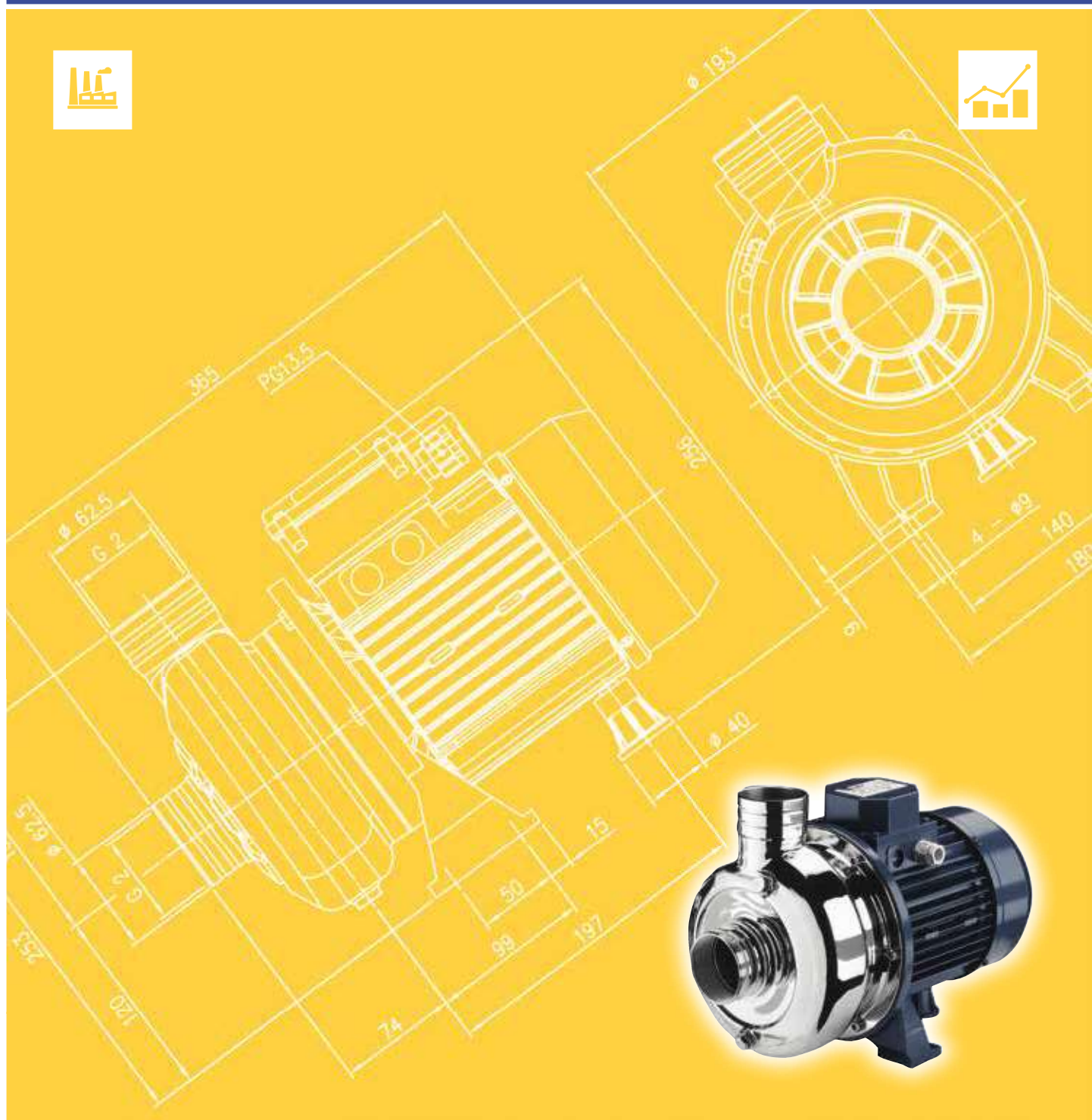




Japanese Technology since 1912

DWO

Data Book 50Hz



	Page
- SPECIFICATIONS	200
PERFORMANCE RANGE and SELECTION CHART	201
TYPE KEY and CURVE SPECIFICATIONS	202
PERFORMANCE CURVES DWO 150	203
PERFORMANCE CURVES DWO 200	204
PERFORMANCE CURVES DWO 300	205
PERFORMANCE CURVES DWO 400	206
- CONSTRUCTIONS	300
SECTIONAL VIEW	300
MECHANICAL SEAL	301
FLUID TEMPERATURE RANGE	303
BEARINGS	304
- DIMENSIONS and WEIGHT	400
PUMP	400
GEOMETRIC TOLERANCES	401
PACKING	402
- TECHNICAL DATA	500
MOTOR DATA	500
NOISE DATA	500

