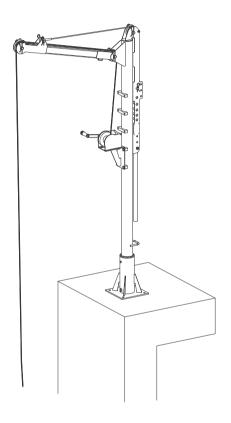
Cranes for SMD, SMG, SFG, SRG, AMD, AMG, AFG and SRP

Installation and operating instructions





Installation and operating instructions
All languages
http://net.grundfos.com/qr/i/96882862



English (GB) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos cranes for AMD, AMG, AFG, SRP, SMD, SMG, SFG and SRG mixers and flowmakers. Sections 1-5 give the information necessary to be able to uppack install and operate the product in a

Sections 1-5 give the information necessary to be able to unpack, install and operate the product in a safe way.

Sections 6-9 give important information about the product, as well as information on service and disposal of the product.

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Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.

1. General information

1.1 Target groups

These installation and operating instructions are intended for professional installers.

1.2 Symbols used in this document

1.2.1 Warnings against hazards involving risk of death or personal injury

DANGER



Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING



Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The text accompanying the three hazard symbols DANGER, WARNING and CAUTION is structured in the following way:

SIGNAL WORD



Description of hazard

Consequence of ignoring the warning.

- Action to avoid the hazard.

1.2.2 Other important notes



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

2. Safety instructions

2.1 General safety instructions

The crane is designed for lifting and must only be used according to the instructions of the manufacturer. Non-observance of these instructions may lead to accidents.



Do not use cranes

- for continuous operation
- at building sites (BGV D7)
- on stages or in studios (BGV C1).

DANGER



Overhead load

Death or serious personal injury

- Do not stand under a suspended load.
- Do not lift loads that may start swinging.

CAUTION

Crushing hazard

- Minor or moderate personal injury Do not use the crane for lifting or transporting people (ZH 1 / 461).
 - Do not lift a load in a diagonal pull.
 - Do not lift a load for an unnecessarily long period of time.

Observe the warning labels on the product. See fig. 1.



Fig. 1 Warning labels

2.2 Safe working practice

Installation, maintenance and repair may only be carried out by trained personnel. See section 2.4 Trained persons.

Use only original replacement parts from the manufacturer.

Do not carry out changes reducing safety. Additional components must not reduce safety.

Always work safely, and be aware of dangers at all times.

Always work according to safety and accident prevention regulations.

Always follow national safety standards and auidelines.

Inform your manager immediately in case of danger or faults on the crane. Do not operate the crane again until the risk has been eliminated or the damage or fault has been repaired.

Check the following every time before you use the crane:

- The winch, lifting wire and crane boom wire must be intact.
- The crane must have a good stability inside the crane foot, and the crane foot must be fixed.
- All parts of the crane must be intact and properly installed.

2.3 Supervision

Make sure that these installation and operating instructions are always at hand.

Do not allow this crane to be operated by untrained staff.

Check regularly that the crane is operated safely and according to these instructions.

2.4 Trained persons

Trained persons are people who have been trained and who have gained experience in the field of winches, lifting and pulling equipment, and who are adequately acquainted with the national standards of accident prevention and safety regulations.

3. Receiving the product



Do not install a damaged crane.

On delivery, check the crane and any accessories supplied with it for transport damage. This also applies when the equipment is delivered to the installation site.

If the crane or any accessories have been damaged, contact your local Grundfos company before continuing to install the equipment. Do not remove a damaged component for further inspection, unless instructed by your local Grundfos company.

Dispose of packaging material according to local regulations.

4. Installing the product

The winch is supplied without lifting wire.

After attaching the lifting wire, check that the winch works correctly by carrying out the commissioning test according to the local regulations.



Crane installation must be carried out by specially trained persons.

4.1 Mounting the crane foot

Use only MKT chemical anchors, type V-A 12-35/160 A4 or V-A 16-45/190 A4, or a similar anchor system for fastening the crane foot.

Fasten the crane foot in crack-free concrete of at least 16 cm (6 in) thickness and a minimum concrete grade of C20/25.

Temperature inside the drilled hole: $-40 \text{ to } +50 \,^{\circ}\text{C}$ ($-40 \,^{\circ}\text{F}$ to $+122 \,^{\circ}\text{F}$), for a short period of time up to $80 \,^{\circ}\text{C}$ ($176 \,^{\circ}\text{F}$).

