

**NIRO® INSTRUCTION FOR**  
**SWIRL FLUIDIZER™**  
**TYPES**  
**STANDARD & HIGH TEMPERATURE**  
**SIZE 6.3 - 800**



**Please read the safety, installation, operation, maintenance and service instructions provided in this instruction thoroughly. All plant personnel must be familiar with these instructions. Failure to follow these instructions may result in injury, fatal accident and plant damage.**

**3470-0008**  
**4810 en**

Published by:  
GEA Process Engineering A/S  
Gladsaxevej 305  
2860 Søborg  
Denmark

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Please visit our web site at: [www.gea.com](http://www.gea.com)

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This instruction includes illustrations which may differ from the state of the product.

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## 1. USER INFORMATION

### 1.1 This instruction

The objective of this instruction is to assist the plant personnel engaged in the operation and maintenance of the SWIRL FLUIDIZER™. The instruction specifies the general precautions relating to installation, operation, maintenance, inspection and service. It is therefore extremely important that all plant personnel are familiar with these instructions.

### 1.2 Symbols

Throughout this instruction symbols and/or signal words are used to indicate procedures or situations which require special attention.

Symbol	Damage/ Injuries to	Signal word	Definition	Consequences
	Persons	<b>DANGER!</b>	Immediate danger	Death or very serious injuries
		<b>WARNING!</b>	Possibly dangerous situation	Possibly death or very serious injuries
		<b>CAUTION!</b>	Less dangerous situation	Light or minor injuries
	Property	<b>NOTICE!</b>	Situation which may result in damage	Damage <ul style="list-style-type: none"> <li>• to the machine and/or its surroundings</li> <li>• to the product being processed</li> </ul>
	----	<b>INFORMATION</b>	Tips on use and other important/useful information and/or instruction	----

### 1.3 Design standards

The SWIRL FLUIDIZER™ is not for use in a potentially explosive atmosphere. If the SWIRL FLUIDIZER™ itself contains a potentially explosive atmosphere preventive measures should be included e.g. pressure-relief systems or explosion suppression systems (refer to section 6.2).

## 1.4 Packaging, handling and transport

Before installation the SWIRL FLUIDIZER™ should be stored in its original packaging under dry and clean conditions. Instructions on the packaging must be observed.

The SWIRL FLUIDIZER™ is prepared for shipment as one unit in its own stand in the size range 6.3-125. Size 160-800 is divided in to two or more packages (gas disperser & process chamber). Process chamber may be divided in to two parts, depending on the system size. All should only be transported in the original packaging (e.g. wooden crate).

By selection of handling equipment, it must be ensured that the equipment is suitable for handling the stated gross weight and the actual size of the component.



### **NOTICE!**

**Only trained personnel should operate the handling equipment.**

## 1.5 Recycling and disposal

### 1.5.1 Disposal of packaging

All packaging materials are generally environmentally friendly and recyclable. Please ask your local environment protection agency about the current legislation and means of disposal.

### 1.5.2 Disposal of SWIRL FLUIDIZER™ and accessories

The SWIRL FLUIDIZER™ and accessories consist of metals, plastic and electrical and electronic components.

Have the SWIRL FLUIDIZER™ dismantled by professional companies, who will in turn ensure proper recycling. If you dismantle the SWIRL FLUIDIZER™ yourself, then sort the parts by metals, plastics, electrical and electronic scrap, liquids and hazardous waste.

After dismantling the equipment, separate its components according to following:

- Contaminated parts (toxic, caustic or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and disposed of.
- Other parts must be separated according to their materials and recycled.



### **INFORMATION**

**Please dispose of the parts in accordance with the applicable laws and regulations in force at the time of disposal.**

---

## 2. SYSTEM DESCRIPTION

### 2.1 General

The SWIRL FLUIDIZER™ is designed for and should only be used for drying of water based products.



#### **NOTICE!**

**Do not use the SWIRL FLUIDIZER™ for products containing chlorine.**

#### 2.1.1 Types

SWIRL FLUIDIZER™ Standard:	Max. Gas inlet temperature 450 °C
SWIRL FLUIDIZER™ High temperature:	Max. Gas inlet temperature 700 °C

#### 2.1.2 Sizes

The SWIRL FLUIDIZER™ is delivered in different sizes from 6.3 to 800. The size designation refers to the nominal process gas flow through the chamber.

#### 2.1.3 Functional description

The SWIRL FLUIDIZER™ is a disintegrating paste dryer with a vertical product transport created by means of hot process gas. The SWIRL FLUIDIZER™ combines disintegrating and drying of a wide range of paste products in the chemical industry.

