4"
Super Stainless
2- wire

Submersible Motors
Quality in the well

Franklin Electric 4“ encapsulated submersible motors, built in ISO 9001/14001 certified facilities for outstanding performance in 4“ or larger water wells.

The genuine Franklin Electric 2-wire motor is a split phase, control-box less submersible motor for direct connection to a fused power supply. It incorporates a long-life electronic switch that allows it to run without the aid of external controls or capacitors. Furthermore, it offers a reverse impact torque that can help loosening sand-locked pumps and comes factory-equipped with automatic reset overload and surge protectors.(functional description see page 13)

Specifications

- Hermetically sealed stator. Anti track, self healing stator resin prevents motor burn out, mechanically supports the winding and provides fast heat dissipation.
- High efficiency electrical design (low operation cost, cool running winding)
- Removable water bloc lead connector
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- No-wear, water lubricated radial and thrust bearings for 100% maintenance free operation
- Non contaminating FES 93 filling liquid
- Various agency approvals for use in drinking water
- Two wire plus ground connection
- Automatic reset overload internal to the motor
- Built-in surge arrestors

Brackish Water Motor Version Specifications:

- For use in water that has more salinity than fresh water, but not as much as seawater.
- The novel Franklin Electric Brackish Water Motor proposes a cost-effective solution wherever standard 4" motors are not giving sufficient service life

Technical specification:

- 2-W motor range: 0,37 – 1,1kW
- 4” NEMA flange
- Rotation: CCW facing shaft end (CW upon request)
- Degree of protection: IP68
- Insulation: Cl.B
- Rated ambient temperature: 30°C
- Required cooling flow: min. 0,08m/s
- Max. starts/hr.: 20, equally distributed
- Mounting: vertical to horizontal, shaft upwards
- Voltage tolerance 50Hz from nominal: -10% / +6%
- Voltage tolerance 60Hz from nominal: ±10%
- Protection requirements: EN 61947-4-1

Options

- Motor cable VDE, KTW approved (1,5m; special lengths available)
- Motors with factory- installed lead in Single Packing

Function Description 2-wire Motors

BIAC Switch Operation/2-Wire Motor Solid State Controls

Power-On: When power is applied to the motor the bi-metal switch contacts are closed so that the TRIAC is conducting. This allows current to pass to the start winding, thus starting the motor.
The BIAC switch responds to voltage from a sensor coil located inside the motor. This sensor coil voltage is proportional to motor speed (RPM).
As speed increases, the increased voltage in the sensor coil generates heat in the bi-metal, causing it to open the start winding circuit. This cuts the starting winding current and the motor continues to run on the main winding only .
Power-off: Approximately 5 seconds after power is cut from the motor, the bi-metal strip cools sufficiently to return into its NC position, and the motor is ready for the next start cycle. If during operation, the motor speed drops for some reason, the lowered voltage in the sensor coil allows the bi-metal contacts to re-close, supplying start winding current to bring the motor back to operation speed.

Reverse Impact Torque:

This unique torque reversing feature will minimize the problems of polluted environments. In a locked rotor condition, the BIAC switch will supply full start winding current for approximately one second. Then the switch begins to open and close rapidly. This action chops the start winding current, switching it between leading and lagging the run winding current. This produces impact torque in both forward and reverse directions.
This reverse impact torque will literally shake and loosen many obstructions. Once cleared, the motor will run in proper rotation.

Extreme Fast Cycling:

(Due to Water - Logged Tank)
The BIAC starting switch will reset within approximately 5 seconds after the motor is stopped. If an attempt is made to restart the motor before the starting switch has reset, the motor may not start; however, there will be current flow through the main winding until the overload protector interrupts the circuit. The reset time for the protector is longer than the reset of the starting switch. So, the start winding switch will have closed and the motor will operate. The repeated on-off cycle will continue until the overload will trip again.
When a severely water – logged condition does occur, the user will be alerted to the problem during the off time (overload reset time), since the pressure will drop dramatically. When a water – logged tank condition is detected, the condition should be corrected to prevent nuisance tripping of the overload protector.

