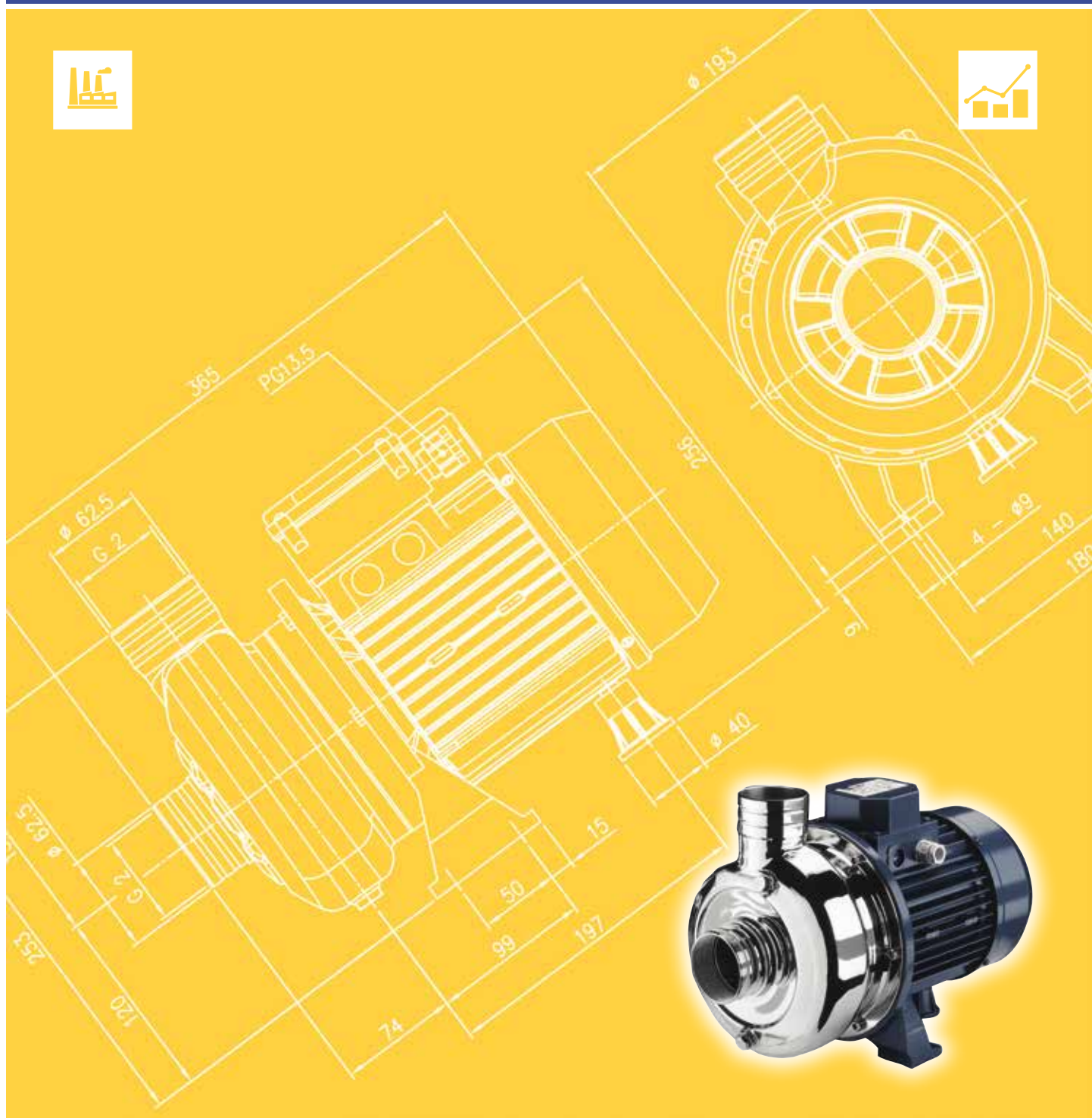




Japanese Technology since 1912

DWO

Data Book 60Hz



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## SPECIFICATIONS

60Hz

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PUMP		
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 [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 <sup>-1</sup> ]	≈ 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	1.5 ÷ 4
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)
	Built in	-
Capacitor	Built in	Provided by the user
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)	

