

# **LAMPIRAN A**

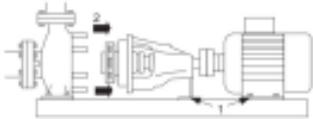
**DETAIL SPESIFIKSI, AKSESORIS, DAN  
PELENGKAP UNIT PENGOLAHAN AIR MINUM  
SUMBER AIR BAKU SUNGAI CIBANTEN KOTA  
SERANG**

## LAMPIRAN A

### SPEKIFIKASI AKSESORIS DAN PELENGKAP UNIT BANGUNAN

#### 4. INTAKE DAN BAR SCREEN

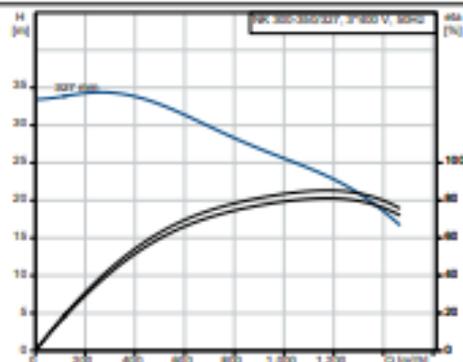
Menggunakan 4 unit pompa NK 300-350/327 AA1F2SBESBQQEWW3 untuk menuju ke aerasi

		Company name: Created by: Phone:
		Date: 22/08/2024
Qty.	Description	
1	<b>NK 300-350/327 AA1F2SBESBQQEWW3</b>    <p style="text-align: center;"><i>Note! Product picture may differ from actual product</i></p> <p>Product No.: On request</p> <p>Non-self-priming, single-stage, centrifugal pump designed according to ISO 5199 with dimensions and rated performance according to EN 733. Flanges are PN 16 with dimensions according to EN 1092-2. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipework.</p> <p>The unbalanced rubber bellows seal is according to DIN EN 12756.</p> <p>The pump is fitted with a foot-mounted, fan-cooled asynchronous motor. Pump and motor are mounted on a common base frame.</p> <p>The product's minimum efficiency index (MEI) is greater or equal to 0.70. This is by the Commission Regulation (EU) considered as an indicative benchmark for best-performing water pump available on the market as from 1 January 2013.</p> <p>Pump and motor are mounted on a common steel base frame in accordance with ISO 3661. The back pull-out design makes it possible to service the pump when the pump housing is still connected to the inlet and discharge pipes.</p> <ol style="list-style-type: none"> <li>1) Remove the bolts in the bearing bracket support foot and motor foot.</li> <li>2) Remove the bearing bracket and the motor from the pump housing.</li> </ol>  <p><b>Pump</b></p> <p>The pump is fitted with an unbalanced rubber bellows seal with torque transmission across the spring and around the bellows. Due to the bellows, the seal does not wear the shaft, and the axial movement is not prevented by deposits on the shaft.</p>  <p>Seal faces:</p> <ul style="list-style-type: none"> <li>• Rotating seal ring material: silicon carbide (SiC)</li> <li>• Stationary seat material: silicon carbide (SiC)</li> </ul> <p>This material pairing is used where higher corrosion resistance is required. The high hardness of this material pairing offers good resistance against abrasive particles.</p> <p>Secondary seal material: EPDM (ethylene-propylene rubber)</p> <p>EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.</p> <p>The shaft is made of stainless steel and has a diameter of 60 mm where the coupling is mounted.</p> <p>The pump uses a standard coupling between the pump and motor shaft.</p>	

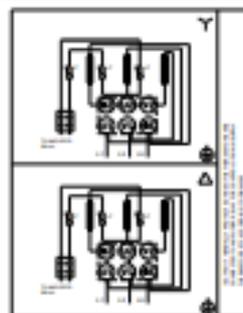
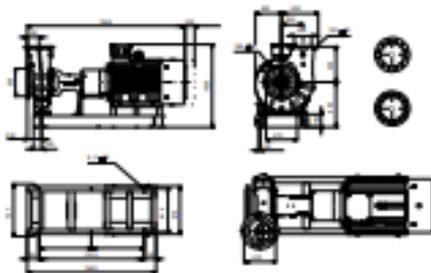
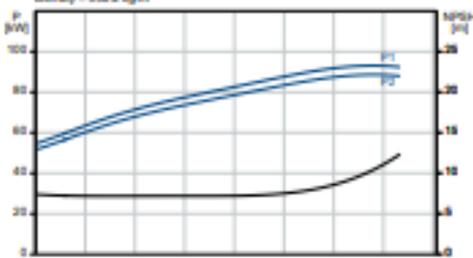
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1

Description	Value
<b>General information:</b>	
Product name:	NK 300-350/327 AA1F25BE5BQOEWW3
Product No:	On request
EAN number:	On request
Price:	
<b>Technical:</b>	
Pump speed on which pump data are based:	1485 rpm
Rated flow:	1172 m <sup>3</sup> /h
Pump with motor (Yes/No):	Y
Rated head:	23.22 m
Actual impeller diameter:	327 mm
Nominal impeller diameter:	350
Shaft diameter:	60 mm
Code for shaft seal:	BOQE
Mechanical seal type:	Single
Curve tolerance:	ISO9906:2012 2B
Pump version:	A1
Bearing design:	Standard
<b>Materials:</b>	
Pump housing:	Ductile iron
Pump housing:	EN 1563 EN-GJS-500-7
Pump housing:	ASTM 70-50-05
Impeller:	Stainless steel
Impeller:	EN 1.4308
Impeller:	ASTM A351 CF8
Internal pump house coating:	Painting
Material code:	5B
Code for rubber:	E
Shaft:	Steel
Shaft:	EN 1.0503/1.4301
Shaft:	AISI 1045/304
<b>Installation:</b>	
Maximum ambient temperature:	40 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1062-2
Type of inlet connection:	DIN
Type of outlet connection:	DIN
Size of inlet connection:	DN 350
Size of outlet connection:	DN 300
Pressure rating for connection:	PN 16
Coupling type:	Flexible w/o spacer
Base frame design:	C-channel
Code for base frame:	540
Grouting (Yes/No):	Y
Connect code:	F
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	-25 - 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m <sup>3</sup>
<b>Electrical data:</b>	
Motor type:	280M
Rated power - P2:	90 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-400/690-690 V
Rated current:	163-155/94-89,9 A



Pumped liquid = Water  
Liquid temperature during operation = 20 °C  
Density = 998.2 kg/m<sup>3</sup>





Company name:  
Created by:  
Phone:

Date: 22/08/2024

Description	Value
Starting current:	690 %
Cos phi - power factor:	0.88
Rated speed:	1485 rpm
IE efficiency:	IE395,2%
IE Efficiency class:	IE3
Motor efficiency at full load:	95.2 %
Motor efficiency at 3/4 load:	95.1 %
Motor efficiency at 1/2 load:	94.4 %
Number of poles:	4
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor No.:	92748768
Bearing insulation type N-end:	N
<b>Controls:</b>	
Frequency converter:	None
Pressure sensor:	N
<b>Others:</b>	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	1410 kg
Gross weight:	1510 kg
Shipping volume:	3.9 m <sup>3</sup>
Language on pump nameplate:	GB



