

Submersible motors for well diameters of 100 mm (4 inches)

Applications

The **oddesse** submersible motors of the series **po-mo4** are designed to drive submersible pumps. They are also applicable for other submersible machines and offshore operation.

Design

The **oddesse** submersible motors **po-mo4** are mono-phase and three-phase asynchronous motors with a short circuit rotor. The mono-phase motors are equipped with a permanent capacitor. All motors up to 1.1 kW have an integrated thermic overload protection.

The 4" submersible motor, **po-mo4** series, is a motor having a gas filled stator. An inner case, placed between stator and rotor and an external case, both welded to lower and upper stainless steel flanges, grant the perfect stator leak proofness. All parts are made of stainless steel. The internal gas assures a perfect electric insulation and a good heat transmission.

The shaft, completely in AISI 420 stainless steel, runs on two radial graphite bearings. On the sliding zone of bearings, the shaft is specially treated to increase its hardness and to get the most favorable degree of roughness ($\pm 0.1 \mu\text{m}$), thus increasing remarkably the life of bearings.

The axial thrust bearing system, with capacity to support up to 3000 N, is with oscillating pads and completely in stainless steel. For motor powers of 3 kW (4 HP), 4 kW (5.5 HP) and 7.5 kW (10 HP) the axial thrust bearing is manufactured to support up to 6000 N. On motors with axial thrust of 1500 N, 3000 N or 6000 N an upper thrust bearing with maximum capacity of 1500 N prevents the shaft from rising more than 0.5 mm. (max. clearance 0.5 mm).

The bearings are lubricated by the motor filling. Eventual volume variations of the inner liquid are compensated by a rubber diaphragm.

The motor is supplied already filled with liquid.

All the machining and overall dimensions follow NEMA standards and these allow the motor mounting on all pumps having NEMA coupling systems.

The motors are completed with pressure-water tide cable connectors and are inside earthed. Construction complies with VDE-regulations and the motors are conform to the EC declaration of conformity as defined by machinery directive 98/37/EEC.

Motors are usable in horizontal and diagonal position depending of the nominal power. Please ask your service.

oddesse motors are working in both directions, clock- and anticlockwise.

A high efficiency guarantees lowest operating costs.

For all the motors **oddesse** hold a detailed supply of control and monitoring equipment available.

Operating data

- Nominal power: up to 7.5 kW (10 HP)
- Voltage: 230 to 460 V
- Kind of current: 1~ and 3~
- Frequency : 50 and 60 Hz
- Degree of protection: IP 68
- Ambient temperature: up to 30 °C (higher on request)
- Switching frequency: max. 20 / h
- Nominal speed: 2850 1/min (3460 1/min)

Special design (on request)

- higher temperatures
- other quality of pumped medium
- other materials
- suction jacket

Subject to alterations

Frequency transformer operation

Every **oddesse** motor is usable for frequency transformer operations. Following items should be considered:

- the frequency transformer must be conform to the nominal power of the submersible motor,
- the max. working range from 30 Hz up to 60 Hz, corresponding speed from 1.740 up to 3.460 1/min,
- the using of a sine-wave generator protect against high tension peaks
- the minimum rate of flow must be 10 % of the nominal rate of flow of the pump, to be assured.

Soft starter operation

Soft starters are very qualified to start a submersible motor. It grants:

- reducing of starting current
- avoidance of water hammer while starting causing switch off of the pump.

Material of construction

Submersible motors po-mo4

According to DIN

components	design	
	G-version	C-version
shaft	stainless steel / 1.4021	stainless steel / 1.4021
motor flange	grey cast iron with chrome steel cover or nickel-plates	stainless steel I / 1.4301 or bronze
motor jacket	stainless steel/ 1.4301	stainless steel/ 1.4301
radial bearing	stainless steel / carbon	stainless steel / carbon
thrust bearing	stainless steel / carbon	stainless steel / carbon
screws, nuts and bolts	stainless steel A2 / 1.4301 / 1.4303	stainless steel A2 / 1.4301 / 1.4303

