

barnova

INNOVATIVE PRESSURE COMPETENCE

TECHNOMAT

Nova / Duo Nova

PROGRESS

- ✓ Constant pressure
- ✓ Deaeration
- ✓ Make-up feed
- ✓ Feed evacuation
- ✓ Temperature measurement
- ✓ Oxygen measurement
- ✓ pH measurement
- ✓ Conductivity measurement
- ✓ Improving water quality

Remote monitoring
Remote control



UTILITY MODEL
PROTECTED

Pressure holding technology

Degassing technology

UTILITY MODEL PROTECTED

- ✓ Fully insulated membrane drip tray with enamelled inside.
- ✓ Supports inspection of inside of membrane drip tray and change of membrane during operation.
- ✓ No interruption of operation required.



Deutschland Bundesrepublik Deutschland Deutschland

Urkunde

über die Eintragung des
Gebrauchsmusters Nr. 20 2021 004 219

Bezeichnung:
Ausgleichssystem, ausgeführt als pumpengesteuerte Druckhaltestation mit drucklosbetriebenen Membranauffangbehälter, zum Ausgleich von Volumenschwankungen eines liquiden Mediums in Heiz-, Kühl- und Solarkreisläufen

IPC:
F24D 3/10

Inhaber/Inhaberin:
Barnova GmbH, 57334 Bad Laasphe, DE

Tag der Anmeldung:
30.09.2021

Abzweigung aus:
10 2021 125 376.4

Tag der Eintragung:
13.02.2023

Die Präsidentin des Deutschen Patent- und Markenamts

Eva Schewior

Eva Schewior

München, 13.02.2023



Die Voraussetzungen der Schutzfähigkeit werden bei der Eintragung eines Gebrauchsmusters nicht geprüft. Den aktuellen Rechtsstand und Schutzzumfang entnehmen Sie bitte dem DPMAregister unter www.dpma.de.

Benefit!

With remote monitoring and remote control you have your system under control everywhere and all the time.



Barnova TECHNOMAT NOVA/DUO NOVA PROGRESS

The constant pressure station that shows what it can do!

TECHNOMAT, the automatic pump-controlled compact station, reveals new ways for constant pressure and deaeration in heating and cooling circuits.

The pressurising, degassing, makeup and discharge functions plus the measurement and evaluation of all parameters provide unique control over the condition of the medium and the operating states.

Complete redundancy option of pressure and level detection.

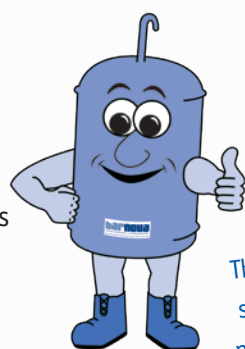
Barnova TECHNOMAT

- ✓ Keeps the pressure constant in the system with low-noise centrifugal pumps – even within tight pressure limits
- ✓ Depressurized operated membrane collecting tank with maximum degassing efficiency.
- ✓ Deaerates system and refilling water in a controlled manner!
- ✓ Back feeds refilling water in a controlled manner
- ✓ Discharges system water in a controlled manner
- ✓ Monitors in conjunction with the multi-language Barnova SPS control system:
 - Membrane rupture
 - pH and conductivity
 - Temperature and oxygen content of the system retaining water
 - Operating states with both time and date particulars
 - Warning and malfunction notifications
- ✓ Transfers all operating states onto control systems
- ✓ Remote monitoring and control through use of intelligent hardware

- ✓ Higher operational security through use of a second pressure transducer.

Thanks to its unique compact design, the Barnova TECHNOMAT can be installed in both an easy-to-operate and ready-to-operate manner.

In short: “How can air problems be dealt without any manual venting?” **By using the Barnova TECHNOMAT and the complete solutions!**

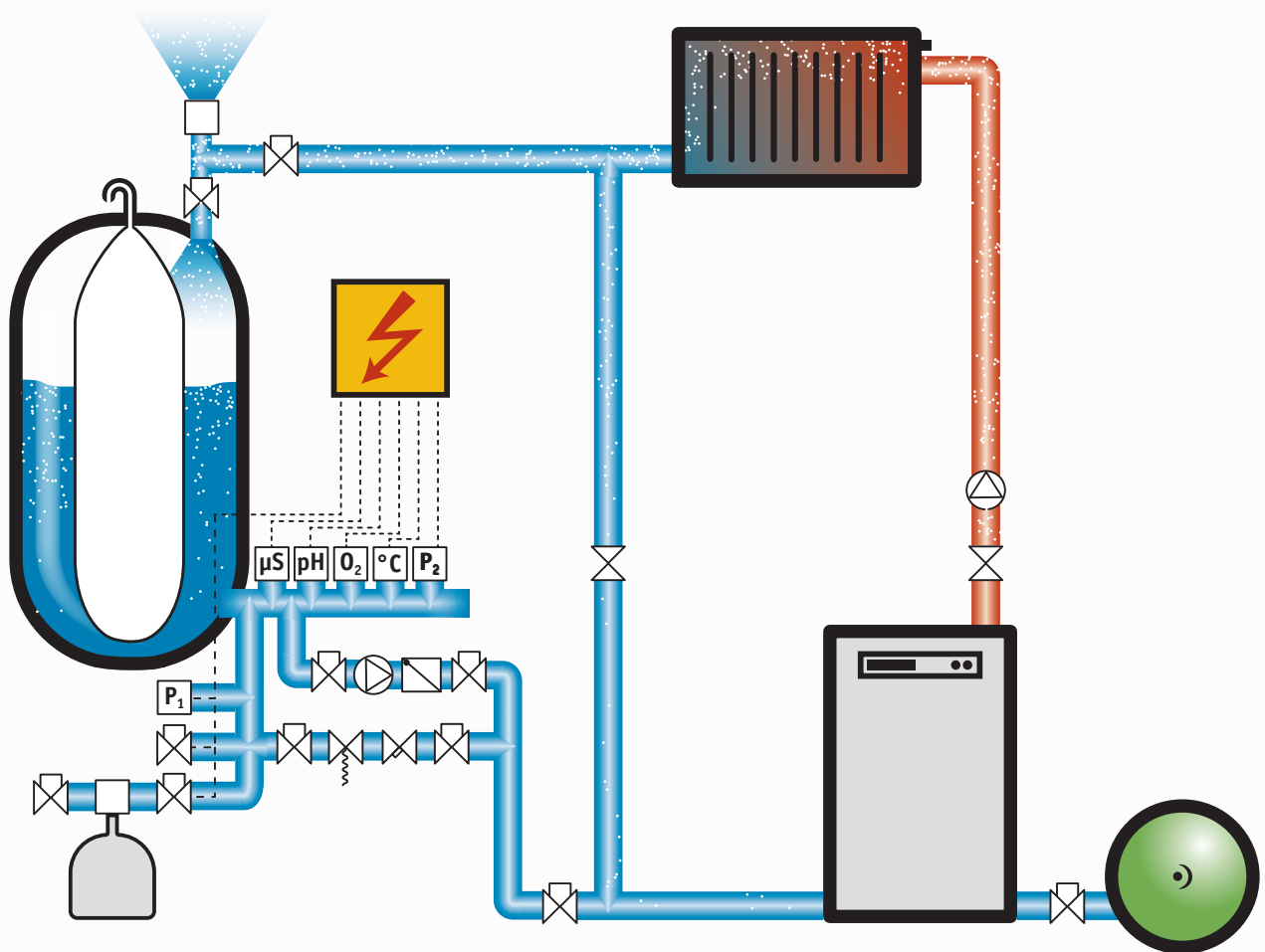


Benefit!

