

# Automatic Control Valves WATTS EU 100 Series



The Watts Industries range of automatic control valves consist of a hydraulically operated valve, which is controlled by a pilot circuit. The main valve (EU 100) is the basis for all control valves and consists of three main parts: body, cover and valve assembly, which includes a diaphragm.

The valve can control a range of applications simply by changing the pilot circuit, these include pressure reduction & sustaining, level control, pressure relief and many more. In most cases functions can be added at a later stage without removing the valve from the line, opening a wide range of possibilities.



A Division of Watts Water Technologies Inc.

## OUR EUROPEAN PRESENCE

2



## CONTENTS

INTRODUCTION	4
PRESSURE REDUCING VALVE EU115	6
PRESSURE SUSTAINING/RELIEF VALVE EU116	7
RATE OF FLOW CONTROL VALVE EU114	8
SOLENOID ON/OFF AND PUMP CONTROL VALVE EU113	9
LEVEL CONTROL VALVES EU110 AND EU127	11
TECHNICAL SPECIFICATIONS	12
VALVE SELECTION AND SIZING	12
MATERIAL SPECIFICATIONS	13

## INTRODUCTION

4

The Watts Industries range of automatic control valves consist of a hydraulically operated valve, which is controlled by a pilot circuit. The main valve (EU 100) is the basis for all control valves and consists of three main parts: body, cover and valve assembly, which includes a diaphragm.

The valve can control a range of applications simply by changing the pilot circuit, these include pressure reduction & sustaining, level control, pressure relief and many more. In most cases functions can be added at a later stage without removing the valve from the line, opening a wide range of possibilities.

The only moving parts in the valve are the diaphragm and the valve assembly, which are guided by an exchangeable bearing in the cover and the valve seat. The nylon diaphragm is covered with rubber on both sides, creating a separate chamber in the upper part of the valve, and thus separating the control pressure from the pipe pressure.

The diaphragm is held in a special clamping construction between the body of the valve and the cover, thus minimizing strain to the diaphragm and ensuring longer service.

Extensive research and development looking at the ratio between the surface areas of the diaphragm and the seal ensures that the valve assembly will close if the pressure in the cover chamber and the inlet chamber are the same.



The seal on the valve assembly closing on to the valve seat guarantees a perfect and long lasting seal, allowing the control valve to act as a leak tight on/off valve at the same time.

The pilot circuit is equipped with a strainer, which ensures that the pilot valve will not become blocked, plus the valve needs no lubrication, has a simple construction and therefore requires little maintenance. Also a long service life is assured. Any work that is required can be done with the valve in position and therefore maintenance can be undertaken on site, reducing down times.

**Operation**

The sectional drawings below show a basic valve equipped with a simple on/off control pilot, mounted in the control tubing connected to the outlet side, and a restriction or needle valve on the inlet side of the valve.

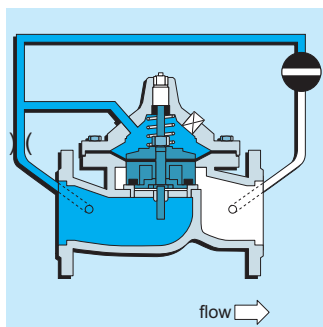
The control valve can perform three tasks:

- open
- close
- regulate

**Note**

In all situations the main valve follows the movements of the control pilot

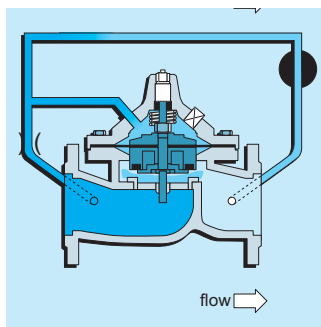
) ( = restriction



Basic valve closed

**Basic valve closed**

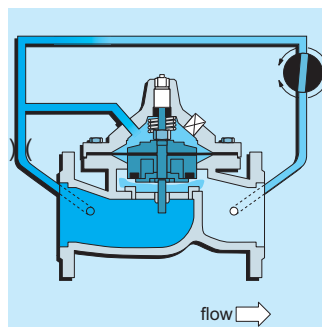
The control pilot does not drain liquid. The medium is being transported in through the inlet side: the main valve closes progressively.



Basic valve open

**Basic valve open**

The control pilot drains more medium than is being added through the restriction: the main valve opens progressively.

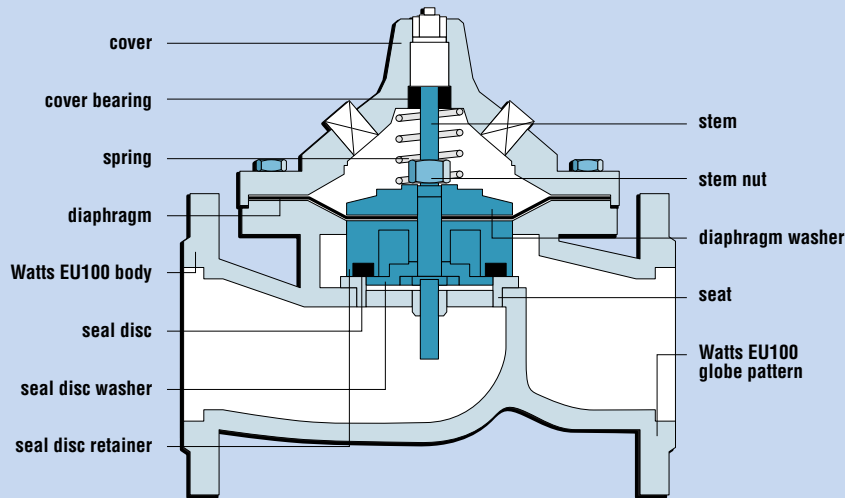


Basic valve regulates

**Basic valve regulates**

When a balance between supply and drain of medium is reached then the main valve is hydraulically placed in the correct position.

