Amaline

Submersible motor recirculation pump with ECB propeller

50 Hz

Applications

Recirculation of activated sludge from nitrification stages into denitrification stages of aeration tanks.
Economic pumping of storm, river and surface water at low heads and in land reclamation.
Creation of flow in impounded water, e. g. leisure parks.

Pump design

Wet installed, horizontal propeller pump with submersible motor, driven via direct drive (DN 300) or spur gear (DN 500/800). ECB propeller with 3 fixed fibre rejecting blades. Automatic boltfree connection to the discharge pipe.

Drive

Three-phase asynchronous motor,
additional flameproof versions EEx d IIB T3 or T4,
400 V *(Var.: 230 V, 500 V, 690 V)*

Operating data

Head:	H	up to 2.0 m
Capacity:	Q	up to 1.5 m^3/s
Motor power:	P_2	up to 16 kW
Temperature of pumped liquid:	t	up to 40 °C
Nominal diameters:	DN 300, 500, 800	
Operating voltage:	U = 400 V, 50 Hz, 3~	
Enclosure typ:	IP 68 to EN 60 529 / IEC 529	

Designation

Amaline P 400-500 / 74 UM G

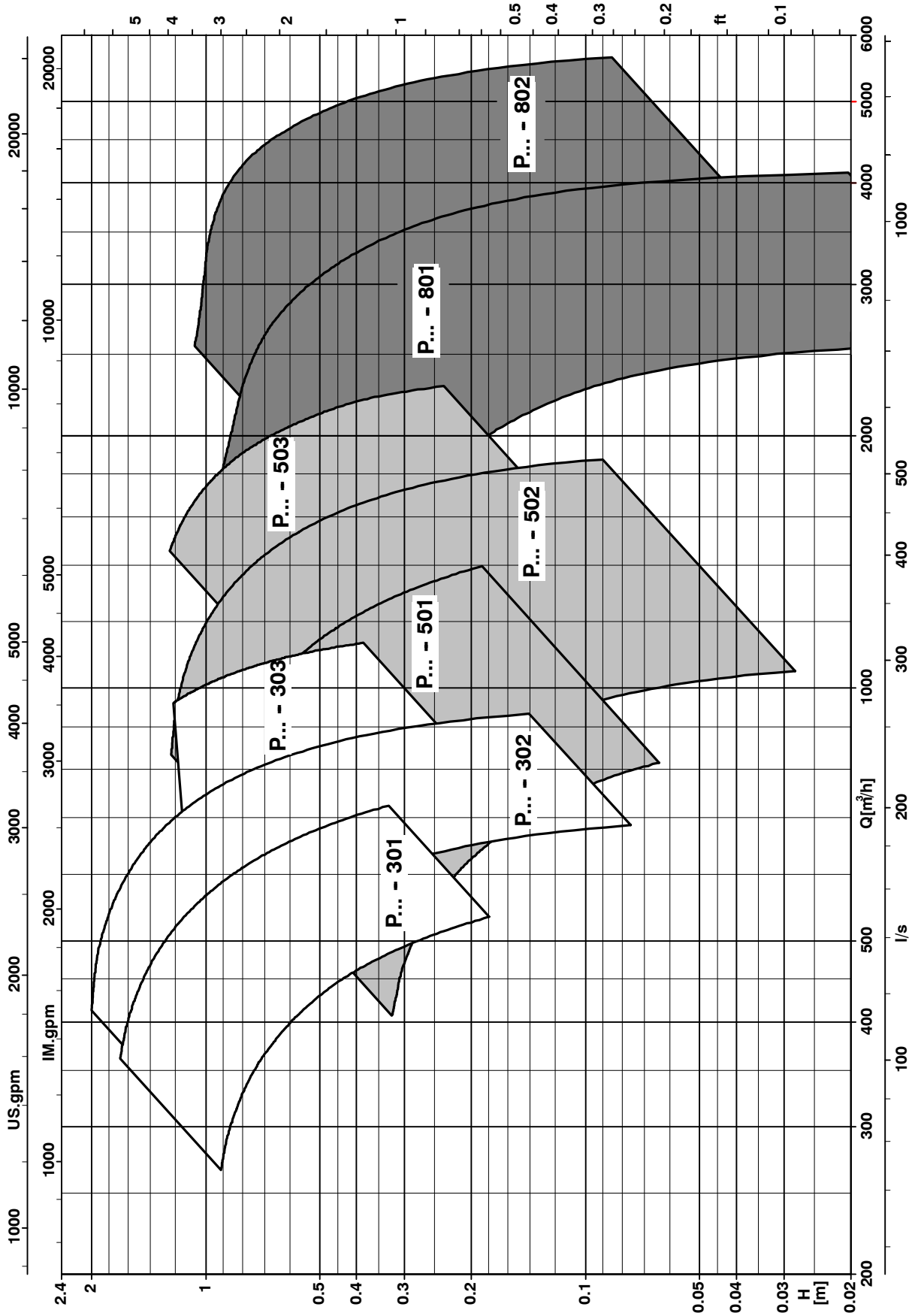
501
502
503

- Pump type
- Propeller
- Nominal speed of propeller [1/min]
- Nominal propeller diameter [mm]
- Nominal propeller diameter with vane inlet angle
- Motor rating
- Number of poles of motor
- Motor variant
  - UM = Temperature of pumped liquid max. 40 °C
  - YM/XM = flameproof
- Material variant
  - G = Pump casing in galvanised steel, Propeller in JL 1040
  - G1 = Pump casing in 1.4571, Propeller in JL 1040
  - GC = Pump casing in 1.4571, Propeller in 1.4517

List of Contents

Selection diagram 50 Hz

Selection charts speed range curves Amaline P ...-301 up to ...-802



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Product advantages

Example: Amaline 300 (direct)

Three-vane propeller with ECB (Ever Clean Blade) sewage hydraulic

Your benefit:
Fibres are automatically rejected by the propeller. Constant clean hydraulic guarantees operating safety and high efficiency.

Flow-favourable pump inlet without inserts likely to get choked

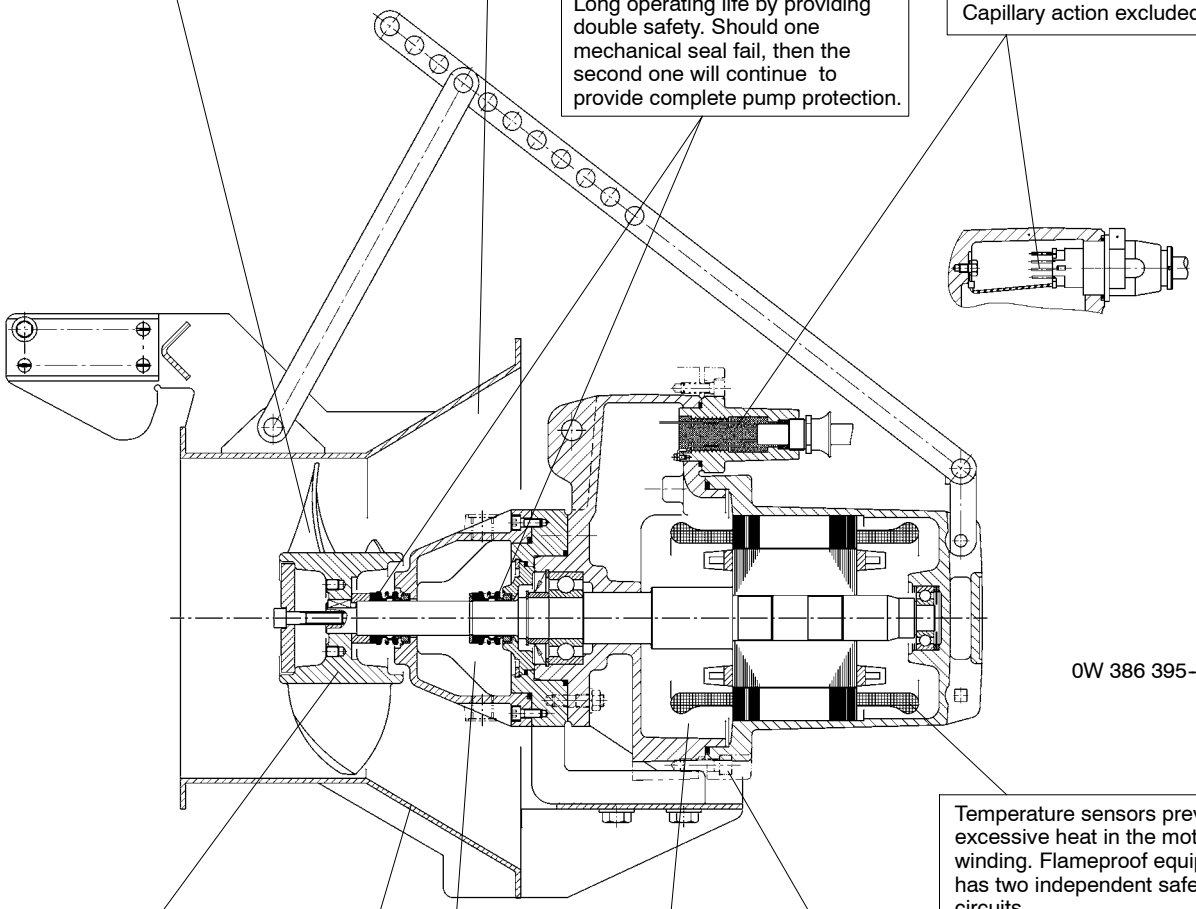
Your benefit:
Operational safety due to optimum inlet conditions as well as support for ECB hydraulics.

Cable entry completely watertight over its entire length.
Multiple safety by:
1. Long rubber gland
2. Cable sleeve additionally cast in resin
3. Individual cores are insulated, tinned and cast in resin. (Design X)

Your benefit:
Even in the event of cable sleeve and core insulation being damaged, no moisture can enter the motor area.
Capillary action excluded.

2 mechanical seals, independent of direction of rotation, with silicon-carbide contact surfaces and one common flushing liquid.

Your benefit:
Long operating life by providing double safety. Should one mechanical seal fail, then the second one will continue to provide complete pump protection.



0W 386 395-00 Bl. 2

Temperature sensors prevent excessive heat in the motor winding. Flameproof equipment has two independent safety circuits.

Your benefit:
The motor cannot be damaged through overheating.

Hydraulics cast in one piece and with thick walls.

Your benefit:
High solidity and good abrasion behaviour of the hydraulics.

Leakage sensor (at option)

Your benefit:
Early symptoms of moisture entering the motor area early warning of pump maintenance requirements.

All fasteners coming in contact with medium are manufactured in stainless steel.

Your benefit:
A minute detail which makes the pump very service-friendly. Easily dismantled even after years of operation.

Robust weld construction of the pump casing

Your benefit:
Durable and safe/reliable connection between pump casing, hydraulics and drive.

Flushing liquid is white oil

Your benefit:
Any oil escaping into the environment is ecologically harmless.

Subject to technical modifications

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Product advantages

Example: Amaline 500/800 (with gear unit)

Three-vane propeller with ECB (Ever Clean Blade) sewage hydraulic

Your benefit:
Fibres are automatically rejected by the propeller. Constant clean hydraulic guarantees operating safety and high efficiency.

