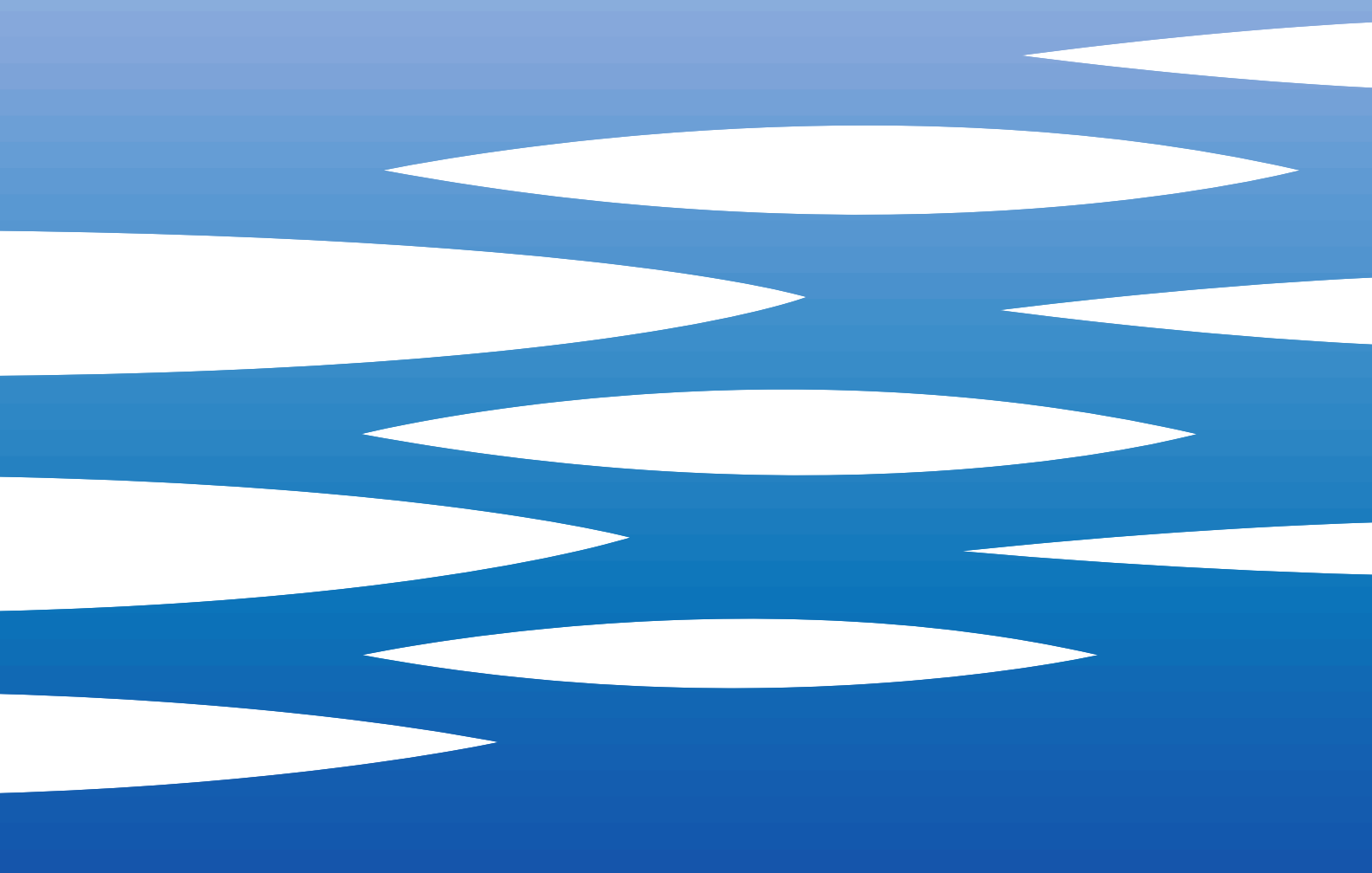




EBARA



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SPECIFICATION

50Hz

Rev. J

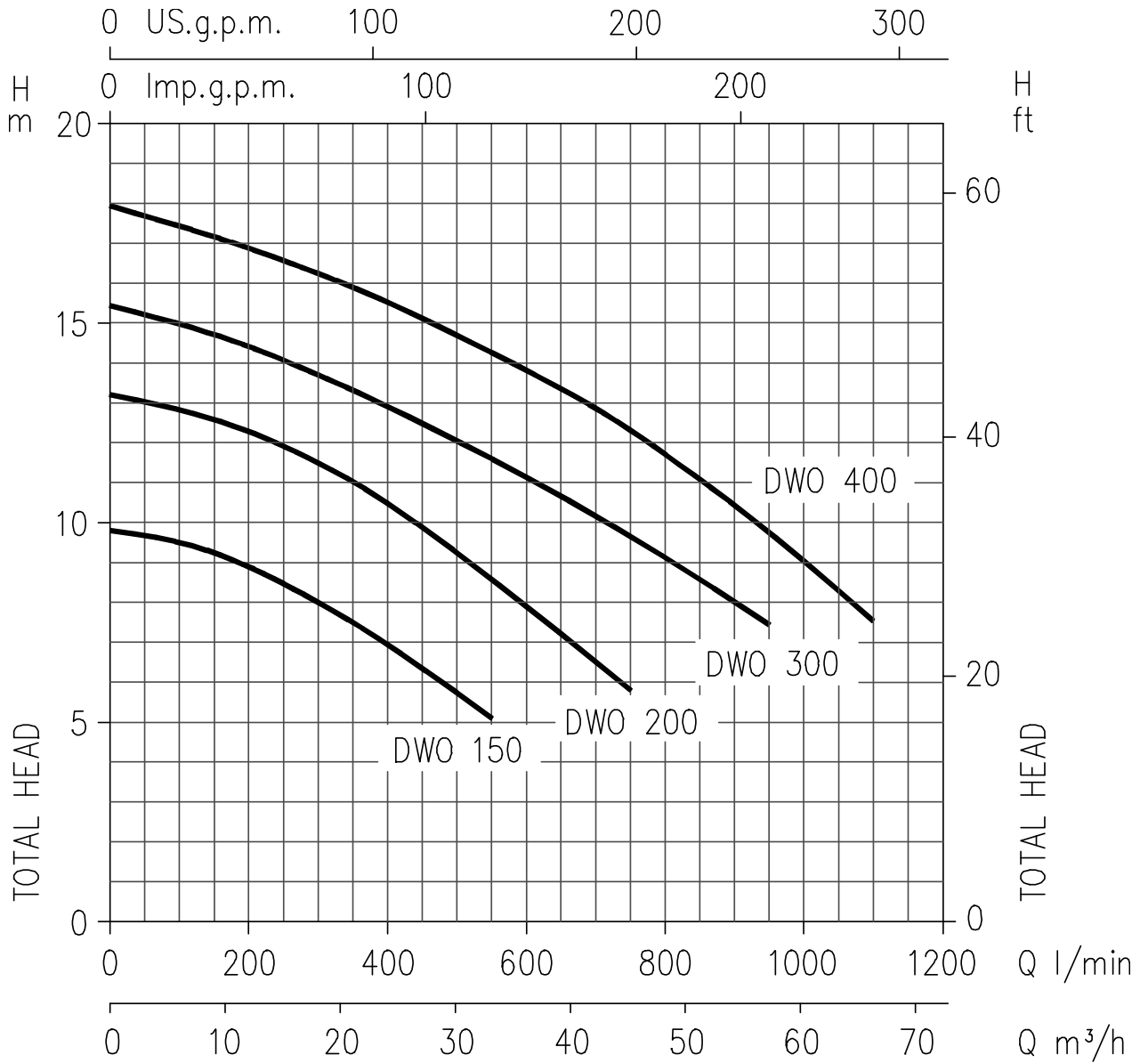
PUMP		
Liquid Handled	Type of liquid	Clean water
	Temperature [°C]	min. -5 max. +90 max. +110 (H-HS-HW-HSW)
Maximum working pressure	[MPa]	0,8
Construction	Impeller	Open centrifugal type
	Shaft seal type	Mechanical seal
	Bearing	Sealed ball bearing
Pipe Connection	Suction	G 2 G 2½ (DWO 300-400)
	Discharge	G 2
Material	Casing	AISI 304
	Impeller	AISI 304
	Casing cover	AISI 304
	Shaft seal	Ceramic/Carbon/NBR (for version see page 301)
	Casing cover	AISI 304
	Shaft	AISI 304 (Wet extension)
	Bracket	Aluminium
Applicable standard of test		ISO 9906 – Annex A

MOTOR		
Type	Electric - TEFC	
	Single Phase	Three Phase
Efficiency level (Reg. 640/2009)	-	IE2 from 1.1 kW up to 3.0 kW IE3 from 1.1 kW up to 3.0 kW
No. of Poles	2	
Rotation speed [min ⁻¹]	≈ 2800	
Insulation Class	F	
Protection degree(CEI EN 60034-5)	IP 55	
