



Fig. 1: GENO-mat MN-Z

### Designated application

The GENO-mat MN-Z filter systems are designed for the reduction of iron resp. manganese. They 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 properly and handled according to the operation manual, pure water values as required by the German Drinking Water Ordinance (TrinkwV) can be achieved.

For an optimum reduction of iron and manganese, a pH value > 7.2 is required. A dosing system for oxidants has to be provided upstream of the filter system.

However, should ammonium (> 0.1 mg/l) be detected in the raw water, an additional treatment stage has to be provided.

If humic acids or hydrogen sulphides are contained in the well water, the pure water quality to be expected might be affected.

### Function

The GENO-mat MN-Z filter systems for demanganisation are operated with the natural, catalytic filter material Fermanit. A central control valve automatically controls the operating cycles filtration - backwash - and first filtrate.

### Filtration

The raw water flows into the filter tank via the raw water inlet and then, from top to bottom, through the catalytic filter material. By means of

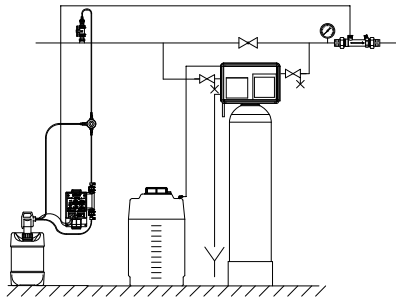


Fig. 2: GENODOS DM-oxi dosing

an oxidation process, dissolved iron and manganese salts are transformed into insoluble oxides and are deposited on the Fermanit material.

In this oxidation process, the Fermanit releases electrons to the iron and manganese until the supply is exhausted. The electrons have to be replaced continuously by dosing GENO-oxi plus (refer to product data sheet).

By dosing oxidants, the oxidation and precipitation of iron and manganese already takes place prior to their contact with the Fermanit material. Thanks to its catalytic properties, a complete oxidation and due to the excellent filtration characteristics, an optimum filtration are achieved. 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 filter 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 filter system is ready for operation once again.

## Demanganisation systems

### GENO-mat

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

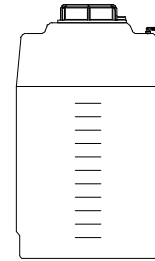


Fig. 3: Regeneration tank

### Regeneration/Disinfection

For operating and hygienic reasons, the filter system must be regenerated with the special granulate GENO-Spezialgranulat or with GENO-oxi plus after 6 months at the latest.

### Control unit

The GENO-mat MN-Z filter system is 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 or manganese in the water (reference value: 0.3 bar(g) 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.

The exchanger tank is made of pressure resistant plastic with fixtures for water flow control and retention of filter material. And a filling of filter material with supporting gravel. The control unit is interference-free. Power supply by means of a cord transformer with 1.5 m cable.

**Scope of supply**

Filter system with water test kit for manganese and operation manual.

 **Note:** We recommend a water analysis to determine the manganese concentration.

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

**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/MN-Z 20/10 - 40/18)  
Order no. 153 094

Regeneration device 300 l  
(FE/MN-Z 50/19 - 60/20)  
Order no. 153 095

Mounting kit R 1"  
(up to type 30/14)  
Order no. 125 845

**Oxidants**

For regeneration/disinfection

1 kg of special granulate  
GENO-Spezialgranulat<sup>1)</sup>  
**Order no. 170 016**

5 kg of special granulate  
GENO-Spezialgranulat<sup>1)</sup>  
**Order no. 170 017**

20 kg of GENO-oxi plus (liquid)  
**Order no. 170 029**

**Dosing systems****GENO DM-oxi 1" and DM-oxi 1½"**

Complete dosing system consisting of dosing pump GP-2/40 (GP-6/40), water meter 1" (1 ½"), dosing point, opaque suction lance, dosing hose. Dosing system suitable for MN-Z 20/10 - MN-Z 30/14

Dosing system  
GENODOS DM-oxi 1"  
**Order no. 163 420**

Dosing system suitable for  
MN-Z 40/17 - MN-Z 60/20  
Dosing system  
GENODOS DM-oxi 1½"  
**Order no. 163 430**

**Overflow valve**

**GENODOS DM-oxi 1", 1½"**  
**Bestell-Nr. 163 790**

**Spare filter filling, complete**

Please refer to the table "Technical specifications"

**Water test kit for manganese**

Measuring range 0.03 mg/l-0.5 mg/l  
For the quantitative, colorimetric determination of dissolved manganese in the measuring range of 0.0 mg/l – 0.8 mg/l respectively 0.03 mg/l – 0.5 mg/l.

