



**4 - 7.5 kW**

**4" High Efficiency System**

**4" High Efficiency Solar System**





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NOTE: Franklin Electric Europa GmbH reserves the right to amend specification without prior notice

For the most up-to-date product information, visit [franklinwater.eu](http://franklinwater.eu).

# 4" HIGH EFFICIENCY SYSTEM (HES) OVERVIEW - UP TO 7.5 KW

Packaged Submersible Borehole System with energy savings up to 16 %\*

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- Up to 13 points (16 %) improved motor efficiency\*
- Excellent partial load behaviour (SKU reduction)
- Due to the high motor efficiency, amps are significantly reduced, which might lead to smaller drop lead cross size and thus cost saving
- One-stop shop and perfectly matching components guarantee first-class performance/efficiency

### EASY INSTALLATION

- Easy system set-up due to Franklin Electric App in combination with tailored pre-settings

### INCREASED LIFETIME

- Incorporated Soft start and protection features (no additional investment)
- Speed control (Optimum aggregate operation - pump matches system any time)

## APPLICATIONS



## 4" HIGH EFFICIENCY SYSTEM (HES) OVERVIEW - UP TO 7.5 KW

Packaged Submersible Borehole System up to 7.5 kW

### SPECIFICATION

- Motor range: 7.5 kW (50 Hz - 3000 rpm)
- System Power Supply: 400 V  $\pm$  10 %
- Frequency: 50 Hz - 60 Hz  $\pm$  2 %
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Vertical and horizontal motor operation
- Protection:
 

motor:	IP68, insulation class B
drive:	IP66/21
filter:	IP00

### OPTIONS

- Special Voltages
- Higher-graded material: 316SS
- Solar

### PACKAGED DEAL

- 4" synchronous submersible NEMA motor
- 4"/6" submersible pump
- Variable frequency drive
- Matching output filter for 400 V systems



### FULLY SUPPORTED

- Fully supported by the Technical Support Professionals and Field Service Engineers





# 4" HIGH EFFICIENCY SOLAR SYSTEM (HES) OVERVIEW - UP TO 7.5 KW

High Efficiency Submersible Borehole Solar System in the range of 4.0 - 7.5 kW

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency  
Less panels, more water respectively
- Direct DC feeding
- MVPT algorithm maximizes system performance

### PACKAGED DEAL

- 4" synchronous submersible NEMA Solar motor
- 4"/6" submersible pump
- Variable frequency drive



### FULLY SUPPORTED

- Fully supported by the Technical Support Professionals and Field Service Engineers



## SPECIFICATION

- Motor range: 7.5 kW (50 Hz)
- System Power Supply: 380 - 500 V AC / 840 - 400 V DC
- Backup Power supply / Direct AC feeding to maximize system runtime
- Top class protection with Electronics in IP66 / 21

## OPTIONS

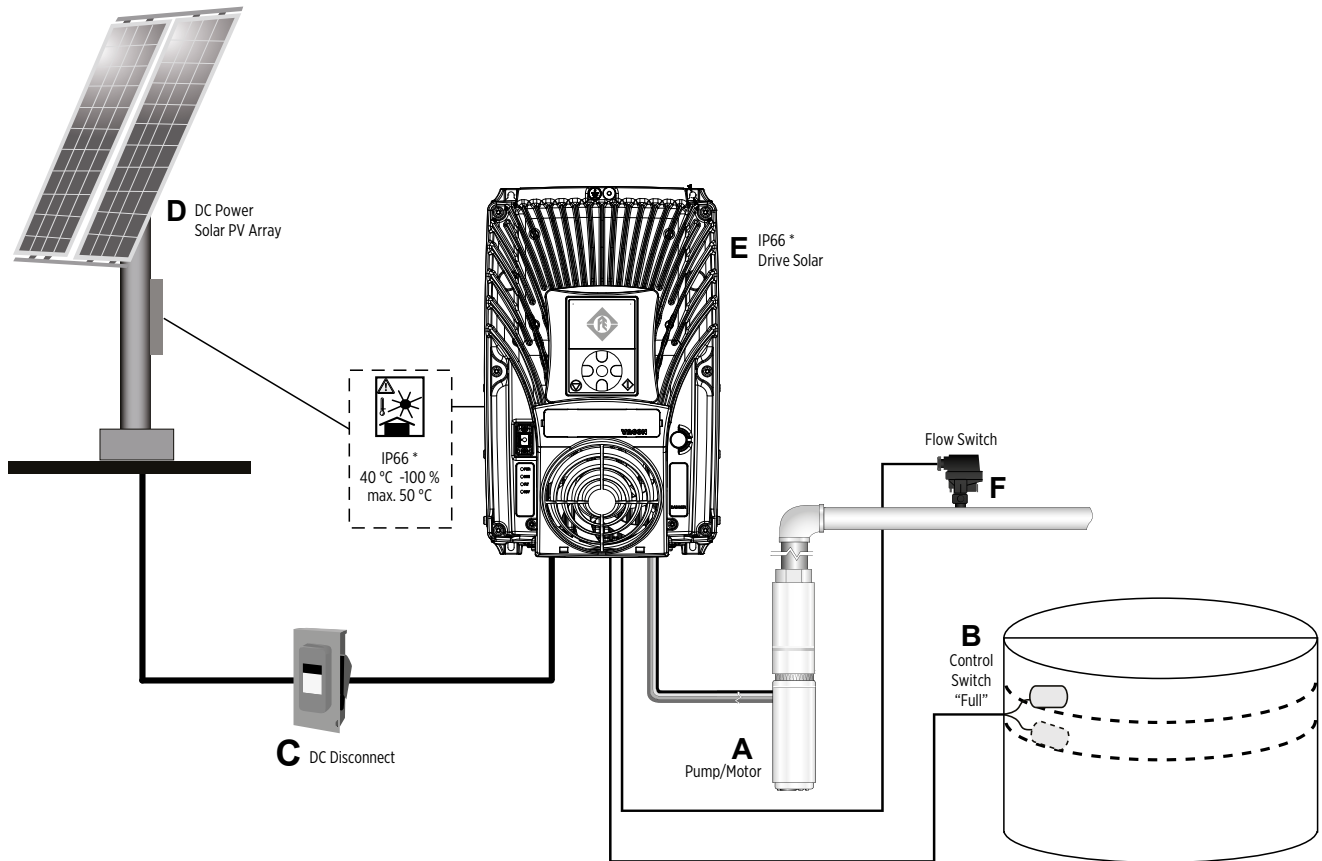
- Special Voltages
- Higher-graded material: 316SS



# 4" HIGH EFFICIENCY SOLAR SYSTEM (HES) OVERVIEW

High Efficiency Submersible Borehole Solar System in the range of 4.0 - 7.5 kW

## SOLAR SYSTEM INSTALLATION




- A. High Efficiency Motor and Pump
- B. Level Control Switch, not included (separate order 308 170 209)
- C. DC Disconnect, not included (separate order 25 A/800V DC: 308 170 325)
- D. Solar Array, not included
- E. Solar inverter
- F. Flow-Switch, included

Please see next page for more details on the system components.


\* for IP21 additional enclosure required

# OPTIONAL SYSTEM COMPONENTS

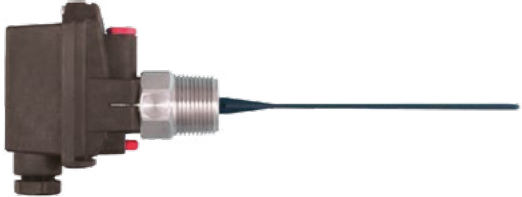
## LEVEL SWITCH

Description	Model number	
A level switch is a device used to detect the level of liquid within a tank.	308 170 209	

## DC DISCONNECT

Description	Model number	
To disconnect the drive even under load safely from the solar generator, Franklin Electric offers suitable DC disconnect switches for all different power ratings.	13 A/800V DC 308 170 313 25 A/800V DC 308 170 325	

## FLOW PADDEL SWITCH

Description	Model number	
<ul style="list-style-type: none"> <li>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.</li> <li>For Flow rates above 4 m<sup>3</sup>/h; Connection: G1"</li> </ul>	226 019 101	



