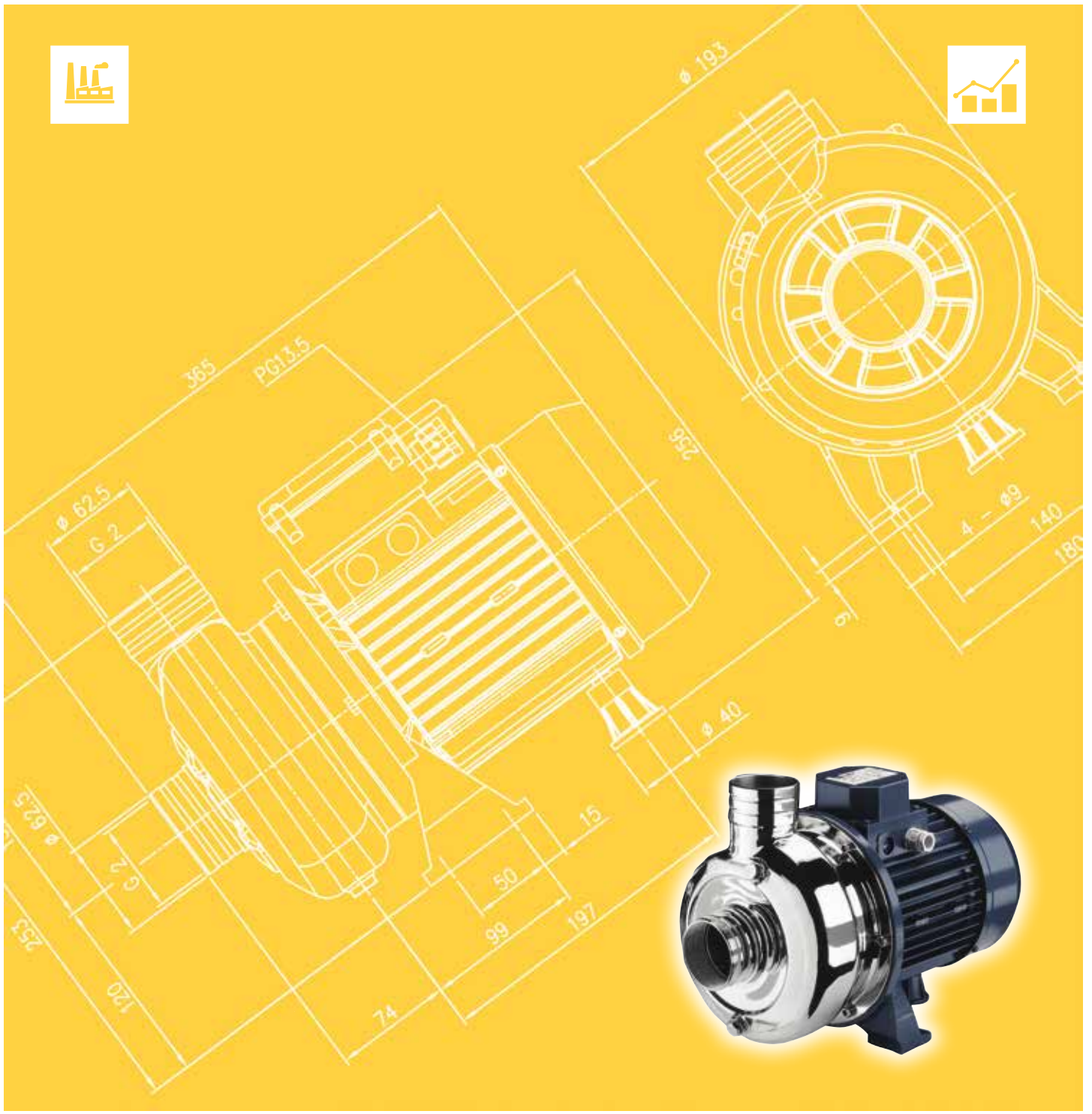




Japanese Technology since 1912

DWO

Data Book 50Hz



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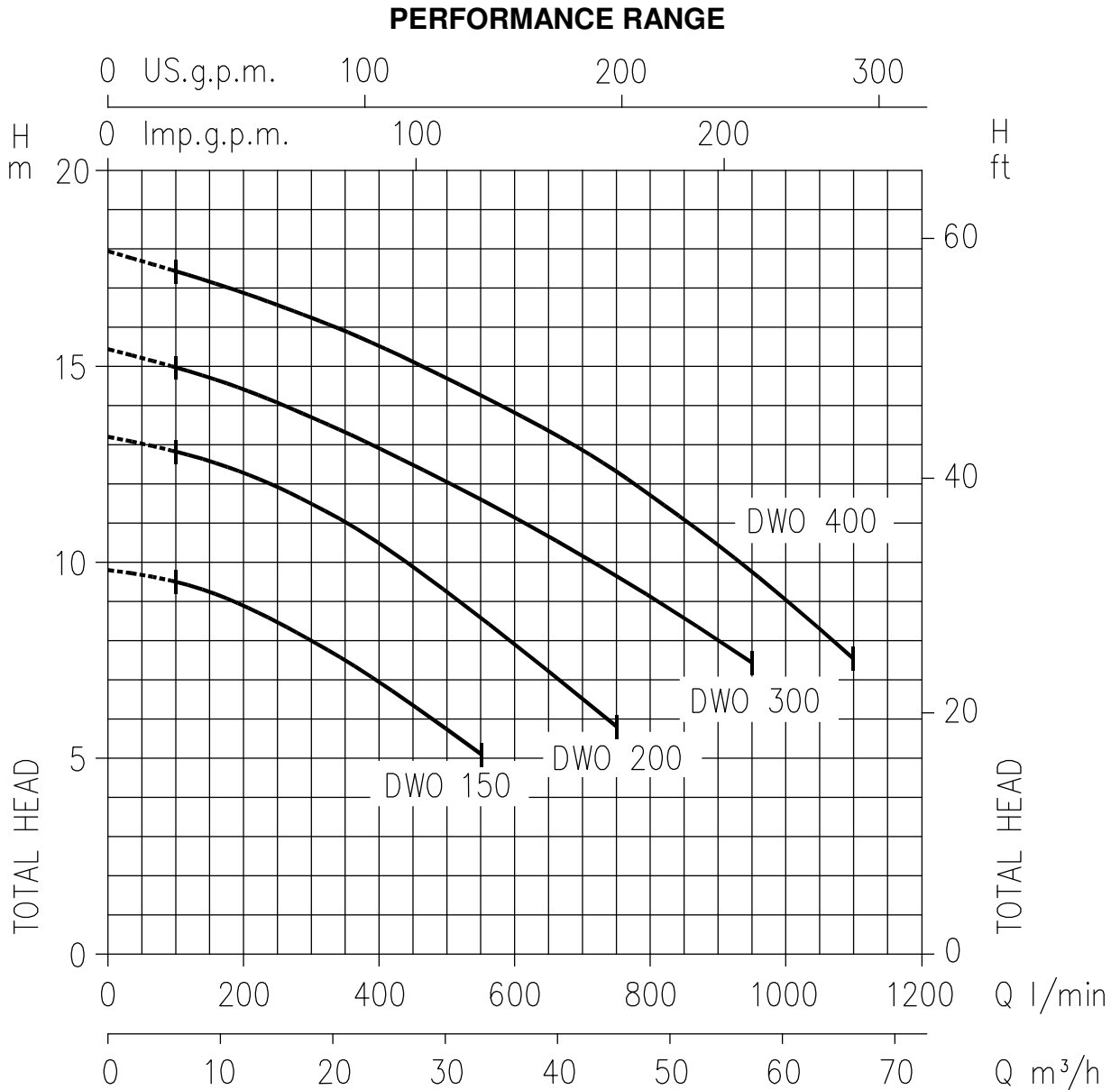
**SPECIFICATIONS**

