



**AIR RELIEF VALVES
NETWORK PROTECTION**

AIR RELIEF VALVES

NETWORK PROTECTION

Problems caused by the presence of air in networks may be solved by fitting suitable equipment.

BELGICAST can supply a wide range of devices with the highest quality to allow you to prevent faults in your system and optimize its performance.

Use this catalogue to choose the most suitable products to regulate the entry and escape of air from networks and protect them from problems such as:

- Head losses
- Pressure variations
- Water hammer
- Pipe breakages





Belgicast® BV-05-60

Double orifice air relief valve for clean waters

ND - 50 / 200

NP - 16 / 25 4 5 6 7



Belgicast® BV-05-61

Single orifice air relief valve for clean waters

ND - 40 / 50 / 65

NP - 16 / 25 8 9



Belgicast® BV-05-62

Anti-water hammer relief valve for clean waters

ND - 50 / 65 / 100 / 150 / 200

NP - 16 / 25 10 11



Belgicast® BS-05-60

Double orifice air relief valve for sewage

ND - 100

NP - 10 12



Belgicast® BS-05-61

Single orifice air relief valve for sewage

ND - 100

NP - 10 13



Belgicast® BS-05-62

Anti-water hammer air relief valve for sewage

ND - 100

NP - 10 14



Belgicast® BV-05-60

Triple function air valve

NP - 50/200

NP - 16/25

Double air valve, providing three functions:

- High flow rate air discharge capacity for pipe-filling operation,
- High flow rate air inlet for pipe drainage operation and in case of pipe burst,
- Continuous evacuation of air under normal working conditions (small orifice function).

APPLICATIONS

- Drinking water networks
- Fire protection networks
- Irrigation networks

TESTS

- Manufacturing fully tested according to ISO 5208-2.

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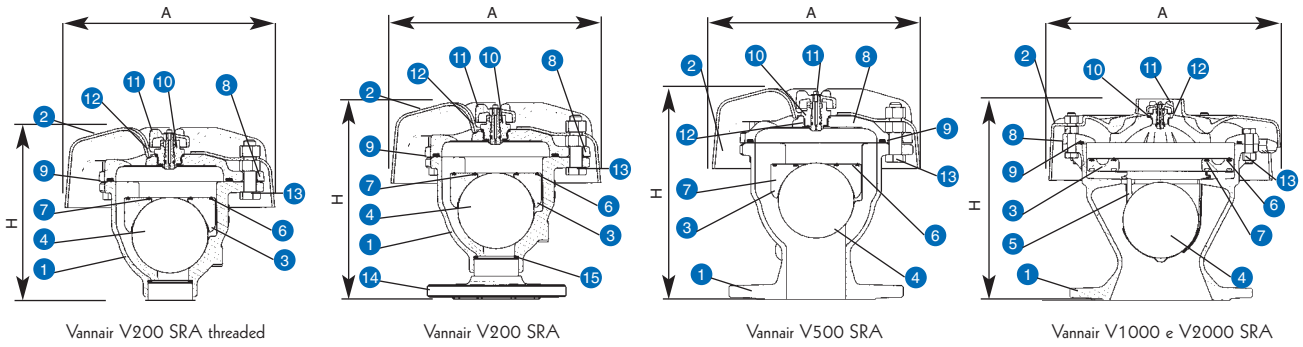
DESCRIPTION

- Design:
 - Ductile iron design.
 - Patented reversible floating disc for closing under water or air flow conditions (type V1000 and V2000).
 - Powder epoxy and cataphoresis coating.
 - Ball basket in stainless steel on types V1000 and V2000.
 - Lateral body boss which can be drilled on request to enable the mounting of pressure gauges.
- Performance:
 - High aeraulic performances.
 - Smooth operation provided by the floating disc.
 - Minimum pressure 0,3 bar.
- Easy to operate and install:
 - Reduced space requirements.
 - Built-in operation controller.
- According to standard EN 1074-4.

TECHNICAL DATA

- Range:
 - type V200: DN 40 to 100.
 - type V500: DN 80 and 100.
 - type V1000: DN 150.
 - type V2000: DN 200.
- Maximal working pressure: PN 16, 25 and 40 (under request).
- Temperature limits: +1°C to + 70°C.
- Seating: class A according to standard ISO 5208-2.
- Flange drilling according to standards EN 1092-2 and ISO 7005-2:
 - ISO PN 10/16 for DN 40 to 150,
 - ISO PN 10 or 16 for DN 200,
 - ISO PN 25 for DN 40 to 200.

AIR RELIEF VALVES - NETWORK PROTECTION



Item	Designation	Qty	Materials	Standards
1	Body	1	GGG 45-10	EN 1563
2	Cover V200 and V500	1	DMC	
	Cover V1000 and V2000	1	ABS	
3	Floating disc	1	Polypropylene	
4	Floating Ball	1	Stell S235-JR coated with EPDM	EN 10025 (for steel)
5	Basket V1000 and V2000	1	Stainless Steel X2CrNi18-9	EN 10088
6	Disc outside O-ring	1	Elastomer/EPDM	
7	Disc inside O-ring	1	Elastomer/EPDM	
8	Bonnet	1	Ductile iron/GGG 45-10	EN 1563
9	Bonnet O-ring	1	Elastomer/EPDM	
10	Controller/Orifice	1	DZR brass CuZn36Pb2Al	EN 12164
11	Controller Handwheel	1	Polyamide	
12	O-ring	1	Elastomer/EPDM	
13	Bolts and screws	s/DN	Stainless Steel A2	EN ISO 3506
14	Flange	1	Ductile iron/GGG 45-10	EN 1563
15	Flange gasket	1	Fibre	

