



Control valve placed at the bottom of the reservoirs, enabling the control of the filling level.



Functions

- Prevents overflowing and closes at a constant and adjustable level.
- Balances the inlet flow rate and the outlet flow rate till approximately 0.40 to 0.50 m below the top level.
- Fully opens at a low level, below the level range.
- Closes and puts into regulation with hand drive.

Applications

- Closing level control of a reservoir.
- Possible application as a pressure reducer to protect installations sensitive to a very low pressure.

Tests

- Manufacturing fully tested according to ISO 5208-2.

Description

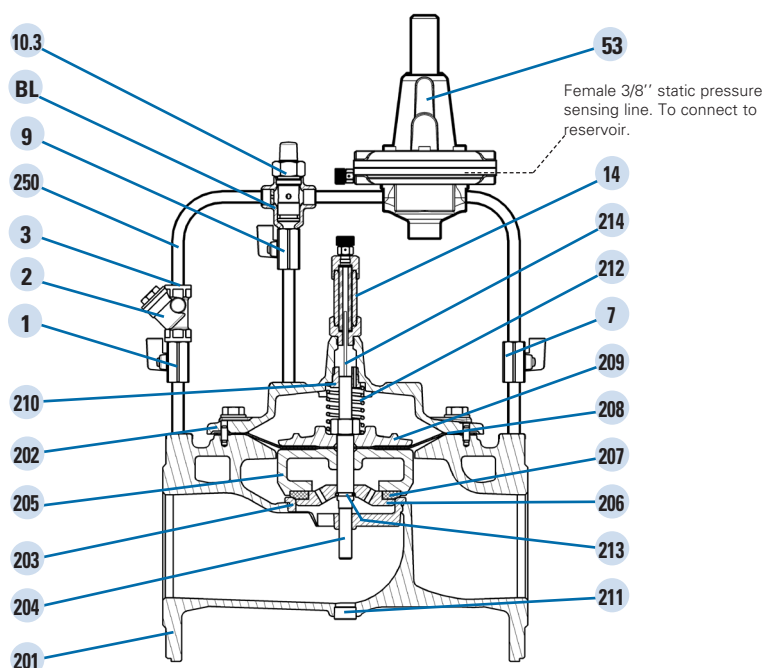
- For general information concerning the operation of a Hydrobloc control valve, please consult our general manual (series K).
- Extensive range including two different designs:
 - XG design:
 - Large flow capacity,
 - Low head loss,
 - Watertight at zero flow rate.
 - XGS design:
 - Particularly suitable to high differential pressures,
 - Better cavitation resistance,
 - Watertight at zero flow rate.
- **Construction:**
 - Self-lubricated double guided mobile unit,
 - Ductile iron body and bonnet,
 - Stainless steel seat for standard version until DN 400 XG design and DN 600 XGS design,
 - Powder epoxy coating,
 - Stainless steel bolting,
 - Stainless steel pilot circuit tube and fittings,
 - Pilot circuit strainer with screen in stainless steel,
 - Individually packed.
- **Easy operation and maintenance:**
 - Visual position indicator with manual drain,
 - Including isolating valve(s) for pressure gauges,
 - Equipped with opening/closing speed controller "RFO" (DN 50 to 300 XG design, and DN 150 to 400 XGS design only),
 - Chamber isolating valve independent from the adjustment of the speed controller,
 - Maintenance without disassembly from the pipeline.
- Altitude pilot valve located on the Hydrobloc main valve (not in the reservoir).
- Product according to standard EN 1074- 5.
- Two level closing/opening type, please consult us.
- Drain plug (stainless steel).

Technical data

- **Range:**
 - DN 50 to 600 for XG design.
 - DN150 to 700 for XGS design.
 - DN 800 to 1000 XG and XGS design, please consult us.
- PN 16.
- Maximum temperature: +1°C to +65°C.
- Seating: class A according to standard ISO 5208-2.
- Face-to-face dimensions according to standards EN 558-1 series 1 (except DN 1000) and ISO 5752 series 1 (except DN 1000).
- Flange drilling according to standards EN 1092-2 and ISO 7005-2: ISO PN 10, 16 or 25 for DN 50 to 1000 (other drillings, please consult us).
- Fluid: drinking water or 2 mm filtered untreated water.
- Adjustment range: 1.5 to 30 mWH (other values, please consult us).



