reflex

Thinking solutions.

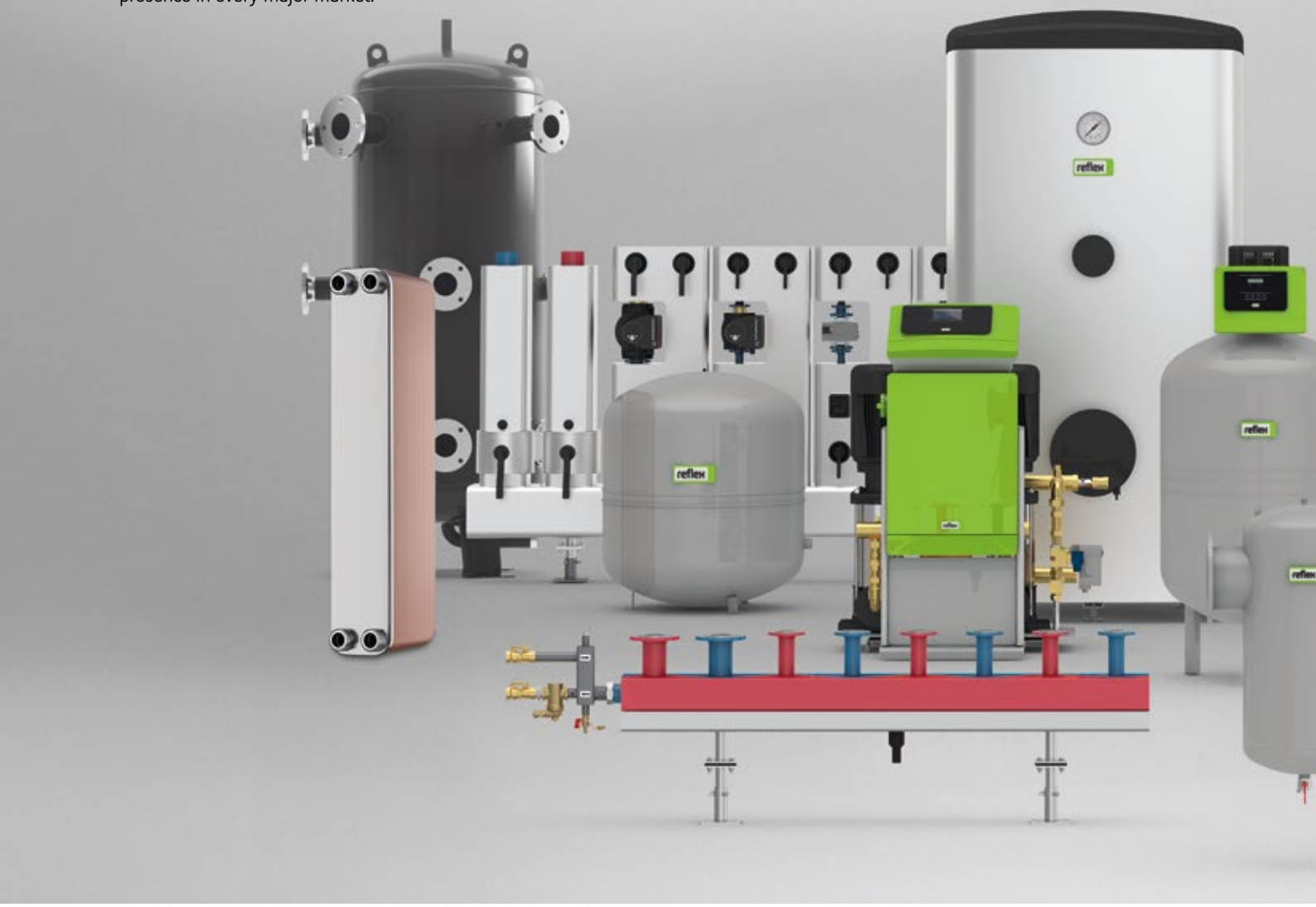
Multivalent solutions

SINUS MultiFlow Center
SINUS MultiFlow Expert

Reflex —
a strong brand for decades

Reflex Winkelmann GmbH — part of the Building+Industry division — is a leading provider of high-quality heating and hot water supply technology systems. Under its Reflex brand, the company, which has its headquarters in Ahlen in the German region of Westphalia, develops, produces and sells expansion vessels, as well as innovative components and holistic solutions for pressure maintenance, water make-up, degassing and water treatment, hot water storage tanks and plate heat exchangers, as well as hydraulic distribution and storage components. Reflex Winkelmann GmbH has more than 2,000 employees worldwide, giving it an international presence in every major market.

With its energy-efficient and sustainable products, the company is already doing its bit to help the environment, as evidenced by its commitment to sustainability and the climate policy goals agreed by the German Federal Government. This support is built on proven technologies and future-oriented innovations. What's more, Reflex Winkelmann GmbH works together with others as equals, always maintains its focus on the customer and offers additional services such as its own factory service centre fleet and a comprehensive range of training options.



Contents

ProSinusX

Configure at
prosinusx.sinusverteiler.com

→ Find out more on p. 24

Reflex City

Ready for the future with multivalent solutions

Living, shopping, working and producing — city-life means diversity. And the demands on supply technology are as individual as the buildings themselves. Whether it's a 5 kW system in a detached home or a safety-related cooling system in a computer centre — Reflex offers products and solutions of all sizes and complexities. This self-image is reflected in the Reflex City concept.

We are making heating and cooling systems future-proof with our multivalent solutions from the SINUS brand. This makes it easy to integrate different types of heat generators into the system and combine them flexibly. In addition, the SINUS MultiFlow Center and SINUS MultiFlow Expert ensure an optimal hydraulic balance. This also applies to medium-sized and large systems and complex requirements.

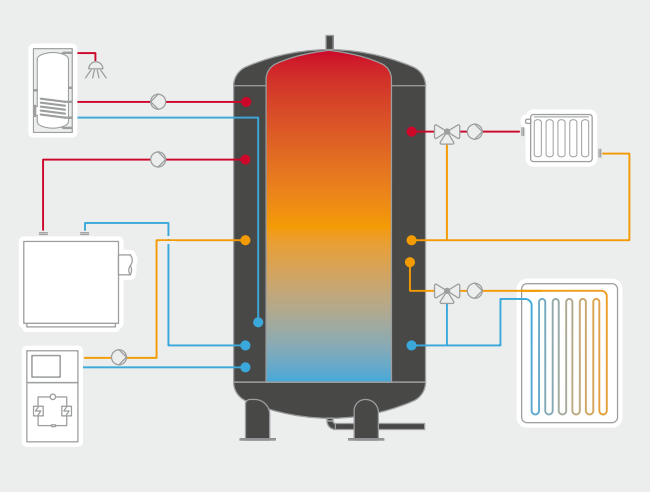
Multivalent solutions

Multivalent systems engineering

In the context of a sustainable climate policy, growing attention is being paid to building technology. CO_2 emissions must be reduced in this sector, too, with the result that regenerative technologies are increasingly being used for energy generation. Intensive innovation work means that many different technologies are now available to the building services sector. These technologies can only achieve their full efficiency with clearly thought-out concepts. Planners and contractors are often faced with the challenge of harmonising a combination of disparate technologies in their systems engineering. The main reason for this, apart from differences in availability times, is divergent system temperatures. For example, a heat pump supplies different flow temperatures from a solid fuel boiler. And a CHP unit makes different demands on the return temperature from a modern condensing boiler. If disparate technologies are also combined on the consumer side (secondary side), the system hydraulics need to be precisely planned so that the different temperatures and mass flows are available at the appropriate points in the network.

