



## CONSTRUCTION PRODUCT TECHNICAL CARD

<b>Product feature:</b> <b>Flowmeters included</b>	<b>Energeo product:</b> <b>New BRADO – R</b>	 Sgn:EN.OZE.20-14.NBR-R
<b>Manufacturer:</b> ASPOL-FV Łódź, Helska st.39/45 www.aspol.com.pl	<b>Distributor well with multi-sectional manifolds</b>	
ENERGEO – GEOTHERMAL TECHNOLOGY FOR GROUND SOURCE HEAT PUMPS – RENEWABLE ENERGY SOURCES		

Legally protected brand according to the decision of the Polish Republic Patent Office

EN.OZE.20-14.NBR-R  
Uniform text dated 10 May, 2014

### 1. List of standards / legislation and other documents related to the product:

- PN-EN 10226-1:2006;
- PN-EN ISO 228-1:2005 PN-EN ISO 228-2:2005;
- PN-EN 12201-1:2012, PN-EN 12201-2:2012, PN-EN 12201-3:2012, PN-EN 12201-4:2013;
- PN-EN 805:2002; PN-EN 805:2002/Ap1:2006;
- PN-EN ISO 1167-1:2007, PN-EN ISO 1167-2:2007, PN-EN ISO 1167-3:2008, PN-EN ISO 1167-4:2008;
- PN-EN 1074-5:2002;
- PN-EN 1267:2012;
- PN-ISO 9624:2001;
- PN-ISO 9623:2001;
- PN-B-02481:1998;
- PN-C-88012:1999;
- PN-C-88013-3:1999;
- VDI 4640;
- DIN 8075:1999;
- EN.OZE-PS:20-14.01; Distributor well assembly guidelines;
- EN.OZE-WW:20-12.1; Ground source for heat pumps assembly guidelines.

### 2. New BRADO-R distributor well – a component of the Energeo\* system

The New BRADO-R distributor well is an element of ground source system for heat pumps. It consists of a *manifold* (collector) in-built into a plastic chamber (*well*).

**2.1 Manifold** – an element of the hydraulic system consisting of two cylindrical collector bars with radial collector (SK) flow sections. Material: HDPE-100/HDPE-100RC.

**Manifold flow line** – flowmeter with flow guard is mounted on each antifreeze circuit in order to provide proper hydraulic balance and adjustment. Every circuit is controlled, with the option of cutting-off (closing).

**Manifold return line** – cut-off ball valve for each antifreeze circuit.

*The manifold main functions are as follows:*

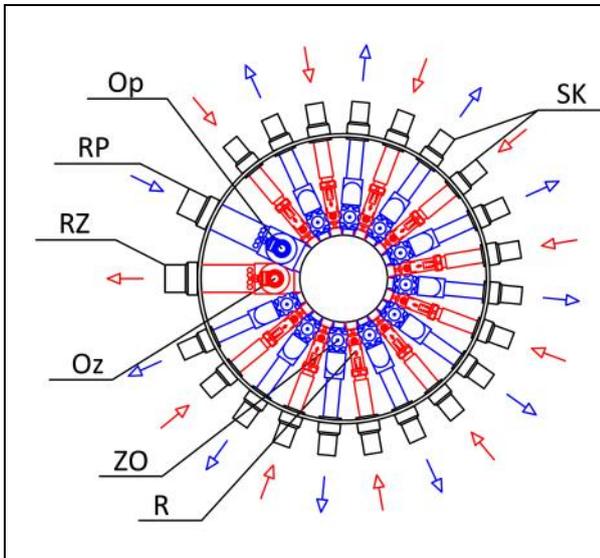
- Divide antifreeze liquid flowing from the heat pump through the manifold return line to the underground heat exchanger and transfer it back through the manifold flow line to the heat pump;
- Ensure hydraulic control, filling-up, cutting-off and venting.

Nickel plated brass internal thread socket (1/2 inch) for air vent, equipped with cut-off valve. Collector pipes (SK) and connection pipes (RD) are intended for both: electro-fusion and socket-welding techniques. Leak tightness is guaranteed by polyfusion welding method

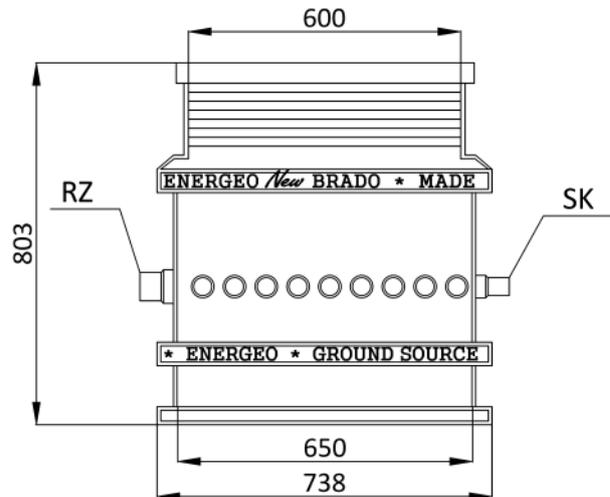
\* ENERCEO is a balanced hydraulic system developed to transfer geothermal energy from the ground, watercourses and water areas to the heat pump which provides energy for heating, cooling and hot water for dwellings, residential buildings and commercial facilities