## 4" HIGH EFFICIENCY SYSTEM (HES) PUMP KITS OVERVIEW

### 4" HES SOLAR PUMPING PAK

High Efficiency System		Solar Controller			Solar Pump (BSPP)				Motor	Output Filter		Flow switch
Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	Part No.	Filter type	Part No.	Part No.
15/21 4HES 380 7,5kW-Solar	308066151S	100 16A	314000108	21	15	21	4" VS 15/21	602152101060063	2340663421L	dv/dt	314005101	226019101
30/06 4HES 380 7,5kW-Solar	308066306S			21	30	6	6" VS 30/06	ETH11300150				
46/05 4HES 380 7,5kW-Solar	308066465S			21	46	5	6" VS 46/05	ETH11460140				
15/21 4HES 380 7,5kW-Solar	308066092S	100 X 16A	314000109	66	15	21	4" VS 15/21	602152101060063	2340663421L	dv/dt	314005101	226019101
30/06 4HES 380 7,5kW-Solar	308066091S			66	30	6	6" VS 30/06	ETH11300150				
46/05 4HES 380 7,5kW-Solar	308066093S			66	46	5	6" VS 46/05	ETH11460140				

### 4" HES PUMPING PAK (4"PM MOTOR 380V - VFD - FILTER - PUMP)

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter	
Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	[V]	Part No.	Type	Part No.
15/21 4HES 380 5.5kW	308066151	DTm 4.040	314000164	66	15	21	4" VS 15/21	602152101060063	7,5	380	2340663421L	dV/dt	314005134
30/06 4HES 380 5.5kW	308066306				30	6	6" VS 30/06	ETH11300150					
46/05 4HES 380 5.5kW	308066091				46	5	6" VS 46/05	ETH11460140					
46/05 4 HES 380 7.5kW	308066465	100 16A	314000108	21	46	5	6" VS 46/05	ETH11460140	7,5	380	2340663421L	dV/dt	314005101
30/06 4HES 380 7.5kW	308066092				30	6	6" VS 30/06	ETH11300150					

### 4" HES PUMPING PAK (4"PM MOTOR 380V - VFD - SINE FILTER - PUMP)

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter	
Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	[V]	Part No.	Type	Part No.
15/21 4HES 380 5.5kW-SIN	308066097	DTm 4.040	314 000 164	66	15	21	4" VS 15/21	602152101060063	7,5	380	2340663421L	sinus	314005135
30/06 4HES 380 5.5kW-SIN	308066093				30	6	6" VS 30/06	ETH11300150					
46/05 4HES 380 5.5kW-SIN	308066094				46	5	6" VS 46/05	ETH11460140					
46/05 4 HES 380 7.5kW-SIN	308066095	100 16A	314 000 108	21	46	5	6" VS 46/05	ETH11460140	7,5	380	2340663421L	sinus	002347011
30/06 4HES 380 7.5kW-SIN	308066096				30	6	6" VS 30/06	ETH11300150					

Motor lead length: 2,5 m

316SS kits with additional digit "B" (e.g. 308062001 B)

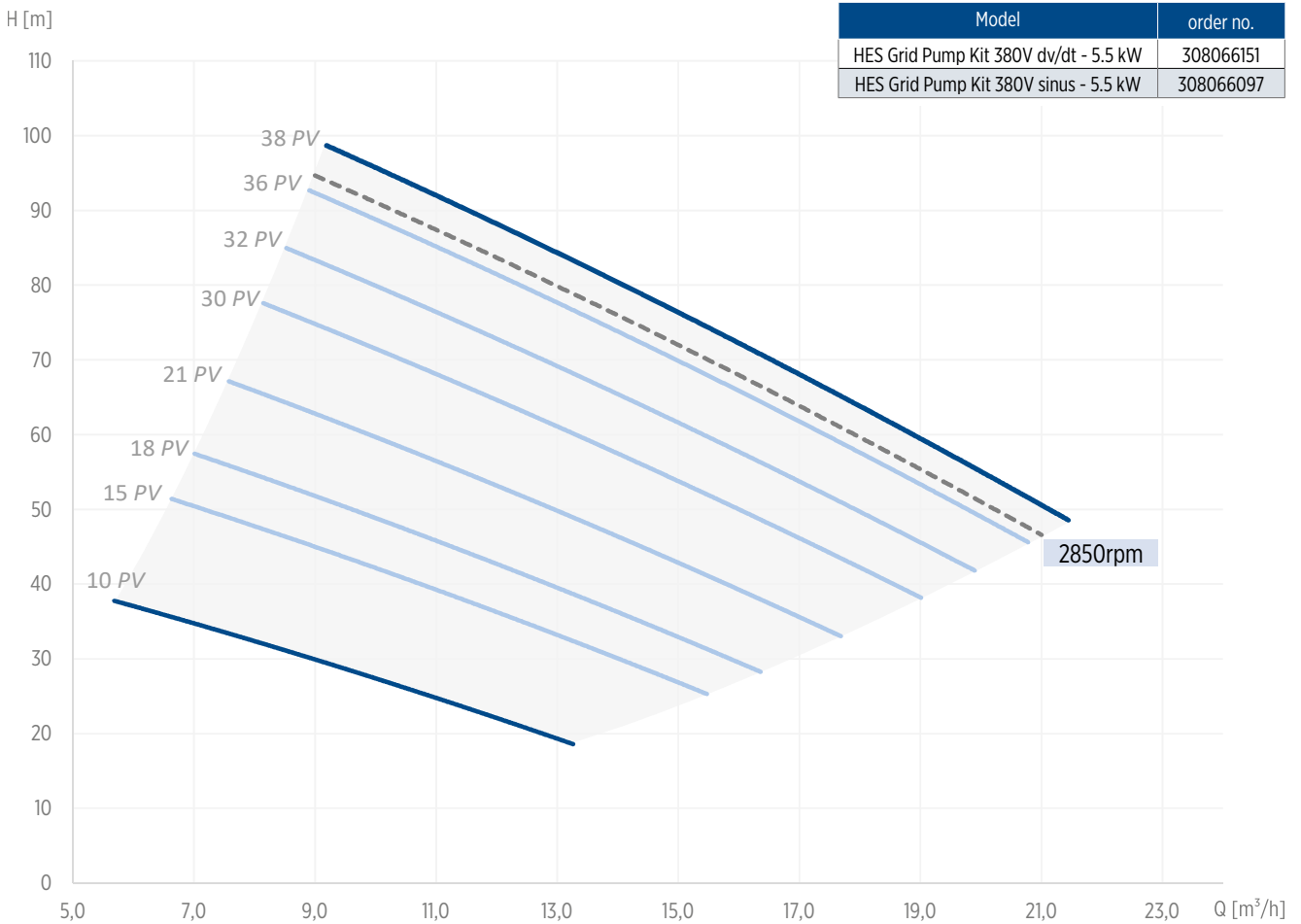
# 4" HES PACKAGE 4.0 - 7.5 KW

VS 15/21 - 5.5 KW - 380 V - 3 PH



Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]	PV-Panel Select							rpm [min <sup>-1</sup> ]
	15	18	21	30	32	36	38	
	Flow - cubic meter / hour [m <sup>3</sup> /h]							
20	17.0	18.7						
30	14.0	15.9	18.5	21.0				
40	10.7	12.8	15.8	18.6	20.3	22.0	23.3	22.5
50	7.2	9.6	12.9	16.0	17.9	19.8	21.1	20.2
60		6.1	9.9	13.3	15.4	17.4	18.9	17.9
70			6.6	10.4	12.8	15.0	16.5	15.5
80				7.4	10.0	12.4	14.1	13.0
90						9.7	11.5	10.3
100							8.8	7.5
110								
120								

