

# Franklin Electric Europa GmbH

## 12" Rewindable Motors

### Product Information and Service



**Franklin Electric**

# QUALITY IN THE WELL

POWERED BY



Franklin Electric



QUALITY



AVAILABILITY



SERVICE



INNOVATION





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# 12" Rewindable Motors

## 12" Rewindable Motors



### 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.

#### 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

#### Standard Motor:

- 185kW - 400kW
- 12" flange
- Protection: IP 68
- Starts per hour: max. 5
- Installation position: vertical / horizontal
- 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:  $v = 0,5$  m/s

#### Options

- 80kN thrust load
- Other voltages
- YΔ - start (pos. of cables 90°)
- PT 100 temperature sensor (sold separately)
- Special lead lengths upon request

# 12" Rewindable Motors



## 12" Rewindable Motors - Model Numbers

P <sub>N</sub> [kW]	U <sub>N</sub> [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

## 12" Rewindable Motors - Performance Data 50Hz

P <sub>N</sub> [kW]	Thrust F [N]	U <sub>N</sub> [V]	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>N</sub> [A]	I <sub>A</sub> /I <sub>N</sub> [A]	η (Eff.) [%] at % load			cos φ (PF) at % load			T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> [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 <sub>N</sub> [kW]	P <sub>max</sub> [kW]	Thrust F [N]	U <sub>N</sub> [V]	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>max</sub> [A]	I <sub>A</sub> /I <sub>N</sub> [A]	η (Eff.) [%] at % load			cos φ (PF) at % load			T <sub>max</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> [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



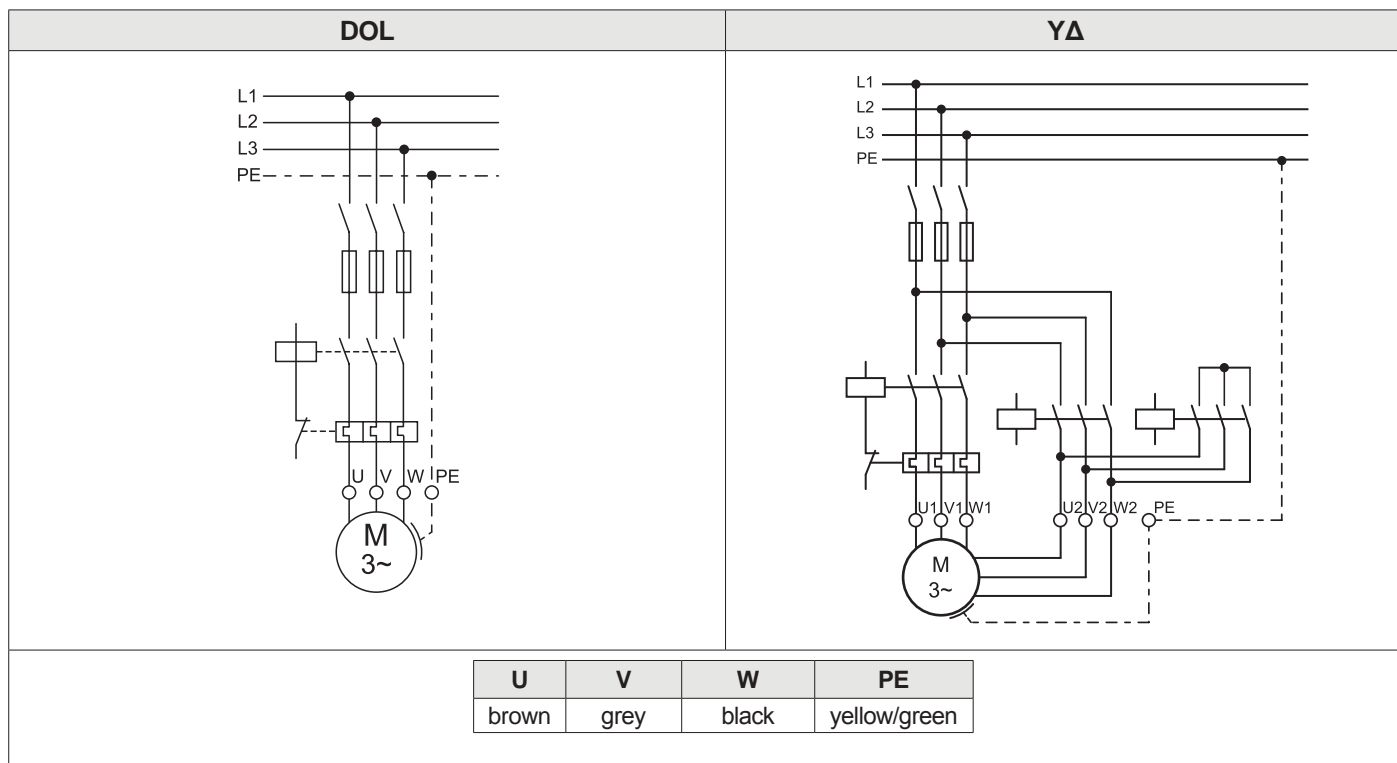
## 12" Rewindable Motors - Motor Leads\*