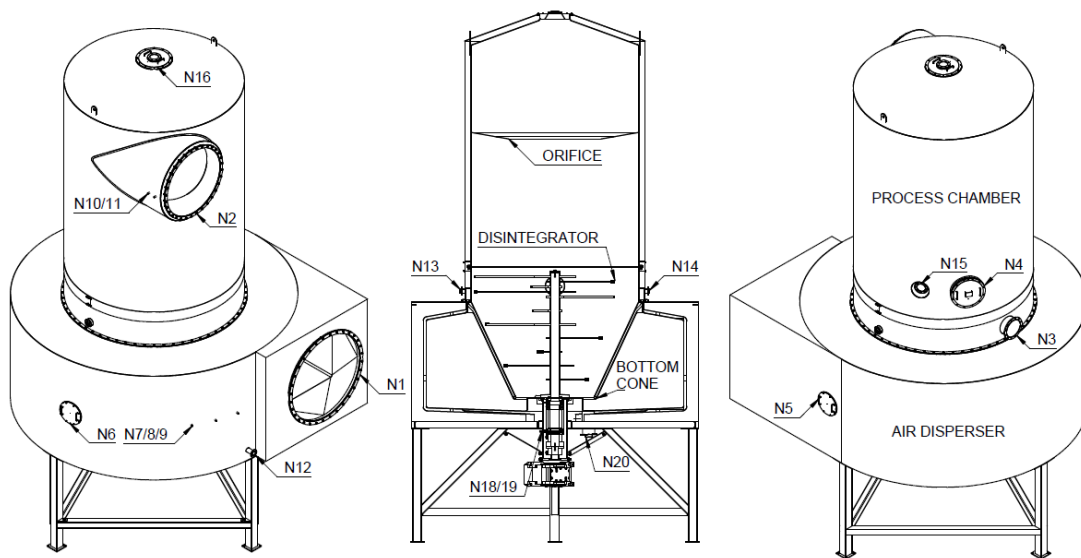
Refer to Fig. 1

The disintegration of the product and the evaporation occurs in the process chamber of the SWIRL FLUIDIZER™. The evaporated water and dried product flows through the combined product and process gas outlet in the top of the chamber (N2). The feed is introduced by means of a screw conveyor (N3) into the drying chamber. A feed nozzle (optional extra) can be mounted on the top of the process chamber (refer to section 7.1) as an alternative feed supply.

#### **Process chamber**

The process chamber is a compact cylindrical unit, with a manhole (N4) on the cylindrical wall for easy maintenance access. A sight glass (N15) is mounted diagonally to the manhole for inspection purposes. An additional manhole with integrated sight glass (N16) is positioned on the chamber top.

An orifice is mounted between the cylindrical part and the top part flanges to obtain classification of the dried particles. 2-3 different orifice sizes (internal diameter) are included in the standard supply to enable adjustment of the powder characteristics.



**Fig. 1** SWIRL FLUIDIZER™

The process chamber is as standard provided with 100 mm insulation on all external surfaces. The process chamber can be equipped with pneumatic hammer(s) (optional extra, refer to section 7) to minimize deposits on the internal chamber surface.

### Gas disperser

The gas disperser is ring shaped with a tangential gas inlet (N1) creating a rotating process gas flow, which transports the dried product to the outlet at the top of the process chamber.

A manhole (N5) is placed at the side of the inlet for easy cleaning of the gas disperser housing and a drain (N20) is installed in the bottom of the housing. Additional manholes (N6, optional extra) can be placed around the gas disperser housing if required.

The gas disperser is provided with 200 mm insulation on the standard model and with 300 mm insulation on the high temperature model to avoid excessive external surface temperature.

### Bottom cone

The bottom cone separates the gas disperser and the process chamber. The cone is flanged to these parts. During operation, the bottom part of the cone is cooled to avoid excessive surface temperature on the chamber side, which may cause deposits on the wall and/or damage the product.

The cooling is achieved by supplying cooling air to the inlet cooling pipe (N13), which is emitted through the outlet cooling pipe (N14).

### Disintegrator

The disintegrator is supported in the bottom of the SWIRL FLUIDIZER™. The disintegrator consists of a vertical shaft, ending just above the feed inlet. The shaft is equipped with blades fitted horizontally in pairs. The lowest is located just above the



bottom of the cone. The blades are fixed to the shaft by double parallel keys and locked with a top nut, and can easily be removed for maintenance.

The shaft is led into the bottom of the gas disperser housing through a labyrinth seal and is fixed in the bearing block which is placed outside the gas disperser housing.

The disintegrator shaft is sealed and cooled by means of air purging. Additional cooling of the bearing block housing is required for the high temperature model and is achieved by sucking (using the exhaust fan) cooling air from the cooling pipe (N12). The air is taken from the surroundings.

The disintegrator is as standard driven by a gear motor and the speed is controlled by frequency converter.

### Instrumentation

The SWIRL FLUIDIZER™ is as standard equipped with connections for the following instrumentation:

- Process gas inlet temperature measurement (N7) positioned on gas disperser.
- Process gas inlet temperature switch (N8) positioned on gas disperser.
- Process gas outlet temperature measurement positioned on chamber top (N10).
- Process gas inlet pressure measurement positioned on gas disperser (N9).
- Process gas outlet pressure measurement positioned on chamber top (N11).

Refer to the P & I diagrams and other plant documentation compiled in the Instruction Handbook for further information.

## 2.2 Technical data:

### 2.2.1 Ambient conditions

Minimum ambient temperature: -20 °C (-4 °F)  
Maximum ambient temperature: +35 °C (+95 °F)

### 2.2.2 Vibrations and emissions

When the SWIRL FLUIDIZER™ is properly mounted and bolted or welded to the foundation, very little or no vibrations will be transferred to the surroundings.

No emissions will occur under normal operation conditions, provided flexible connections and flange seals are properly tightened and intact.

### 2.2.3 Other technical data

Refer to the enclosed instruction drawing and data sheet.