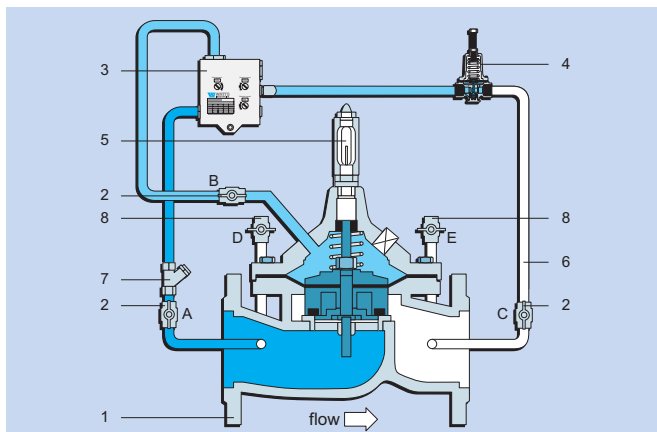




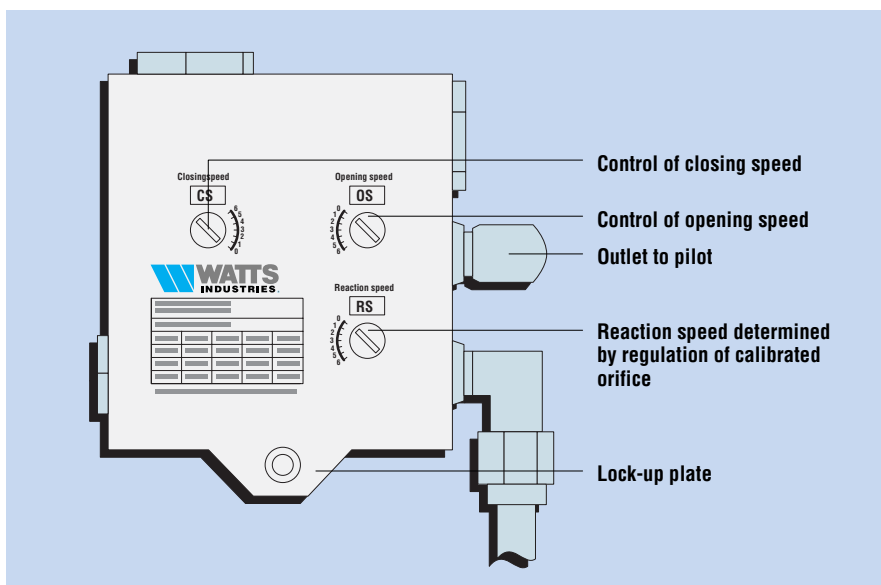
For material specifications see page 13

### Characteristics of the basic valve:

- Minimal friction  
The diaphragm-operated stem assembly allows frictionless movement, causing a negligible hysteresis.
- Low maintenance  
The valve has only one moving part, which guarantees dependable operation with a minimum of maintenance.
- Epoxy coating  
All cast-iron parts are protected inside and out by an epoxy coating.
- Model  
Watts EU 100 globe pattern.
- Combinations of functions can be made with a single basic valve.



No.	Name
1	Body/Main Valve
2	Ball Valve
3	Control Unit EU900
4	Pilot Valve
5	Position Indicator
6	Piping
7	Y-strainer
8	Pressure Gauge Ball Valves
9	Varying per version
10	Varying per version



### Characteristics of the control unit:

The EU 900 is a centralized control unit which incorporates three main hydraulic functions in one compact and lockable unit.

- progressive regulating orifice for operating speed setting (positions 0 to 6)
- opening speed setting totally independent of closing speed setting
- control of closing speed
- manufactured from stainless steel
- lock-up plate provides tamper-proof settings