Lead	Ø [mm <sup>2</sup> ]	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 Y $\Delta$ **	185 - 400 DOL	-	DOL 1 Y $\Delta$ 2	308 711 100	308 661 120	
			185 - 250 Y $\Delta$ **	185 - 400 Y $\Delta$ **	185 - 400 DOL				
 1X35	15,3	6	185 - 250 Y $\Delta$ **	185 - 400 Y $\Delta$ **	185 - 400 DOL	DOL 1 Y $\Delta$ 2	308 711 101	308 661 121	
 1G35	13	6	Groundlead (For 1X35 mm <sup>2</sup> cable equipped motors)			1	308 056 060		
<b>Lead opening seal kit</b>			<b>250 - 400 kW - DOL / Y<math>\Delta</math></b>			1	308 661 122		

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

\*\* For YD motors please order two Lead (sealing) kits

## Electrical Connection

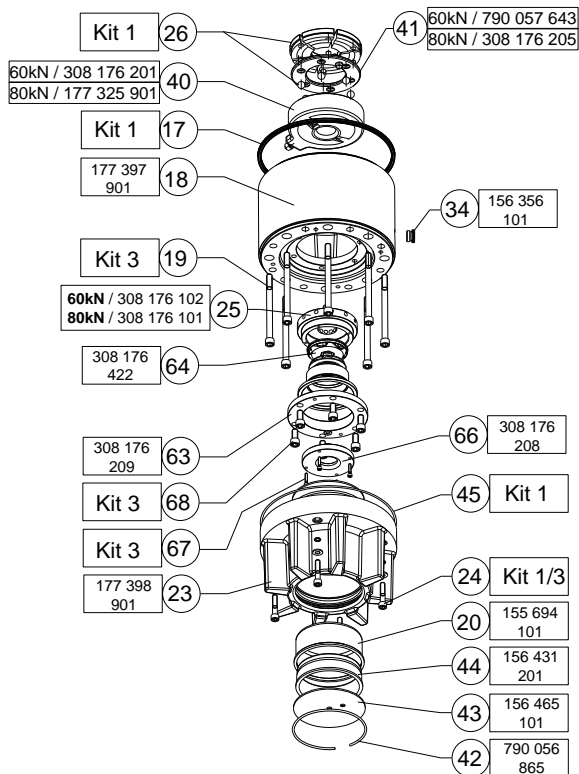
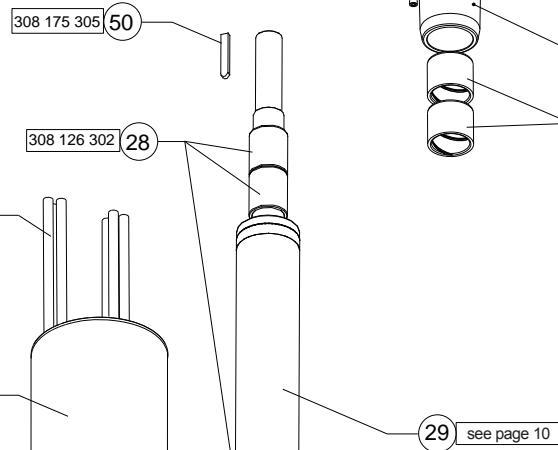
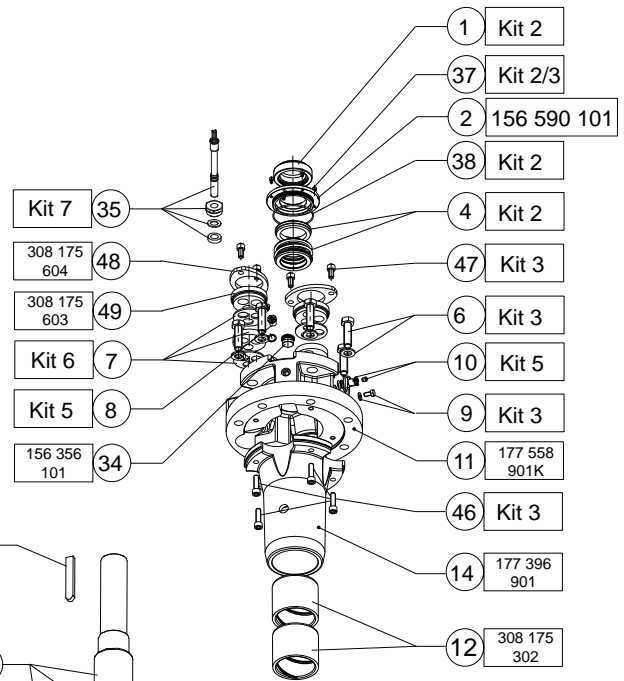