2.2 Well – plastic manifold chamber which protects against soil pressure and enables service procedures.

**Installation – outside buildings, in the ground.**  
See “Distributor well assembly guidelines” EN.OZE-PS:20-14.01.

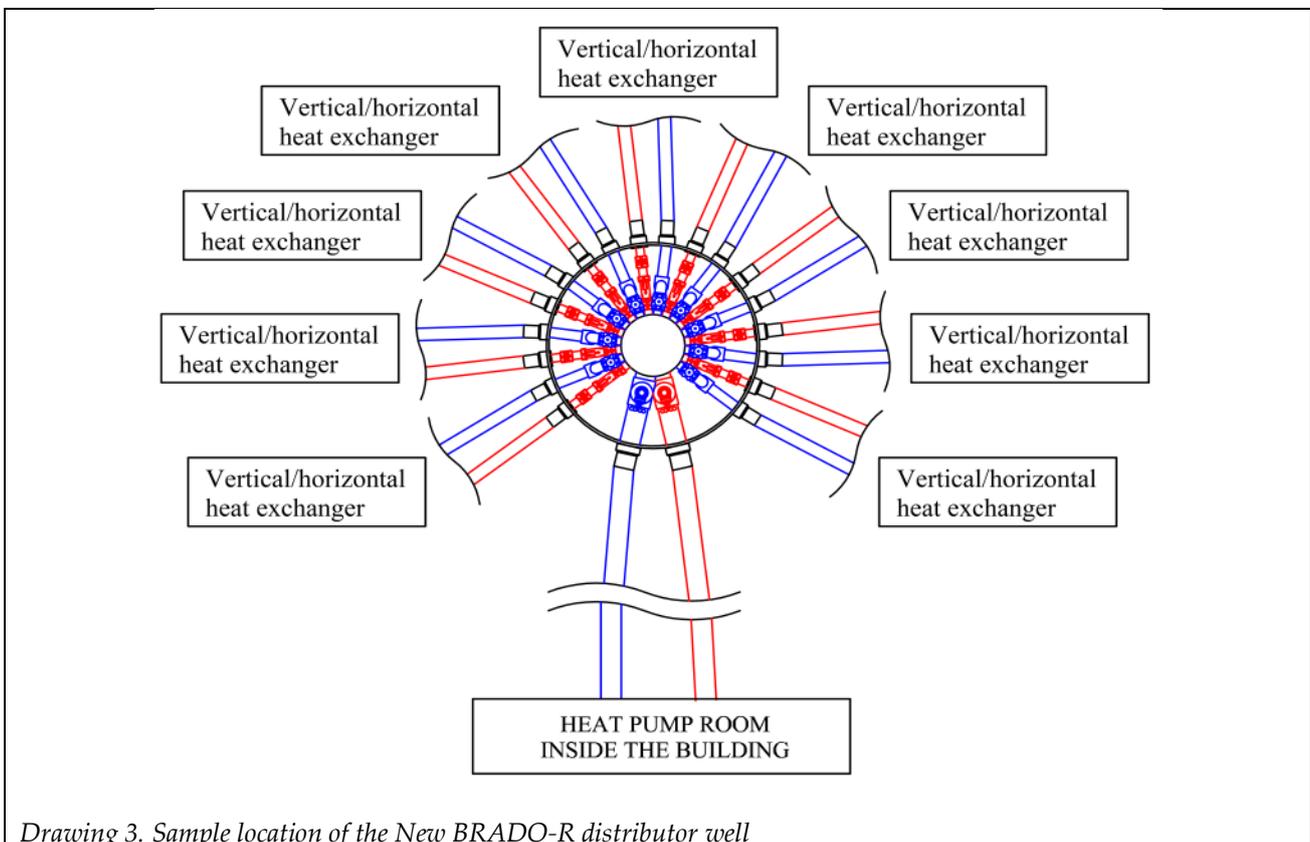


Drawing 1. New BRADO-R. Distributor well  
Cross-section



Drawing 2. New BRADO-R. Distributor Well.  
Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 3. Sample location of the New BRADO-R distributor well

### 3. Technical parameters of the New BRADO-R distribution well

Table 1. New BRADO - technical parameters

PARAMETER	New BRADO - R
Number of sections (SK)	2-12 [pairs]
Material of chamber/manifold	HDPE/HDPE
Manifold pressure class	PN16
Standard collector pipe diameter (SK)	25, 32, 40 [mm]
SK pipe welding method	Thermal polyfusion
Standard connection tube diameter (RD)	40, 50, 63, 75, 90 [mm]
RD pipe welding method	Thermal polyfusion
Diameter of manifold main supply	Ø200 [mm]
Nickel plated brass internal thread socket for air vent/ filling up	½"
A flowmeters range	2-12 [dm <sup>3</sup> /min]
B flowmeters range	8-38 [dm <sup>3</sup> /min]
C flowmeters range	20-70 [dm <sup>3</sup> /min]
Angle flowmeters range	5-50 [dm <sup>3</sup> /min]
Dimensions: Height/outside bottom part diameter/inside diameter	803/738/650 [mm]
Maximum foundation depth	1300 [mm]

#### 3.1 The New BRADO weight, pressure losses and capacity

Table 2. The New BRADO technical data

Sections	New Brado Weight	Capacity	Antifreeze liquid			
			Manifold pressure drop for a flow of 0.5 m <sup>3</sup> /h per section		Manifold pressure drop for a flow of 1.5 m <sup>3</sup> /h per section	
			Ethylene glycol water solution 20E15 (-15°C)	Propylene glycol water solution 20P15 (-15°C)	Ethylene glycol water solution 20E15 (-15°C)	Propylene glycol water solution 20P15 (-15°C)
-	[kg]	[dm <sup>3</sup> ]	[kPa]	[kPa]	[kPa]	[kPa]
2	21	4,7	1,63	1,76	16,30	16,60
3	23	4,9	2,00	2,07	19,14	19,26
4	25	5,2	2,49	2,61	23,08	22,95
5	27	5,5	3,10	3,23	28,11	27,67
6	29	8,7	1,74	1,84	17,11	17,57
7	31	9,0	1,87	1,98	18,24	18,69
8	33	9,2	2,03	2,13	19,53	19,97
9	35	9,5	2,20	2,31	20,99	21,43
10	37	9,7	2,40	2,50	22,63	23,04
11	39	10,0	2,61	2,71	24,43	24,83
12	41	10,3	2,84	2,95	26,40	26,79

Approximate values. Calculation condition up to 5 SK (manifold bar 160 diameter, RD 40 dia., SK 32 dia.) over 5 SK (bar 200, RD 63 dia., SK 32 dia.)

#### 4. Load-capacity, thermal insulation, foundation depth

To increase the well foundation depth (New BRADO max. 1300 mm), an ERGA extension pot has to be added to the well. The contact area between the extension pot and the well should be secured with the BAGELAN gasket. The extension pot increases the well foundation depth by 500mm. The height of the extension pot can be reduced as required by the cutting to the desired height: taking its construction into consideration.

Each distributor well is equipped with a HDPE cover (load capacity of 10 kN). The cover may be additionally equipped with a closing mechanism.

If it is required that the distribution well carry larger loads, it can be additionally equipped with:

- Polyester manhole cover with a conical load ring made of resin-cement. Load capacity up to 125 kN;
- Cast iron manhole, class D400, with loading concrete plate to carry loads up to 400 kN.

NOTE! The well capping method used should be based on a technical and construction design that takes into consideration all relevant water and ground conditions, the well's size and expected loads in accordance with the following standards: PN-EN 1991-2:2007 and PN-EN 1990:2004.

#### 5. Equivalent products – see technical charts

- ALTRA Distributor well, full range in accordance with EN.OZE.20-13;AL;
- REGA Distributor cabinet, of up to 3 sections in accordance with EN.OZE.20-13;RG;
- NOMO Distributor cabinet, up to 6 sections in accordance with EN.OZE.20-13;NM;
- Multi- sectional manifold type RS, full range in accordance with EN.OZE.20-13;RS.

