



# 4" / 6" / 8" / 10" High Efficiency Solar System 4" / 6" / 8" / 10" High Efficiency System





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# OVERVIEW HIGH EFFICIENCY SYSTEMS

Overview packaged deals



## PACKAGED DEAL 4"

- 4" encapsulated synchronous submersible motor
- 4"/6" submersible pump
- Variable frequency drive
- Matching output filter for 400 V systems
- Flow switch (Solar systems 4 - 7.5 kW)
- Motor range:
  - 1.1 / 2.2 / 3.0 / 4.0 / 7.5 kW (100 Hz - 3000 rpm)
  - 1.2 / 2.5 / 3.4 / 4.6 / 8.6 kW (120 Hz - 3600 rpm)
- System Power Supply: 220-400 / 460 V ± 10 % (50/60 Hz)

→ 4" HES

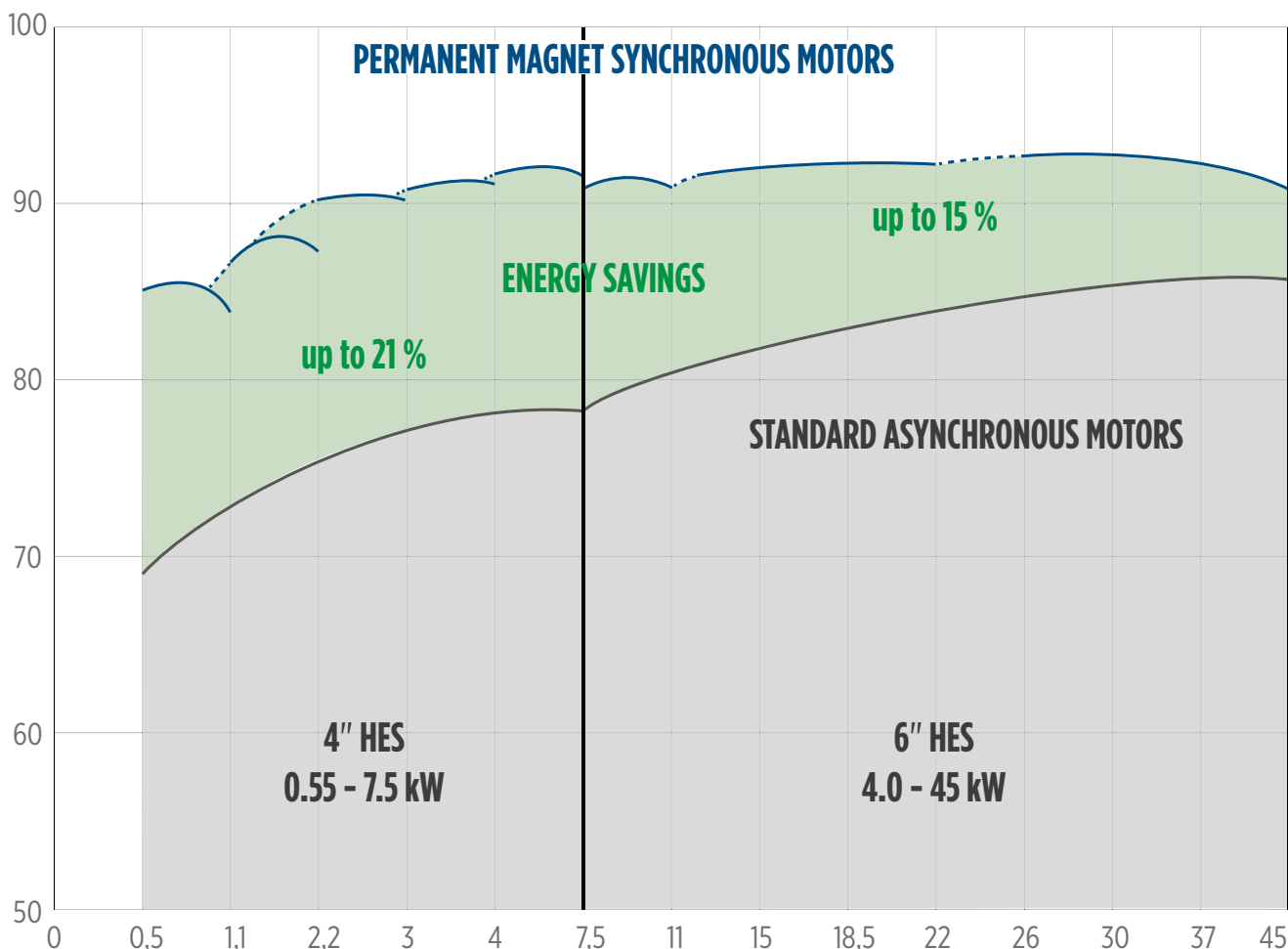
## PACKAGED DEAL 6"

- 6" encapsulated synchronous submersible motor
- 6" submersible pump (optional)
- Variable frequency drive
- Matching output filter
- Flow switch (Solar systems)
- Motor range:
  - 4.0 - 11.0 / 13.0 - 22.0 / 26.0 - 45.0 kW (100 Hz - 3000 rpm)
  - 4.5 - 12.7 / 15.0 - 25.0 / 30.0 - 51.7 kW (120 Hz - 3600 rpm)
- System Power Supply: 380-400 V / 460 V ± 10 % (50/60 Hz)

→ 6" HES

### Motor performance curves 4"/6"/8"/10"

efficiency [%]



# OVERVIEW HIGH EFFICIENCY SYSTEMS

Overview packaged deals



## PACKAGED DEAL 8"

- 8" rewindable synchronous submersible motor
- 8" submersible pump (optional)
- Variable frequency drive
- Matching output filter
- Flow switch (Solar systems)
  
- Motor range: 75 / 100 / 130 kW (100 Hz - 3000 rpm)  
86.3 / 115 / 150 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 / 460 V ± 10 % (50/60 Hz)

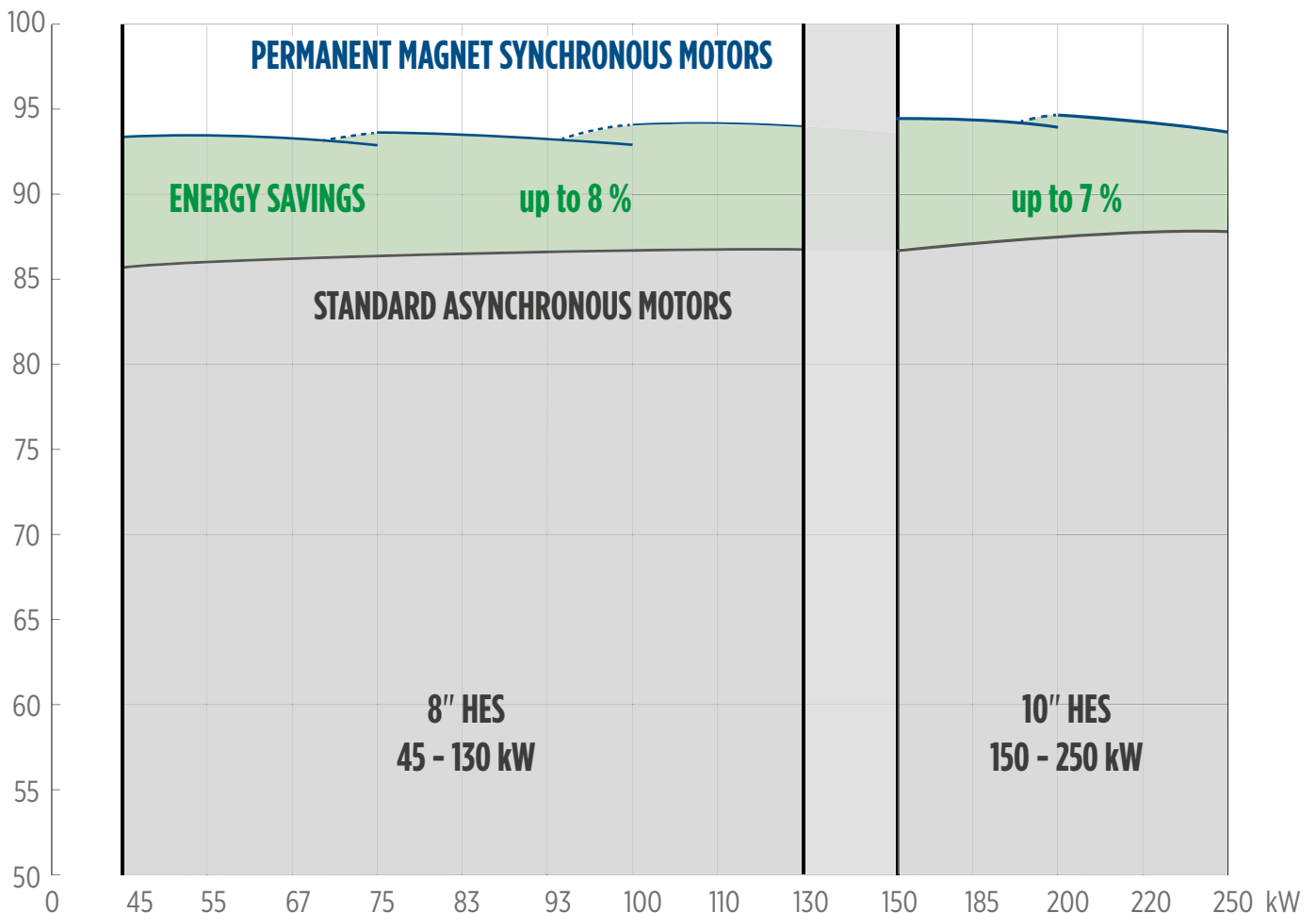
## PACKAGED DEAL 10"

- 10" rewindable synchronous submersible motor
- 10" submersible pump VSC10 (optional)
- Variable frequency drive
- Matching output filter
- Flow switch (Solar systems)
  
- Motor range: 190 - 250 kW (100 Hz - 3000 rpm)  
230 - 290 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 / 460 V ± 10 % (50/60 Hz)

→ 8" HES

→ 10" HES

efficiency [%]

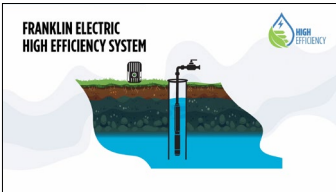


# OVERVIEW HIGH EFFICIENCY SYSTEMS (HES)

## Energy savings with the permanent magnet motor technology

The key factor for energy savings and superior efficiency is the permanent magnet technology of the motor. Instead of a short-circuit induction type rotor, the high efficiency motor contains a permanent magnet rotor design with buried magnets and magnetic core segments.