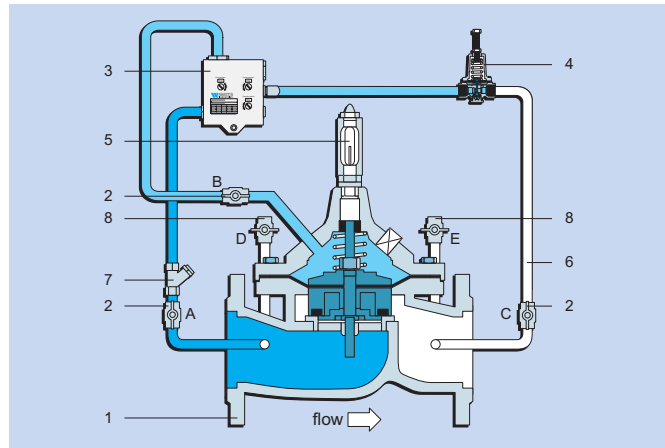
## PRESSURE REDUCING VALVE

6

**EU115**

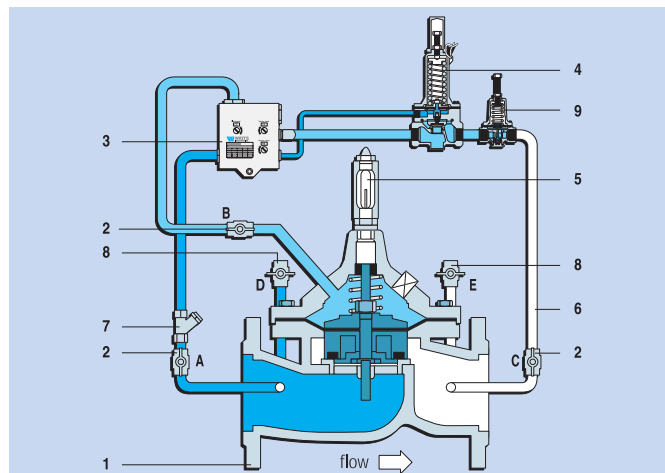
Pressure Reducing Valve reduces a higher upstream pressure to a constant lower downstream pressure.

The standard pressure range is: 1.4 - 12 bar  
On request: 0.1 - 2 bar  
7 - 21 bar

**EU115-02**

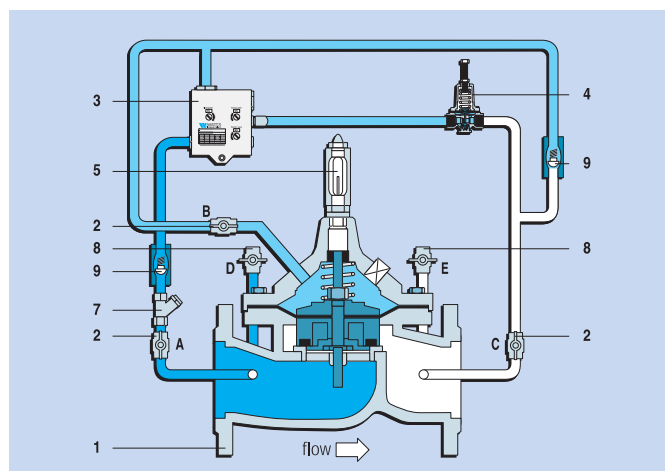
Pressure Reducing/Sustaining Valve reduces a higher upstream pressure to a constant lower downstream pressure but will close to maintain the upstream pressure should the supply pressure fall below a set point.

The standard pressure range is: 1.4 - 12 bar  
On request: 0.1 - 2 bar  
7 - 21 bar

**EU115-03**

Pressure Reducing Valve with Check valve function reduces a higher upstream pressure to a constant lower downstream pressure. When the downstream pressure exceeds the upstream pressure the main valve closes.

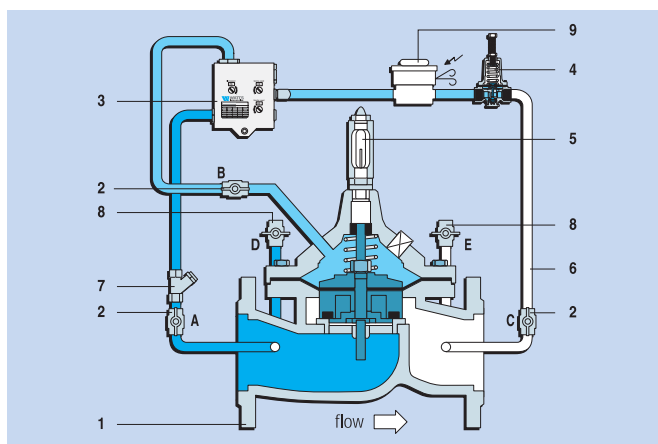
The standard pressure range is: 1.4 - 12 bar  
On request: 0.1 - 2 bar  
7 - 21 bar



## EU115-04

Pressure reducing valve with a solenoid operated On/Off function that can be controlled remotely via an electrical signal.

The standard pressure range is: 1.4 - 12 bar  
On request: 0.1 - 2 bar  
7 - 21 bar



Also available:

**EU115-07** Pilot operated Pressure Reducing Valve/Surge Valve for rapidly decreasing flow rate systems

**EU115-11** Pilot operated Pressure Reducing and Sustaining Valve with solenoid On/Off function

**EU115-51** Pilot operated Pressure Reducing Valve with Low Pressure Shut-Off function

**EU115HL-AS** Dual Set point Pressure Reducing Valve Auto Shift for low and high flow demands

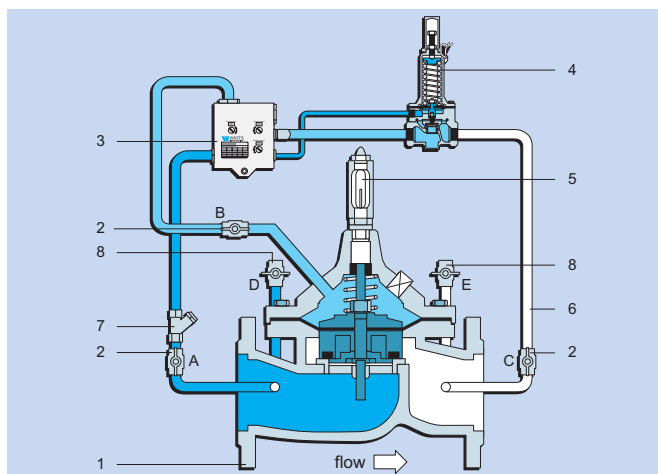
Other combinations on request.