### 2.2.4 Name plate & markings

Refer to the enclosed instruction drawing.

### 3. SETTING UP

#### 3.1 Installation

**NOTICE!**

**Any lift of the SWIRL FLUIDIZER™ must be made with care. Use the built-in eyelets when lifting the SWIRL FLUIDIZER™.**

**DANGER!**

**Do not stay below the SWIRL FLUIDIZER™ when suspended.**

Refer to Fig. 1

The SWIRL FLUIDIZER™ should be installed in the customer's building on a suitable supporting structure possessing the strength and stability complying with the emergency weight of the unit. It is the responsibility of the customer that the supporting structure meets the specified static and dynamical requirements. Refer to the order specific data.

Check that the supporting structure is in level horizontally at the mounting place before installing the SWIRL FLUIDIZER™.

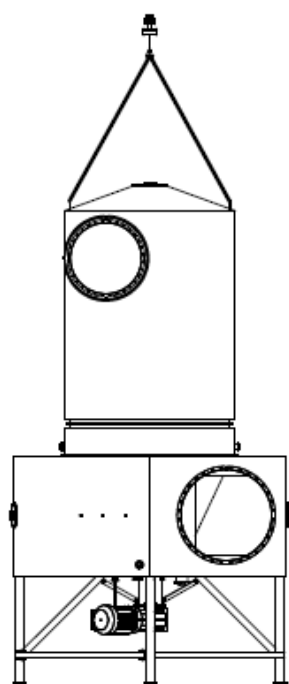
When practically possible the SWIRL FLUIDIZER™ is delivered as a fully mounted unit without need for site welding. If this is not possible, the parts and components should be assembled on site according to the drawings prepared for site welding of the main parts.

#### 3.2 Lifting instructions

Lifting of a full assembled SWIRL FLUIDIZER™

**DANGER!**

**It is only safe to lift a full assembled SWIRL FLUIDIZER™ up to size 80. Above this size process chamber & gas disperser must be divided in flange connection.**



Lifting of a full assembled SWIRL FLUIDIZER™ is done by lifting the complete unit in lifting lugs, placed on top of the process chamber.

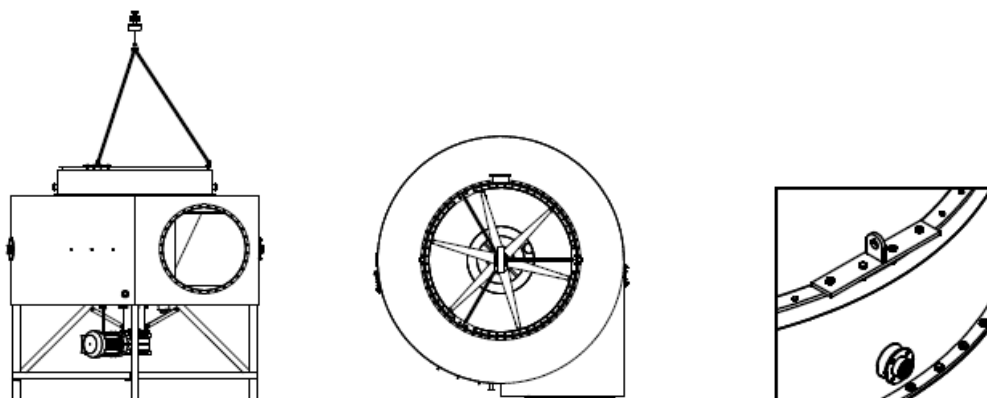
Lifting of process chamber is the same procedure.

Approx. assembled weight according to size (Kg):

31.5	1200
40	1400
50	1600
63	1900
80	2300
100	2700
125	3200
160	3700
200	4400
250	5300
315	6300
400	7500
500	9100
630	10700
800	12000

**Fig. 2** Lifting of a full assembled SWIRL FLUIDIZER™

Lifting of gas disperser and / or bottom cone is done by mounting the belonging lifting lugs for the bottom cone. Bottom cone & gas disperser are divided by flange connection.



**Fig. 3** Lifting of gas disperser

Lifting of bearing block can only take place after disassembling the disintegrator. Refer to sec. 5.1 dismantling disintegrator arrangement.



**WARNING!**

**Mind your hands! Dismantling of parts of the disintegrator arrangement may cause unexpected movements of shafts and gear wheels, due to stored energy (inertia).**

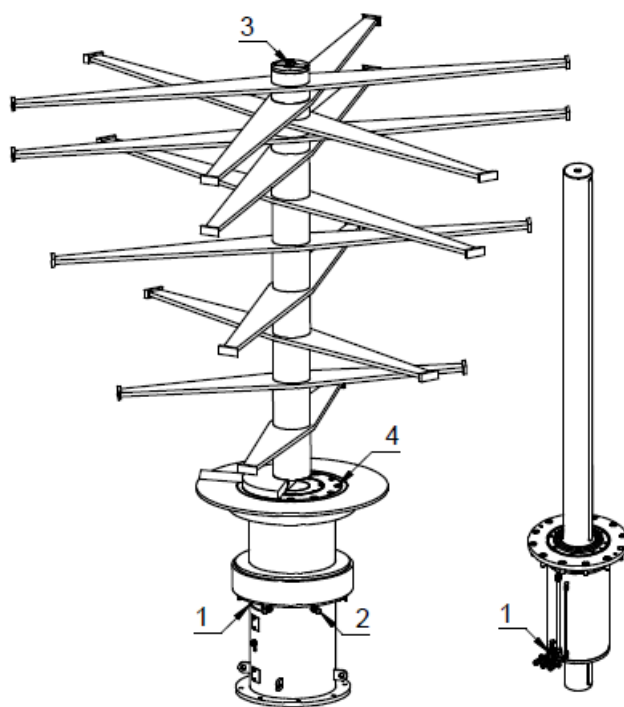
**NOTICE!**

A crane or hand tackle may be required to remove the disintegrator arms.

