

# **Operating Instructions**

Dry feeder TGD-RC 18.13, 30.13, 38.13





Please read the operating instructions carefully before commissioning the device and keep it at a safe place! The warranty becomes invalid in case of damages caused by operating errors!

## Imprint

Imprint: Operating Instructions Dry Feeder TGD 18.13-RC, 30.13-RC, 38.13-RC

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# General notes for the user

Please read the following notes for the user carefully! The operating instructions will then be of greater benefit to you.

The following are especially highlighted in the text:

• enumerations

Working notes:

#### NOTE

A note is intended to make the work easier for you.

and safety notes:



#### WARNING

Characterizes a possibly hazardous situation. If not avoided, your life is in danger and serious injuries may result.



## CAUTION

Characterizes a possibly hazardous situation. If not avoided, slight or minor injuries or property damages may result.



#### IMPORTANT

Characterizes a possibly endangering situation. If not avoided, damages to property my result.

# **1** About this dry feeder

The dry feeder TGD-RC is a spiral metering device for continuous metering of dry and pourable polyelectrolytes and forms part of the Ultromat<sup>®</sup> plants. Given external control through a frequency converter, the unit can be used for quantity-proportional metering.

# 2 Unit layout



Fig. 1 Dry feeder TGD-RC

## 2.1 Description of functions

The dry feeder consists of the following main components:

	Component	Material
а	Body	PP
b	Drive unit	-
С	Feeder screw pipe	stainless steel
d	Feed spiral incl. core	stainless steel
е	Bulker wheel	stainless steel
f	Push-on lid	PP
g	Protective screen	steel, galvanized
h	Feeder screw pipe heater	-
i	Level sensor	-

The drive (b) is screwed down to the body (a) of the dry feeder. The three-phase a.c. motor drives the feed spiral (d) via a reducing gear. The feed spiral in turn rotates a bulker wheel (e). This prevents bridging of the metering chemical within the dry feeder. The metering chemical is fed through the feeder screw pipe (c). A protective screen (g) within the dry feeder protects the rotating feed spiral from direct access. The push-on lid (f) servers as cover for the hopper. If moisture enters the feeder

screw pipe, the metering chemical might clot. The feeder screw pipe heater (h) is clamped onto the feeder screw pipe and removes the penetrated moisture by heating the metering chemical within the feeder screw pipe. The level sensor (i) permits an early alarm for lacking metering chemical and signalizes the required re-filling of the dry feeder.

## 2.2 Feeder sizes

The dry feeder TGD-RC is available in the three sizes 18, 30, and 38 (inside diameter of the feeder screw pipe). The size depends on the required metering output.

Order no.	1020800	1021030	1021031
Dry feeder	TGD 18.13 RC	TGD 30.13 RC	TGD 38.13 RC
Metering output	0 - 18.0 kg/h	0 - 55.0 kg/h	0 - 109.0 kg/h

The metering outputs stated may deviate from the figures listed depending on the metering chemical used. The relevant feed characteristics are listed in the performance charts.

#### NOTE

The output data are measuring and standard values referred to polyelectrolyte powder depending on the given test conditions, in particular humidity and ambient temperature. Thus, an independent calibration at the site is required.

# 3 Accessories

The following accessories are available for the dry feeder:

## 3.1 Add-on hopper

With the add-on hoppers, the metering chemical supply of the dry feeder can be extended (capacity dry feeder: approx. 13 l). Three add-on hoppers with an additional capacity of 50, 75, and 100 l, respectively, are available. The 100 l add-on hopper is equipped with a relieve cone. For dimensions, please refer to the annex.

## 3.2 Add-on hopper with adapter lid

Add-on hoppers with adapter lid and capacities of 50, 75, and 100 l, respectively, are available for the operation of a small-type feeder (e.g. KFG 205.12). The small-type feeder can be fixed onto the adapter lid with a mounting kit (3 clamps with screws).

