



CONSTRUCTION PRODUCT TECHNICAL CARD

Product feature: Flowmeter included	Energeo product: STUDNIA ROZDZIELACZOWA SPIDER MAXI – R	 Sgn:EN.OZE.20-13.SPM
Manufacturer: ASPOL-FV Łódź, ul. Helska 39/45 www.aspol.com.pl		
ENERGEO – GEOTHERMAL TECHNOLOGY FOR GROUND SOURCE HEAT PUMPS – RENEWABLE ENERGY		

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

EN.OZE.20-13.SPM

Uniform text dated 14 October 2013

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. SPIDER MAXI-R distributor well – a component of the Energeo* system

The SPIDER MAXI-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*).

SPIDER MAXI-R is a well manhole (allows servicing).

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.

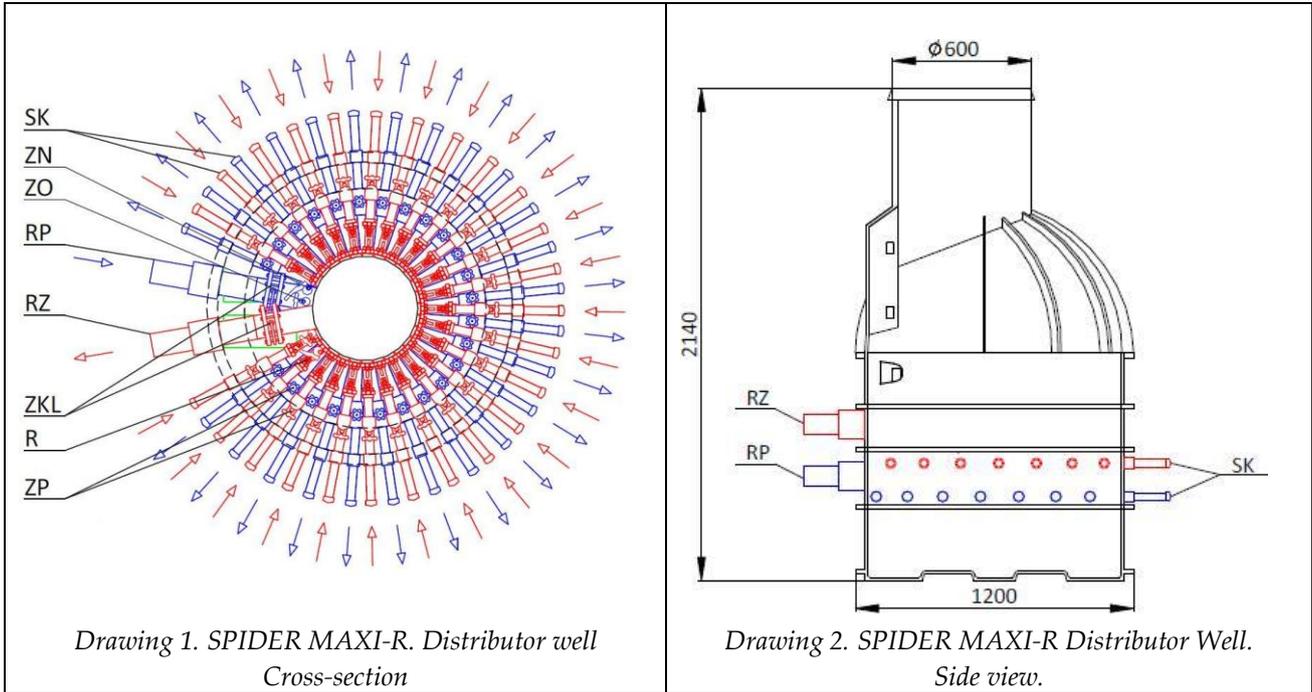
Outlet section with nickel plated brass internal thread socket for air vent valve is equipped with cut-off valve as standard Collector pipes (SK) and connection pipes (RD) are intended for both: electro-fusion and socket-welding techniques. Leak tightness is guaranteed by polyfusion welding method.

*ENERGEO 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

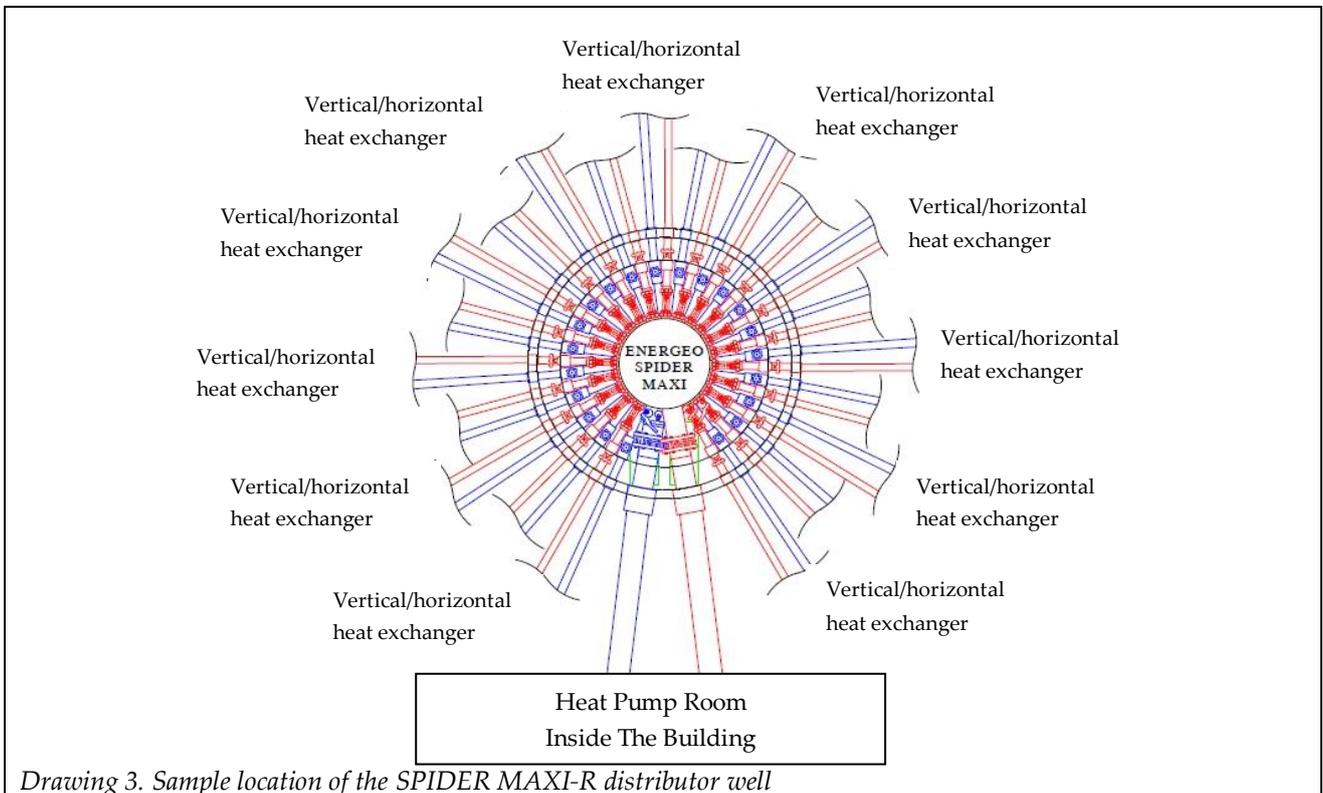


2.2 Well – plastic manifold chamber which protects against soil pressure and enables service procedures.

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



SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4 " socket for filling up, ZKL – butterfly valve



