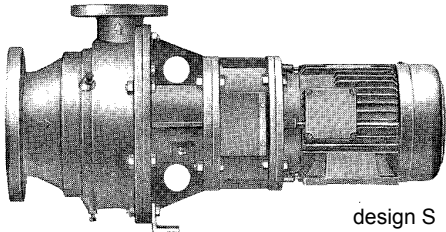
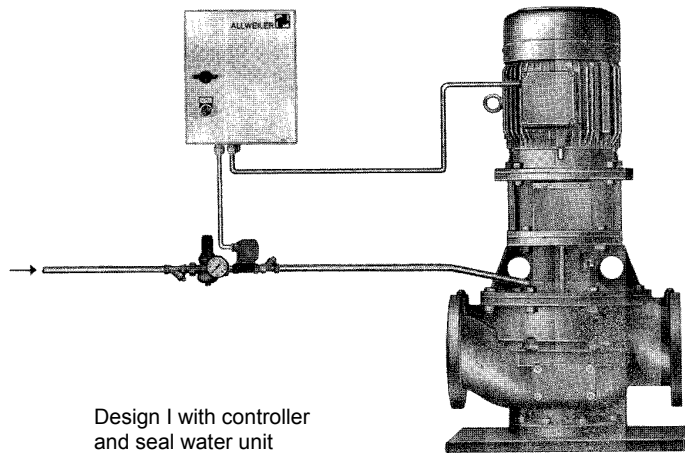


Macerators Series AM Design S and I



design S



Design I with controller and seal water unit

Usage

Macerators chop solids conveyed in liquids like wood, textiles, plastics, paper, rubber, bones, skins, glass etc. and make them pumpable. After treatment the solids have a grain size of approx. 3.5 mm and fibres a size of approx. 1,5 cm².

As metal parts and stones destroy the cutting tools of the impeller, a collecting tank should be installed in front of the macerator to separate them.

Main Application Fields

Preparation-, size reduction-, mixing- and process techniques as well as for the treatment of waste products in all branches of industry.

The macerator chops bulky and fibrous parts thus

avoiding clogging of pipings, fittings and pumps.

Pipings and fittings with smaller diameters may be used, the size of which is only determined by the medium quantity to be pumped.

Further important applications are to be found in domestic- and industrial sewage treatment plants, where sludge treatment and processing of the most different kinds are effected. With all treatments it turned out to be economical to chop the accumulating solids before further treatment. Besides the above advantage the following reasons speak for it:

Excessive wear of the pumps' delivery elements, decanters and centrifuges does not occur any more.

Thickened sludge without coarse solids may be dewatered without much problems.

The chopped parts have bigger surfaces. By this a more thorough and quicker putrefaction process is reached.

Dry sludge in granulated form may be transported and scattered more easily.

Further Application Fields

Food industry, fish treatment, tinneries, meat factories, fruit-vegetable- and meat treatment.

Chemical-, petro-chemical- and pharmaceutical industry, paper- and cellulose industry.

Factories for animal aliments, tanyards, slaughter houses, animal utilizing plants.

Shopping centres, restaurants, hotels, super markets, canteens, big kitchens, barracks, river-, coasting- and sea navigation.

} Process technic and waste treatment
 } Preparation and size reduction technic
 } Process technic and waste treatment
 } Waste treatment

Design and Functioning

Macerators of series AM are supplied in two designs

Design S

For lateral installation to a collection tank or basin. Macerators of this design work as disintegrator pump with a delivery head of 3 m and thus automatically lead back the chopped particles into the main flow.

Design I

For direct installation into the piping. With this design the macerator must be topped by a helical rotor pump sucking the solids through the macerator and pumping it into the plant for further treatment.

The macerator casing is connected to the drive motor by means of a bearing casing and coupling casing. A cutting ring is fixed in the macerator casing in which the impeller equipped with exchangeable blades turns. The solids floating in the delivery medium are seized by the impeller, flung against the cutting ring and crushed into smallest particles.

The four exchangeable highly wear resistant blades of the impeller have symmetrical cutting edges and therefore adapt with every sense of rotation of the motor. Alteration of the sense of rotation with every motor switching increases considerably lifetime of the cutting tools.

The drive- and bearing unit (including impeller and cutting ring) may be easily dismantled towards the drive side. During this procedure the macerator casing may remain in the piping.