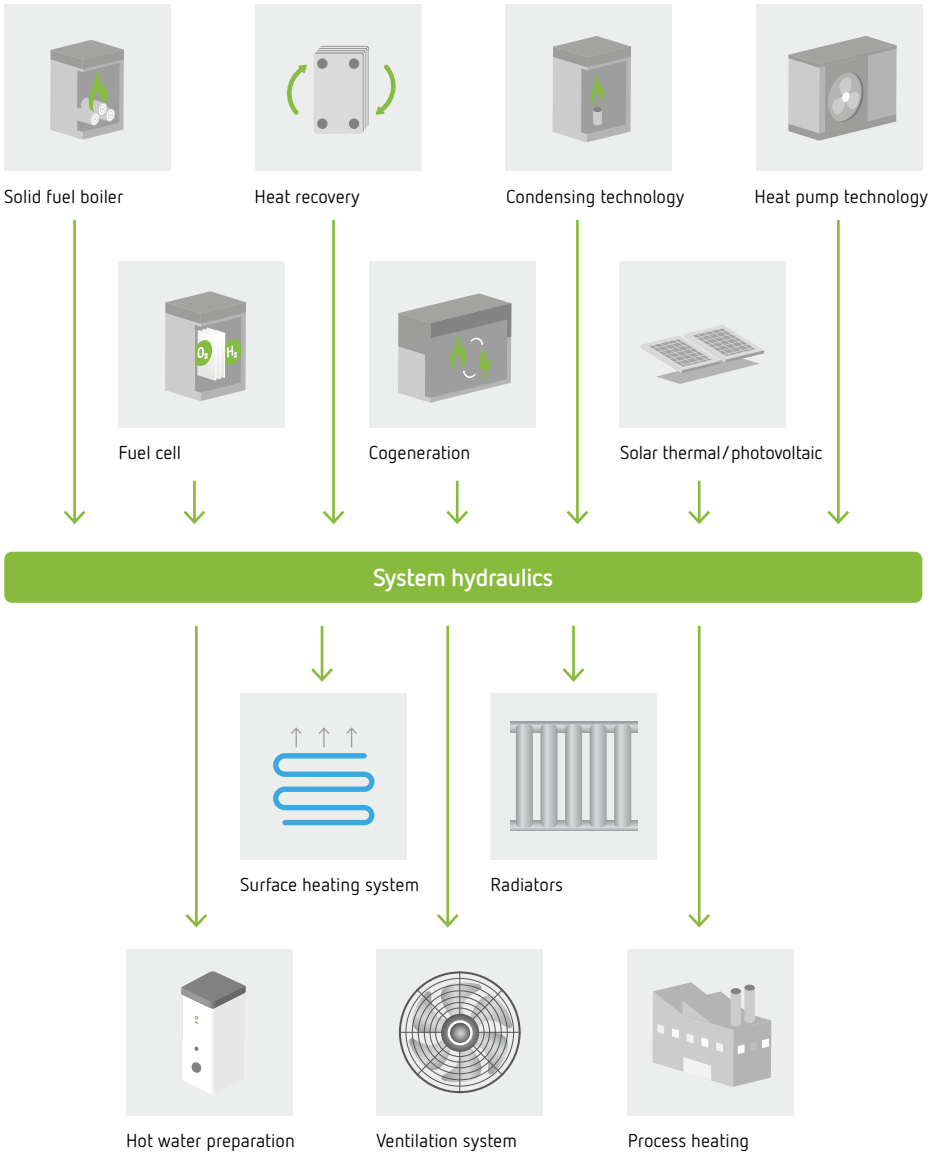
Function

Systems with different technologies for generating heat or cold are multivalent systems. With regard to the hydraulics, challenges arise here due to different temperature levels. By using a SINUS MultiFlow Expert or SINUS MultiFlow Center, the systems can be reliably divided into the respective temperature levels. A SINUS MultiFlow Center functions as a hydraulic switching point, a manifold and energy storage system in one. At the same time, the system is divided into different hydraulic temperature zones. This results in a very efficient function with maximum system safety.



Hydraulic decoupling of the generator and consumer circuits

Primary side of the system hydraulics
On the primary side, many different technologies are available; these need to be correctly integrated hydraulically.



Secondary side of the system hydraulics
On the secondary side, too, different temperatures and mass flows must be provided as needed via the hydraulics.

Heating system	Energy source	Note
Monovalent system	A single energy source, e.g. oil, gas, wood	Several heat generators in parallel operation (cascade connection) also possible
Bivalent system	Two energy sources	Example: Gas condensing boiler with solar system
Multivalent system	A variety of energy sources can be used	Example: Gas condensing boiler with heat pump and solar system

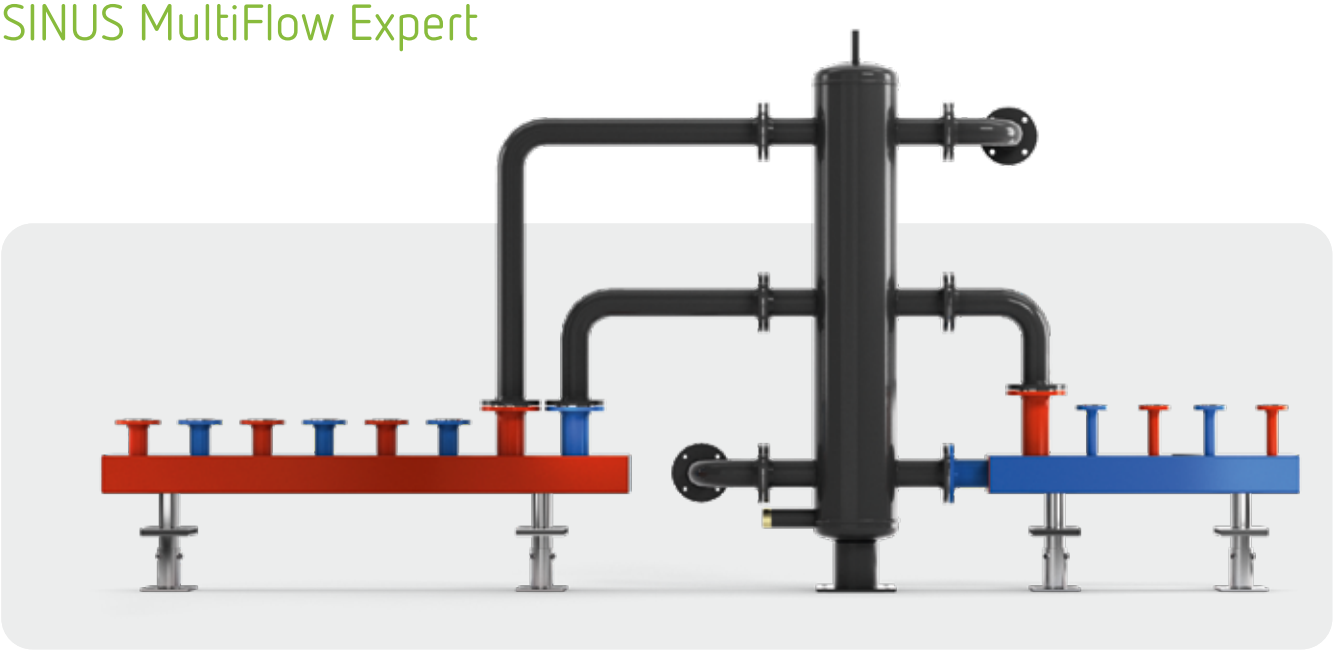
Reflex solutions — product overview

SINUS MultiFlow Center

The SINUS MultiFlow Center is a project-specific and individually designed all-rounder. The multi-layer storage tank combines the function of multivalent distribution, energy storage and hydraulic decoupling in one product. In this way, both the minimum running times of the generators and peak loads can be covered, while secure and trouble-free operation can be guaranteed.

- In all systems, also those over 9 MW and with a variable number of temperature zones
- Multivalent distribution, energy storage and hydraulic decoupling.
- Both the minimum running times of the generators and peak loads can be covered, while secure and trouble-free operation can be guaranteed.