3. Technical parameters of the SPIDER MAXI-R distribution well

PARAMETER	SPIDER MAXI - R
Number of sections (SK)	20-30 [pairs]
Material of chamber/manifold	HDPE/HDPE
Manifold pressure class	PN16
Standard collector pipe diameter (SK)	32, 40 [mm]
SK pipe welding method	Polyfusion
Standard connection tube diameter (RD)	63,75,90,110,125, 160, 200 [mm]
RD pipe welding method	Polyfusion
Diameters of the bar collector (supply and return)	400 [mm]
Internal thread socket for air vent valve	1/2"
Internal thread socket for filling	3/4"
A flowmeters range	2÷12 [dm ³ /min]
B flowmeters range	8÷38[dm ³ /min]
C flowmeters range	20÷70 [dm ³ /min]
Angle flowmeters range	5÷50 [dm ³ /min]
Dimensions: height / diameter	2140/1200 [mm]
Maximum foundation depth	2140 [mm]

3.1 The SPIDER MAXI-R weight, pressure losses and capacity:

Sections	SPIDER MAXI Weight	Capacity	Antifreeze liquid			
			Manifold pressure drop for a flow of 0.5 m ³ /h per section		Manifold pressure drop for a flow of 1.5 m ³ /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 ³]	[kPa]	[kPa]	[kPa]	[kPa]
20	240	52,2	2,32	2,42	20,78	21,24
21	242	52,5	2,37	2,47	21,14	21,59
22	243	52,8	2,41	2,51	21,50	21,96
23	245	53,1	2,45	2,55	21,90	22,35
24	247	53,5	2,50	2,60	22,30	22,75
25	250	53,8	2,55	2,64	22,71	23,17
26	252	56,8	2,60	2,70	23,16	23,61
27	254	57,3	2,69	2,75	23,60	24,06
28	256	57,7	2,70	2,81	24,08	24,54
29	258	58,1	2,76	2,86	24,57	25,03
30	260	58,5	2,81	2,92	25,08	25,53

Approximate values. Calculation condition: Operating temperature :0°C, Linear Flowmeter, RD- diameter 110 mm, length 50 cm, SK diameter 32 mm, length 40 cm.

4. Load-capacity, thermal insulation, foundation depth

The foundation depth of SPIDER MAXI is 2140 mm. Each distributor well is equipped with a HDPE cover (load capacity of 10 kN). The cover may be

additionally equipped with a closing mechanism and/ or thermal insulation.

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 card

- Distributor well SPIDER - range to 25 section in accordance with EN.OZE.20-13;SP;
- Wall distributor type RS, full range in accordance with EN.OZE.20-13;RS.

6. Information Technology

- The SPIDER MAXI-R is available in the "ENERGEO SOFT" computer program (design/selection of ground sources for heat pumps).
- The SPIDER MAXI-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);
- Service platform (in accordance with EN.OZE.20-13;PS);
- Marking accessories;

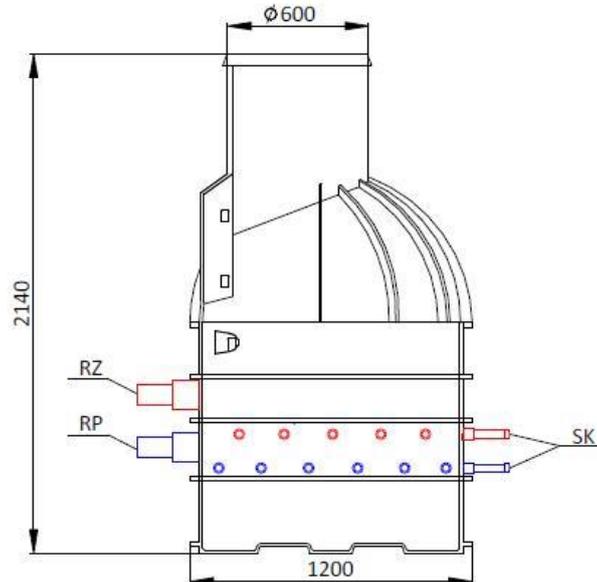
8. Classification, training, qualifications and certification

Qualifications to install the system of ground source heat pumps, including the SPIDER MAXI-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:

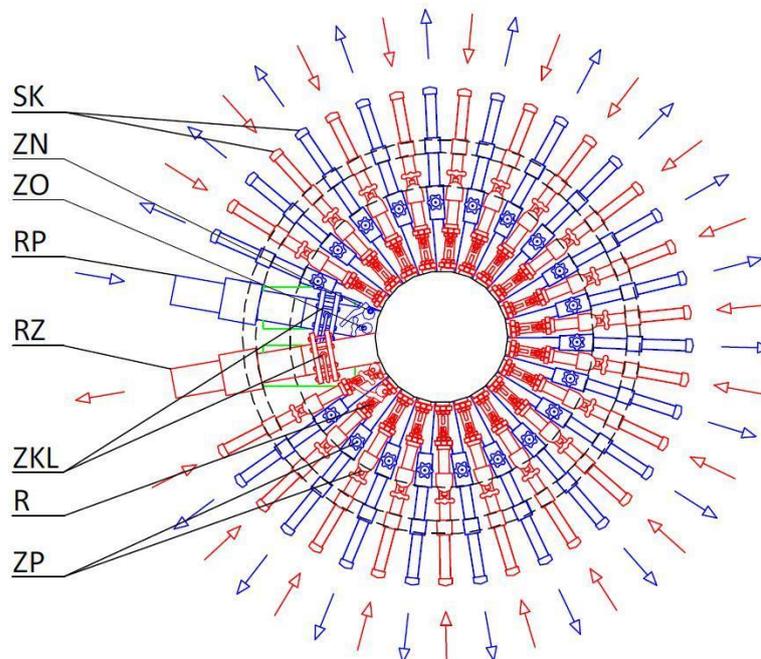
- Material uniformity for all plastic hydraulic elements: HDPE-100/HDPE-100RC;
- The chamber tightness
- All plastic connections base on polyfusion welding method;
- Ability to mount the platform to facilitate maintenance operations
- Collector sections (inflow and return) are grouped in pairs (don't 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. 20-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 4. SPIDER MAXI - R. 20-section Distribution well. Side view.

SK – collector pipes, **RZ** – supply connection tube, **RP** – return connection tube, **ZP** – straight valve, **R** - flowmeter, **ZO** – ball valve with 1/2" socket for air vent, **ZN** – ball valve with 3/4" socket for filling up, **ZKL** – butterfly valve

