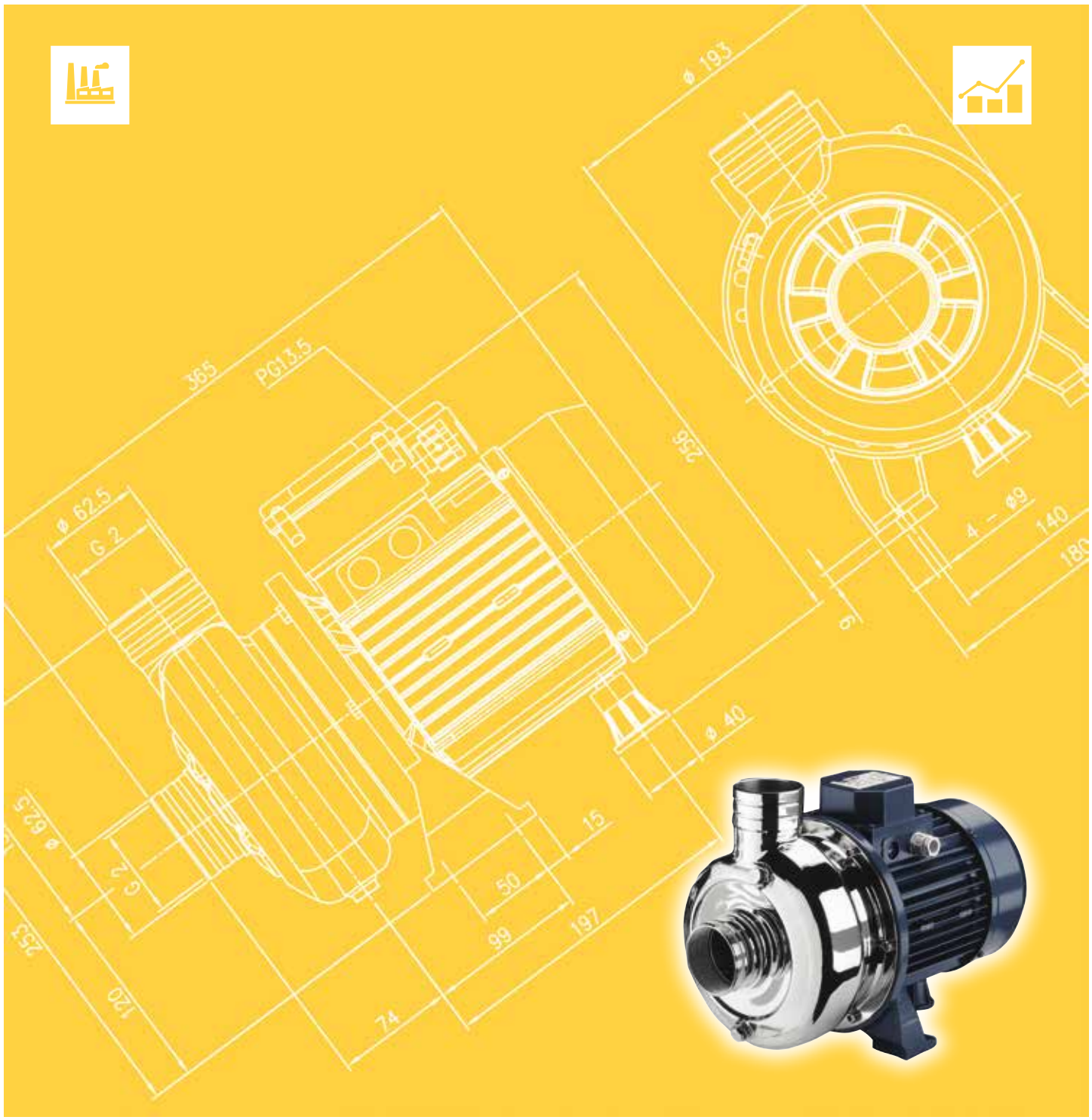




Japanese Technology since 1912

DWO

Data Book 60Hz



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SPECIFICATIONS

60Hz

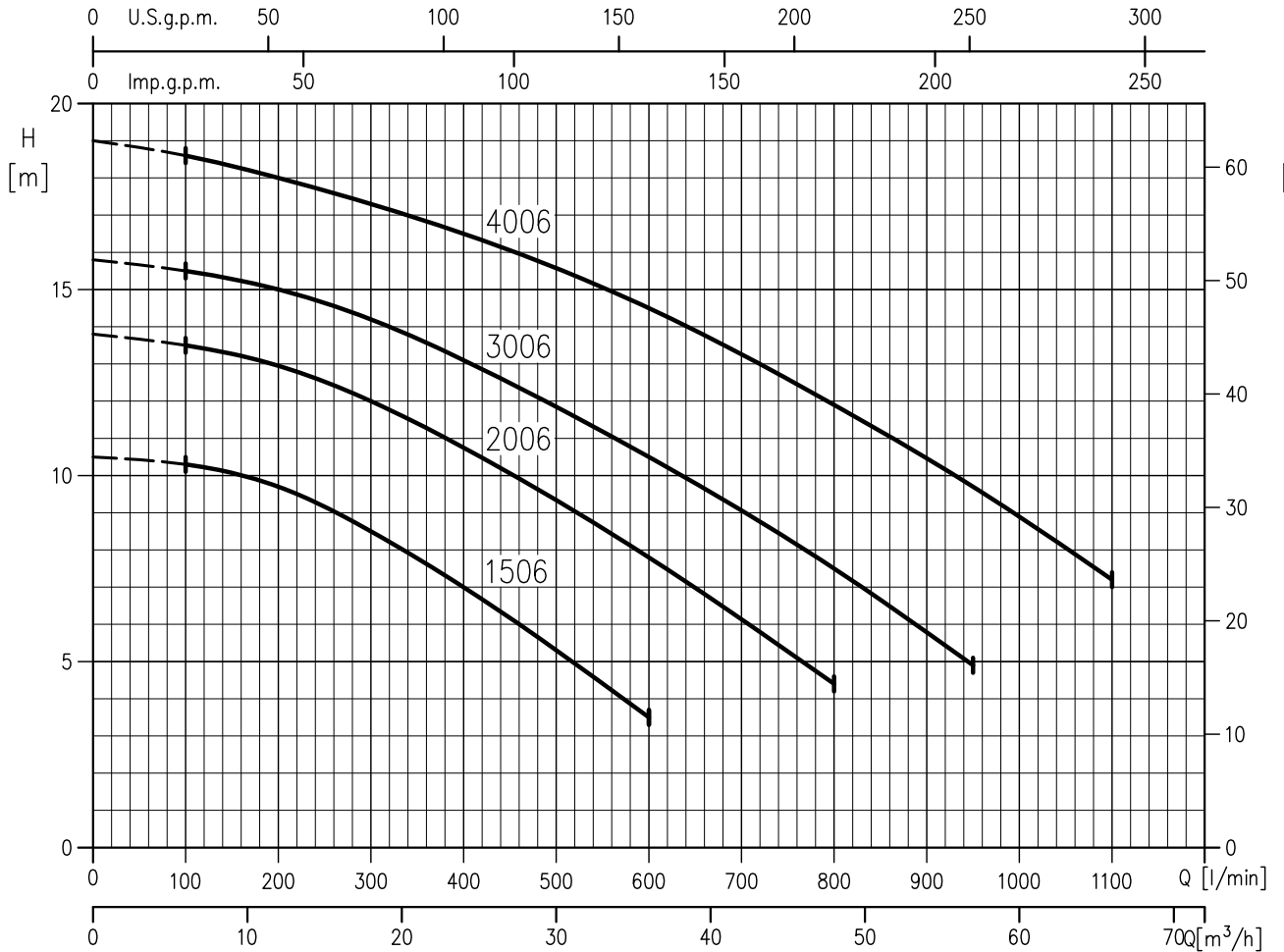
Rev. I

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. +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 [inch]	G 2 (G2½ for DWO 3006-4006) UNI ISO 228
	Discharge [inch]	G 2 UNI ISO 228
Material	Casing	EN 1.4301 (AISI 304)
	Impeller	EN 1.4301 (AISI 304)
	Casing cover	EN 1.4301 (AISI 304)
	Shaft seal	Ceramic/Carbon/NBR (for version see page 301)
	Shaft	EN 1.4301 (AISI 304) (wet extension)
Bracket		Aluminium
Applicable standard of test		ISO 9006:2012 - Grade 3B

MOTOR		
Type	Electric - TEFC	
	Single Phase	Three Phase
Efficiency Level	-	- from 1.1 up to 3.0 kW IE3* from 1.1 up to 3.0 kW (* only for 460V)
No. of Poles	2	
Rotation speed [min ⁻¹]	≈ 3450	
Insulation Class	F	
Protection degree (CEI EN 60034-5)	IP 55	
Power rating [kW]	1.1 ÷ 1.5	1.1 ÷ 3
	[HP]	1.5 ÷ 2
Frequency [Hz]	60	
Voltage [V]	220-230 ±6%	220/380 ±10% (from 1.1 up to 3.0 kW) 220/380-460 ±10% (IE3* from 1.1 up to 3.0 kW)
Capacitor	Built in	-
Over load protection	Built in	Provided by the user
Casing material	Aluminium	
Base material / Motor support	Aluminium	
Dimensions of cable entry	PG 11 - PG 13.5 - G 3/8 - M20x1.5 (see page 400)	

