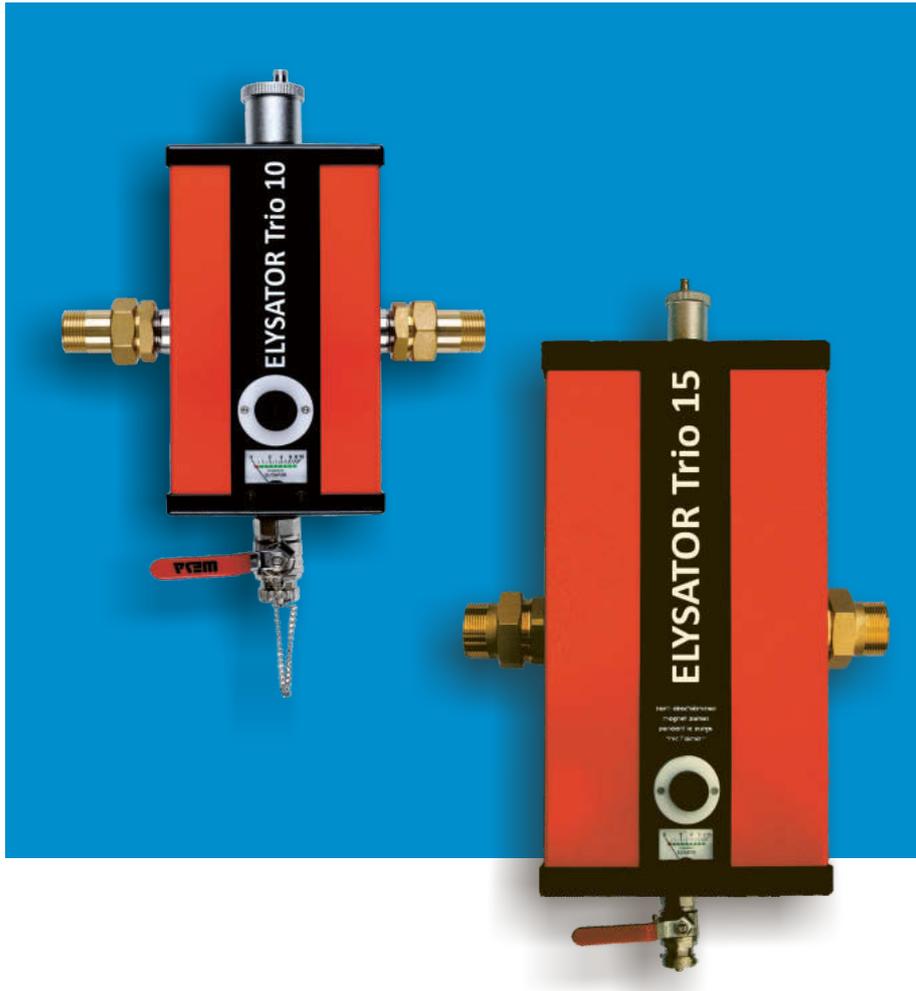


ELYSATOR trio

Corrosion protection
for heating systems



The rust and sludge protection for clean heating water in renovation and new construction, from single family homes to large-scale systems.

3 times the peace-of-mind

Degassing

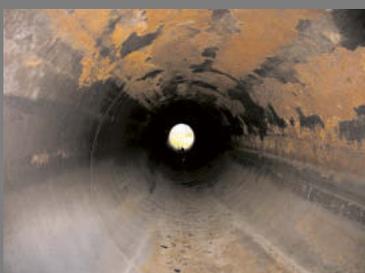
Anodic protection

Magnetic filter

Removal of micro air bubbles

ELYSATOR anti-corrosion system

Sludge removal and cleaning



Early underfloor heating systems used plastic pipes that were permeable to oxygen. Technology has since advanced to the point where it is now possible to produce underfloor heating pipes that are practically diffusion proof. Valves, threaded joints, circulating pumps, regulators, automatic bleed devices and faulty expansion tanks, however, are still potentially important sources of oxygen uptake. Oxygen diffusing into the heating water, too low a pH value and raised electrical conductivity of the system water can all lead to corrosion and blockage of the heating system from corrosion products. In the past, the most common method of corrosion protection was to add chemical corrosion inhibitors. In many cases, however, it was found

