

SUBMERSIBLE MOTORS DRIVES, SYSTEMS AND ACCESSORIES





Quality in the Well



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4" Super Stainless 1~ PSC



Submersible Motors

Quality in the Well

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

The single phase PSC motor has been electrically optimized to offer reliable pump starting over a wide range of incoming voltages. It should ideally be combined to the Franklin Electric SubStart/SubTronicSC control boxes for maximum system performance, protection and warranty.

Features:

- Hermetically sealed stator with 316SS shell. 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

Pollution Recovery Motor Version Specifications:

- Fluorelastomere (Viton®) rubber parts
- Special Polyurethane (PUR) lead assemblies
- 304SS (316SS Stator) graded stainless steel as standard

Technical specification:

- 0,25 – 2,2kW
- 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 from nominal: -10% / +6%
- Protection requirements: EN 60947-4-1

Options:

- Various cable lengths
- PSC Motor sets available (see Page 12/13) including control box, lead and splice kit
- Alternative material executions

4" PSC Motor Model numbers 50 Hz

P _N [kW]	U _N [V]	304SS		
		Standard Motors (Single pack, with Lead)*	Standard Motors (40 motors packing unit)	Pollution Recovery Motors (Single pack, with Lead)*
0,25	220-230	254 803 6700L	254 803 6700	254 803 6715L
	230-240	254 813 6700L	254 813 6700	254 813 6715L
0,37	220-230	254 805 6700L	254 805 6700	254 805 6715L
	230-240	254 815 6700L	254 815 6700	254 815 6715L
0,55	220-230	254 807 6700L	254 807 6700	254 807 6715L
	230-240	254 817 6700L	254 817 6700	254 817 6715L
0,75	220-230	254 808 6700L	254 808 6700	254 808 6715L
	230-240	254 818 6700L	254 818 6700	254 818 6715L
1,10	220-230	254 809 6700L	254 809 6700	254 809 6715L
	230-240	254 819 6700L	254 819 6700	254 819 6715L
1,50	220-230	254 810 6700L	254 810 6700	254 810 6715L
	230-240	254 820 6700L	254 820 6700	254 820 6715L
2,20	220-230	254 811 6700L	254 811 6700	254 811 6715L
	230-240	254 821 6700L	254 821 6700	254 821 6715L

* Lead lengths Motors "L" : up to 1.5kW with 1.5m preassembled cable, starting at 2.2 kW with 2.5m pre-mounted cable

4" PSC Performance Data 50 Hz

220V - 230V version

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]	Capacitor μF (U _c =450V)
						50	75	100	50	75	100			
0,25	4000	220	2865	2,3	9,0	33	45	51	0,91	0,93	0,96	0,82	0,73	12,5
		230	2875	2,4	9,4	28	42	50	0,80	0,88	0,92	0,83	0,80	
0,37	4000	220	2850	3,2	12,1	36	47	54	0,86	0,92	0,97	1,21	1,07	16
		230	2860	3,3	12,6	35	46	54	0,78	0,85	0,91	1,24	1,17	
0,55	4000	220	2840	4,2	16,9	46	57	63	0,94	0,97	0,98	1,85	1,50	20
		230	2850	4,3	17,7	45	57	63	0,86	0,91	0,94	1,90	1,63	
0,75	4000	220	2825	5,7	21,7	44	54	61	0,97	0,99	0,99	2,5	2,3	35
		230	2845	5,7	22,7	41	52	59	0,92	0,96	0,98	2,5	2,5	
1,1	4000	220	2830	8,1	32,5	47	59	65	0,86	0,94	0,97	3,7	2,9	40
		230	2845	8,4	33,9	43	56	63	0,77	0,86	0,92	3,7	3,1	
1,5	4000	220	2820	10,4	39,9	52	63	68	0,90	0,95	0,98	5,1	3,6	50
		230	2830	10,7	41,7	48	59	66	0,82	0,90	0,95	5,1	3,9	
2,2	4000	220	2825	14,7	59,2	55	65	70	0,93	0,98	0,99	7,4	5,0	70
		230	2840	14,7	61,8	51	62	68	0,86	0,93	0,97	7,4	5,5	

230V - 240V version

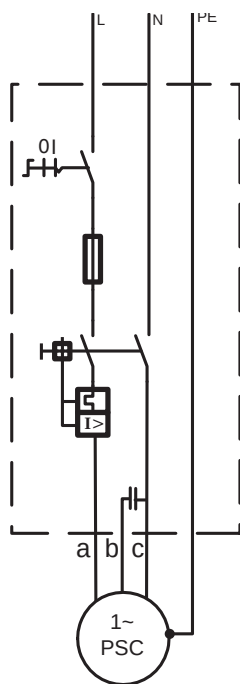
P _N [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cos φ (Pf.) at % load			T _N [Nm]	T _A [Nm]	Capacitor μF (U _c =450V)
						50	75	100	50	75	100			
0,25	4000	230	2865	2,2	8,6	33	45	51	0,91	0,93	0,96	0,82	0,73	12,5
		240	2875	2,3	9,0	28	42	50	0,80	0,88	0,92	0,83	0,80	
0,37	4000	230	2850	3,1	11,6	36	47	54	0,86	0,92	0,97	1,21	1,07	16
		240	2860	3,2	12,1	35	46	54	0,78	0,85	0,91	1,24	1,17	
0,55	4000	230	2840	4,0	16,2	46	57	63	0,94	0,97	0,98	1,85	1,50	20
		240	2850	4,1	16,9	45	57	63	0,86	0,91	0,94	1,90	1,63	
0,75	4000	230	2825	5,5	20,8	44	54	61	0,97	0,99	0,99	2,5	2,3	35
		240	2845	5,5	21,8	41	52	59	0,92	0,96	0,98	2,5	2,5	
1,1	4000	230	2830	7,8	31,1	47	59	65	0,86	0,94	0,97	3,7	2,9	40
		240	2845	8,1	32,5	43	56	63	0,77	0,86	0,92	3,7	3,1	
1,5	4000	230	2820	10,0	38,3	52	63	68	0,90	0,95	0,98	5,1	3,6	50
		240	2830	10,2	40,0	48	59	66	0,82	0,90	0,95	5,1	3,9	
2,2	4000	230	2825	14,0	56,7	55	65	70	0,93	0,98	0,99	7,4	5,0	70
		240	2840	14,1	59,3	51	62	68	0,86	0,93	0,97	7,4	5,5	



PSC Winding resistance 50 Hz

P_N [kW]	U_N [V]	Stator-Ref. # 304SS	Main phase [Ohm]	Start phase [Ohm]
0,25	220 - 230	326 738 942	8,2 - 10,0	31,1 - 38,1
	230 - 240	326 800 942	8,9 - 10,9	26,7 - 32,6
0,37	220 - 230	326 739 942	6,7 - 8,1	21,7 - 26,5
	230 - 240	326 801 942	7,2 - 8,8	20,8 - 25,4
0,55	220 - 230	326 740 942	4,4 - 5,4	13,6 - 16,6
	230 - 240	326 802 942	4,8 - 5,8	13,1 - 16,0
0,75	220 - 230	326 741 942	3,3 - 4,1	8,1 - 9,9
	230 - 240	326 803 942	3,7 - 4,6	7,7 - 9,4
1,1	220 - 230	326 742 942	2,3 - 2,8	6,8 - 8,3
	230 - 240	326 804 942	2,5 - 3,0	6,5 - 7,9
1,5	220 - 230	326 743 942	1,8 - 2,2	4,7 - 5,7
	230 - 240	326 805 942	1,9 - 2,4	4,4 - 5,4
2,2	220 - 230	326 744 942	1,2 - 1,5	3,2 - 3,9
	230 - 240	326 806 942	1,3 - 1,6	3,0 - 3,6

Electrical connection PSC Motors

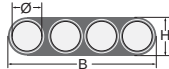
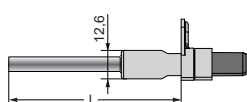


a	b	c	PE
black	brown	grey	yellow/green

Motor Leads*

PSC Motor- VDE / ACS/ KTW Approved Flat Leads

$\varnothing$ [mm ²]	B [mm]	H [mm]
4X1,5	14,6 ± 0,3	5,1 ± 0,3

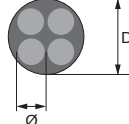
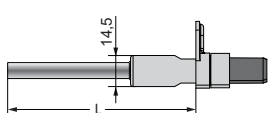



L [m]	304 SS / 316 SS
1,5	310 178 501
2,5	310 178 502
5	310 178 505
10	310 178 510
15	310 178 515
20	310 178 520
30	310 178 530
40	310 178 540
50	310 178 550

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

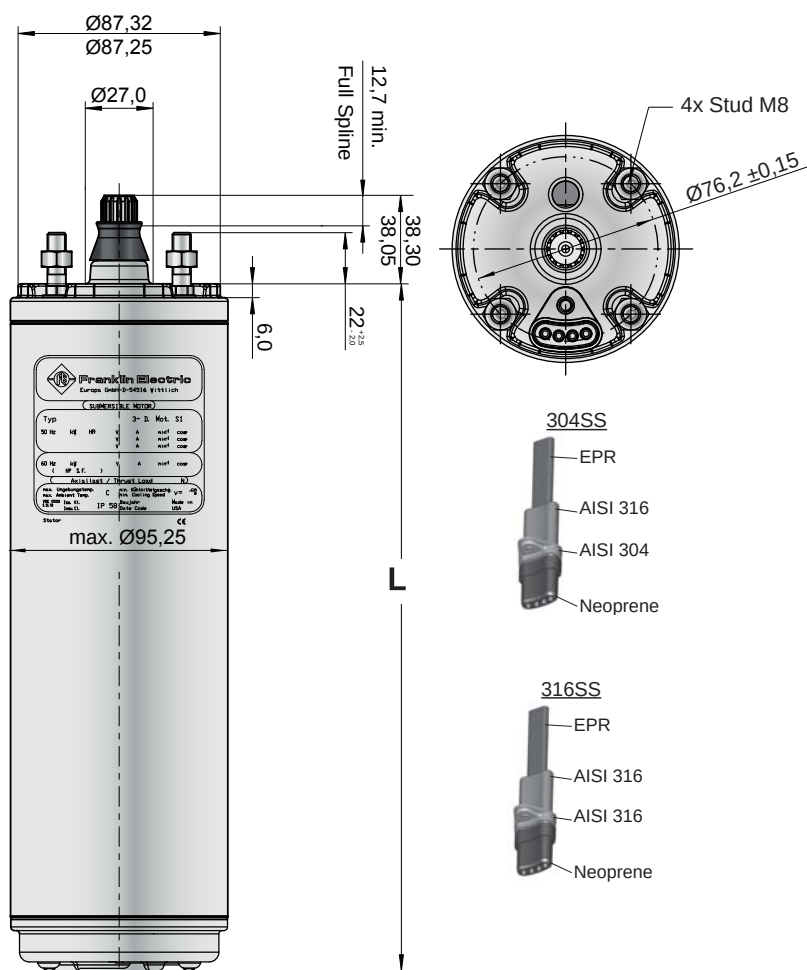
PSC Motor- Pollution Recovery Round Leads

$\varnothing$ [mm ²]	$\varnothing D$ [mm]
4X1,5	9,8 ± 0,3

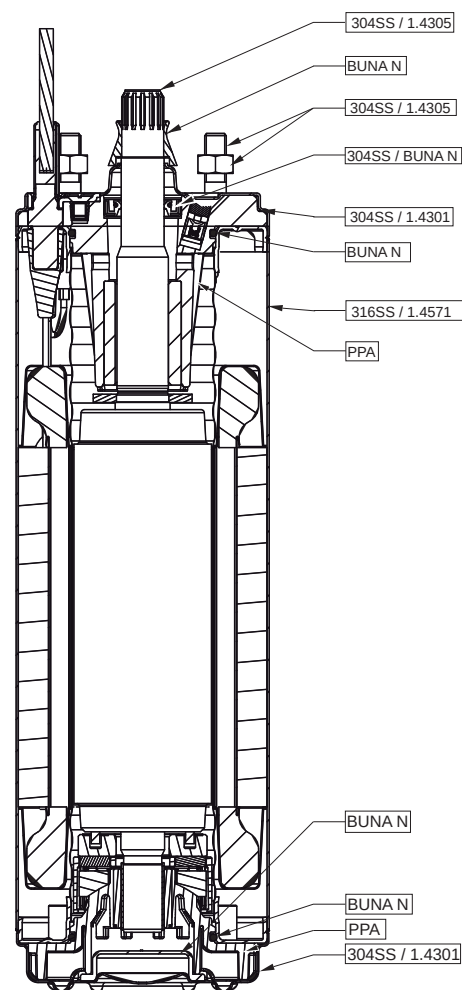
L [m]	304SS / 316 SS
1,5	310 318 501
2,5	310 318 502
5	310 318 505
10	310 318 510
15	310 318 515
20	310 318 520
30	310 318 530
40	310 318 540
50	310 318 550

Outline Drawing PSC Motors



Tolerances according to NEMA MG 1-18.388

Material Description

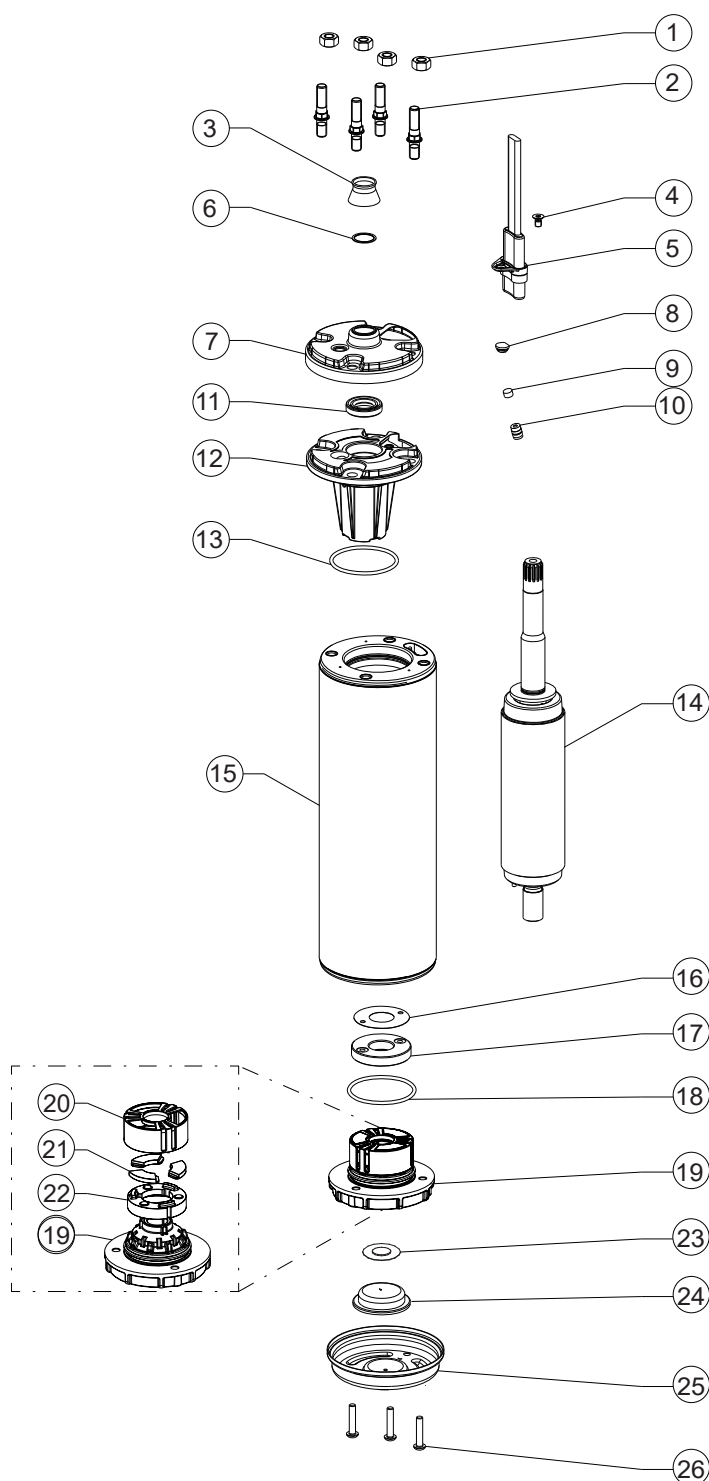


4" PSC Motors Lengths and Weights / Packing sizes

P _N		L [mm]	M [kg]	Motor with Lead in single pack		Motor Package size (40 motors per packing unit)	
				[mm]	[kg]	[mm]	[kg]
0,25	0,33	237,2	6,55	400 x 100 x 110	7,25	800 x 500 x 870	262,0
0,37	0,50	251,1	7,20	400 x 100 x 110	7,9	800 x 500 x 870	306,8
0,55	0,75	276,2	8,35	530 x 100 x 110	9,05	800 x 500 x 870	352,8
0,75	1,00	297,2	9,30	530 x 100 x 110	10,0	800 x 500 x 870	390,8
1,10	1,50	321,2	10,45	530 x 100 x 110	11,15	800 x 500 x 870	436,8
1,50	2,0	353,2	11,90	796 x 100 x 110	12,6	800 x 500 x 870	494,8
2,20	3,0	451,2	16,65	796 x 100 x 110	17,35	800 x 500 x 870	684,8



4" PSC Motor Part Description Design start: 07.2016



Pos.	Part Description	Qty.	Part No.
1	Nut M8	4	Kit C
2	Stud M8	4	Kit C
3	Protector, Spline	1	Kit B
4	Screw (Motor lead)	1	Kit C
5	Motor lead	1	see page 11
6	Washer	1	Kit B
7	Top Endbell, Cover	1	Kit
8	Plug	1	Kit B
9	Filter	1	Kit B
10	Valve	1	Kit
11	Shaft Seal	1	Kit B
12	Top Endbell	1	Kit
13	O- Ring	1	Kit B
14	Rotor	1	see page 9
15	Stator	1	see page 9
16	Level washer	1	Kit A
17	Thrust disk assy	1	Kit A
18	O- Ring	1	Kit B
19	Bottom Endbell	1	A1
20	Bearing cage	1	Kit A
21	Segments	3	Kit A
22	Rocking Disk	1	Kit A
23	Diaphragm washer	1	Kit B1
24	Diaphragm	1	Kit B
25	Bottom Endbell Cover	1	156 414 201
26	Screw, Cover	3	Kit C

4" PSC Motor Spare Part Kits Design start: 07.2016

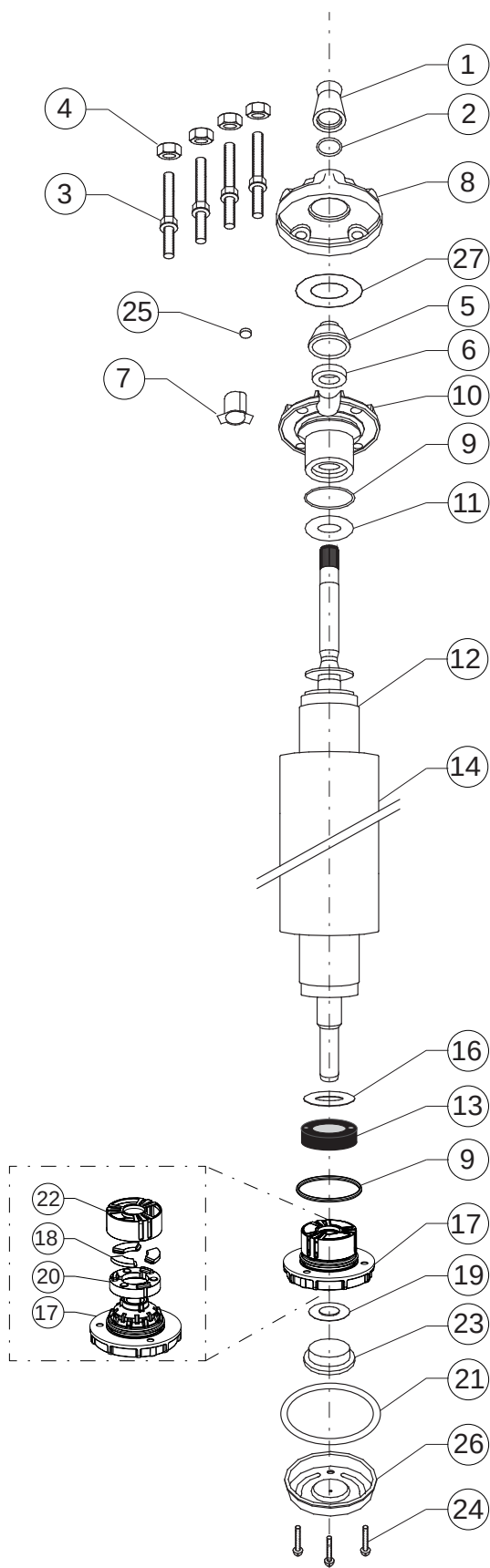
P_N [kW]	0,25 - 2,2kW		
Kit A1	End bell, upper 304SS (Pos. 7 - 13)	incl. Pos.: 7 - 13	308 462 901
Kit A2	Endbell lower incl. Thrust Bearing Kit 4000N	incl. Pos.: 16 - 22	308 464 911
Kit B1	Seal Kit 304SS	incl. Pos.: 3, 6, 8, 9, 11, 13, 18, 23, 24	308 650 201
Kit B2	Seal Kit Pollution Recovery	incl. Pos.: 3, 6, 8, 9, 11, 13, 18, 23, 24	308 650 202
Kit C	Fastener Kit 304SS	incl. Pos.: 1, 2, 4, 26	308 656 201

PSC Replacement Stator (316SS) and Rotor 50 Hz

P_N [kW]	Volt	Motor Model No.	Stator	Rotor
0,25	220-230	254 803 6700 / L	305 491 701	178 165 951K
	230-240	254 813 6700 / L	305 491 721	
0,37	220-230	254 805 6700 / L	305 491 702	178 165 952K
	230-240	254 815 6700 / L	305 491 722	
0,55	220-230	254 807 6700 / L	305 491 703	178 165 953K
	230-240	254 817 6700 / L	305 491 723	
0,75	220-230	254 808 6700 / L	305 491 704	178 165 954K
	230-240	254 818 6700 / L	305 491 724	
1,10	220-230	254 809 6700 / L	305 491 705	178 165 955K
	230-240	254 819 6700 / L	305 491 725	
1,50	220-230	254 810 6700 / L	305 491 706	178 165 956K
	230-240	254 820 6700 / L	305 491 726	
2,20	220-230	254 811 6700 / L	305 491 707	178 165 957K
	230-240	254 821 6700 / L	305 491 727	



4" PSC Standard Motor* Part Description Design up to: 06.2016



Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit B
2	Washer	4	Kit B
3	Stud	4	Kit C
4	Nut	1	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 11
13	Thrust disk assy	1	Kit A
14	Stator	1	page 9
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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, Cover	3	Kit C
25	Filter	1	Kit B
26	Bottom Endbell Cover		156 414 101
27	Washer	1	Kit B

* Spare Parts for Pollution Recovery and Brackish Water Motors on Request

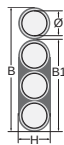
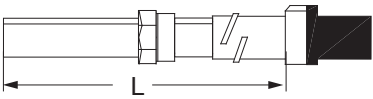
4" PSC Standard Motor* Spare Part Kit's Design up to: 06.2016

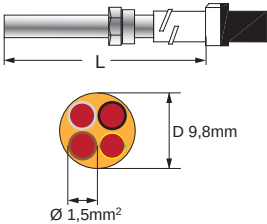
P _N [kW]	Thrust Bearing	End bell, upper (Pos. 5 - 10, 27)	End bell, lower (Pos. 17)	Up thrust washer (Pos. 11)
0,25 - 0,55	Kit A1	177 231 904	Kit A1	150 954 102
0,75 - 1,5		177 233 904		151 093 105
2,2		(0,75 - 2,2kW)		
Kit A1	End bell (lower) incl. Thrust bearing Kit 3000N/4000N		inkl. Pos.: 9, 13, 16, 17, 18, 20, 22	308 464 901
Kit B1	Seals Kit		inkl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 101
Kit B2	Seals Kit (Viton)		inkl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 104
Kit C	Screws Kit		inkl. Pos.: 3, 4, 24	308 656 101

PSC Replacement Stator and Rotor 50 Hz

P _N [kW]	Volt	Motor Model No.	Stator	Rotor
0,25	220-230	254 803 1621 / L	305 491 101	178 610 902K
	230-240	254 813 1621 / L	305 491 121	
0,37	220-230	254 805 1621 / L	305 491 102	178 611 902K
	230-240	254 815 1621 / L	305 491 122	
0,55	220-230	254 807 1621 / L	305 491 103	178 612 902K
	230-240	254 817 1621 / L	305 491 123	
0,75	220-230	254 808 1621 / L	305 491 104	178 613 902K
	230-240	254 818 1621 / L	305 491 124	
1,10	220-230	254 809 1621 / L	305 491 105	178 614 902K
	230-240	254 819 1621 / L	305 491 125	
1,50	220-230	254 810 1621 / L	305 491 106	178 615 902K
	230-240	254 820 1621 / L	305 491 126	
2,20	220-230	254 811 2521 / L	305 491 107	178 616 902K
	230-240	254 821 2521 / L	305 491 127	

VDE / ACS/ KTW Approved Standard Motor 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]	PSC Motor Leads		
	Brass	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	Pollution Recovery Motor Leads	
[m]	Model number (only 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.

4" Super Stainless PSC Motor Set

Submersible Motor Set

Quality in the Well

In an effort to ease our customers ordering, stock holding and inventory management, Franklin Electric Europa GmbH is introducing the PSC Motor Kit.

Consisting of the submersible motor, control box, motor short lead and splicing kit all packaged into one compact yet sturdy box, this kit is the ideal stock item to drive your pump.



Product advantages:

- One stop shop – no hassle selecting different components to work together
- Everything available at the same time
- All components matched and warranted by Franklin Electric
- Maximum flexibility – one motor kit can drive as many as 5 different pump models
- Any practical drop cable length (up to 10mm²) can be spliced using included kit
- available with SubStartSC Motorstarter or SubTronicSC Motor Protection Box

Technical Specifications

- Motor range 0,25 - 2,2kW
- 4" PSC Motor with NEMA flange
- Motor protection level: IP 68
- Box protection level: IP 54
- Voltage: 220 - 240V; - 6 / +10 %; 50Hz single phase

Options

- Motor cable VDE / ACS / KTW approved (1,5m; and special lengths available)

PSC Motor Set Model numbers

P _N [kW]	U _N [V]	Model No.	
		Standard PSC Motor Set with SubStartSC Box	PSC Motor Set with SubTronicSC Box
0,25	220-230	254 803 6700C	254 803 6700D
	230-240	254 813 6700C	254 813 6700D
0,37	220-230	254 805 6700C	254 805 6700D
	230-240	254 815 6700C	254 815 6700D
0,55	220-230	254 807 6700C	254 807 6700D
	230-240	254 817 6700C	254 817 6700D
0,75	220-230	254 808 6700C	254 808 6700D
	230-240	254 818 6700C	254 818 6700D
1,10	220-230	254 809 6700C	254 809 6700D
	230-240	254 819 6700C	254 819 6700D
1,50	220-230	254 810 6700C	254 810 6700D
	230-240	254 820 6700C	254 820 6700D
2,20	220-230	254 811 6700C	254 811 6700D
	230-240	254 821 6700C	254 821 6700D

PSC Motor Set Description

The PSC Motor

Submersible Motors

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

The single phase PSC motor has been electrically optimized to offer reliable pump starting over a wide range of incoming voltages. It should ideally be combined to the Franklin Electric SubStart/SubTronicSC control boxes for maximum system performance, protection and warranty.

Product advantages:

- 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

Technical specification:

- Motor range: 0,25 – 2,2kW
- 4" NEMA flange
- Rotation: CCW facing shaft end (CW upon request)
- Degree of protection: IP68
- Insulation: Cl.B
- Rated ambient temperature: max. 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%
- Protection requirements: EN 60947-4-1



The SubStartSC® / SubTronicSC® Single phase - Submersible Motor Starter/Protection*

The SubStartSC and SubTronicSC range covers all PSC motors from 0.25kW to 2.2kW for all voltages. Ergonomic design, attention to detail and unique features make the SubStartSC® motor starter range your first choice when considering submersible motor protection. In conjunction with Franklin Electric submersible motors you now have an tangible water system advantage resulting in ease of installation and reliable protection.

Product features:

- Attention to detail – every aspect engineered for the application
- The complete package – The device is 100% compatible with the motor characteristics
- All in one name – Reliability backed by the leader in submersible motors

* For detailed product information, please see page: 206-207 and 210-211



The Lead Termination Kit 1,5 - 10mm²

- 4 wire
- 1,5 - 10mm²
- up to 1,2kV





4" Super Stainless 2- wire

Submersible Motors

Quality in the well

Franklin Electric 4" encapsulated submersible motors, built in ISO 9001 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 15)



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:

- 0,37 – 1,1kW
- 4" NEMA flange
- Rotation: CCW facing shaft end (CW upon request)
- Degree of protection: IP68
- Insulation: CI.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 60947-4-1

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" 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

* Lead lengths Motors "L" : with 1.5m preassembled cabl

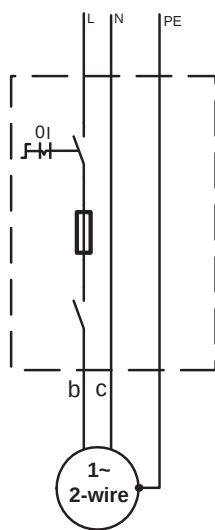
Performance Data 220 / 230 Volt 50 Hz

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

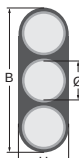
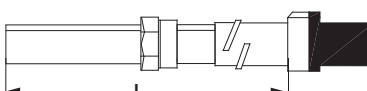
P _N [kW]	Volt	Motor Ref.	Ohm [Ω]
0,37	230	244 755 1221 / L	7,2 - 8,8
0,55		244 757 1221 / L	5,0 - 6,1
0,75		244 758 1221 / L	3,6 - 4,4
1,10		244 759 1221 / L	2,3 - 2,8

Electrical Connection



b	c	PE
brown	grey	yellow/green

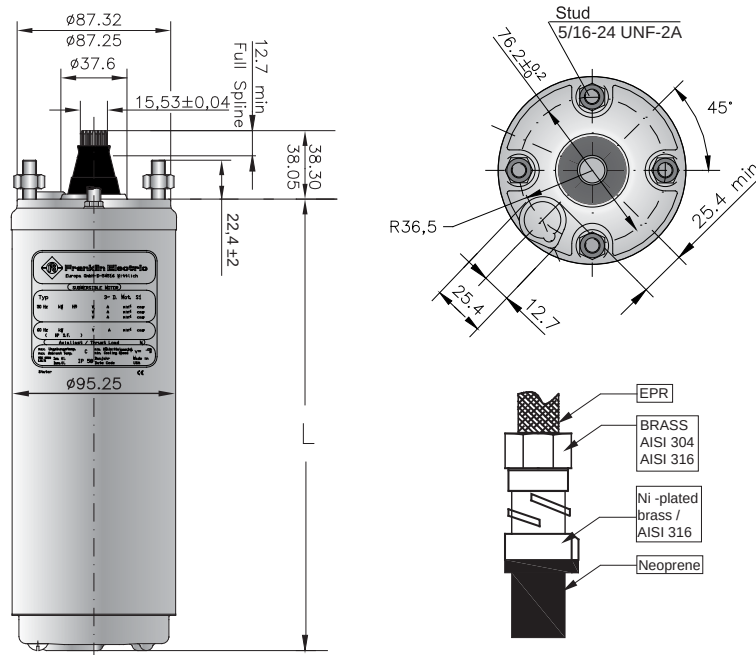
VDE / ACS / KTW Approved Leads*

Ø [mm ²]	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.

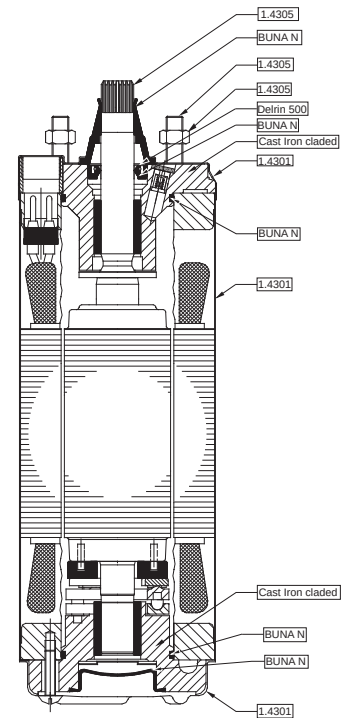
4" 1~ Motor Outlines 2-wire

Outline Drawing



Tolerances according to NEMA MG 1-18.388

Material Description

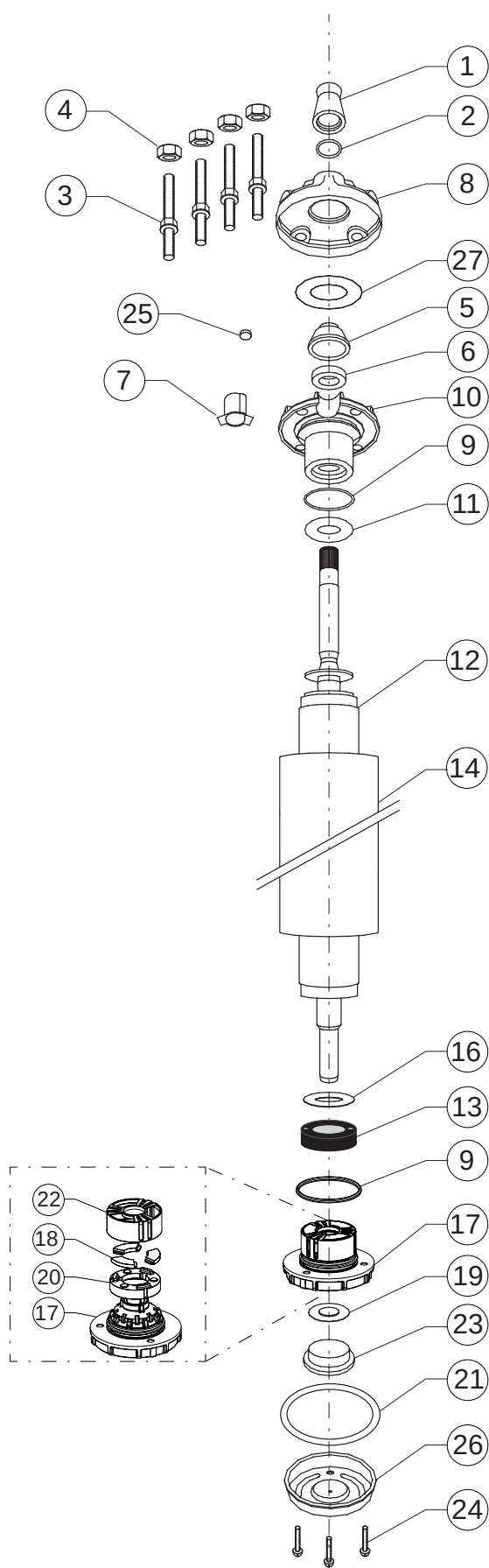


4" 2-wire Standard Lengths & Weights

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 19
13	Thrust disk assy	1	Kit A
14	Stator	1	page 19
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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



4" Super Stainless 3-wire

Submersible Motors

Quality in the Well

Franklin Electric 4" encapsulated submersible motors, built in ISO 9001 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.



Features:

- Hermetically sealed stator with 316SS shell. 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

Pollution Recovery Motor Version Specifications:

- Fluorelastomere (Viton®) rubber parts
- Special Polyurethane (PUR) lead assemblies
- 304SS (316SS Stator) graded stainless steel as standard

Technical specification:

- 0,25 – 2,2kW
- 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 from nominal: -10% / +6%
- Protection requirements: EN 60947-4-1

Optional:

- Motors in full 316SS
- Various cable lengths
- Alternative material executions

4" 3- wire Motor Numbers 50Hz

P _N [kW]	U _N [V]	Digit 1-6	Digit 7-10							
			304SS (Single pack, with Lead)*	304SS (40 motors packing unit)	304SS Pollution Recovery (Single pack, with Lead)*	304SS Pollution Recovery (40 motors packing unit)	316SS (Single pack, with Lead)*	316SS (40 motors packing unit)	316SS Pollution Recovery (Single pack, with Lead)*	316SS Pollution Recovery (40 motors packing unit)
0,25	220 / 230	214 753	6700L	6700	6715L	6715	6800L	6800	6815L	6815
0,37	220 / 230	214 755	6700L	6700	6715L	6715	6800L	6800	6815L	6815
0,55	220 / 230	214 757	6700L	6700	6715L	6715	6800L	6800	6815L	6815
0,75	220 / 230	214 758	6700L	6700	6715L	6715	6800L	6800	6815L	6815
1,10	220 / 230	224 750	6700L	6700	6715L	6715	6800L	6800	6815L	6815
1,50	220 / 230	224 751	6700L	6700	6715L	6715	6800L	6800	6815L	6815
2,20	220 / 230	224 752	6700L	6700	6715L	6715	6800L	6800	6815L	6815

* Lead lengths Motors "L" : up to 1.5kW with 1.5m preassembled cable, starting at 2.2 kW with 2.5m pre-mounted cable

4" 3-Wire Performance Data 50 Hz

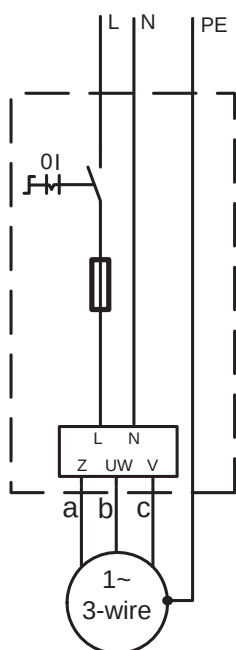
P _N [kW]	Thrust F [N]	U _N [V]	n _N [min-1]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cos φ (Pf.) at % load			T _N [Nm]	T _A [Nm]
						50	75	100	50	75	100		
0,25	4000	220	2850	2,8	9,3	43	50	53	0,61	0,70	0,78	0,83	1,45
		230	2870	2,8	9,7	42	50	53	0,58	0,67	0,75	0,83	1,65
0,37	4000	220	2855	3,9	13,1	48	55	56	0,58	0,69	0,77	1,23	1,90
		230	2870	4,0	13,7	46	53	56	0,55	0,65	0,74	1,23	2,05
0,55	4000	220	2860	5,9	20,6	46	53	56	0,58	0,69	0,77	1,84	3,0
		230	2880	5,9	21,6	45	53	56	0,53	0,64	0,73	1,82	3,2
0,75	4000	220	2850	7,3	26,6	53	59	60	0,59	0,71	0,79	2,5	3,8
		230	2870	7,3	27,8	51	58	61	0,55	0,67	0,76	2,5	4,2
1,1	4000	220	2875	8,6	41,3	63	68	69	0,69	0,80	0,87	3,7	6,9
		230	2885	8,6	41,2	60	67	68	0,65	0,76	0,84	3,7	6,8
1,5	4000	220	2860	10,6	55,4	66	71	71	0,75	0,85	0,91	5,0	9,6
		230	2875	10,4	53,3	64	70	71	0,69	0,81	0,88	4,9	9,5
2,2	4000	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



Standard Windings Resistance 50 Hz 304SS / 316SS Motors

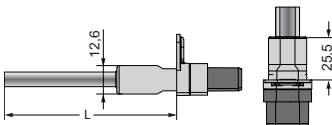
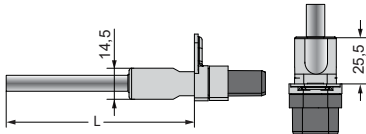
P_N [kW]	U_N [V]	Stator Ref.	Main phase Ohm	Start phase Ohm
220 / 230	326 807 942 / 952	10,6 - 13,0	38,3 - 46,8	38,3 - 46,8
220 / 230	326 808 942 / 952	7,3 - 8,9	23,9 - 29,3	23,9 - 29,3
220 / 230	326 809 942 / 952	4,8 - 5,8	18,5 - 22,7	18,5 - 22,7
220 / 230	326 810 942 / 952	3,5 - 4,3	14,8 - 18,0	14,8 - 18,0
220 / 230	326 811 942 / 952	2,6 - 3,2	6,9 - 8,4	6,9 - 8,4
220 / 230	326 812 942 / 952	2,0 - 2,4	5,3 - 6,4	5,3 - 6,4
220 / 230	326 813 942 / 952	1,3 - 1,6	3,8 - 4,6	3,8 - 4,6

Electrical connection 3-wire Motors



a	b	c	PE
black	brown	grey	yellow/green

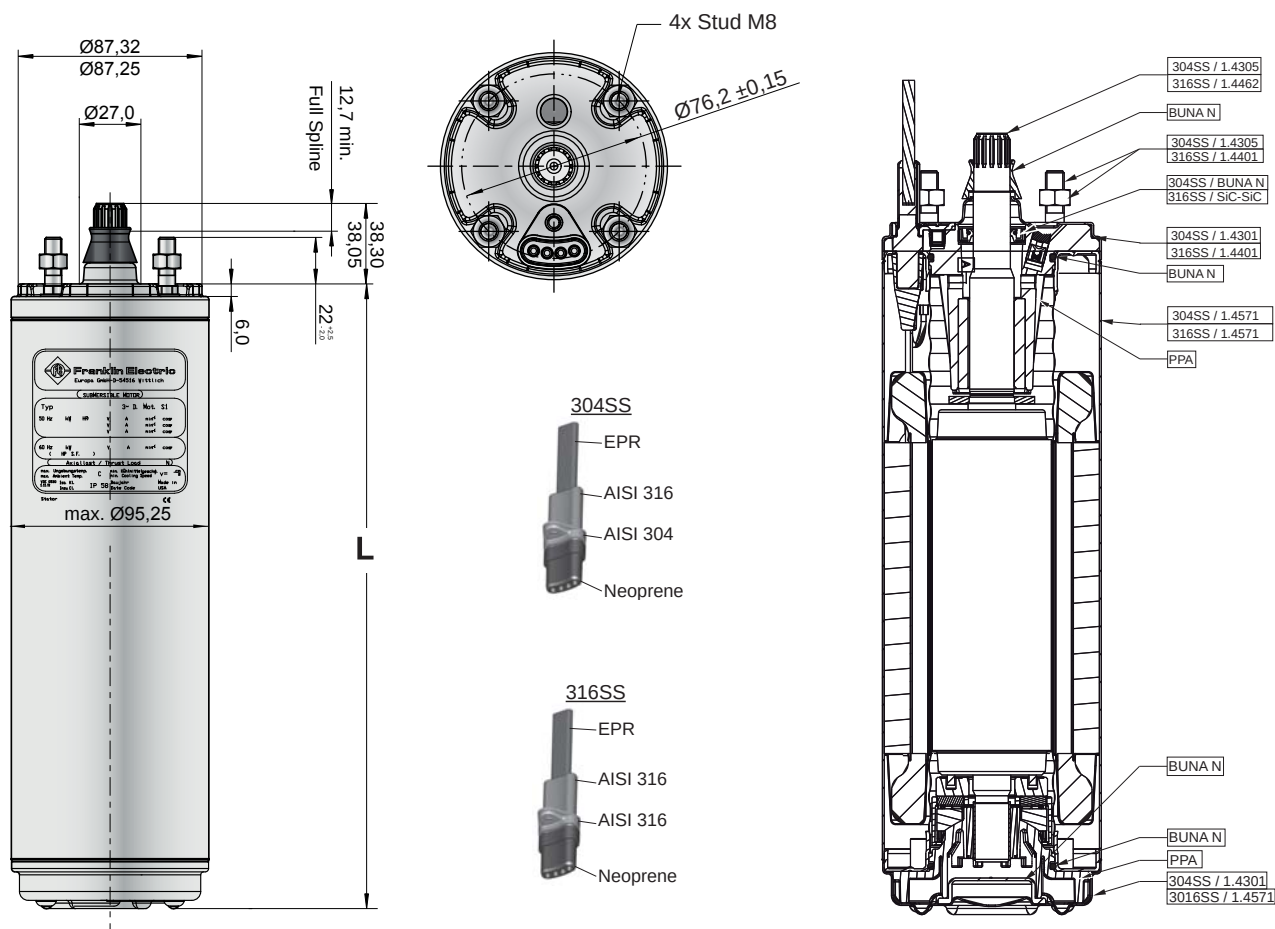
Motor Leads*

Ø [mm²]		B [mm]	H [mm]
4X1,5		14,6 ± 0,3	5,1 ± 0,3
			
L	3 wireMotor- Flat Leads		
[m]	304SS / 316 SS		
1,5	310 178 501		
2,5	310 178 502		
5	310 178 505		
10	310 178 510		
15	310 178 515		
20	310 178 520		
30	310 178 530		
40	310 178 540		
50	310 178 550		
Ø [mm²]		Ø D (mm)	
4X1,5		9,8 ± 0,3	
			
L	3 wire Motor- Pollution Recovery Round Leads		
[m]	304SS / 316 SS		
1,5	310 318 501		
2,5	310 318 502		
5	310 318 505		
10	310 318 510		
15	310 318 515		
20	310 318 520		
30	310 318 530		
40	310 318 540		
50	310 318 550		

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

Standard 0,25 - 3,7kW

Material Description



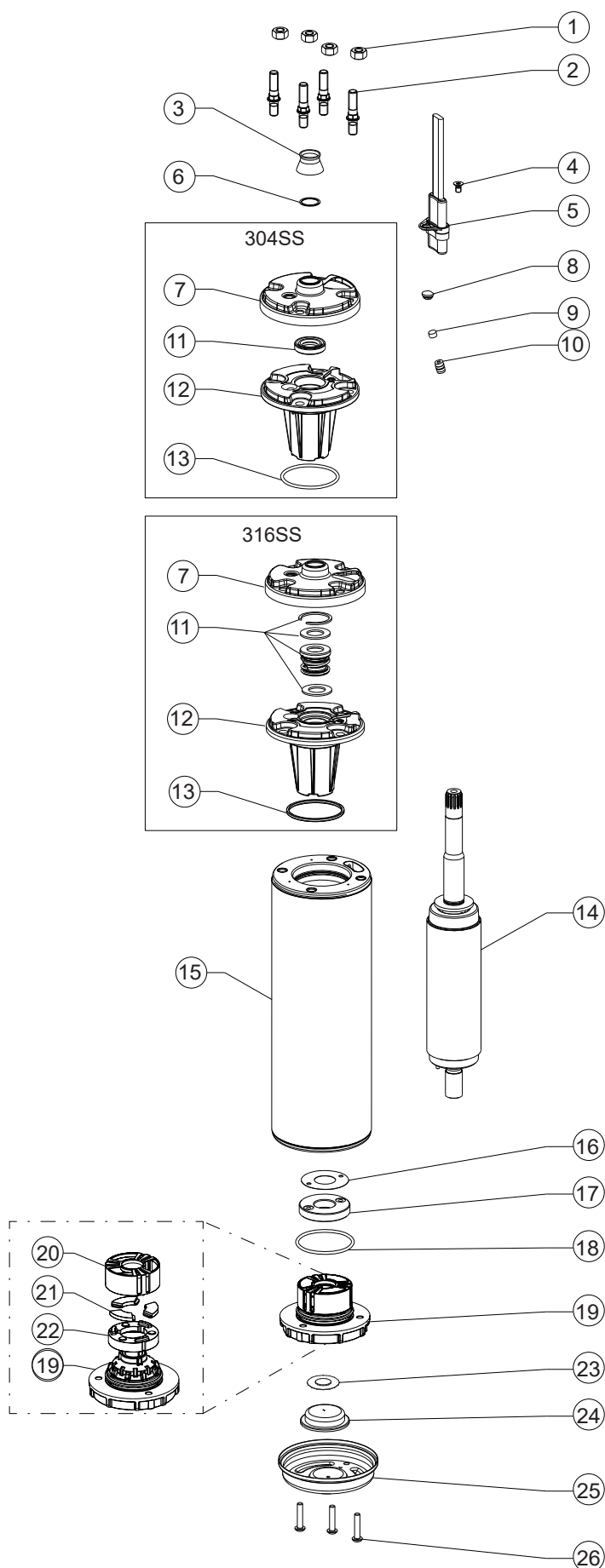
Tolerances according to NEMA MG 1-18.388

4" 3-wire Motors Lengths and Weights / Packing sizes

P_N		L [mm]	M [kg]	Motor with Lead in single pack		Motor Package size (40 motors per packing unit)	
[kW]	[HP]			[mm]	[kg]	[mm]	[kg]
0,25	0,33	237,2	5,58	400 x 100 x 110	6,3	800 x 500 x 870	242
0,37	0,50	251,1	6,40	400 x 100 x 110	7,2	800 x 500 x 870	274,8
0,55	0,75	271,2	7,25	530 x 100 x 110	8,0	800 x 500 x 870	308,8
0,75	1,00	297,2	8,55	530 x 100 x 110	9,3	800 x 500 x 870	360,8
1,10	1,50	353,2	11,05	796 x 100 x 110	11,8	800 x 500 x 870	460,8
1,50	2,0	364,2	11,5	796 x 100 x 110	12,3	800 x 500 x 870	478,8
2,20	3,0	451,2	16,65	796 x 100 x 110	17,35	800 x 500 x 870	684,8



4" 3- wire Motors Parts Description Design start 07.2016



Pos.	Part Description	Qty.	Part No.
1	Nut M8	4	Kit C
2	Stud M8	4	Kit C
3	Protector, Spline	1	Kit B
4	Screw (Motor lead)	1	Kit C
5	Motor lead	1	see page 22
6	Washer	1	Kit B
7	Top Endbell, Cover	1	Kit
8	Plug	1	Kit B
9	Filter	1	Kit B
10	Valve	1	Kit
11	Shaft Seal	1	Kit B
12	Top Endbell	1	Kit
13	O- Ring	1	Kit B
14	Rotor	1	see page 25
15	Stator	1	see page 25
16	Level washer	1	Kit A
17	Thrust disk assy	1	Kit A
18	O- Ring	1	Kit B
19	Bottom Endbell	1	A1
20	Bearing cage	1	Kit A
21	Segments	3	Kit A
22	Rocking Disk	1	Kit A
23	Diaphragm washer	1	Kit B
24	Diaphragm	1	Kit B
25	Bottom Endbell Cover 304SS	1	156 414 201
	Bottom Endbell Cover 316SS		156 414 301
26	Screw, Cover	3	Kit C

4" 3- wire Spare Parts 304SS and 316SS Design start 07.2016

P_N [kW]	0,25 - 2,2kW		
Kit A1	End bell, upper 304SS (Pos. 7 - 13)	incl. Pos.: 7 - 13	308 462 901
	End bell, upper 316SS (Pos. 7 - 13)		308 462 951
Kit A2	Endbell lower incl. Thrust Bearing Kit 4000N	incl. Pos.: 16 - 22	308 464 911
Kit B	Seal Kit 304SS	incl. Pos.: 3, 6, 8, 9, 11, 13, 18, 23, 24	308 650 201
	Seal Kit 304SS Pollution Recovery		308 650 251
	Seal Kit 316SS		308 650 251
	Seal Kit 316SS Pollution Recovery		308 650 252
Kit C	Fastener Kit 304SS	incl. Pos.: 1, 2, 4, 26	308 656 201
	Fastener Kit 316SS		308 656 251

Replacement 304SS Motors 3- wire Stators and Rotors 50 Hz Design start 07.2016

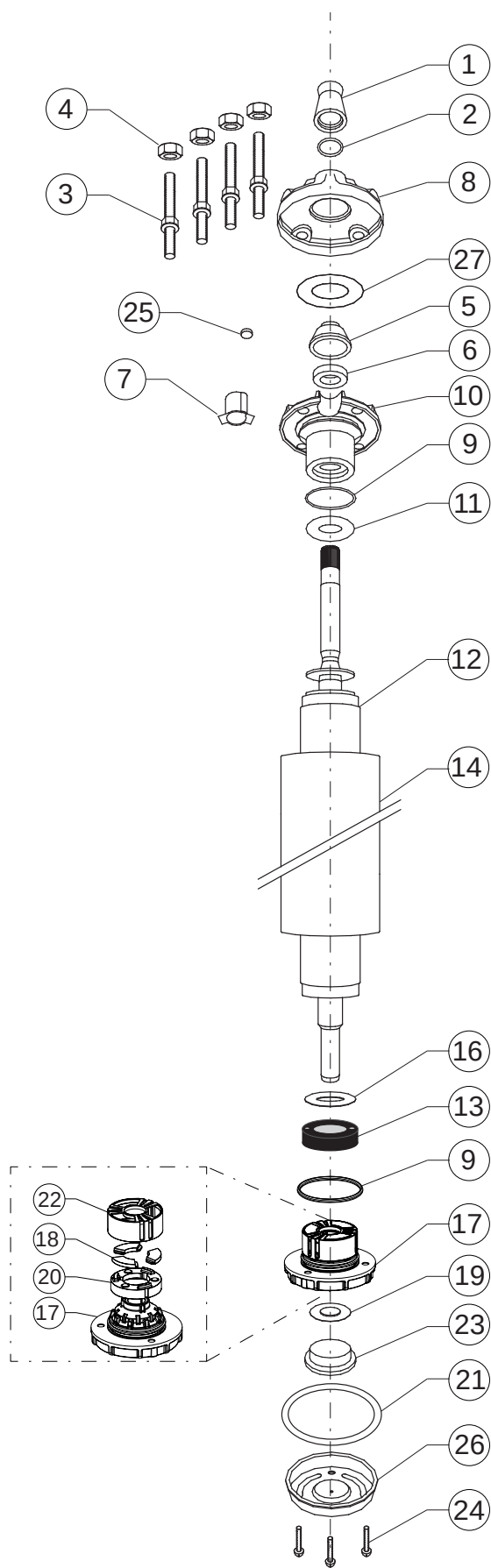
P_N [kW]	U_N [V]	Motor Nb.	Stator	Rotor
0,25	220 / 230	214 753 6700/6715	305 491 741	178 164 901K
0,37	220 / 230	214 755 6700/ 6715	305 491 742	178 164 902K
0,55	220 / 230	214 757 6700/ 6715	305 491 743	178 164 903K
0,75	220 / 230	214 758 6700/ 6715	305 491 744	178 164 905K
1,10	220 / 230	224 750 6700/ 6715	305 491 745	178 164 908K
1,50	220 / 230	224 751 6700/ 6715	305 491 746	178 164 909K
2,20	220 / 230	224 752 6700/ 6715	305 491 747	178 164 911K

Replacement 316SS Motors 3- wire Stators and Rotors 50 Hz Design start 07.2016

P_N [kW]	U_N [V]	Motor Nb.	Stator	Rotor
0,25	220 / 230	214 753 6800/6815	305 491 741	178 164 951K
0,37	220 / 230	214 755 6800/6815	305 491 742	178 164 952K
0,55	220 / 230	214 757 6800/6815	305 491 743	178 164 953K
0,75	220 / 230	214 758 6800/6815	305 491 744	178 164 955K
1,10	220 / 230	224 750 6800/6815	305 491 745	178 164 958K
1,50	220 / 230	224 751 6800/6815	305 491 746	178 164 959K
2,20	220 / 230	224 752 6800/6815	305 491 747	178 164 961K



4" 3- wire Motors* 304SS Parts Description Design up to 06.2016



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 27
13	Thrust disk assy	1	Kit A
14	Stator	1	page 27
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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

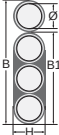
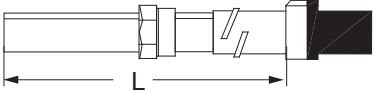
4" 3- wire Spare Parts 304SS Design up to 06.2016

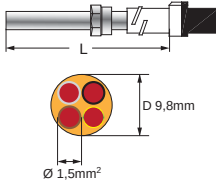
P _N [kW]	Thrust Bearing	End bell upper Pos. 5 - 10, 27	End bell, Lower Pos. 17	Upthrust washer Pos. 11
0,25 - 0,55	Kit A1	177 231 904	Kit A1	150 954 102
0,75		177 233 904		151 093 105
1,10 – 1,5				
2,2				
Kit 1500N 0,25 – 0,55kW up to 07.2008	Thrust bearing Kit		incl. Pos.: 13, 15, 16, 18	
Kit A1	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		incl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 101
Kit B2	Seal Kit (Viton)		incl. Pos.: 1, 2, 6, 9, 21, 23, 25, 27	308 650 104
Kit C	Screw Kit		incl. Pos.: 3, 4, 24	308 656 101

Replacement Stators and Rotors 50 Hz Design up to 06.2016

P _N [kW]	U _N [V]	Motor No.	Stator	Rotor
0,25	220 / 230	214 753 1621 / L	305 491 141	178 156 902K
0,37	220 / 230	214 755 1621 / L	305 491 142	178 157 902K
0,55	220 / 230	214 757 1621 / L	305 491 143	178 158 902K
0,75	220 / 230	214 758 1621 / L	305 491 144	178 160 902K
1,10	220 / 230	224 750 1621 / L	305 491 145	178 163 902K
1,50	220 / 230	224 751 1621 / L	305 491 146	178 124 902K
2,20	220 / 230	224 752 2521 / L	305 491 147	178 126 902K

VDE / ACS / KTW Approved Leads* Design up to 06.2016

Ø [mm²]	B [mm]	B1 [mm]	H [mm]	L [m]	Part Numbers	
					Standard	304 SS
3X1,5+1G1,5	16,8 ± 0,3	10,7 ± 0,3	5,0 ± 0,3	1,5	310 113 001	310 113 401
				2,5	310 113 002	310 113 402
				5	310 113 005	310 113 405
				10	310 113 010	310 113 410
				15	310 113 015	310 113 415
				20	310 113 020	310 113 420
				30	310 113 030	310 113 430
				40	310 113 040	310 113 440
				50	310 113 050	310 113 450

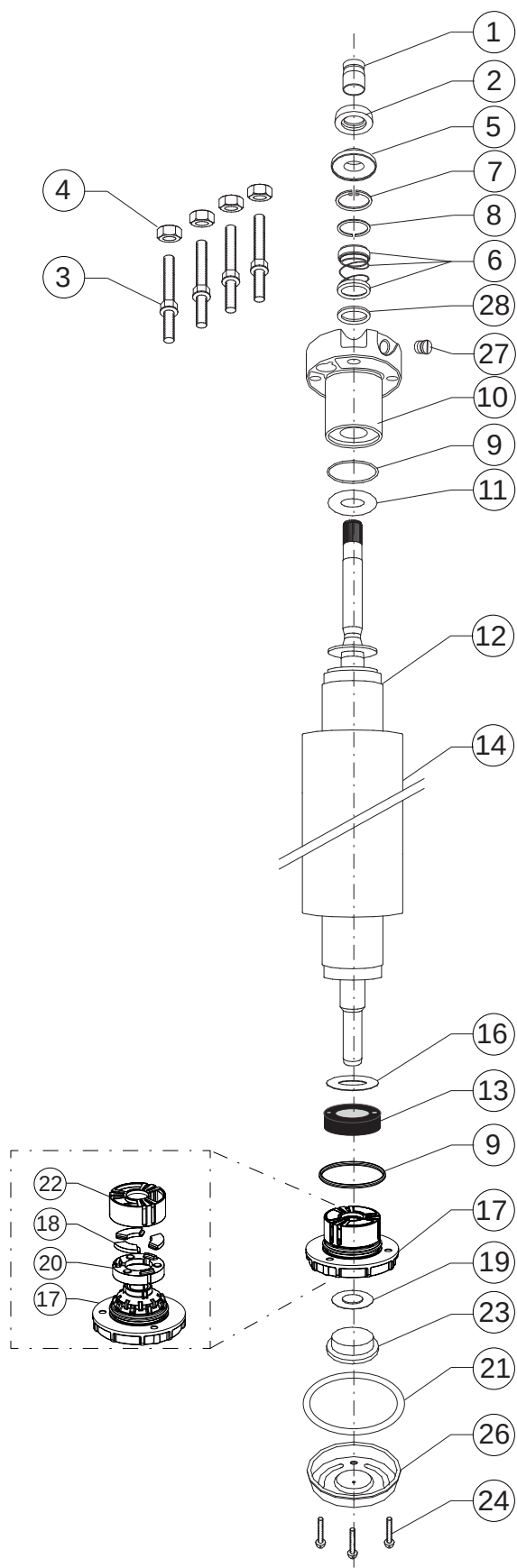
L [m]	Pollution Recovery Motor cable*	
	Modelnb. (only in 316SS)	
1,5	310 313 501	
2,5	310 313 502	
10	310 313 510	
20	310 313 520	
30	310 313 530	
40	310 313 540	
50	310 313 550	

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

* Spare Parts for Brackish Water Motors on Request



4" 3- wire Motors* 316SS Parts Description Design up to 06.2016



Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit C
2	Slinger	1	Kit C
3	Stud	4	Kit D
4	Nut	4	Kit D
5	Seal cover	1	Kit B + C
6	Shaft Seal	1	Kit B
7	Retain Ring	1	Kit B
8	Ring	1	Kit B
9	O-Ring	2	Kit B
10	Top Endbell	1	Kit
11	Upthrust washer	1	Kit
12	Rotor	1	page 29
13	Thrust disk assy	1	Kit A
14	Stator	1	page 29
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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 D
25	Valve		Incl. Pos.: 10
26	Bottom Endbell Cover	1	156 414 102
27	Sealing Screw	1	308 279 903
28	Washer	1	308 747 201

* Spare Parts for Brackish Water Motors on Request

4" 3- wire Spare Parts 316SS Design up to 06.2016

P _N [kW]	Thrust Bearing	End bell, upper (Pos. 10)	End bell, lower (Pos. 17)	Upthrust washer (Pos. 11)
0,25 - 0,55	Kit A1	177 390 955	Kit A1	308 268 104
0,75				
1,1 - 1,5				
2,2 - 3,0				
Kit 1500N up to 07.2008	Thrust bearing Kit		inkl. Pos.: 13, 15, 16, 18, 20	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 B	Seals		inkl. Pos.: 5, 6, 7, 8, 9, 21, 23	308 650 105
Kit B2	Seal Kit (Viton)		inkl. Pos.: 5, 6, 7, 8, 9, 21, 23	308 650 106
Kit C	Sand Protection Seal Kit		inkl. Pos.: 1, 2, 5	308 825 201
Kit D	Screw Kit		inkl. Pos.: 3, 4, 24	308 656 102

Replacement Standard Motor* Stators and Rotors 50 Hz

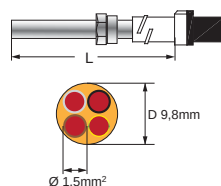
P _N [kW]	U _N [V]	Motor No.	Stator	Rotor
0,25	220 / 230	214 753 0521 / L	305 491 501	178 156 912K
0,37	220 / 230	214 755 0521 / L	305 491 502	178 157 912K
0,55	220 / 230	214 757 0521 / L	305 491 503	178 158 912K
0,75	220 / 230	214 758 0521 / L	305 491 504	178 160 912K
1,10	220 / 230	224 750 0521 / L	305 491 505	178 163 912K
1,50	220 / 230	224 751 0521 / L	305 491 506	178 124 912K
2,20	220 / 230	224 752 2221 / L	305 491 507	178 126 912K

VDE / ACS / KTW Approved Leads* Design up to 06.2016

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 316SS
1,5	310 113 501
2,5	310 113 502
5	310 113 505
10	310 113 510
15	310 113 515
20	310 113 520
30	310 113 530
40	310 113 540
50	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.

* Spare Parts for Brackish Water Motors on Request



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

Technical Specification

- 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

Pollution Recovery Motor Version Specifications:

- Fluorelastomere (Viton®) rubber parts
- Special Polyuretane (PUR) lead assemblies
- 304SS (316SS Stator) graded stainless steel as standard

Options

- Motor cable VDE, KTW approved (1,5m; special lengths available)
- Motors with factory- installed lead in Single Packing
- Built in lightning arrestors
- Built in overload protection
- 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			
			Standard		Pollution Recovery		Standard		Pollution Recovery	
			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 40 motors packing unit	Motors in single pack, with Lead*	Motors in 40 motors packing unit	Motors in single pack, with Lead*
2,2	220 / 230	224 752	3421	3421L	3422	3422L	3521	3521L	3522	3522L
3,7	220 / 230	224 753	3421	3421L	3422	3422L	3521	3521L	3522	3522L

* Lead lengths Motors "L": with 2.5m pre-mounted cable

4" 3-Wire High Thrust Performance Data 50 Hz

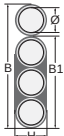
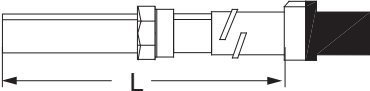
P _N [kW]	Thrust F [N]	U _N [V]	n _N [min-1]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cos φ (Pf.) at % load			T _N [Nm]	T _A [Nm]
						50	75	100	50	75	100		
2,2	6500	220	2875	15,2	71,2	67	73	74	0,76	0,86	0,91	7,3	13,8
		230	2885	15,3	74,5	63	70	73	0,69	0,80	0,88	7,3	15,0
3,7	6500	220	2880	22,5	97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

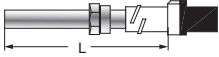
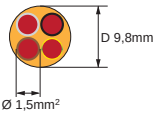
P _N [kW]	U _N [V]	Stator Ref.	Main phase Ohm	Start sphase Ohm
2,2	220 / 230	326 813 912	1,3 - 1,6	3,8 - 4,6
3,7	220 / 230	326 813 912	1,0 - 1,3	2,5 - 3,1



VDE / ACS / KTW Approved Leads*

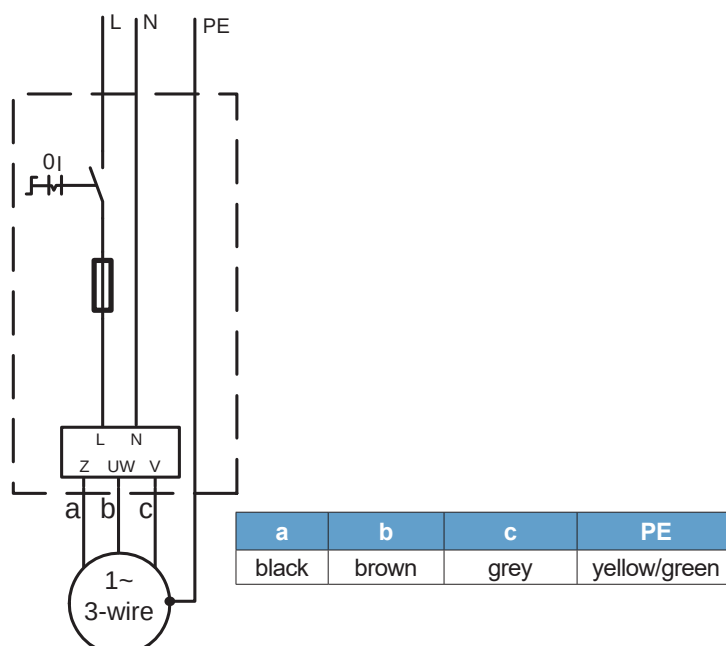
Ø [mm²]	B [mm]	B1 [mm]	H [mm]
3X1,5+1G1,5	16,8 ± 0,3	10,7 ± 0,3	5,0 ± 0,3
 			

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	

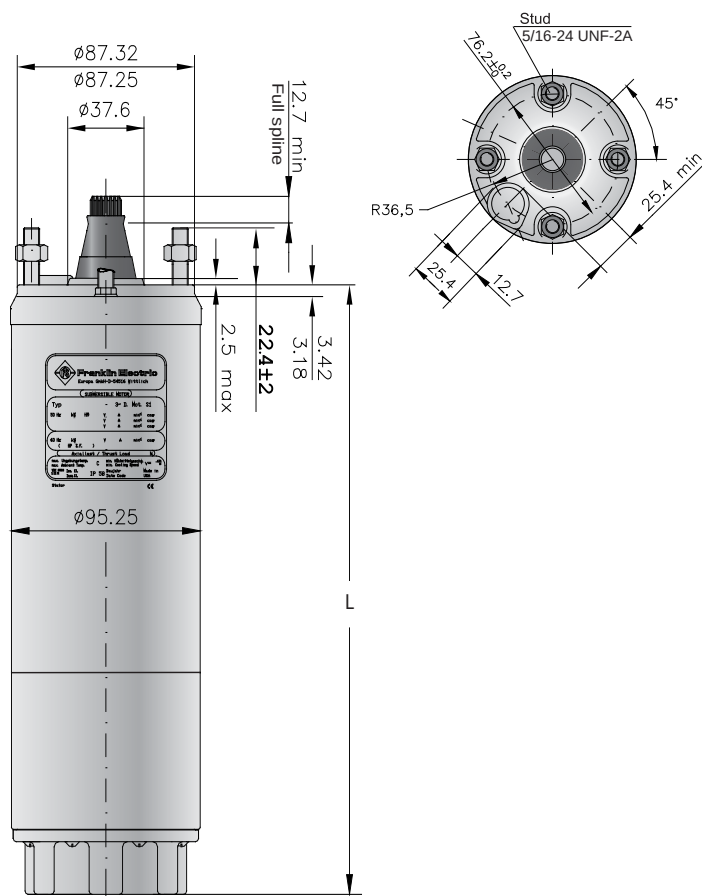
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.

Electrical Connection



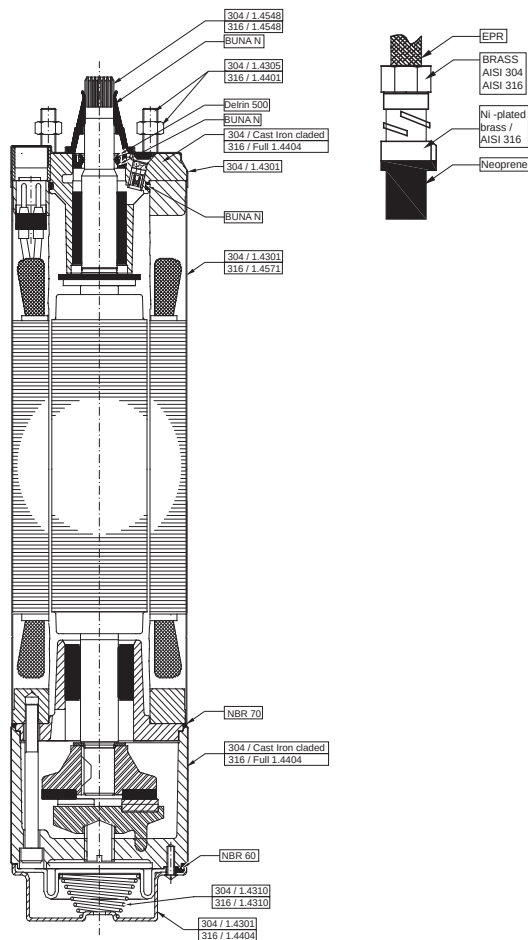
4" 3- wire Motors Lengths & Weights

High Thrust 2,2 - 3,7kW



Tolerances according to NEMA MG 1-18.388

Material Description

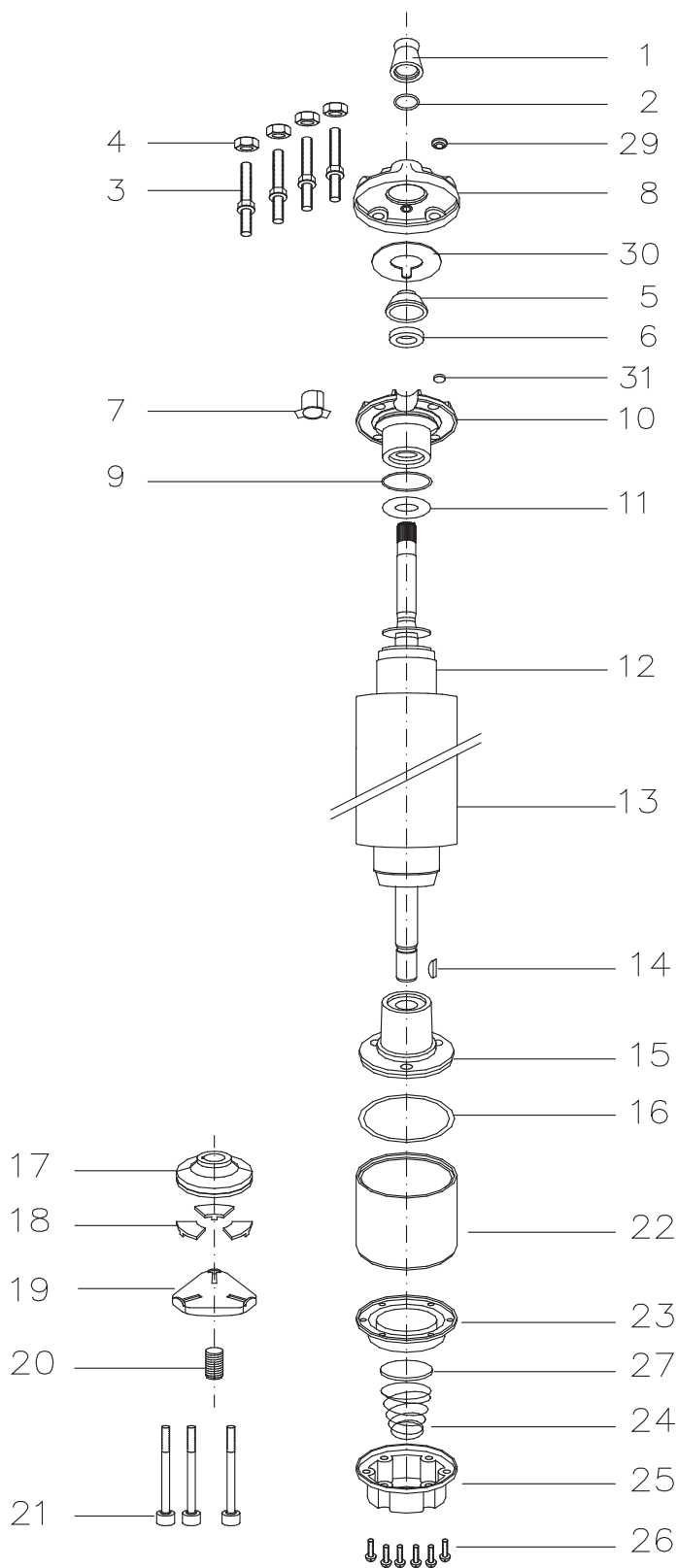


Standard High Thrust Version

P_N [kW]	304 L [mm]	316SS L [mm]	304 M [kg]	316SS M [kg]	Motor with Lead (in single pack)		
					[mm]	304 [kg]	316SS [kg]
2,2	520,2	529,4	21,3	21,8	796 x 100 x 110	23,1	23,6
3,7	652,5	661,7	26,4	27,3	904 x 100 x 110	28,5	29,4



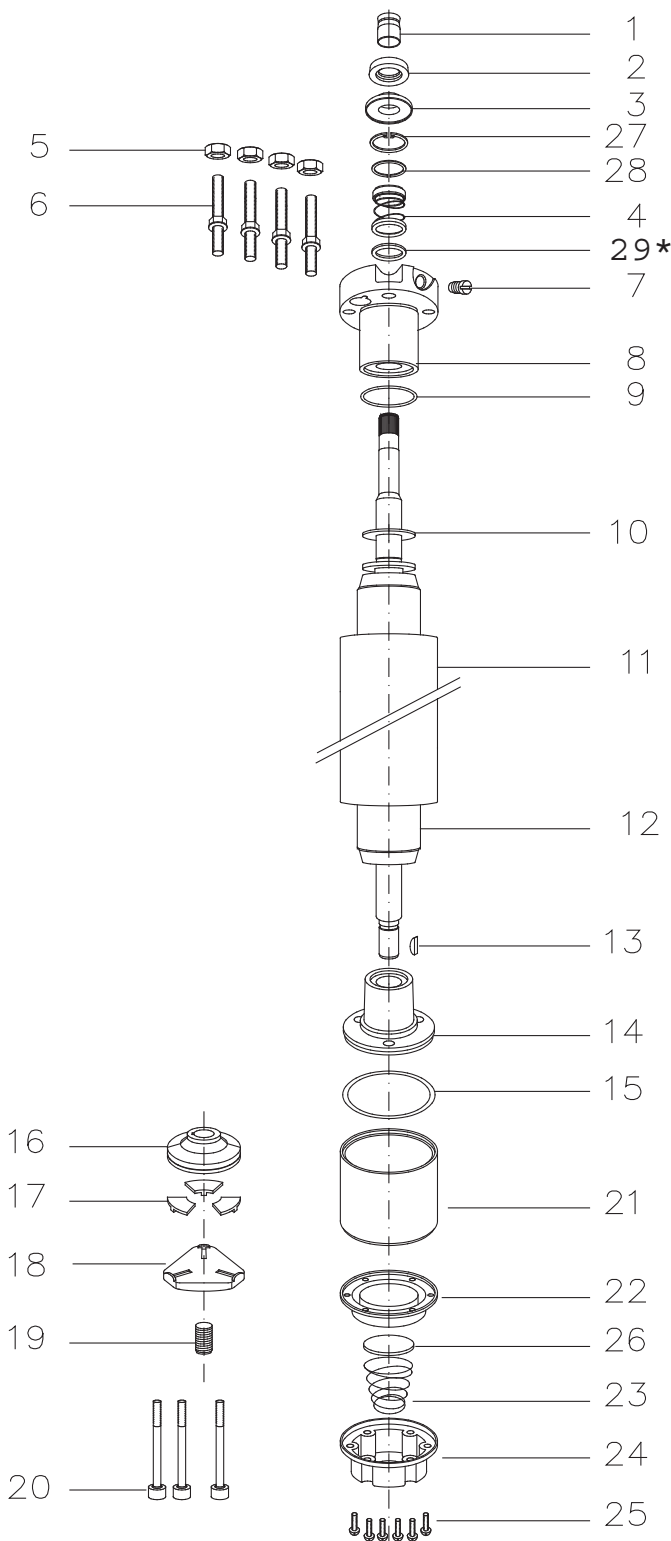
4" 3- wire Standard Motors* Parts List High Thrust 304



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

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

4" Super Stainless 3 Phase

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 three phase motor offers maximum life and highest efficiency under various load conditions. It should ideally be combined to the Franklin Electric SubStart/ SubTronic3P control boxes for maximum system performance, protection and warranty.