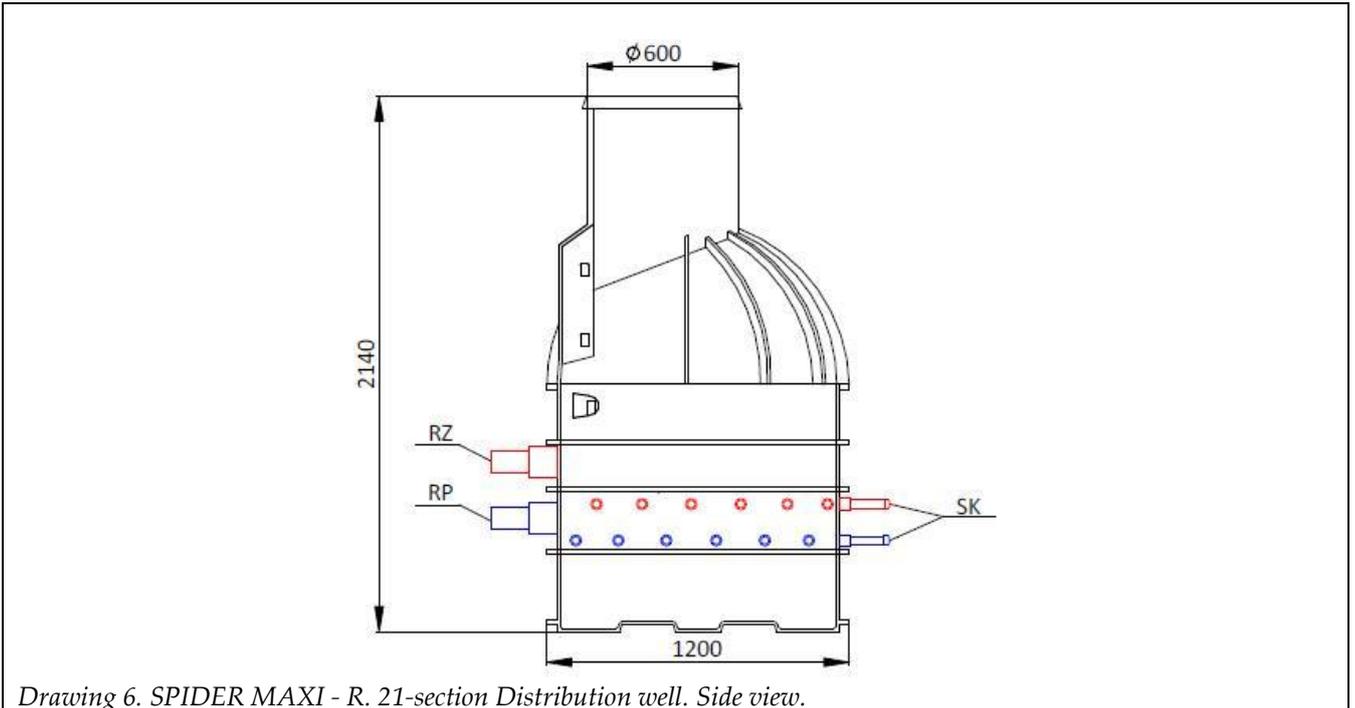


Drawing 5. SPIDER MAXI R. 20-section Distribution Well. Cross-section.

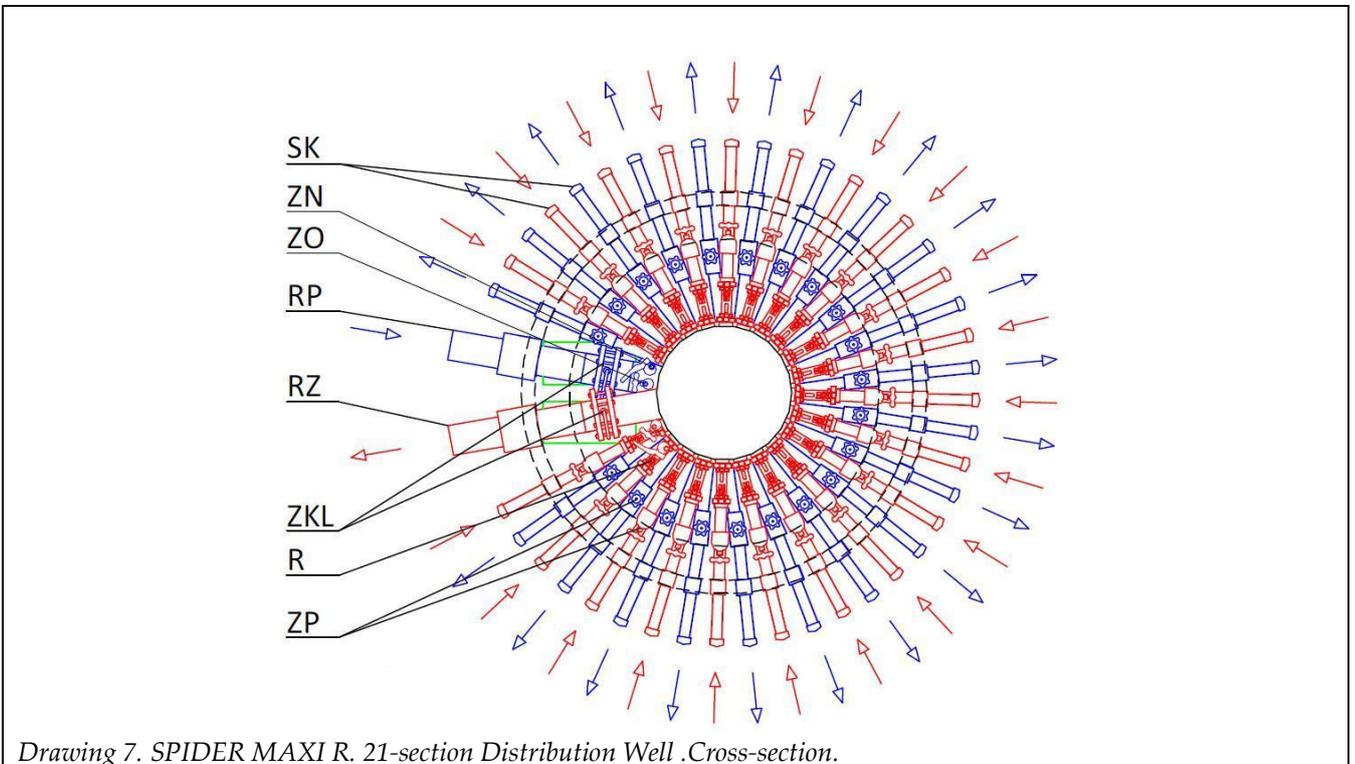
* Changes in technical solutions may cause differences between the drawings and the product



11. 21-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*

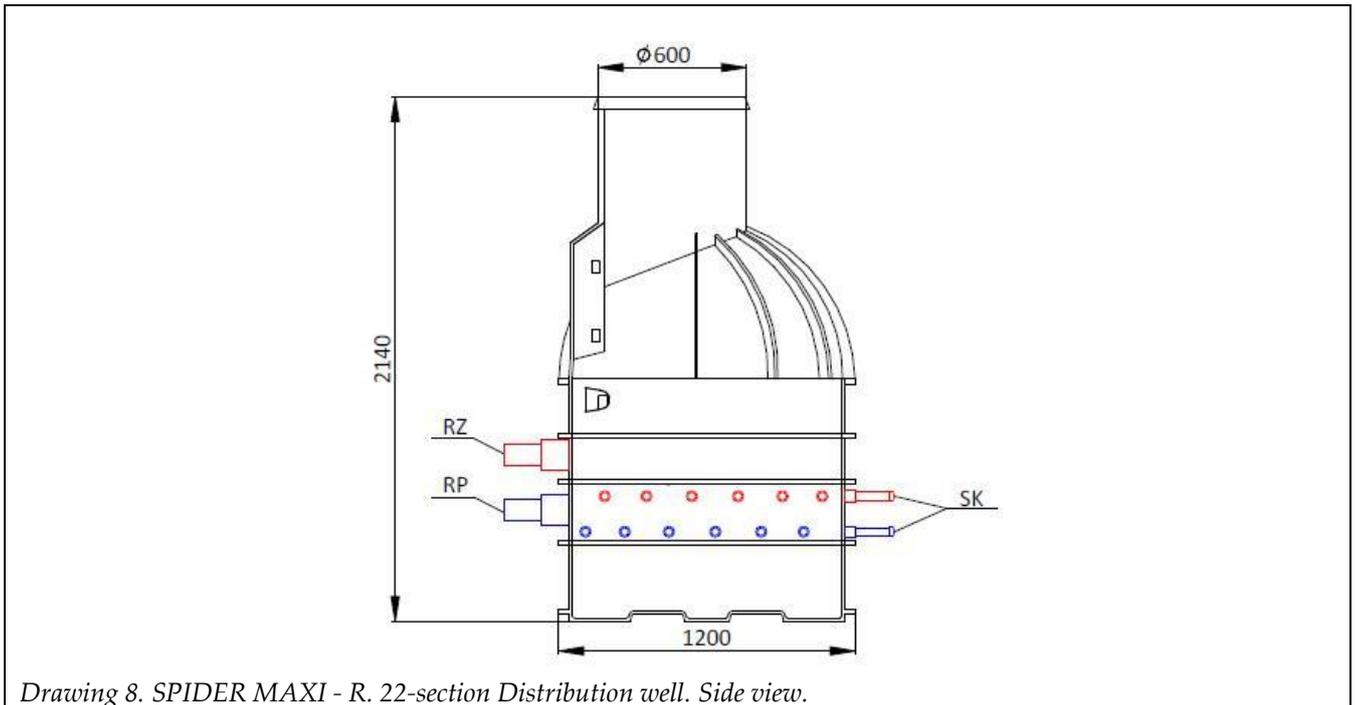


SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4 " socket for filling up, ZKL – butterfly valve