#### 6. Information Technology

- The New Brado-R is available in the "ENERGEO SOFT" computer program (design/selection of ground sources for heat pumps).
- The New Brado-R is designed to be compatible with Electronic Diagnostic System for GSHP (EDS) to facilitate electronic diagnostics and

archiving of working parameters of ground source in accordance with EN.EDS.20-13;01

#### 7. Supplementary components

- Connection pipes (in accordance with EN.OZE.20-13;RD);
- Distribution pipes (in accordance with EN.OZE.20-13;RR);
- Vertical/horizontal exchangers (in accordance with EN.OZE.20-13;WG);
- Pipeway through wall barriers (in accordance with EN.OZE.20-13;PB);
- Heat pump engine room equipment;
- Antifreeze liquids: glycols and glycol water solutions (in accordance with EN.OZE.20-13;GH);
- Marking accessories.

#### 8. Classification, training, qualifications and certification

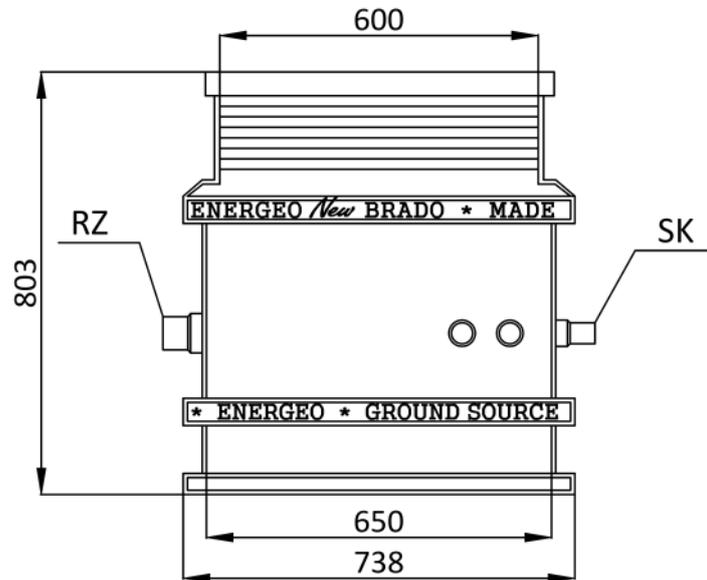
Qualifications to install the system of ground source heat pumps, including the New BRADO - R well, should be gained through participation in training courses organized by the producer or by training institutions authorised by them.

#### 9. The product is characterised by the following features:

- Material uniformity for all plastic hydraulic elements: HDPE-100/HDPE-100RC;
- The chamber tightness
- Chamber has strengthened bottom and crosswise ribs to increase its resistance to ground pressure;
- All plastic connections base on polyfusion welding method;
- Collector sections (inflow and return) are grouped in pairs (don't cross);
- Easy accesses to vents;
- A regular system of training courses available to ensure professional installation;
- IT design tools available to enable correct selection and product configuration for any system of ground sources;
- Certified technical service is provided.

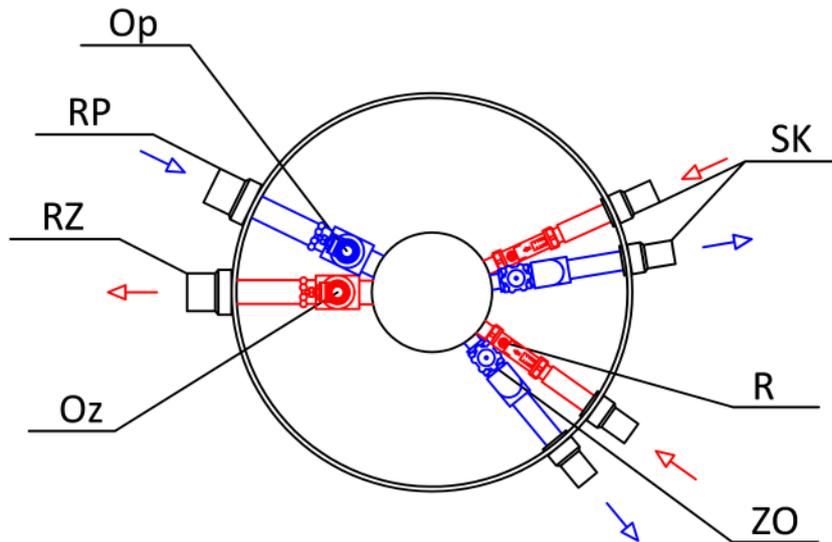


10. 2-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 4. New BRADO-R. 2-section Distribution well. Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve,  
 R – flowmeter, Oz – supply line with ½" socket for air vent, Op – return line with ½" socket for air vent.