Product features

- Hermetically sealed stator with 316SS shell. 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

Pollution Recovery Motor-version Specifications

- Fluorelastomere (Viton®) rubber parts
- Special Polyuretane (PUR) lead assemblies
- 304 graded stainless steel as standard, 316SS as an option

Technical Specification

- 0,37 – 3kW
- 4" NEMA flange
- Rotation: reversible
- 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 from nominal: -10% / +6%
- Protection requirements: EN 61947-4-1

Options

- Built in lightning arrestors
- Motors in full 316SS
- Various cable lengths
- Special voltages
- Alternative material executions



3- Phasen 304SS / 316SS Model Numbers 50 Hz

P _N [kW]	U _N [V]	Digit 1 - 6	Digit 7 - 10							
			Standard 304SS		Pollution Recovery 304SS		Standard 316SS		Pollution Recovery 316SS	
			Single pack, with Lead*	40 motors packing unit	Single pack, with Lead*	40 motors packing unit	Single pack, with Lead*	40 motors packing unit	Single pack, with Lead*	40 motors packing unit
0,37	220, 230	234 751	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 761	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 791	6700L	6700	6715L	6715	6800L	6800	6815L	6815
0,55	220, 230	234 752	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 762	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 792	6700L	6700	6715L	6715	6800L	6800	6815L	6815
0,75	220, 230	234 753	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 763	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 793	6700L	6700	6715L	6715	6800L	6800	6815L	6815
1,10	220, 230	234 754	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 724	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 794	6700L	6700	6715L	6715	6800L	6800	6815L	6815
1,50	220, 230	234 755	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 725	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 795	6700L	6700	6715L	6715	6800L	6800	6815L	6815
2,20	220, 230	234 756	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 726	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 796	6700L	6700	6715L	6715	6800L	6800	6815L	6815
3,00	220, 230	234 766	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	380 - 415	234 764	6700L	6700	6715L	6715	6800L	6800	6815L	6815
	500	234 768	6700L	6700	6715L	6715	6800L	6800	6815L	6815

* Lead lengths Motors "L" : up to 1.5kW with 1.5m preassembled cable, starting at 2.2 kW with 2.5m pre-mounted cable

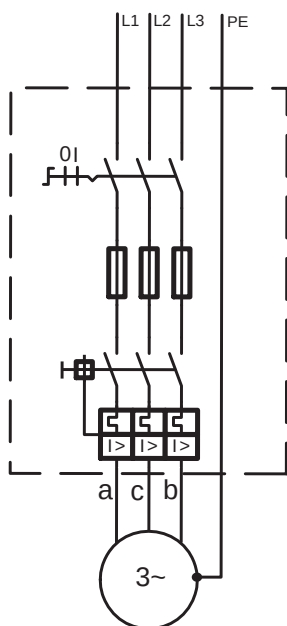
3-Phase Performance Data 50 Hz

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		
0,37	4000	220	2850	1,91	8,83	55	63	66	0,60	0,71	0,79	1,23	2,70
		230	2870	1,90	9,36	54	63	66	0,55	0,66	0,74	1,22	3,00
		380	2850	1,10	5,10	55	63	66	0,60	0,71	0,79	1,23	2,70
		400	2870	1,10	5,41	54	63	66	0,55	0,66	0,74	1,22	3,00
		415	2880	1,14	5,61	53	61	65	0,51	0,62	0,71	1,23	3,20
0,55	4000	500	2830	0,84	3,88	55	63	68	0,60	0,71	0,79	1,23	2,70
		220	2855	2,7	12,2	57	64	68	0,60	0,71	0,79	1,84	3,80
		230	2870	2,8	12,9	55	63	68	0,53	0,65	0,74	1,82	4,20
		380	2855	1,6	7,0	57	64	68	0,60	0,71	0,79	1,84	3,80
		400	2870	1,6	7,4	55	63	68	0,53	0,65	0,74	1,82	4,20
0,75	4000	415	2880	1,7	7,7	50	60	65	0,50	0,61	0,70	1,82	4,60
		500	2855	1,2	5,3	57	64	68	0,60	0,71	0,79	1,84	3,80
		220	2840	3,5	17,4	63	69	70	0,61	0,73	0,81	2,51	6,05
		230	2865	3,5	18,3	61	68	70	0,55	0,68	0,77	2,49	6,70
		380	2840	2,0	10,1	63	69	70	0,61	0,73	0,81	2,51	6,05
1,1	4000	400	2865	2,0	10,6	61	68	70	0,55	0,68	0,77	2,49	6,70
		415	2875	2,1	10,9	58	66	69	0,51	0,63	0,73	2,48	7,20
		500	2840	1,5	7,6	63	69	70	0,61	0,73	0,81	2,51	6,05
		220	2830	4,9	26,4	68	73	74	0,63	0,75	0,82	3,71	10,23
		230	2850	4,9	27,8	66	72	74	0,57	0,69	0,78	3,67	11,33
1,5	4000	380	2830	2,8	15,3	68	73	74	0,63	0,75	0,82	3,71	10,23
		400	2850	2,8	16,0	66	72	74	0,57	0,69	0,78	3,67	11,33
		415	2865	2,9	16,7	64	70	73	0,52	0,65	0,74	3,64	12,20
		500	2830	2,1	11,6	68	73	74	0,63	0,75	0,82	3,71	10,23
		220	2830	6,7	34,0	67	72	73	0,62	0,74	0,83	5,04	12,77
2,2	4000	230	2855	6,7	35,9	65	71	73	0,55	0,68	0,78	5,00	14,10
		380	2830	3,9	19,7	67	72	73	0,62	0,74	0,83	5,04	12,77
		400	2855	3,9	20,7	65	71	73	0,55	0,68	0,78	5,00	14,10
		415	2865	4,0	21,5	62	69	72	0,50	0,63	0,73	5,00	15,20
		500	2830	2,9	14,9	67	72	73	0,62	0,74	0,83	5,04	12,77
3	4000	220	2820	9,3	49,0	71	75	75	0,6	0,74	0,82	7,42	19,87
		230	2845	9,5	51,6	69	74	75	0,52	0,66	0,77	7,37	22
		380	2820	5,4	28,3	71	75	75	0,6	0,74	0,82	7,42	19,87
		400	2845	5,5	29,8	69	74	75	0,52	0,66	0,77	7,37	22
		415	2855	5,8	30,9	65	72	74	0,47	0,61	0,72	7,33	23,67
3	4000	500	2820	4,1	21,5	71	75	75	0,6	0,74	0,82	7,42	19,87
		220	2820	12,8	69,1	73	77	77	0,61	0,74	0,82	10,16	28,80
		230	2845	13,0	72,8	70	76	76	0,53	0,67	0,77	10,06	31,93
		380	2820	7,4	39,9	73	77	77	0,61	0,74	0,82	10,16	28,80
		400	2845	7,5	42,0	70	76	76	0,53	0,67	0,77	10,06	31,93
3	4000	415	2855	7,9	43,6	67	73	75	0,47	0,61	0,72	10,04	34,33
		500	2820	5,6	30,3	73	77	77	0,61	0,74	0,82	10,16	28,80

Winding Resistances 304SS / 316SS 50Hz

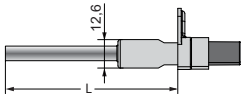
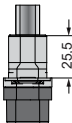
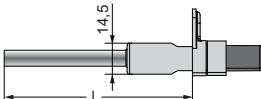
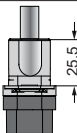
P _N [kW]	U _N [V]	Stator Ref.	U - V / Ohm
0,37	220 - 230	326 775 945 / 955	14,6 - 17,8
	380 - 400 - 415	326 710 945 / 955	44,8 - 54,8
	500	326 787 945 / 955	90,8 - 111,0
0,55	220 - 230	326 776 945 / 955	11,3 - 13,8
	380 - 400 - 415	326 711 945 / 955	34,2 - 41,8
	500	326 788 945 / 955	57,3 - 70,0
0,75	220 - 230	326 777 945 / 955	7,6 - 9,2
	380 - 400 - 415	326 712 945 / 955	23,2 - 28,3
	500	326 789 945 / 955	38,7 - 47,3
1,1	220 - 230	326 778 945 / 955	4,5 - 5,4
	380 - 400 - 415	326 713 945 / 955	13,8 - 16,8
	500	326 790 945 / 955	23,1 - 28,3
1,5	220 - 230	326 779 945 / 955	3,6 - 4,3
	380 - 400 - 415	326 714 945 / 955	10,9 - 13,4
	500	326 791 945 / 955	20,7 - 25,3
2,2	220 - 230	326 780 945 / 955	2,5 - 3,0
	380 - 400 - 415	326 715 945 / 955	7,1 - 8,6
	500	326 792 945 / 955	11,9 - 14,5
3	220 - 230	326 781 945 / 955	1,5 - 1,9
	380 - 400 - 415	326 716 945 / 955	4,7 - 5,8
	500	326 793 945 / 955	8,4 - 10,2

Electrical connection 3 Phase Motors DOL



a	b	c	PE
black	brown	grey	yellow/green

Motor Leads*

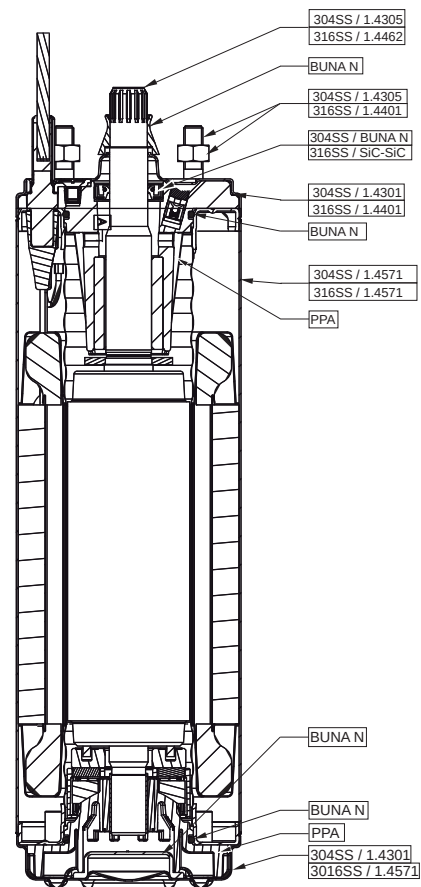
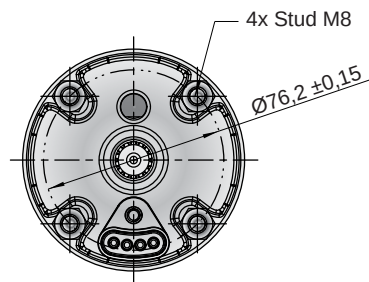
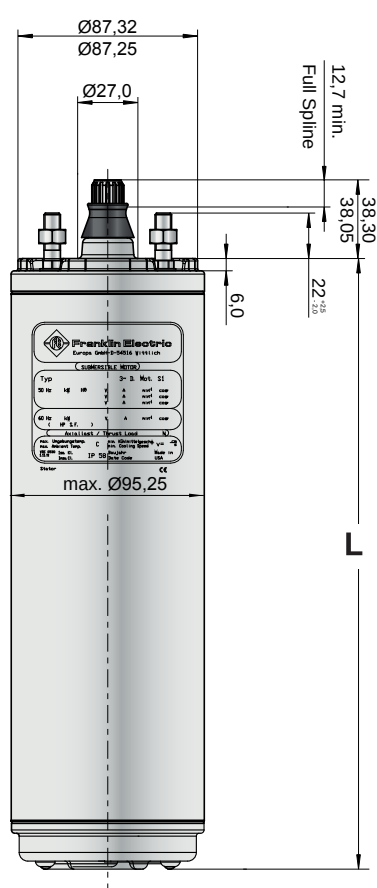
Ø [mm²]	B [mm]	H [mm]
4X1,5	14,6 ± 0,3	5,1 ± 0,3
		
L	3 ~ Standard Motor- Flat Leads	
[m]	304SS / 316 SS	
1,5	310 178 501	
2,5	310 178 502	
5	310 178 505	
10	310 178 510	
15	310 178 515	
20	310 178 520	
30	310 178 530	
40	310 178 540	
50	310 178 550	
Ø [mm²]	Ø D (mm)	
4X1,5	9,8 ± 0,3	
		
L	3 ~ Motor- Pollution Recovery Round Leads	
[m]	304SS / 316 SS	
1,5	310 318 501	
2,5	310 318 502	
5	310 318 505	
10	310 318 510	
15	310 318 515	
20	310 318 520	
30	310 318 530	
40	310 318 540	
50	310 318 550	

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



0,37kW - 3,0kW

Material Description

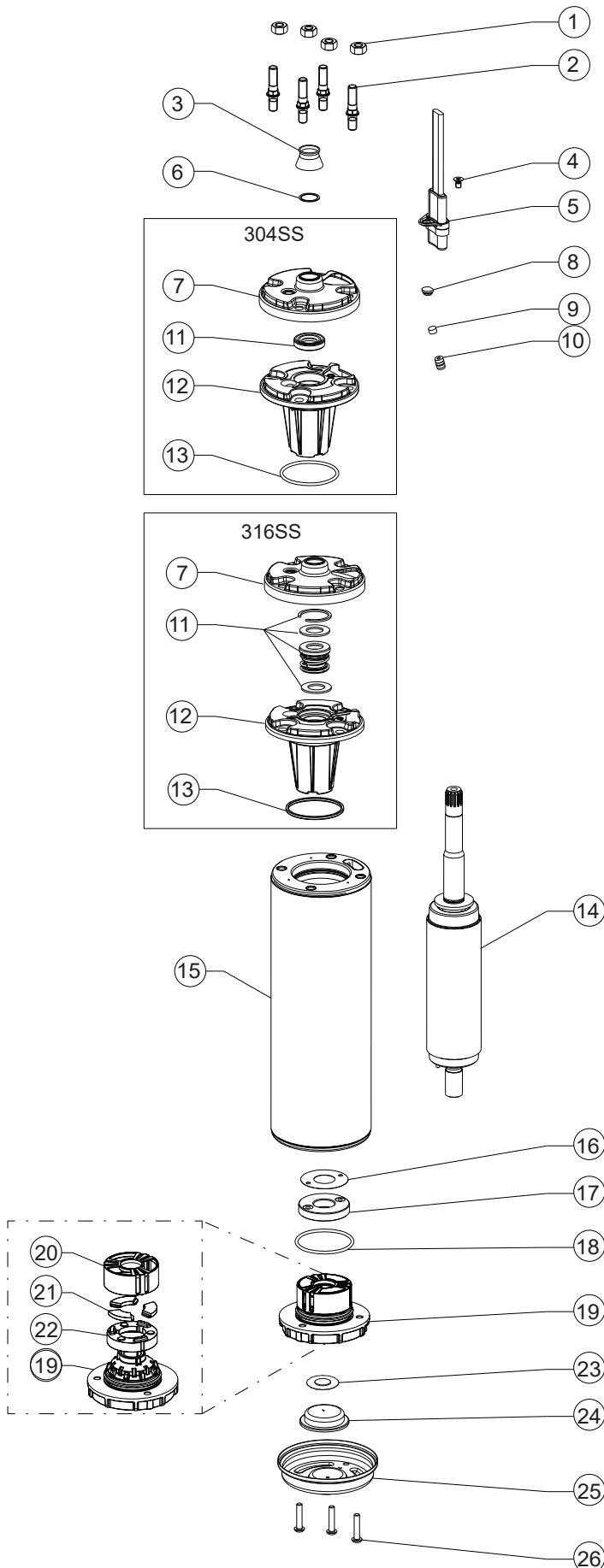


Tolerances according to NEMA MG 1-18.388

4" 3- Phase Motors Lengths & Weights

P _N		L [mm]	M [kg]	Motor with Lead in single pack		Motor Package size (40 motors per packing unit)	
[kW]	[HP]			[mm]	[kg]	[mm]	[kg]
0,37	0,5	237,2	5,58	400 x 100 x 110	6,3	800 x 500 x 870	242
0,55	0,75	251,1	6,40	400 x 100 x 110	7,2	800 x 500 x 870	274,8
0,75	1,0	271,2	7,25	530 x 100 x 110	8,0	800 x 500 x 870	308,8
1,10	1,5	297,2	8,55	530 x 100 x 110	9,3	800 x 500 x 870	360,8
1,50	2,0	321,2	9,55	530 x 100 x 110	10,3	800 x 500 x 870	400,8
2,20	3,0	353,2	11,05	796 x 100 x 110	11,8	800 x 500 x 870	460,8
3,0	4,0	408,2	13,55	796 x 100 x 110	14,3	800 x 500 x 870	560,8

4" 3- Phase Motors Part Description Design start 07.2016



Pos.	Part Description	Qty.	Part No.
1	Nut M8	4	Kit C
2	Stud M8	4	Kit C
3	Protector, Spline	1	Kit B
4	Screw (Motor lead)	1	Kit C
5	Motor lead	1	see page 39
6	Washer	1	Kit B
7	Top Endbell, Cover	1	Kit
8	Plug	1	Kit B
9	Filter	1	Kit B
10	Valve	1	Kit
11	Shaft Seal	1	Kit B
12	Top Endbell	1	Kit
13	O- Ring	1	Kit B
14	Rotor	1	see page 42
15	Stator	1	see page 42
16	Level washer	1	Kit A
17	Thrust disk assy	1	Kit A
18	O- Ring	1	Kit B
19	Bottom Endbell	1	A1
20	Bearing cage	1	Kit A
21	Segments	3	Kit A
22	Rocking Disk	1	Kit A
23	Diaphragm washer	1	Kit B
24	Diaphragm	1	Kit B
25	Bottom Endbell Cover 304SS	1	156 414 201
	Bottom Endbell Cover 316SS		156 414 301
26	Screw, Cover	3	Kit C



4" 3- Phase Spare Parts 304SS/316SS Design start 07.2016

P_N [kW]	0,37 - 3,0 kW		
Kit A1	End bell, upper 304SS (Pos. 7 - 13)	incl. Pos.: 7 - 13	308 462 901
	End bell, upper 316SS (Pos. 7 - 13)		308 462 951
Kit A2	Endbell lower incl. Thrust Bearing Kit 4000N	incl. Pos.: 16 - 22	308 464 911
Kit B	Seal Kit Standard 304SS	incl. Pos.: 3, 6, 8, 9, 11, 13, 18, 23	308 650 201
	Seal Kit Pollution recovery 316SS		308 650 202
	Seal Kit Standard 316SS		308 650 251
	Seal Kit Pollution recovery 316SS		308 650 252
Kit C	Fastener Kit 304SS	incl. Pos.: 1, 2, 4, 26	308 656 201
	Fastener Kit 316SS		308 656 251

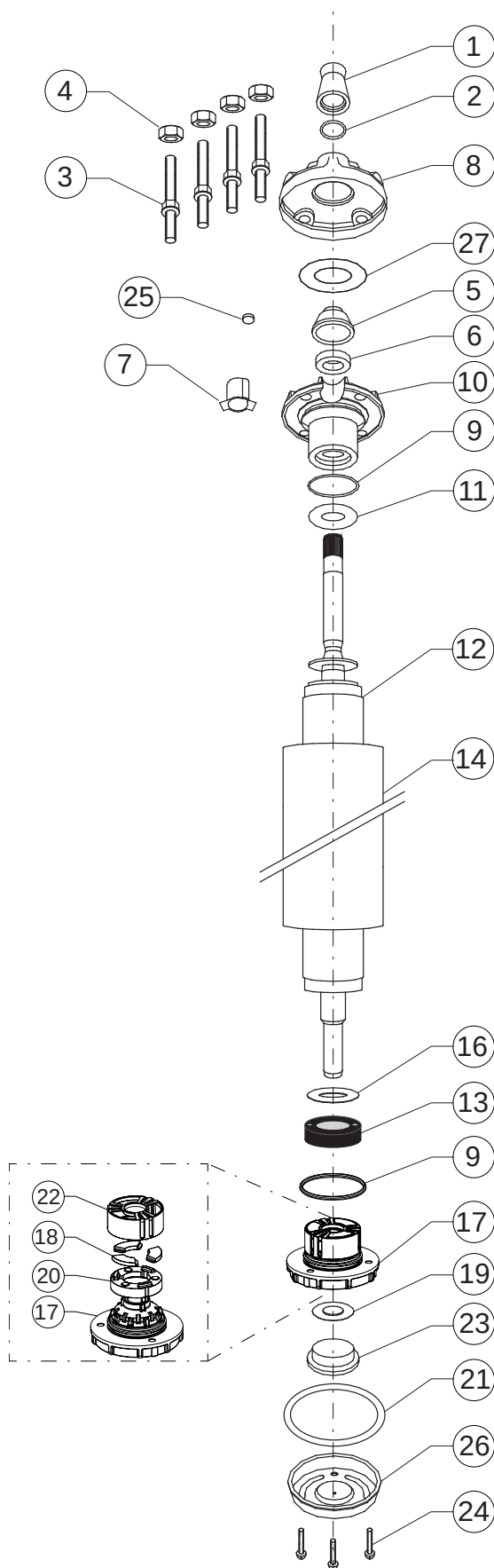
Replacement 304SS Motors Stator and Rotor 50 Hz Design start 07.2016

P_N [kW]	U_N [V]	Motor Nb.	Stator Nb.	Rotor
0,37	220, 230	234 751 6700 / 6715	305 491 751	178 164 901K
	380, 400, 415	234 761 6700 / 6715	305 491 761	
	500	234 791 6700 / 6715	305 491 771	
0,55	220, 230	234 752 6700 / 6715	305 491 752	178 164 902K
	380, 400, 415	234 762 6700 / 6715	305 491 762	
	500	234 792 6700 / 6715	305 491 772	
0,75	220, 230	234 753 6700 / 6715	305 491 753	178 164 903K
	380, 400, 415	234 763 6700 / 6715	305 491 763	
	500	234 793 6700 / 6715	305 491 773	
1,10	220, 230	234 754 6700 / 6715	305 491 754	178 164 905K
	380, 400, 415	234 724 6700 / 6715	305 491 764	
	500	234 794 6700 / 6715	305 491 774	
1,50	220, 230	234 755 6700 / 6715	305 491 755	178 164 907K
	380, 400, 415	234 725 6700 / 6715	305 491 765	
	500	234 795 6700 / 6715	305 491 775	
2,20	220, 230	234 756 6700 / 6715	305 491 756	178 164 908K
	380, 400, 415	234 726 6700 / 6715	305 491 766	
	500	234 796 6700 / 6715	305 491 776	
3,00	220, 230	234 766 6700 / 6715	305 491 757	178 164 910K
	380, 400, 415	234 764 6700 / 6715	305 491 767	
	500	234 768 6700 / 6715	305 491 777	

Replacement 316SS Motors Stator and Rotor 50 Hz Design start 07.2016

P_N [kW]	U_N [V]	Motor Nb.	Stator Nb.	Rotor
0,37	220, 230	234 751 6800 / 6815	305 491 751	178 164 951K
	380, 400, 415	234 761 6800 / 6815	305 491 761	
	500	234 791 6800 / 6815	305 491 771	
0,55	220, 230	234 752 6800 / 6815	305 491 752	178 164 952K
	380, 400, 415	234 762 6800 / 6815	305 491 762	
	500	234 792 6800 / 6815	305 491 772	
0,75	220, 230	234 753 6800 / 6815	305 491 753	178 164 953K
	380, 400, 415	234 763 6800 / 6815	305 491 763	
	500	234 793 6800 / 6815	305 491 773	
1,10	220, 230	234 754 6800 / 6815	305 491 754	178 164 955K
	380, 400, 415	234 724 6800 / 6815	305 491 764	
	500	234 794 6800 / 6815	305 491 774	
1,50	220, 230	234 755 6800 / 6815	305 491 755	178 164 957K
	380, 400, 415	234 725 6800 / 6815	305 491 765	
	500	234 795 6800 / 6815	305 491 775	
2,20	220, 230	234 756 6800 / 6815	305 491 756	178 164 958K
	380, 400, 415	234 726 6800 / 6815	305 491 766	
	500	234 796 6800 / 6815	305 491 776	
3,00	220, 230	234 766 6800 / 6815	305 491 757	178 164 960K
	380, 400, 415	234 764 6800 / 6815	305 491 767	
	500	234 768 6800 / 6815	305 491 777	

4" 3~ Standard Motor* Part Standard 304SS Design up to 06.2016



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 44
13	Thrust disk assy	1	Kit A
14	Stator	1	page 44
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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		156 414 101
27	Washer	1	Kit

* Spare Parts for Heat Pump, Pollution Recovery and Brackish Water Motors on Request



4" 3~ Spare Parts 304SS Design up to 06.2016

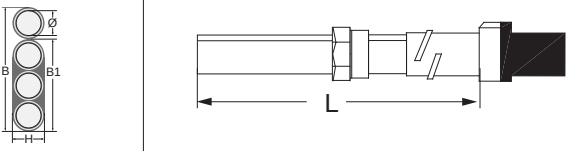
P _N [kW]	Thrust Bearing	End bell, Upper Pos. 5 - 10, 27	End bell, Lower Pos. 17	Upthrust washer Pos. 11
0,25 - 0,75	Kit A1	177 231 904	Kit A1	150 954 102
1,10 – 1,5		177 233 904		151 093 105
2,2 - 3,0				
Kit 1500N 0,25 - 0,75kW up to 07.2008	Thrust bearing Kit		inkl. Pos.: 13, 15, 16, 18, 20	308 652 101
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* Stator and Rotor 50 Hz Design up to 06.2016

P_N [kW]	U_N [V]	Motor Model No.	Stator Model No.	Rotor
0,37	220, 230	234 751 1621	305 491 301	178 156 902K
	380, 400, 415	234 761 1621	305 491 321	
	500	234 791 1621	305 491 341	
0,55	220, 230	234 752 1621	305 491 302	178 157 902K
	380, 400, 415	234 762 1621	305 491 322	
	500	234 792 1621	305 491 342	
0,75	220, 230	234 753 1621	305 491 303	178 158 902K
	380, 400, 415	234 763 1621	305 491 323	
	500	234 793 1621	305 491 343	
1,10	220, 230	234 754 1621	305 491 304	178 160 902K
	380, 400, 415	234 724 1621	305 491 324	
	500	234 794 1621	305 491 344	
1,50	220, 230	234 755 1621	305 491 305	178 162 902K
	380, 400, 415	234 725 1621	305 491 325	
	500	234 795 1621	305 491 345	
2,20	220, 230	234 756 2521	305 491 306	178 163 902K
	380, 400, 415	234 726 2521	305 491 326	
	500	234 796 2521	305 491 346	
3,00	220, 230	234 766 2521	305 491 307	178 125 902K
	380, 400, 415	234 764 2521	305 491 327	
	500	234 768 2521	305 491 347	

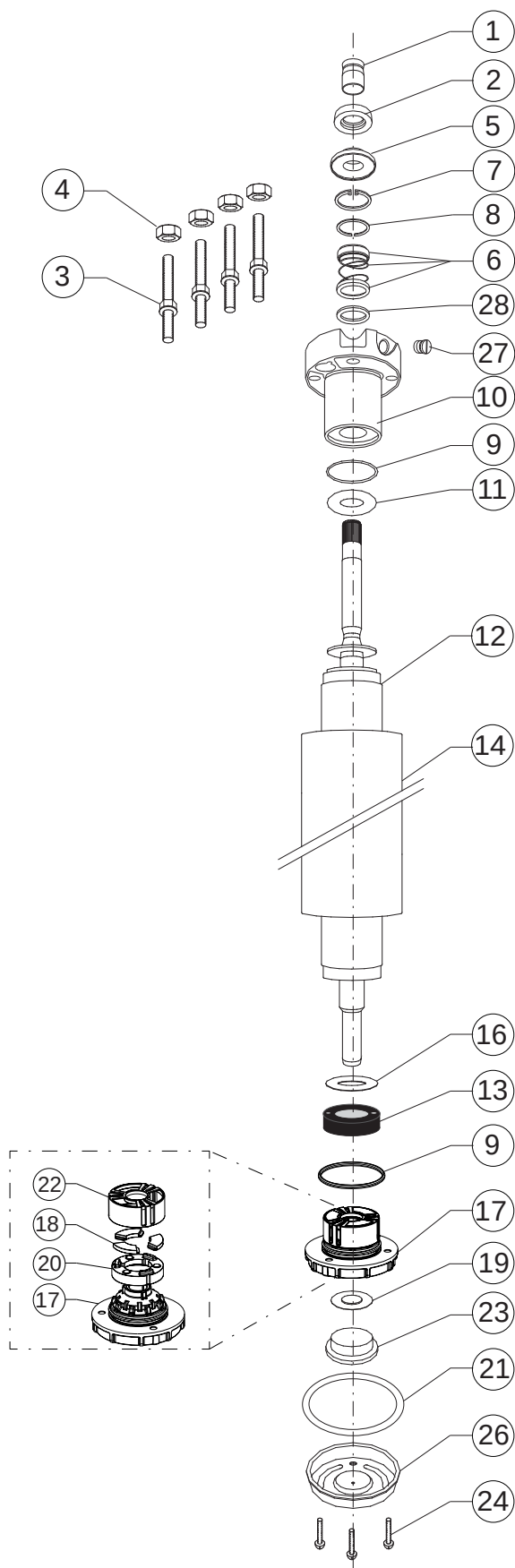
* Spare Parts for Heat Pump, Pollution Recovery and Brackish Water Motors on Request

VDE / ACS / KTW Approved Leads* Design up to 06.2016

$\varnothing$ [mm ²]	B [mm]	B1 [mm]	H [mm]
3X1,5+1G1,5	16,8 ± 0,3	10,7 ± 0,3	5,0 ± 0,3
			
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.			

L [m]	Part Numbers	
	Standard	304 SS
1,5	310 113 001	310 113 401
2,5	310 113 002	310 113 402
5	310 113 005	310 113 405
10	310 113 010	310 113 410
15	310 113 015	310 113 415
20	310 113 020	310 113 420
30	310 113 030	310 113 430
40	310 113 040	310 113 440
50	310 113 050	310 113 450

4" 3~ Motor Motor* Part Standard 316SS Design up to 06.2016



Pos.	Part Description	Qty.	Part No.
1	Protector, Spline	1	Kit C
2	Slinger	1	Kit C
3	Stud	4	Kit D
4	Nut	4	Kit D
5	Seal cover	1	Kit B + C
6	Shaft Seal	1	Kit B
7	Retain Ring	1	Kit B
8	Ring	1	Kit B
9	O-Ring	2	Kit B
10	Top Endbell	1	Kit
11	Upthrust washer	1	Kit
12	Rotor	1	page 46
13	Thrust disk assy	1	Kit A
14	Stator	1	page 46
15	Leveling Disk (only 1500N)	1	Kit A
16	Level washer	1	Kit A
17	Bottom Endbell	1	Kit
18	Segments	3	Kit A
19	Diaphragm washer	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 D
25	Valve		Incl. Pos.: 10
26	Bottom Endbell Cover	1	156 414 102
27	Sealing Screw	1	308 279 903
28	Washer	1	308 747 201

* Spare Parts for Heat Pump, Pollution Recovery and Brackish Water Motors on Request



4" 3~ Spare Part Kits 316SS Standard Design up to 06.2016

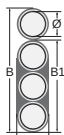
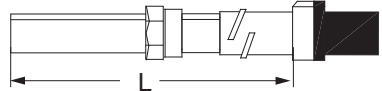
P _N [kW]	Thrust Bearing	End bell, upper (Pos. 10)	End bell, lower (Pos. 17)	Upthrust washer (Pos. 11)
0,37 - 0,75	Kit A1	177 390 955	Kit A1	308 268 104
1,1 - 1,5				
2,2 - 3,0				
Kit A1	End bell (lower) incl. Thrust Bearing Kit 3000N / 4000N		inkl. Pos.: 9, 13, 16, 17, 18, 20, 22	308 464 901
Kit B1	Seals Kit		inkl. Pos.: 5,6,7,8,9,21,23	308 650 105
Kit B2	Seals Kit (Viton)		inkl. Pos.: 5,6,7,8,9,21,23	308 650 106
Kit C	Sand Protection Kit		inkl. Pos.: 1,2,5	308 825 201
Kit D	Screw Kit		inkl. Pos.: 3, 4, 24	308 656 102

Replacement Standard Motor* Stator and Rotor 50 Hz DOL Design up to 06.2016

P_N [kW]	U_N [V]	Motor Model No.	Stator Model No.	Rotor
0,37	220, 230	234 751 0521	305 491 581	178 156 912K
	380, 400, 415	234 761 0521	305 491 601	
	500	234 791 0521	305 491 621	
0,55	220, 230	234 752 0521	305 491 582	178 157 912K
	380, 400, 415	234 762 0521	305 491 602	
	500	234 792 0521	305 491 622	
0,75	220, 230	234 753 0521	305 491 583	178 158 912K
	380, 400, 415	234 763 0521	305 491 603	
	500	234 793 0521	305 491 623	
1,10	220, 230	234 754 0521	305 491 584	178 160 912K
	380, 400, 415	234 724 0521	305 491 604	
	500	234 794 0521	305 491 624	
1,50	220, 230	234 755 0521	305 491 585	178 162 912K
	380, 400, 415	234 725 0521	305 491 605	
	500	234 795 0521	305 491 625	
2,20	220, 230	234 756 2221	305 491 586	178 163 912K
	380, 400, 415	234 726 2221	305 491 606	
	500	234 796 2221	305 491 626	
3,00	220, 230	234 766 2221	305 491 587	178 125 912K
	380, 400, 415	234 764 2221	305 491 607	
	500	234 768 2221	305 491 627	

* Spare Parts for Heat Pump, Pollution Recovery and Brackish Water Motors on Request

VDE / ACS / KTW Approved Leads* Design up to 06.2016

$\varnothing$ [mm ²]	B [mm]	B1 [mm]	H [mm]
3X1,5+1G1,5	16,8 ± 0,3	10,7 ± 0,3	5,0 ± 0,3
 			
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.			

L [m]	Part Numbers
	316SS
1,5	310 113 501
2,5	310 113 502
5	310 113 505
10	310 113 510
15	310 113 515
20	310 113 520
30	310 113 530
40	310 113 540
50	310 113 550

4" Super Stainless 3 Phase High Thrust



Submersible Motors

Quality in the Well

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

The three phase motor offers maximum life and highest efficiency under various load conditions in combination with a 6500 N thrust bearing. It should ideally be combined to the Franklin Electric SubStart/SubTronic3P control boxes for maximum system performance, protection and warranty.

Product features

- Hermetically sealed stator with 316SS shell. 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.

Pollution Recovery Motor-version Specifications

- Fluorelastomere (Viton®) rubber parts
- Special Polyuretane (PUR) lead assemblies
- 304 graded stainless steel as standard, 316SS as an option

Technical Specification

- 2,2 – 9,3kW
- 4" NEMA flange
- Thrust capacity: 6500 N
- Rotation: reversible
- 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

- Motors in full 316SS with SiC seal
- Motors with factory- installed lead in Single Packing
- Built-in lightning arrestor
- Various cable lengths
- Special voltages on request
- Alternative material executions



3- Phase High Thrust Model Numbers 50 Hz

P _N [kW]	U _N [V]	Digit 1-6		Digit 7-10					
		DOL	YΔ (only in 316SS)	304 (Motors in 40 motors packing unit)	304 (with Lead and Single Pack)*	316SS (Motors in 40 motors packing unit)	316 SS (with Lead and Single Pack)*	Pollution Recovery Motor (with Lead and Single Pack)*	Brackish Water Motor (with Lead and Single Pack)*
2,2	220, 230	234 756	234 780	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 726	234 770	3421	3421L	3521	3521L	3422L	3424L
	500	234 796	-	3421	3421L	3521	3521L	3422L	3424L
3,0	220, 230	234 766	234 781	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 764	234 771	3421	3421L	3521	3521L	3422L	3424L
	500	234 768	-	3421	3421L	3521	3521L	3422L	3424L
3,7	220, 230	234 757	234 782	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 727	234 772	3421	3421L	3521	3521L	3422L	3424L
	500	234 797	-	3421	3421L	3521	3521L	3422L	3424L
4,0	220, 230	234 767	234 783	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 765	234 773	3421	3421L	3521	3521L	3422L	3424L
	500	234 769	-	3421	3421L	3521	3521L	3422L	3424L
5,5	220, 230	234 758	234 784	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 728	234 778	3421	3421L	3521	3521L	3422L	3424L
	500	234 798	-	3421	3421L	3521	3521L	3422L	3424L
7,5	220, 230	-	-	3421	3421L	3521	3521L	3422L	3424L
	380 - 415	234 729	234 779	3421	3421L	3521	3521L	3422L	3424L
	500	234 799	-	3421	3421L	3521	3521L	3422L	3424L
9,3	380 - 415	234 788	-		3429L		3529L		

* Lead lengths Motors "L" : with 2.5m pre-mounted cable

3-Phase High Thrust 50 Hz Performance Data

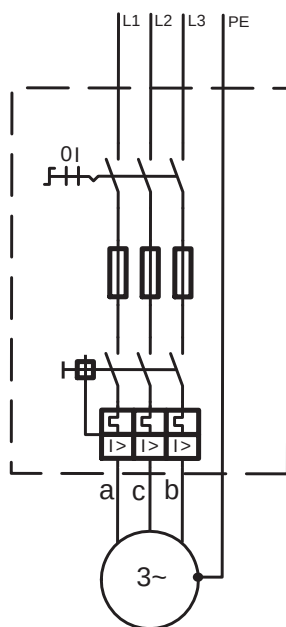
P _N [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cos φ (Pf.) at % load			T _N [Nm]	T _A [Nm]
						50	75	100	50	75	100		
2,2	6500	220	2820	9,3	49,0	71	75	75	0,6	0,74	0,82	7,42	19,87
		230	2845	9,5	51,6	69	74	75	0,52	0,66	0,77	7,37	22
		380	2820	5,4	28,3	71	75	75	0,6	0,74	0,82	7,42	19,87
		400	2845	5,5	29,8	69	74	75	0,52	0,66	0,77	7,37	22
		415	2855	5,8	30,9	65	72	74	0,47	0,61	0,72	7,33	23,67
		500	2820	4,1	21,5	71	75	75	0,6	0,74	0,82	7,42	19,87
3	6500	220	2820	12,8	69,1	73	77	77	0,61	0,74	0,82	10,16	28,80
		230	2845	13,0	72,8	70	76	76	0,53	0,67	0,77	10,06	31,93
		380	2820	7,4	39,9	73	77	77	0,61	0,74	0,82	10,16	28,80
		400	2845	7,5	42,0	70	76	76	0,53	0,67	0,77	10,06	31,93
		415	2855	7,9	43,6	67	73	75	0,47	0,61	0,72	10,04	34,33
		500	2820	5,6	30,3	73	77	77	0,61	0,74	0,82	10,16	28,80
3,7	6500	220	2815	15,3	86,1	75	79	78	0,62	0,75	0,83	12,6	37,5
		230	2840	15,5	90,6	73	77	78	0,54	0,69	0,78	12,5	41,5
		380	2815	8,8	49,7	75	79	78	0,62	0,75	0,83	12,6	37,5
		400	2840	9,0	52,3	73	77	78	0,54	0,69	0,78	12,5	41,5
		415	2850	9,3	54,3	70	76	77	0,49	0,63	0,73	12,4	44,7
		500	2815	6,7	37,8	75	79	78	0,62	0,75	0,83	12,6	37,5
4	6500	220	2820	16,7	93,7	75	78	78	0,60	0,74	0,82	13,5	39,7
		230	2840	17,2	98,7	72	77	78	0,52	0,67	0,77	13,4	44,0
		380	2820	9,7	54,1	75	78	78	0,60	0,74	0,82	13,5	39,7
		400	2840	9,9	57,0	72	77	78	0,52	0,67	0,77	13,4	44,0
		415	2855	10,4	59,1	69	75	77	0,47	0,61	0,72	13,4	47,4
		500	2820	7,3	41,1	75	78	78	0,60	0,74	0,82	13,5	39,7
5,5	6500	220	2845	21,9	127,0	77	80	79	0,66	0,79	0,85	18,5	51,0
		230	2865	21,8	133,7	75	79	79	0,59	0,73	0,81	18,3	56,5
		380	2845	12,6	73,3	77	80	79	0,66	0,79	0,85	18,5	51,0
		400	2865	12,6	77,2	75	79	79	0,59	0,73	0,81	18,3	56,5
		415	2875	12,8	80,1	73	77	79	0,54	0,68	0,77	18,2	60,9
		500	2845	9,6	55,7	77	80	79	0,66	0,79	0,85	18,5	51,0
7,5	6500	380	2830	17,2	94,3	78	80	79	0,66	0,79	0,86	25,3	65,9
		400	2855	17,1	99,3	75	79	79	0,58	0,72	0,81	25,1	73,1
		415	2865	17,6	103,0	73	78	79	0,52	0,67	0,77	25,0	78,6
		500	2830	13,1	71,7	78	80	79	0,66	0,79	0,86	25,3	65,9
9,3	6500	380	2825	21,2	108,0	77	80	79	0,65	0,78	0,86	31,4	73,8
		400	2850	21,4	113,0	75	79	79	0,56	0,71	0,81	31,1	81,8
		415	2860	22,1	118,0	72	77	78	0,47	0,58	0,76	31,0	88,0



Winding Resistances 50Hz

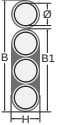
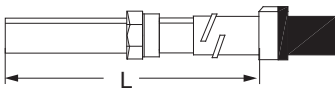
P_N [kW]	U_N [V]	Stator Ref.	U - V / Ohm [Ω]
2,2	220 - 230	326 780 902	2,5 - 3,0
	380 - 400 - 415	326 715 902	7,1 - 8,6
	500	326 792 902	11,9 - 14,5
3,0	220 - 230	326 781 902	1,5 - 1,9
	380 - 400 - 415	326 716 902	4,7 - 5,8
	500	326 793 902	8,4 - 10,2
3,7	220 - 230	326 784 902	1,2 - 1,5
	380 - 400 - 415	326 717 902	3,7 - 4,5
	500	326 796 902	6,5 - 7,9
4,0	220 - 230	326 785 902	1,1 - 1,3
	380 - 400 - 415	326 718 902	3,3 - 4,0
	500	326 797 902	5,8 - 7,1
5,5	220 - 230	326 786 902	0,9 - 1,1
	380 - 400 - 415	326 719 902	2,6 - 3,2
	500	326 798 902	4,6 - 5,7
7,5	380 - 400 - 415	326 720 902	1,9 - 2,3
	500	326 799 902	3,3 - 4,1
9,3	380 - 400 - 415	326 995 920	1,5 - 1,7

Electrical Connection DOL

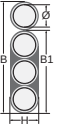
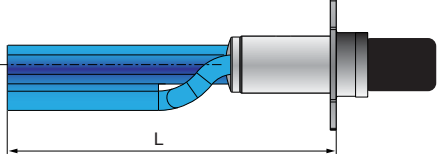
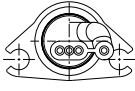


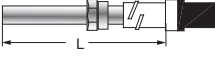
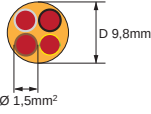
a	b	c	PE
black	brown	grey	yellow/green

Motor cable* 2,2 - 7,5kW

$\varnothing$ [mm ²]	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

Motor cable* 9,3kW

$\varnothing$ [mm ²]	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 number		
2,5	310 116 502K		
5	310 116 505K		
10	310 116 510K		
20	310 116 520K		
30	310 116 530K		

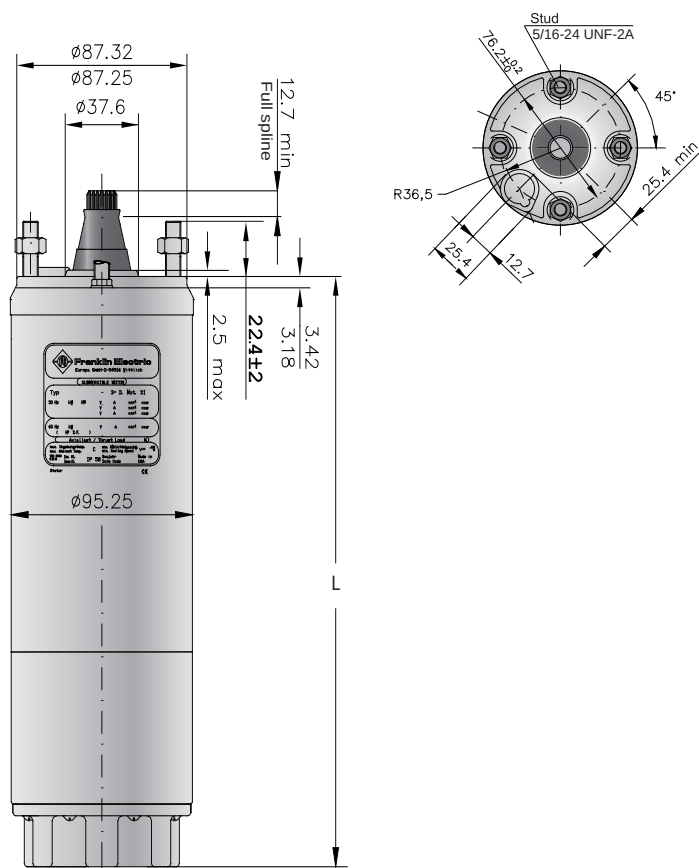
L [m]	Pollution Recovery Motor cable*	
	Modelnb. (only in 316SS)	
1,5	310 313 501	 
2,5	310 313 502	
10	310 313 510	
20	310 313 520	
30	310 313 530	
40	310 313 540	
50	310 313 550	

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

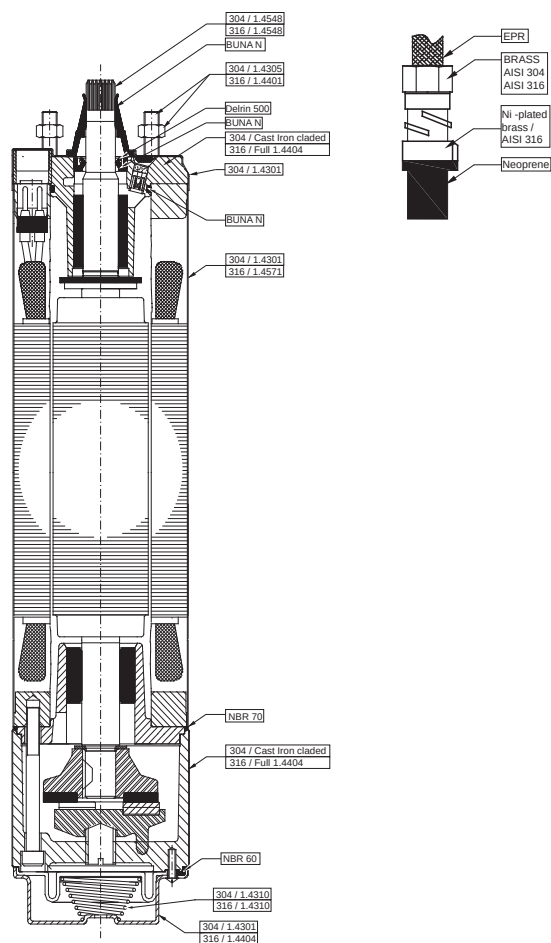


4" 3~ Motor Outlines 2,2 up to 7,5kW

High Thrust 2,2kW - 7,5kW



Material Description

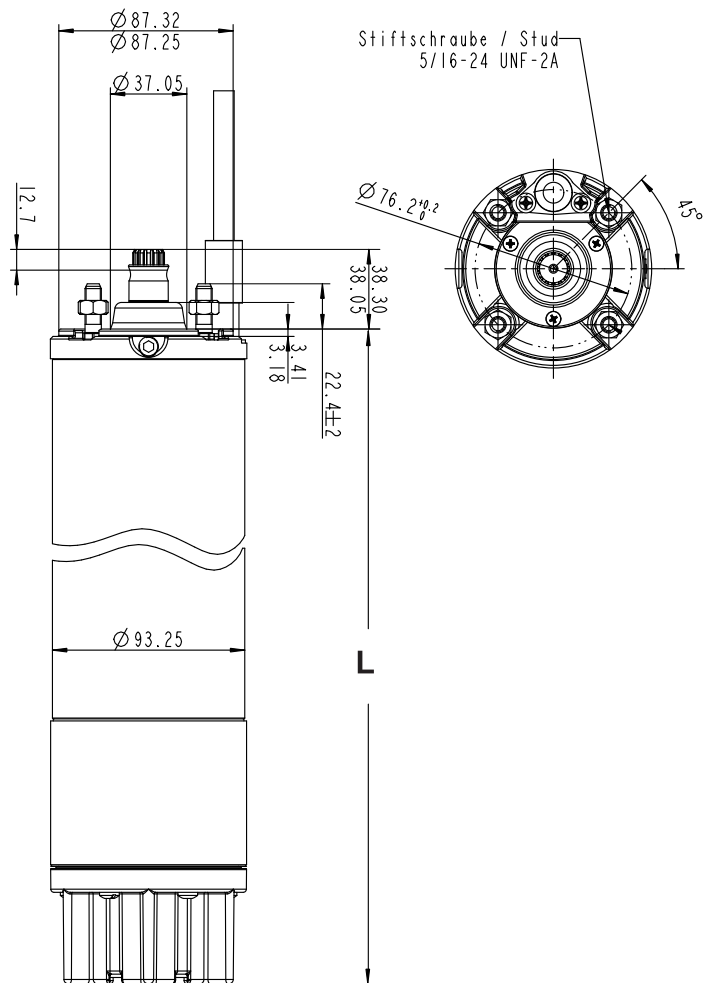


Tolerances according to NEMA MG 1-18.388

4" 3- Phase High Thrust Motors Lengths & Weights

P _N [kW]	304 L [mm]	316SS L [mm]	304 [kg]	316SS [kg]	Motor with Lead ,in single pack	
					[mm]	[kg]
2,2	422,2	431,4	15,0	15,5	796 x 100 x 110	16,8
3,0	477,2	486,4	17,0	17,5	796 x 100 x 110	18,9
3,7	520,2	529,4	19,1	19,6	796 x 100 x 110	20,9
4,0	543,2	552,4	20,0	20,5	796 x 100 x 110	21,8
5,5	652,5	661,7	26,6	27,1	904 x 100 x 110	28,7
7,5	730,5	739,7	30,6	31,1	904 x 100 x 110	32,7

4" 3~ Motor Outlines 9,3kW



Tolerances according to NEMA MG 1-18.388

Motors Lengths & Weights

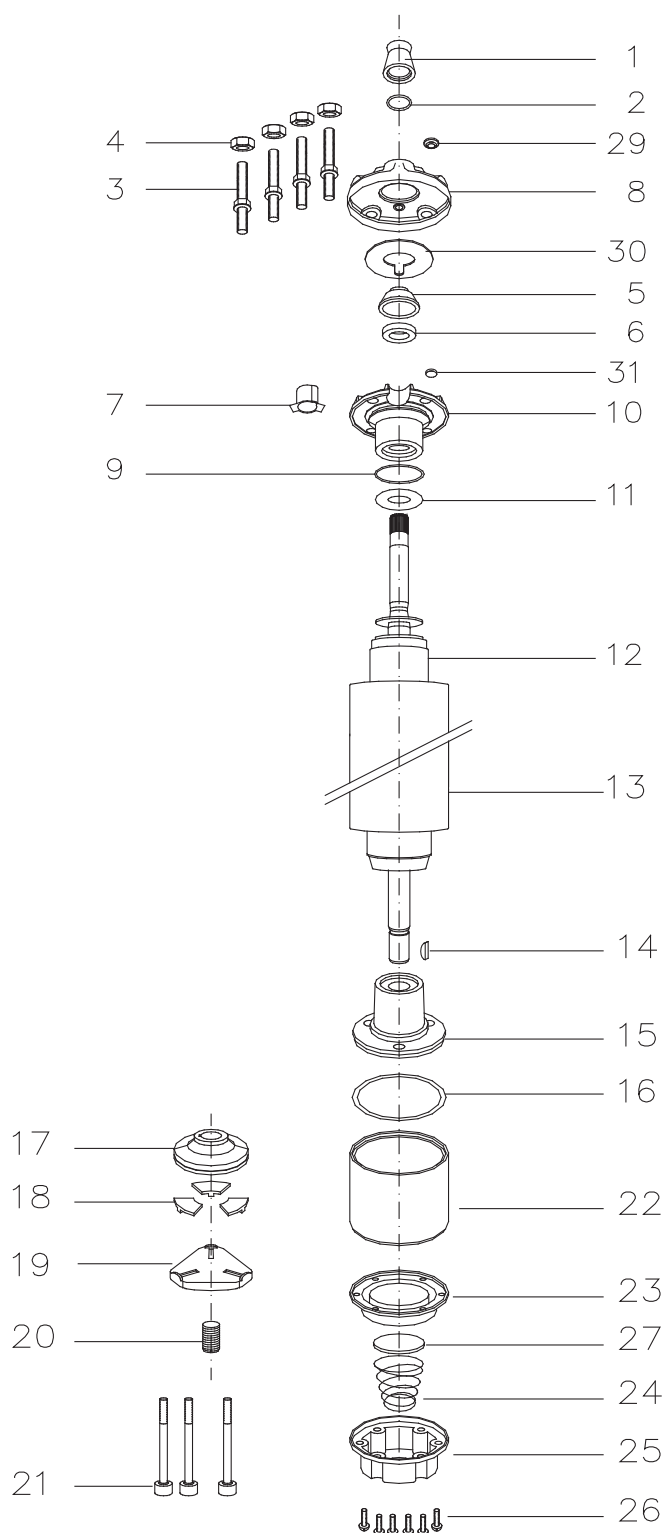
P_N [kW]	L [mm]	M [kg]	Motor with Lead in single pack	
			[mm]	[kg]
9,3	855,1	37,9	904 x 100 x 110	41,3

Material DIN / AISI

Part	Material description
Shell	1.4301
End bell, upper	1.4401
End bell, lower	Cast iron
Thrust housing	1.4401
Shaft Seal	SiC / SiC
Seal Cover	1.4401
Slinger	NBR
Shaft Extensions	17-4 SS
Diaphragm	NBR
Diaphragm housing	Cast iron / 1.4301
Motor Lead	EPR
Seals	NBR 70



4" 3- phase Standard Motor* High Thrust 2,2 - 7,5kW Motor Parts 304SS



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 55
13	Stator	1	page 55
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

4" 3- phase Spare Part Kits 304SS High Thrust

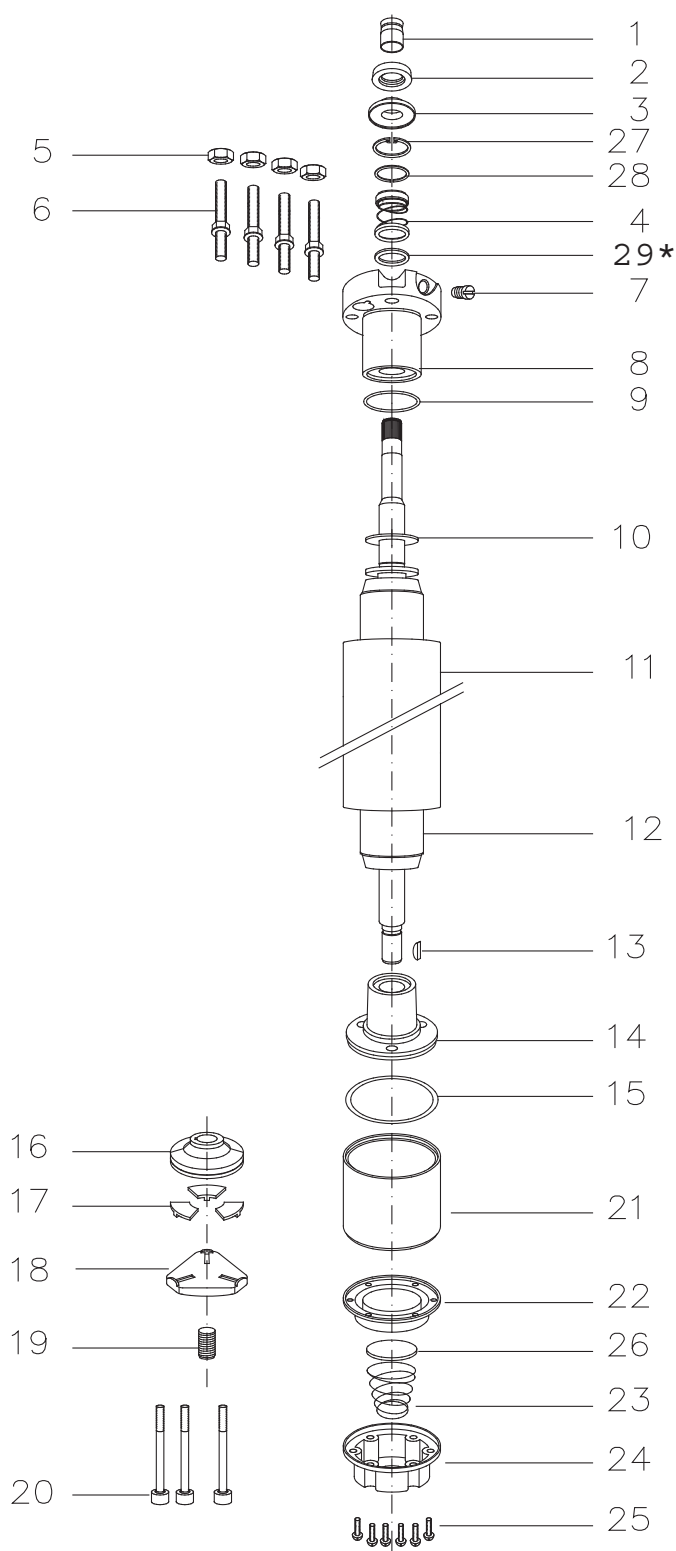
P _N [kW]	Thrust Bearings	End bell upper (Pos. 10)	End bell, lower (Pos. 15)	Upthrust washer (Pos. 11)
2,2	6500 N / KIT A	Kit D1	177 379 921	308 268 104
3,0				
3,7				
4,0				
5,5		Kit D2	177 379 901	308 317 901
7,5				
Kit A 6500N	Thrust Bearing Kit		incl. Pos.: 17, 18	308 700 301
Kit B	Seal Kit		incl. Pos.: 1, 2, 6, 9, 16, 23, 29, 31	308 900 351
Kit B1	Seal Kit Pollution Recovery		incl. Pos.: 1, 2, 6, 9, 16, 23, 29, 31	308 900 401
Kit C	Screw Kit		incl. Pos.: 3, 4, 21, 26	308 658 351
Kit D1	End bell PE 2,2- 4,0kW		incl. Pos.: 5, 6, 7, 8, 9, 10, 29, 30, 31	308 233 509
Kit D2	End bell PE 5,5- 7,5kW		incl. Pos.: 5, 6, 7, 8, 9, 10, 29, 30, 31	308 434 501

Replacement Standard Motor* Stator and Rotor 50 Hz

P _N [kW]	U _N [V]	Motor Model No.	Stator Model No.	Rotor
2,2	220, 230	234 756 3421/3422	305 491 361	178 163 903K
	380, 400, 415	234 726 3421/3422	305 491 381	
	500	234 796 3421/3422	305 491 401	
3,0	220, 230	234 766 3421/3422	305 491 362	178 125 903K
	380, 400, 415	234 764 3421/3422	305 491 382	
	500	234 768 3421/3422	305 491 402	
3,7	220, 230	234 757 3421/3422	305 491 363	178 126 903K
	380, 400, 415	234 727 3421/3422	305 491 383	
	500	234 797 3421/3422	305 491 403	
4,0	220, 230	234 767 3421/3422	305 491 364	178 127 903K
	380, 400, 415	234 765 3421/3422	305 491 384	
	500	234 769 3421/3422	305 491 404	
5,5	220, 230	234 758 3421/3422	305 491 365	178 133 903K
	380, 400, 415	234 728 3421/3422	305 491 385	
	500	234 798 3421/3422	305 491 405	
7,5	380, 400, 415	234 729 3421/3422	305 491 386	178 134 903K
	500	234 799 3421/3422	305 491 406	



4" 3- phase Standard Motor* High Thrust 2,2 - 7,5kW Parts 316SS



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	Nut	4	Kit D
6	Stud	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 57
12	Rotor	1	page 57
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 Heat Pump, Pollution Recovery and Brackish Water Motors on Request**

4" 3- phase Spare Part Kits 316SS High Thrust

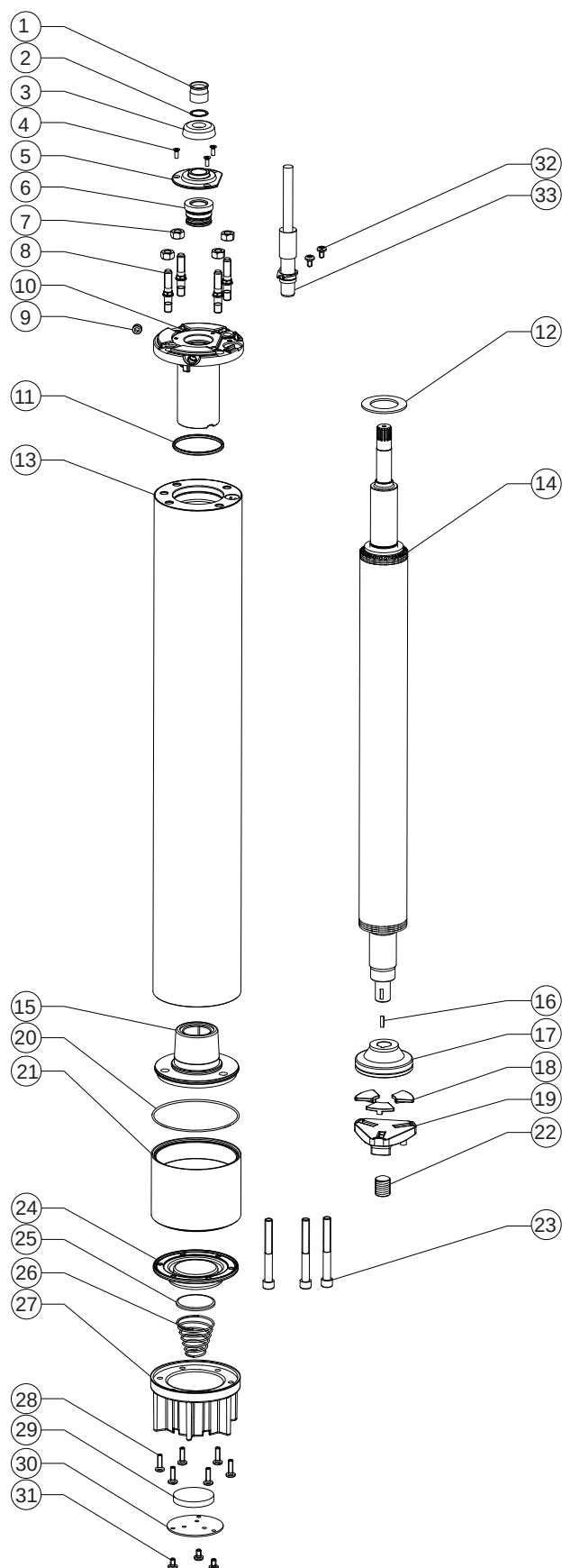
P _N [kW]	End bell, upper (Pos 8)		End bell, lower (Pos. 14)	Upthrust washer (Pos. 10)
	3 ~ DOL	3 ~ YΔ		
2,2 - 4,0	177 390 955	177 390 956	177 379 921	308 317 901
5,5 - 7,5	177 390 951	177 390 953	177 379 901	
Kit A 6500N	Thrust bearing Kit		inkl. Pos.: 16, 17	308 700 301
Kit B	Seal Kit		inkl. Pos.: 3, 4, 9, 15, 22, 27, 28	308 900 302
Kit B1	Seal Kit Pollution Recovery		inkl. Pos.: 1, 2, 3, 4, 9, 15, 22, 27, 28	308 900 402
Kit C	Slinger Kit		inkl. Pos.: 1, 2, 3	308 825 201
Kit D	Screw Kit		inkl. Pos.: 5, 6, 20, 25	308 658 301

Replacement Standard Motor* Stator and Rotor High Thrust 50 Hz DOL

P _N [kW]	U _N [V]	Motor Model No.	Stator Model No.	Rotor
2,2	220, 230	234 756 3521/3522	305 491 641	178 163 913K
	380, 400, 415	234 726 3521/3522	305 491 661	
	500	234 796 3521/3522	305 491 681	
3,0	220, 230	234 766 3521/3522	305 491 642	178 125 913K
	380, 400, 415	234 764 3521/3522	305 491 662	
	500	234 768 3521/3522	305 491 682	
3,7	220, 230	234 757 3521/3522	305 491 643	178 126 913K
	380, 400, 415	234 727 3521/3522	305 491 663	
	500	234 797 3521/3522	305 491 683	
4,0	220, 230	234 767 3521/3522	305 491 644	178 127 913K
	380, 400, 415	234 765 3521/3522	305 491 664	
	500	234 769 3521/3522	305 491 684	
5,5	220, 230	234 758 3521/3522	305 491 645	178 133 913K
	380, 400, 415	234 728 3521/3522	305 491 665	
	500	234 798 3521/3522	305 491 685	
7,5	380, 400, 415	234 729 3521/3522	305 491 666	178 134 913K
	500	234 799 3521/3522	305 491 686	



4" 3- phase Standard Motor* High Thrust 9,3kW Parts



Pos.	Description	Qty.	Part Nb.
1	Protector, Spline	1	Kit B
2	Washer	1	275 542 102
3	Slinger	1	Kit B
4	Screw, Seal cover	3	Kit C
5	Seal cover	1	156 275 102
6	Shaft Seal	1	Kit B
7	Nut	4	Kit C
8	Stud	4	Kit C
9	Plug screw	1	282 230 101
10	Top Endbell	1	177 553 901
11	O-Ring	1	Kit B
12	Upthrust washer	1	308 317 901
13	Stator	1	see page 59
14	Rotor	1	see page 59
15	Bottom Endbell	1	177 379 901
16	Woodruff key	1	275 250 104
17	Thrust disc	1	Kit A
18	Segments	3	Kit A
19	Leveling disc	1	155 660 101
20	O- Ring	1	Kit B
21	Thrust housing	1	177 378 901
22	Screw, adj.	1	151 048 102
23	Screw	3	Kit C
24	Diaphragm	1	Kit B
25	Cup spring, Diaphragm	1	151 448 201
26	Spring	1	151 449 101
27	Diaphragm housing	1	177 965 101
28	Screw	6	Kit C
29	Filter	1	156 276 101
30	Cover, Diaphragm	1	156 278 101
31	Screw	3	Kit C
32	Screw	2	Kit C
33	Motor cable, 2,5m	1	see page 51

4" 3- phase Spare Part Kits High Thrust 9,3kW

P_N [kW]	Thrust Bearing	End bell, upper (Pos. 10)	End bell, bottom (Pos. 15)	Upthrust-Disc (Pos. 12)
9,3	6500 N / KIT A	177 553 901	177 379 901	308 317 901
Kit A 6500N	Thrust Bearing Kit		incl. Pos.: 17, 18	308 700 301
Kit B	Seal Kit		incl. Pos.: 1; 3; 6; 11; 20; 24	308 900 501
Kit C	Screw Kit		incl. Pos.: 4; 7; 8; 23; 28; 31; 32	308 658 501

Replacement 9,3kW High Thrust Stator and Rotor 50 Hz

P_N [kW]	U_N [V]	Motor nb.	Stator nb.	Rotor
9,3	380 - 415	234 788	326 995 920	178 139 915

6" Encapsulated Motors

Standard: **SAND FIGHTER**

Submersible Motors

Quality in the Well

These 6" encapsulated motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 6" diameter or larger water wells.

Water lubricated thrust and radial bearings enable a maintenance free operation.

A special diaphragm ensures pressure compensation inside the motor. The motor is filled with a special FES91 fluid, providing frost protection down to -15°C storage temperature.

The Sand fighter® SiC seal system is standard.

Product advantages:

- Hermetically sealed stator, anti track, self healing stator resin prevents motor burn out
- 37 and 45kW up to 50°C ambient temperature
- Removable "Water Bloc" lead connector
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- „Sand fighter®“ Motor with SiC-Mechanical Seal and Sand Slinger
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Non contaminating FES91 -filled design
- 45kN Thrust Capacity (Standard in 37kW and 45kW motors)

Technical Specifications

- 4 ... 45 kW
- 6" NEMA flange
- Protection: IP 68
- Starts per hour: 20
- Installation: vertical/horizontal
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50 Hz from nominal: -10%/+6%
- Voltage tolerance 60 Hz from nominal: ±10%
- Motor protection: Select thermal overloads according to DIN 61947-4-1
- Insulation: Class F
- Rated ambient temperature: 4- 30kW up to 30°C; 37 & 45 kW up to 50°C
- Cooling flow: min. 0,16 m/s
- Motor lead in 4m length (VDE / ACS / KTW approved)

Options

- Other voltages
- YΔ - start (pos. of cables 90°)
- 45kN High Thrust Version (standard in 37kW and 45kW motors)
- Motors complete in 304SS and in 316SS
- PT 100 temperature sensor (sold separately)
- Special Lead lengths up to 50m
- Built-in PTC temperature sensor
- Built-in SubMonitor Transmitter (standard for 37&45kW)



6" Standard Model Numbers 50 Hz

P _N [kW]	U _N [V]	Model Number Digit 1 – 6		Model Number Digit 7 - 10									
		DOL	YΔ	Standard			with SubMonitor Transmitter			with PTC			45 000N Motor Version
				Cast Iron	304SS	316SS	Cast Iron	304SS	316SS	Cast Iron	304SS	316SS	
4	220, 230	236 680	236 670	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 610	236 710										
	500	236 700	236 790										
5,5	220, 230	236 681	236 671	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 611	236 711										
	500	236 701	236 791										
7,5	220, 230	236 682	236 672	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 612	236 712										
	500	236 702	236 792										
9,3	220, 230	236 015	236 005	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 001	236 011										
	500	236 008	236 018										
11	220, 230	236 683	236 673	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 613	236 713										
	500	236 703	236 793										
15	220, 230	236 684	236 674	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 614	236 714										
	500	236 704	236 794										
18,5	220, 230	236 685	236 675	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 615	236 715										
	500	236 705	236 795										
22	220, 230	236 686	236 676	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 616	236 716										
	500	236 706	236 796										
30	220, 230		236 677	9061	1061	3961	6061	1161	4061	2061	1261	3661	**63
	380 - 415	236 617	236 717										
	500	236 707	236 797										
37	380 - 415	276 618	276 718				6161		6361				Standard
45	380 - 415	276 619	276 719				6161		6361				Standard



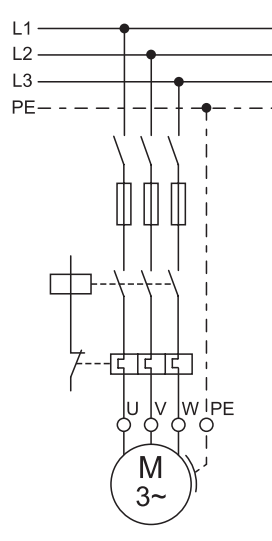
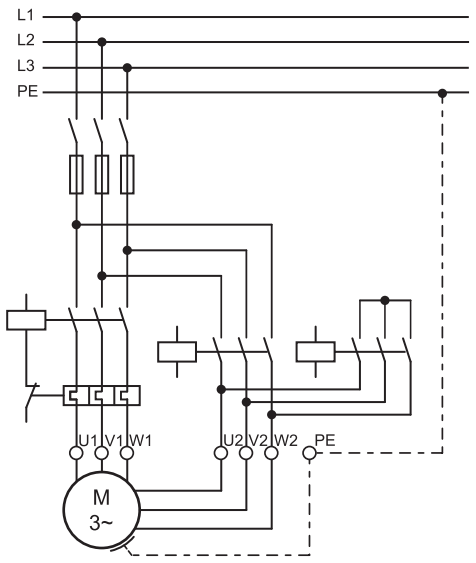
6" Performance Data 50 Hz

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		
4,0	15.500	220	2840	16,4	73	76,0	78,5	77,0	0,70	0,80	0,85	12,5	17,9
		230	2860	16,1	75	74,0	77,5	78,0	0,62	0,74	0,82	12,3	20,2
		380	2840	9,5	42	76,0	78,5	77,0	0,70	0,80	0,85	12,5	17,9
		400	2860	9,3	43	74,0	77,5	78,0	0,62	0,74	0,82	12,3	20,2
		415	2880	9,3	46	74,5	78,0	78,5	0,57	0,70	0,78	12,3	20,8
		500	2840	7,2	32	76,0	78,5	77,0	0,70	0,80	0,85	12,5	17,9
5,5	15.500	220	2850	22,1	104	77,0	79,0	78,0	0,70	0,80	0,85	18,7	30,3
		230	2870	21,7	106	74,0	78,0	79,0	0,63	0,75	0,82	18,6	35,0
		380	2850	12,8	60	77,0	79,0	78,0	0,70	0,80	0,85	18,7	30,3
		400	2870	12,5	64	74,0	78,0	79,0	0,63	0,75	0,82	18,6	35,0
		415	2880	12,8	66	74,0	77,5	78,0	0,58	0,70	0,78	18,6	35,9
		500	2850	9,7	46	77,0	79,0	78,0	0,70	0,80	0,85	18,7	30,3
7,5	15.500	220	2850	28,2	143	77,5	79,5	79,0	0,74	0,83	0,87	25,0	43,0
		230	2860	27,7	144	75,0	78,5	79,0	0,70	0,81	0,86	25,0	47,7
		380	2850	16,3	83	77,5	79,5	79,0	0,74	0,83	0,87	25,0	43,0
		400	2860	16,0	83	75,0	78,5	79,0	0,70	0,81	0,86	25,0	47,7
		415	2880	16,2	91	75,0	78,5	79,0	0,61	0,74	0,81	24,7	51,3
		500	2850	12,4	63	77,5	79,5	79,0	0,74	0,83	0,87	25,0	43,0
9,3	15.500	220	2870	36,4	183	79,0	81,0	81,0	0,71	0,81	0,86	31,1	61,6
		230	2870	36,0	189	78,0	81,0	81,0	0,58	0,72	0,80	31,1	68,6
		380	2870	21,0	106	79,0	81,0	81,0	0,71	0,81	0,86	31,1	61,6
		400	2870	20,7	112	78,0	81,0	81,0	0,58	0,72	0,80	31,1	68,2
		415	2890	21,0	116	74,0	79,0	80,0	0,55	0,70	0,78	30,8	74,1
		500	2870	16,0	80	79,0	81,0	81,0	0,71	0,81	0,86	31,1	61,6
11,0	15.500	220	2860	41,5	218	80,0	82,0	81,0	0,73	0,82	0,87	37,4	72,8
		230	2860	40,4	224	78,5	81,0	81,0	0,68	0,79	0,85	37,3	78,3
		380	2860	24,0	126	80,0	82,0	81,0	0,73	0,82	0,87	37,4	72,8
		400	2860	23,3	129	78,5	81,0	81,0	0,68	0,79	0,85	37,3	78,3
		415	2870	24,1	136	74,5	78,5	79,5	0,61	0,74	0,81	37,2	84,8
		500	2860	18,2	96	80,0	82,0	81,0	0,73	0,82	0,87	37,4	72,8
15,0	15.500	220	2850	55,0	283	81,0	83,0	82,0	0,76	0,84	0,86	50,0	104,0
		230	2860	54,2	289	79,0	81,5	81,0	0,70	0,80	0,85	49,9	107,3
		380	2850	32,0	164	81,0	83,0	82,0	0,76	0,84	0,86	50,0	104,0
		400	2860	31,3	169	79,0	81,5	81,0	0,70	0,80	0,85	49,9	107,3
		415	2870	31,0	179	77,0	81,0	81,0	0,65	0,77	0,83	49,6	116,6
		500	2850	24,3	124	81,0	83,0	82,0	0,76	0,84	0,86	50,0	104,0
18,5	15.500	220	2850	69,2	380	82,0	83,0	82,0	0,76	0,84	0,87	62,4	139,7
		230	2860	66,7	392	80,0	82,5	82,0	0,68	0,79	0,85	62,4	159,6
		380	2850	40,0	220	82,0	83,0	82,0	0,76	0,84	0,87	62,4	139,7
		400	2850	38,5	231	80,0	82,5	82,0	0,68	0,79	0,85	62,4	154,6
		415	2850	38,5	240	78,5	81,5	82,0	0,64	0,76	0,83	62,1	166,8
		500	2850	30,5	168	82,0	83,0	82,0	0,76	0,84	0,87	62,4	139,7
22	15.500	220	2840	81,2	441	82,0	83,0	82,0	0,78	0,86	0,88	75,3	160,0
		230	2860	78,5	455	81,0	83,0	83,0	0,71	0,81	0,86	74,7	177,6
		380	2840	47,0	255	82,0	83,0	82,0	0,78	0,86	0,88	75,3	160,0
		400	2860	45,3	268	81,0	83,0	83,0	0,71	0,81	0,86	74,7	177,6
		415	2870	45,0	278	79,5	82,5	82,5	0,66	0,78	0,84	74,5	189,9
		500	2840	35,8	194	82,0	83,0	82,0	0,78	0,86	0,88	75,3	160,0
30	27.500	220	2860	111	645	83,0	83,5	82,5	0,74	0,82	0,85	99,6	237,4
		230	2860	107	670	80,5	83,0	83,0	0,67	0,79	0,84	99,4	263,1
		380	2860	64,1	373	83,0	83,5	82,5	0,74	0,82	0,85	99,6	237,4
		400	2860	63,5	393	80,5	83,0	83,0	0,67	0,79	0,84	99,4	263,1
		415	2880	64,5	407	79,0	82,0	82,5	0,62	0,74	0,81	99,0	283,5
		500	2860	49,0	283	83,0	83,5	82,5	0,74	0,82	0,85	99,6	237,4
37	45.000	380	2850	80,1	387	77	80,0	81,0	0,75	0,82	0,87	124,8	269,8
		400	2870	77,9	411	76	80,0	81,0	0,68	0,78	0,85	124,5	269,8
		415	2880	77,9	423	75	79,0	81,0	0,64	0,75	0,82	123,8	269,8
45	45.000	380	2850	95,5	480	79	81,0	82,0	0,76	0,83	0,87	150,5	287,4
		400	2870	93,9	509	78	80,0	82,0	0,72	0,79	0,84	149,1	325,4
		415	2880	93,2	531	77	80,0	82,0	0,68	0,77	0,82	149,1	355,2

Winding Resistances 50 Hz

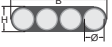
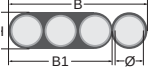
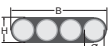
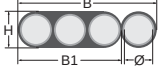
P _N kW	U _N [V]	3 ~ DOL		3 ~ YΔ	
		Stator Ref.	U - V / Ohm V - W / Ohm U - W / Ohm	Stator Ref.	U ₁ - U ₂ / Ohm V ₁ - V ₂ / Ohm W ₁ - W ₂ / Ohm
4.0	220, 230	336 694 ...	1.20 - 1.40	336 740 ...	1.75 - 2.15
	380 - 415	336 327 ...	3.40 - 4.20	336 747 ...	5.40 - 6.60
	500	336 787 ...	5.80 - 7.10	337 224 ...	9.00 - 11.0
5.5	220, 230	336 695 ...	0.72 - 0.90	336 741 ...	1.10 - 1.30
	380 - 415	336 328 ...	2.20 - 2.70	336 748 ...	3.70 - 4.50
	500	336 788 ...	4.00 - 4.90	337 225 ...	6.28 - 7.70
7.5	220, 230	336 696 ...	0.59 - 0.72	336 742 ...	0.87 - 1.08
	380 - 415	336 329 ...	1.70 - 2.20	336 749 ...	2.40 - 2.90
	500	336 789 ...	3.20 - 3.90	337 226 ...	4.53 - 5.54
9.3	220, 230	338 100 ...	0.42 - 0.50	338 103 ...	0.63 - 0.77
	380 - 415	337 915 ...	1.25 - 1.55	338 061 ...	1.94 - 2.38
	500	338 220 ...	2.60 - 3.10	338 223 ...	3.27 - 4.00
11.0	220, 230	336 697 ...	0.35 - 0.44	336 743 ...	0.53 - 0.65
	380 - 415	336 330 ...	1.05 - 1.30	336 750 ...	1.64 - 2.00
	500	336 790 ...	1.80 - 2.20	337 227 ...	2.73 - 3.35
15.0	220, 230	336 698 ...	0.25 - 0.30	336 744 ...	0.38 - 0.47
	380 - 415	336 331 ...	0.75 - 0.94	336 751 ...	1.22 - 1.50
	500	336 791 ...	1.30 - 1.60	337 228 ...	2.04 - 2.50
18.5	220, 230	336 699 ...	0.20 - 0.24	336 745 ...	0.29 - 0.36
	380 - 415	336 332 ...	0.59 - 0.73	336 752 ...	0.93 - 1.15
	500	336 792 ...	1.10 - 1.34	337 229 ...	1.70 - 2.10
22.0	220, 230	336 700 ...	0.16 - 0.20	336 746 ...	0.24 - 0.30
	380 - 415	336 333 ...	0.48 - 0.60	336 753 ...	0.74 - 0.92
	500	336 793 ...	0.83 - 1.00	337 230 ...	1.26 - 1.55
30.0	220, 230			337 353 ...	0.16 - 0.20
	380 - 415	336 334 ...	0.32 - 0.40	336 754 ...	0.50 - 0.61
	500	336 794 ...	0.60 - 0.73	337 231 ...	0.91 - 1.11
37.0	380 - 415	336 710 ...	0.25 - 0.32	336 755 ...	0.36 - 0.45
45.0	380 - 415	336 336 ...	0.22 - 0.27	336 756 ...	0.33 - 0.41

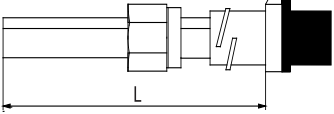
Electrical Connection

DOL	YΔ								
 The diagram shows a three-phase supply (L1, L2, L3) connected to a three-phase motor (M 3~) via a switch. The motor terminals are labeled U, V, W, and PE. The switch is a three-pole switch with a common stop button.	 The diagram shows a three-phase supply (L1, L2, L3) connected to a three-phase motor (M 3~) via a switch. The motor terminals are labeled U1/V1/W1, U2/V2/W2, and PE. The switch is a three-pole switch with a common stop button. The motor is connected in a star-delta configuration.								
<table><tr><th>U</th><th>V</th><th>W</th><th>PE</th></tr><tr><td>black</td><td>grey</td><td>brown</td><td>yellow/green</td></tr></table>		U	V	W	PE	black	grey	brown	yellow/green
U	V	W	PE						
black	grey	brown	yellow/green						



VDE / ACS / KTW Approved Leads* 304 / 316SS

DOL	Ø mm ²	Lenght [m]	St.#	Motor			B [mm] (± 0,3)	B1 [mm] (±0,3)	H [mm] (± 0,3)
				220V	380 - 415V	500V			
	4G4	4	1	4-11kW	4-22 kW	4-30 kW	19,0	-	7,0
	3X8,4+1G8,4	4	1	15-22 kW	30-45 kW		29,5	19,5	8,9
YΔ	Ø mm ²	Lenght [m]	St.#	Motor			B [mm] (± 0,3)	B1 [mm] (±0,3)	H [mm] (± 0,3)
				220V	380 - 415V	500V			
	4G4 (L=4m)	4	2	4-22kW	4-30 kW		19,0	-	7,0
 	3X8,4+1G8,4	4	1	30-37kW	37-45 kW		29,5	19,5	8,9
	3X8,4		1				19,6	-	8,9

	Lead Part Numbers 304		
	4G4mm ²	3X8,4+1G8,4mm ²	3X8,4mm ²
4 m	310 125 004	310 145 004	310 155 004
8 m	310 125 008	310 145 008	310 155 008
10 m	310 125 010	310 145 010	310 155 010
15 m	310 125 015	310 145 015	310 155 015
20 m	310 125 020	310 145 020	310 155 020
25 m	310 125 025	310 145 025	310 155 025
30 m	310 125 030	310 145 030	310 155 030
35 m	310 125 035	310 145 035	310 155 035
40 m	310 125 040	310 145 040	310 155 040
45 m	310 125 045	310 145 045	310 155 045
50 m	310 125 050	310 145 050	310 155 050
	Lead Part Numbers 316SS		
	4G4mm ²	3X8,4+1G8,4mm ²	3X8,4mm ²
4 m	310 125 504	310 145 504	310 155 504
8 m	310 125 508	310 145 508	310 155 508
10 m	310 125 510	310 145 510	310 155 510
15 m	310 125 515	310 145 515	310 155 515
20 m	310 125 520	310 145 520	310 155 520
25 m	310 125 525	310 145 525	310 155 525
30 m	310 125 530	310 145 530	310 155 530
35 m	310 125 535	310 145 535	310 155 535
40 m	310 125 540	310 145 540	310 155 540
45 m	310 125 545	310 145 545	310 155 545
50 m	310 125 550	310 145 550	310 155 550

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

6" Motor Design 4- 30 kW

Cast Iron Version
304SS
316SS


Material DIN / AISI

Part	Cast Iron Version	304	316 SS
Shell	1.4301	1.4301	1.4571
Upper end bell	Cast iron powder coated	1.4301	1.4408
Thrust housing	Cast iron powder coated	1.4301	1.4408
Mechanical seal	SiC / SiC	SiC / SiC	SiC / SiC
Seal cover	1.4301	1.4301	1.4401
Slinger	NBR	NBR	NBR
Shaft end	1.4305	1.4305	1.4462
Diaphragm	NBR	NBR	NBR
Lead	EPR	EPR	EPR

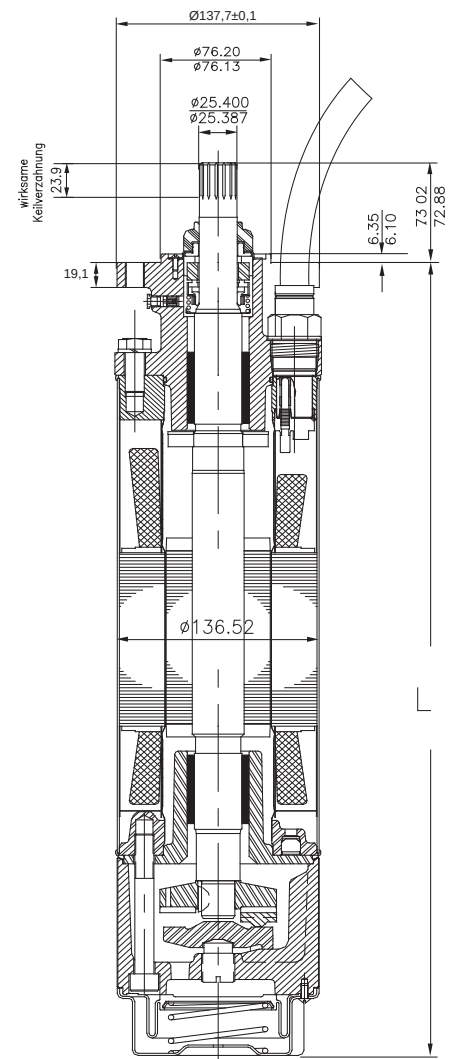
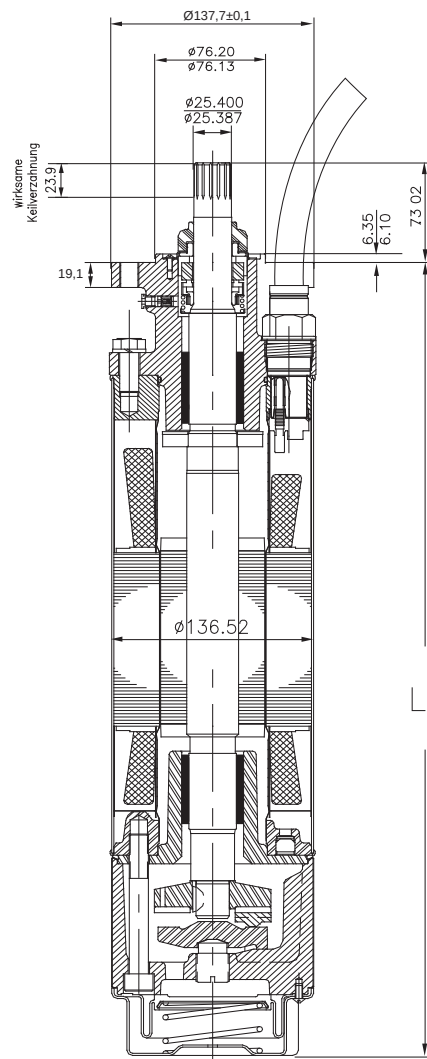
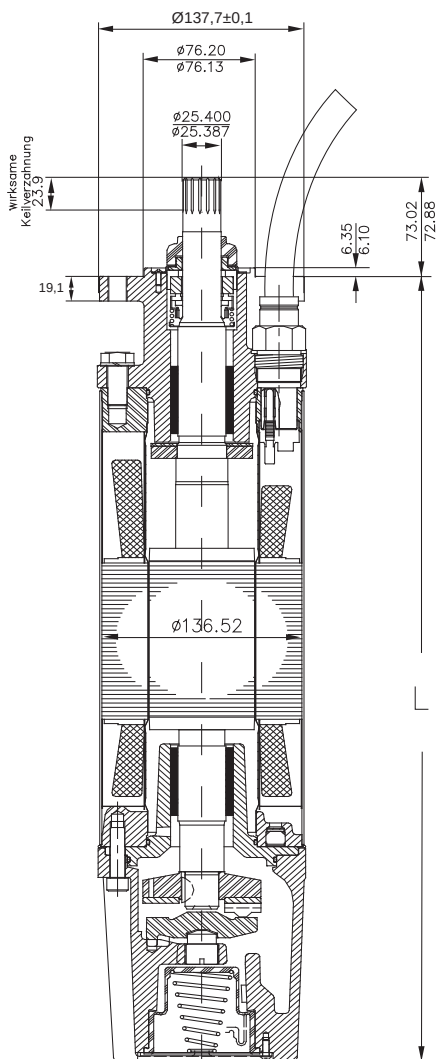


