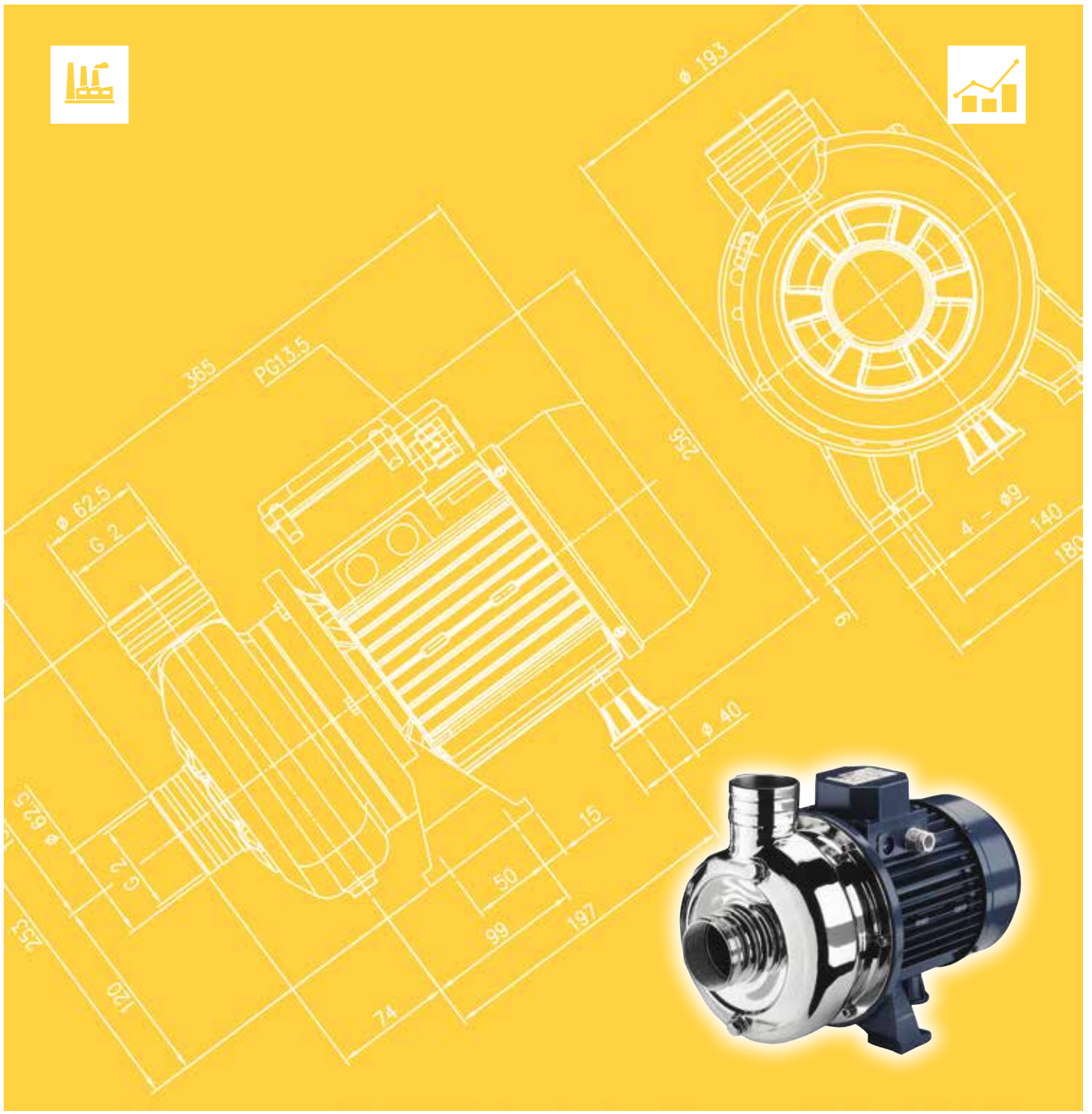




Japanese Technology since 1912

DWO

Data Book 50Hz



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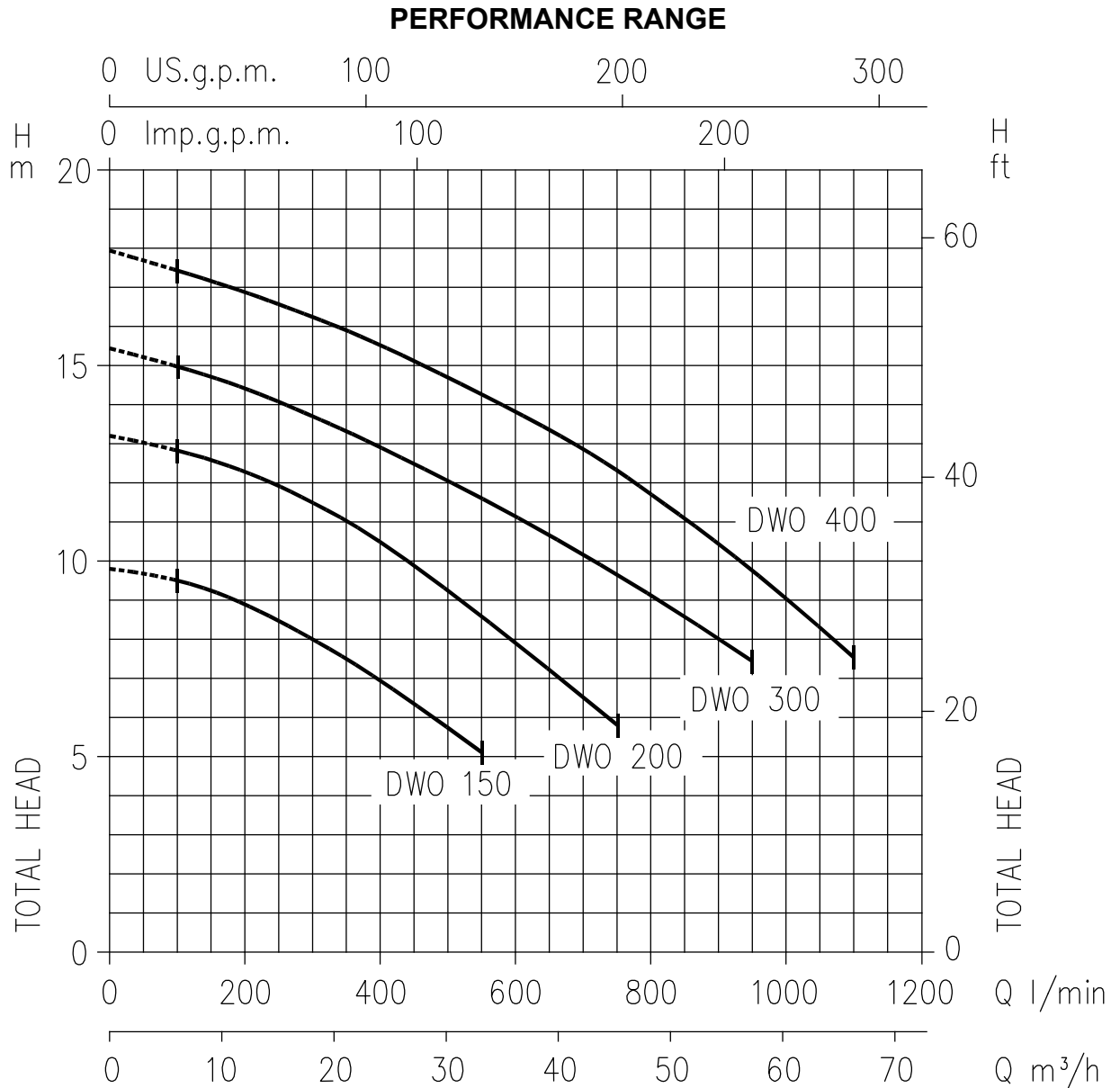
**SPECIFICATIONS**

50Hz

Rev. N

<b>PUMP</b>		
Liquid Handled	Type of liquid	Moderate aggressive fluids, glycol solutions, liquids containing Impurities, liquids suitable for industrial washing equipments. Not suitable for clean water. For other industrial fluids please contact our Technical Customer Service.
