

DMF – 5.2

DMF – 20.2

DMF – 50.2

DMF – 200.2

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Keep the operating manual for future use!

Record the exact type and serial number here.
(can be read off the type plate of the dry material feeder)

Type :

Serial No. :

These data are important in the case of queries or for ordering spare and/or wear parts and must always be stated.

Operating instructions

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Operating instructions






1. General information

1.1 General user instructions

The applicable regulations for the installation site must be observed before the commissioning and during the operation of the dry material feeder from **sera**.
 The **sera** dry material feeder is delivered ready for connection. Always read these instructions and particularly the safety instructions before installation and commissioning.



1.2 Marking of notes in these operating instructions

Special notes in these operating instructions are marked with text and danger symbols.

Designation of the note (text and symbol)	Danger type			Definition of the note (in the operating instructions)
	Danger of fatal injury	Risk of injury	Damage to property	
DANGER! 	X	X	X	Identifies an imminent danger that results in fatal or severe injuries if not avoided.
WARNING! 	X	X	X	Designates a potentially dangerous situation. There might be danger to life or serious injury and damage to property if it is not avoided.
CAUTION! 		X	X	Designates a potentially dangerous situation. There might be slight or minor injury or damage to property if it is not avoided.
ATTENTION! 			X	Designates a potentially dangerous situation that could lead to damage to property if not avoided.
NOTE! 				Designates information which helps to make work easier and is useful for trouble-free operation

1.3 Marking of notes on the product

Symbols which are directly attached to the dry material feeder such as warning notices or rotation direction arrows on the drive motor must be strictly observed and kept in completely legible condition.

Designation of the note	Symbol	Definition of the note
DANGER OF INJURIES!		Warning about automatic start Never reach into the rotating feed screw!
DANGER OF BURNS!		Warning of hot surfaces. Never touch the ring heater during operation without suitable protective equipment!

1.4 Quality notes

Compliance with these operating instructions and, in particular, the safety instructions, helps to:

- prevent danger to people, machines and the environment
- increase the reliability and service life of the dry material feeder
- reduce repair costs and downtimes

The **sera** quality management and quality assurance system is certified in accordance with ISO 9001:2008. The **sera** dry material feeder complies with the applicable safety requirements and accident prevention regulations.



ATTENTION!

Always keep this operating manual accessible at the operating site of the dry material feeder.

2. Safety instructions

2.1 Personnel qualification and training

The personnel who operate, service, check and install the system must be suitably qualified. Area of responsibility and supervision of the personnel must be clearly defined by the owner. If the personnel do not have the required knowledge, appropriate training and instruction must be performed by the owner. If required, this can be carried out by the manufacturer / supplier upon order of the owner. The owner must also ensure that the personnel have understood the content of the operating manual.

2.2 Dangers in the case of non-observance of the safety instructions

Non-observance of the safety instructions can result in danger to persons, hazards to the environment and damage to the machine.

For example, non-observance can result in:

- Failure of important functions of the machine
- Failure of prescribed methods regarding maintenance and service
- Danger to people due to electrical, mechanical and chemical influences.
- Hazards to the environment by leaking dangerous substances.

2.3 Safety conscious working

The safety instructions specified in this operating manual, the existing national regulations for accident prevention, the applicable safety regulations for the conveyed medium for the respective country of use and any internal working, operating and safety regulations of the owner must be observed.

2.4 Safety instructions for the owner / operator

Hot or cold machine parts must be secured against contact by the customer if these result in hazards.

Protective devices against contact with moving parts must not be removed for machines in operation.

Leaks of dangerous conveyed media (e.g. explosive, toxic, hot) must be led away so that there is no danger to persons and the environment. Legal regulations must be observed.

Hazards from electric energy must be ruled out.

2.5 Safety instructions for maintenance, inspection and installation work

The owner must ensure that all maintenance, inspection and installation work is exclusively carried out by authorised and qualified skilled personnel who have been sufficiently informed by in-depth study of the operating instructions. Only work which is described in the operating manual is permitted to be carried out.

Only use spare parts which comply with the requirements of the specified operating conditions.

All safety and protective devices must be reinstalled and/ or made operative immediately after completion of the work.

The points in the "Start-up" section must be observed before the system is restarted.

2.6 *Unauthorised modification*

Conversion or modification of the dry material feeder requires the permission of the manufacturer. Original spare parts and accessories approved by the manufacturer increase safety.



CAUTION!

If non-approved parts are used or if the dry material feeder is modified arbitrarily, the manufacturer refuses any liability claims.

2.7 *Improper operation*

The operational reliability of the supplied dry material feeder is only guaranteed if the product is used as intended in accordance with the "Intended Use" chapter.

2.8 *Intended use*

The **sera** dry material feeders are used for dosing dry goods and must only be used for the intended purpose specified in the product description and the acceptance certificate.

If the dry material feeder is to be used for other applications, the suitability of the dry material feeder for the new operating conditions must be clarified with **sera**.

Criteria for intended use of the dry material feeder:

- Take account of characteristics of the dry material (see safety and product data sheet of the dry material used – the safety data sheet must be provided by the supplier / owner of the dry material).
- Stability of the materials which come into contact with the dry material.
- Operating conditions at the installation site.
- Power supply.
- Installation site (environmental conditions).

sera does not accept any liability if these criteria are not or are only partly specified or complied with by the purchaser / owner.

2.9 Personal protection equipment for maintenance and repair

The safety recommendations of the German Ordinance on Hazardous Substances (GefStoffV) (§14 Safety Data Sheet) and relevant national safety regulations for the medium must be observed.

In the case of a fault, pay attention to the following possible emissions:

- Discharge of dry material
- Noise emissions
- Discharge of operating materials

Emissions must be monitored by corresponding control systems of the complete plant.



Wear protective clothing, gloves and a suitable face protection and respirator.

ATTENTION!



Personal protective equipment must be provided by the owner of the dry material feeder!

HINWEIS!



NOTE!



2.10 Operating materials

The **sera** dry material feeders have been lubricated for life.

2.11 Foreseeable misuse

The following misuses are assigned to the life cycles of the machine.



DANGER!

Misuse can result in danger to the operating personnel.

2.11.1 Transport

- Tipping behaviour during transport, loading and unloading ignored.
- Weight underestimated during lifting.
- Pointed parts and sharp edges due to damage during transport not paid attention to when removing packaging material.
- Sufficient clearance from hot parts and ignition sources not paid attention to.
- Limits of the machine during transport not paid attention to.
- Insufficient or no protective equipment worn.

2.11.2 Assembly and installation

- Mains power supply not fuse protected (no fuse / fuse too large, mains power supply not compliant with standards).
- No or unsuitable fastening material of the machine.
- Dry material feeder not fixed sufficiently during installation.
- Base not suitable due to unevenness or insufficient load capacity.
- Non-observance of the centre of gravity of the machine during positioning and mounting.
- Non-observance that the unit can start up during connection of the power supply or during connection to a higher level system and non-observance of the resulting danger from rotating parts.
- Mains power supply connection without protective earth.
- Accessibility of fastening points for fixing and of the power supply for safe disconnection of the machine not paid attention to.
- Non-observance of the operating side of the machine and/or sufficient lighting during the complete assembly and installation.
- Non-observance of enabling of the mains power supply during assembly, connection of the power supply or connection to a higher level system.
- Insufficient or no protective equipment worn.
- Mains plug cut off and direct mains power connection whereby safe disconnection is not possible. Safe disconnection e.g. by 2-pole main switch.
- Incorrect connection cables for mains power supply (cross section too small, incorrect insulation)
- Damage of insulation during assembly.
- Short circuit of the internal power supply (15 V DC) at the control cable during installation.