In addition, fulfil the approval conditions of ETA-05/0231.



Do not use the chemical anchors in a chloric environment.

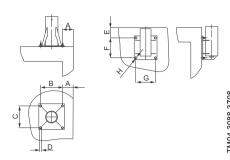


Fig. 2 Horizontal and vertical fixation

Horizontal fixation, load and dimensions

Max. load	Crane type			
[kg (lb)]	s	M	L	
Dimensions	100 (220)	250 (550)	500 (1100)	
A [mm (in)]	100	150	150	
	(3 7/8)	(5 7/8)	(5 7/8)	
B [mm (in)]	200	300	300	
	(7 7/8)	(11 3/4)	(11 3/4)	
C [mm (in)]	200	300	300	
	(7 7/8)	(11 3/4)	(11 3/4)	
D	M12	M12	M12	
	(1/2")	(1/2")	(1/2")	

Vertical fixation, load and dimensions

Max. load	Crane type			
[kg (lb)]	S M		L	
Dimensions	100 (220)	250 (550)	500 (1100)	
E [mm (in)]	150	150	150	
	(5 7/8)	(5 7/8)	(5 7/8)	
F [mm (in)]	200	300	300	
	(7 7/8)	(11 3/4)	(11 3/4)	
G [mm (in)]	200	300	300	
	(7 7/8)	(11 3/4)	(11 3/4)	
Н	M12	M16	M16	
	(1/2")	(5/8")	(5/8")	

4.1.1 Mounting of chemical anchor

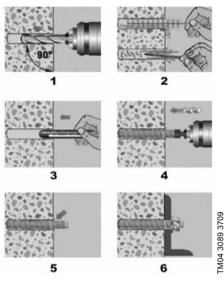
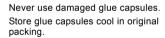


Fig. 3 How to mount a chemical anchor

- 1. Drill a hole in the concrete. Make sure that diameter and depth are correct. See section 8.2.1 Mounting dimensions of anchor bolt.
- 2. Carefully clean the hole of the drill dust.
- 3. Insert the glue capsule into the hole.

Before inserting the glue capsule, check the viscosity of the resin in the glue capsule. The glue capsule must be lukewarm and the resin soft.



- Using a power drill, crush the chemical anchor inside the hole by means of a threaded stud. The space between anchor and hole must be filled completely.
- 5. The ring mark on the stud must be flush with the concrete surface.
- 6. Let the chemical anchor cure. See section 8.2.2 Curing time of anchor bolt.
- Mount the crane foot and secure by means of nuts

4.2 Mounting the crane

Position indicators of parts (letters) in sections 4.2.1 Mounting the crane mast to 4.2.4 Adjusting the crane boom refer to fig. 4.

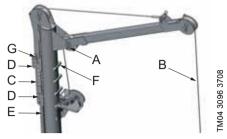


Fig. 4 Crane components

Legend for fig. 4:

Pos.	Description
Α	Mounting bolt
В	Lifting wire
С	Fixing holes
D	Fixing brackets for swinging arm and crane boom wire
Е	Swinging arm
F	Mounting points for winch
G	Bolt for crane boom wire

4.2.1 Mounting the crane mast

- Insert the crane mast into the crane foot. Inside the foot there is a bolt for centring and guidance.
- 2. Fix the fixing bracket (D) of swinging arm (E) at optional heights among the fixing holes (C).
- Check that the crane mast can turn in the foot after insertion.

4.2.2 Mounting the winch

- Fasten the adapter with winch to the appropriate mounting point (F). Use four hexagon-head screws. M10.
- 2. Choose freely the mounting height among the mounting points (F).

4.2.3 Mounting the crane boom and the lifting wire

- 1. Lift the crane boom with pulley into place, and insert mounting bolt (A). See fig. 4.
- 2. Secure the bolt with a split pin.
- Direct the lifting wire (B) over the pulley of the crane boom, and fasten it to the wire drum. To assemble the wire in the sleeve, see section 4.3 Mounting of the lifting wire in the drum.
- Direct the crane boom wire over the pulley at the top of the crane mast and fix it with bolt (G) in hole (C).

4.2.4 Adjusting the crane boom

The crane boom height (or angle) can be adjusted by selecting among the fixing holes (C). See sections 5.2.1 Relocating the crane boom and 8. Technical data.