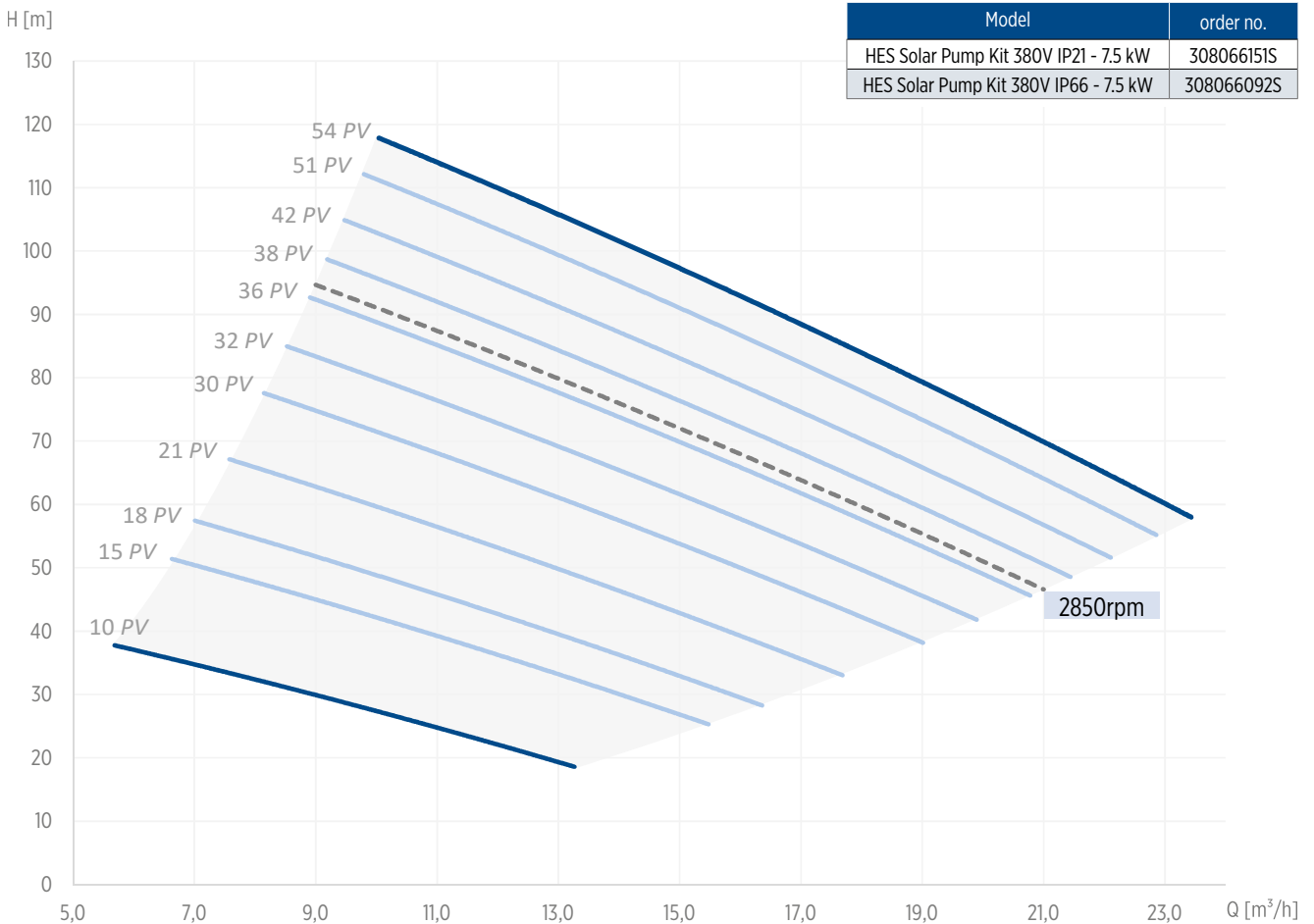


# 4" HES PACKAGE 4.0 - 7.5 KW

VS 15/21 - 7.5 KW - 380 V - 3 PH

Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]	PV-Panel Select										rpm [min <sup>-1</sup> ]	
	15	18	21	30	32	36	38	42	51	54		
Flow - cubic meter / hour [m <sup>3</sup> /h]												
20	17.0	18.7										2850
30	14.0	15.9	18.5	21.0								
40	10.7	12.8	15.8	18.6	20.3	22.0	23.3	24.5				22.5
50	7.2	9.6	12.9	16.0	17.9	19.8	21.1	22.4				20.2
60		6.1	9.9	13.3	15.4	17.4	18.9	20.3	22.0	23.0		17.9
70			6.6	10.4	12.8	15.0	16.5	18.1	19.8	21.0		15.5
80				7.4	10.0	12.4	14.1	15.7	17.7	19.0		13.0
90						9.7	11.5	13.3	15.6	16.8		10.3
100							8.8	10.8	13.0	14.5		7.5
110								8.1	10.5	12.3		
120										9.7		



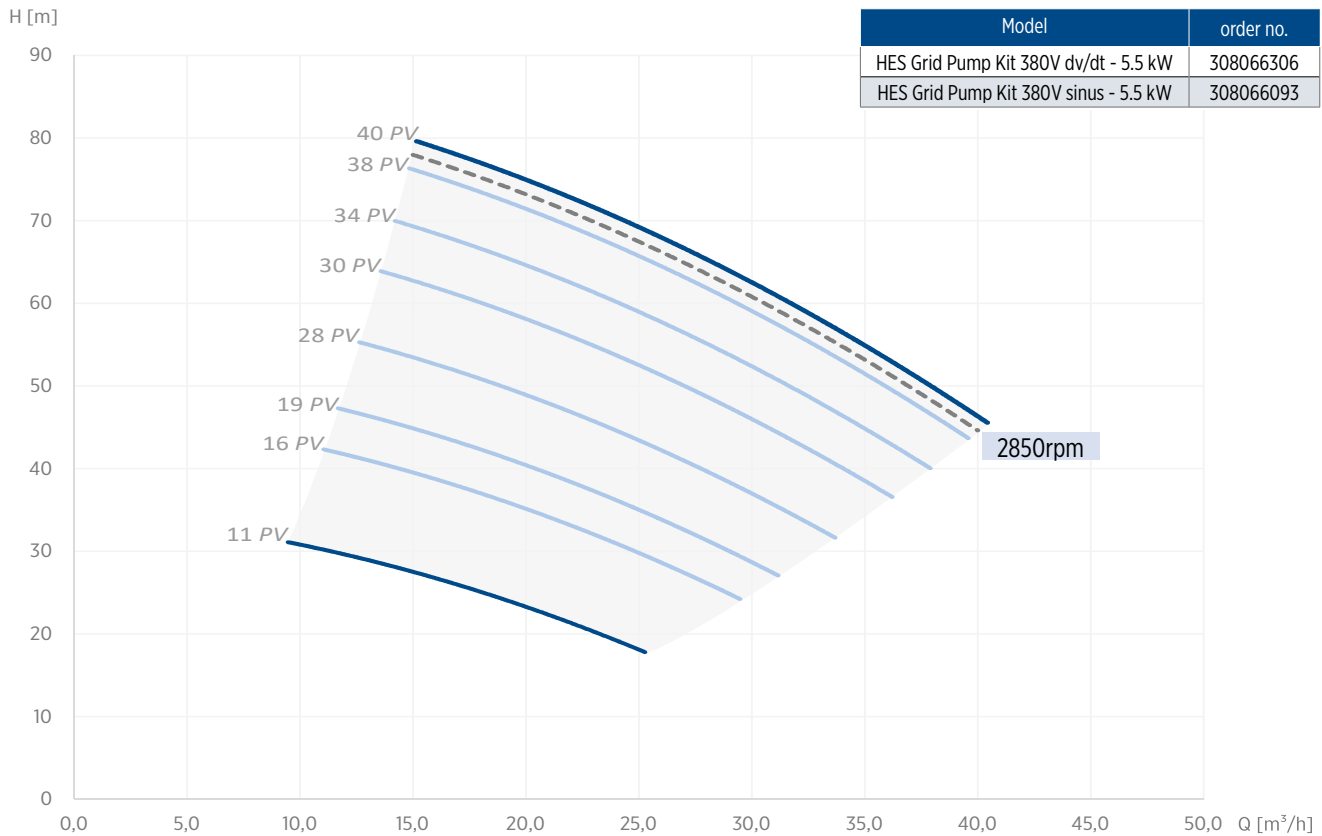
# 4" HES PACKAGE 4.0 - 7.5 KW

VS 30/06 - 5.5 KW - 380 V - 3 PH



Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]	PV-Panel Select							rpm [min <sup>-1</sup> ]
	16	19	28	30	34	38	40	
Flow - cubic meter / hour [m <sup>3</sup> /h]								
30	28.8	29.0						
35	20.2	25.0	31.4					
40	14.4	20.4	27.8	34.0	39.7			42.5
45		14.9	23.7	30.7	34.9	38.9	41.0	39.8
50			18.9	27.0	31.7	35.9	38.0	36.9
55			13.0	22.9	28.1	32.8	35.0	33.9
60				18.0	24.2	29.4	32.0	30.6
65				12.0	19.6	26.6	28.5	26.9
70					14.2	21.4	24.9	22.9
75						16.4	20.0	18.2
80							15.0	
85								
90								