The TECHNOMAT is the pressure holding station that measures oxygen content, pH value and conductivity depending on the temperature and therefore always knows what it's doing!

The Barnova TECHNOMAT PROGRESS Principle

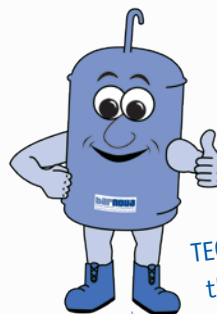
featuring high deaeration efficiency



**Interaction of intelligent components –
from the very beginning:**

TECHNOMAT → Füll → WE → TOPCAT

The Barnova WE water softener complies with the VDI 2035 requirements. A membrane rupture signaller constantly monitors the membrane operation. In the heating up stage, the membrane collecting tank takes up the expanding system water via the relief valve (mechanical or elec-



Benefit!

TECHNOMAT feeds the extracted gas into the water-free and unpressurised tank space from above (sparkling water effect) instead of blowing it from below into the membrane and thus against the static tank pressure.

trical) and makes it available again once the pump cools down. Since the membrane separates the system water from the atmosphere, the tank is of an enclosed system.

Tip:

The interaction of the innovative products significantly reduces corrosion and heat loss.
The ideal way to save energy and money!



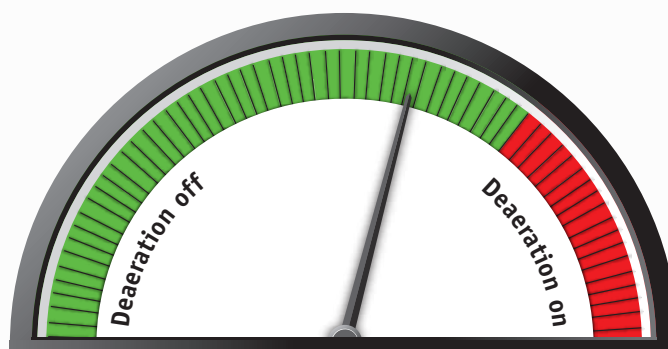
Selective setting of the pumps and relief valves can ensure that the system pressure is kept within the Delta-P range of 0.2 bar. Deaeration is undertaken by a separate solenoid valve which allows some of the main volumetric flow of the system return to flow directly into the non-water area of the membranes. This relief is accompanied by separation of the gases from the system water and discharge via the vent valve. The pump then returns the deaerated system water to the system. This operation is repeated for as long as the interval or constant deaeration cycles last.

The TECHNOMAT Füll or Füll K make-up feed ensures that the minimum water level in the tank stays constant and offsets any water and volume losses, which deaeration and leaks could be responsible for, in a quantity-controlled manner. The point of discharging is to stop any overfilling of the collecting tank; this is particularly important should it not be possible to precisely determine the system capacity.

Especially with return temperatures over 70 °C, constant temperature monitoring of the system return flow pre-

vents damage and thus any costs of repair. The effect of the set value being exceeded is for automatic cooling to protect the system.

The revolutionary oxygen measurement in mg/l is the Barnova TECHNOMAT's No. 1 innovation. Deaeration is only activated once the pre-set value is exceeded. This stops the fluid becoming so corrosive from uncontrolled deaeration that it seeks to again become saturated with gases. By consistently measuring the water's pH levels and conductivity in the system, the prescribed guideline values are continuously kept in check.



Specifications

Type

TECHNOMAT with CE Marking, constructed and tested in accordance with EU Pressure Equipment Directive 2014/68/EU and DIN EN 13831 or AD 2000.

Electromagnetic compatibility in accordance with Regulation 2014/30/EU based on standards EN 61326-1:2013-07 and EN 61439-1:2012-06.

Requirement of Low Voltage Directive 2014/35/EU based on standard EN 61010-1:2011-07/BGV A2.

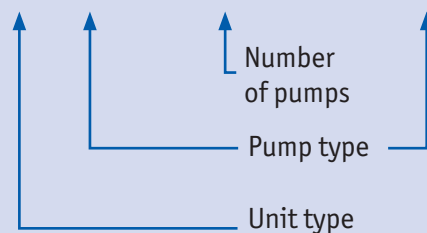
Electrical equipment in accordance with VDE 0116-1:2023-02 and EN 50156-1.

Areas of application

- hot water heating systems in accordance with DIN EN 12828 and VDI 4708
- temperature controller set to $> 105^{\circ}\text{C}$
- with safety requirements/equipment according to DIN EN 12952 and DIN EN 12953
- up to approx. 12 MW
- max. operating pressure 10.0 / 16.0 bar
- cooling circuit with water mixtures with a glycol concentration of up to 50%
- with temperature controller set to $> 105^{\circ}\text{C}$
- with safety requirements/equipment according to TRD 604 Sheet 2
- 72 hours of unsupervised operation
- see TECHNOMAT DUO PLUS brochure

Barnova TECHNOMAT

NOVA 1 to DUO NOVA 14



TECHNOMAT DUO NOVA PROGRESS



- | | |
|---|--|
| 1: Constant pressure pump | 13: System disconnecter |
| 2: Relief valve (mechanical or electrical) | 14: Water meter/Contact water meter |
| 2a: Dirt trap | 15: Solenoid valve (make-up feed) |
| 3: Make-up feed connection | 16: Level detector/sensor or pressure transducer |
| 4: Deaerating valve | 17: Ventilation and venting elbow (see flow chart p. 18/19) |
| 5: Electrical control cabinet | 18: pH measurement |
| 6: Capped ball valve | 19: Temperature measurement point |
| 6a: Return flow stopper | 20: Drinking water connection |
| 7: System connection 1 1/2" (can be optionally used left/right) | 21: Solenoid valve (discharging and draining) |
| 8: Supporting frame | 22: Conductivity measurement |
| 9: Membrane collecting tank | 23: Oxygen measurement point |
| 10: Pressure transmitter | 24: Connection between control unit and membrane collecting tank |
| 11: Safety valve (when SV of the heat generator > 2.0 bar) | 25: Inspection and cleaning flange |
| 12: Solenoid valve (deaeration) | |

Electronic particulars and operating parameters

Below you will find the electronic data and operating parameters of the pumps and the control unit.