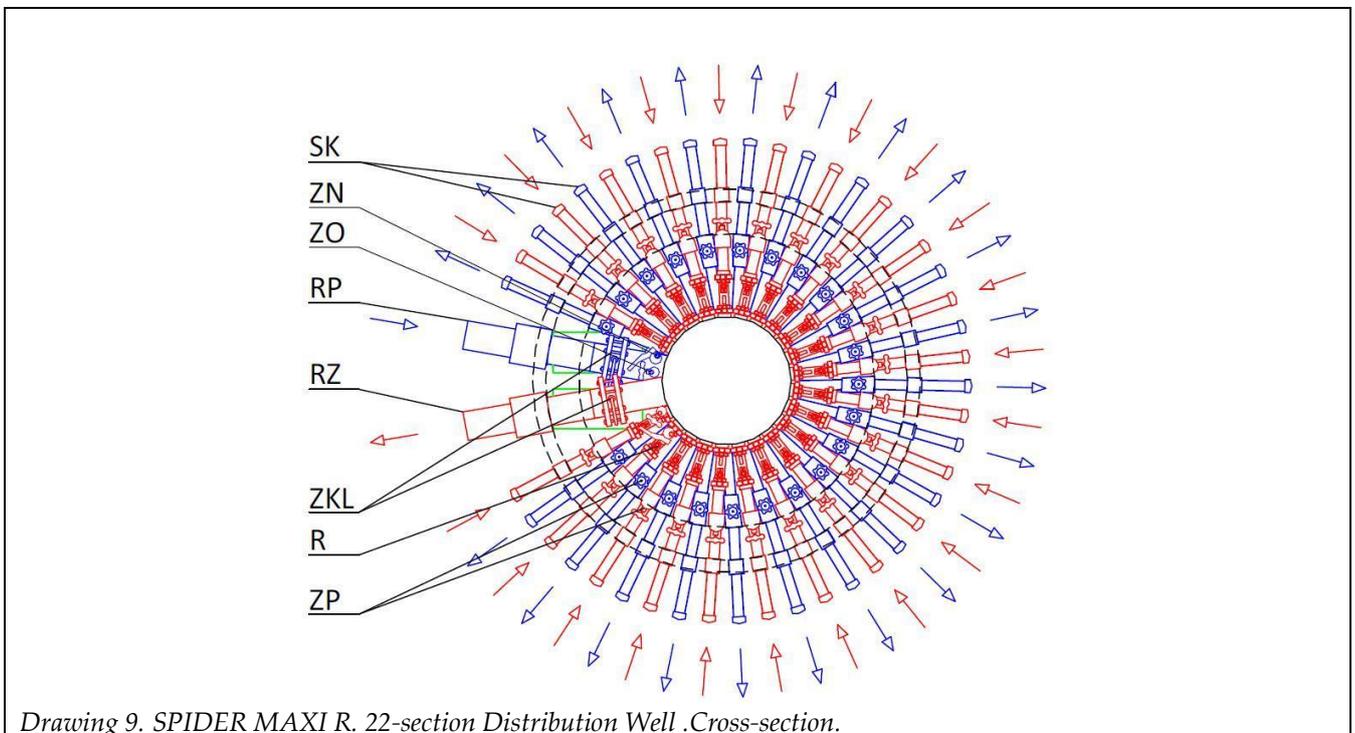
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12. 22-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 8. SPIDER MAXI - R. 22-section Distribution well. Side view.

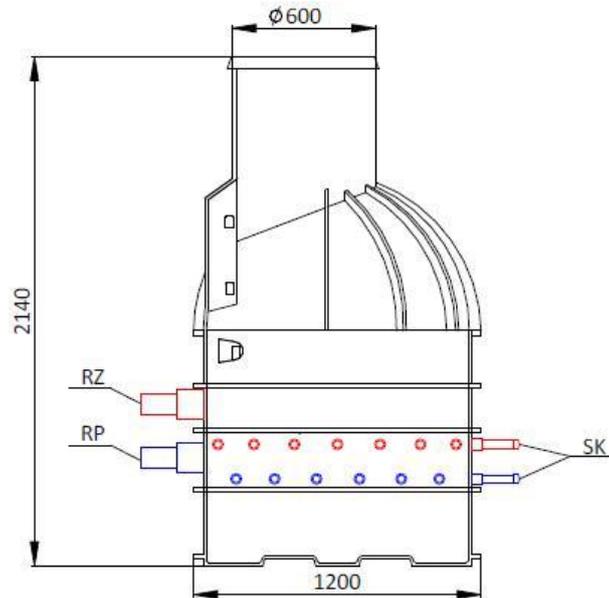
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R – flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up, ZKL – butterfly valve



Drawing 9. SPIDER MAXI R. 22-section Distribution Well. Cross-section.

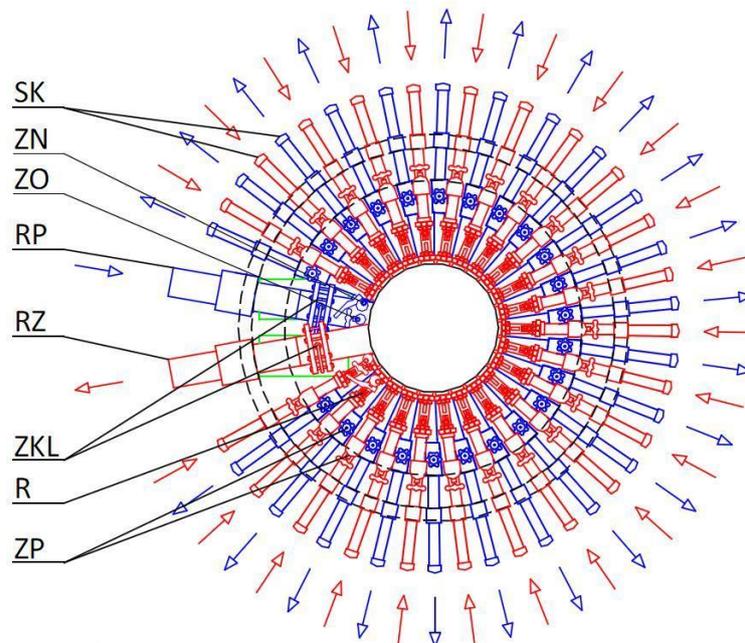
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13. 23-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 10. SPIDER MAXI - R. 23-section Distribution well. Side view.

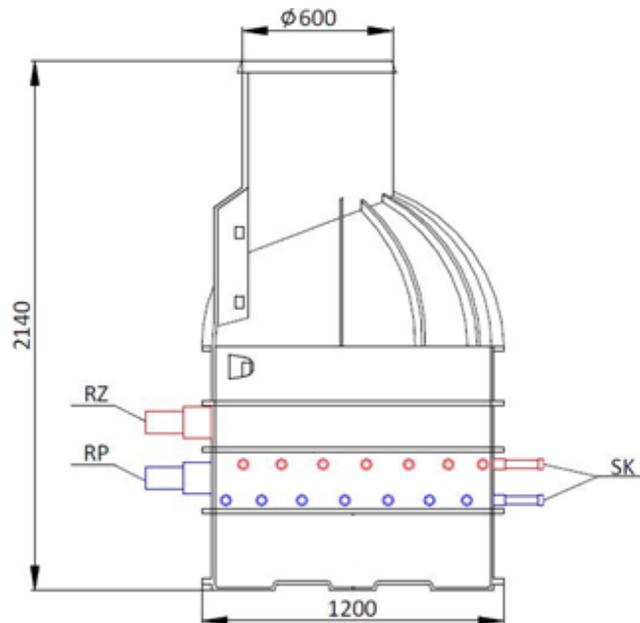
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up, ZKL – butterfly valve



Drawing 11. SPIDER MAXI R. 23-section Distribution Well. Cross-section.