Quick test kit consisting of:  
2 test vials and comparison scale  
2 reagents Mn - 1 A  
1 reagent Mn - 2 A  
1 reagent Mn - 3 A  
**Order no. 170 124**

**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:

1 Test glass with 3 chambers and scale  
Test tablets (0.0 mg/l-0.8 mg/l) 30 tablets;  
Test tablets (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 and ensure the system's protection 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, filter systems routinely require a functional check to be performed by the operator and maintenance to be performed by an authorised customer service company.

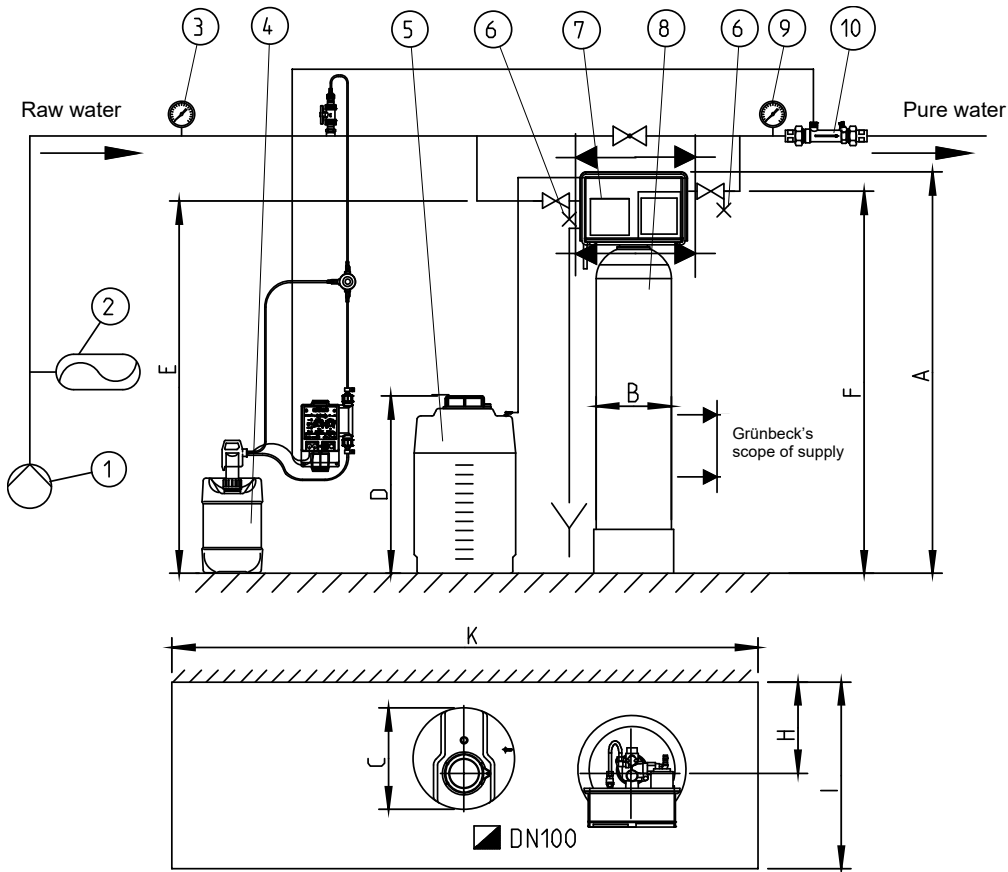
## Technical specifications/Dimensions

GENO-mat demanganisation system		MN-Z 20/10	MN-Z 25/13	MN-Z 30/14	MN-Z 40/17	MN-Z 40/18	MN-Z 50/19	MN-Z 60/20	
<b>Connection data</b>									
Nominal connection diameter		DN 25 (1")			DN 40 (1 1/2")				
Min. drain connection		DN 50			DN 70				
Nominal flow (depending on iron and manganese 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>									
A Total height		[mm]	1360	1620	1620	1900	1900	1870	2100
B Exchanger tank ∅		[mm]	210	260	340	370	420	550	620
C: Regeneration tank ∅		[mm]	465				680		
D: Height of regeneration tank		[mm]	840				1010		
E: Connection height/raw water piping		[mm]	1160	1420	1420	1710	1710	1680	1910
F: Connection height/pure water piping		[mm]	1210	1470	1470	1735	1735	1705	1935
H: Distance to wall		[mm]	200	230	280	280	300	365	405
I: Depth of foundation		[mm]	400	450	500	500	550	600	650
K: Length of foundation		[mm]	1850	1950	2050	2050	2100	2250	2350
Operating weight (incl. water)		[kg]	76	136	211	315	365	647	965
<b>Filling volume and consumption data<sup>1)</sup></b>									
Filter layer I, bottom, gravel 3.0 - 5.6		[kg]	10	10	25	25	25	50	50
Filter layer I, bottom, gravel 3.0 - 5.6		[l]	7	7	18	18	18	35	35
Filter layer I, bottom, gravel 3.0 - 5.6 (dimension a)		[mm]	860	1170	1100	1400	1430	1320	1570
Filter layer II, middle, GENO®-Fermanit		[kg]	25	50	50	100	125	200	325