Branch Positions

Design S suction branch: axial
 delivery branch: standard, radially upwards acc. to hole arrangement each to be turned by 45°

Design I Inlet- and outlet branch: same nominal widths opposite in line

Flanges

with both designs: Connection dimensions acc. to DIN 2501, PN 10 or acc. to ANSI B 16.1 Class 125

Shaft Sealing

By means of maintenance free mechanical seal with highly wear resistant hard metal seal rings and rubber bellow secondary gasket.

Materials:

rotary seal ring	silicon carbide
stationary seal ring	silicon carbide
bellow	Perbunan
O-ring	Perbunan
metal parts	stainless steel



The mechanical seal must be quenched with seal water. The least pressure of the sealing water should be 0.5...2 bar above the system pressure.

Against surcharge a sealing water supply unit may be supplied.

Bearing

In generously dimensioned cylindrical roller bearings acc. to DIN 5412. Appearing axial loads are absorbed by means of a grooved ball bearing (DIN 625). All bearings are grease lubricated.

Shaft Coupling

Flexible shaft coupling acc. to DIN 740 with integrated break off ring.

Connections

With both series the following connections are always provided:

- E1 venting
- M1 Pressure gauge
- S1 external sealing water for shaft sealing

Drive

Surface cooled threephase A.C. motors, design V1 (with macerator design I) and B3/B5 (with macerator design S), enclosure IP 55 acc. to IEC standards, insulation class B, capacities and main dimensions acc. to DIN 42677.

Technical Data

Design S

macerator type	max. throughput sludge with 3% d.s. m ³ /h ⊕	speed 1/min	drive capacity kW	delivery head m	weight approx.kg
AM 10 S-1	10	1500	4.0	3.0	124
AM 20 S-1	20	1500	5.5		149
AM 40 S-1	40	1000	7.5		277
AM 80 S-1	80	1000	11.0		300

permissible negative pressure 0.9 bar
 permissible internal pressure 10 bar
 permissible temperature of medium to be pumped 80°C ⊕

Design I

macerator type	max. throughput sludge with 3% d.s. m ³ /h ⊕	speed 1/min	drive capacity kW	weight approx. kg
AM 10 I-1	10	1500	4.0	191
AM 20 I-1	20	1500	5.5	216
AM 40 I-1	40	1000	7.5	352
AM 80 I-1	80	1000	11.0	376
AM 120 I-1	120	750	15.0	656
AM 160 I-1	160	750	18.5	738

permissible negative pressure 0.9 bar
 permissible internal pressure 10 bar
 permissible temperature of medium to be pumped 80°C ⊕

Exchangeability of Components

The diagram on the opposite page shows the combination possibilities of components with the different AM..S- and AM..I types. Consistent practice of the unit assembly system enables an easy and priceworthy spare part keeping.

Materials

Denomination	Part No.	Material Design W1
bearing casing	105	GG-20 (c.i.)
shaft	113	1.4034
mechanical seal casing	204	1.4021
mechanical seal casing cover	207	1.4021
Impeller complete	403	1.4312 with stellite segments
pressure ring	408	1.0112
cutting ring	409	1.2601
cutting ring bearing	410	Perbunan
macerator casing	502	GG-20 (c.i.)

Accessories

The following will be supplied against surcharge:

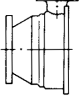
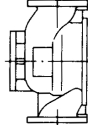













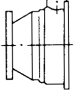
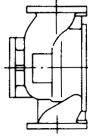



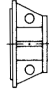






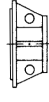


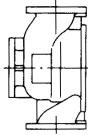



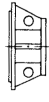






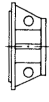


- 1 Seal water supply unit for shaft sealing, consisting of flap, pressure reducer and gauge, magnetic valve, nonreturn valve and complete piping.
- 1 Macerator control unit for the seal water unit and the automatic change of the sense of rotation.
 The automatic change of the sense of rotation is activated at each start and after.

Further information can be found on the backside of this brochure and in our brochure VM 770.0002 - Ident-No. 151003.