SINUS MultiFlow Expert



The SINUS MultiFlow Expert consists of a multi-temperature zone switching point and a manifold for a high-temperature and low-temperature ranges. This solution is designed for heating and cooling systems with three temperature zones. The residual heat from the high-temperature circuit is used to supply the low-temperature circuits. As a result, a extremely high level of efficiency is achieved and the hydraulic decoupling ensures a safe functionality in all operating conditions.

- Up to 9 MW with three temperature zones
- It functions hydraulically in the same way as the SINUS MultiFlow Center
- Even clearer and easier installation thanks to the addition of two compact manifolds

SINUS MultiFlow Center

Key advantages

System safety through perfectly functioning hydraulics

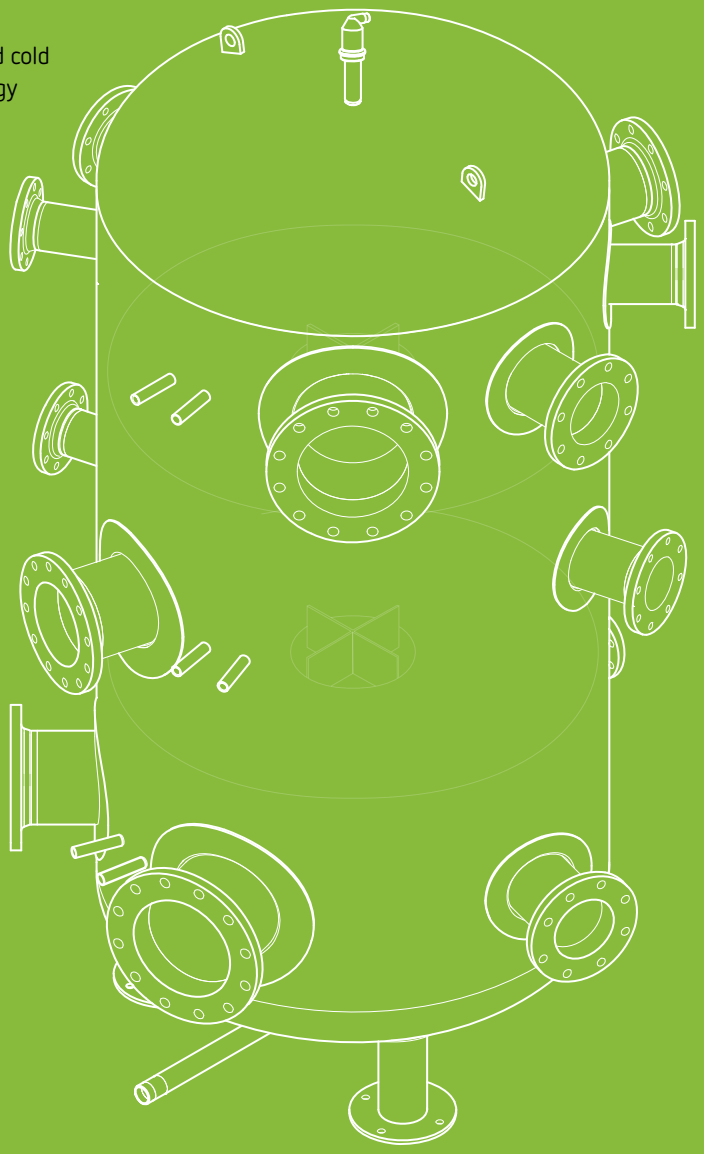
- Hydraulic decoupling ensures system safety
- Easy combination of different energy sources
- No influence on the different circuits in different load conditions

Efficient overall system

- Clear demarcation of the different temperature zones
- Suitable temperatures are provided where they are needed
- Use of residual heat
- Running time optimisation of sensitive heat and cold generators through possible tank volume (energy storage)
- Integrated energy storage

Can be used everywhere

- Can be used in heating and cooling systems as well as change over
- Solutions for system size in the commercial and industrial sector
- Individually designed and custom-made
- Individually configurable for all system sizes



Design, function, application

Construction of the SINUS MultiFlow Center

1. Hot water storage tanks
   are always planned and manufactured individually and project-specifically
2. Connections
   the type and number of connections can be selected individually
3. Venting
4. Draining

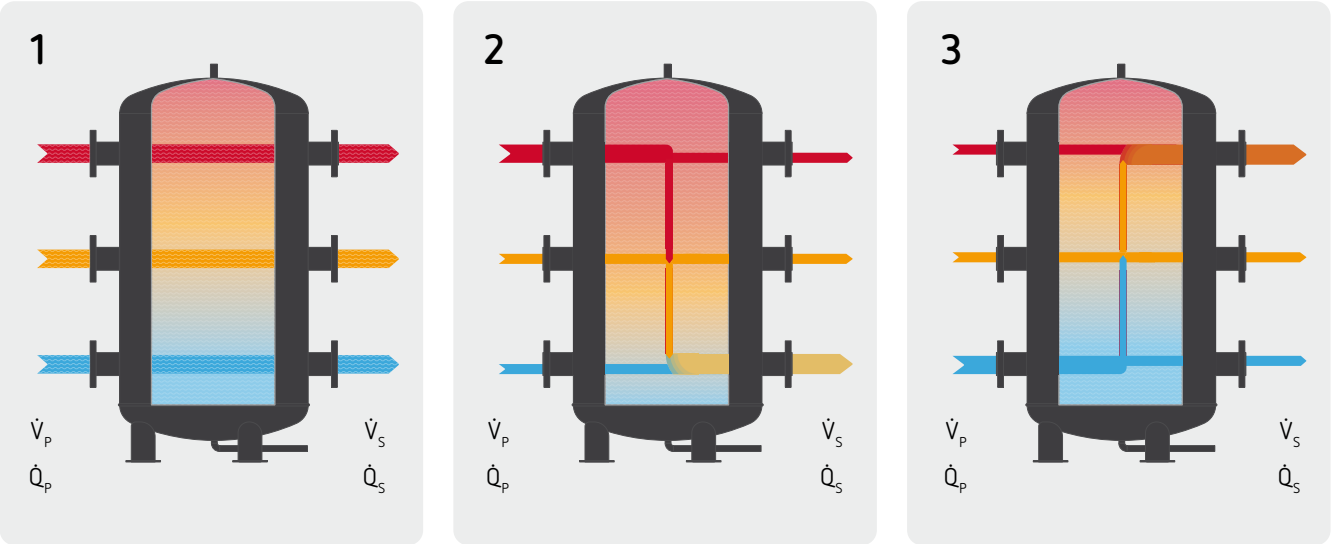
This SINUS MultiFlow Center distribution and collection centre is a product from the solutions portfolio for multivalent heating or cooling systems. Hydraulic separators and manifolds are brought together in this product. In addition to the other variants, this distribution and collection centre allows the system volume to be increased in order, for example, to use quantities of residual energy or to reduce pulse frequencies.

A buffer tank is the key element of this distribution and collection centre. Options are available for the required height and tank capacity. The hot water storage tank is subdivided inside the vessel into different zones, each of which forms an independent temperature zone.

A specifically sized baffle plate is located between two adjacent temperature zones to ensure optimum formation of the temperature zones and a sufficient buffer volume. The baffle plate and special inflow pipes are designed such that only differential mass flows are exchanged between two adjacent temperature zones. Any number of zones can be selected and both primary and secondary circuits can be positioned within their temperature range as required.