Unit		NOVA1/ DUO NOVA1	NOVA3/ DUO NOVA3	NOVA5/ DUO NOVA5	NOVA7/ DUO NOVA7	NOVA8/ DUO NOVA8	NOVA14/ DUO NOVA14
Temperature range		70	70	70	70	70	70
KW	NOVA	0.55	0.55	0.75	1.1	1.1	1.5
	DUO NOVA	1.10	1.10	1.5	2.2	2.2	3.0
A	NOVA	3.50	3.50	4.10	5.90	7.85	6.50
	DUO NOVA	7.00	7.00	8.20	11.80	15.70	13.00
Max. permitted operating positive pressure (bar)		10	10	10	10	10	10
Max. holding pressure (bar)		2.5	2.8	5.0	6.5	8.0	13.0
Max. volume flow of the pump(s) (m ³ /h)		1.5/3.0	1.5/3.0	1.5/3.0	1.5/3.0	1.5/3.0	1.5/3.0
Max. permitted operating temperature (°C)		70	70	70	70	70	70
Max. permitted supply temperature (°C)		120	120	120	120	120	120
Max. permitted ambient temperature (°C)		0-45	0-45	0-45	0-45	0-45	0-45
Noise level (approx. dB)		55	55	55	60	60	<70
Degree of protection		IP54	IP54	IP54	IP54	IP54	IP54
Electr. connection		230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz	230 V / 50 Hz

TECHNOMAT DS / DSB

Here you find the dimensions of the membrane collecting tanks as basic tank (DS) and add-on tank (DSB) for Barnova TECHNOMAT NOVA / DUO NOVA / DUO PLUS

Applications:

- Water heating systems compliant with DIN EN 12828
- Cooling water networks

Max. operating pressure:

- 2.0 bar

Max. membrane operating temperature:

- 70°C

Connection for NOVA/DUO NOVA:

- R 1" oder R 1 1/2"

CONNECTION FOR DUO PLUS:

- DN 80 or DN 100

Basic container:

- Tank equipment complete with control on the tank, depth about 400 mm, and safety valve and vent

Add-on container:

- Container equipment complete with safety valve and vent

Construction:

- TECHNOMAT with CE mark, built and tested in accordance with EU Pressure Equipment Directive 2014/68/EU and EN 13831 or AD 2000.

2.0 bar / 105°C / color: blue

Type/ Contents	Diameter (mm)	Height (mm)	Weight (kg)
150	550	1 400	65.0
200	550	1 530	75.0
300	650	1 550	95.0
400	650	1 860	105.0
500	750	1 880	110.0
600	750	2 108	120.0
800	850	2 180	135.0
1 000	1 000	2 111	170.0
1 250	1 000	2 354	185.0
1 600	1 250	2 100	275.0
2 000	1 250	2 400	295.0
2 500	1 250	2 800	320.0
3 000	1 600	2 300	495.0
3 500	1 600	2 550	545.0
4 000	1 600	2 800	595.0
5 000	1 600	3 300	670.0
6 000	1 600	3 800	720.0
7 000	1 600	4 300	810.0
8 000	1 600	4 800	840.0
9 000	1 600	5 300	890.0
10 000	1 600	5 800	930.0

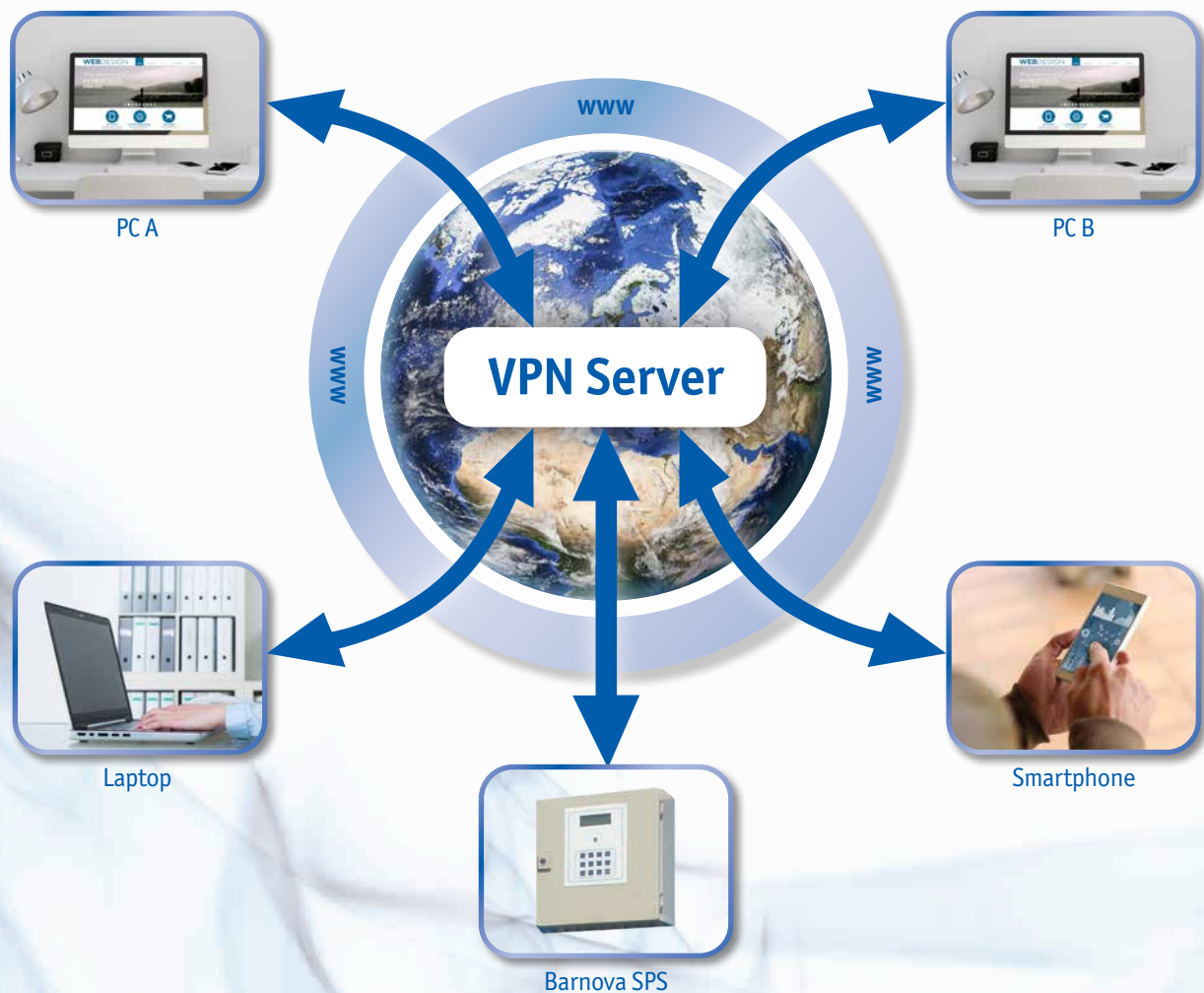
We reserve the right to make technical changes and special tanks are available on request.

VPN-M2M-NETWORKS

The Barnova VPN solution for remote monitoring, remote control, networking and alarms

With the VPN-M2M-NETWORK you are directly connected to the Barnova SPS. This makes it possible not only to view operating states, warnings and malfunctions, but also to intervene directly. Diagnoses, reconfiguration and resetting parameters can all be done from the convenience of your own home.