Flow-favourable pump inlet without inserts likely to get choked

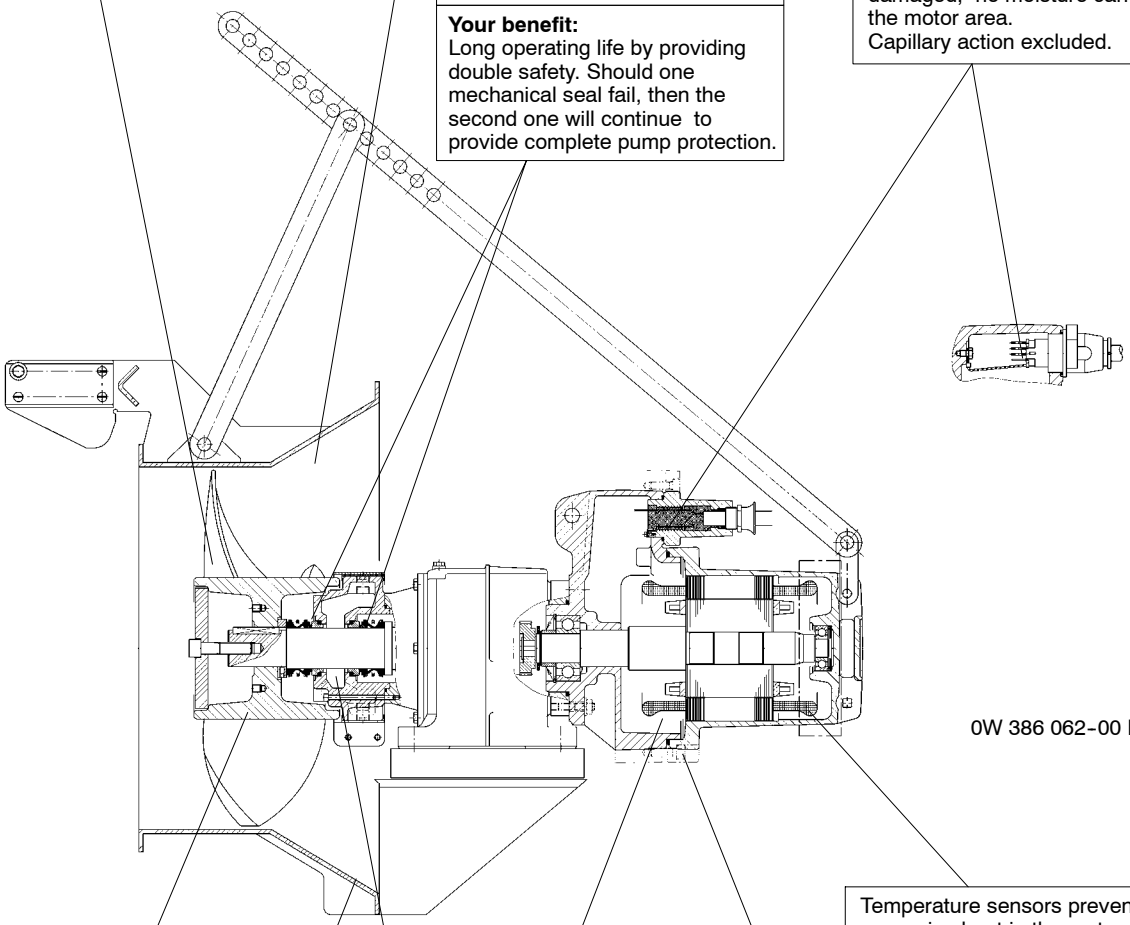
Your benefit:
Operational safety due to optimum inlet conditions as well as support for ECB hydraulics.

Cable entry completely watertight over its entire length.
Multiple safety by:
1. Long rubber gland
2. Cable sleeve additionally cast in resin
3. Individual cores are insulated, tinned and cast in resin. (Design X)

Your benefit:
Even in the event of cable sleeve and core insulation being damaged, no moisture can enter the motor area.
Capillary action excluded.

2 mechanical seals, independent of direction of rotation, with silicon-carbide contact surfaces and one common flushing liquid.

Your benefit:
Long operating life by providing double safety. Should one mechanical seal fail, then the second one will continue to provide complete pump protection.



0W 386 062-00 Bl. 2

Temperature sensors prevent excessive heat in the motor winding. Flameproof equipment has two independent safety circuits.

Your benefit:
The motor cannot be damaged through overheating.

Leakage sensor (at option)

Your benefit:
Early symptoms of moisture entering the motor area early warning of pump maintenance requirements.

Hydraulics cast in one piece and with thick walls.

Your benefit:
High solidity and good abrasion behaviour of the hydraulics.

All fasteners coming in contact with medium are manufactured in stainless steel.

Your benefit:
A minute detail which makes the pump very service-friendly. Easily dismantled even after years of operation.

Robust weld construction of the pump casing

Your benefit:
Durable and safe/reliable connection between pump casing, hydraulics and drive.

Flushing liquid is white oil

Your benefit:
Any oil escaping into the environment is ecologically harmless.

Subject to technical modifications

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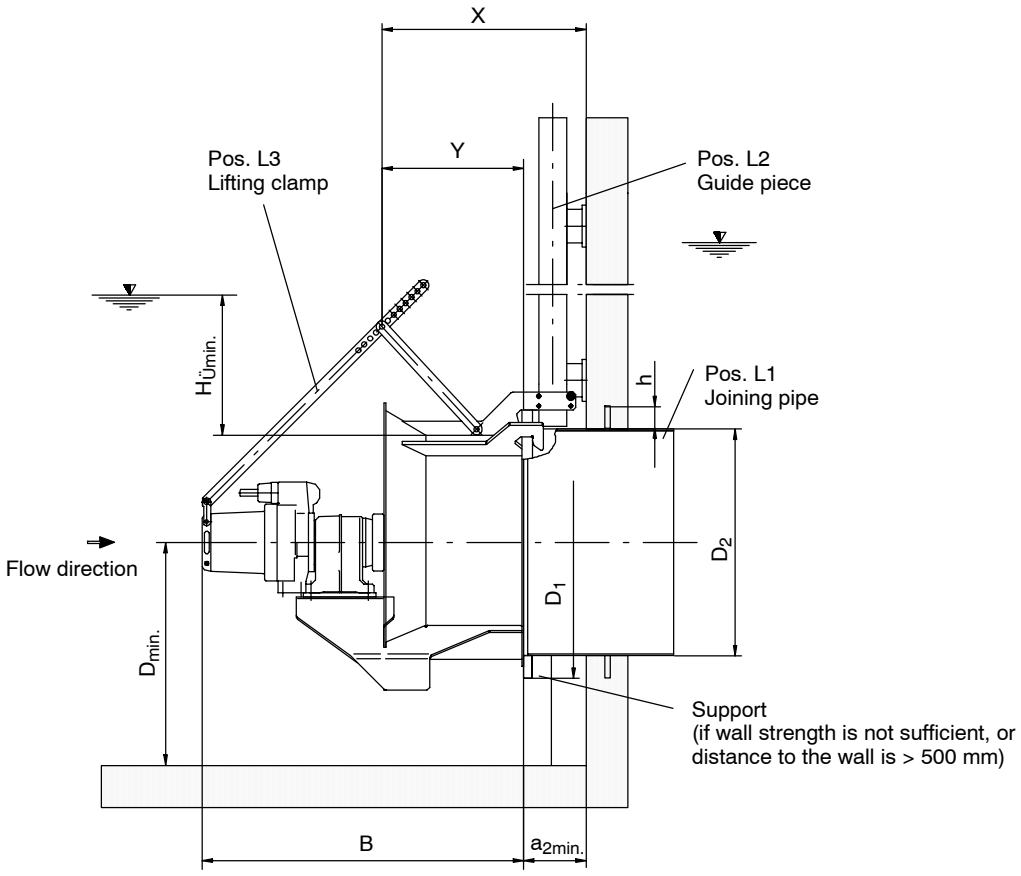
Installation Drawing



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Stationary installation of the submersible recirculation pump type Amaline requires a joining pipe of DN 300/500/800, depending on the pump size.
It is set in concrete into the tank wall, where it absorbs all forces (thrust in opposite flow direction and unit weight). The concrete used shall be of sufficient strength (min. B25) in accordance with DIN 1045 or equivalent standards.
Responsibility for wall thickness and for accurate positioning of the joining pipe in the wall lies with the system designer and the construction company.

The pump unit is guided into the operating position shown by a guide piece consisting of a square rail 100 x 100, which it mounted on the tank wall with 4 heavy-duty anchor bolts or composite anchor bolts.
The perfectly vertical attitude of the guide piece, the position relative to the joining pipe and the correct installation of the joining pipe (with perfectly vertical mating flange parallel to the wall) are of paramount importance for the correct function of the pump unit.

For dimensions and weights of the pump units please refer to pages 20 ff, also for a detailed illustration of installation parts plus ordering information and instructions for selecting available lifting gear.
For a detailed description of lifting gear please refer to the type series booklet ”KSB Lifting Equipment”, ref. No. 1596 5.

Technical Data – Standard Programme / *(Standard variants)*

Material variant G, G1

EN	DIN	ASTM equivalent
JL 1040	GG-25	A 48 Class 40 B
1.4517	1.4517	A 743 CD 4 MCU
1.4021	1.4021	A 276 Type 420
1.4301	1.4301	A 276 Type 316
1.4306	1.4306	A 276 Type 304
1.4571	1.4571	A 276 Type 316 Ti
C 45 + N	C 45 N	A 576 Gr. 1045
NBR	NBR	NBR
FPM	FPM	FKM

G = **standard version**
- main components in cast iron (JL 1040)
- pump casing in galvanised steel

G1 = **like G** – but:
- pump casing in 1.4571

GC = **like G1** – but:
- propeller in 1.4517

	Variants		
	...-300 ./ ... G [1)] ...-500 ./ ... G [2)] ...-800 ./ ... G [2)]	...-300 ./ ... G1 [1)] ...-500 ./ ... G1 [2)] ...-800 ./ ... G1 [2)]	...-300 ./ ... GC [1)] ...-500 ./ ... GC [2)] ...-800 ./ ... GC [2)]
Component	**Materials**		
Pump unit			
Motor casing	JL 1040		
Bearing bracket	JL 1040		
Gear unit	JL 1040 (only for size 500/800)		
Seat ring holder	JL 1040		
Impeller drive shaft	Amaline 300: 1.4021 Amaline 500/800: 1.4306		
Motor shaft	Amaline 300: 1.4021 Amaline 500/800: C45 + N		
Mechanical seals			
– propellers side	Bellows-type mechanical seal SiC/SiC-FPM *(Var.: mechanical seal with covered spring SiC/SiC-FPM)*		
– gear unit side or motor side	Bellows-type mechanical seal SiC/SiC-FPM		
O-Ring	NBR *(Var.: FPM)*		
Propeller	JL 1040		1.4517
Pump casing	galvanised steel	1.4571	
Bolts and nuts	A4 (equivalent to 1.4571)		

