



**4" 3-wire
High Thrust Motors
PRODUCT CATALOG**



Franklin Electric



Franklin Electric



Quality in the Well

4" Super Stainless 1~ 3-wire High Thrust

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 single phase 3-wire motor has been designed for highest achievable starting torque and shaft power from single phase power supplies. It is therefore ideally suited for applications where starting torque is paramount and 3 phase motors cannot be used. It should ideally be combined to the Franklin Electric 3-wire control boxes for maximum system performance, protection and warranty.



Product features

- 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
- 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

Brackish Water 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

- Motor range: 2,2 – 3,7kW
- Thrust capacity: 6500 N
- 4" NEMA flange
- Rotation: CCW facing shaft end
- 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
- Built in lightning arrestors
- Alternative material executions
- Motor complete in AISI 316SS with SiC seal



4" 3- wire Motor Model Numbers High Thrust

P _N [kW]	U _N [V]	Digit 1-6	Digit 7-10				
			304		316 SS		Brackish Water Motor
			(Motors in 40 motors packing unit)	(Motors in single pack, with Lead)	(Motors in 40 motors packing unit)	(Motors in single pack, with Lead)	(Motors in single pack, with Lead)
2,2	220 / 230	224 752	3421	3421L	3521	3521L	3424L
3,7	220 / 230	224 753	3421	3421L	3521	3521L	3424L

4" 3-Wire High Thrust Performance Data 50 Hz

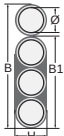
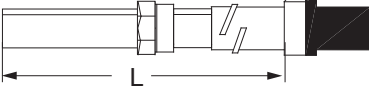
P _N [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cos φ (Pf.) at % load			T _N [Nm]	T _A [Nm]
						50	75	100	50	75	100		
2,2	6500	220	2875	15,2	71,2	67	73	74	0,76	0,86	0,91	7,3	13,8
		230	2885	15,3	74,5	63	70	73	0,69	0,80	0,88	7,3	15,0
3,7	6500	220	2880	22,5	97	72	77	78	0,98	0,99	0,99	12,3	16,1
		230	2895	21,4	101	70	76	77	0,97	0,98	0,99	12,2	17,6

Standard Windings Resistance 50 Hz

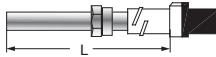
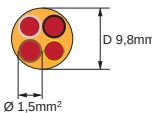
P _N [kW]	U _N [V]	Stator Ref.	Main phase Ohm	Start phase Ohm
2.2	220 / 230	326 813 912	1,3 - 1,6	3,8 - 4,6
3,7	220 / 230	326 813 912	1,0 - 1,3	2,5 - 3,1



VDE / ACS / KTW Approved Leads*

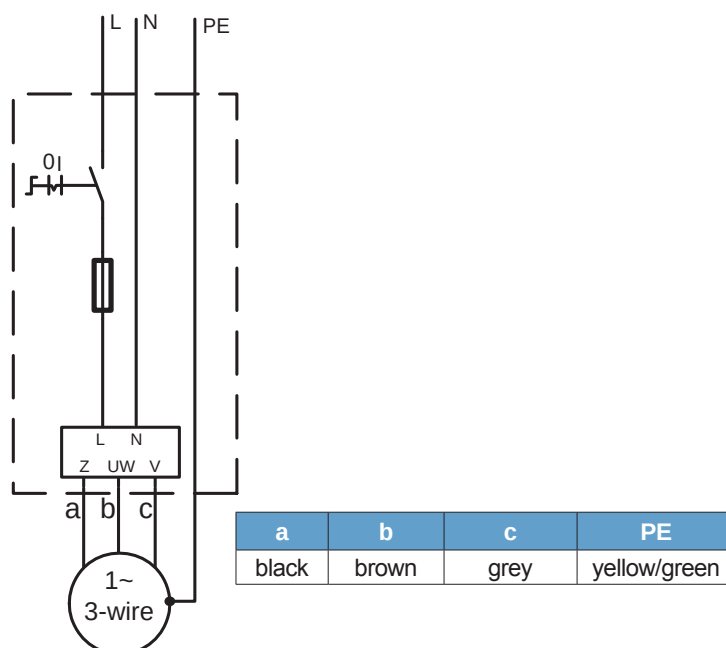
Ø [mm²]	B [mm]	B1 [mm]	H [mm]
3X1,5+1G1,5	16,8 ± 0,3	10,7 ± 0,3	5,0 ± 0,3
 			