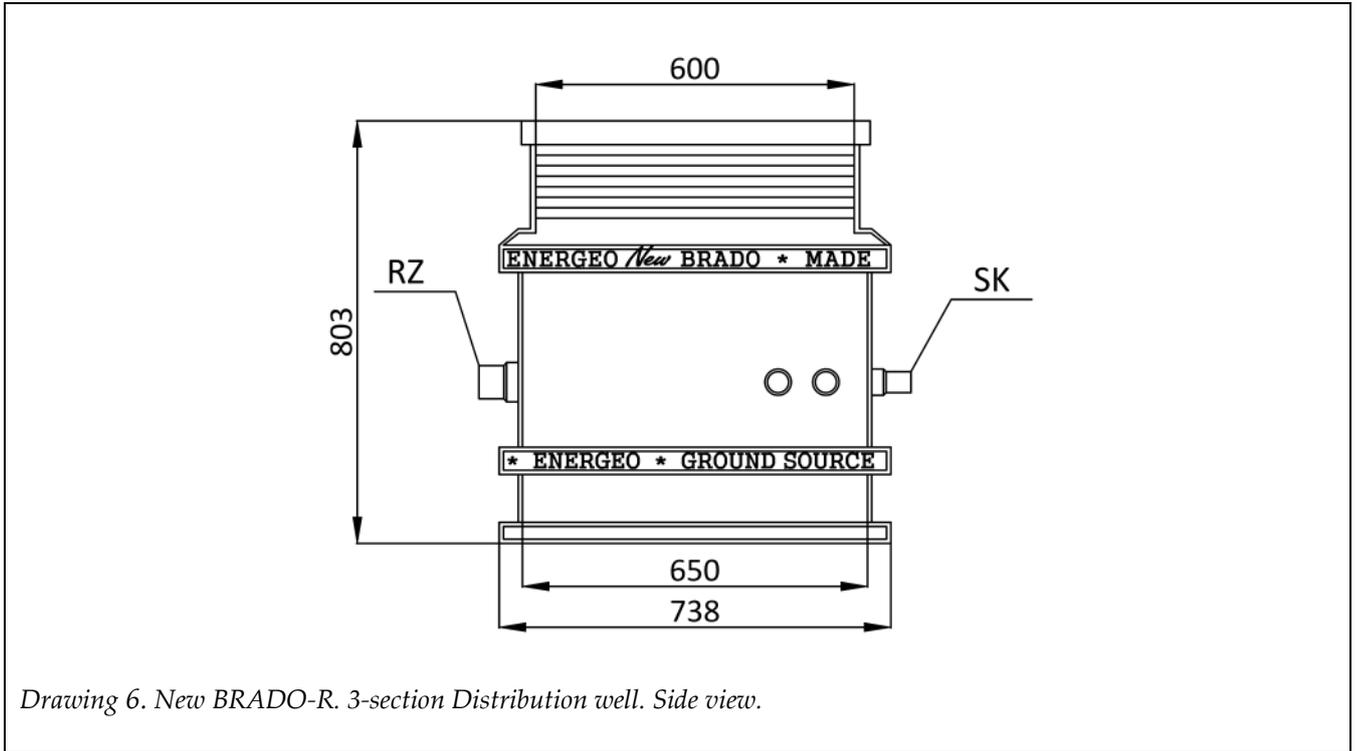


Drawing 5. New BRADO-R. 2-section Distribution Well .Cross-section.

\*Changes in technical solutions may cause differences between the drawings and the product

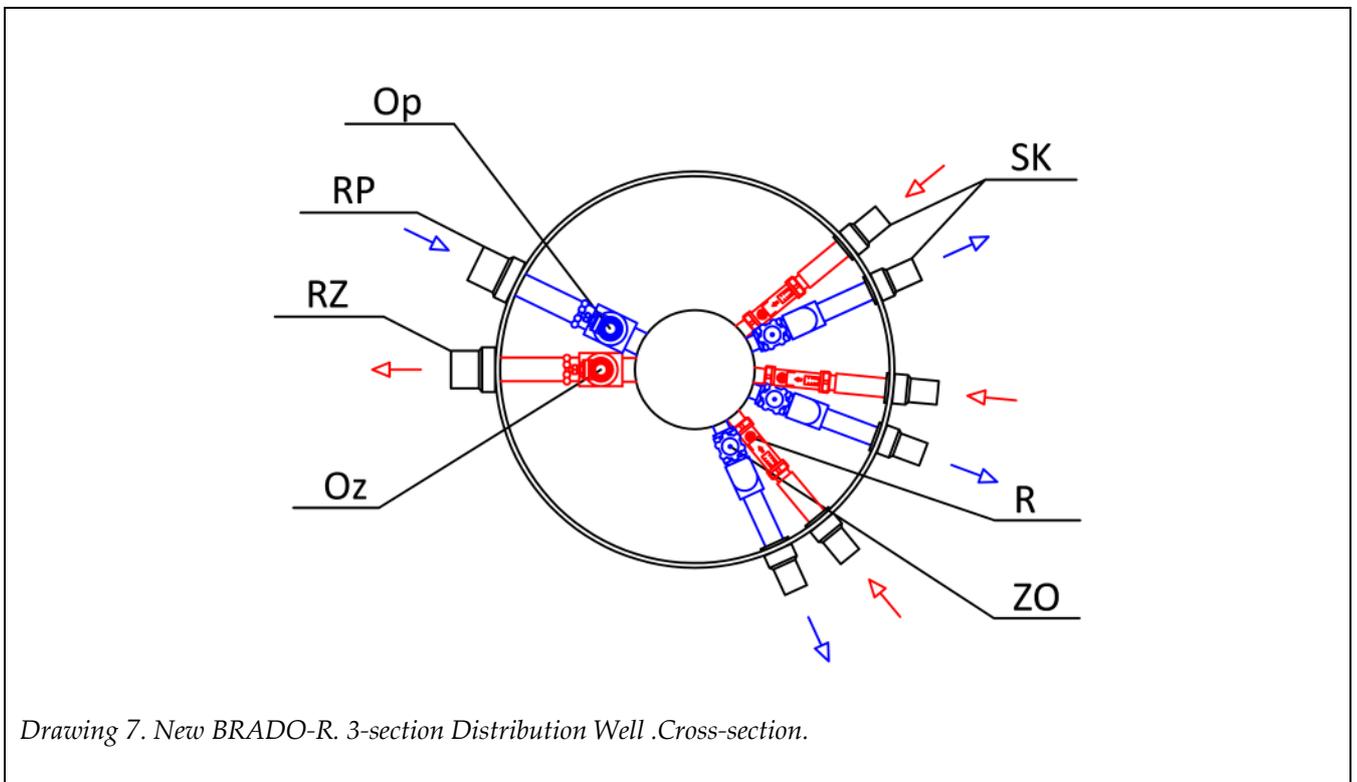


11. 3-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 6. New BRADO-R. 3-section Distribution well. Side view.

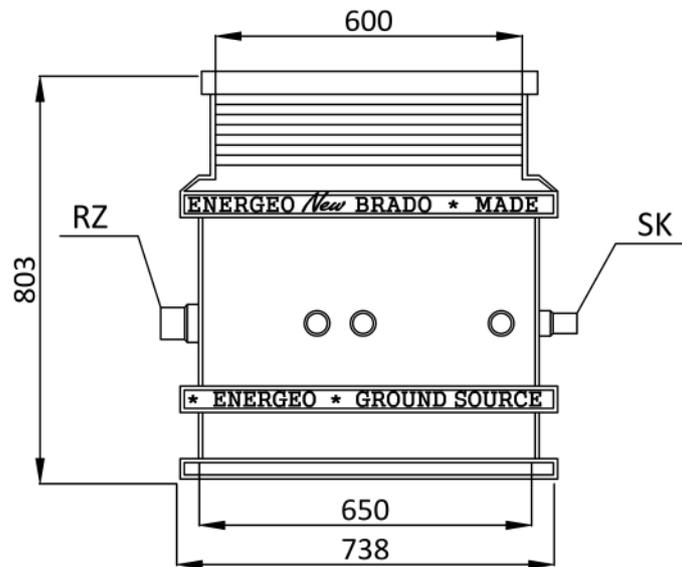
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with ½" socket for air vent, Op – return line with ½" socket for air vent.



Drawing 7. New BRADO-R. 3-section Distribution Well. Cross-section.