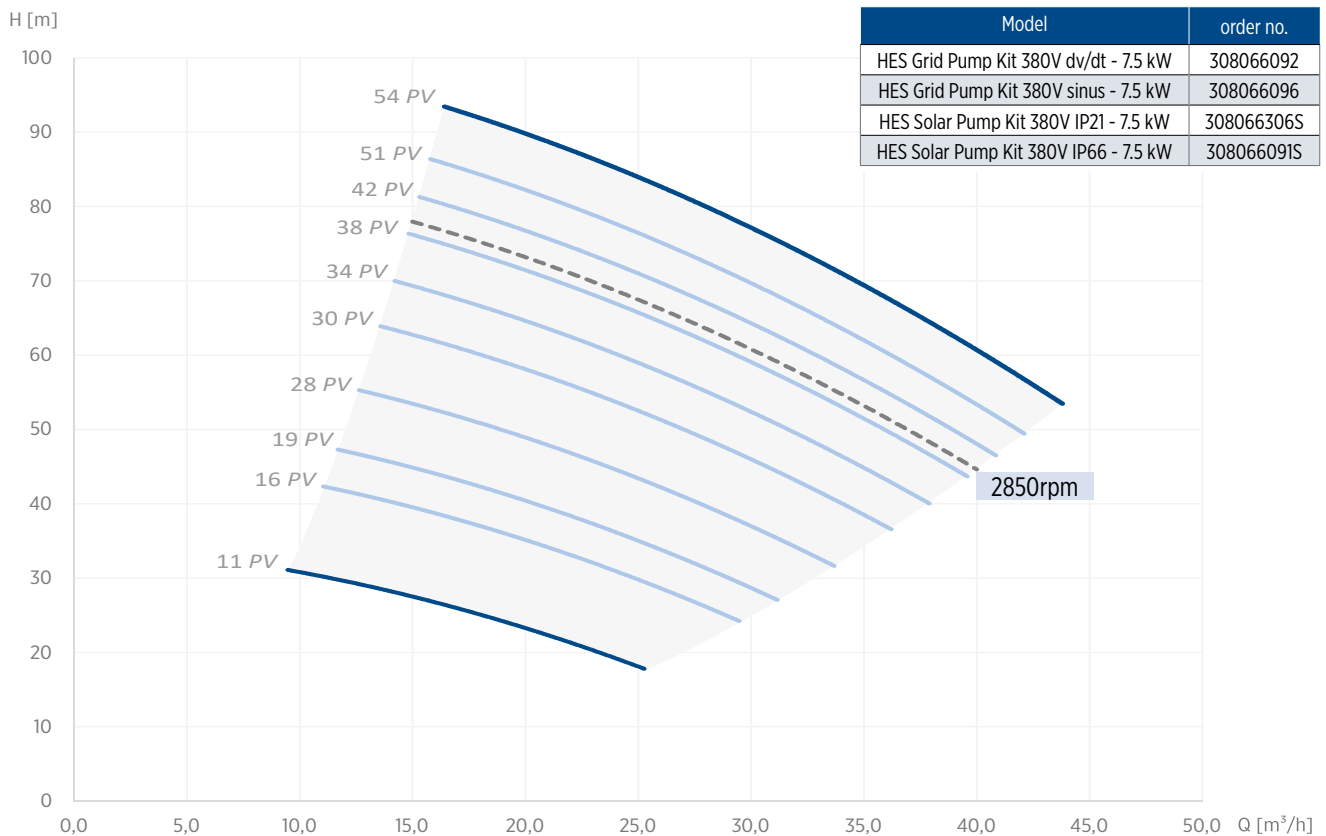


# 4" HES PACKAGE 4.0 - 7.5 KW

VS 30/06 - 7.5 KW - 380 V - 3 PH

Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]	PV-Panel Select									rpm [min <sup>-1</sup> ]	
	16	19	28	30	34	38	42	51	54		
Flow - cubic meter / hour [m <sup>3</sup> /h]											
30	28.8	29.0									2850
35	20.2	25.0	31.4								
40	14.4	20.4	27.8	34.0	39.7	41.6					42.5
45		14.9	23.7	30.7	34.9	38.9	41.7	44.4			39.8
50			18.9	27.0	31.7	35.9	39.0	41.8	45.5		36.9
55			13.0	22.9	28.1	32.8	36.0	39.1	43.0		33.9
60				18.0	24.2	29.4	32.9	36.2	40.0		30.6
65				12.0	19.6	26.6	29.5	33.1	37.0		26.9
70					14.2	21.4	25.8	29.8	35.0		22.9
75						16.4	21.6	26.1	31.5		18.2
80							16.7	22.0	28.0		
85								17.3	24.5		
90									20.0		





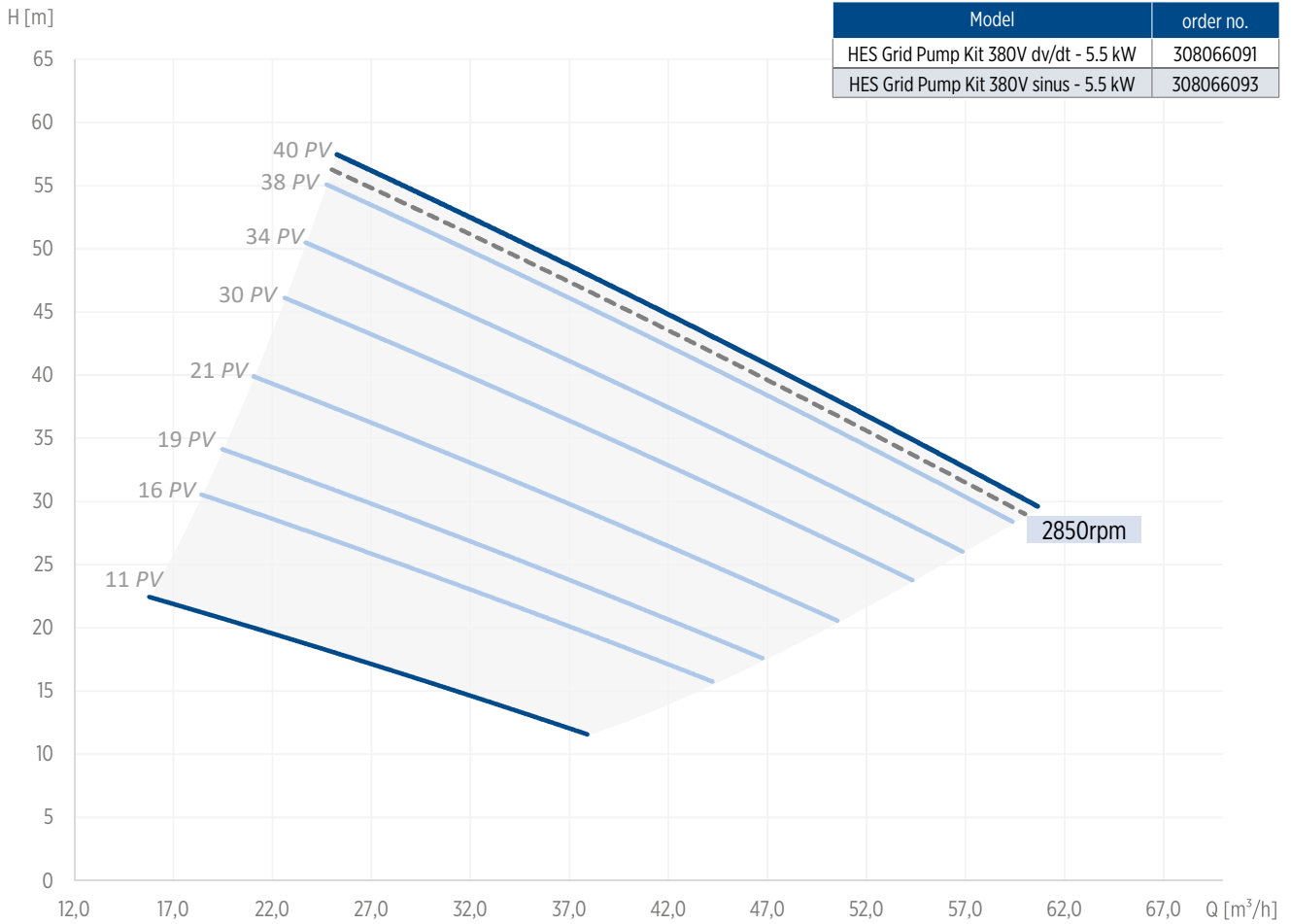
# 4" HES PACKAGE 4.0 - 7.5 KW

VS 46/05 - 5.5 KW - 380 V - 3 PH



Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]	PV-Panel Select							rpm [min <sup>-1</sup> ]
	16	19	21	30	34	38	40	
	Flow - cubic meter / hour [m <sup>3</sup> /h]							
15	45.3	50.6						
20	37.1	42.9	51.2	59.1				
25	28.5	35.0	44.1	52.6	58.0	63.3		64.6
30	19.4	26.6	36.6	45.8	51.7	57.3	61.3	58.7
35		17.9	28.9	38.9	45.2	51.2	54.6	52.6
40			20.9	31.7	38.5	44.9	48.0	46.4
45				24.3	31.5	38.4	42.0	40.0
50					24.4	31.7	36.0	33.5
55						24.8	30.0	26.7
60								
65								