*only for 460 V

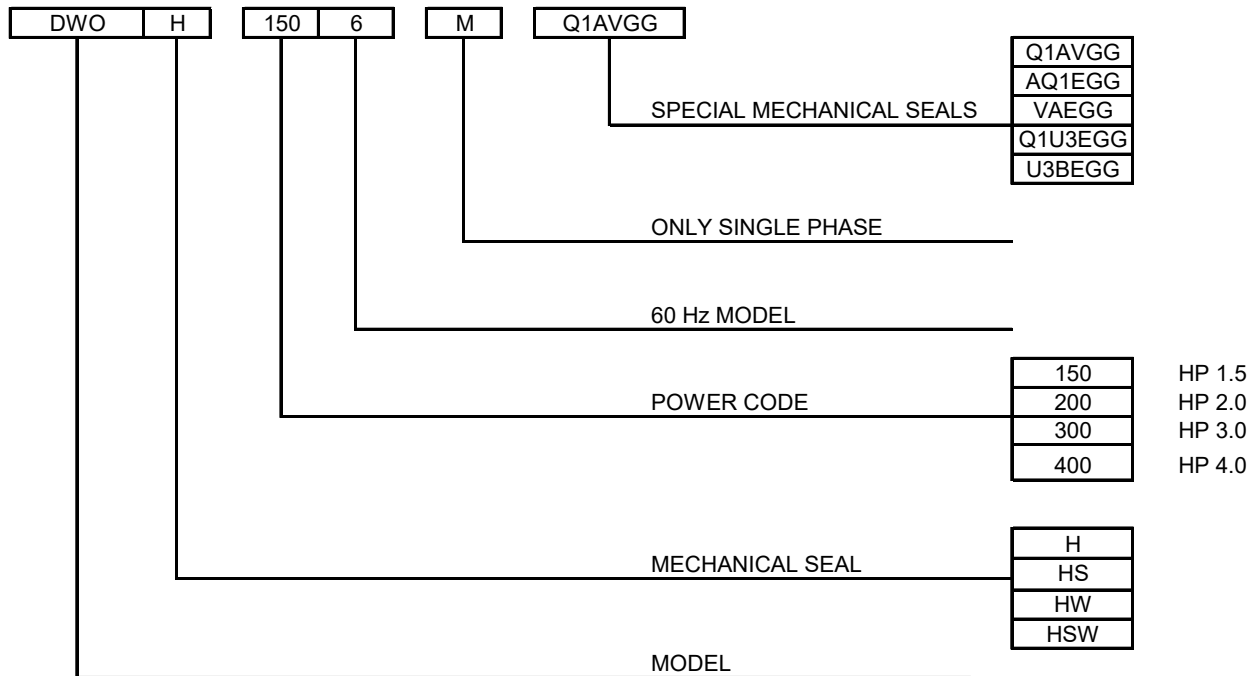
PERFORMANCE RANGE



SELECTION CHART

Pump type		Power		Q=Capacity									
				l/min	0	100	200	300	400	600	800	950	1100
Single Phase	Three Phase	[kW]	[HP]	m³/h	0	6	12	18	24	33	42	57	66
H=Total manometric head in meters													
DWO 1506 M	DWO 1506	1,1	1,5	10,5	10,3	9,7	8,5	7,0	3,5	-	-	-	-
DWO 2006 M	DWO 2006	1,5	2	13,8	13,5	12,9	12	10,7	7,8	4,4	-	-	-
-	DWO 3006	2,2	3	15,8	15,5	15	14,2	13,1	10,5	7,5	4,9	-	-