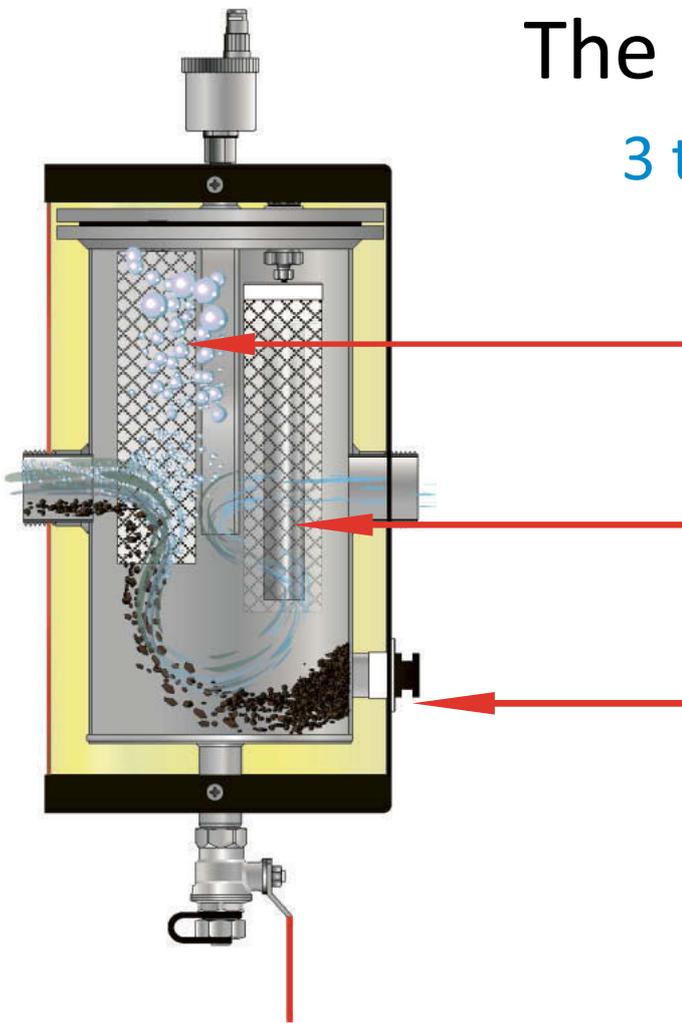
impossible to provide active protection in cracks or under deposits of dirt or rust, so this approach could not deliver a satisfactory solution to the problem. Furthermore, it is costly and time-consuming to monitor that the correct amounts of inhibitors are added. Using heat exchangers to separate the system into a heating circuit and hot-water circuit ultimately merely splits the problem into two parts without achieving active corrosion protection. Modern heating systems are more sensitive to signs of corrosion, limescale and any other deposits.

Possible Problems

- Underfloor heating pipes clogged with corrosion products
- Blockages in control valves and pumps
- Boiler corroded through
- Holes in radiators leading to water damage
- Noisy circulation from gases produced by corrosion
- Increased power consumption from irregular heat distribution

The new ELYSATOR trio

3 times the peace-of-mind
for clean heating water



1) Degassing

Removal of micro air bubbles

2) Anodic protection

ELYSATOR anti-corrosion system

3) Magnetic filter

Sludge removal and cleaning

1) Degassing

Gases dissolve in cold water that are later released when the water heats up. This produces tiny gas bubbles, like those in a glass of mineral water (also known as "Henry's law of absorption").

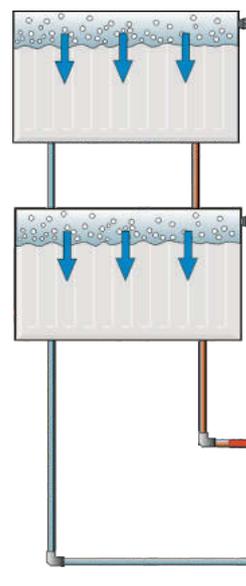
In a heating system, the water cools down in the radiators and heating circuits. Here the water "breathes in" gases, releasing them again after being heated in the boiler. Unfortunately these micro air bubbles are carried along by the circulation because they rise to the surface too slowly compared with the flow rate. Standard automatic air vents can only remove stationary and larger air pockets.