⊕ Designs for higher temperatures upon request

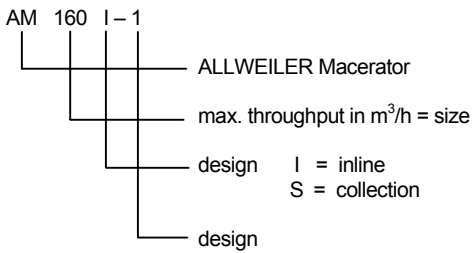
⊕ With sludge of 3-8% dry substance throughput is reduced by half.

Diagram-Combination of Components

size	macerator casing		impeller ①	cutting ring ①	mechanical seal casing and mechanical seal casing cover ①	bearing casing ①	shaft ①	coupling casing ①
	design S	design I						
10				 200				
20				 200				
40				 300				
80				 300				
120	-			 400				
160				 400				

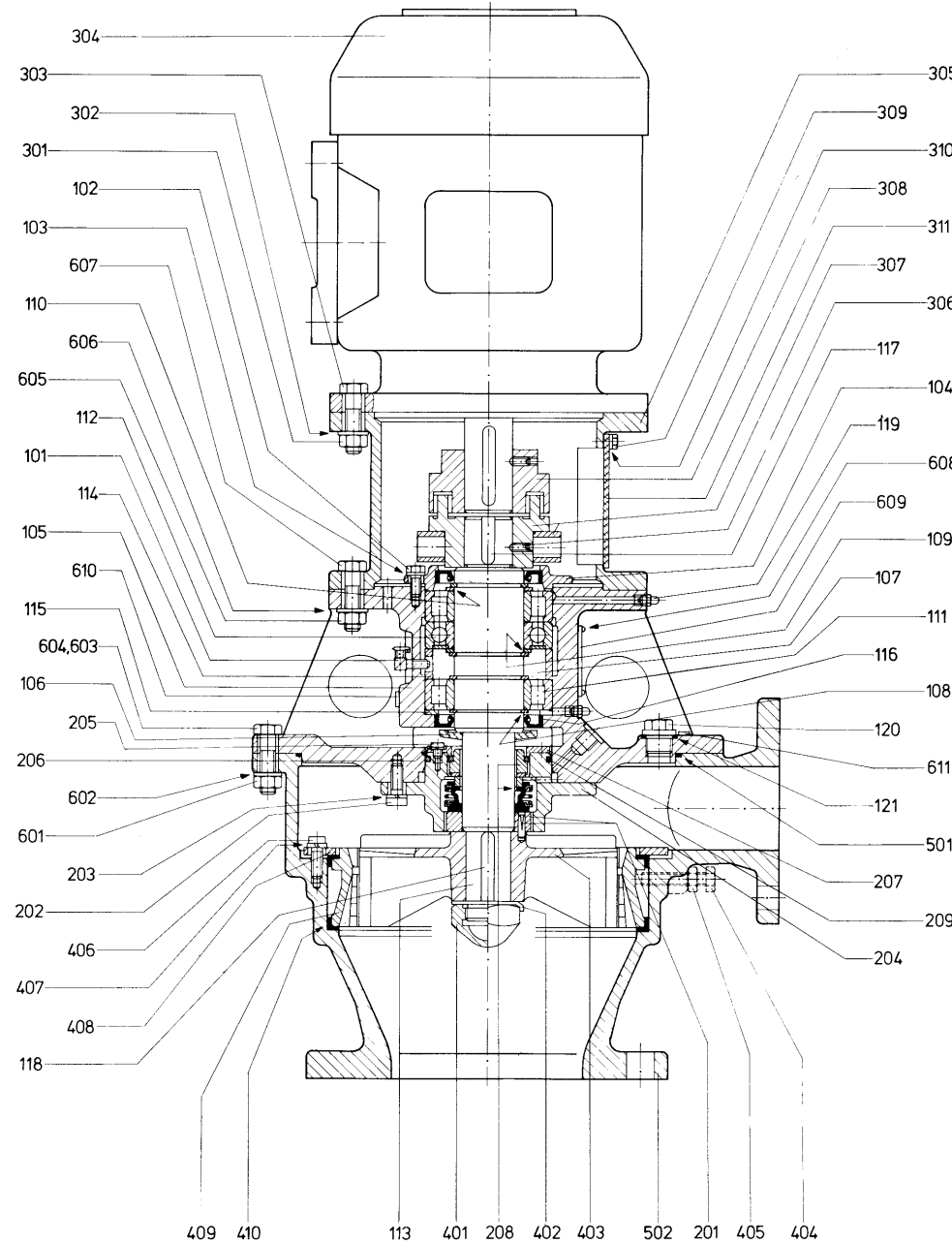
① components same for both designs

Abbreviation System of a Macerator





Sectional Drawing
AM..S-1 with drive motor

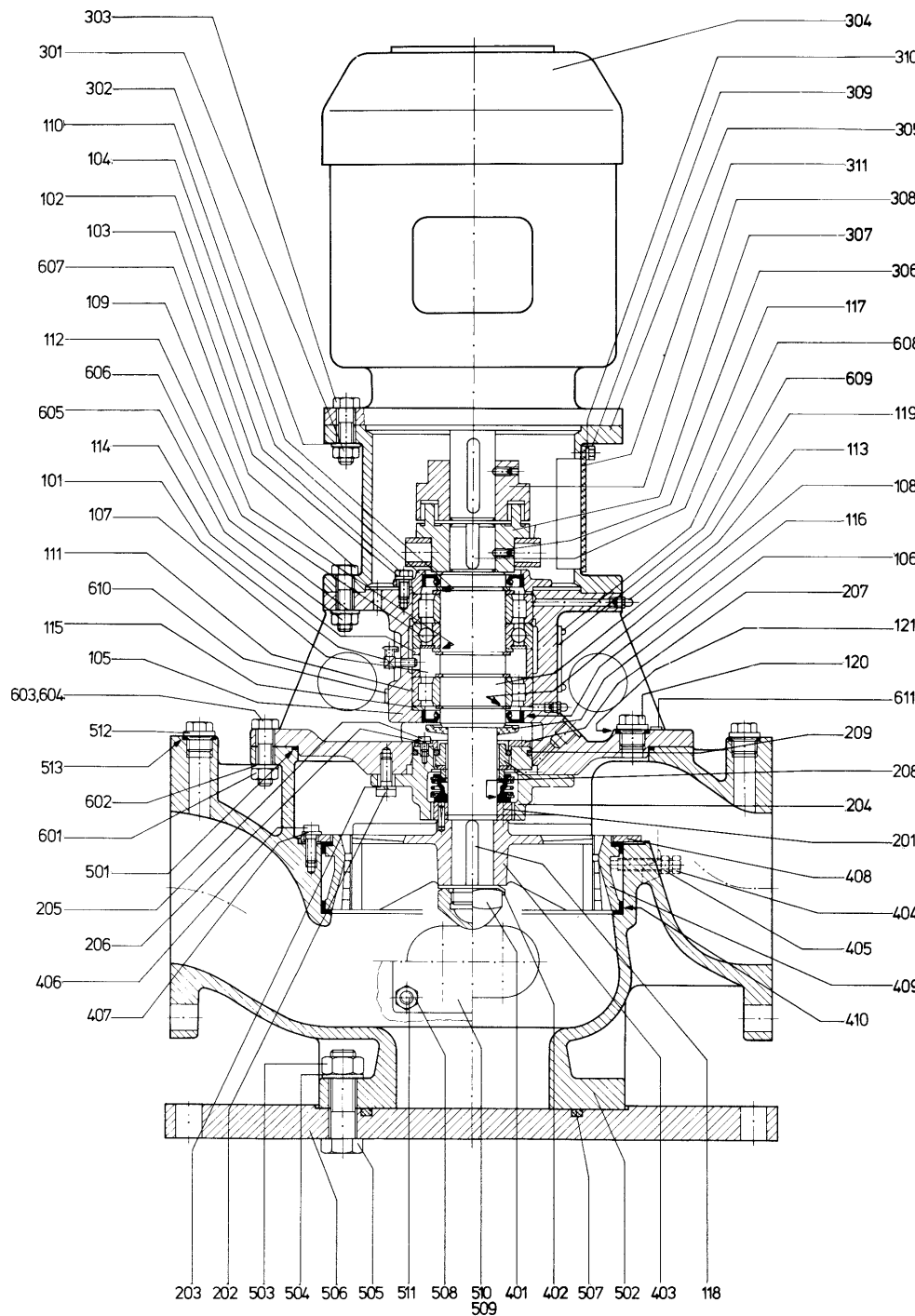


Denomination	Part No.
grease quantity control	101
hexagonal screw	102
serrated lock washer	103
bearing cover	104
bearing casing	105
splash ring	106
grease	107
circlip	108
support disc	109
key	110
cylindrical roller bearing	111
grooved ball bearing	112
shaft	113
distance ring	114
support disc	115
radial seal ring	116
key	117
key	118
lubricating nipple	119
threaded plug	120
joint washer	121
distance ring with grooved pin	201
socket head cap screw	202
spring washer	203
mechanical seal casing	204
socket head cap screw	205
spring washer	206
mechanical seal casing cover	207
mechanical seal	208
O-ring	209
hexagonal nut	301
serrated lock washer	302
hexagonal screw	303
motor	304
coupling casing	305
stud	306
coupling half complete	307 ②
coupling half	308
hexagonal screw	309
tension sheet	310
sealing plate	311
shaft nut	401
locking plate	402
impeller complete	403 ①
hexagonal screw	404
hexagonal nut	405
socket head cap screw	406
spring washer	407
pressure ring	408
cutting ring	409
cutting ring bearing	410
O-ring	501
macerator casing	502
hexagonal nut	601
serrated lock washer	602
hexagonal screw	603
stud	604
hexagonal nut	605
serrated lock washer	606
hexagonal screw	607
grooved stud	608
name plate	609
information sign	610
information sign	611

- ① consisting of: impeller with for soldered-in segmental rings which, when worn can be turned
- ② consisting of: coupling half and break-off ring