4.3 Mounting of the lifting wire in the drum



Always use only original Grundfos lifting wires

Grundfos offers two types of lifting wire, one without and one with end sleeve.

Lifting wire without end sleeve

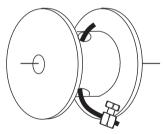


Fig. 5 Wire without end sleeve

- 1. Insert the lifting wire through the hole in the drum and into the enclosed wire clamp.
- 2. Make sure that the clamping screw is tightened properly. See fig. 5.
- 3. Carry out the commissioning test according to the local regulations.



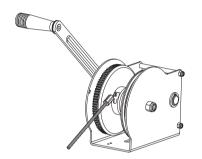
At least three turns of wire must always remain on the drum and be marked with colour. The wire must be wound under pretension. Make sure that the wire is wound evenly.

Lifting wire with end sleeve

- 1. Put the end of the wire into the opening in the drum. See fig. 6.
- 2. Secure the lifting wire by tightening the safety screw (S). See fig. 7.
- 3. Check that the end of the wire is connected correctly and safely.
- 4. Carry out the commissioning test according to the local regulations.



At least three turns of wire must always remain on the drum and be marked with colour. The wire must be wound under pretension. Make sure that the wire is wound evenly.



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FM04 3092 0917

Fig. 6 Drum opening for wire with end sleeve

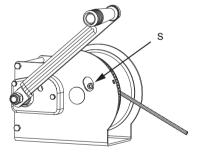


Fig. 7 Safety screw



FM04 3090 3708

Before every use of the winch, check that the pawl is turned towards the brake (contrary to the nut) and that the brake assembly is functioning faultlessly.

5. Handling and storing the product

5.1 Handling the product



Before every use, check that the winch and the crane operate flawlessly.

Only handle the crane in accordance with the following instructions:

- The crane must be in perfect technical condition.
- The crane must only be used by trained persons. See section 2.4 Trained persons.
- When using the crane for lifting, lowering and swivelling, the load must not be obstructed.



Clean the crane and the winch after every operation.

5.1.1 Handling procedure



Do not exceed the maximum load. See section 4.1 Mounting the crane foot.

The winch is designed for lifting or pulling a load on an even or inclining surface.

- 1. Fasten the end of the lifting wire to the load.
- 2. Turn the handle until the wire is tight.
- 3. Make sure the pawl is in locking position.
- 4. Lift up the load by turning the handle. When the load is to be lowered, release the pawl, and turn the handle slowly in the opposite direction. Do not drop the load!

You can lift up and lower loads by turning the handle according to the directions "Up" and "Down" on the brake housing. You can stop the load at any time by letting go of the pawl which stops the rotation of the drum.

Make sure that the wire is guided properly during the winding procedure in order to prevent seizing of the wire. Be aware that the brake only functions automatically if there is a minimum load on the winch.

Make sure that the brake assembly does not heat up when lowering a load over a long period of time.

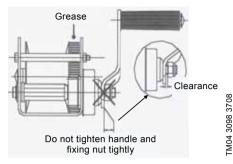


Fig. 8 Winch



At least three turns of wire must always remain on the drum.

5.2 Relocating the product

5.2.1 Relocating the crane boom

The crane boom can be raised or lowered, thus changing the angle and the distance from the mast.

CAUTION



Crushing hazard Minor or moderate personal injury

Only relocate the crane boom when it is unloaded.

- 1. Hold the crane boom so that it does not fall down.
- Remove the split pin and pull out the mounting bolt (G).
- Lift or lower the crane boom to its new position by changing the position of bolt (G) in the fixing bracket (D).
- 4. Fit the mounting bolt and split pin.

5.2.2 Relocating the winch

The winch can be relocated up and down the crane mast.

CAUTION



Crushing hazard

Minor or moderate personal injury

Only relocate the winch when it is unloaded.

- 1. Remove the four hexagon-head screws of the adapter. See section 4.2.2 Mounting the winch.
- 2. Move the winch to its new position.
- 3. Fit and tighten the hexagon-head screws.

5.2.3 Swivelling the crane

The crane can be swivelled by pushing or pulling of the swinging arm.

DANGER



Overhead load

Death or serious personal injury

- Do not stand under a suspended load.



Do not use the winch for swivelling the crane.

To facilitate swivelling, grease the nylon ring and the centring bolt inside the crane foot.