Power rating	[kW]	1.1 ÷ 1.5
	[HP]	1.5 ÷ 2
Frequency [Hz]	50	
Voltage [V]	230 ±10%	230/400 ±10%
Capacitor	Built in	-
Over load protection	Built in	Provided by the user
Casing material	Aluminium	
Base material/motor support	Aluminium	
Dimensions of cable entry	PG11 - PG13.5 – M20x1.5 (See page 400)	

SELECTION CHART

50Hz

Rev. J



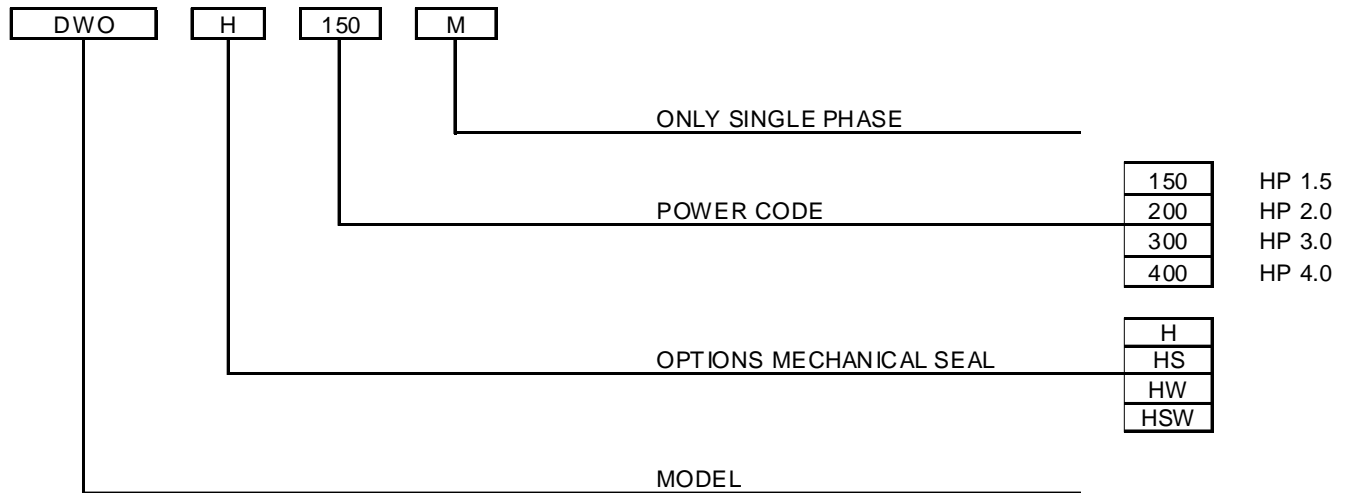
Pump type		Power		Q=Capacity									
Single Phase	Three Phase	[kW]	[HP]	l/min	0	100	200	300	400	550	750	950	1100
				m³/h	0	6	12	18	24	33	42	57	66
H=Total manometric head in meters													
DWO 150 M	DWO 150	1.1	1.5	9.8	9.5	8.9	7.9	6.9	5.1	-	-	-	-
DWO 200 M	DWO 200	1.5	2	13.2	12.7	12.3	11.5	10.5	8.6	5.8	-	-	-
-	DWO 300	2.2	3	15.5	15	14.5	13.8	12.9	11.7	9.7	7.5	-	-
-	DWO 400	3	4	18	17.5	16.9	16.3	15.6	14.3	12.4	9.8	7.6	-

TYPE KEY AND CURVE SPECIFICATIONS

50Hz

Rev. J

TYPE KEY



PERFORMANCE CURVE SPECIFICATIONS

The specifications below qualify the curves shown on the following pages.