- Menggunakan 1 unit blower Showfou Tipe RL-250 dengan daya 75,55 Kw

**COMPLETE SET ROOTS BLOWER INSTALLATION :**  
with standard accessories

■ **PRESSURE OPERATION (RLC · RWC)**

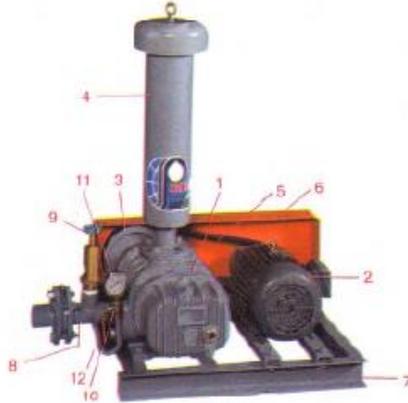


Fig 1

**STANDARD ACCESSORIES**

NO	NAME
1	BLOWER BODY
2	MOTOR
3	BLOWER PULLEY
4	SUCTION SILENCER SET (WITH AIR FILTER & COVER)
5	V-BELT
6	BELT COVER
7	BASE PLATE
8	T-TYPE REDUCER
9	PRESSURE SAFETY VALVE
10	BALL VALVE
11	PRESSURE GAUGE
12	GAUGE PIPE

TYPE	Bore inch(mm)	Revolutions rpm	1000mmAq 9.8kpa		2000mmAq 19.6kpa		3000mmAq 29.4kpa		4000mmAq 39.2kpa		5000mmAq 49.0kpa		6000mmAq 58.8kpa		7500mmAq 73.5kpa		9000mmAq 88.2kpa		
			m <sup>3</sup> /min	kw															
RL-125	5 (125)	600	11.0	3.3	10.1	3.0	9.3	2.8	8.5	2.6	7.7	2.4	6.9	2.2	6.1	1.9	5.3	1.7	4.5
		900	12.5	3.6	11.6	3.4	10.8	3.2	9.3	2.8	8.5	2.6	7.7	2.4	6.9	2.2	6.1	1.9	5.3
		1000	13.9	3.9	13.1	3.7	12.4	3.6	11.7	3.5	11.0	3.3	10.5	3.1	9.9	2.9	9.4	2.7	5.7
		1100	15.4	4.2	14.6	4.0	13.9	3.9	13.2	3.8	12.6	3.6	12.1	3.4	11.6	3.2	11.1	2.9	5.8
		1200	16.9	4.5	16.1	4.3	15.5	4.2	14.8	4.0	14.3	3.8	13.8	3.6	13.3	3.4	12.8	3.0	6.0
		1300	18.4	4.8	17.7	4.6	17.0	4.4	16.0	4.2	15.5	4.0	15.0	3.8	14.5	3.6	13.9	3.2	6.1
		1400	19.8	5.1	19.3	4.9	18.6	4.7	17.7	4.5	17.0	4.3	16.5	4.1	15.9	3.8	14.5	3.4	6.2
		1500	21.4	5.4	20.8	5.2	20.1	5.0	19.6	4.8	19.1	4.6	18.7	4.4	18.2	4.2	17.7	4.0	6.3
RL-150	6 (150)	800	17.0	5.1	16.0	4.8	15.1	4.6	14.0	4.3	13.4	4.1	12.7	3.9	12.3	3.7	11.8	3.5	6.4
		900	19.7	5.6	18.7	5.3	17.8	5.0	16.7	4.7	16.1	4.5	15.5	4.3	15.0	4.1	14.5	3.8	6.5
		1000	22.5	6.1	21.5	5.7	20.5	5.4	19.5	5.1	18.9	4.9	18.3	4.7	17.8	4.5	17.3	4.0	6.6
		1100	25.2	6.6	24.2	6.1	23.2	5.8	22.2	5.5	21.7	5.3	21.1	5.1	20.5	4.9	20.0	4.7	6.7
		1200	28.0	7.1	27.0	6.5	25.9	6.2	25.0	5.9	24.3	5.6	23.9	5.4	23.2	5.2	22.7	4.9	6.8
		1300	30.7	7.6	29.7	6.9	28.6	6.6	27.2	6.3	26.7	6.0	26.2	5.8	25.6	5.5	25.0	5.2	6.9
		1400	33.4	8.1	32.4	7.3	31.3	7.0	30.5	6.7	29.0	6.4	28.5	6.2	27.9	6.0	27.7	5.7	7.0
		1500	36.2	8.6	35.2	7.7	34.1	7.4	33.3	7.1	32.8	6.8	32.3	6.6	31.5	6.3	31.0	6.0	7.1
RL-200	8 (200)	100	25.2	7.6	24.3	7.3	23.2	7.0	22.5	6.7	21.8	6.4	21.1	6.1	20.5	5.9	19.9	5.6	7.2
		800	30.1	9.1	29.2	8.7	28.1	8.4	27.4	8.1	26.8	7.8	26.0	7.5	25.4	7.2	24.9	6.9	7.3
		900	35.1	10.6	34.2	10.2	33.1	9.9	32.4	9.6	31.8	9.3	31.1	9.0	30.5	8.7	30.0	8.4	7.4
		1000	40.0	12.1	39.1	11.7	38.0	11.4	37.4	11.1	36.8	10.8	36.6	10.6	36.0	10.3	35.2	10.0	7.5
		1100	45.0	13.6	44.1	13.2	43.0	13.0	42.4	12.7	41.8	12.4	41.4	12.2	40.7	11.9	40.1	11.6	7.6
		1200	50.0	15.1	49.0	14.7	48.0	14.5	47.4	14.2	46.8	14.0	46.2	13.8	45.6	13.5	45.0	13.2	7.7
		1300	55.0	16.6	54.0	16.2	53.0	16.0	52.4	15.7	51.8	15.5	51.0	15.2	50.5	14.9	50.0	14.6	7.8
		RL-250	10 (250)	100	40.2	12.1	47.7	14.1	46.0	13.8	44.3	13.5	43.0	13.2	41.7	12.9	41.4	12.7	40.0
800	56.4			16.3	54.7	16.2	53.1	15.9	51.4	15.6	49.9	15.3	48.3	15.0	47.2	14.7	46.3	14.4	8.0
900	63.5			18.6	61.8	18.3	60.2	18.0	58.5	17.7	57.1	17.4	55.6	17.1	54.4	16.8	53.6	16.5	8.1
1000	70.7			20.9	68.8	20.6	67.3	20.3	65.7	20.0	64.3	19.7	62.9	19.4	61.7	19.1	60.9	18.8	8.2
1100	77.8			23.2	75.9	22.9	74.4	22.6	72.8	22.3	71.5	22.0	70.2	21.7	68.9	21.4	68.2	21.1	8.3
1200	85.0			25.5	83.0	25.2	81.5	24.9	80.0	24.6	78.7	24.3	77.5	24.0	76.2	23.7	75.5	23.4	8.4
1300	92.1			27.8	90.0	27.5	88.6	27.2	87.1	26.9	85.9	26.6	84.7	26.3	83.4	26.0	82.8	25.7	8.5

- Menggunakan pompa aerasi menuju ke koagulasi dengan merk Bedu Pompa tipe Seri Haberman HPK head pompa 70 m

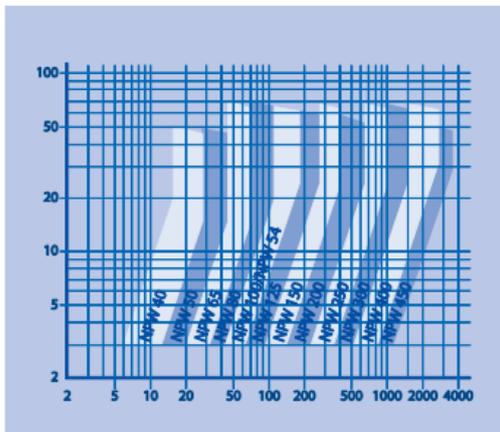


Die Pumpen sind mit leicht auswechselbaren Verschleißteilen und einer einfachen Nachstellmöglichkeit des Saugspaltes ausgestattet.

Die auswechselbaren Schleißplatten sind mit dem metallischen Außengehäuse verschraubt, der ebenfalls auswechselbare Panzerersatz ist lose eingelegt.