Of course, the PM motor also has all the advantages of standard Franklin motors, such as Franklin Electric's proven StatorSHIELD encapsulation system in the 4" and 6" motors with its encapsulated windings, or the hydrodynamic liquid-lubricated bearings and Kingsbury thrust bearings that provide maintenance-free operation.



Click to view the video about cost savings of Franklin Electric High Efficiency Systems

### SandFighter® sealing system

SandFighter® sealing system with SiC mechanical seal and sand slinger (6-12")



### StatorSHIELD™ - Franklin encapsulation system (4"/6" HES)

Franklin Electric encapsulated motors are equipped with hermetically-sealed windings. The Anti track stator resin mechanically supports the winding and provides fast heat dissipation.

### Hydrodynamic liquid lubricated radial bearings

100 % maintenance free operation for all Franklin Electric encapsulated and rewindable motors.

### Permanent Magnet Technology

Motor rotors are equipped with permanent magnets that eliminate rotor losses thus significantly reducing motor current and heat rise.

### Kingsbury type thrust bearing

High capacity Kingsbury type thrust bearing for 100 % maintenance free operation



Pressure-equalizing diaphragm

### NEMA mounting design

Standard NEMA dimensions for all motors 4" - 8" 10" motors with double flange mounting design according to industry standards



### Best class winding wires in rewindable motors

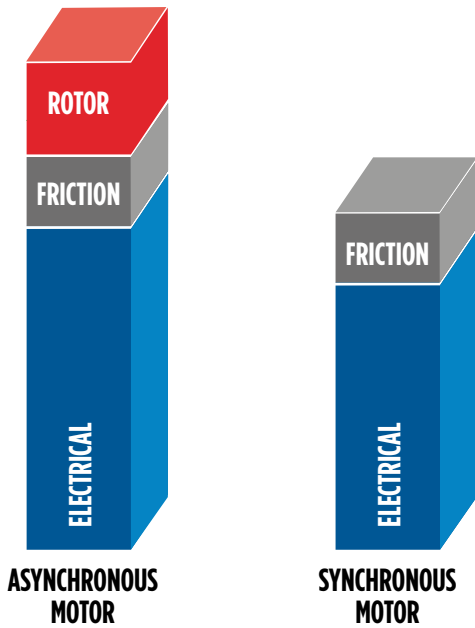
The rewindable motors are equipped with best class winding wires. The windings can easily be replaced. The Franklin motors are factory filled with Franklin's FES non-toxic water soluble fill solution.

# OVERVIEW HIGH EFFICIENCY SYSTEMS (HES)

## Energy savings with the permanent magnet motor technology

The total rotor losses of a PM motor are eliminated, resulting in a significant improvement in efficiency. In addition, the PM motor has less temperature heat rise and requires lower Amps to run at the same pump load.

### Overall electrical and mechanical losses of a submersible motor



- ✓ No rotor losses with permanent magnet motors
- ✓ Significant improvement in efficiency
- ✓ Synchronous speed (no slip)



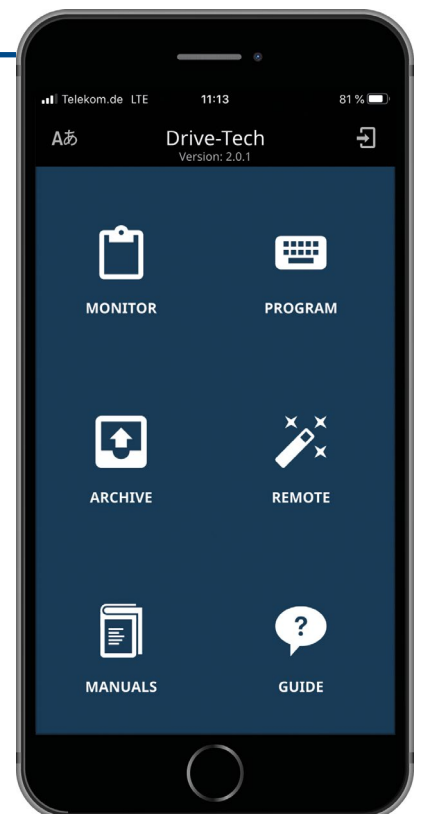
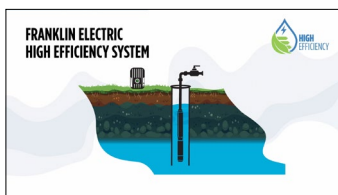
## EASY INSTALLATION AND REMOTE-CONTROL

For the operation of a PM motor, a frequency converter is required. Franklin Electric offers various models for the different systems:

- Operation with grid or solar supply
- Easy and fast commissioning due to initial configuration wizard
- Remote control and real-time monitoring via Mobile App (4")
- Remote assistance from the Franklin Electric support team (4")

Youtube tutorial configuration High Efficiency Systems: [configuration tutorial](#)

Click to view the video about cost savings of Franklin Electric High Efficiency Systems



# OVERVIEW HIGH EFFICIENCY SOLAR SYSTEMS



## PACKAGED SOLAR DEAL



- Synchronous submersible motor
- Submersible pump
- Variable frequency drive
- Matching output filter
- Flow switch (systems  $\geq 4$  kW)

- ✓ One-stop shop and perfectly matching components guarantee first-class performance/efficiency
- ✓ Direct DC feeding, AC and DC power source compatible
- ✓ Suitable for the use in remote areas and harsh environments without grid supply
- ✓ Robust Electronics enclosure designs

### Maximum system performance through MPPT algorithm

- ✓ The Franklin Electric MPPT algorithm maximizes the system performance.

The solar system must be carefully sized to achieve the desired system performance. In addition to solar irradiance, this depends on the number of solar panels and how well the solar drive controls motor and pump.

### 4" Solar Voltage Boost (up to 2.2 kW)

- ✓ Sizing in power rather than voltage
- ✓ Less panels, more water respectively
- ✓ Reduction of required Solar panels
- ✓ Saving of investments and installation work

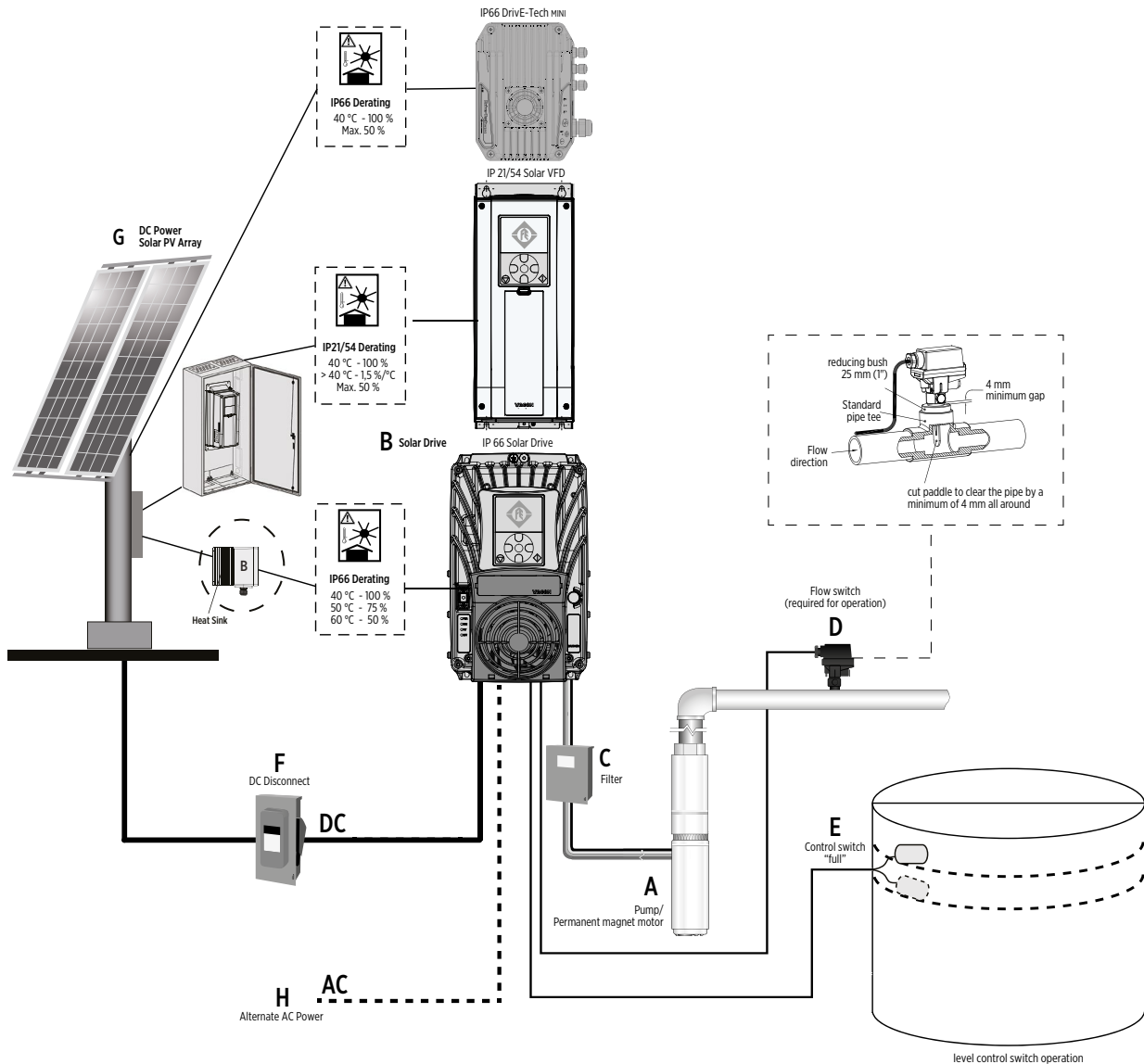
To generate the required voltage level to operate the system at full speed, enough solar panels need to be connected in series. With changing weather conditions, the voltage can drop, causing the system to immediately reduce pump speed to keep running. This reduces the amount of water pumped, but not just linearly. Due to pump affinity laws, the pump head or pressure is reduced squared, which then leads to a further reduction in water flow as it runs at a different pump operating point.