## PRESSURE SUSTAINING/RELIEF VALVE

### EU116

Pressure Sustaining/Relief Valve maintains a constant upstream pressure by relieving excess upstream pressure to the downstream of the valve.

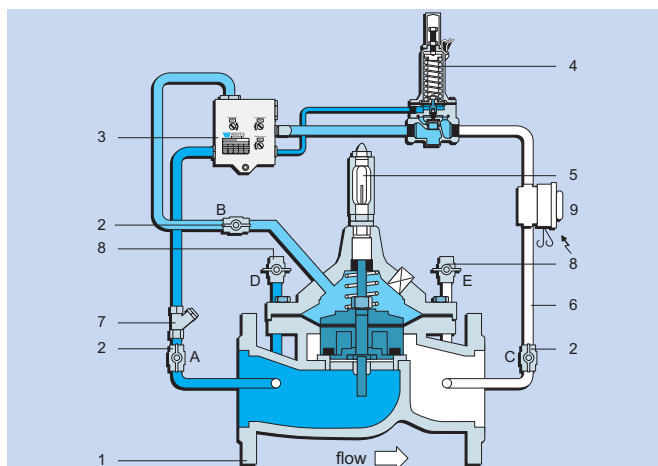
The standard pressure range is: 1.4 - 12 bar  
Other pressure ranges on request.



### EU116-31

Pressure Sustaining/Relief Valve maintains a constant upstream pressure by relieving excess upstream pressure to the downstream of the valve. The solenoid operated On/Off function can be operated via an electrical signal to override the sustaining/relief function.

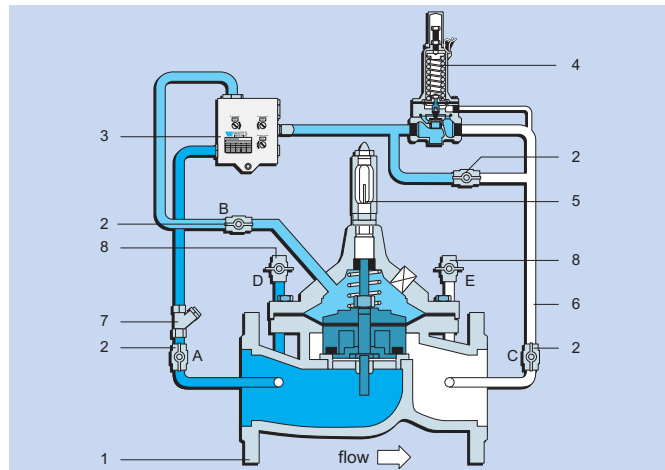
The standard pressure range is: 1.4 - 14 bar  
The standard Solenoid: 230 V AC, NC,  
0.2-16 bar.  
Other pressure ranges and solenoids on request.



## EU116-34

Low Pressure Shut-off Valve with Manual Reset closes when the downstream pressure drops below a (adjustable) set point. The Manual Reset permits the valve opening to restore downstream pressure.

The standard pressure range is: 1.4 - 14 bar  
Other pressure ranges on request.



Also available:

**EU116-05**

Pressure Sustaining/Relief Valve with Check Valve function

**EU116-23**

Pressure Differential Relief Valve

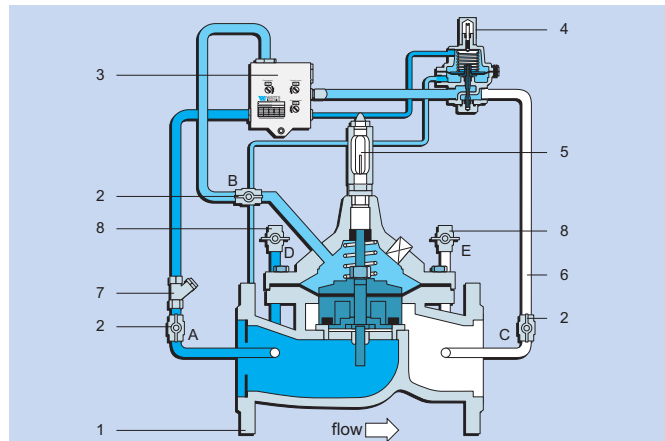
**EU116-52**

Surge Anticipation Control Valve

## RATE OF FLOW CONTROL VALVE

## EU114

Flow Control Valve maintains an adjustable maximum constant flow rate independent of the inlet pressure.

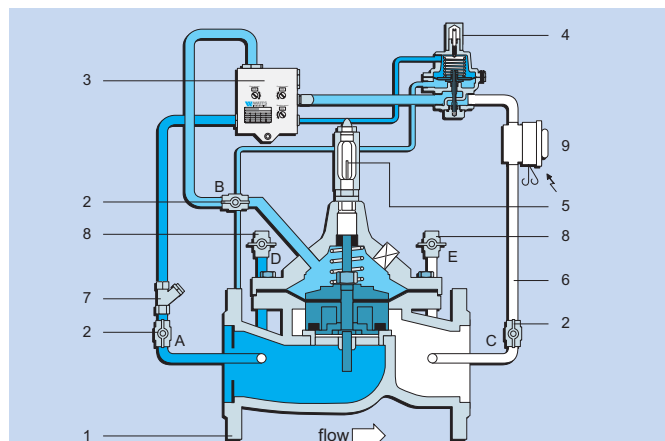


## EU114-01

Flow Control Valve maintains an adjustable maximum constant flow rate independent of the inlet pressure.

