



Fig. 1: GENO-mat FE-Z

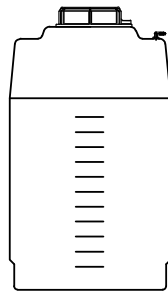


Fig. 2: Regeneration tank

## Deferrisation system GENO-mat

FE-Z 20/10  
FE-Z 25/13  
FE-Z 30/14  
FE-Z 40/17  
FE-Z 40/18  
FE-Z 50/19  
FE-Z 60/20

### Designated application

The GENO-mat FE-Z deferrisation systems are designed for the oxidation of dissolved iron and manganese contained in the raw water. The systems are used for private water supply systems with maximum values of up to 3.0 mg/l of iron and 1.0 mg/l of manganese. If the systems are operated and handled according to the instructions, pure water values with a concentration of less than 0.1 mg/l of iron and manganese can be obtained.

The following requirements must be observed in order to obtain optimum results when using the deferrisation system:

- Hydrogen sulphide and oil must not be detected in the water to be deferrised.
- Organic compounds should preferably not be contained in the water, however, the maximum allowable value is 4 to 5 mg/l above the COD.
- The oxygen concentration should be proportionally 15 % of the existing iron concentration and the pH value must be higher than 7.0.
- However, should ammonium (> 0.1 mg/l) be detected in the raw water, an additional treatment step is required.
- Should humic acids be contained in the well water, the pure water quality to be expected might be affected.

### Function

The GENO-mat FE-Z deferrisation systems for the removal of iron work with an active insoluble catalytic filter material. A central control valve automatically controls the operating cycles filtration - backwash - and first filtrate.

#### Deferrisation and demanganisation (filtration)

The raw water enters the exchanger tank via the raw water inlet and flows through the catalytic filter material from top to bottom. Thus, the reaction of the oxygen with the iron contained in the water is accelerated.

Bivalent iron is transformed into insoluble, filterable, trivalent iron (adding air sparingly might be required in order to improve the oxidation process). The filtered pure water is then directed via the lower distributing nozzle and the riser pipe through the pure water outlet into the piping system.

#### Backwash

During the backwash process, the filter bed is forcibly flushed from bottom to top and thus loosened up. Impurities retained during the filtration process are washed out via the drain outlet at the control valve. The deferrisation system has to be backwashed every 6 days at the latest.

#### First filtrate

By an automatic switch-over of the central control valve, the filter bed will forcibly be flushed from top to bottom. This first filtrate is discharged to the drain and afterwards the deferrisation system is ready for operation once again.

#### Regeneration/Disinfection

For operating and hygienic reasons, the deferrisation system must be regenerated every 6 months with the special granulate GENO-Spezialgranulat or with GENO-oxi plus.

#### Control unit

The GENO-mat FE-Z deferrisation systems are time-controlled via an electrical timer.

In order to properly use the automatic timer control, the time interval between two filter sequences (backwash interval in days) must be set. In case the differential pressure of the filter is too high after 6 days due to a higher level of iron in the water (reference value: 0.3 bar (overpressure) above normal), we recommend performing a backwash every 4 days or at an even shorter interval. The same applies in case of a premature breakthrough of suspended matter. The backwash will always be performed at 2:00 o'clock (fixed setting).

### Design

5-cycle control valve made of red bronze with time-dependent control via an electric timer. Control valve top with rotating discs to set the backwash intervals; cover for protection against splash water and unauthorised access.

Exchanger tank made of pressure resistant plastic with fixtures for water flow control and retention of filter material. And a filling of material filter with supporting gravel.

The control unit is interference-free. Power supply by means of a transformer plug with 1.5 m feed line.

### Scope of supply

Deferrisation system with water test kit for iron as well as operation manual.

### Accessories

#### Regeneration device 100 / 300 l

100 l resp. 300 l PE tank with litre scale and hand mixer to prepare the regeneration solution. The tank features an integrated suction device.