Operating statuses for multivalent solutions

using the example of the SINUS MultiFlow Center



1. Volume flow heat generator = volume flow heat consumer

- Equal amount of heat from the generator and consumer circuits
- Uniform stratification in the SINUS MultiFlow
- Identical temperatures on the producer and consumer sides

2. Volume flow heat generator > volume flow heat consumer

- Heat input is greater than heat output
- Hot flow water is added to the primary return flow by the SINUS MultiFlow Center
- The design of the SINUS MultiFlow Center ensures that only the difference between the water quantities is added. Otherwise, stratification is maintained

3. Volume flow heat generator < volume flow heat consumer

- Heat output is greater than heat input
- Colder return flow water is added to the flows on the secondary side via the SINUS MultiFlow Center
- The design of the SINUS MultiFlow Center ensures that only the difference between the water quantities is added. Otherwise, stratification is maintained

Videos showing how this and other products work can be found at
www.youtube.com/@ReflexWinkelmannUnitedKingdom

Product range

SINUS MultiFlow Center

Technical **Features**

- designed as a hydraulic centre for collecting and distributing producer and consumer circuits at different temperatures
- in a cylindrical standing version with boiler ends, standing on three feet
- made of S 235 JRG2 or P 265 GH steels
- perfectly functioning hydraulics at part and full load
- a specifically sized baffle plate between two adjacent temperature zones to ensure the ideal formation of the temperature zones and a sufficient buffer volume
- the baffle plate is designed so that only differential mass flows are exchanged between two adjacent temperature zones
- no interfering pumps due to safe hydraulic decoupling of the generator and consumer circuits
- specially installed inflow pipes for flow-controlled media introduction
- in conjunction with the star-shaped baffle plates used, an even temperature distribution within a zone is achieved
- designed and manufactured in accordance with DGRL Art. 4 para. 3 and a supplementary factory standard
- tested for leak tightness at 1.43 times operating pressure by water pressure test
- permissible operating temperature: –10 °C – 110 °C
- permissible operating overpressure: 0 bar – 10 bar
- diameter and contents as required

We would be happy to advise you on your individually designed and custom-made SINUS MultiFlow Center. Contact us!

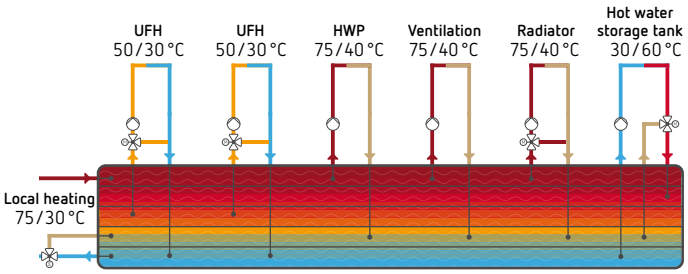
sinus@reflex.de

Selection and calculation

Dimensioning the SINUS MultiFlow Center

1. Allocating the circuits to the respective temperature zones

- The generators and consumers are assigned to the different temperature zones with their respective flow and return temperatures
- Returns with high temperatures can be used as a supply for return flows at lower temperatures to utilise residual heat
- When integrating hot water preparation systems, they should always be in the top temperature zone in order to have priority
- Heating circuits with specifically planned flow temperatures must be equipped with a three-way valve or mixer to control the temperature



UFH: Underfloor heating
HWP: Hot water preparation

2. Dimensioning of the required tank volume

- If a tank volume is required (for example, when ensuring the storage period of energy generators), the volume can be determined using the following equation
- The storage period (minimum running times) need to be coordinated with the manufacturer of the heat or cold generator

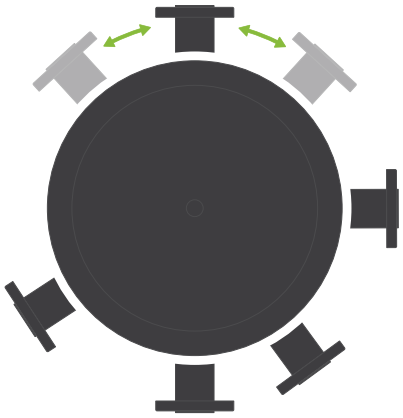
Related terms for storage period:
Minimum standstill time / min. combustion time

$$V = \frac{\dot{Q} \times t}{cp \times \Delta\vartheta}$$

V	=	tank volume [m³]
$\dot{Q}$	=	thermal output [kW]
c	=	constant; 1.163 kWh/[m³ × K]
$\Delta\vartheta$	=	temperature spread [K]
t	=	storage period [h]

3. Dimensioning of the nozzle sizes and configuration of the assembly

- The nozzles sizes should correspond to the nominal widths from the pipe network calculation
- Thanks to the special internal design of the SINUS MultiFlow Center, flow velocities the turbulent range (up to 2 m/s) can also be covered
- Flow abatement takes place inside in a laminar region
- The nozzles can be placed around the entire circumference
- SINUS designs the internal pipe routing in such a way that a homogeneous temperature is achieved within a zone

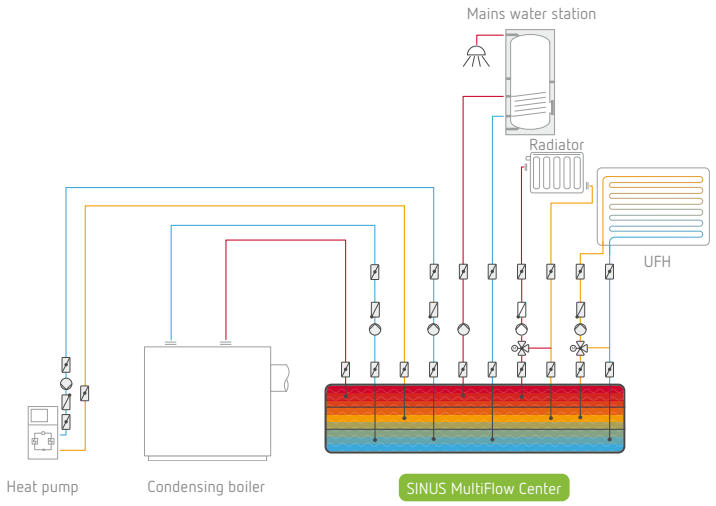


ProSinusX

Configure at:
prosinusx.sinusverteiler.com

Installation examples

A condensing boiler with heat pump and SINUS MultiFlow Center

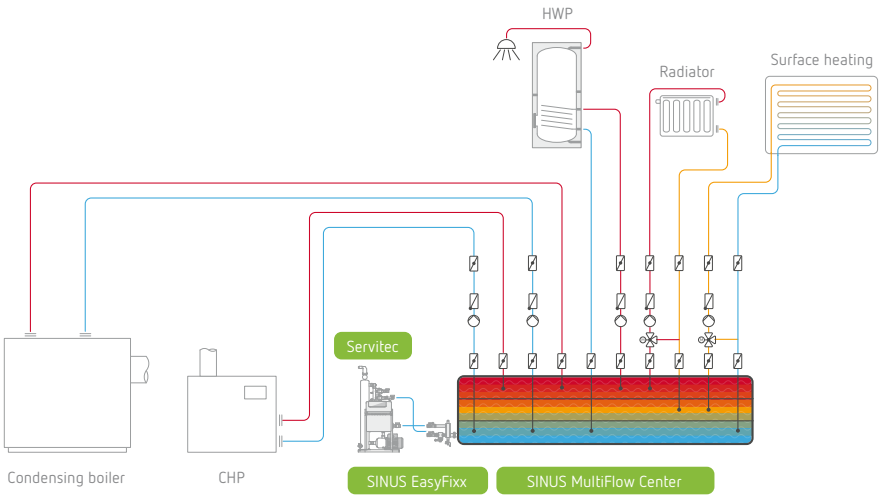


Condensing boiler with heat pump as support

SINUS MultiFlow Center as hydraulic separator, hot water storage tank and manifold in one

Underfloor heating makes ideal use of the mean temperature from the heat pump

SINUS MultiFlow Center in a cogeneration (CHP) unit with peak load boiler



A CHP unit supported by a condensing boiler for peak load coverage

SINUS MultiFlow Center with three temperature levels inc. tank volume for the CHP unit's minimum running times