The solenoid operated On/Off function can be operated via an electrical signal to override the rate of flow control function.

The standard Solenoid: 230 V AC, NC,  
0.2-16 bar.  
Other pressure ranges and solenoids on request.

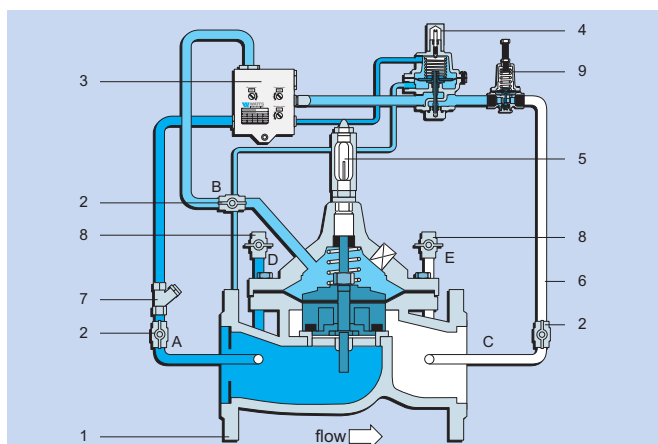




## EU114-02

Flow Control/Pressure Reducing Valve maintain an adjustable constant flow rate and reduces a higher upstream pressure to a constant lower downstream pressure.

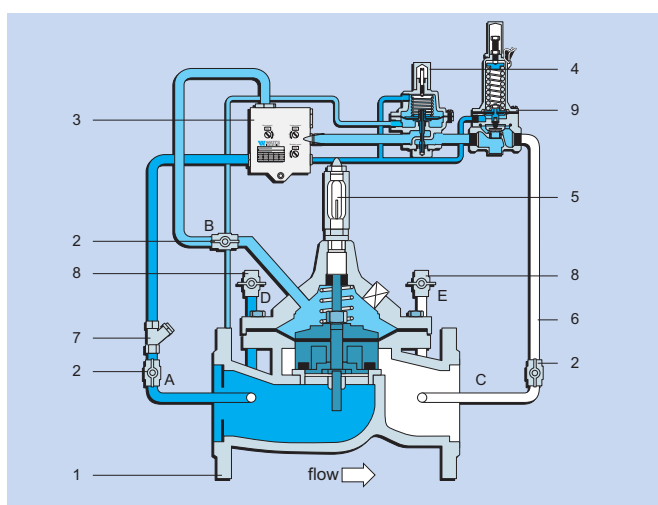
The standard pressure range is: 1.4 - 12 bar  
Other pressure ranges on request.



## EU114-08

Flow Control/Pressure Sustaining Valve maintain an adjustable constant flow rate and prevents that the upstream pressure drops below a set point.

The standard pressure range is: 1.4 - 14 bar  
On request: 0.1 - 2 bar  
7 - 21 bar



Also available:

**EU114-03**

Pilot operated flow control with check valve function

**EU117**

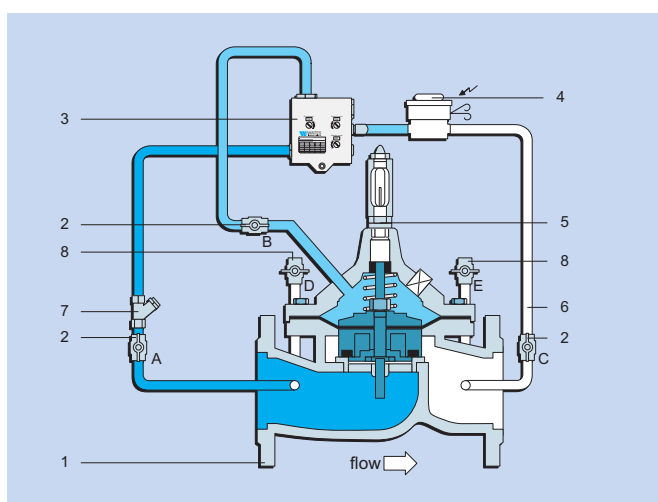
Pilot operated excess flow shut-off

## SOLENOID ON/OFF AND PUMP CONTROL VALVE

## EU113

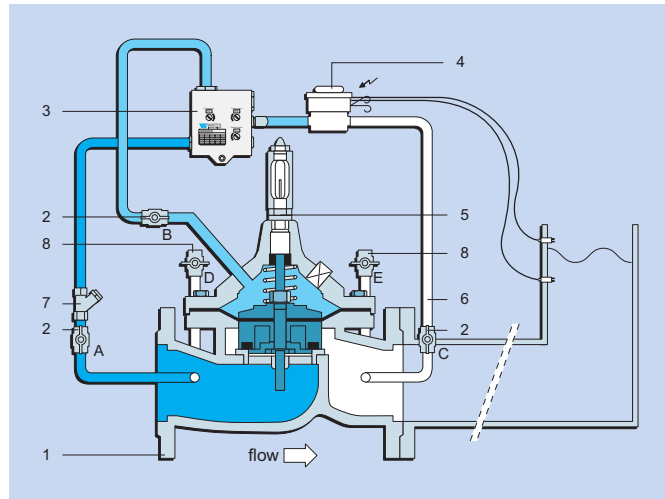
Solenoid Control On/Off Valve

Supplied with a 230V AC, normally closed, 0.1 - 16 bar solenoid as standard.  
Other options available on request.



