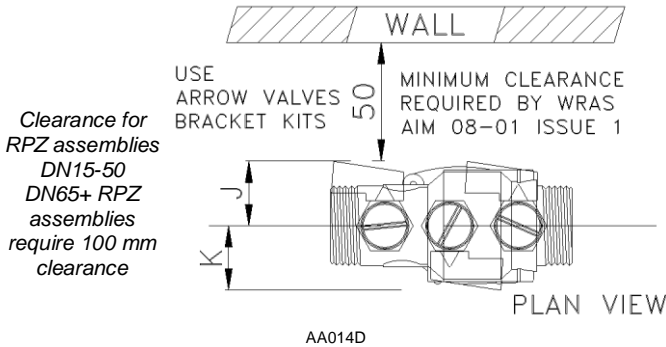


Reduced Pressure Zone (RPZ) Valves

BA Devices — Tamperproof Brackets & Cabinets — Datasheet Page 3 of 4

Description

RPZ Valves must have a minimum of 50 mm horizontal clearance between the RPZ assembly and any rear wall or cabinet for assemblies DN15 – 50 and 100 mm clearance for assemblies DN65+.



RPZ in grey square cabinet 300x300x150

Cabinets

Arrow Valves RPZ cabinets provide a tamperproof environment as required by the Regulations. Grey square (CAB2) and GRP bespoke RPZ cabinets are available. The CAB2 incorporates a 15 or 22 mm Option A or B assy. All cabinets and assemblies conform to the requirements of the Regulations & IGN 9-03-02.

Arrow Valves manufacture brackets and cabinets with the required rear clearance. RPZ Valves must be installed in a "tamper-free environment". This is to ensure the test cocks are not inadvertently opened and backflow prevention is not impaired. Plant rooms, boiler rooms, service voids etc, are considered to be tamper-free and a cabinet is not required, use brackets only.

2-hole fixing minimises installation time. A key secures the door. A vinyl instruction label is fitted to cover. Cabinet base must be 300 – 1500 mm above ground or floor. Allow 150 mm minimum above the cabinet.

Where the RPZ Valve is to be installed in a kitchen, laundry room or any area accessible to the public or non-maintenance staff, the assembly should be housed in a tamperproof cabinet.

Grey cabinets without a base provide a tamperproof and hygienic environment – particularly suitable for dishwashers and washing machines.

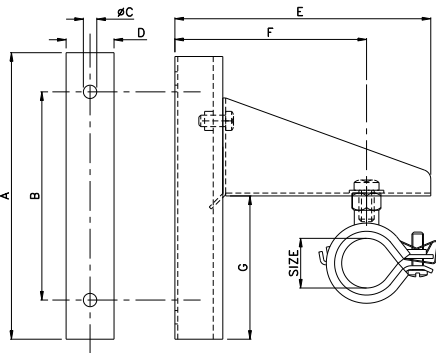
The tundish is extended below the base to provide a conspicuous discharge and to ensure the cabinet cannot become flooded.



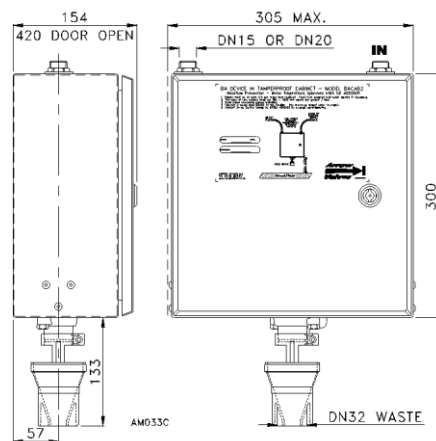
RPZ Option F and wall fixing brackets – providing rear clearance as required by the Water Regulations

Specification – Grey Square Cabinets

Material	Steel, zinc plated
Colour	Grey – epoxy powder coated
Fasteners	Steel – zinc plated
Base	None – open
Accommodates	Options A or B, 15 or 22 mm



