

EBARA

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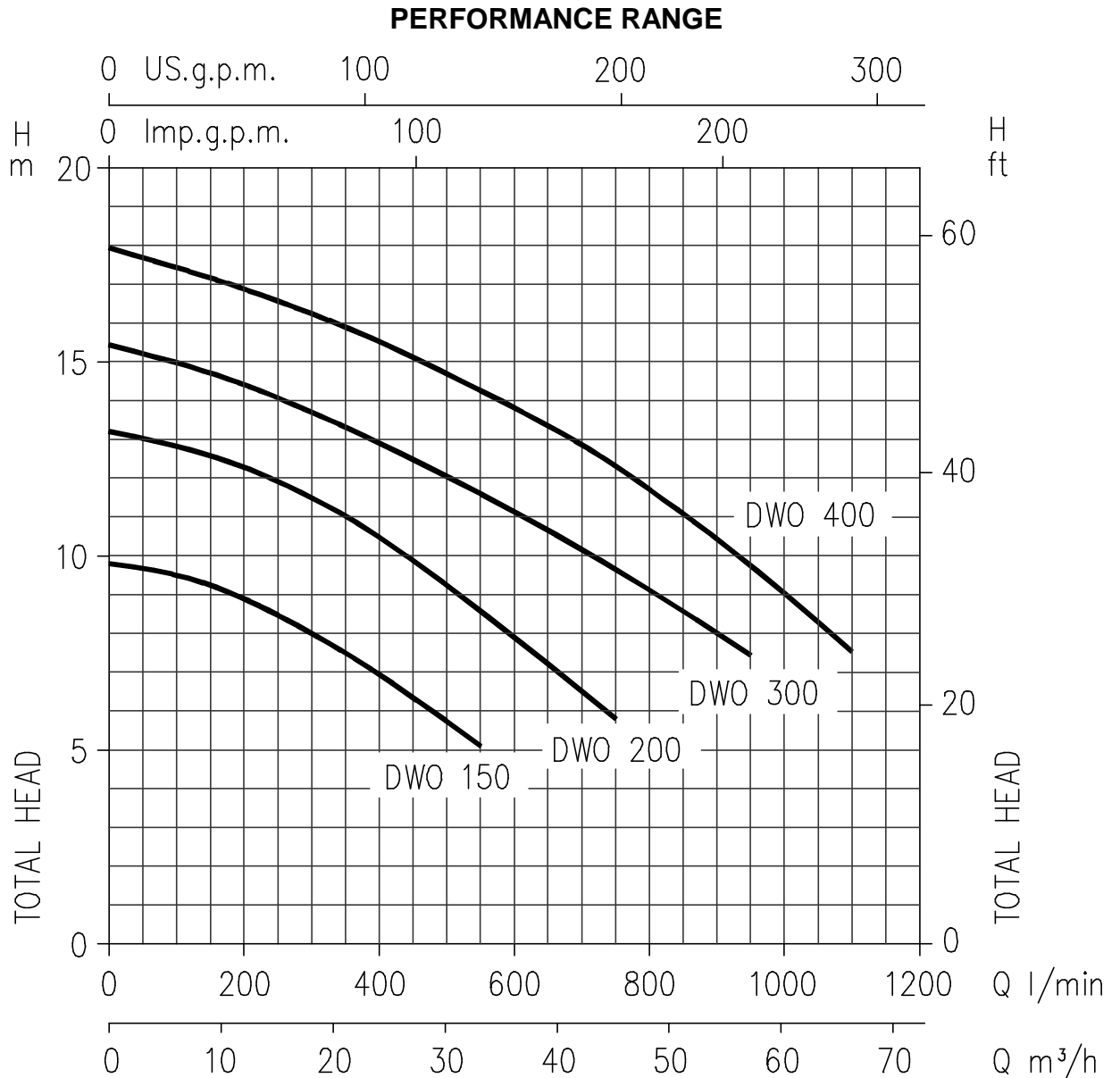
SPECIFICATION

50Hz

Rev. K

| PUMP | | |
|--------------------------------|------------------|---|
| Liquid Handled | Type of liquid | Clean water |
| | Temperature [°C] | min. -5 max. +90 (Standard, Q1AVGG, AQ1EGG, VAEGG, Q1U3EGG, U3BEGG) max. +110 (H-HS-HW-HSW) |
| 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 (for version see page 301) |
| | 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. 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 ⁻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 page 400) | |