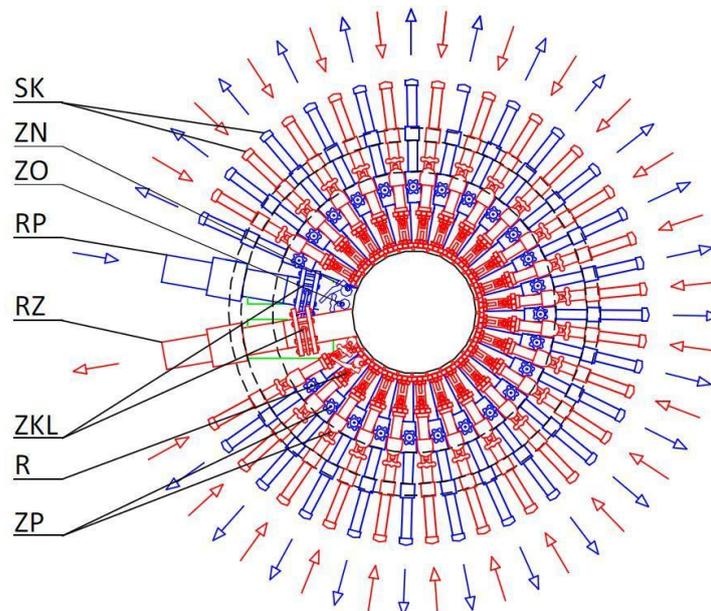
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14. 24-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 12. SPIDER MAXI R. 24-section Distribution Well . Side view.

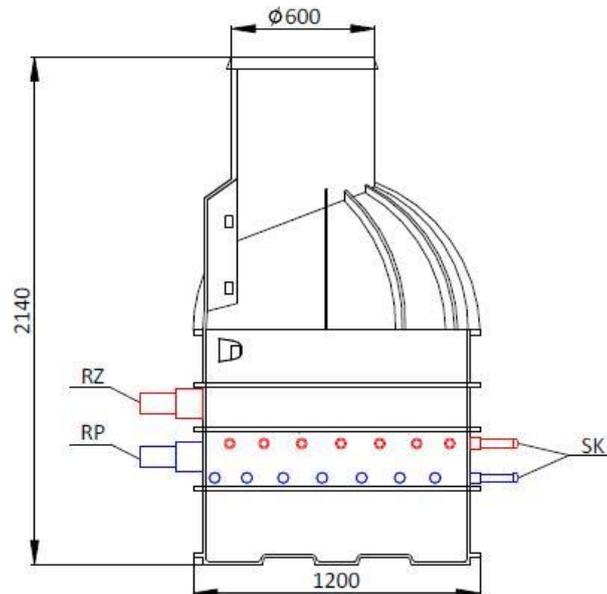
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R - flowmeter, ZO – ball valve with ½" socket for air vent, ZN – ball valve with ¾ " socket for filling up, ZKL – butterfly valve



Drawing 13. SPIDER MAXI R. 24-section Distribution Well .Cross-section.

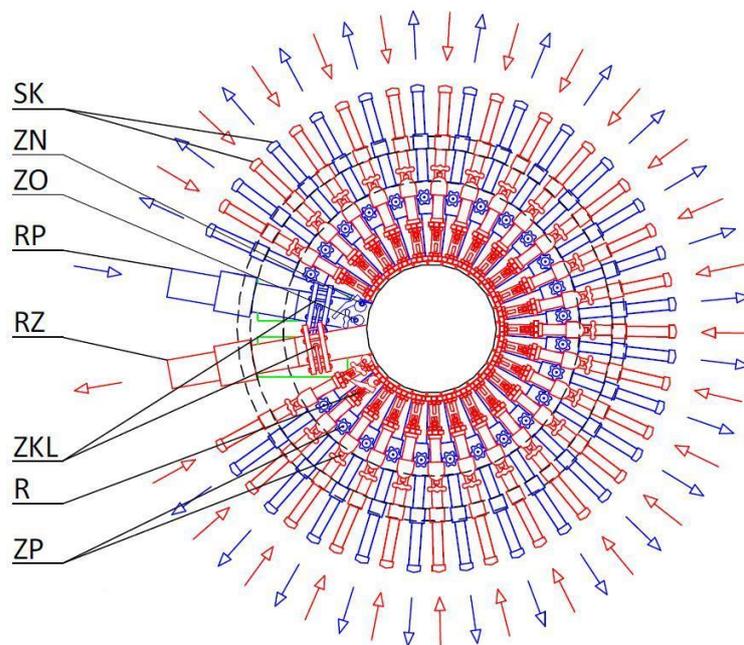
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15. 25-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 14. SPIDER MAXI R. 25-section Distribution Well . Side view.

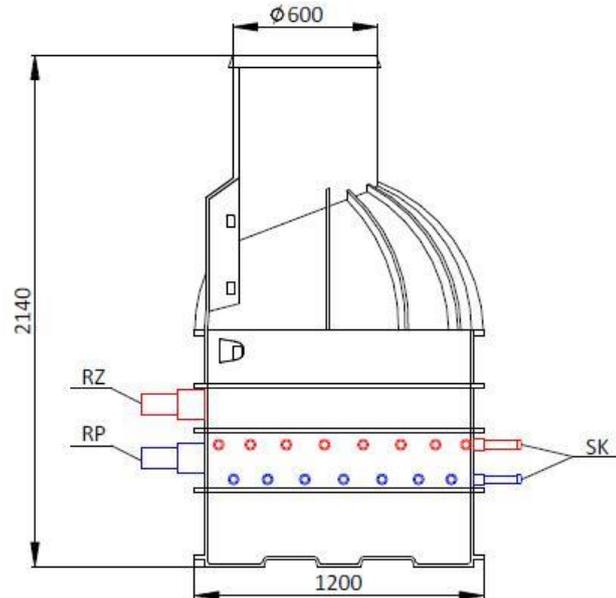
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R – flowmeter, ZO – ball valve with ½" socket for air vent, ZN – ball valve with ¾" socket for filling up, ZKL – butterfly valve



Drawing 15. SPIDER MAXI R. 25-section Distribution Well .Cross-section.

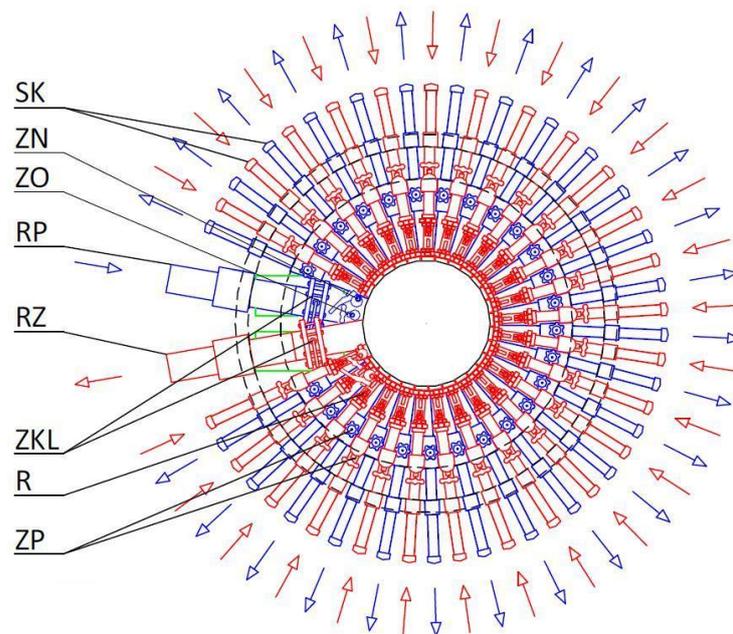
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16. 26-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 16. SPIDER MAXI R. 26-section Distribution Well . Side view.