Bound Pump (sand-locked):

When the motor is not free to turn, as with a sand-locked pump, the BIAC switch creates a “reverse impact torque “ as described above. This is a unique feature, particularly interesting in sandy environments or applications where long stand-still periods are to be expected (seasonal usage of water).

4" Encapsulated Motors

4" 2 wire Motors Model numbers

P_N [kW]	Hp	U_N [V]	Model No. 50Hz		
			Standard Motors (40 motors packing unit)	**Standard Motors** (single pack, with Lead)	**Brackish Water Motors** (single pack, with Lead)
0,37	0,50	230	244 755 1221	244 755 1221L	244 755 1224L
0,55	0,75	230	244 757 1221	244 757 1221L	244 757 1224L
0,75	1,1	230	244 758 1221	244 758 1221L	244 758 1224L
1,10	1,50	230	244 759 1221	244 759 1221L	244 759 1224L

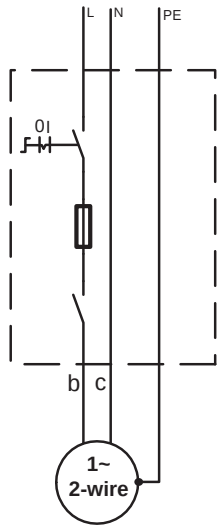
Performance Data 220 / 230 Volt 50 Hz

P_N [kW]	Thrust F[N]	U_N [V]	n_N [min^{-1}]	I_N [A]	I_A [A]	η (Eff.) at % load [%]			cos φ (Pf.) at % load [%]			T_N [Nm]	T_A [Nm]
						50	75	100	50	75	100		
0,37	3000	220	2875	4,1	24,4	48	55	57	0,57	0,68	0,76	1,24	1,18
		230	2890	4,1	25,5	47	54	57	0,53	0,64	0,73	1,23	1,29
0,55	3000	220	2870	5,7	35,0	50	57	59	0,55	0,67	0,77	1,85	1,7
		230	2890	5,8	36,6	47	55	59	0,51	0,63	0,73	1,85	1,9
0,75	3000	220	2875	7,2	46,6	54	61	62	0,57	0,69	0,78	2,5	2,1
		230	2890	7,3	48,7	51	59	61	0,53	0,65	0,75	2,5	2,3
1,10	3000	220	2880	10,6	57,9	56	62	63	0,56	0,68	0,77	3,7	2,7
		230	2895	10,8	59,7	52	60	63	0,51	0,63	0,73	3,7	2,9

2- wire Winding Resistances 50 Hz

P_N [kW]	Volt	Motor Ref.	Ohm [Ω]
0,37	230	244 755 1221 / L	7,2 - 8,8
0,55		244 757 1221 / L	5,0 - 6,1
0,75		244 758 1221 / L	3,6 - 4,4
1,10		244 759 1221 / L	2,3 - 2,8