SELECTION CHART

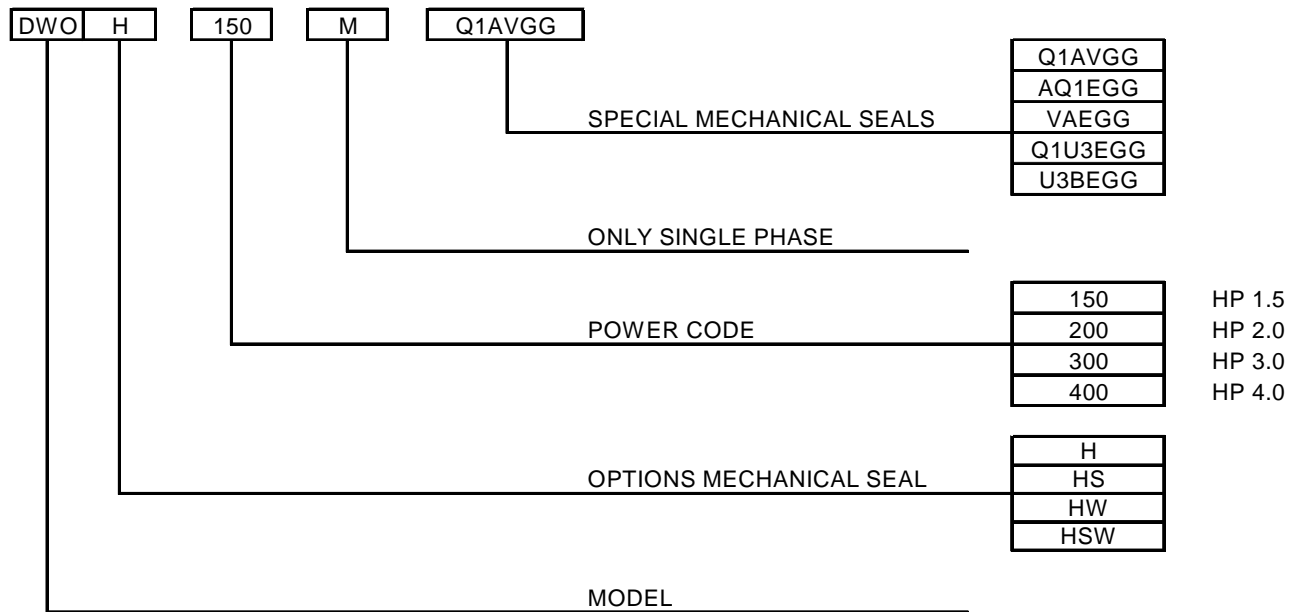
| Pump type | | Power | | Q=Capacity | | | | | | | | | |
|-----------------------------------|-------------|-------|------|------------|------|------|------|------|------|------|-----|-----|------|
| | | | | l/min | 0 | 100 | 200 | 300 | 400 | 550 | 750 | 950 | 1100 |
| Single Phase | Three Phase | [kW] | [HP] | m³/h | 0 | 6 | 12 | 18 | 24 | 33 | 42 | 57 | 66 |
| H=Total manometric head in meters | | | | | | | | | | | | | |
| DWO 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 CURVE SPECIFICATIONS

50Hz

Rev. K

TYPE KEY



PERFORMANCE CURVE 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.

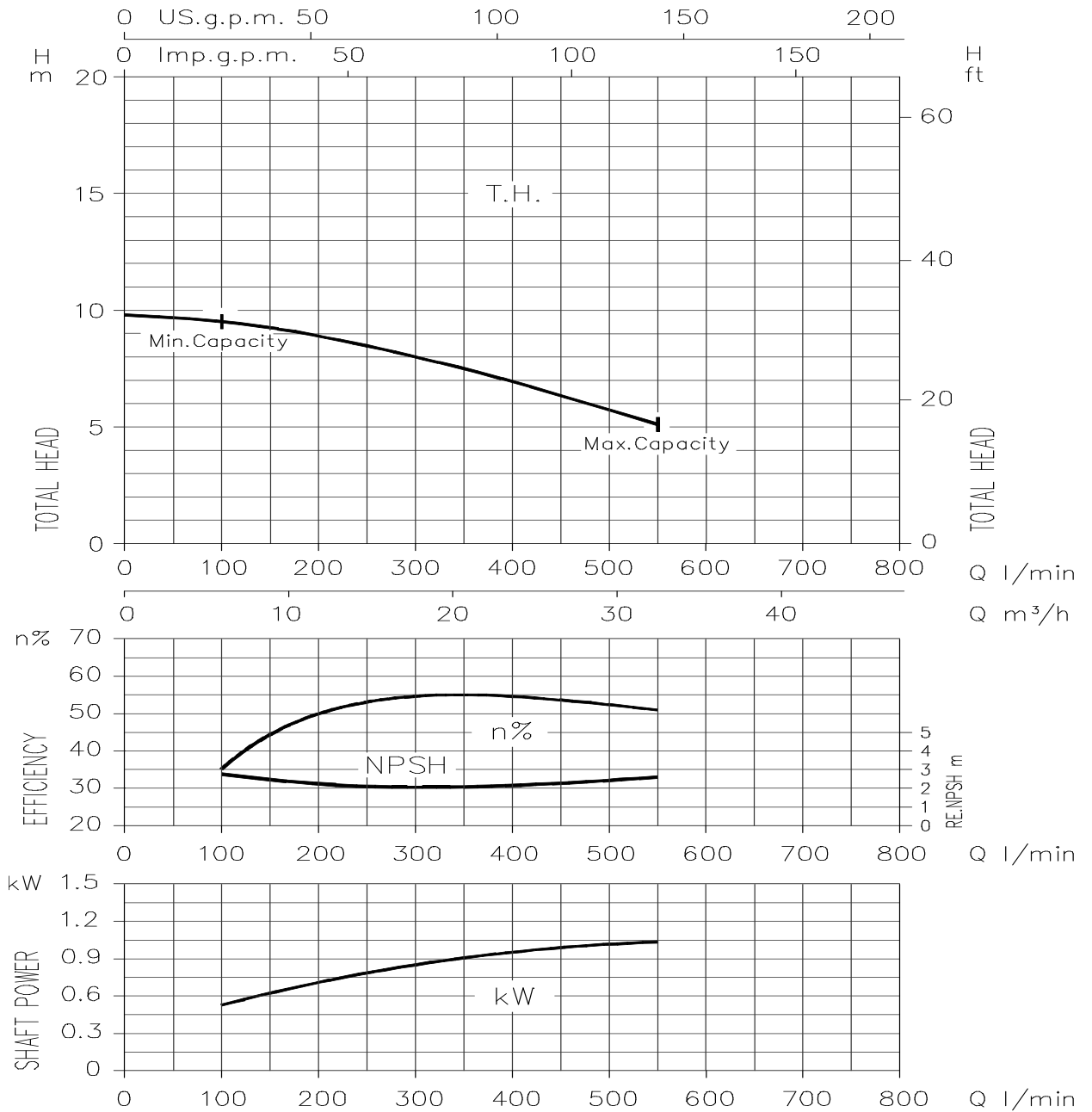
The continuous curves indicate the recommended working range. The dotted curve is only a guide.