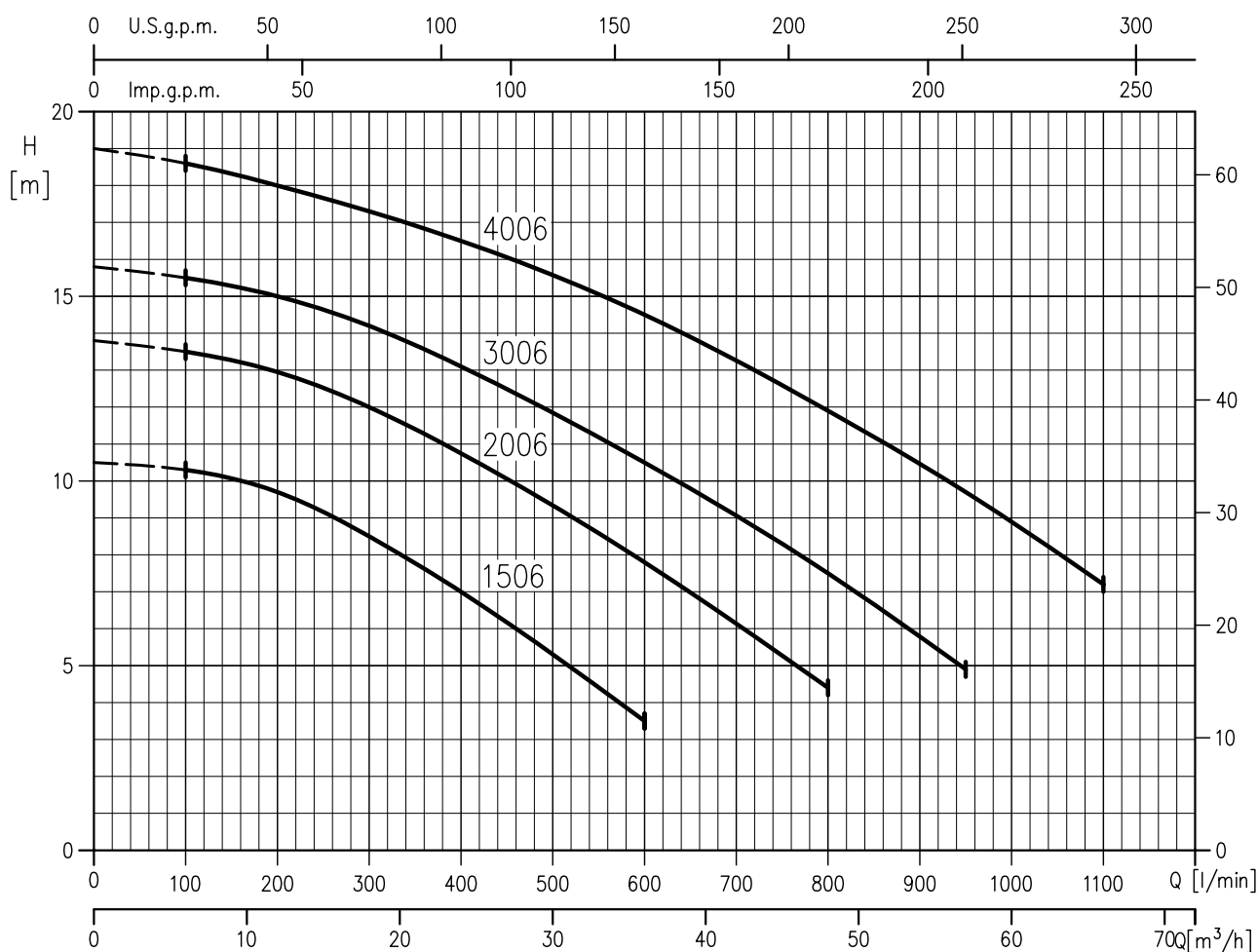
\*only for 460 V

## PERFORMANCE RANGE and SELECTION CHART

60Hz

Rev. G

## PERFORMANCE RANGE



## SELECTION CHART

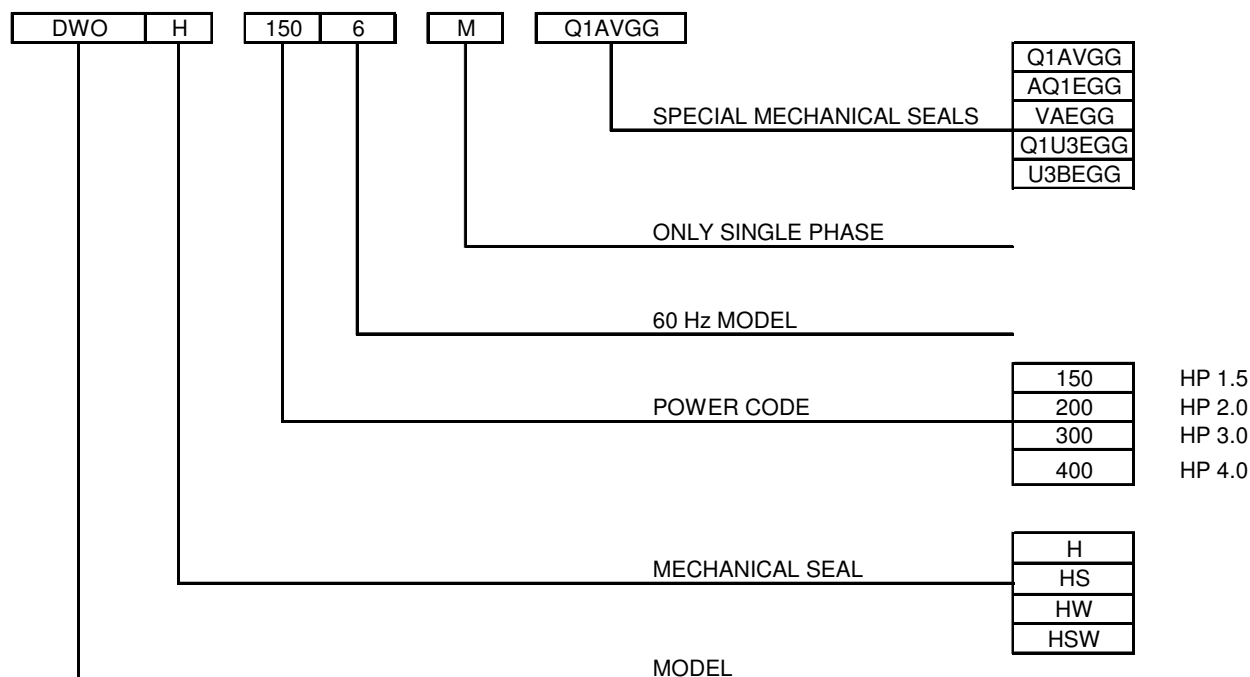
Pump type		Power		Q=Capacity									
				l/min	0	100	200	300	400	600	800	950	1100
Single Phase	Three Phase	[kW]	[HP]	m³/h	0	6	12	18	24	33	42	57	66
H=Total manometric head in meters													
DWO 1506 M	DWO 1506	1,1	1,5	10,5	10,3	9,7	8,5	7,0	3,5	-	-	-	-
DWO 2006 M	DWO 2006	1,5	2	13,8	13,5	12,9	12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