6" Motor Design 4 - 30 kW

Cast Iron Version

304SS

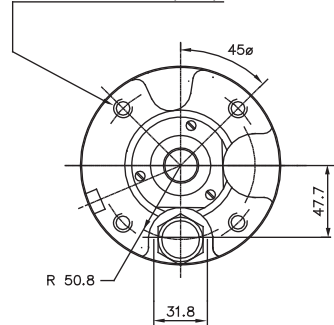
316SS



Motor Sizes

P _N [kW]	Cast Iron L [mm]	304SS L [mm]	316SS L [mm]	Motor Package Size [mm]	Shipping Weight [kg]	
					DOL	YΔ
4	581,2	570,7	570,7	155 x 212 x 800	41,3	40,3
5,5	614,4	604,0	604,0	155 x 212 x 800	44,9	43,9
7,5	646,2	635,8	635,8	155 x 212 x 800	49,0	48,0
9,3	678,7	668,3	668,3	155 x 212 x 1070	50,3	51,3
11	711,2	700,8	700,8	155 x 212 x 1070	54,7	53,7
15	776,2	765,8	765,8	155 x 212 x 1070	60,5	59,5
18,5	841,5	831,1	831,1	155 x 212 x 1070	67,1	66,1
22	906,5	896,1	896,1	155 x 212 x 1070	73,1	72,1
30	1036,6	1026,2	1026,2	155 x 212 x 1200	87,7	87,7

4 threaded holes
1/2-20 UNF-2B
hole circle - Ø111,2±0,3



6" Motor Design 37- 45 kW

Cast Iron Version

316SS



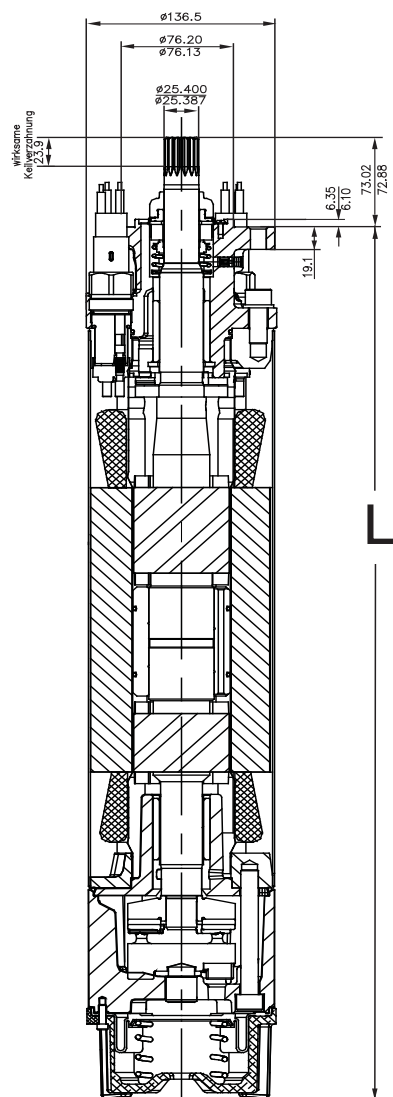
Material DIN / AISI

Part	Cast Iron Version	316 SS
Shell	1.4301	1.4571
Upper end bell	Cast iron powder coated	1.4408
Thrust housing	Cast iron powder coated	1.4408
Mechanical seal	SiC / SiC	SiC / SiC
Seal cover	1.4301	1.4401
Slinger	Viton	Viton
Shaft end	1.4305	1.4542
Diaphragm	Viton	Viton
Lead	EPR	EPR
Jam Nut (Lead)	Brass	1.4401
Lead bushing	Rubber	Rubber

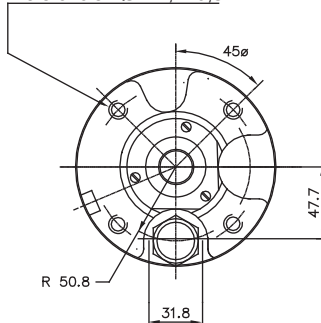


6" Motor Design 37- 45 kW

Cast Iron / 316SS



4 threaded holes
1/2-20 UNF-2B
hole circle - $\varnothing 111,2 \pm 0,3$



Motor Sizes

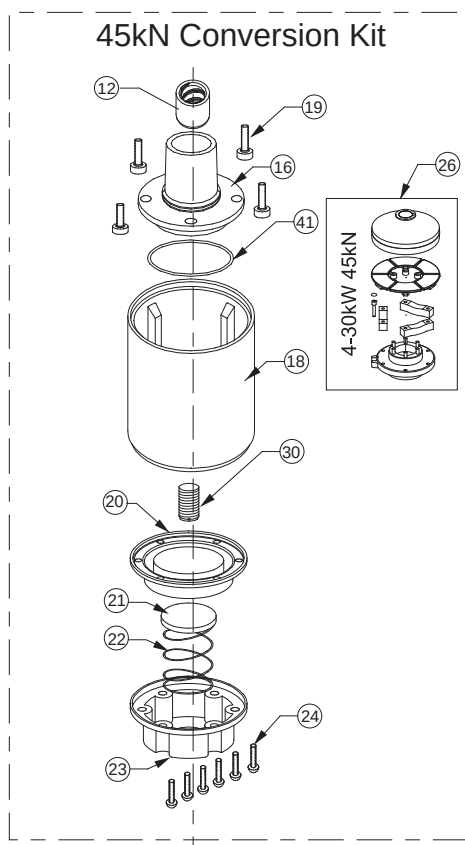
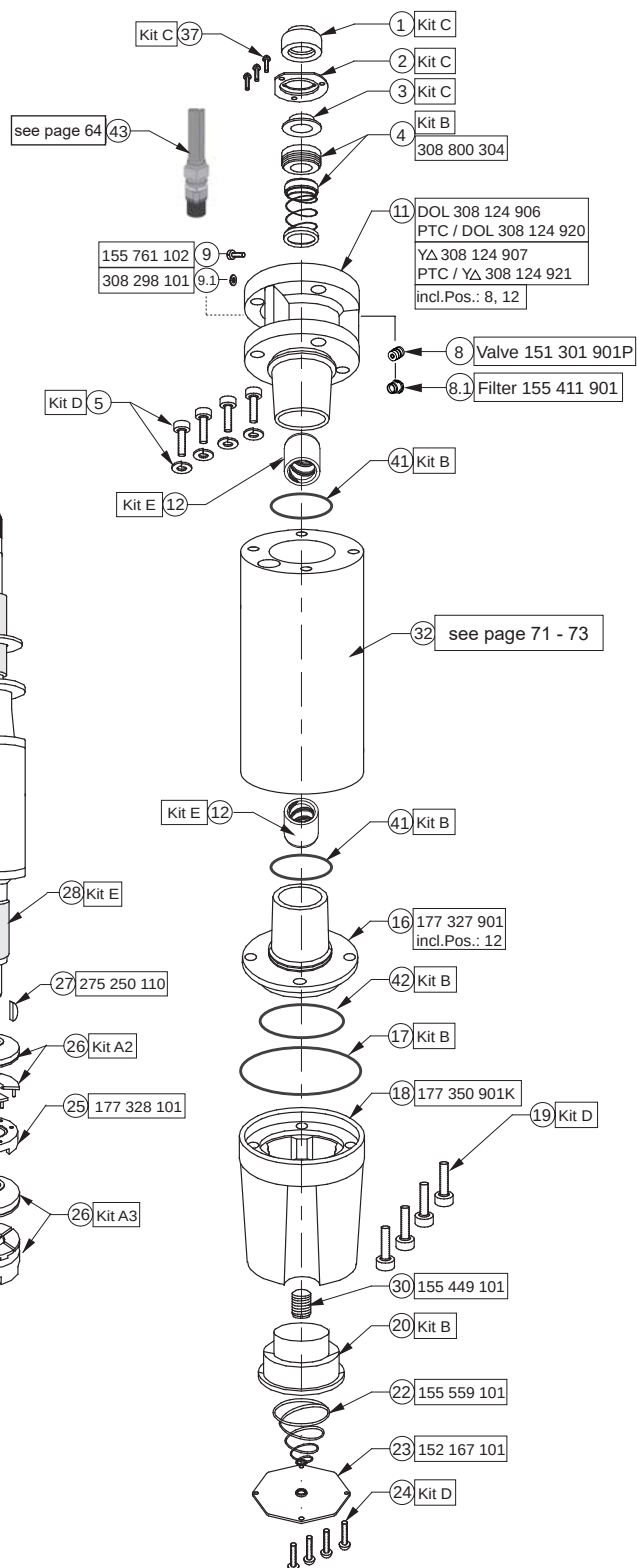
P_N [kW]	304 L [mm]	316 L [mm]	Motor Package Size [mm]	Shipping Weight [kg]
37	1476,7	1476,7	223 x 267 x 1823	140
45	1629,2	1629,2	223 x 267 x 1823	156

6" Encapsulated Cast Iron Version

4 - 30kW

Rotor Kit 6500N to 15.500N	4,0 kW	incl. Pos.: 25; 26; 29	305 330 901
	5,5 kW	incl. Pos.: 25; 26; 29	305 330 902
Kit A2 15.500N / 4-22kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 120
Kit A3 27.500N / 30kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 200
Kit A4	Thrust Bearing Kit 45.000N	incl. Pos.: 26	308 750 510
45kN Conversion Kit 4,0 - 30kW		incl. Pos.: 12; 16; 18; 19; 20; 21; 22; 23; 24; 26; 30; 41	308 750 500
Kit B1 4 - 30kW	Seal Kit	incl. Pos.: 4; 17; 20; 41; 42	308 800 125
Kit C1	Slinger Kit	incl. Pos.: 1; 2; 3; 37	308 725 101
Kit D3 up to 07.2002	Screw Kit	incl. Pos.: 5; 19; 24	308 659 120
Kit D4 starting 07.2002	Screw Kit	incl. Pos.: 5; 19; 24	308 659 121
Kit E* 4 - 30 kW	Radial Bearing Kit	incl. Pos.: 12; 28	308 678 101

* Radial Bearing Parts are unfinished



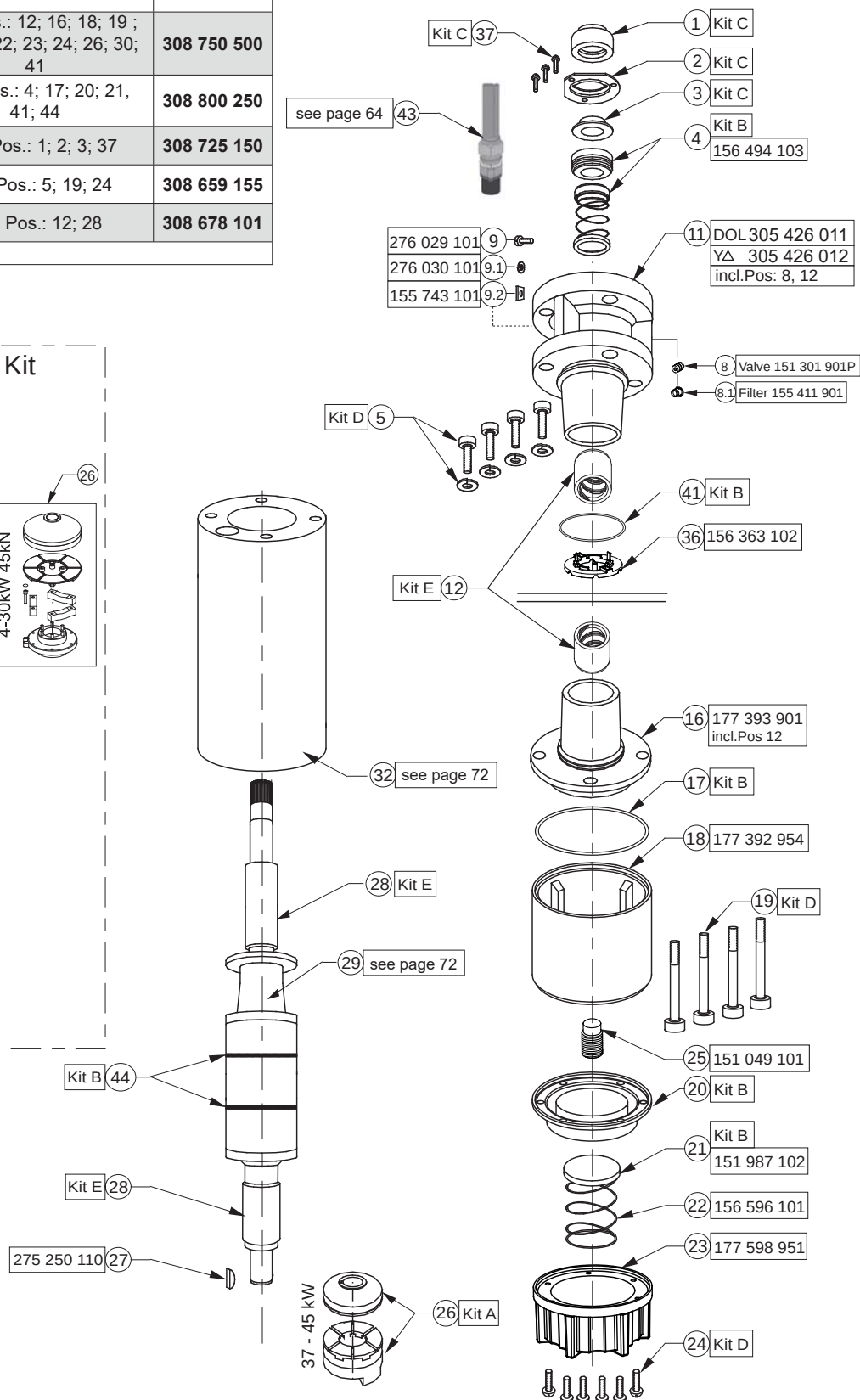
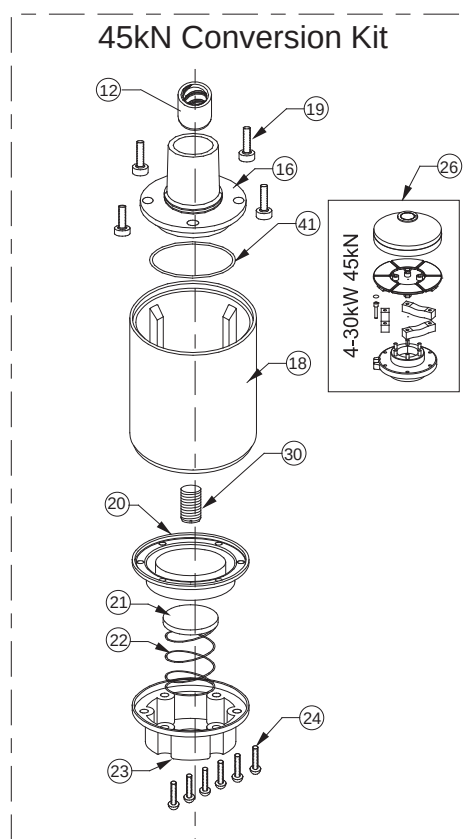


6" Encapsulated Cast Iron Version

37- 45 Kw

Kit A3	Thrust Bearing Kit 27.500N	incl. Pos.: 26	308 750 200
Kit A4	Thrust Bearing Kit 45.000N	incl. Pos.: 26	308 750 510
45kN Conversion Kit 37 - 45kWkW		incl. Pos.: 12; 16; 18; 19 ; 20; 21; 22; 23; 24; 26; 30; 41	308 750 500
Kit B3	Seal Kit	incl. Pos.: 4; 17; 20; 21, 41; 44	308 800 250
Kit C3	Slinger Kit	incl. Pos.: 1; 2; 3; 37	308 725 150
Kit D5	Screw Kit	incl. Pos.: 5; 19; 24	308 659 155
Kit E*	Radial Bearing Kit	incl. Pos.: 12; 28	308 678 101

* Radial Bearing Parts are unfinished



Replacement Stators and Rotors Cast Iron Version / 50 Hz

3 ~ ohne SubMonitor Transmitter 3 ~ without SubMonitor Transmitter	3 ~ sans transm. SubMonitor 3 ~ senza trasmettitore SubMonitor	3 ~ sin transmissor SubMonitor 3 ~ sem transmissor SubMonitor
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P _N [kW]	U _N [V]	Thrust F [N]	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 90**	305 478 927	236 670 90**	305 478 930	178 117 912K
	380, 400, 415		236 610 90**	305 478 928	236 710 90**	305 478 931	
	500		236 700 90**	305 478 929	236 790 90**	305 478 932	
5,5	220, 230	15.500	236 681 90**	305 479 930	236 671 90**	305 479 933	178 118 911K
	380, 400, 415		236 611 90**	305 479 931	236 711 90**	305 479 934	
	500		236 701 90**	305 479 932	236 791 90**	305 479 935	
7,5	220, 230	15.500	236 682 90**	305 480 932	236 672 90**	305 480 935	178 119 906K
	380, 400, 415		236 612 90**	305 480 933	236 712 90**	305 480 936	
	500		236 702 90**	305 480 934	236 792 90**	305 480 937	
9,3	220, 230	15.500	236 015 90**	305 481 921	236 005 90**	305 481 924	178 182 906K
	380, 400, 415		236 001 90**	305 481 922	236 011 90**	305 481 925	
	500		236 008 90**	305 481 923	236 018 90**	305 481 926	
11,0	220, 230	15.500	236 683 90**	305 482 933	236 673 90**	305 482 936	178 120 906K
	380, 400, 415		236 613 90**	305 482 934	236 713 90**	305 482 937	
	500		236 703 90**	305 482 935	236 793 90**	305 482 938	
15,0	220, 230	15.500	236 684 90**	305 484 933	236 674 90**	305 484 936	178 121 906K
	380, 400, 415		236 614 90**	305 484 934	236 714 90**	305 484 937	
	500		236 704 90**	305 484 935	236 794 90**	305 484 938	
18,5	220, 230	15.500	236 685 90**	305 485 930	236 675 90**	305 485 933	178 122 906K
	380, 400, 415		236 615 90**	305 485 931	236 715 90**	305 485 934	
	500		236 705 90**	305 485 932	236 795 90**	305 485 935	
22,0	220, 230	15.500	236 686 90**	305 486 934	236 676 90**	305 486 937	178 123 906K
	380, 400, 415		236 616 90**	305 486 935	236 716 90**	305 486 938	
	500		236 706 90**	305 486 936	236 796 90**	305 486 939	
30,0	220, 230	27.500			236 677 90**	305 488 923	178 115 906K
	380, 400, 415		236 617 90**	305 488 921	236 717 90**	305 488 924	
	500		236 707 90**	305 488 922	236 797 90**	305 488 925	

(*) : **Kabel 90° versetzt**
Pos. of leads 90°
Pos. des câbles 90°

Pos. de cavi 90°
Pos. de los cables 90°
Pos. dos cabos 90°



Replacement Stators and Rotors Cast Iron Version / 50 Hz

3 ~ mit SubMonitor Transmitter 3 ~ with SubMonitor Transmitter	3 ~ avec transm. SubMonitor 3 ~ con trasmettitore SubMonitor	3 ~ con transmissor SubMonitor 3 ~ com transmissor SubMonitor
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P _N [kW]	U _N [V]	Thrust F [N]	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 60**	305 478 907	236 670 60**	305 478 910	178 117 912K
	380, 400, 415		236 610 60**	305 478 908	236 710 60**	305 478 911	
	500		236 700 60**	305 478 909	236 790 60**	305 478 912	
5,5	220, 230	15.500	236 681 60**	305 479 910	236 671 60**	305 479 913	178 118 911K
	380, 400, 415		236 611 60**	305 479 911	236 711 60**	305 479 914	
	500		236 701 60**	305 479 912	236 791 60**	305 479 915	
7,5	220, 230	15.500	236 682 60**	305 480 912	236 672 60**	305 480 915	178 119 906K
	380, 400, 415		236 612 60**	305 480 913	236 712 60**	305 480 916	
	500		236 702 60**	305 480 914	236 792 60**	305 480 917	
9,3	220, 230	15.500	236 015 60**	305 481 901	236 005 60**	305 481 904	178 182 906K
	380, 400, 415		236 001 60**	305 481 902	236 011 60**	305 481 905	
	500		236 008 60**	305 481 903	236 018 60**	305 481 906	
11,0	220, 230	15.500	236 683 60**	305 482 913	236 673 60**	305 482 916	178 120 906K
	380, 400, 415		236 613 60**	305 482 914	236 713 60**	305 482 917	
	500		236 703 60**	305 482 915	236 793 60**	305 482 918	
15,0	220, 230	15.500	236 684 60**	305 484 913	236 674 60**	305 484 916	178 121 906K
	380, 400, 415		236 614 60**	305 484 914	236 714 60**	305 484 917	
	500		236 704 60**	305 484 915	236 794 60**	305 484 918	
18,5	220, 230	15.500	236 685 60**	305 482 910	236 675 60**	305 485 913	178 122 906K
	380, 400, 415		236 615 60**	305 485 911	236 715 60**	305 485 914	
	500		236 705 60**	305 482 912	236 795 60**	305 485 915	
22,0	220, 230	15.500	236 686 60**	305 486 914	236 676 60**	305 486 917	178 123 906K
	380, 400, 415		236 616 60**	305 486 915	236 716 60**	305 486 918	
	500		236 706 60**	305 486 916	236 796 60**	305 486 919	
30,0	220, 230	27.500			236 677 60**	305 488 907	178 115 906K
	380, 400, 415		236 617 60**	305 488 905	236 717 60**	305 488 908	
	500		236 707 60**	305 488 906	236 797 60**	305 488 909	
37,0	380, 400, 415	45.000	276 618 6161	305 489 920	276 718 6161	305 489 919	305 223 920
45,0	380, 400, 415	45.000	276 619 6161	305 490 920	276 719 6161	305 490 919	305 223 921

(*) : **Kabel 90° versetzt** **Pos. de cavi 90°**
Pos. of leads 90° **Pos. de los cables 90°**
Pos. des câbles 90° **Pos. dos cabos 90°**

Replacement Stators and Rotors Cast Iron Version / 50 Hz

3 ~ mit PTC 3 ~ with PTC	3 ~ avec PTC 3 ~ con PTC	3 ~ con PTC 3 ~ com PTC
-----------------------------	-----------------------------	----------------------------

P _N [kW]	U _N [V]	Thrust F [N]	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 20**	305478933	236 670 20**	305478936	178 117 912K
	380, 400, 415		236 610 20**	305478934	236 710 20**	305478937	
	500		236 700 20**	305478935	236 790 20**	305478938	
5,5	220, 230	15.500	236 681 20**	305479936	236 671 20**	305479939	178 118 911K
	380, 400, 415		236 611 20**	305479937	236 711 20**	305479940	
	500		236 701 20**	305479938	236 791 20**	305479941	
7,5	220, 230	15.500	236 682 20**	305480938	236 672 20**	305480941	178 119 906K
	380, 400, 415		236 612 20**	305480939	236 712 20**	305480942	
	500		236 702 20**	305480940	236 792 20**	305480943	
9,3	220, 230	15.500	236 015 20**	305481927	236 005 20**	305481930	178 182 906K
	380, 400, 415		236 001 20**	305481928	236 011 20**	305481931	
	500		236 008 20**	305481929	236 018 20**	305481932	
11,0	220, 230	15.500	236 683 20**	305482939	236 673 20**	305482942	178 120 906K
	380, 400, 415		236 613 20**	305482940	236 713 20**	305482943	
	500		236 703 20**	305482941	236 793 20**	305482944	
15,0	220, 230	15.500	236 684 20**	305484939	236 674 20**	305484942	178 121 906K
	380, 400, 415		236 614 20**	305484940	236 714 20**	305484943	
	500		236 704 20**	305484941	236 794 20**	305484944	
18,5	220, 230	15.500	236 685 20**	305485936	236 675 20**	305485939	178 122 906K
	380, 400, 415		236 615 20**	305485937	236 715 20**	305485940	
	500		236 705 20**	305485938	236 795 20**	305485941	
22,0	220, 230	15.500	236 686 20**	305486940	236 676 20**	305486943	178 123 906K
	380, 400, 415		236 616 20**	305486941	236 716 20**	305486944	
	500		236 706 20**	305486942	236 796 20**	305486945	
30,0	220, 230	27.500			236 677 20**	305488928	178 115 906K
	380, 400, 415		236 617 20**	305488926	236 717 20**	305488929	
	500		236 707 20**	305488927	236 797 20**	305488930	

(*) : **Kabel 90° versetzt**
Pos. of leads 90°
Pos. des câbles 90°

Pos. de cavi 90°
Pos. de los cables 90°
Pos. dos cabos 90°

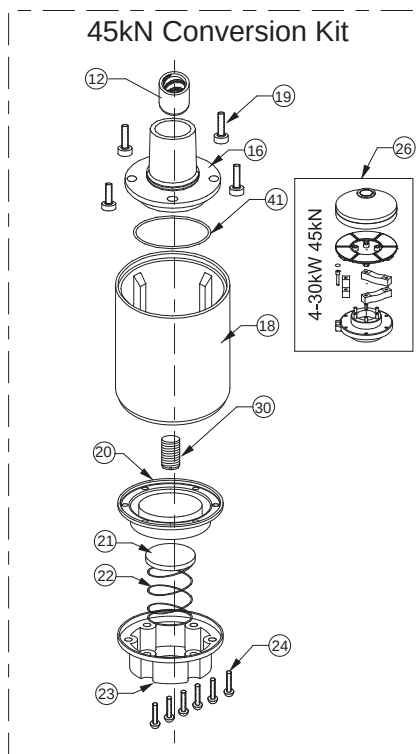
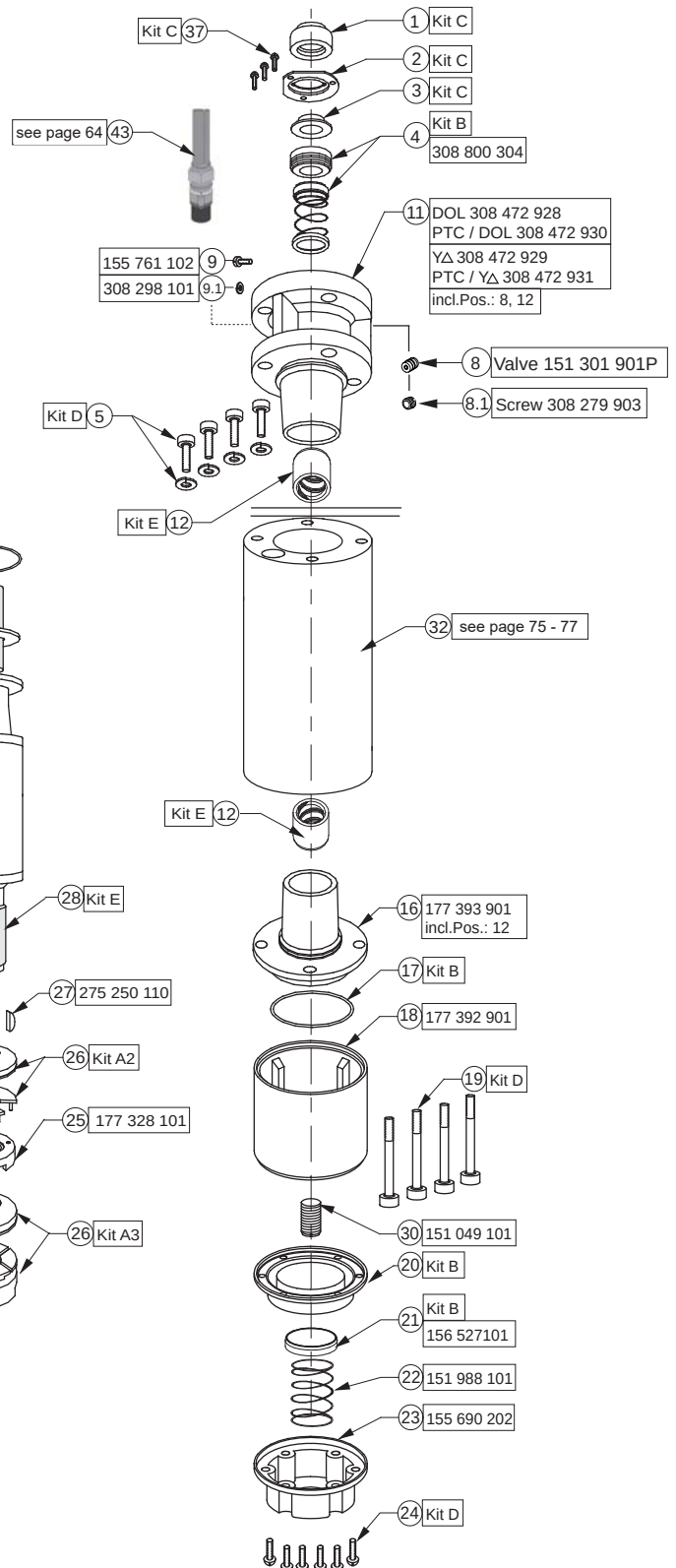


6" Encapsulated 304SS

4 - 30kW

Kit A2 15.500N / 4-22kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 120
Kit A3 27.500N / 30kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 200
Kit A4 45.000N / 30kW	Thrust Bearing Kit	incl. Pos.: 26	308750 510
45kN Conversion Kit 4,0 - 30kW		incl. Pos.: 12; 16; 18; 19; 20; 21; 22; 23; 24; 26; 30; 41	308 750 500
Kit B2 4 - 30kW	Seal Kit	incl. Pos.: 4; 17; 20; 21, 22, 41	308 800 302
Kit C2	Slinger Kit	incl. Pos.: 1; 2; 3; 37	308 725 302
Kit D4	Screw Kit	incl. Pos.: 5; 19; 24	308 659 302
Kit E* 4 - 30 kW	Radial Bearing Kit	incl. Pos.: 12; 28	308 678 101

* Radial Bearing Parts are unfinished



Replacement Stators and Rotors 304SS / 50 Hz

3 ~ ohne SubMonitor Transmitter 3 ~ without SubMonitor Transmitter	3 ~ sans transm. SubMonitor 3 ~ senza trasmettitore SubMonitor	3 ~ sin transmissor SubMonitor 3 ~ sem transmissor SubMonitor
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P _N [kW]	Volts	Thrust F [N]	DOL		Y _Δ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 10**	305 478 ***	236 670 10**	305 478 ***	178 117 912K
	380, 400, 415		236 610 10**	305 478 ***	236 710 10**	305 478 ***	
	500		236 700 10**	305 478 ***	236 790 10**	305 478 ***	
5,5	220, 230	15.500	236 681 10**	305 479 ***	236 671 10**	305 479 ***	178 118 911K
	380, 400, 415		236 611 10**	305 479 ***	236 711 10**	305 479 ***	
	500		236 701 10**	305 479 ***	236 791 10**	305 479 ***	
7,5	220, 230	15.500	236 682 10**	305 480 ***	236 672 10**	305 480 ***	178 119 906K
	380, 400, 415		236 612 10**	305 480 ***	236 712 10**	305 480 ***	
	500		236 702 10**	305 480 ***	236 792 10**	305 480 ***	
9,3	220, 230	15.500	236 015 10**	305 481 ***	236 005 10**	305 481 ***	178 182 906K
	380, 400, 415		236 001 10**	305 481 ***	236 011 10**	305 481 ***	
	500		236 008 10**	305 481 ***	236 018 10**	305 481 ***	
11,0	220, 230	15.500	236 683 10**	305 482 ***	236 673 10**	305 482 ***	178 120 906K
	380, 400, 415		236 613 10**	305 482 ***	236 713 10**	305 482 ***	
	500		236 703 10**	305 482 ***	236 793 10**	305 482 ***	
15,0	220, 230	15.500	236 684 10**	305 484 ***	236 674 10**	305 484 ***	178 121 906K
	380, 400, 415		236 614 10**	305 484 ***	236 714 10**	305 484 ***	
	500		236 704 10**	305 484 ***	236 794 10**	305 484 ***	
18,5	220, 230	15.500	236 685 10**	305 485 ***	236 675 10**	305 485 ***	178 122 906K
	380, 400, 415		236 615 10**	305 485 ***	236 715 10**	305 485 ***	
	500		236 705 10**	305 485 ***	236 795 10**	305 485 ***	
22,0	220, 230	15.500	236 686 10**	305 486 ***	236 676 10**	305 486 ***	178 123 906K
	380, 400, 415		236 616 10**	305 486 ***	236 716 10**	305 486 ***	
	500		236 706 10**	305 486 ***	236 796 10**	305 486 ***	
30,0	220, 230	27.500			236 677 10**	305 488 ***	178 115 906K
	380, 400, 415		236 617 10**	305 488 ***	236 717 10**	305 488 ***	
	500		236 707 10**	305 488 ***	236 797 10**	305 488 ***	

(*) : **Kabel 90° versetzt**
Pos. of leads 90°
Pos. des câbles 90°

Pos. de cavi 90°
Pos. de los cables 90°
Pos. dos cabos 90°



Replacement Stators and Rotors 304SS / 50 Hz

3 ~ mit SubMonitor Transmitter
3 ~ with SubMonitor Transmitter

3 ~ avec transm. SubMonitor
3 ~ con trasmettitore SubMonitor

3 ~ con transmissor SubMonitor
3 ~ com transmissor SubMonitor

P _N [kW]	Volts	Thrust F [N]	DOL		Y _Δ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 11**	305 478 ***	236 670 11**	305 478 ***	178 117 912K
	380, 400, 415		236 610 11**	305 478 ***	236 710 11**	305 478 ***	
	500		236 700 11**	305 478 ***	236 790 11**	305 478 ***	
5,5	220, 230	15.500	236 681 11**	305 479 ***	236 671 11**	305 479 ***	178 118 911K
	380, 400, 415		236 611 11**	305 479 ***	236 711 11**	305 479 ***	
	500		236 701 11**	305 479 ***	236 791 11**	305 479 ***	
7,5	220, 230	15.500	236 682 11**	305 480 ***	236 672 11**	305 480 ***	178 119 906K
	380, 400, 415		236 612 11**	305 480 ***	236 712 11**	305 480 ***	
	500		236 702 11**	305 480 ***	236 792 11**	305 480 ***	
9,3	220, 230	15.500	236 015 11**	305 481 ***	236 005 11**	305 481 ***	178 182 906K
	380, 400, 415		236 001 11**	305 481 ***	236 011 11**	305 481 ***	
	500		236 008 11**	305 481 ***	236 018 11**	305 481 ***	
11,0	220, 230	15.500	236 683 11**	305 482 ***	236 673 11**	305 482 ***	178 120 906K
	380, 400, 415		236 613 11**	305 482 ***	236 713 11**	305 482 ***	
	500		236 703 11**	305 482 ***	236 793 11**	305 482 ***	
15,0	220, 230	15.500	236 684 11**	305 484 ***	236 674 11**	305 484 ***	178 121 906K
	380, 400, 415		236 614 11**	305 484 ***	236 714 11**	305 484 ***	
	500		236 704 11**	305 484 ***	236 794 11**	305 484 ***	
18,5	220, 230	15.500	236 685 11**	305 485 ***	236 675 11**	305 485 ***	178 122 906K
	380, 400, 415		236 615 11**	305 485 ***	236 715 11**	305 485 ***	
	500		236 705 11**	305 485 ***	236 795 11**	305 485 ***	
22,0	220, 230	15.500	236 686 11**	305 486 ***	236 676 11**	305 486 ***	178 123 906K
	380, 400, 415		236 616 11**	305 486 ***	236 716 11**	305 486 ***	
	500		236 706 11**	305 486 ***	236 796 11**	305 486 ***	
30,0	220, 230	27.500			236 677 11**	305 488 ***	178 115 906K
	380, 400, 415		236 617 11**	305 488 ***	236 717 11**	305 488 ***	
	500		236 707 11**	305 488 ***	236 797 11**	305 488 ***	

(*) : Kabel 90° versetzt
Pos. of leads 90°
Pos. des câbles 90°

Pos. de cavi 90°
Pos. de los cables 90°
Pos. dos cabos 90°

Replacement Stators and Rotors 304SS / 50 Hz

3 ~ mit PTC 3 ~ with PTC			3 ~ avec PTC 3 ~ con PTC		3 ~ con PTC 3 ~ com PTC		
			DOL		Y _Δ (*)		
P _N [kW]	Volts	Thrust F [N]	Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	Rotor Model No.
4,0	220, 230	15.500	236 680 12**	305 478 ***	236 670 12**	305 478 ***	178 117 912K
	380, 400, 415		236 610 12**	305 478 ***	236 710 12**	305 478 ***	
	500		236 700 12**	305 478 ***	236 790 12**	305 478 ***	
5,5	220, 230	15.500	236 681 12**	305 479 ***	236 671 12**	305 479 ***	178 118 911K
	380, 400, 415		236 611 12**	305 479 ***	236 711 12**	305 479 ***	
	500		236 701 12**	305 479 ***	236 791 12**	305 479 ***	
7,5	220, 230	15.500	236 682 12**	305 480 ***	236 672 12**	305 480 ***	178 119 906K
	380, 400, 415		236 612 12**	305 480 ***	236 712 12**	305 480 ***	
	500		236 702 12**	305 480 ***	236 792 12**	305 480 ***	
9,3	220, 230	15.500	236 015 12**	305 481 ***	236 005 12**	305 481 ***	178 182 906K
	380, 400, 415		236 001 12**	305 481 ***	236 011 12**	305 481 ***	
	500		236 008 12**	305 481 ***	236 018 12**	305 481 ***	
11,0	220, 230	15.500	236 683 12**	305 482 ***	236 673 12**	305 482 ***	178 120 906K
	380, 400, 415		236 613 12**	305 482 ***	236 713 12**	305 482 ***	
	500		236 703 12**	305 482 ***	236 793 12**	305 482 ***	
15,0	220, 230	15.500	236 684 12**	305 484 ***	236 674 12**	305 484 ***	178 121 906K
	380, 400, 415		236 614 12**	305 484 ***	236 714 12**	305 484 ***	
	500		236 704 12**	305 484 ***	236 794 12**	305 484 ***	
18,5	220, 230	15.500	236 685 12**	305 485 ***	236 675 12**	305 485 ***	178 122 906K
	380, 400, 415		236 615 12**	305 485 ***	236 715 12**	305 485 ***	
	500		236 705 12**	305 485 ***	236 795 12**	305 485 ***	
22,0	220, 230	15.500	236 686 12**	305 486 ***	236 676 12**	305 486 ***	178 123 906K
	380, 400, 415		236 616 12**	305 486 ***	236 716 12**	305 486 ***	
	500		236 706 12**	305 486 ***	236 796 12**	305 486 ***	
30,0	220, 230	27.500			236 677 12**	305 488 ***	178 115 906K
	380, 400, 415		236 617 12**	305 488 ***	236 717 12**	305 488 ***	
	500		236 707 12**	305 488 ***	236 797 12**	305 488 ***	

(*) : **Kabel 90° versetzt** **Pos. de cavi 90°**
Pos. of leads 90° **Pos. de los cables 90°**
Pos. des câbles 90° **Pos. dos cabos 90°**

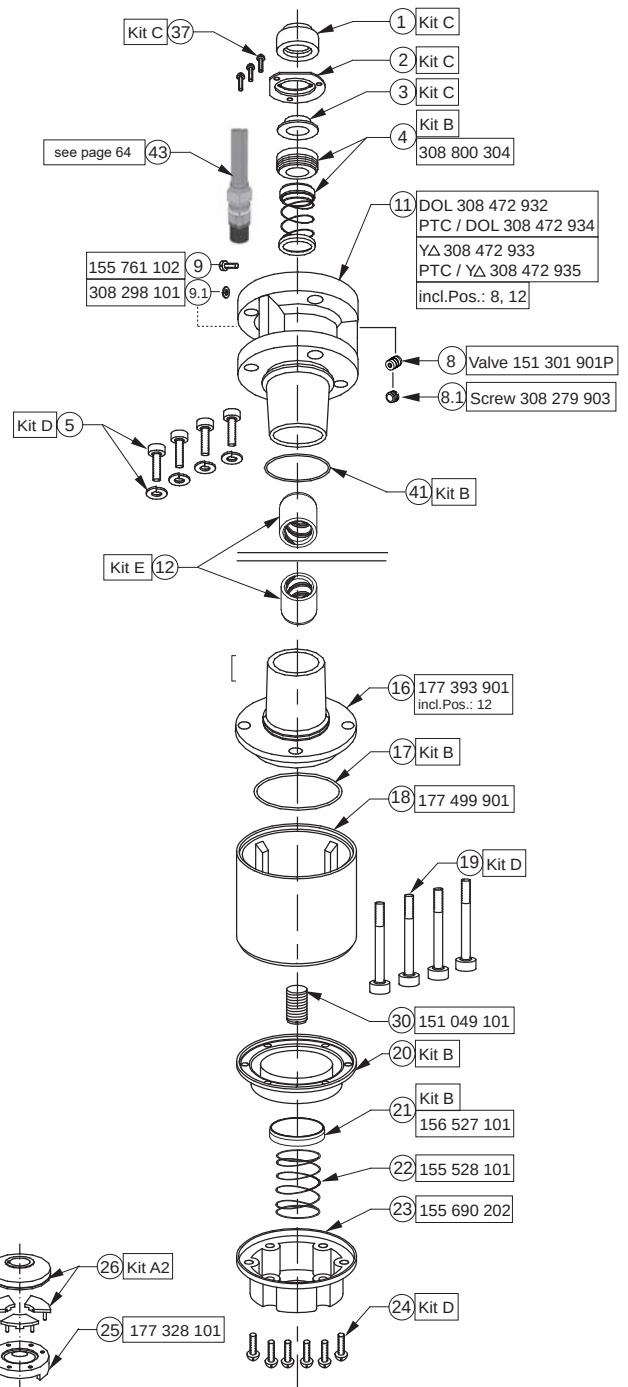
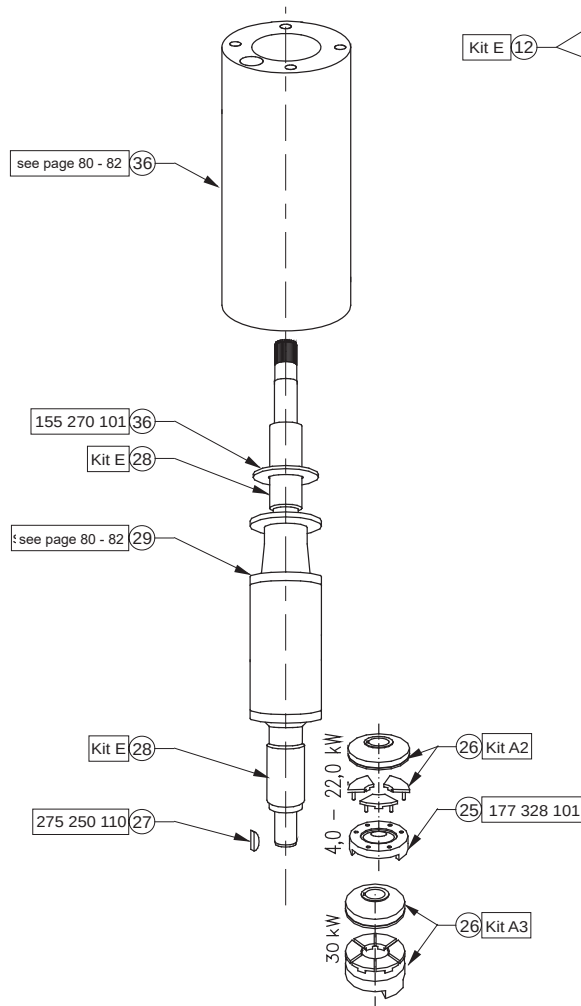
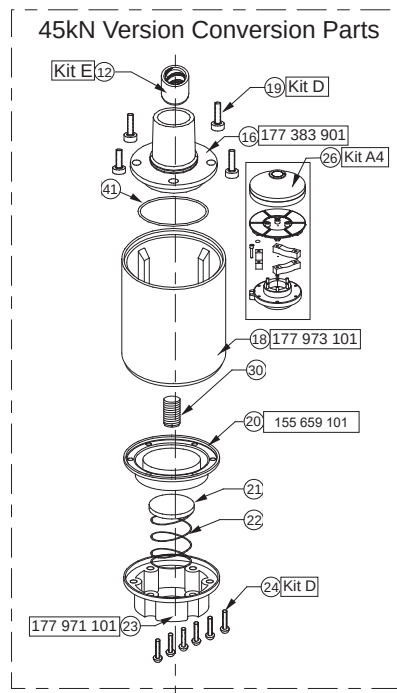


6" Encapsulated 316SS

4- 30 kW

Rotor Kit 6500N to 15.500N	4,0 kW	incl. Pos.: 25; 26, 29	305 330 911
	5,5 kW	incl. Pos.: 25; 26, 29	305 330 912
Kit A2 15.500N / 4-22kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 120
Kit A3 27.500N / 30kW	Thrust Bearing Kit	incl. Pos.: 26	308 750 200
Kit A4 45.000N	Thrust Bearing Kit	incl. Pos.: 26	308 750 120
45kN Conversion Kit 4,0 - 30kW		incl. Pos.: 12; 16; 18; 19; 20; 21; 22; 23; 24; 26; 30; 41	308 750 550
Kit B2 4 - 30kW	Seal Kit	incl. Pos.: 4; 17; 20; 21, 22, 41	308 800 302
Kit C2	Slinger Kit	incl. Pos.: 1; 2; 3; 37	308 725 302
Kit D3 up to 07.2002	Screw Kit	incl. Pos.: 5; 19; 24	308 659 301
Kit D4 starting 07.2002	Screw Kit	incl. Pos.: 5; 19; 24	308 659 302
Kit E* 4 - 30 kW	Radial Bearing Kit	incl. Pos.: 12; 28	308 678 101

* Radial Bearing Parts are unfinished

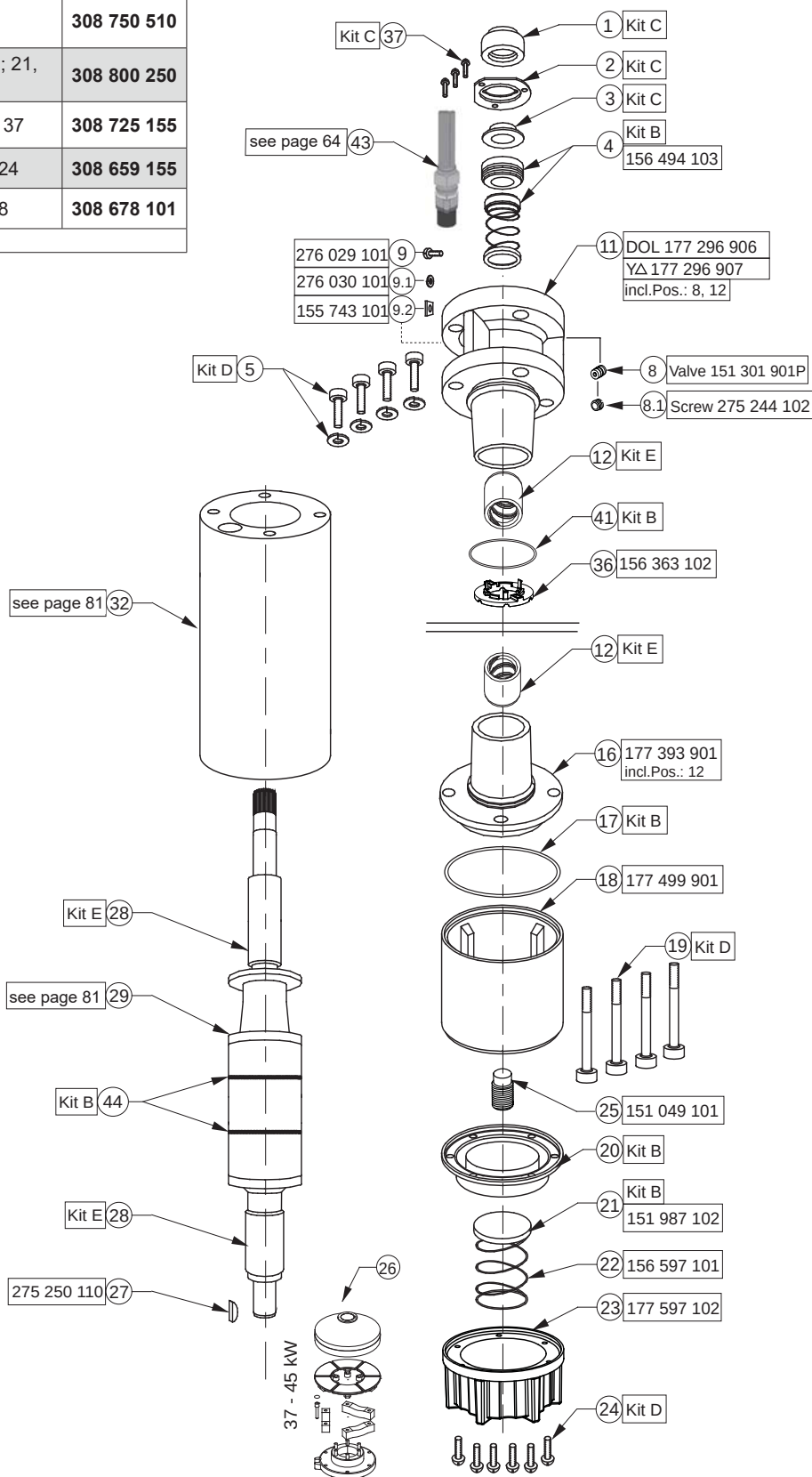
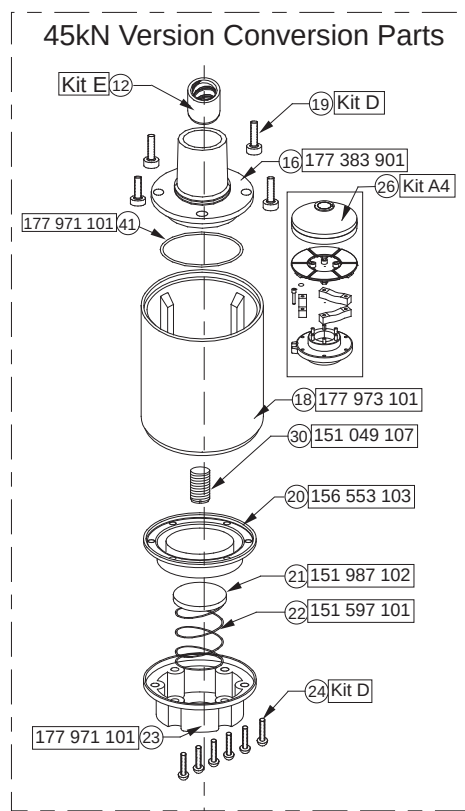


6" Encapsulated 316SS

37- 45 kW

Kit A3	Thrust Bearing Kit 27.500N	incl. Pos.: 26	308 750 200
Kit A4	Thrust Bearing Kit 45.000N	incl. Pos.: 26	308 750 510
Kit B3	Seal Kit	incl. Pos.: 4; 17; 20; 21, 41; 44	308 800 250
Kit C4	Slinger Kit	incl. Pos.: 1; 2; 3; 37	308 725 155
Kit D5	Screw Kit	incl. Pos.: 5; 19; 24	308 659 155
Kit E*	Radial Bearing Kit	incl. Pos.: 12; 28	308 678 101

* Radial Bearing Parts are unfinished





Replacement Stators and Rotors 316SS / 50 Hz

3 ~ ohne SubMonitor Transmitter 3 ~ without SubMonitor Transmitter	3 ~ sans transm. SubMonitor 3 ~ senza trasmettitore SubMonitor	3 ~ sin transmissor SubMonitor 3 ~ sem transmissor SubMonitor
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P _N [kW]	U _N [V]	Thrust (N)	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 39**	305478917	236 670 39**	305478920	178 117 913K
	380 - 415		236 610 39**	305478918	236 710 39**	305478921	
	500		236 700 39**	305478919	236 790 39**	305478922	
5,5	220, 230	15.500	236 681 39**	305479920	236 671 39**	305479923	178 118 912K
	380 - 415		236 611 39**	305479921	236 711 39**	305479924	
	500		236 701 39**	305479922	236 791 39**	305479925	
7,5	220, 230	15.500	236 682 39**	305480922	236 672 39**	305480925	178 119 908K
	380 - 415		236 612 39**	305480923	236 712 39**	305480926	
	500		236 702 39**	305480924	236 792 39**	305480927	
9,3	220, 230	15.500	236 015 39**	305481911	236 005 39**	305481914	178 182 907K
	380 - 415		236 001 39**	305481912	236 011 39**	305481915	
	500		236 008 39**	305481913	236 018 39**	305481916	
11,0	220, 230	15.500	236 683 39**	305482923	236 673 39**	305482926	178 120 908K
	380 - 415		236 613 39**	305482924	236 713 39**	305482927	
	500		236 703 39**	305482925	236 793 39**	305482928	
15,0	220, 230	15.500	236 684 39**	305484923	236 674 39**	305484926	178 121 907K
	380 - 415		236 614 39**	305484924	236 714 39**	305484927	
	500		236 704 39**	305484925	236 794 39**	305484928	
18,5	220, 230	15.500	236 685 39**	305485920	236 675 39**	305485923	178 122 907K
	380 - 415		236 615 39**	305485921	236 715 39**	305485924	
	500		236 705 39**	305485922	236 795 39**	305485926	
22,0	220, 230	15.500	236 686 39**	305486924	236 676 39**	305486927	178 123 907K
	380 - 415		236 616 39**	305486925	236 716 39**	305486928	
	500		236 706 39**	305486926	236 796 39**	305486929	
30,0	220, 230	27.500			236 677 39**	305488915	178 115 906K
	380 - 415		236 617 39**	305488913	236 717 39**	305488916	
	500		236 707 39**	305488914	236 797 39**	305488917	

(*) : **Kabel 90° versetzt** **Pos. de cavi 90°**
Pos. of leads 90° **Pos. de los cables 90°**
Pos. des câbles 90° **Pos. dos cabos 90°**

Replacement Stators and Rotors 316SS / 50 Hz

3 ~ mit SubMonitor Transmitter 3 ~ with SubMonitor Transmitter	3 ~ avec transm. SubMonitor 3 ~ con trasmettitore SubMonitor	3 ~ con transmissor SubMonitor 3 ~ com transmissor SubMonitor
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P _N [kW]	U _N [V]	Thrust F (N)	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 40**	305 478 947	236 670 40**	305 478 950	178 117 913K
	380 - 415		236 610 40**	305 478 948	236 710 40**	305 478 951	
	500		236 700 40**	305 478 949	236 790 40**	305 478 952	
5,5	220, 230	15.500	236 681 40**	305 479 950	236 671 40**	305 479 953	178 118 912K
	380 - 415		236 611 40**	305 479 951	236 711 40**	305 479 954	
	500		236 701 40**	305 479 952	236 791 40**	305 479 955	
7,5	220, 230	15.500	236 682 40**	305 480 952	236 672 40**	305 480 955	178 119 908K
	380 - 415		236 612 40**	305 480 953	236 712 40**	305 480 956	
	500		236 702 40**	305 480 954	236 792 40**	305 480 957	
9,3	220, 230	15.500	236 015 40**	305 481 941	236 005 40**	305 481 944	178 182 907K
	380 - 415		236 001 40**	305 481 942	236 011 40**	305 481 945	
	500		236 008 40**	305 481 943	236 018 40**	305 481 946	
11,0	220, 230	15.500	236 683 40**	305 482 953	236 673 40**	305 482 956	178 120 908K
	380 - 415		236 613 40**	305 482 954	236 713 40**	305 482 957	
	500		236 703 40**	305 482 955	236 793 40**	305 482 958	
15,0	220, 230	15.500	236 684 40**	305 484 953	236 674 40**	305 484 956	178 121 907K
	380 - 415		236 614 40**	305 484 954	236 714 40**	305 484 957	
	500		236 704 40**	305 484 955	236 794 40**	305 484 958	
18,5	220, 230	15.500	236 685 40**	305 485 950	236 675 40**	305 485 953	178 122 907K
	380 - 415		236 615 40**	305 485 951	236 715 40**	305 485 954	
	500		236 705 40**	305 485 952	236 795 40**	305 485 955	
22,0	220, 230	15.500	236 686 40**	305 486 954	236 676 40**	305 486 957	178 123 907K
	380 - 415		236 616 40**	305 486 955	236 716 40**	305 486 958	
	500		236 706 40**	305 486 956	236 796 40**	305 486 959	
30,0	220, 230	27.500			236 677 40**	305 488 939	178 115 906K
	380 - 415		236 617 40**	305 488 937	236 717 40**	305 488 940	
	500		236 707 40**	305 488 938	236 797 40**	305 488 941	
37,0	380 - 415	45.000	276 618 6361X	338 710 908	276 718 6361X	336 755 906	305 223 920
45,0	380 - 415	45.000	276 619 6361X	305 490 921	276 719 6361X	336 756 103	305 223 921

(*) : **Kabel 90° versetzt** **Pos. de cavi 90°**
Pos. of leads 90° **Pos. de los cables 90°**
Pos. des câbles 90° **Pos. dos cabos 90°**



Replacement Stators and Rotors 316SS / 50 Hz

3 ~ mit PTC 3 ~ with PTC	3 ~ avec PTC 3 ~ con PTC	3 ~ con PTC 3 ~ com PTC
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P _N [kW]	U _N [V]	Thrust F (N)	DOL		YΔ (*)		Rotor Model No.
			Motor Model No.	Stator Model No.	Motor Model No.	Stator Model No.	
4,0	220, 230	15.500	236 680 36**	305 478 953	236 670 36**	305 478 956	178 117 913K
	380 - 415		236 610 36**	305 478 954	236 710 36**	305 478 957	
	500		236 700 36**	305 478 955	236 790 36**	305 478 958	
5,5	220, 230	15.500	236 681 36**	305 479 956	236 671 36**	305 479 959	178 118 912K
	380 - 415		236 611 36**	305 479 957	236 711 36**	305 479 960	
	500		236 701 36**	305 479 958	236 791 36**	305 479 961	
7,5	220, 230	15.500	236 682 36**	305 480 958	236 672 36**	305 480 961	178 119 908K
	380 - 415		236 612 36**	305 480 959	236 712 36**	305 480 962	
	500		236 702 36**	305 480 960	236 792 36**	305 480 963	
9,3	220, 230	15.500	236 015 36**	305 481 947	236 005 36**	305 481 950	178 182 907K
	380 - 415		236 001 36**	305 481 948	236 011 36**	305 481 951	
	500		236 008 36**	305 481 949	236 018 36**	305 481 952	
11,0	220, 230	15.500	236 683 36**	305 482 959	236 673 36**	305 482 962	178 120 908K
	380 - 415		236 613 36**	305 482 960	236 713 36**	305 482 963	
	500		236 703 36**	305 482 961	236 793 36**	305 482 964	
15,0	220, 230	15.500	236 684 36**	305 484 959	236 674 36**	305 484 962	178 121 907K
	380 - 415		236 614 36**	305 484 960	236 714 36**	305 484 963	
	500		236 704 36**	305 484 961	236 794 36**	305 484 964	
18,5	220, 230	15.500	236 685 36**	305 485 956	236 675 36**	305 485 959	178 122 907K
	380 - 415		236 615 36**	305 485 957	236 715 36**	305 485 960	
	500		236 705 36**	305 485 958	236 795 36**	305 485 961	
22,0	220, 230	15.500	236 686 36**	305 486 960	236 676 36**	305 486 963	178 123 907K
	380 - 415		236 616 36**	305 486 961	236 716 36**	305 486 964	
	500		236 706 36**	305 486 962	236 796 36**	305 486 965	
30,0	220, 230	27.500			236 677 36**	305 488 944	178 115 906K
	380 - 415		236 617 36**	305 488 942	236 717 36**	305 488 945	
	500		236 707 36**	305 488 943	236 797 36**	305 488 946	

(*) : **Kabel 90° versetzt** **Pos. de cavi 90°**
 Pos. of leads 90° **Pos. de los cables 90°**
 Pos. des câbles 90° **Pos. dos cabos 90°**

6" Encapsulated Motor

„HighTemp 90°C“

Standard:



Submersible Motors

Quality in the Well

These 6" encapsulated motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 6" diameter or larger water wells with ambient temperature up to 90°C.

Water lubricated thrust and radial bearings enable a maintenance free operation. A special diaphragm ensures pressure compensation inside the motor. The motor is filled with a special FES92 fluid, providing frost protection down to -15°C storage temperature.

The Sand fighter® SiC seal system is standard.

Product advantages:

- Up to 90°C ambient temperature
- Increased thrust capacity up to 30°C
- No cooling flow in larger wells (12" / open reservoirs) up to 30°C ambient
- Hermetically sealed encapsulated stator, anti track, self healing stator resin
- Removable "Water Bloc" lead connector
- „Sand fighter“ Motor with SiC-Mechanical Seal
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested. Max. storage temperature -15°C - + 60°C
- High temperature leads
- Non contaminating FES92 -filled design
- 45kN Thrust Bearing Capacity is Standard

Technical Specifications

- 3,7 ... 30 kW
- 6" NEMA double flange
- Protection: IP 68
- Starts per hour: 20
- Installation: vertical/horizontal
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to DIN 61947-4-1
- Insulation: Class F
- Rated ambient temperature: 90°C
- Cooling flow: min. 0,16 m/s
- DOL / YΔ - start (pos. of cables 90°)
- Motor lead in 4m length

Options

- Other voltages
- Motors complete in 316 SS



6" HighTemp90 Model Numbers 50 Hz

P _N [kW]	P _N [Hp]	U _N [V]	Model Number Digit 1 – 6		Model Number Digit 7 - 11	
			DOL	YΔ	304	316SS
3,7	5	380 - 415	276 610	276 710	0000	3000
5,5	7,5	380 - 415	276 611	276 711	0000	3000
7,5	10	380 - 415	276 612	276 712	0000	3000
11	15	380 - 415	276 613	276 713	0000	3000
15	20	380 - 415	276 614	276 714	0000	3000
18,5	25	380 - 415	276 615	276 715	0100	3100
22	30	380 - 415	276 616	276 716	0100	3100
30	40	380 - 415	276 617	276 717	0100	3100

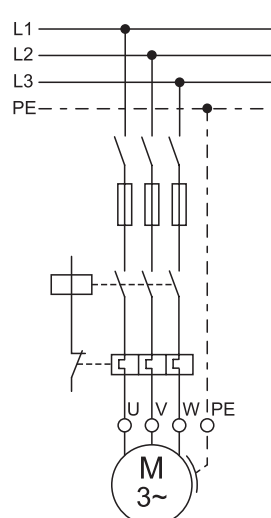
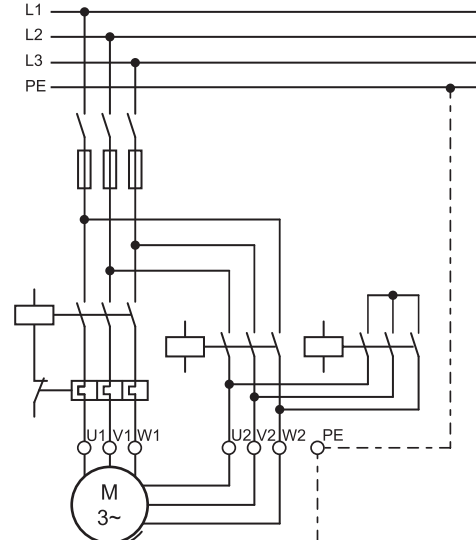
6" HighTemp90 Model Numbers 60 Hz

P _N [kW]	P _{max.} [kW]	U _N [V]	Model Number Digit 1 – 6		Model Number Digit 7 - 11		
			DOL	YΔ	304	316SS	High Thrust 45000N Motor Version
3,7	4,3	230	276 600	276 720	0000X	3000X	**63X
		380	276 660	276 780	0000X	3000X	**63X
		460	276 610	276 710	0000X	3000X	**63X
5,5	6,3	230	276 601	276 721	0000X	3000X	**63X
		380	276 661	276 781	0000X	3000X	**63X
		460	276 611	276 711	0000X	3000X	**63X
7,5	8,6	230	276 602	276 722	0000X	3000X	**63X
		380	276 662	276 782	0000X	3000X	**63X
		460	276 612	276 712	0000X	3000X	**63X
11	12,6	230	276 603	276 723	0000X	3000X	**63X
		380	276 663	276 783	0000X	3000X	**63X
		460	276 613	276 713	0000X	3000X	**63X
15	17,2	230	276 604	276 724	0000X	3000X	**63X
		380	276 664	276 784	0000X	3000X	**63X
		460	276 614	276 714	0000X	3000X	**63X
18,5	21,3	230	276 605	276 725	0100X	3100X	**63X
		380	276 665	276 785	0100X	3100X	**63X
		460	276 615	276 715	0100X	3100X	**63X
22	25,3	230	276 606	276 726	0100X	3100X	Standard
		380	276 666	276 786	0100X	3100X	Standard
		460	276 616	276 716	0100X	3100X	Standard
30	34,5	230	276 607	276 727	0100X	3100X	Standard
		380	276 667	276 787	0100X	3100X	Standard
		460	276 617	276 717	0100X	3100X	Standard

6" HighTemp 90 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		
3,7	45.000	380	2865	8,8	49,9	66	72	74	0,78	0,85	0,88	12,4	27,9
		400	2880	8,5	52,5	66	72	75	0,74	0,82	0,86	12,3	31,4
		415	2890	8,4	54,5	65	72	75	0,70	0,79	0,84	12,3	34,2
5,5	45.000	380	2880	12,7	78,6	70	75	77	0,77	0,85	0,88	18,6	42,8
		400	2890	12,3	83,0	70	75	77	0,72	0,81	0,86	18,4	48,3
		415	2900	12,3	86,0	69	75	77	0,67	0,77	0,84	18,4	52,4
7,5	45.000	380	2880	16,4	105	74	78	80	0,76	0,84	0,88	24,7	68,1
		400	2890	16,0	110	74	79	81	0,69	0,79	0,85	24,5	76,6
		415	2900	16,1	114	71	77	80	0,65	0,76	0,83	24,5	83,4
11,0	45.000	380	2880	24,4	152	75	79	80	0,74	0,83	0,85	37,0	99,1
		400	2890	24,2	160	74	79	80	0,67	0,77	0,82	36,9	111,4
		415	2895	24,4	166	73	78	79	0,61	0,73	0,79	36,7	123,5
15,0	45.000	380	2865	33,3	195	76	79	80	0,73	0,82	0,87	49,6	143,7
		400	2885	33,0	205	75	79	80	0,65	0,77	0,83	49,4	161,3
		415	2890	33,3	213	74	78	80	0,60	0,72	0,80	49,2	196,6
18,5	45.000	380	2870	40,7	253	79	82	82	0,70	0,80	0,86	61,9	199,3
		400	2890	40,5	266	78	82	83	0,62	0,74	0,82	61,5	227,8
		415	2895	41,4	276	76	80	82	0,57	0,69	0,78	61,4	248,1
22	45.000	380	2870	49,2	289	76	79	80	0,76	0,83	0,88	74,3	196,6
		400	2885	48,0	304	75	79	81	0,70	0,80	0,85	74,0	221,0
		415	2895	47,9	316	74	79	80	0,65	0,76	0,82	73,8	241,3
30	45.000	380	2870	65,0	419	80	82	83	0,70	0,80	0,86	99,2	267,1
		400	2885	64,5	441	79	82	83	0,63	0,75	0,82	98,7	301,0
		415	2895	65,6	458	77	81	83	0,58	0,70	0,78	98,4	326,7

Electrical Connection

DOL	YD								
									
<table><tr><th>U</th><th>V</th><th>W</th><th>PE</th></tr><tr><td>black</td><td>white</td><td>red</td><td>green</td></tr></table>		U	V	W	PE	black	white	red	green
U	V	W	PE						
black	white	red	green						

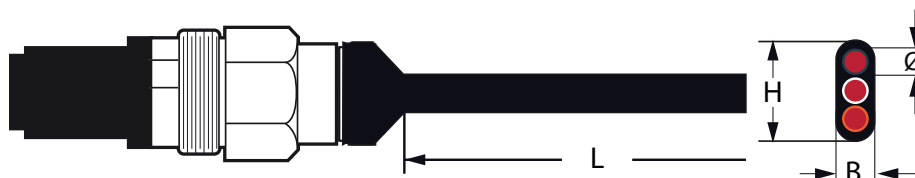
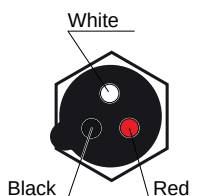


6" HighTemp 90 Performance Data 60 Hz

P_N [kW]	P_{max} [kW]	Thrust [N]	U_N [V]	Hz	n_N [min ⁻¹]	I_{max} [A]	I_A [A]	LINE TO LINE RESISTANCE OHMS
4,0	4,6	45.000	230	60	3450	17.2	108	.68 - .84
			380	60	3450	10.4	66.0	2.0 - 2.4
			460	60	3450	8.6	54.0	2.8 - 3.4
			575	60	3450	6.9	43.0	4.7 - 5.7
5,5	6,3	45.000	230	60	3450	24.6	168	.41 - .50
			380	60	3450	14.9	102	1.1 - 1.4
			460	60	3450	12.3	84.0	1.7 - 2.0
			575	60	3450	9.9	67.0	2.6 - 3.2
7,5	8,6	45.000	230	60	3450	31.6	238	.28 - .35
			380	60	3450	19.2	144	.80 - .98
			460	60	3450	15.8	119	1.2 - 1.4
			575	60	3450	12.7	95.0	1.8 - 2.2
11	12,7	45.000	230	60	3450	47.4	354	.19 - .24
			380	60	3450	28.7	214	.52 - .65
			460	60	3450	23.7	177	.78 - .96
			575	60	3450	19.0	142	1.2 - 1.4
15	17,3	45.000	230	60	3450	64.0	418	.14 - .18
			380	60	3450	38.8	253	.41 - .51
			460	60	3450	32.0	209	.58 - .72
			575	60	3450	25.6	167	.93 - 1.15
18,5	21,3	45.000	230	60	3450	78.8	578	.11 - .14
			380	60	3450	47.7	350	.27 - .34
			460	60	3450	39.4	289	.41 - .51
			575	60	3450	31.6	231	.70 - .86
22	25,3	45.000	230	60	3450	94.4	640	.09 - .12
			380	60	3450	57.2	387	.23 - .29
			460	60	3450	47.2	320	.34 - .42
			575	60	3450	37.8	256	.52 - .65
30	34,5	45.000	380	60	3450	76.0	545	.18 - .23
			460	60	3450	62.8	450	.23 - .29
			575	60	3450	50.2	360	.34 - .43

6" High Temp 90 Motor Leads* 304 / 316SS

P_N [kW]	Jam Nut Material	L [m]	Ø [mm²]	H [mm]	B [mm]	Part numbers
All Ratings	316 SS	5	3 x 8,4 mm²	21,5 mm (±0,3mm)	9,4 mm (±0,3mm)	305 602 905
		8				305 602 906



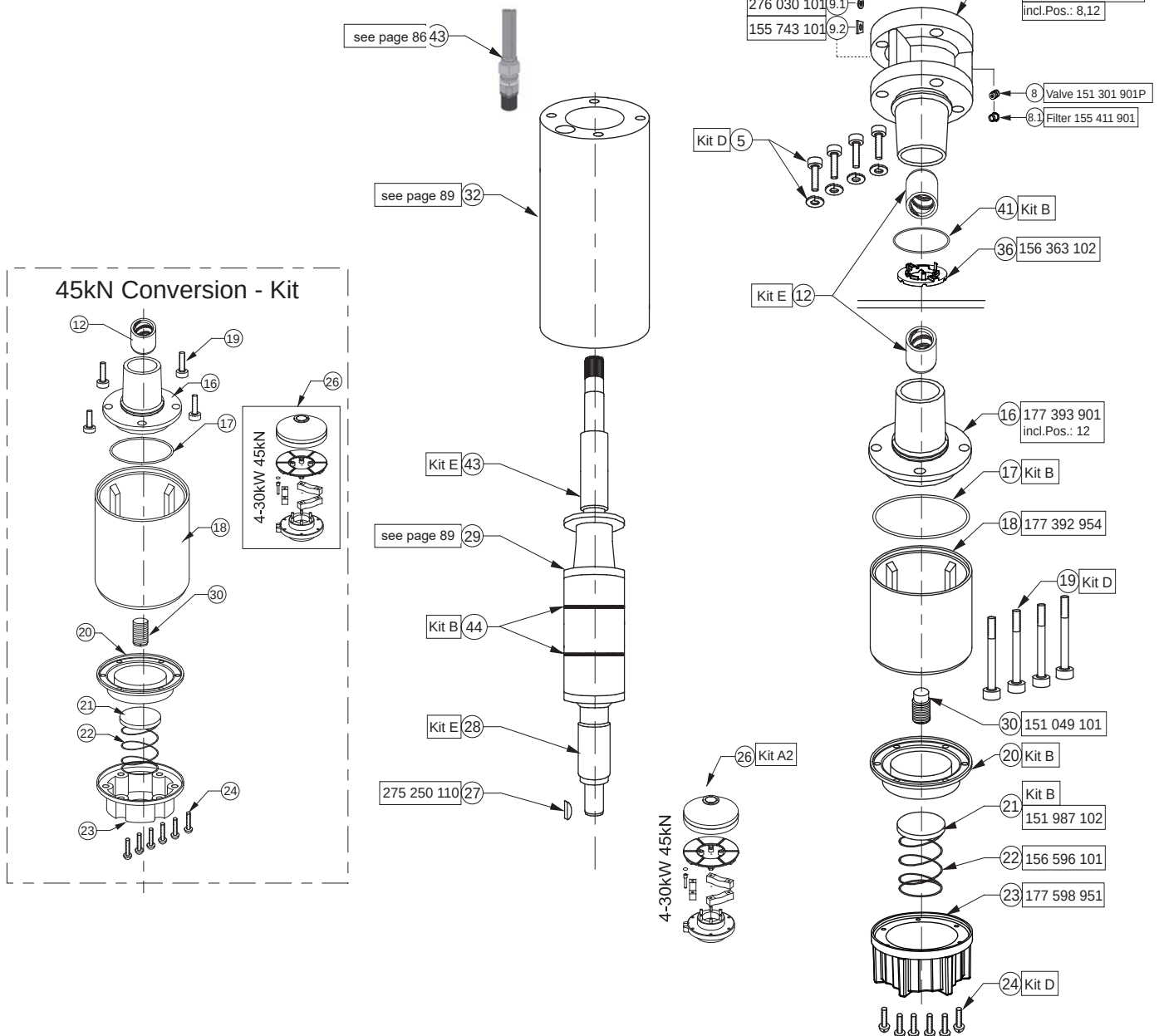
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.

6" HighTemp 90 Encapsulated Cast Iron Version

4 - 30 kW

Kit A2	Thrust Bearing 15.500N	Incl.Pos.: 25; 26	308 750 120
Kit A3	Thrust Bearing 27.500N	Incl.Pos.: 26	308 750 200
Kit A4	Thrust Bearing 45.000N	Incl.Pos.: 26	308 750 510
45kN Conversion Kit A4 4,0 - 30kW		incl. Pos.: 12; 16; 17; 18; 19 ; 20; 21; 22; 23; 24; 26; 30	308 750 500
Kit B3	Seal Kit	Incl.Pos.: 4; 17; 20; 21, 41; 44	308 800 250
Kit C4	Slinger Kit	Incl.Pos.: 1; 2; 3; 37	308 725 155
Kit D5	Screw Kit	Incl.Pos.: 5; 19; 24	308 659 155
Kit E*	Radial Bearing Kit	Incl.Pos.: 12; 28	308 678 101

* Parts are unfinished

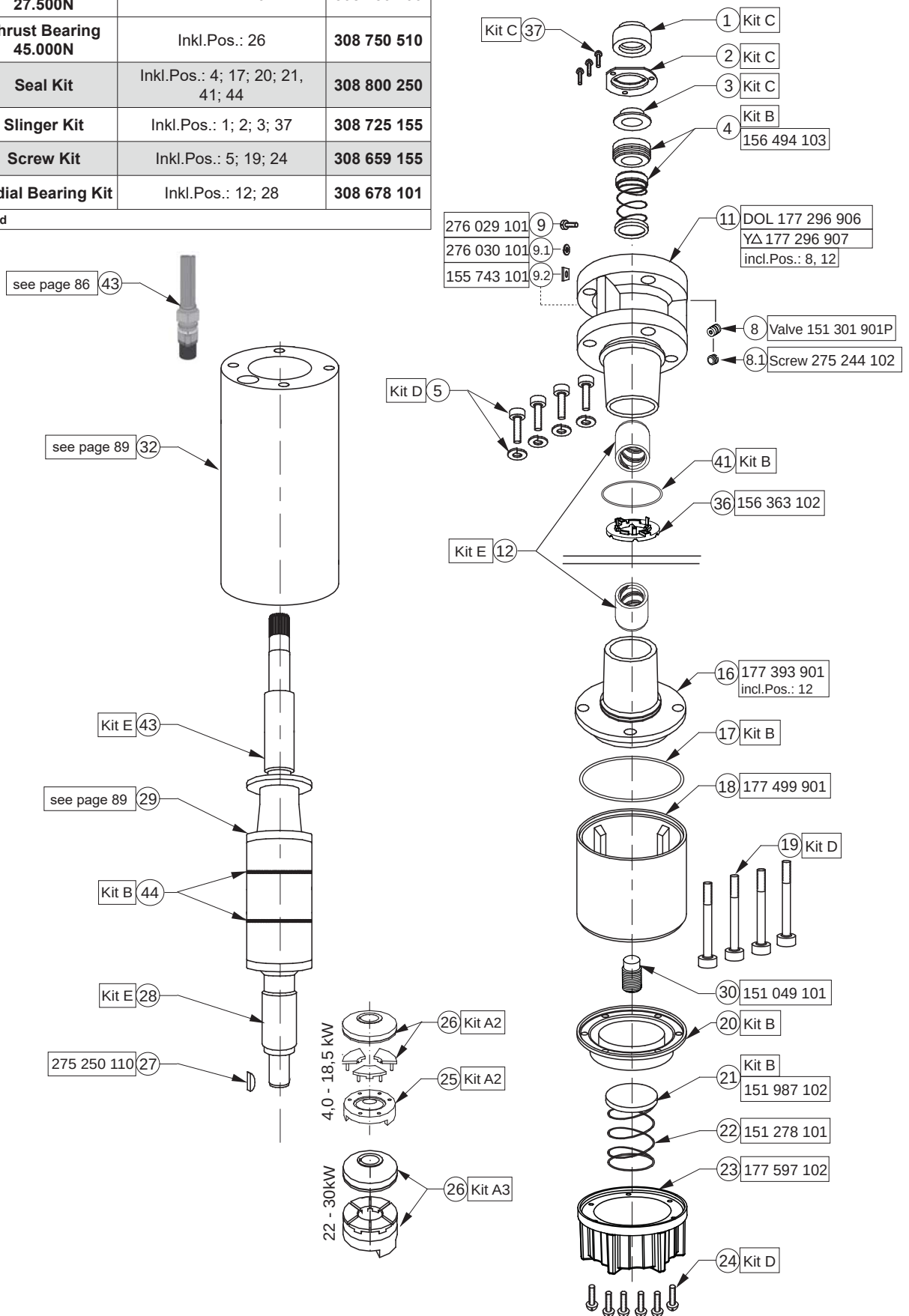




6" HighTemp 90 Encapsulated 316SS 4-30 kW

Kit A2	Thrust Bearing 15.500N	Inkl.Pos.: 25; 26	308 750 120
Kit A3	Thrust Bearing 27.500N	Inkl.Pos.: 26	308 750 200
Kit A4	Thrust Bearing 45.000N	Inkl.Pos.: 26	308 750 510
Kit B3	Seal Kit	Inkl.Pos.: 4; 17; 20; 21, 41; 44	308 800 250
Kit C4	Slinger Kit	Inkl.Pos.: 1; 2; 3; 37	308 725 155
Kit D5	Screw Kit	Inkl.Pos.: 5; 19; 24	308 659 155
Kit E*	Radial Bearing Kit	Inkl.Pos.: 12; 28	308 678 101

* Parts are unfinished



6" HighTemp 90 Replacement Stators and Rotors 50 Hz

P _N [kW]	U _N [V]	Thrust F [N]	DOL		YΔ		Rotor 316 Model No.
			Motor Model No.	Stator 316 Model No.	Motor Model No.	Stator 316 Model No.	
3,7	380 - 415	45.000	276 610 *****	331 634 903	276 710 *****	331 668 902	305 575 901
5,5	380 - 415	45.000	276 611 *****	331 635 903	276 711 *****	331 666 902	305 575 902
7,5	380 - 415	45.000	276 612 *****	331 636 903	276 712 *****	331 667 902	305 575 903
11,0	380 - 415	45.000	276 613 *****	305 482 974	276 713 *****	331 668 902	305 575 904
15,0	380 - 415	45.000	276 614 *****	331 616 903	276 714 *****	331 617 903	305 575 905
18,5	380 - 415	45.000	276 615 *****	305 485 972	276 715 *****	331 669 903	305 575 906
22,0	380 - 415	45.000	276 616 *****	305 486 976	276 716 *****	331 614 903	305 223 920
30,0	380 - 415	45.000	276 617 *****	305 490 913	276 717 *****	331 670 903	305 223 921

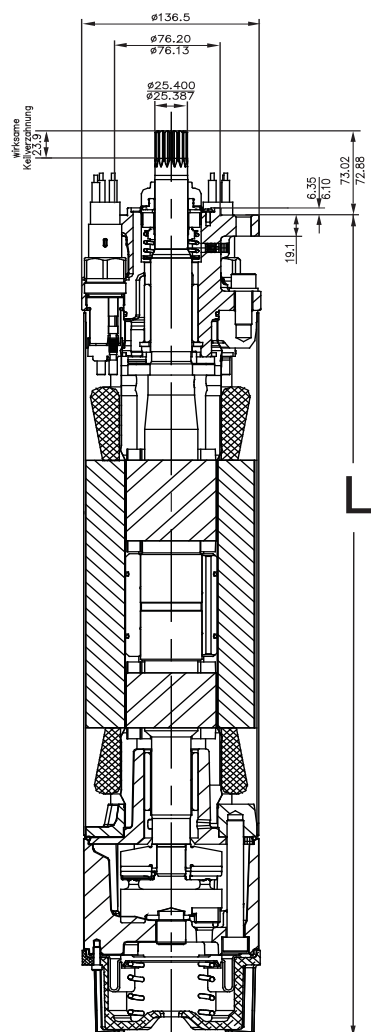
6" HighTemp 90 Replacement Stators and Rotors 60 Hz

P _{max} [kW]	U _N [V]	Thrust F [N]	DOL		YΔ		Rotor 316 Model No.
			Motor Model No.	Stator 316 Model No.	Motor Model No.	Stator 316 Model No.	
4,3	230	45.000	276 600	331 *** **	276 720	331 *** **	305 575 901
	380	45.000	276 660	331 *** **	276 780	331 *** **	
	460	45.000	276 610	331 *** **	276 710	331 *** **	
6,3	230	45.000	276 601	331 *** **	276 721	331 *** **	305 575 902
	380	45.000	276 661	331 *** **	276 781	331 *** **	
	460	45.000	276 611	331 *** **	276 711	331 *** **	
8,6	230	45.000	276 602	331 *** **	276 722	331 *** **	305 575 903
	380	45.000	276 662	331 *** **	276 782	331 *** **	
	460	45.000	276 612	331 *** **	276 712	331 *** **	
12,6	230	45.000	276 603	331 *** **	276 723	331 *** **	305 575 904
	380	45.000	276 663	331 *** **	276 783	331 *** **	
	460	45.000	276 613	331 *** **	276 713	331 *** **	
17,2	230	45.000	276 604	331 *** **	276 724	331 *** **	305 575 905
	380	45.000	276 664	331 *** **	276 784	331 *** **	
	460	45.000	276 614	331 *** **	276 714	331 *** **	
21,3	230	45.000	276 605	331 *** **	276 725	331 *** **	305 575 906
	380	45.000	276 665	331 *** **	276 785	331 *** **	
	460	45.000	276 615	305 485 902	276 715	331 *** **	
25,3	230	45.000	276 606	331 *** **	276 726	331 *** **	305 223 920
	380	45.000	276 666	331 *** **	276 786	331 *** **	
	460	45.000	276 616	331 *** **	276 716	331 *** **	
34,5	230	45.000	276 607	331 *** **	276 727	331 *** **	305 223 921
	380	45.000	276 667	331 *** **	276 787	331 *** **	
	460	45.000	276 617	331 *** **	276 717	331 *** **	

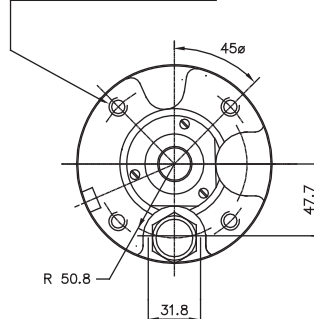


6" HighTemp 90 Motor Design 4 - 30 kW

304 / 316SS



4 threaded holes
1/2-20 UNF-2B
hole circle - $\varnothing 111.2 \pm 0.3$



Material DIN / AISI		
Part	304	316 SS
Shell	1.4301	1.4571
Upper end bell	Cast iron powder coated	1.4408
Lower end bell	Cast iron	1.4401
Thrust housing	Cast iron powder coated	1.4408
Mechanical seal	SiC / SiC	SiC / SiC
Seal cover	1.4301	1.4401
Slinger	Viton	Viton
Shaft end	1.4305	1.4542
Diaphragm	Viton	Viton
Lead	EPR	EPR
Jam Nut (Lead)	1.4401	1.4401
Lead bushing	1.4401	1.4401

Motor Sizes				
P _N [kW]	304 L [mm]	316 L [mm]	Motor Package Size [mm]	Shipping Weight [kg]
4	716	716	222 x 267 x 876	53
5,5	752	752	222 x 267 x 940	59
7,5	780	780	222 x 267 x 1073	66
11	846	846	222 x 267 x 1073	71
15	909	909	222 x 267 x 1302	79
18,5	1041	1041	222 x 267 x 1302	92
22	1476,7	1476,7	223 x 267 x 1823	140
30	1629,2	1629,2	223 x 267 x 1823	156

8" Encapsulated Motors

Optional: **SAND FIGHTER**

Submersible Motors

Quality in the Well

These 8" encapsulated motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 8" diameter or larger water wells. It is fitted with water lubricated radial and thrust bearings for maintenance-free operation. A special diaphragm ensures pressure compensation inside the motor. The motor is filled with a special FES91 fluid, providing frost protection down to -15°C storage temperature. The Sand fighter® SiC seal system is the option for sandy applications.