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:

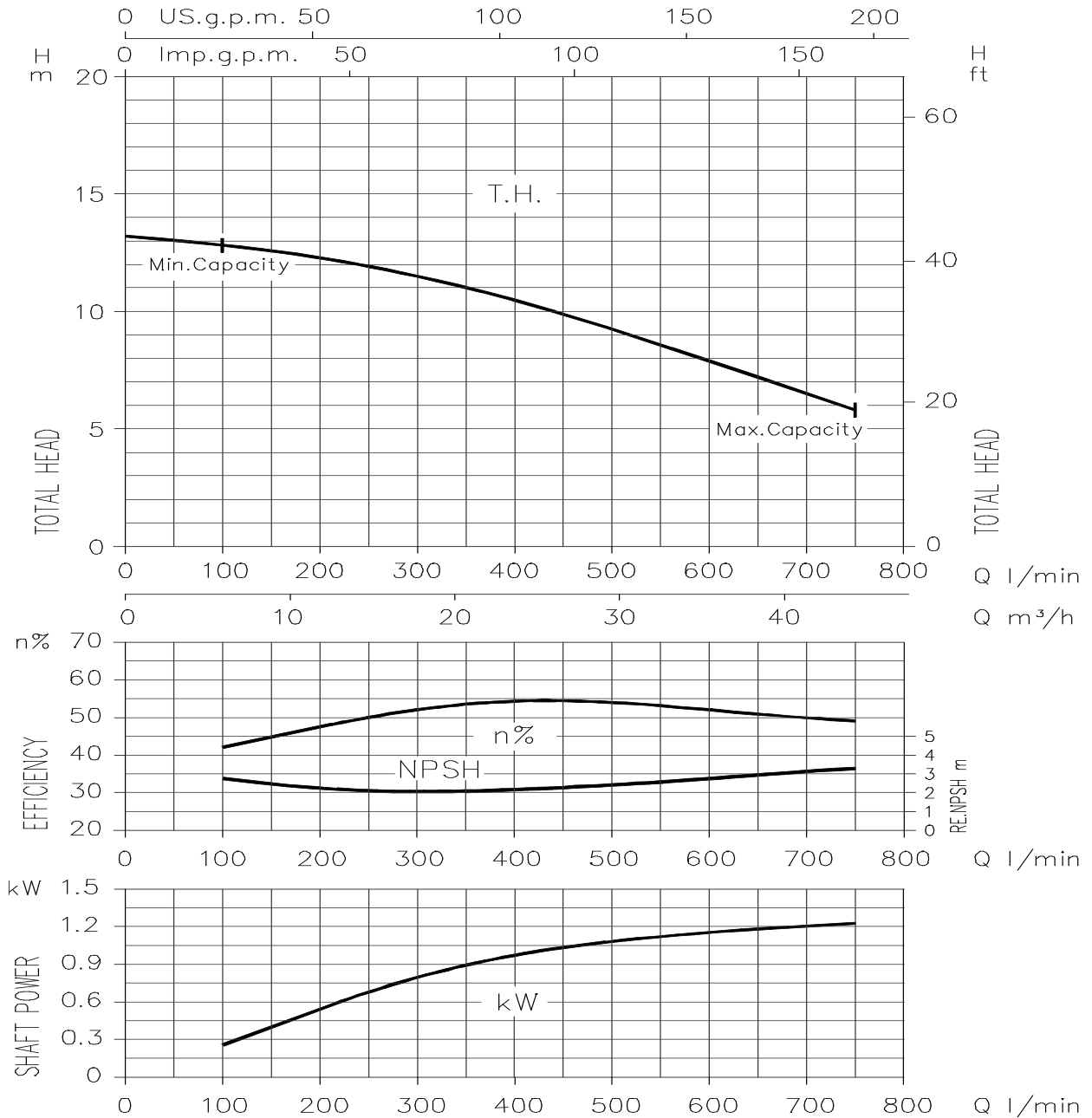
- Q = volume flow rate
- H = total head
- P_2 = pump power input (shaft power)
- η = pump efficiency
- NPSH = net positive suction head required by the pump

