GENO-K4®

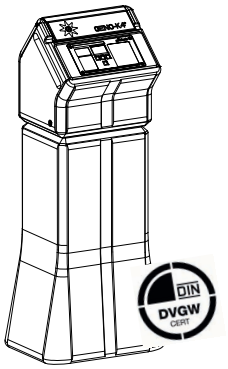


Fig.1: GENO-K4®

Intended Application

Alternative anti-scaling system GENO-K4® to reduce scale deposits. The GENO-K4® offers high protection against scaling in warm-water boilers and pipes without adding auxiliary substances such as chemicals, phosphates or regeneration salt.

The system is designed for installation in 1 or 2 family homes. The system may be either installed into the cold water supply pipe or the feed pipe of the warm-water boiler.

High efficiency without harmful side effects.

Function

General description of the process technology

The alternative anti-scaling system GENO-K4® makes use of the soft voltage effect. The system is equipped with two electrodes. By applying voltage, lime crystals are generated on the electrodes. Due to the GENO-K4®'s sophisticated electrode surface which was specifically developed for this process, the formation of lime crystals already sets in at a minimum voltage which is lower than the electrolysis voltage of the water.

The regular reversion of the electrodes' polarity leads to the release of the lime crystals and with the water flow, the microscopically small seed crystals are flushed from the GENO-K4® into the residential water net. In the drinking water system downstream of the GENO-K4®, scale deposits preferably settle on these seed crystals and not on the surface of the heating coil or on the pipes. The crystals which have grown due to the scale deposits are removed from the system by means of the outgoing water. The visual effect of this process is a considerable reduction of scale deposits in warm-water boilers and pipes.

Advantages of the soft voltage

As the direct voltage used is far lower than the electrolysis voltage, Grünbeck calls this kind of treatment "a gentle electrochemical process". So far, the soft voltage deposition in such a low voltage range is unique and offers a multitude of essential advantages.

- There is no electrochemical separation of the water!
- Breakdown products such as CO_2, detonating gas or nitrite which are corrosive, explosive or harmful to health cannot occur.
- High efficiency without adverse side effects for the drinking water quality!

Electronic controller

The electronic controller of the GENO-K4® monitors the treatment parameters according to the carbonate hardness in the water as well as the water volume. The display indicates the current values, operating status as well as remaining treatment capacity. By means of a voltage-free output, maintenance and error signals may be passed on to external stations.

Water stop (accessories)

The water stop function is provided for in the electronic controller of the GENO-K4® and may be activated after the installation of the respective accessory. The floor sensor monitors the installation site. Furthermore, the GENO-K4® monitors all water withdrawals in the complete water net work downstream of the system for withdrawal duration, volume and flow. In case of longer periods of absence, stricter monitoring may be activated (= holiday mode).

Design

GENO-K4® as free-standing device with electronic controller and provision for water stop, treatment unit with automatic flushing device, ready for connection, with a 1.5 m shock-proof power cable. The integrated compartment in the top of the housing contains a measuring test kit for carbonate hardness as well as the operating instructions.

The GENO-K4® system is installed into the residential water pipe by means of corrugated stainless steel hoses and a connection block R1''. The connection block has two built-in shut-off valves as well as one overflow valve as bypass. All materials used may be recovered resp. recycled.

Scope of delivery

Compact stand-alone system, ready for connection, with built-in electronic controller, automatic flushing device, provisions for optional water stop, connection bloc R 1" incl. 2 shut-off valves and corrugated stainless steel hoses.

Accessories

Water stop R 1" for GENO-K4®
consisting of water stop solenoid valve with 1.5 m cable, floor sensor with 2 m cable and mounting instructions.
Order no.: 157 110

Test kit for carbonate hardness
Order no.: 170 169

Replacement treatment module for GENO-K4®
Order no.: 157 600

Connection set Twin-GENO-K4®
for parallel connection of two GENO-K4® systems in one 1¼ " pipe
Order no.: 157 120

Installation requirements

Please observe local installation guidelines, general regulations (e. g. WVU, EVU, VDE, DIN, DVGW resp. ÖVGW or SVGW) and the technical specifications for the GENO-K4®.

The installation site must be frost-proof. The system must be protected from chemicals, dyes, solvents and vapors.

Always install a fine filter upstream of the system.