Type	PN	DN mm	H mm	A mm	Handwheel controller color	Weight Kg
V200	16	female thread 2"	228	280	Black	9
V200	25	female thread 2"	228	280	Red	9
V200	16	40/60 - 50 - 60/65 - 80 - 100	262	280	Black	11,5 (13,2 for DN 80 and 100)
V200	25	50 - 60/65 - 80 - 100	262	280	Red	11,5 (13,2 for DN 80 and 100)
V500	16	80 - 100	285	280	Black	18
V500	25	80 - 100	285	280	Red	18
V1000	16	150	316	374	Black	32
V1000	25	150	316	374	Red	32
V2000	16	200 ISO PN10 or PN16	398	472	Black	55,5
V2000	25	200	398	472	Red	55,5

Operation

DESCRIPTION

“Vannair” double orifice air valves are built according to an original compact design, with or without isolating valve. They are made of two floats mechanically free, operating in a single chamber body, aerodynamically shaped. One float is a ball fully covered with elastomer, the other is a disc in which are inserted two O-rings in a concentric way. Movements of the floats are guided in up and down direction. The floating ball ensures the shut-off of the small orifice, whereas the floating disc ensures the shut-off of the bonnet large orifices. These large orifices have a surface area calculated to insure free passage of the required quantities of air. An exhaust controller placed in the middle of the bonnet allows to check if the small orifice is not filled up (device similar to the one use on single orifice air valve). A cover protects the bonnet large orifices against dirt, and allows to direct air exhaust in downward direction. The original concept ensures a safety operation without problems.

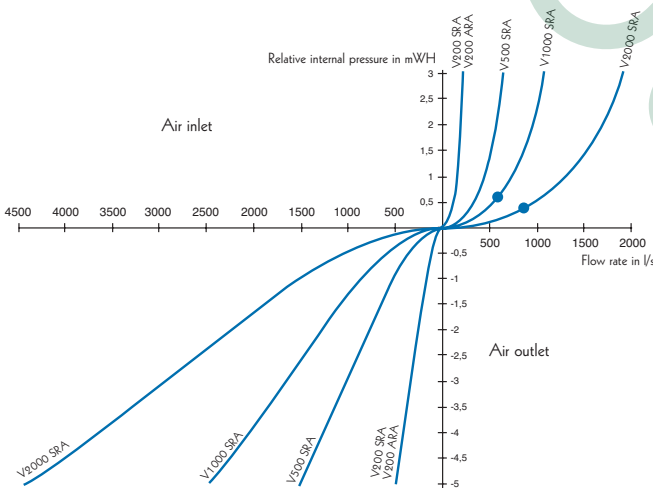
OPERATION

During pipe filling, air goes out freely at high flow rate through the bonnet large orifices. When the inlet of the valve fills gradually, with water replacing the air, the floating ball and disc rise and come into contact with the small and large orifices, shutting them off. During pipe drainage operation, or in case of pipe burst, the float-disc drops, thus opening the orifices and allowing air in-flow at large rate. Types V1000 and V2000 are delivered in standard with reversible disc (patented). This original concept allows to choose to close under air flow rate or water flow rate (see graphic below for flow rate values in order to get closing under air flow conditions).

- closing under air flow rate > disc side with groove on the top.
- closing under water flow rate > flat disc side on the top.

Hydraulic characteristics

Inlet/outlet air flow rate performances, in pipeline internal conditions, for Vannair PN16 and PN25.



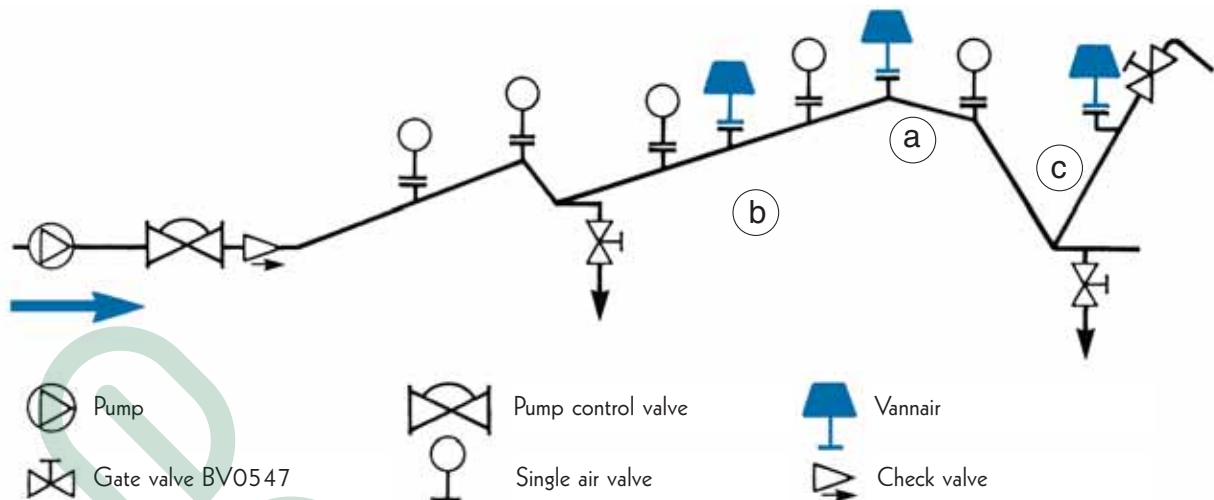
Type	PN bar	Ø ball mm	Ø small mm	Flow rate l/s
V200	16	102	1,8	0,5
V200	25	102	1,5	0,35
V500	16	102	1,8	0,5
V500	25	102	1,5	0,35
V1000	16	102	1,8	0,5
V1000	25	102	1,5	0,35
V2000	16	150	2,5	0,95
V2000	25	150	1,8	0,5

Vannair Sizing

For air inlet (pipe drainage operation, or in case of pipe burst): Vannair sizing must be done according to the theoretical calculated drainage flow rate and the acceptable depression in the pipeline. For air outlet (pipe filling): Vannair sizing must be done according to the theoretical calculated filling flow rate. For obvious safety reasons, practical experience advises to use low filling velocity around 0.5 m/s. In simplified approach use chart.