2.11.3 Commissioning

- Non-observance of pointed parts during the commissioning.
- Insufficient / incorrect fastening of the machine while removing the transport lock / fixing.
- Access to the machine / operating side during commissioning is not ensured or insufficiently illuminated.
- Non-observance of the operating side of the machine and/or sufficient lighting / cleanliness / legibility during the commissioning.
- Removal of covers and protective caps (gear motor) and non-observance of rotating parts during the commissioning.
- Non-observance of the positioning conditions such as sufficient clearance from parts under high voltage or the operating limits such as temperature.
- Insufficient dimensioning of supply lines.
- Covers of ventilation openings (e.g. motor).
- Non-observance of the safety data sheets of the dry goods used and the compatibility of the dry goods with each other during the test run / test operation and during the transfer in normal operation.
- Operation of a damaged dry material feeder.
- Entry of impurities or solids into the machines which destroy these or react with the dry material.
- Insufficient or no protective equipment worn.

2.11.4 Operation

- Break of the metering screw, production of sharp and pointed places.
- Reaching into the metering screw or the hopper during operation (rotating parts).
- Unauthorised conversion of the unit or installation of parts by the customer or modification of the dry material feeder.
- Undoing the fastenings of the dry material feeder.
- Non-observance of stored energy from loosening, overloaded machine parts or relative height of container to the floor.
- Non-observance of the safety data sheets of the dry goods used and the compatibility of the dry goods with each other during the test run / test operation and during the transfer in normal operation.
- Non-observance of the positioning conditions / limits of the machine such as sufficient clearance from parts under high voltage or the operating limits such as temperature.
- Non-observance of destroyed insulation due to heat radiation or ageing.
- Non-observance of heat radiation emitted from the heater element.
Temperatures of more than 60 °C can be reached.
- Non-observance of the specified operating parameters, unbalance setting, vibration and interval time and sufficient damping of adjacent parts of the electric vibrator used.
- Non-observance of the safety data sheets of the dry goods used and the compatibility of the dry goods with each other during the test run / test operation and during the transfer in normal operation.
- Long standstill of the machine with filled hopper.
- Non-observance of the stability of the materials used as compared with the dry material.
- Storage of unauthorised materials on the machine.
- Non-observance of leaks or discharge of the dry material from the case of the machine ► "Danger for environment and operator" in the case of an error".
- Insufficient or no protective equipment worn.

2.11.5 Maintenance / repair

- Non-observance of pointed, sharp parts / places which occur due to opening of the machine or due to breakage / damage of parts.
- Use of incorrect spare parts / oils (e.g. not sera original spare parts, incorrect viscosity)
- Non-observance of stored energy in the form of the relative height of dry materials as compared with the floor ► dry material feeder empties completely when the discharge pipe is removed.
- Non-observance of wear parts / parts which lose their grip during removal of other parts, during replacement or during repair work.
- Removal of covers, protective cover of the gear motor without disconnection of the power supply.
- Non-observance of rotating parts during the inspection or stopping of the machine.
- Non-observance of the stability of the machine when undoing fastenings or due to the retrofitting or attachment of parts.
- Reduction of the stability by parts which work loose during the removal of other parts.
- Improper installation of spare / wear parts (e.g. incorrect tightening torque).
- Prescribed maintenance schedules ignored
- Temporary fixings and parts not belonging to the machine not removed before the restart ► Danger from ejected / flung out materials.
- No switching off and/or disconnection of the power supply of the machine before carrying out maintenance and repair work.
- Non-observance of minimum clearances from parts under high voltage.
- Non-observance of the cooling down time of at least 1 hour before removing the heater or adjacent components.
- Non-observance of the safety data sheet of the dry material used and the associated safety precautions ► suitable protective clothing, cleaning of the unit before the maintenance / repair.
- Replacement of wear parts before the complete emptying of the dry material feeder.
- Entry of impurities and/or foreign bodies into the feeder ► destruction or increased wear of seal (gamma ring) and metering screw.
- Carrying out work that is not described in the operating manual (work on the gearbox).
- Continued use of parts with damaged insulation.
- No shut down / no protection against a restart before maintenance and repair work.
- Mix-up of sensor cables.
- Damage of the seal and/or omission of the seal, ingress of soiling under the seal or defective lubrication of the contact surface ► dry material discharges.
- Start-up of an incomplete and/or incorrectly installed dry material feeder.

2.11.6 Cleaning

- Insufficient or no protective equipment worn.
- Incorrect or too hot rinsing medium or cleaning medium, non-observance of reactions with the used materials, seals, insulation, reaction with hot surfaces or reaction / incompatibility with the used dry material.
- Non-observance of the safety data sheets of the dry goods used and use of suitable protective clothing during the cleaning.
- No disconnection of the power supply before cleaning the interior of the case, the discharge pipe or the metering screw.
- Use of a high-pressure cleaner for cleaning the unit ► cleaning in accordance with the degree of protection.
- Cleaning without removing loose parts.
- Use of unsuitable cleaning utensils (material changed, mechanical damage due to high pressure cleaner).
- Entry of impurities and/or foreign bodies into the feeder ► destruction or increased wear of seal (gamma ring), metering screw and dry material feeder.
- Recognition of warnings is not ensured.
- Untrained and not instructed personnel

2.11.7 Dismantling

- Non-observance of pointed, sharp parts / places which occur during dismantling due to breakage / damage of parts.
- Non-observance of dangers arising from transport equipment used, disregard of the accident prevention regulations.
- Non-observance of parts which lose their grip during removal of other parts.
- Disregard of loose, falling objects due to brittle /corroded or no longer originally proper fastenings ► prevention by regular check of the connections.
- Change of the centre of gravity when removing parts without sufficient fixing.
- Insufficient standing area of the machine available for the removal.
- No shut down / no protection against a restart before undoing fastenings.
- Non-observance of minimum clearances from parts under high voltage.
- Non-observance of the cooling down time of at least 1 hour before removing the heater or adjacent components.
- Disregard of presence of dry goods and operating materials.
- Residues of conveyed medium and operating materials in the dry material feeder during the dismantling.
- Non-observance of the safety data sheet of the dry material used and the associated safety precautions ► provide suitable protective clothing.
- Non-observance of the limits of the machine during the dismantling.
- Use of incorrect dismantling tools.

2.11.8 Disposal

- Improper disposal of dry goods, consumables and materials.
- No identification of hazardous substances.