Schleißplatten in drei Auum-Polyurethanqualitäten



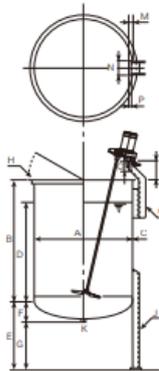
Leistungsbereich NPW	
Förderstrom bis	4600 (m <sup>3</sup> /h)
Förderhöhe, einstufig bis	70 (mF.S)
Pumpendrehzahl je nach Baugröße bis	2950 (min <sup>-1</sup> )
Anschlussnennweiten	DN 40 bis DN 450
Maximaler Betriebsdruck	6 bar
Temperatur der Förderflüssigkeit bis	130 [°C]
Normalsaugend bis	8 (m.W.S.)
Druckstufenstellung	stufenweise verdröhrbar
Hohe Korrosionsbeständigkeit bei pH	3 bis 14 abhängig vom Werkstoff

## 6. KOAGULASI

- Menggunakan bak tangki pembubuh koagulan dengan merk Satake Portable ZT Series model ZT-3000S dengan kedalaman 2,3 m.



Specification of optional tanks



Model	Available capacity		Tank dimension (mm)											Weight (kg)	
	l	l	A	B	C	D	E	F	G	H(SUS)	J(S)	K	Tank	Lid*	
ZTF-100	100	130	500	600	3	450	450	134	316	L25×25×3	3-4.50×50×6	1/2 B Socket	43	3	
ZTF-150	150	182	550	700	3	562	450	144	306	L30×30×3	3-4.50×50×6	1/2 B Socket	51	4	
ZTF-200	200	260	650	700	3	520	450	163	287	L30×30×3	3-4.50×50×6	1/2 B Socket	60	5.5	
ZTF-300	300	361	700	850	3	662	500	173	327	L40×40×3	4-4.50×50×6	1/2 B Socket	77	6.5	
ZTF-400	400	478	800	850	3	695	500	192	308	L40×40×3	4-4.50×50×6	1/2 B Socket	88	8	
ZTF-500	500	600	850	950	3	770	500	202	298	L40×40×3	4-4.65×65×6	1/2 B Socket	106	9	
ZTF-800	800	963	1000	1100	3	900	550	240	310	L40×40×5	4-4.100×50×5	1B Socket	155	12	
ZTF-1000	1000	1177	1100	1100	3	910	550	260	290	L40×40×5	4-4.100×50×5	1B Socket	170	19	
ZTF-1500	1500	1721	1250	1245	4	1065	600	290	310	L40×40×5	4-4.100×50×5	1B Socket	260	24	
ZTF-2000	2000	2275	1300	1550	4	1345	600	298	302	L50×50×6	4-4.125×65×6	1B Socket	325	26	
ZTF-2000S	2000	2273	1400	1300	4	1125	600	318	282	L50×50×6	4-4.125×65×6	1B Socket	325	30	
ZTF-2500	2500	3073	1500	1550	4	1230	700	370	330	L50×50×6	4-4.125×65×6	1B JIS 10KF	400	34	
ZTF-3000	3000	3603	1500	1550	4	1540	700	370	330	L50×50×6	4-4.125×65×6	1B JIS 10KF	448	34	
ZTF-3000S	3000	3521	1600	1550	4	1200	750	400	350	L50×50×6	4-4.125×65×6	1B JIS 10KF	422	38	
ZTF-3500	3500	4125	1600	1550	4	1540	700	400	360	L50×50×6	4-4.150×75×9	1B JIS 10KF	524	38	
ZTF-3500S	3500	4004	1700	1550	4	1330	800	430	370	L50×50×6	4-4.150×75×9	1B JIS 10KF	514	43	
ZTF-4000	4000	4685	1700	1950	4	1550	800	430	370	L65×65×6	4-4.150×75×9	1 1/2 B JIS 10KF	575	45	
ZTF-4000S	4000	4520	1800	1500	4	1345	800	450	350	L65×65×6	4-4.150×75×9	1 1/2 B JIS 10KF	550	50	
ZTF-4500	4500	5285	1800	1950	5	1542	800	450	350	L65×65×6	4-4.200×90×8	1 1/2 B JIS 10KF	750	50	
ZTF-5000	5000	5924	1900	1950	5	1530	900	500	460	L65×65×6	4-4.200×90×8	2B JIS 10KF	800	56	

\*The lids have a thickness of 1.5t for A dimension up to 1000, and 2.0t for A dimension above that.  
\*Jacket type is also available.

- Menggunakan motor pengaduk koagulan dengan merk Satake Portable A720 model A720-1.5B power 1,5 kW

SATAKE PORTABLE MIXER

A720, A725

Medium-speed type

Impeller speed 50Hz: 300min<sup>-1</sup> 60Hz: 360min<sup>-1</sup>

The A720 and A725 are compact and lightweight with integrated design of clamp and body. It has good mixing efficiency, high durability, and can be used in a wide range of fields.

This new type of mixer is ideal for general soluble liquid-liquid mixing, dilution, heat transfer, relatively soluble solid-liquid mixing, dispersion, prevent solids suspension, and uniform mixing.

Model Coding

**A720** **Q** - **0.2** **A** **I**

Options: 1: Impeller 2: PSE-compliant type

Type of motor:

- A: Single phase 100V, fully enclosed fan-cooled motor for indoor use
- B: Three phase 200V, fully enclosed fan-cooled motor for indoor use
- C: Three phase 200V, fully enclosed fan-cooled motor for outdoor use
- D: Three phase 200V, increased safety explosion proof motor for indoor use
- E: Three phase 200V, increased safety explosion proof motor for outdoor use
- F: Single phase 100V and 200V, fully enclosed fan-cooled motor for indoor use
- G: Single phase 100V and 200V, fully enclosed fan-cooled motor for outdoor use
- H: Single phase 100V and 200V, increased safety explosion proof motor for indoor use
- I: Single phase 100V and 200V, increased safety explosion proof motor for outdoor use

Power of motor: From 0.065kW to 1.5 kW

Number of poles: 2: 4P 3: 6P

SATAKE PORTABLE MIXER Medium speed type



BTFS300 Impeller \*option

PSE Impeller For Medium-speed type

A high-performance hydrofoil-type impeller with camber and ripple angle on the impeller blades. It creates the swirling flow, concentrates the flow in the axial direction and creates a high-speed axial flow.

The impeller blades are specially designed to open and close by centrifugal force. Since it is compact when not in use, allows it to pass through small openings.



The PSE-compliant type comes with an overload protection device, switch and power cord. See Page 18 for details.