A specially designed filter is needed to remove micro air

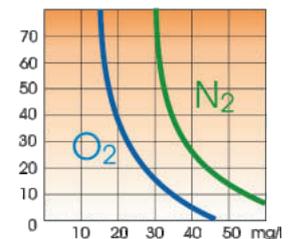
bubbles. The fine gas bubbles must be captured and combined. Once a large bubble is formed, it is buoyant enough to rise up into a still area, where it is then removed from the system by an automatic air vent.

If the heating water is degassed after being heated in the boiler, this creates water that is once again ideal for gas to dissolve into.

Therefore the ELYSATOR trio acts like a "pump", exploiting the temperature difference in the circuit to remove air and gas from the system. This means that even air that has collected in the highest points in the heating system can be dissolved into the water



Solubility of gases in water (at 2 bar)



At rising temperature, the solubility of gas in water is decreasing. Micro air-bubbles are being formed.

and then filtered out. Continuously, efficiently and without an external power supply.

Circulation noises and air pockets disappear, pumps last longer and corrosion is checked. The filter unit is

made of stainless steel and so is practically wear-free. Solubility of gases in water (at 2 bar).

As the temperature rises, the water can hold less dissolved gas and gas bubbles are released

2) Anodic protection

A reaction tank containing high-purity magnesium anodes - the ELYSATOR - is installed in a bypass circuit of the heating system.

The reaction with the sacrificial metal (magnesium), which goes into solution, reduces the concentration of atmospheric oxygen diffusing into the water to a negligible level. The magnesium hydroxide produced in this process helps to raise the pH value to an optimum range.

Depending on the composition of the water in the system, its electrical conductivity

then drops thanks to partial precipitation which reduces the water hardness. The result is alkaline water that is low in salts and has a minimum oxygen concentration.

Corrosion damage is unlikely in systems containing water with these properties.

Corrosion residues that are carried along by the flow of water are deposited in the ELYSATOR for removal as sludge in the restoration phase, until the water is clear.

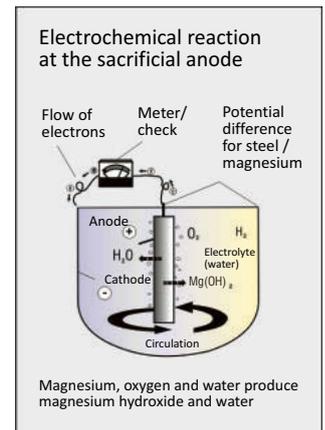
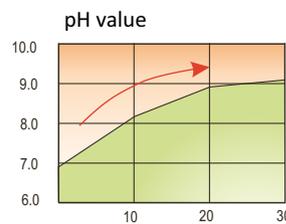
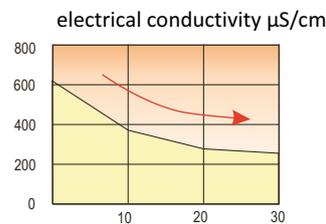
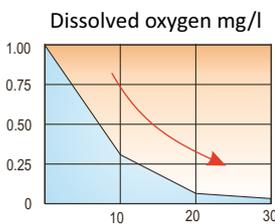
Old systems, however, that

are heavily contaminated or treated with chemicals must be flushed through thoroughly before fitting the ELYSATOR (e.g. using SANOL H-15).

Subsequent maintenance simply involves changing the anodes every 3 to 5 years; the ELYSATOR works without an external power supply and without chemical additives.

The ELYSATOR is the market leader in this field of corrosion protection, and has been used successfully for over 30 years in heating and cooling systems. The

process is equally suited to protecting new installations and restoring existing systems to health.



3) Magnetic filter

In order to prevent deposits of sludge from clogging heating circuits and providing favourable sites for corrosion, the sludge must be filtered out of the heating system.

Conventional sludge collectors work on the gravity principle; they do not pick up small particles at full flow rates however.