50Hz

Rev. M

<b>PUMP</b>		
Liquid Handled	Type of liquid	Clean water
	Temperature [°C]	min. -5 max. +90 (Standard mechanical seal) max. +110 (Optional and Q1AVGG mechanical seal) max. +120 (VAEGG, Q1U3EGG, U3BEGG mechanical seal)
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
	Casing cover	AISI 304
	Shaft	AISI 304 (Wet extension)
	Bracket	Aluminium
Applicable standard of test		ISO 9906:2012 - Grade 3B

<b>MOTOR</b>		
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 <sup>-1</sup> ]	≈ 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 DIMENSIONS TABLE page 400)	



**SELECTION CHART**

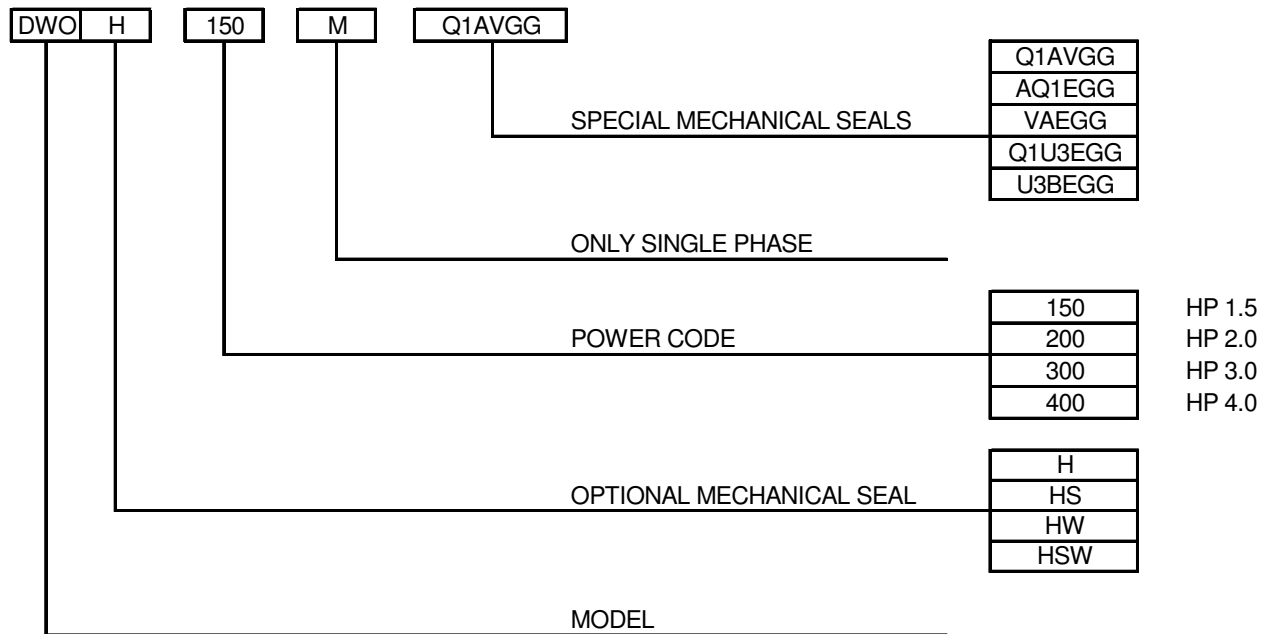
Pump type		Power		Q=Capacity									
Single Phase	Three Phase	[kW]	[HP]	l/min	0	100	200	300	400	550	750	950	1100
				m³/h	0	6	12	18	24	33	42	57	66
H=Total manometric head in meters													
DWO 150 M	DWO 150	1,1	1,5	9,8	9,5	8,9	7,9	6,9	5,1	-	-	-	-
DWO 200 M	DWO 200	1,5	2	13,2	12,7	12,3	11,5	10,5	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 CURVES SPECIFICATIONS

50Hz

Rev. M

### TYPE KEY



### CURVES SPECIFICATIONS

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

Tolerances according to ISO 9906:2012 - Grade 3B

The curves refer to effective speed of asynchronous motors at 50 Hz, 2 poles.

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.