1) direct-drive version
2) with gear unit

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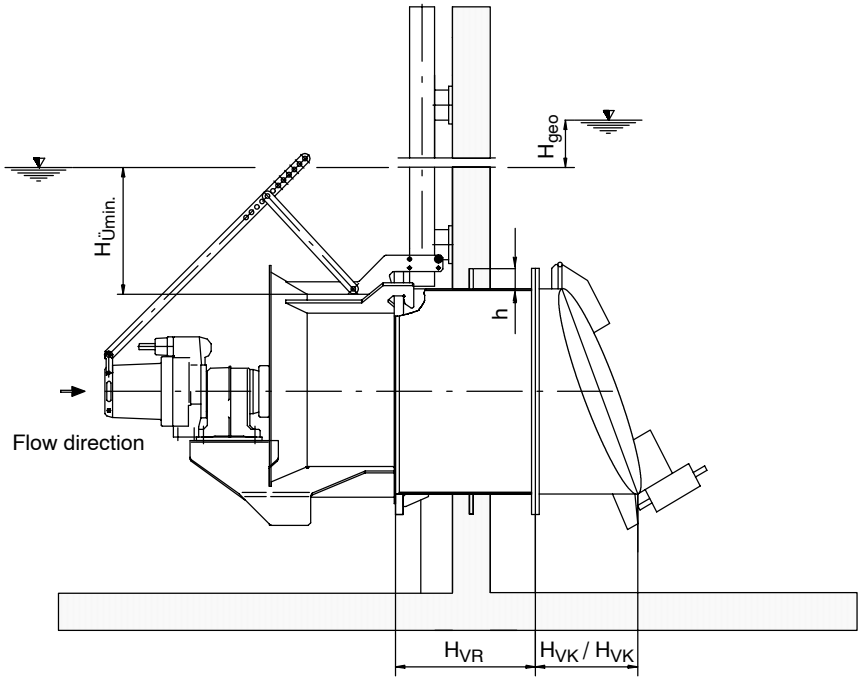
Technical Data – Standard Programme / *(Standard variants)*

Material variant G, G1

Pump unit	**Materials**
Installation parts	
Guide pipe	galvanised steel / 1.4571
Lifting clamp	1.4301
Lifting rope (if available)	1.4401
Shackle / dowel	1.4401
Motor size	
4-pole	014, 024, 034, 54, 74, 114, 164
6-pole	46, 66
8-pole	58
Power rating approx.	1,3 kW up to 16 kW
Bearing assembly	
Motor	Rolling element bearings – sealed for life with grease filling
Gear unit	Oil-lubricated roller bearings (size 500/800)
Motor	
Version **UM**	Non-flameproof
Version **XM**/**YM**	Flameproof to EEx d II B T3/T4
Switching method	up to 4 kW direct / > 4 kW direct or star-delta
Voltage	400 V *(Var.: 230 V (only motor 014, 024, 034), 500 V, 690 V)*
Cooling	by ambient medium
Immerson depth	up to 30 m
Cable	
Length	10 m *(Var.:* up to *50 m)*
Entry	cast in resin, completely watertight over its entire length
Type	see motor catalogue, cable sheathing of chloroprene rubber
Monitoring	
Motor version **UM**	one control circuit, i. e. automatic start/stop when reaching the admissible winding temperature
Motor version **XM**/**YM**	as UM additionally with limiting circuit for flameproof equipment
Moisture	*(Var.: leakage sensor in motor chamber)*
Paint coat	non-toxic KSB standard paint, colour RAL 5002 (blue) *(Var.: 250 µm 2-comp. epoxy resin coating (black))*
Admissible temperature of pumped media	
Motor version **UM**	40 °C
Motor version **XM**/**YM**	40 °C
Acceptance tests	
Hydraulic	Guarantee of operating data according to (DIN 1944/III or ISO 2548C), **without acceptance test**

Subject to technical modifications

Design



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$H_Ü$ = covering
H_{geo} = geodetic discharge head
$H_{Vtot.}$ = plant losses
H_{VR} = pipework losses
H_{VK} = valve losses
H_{VA} = outlet losses

Example:

Given:

Flow rate: Q = 1350 m^3/h

Geodetic discharge head:
H_{geo} = 0.3 m

(1) Preliminary selection **Amaline** with **DN 500** (see fig. 1)

(2) Determination of outlet losses (see fig. 2)

H_{VA} = $v^2/2g$ = 0.15 m

(3) Determination of discharge head

H = $H_{geo} + H_{Vtot.}$

$H_{Vtot.}$ = $H_{VR} + H_{VK} + H_{VA}$

H_{VR} = 0 m (short pipeline)

H_{VK} = 0.15 m (data by manufacturer. consider $H_{VK\,(Q)}$ course)

H_{VA} = $v^2/2g$ = 0.15 m

→ H = 0.3 m + 0 m + 0.15 m + 0.15 m = 0.6 m

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④ **Preliminary pump selection** (see fig. 1)
→ **P 400-50...**

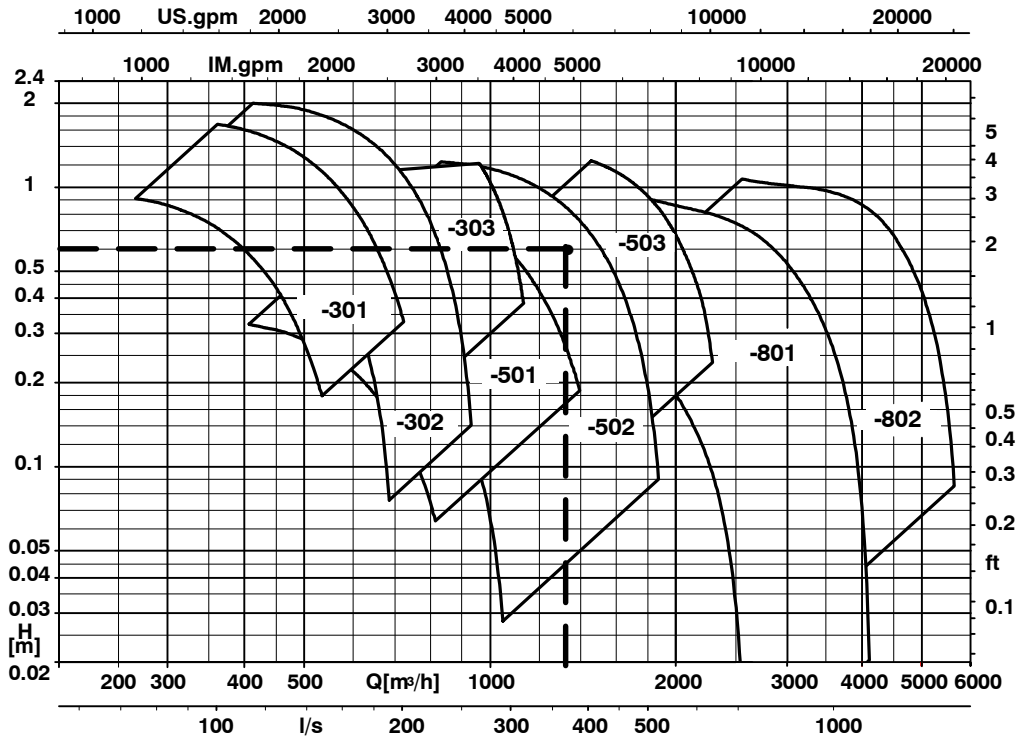

Fig. 1: Preliminary selection hydraulic diameter

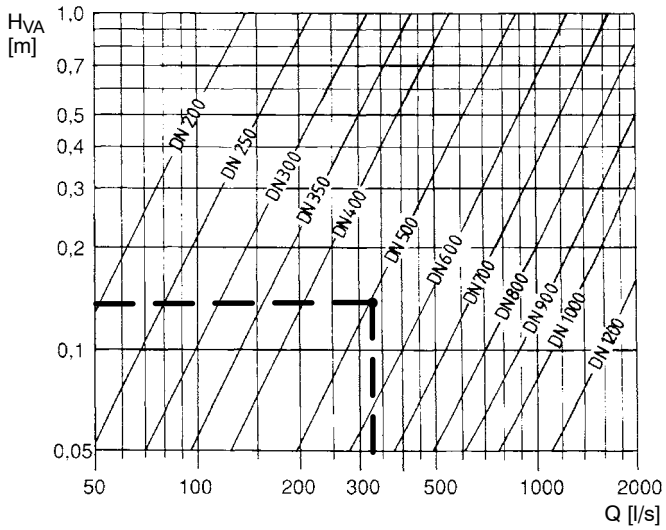

Fig. 2: Outlet loss $H_{VA} = v^2/2g$

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(5) Duty point = design point (acc. to fig. 3)

The design point can be reached without deviation by using a frequency converter.

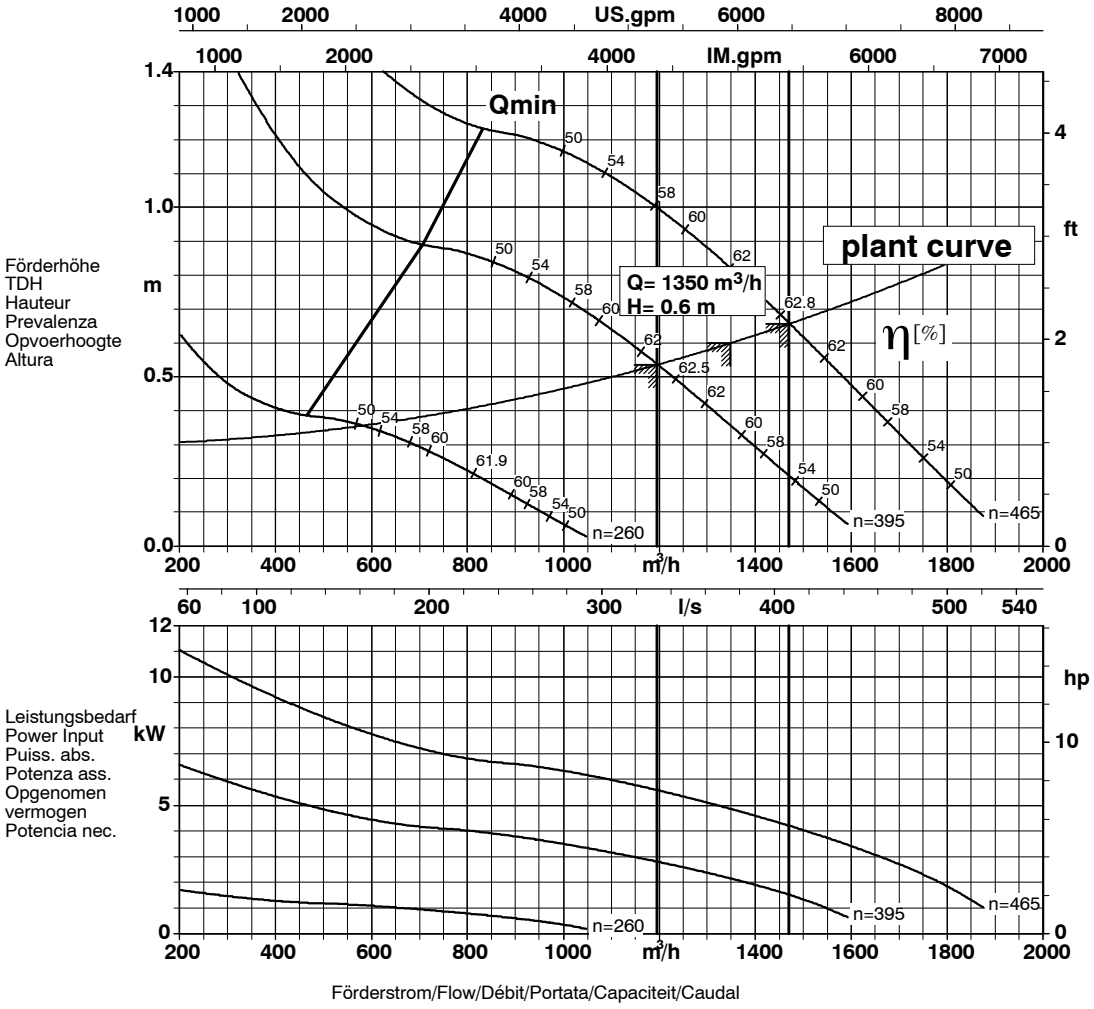


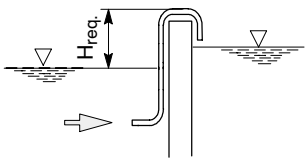
Fig. 3: Selection charts speed Amaline P ...-502

Operational speed is 395 1/min or 465 1/min. All pump units have a sufficient motor power reserve (motor power utilization: max. 85 %).