2.11.9 Decommissioning

- Non-observance of pointed, sharp parts / places which are difficult to detect in the other life cycle phases, are not accessible or occur due to breakage / damage of parts.
- Disregard of loose, falling objects due to brittle / corroded or no longer originally proper fastenings ► prevention by regular check of the connections.
- Non-observance of stored energy in the form of the relative height of dry materials as compared with the floor ► dry material feeder empties completely when the discharge pipe is removed.
- Undoing fastening without applying sufficient fixing ► tipping of the machine.
- Non-observance of the stability of the machine when undoing fastenings or due to the retrofitting or attachment of parts.
- Improper dismantling.
- Non-observance of minimum clearances from parts under high voltage.
- Non-observance of the cooling down time of at least 1 hour before removing the heater or adjacent components.
- Non-observance of the safety data sheet of the dry material used and the associated safety precautions for cleaning of the machine ► provide suitable protective clothing.
- Undoing the fastenings before the complete emptying of the dry material feeder.
- Entry of impurities and/or foreign bodies into the feeder ► destruction or increased wear of seal, metering screw and dry material feeder.
- Insufficient lighting of or access to the machine.
- Continued use of damaged parts.
- No shut down / no protection against a restart before undoing fastenings or before disconnection of the power supply.
- System not de-energised ► Electrical hazard.

3. Transport and storage

3.1 General

sera products are checked for faultless condition and function before shipment.

The products are packed according to the transport conditions.

The customer must check the product for transport damage immediately after receipt. Any damage detected must be reported immediately to the responsible carrier and the supplier.

The dry material feeder should only be transported using suitable means of transport and/or hoists. Take into account the weight of the dry material feeder and the load capacity of the means of transport.



The packaging material must be disposed of properly!

NOTE!

3.2 Transport

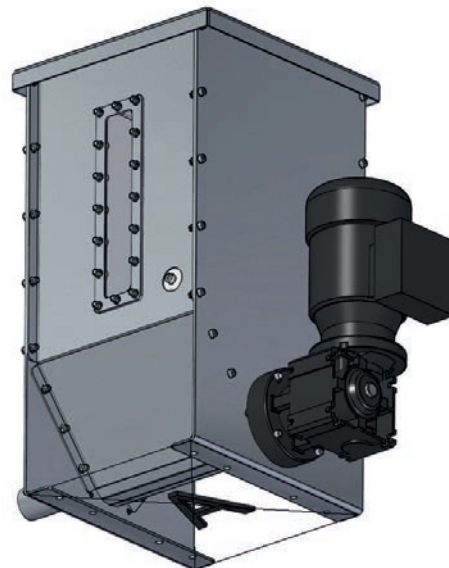
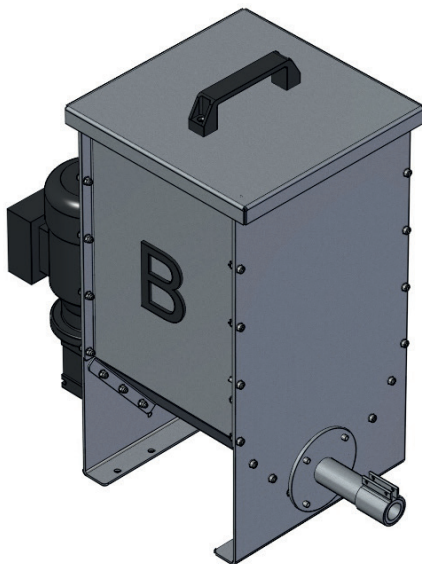


WARNING!

The accident prevention regulations must be observed for transport and shunting.

Pay attention to the following for transport:

- When removing packaging material, pay attention to pointed or sharp places which can be produced due to damage of the machine during the transport.
- Loose parts (covers) ► danger due to falling during the transport.
- Sufficient stability of the ground.
- Sufficient clearance from ignition sources or parts under high voltage.
- Observe the permitted transport surfaces ► danger due to tipping.
The preferred transport surface of the dry material feeder is the surface A (see illustration).
The surfaces B (see illustration) without the cover are also suitable.



WARNING!

The position of the centre of gravity can change due to attached options ► danger due to reduced stability or tipping of the machine. Attachment of components by the customer is always prohibited.

Operating instructions

3.3 Storage

Undamaged packaging guarantees protection during subsequent storage and it should only be opened when the dry material feeder is installed.

Proper storage increases the service life of the dry material feeder. Proper storage means keeping away from negative influences such as heat, humidity, dust, chemicals, etc.

The following storage instructions must be complied with:

- Storage location: cool, dry, dust-free, no exposure to direct sunlight, and slightly vented.
- Storage temperatures between +2° C and +40 °C.
- Relative air humidity not more than 85%.
- The maximum storage time for the standard system is 12 months.

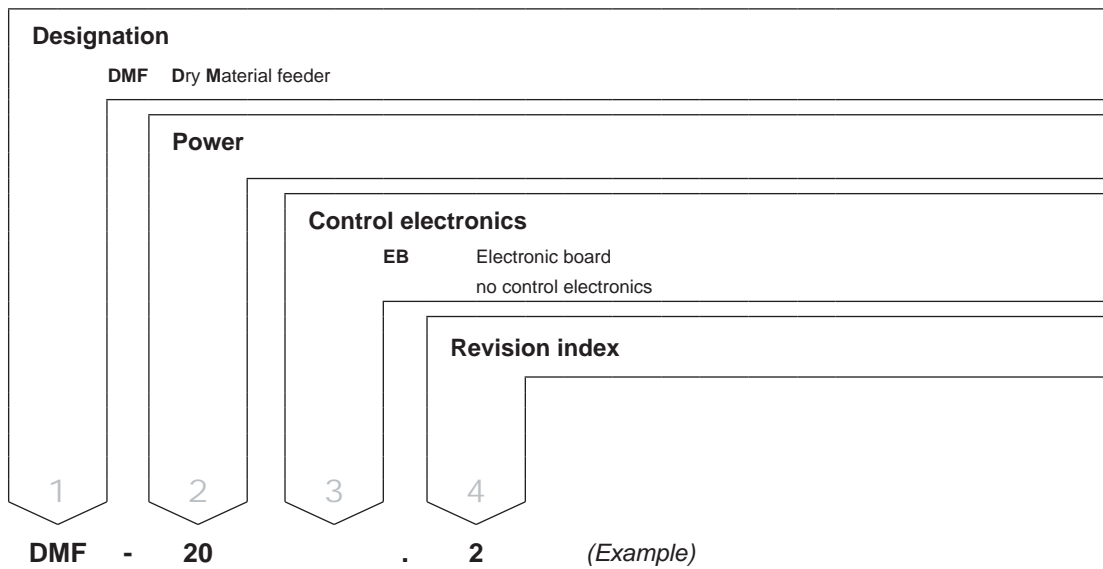
If these values are exceeded, metal products should be sealed air-tight in foil and protected from condensation water using a suitable desiccant.

Do not store solvents, fuels, lubricants, chemicals, acids, disinfectants and similar in the storage room.

4. Product description

4.1 Types

4.1.1 Type code

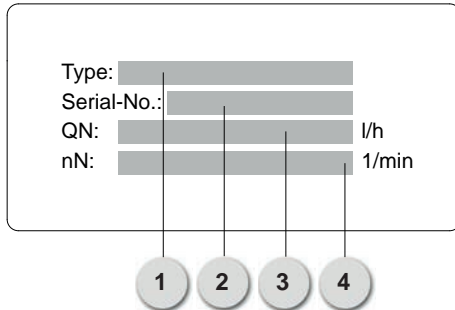


Example: DMF-20.2 Dry material feeder with an output of 20 l/h

Operating instructions

4.1.2 Type plate

All **sera** dry material feeders are provided with a type plate at the factory. The following data are indicated on the type plate:



1	Type of the dry material feeder
2	Works No. (serial number) of the dry material feeder
3	Rated delivery output of the dry material feeder for the specified reference medium
4	Rated speed The actual speed can differ by $\pm 10\%$

4.2 Materials

The materials used are stated in the product description in the Appendix. The suitability of the materials for the medium must be checked.