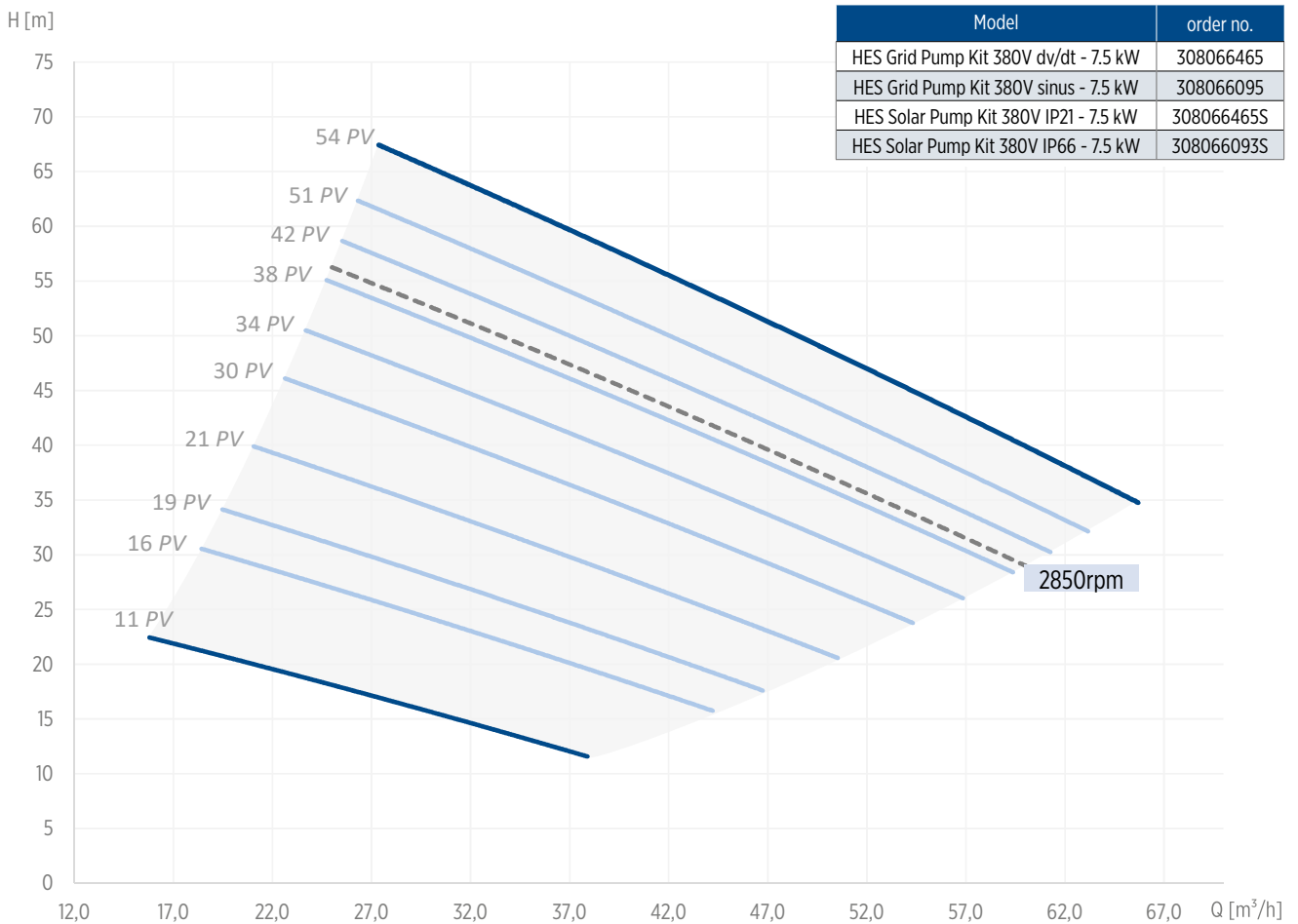


# 4" HES PACKAGE 4.0 - 7.5 KW

VS 46/05 - 7.5 KW - 380 V - 3 PH

Standard Polycrystalline PV-Panel 270 Wmp (STC Condition 1000 W/m<sup>2</sup>)

Head [m]										rpm [min <sup>-1</sup> ]
	16	19	21	30	34	38	42	51	54	2850
15	45.3	50.6								
20	37.1	42.9	51.2	59.1						
25	28.5	35.0	44.1	52.6	58.0	63.3	67.2			64.6
30	19.4	26.6	36.6	45.8	51.7	57.3	61.4	65.4		58.7
35		17.9	28.9	38.9	45.2	51.2	55.5	59.8	66.5	52.6
40			20.9	31.7	38.5	44.9	49.5	54.0	60.4	46.4
45				24.3	31.5	38.4	43.3	48.0	54.0	40.0
50					24.4	31.7	36.9	42.0	49.0	33.5
55						24.8	30.4	35.7	43.0	26.7
60							23.7	29.3	37.0	
65								22.8	31.0	



# 4" HIGH EFFICIENCY SYSTEM (HES) PACKAGE OVERVIEW

## 4" HES SOLAR PAK (4"PM MOTOR 380V - VFD - FILTER - FLOW SWITCH)

High Efficiency System		Controller			Solar Pump (BSPP)				Motor		Output Filter		Flow Switch		
HES Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	[kW]	[V]	Part No.	Filter Type	Part No.	Model	Part No.
4HES 380 7,5kW-Solar	308066001S	100 16A	314000108	21	-	-	-	-	7.5	380	2340663421L	dv/dt	314005101	F21 >4m <sup>3</sup> /h	226019101
4HES 380 7,5kW-Solar	308066005S	100 X 16A	314000109	66	-	-	-	-	7.5	380	2340663421L	dv/dt	314005101	F21 >4m <sup>3</sup> /h	226019101

## 4" HES PAK (4"PM MOTOR 380V - VFD - FILTER)

High Efficiency System		Controller			Pump (BSPP)				Motor		Output Filter*		
HES Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	[kW]	[V]	Part No.	Filter Type	Order No.
4HES 380 5,5kW	308066003	DTm 4.040	314000164	66	-	-	-	-	7.5	3x 380V	2340663421L	dv/dt	314005134
4HES 380 7,5kW	308066001	100 16A	314000108	21	-	-	-	-	7.5	3x 380V	2340663421L	dv/dt	314005101

## 4" HES PAK (4"PM MOTOR 380V - VFD - SINE FILTER)

High Efficiency System		Controller			Pump (BSPP)				Motor		Output Filter*		
HES Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	[kW]	[V]	Part No.	Filter Type	Order No.
4HES 380 5,5kW-SIN	308066004	DTm 4.040	314000164	66	-	-	-	-	7.5	3x 380V	2340663421L	sinus	314005135
4HES 380 7,5kW-SIN	308066002	100 16A	314000108	21	-	-	-	-	7.5	3x 380V	2340663421L	sinus	002347011

Motor lead length: ≤ 2,2: 1,5 m; ≥ 3: 2,5 m

316SS kits with additional digit "B" (e.g. 308066001 B)

\*For lead lengths up to 120 m use dv/dt filter, for > 120 m use sinus filter

## 4" 3~ ENCAPSULATED PM MOTOR

### SPECIFICATION

- 4" NEMA mounting design
- Stainless steel splined shaft
- StatorShield™ - Franklin encapsulation system
- Factory filled with Franklin's non-toxic water soluble fill solution
- High-capacity *Kingsbury type* water lubricated thrust bearing
- Field replaceable lead using Franklin's exclusive *Water Bloc* technology
- Pressure-equalizing diaphragm
- High efficiency electrical design for low operation costs
- All motors manufactured in ISO 9001 & 14001 certified plants and 100% tested
- Drinking water approvals
  
- Ratings: 7.5 kW; Thrust load 6.5 kN
- Voltage: 380 V
- Voltage tolerance: -10% / +6% (50 Hz)
- Nominal ambient temperature: 30 °C with 0.08 m/s cooling flow
- Protection IP68 / insulation class B
- Frequency of starts: max. 20 ; with 3 min. rest period
- Special lead lengths on request
- Vertical and horizontal operation
- All motors with factory installed leads, Motor lead length: 2,5 m



### 3~ 304SS / 316SS MODEL NUMBERS 380 V / 100 HZ

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Thrust F [N]	Digit 1 - 6	Digit 7 - 10	
				Standard 304SS	Standard 316SS
				Single pack with lead*	Single pack with lead*
4.0 - 7.5	380	6500	234 066	3421L	3521L