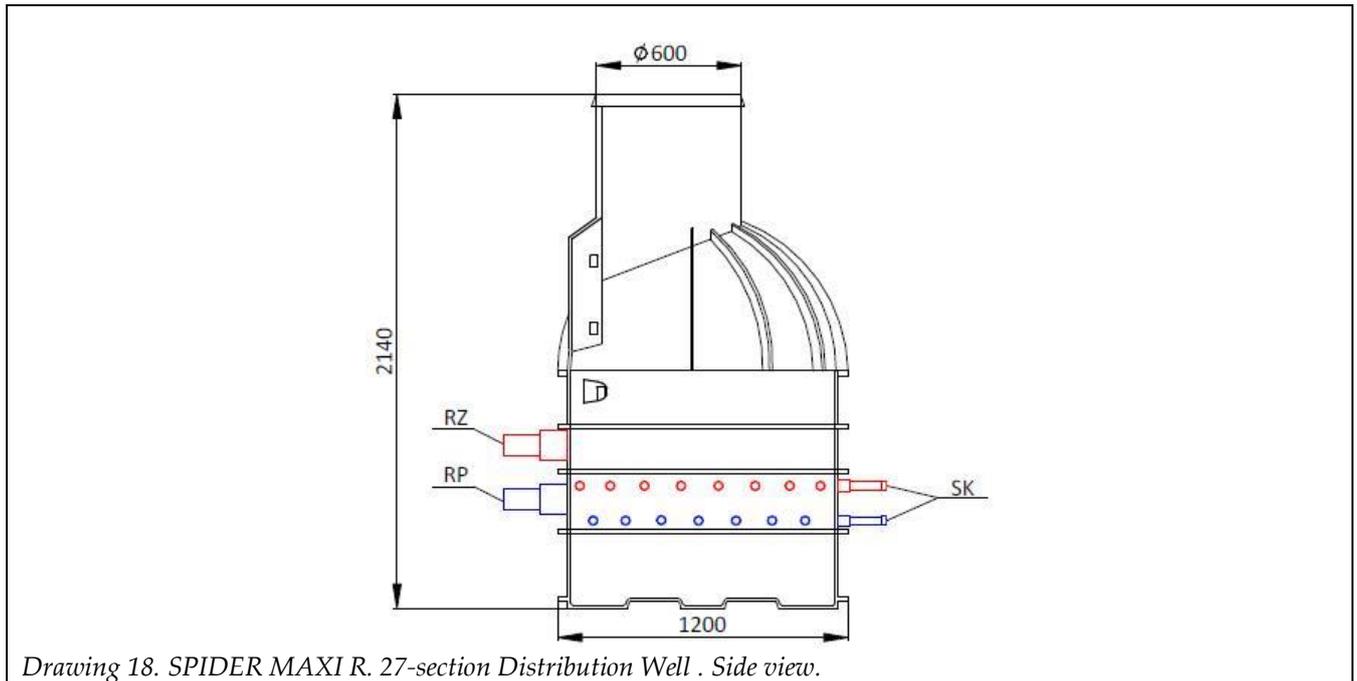
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve,
R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up,
ZKL – butterfly valve



Drawing 17. SPIDER MAXI R. 26-section Distribution Well .Cross-section.

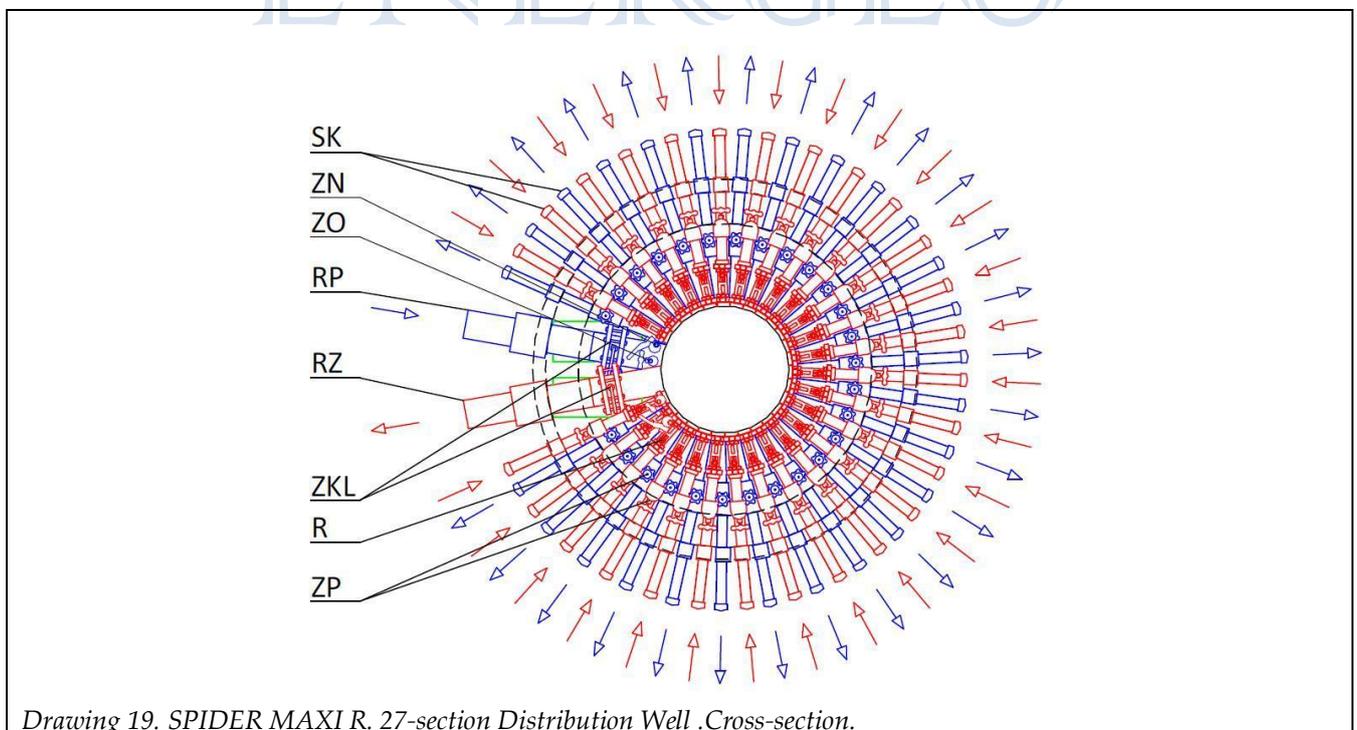
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17. 27-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 18. SPIDER MAXI R. 27-section Distribution Well . Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up, ZKL – butterfly valve

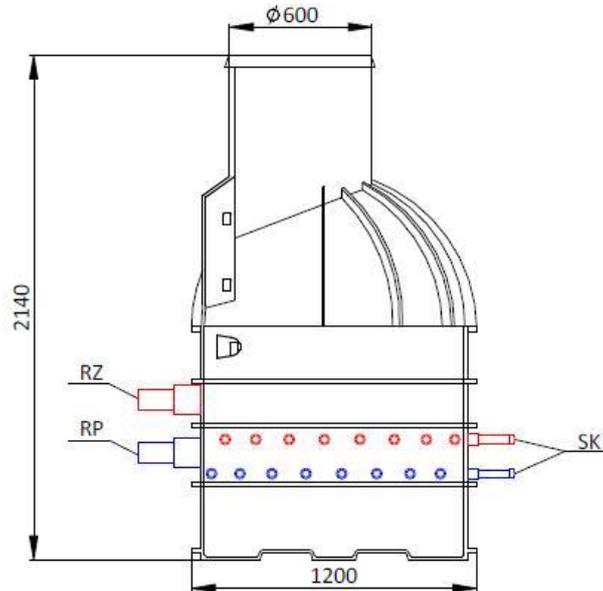


Drawing 19. SPIDER MAXI R. 27-section Distribution Well . Cross-section.

