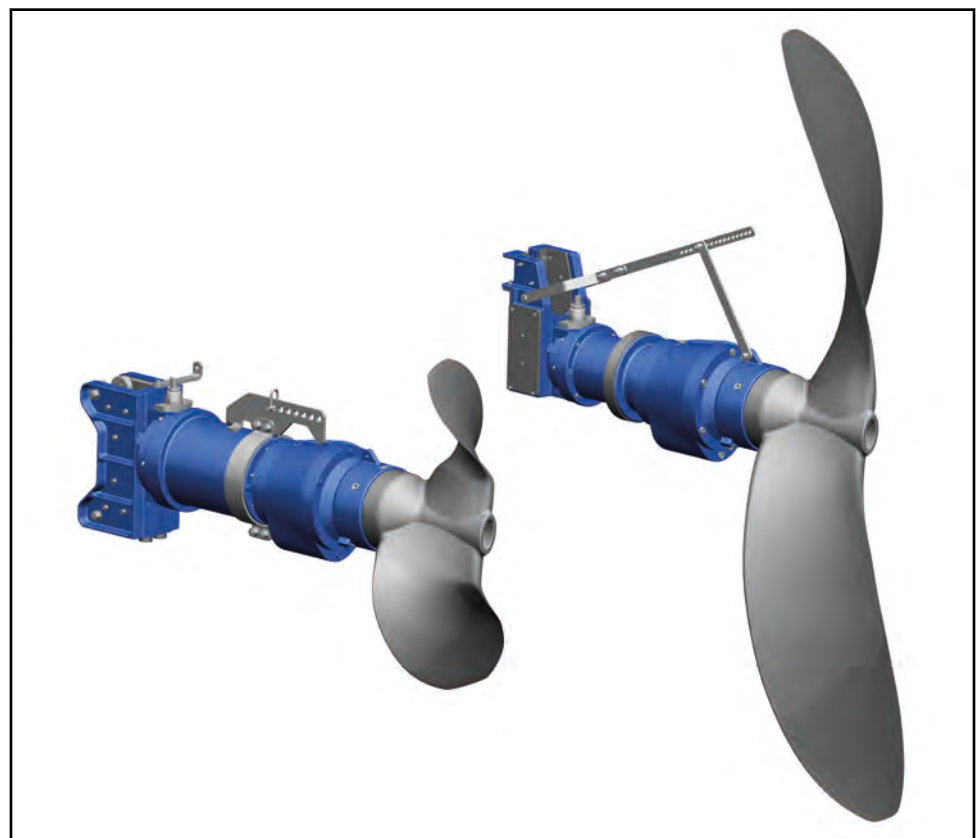


Submersible Mixer

# Amaprop

For Biogas Plants  
50 Hz

## Type Series Booklet



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Type Series Booklet Amaprop

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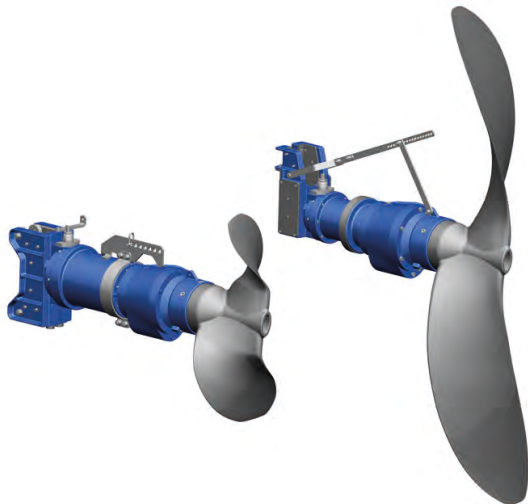
Contents

<b>Biogas</b> .....	<b>4</b>
Submersible Mixer .....	4
Amaprop .....	4
Main applications .....	4
Fluids handled .....	4
Operating data .....	4
Designation .....	4
Design details .....	4
Materials .....	5
Coating and preservation .....	5
Product benefits .....	5
Acceptance tests / Warranties .....	5
Selection information .....	5
Minimum level of fluid handled .....	7
Overview of product features .....	8
Standard and special designs .....	9
Technical data .....	10
Dimensions .....	11
Amaprop 1000 .....	11
Amaprop 1380 .....	12
Amaprop 2500 .....	13
Scope of supply .....	14
Accessories .....	15
Propeller fitting tool .....	15
Forcing screw .....	16
Cable support/carabine hook/strain relief device .....	17
Lifting equipment .....	18
Guide rails .....	19
Installation accessories .....	21
General assembly drawings with list of components .....	36
Amaprop J 1000 .....	36
Amaprop J 1380 .....	37
Amaprop K 2500 .....	38
Enquiry sheet .....	39

## Biogas

### Submersible Mixer

## Amaprop



### Designation

**Example: Amaprop J 184 - 1000 / 16 4 UR G**

Designation key

Code	Description
Amaprop	Type series
J	Propeller material
J	Amaprop 1380: nodular cast iron EN-GJS-400-15
J	Amaprop 1000: nodular cast iron EN-GJS-400-15
K	Amaprop 2500: ceramic-coated composite material
184	Nominal propeller speed [rpm]
1000	Size/nominal propeller diameter [mm]:
	1000
	1380
	2500
16	Motor size
	Amaprop 1000: 11, 16, 23
	Amaprop 1380: 6, 11, 16, 23
	Amaprop 2500: 6
4	Number of motor poles
UR	Motor version
UR	Standard
YR	Explosion-proof (T4)
WR	For fluid temperatures up to 60 °C
ZR	Explosion-proof (T3) up to 60 °C
G	Material variant
G	Grey cast iron

### Main applications

- For mixing the digestion substrate and homogenising the concentration and temperature in the main digester and post-digester
- To prevent (or destroy and re-homogenise) floating sludge blankets
- For mixing the digestion substrates
  - In mixing tanks
  - In main digesters and post-digesters
  - In final storage tanks (digestate storage tanks)
  - In tanks for semi-liquid manure

### Fluids handled

- Fluids with a dry solids content:
  - < 10 % (Amaprop 2500)
  - > 10 % to 15 % (Amaprop 1000 and 1380)

### Operating data

Operating properties

Characteristic	Value	Amaprop		
		1000	1380	2500
		Motor rating	P [kW]	10 to 20
Installation depth	H [m]	≤ 10 <sup>1)</sup>		
Fluid temperature	T [°C]	Motor versions UR/YR: < 45		
		Motor versions WR/ZR: < 60		

1) Larger installation depths on request

### Design details

#### Design

- Fully flooded submersible mixer
- Horizontal installation

#### Propeller

- Self-cleaning (ECB) propeller

#### Shaft seal

- Two bi-directional mechanical seals in tandem arrangement, with liquid reservoir
- Additional leakage chamber between the mating ring carrier and the gear unit

#### Bearings

- Motor-end rolling element bearings, greased for life
- Gear-end rolling element bearings, oil-lubricated

#### Drive

- Three-phase asynchronous squirrel-cage motor
- Motors integrated in explosion-proof submersible mixers are supplied in Ex d IIB type of protection.

## Materials

Overview of available materials

Part No.	Description		Material variant G	
			Amaprop 1000/1380	Amaprop 2500
811	Motor housing		EN-GJL-250	
812	Motor housing cover		EN-GJL-250	
870	Gear housing		EN-GJL-250	
476	Mating ring carrier		EN-GJL-250	
23-9	Propeller		EN-GJS-400-15	Glass fibre reinforced epoxy resin
433.01	Mechanical seal	Drive end	SiC/SiC	
433.02		Propeller end	SiC/SiC	
732	Guide bracket		EN-GJL-250, plastic-lined	EN-GJS-400-15, plastic-lined
-	Propeller shaft		1.4122	
-	Elastomer seals		FPM/NBR	
-	Screws/bolts		A4 (= 1.4571)	

### Grey cast iron EN-GJL-250 (lamellar graphite cast iron):

Lamellar graphite cast iron to EN 1561 is the most widely used cast material for handling municipal sewage, waste water and sludges as well as stormwater and surface water. It is suitable for neutral fluids which are only slightly aggressive and cause little wear. The pH value should be  $\geq 6.5$ , the sand content  $\leq 0.5$  g/l.

### Nodular cast iron EN-GJS-400-15

Its ductile structure, mechanical properties and wear resistance make this nodular cast iron to EN 1561 a suitable propeller material. Also suitable for handling digestion substrate.

### Glass fibre reinforced epoxy resin

The high-performance composite material consists of glass fibre reinforced epoxy resin, a metal hub insert and a protective gel coating which is resistant to abrasion and chemicals.

## Coating and preservation

### Primer and top coat

Surface treatment:	SA 2 1/2 degree of cleanliness to DIN EN ISO 12944
Primer coat:	2-component epoxy resin zinc phosphate primer, min. film thickness = 35 $\mu$ m
Top coat:	2-component high-solid epoxy resin top coat (RAL 5002), min. film thickness = 100 $\mu$ m

### Special coating

Available from the manufacturer on request (a surcharge and longer delivery time apply).

## Product benefits

- Two bi-directional mechanical seals with oil reservoir filled with ecologically acceptable oil provide double safety
- Perfectly protected by absolutely water-tight cable gland protecting the motor against moisture
- Motor monitored by temperature sensors to prevent it from overheating
- Leakage chamber between oil reservoir and gear unit for high reliability
- Easy to install

Amaprop 1000 and 1380:

- Little wear, high break resistance and long service life due to propeller made of nodular cast iron

Amaprop 2500:

- Absolutely break-proof due to propeller blades made of glass fibre reinforced epoxy resin with metal hub insert and ceramic coating.

## Acceptance tests / Warranties

- Functional test  
Every submersible mixer is subjected to a functional test to KSB standard ZN 56525.
- Quality is assured by means of an audited and certified quality assurance system to DIN EN ISO 9001.
- Special acceptance tests are available on request.

## Warranty information

Our warranty is based on and exclusively applies to your specifications as documented in the data sheet of the submersible mixer, and covers the relevant physical properties. Any warranty claims beyond the aforementioned aspects, as well as any claims resulting from an excessive solids content in the plant, the formation of floating blankets as well as failure to produce a specific gas yield, shall be excluded. The correct positioning of the submersible mixers is crucial for the overall function of the equipment. KSB's warranty obligations shall not cover any damage that may occur as a result of incorrect mixer positioning, i. e. installing the mixer in a position not expressly approved by KSB. In addition, low-flow areas (flow separation) resulting from the tank geometry shall not be covered by our warranty. Furthermore, we shall not assume any liability if our submersible mixers are used in patented processes and/or in case of protected rights of third parties.

Unauthorised modifications, the mixer's use for fluids and operating conditions not specified in the purchase order, as well as the use of non-KSB installation parts without KSB's prior consent will result in the forfeiture of any and all claims for damages. The same applies to consequential damage (e.g. resultant process downtime).

## Selection information

- Good mixing results and safe and reliable operation of the submersible mixers essentially depend on the position of the mixers in the tank and relative to each other. It is therefore imperative to position the submersible mixers as shown in KSB's general arrangement drawing. KSB shall not be held responsible for any damage resulting from mixer positions not expressly approved by KSB.

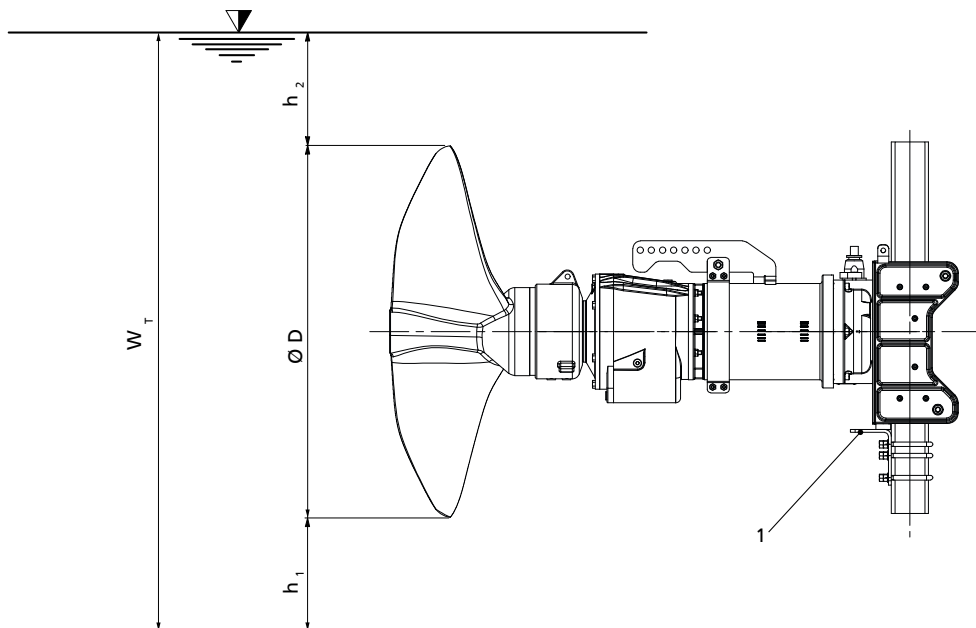
- The minimum and maximum submergence indicated in the data sheet of the submersible mixer must be complied with. The propeller must not be operated outside the fluid. Air-entraining vortices must be avoided. Always use level control equipment which trips the submersible mixer if the fill level drops below the minimum operating level.
- For servicing the submersible mixers, access openings and appropriate means of removal must be provided, so that the mixers can be lifted out of the filled tank at any time. For this purpose, the minimum dimensions for removing the submersible mixers must be observed.
- If the submersible mixer trips due to excessive temperature, check the motor housing for insulating substrate deposits and clean with appropriate equipment (e. g. high-pressure cleaner) as required. Consult KSB, if necessary.
- For higher fill levels, the guide rails of the Amaprop 1000 installation accessories must be secured against vibrations by means of a middle support fitted on site.
- In order to prevent any damage caused by the propeller or layers of floating sludge, if any, cable supports must be used for routing the power cable properly, i.e. without excessive slack.