## EU113-08

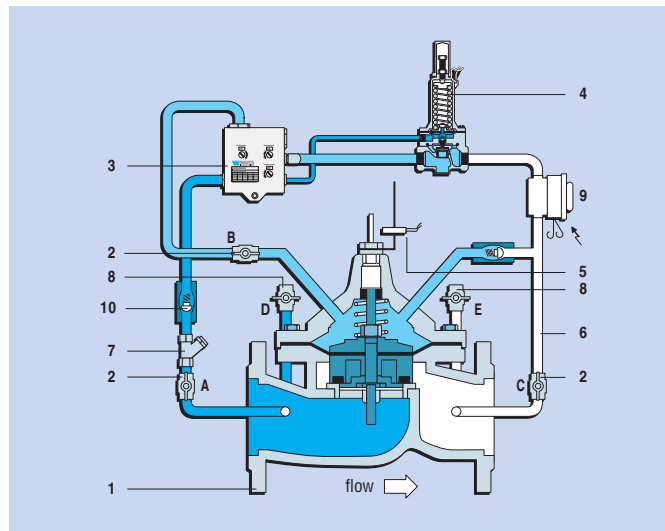
Solenoid operated Level Control Valve to maintain a constant level in a reservoir. If water is drawn from the reservoir then the level sensor will switch the solenoid allowing the main valve to open thus refilling the reservoir. Also suitable as overflow protection; pump protection; High level alarm. Opening and Closing speed adjustable.



## EU113-19

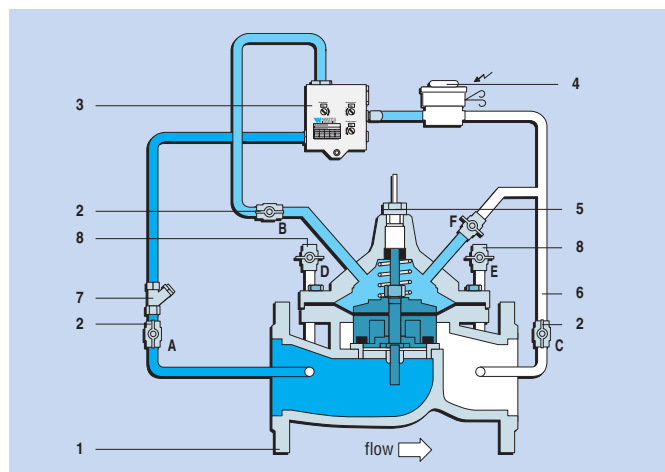
Booster Pump Control Valve with Pressure Sustaining and Check Valve function.

- Maintains a constant back pressure to pump
- Valve close when discharge pressure exceeds inlet pressure (power failure or pump failure)
- Opens at a controlled rate on pump start-up (adjustable)
- Closes at a controlled rate on pump shut-off (adjustable)



## EU113B

Fire Protection Valve opens when the mains power fails. Manual operated in case of power system failure.



Also available:

### EU113-40

Solenoid Controlled/Electronically Positioned Valve

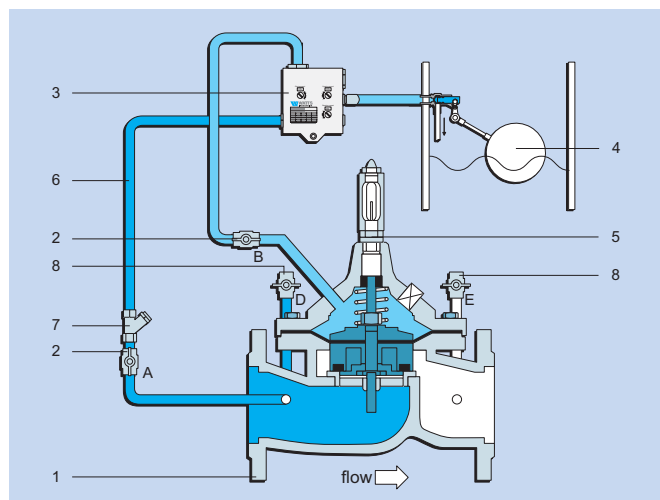
## LEVEL CONTROL VALVE

### EU110-10

Modulating Float Valve to maintain a constant level. The pilot can be mounted away from the main valve.

Opening and Closing speed adjustable.

(10 mm piping from the main valve to the pilot is not included)

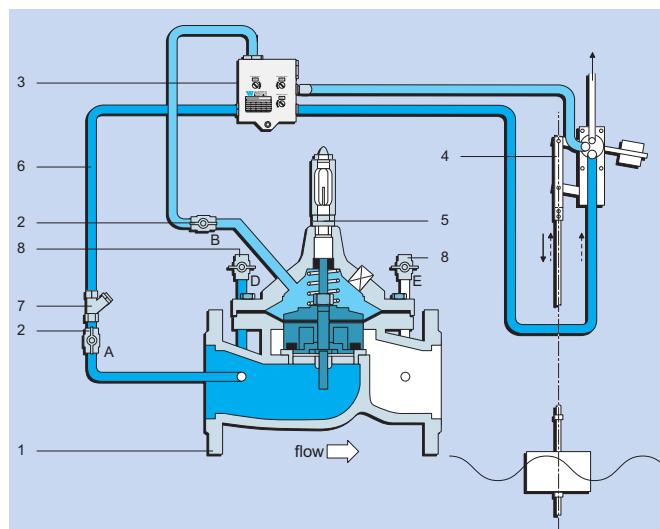


### EU110-14

On/Off Float Valve with adjustable Hi/Lo level, to maintain a constant level. The main valve opens when the (adjustable) minimum level is reached and closes when the (adjustable) maximum level is reached. The difference between the minimum and maximum level is between 0,5 and 2 metres.