- ✓ Multi-client system, user groups scalable to any level
- ✓ Highest security standards through certificate-based VPN connections and firewall
- ✓ Low investment and operating costs
- ✓ Reduction of travel and personnel costs
- ✓ Troubleshooting and issue resolution 24/7
- ✓ Automatic notification of warnings and/or malfunctions



Barnova remote control, remote monitoring webshots

Overview

Druckhalteanlage barnova gmbh
Version: 5.40
Anlagennummer: 1622102
Herstellnummer: DS 169201286

barnova gmbh
Servicenummern #
Tel1: 02754/21251-0
Tel2: 0171/1961237

Datum: 01.08.16
Zeit: 13:37

Start/Stop der Dauerentgasung
Start-Zeit: 14:25
Restzeit: 01:00

Normalbetrieb:
Messwerte
Systemdruck: 2.7 bar
Niveau: 47 %
Pumpe P1: Automatik
Pumpe P2: Aus
Entgasung GAS: 1
Überströmer US1: OFF
Überströmer US2: OFF
Keine Störung
Laufzeit Pumpe 1: 20 h
Laufzeit Pumpe 2: 21 h
Restlaufzeit: 30 m
Wasserzähler: 31 L

Sensoren
Temperatur: 45 °C
Sauerstoff: 0.9 mg/l
pH-Wert: 8.7
Leitfähigkeit: 40 uS
Drucksensor 1: ./ bar
Drucksensor 2: ./ bar
Niveausensor 1: ./ %
Niveausensor 2: ./ %

Erweiterungsmodul (NICHT vorhanden)
Relaiszustände
R4: ./ R5: ./ R6: ./ R7: ./ R8: ./ R9: ./
Eingänge
IN5: ./ IN6: ./ IN7: ./ IN8: ./ IN9: ./ IN10: ./

Operator

statische Höhe: 20 m
Min. Druck: 2.1 bar
Max. Druck: 3.3 bar
maximal:

Grundlastpumpe:

Schaltpunkte:
Einschalt: 2.3 bar
Ausschalt: 2.5 bar

Verzögerung:
Einschalt: 3 Sek.
Ausschalt: 5 Sek.

Spitzenlastpumpe: (sofern 2 Pumpen vorhanden)

Schaltpunkte:
Einschalt: ./ bar
Ausschalt: ./ bar

Verzögerung:
Einschalt: ./ Sek.
Ausschalt: ./ Sek.

Entgasung:
Ansprech-Druck: 2.5 bar
Abströmzeit: 10 Sek.
Entgasungszeit: 5 min
Freigabe: 1 = uhrzeitabhängig
von 08:00 bis 16:00

Nachspeisung:

Normalbetrieb
Ein: 20 % Aus: 30 %
min. ./ % max. ./ %
Zeit: 60 min
Nachspeisung frei bei
Überströmer: 1 = ja

Klimabetrieb:
Ein: 000 %
Aus: ./ %
Zeit: ./ min

Abspeisung:
Einschalt: 000 %
Ausschalt: ./ %

Schaltdrücke der elektrischen Überströmer:
Einschalt U1: 3.0 bar Ausschalt U1: 2.8 bar
Einschalt U2: ./ bar Ausschalt U2: ./ bar

Communication modules

Modbus RTU/TCP; Profibus/Profinet; Bacnet

Professionally controlling the water quality in hot water heating systems in accordance with EN 12828, VDI guideline 2035, EN 1717 and EN 1988-100

In most cases, untreated/drinking water is inappropriate for refilling your heating system!

Its properties limit the extent to which untreated raw/drinking water can be used to fill/top up your heating system. The quality of the water you use to top up your heating system has a decisive influence on stone formation, calcification and corrosion. Hard and/or corrosive water will shorten the service life of heat generators, heat exchangers and the entire heating system, resulting in heat loss, malfunctions and reduced efficiency.

The substances dissolved in raw/drinking water are divided into cations and anions.

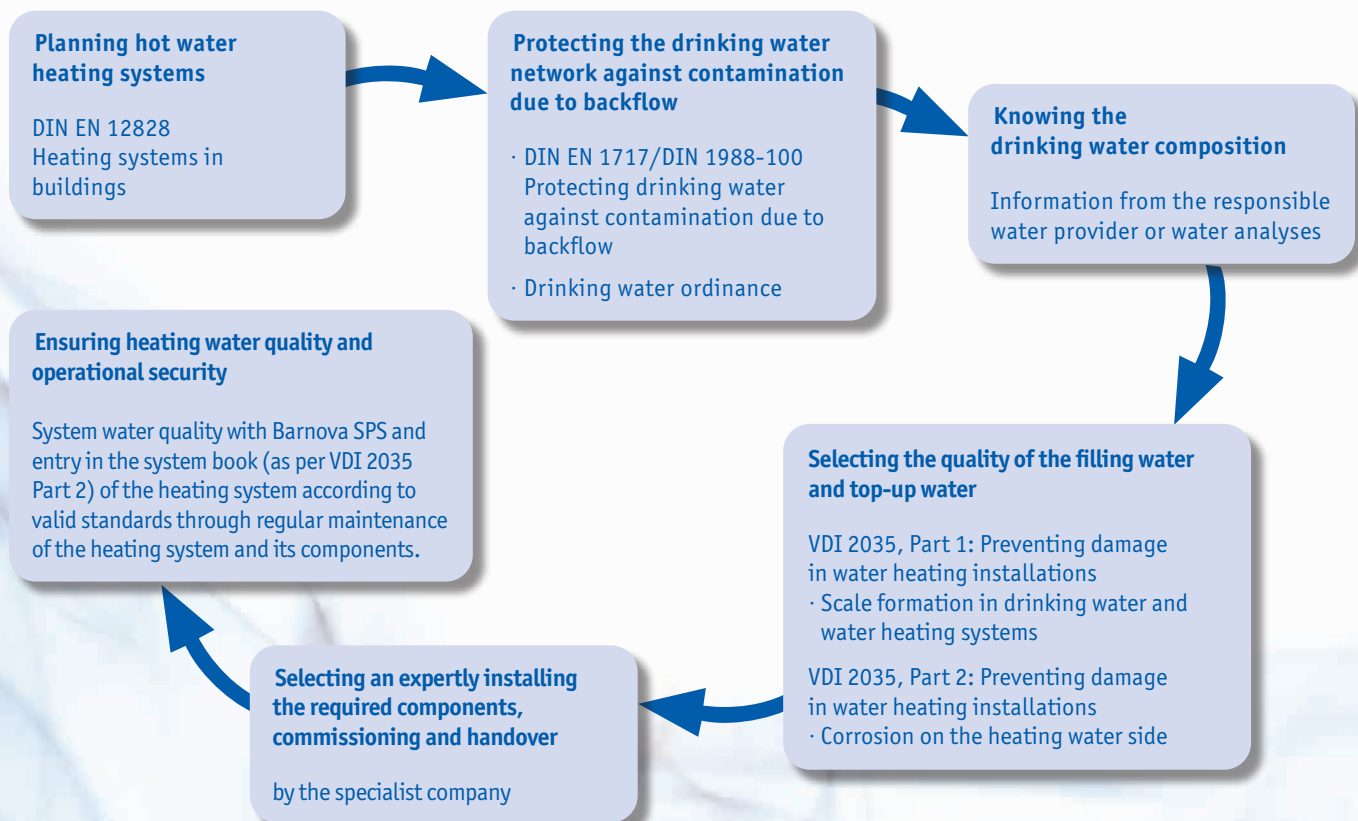
Cations are positively charged ions and are referred to as hardness components or carbonate hardness. Magnesium and calcium cations are mainly responsible for stone formation and calcification.