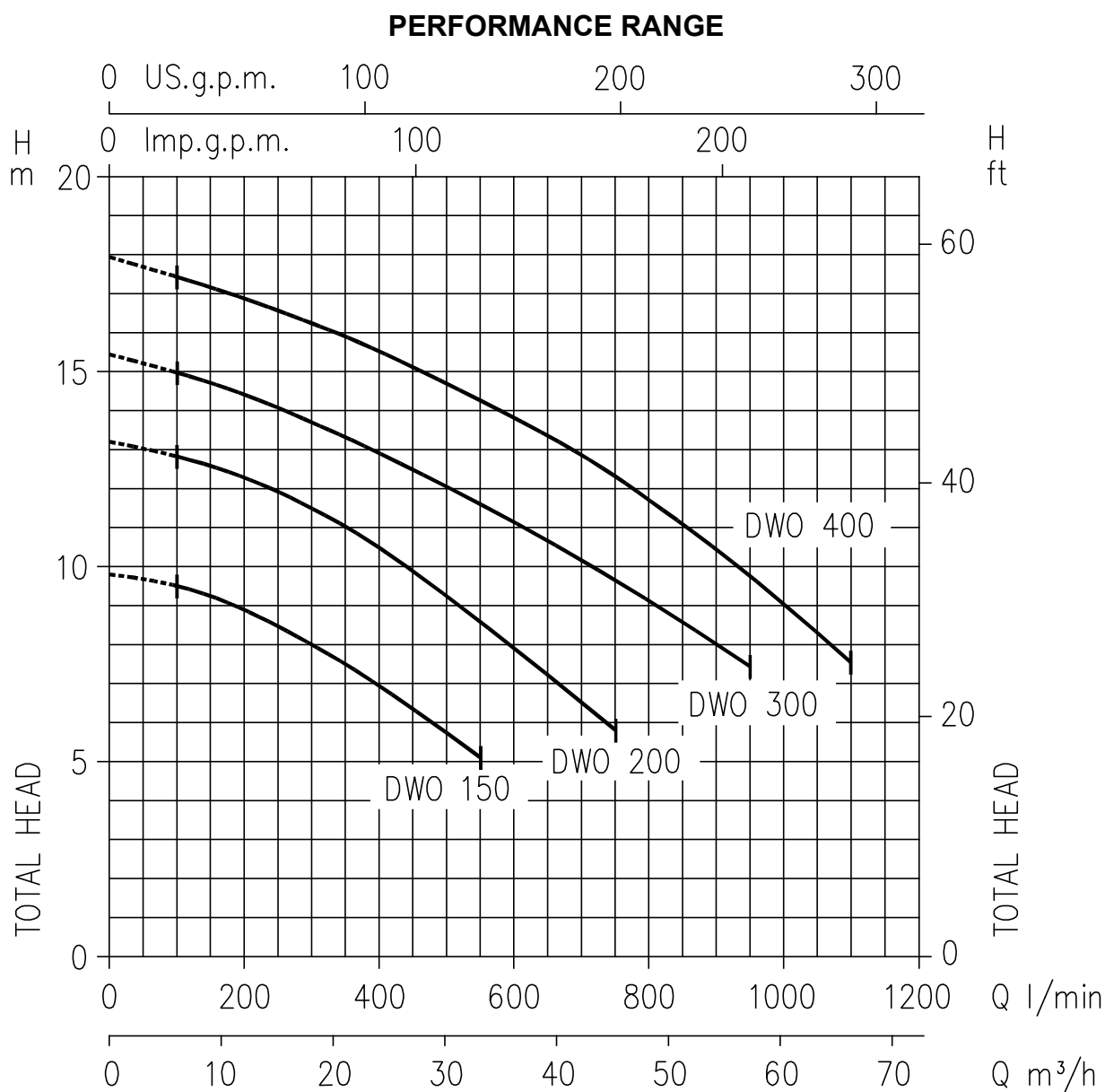
SPECIFICATIONS

50Hz

Rev.R

PUMP		
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. +120 For full details see section "FLUID TEMPERATURE RANGE"
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

MOTOR		
Type	Electric - TEFC	
	Single Phase	Three Phase
Efficiency level (Reg. 1781/2019)	IE2	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 DIMENSIONS TABLE page 400)	

**SELECTION CHART**

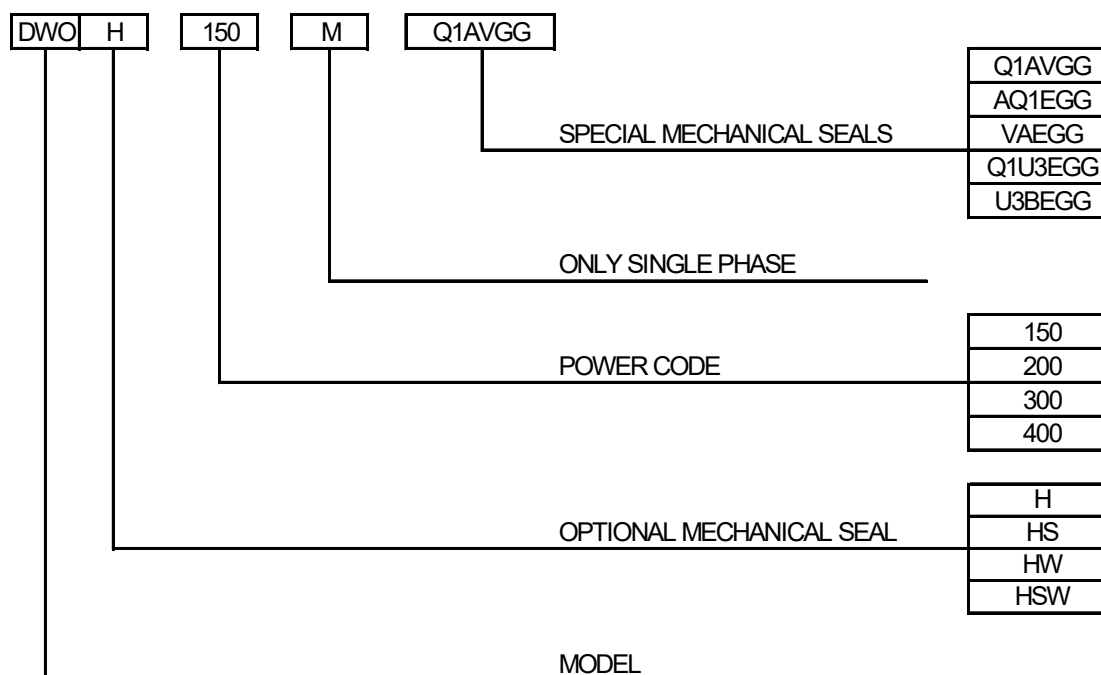
Pump type		Q=Capacity									
		l/min	0	100	200	300	400	550	750	950	1100
Single Phase	Three Phase	m³/h	0	6	12	18	24	33	42	57	66
H=Total manometric head in meters											
DWO 150 M	DWO 150	9,8	9,5	8,9	7,9	6,9	5,1	-	-	-	-
DWO 200 M	DWO 200	13,2	12,7	12,3	11,5	10,5	8,6	5,8	-	-	-
-	DWO 300	15,5	15	14,5	13,8	12,9	11,7	9,7	7,5	-	-
-	DWO 400	18	17,5	16,9	16,3	15,6	14,3	12,4	9,8	7,6	-

TYPE KEY and CURVES SPECIFICATIONS

50Hz

Rev.R

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.