L [m]	Part Numbers		
	Standard	304 SS	316 SS
1,5	310 113 001	310 113 401	310 113 501
2,5	310 113 002	310 113 402	310 113 502
5	310 113 005	310 113 405	310 113 505
10	310 113 010	310 113 410	310 113 510
15	310 113 015	310 113 415	310 113 515
20	310 113 020	310 113 420	310 113 520
30	310 113 030	310 113 430	310 113 530
40	310 113 040	310 113 440	310 113 540
50	310 113 050	310 113 450	310 113 550

L [m]	Pollution Recovery Motor cable*	
	Modelnb. (only in 316SS)	
1,5	310 313 501	 
2,5	310 313 502	
10	310 313 510	
20	310 313 520	
30	310 313 530	
40	310 313 540	
50	310 313 550	

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

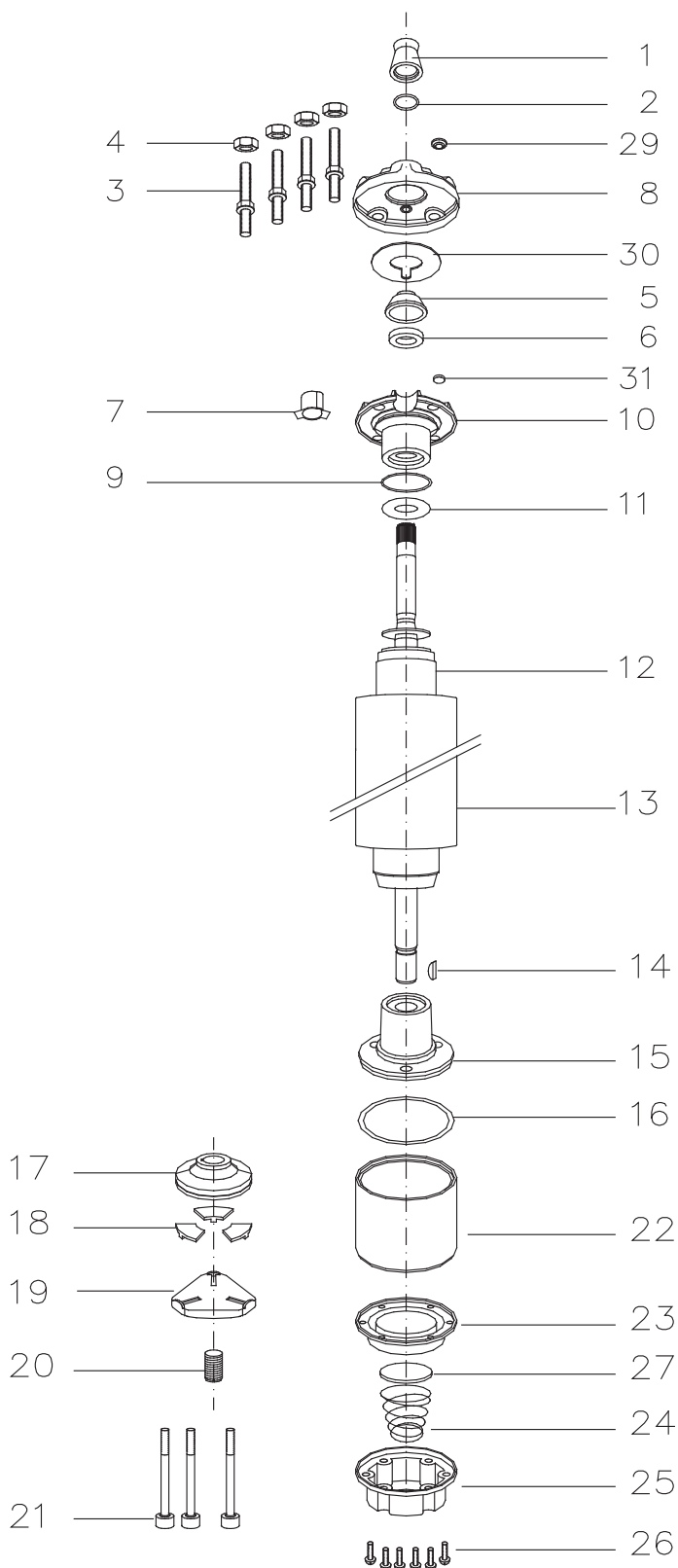
Electrical Connection







4" 3- wire Standard Motors* Parts List High Thrust 304