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



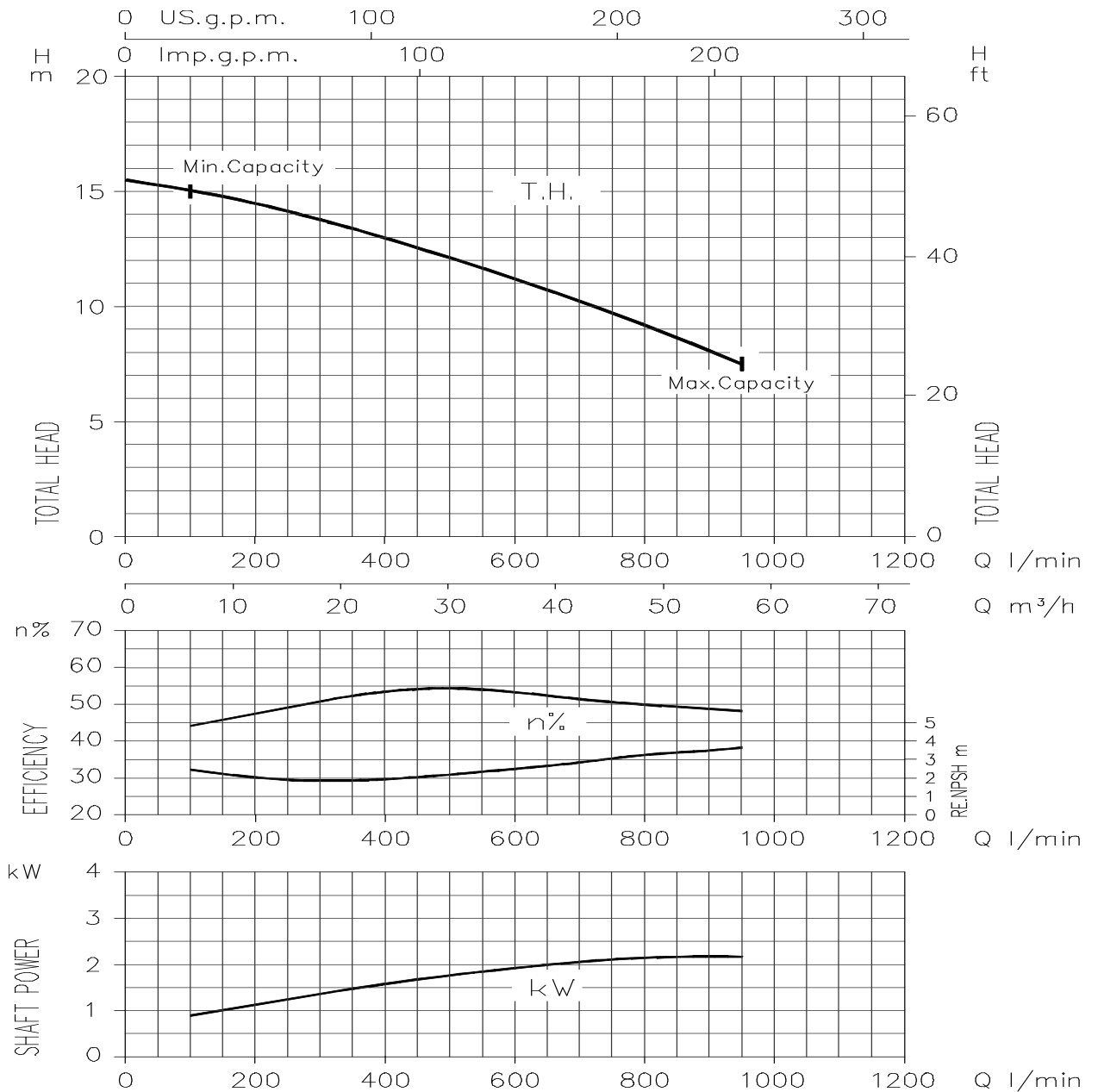
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906:2012 - Grade 3B