Type	PN bar	Ø ball mm	For pipeline up to filling with V=0,5 m/s	filling with V=1 m/s
V200 SRA	16 et 25	102	DN 500	DN 400
V200 ARA	16 et 25	102	DN 500	DN 400
V500 SRA	16 et 25	102	DN 1000	DN 700
V1000 SRA	16 et 25	102	DN 1500	DN 1100
V2000 SRA	16 et 25	150	DN 2000	DN 1400

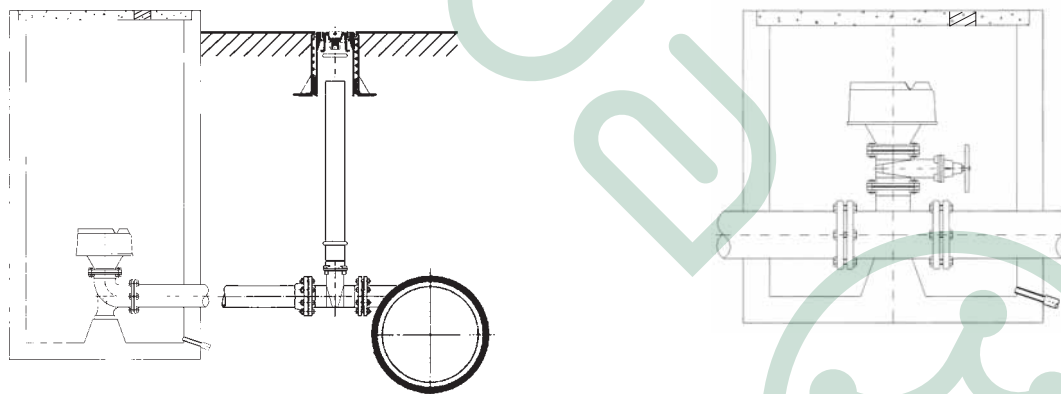
Installation of the Vannair on a pressurized pipeline



- (a) At each main high point to guarantee a fast filling of the pipelines. The advised filling speed is 0.5 m/s.
- (b) At regular intervals along the pipeline, at least every kilometre, to avoid entrapping of air pockets while filling up.
- (c) Before or after every isolating valve, depending on the slope of the pipeline, to avoid the negative pressurising of the pipe after closing the isolating valves.

Note: It is recommended to mount single orifice air valves (BV-05-61) at each geometrical high point, when sudden-descending slope changes occur, and at every 500 metres.

Typical Installations



Installations

The chamber should be adequately sized to enable easy access to the air-valve (see typical installations) for maintenance operations to be carried out when necessary and must be fitted out with a drain-outlet in order to evacuate any water from the chamber.

The quantity of air to be evacuated upon filling operations, or drawn in upon emptying operations can be quite considerable. It is essential then, to provide a pipe or suitable opening to the outside which has a cross-section at least equal to that of the inlet of the device.

Provide a manhole of adequate dimensions to allow installation of the device. If necessary, put a surface box to enable opening and closing from the ground.

Installation can be carried out either:

- directly onto the vertical branch of a tee.
- offset : In this case, a tee with tangential outlet, or equivalent, should be used to ensure correct functioning of the installation. It is also essential to respect a minimum slope of 5 mm/meter for the pipe leading upwards to the air valve.

When positioning the device, ensure that the flange is perfectly horizontal, and the absence of foreign bodies in the air valve and in the pipeline.

Before operation, ensure that the controller is in the "Service" position.

Maintenance

Check visits should be carried out at regular intervals (normally once per year). To check that the device is functioning correctly, put the exhaust controller in the "test" position (turn the controller knob gently in an anti-clockwise direction until it blocks). Water should be ejected through the exhaust controller.

If instead, air escapes, then either the working pressure is too great, or the floating ball is damaged and needs replacing. If neither air nor water is evacuated, ensure that the built-in stop cock/isolating valve is opened or that the orifice is not blocked. In operation, the device should be perfectly watertight. If not, then the device should be dismantled and cleaned. The moving parts, gaskets and exhaust controller, should be replaced if necessary.

After a long period of working, we advise to carry out a general cleaning operation:

- Close the built-in stop-cock / isolating valve.
- Remove the exhaust controller, orifice plate and cover by unscrewing the appropriate nuts and bolts.
- Clean and rinse the moving parts, clean the exhaust controller mechanism, change if necessary the ball, etc...
- Replace the gaskets.
- Reassemble the device.
- Open the built-in stop-cock / isolating valve.



Belgicast® **BV-05-61**

Single orifice air valve
for elimination of air pockets
in pipelines

DN - 40/50/60/65/80

PN - 16/25/40

DESCRIPTION

- Isolating 1/4 turn ball valve included, with 17 x 17 lockable square cap.
- Built-in operation controller.
- Ductile iron construction.
- Powder epoxy and cataphoresis coating.
- Stainless steel bolts.
- Minimum pressure: 0.1 bar.
- In conformity with EN 1074 - 4 standard.

