1. Information

1.1 Heating	Project number	
	Project name	**Solutia Reflex 12**
	Responsible person	**Cristian Tudor**
	date	**2021-09-20**
	Note	
	Language	**English**

2. System data of the solution

2.1 System data, general	Configuration according to	**DIN EN 12828, VDI 4708**
2.2 Futher settings for functional requirements	Option system monitoring	**yes**
	Option Configure degassing	**yes**
	Option select seperation	**yes**
	Option Configure feed-in	**yes**
2.3 Temperatures	Highest setpoint setting of the temperature controller	**90** °C
	Expansion	**3.6** %
	Flow temperature	**90** °C
	Return temperature	**70** °C
	Safety temperature limiter / guard	**95** °C
	Antifreeze content	**0.0** %
	Minimum system temperature	**10** °C
2.4 Pressures	Static pressure	**7.0** bar
	Safety Valve Actuating Pressure	**9.0** bar
	Final pressure	**8.1** bar
	Minimum Operating Pressure	**7.2** bar
	Minimum intake pressure for circulating pumps	**1.0** bar
	Evaporation pressure	**0.0** bar
	Display make-up system pressure	**yes**
	Potable supply pressure	**9.6** bar
2.5 Heating power and system volume	Heat generator	
	1. Heat generator	
	Heat generator type	**Steel boiler / burner blower**
	Power	**4000** kW
	Volume	**8000** L
	Individual protection	**yes**
	Consumer	
	1. Heating circles	
	Consumer type	**Panel radiator**
	Power	**4000** kW
	Part	**100.0** %
	Volume	**26000** L
	Flow	**90** °C
	Return	**70** °C

2. System data of the solution

	Volume	**5000** L
	Special pipelines/long pipelines	
	1. Special lines	
	Diameter in DN	**DN 10**
	length	**0.0** m
	Volume	**0** L
	Other Volume	**2000** L
	comment	
	Total power heat generator	**4000** kW
	Calculated system volume	**41000** L
	Expansion volume	**1188** L
	Water reserve	**0.5** %
	Water reserve	**165** L
	effective water reserve	**0.5** %
	effective water reserve	**174** L
2.6 System data, separation	Deposition Magentid	**yes**
	Flow	**171.40** m³/h
	Pipe size	**DN 200**
2.7 System data, make-up and water treatment	Option softening	**yes**
	Temper-IS	**12.0** °dH
	Hardening-SHOULD	**0.3** °dH
	Possible refill quantity per cartridge	**513** L
2.8 System data, low loss headers	Flow	**171.40** m³/h
2.9 System data, heat exchanger	Heating capacityQ	**4000** kW

3. System / Net

3.1 Variomat

Position	Art. No.	Quantity	Article text
3.1.1	8931028	1	**Variomat Giga GS 3 + GH 100** Factory assembled unit consisting of:Reflex Variomat Giga Control Unit GS For control and operation of the Reflex Variomat Giga pump controlled pressurisation station. Actuation of the corresponding Variomat Giga GH hydraulics (separate product), assembled and internally wired with the appropriate components so that it is fully functioning.Constructed in compliance with DIN EN 12828 and the requirements of VDI 4708, with CE marking.The Control Touch operating unit with TFT colour display inclusive of communications electronics is integrated in a panel-type rugged plastic housing and mounted directly on the control unit with a horizontal alignment. An optional separate and vertical wall mounting plate at maximum three metres distance from the power electronics is possible. Communication electronics comprising: – 4,3" resistive colour touchscreen for programming, operating documentation and monitoring as well as provision of help texts for all functions – Two RS485 serial interfaces as data and/or communication interfaces – Serial TTL-interface with two connection terminals for connection of 2 IO-boards – Potential-free output for forwarding of the collective message – Two electrically isolated analogue outputs e.g. for system pressure – Input for the evaluation of contact water meters – Slot for an HMS network module, one SD card, e.g. for data read-out, software updates, etc. The power electronics are installed in a dedicated plastic control cabinet which is mounted directly below the operating unit. Power supply is via a main switch. Featuring in detail: – Main switch on housing exterior – Pump control – Cable management for external connections – Mounting slot for optional modules Control unit completely piped and wired ready for connection according to VDE regulations. System connections by means of integrated shut-off valves. Control Touch is a fully automatic and freely programmable microprocessor control with touchscreen operation, real-time clock, differentiating error and parameter memory, combined graphical and clear-text display of system pressure, tank level and all relevant operating and fault messages, functional diagram, signalling of the active operating mode, collective fault message, low water level, functioning of pump, overflow valve and make-up valve.Functioning of the pressurisation in the limits +/- 0.2 bar including pump monitoring. Optimised system water degassing due to patented, fully-automatic overflow control with cycles for continuous, interval and run-on degassing. Controlled make-up, automatic interruption and fault message upon exceeding of the runtime and/or the number of cycles. Processing of the signal of a contact water meter for maximum volume limit and/or capacity evaluation of ion exchangers located in the make-up line. Documentation and control of the entire system in respect of the above mentioned parameters.Reflex Variomat Giga hydraulic scheme