Tolerances according to ISO 9906 Annex A

The curves refer to effective speed of asynchronous motors at 50 Hz

Measurements were carried out with clean water at 20°C of temperature and with a kinematic viscosity of $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt)

The NPSH curve is an average curve obtained in the same conditions of performance curves.

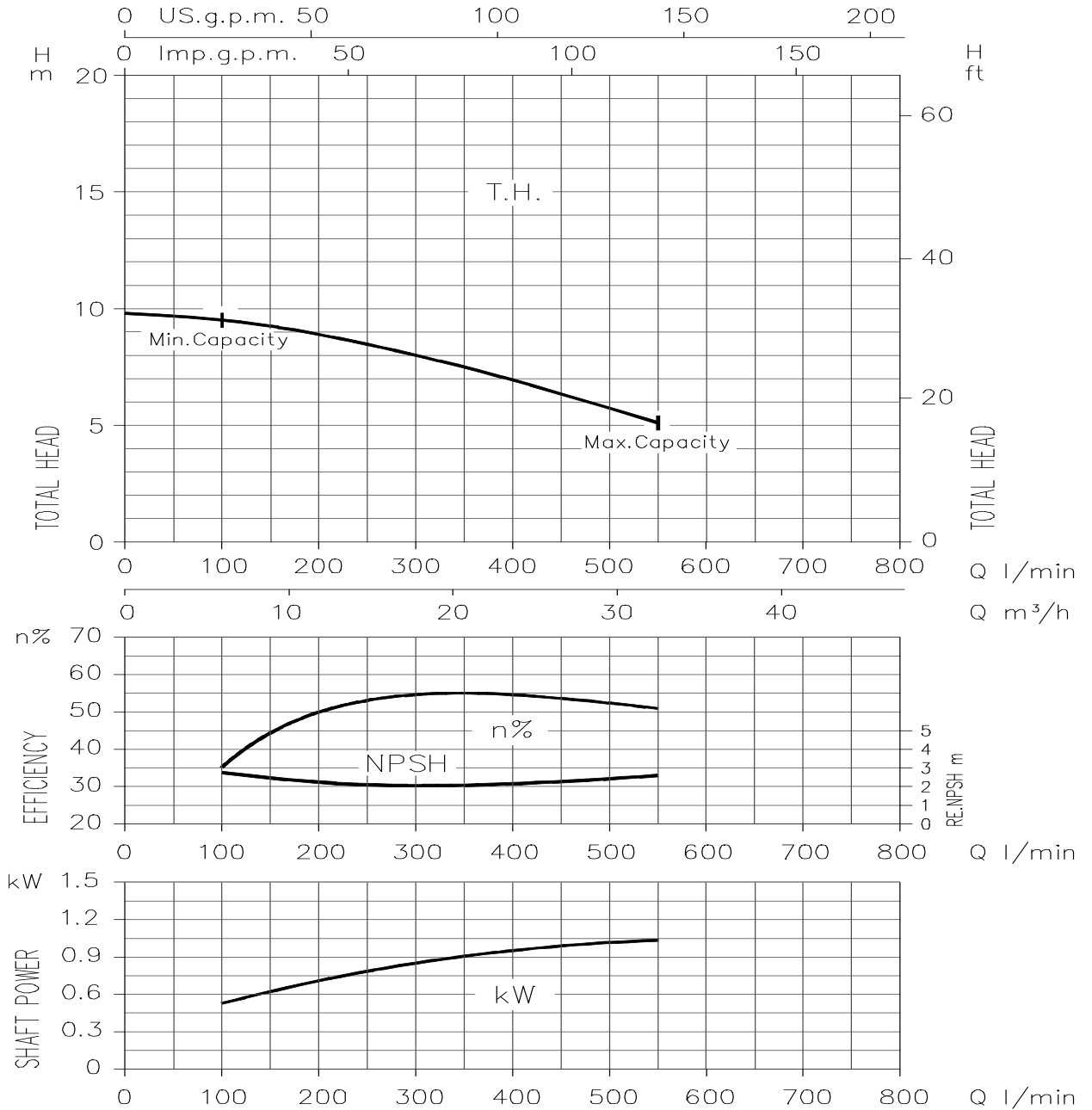
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