Anions are negatively charged ions and are known as neutral salts or non-carbonate hardness. Chloride, sulphate and nitrate anions are mainly responsible for corrosion.

Sheet 1 describes the prevention of stone formation and calcification. Sheet 2 describes the prevention of corrosion.

Standard-compliant steps – from planning to operation

Drinking water is not the same as heating water



Guideline Values

Improving water quality, avoiding breakdowns

The water quality in heating systems has a significant impact on operational security and efficiency. Poor water quality leads to breakdowns and system damage through deposits and corrosion. Our experience from numerous cases has shown that water quality is not a focus and therefore does not fulfil the respective requirements. Associated with this in many cases are difficulties having warranty claims granted by boiler manufacturers.

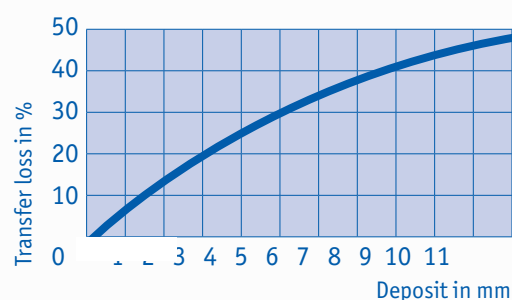
The rules define limits for the pH value, hardness, conductivity and oxygen content. **These parameters** have a significant impact on whether deposits, breakdowns and corrosion occur in a system. These values differ depending on whether the system is operated with high or low salt content. The pH value range to be maintained, by contrast, depends heavily on the boiler material. For example, the use of aluminium materials require maintaining a very tight pH value range (8.2 to 8.5). Therefore, in many cases, the low salt option is preferable, but due to the wide range of factors that could have an impact, we recommend a **technical consultation with our heating water experts for your individual application.**

Water quality requirements are defined in:

- VDI 2035
- AGFW worksheet ("Arbeitsblatt") FW 510
- the requirements of the boiler manufacturers



Just 3 mm of deposits lead to heat loss of 20%



Overview of guideline values

Requirements for the operational mode of the heating network	Low salt content		High salt content
Conductivity at 25 °C (µS/cm)	10 - 30	30 - 100	100 - 1500
Appearance	clear, free of suspended substances		
pH value at 25 °C	9.0 - 10.0*	9.0 - 10.5*	9.0 - 10.5*
Oxygen (mg/l)	< 0.1	< 0.05	< 0.02
Hardness (mmol/l)	< 0.02**	< 0.02**	< 0.02**

* does not apply to the use of aluminium materials (pH 8.2–8.5);

** Amounts to 0.11 dH° > Source: AGFW worksheet FW 510. VDI 2035

PLC control programme

Standard display

Power On

- Display

```
Constant pressure unit
-----
barnova gmbh
Version X.XX
```

Standard operation

Use the ▲ and ▼ buttons to move up and down the programme menu items.

- Display of function and operating parameters

```
System pressure: bar
Level:           %
P1 P2           NS GAS
ÜS1             ÜS2
```

- Display of the temperature and oxygen content

```
Temperature:    °C
Oxygen:         mg/l
```

- Display of additional pressure sensor

```
Pressure s. 1:   bar
Pressure s. 2:   bar
Active:
Switchover      with 1/2
```

- Display of pH value and conductivity

```
pH value:       °dH
Conductivity:    µS
```

- Display of additional level sensor

```
Level s.1:      %
Level s.2:      %
Active:
Switchover      with 1/2
```

- Display of the pump running times

```
Pump 1:         h
Pump 2:         h
Remaining running time:m
Water meter:    1
```

- Display of unit and maker's Nos.

```
U-number:**0000000**
M-number:**0000000**
```

- Display of the service phone numbers

```
barnova gmbh
# Service numbers #
Tel 1: XXXXX
Tel 2: XXXXX
```

- Display of the actual date and time

```
Date
Time
Change with 'No'
```

- Start/Stop of constant deaeration

```
Constant outflow
Start??
Time:         h
YES           NO
```

- Remaining time of the constant outflow

```
Constant outflow
in operation
Time remaining:    h
JA=Continue        NO=Stop
```

Altering the Parameter menu – 1: Operator

```
Programming mode *1*
1: Operator
2: Service
3: Malfunction memory
4: Data logger
```

- Language setting

```
Language:      **_**
0:German
1:English
2:Norwegian
3:Slovenian
```

- Setting the static height as well as the minimum and maximum pressure

```
Static height      m
Min.Pressure:      b
Max.Pressure:      b
maximum:           m
```

- Setting the time delay for the fault notification – Minimum pressure not reached

```
Delays
Min.Pressure:      min
Range: 0..30
0 = no delay
```

- Setting the switch-on and switch-off pressures of the basic load pump

Switch points
Base load pump
Cut-in pressure bar
Cut-out pressure bar



- Switch-on and switch-off pressures of the peak load pump

Switch points
Peak load pump
Cut-in pressure bar
Cut-out pressure bar



- Setting the delay times for the basic load pump

Delay basic load p.
Switch on sec.
Switch off sec.
Range: 0..20 sec.



- Setting the delay times for the peak load pump

Delay peak load p.
Switch on sec.
Switch off sec.
Range: 0..20 sec.



- Setting the response pressure for deaeration

Deaeration:
Response press: bar
00.0: without deaeration



- Setting the outflow and deaeration times

Deaeration:
Outflow time: s
Deaeration time m



- Release for degassing

Deaeration time

Release 0/1



- Setting the make-up feed as a % of the tank filling level

Make-up f.. On %
Make-up f.. Off %
Minimum %
Maximum %



- Setting the maximum make-up feed time

Make-up f.. On %
Make-up f.. Off %
Make-up f.. Time min
Maximum 240 min



- Blocking the make-up feed given non-closed relief valves

Make-up feed unobstructed
with relief valve
** **
0 = No 1 = Yes



- Settings of the make-up feed for air-conditioning operations as a % of the tank filling level and maximum make-up feed time

Air-cond. op.
Make-up f.. On %
Make-up f.. Off %
Make-up f.. Time min



- Settings for discharge as a % of the tank filling level

Discharging
Switch on: %
Switch off: %
0 = No discharging



- Setting the switching pressures for the electrical relief valves

Switch on U1 bar
Switch off U1 bar
Switch on U2 bar
Switch off U2 bar



Please wait..
BNHD V00XXX

You get back to the start image.



Tip:
Detailed information in
the installation and oper-
ating instructions

Programming mode
2: service menu,
3: fault memory, and
4: data logger
can only be viewed and
edited after entering the
password

Selection

Selection and ordering particulars

The optimum use of the TECHNOMAT NOVA and DUO NOVA constant pressure stations is to be selected as a function of the p0 minimum operating pressure, the unit's rated thermal output and the Vn nominal volume of the membrane collecting tank.