Designation Amaline P ...	Speed $n_{eff.}$ [min^{-1}]	Motor power P_2 [kW]	Drive with gear unit	Transmission ratio
400-502 / 54 YMG	395	4.0	S34B	3.62
400-502 / 54 UMG / XMG	395	5.5	S34B	3.62
400-502 / 74 UMG / XMG	398	7.5	S34B	3.62
460-502 / 114 UMG / XMG	465	11.8	S44B	3.15

(6) Operation characteristics

Pipework length: L > 5 x D:
When starting the pump, larger discharge heads are to be stated due to accelaration of the pipework contents. That is why the pump briefly exceeds its operating limits!



Operating in lifting pipes:
The duty point for filling the pipe has to be inferior to the operating limit:
$H_{max.} \leq$ operating limit

Discharge heads and capacity data apply to media with a density of ϱ = 1 kg/dm^3 and a kinematic viscosity ν to 20 mm^2/s.

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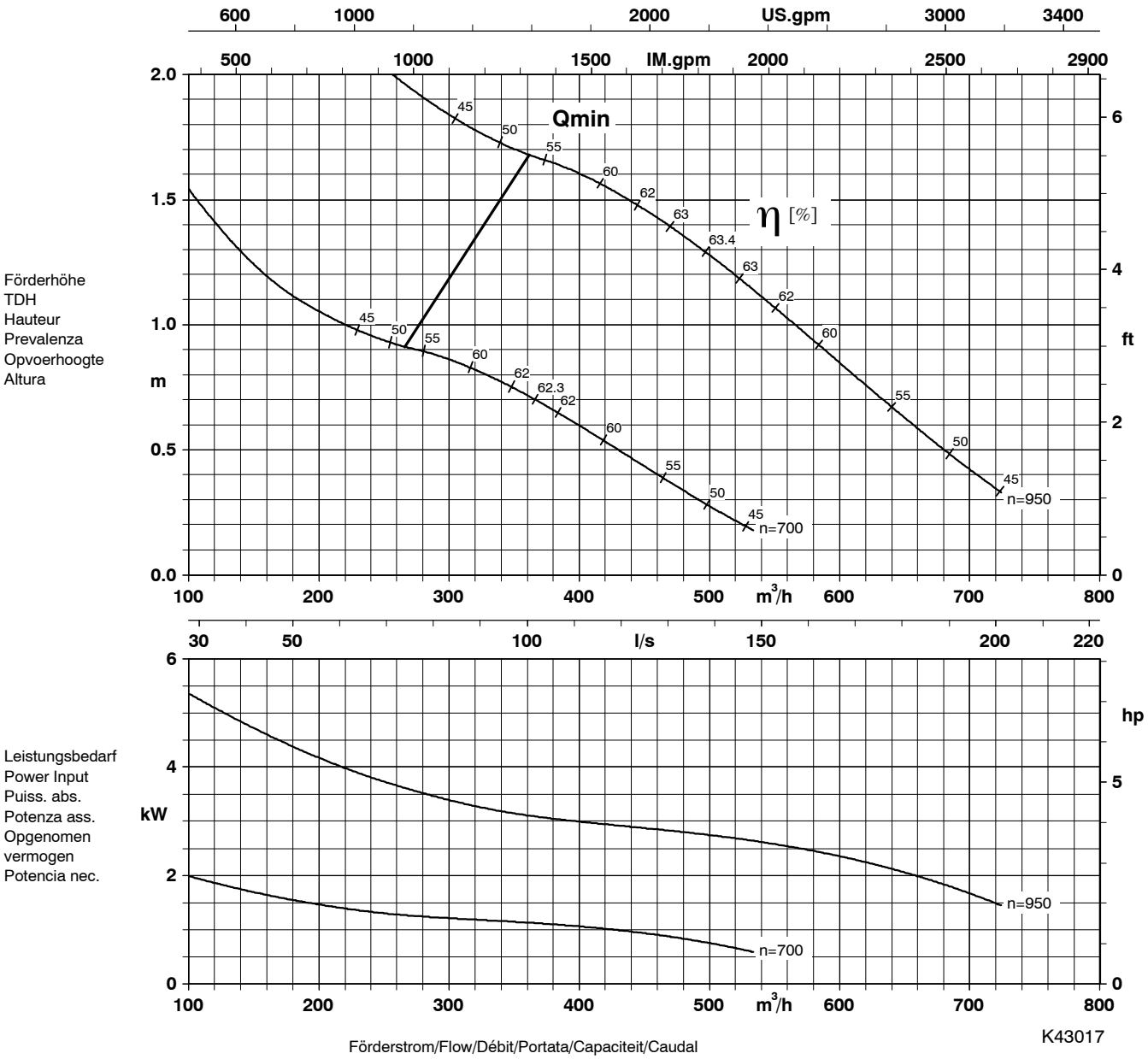
Amaline P ... -301

Propeller-Ø 300 mm



Förderstrom/Flow/Débit/Portata/Capaciteit/Caudal

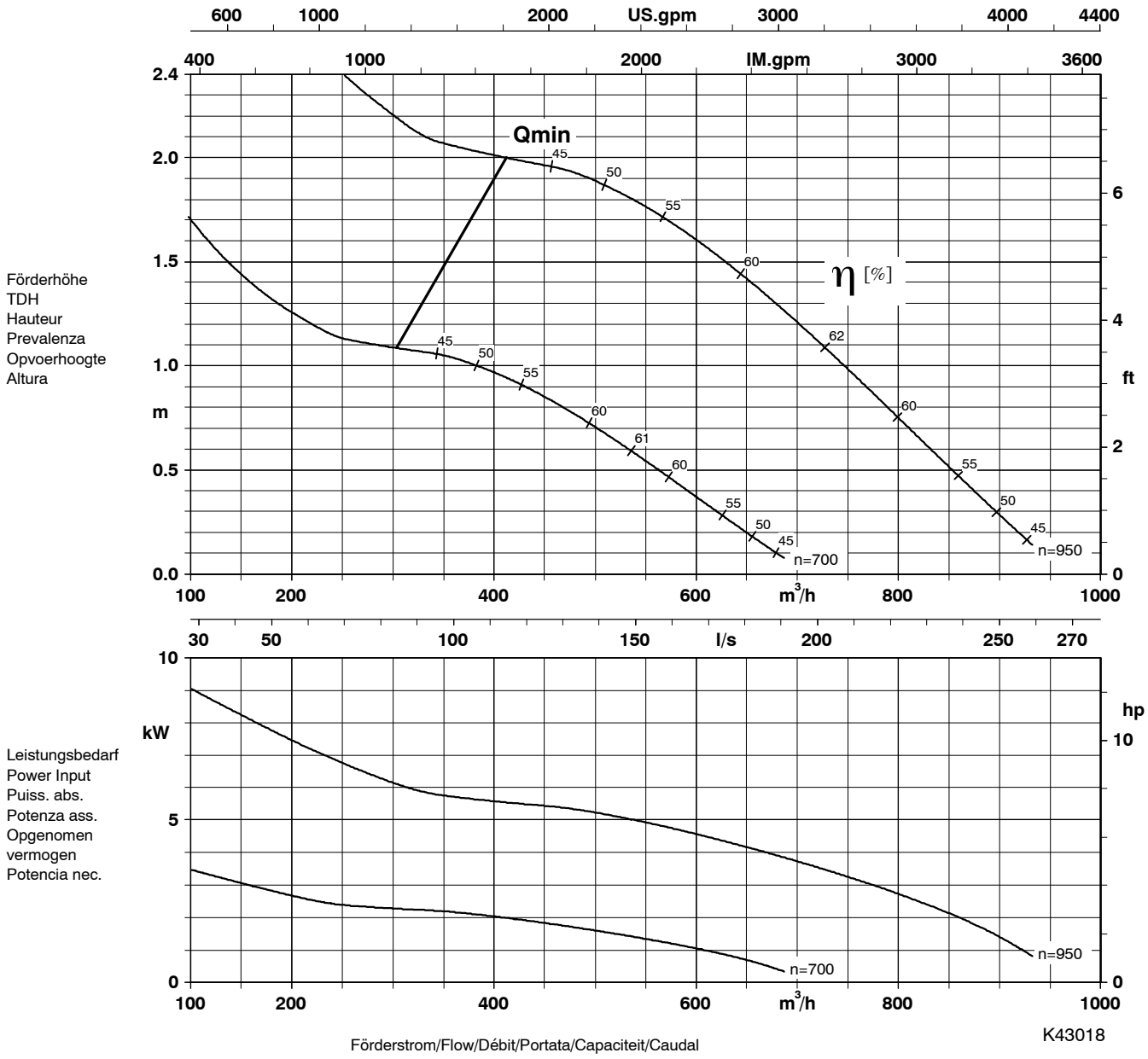
Kugeldurchgang/Free passage/Passage intégral 60 mm
Passaggio libero/Kogeldoorgang/Paso libre 60 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.}$= H_{VR} + H_{VK} + H_{VA}

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
725-301 / 58 UMG / YMG	700	3,5	–	–
960-301 / 46 UMG / XMG	950	4,8	–	–
960-301 / 66 UMG / XMG	945	6,0	–	–

Amaline P ... -302

Propeller-Ø 300 mm



Förderhöhe
TDH
Hauteur
Prevalenza
Opvoerhoogte
Altura

Leistungsbedarf
Power Input
Puiss. abs.
Potenza ass.
Opgenomen
vermogen
Potencia nec.