#### **Information on frequency inverter operation**

- All submersible mixers from KSB are suitable for frequency inverter operation.
- The permissible control range is 30 - 50 Hz.
- In addition to any capacity reserves required for hydraulic reasons, a motor power reserve of 5 % must be provided when mixers are operated on frequency inverters.

### Minimum level of fluid handled

The submersible mixer is operational when the fluid level is not lower than dimension  $W_T$ . This minimum level of the fluid handled must also be ensured during automatic operation.



Minimum level of fluid handled

A submergence  $h_2$  from the top propeller tip to the substrate surface must be ensured to reliably prevent the formation of air-entraining vortices. Air-entraining vortices will cause rough running and damage to submersible mixers and installation parts. The formation of air-entraining vortices can be checked through the sight glasses fitted in the tank wall ( $\Rightarrow$  Page 5). The situation can be remedied by increasing the fill level (for Amaprop 2500) or adjusting the installation level of the mixer, if possible. (For Amaprop 1000 and 1380 with accessories set 22: The position of the mixer in relation to the fill level can be adjusted by using the winch. The adjustment can be made by changing the position of the retaining bracket (1) or, in the case of mixers suspended from lifting equipment, via the lifting equipment.)

Minimum level of fluid handled

$\varnothing D$	$h_1^{2)}$	$h_2^{2)}$
[mm]	[m]	[m]
1000	0,3	0,5
1380	0,3	0,5
2500	0,3	0,5

2) Minimum

## Overview of product features

Technical data of material variant G

Feature	Amaprop 1000	Amaprop 1380	Amaprop 2500
<b>Explosion protection</b>			
Motor version UR	Not explosion-proof (fluid temperatures < 45 °C)		
Motor version WR	Not explosion-proof (fluid temperatures < 60 °C)		
Motor version YR	⊕ II2G Ex dc IIB T4 (fluid temperatures < 45 °C)		
Motor version ZR	⊕ II2G Ex dc IIB T3 (fluid temperatures < 60 °C)		
<b>Motor</b>			
Starting method	DOL or star-delta		
Voltage and frequency	400 V <sup>3)</sup> 50 Hz, suitable for frequency inverter operation		
Cooling	By surrounding fluid		
Submergence	Up to 10 m <sup>4)</sup>		
<b>Power cable</b>			
Length	10 m <sup>5)</sup>		
Cable entry	Totally watertight		
Type	See table "Overview of power cables"		
<b>Bearings</b>			
Motor	Grease-packed rolling element bearings sealed for life		
Gear unit	Oil-lubricated rolling element bearings		
Gear unit	Spur gear		
<b>Sealing elements</b>			
Elastomer seals	Viton (fluorocarbon rubber FPM)		
Shaft seal	Propeller end	Cartridge mechanical seal with covered spring	
	Drive end	Bellows-type mechanical seal	
<b>Monitoring equipment</b>			
Winding temperature	PTC resistor		
Motor leakage	Leakage sensor in the motor space		
Coating	Two-component epoxy resin coating		
<b>Permissible fluid temperature</b>			
Motor versions UR, YR	45 °C		
Motor versions WR, ZR	60 °C		
Acceptance tests	To ISO 9001 <sup>6)</sup>		
<b>Installation</b>			
Stationary	Installation depth up to 10 m <sup>7)</sup>		

## Overview of power cables

Feature	Rubber-sheathed cable	
	S1BN8-F	S07RC4N8-F
Version	Standard	Optional
Rated voltage	1000 V	750 V
EMC screening	-	✓
Insulation material	EPR <sup>8)</sup>	EPR <sup>8)</sup>
Max. continuous temperature of insulation	90 °C	90 °C
For permanent immersion in digestion substrate to DIN VDE 0282-16/HD22.16	✓	✓

- 3) Optional: 500 V, 690 V  
4) Deeper submergence on request  
5) Optional: 15 m, 20 m, > 20 m on request  
6) Optional: with test report 10204-2.2  
7) Larger installation depths on request  
8) EPR = ethylene propylene rubber



## Standard and special designs

Standard and special designs

Option	Comments
Power cable > 20 m	Available for all sizes
Analysing device for leakage sensor, thermistor tripping unit for monitoring the winding temperature	Available for all sizes
Special voltages 500 V and 690 V	Available for all sizes
Two-component epoxy resin coating, 250 µm	Available for all sizes
Additional operating manuals	Standard: 1 operating manual per pump set
Customer-specific installation drawing	Available for all sizes
Flow simulation	Available for all sizes
Installation consultancy	Available for all sizes

For any versions not documented in this type series booklet or special versions please always contact KSB for technical details, prices and delivery periods.

### Examples:

- Other voltages (except 400 V, 500 V and 690 V)
- Special coatings
- Combinations with special motor/special propeller/special gear unit (e.g. for higher-viscosity fluids)
- Special installation parts
- Special cables
- Tank
- Tank accessories (wall duct for electric cables)
- Access openings and associated covers in tank roof for rapidly removing/re-installing submersible mixers

### Technical data

Performance data (400 V, 50 Hz), material variant G

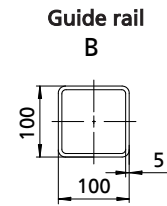
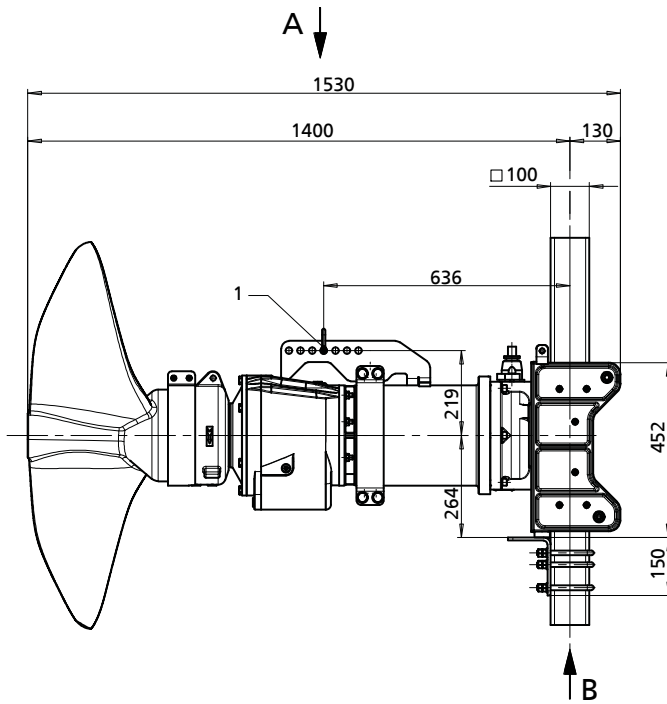
Designation	Propeller speed $n_2$	Motor rating $P_2$	Gear unit size	[kg] <sup>9)</sup>
	[rpm]	[kW]		
<b>Amaprop J 1000 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)</b>				
166-1000/11 4 URG / YRG	166	10	SP 190	327
175-1000/16 4 URG / YRG	175	15	SP 190	340
184-1000/16 4 URG / YRG	184	15	SP 190	340
192-1000/16 4 URG / YRG	192	15	SP 190	340
185-1000/23 4 URG / YRG	185	20	SP 190	351
208-1000/23 4 URG / YRG	208	20	SP 190	351
<b>Amaprop J 1000 (motor version WR/ZR, applications with fluid temperatures from 45 °C to 60 °C)</b>				
166-1000/16 4 WRG / ZRG	166	11,8	SP 190	340
174-1000/16 4 WRG / ZRG	174	11,8	SP 190	340
181-1000/23 4 WRG / ZRG	181	16	SP 190	351
184-1000/23 4 WRG / ZRG	184	16	SP 190	351
189-1000/23 4 WRG / ZRG	189	16	SP 190	351
<b>Amaprop J 1380 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)</b>				
88-1380/6 4 URG / YRG	88	6,5	SP 190	322
99-1380/11 4 URG / YRG	99	10,0	SP 190	322
105-1380/11 4 URG / YRG	105	10,0	SP 190	322
114-1380/16 4 URG / YRG	114	13,0	SP 190	335
<b>Amaprop J 1380 (motor version UR/YR, applications with fluid temperatures from 45 °C to 60 °C)</b>				
88-1380/6 4 WRG / ZRG	88	6,0	SP 190	322
99-1380/16 4 WRG / ZRG	99	10,0	SP 190	335
105-1380/16 4 WRG / ZRG	105	11,8	SP 190	335
114-1380/23 4 WRG / ZRG	114	13,0	SP 190	346
<b>Amaprop K 2500 (motor version UR/YR, applications with fluid temperatures of up to 45 °C)</b>				
38-2500/6 4 URG / YRG	38	6,5	SP 190	276
42-2500/6 4 URG / YRG	42	6,5	SP 190	276
<b>Amaprop K 2500 (motor version WR/ZR, applications with fluid temperatures from 45 °C to 60 °C)</b>				
38-2500/6 4 WRG / ZRG	38	6	SP 190	276
42-2500/6 4 WRG / ZRG	42	6	SP 190	276

<sup>9)</sup> Weight incl. guide bracket

**Dimensions**

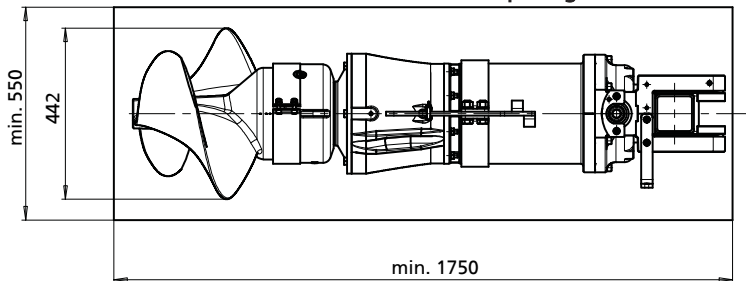
**Amaprop 1000**

Dimensions [mm]



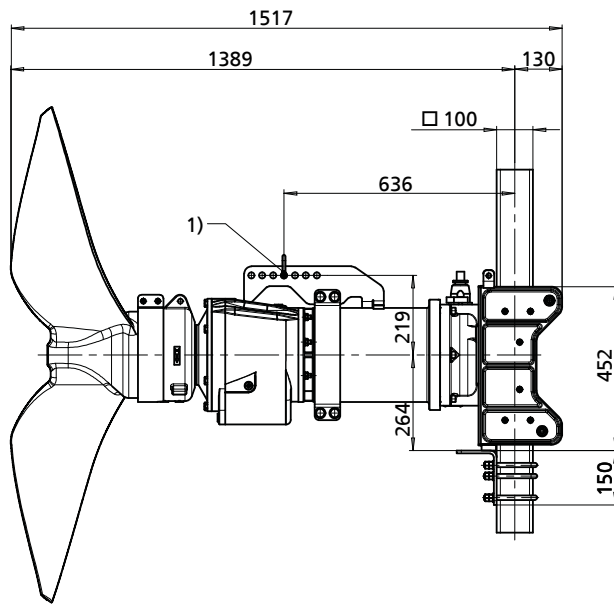
1 = attachment point

**Minimum dimensions of access opening**

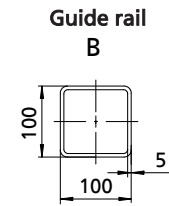


**Amaprop 1380**

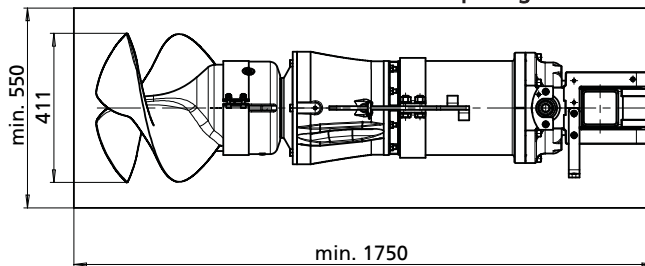
Dimensions [mm]