The Franklin Electric High Efficiency Solar system avoids dead head (zero flow) situation, when the pump is still operating, but it's not generating enough head to overcome a certain level. With the lower energy consumption of the High Efficiency System, there is an additional safety reserve to pump more water, or for a longer time period.



# OVERVIEW HIGH EFFICIENCY SOLAR SYSTEMS

## Solar system installation



- A. High Efficiency permanent magnet motor and pump
- B. HES Solar drives
- C. Output filter
- D. Flow-Switch (< 4 kW optional: > 4 m<sup>3</sup>/h: 226 019 101; < 4 m<sup>3</sup>/h: 226 014 101)
- E. Level Control Switch (optional: 308 170 209)
- F. DC Disconnect (optional 0 - 11A/800V DC - 308 170 313; 12 - 22A/800V DC - 308 170 325)
- G. Solar Array, not included
- H. Alternate AC Power supply, not included (only one supply source at a time)

# 4" CT HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with energy savings up to 21 %\*

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- Up to 15 points (21 %) 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
- Power factor corrected input (No power compensation needed)

### 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)

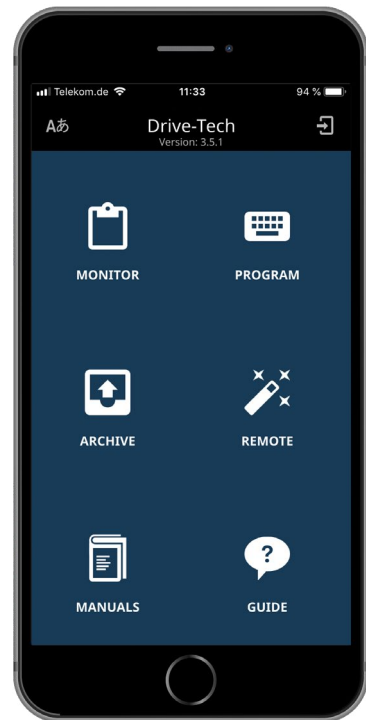
### UP-TO-DATE CONNECTIVITY

- Factory-featured with Bluetooth 4.0 Connectivity
- Remote control and maintenance via Mobile App



### FULLY SUPPORTED

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



## APPLICATIONS



\* in comparison to current asynchronous technology

# 4" CT HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with energy savings up to 21%\*

## SPECIFICATION

- Motor range:
  - 1.1 / 2.2 / 3.0 / 4.0 / 7.5 kW (100 Hz - 3000 rpm)
  - 1.2 / 2.5 / 3.4 / 4.6 / 8.6 kW (120 Hz - 3600 rpm)
- System Power Supply: 220 V - 400 V ± 10 %
- System Supply Frequency: 50 Hz - 60 Hz ± 2 %
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Motor installation orientation: Vertical / horizontal (shaft end heightened)
- Protection:
  - motor: IP68, insulation class B
  - drive: IP66/65 (up to 4 kW), IP66/21 (up to 7.5 kW)
  - filter: IP00
- 220/230 V kits without additional output filter

## OPTIONS



- Special Voltages
- Higher-graded material: 316SS
- Sinus output filters in IP00 (400 V)
- VFD IP21 for 400 V systems
- Solar

## PACKAGED DEAL



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



\* in comparison to current asynchronous technology

## 4" CT HIGH EFFICIENCY SYSTEM (HES) PACKAGES

### GRID PUMP KITS 220 V AC

High Efficiency System		Controller		Pump (BSPP)				Motor	
Model	Order No.	Drive Model	Part No.	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	Part No.
1/26 4HES 220 1.1 kW	308071126	Drive-Tech MINI 2.011	002149112	1	26	4" VS 1/26	602012601050063	1.1	2340716721L
2/20 4HES 220 1.1 kW	308071220			2	20	4" VS 2/20	602022001050063		
4/14 4HES 220 1.1 kW	308071414			4	14	4" VS 4/14	602041401050063		
2/27 4HES 220 2.2 kW	308072227	Drive-Tech MINI 2.015	002149152	2	27	4" VS 2/27	602022701050063	2.2	2340726721L
4/27 4HES 220 2.2 kW	308072427			4	27	4" VS 4/27	602042701050063		
6/13 4HES 220 2.2 kW	308072613			6	13	4" VS 6/13	602061301060063		
6/19 4HES 220 3.0 kW	308073619	Drive-Tech 3.030 MP	314000161	6	19	4" VS 6/19	602061901060063	3.0	2340736721L
4/44 4HES 220 4.0 kW	308074444	Drive-Tech 3.030 MP	314000161	4	44	4" VS 4/44	602044401050063	4.0	2340743421L
6/34 4HES 220 4.0 kW	308074634			6	34	4" VS 6/34	602063401060063		
8/23 4HES 220 4.0 kW	308074823			8	23	4" VS 8/23	602082301060063		
10/08 4HES 220 4.0 kW	308074108			10	18	4" VS 10/18	602121801060063		
4HES 220 0.55 - 1.1 kW	308071001	Drive-Tech MINI 2.011	002149112	-	-	-	-	1.1	2340716721L
4HES 220 1.1 - 2.2 kW	308072001	Drive-Tech MINI 2.015	002149152	-	-	-	-	2.2	2340726721L
4HES 220 2.2 - 3.0 kW	308073001	Drive-Tech 3.030 MP	314000161	-	-	-	-	3.0	2340736721L
4HES 220 3.0 - 4.0 kW	308074001	Drive-Tech 3.030 MP	314000161	-	-	-	-	4.0	2340743421L

### GRID PUMP KITS 380 V AC WITH DV/DT FILTER

High Efficiency System		Controller		Pump (BSPP)				Motor		Output filter
Model	Order No.	Drive Model	Part No.	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	Part No.	Part No.
2/27 4HES 380 2.2 kW	308062227	Drive-Tech MINI 4.011	314000162	2	27	4" VS 2/27	602022701050063	2.2	2340626721L	002 352 414
4/27 4HES 380 2.2 kW	308062427			4	27	4" VS 4/27	602042701050063			
6/13 4HES 380 2.2 kW	308062613			6	13	4" VS 6/13	602061301060063			
6/19 4HES 380 3.0 kW	308063619	Drive-Tech MINI 4.022	314000163	6	19	4" VS 6/19	602061901060063	3.0	2340636721L	002 352 414
4/44 4HES 380 4.0 kW	308064444	Drive-Tech MINI 4.040	314000164	4	44	4" VS 4/44	602044401050063	4.0	2340643421L	002 352 414
6/34 4HES 380 4.0 kW	308064634			6	34	4" VS 6/34	602063401060063			
8/23 4HES 380 4.0 kW	308064823			8	23	4" VS 8/23	602082301060063			
10/08 4HES 380 4.0 kW	308064108			10	18	4" VS 10/18	602121801060063			
15/21 4HES 380 5.5 kW	308066151	Drive-Tech MINI 4.040	314000164	15	21	4" VS 15/21	602152101060063	5.5	2340643421L	002 352 414
30/06 4HES 380 5.5 kW	308066306			30	6	6" VS 30/06	ETH11300150			
46/05 4HES 380 5.5 kW	308066091			46	5	6" VS 46/05	ETH11460140			
46/05 4 HES 380 7.5 kW	308066465	100 16A	314000108	46	5	6" VS 46/05	ETH11460140	7.5	2340663421L	314005101
30/06 4HES 380 7.5 kW	308066092			30	6	6" VS 30/06	ETH11300150			
4HES 380 1.1 - 2.2 kW	308062001	Drive-Tech MINI 4.011	314000162	-	-	-	-	2.2	2340626721L	002 352 414
4HES 380 2.2 - 3.0 kW	308063001	Drive-Tech MINI 4.022	314000163	-	-	-	-	3.0	2340636721L	002 352 414
4HES 380 3.0 - 4.0 kW	308064001	Drive-Tech MINI 4.040	314000164	-	-	-	-	4.0	2340643421L	002 352 414
4HES 380 5.5 kW	308066003	Drive-Tech MINI 4.040	314000164	-	-	-	-	5.5	2340663421L	002 352 414
4HES 380 7.5kW	308066001	100 16A	100 16A	-	-	-	-	7.5	2340663421L	314005101