60Hz

Rev. G

## 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.

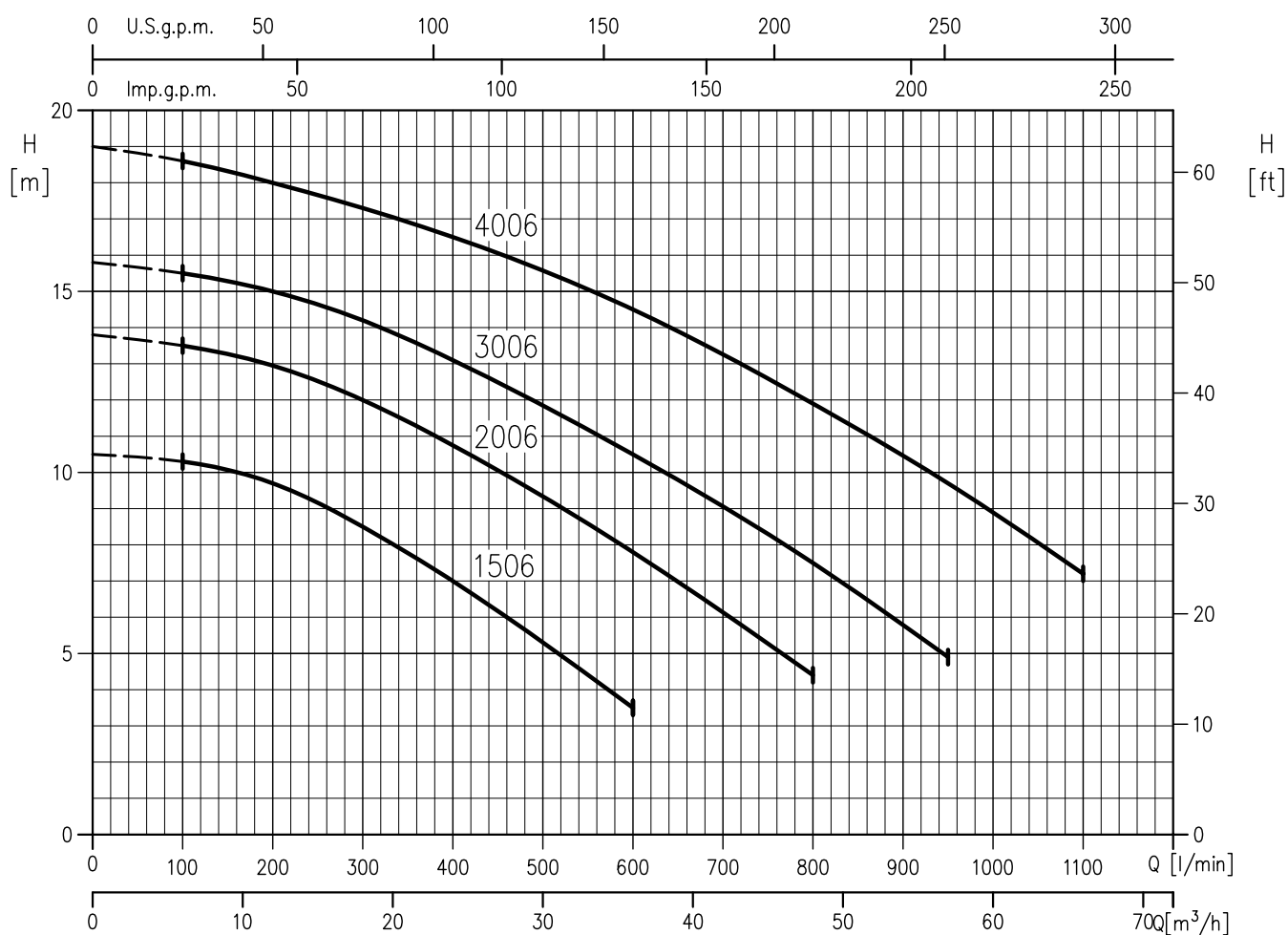
In order to avoid the risk of over-heating, the pumps should not be used at a flow rate below 10% of best efficiency point.

Symbols explanation:

Q = volume flow rate

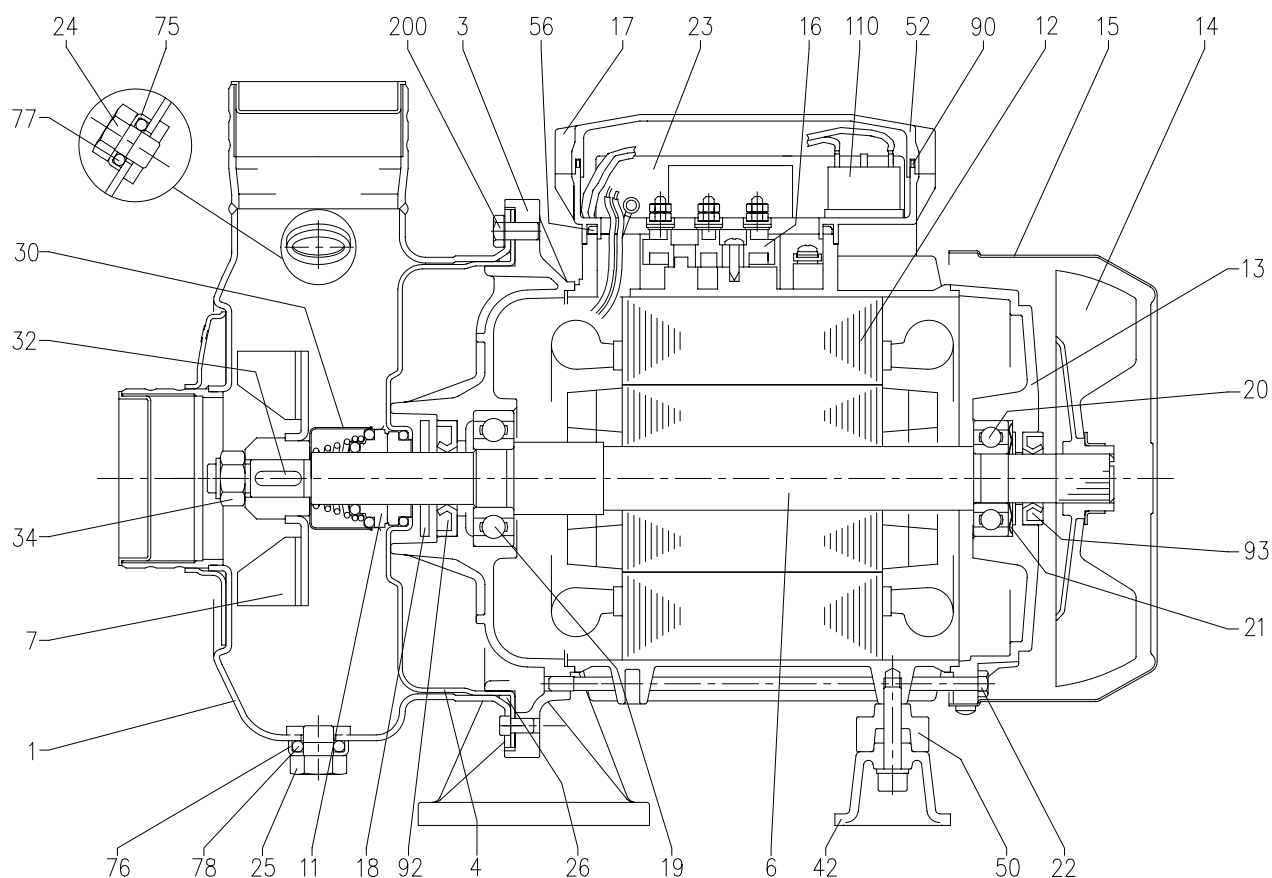
H = total head

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)

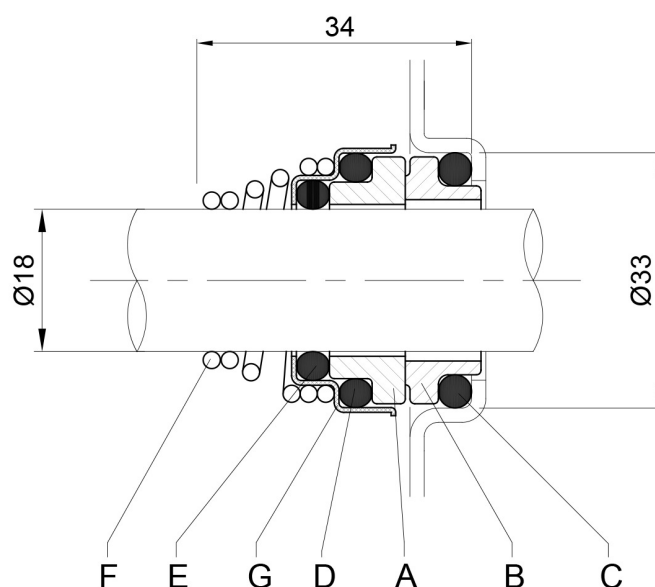
NBR only for Standard version (see pages 302, 303)