APPLICATIONS

- Drinking water networks,
- Fire protection networks,
- Irrigation networks.

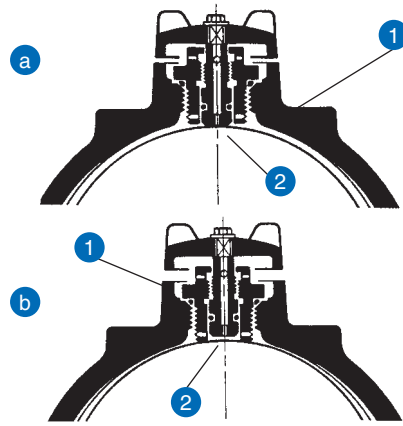
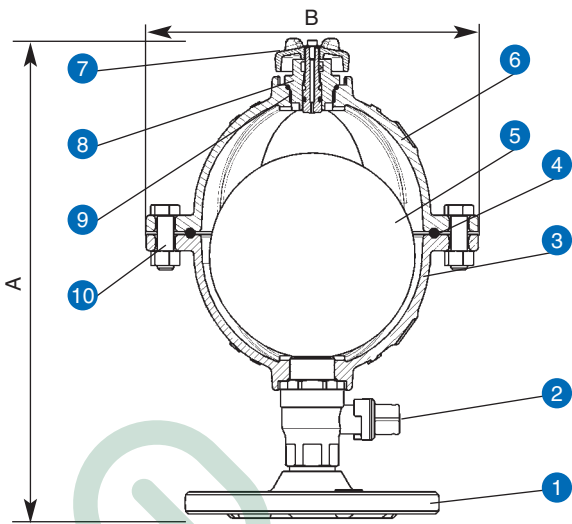
TESTS

- Fully tested manufacturing according to standard ISO 5208-2.

TECHNICAL DATA

- Range:
 - Type 102, PN 16 and 25: DN 40 to 80 and model 1" male BSP
 - Type 150, PN 25 and 40: DN 50 to 80 and model 1" male BSP
- Maximal working pressure: PN 16, 25, and 40.
- Temperature limits: +1 °C to +70 °C.
- Flange drilling according to standards EN 1092-2 and ISO 7005 - 2:
 - ISO PN 10/16 for DN 40 to 80
 - ISO PN 25 for DN 50 to 80
 - ISO PN 40 for DN 50 to 80
- "BSP" profile thread according to standards ISO 228 - 1 and EN 03 - 005.

AIR RELIEF VALVES - NETWORK PROTECTION



OPERATION

When there is no air, the force of water on the float, assisted by the internal pressure, closes the evacuation orifice. If an air pockets fills the air valve, the weight of the float exceeds the effect of the internal pressure and the float moves downwards to open the orifice. When water comes, the assembly closes. The built-stopcock allows the device to be isolated for checking and maintenance.

EXHAUST CONTROLLER

Model specially design for the safety and simplicity of its operation. This controller is composed of a fixed body **1** screwed in the bonnet and bearing inside a drilled thrust ring, as well as a screw plunger **2**, through which the exit orifice passes. In the operating position **a**, the thrust ring extends beyond the orifice and thus is in direct contact with the float. In the checking position **b**, the seat moves back inside the drilled ring. The float is stopped by this ring, against which it presses, thus clearing the orifice, without any risk of damage to the elastomer covering of the float. A leak is therefore created, which allows the operating states of the device.

INSTALLATION

Unit must be mounted in vertical position:

- at the highest point,
- when accentuating the slope in the flow direction,
- downstream of control valves fitted on descending pipeline,
- at regular intervals along ascending/descending pipeline, at least every 500 meters.

LOCKABLE SQUARE CAP

In order to avoid untimely operations, this type of square cap allows to lock the isolating valve in open or closed position. Just remove the square cap, and fix it in the suitable position.

Item	Designation	Qty	Materials	Standards
1	Flange	1	Ductile iron GS/EN-GJS-450-10	EN 1563
2	Isolating valve	1	Nickel plated brass	
3	Body	1	Ductile iron GS/EN-GJS-450-10	EN 1563
4	O-ring	1	Elastomer/EPDM	
5	Ball	1	Steel S-235-JR coated with EPDM (for steel)	EN 10025 (for steel)
6	Bonnet	1	Ductile iron GS/EN-GJS-450-10	EN 1563
7	Controller handwheel	1	Polyamide/PA 6	
8	Controller/orifice	1	Non de-zincifiable brass CuZn36Pb2As	EN 12164
9	O-ring	1	Elastomer/EPDM	
10	Bolts	s/DN	Stainless steel/Stainless steel A2	

Type	PN	DN	A mm	B mm	Weight kg	Controller colour
102	16	G1"	250	180	4,7	Black
102	16	40/50/60/65	287	180	8	Black
102	16	80	287	180	10	Black
102	25	G1"	250	180	4,7	Red
102	25	40/50/60/65	287	180	8	Red
102	25	80	287	180	10	Red
150	25	G1"	315	242	10	Black
150	25	50	350	242	13	Black
150	25	60/65	350	242	13	Black
150	25	80	350	242	15	Black
150	40	G1"	315	242	10	Red
150	40	50	350	242	13	Red
150	40	60/65	350	242	13	Red
150	40	80	350	242	15	Red

DISCHARGE CAPACITY

Type	PN	ø Orifice mm	Flow rate (l/s)
102	16	1,8	0,50
102	25	1,5	0,35
150	25	2,5	0,95
150	40	1,8	0,50