Motor lead length: ≤ 2,2 kW: 1.50 m; ≥ 3 kW: 2.50 m  
 316SS kits with additional digit "B" (e.g. 308062001 B)

# 4" CT HIGH EFFICIENCY SYSTEM (HES) PACKAGE

## GRID PUMP KITS 380 V AC WITH SINUS FILTER

High Efficiency System		Controller		Pump (BSPP)				Motor		Output filter
Model	Order No.	Drive Model	Part No.	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	Part No.	Part No.
2/27 4HES 380 2.2 kW-Sin	308062091	Drive-Tech MINI 4.011	314000162	2	27	4" VS 2/27	602022701050063	2.2	2340626721L	002 347 013
4/27 4HES 380 2.2 kW-Sin	308062092			4	27	4" VS 4/27	602042701050063			
6/13 4HES 380 2.2 kW-Sin	308062093			6	13	4" VS 6/13	602061301060063			
6/19 4HES 380 3.0 kW-Sin	308063091	Drive-Tech MINI 4.022	314000163	6	19	4" VS 6/19	602061901060063	3.0	2340636721L	002 347 013
4/44 4HES 380 4.0 kW-Sin	308064091	Drive-Tech MINI 4.040	314000164	4	44	4" VS 4/44	602044401050063	4.0	2340643421L	002 347 013
6/34 4HES 380 4.0 kW-Sin	308064092			6	34	4" VS 6/34	602063401060063			
8/23 4HES 380 4.0 kW-Sin	308064093			8	23	4" VS 8/23	602082301060063			
10/08 4HES 380 4.0 kW-Sin	308064094			10	18	4" VS 10/18	602121801060063			
15/21 4HES 380 5.5 kW-Sin	308066097	Drive-Tech MINI 4.040	314000164	15	21	4" VS 15/21	602152101060063	7.5	2340663421L	002347011
30/06 4HES 380 5.5 kW-Sin	308066093			30	6	6" VS 30/06	ETH11300150			
46/05 4HES 380 5.5 kW-Sin	308066094			46	5	6" VS 46/05	ETH11460140			
46/05 4 HES 380 7.5 kW-Sin	308066095	100 16A	314000108	46	5	6" VS 46/05	ETH11460140	7.5	2340663421L	002347011
30/06 4HES 380 7.5 kW-Sin	308066096			30	6	6" VS 30/06	ETH11300150			
4HES 380 1.1 - 2.2 kW-Sin	308062002	Drive-Tech MINI 4.011	314000162	-	-	-	-	2.2	2340626721L	002 347 013
4HES 380 2.2 - 3.0 kW-Sin	308063002	Drive-Tech MINI 4.022	314000163	-	-	-	-	3.0	2340636721L	002 347 013
4HES 380 3.0 - 4.0 kW-Sin	308064002	Drive-Tech MINI 4.040	314000164	-	-	-	-	4.0	2340643421L	002 347 013
4HES 380 5.5 kW-Sin	308066004	Drive-Tech MINI 4.040	314000164	-	-	-	-	7.5	2340663421L	002 347 011
4HES 380 7.5 kW-Sin	308066002	100 16A	314000108	-	-	-	-	7.5	2340663421L	002 347 011

Motor lead length: ≤ 2.2 kW: 1.50 m; ≥ 3 kW: 2.50 m  
 316SS kits with additional digit "B" (e.g. 308062001 B)

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

# 4" CT HIGH EFFICIENCY SOLAR SYSTEM

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency  
Less panels, more water respectively
- Integrated voltage “boost” (up to 2.2 kW) significantly reduces number of solar panels
- Direct DC feeding
- MPPT algorithm maximizes system performance

### UP-TO-DATE CONNECTIVITY

- Factory-featured with Bluetooth 4.0 Smart Connectivity
- Remote control and maintenance via Mobile App



### PACKAGED DEAL

- 4" encapsulated synchronous submersible NEMA Solar motor
- 4"/6" submersible pump
- Variable frequency drive
- Flow switch (for systems > 4 kW)



### FULLY SUPPORTED

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



## SPECIFICATION

- Motor range:  
1.1 / 2.2 / 3.0 / 4.0 / 7.5 kW (100 Hz - 3000 rpm)  
1.2 / 2.5 / 3.4 / 4.6 / 8.6 kW (120 Hz - 3600 rpm)
- System Power Supply: ≤ 2.2 kW: 90 - 400 V DC / AC Backup: 90 - 265 V  
≥ 3.0 kW: 160 - 850 V DC / AC Backup: 190 - 520 V  
≥ 4 kW: 380 - 500 V AC / 400 - 800 V DC
- Motor installation orientation: Vertical / horizontal (shaft end heightened)
- Backup Power supply / Direct AC feeding to maximize system runtime
- Top class protection with Electronics in IP66 / 65 / 21  
No cabinet - no cooling fan / dust filter - no maintenance

### OPTIONS

- Special Voltages
- Higher-graded material: 316SS



# 4" CT HIGH EFFICIENCY SOLAR SYSTEM PUMPING KITS

## SOLAR KITS 220 V / 380 V

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.	P <sub>N</sub> [kW]	Part No.	Filter Type	Part No.	Model	Part No.
1/19 4HES 220 0.75 Solar	308071119S	DTm Solar 2.005 MP	314000165	66	1	19	4" VS 1/19	602011901050063	1.1	2340716721L	-	-	-	-
1/26 4HES 220 1.1 Solar	308071126S	DTm Solar 2.011 MP	314000166	66	1	26	4" VS 1/26	602012601050063	1.1	2340716721L	-	-	-	-
2/20 4HES 220 1.1 Solar	308071220S			66	2	20	4" VS 2/20	602022001050063						
4/14 4HES 220 1.1 Solar	308071414S			66	4	14	4" VS 4/14	602041401050063						
2/27 4HES 220 2.2 Solar	308072227S	DTm Solar 2.015 MP	314000167	66	2	27	4" VS 2/27	602022701050063	2.2	2340726721L	-	-	-	-
4/27 4HES 220 2.2 Solar	308072427S			66	4	27	4" VS 4/27	602042701050063						
6/13 4HES 220 2.2 Solar	308072613S			66	6	13	4" VS 6/13	602061301060063						
6/19 4HES 220 3.0 Solar	308073619S	Drive-Tech 3.030 MP	314000161	65	6	19	4" VS 6/19	602061901060063	3.0	2340736721L	-	-	-	-
4/44 4HES 220 4.0 Solar	308074444S	Drive-Tech 3.030 MP	314000161	65	4	44	4" VS 4/44	602044401050063	4.0	2340743421L	-	-	-	-
6/34 4HES 220 4.0 Solar	308074634S			65	6	34	4" VS 6/34	602063401060063						
8/23 4HES 220 4.0 Solar	308074823S			65	8	23	4" VS 8/23	602082301060063						
10/08 4HES 220 4.0 Solar	308074108S			65	10	18	4" VS 10/18	602121801060063						
15/21 4HES 380 7.5 Solar	308066151S	100 16A	314000108	21	15	21	4" VS 15/21	602152101060063	7.5	2340663421L	-	314005101	F21 >4m <sup>3</sup> /h	226019101
30/06 4HES 380 7.5 Solar	308066306S			21	30	6	6" VS 30/06	ETH11300150						
46/05 4HES 380 7.5 Solar	308066465S			21	46	5	6" VS 46/05	ETH11460140						
15/21 4HES 380 7.5 Solar	308066092S	100 X 16A	314000109	66	15	21	4" VS 15/21	602152101060063	7.5	2340663421L	-	314005101	F21 >4m <sup>3</sup> /h	226019101
30/06 4HES 380 7.5 Solar	308066091S			66	30	6	6" VS 30/06	ETH11300150						
46/05 4HES 380 7.5 Solar	308066093S			66	46	5	6" VS 46/05	ETH11460140						
4HES 220 0.55-0.75 Solar	308071002S	DTm Solar 2.005 MP	314000165	66	-	-	-	-	0.55-0.75	2340716721L	-	-	-	-
4HES 220 0.55 - 1.1 Solar	308071001S	DTm Solar 2.011 MP	314000166	66	-	-	-	-	0.55-1.1	2340716721L	-	-	-	-
4HES 220 1.1 - 2.2 Solar	308072001S	DTm Solar 2.015 MP	314000167	67	-	-	-	-	1.1-2.2	2340726721L	-	-	-	-
4HES 220 2.2 - 3.0 Solar	308073001S	Drive-Tech 3.030 MP	314000161	65	-	-	-	-	2.2-3.0	2340736721L	-	-	-	-
4HES 220 3.0 - 4.0 Solar	308074001S	Drive-Tech 3.030 MP	314000161	65	-	-	-	-	3.0-4.0	2340743421L	-	-	-	-
4HES 380 7.5 Solar	308066001S	100 16A	314000108	21	-	-	-	-	7.5	2340663421L	dv/dt	314005101	F21 >4m <sup>3</sup> /h	226019101
4HES 380 7.5 Solar	308066005S	100 X 16A	314000109	66	-	-	-	-	7.5	2340663421L	dv/dt	314005101	F21 >4m <sup>3</sup> /h	226019101