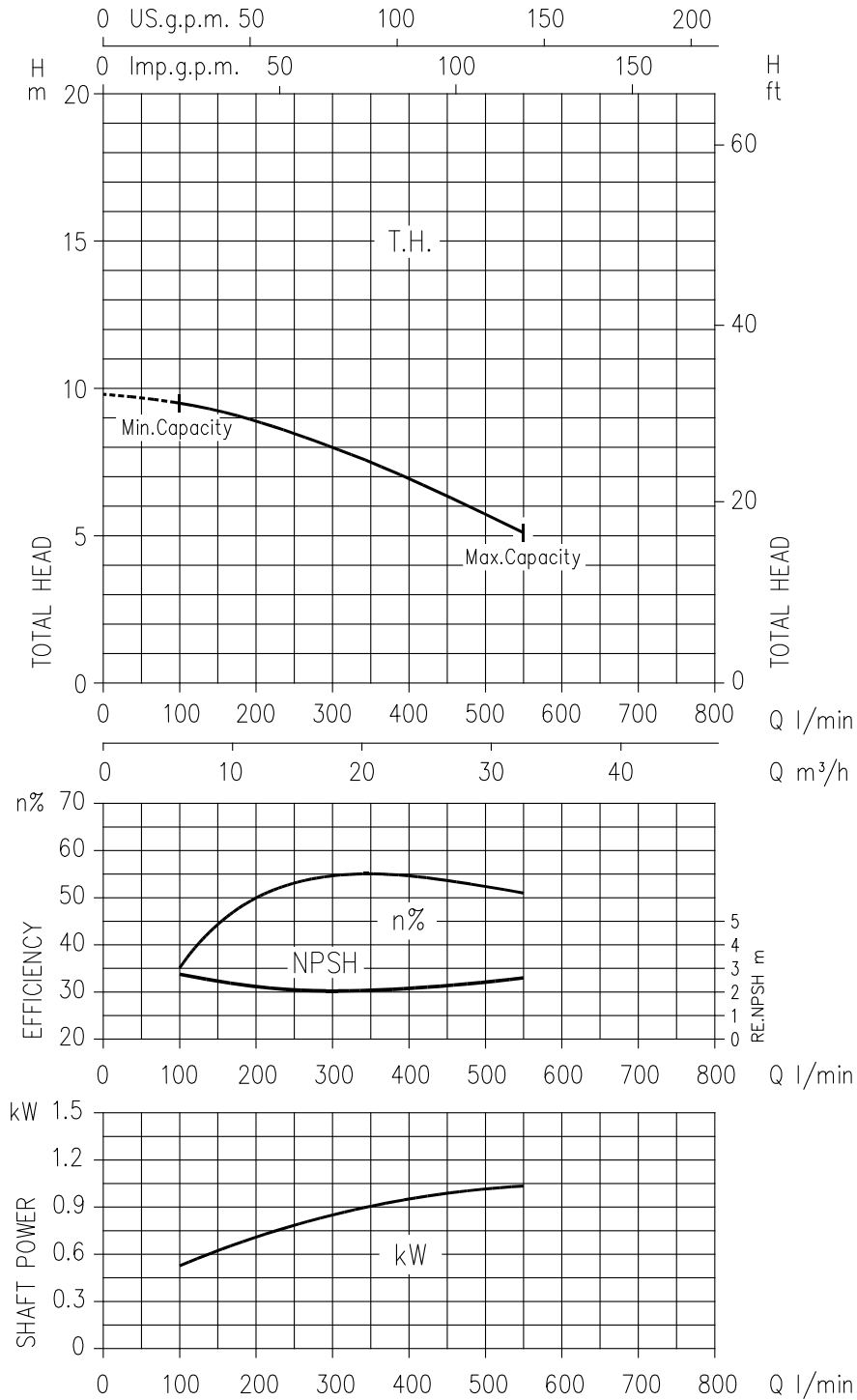
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

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)
- $\eta$  = pump efficiency
- NPSH = net positive suction head required by the pump

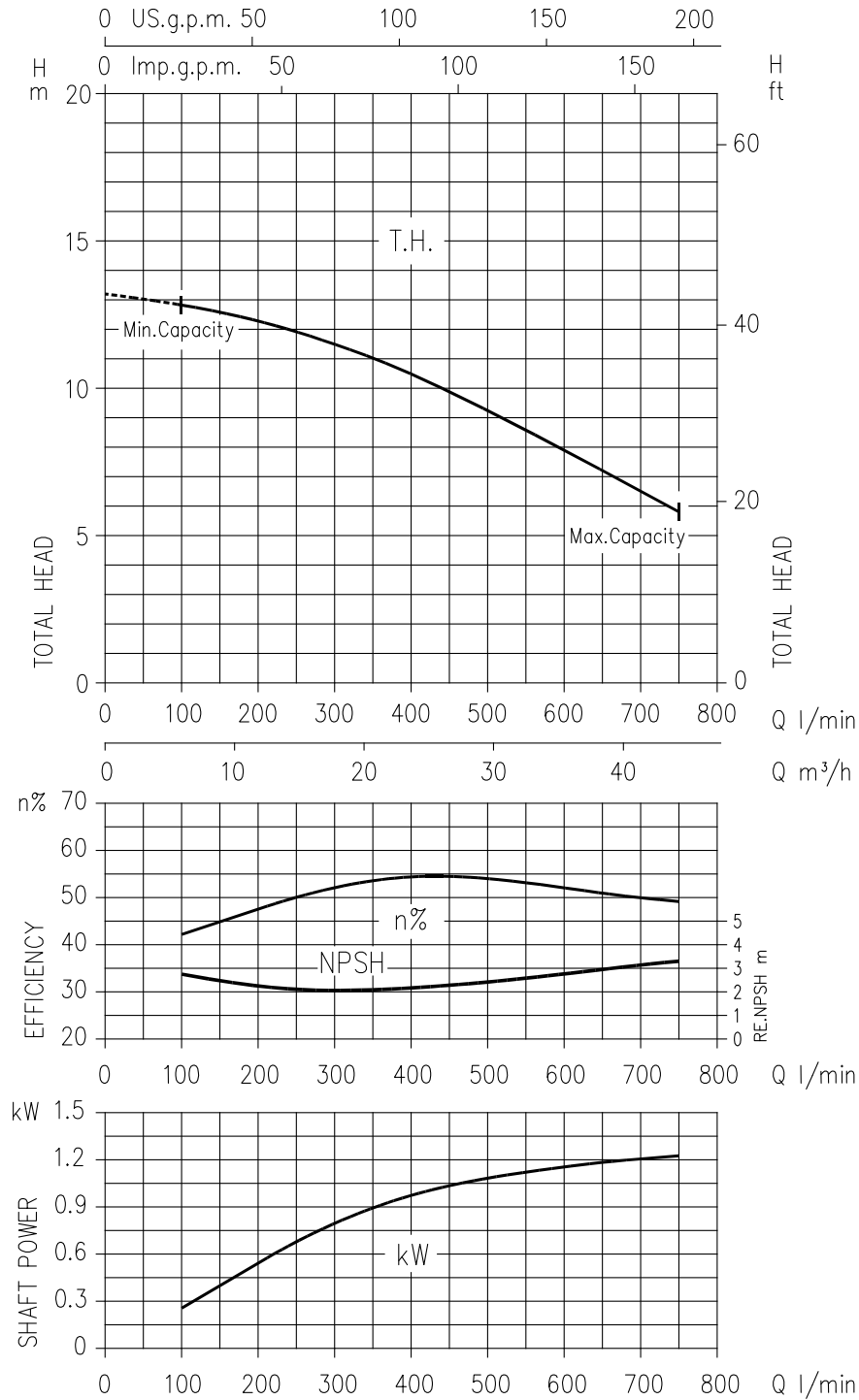
DWO 150 (1.1 kW) - Impeller diameter = 88 mm