Förderstrom/Flow/Débit/Portata/Capaciteit/Caudal

Kugeldurchgang/Free passage/Passage intégral	60 mm
Passaggio libero/Kogeldoorgang/Paso libre	60 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.} = H_{VR} + H_{VK} + H_{VA}$

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
725-302 / 58 UMG / YMG	700	3,5	–	–
960-302 / 46 UMG / XMG	950	4,8	–	–
960-302 / 66 UMG / XMG	945	6,0	–	–

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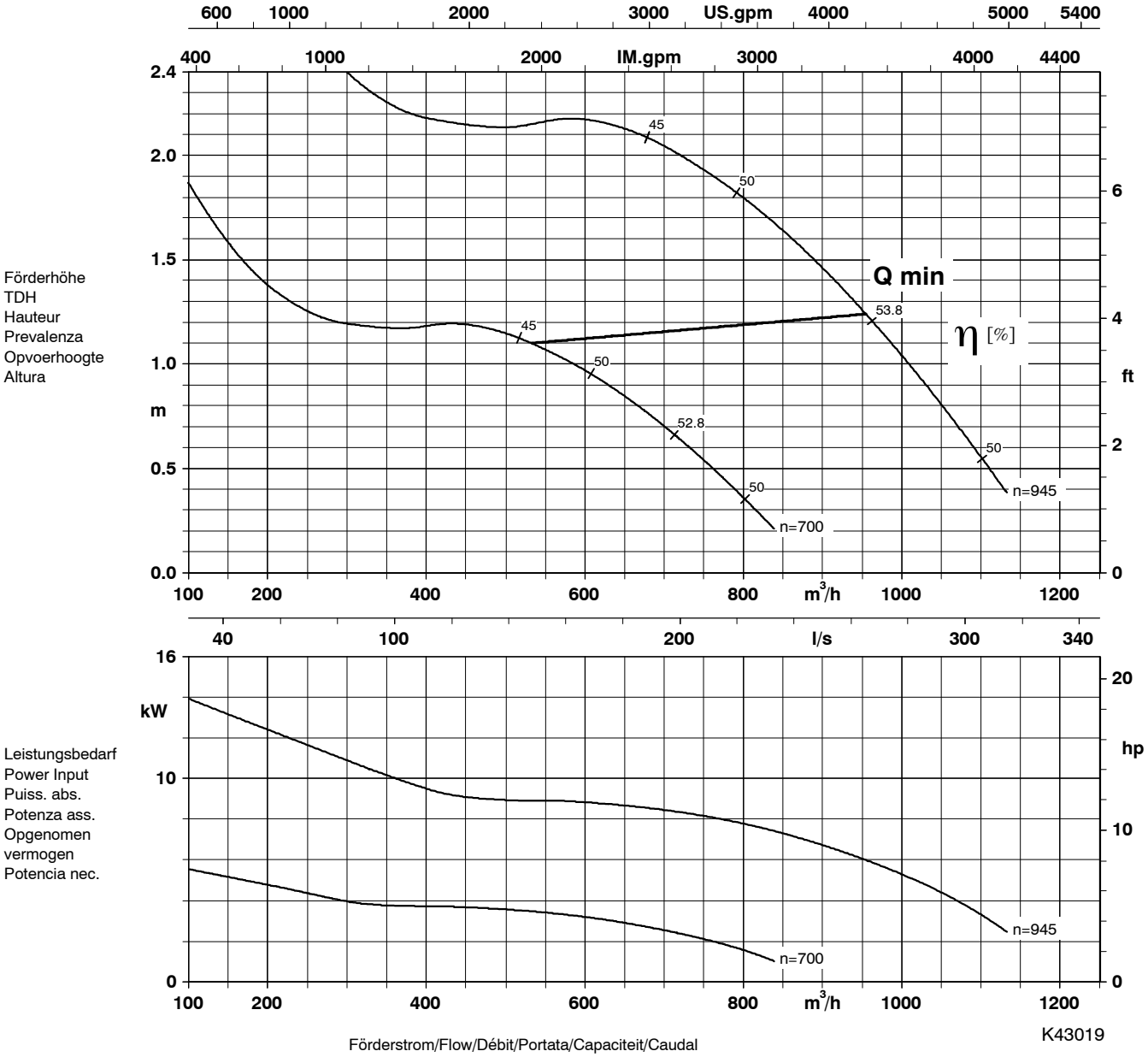
Amaline P ... -303

Propeller-Ø 300 mm



Förderhöhe
TDH
Hauteur
Prevalenza
Opvoerhoogte
Altura

Leistungsbedarf
Power Input
Puiss. abs.
Potenza ass.
Opgenomen vermogen
Potencia nec.

Förderstrom/Flow/Débit/Portata/Capaciteit/Caudal

Kugeldurchgang/Free passage/Passage intégral Passaggio libero/Kogeldoorgang/Paso libre	60 mm 60 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.}$= H_{VR} + H_{VK} + H_{VA}

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
725-303 / 58 UMG / YMG	700	3,5	-	-
960-303 / 66 UMG / XMG	945	6,0	-	-

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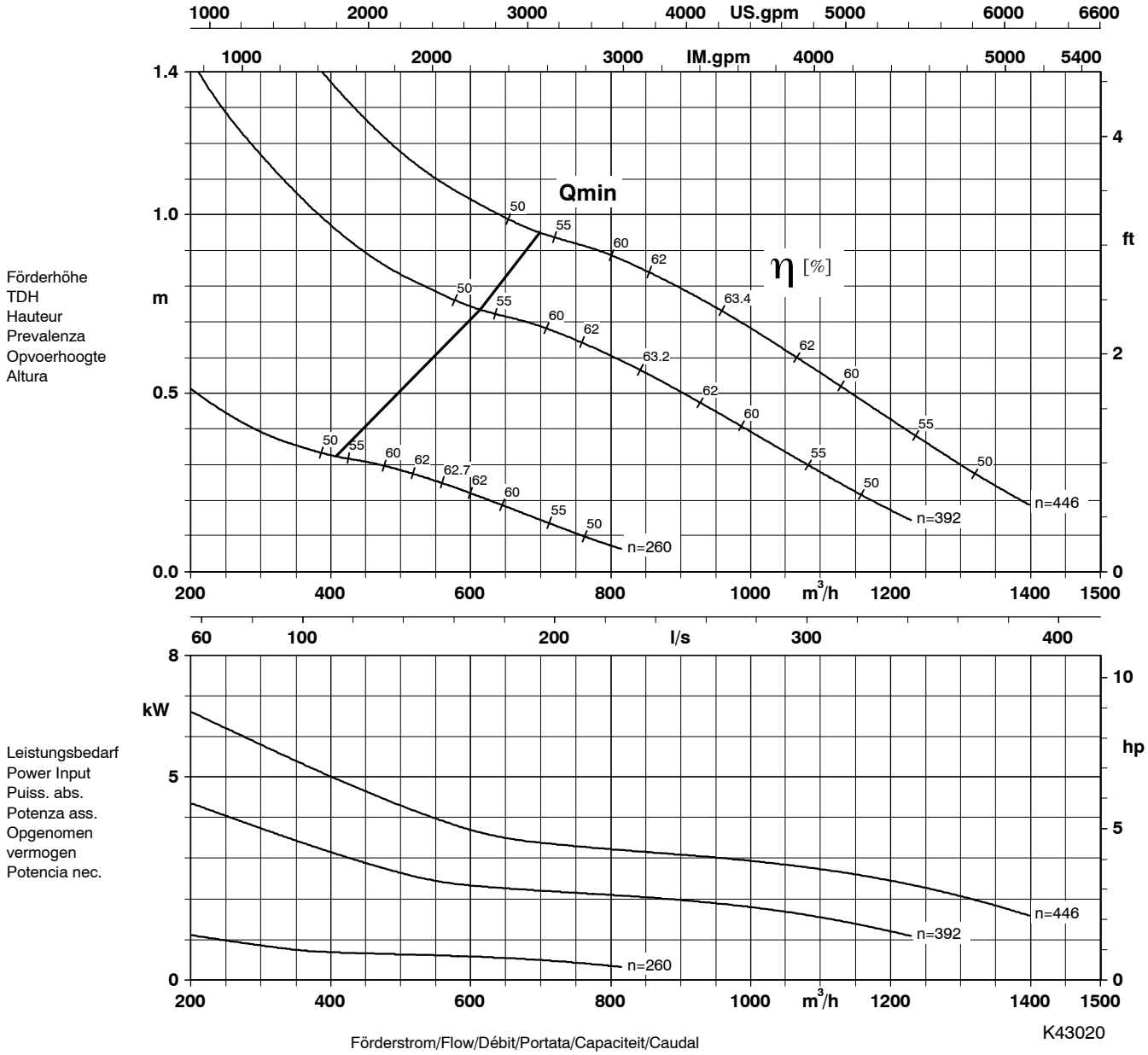
Amaline P ... -501

Propeller-Ø 480 mm



Kugeldurchgang/Free passage/Passage intégral	100 mm
Passaggio libero/Kogeldoorgang/Paso libre	100 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.} = H_{VR} + H_{VK} + H_{VA}$

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
260-501 / 014 UMG / YMG	256	1,3	S24B	5,47
260-501 / 024 UMG / YMG	260	2,4	S24B	5,47
400-501 / 024 UMG / YMG	392	2,4	S34B	3,62
400-501 / 034 UMG / YMG	391	3,15	S34B	3,62
400-501 / 54 YMG	395	4,0	S34B	3,62
460-501 / 74 UMG / XMG	446	7,5	S34B	3,232

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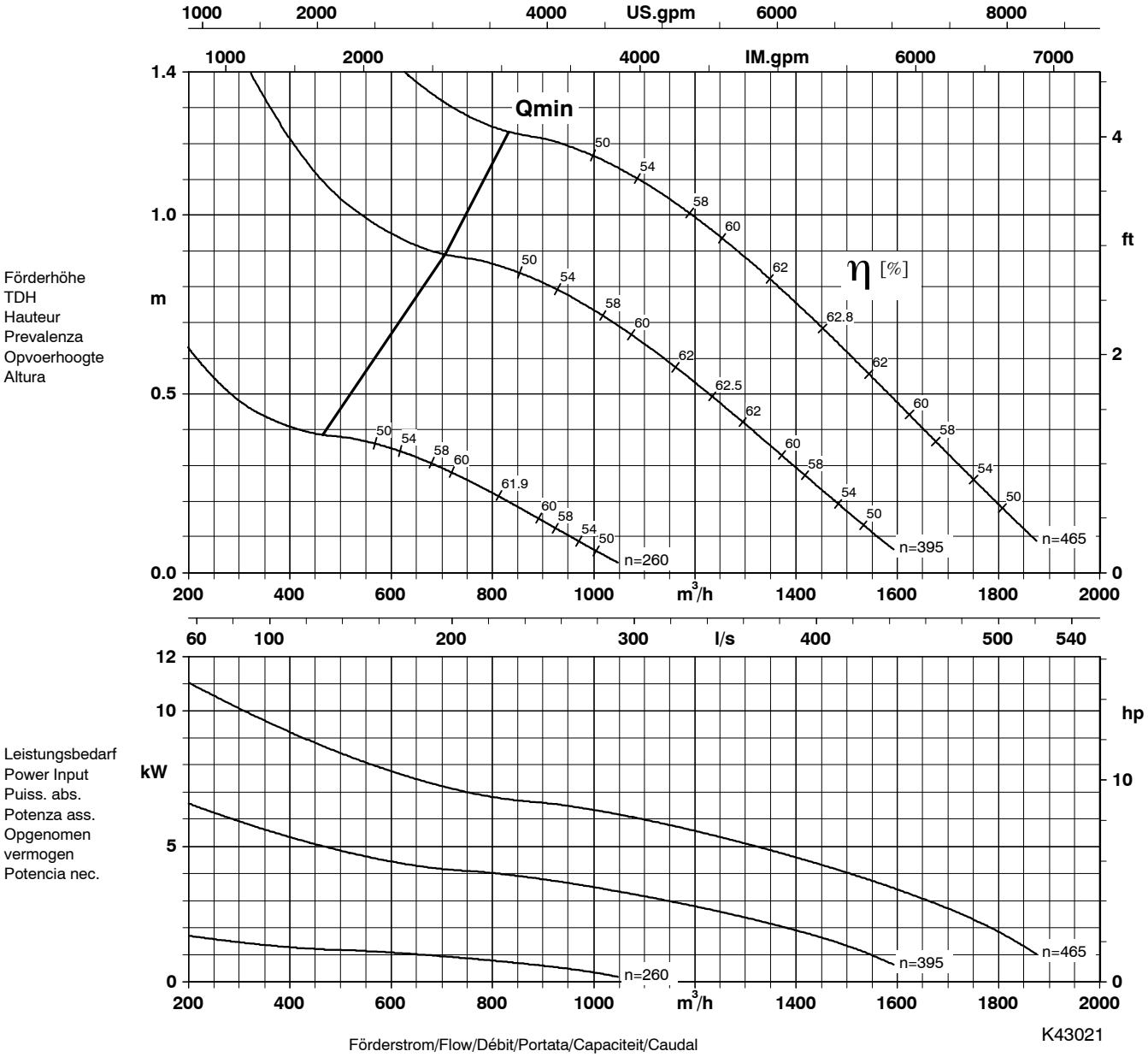
Amaline P ... -502