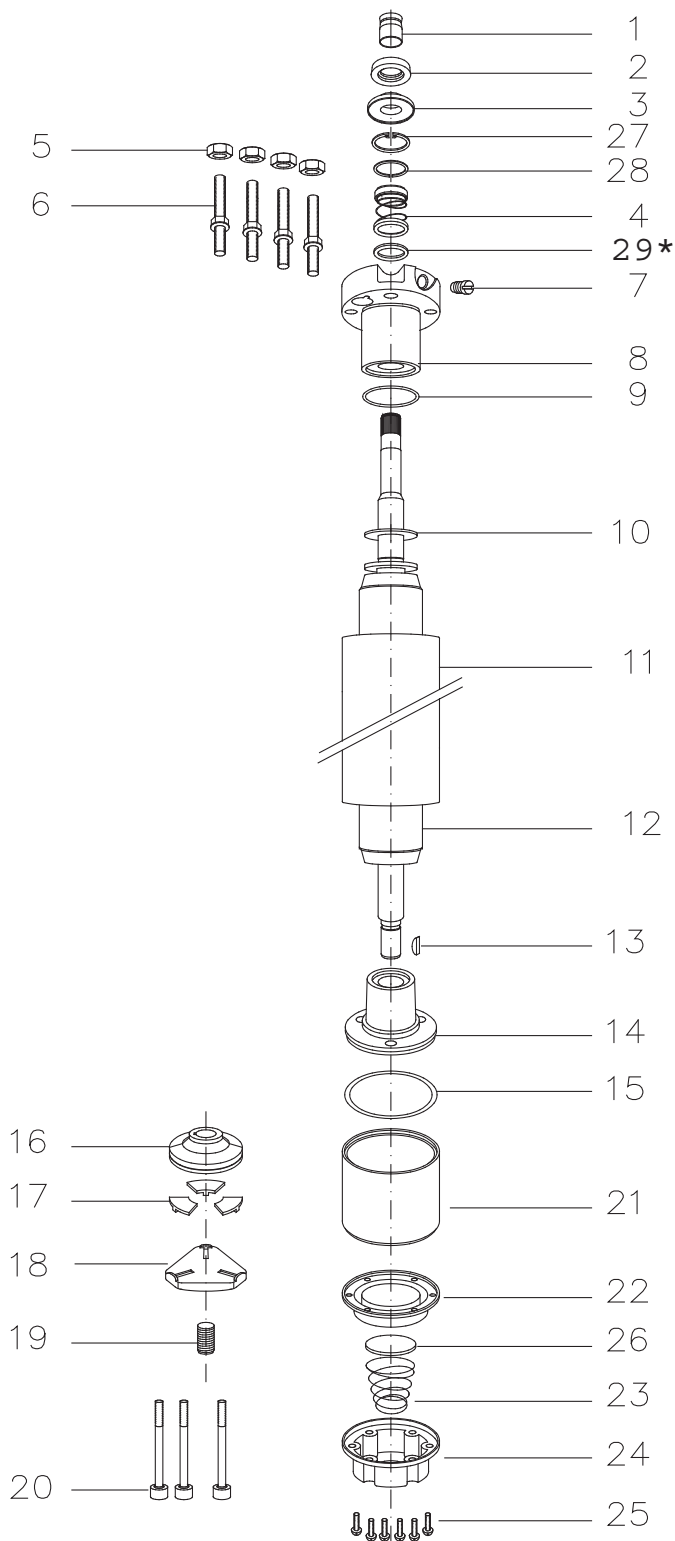
Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit B
2	Washer	1	Kit B
3	Stud	4	Kit C
4	Nut	4	Kit C
5	Seal cover	1	Kit D
6	Shaft Seal	1	Kit B+D
7	Connector boss	1	Kit D
8	Top Endbell, Cover	1	Kit D
9	O-Ring	1	Kit B+D
10	Top Endbell	1	Kit D
11	Upthrust washer	1	Kit
12	Rotor	1	page 36
13	Stator	1	page 36
14	Woodruff key	1	275 250 104
15	Bottom Endbell	1	Kit
16	O-Ring	1	Kit B
17	Thrust disc	1	Kit A
18	Segment	1	Kit A
19	Leveling disc	1	155 660 101
20	Screw, adj.	1	151 048 102
21	Screw	3	Kit C
22	Thrust housing	1	177 378 901
23	Diaphragm	1	Kit B
24	Spring	1	151 449 101
25	Cover, Diaphragm	1	155 647 101
26	Screw	6	Kit C
27	Cup spring, Diaphragm	1	151 448 101
29	Sealing stopper	1	Kit B+D
30	Seal	1	Kit D
31	Filter	1	Kit B+D