Rotation speed  $\approx 2800 \text{ min}^{-1}$

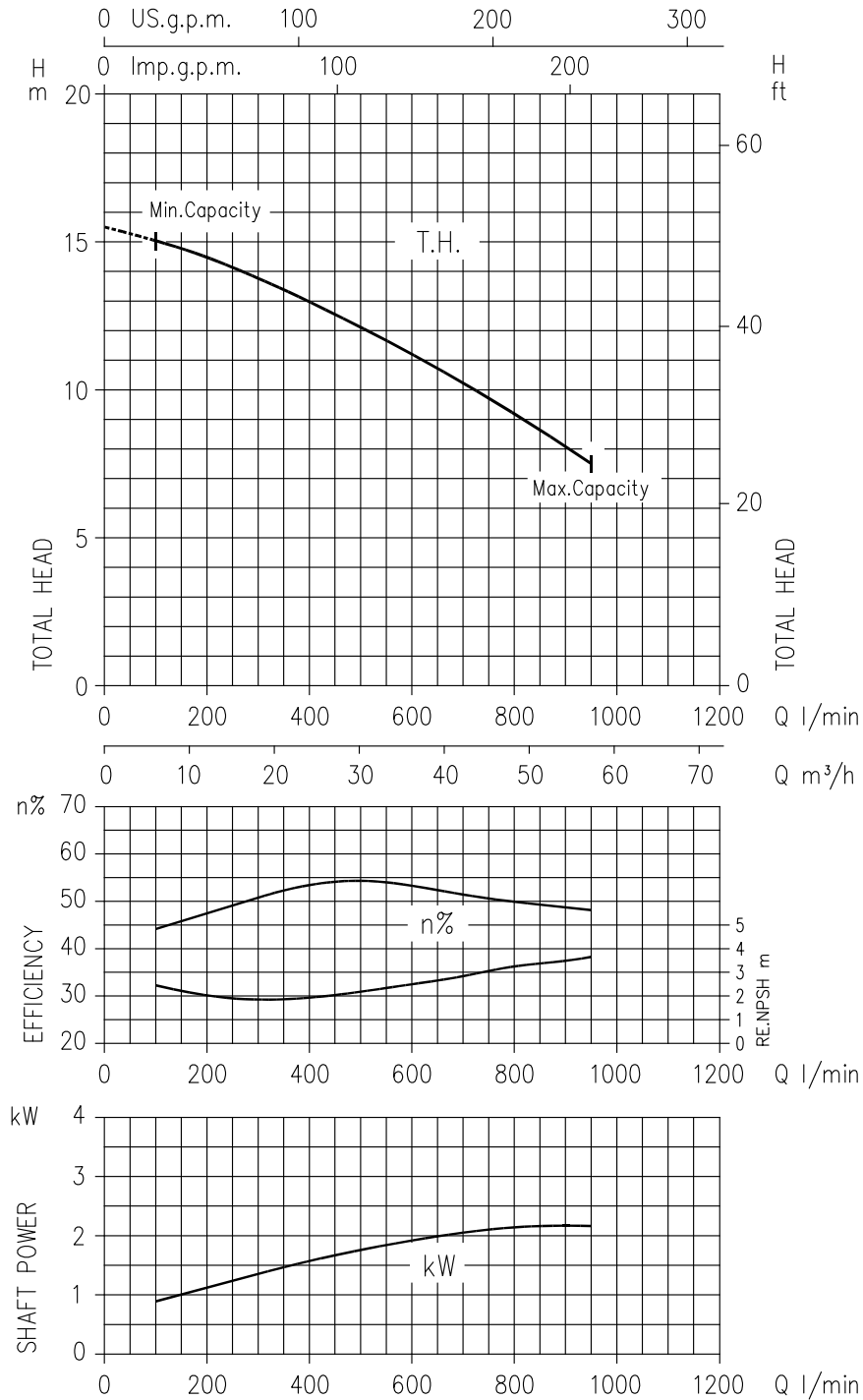
Test standard: ISO 9906:2012 - Grade 3B

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



Rotation speed  $\approx 2800 \text{ min}^{-1}$   
 Test standard: ISO 9906:2012 - Grade 3B