Residual heat from the static heating system is used by the underfloor heating

Integration of Servitec degassing with SINUS EasyFixx

Two condensing boilers with SINUS MultiFlow Center and Variomat

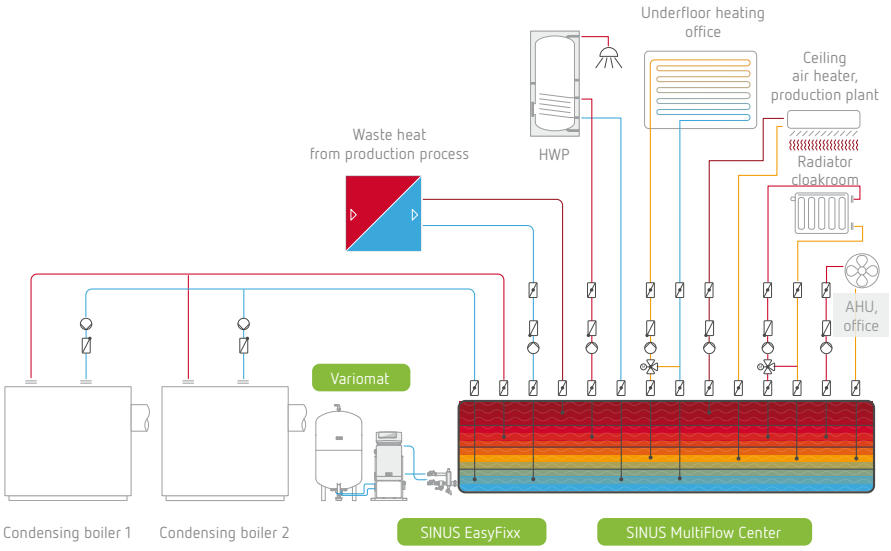
Two condensing boilers on the primary side

SINUS MultiFlow Center with four temperature zones as hydraulic separator, hot water storage tank and manifold in one

Ceiling air heater with high flow temperature uses the heat from the production waste heat

Underfloor heating uses residual heat from high-temperature circuits

Integration of Reflex Variomat pressure maintenance with primary vessel, through SINUS EasyFixx

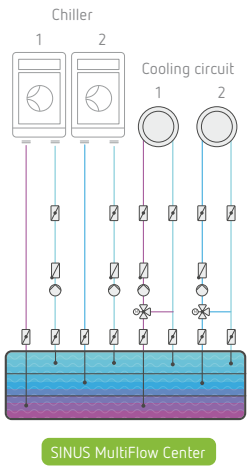


Two chillers with SINUS MultiFlow Center

Two chillers on the primary side with different flow temperatures

SINUSMultiFlow Center with three temperature levels for different consumer requirements

Cooling circuit 2 uses both the cold from the cooling circuit 1 return and the cold from chiller 2 with the lower flow temperature



The diagram is only meant to illustrate the interconnections.
Installation must be adapted to suit local conditions and specified in more detail.

SINUS MultiFlow Expert

Key advantages

System safety through perfectly functioning hydraulics

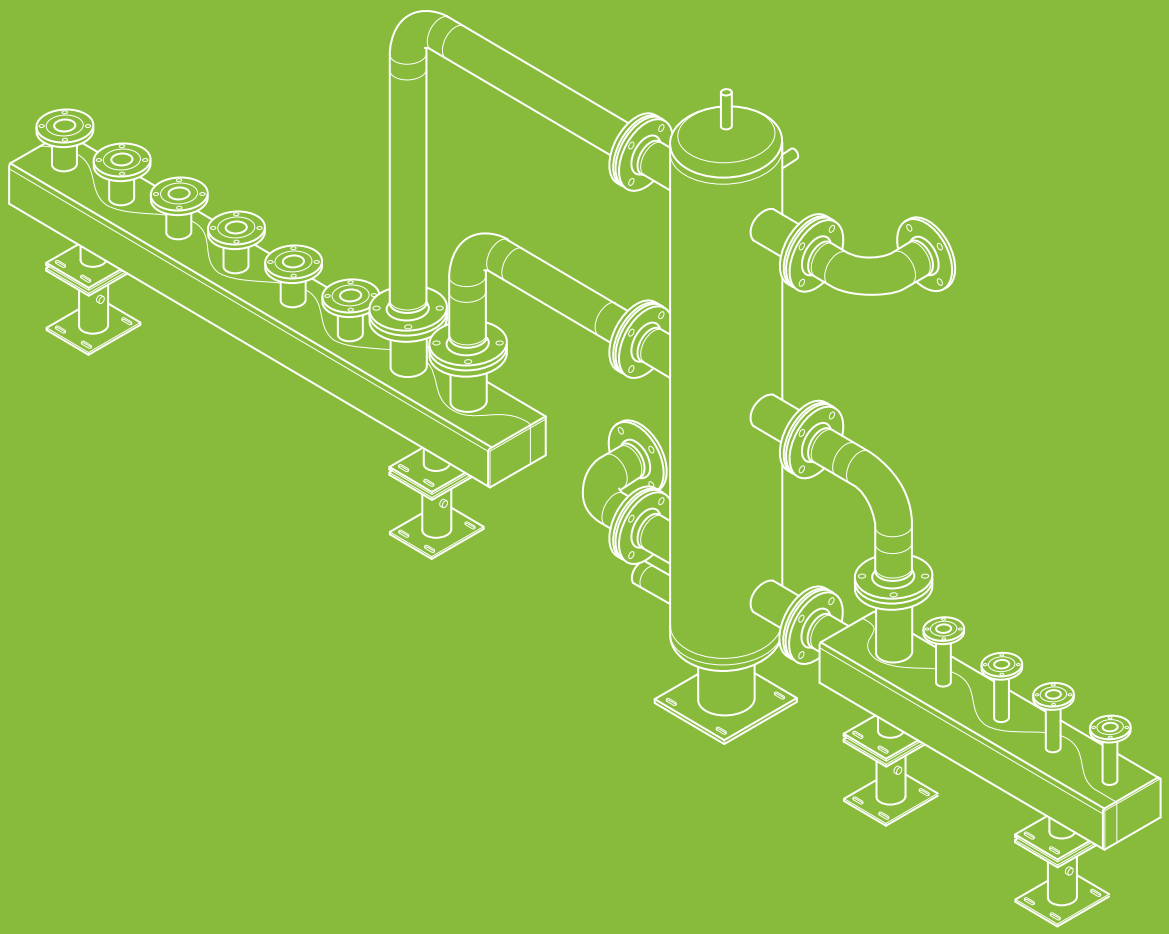
- Hydraulic decoupling ensures system safety
- Easy combination of various energy sources
- No influence on the different circuits in different load conditions
- Quick and easy assembly through combination with compact distributors

Efficient overall system

- Clear demarcation of the different temperature zones
- Suitable temperatures are provided where they are needed
- Use of residual heat
- Running time optimisation of sensitive heat and cold generators through possible tank volume (energy storage)
- Integrated energy storage

Can be used everywhere

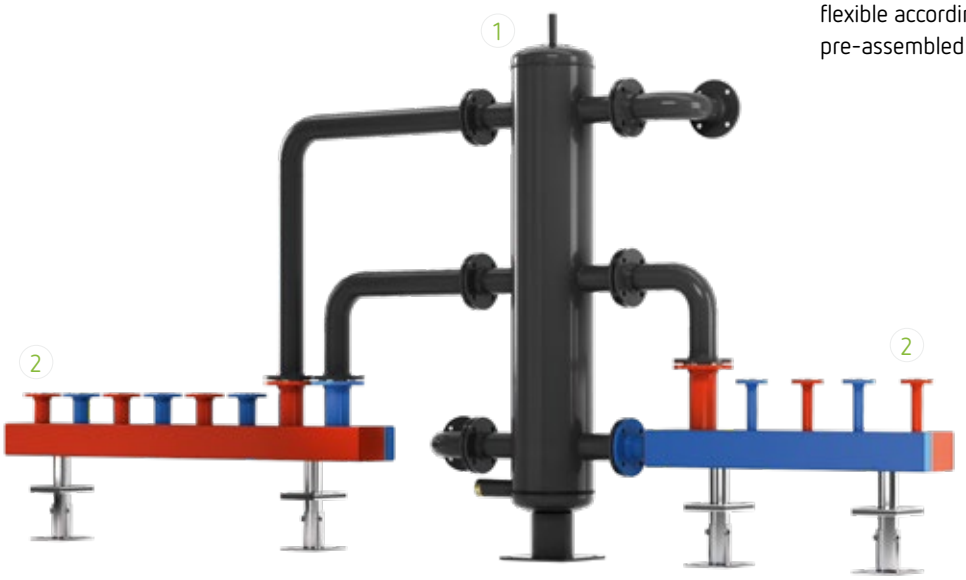
- Can be used in heating and cooling systems as well as change over
- Solutions for system size in the commercial and industrial sector
- Individually designed and custom-made