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



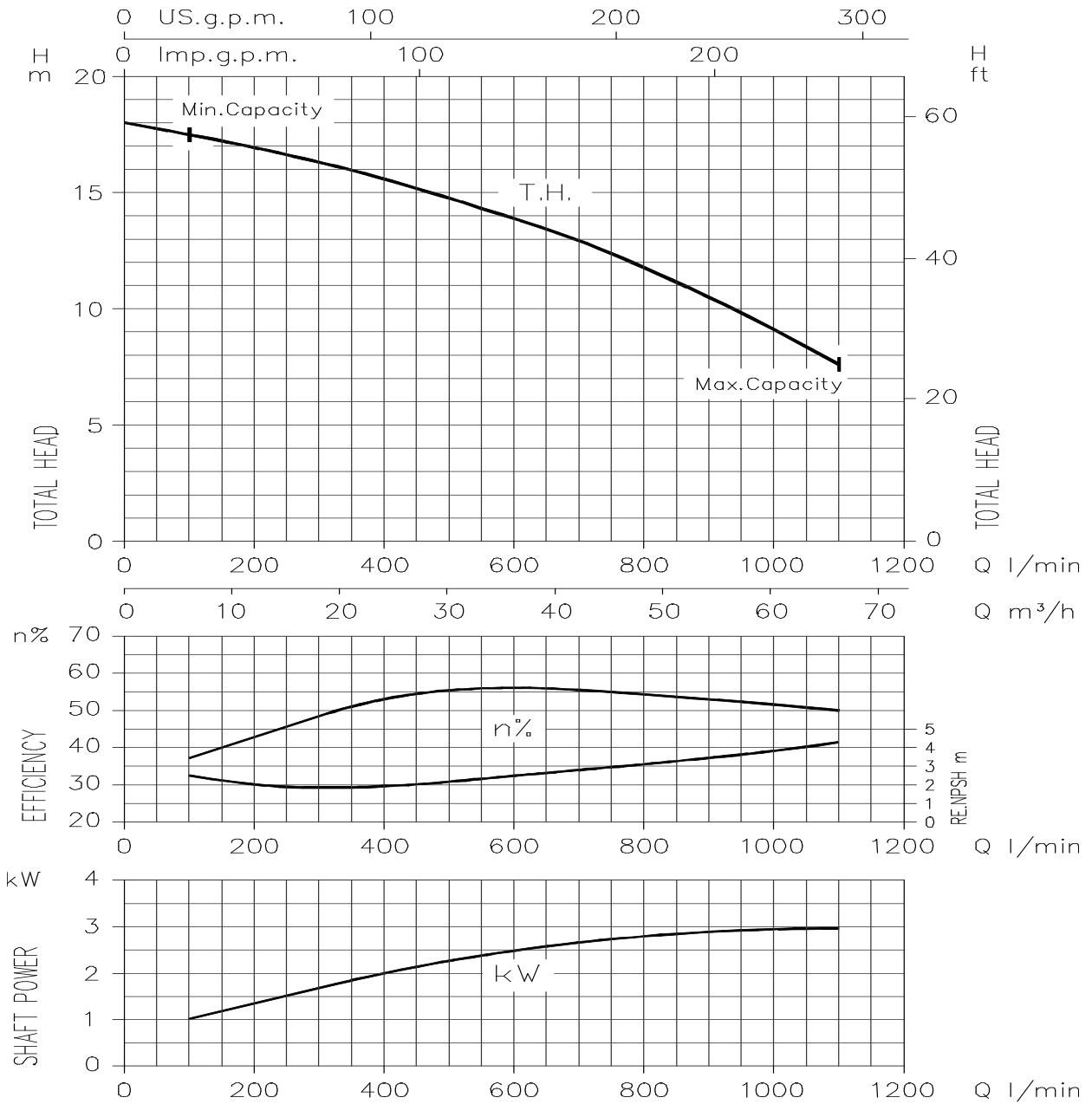
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906:2012 - Grade 3B

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



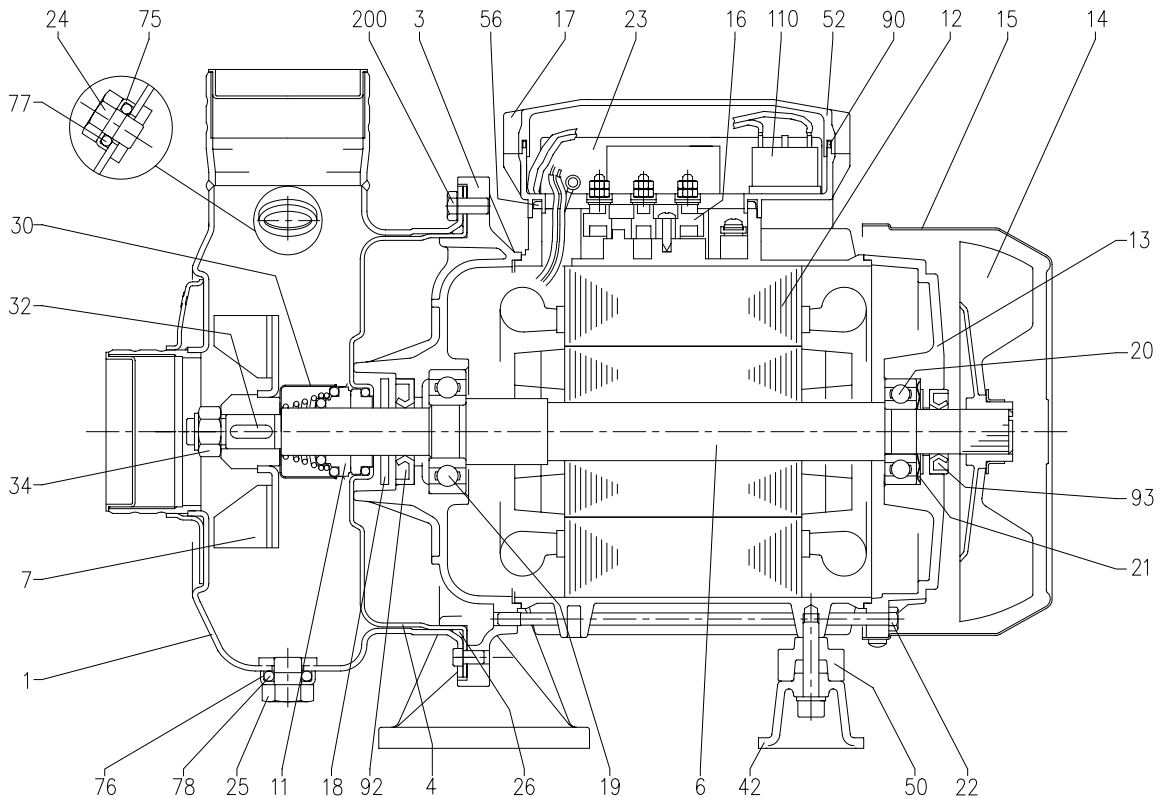
Rotation speed $\approx 2800 \text{ min}^{-1}$
 Test standard: ISO 9906:2012 - Grade 3B