Standard specification

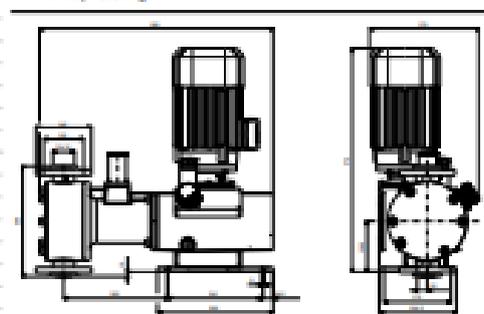
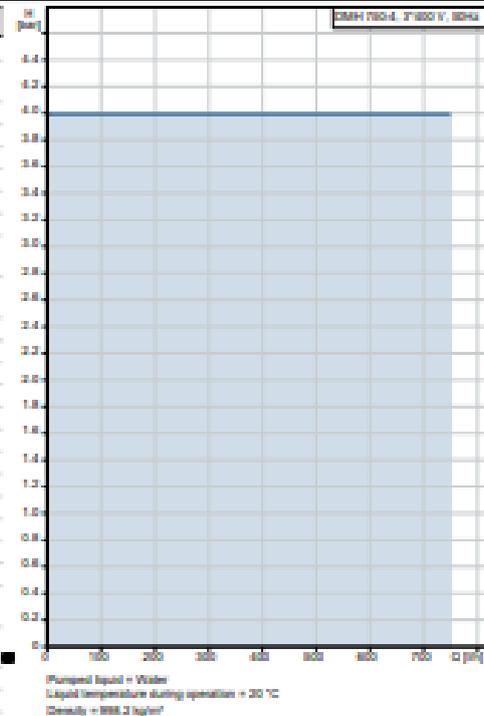
Model	Frame number	Motor			Impeller			Shaft length (mm)	
		Power (kW)	Number of poles (P)	Phase and voltage (V)	Frequency (Hz)	Revolution (min <sup>-1</sup> )	Diameter (mm)		Stage
A720-0.065A	1	0.065	4	Single phase 100V	50	300	150	1	800
A720-0.1A		0.1	4	Three phase 200V	50	300	220	1	800
A720-0.1B	2	0.1	4	Single phase 100V	50	300	220	1	800
A720-0.2A		0.2	4	Three phase 200V	50	300	270	1	1000
A720-0.2B	3	0.2	4	Single phase 100V	50	300	270	1	1000
A720-0.4B		0.4	4	Three phase 200V	50	300	310	1	1250
A720-0.4B	4	0.4	6	Three phase 200V	50	300	350	1	1500
A720-0.75B		0.75	4	Three phase 200V	50	300	350	1	1500
A720-0.75B	5	0.75	6	Three phase 200V	50	300	400	1	2000
A720-1.5B		1.5	4	Three phase 200V	50	300	400	1	2000

\* The standard materials for the shaft and the impeller are SUS304 or SUS316.  
\* The A720 and A725 are the equipment for the A500.

- Menggunakan dosing pump koagulasi DMH 750-4 B-PVC/V/G-X-E1B8B8XEMAG

		<b>Company name:</b> <b>Created by:</b> <b>Phone:</b>  <b>Date:</b> 10/09/2024
Qty.	Description	
1	<b>DMH 750-4 B-PVC/V/G-X-E1B8B8XEMAG</b>    <p style="text-align: center;"><small>Note! Product picture may differ from actual product</small></p> <p>Product No.: On request</p> <p>The pump of the DMH series is a versatile positive displacement diaphragm dosing pump.</p> <p>The diaphragm is coupled hydraulically via a precise gear-eccenter-tapet-system to a high efficiency AC motor. The dosing capacity is adjusted by varying the stroke length at the stroke adjustment knob in the ratio 1 to 10.</p> <p>The range is highly versatile, it covers a wide flow range and offers a variety of dosing head sizes, materials and accessories. Customers worldwide have enjoyed years of trouble-free operation from their DMH pumps.</p> <p>The Grundfos DMH range is a series of extremely strong, robust pumps for applications requiring reliable dosing capability, such as process engineering.</p> <p>The liquid end is composed of:</p> <ul style="list-style-type: none"> <li>- Dosing head</li> <li>- PTFE diaphragm</li> <li>- Ball valves</li> </ul> <p>Other features:</p> <ul style="list-style-type: none"> <li>- Robust industrial pump with aluminium or cast iron enclosure</li> <li>- Easy to install and operate design</li> <li>- Long life PTFE diaphragm</li> <li>- Optimum capacity and stroke frequency graduation</li> <li>- Dosing flow variation <math>\pm 1.5\%</math> (FS), linearity <math>\pm 2\%</math> (FS)</li> </ul> <p>Applies only to pumps with ATEX certification          The dosing pump DMH 25x is certified according to the ATEX guideline RL 94/9/EC for non-electrical operating supplies.          The motor versions EEx e and EEx de defined by Grundfos are certified by the manufacturers according to ATEX guidelines for electrical operating supplies. The motor type plate is labelled according to ATEX.          The ATEX approved DMH pumps are available in a variety of configurations - some can be used for dosing combustible liquids.</p> <p>Electronics features:          Applies only to pumps with control variant: AR          Etron Profi microprocessor electronics, direct attached to motor:</p> <ul style="list-style-type: none"> <li>- Stroke frequency adjustable from 1 stroke/min to maximum stroke frequency</li> <li>- Pulse control with multiplier and divisor</li> <li>- Analogue signal control 0/4-20 mA</li> <li>- Level control with input for two level signals.</li> <li>- Pulse, analogue and remote on/off input</li> <li>- Analogue output</li> <li>- Alarm relay output</li> <li>-Stroke output</li> <li>-input for dosing controller and diaphragm monitoring sensor</li> </ul>	

Description	Value
<b>General information:</b>	
Product name:	DMH 750-4 B-PVC/WG-X-E1888XEMAG
Product No:	On request
EAN number:	On request
<b>Technical:</b>	
Nominal flow rate at 50 Hz:	750 l/h
Number of dosing heads:	1
Approvals:	CE, EAC, CNROHSEX
Non return valve type, inlet pump 1:	Standard
Non return valve type, outlet pump 1:	Standard
Max viscosity:	50 mPas
<b>Materials:</b>	
Pump housing:	Aluminium
Dosing head, pump 1:	Plastic
Dosing head, pump 1:	PVC
Valve ball:	Glass
Valve ball:	SiLibeads Type P
Valve seat:	Plastic
Valve seat:	PE
Valve gasket:	FRM
Valve gasket:	Rubber
<b>Installation:</b>	
Max operating pressure at 50 Hz:	4 bar
Maximum permissible inlet pressure:	0.8 bar
Type of inlet connection:	Cementing
Type of outlet connection:	Cementing
Size of inlet connection:	40
Size of outlet connection:	40
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	0 ... 40 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m <sup>3</sup>
<b>Electrical data:</b>	
Power input P1:	1 kW
Mains frequency:	50 Hz
Max. frequency:	50 Hz
Rated voltage:	3 x 230/400 V
Enclosure class (IEC 34-5):	IP68
Cable included (Yes/No):	N
Power plug:	No plug
<b>Controls:</b>	
Type of connector:	No plug
Type of control variant:	Standard
Frequency converter:	Not prepared for VFD
<b>Others:</b>	
Net weight:	65 kg
Gross weight:	73.7 kg
Shipping volume:	0.995 m <sup>3</sup>
Diaphragm Leakage Detection:	N
Country of origin:	SG
Custom tariff no.:	84135021



- Menggunakan motor pengaduk bak koagulasi dengan merk Tohkemy Corporation model NTB-150 power 15 kW

Model

# NTB

Vertical type belt-reduction medium-speed agitator

## Features

- Available on a wide range of capacities from small to large (power: 0.1 to 22kW)
- Smooth and low vibration with V-belt drive
- Simple structure makes maintenance easy



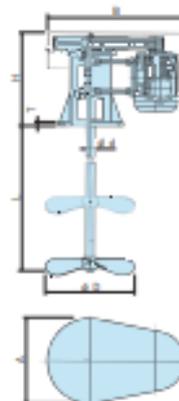
## Standard specifications (V-belt reduction)

Model No.	Power		Rated speed (min <sup>-1</sup> )		3-blade propeller		Shaft (mm)		Maximum agitating capacity (m <sup>3</sup> )	
	Output (kW)	Number of poles (P)	50Hz	60Hz	Propeller diameter φD	Number of stages S	Shaft diameter φd	Standard length L	Dilute liquid	Medium viscosity <sup>*)</sup>
NTB4-001	0.1	4	300	360	200	1	16	800	0.6	0.2
NTB4-002	0.2				250	1	19	1,000	1.2	0.4
NTB4-004	0.4				300	1	22	1,200	2.4	0.8
NTB4-007	0.75				350	1	25	1,500	4.5	1.5
NTB4-015	1.5				350	2	30	1,650	8.5	3
NTB4-022	2.2				400	2	35	1,800	13	5
NTB4-037	3.7				450	2	40	2,000	20	8
NTB4-055	5.5				500	2	50	2,200	30	12
NTB4-075	7.5				550	2	60	2,500	45	16
NTB4-110	11				600	2	70	2,700	65	22
NTB4-150	15				650	2	80	2,800	90	30
NTB4-185	18.5				700	2	90	3,000	115	38
NTB4-220	22				750	2	100	3,000	140	50

- A totally enclosed fan-cooling outdoor motor made by Hitachi is used as standard.
- Possible to assemble the propellers with 2 stages for the models of 1 stage. (The diameter of propellers shall be smaller in case of 2 stages than the standard 1 stage.)
- Possible to assemble the shaft seal for 0.2kW or larger models.
- Possible to assemble the IP motor for 0.8kW or larger models. Please contact us for further information.
- Rating (no-load operation) is strictly prohibited.
- Dilute liquids have a viscosity of about 0.1 Pa·s (100 cP), and medium-viscosity liquids have a viscosity of about 0.1 to 0.5 Pa·s (100 to 500 cP).