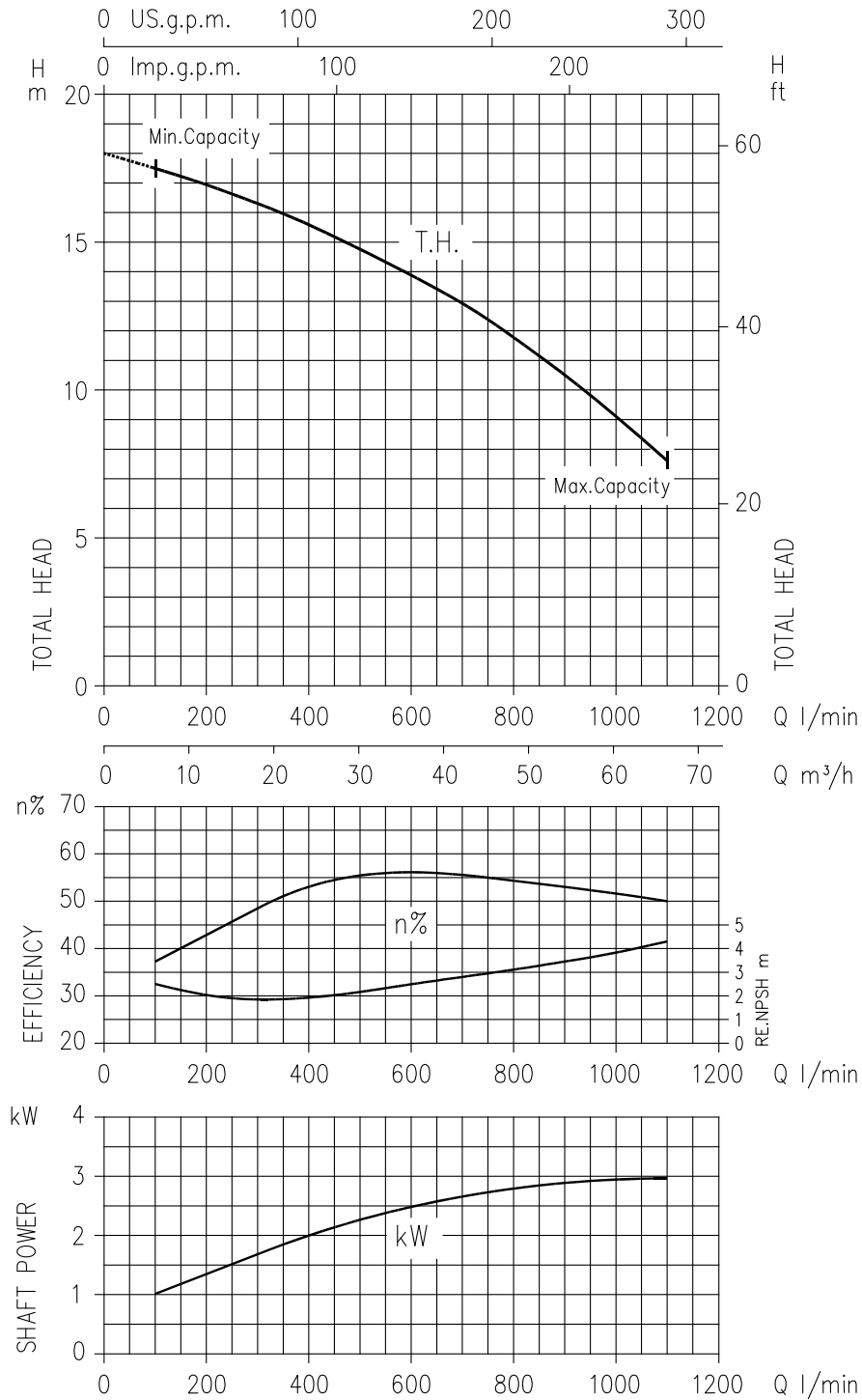
DWO 300 (2.2 kW) - Impeller diameter = 107 mm



Rotation speed  $\approx 2800 \text{ min}^{-1}$   
 Test standard: ISO 9906:2012 - Grade 3B

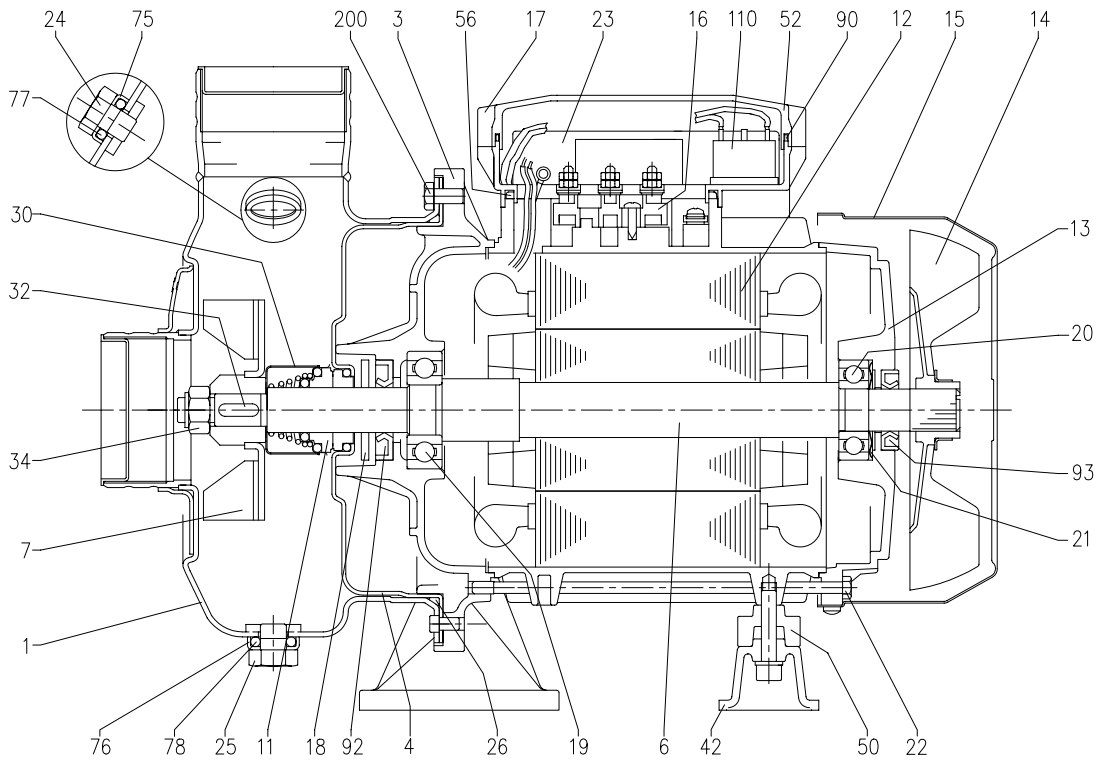


DWO 400 (3 kW) - Impeller diameter: 118 mm



Rotation speed  $\approx 2800 \text{ min}^{-1}$   
 Test standard: ISO 9906:2012 - Grade 3B