# 12" Rewindable Motors

## 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; 24; 26; 27; 39; 45	308 750 802
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 7
Kit 7 PT 100 Kit	Incl.Pos.: 35	see page 14
Kit 8 Up-Thrust Bearing Kit	Incl.Pos.: 36	308 751 702



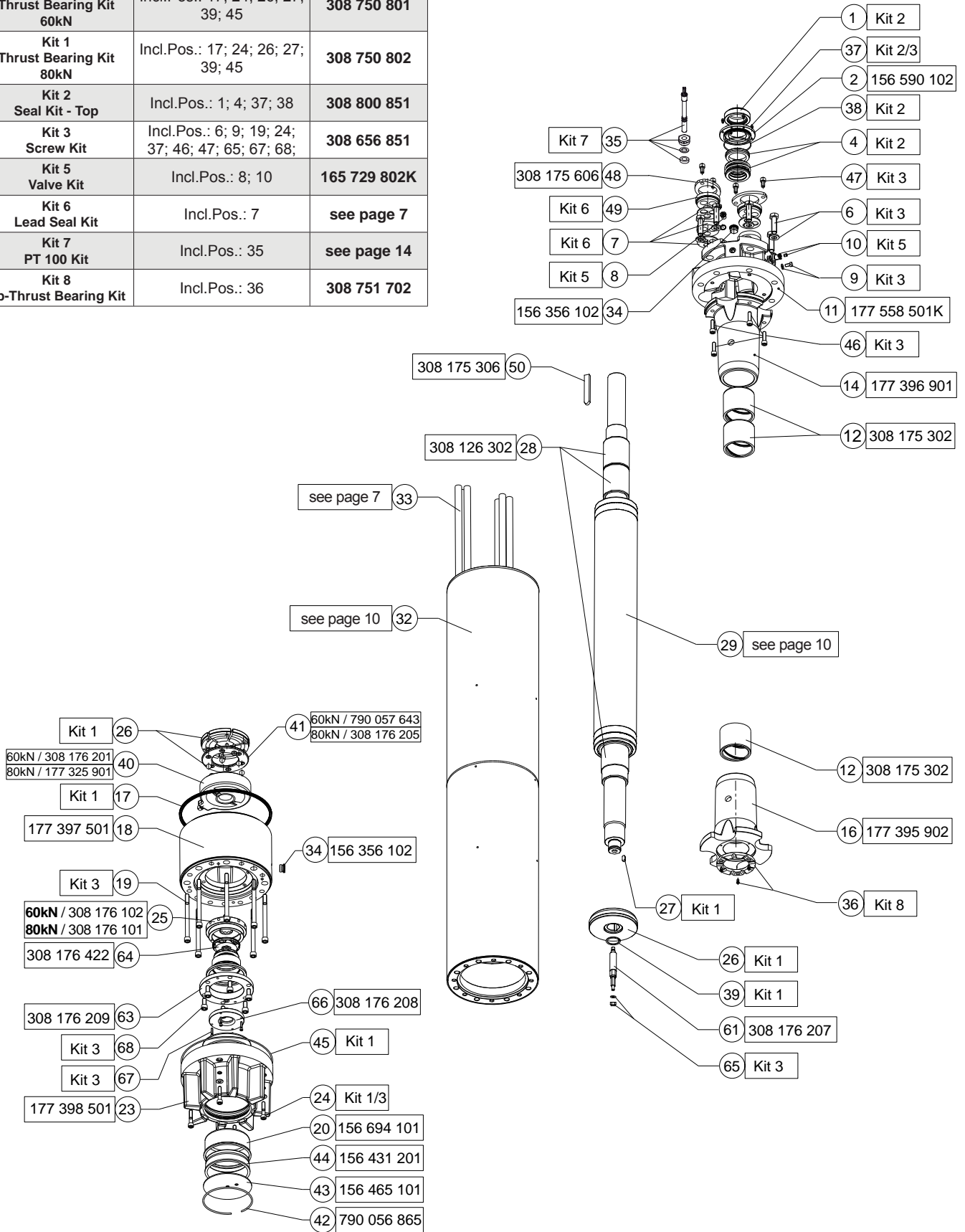


# 12" Rewindable Motors



## 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; 24; 26; 27; 39; 45	308 750 802
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;	308 656 851
Kit 5 Valve Kit	Incl.Pos.: 8; 10	165 729 802K
Kit 6 Lead Seal Kit	Incl.Pos.: 7	see page 7
Kit 7 PT 100 Kit	Incl.Pos.: 35	see page 14
Kit 8 Up-Thrust Bearing Kit	Incl.Pos.: 36	308 751 702





# 12" Rewindable Motors

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

P <sub>N</sub> [kW]	U <sub>N</sub> / 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