Whilst the minimum operating pressure determines the required pump pressure, the thermal output does the same for the quantity conveyed.

The nominal capacity of the membrane collecting tank is determined by the water content of the unit and the corresponding operating temperatures.

Thermal output	kW
Safety temperature STB	°C
Supply temperature	°C
Return temperature	°C
Static height	m
Response pressure of safety valve	bar

Calculation of the pumping capacity (Q volumetric flow)

Heating systems: $\text{Output (kW)} \times 0.85 \times \frac{I}{\text{h kW}} = \frac{I}{h}$

Cooling systems: $\text{Output (kW)} \times 0.35 \times \frac{I}{\text{h kW}} = \frac{I}{h}$

barnool



Tip:
Proportioning and design
programme on
www.barnova.de

System/Netz

Art der Heizanlagen	Anteil (%)	Leistung (kW)	Vorlauf (°C)	Rücklauf (°C)	Wasserinhalt (ltr.)
Konvektoren	0.0	0.0	75.0	55.0	0.0
Lüftungsanlagen	20.0	40.0	75.0	55.0	440.0
Plattenheizkörper	80.0	160.0	75.0	55.0	2.040.0
Radiatoren	0.0	0.0	75.0	55.0	0.0
Flächenheizung	0.0	0.0	75.0	55.0	0.0
Heizflächenleistung installiert		200.0 kW			
Restwärmeleistung Wärmeerzeuger		200.0 kW			
			Fernleitungen		1.952.0 ltr.
			Sonstiges		0.0 ltr.
			Anlage		2.496.0 ltr.
			Wärmeerzeuger		400.0 ltr.
			Gesamtinhalt		4.848.0 ltr.

Proportioning of the membrane collecting tank

$$V_e = n \frac{V_a}{100}$$

$$V_v = 0.5 \frac{V_a}{100}$$

$$V_n = \frac{(V_e + V_v)}{0.9}$$

V_a = Water content of the unit

V_e = Expansion volume

V_v = Water reservoir

V_n = Nominal capacity

Example of calculation:

kW = 850

STB = 105 °C

VL = 110 °C

RL = 70 °C

Static height = 35 m

SV = 5 bar

Va not known

100% radiators

Water content of the Unit Va with approximate values (Ltr./KW)

Heating systems	Supply temperature				
	70 °C	80 °C	90 °C	100 °C	110 °C
Convectors	9.5	7.5	6.0	5.0	4.0
Ventilating systems	12.5	10.0	8.0	6.5	5.5
Panel-type radiators	14.5	11.0	9.0	7.5	6.5
Radiators	22.0	17.0	13.5	11.0	9.5

Expansion coefficient

Expansion factors n in % and the evaporating pressure pD in bar positive pressure								
°C	n	pD	°C	n	pD	°C	n	pD
20	0.14	-	60	1.68	-	105	4.74	0.21
30	0.40	-	70	2.25	-	110	5.16	0.50
40	0.75	-	80	2.89	-	115	5.59	0.70
50	1.18	-	90	3.58	-	120	6.03	1.00
55	1.42	-	100	4.34	-	130	6.97	1.70

$$Q = 850 \times 0.85 = 722.50 \text{ l/h} = 0.7225 \text{ m}^3/\text{h}$$

$$V_e = 5.16 \frac{(9.5 \times 850)}{100} = 416.67 \text{ Ltr.}$$

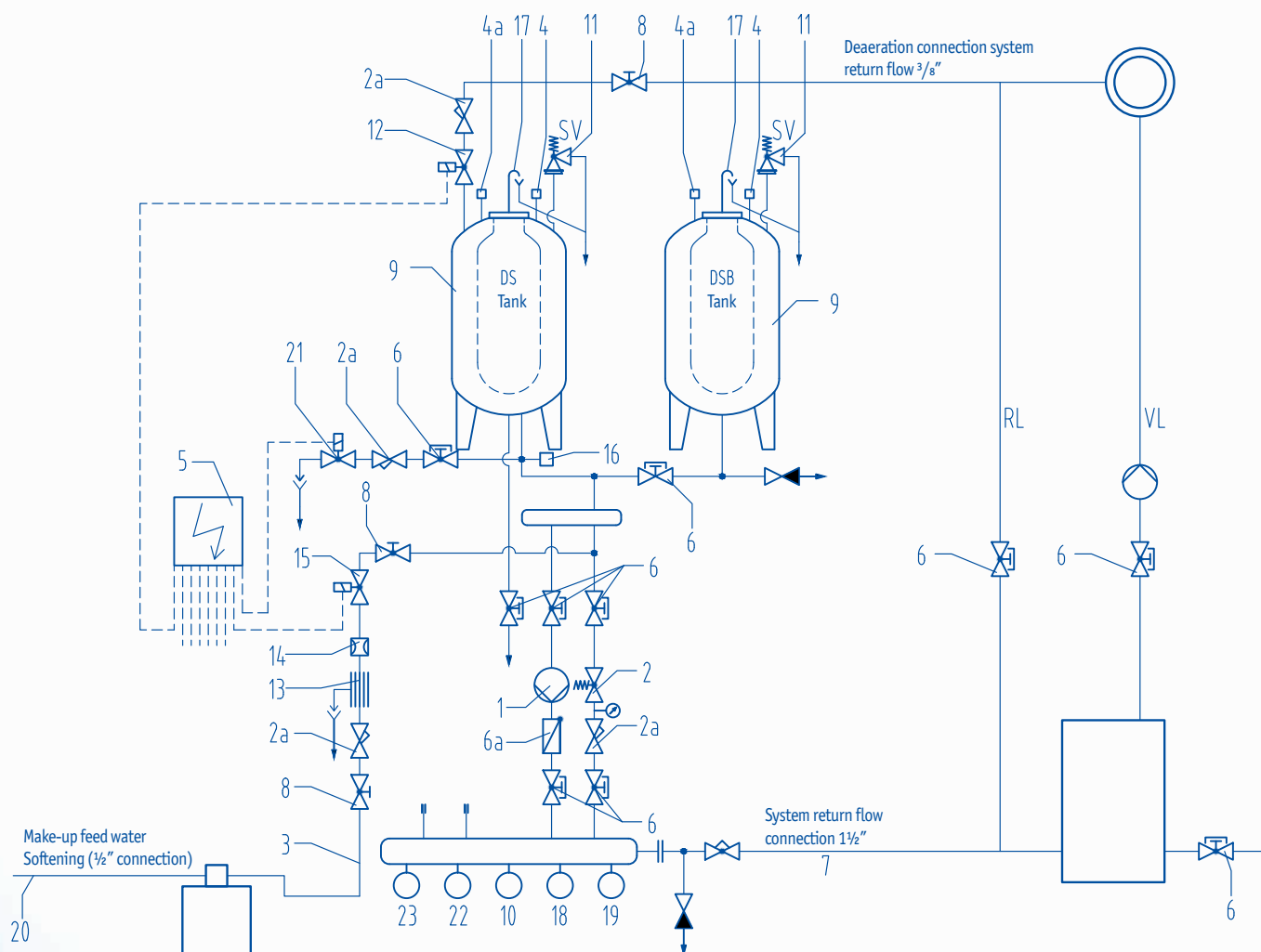
$$V_v = 0.5 \frac{8,075}{100} = 40.38 \text{ Ltr.}$$