# 4 Assembly

The feeder is pre-assembled ex works onto the Ultromat<sup>®</sup> plant. The Ultromat<sup>®</sup> plants with integrated dry feeder must be installed at a dry place. The ambient temperature should not exceed 40 °C.

# 5 Installation, electrical



## IMPORTANT

- The valid regulations for electrical installations must be observed!
- The valid national regulations must be observed!
- The electrical installation of the system may only be performed by qualified technicians with corresponding certificates.

## 5.1 Delta connection

The dry feeder is wired ready for connection on all Ultromat<sup>®</sup> systems. For operation via a speed controller with an output of  $3 \times 230$  V, the motor is connected in delta connection.



## 5.2 Y connection

If the dry feeder is operated at 3 x 400 V, Y connection is to be applied. In principle, all three-phase a.c. motors are to be protected using a protective motor switch.





# 6 Commissioning

#### WARNING



Never force out the protective screen and never reach into the unprotected trough bottom during operation of the system - risk of crushing in the area of the feed spiral!

## 6.1 Trial run

The functions of the dry feeder are to be checked in empty condition. During the trial run, the following items are to be checked in particular:

- Check direction of rotation of motor (if required, change the terminal connections by exchanging two phases)
- Check the switching function of the level sensor.

#### NOTE

Dragging of the feed screw within the feeder screw pipe and related dragging noises are unavoidable, however, do not affect the function of the system.

## 6.2 Calibration

The Ultromat<sup>®</sup> systems of the types 96 and RC are equipped with a control. At commissioning and the exchange of the metering chemical used, the system is to be calibrated. For calibration, a suitable collecting basin for the metering chemical and a precise scale (if possible with tare function) are required. The following procedure is recommended:

- Remove wetting unit.
- Weigh the collecting basin or compensate the weight through the tare function.
- Place the collecting basin under the feeder screw pipe.
- If not yet done, fill the dry feeder with the metering chemical to be used.
- Access the calibration menu in the control and start the calibration by pressing the button "T". The dry feeder now operates at 100 % output.
- Press the button "T" at the control again after approx. 3 minutes to stop the dry feeder. The time expired is indicated in the display of the control.
- The net weight of the dry chemical produced during this time is weighed and the value is entered in the control. The control calculates the metering output in grams/minute.
- Re-assemble the wetting unit to the Ultromat<sup>®</sup>.



#### WARNING

Metering chemicals spilled onto the floor may result in increased slipping risk when moist (e.g. polyelectrolytes) and are thus to be removed immediately.

## 6.3 Setting of the level sensor

The response threshold of the capacitive level sensor is adapted to the different metering chemicals:

- Fill the dry feeder with powder until the sensor is completely covered. First, turn the adjusting screw for the response threshold of the level sensor to the left (reduction of the sensitivity) until the LED extinguishes.
- Then, carefully turn the adjusting screw to the right (increase of sensitivity) until the LED comes on again. Turn the adjusting screw to the right by further 2 turns.
- Check the switching function during operation after completion of the setting.

# 7 Placing out of service

If the dry feeder is placed out of service for more than 2 days, the metering chemical is to be removed completely from the system. This applies in particular for powered polymers. Powdered polymers are hygroscopic and attract humidity from the ambient air. Stones will form and metering failures might occur.

## 8 Maintenance

The drive of the dry feeder is maintenance-free because the gear is equipped with life-time lubrication.

## 9 Repair



#### WARNING

Disconnect the system from the mains and protect it against unauthorized operation before carrying out any repair work.

## 9.1 Replacing the feeder screw

- The system should be empty before removing the feeder screw.
- Loosen the four flange screws (1) and pull out the drive and feeder screw assembly horizontally from the dry feeder.
- The feeder screw can now be accessed and can be unscrewed from the drive box (left-handed thread!).
- Assembly is in the reverse order of the removal.