### SECTIONAL VIEW

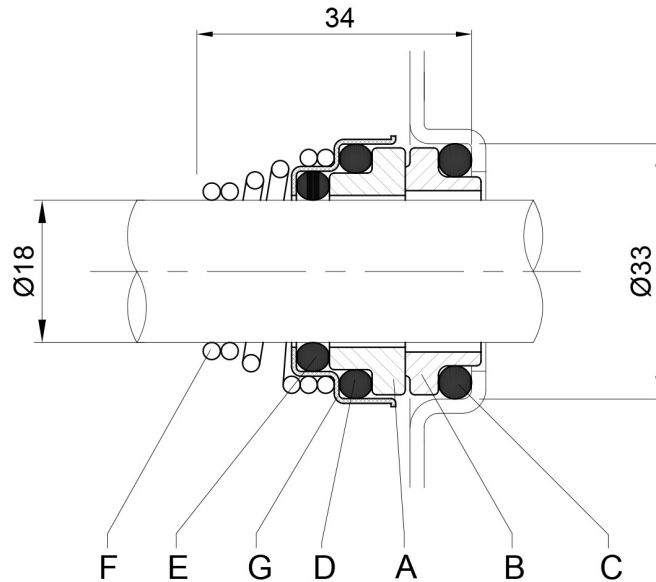


N°	PART NAME	MATERIAL	Q.TY
1	Casing	AISI 304	1
3	Motor bracket	Aluminium	1
4	Casing cover	AISI 304	1
6	Shaft with rotor	AISI 304 (Wet extention)	1
7	Impeller	AISI 304	1
11	Mechanical seal [3]	Carbon/Ceramic/NBR	1
12	Motor frame with stator	-	1
13	Motor cover	Aluminium	1
14	Fan	PP	1
15	Fan cover	Fe P04 Zincate	1
16	Terminal box	-	1
17	Terminal box cover [2]	Aluminium	1
18	Splash ring	NBR	1
19	Pump side ball bearing	-	1
20	Fan side ball bearing	-	1
21	Adjusting ring	Steel C70	1
22	Tie rod	Fe 420 Zincate	4
23	Capacitor [1]	-	1
24	Priming plug	AISI 303	1

N°	PART NAME	MATERIAL	Q.TY
25	Drain plug	AISI 303	1
26	O-ring [4]	NBR/FPM/EPDM	1
30	Mechanical seal protection	AISI 304	1
32	Key	AISI 316	1
34	Impeller nut	AISI 304	1
42	Motor support	Aluminium	1
50	Spacer	-	1
52	Terminal box [1]	PP	1
56	Box gasket	NBR	1
75	Washer	AISI 304	1
76	Washer	AISI 304	1
77	O-ring [4]	NBR/FPM/EPDM	1
78	O-ring [4]	NBR/FPM/EPDM	1
90	Terminal box cover gasket [1]	NBR	1
92	Lip seal	-	1
93	Lip seal	-	1
110	Protector [1]	-	1
200	Screw	Stainless steel A2 UNI7323	6

- [1] Only for Single phase  
 [2] Only for Three phase  
 [3] See **MECHANICAL SEAL** pages 301, 302  
 [4] FPM for H-HS-HW-HSW-Q1AVGG (see pages 301, 302)  
 EPDM for AQ1EGG-VAEGG-Q1U3EGG-U3BEGG (see pages 301, 302)  
 NBR only for Standard version (see pages 301, 302)

MECHANICAL SEAL



REF	PART NAME	MATERIAL
A	Rotary seal ring	Ceramic
B	Stationary seal ring	Carbon graphite
C	O-ring	NBR
D	O-ring	NBR
E	O-ring	NBR
F	Self driving spring	AISI 316
G	Frame	AISI 304

STANDARD

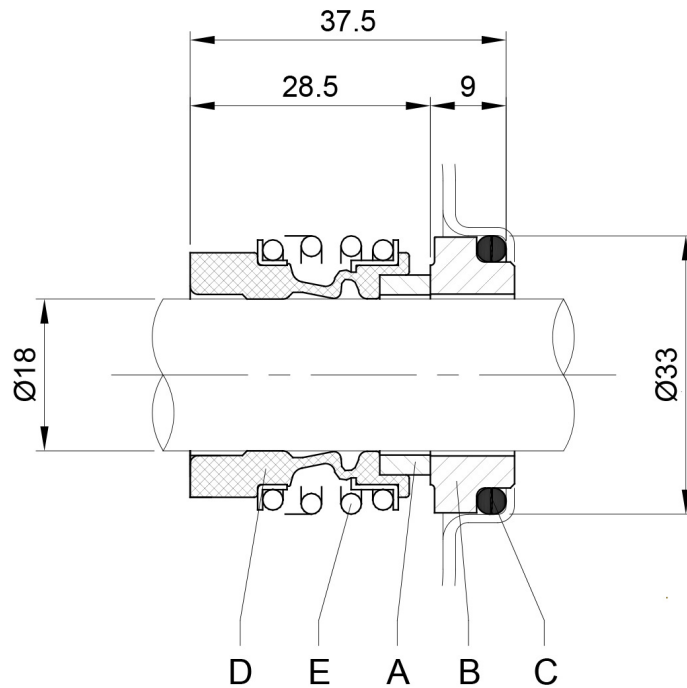
REF	PART NAME	MATERIAL			
		H	HS	HW	HSW
A	Rotary seal ring	Ceramic	Silicon carbide	Tungsten carbide	Silicon carbide
B	Stationary seal ring	Carbon graphite	Silicon carbide	Tungsten carbide	Tungsten carbide
C	O-ring	FPM	FPM	FPM	FPM
D	O-ring	FPM	FPM	FPM	FPM
E	O-ring	FPM	FPM	FPM	FPM
F	Self driving spring	AISI 316	AISI 316	AISI 316	AISI 316
G	Frame	AISI 304	AISI 316	AISI 316	AISI 316