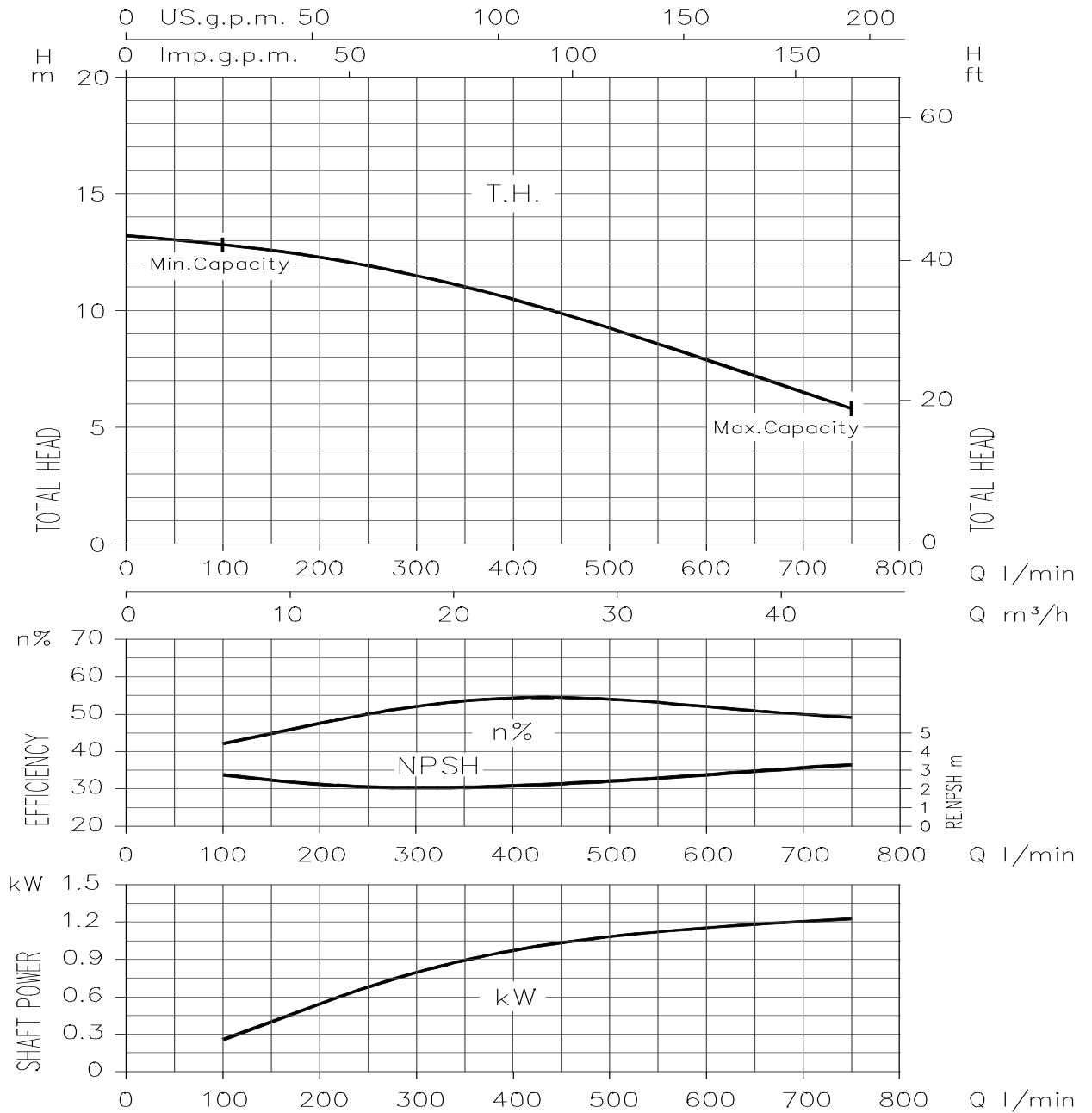
- Q = volume flow rate
- H = total head
- P_2 = pump power input (shaft power)
- η = pump efficiency
- NPSH = net positive suction head required by the pump

DWO 150 (1.1 kW) - Impeller diameter = 88 mm



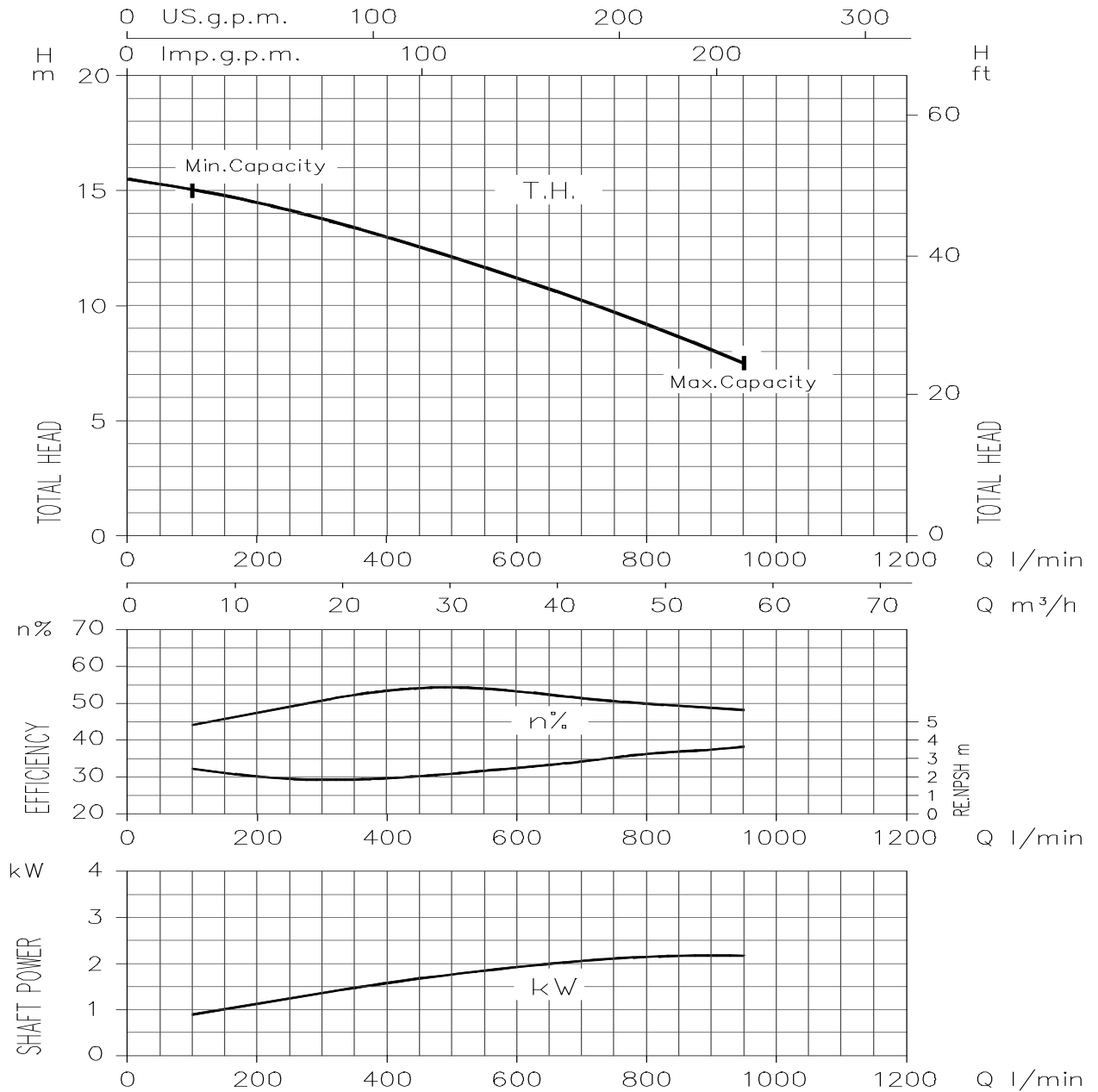
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