4.3 Dry goods

Boundary conditions and characteristics of the approved dry goods:

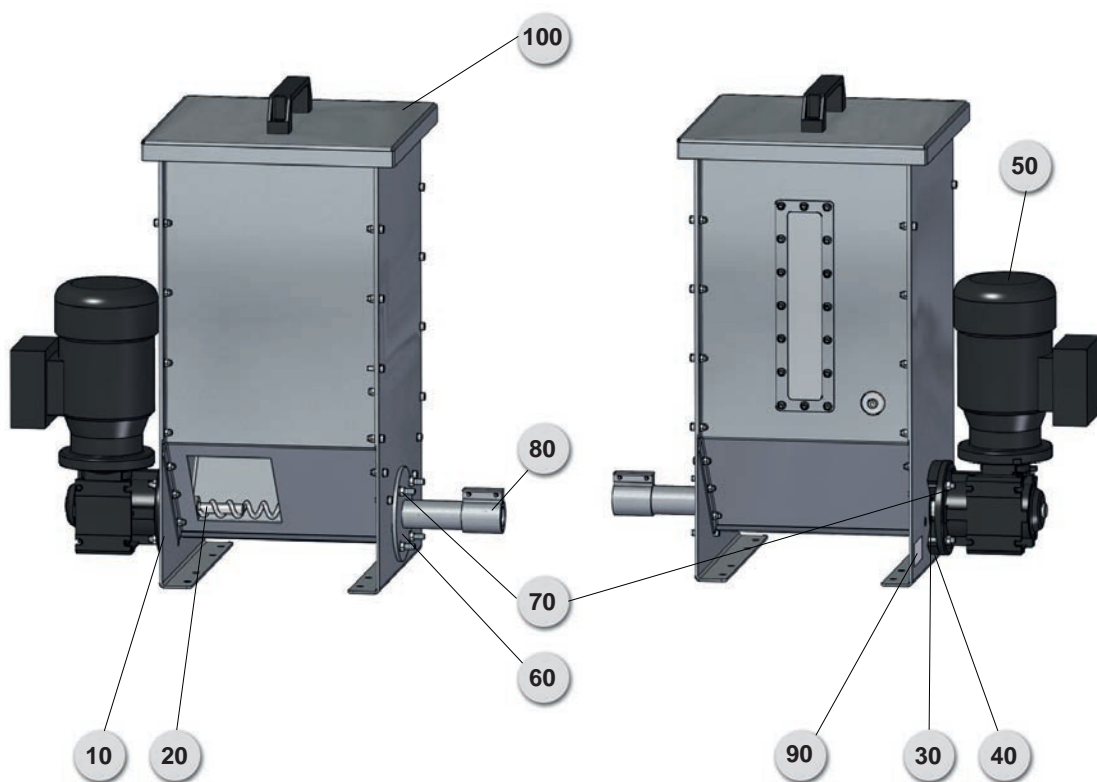
- Density ► 0.5 to max. 1.2 kg/l
- Grain size ► up to max. 1.5 mm
- Characteristics ► dry, powder to granulate, cohesionless, free-flowing
- Temperature ► maximum bulk material temperature of 40 °C

4.4 Functional description

4.4.1 General

The dry material feeder is suitable for the dosing of dry goods which do not tend to adhere. The dry material feeder is a volumetric feeder which delivers a reproducible portion from a container depending on the speed. In addition to the speed, the dry material characteristics, particularly the density of the dry good, also affects the delivery output. The dry material feeder consists of a basic unit which can be supplemented with different options (see Chapter "Options").



4.4.2 Basic unit




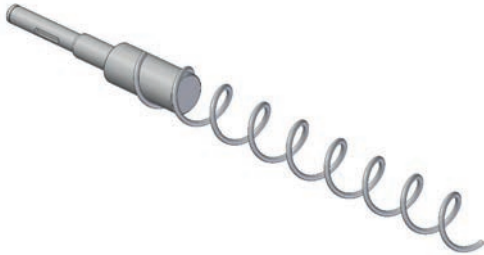
No.	Designation
10	Case
20	Metering screw
30	Seal
40	Bearing flange
50	Drive motor
60	Discharge pipe
70	Fastening set (with locking ring and feather key)
80	Ring for heater
90	Type plate
100	Cover

4.4.2.1 Metering screw

The metering screw which is driven by a gear motor takes up the material and feeds it continuously and dust-free to the discharge pipe.

 CAUTION!	<p>Moving machine parts! Never reach into the rotating metering screw! Risk of injury!</p>	
------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

Different metering screws are used, depending on the type. The shaft material is 1.4571. The spirals are made of 1.4310.

Figure	Pitch p (mm)	External diameter da (mm)	DMF Type
	22	22	<ul style="list-style-type: none"> ■ DMF-5.2 ■ DMF-20.2
	50	50	<ul style="list-style-type: none"> ■ DMF-50.2 ■ DMF-200.2

4.4.2.2 Drive motor

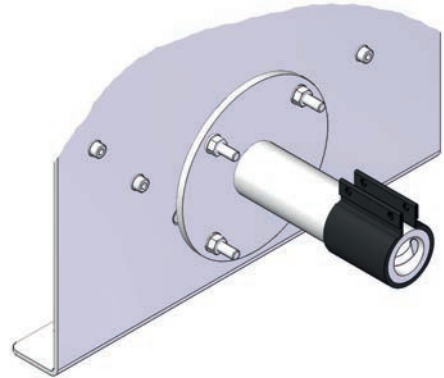
The unit is driven by a three-phase gear motor

(for information about how to connect the drive motor, see Chapter "Electrical Connections" and for motor data, see Chapter "Motor Data").

4.4.2.3 Ring heater

Heating the discharge pipe should prevent the entry of moisture into the feeder and thus the sticking together or caking of the dry material.

The ring heater material is temperature-resistant up to a maximum temperature of 450 °C. The heater is not temperature-regulated. The temperature is only limited by the output limitation.



Type	DMF Type	Internal diameter mm	Width	Voltage V	Rated current A	Power W
35/50	<ul style="list-style-type: none"> ■ DMF-5.2 ■ DMF-20.2 	35	50	24	0.2	5
60/50	<ul style="list-style-type: none"> ■ DMF-50.2 ■ DMF-200.2 	60				