1 = attachment point

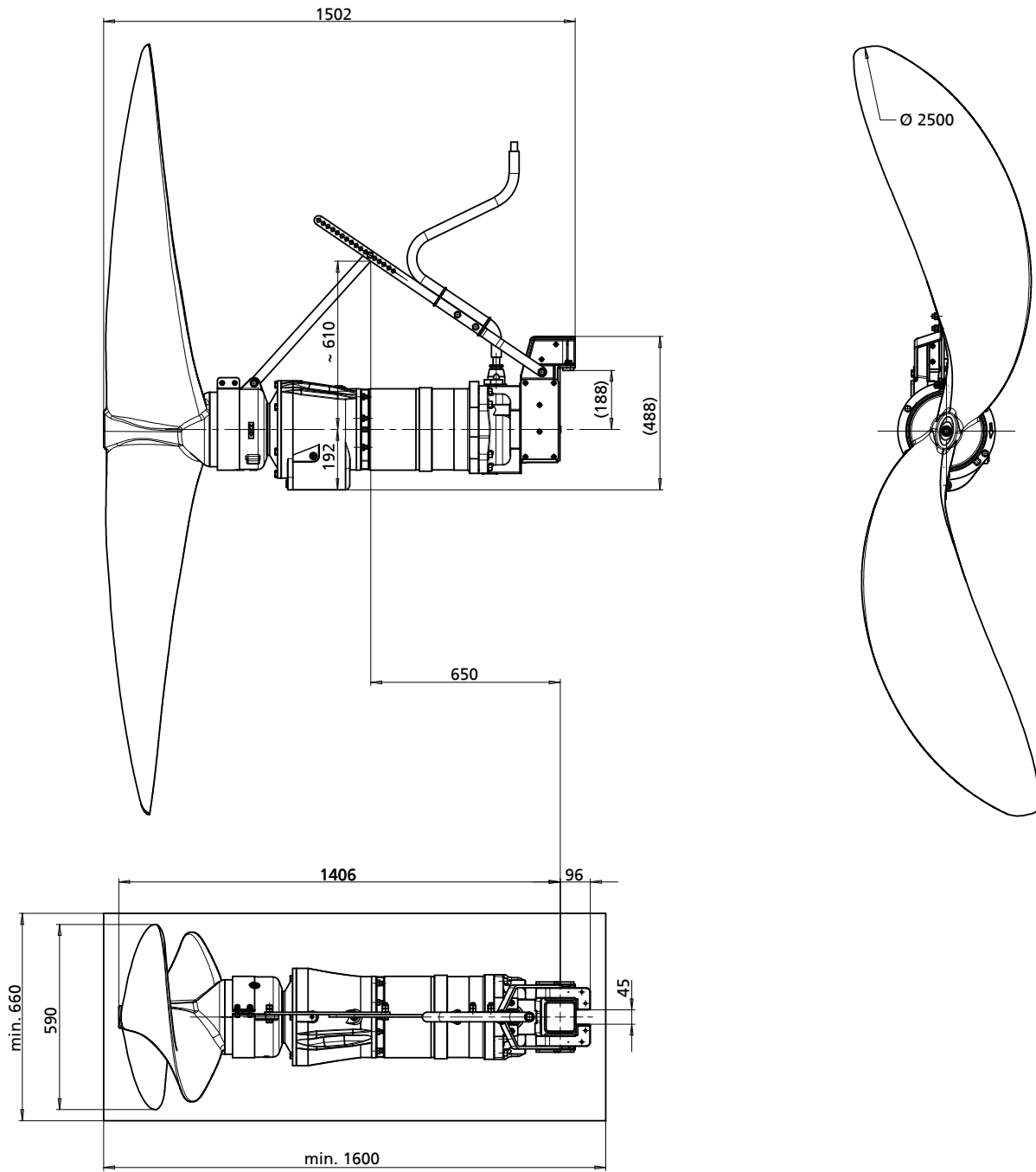


**Minimum dimensions of access opening**



Amaprop 2500

Dimensions [mm]

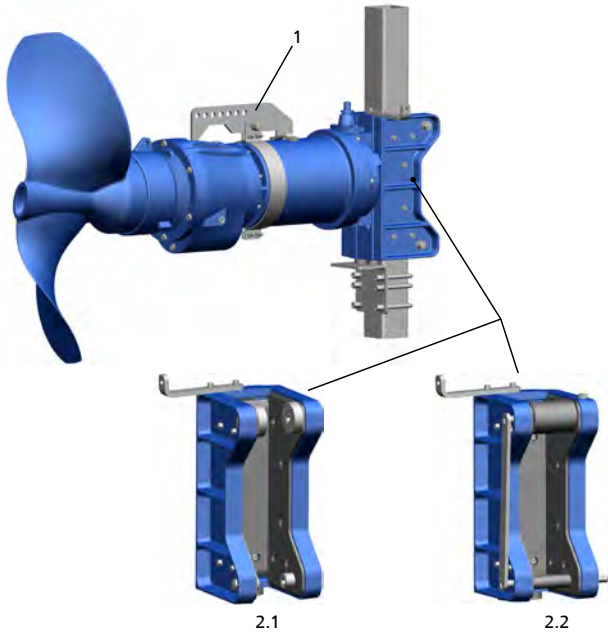


**Scope of supply**

Depending on the model, the following items are included in the scope of supply:

- Submersible mixer, complete with lifting bail or supporting strap and power cable
- Guide bracket
- Gearboxes
- Two shackles (for lifting tackle and cable support)
- Cable support for properly routing the power cables
- Separate name plate

**Amaprop 1000 and 1380:**



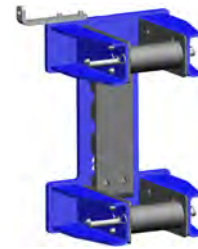
Amaprop 1000 with accessories set 22 and with accessories of other makes for gas-tight tanks

1	Supporting strap
2.1	Guide bracket with individual rollers (for accessories set 22 and for operation with mixer suspended from lifting equipment, with guide rail narrowing upwards. The guide bracket is mounted to the guide rail from the top; the rollers do not need to be removed/reassembled.)
2.2	Guide bracket (for operation with mixer suspended from lifting equipment. The guide bracket can be mounted to the guide rail from the side; the rollers need to be removed/reassembled.)

For Amaprop 1000 and 1380 guide brackets for guide rails of 100 × 150 mm and 150 × 150 mm are available as an option (surcharge, delivery time and dimensions on request). Selection of the guide bracket is based on the existing installation parts.

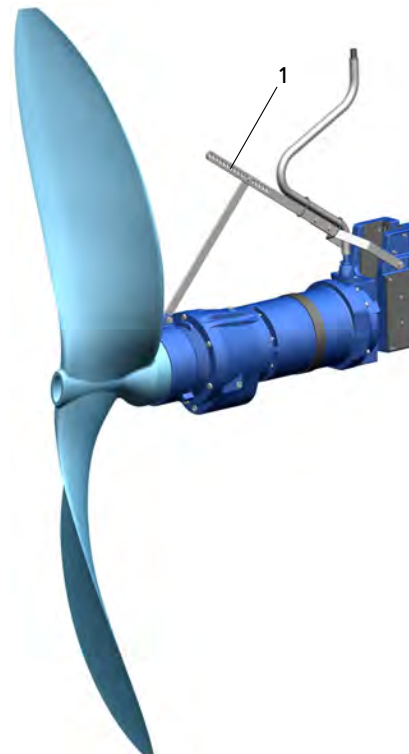


Guide bracket for guide rail 100 × 150 mm



Guide bracket for guide rail 150 × 150 mm

**Amaprop 2500:**



Amaprop 2500

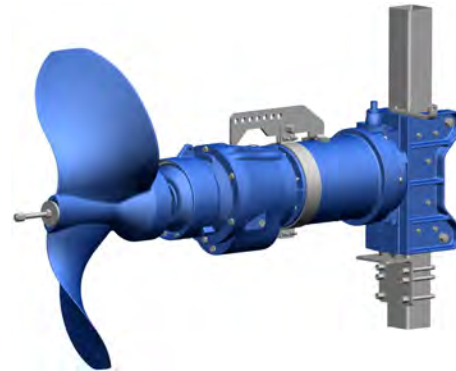
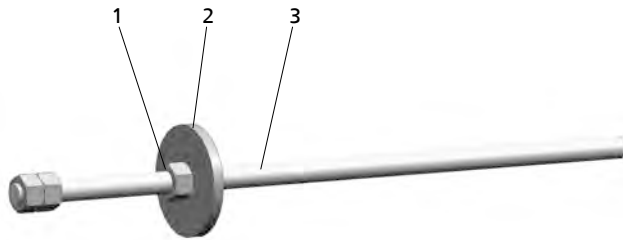
1	Lifting bail
---	--------------

**Accessories**

- Submersible mixer stand
- Forcing screw
- Propeller fitting tool
- Other accessories on request

Accessories

Propeller fitting tool



Propeller fitting tool

Propeller with propeller fitting tool

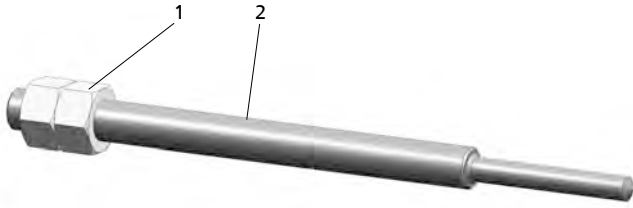
1	Nut
2	Disc
3	Fully threaded stud

The propeller fitting tool facilitates fitting the propeller on the submersible mixer shaft. The fully threaded stud (3) is screwed into the shaft, and the propeller and the disc (2) are placed on the shaft. The nut (1) is tightened up to the stop, pulling the propeller onto the shaft.

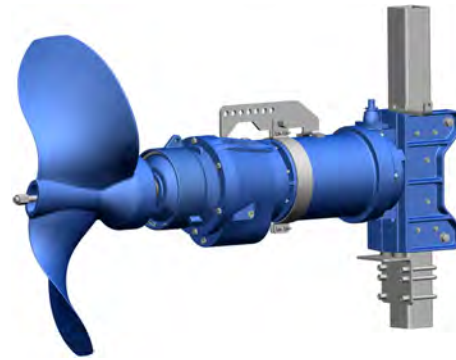
Accessory: propeller fitting tool

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Propeller fitting tool	<b>x</b>	<b>x</b>	<b>x</b>	A4-70	01428379	1.22

Forcing screw



Forcing screw



Propeller with forcing screw

1	Nut
2	Fully threaded stud

The forcing screw facilitates dismantling and pulling the propeller off the submersible mixer shaft. The hexagon socket head cap screw with washer is removed and the fully threaded stud (2) is screwed into the propeller's forcing thread up to the stop using the nut (1), pulling the propeller smoothly off the shaft.

Accessory: propeller forcing screw

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Forcing screw	-	<b>X</b>	-	A4-70	11306648	0.77
Forcing screw	<b>X</b>	-	<b>X</b>	A4-70	11306649	1.05



### Cable support/carabine hook/strain relief device

#### Cable support

The cable support is used for supporting the power cable at the lifting rope or tank edge (one included in standard scope of supply; additional or spare cable supports available).

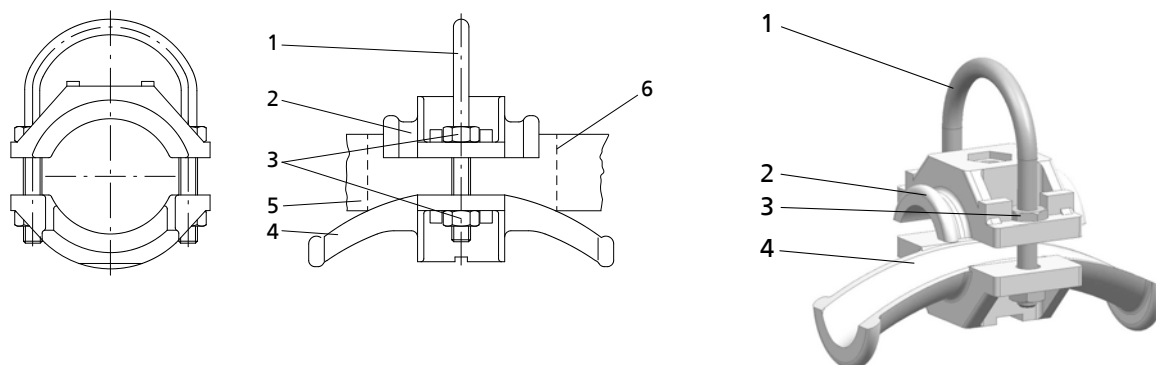
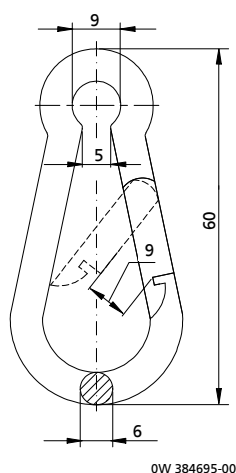


Illustration of cable support

1	U-bolt
2	Moulded part made of polypropylene
3	Hexagon nut made of A4
4	Moulded part made of polypropylene
5	Power cable with defined diameter <sup>10)</sup>
6	Rubber pad

**i** For power cable diameters  $\leq 17$  mm a rubber pad is inserted to make sure the cable is clamped properly.

#### Carabine hook



0W 384695-00

Dimensions of carabine hook [mm]

Load-carrying capacity = 150 kg

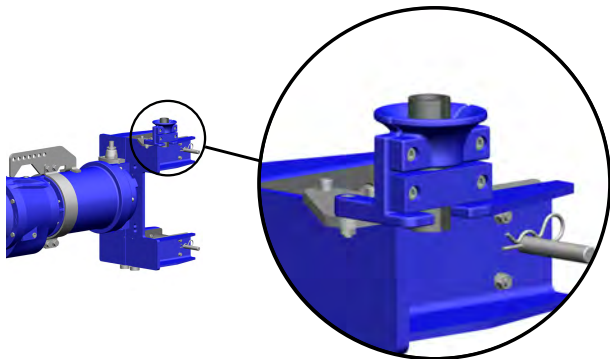
<sup>10)</sup> Refer to the power cable data given in the motor catalogue.