	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

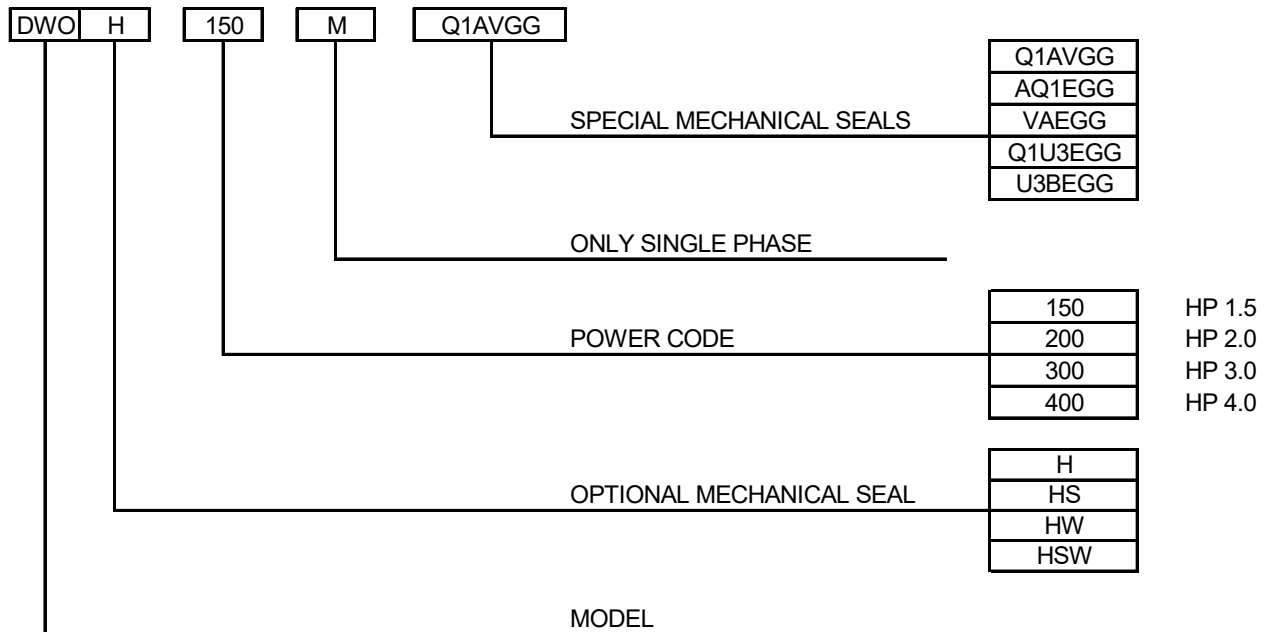
<b>MOTOR</b>		
Type	Electric - TEFC	
	Single Phase	Three Phase
Efficiency level (Reg. 640/2009)	-	IE2 from 1.1 kW up to 3.0 kW IE3 from 1.1 kW up to 3.0 kW
No. of Poles	2	
Rotation speed [min <sup>-1</sup> ]	≈ 2800	
Insulation Class	F	
Protection degree(CEI EN 60034-5)	IP 55	
Power rating	[kW]	1.1 ÷ 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