Filter layer II, middle, GENO®-Fermanit		[l]	12.5	25	25	50	63	100	163
Filter layer II, middle, GENO®-Fermanit (dimension b)		[mm]	500	690	810	930	950	900	1020
Filter layer III, top, with quartz sand 0.4 – 0.8		[kg]	10	25	50	75	75	150	250
Filter layer III, top, with quartz sand 0.4 – 0.8		[l]	7	17	33	50	50	100	167
Filter layer III, top, with quartz sand 0.4 – 0.8 (dimen. c)		[mm]	300	370	430	460	560	490	450
Free board		[l]	7	12	30	22	40	74	71
<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®-Spezialgranulat		[g]	105	175	210	350	350	700	1050
GENO®-oxi plus		[l]	5	9	11	17	17	35	53
Total waste water volume per regeneration (3 bar)		[m³]	1	1.3	1.7	2	2.7	3.4	5.4
<b>Ambient data</b>									
Duration of washing out (regeneration)		[min.]	30						
Duration of backwash		[min.]	10						
Backwash capacity		[m³/h]	1.6	2.3		3.4		5.7	
Max. water temperature		[°C]	30						
Max. ambient temperature		[°C]	40						
<b>Order no.</b>			<b>153 410</b>	<b>153 420</b>	<b>153 430</b>	<b>153 440</b>	<b>153 450</b>	<b>153 460</b>	<b>153 470</b>
<b>Spare filter fillings<sup>3)</sup></b>									
<b>Order no.</b>			<b>153 020</b>	<b>153 022</b>	<b>153 024</b>	<b>153 026</b>	<b>153 028</b>	<b>153 030</b>	<b>153 032</b>

<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.

<sup>3)</sup> All three filter layers



- |  |  |  |
|--|--|--|
| ① Pump (provided by others)                          | ⑤ Regeneration tank for demanganisation (optional) | ⑧ Demanganisation system incl. filter material   |
| ② Membrane expansion vessel (provided by others)     | ⑥ Sampling valve (provided by others)              | ⑨ Pressure gauge outlet pressure (by others)     |
| ③ Pressure gauge inlet pressure (provided by others) | ⑦ Control valve for operating voltage              | ⑩ Contact water meter (scope of delivery item 4) |
| ④ GENODOS DM-oxi dosing (optional)                   |  |  |

Fig. 4: Installation and dimensional drawing

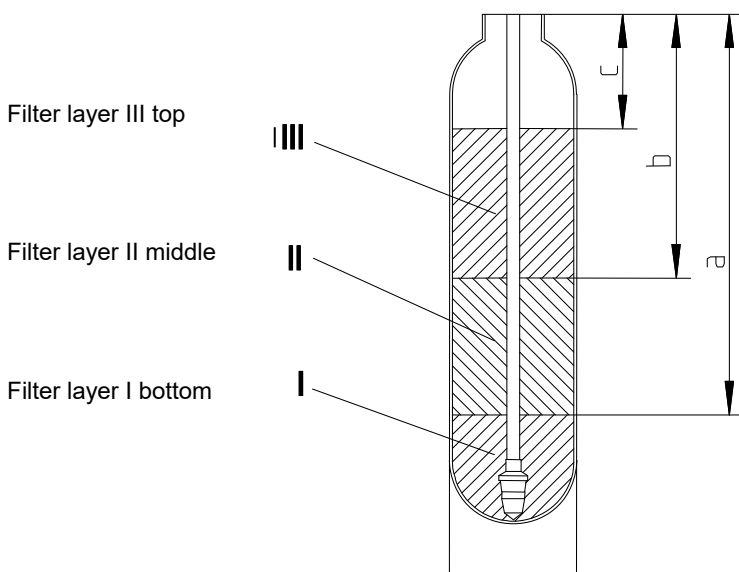


Fig. 5: Filling of filter layers