Overview of cable supports/carabine hooks

Description	Amaprop			Suitable for motor				Material	Mat. No.	[kg]
	1000	1380	2500	6 4	11 4	16 4	23 4			
Cable support, incl. carabine hooks	X	-	-	X <sup>11)</sup>	-	-	-	Cable support: plastic / A4, carabine hook: A4	19555523	0.09
Cable support, incl. carabine hooks	-	X	-	X <sup>11)</sup>	X <sup>11)</sup>	X <sup>11)</sup>	X <sup>11)</sup>	Cable support: plastic / A4, carabine hook: A4	19555523	0.09
Cable support, incl. carabine hooks	-	-	X	-	X <sup>11)</sup>	X <sup>11)</sup>	X <sup>11)</sup>	Cable support: plastic / A4, carabine hook: A4	19555523	0.09

**Strain relief device**

To relieve the strain of the power cable on Amaprop 1000 and 1380 a customer-specific strain relief device can be fitted as an option. Depending on the system, various strain relief devices are offered for the power cable. As an option, a KSB strain relief device can be fitted to the fastening points of the spacer.



Amaprop 1000 with guide bracket for guide rail 150 × 150 mm and fitted strain relief device for the power cable

Accessory: strain relief device for the power cable

Description	Amaprop			Material	Mat. No.	[kg]
	1000	1380	2500			
Strain relief device	X	X	-	EN-GJL-250	01608408	3.6

**Lifting equipment**

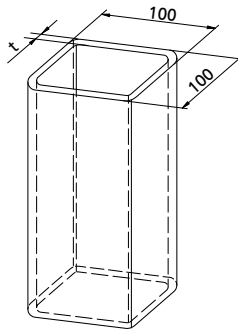
- See type series booklet "KSB Lifting Equipment" 1596.5

11) Diameter of power cable: Ø = 17-25 mm

### Guide rails

The guide rail length required depends on the fluid level. Guide rails are supplied in standard lengths of 3 m or 6 m. Free guide rail ends should not protrude more than 0.5 m above the fluid surface. If the guide rail is to be fastened to the roofing structure, the guide rail length must be selected accordingly. If necessary, shorten the guide rails at the site.

For larger installation depths, the guide rails must be extended by adding guide rail extensions (3 m or 6 m). Welding and subsequent treatment must be performed at the site in accordance with the relevant regulations. To allow smooth lifting and lowering of the submersible mixers, the weld seam at the outside of the guide rail must be ground down to a max. projection of 0.5 mm.



UG 1145303

t = 5 mm

Square guide rail to DIN EN 10219-2

### Amaprop 1000 and 1380

Overview of guide rails for Amaprop 1000/1380<sup>12)</sup>

Description	Length	Material	Mat. No.	[kg]
	[m]			
Guide rail 100 x 100 x 5 mm	3,0	1.4301	11304598	43.2
Guide rail 100 x 100 x 5 mm	3,0	1.4571	11304599	43.2
Guide rail 100 x 100 x 5 mm	6,0	1.4301	11304600	86.4
Guide rail 100 x 100 x 5 mm	6,0	1.4571	11304601	86.4

### Amaprop 2500

Overview of guide rails and installation types for Amaprop 2500

Guide rail		Free-standing	With upper holder
Length	Cross-section		
[m]			
< 7	100 × 100 × 5	X	X <sup>13)</sup>
< 9	100 × 100 × 5	-	X
> 9	100 × 100 × 5	-	X

<sup>12)</sup> In biogas digester: 1.4571 as standard; in mixing tank and digestate storage tank: 1.4301 as standard / 1.4571 on option

<sup>13)</sup> Only if guide rail is not fastened to roofing structure

Overview of guide rails, high and low position, for Amaprop 2500

Description	Length	Material	Mat. No.	[kg]
	[m]			
Guide rail 100 x 100 x 5 mm <sup>14)</sup>	3,0	1.4571	11304599	43.2
Guide rail 100 x 100 x 5 mm <sup>14)</sup>	3,0	1.4571	11304601	86.4

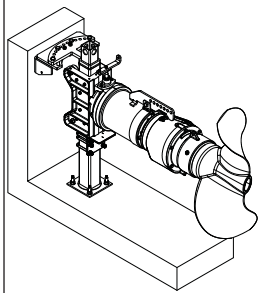
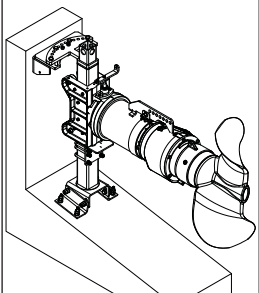
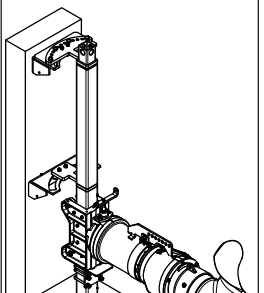
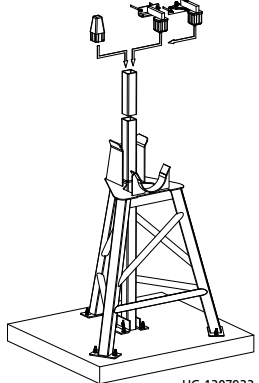
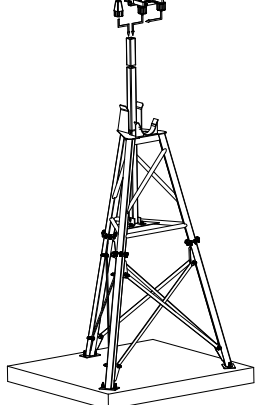
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<sup>14)</sup> If guide rail cannot be fastened to roofing structure: always combined with insert sleeve

**Installation accessories**

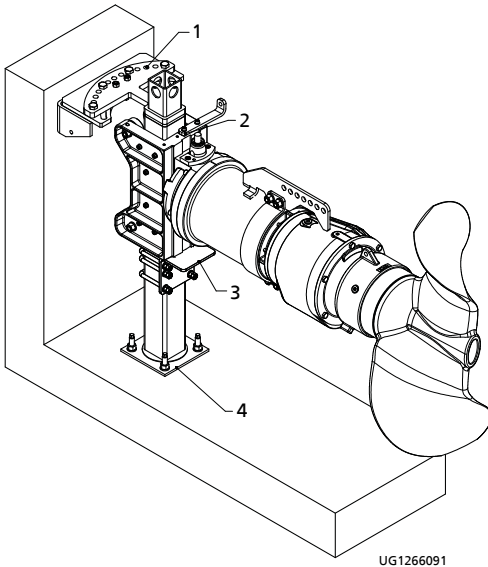
**Overview of installation accessories**

Overview of installation accessories for Amaprop 1000/1380 and Amaprop 2500

Accessories	Installation example		
<p><b>Amaprop 1000 and 1380</b> Accessories set 22</p>	<p>Mounting on tank wall and horizontal tank floor (0 - 0.5°) (⇒ Page 22)</p> 	<p>Mounting on tank wall and sloping tank floor (0.5° - 10°) (⇒ Page 24)</p> 	<p>Middle support for guide rail 100 x 100 x 5, for large installation depths (⇒ Page 26)</p> 
<p><b>Amaprop 2500</b> Low-position submersible mixer stand</p>	 <p>UG 1307922</p> <p>Free-standing installation on horizontal tank floor in biogas digesters (near-floor position) (⇒ Page 28)</p>		
<p>High-position submersible mixer stand</p>	 <p>UG 1308395</p> <p>Free-standing installation on horizontal tank floor in biogas digesters (near-surface position) (⇒ Page 28)</p>		

**Accessories set 22 - Amaprop 1000 and 1380**

For mounting at the top of the tank wall and on a horizontal tank floor (0° - 0.5°), level-adjustable and with horizontal swivelling option.



Installation example: Amaprop 1000 and 1380 mounted on tank wall and horizontal tank floor

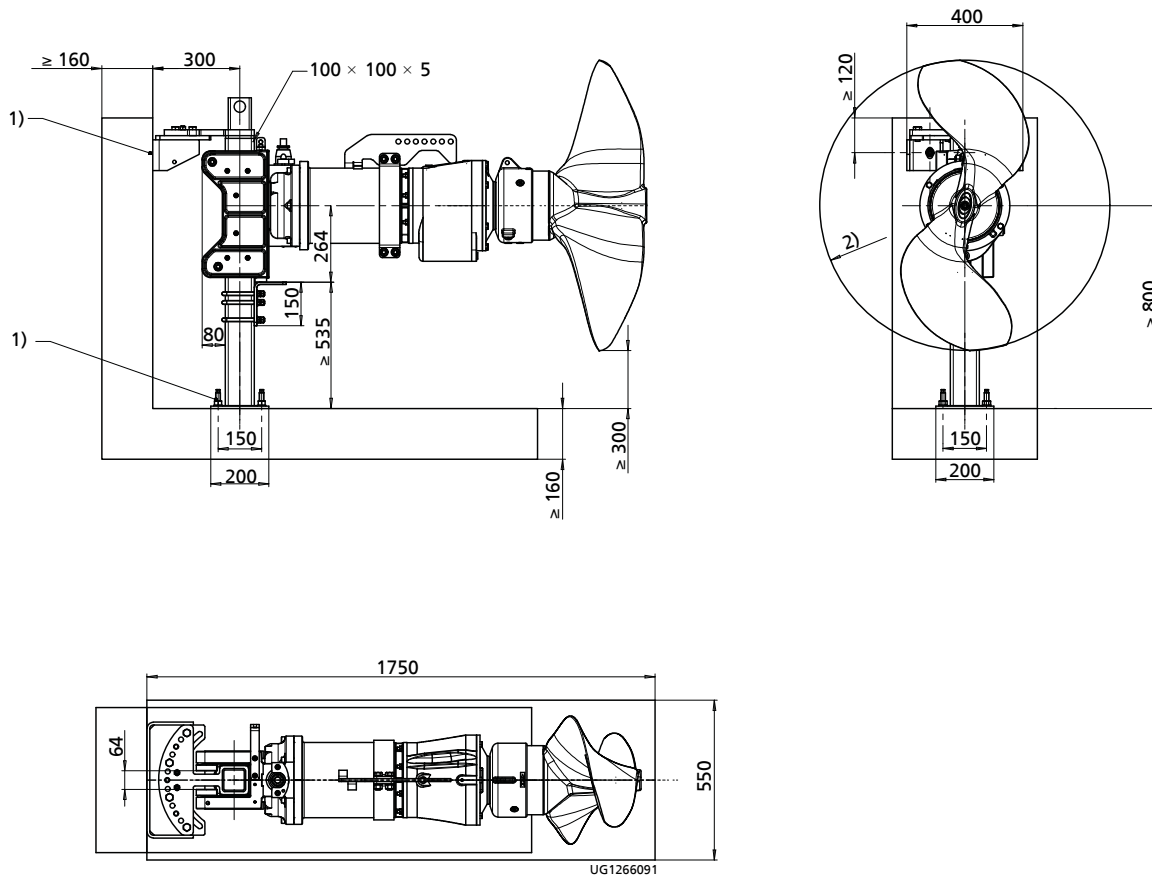
1	Upper holder
2	Guide rail
3	Retaining bracket
4	Lower holder

**Accessories set 22 - Mounting on tank wall and horizontal tank floor**

Description	Material	Mat. No.	[kg]
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313459	23.23
Guide rail	(⇒ Page 19)		
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4571	19202370	3.5
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4301	01118892	5.68
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4571	01118903	5.68

**General arrangement drawing of accessories set 22 - Amaprop 1000 and 1380**

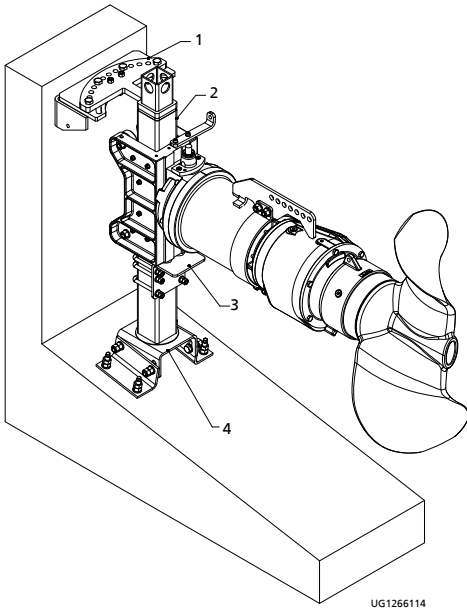
For mounting at the top of the tank wall and on a horizontal tank floor (0° - 0.5°), level-adjustable and with horizontal swivelling option.