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

[5] See **BEARINGS** page 303



## MECHANICAL SEAL



STANDARD

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

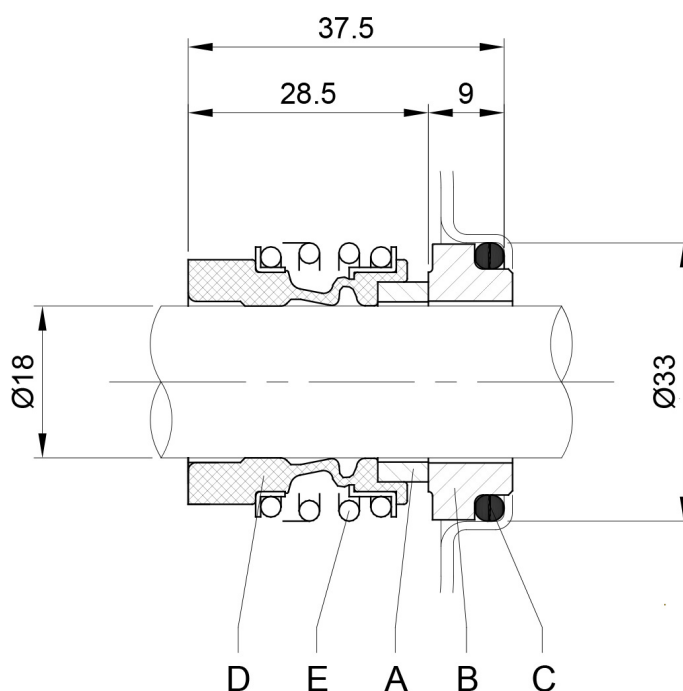
OPTIONAL

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

SPECIAL

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

## MECHANICAL SEAL



SPECIAL

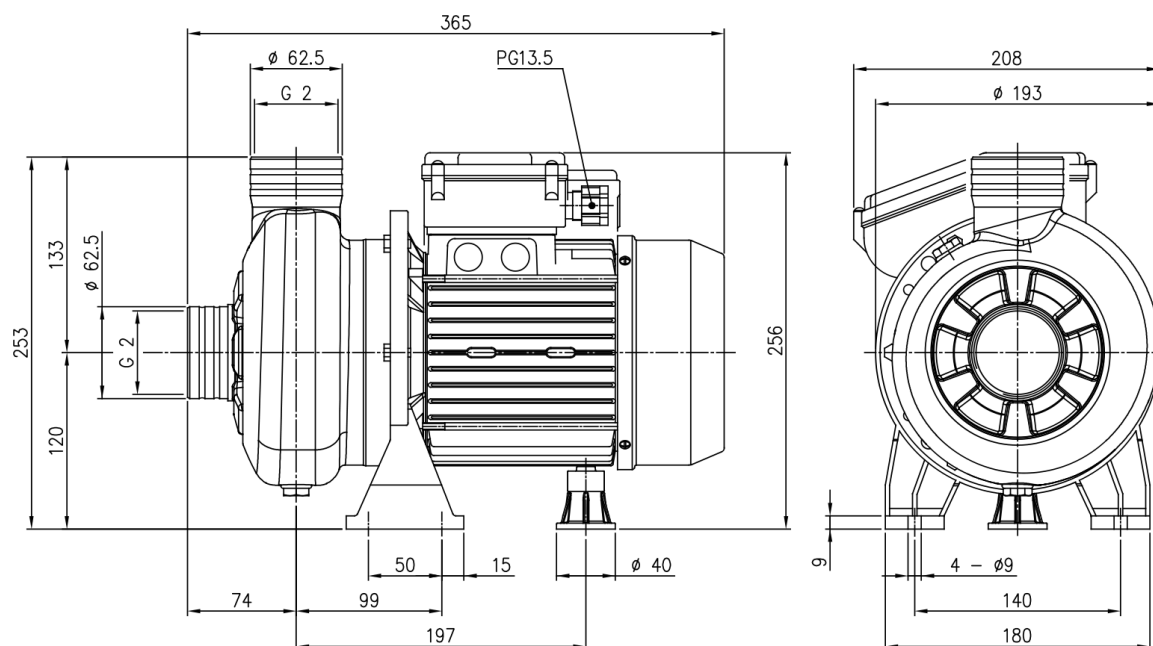
REF	PART NAME	MATERIAL AQ1EGG
A	Rotary seal ring	Metallised carbon
B	Stationary seal ring	Silicon carbide
C	O-ring	EPDM
D	Bellows	EPDM
E	Frame + spring	AISI 316