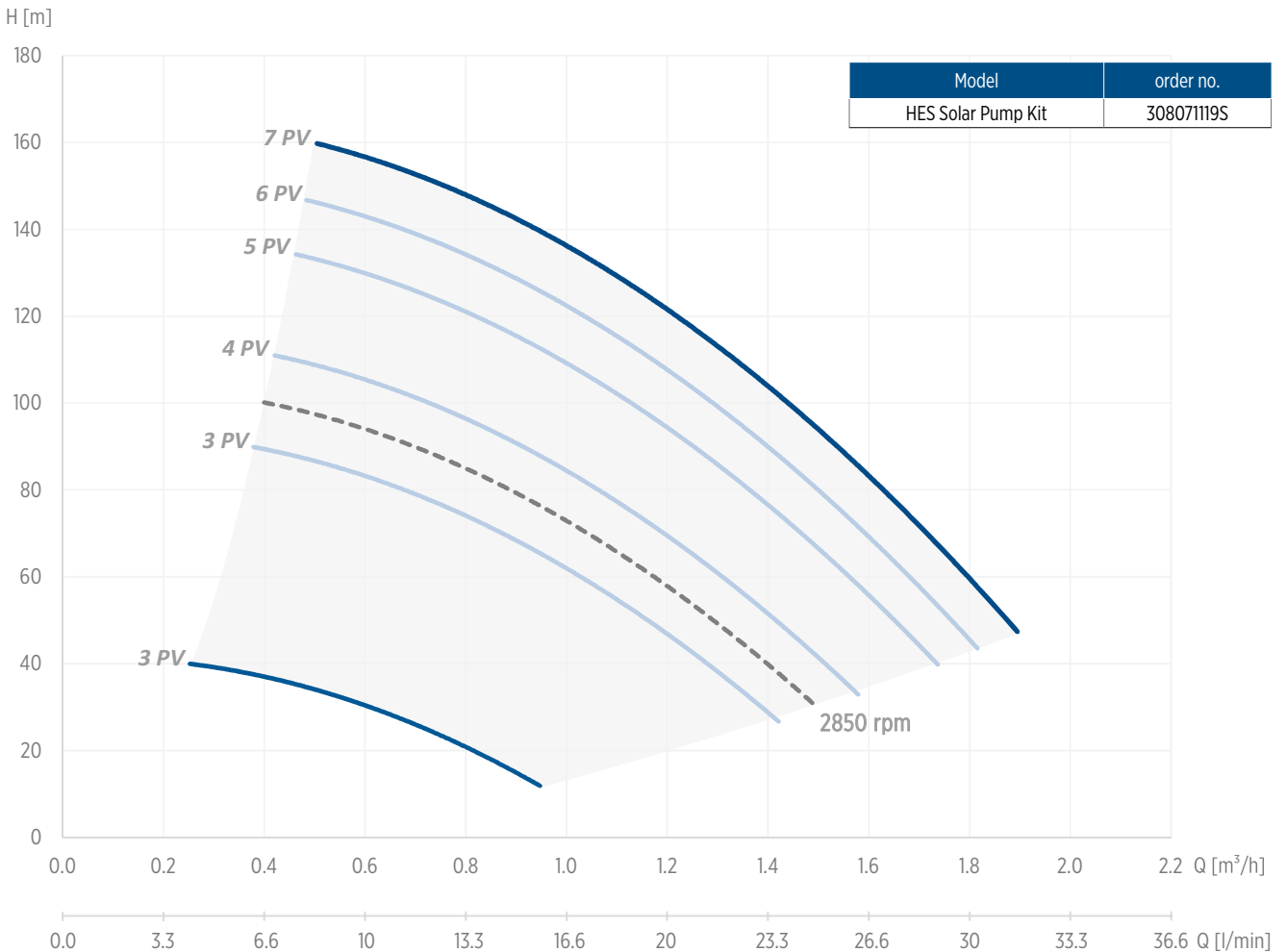
Motor lead length: ≤ 2.2 kW: 1.50 m; ≥ 3 kW: 2.50 m  
 316SS kits with additional digit "B" (e.g. 308062001 B)

# 4" CT HIGH EFFICIENCY PUMPING KITS 0.55 - 0.75 KW

VS 1/19 - 230 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> ]
	3	3	4	5	6	7	
	Flow - cubic meter / hour [m <sup>3</sup> /h]						
10	1.0	1.6					2850
20	0.8	1.5					
30	0.6	1.4	1.6				1.5
40	0.3	1.3	1.5	1.7			1.4
50		1.2	1.4	1.7	1.8	1.9	1.3
60		1.0	1.3	1.6	1.7	1.8	1.2
70		0.9	1.2	1.5	1.6	1.7	1.1
80		0.7	1.1	1.4	1.5	1.7	0.9
90		0.4	0.9	1.3	1.4	1.6	0.8
100			0.7	1.2	1.3	1.5	0.4
110			0.5	1.0	1.2	1.4	
120				0.8	1.1	1.2	
130				0.6	0.9	1.2	
140					0.7	1.0	
150					0.5	0.8	
160						0.6	



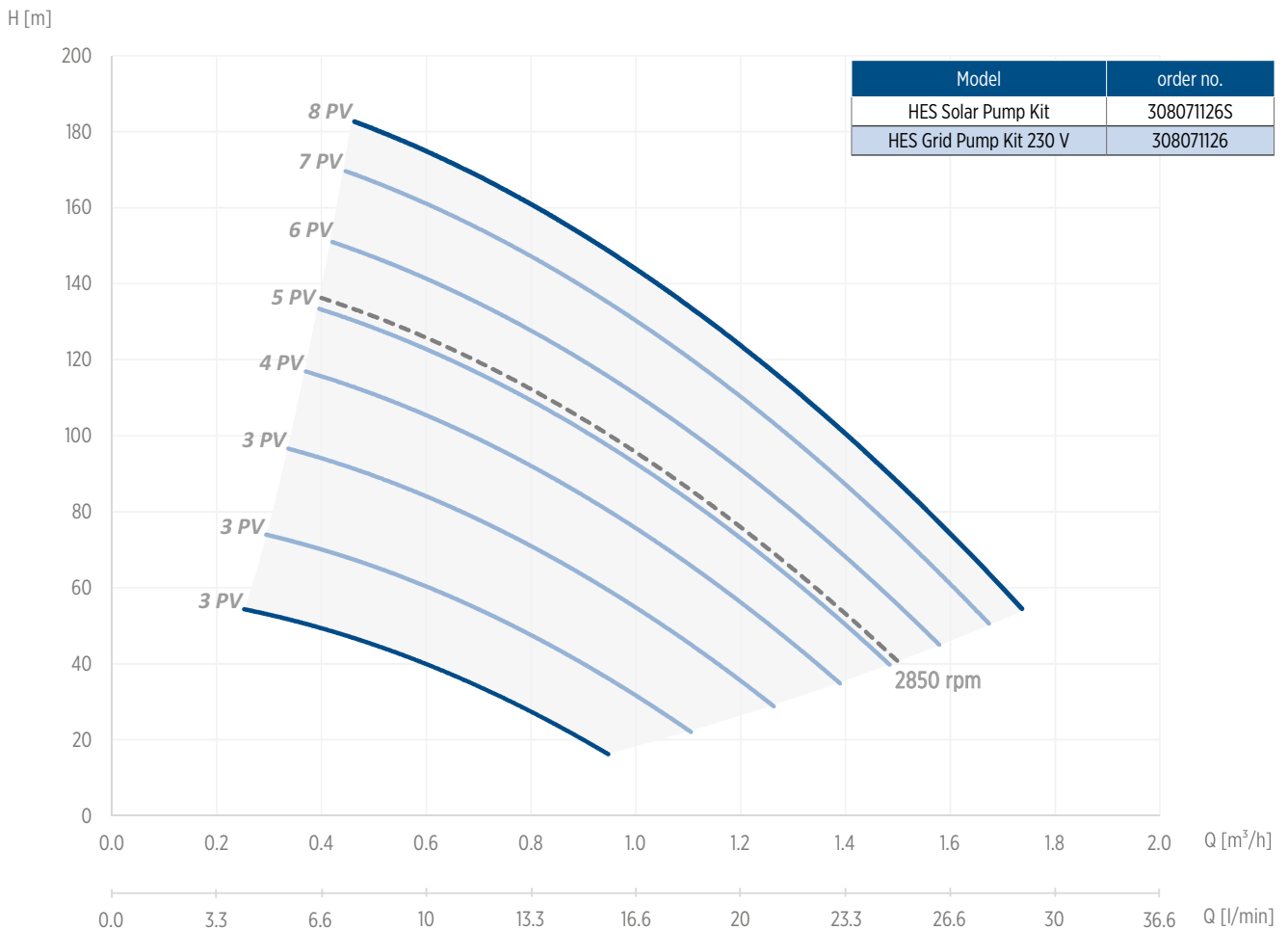


# 4" CT HIGH EFFICIENCY PUMPING KITS 0.55 - 1.1 KW

VS 1/26 - 230 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> ]
	3	3	3	4	5	6	7	8	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								2850
40	0.6	0.9	1.2	1.4	1.5				1.5
50	0.4	0.8	1.1	1.3	1.4	1.6	1.7	1.8	1.5
60		0.6	1.0	1.2	1.3	1.5	1.6	1.7	1.4
70		0.4	0.8	1.1	1.2	1.4	1.6	1.7	1.3
80			0.7	1.0	1.1	1.3	1.5	1.6	1.2
90			0.5	0.9	1.1	1.2	1.4	1.5	1.1
100				0.7	0.9	1.1	1.3	1.4	1.0
110				0.6	0.8	1.0	1.2	1.3	0.9
120					0.7	0.9	1.2	1.2	0.7
130					0.5	0.8	1.0	1.2	0.5
140						0.7	0.9	1.1	
150						0.5	0.8	1.0	
160							0.6	0.8	
170							0.5	0.7	