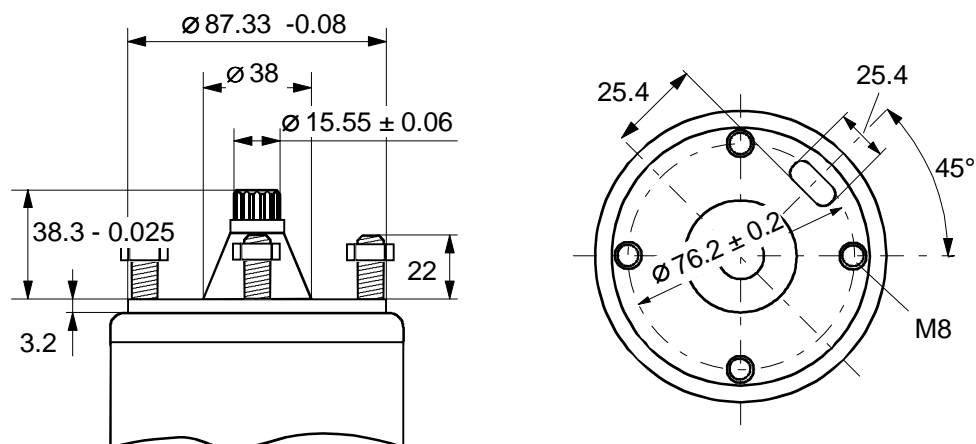
According to AISI

components	design	
	G-version	C-version
shaft	stainless steel / AISI 420	stainless steel / AISI 420
motor flange	grey cast iron with chrome steel cover or nickel-plates	stainless steel I / AISI 304 or bronze
motor casing	stainless steel/ AISI 304	stainless steel/ AISI 304
radial bearing	stainless steel / carbon	stainless steel / carbon
thrust bearing	stainless steel / carbon	stainless steel / carbon
screws, nuts and bolts	stainless steel A2 / AISI 304 / 305	stainless steel A2 / AISI 304 / 305

oddesse reserve the right to employ construction materials following German (DIN) standard

special design on request

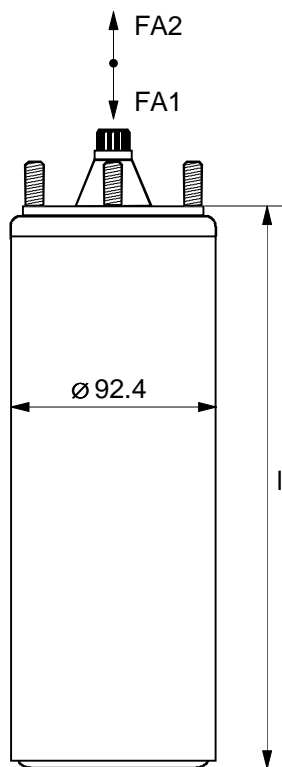
Subject to alterations



Pump connection acc. to **NEMA**-standards

po-mo4.2 • 50 Hz • 3 ~

Power P		Length l		Weight m	
kW	HP	mm	inch	kg	lbs
0.37	0.5	216	8.5	6.0	13.2
0.55	0.75	236	9.3	6.7	14.8
0.75	1.0	266	10.5	8.0	17.6
1.1	1.5	286	15.2	9.0	19.8
1.5	2.0	348	13.7	11.0	24.3
2.2	3.0	393	15.5	13.0	28.7
3.0	4.0	544	21.4	19.7	43.3
4.0	5.5	614	24.2	23.0	50.7
5.5	7.5	684	26.9	26.6	58.6
7.5	10.0	764	30.1	30.6	67.5



Main dimensions [mm]

po-mo4.2 • 50 Hz • 1 ~

Power P		Length l		Weight m	
kW	HP	mm	inch	kg	lbs
0.37	0.5	236	9.3	6.7	14.8
0.55	0.75	266	10.5	8.0	17.6
0.75	1.0	286	11.3	9.0	19.8
1.1	1.5	331	13.0	11.0	24.3
1.5	2.0	393	15.5	13.0	28.7
2.2	3.0	413	16.2	13.8	30.4
3.7	5.0	684	24.2	26.6	58.6