**NOTICE!**

Disconnect the purge air, bearing lubrication pipes & temperature sensor before lifting the bearing block.

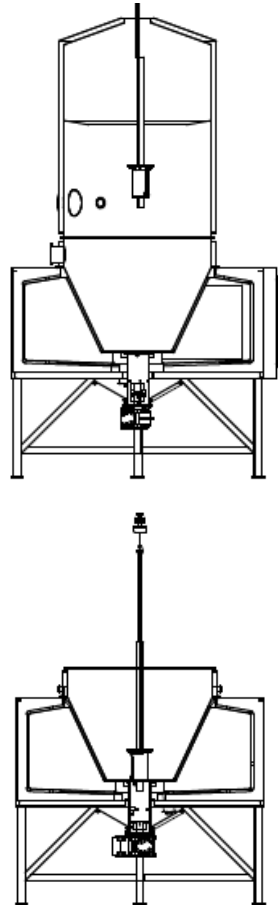
If process chamber are assembled with gas disperser, disintegrator arms are removed through side manhole in process chamber.



1. Disconnect the purge air, bearing lubrication pipes & temperature sensor at bottom of gas disperser.
2. Untighten support screws on motor console.
3. Remove screws, lock plate & top cover, and disassemble the disintegrator arrangement.
4. Remove screws and lift bearing block out of motor console, with upper part of coupling attached.

**Fig. 4** Disintegrator arrangement

If process chamber are assembled with gas disperser, bearing block are lifted through manhole on top of process chamber.



Assembled weight of bearing block according to size (Kg):

31.5-80	200
100-250	400
315-800	800

**Fig. 5** Lifting of bearing block



**NOTICE!**

Remove cover for motor cooling fan, and rotate shaft for alignment of coupling parts, when placing bearing block in motor console.

### 3.3 Utility connections

The utility systems and pipelines including valves and controlling devices for air supply, drainage as well as pneumatics and/or electrical connections must be completed on site. Any electrical or pneumatic installation and/or connection must be made as described in the relevant component instructions.

Note that all utility piping should be inclined to ensure draining towards the connection points.

Refer to the P & I diagrams and/or the plant piping drawings compiled in the Instruction Handbook.

### 3.4 Initial start-up

**The initial start-up must be limited to idling conditions i.e. without water or product and process gas supply to the SWIRL FLUIDIZER™.**

**Before the initial start-up, the following checks are essential:**

- Inspect the interior for any foreign materials and ensure that the parts are clean.
- Ensure that all covers are closed and guards are mounted.
- Check that the electrical cables for the motor are connected and power is available.

**Start the disintegrator motor**

**Check and inspect:**

- Correct direction of rotation
- Level of noise and vibration
- Rotational speed settings for frequency converter



#### **NOTICE!**

**The maximum and minimum rotational speed of the disintegrator must be secured. The frequency converter must be programmed especially to operate within the limitations. In case the frequency converter is supplied by GEA Process Engineering A/S, the set values are stated on the supplied configuration sheets. The set values are not the same as factory-set values. In case of repair of the frequency converter, it is extremely essential to check and correct the settings.**

- Ensure that air purge and cooling systems are operational.
- Check any auxiliary equipment (refer to section 6 and separate instructions).
- Verify that instruments are functioning and correctly connected to the control system.

**The SWIRL FLUIDIZER™ is now ready for operation.**

---

## 4. OPERATION

### 4.1 Start-up and operation

The start-up and operational procedures for the feed tank is an integral part of the main process plant procedures. Refer to the plant operational procedures.



#### **WARNING!**

Depending on process conditions the SWIRL FLUIDIZER™ may operate with dusty, inflammable, poisonous or other dangerous products and gases!



#### **CAUTION!**

Do not open the cleaning covers or any other access during operation. Depending on the process conditions a sudden overpressure or vacuum may occur at the open access.



#### **WARNING!**

Do not operate the SWIRL FLUIDIZER™ without the covers. The disintegrator arrangement includes rotating parts.



#### **WARNING!**

Do not climb or stay on the SWIRL FLUIDIZER™ during operation.



#### **CAUTION!**

Beware of warm SWIRL FLUIDIZER™ surfaces during operation (exceeding 55°C (131°F) depending on process). Contact with warm surfaces can lead to personal injuries. Use protective gloves and clothing. Do not service the SWIRL FLUIDIZER™ during operation or after shut-down until the surfaces are adequately cooled.

Before start-up make sure that purge air (for disintegrator shaft seal) and cooling air systems (for cone and disintegrator bearing block on high temperature models) are operational.