DN 50 XG to 300 XG and DN 150 XGS to 400 XGS



Item	Designation	Qty	Materials	Standards
Main Valve				
201	Body*	1	Ductile iron/EN-GJS-450-10	EN 1563
202	Bonnet**	1	Ductile iron/EN-GJS-450-10	EN 1563
203	Seat	1	Stainless Steel 316/X5CrNiMo17-12-2	EN 10088
204	Stem	1	Stainless Steel 420 / X20Cr13	EN 10088
205	Valve disc holder**:	1	Cast iron/EN-GJL-250	EN 1561
	DN50XG to 200XG		Ductile iron/EN-GJS-450-10	EN 1563
	DN250XG to 300XG		Cast iron/EN-GJL-250	EN 1561
	DN150XGS to 250XGS		Ductile iron/EN-GJS-450-10	EN 1563
	DN300XGS to 400XGS		Cast iron/EN-GJL-250	EN 1561
206	Valve disc fastener	1	Stainless Steel 316/X5CrNiMo17-12-2	EN 10088
207	Resilient valve disc	1	Elastomer / EPDM	
208	Diaphragm	1	Textile reinforced elastomer / CR	
209	Upper diaphragm holder**:	1	Cast iron/EN-GJL-250	EN 1561
	DN50XG to 150XG		Ductile iron/EN-GJS-450-10	EN 1563
	DN200XG to 300XG		Cast iron/EN-GJL-250	EN 1561
	DN150XGS to 200XGS		Ductile iron/EN-GJS-450-10	EN 1563
	DN250XGS to 400XGS		Cast iron/EN-GJL-250	EN 1561
210	Guide bushing	1	Bronze / CuSn12	EN 1982
211	Drain plug**	1	Stainless Steel 316L/X2CrNiMo17-12-2	EN 10088
212	Spring	1	Stainless Steel 302 / X10CrNi18-08	EN 10088
213	Stop ring	1	Stainless Steel 302 / X10CrNi18-08	EN 10088
214	Indicature stem	1	Stainless Steel 321 / X6CrNiTi18-10	EN 10088
14	Visual position indicator	1	Copper-alloy+Glass+Elastomer / CuZn39Pb3+Glass+EPDM	EN 12164
	O-ring	acc/DN	Elastomer / EPDM	
	Bolting and washers	acc/DN	Stainless Steel 304L / X2CrNi 18-9	EN 10088
Pilot circuit				
1	Upstream isolating valve	1	Nickel plated Copper-alloy	
2	Strainer	1	Bronze+Copper-alloy+Stainless Steel	
3	Small orifice plate / Restrictor	1	Stainless Steel 303 / X8CrNiS18-9	EN 10088
7	Downstream isolating valve	1	Nickel plated Copper-alloy	
9	Chamber isolating valve	1	Nickel plated Copper-alloy	
10.3	Opening/Closing speed controller	1	Copper-alloy+Stainless Steel+EPDM	
53	3/8" Altitude pilot valve	1	See details opposite	
BL	Chamber feed box / Combi bloc	1	Bronze / CuSn12	EN 1982
250	Pilot circuit tube	acc/DN	Stainless Steel 316L/X2CrNiMo17-12-2	EN 10088
	Pilot circuit fittings***	acc/DN	Stainless Steel 316L/X2CrNiMo17-12-2	EN 10088
	Isolating valve for pressure gauges*** (at the inlet only)	1	Nickel plated Copper-alloy	

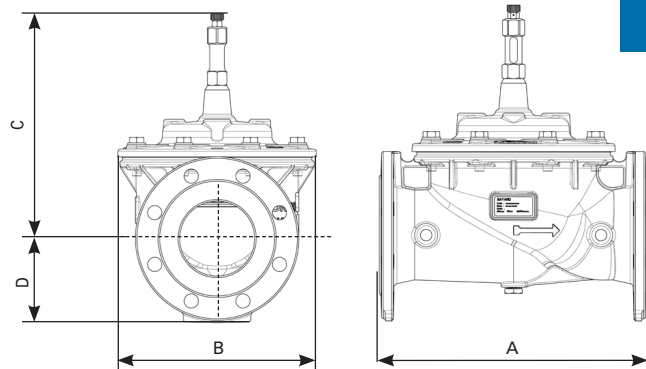
Drawing and part list for DN50XG to 300XG and DN150XGS to 400XGS. Other DN, please consult us.

* Blue epoxy coating.

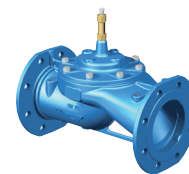
** Epoxy cataphoresis coating + blue epoxy coating.