5.2.4 Relocating the complete crane

Do not

 wind the lifting wire in the opposite direction as this will cause the brake to fail



- leave the crane unattended when children or untrained persons can reach the winch
- use the winch together with a motor
- dismantle or replace the winch
- exceed the maximum load
- use a damaged wire
- load the crane until the foot has been fixed correctly.

CAUTION



Sharp element

Minor or moderate personal injury

Protect yourself from injuries caused by salient wire strings.

The crane can fairly easily be moved to a new position.

- 1. Remove the lifting wire.
- Dismantle the crane boom according to the instructions in section 4.2.3 Mounting the crane boom and the lifting wire in reverse order.
- 3. Move the crane to its new position.
- Reassemble the crane according to the instructions in section 4.2.3 Mounting the crane boom and the lifting wire.

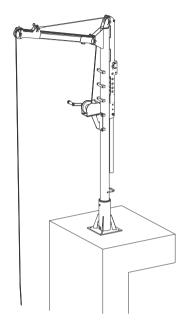
5.3 Storing the product

When the crane is not used for a long period, we recommend that you store it in a dry location or cover. Also, when the crane is not used for a long time, a regular maintenance must be conducted to ensure that the crane does not loose the handling ability. See section 7. Servicing the product.

6. Product introduction

6.1 Product description

The crane is made of steel and has variable working radius and variable fixing of lifting wire in either a galvanised or a stainless-steel winch.



6.2 Applications

The crane is typically used at wastewater treatment plants for lifting and lowering mixers and flowmakers out of and into wastewater treatment tanks.

The crane is used for lifting, lowering and swivelling loads. It complies with lifting class H1 according to DIN 15018 and is suitable for a total of load changes less than $2 \times 100,000$ times.

6.3 Identification

6.3.1 Nameplate

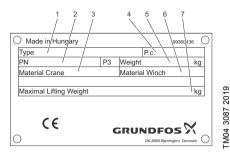


Fig. 9 Nameplate

Legend for fig. 9:

Pos.	Description
1	Type designation
2	Production code
3	Material, crane
4	Product number
5	Weight [kg (lb)]
6	Material, winch
7	Maximum lifting capacity

6.4 Installation types

TM04 3095 3708

The crane is fastened in a crane foot. There are two types of crane foot, one for horizontal mounting outside the tank and one for vertical mounting inside the tank.

For further information, see section 8. *Technical data*.

7. Servicing the product

7.1 Maintaining the product



The crane, winch and wires must be checked at least once a year.



The crane must be unloaded before you carry out maintenance or service work.

7.1.1 Maintenance of the winch

Before operating the winch

Check functional capability of the winch before every operation.

If there is any doubt that the winch functions correctly, do not use the winch.



Do not operate the winch in case of damaged load in the hook or wire.

After operating the winch

Clean the winch after every operation; this will extend the life of the winch. The following points in the winch must be checked regularly by trained personnel:

 Gears, bearing bushes and drive shaft Parts must always be greased.



Do not grease the braking system.

· Winch wire

Check that the wire is undamaged. For operation, maintenance and replacement of worn wires, please see DIN 15020.

Keep winch in good condition. Unmaintained machine parts can lead to malfunction or even accidents. Use only original replacement parts from the manufacturer.

8. Technical data

8.1 Operating conditions

Ambient temperature

The ambient temperature during operation must be between -10 and +50 °C (14 and 122 °F).

8.2 Mechanical data

8.2.1 Mounting dimensions of anchor bolt

	Stud size:	M12 (7/16)	M16 (3/8)
d _o	Drill hole diameter [mm (in)]	14 (9/16)	18 (5/8)
	Hole diameter through crane foot [mm (in)]	14 (9/16)	18 (5/8)
h	Minimum concrete thickness [mm (in)]	160 (6)	
h ₁	Drill hole depth [mm (in)]	110 (4 1/2)	125 (5)
T _{inst}	Installation torque [Nm (lbf ft)]	40 (30)	80 (60)
	Wrench size [mm (in)]	19 (3/4)	24 (15/16)
	Wrench size for outer hexagon [mm (in)]	8 (5/16")	12 (15/32)

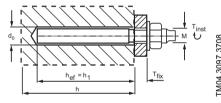


Fig. 10 Anchoring sketch

8.2.2 Curing time of anchor bolt

Temperature of base material [°C (°F)]	Curing time, drilled hole dry [min.]	Curing time, drilled hole wet [min.]
35 (95)	10	20
30 (86)	10	20
20 (68)	20	40
10 (50)	60	120
5 (41)	60	120
0 (32)	300	600
-5 (23)	300	600