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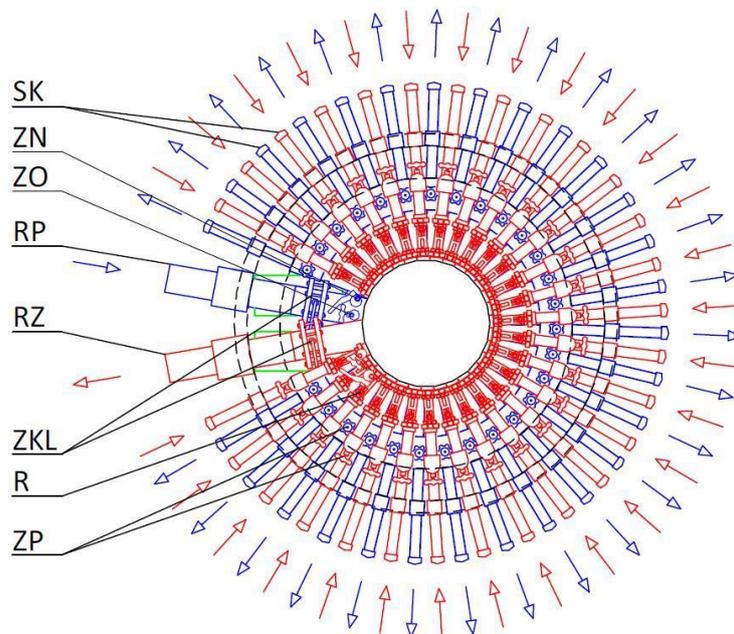


18.28-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 20. SPIDER MAXI R. 28-section Distribution Well . Side view.

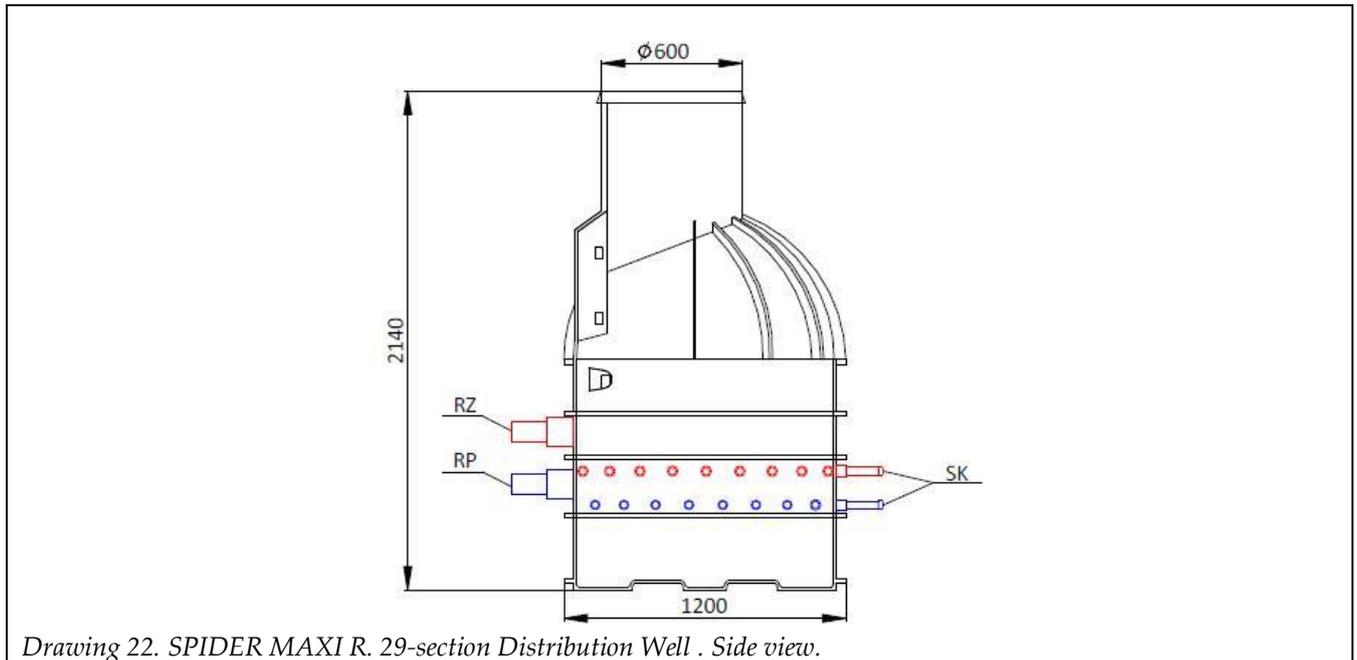
SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve,
 R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4 " socket for filling up,
 ZKL – butterfly valve



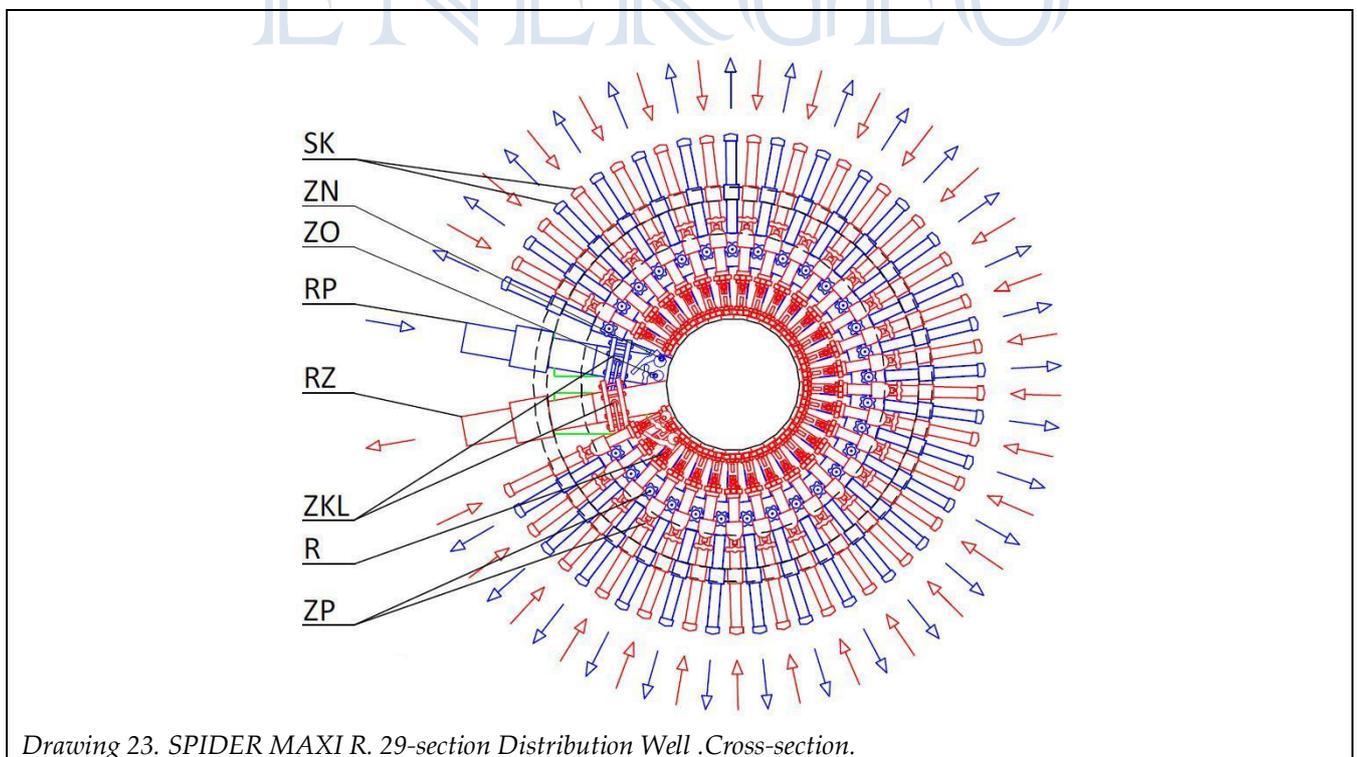
Drawing 21. SPIDER MAXI R. 28-section Distribution Well .Cross-section.