### 4.2 Shut-down

The shut-down procedure for the SWIRL FLUIDIZER™ is an integral part of the main process plant shut-down procedure. Refer to the plant operational procedures.

It is recommended to stop the process gas heater and the product supply and run the SWIRL FLUIDIZER™ empty before stopping the exhaust fan.

## 5. DISMANTLING AND ASSEMBLING OF MAIN COMPONENTS



### **WARNING!**

Service and maintenance must only be performed when the plant is stopped, adequately cooled, ventilated and secured against unintentional restart.



### **WARNING!**

Mind your hands! Dismantling of parts of the disintegrator arrangement may cause unexpected movements of shafts and gear wheels, due to stored energy (inertia).



### **NOTICE!**

Disconnect the purge air, bearing lubrication pipes & temperature sensor before lifting the bearing block.

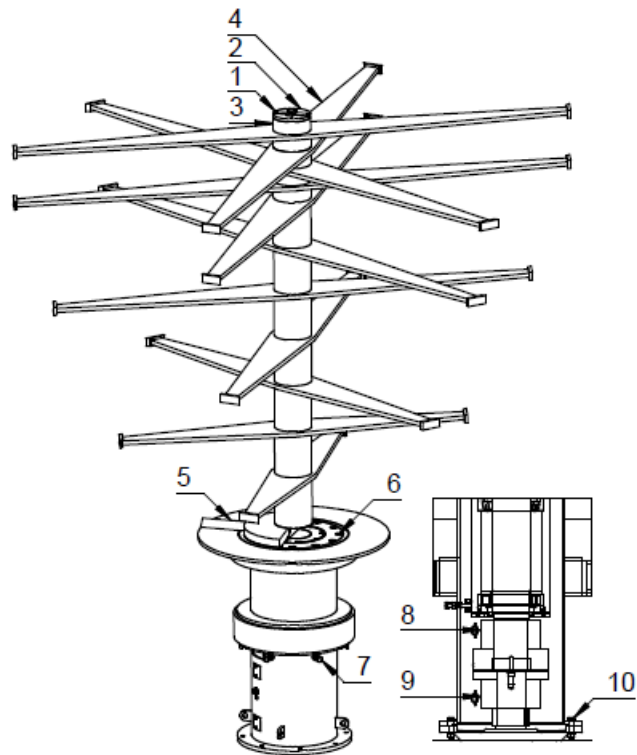
Before dismantling of components, refer to sec.3.2 lifting instruction.

### 5.1 Dismantling of disintegrator arrangement

Refer to Fig. 6&7

1. Dismount screws (1, Fig. 6) and remove the lock plate & top cover (2, Fig. 6). Remove bushings & blades (3 & 4, Fig. 4).
2. Remove hub (5, Fig. 6). Use tape to fasten parallel keys to shaft (1 & 2, Fig. 7).
3. Dismount screws (6, Fig. 6) from the outer flange that fastens the bearing block to the support. Remember to loosen the support screws (7, Fig. 6) at the bottom of the bearing block.
4. Remove the top part of coupling from shaft.
5. Remove screws (10, Fig. 7) at both ends of the bearing block.
6. Remove the bottom cover (8, Fig. 7) and remove the O-ring and oil sealing ring (18 & 20, Fig. 7).
7. Dismount the shaft lock nut & washer (19 & 17, Fig. 7).
8. Remove the top cover (4, Fig.7) and remove the O-ring and oil sealing ring (12 & 13, Fig. 7).
9. Remove the top distance ring (5, Fig. 7).
10. Withdraw shaft (1, Fig. 7) with upper bearing (14, Fig. 7) through the bearing block. Remove the Nilos ring (15, Fig. 7).
11. Remove the lower bearing (16, Fig. 7) and bottom distance ring (7, Fig. 7).