Belgicast®

BV-05-62 DJET

Anti-water hammer relief valve for clean waters

ND - 50/65/100/150/200

NP - 16/25

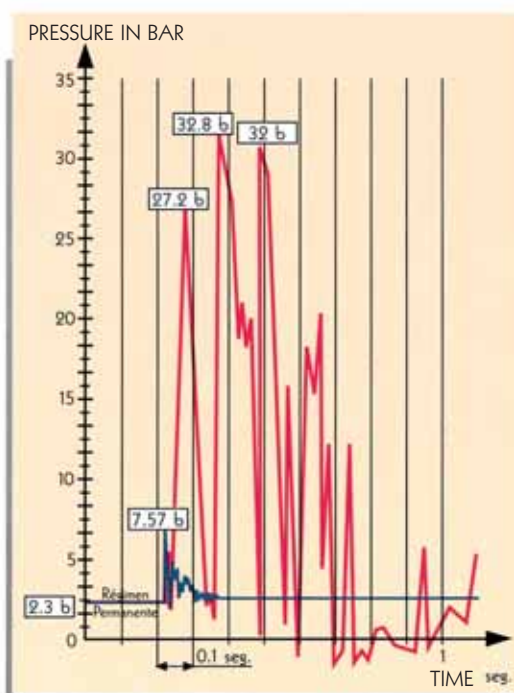
FEATURES

The BELGICAST BV-05-62 relief valve protects installations against excess pressures and water hammer. It immediately expels excess water as the pressure comes within a preset range, damping the impact of water hammer on the network and preventing pipe breakage or other adverse consequences.

- Strong construction enables it to work with high pressures.
- Complete anti-corrosion epoxy coating (RAL 5015).
- Very low inertia and rapid response to excess pressures.
- Fitted with a pressure gauge to control network pressure.
- Four models available: ND-50/65 and ND-100 (direct action), and ND-150 and ND-200 (piloted).
- NP - 16/25.

OPERATION

The BELGICAST BV-05-62 relief valve is equipped with a spring-operated trigger system which lets the valve open as soon as the set pressure is reached (max. 2 bar excess pressure). When the effect of pressure on the valve seal exceeds the force of the spring, the valve opens instantaneously to allow discharge in proportion to the excess pressure. As soon as the irregularity disappears the valve progressively returns to the "closed" position.



The spring-operated trigger system can be adjusted on the spot ± 1 bar by means of a manual key on the top of the valve.

For adjustments bigger than ± 1 bar it should be verified that it fits the pressure range admitted by the spring:

The valves are supplied with 5 types of springs for following pressure range:

DN-100: 1 to 5 / 5 to 7 / 7 to 16 / 16 to 25 / bar

DN-50 / 65 / 150 / 200: 1 to 5 / 5 to 10 / 10 to 16 / 16 to 25 bar

The adjustment device is protected against humidity and water discharge by an EPDM gasket.

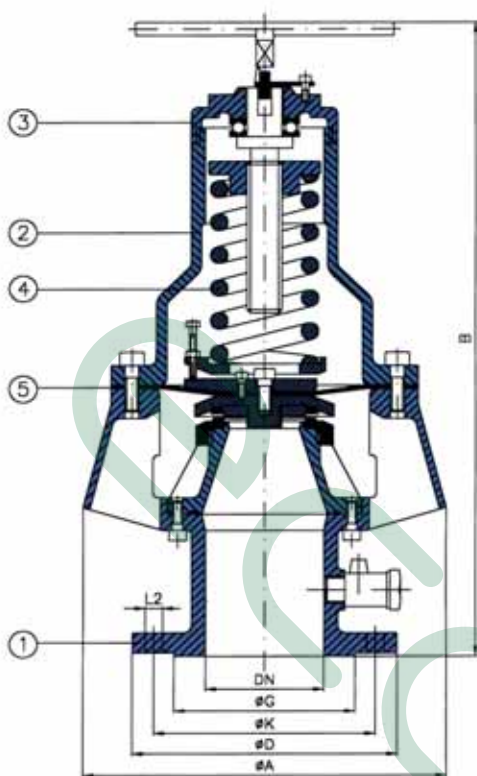
— Water hammer without relief valve.

— Water hammer with BV-05-62 ND-200 relief valve set to 6 bar.



AIR RELIEF VALVES - NETWORK PROTECTION

FEATURES



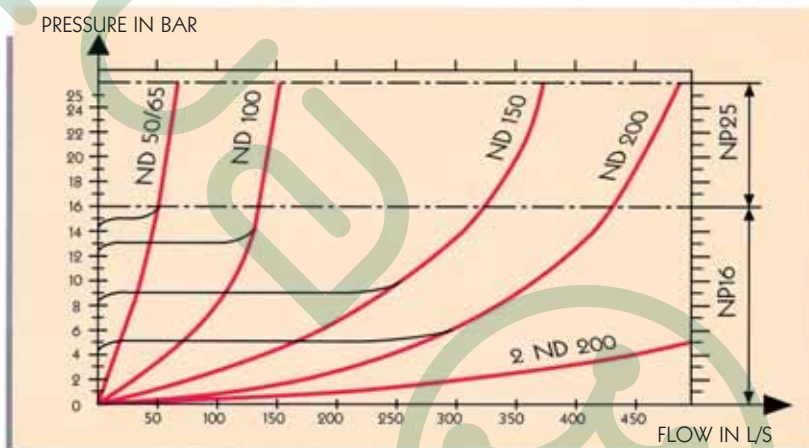
ND	A	B
50/65	210	460
100	300	590
150	445	690
200	445	690