*** Non represented (pressure gauges optional).

"HYDRO" ALTITUDE VALVE DN 50 to 1000 - Series K3 10



Globe pattern.
Single Chamber.
XG and XGS design
from DN 350.



Globe pattern.
Single Chamber.
XGS design until
DN 300.

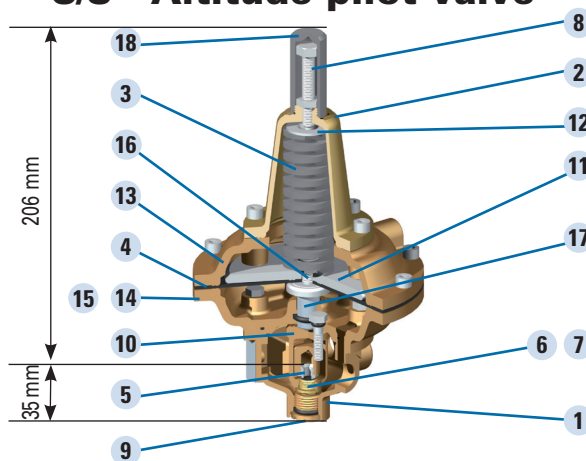
DN	XGS design					XG design			
	A mm	B** mm	C*** mm	D mm	Weight kg	B** mm	C*** mm	D mm	Weight kg
50*	230	-	-	-	-	173	238	84.5	14.2
65*	290	-	-	-	-	198	257	94.5	18.7
80*	310	-	-	-	-	226	277	102	22.6
100	350	-	-	-	-	265	302	120	35.1
125	400	-	-	-	-	307	396	137	42.7
150	480	265	302	140	43.2	351	443	152	67.9
200	600	351	443	182	80.8	436	567	182	116.8
250	730	436	580	212	134.9	524	609	212	156.7
300	850	524	631	242	193.3	606	657	242	219.0
350	980	606	657	278	249.3	-	-	-	-
400	1100	606	657	312	270.4	835	847	355	540.0
500	1250	835	847	367	600.0	-	-	-	-
600	1450	835	847	422.5	717.0	1085	1229	422.5	1205.0
700	1650	1085	1229	480	1421	-	-	-	-

* Double drilling on DN 50, 65, 80 ISO PN16 flanges, respectively 40/50, 60/65, 80-4/8 holes. Simple drilling, please consult us.

*** Add 100 mm on both sides to B for pilot circuit dimension on standard product, pressure gauges excluded (other construction, please consult us).

*** Add 150 mm to C for pilot circuit height on standard product (other construction, please consult us).

3/8" Altitude pilot valve



Item	Designation	Qty	Materials	Standards
1	Body	1	Bronze / CuSn12	EN 1982
2	Bonnet	1	Bronze / CuSn12	EN 1982
3	Spring : 1.5 to 8 mWH	1	Steel / CrV	
	6 to 30 mWH*		Steel / CrV	
4	Diaphragm	1	Textile reinforced elastomer / NBR	
5	Seat	1	Stainless Steel 316L / X2CrNiMo17-12-2	EN 10088
6	Valve disc fastener	1	Bronze / CuSn12	EN 1982
7	Resilient valve disc	1	Elastomer / EPDM	
8	Setting screw	1	Stainless Steel 304L / X2CrNi18-09	EN 10088
9	Lower guide	1	Bronze / CuSn12	EN 1982
10	Valve stirrup	1	Bronze-aluminium / CuAl9	EN 1982
11	Upper diaphragm holder	1	Stainless Steel 420 / X20Cr13	EN 10088
12	Spring base plate	1	Stainless Steel 316L / X2CrNiMo17-12-2	EN 10088
13	Upper intermediate part	1	Bronze / CuSn12	EN 1982
14	Lower intermediate part	1	Bronze / CuSn12	EN 1982
15	Air drain valve (not symbolized)	1	Nickel plated Copper-alloy	
16	Shaft	1	Stainless Steel 316L / X2CrNiMo17-12-2	EN 10088
17	Bushing	1	PETP	
18	Cap	1	PVC	
	O-ring	acc/DN	Elastomer / EPDM	
	Bolting	acc/DN	Stainless Steel 304L/X2CrNi18-9	EN 10088

* Drawing and part list for 3/8" altitude pilot valve. Other sizes, please consult us.

The technical data and performance can be modified
without prior notice depending on the technical evolution.