DWO 200 (1.5 kW) - Impeller diameter = 103 mm



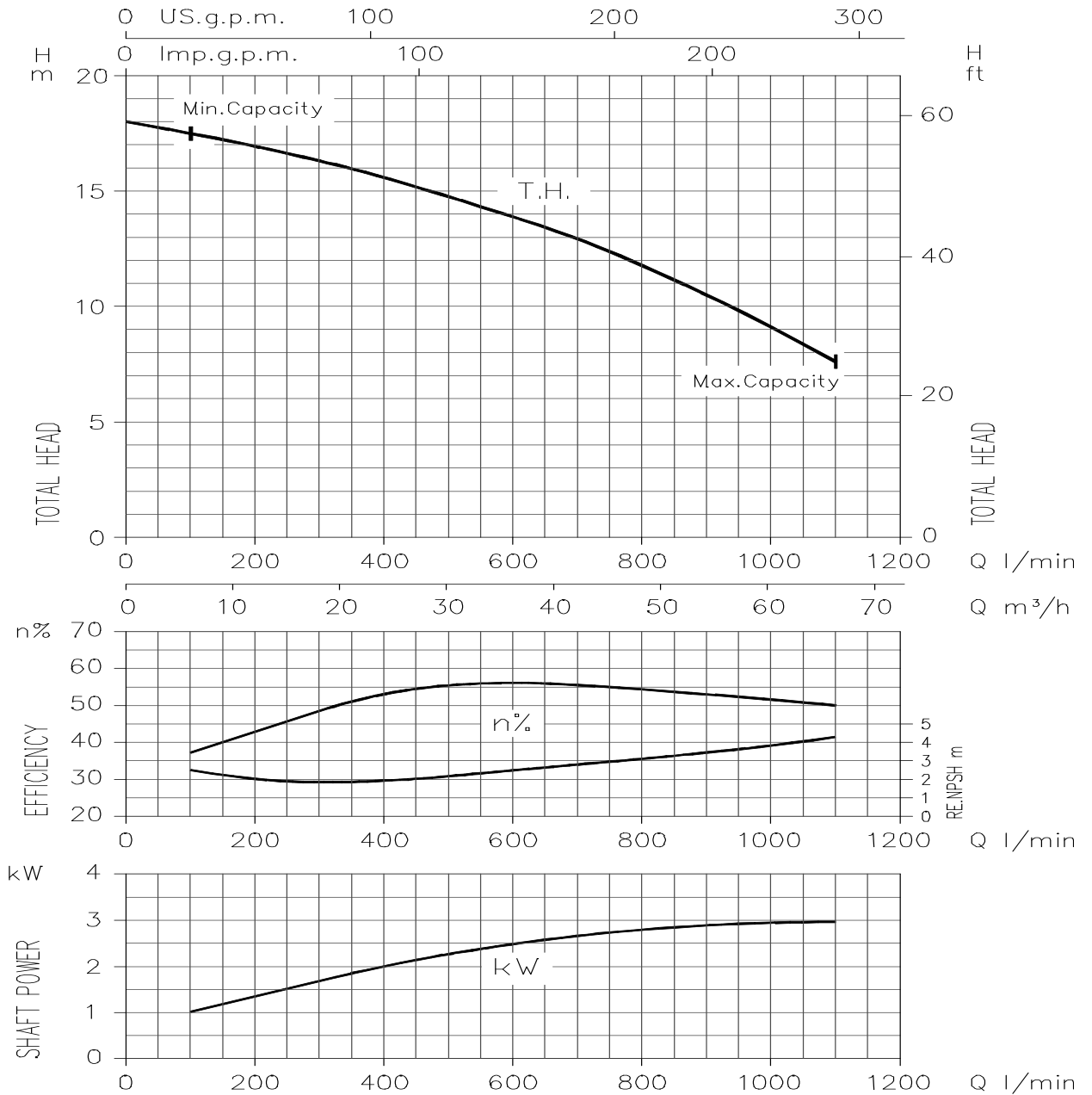
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

DWO 300 (2.2 kW) - Impeller diameter = 107 mm



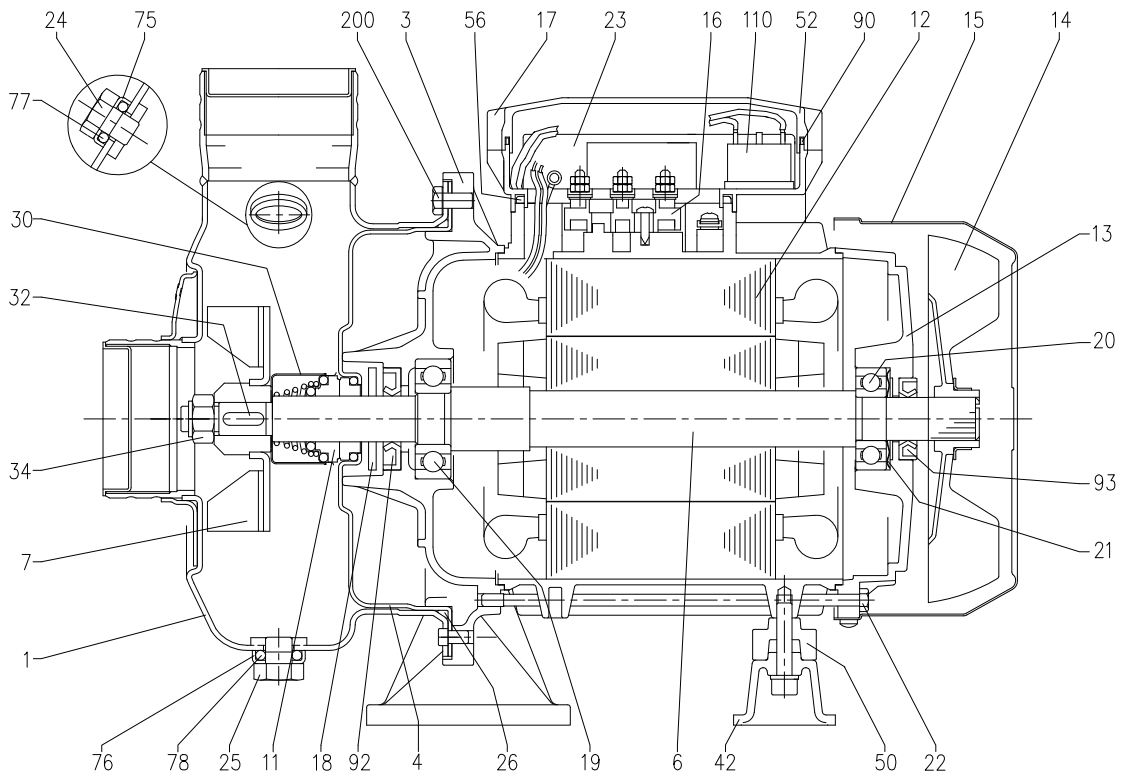
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