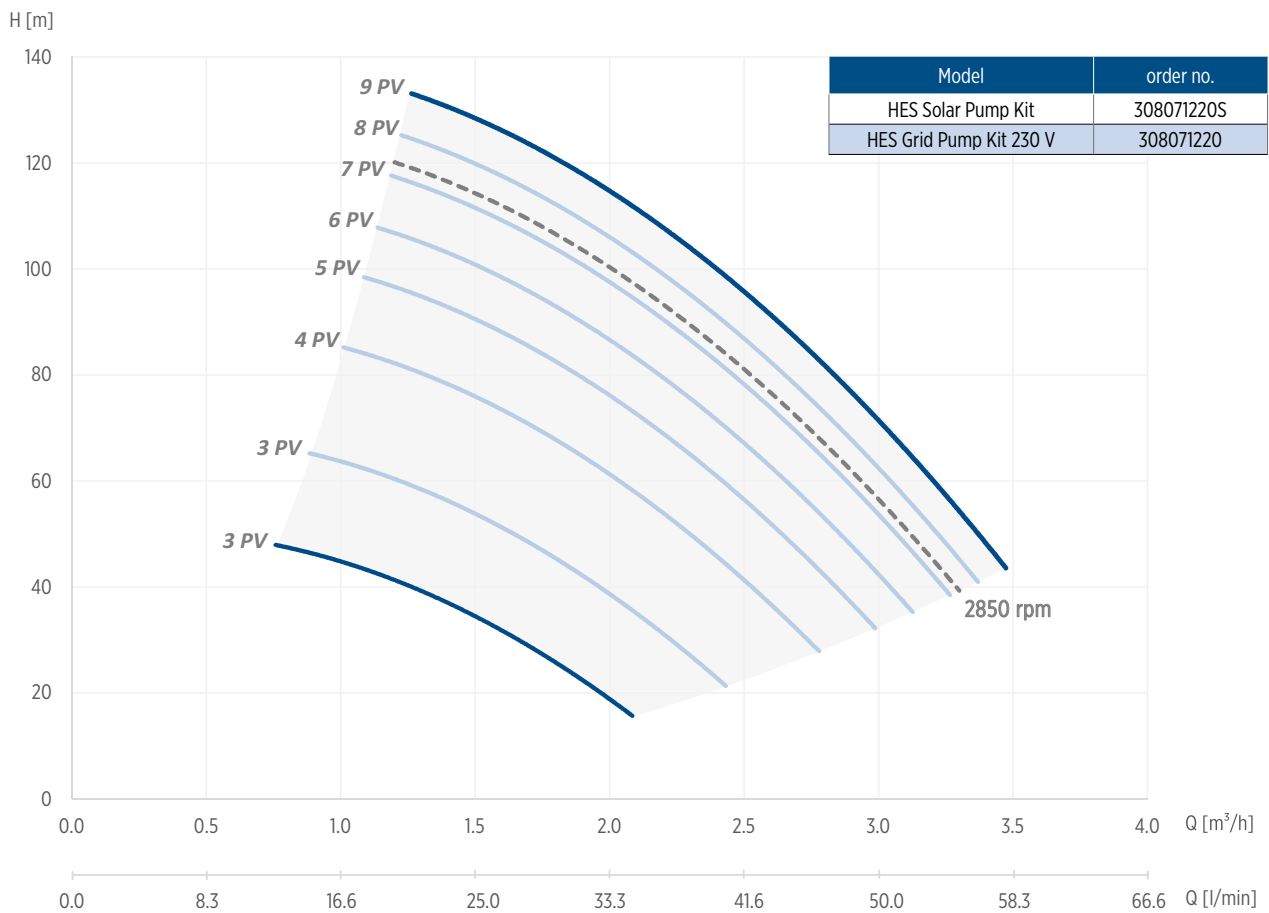


# 4" CT HIGH EFFICIENCY PUMPING KITS 0.55 - 1.1 KW

VS 2/20 - 230 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> ]
	3	3	4	5	6	7	8	9	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
10									
20	2.0	2.4							
30	1.7	2.3	2.7	3.0					
40	1.3	2.0	2.5	2.8	3.0	3.2	3.3	3.5	3.1
50		1.6	2.3	2.6	2.8	3.1	3.2	3.4	2.9
60		1.2	2.0	2.4	2.7	2.9	3.0	3.2	2.8
70			1.7	2.2	2.4	2.7	2.8	3.0	2.5
80			1.3	1.9	2.2	2.5	2.6	2.8	2.3
90				1.6	1.9	2.2	2.4	2.6	2.0
100				1.0	1.6	1.9	2.2	2.4	1.7
110					1.1	1.6	1.9	2.1	1.2
120						1.1	1.5	1.8	
130							1.0	1.5	

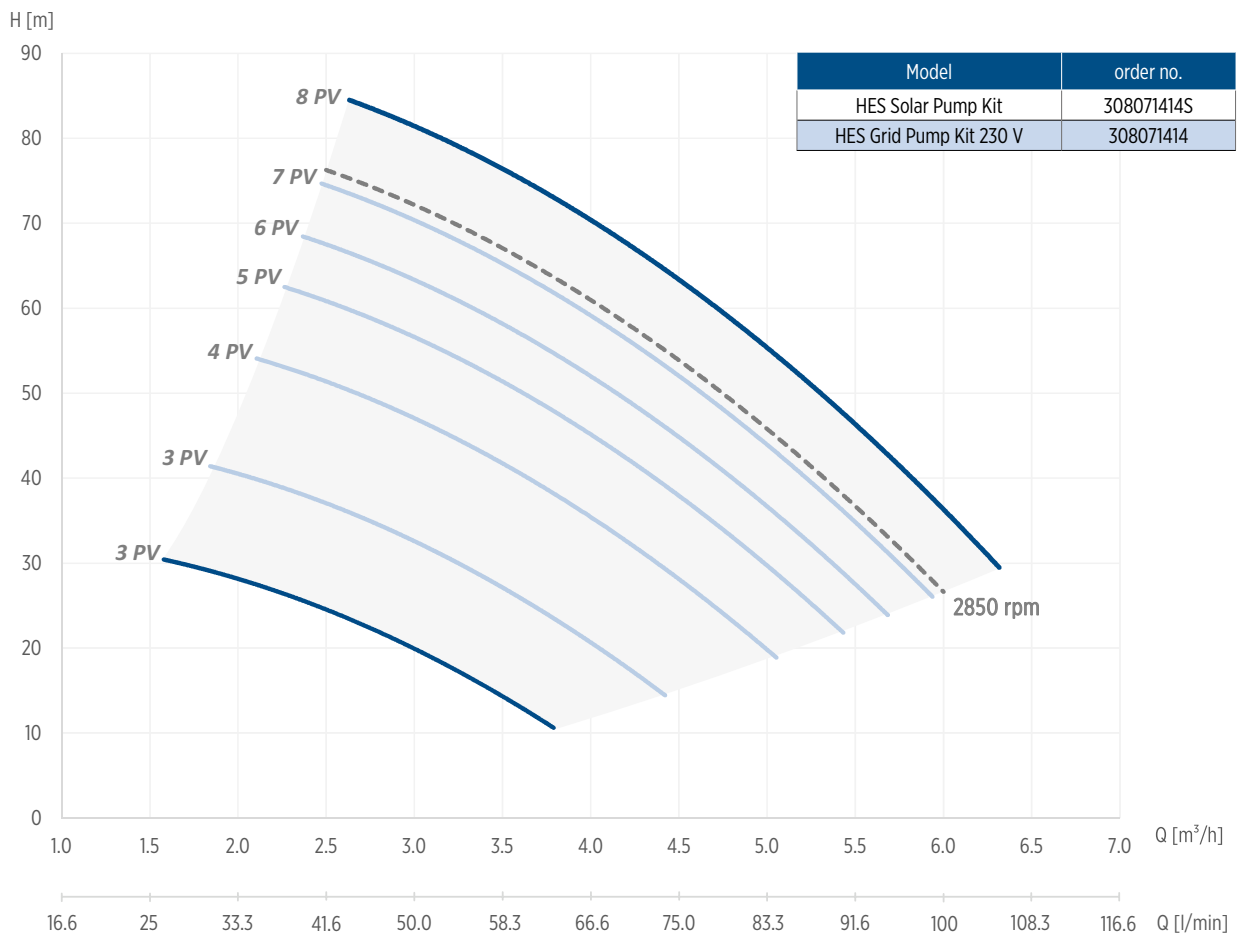


# 4" CT HIGH EFFICIENCY PUMPING KITS 0.55 - 1.1 KW

VS 4/14 - 230 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> ]
	3	3	4	5	6	7	8	
Flow - cubic meter / hour [m <sup>3</sup> /h]								2850
10	3.8							
15	3.5	4.3						
20	3.0	4.0	5.0	5.5				
25	2.5	3.6	4.7	5.2	5.6	6.1		6.2
30	1.7	3.3	4.4	5.0	5.3	5.8	6.3	5.9
35		2.7	4.0	4.6	5.1	5.6	6.1	5.7
40		2.2	3.6	4.3	4.8	5.3	5.8	5.4
45			3.2	4.0	4.5	5.0	5.5	5.1
50			2.7	3.6	4.2	4.7	5.3	4.8
55			2.1	3.2	3.7	4.4	5.0	4.5
60				2.6	3.3	4.1	4.7	4.2
65				2.0	2.8	3.6	4.4	3.7
70					2.2	3.2	4.0	3.3
75						2.7	3.6	2.8
80							3.2	
85							2.7	