3. System / Net

3.1 Variomat

Position	Art. No.	Quantity	Article text

Variomat Giga GS 3 + GH 100

Hydraulic module in compact design for Reflex Variomat Giga pump-controlled pressurisation station. Suitable and equipped for use in heat generation systems according to DIN EN 12828, DIN EN 12952, 12953 as well as for meeting the requirements of TRD 604 Bl 2. and VDI 4708. Implementation of the functions, pressurisation and automatic make-up in closed heating and cooling circuits. Additional degassing of the system water with corresponding mains connection and operating parameters (70 °C) possible. Then self-regulating and optimised degassing control. All components are compactly arranged in a self-supporting, plastic coated tubular steel structure with foot plate so that they can be easily accessed and isolated. Pressurisation takes place using two low-noise vertical stainless steel high pressure centrifugal pumps with vibration decoupling in conjunction with two likewise, parallel arranged overflow lines. In detail these comprise a dirt trap connected in series and a dirt-insensitive motorised ball as an automatically adjustable overflow device. The entire overflow path is additionally protected in the event of minimum pressure undershooting by an additional solenoid valve in conjunction with a minimum pressure limiter integrated in the hydraulic scheme.Replenishment takes place via an electrically actuated valve. Control and operation of the Variomat Giga hydraulics takes place via an appropriate Variomat Giga control unit (separate product) installed in the hydraulics module.

Type	**GS 3 + GH 100**
Control unit	**Adjoining**
Max. perm. operating temperature	**70** °C
Max. perm. operating pressure	**16** bar
Degree of protection	
Electric connection	
Expansion line connection	**DN80/PN16**
Make-up connection	**Rp 1/2"**
Max. electrical rated power	**6.00** kW
Height	**1194** mm
Width	**1548** mm
Depth	**1307** mm
Weight	**210.00** kg

Rated heat output	**4000** kW
Heat generator safety temperature limiter	**95** °C
Static head	**70.0** m
Heat generator safety valve	**9.0** bar

3.1.2	8920405	1	**Variomat Giga GG 2000**

Reflex Variomat Giga GG
Diaphragm expansion vessel for Reflex Variomat Giga pressure maintenance stations, unpressurised, closed to atmosphere. Approval according to the EU Pressure Equipment Directive 2014/68/EU. Built according to DIN EN 13831 and VDI 4708 or AD 2000.

– Floor-standing with foot structure

3. System / Net

3.1 Variomat

Position	Art. No.	Quantity	Article text

Variomat Giga GG 2000

– Replaceable full diaphragm - compliant with DIN EN 13831
– Exterior plastic-coated
– With dipstick tube degassing

– Including transducer for level sensing

– Connection arrangement suitable for system water partial flow degassing in conjunction with Variomat Giga GH Hydraulic Module

Type	**GG 2000**
Colour	**grey**
Max. useful volume	**1800** l
Max. permissible system temperature	**120** °C
Max. perm. operating temperature	**70** °C
Max. perm. operating pressure	**6** bar
Connection	**DN65/PN6**
Height	**2587** mm
High water connection	**285** mm
Weight	**430.00** kg

3.1.3 9119352 1

Reflex Valve Safecontrol

Reflex Safecontrol
Motor-controlled ball valve as conversion kit for water make-up in conjunction with Reflex Servitec and Variomat.Actuation takes place directly from the Reflex control unit. The dirt-resistant motor-controlled ball valve is spring-closed without any need for an electrical supply.Hydraulic and electrical connections must be made by the installer.