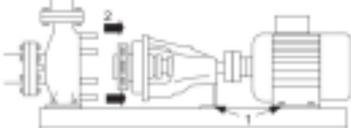
## Dimension table

Model No.	Mounting flange dimensions (mm)					Approximate main dimensions (mm)			Maximum required length (kg)
	Similarity JS 10K	Outer diameter OD	Flange Outer Diameter PCD	Number of mounting holes & hole diameter φ in mm	Flange thickness T	H	A	B	
NTB4-001	100A	210	175	4-φ19	16	276	290	425	18
NTB4-002	100A	210	175	4-φ19	16	276	290	425	20
NTB4-004	125A	250	210	4-φ19	18	353	300	490	30
NTB4-007	125A	250	210	4-φ19	18	353	300	490	38
NTB4-015	150A	280	240	4-φ23	18	396	340	550	55
NTB4-022	200A	330	290	6-φ23	20	472	430	695	115
NTB4-037	200A	330	290	6-φ23	20	472	430	695	130
NTB4-055	250A	400	355	6-φ25	22	620	510	835	200
NTB4-075	250A	400	355	6-φ25	24	700	560	870	230
NTB4-110	300A	445	400	8-φ25	26	830	700	1,050	430
NTB4-150	300A	445	400	8-φ25	26	830	700	1,050	450
NTB4-185	350A	490	455	8-φ25	32	910	760	1,080	520
NTB4-220	350A	490	455	8-φ25	32	910	760	1,080	550

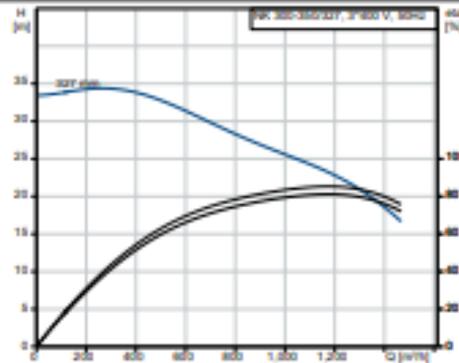


## 7. SEDIMENTASI

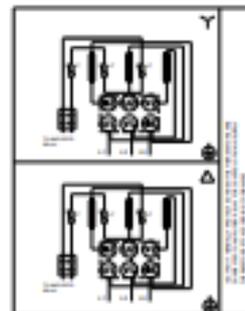
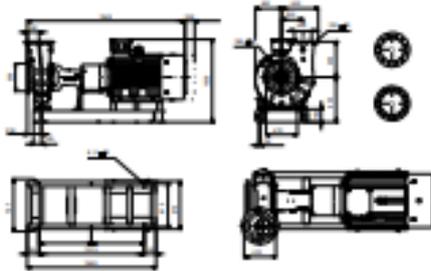
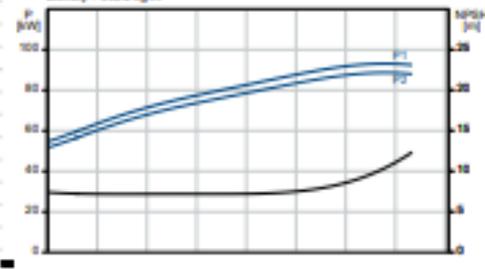
Menggunakan 4 unit pompa centrifugal NK 300-350/327 AA1F2SBESBQQEWW3 untuk menuju ke unit filtrasi

	
<p>Company name: Created by: Phone: Date: 22/08/2024</p>	
Qty.	Description
1	<p><b>NK 300-350/327 AA1F2SBESBQQEWW3</b></p>  <p>Note! Product picture may differ from actual product</p> <p>Product No.: On request</p> <p>Non-self-priming, single-stage, centrifugal pump designed according to ISO 5199 with dimensions and rated performance according to EN 733. Flanges are PN 16 with dimensions according to EN 1092-2. The pump has an axial suction port, a radial discharge port and horizontal shaft. It is of the back pull-out design enabling removal of the motor, coupling, bearing bracket and impeller without disturbing the pump housing or pipework.</p> <p>The unbalanced rubber bellows seal is according to DIN EN 12756.</p> <p>The pump is fitted with a foot-mounted, fan-cooled asynchronous motor. Pump and motor are mounted on a common base frame.</p> <p>The product's minimum efficiency index (MEI) is greater or equal to 0.70. This is by the Commission Regulation (EU) considered as an indicative benchmark for best-performing water pump available on the market as from 1 January 2013.</p> <p>Pump and motor are mounted on a common steel base frame in accordance with ISO 3661. The back pull-out design makes it possible to service the pump when the pump housing is still connected to the inlet and discharge pipes.</p> <ol style="list-style-type: none"> <li>1) Remove the bolts in the bearing bracket support foot and motor foot.</li> <li>2) Remove the bearing bracket and the motor from the pump housing.</li> </ol>  <p><b>Pump</b></p> <p>The pump is fitted with an unbalanced rubber bellows seal with torque transmission across the spring and around the bellows. Due to the bellows, the seal does not wear the shaft, and the axial movement is not prevented by deposits on the shaft.</p>  <p>Seal faces:</p> <ul style="list-style-type: none"> <li>• Rotating seal ring material: silicon carbide (SiC)</li> <li>• Stationary seat material: silicon carbide (SiC)</li> </ul> <p>This material pairing is used where higher corrosion resistance is required. The high hardness of this material pairing offers good resistance against abrasive particles.</p> <p>Secondary seal material: EPDM (ethylene-propylene rubber)</p> <p>EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.</p> <p>The shaft is made of stainless steel and has a diameter of 60 mm where the coupling is mounted.</p> <p>The pump uses a standard coupling between the pump and motor shaft.</p>

Description	Value
<b>General information:</b>	
Product name:	NK 300-350/327 AA1F258E5BQOEWW3
Product No:	On request
EAN number:	On request
Price:	
<b>Technical:</b>	
Pump speed on which pump data are based:	1485 rpm
Rated flow:	1172 m <sup>3</sup> /h
Pump with motor (Yes/No):	Y
Rated head:	23.22 m
Actual impeller diameter:	327 mm
Nominal impeller diameter:	350
Shaft diameter:	60 mm
Code for shaft seal:	BOQE
Mechanical seal type:	Single
Curve tolerance:	ISO9906:2012 2B
Pump version:	A1
Bearing design:	Standard
<b>Materials:</b>	
Pump housing:	Ductile iron
Pump housing:	EN 1563 EN-GJS-500-7
Pump housing:	ASTM 70-50-05
Impeller:	Stainless steel
Impeller:	EN 1.4308
Impeller:	ASTM A351 CF8
Internal pump house coating:	Painting
Material code:	SB
Code for rubber:	E
Shaft:	Steel
Shaft:	EN 1.0503/1.4301
Shaft:	AISI 1045/304
<b>Installation:</b>	
Maximum ambient temperature:	40 °C
Maximum operating pressure:	16 bar
Pipe connection standard:	EN 1062-2
Type of inlet connection:	DIN
Type of outlet connection:	DIN
Size of inlet connection:	DN 350
Size of outlet connection:	DN 300
Pressure rating for connection:	PN 16
Coupling type:	Flexible w/o spacer
Base frame design:	C-channel
Code for base frame:	540
Grouting (Yes/No):	Y
Connect code:	F
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	-25 - 120 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m <sup>3</sup>
<b>Electrical data:</b>	
Motor type:	280M
Rated power - P2:	90 kW
Main frequency:	50 Hz
Rated voltage:	3 x 380-400/690-690 V
Rated current:	163-155/94-89,9 A