	ND	50	65	100	150	200
NP - 10	D	165	185	220	285	340
	K	125	145	180	240	295
	G	99	118	156	211	266
	L2	19	19	19	23	23
	N°	4	4	8	8	8
NP - 16	D	165	185	220	285	340
	K	125	145	180	240	295
	G	99	118	156	211	266
	L2	19	19	19	23	23
	N°	4	4	8	8	12
NP - 25	D	165	185	235	300	360
	K	125	145	190	250	310
	G	99	118	156	211	274
	L2	19	19	23	28	28
	N°	8	8	8	8	12

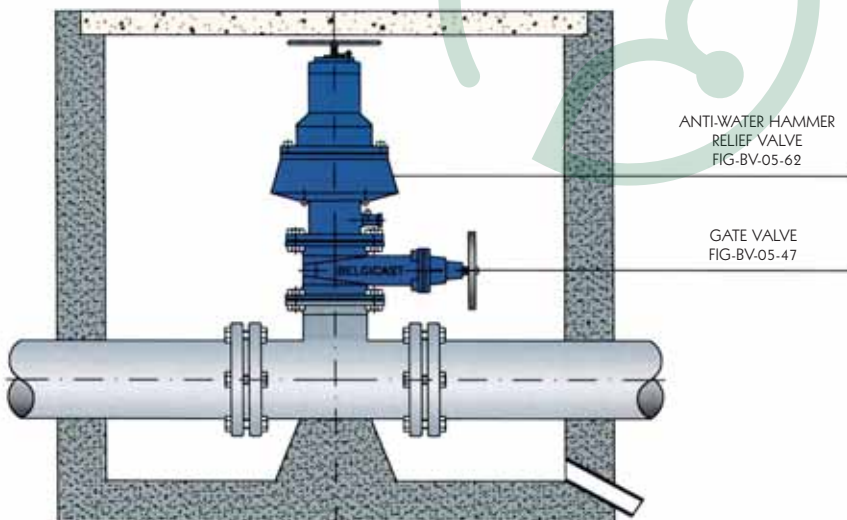
N°	NAME	N° PARTS	MATERIAL
1	BODY	1	GGG42
2	BONNET	1	GGG42
3	TOP BONNET	1	GGG42
4	SPRING	1	STEEL
5	GASKET	1	EPDM

FLOW/PRESSURE DISCHARGE CAPACITIES

Example: For a sealing pressure of 8 bar, a BV-05-62 relief valve of DN-150 is capable of discharging a maximum flow of 240 l/s with an excess pressure of 2 bar.



FITTING DIAGRAM FOR BELGICAST BV-05-62 DJET RELIEF VALVE





Belgicast® BS-05-60

Double orifice air relief
valve for **sewage**

ND - 100

NP - 10

FEATURES

- Strongly built, with body and cover of ductile cast iron.
- Fully protected against corrosion by internal and external epoxy coating (RAL 5015).
- Fitted with connection and valve for cleaning.
- Large through channel section.
- Mechanical elements kept away from contact with water.
- Special design avoids stagnated materials or deposits of foreign bodies.
- Weight: 44 Kg.
- Maximum permissible flow $Q=200$ l/s.
- Maximum permissible pressure: 4 bar (test pressure 25 bar).
- Flange connection ND-100, NP-10.

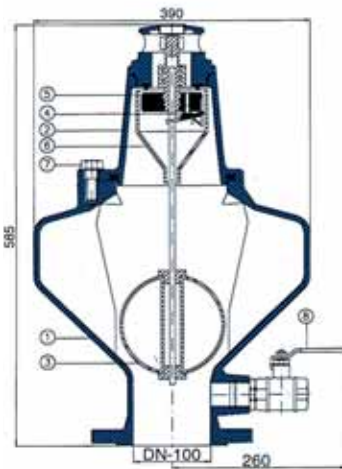
SPECIFICATION

OPERATION

The BELGICAST BS-05-60 air relief valve for sewage performs three operations essential to proper functioning of the system.

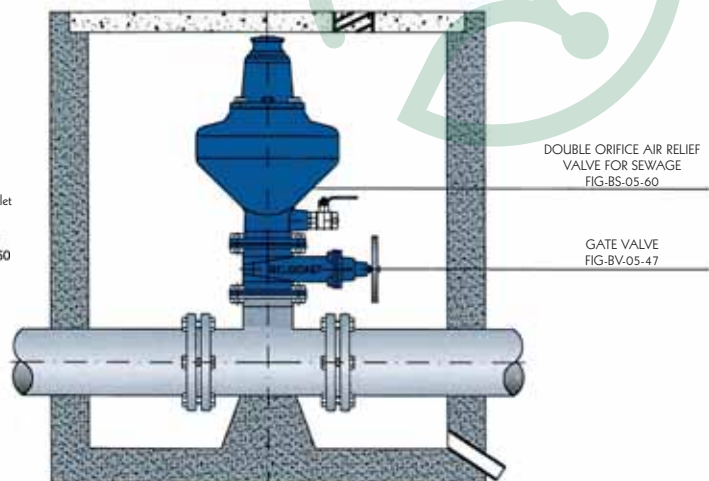
- It discharges air from piping during filling (Q max. 200 l/s).
- It lets air enter during pipe drainage operations.
- It bleeds air under pressure during normal system operation.