-	DWO 4006	3,0	4	19	18,6	18	17,3	16,5	14,5	11,9	9,7	7,2	-

TYPE KEY



CURVES SPECIFICATIONS

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

Tolerances according to ISO 9006:2012 - Grade 3B.

The curves refer to effective speed of asynchronous motors at 60 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)

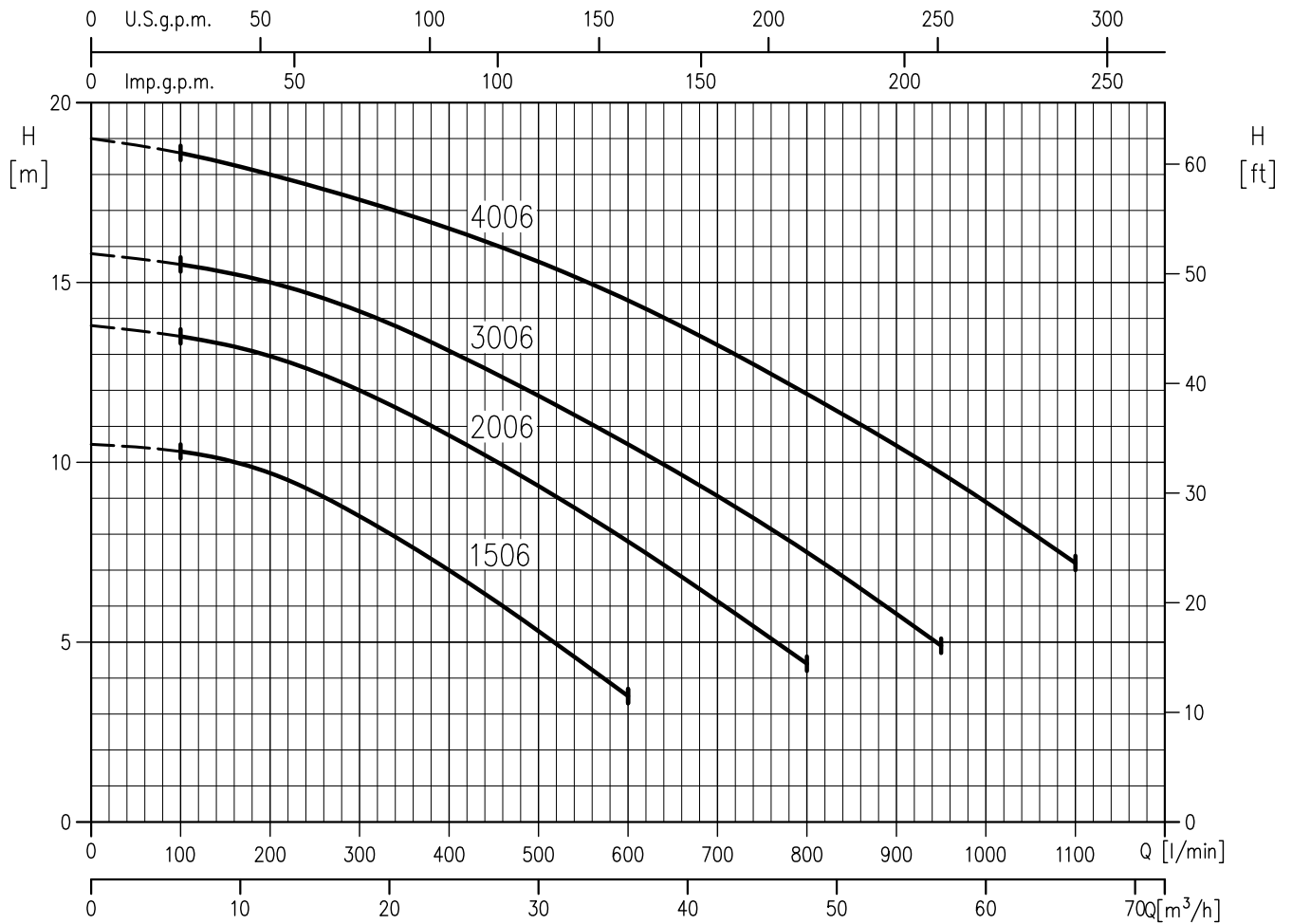
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