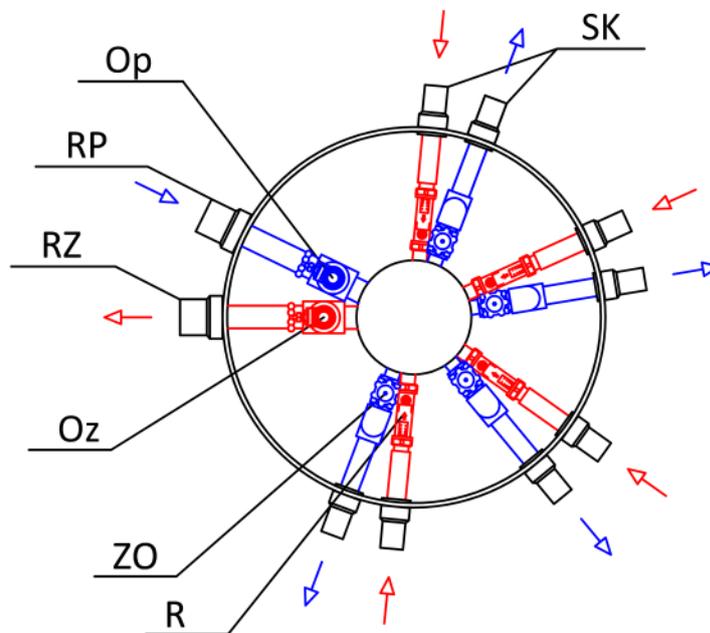
\*Changes in technical solutions may cause differences between the drawings and the product

## 12. 4-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 8. New BRADO-R. 4-section Distribution well. Side view..

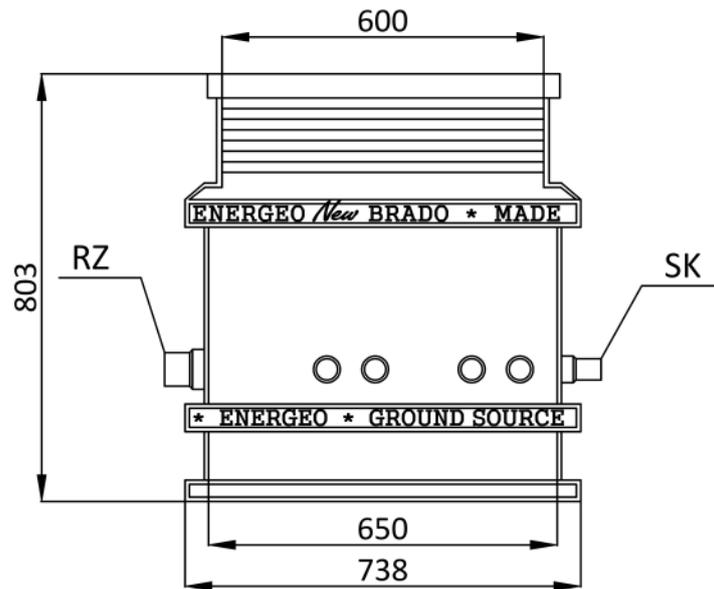
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 9. New BRADO-R. 4-section Distribution Well .Cross-section.

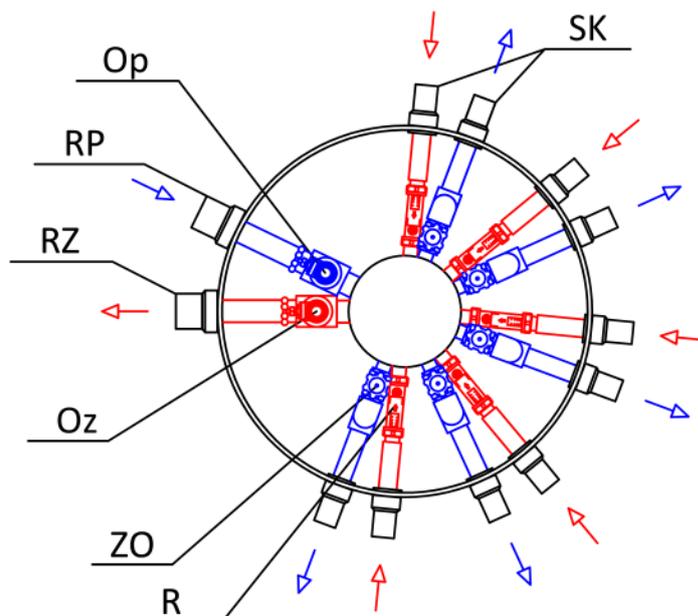
\* Changes in technical solutions may cause differences between the drawings and the product

## 13. 5-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 10. New BRADO-R. 5-section Distribution well. Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with ½" socket for air vent, Op – return line with ½" socket for air vent.

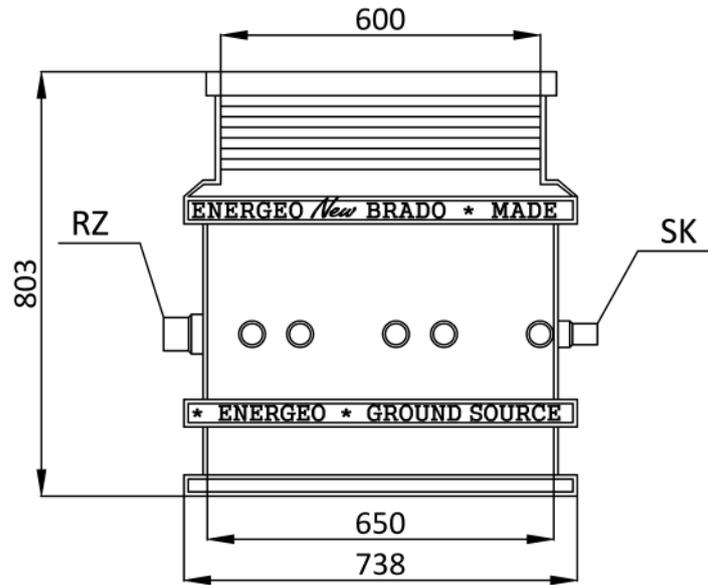


Drawing 11. New BRADO-R. 5-section Distribution Well .Cross-section.