Installation of accessories set 22 - Amaprop 1000 and 1380

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: Ø = 1000 mm, Amaprop 1380: Ø = 1380 mm

For mounting on tank wall and sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option



Installation example: Amaprop 1000 and 1380 mounted on sloping tank floor

1	Upper holder
2	Guide rail
3	Retaining bracket
4	Lower holder

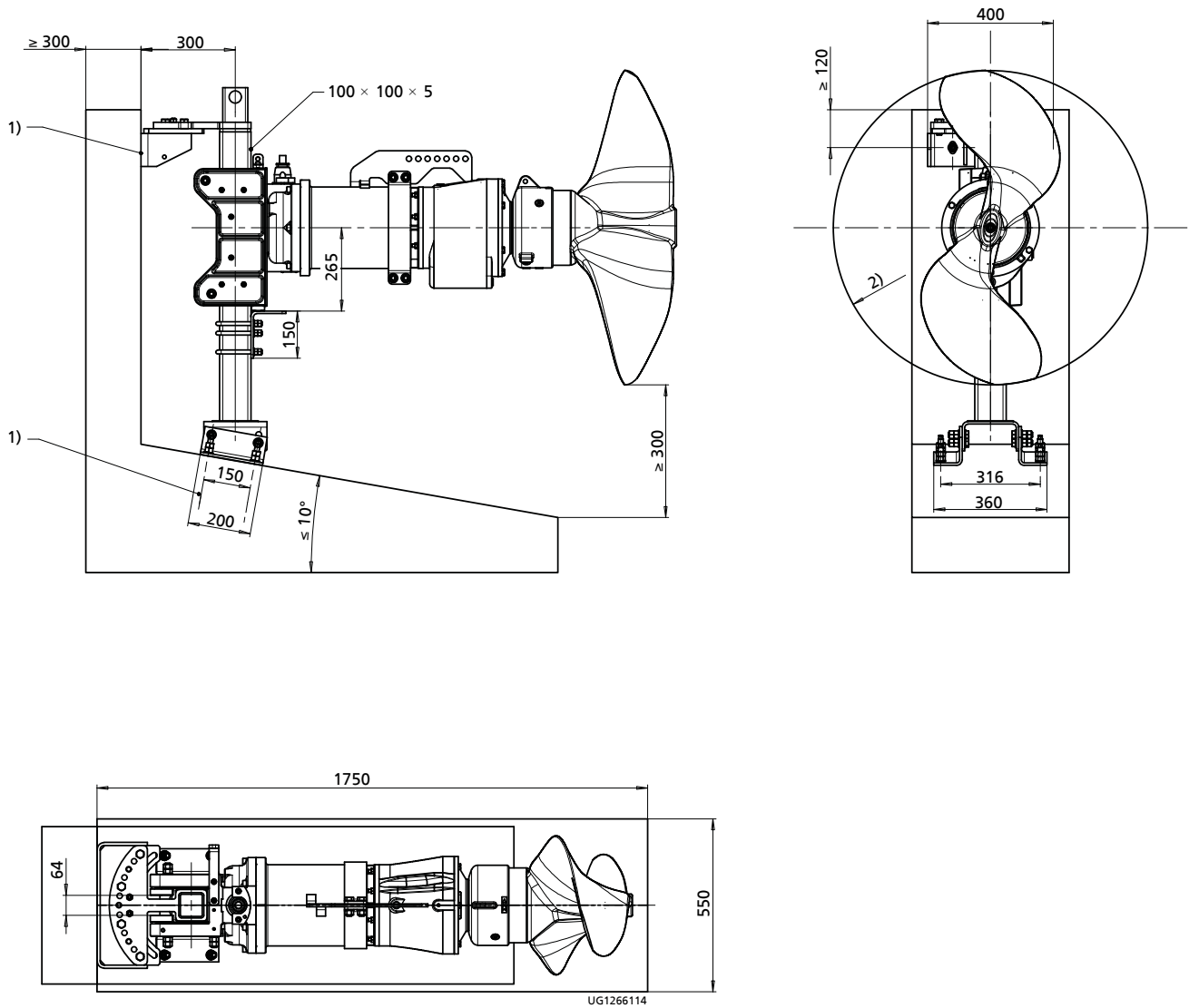
Accessories set 22 - Mounting on tank wall and sloping tank floor

Description	Material	Mat. No.	[kg]
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313458	23.23
Upper holder for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313459	23.23
Guide rail	(⇒ Page 19)		
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4301	01129810	3.5
Retaining bracket for guide rail 100 x 100 x 5 mm	1.4571	19202370	3.5
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4301	01118906	11.92
Lower holder for guide rail 100 x 100 x 5 mm, incl. 4 chemical anchors	1.4571	01118907	11.92



**General arrangement drawing of accessories set 22 - Amaprop 1000 and 1380**

For mounting at the top of the tank wall and on a sloping tank floor (0.5° - 10°), level-adjustable and with horizontal swivelling option.

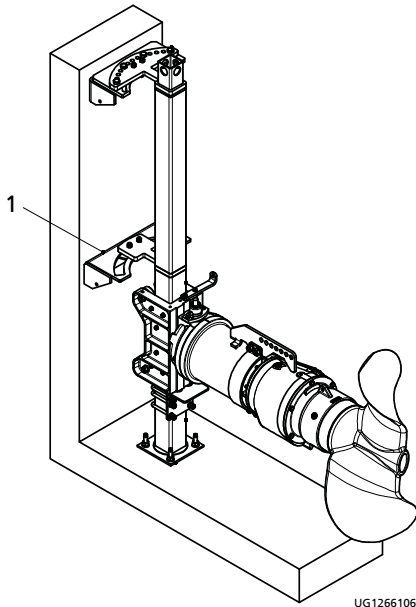


**Installation of accessories set 22 - Amaprop 1000 and 1380**

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: $\varnothing$ 1000 mm, Amaprop 1380: $\varnothing$ 1380 mm

### Middle support

Middle support for guide rail 100 x 100 x 5 mm, for large installation depths



Installation example: Amaprop 1000 and 1380 mounted on tank edge and horizontal tank floor

1	Middle support
---	----------------

Amaprop 1000, required middle support; guide rail length 6 m

Size	T	Middle support required
	[°C]	
J 166-1000/114URG/YRG	45	-
J 175-1000/164URG/YRG	45	-
J 184-1000/164URG/YRG	45	-
J 192-1000/164URG/YRG	45	-
J 185-1000/164URG/YRG	45	-
J 208-1000/234URG/YRG	45	X
J 166-1000/164WRG/ZRG	60	-
J 174-1000/164WRG/ZRG	60	-
J 181-1000/234WRG/ZRG	60	-
J 184-1000/234WRG/ZRG	60	-
J 189-1000/234WRG/ZRG	60	-

Amaprop 1000, required middle support; guide rail length 8 m

Size	T	Middle support required
	[°C]	
J 166-1000/114URG/YRG	45	-
J 175-1000/164URG/YRG	45	-
J 184-1000/164URG/YRG	45	X
J 192-1000/164URG/YRG	45	X
J 185-1000/164URG/YRG	45	X
J 208-1000/234URG/YRG	45	X
J 166-1000/164WRG/ZRG	60	-
J 174-1000/164WRG/ZRG	60	-
J 181-1000/234WRG/ZRG	60	X
J 184-1000/234WRG/ZRG	60	X
J 189-1000/234WRG/ZRG	60	X

Amaprop 1380, required middle support; guide rail length 6 m

Size	T	Middle support required
	[°C]	
J 88-1380/64URG/YRG	45	-
J 99-1380/114URG/YRG	45	-
J 105-1380/114URG/YRG	45	-

Size	T	Middle support required
	[°C]	
J 114-1380/164URG/YRG	45	-
J 88-1380/64WRG/ZRG	60	-
J 99-1380/164WRG/ZRG	60	-
J 105-1380/164WRG/ZRG	60	-
J 114-1380/234WRG/ZRG	60	-

Amaprop 1380, required middle support; guide rail length 8 m

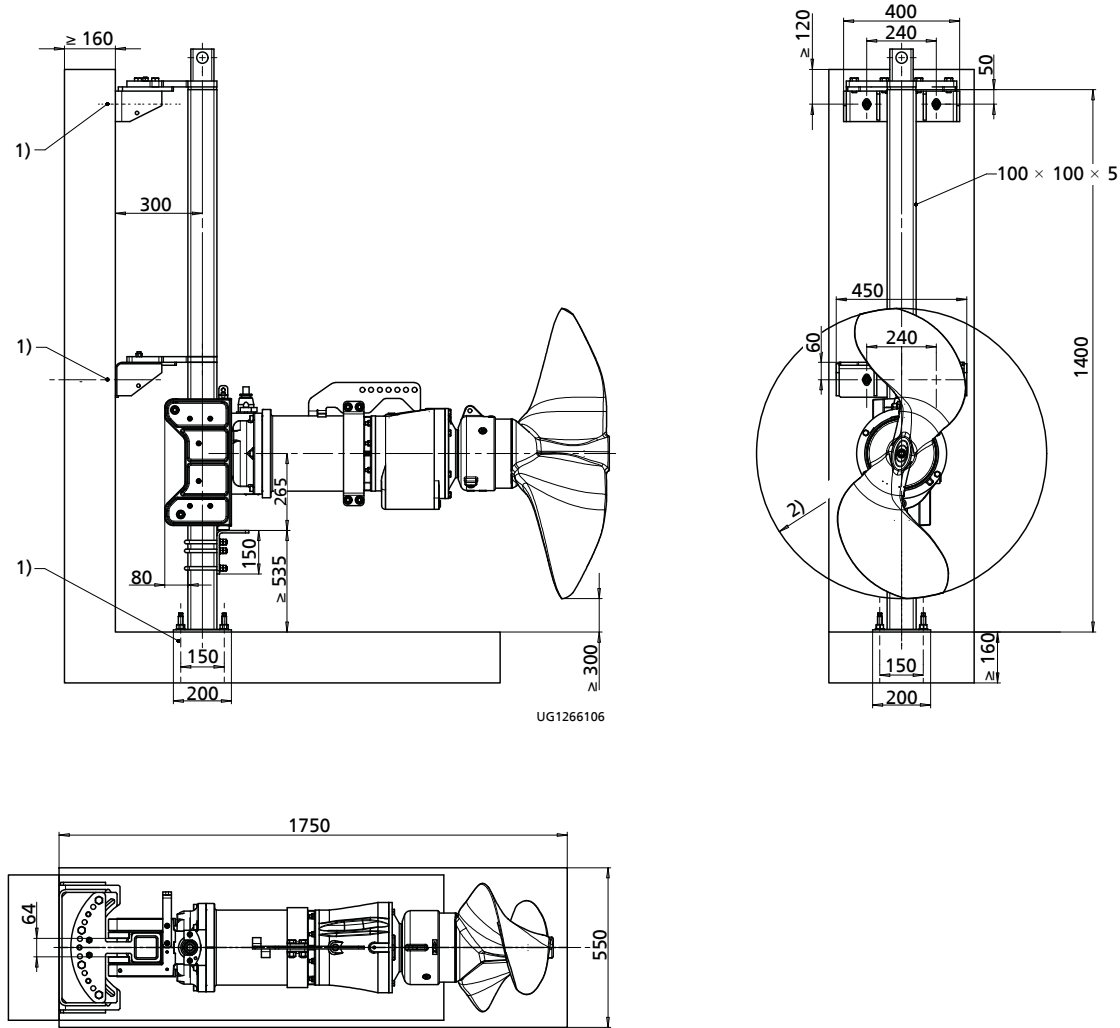
Size	T	Middle support required
	[°C]	
J 88-1380/64URG/YRG	45	-
J 99-1380/114URG/YRG	45	-
J 105-1380/114URG/YRG	45	X
J 114-1380/164URG/YRG	45	X
J 88-1380/64WRG/ZRG	60	-
J 99-1380/164WRG/ZRG	60	-
J 105-1380/164WRG/ZRG	60	X
J 114-1380/234WRG/ZRG	60	X

Standard accessories set 22 - Middle support for guide rail 100 x 100 x 5 mm, for large installation depths

Description	Material	Mat. No.	[kg]
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4301	01313462	19.26
Middle support for guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	1.4571	01313463	19.26

**General arrangement drawing of accessories set 22 - Amaprop 1000 and 1380**

For mounting at the top of the tank wall and on a horizontal tank floor (0° - 0.5°), level-adjustable and with horizontal swivelling option.



Installation of accessories set 22 - Amaprop 1000 and 1380

1)	Hole diameter = 18 mm, hole depth = 125 mm, max. tightening torque = 60 Nm
2)	Amaprop 1000: Ø = 1000 mm, Amaprop 1380: Ø = 1380 mm

## Standard accessories - low-position and high-position biogas stands

### Design details

#### Design

- Stand (tripod)
- Square guide rail
- Retaining bracket

#### Optional:

- 3 leg extensions (for high position only)
- 6 diagonal struts (for high position only)
- Square guide rail extension

#### Fastening

- The submersible mixer stand is fastened on the tank floor with chemical anchors.