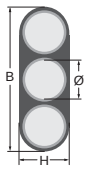
Electrical Connection

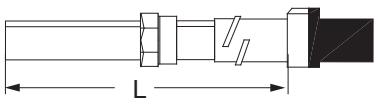


b	c	PE
brown	grey	yellow/green

VDE / ACS / KTW Approved Leads*

Ø [mm²]	B [mm]	H [mm]
3X1,5	10,7 ± 0,3	5,0 ± 0,3



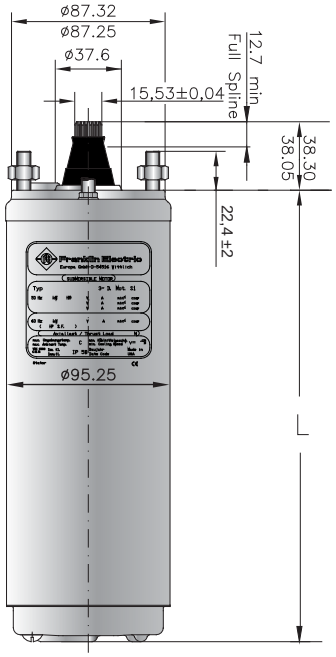


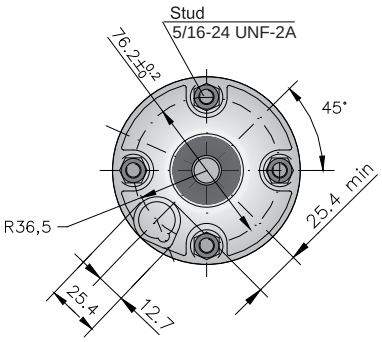
L [m]	Part Numbers	
	Standard	**304SS**
1,5	310 134 001	310 134 401
2,5	310 134 002	310 134 402
5	310 134 005	310 134 405
10	310 134 010	310 134 410
15	310 134 015	310 134 415
20	310 134 020	310 134 420
30	310 134 030	310 134 430
40	310 134 040	310 134 440

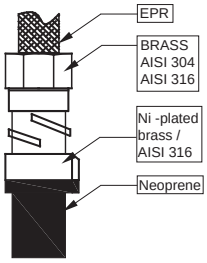
***Cables are designed for submerged operation. For air operation please consult Franklin Electric.**