The new ELYSATOR trio magnetic filter provides additional active filtration using an extremely powerful permanent magnet. The appliance makes use of the magnetic attraction of corrosion

particles. The unique feature of the ELYSATOR trio is that the magnet is located outside the appliance and has a massive pulling force of 220 Newtons.

This lets you remove the sludge while the heating is still running.

Retracting the magnet releases the corrosion particles, which can then be removed easily through the sludge-removal drain. There is no need to open up the appliance or to remove the magnet.

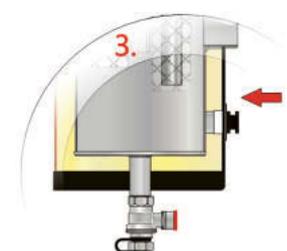
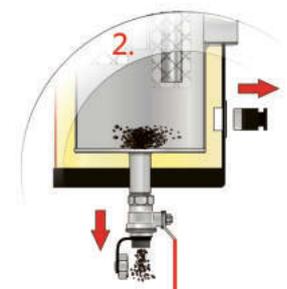
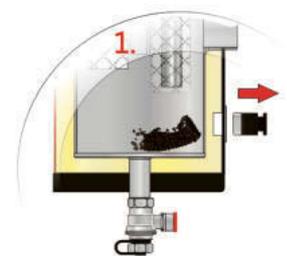
This technically elegant

ELYSATOR trio solution posed a real challenge to our development engineers.

The entire filter needed to be constructed of stainless steel, because regular steel would have blocked the magnetic field.

The high-tech magnet is also made of a rare-earth alloy (NdFeB) that packs an astounding attractive force of 22 kg into the size of a coin.

This means that the ELYSATOR trio deals with even the smallest sludge particles.



Correct mounting

The ELYSATOR trio is normally installed directly after the boiler in the main system pipe.

This is possible up to pipe dimensions of 1 1/2". In systems with larger pipe sizes, the ELYSATOR trio can also be positioned in a bypass circuit or a branch circuit.

In large-scale installations it is more effective to treat the water in separate sub-circuits. In this case we place the ELYSATOR trio in the flow line of individual heating units or sub-stations.

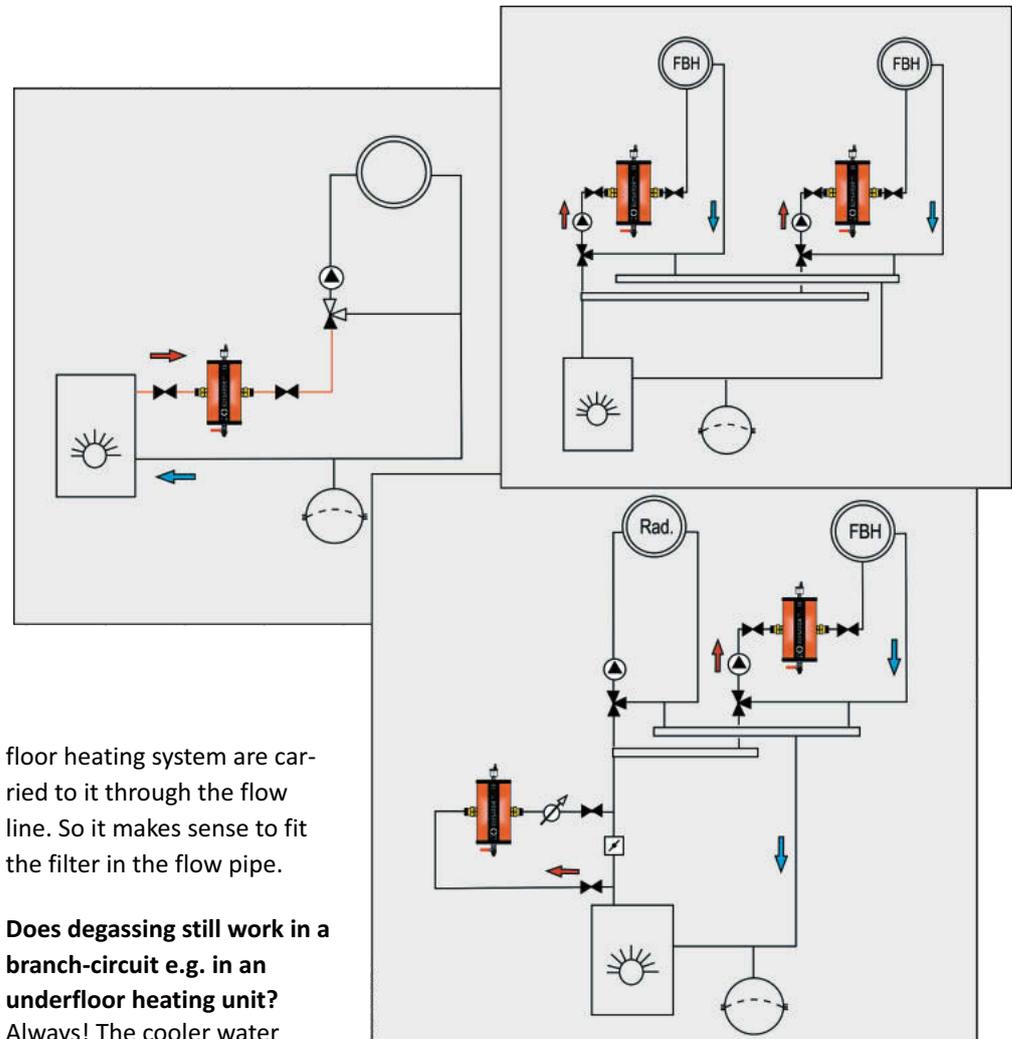
The anodic protection is designed for a total water capacity of 1500 l. Several appliances can be combined for larger systems.