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:

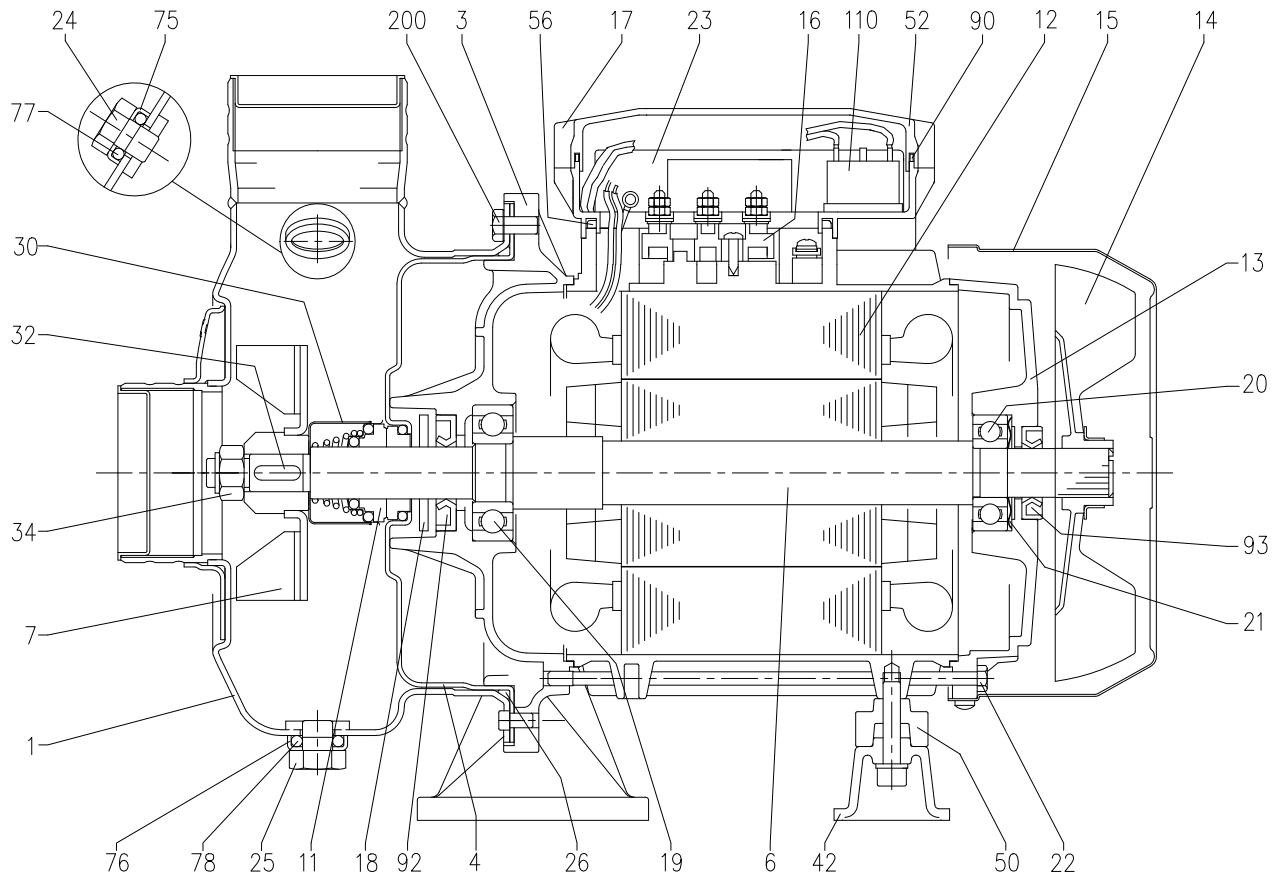
- Q = volume flow rate
- H = total head

DWO 1506 (1.1 kW) - Impeller diameter = 88 mm
 DWO 2006 (1.5 kW) - Impeller diameter = 88 mm
 DWO 3006 (2.2 kW) - Impeller diameter = 118 mm
 DWO 4006 (3 kW) - Impeller diameter = 118 mm



Rotation speed $\approx 3400 \text{ min}^{-1}$
 Test standard: ISO 9006:2012 - Grade 3B

SECTIONAL VIEW DRAWING



SECTIONAL VIEW TABLE

N°	PART NAME	MATERIAL	DIMENSIONS	STANDARD	Q.TY
1	Casing	EN 1.4301 (AISI 304)			1
3	Motor bracket	Aluminium			1
4	Casing cover	EN 1.4301 (AISI 304)			1
6	Shaft with rotor	EN 1.4301 (AISI 304) wet extension			1
7	Impeller	EN 1.4301 (AISI 304)			1
11	Mechanical seal [4]	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	40x17.5x3		1
19	Pump side ball bearing [5]	-			1
20	Fan side ball bearing [5]	-			1
21	Adjusting ring	Steel C70			1
22	Tie rod	Fe 420 Zincate		EBARA drawing	4
23	Capacitor [1]	-			1
24	Priming plug	EN 1.4305 (AISI 303)			1
25	Drain plug	EN 1.4305 (AISI 303)			1
26	O-ring [3]	NBR/FPM/EPDM	148.8x3.53		1
30	Mechanical seal protection	EN 1.4301 (AISI 304)			1
32	Key	EN 1.4401 (AISI 316)	5x5x15	UNI 6604	1
34	Impeller nut	EN 1.4301 (AISI 304)	M10x1.25	UNI 7474	1
42	Motor support	Aluminium			1
50	Spacer	-			1
52	Terminal box [1]	PP			1
56	Box gasket	NBR			1
75	Washer	EN 1.4301 (AISI 304)			1
76	Washer	EN 1.4301 (AISI 304)			1
77	O-ring [3]	NBR/FPM/EPDM	13.1x2.62	OR 117	1
78	O-ring [3]	NBR/FPM/EPDM	13.1x2.62	OR 117	1
90	Terminal box cover gasket [1]	NBR	171.12X2.62		1
92	Lip seal	-	18x40x7		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] FPM for H-HS-HW-HSW-Q1AVGG (see pages 302, 303)

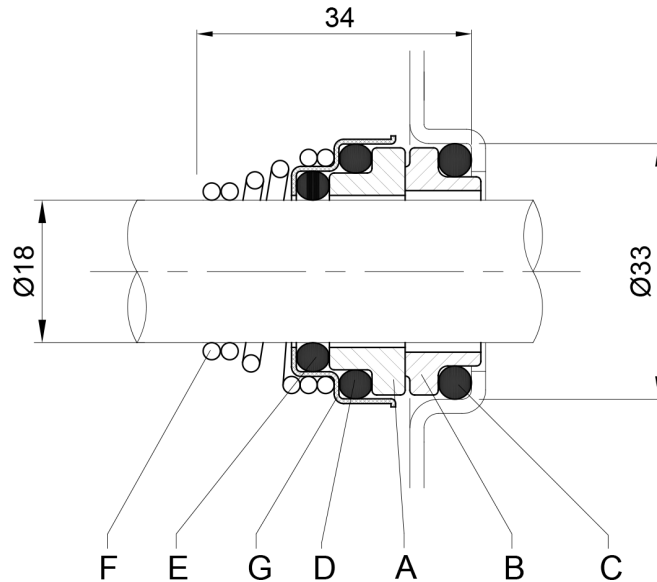
EPDM for AQ1EGG-VAEGG-Q1U3EGG-U3BEGG (see pages 302, 303)

NBR only for Standard version (see pages 302, 303)