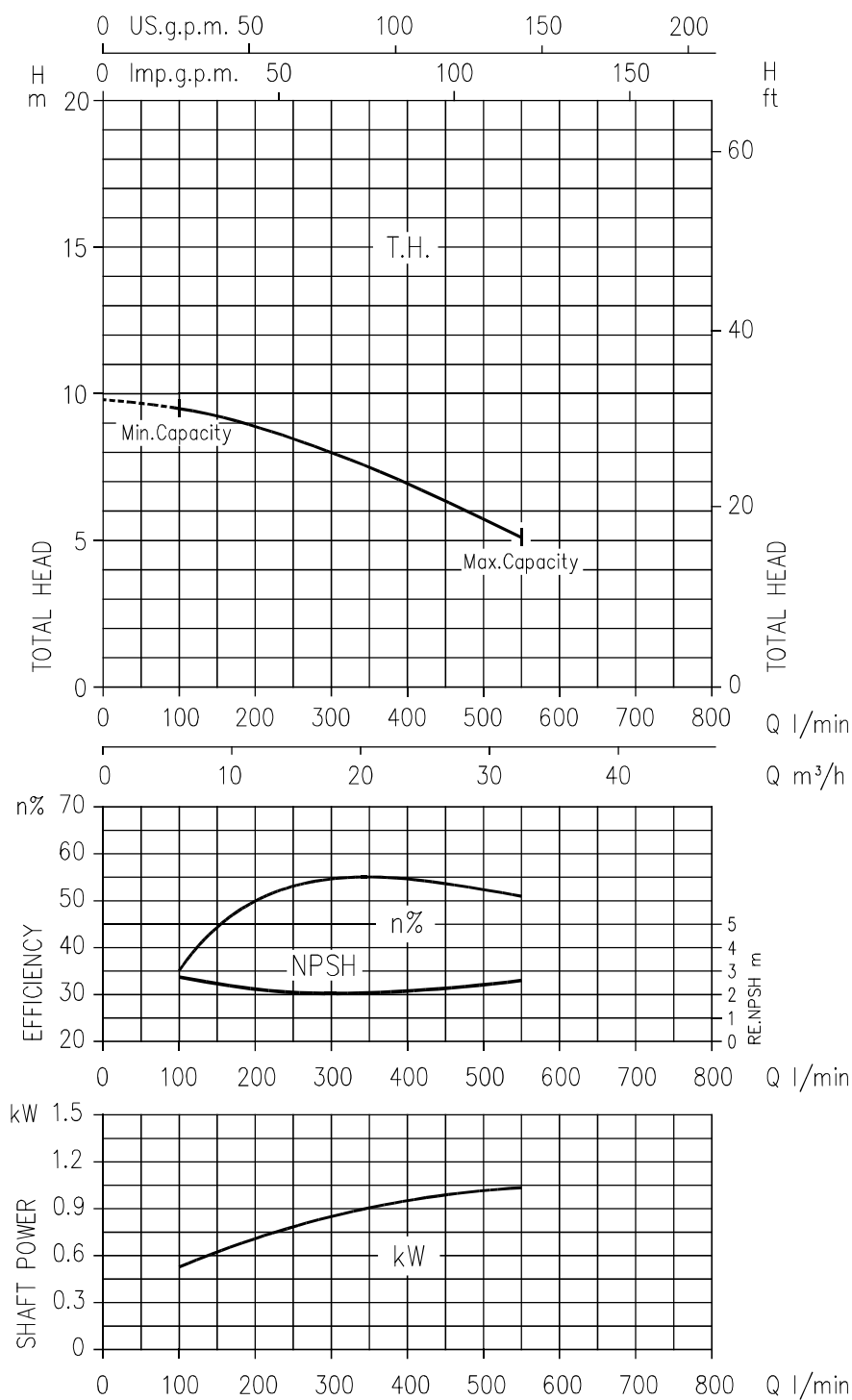
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

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:

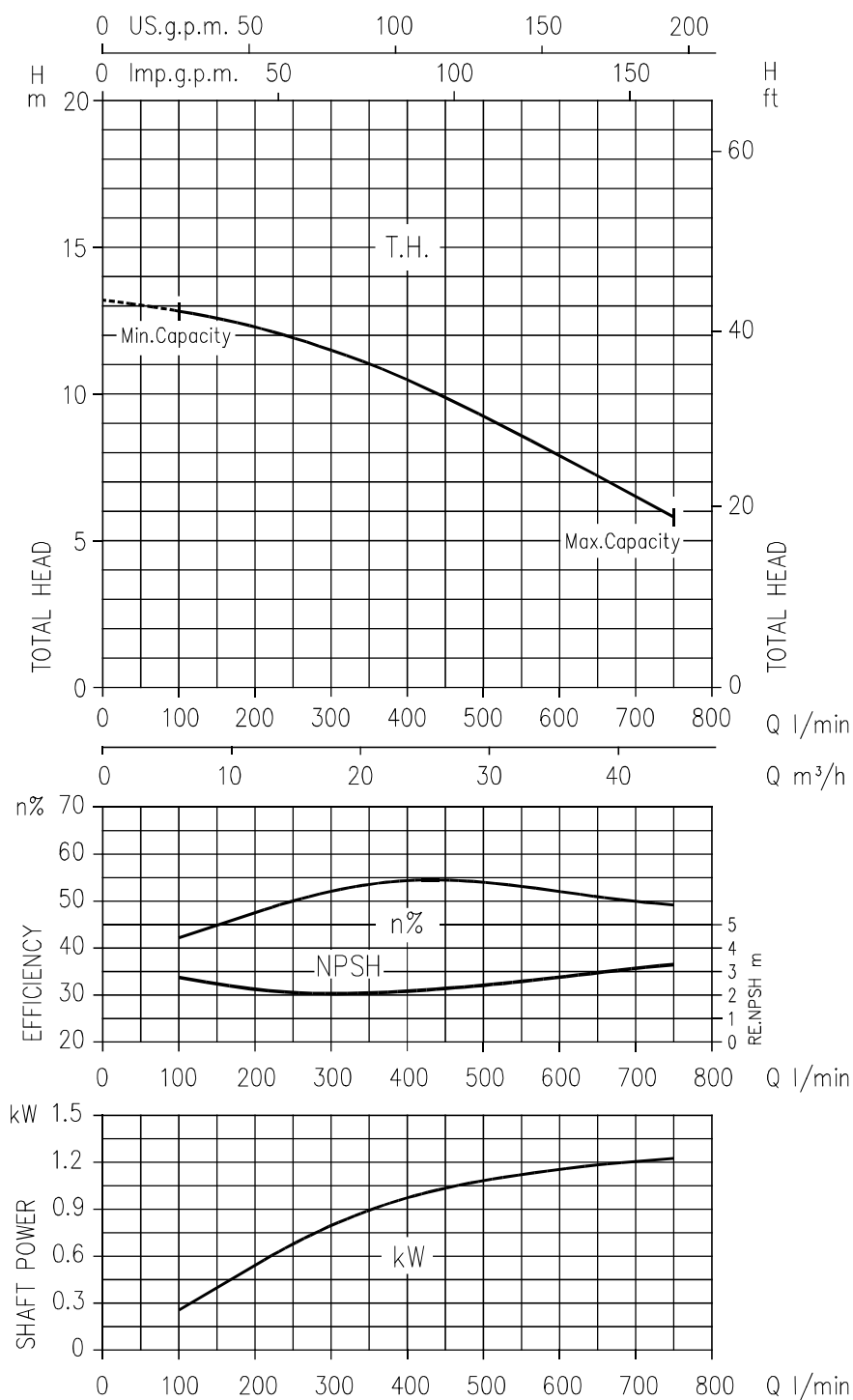
- Q = volume flow rate
- H = total head
- P_2 = pump power input (shaft power)
- η = pump efficiency
- NPSH = net positive suction head required by the pump