Design, function, application

Construction of the SINUS MultiFlow Expert

1. SINUS MultiFlow Expert
   as a hydraulic separator and hot water storage tank in one
2. Manifold
   flexible according to the customer's requirements, pre-assembled for quick installation



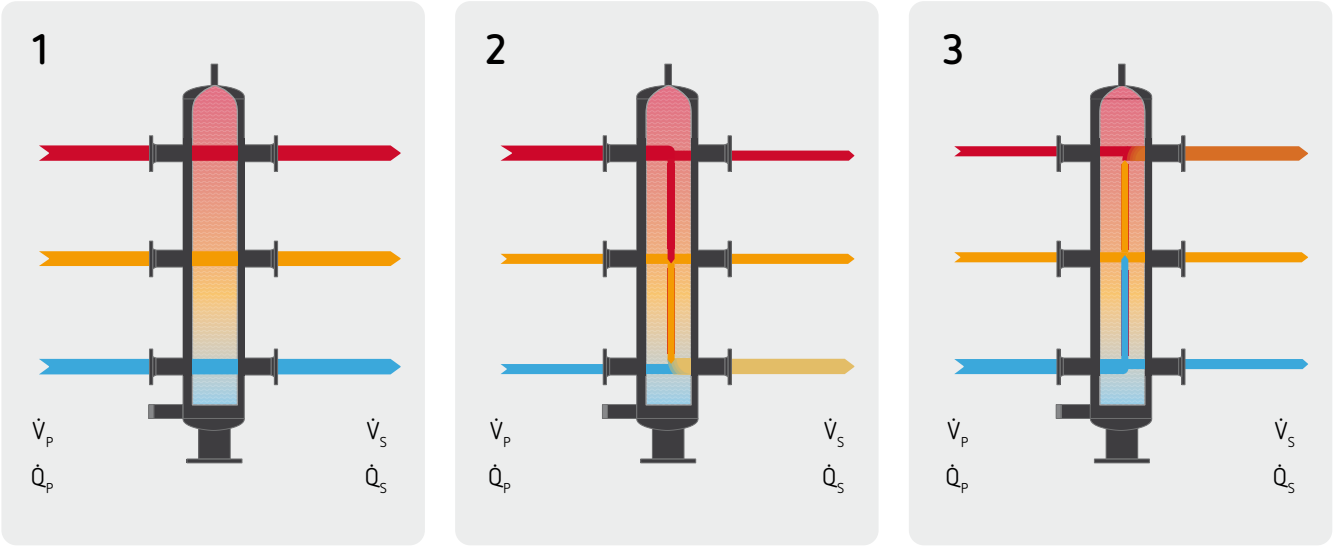
The SINUS MultiFlow Expert is particularly suitable for large systems. Developed for use in multivalent heating systems, it combines hydraulic separator, manifold and hot water storage tank in one. The modular design can be flexibly tailored to customer requirements. It increases the efficiency of multivalent systems through its special design that uses temperature zones. This is done by arranging the heating circuits in descending order of their temperature levels, with the return of the high-temperature heating circuit before the flow of the next warmest heating circuit. In this way, the return temperature of the high-temperature heating circuit serves as the flow temperature of the low-temperature heating circuit and the energy is used optimally.

The integrated hydraulic separator decouples the heating circuits from each other hydraulically and thus increases the entire system's operational safety. By functioning as a hot water storage tank, the SINUS MultiFlow Expert prevents the heat source from wear-inducing pulsing and ensures its longer service life. The patented internal design ensures clear differentiation between the flow and temperatures. The temperature and the flow are therefore only ever switched between two neighbouring temperature zones depending on the operating status.

In addition to its technical advantages, the construction of the SINUS MultiFlow Expert offers, in particular, quick installation and easy maintenance.

Operating statuses for multivalent solutions

using the example of the SINUS MultiFlow Expert



1. Volume flow heat generator = volume flow heat consumer

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- Uniform stratification in the SINUS MultiFlow Expert
- Identical temperatures on the producer and consumer sides

2. Volume flow heat generator > volume flow heat consumer

- Heat input is greater than heat output
- Hot flow water is added to the primary return flow by the SINUS MultiFlow Expert
- The design of the SINUS MultiFlow Expert ensures that only the difference between the water quantities is added. Otherwise, stratification is maintained

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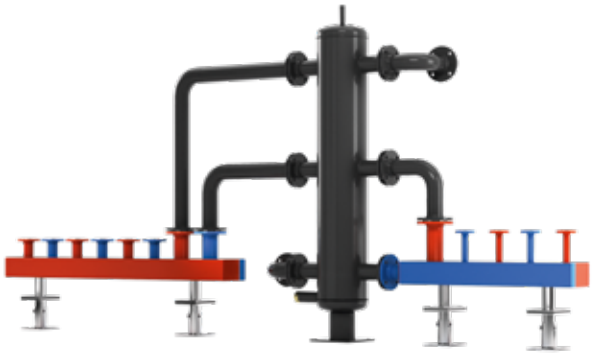
Product range



SINUS MultiFlow Expert

Technical Features

- multi-temperature zone switching point for collecting and distributing volume flows and temperatures of different sizes in different temperature zones using patented SINUS diffuser tubes
- internal pressure-loss-free nozzle chambers prevent the unwanted mixing of temperatures
- this prevents pumps and various control loops from being influenced
- consisting of a vertical round chamber made of welded P235 pipe with a welded-in lid and base
- connecting pieces made of welded steel pipe with welding neck flanges, PN6/PN16
- can be used as a switching point distribution center, hydraulic centre and, at the same time, in refrigeration technology as a buffer tank
- tested 100% for leaks, and primed at the factory
- permissible operating temperature: –10 °C – 110 °C
- permissible operating overpressure: 0 bar – 6 bar
- 2" threaded connector for desludging
- ½" sleeve for temperature sensor

Type	Prod. no.	Material group	Largest connectors	V_{max} [m³/h]	Chamber size
MTW-150	4206366	0003	DN65	12.0	DN150
MTW-200	4206469	0003	DN100	28.0	DN200
MTW-250	4206464	0003	DN125	40.0	DN250
MTW-300	4206465	0003	DN150	65.0	DN300
MTW-350	4206482	0003	DN200	85.0	DN350
MTW-400	4206452	0003	DN200	125.0	DN400
MTW-500	4206491	0003	DN300	215.0	DN500
MTW-600	4206463	0003	DN400	300.0	DN600
MTW-700	4206657	0003	DN400	400.0	DN700