* Spare Parts for Brackish Water Motors on Request



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4" 3- wire Standard Motors* Parts List High Thrust 316



Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit C
2	Slinger	1	Kit C
3	Seal cover	1	Kit B + C
4	Shaft Seal	1	Kit B
5	Stud	4	Kit D
6	Nut	4	Kit D
7	Sealing Screw	1	308 279 903
8	Top Endbell	1	Kit
9	O-Ring	1	Kit B
10	Upthrust washer	1	Kit
11	Stator	1	page 36
12	Rotor	1	page 36
13	Woodruff key	1	275 250 104
14	Bottom Endbell	1	Kit
15	O-Ring	1	Kit B
16	Thrust disc	1	Kit A
17	Segments	1	Kit A
18	Leveling disc	1	155 660 101
19	Screw, adj.	1	151 048 102
20	Screw	3	Kit D
21	Thrust housing	1	177 378 951
22	Diaphragm	1	Kit B
23	Spring	1	151 449 101
24	Cover, Diaphragm	1	155 647 201
25	Screw	6	Kit D
26	Cup spring, Diaphragm	1	151 448 101
27	Ring	1	Kit B
28	Retain Ring	1	Kit B
29*	Washer	1	308 747 201

* only for 2,2 - 3kW

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

**4" 3- wire Standard Motors* Spare Parts High Thrust 304SS**

P_N [kW]	End bell upper (Kit D1) inkl. Pos.: 5, 6, 7, 8, 9, 10, 29,30, 31	End bell, Lower (Pos. 15)	Upthrust washer (Pos. 11)
2,2	308 233 509	177 379 921	308 268 104
3,7	308 434 501	177 379 921	308 317 901
Kit A 6500N	Thrust Bearing Kit	inkl. Pos.: 17, 18	308 700 301
Kit B	Seal Kit	inkl. Pos.: 1, 2, 6, 9, 16, 23,29, 31	308 900 351
Kit B1	Seal Kit Pollution Recovery	inkl. Pos.: 1, 2, 6, 9, 16, 23,29, 31	308 900 401
Kit C	Screw Kit	inkl. Pos.: 3, 4, 21, 26	308 658 351

Standard Motors* High Thrust Replacement Stator and Rotor 304 50 Hz

P_N [kW]	U_N [V]	Motor No.	Stator	Rotor
2,2	220 / 230	224 752 3421 / L	305 491 181	178 126 903K
3,7	220 / 230	224 753 3421 / L	305 491 182	178 135 903K

* Spare Parts for Brackish Water Motors on Request

4" 3- wire Standard Motors* Spare Parts High Thrust 316SS

P_N [kW]	End bell upper (Pos 8)	End bell, Lower (Pos. 14)	Upthrust washer (Pos. 10)
2,2	177 390 955	177 379 921	308 317 901
3,7			
Kit A 6500N	Thrust bearing Kit	inkl. Pos.: 16, 17	308 700 301
Kit B	Seal Kit	inkl. Pos.: 4, 9, 15, 22, 27, 28	308 900 302
Kit C	Sand Protection Kit	inkl. Pos.: 1, 2, 3	308 825 201
Kit D	Screw Kit	inkl. Pos.: 5, 6, 20, 25	308 658 301

Standard Motors* High Thrust Replacement Stator and Rotor 316SS / 50 Hz

P_N [kW]	U_N [V]	Motor Model No.	Stator	Rotor
2,2	220 / 230	224 752 3521 / L	305 491 541	178 126 913K
3,7	220 / 230	224 753 3521 / L	305 491 542	178 135 913K

* Spare Parts for Brackish Water Motors on Request



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Termination Kit 4"

This proven, sturdy solution is your choice of cable joining in temporary pump applications or when re-usage if the drop cable is desired. Furthermore, the flexibility and safety it provides for under field service conditions makes it the preferred choice over conventional, not breakable splicing kits.