Why do you fit the ELYSATOR trio in the flow line of heating systems?

Degassing works best at the hottest point in a circuit. In heating systems this is in the flow line, and in cooling systems in the return line.

Doesn't a sludge filter always belong in the main return line?

No. In any event, it can only filter out circulating particles. So the filter can be located at any point in the system in which the flow is good. Particles that clog an under



floor heating system are carried to it through the flow line. So it makes sense to fit the filter in the flow pipe.

Does degassing still work in a branch-circuit e.g. in an underfloor heating unit?

Always! The cooler water from the return pipe is warmed by mixing with the hot water, immediately producing micro gas bubbles. It is particular practical to perform degassing inside the heating-unit circuit if the gas is entering the system here, for instance where underfloor heating pipes are not gas-tight.

Is the ELYSATOR trio still effective in a bypass circuit?

Of course, although the performance drops in line with

the reduced flow rate. The performance can be boosted again by adding extra appliances in the system.

Are the stopcocks before and after the ELYSATOR trio necessary?

We strongly recommend them for servicing, because otherwise the entire system must be drained. The ELYSATOR trio can be desludged with the heating still

running, however.

What happens if a system with a 2500 l capacity is fitted with just one ELYSATOR trio?

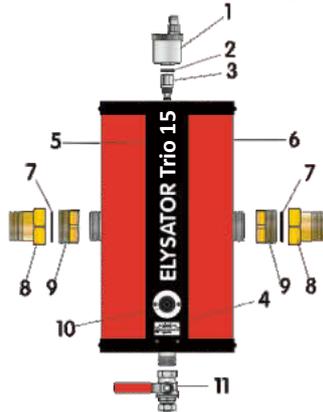
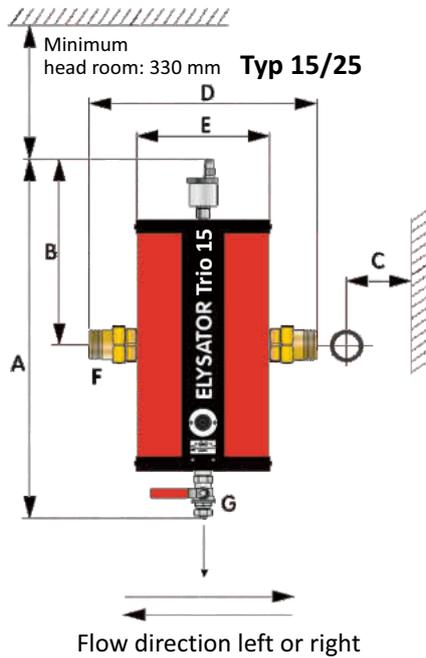
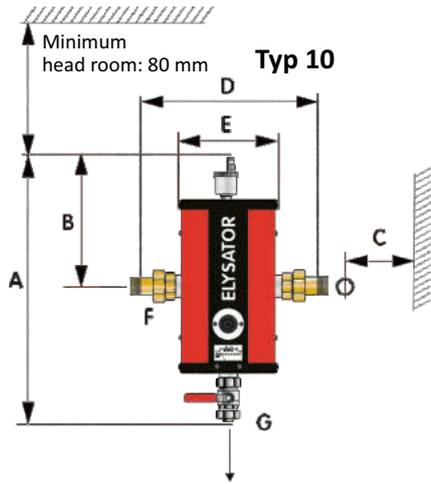
One ELYSATOR trio in a system containing over 1500 l of water does not suddenly become completely ineffective, it is just proportionally less effective. The performance can be boosted, however, by adding extra appliances in the system.