#### Guide rail

- Cross-section: 100 x 100 mm
- Wall thickness: 3 or 5 mm (depending on guide rail length and fastening of upper guide rail end)
- Material 1.4571

#### Installation types

- Free-standing, without upper holder
- With upper holder mounted on the tank wall or roofing structure



Submersible mixer stand  
Low position

Free-standing,  
with insert sleeve

Installation  
with upper holder

Submersible mixer stand  
High position

Free-standing,  
with insert sleeve

Installation  
with upper holder

**Scope of supply**

Depending on the model, the following items are included in the scope of supply:

**Submersible mixer stand - Low position**

- Stand (tripod)



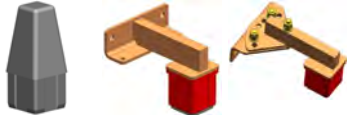
- Square guide rail/Square guide rail extension, if necessary



- Retaining bracket for square guide rail (2 pcs.)



- Insert sleeve or upper holder (fixed or with swivelling option)



- Chemical anchor (6 pcs.)



- Installation accessories



**Submersible mixer stand - High position**

- Stand (tripod)



- Square guide rail/Square guide rail extension, if necessary



- Retaining bracket for square guide rail (2 pcs.)



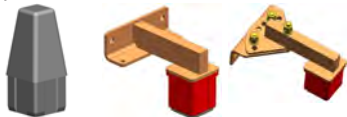
- Leg extensions (3 pcs.)



- Diagonal strut (6 pcs.)



- Insert sleeve or upper holder (fixed or with swivelling option)



- Chemical anchor (10 pcs.)

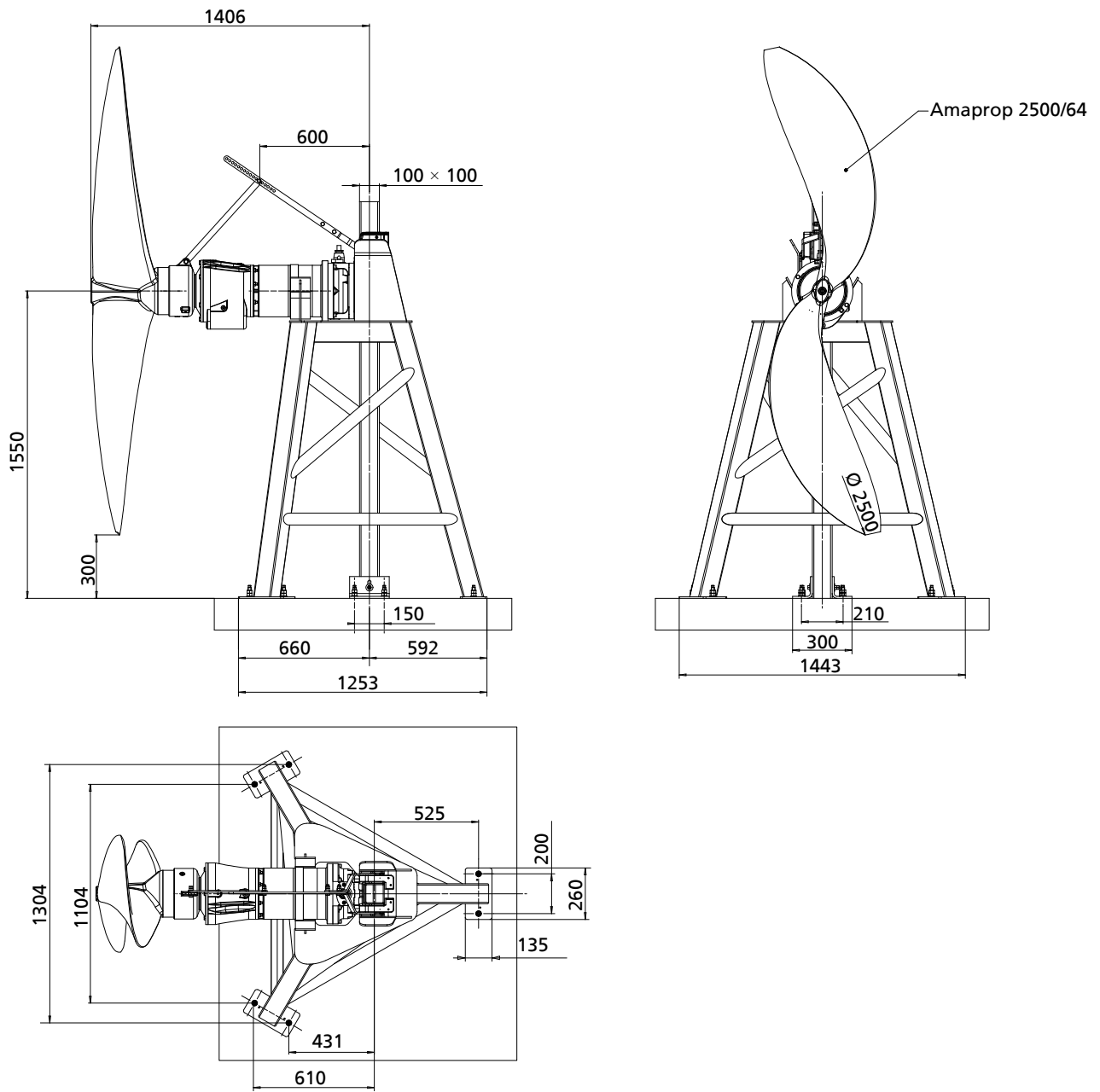
### Standard accessories: submersible mixer stand for Amaprop 2500

Standard accessories: submersible mixer stand for Amaprop 2500

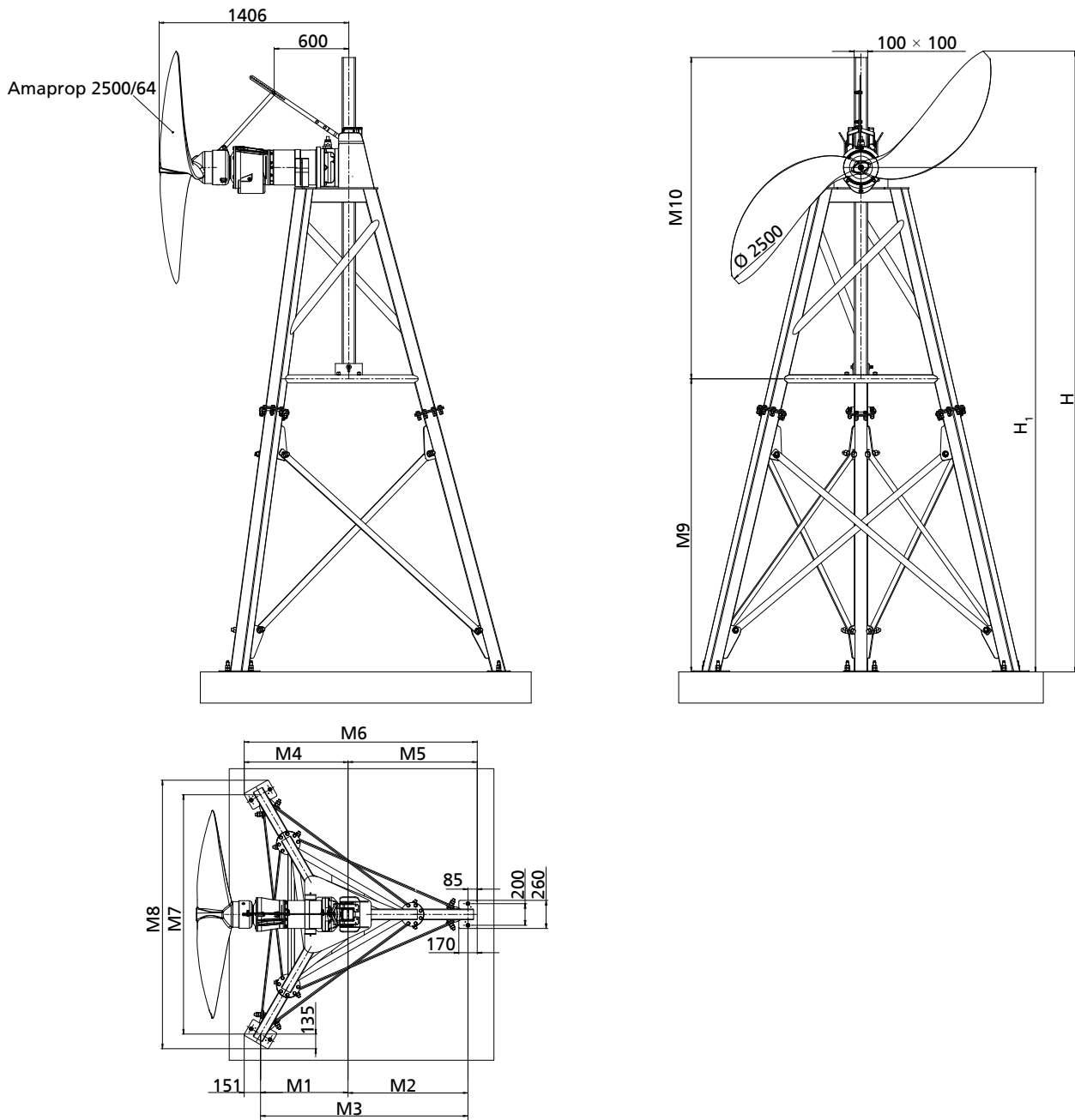
Description	Mat. No.	Material	[kg]
<b>Submersible mixer stand for low-position installation</b>			
Submersible mixer stand (incl. installation accessories), mixer shaft centreline height: 1550 mm above tank floor	01205324	1.4301	177
<b>Submersible mixer stand for high-position installation</b>			
Tripod (incl. installation accessories), upper part of submersible mixer stand, identical for all shaft centreline heights	01213034	1.4301	217
Leg extensions (3 pcs.), shaft centreline height: 3.0 m to 4.5 m	01213223	1.4301	18.9 to 32.9
Leg extensions (3 pcs.), shaft centreline height: 4.5 m	01200190	1.4301	48,7
Leg extensions (3 pcs.), shaft centreline height: 8.0 m	01200190	1.4301	101,4
Diagonal struts (6 pcs.), shaft centreline height up to 3 m <sup>15)</sup>	01201525	1.4301	6.4
Diagonal struts (6 pcs.), shaft centreline height: 3.01 m to 3.50 m	01201526	1.4301	7.8
Diagonal struts (6 pcs.), shaft centreline height: 3.51 m to 4.00 m	01200192	1.4301	9.75
Diagonal struts (6 pcs.), shaft centreline height: 4.01 m to 4.50 m	01201543	1.4301	11.7
Diagonal struts (6 pcs.), shaft centreline height: 4.51 m to 5.00 m	01201544	1.4301	15.6
Diagonal struts (6 pcs.), shaft centreline height: 5.01 m to 5.50 m	01201546	1.4301	17.55
Diagonal struts (6 pcs.), shaft centreline height: 5.51 m to 6.00 m	01201557	1.4301	19.5
Diagonal struts (6 pcs.), shaft centreline height: 6.01 m to 6.50 m	01201558	1.4301	21.45
Diagonal struts (6 pcs.), shaft centreline height: 6.51 m to 7.00 m	01201559	1.4301	23.4
<b>Upper holder</b>			
Upper holder 90°, additional holder for supporting the top end of the guide rail 100 x 100 x 3 mm, incl. 2 chemical anchors	01189497	1.4571	7.35
Upper holder 45°/60°/75°, additional holder for supporting the top end of the guide rail 100 x 100 x 3 mm, incl. 2 chemical anchors	01189499	1.4571	8.15
Upper holder 90°, additional holder for supporting the top end of the guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	01108430	1.4571	7.35
Upper holder 45°/60°/75°, additional holder for supporting the top end of the guide rail 100 x 100 x 5 mm, incl. 2 chemical anchors	01108432	1.4571	8.15
<b>Insert sleeve</b>			
Insert sleeve for guide rail 100 x 100 x 5 mm	11306485	PP	0.8

<sup>15)</sup> No diagonal struts required for shaft centreline heights of 2.2 m and 2.5 m