Schematic diagram – design alters with size



BA15BCAB2 / BA22BCAB2

Codes and Descriptions

Size	Code	Description
15 mm	BRA14-16	DN15 - 32 RPZ Bracket Kit (Pair)
22-1/2"	BRA20-24	DN15 - 32 RPZ Bracket Kit (Pair)
28-3/4"	BRA25-28	DN15 - 32 RPZ Bracket Kit (Pair)
35-1"	BRA33-37	DN15 - 32 RPZ Bracket Kit (Pair)
42-11/4"	BRA38-43	DN40 - 50 RPZ Bracket Kit (Pair)
54 mm	BRA50-54	DN40 - 50 RPZ Bracket Kit (Pair)

Codes and Descriptions

Size	Code	Description
15	BA15BCAB2	RPZ Assy c/w Cabinet Grey 300x300x150
22	BA22BCAB2	RPZ Assy c/w Cabinet Grey 300x300x150

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Reduced Pressure Zone (RPZ) Valves

BA Devices – Tundish Discharge Fittings – Datasheet Page 4 of 4

Description

RPZ Valves are designed to dump the contents of the valve only (approx tea cup full) if the supply pressure reduces by more than 0.3 bar whilst there is no flow. Arrow Options (except Option A) are less prone to this because the inlet pressure is stabilised. RPZ valves can also discharge if there is a fault within the valve (e.g. debris in the upstream check valve). Generally the discharge rate is a drip or trickle.

Because the likely discharge is so small, 22 mm (3/4") warning pipe size pipe will generally provide sufficient capacity for 15 mm RPZ valves - provided the pipe length is short (e.g. <1 m). This is often used where the valve is mounted on an external wall, through which the valve can discharge.

Installation

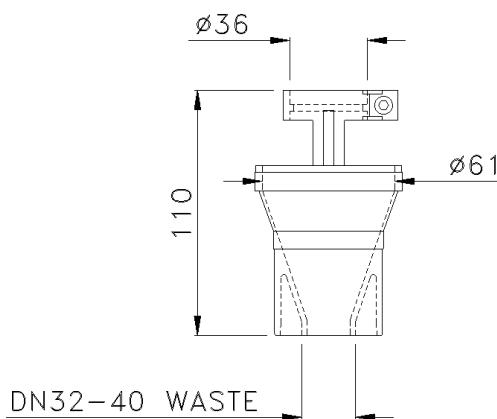
The RPZ valve should be installed in an area not liable to flooding. Consider the following –

1. Discharging water must not splash onto electrical equipment or damage any items.
2. The area into which the valve would discharge has a drain/gully that cannot become flooded.
3. The discharge should ideally be conspicuous.
4. A health hazard is not created should a discharge occur. (A tamperproof cabinet with waterless trap is preferred for kitchen installations, e.g. Dishwashers).

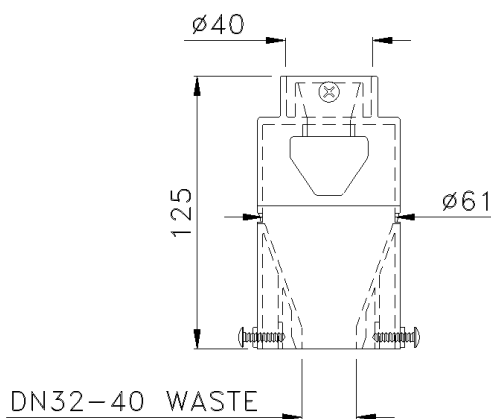
Kitchens & laundry rooms etc - Where there is no gully, the discharge can be connected to a waste pipe. These are typically 32 or 40 mm. Do not use a conventional S bend trap, it will dry out and the air "seal" will become inoperative. Instead, use a "Waterless Trap".

Where it is impractical to install a proper discharge pipe, a waste vessel can be considered with some form of warning device.

Dimensions



Tundish DN15 - 20



Tundish DN25 - 50



Tundish DN25 – 50



Tundish DN15 - 20

TUNDISH PROVIDES
TYPE "AA" AIR GAP.

Arrow RPZ valves have an integral "Tundish" - which provide a Type AA air gap. This satisfies the requirements of the regulations and should not be removed.

DN15 and 20 RPZ valves have a tundish intended for connection to 32 mm. A PVC adapter is supplied for other sizes to accept a PVC-U adapter that fits neatly into the tundish.

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