\* Changes in technical solutions may cause differences between the drawings and the product

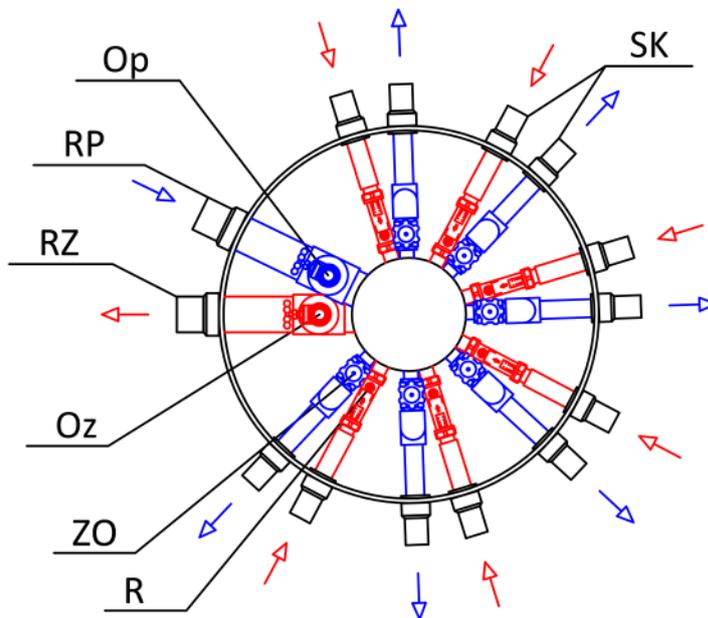


14. 6-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 12. New BRADO-R. 6-section Distribution well. Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with ½" socket for air vent, Op – return line with ½" socket for air vent.

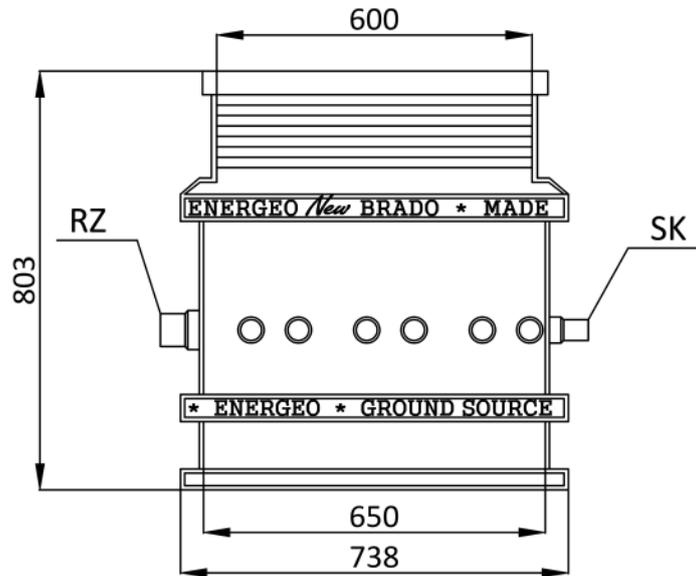


Drawing 13. New BRADO-R. 6-section Distribution Well. Cross-section.

\* Changes in technical solutions may cause differences between the drawings and the product

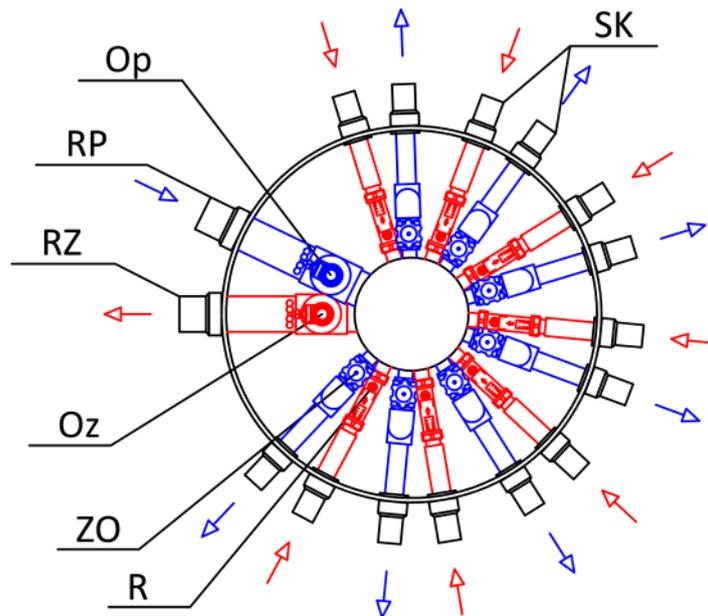


15. 7-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 14. New BRADO-R. 7-section Distribution well. Side view.

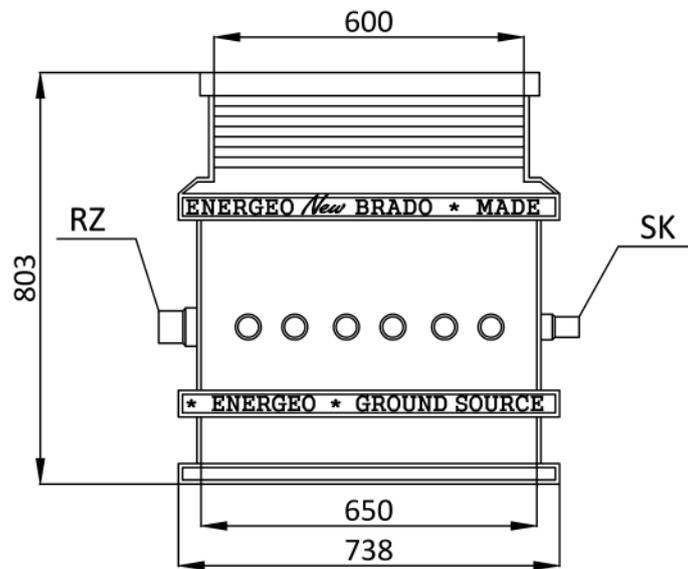
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 15. New BRADO-R. 7-section Distribution Well. Cross-section.

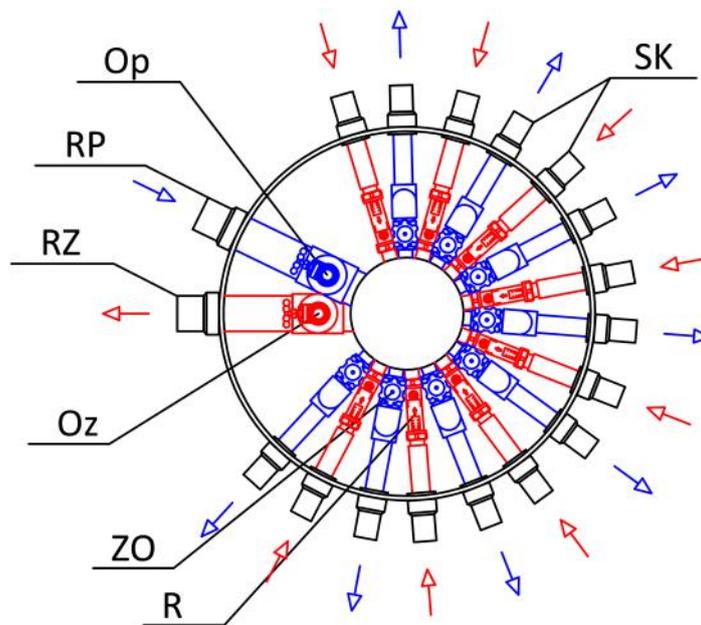
\* Changes in technical solutions may cause differences between the drawings and the product