4" 1~ Motor Outlines 2-wire

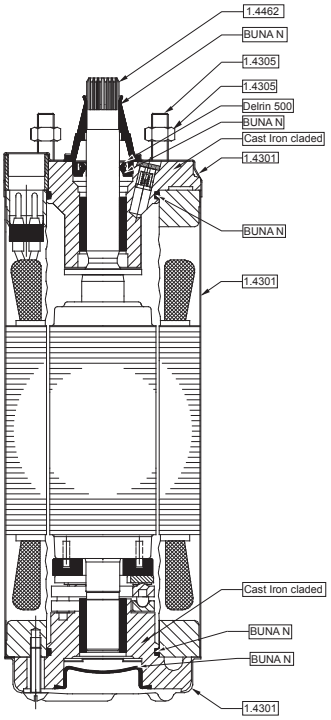
Outline Drawing







Material Description

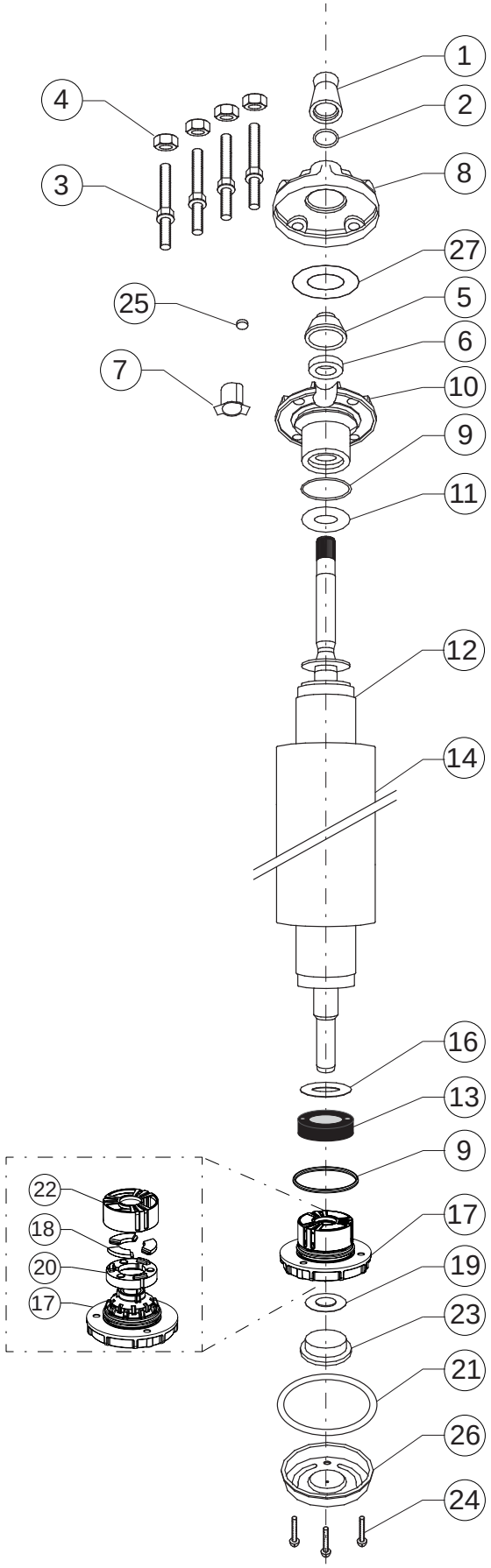


Tolerances according to NEMA MG 1-18.388

4" 2- wire Standard Lengths & Weights

P_N		L [mm]	M [kg]	Motor Package size (40 motors per packing unit)		Motor with Lead in single pack	
[kW]	[HP]			[mm]	[kg]	[mm]	[kg]
0,37	0,50	228,2	7,8	800 x 500 x 870	340	400 x 100 x 110	9,5
0,55	0,75	248,2	8,5	800 x 500 x 870	355	400 x 100 x 110	9,8
0,75	1,00	282,6	9,9	800 x 500 x 870	450	530 x 100 x 110	12,0
1,10	1,50	338,6	12,3	800 x 500 x 870	600	530 x 100 x 110	14,4

4" 2- wire Standard Motor* 304SS Parts Description



Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit B
2	Washer	1	Kit B
3	Stud	4	Kit C
4	Nut	4	Kit C
5	Seal cover	1	Kit
6	Shaft Seal	1	Kit B
7	Connector boss	1	151 820 102
8	Top Endbell, Cover	1	Kit
9	O-Ring	2	Kit B
10	Top Endbell	1	Kit
11	Upthrust washer	1	Kit
12	Rotor	1	page 17
13	Thrust disk assy	1	Kit A
14	Stator	1	page 17
15	Leveling Disk (only 1500N)	1	Kit A
16	Washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm Insert	1	151 314 101
20	Rocking Disk	1	Kit A
21	Gasket	1	Kit B
22	Bearing cage	1	Kit A
23	Diaphragm	1	Kit B
24	Screw, Seal	3	Kit C
25	Filter	1	Kit B
26	Bottom Endbell Cover	1	156 414 101
27	Washer	1	Kit

*** Spare Parts for Brackish Water Motors on Request**

4" 2- wire Spare Parts

P_N [kW]	End bell, upper Pos. 5 - 10, 27	End bell, lower Pos. 17	Upthrust washer Pos. 11	Thrust bearing
0,37	177 231 924	Kit A1	150 954 102	Kit A1
0,55				
0,75	177 233 924		151 093 105	
1,10				
Kit 1500N 0,25 – 0,55kW up to 07.2008	Thrust bearing Kit		incl. Pos.: 13, 15, 16, 18	308 652 101
Kit A1	End bell (lower) incl. Thrust bearing Kit 3000N/4000N		inkl. Pos.: 9, 13, 16, 17, 18, 20, 22	308 464 901
Kit B1	Seal Kit		inkl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 101
Kit B2	Seal Kit (Viton)		inkl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 104
Kit C	Screw Kit		inkl. Pos.: 3, 4, 24	308 656 101

Replacement Standard Motor* Stators and Rotors 50 Hz

P_N [kW]	Volt	Motor Model No.	Stator	Rotor
0,37	220-230	244 755 1221 / L	326 821 914	178 157 902K
0,55		244 757 1221 / L	326 822 914	178 158 902K
0,75		244 758 1221 / L	326 823 914	178 160 902K
1,10		244 759 1221 / L	326 824 914	178 163 902K

*** Spare Parts for Brackish Water Motors on Request**