## 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

## DIMENSIONS and WEIGHT

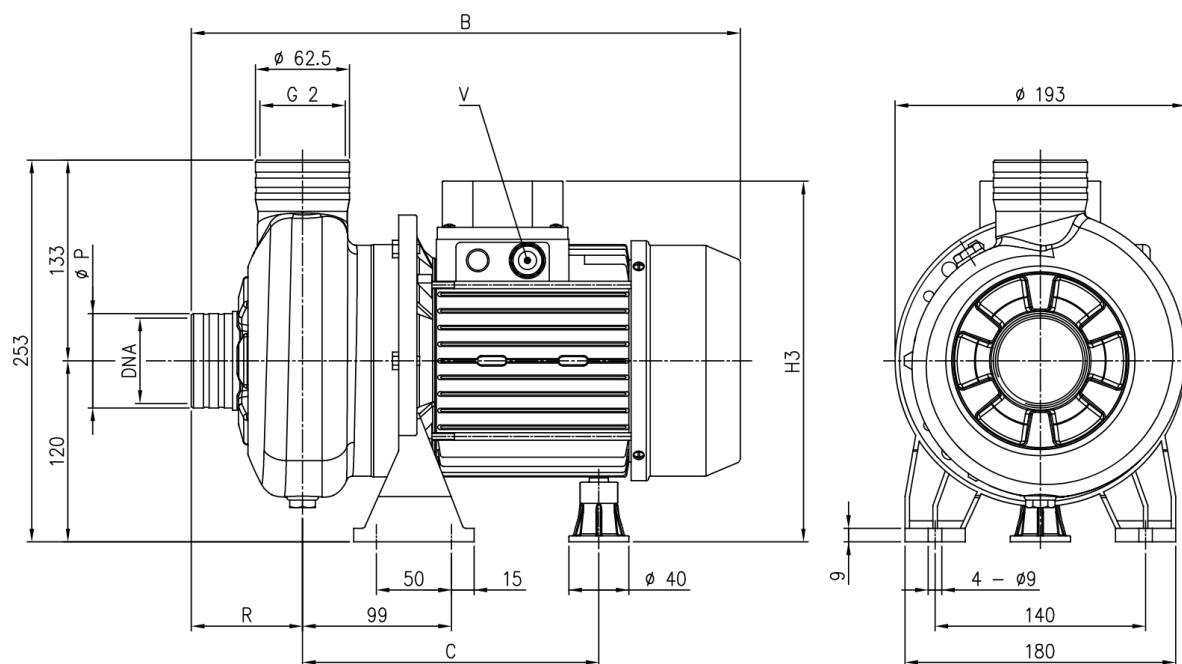
60Hz

Rev. G

## PUMP

## THREE PHASE

**DWO 1506/2006/3006/4006**

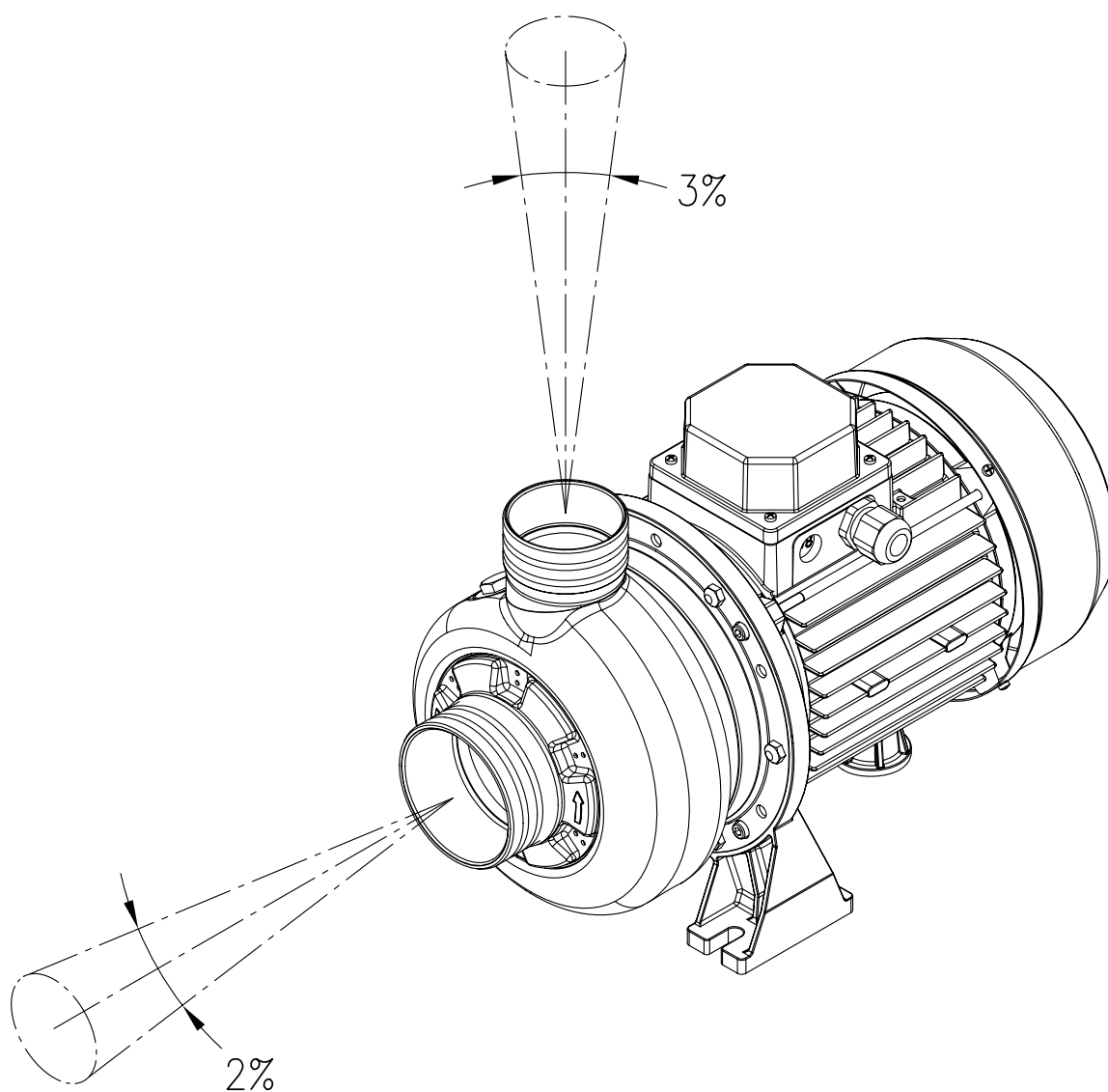


Pump type	Dimension [mm]											Weight [kgf]	
	B		C		H3		R	P	V		DNA	[3~]	
	[3~]	(*)	[3~]	(*)	[3~]	(*)			∅	[3~]		(*)	[3~]
DWO 1506	365	390	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	14.6	15.5
DWO 2006	378	390.5	197	197	239	239	74	62.5	PG11	M20x1.5	G 2	16.4	17.3
DWO 3006	416	394.5	230/241	197	244	239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

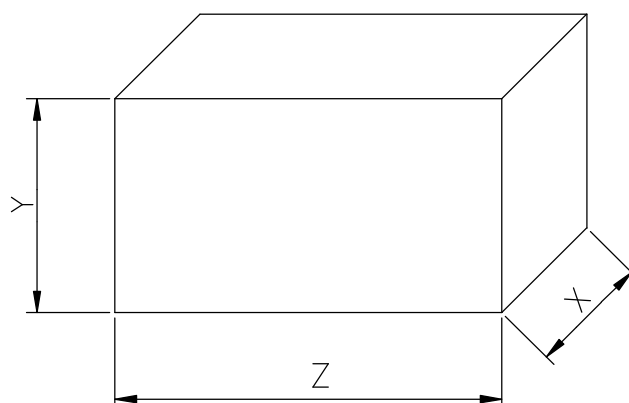
[3~] Three phase

(\*) 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	Three phase (380 V)			Three phase (460 V)			Single Phase	Three Phase	[A]				[A]			
						[μF]	[V]	50%	75%	100%	50%	75%	100%	Phase	Phase	Single Phase	Three Phase			Single Phase	Three Phase		
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	-	-	35	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