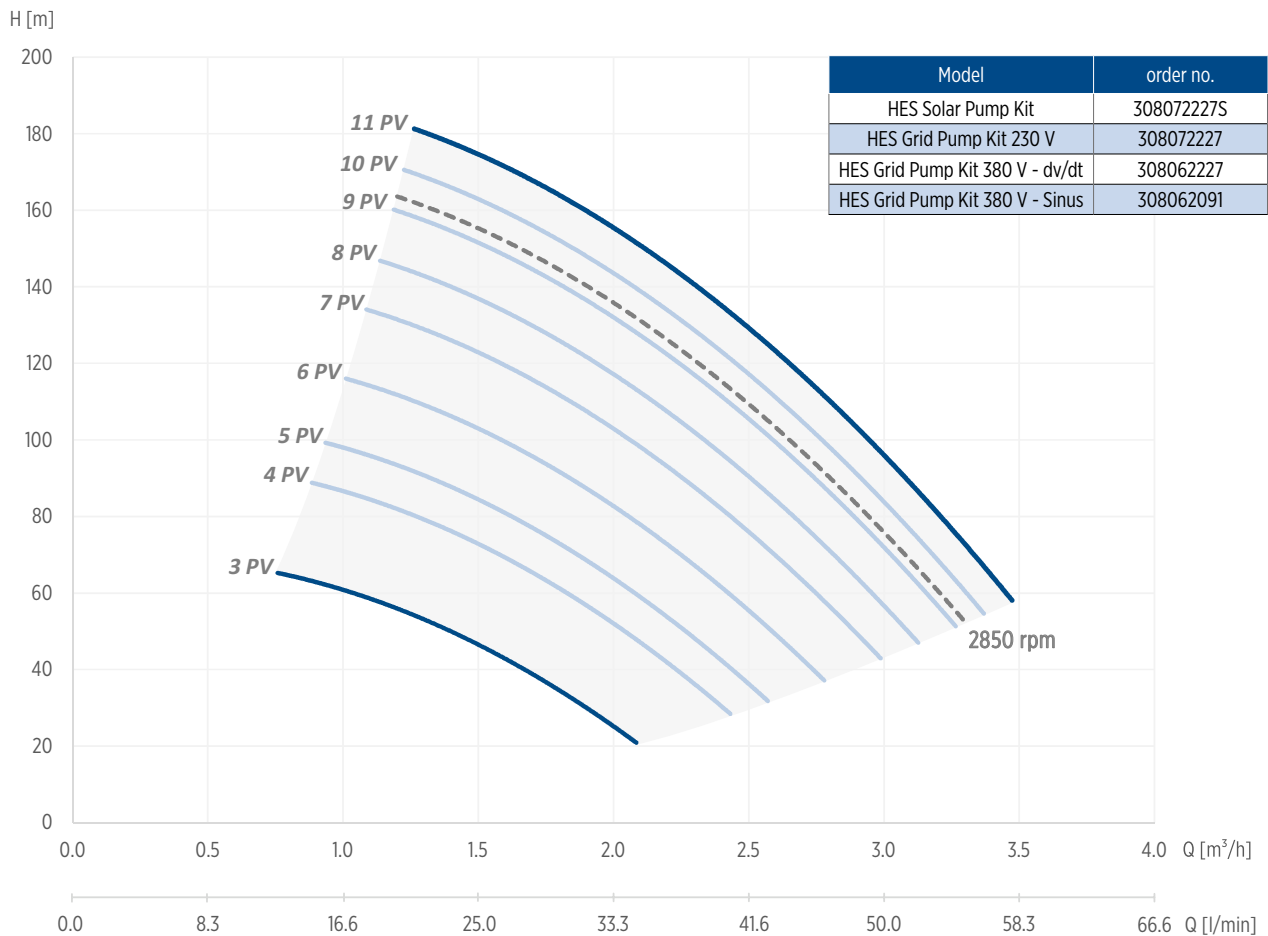


# 4" CT HIGH EFFICIENCY PUMPING KITS 1.1 - 2.2 KW

VS 2/27- 230 V / 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> ]
	3	4	5	6	7	8	9	10	11		
	Flow - cubic meter / hour [m <sup>3</sup> /h]										
40	1.6	2.2	2.5	2.7	3.0						2850
50	1.3	2.0	2.2	2.6	2.9	3.1	3.3	3.4			3.4
60	1.0	1.8	2.1	2.4	2.7	3.0	3.2	3.3	3.5		3.3
70		1.6	1.9	2.2	2.6	2.8	3.0	3.2	3.3		3.1
80		1.3	1.6	2.1	2.4	2.7	2.9	3.1	3.2		3.0
90		0.9	1.3	1.9	2.3	2.5	2.8	2.9	3.1		2.9
100			1.0	1.6	2.1	2.3	2.6	2.8	3.0		2.7
110				1.3	1.8	2.2	2.4	2.6	2.8		2.5
120				0.9	1.6	2.0	2.3	2.5	2.7		2.4
130					1.3	1.7	2.0	2.3	2.5		2.2
140						1.4	1.8	2.1	2.3		1.9
150							1.6	1.9	2.1		1.7
160								1.2	1.6	1.9	1.3
170									1.3	1.7	
180										1.3	

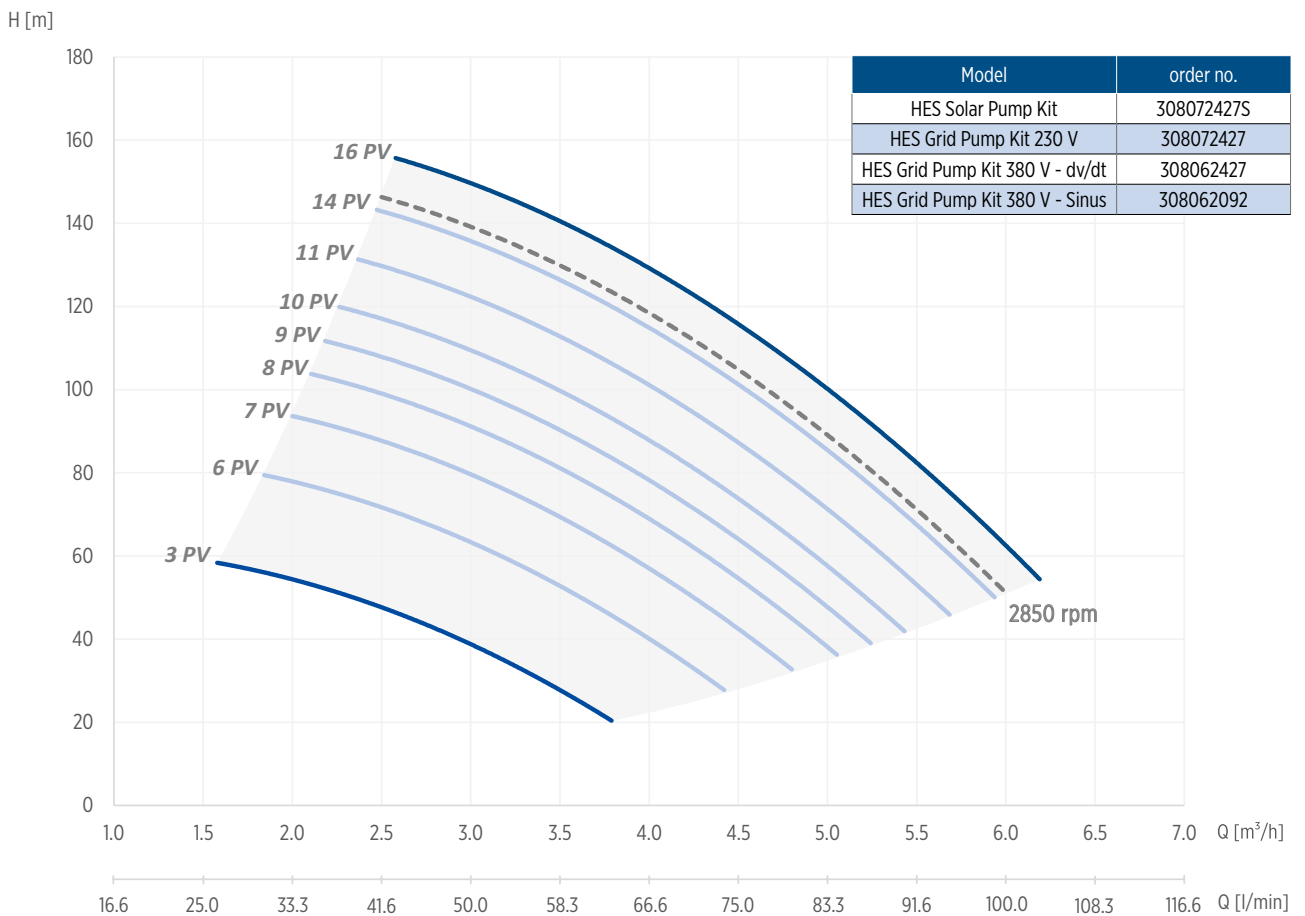


# 4" CT HIGH EFFICIENCY PUMPING KITS 1.1 - 2.2 KW

VS 4/27 - 230 V / 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> ]
	3	6	7	8	9	10	11	14	16	
	Flow - cubic meter / hour [m <sup>3</sup> /h]									
40	3.0	4.0	4.6	4.9	5.2	5.5	5.8			2850
50	2.5	3.6	4.3	4.6	4.9	5.2	5.6	5.9	6.3	6.1
60	1.5	3.2	3.9	4.3	4.6	4.9	5.3	5.7	6.1	5.8
70		2.6	3.5	4.0	4.3	4.6	5.0	5.4	5.9	5.6
80		1.8	3.0	3.6	3.9	4.3	4.7	5.2	5.5	5.4
90			2.3	3.1	3.5	3.9	4.4	4.9	5.4	5.0
100				2.4	3.0	3.5	4.0	4.5	5.0	4.7
110					2.3	3.0	3.6	4.2	4.7	4.4
120						2.3	3.1	3.8	4.4	4.0
130							2.5	3.3	3.7	3.5
140								2.7	3.2	3.0
150									2.5	