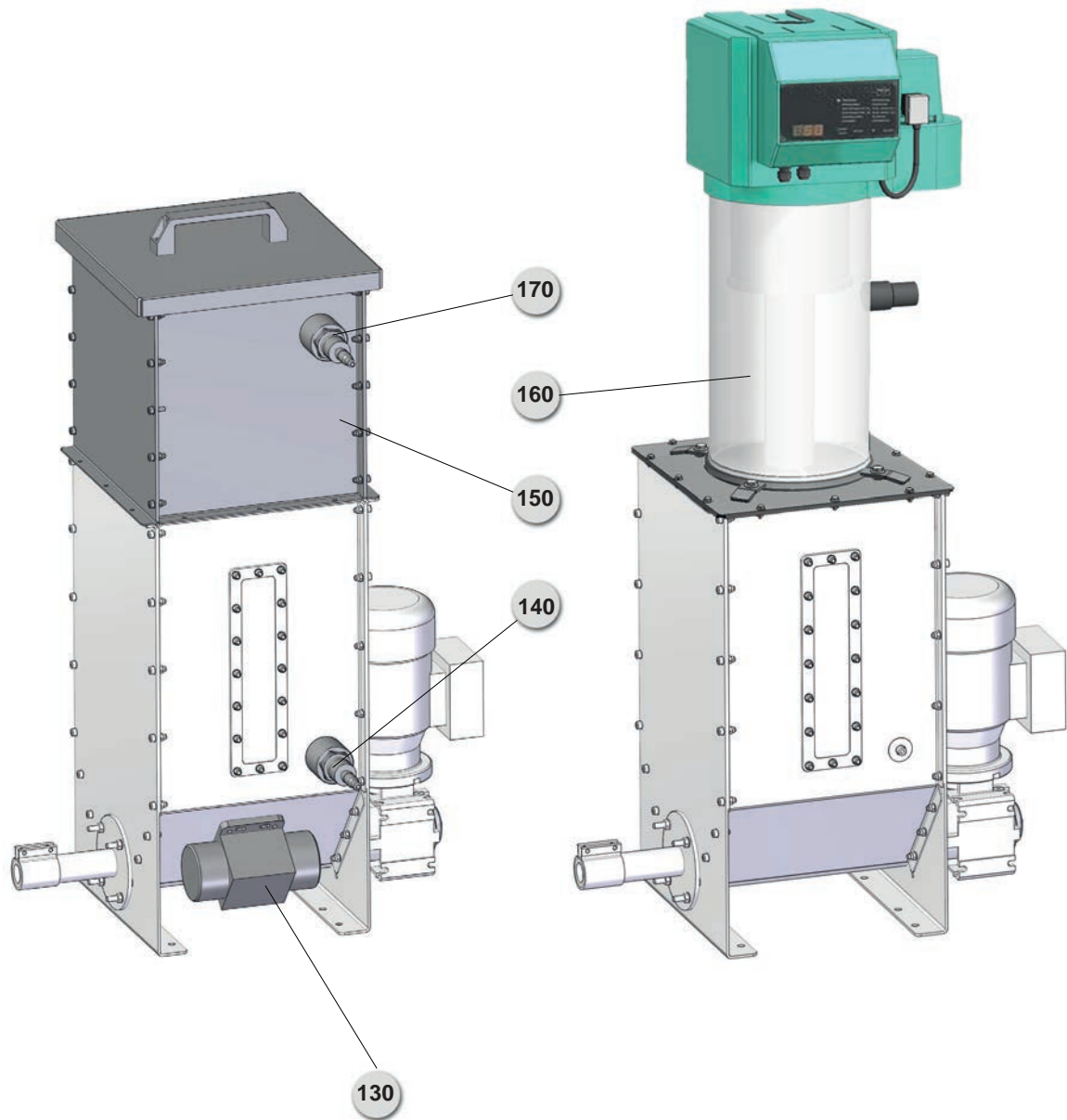


CAUTION!

**Never touch the ring heater during operation:
Danger of burns!**



4.4.3 Options

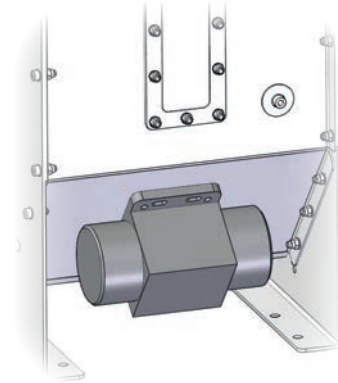


No.	Designation
130	Vibrator
140	Sensor empty signal for hopper
150	Hopper extension
160	Conveying system
170	Sensor full signal for hopper

4.4.3.1 Vibrator

Type	Rated power kW	Rated voltage V	Rated current A
NEG 5050	0.045	400/480 (50/60 Hz)	0.16


Under certain conditions the dry material can form bridges in the hopper which impede continuous conveyance. A vibrator can be used to destroy these bridges. The vibrator should only operate in cycle mode so that the dry material is not additionally compacted.






ATTENTION!

Cycle time: 3 seconds ► operation
 1 minute ► pause




NOTE!

Observe the operating instructions on the data carrier for the vibrator.




ATTENTION!

Do not touch the vibrator during operation.



ATTENTION!

The vibration level of the vibrator is set to 11% at the factory. This value must not be increased as this could damage the dry material feeder. The vibration level must only be adjusted by qualified personnel after interruption of the power supply and in consultation with sera.



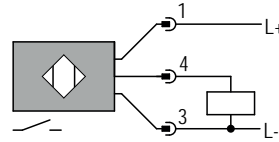
ATTENTION!

Vibration times exceeding 3 seconds can result in high compaction of the conveyed medium and thus damage of the metering screw.

4.4.3.2 Sensor

A sensor for empty hopper signal are available.

Pin assignment

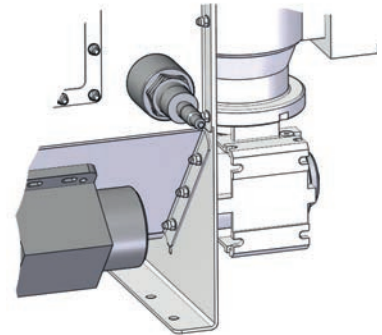


The connection is an M12 plug-in connection.

Empty signal for hopper

The sensor has a programmable output function (normally closed / normally open contact). It is recommended to use as normally open contact so that undercutting of the sensor is detected at a remaining volume of approx. 10 l. The sensor functions after successful setting during the commissioning.

See data carrier for the operating instructions.



Full signal for hopper

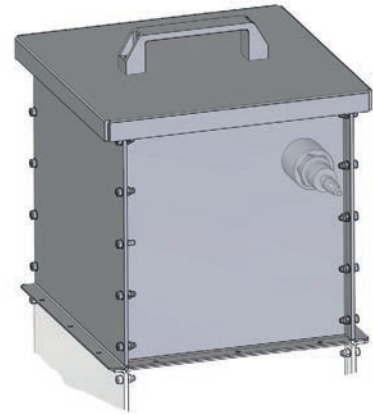
The sensor has a programmable output function (normally closed / normally open contact). It is recommended to use as normally open contact so that overcutting of the sensor is detected at a remaining volume of approx. 55 l. The sensor functions after successful setting during the commissioning.

See data carrier for the operating instructions.



4.4.3.3 Hopper extension

The storage capacity of the dry material feeder can be expanded using a hopper attachment.
Expansion of the capacity: ca. 23 litres.



4.4.3.4 Conveying system

The conveying system is used for automatic loading of the DMF case with the dry material.

The operating instructions of the conveying system on the data carrier must be observed.



Conveying distance (total) [m]	Suction height [m]	Conveying capacity [kg/h]	Remark
15	4	70	(Manufacturer indication)
4	1,4	~ 280	Polymer (0,8 kg/l); measured
4	0	~ 320	Polymer (0,8 kg/l); measured

5. Technical data

Type	Output l/h	Hopper volume Litre
DMF-5.2	5	35
DMF-20.2	20	35
DMF-50.2	50	35
DMF-200.2	200*	35

* a performance comparison is required using a dry material feeder (DMF) with conveying system (option) (> see operating instructions DMF)

Empty weight (kg)

Basic unit	Options		
	Hopper extension	Conveying system	Vibrator
28	3	34	2

Note the total weight ► the weight is increased when dry material is added.