**Fig. 6** Disintegrator arrangement

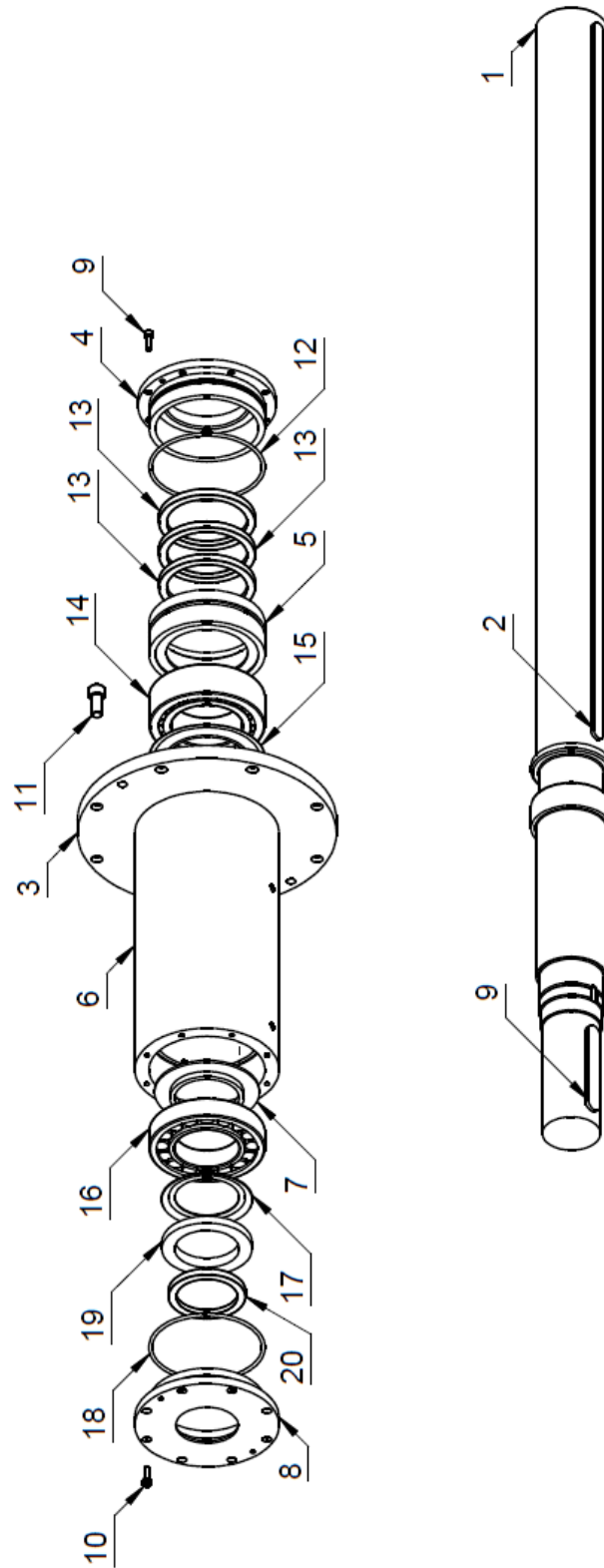


Fig. 7 Bearing block arrangement

## 5.2 Assembly of disintegrator arrangement

Refer to Fig. 6&7

1. Place the upper bearing (14, Fig. 7) on shaft (1, Fig. 7).
2. Place the Nilos ring (15, Fig. 7) in the bearing block and drive the shaft through.
3. Place the bottom distance ring (7, Fig. 7) and the lower bearing (16, Fig. 7) around the shaft in the bearing block.
4. Place the shaft lock washer (17, Fig. 7) and tighten the shaft lock nut (19, Fig. 7).
5. Place O-ring (18, Fig. 7) and oil sealing ring (20, Fig. 7) in the bottom cover (8, Fig. 7).
6. Mount the bottom cover using screws (10, Fig. 7).
7. Place the top distance ring (5, Fig. 7) around the shaft in the bearing block.
8. Place O-ring (12, Fig. 7) and oil sealing ring (13, Fig. 7) in the top cover (4, Fig. 7).
9. Mount the top cover using screws (9, Fig. 7).
10. Mount the top part of coupling on shaft end. If necessary, adjust coupling through holes or remove cover.
11. Place the bearing block assembly in the SWIRL FLUIDIZER™ and fasten screws (6, Fig. 6) to the flange of the support.



### NOTICE!

**Make sure that purge air and lubrication nipples are aligned with the purge air and lubrication arrangement.**

12. Connect purge air, bearing lubrication arrangement & temperature sensors.
13. Fasten support screws (7, Fig. 6) at the bottom of the bearing block.
14. Place parallel keys in shaft and mount hub (5, Fig. 6).
15. Mount bushings & blades (3 & 4, Fig. 6).
16. Mount the top cover & lock plate (2, Fig. 6) and tighten the screws (1, Fig. 6).

## 5.3 Dismantling of gear motor

Refer to Fig. 3

1. Place a fork lift or similar underneath the gear motor and remove bolts from flanges (10, Fig. 6).
2. If necessary, loosen bottom part of coupling from gear shaft through cover (9, Fig. 6).

#### 5.4 Assembling of gear motor

Refer to Fig. 3

1. Lift the gear motor and mount bolts for flanges (10, Fig. 6).
2. If necessary, adjust bottom part of coupling through cover (9, Fig. 6).

### 6. AUXILIARY EQUIPMENT AND SAFETY SYSTEMS

#### 6.1 Auxiliary equipment

Depending on application one or more of the following equipment may be installed on the SWIRL FLUIDIZER™.

##### 6.1.1 Feed nozzle for slurry products

Feed nozzle(s) can be mounted on top of the process chamber (1, Fig. 1) as an alternative to screw conveyor feeding. The feed supply is usually controlled by the main plant control system. Refer to the enclosed instruction drawing and separate instructions in the Instruction Handbook.



#### **NOTICE!**

**The screw conveyor must be connected to the SWIRL FLUIDIZER™ during operation with feed nozzle(s). The feed tank unit should be properly closed and sealed to avoid ambient air entering the SWIRL FLUIDIZER™ through the feed system.**

##### 6.1.2 Pneumatic hammer

The process chamber can be equipped with a pneumatic hammer(s) to minimize product deposits on the internal surface. Refer to separate instructions.

##### 6.1.3 Fire extinguishing nozzles

Fire extinguishing nozzles can be placed on the process chamber. The fire extinguishing nozzles are connected to and operated by the main plant control system. Refer to separate instructions.

#### 6.2 Explosion protection

Depending on application one more of the following equipment may be installed on the SWIRL FLUIDIZER™.

##### 6.2.1 Pressure relief vent

Pressure relief vents can be installed on the process chamber. Opening switches/sensors placed on the pressure relief vent provides signals to the plant control system for opening indication and/or alarm. Refer to the enclosed instruction drawing and separate instructions in the Instruction Handbook.