PPHT06-01-147A-EN

Operating principle

- Please refer to the general manual on Hydrobloc control valves (series K) for performances, operating principle, and options available for the products.
- **Altitude control function**
The altitude pilot valve (item 53) is linked to the reservoir through a pressure sensing line (tube, fittings and isolating valve not supplied). The measured water height in the reservoir operates under the diaphragm of the pilot, exerting a thrust opposite to the spring force:
 - If the reservoir level rises, the altitude pilot valve (item 53) closes, causing the main valve to close.
 - If the level drops, the altitude pilot opens, causing the main valve to open.

The device maintains a constant reservoir level, on condition that the entering flow rate is higher than the demand.

The main valve copies the movement of the pilot valve.

• Performances:

- The use of a pilot with a wide diaphragm guarantees excellent operating accuracy (the closing level remains within ± 10 cm of the set value).
- On occasion, when the demand is higher than the entering flow rate, the altitude control valve fully opens, and enabling supply with a low pressure drop (see below the choice of the diameter).
- Usually, the valve opens fully when the level in the reservoir drops to 40 to 50 cm below the closing level.

Sizing of the Hydrobloc

How to choose the design

Up from DN150 the BAYARD range offers two different versions: XG and XGS design. The decision which design to take depends on the required application and on the pressure and flow rate conditions.

- The XGS design specially fits when available differential pressure is important and when there is a risk of cavitation.
- The XG design suits better for low head loss conditions.

Recommended velocity (VE*)

	XGS design	XG design
	m/s	m/s
Permanent maxi velocity	4	5
Exceptional maxi velocity	6	7

How to choose the diameter

To size an altitude control valve, following information concerning the network hydraulic and reservoir operating conditions is required:

- The maximum static pressure, when valve is closed (PSM),
- The network or the upstream pipeline flow capacity, i.e. the maximum flow (QM) with end of line valve totally open to be compared with average flow required (Q) in the project.

Case 1:

If the maximum static pressure is low ($PSM < 1$ bar) or if upstream flow capacity (QM) is lower than the average flow required (Q) (even if $PSM > 1$ bar), we advise to «oversize» the valve.

A maximum equivalent speed (VE) of 2 m/s is recommended for XGS design, and 2.5 m/s for XG design. At this speed the minimum pressure drop of the open main valve is:

- Between 3 and 5 mWH for XGS design (depending on the DN),
- Between 2 and 3 mWH for XG design (depending on the DN).

Case 2:

If the PSM is high and the flow capacity (QM) is higher than the average flow required (Q), then higher velocities can be admitted (beforehand check that the available head loss is higher than the head loss through the fully open valve at the maxi considered flow rate):

- 4 m/s for permanent maxi velocity, and 6 m/s for exceptional maxi velocity on XGS design,
- 5 m/s for permanent maxi velocity, and 7 m/s for exceptional maxi velocity on XG design.

Recommended flow rates (l/s)

		VE*/ DN	50	65	80	100	125	150	200	250	300	350	400	500	600	700	800	900	1000
XGS Design	Case 1 Mini flow rate	0.2	-	-	-	-	-	3.5	6.3	9.8	14	19	25	39	57	77	-	127	157
	Maxi permanent flow rate	2	-	-	-	-	-	35	63	98	141	192	251	393	565	770	-	1272	1571
	Case 2 Mini flow rate	0.4	-	-	-	-	-	7.1	13	20	28	38	50	79	113	154	-	254	314
	Maxi permanent flow rate	4	-	-	-	-	-	71	126	196	283	385	503	785	1131	1539	-	2545	3142
XG Design	Case 1 Mini flow rate	0.2	0.4	0.7	1	1.6	2.5	3.5	6.3	9.8	14	-	25	-	57	-	101	-	-
	Maxi permanent flow rate	2.5	4.9	8.3	13	20	31	44	79	123	177	-	314	-	707	-	1257	-	-
	Case 2 Mini flow rate	0.4	0.8	1.3	2	3.1	4.9	7.1	13	20	28	-	50	-	113	-	201	-	-
	Maxi permanent flow rate	5	9.8	17	25	39	61	88	157	245	353	-	628	-	1414	-	2513	-	-

*VE (m/s) = Equivalent velocity: average velocity in the inlet section (DN).

Cavitation

It is recommended to use the cavitation diagram which is included in the general manual for Hydrobloc control valves (series K) in order to check for safe operation area.

Adjustment ranges

The following table shows the adjustment range in function of the diameter (DN) and the type of pilot. It is recommended to previously mention the H height: difference between the pilot valve and the closing level required. The H value determines the choice of the spring.