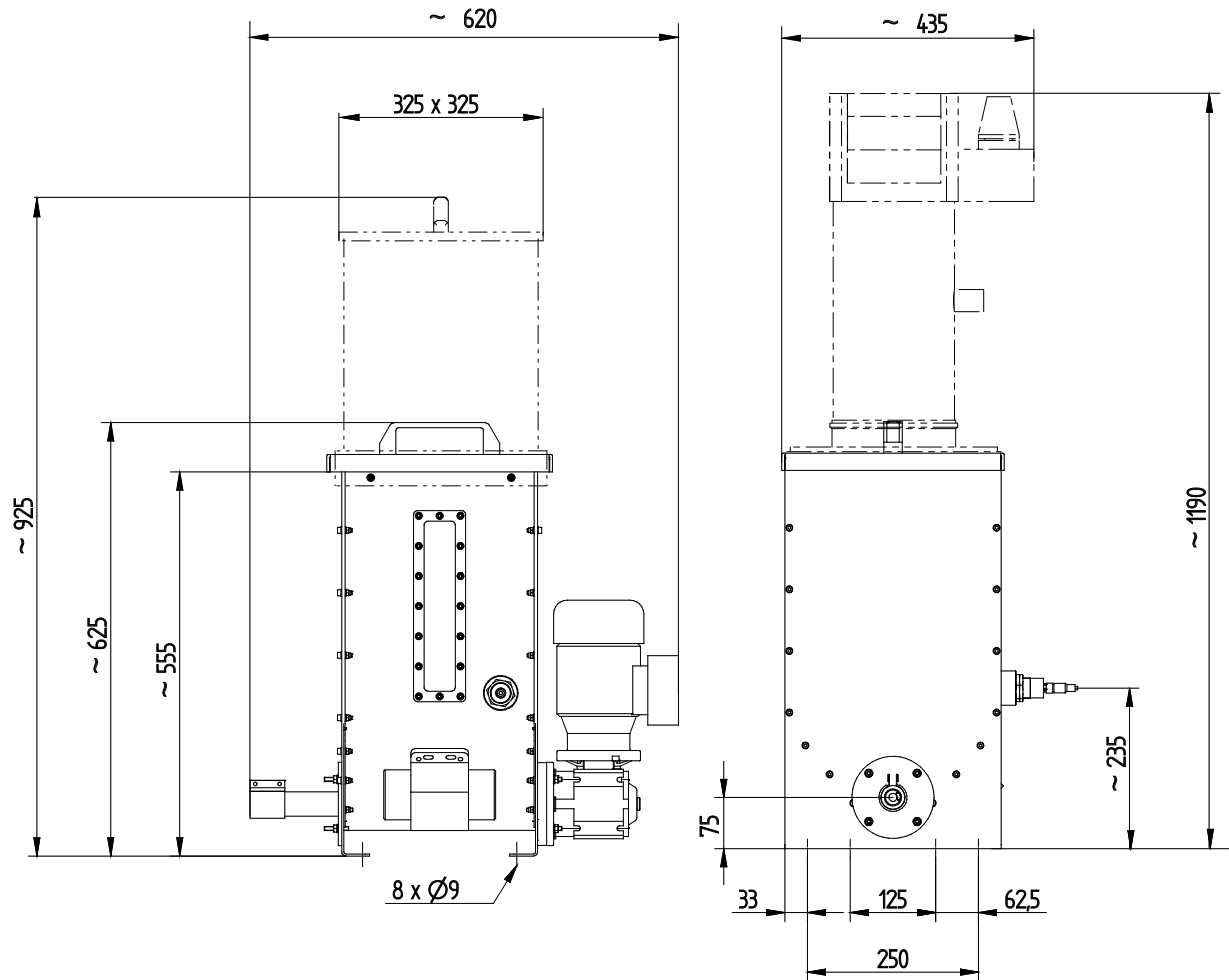
5.2 Motor data

Three-phase gear motor (drive motor) DSGM								
Type	Installation size	Power kW 50 Hz	Frequency Hz	Voltage V 50 Hz	Rated current A 50 Hz	Insulation class	Enclosure IP	Speed rpm
DMF-5.2 DMF-50.2	63 S/4	0.09	50	230 / 400	0.94 ¹⁾ 0.54 ²⁾	F	55	17
DMF-20.2 DMF-200.2	63 L/4	0.18	50	230 / 400	1.18 ¹⁾ 0.68 ²⁾	F	55	68

¹⁾ Δ delta connection

²⁾ Y star connection

5.3 Dimensions



Operating instructions

6. Assembly / Installation

The following points must be observed for the installation of the dry material feeder:

- Disconnect the power supply of the dry material feeder during the installation at the destination.



Danger from sudden starting of rotating and/or moving parts during connection of the power supply or connection to a higher level system.

WARNING!

- Check the complete dosing system for damage (e.g. transport damage).
- Check and tighten all screw connections:

Tightening torques

Gear motor	M6	7 Nm
Discharge pipe	M6	7 Nm
Vibrator	M6	10.4 Nm

- Fasten the dry material feeder at the installation location using the fixing holes (4xM8) (see Chapter "Dimensions").
- Pay attention to sufficient clearance from parts under high voltage during the installation.
- Pay attention to sufficient dimensioning of the power supply cable ► danger of electric shock in the case of use of damaged cables.
- Clearly mark danger points.
- Ensure access to the machine, particularly for operating, measurement and inspection points.
- Keep free of soiling.
- Ensure sufficient lighting.

6.1 Installation location

- The dry material feeder is only approved for installation in dry areas with non-aggressive atmosphere at temperatures between 2° and 45 °C and air humidity of up to 90%.
- No exposure to direct sunlight.
- Maximum installation height is 2000 m (reduction in performance above 1000 m above sea level).
- The installation location must be equipped with proper lighting for all work (installation, operation, maintenance etc.).
- Place the dry material feeder so that operation and maintenance are possible at any time.



**The installation area must be level.
Height differences must be compensated for by appropriate measures.**

ATTENTION!

7. Electrical connections

The dry material feeder is driven by a three-phase gear motor.

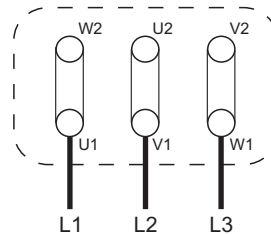
7.1 Mains power connection

The motor connection depends on the voltage indication on the rating plate and the applied mains power supply.

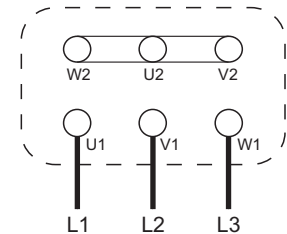
Example:

Specification on rating plate: 230/400 V
Available three-phase mains power supply:
400 V

Correct motor connection:
Star connection (Y)



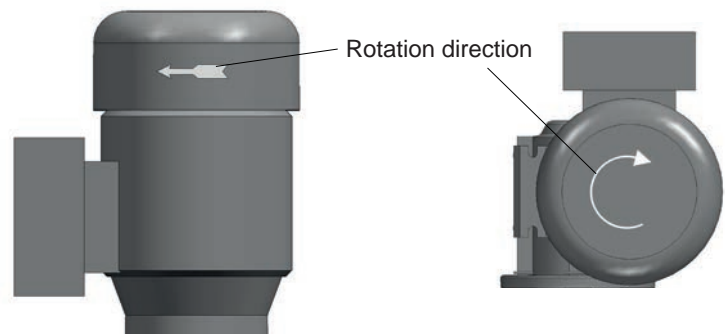
Δ Delta connection



Y Star connection

7.2 Rotation direction

The rotation direction of the drive is clockwise and indicated by an arrow.