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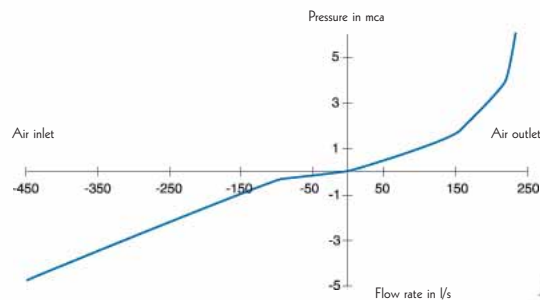


N°	NAME	N° OF PARTS	MATERIAL
1	BODY	1	GGG42
2	BONNET	1	GGG42
3	FLOAT	1	POLYETHYLENE
4	CAM SYSTEM	4	STAINLESS STEEL
5	FLOATING DISC	1	POLYPROPYLENE
6	DEFLECTOR	1	POLYPROPYLENE
7	BODY-BONNET SCREW	4	STAINLESS STEEL
8	CLEANING VALVE	1	EPDM

FITTING DIAGRAM



ADMISSION/DISCHARGE CAPACITY





Belgicast® BS-05-61

Single orifice air relief valve for **sewage**

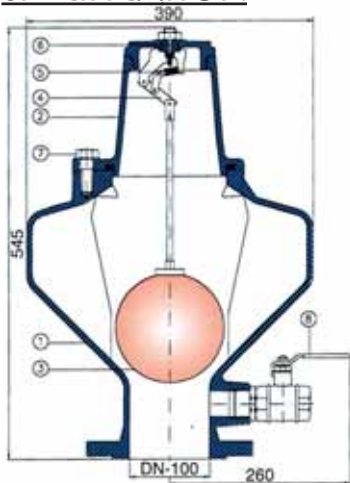
ND - 100

NP - 10

FEATURES

- Strongly built, with body and cover of ductile cast iron.
- Fully protected against corrosion by internal and external epoxy coating (RAL 5015).
- Fitted with connection and valve for cleaning.
- Large through channel section.
- Mechanical elements kept away from contact with water.
- Special design avoids stagnated materials or deposits of foreign bodies.
- Weight: 42 Kg.
- Maximum permissible pressure: 4 bar (test pressure 25 bar).
- Flange connection ND-100, NP-10.

SPECIFICATION

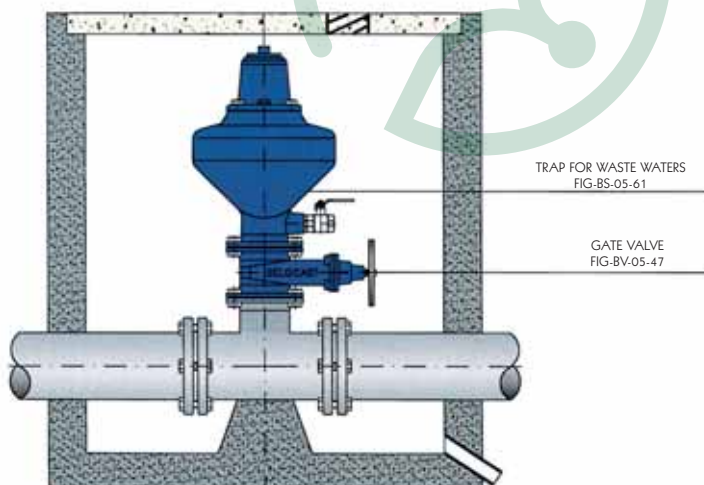


OPERATION

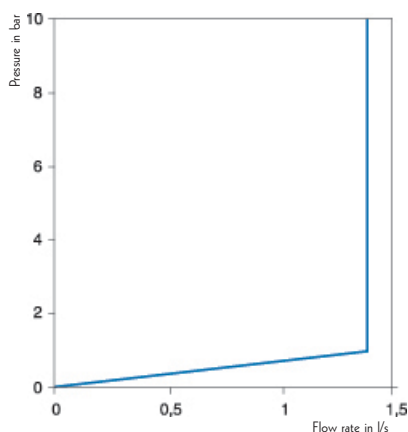
The BELGICAST BS-05-61 air relief valve allows the escape of air which builds up under pressure while the system is working. Ample diameter of the bleed hole.

N°	NAME	N° OF PARTS	MATERIAL
1	BODY	1	GGG42
2	BONNET	1	GGG42
3	FLOAT	1	STAINLESS STEEL
4	LEVER SYSTEM	4	STAINLESS STEEL
5	NOZZLE SEAL	1	NBR
6	NOZZLE	1	STAINLESS STEEL
7	BODY-BONNET SCREW	4	STAINLESS STEEL
8	CLEANING VALVE	1	STEEL

FITTING DIAGRAM FOR BS-05-61



DISCHARGE CAPACITY





Belgicast® BS-05-62

Anti-water hammer air relief valve for **sewage**

ND - 100

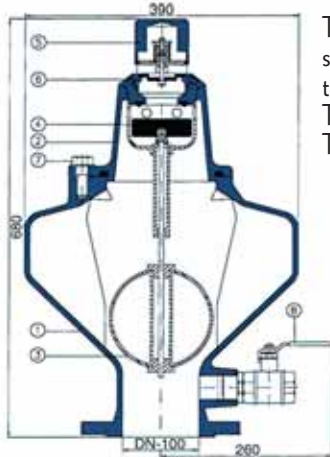
NP - 10

FEATURES

- Strongly built, with body and cover of ductile cast iron.
- Fully protected against corrosion by internal and external epoxy coating (RAL 5015).
- Fitted with connection and valve for cleaning.
- Large through channel section.
- Mechanical elements kept away from contact with water.
- Special design avoids stagnated materials or deposits of foreign bodies.
- Weight: 44 Kg.
- Maximum permissible flow $Q=90$ l/s. at -2 M.W.C.
- Air discharge flow 1 l/s.
- Maximum permissible pressure: 4 bar (test pressure 25 bar).
- Flange connection ND-100, NP-10.