$$V_n = \frac{(416.67 + 40.38)}{0.9} = 507.8 \text{ Ltr.}$$

Chosen: NOVA 5-600

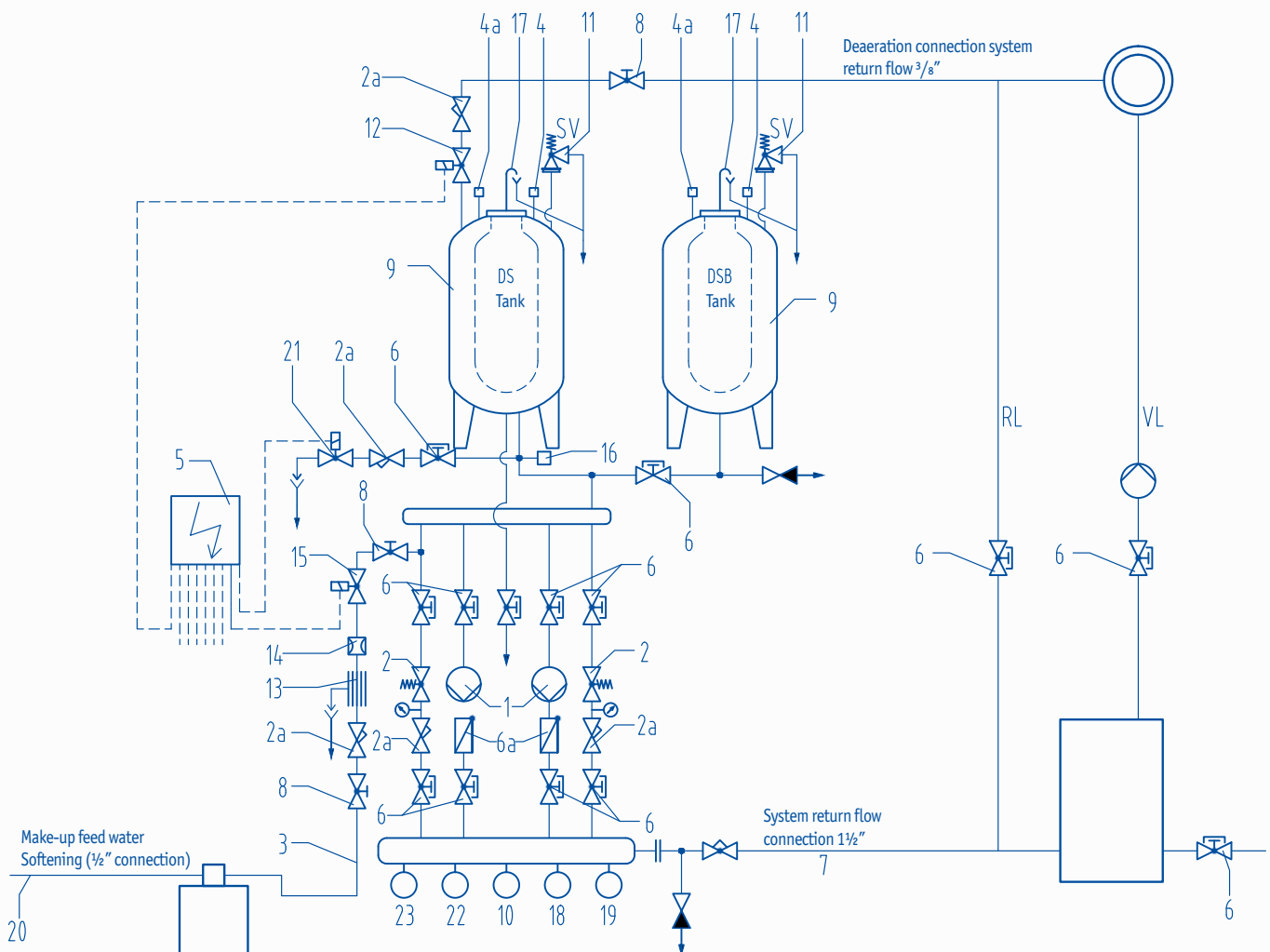
Special-purpose pressure appliances up to 400 MW with control unit and membrane collecting tank for temperatures > 105 °C, for hot water installations in keeping with TRD 604 Sheet 2, EN 12952/EN 12953 for BOB 72h can be supplied in whatever size involving individual planning according to specific customer requirements.

Flow sheet NOVA PROGRESS



- | | |
|---|--|
| 1: Constant pressure pump | 11: Safety valve (when SV of the heat generator < 2.0 bar) |
| 2: Relief valve (electrical or mechanical) | 12: Solenoid valve (deaeration) |
| 2a: Dirt trap | 13: System disconnecter |
| 3: Make-up feed connection | 14: Water meter/Contact water meter |
| 4: Deaerating valve | 15: Solenoid valve (make-up feed) |
| 4a: Venting valve | 16: Level detector/sensor or pressure transducer |
| 5: Electrical control cabinet | 17: Ventilation and venting elbow |
| 6: Capped ball valve | 18: Oxygen measurement point |
| 6a: Capped ball valve with integrated return flow stopper | 19: Temperature measurement point |
| 7: System connection (can be optionally used left/right) | 20: Drinking water connection |
| 8: Stopcock | 21: Solenoid valve (discharging) |
| 9: Membrane collecting tank | 22: Conductivity measurement |
| 10: Pressure transmitter | 23: pH measurement |