# 4" 3~ ENCAPSULATED PM MOTOR

## PERFORMANCE DATA 380 V

System model number	f [Hz]	Motor MDL	P <sub>N</sub> [kW]	Thrust F [N]	U <sub>N</sub> [V]	n [min <sup>-1</sup> ]	I <sub>N</sub> [A]	I <sub>A</sub> /I <sub>N</sub> [A]	[%]	cos φ (Pf) [%]	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
308066xxx	50	234066	4.0	6500	380	3000	7,3	1	90,7	0,95	12,7	1
			5.5	6500	380	3000	9,7	1	91,0	0,95	17,5	1
			7.5	6500	380	3000	13,1	1	90,50	0,96	23,9	1

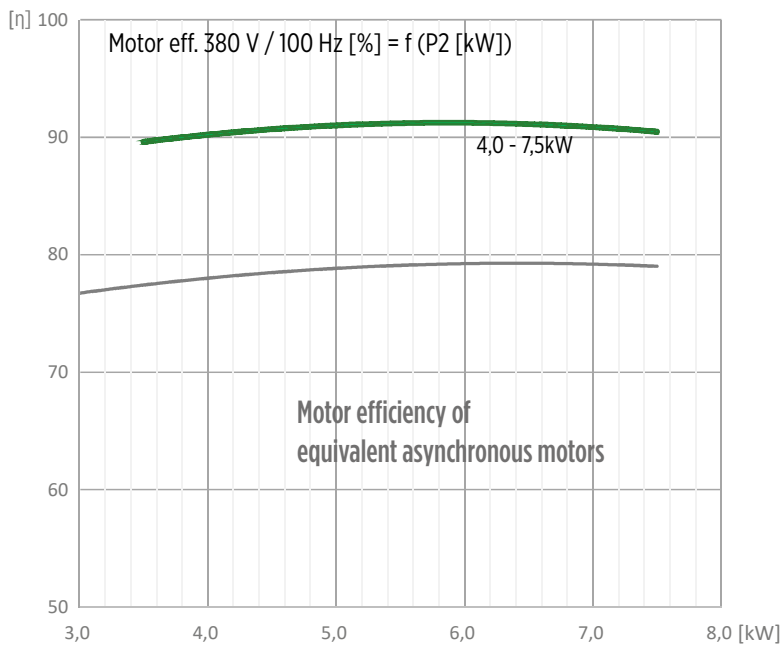
Performance data are based on measurements with Franklin Electric original equipment.

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

## WINDING RESISTANCE 380 V

P <sub>N</sub> [kW]	f [Hz]	U <sub>N</sub> [V]	Stator Ref.	U -V (Ohm)	Rotor Ref.
4.0 - 7.5	100	380	327 454 902	1.88 - 2.07	178 141 901

## EFFICIENCY CURVE AT 3000 RPM

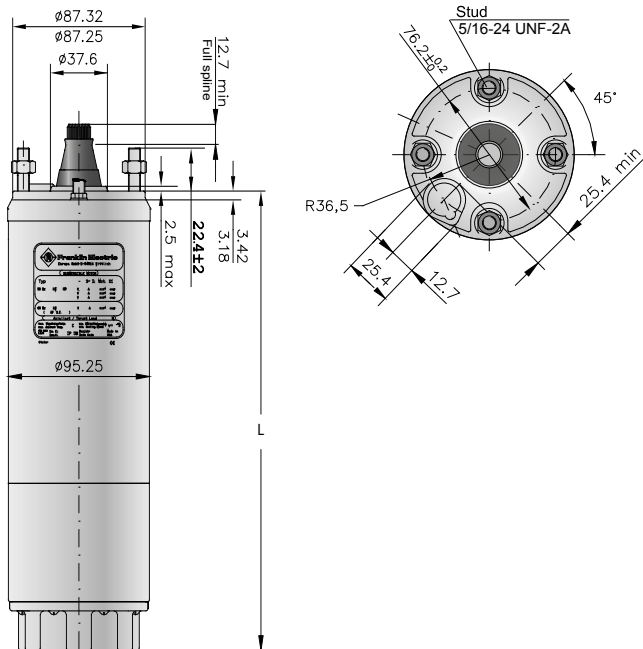




# 4" 3~ ENCAPSULATED PM MOTOR

## MOTOR DIMENSIONS

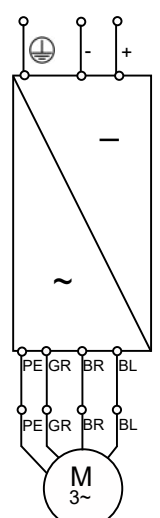
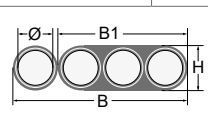
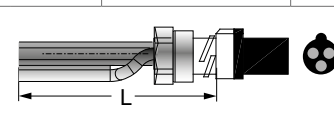
7.5 kW [6500 N]



$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	L [mm]	M [kg]	Motor with lead in single pack	
					[mm]	[kg]
7.5	380	6500	530,5	19,8	796 x 100 x 110	20,2

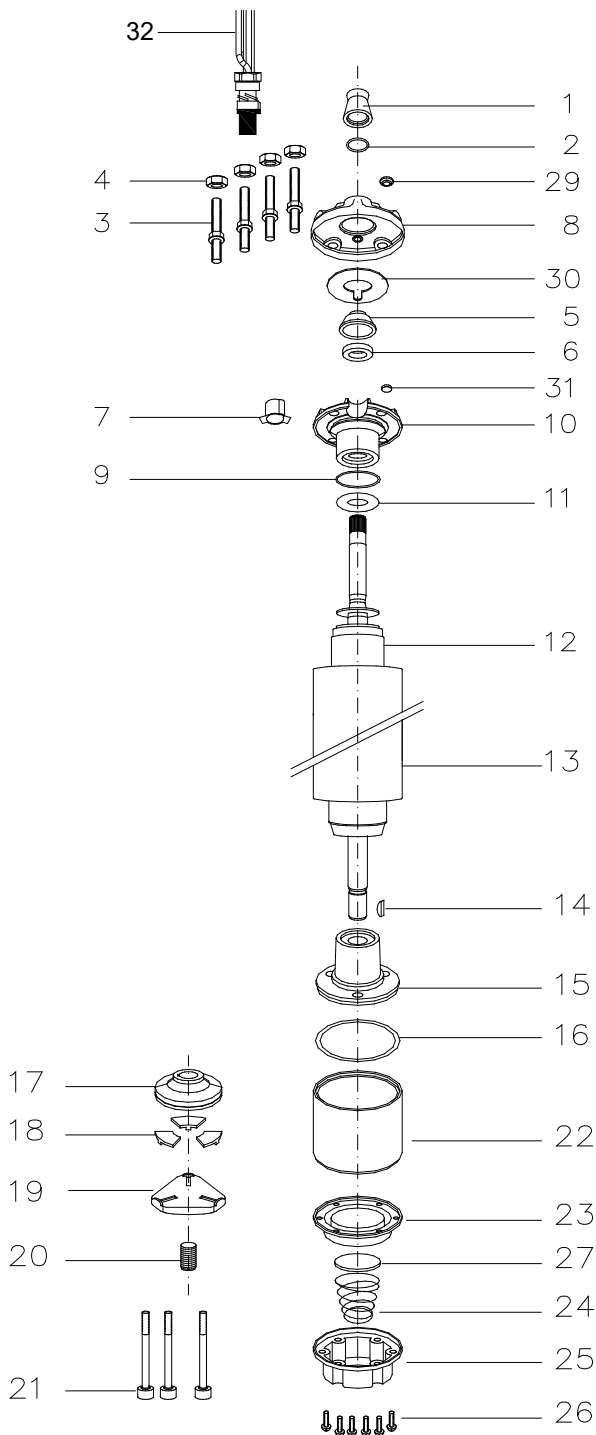
tolerances according to NEMA MG 1-18.388

## ELECTRICAL CONNECTION 3~ MOTORS DOL

3- PM motors DOL	Motor Leads			
	7.5kW [6500 N]			
	$\varnothing$ [mm <sup>2</sup> ]	B [mm]	B1 [mm]	H mm]
		3 x 1,5 + 1G 1,5	16,8	10,7
				
	L [m]*	304SS / 316SS		
	2,5	310 113 502		
	5	310 113 505		
	10	310 113 510		
	15	310 113 515		
	20	310 113 520		
	For special lead lengths, please consult Franklin Electric. *Cables are designed for submerged operation. For air operation, please consult Franklin Electric.			