Product advantages:

- Hermetically sealed stator, anti track, self healing stator resin prevents motor burn out
- Removable "Water Bloc" lead connector
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- Sand slinger and Mechanical seal for high performance in sand
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Non contaminating FES91 -filled design

Technical Specifications

- 30 ... 150 kW
- 8" NEMA flange
- Protection: IP 68
- Starts per hour: 10
- Installation: vertical/horizontal
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to DIN 61947-4-1
- Insulation: Class F
- Rated ambient temperature: 30°C
- Cooling flow: min. 0,16 m/s
- Built-in SubMonitor Transmitter
- Motor lead in 8 m length (VDE / ACS / KTW approved)

Options

- Other voltages
- YΔ - start (pos. of cables 90°)
- Motors complete in 316 SS
- PT 100 temperature sensor (sold separately)
- „Sand fighter®“ Motor with SiC- Mechanical seal



8" Standard Model Numbers 50 HZ

P _N [kW]	U _N [V]	Model Number Digit 1 - 6		Model Number Digit 7 – 10 with SubMonitor Transmitter			
		DOL	YΔ	304		316 SS	
				DOL	YΔ	DOL	YΔ
30	220	-	239 400	-	8023	-	-
	380, 400, 415	239 600	239 620	7023	8023	7223	8223
	500,525	239 670	239 720	7023	8023	-	-
37	220	-	239 401	-	8023	-	-
	380, 400, 415	239 601	239 621	7023	8023	7223	8223
	500,525	239 671	239 721	7023	8023	-	-
45	220	-	239 402	-	8023	-	-
	380, 400, 415	239 602	239 622	7023	8023	7223	8223
	500,525	239 672	239 722	7023	8023	-	-
55	220	-	239 403	-	8043	-	-
	380, 400, 415	239 603	239 623	7043	8043	7243	8243
	500,525	239 673	239 723	7043	8043	-	-
75	220	-	239 404	-	8043	-	-
	380, 400, 415	239 604	239 624	7043	8043	7243	8243
	500,525	239 674	239 724	7043	8043	-	-
93	220	-	-	-	-	-	-
	380, 400, 415	239 105	239 125	7019	8019	7219	8219
	500,525	239 175	239 225	7019	8019	-	-
110	220	-	-	-	-	-	-
	380, 400, 415	239 106	239 126	7519	7619	7219	8219
	500,525	239 176	239 226	7519	7619	-	-
130	380, 400, 415	239 107	239 127	7519	7619	7219	8219
	500,525	239 177	239 227	7519	7619	-	-
150	380, 400, 415	239 108	239 128	7519	7619	7219	8219
	500,525	239 178	239 228	7519	7619	-	-

8" 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		
30	45 000	380	2890	61	397	85	86	86	0,75	0,84	0,88	98	231
		400	2900	61	418	83	86	86	0,68	0,78	0,84	97	255
		415	2910	62	433	82	85	86	0,62	0,73	0,80	97	275
		500	2890	47	302	85	86	86	0,75	0,84	0,88		
		525	2900	47	318	83	86	86	0,68	0,78	0,84		
37	45 000	380	2905	75	507	85	87	87	0,78	0,85	0,89	122	266
		400	2920	74	534	84	87	87	0,71	0,81	0,86	121	295
		415	2925	74	554	83	86	87	0,66	0,76	0,83	121	317
		500	2905	57	385	85	87	87	0,78	0,85	0,89		
		525	2920	57	404	84	87	87	0,71	0,81	0,86		
45	45 000	380	2910	89	612	86	87	87	0,77	0,85	0,89	146	363
		400	2920	89	645	85	87	87	0,71	0,81	0,85	145	395
		415	2925	89	669	84	86	87	0,65	0,76	0,82	146	428
		500	2910	68	466	86	87	87	0,77	0,85	0,89		
		525	2920	68	494	85	87	87	0,71	0,81	0,85		
55	45 000	380	2910	111	819	86	88	88	0,79	0,86	0,89	182	507
		400	2920	108	862	85	87	88	0,72	0,82	0,87	182	563
		415	2925	108	895	84	87	88	0,67	0,78	0,84	182	605
		500	2910	85	623	86	88	88	0,79	0,86	0,89		
		525	2920	83	661	85	87	88	0,72	0,82	0,87		
75	45 000	380	2920	153	1099	86	88	88	0,79	0,83	0,86	243	506
		400	2925	151	1157	85	87	87	0,72	0,82	0,83	242	561
		415	2930	151	1200	84	87	87	0,67	0,78	0,80	242	603
		500	2920	113	835	86	88	88	0,79	0,86	0,89		
		525	2925	111	861	85	87	87	0,72	0,82	0,87		
93	45 000	380	2920	194	1265	85	87	87	0,75	0,83	0,86	303	511
		400	2930	190	1332	84	86	87	0,68	0,78	0,83	302	567
		415	2935	191	1382	83	86	87	0,63	0,74	0,80	302	610
		500	2920	148	961	85	87	87	0,75	0,83	0,86		
		525	2930	145	1015	84	86	87	0,68	0,78	0,83		
110	45 000	380	2920	226	1517	86	88	88	0,77	0,84	0,87	364	694
		400	2930	222	1597	85	87	88	0,70	0,80	0,84	363	769
		415	2935	223	1657	84	87	88	0,64	0,75	0,81	363	828
		500	2920	172	1153	86	88	88	0,77	0,84	0,87		
		525	2930	170	1217	85	87	88	0,70	0,80	0,84		
130	45 000	380	2910	260	1651	86	87	87	0,83	0,87	0,89	425	837
		400	2920	252	1738	86	87	88	0,79	0,84	0,87	424	927
		415	2930	247	1803	85	87	88	0,74	0,81	0,86	423	1153
		500	2910	198	1255	86	87	87	0,83	0,87	0,89		
		525	2920	192	1324	86	87	88	0,79	0,84	0,87		
150	45 000	380	2910	294	1765	86	88	88	0,83	0,88	0,90	487	933
		400	2920	284	1858	86	88	88	0,79	0,86	0,88	485	1034
		415	2930	277	1928	86	88	88	0,75	0,83	0,87	485	1113
		500	2910	224	1341	86	88	88	0,83	0,88	0,90		
		525	2920	217	1416	86	88	88	0,79	0,86	0,88		



Winding Resistances 50 Hz

P_N [kW]	U_N [V]	3 ~ DOL		3 ~ YΔ	
		Stator Ref.	U - V / Ohm V - W / Ohm U - W / Ohm	Stator Ref.	$U_1 - U_2$ / Ohm $V_1 - V_2$ / Ohm $W_1 - W_2$ / Ohm
30	220	-	-	338 382 ...	0.123 - 0.150
	380, 400, 415	338 382 ...	0.247 - 0.302	338 443 ...	0.345 - 0.423
	500, 525	338 610 ...	0.399 - 0.487	338 610 ...	0.621 - 0.759
37	220	-	-	338 383 ...	0.090 - 0.111
	380, 400, 415	338 383 ...	0.181 - 0.221	338 588 ...	0.272 - 0.332
	500, 525	338 611 ...	0.280 - 0.342	338 611 ...	0.464 - 0.566
45	220	-	-	338 384 ...	0.071 - 0.087
	380, 400, 415	338 384 ...	0.142 - 0.174	338 645 ...	0.210 - 0.257
	500, 525	338 612 ...	0.227 - 0.277	338 612 ...	0.369 - 0.450
55	220	-	-	338 385 ...	0.053 - 0.065
	380, 400, 415	338 385 ...	0.105 - 0.128	338 646 ...	0.164 - 0.200
	500, 525	338 613 ...	0.169 - 0.207	338 613 ...	0.267 - 0.327
75	220	-	-	338 386 ...	0.036 - 0.045
	380, 400, 415	338 386 ...	0.073 - 0.089	338 591 ...	0.102 - 0.125
	500, 525	338 614 ...	0.129 - 0.158	338 614 ...	0.198 - 0.243
93	380, 400, 415	336 053 ...	0.055 - 0.067	336 053 ...	0.083 - 0.101
	500, 525	338 514 ...	0.091 - 0.112	338 514 ...	0.137 - 0.168
110	380, 400, 415	336 054 ...	0.046 - 0.056	336 054 ...	0.069 - 0.084
	500, 525	338 515 ...	0.086 - 0.106	338 515 ...	0.129 - 0.159
130	380, 400, 415	336 524 ...	0.042 - 0.052	336 524 ...	0.063 - 0.078
	500, 525	338 516 ...	0.073 - 0.090	338 516 ...	0.110 - 0.135
150	380, 400, 415	336 055 ...	0.036 - 0.044	336 055 ...	0.054 - 0.066
	500, 525	337 071 ...	0.057 - 0.070	337 071 ...	0.086 - 0.105

VDE / KTW Approved Leads* 304 / 316SS

3 ~ DOL start

	P_N [kW]	$\emptyset$	Size [mm]	Type	Qty.	L (m)	Part numbers	
							304	316SS
	30 - 45	1x 4G8,4 mm ²	B 29,5 / H 8,9	VDE/КТW	1	8	305 312 901	305 312 911
	55 - 93	3 x (1X16 mm ²)	D 11,6 (±0,2)	VDE/КТW	1	8	305 310 901	305 310 951
	110 - 150*	3 x (1X35 mm ²)	Ø 14,5 (±0,3)	VDE/КТW	1	8	305 309 901	

* 3 Leads with single conductors

3 ~ YΔ Start (Pos. of cables 90°)

	P_N [kW]	$\emptyset$	Size [mm]	Type	Qty.	L (m)	Part numbers	
							304	316SS
	30 - 45	1x 4G8,4 mm ²	B 29,5 / H 8,9	VDE/КТW	1	8	305 312 902	305 312 912
		1x 3X8,4 mm ²	B 19,6 / H 8,9		1			
	55 - 150	3 x (1X16 mm ²)	D 11,6 (±0,2)	VDE/КТW	2	8	305 310 901	305 310 951

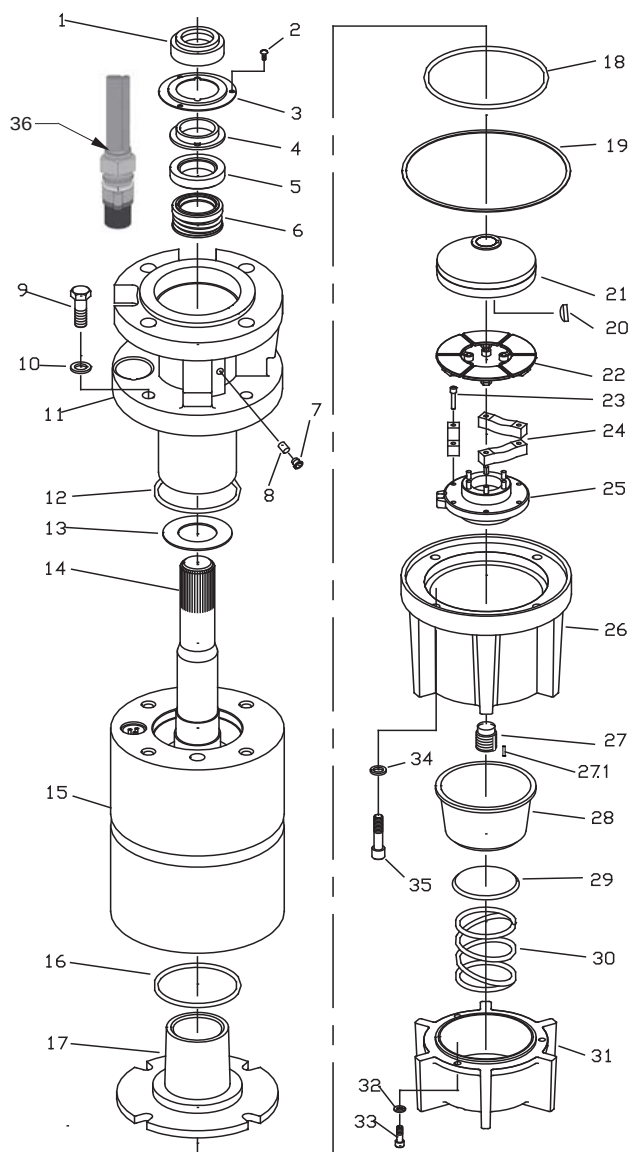
Ground Leads

	P_N [kW]	$\emptyset$	Size [mm]	Type	Qty.	L (m)	Part numbers	
							304/316SS	
	55 - 150	1G25 mm ²	D 13 mm (±0,3)	VDE/КТW	1	8	308 053 080	

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

8" Encapsulated Cast Iron

30 - 45 kW Type 2.1***



Position	Part Description	Qty	Kit
1	Rubber Slinger	1	B
2	Bushing Cover Screw	3	B, F
3	Bushing Cover	1	B
4	Slinger Bushing	1	B
5, 6	Shaft Seal	1	B
7	Filter Assembly	1	B
8	Valve Assembly	1	B
9, 10	Screw/Lockwasher	4	C, D, F
11	End Bell, Upper w/Radial Brg	1	C, D
12	O-Ring	1	B, C, D
13	Upthrust Washer	1	A
14	Rotor	1	see page 97
15	Stator	1	see page 97
16	O-Ring	1	B, E
17	End Bell, Lower w/Radial Brg	1	E
18	O-Ring	1	B, E
19	Gasket	1	B
20	Woodruff Key	1	A
21	Thrust Disc Asm	1	A
22, 23, 24, 25	Thrust Segment Asm	1	A
26	Thrust Housing	1	G
27	Adjusting Screw	1	A
27.1	Pin (Brass)	1	A
28	Diaphragm	1	B
29	Spring Plate	1	B
30	Diaphragm Spring	1	B
31	Diaphragm Cover	1	H
32, 33	Screw/Lockwasher	3	F, H
34, 35	Screw/Lockwasher	4	F, G
36	Lead	1/2	see page 94

	Description	Includes Pos.	Part Number
Kit A 40 - 60 HP	Thrust Bearing	13, 19 - 25, 27, 27.1	305 428 001
Kit B 40 - 60 HP	Seal Carbon/Ceramic	1 - 8, 12, 16, 18, 19, 28 - 30	305 428 002
Kit B1 40 - 60 HP	Seal SiC	1 - 8, 12, 16, 18, 19, 28 - 30	305 428 011
Kit C1 40 - 60 HP 3 Lead	End Bell, Upper	9 - 12	305 428 003
Kit D1 40 - 60 HP 6 Lead	End Bell, Upper	9 - 12	305 428 005
Kit E 40 - 60 HP	End Bell, Lower*	16 - 18	305 428 007
Kit F 40 - 60 HP	Fasteners*	2, 9, 10, 32 - 35	305 428 017
Kit G 40 - 60 HP	Thrust Housing	26, 34, 35	305 428 009
Kit H 40 - 60 HP	Diaphragm Cover	31 - 33	305 428 010
Kit I 40 - 60 HP	Radial Bearing**	SS Sleeve & Carbon Bushing	305 428 054

* Suitable for 304 and 316SS Motors

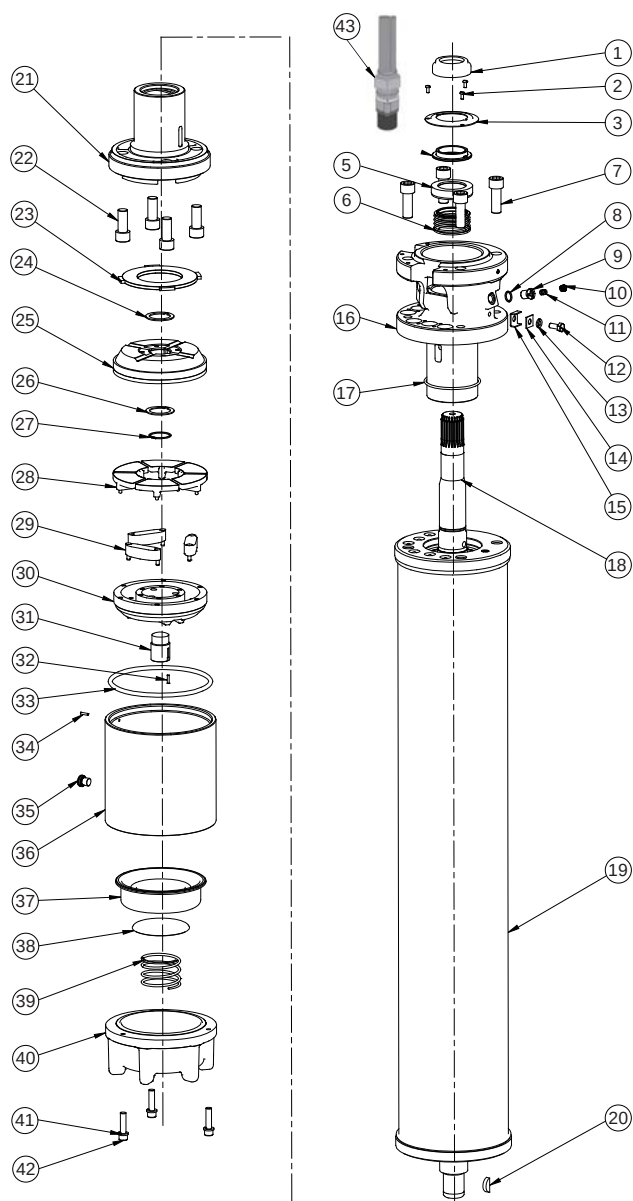
** Parts are Semi finished

*** Spare parts for motors build up to june 2015 please contact FE



8" Encapsulated 304

55 - 150 kW Type 1



Position	Part Description	Qty	Kit
1	Rubber Slinger	1	B
2	Bushing Cover Screw	3	B, F
3	Bushing Cover	1	B
4	Slinger Bushing	1	B
5, 6	Shaft Seal	1	B
7	Screw/Lockwasher	4	C, D, F
8, 9, 11	Valve Assembly	1	B, C, D
10	Filter Assembly	1	B
12, 13, 14, 15	Ground Lug Asm	1	C, D
16	End Bell, Upper w/Radial Brg	1	C, D
17	O-Ring	1	B, C, D
18	Rotor	1	see page 97
19	Stator	1	see page 97
20	Woodruff Key	1	A
21	End Bell, Lower w/Radial Brg	1	E
22	Screw	4	E, F
23	Upthrust Washer	1	A 155 318 201K
24, 26, 27	Shim/Retainer Ring	1	A
25	Thrust Disc Asm	1	A
28, 29, 30	Thrust Segment Asm	1	A
31	Adjusting Screw	1	A
32	Pin	1	A
33	O-Ring	1	A, E
34, 36	Thrust Housing	1	G
35	Plug	1	--
37	Diaphragm	1	B
38	Spring Plate	1	B
39	Diaphragm Spring	1	B
40	Diaphragm Cover	1	H
41, 42	Screw/Lockwasher	3	F, H
43	Lead	3 / 6	see page 94

	Description	Includes Pos.	Part Number
Kit A 75 - 200 HP	Thrust Bearing	20, 23 - 33	305 428 020
Kit B1 75 - 200 HP	Seal Kit	1 - 6, 10, 11, 17, 32, 33, 37 - 39	305 428 021
Kit B2 75 - 200 HP	Seal SiC ***	1 - 6, 10, 11, 17, 32, 33, 37 - 39	305 428 022
Kit C1 75 HP 3 Lead	End Bell, Upper	7, 11 - 17	305 428 023
Kit C2 150 - 200 HP 3 Lead	End Bell, Upper	7, 11 - 17	305 428 024
Kit D 75 - 200 HP 6 Lead	End Bell, Upper	7, 11 - 17	305 428 025
Kit E 75 - 200 HP	End Bell, Lower*	21, 22, 32, 33	305 428 037
Kit F 75 - 200 HP	Fasteners*	2, 7, 22, 41, 42	305 428 039
Kit G 75 - 200 HP	Thrust Housing	34, 36	305 428 029
Kit H 75 - 200 HP	Diaphragm Cover	40 - 42	305 428 030
Kit I 75 - 200 HP	Radial Bearing**	SS Sleeve & Carbon Bushing	305 428 055

* Suitable for 304 and 316SS Motors

** Parts are Semi finished

*** Spring DM 62,7mm for 125 - 200 HP only

Replacement Stators and Rotors 304 / 50 Hz

3 ~ Direct start with SubMonitor Transmitter

P _N [kW]	U _N [V]	Motor Model No.	Stator	Rotor
30	380, 400, 415	239 600 7023	305 500 901	575 122 925
	500, 525	239 670 7023	338 610 902	
37	380, 400, 415	239 601 7023	305 501 901	575 122 930
	500, 525	239 671 7023	338 611 903	
45	380, 400, 415	239 602 7023	305 502 901	575 122 931
	500, 525	239 672 7023	338 612 904	
55	380, 400, 415	239 603 7043	338 386 915	575 122 920
	500, 525	239 673 7043	338 613 902	
75	380, 400, 415	239 604 7043	338 386 915	575 122 921
	500, 525	239 674 7043	338 614 907	
93	380, 400, 415	239 105 7019	305 505 901	575 122 922
	500, 525	239 175 7019	338 514 951	
110	380, 400, 415	239 106 7519	305 506 902	575 122 923
	500, 525	239 176 7519	338 515 951	
130	380, 400, 415	239 107 7519	336 524 101	575 122 924
	500, 525	239 177 7519	*	
150	380, 400, 415	239 108 7519	336 055 905	575 122 918
	500, 525	239 178 7519	337 071 912	

Replacement Stators and Rotors 304 / 50 Hz

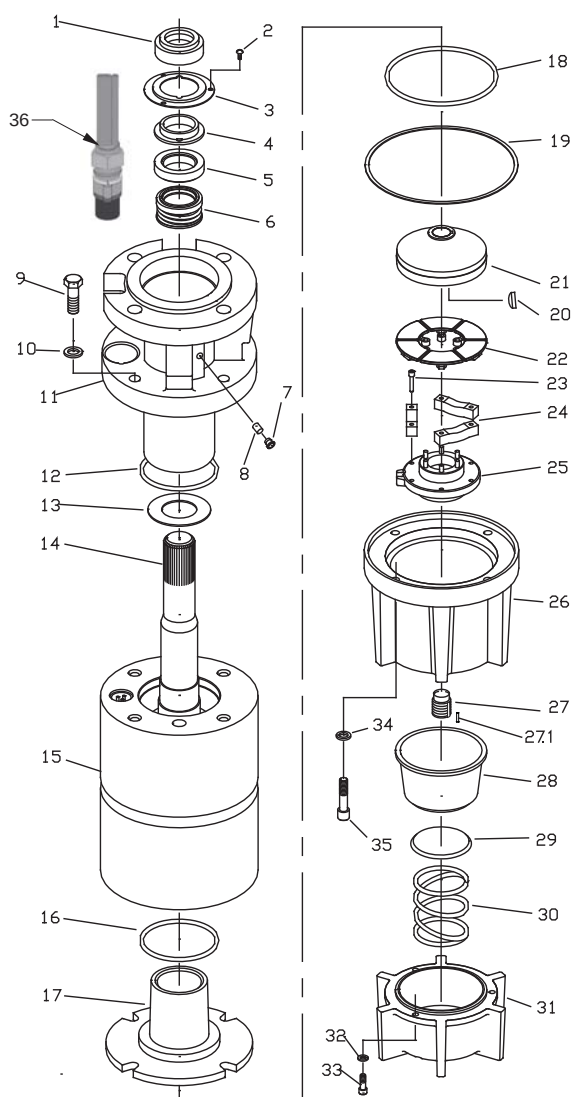
3 ~ YΔ Start with SubMonitor Transmitter (Pos. of cables 90°)

P _N [kW]	U _N [V]	Motor Model No.	Stator	Rotor
30	220	239 400 8023	338 382 911	575 122 925
	380, 400, 415	239 620 8023	305 500 503	
	500, 525	239 720 8023	338 610 904	
37	220	239 401 8023	305 501 903	575 122 930
	380, 400, 415	239 621 8023	305 501 904	
	500, 525	239 721 8023	338 611 906	
45	220	239 402 8023	305 502 902	575 122 931
	380, 400, 415	239 622 8023	305 502 905	
	500, 525	239 722 8023	338 612 906	
55	220	239 403 8043	305 503 904	575 122 920
	380, 400, 415	239 623 8043	305 503 909	
	500, 525	239 723 8043	338 613 906	
75	220	239 404 8043	338 386 904	575 122 921
	380, 400, 415	239 624 8043	305 504 904	
	500, 525	239 724 8043	305 504 908	
93	380, 400, 415	239 125 8019	305 505 903	575 122 922
	500, 525	239 225 8019	305 505 910	
110	380, 400, 415	239 126 7619	305 506 903	575 122 923
	500, 525	239 226 7619	338 515 952	
130	380, 400, 415	239 127 7619	336 524 917	575 122 924
	500, 525	239 227 7619	338 516 902	
150	380, 400, 415	239 128 7619	336 055 919	575 122 918
	500, 525	239 228 7619	337 071 914	



8" Encapsulated 316SS

30 - 45 kW Type 2.1***



Position	Part Description	Qty	Kit
1	Rubber Slinger	1	B
2	Bushing Cover Screw	3	B, F
3	Bushing Cover	1	B
4	Slinger Bushing	1	B
5, 6	Shaft Seal	1	B
7	Filter Assembly	1	B
8	Valve Assembly	1	B
9, 10	Screw/Lockwasher	4	C, D, F
11	End Bell, Upper w/Radial Brg	1	C, D
12	O-Ring	1	B, C, D
13	Upthrust Washer	1	A, B1 155 941 101
14	Rotor	1	see page 100
15	Stator	1	see page 100
16	O-Ring	1	B, E
17	End Bell, Lower w/Radial Brg	1	E
18	O-Ring	1	B, E
19	Gasket	1	B
20	Woodruff Key	1	A
21	Thrust Disc Asm	1	A
22, 23, 24, 25	Thrust Segment Asm	1	A
26	Thrust Housing	1	G
27	Adjusting Screw	1	A
27.1	Pin (Brass)	1	A
28	Diaphragm	1	B
29	Spring Plate	1	B
30	Diaphragm Spring	1	B
31	Diaphragm Cover	1	H
32, 33	Screw/Lockwasher	3	F, H
34, 35	Screw/Lockwasher	4	F, G
36	Lead	1/2	see page 94

	Description	Includes Pos.	Part Number
Kit A 40 - 60 HP	Thrust Bearing*	13, 19 - 25, 27, 27.1	305 428 001
Kit B 40 - 60 HP	Seal Kit	1 - 8, 12, 16, 18, 19, 28 - 30	305 428 012
Kit C1 40 - 60 HP 3 Lead	End Bell, Upper	9 - 12	305 428 013
Kit D1 40 - 60 HP 6 Lead	End Bell, Upper	9 - 12	305 428 015
Kit E 40 - 60 HP	End Bell, Lower*	16 - 18	305 428 007
Kit F 40 - 60 HP	Fasteners*	2, 9, 10, 32 - 35	305 428 017
Kit G 40 - 60 HP	Thrust Housing	26, 34, 35	305 428 018
Kit H 40 - 60 HP	Diaphragm Cover	31 - 33	305 428 019
Kit I 40 - 60 HP	Radial Bearing**	SS Sleeve & Carbon Bushing	305 428 054

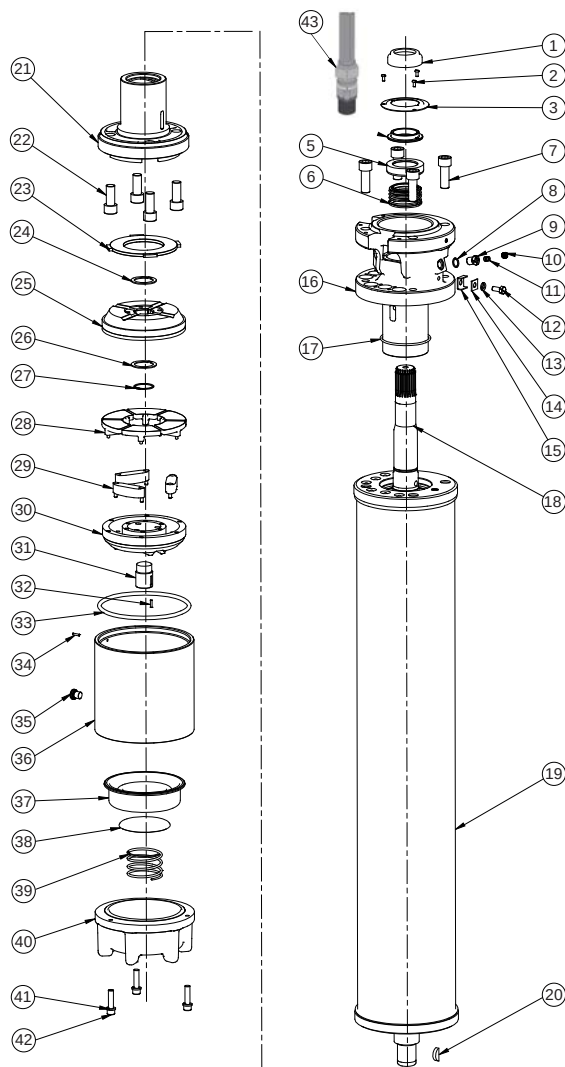
* Suitable for 304 and 316SS Motors

** Parts are Semi finished

*** Spare parts for motors build up to june 2015 please contact FE

8" Encapsulated 316SS

55 - 150 kW Type 1



Position	Part Description	Qty	Kit
1	Rubber Slinger	1	B
2	Bushing Cover Screw	3	B, F
3	Bushing Cover	1	B
4	Slinger Bushing	1	B
5, 6	Shaft Seal	1	B
7	Screw/Lockwasher	4	C, D, F
8, 9, 11	Valve Assembly	1	B, C, D
10	Filter Assembly	1	B
12, 13, 14, 15	Ground Lug Asm	1	C, D
16	End Bell, Upper w/Radial Brg	1	C, D
17	O-Ring	1	B, C, D
18	Rotor	1	see page 100
19	Stator	1	see page 100
20	Woodruff Key	1	A
21	End Bell, Lower w/Radial Brg	1	E
22	Screw	4	E, F
23	Upthrust Washer	1	A
24, 26, 27	Shim/Retainer Ring	1	A
25	Thrust Disc Asm	1	A
28, 29, 30	Thrust Segment Asm	1	A
31	Adjusting Screw	1	A
32	Pin	1	A
33	O-Ring	1	A, E
36	Thrust Housing	1	G
35	Plug	1	--
37	Diaphragm	1	B
38	Spring Plate	1	B
39	Diaphragm Spring	1	B
40	Diaphragm Cover	1	H
41, 42	Screw/Lockwasher	3	F, H
43	Lead	3 / 6	see page 94

	Description	Includes Pos.	Part Number
Kit A 75 - 200 HP	Thrust Bearing	20, 23 - 33	305 428 020
Kit B 75 - 200 HP	Seal SiC***	1 - 6, 10, 11, 17, 32, 33, 37 - 39	305 428 033
Kit C1 75 HP 3 Lead	End Bell, Upper	7, 11 - 17	305 428 034
Kit C2 150 - 200 HP 3 Lead	End Bell, Upper	7, 11 - 17	305 428 035
Kit D 75 - 200 HP 6 Lead	End Bell, Upper	7, 11 - 17	305 428 036
Kit E 75 - 200 HP	End Bell, Lower*	21, 22, 32, 33	305 428 037
Kit F 75 - 200 HP	Fasteners*	2, 7, 22, 41, 42	305 428 039
Kit G 75 - 200 HP	Thrust Housing	34, 35, 36	305 428 040
Kit H 75 - 200 HP	Diaphragm Cover	40 - 42	305 428 041
Kit I 75 - 200 HP	Radial Bearing**	SS Sleeve & Carbon Bushing	305 428 055

* Suitable for 304 and 316SS Motors

** Parts are Semi finished

*** Spring DM 62,7mm for 125 - 200 HP only



Replacement Stators and Rotors 316SS/ 50 Hz

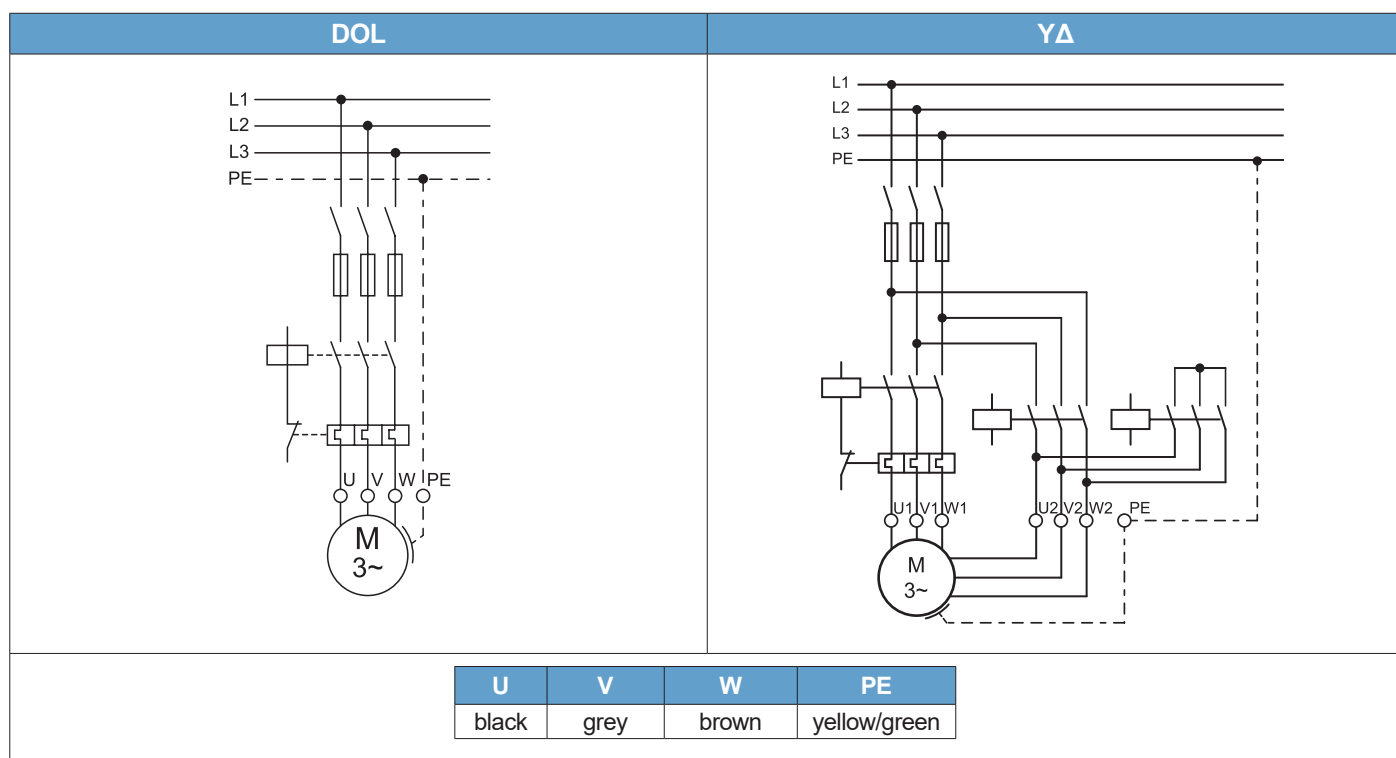
3 ~ Direct start with SubMonitor Transmitter

P _N [kW]	U _N [V]	Motor Model No.	Stator	Rotor
30	380, 400, 415	239 600 7223	305 500 902	575 122 925
37	380, 400, 415	239 601 7223	305 501 902	575 122 930
45	380, 400, 415	239 602 7223	305 502 903	575 122 931
55	380, 400, 415	239 603 7243	338 385 915	575 122 920
75	380, 400, 415	239 604 7243	338 386 915	575 122 921
93	380, 400, 415	239 105 7219	305 505 902	575 122 922
110	380, 400, 415	239 106 7219	305 506 906	575 122 923
130	380, 400, 415	239 107 7219	336 524 915	575 122 924
150	380, 400, 415	239 108 7219	336 055 916	575 122 918

3 ~ YΔ Start with SubMonitor Transmitter (Pos. of cables 90°)

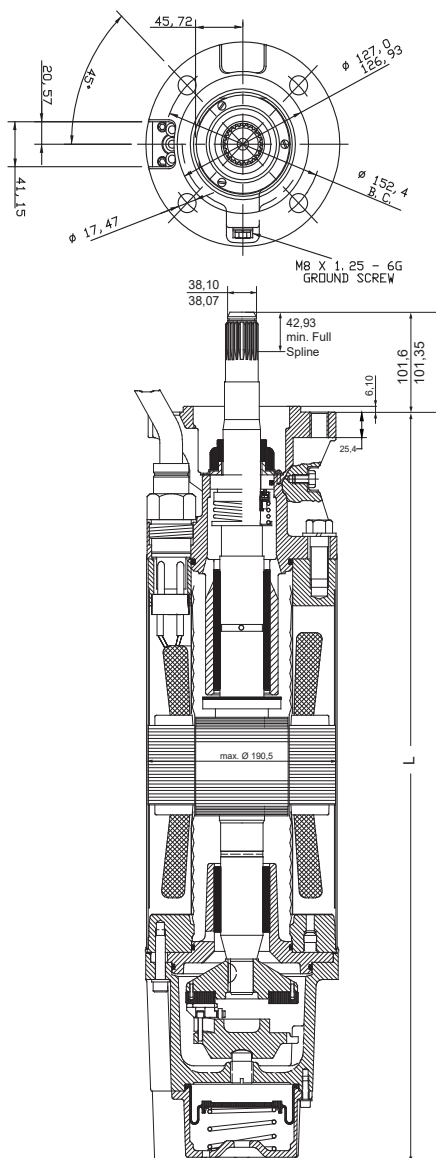
P _N [kW]	U _N [V]	Motor Model No.	Stator	Rotor
30	380, 400, 415	239 620 8223	338 443 904	575 122 925
37	380, 400, 415	239 621 8223	338 588 904	575 122 930
45	380, 400, 415	239 622 8223	305 502 906	575 122 931
55	380, 400, 415	239 623 8223	338 646 906	575 122 920
75	380, 400, 415	239 624 8223	338 591 908	575 122 921
93	380, 400, 415	239 125 8219	305 505 904	575 122 922
110	380, 400, 415	239 126 8219	305 506 905	575 122 923
130	380, 400, 415	239 127 8219	336 524 918	575 122 924
150	380, 400, 415	239 128 8219	305 508 904	575 122 918

Electrical Connection

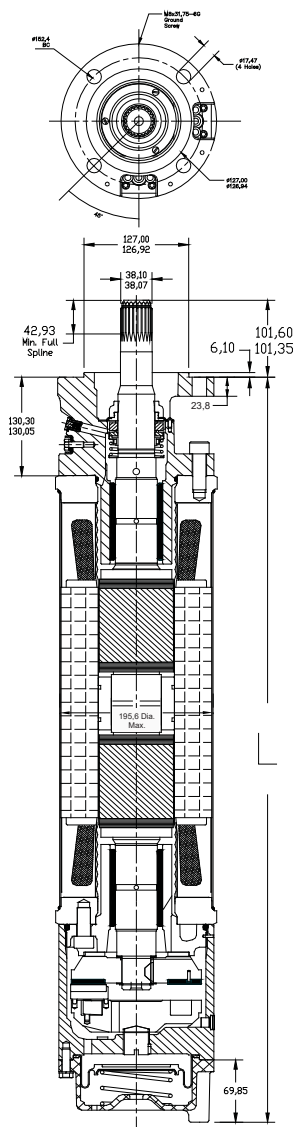


8" Outline Drawings 304 / 316 SS

30 - 45 kW



55 - 150 kW



Material DIN / AISI

Parts	304 SS	316 SS
Shell	1.4301	1.4571
Upper end bell	Cast iron powder coated	1.4408
Lower end bell	Cast iron 20	1.4401
Thrust housing	Cast iron powder coated	1.4408
Mechanical seal	Carbon/Ceramic*	SiC
Seal cover	1.4301	1.4401
Slinger	BUNA N	Hydrin 100
Shaft end	1.4305	1.4542
Diaphragm	BUNA N	Hydrin
Cable	EPR	EPR
Cap screw (cable)	Brass	1.4401
Lead sleeve	Brass , Ni - plated	1.4401
Lead bushing	Rubber	Rubber
Other seals	BUNA N	BUNA N

* 30 - 45 kW C / C ; 55 - 150 kW SiC

Lengths & Weights

P _N [kW]	" L " Dim. [mm]	Shipping Weight [kg]	Shipping Size [mm]
30	925	145	228 x 430 x 1308
37	1000	157	228 x 430 x 1308
45	1077	172	228 x 430 x 1308
55	1264	227	228 x 430 x 1632
75	1455	265	228 x 447 x 1981
93	1748	318	228 x 447 x 1981
110	1976	381	228 x 447 x 2438
130	2179	420	228 x 447 x 2438
150	2408	494	228 x 447 x 2438

8" Encapsulated Motors „HighTemp 75°C“

Standard:

**SAND
FIGHTER**



Submersible Motors

Quality in the Well

These 8" encapsulated motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 8" diameter or larger water wells with ambient temperature up to 75°C.

It is fitted with water lubricated radial and thrust bearings for maintenance-free operation. The motor is filled with a special FES92 fluid, providing frost protection down to -15°C storage temperature.

A special diaphragm ensures pressure compensation inside the motor. The Sand fighter® SiC seal system is standard.

Product advantages:

- Up to 75°C ambient temperature
- Increased thrust capacity up to 30°C
- No cooling flow in larger wells (open reservoirs) up to 30°C ambient
- Hermetically sealed encapsulated stator
- Removable "Water Bloc" lead connector
- „Sand fighter®" Motor with SiC-Mechanical Seal
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested. Max. storage temperature -15°C - + 60°C
- High temperature leads
- Non contaminating FES 92 filled design

Technical Specifications

- 30 ... 110 kW
- 8" NEMA double flange
- Protection: IP 68
- Starts per hour: 10
- Installation: vertical/horizontal
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to DIN 61947-4-1
- Insulation: Class F
- Rated ambient temperature: 75°C
- Cooling flow: min. 0,16 m/s
- Motor lead in 4m length

Options

- Other voltages
- YΔ - start (pos. of cables 90°)
- Motors complete in 316 SS
- Motor lead in 8m length

HighTemp 75°C Model numbers 50 Hz

P _N [kW]	P _N [Hp]	U _N [V]	Model Number Digit 1 – 6		Model Number Digit 7 - 11	
			DOL	YΔ	304	316SS
30	40	380 - 415	279 100	279 120	9004X	9204X
37	50	380 - 415	279 101	279 121	9004X	9204X
45	60	380 - 415	279 102	279 122	9004X	9204X
55	75	380 - 415	279 103	279 123	9004X	9204X
75	100	380 - 415	279 104	279 124	9004X	9204X
93	125	380 - 415	279 105	279 125	9004X	9204X
110	150	380 - 415	279 106	279 126	9004X	9204X

HighTemp 75°C Model numbers 60 Hz

P _N [kW]	P _{max.} [kW]	U _N [V]	Model Number Digit 1 – 6		Model Number Digit 7 - 11	
			DOL	YΔ	304	316SS
30	34,5	380	279 160	279 180	9004X	9204X
		460	279 100	279 120	9004X	9204X
		575	279 110	279 190	9004X	9204X
37	42,5	380	279 161	279 181	9004X	9204X
		460	279 101	279 121	9004X	9204X
		575	279 111	279 191	9004X	9204X
45	51,7	380	279 162	279 182	9004X	9204X
		460	279 102	279 122	9004X	9204X
		575	279 112	279 192	9004X	9204X
55	64	380	279 163	279 183	9004X	9204X
		460	279 103	279 123	9004X	9204X
		575	279 113	279 193	9004X	9204X
75	86,2	380	279 164	279 184	9004X	9204X
		460	279 104	279 124	9004X	9204X
		575	279 114	279 194	9004X	9204X
93	106,9	380	279 165	279 185	9004X	9204X
		460	279 105	279 125	9004X	9204X
		575	279 115	279 195	9004X	9204X
110	126,5	380	279 166	279 186	9004X	9204X
		460	279 106	279 126	9004X	9204X
		575	279 116	279 196	9004X	9204X



8" HighTemp 75°C Performance Datas 50 Hz

P _N [kW]	Thrust F [N]	U _N [V]	Hz	n _N [min ⁻¹]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cosφ (Pf.) at % load			T _N [Nm]	T _A [Nm]
							50	75	100	50	75	100		
30	45000	380	50	2920	66,8	474	72	78	80	0,76	0,82	0,86	98,1	265
		400	50	2930	65,5	499	72	78	80	0,70	0,78	0,83	97,8	298
		415	50	2935	65,8	518	71	77	80	0,65	0,74	0,80	97,6	324
37	45000	380	50	2930	80,7	654	75	80	83	0,76	0,83	0,87	121	354
		400	50	2940	79,6	692	74	80	82	0,70	0,79	0,84	120	398
		415	50	2945	80,1	720	73	79	82	0,65	0,75	0,81	120	429
45	45000	380	50	2935	94,3	835	78	83	85	0,75	0,82	0,87	146	413
		400	50	2945	93,1	884	77	82	84	0,69	0,78	0,84	146	465
		415	50	2950	93,0	920	76	82	84	0,64	0,74	0,81	146	501
55	45000	380	50	2920	118	876	78	82	84	0,77	0,84	0,87	183	467
		400	50	2930	115	927	78	82	84	0,72	0,81	0,85	182	526
		415	50	2935	113	965	77	82	84	0,69	0,78	0,83	182	566
75	45000	380	50	2925	155	1185	81	84	85	0,76	0,83	0,87	244	617
		400	50	2935	151	1254	80	84	86	0,71	0,80	0,85	244	695
		415	50	2940	150	1306	80	84	85	0,66	0,76	0,82	243	748
93	45000	460	60	3525	131	1246	77	82	85	0,72	0,80	0,85	233	571
		380	50	2915	191	1404	81	85	86	0,78	0,85	0,88	304	843
		400	50	2925	186	1482	81	84	86	0,73	0,80	0,86	304	949
110	45000	415	50	2930	184	1544	80	84	86	0,69	0,76	0,84	303	1021
		380	50	2925	231	1596	81	84	85	0,77	0,84	0,88	359	890
		400	50	2935	224	1690	81	84	86	0,72	0,81	0,85	358	1002
		415	50	2940	222	1760	80	84	86	0,68	0,77	0,83	357	1078

8" HighTemp 75°C Performance Datas 60 Hz

P _N [kW]	P _{max} [kW]	Thrust [N]	U _N [V]	Hz	n _N [min ⁻¹]	I _{max} [A]	I _A [A]	η (Eff.) [%] at 100% load	Line to Line Resis- tance ohms
30	34,5	45000	380	60	3450	78.7	616	78	.11 - .14
			460	60	3450	65.0	509	78	.16 - .19
			575	60	3450	52.0	407	78	.25 - .31
37	42,5	45000	380	60	3450	95.4	832	80	.07 - .09
			460	60	3450	78.8	687	80	.11 - .14
			575	60	3450	63.0	550	80	.18 - .22
45	51,7	45000	380	60	3450	112	1081	82	.06 - .07
			460	60	3450	92.1	893	82	.09 - .11
			575	60	3450	73.7	715	82	.13 - .16
55	64	45000	380	60	3450	141	1175	82	.05 - .06
			460	60	3450	114	922	82	.07 - .09
			575	60	3450	92	738	82	.11 - .14
75	86,2	45000	380	60	3450	181	1508	85	.04 - .05
			460	60	3450	149	1246	85	.05 - .07
			575	60	3450	119	997	85	.08 - .10
93	106,9	45000	380	60	3450	223	1793	85	.03 - .04
			460	60	3450	184	1481	85	.04 - .06
			575	60	3450	148	1185	85	.07 - .09
110	126,5	45000	380	60	3450	269	2012	84	.02 - .03
			460	60	3450	222	1662	84	.03 - .05
			575	60	3450	178	1330	84	.05 - .07

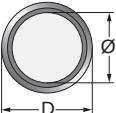
8" HighTemp 75°C DOL Motor leads* 304/316SS

(For YD motors please order 2 of them)

P _N [kW]	Jam Nut Material	L [m]	Ø	DØ [mm]	Part numbers
All Ratings	316SS	4	3 x (33,6mm ²)	max. 13,7	305 315 901
		8			305 315 902



8" HighTemp 75°C Ground leads* 304/316SS

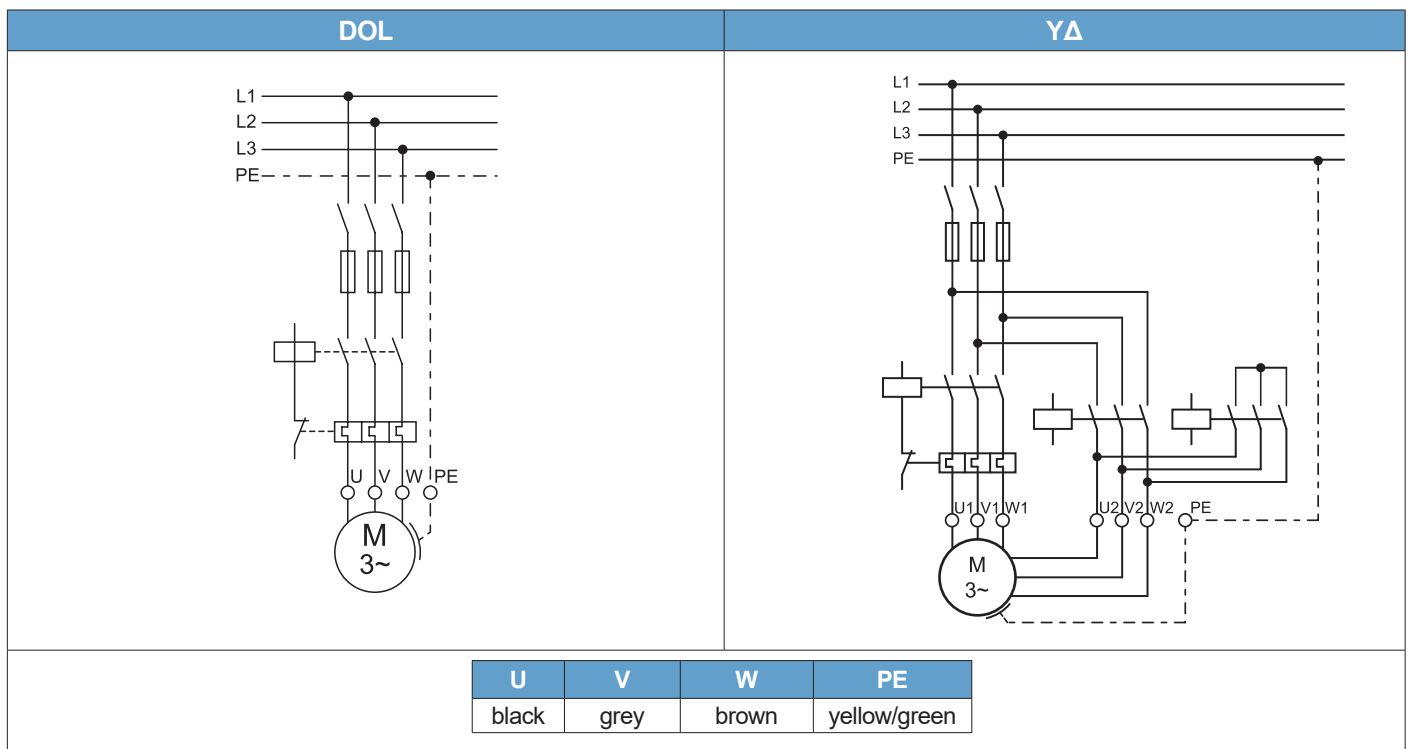
	P _N [kW]	L [m]	Ø	D [mm]	Part numbers
	All Ratings	8	1G25 mm ²	13	308 053 080

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

8" HighTemp 75°C Winding Resistance 3~ 50 Hz (20°C)

P_N kW	U_N [V]	Stator Ref.	Line to Line Resistance [Ohm]
30	380 - 415	331 659 ...	0,25 - 0,27
	500		
37	380 - 415	331 677 ...	0,17 - 0,19
	500	326 558 ...	0,09 - 0,01
45	380 - 415	331 678 ...	0,13 - 0,15
	500	326 687 ...	0,20 - 0,22
55	380 - 415	331 679 ...	0,11 - 0,12
	500		
75	380 - 415	331 680 ...	0,08 - 0,09
	500	326 512 ...	0,12 - 0,14
93	380 - 415	331 681 ...	0,14 - 0,15
	500	326 683 ...	0,10 - 0,12
110	380 - 415	331 660 ...	0,05 - 0,06
	500	326 598 ...	0,09 - 0,10

8" HighTemp 75°C Electrical Connection





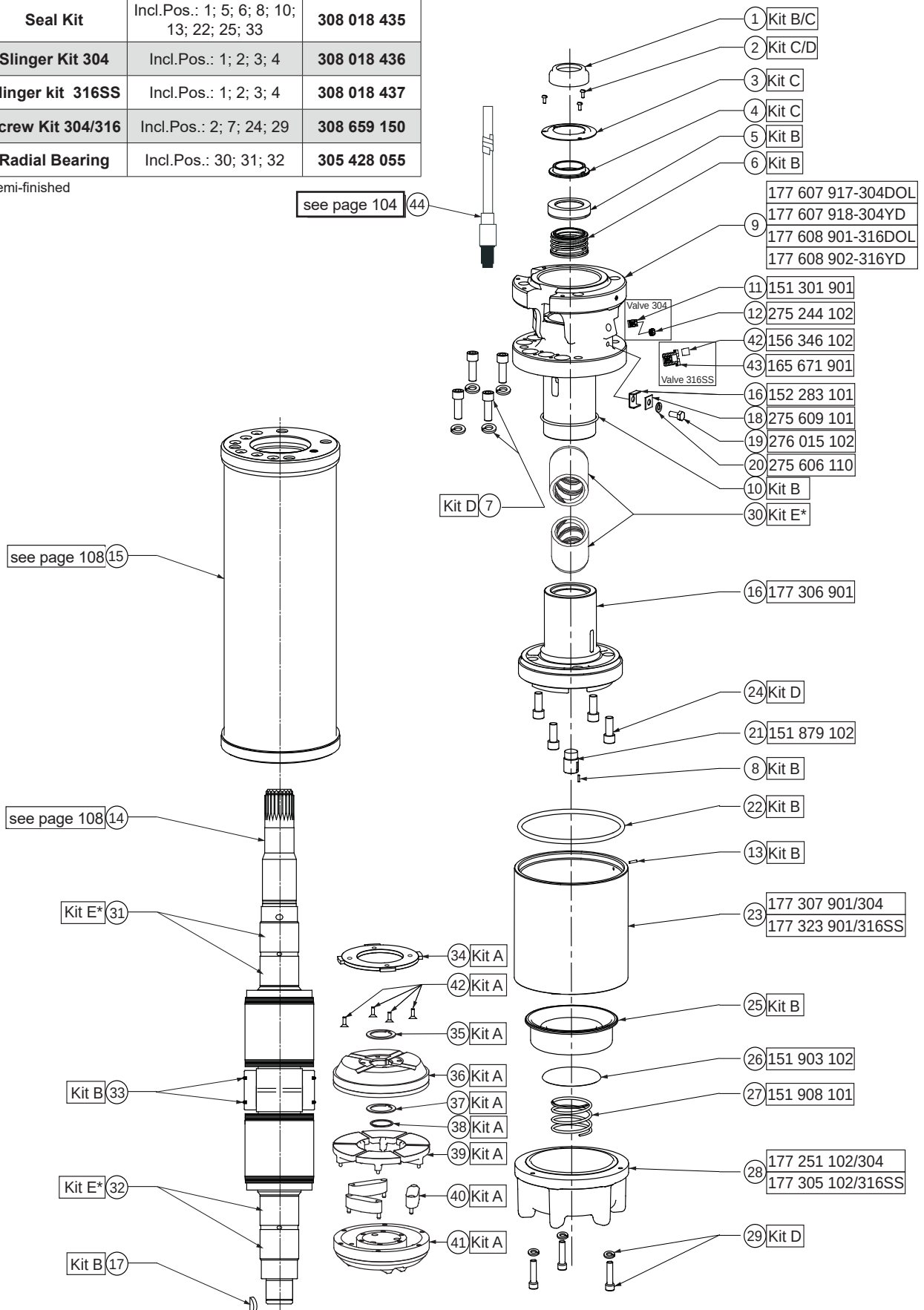
Sizes

Technical changes without notice / Techn. Änderungen vorbehalten / Modifications techniques réservées sans préavis / 5930

8" Spare parts 304/316SS HighTemp. 75°C

Kit A	Thrust Bearing	Incl.Pos.: 34; 35; 36; 37; 38; 39; 40; 41; 42	305 428 020
Kit B	Seal Kit	Incl.Pos.: 1; 5; 6; 8; 10; 13; 22; 25; 33	308 018 435
Kit C1	Slinger Kit 304	Incl.Pos.: 1; 2; 3; 4	308 018 436
Kit C2	Slinger kit 316SS	Incl.Pos.: 1; 2; 3; 4	308 018 437
Kit D	Screw Kit 304/316	Incl.Pos.: 2; 7; 24; 29	308 659 150
Kit E*	Radial Bearing	Incl.Pos.: 30; 31; 32	305 428 055

* Parts are semi-finished





8" HighTemp 75°C Replacement Stators and Rotors 50/60Hz DOL

P _N		[V] / [Hz]	Motor 304SS	Stator 304SS	Motor 316SS	Stator 316SS	Rotor
[kW]	[HP]						
30	40	380-415 / 50	2791009004X	331659902	2791009204X	331659903	575 122 919
		460 / 60					
		380 / 60	2791609004X	326653902	2791609204X	326653903	
37	50	380-415 / 50	2791019004X	331677902	2791019204X	331677903	575 122 920
		460 / 60					
		380 / 60	2791619004X	326654902	2791619204X	326654903	
45	60	380-415 / 50	2791029004X	331678902	2791029204X	331678903	575 122 921
		460 / 60					
		380 / 60	2791629004X	326655902	2791629204X	326655903	
55	75	380-415 / 50	2791039004X	331679902	2791039204X	331679903	575 122 922
		460 / 60					
		380 / 60	2791639004X	326650902	2791639204X	326650903	
75	100	380-415 / 50	2791049004X	331680902	2791049204X	331680903	575 122 923
		460 / 60					
		380 / 60	2791649004X	326583902	2791649204X	326583903	
93	125	380-415 / 50	2791059004X	331681902	2791059204X	331681903	575 122 924
		460 / 60					
		380 / 60	2791659004X	326584902	2791659204X	326584903	
110	150	380-415 / 50	2791069004X	331660902	2791069204X	331660903	575 122 918
		460 / 60					
		380 / 60	2791669004X	326651902	2791669204X	326651903	

8" HighTemp 75°C Replacement Stators and Rotors 50/60Hz YΔ

P _N		[V] / [Hz]	Motor 304SS	Stator 304SS	Motor 316SS	Stator 316SS	Rotor
[kW]	[HP]						
30	34,5	380-415 / 50	2791209004X	331659905	2791209204X	331659906	575 122 919
		460 / 60					
		380 / 60	2791809004X	326653905	2791809204X	326653906	
37	42,5	380-415 / 50	2791219004X	331677905	2791219204X	331677906	575 122 920
		460 / 60					
		380 / 60	2791819004X	326654905	2791819204X	326654906	
45	51,7	380-415 / 50	2791229004X	331678905	2791229204X	331678906	575 122 921
		460 / 60					
		380 / 60	2791829004X	326655905	2791829204X	326655906	
55	64	380-415 / 50	2791239004X	331679905	2791239204X	331679906	575 122 922
		460 / 60					
		380 / 60	2791839004X	326650905	2791839204X	326650906	
75	86,2	380-415 / 50	2791249004X	331680905	2791249204X	331680906	575 122 923
		460 / 60					
		380 / 60	2791849004X	326583905	2791849204X	326583906	
93	106,9	380-415 / 50	2791259004X	331681905	2791259204X	331681906	575 122 924
		460 / 60					
		380 / 60	2791859004X	326584905	2791859204X	326584906	
110	126,5	380-415 / 50	2791269004X	331660905	2791269204X	331660906	575 122 918
		460 / 60					
		380 / 60	2791869004X	326651905	2791869204X	326651906	

6" Rewindable Motors

Standard: **SAND FIGHTER**

Optional: **STAINLESS STEEL 316 SS** **STAINLESS STEEL 904 L**



Submersible Motors

Quality in the Well

These 6" rewindable motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 6" diameter or larger water wells. Water lubricated thrust and radial bearings enable a maintenance free operation. A special diaphragm ensures pressure compensation inside the motor. The motor is filled with a special FES93 fluid, providing frost protection down to -15°C storage temperature.

The Sand fighter® SiC seal system is the option for sandy applications. For applications in aggressive media, motors made of 316SS and 904L are available.

Product advantages:

- Sand fighter® SiC seal system is standard
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Design for retrofitable PT100 sensor
- Approved Franklin Electric „Kingsbury Type“ thrust bearing
- Non contaminating FES 93 -filled design
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- Standard Motors complete 304SS

Technical Specifications

- 4,0 - 37,0kW
- 6" NEMA flange with Studs (M 12)
- Protection: IP 68
- Starts per hour: max. 20
- Installation position: vertical / horizontal (**37 kW** motors may not be installed horizontally)
- Motor Lead in 4m length (KTW approved)
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to EN 61947-4-1
- Standard motor with PVC winding insulation (37kW in standard with PE2/PA insulation) for max. ambient temp. of 30°C with a min. cooling flow:

$$\begin{aligned} 4 \text{ kW} - 15 \text{ kW} & \quad v = 0,2 \text{ m/s} \\ 18,5 \text{ kW} - 37 \text{ kW} & \quad v = 0,5 \text{ m/s} \end{aligned}$$

Options

- Other voltages
- DOL / YΔ - start (pos. of cables 90°)
- Motors in 316SS and 904L
- Motors up to 30kW with PE2/PA winding insulation for max. ambient temp. of 50°C at the same cooling conditions as standard (37 kW max. 45°C)
- PT 100 temperature sensor (sold separately)
- Lead in different lengths up to 50m



6" Rewindable Motors - Model Numbers *

P _N [kW]	U / f _N [V] / [Hz]	Model Number Digit 1 – 6		Model Number Digit 7 – 10			
		DOL	YΔ	304SS	316SS	904L	PE2/PA
4,0	380 - 415 / 50 460 / 60	262 610	262 710	8611	6611	7611	*7** ONLY DOL
	380/ 60	262 660	262 780				
5,5	380 - 415 / 50 460 / 60	262 611	262 711	8611	6611	7611	*7** ONLY DOL
	500 / 50	262 511	262 811				
	380/ 60	262 661	262 781				
7,5	380 - 415 / 50 460 / 60	262 612	262 712	8611	6611	7611	*7** ONLY DOL
	500 / 50	262 512	262 812				
	380/ 60	262 662	262 782				
9,3	380 - 415 / 50 460 / 60	262 231	262 331	8611	6611	7611	*7** ONLY DOL
	500 / 50	262 27	262 371				
	380/ 60	262 221	262 321				
11	380 - 415 / 50 460 / 60	262 613	262 713	8611	6611	7611	*7** ONLY DOL
	500 / 50	262 513	262 813				*7**
	380/ 60	262 663	262 783				
13	380 - 415 / 50 460 / 60	262 232	262 332	8611	6611	7611	*7**
	500 / 50	262 27	262 372				
	380/ 60	262 222	262 322				
15	380 - 415 / 50 460 / 60	262 614	262 714	8611	6611	7611	*7**
	500 / 50	262 514	262 814				
	380/ 60	262 664	262 784				
18,5	380 - 415 / 50 460 / 60	262 615	262 715	8611	6611	7611	*7**
	500 / 50	262 515	262 815				
	380/ 60	262 665	262 785				
22	380 - 415 / 50 460 / 60	262 616	262 716	8611	6611	7611	*7**
	500 / 50	262 516	262 816				
	380/ 60	262 666	262 786				
26	380 - 415 / 50 460 / 60	262 233	262 333	8611	6611	7611	*7**
	500 / 50	262 273	262 373				
	380/ 60	262 223	262 323				
30	380 - 415 / 50 460 / 60	262 617	262 717	8611	6611	7611	*7**
	500 / 50	262 517	262 817				
	380/ 60	262 667	262 787				
37	380 - 415 / 50 460 / 60	262 618	262 718	8711	6711	7711	STANDARD
	500 / 50	262 518	262 818				
	380/ 60	262 668	262 788				

* For VFD Operation is PE2/PA mandatory!

6" Rewindable Motors - Performance Data 50Hz

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		
4	15500	380	2910	10,4	48	71	75	76	0,59	0,71	0,78	13,1	15,5
		400	2930	10,6	51	68	73	76	0,53	0,65	0,73	13,1	17,3
		415	2930	10,9	53	65	72	76	0,50	0,61	0,69	13,0	18,8
5,5	15500	380	2860	13,7	48	74	76	75	0,67	0,78	0,83	18,3	15,5
		400	2890	13,3	51	72	76	76	0,62	0,74	0,81	18,2	17,3
		415	2890	13,4	53	71	75	75	0,59	0,71	0,78	18,1	18,8
		500	2890	10,6	41	72	76	76	0,62	0,74	0,81	17	18
7,5	15500	380	2860	18,3	59	77	78	76	0,70	0,80	0,84	25,0	19,2
		400	2880	17,7	63	75	78	77	0,65	0,76	0,82	24,8	21,5
		415	2890	17,7	65	73	77	77	0,61	0,73	0,80	24,7	23,4
		500	2880	14,0	50	75	78	77	0,65	0,76	0,82	22	25
9,3	15500	380	2850	22,0	74	79	80	78	0,71	0,80	0,84	31,1	25,9
		400	2870	21,4	78	78	79	78	0,64	0,76	0,82	31,0	29,0
		415	2880	21,2	81	76	79	78	0,60	0,72	0,80	30,9	31,4
		500	2870	17,1	62	78	79	78	0,64	0,76	0,82	29	31
11,0	15500	380	2860	25,8	93	78	80	78	0,71	0,80	0,85	36,7	31,5
		400	2880	25,2	98	77	80	79	0,65	0,76	0,83	36,4	35,3
		415	2890	25,1	102	75	78	79	0,61	0,73	0,80	36,3	38,2
		500	2880	20,0	79	77	80	79	0,65	0,76	0,82	35	36
13,0	15500	380	2880	30,1	118	80	81	80	0,68	0,79	0,84	43,1	45,0
		400	2900	29,6	125	78	80	80	0,61	0,74	0,81	42,8	50,3
		415	2900	29,7	130	76	79	80	0,57	0,70	0,78	42,7	54,6
		500	2900	23,7	100	78	80	80	0,61	0,74	0,81	50	43
15,0	15500	380	2880	33,9	140	81	82	81	0,71	0,81	0,85	49,7	53,9
		400	2890	33,1	148	79	81	81	0,65	0,77	0,83	49,4	60,4
		415	2900	33,0	154	77	80	81	0,60	0,73	0,81	49,3	65,5
		500	2890	26,4	119	79	81	81	0,65	0,77	0,83	60	49
18,5	15500	380	2860	42,3	172	81	82	81	0,68	0,78	0,84	61,7	75,2
		400	2880	42,0	182	78	81	81	0,61	0,74	0,80	61,2	84,3
		415	2890	42,5	189	76	79	80	0,57	0,70	0,77	61,1	91,3
		500	2880	33,6	146	78	81	81	0,61	0,74	0,80	84	61
22,0	15500	380	2880	49,1	218	82	84	83	0,68	0,78	0,84	72,6	91,2
		400	2900	49,0	231	80	82	82	0,61	0,73	0,80	72,5	102,2
		415	2910	49,6	240	77	81	82	0,56	0,69	0,77	72,2	110,7
		500	2900	39,2	185	80	82	82	0,61	0,73	0,80	102	72
26	15500	380	2880	57,5	268	83	84	83	0,68	0,79	0,86	86,0	120,4
		400	2900	56,7	284	81	83	83	0,61	0,74	0,83	85,6	134,7
		415	2910	57,3	296	78	82	82	0,56	0,69	0,80	85,3	146,1
		500	2900	45,7	227	80	83	83	0,61	0,74	0,81	135	86
30,0	27500	380	2900	66,4	328	82	84	83	0,67	0,78	0,84	98,8	135,0
		400	2910	66,4	347	80	83	83	0,60	0,73	0,80	98,4	151,0
		415	2910	67,5	361	77	81	82	0,55	0,68	0,77	98,2	163,0
		500	2910	53,2	277	80	83	83	0,60	0,73	0,80	151	98
37	27500	380	2890	82,0	409	83	84	83	0,67	0,78	0,85	122,1	192,8
		400	2900	81,9	433	80	83	83	0,60	0,72	0,80	121,6	215,8
		415	2910	83,9	450	77	81	82	0,55	0,68	0,76	121,3	234,0
		500	2900	65,6	346	80	83	83	0,60	0,72	0,80	216	122



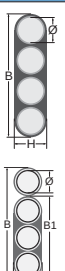
6" Rewindable Motors - Performance Data 60Hz

P _N [kW]	P _{max} [kW]	Thrust F [N]	U _N [V]	n _{max} [min ⁻¹]	I _{max} [A]	I _A [A]	η _{max} (Eff.) [%] at % load			cos φ _{max} (Pf.) at % load			T _{max} [Nm]	T _A [Nm]
							50	75	100	50	75	100		
4	4,6	15500	230	3520	21,0	106	70	75	77	0,52	0,64	0,73	12,5	18,6
			380	3530	13,3	61	66	72	77	0,51	0,63	0,71	12,4	15,0
			460	3520	10,1	51	70	76	78	0,56	0,67	0,75	12,5	15,3
5,5	6,3	15500	230	3490	26,1	106	74	78	78	0,61	0,73	0,80	17,3	15,9
			380	3480	15,4	61	76	78	78	0,64	0,75	0,81	17,3	15,0
			460	3480	12,9	51	74	77	77	0,65	0,76	0,82	17,3	15,1
7,5	8,6	15500	230	3490	35,9	146	75	79	79	0,58	0,71	0,78	23,6	22,4
			380	3480	20,8	81	76	79	79	0,64	0,75	0,81	23,6	20,2
			460	3470	17,2	64	75	78	78	0,67	0,77	0,82	23,7	19,4
9,3	10,7	15500	230	3490	44,4	183	75	79	79	0,59	0,71	0,78	29,3	28,9
			380	3470	25,6	100	77	80	80	0,64	0,75	0,81	29,4	25,9
			460	3460	20,8	78	78	80	80	0,67	0,78	0,82	29,4	24,4
11,0	12,7	15500	230	3490	51,2	220	77	80	81	0,60	0,72	0,79	34,6	35,6
			380	3490	30,3	129	77	81	81	0,62	0,74	0,80	34,5	34,3
			460	3480	25,0	98	78	81	80	0,68	0,77	0,83	34,7	31,5
13,0	15,0	15500	230	3500	62,4	288	76	80	81	0,55	0,68	0,76	40,7	50,5
			380	3500	36,3	164	77	81	82	0,59	0,71	0,78	40,7	47,2
			460	3490	29,0	125	78	81	81	0,65	0,76	0,82	40,9	43,3
15,0	17,3	15500	230	3500	65,9	325	80	83	83	0,63	0,74	0,81	47,0	59,5
			380	3490	39,1	188	81	83	83	0,66	0,77	0,82	47,2	56,5
			460	3490	32,1	151	80	83	83	0,68	0,78	0,84	47,1	55,6
18,5	21,3	15500	230	3490	85,4	402	77	81	82	0,59	0,71	0,78	58,1	81,8
			380	3490	52,5	249	76	80	81	0,58	0,70	0,77	58,1	83,6
			460	3480	40,6	184	80	82	82	0,65	0,76	0,81	58,4	74,5
22,0	25,3	15500	230	3510	100,2	520	82	84	84	0,65	0,74	0,77	68,8	96,6
			380	3510	59,9	309	82	84	84	0,67	0,75	0,78	68,8	94,9
			460	3500	47,1	232	83	84	84	0,72	0,79	0,82	69,1	85,8
26	29,9	15500	230	3510	118,3	657	83	85	85	0,63	0,72	0,76	81,3	135,0
			380	3500	67,5	360	83	85	85	0,62	0,74	0,81	81,6	121,4
			460	3500	55,7	287	83	85	85	0,64	0,76	0,84	81,6	117,2
30,0	34,5	27500	230	3510	135,7	758	78	82	83	0,58	0,71	0,78	93,8	139,6
			380	3510	79,6	436	79	83	84	0,62	0,74	0,81	93,9	132,9
			460	3500	64,4	346	81	84	84	0,64	0,75	0,82	94,0	126,4
37,0	42,6	27500	230	3510	169,9	937	77	81	82	0,59	0,71	0,78	115,8	193,6
			380	3510	102,8	567	77	81	82	0,59	0,71	0,78	115,8	193,6
			460	3500	79,1	430	82	84	85	0,63	0,75	0,81	116,0	177,8

6" Rewindable Motors - Motor Leads*

DOL	P _N [kW]	St.#	Ø [mm²]	H / B [mm]	Length [m]	Lead Mod.- Nr.	Motor Design up to 12.2012			Motor Design starting 01.2013
							Lead seal Kit Cast Iron	Lead seal Kit 316 SS	Lead seal Kit 904 L	Lead seal Kit
	4 - 13	1	4G2,5	7,0 x 19,0	4	308 710 100	308 660 801	308 660 821	308 660 831	308 660 811
	15 - 22	1	4G4	8,2 x 23,0	4	308 710 101	308 660 802	308 660 822	308 660 832	308 660 812
	26 - 37	1	4G6	9,0 x 25,0	4	308 710 103	308 660 803	308 660 823	308 660 833	308 660 813

For PE2/PA engines additionally the special Tape **700 541 688** is absolutely necessary

YΔ	P _N [kW]	St.#	Ø [mm²]	B / H [mm]	Length [m]	Lead Mod.- Nr.	Motor Design up to 12.2012			Motor Design starting 01.2013
							Lead seal Kit Cast Iron	Lead seal Kit 316 SS	Lead seal Kit 904 L	Lead seal Kit
	4 - 22	1	3X2,5	7,3 x 15,3	4	308 710 104	308 660 806	308 660 826	308 660 836	308 660 816
		1	4G2,5	7,0 x 19,0	4					
	26 - 30	1	3X4	8,5 x 17,8	4	308 710 105	308 660 807	308 660 827	308 660 837	308 660 817
		1	4G4	8,2 x 23,0	4					
	37	1	3X4	8,5 x 17,8	4	308 710 106	308 660 807	308 660 827	308 660 837	308 660 817
		1	4G4	8,2 x 23,0	4					

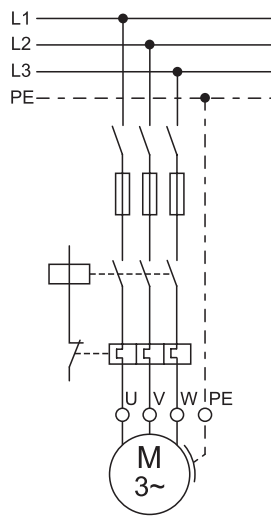
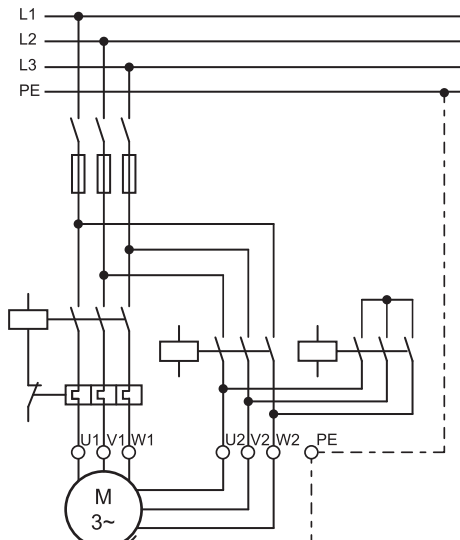
For PE2/PA engines additionally the special Tape **700 541 688** is absolutely necessary

Ground Leads

	P _N [kW]	Ø	Size [mm]	Type	Qty.	L (m)	Part Numbers
							304/316/904L
	all Ratings	1G10 mm²	D 6,1 mm (±0,3)	VDE/KTW	1	4	308 055 040
Lead opening seal Kit				Motor Design up to 12.2012			Motor Design starting 01.2013
4 - 37 kW DOL / YΔ				Cast Iron-304SS	Kit 316 SS	Kit 904 L	Kit
				308 660 805	308 660 825	308 660 835	308 660 815

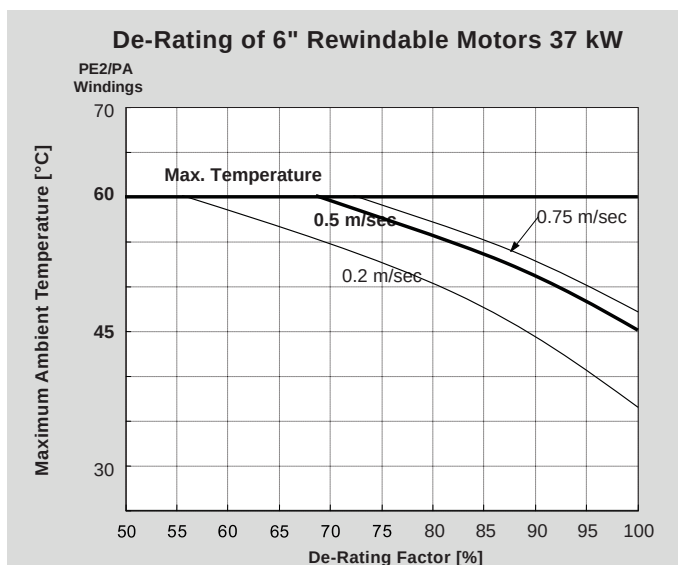
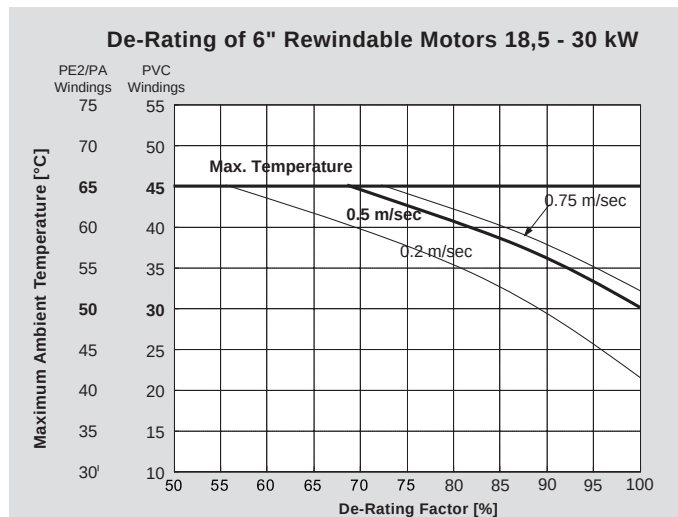
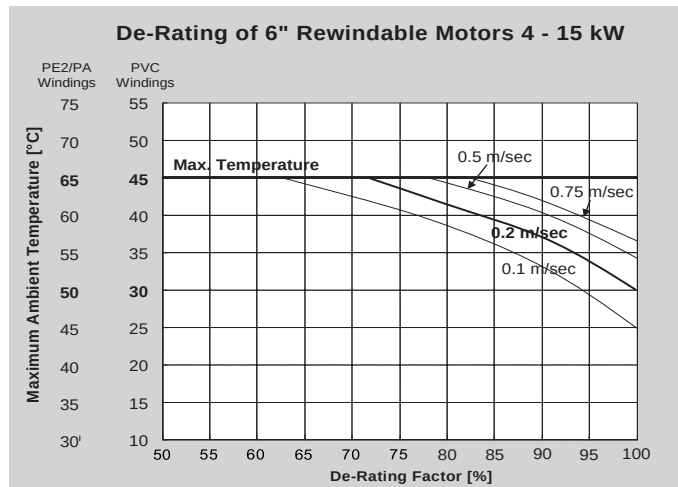
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.

Electrical Connection

DOL	YΔ								
									
<table><tr><th>U</th><th>V</th><th>W</th><th>PE</th></tr><tr><td>brown</td><td>grey</td><td>black</td><td>yellow/green</td></tr></table>		U	V	W	PE	brown	grey	black	yellow/green
U	V	W	PE						
brown	grey	black	yellow/green						



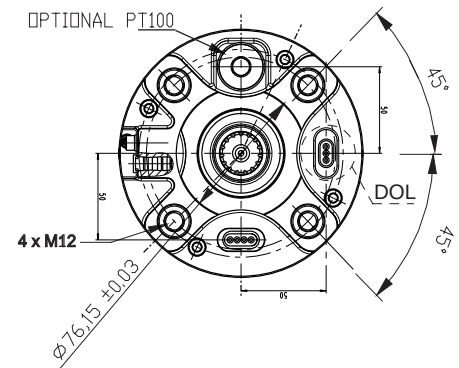
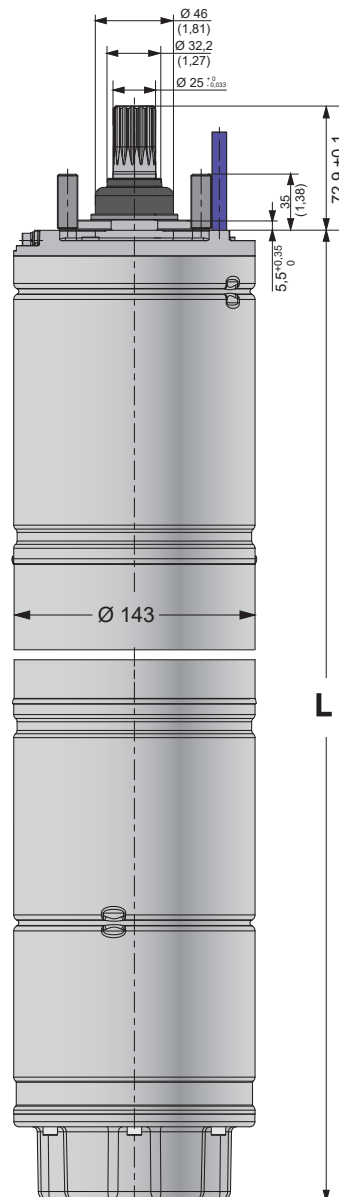
6" Rewindable De-Rating Curves



If these conditions are not met please contact Franklin Electric !