DWO 150 - Impeller diameter = 88 mm

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

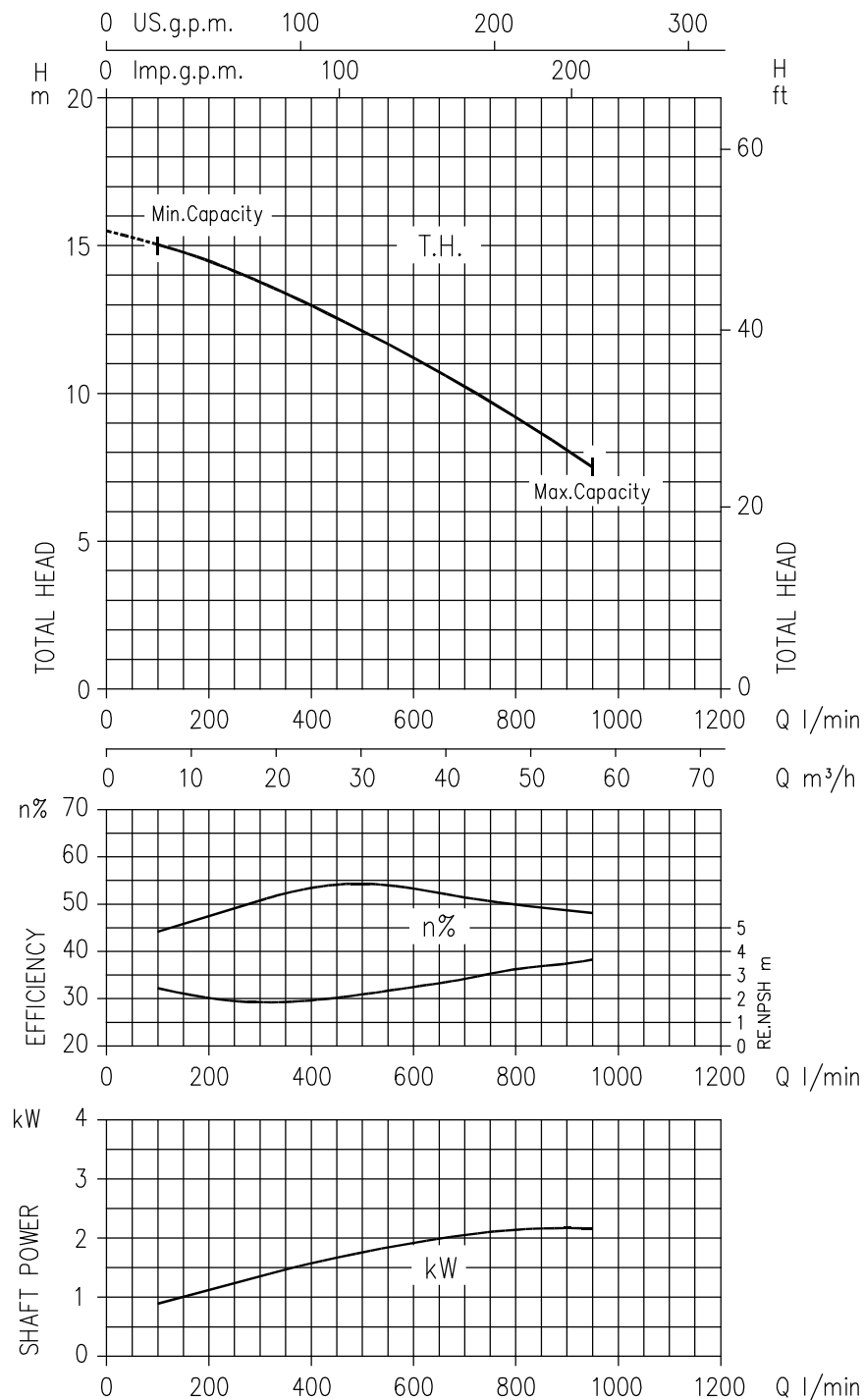
Test standard: ISO 9906:2012 - Grade 3B

DWO 200 - Impeller diameter = 103 mm

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

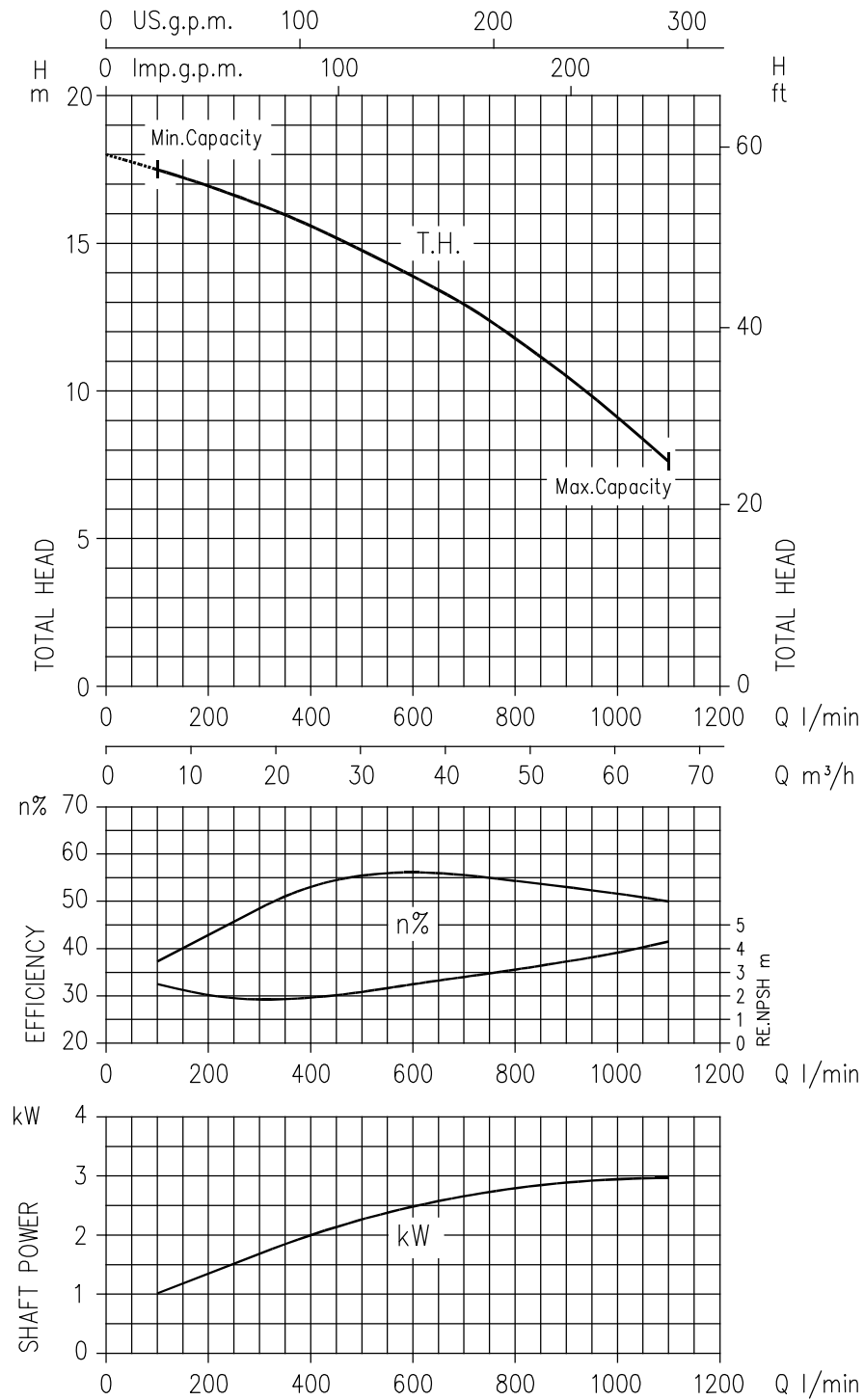
Test standard: ISO 9906:2012 - Grade 3B

DWO 300 - Impeller diameter = 107 mm

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

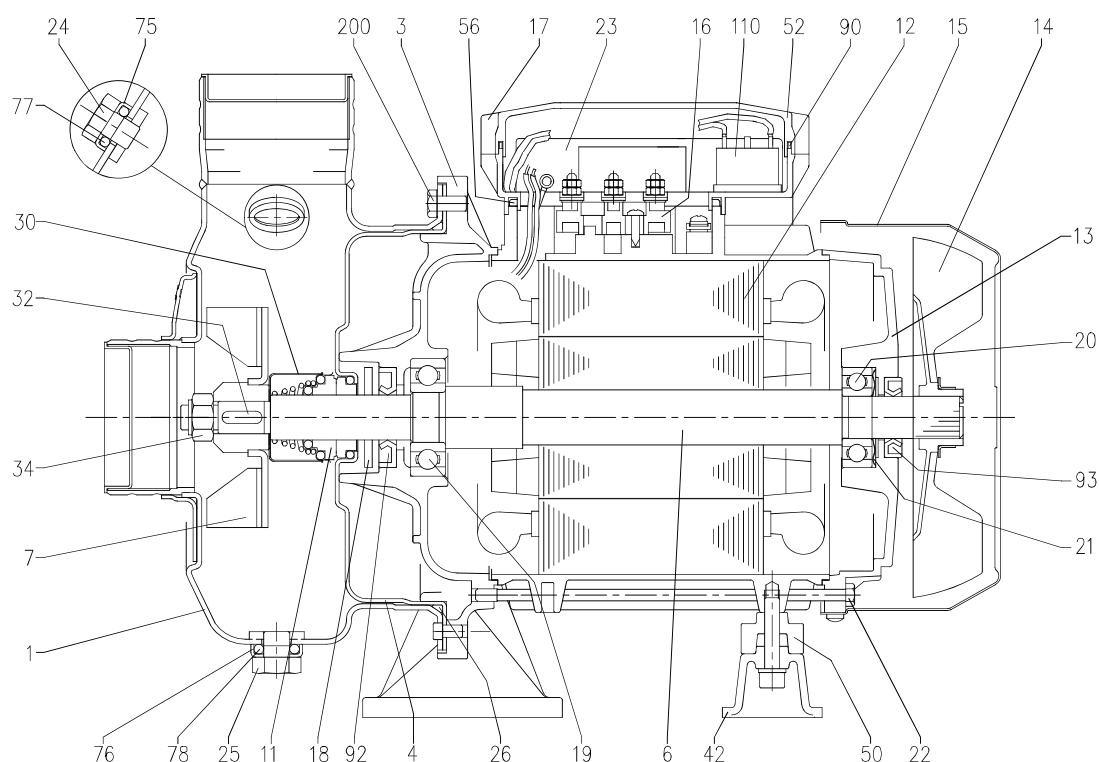
Test standard: ISO 9906:2012 - Grade 3B

DWO 400 - 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

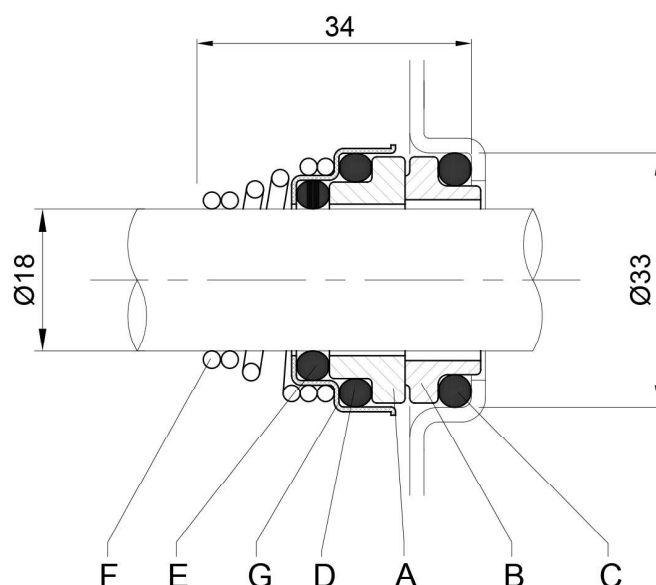
[3] See **MECHANICAL SEAL** pages 301, 302

[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

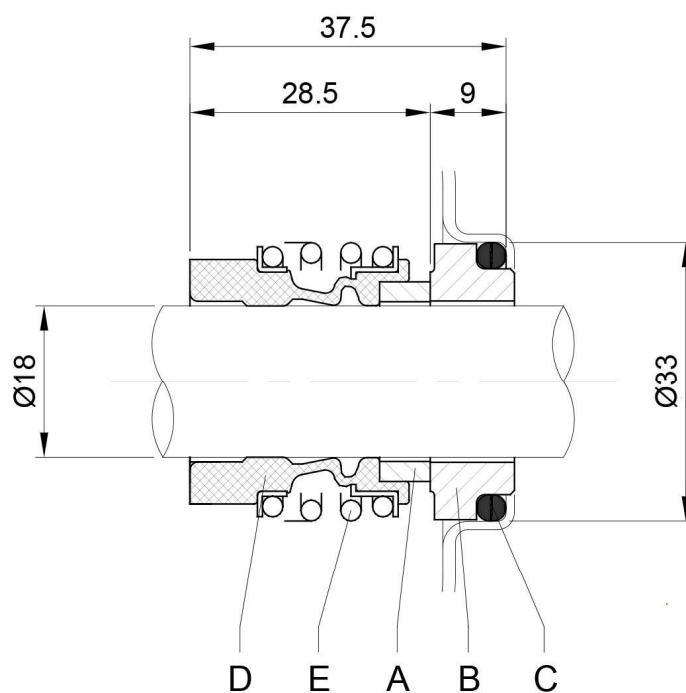
REF	PART NAME	MATERIAL			
		H	HS	HW	HSW
A	Rotary seal ring	Ceramic	Silicon carbide	Tungsten carbide	Silicon carbide
B	Stationary seal ring	Carbon graphite	Silicon carbide	Tungsten carbide	Tungsten carbide
C	O-ring	FPM	FPM	FPM	FPM
D	O-ring	FPM	FPM	FPM	FPM
E	O-ring	FPM	FPM	FPM	FPM
F	Self driving spring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

FLUID TEMPERATURE RANGE

The fluid temperature range depends on:

- Material of the elastomers
- Type of fluid pumped
- Material of the sealing faces

for each combination of these parameters the fluid temperature range may be different.

		SEALING FACES MATERIAL			
ELASTOMER		CERAMIC-CARBON		ALL (except ceramic-carbon)	
	NBR	-5 °C	90°C	-5 °C	90°C
	EPDM	-5 °C	90°C	-5 °C	120°C
	FPM	-5 °C	75°C	-5 °C	75°C ¹
		MIN	MAX	MIN	MAX
FLUID TEMPERATURE RANGE					

¹In case of fluids not containing water, the temperature limit could be increased to 110°C

Therefore, the fluid temperature range is related to the choice of the mechanical seal and its materials.