Kit- Type	Mod. Number	Description
Standard	308 090 901	without . Strain relief Attention: Limited shelf life of Resin and Hardener
Strain Relief	308 090 902	incl. Strain relief Attention: Limited shelf life of Resin and Hardener



Double Plug Lead for Termination Kit

Required for use of lead termination kit. Connected between termination kit and 4" motor.

- PSC / 2-wire / 3-wire Motors and 3 ~ Motors up to 2,2kW
- Material: Connector- Ni plated brass; Lead: rubber
- 2 / 3 wire lead with ground
- Optional strain relief
- Max. current 16 amps.
- Approvals: KTW

4" High Thrust and Motor Design up to 06.2016

Mod. No.	2 - wire	Mod. No.	PSC / 3 - wire / 3-Phase (up to 2,2kW)
310 131 001	3X1,5mm ² 1,5 m - without . Strain relief	310 111 001	3X1,5+1G1,5mm ² 1,5 m - without . Strain relief
310 131 002	3X1,5mm ² 2,5 m - without . Strain relief	310 111 002	3X1,5+1G1,5mm ² 2,5 m - without . Strain relief
310 132 001	3X1,5mm ² 1,5 m - incl. Strain relief	310 112 001	3X1,5+1G1,5mm ² 1,5 m - incl. Strain relief
310 132 002	3X1,5mm ² 2,5 m - incl. Strain relief	310 112 002	3X1,5+1G1,5mm ² 2,5 m - incl. Strain relief



4" Standard Motor start 07.2016

Mod. No.	PSC / 3 - wire / 3-Phase (up to 2,2kW)
309 111 401	3X1,5+1G1,5mm ² 1,5 m - without . Strain relief



Lead Termination Kit 1,5 - 10mm²

- 3M Quality
 - 4 wire
 - 1,5 - 10mm²
 - up to 1,1kV
- Part number: 308 090 921**



PTC Lead (only as spare parts)

Ø = 2x0,75 mm ²	D = 7,0 mm	L (m)	Mod.-No.
		4	310 364 004
		10	310 364 010
		20	310 364 020
		30	310 364 030

Brackish Water Motor Lead (only as spare parts)

Ø = 4x1,5 mm ²	L (m)	Mod.-No.
	2,5	310 113 402G

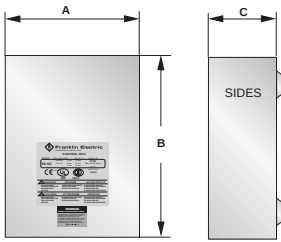
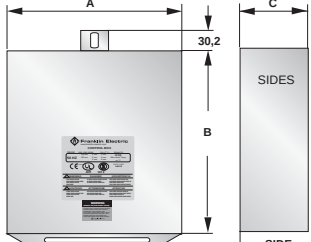
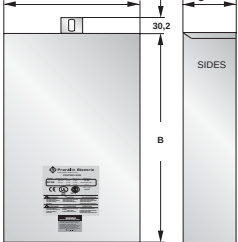


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3- wire Motor Control Boxes

Application:	Control and Protection of Franklin Electric 3-wire single phase motors.		
Specification:	- Voltage: 220 – 230 V - Degree of protection: IP 23 - Metal version - Includes starting capacitor - Manual reset overload - Max. Amb Temp. 40°C 50 Hz		
Ordering information:	Motor Rating	Control Box Mod. Number	Weights (kg)
220 / 230 / 240 V	0,25	280 355 2115	1,36
	0,37		
	0,55		
	0,75	280 358 2115	2,8
	1,1	282 350 8114	
	1,5	282 351 8114	
	2,2	282 352 8114	
	3,7	282 253 4014	4,7

Outline Drawing [mm]