Type	**Safecontrol**
Max. perm. operating temperature	**70** °C
Max. perm. operating pressure	**10** bar
Connection	**Rp 1/2"**
Weight	**0.97** kg

3.1.4 7945724 1

Commissioning Variomat Giga

Service description:
Reflex commissioning for a two-pump/compressor standard system in the Variomat Giga range by the Reflex customer service, comprising:

– Adjustment of system to the operating parameters specified by the client,
– Checking the settings and operating parameters, and the system's performance and function in the overall system,
– All set values documented in a report.

3. System / Net

3.1 Variomat

Position	Art. No.	Quantity	Article text

Commissioning Variomat Giga

Requirements:

- electrical and hydraulic connection of the control unit, the accessory components and filled supply system.
- The expansion vessels of the pressurisation station must not be filled with water.
- A sufficient supply of filling water must be provided.

Customer benefits:
While it is entirely possible for customers to put a recently purchased system into service themselves, there are a number of reasons why commissioning by Reflex is a better idea.

- Certainty that the system is set up for optimum operation
- Excluding of possible damage due to incorrect commissioning thus reliability and avoidance of time and costs for downtimes

Commissioning date:
the service can take place within the local country inside about three weeks, internationally within about six weeks after placing of the corresponding order.
Services provided by Reflex Service are **net**!The price does not include any site waiting times or work arising from improper installation or improper condition.Programming the I/O and bus modules is not included in the scope of commissioning. Programming is charged separately according to time and effort.

Type	**Variomat Giga**
Weight	**0.00** kg

3.2 Water treatment

Position	Art. No.	Quantity	Article text
3.2.1	6811205	1	

Fillset pulse

Reflex Fillset Impuls
Fitting with assembly bracket for direct connection of make-up devices for heating and chilled water systems to mains water grids. Featuring in detail:

- Shut-off ball valve fittings
- System separator according to DIN 1988-100 or DIN EN 1717 (BA), with integrated dirt trap
- Assembly bracket for horizontal wall mounting

- Water meter with pulse output

3. System / Net

3.2 Water treatment

Position	Art. No.	Quantity	Article text

Fillset pulse

Type	**Impuls 0,8**
Max. perm. operating temperature	**60** °C
Max. perm. operating pressure	**10** bar
Min. flow pressure	**p0 + 1,3 bar**
Inlet connection	**R 1/2"**
Outlet connection	**R 1/2"**
Flow rate characteristic value kvs	**0.8** m³/h
Height	**226** mm
Width	**293** mm
Depth	**110** mm
Installation length	**293** mm
Weight	**2.80** kg

3.3 Water make-up

Position	Art. No.	Quantity	Article text
3.3.1	9125661	1	

Fillsoft FG II

Reflex Fillsoft cartridge housing, compact basic fitting for treatment of filling and makeup water using an ion-exchanger process for the protection of heat generators and hot water heating systems according to VDI 2035. Cartridge housing can be used in combination with the corresponding cartridge inserts (separate products) optionally for water softening or water desalination.Empty housing is assembly-ready with wall mounting bracket for optional equipping with two each of i:

- Fillsoft water softening resin cartridge (green) FSP 6000 for the water softeningor
- Fillsoft Zero mixed bed resin cartridge (grey) FZP 3000 for water desalination

Fillsoft II individually comprising:

- two cylindrical propylene housings connected in series with brass thread connections for holding two each of the above mentioned water treatment cartridges and optional attachment of a Reflex Softmix mixing mechanism
- Flow limiter
- Shut-off ball valve with sampling tap

Components are arranged as a compact fitting for installation in the filling and makeup water line.