### 6.2.2 Fire suppressing equipment

Fire suppressing equipment (explosion suppressing equipment) can be installed on the process chamber.

If fire suppressing equipment is installed it is a prerequisite that measures are taken to prevent against opening of any cleaning cover or manhole during operation. Opening switches/sensors should be placed on cleaning covers/manholes providing signals to the plant control system for indication and/or alarm.

Refer to the enclosed instruction drawing and separate instructions in the Instruction Handbook.

## 7. SERVICE AND MAINTENANCE

### 7.1 General

Service and maintenance shall only be performed by personnel skilled in the maintenance of industrial machinery, being familiar with the contents of this instruction.



#### **WARNING!**

**Service and maintenance must only be performed when the plant is stopped, adequately cooled, ventilated and secured against unintentional restart.**

### 7.2 Spare parts

#### 7.2.1 General

Only genuine GEA spare parts should be used. Always maintain a complete set of recommended spare parts on hand. A spare parts quotation including a list of recommended spare parts will be submitted by GEA Process Engineering A/S.

When ordering spare parts, please state:

- Plant order number
- SWIRL FLUIDIZER™ size and serial number
- Item no. of the required parts

Refer to the name plate, the enclosed instruction drawing and spare parts lists.

## 7.2.2 Spare parts for bearing block arrangement

## 7.2.2.1 Standard items for system size 6.3 - 8

Refer to Fig. 7

Pos. no.	Description	QTY	GEA Item no./ Order no.
1	Shaft	1	project specific
2	Parallel key DIN 6885	2	project specific
3	Top flange – Bearing block group 0	1	692247
4	Top cover – Bearing block group 0	1	692248
5	Top distance ring – Bearing block group 0	1	692249
6	Housing – Bearing block group 0	1	692250
7	Bottom distance ring – Bearing block group 0	1	692251
8	Bottom cover – Bearing block group 0	1	692252
9	Parallel key DIN 6885 – A 8x7x40	1	648575
10	Screw DIN912 M6x25	6	549262
11	U-insex screw DIN 7991 M8x20	6	414965
12	O-ring DIN 3771, $\varnothing$ 78.97x3.53	1	692297
13	Oil sealing ring DIN 3760, 60/75/8	2	692299
14	Spherical roller bearing 22209	1	692291
15	Nilos ring JV 22209	1	692304
16	Cylindrical roller bearing NU207	1	692265
17	Lock washer MB7	1	692302
18	O-ring DIN 3771, $\varnothing$ 66.27x3.53	1	692296
19	Lock nut KM7	1	693510
20	Oil sealing ring DIN 3760, 30/62/7	1	692298

## 7.2.2.2 Standard items for system size 10 - 25

Refer to Fig. 7

Pos. no.	Description	QTY	GEA Item no./ Order no.
1	Shaft	1	project specific
2	Parallel key DIN 6885	2	project specific
3	Top flange – Bearing block group 1	1	662058
4	Top cover – Bearing block group 1	1	662057
5	Top distance ring – Bearing block group 1	1	662056
6	Housing – Bearing block group 1	1	662059
7	Bottom distance ring – Bearing block group 1	1	662055
8	Bottom cover – Bearing block group 1	1	662054
9	Parallel key DIN 6885 – A 12x8x63	1	627997
10	Screw DIN 912 M6x25	12	655503
11	Screw DIN 912 M12x35	8	518825
12	O-ring DIN 3771, $\varnothing$ 101x5	1	862099
13	Oil sealing ring DIN 3760, 70/90/10	3	862101
14	Spherical roller bearing 22212	1	862124
15	Nilos ring JV 22212	1	862114
16	Cylindrical roller bearing NU210	1	862126
17	Lock washer MB10	1	862063
18	O-ring DIN 3771, $\varnothing$ 83x4	1	862100
19	Lock nut KM10	1	862091
20	Oil sealing ring DIN 3760, 45/62/8	1	862110

## 7.2.2.3 Standard items for system size 31.5 – 80

Refer to Fig. 7

Pos. no.	Description	QTY	GEA Item no./ Order no.
1	Shaft	1	project specific
2	Parallel key DIN 6885	2	project specific
3	Top flange – Bearing block group 2	1	758936
4	Top cover – Bearing block group 2	1	758935
5	Top distance ring – Bearing block group 2	1	758934
6	Housing – Bearing block group 2	1	758937
7	Bottom distance ring – Bearing block group 2	1	758933
8	Bottom cover – Bearing block group 2	1	758932
9	Parallel key DIN 6885 – A 18x11x63	1	878560
10	Screw DIN 912 M8x20	16	616928
11	Screw DIN 912 M16x35	8	655203
12	O-ring DIN 3771, $\varnothing$ 131x5	1	677883
13	Oil sealing ring DIN 3760, 95/120/12	3	677890
14	Spherical roller bearing 22216	1	677635
15	Nilos ring JV 22216	1	677914
16	Cylindrical roller bearing NU214	1	677834
17	Lock washer MB14	1	677919
18	O-ring DIN 3771, $\varnothing$ 118x4	1	677882
19	Lock nut KM14	1	677926
20	Oil sealing ring DIN 3760, 65/90/10	1	677902