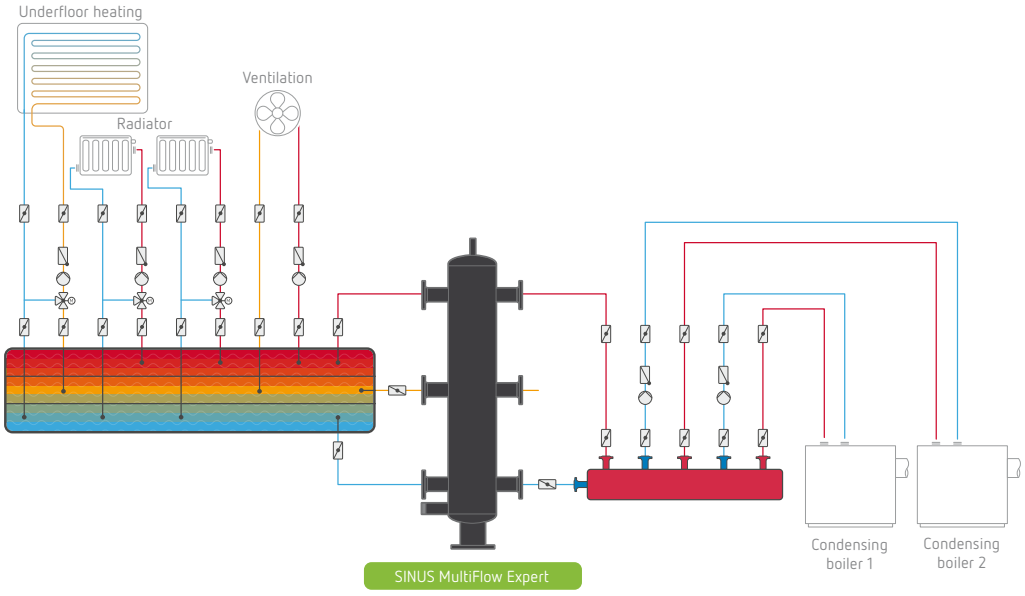
SINUS EasyFixx

- Can be used in combination with dynamic pressure maintenance and/or degassing
- Power range approx. 250 kW to 2,100 kW
- Permissible operating temperature: 110 °C
- Permissible operating overpressure: 6 bar

Type	Prod. no.	Material group	Weight [kg]
SINUS EasyFixx	4202284	0003	4.46

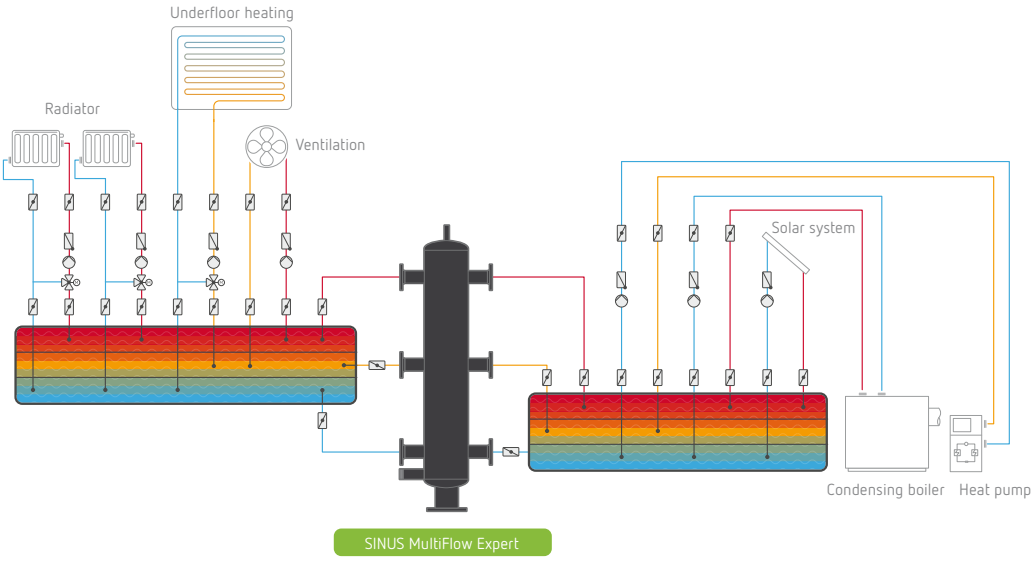
Installation examples

Two condensing boilers on the primary side with SINUS MultiFlow Expert



On the primary side, two condensing boilers and on the secondary side: heating circuits with different temperature levels (underfloor heating, static heating, and ventilation)

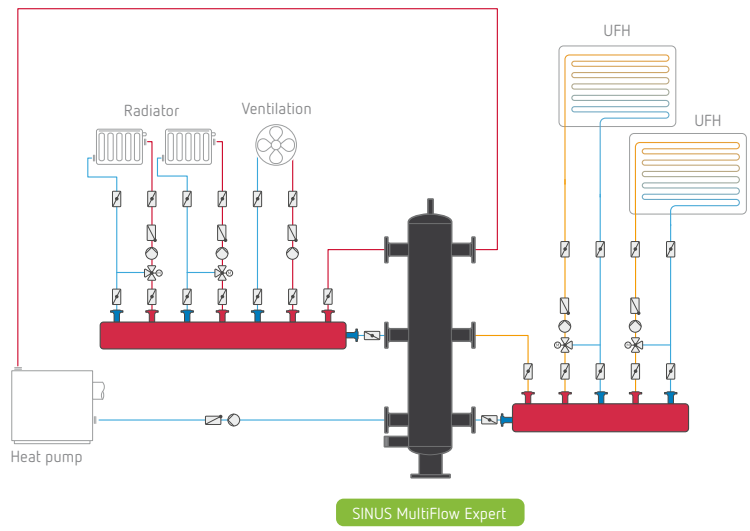
Combination of condensing boiler and heat pump with SINUS MultiFlow Expert



A combination of primary side condensing boiler and heat pump, and secondary-side heating circuits with different temperature levels (underfloor heating, static heating and ventilation)

A condensing boiler with SINUS MultiFlow Expert

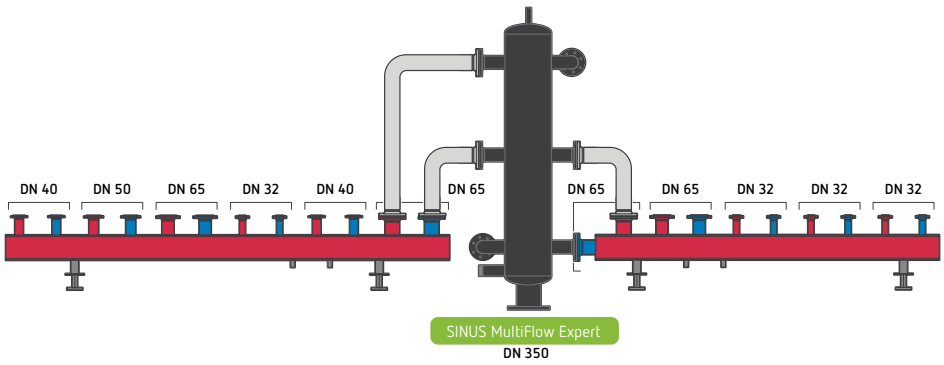
On the primary side, a condensing boiler and secondary-side heating circuits with different temperature levels (underfloor heating, static heating, and ventilation)



A condensing boiler with SINUS MultiFlow Expert

1600 kW condensing boiler with two 300/200 compact manifolds and a Sinus MultiFlow Expert DN 350.