### 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.

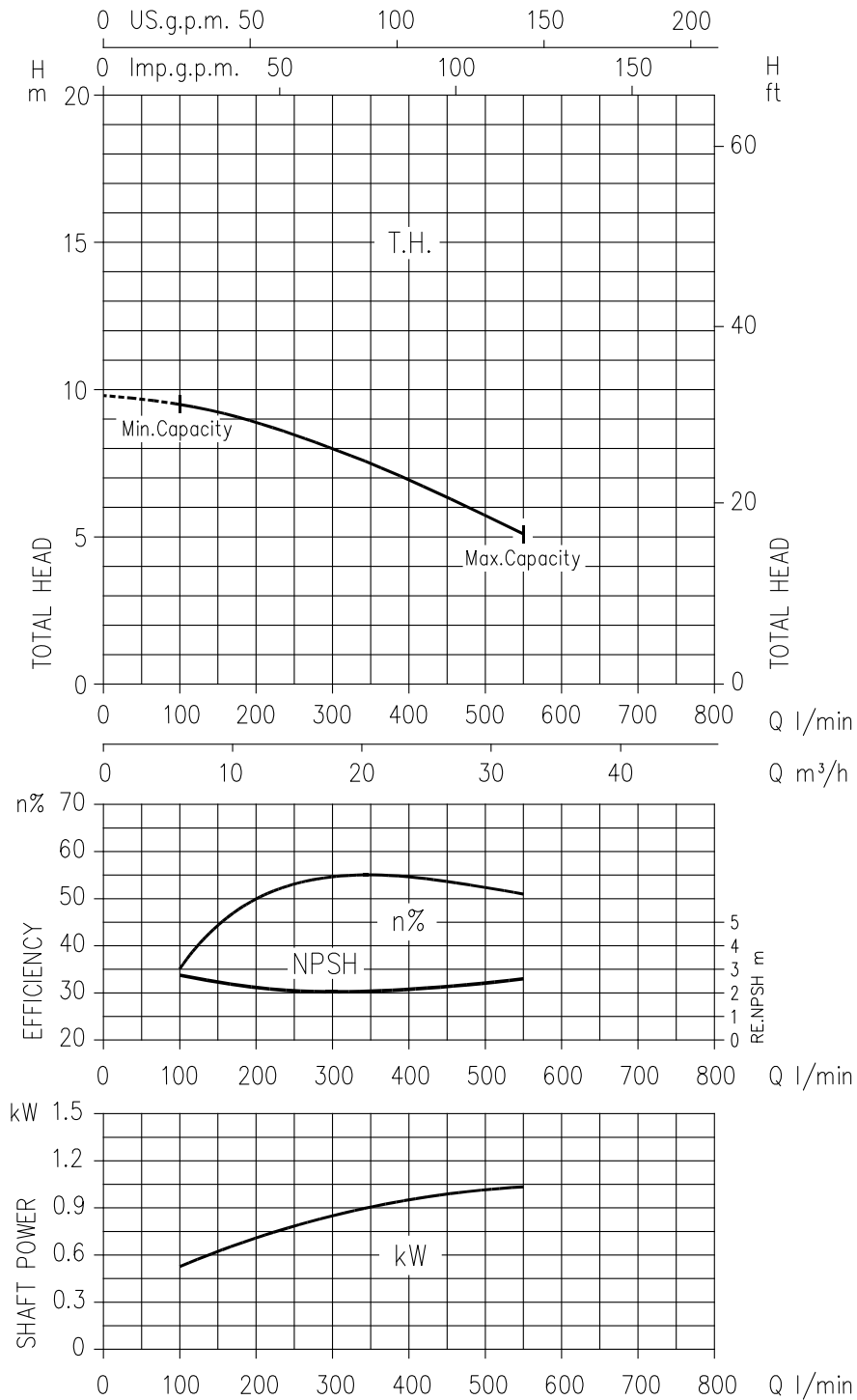
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