CAUTION!

When connecting the power to the terminal box, check the rotation direction of the drive before filling the feeder with the medium.

7.3 Terminal box

Before closing the terminal box, check that:

- all terminal connections are tight
- the interior is clean and free of foreign bodies
- unused cable entries are closed and screw plugs are tightened
- the seal is correctly inserted in the cover of the terminal box; check proper condition of all sealing surfaces so that the requirements of the protection category are fulfilled.

7.4 Motor protection

Provide adequate motor protection equipment to protect the motor from overload (e.g. motor protection switch with thermal overcurrent release).

Always connect the earth conductor to the marked grounding screw in accordance with VDE 0100.



CAUTION!

Fuses do not protect the motor.

8. Commissioning

- The dry material feeder must only be operated without pressure (level position, clear bulk material outlet and no unauthorised extension of the discharge pipe).
- Also pay attention to the load capacity of the metering screw and the permitted limits of the dry material.
- Before switching the system on for the first time, the following points should be checked:
 - Check of the electrical connections.
 - Check the electrical overcurrent protection devices for correct operation and correct setting.
 - Check whether the local supply voltage and frequency match the information on the rating plates.
 - Check the fastening and the screw connections.
- Pay attention to the rotation direction during connection of the dry material feeder: The metering screw must rotate clockwise, view direction on to the discharge pipe.
- It must be ensured that the materials are resistant to the dry good before using the dry material feeder.
- Pay attention to the compatibility of the dry goods with each other when replacing the dry material.



Observe the safety data sheet of the dry material.

ATTENTION!



Danger of electric shock in the case of use of damaged cables!

DANGER!



Danger from rotating and/or moving parts during the commissioning!

WARNING!



Attached heater, neighbouring components (discharge pipe), gear motor and electric vibrator must not be touched during operation and for a short time after switching off as there is a danger of burn injuries.

CAUTION!



Impurities or lump formation (due to the ingress of moisture) can result in damage to the metering screw.

ATTENTION!

- Calibration of the dry material feeder using a balance; in doing so, the metering screw must at least be covered with the dry material.
- For the vibrator option:
 - Tighten the screw connections of the adapter after 1 hour operating time after the commissioning (see Chapter "Placement / Installation" for tightening torques).
 - Provide damping in the event of unwanted vibration transfer to neighbouring components.
- Set all options / accessories in accordance with the accompanying product documentation.
- The "hopper empty signal" has already been preset at the factory for shipment. Full adjustment is necessary depending on the dry material (particularly for dry goods with low permittivity).



ATTENTION!

A start-up of the machine is possible while performing a full adjustment; switch the dry material feeder offline in doing so.

8.1 Drive motor

Requirements:

Make sure that voltage and frequency correspond with the indications on the rating plate of the motor.
Permissible voltage tolerance (DIN VDE 0530)

for rated voltage	+10%
for rated voltage range	+/-5%

The connecting cable must be dimensioned according to the rated electrical data of the motor.
Secure connecting cable with a strain relief.

The specified rated motor power refers to an ambient temperature of max. 40 °C and an installation site below 1000 m above sea level. Motor output will be reduced if these values are exceeded (see VDE 0530).

Suitable for "moderate" climates according to IEC 721-2-1.



NOTE!

The operation of the dry material feeder results in heating of the drive motor.
Do not touch the motor during operation!

8.2 Initial commissioning / Recommissioning

Checks before every start-up

- Check whether the screw fastenings of the complete dry material feeder have been tightened with the specified torque (see Chapter "Placement / Installation") and tighten if necessary.
- Check whether all electrical connections are correct.

9. Operation



NOTE!

As soon as the drive motor is supplied with power,
the dry material feeder starts to operate.

The dry material feeder does not have an I/O switch.
Devices for switching the dry material feeder on and off must be installed by the owner.
In the case of actuation using a frequency converter, the linear dosing range is between 20-60 Hz.

10. Maintenance

10.1 General



DANGER!

Disconnect the dry material feeder from the power supply and protect it against a sudden start by taking appropriate measures. Strictly consult a qualified electrician for this.



DANGER!

Always switch off the dry materials dosing feeder before disconnecting the main power supply ► danger from arcing.



CAUTION!

Attached heater, neighbouring components (discharge pipe), gear motor and electric vibrator must not be touched after switching off as there is a danger of burn injuries.

The following checks should be performed regularly:

- Monthly check of all screw fastenings for tightness (see Chapter "Placement / Installation" for tightening torques).
- When using the vibrator, weekly check of all screw fastenings for tightness (see Chapter "Placement / Installation" for tightening torques).
- Check of the electrical connections / cables / insulation for proper condition.
- When using a mixing unit:
Weekly check of the mixing unit and the discharge pipe for adhesion of dry material.
If necessary, remove adhesions with suitable cleaner.

Pay attention to the following for maintenance work:

- Pointed parts (metering screw, screw connections, broken parts ► wear gloves.
- Accessibility of the dry material feeder, particularly the operating, measurement and inspection points.
- Visibility of danger points.
- Adequate lighting.
- Keep clear of soiling.



ATTENTION!

Observe the safety data sheet of the dry material.



ATTENTION!

It is not permitted to remove the fan blade cover.



CAUTION!

Pay attention to the unstable parts when undoing screw connections.
Danger from falling parts and the reduction of stability of the dry material feeder.



WARNING!

Live parts! Pay attention to the protection class during maintenance work.
Pay attention to sufficient clearance from parts under high voltage.

10.2 Cleaning

Cleaning the interior of the dry material feeder can be necessary when changing the dry material or replacing the seal:

- Empty the dry material feeder by removing the discharge pipe.
- Remove residues using a vacuum cleaner or a dry cloth.
- If necessary, remove adhering dry material residues using a moist cloth.



ATTENTION!

Do not clean the dry material feeder with a high-pressure cleaner or rinse the hopper with water!

In the case of difficult to remove dry material residues:

- Remove metering screw, gear motor, bearing flange and discharge pipe.
- Rinse out container.



WARNING!

Stored energy in the form of dry material.
When the metering screw, discharge pipe or the gear motor is removed, the dry material feeder partially or completely empties itself. Provide a container to collect the dry material during the dismantling.



ATTENTION!

Prevent bending of the metering screw during assembly.



ATTENTION!

For the cleaning, pay attention to the compatibility of the materials and dry material with the cleaning materials.

10.3 Drive motor

The three-phase gear motor must always be kept clean so that neither dust, dirt, oil nor other contaminants can disrupt the correct operation.