Type	**FG II**
Max. perm. operating temperature	**40** °C
Max. perm. operating pressure	**8** bar
Inlet connection	**Rp 1/2"**
Outlet connection	**Rp 1/2"**
Height	**600** mm

3. System / Net

3.3 Water make-up

Position	Art. No.	Quantity	Article text
			Fillsoft FG II

Width	**380** mm
Weight	**3.60** kg

Position	Art. No.	Quantity	Article text
3.3.2	6811800	4	**Fillsoft FSP 6000**

Reflex Fillsoft cartridge
Cation resin cartridge for filling and make-up water softening, fitting in the Fillsoft I or II cartridge housing. Comprising cylindrical polypropylene cartridge filled with cation exchanger resin for softening of filling and make-up water according to VDI 2035 and/or manufacturer specifications in hot water based heating systems according to DIN EN 12828.

Type	**FSP 6000**
Colour	**green**
Max. perm. operating temperature	**40** °C
Max. perm. operating pressure	**8** bar
Height	**513** mm
Weight	**1.50** kg

Position	Art. No.	Quantity	Article text
3.3.3	9200276	1	**Reflex Fillsoft Tool**

Reflex Fillsoft key
Sturdy plastic key for safe undoing and tightening of the Reflex Fillsoft fitting to simplify cartridge replacement.

Type	**Tool**
Colour	**black**
Diameter	**143** mm
Height	**298** mm
Weight	**0.40** kg

3.4 Separator Exdirt

Position	Art. No.	Quantity	Article text
3.4.1	8252460	1	**Exdirt D 200 R**

Reflex Exdirt
Dirt and sludge separator for heating and cooling water systems or closed liquid-filled plant systems.
Suitable for the media water and water/glycol mixtures up to a mixing ratio of 50/50%.
Fitting for removing particles with a size of up to 5.0 micrometres from the flow of liquid by use of an insert designed specially for the purpose.

3. System / Net

3.4 Separator Exdirt

Position	Art. No.	Quantity	Article text

Exdirt D 200 R

The cleaning and emptying of the dirt collection chamber is possible via a dedicated desludging ball valve without any necessity to interrupt operation.
Maintenance flange for easy housing access during cleaning and maintenance work.

Type	**D 200 R**
Colour	**grey**
Housing material	**painted steel**
Installation variant	**horizontal**
Max. perm. operating temperature	**110** °C
Max. perm. operating pressure	**10** bar
Connection	**DN200/PN16**
Cleaning connection	**IG 1"**
Connection variant	**flange**
Max. volume flow	**180.0** m³/h
Flow rate characteristic value kvs	**780.6** m³/h
Diameter	**409** mm
Height	**1021** mm
Height mid-flange (dirt separation)	**295** mm
Min. maintenance height	**650** mm
Width	**430** mm
Installation length	**775** mm
Weight	**121.00** kg

3.4.2 9258370 1

Reflex Exferro D/TW 200 (219.1)

Reflex Exferro
High-strength permanent magnet for optional installation or retrofitting in Reflex Exdirt/Extwin sludge and dirt separators. Magnet comprises an isostatically pressed neodymium-iron-boron rod inserted in a screw-in immersion sleeve. Separation and fixing of ferromagnetic particles from the separation process. Particles can be permanently and systematically removed from the fluid flow by screwing the magnet sleeve out of the separator housing and then cleaning it.

Type	**D/TW 200 (219.1)**
Max. perm. operating temperature	**110** °C
Max. perm. operating pressure	**10** bar
Connection	**G 1"**
Diameter	**25** mm
Installation length	**565** mm
Weight	**2.35** kg

4. Heat generator protection 1

4.1 Separator Exvoid-T

Position	Art. No.	Quantity	Article text
4.1.1	9250000	1	**Exvoid T 1/2**

Reflex Exvoid T
Automatic quick and large ventilator for heating and chilled water systems or sealed, liquid-filled system circuits.Suitable for the media water and water/glycol mixtures up to a mixing ratio of 50/50%.Fitting for the permanent discharge of gas bubbles from high points or collection points in the hydraulic/piping system that have been provided for this purpose.

Type	**T 1/2**
Housing material	**brass**
Installation variant	**vertical**
Max. perm. operating temperature	**110** °C
Max. perm. operating pressure	**10** bar
Connection	**IG 1/2"**
Vent connection	**G 1/2"**
Diameter	**63** mm
Height	**122** mm
Central flange-jacket	**46** mm
Width	**78** mm
Weight	**0.63** kg