General arrangement drawing



Amaprop biogas mixer stand - Low position



Amaprop biogas mixer stand - High position

Amaprop biogas mixer stand - High position

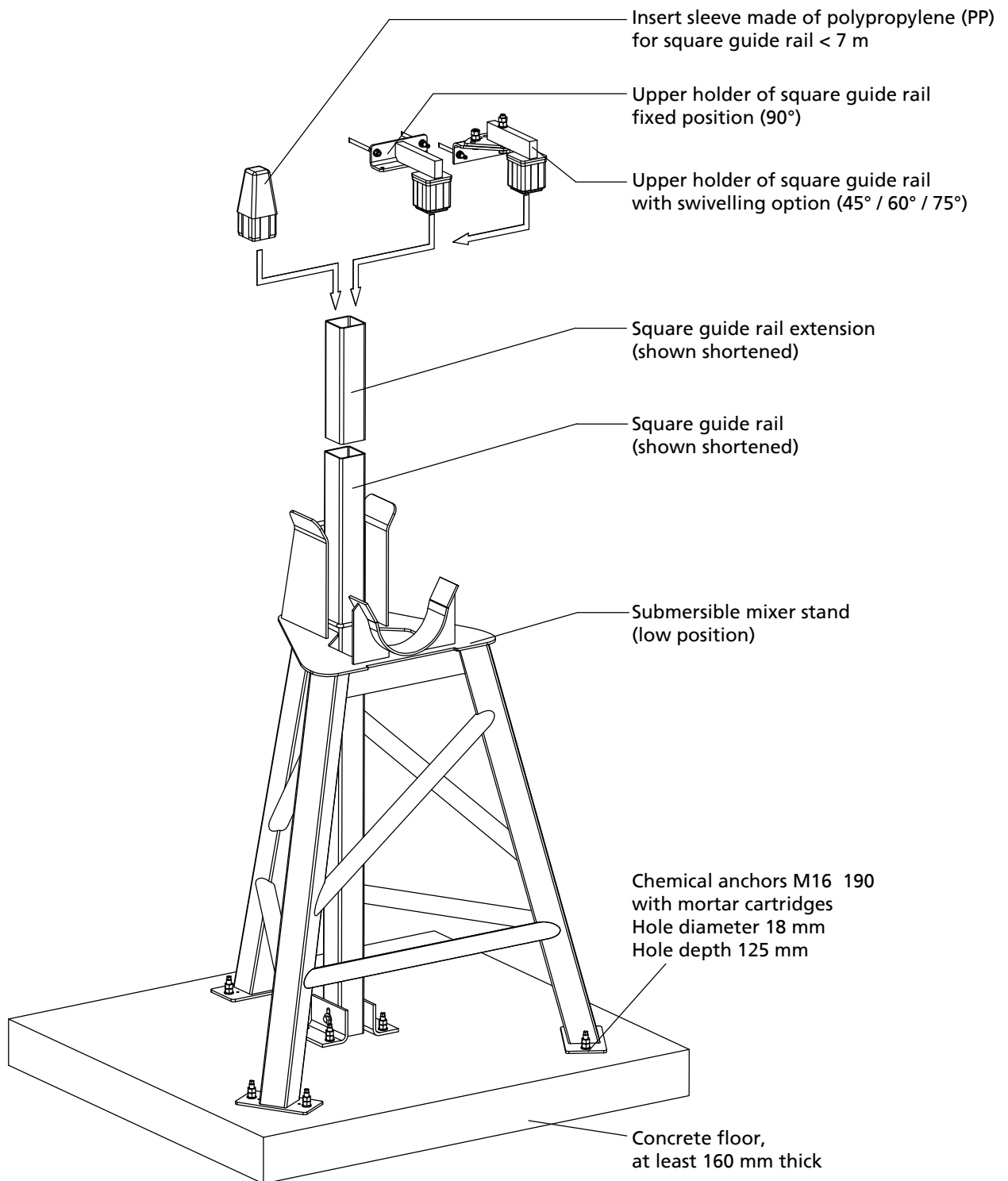
H	H <sub>1</sub>	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3450	2200	604	696	1300	755	781	1536	1500	1770	635	3615
3750	2500	644	777	1420	795	862	1656	1640	1910	935	3615
4250	3000	711	911	1621	862	996	1857	1872	2142	1435	3615
4350	3100	724	937	1662	875	1022	1898	1918	2188	1535	3615
4450	3200	738	964	1702	889	1049	1938	1965	2235	1635	3615
4550	3300	751	991	1742	902	1076	1978	2011	2281	1735	3615
4650	3400	764	1018	1782	915	1103	2018	2057	2327	1835	3615
4750	3500	778	1045	1822	929	1130	2058	2104	2374	1935	3615
4850	3600	791	1071	1863	942	1156	2099	2150	2420	2035	3615
4950	3700	805	1098	1903	956	1183	2139	2197	2467	2135	3615



H	H <sub>1</sub>	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
5000	3750	811	1112	1923	962	1197	2159	2220	2490	2185	3615
5050	3800	818	1125	1943	969	1210	2179	2243	2513	2235	3615
5150	3900	831	1152	1983	982	1237	2219	2289	2559	2335	3615
5250	4000	845	1179	2023	996	1264	2259	2336	2606	2435	3615
5350	4100	858	1205	2064	1009	1290	2300	2382	2652	2535	3615
5450	4200	872	1232	2104	1023	1317	2340	2429	2699	2635	3615
5550	4300	885	1259	2144	1036	1344	2380	2475	2745	2735	3615
5650	4400	898	1286	2184	1049	1371	2420	2521	2791	2835	3615
5750	4500	912	1313	2224	1063	1398	2460	2568	2838	2935	3615
5850	4600	925	1339	2265	1076	1424	2501	2614	2884	3035	3615
5950	4700	939	1366	2305	1090	1451	2541	2661	2931	3135	3615
6050	4800	952	1393	2345	1103	1478	2581	2707	2977	3235	3615
6150	4900	965	1420	2385	1116	1505	2621	2753	3023	3335	3615
6250	5000	979	1447	2425	1130	1532	2661	2800	3070	3435	3615
6350	5100	992	1473	2465	1143	1558	2701	2846	3116	3535	3615
6450	5200	1006	1500	2506	1157	1585	2742	2893	3163	3635	3615
6550	5300	1019	1527	2546	1170	1612	2782	2939	3209	3735	3615
6650	5400	1032	1554	2586	1183	1639	2822	2986	3256	3835	3615
6750	5500	1046	1580	2626	1197	1665	2862	3032	3302	3935	3615
6850	5600	1059	1607	2666	1210	1692	2902	3078	3348	4035	3615
6950	5700	1073	1634	2707	1224	1719	2943	3125	3395	4135	3615
7050	5800	1086	1661	2747	1237	1746	2983	3171	3441	4235	3615
7150	5900	1099	1688	2787	1250	1773	3023	3218	3488	4335	3615
7250	6000	1113	1714	2827	1264	1799	3063	3264	3534	4435	3615
7350	6100	1126	1741	2867	1277	1826	3103	3310	3580	4535	3615
7450	6200	1140	1768	2908	1291	1853	3144	3357	3627	4635	3615
7550	6300	1153	1795	2948	1304	1880	3184	3403	3673	4735	3615
7650	6400	1166	1822	2988	1317	1907	3224	3450	3720	4835	3615
7750	6500	1180	1848	3028	1331	1933	3264	3496	3766	4935	3615
7850	6600	1193	1875	3068	1344	1960	3304	3542	3812	5035	3615
7950	6700	1207	1902	3109	1358	1987	3345	3589	3859	5135	3615
8050	6800	1220	1929	3149	1371	2014	3385	3635	3905	5235	3615
8150	6900	1233	1956	3189	1384	2041	3425	3682	3952	5335	3615
8250	7000	1247	1982	3229	1398	2067	3465	3728	3998	5435	3615

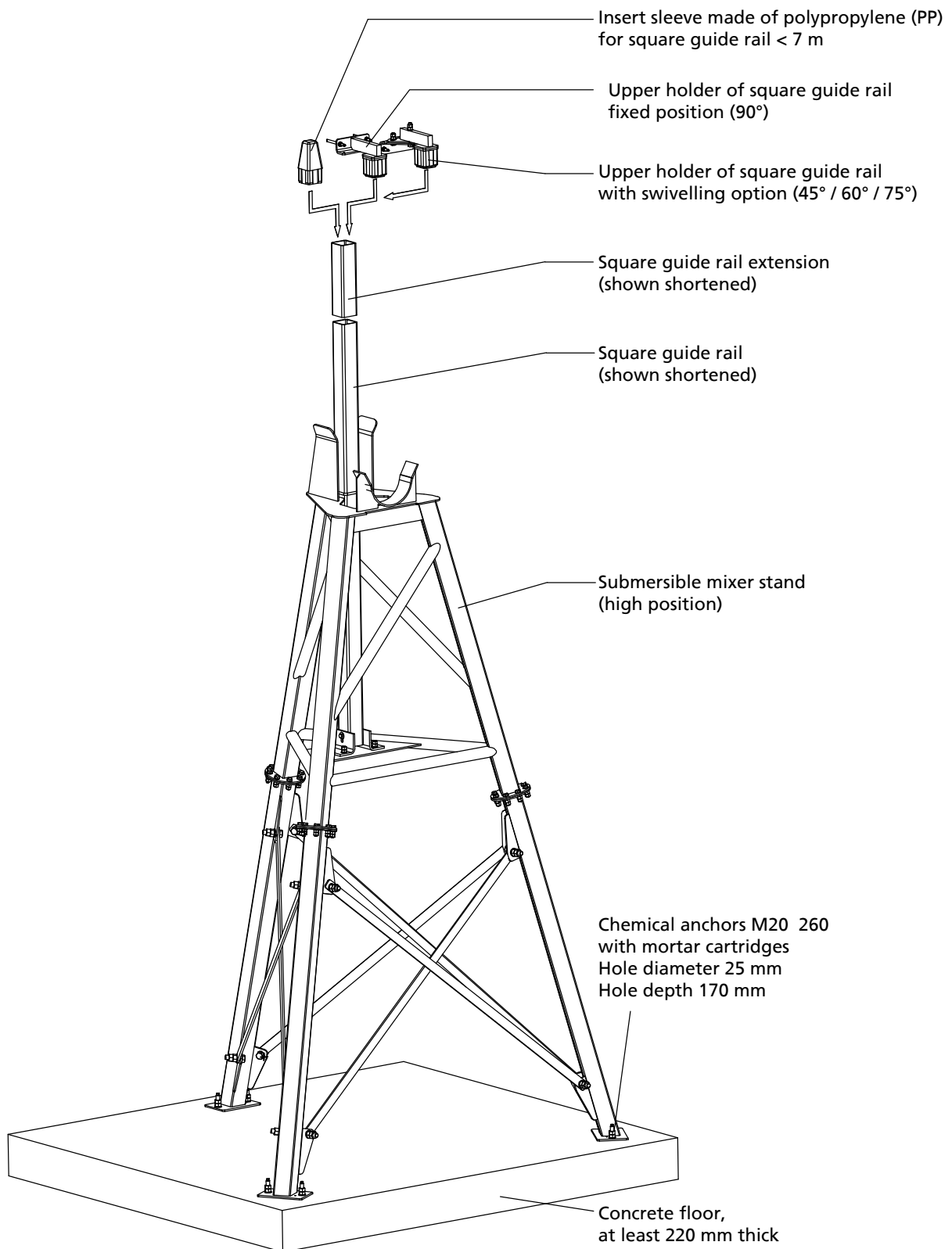
**General assembly drawing showing individual components**