6" Rewindable Motor Design

304SS / 316SS / 904L



Construction Materials

Component	304SS	316SS	904L
Shaft Extensions	1.4021	1.4462	1.4462
Slinger	NBR	NBR	NBR
Seal	SiC/SiC	SiC/SiC	SiC/SiC
End bell, NEMA	1.4308	1.4408	1.4539
Stator Shell	1.4301	1.4571	1.4539
Diaphragm	EPDM	EPDM	EPDM
Diaphragm Cover	1.4301	1.4404	1.4539

P [kW]	Motor Lengths	Motor weights [kg]		Motor Shipping Size		
	L [mm] 304SS / 316SS / 904L	304SS / 316SS / 904L		B [mm]	H [mm]	L [mm]
		Motor	incl. pack			
4	679	43	48	155	270	905
5,5	679	43	48			
7,5	699	45	50			
9,3	729	49	54			
11	759	53	58			
13	809	57	62	155	270	1135
15	854	61	66			
18,5	899	66	71			
22	989	77	82			
26	1094	88	93			
30	1194	98	103	155	270	1435
37	1274	105	110			



PVC Insulation Standard Windings (380 – 415 V / 50 Hz and 460 V / 60 Hz)

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
4	326 364 999	53+53+53+53	0,9 / 1,6	PVC	Serie	540,00	4,8800	5,1700	3,5000
5,5	326 364 999	53+53+53+53	0,9 / 1,6	PVC	Serie	540,00	4,8800	5,1700	3,5000
7,5	326 375 999	47+47+47+47	1,0 / 1,7	PVC	Serie	500,00	3,6710	4,0400	2,7200
9,3	326 374 999	41+41+41+41	1,1 / 1,8	PVC	Serie	466,00	2,8270	3,0200	2,0600
11	326 373 999	36+36+36+36	1,2 / 1,9	PVC	Serie	436,00	2,2200	2,3500	1,6060
13	326 372 999	30+30+30+30	1,3 / 2,0	PVC	Serie	400,00	1,7330	1,8800	1,2430
15	326 366 999	27+27+27+27	1,4 / 2,2	PVC	Serie	395,00	1,4550	1,5260	1,0160
18,5	326 371 999	23+23+23+23	1,5 / 2,3	PVC	Serie	362,00	1,1610	1,2220	0,8250
22	326 370 999	19+19+19+19	1,7 / 2,5	PVC	Serie	342,00	0,8520	0,9200	0,7130
26	326 378 999	16+16+16+16	1,9 / 2,7	PVC	Serie	330,00	0,6570	0,6980	0,4700
30	326 369 999	27+27	1,4 / 2,2	PVC	Parallel	624,00	0,3810	0,6100	0,4120
37	326 377 999	12+12+12+12	2,0 / 2,9 / 3,1	PE2/PA	Serie	302,00	0,5420	0,5900	0,3840

PE2/PA Insulation Standard Windings (380 – 415 V / 50 Hz and 460 V / 60 Hz)

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
4	326 461 999	30+30+30+30	1,1 / 2,0	PE2/PA	Serie Y	311	1,8500	-	3,7000
5,5	326 461 999	30+30+30+30	1,1 / 2,0	PE2/PA	Serie Y	311	1,8500	-	3,7000
7,5	326 428 999	27+27+27+27	1,3 / 2,2	PE2/PA	Serie Y	295	1,2480	-	2,4960
9,3	326 429 999	23+24+24+23	1,4 / 2,4	PE2/PA	Serie Y	274	1,0060	-	2,3200
11	326 430 999	20+21+21+20	1,4 / 2,4	PE2/PA	Serie Y	255	0,9280	-	1,8560
13	326 431 999	17+18+18+17	1,6 / 2,6	PE2/PA	Serie Y	240	0,6670	-	1,3340
15	326 432 999	27+27+27+27	1,3 / 2,2	PE2/PA	Serie	395	1,6870	1,6870	1,2466
18,5	326 433 999	23+23+23+23	1,3 / 2,2	PE2/PA	Serie	362	1,5500	1,5500	1,0333
22	326 434 999	19+19+19+19	1,5 / 2,5	PE2/PA	Serie	342	1,0940	1,0940	0,7293
26	326 435 999	16+16+16+16	1,7 / 2,7	PE2/PA	Serie	330	0,8210	0,8210	0,5473
30	326 436 999	27+27	1,3 / 2,2	PE2/PA	Parallel	624	1,3260	0,6630	0,4420
37	326 377 999	12+12+12+12	2,0 / 2,9 / 3,1	PE2/PA	Serie	302,00	0,5420	0,5900	0,3840

Insulation resistance (20°C / 500 VDC)

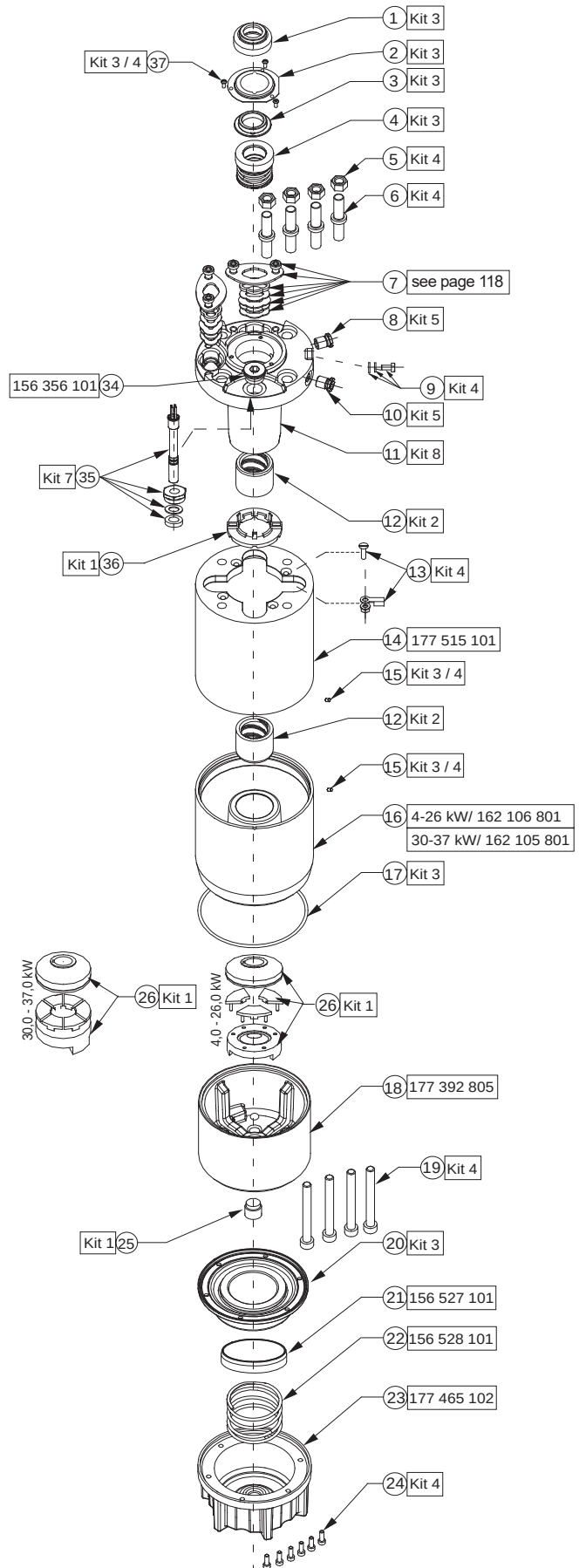
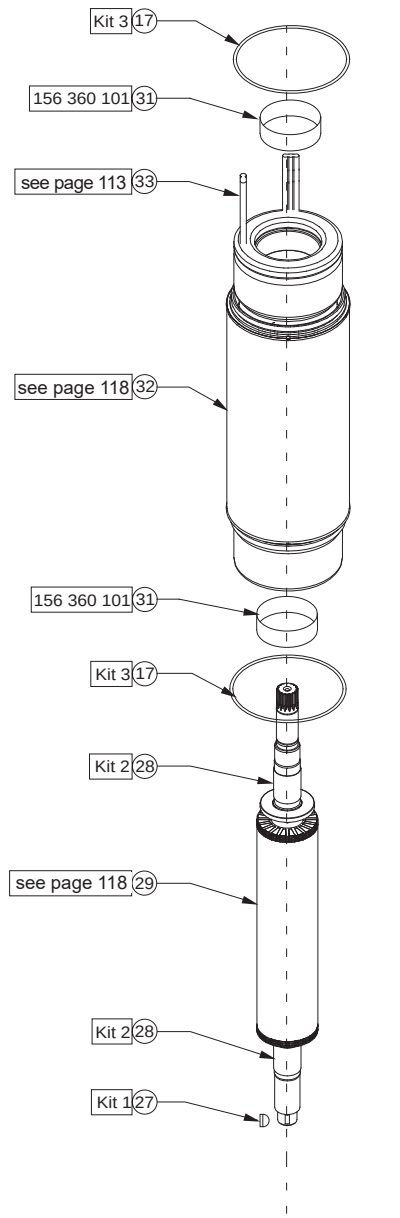
New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

Motor Repair instruction

Pictured Repair instruction)	Cast Iron - 304SS	Motor Design up to 12.2012	Mod.- Nb. :	308 018 460
	316SS / 904L			308 018 ***
	304SS / 316SS / 904L	Motor Design starting 01.2013		308 018 624

6" Rewindable Spare Parts Cast Iron-304SS Version (up to 01.2013)

Kit 1 Thrust Bearing Kit	4-26kW	Pos.: 17; 25; 26; 27; 36	308 750 301
	30-37kW		308 750 302
Kit 2 Radial Bearing Kit	4-26kW	Pos.: 12; 28	308 750 401
	30-37kW		308 750 402
Kit 3 Seal Kit	Standard	Pos.: 1; 2; 3; 4; 15; 17; 20; 37	308 800 412
	Sandfighter		308 800 415
Kit 4 Screw Kit	Pos.: 5; 6; 9; 13; 15; 19; 24; 37		308 659 320
Kit 5 Valve Kit	Pos.: 8; 10		308 800 414
Kit 6 Lead Seal Kit	Pos.: 7		see page 113
Kit 7 PT100 Kit	Pos.: 35		see page 230
Kit 8 Endbell upper	4 - 26kW DOL	Pos.: 11	162 104 802
	30- 37kW DOL	Pos.: 11	162 103 802
	4- 26kW YD	Pos.: 11	162 104 801
	30- 37kW YD	Pos.: 11	162 103 801



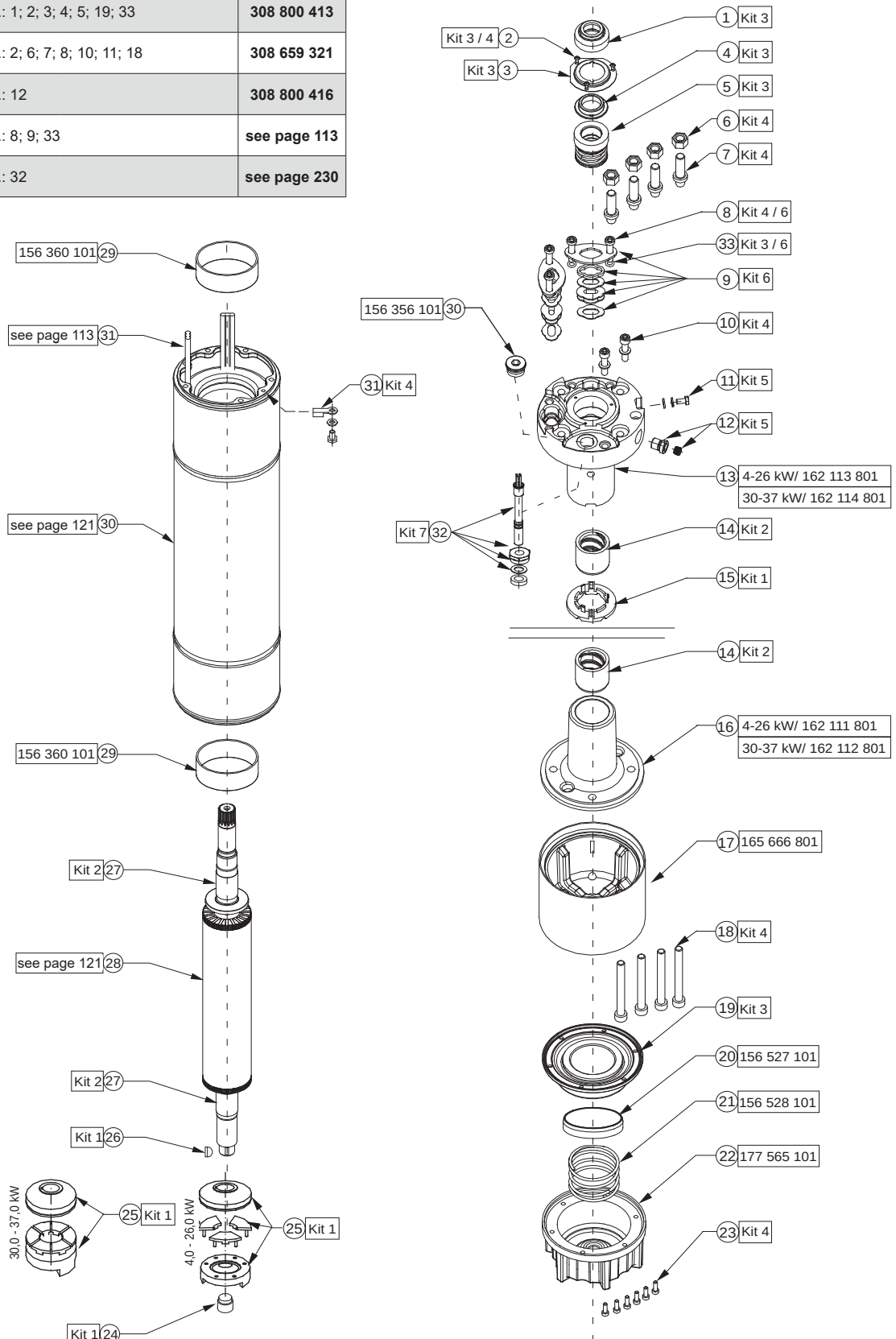


Cast Iron Version Stator and Rotor Model Number (380 - 415 Volts / 50Hz) (up to 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 304		YΔ 304		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 931	326 461 931	326 364 981		161 133 811K
5,5	326 364 931	326 461 931	326 364 981		161 133 811K
7,5	326 375 931	326 428 931	326 375 981		161 133 810K
9,3	326 374 931	326 429 931	326 374 981		161 133 809K
11	326 373 931	326 430 931	326 373 981		161 133 808K
13	326 372 931	326 431 931	326 372 981		161 133 807K
15	326 366 931	326 432 931	326 366 981	326 432 981	161 133 806K
18,5	326 371 931	326 433 931	326 371 981	326 433 981	161 133 805K
22	326 370 931	326 434 931	326 370 981	326 434 981	161 133 804K
26	326 378 931	326 435 931	326 378 981	326 435 981	161 133 801K
30	326 369 931	326 436 931	326 369 981	326 436 981	161 133 802K
37		326 377 931		326 377 981	161 133 803K

6" Rewindable Spare Parts 316SS (up to 08.2012)

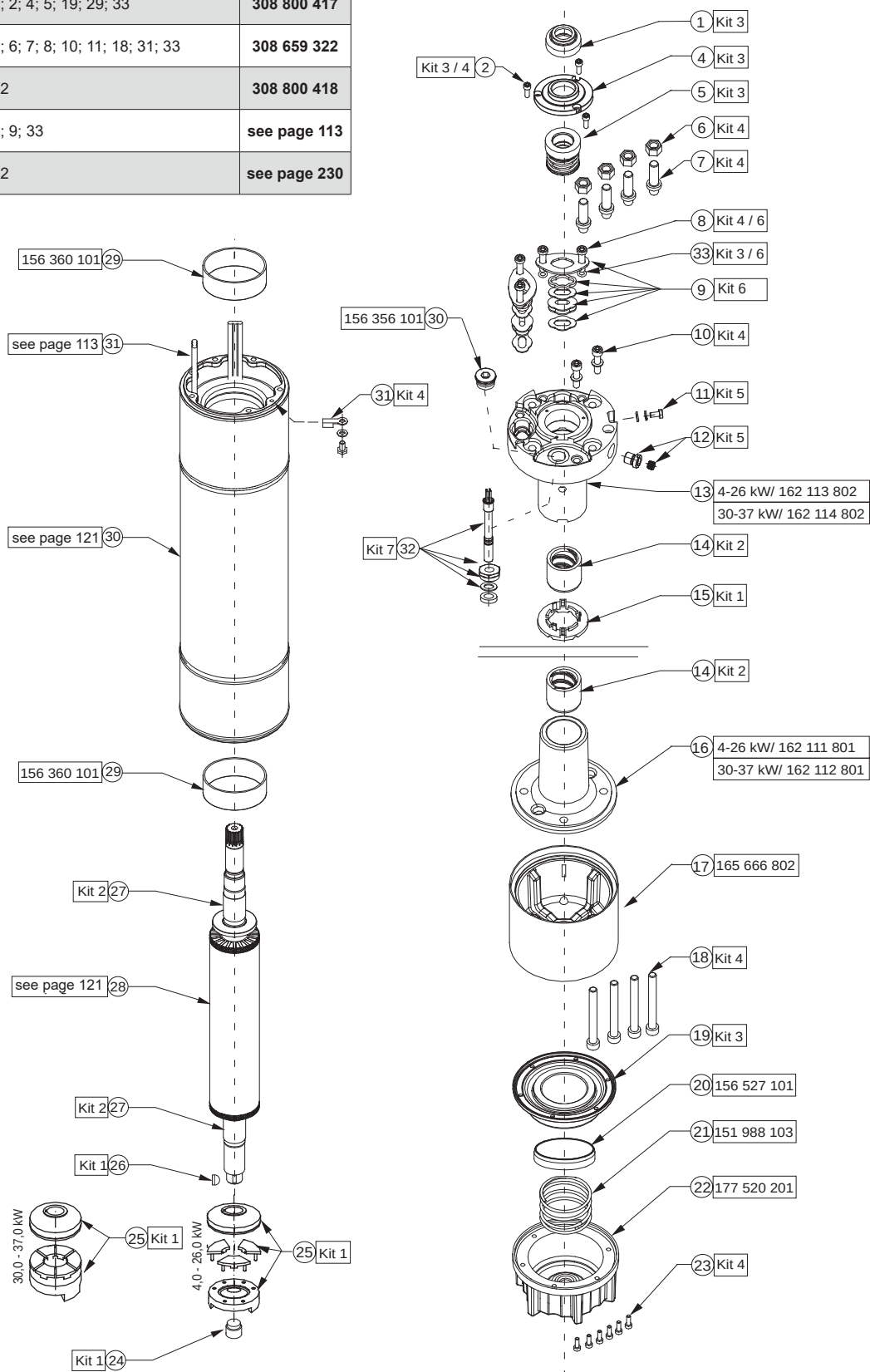
Kit 1 Thrust Bearing Kit	4-26kW	Pos.: 15; 24; 25; 26	308 750 301
	30-37kW		308 750 302
Kit 2 Radial Bearing Kit	4-26kW	Pos.: 14; 27	308 750 401
	30-37kW		308 750 402
Kit 3 Seal Kit	Pos.: 1; 2; 3; 4; 5; 19; 33		308 800 413
Kit 4 Screw Kit	Pos.: 2; 6; 7; 8; 10; 11; 18		308 659 321
Kit 5 Valve Kit	Pos.: 12		308 800 416
Kit 6 Lead Seal Kit	Pos.: 8; 9; 33		see page 113
Kit 7 PT100 Kit	Pos.: 32		see page 230





6" Rewindable Spare Parts 904L (up to 08.2012)

Kit 1 Thrust Bearing Kit	4-26kW	Pos.: 15; 24; 25; 26	308 750 301
	30-37kW		308 750 302
Kit 2 Radial Bearing Kit	4-26kW	Pos.: 14; 27	308 750 401
	30-37kW		308 750 402
Kit 3 Seal Kit	Pos.: 1; 2; 4; 5; 19; 29; 33		308 800 417
Kit 4 Screw Kit	Pos.: 2; 6; 7; 8; 10; 11; 18; 31; 33		308 659 322
Kit 5 Valve Kit	Pos.: 12		308 800 418
Kit 6 Lead Seal Kit	Pos.: 8; 9; 33		see page 113
Kit 7 PT100 Kit	Pos.: 32		see page 230



316SS Stator and Rotor Md. Nr. (380 - 415 Volts / 50Hz) (up to 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 316 SS		YΔ 316 SS		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 941	326 461 941	326 364 991		161 137 801K
5,5	326 364 941	326 461 941	326 364 991		161 137 801K
7,5	326 375 941	326 428 941	326 375 991		161 137 802K
9,3	326 374 941	326 429 941	326 374 991		161 137 803K
11	326 373 941	326 430 941	326 373 991		161 137 804K
13	326 372 941	326 431 941	326 372 991		161 137 805K
15	326 366 941	326 432 941	326 366 991	326 432 991	161 137 806K
18,5	326 371 941	326 433 941	326 371 991	326 433 991	161 137 807K
22	326 370 941	326 434 941	326 370 991	326 434 991	161 129 804K
26	326 378 941	326 435 941	326 378 991	326 435 991	161 129 801K
30	326 369 941	326 436 941	326 369 991	326 436 991	161 129 802K
37		326 377 941		326 377 991	161 129 803K

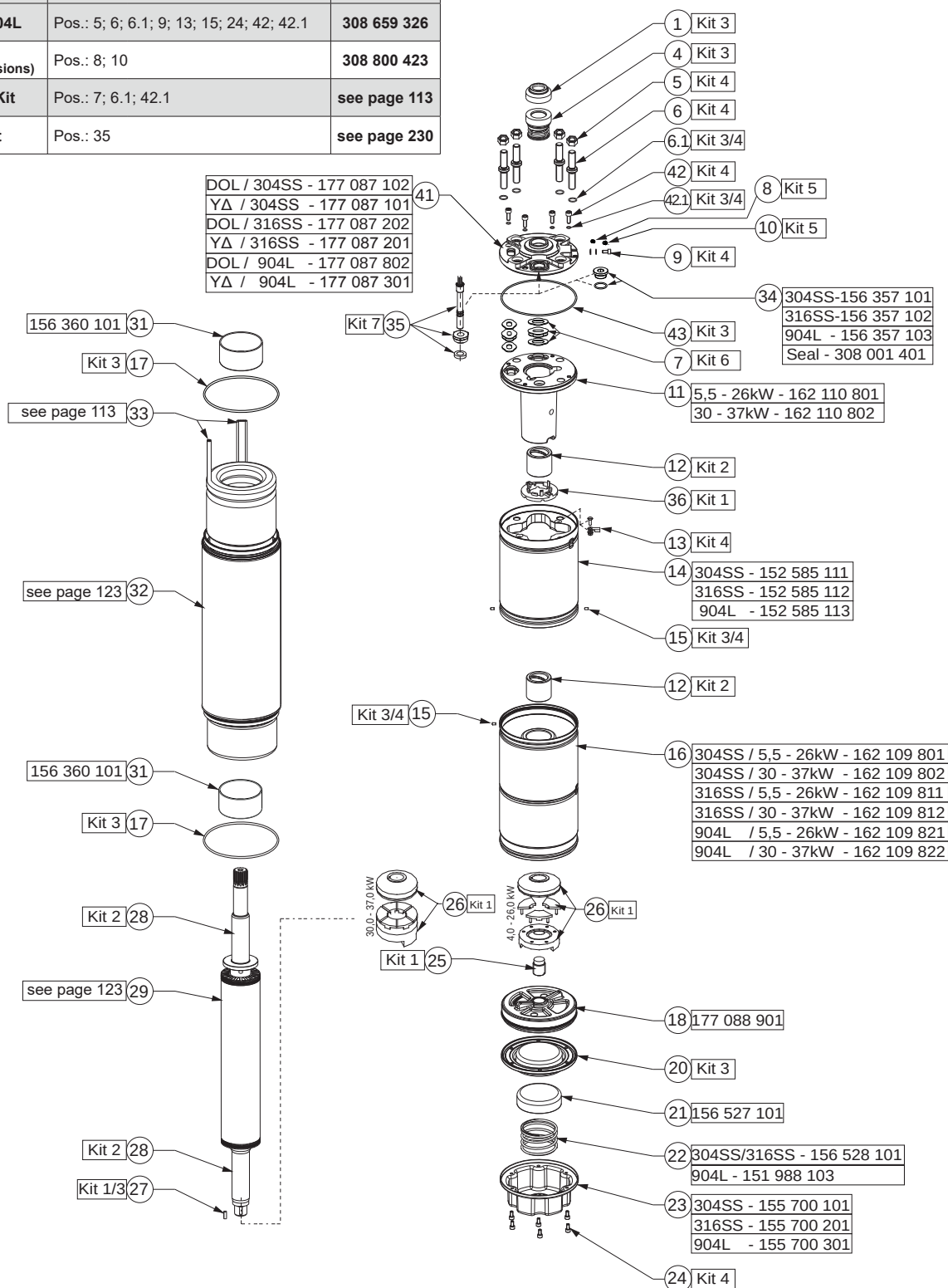
904L Stator and Rotor Model Number (380 - 415 Volts / 50Hz) (up to 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 904 L		YΔ 904 L		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 921	326 461 921	326 364 971		161 137 801K
5,5	326 364 921	326 461 921	326 364 971		161 137 801K
7,5	326 375 921	326 428 921	326 375 971		161 137 802K
9,3	326 374 921	326 429 921	326 374 971		161 137 803K
11	326 373 921	326 430 921	326 373 971		161 137 804K
13	326 372 921	326 431 921	326 372 971		161 137 805K
15	326 366 921	326 432 921	326 366 971	326 432 971	161 137 806K
18,5	326 371 921	326 433 921	326 371 971	326 433 971	161 137 807K
22	326 370 921	326 434 921	326 370 971	326 434 971	161 129 804K
26	326 378 921	326 435 921	326 378 971	326 435 971	161 129 801K
30	326 369 921	326 436 921	326 369 971	326 436 971	161 129 802K
37		326 377 921		326 377 971	161 129 803K



6" Rewindable Spare Parts 304SS / 316SS / 904L (starting 08.2012)

Kit 1	Thrust Bearing Kit	4-26kW	Pos.: 17; 25; 26; 27; 36	308 750 301
		30-37kW		308 750 302
Kit 2	Radial Bearing Kit	4-26kW	Pos.: 12; 28	308 750 401
		30-37kW		308 750 402
Kit 3A	Seal Kit Standard 304SS / 316SS / 904L	Pos.: 1; 4; 6.1; 15; 17; 20; 34; 42.1, 43		308 800 422
Kit 3B	Seal Kit Viton 304SS / 316SS / 904L	Pos.: 1; 4; 6.1; 15; 17; 20; 34; 42.1, 43		308 800 424
Kit 4	Screw Kit 304SS / 316SS	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 325
	Screw Kit 904L	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 326
Kit 5	Valve Kit (all material versions)	Pos.: 8; 10		308 800 423
Kit 6	Lead Seal Kit	Pos.: 7; 6.1; 42.1		see page 113
Kit 7	PT100 Kit	Pos.: 35		see page 230



304SS Stator and Rotor Model Number (380 - 415 Volts / 50Hz) (starting 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 304		YD 304		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 811	326 461 811	326 364 861		161 133 811K
5,5	326 364 811	326 461 811	326 364 861		161 133 811K
7,5	326 375 811	326 428 811	326 375 861		161 133 810K
9,3	326 374 811	326 429 811	326 374 861		161 133 809K
11	326 373 811	326 430 811	326 373 861		161 133 808K
13	326 372 811	326 431 811	326 372 861		161 133 807K
15	326 366 811	326 432 811	326 366 861	326 432 861	161 133 806K
18,5	326 371 811	326 433 811	326 371 861	326 433 861	161 133 805K
22	326 370 811	326 434 811	326 370 861	326 434 861	161 133 804K
26	326 378 811	326 435 811	326 378 861	326 435 861	161 133 801K
30	326 369 811	326 436 811	326 369 861	326 436 861	161 133 802K
37		326 377 811		326 377 861	161 133 803K

316SS Stator and Rotor Model Number (380 - 415 Volts / 50Hz) (starting 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 316SS		YD 316SS		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 821	326 461 821	326 364 871		161 177 801K
5,5	326 364 821	326 461 821	326 364 871		161 177 801K
7,5	326 375 821	326 428 821	326 375 871		161 177 802K
9,3	326 374 821	326 429 821	326 374 871		161 177 803K
11	326 373 821	326 430 821	326 373 871		161 177 804K
13	326 372 821	326 431 821	326 372 871		161 177 805K
15	326 366 821	326 432 821	326 366 871	326 432 871	161 177 806K
18,5	326 371 821	326 433 821	326 371 871	326 433 871	161 177 807K
22	326 370 821	326 434 821	326 370 871	326 434 871	161 176 804K
26	326 378 821	326 435 821	326 378 871	326 435 871	161 176 803K
30	326 369 821	326 436 821	326 369 871	326 436 871	161 176 802K
37		326 377 821		326 377 871	161 176 801K

904L Stator and Rotor Model Number (380 - 415 Volts / 50Hz) (starting 08.2012)

P _N [kW]	Stator (incl. winding and 4m motor lead)				Rotor
	DOL 904L		YD 904L		
	PVC	PE2/PA	PVC	PE2/PA	
4	326 364 831	326 461 831	326 364 881		161 177 801K
5,5	326 364 831	326 461 831	326 364 881		161 177 801K
7,5	326 375 831	326 428 831	326 375 881		161 177 802K
9,3	326 374 831	326 429 831	326 374 881		161 177 803K
11	326 373 831	326 430 831	326 373 881		161 177 804K
13	326 372 831	326 431 831	326 372 881		161 177 805K
15	326 366 831	326 432 831	326 366 881	326 432 881	161 177 806K
18,5	326 371 831	326 433 831	326 371 881	326 433 881	161 177 807K
22	326 370 831	326 434 831	326 370 881	326 434 881	161 176 804K
26	326 378 831	326 435 831	326 378 881	326 435 881	161 176 803K
30	326 369 831	326 436 831	326 369 881	326 436 881	161 176 802K
37		326 377 831		326 377 881	161 176 801K



PVC Insulation Standard Windings (380 – 415 V / 50 Hz and 460 V / 60 Hz)

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
4	326 364 999	53+53+53+53	0,9 / 1,6	PVC	Serie	540,00	4,8800	5,1700	3,5000
5,5	326 364 999	53+53+53+53	0,9 / 1,6	PVC	Serie	540,00	4,8800	5,1700	3,5000
7,5	326 375 999	47+47+47+47	1,0 / 1,7	PVC	Serie	500,00	3,6710	4,0400	2,7200
9,3	326 374 999	41+41+41+41	1,1 / 1,8	PVC	Serie	466,00	2,8270	3,0200	2,0600
11	326 373 999	36+36+36+36	1,2 / 1,9	PVC	Serie	436,00	2,2200	2,3500	1,6060
13	326 372 999	30+30+30+30	1,3 / 2,0	PVC	Serie	400,00	1,7330	1,8800	1,2430
15	326 366 999	27+27+27+27	1,4 / 2,2	PVC	Serie	395,00	1,4550	1,5260	1,0160
18,5	326 371 999	23+23+23+23	1,5 / 2,3	PVC	Serie	362,00	1,1610	1,2220	0,8250
22	326 370 999	19+19+19+19	1,7 / 2,5	PVC	Serie	342,00	0,8520	0,9200	0,7130
26	326 378 999	16+16+16+16	1,9 / 2,7	PVC	Serie	330,00	0,6570	0,6980	0,4700
30	326 369 999	27+27	1,4 / 2,2	PVC	Parallel	624,00	0,3810	0,6100	0,4120
37	326 377 999	12+12+12+12	2,0 / 2,9 / 3,1	PE2/PA	Serie	302,00	0,5420	0,5900	0,3840

PE2/PA Insulation Standard Windings (380 – 415 V / 50 Hz and 460 V / 60 Hz)

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
4	326 461 999	30+30+30+30	1,1 / 2,0	PE2/PA	Serie Y	311	1,8500	-	3,7000
5,5	326 461 999	30+30+30+30	1,1 / 2,0	PE2/PA	Serie Y	311	1,8500	-	3,7000
7,5	326 428 999	27+27+27+27	1,3 / 2,2	PE2/PA	Serie Y	295	1,2480	-	2,4960
9,3	326 429 999	23+24+24+23	1,4 / 2,3	PE2/PA	Serie Y	274	1,0060	-	2,3200
11	326 430 999	20+21+21+20	1,4 / 2,4	PE2/PA	Serie Y	255	0,9280	-	1,8560
13	326 431 999	17+18+18+17	1,6 / 2,6	PE2/PA	Serie Y	240	0,6670	-	1,3340
15	326 432 999	27+27+27+27	1,3 / 2,2	PE2/PA	Serie	395	1,6870	1,6870	1,2466
18,5	326 433 999	23+23+23+23	1,3 / 2,2	PE2/PA	Serie	362	1,5500	1,5500	1,0333
22	326 434 999	19+19+19+19	1,5 / 2,5	PE2/PA	Serie	342	1,0940	1,0940	0,7293
26	326 435 999	16+16+16+16	1,7 / 2,7	PE2/PA	Serie	330	0,8210	0,8210	0,5473
30	326 436 999	27+27	1,3 / 2,2	PE2/PA	Parallel	624	1,3260	0,6630	0,4420
37	326 377 999	12+12+12+12	2,0 / 2,9 / 3,1	PE2/PA	Serie	302,00	0,5420	0,5900	0,3840

Insulation resistance (20°C / 500 VDC)

New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

Motor Repair instruction

Pictured Repair instruction)	Cast Iron - 304SS	Motor Design up to 12.2012	Mod.- Nb. :	308 018 460
	316SS / 904L			308 018 ***
	304SS / 316SS / 904L	Motor Design starting 01.2013		308 018 624

8" Rewindable Motors



Submersible Motors

Quality in the Well

These 8" rewindable motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 8" diameter or larger water wells. It is fitted with water lubricated radial and thrust bearings for maintenance-free operation. The motor is filled with a special FES93 fluid, providing frost protection down to -15°C storage temperature. A special diaphragm ensures pressure compensation inside the motor. The Sand fighter® SiC seal system is standard. For applications in aggressive media, motors made of 316SS and 904L are available.

Product advantages:

- Easy to assemble with double flange
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- Sand fighter® SiC seal system for high performance in sand
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Design for retrofitable PT100 sensor
- Non contaminating FES 93 filled design

Technical Specifications

- 30,0 - 93,0kW
- 8" NEMA flange
- Protection: IP 68
- Starts per hour: max. 10
- Installation position: vertical / horizontal (**93 kW** motors may not be installed horizontally)
- Motor Lead in 6 m length (KTW approved)
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [$380-415V = (380-10\%) - (415+6\%)$]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to EN 61947-4-1
- Standard motor with PVC winding insulation
- for max. ambient temp. of 30°C with a min. cooling flow:

30 kW - 52 kW $v = 0,2 \text{ m/s}$

55 kW - 93 kW $v = 0,5 \text{ m/s}$

Options

- Other voltages
- Motors in complete 316 SS and 904 L
- YΔ - start (pos. of cables 90°)
- PE2/PA winding insulation for max. ambient temp. of 50°C at the same cooling conditions as standard
- PT 100 temperature sensor (sold separately)
- Lead in different lengths up to 50m



8" Rewindable Motors - Model Numbers 50Hz / 60Hz *

P _N [kW]	U _N / f	Model Number Digit 1 – 6		Model Number Digit 7 – 10					
	[V] / [Hz]	DOL	YΔ	304	316 SS	904L	PE2/PA		
							304	316 SS	904L
30	380 - 415 / 50 460 / 60	263 610	263 710	5111	6111	7111	5311	6311	7311
	380 / 60	263 660	263 780						
37	380 - 415 / 50 460 / 60	263 611	263 711	5111	6111	7111	5311	6311	7311
	380 / 60	263 661	263 781						
45	380 - 415 / 50 460 / 60	263 612	263 712	5111	6111	7111	5311	6311	7311
	380 / 60	263 662	263 782						
52	380 - 415 / 50 460 / 60	263 260	263 270	5111	6111	7111	5311	6311	7311
	380 / 60	263 310	263 360						
55	380 - 415 / 50 460 / 60	263 613	263 713	5111	6111	7111	5311	6311	7311
	380 / 60	263 663	263 783						
60	380 - 415 / 50 460 / 60	263 261	263 271	5111	6111	7111	5311	6311	7311
	380 / 60	263 311	263 361						
67	380 - 415 / 50 460 / 60	263 262	263 272	5111	6111	7111	5311	6311	7311
	380 / 60	263 312	263 362						
75	380 - 415 / 50 460 / 60	263 614	263 714	5111	6111	7111	5311	6311	7311
	380 / 60	263 664	263 784						
83	380 - 415 / 50 460 / 60	263 263	263 273	5111	6111	7111	5311	6311	7311
	380 / 60	263 313	263 363						
93	380 - 415 / 50 460 / 60	263 615	263 715	5111	6111	7111	5311	6311	7311
	380 / 60	263 665	263 785						

P _N [kW]	U _N / f	Model Number Digit 1 – 6		Model Number Digit 7 – 10					
	[V] / [Hz]	DOL	YΔ	304	316 SS	904L	PE2/PA		
							304	316 SS	904L
30	500/ 50	263 620	263 790	5111	6111	7111	5311	6311	7311
37	500/ 50	263 621	263 791	5111	6111	7111	5311	6311	7311
45	500/ 50	263 622	263 792	5111	6111	7111	5311	6311	7311
52	500/ 50	263 240	263 340	5111	6111	7111	5311	6311	7311
55	500/ 50	263 623	263 793	5111	6111	7111	5311	6311	7311
60	500/ 50	263 241	263 341	5111	6111	7111	5311	6311	7311
67	500/ 50	263 242	263 342	5111	6111	7111	5311	6311	7311
75	500/ 50	263 624	263 794	5111	6111	7111	5311	6311	7311
83	500/ 50	263 243	263 343	5111	6111	7111	5311	6311	7311
93	500/ 50	263 625	263 795	5111	6111	7111	5311	6311	7311

* For VFD Operation is PE2/PA mandatory!

8" Rewindable Motors - Performance Data 50Hz

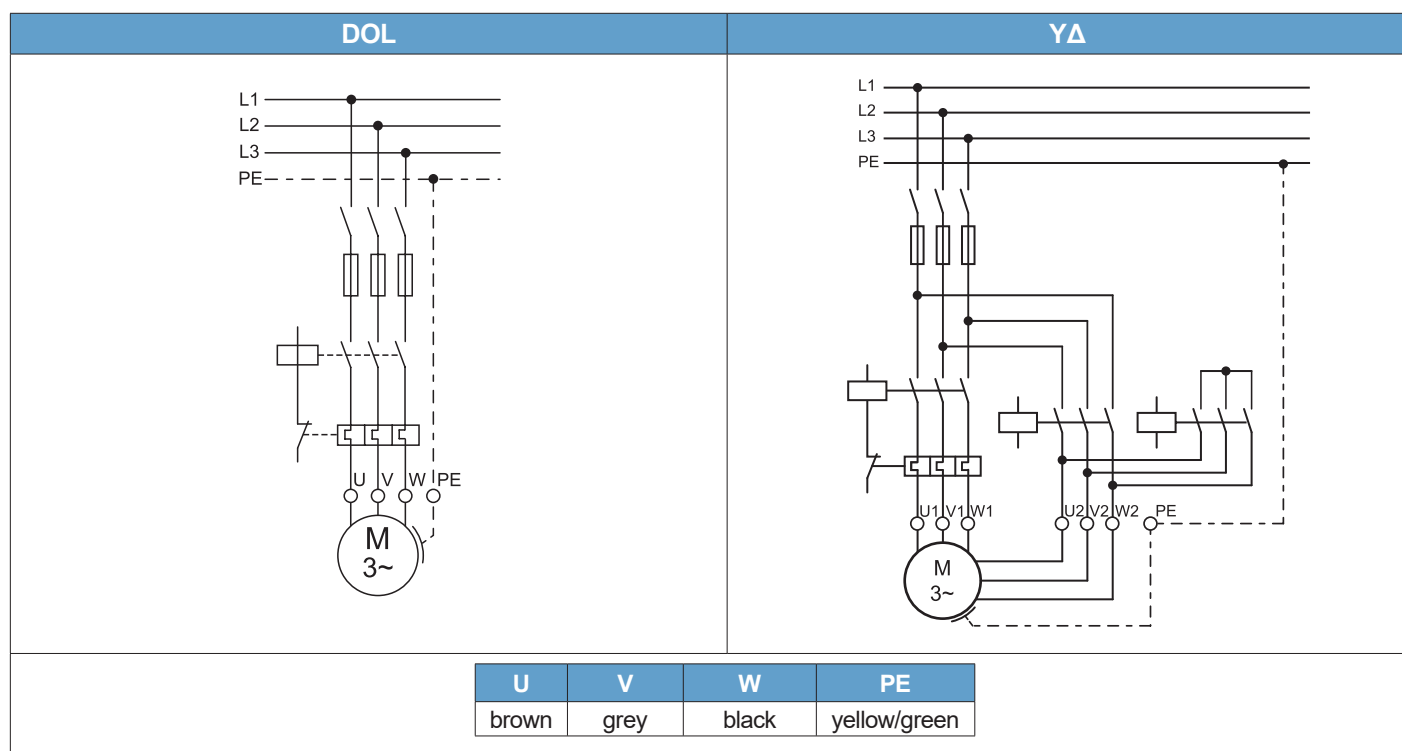
P _N [kW]	Thrust F[N]	U _N [V]	n _N [min ⁻¹]	I _N [A]	I _A [A]	η (Eff.) [%] at % load			cosφ (PF) at % load			T _N [Nm]	T _A [Nm]
						50	75	100	50	75	100		
30	45 000	380	2880	63	300	83,5	84,4	83,1	0,89	0,88	0,89	99	126
		400	2900	60	318	83,6	85	84,3	0,80	0,86	0,89	99	141
		415	2910	58	332	83,5	85,2	84,9	0,77	0,89	0,88	98	151
		500	2880	48	228	84	84	83	0,84	0,88	0,89		
37	45 000	380	2890	79	378	84,6	85,3	83,9	0,80	0,86	0,88	122	156
		400	2900	76	400	83,9	85,2	84,6	0,74	0,82	0,86	122	176
		415	2910	75	412	82,6	84,5	84,3	0,7	0,80	0,84	121	190
		500	2890	60	287	85	85	84	0,80	0,86	0,88		
45	45 000	380	2900	93	491	85,8	86,4	85,2	0,79	0,86	0,88	149	218
		400	2910	90	520	85,3	86,5	85,9	0,74	0,82	0,86	148	241
		415	2910	89	541	84,5	86,2	85,8	0,69	0,79	0,84	148	263
		500	2905	73	393	85	87	86	0,74	0,82	0,86		
		1000	2910	35	208	85	88	87	0,81	0,87	0,89		
52	45 000	380	2900	107	575	86,5	86,7	85,3	0,81	0,87	0,89	175	284
		400	2910	103	608	86,4	87,1	86,2	0,76	0,84	0,87	175	318
		415	2920	101	633	85,6	87	86,7	0,71	0,80	0,85	174	345
		500	2915	84	437	87	87	85	0,81	0,87	0,85	170	338
55	45 000	380	2900	114	624	86,5	86,9	85,7	0,78	0,85	0,88	182	301
		400	2915	110	660	85,9	87	86,4	0,72	0,82	0,86	181	340
		415	2920	109	688	84,8	86,4	86,2	0,67	0,78	0,83	181	366
		500	2910	88	474	86	87	86	0,78	0,85	0,86		
		1000	2910	45	250	76	87	86	0,76	0,83	0,87	181	301
60	45 000	380	2900	122	698	87,2	87,6	86,5	0,81	0,87	0,89	198	319
		400	2910	116	725	86,8	87,7	87,0	0,77	0,84	0,88	197	357
		415	2920	115	768	86,1	87,4	87,1	0,73	0,82	0,86	197	387
		500	2910	93	530	86	87	86	0,78	0,85	0,88		
		1000	2920	46	300	87	88	87	0,77	0,84	0,88		
67	45 000	380	2900	137	759	87,2	87,6	86,4	0,79	0,86	0,89	220	352
		400	2910	133	797	86,5	87,5	86,9	0,74	0,82	0,86	220	395
		415	2920	131	828	85,6	87	86,6	0,69	0,79	0,84	219	427
		500	2900	104	576	87	88	86	0,79	0,86	0,89	220	392
		1000	2910	52	330	87	88	87	0,74	0,82	0,86		
75	45 000	380	2900	154	892	86,7	87,1	85,9	0,79	0,86	0,89	247	419
		400	2910	148	942	86,2	87,3	86,7	0,74	0,83	0,87	246	472
		415	2920	147	982	85,4	86,9	86,6	0,69	0,79	0,84	245	510
		500	2910	118	678	87	87	86	0,79	0,86	0,86	246	472
		1000	2910	60	377	74	83	87	0,86	0,87	0,87	246	472
83	45 000	380	2910	166	1019	87,8	88,3	87,2	0,81	0,87	0,90	275	483
		400	2920	160	1077	87,5	88,4	87,6	0,77	0,84	0,88	273	544
		415	2925	156	1120	87,2	88,4	88,0	0,73	0,82	0,86	273	586
		500	2915	128	775	88	88	87	0,81	0,87	0,88		
93	45 000	380	2910	188	1186	87,8	88,4	87,5	0,77	0,85	0,88	306	557
		400	2920	183	1276	87,2	88,3	87,8	0,71	0,81	0,86	305	626
		415	2930	184	1308	86,2	87,8	87,7	0,65	0,76	0,83	305	676
		500	2910	144	902	88	88	87	0,77	0,85	0,87		
		1000	2920	73,7	508	87	88	88	0,72	0,80	0,85	304	622



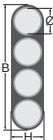
8" Rewindable Motors - Performance Data 60Hz

P _N [Kw]	P _{max} [Kw]	Thrust F [N]	U _N [V]	n _{max} [min ⁻¹]	I _{max} [A]	I _A [A]	η _{max} (Eff.) [%] at % load			cos φ _{max} (Pf.) at % load			T _{max} [Nm]	T _A [Nm]
							50	75	100	50	75	100		
30	34,5	45 000	380	3500	74	394	82,4	84,6	84,5	0,80	0,86	0,88	99	141
			460	3490	61	324	81,5	83,6	83,5	0,82	0,87	0,89	99	130
37	42,6	45 000	380	3510	92	514	83,0	85,2	85,4	0,72	0,81	0,85	122	178
			460	3490	75	407	83,8	85,3	84,8	0,77	0,84	0,87	123	162
45	51,8	45 000	380	3500	108	660	83,6	85,7	85,8	0,73	0,81	0,86	149	240
			460	3500	89	524	85,0	86,6	86,3	0,77	0,84	0,87	149	221
52	59,5	45 000	380	3510	125	765	85,4	87,0	86,9	0,75	0,83	0,87	175	300
			460	3505	102	606	85,0	86,6	86,2	0,79	0,86	0,88	175	276
55	63	45 000	380	3510	132	842	84,4	86,5	86,5	0,71	0,80	0,87	182	321
			460	3510	109	657	85,8	87,1	86,7	0,77	0,84	0,87	181	287
60	69	45 000	380	3510	141	931	86,2	87,7	87,7	0,77	0,84	0,87	198	362
			460	3510	116	734	85,4	86,9	86,7	0,80	0,86	0,88	198	332
67	77	45 000	380	3520	142	1037	84,4	86,4	86,7	0,73	0,82	0,84	220	396
			460	3510	131	803	85,7	87,2	86,9	0,77	0,85	0,87	220	366
75	86	45 000	380	3510	175	1143	86,3	87,8	87,4	0,77	0,85	0,88	247	427
			460	3510	145	947	86,3	87,8	87,4	0,77	0,85	0,88	247	427
83	95	45 000	380	3510	191	1377	86,0	88,0	88,0	0,75	0,83	0,89	274	532
			460	3510	158	1090	86,5	87,9	87,7	0,80	0,86	0,89	275	489
93	107	45 000	380	3510	218	1586	88,0	88,6	88,4	0,77	0,83	0,87	306	613
			460	3510	180	1256	86,7	88,3	88,3	0,76	0,83	0,87	306	561

Electrical Connection



8" Rewindable Motors - Motor Leads*

DOL									
Lead	P _N [kW]	Ø (mm ²)	B / H (mm)		Lengths (m)	Qty.	Lead Mod.- Nr.	Lead seal Kit 304/316 Mod.- Nr.	Lead seal Kit 904L Mod.- Nr.
	30 – 45	4G10	B	30,0	6	1	308 710 107	308 660 612	308 660 619
			H	10,5					
	52 – 93	4G16	B	38,0	6	1	308 710 108	308 660 618	308 660 620
			H	12,8					
	93 (PE2/PA)	3X25	B	37,5	6	1	308 710 109	308 660 613	308 660 621
			H	16,0					
Ground lead (optional)	P _N [kW]	Ø (mm ²)	D (mm)		Lengths (m)	Qty.	Mod.-Nr.		
	all ratings	1G25	13,0		8	1	308 053 080		

For PE2/PA engines additionally the special Tape 700 541 688 is absolutely necessary

YΔ									
Lead	P _N [kW]	Ø (mm²)	B / H (mm)		Lengths (m)	Qty.	Lead Mod.- Nr.	Lead seal Kit 304/316 Mod.- Nr.	Lead seal Kit 904L Mod.- Nr.
 	30 – 60	3X6	B	19,5	6	1	308 710 110	308 660 614	308 660 622
			H	9,5		1			
		4G6	B	25,0					
			H	9,0					
	65 – 83	3X10	B	24,5	6	1	308 710 111	308 660 615	308 660 623
			H	11,5		1			
		4G10	B	30,0					
			H	10,5					
	93	3X16	B	30,3	6	1	308 710 112	308 660 616	308 660 624
			H	13,2		1			
		4G16	B	38,0					
			H	12,8					

For PE2/PA engines additionally the special Tape 700 541 688 is absolutely necessary

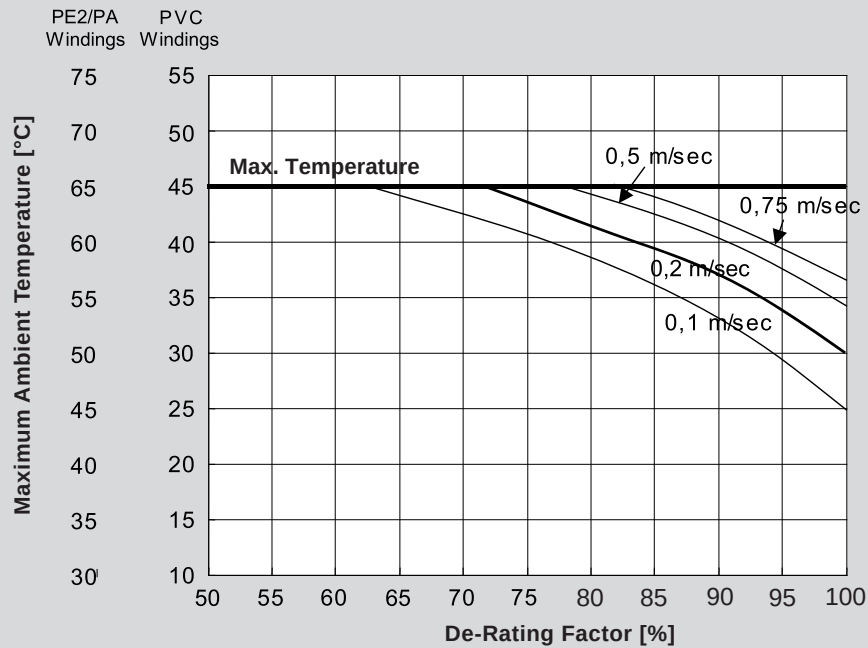
Lead opening seal kit	30 – 93 kW DOL / YΔ	Mod.- Nr.:	304/316	308 660 617
			904L	308 660 625

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

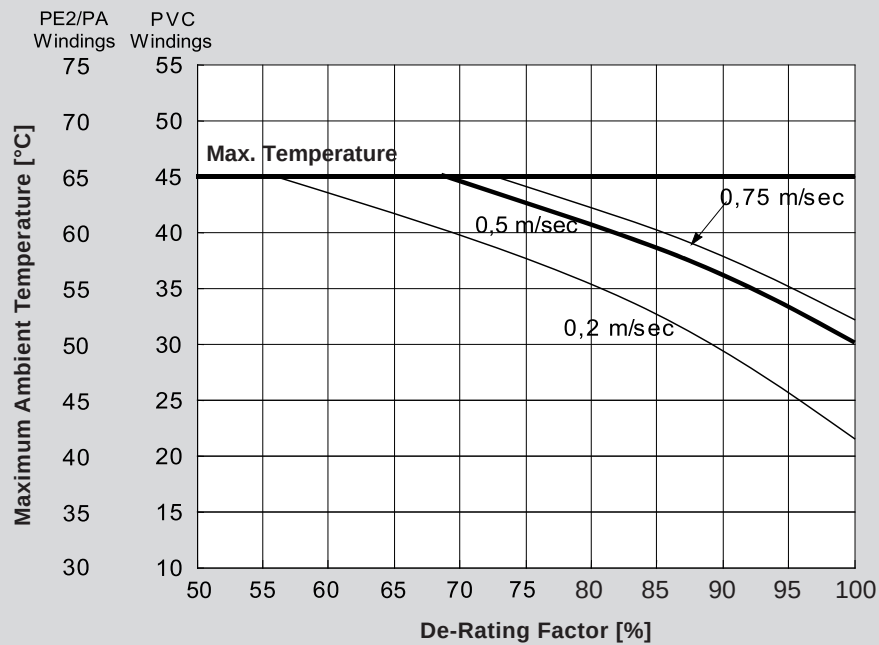


8" Rewindable De-Rating Curves

De-Rating of 8" Rewindable Motors 30 - 52 kW



De-Rating of 8" Rewindable Motors 55 - 93 kW



If these conditions are not met please contact Franklin Electric !

PVC Insulation Windings (380 – 415 V / 50 Hz)									
P _N [kW]	Mod.-No. Winding kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
30	326 349 999	9+10+9+10	2,2 / 3,1	PVC	Series	450,00	0,2640	0,5400	0,3700
37	326 101 999	17+17+17+17	1,6 / 2,4	PVC	Parallel	630,00	0,8930	0,4750	0,3110
45	326 110 999	14+14+14+14	1,8 / 2,6	PVC	Parallel	582,48	0,6545	0,3480	0,2350
52	326 120 999	12+12+12+12	1,9 / 2,7	PVC	Parallel	655,00	0,5695	0,3130	0,1900
55	326 119 999	11+12+11+12	2,0 / 2,9	PVC	Parallel	542,40	0,4925	0,2720	0,1730
60	326 129 999	10+10+10+10	2,2 / 3,1	PVC	Parallel	536,40	0,4024	0,2170	0,1430
67	326 128 999	9+10+9+10	2,2 / 3,1	PVC	Parallel	510,48	0,3823	0,2090	0,1390
75	326 135 999	8+9+8+9	1,6 / 2,4 2DR.II	PVC	Parallel	990,72	0,3503	0,1930	0,1240
83	326 142 999	7+8+7+8	1,7 / 2,5 2DR.II	PVC	Parallel	1008,00	0,3159	0,1670	0,1053
93	326 141 999	7+7+7+7	1,8 / 2,6 2DR.II	PVC	Parallel	943,20	0,2630	0,1400	0,0940

PE2/PA Insulation Windings (380 – 415 V / 50 Hz)									
P _N [kW]	Mod.-No. Winding kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YD (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
30	326 514 999	9+10+9+10	2,0 / 3,1	PE2/PA	Series	360	0,3212	0,6424	0,4282
37	326 239 999	8+9+8+9	2,0 / 3,1	PE2/PA	Series	315	0,2874	0,5748	0,3832
45	326 248 999	14+14+14+14	1,6 / 2,6	PE2/PA	Parallel	582	0,8283	0,4141	0,2761
52	326 259 999	12+12+12+12	1,7 / 2,7	PE2/PA	Parallel	565	0,7113	0,3556	0,2371
55	326 258 999	11+12+11+12	1,9 / 2,9	PE2/PA	Parallel	542	0,5457	0,2728	0,1819
60	326 269 999	10+10+10+10	2,0 / 3,1	PE2/PA	Parallel	536	0,4868	0,2434	0,1622
67	326 268 999	9+10+9+10	2,0 / 3,1	PE2/PA	Parallel	510	0,4625	0,2312	0,1541
75	326 275 999	8+9+8+9	2,0 / 3,1	PE2/PA	Parallel	495	0,4483	0,2241	0,1494
83	326 283 999	7+8+7+8	1,5 / 2,5 2DR.II	PE2/PA	Parallel	1008	0,4057	0,2028	0,1352
93	326 282 999	7+7+7+7	1,6 / 2,6 2DR.II	PE2/PA	Parallel	943	0,3328	0,1664	0,1109

PE2/PA Insulation Windings (500 V / 50 Hz)							
P _N [kW]	Mod.-No. Winding kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]
37	326 240 999	10+11+10+11	1,9 / 2,7 / 2,9	PE2/PA	Series	387	0,3934
45	326 250 999	9+9+9+9	2,0 / 2,9 / 3,1	PE2/PA	Series	371	0,3408
55	326 260 999	14+15+14+15	1,6 / 2,4 / 2,6	PE2/PA	Parallel	679	0,9703
67	326 270 999	12+12+12+12	1,7 / 2,5 / 2,7	PE2/PA	Parallel	640	0,8087
75	326 277 999	10+11+10+11	1,9 / 2,7 / 2,9	PE2/PA	Parallel	607	0,6137
93	326 284 999	9+9+9+9	2,0 / 2,9 / 3,1	PE2/PA	Parallel	601	0,5478

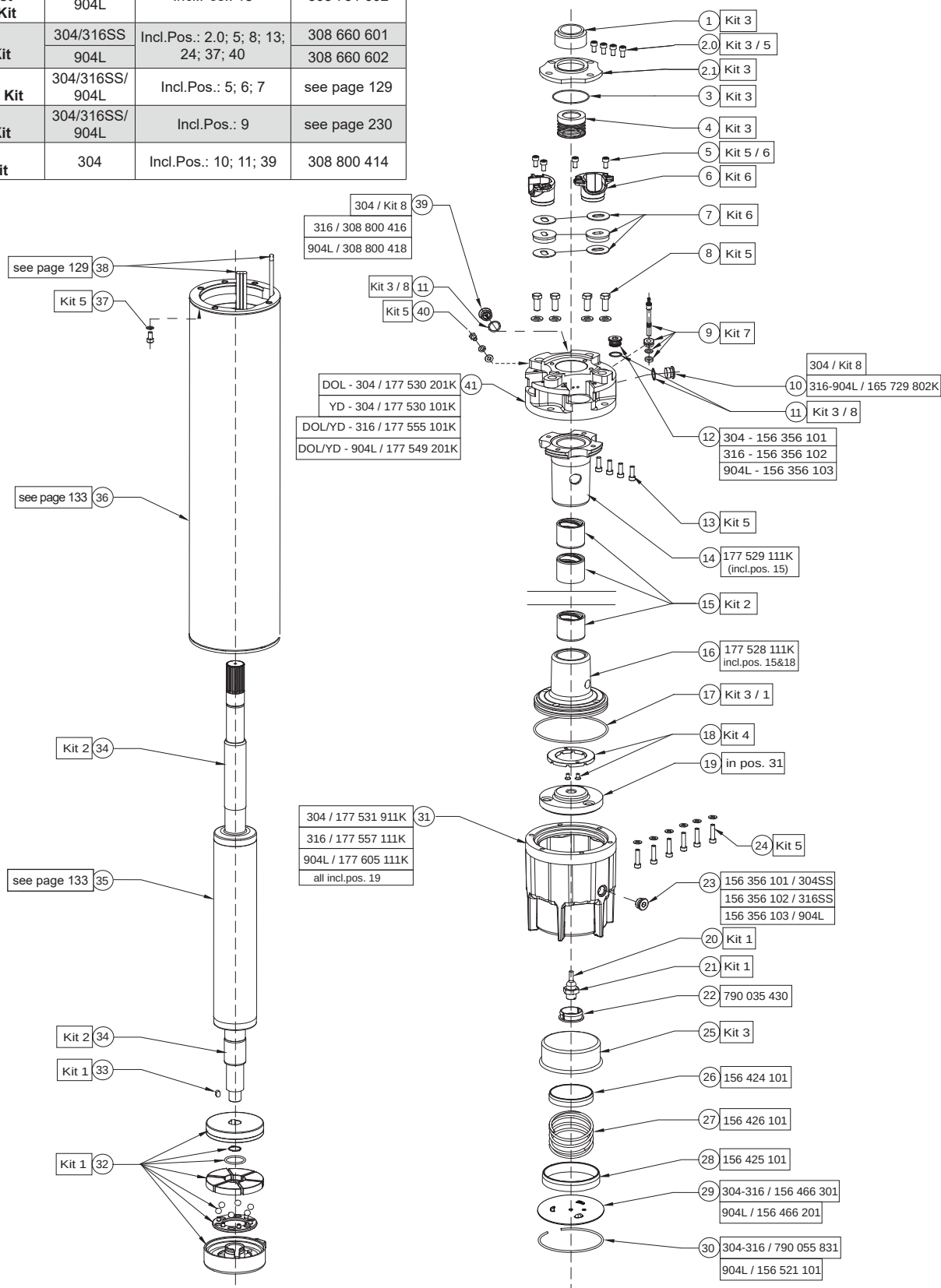
PE2/PA Insulation Windings (380 V / 60 Hz)							
P _N [kW]	Mod.-No. Winding kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]
37	326 237 999	13+14+13+14	1,7 / 2,5 / 2,7	PE2/PA	Parallel	504	0,6318
45	326 246 999	11+11+11+11	1,9 / 2,7 / 2,9	PE2/PA	Parallel	461	0,4616
52	326 585 999	9+10+9+10	2,0 / 2,9 / 3,1	PE2/PA	Parallel	451	0,4125
55	326 256 999	9+9+9+9	2,0 / 2,9 / 3,1	PE2/PA	Parallel	428	0,3855
60	326 586 999	8+8+8+8	1,5 / 2,3 / 2,5	PE2/PA	Parallel	865	0,3473
67	326 266 999	7+8+7+8	1,5 / 2,3 / 2,5	PE2/PA	Parallel	813	0,3246
75	326 273 999	6+7+6+7	1,7 / 2,5 / 2,7	PE2/PA	Parallel	766	0,2373
83	326 153 999	6+6+6+6	1,8 / 2,6 / 2,8	PE2/PA	Parallel	994	0,2240
93	326 280 999	5+6+5+6	1,9 / 2,7 / 2,9	PE2/PA	Parallel	748	0,1854

Insulation resistance (20°C / 500 VDC)			
New motor without drop cable		400 >	MΩ
Used motor without drop cable		20 >	MΩ
New motor with drop cable		4 >	MΩ
Used motor with drop cable		1	MΩ



8" Rewindable Spare Parts

Kit 1 Thrust Bearing Kit	304/316SS/ 904L	Incl.Pos.: 17; 20; 21; 32; 33	308 750 601
Kit 2 Radial Bearing Kit	304/316SS/ 904L	Incl.Pos.: 15; 34	308 751 601
Kit 3 Seal Kit	304/316SS 904L	Incl.Pos.: 1 - 4; 11; 17; 25	308 800 603 308 800 604
Kit 4 Up-Thrust Bearing Kit	304/316SS/ 904L	Incl.Pos.: 18	308 751 602
Kit 5 Screw Kit	304/316SS 904L	Incl.Pos.: 2.0; 5; 8; 13; 24; 37; 40	308 660 601 308 660 602
Kit 6 Lead Seal Kit	304/316SS/ 904L	Incl.Pos.: 5; 6; 7	see page 129
Kit 7 PT100 Kit	304/316SS/ 904L	Incl.Pos.: 9	see page 230
Kit 8 Valve Kit	304	Incl.Pos.: 10; 11; 39	308 800 414



304 / 316SS Stator and Rotor Model Number (380 - 415/ 460 Volts - 50 / 60Hz)

P _N [kW]	Stator (incl. winding and 6m motor lead)				Rotor
	DOL PVC	DOL PE2/PA	YΔ PVC	YΔ PE2/PA	
30	326 349 931	326 514 931	326 349 981	326 514 981	161 580 801K
37	326 101 931	326 239 931	326 101 981	326 239 981	161 580 801K
45	326 110 931	326 248 931	326 110 981	326 248 981	161 580 802K
52	326 120 931	326 259 931	326 120 981	326 259 981	161 580 803K
55	326 119 931	326 258 931	326 119 981	326 258 981	161 580 803K
60	326 129 931	326 269 931	326 129 981	326 269 981	161 580 804K
67	326 128 931	326 268 931	326 128 981	326 268 981	161 580 804K
75	326 135 931	326 275 931	326 135 981	326 275 981	161 580 805K
83	326 142 931	326 283 931	326 142 981	326 283 981	161 580 806K
93	326 141 931	326 282 931	326 141 981	326 282 981	161 580 806K

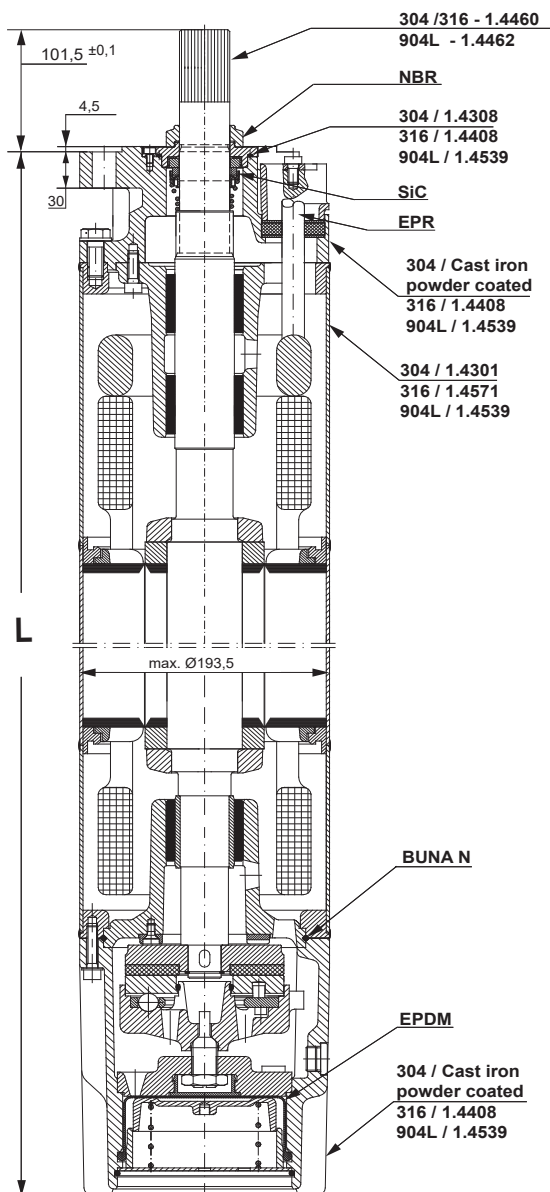
904L Stator and Rotor Model Number (380 - 415/ 460 Volts - 50 / 60Hz)

P _N [kW]	Stator (incl. winding and 6m motor lead)				Rotor
	DOL PVC	DOL PE2/PA	YΔ PVC	YΔ PE2/PA	
30	326 349 921	326 514 921	326 349 971	326 514 971	161 580 811K
37	326 101 921	326 239 921	326 101 971	326 239 971	161 580 811K
45	326 110 921	326 248 921	326 110 971	326 248 971	161 580 812K
52	326 120 921	326 259 921	326 120 971	326 259 971	161 580 813K
55	326 119 921	326 258 921	326 119 971	326 258 971	161 580 813K
60	326 129 921	326 269 921	326 129 971	326 269 971	161 580 814K
67	326 128 921	326 268 921	326 128 971	326 268 971	161 580 814K
75	326 135 921	326 275 921	326 135 971	326 275 971	161 580 815K
83	326 142 921	326 283 921	326 142 971	326 283 971	161 580 816K
93	326 141 921	326 282 921	326 141 971	326 282 971	161 580 816K

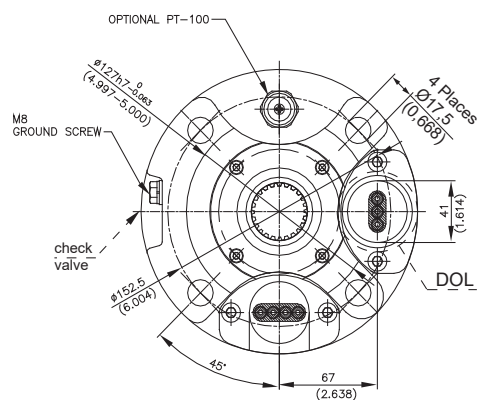


8" Rew Motor Design

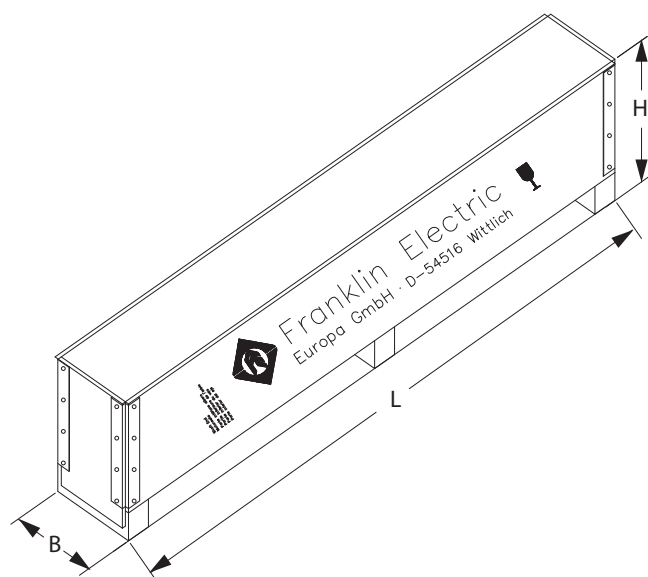
Motor - 304/316SS/904L



End Bell



Motor Box



(sample Drawing)

P _N [kW]	Motor Lengths L [mm]	Motor Weights [kg]		Motor Shipping Size [mm]		
	304 / 316 / 904L	304 / 316 / 904L	Incl. Pack [kg]	B	H	L
30	1140	140	169	310	472	1596
37	1140	140	169			
45	1230	156	185			
52	1340	179	208			
55	1340	179	208			
60	1470	198	235	310	472	1996
67	1470	198	235			
75	1560	215	252			
83	1740	247	284			
93	1740	247	284			

10" Rewindable Motors



Submersible Motors

Quality in the Well

These 10" rewindable motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 10" diameter or larger water wells.

It is fitted with water lubricated radial and thrust bearings for maintenance-free operation. The motor is filled with a special FES93 fluid, providing frost protection down to -15°C storage temperature.

A special diaphragm ensures pressure compensation inside the motor. The Sand fighter® SiC seal system is standard. For applications in aggressive media, motors made of 316SS and 904L are available.

Product advantages:

- Easy to assemble with double flange
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- Sand fighter® SiC seal system for high performance in sand
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Design for retrofitable PT100 sensor
- Non contaminating FES 93 filled design

Technical Specifications

- 85,0 - 185,0kW
- 10" flange
- Protection: IP 68
- Starts per hour: max. 10
- Installation position: vertical / horizontal (**185 kW** motors may not be installed horizontally)
- Motor Lead in 6 m length (KTW approved)
- Standard Voltage: 380-415V/50Hz, 460V/60Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to EN 61947-4-1
- Standard motor with PVC winding insulation for max. ambient temperature of 25°C with a min. cooling flow: $v = 0,5 \text{ m/s}$

Options

- Other voltages
- YΔ - start (pos. of cables 90°)
- Motors in complete 316 SS and 904 L
- PE2/PA winding insulation for max. ambient temp. of 45°C at the same cooling conditions as standard
- PT 100 temperature sensor (sold separately)
- Lead in different lengths up to 50m



10" Rewindable Motors - Model Numbers 50/60Hz *

P _N [kW]	U _N / f	Model Numbers Digit 1 – 6		Model Numbers Digit 7 – 10					
	[V] / [Hz]	DOL	YΔ	304	316 SS	904L	PE2/PA		
							304	316 SS	904L
85	380 - 415 / 50 460 / 60	264 131	264 231	5111	6111	7111	53**	63**	73**
	380 / 60	264 661	264 761						
110	380 - 415 / 50 460 / 60	264 133	264 233	5111	6111	7111	53**	63**	73**
	380 / 60	264 663	264 763						
130	380 - 415 / 50 460 / 60	264 134	264 234	5111	6111	7111	53**	63**	73**
	380 / 60	264 664	264 764						
150	380 - 415 / 50 460 / 60	264 135	264 235	5111	6111	7111	53**	63**	73**
	380 / 60	264 665	264 765						
185	380 - 415 / 50 460 / 60	264 136	264 236	5111	6111	7111	53**	63**	73**
	380 / 60		264 766						

* For VFD Operation is PE2/PA mandatory!

10" Rewindable Motors - Performance Data 50Hz

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		
85	60 000	380	2890	179	783	85	86	85	0,78	0,85	0,87	281	282
		400	2900	174	828	83	85	85	0,72	0,81	0,85	280	316
		415	2910	171	863	83	85	85	0,68	0,78	0,83	279	342
		500	2890	136	595	84	85	84	0,78	0,84	0,87	281	282
		525	2900	133	631	83	85	85	0,72	0,81	0,85	280	316
		1000	2900	68	331	83	85	85	0,72	0,81	0,85	280	316
110	60 000	380	2910	235	1095	86	87	86	0,72	0,81	0,85	361	418
		400	2920	232	1158	84	86	86	0,65	0,76	0,82	360	467
		415	2920	233	1206	83	85	86	0,59	0,71	0,79	360	507
		500	2910	180	875	86	87	86	0,69	0,79	0,83	360	432
		525	2920	179	923	85	86	86	0,62	0,73	0,80	359	482
		1000	2920	89	463	84	86	86	0,65	0,76	0,82	360	467
130	60 000	380	2900	266	1271	88	88	87	0,79	0,85	0,87	428	487
		400	2920	256	1344	87	88	88	0,74	0,82	0,86	425	546
		415	2920	255	1400	87	88	87	0,69	0,78	0,83	425	592
		500	2900	202	966	87	88	87	0,79	0,85	0,87	428	487
		525	2920	195	1024	87	88	87	0,73	0,81	0,85	425	546
		1000	2910	104	523	87	88	87	0,76	0,83	0,86	426	516
150	60 000	380	2910	307	1502	87	87	86	0,79	0,85	0,88	492	568
		400	2920	298	1590	86	88	87	0,73	0,81	0,85	491	635
		415	2930	296	1655	86	87	87	0,67	0,77	0,83	489	689
		500	2910	233	1142	87	87	86	0,79	0,85	0,88	492	568
		525	2920	227	1211	86	87	87	0,73	0,81	0,85	491	635
		1000	2920	117	636	86	88	87	0,73	0,81	0,85	491	635
185	60 000	380	2900	390	2030	87	88	87	0,72	0,81	0,85	609	913
		400	2920	384	2148	86	88	88	0,64	0,75	0,81	605	1022
		415	2920	389	2237	84	86	86	0,57	0,70	0,79	605	1109
		500	2900	294	1500	87	88	87	0,72	0,81	0,85	610	888
		525	2910	289	1580	86	87	87	0,65	0,76	0,82	607	988
		1000	2900	148	859	87	88	87	0,72	0,81	0,85	609	913

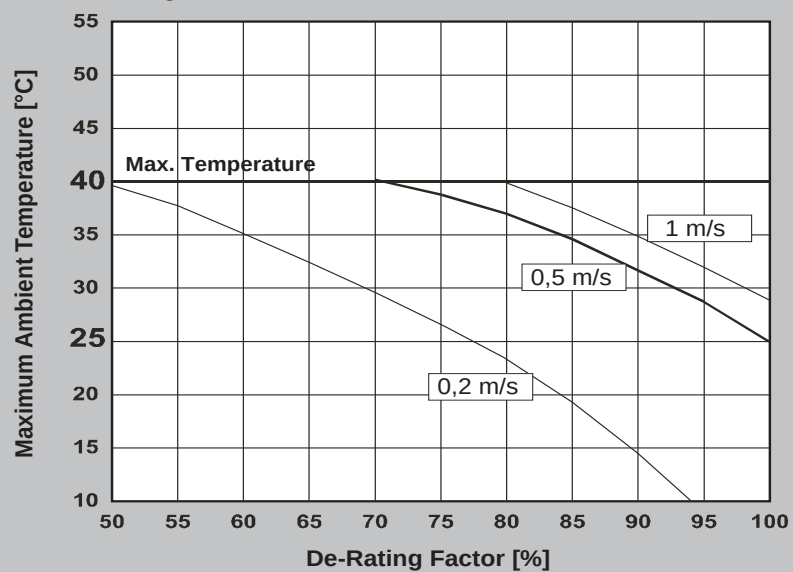
10" Rewindable Motors - Performance Data 60Hz

P _N [kW]	P _{max} [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _{max} [A]	I _A [A]	η _{max} (Eff.) [%] at % load			cos φ _{max} (PF) at % load			T _{max} [Nm]	T _A [Nm]
							50	75	100	50	75	100		
85	98	60 000	460	3500	172	803	83	85	85	0,76	0,83	0,86	267	281
			380	3510	216	1120	82	84	85	0,69	0,78	0,83	267	325
110	127	60 000	460	3510	225	1160	84	86	86	0,71	0,80	0,84	345	375
			380	3510	273	1430	84	86	86	0,70	0,79	0,84	346	382
130	149	60 000	460	3510	254	1308	86	87	87	0,77	0,84	0,87	408	437
			380	3510	309	1710	85	87	86	0,73	0,82	0,86	408	474
150	173	60 000	460	3510	294	1557	85	87	87	0,77	0,84	0,87	469	508
			380	3510	362	1980	85	87	87	0,75	0,83	0,86	468	535
185	213	60 000	460	3510	377	2130	85	87	87	0,70	0,79	0,84	585	858
			380	3510	448	2690	84	87	87	0,66	0,77	0,87	583	896

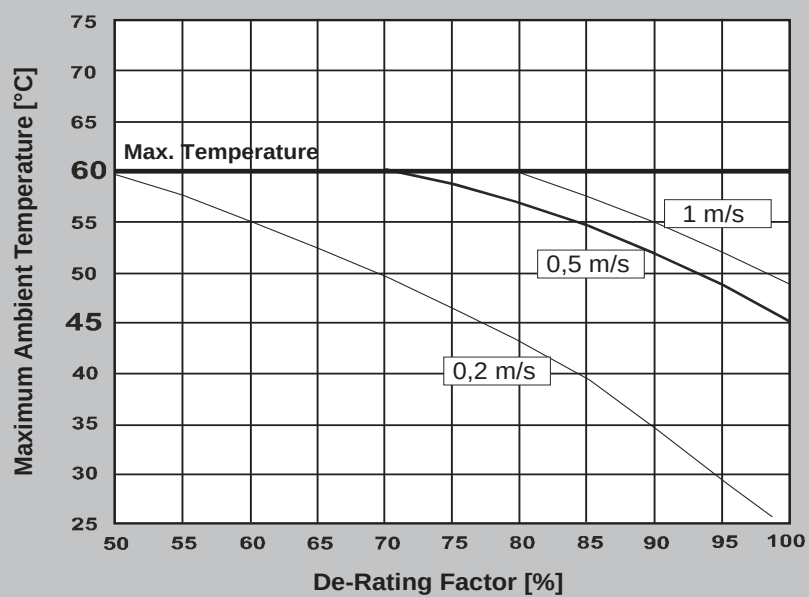


10" Rewindable De-Rating Curves

De-Rating of 10" Rewindable Motors with PVC Insulation

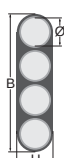


De-Rating of 10" Rewindable Motors with PE2/PA Insulation

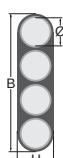


If these conditions are not met please contact Franklin Electric !

10" Rewindable Motors - Motor Leads*

DOL									
Lead	P _N [kW]	Ø [mm²]	B / H [mm]		Lengths [m]	Qty.	Lead Mod.- Nr.	Lead seal Kit 304 / 316 Mod.- Nr.	Lead seal Kit 904L Mod.- Nr.
	85	4G25	B	44,3	6	1	308 710 116	308 660 720	308 660 724
			H	14,5					
	110 – 130	4G35	B	48,5	6	1	308 710 117	308 660 721	308 660 725
			H	16,5					
	130 - 150 (PE2/PA)	3X50	B	46,5	6	1	308 710 113	308 660 712	308 660 726
			H	19,5					
	185**	1X70	D	20,7	6	3	308 711 100	308 660 732	308 660 733

For PE2/PA engines additionally the special Tape **700 541 688** is absolutely necessary

YΔ									
Lead	P _N [kW]	Ø [mm²]	B / H [mm]		Lengths [m]	Qty.	Lead Mod.- Nr.	Lead seal Kit 304 / 316 Mod.- Nr.	Lead seal Kit 904L Mod.- Nr.
	85	3X16	B	28,8	6	1	308 710 118	308 660 722	308 660 727
			H	12,2		1			
		4G16	B	38,0					
			H	12,8					
	110 - 150	3X25	B	37,5	6	1	308 710 114	308 660 713	308 660 728
			H	16		1			
		4G25	B	44,3					
			H	14,5					
	185	4G35	B	48,5	6	1	308 710 121	308 660 723	308 660 729
			H	16,5		1			
		3X35	B	38,5					
			H	16,5					

For PE2/PA engines additionally the special Tape **700 541 688** is absolutely necessary

Ground lead (optional)	Ø [mm²]	D Ø [mm]	Lengths [m]	St.	Mod.-Nr.
	1G25	13,0	8	1	308 053 080
	1G35	15,3	8	1	308 056 060

Lead opening seal kit	85 – 185 kW DOL / YΔ	304 / 316	308 660 715
		904L	308 660 730

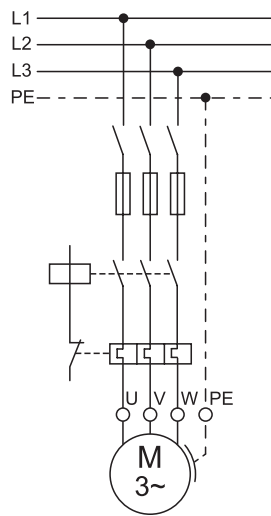
*Cables are designed for submerged operation. For air operation please consult Franklin Electric.