In addition, we recommend checking that:

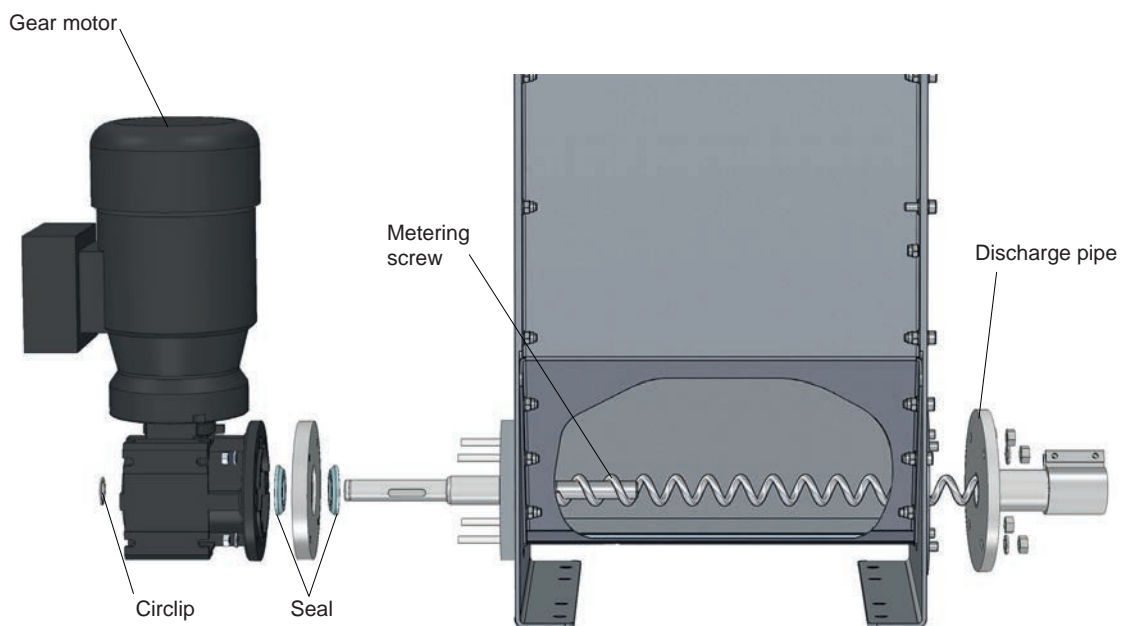
- the motor operates without strong vibrations.
- suction and blowing openings for the supply of cooling air are not closed or restricted (can result in unnecessary high temperatures in the windings).

The ball bearings used in the motor are lubricated for life.

10.4 Spare parts

Replacement of the metering screw and seal (gamma ring):

- Completely empty and clean dry material feeder (see Chapter "Cleaning").
- Detach discharge pipe and heater.
- Remove locking ring on the shaft of the metering screw.
- The metering screw can be pushed out or pulled out.



- Installation in reverse order. Grease seal (gamma ring) of the metering screw on the contact surface before installation.
- Only press the gamma ring onto the shaft of the metering screw using a suitable mounting tool. The sealing lip of the gamma ring faces the direction of the shaft journal.



ATTENTION!

The contact surface of the seal must be free from dust and soiling.

Operating instructions

The following parts are available as spare parts:

- Metering screw - 22mm (incl. shaft)
- Metering screw - 55mm (incl. shaft)
- Acrylic glass for storage hopper
- Seal 24.47.10 CC
- Gear motor
- Fan, complete

11. Fault analysis and fault correction

sera products are sophisticated technical products which are only shipped after having been thoroughly tested and checked at our factory.

Nevertheless, should any faults occur, these can be detected and rectified easily and quickly on the basis of the instructions in the table.

Kind of trouble						Possible cause	Corrective action
Unit does not deliver	Delivery output is not reached	Delivery output fluctuates	Unit vibrates heavily	High noise development	Discharge of dry material		
■	■					No dry material in storage hopper	Fill storage hopper
					■	Leak at attached components	Check screw connections and tighten if necessary.
■	■					Temperature too low or too high.	Observe characteristics of the dry material. Observe temperature range of the feeder.
			■	■		Gearbox / drive damaged.	Contact the manufacturer.
■	■	■				Bridging in the area of the metering screw.	Adjust setting of the vibrator. Pay attention to intended use of the dry material feeder (see application range).
■						Discharge pipe clogged.	Clean discharge pipe.
■	■					Dry material sticks to metering screw or discharge pipe.	Clean discharge pipe, switch on heater and check for function.

12. Decommissioning

- Switch off dry material feeder.
- Remove the dry material from the unit by vacuuming or brushing out whereby the aids must be suitable for the dry material and the dry material feeder.

13. Disposal

- Shut down dry material feeder. See "Decommissioning".

13.1 Removal and transport

- Shut down dry material feeder. See "Decommissioning".
- Clean thoroughly, neutralise and decontaminate.
- Package unit and ship.



NOTE!

A clearance certificate must be filled in when systems are returned to the manufacturer (see Chapter "Clearance certificate").

13.2 Complete disposal

- Remove all dry material residues from the unit.
- Remove materials according to type and send them to a suitable recycling centre.



WARNING!

The sender is responsible for damage caused by dry material residues!

Operating instructions

14. Clearance certificate



NOTE!

Inspection / repair of machines and machine parts is only carried out after the opposite clearance certificate was filled in correctly and completely by authorized and qualified personnel.



NOTE!

Acceptance will be refused if parts are returned to the manufacturer without a proper clearance certificate.

All industrial companies are obligated by the legal provisions for occupational health, e.g. the workplaces ordinances, the Ordinance on Hazardous Substances, the regulations for prevention of accidents and the environmental protection regulations such as the Waste Management Act and the German Household Water Act to protect their employees or man and the environment from detrimental effects when handling hazardous substances.

Should special safety precautions be necessary despite careful draining and cleaning of the product the necessary information are to be provided.

Machines which are operated with radioactive media shall only be inspected and/or repaired in the safety area of the owner by a sera specialized fitter.

The clearance certificate is part of the inspection-/repair order.
sera reserves the right to refuse acceptance of the order for other reasons.



NOTE!

Please make a copy and leave the original with the operating instructions!
(can also be downloaded from: www.sera-web.com)

DMF-... .2

Operating instructions

Clearance Certificate

Product

Type: Serial-No.:

the product was carefully emptied before shipping / delivery, and cleaned inside and outside. YES

Conveying medium

Designation: Concentration: %

Properties

Please tick!

Harmless

Toxic Corrosive Flammable Oxidising Unhealthy

Explosive Dangerous for the environment Irritant Bio-hazardous Radioactive

if either of the stated properties, then enclose the appropriate safety and handling instructions.

The product was used with health or water-polluting substances and came up with labeling requirements and pollution prone media in contact. YES NO

Special security arrangements with respect to health or water-hazardous media are in the further handling not required required

The following safety precautions regarding rinsing, residual liquids and waste disposal are required:

Process data

The product was used with the following operating conditions described conveying medium:

Temperature: °C Pressure: bar

Sender

Company: Telephone:

Contact person: FAX:

Address: E-mail:

Zip code, City: Your order No.:

We confirm that we have the information in this safety certificate (Clearance Certificate) have been correctly and completely and that the returned parts were carefully cleaned.

The parts are sent free of residues of dangerous amount.

Place, Date: _____ Department: _____ Signature (and company stamp): _____

DMF-... .2

Operating instructions

NOTES

FOLLOW US



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