**Biogas mixer stand - Low position**



Biogas mixer stand - Low position

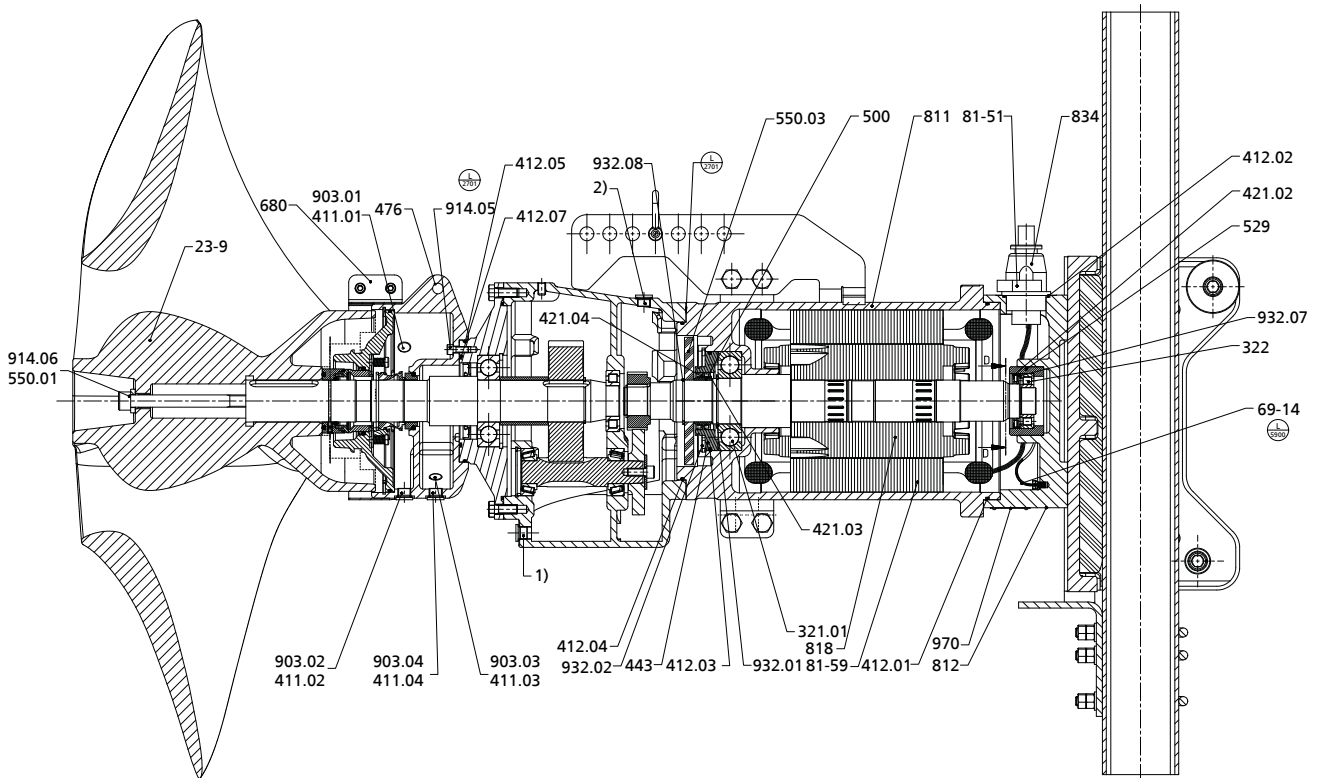
**Biogas mixer stand - High position**



**Biogas mixer stand - High position**

General assembly drawings with list of components

Amaprop J 1000



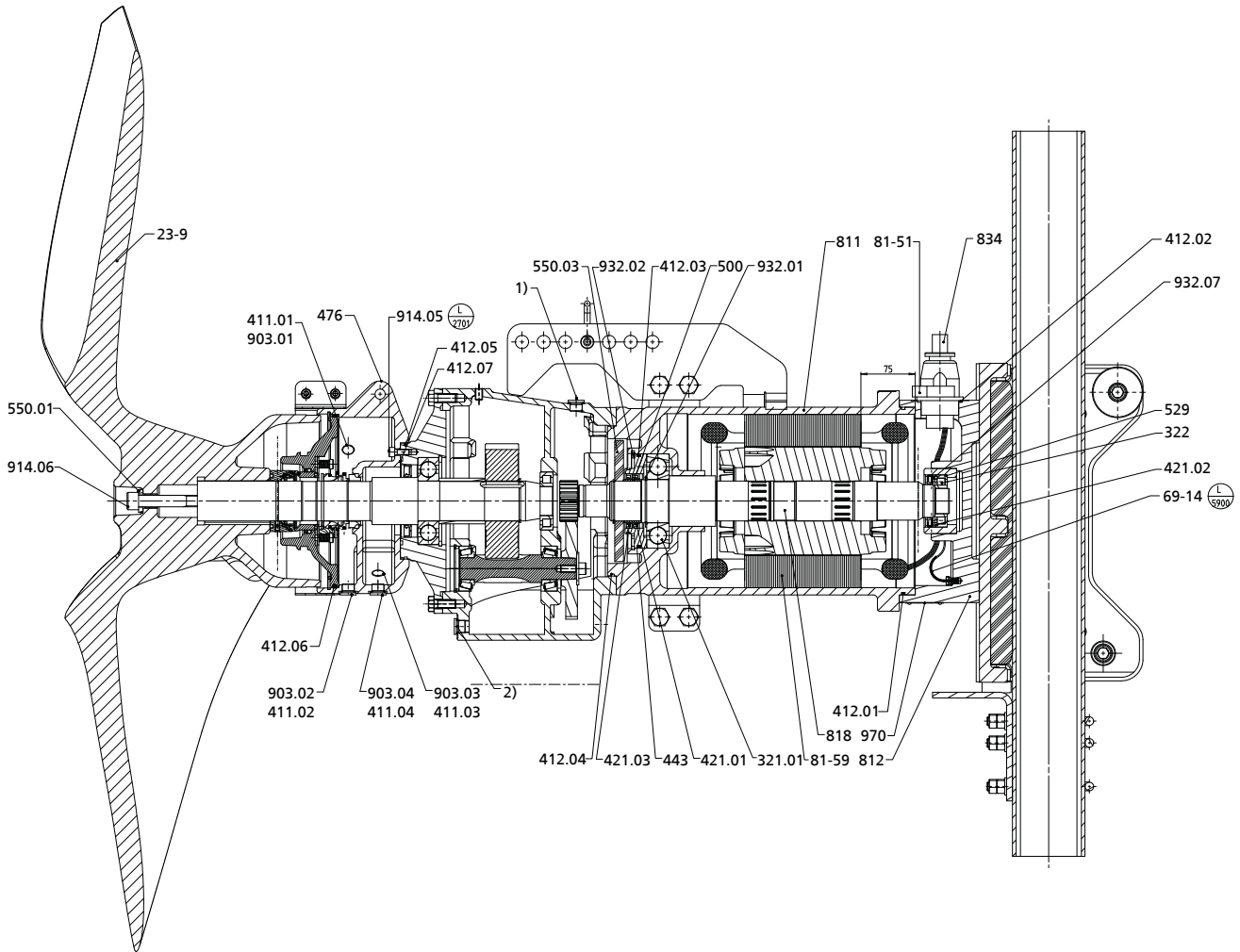
General assembly drawing of Amaprop J 1000

1)	Oil drain plug
2)	Oil filler plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	680	Guard
321.01	Radial ball bearing	81-51	Shim
322	Radial roller bearing	81-59	Stator
411.01/.02/.03/.04	Joint ring	811	Motor housing
412.01/.03/.04/.05/.07	O-ring	812	Motor housing cover
421.01/.02/.03/.04	Lip seal	818	Rotor
443	Seal insert	834	Cable gland
476	Mating ring carrier	903.01/.02/.03/.04	Screw plug
500	Ring	914.05/.06	Hexagon socket head cap screw
529	Bearing sleeve	932.01/.02/.07/.08	Circlip
550.01/.03	Disc	970	Label/plate
69-14	Leakage monitor		

**Amaprop J 1380**



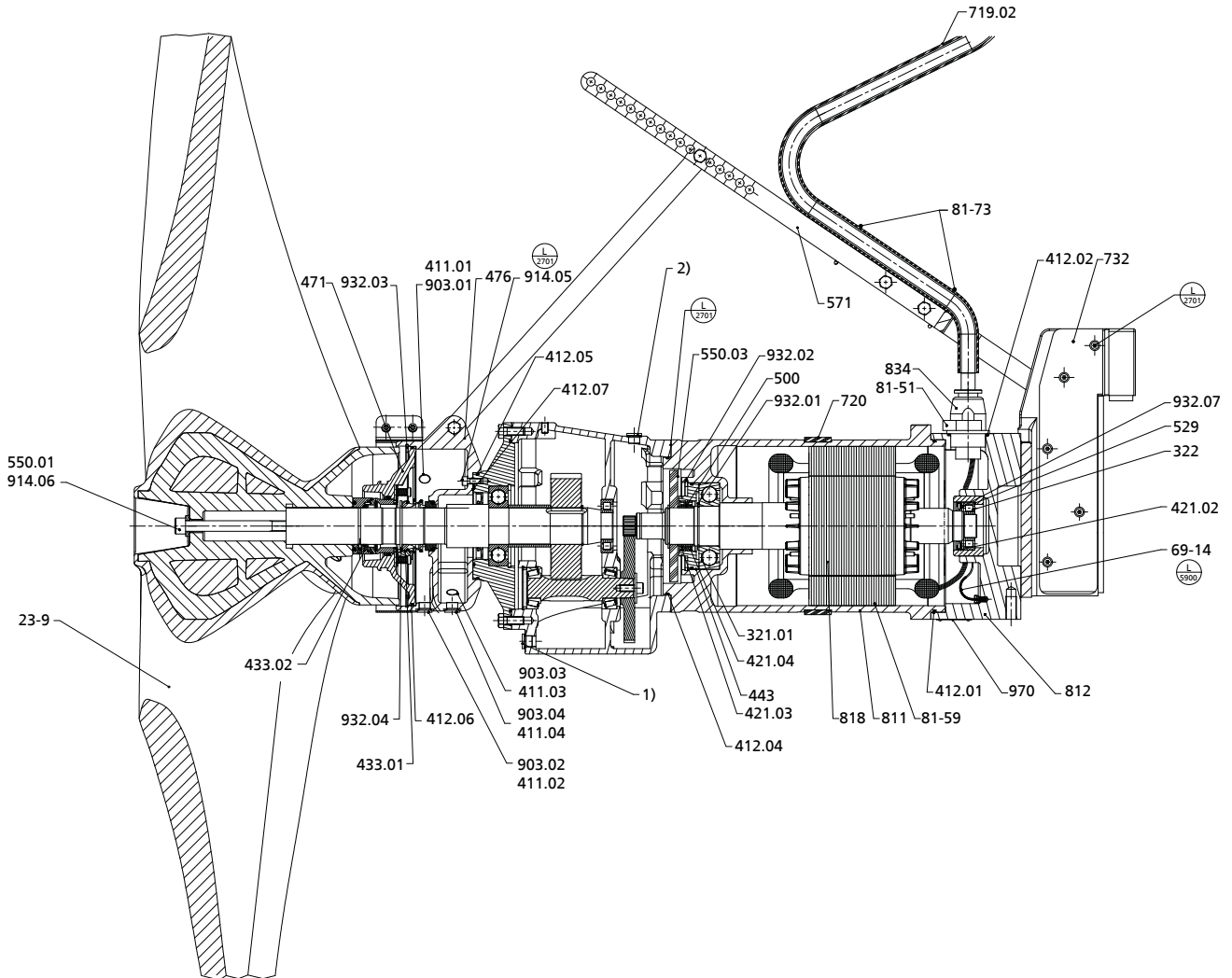
General assembly drawing of Amaprop J 1380

1)	Oil filler plug
2)	Oil drain plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	69-14	Leakage monitor
321.01	Radial ball bearing	81-51	Clamping element
322	Radial roller bearing	81-59	Stator
411.01/.02/.03/.04	Joint ring	811	Motor housing
412.01/.02/.03/.04/.05/.06/.07	O-ring	812	Motor housing cover
421.02/.03/.04	Lip seal	818	Rotor
443	Seal insert	834	Cable gland
476	Mating ring carrier	903.01/.02/.03/.04	Screw plug
500	Ring	932.01/.02/.07	Circlip
529	Bearing sleeve	914.06	Hexagon socket head cap screw
550.01/.03	Disc	970	Label/plate

Amaprop K 2500



General assembly drawing of Amaprop K 2500

1)	Oil drain plug
2)	Oil filler plug

List of components

Part No.	Description	Part No.	Description
23-9	Axial propeller	69-14	Leakage monitor
321.01	Radial ball bearing	719.02	Sheathing
322	Radial roller bearing	720	Fitting
411.01/02/03/04	Joint ring	732	Guide bracket
412.01/02/04/05/06/07	O-ring	81-51	Shim
421.02/03/04	Lip seal	81-59	Stator
433.01	Mechanical seal (gear side)	81-73	Cable support
433.02	Mechanical seal (propeller side)	811	Motor housing
443	Seal insert	812	Motor housing cover
471	Seal cover	818	Rotor
476	Mating ring carrier	834	Cable gland
500	Ring	903.01/02/03/04	Screw plug
529	Bearing sleeve	914.05/06	Hexagon socket head cap screw
550.01/03	Disc	932.01/02/03/04/07	Circlip
571	Lifting bail	970	Label/plate
680	Guard		

**Enquiry sheet**

To:  
KSB Aktiengesellschaft  
Turmstraße 92  
06110 Halle/Saale (Germany)  
Tel.: +49 345 4826-4648/4929  
Fax: +49 345 4826-5107

From:

Company name	
Contact person	
Street/number	
Post/zip code, city	
Country	
Telephone number	
Fax number	
E-mail	

Project name

Mains frequency:

- 50 Hz  
 60 Hz

Mains voltage:

U [V]	
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**Digestion process**

Type of digestion process

- Mesophilic/thermophilic  
 Substrate preparation  
 Wet digestion  
 Dry digestion  
 External hydrolysis stage  
 Other:

**Tank (round)**

Tank type:

- Main digester  
 Post-digester  
 Mixing tank (open/closed)  
 Digestate storage tank (open/closed)

Material:

- Concrete  
 Steel  
 Stainless steel  
 Steel, enamelled

Coating:

Explosion protection:

- Yes  
 No

Inside diameter:

D [ft]	
D [m]	

Tank height:

D [ft]	
H [m]	

Fill level:

H [ft]	
H [m]	

Fill volume:

V [ft <sup>3</sup> ]	
V [m <sup>3</sup> ]	

Expected dry solids content:

[%]	
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Temperature:

T [°F]	
T [°C]	

Fluctuating fill levels (from/to):

[ft]	
[m]	

Tank roof design:

- Concrete  
 Membrane

**Fluid**

Type of substrate input:

- Wet input
- Dry input

Type of fluid:

<input type="checkbox"/> Maize/corn silage	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Grass silage	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Rye (whole plant silage)	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Semi-liquid cattle manure	[ft <sup>3</sup> /d]	
	[m <sup>3</sup> /h]	
<input type="checkbox"/> Dry chicken manure	[cwt/d]	
	[t/d]	
<input type="checkbox"/> Semi-liquid pig manure	[ft <sup>3</sup> /d]	
	[m <sup>3</sup> /h]	
<input type="checkbox"/> Centrate	[ft <sup>3</sup> /d]	
	[m <sup>3</sup> /h]	
<input type="checkbox"/> Other:	[cwt/d]	
	[t/d]	
	[ft <sup>3</sup> /d]	
	[m <sup>3</sup> /h]	

Total dry solids content of substrates:

[%]	
-----	--

Other:








**KSB Aktiengesellschaft**

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