Sectional Drawing
AM..I-1 with drive motor

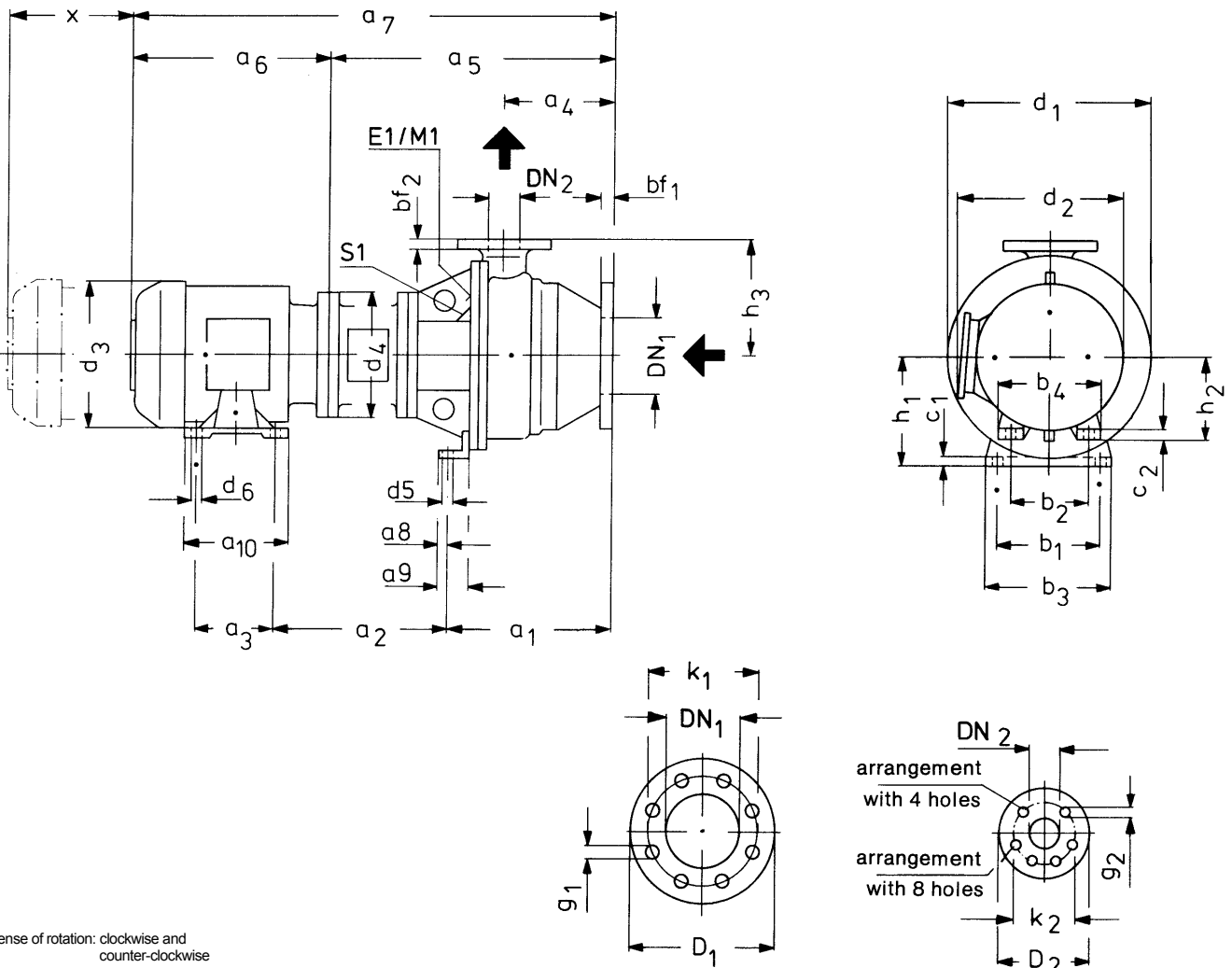


Denomination	Part No.
grease quantity control	101
hexagonal screw	102
serrated lock washer	103
bearing cover	104
bearing casing	105
splash ring	106
grease filling	107
circlip	108
support disc	109
key	110
cylindrical roller bearing	111
grooved ball bearing	112
shaft	113
distance ring	114
support disc	115
radial seal ring	116
key	117
key	118
lubricating nipple	119
threaded plug	120
joint washer	121
distance ring with grooved pin	201
socket head cap screw	202
spring washer	203
mechanical seal casing	204
socket head cap screw	205
spring washer	206
mechanical seal cover	207
mechanical seal	208
O-ring	209
hexagonal nut	301
serrated lock washer	302
hexagonal screw	303
motor	304
coupling casing	305
stud	306
coupling half complete	307 ②
coupling half	308
hexagonal screw	309
tension sheet	310
sealing plate	311
shaft nut	401
locking plate	402
impeller complete	403 ①
hexagonal screw	404
hexagonal nut	405
socket head cap screw	406
spring washer	407
pressure ring	408
cutting ring	409
cutting ring bearing	410
O-ring	501
macerator casing	502
hexagonal nut	503
serrated lock washer	504
hexagonal screw	505
foundation plate	506
O-ring	507
hexagonal nut	508
handhole cover	509
handhole gasket	510
stud	511
threaded-plug	512
joint washer	513
hexagonal nut	601
serrated lock washer	602
hexagonal screw	603
stud	604
hexagonal nut	605
serrated lock washer	606
hexagonal screw	607
grooved stud	608
name plate	609
information sign	610
information sign	611

- ① consisting of: impeller with for soldered-in segmental rings which, when worn can be turned
- ② consisting of: coupling half and break-off ring