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

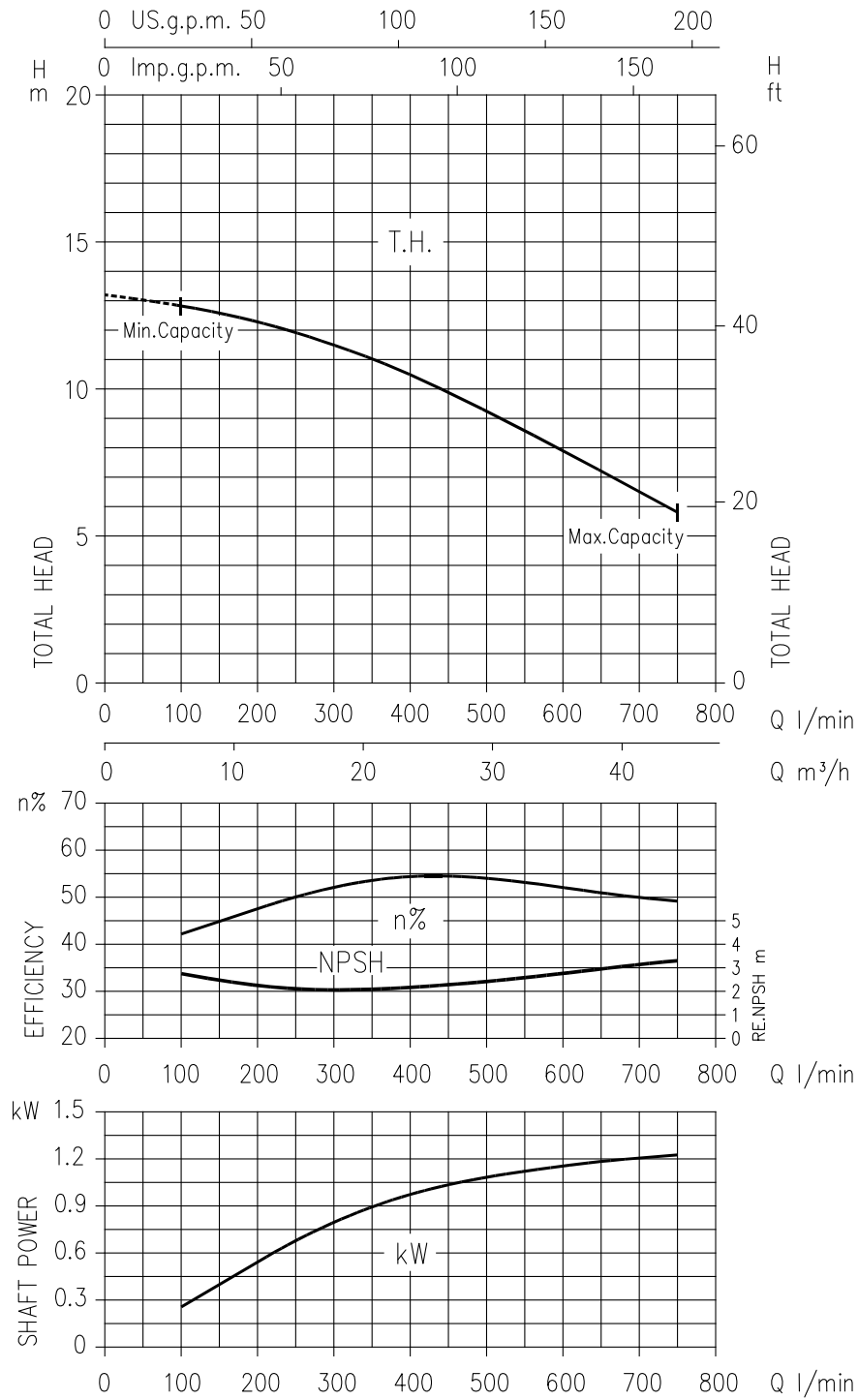
DWO 150 (1.1 kW) - Impeller diameter = 88 mm