OPTIONAL

REF	PART NAME	MATERIAL			
		Q1AVGG	VAEGG	Q1U3EGG	U3BEGG
A	Rotary seal ring	Silicon carbide	Ceramic	Silicon carbide	Tungsten carbide
B	Stationary seal ring	Metallized carbon	Metallized carbon	Tungsten carbide	Graphite
C	O-ring	FPM	EPDM	EPDM	EPDM
D	O-ring	FPM	EPDM	EPDM	EPDM
E	O-ring	FPM	EPDM	EPDM	EPDM
F	Self driving spring	AISI 316	AISI 316	AISI 316	AISI 316
G	Frame	AISI 316	AISI 316	AISI 316	AISI 316

SPECIAL

MECHANICAL SEAL



SPECIAL

REF	PART NAME	MATERIAL AQ1EGG
A	Rotary seal ring	Metallised carbon
B	Stationary seal ring	Silicon carbide
C	O-ring	EPDM
D	Bellows	EPDM
E	Frame + spring	AISI 316

BEARINGS

Pump type		Ball Bearing			
Single Phase	Three Phase	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

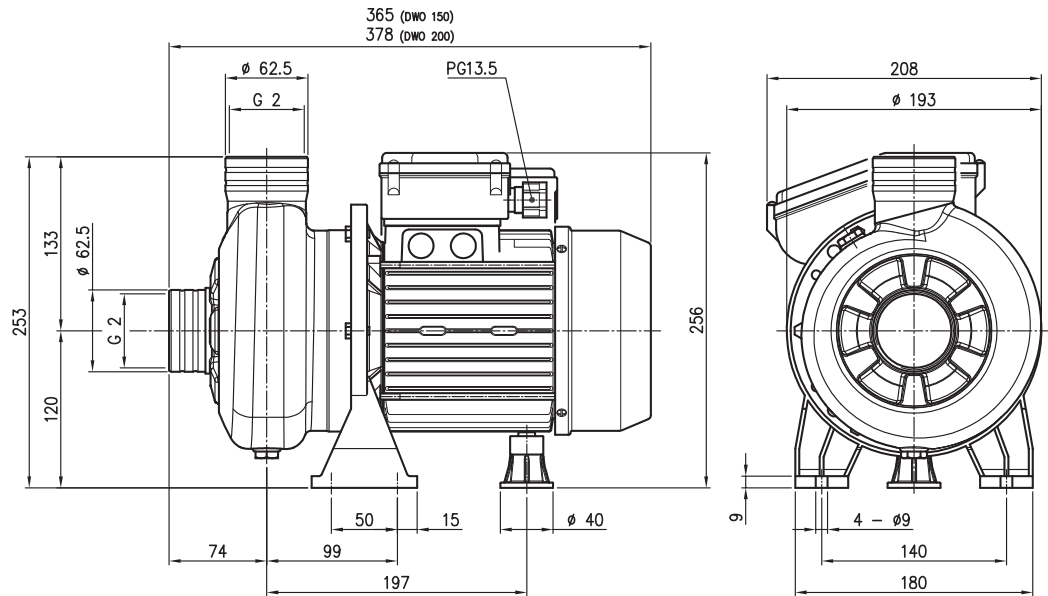
## DIMENSIONS and WEIGHT

50Hz

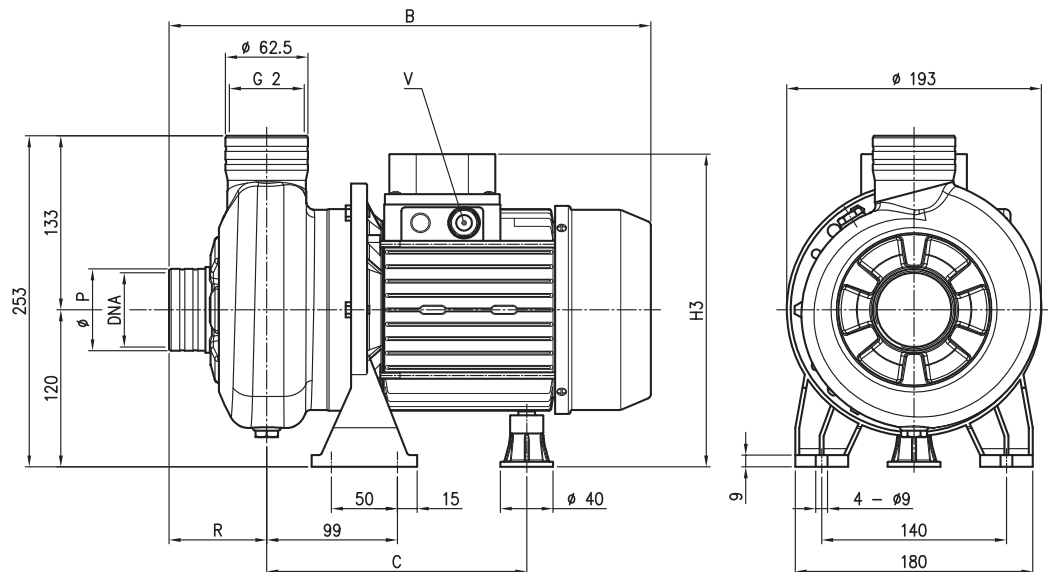
Rev. M

### PUMP

[1~] Single phase  
DWO 150  
DWO 200



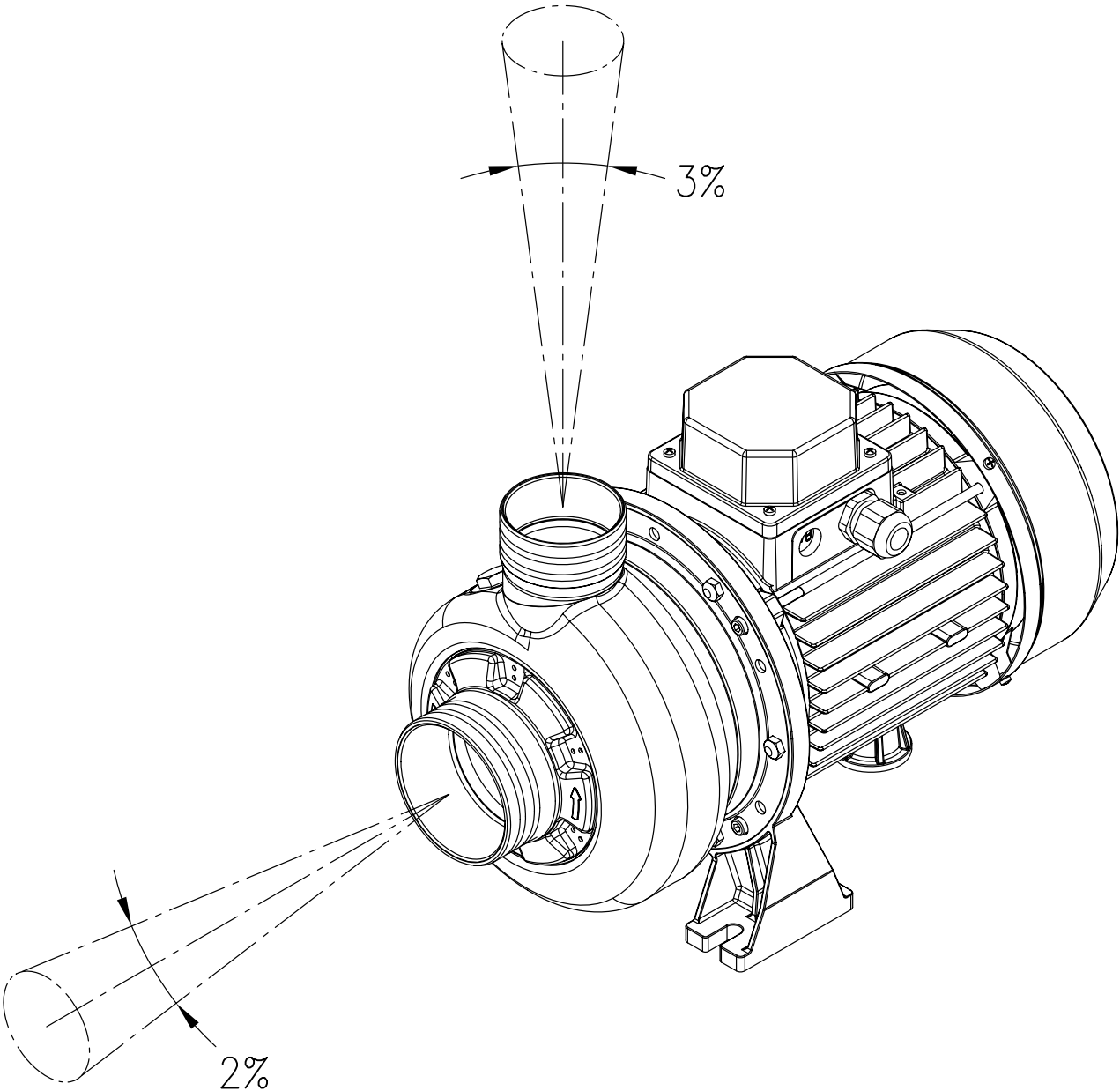
[3~] Three phase  
DWO 150  
DWO 200  
DWO 300  