** Please contact Franklin Electric.

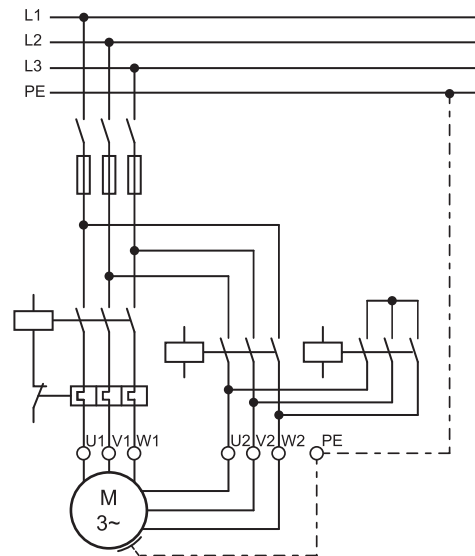


Electrical Connection

DOL



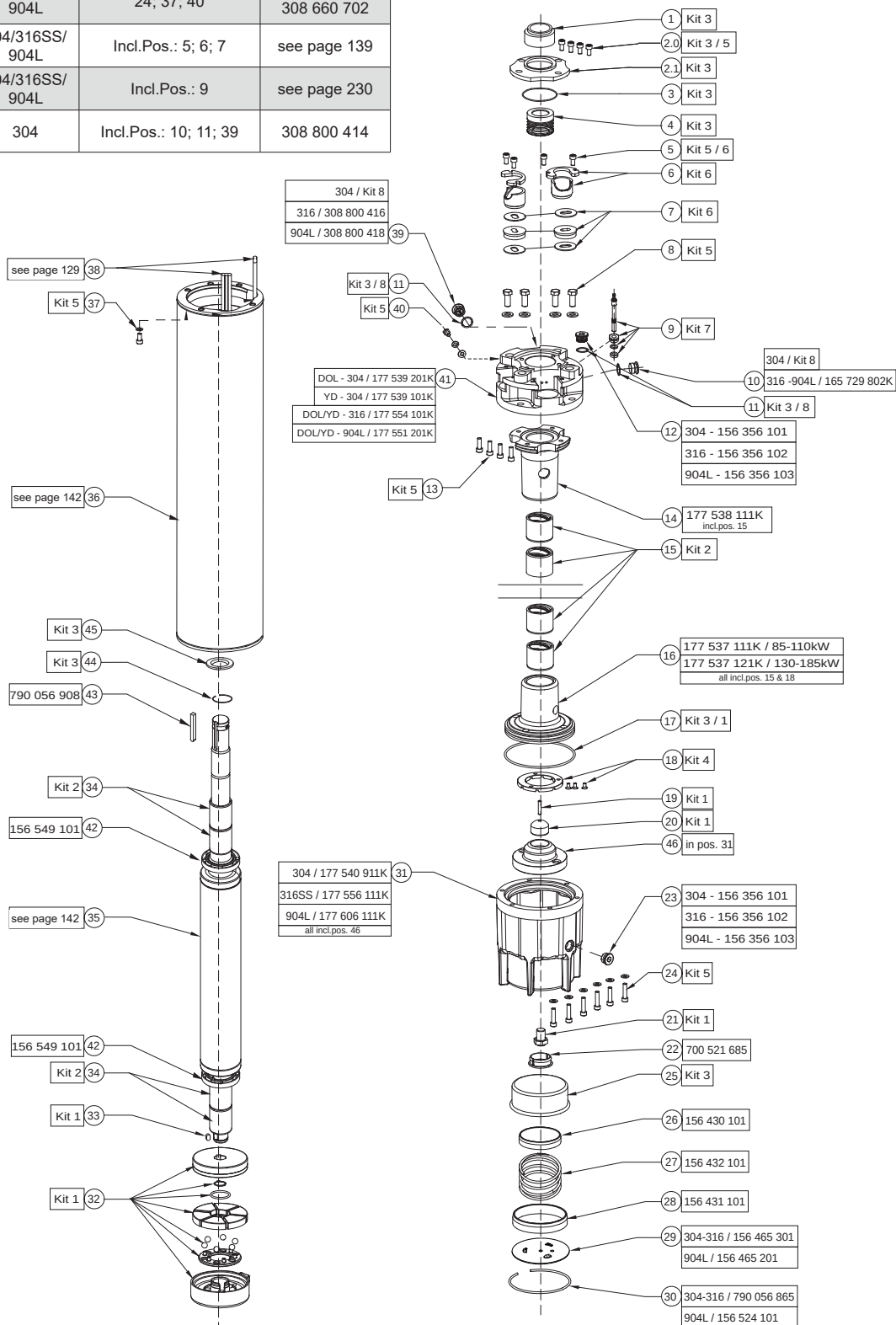
YΔ



U	V	W	PE
brown	grey	black	yellow/green

10" Rewindable Spare Parts

Kit 1 Thrust Bearing Kit	304/316SS/ 904L	Incl.Pos.: 17; 19; 20; 21; 32; 33	308 750 701
Kit 2 Radial Bearing Kit	304/316SS/ 904L	Incl.Pos.: 15; 34	308 751 701
Kit 3 Seal Kit	304/316SS	Incl.Pos.: 1 - 4; 11; 17; 25	308 800 703
	904L		308 800 704
Kit 4 Up-Thrust Kit	304/316SS/ 904L	Incl.Pos.: 18	308 751 702
Kit 5 Screw Kit	304/316SS	Incl.Pos.: 2.0; 5; 8; 13; 24; 37; 40	308 660 701
	904L		308 660 702
Kit 6 Lead Seal Kit	304/316SS/ 904L	Incl.Pos.: 5; 6; 7	see page 139
Kit 7 PT100 Kit	304/316SS/ 904L	Incl.Pos.: 9	see page 230
Kit 8 Valve Kit	304	Incl.Pos.: 10; 11; 39	308 800 414





Stator and Rotor Model Number (50 / 60Hz)

P _N [kW]	U _N / f [V] / [Hz]	Stator (incl. Winding and 6 m motor lead)								Rotor
		304/316		904L		304/316		904L		
		DOL PVC	DOL PE2/PA	DOL PVC	DOL PE2/PA	YΔ PVC	YΔ PE2/PA	YΔ PVC	YΔ PE2/PA	
85	380 - 415/50 460/60	326 150 931	326 292 931	326 150 921	326 292 921	326 150 981	326 292 981	326 150 971	326 292 971	176 379 801K
110	380 - 415/50 460/60	326 158 931	326 302 931	326 158 921	326 302 921	326 158 981	326 302 981	326 158 971	326 302 971	176 379 802K
130	380 - 415/50 460/60	326 168 931	326 314 931	326 168 921	326 314 921	326 168 981	326 314 981	326 168 971	326 314 971	176 379 803K
150	380 - 415/50 460/60					326 177 981	326 325 981	326 177 971	326 325 971	176 379 804K
185	380 - 415/50 460/60					326 360 981	326 448 981	326 360 971	326 448 971	176 379 805K

PVC Insulation Standard Windings (380 – 415V/50Hz / 460V/60 Hz)

P _N [kW]	Mod.-No. Windingktis	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YΔ (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
85	326 150 999	11+11+11+11	2,5 / 3,6	PVC	Parallel	487,92	0,2825	0,141	0,094
110	326 158 999	8+9+8+9	2,8 / 4,0	PVC	Parallel	426,00	0,1955	0,1080	0,0680
130	326 168 999	7+8+7+8	2,2 / 3,1 2DR.II	PVC	Parallel	849,60	0,1579	0,0789	0,0570
150	326 177 999	6+7+6+7	2,3 / 3,3 2DR.II	PVC	Parallel	809,76	0,1374	0,0730	0,0458
185	326 360 999	5+5+6+5	2,5 / 3,6 2DR.II	PVC	Parallel	736,56	0,1050	0,0570	0,035

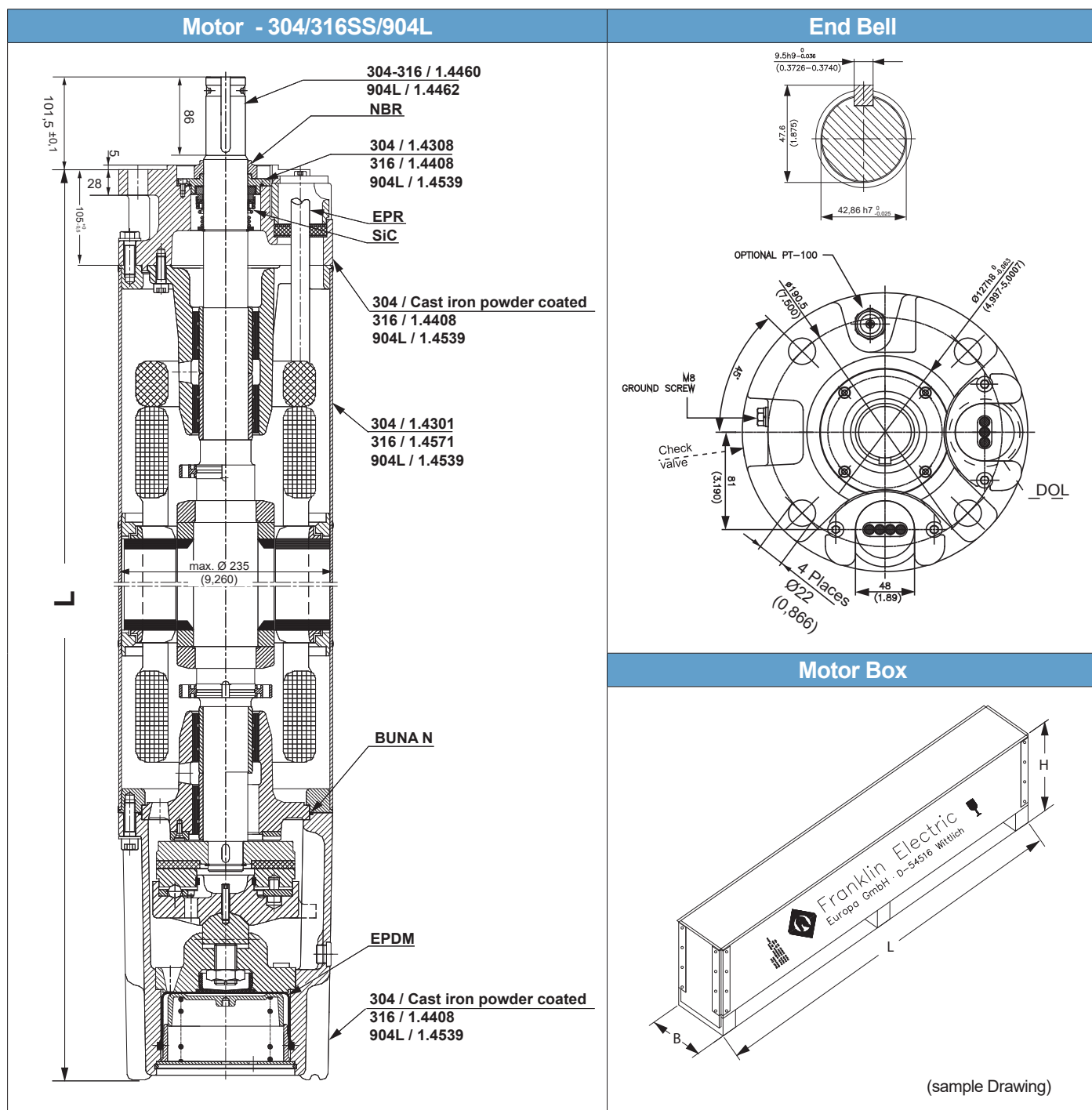
PE2/PA Insulation Standard Windings (380 – 415V/50Hz / 460V/60 Hz)

P _N [kW]	Mod.-No. Windingktis	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance YΔ(U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
85	326 292 999	11+11+11+11	2,3 / 3,5	PE2/PA	Parallel	488	0,3337	0,1668	0,1112
110	326 302 999	8+9+8+9	2,6 / 3,9	PE2/PA	Parallel	426	0,2267	0,1133	0,0755
130	326 314 999	7+8+7+8	2,0 / 3,1 2DR.II	PE2/PA	Parallel	850	0,1910	0,0955	0,0636
150	326 325 999	6+7+6+7	2,1 / 3,3 2DR.II	PE2/PA	Parallel	810	0,1647	0,0823	0,0549
185	326 448 999	5+5+6+5	2,3 / 3,5 2DR.II	PE2/PA	Parallel	735	0,1240	0,0620	0,0413

Insulation resistant (20°C / 500 VDC)

New motor without drop cable	400 > MΩ
Used motor without drop cable	20 > MΩ
New motor with drop cable	4 > MΩ
Used motor with drop cable	1 MΩ

10" Rewindable Motor Design



P _N [kW]	Motor Lengths	Motor Weights [kg]		Motor Shipping Size [mm]		
	L [mm]	Motor	Incl. Pack	B	H	L
85	1419	280	326	341	562	1896
110	1529	315	361			
130	1659	362	412	341	562	2296
150	1769	413	463			
185	1919	449	499			

12" Rewindable Motors

Standard: **SAND FIGHTER**

Optional: **STAINLESS STEEL 316 SS**



Submersible Motors

Quality in the Well

These 12" rewindable motors, manufactured in ISO 9001 certified facilities, are built for dependable operation in 12" diameter or larger water wells.

It is fitted with water lubricated radial and thrust bearings for maintenance-free operation. The motor is filled with a special FES93 fluid, providing frost protection down to -15°C storage temperature.

A special diaphragm ensures pressure compensation inside the motor. The Sand fighter® SiC seal system is standard. For applications in aggressive media, motors made of 316SS are available.

Product advantages:

- Easy to assemble with double flange
- Cable material according to drinking water regulations (VDE / ACS / KTW approved)
- Sand fighter® SiC seal system for high performance in sand
- High efficiency electrical design for low operation cost
- All motors prefilled and 100% tested
- Max. storage temperature -15°C - + 60°C
- Design for retrofitable PT100 sensor
- Non contaminating FES 93 filled design

Technical Specifications

- 185kW - 400kW
- 12" flange
- Protection: IP 68
- Starts per hour: max. 5
- Installation position: vertical / horizontal
- DOL - start / YΔ - start (pos. of cables 90°)
- Motor Lead in 6 m length (KTW approved)
- Standard voltage:
 - 380-415V/50Hz, 460V/60Hz
 - 500V/50Hz
 - 1000V/50Hz
- Voltage tolerance 50Hz: -10% / +6% U_N [380-415V = (380-10%) – (415+6%)]
- Voltage tolerance 60Hz: $\pm 10\% U_N$
- Motor protection: Select thermal overloads according to EN 61947-4-1
- 30°C ambient temperature with a min. cooling flow: $v = 0,5 \text{ m/s}$

Options

- 80kN thrust load
- PT 100 temperature sensor (sold separately)
- Other voltages
- Special lead lengths upon request

12" Rewindable Motors - Model Numbers

P _N [kW]	U _N [V] / [Hz]	Model Numbers Digit 1 – 6		Model Numbers Digit 7 – 10			
		DOL	YΔ	304	316SS	High Thrust	
						304	316SS
185	380 - 415 / 50 460 / 60	265 610	265 710	5011	6011	5111	6111
	500 / 50	265 620	265 790				
	1000 / 50	265 510					
220	380 - 415 / 50 460 / 60	265 611	265 711	5011	6011	5111	6111
	500 / 50	265 621	265 791				
	1000 / 50	265 511					
250	380 - 415 / 50 460 / 60	265 612	265 712	5011	6011	5111	6111
	500 / 50	265 622	265 792				
	1000 / 50	265 512					
300	380 - 415 / 50 460 / 60	265 614	265 714	5011	6011	5111	6111
	500 / 50	265 624	265 794				
	1000 / 50	265 514					
350	380 - 415 / 50 460 / 60		265 716	5011	6011	5111	6111
	500 / 50	265 626	265 796				
	1000 / 50	265 516					
400	380 - 415 / 50 460 / 60		265 717	5011	6011	5111	6111
	500 / 50	265 627	265 797				
	1000 / 50	265 517					



12" Rewindable Motors - Performance Data 50Hz

P _N [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _N [A]	I _A /I _N [A]	η (Eff.) [%] at % load			cos φ (PF) at % load			T _N [Nm]	T _A /T _N [Nm]
						50	75	100	50	75	100		
185	60 000	380	2940	368	4,70	88	88	87	0,82	0,87	0,88	602	0,81
		400	2945	351	5,30	87	88	87	0,79	0,85	0,86	600	0,90
		415	2950	344	5,76	87	88	88	0,76	0,84	0,84	599	0,97
		500	2940	286	5,30	87	88	87	0,79	0,85	0,87	600	0,90
		1000	2945	141	5,30	87	88	87	0,79	0,85	0,86	600	0,90
220	60 000	380	2930	448	4,79	88	88	87	0,83	0,87	0,88	716	0,77
		400	2935	430	5,40	88	89	88	0,80	0,86	0,87	714	0,84
		415	2940	427	5,85	88	89	88	0,77	0,85	0,84	712	0,94
		500	2940	334	5,40	88	89	88	0,80	0,86	0,88	714	0,84
		1000	2945	177	5,40	88	89	88	0,80	0,86	0,87	714	0,84
250	60 000	380	2930	507	4,7	87	87	86	0,85	0,88	0,85	815	0,85
		400	2935	481	5,2	88	89	88	0,80	0,85	0,80	812	0,95
		415	2940	471	5,6	88	89	88	0,76	0,83	0,76	812	1,02
		500	2935	385	5,2	88	89	88	0,80	0,85	0,88	812	0,95
		1000	2930	193	5,2	88	89	88	0,80	0,85	0,85	812	0,95
300	60 000	380	2940	586	4,9	88	89	87	0,87	0,90	0,88	974	0,83
		400	2945	551	5,6	88	89	88	0,85	0,89	0,88	971	0,94
		415	2950	532	6,0	88	89	88	0,83	0,88	0,89	970	1,03
		500	2945	435	5,6	88	89	88	0,85	0,89	0,88	971	0,94
		1000	2945	217	5,6	88	89	88	0,85	0,89	0,88	971	0,94
350	60 000	380	2920	720	4,7	88	88	86	0,85	0,88	0,87	1140	0,80
		400	2930	676	5,2	88	88	87	0,82	0,87	0,88	1137	0,90
		415	2935	652	5,4	87	88	87	0,79	0,86	0,87	1135	0,95
		500	2930	541	5,2	88	88	87	0,82	0,87	0,87	1137	0,90
		1000	2930	270	5,2	88	88	87	0,82	0,87	0,87	1137	0,90
400	60 000	380	2920	795	4,2	90	90	89	0,85	0,88	0,87	1306	0,73
		400	2930	750	4,8	90	90	90	0,82	0,87	0,87	1301	0,84
		415	2940	719	5,2	89	90	90	0,80	0,85	0,87	1299	0,92
		500	2930	600	4,8	90	90	90	0,82	0,87	0,87	1301	0,84
		1000	2935	298	4,8	90	90	90	0,82	0,87	0,87	1301	0,84

12" Rewindable Motors - Performance Data 60Hz

P _N [kW]	P _{max} [kW]	Thrust F [N]	U _N [V]	n _N [min ⁻¹]	I _{max} [A]	I _A /I _N [A]	η _{max} (Eff.) [%] at % load			cos φ _{max} (PF) at % load			T _{max} [Nm]	T _A /T _N [Nm]
							50	75	100	50	75	100		
185	212	60 000	460	3540	339							0,87		
220	252	60 000	460	3530	425	5,44	90	91	91	0,81	0,84	0,86	776	0,95
250	287	60 000	460	3530	462	5,44	90	91	91	0,81	0,84	0,84	776	0,95
300	345	60 000	460	3530	533	5,85	90	91	91	0,85	0,89	0,89	928	0,94
350	402	60 000	460	3530	647	5,13	89	90	90	0,83	0,87	0,88	1085	0,90
400	460	60 000	460	3520	745	4,79	89	90	90	0,84	0,87	0,87	1243	0,84

12" Rewindable Motors - Motor Leads*

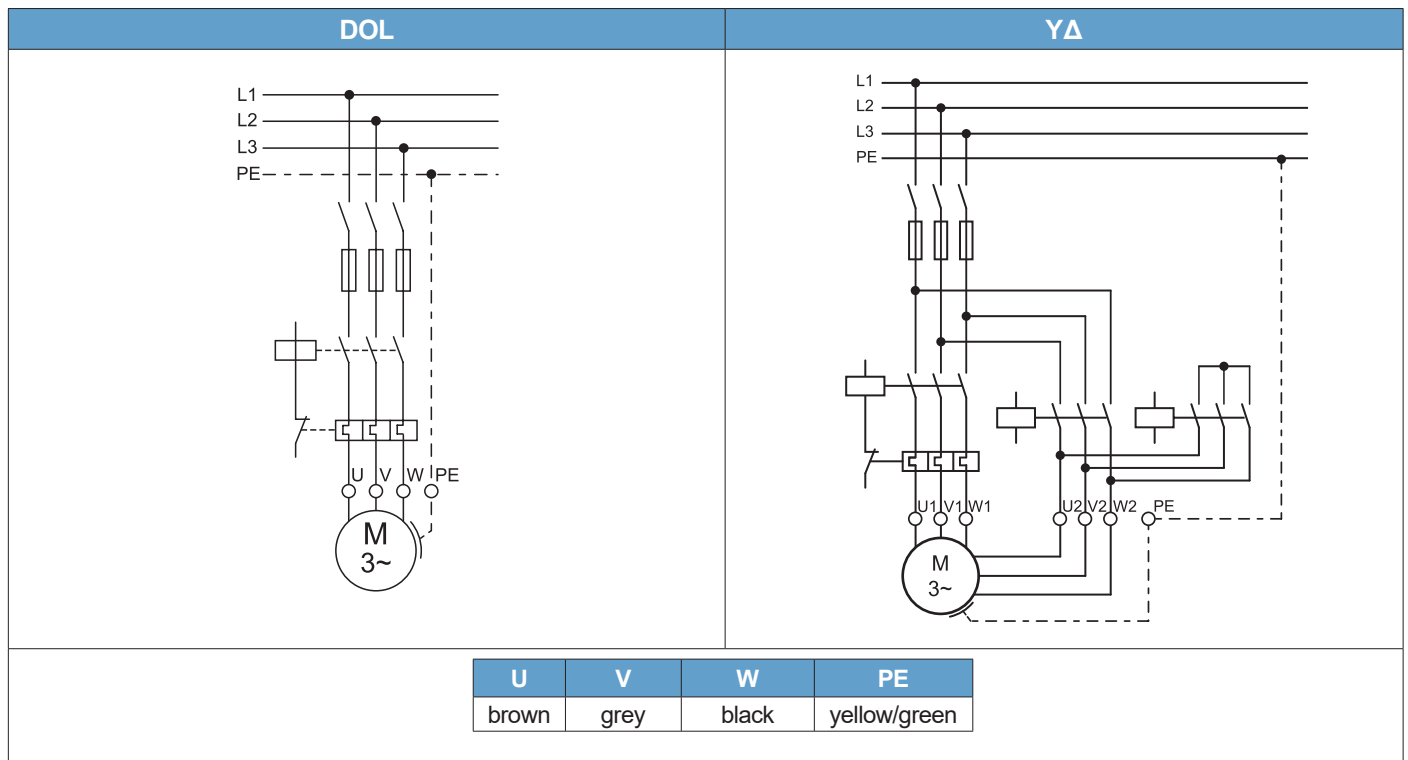
Lead	Ø [mm²]	D [mm]	Lengths [m]	Motor [kW]			Qty.	Lead Kit (3 Single Leads)	Lead seal Kit.
				380 - 415V / 50Hz 460V / 60Hz	500V/ 50Hz	1000V / 50Hz			
	1X70	20,7	6	185 - 300 DOL 300 -400 YΔ**	185 - 400 DOL	-	DOL 1	308 711 100	308 661 120
							YΔ 2		
	1X35	15,3	6	185 - 250 YΔ**	185 - 400 YΔ**	185 - 400 DOL	DOL 1	308 711 101	308 661 121
							YΔ 2		
	1G35	15,3	6	Groundlead (For 1X35 mm² cable equipped motors)			1	308 056 060	
Lead opening seal kit				250 - 400 kW - DOL / YΔ			1	308 661 122	

For this standard PE2/PA motors must additionally ordered the special Tape **700 541 688**, is absolutely necessary.

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

** For YΔ motors please order two Lead (sealing) kits

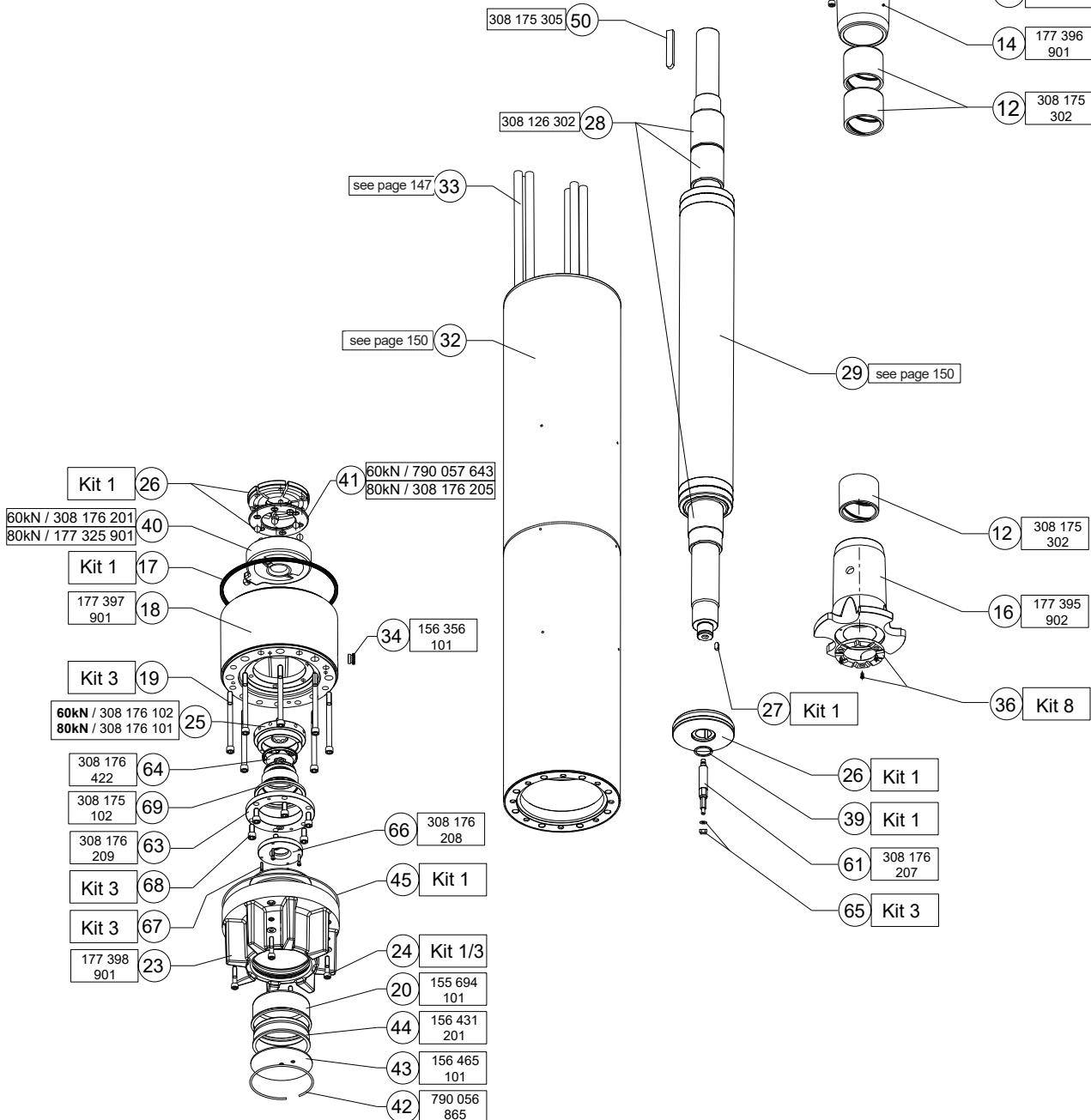
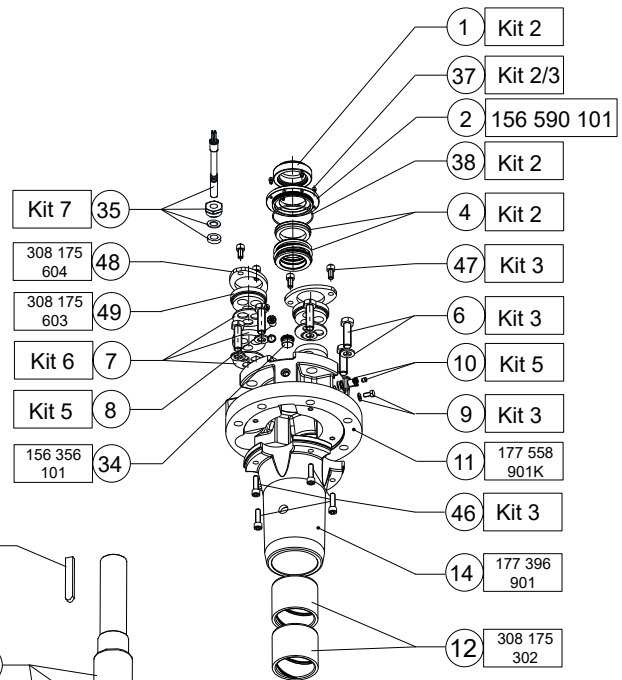
Electrical Connection





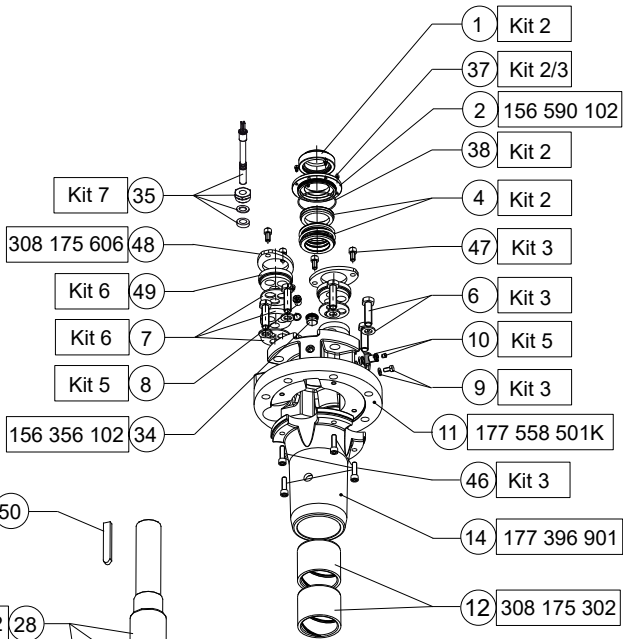
12" Rewindable Spare Parts 304

Kit 1 Thrust Bearing Kit 60kN	Incl.Pos.: 17; 24; 26; 27; 39; 45	308 750 801
Kit 1 Thrust Bearing Kit 80kN	Incl.Pos.: 17; 26; 27; 39; 45	308 750 802
Motor Conversion Kit 80kN Incl.Pos.: 17; 26; 40; 45; 69		308 750 803
Kit 2 Seal Kit - Top	Incl.Pos.: 1; 4; 37; 38	308 800 801
Kit 3 Screw Kit	Incl.Pos.: 6; 9; 19; 24; 37; 46; 47; 65; 67; 68;	308 656 801
Kit 5 Valve Kit	Incl.Pos.: 8; 10	308 800 421
Kit 6 Lead Seal Kit	Incl.Pos.: 7	see page 147
Kit 7 PT 100 Kit	Incl.Pos.: 35	see page 230
Kit 8 Up-Thrust Bearing Kit	Incl.Pos.: 36	308 751 702



12" Rewindable Spare Parts 316SS

Kit 1 Thrust Bearing Kit 60kN	Incl.Pos.: 17; 24; 26; 27; 39; 45	308 750 801
Kit 1 Thrust Bearing Kit 80kN	Incl.Pos.: 17; 26; 27; 39; 45	308 750 802
Motor Conversion Kit 80KN Incl.Pos.: 17; 26; 40; 45; 69		308 750 803
Kit 2 Seal Kit - Top	Incl.Pos.: 1; 4; 37; 38	308 800 851
Kit 3 Screw Kit	Incl.Pos.: 6; 9; 19; 24; 37; 46; 47; 65; 67; 68;	308 656 801
Kit 5 Valve Kit	Incl.Pos.: 8; 10	165 729 802K
Kit 6 Lead Seal Kit	Incl.Pos.: 7	see page 147
Kit 7 PT 100 Kit	Incl.Pos.: 35	see page 230
Kit 8 Up-Thrust Bearing Kit	Incl.Pos.: 36	308 751 702





304/316SS Stator and Rotor Model Number (380 - 415 Volts / 50Hz)

P _N [kW]	U _N / f [V] / [Hz]	Stator (incl. Winding and 6 m motor lead)				Rotor
		DOL PVC	DOL PE2/PA	YΔ PVC	YΔ PE2/PA	
185	380 - 415 / 50 460 / 60		326 013 902K		326 013 952K	176 381 500K
220	380 - 415 / 50 460 / 60		326 639 902K		326 639 952K	176 381 501K
250	380 - 415 / 50 460 / 60		326 639 902K		326 639 952K	176 381 501K
300	380 - 415 / 50 460 / 60		326 640 902K		326 640 952K	176 381 502K
350	380 - 415 / 50 460 / 60				326 696 952K	176 381 504K
400	380 - 415 / 50 460 / 60				326 641 952K	176 381 503K

Insulation Standard Windings (380 – 415 Volts 50 Hz)

P _N [kW]	Mod.-No. Winding- kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance Y _Δ (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
185	326 013 999	6+6+6+6	2,6 / 3,9 (2GrII)	PE2/PA	Parallel Delta	794	0,1061		
220	326 639 999	5+6+5+6	2,7 / 4,1 (2GrII)	PE2/PA	Parallel Delta	770	0,0235		
250	326 639 999	5+6+5+6	2,7 / 4,1 (2GrII)	PE2/PA	Parallel Delta	770	0,0235		
300	326 640 999	4+5+4+5	3,0 / 4,5 (2GrII)	PE2/PA	Parallel Delta	720	0,0178		
350	326 696 999	4+4+4+5	3,0 / 4,5 (2GrII)	PE2/PA	Parallel Delta	706	0,0175		
400	326 641 999	4+4+4+4	3,4 / 5,0 (2GrII)	PE2/PA	Parallel Delta	700	0,0133		

Insulation Standard Windings (500 Volts 50 Hz)

P _N [kW]	Mod.-No. Winding- kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance Y _Δ (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
185	326 *** 999								
220	326 701 999	7+7+7+7	2,5 / 3,8 (2GrII)	PE2/PA	Parallel Delta	889	0,0244		
250	326 702 999	6+7+7+7	2,5 / 3,8 (2GrII)	PE2/PA	Parallel Delta	924	0,0331		
300	326 703 999	5+6+5+6	2,7 / 4,1 (2GrII)	PE2/PA	Parallel Delta	861	0,0265		
350	326 697 999	5+5+5+6	2,7 / 4,1 (2GrII)	PE2/PA	Parallel Delta	856	0,0263		
400	326 704 999	5+5+5+5	3,0 / 4,5 (2GrII)	PE2/PA	Parallel Delta	848	0,0221		

Insulation Standard Windings (1000 Volts 50 Hz)

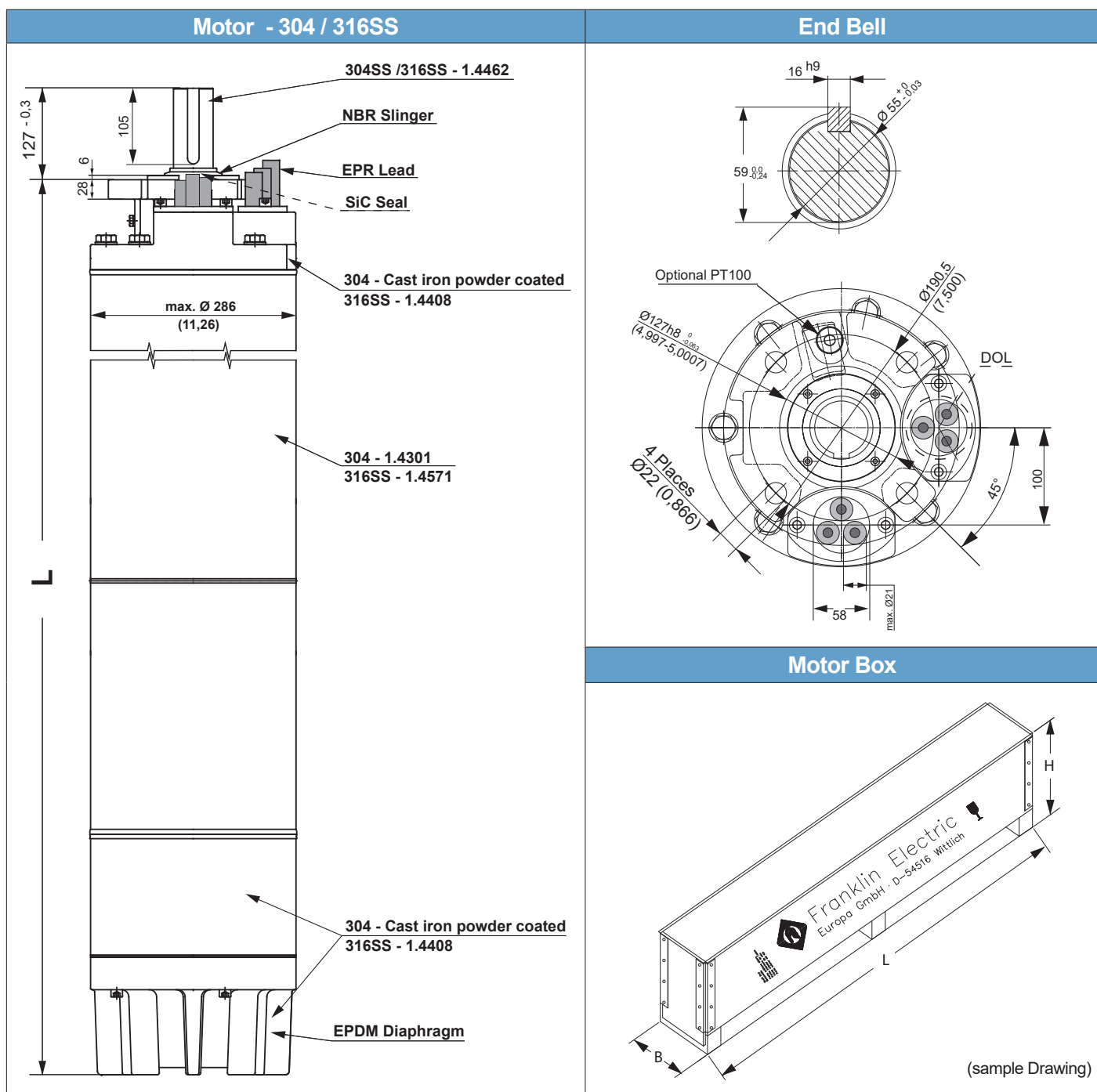
P _N [kW]	Mod.-No. Winding- kits	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance Y _Δ (U1-U2) [Ω]	Resistance DoI (U1-V1) [Ω]
185	327 016 999	15+15+15+15	2,3 / 3,5	PE2/PA	Parallel Delta	1138	0,7836		0,221
220	326 928 999	14+14+14+14	2,5 / 3,8	PE2/PA	Parallel Delta	902	0,5251		0,177
250	326 699 999	13+14+13+14	2,5 / 3,8	PE2/PA	Parallel Delta	888	0,1290		0,165
300	326 700 999	11+11+11+11	2,7 / 4,1	PE2/PA	Parallel Delta	825	0,1024		0,135
350	326 698 999	10+11+10+11	2,7 / 4,1	PE2/PA	Parallel Delta	820	0,1017		0,136
400	326 674 999	10+10+10+10	3,0 / 4,5	PE2/PA	Parallel Delta	812	0,0815		0,106

Insulation resistant (20°C / 500 VDC)

New motor without drop cable	400 > MΩ
Used motor without drop cable	20 > MΩ
New motor with drop cable	4 > MΩ
Used motor with drop cable	1 MΩ



12" Motor Design 304 / 316SS



P _N [kW]	Motor Lengths	Motor Weights		Motor Shipping Size [mm]		
	L [mm]	Motor [kg]	incl. Pack [kg]	B	H	L
185	1703	663	743	396	572	2296
220	1893	663	743			
250	1893	663	743			
300	2043	726	806			
350	2143	769	849	396	572	2596
400	2193	794	874			

6" High Efficiency System

Quality in the Well

In consideration of environmental relief and energy saving Franklin Electric developed a High Efficiency 6" Submersible Borehole System, consisting of a synchronous submersible 304SS NEMA motor associated variable frequency drive and output filter.



System Product advantages:

- One-stop shop – perfectly matching components guarantee first class performance
- Up to **20% energy saving***
 - ⇒ *System payback < 2 years*
- Up to **13% improved motor efficiency** (system up to 11%) with excellent partial load behaviour*
 - ⇒ *SKU Reduction*
- Significant lower motor heat rise
 - ⇒ *Increased lifetime*
- Higher power density*
 - ⇒ *Lightweight*
- Easy set-up due to tailored pre-setting, user interface and own **Franklin Electric software**
- Speed control
 - ⇒ *Optimum aggregate operation - pump matches system any time*
- Incorporated Soft start and protection features
 - ⇒ *Increased lifetime*
 - ⇒ *No additional investment*
- Reduced amps
 - ⇒ *Smaller drop lead cross size*
- Top class protection with Electronics in IP66/54**
 - ⇒ *Easy retrofit - no additional cabinet cost*
- Power factor corrected input
 - ⇒ *No power compensation needed*
- Communication Modbus (RS485 and Ethernet)

System Technical Specification:

- Rating: 4 - 37kW
- Power Supply: Voltage 400V +/- 10%
Frequency 50Hz +/- 6%

*In comparison to current asynchronous technology

**Alternative Electronics in IP21/00 for cabinet assembly available



Model Numbers

400V-50Hz / 460V/60Hz High Efficiency System (304SS Motor, VFD & Filter)

P _N [kW]	For panel mount - VFD IP21 & Filter IP00		For wall mount - VFD IP66 & Filter IP54	
	du/dt Filter	Sinus Filter	du/dt Filter	Sinus Filter
4,0	308 010 016*	308 010 116*	308 010 216*	308 010 316*
5,5				
7,5				
9,3	308 014 023	308 014 123*	308 014 223	308 014 323*
11				
13	308 014 038	308 014 131*	308 014 238	308 014 338*
15		308 014 138*		
18,5		308 016 146*		
22	308 016 061	308 016 161*	308 016 261	308 016 361*
26		308 016 187*		
30				
37	308 016 087*	308 016 187*		

*Non-stock items

For lead length > 120m please consult Franklin Electric

System Options:

- Plug-in card 6x DI/DO - 308 170 201
- Plug-in card PT100 - 308 170 202
- Plug-in card Profibus - 308 170 203
- Plug-in card 1x AI & 2x AO 308 170 206
- Power Supply: 200V & 500V
- Sinus output filters in IP54 and IP00
- PT100 protection
- Motors in 316SS and 904L

To find the right System please use Selection & Payback link on: www.franklinwater.eu

Control modes and necessary sensor technologies

Process reference	Control reference	Flow meter	Pressure sensor	Level sensor	PT100 sensor & Drive slot card	Flow switch (digital)
Q - Flow	No (Optional)	mandatory			Optional	
	P	mandatory	mandatory			
	H	mandatory		mandatory		
P - pressure	No (Optional)	Yes*	mandatory		Optional	
	Q	mandatory	mandatory			
	H		mandatory	mandatory		
H - level	No (Optional)	Yes*		mandatory	Optional	
	Q	mandatory		mandatory		
	P		mandatory	mandatory		
Direct Mode	No	Yes**	No	No	Optional	No
Manual Mode	No				Yes*	
Solar	No				Yes*	mandatory

*please consult Franklin Electric

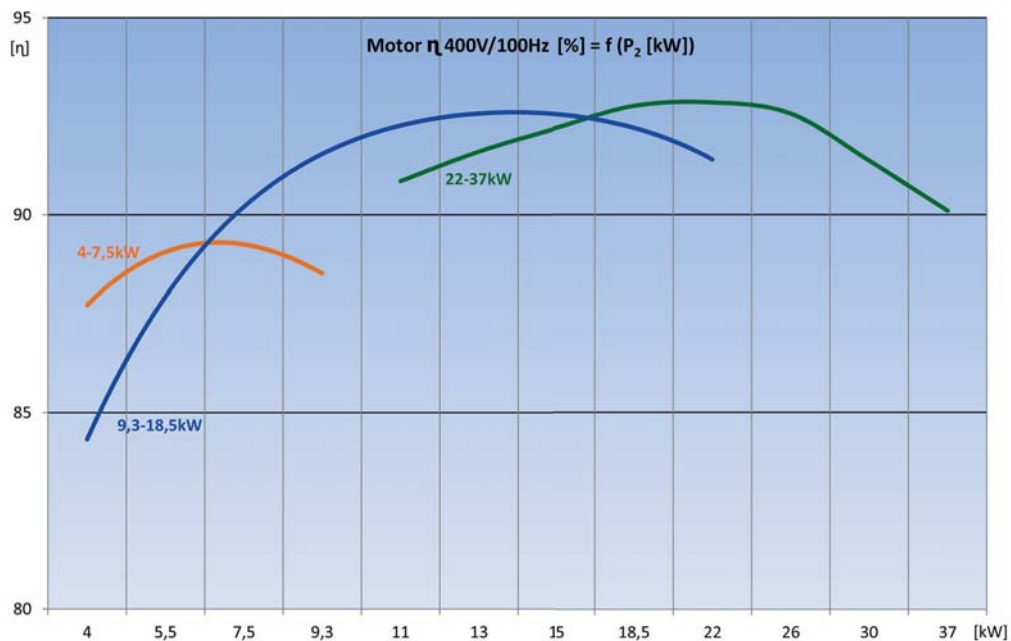
** need to be evaluated to PLC

Performance Data 400V-50Hz / 460V/60Hz

400V-50Hz / 460V-60Hz	P_N [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A / I_N^* [A]	η [%]	PF [cos ϕ]	T_N [Nm]	T_A / T_N^* [Nm]
308 010 X16	4	15,5	3000 / 3600	8	1	88	0,95	12,9	1
	5,5	15,5	3000 / 3600	10	1	89	0,95	17,5	1
	7,5	15,5	3000 / 3600	13	1	89,5	0,95	23,8	1
308 014 X23	9,3	15,5	3000 / 3600	18	1	91,5	0,95	29,6	1
	11	15,5	3000 / 3600	20	1	92	0,95	35	1
308 014 X38	13	15,5	3000 / 3600	23	1	92,5	0,95	41,5	1
	15	15,5	3000 / 3600	26	1	92,5	0,95	46,1	1
	18,5	15,5	3000 / 3600	32	1	92	0,95	59	1
308 016 X61	22	27,5	3000 / 3600	39	1	93	0,95	70	1
	26	27,5	3000 / 3600	46	1	92,5	0,95	82,6	1
	30	27,5	3000 / 3600	54	1	91,5	0,95	95,5	1
308 016 X87	37	27,5	3000 / 3600	72	1	90	0,95	117,8	1

Performance data are based on measurements with Franklin Electric original equipment!

*Since this is an integrated system (motor plus electronics) these figures relate to VFD input





6" High Efficiency Motor



Motor Features:

- Motor complete in 304SS
- PE2/PA winding as a standard
- SandFighter® SIC seal system
- Easy rewinding - winding housings removable
- Non-contaminating FES93 filling
- All motors pre-filled and 100% tested
- Max. storage temperature -15 ... +60°C
- Drinking water approved

Motor Technical Specification:

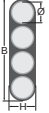
- 4 – 37kW
- Power supply 400V/100Hz
- 6" NEMA flange with studs (M12)
- Protection IP68
- 20 Starts per hour
- Installation vertical (for horizontal operation please consult FE)
- Motor lead in 4m length
- 30°C nominal ambient temperature with 0,2m/sec cooling flow

Motor Options:

- Other voltages
- PT100 temperature sensor (retrofitable)
⇒ VFD PT100 Plug-in Card (308 170 202) necessary
- Motors complete in 316SS and 904L

System model number	P _N [kW]	Motor model number		
		304SS	316SS	904L
308 010 xxx	4 - 7,5	262 010 8711	262 010 6711	262 010 7711
308 014 xxx	9,3 - 18,5	262 014 8711	262 014 6711	262 014 7711
308 016 xxx	22 - 37	262 016 8711	262 016 6711	262 016 7711

Motor Short Leads*

DOL	P _N [kW]	St.#	Ø [mm²]	H / B [mm]	Length [m]	Lead Mod.- Nr.	Lead seal Kit
	4 - 18,5	1	4G4	8,2 x 23,0	4	308 710 101	308 660 812
	22 - 37	1	4G6	9,0 x 25,0	4	308 710 103	308 660 813

additionally the special Tape **700 541 688** is absolutely necessary

*Cables are designed for submerged operation.

Motor Drop Lead

Lead lengths in meters for 400V-50Hz / 460V-60Hz and max. 3% voltage drop at 50°C ambient

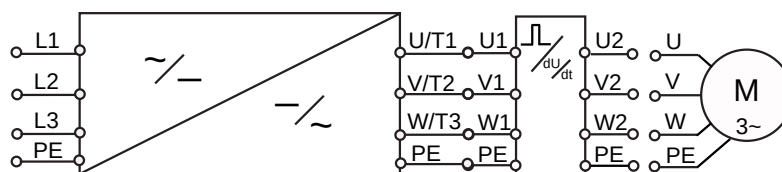
P _N [kW]	cable size mm², copper wire - 90°C rated insulation						
	4	6	10	16	25	35	50
4	160	250	410	-	-	-	-
5,5	140	200	340	530	-	-	-
7,5	100	150	250	390	-	-	-
9,3	75	110	190	300	460	-	-
11	65	100	160	260	400	-	-
13	55	85	140	220	340	460	-
15	-	70	120	190	300	400	-
18,5	-	60	100	160	240	320	440
22	-	-	80	130	200	270	370
26	-	-	65	110	170	230	320
30	-	-	55	90	140	190	270
37	-	-	-	65	100	140	200

For lead length > 120m please consult Franklin Electric.

Further potential energy saving due to more conservative lead sizing (< 3% voltage drop)

Electrical Connection

DOL

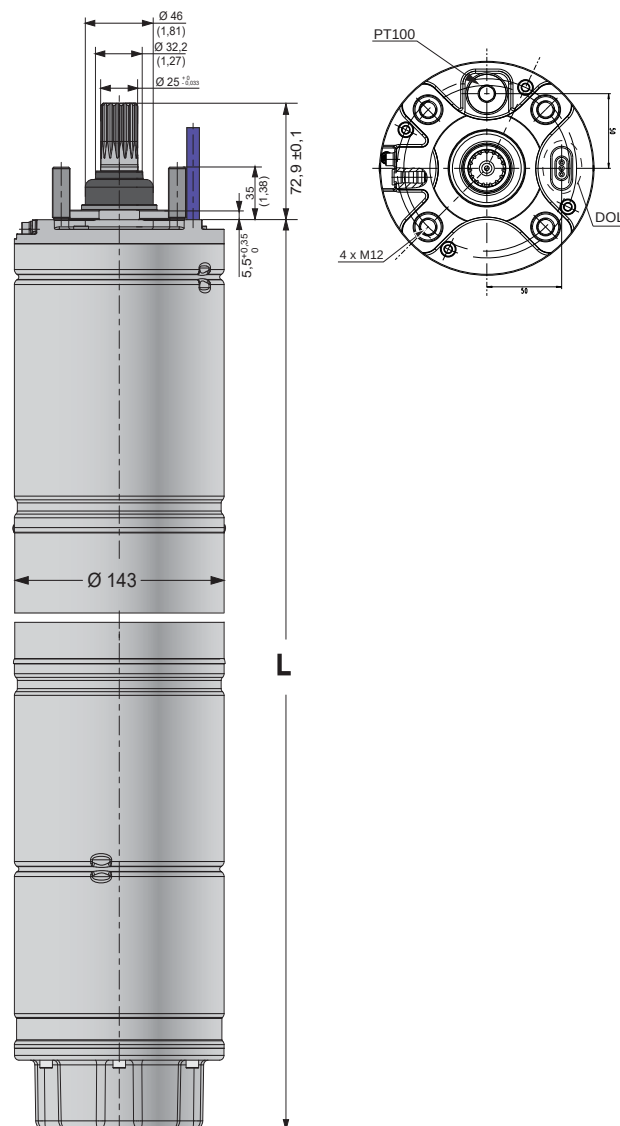


U	V	W	PE
brown	grey	black	yellow/green



Motor Design

304SS / 316SS / 904L



Construction Materials

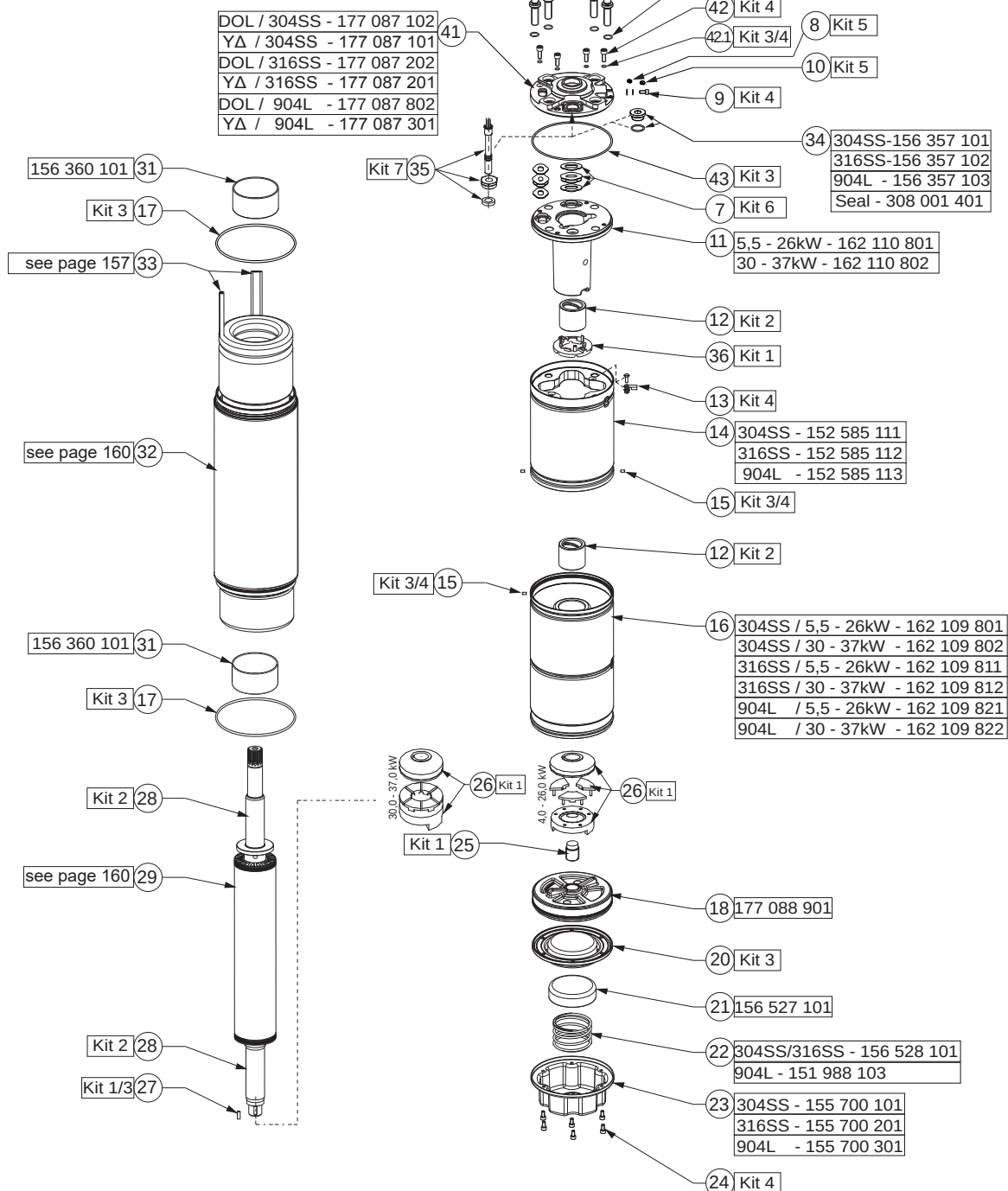
Component	304SS	316SS	904L
Shaft Extensions	1.4021	1.4462	1.4462
Slinger	NBR	NBR	NBR
Seal	SiC/SiC	SiC/SiC	SiC/SiC
End bell, NEMA	1.4308	1.4408	1.4539
Stator Shell	1.4301	1.4571	1.4539
Diaphragm	EPDM	EPDM	EPDM
Diaphragm Cover	1.4301	1.4404	1.4539

Motor Lengths and Weights

P [kW]	Motor Lengths L [mm]	Motor weights [kg]		Motor Shipping Size		
		Motor	incl. pack	B [mm]	H [mm]	L [mm]
4 - 7,5	655	41	46	155	270	905
9,3 - 18,5	809	56	61	155	270	1135
22 - 37	971	72	77			

Motor Spare Parts 304SS / 316SS / 904L

Kit 1	Thrust Bearing Kit	4-18,5kW	Pos.: 17; 25; 26; 27; 36	308 750 301
		22-37kW		308 750 302
Kit 2	Radial Bearing Kit	4-18,5kW	Pos.: 12; 28	308 750 401
		22-37kW		308 750 403
Kit 3	Seal Kit 304SS / 316SS / 904L	Pos.: 1; 4; 6.1; 15; 17; 20; 34; 42.1, 43		308 800 422
Kit 4	Screw Kit 304SS / 316SS	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 325
	Screw Kit 904L	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 326
Kit 5	Valve Kit (all Material version)	Pos.: 8; 10		308 800 423
Kit 6	Lead Seal Kit	Pos.: 7		see page 157
Kit 7	PT100 Kit	Pos.: 35		see page 230





304SS Stator and Rotor Model Number (400V-50Hz / 460V/60Hz)

P _N [kW]	Stator (incl. winding and 4m motor lead)	Rotor
4 - 7,5	327 086 701K	161 122 805K
9,3 - 18,5	327 075 701K	161 122 802K
22 - 37	327 076 701K	161 122 803K

Windings 400V-50Hz / 460V/60Hz

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance DOL (U1-V1) [Ω]
4 - 7,5	327 086 999	28+28+28+28	1,3 / 2,2	PE2/PA	Serie Y	212	0,2393	1,914
9,3 - 18,5	327 075 999	14+14+14+14	2 / 3,1	PE2/PA	Serie Y	161	0,0794	0,635
22 - 37	327 076 999	18+18+18+18	1,7 / 2,7	PE2/PA	Serie / Parallel Y	276	0,1797	0,359

Insulation resistance (20°C / 500 VDC)

New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

Motor Repair Instructions

Pictured Repair Instructions 304SS / 316SS / 904L		308 018 624
Motor Mounting Kit		308 239 214

Variable Speed Drive (VFD)



VFD Features:

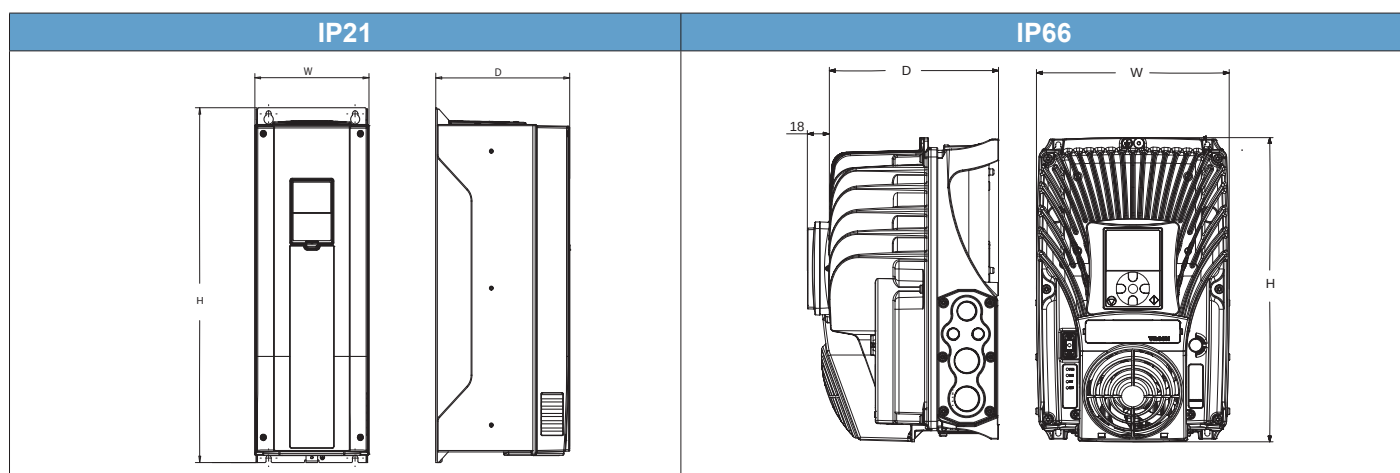
- Supports induction and permanent magnet motors
- Top class protection IP66 with Aluminium die casting powder coated enclosure . Alternative in IP21 with plastic enclosure
- Optimized for submersible permanent motor feeding – first class performance (Tailored pre-setting, user interface and software)

VFD Technical Specification:

Power supply	Input voltage U_{IN}	380 - 500V ; -10%....+10% 400 - 840V DC - min starting voltage 440V
	Input frequency f_{IN}	47 - 65Hz
	Starts per hour	20 ; with min 3min rest period
Motor connection	Output voltage	0 - U_N
	Output current	I_N at rated Ambient temperature (40°C) Overload: IP66: 1,5 x I_N (1min/10min) IP21: 1,1 x I_N
	Output frequency	0- f_N , resolution 0,01Hz
Performance	Efficiency	97,5%
Control characteristics	Switching frequency	3,6 6 kHz; default setting 4 kHz
Ambient conditions	Operation temperature	-10°C...+50°C (>40°C with derating) - 40°C optional for IP66
	Storage temperature	-40°C+70°C
	Altitude	3000m (>1000m with derating)
EMC	Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment
Communication	RS 485	Standard: Modbus
	Ethernet	Standard: Modbus
I/O connections	Digital Input (DI)	6x
	Analog Input (AI)	2x
	Analog Output (AO)	1x
	Relay Output (RO)	2x (change-over contact)
For further details please see separate Franklin Electric Quick Installation guide and VFD literature.		



VFD Model Numbers and Dimensions 400V-50Hz / 460V/60Hz



VFD High Efficiency System Model Numbers and Dimensions 400V-50Hz / 460V/60Hz IP21 up to 37kW

System Model Number	AC Drive Type	IP Type	I_N [A]	Dimensions WxHxD [mm]	Weight [kg]
308 010 016/116	314 000 108	21	16	144 x 419 x 214	10,0
308 014 023/123	314 000 101	21	23	144 x 419 x 214	10,0
308 014 038 /131 / 138	314 000 102	21	38	195 x 557 x 229	20,0
308 016 061/161	314 000 103	21	61	195 x 557 x 229	20,0
308 016 087/187	314 000 104	21	87	237 x 660 x 259	37,5

VFD High Efficiency System 400V-50Hz / 460V/60Hz IP66 up to 30kW

System Model Number	AC Drive Type	IP Type	I_N [A]	Dimensions WxHxD [mm]	Weight [kg]
308 010 216/316	314 000 109	66	16	233 x 368 x 214	14,9
308 014 223/323	314 000 105	66	23	233 x 368 x 214	14,9
308 014 238/338	314 000 106	66	38	350 x 500 x 236	31,5
308 016 261/361	314 000 107	66	61	350 x 500 x 236	31,5

VFD Options:

- 200V - 230V
- Plug-in card 6x DI/DO 308 170 201
- Plug-in card PT100 308 170 202
- Plug-in card Profibus 308 170 203
- Plug-in card 1x AI & 2x AO 308 170 206
- Replacement Battery VFD IP21 - 308 170 205
- Replacement Battery VFD IP66 - 308 170 204

Output Filter

Output Filter Features:

- du/dt filter for lead lengths up to 120m, for lead lengths >120m please consult Franklin Electric.
- filter available in IP54 and IP00
- Optimized for submersible permanent magnet motor feeding



Output Filter Technical Specification:

- Voltage → 380 - 500V
- Frequency → 0 - 120 Hz
- Switching Frequency → 4kHz
- Ambient Temperature → < 40°C

Output Filter Options:

- Sinus filter in IP54 and IP00 for lead length >120m and/ or special applications
- Other voltages

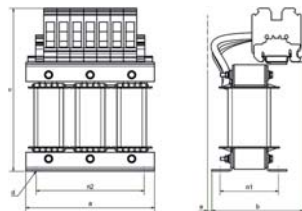
Output Filter dV/dt High Efficiency System 400/500V Model Data - Protection Class IP00*

System model number	Filter order code	I _N [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d	e		main [mm ²]	PE [mm ²]	main [Nm]	PE [Nm]
308 010 016 308 014 023	314 005 101	24	125	92	161	55	100	5	15	2,5	1,5 - 16	1,5 - 16	2,5 - 3	2,5 - 3
308 014 038	314 005 102	38	155	96	197	56	130	8	20	4	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 061	314 005 103	62	155	105	197	65	130	8	25	5	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 087	314 005 104	88	190	116	238	67	170	8	30	8	25 - 50	M10	6 - 8	46 - 50

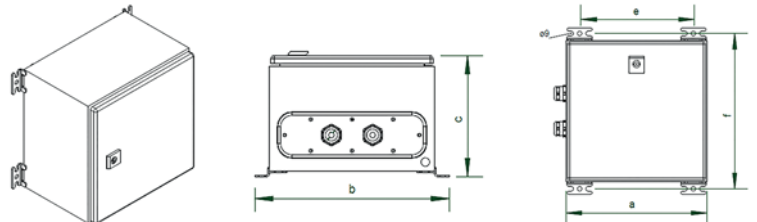
Output Filter dV/dt High Efficiency System 400/500V Model Data - Protection Class IP54*

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
										[mm²]	[mm²]	[Nm]	[Nm]
308 010 216 308 014 223	314 005 110	24	325	354	227	242	330	2x23-33,5	10	1,5 - 16	1,5 - 16	2,5 - 3	2,5 - 3
308 014 238	314 005 111	38	325	354	227	242	330	2x23-33,5	12	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 261	314 005 112	62	325	354	227	242	330	2x29-40	18	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7

IP00 dV/dt Filter - Outlines

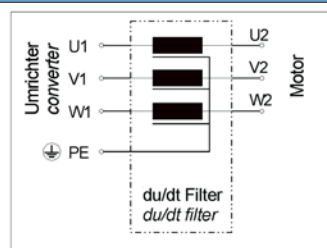


IP54 dV/dt Filter - Outlines



*By changing the supplier it can be differentiated with the dimensions!

dV/dt Filter - Connection Plan

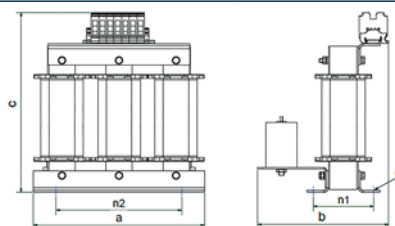




Output Filter Sinus High Efficiency System 400/500V Model Data - Protection Class IP00*

System model number	Filter order code	I_N [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main [mm ²]	PE [mm ²]	main [Nm]	PE [Nm]
308 010 116	314 005 105	16	240	188	285	75	185	10	18	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 123/131	314 005 106	31	240	208	285	95	185	10	27	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 138/146	314 005 107	46	300	222	351	131	250	10	34	25 - 50	25 - 50	6 - 8	23 - 25
308 016 161	314 005 108	72	360	276	410	127	264	10	56	25 - 50	25 - 50	6 - 8	23 - 25
308 016 187	314 005 109	105	360	276	413	127	264	10	57	35 - 95	M10	15 - 20	46 - 50

Filter outlines



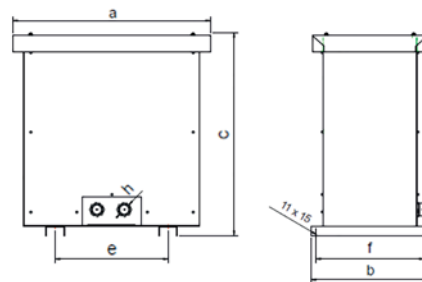
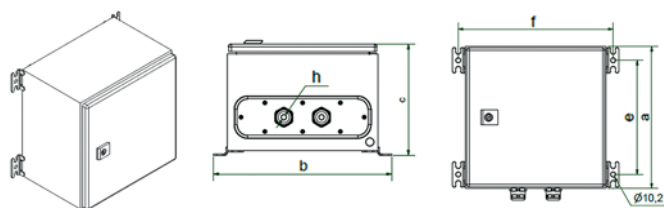
Output Filter Sinus High Efficiency System 400/500V Model Data - Protection Class IP54*

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
										[mm²]	[mm²]	[Nm]	[Nm]
308 010 316	314 005 117	16	600	435	230	542	410	2x23-33,5	49	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 323*	314 005 113	23	550	560	550	185	520	2x23-33,5	56	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 338*	314 005 115	38	770	610	620	450	570	2x23-33,5	65	25 - 50	25 - 50	6 - 8	23 - 25
308 016 361*	314 005 116	72	770	610	620	450	570	2x35-46	112	25 - 50	25 - 50	6 - 8	23 - 25

*Floor mount

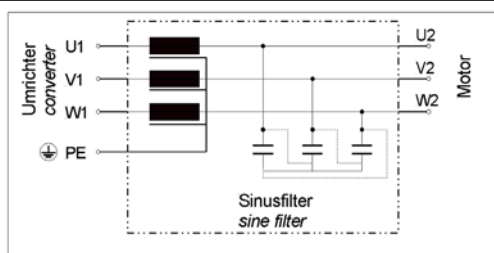
Wall mount outlines

Floor mount outlines



*By changing the supplier it can be differentiated with the dimensions!

Filter Connection Plan



SS Pump

For any pump support please refer to:
<http://franklinwater.eu/products/>



8" High Efficiency System

Franklin Electric is pleased to introduce the extended power range up to 150kW for its High Efficiency Submersible Borehole systems (HES). The system consists of an 8" synchronous submersible NEMA motor with associated variable frequency drive and matching output filter.

Ever since their introduction, our 6" HES have proven their world-class efficiency in more than 400 applications to date, saving up to 20% of electrical energy when compared to standard asynchronous motor system.



System Product advantages:

- One-stop shop - perfectly matching components guarantee first class performance/ efficiency
⇒ *System payback < 2 years*
- Up to **8% improved motor efficiency** with excellent partial load behaviour
⇒ *SKU Reduction*
- Significant lower motor heat rise
⇒ *Increased lifetime*
- Higher power density
⇒ *Lightweight*
- Easy set-up due to tailored pre-setting, user interface and own **Franklin Electric software**
- Speed control
⇒ *Optimum aggregate operation - pump matches system any time*
- Incorporated Soft start and protection features
⇒ *Increased lifetime*
⇒ *No additional investment*
- Reduced amps
⇒ *Smaller drop lead cross size*
- Power factor corrected input
⇒ *No power compensation needed*
- Communication Modbus (RS485, Ethernet and optional Profibus)

System Technical Specification:

- Rating: 75 / 100 / 150kW
- Power Supply: Voltage 400V +/- 10%
Frequency 50Hz +/- 6%

System Options:

- | | |
|--|---|
| • Plug-in card 6x DI/DO - 308 170 201 | • Other voltages |
| • Plug-in card PT100 - 308 170 202 | • Sinus output filters in IP54 and IP00 |
| • Plug-in card Profibus - 308 170 203 | • PT100 protection |
| • Plug-in card 1x AI & 2x AO 308 170 206 | • Motors in 316SS and 904L |

Model Numbers

400V-50Hz High Efficiency System (Synchronous Motor, VFD & Filter)

P [kW]	For panel mount - IP00		For wall mount - IP54	
	dV/dt Filter	Sinus Filter	dV/dt Filter	Sinus Filter
75	308 014 001	308 014 101	308 014 201	308 014 301
100	308 016 001	308 016 101	308 016 201	308 016 301
150	308 017 001	308 017 101	308 017 201	308 017 301

Non-stock items

For lead length > 120m please consult Franklin Electric

Performance Data 400V-50Hz

	P [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A / I_N^* [A]	η [%]	$\cos \phi$ [%]	T_N [Nm]	T_A / T_N^* [Nm]
308 014 X01	45	45	3000	74	1	93,3	0,96	143	1
	55	45	3000	91	1	93,3	0,96	175	1
	67	45	3000	112	1	93	0,96	213	1
	75	45	3000	128	1	92,5	0,96	239	1
308 016 X01	75	45	3000	129	1	93,5	0,95	239	1
	83	45	3000	143	1	93,3	0,95	264	1
	93	45	3000	162	1	93	0,95	296	1
	100	45	3000	178	1	92,7	0,95	319	1
308 017 X01	100	45	3000	176	1	94,2	0,94	319	1
	110	45	3000	193	1	94,2	0,94	350	1
	130	45	3000	229	1	94	0,94	413	1
	150	45	3000	270	1	93,4	0,94	477	1

Performance data are based on measurements with Franklin Electric original equipment!

*Since this is an integrated system (motor plus electronics) these figures relate to VFD input

Performance Data 500V-50Hz

	P [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A / I_N^* [A]	η [%]	$\cos \phi$ [%]	T_N [Nm]	T_A / T_N^* [Nm]
308 024 X01	45	45	3000	60	1	93,2	0,95	143	1
	55	45	3000	74	1	93,2	0,95	175	1
	67	45	3000	91	1	93	0,95	213	1
	75	45	3000	103	1	92,5	0,95	239	1
308 026 X01	75	45	3000	105	1	93,5	0,94	239	1
	83	45	3000	116	1	93,3	0,94	264	1
	93	45	3000	131	1	93,2	0,94	296	1
	100	45	3000	143	1	92,9	0,94	319	1
308 027 X01	100	45	3000	140	1	93,9	0,95	319	1
	110	45	3000	154	1	93,8	0,95	350	1
	130	45	3000	183	1	93,7	0,95	413	1
	150	45	3000	216	1	93,2	0,95	477	1

Performance data are based on measurements with Franklin Electric original equipment!

*Since this is an integrated system (motor plus electronics) these figures relate to VFD input

Control modes and necessary sensor technologies

Process reference	Control reference	Flow meter	Pressure sensor	Level sensor	PT100 sensor & Drive slot card	Flow switch (digital)
Q - Flow	No (Optional)	mandatory			Optional	
	P	mandatory	mandatory			
	H	mandatory		mandatory		
P - pressure	No (Optional)	Yes*	mandatory		Optional	
	Q	mandatory	mandatory			
	H		mandatory	mandatory		
H - level	No (Optional)	Yes*		mandatory	Optional	
	Q	mandatory		mandatory		
	P		mandatory	mandatory		
Direct Mode	No	Yes**	No	No	Optional	No
Manual Mode	No				Yes*	
Solar	No				Yes*	mandatory

*please consult Franklin Electric

** need to be evaluated to PLC



8" High Efficiency Motor

Motor Features:

- 8" Motor in 304SS / CI (Powder Coated)
- PE2/PA winding as a standard
- SandFighter® SIC seal system
- Non-contaminating FES93 filling
- All motors pre-filled and 100% tested
- Max. storage temperature -15 ... +60°C
- Drinking water approved

Motor Technical Specification:

- 75 / 100 / 150kW
- Power supply 400V/100Hz
- 8" NEMA flange
- Protection IP68
- 10 Starts per hour
- Installation vertical (for horizontal operation please consult FE)
- Motor lead in 6 m length
- 30°C nominal ambient temperature with 0,5m/sec cooling flow

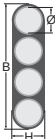
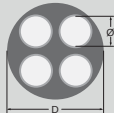
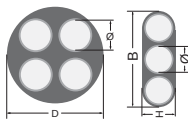
Motor Options:

- Other voltages
- PT100 temperature sensor (retrofitable)
⇒ VFD PT100 Plug-in Card (308 170 202) necessary
- Motors complete in 316SS and 904L available



System model number	P [kW]	400V / 100 Hz 304SS/CI Motor model number	400V / 100 Hz 316SS Motor model number	400V / 100 Hz 904L Motor model number
308 014 xxx	75	263 014 5311	263 014 6311	263 014 7311
308 016 xxx	100	263 016 5311	263 016 6311	263 016 7311
308 017 xxx	150	263 017 5311	263 017 6311	263 017 7311

8" Rewindable Motors 400V- Motor Leads*

DOL									
Lead	kW	Ø (mm²)	B / H (mm)		Lengths (m)	Qty.	Lead Mod.- Nr.	Lead seal Kit 304/316 Mod.- Nr.	Lead seal Kit 904L Mod.- Nr.
	75	4G16	B	38,0	6	1	308 710 108	308 660 618	308 660 620
			H	12,8					
	100	4G25	D	32	6	1	308 710 140	308 660 633	308 660 634
	150	4G25 + 3X25	D	32	6	1	308 710 141	308 660 635	308 660 636
			B X H	37,5 x 16					
Ground lead (optional)	kW	Ø (mm²)	D (mm)		Lengths (m)	Qty.	Mod.-Nr.		
	all ratings	1G25	13,0		8	1	308 053 080		
Lead opening seal kit		30 – 93 kW DOL / YΔ					Mod.- nb.:	304/316	308 660 617
								904L	308 660 625

For PE2/PA engines additionally the special Tape 700 541 688 is absolutely necessary

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

Motor Drop Lead

Lead lenghts in meters for 400V-50Hz / 460V-60Hz and max. 3% voltage drop at 50°C ambient

P _N [kW]	cable size mm², copper wire - 90°C rated insulation											
	16	25	35	50	70	95	120	150	185	240	300	400
45	65	100	140	200	280	370	460					
55		85	120	170	230	300	370	450				
67			90	130	180	240	300	360	420			
75			80	115	160	200	260	310	370	460		
83				100	140	190	235	285	340	420		
93					115	160	200	240	290	350	410	
110					100	140	170	210	250	305	360	440
130						115	145	175	210	260	305	370
150							120	150	175	215	255	310

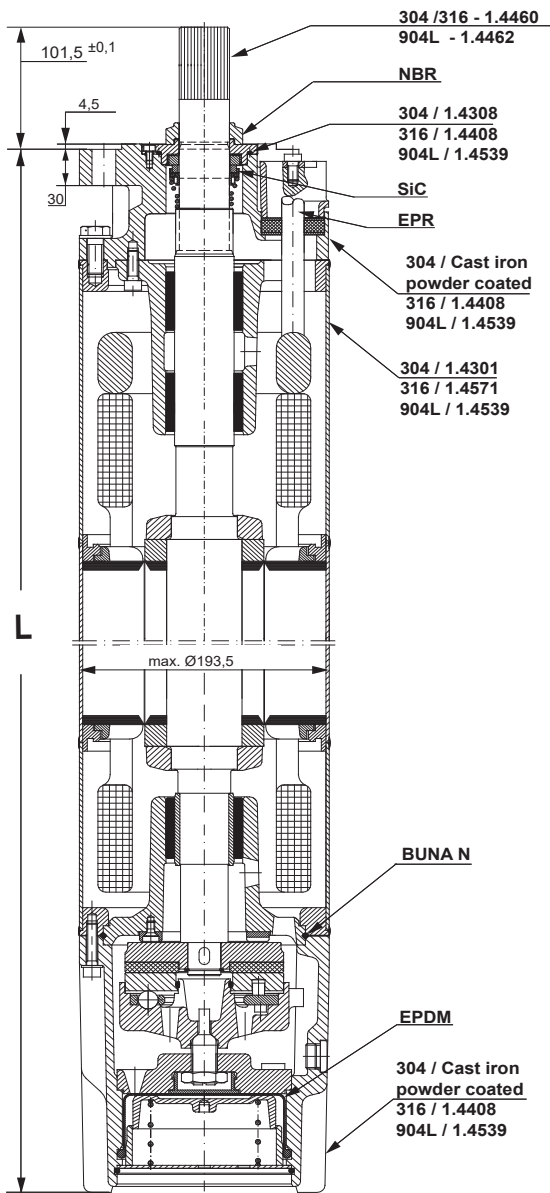
For lead lenght > 120m please consult Franklin Electric.