# 4" 3~ ENCAPSULATED PM MOTOR SPARE PARTS 7.5 kW / 6500N

## MOTOR 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 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	see page 21
13	Stator	1	see page 21
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
32	Motor lead	1	see page 19

## 4" 3~ ENCAPSULATED PM MOTOR SPARE PARTS 7.5 kW / 6500N

### OVERVIEW SPARE PARTS KITS MOTORS 6500N

$P_N$ [kW]	End bell upper (Pos. 10)	End bell, lower (Pos. 15)	Upthrust washer (Pos. 11)
7.5	308 233 509	177 379 921	308 268 104
Kit A	Thrust Bearing Kit 6500N	incl. pos. 17, 18	308 700 301
Kit B	Seal Kit	incl. pos. 1, 2, 6, 9, 16, 23, 29, 31	308 900 352
Kit D	Screw Kit	incl. pos. 3, 4, 21, 26	308 658 351

### SPARE PARTS STATOR AND ROTOR 7.5 kW / 380 V

$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	Model no. Motor		Model no. Stator	Model no. Rotor
			304SS	316SS		
7.5	380	6500	3421L	3521L	327 454 902	178 141 921

# 4" & 6" SUBMERSIBLE PUMP VS4 & VS6

## APPLICATIONS

- Municipal water works, fountains and waste water
- Water distribution and pressure boosting
- Irrigation and sprinkler systems, water treatment plants, filtration and reverse osmosis
- Industrial cooling and processing
- Mining industry, drainage and dewatering
- Fire-fighting equipment
- Water supply to and from tanks, reservoir and wells
- Lifting and distribution of a wide range of liquids
- Autoclave and cistern charge and discharge
- Turf and landscape
- Greenhouses and nurseries
- Residential and farm wells and drainage
- Food industry
- General industry

## FEATURES

- Compact, reliable and suited to operate in horizontal position
- Built-in check valve to protect the pump against water hammer risk
- Floating impellers to grant a better performance and longer life for the pump against abrasion (only 4" Pumps)
- The hydraulic design is such to enhance the overall efficiency thus reducing energy consumption and making the pumping systems more cost effective

## SPECIFICATION

- Flow: up to 24 m<sup>3</sup>/h at 50 Hz
- Head: up to 278 m at 50 Hz
- Pumped liquid: chemically and mechanically non aggressive
- Water temperature range: from 0 °C to 40 °C
- Maximum allowable amount of sand 100 g/m<sup>3</sup>, solid dimension max. 2 mm
- Maximum pump diameter (including cable guard): 4" / 95 mm; 6" / 142,5mm
- Outlet diameter: 1"¼ for VS 15/21; 3" for VS 30/06 & VS 46/05
- Pump can work continuously in vertical or horizontal position



# VARIABLE SPEED DRIVE (VFD)

## FEATURES

- Supports induction and permanent magnet motors
- Top class protection IP66/21 enclosure class
- Optimized for submersible permanent magnet motor feeding first class performance
- Franklin Electric Start-up Guide for easy set-up with tailored pre-settings
- Solar (VFD Type 100 & 100 X)
- Bluetooth connection (VFD Type DTm)
- Mobile App (VFD Type DTm)



## TECHNICAL SPECIFICATION

<b>Power supply</b>	Input voltage $U_{IN}$	380 - 500V ; -10%...+10% 400 - 840V DC	
	Input frequency $f_{IN}$	47 - 65Hz	
	Starts per hour	20 ; with min 3min rest period	
<b>Motor connection</b>	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	
<b>Performance</b>	Efficiency	97,5%	
<b>Control characteristics</b>	Switching frequency	2 ..... 8 kHz; default setting 4 kHz	
<b>Ambient conditions</b>	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)	
<b>EMC</b>	Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment	
<b>Communication</b>	RS 485	Standard: Modbus	
	Ethernet	Standard: Modbus	
<b>I/O connections</b>		VFD 100 & 100 X	VFD DTm 4.040
	Digital Input (DI)	6x	4x
	Analog Input (AI)	2x	4x
	Analog Output (AO)	1x	
	Relay Output (RO)	2x (change-over contact)	

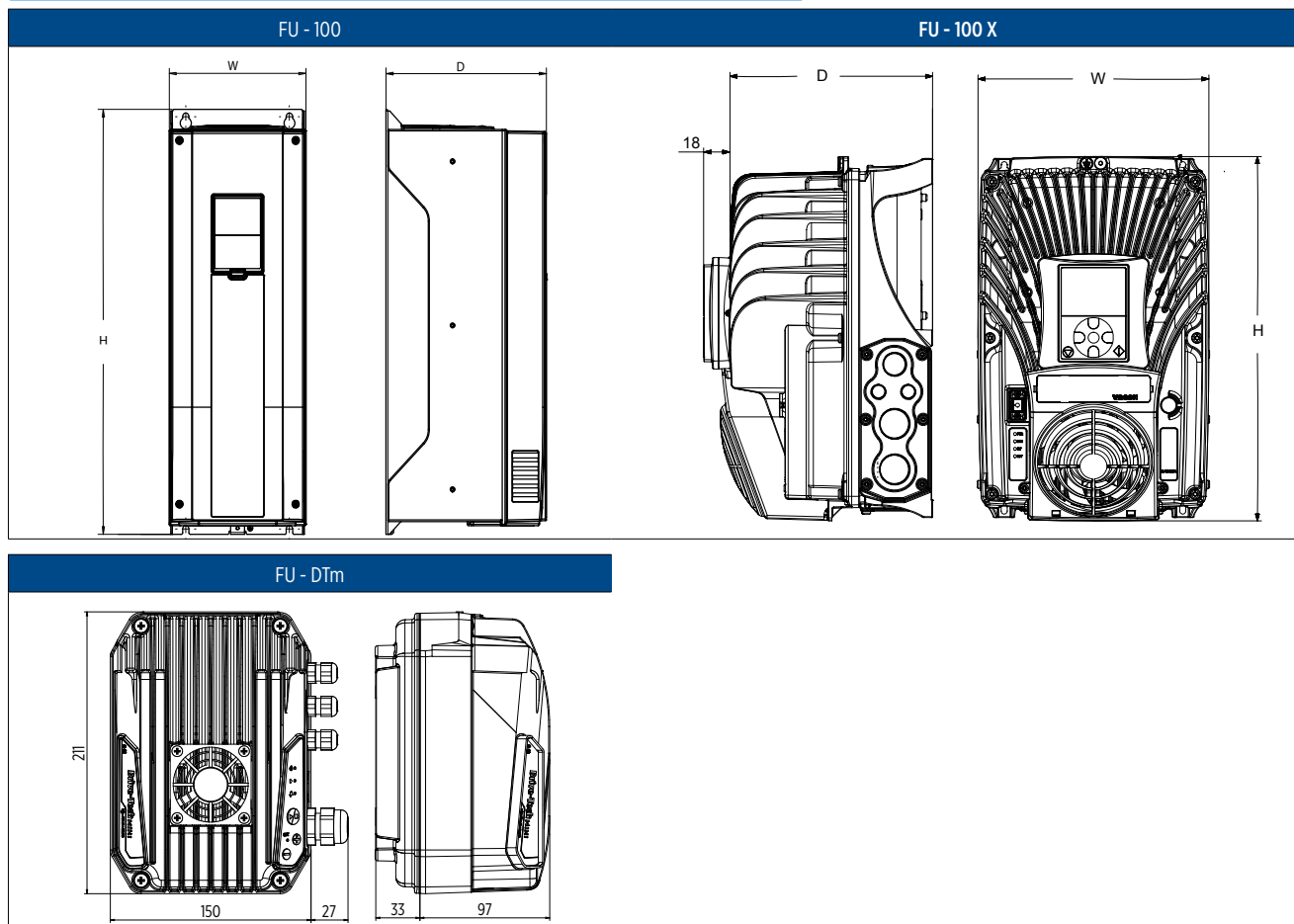


# VARIABLE SPEED DRIVE (VFD)

## MODEL NUMBERS AND DIMENSIONS 220 - 400 V / 50-60 HZ

System Model Number	Drive MDL	Drive Type	IP Type	Input-Voltage [V]	I <sub>N</sub> [A]	Dimensions W x H x D [mm]	Weight [kg]
308066151S	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066306S	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066465S	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066092S	314000109	100 X 16A	66	3x 400	16	233 x 368 x 214	14,9
308066093S	314000109	100 X 16A	66	3x 400	16	233 x 368 x 214	14,9
308066091S	314000109	100 X 16A	66	3x 400	16	233 x 368 x 214	14,9
308066151	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066306	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066091	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066465	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066092	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066097	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066093	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066094	314000164	DTm 4.040	66	3x 400	10,5	150x 130 x 211	2,8
308066095	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10
308066096	314000108	100 16A	21	3x 400	16	144 x 419 x 214	10