Opening and Closing speed adjustable.

(10 mm piping from the main valve to the pilot is not included)



### EU127-01

Pilot operated Altitude Valve to maintain a constant (adjustable) level. If the water is drawn from the reservoir, head pressure is lowered and the main valve opens.

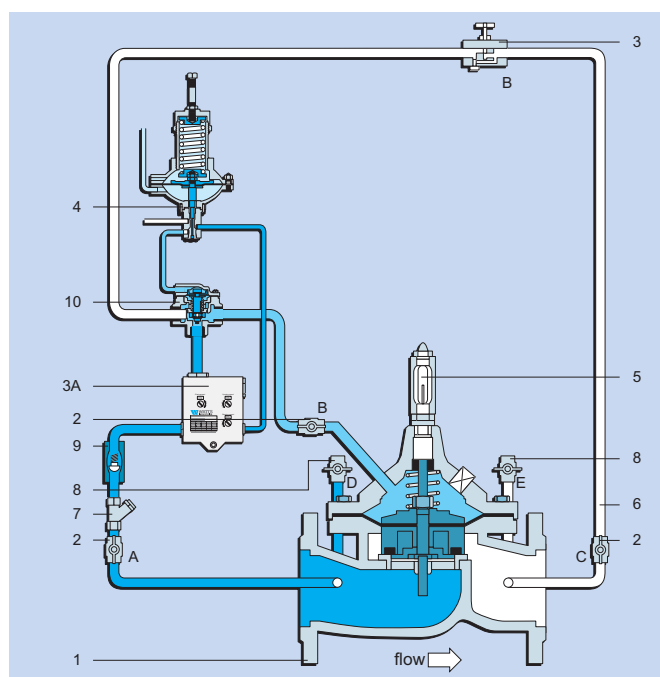
Standard range: 3 - 20 MWC

On request: 1 - 6 MWC

15 - 65 MWC

Opening and Closing speed adjustable.

(piping from the main valve to the basin)



Also available:

**EU110-22**

Pilot operated Float Valve with Flow Control function

**EU127-08**

Pilot operated Altitude Valve with Pressure Sustaining function

## TECHNICAL SPECIFICATIONS

**Build-in lengths:** ISO 5752 series 1, DIN 3202 series F1  
NFE 29305 series 1
**Test standards:** ISO 5208, NFE 29311**Flanges:** ISO 7005-2: PN10, PN16**Body/cover test:** 40 bar**Sealing:** 28 bar

## VALVE SELECTION AND SIZING

**Practical method**

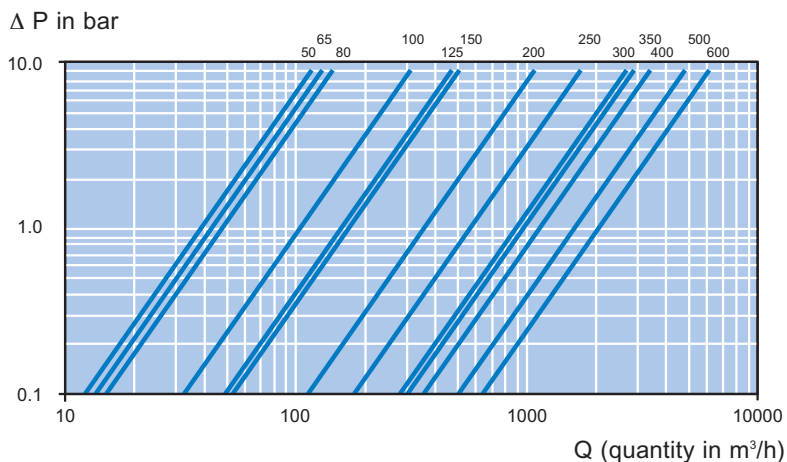
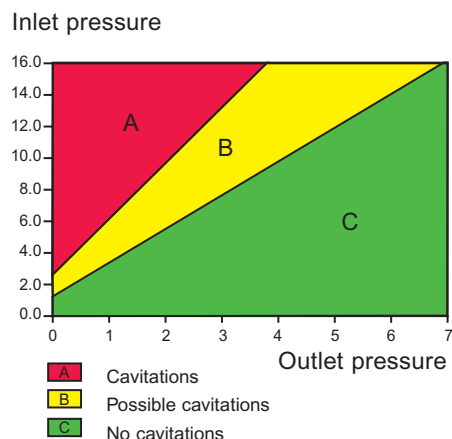
Not applicable to control valves EU116 and EU114 (based on velocity V (m/s), measured at main valve inlet).