Propeller-Ø 480 mm



Förderstrom/Flow/Débit/Portata/Capaciteit/Caudal

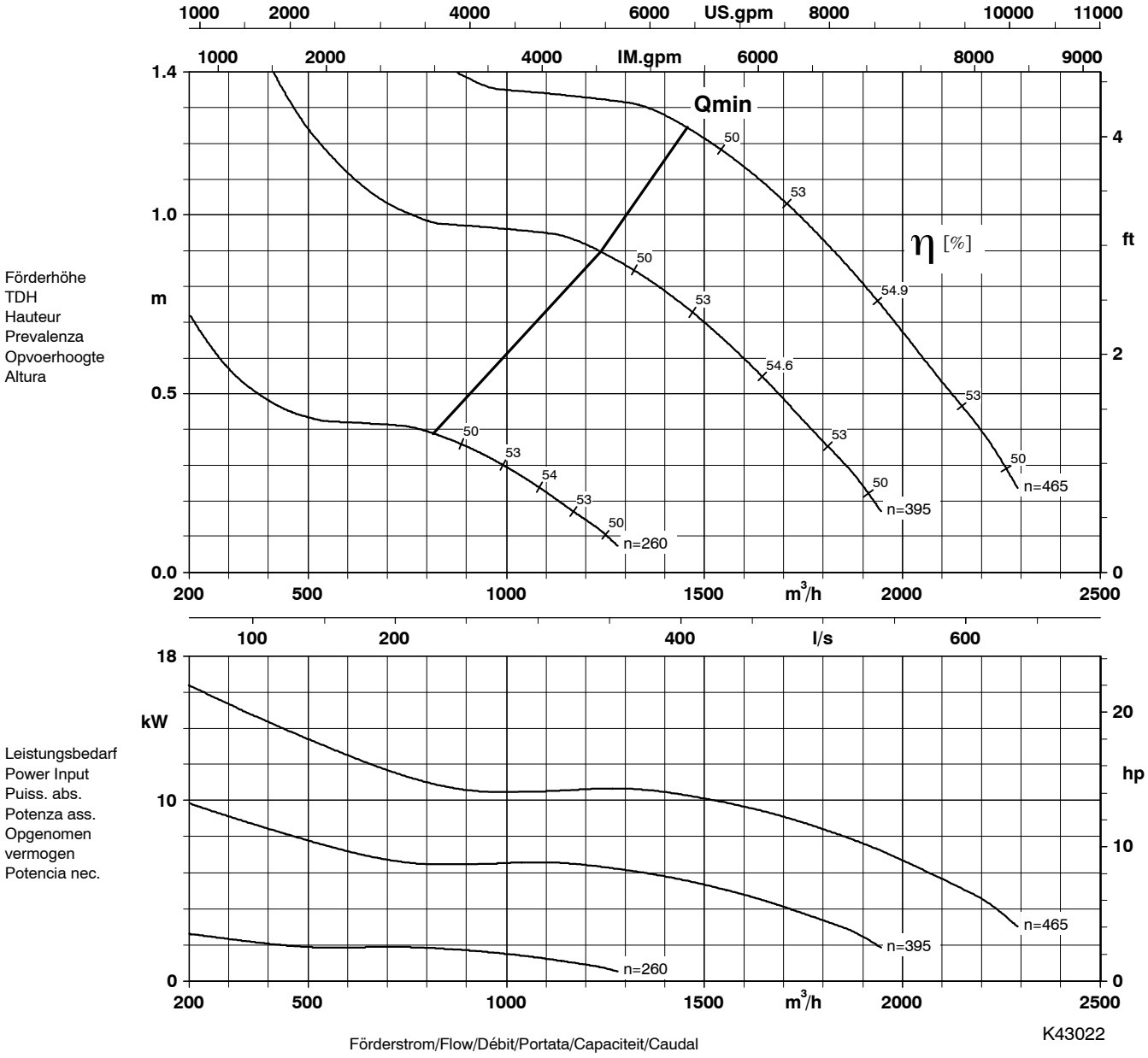
Kugeldurchgang/Free passage/Passage intégral 100 mm
Passaggio libero/Kogeldoorgang/Paso libre 100 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.} = H_{VR} + H_{VK} + H_{VA}$

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
260-502 / 024 UMG / YMG	260	2,4	S24B	5,47
260-502 / 034 UMG / YMG	259	3,15	S24B	5,47
400-502 / 54 YMG	395	4,0	S34B	3,62
400-502 / 54 UMG / XMG	395	5,5	S34B	3,62
400-502 / 74 UMG / XMG	398	7,5	S34B	3,62
460-502 / 114 UMG / XMG	465	11,8	S44B	3,15

Amaline P ... -503

Propeller-Ø 480 mm



Kugeldurchgang/Free passage/Passage intégral	100 mm
Passaggio libero/Kogeldoorgang/Paso libre	100 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.} = H_{VR} + H_{VK} + H_{VA}$

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
260-503 / 034 UMG / YMG	259	3,15	S24B	5,47
260-503 / 54 YMG	261	4,0	S34B	5,47
400-503 / 54 UMG / XMG	395	5,5	S34B	3,62
400-503 / 74 UMG / XMG	398	7,5	S34B	3,62
460-503 / 164 UMG / XMG	465	16	S44B	3,15

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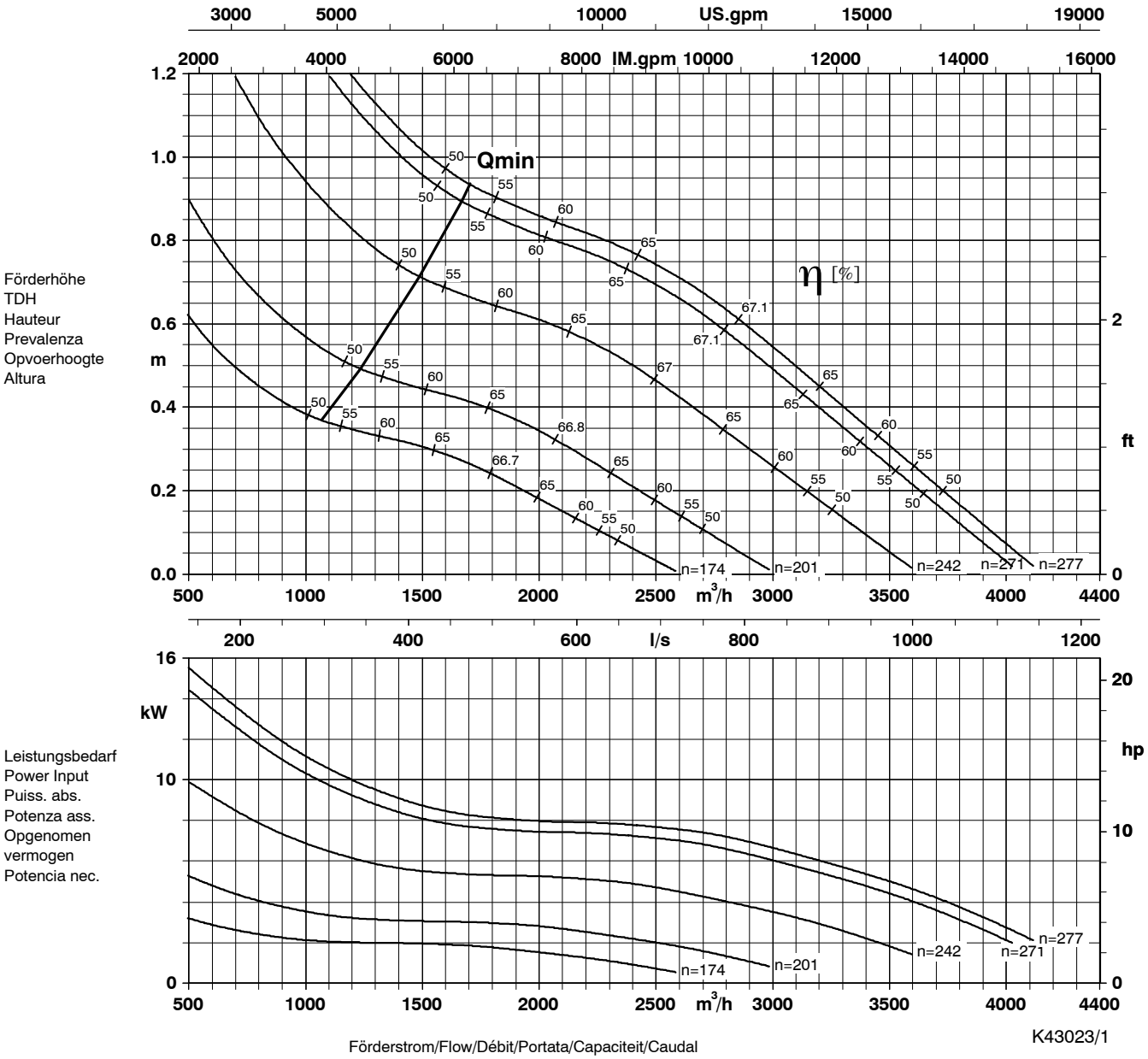
Amaline P ... -801

Propeller-Ø 780 mm



Förderhöhe
TDH
Hauteur
Prevalenza
Opvoerhoogte
Altura

Leistungsbedarf
Power Input
Puiss. abs.
Potenza ass.
Opgenomen vermogen
Potencia nec.