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

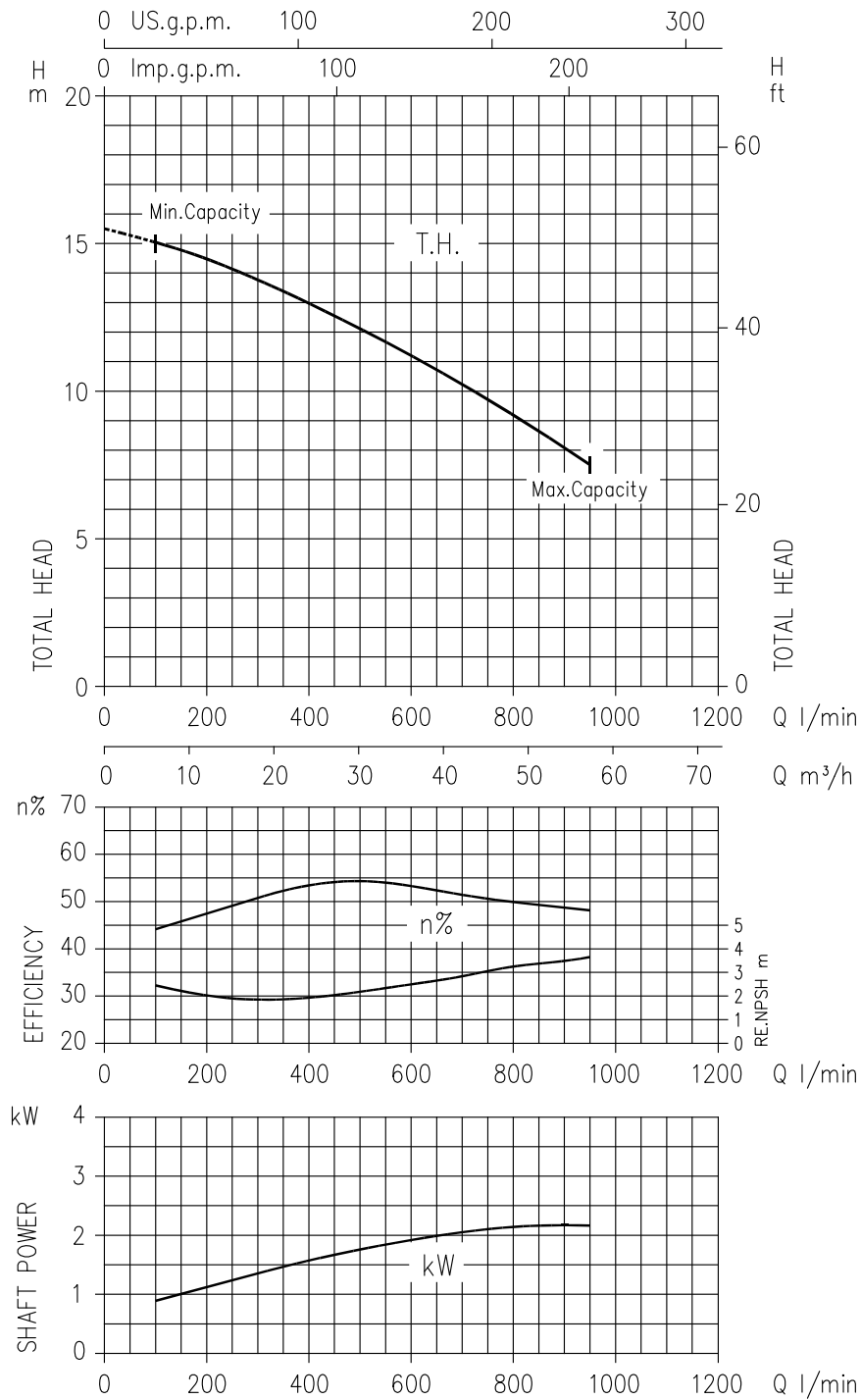
Test standard: ISO 9906:2012 - Grade 3B

**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**

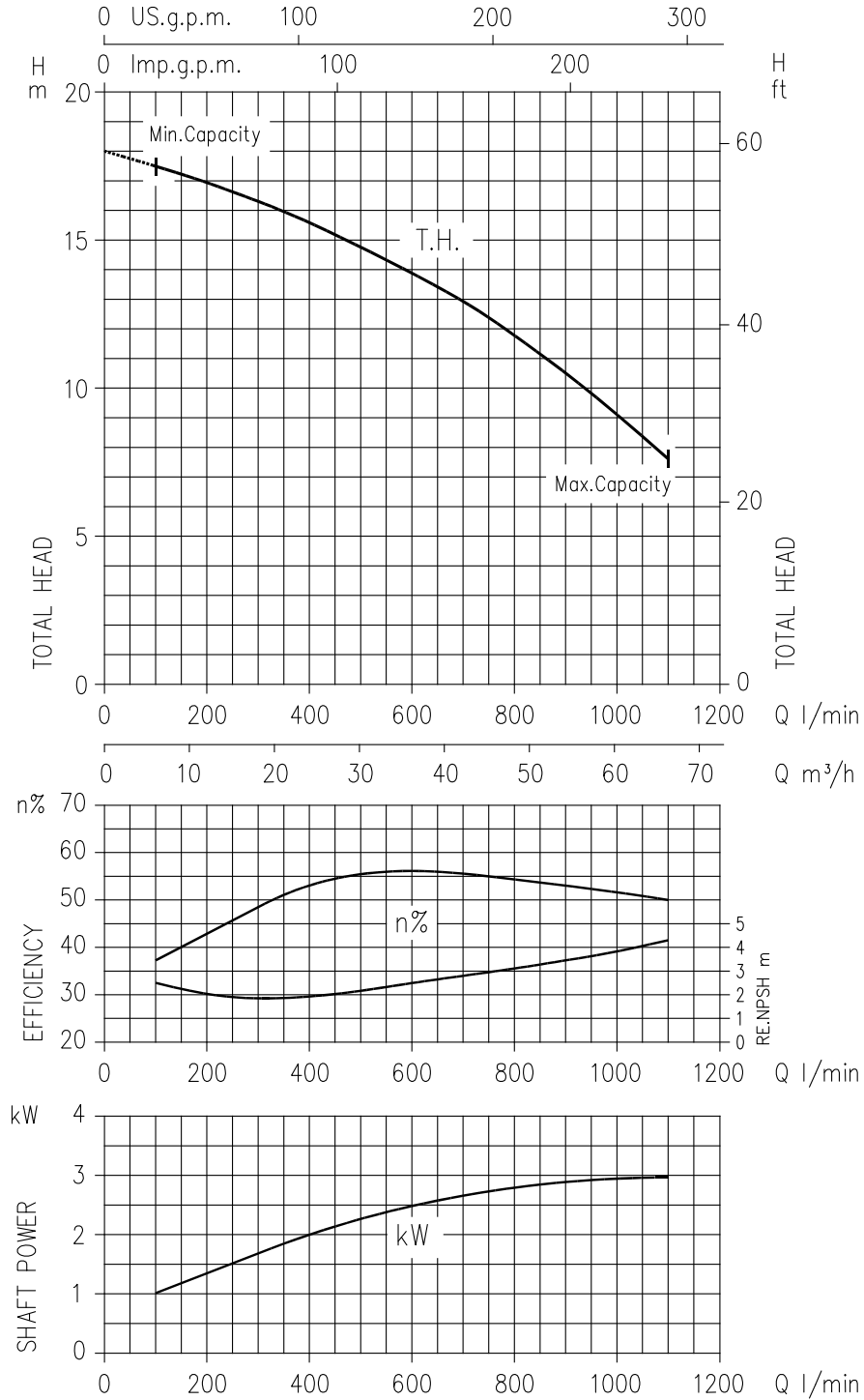


Rotation speed  $\approx 2800 \text{ min}^{-1}$

Test standard: ISO 9906:2012 - Grade 3B



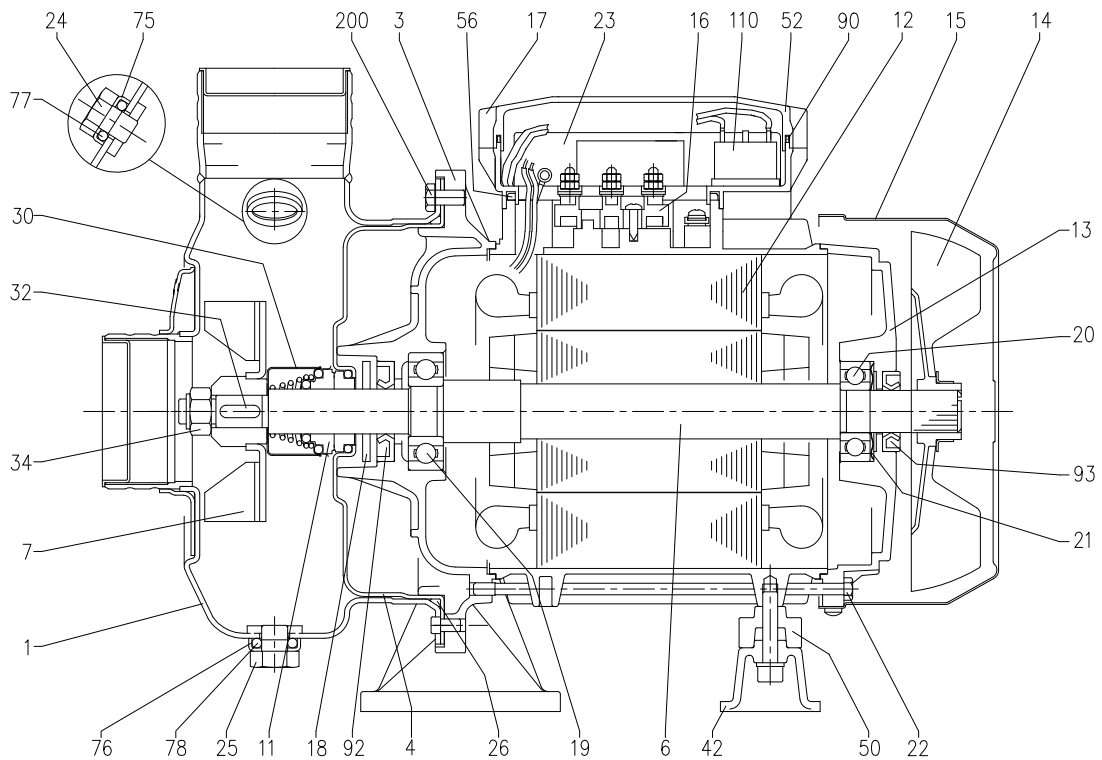
DWO 400 (3 kW) - Impeller diameter: 118 mm



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

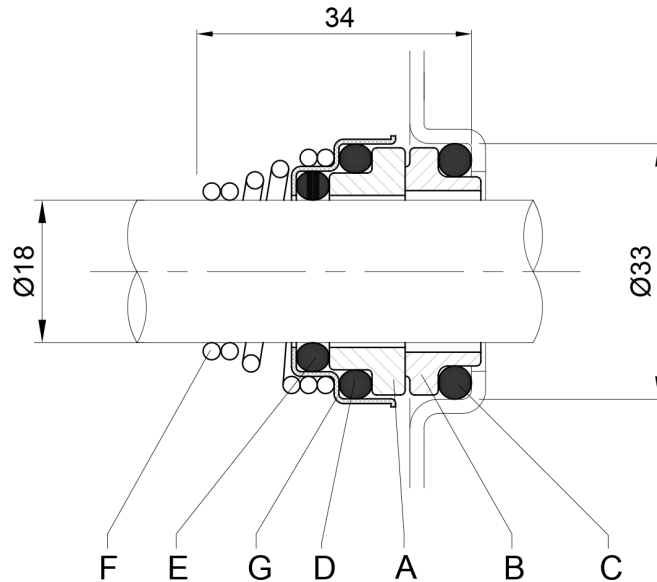