Further potential energy saving due to more conservative lead sizing (< 3% voltage drop)

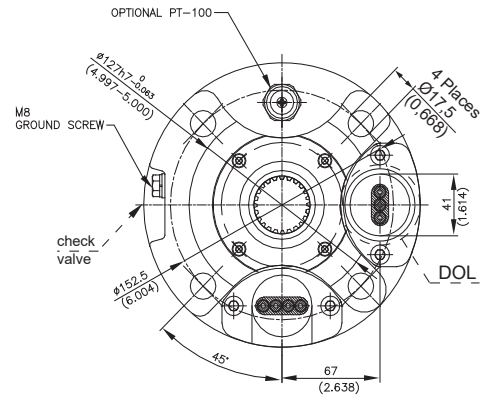


8" Rew Motor Design

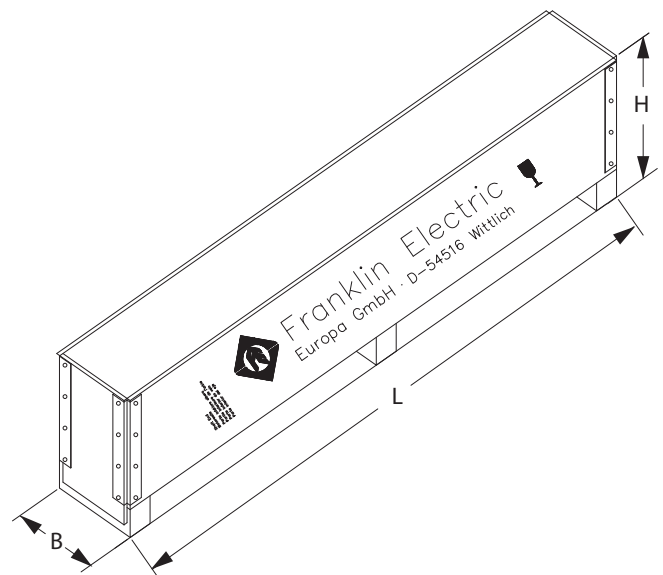
Motor - 304/316SS/904L



End Bell



Motor Box

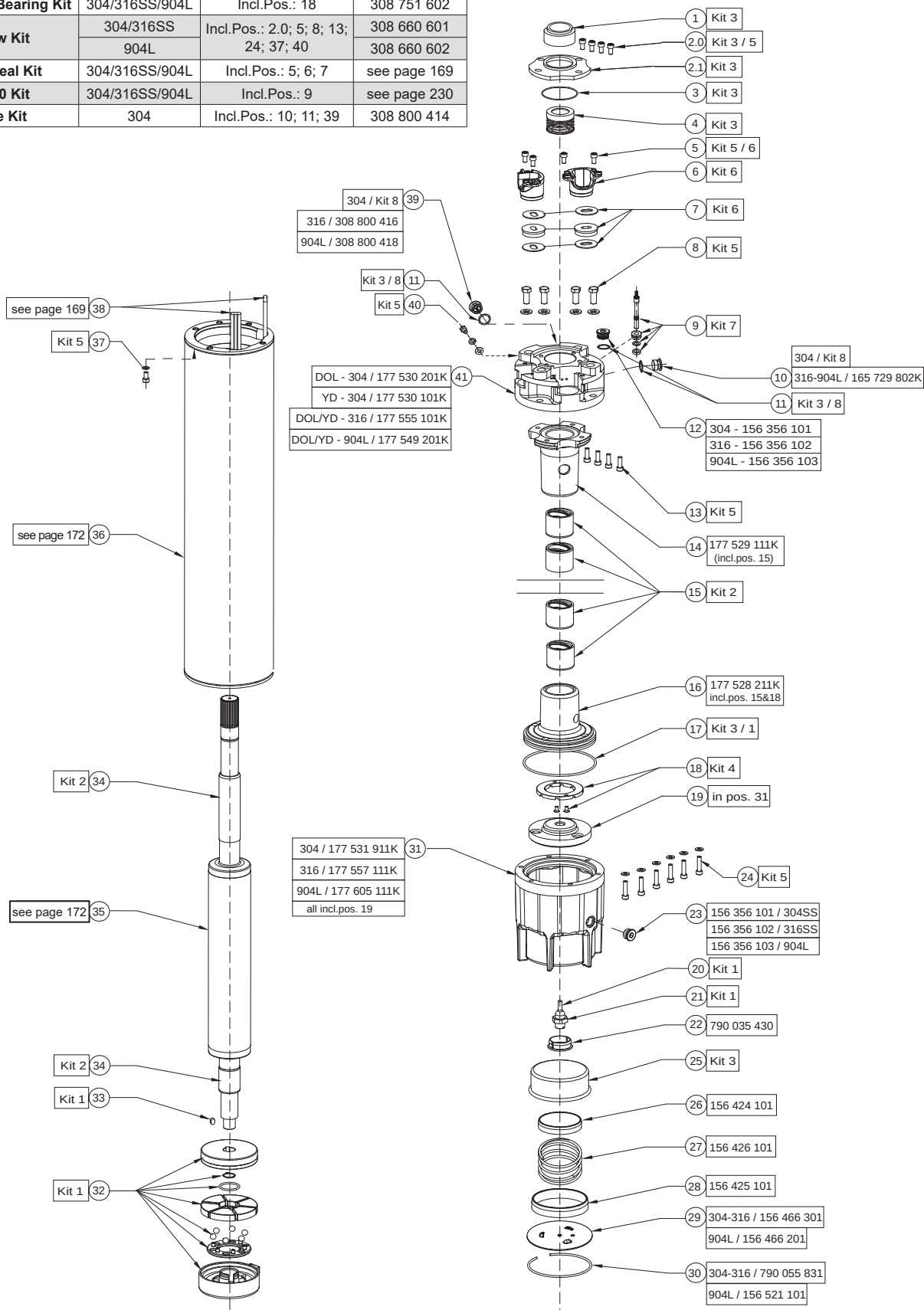


(sample drawing)

P [kW]	Motor Lengths L [mm]	Motor Weights [kg]		Motor Shipping Size [mm]		
	304 / 316 / 904L	304 / 316 / 904L	Incl. Pack [kg]	B	H	L
75	1205	150	179	310	472	1596
100	1316	169	198	310	472	1596
150	1594	215	252	310	472	1996

8" PM Rewindable Spare Parts 304 / 316SS / 904L

Kit 1 Thrust Bearing Kit	304/316SS/904L	Incl.Pos.: 17; 20; 21; 32; 33	308 750 601
Kit 2 Radial Bearing Kit	304/316SS/904L	Incl.Pos.: 15; 34	308 751 603
Kit 3 Seal Kit	304/316SS	Incl.Pos.: 1 - 4; 11; 17; 25	308 800 603
	904L		308 800 604
Kit 4 Up-Thrust Bearing Kit	304/316SS/904L	Incl.Pos.: 18	308 751 602
Kit 5 Screw Kit	304/316SS	Incl.Pos.: 2.0; 5; 8; 13; 24; 37; 40	308 660 601
	904L		308 660 602
Kit 6 Lead Seal Kit	304/316SS/904L	Incl.Pos.: 5; 6; 7	see page 169
Kit 7 PT100 Kit	304/316SS/904L	Incl.Pos.: 9	see page 230
Kit 8 Valve Kit	304	Incl.Pos.: 10; 11; 39	308 800 414





304 / 316SS Stator and Rotor Model numbers 400V / 50Hz (Motors starting 08.2017)

P [kW]	Stator (incl. winding and 6m motor lead)		Rotor
	U _N [V]	DOL [PE2/PA]	
75	400V	327 154 702K	161 123 811K
100	400 V	327 155 702K	161 123 812K
150	400 V	327 156 704K	161 123 813K

304 / 316SS Stator and Rotor Model numbers 400V / 50Hz (Motors up to 07.2017)

P [kW]	Stator (incl. winding and 6m motor lead)		Rotor
	U _N [V]	DOL [PE2/PA]	
75	400V	327 154 901K	161 123 801K
100	400 V	327 155 901K	161 123 802K
150	400 V	327 156 904K	161 123 803K

Windings 400V-50Hz

P [kW]	U _N [V]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance DOL (U1-V1) [Ω]
75	400	327 154 999	16	1,9/2,1&1,8/2,8 (2GR II)	PE2/PA	Parallel Y	290	0,146	0,146
	500	327 151 999	20	2,3/3,5 (2GR II)			350	0,235	0,235
100	400	327 155 999	12	2,0/3,1&2,1/3,3 (2GR II)	PE2/PA	Parallel Y	260	0,103	0,103
	500	327 144 999	17	2,5/3,8 (2GR II)			350	0,213	0,213
150	400	327 156 999	16	1,9/2,1&1,8/2,8 (4GR II)	PE2/PA	Parallel Y	432	0,114	0,057
	500	327 145 999	20	2,3/3,5 (4GR II)			540	0,188	0,094

Insulation resistance (20°C / 500 VDC)

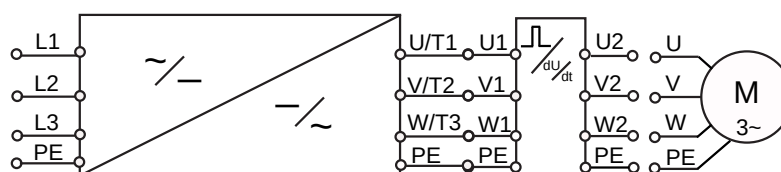
New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

Motor Repair Instructions

Pictured Repair Instructions 304SS / 316SS / 904L	Mod.Nb.:	308 018 697
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Electrical Connection

DOL



U	V	W	PE
brown	grey	black	yellow/green

Variable Speed Drive (VFD)

VFD Features:

- Supports induction and permanent magnet motors
- Top class protection IP54/21 enclosure classes
- Optimized for submersible permanent motor feeding – first class performance (Tailored pre-setting, user interface and software)



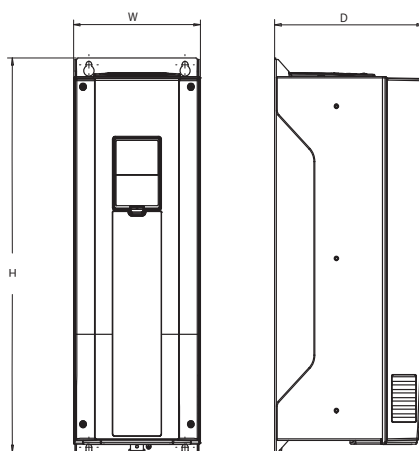
VFD Technical Specification:

Technical Data		
Power supply	Input voltage U_{IN}	380 - 500V ; -10%....+10%
	Input frequency f_{IN}	47 - 65Hz
	Starts per hour	20 ; with min 3min rest period
Motor connection	Output voltage	0 - U_N
	Output current	I_N at rated Ambient temperature (40°C) Overload:IP21: 1,1 x I_N
	Output frequency	0- f_N , resolution 0,01Hz
Performance	Efficiency	97,5%
Control characteristics	Switching frequency	3,6 6 kHz; default setting 4 kHz
Ambient conditions	Operation temperature	-10°C...+50°C (>40°C with derating)
	Storage temperature	-40°C+70°C
	Altitude	3000m (>1000m with derating)
EMC	Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment
Communication	RS 485	Standard: Modbus
	Ethernet	Standard: Modbus
I/O connections	Digital Input (DI)	6x
	Analog Input (AI)	2x
	Analog Output (AO)	1x
	Relay Output (RO)	2x (change-over contact)
For further details please see separate Franklin Electric Quick Installation guide and VFD literature.		



VFD Model Numbers and Dimensions 400-500V / 50-60Hz

IP54/21/00



VFD Model Numbers and Dimensions

System Model Number	AC Drive Type	IP Type	I _N [A]	Dimensions WxHxD [mm]	Weight [kg]
308 014 001/101	314 000 116	21	140	290x966x343	66
308 016 001/101	314 000 117	21	205*	290x966x343	66
308 017 001/101	314 000 118	00	310*	480x971x365	104
308 014 201/301	314 000 113	54	140	290x966x343	66
308 016 201/301	314 000 114	54	205*	290x966x343	66
308 017 201/301	314 000 115	54	310*	480x1150x365	108

* Without derating for default switching frequency setting

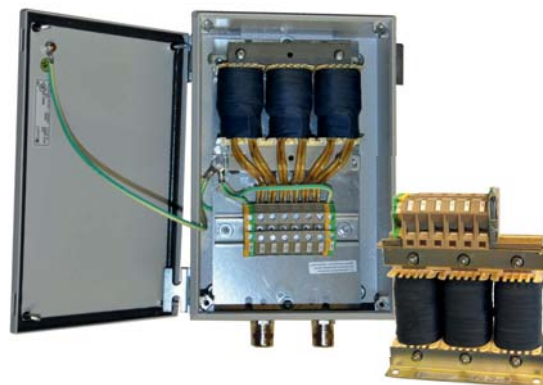
VFD Options:

- Plug-in card 6x DI/DO 308 170 201
- Plug-in card PT100 308 170 202
- Plug-in card Profibus 308 170 203
- Plug-in card 1x AI & 2x AO 308 170 206
- Replacement Battery VFD 308 170 205

Output Filter

Output Filter Features:

- dV/dt filter for lead lengths up to 120m, for lead lengths >120m please consult Franklin Electric.
- filter available in IP54 and IP00
- Optimized for submersible permanent magnet motor feeding



Output Filter Technical Specification:

- Voltage → 380 - 500V
- Frequency → 0 - 120 Hz
- Switching Frequency → 4kHz
- Ambient Temperature → < 40°C

Output Filter Options:

- Sinus filter in IP54 and IP00 for lead length >120m and/ or special applications
- Other voltages

400/500V dV/dt Output Filter Model Data - Protection Class IP00*

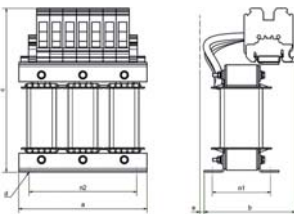
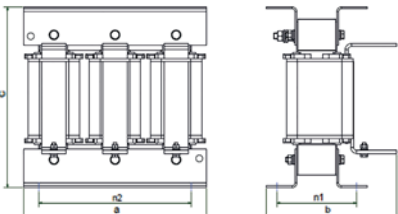
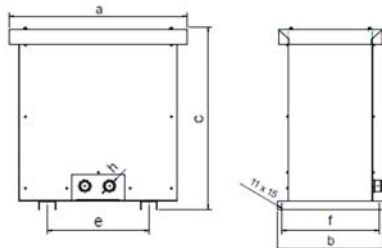
System model number	Filter order code	I _N [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d	e		main	PE	main	PE
308 014 001	314 005 130	140	240	139	335	75	185	10	35	18	50 - 150	M10	25 - 30	46 - 50
308 016 001	314 005 119	205	240	149	335	85	185	10	40	20	50 - 150	M10	25 - 30	46 - 50
308 017 001	314 005 120	310	300	168	256	107	224	10	-	35	70 - 240	M10	25 - 30	46 - 50

400/500V dV/dt Output Filter Model Data - Protection Class IP54*

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
308 014 201	314 005 124*	140	550	560	550	185	520	6x23-35,5	48	50 - 150	M10	25 - 30	46 - 50
308 016 201	314 005 125*	205	550	560	550	185	520	6x23-35,5	53	50 - 150	M10	25 - 30	46 - 50
308 017 201	314 005 126*	310	550	560	550	185	520	6x23-35,5	70	70 - 240	M10	25 - 30	46 - 50

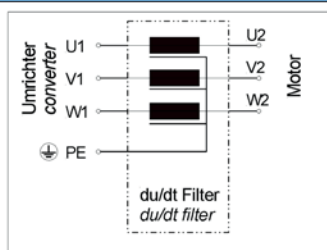
*Floor mount

IP00 Filter - Outlines

314 005 130 / 119	314 005 120	Floor mount Filter outlines*
		

*By changing the supplier it can be differentiated with the dimensions!

dV/dt Filter - Connection Plan





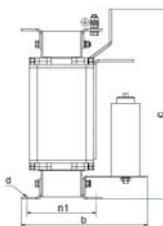
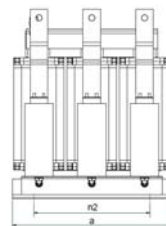
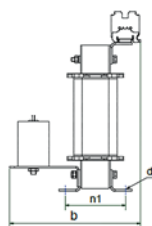
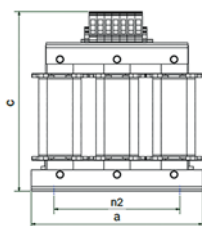
400/500V Sinus Filter Model Data - Protection Class IP00*

System model number	Filter order code	I_N [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
										main	PE	main	PE
			a	b	c	n1	n2	d		[mm ²]		[Nm]	
308 014 101	314 005 121	140	360	311	440	157	264	10	75	50 - 150	M10	25 - 30	46 - 50
308 016 101	314 005 122	205	420	335	510	173	316	13	105	70 - 240	M10	25 - 30	46 - 50
308 017 101	314 005 123	310	420	365	460	173	346	13	140	70 - 240	M10	25 - 30	46 - 50

IP00 Sinus Filter - Outlines

314 *** 121 / 122

314 *** 123

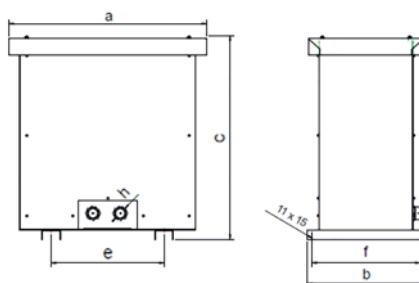


400/500V Sinus Filter Model Data - Protection Class IP54*

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
										main	PE	main	PE
			a	b	c	e	f			[mm²]		[Nm]	
308 014 301	314 005 127*	140	770	610	620	450	570	6x23-33,5	140	50 - 150	M10	25 - 30	46 - 50
308 016 301	314 005 128*	205	1150	920	890	550	880	6x23-33,5	250	70 - 240	M10	25 - 30	46 - 50
308 017 301	314 005 129*	310	1150	920	890	550	880	6x23-33,5	380	70 - 240	M10	25 - 30	46 - 50

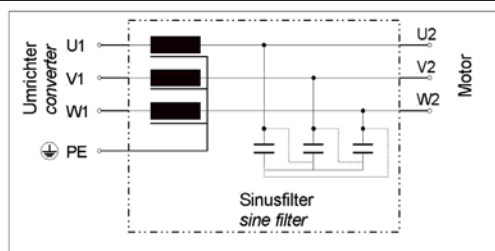
*Floor mount

IP54 Sinus - Floor mount Filters outlines*



*By changing the supplier it can be differentiated with the dimensions!

Sinus Filter - Connection Plan



SS Pump

For any pump support please refer to:
<http://franklinwater.eu/products/>





ALL-IN-ONE PACKAGE

The Fhoton™ SolarPAK Centrifugal is the system solution to your solar pumping requirements. By utilizing quality components, innovative thinking based on global market inputs, and a technical expertise in groundwater pumping, Franklin Electric has developed a rugged, high-output system which tackles the challenges of harsh and remote environments. No other system delivers the features, benefits, and reliability of Fhoton™ SolarPAK in just one package!

FEATURES

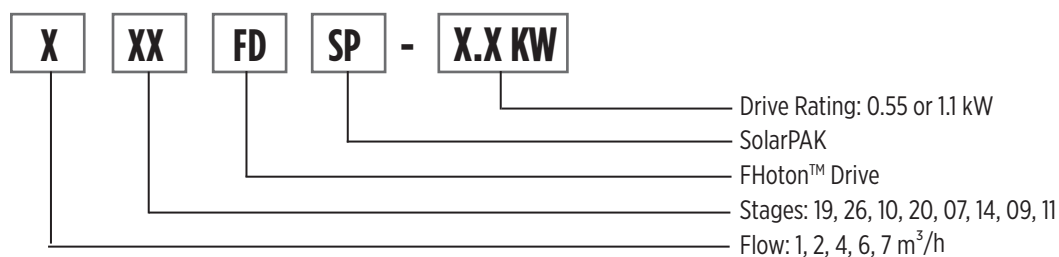
- High-flow system for faster tank-fill and significant water output
- Proven motor and pump technology for long-term reliability
- Robust IP66, NEMA 4 enclosure minimizes impact from wildlife, insects, dust, and weather
- DC solar array
- Operating status indicated by multi-color LED
- Terminals provided for an optional data communications board
- Max Power Point Tracking (MPPT) for maximizing efficiency of input power
- Soft-start feature prevents water hammer and increases system life
- Allows use of new solar array or retrofit to existing array (subject to size and performance check)
- Simple installation with no required maintenance
- Built-in diagnostics and protection
- CE, C-Tick, cULus and UL approved



SOLARPAK CONTENTS

- Franklin Electric 4" submersible motor
- Franklin Electric 4" submersible pump
- Fhoton™ Solar controller
- Flow switch
- Variety of flow rates available: 17, 30, 67, 100, 117 lpm (1, 2, 4, 6, 7 m³/h)
- Motor and drive ratings available: 0.55 or 1.1 kW

MODEL NOMENCLATURE STANDARD



PHOTON™ SOLARPAK – ORDERING INFORMATION

SOLARPAK MODEL NUMBERS

SolarPAK EU MDL		Photon™ Solar Controller		Solar Pump (BSPP)				Motor*		Flow Switch (NPT)	
SolarPak Model	Order No.	Drive Model	Part No.	m ³ /h	Stages	Solar Pump	Part No.	kW	Part No.	Model	Part No.
FDSP 0.55kW (without pump)	308 752 670	FD Solar 0.55 kW N4	581 013 000 86C-62IS000	-	-	-	-	0.75	234 802 6700L	-	-
FDSP 1.10 kW (without pump)	308 754 670	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	-	-	-	-	1.1	234 703 6700L	-	-
119-FDSP 0.55 kW	308 752 671	FD Solar 0.55 kW N4	581 013 000 86C-62IS000	1	19	VS 1/19	710 101 90	0.75	234 802 6700L	C25	226 014 101
126-FDSP 1.10 kW	308 754 671	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	1	26	VS 1/26	710 102 60	1.1	234 703 6700L	C25	226 014 101
210-FDSP 0.55 kW	308 752 672	FD Solar 0.55 kW N4	581 013 000 86C-62IS000	2	10	VS 2/10	710 201 00	0.75	234 802 6700L	C25	226 014 101
220-FDSP 1.10 kW	308 754 672	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	2	20	VS 2/20	710 202 00	1.1	234 703 6700L	C25	226 014 101
407-FDSP 0.55 kW	308 752 674	FD Solar 0.55 kW N4	581 013 000 86C-62IS000	4	7	VS 4/07	710 400 70	0.75	234 802 6700L	F21	226 019 101
414-FDSP 1.10 kW	308 754 674	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	4	14	VS 4/14	710 401 40	1.1	234 703 6700L	F21	226 019 101
609-FDSP 1.10 kW	308 754 676	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	6	9	VS 6/09	710 600 90	1.1	234 703 6700L	F21	226 019 101
**711-FDSP 1.10 kW	308 754 677	FD Solar 1.10 kW N4	581 014 200 86C-62IS002	7	11	VS 7/11	710 701 10	1.1	234 703 6700L	F21	226 019 101

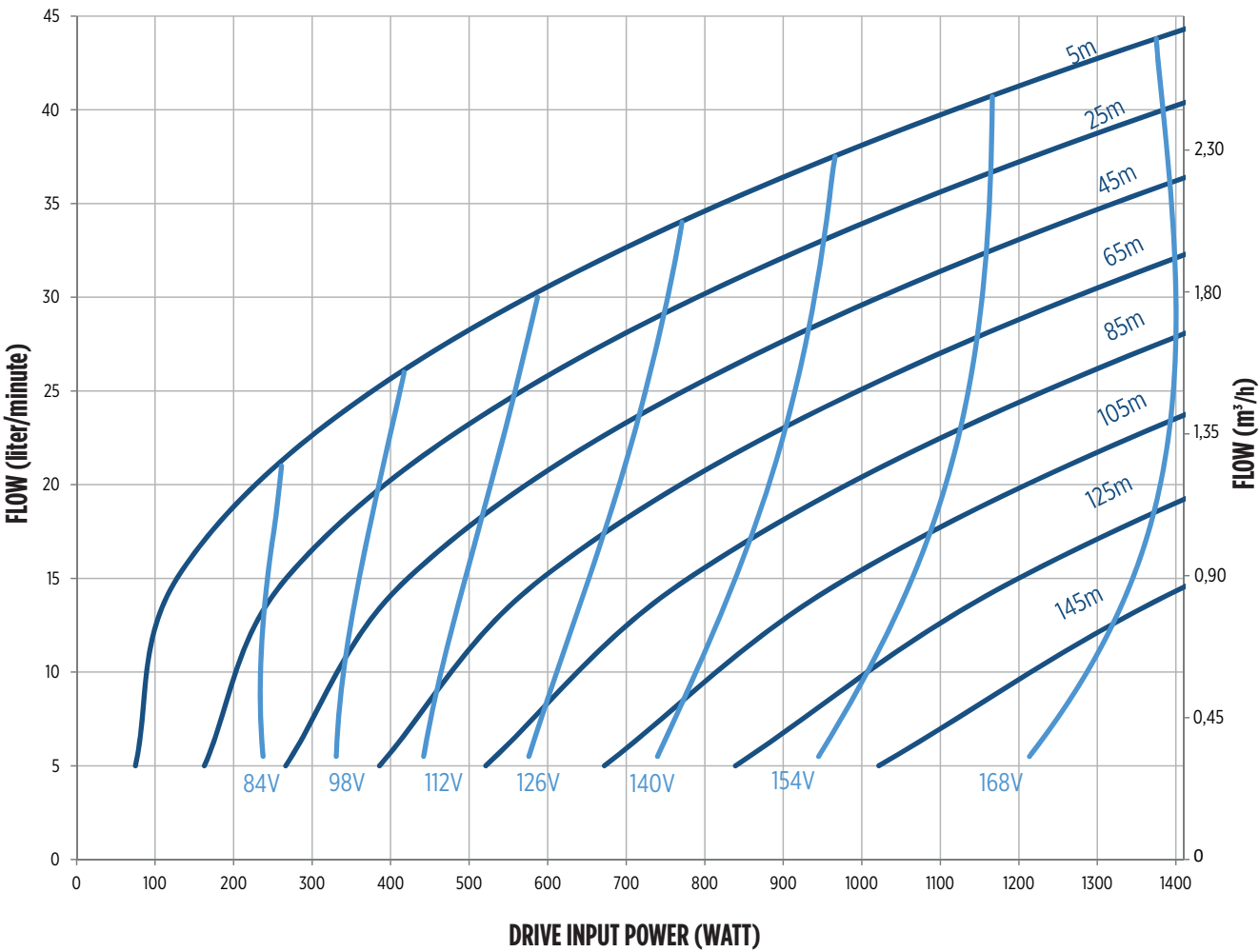
*full 316 stainless steel motors available on request

** available on stock from mid-May 2017



PHOTON™ SOLARPAK - 0.55 PERFORMANCE

119-FDSP-0.55 KW

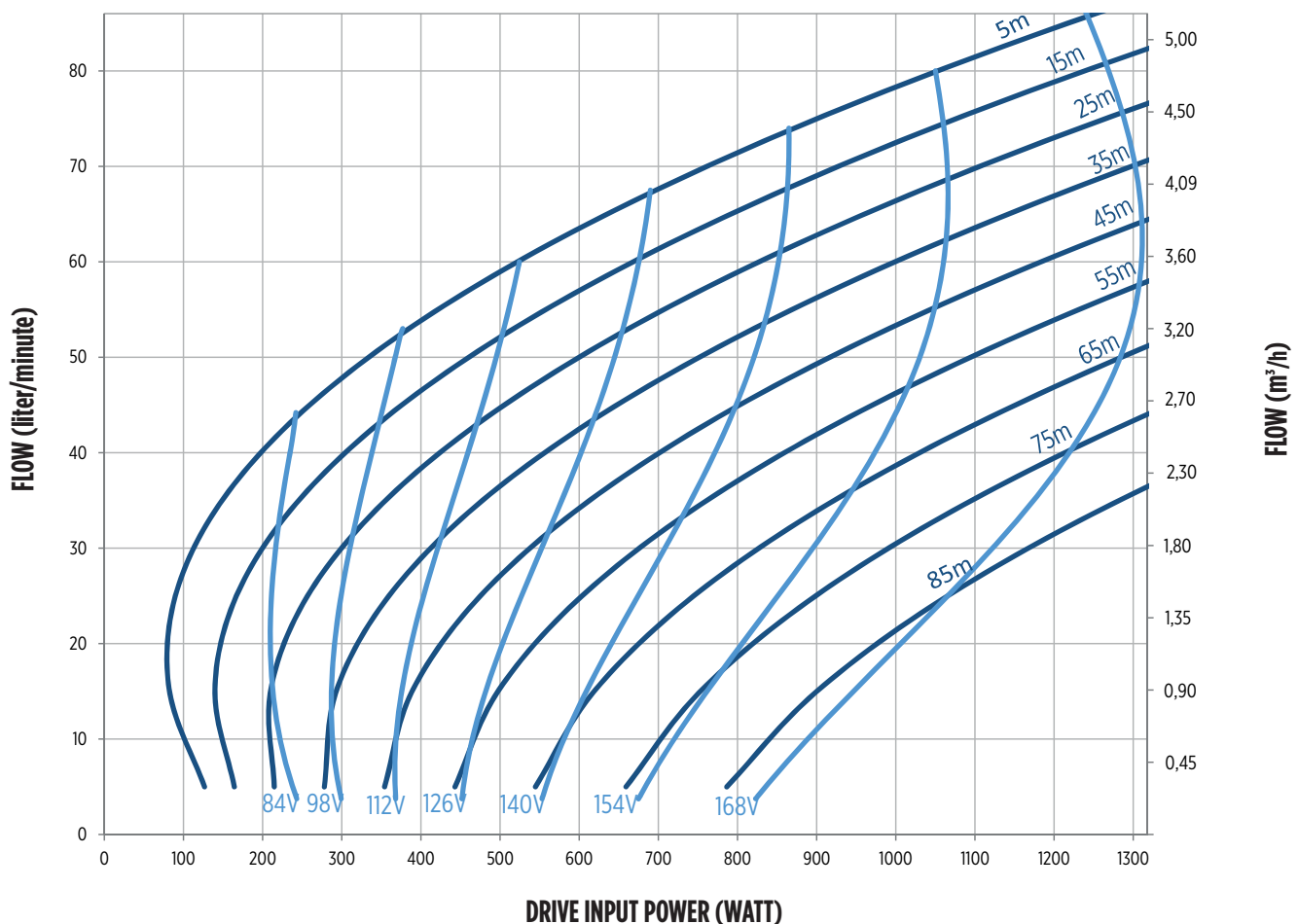


TDH (m)	PV Power (Watts)*												
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
	Flow (lpm)												
5	19	22	25	28	31	32.5	34	36	38	40	41	43	
25	9	16	20	23	26	28	30	32	34	36	38	37	
45		7.5	14	18	21	23	26	28	30	31	33	35	
65			6	12	15	18	21	23	25	27	28	31	32
85					8	12	16	18	21	22	24.5	26	28
105						6	10	13	16	17.5	20	22	23
125								7	10	12	15	17	
145										7	10	12.5	

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

PHOTON™ SOLARPAK - 0.55 PERFORMANCE

210-FDSP-0.55 KW



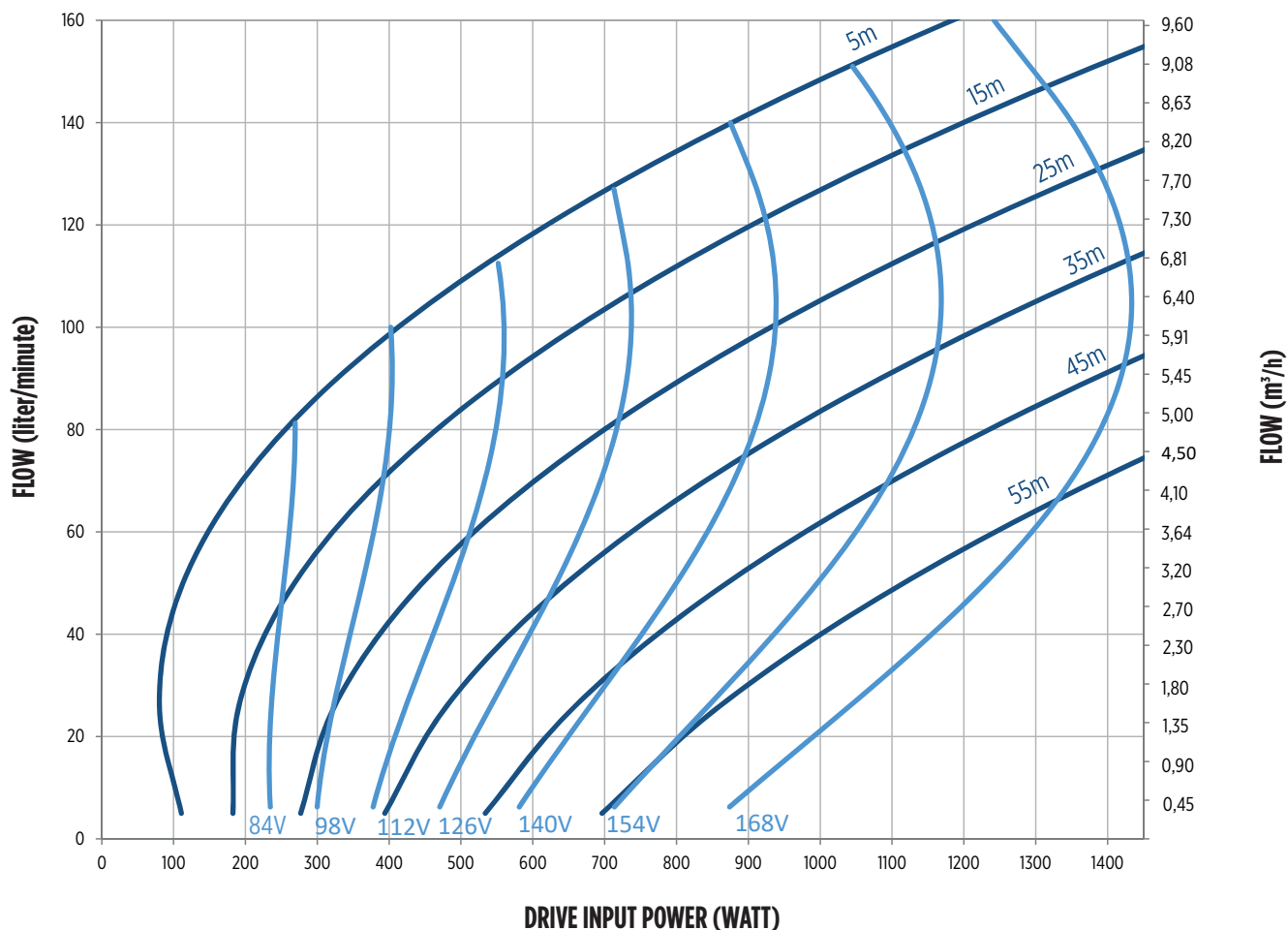
TDH (m)	PV Power (Watts)*											
	200	300	400	500	600	700	800	900	1000	1100	1200	1300
	Flow (lpm)											
5	40	48	54	59	64	67	71	75	77	82		
15	30	40	46	52	57	62	65	68	73	76		
25		30	38	45	50	55	59	62	66	70	74	
35		17.5	30	36	42.5	47	52	56	60	64	67	70
45			17	27	35	40	45	49	53	56	60	65
55				15	25	32	37	42	46	50	54	57
65					14	22	29	34	38	43	46	
75						10	18	25	30	35	40	
85							6	15	22	26.5	32	

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.



PHOTON™ SOLARPAK - 0.55 PERFORMANCE

407-FDSP-0.55 KW

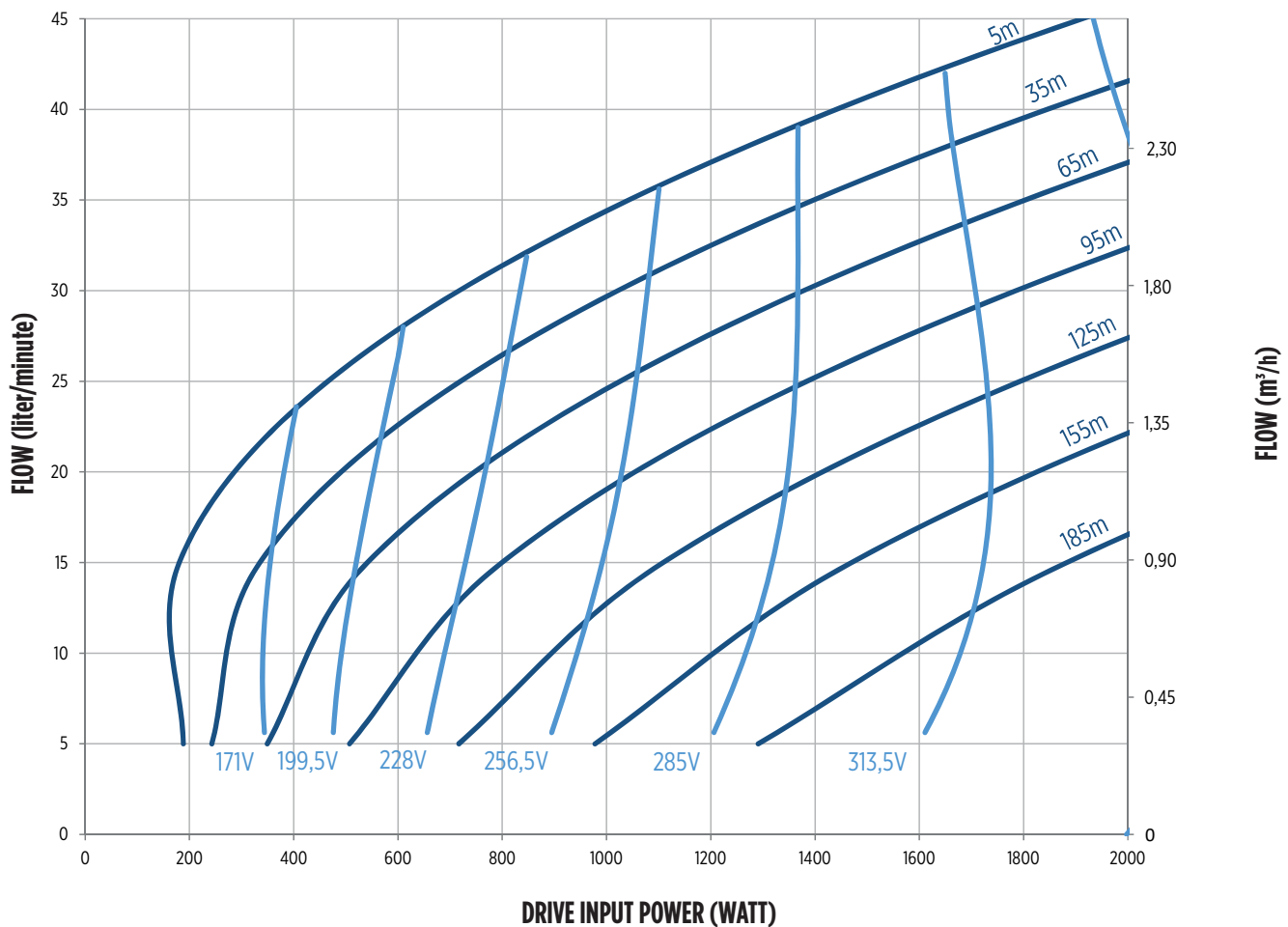


TDH (m)	PV Power (Watts)*												
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
	Flow (lpm)												
5	75	86	100	110	118	126	135	140	150				
15	30	58	73	85	95	105	112	120	126	135	140		
25		20	45	59	70	80	90	98	105	112	120	125	
35			10	30	45	55	65	75	85	90	100	115	112
45					18	30	43	54	62	70	78	85	92
55						5	20	30	40	50	57	65	

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

PHOTON™ SOLARPAK - 1.1 PERFORMANCE

126-FDSP-1.1 KW



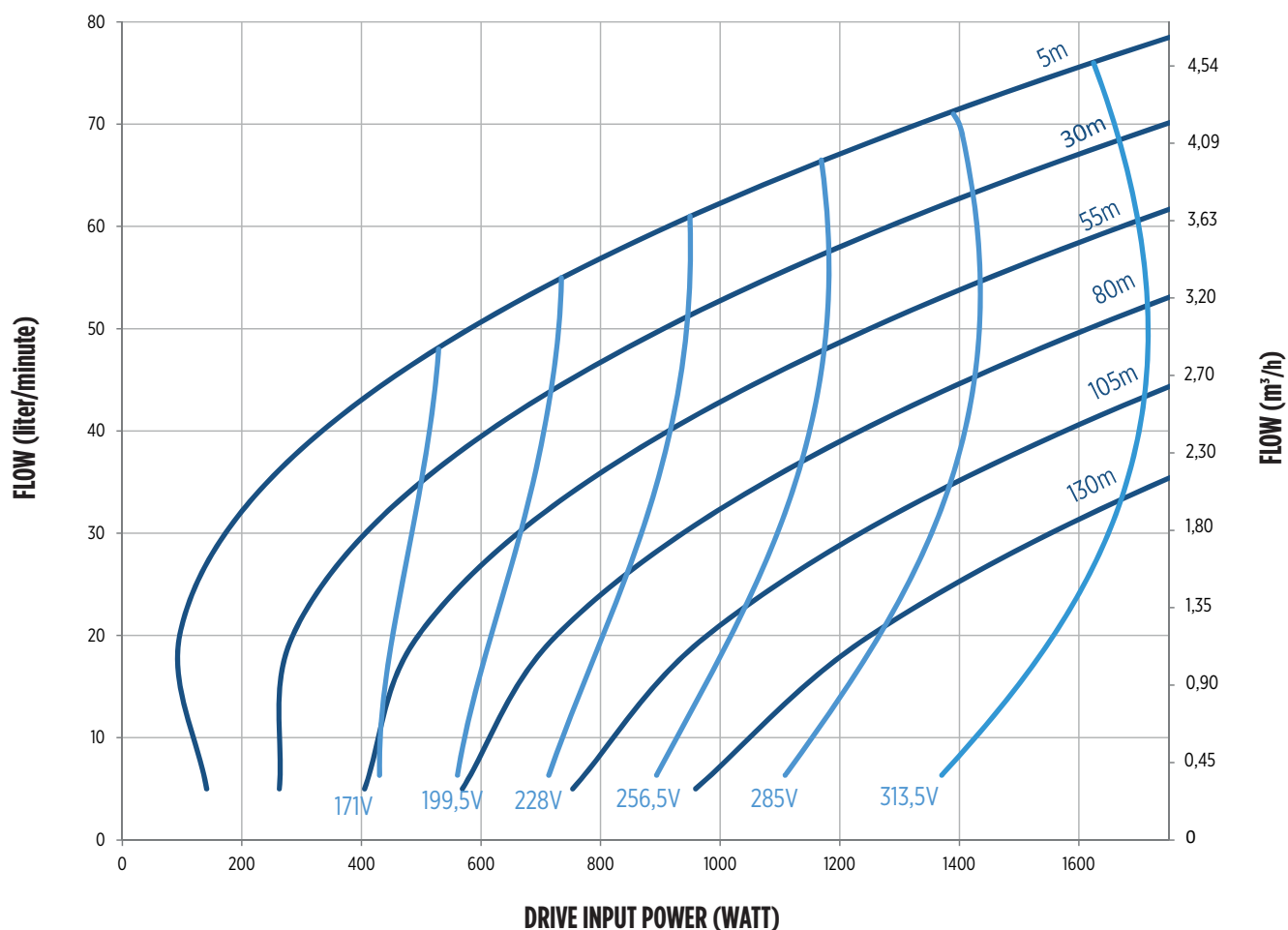
TDH (m)	PV Power (Watts)*									
	200	400	600	800	1000	1200	1400	1600	1800	2000
	Flow (lpm)									
5		23	28	31	34.5	37	39	43	44	
35		17	24	26	30	32	35	37.5	39	
65		7.5	16	21	25	27.5	30	32.5	35	37
95			8	15	19	22.5	25	27.5	30	32
125				7.5	13	16	20	22.5	25	27.5
155					6	10	14	16	20	22
185							7	11	13.5	16

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.



PHOTON™ SOLARPAK - 1.1 PERFORMANCE

220-FDSP-1.1 KW

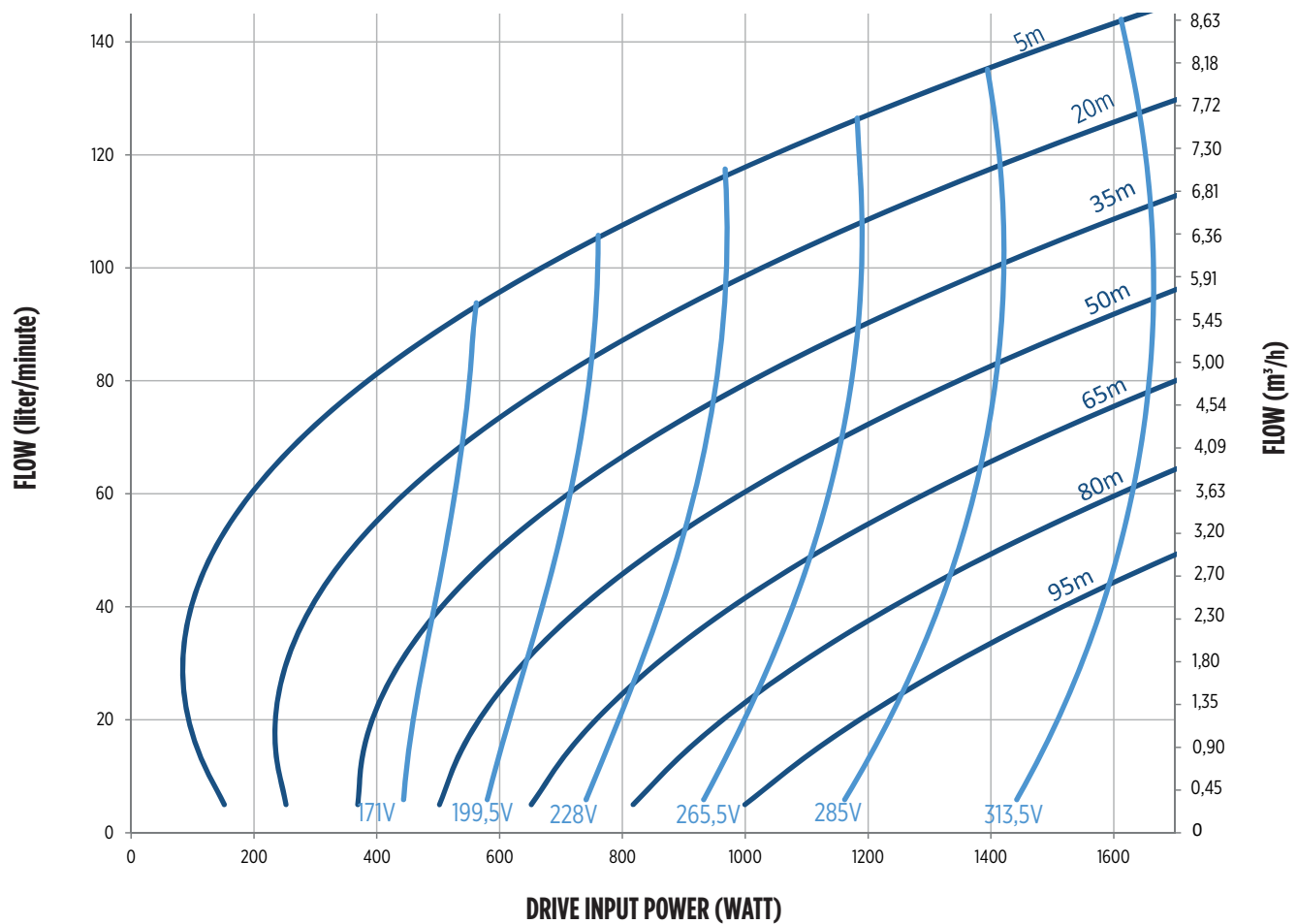


TDH (m)	PV Power (Watts)*								
	200	400	600	800	1000	1200	1400	1600	1700
	Flow (lpm)								
5	32.5	42.5	51	57	62.5	67	72	75	
30		30	40	46	52.5	58	63	67	
55			27	36	42.5	49	54	58	60
80			8	24	32.5	39	45	50	52
105				8	22	29	35	41	43
130					7.5	18	25	32	33

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

PHOTON™ SOLARPAK - 1.1 PERFORMANCE

414-FDSP-1.1 KW



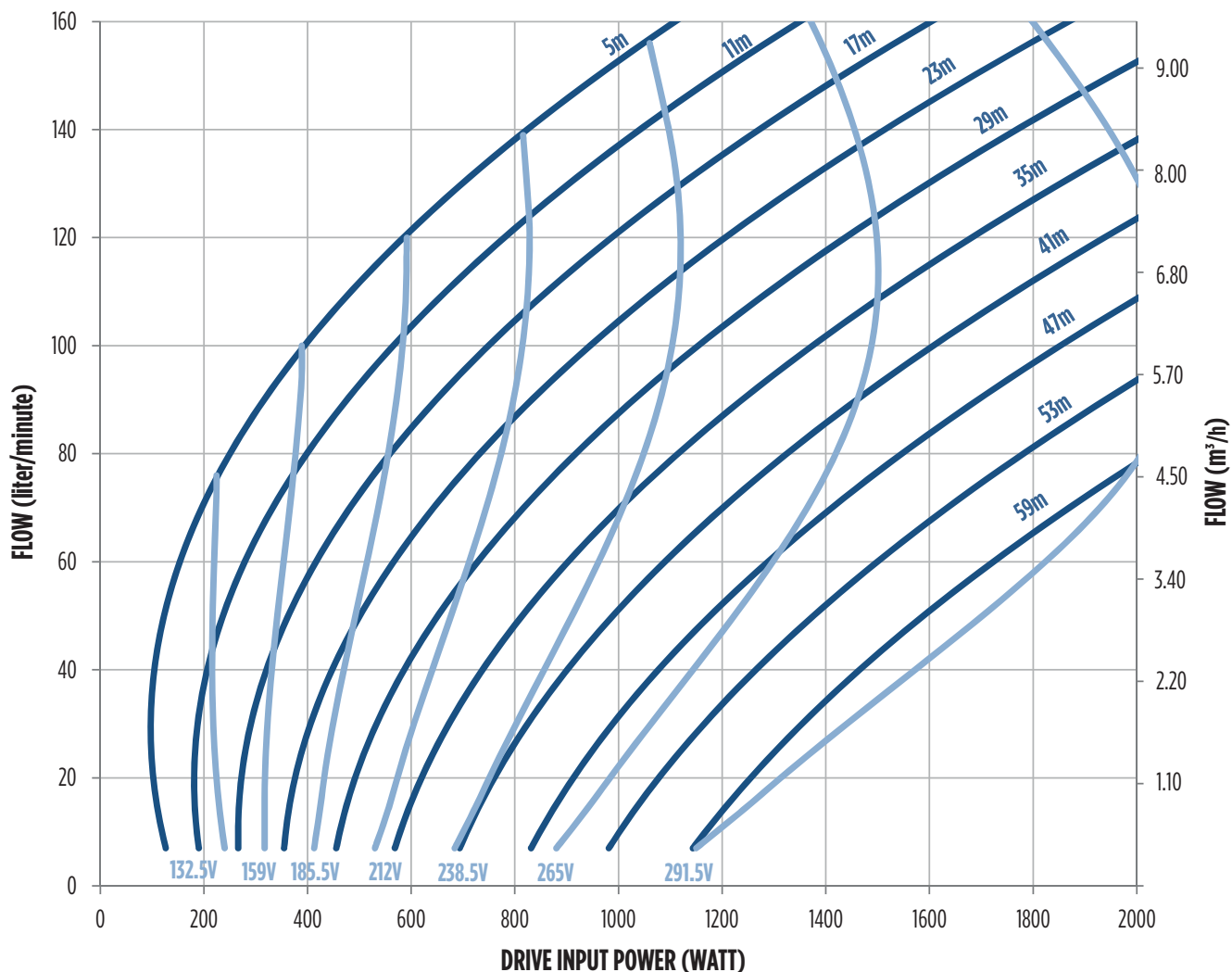
TDH (m)	PV Power (Watts)*							
	200	400	600	800	1000	1200	1400	1600
	Flow (lpm)							
5	60	80	95	107	118	128	135	145
20		55	75	87	100	118	118	125
35		22	50	68	80	90	100	110
50			25	48	60	72	82	92
65				28	41	55	63	75
80					22	48	50	60
95						20	33	45

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.



PHOTON™ SOLARPAK - 1.1 PERFORMANCE

609-FDSP-1.1 KW

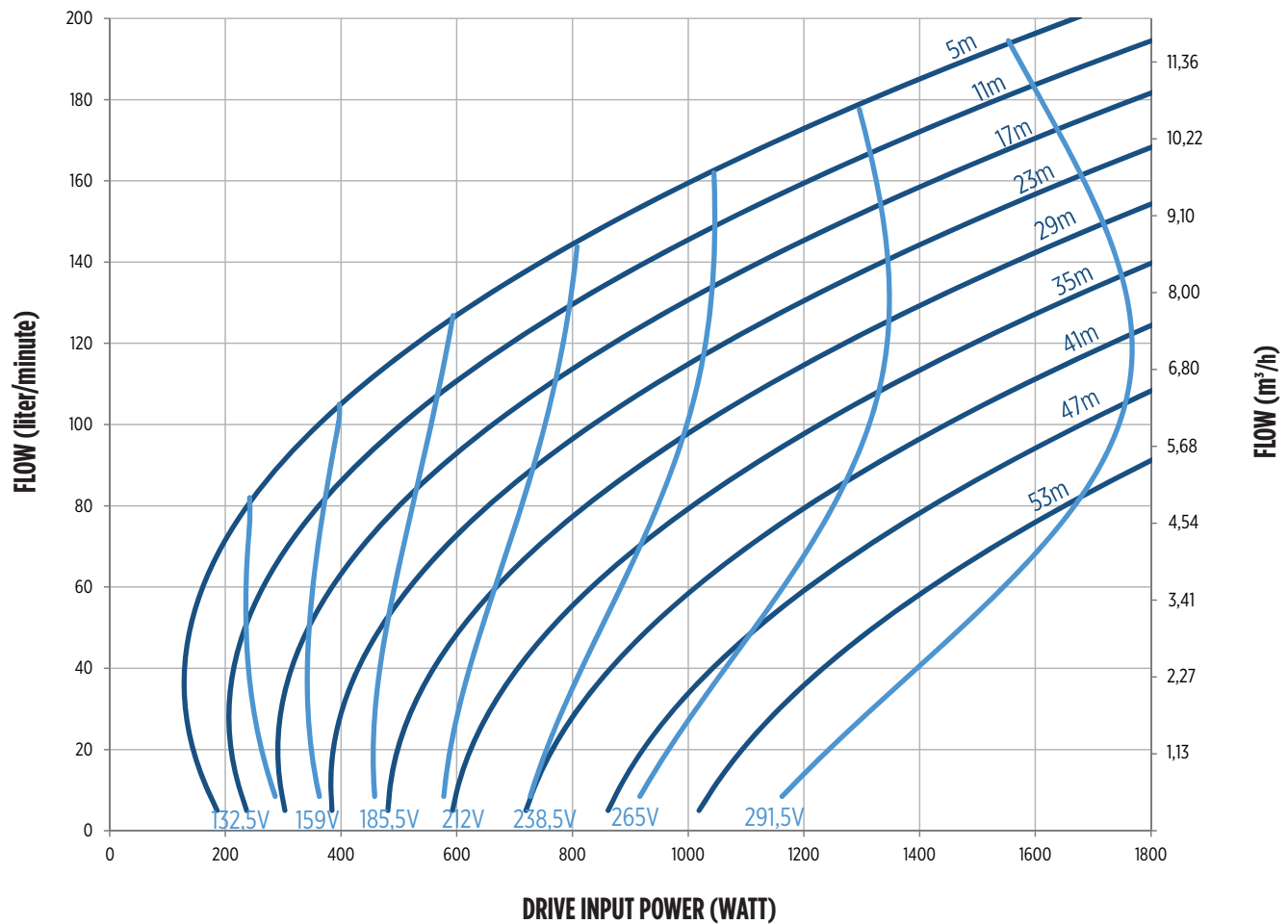


TDH (m)	PV Power (Watts)*									
	200	400	600	800	1000	1200	1400	1600	1800	2000
	Flow (lpm)									
5	70	100	120	140	155	170				
11	40	80	105	120	138	150	162			
17		60	85	105	120	135	150	160		
23		30	65	88	105	120	132	146	157	
29			42	70	98	105	118	130	141	
35			19	50	70	88	102	115	128	
41				30	50	70	86	100	112	124
47					31	52	70	85	96	110
53					10	33	52	69	80	94
59						15	35	51	65	79

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

PHOTON™ SOLARPAK - 1.1 PERFORMANCE

711-FDSP-1.1 KW



TDH (m)	PV Power (Watts)*								
	200	400	600	800	1000	1200	1400	1600	1700
	Flow (lpm)								
5	70	106	130	145	160	175	185		
11	30	86	110	130	145	160	172	185	
17		65	92	115	130	147	160	170	
23		30	72	96	115	130	145	156	
29			50	79	98	115	130	142	150
35			10	55	80	98	112	128	135
41				30	60	80	96	110	119
47					35	60	80	95	100
53						36	60	76	82

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

FHOTON™ SOLARPAK – DRIVE SPECIFICATIONS

SOLAR CONTROLLER

			0.55 kW Model	1.1 kW Model	
Controller Model No.			58101300086C-62IS000		58101420086C-62IS002
Output					
Max. Output Voltage			100V AC, 3-phase		200V AC, 3-phase
Max. Amps (RMS)			8.6 A, each phase		6.8 A, each phase
Output Frequency			20-60 Hz		
Efficiency at Max Power			98%		
PV Source / Input					
Max. Input Voltage			*45 - 300 VDC		**115 - 420 V DC
Max. Amps Input			7.2 A DC, continuous		6.2 A DC, continuous
Power at MPP			Up to 1200 watts		Up to 2000 watts
VOC			300 V		420 V
For Use With					
Franklin Electric Motor			234 802 6700L		234 703 6700L
Solar Pumps (BSPP)	LPM	Stages	Model No.	Stages	Model No.
	17	19	710 101 90	26	710 102 60
	30	10	710 201 00	20	710 202 00
	67	7	710 400 70	14	710 401 40
	100	-	-	9	710 600 90
	117	-	-	11	710 701 10
Controller Size - L x W x D					
mm			152 x 152 x 190		152 x 152 x 190
Controller Weight					
kg			4.5		4.5
Operating Conditions					
Temperature Range			-25 °C to 50 °C (40 °C max when using AC generator)		
Relative Humidity Range			0 to 100% Condensing		
Enclosure Rating			IP66		

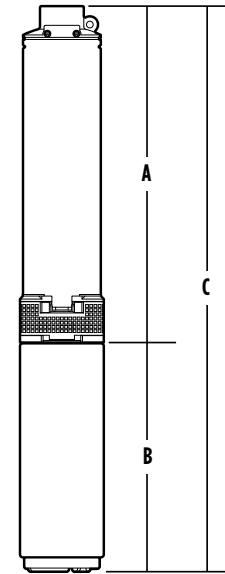
* 45 and ** 115 VDC for the 0.55 kW and 1.1 kW models respectively should not be interpreted as an adequate rated PV array output voltage for any installation. See the PV Solar Array Specifications and System Sizing program for indication of adequate array voltage to provide useful pumping capability.

FHOTON™ SOLARPAK - DIMENSIONS

SOLAR PMA DIMENSIONS

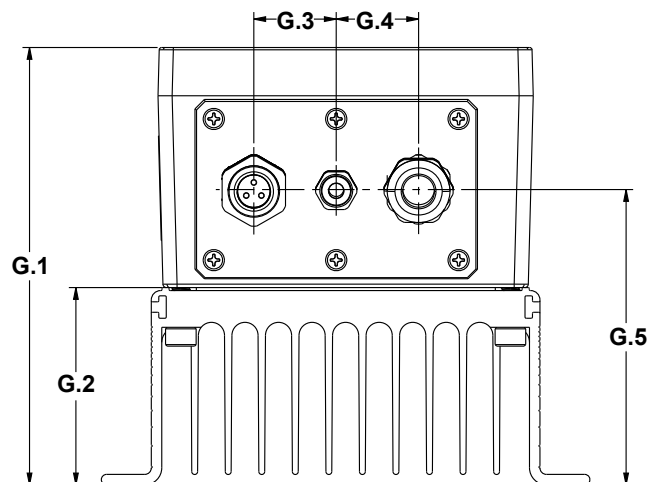
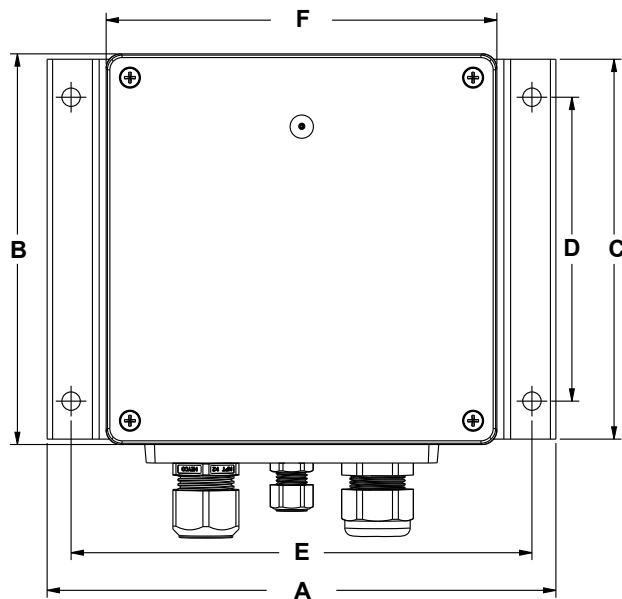
SolarPAK MDL	kW	Stages	A	B	C	Discharge (in)	Pump Weight kg	PMA Weight kg
			mm	mm	mm			
119-FDSP 0.55 kW	0.55	19	528	270	798	1" 1/4	5.6	13.8
126-FDSP 1.10 kW	1.10	26	680	298	978	1" 1/4	7.4	16.6
210-FDSP 0.55 kW	0.55	10	367	270	637	1" 1/4	4	12.2
220-FDSP 1.10 kW	1.10	20	542	298	840	1" 1/4	5.6	14.8
407-FDSP 0.55 kW	0.55	7	343	270	613	1" 1/4	3.5	11.7
414-FDSP 1.10 kW	1.10	14	498	298	796	1" 1/4	5.1	14.3
609-FDSP 1.10 kW	1.10	9	461	298	759	2"	4	13.2
711-FDSP 1.10 kW	1.10	11	542	298	840	2"	4.5	13.7

NOTE: Maximum diameter across cable guard is 99 mm on all models.



SOLAR CONTROLLER DIMENSIONS

Dimensions	A	B	C	D	E	F	G.1	G.2	G.3	G.4	G.5
mm	208	158	155	124	188	158	186	84	35	35	125





FHOTON™ SOLARPAK HR - ALL-IN-ONE PACKAGE

The Photon™ HR SolarPAK System features helical rotor pumps, as an addition to the current Photon SolarPAK product family. The helical rotor pump (sometimes called a progressive cavity or positive displacement pump) generates substantial water pressure at lower flows, providing water even during times of indirect sunlight. Since less energy is required, the Photon HR SolarPAK utilizes a minimum number of solar panels, making it ideal for applications with flexible water volume requirements.

FEATURES

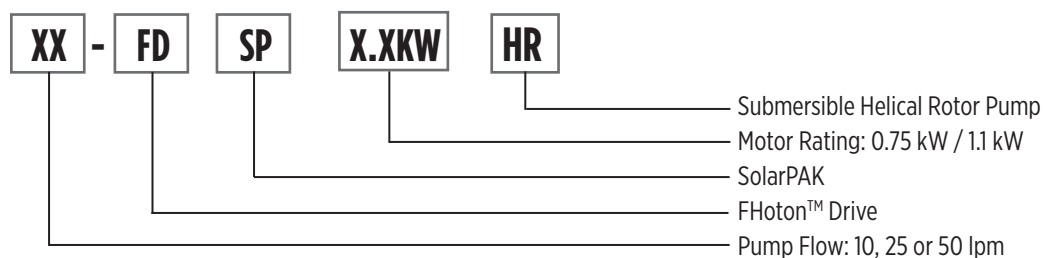
- Four-inch NEMA standard construction dimensions
- Flex-shaft that allows for minimal radial wear to the motor
- Proprietary software provides increased dry-run and low-flow protection without the need for external devices
- Four-inch Franklin Electric motor
- Built-in check valve
- Pump upthrust washer serves as additional shaft protection from excessive wear in the event of reversed rotation
- Serviceability by pump and motor detaching when needed
- Unique HR Photon drive algorithm provides increased starting torque levels

SOLARPAK CONTENTS

- Franklin Electric 4" submersible motor 0.75 kW / 1.1 kW
- Franklin Electric 4" submersible helical rotor pump 10, 25 or 50 lpm
- Photon™ Solar controller: 0.55 kW / 1.1 kW



MODEL NOMENCLATURE



FHOTON™ SOLARPAK HR - ORDERING INFORMATION

SOLARPAK HR MODEL NUMBERS

SolarPAK HR EU MDL		Photon™ Solar Controller		Solar Pump (BSPP)**			Motor*	
SolarPak HR Model	Order No.	Drive Model	Part No.	lpm	Solar Pump	Part No.	kW	Part No.
10-FDSP 0.55 kW-HR	308 752 681	FD Solar 0.55 kW N4	581 013 000 86C-62IP000	10	10SL07S4-HRXB	830 008 624	0.75	234 802 6700L
25-FDSP 0.55 kW-HR	308 752 681	FD Solar 0.55 kW N4	581 013 000 86C-62IP001	25	25SL07S4-HRXB	830 008 661	0.75	234 802 6700L
50-FDSP 1.10 kW-HR	308 754 683	FD Solar 1.10 kW N4	581 014 200 86C-62IP002	50	50SL07S4-HRXB	830 008 654	1.10	234 703 6700L

*full 316 Stainless Steel motors available on request

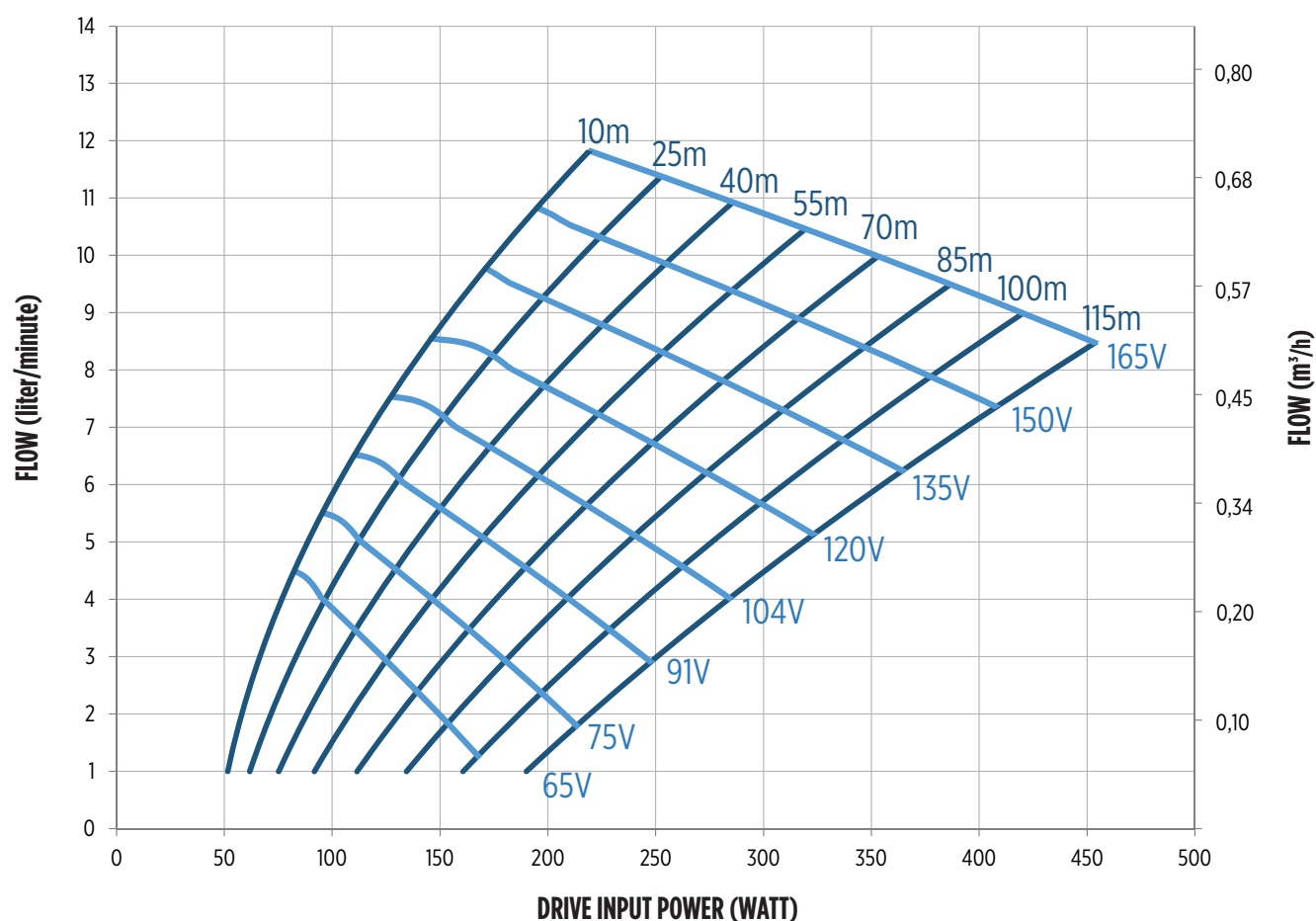
Optional Flow Switch (BSPP)	
Model	Part No.
C25	226 014 101

* Motors shown above include an individual conductor lead installed in the motor.

** All pumps included in HR SolarPaks are supplied an internal check valve.

PHOTON™ HR SOLARPAK - 0.55 KW PERFORMANCE

10-FDSP 0.55 KW HR

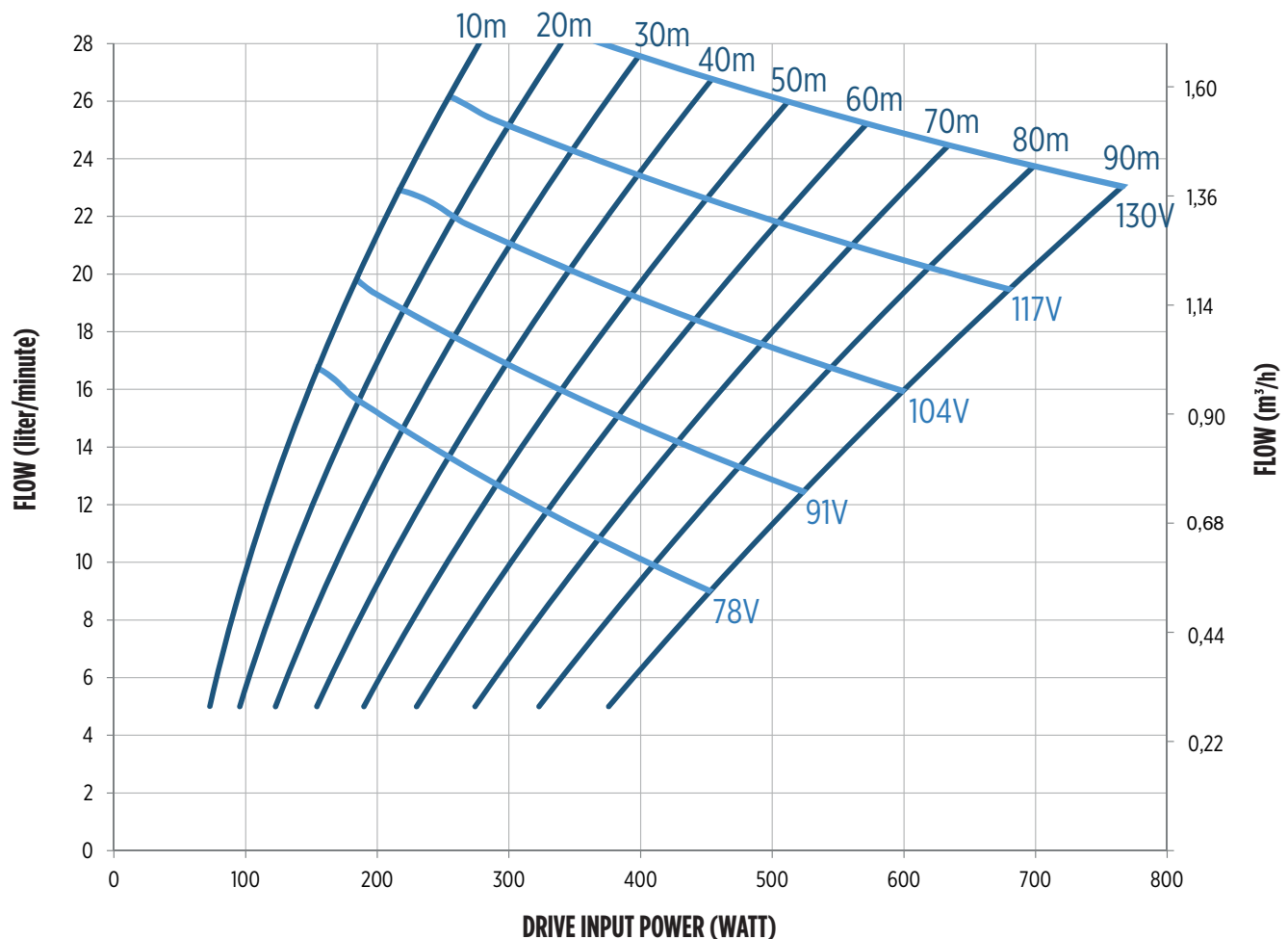


TDH (m)	DRIVE INPUT POWER (WATTS)*							
	100	150	200	250	300	350	400	450
	Flow (lpm)							
10	5.8	8.9	11					
25	4.2	7.1	9.4	11.5				
40	3	5.7	7.9	9.9				
55	1.5	4.1	6.3	8.3	10			
70		3	5	6.9	8.5	10		
85		1	3.7	5.5	7	8.5		
100			2.5	4.1	5.8	7	8.5	
115			1.5	3	4.5	6	7	8.5

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

PHOTON™ HR SOLARPAK - 0.55 KW PERFORMANCE

25-FDSP 0.55 KW HR



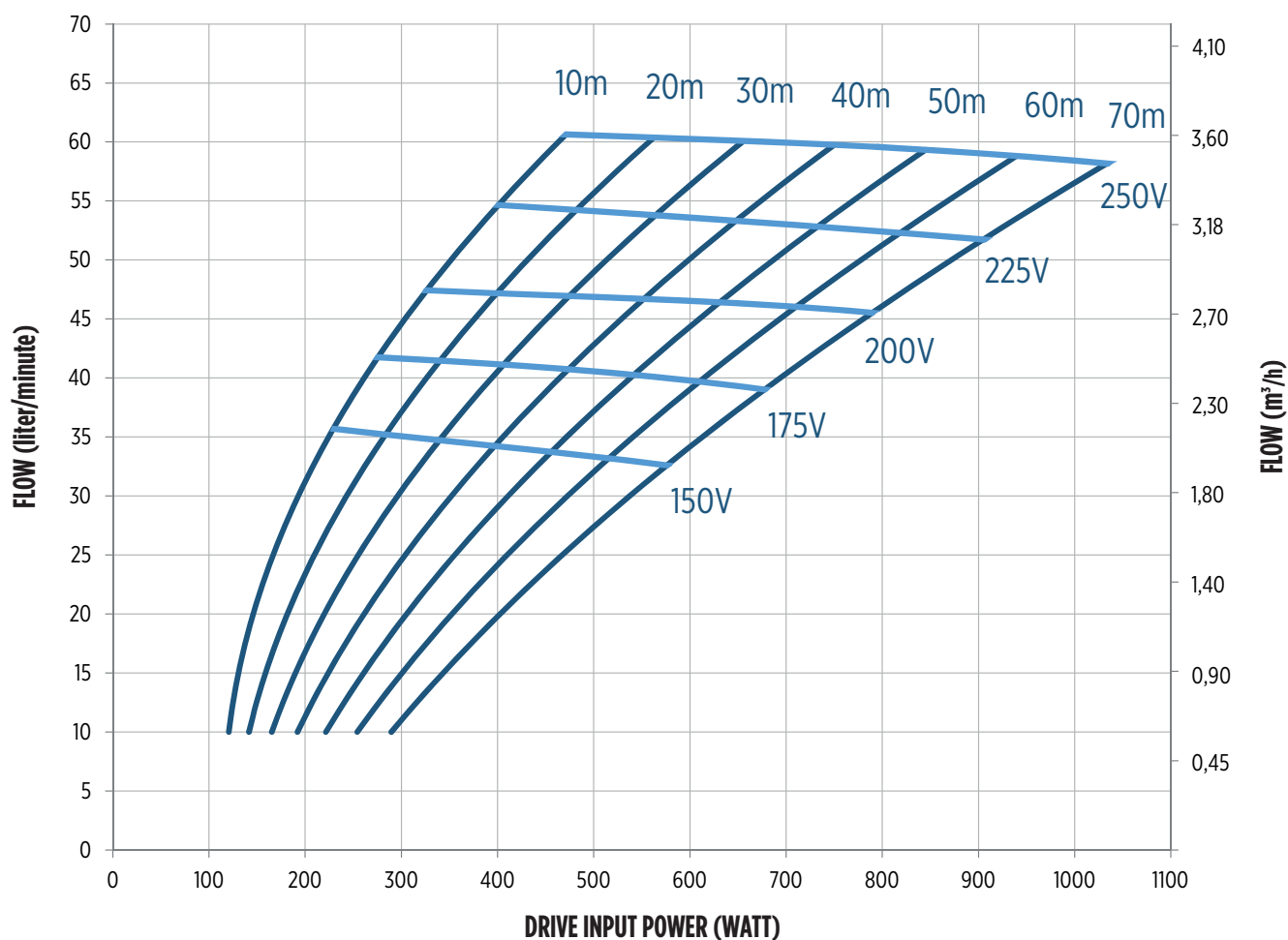
TDH (m)	DRIVE INPUT POWER (WATTS)*						
	100	200	300	400	500	600	700
	Flow (lpm)						
10		21					
20		17	25				
30			21	27.5			
40			17	23.7			
50			13.5	20	25.9		
60			10	16	21.8		
70				12.5	18	23	
80				9.7	15	19.5	24
90					11.5	16	20

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.



PHOTON™ HR SOLARPAK - 1.1 KW PERFORMANCE

50-FDSP 1.10 KW HR



TDH (m)	DRIVE INPUT POWER (WATTS)*							
	300	400	500	600	700	800	900	1000
	Flow (lpm)							
10	45	55						
20	37.5	47.5	55					
30		41	49	56				
40		35	43	50	56.5			
50			37.5	45	51	57		
60			32.5	40	45	51	57	
70			27.5	35	40	45.5	52	56.5

*NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges. Performance data are based on measurements with Franklin Electric original equipment and complies to industry standards.

FHOTON™ HR SOLARPAK – DRIVE SPECIFICATIONS

HR SOLAR CONTROLLER

	0.55 kW Model	1.1 kW Model
Controller Model No.	58101300086C-62IP000 58101300086C-62IP001	58101420086C-62IP002
Output		
Max. Output Voltage	100V AC, 3-phase	200V AC, 3-phase
Max. Amps (RMS)	8.6 A, each phase	6.8 A, each phase
Output Frequency	20-50 Hz	
Efficiency at Max Power	98%	
PV Source / Input		
Max. Input Voltage	*45 - 300 VDC	**115 - 420 V DC
Max. Amps Input	7.2 A DC, continuous	6.2 A DC, continuous
Power at MPP	Up to 1200 watts	Up to 2000 watts
VOC	300 V	420 V
Controller Size - L x W x D		
mm	152 x 152 x 190	152 x 152 x 190
Controller Weight		
kg	4.5	4.5
Operating Conditions		
Temperature Range	-25 °C to 50 °C (40 °C max. when using AC generator)	
Relative Humidity Range	0 to 100% Condensing	
Enclosure Rating	IP66	

* 45 and ** 115 VDC for the 0.55 kW and 1.1 kW models respectively should not be interpreted as an adequate rated PV array output voltage for any installation. See the PV Solar Array Specifications and System Sizing program for indication of adequate array voltage to provide useful pumping capability.

FHOTON™ HR SOLARPAK - DIMENSIONS

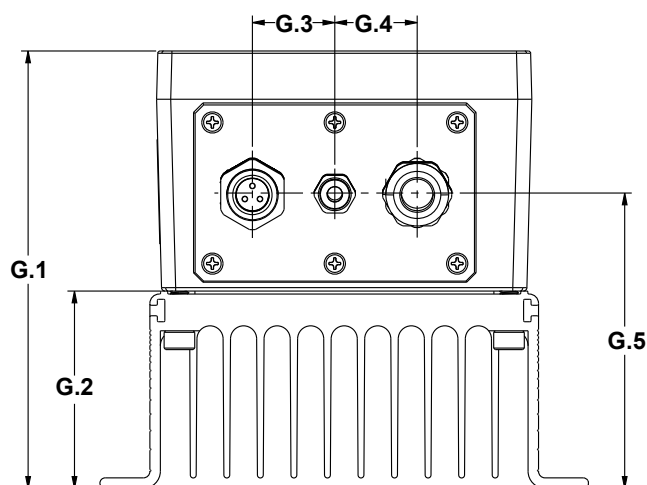
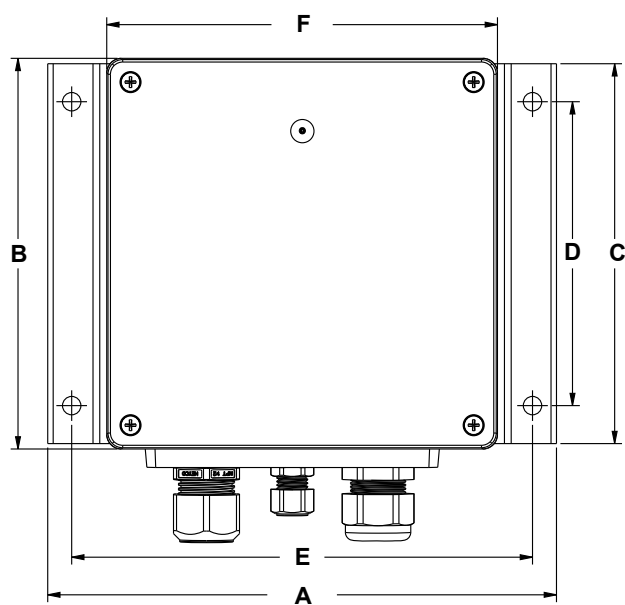
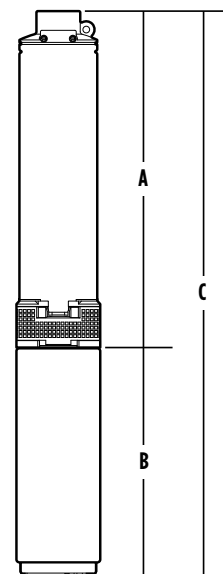
HR SOLAR PMA DIMENSIONS

SolarPAK HR	kW	A	B	C	Discharge		Pump Weight	PMA Weight
		mm	mm	mm	inches	mm	kg	kg
10-FDSP 0.55 kW-HR	0.75	630	270	900	1" 1/4	32	4.5	14.1
25-FDSP 0.55 kW-HR	0.75	630	270	900	1" 1/4	32	5.5	15.0
50-FDSP 1.10 kW-HR	1.10	630	298	928	1" 1/4	32	6.4	15.6

NOTE: Maximum diameter across cable guard is 99 mm on all models.

SOLAR CONTROLLER DIMENSIONS

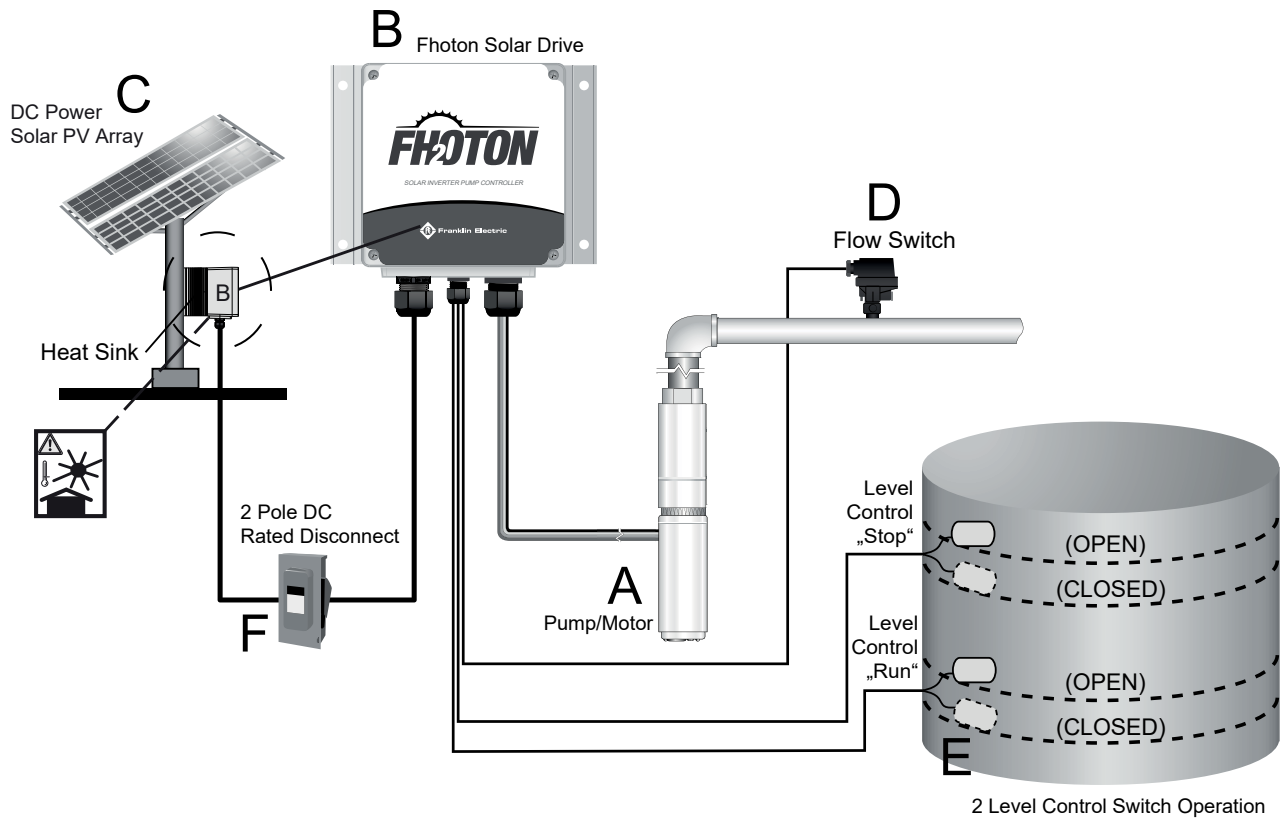
Dimensions	A	B	C	D	E	F	G.1	G.2	G.3	G.4	G.5
mm	208	158	155	124	188	158	186	84	35	35	125



FHOTON™ SOLARPAK - QUICK INSTALLATION GUIDE

SOLARPAK INSTALLATION

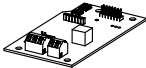
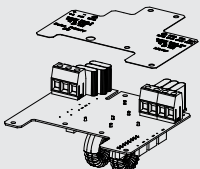
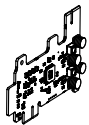
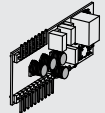
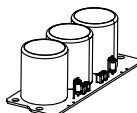
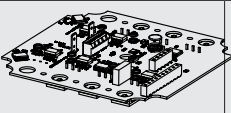
The Franklin Electric Photon™ Drive is designed to be part of a system that consists of:

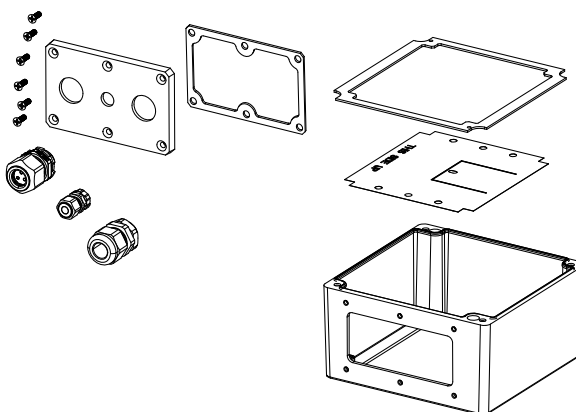
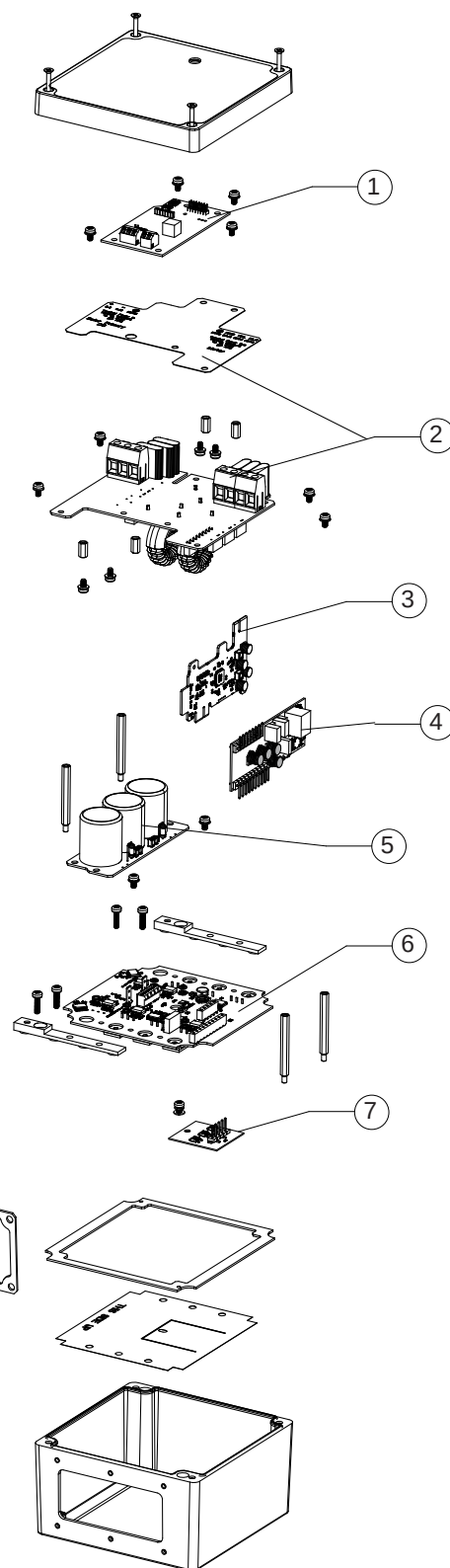


- A. Pump and Motor
- B. Fhoton™ Solar Drive
- C. Solar Array (not included)
- D. Flow Switch
- E. Control Switches (not included)
- F. DC Disconnect (not included)



FHoton Drive Spare Parts

No.	Part Description	Layout	Qty.	Rating [kW]	Spare Part number
1	User Interface Card		1	0,55 - 1,1	308 752 101
2	Terminal Block and Filter Card		1	0,55	308 752 102
				1,1	308 754 101
3	Motor Control Card		1	0,55 - 1,1	308 752 103
4	Power Supply Card		1	0,55	308 752 104
				1,1	308 754 102
5	Capacitor Board		1	0,55	308 752 105
				1,1	308 754 103
6	Inverter Card		1	0,55 - 1,1	308 752 106
7	IMS Resistor Card		1	0,55	308 752 107
				1,1	308 754 104



PHOTON™ SOLARPAK SELECTOR

Franklin's user-friendly Photon™ SolarPAK Selector helps you determine the optimal system for your solar project. Simply input your location, duty requirements and solar panel characteristics (if known) and the system will automatically recommend the Photon model and array configuration best for your application.