STANDARD mechanical seal	TEMPERATURE	
	MIN	MAX
STANDARD	-5 °C	90 °C

OPTIONAL mechanical seal	TEMPERATURE	
	MIN	MAX
H	-5 °C	75 °C
HS	-5 °C	75 °C
HW	-5 °C	75 °C
HSW	-5 °C	75 °C

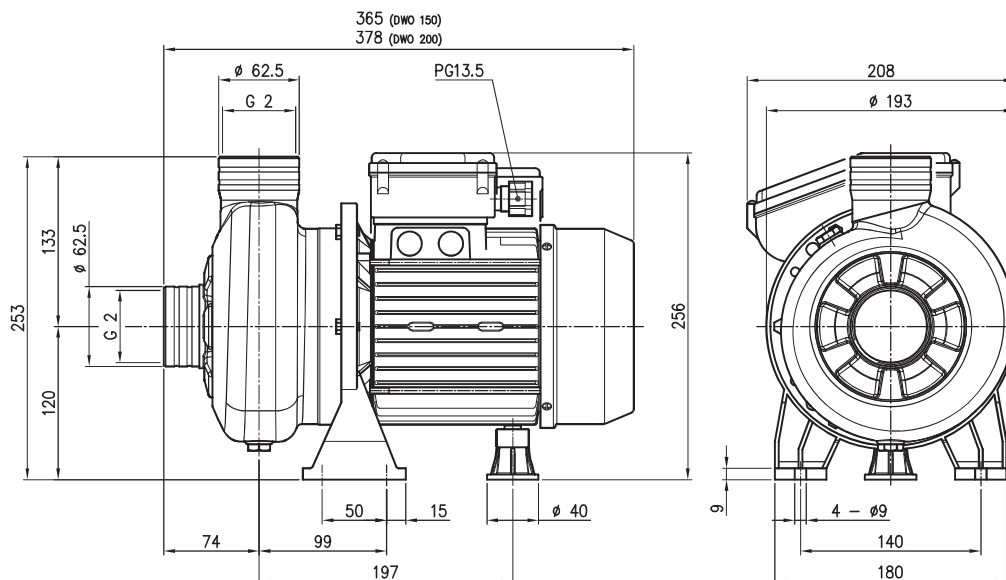
SPECIAL mechanical seal	TEMPERATURE	
	MIN	MAX
Q1AVGG	-5 °C	75 °C
AQ1EGG	-5 °C	120 °C
VAEGG	-5 °C	90 °C
Q1U3EGG	-5 °C	120 °C
U3BEGG	-5 °C	120 °C

BEARINGS

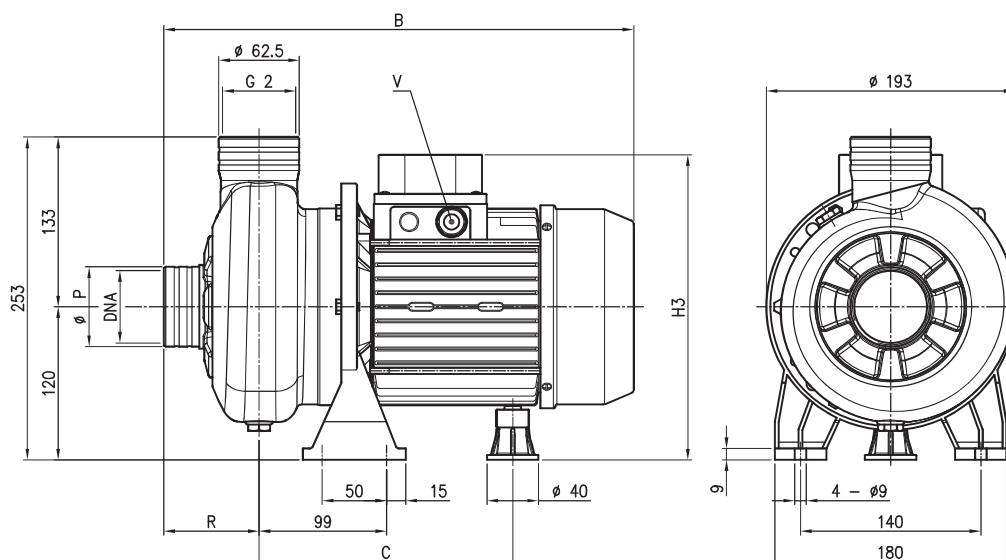
Pump type		Ball Bearing	
Single Phase	Three Phase	Pump side	Fan side
DWO 150 M	DWO 150	6204	6203
DWO 200 M	DWO 200	6204	6203
-	DWO 300	6204	6203
-	DWO 400	6305	6205