Regeneration device 100 l

(FE-Z 20/10-40/18)

Order no. 153 094

Regeneration device 300 l

(FE-Z 50/19-60/20)

Order no. 153 095

Mounting set 1:

For convenient hydraulic connection. Compact valve block R 1" female thread, integrated bypass with shut-off valve, shut-off valves for hard and soft water, outlet for raw water (e.g. garden hose), 2 connection hoses (up to type 30/14

Order no. 125 845

#### GENO-Spezialgranulat<sup>1)</sup>

For regeneration/disinfection

1 kg GENO-Spezialgranulat

Order no. 170 016

5 kg GENO-Spezialgranulat

Order no. 170 017

GENO-oxi plus 20 kg (19.7 l)

Order no. 170 029



<sup>1)</sup> **Note:** Registration by the Federal Surveillance Authority for Opium according to the Controlled Substances and Precursors Act required.

#### Spare water test kit

Test kit for iron, measuring range 0.0 mg/l - 0.8 mg/l and 1.0 mg/l - 10.0 mg/l.

For the quantitative, colorimetric determination of dissolved iron in the measuring range of 0.0 mg/l - 0.8 mg/l respectively 1.0 mg/l - 10 mg/l. Quick test kit consisting of:

#### Test kit for iron

1 Test glass with 3 chambers and scale

Test tablets (0.0 mg/l-0.8 mg/l) 30 tablets;

Test tablet (0.1 mg/l-10 mg/l) 30 tablets;

Order no. 170 150

### Installation requirements

Please observe local installation directives, general guidelines and technical specifications.

The installation site must be frost-proof. The system must be protected from chemicals, dyes, solvents and vapours. The ambient temperature as well as the radiation temperature next to the system must not exceed 40 °C.

For the electrical connection a separate socket (230 V / 50 Hz) within approx. 1.2 m from the system is required. The installation room must have a floor drain (DN 100). If no floor drain is available, a corresponding water stop device has to be installed.

For the discharge of the backwash water, a drain connection must be provided. If the waste water is directed to a lifting system, make sure that this is sufficiently dimensioned in order to cope with the waste water volume to be expected. Floor drains that discharge to a lifting system do not work in case of a power failure.

According to DIN EN 806-5, deferrisation systems routinely require a functional check to be performed by the operator and maintenance to be performed by an authorised technical service company.

- ① Pump (provided by others)
- ② Diaphragm expansion tank (provided by others)
- ③ Pressure gauge inlet pressure (provided by others)
- ④ Regeneration tank for deferrisation (option)
- ⑤ Sampling valve (provided by others)
- ⑥ Control valve operating voltage 24 V / 50 Hz
- ⑦ Deferrisation system incl. filter material
- ⑧ Pressure gauge outlet pressure (provided by others)
- ⑨ BOXER K drinking water filter