[4] See **MECHANICAL SEAL** pages 302, 303

[5] See **BEARINGS** page 303

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

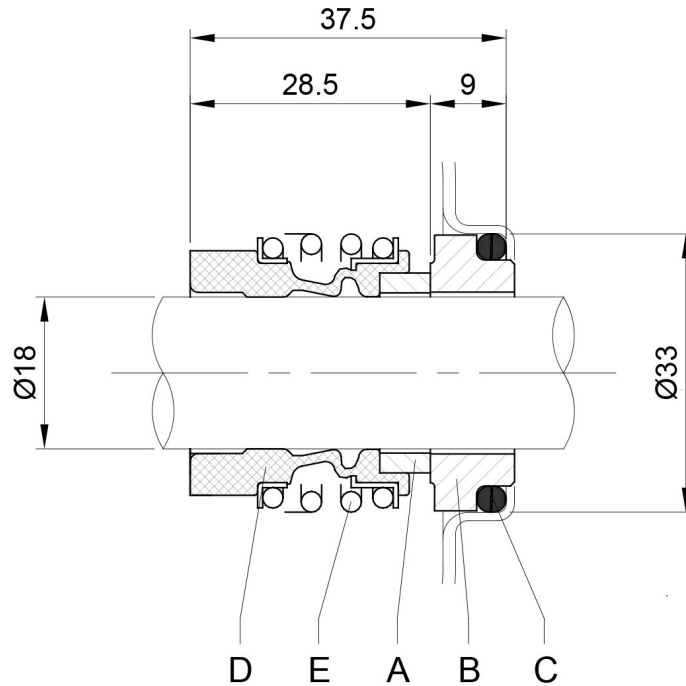
REF	PART NAME	MATERIAL			
		H	HS	HW	HSW
A	Rotary seal ring	Ceramic	Silicon carbide	Tungsten carbide	Silicon carbide
B	Stationary seal ring	Carbon graphite	Silicon carbide	Tungsten carbide	Tungsten carbide
C	O-ring	FPM	FPM	FPM	FPM
D	O-ring	FPM	FPM	FPM	FPM
E	O-ring	FPM	FPM	FPM	FPM
F	Self driving spring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

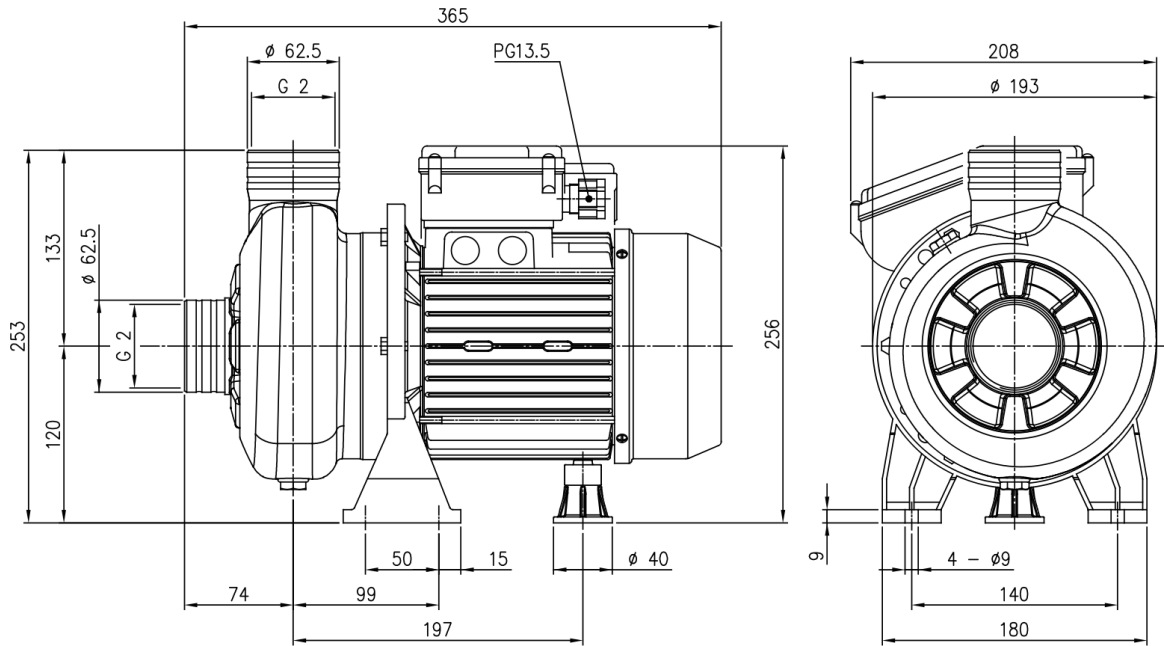
BEARINGS

Pump type		Ball Bearing			
Single Phase	Three Phase	Pump side		Fan side	
			(*)		(*)
DWO 1506 M	DWO 1506	6204 2RSH	6204-ZZ C3	6203 2RSH	6203-ZZ C3
DWO 2006 M	DWO 2006	6204 2RSH	6204-ZZ C3	6203 2RSH	6203-ZZ C3
-	DWO 3006	6305 2RS1	6305-ZZ C3	6205 2RSH	6205-ZZ C3
-	DWO 4006	6305 2RS1	6305-ZZ C3	6205 2RSH	6205-ZZ C3