PUMP

[1~] Single phase
DWO 150
DWO 200



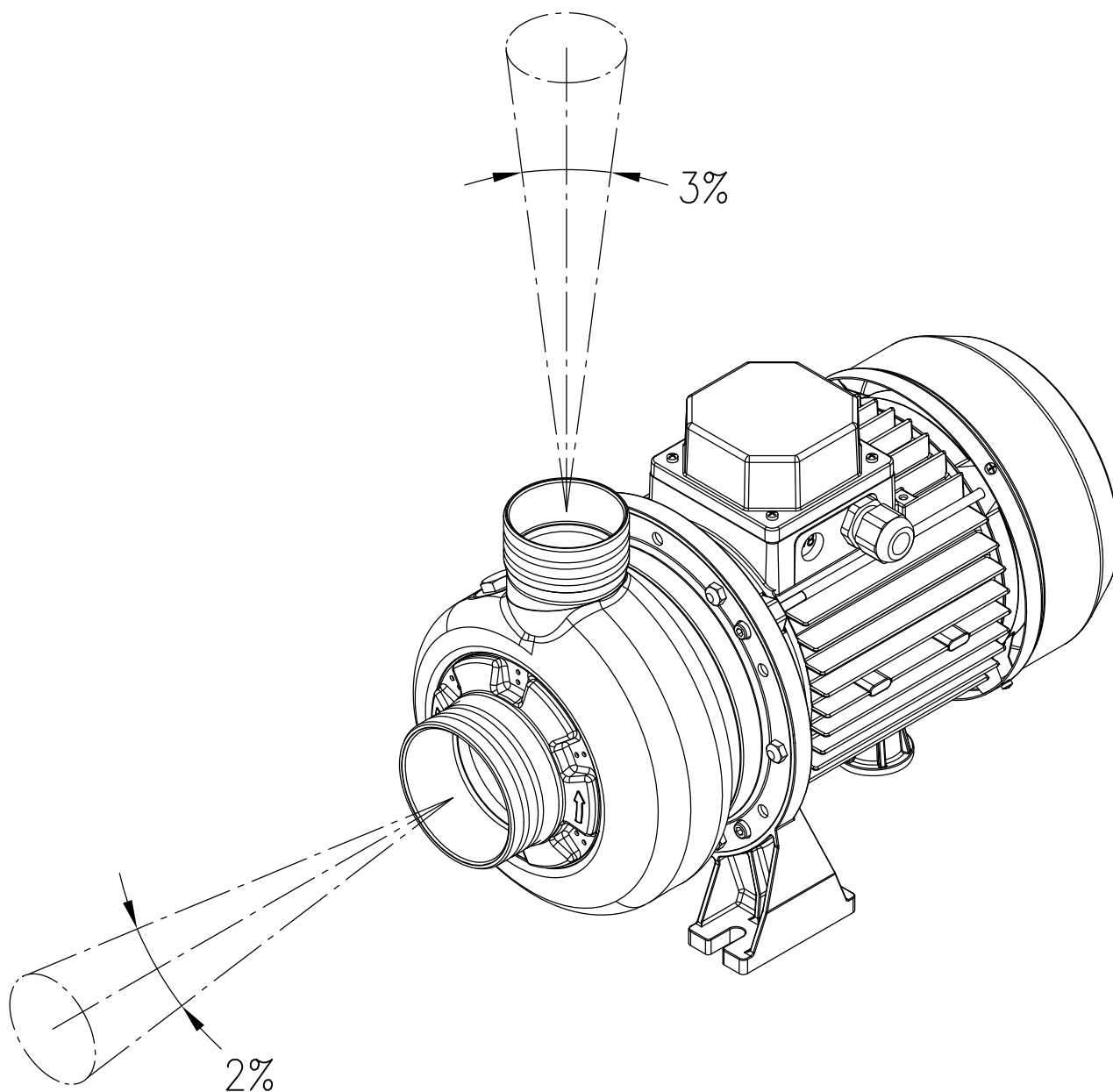
[3~] Three phase
DWO 150
DWO 200
DWO 300
DWO 400



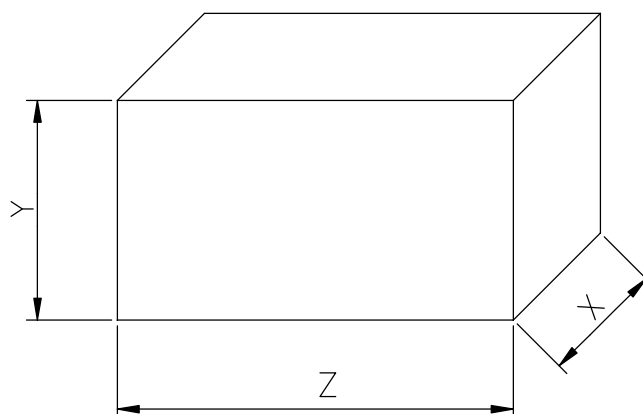
Pump type	Dimensions [mm]								Weight [kgf]	
	B		C	H3	R	P	V	DNA		
	[1~]	[3~]	[3~]	[3~]	[3~]	[3~]	[3~]	[3~]	[1~]	[3~]
DWO 150	390	390	197	239	74	Ø62,5	M20x1.5	G 2	17	15,4
DWO 200	390	390	197	239	74	Ø62,5	M20x1.5	G 2	17,5	17,1
DWO 300	-	395	197	239	78	Ø80	M20x1.5	G 2½	-	19,4
DWO 400	-	455	230/241	244	78	Ø80	M20x1.5	G 2½	-	22,4

[1~] Single phase
[3~] Three phase

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	245	245	315	315	590	590	18,5	16,2
DWO 200 M	DWO 200	245	245	315	315	590	590	19	17,9
-	DWO 300	-	245	-	315	-	590	-	20,3
-	DWO 400	-	245	-	315	-	590	-	23,2

[1~] Single phase

[3~] Three phase

MOTOR DATA

Pump type	Power		Efficiency	Capacitor		Efficiency (% load) and power factor				Input	Full load current		Locked rotor current	
Single Phase	[kW]	[HP]	[IE2 / IE3]	[μF]	[V]	η %			cos-φ	[kW]	[A]		[A]	
						50%	75%	100%			110 V	230 V	110 V	230 V
DWO 150 M	1,5	2,0	IE2	40	450	69,8	76,6	81,3	0,92	1,90	-	9,0	-	65,2
DWO 200 M	1,8	2,4	IE2	40	450	73,1	78,8	82,2	0,93	2,20	-	10,5	-	65,2

Pump type	Power		Efficiency	Efficiency (% load)			Input [kW]	Full load current		Locked rotor current	
Three Phase	[kW]	[HP]		η %				[A]		[A]	
				50%	75%	100%		230 V	400 V	230 V	400 V
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	1,5	2,0	IE3	78,6	83,0	84,2	1,78	6,3	3,7	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	IE3	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	IE3	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		L _{pA} - dB(A) *
Single Phase	Three Phase	
DWO 150 M	DWO 150	<70
DWO 200 M	DWO 200	
-	DWO 300	
-	DWO 400	

* Mean value of several measures at 1m distance around
Tolerance ± 2.5 dB.