FA1 Downthrust capacity (up to 1.1 kW):

2 kN / 440 lbs

FA1 Downthrust capacity (1.1 kW - 2.2 kW):

3 kN / 660 lbs

FA1 Downthrust capacity (above 3.7 kW):

6 kN / 1320 lbs

Subject to alterations

po-mo4.2 • 400 V • 50 Hz • 3 ~

P _n		I _n	I _a /I _n	η			cos φ			M _a /M _n	M _k /M _n	n	Flat cable
kW	HP	A		2/4	3/4	4/4	2/4	3/4	4/4			1/min	mm ²
0.37	0.5	1.6	4.6	49	52	53	55	60	70	3.0	3.2	2820	1 fl 4 × 1.5
0.55	0.75	1.9	4.3	50	56	60	50	60	71	2.2	2.9	2830	1 fl 4 × 1.5
0.75	1.0	2.4	4.2	54	61	63	55	60	73	2.3	3.1	2830	1 fl 4 × 1.5
1.1	1.5	3.4	4.3	54	63	64	59	65	76	2.2	3.2	2830	1 fl 4 × 1.5
1.5	2.0	4.4	4.3	61	65	68	60	65	72	2.2	3.1	2830	1 fl 4 × 1.5
2.2	3.0	5.9	5	63	67	71	60	65	78	2.4	3.1	2820	1 fl 4 × 1.5
3.0	4.0	8.3	5.1	66	70	74	60	70	71	2.6	3.4	2840	1 fl 4 × 1.5
4.0	5.5	10.0	5.1	67	71	75	64	71	79	2.5	3.3	2850	1 fl 4 × 1.5
5.5	7.5	14.0	4.9	68	71	77	65	70	74	2.6	3.2	2850	1 fl 4 × 1.5
7.5	10.0	17.4	4.6	70	75	79	70	75	79	2.6	3.0	2850	1 fl 4 × 2.5

po-mo4.2 • 230 V • 50 Hz • 1 ~

P _n		I _n	I _a /I _n	η			cos φ			M _a /M _n	M _k /M _n	n	Flat cable
kW	HP	A		2/4	3/4	4/4	2/4	3/4	4/4			1/min	mm ²
0.37	0.5	3.3	2.8	43	47	50	77	78	79	0.61	2.0	2820	1 fl 4 × 1.5
0.55	0.75	4.6	2.9	47	50	56	82	83	84	0.59	2.15	2820	1 fl 4 × 1.5
0.75	1.0	6.2	3.6	47	51	58	79	80	82	0.60	2.1	2830	1 fl 4 × 1.5
1.1	1.5	8.6	3.9	50	55	62	89	90	92	0.63	2.0	2820	1 fl 4 × 1.5
1.5	2.0	11	4.3	55	60	65	86	89	91	0.58	1.95	2820	1 fl 4 × 1.5
2.2	3.0	16	4.1	60	65	65	89	90	94	0.62	2.3	2820	1 fl 4 × 1.5
3.7	5.0	25	4.1	60	67	65	91	93	95	0.56	2.3	2850	1 fl 4 × 2.5

P_n	Rated output	cos φ	Power factor
I_n	Rated current	M_a/M_n	Starting torque / rated torque
I_a/I_n	Starting current / rated current	M_k/M_n	Breakdown torque / rated torque
η	Efficiency	n	Rated speed

- Connection 4" NEMA
- Cable length 2.7 m (up to 5.5 kW), 3.5 m (7.5 kW)
- Degree of protection IP68 (IEC 529, EN 60529)
- Tolerances DIN VDE 0530 / IEC 34
- Voltage tolerances +6 % / -10 % (DIN IEC 38)
- Switch frequency max. 20/h
- Ambient temperature max. 30 °C
- Cooling flow min. 0.12 m/s
- Horizontal use possible

Special design on request

Subject to alterations