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 w ith 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 | 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 | NBR | 1 |
| 78 | O-ring | NBR | 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 |

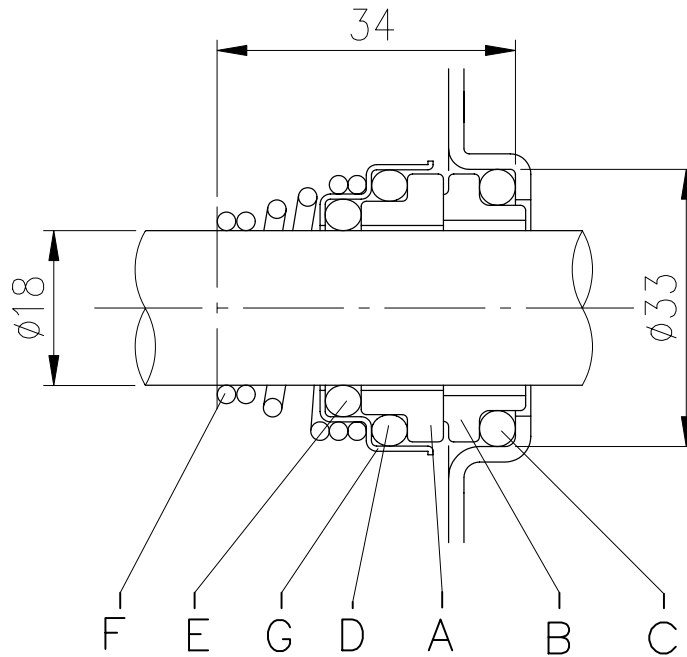
[1] Only for single phase

[2] Only for three phase

[3] See constructions mechanical seal page 301

[4] FPM for DWOH, DWOHS, DWOHW, DWOHSW
EPDM for AQ1EGG, VAEGG, Q1U3EGG, U3BEGG

MECHANICAL SEAL



| REF | PART NAME | MATERIAL | | | | |
|-----|----------------------|-----------------|-----------------|-----------------|------------------|------------------|
| | | Standard (DWO) | (H) | (HS) | Optional (HW) | |
| A | Rotary seal ring | Ceramic | Ceramic | Silicon carbide | Tungsten carbide | Silicon carbide |
| B | Stationary seal ring | Carbon graphite | Carbon graphite | Silicon carbide | Tungsten carbide | Tungsten carbide |
| C | O Ring | NBR | FPM | FPM | FPM | FPM |
| D | O Ring | NBR | FPM | FPM | FPM | FPM |
| E | O Ring | NBR | FPM | FPM | FPM | FPM |
| F | Self driving spring | AISI 316L | AISI 316L | AISI 316L | AISI 316L | AISI 316L |
| G | Frame | AISI 304 | AISI 304 | AISI 316 | AISI 316 | AISI 316 |

| REF | PART NAME | MATERIAL | | | | |
|-----|----------------------|-------------------|-------------------|-------------------|------------------|------------------|
| | | (Q1AVGG) | (AQ1EGG) | Special (VAEGG) | (Q1U3EGG) | (U3BEGG) |
| A | Rotary seal ring | Silicon carbide | Metallised carbon | Ceramin | Silicon carbide | Tungsten carbide |
| B | Stationary seal ring | Metallised carbon | Silicon carbide | Metallised carbon | Tungsten carbide | Graphite |
| C | O Ring | FPM | EPDM | EPDM | EPDM | EPDM |
| D | O Ring | FPM | EPDM | EPDM | EPDM | EPDM |
| E | O Ring | FPM | EPDM | EPDM | EPDM | EPDM |
| F | Self driving spring | AISI 316 | AISI 316 | AISI 316 | AISI 316 | AISI 316 |
| G | Frame | AISI 316 | AISI 316 | AISI 316 | AISI 316 | AISI 316 |