Data Sheet / Unit Dimensions

AM..S-1 with drive motor



Sense of rotation: clockwise and counter-clockwise

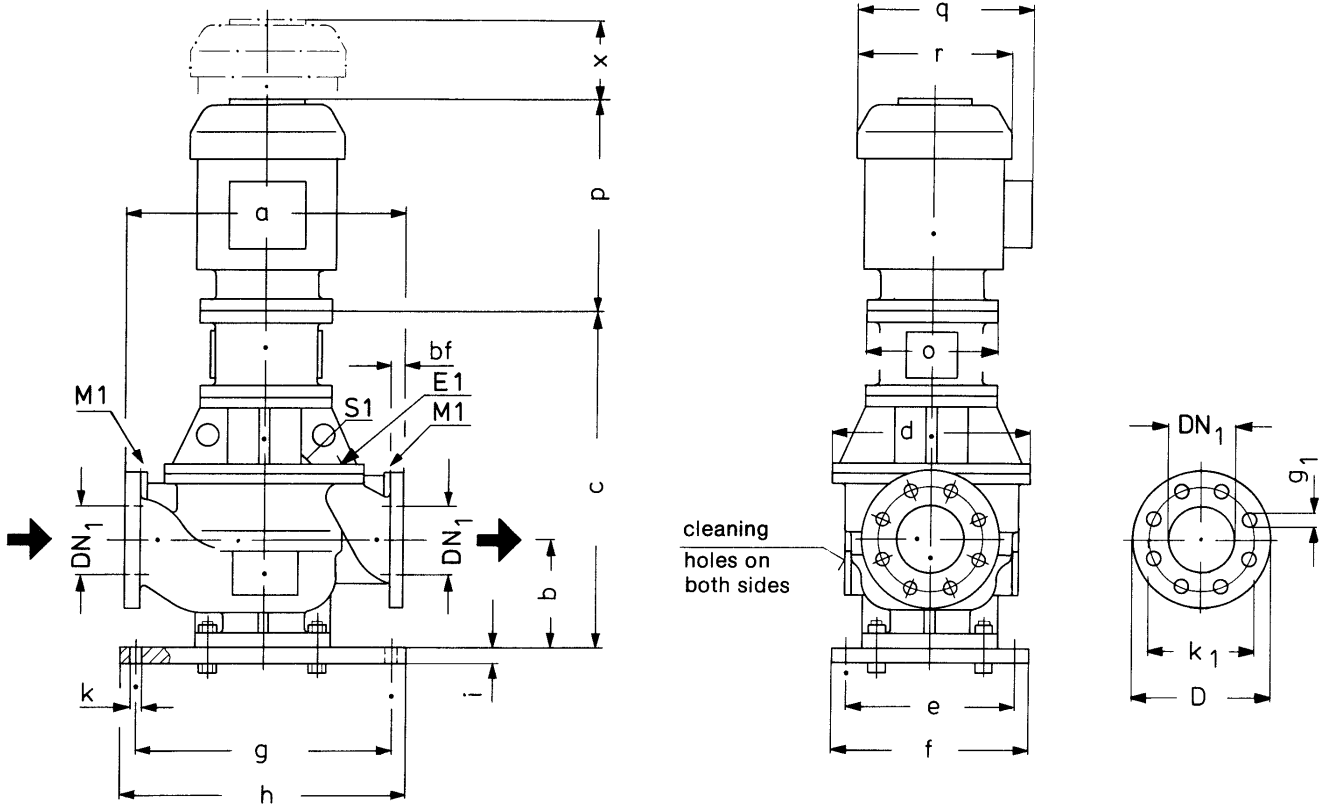
Dimensions in mm alterations reserved

macerator type	cutting ring Ø mm	max. throughput sludge with 3% d.s. m ³ /h	motor			flanges											
			size	nominal capacity kW	speed 1/min	connection dimensions acc. to DIN 2501, PN 10											
						DN ₁	D ₁	bf ₁	k ₁	g ₁	number of holes	DN ₂	D ₂	bf ₂	k ₂	g ₂	number of holes
AM 10 S-1	200	10	112 M	4,0	1500	150	282	26	240	22	8	65	185	20	145	18	4
AM 20 S-1	200	20	132 S	5,5	1500	150	282	26	240	22	8	65	185	20	145	18	4
AM 40 S-1	300	40	160 M	7,5	1000	200	343	29	295	22	8	80	196	22	160	18	8
AM 80 S-1	300	80	160 L	11,0	1000	200	343	29	295	22	8	80	196	22	160	18	8

macerator type	flanges												unit dimensions						
	connection dimensions acc. to ANSI B 16.1 class 125																		
	DN ₁	D ₁	bf ₁	k ₁	g ₁	number of holes	DN ₂	D ₂	bf ₂	k ₂	g ₂	number of holes	a ₁	a ₂	a ₃	a ₄	a ₅	a ₆	a ₇