DWO 400 (3 kW) - Impeller diameter: 118 mm



Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906 – Annex A

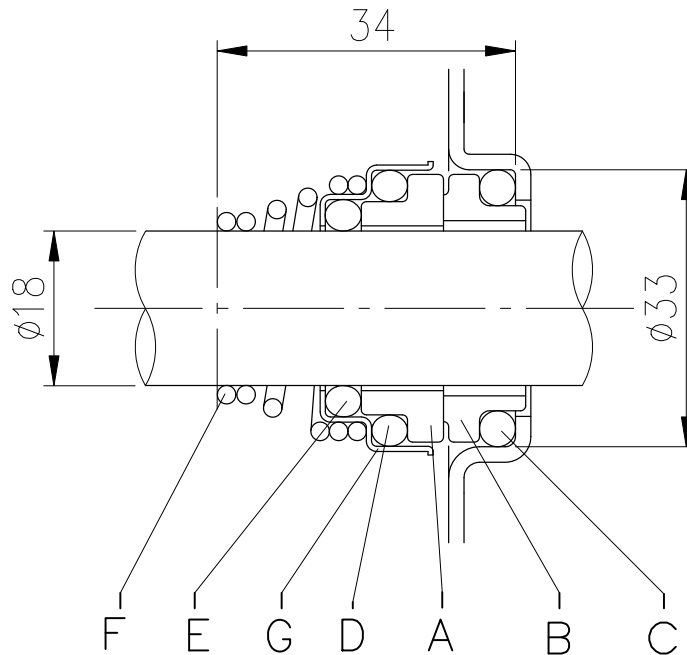
SECTIONAL VIEW



N°	PART NAME	MATERIAL	Q.TY	N°	PART NAME	MATERIAL	Q.TY
1	Casing	AISI 304	1	25	Drain plug	AISI 303	1
3	Motor bracket	Aluminium	1	26	O-ring [4]	NBR	1
4	Casing cover	AISI 304	1	30	Mechanical seal protection	AISI 304	1
6	Shaft with rotor	AISI 304 (Wet extention)	1	32	Key	AISI 316	1
7	Impeller	AISI 304	1	34	Impeller nut	AISI 304	1
11	Mechanical seal [3]	Carbon/Ceramic/NBR	1	42	Motor support	Aluminium	1
12	Motor frame with stator	-	1	50	Spacer	-	1
13	Motor cover	Aluminium	1	52	Terminal box [1]	PP	1
14	Fan	PP	1	56	Box gasket	NBR	1
15	Fan cover	Fe P04 Zincate	1	75	Washer	AISI 304	1
16	Terminal box	-	1	76	Washer	AISI 304	1
17	Terminal box cover [2]	Aluminium	1	77	O-ring	NBR	1
18	Splash ring	NBR	1	78	O-ring	NBR	1
19	Pump side ball bearing	-	1	90	Terminal box cover gasket [1]	NBR	1
20	Fan side ball bearing	-	1	92	Lip seal	-	1
21	Adjusting ring	Steel C70	1	93	Lip seal	-	1
22	Tie rod	Fe 420 Zincate	4	110	Protector [1]	-	1
23	Capacitor [1]	-	1	200	Screw	Stainless steel A2 UNI7323	6
24	Priming plug	AISI 303	1				

- [1] Only for single phase
- [2] Only for three phase
- [3] See constructions mechanical seal page 301
- [4] FPM for DWOH, DWOHS, DWOHW, DWOHSW