SPECIFICATION

OPERATION



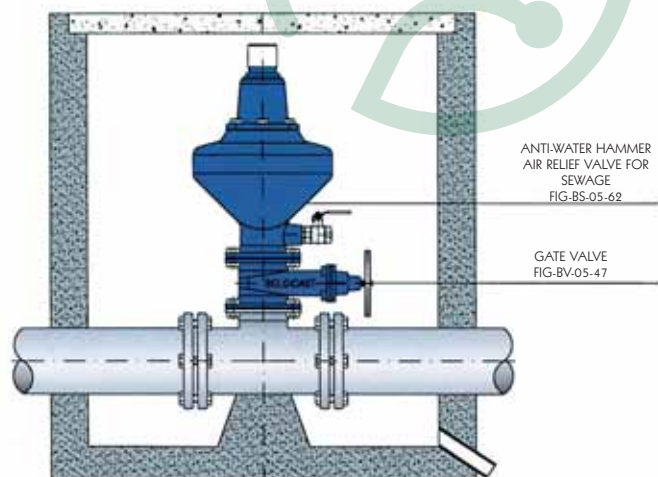
The BELGICAST BS-05-62 anti-water hammer air relief valve for sewage allows a significant quantity of air to enter (max. 90 l/s. at -2 M.W.C.), while discharge is limited to 1 l/s.

This allows the air pocket in the piping to damp the return wave from the water hammer.

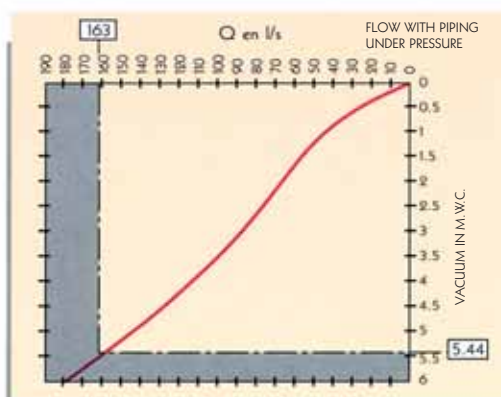
The device is recommended for pipes up to DN-400 and lengths greater than 200 metres.

N°	NAME	N° OF PARTS	MATERIAL
1	BODY	1	GGG42
2	BONNET	1	GGG42
3	FLOAT	1	POLYETHYLENE
4	FLOATING DISC	1	POLYPROPYLENE
5	PROTECTOR	1	STAINLESS STEEL
6	TOP BONNET	1	GGG42
7	BODY-BONNET SCREW	4	STAINLESS STEEL
8	CLEANING VALVE	1	STEEL

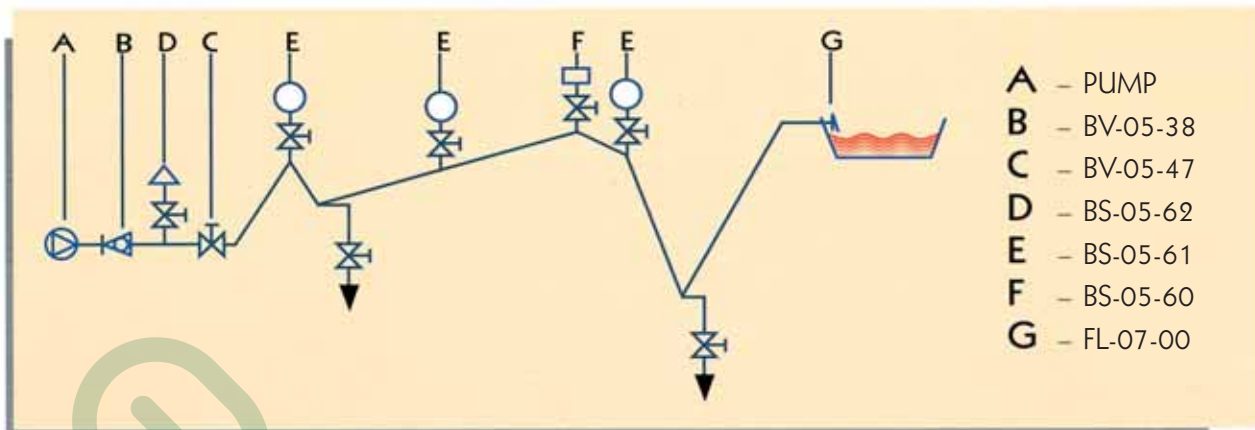
FITTING DIAGRAM



AIR ADMISSION CAPACITY



SITING OF BELGICAST DEVICES FOR WASTE WATERS



BV-05-38

Ball check valve
ND - 50 / 400
NP - 10



BV-05-47

Resilient seated gate valve
ND - 40 / 1200
NP - 10/16/25



BS-05-62

Anti-water hammer air relief valve for sewage
ND - 100
NP - 10



BS-05-61

Single orifice air relief valve for sewage
ND - 100
NP - 10



BS-05-60

Double orifice air relief valve for sewage
ND - 100
NP - 10



FL-07-00

Flap valve
ND - 200 / 2000

The illustrations, technical data, dimensions and weights shown in this catalogue are subject to modification without prior notice.



PRODUCT RANGE

SOFT SEALING GATE VALVES
BUTTERFLY VALVES
NON RETURN VALVES
BALL CHECK VALVES
AUTOMATIC VALVES
TRIFUNCTIONAL AIR VALVES
SINGLE AIR VALVES
IRRIGATION
HYDRANTS
FLANGE ADAPTORS AND PUSH FIT FLANGES
GREAT TOLERANCE COUPLINGS
PENSTOCK

tyco / *Flow Control* / **Tyco Waterworks**

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