Förderstrom/Flow/Débit/Portata/Capaciteit/Caudal

K43023/1

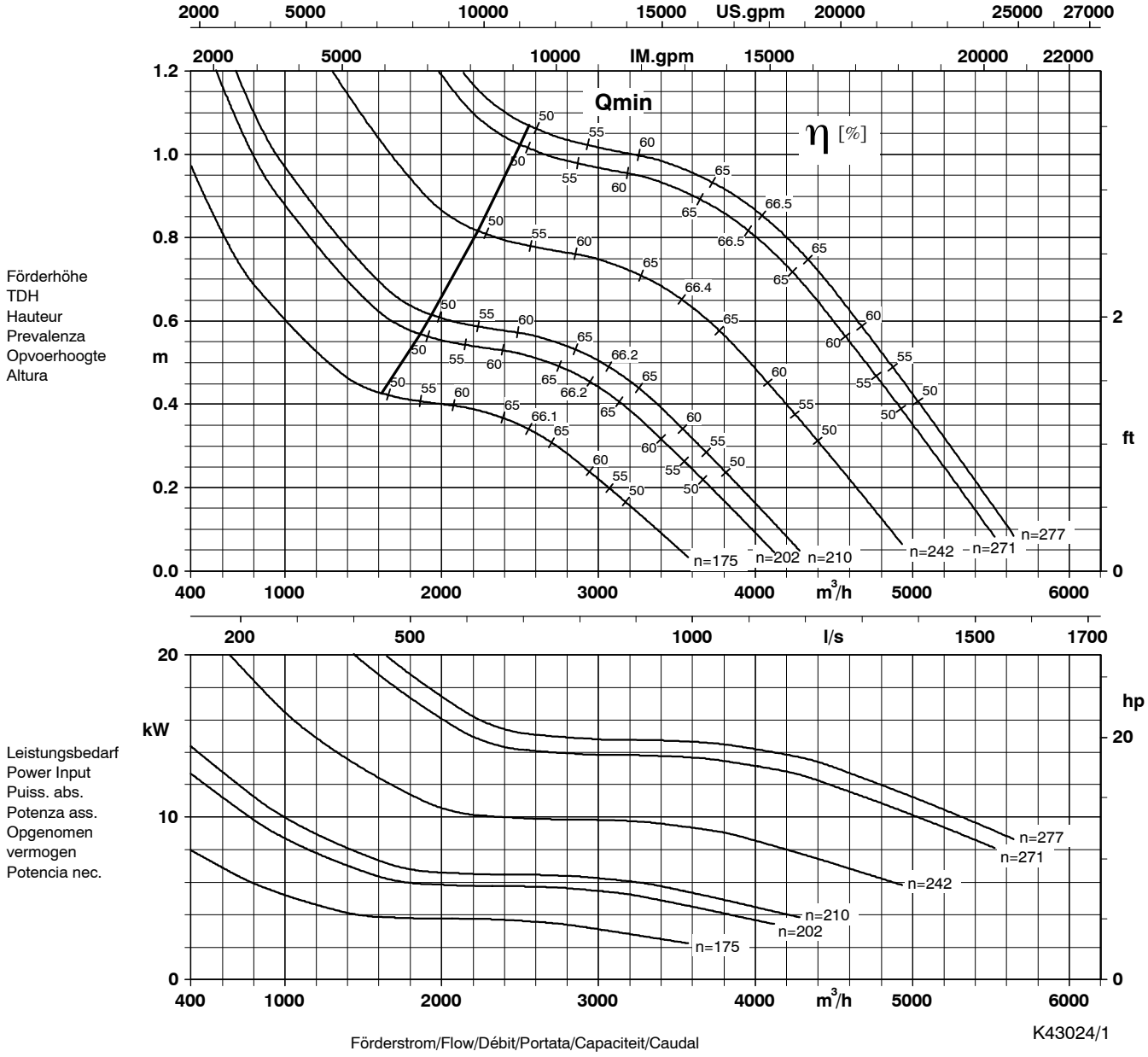
Kugeldurchgang/Free passage/Passage intégral 160 mm
Passaggio libero/Kogeldoorgang/Paso libre 160 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.} = H_{VR} + H_{VK} + H_{VA}$

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
180-801 / 034 UMG / YMG	174	3,15	S34B	8,15
200-801 / 54 UMG / XMG	201	5,5	S34B	7,12
240-801 / 114 UMG / XMG	242	11,8	S44B	6,051
270-801 / 114 UMG / XMG	271	11,8	S44B	5,4
280-801 / 164 UMG / XMG	277	11,8	S44B	5,294

Amaline P ... -802

Propeller-Ø 780 mm



Kugeldurchgang/Free passage/Passage intégral	160 mm
Passaggio libero/Kogeldoorgang/Paso libre	160 mm

Anlagenverluste beachten / calculate plant losses / (s. Seite 9 / see page 9) / $H_{Vges.}$ / $H_{Vtot.}$= H_{VR} + H_{VK} + H_{VA}

Benennung Designation Amaline P ...	Drehzahl Speed $n_{eff.}$ [min^{-1}]	Motorleistung Motor power P_2 [kW]	Antrieb mit Getriebe Drive with gear unit	Übersetzungsverhältnis Transmission ratio
180-802 / 54 UMG / XMG	175	5,5	S34B	8,15
200-802 / 74 UMG / XMG	202	7,5	S34B	7,12
210-802 / 114 UMG / XMG	210	11,8	S44B	6,97
240-802 / 114 UMG / XMG	242	11,8	S44B	6,051
270-802 / 164 UMG / XMG	271	16	S44B	5,4
280-802 / 164 UMG / XMG	277	16	S44B	5,294

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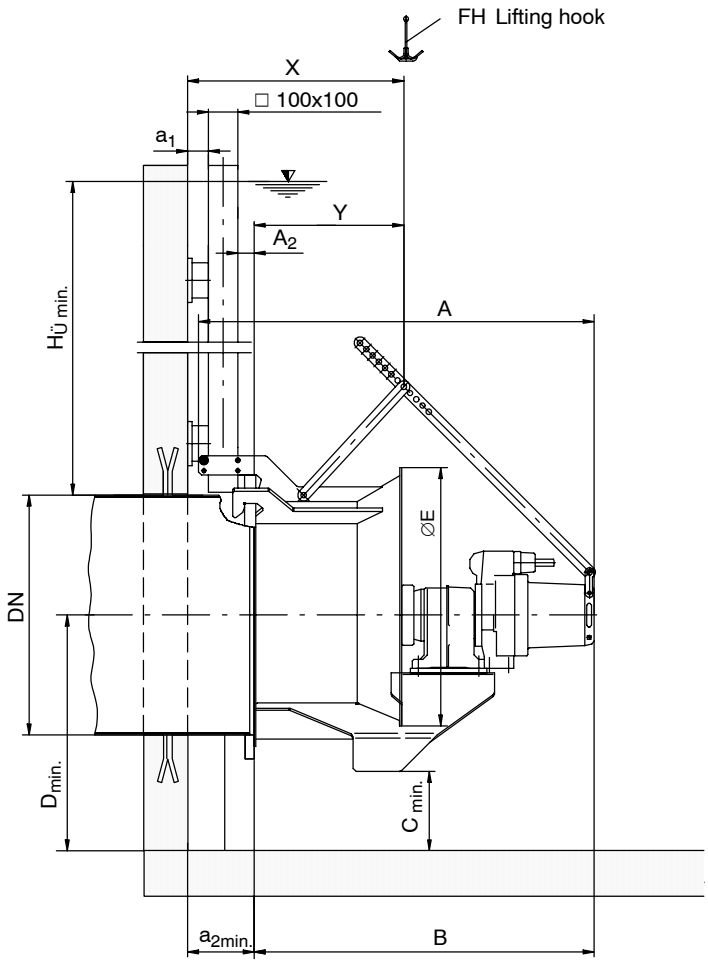
Amaline P ...-300 **Motor: 46, 66, 58**



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	Amaline P ...-300
A_2	40 mm
$a_{1min.}$	70 mm
$a_{2min.}$	210 mm

Dimensions table

Size Amaline P ...	Dimensions [mm] A	B	C	D min.	ØE	$H_{Ü\ min.}$	Y	X min.	DN	Weight [kg]
725-301/58	944	775	79	350	542	500	approx. 400	approx. 610	300	154
725-302/58										
725-303/58										
960-301/46										151
960-301/66										156
960-302/46										151
960-302/66										156
960-303/66										

Subject to technical modifications

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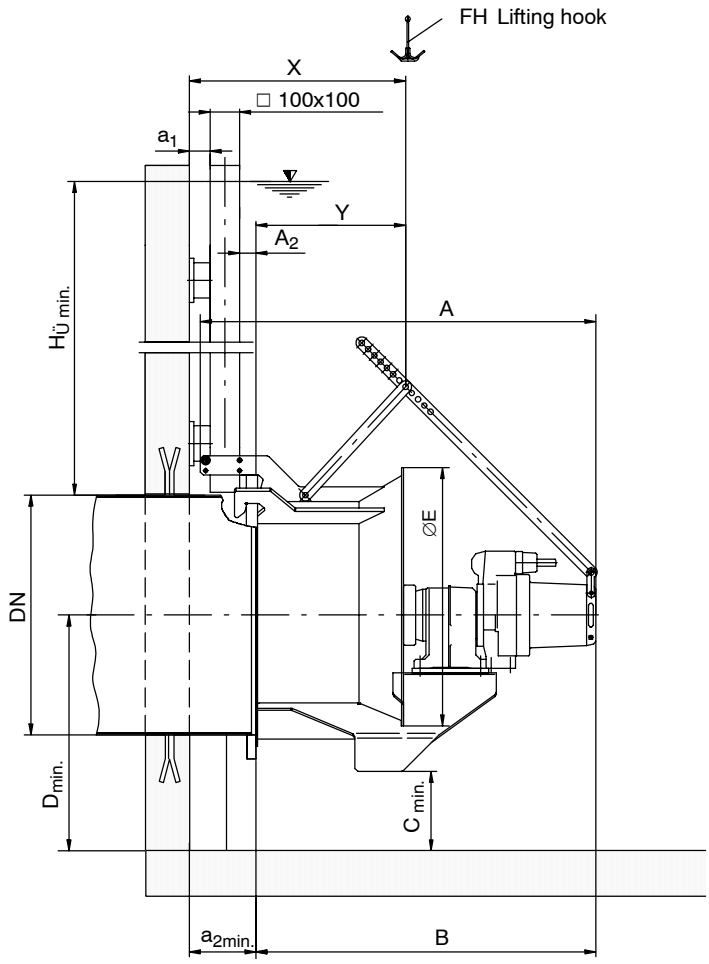
Amaline P ...-500/800 **Motor: 014, 024, 034**