Pumped liquid = Water  
Liquid temperature during operation = 20 °C  
Density = 998.2 kg/m<sup>3</sup>





Company name:  
Created by:  
Phone:

Date: 22/08/2024

Description	Value
Starting current:	690 %
Cos phi - power factor:	0.88
Rated speed:	1485 rpm
IE efficiency:	IE395,2%
IE Efficiency class:	IE3
Motor efficiency at full load:	95.2 %
Motor efficiency at 3/4 load:	95.1 %
Motor efficiency at 1/2 load:	94.4 %
Number of poles:	4
Enclosure class (IEC 34-5):	55 (Protect. water jets/dust)
Insulation class (IEC 85):	F
Built-in motor protection:	PTC
Motor No:	92748768
Bearing insulation type N-end:	N
<b>Controls:</b>	
Frequency converter:	None
Pressure sensor:	N
<b>Others:</b>	
Minimum efficiency index, MEI ≥:	0.70
Net weight:	1410 kg
Gross weight:	1510 kg
Shipping volume:	3.9 m <sup>3</sup>
Language on pump nameplate:	GB

## 8. FILTRASI

Menggunakan pompa 98433096 HyMPC-E/P 3CRE 10-3 3x400/50-60 DL untuk backwash unit filtrasi dengan head pompa 44,2 m.

	
Company name: Created by: Phone: Date: 20/11/2024	
Qty.	Description
1	<p><b>HyMPC-E/P 3CRE 10-3 3x400/50-60 DL</b></p>  <p style="text-align: center;"><i>Note! Product picture may differ from actual product</i></p> <p>Product No.: On request</p> <p>The pressure booster system Hydro MPC-E, supplied as compact assembly, maintains a constant pressure through continuous adjustment of the speed of the pumps.</p> <p>The system performance is adapted to the demand through cutting in/out the required number of pumps and through parallel control of the pumps in operation.</p> <p>Pump changeover is automatic and depends on load, time and fault.</p> <p>From 0.37 to 11 kW, the booster set is equipped with CRE pumps with electronically commutated permanent magnet motor with extremely high efficiency.</p> <p>The total efficiency of this motor including the frequency converter is better than the IE4 level in IEC60034-31, even though this standard only applies for the motor.</p> <p>From 15 to 22 kW the booster is equipped with CRE pumps with integrated frequency controlled motors. The total efficiency of this motor including the frequency converter is better than the IE3 level in IEC60034-31, even though this standard only applies for the motor.</p> <p>From 30 kW the booster is equipped with CR pumps connected to an external Grundfos CUE frequency converter (one per pump).</p> <p>The system consists of these parts:</p> <ul style="list-style-type: none"> <li>- vertical multistage centrifugal pumps, type CRE10-3. Pump bases and heads are of either cast iron EN-GJS-500-T; other vital parts are made of stainless steel EN DIN 1.4301(AISI 304).</li> </ul> <p>The pumps are equipped with a service-friendly cartridge shaft seal, HQQE (SiC/SiC/EPDM).</p> <ul style="list-style-type: none"> <li>- Two manifolds of stainless steel EN DIN 1.4301(AISI 304).</li> <li>- Base frame of galvanized steel up to CR 90; above CR90 the pumps are placed on a galvanized I-Beam frame.</li> <li>- One non-return valve and two isolating valves for each pump.</li> <li>- Adapter with isolating valve for connection of diaphragm tank.</li> <li>- Pressure gauge and pressure transmitter (analog output 4-20 mA).</li> <li>- Control MPC in a steel cabinet, IP 54, including main switch, all required fuses, motor protection, switching equipment and microprocessor-controlled CU 352.</li> </ul> <p>Dry-running protection and diaphragm tank are available according to the list of accessories.</p> <p>Pump operation is controlled by Control MPC with the following functions:</p> <ul style="list-style-type: none"> <li>- Intelligent multi-pump controller, CU 352.</li> <li>- Constant pressure control through continuously variable adjustment of the speed of each individual pump.</li> <li>- PID controller with adjustable PI parameters (Kp + Ti).</li> <li>- Constant pressure at setpoint, independent of inlet pressure.</li> <li>- On/off operation at low flow.</li> <li>- Automatic cascade control of pumps for optimum efficiency.</li> <li>- Selection of min. time between start/stop, automatic pump changeover and pump priority.</li> <li>- Automatic pump test function to prevent idle pumps from seizing up.</li> <li>- Possibility of standby pump allocation.</li> </ul>

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1



Company name:

Created by:

Phone:

Date:

20/11/2024

**Qty. | Description**

1

Possibility of backup sensor (redundant primary sensor).  
 Manual operation.  
 Possibility of external setpoint influence  
 Log function  
 Setpoint Ramp  
 Possibility of digital remote-control functions:  
 system on/off,  
 max., min. or user-defined duty  
 up to 8 alternative setpoints.  
 Digital inputs and outputs can be configured individually.  
 Pump and system monitoring functions:  
 minimum and maximum limits of current value  
 inlet pressure  
 motor protection.  
 Sensors monitored against malfunction.  
 Alarm log with the previous 24 warnings/alarms.  
 Display and indication functions:  
 Colour screen display  
 green indicator light for operating indications and red indicator light for fault indications  
 potential-free changeover contacts for operation and fault.  
 Grundfos bus communication.

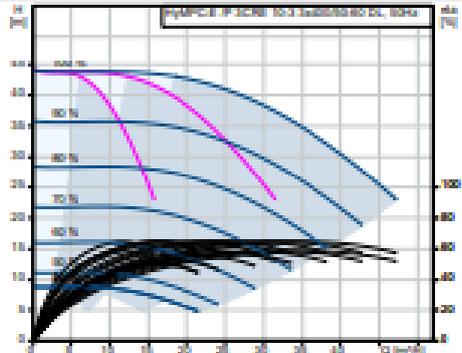
It is possible to add CIM communication modules for communicating with Scada/BMS.

Pumps, piping, cabling complete as well as Control MPC are mounted on the base frame.

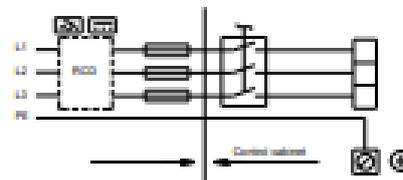
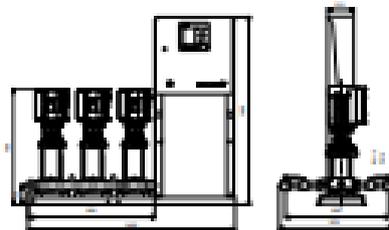
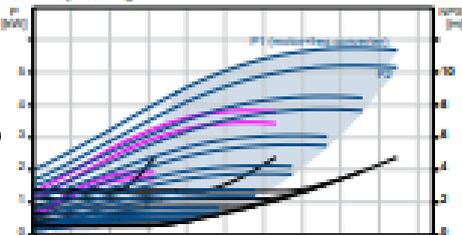
The booster system has been prewet and tested.