Size 31.5 – 800 are equipped with temperature sensors.  
GEA Item no. / order no. 678397

Size 31.5 – 800 can be equipped with inductive proximity switch.  
GEA Item no. / order no. 678413



## 7.2.2.4 Standard items for system size 100 - 250

Refer to Fig. 7

Pos. no.	Description	QTY	GEA Item no./ Order no.
1	Shaft	1	project specific
2	Parallel key DIN 6885	2	project specific
3	Top flange – Bearing block group 3	1	758916
4	Top cover – Bearing block group 3	1	758915
5	Top distance ring – Bearing block group 3	1	758914
6	Housing – Bearing block group 3	1	758917
7	Bottom distance ring – Bearing block group 3	1	758913
8	Bottom cover – Bearing block group 3	1	758912
9	Parallel key DIN 6885 – A 25x14x160	1	888615
10	Screw DIN 912 M8x20	16	616928
11	Screw DIN 912 M16x35	8	655203
12	O-ring DIN 3771, $\varnothing$ 171x5	1	677884
13	Oil sealing ring DIN 3760, 125/150/12	3	677889
14	Spherical roller bearing 23122	1	677631
15	Nilos ring JV 23122	1	677915
16	Cylindrical roller bearing NU220	1	677837
17	Lock washer MB20	1	677920
18	O-ring DIN 3771, $\varnothing$ 171x5	1	677884
19	Lock nut KM20	1	677927
20	Oil sealing ring DIN 3760, 95/120/12	1	677903

Size 31.5 – 800 are equipped with temperature sensors.  
GEA Item no. / order no. 678397

Size 31.5 – 800 can be equipped with inductive proximity switch.  
GEA Item no. / order no. 678413

## 7.2.2.5 Standard items for system size 315 – 800

Refer to Fig. 7

Pos. no.	Description	QTY	GEA Item no./ Order no.
1	Shaft	1	project specific
2	Parallel key DIN 6885	2	project specific
3	Top flange – Bearing block group 4	1	758926
4	Top cover – Bearing block group 4	1	758925
5	Top distance ring – Bearing block group 4	1	758924
6	Housing – Bearing block group 4	1	758927
7	Bottom distance ring – Bearing block group 4	1	758923
8	Bottom cover – Bearing block group 4	1	758922
9	Parallel key DIN 6885 – A 32x18x160	1	864761
10	Insex Screw DIN 912 M8x20 A4	16	616928
11	Insex Screw DIN 912 M16x35 A4	12	655203
12	O-ring DIN 3771, $\varnothing$ 240x6	1	677885
13	Oil sealing ring DIN 3760, 168/200/15	3	865250
14	Spherical roller bearing 23130	1	677579
15	Nilos ring JV 23130	1	677917
16	Cylindrical roller bearing NU228	1	677838
17	Lock washer MB28	1	677922
18	O-ring DIN 3771, $\varnothing$ 240x5	1	677885
19	Lock nut KM28	1	677928
20	Oil sealing ring DIN 3760, 135/170/12	1	677904

Size 31.5 – 800 are equipped with temperature sensors.  
GEA Item no. / order no. 678397

Size 31.5 – 800 can be equipped with inductive proximity switch.  
GEA Item no. / order no. 678413

## 7.3 Initial maintenance

**NOTICE!**

**All screws, bolts and nuts must be checked and tightened after the initial 50 hours of operation.**

## 7.4 Regular maintenance

The following intervals are recommended for the SWIRL FLUIDIZER™ maintenance:

After hours of operation	To be carried out	Refer to section
24	Visual inspection. Inspect for visible damage and repair if necessary.	
2000 or every 3 months	Grease the bearing block bearings through the lubrication nipples on the housing (5, Fig. 2).	SWF component datasheet (Located in Instruction Handbook)
8000 or every 12 months	Inspect the SWIRL FLUIDIZER™ for damage including cleaning covers, flexible connections and auxiliary equipment. Dismantle, clean and inspect the disintegrator arrangement. Repair damage and replace worn parts.	6

**NOTICE!**

**The above time intervals for the regular maintenance are based on ideal conditions of operation. The user shall determine these intervals through frequent inspection during the first year of operation.**

## 7.5 Cleaning

The SWIRL FLUIDIZER™ is as standard designed for manual cleaning. Manual cleaning may be performed with a dust brush or broom, a vacuum cleaner or a rinsing hose through the cleaning covers.

Use only the approved cleaning liquids for cleaning any parts (i.e., water, dilute organic acids and CIP liquids recommended for stainless steel surfaces). When in doubt, consult GEA Process Engineering A/S. Do not under any circumstances use liquids containing chlorine. Water level must not exceed the bottom of the bottom cone (13, Fig. 1).

To avoid product lumping and clogging, the SWIRL FLUIDIZER™ must be thoroughly dried inside using hot process gas after any wet cleaning.



### **WARNING!**

**Depending on process conditions the SWIRL FLUIDIZER™ may operate with dusty, inflammable, poisonous or other dangerous products and gases!**



### **WARNING!**

**Manual cleaning should only be performed when the plant is stopped, adequately cooled, ventilated and secured against unintentional restart.**



### **WARNING!**

**Do not flush electrical and/or pneumatic equipment directly with water or any other liquid.**

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