MECHANICAL SEAL



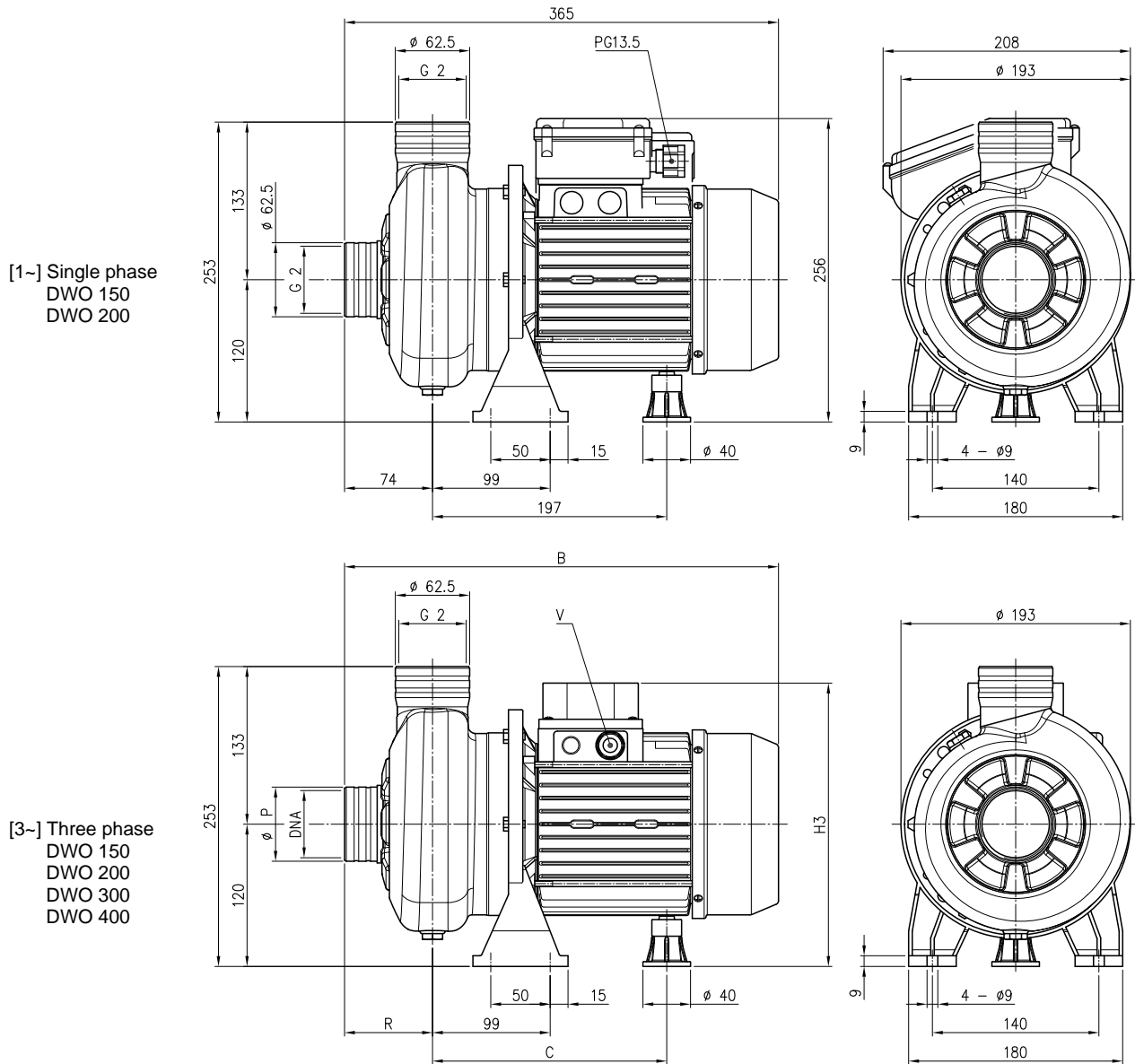
REF	PART NAME	Product standard (DWO)	MATERIAL			
			(DWOH)	(DWOHS)	Optional	
				(DWOHW)	(DWOHSW)	
A	Rotary seal ring	ceramic	Ceramic	Silicon carbide	Tungsten carbide	Silicon carbide
B	Stationary seal ring	carbon graphite	Carbon graphite	Silicon carbide	Tungsten carbide	Tungsten carbide
C	O Ring	NBR	FPM	FPM	FPM	FPM
D	O Ring	NBR	FPM	FPM	FPM	FPM
E	O Ring	NBR	FPM	FPM	FPM	FPM
F	Self driving spring	AISI 316L	AISI 316L	AISI 316L	AISI 316L	AISI 316L
G	Frame	AISI 304	AISI 304	AISI 316	AISI 316	AISI 316

BEARINGS

Pump type		Ball Bearing			
Single Phase	Three Phase	Pump side	(*)	Fan side	(*)
			Pump side		Fan side
DWO 150 M	DWO 150	6204 2RSH	6204-ZZ C3	6203 2RSH	6203-ZZ C3
DWO 200 M	DWO 200	6204 2RSH	6204-ZZ C3	6203 2RSH	6203-ZZ C3
-	DWO 300	6305 2RSH	6305-ZZ C3	6205 2RSH	6205-ZZ C3
-	DWO 400	6305 2RSH	6305-ZZ C3	6205 2RSH	6205-ZZ C3