Flow media:	Water
Liquid temperature:	5 °C - 60 °C
Max operating pressure:	16 bar
Mains supply:	380-415 V
Starting main:	Electronically
Rated current:	13.8 A
Suction port:	R 21/2
Discharge port:	R 21/2
Net weight:	299 kg
Gross weight:	449 kg

Description	Value
<b>General information:</b>	
Product name:	Hydro MPC 1P 3CRN 103 320030 DL 0094
Product No:	On request
EAN number:	On request
<b>Technical:</b>	
Max flow:	47.1 m <sup>3</sup> /h
Max flow system:	31.4 m <sup>3</sup> /h
Head max:	44.2 m
Main pump name:	CRN 10-3
Main pump No:	98390282
Number of pumps:	3
Non-ret. valve:	at discharge side
<b>Materials:</b>	
Manifolds:	DIN 1.4301 (AISI 304)
<b>Installation:</b>	
Maximum operating pressure:	16 bar
Maximum permissible inlet pressure:	11.6 bar
Manifold inlet:	R 2 1/2
Manifold outlet:	R 2 1/2
Pressure rating:	PN 16
Earth connection:	PE
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	5 - 60 °C
Selected liquid temperature:	20 °C
Density:	998.2 kg/m <sup>3</sup>
<b>Electrical data:</b>	
Power (P2) main pump:	2.2 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-415 V
Rated current of system:	13.8 A
Start method:	electronically
Enclosure class (IEC 34-5):	IP54
Radio interference suppression:	EMC Certificate - Hydro MPC 1 (2007)
<b>Controls:</b>	
Control type:	E
<b>Tank:</b>	
Diaphragm tank:	No
<b>Others:</b>	
Basic plant:	Y
Net weight:	299 kg
Gross weight:	440 kg
Sales region:	South Europe
Country of origin:	ID
Custom tariff no.:	84137042



Losses in fittings and valves not included  
Pumped liquid = Water  
Liquid temperature during operation = 20 °C  
Density = 998.2 kg/m<sup>3</sup>



## 10. SLUDGE DRYING BED

Menggunakan pompa lumpur dengan merk Cnzking model MZ Series



### MZ SERIES

#### Overview

The mill underflow duty MZ pump range is specifically designed for the most aggressive and coarse applications such as ball mill cyclone feed and water flush crushing in mineral processing plants. The MZ pumps easily manage large size particles in dense abrasive slurries and offer the right combination of ruggedness, durability, hydraulics and materials.

#### Specifications

Discharge size range: 125mm to 750mm [5" to 30"]  
Flow rates to: 17000<sup>3</sup>/hr [74,790GPM]  
Heads to: 60m [197ft]



23 / MZ Series

### MZ SERIES

#### Key features

Large diameter, low speed, high efficiency impellers manufactured from a range of abrasion resistant hard alloys provides increased wear life.

Unique design and excellent hydraulics ensures high performance efficiency.

4-vane, large open impeller internal passages allow for larger particle passing.

Latest wear resistant materials combination optimizes component performance.

Interchangeable metal or elastomer liners provides ease of maintenance.

A large diameter shaft with the shortest possible over hang and heavy duty roller bearings housed in a removable bearing box extends bearing life.

Impeller release collar facilitates the impeller removal.

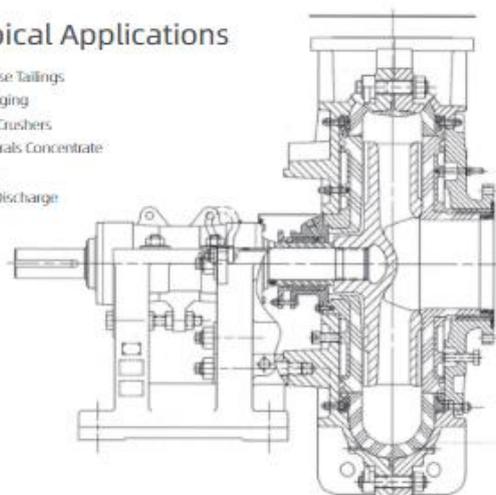
Simple full face side liner adjustment allows the liner to move closer to the impeller face to minimize the impeller throat/bush gap and to extend wear life.

Fast one-piece wet-end change-out on larger sized pumps ensures minimum mill downtime to save time and money.

Available pump body reverse rotations allows for both right vertical (standard) and left vertical (optional) discharge positions to offer plant design flexibility.

#### Typical Applications

- Coarse Tailings
- Dredging
- Wet Crushers
- Minerals Concentrate
- Coal
- Mill Discharge



26 / MZ Series

## 11. KATALOG PIPA

### HDPE PIPES DIMENSIONS

#### UNILON SNI - 06 - 4829 - 2005 : PE 80 & PE 100

Series	S - 4	S - 5	S - 6,3	S - 8	S - 10	S - 12,5	S - 16	S - 20
SDR	SDR - 9	SDR - 11	SDR - 13,6	SDR - 17	SDR - 21	SDR - 26	SDR - 33	SDR - 41
PE 80	PN - 16	PN - 12,5	PN - 10	PN - 8	PN - 6,3	PN - 5	PN - 4	PN - 3,2
PE 100	PN - 20	PN - 16	PN - 12,5	PN - 10	PN - 8	PN - 6,3	PN - 5	PN - 4
OD	Wall Thickness							
(mm)	(mm)							
16	1,8	1,6						
20	2,3	1,9	1,6					
25	2,8	2,3	1,9	1,6				
32	3,6	2,9	2,4	1,9	1,6			
40	4,5	3,7	3,0	2,4	1,9	1,6		
50	5,6	4,6	3,7	3,0	2,4	2,0	1,6	
63	7,1	5,8	4,7	3,8	3,0	2,4	2,0	1,6
75	8,4	6,8	5,5	4,5	3,6	2,9	2,3	1,9
90	10,1	8,2	6,6	5,4	4,3	3,5	2,8	2,2
110	12,3	10,0	8,1	6,6	5,3	4,3	3,4	2,7
125	14,0	11,4	9,2	7,4	6,0	4,8	3,9	3,1
140	15,7	12,7	10,3	8,3	6,7	5,4	4,3	3,5
160	17,9	14,6	11,8	9,5	7,7	6,2	4,9	4,0
180	20,1	16,4	13,3	10,7	8,6	6,9	5,5	4,4
200	22,4	18,2	14,7	11,9	9,6	7,7	6,2	4,9
225	25,1	20,5	16,6	13,4	10,8	8,6	6,9	5,5
250	27,5	22,7	18,4	14,8	11,9	9,6	7,7	6,2
280	31,3	25,4	20,6	16,6	13,4	10,7	8,5	6,9
315	35,2	28,6	23,2	18,7	15,0	12,1	9,7	7,7
355	39,6	32,2	26,1	21,1	16,9	13,6	10,9	8,7
400	44,7	36,3	29,4	23,7	19,1	15,3	12,3	9,8
450	50,2	40,9	33,1	26,7	21,5	17,2	13,8	11,0
500	55,8	45,4	36,8	29,6	23,9	19,1	15,3	12,3
560		50,8	41,2	33,2	26,7	21,4	17,2	13,7
630		57,2	46,3	37,2	30,0	24,1	19,3	15,4
710			52,2	42,1	33,9	27,2	21,8	17,4
800				47,4	38,1	30,6	24,5	19,6
900				53,5	42,9	34,4	27,6	22,0
1000				59,3	47,7	38,2	30,6	24,5
1200					57,2	45,9	36,7	29,4
1400					66,7	53,2	42,9	34,4
1600					76,2	61,3	49,0	39,3

#### MDPE PIPE UNILON FOR GAS - ISO 4437

OD (mm)	Wall Thickness (mm)			OD (mm)	Wall Thickness (mm)		
	SDR11-S5	SDR17-S8	SDR17.6-S8.3		SDR11-S5	SDR17-S8	SDR17.6-S8.3
20	2,0			140	12,7	8,3	8,0
25	2,3			160	14,6	9,5	9,1
32	2,9			180	16,4	10,7	10,3
40	3,7			200	18,2	11,9	11,4
50	4,6			225	20,5	13,4	12,8
63	5,8	3,8	3,6	250	22,7	14,8	14,2
75	6,8	4,5	4,3	280	25,4	16,6	16,0
90	8,2	5,4	5,2	315	28,6	18,7	17,9
110	10,0	6,6	6,3	355	31,4	21,1	19,6
125	11,4	7,4	7,1				

# **LAMPIRAN B**

**GAMBAR DETAIL UNIT PENGOLAHAN AIR  
MINUM SUMBER AIR BAKU SUNGAI CIBANTEN**



PROGRAM TEKNIK LINGKUNGAN  
 FAKULTAS TEKNIK  
 UNIVERSITAS PEMBANGUNAN NASIONAL  
 "VETERAN" JAWA TIMUR

**JENIS TUGAS**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**DOSEN PENGAMPU**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**DOSEN PEMBIMBING**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**MAHASISWA**

**NPM**

HASNA AQILAH P. A.  
 INTAN LAILI N. K.