Operation & Servicing

The ELYSATOR trio is low maintenance. An operating meter indicates the level of anodic protection. This is self-regulating. The higher the needle deflection, the more intensively the appliance is being asked to work. Changing the anode is straightforward and falls due every 2 to 4 years when the needle goes into the red region.

The micro air-bubble removal system does not need servicing. Sludge should be removed from the magnetic filter as and when required, but at least once per heating season. The heating system can continue running during sludge removal, which is quick and easy for owners to do themselves. If the heating installation is heavily clogged with deposits, it should be flushed through before fitting the appliance; it would otherwise take too long to filter out large amounts of residues. Any chemical additives in the water must also be completely removed before putting the appliance into operation.

Technical data

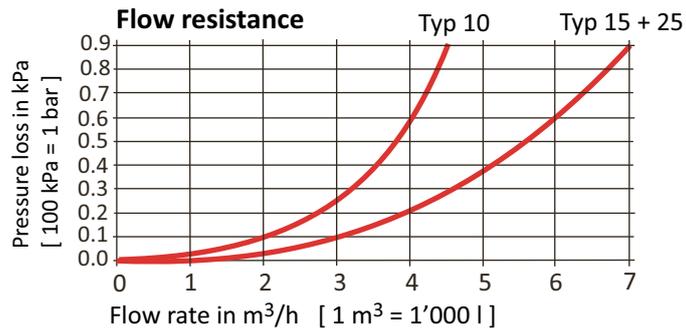


Material of vessel: stainless steel

Insulation: foam with coated metal sheet

Dimensions in mm	Typ 10	Typ 15	Typ 25
A Height over all	420 mm	580 mm	750 mm
B Top - connection	210 mm	290 mm	290 mm
C wall - connection	72 mm	107. mm	107.5mm
D Length over all Incl. couplings	260 mm	360 mm	360 mm
E Breadth	145 mm	225 mm	225 mm
F Connections	1 "	1 1/2 "	1 1/2 "
G Drain	3/4 "	3/4 "	3/4 "

Performance data:	Typ 10	Typ 15	Typ 25
Plant volume:	< 500 l	< 1'500 l	< 5'000 l
max. circulation rate:	< 3 m ³ /h	< 5 m ³ /h	< 7 m ³ /h
Connection :	1 "	1 1/2 "	1 1/2 "
Working pressure max.:	< 10 bar	< 10 bar	< 10 bar
Working temp max.:	< 90° C	< 90° C	< 90° C



Delivery content

- | | |
|-------------------|--------------------------|
| 1 air vent | 7 gaskets |
| 2 gasket | 8 coupling male 1 1/2" |
| 3 safety valve | 9 coupling female 1 1/2" |
| 4 anode indicator | 10 super magnet |
| 5 steel housing | 11 drain valve |
| 6 reaction vessel | |

7 good reasons

- ✓ The first appliance to combine the three proven corrosion-protection measures.
- ✓ Complete confidence that your heating system will retain its value, whether old or new.
- ✓ Quality engineering built upon years of research and development.
- ✓ A long-lasting product made to Swiss quality standards from corrosion-proof materials.
- ✓ Environmentally friendly technology that works without external power and chemicals
- ✓ Self-regulating, low-maintenance operation
- ✓ Appliance operation can be metered and monitored.