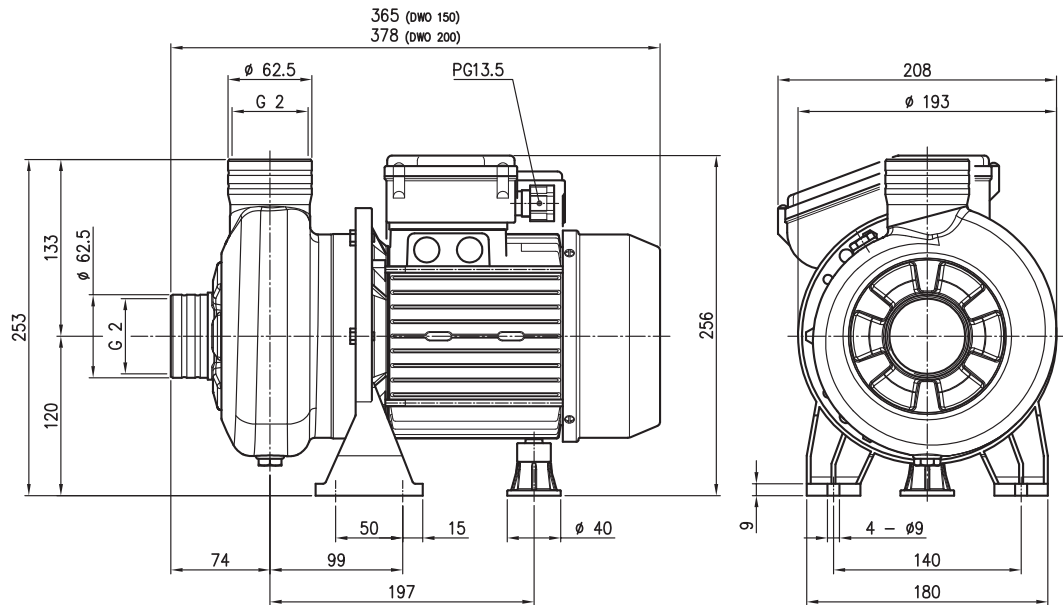
BEARINGS

| Pump type | | Ball Bearing | | | |
|--------------|-------------|--------------|------------------|-----------|-----------------|
| Single Phase | Three Phase | Pump side | (*) Pump side | Fan 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 |