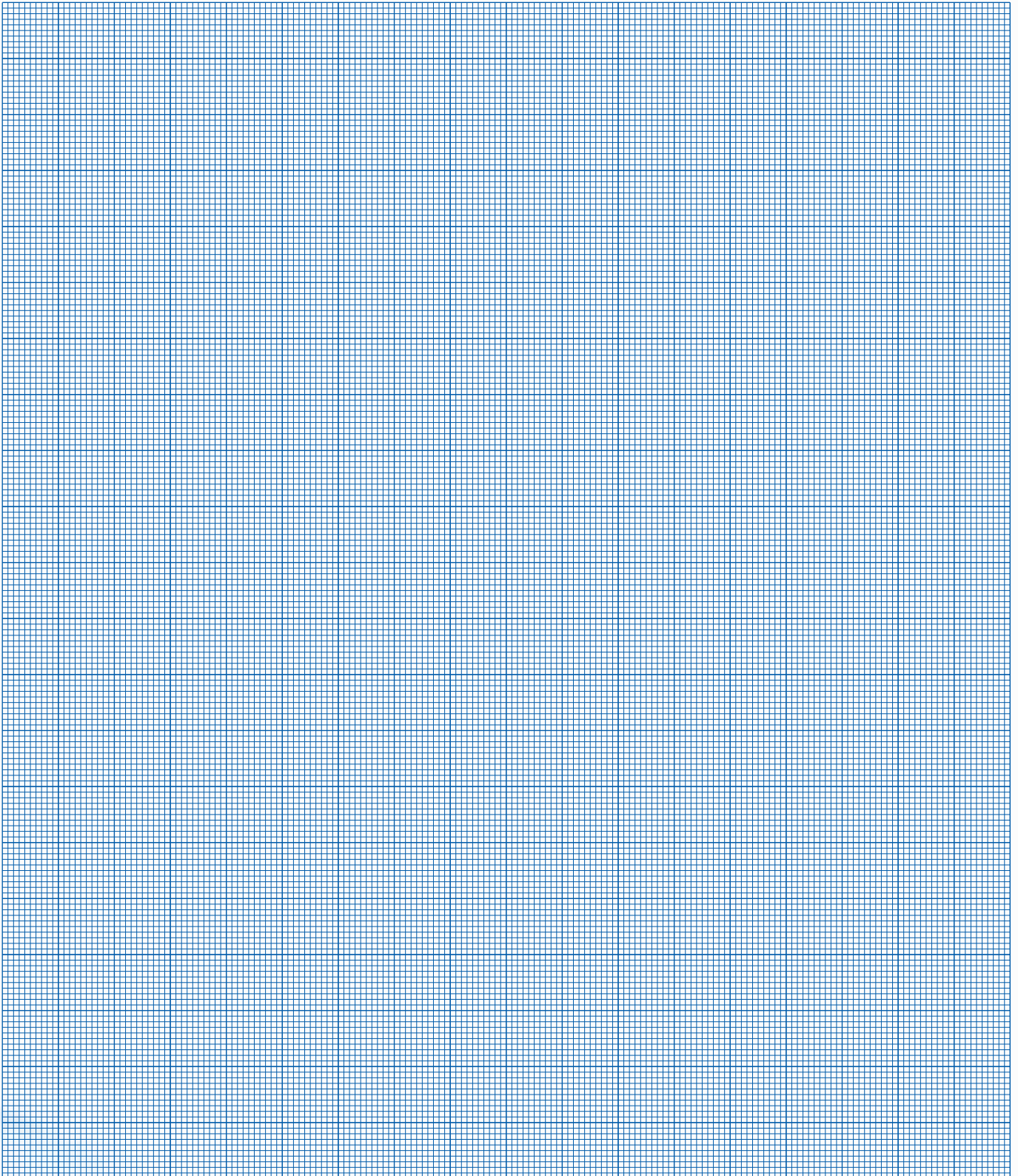
Flow sheet DUO NOVA PROGRESS



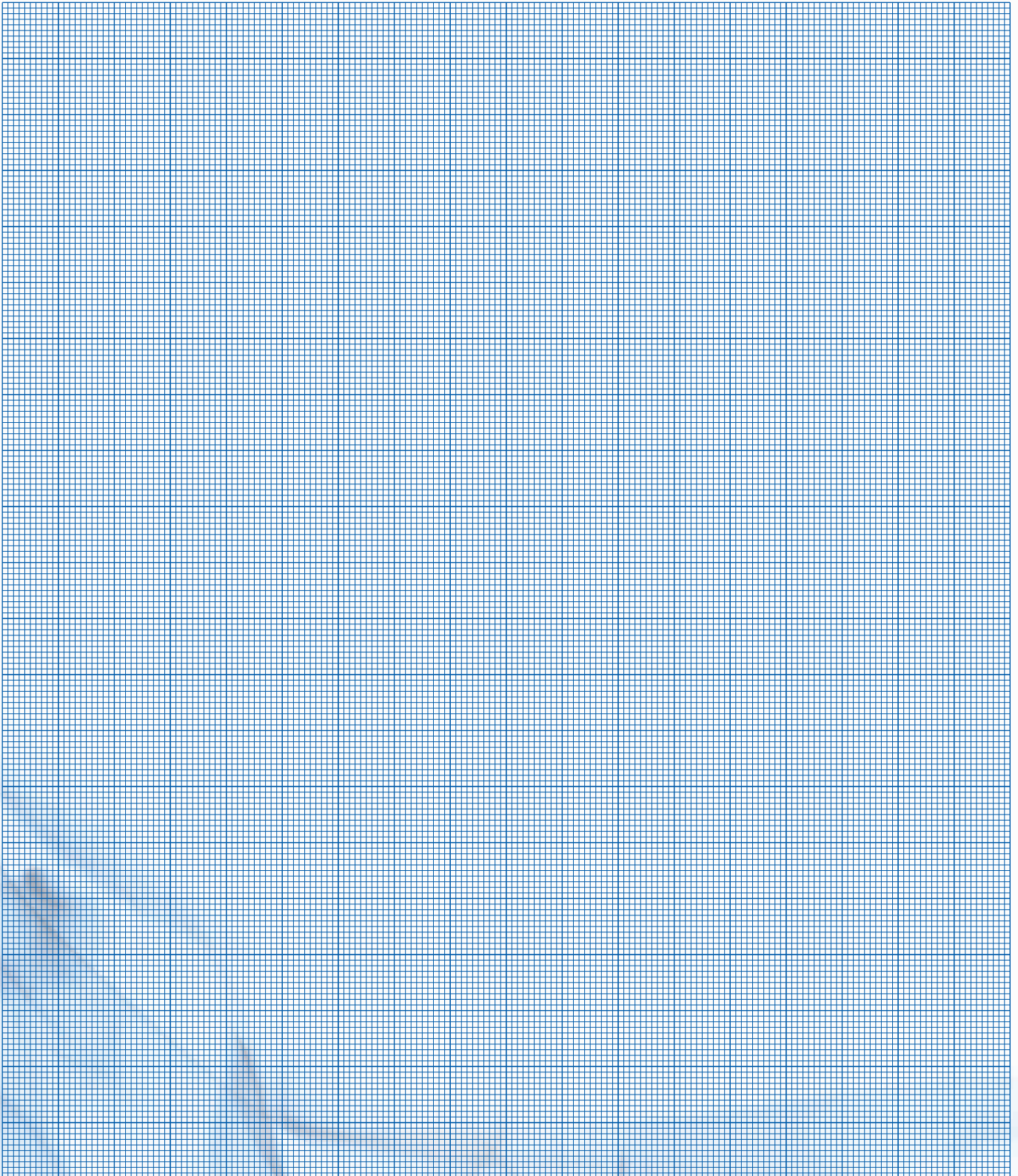
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| 1: Constant pressure pump | 11: Safety valve (when SV of the heat generator < 2.0 bar) |
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Notes



Notes



INNOVATIVE PRESSURE COMPETENCE

For over two decades, BARNOVA has been an established name in the field of pressurisation, degassing and plant technology both at home and abroad.

Our innovative pressuriser and degassing stations, membrane expansion vessels, separators, vessels and plant equipment of any kind enable us to offer solutions tailored to your specific needs.



INNOVATIVE PRESSURE COMPETENCE

Barnova GmbH

Höhenweg 16
57334 Bad Laasphe

Tel. 02752-4799798
info@barnova.de
www.barnova.de

Branch:

Barnova GmbH
Lahnuferstraße 7
57334 Bad Laasphe

Tel. 02752-50959
info@barnova.de