# 12" Rewindable Motors



## 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 [ $\Omega$ ]	Resistance $Y_{\Delta}$ (U1-U2) [ $\Omega$ ]	Resistance DoI (U1-V1) [ $\Omega$ ]
185	326 013 999								
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 [ $\Omega$ ]	Resistance $Y_{\Delta}$ (U1-U2) [ $\Omega$ ]	Resistance DoI (U1-V1) [ $\Omega$ ]
185	326 *** 999								
220	326 *** 999								
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 [ $\Omega$ ]	Resistance $Y_{\Delta}$ (U1-U2) [ $\Omega$ ]	Resistance DoI (U1-V1) [ $\Omega$ ]
185	327 016 999	15+15+15+15	2,3 / 3,5	PE2/PA	Parallel Delta	1138	0,7836		
250									
250	326 699 999	13+14+13+14	2,5 / 3,8	PE2/PA	Parallel Delta	888	0,1290		
300	326 700 999	11+11+11+11	2,7 / 4,1	PE2/PA	Parallel Delta	825	0,1024	0,0512	0,0341
350	326 698 999	10+11+10+11	2,7 / 4,1	PE2/PA	Parallel Delta	820	0,1017		
400	326 674 999	10+10+10+10	3,0 / 4,5	PE2/PA	Parallel Delta	812	0,0815		