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19. 29-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*

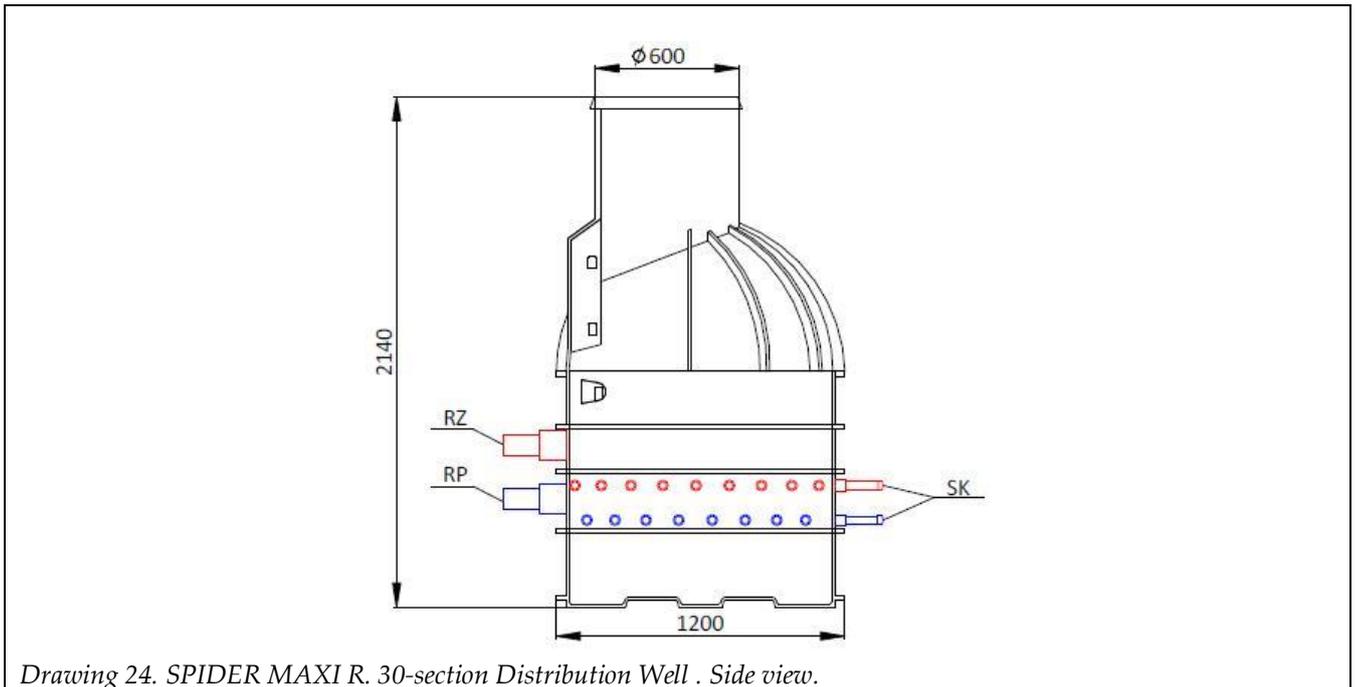


SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve, R – flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up, ZKL – butterfly valve



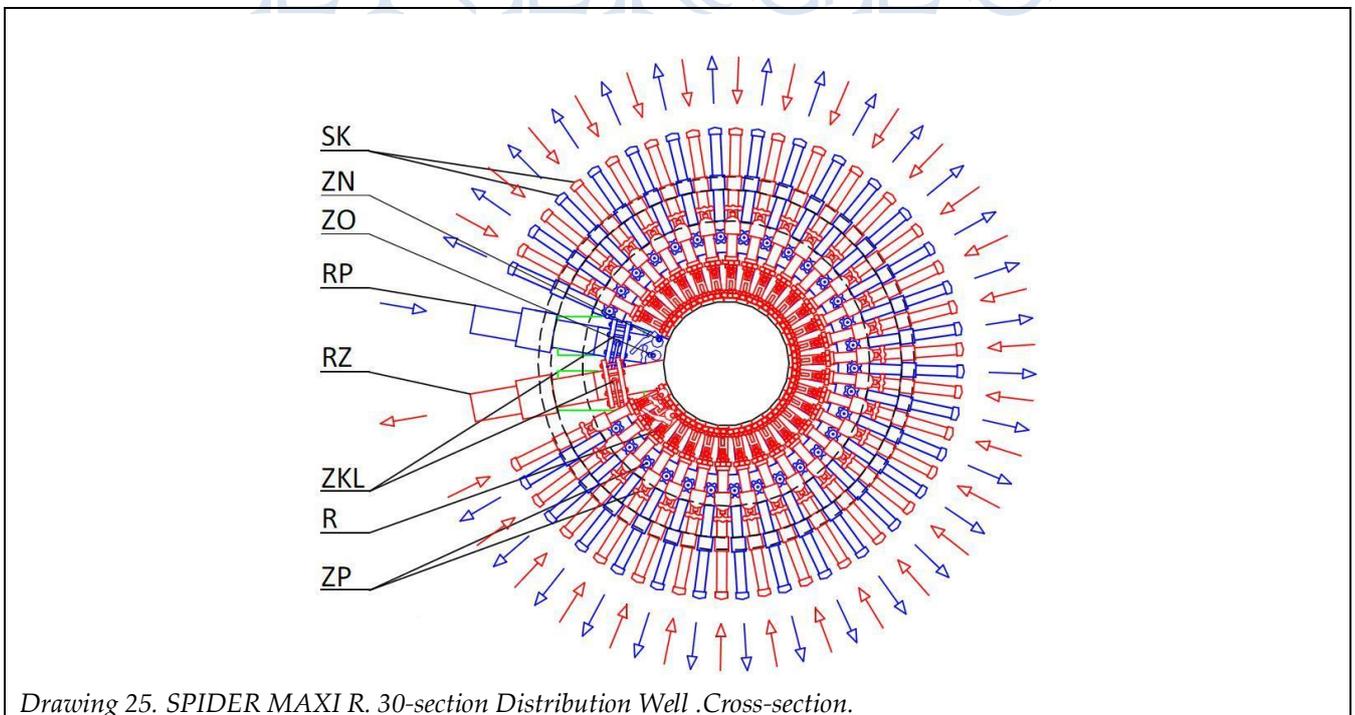
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20. 30-section distribution well: SPIDER MAXI-R flowmeters included– technical drawings*



Drawing 24. SPIDER MAXI R. 30-section Distribution Well . Side view.

SK – collector pipes, RZ – supply connection tube, RP – return connection tube, ZP – straight valve,
 R - flowmeter, ZO – ball valve with 1/2" socket for air vent, ZN – ball valve with 3/4" socket for filling up,
 ZKL – butterfly valve



Drawing 25. SPIDER MAXI R. 30-section Distribution Well .Cross-section.

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