AM 10 S-1	6"	282	26	241	22	8	2 1/2"	185	20	140	19	4	300	275	140	210	505	319	824
AM 20 S-1	6"	282	26	241	22	8	2 1/2"	185	20	140	19	4	300	314	140	210	525	362	887
AM 40 S-1	8"	343	29	299	22	8	3"	196	22	152	19	4	385	391	210	278	668	473	1141
AM 80 S-1	8"	343	29	299	22	8	3"	196	22	152	19	4	385	391	254	278	668	517	1185

macerator type	unit dimensions																		extens. measurement x	connections	
	a ₈	a ₉	a ₁₀	b ₁	b ₂	b ₃	b ₄	c ₁	c ₂	d ₁	d ₂	d ₃	d ₄	d ₅	d ₆	h ₁	h ₂	h ₃		venting/ pressure gauge E1/M1	external flushing S1
AM 10 S-1	20	50	180	210	190	270	225	8	15	370	286	222	250	13	13	197	112	220	300	G1/4"	G1/4"
AM 20 S-1	20	50	180	210	216	270	250	8	15	370	350	265	300	13	13	197	132	220	300	G1/4"	G1/4"
AM 40 S-1	30	65	260	280	254	340	320	8	21	500	400	323	350	13	15	260	160	295	400	G1/4"	G1/4"
AM 80 S-1	30	65	304	280	254	340	320	8	21	500	400	323	350	13	15	260	160	295	400	G1/4"	G1/4"