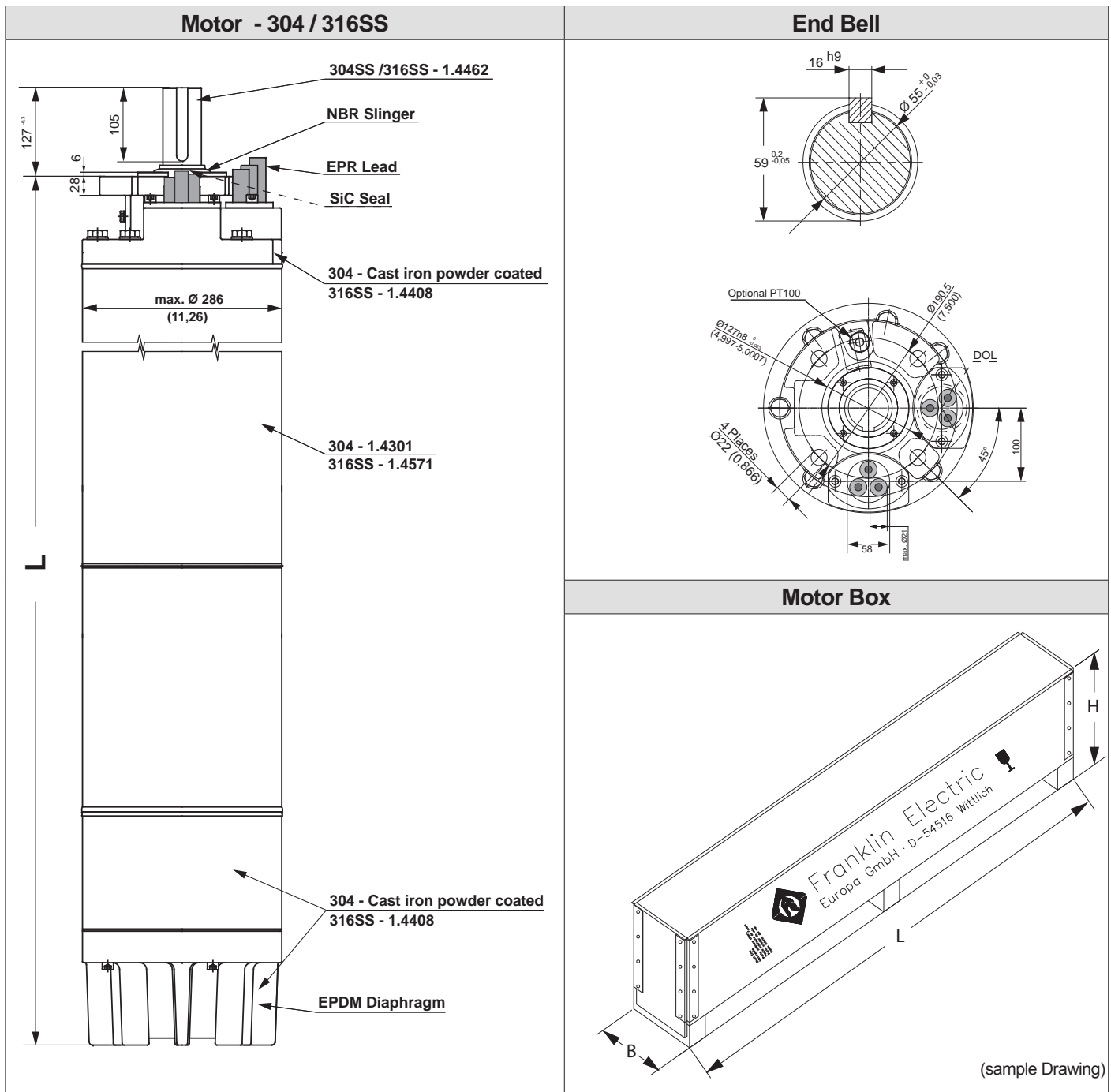
## Insulation resistant ( 20°C / 500 VDC)

New motor without drop cable	400 > M $\Omega$
Used motor without drop cable	20 > M $\Omega$
New motor with drop cable	4 > M $\Omega$
Used motor with drop cable	1 M $\Omega$



# 12" Rewindable Motors

## 12" Motor Design 304 / 316SS



P <sub>N</sub> [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			



## 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 High-Temp90	→	FES92	Rewindable Motors All	→	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





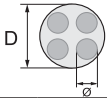
# Accessories

## PT100 Rewindable Motors

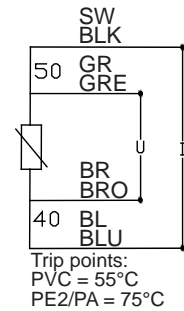
### Application

- 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 [mm <sup>2</sup> ]	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
<b>PT 100</b>	4X0,5	8	10	Mod.- No.:	308 016 501	308 016 522	308 016 401	308 016 422
<b>PT 100</b>	4X0,5	8	20	Mod.- No.:	308 016 502	-	308 016 402	-
<b>PT 100</b>	4X0,5	8	30	Mod.- No.:	308 016 503	-	308 016 403	-
<b>PT 100</b>	4X0,5	8	50	Mod.- No.:	308 016 505	308 016 526	308 016 405	308 016 426