[3] See **MECHANICAL SEAL** pages 301, 302

[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

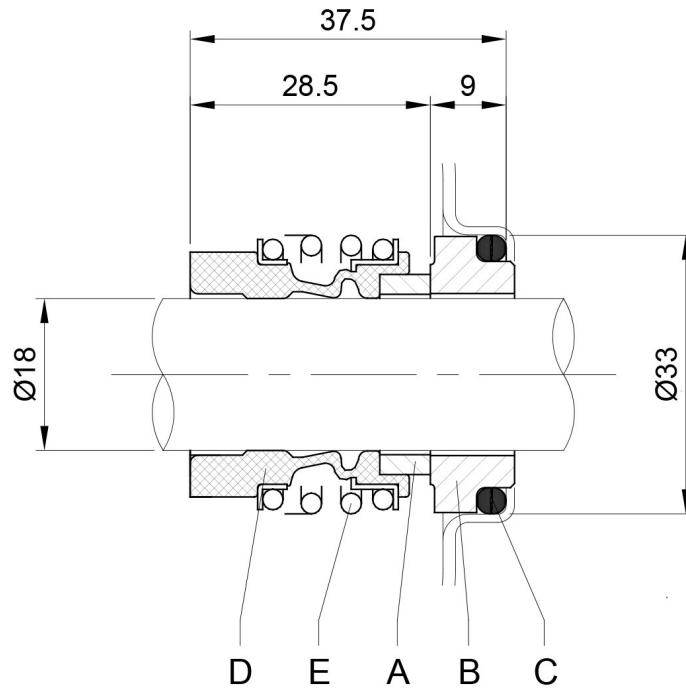
REF	PART NAME	MATERIAL			
		H	HS	HW	HSW
A	Rotary seal ring	Ceramic	Silicon carbide	Tungsten carbide	Silicon carbide
B	Stationary seal ring	Carbon graphite	Silicon carbide	Tungsten carbide	Tungsten carbide
C	O-ring	FPM	FPM	FPM	FPM
D	O-ring	FPM	FPM	FPM	FPM
E	O-ring	FPM	FPM	FPM	FPM
F	Self driving spring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