Combination of different nozzle sources



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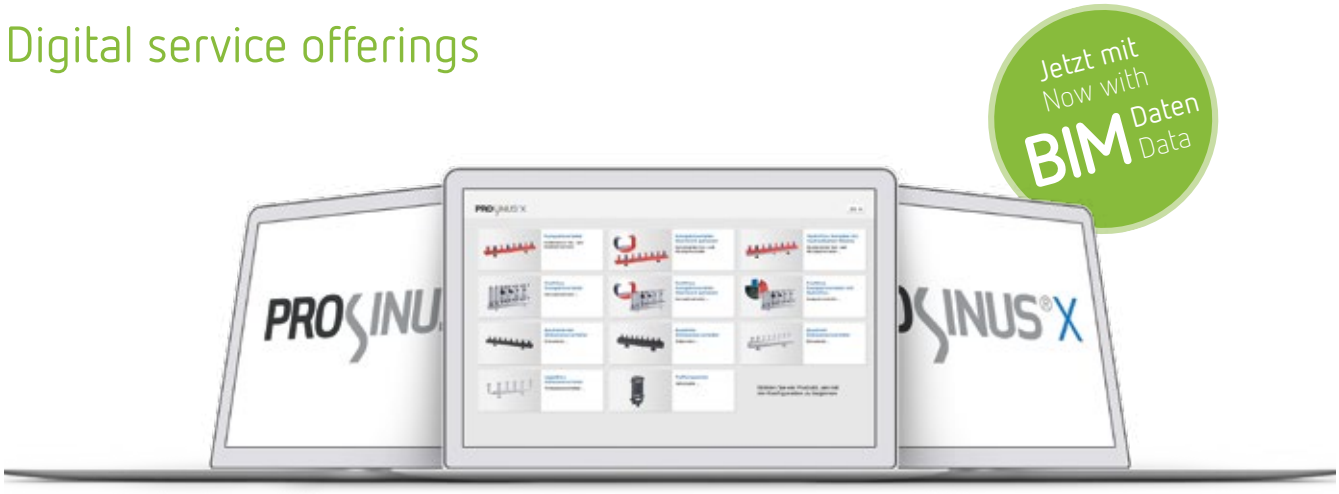
Your notes

Reflex added value

Digital service offerings



Higher performance and more features
A good configurator should be easy to understand and use, as well as convenient and fast. It must also provide optimal support for specialist tradespeople and planners. The SINUS product configurator does this. SINUS has been recognised on the market for more than three decades as a reliable and competent provider of innovative heating distributors in domestic and industrial technology - with small 30 kW manifolds, large distributors with outputs of over 9,000 kW and tailor-made heating manifolds.

The SINUS product configurator allows users with a planning task to individually configure specific buffer tanks up to 25,000 litres and other hydraulic components in just a few steps. Finalised plans can then transferred to a user's CAD drawing software via the most commonly used interfaces.

The free-to-use and user-friendly 3D configurator has recently been updated to make everyday use even easier and more straightforward for specialist tradespeople such as planners. Associated BIM data are now also presented at the same time as the specific configuration. This takes place in the background during configuration and can then be called up using the project number via info@sinusverteiler.com. The information is then sent quickly and easily by email. This step allows the configuration to be checked in advance which ensures optimum quality of results for the user.

Start designing your configuration now for free:

prosinusx.sinusverteiler.com

Reflex Solutions Pro — complete product solutions quickly and easily
The current generation of the proven configuration tool allows products from the entire Reflex portfolio to be individually compiled and configured to suit a specific system, irrespective of size — from a single-family home to residential buildings and industrial premises. Whether a single product or a complete system, just choose the application, then enter the relevant system parameters, Reflex Solutions Pro will work out the appropriate configuration quickly and precisely. Then, with one click, you can download the entire documentation such as product data, tender texts and BIM data.

Register now and enjoy the benefits!

rsp.reflex.de/en

Reflex Training — expertise gives us the edge

Close to our headquarters in Ahlen, professional craftsmen, planners and operators gear up to meet the challenges posed by heating and hot water supply in modern building technology. From installation and planning to consulting and technical operation, the Reflex Training Centre and its team aligns its programme to those partners who want to learn more about technology, standards and service from the horse's mouth. Newly acquired expertise is put into practice, refined and experienced straight away on Reflex systems in a former manor house that has been refurbished to modern-day standards in the German region of Westphalia. Realistic simulations and a comprehensive portfolio of systems help to put the content learned to practical use, skilfully combining theory with practical aspects. The Reflex4Experts training courses are now also available online, for example, as webinars for PC, tablet or smartphone, And they include short, interesting learning units on current and exciting topics that can be easily followed in the office, at home or on the road.

You can access further technical information at
www.reflex4experts.com/en

Reflex Training Center

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seminare@reflex.de

Our performance promise — Reflex After Sales & Service

Supply technology systems are becoming increasingly complex. This is true for both the technology and the documentation and testing requirements. With Reflex After Sales & Service, you remain in good hands after your purchase. Our years of expertise specialising in the Reflex product world ensure the full safety and functionality of your system.

- Expertise and many years of experience with all Reflex products
- Qualified personnel with expertise in the latest products and guidelines
- Compliance with statutory regulations and therefore also with liability and warranty provisions
- Systems optimally adapted for maximum efficiency and functionality

Factory Service Centre

+49 2382 7069-9505
aftersales@reflex.de

Technical Hotline

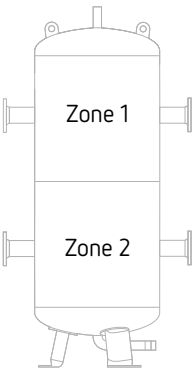
+49 2382 7069-9546
aftersales@reflex.de

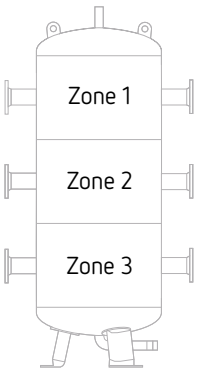
Commercial Processing

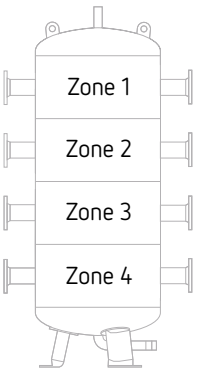
+49 2382 7069-9393
sinus@reflex.de

Enquiry form for SINUS MultiFlow Center

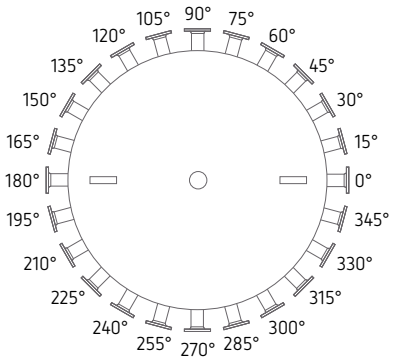
Project name:*







Please select number of zones and draw in numbered nozzles.



Please mark nozzle alignment.

Configuration:*

Nozzle number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Designation														
DN size														
Zone temperature														
Temperature														
Alignment														

Application:*

☐ Heating
☐ Cooling

Manufacturing:*

☐ Factory standard
☐ PED
Inspection openings:*
☐ standard manhole 320 x 420 mm
☐ standard handhole 100 x 150 mm
☐ with swivel device DN 500
☐ with swivel device DN 600

Max. design temperature:*

☐ 50 °C ☐ 110 °C

Max. height:

☐ mm

*mandatory

Volume: (no other options possible):*

☐ 250 l ☐ 300 l ☐ 400 l
☐ 500 l ☐ 600 l ☐ 750 l
☐ 1,000 l ☐ 1,200 l ☐ 1,500 l
☐ 2,000 l ☐ 2,500 l ☐ 3,000 l
☐ 3,500 l ☐ 4,000 l ☐ 5,000 l
☐ 6,000 l ☐ 7,000 l ☐ 8,000 l
☐ 10,000 l ☐ 12,000 l ☐ 15,000 l
☐ 20,000 l ☐ 25,000 l

Diameter:*

☐ DN 450 ☐ DN 600 ☐ DN 800
☐ DN 1000 ☐ DN 1200 ☐ DN 1400
☐ DN 1500 ☐ DN 1600 ☐ DN 1800
☐ DN 2000 ☐ DN 2200 ☐ DN 2400

Please consider that due to a good stratification not all volumes are compatible with the diameter!

Max. design pressure:*

☐ 6 bar ☐ 10 bar

Corrosion protection:*

☐ Inside untreated, outside primed (Also suitable for cold insulation)
☐ Inside untreated, outside according to AGI Q-151 (for cold)

SINUS EasyFixx:

(For connection of pressure maintenance or degassing)
☐ Including

Start your configuration with ProSinusX
prosinusx.sinusverteiler.com

Your notes

Always up to date

Further product literature and materials can be downloaded at or hard copies ordered from:
www.reflex-winkelmann.com/en/services-downloads

RE21154en/9131035/07-2023
Subject to technical changes

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