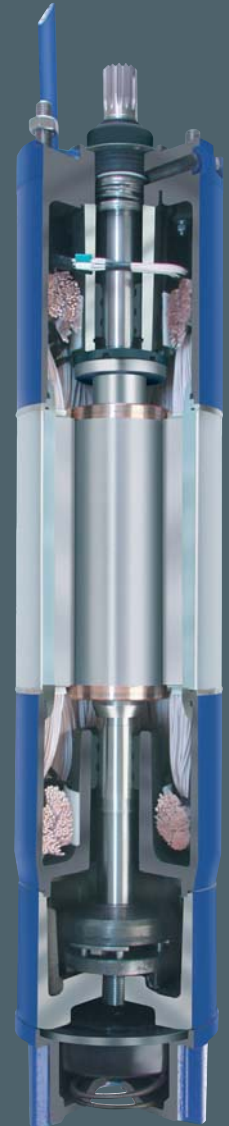
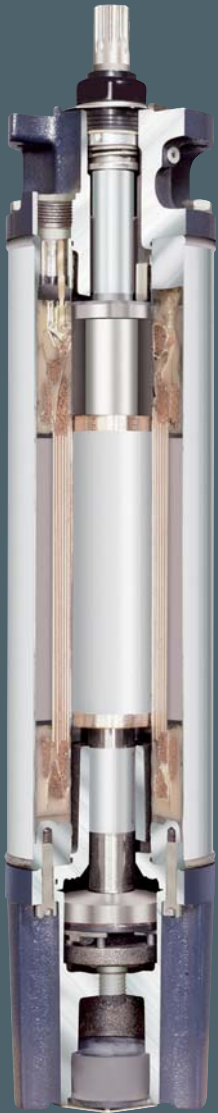


# QUALITY IN THE WELL

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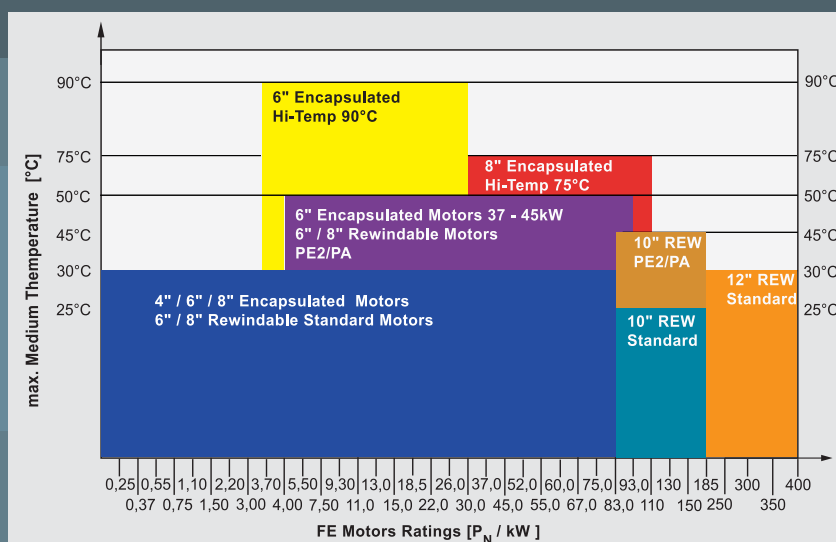


Franklin Electric



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## Franklin Electric Product Line





## **Franklin Electric**

Franklin Electric Europa GmbH  
Rudolf-Diesel-Strasse 20  
D-54516 Wittlich/Germany  
Tel.: +49 (0) 6571 / 105-0  
Fax: +49 (0) 6571 / 105-520  
e-mail: [info@franklin-electric.de](mailto:info@franklin-electric.de)  
[www.franklin-electric.eu](http://www.franklin-electric.eu)