Fig. 4 Disassembly of the dry feeder TGD-RC

# 10 Remedy of function failures



#### WARNING

Always disconnect the system from the mains before remedying any failures which require repair work at the feeder.

## 10.1 Bridging

- Check whether the metering chemical is moist and dry, if required.
- Install additional unbalance motor.

## 10.2 Level sensor does not respond

- The sensor does not respond because of bridging of metering chemicals above the sensor. Remedy: Take measures against bridging.
- The sensor itself is defective. Remedy: Check connections of the sensor, then re-adjust the response threshold, if required.

## 10.3 Caking of feeder spiral and feeder screw pipe

- Check heater for proper functioning (temperature approx. 40 °C).
- When using the Ultromat<sup>®</sup> control, check the setting parameters for the heater (heater switchon time and heater switch-off time).
- Keep away humidity by installing the system at a dry place.

## CAUTION

Risk of burning exists at the feeder screw pipe heater. The heater cover may only become warm to the touch (approx. 35  $^{\circ}$ C).

## 10.4 No metering chemical is fed at running motor

- Check the filling level of the metering chemical and refill metering chemical as required.
- Does bridging prevent any subsequent supply of dry powder? Take measures against bridging.
- Check the direction of rotation of the spiral screw and the motor.

# 11 Technical data

## 11.1 System data

System types	TGD 18.13	TGD 30.13	TGD 38.13
Speed feeder spiral at 50/100Hz drive	100/200 U/min	100/200 U/min	100/200 U/min
Metering output at 50 Hz (160 rpm)	9.0 kg/h	27.5 kg/h	54.5 kg/h
Metering output at 100 Hz (320 rpm)	18.0 kg/h	55.0 kg/h	109.0 kg/h
Metering output at 5 Hz (16 rpm)	0.9 kg/h	2.8 kg/h	5.5 kg/h
Hopper capacity	13	13 I	13
Noise level in metering operation	<70 dB(A)	<70 dB(A)	<70 dB(A)

The metering outputs stated may deviate from the figures listed depending on the metering chemical used.

## 11.2 Motor data

Motor type:	SKg 63-4 B2
Output:	0.18 kW
Number of poles:	4
Cos φ:	0.70
Voltage:	230/400 V
Nominal current:	1.10/0.65 A
System of protection:	IP 54
Model:	B2
Insulation class:	F
Motor speed:	1380 rpm
Gear reduction:	1 : 13.5
Speed feeder spiral at 50 Hz drive	100 rpm
Weight:	7.75 kg

## **11.3 Performance charts**

The measurements were performed using a commercially available polyelectrolyte powder. The performance data determined are only non-binding standard values, depending both on the condition and the powder density of the metering chemical used for measurement and on the prevailing test conditions such as humidity and ambient temperature.