## 16. 8-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 16. New BRADO-R. 8-section Distribution well. Side view.

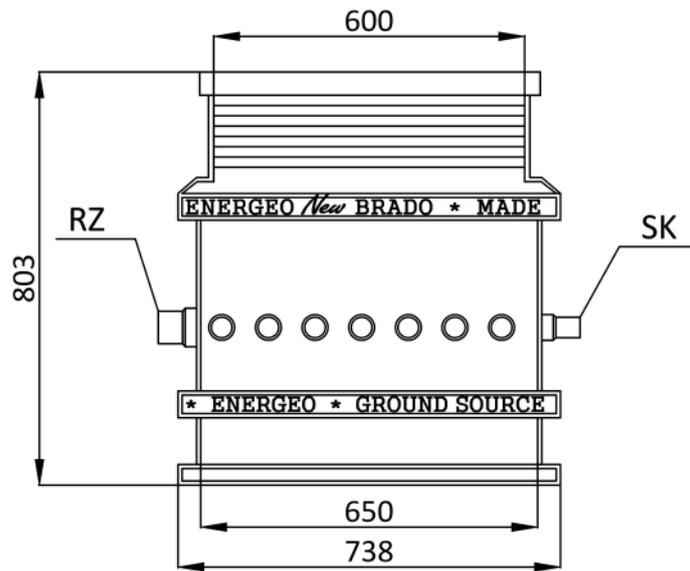
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve,  
 R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 17. New BRADO-R. 8-section Distribution Well .Cross-section.

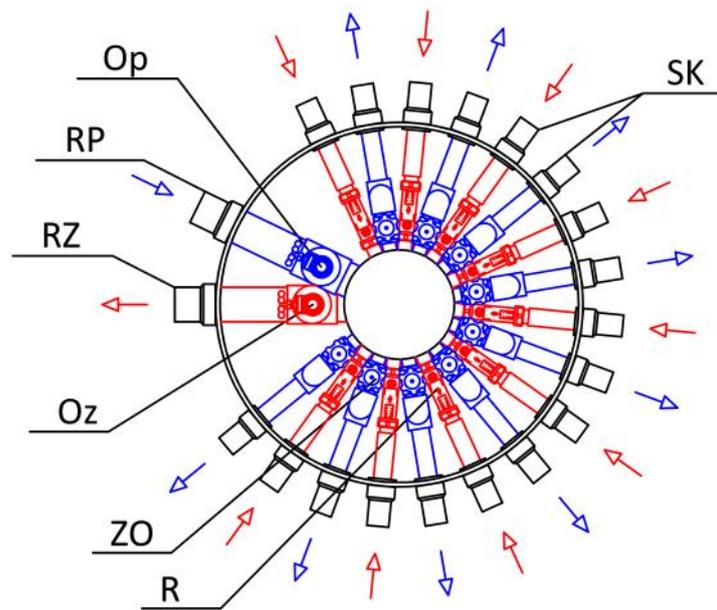
\* Changes in technical solutions may cause differences between the drawings and the product

## 17. 9-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 18. New BRADO-R. 9-section Distribution well. Side view.

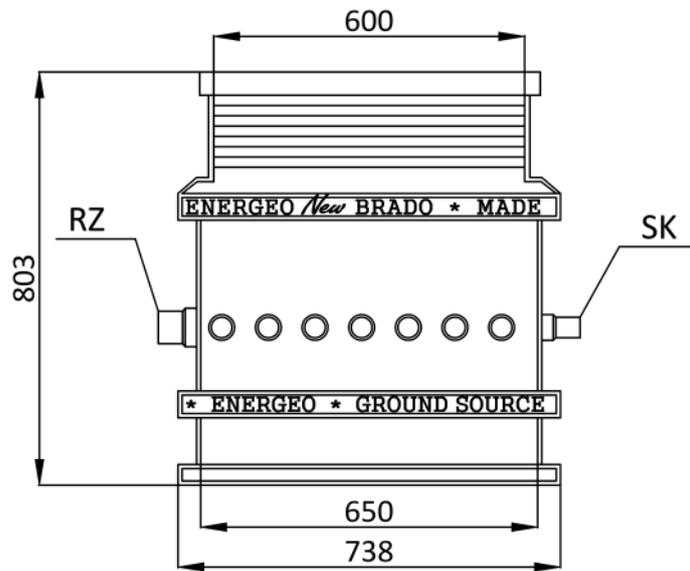
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve,  
 R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 19. New BRADO-R. 9-section Distribution Well .Cross-section.

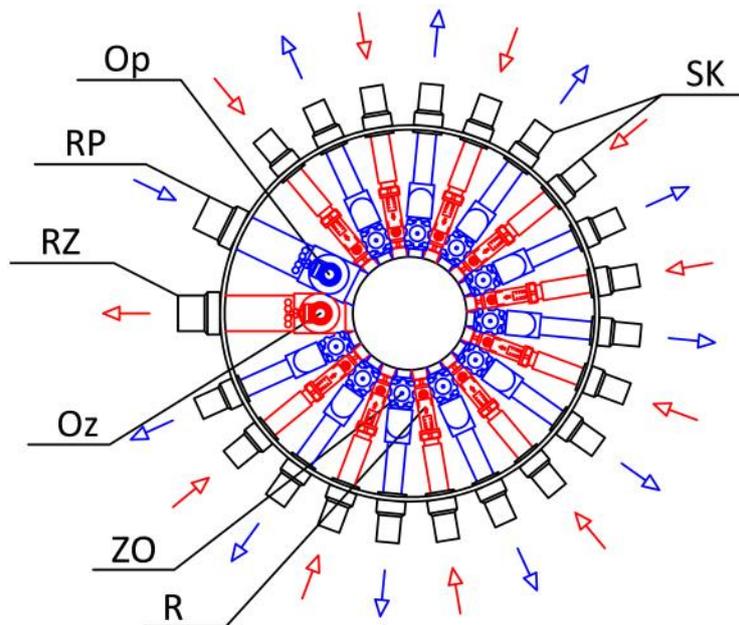
\* Changes in technical solutions may cause differences between the drawings and the product

## 18. 10-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 20. New BRADO-R. 10-section Distribution well. Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve,  
 R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.