(*) Only for IE3 Motors

PUMP

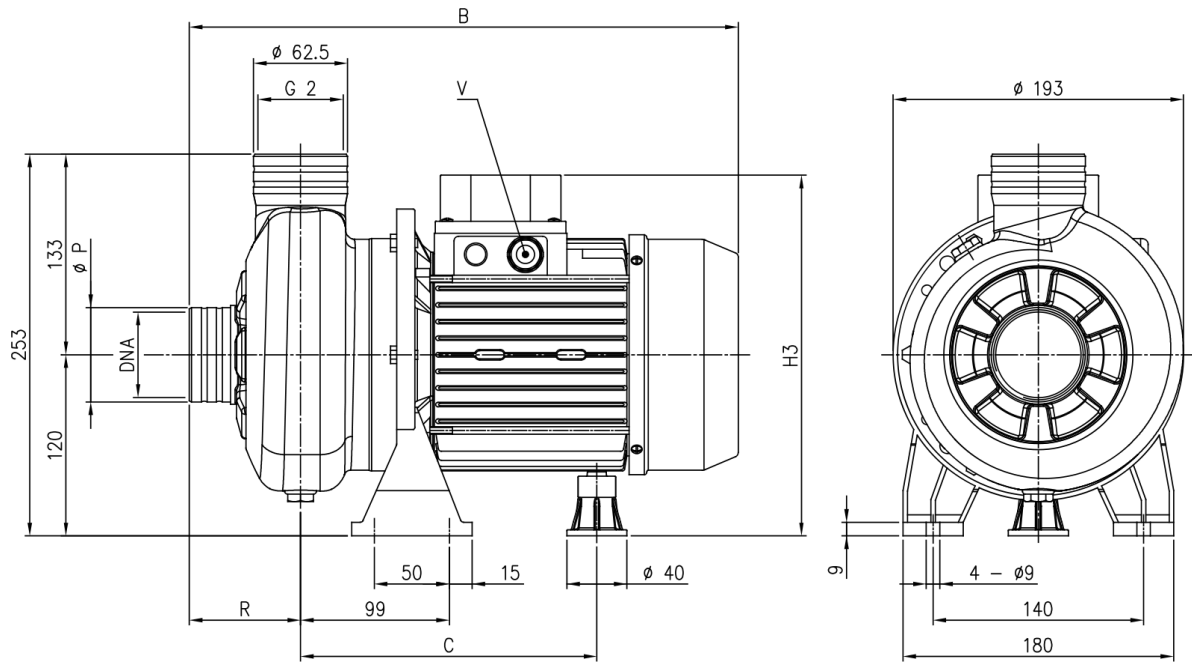
SINGLE PHASE
DWO 1506/2006



Pump type	Weight [kgf]
DWO 1506	13,6
DWO 2006	15,7

PUMP

THREE PHASE DWO 1506/2006/3006/4006

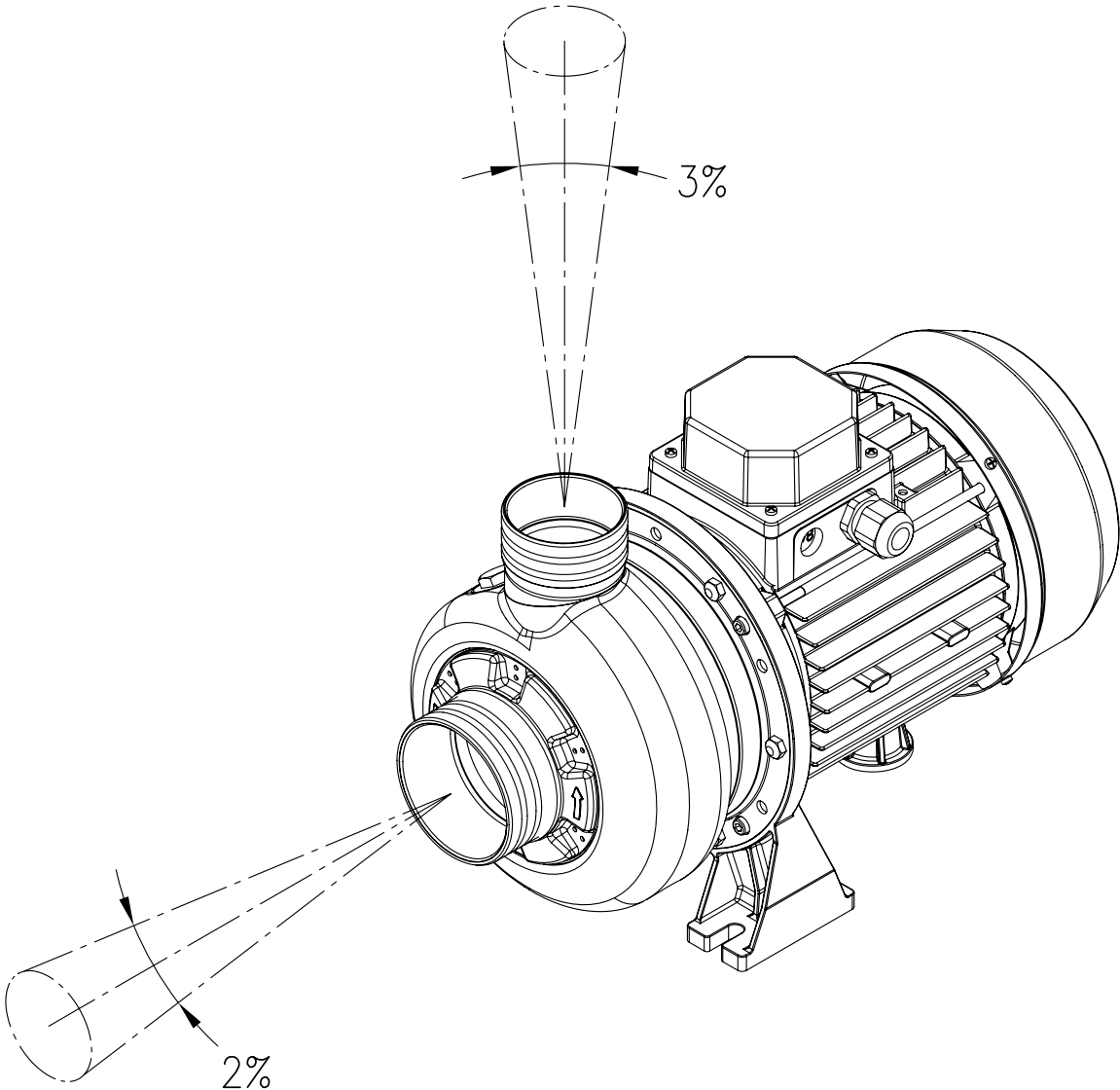


Pump type	Dimension [mm]											Weight [kgf]	
	B		C		H3		R	P	V		DNA	Weight [3~]	
	[3~]	(*)	[3~]	(*)	[3~]	(*)			[3~]	(*)		[3~]	(*)
DWO 1506	365	390	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	14.6	15.5
DWO 2006	378	390.5	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	16.4	17.3
DWO 3006	416	394.5	230/241	197	244	239	78	80	PG13.5	M20x1.5	G 2½	19.2	19.2
DWO 4006	455	455	230/241	230/241	244	244	78	80	PG13.5	M20x1.5	G 2½	22.3	22.3

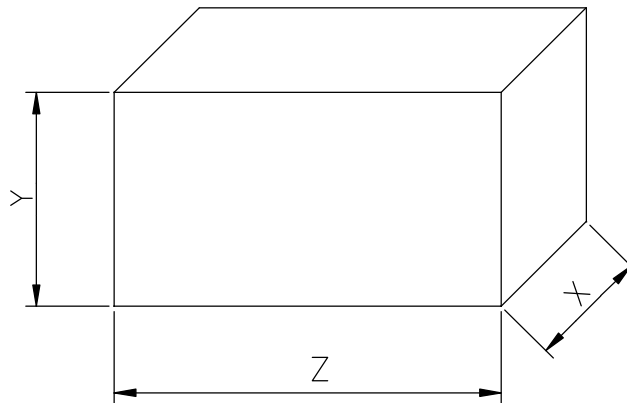
[3~] Three phase

(*) 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 1506 M	DWO 1506	205	205	280	280	432	432	14.5	15.4	16.3
DWO 2006 M	DWO 2006	205	205	280	280	432	477	16.3	17.3	18.2
-	DWO 3006	-	205	-	280	-	477	-	21.2	21.2
-	DWO 4006	-	205	-	280	-	477	-	23.1	23.1

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

MOTOR DATA