## 11.3.1 Performance chart dry feeder TGD-RC 18.13 RC



Fig. 5 Performance chart for TGD 18.13 RC



11.3.2 Performance chart dry feeder TGD 30.13 RC

Fig. 6 Performance chart for TGD 30.13 RC



## 11.3.3 Performance chart dry feeder TGD 38.13 RC

Fig. 7 Performance chart for TGD 38.13 RC

# 11.4 Replacement parts

# 11.4.1 Replacement parts for dry feeder TGD 18.13 RC



Fig. 8 Exploded view of TGD 18.13 RC

Item	No.	Description	Order no.
1	1	Feeder screw pipe, size 18, complete	791741
2	1	Heater cover - Ultromat <sup>®</sup> TD 18.20	204251
3	4	Cyl. screw DIN 912 M 6x25 A2	468021
4	1	Push-on lid on TGD RC	1020860
5	1	Protective screen, cold galvanized	741177
6	1	Capacitive proximity switch, M30x1.5; 3m cable	710253
7	1	Bulker wheel, size 18, complete, RC	1020866
8	1	Axle SW 7x150 RC 1.4305	1021032
9	1	Screw with core, size 18, complete, 1.4301 RC	1020863
10	1	Cyl. screw DIN 912 M 5x20 A2	1006258
11	1	Washer DIN 125 A 5.3 A2	1003393
12	1	Drive shaft d35x55 TGD RC	1020862
13	1	Setscrew DIN 913 M 5x8 A2	1008088
14	3	Cyl. screw DIN 912 M 6x25 A2	468021
15	1	Cyl. screw DIN 912 M 6x20 A2	791791
16	1	Intermediate plate TGD RC	1020854
17	4	Cyl. screw DIN 912 M 6x30 A2	791792
18	1	Drive unit 0.18 kW	741213



11.4.2 Replacement parts for dry feeder TGD 30.13 RC

Fig. 9 Exploded view of TGD 30.13 RC

Item	No.	Description	Order no.
1	1	Feeder screw pipe, size 30, complete	791742
2	1	Heater cover - Ultromat® TD 30.20	204252
3	4	Cyl. screw DIN 912 M 6x25 A2	468021
4	1	Push-on lid on TGD RC	1020860
5	1	Protective screen, cold galvanized	741177
6	1	Capacitive proximity switch, M30x1.5; 3m cable	710253
7	1	Bulker wheel, size 30, complete, RC	1021061
8	1	Axle SW 7x150 RC 1.4305	1021032
9	1	Screw with core, size 30, complete, 1.4301 RC	1021058
10	1	Cyl. screw DIN 912 M 5x20 A2	1006258
11	1	Washer DIN 125 A 5.3 A2	1003393
12	1	Drive shaft d35x55 TGD RC	1020862
13	1	Setscrew DIN 913 M 5x8 A2	1008088
14	3	Cyl. screw DIN 912 M 6x25 A2	468021
15	1	Cyl. screw DIN 912 M 6x20 A2	791791
16	1	Intermediate plate TGD RC	1020854
17	4	Cyl. screw DIN 912 M 6x30 A2	791792
18	1	Drive unit 0.18 kW	741213



11.4.3 Replacement parts for dry feeder TGD 38.13 RC

Fig. 10 Exploded view of TGD 38.13 RC

Item	No.	Description	Order no.
1	1	Feeder screw pipe, size 38, complete	791743
2	1	Heater cover - Ultromat® TD 38.20	204253
3	4	Cyl. screw DIN 912 M 6x25 A2	468021
4	1	Push-on lid on TGD RC	1020860
5	1	Protective screen, cold galvanized	741177
6	1	Capacitive proximity switch, M30x1.5; 3m cable	710253
7	1	Bulker wheel, size 38, complete, RC	1021062
8	1	Axle SW 7x150 RC 1.4305	1021032
9	1	Screw with core, size 38, complete, 1.4301 RC	1021059
10	1	Cyl. screw DIN 912 M 5x20 A2	1006258
11	1	Washer DIN 125 A 5.3 A2	1003393
12	1	Drive shaft d35x55 TGD RC	1020862
13	1	Setscrew DIN 913 M 5x8 A2	1008088
14	3	Cyl. screw DIN 912 M 6x25 A2	468021
15	1	Cyl. screw DIN 912 M 6x20 A2	791791
16	1	Intermediate plate TGD RC	1020854
17	4	Cyl. screw DIN 912 M 6x30 A2	791792
18	1	Drive unit 0.18 kW	741213

# 11.5 Dimension diagrams

# 11.5.1 Dimension diagram for dry feeder TGD-RC



11.5.2 Dimension diagram for add-on hopper RC 50 I



Fig. 12 Dimension diagram for add-on hopper RC 50 I

11.5.3 Dimension diagram for add-on hopper RC 75 I



Fig. 13 Dimension diagram for add-on hopper RC 75 I





Fig. 14 Dimension diagram for add-on hopper RC 100 I

# Addresses and delivery information from the manufacturer:

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