DWO 400



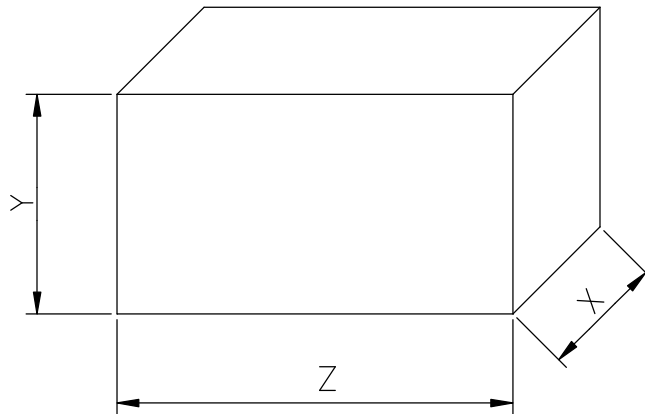
Pump type	Dimensions [mm]											Weight [kgf]		
	B		C		H3		R	P	V	DNA	[1~]	[3~]		
	[3~]	(*)	[3~]	(*)	[3~]	(*)	[3~]	[3~]	[3~]	[3~]		(*)	(*)	
DWO 150	365	390	197	197	239	239	74	62,5	PG11	M20x1.5	G 2	14,4	14,5	15,4
DWO 200	378	390,5	197	197	239	239	74	62,5	PG11	M20x1.5	G 2	15,7	16,2	17,1
DWO 300	416	394,5	230/241	197	244	239	78	80	PG13.5	M20x1.5	G 2½	-	19,4	19,4

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

GEOMETRIC TOLERANCES



PACKING



Pump type		Packing [mm]						Weight [kgf]		
Single Phase	Three Phase	X		Y		Z		[1~]	[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	Single Phase	Three Phase	Single Phase	Three Phase	Single Phase	Three Phase
				Phase	Phase	[μF]	[V]	50%	75%	100%	Phase	Phase	230 V	230 V	400 V	230 V	230 V	400 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	-	-	83.5	84.3	84.6	-	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 <sub>pA</sub> - 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.