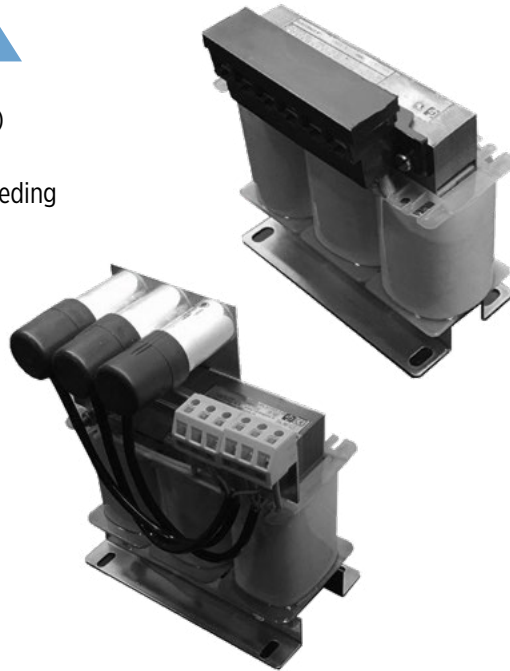
## DIMENSIONAL DATA



# OUTPUT FILTER

## SPECIFICATION

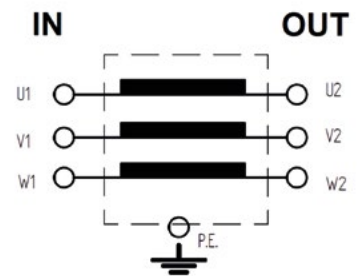
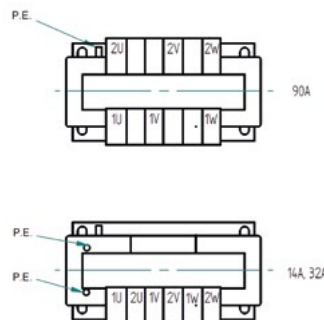
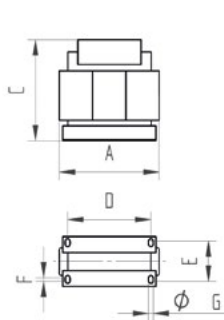
- dV/dt filter for lead lengths up to 120 m  
(for lead lengths >120 m please consult Franklin Electric)
- Filter available in IP00
- Optimized for submersible permanent magnet motor feeding
- Voltage: 380 - 500 V
- Frequency: 0 - 120 Hz
- Switching Frequency: 4 kHz
- Ambient Temperature: < 40 °C
- Special voltages on request
- Sinus filter in IP00 for lead length >120 m  
and/or special applications on request



## MODEL DATA DV/DT OUTPUT FILTER 400/500 V

Protection Class IP00*									
Filter order number	$I_N$ [A]	Dimensions [mm]							weight [kg]
		A	B (B1)	C	D	E	F	G	
314 005 134	14	120	67	115	100	60	5	5.5	2.7

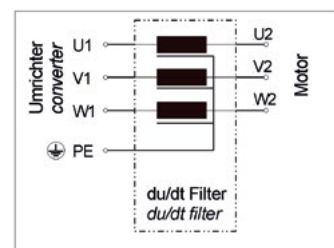
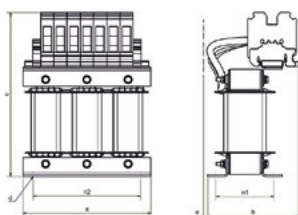
Filter outlines



Filter order number	$I_N$ [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque	
		a	b	c	n1	n2	d	e		main [mm <sup>2</sup> ]	PE [mm <sup>2</sup> ]	main [Nm]	PE [Nm]
314 005 101	23	125	92	161	55	100	5	15	2.5	1.5 - 16	1.5 - 16	2.5 - 3.0	2.5 - 3.0

Filter outlines

dV/dt Filter Connection Plan



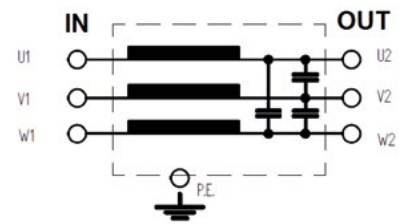
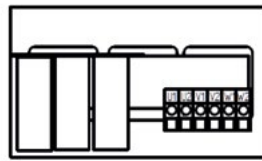
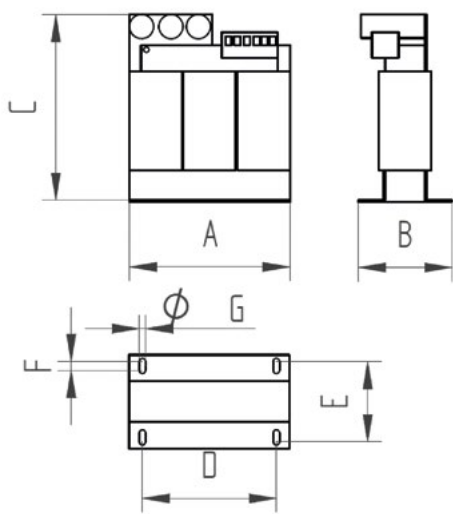
\* For IP54 rating the recommended enclosure size is 10Liter.

# OUTPUT FILTER

## MODEL DATA SINUS OUTPUT FILTER 400/500 V

Protection Class IP00*									
Filter order number	$I_N$ [A]	Dimensions [mm]							weight [kg]
		A	B (B1)	C	D	E	F	G	
314005135	14	180	105	210	150	90	10	6,5	10
002347011	32	240	115	280	200	95	10	9.5	17.5

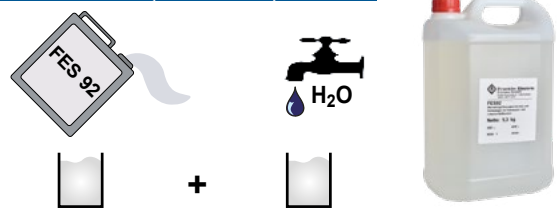
Filter outlines




\*For IP54 rating the recommended enclosure size is 20 liter.

## ACCESSORIES


### MOTOR FILLING LIQUID

Description	Model number	
Motor filling liquid FES92	308 353 941	<div style="text-align: center;"> <p><b>FES 91 (4" PM Motors)</b></p>  </div>

### MOTOR FILLING KIT

Description	Model number	
This kit contains all necessary tools to check and replenish Franklin Electric submersible motors with filling liquid (fill solution/concentrate must be ordered separately).	308 726 103	

### LEAD TERMINATION KIT 4"

Description	Model number	
Standard 304SS	308 090 901	
316SS	308 090 911	
Strain Relief 304SS	308 090 902	

# ACCESSORIES

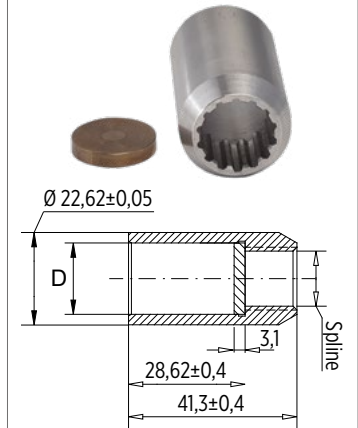
## DOUBLE PLUG LEAD FOR TERMINATION KIT 4"

Description	Material	Lenght [m]	Model number
without strain relief	304SS	1,5	310 111 001
without strain relief	316SS	1,5	310 111 501
with strain relief	304SS	1,5	310 112 001
with strain relief	316SS	1,5	-
without strain relief	304SS	2,5	310 111 002
without strain relief	316SS	2,5	310 111 502
with strain relief	304SS	2,5	310 112 002
with strain relief	316SS	2,5	-



## 4" MOTOR/PUMP COUPLING

Description	Mat.	Model number	Dimensions Ø D [mm]
4" Motor/Pump coupling	316SS	308 712 904	Max. 17,50 / Min. 17,48



**CATALOG REVISION CHANGE NOTES**

Rev. No.	Changes	Page
01	Adapting the model numbers	9 / 15 / 16 / 24
02	VFD DTm (Drive Tech mini) added to the VFD selection	5 / 6 / 9 / 16 / 23 / 24









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