Pump type		Power		Efficiency		Capacitor		Efficiency (% load)			Efficiency (% load)			Input		Full load current				Locked rotor current			
Single Phase	Three Phase	[kW]	[HP]	Single Phase	Three Phase	Single Phase		Three phase (380 V)			Three phase (460 V)			Single Phase	Three Phase	[A]			[A]				
						[μF]	[V]	50%	75%	100%	50%	75%	100%			220-230 V	220 V	380 V	460 V	220-230 V	220 V	380 V	460 V
DWO 1506 M	DWO 1506	1,1	1,5	-	-	35	450	78,3	80,4	81,0	-	-	-	1,5	2,00	7,2	5,7	3,3	-	55,0	38,8	22,4	-
-	DWO 1506	1,1	1,5	-	IE3*	-	-	84,2	84,7	84,5	83,2	84,7	85,7	-	1,75	-	5,3	3,1	2,9	-	40,2	23,2	28,1
DWO 2006 M	DWO 2006	1,5	2,0	-	-	40	450	82,4	83,0	82,2	-	-	-	2,06	2,90	9,8	8,1	4,7	-	69,0	54,4	31,4	-
-	DWO 2006	1,5	2,0	-	IE3*	-	-	86,5	86,8	86,2	86,9	87,8	87,4	-	2,48	-	7,5	4,3	4,1	-	55,7	32,2	38,9
-	DWO 3006	2,2	3,0	-	-	-	-	80,5	83,3	83,5	-	-	-	-	2,90	-	7,0	4,1	-	-	61,5	35,5	-
-	DWO 3006	2,2	3,0	-	IE3*	-	-	86,5	86,8	86,2	86,9	87,8	87,4	-	2,48	-	7,5	4,3	4,1	-	55,7	32,2	38,9
-	DWO 4006	3,0	4,0	-	-	-	-	84,0	85,9	85,2	-	-	-	-	3,90	-	10,5	6,1	-	-	92,1	53,2	-
-	DWO 4006	3,0	4,0	-	IE3*	-	-	86,8	87,0	87,5	87,0	87,9	88,5	-	3,42	-	10,2	5,9	5,6	-	75,7	43,7	52,8

*only for 460V