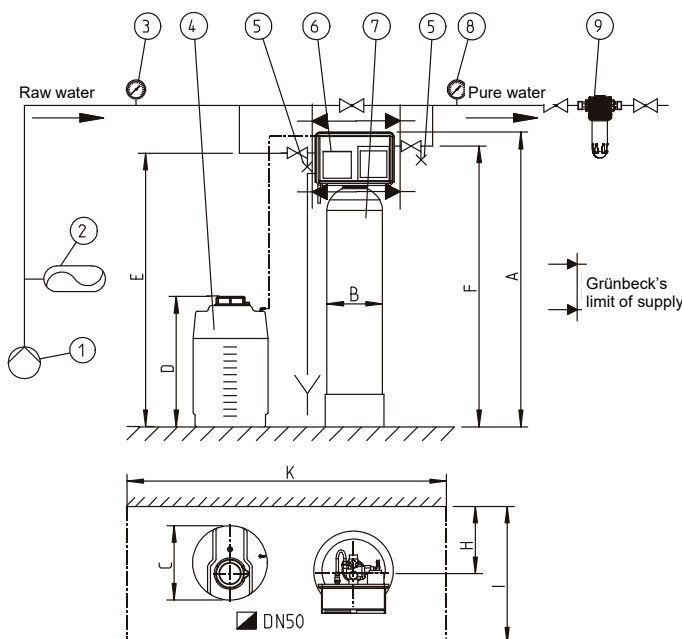


Fig. 3: Installation and dimensional drawing

**Technical specifications/Dimensions**

GENO-mat FE-Z	20/10	25/13	30/14	40/17	40/18	50/19	60/20	
<b>Connection data</b>								
Nominal connection diameter	DN 25 (1")			DN 40 (1½")				
Min. drain connection	DN 50			DN 70				
Nominal flow rate (depending on the iron concentration)	[m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Power supply	[V]/[Hz]	230/50						
Connected load	[VA]	10						
Protection/protection class		IP 54/⊕						
<b>Performance data</b>								
Nominal pressure		PN 10						
Min./max. operating pressure	[bar]	2.5/6.0						
Pressure loss at nominal flow	[bar]	0.5	1.1	1.0	1.1	1.0	0.8	1.1
<b>Dimensions and weights<sup>1)</sup></b>								
Total height	[mm]	1360	1620	1620	1900	1900	1870	2100
Exchanger tank Ø	[mm]	210	260	340	370	420	550	620
Regeneration tank Ø	[mm]	465				680		
Height of regeneration tank	[mm]	840				1010		
Connection height/raw water piping	[mm]	1160	1420	1420	1710	1710	1680	1910
Connection height/pure water piping	[mm]	1210	1470	1470	1735	1735	1705	1935
Distance to wall	[mm]	200	230	280	280	300	365	405
Depth of foundation	[mm]	400	450	500	500	550	600	650
Length of foundation	[mm]	1850	1950	2050	2050	2100	2250	2350
Operating weight (incl. water)	[kg]	50	85	150	200	240	425	580
<b>Filling volumes and consumption data</b>								
Bottom filter layer I, quartz gravel 3.0 - 5.6 T	[kg]	-	-	25	25	25	50	50
Bottom filter layer I, quartz gravel 3.0 - 5.6 T	[l]	-	-	18	18	18	36	36
Bottom filter layer I, quartz gravel 3.0 - 5.6 T (dimension a)	[mm]	-	-	1100	1400	1430	1320	1570
Top filter layer II GENO-Ferrocac	[l]	28	52	72	100	112	224	308
Top filter layer II GENO-Ferrocac (dimension b)	[mm]	290	360	270	460	570	390	520
Free board	[l]	5	8	15	18	36	45	88
<b>Amount of regeneration agent required</b>								
Preparation amount	[l]	30 <sup>2)</sup>	50 <sup>2)</sup>	60 <sup>2)</sup>	100 <sup>2)</sup>	100 <sup>2)</sup>	200 <sup>2)</sup>	300 <sup>2)</sup>
GENO-oxi plus	[l]	5	9	11	17	17	35	53
GENO-Spezialgranulat (special granulate)	[g]	105	175	210	350	350	700	1050
Regeneration/disinfection interval		regeneration when required / disinfection after 6 months at the latest						
Concentration of preparation	[%]	0.35						
Total waste water volume per regeneration at 3 bar, approx.	[m³]	1	1.3	1.7	2	2.7	3.4	5.4
Duration of washing out (regeneration)	[min.]	30						
Duration of backwash	[min.]	10						
Backwash capacity	[m³/h]	1.6		3.4		5.7		
<b>Ambient data</b>								
Max. water temperature	[°C]	30						
Max. ambient temperature	[°C]	40						
<b>Order no.</b>		<b>153 210</b>	<b>153 220</b>	<b>153 230</b>	<b>153 240</b>	<b>153 250</b>	<b>153 260</b>	<b>153 270</b>
<b>Spare filter filling</b>								
GENO-Ferrocac (28 l per bag)		1x170170	1x170170	2x170170	3x170170	4x170170	8x170170	11x170170
GENO-Ferrocac (4 l per bucket)		-	6x153610	4x153610	4x153610	-	-	-
Quartz gravel SB 3.0 - 5.6 T (25 kg per bag)		-	-	1x170208	1x170208	1x170208	2x170208	2x170208

<sup>1)</sup> All indications are approximate.

<sup>2)</sup> If the liquid product GENO-oxi plus is used, the GENO-oxi plus amount must be subtracted from the preparation amount.

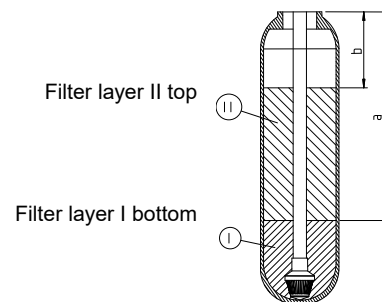


Fig. 4: Filling of filter layers