21034010008  
 21034010016

**GAMBAR**

**SKALA**

1:730

DENAH UNIT  
 PENGOLAHAN AIR  
 BERSIH

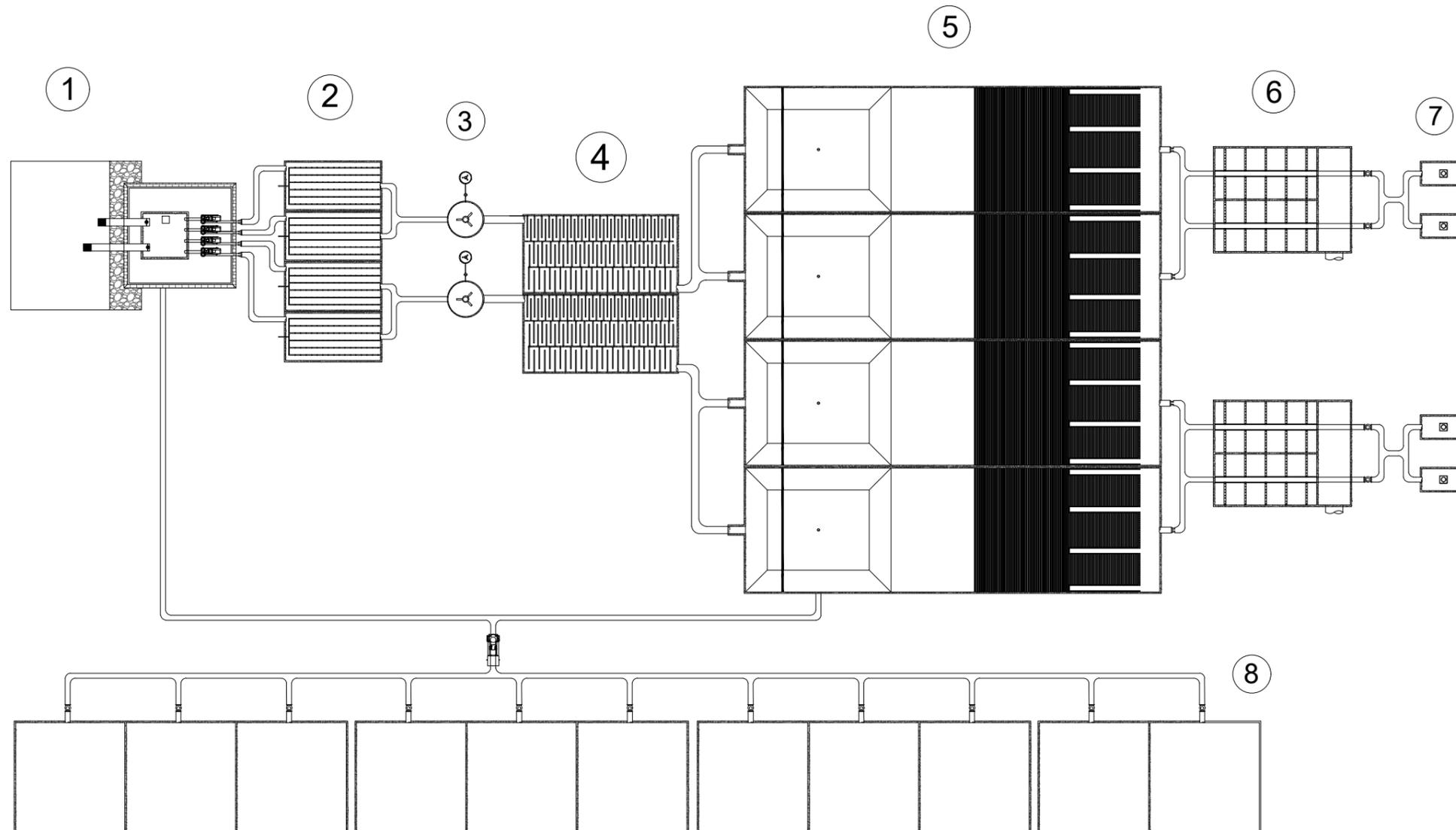
**SATUAN**

CENTIMETER

**NOMOR GAMBAR**

20

**KETERANGAN**



1. INTAKE
2. AERASI
3. KOAGULASI
4. FLOKULASI
5. SEDIMENTASI
6. FILTRASI
7. RESERVOIR
8. SLUDGE DRYING BED



PROGRAM TEKNIK LINGKUNGAN  
 FAKULTAS TEKNIK  
 UNIVERSITAS PEMBANGUNAN NASIONAL  
 "VETERAN" JAWA TIMUR

**JENIS TUGAS**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**DOSEN PENGAMPU**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**DOSEN PEMBIMBING**

TUGAS PERACANGAN BANGUNAN  
 PENGOLAHAN AIR MINUM

**MAHASISWA**

HASNA AQILAH P. A.  
 INTAN LAILI N. K.

**NPM**

21034010008  
 21034010016

**GAMBAR**

PROFIL HIDROLIS UNIT  
 PENGOLAHAN AIR  
 BERSIH

**SKALA**

1:730

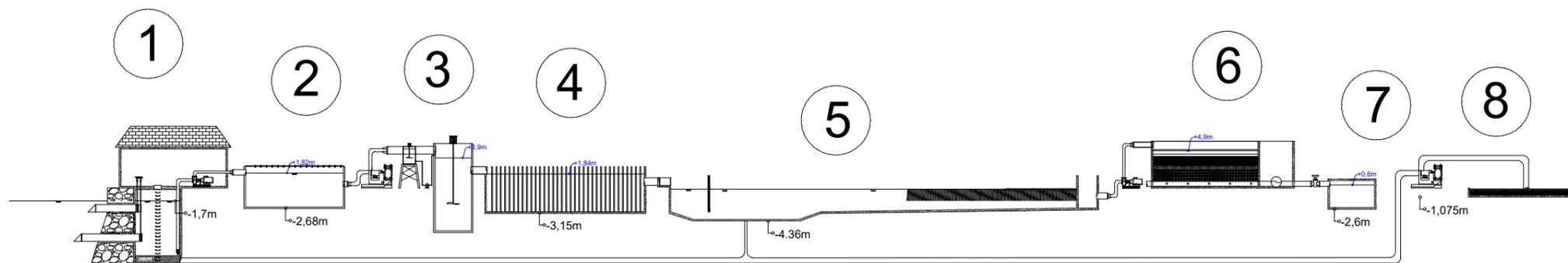
**SATUAN**

CENTIMETER

**NOMOR GAMBAR**

19

**KETERANGAN**



1. INTAKE
2. AERASI
3. KOAGULASI
4. FLOKULASI
5. SEDIMENTASI
6. FILTRASI
7. RESERVOIR
8. SLUDGE DRYING BED