XGS design	DN XG design	Pilot	Springs adjustment range
150 to 400	50 to 300	3/8"	1.5 to 8 mCE - standard 6 to 30 mCE - alternative
500 to 700	400 to 600	3/4"	20 to 40 mCE - other values, please consult us 1.5 to 8 mCE - standard 6 to 30 mCE - alternative

Installation

- Installation and maintenance manual delivered with the product, and available if necessary on request.
- Typical installation drawings are shown below. It is recommended to fit a strainer box (3) and upstream (2) and downstream (2) isolating valve for secure working conditions and easy maintenance. An air valve (1) or Vannair (1) is required upstream the device if the pipeline rises or is in a horizontal position ; a vertical installation is possible on request (consult us first).
- For a proper operation, the pressure sensing line of the pilot valve (tube, fittings and isolating valve (5) not supplied) must be linked either directly to the reservoir (fig. 1, 2, 3) or on a ducting without flow directly fitted to the reservoir (fig. 4), external drain pipe for example (static pressure measure).
- In case of mounting in a manhole, it must be sufficient spacious and accessible to allow easy checking of the pressure gauges (optional) and position indicator, as well as maintenance operations. Required minimum free space (to adapt according to valve diameter):
 - All around the device and above: 1 m,
 - Below the device: 0.20 m.
- The manhole must be fitted with draining or water evacuation facilities.
- The pressure difference between the upstream and downstream creates a thrust which can be quite powerful. Therefore, in order to ensure no movement of the valve and pipeline, it is necessary then to install a chocking device.

Fig. 1
Supply from above

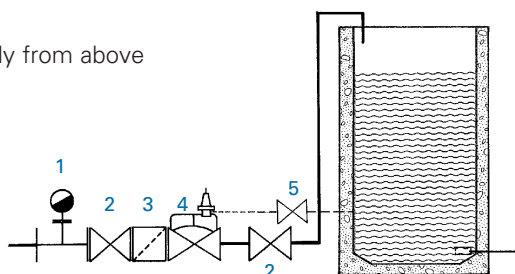


Fig. 2
Supply from below

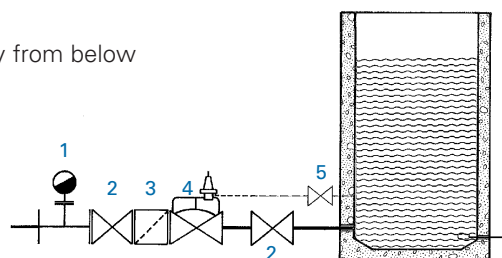


Fig. 3
Supply - distribution

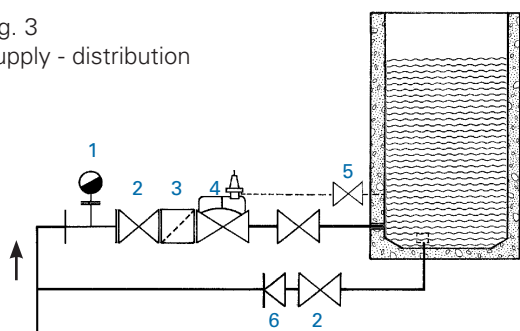
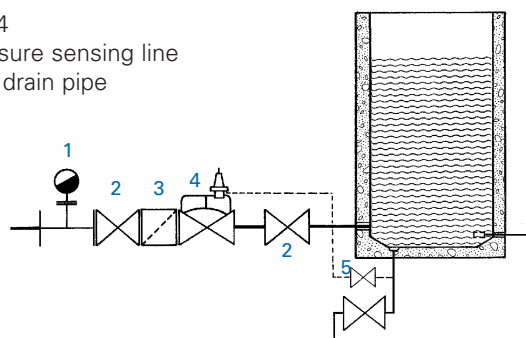


Fig. 4
Pressure sensing line
on a drain pipe



- 1 Air relief valve (simple or double orifices) 4 Hydro Altitude control valve
2 Soft sealing gate valve 5 Isolating valve
3 Strainer box 6 Check valve

Maintenance

Please refer to installation and maintenance manual delivered with the product.

Particular applications

For the options available with the main valve or the pilot circuit, check the general manual for Hydrobloc control valves (series K).

Please contact us for specific applications, mentioning the conditions of use (upstream and downstream pressures, minimum and maximum flow rates, height and level of the reservoir, type and conditions of installation, required functions, etc.).