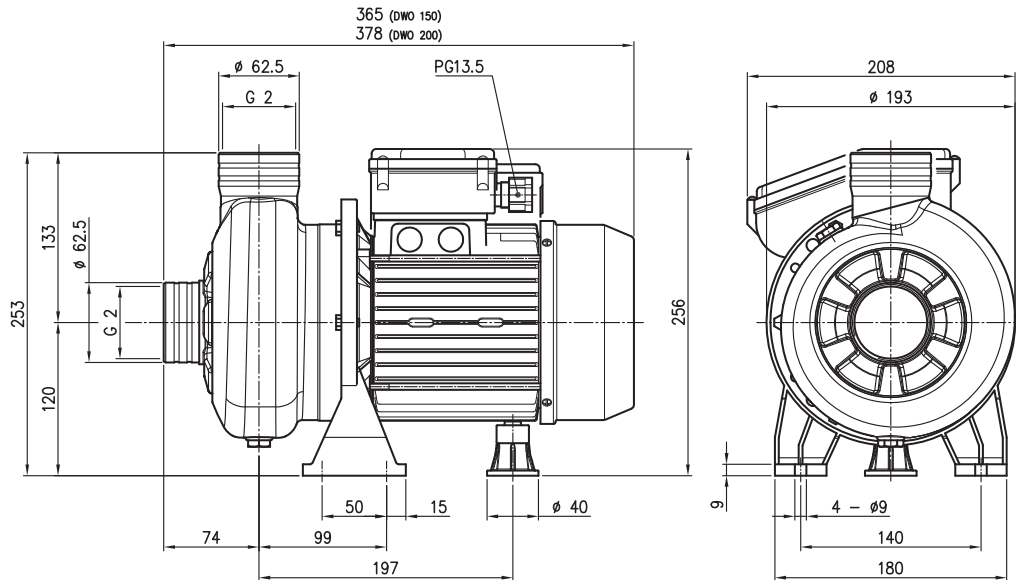
BEARINGS

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

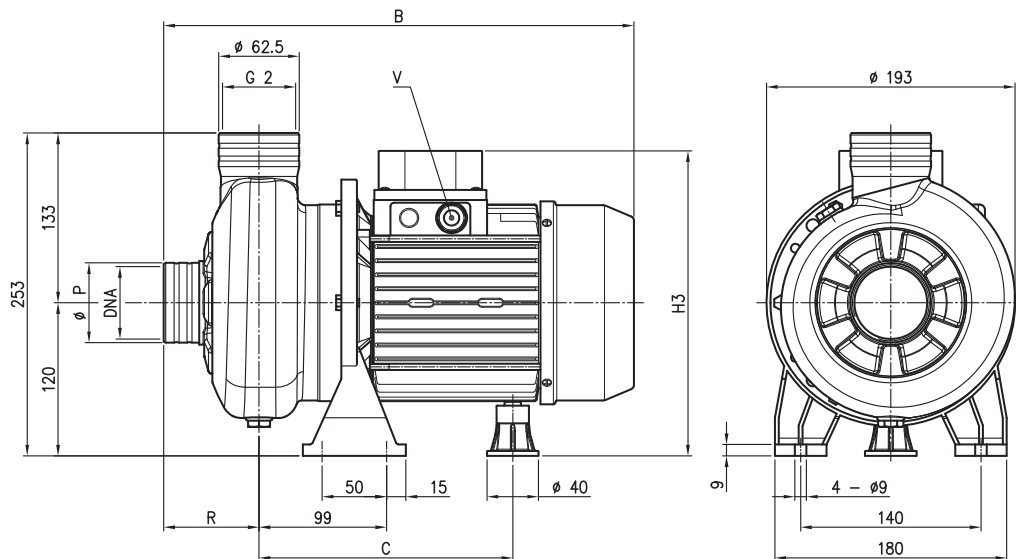
(\*) Only for IE3 Motors

### PUMP

[1~] Single phase  
DWO 150  
DWO 200



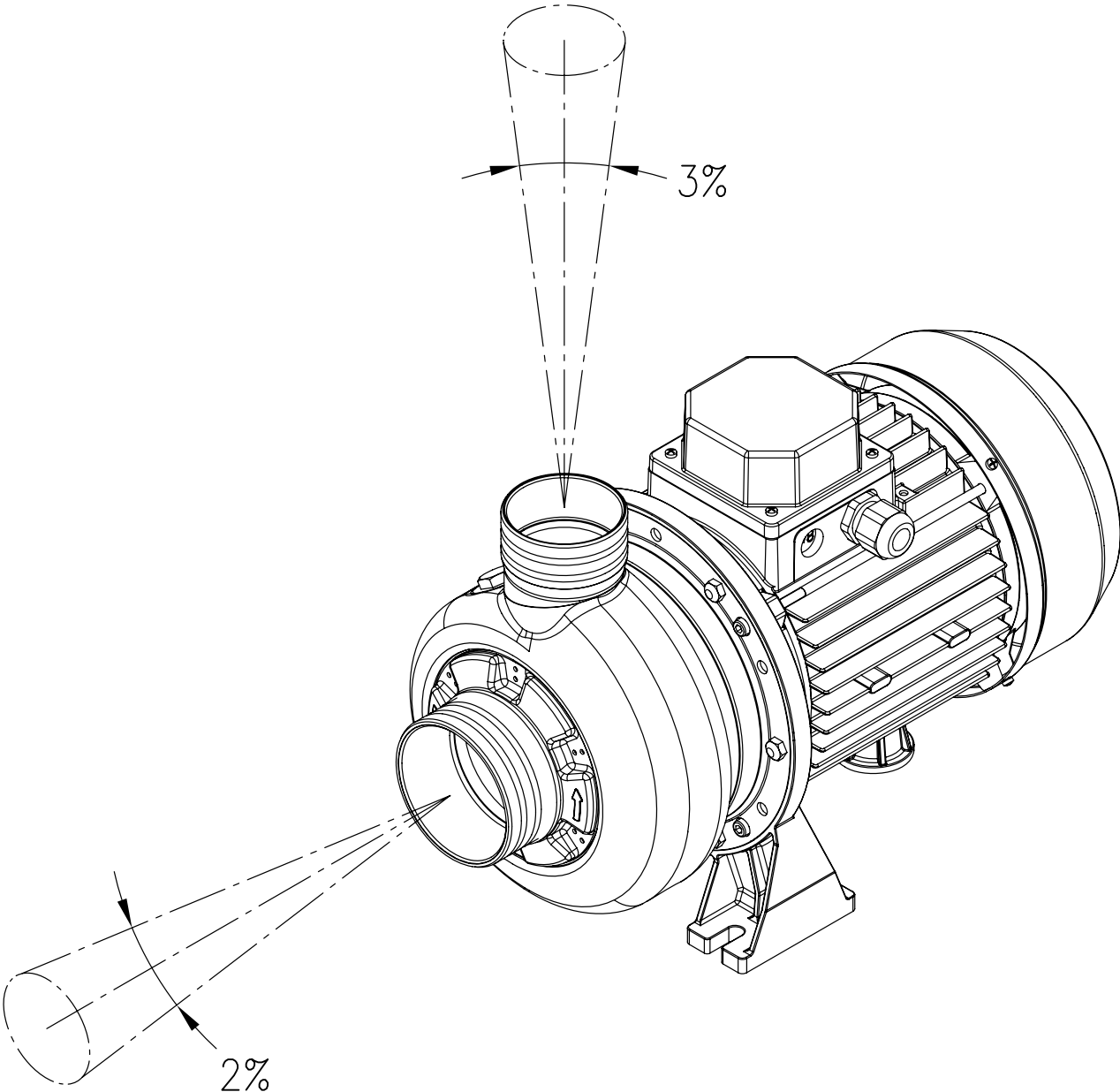
[3~] Three phase  
DWO 150  
DWO 200  
DWO 300  
DWO 400



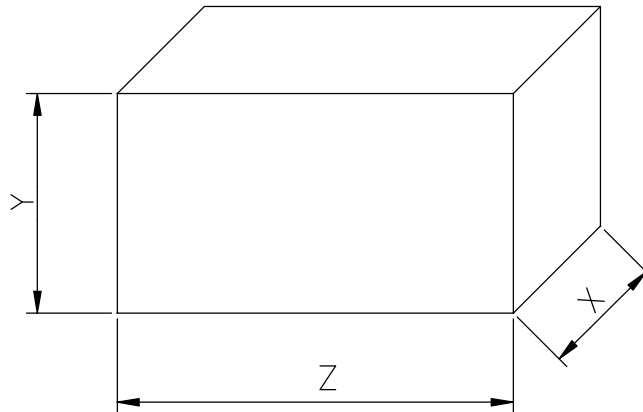
Pump type	Dimensions [mm]										Weight [kgf]			
	B [3~]		C [3~]		H3 [3~]	R	P	V [3~]	DNA		[1~]	[3~]		
	(*)		(*)		(*)	[3~]	[3~]	(*)	[3~]			(*)		
DWO 150	365	390	197	197	239	239	74	Ø62,5	PG11	M20x1.5	G 2	14.4	14.5	15.4
DWO 200	378	390.5	197	197	239	239	74	Ø62,5	PG11	M20x1.5	G 2	15.7	16.2	17.1
DWO 300	416	394.5	230/241	197	244	239	78	Ø80	PG13.5	M20x1.5	G 2½	-	19.4	19.4
DWO 400	455	455	230/241	230/241	244	244	78	Ø80	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	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		Three phase			[kW]		[A]			[A]		
						[μF]	[V]	50%	75%	100%	Single Phase	Three Phase	Single Phase	Three Phase	Single Phase	Three Phase	Single Phase	Three Phase
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.