8.3 Components

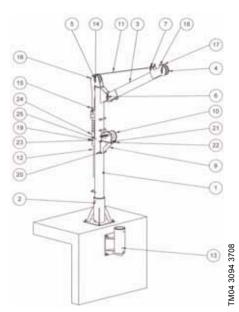


Fig. 11 Component drawing

Crane type S

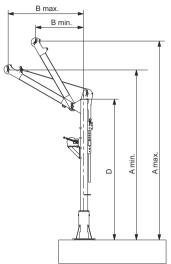
		Component		
Pos. Description		Pcs.	Size [mm (in)]	
1	Mast complete	1	-	
2	Crane foot	1	-	
3	Crane boom	1	-	
4	Pulley	3	-	
5	Bolt	2	Ø20 (Ø0.79)	
6	Bolt	1	Ø20 (Ø0.79)	
7	Bolt	2	∅18 (∅0.71)	
9	Winch adapter complete	1	-	
10	Winch, 6AF	1	-	
11	Wire complete with wire thimble	1	Ø4 (Ø0.16)	
12	Swinging arm	1	1	
13	Crane foot for vertical installation	1	1	
14	Split pin	6	d5	
15	Split pin	4	d4	
16	Washer	4	M8 (5/16)	
17	Lock nut	2	M8 (5/16)	
18	Hexagon-head screw	2	M8 x 80 (5/16 x 3.15)	
19	Washer	12	M10 (7/16)	
20	Hexagon-head screw	4	M10 x 16 (7/16 x 0.63)	
21	Hexagon-head screw	3	M10 x 20 (7/16 x 0.79)	
22	Hexagon nut	3	M10 (7/16)	
23	Hexagon-head screw	1	M10 x 80 (7/16 x 3.15)	
24	Lock nut	1	M10 (7/16)	
25	Nameplate	1	1	

Crane type M and L

		Component		
Pos.	Description	Pcs.	Size [mm (in)]	
1	Mast complete	1	-	
2	Crane foot	1	-	
3	Crane boom	1	-	
4	Pulley	3	-	
5	Bolt	2	Ø30 (Ø1.18)	
6	Bolt	1	Ø30 (Ø1.18)	
7	Bolt	2	Ø20 (Ø0.79)	
9	Winch adapter complete	1	-	
10	Winch, 8AF - type M	4		
10	Winch, 12AF - type L	- 1	-	
44	Wire complete with wire thimble - type M	_	Ø6 (Ø0.24)	
11	Wire complete with wire thimble - type L	- 1	Ø7 (Ø0.28)	
12	Swinging arm	1	-	
13	Crane foot for vertical installation	1	-	
14	Split pin	6	d5	
15	Split pin	4	d4	
16	Washer	4	M8 (5/16)	
17	Lock nut	2	M8 (5/16)	
18	Hexagon-head screw	2	M8 x 80 (5/16 x 3.15)	
19	Washer	14	M10 (7/16)	
20	Hexagon-head screw	4	M10 x 16 (7/16 x 0.63)	
21	Hexagon-head screw	4	M10 x 20 (7/16 x 0.79)	
22	Hexagon nut	4	M10 (7/16)	
23	Hexagon-head screw	1	M10 x 80 (7/16 x 3.15)	
24	Lock nut	1	M10 (7/16)	
25	Nameplate	1	-	

8.4 Dimensions and weights

8.4.1 Dimensions



TM04 3086 3410

Fig. 12 Crane dimensions

Crane	A		B		D
	[mm (in)]		[mm (in)]		[mm (in)]
type	min.	max.	min.	max.	[[[[]]
s	2255	2911	405	1005	2130
	(89)	(115)	(16)	(40)	(84)
М	2838	3521	654	1474	2286
	(112)	(139)	(26)	(58)	(90)
L	2838	3521	654	1474	2280
	(112)	(139)	(26)	(58)	(90)

8.4.2 Weights

Crane type	s	М	L
Total weight [kg (lb)]	35.0	61.2	76.5
	(77.2)	(135.0)	(168.7)

9. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

- 1. Use the public or private waste collection service.
- 2. If this is not possible, contact the nearest Grundfos company or service workshop.

See also end-of-life information at www.grundfos.com/product-recycling.

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