SolarPAK

Selection Criteria Search Results

BASIC OPERATING CONDITIONS

Total Dynamic Head:

Solve To:

Flow:

Thread Type:

LOCATION



Degrees Latitude:

Degrees Longitude:

City/State:

Country:

SOLAR PANEL CHARACTERISTICS

Performance Data Type:

Watts (Wmpp):

Volts (Vmpp):

Volts (Voc):

Use Solar Tracker Array: ☐

Peak Month For Sizing:

WIRE*

Length:

Material Type:

Insulation Temperature:

*Wire sizing and wire lengths must conform to local, national or government electrical wiring standards and regulations.

Solar Irradiation for Rudolf-Diesel-Stra?e 20 Wittlich: 3 Solar Hours



Month	Average Monthly Solar Irradiation (Hours)
Jan	1.4
Feb	2.3
Mar	3.0
Apr	3.8
May	4.3
Jun	4.2
Jul	4.3
Aug	4.2
Sep	3.3
Oct	2.3
Nov	1.5
Dec	1.2


Franklin Electric

* Above screen shot is illustrative only and is subject to continuous improvement

The Franklin Electric Photon™ SolarPAK Selector and other information on our series of solar products can be found at franklinwater.eu/solar

6" High Efficiency Solar System

Quality in the Well

Franklin Electric is pleased to announce the introduction of the extended SOLAR feature for its 6" High Efficiency Submersible Borehole systems (HES).

These systems, consisting of a full stainless, synchronous submersible NEMA motor associated with a variable frequency drive and matching output filter have proven their world-class efficiency in over 300 applications to date, saving up to 20% of electrical energy when compared to standard synchronous motor systems.



System Product advantages:

- One-stop shop – perfectly matching components guarantee first class performance / efficiency
⇒ *Less panels, more water respectively*
- Direct DC feeding
- Special MPP algorithm for centrifugal borehole pumps
- Top class protection with Electronics in IP66/54
⇒ *No cabinet - no cooling fan/ dust filter - no maintenance*
- GORE® vent
⇒ *No condensation*
- Easy set-up due to tailored pre-setting, user interface and **Franklin Electric software**
- Reduced amps
⇒ *Smaller drop lead cross size*
- Higher power density
⇒ *Lightweight*
- Significant lower motor heat rise
⇒ *Increased lifetime*
- Communication Modbus (RS485 and Ethernet)

System Technical Specification:

- Rating: 4 - 30kW
- Power Supply: Voltage 400 - 800V DC (min. starting voltage 440V)
- Frequency 30 - f_N (50 respectively 60Hz)

System Options:

- Plug-in card 6x DI/DO - 308 170 201
- Plug-in card PT100 - 308 170 202
- Plug-in card Profibus - 308 170 203
- Plug-in card 1x AI & 2x AO 308 170 206
- Other voltages
- Sinus output filters in IP54
- PT100 protection
- Motors in 316SS and 904L

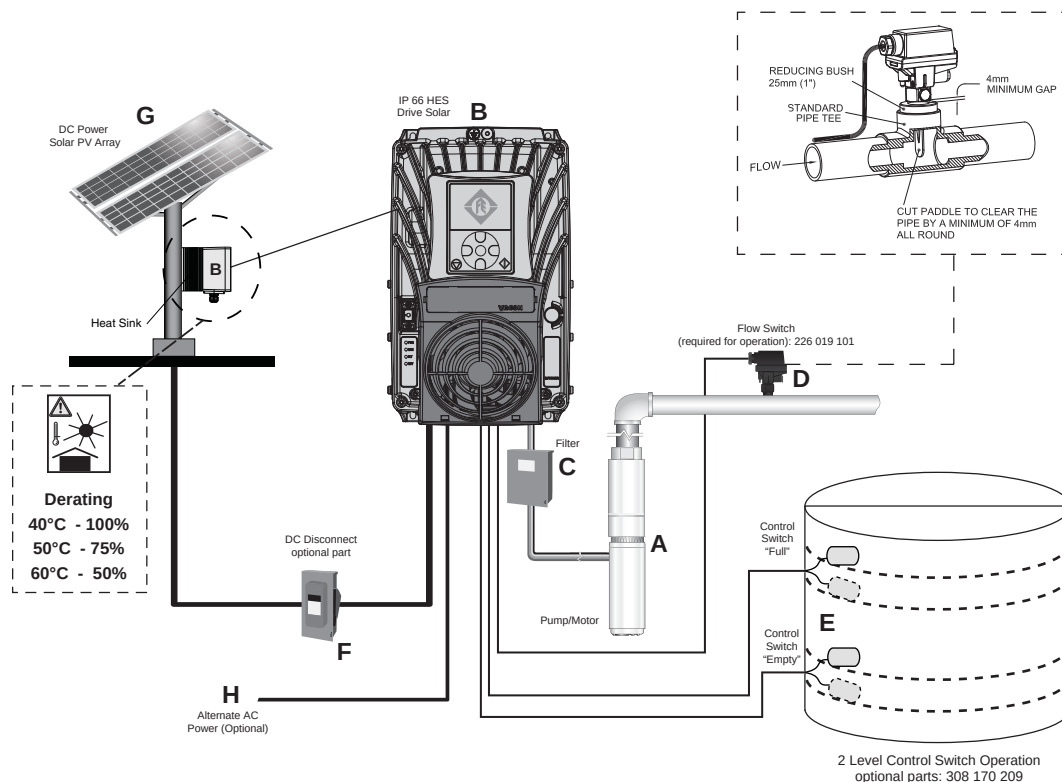
Model Numbers Solar System Option

400V High Efficiency Solar System (304SS Motor, VFD & Filter and Flow switch)

P_N [kW]	VFD IP66 & Filter IP54	
	du/dt Filter	Sinus Filter
4,0 - 7,5	308 010 216S	308 010 316S*
9,3 - 11	308 014 223S	308 014 323S*
13 - 18,5	308 014 238S	308 014 338S*
22 - 30	308 016 261S	308 016 361S*

*Non-stock items

For lead length > 120m please consult Franklin Electric



- A. High Efficiency Motor and Pump
- B. IP66 HES Drive Solar
- C. OutputFilter
- D. Flow Switch (226 019 101)
- E. Level Control Switch (not included- serarate order 308 170 209)
- F. DC Disconnect, not included- separate order:
0 - 11A/800V DC - 308 170 313
12 - 22A/800V DC - 308 170 325
- G. Solar Array (not included)
- H. AC Alternative Power supply (not included)

Control modes and necessary sensor technologies

Process reference	Control reference	Flow meter	Pressure sensor	Level sensor	PT100 sensor & Drive slot card	Flow switch (digital)
Manual Mode	No				Yes*	
Solar	No				Yes*	mandatory

*please consult Franklin Electric

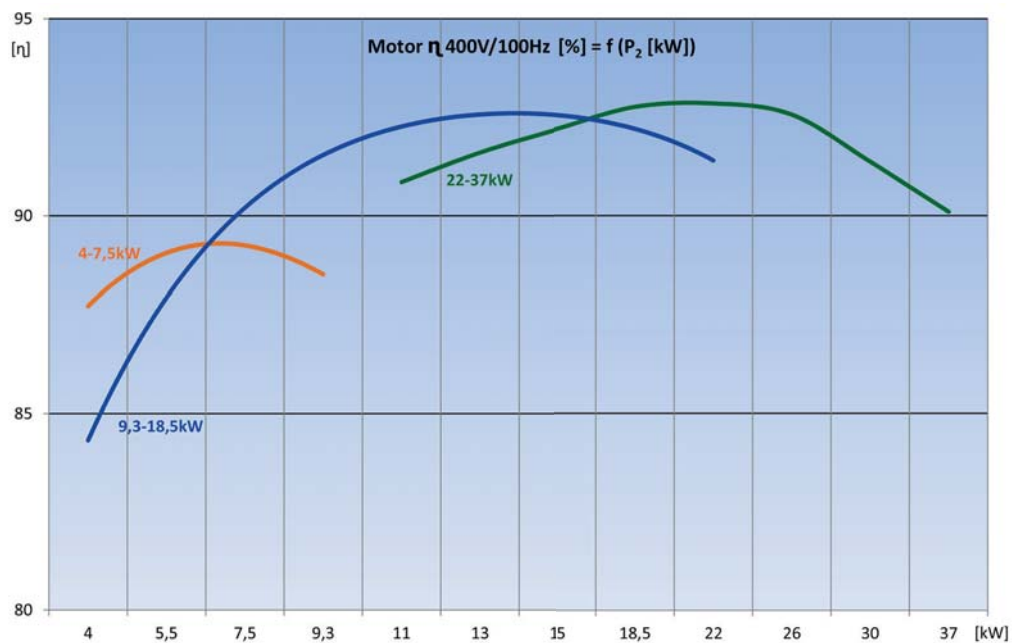


Performance Data 400V-50Hz / 460V/60Hz

400V-50Hz / 460V-60Hz	P_N [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A / I_N^* [A]	η [%]	PF [cos ϕ]	T_N [Nm]	T_A / T_N^* [Nm]
308 010 X16	4	15,5	3000 / 3600	8	1	88	0,95	12,9	1
	5,5	15,5	3000 / 3600	10	1	89	0,95	17,5	1
	7,5	15,5	3000 / 3600	13	1	89,5	0,95	23,8	1
308 014 X23	9,3	15,5	3000 / 3600	18	1	91,5	0,95	29,6	1
	11	15,5	3000 / 3600	20	1	92	0,95	35	1
308 014 X38	13	15,5	3000 / 3600	23	1	92,5	0,95	41,5	1
	15	15,5	3000 / 3600	26	1	92,5	0,95	46,1	1
	18,5	15,5	3000 / 3600	32	1	92	0,95	59	1
308 016 X61	22	27,5	3000 / 3600	39	1	93	0,95	70	1
	26	27,5	3000 / 3600	46	1	92,5	0,95	82,6	1
	30	27,5	3000 / 3600	54	1	91,5	0,95	95,5	1
308 016 X87	37	27,5	3000 / 3600	72	1	90	0,95	117,8	1

Performance data are based on measurements with Franklin Electric original equipment!

*Since this is an integrated system (motor plus electronics) these figures relate to VFD input



6" High Efficiency Motor



Motor Features:

- Motor complete in 304SS
- PE2/PA winding as a standard
- SandFighter® SIC seal system
- Easy rewinding - winding housings removable
- Non-contaminating FES93 filling
- All motors pre-filled and 100% tested
- Max. storage temperature -15 ... +60°C
- Drinking water approved

Motor Technical Specification:

- 4 – 37kW
- Power supply 400V/100Hz
- 6" NEMA flange with studs (M12)
- Protection IP68
- 20 Starts per hour
- Installation vertical (for horizontal operation please consult FE)
- Motor lead in 4m length
- 30°C nominal ambient temperature with 0,2m/sec cooling flow

Motor Options:

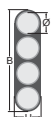
- Other voltages
- PT100 temperature sensor (retrofitable)
⇒ VFD PT100 Plug-in Card (308 170 202) necessary
- Motors complete in 316SS and 904L



System model number	P _N [kW]	Motor model number		
		304SS	316SS	904L
308 010 xxx	4 - 7,5	262 010 8711	262 010 6711	262 010 7711
308 014 xxx	9,3 - 18,5	262 014 8711	262 014 6711	262 014 7711
308 016 xxx	22 - 37	262 016 8711	262 016 6711	262 016 7711



Motor Short Leads*

DOL	P _N [kW]	St.#	Ø [mm²]	H / B [mm]	Length [m]	Lead Mod.- Nr.	Lead seal Kit
	4 - 18,5	1	4G4	8,2 x 23,0	4	308 710 101	308 660 812
	22 - 37	1	4G6	9,0 x 25,0	4	308 710 103	308 660 813

additionally the special Tape **700 541 688** is absolutely necessary

*Cables are designed for submerged operation.

Motor Drop Lead

Lead lenghts in meters for 400V-50Hz / 460V-60Hz and max. 3% voltage drop at 50°C ambient

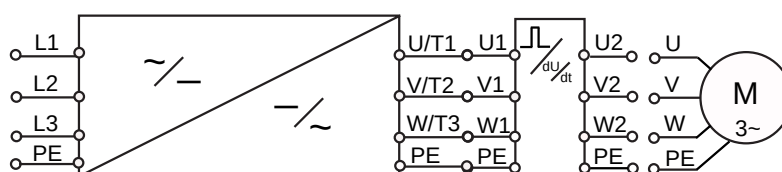
P _N [kW]	cable size mm², copper wire - 90°C rated insulation						
	4	6	10	16	25	35	50
4	160	250	410	-	-	-	-
5,5	140	200	340	530	-	-	-
7,5	100	150	250	390	-	-	-
9,3	75	110	190	300	460	-	-
11	65	100	160	260	400	-	-
13	55	85	140	220	340	460	-
15	-	70	120	190	300	400	-
18,5	-	60	100	160	240	320	440
22	-	-	80	130	200	270	370
26	-	-	65	110	170	230	320
30	-	-	55	90	140	190	270
37	-	-	-	65	100	140	200

For lead lenght > 120m please consult Franklin Electric.

Further potential energy saving due to more conservative lead sizing (< 3% voltage drop)

Electrical Connection

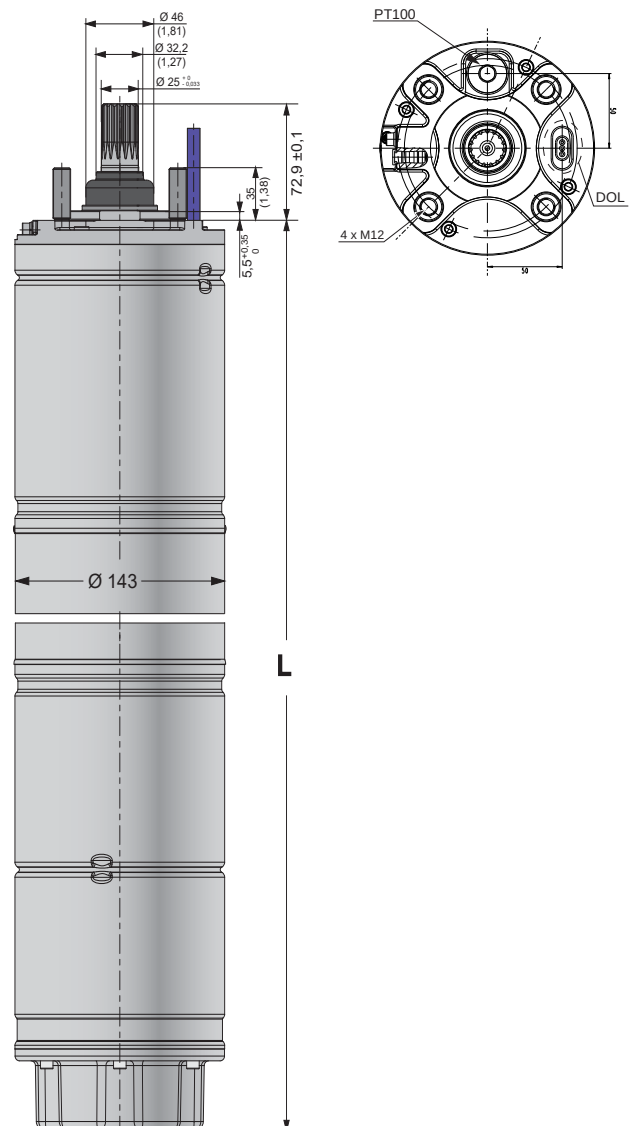
DOL



U	V	W	PE
brown	grey	black	yellow/green

Motor Design

304SS / 316SS / 904L



Construction Materials

Component	304SS	316SS	904L
Shaft Extensions	1.4021	1.4462	1.4462
Slinger	NBR	NBR	NBR
Seal	SiC/SiC	SiC/SiC	SiC/SiC
End bell, NEMA	1.4308	1.4408	1.4539
Stator Shell	1.4301	1.4571	1.4539
Diaphragm	EPDM	EPDM	EPDM
Diaphragm Cover	1.4301	1.4404	1.4539

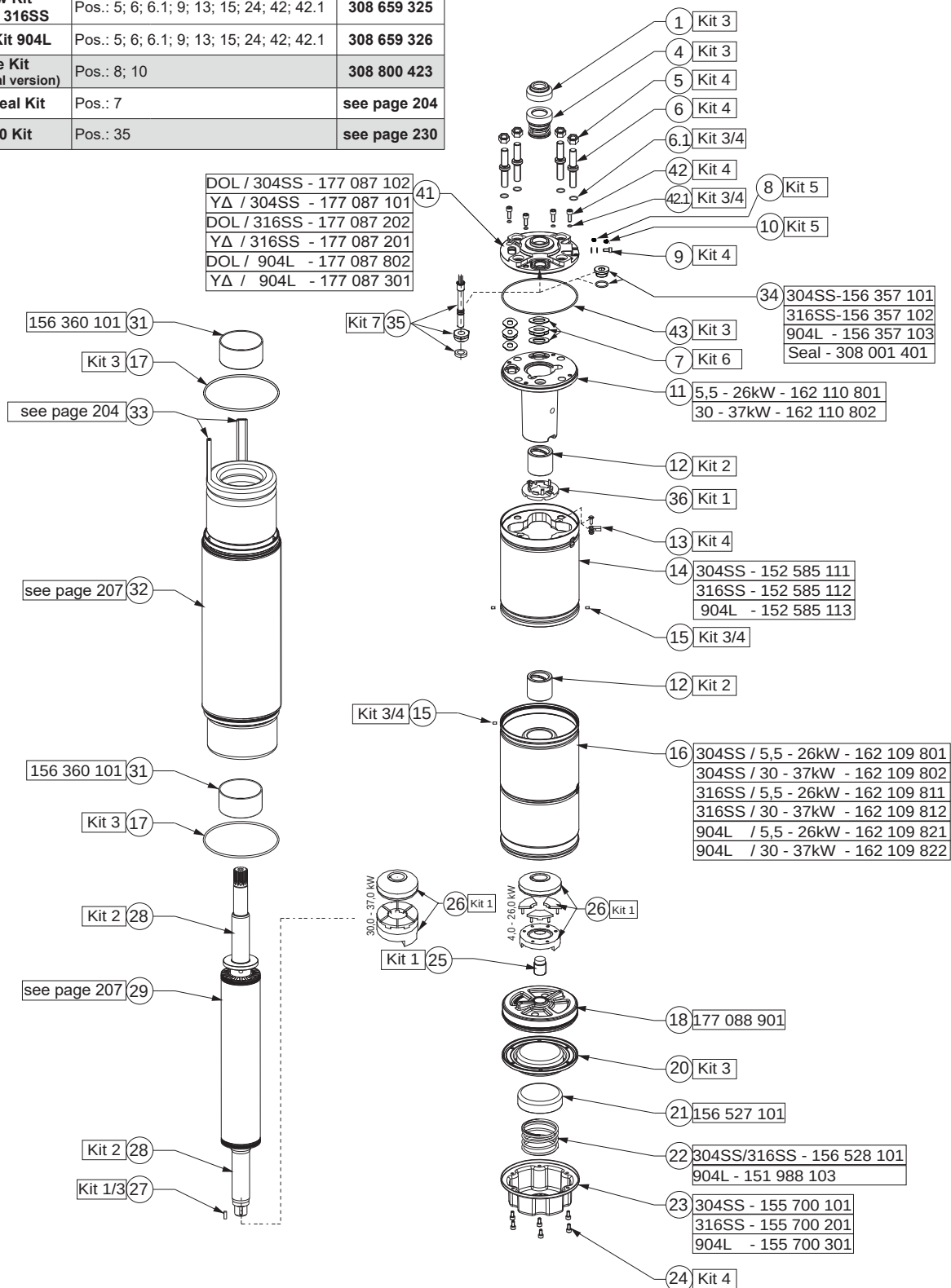
Motor Lengths and Weights

P [kW]	Motor Lengths L [mm]	Motor weights [kg]		Motor Shipping Size		
		Motor	incl. pack	B [mm]	H [mm]	L [mm]
4 - 7,5	655	41	46	155	270	905
9,3 - 18,5	809	56	61	155	270	1135
22 - 37	971	72	77			



Motor Spare Parts 304SS / 316SS / 904L

Kit 1	Thrust Bearing Kit	4-18,5kW	Pos.: 17; 25; 26; 27; 36	308 750 301
		22-37kW		308 750 302
Kit 2	Radial Bearing Kit	4-18,5kW	Pos.: 12; 28	308 750 401
		22-37kW		308 750 403
Kit 3	Seal Kit 304SS / 316SS / 904L	Pos.: 1; 4; 6.1; 15; 17; 20; 34; 42.1, 43		308 800 422
Kit 4	Screw Kit 304SS / 316SS	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 325
	Screw Kit 904L	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 326
Kit 5	Valve Kit (all Material version)	Pos.: 8; 10		308 800 423
Kit 6	Lead Seal Kit	Pos.: 7		see page 204
Kit 7	PT100 Kit	Pos.: 35		see page 230



304SS Stator and Rotor Model Number (400V-50Hz / 460V/60Hz)

P _N [kW]	Stator (incl. winding and 4m motor lead)	Rotor
4 - 7,5	327 086 701K	161 122 805K
9,3 - 18,5	327 075 701K	161 122 802K
22 - 37	327 076 701K	161 122 803K

Windings 400V-50Hz / 460V/60Hz

P _N [kW]	Mod.-No. Windingkit	Turns per coil	Wire diameter [mm]	Type of Isolation	Group connection	Total Wire length [m]	Resistance coil [Ω]	Resistance DOL (U1-V1) [Ω]
4 - 7,5	327 086 999	28+28+28+28	1,3 / 2,2	PE2/PA	Serie Y	212	0,2393	1,914
9,3 - 18,5	327 075 999	14+14+14+14	2 / 3,1	PE2/PA	Serie Y	161	0,0794	0,635
22 - 37	327 076 999	18+18+18+18	1,7 / 2,7	PE2/PA	Serie / Parallel Y	276	0,1797	0,359

Insulation resistance (20°C / 500 VDC)

New motor without drop cable	400 >	MΩ
Used motor without drop cable	20 >	MΩ
New motor with drop cable	4 >	MΩ
Used motor with drop cable	1	MΩ

Motor Repair Instructions

Pictured Repair Instructions 304SS / 316SS / 904L		308 018 624
Motor Mounting Kit		308 239 214

Variable Speed Drive (VFD)

VFD Features:

- Supports induction and permanent magnet motors
- Top class protection IP66 with Aluminium die casting powder coated enclosure . Alternative in IP21 with plastic enclosure
- Optimized for submersible permanent motor feeding – first class performance (Tailored pre-setting, user interface and software)

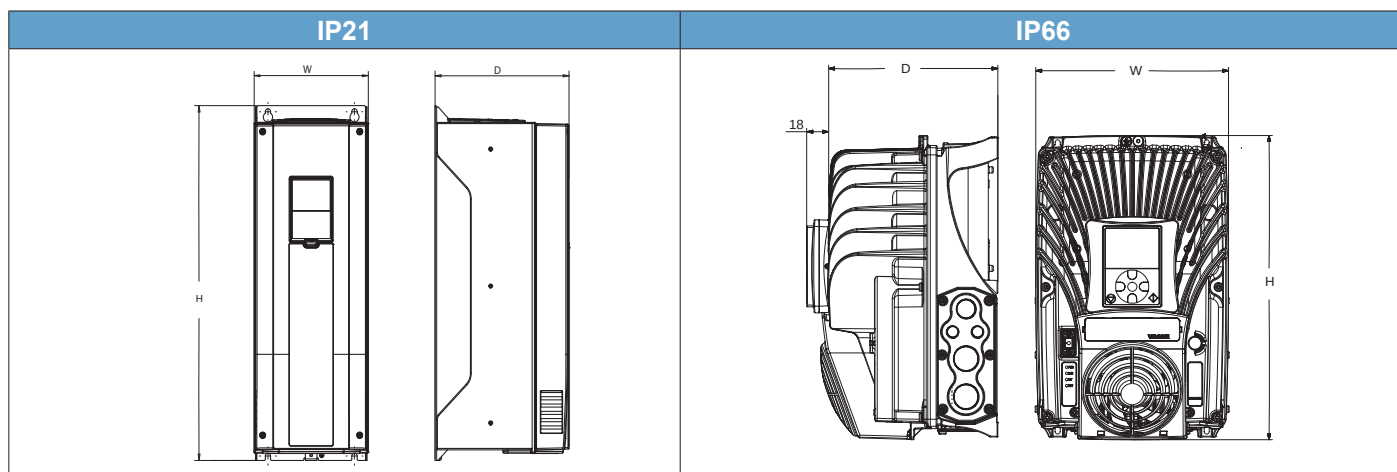


VFD Technical Specification:

Power supply	Input voltage U_{IN}	380 - 500V ; -10%....+10% 400 - 840V DC - min starting voltage 440V
	Input frequency f_{IN}	47 - 65Hz
	Starts per hour	20 ; with min 3min rest period
Motor connection	Output voltage	0 - U_N
	Output current	I_N at rated Ambient temperature (40°C) Overload: IP66: 1,5 x I_N (1min/10min) IP21: 1,1 x I_N
	Output frequency	0- f_N , resolution 0,01Hz
Performance	Efficiency	97,5%
Control characteristics	Switching frequency	3,6 6 kHz; default setting 4 kHz
Ambient conditions	Operation temperature	-10°C...+50°C (>40°C with derating) - 40°C optional for IP66
	Storage temperature	-40°C+70°C
	Altitude	3000m (>1000m with derating)
EMC	Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment
Communication	RS 485	Standard: Modbus
	Ethernet	Standard: Modbus
I/O connections	Digital Input (DI)	6x
	Analog Input (AI)	2x
	Analog Output (AO)	1x
	Relay Output (RO)	2x (change-over contact)

For further details please see separate Franklin Electric Quick Installation guide and VFD literature.

VFD Model Numbers and Dimensions 400V-50Hz / 460V/60Hz



VFD High Efficiency System Model Numbers and Dimensions 400V-50Hz / 460V/60Hz IP21 up to 37kW

System Model Number	AC Drive Type	IP Type	I_N [A]	Dimensions WxHxD [mm]	Weight [kg]
308 010 016/116	314 000 108	21	16	144 x 419 x 214	10,0
308 014 023/123	314 000 101	21	23	144 x 419 x 214	10,0
308 014 038/138	314 000 102	21	38	195 x 557 x 229	20,0
308 016 061/161	314 000 103	21	61	195 x 557 x 229	20,0
308 016 087/187	314 000 104	21	87	237 x 660 x 259	37,5

VFD High Efficiency System 400V-50Hz / 460V/60Hz IP66 up to 30kW

System Model Number	AC Drive Type	IP Type	I_N [A]	Dimensions WxHxD [mm]	Weight [kg]
308 010 216/316	314 000 109	66	16	233 x 368 x 214	14,9
308 014 223/323	314 000 105	66	23	233 x 368 x 214	14,9
308 014 238/338	314 000 106	66	38	350 x 500 x 236	31,5
308 016 261/361	314 000 107	66	61	350 x 500 x 236	31,5

VFD Options:

- 200V - 230V
- Plug-in card 6x DI/DO 308 170 201
- Plug-in card PT100 308 170 202
- Plug-in card Profibus 308 170 203
- Plug-in card 1x AI & 2x AO 308 170 206
- Replacement Battery VFD IP21 - 308 170 205
- Replacement Battery VFD IP66 - 308 170 204

Output Filter

Output Filter Features:

- du/dt filter for lead lengths up to 120m, for lead lengths >120m please consult Franklin Electric.
- filter available in IP54 and IP00
- Optimized for submersible permanent magnet motor feeding



Output Filter Technical Specification:

- Voltage → 380 - 500V
- Frequency → 0 - 120 Hz
- Switching Frequency → 4kHz
- Ambient Temperature → < 40°C

Output Filter Options:

- Sinus filter in IP54 and IP00 for lead length >120m and/ or special applications
- Other voltages

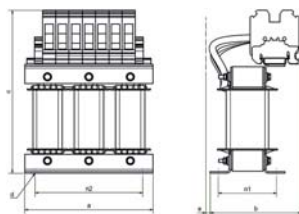
Output Filter dV/dt High Efficiency System 400/500V Model Data - Protection Class IP00*

System model number	Filter order code	I _N [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d	e		main [mm²]	PE [mm²]	main [Nm]	PE [Nm]
308 010 016 308 014 023	314 005 101	24	125	92	161	55	100	5	15	2,5	1,5 - 16	1,5 - 16	2,5 - 3	2,5 - 3
308 014 038	314 005 102	38	155	96	197	56	130	8	20	4	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 061	314 005 103	62	155	105	197	65	130	8	25	5	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 087	314 005 104	88	190	116	238	67	170	8	30	8	25 - 50	M10	6 - 8	46 - 50

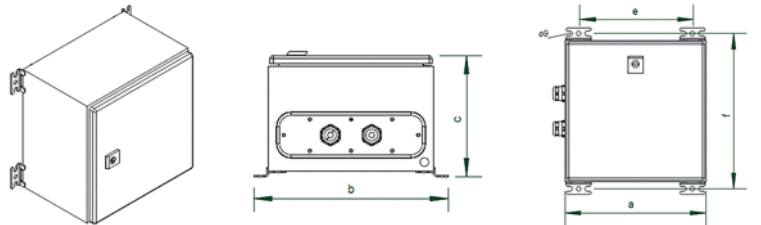
Output Filter dV/dt High Efficiency System 400/500V Model Data - Protection Class IP54*

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
										[mm²]	[mm²]	[Nm]	[Nm]
308 010 216 308 014 223	314 005 110	24	325	354	227	242	330	2x23-33,5	10	1,5 - 16	1,5 - 16	2,5 - 3	2,5 - 3
308 014 238	314 005 111	38	325	354	227	242	330	2x23-33,5	12	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 016 261	314 005 112	62	325	354	227	242	330	2x29-40	18	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7

IP00 dV/dt Filter - Outlines

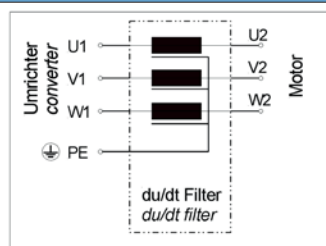


IP54 dV/dt Filter - Outlines



*By changing the supplier it can be differentiated with the dimensions!

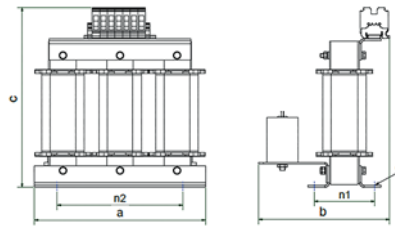
dV/dt Filter Connection Plan



Output Filter Sinus High Efficiency System 400/500V Model Data - Protection Class IP00*

System model number	Filter order code	I_N [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main [mm ²]	PE [mm ²]	main [Nm]	PE [Nm]
308 010 116	314 005 105	16	240	188	285	75	185	10	18	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 123/131	314 005 106	31	240	208	285	95	185	10	27	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 138/146	314 005 107	46	300	222	351	131	250	10	34	25 - 50	25 - 50	6 - 8	6 - 8
308 016 161	314 005 108	72	360	276	410	127	264	10	56	25 - 50	25 - 50	6 - 8	6 - 8
308 016 187	314 005 109	105	360	276	413	127	264	10	57	35 - 95	M10	15 - 20	46 - 50

IP00 Sinus Filter - Outlines

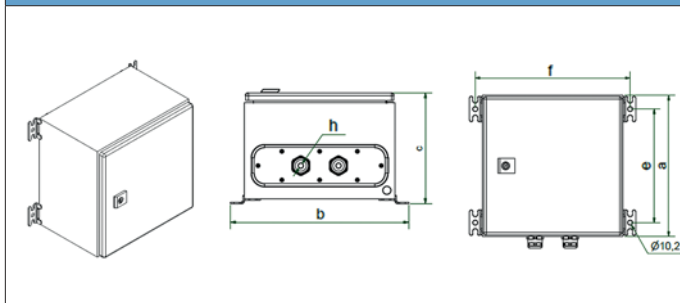


Output Filter Sinus High Efficiency System 400/500V Model Data - Protection Class IP54*

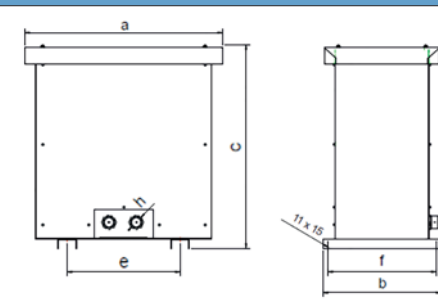
System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main [mm²]	PE [mm²]	main [Nm]	PE [Nm]
308 010 316	314 005 117	16	600	435	230	542	410	2x23-33,5	49	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 323*	314 005 113	23	550	560	550	185	520	2x23-33,5	56	1,5 - 35	1,5 - 35	3,2 - 3,7	3,2 - 3,7
308 014 338*	314 005 115	38	770	610	620	450	570	2x23-33,5	65	25 - 50	25 - 50	6 - 8	23 - 25
308 016 361*	314 005 116	72	770	610	620	450	570	2x35-46	112	25 - 50	25 - 50	6 - 8	23 - 25

*Floor mount

IP54 Sinus Filter - Wall mount outlines

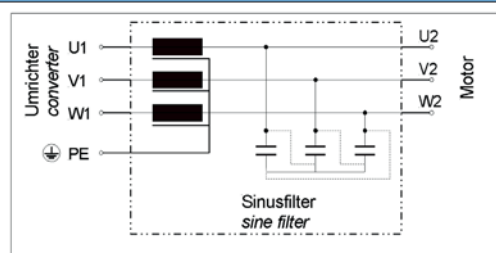


IP54 Sinus Filter - Floor mount outlines



*By changing the supplier it can be differentiated with the dimensions!

Sinus Filter Connection Plan





SS Pump

For any pump support please refer to:
<http://franklinwater.eu/products/>



SubMonitor Motor Protection

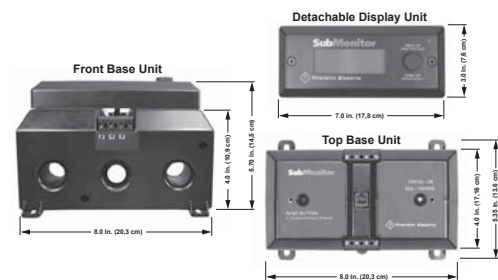
The SubMonitor is designed to protect 3-phase pumps with horsepower ratings between 3 and 200 Hp. Current, voltage and motor temperature are monitored using three integrated current transformers. A digital display provides current and voltage readings for all three legs and allows the user to set up the SubMonitor quickly and easily. The SubMonitor is the latest innovation in 3-phase pump protection from Franklin Electric. Using state-of-the-art technology, the SubMonitor provides the ultimate protection for a pump and motor. There is simply no better way to protect a large 3-phase submersible pump investment than with a SubMonitor. It's the protection device that can sense overheating straight from the motor windings! And it is made by the world leader in submersible motors - Franklin Electric.



Product advantages:

- Quick setup to monitor a motor, simply enter the Line Frequency (Hz), Line Voltage (volts), and Motor Service Factor Amp rating
- Digital display indicates voltage and current on all three legs at the same time, and fault messages are in easily understandable text
- Monitors - Under/Overload; Under/Overtorque; Current Unbalance; Overheated Motor (Subtrol Equipped); False Start (Chattering); Phase Reversal
- For motors with service factor amp ratings between 3 and 359 amps
- One unit covers the entire range from 190 to 600 Volts
- No need to make additional turns around the CT or add external CTs
- Password Protection Option
- DIN Rail Mounting Option
- Stores fault, setting changes, and pump run-time, that can be accessed through the display
- Detachable NEMA 3R display unit can be mounted on panel door
- UL 508 Listed

Model number	
Premium Package	586 000 5100
Input Voltage	190 – 600 VAC
Frequency	60/50 Hz
Motor Service Factor Amps	3 to 359 Amps
Maximum Conductor Size Through Sensors	
Max. Diameter	0.920 in. (23 mm)
Trip Response	
Motor, Under / Overload, Under / Overtorque, Overheat Unbalance	3 seconds
Control Circuit Rating	1.5 Amp AC, up to 600 volts
Signal Circuit Rating	1 Amp AC, up to 250 volts (Incandescent: 100 watts max.)
Wiring Terminals	
Wire Gauge	#12 to #18 AWG
Tighten to	4.5 in-lbs
Weight (SubMonitor)	3.3 lbs/7,3 kg
Carton Size (Std. Unit)	7,75 in x 11,5 in x 6,75 in (19,7 cm x 29,2 cm x 17,1 cm)
Shipping Weight (Std. Unit)	3.5 Lbs./7.5 kg



SubMonitor Accessory



D3 Data Download Tool

D3 is a service tool that provides the capability to download data from SubMonitor and transfer that data to a PC.

Includes:

- D3 unit
- Transfer software
- USB cable

Part Nb.: 585 001 1100



SubStartSC® Single phase Submersible Motor Starter

The SubStartSC® range covers all PSC motors from 0.25kW to 2.2kW for all voltages. Ergonomic design, attention to detail and unique features make the SubStartSC® motor starter range your first choice when considering submersible motor protection. In conjunction with Franklin Electric submersible motors you now have an tangible water system advantage resulting in ease of installation and reliable protection.

Product features:

- Attention to detail – every aspect engineered for the application
- The complete package – The device is 100% compatible with the motor characteristics
- All in one name – Reliability backed by the leader in submersible motors



Ergonomically designed	
Mounting	Easy wall mounting without destroying the protection rating of the enclosure.
Wiring	Sufficient space is provided for ease of wiring.
Enclosure	
Protection	IP54
Material	PVC / Polycarbonat
Components	
ON/OFF switch	Illuminated integral ON/OFF switch for ease of power
Circuit breaker	Thermal circuit breaker for protection of the motor.
Capacitor	High quality motor run capacitor for long life
Terminal board	Terminal board suitable for ease of reliable connections
Cable glands	Cable glands to ensure IP54 rating

Technical Specifications:

Mechanical

Protection level	IP54
External dimensions	168 x 142 x 85mm
Weight	0,6 - 1,0 kg
Mounting	Wall mounting (mounting hardware provided)
Temperature	-5°C - +40°C
Humidity	50% at 55°C (without condensation)

Electrical

Voltage	220 - 240V; - 6 / + 10 %; 50Hz single phase
Current	2,2 - 16 A
Power	0,25 - 2,2 kW

Standards

IEC 60439-1

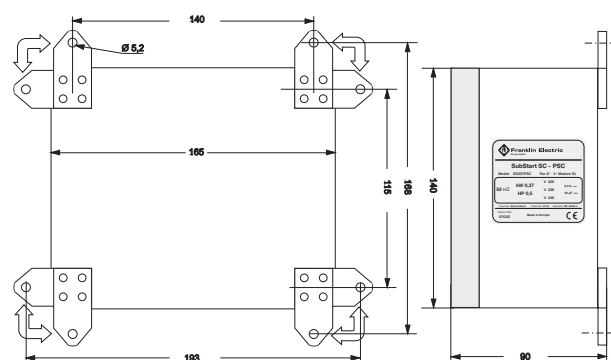
SubStartSC® Starter Specifications

Part Number ¹	Type ²	Motor rating [kW]	Nominal Current ³ [A]	Maximal expected current ⁴ [A]	Capacitor [μF] 450V ac
284 623 3510	SS025SC	0,25	2,4	9,4	12,5
284 624 3510	SS037SC	0,37	3,3	12,6	16
284 625 3510	SS055SC	0,55	4,3	17,7	20
284 626 3510	SS075SC	0,75	5,7	22,7	35
284 627 3510	SS110SC	1,10	8,4	33,9	40
284 628 3510	SS150SC	1,50	10,7	41,7	50
284 629 3510	SS220SC	2,20	14,7	61,8	70

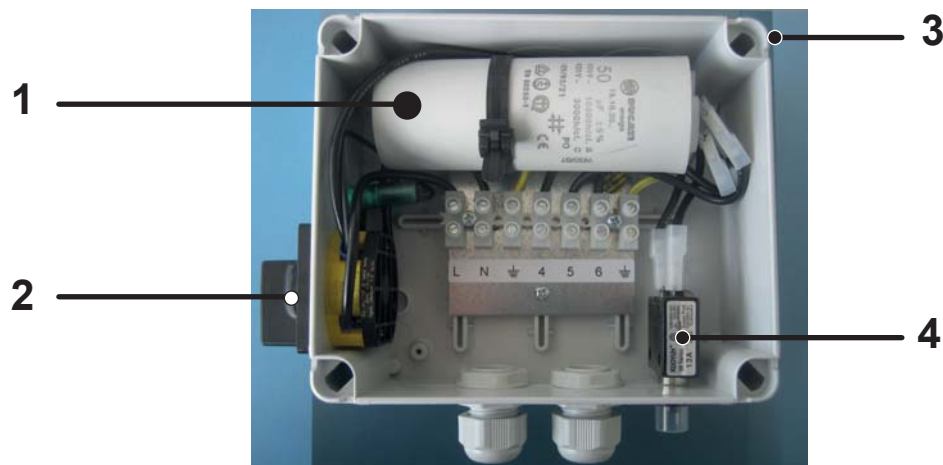
Notes:

1. Can be used with both 220-230V and 230-240V PSC motor ranges.
2. Type indicates motor power rating and motor type.
3. Nominal supply current at nominal voltage
4. Motor starting current under nominal conditions

Dimensions



SubStartSC® Spare Parts



1 Part: Capacitor - Kit

Rating [kw]	Mod. Nb.		μF
0,25	308 005 801	-	12,5
0,37	308 005 802	-	16
0,55	308 005 803	-	20
0,75	308 005 804	-	35
1,1	308 005 805	-	40
1,5	308 005 806	-	50
2,2	308 005 807	-	70



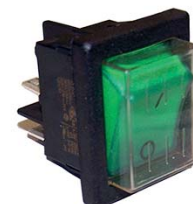
4 Part: Overload - Kit

Rating [kw]	Mod. Nb.		Amp
0,25	308 005 811	-	3
0,37	308 005 812	-	5
0,55	308 005 813	-	6
0,75	308 005 814	-	8
1,1	308 005 815	-	10
1,5	308 005 816	-	13
2,2	308 005 817	-	18



2 Part: Rotary - Switch - Kit

Mod. Nb.
308 005 822



3 Part: Rocker - Switch - Kit

Mod. Nb.
308 005 821



SubStart3P® Three phase Submersible Motor Starter

The SubStart3P® range covers all 3 phase motors from 0.37kW to 7,5kW. Ergonomic design, attention to detail and unique features make the SubStart3P® motor starter range your first choice when considering submersible motor protection. In conjunction with Franklin Electric submersible motors you now have an tangible water system advantage resulting in ease of installation and reliable protection

Product features:

- Attention to detail – every aspect engineered for the application
- The complete package – The device is 100% compatible with the motor characteristics
- All in one name – Reliability backed by the leader in submersible motors

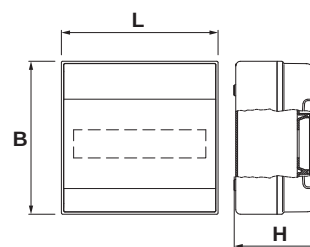


Ergonomically designed	
Mounting	Easy wall mounting without destroying the protection rating of the enclosure.
Wiring	Sufficient space is provided for ease of wiring.
Enclosure	
Protection	IP54
Material	PVC / Polycarbonate
Components	
ON/OFF Switch	Manual motor starter switch
Circuit breaker	Integrated thermal and magnetic overload protection
Auxiliary relay	Powered auxiliary contactor for use with external switches
Cable glands	Ensure IP54 rating

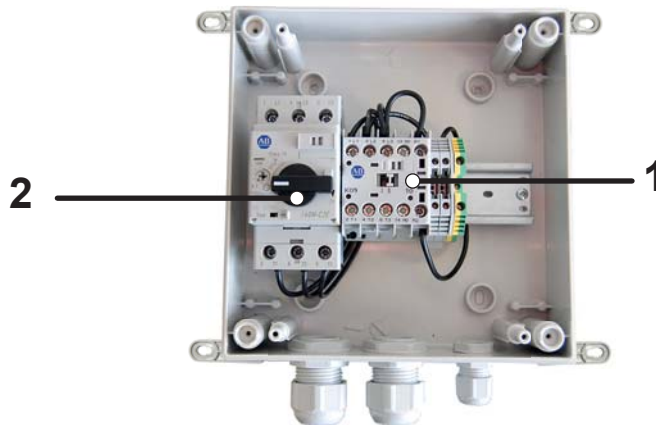
SubStart3P® Model Parameters				
Motor Rating (kW)	Type 3~ 400V 50Hz	Model Number	Nom. Current (A)	Starting Current (A)
0,37	SS037P3	288 500 3510	1,1	5,4
0,55	SS055P3	288 501 3510	1,6	7,4
0,75	SS075P3	288 502 3510	2	10,6
1,10	SS110P3	288 503 3510	2,8	16
1,50	SS150P3	288 504 3510	3,9	20,7
2,20	SS220P3	288 505 3510	5,5	29,8
3,0	SS300P3	288 506 3510	7,5	42
3,7	SS370P3	288 507 3510	9	52,3
4,0	SS400P3	288 508 3510	9,9	57
5,5	SS550P3	288 509 3510	12,6	77,2
7,5	SS750P3	288 510 3510	17,1	99,3

Specifications	
Mechanical Specification	
Protection level	IP 54
Environment	This equipment is suitable for environment B according to IEC/EN 61439 - 1 : 2010
Altitude	max 2000m above sea level
External dimensions	190x184x106mm <= 4kW 250x256x140mm >= 5,5kW
Weight	1,2 kg <= 4kW 2,3 kg >= 7,5kW
Mounting	Wall mounting (mounting hardware provided)
Storage temperature	-25°C to +55°C
Operation temperature	-5°C to +40°C
Humidity	50% at 40°C (without condensation)
Electrical Specifications	
Working Voltage	3~ / 50Hz 380 - 415V / -10% +6%
Voltage tolerance	380V -10% / 415V+6%
Rated insulation voltage	400 Vac
Rated short-time withstand current	50 kA
Rated conditional short-circuit current	50 kA
Current	5A, 9A, 16 A
Power	0,37kW - 7,5kW
Standards	
IEC/EN 61439 - 1 : 2010	

Dimensions			
Motor Rating (kW)	W [mm]	L [mm]	H [mm]
0,37kW - 4,0kW	190	184	106
5,5kW - 7,5kW	250	256	140



SubStart3P® Spare parts



1 Part: Contactor

Rating [kw]	Mod. Nb.
0,37	308 027 201
0,55	308 027 201
0,75	308 027 201
1,1	308 027 201
1,5	308 027 201
2,2	308 027 202
3,0	308 027 202
3,7	308 027 203
4,0	308 027 203
5,5	308 027 204
7,5	308 027 205

2 Part: Motor Starter

Rating [kw]	Mod. Nb.
0,37	308 027 101
0,55	308 027 102
0,75	308 027 102
1,1	308 027 103
1,5	308 027 104
2,2	308 027 104
3,0	308 027 105
3,7	308 027 105
4,0	308 027 106
5,5	308 027 106
7,5	308 027 107



SubTronicSC® Single Phase Motor Protection

The SubTronicSC® range covers all PSC motors from 0.25kW to 2.2kW for all voltages. Ergonomic design, attention to detail and unique features make the SubTronicSC® motor starter range your first choice when considering submersible motor protection. In conjunction with Franklin Electric submersible motors you now have a tangible water system advantage resulting in ease of installation and reliable protection.

Product features:

- Attention to detail – every aspect engineered for the application
- The complete package – The device is 100% compatible with the motor characteristics
- All in one name – Reliability backed by the leader in submersible motors



Ergonomically designed	
Mounting	Easy wall mounting offering various options without destroying the protection rating of the enclosure.
Wiring	Reliable connectors are provided for ease of wiring.
Motor compatible design	
Matching range	The SubTronicSC® Protector range was designed to match the Franklin Electric range of PSC motors.
Wide range of operation	Compatibility with motor design allows for a wide range of operation resulting in minimized nuisance tripping.
Intelligent Protection and Management features	
Dry-run detection (without probes)	Prevents motor and pump damage due to running the pump without water based on a proprietary reliable detection method.
Dry-run auto- reset	Automatic dry-run reset time is based on a proprietary search algorithm to find the best operating point for weak wells. Reset time 6 to 60 minutes.
Over & Under voltage	Prevents motor damage that may be caused by abnormal voltage conditions without limiting the range of operation, made possible by matching the design of the SubTronicSC® Protector with the motor. Reset time approximately 3 minutes.
Over current protection	Prevents operation under conditions where motor current may exceed safe levels due to bound pump or other fault condition. Detection is based on current heating capacity measurement to prevent unnecessary nuisance tripping. Reset time approximately 10 minutes.
Faulty Start Protection	Prevents system damage due to factors such as faulty contacts or switch. Contact failure detection reacts fast and will prevent damage to system components.
Rapid Cycle Protection	Prevents system damage due to factors such as continuous rapid cycling and excessive motor thermal cycling caused by waterlogged tank, faulty contacts or faulty pressure switch.
Indicators	
Status	Indication shows normal operation or other condition.
Voltage	Faulty voltage condition is indicated.
Fault conditions	Dry-run, Over current, Rapid Cycling, and Faulty start are indicated.

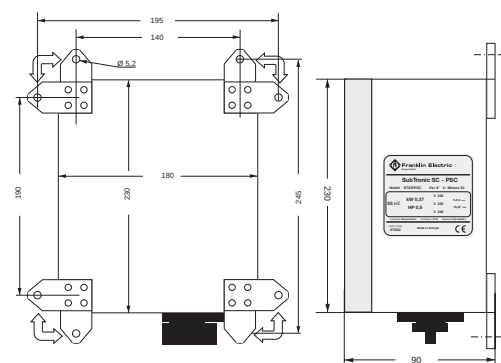
Technical Specifications

Mechanical	
Protection level	IP54
External dimensions	290 x 230 x 95mm
Weight	0,6 - 1,0 kg
Mounting	Wall mounting (with options)
Temperature	-5°C - +40°C
Humidity	50% at 55°C (without condensation)
Electrical	
Voltage	220 - 240V; ± 10 %; 50Hz single phase
Current	16 A
Power	0,25 - 2,2 kW
Standards	
IEC 60439-1 when supplied with suitably fused supply.	

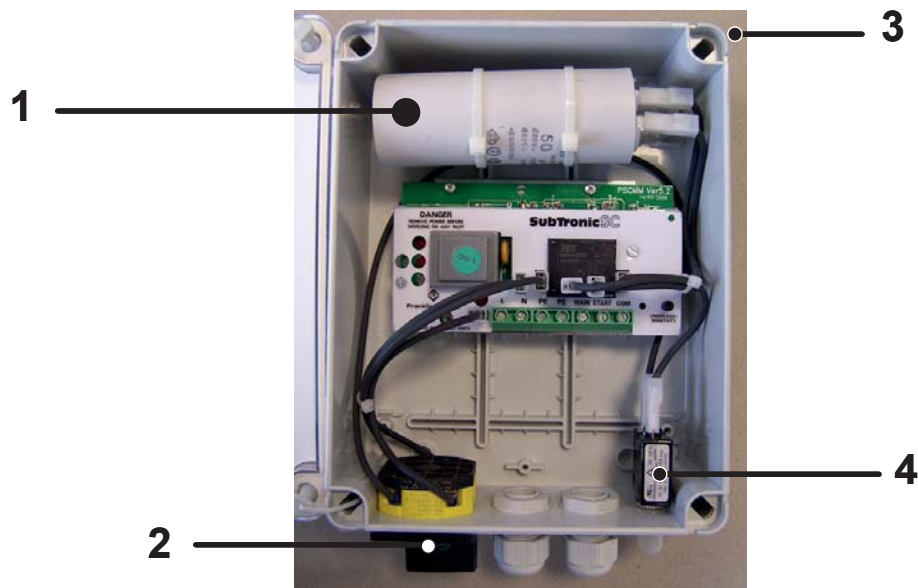
SubTronicSC Motor Protection Specifications

Part Number	Type	Motor rating [kW]	Nominal Current [A]	Maximal expected current [A]	Capacitor [µF] 450V ac
284 623 3511	ST025PSC	0,25	2,4	9,4	12,5
284 624 3511	ST037PSC	0,37	3,3	12,6	16
284 625 3511	ST055PSC	0,55	4,3	17,7	20
284 626 3511	ST075PSC	0,75	5,7	22,7	35
284 627 3511	ST110PSC	1,10	8,4	33,9	40
284 628 3511	ST150PSC	1,50	10,7	41,7	50
284 629 3511	ST220PSC	2,20	14,7	61,8	70

Dimensions



SubTronicSC® Spare Parts

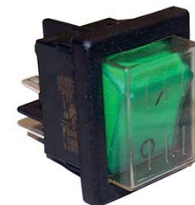


1 Part: Capacitor - Kit

Rating [kw]	Mod. Nb.		μF
0,25	308 005 801	-	12,5
0,37	308 005 802	-	16
0,55	308 005 803	-	20
0,75	308 005 804	-	35
1,1	308 005 805	-	40
1,5	308 005 806	-	50
2,2	308 005 807	-	70

4 Part: Overload - Kit

Rating [kw]	Mod. Nb.		Amp
0,25	308 005 811	-	3
0,37	308 005 812	-	5
0,55	308 005 813	-	6
0,75	308 005 814	-	8
1,1	308 005 815	-	10
1,5	308 005 816	-	13
2,2	308 005 817	-	18



2 Part: Rotary - Switch - Kit

Mod. Nb.
308 005 822

3 Part: Rocker - Switch - Kit

Mod. Nb.
308 005 821



SubTronic3P® Three Phase Motor Protection

The SubTronic3P® range covers all 4 inch 3 phase motors from 0.37kW to 7,5kW. Ergonomic design, attention to detail and unique features make the SubTronic3P® range your first choice when considering submersible motor protection and management. Together with Franklin Electric submersible motors you have an undisputable advantage, resulting in ease of installation, sophisticated system management and peace of mind.

Product features:

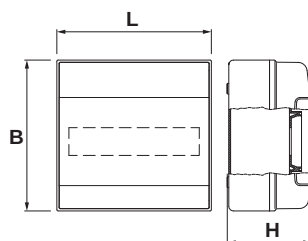
- Attention to detail – every aspect engineered for the application
- The complete package – The device is 100% compatible with the motor characteristics
- All in one name – Reliability backed by the leader in submersible motors



Ergonomically designed	
Mounting	Easy wall mounting offering various options without destroying the protection rating of the enclosure.
Wiring	Reliable connectors are provided for ease of wiring.
Motor compatible design	
Matching range	The SubTronic3P® Protector range was designed to match the Franklin Electric range of 3 phase motors.
Wide range of operation	Compatibility with motor design allows for a wide range of operation resulting in minimized nuisance tripping.
Intelligent Protection and Management features	
Dry-run detection (without probes)	Prevents motor and pump damage due to running the pump without water based on a proprietary reliable detection method.
Dry-run auto- reset	Automatic dry-run reset time is based on a proprietary search algorithm to find the best operating point for weak wells. Reset time in max. 60 minutes.
Over & Under voltage	Prevents motor damage that may be caused by abnormal voltage conditions without limiting the range of operation, made possible by matching the design of the SubTronic3P® Protector with the motor. Reset time approximately 3 minutes.
Over current protection	Prevents operation under conditions where motor current may exceed safe levels due to bound pump or other fault condition. Detection is based on current heating capacity measurement to prevent unnecessary nuisance tripping. Auto-reset in 15 minutes. Manual reset possible in approximately 5 minutes by reapplying power.
Rapid Cycle Protection	Prevents system damage due to factors such as continuous rapid cycling and excessive motor thermal cycling caused by waterlogged tank, faulty contacts or faulty pressure switch. Auto-reset in 5 minutes if condition clears. Manual reset possible in approximately 5 minutes by reapplying power.
Indicators	
Status	Indication shows normal operation or other condition.
Voltage	Faulty voltage condition is indicated.
Fault conditions	Dry-run, Over Current, Rapid Cycling, Over Voltage and Under Voltage are indicated.

Dimensions

Motor Rating [kW]	W [mm]	L [mm]	H [mm]
0,37kW - 3kW	190	184	106
3,7kW - 7,5kW	250	256	140



Specifications	
Mechanical Specification	
Protection level	IP 54
Environment	This equipment is suitable for environment B according to IEC/ EN 61439 - 1 : 2010
Altitude	max 2000m above sea level
External dimensions	190 x 184 x 106 mm <= 3kW 250 x 256 x 140 mm >= 3,7kW
Weight	1,2 kg <= 3kW 2,5 kg >= 3,7kW
Mounting	Wall mounting (mounting hardware provided)
Storage temperature	-25°C to +55°C
Operation temperature	-5°C to +40°C
Humidity	50% at 40°C (without condensation)
Electrical Specifications	
Rated Voltage	3~ / 50Hz 380 - 415V
Voltage tolerance	380V -10% / 415V+6%
Rated insulation voltage	400 Vac
Rated short-time withstand current	50 kA
Rated conditional short-circuit current	50 kA
Current	5 A ; 9 A ; 25 A
Power	0,37 - 7,5kW
Standards	
IEC/EN 61439 - 1 : 2010	

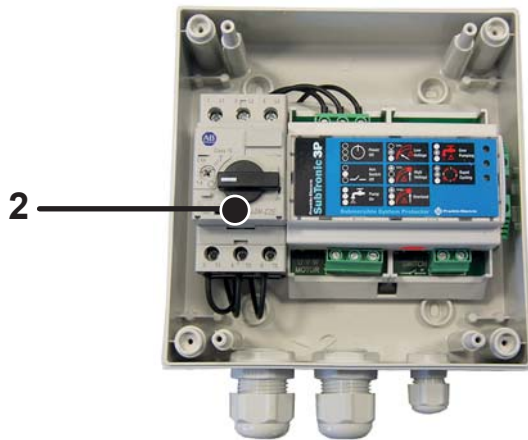
SubTronic3P Motor Protection Specifications

Motor Rating [kW]	Type 3phase / 400V 50Hz	Model Number	Nom. Current [A]	Max. Current [A]
0,37	ST037P3	288 500 3511	1,1	5,4
0,55	ST055P3	288 501 3511	1,6	7,4
0,75	ST075P3	288 502 3511	2	10,6
1,10	ST110P3	288 503 3511	2,8	16
1,50	ST150P3	288 504 3511	3,9	20,7
2,20	ST220P3	288 505 3511	5,5	29,8
3	ST300P3	288 506 3511	7,5	42
3,7	ST370P3	288 507 3511	9	52,3
4	ST400P3	288 508 3511	9,9	57
5,5	ST550P3	288 509 3511	12,6	77,2
7,5	ST750P3	288 510 3511	17,1	99,3

SubTronic3P® Spare Parts

0,37kW - 3,0kW

3,7kW - 7,5kW



1 Part: Contactor - > 3,7kW

Rating [kW]	Mod. Nb.
0,37	-
0,55	-
0,75	-
1,1	-
1,5	-
2,2	-
3,0	-
3,7	308 027 206
4,0	308 027 206
5,5	308 027 204
7,5	308 027 205

2 Part: Motor Starter

Rating [kW]	Mod. Nb.
0,37	308 027 101
0,55	308 027 102
0,75	308 027 102
1,1	308 027 103
1,5	308 027 104
2,2	308 027 104
3,0	308 027 105
3,7	308 027 105
4,0	308 027 106
5,5	308 027 106
7,5	308 027 107

SubDrive® Connect

This new generation of our proven constant pressure system, includes all the functionality of the current design, as well as the benefits and advanced features of the new SubDrive Connect System. Taking into account over 16 years of field experience with the SubDrive Family, the new platform is capable to optimize system performance, water pressure supply and system operating diagnostics.

In addition to the enhanced features below, the Connect models offering Wi-Fi connection for use with the FE Connect mobile application. With state of the art technology and well-chosen components, the new SubDrive Controllers provides constant pressure through variable speed control of submersible pumps.



Features:

- Constant water pressure with a wide range of settings (0.5 to 9.5bar)
- User-defined motor frequency range
- FE Connect Mobile Application for advanced settings and monitoring
- Plug and play system
- Built-in diagnostics and protection
- Easy-to-read LCD display for system pressure and fault identification
- Built-in duplex alternator for dual drive operation
- Proven components for long-term reliability
- Backwards compatibility and easy installation
- Single-phase 3-Wire motor operation (60Hz)
- Advanced motor soft-start feature increases motor life
- CE, cULus and UL approved

System Options:

- Moisture Sensor – Weet floor identification
- 4-20mA analog pressure transducer – 6, 10, 16bar
- Outdoor rated cable kit for analog pressure transducer
- Communication cable kit for built-in duplex alternator
- Replacement Kit for Input and Display Board
- Input and Output Filter
- Lightning Arrestor
- Fan Replacement Kit
- Standard SubDrive Pressure Switch

Service / Support:

- Easy commissioning by plug and play system
- User defined set-up
- Spare part kits for electronic controller and motor (on Request)
- Franklin Electric Connect Mobile Application

SubDrive Connect ordering Information:

Drive Model	Order Nb.	Three Phase Motors		Single-Phase (3-Wire) Motors 60 Hz
		50 Hz	60 Hz	
SubDrive 1100	5870205153C	0,75kW - 1,1kW	0,75kW - 1,1kW	0,37kW - 1,1kW
SubDrive 1500	5870205353C	0,75kW - 1,5kW	0,75kW - 1,5kW	0,37kW - 1,5kW
SubDrive 2200	5870205453C	0,75kW - 2,2kW	0,75kW - 2,2kW	0,37kW - 2,2kW

SubDrive Connect Specification:

Drive Model	SD 1100	SD 1500	SD 2200
SubDrive Model Nb.	5870205153C	5870205353C	5870205453C
Input Voltage	230V AC, 1-phase	230V AC, 1-phase	230V AC, 1-phase
Max. Input Amps	12 A	19 A	23 A
Output Frequency	30 - 77 Hz	30 - 77 Hz	30 - 77 Hz
Max. Output Amps	5,9 A (3-phase) 10,4 (single-phase)	8,1 A (3-phase) 13,2 (single-phase)	0,9 A (3-phase) 13,2 (single-phase)
Pressure Range	0,5 - 9,5 bar	0,5 - 9,5 bar	0,5 - 9,5 bar

Termination Kit 4"

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

Kit- Type	Mod. Number	Description
Standard 304SS	308 090 901	w/o Strain relief
316SS	308 090 911	Attention: Limited shelf life of Resin and Hardener
Strain Relief 304SS	308 090 902	with. Strain relief
		Attention: Limited shelf life of Resin and Hardener



Technical Description:

- Max. current 18 Ampere in air @ max. 50°C ambient temperature
- Max. current 23 Ampere submersed in water @ max. 30°C ambient temperature
- Max. voltage 750 V

Double Plug Lead for Termination Kit

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

- max. current 18 Ampere in air @ max. 50°C ambient temperature
- max. current 23 Ampere submersed in water @ max. 30°C ambient temperature
- max. Voltage 750V AC
- PSC / 2-wire / 3-wire Motors and 3 ~ Motors
- Optional strain relief
- Approvals: KTW

4" Standard Motor Design start 07.2016

L (m)	Mat.	Mod. No.	PSC / 3 - wire / 3-Phase	
1,5	304SS	309 111 401	3X1,5+1G1,5mm ² 1,5 m - w/o Strain relief	
2,5	304SS	309 111 402		
1,5	316SS	309 111 501		
2,5	316SS	309 111 502		

4" High Thrust and Standard Motor Design up to 06.2016

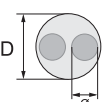
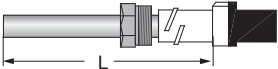
Description	Mat.	2- wire - Mod. Nb.	Description	Mat.	PSC / 3-wire/ 3-Phase	
3X1,5mm ²	304SS	310 131 001	3X1,5 & 1G1,5mm ²	304SS	310 111 001	
1,5 m - w/o . Strain relief	316SS	310 131 501	1,5 m - w/o. Strain relief	316SS	310 111 501	
3X1,5mm ²	304SS	310 131 002	3X1,5 & 1G1,5mm ²	304SS	310 111 002	
2,5 m - w/o. Strain relief	316SS	310 131 502	2,5 m - w/o Strain relief	316SS	310 111 502	
3X1,5mm ²	304SS	310 132 001	3X1,5 & 1G1,5mm ²	304SS	310 112 001	
1,5 m - incl. Strain relief	316SS	-	1,5 m - with. Strain relief	316SS	-	
3X1,5mm ²	304SS	310 132 002	3X1,5 & 1G1,5mm ²	304SS	310 112 002	
2,5 m - incl. Strain relief	316SS	-	2,5 m - with. Strain relief	316SS	-	

Lead Termination Kit 1,5 - 10mm²

- 4 wire
 - 1,5 - 10mm²
 - up to 1,2kV
- Part number: 308 090 921**

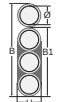
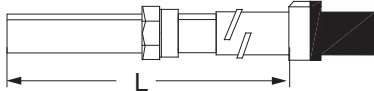


PTC Lead (only as spare parts)

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)

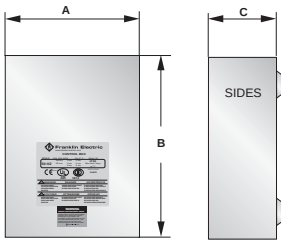
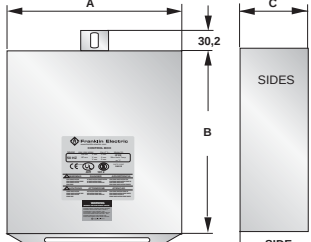
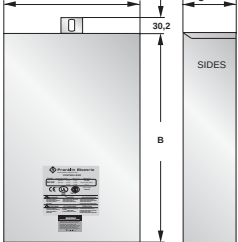
Ø = 4x1,5 mm ²		L (m)	Mod.-No.
		2,5	310 113 402G



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				

Corrosion protection in aggressive water for 4" 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 Design up to 06.2016	LT starting 07.2016
	
308 250 912	308 250 914

Corrosion protection in aggressive water for 4" High Thrust 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

HT

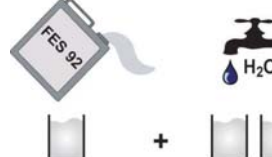
308 250 913

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.

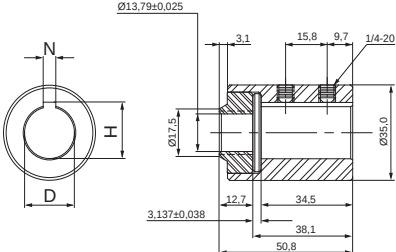


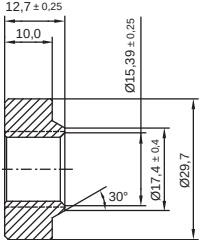
4" Motor - Pump couplings

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	304SS			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	
				

	
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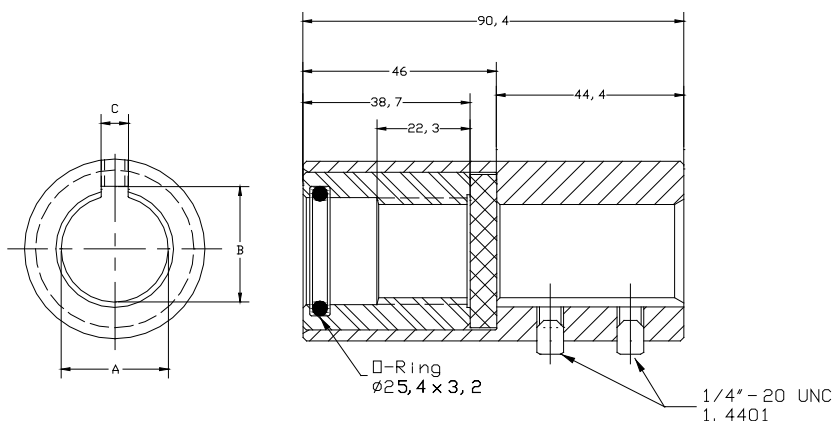
Coupling 2	316SS
	308 712 904
	Dimension D Max. / Min.
	17,50 / 17,48
Technical drawing of a coupling. The drawing shows a cross-section of a coupling with a 30° chamfer. The dimensions are: Ø22.62±0,05 (outer diameter), 30° (chamfer angle), Ø13.79±0,03 (inner diameter), D (dimension D), 28.6±0,4 (dimension), and 41,3±0,4 (dimension).	

6" 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

Outline Drawing:

6" Couplings



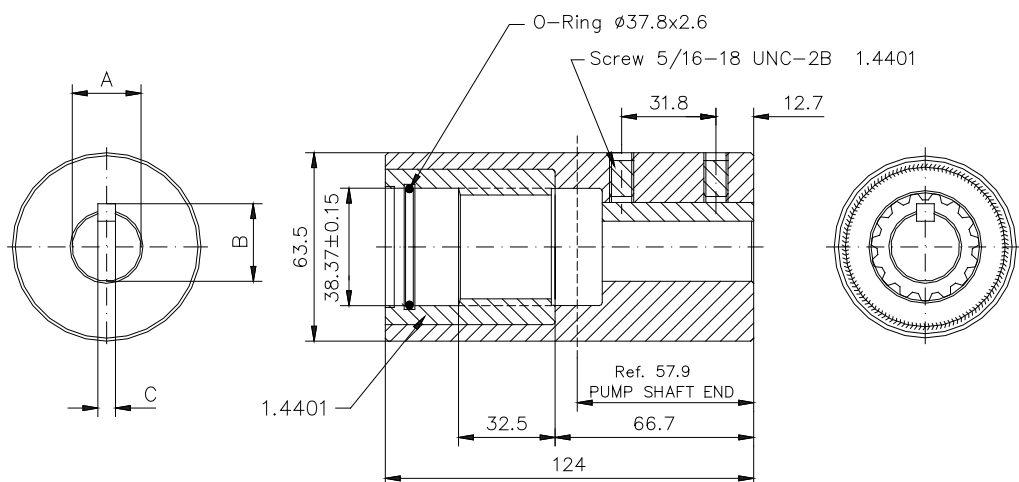
Ordering information

No.	Coupling Material DIN / AISI	Dimension A (mm) Max. / Min.	Dimension B (mm) Max. / Min.	Dimension C (mm) Max. / Min.
151 935 902	1.4005 (304)	19,075 / 19,063	20,70 / 20,52	4,84 / 4,79
151 935 922	1.4401 (316SS)			
151 935 910	1.4005 (304)	20,025 / 20,013	22,76 / 22,60	6,05 / 6,00
151 935 927	1.4401 (316SS)			
151 935 908	1.4005 (304)	22,025 / 22,013	25,53 / 25,32	8,03 / 7,98
151 935 928	1.4401 (316SS)			
151 935 901	1.4005 (304)	22,250 / 22,238	24,54 / 24,36	6,43 / 6,38
151 935 921	1.4401 (316SS)			
151 935 906	1.4005 (304)	25,025 / 25,013	28,70 / 28,30	8,03 / 7,98
151 935 926	1.4401 (316SS)			
151 935 909	1.4005 (304)	25,425 / 25,413	27,74 / 27,56	6,43 / 6,38
151 935 929	1.4401 (316SS)			



8" Motor-Pump Couplings

Outline Drawing:



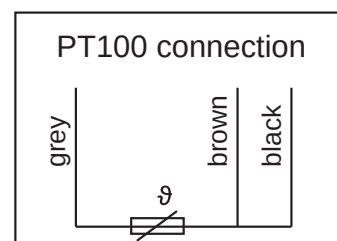
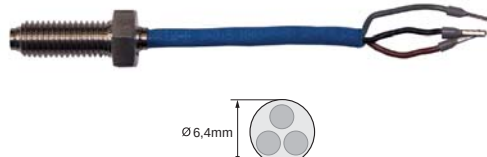
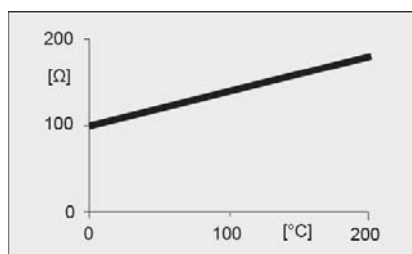
Ordering information

Part No.	Coupling Material DIN / AISI	Dimension A (mm) Max. / Min.	Dimension B (mm) Max. / Min.	Dimension C (mm) Max. / Min.
156 563 901	1.4005 (304)	25,425 / 25,413	28,27 / 28,17	6,38 / 6,32
156 563 921	1,4404 (316SS)			
156 563 902	1.4005 (304)	30,188 / 30,175	33,73 / 33,63	7,96 / 7,91
156 563 922	1,4404 (316SS)			
156 563 903	1.4005 (304)	31,775 / 31,763	35,36 / 35,26	7,96 / 7,91
156 563 923	1,4404 (316SS)	38,125 / 38,113		
156 563 904	1.4005 (304)	38,125 / 38,113	42,37 / 42,27	9,55 / 9,50
156 563 924	1,4404 (316SS)	38,125 / 38,113		
156 563 905	1.4005 (304)	19,085 / 19,063	20,70 / 20,52	4,84 / 4,79
156 563 906	1.4005 (304)	30,188 / 30,175	33,02 / 32,92	6,38 / 6,32
156 563 926	1,4404 (316SS)	30,188 / 30,175	33,02 / 32,92	6,38 / 6,32
156 563 907	1.4005 (304)	22,250 / 22,238	24,54 / 24,36	6,43 / 6,38
156 563 908	1.4005 (304)	22,024 / 22,011	25,53 / 25,32	8,03 / 7,98
156 563 931	1,4404 (316SS)			
156 563 929	1,4404 (316SS)	42,888 / 42,850	47,12 / 47,04	9,55 / 9,50
156 563 909	1.4005 (304)	25,024 / 25,011	28,70 / 28,30	8,03 / 7,98
156 563 932	1,4404 (316SS)			

PT100 for 6" and 8" Encapsulated Motors

The PT100 is a precision platinum wire resistor that is specified occasionally as a temperature input for process control equipment. A jacketed control lead must be run from the PT100 lead to the above-ground equipment. The above-ground equipment is not available from Franklin Electric and is typically part of a custom panel or data acquisition system.

PT100 sensor retrofit kits from Franklin Electric come with complete instructions and allow for easy field installation.



To install the PT100 sensor bolt, remove the top end bell bolt that is opposite of the lead and replace it with the PT100 screw. Tighten the sensor bolt to the torque values shown below.

6" PT100 -	4kW- 45kW	54- 61 Nm
8" PT100 -	30kW- 45kW	54- 61 Nm
	55kW- 150kW	115- 122 Nm

Franklin Electric does not offer the required sensing device, it is available from speciality dealers.

Conditions	Temp. of the water without motor operation	Max. Trip temp. / Resistance Setting (for standard Lead length)
Motor operating at nameplate output with 0.16 m/sec flow past the motor	10°C	40°C / 115,5 Ω
	15°C	44°C / 117,0 Ω
	20°C	48°C / 118,6 Ω
	25°C	51°C / 119,7 Ω
	30°C	55°C / 121,3 Ω
Motor that has been <u>Derated</u> with 1 m/sec flow past the motor	35°C	59°C / 122,8 Ω
	40°C	63°C / 124,3 Ω
	45°C	66°C / 125,5 Ω
	50°C	70°C / 127,0 Ω
	55°C	74°C / 128,6 Ω
	60°C	78°C / 130,1 Ω

6" PT100 CT

Kit Number	Motor Type	Wire Insul.	max. Medium Temp.	Lead (mm²)	Lead length (m)
305 327 903	6" all Ratings ½ - 13 UNC Europe Motors starting 07. 2002 US Motors starting 11.2001 on	Rubber	60°C	3X0,5	10

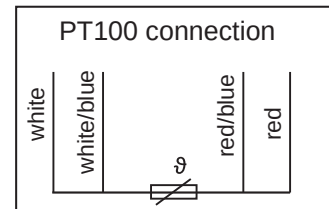
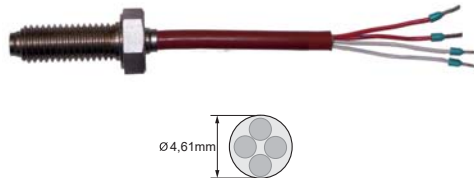
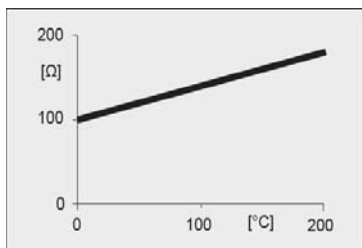
8" PT100 CT

Kit Number	Motor Type	Wire Insul.	max. Medium Temp.	Lead (mm²)	Lead length (m)
305 326 902	30 - 45kW (Type 2.1)	Rubber	60°C	3X0,5	10
305 326 901	55 - 150kW (Type 1)	Rubber	60°C	3X0,5	10



6" / 8" Encapsulated PT100 HighTemp

Its ohmic resistance is proportional to the sensed temperature. The FE field replaceable PT100 is potted into a screw holding the upper end bell. Because of his remote position relative to the windings, the sensing relay should be adjusted according to the below table.



To install the PT100 sensor bolt, remove the top end bell bolt that is opposite of the lead and replace it with the PT100 screw. Tighten the sensor bolt to the torque values shown below.

6" PT100 - 4kW- 30kW 54- 61 Nm
8" PT100 - 30kW- 110kW 115 - 122 Nm

Franklin Electric does not offer the required sensing device, it is available from speciality dealers.

Conditions	Temp. of the water without motor operation	Max. Trip temp. / Resistance Setting
Motor operating at nameplate output with 0.16 m/sec flow past the motor	50°C	60°C
	60°C	70°C
	70°C	80°C
	75°C	85°C
	80°C	90°C
	90°C	100°C

6" PT100 HighTemp90

Kit Number	Motor Type	Wire Insul.	max. Medium Temp.	Lead (mm²)	Lead length (m)
156 098 111K	4 - 30kW	Silicon	90°C	4X0,35	10
156 098 112K		Silicon	90°C	4X0,35	130

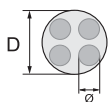
8" PT100 HighTemp75

Kit Number	Motor Type	Wire Insul.	max. Medium Temp.	Lead (mm²)	Lead length (m)
156 098 116K	30 - 110kW (Type 1)	Silicon	90°C	4X0,35	10
156 098 117K		Silicon	90°C	4X0,35	130

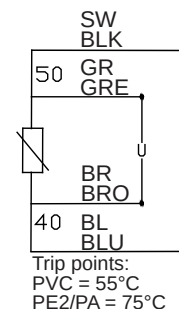
PT100 Rewindable Motors

- Fitted into the upper end bell flange , all end bells 6" ,8" , 10" and 12" Rewindable are prepare for installation PT100
- Measures the temperature of the filling liquid
- Conductor with a resistance proportional to the temperature
- Allows monitoring the temperature continuously

The above-ground equipment is not available from Franklin Electric and is typically part of a custom panel or data acquisition system. PT100 sensor retrofit kits from Franklin Electric come with complete instructions and allow for easy field installation.



	Ø [mm²]	D [mm]	Lead Lengths [m]	Mod.- No.:	6" Rew Redesign starting 08.2012		6" (Cast Iron/304SS) / 8" / 10" / 12"	
					304/316	904L	304/316	904L
PT 100	4X0,5	8	10		308 016 501	308 016 522	308 016 401	308 016 422
PT 100	4X0,5	8	20		308 016 502	-	308 016 402	-
PT 100	4X0,5	8	30		308 016 503	-	308 016 403	-
PT 100	4X0,5	8	50		308 016 505	308 016 526	308 016 405	308 016 426



6" Permanent Star Plug

For some applications it may be necessary to permanently run a star-delta submersible motor in star connection. This may be achieved by using the PERMANENT-STAR-PLUG . This connector short - circuits all three pins in one of the two motor sockets and is designed to replace one lead.



Part- Nb.: 304- 308 065 901

Part- Nb.: 316SS - 308 065 951

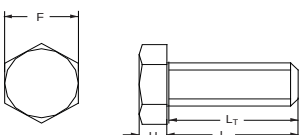
Surge Arrestor

These surge arrestors or their equivalents are highly recommended for protecting submersible motors from a variety of commonly occurring high voltage spikes which can damage the motor insulation system and cause motor winding failure. These arrestors will not, as is true of any surge protection equipment, protect the motor from a direct lightning strike.



Part-Nb.: 155 440 902

6" CT - Pump connection screw Kit's

	Material	L / L _T [mm]	H [mm]	F [mm]	Mod.- No.:
	316SS	38,1	8	19	308 659 318



Flow Paddle Switch

The flow switch utilizes the force of liquid flow to propel its paddle and to detect the incoming flow or movement of the existing liquid in the pipe. For Flow rates above 4m³/h; Connection: G1 "



Mod.Nb.: 226 019 101

Inline Flow Switch

The Inline Flow Switch operates magnetically. The piston within the switch body should be a free fit and spring back to its off position as soon as flow stops. For flow rates up to 4 m³/h; Connection: G1"



Mod.Nb.: 226 014 101

Level Switch

A float switch is a device used to detect the level of liquid within a tank. A required Part of the 6" High Efficiency Solar System.

Mod.Nb.: 308 170 209



DC Disconnect

To disconnect the drive even under load safely from the solar generator, Franklin Electric offers suitable DC disconnect switches for all different power ratings.

0 - 11A/800V DC - 308 170 313
12 - 22A/800V DC - 308 170 325



Pressure Switch SubDrive Constant- pressure Controller

The pressure switch signals continuously prevailing in the water supply system pressure to the SubDrive controller. The factory setting of the desired pressure is 3,4bar; can be changed.

Mod.Nr.: 223 995 901



Pressure Switch SubDrive Connect

The pressure switch signals continuously prevailing in the water supply system pressure to the SubDrive controller.

Mod.Nr.: 223 995 801



Notes

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This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

Katalog revision changes notice

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