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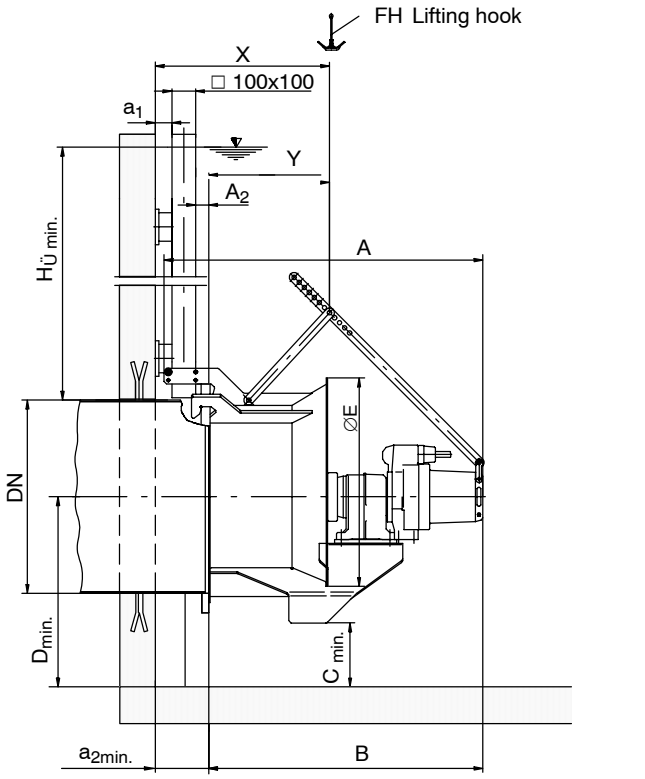
	Amaline P	
	...-500	...-800
A_2	50 mm	55 mm
$a_{1min.}$	70 mm	70 mm
$a_{2min.}$	220 mm	225 mm

Dimensions table

Size Amaline P ...	Dimensions [mm] A	B	C	D min.	ØE	HÜ min.	Y	X min.	DN	Weight [kg]
260-501/014	1226	1043	85	450	730	700	approx. 330	approx. 550	500	186
260-501/024										189
260-502/034										191
260-502/024										189
260-503/034										191
400-501/024	1241	1058					approx. 380	approx. 600		202
400-501/034										205
180-801/034	1416	1228	85	600	1030	1100	approx. 500	approx. 725	800	295

Subject to technical modifications

Amaline P ...-500/800 **Motor: 54, 74, 114, 164**



	Amaline P	
	...-500	...-800
A_2	50 mm	55 mm
$a_{1min.}$	70 mm	70 mm
$a_{2min.}$	220 mm	225 mm

Dimensions table

Size	Dimensions [mm]									Weight
Amaline P ...	A	B	C	$D_{min.}$	ØE	$H_{Ü\ min.}$	Y	$X_{min.}$	DN	[kg]
260-503/54	1175	992	85	450	730	700	approx. 400	approx. 620	500	229
400-501/54										229
400-502/54										229
400-502/74										236
400-503/54										229
400-503/74										236
460-501/74										236
460-502/114	1231	1048					approx. 470	approx. 690		283
460-503/164										306
180-802/54	1350	1162	85	600	1030	1100	approx. 500	approx. 725	800	334
200-801/54										334
200-802/74										341
210-802/114	1406	1218	85	600	1030	1100	approx. 550	approx. 775	800	388
240-801/114	1536	1348					approx. 620	approx. 845		438
240-802/114										438
270-801/114										438
270-802/164							approx. 670	approx. 895		461
280-801/114										461
280-802/164										461

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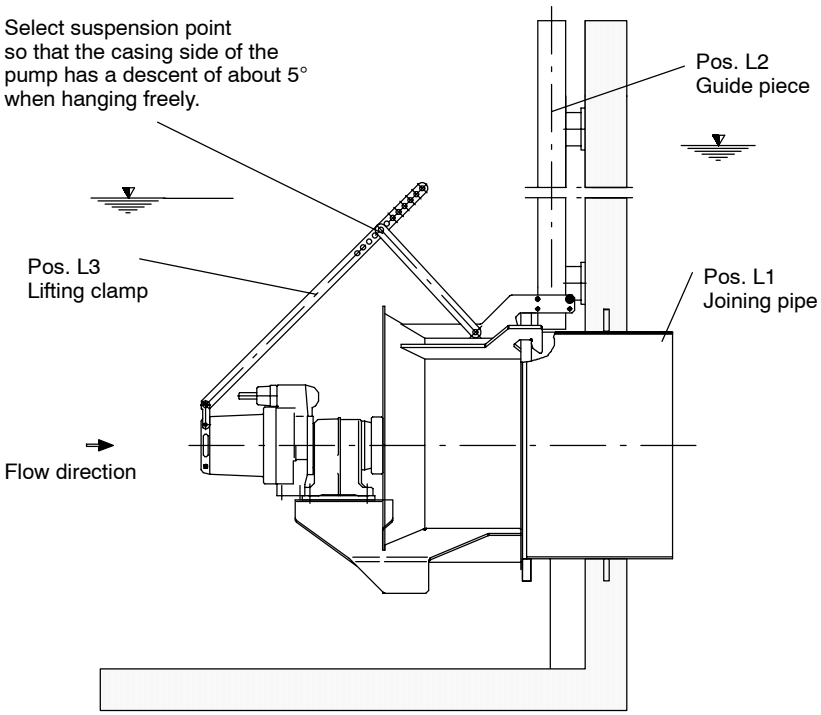
Fastening equipment

Position L1, L2, L3



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Technical Data

Item No.	Designation	Weight	Material	
		[kg]	galvanised steel	1.4571
L1	Joining pipe length a_3 = 1 m (standard)			
L1.1	DN 300	102	X	X
L1.2	DN 500	198	X	X
L1.3	DN 800	390	X	X
L1.1.1	Extension DN 300 per 1 m	48	X	X
L1.2.1	Extension DN 500 per 1 m	79	X	X
L1.3.1	Extension DN 800 per 1 m	125	X	X
L2	Guide piece standard length l_1 = 1 m	20	X	X
L2.1	Extension – per 1 m	12	X	X
L3	Lifting clamp		1.4301	

Dimensions and designations: see page 24 ff.

Scope of Supply

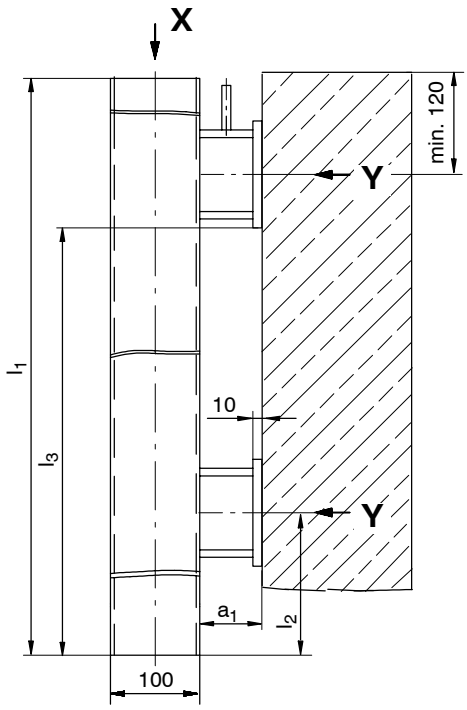
- Amaline recirculation pump including lifting clamp, 10 m power cable, bolts in A4
- Bolts in A4
- Joining pipe

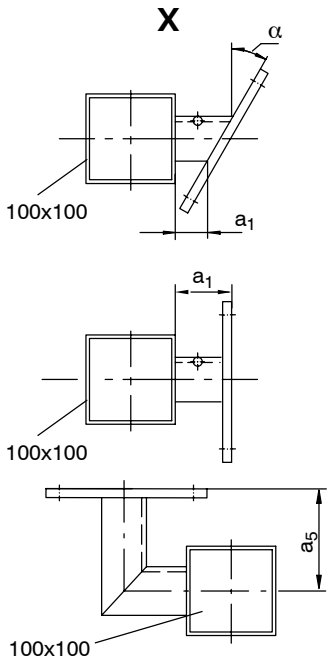
Subject to technical modifications

Order data

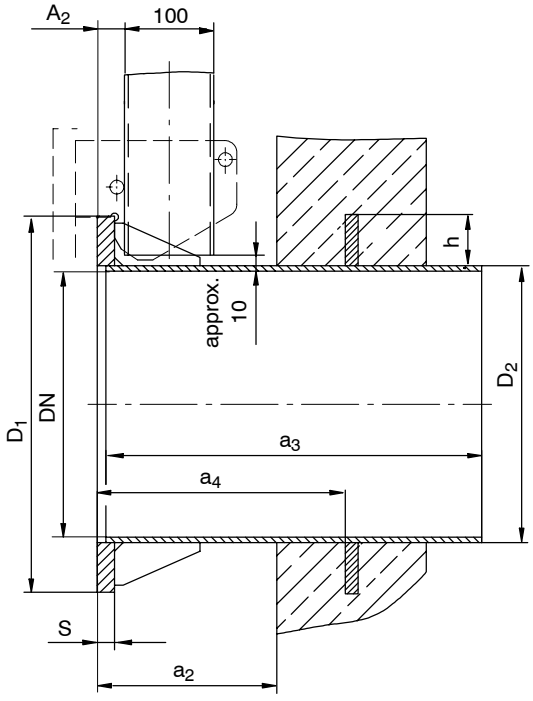
Assembly acessories - standard

1. Guide piece





2. Joining pipe



Size	Dimension [mm]	Remark
a_1		min. 70 mm
a_2		$a_2 = a_1 + A_2 + 100$ mm DN 300: $A_2 = 40$ mm DN 500: $A_2 = 50$ mm DN 800: $A_2 = 55$ mm
a_3		depends on plant
a_4		if necessary
a_5		>0.5 x ØE, (see page 20, 21, 22) only with angled version
l_1		acc. to installation depth
l_2		acc. to installation depth min. 120 mm
l_3		acc. to installation depth
α		Note: $a_{1\ min.} = 70 + 50 \times \tan \alpha$
Dimensions DN, D_1, D_2, S and h see table p. 25		

Subject to technical modifications

Dimensions table

Size Amaline	DN [mm]	Gear unit	D_1	D_2	S	h
			[mm]			
P ...-300 (-301, -302, -303)	300	–	440	324	20	60
P ...-500 (-501, -502, -503)	500	x	645	508	30	70
P ...-800 (-801, -802)	800	x	975	813	30	80

Subject to technical modifications

The following data is required for ordering the guide piece:

- l_1, l_2, l_3, and a_1, (ggf. auch a_5 or α)
- Material (galvanised steel / 1.4571)

The following data is required for ordering the joining pipe:

- a_3, a_4
- Material (galvanised steel / 1.4571)

Material variants		galvanised steel	1.4571
Designation	Size	Ident. No.	
1. Guide piece	300/500/800	19 219 569	19 219 568
		Do not forget the following ordering data: l_1 = _____ mm l_2 = _____ mm l_3 = _____ mm a_1 = _____ mm a_5 = _____ mm α = _____ o	
	Fasteners for item 1 (guide piece): Composite anchor bolts M12x160 (threaded pin and mortar cartridge): Ident. No.: 01 093 519 + 01 093 565 (A4), 4 pcs required		
2. Fit joining pipe	300	19 219 500	19 219 571
	500	19 219 572	19 219 573
	800	19 219 574	19 219 575
		Do not forget the following ordering data: a_3 = _____ mm a_4 = _____ mm	