Recommended quantity/interval (l/s) / (m³/h)										
DN	minimum				recommended		max.		max.	
					continuous				peak	
	1 P ≤ 2,5 bar		1 P > 2,5 bar		V = 2,3 m/s		V = 3,4 m/s		V = 4,3 m/s	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
50	0,35	1,25	1,07	3,85	4	15	7	25	8	29
65	0,35	1,25	1,07	3,85	8	28	11	40	14	50
80	0,35	1,25	1,07	3,85	12	43	17	61	22	79
100	0,53	1,90	1,63	5,85	18	65	27	97	34	122
125	0,83	3,0	2,56	9,20	28	101	42	151	53	191
150	0,83	3,0	2,56	9,20	41	148	60	216	76	274
200	1,63	5,85	5,00	18,00	72	259	107	385	135	486
250	2,56	9,20	7,85	28,25	113	407	167	601	211	760
300	3,75	13,50	11,53	41,50	162	583	240	864	304	1094
350	3,75	13,50	11,53	41,50	221	796	327	1177	413	1487
400	5,28	19,00	16,25	58,50	289	1040	427	1537	540	1944
500	7,36	26,50	22,64	81,50	451	1624	667	2401	844	3038
600	10,00	36,00	30,70	110,50	650	2340	961	3460	1215	4374
distribution systems							irrigation		fire	
									protection	
applications										

Maximum flow for EU114.

DN	CAPACITY
	m³/h
DN50	-
	5->11
	10->25
DN65	8->30
	15->55
DN80	10->40
	30->70
DN100	20->50
	35->80
DN125	40->110
DN150	60->200
DN200	70->230

Other ranges on request.

**Pressure Loss Curve**

**Cavitation Curve**

**Minimum required pressure difference for opening valve**

Basic valve EU 100 (chamber connected to device outlet):

- with standard spring 0.10 bar

Regulating valve:

- with standard spring 0.25 bar

**Maximum rate of flow (measured at valve inlet):**

Maximum continuous 3.4 m/s

Maximum peak 4.3 m/s (if higher rates occur, contact your supplier)

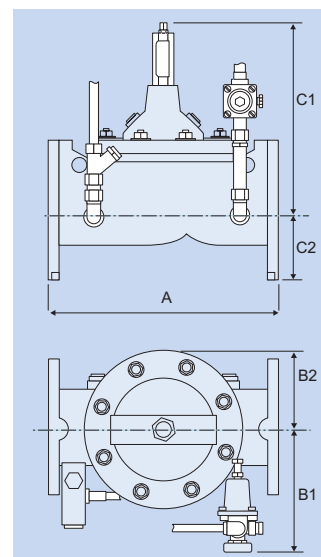
It is to be recommended to install the valves horizontally.

**MATERIAL SPECIFICATIONS**

Main valve		Pilot circuit	
Body/cover/ Diaphragm plates	Ductile iron GGG 40, inside and outside epoxy coating min. thickness 150 m	Control pilot:	
Cover bearing	Stainless steel	• Body/cover	Bronze/SS/nickel-plated
Seat/valve	Stainless steel	• Seat	Stainless steel
Valve stem/stem nut	Stainless steel	• Rubber parts	NBR
Spring	Stainless steel	Fittings, tubing etc.	Nickel-plated brass/SS/brass
Studs/nuts	Stainless steel	Strainer	Nickel-plated brass
Seal disc	NBR nitrile rubber	Control unit	Stainless steel
Diaphragm	NBR nitrile rubber with nylon inlay according to FDA and European approvals		
	DN 50 - DN 150: single layer - thickness 1.3 mm		
	DN 200 - DN 600: double layer - thickness 3.2 mm		



DN	PN	A	B1	B2	C1	C2	Kg
50	10/16	230	160	85	265	85	20
65/60	10/16	290	170	85	265	95	25
80	10/16	310	175	85	265	100	30
100	10/16	350	190	120	310	110	40
125	10/16	400	200	150	385	125	70
150	10/16	480	210	150	385	145	90
200	10	600	235	200	460	170	150
200	16	600	235	200	460	170	150
250	10	730	280	255	570	200	400
250	16	730	280	255	570	200	400
300	10	850	305	300	650	230	550
300	16	850	305	300	650	230	550
350	10	980	330	300	650	255	700
350	16	980	330	300	650	260	700
400	10	1100	355	360	800	285	1100
400	16	1100	355	360	800	290	1100
500	10	1250	405	420	900	335	1250
500	16	1250	405	420	900	360	1250
600	10	1450	455	460	950	390	1550
600	16	1450	455	460	950	420	1550





### **Product range Watts Industries**

- System Disconnectors
- Backflow Protection Devices
- Check Valves
- Safety Units
- Safety Relief Valves
- Pressure Reducing Valves
- Automatic Control Valves
- Butterfly Valves
- Shut-Off Valves
- Measuring Gauges
- Temperature Control
- Expansion Vessels
- Process Switches
- Fuel Products
- Gas Products
- Electronic Controls
- Installation Protection Products
- Radiator Valves
- System Products
- Manifolds and Fittings



A Division of Watts Water Technologies Inc.

#### **Watts Industries Netherlands B.V.**

Kollergang 14, 6961 LZ Eerbeek, The Netherlands

Phone +31 313 673 700 - Fax +31 313 652 073

E-mail [info@wattsindustries.nl](mailto:info@wattsindustries.nl) - Site [www.wattsindustries.com](http://www.wattsindustries.com)