(*) Only for IE3 Motors

PUMP



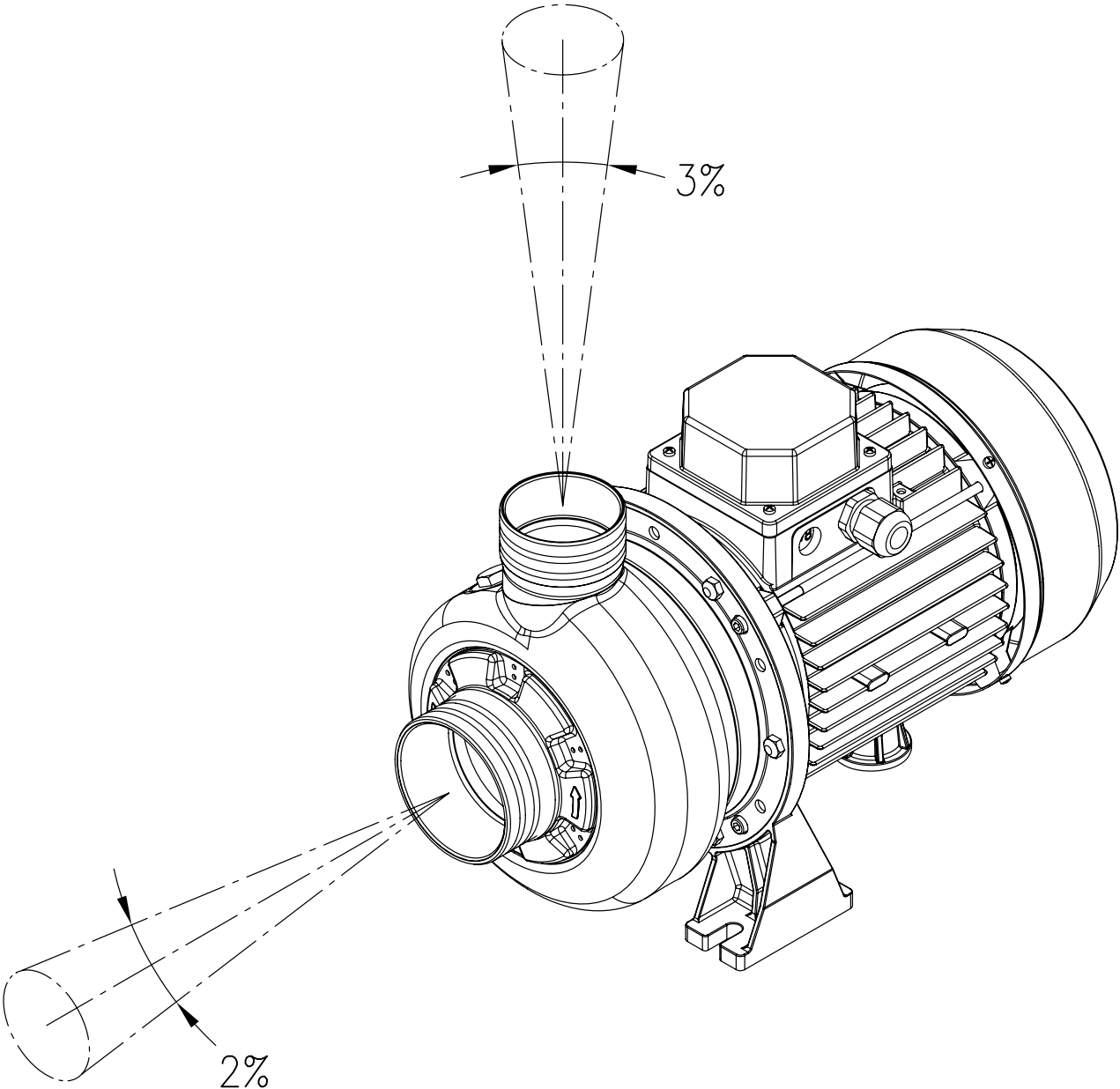
[1~] Single phase
DWO 150
DWO 200

[3~] Three phase
DWO 150
DWO 200
DWO 300
DWO 400

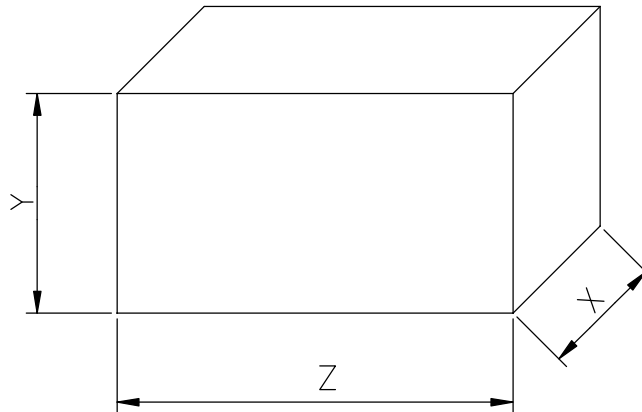
Pump type	Dimension [mm]										Weight [kgf]			
	B [3~]	(*) [3~]	C [3~]	(*) [3~]	H3 [3~]	(*) [3~]	R [3~]	P [3~]	V [3~]	(*) [3~]	DNA [3~]	[1~]	[3~]	(*) [3~]
DWO 150	365	390	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	14.4	14.5	15.4
DWO 200	378	390.5	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	15.7	16.2	17.1
DWO 300	416	394.5	230/241	197	244	239	78	80	PG13.5	M20x1.5	G 2½	-	19.4	19.4
DWO 400	455	455	230/241	230/241	244	244	78	80	PG13.5	M20x1.5	G 2½	-	22.4	22.4

[1~] Single phase
[3~] Three phase
(*) Only for IE3 Motors

GEOMETRIC TOLERANCES



PACKING



Pump type		Packing [mm]						Weight [kgf]		
Single Phase [1~]	Three Phase [3~]	X		Y		Z		[1~]	[3~]	(*) [3~]
		[1~]	[3~]	[1~]	[3~]	[1~]	[3~]			
DWO 150 M	DWO 150	205	205	280	280	432	432	15.3	15.3	16.2
DWO 200 M	DWO 200	205	205	280	280	432	477	16.5	17	17.9
-	DWO 300	-	205	-	280	-	477	-	20.3	20.3
-	DWO 400	-	205	-	280	-	477	-	23.2	23.2

[1~] Single phase

[3~] Three phase

(*) Only for IE3 Motors

MOTOR DATA

Pump type		Power		Efficiency		Capacitor		Efficiency (% load)			Input		Full load current			Locked rotor current		
Single Phase	Three Phase	[kW]	[HP]	Single Phase	Three Phase	Single Phase	Single Phase	Three phase			Single Phase	Three Phase	[A]			[A]		
								[μF]	[V]	50%			75%	100%	230 V	230 V	400 V	230 V
DWO 150 M	DWO 150	1.1	1.5	-	IE2	35	450	79.7	82.5	83.0	1.36	1.80	6.8	5.6	3.2	41	45.0	25.7
-	DWO 150	1.1	1.5	-	IE3	-	-	83.0	85.8	85.6	-	1.77	-	5.8	3.3	-	47.4	27.4
DWO 200 M	DWO 200	1.5	2.0	-	IE2	40	450	78.6	83.0	84.2	2.05	1.78	9.0	6.3	3.7	43	34.3	20.0
-	DWO 200	1.5	2.0	-	IE3	-	-	82.7	86.1	87.0	-	1.72	-	6.6	3.8	-	66.6	38.4
-	DWO 300	2.2	3.0	-	IE2	-	-	83.1	85.7	86.2	-	2.55	-	7.8	4.5	-	75.0	43.5
-	DWO 300	2.2	3.0	-	IE3	-	-	86.2	87.0	86.0	-	2.55	-	8.2	4.7	-	66.6	38.4
-	DWO 400	3.0	4.0	-	IE2	-	-	85.0	86.7	86.3	-	3.48	-	10.6	6.1	-	100.0	57.7
-	DWO 400	3.0	4.0	-	IE3	-	-	85.9	87.5	87.1	-	3.44	-	11.1	6.4	-	90.0	52.0

NOISE DATA

Pump type		Power		L _{pA} - dB(A) *
Single Phase	Three Phase	[kW]	[HP]	
DWO 150 M	DWO 150	1.1	1.5	<70
DWO 200 M	DWO 200	1.5	2.0	
-	DWO 300	2.2	3.0	
-	DWO 400	3.0	4.0	

* Mean value of several measures at 1m distance around the pump.

Tolerance ± 2.5 dB.