0,25 – 0,75 kW			1,1 kW / 1,5 kW / 2,2kW			3,7 kW		
								
A	B	C	A	B	C	A	B	C
125	215	68	205	216	154	205	384	154

Spare Parts Control Box 50 Hz

P _N [kW]	Box Nb.	Relay-Kit	Qty.	Start Capacitor	Qty.	Run Capacitor	Qty.	Overload relay of main phases	Qty.	Overload relay of start phases	Qty.
		Pos. 1		Pos. 2		Pos. 3		Pos. 4		Pos. 5	
0,37	2803552115	305213912	1	305218957 48µF 220V	1	-----	0	*	1	-----	0
0,55	2803572115	305213912	1	305218906 65µF 220V	1	-----	0	*	1	-----	0
0,75	2803582115	305213912	1	305218918 95µF 220V	1	-----	0	*	1	-----	0
1,1	2823508114	305213912	1	305207913 115µF 220V	1	305 204 902 10µF 370V	1	305 215 914	1	-----	0
1,5	2823518114	305213912	1	305208915 208µF 220V	1	305 204 903 20µF 370V	1	305 215 902	1	305 215 906	1
2,2	2823528114	305213912	1	305208919 300µF 220V	1	305 203 902 35µF 370V	1	305 215 907	1	305 214 907	1
3,7	2822534014	305213912	1	305208915 208µF 220V	2	305 203 909 45µF 370V	1	305 214 902	1	305 215 902	1
						305 203 901 30µF 370V	1				



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4" Corrosion protection in aggressive water for Standard Motors

Wells with extremely high levels of chlorides and other elements in combination with high temperatures will aggressively attack and corrode nearly any type of metal, including stainless steel. Typical severe applications are geothermal wells and mine wells, and applications with low service times.

Material Specification: GG25

LT	HT
	
308 250 912	308 250 913

4" Corrosion protection in aggressive water for NextGen Motors

Wells with extremely high levels of chlorides and other elements in combination with high temperatures will aggressively attack and corrode nearly any type of metal, including stainless steel. Typical severe applications are geothermal wells and mine wells, and applications with low service times.

These sacrificial anodes, affixed to the motor body, will increase the service life of the motor when used in such environments.

Material Specification: GG25

LT

308 250 914

Motor Filling Liquid

Filling liquid 5 L FES92					
4" Encapsulated	→	FES93	8" Encapsulated Standard	→	FES91
6" Encapsulated Standard	→	FES91	8" Encapsulated HighTemp75	→	FES92
6" Encapsulated HighTemp90	→	FES92	6" / 8" / 10" / 12" Rew Motors 6" / 8" Rew PM Motors		FES93



Part number:
308 353 941

FES91	FES92	FES93
		

Motor Filling Kit

This kit contains all necessary tools to check and replenish Franklin Electric submersible motors with FES 91, 92 or 93 filling liquid (fill solution/concentrate must be ordered separately).

Part number: 308 726 103





Couplings

Franklin Electric offers this line of motor-pump couplings for maximum customer convenience in matching the Franklin motor to a variety of pump shafts. Couplings are designed to transmit the pump thrust to the motor in order to provide maximum benefits from the Franklin internal thrust bearing construction.

Hardened stainless steel spacer discs in the 4" and 6" couplings assure positive bearing between motor and pump shafts, and assure full support for downward thrust created by the pump.

8" couplings DO NOT contain hardened spacer discs, since the motor shaft itself is hardened.

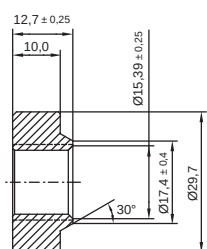
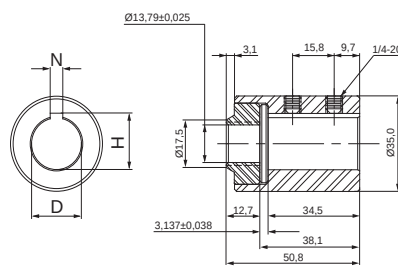


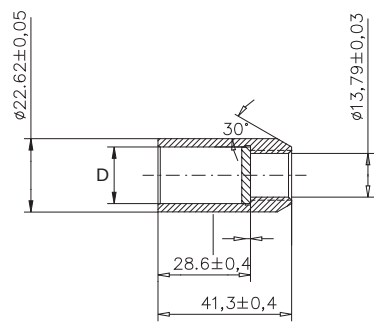
4" Motor - Pump couplings

Application: Allow connection of pump to motors shaft.

Specification:

- Material: 304 / 316 SS
- NEMA standard measuring on motor shaft
- separation washer between motor & pump shafts

Coupling 1	304			Coupling Insert only (316SS)
	151 551 911			151 970 102
	Dimension D Max. / Min.	Dimension N Max. / Min.	Dimension H Max. / Min.	
	19,075 / 19,063	4,838 / 4,788	20,70 / 20,53	
				

Coupling 2	316SS		
	308 712 904		
	Dimension D Max. / Min.		
	17,50 / 17,48		
			

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Franklin Electric

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