Data Sheet / Unit Dimensions
AM..I-1 with drive motor



Sense of rotation: clockwise and counter-clockwise

Dimensions in mm alterations reserved

macerator type	cutting ring ø mm	max. throughput sludge with 3% d.s. m³/h	motor			flanges											
			size	nominal capacity kW	speed 1/min	connect. dim. acc. to DIN 2501. PN 10						connect. dim. acc. to ANSI B 16.1 class 125					
						DN ₁	D	bf	k ₁	g ₁	number of holes	DN ₁	D	bf	k ₁	g ₁	number of holes
AM 10 I-1	200	10	112 M	4,0	1500	125	254	26	210	18	8	5"	254	26	216	22	8
AM 20 I-1	200	20	132 S	5,5	1500	125	254	26	210	18	8	5"	254	26	216	22	8
AM 40 I-1	300	40	160 M	7,5	1000	150	285	26	240	22	8	6"	285	26	241	22	8
AM 80 I-1	300	80	160 L	11,0	1000	150	285	26	240	22	8	6"	285	26	241	22	8
AM 120 I-1	400	120	200 L	15,0	750	200	343	29	295	22	8	8"	343	29	299	22	8
AM 160 I-1	400	160	225 S	18,5	750	200	343	29	295	22	8	8"	343	29	299	22	8

macerator type	unit dimensions															extension measurement x	connections		
	a	b	c	d	e	f	g	h	i	k	o	p	q	r	pressure gauge M1		venting E1	external flushing S1	
AM 10 I-1	500	182	550	370	310	350	470	510	23,5	22	250	319	286	222	300	G1/2"	G1/4"	G1/4"	
AM 20 I-1	500	182	570	370	310	350	470	510	23,5	22	300	362	350	265	300	G1/2"	G1/4"	G1/4"	
AM 40 I-1	700	200	671	500	310	350	470	510	23,5	22	350	473	400	323	400	G1/2"	G1/4"	G1/4"	
AM 80 I-1	700	200	671	500	310	350	470	510	23,5	22	350	517	400	323	400	G1/2"	G1/4"	G1/4"	
AM 120 I-1	840	235	775	610	310	350	470	510	23,5	22	400	640	531	413	500	G1/2"	G1/4"	G1/4"	
AM 160 I-1	840	235	805	610	310	350	470	510	23,5	22	450	660	585	460	500	G1/2"	G1/4"	G1/4"	

Macerator Control Device

Tasks of the control device

1. Control of the seal water supply unit for the shaft sealing.
2. Automatic change of the sense of rotation with every start in order to increase the service life of the cutting tools or after reaction of the overload protection to prevent clogging.
3. Control of the safety device of a stand-by pump to be put in operation if necessary.

Functional Characteristic

The macerator control is activated via a start/stop switch. After the release signal (e.g. external pressure or level switch or push button control) the solenoid valve of the seal water unit opens and the mechanical seal is flushed with sealing liquid. After 30 s., macerator and pump are switched on automatically.

After switch-off, macerator and pump stop working immediately while seal water unit shut-off with a delay of 30 s. With every new start, the sense of rotation of the macerator is altered automatically.

To prevent clogging, the macerator control monitors the motor current. When the current limit is exceeded, the contactors are activated and the sense of rotation is changed. If the current remains above the limit, the sense of rotation is changed again. This procedure will be repeated up to 4 times. If the current is still above the limit, macerator and pump will be switched off.

Subject to technical alterations.



ALLWEILER GmbH
Werk Bottrop

Postfach 200123 · 46223 Bottrop
Kirchhellener Ring 77-79 · 46244 Bottrop
Germany

Tel. +49 (0)2045 966-60
Fax +49 (0)2045 966-679
E-Mail: service-ge@allweiler.de
Internet: <http://www.allweiler.com>

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