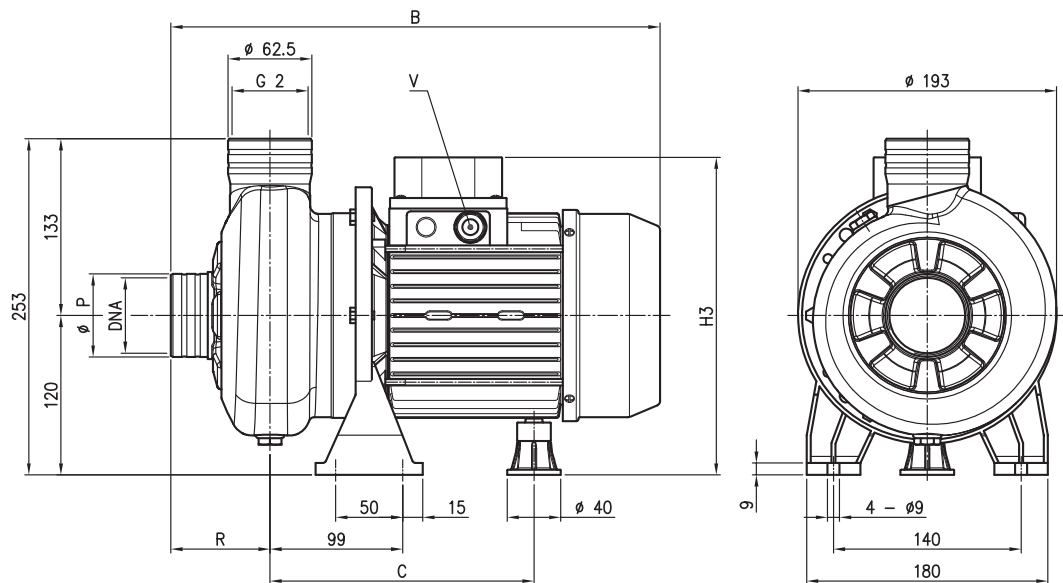
(*) Only for IE3 Motors

PUMP

[1~] Single phase
DWO 150
DWO 200



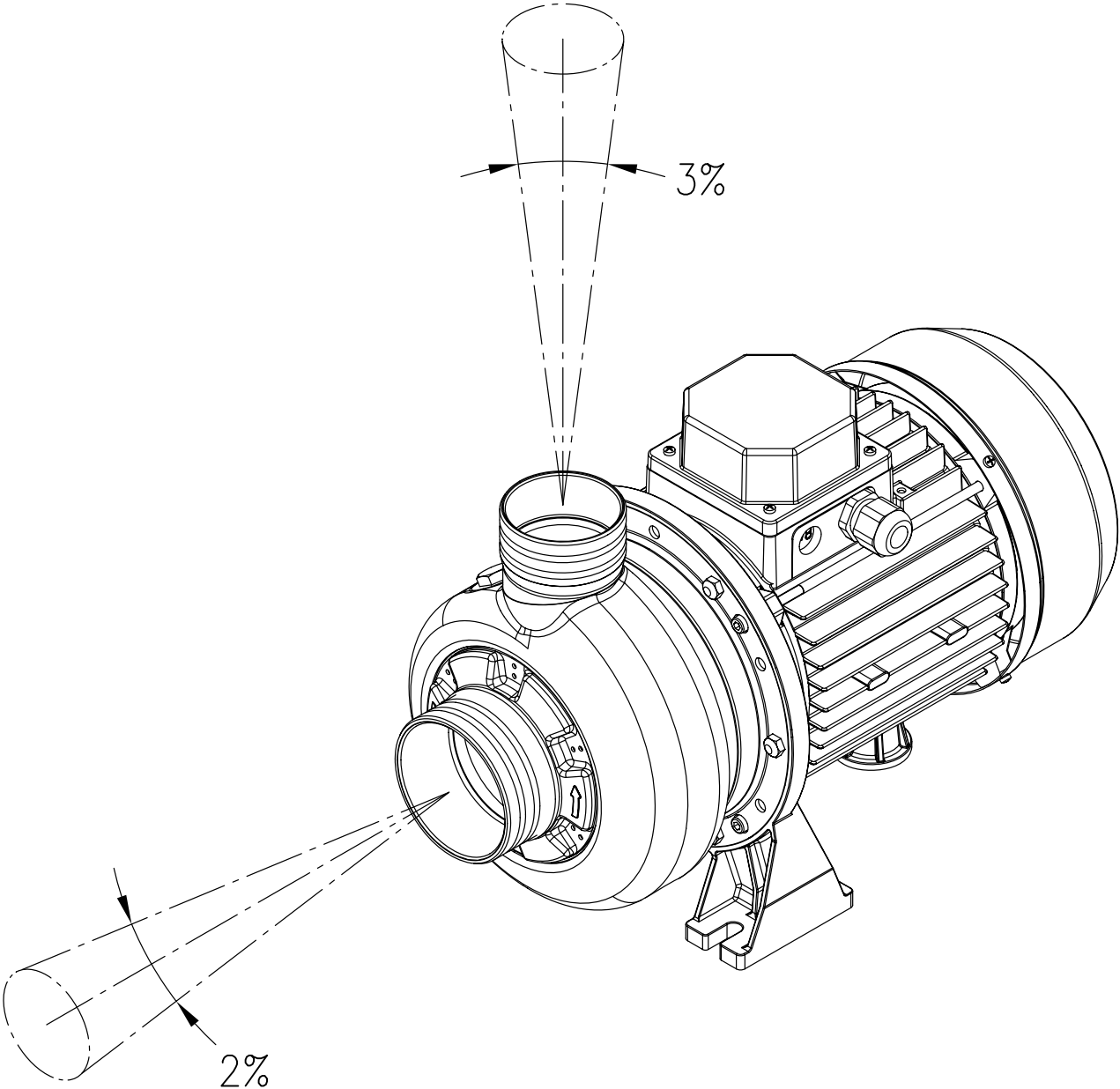
[3~] Three phase
DWO 150
DWO 200
DWO 300
DWO 400



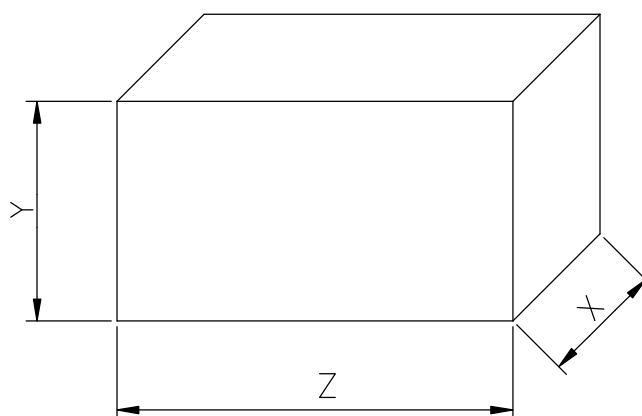
| Pump type | Dimension [mm] | | | | | | | | | | | | Weight [kgf] | | |
|-----------|----------------|----------|---------|----------|------|----------|------|-------|--------|----------|------|------|--------------|------|--|
| | B | | C | | H3 | | R | P | V | | DNA | [1~] | [3~] | (*) | |
| | [3~] | (*) [3~] | [3~] | (*) [3~] | [3~] | (*) [3~] | [3~] | [3~] | [3~] | (*) [3~] | [3~] | [1~] | [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 [1~] | Three Phase [3~] | X | | Y | | Z | | [1~] | [3~] | (*) [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 | | | Single Phase | Three Phase | [A] | | | [A] | | |
| | | | | | | [μF] | [V] | 50% | 75% | 100% | | | 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_{pA} - 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.