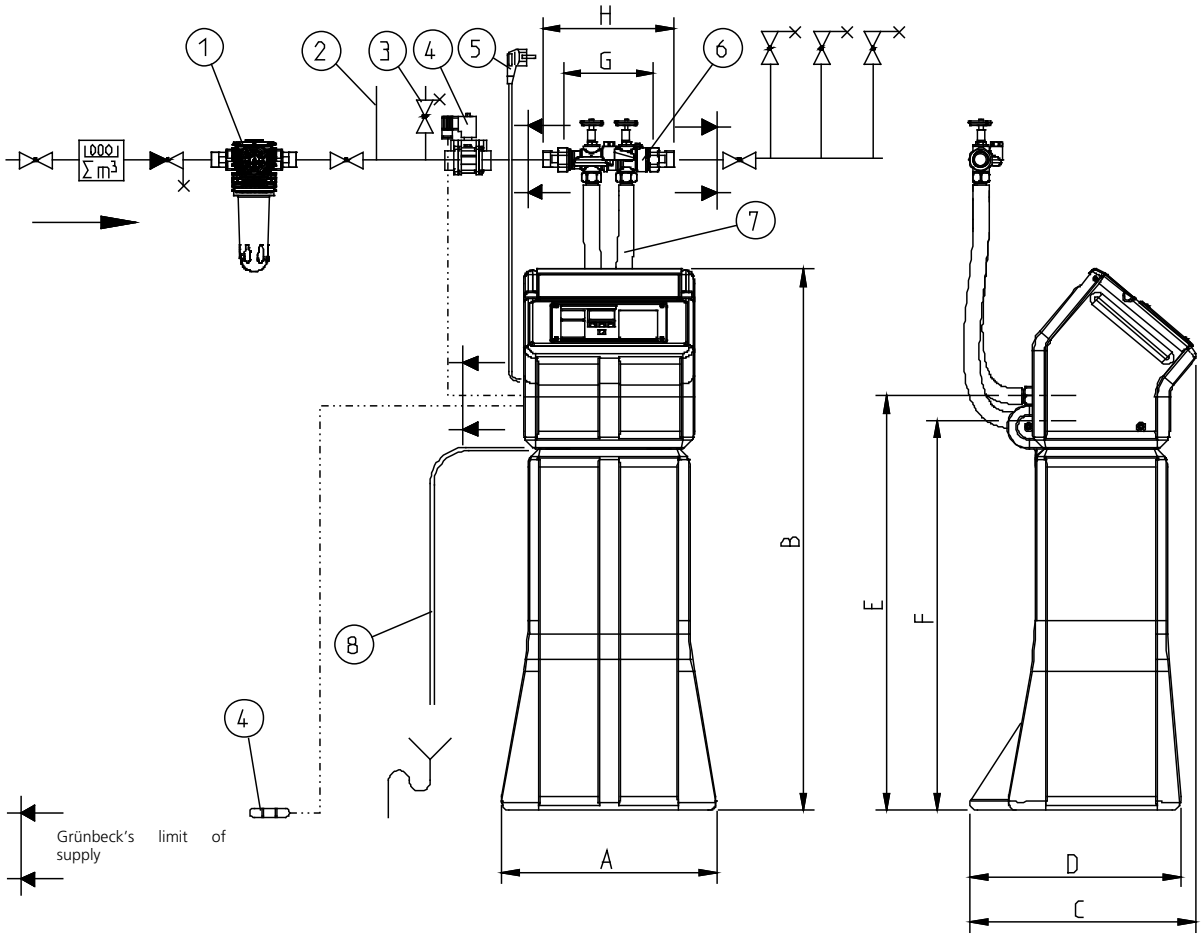
A separate socket (230 V / 50 Hz) within a range of 1.2 m is required for the power supply.

For the drainage of the flushing water, a drain connection of at least DN 50 is required.

The installation room must have a floor drain. If no floor drain is available, a water stop R 1" for GENO-K4® (refer to accessories) or a similar water stop device must be installed.

Technical specifications				**GENO-K4®**
Anschlussdaten				
Nominal connection diameter				DN 25 (R 1" male thread)
Drain connection				DN 50
Power supply			[V/Hz]	230 / 50/60 (system operation with protective low voltage)
Connected load (without / with water stop)			[VA]	60 / 70
Protection				IP 54
Performance data				
Nominal pressure				PN 10
Operating pressure			[bar]	1 – 10
Nominal flow			[m³/h]	2.5
Pressure loss at nominal flow (without/with water stop)			[bar]	0.5 / 0.9
Recommended application – carbonate hardness of the water*			[°KH]	10 – 24
Application range				1 - 2 family homes
Dimensions and weights				
A System width			[mm]	450
B System height			[mm]	1130
C / D Total system depth / pedestal			[mm]	470 / 450
E / F Connection height inlet / outlet			[mm]	860 / 810
G / H Installation length connection block without / with screw connections			[mm]	190 / 272
Weight empty / operating weight / shipping weight, approx.			[kg]	19.5 / 28 / 30
Consumption data				
Total waste water volume per flushing, approx. **			[l]	12
Power consumption, approx. (without / with water stop)			[kWh/m³]	0.8 / 1.1
Service life *** of treatment module	1 family homes	complete cold-water supply pipe	years, approx.	3
		feed pipe – warm-water boiler	years, approx.	6 – 8
	2 family homes	complete cold-water supply pipe	years, approx.	2
		feed pipe – warm-water boiler	years, approx.	4 – 6
Ambient data				
Max. water temperature			[°C]	30
Max. ambient temperature			[°C]	40
Test mark/certification mark				
DVGW-registration number				DW-9191BN0435
Order no.				**157 100**

* The total hardness must at least be 14 °dH (hardness range 3).
** Flushing only occurs if no water has been withdrawn for a longer period of time, e. g. holidays, weekends, ...
*** At average water quality and consumption according to the Bundesverband der deutschen Gas- und Wasserwirtschaft (Federal Association of German Gas and Water Management).



① Fine filter BOXER® KD
② in case a water stop is installed, feed pipes for thermal safety devices have to be branched off upstream of the water stop
③ e. g. garden pipe
④ (accessories) water stop valve and floor sensor
⑤ power cable, approx. 1.5 m
⑥ connection block R 1"
⑦ flexible corrugated stainless steel hoses, approx. 800 mm (nominal diameter 25)
⑧ flushing water hose, approx 1.2 m (flows off with pipe pressure)

Fig. 2: Mounting- and Installation example GENO-K4®