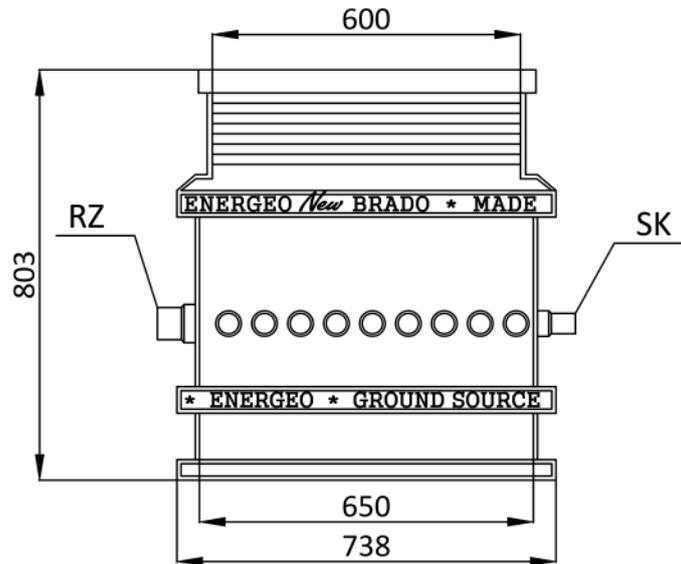


Drawing 21. New BRADO-R. 10-section Distribution Well .Cross-section.

\*Changes in technical solutions may cause differences between the drawings and the product

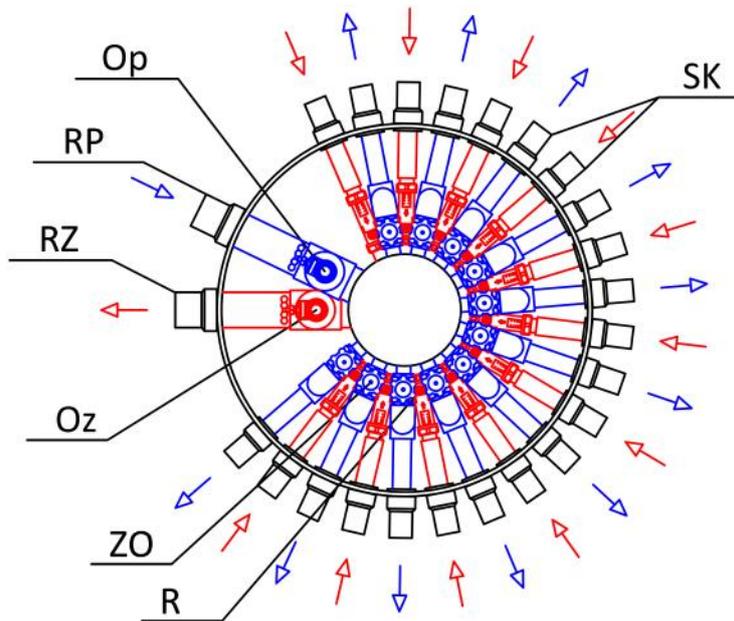


19. 11-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 22. New BRADO-R. 11-section Distribution well. Side view.

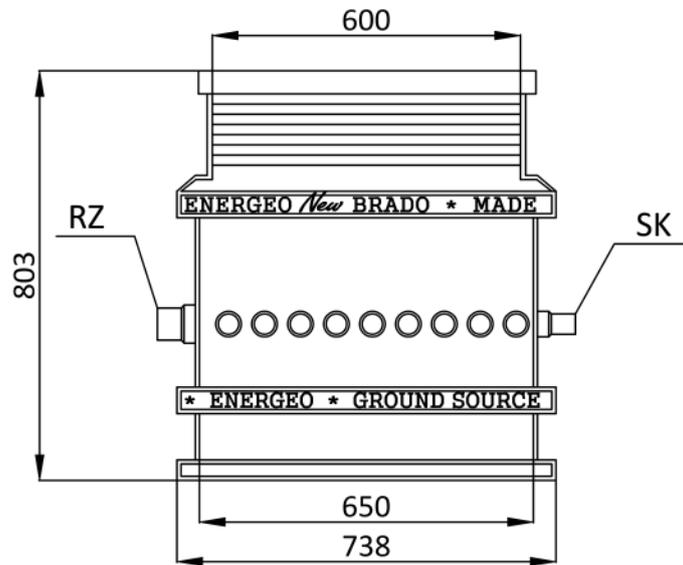
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 23. New BRADO-R. 11-section Distribution Well .Cross-section.

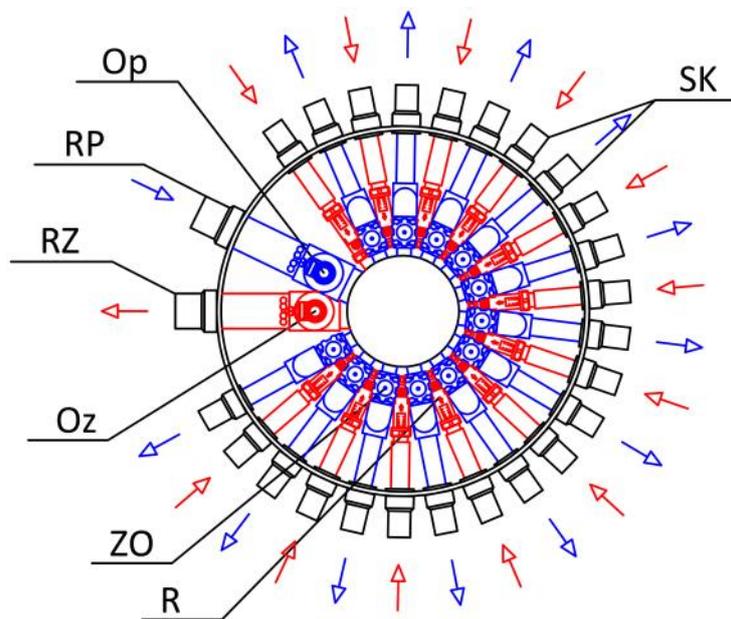
\* Changes in technical solutions may cause differences between the drawings and the product

## 20. 12-section distribution well: New BRADO-R. flowmeters included– technical drawings\*.



Drawing 24. New BRADO-R. 12-section Distribution well. Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZO – cut-off valve, R – flowmeter, Oz – supply line with 1/2" socket for air vent, Op – return line with 1/2" socket for air vent.



Drawing 25. New BRADO-R. 12-section Distribution Well .Cross-section.

\* Changes in technical solutions may cause differences between the drawings and the product