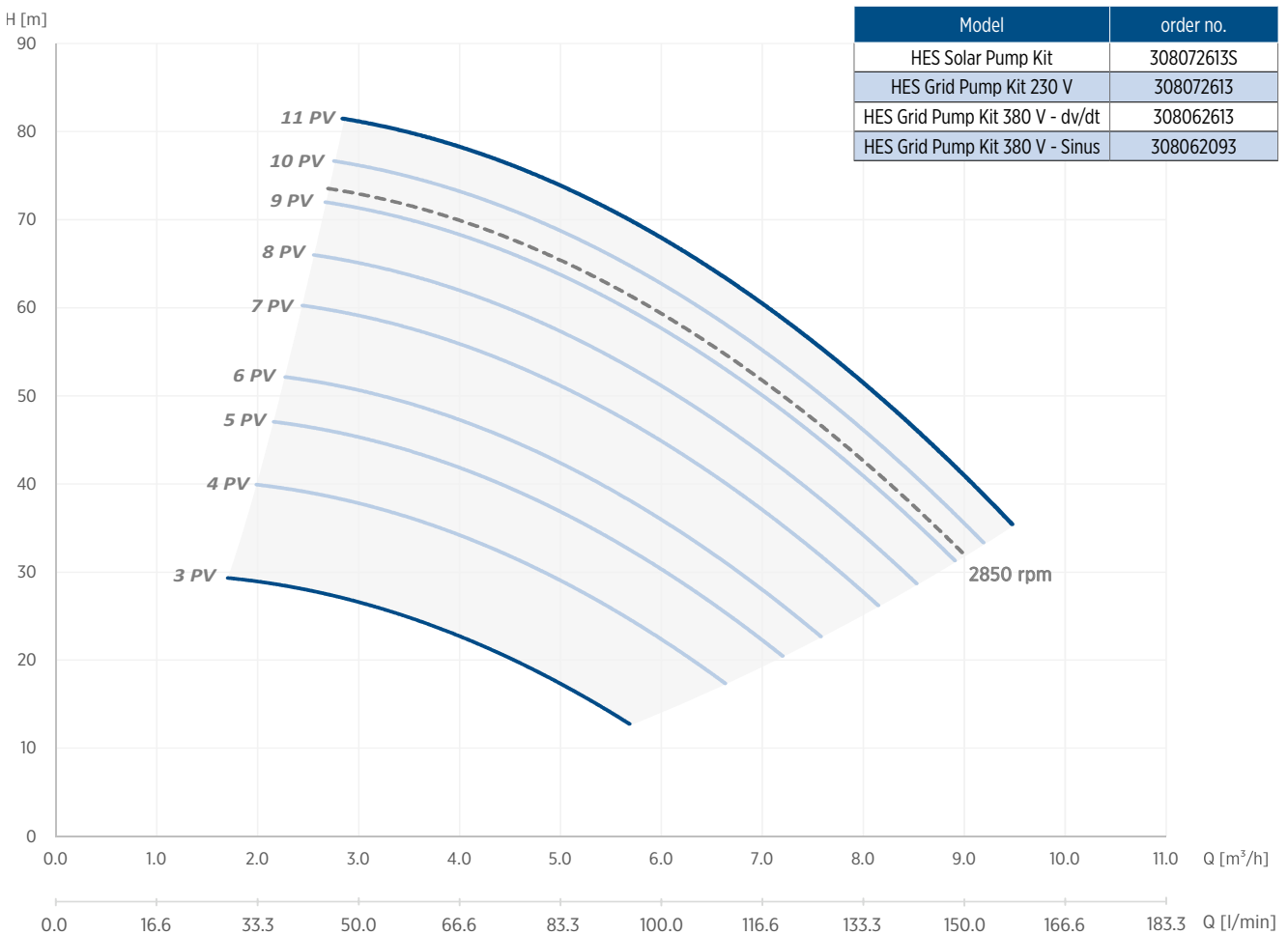


# 4" CT HIGH EFFICIENCY PUMPING KITS 1.1 - 2.2 KW

VS 6/13- 230 V / 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> ]
	3	4	5	6	7	8	9	10	11		
	Flow - cubic meter / hour [m <sup>3</sup> /h]										
20	4.5	6.3	7.2	7.9							
25	3.5	5.6	6.8	7.3	8.3						
30	1.8	4.9	6.0	6.9	7.9	8.4	9.0				9.2
35		3.9	5.5	6.2	7.4	8.0	8.5	9.0	9.5		8.8
40		2.0	4.6	5.5	6.8	7.4	8.0	8.6	9.0		8.3
45			3.5	4.5	6.0	6.9	7.7	8.1	8.7		7.9
50				3.2	5.2	6.2	7.0	7.7	8.0		7.3
55					4.5	5.5	6.5	7.0	7.5		6.8
60					2.6	4.5	5.8	6.4	7.0		5.0
65						3.5	4.9	5.7	6.5		5.2
70							3.5	4.9	5.9		3.7
75								4.0	5.0		
80									3.5		

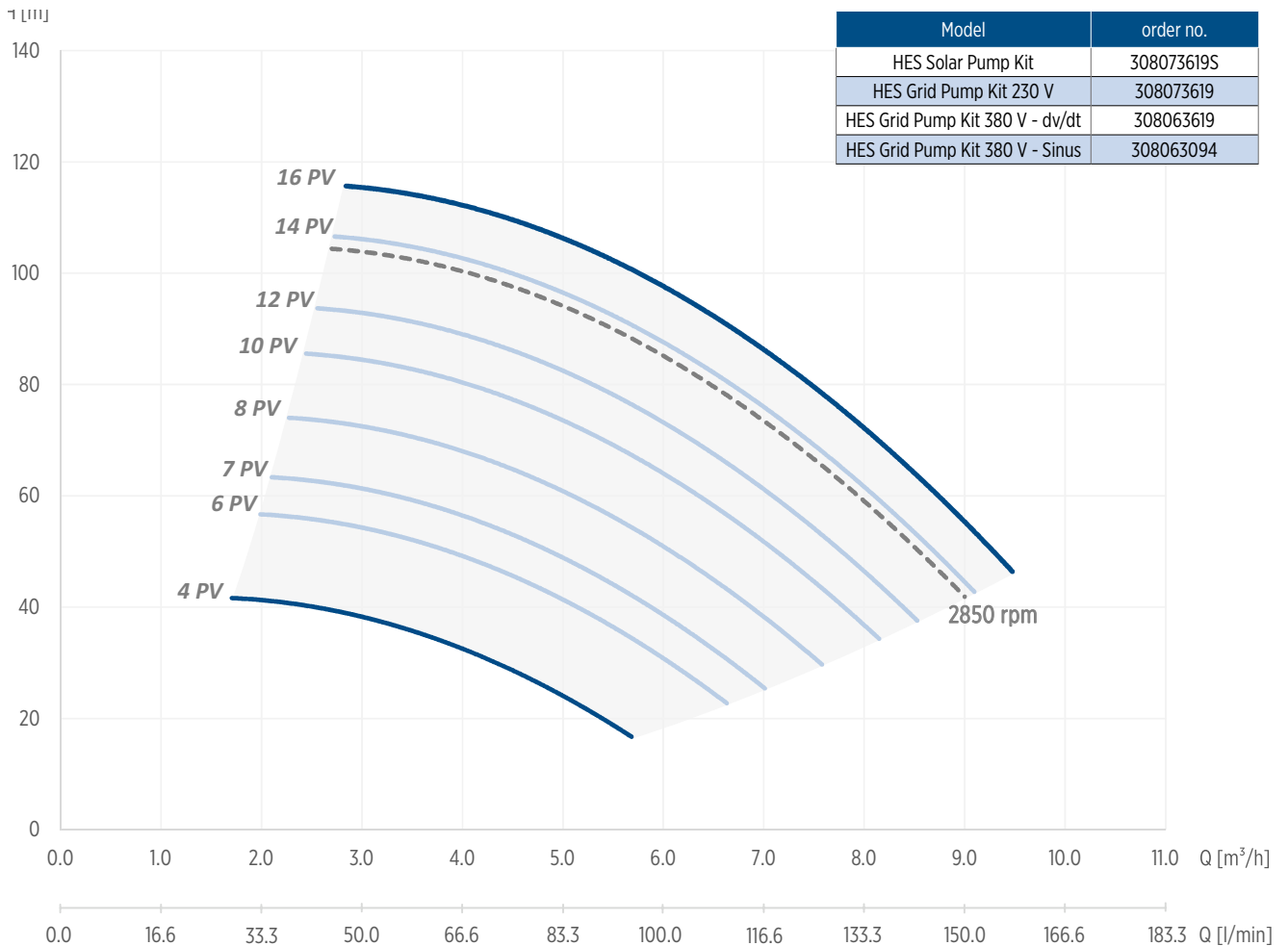


# 4" CT HIGH EFFICIENCY PUMPING KITS 2.2 - 3.0 KW

VS 6/19- 230 V / 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> ]
	4	6	7	8	10	12	14	16	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
30	4.5	6.1	6.7	7.6	8.4				2850
40	2.5	5.1	5.9	6.9	7.8	8.4	9.2	9.8	9.1
50		3.9	4.9	6.1	7.1	7.8	8.7	9.3	8.6
60			3.3	5.1	6.4	7.1	8.1	8.7	8.0
70				3.6	5.4	6.3	7.4	8.1	7.4
80					4.1	5.3	6.7	7.5	6.6
90						3.8	5.8	6.7	5.6
100							4.5	5.8	4.4
110								4.4	

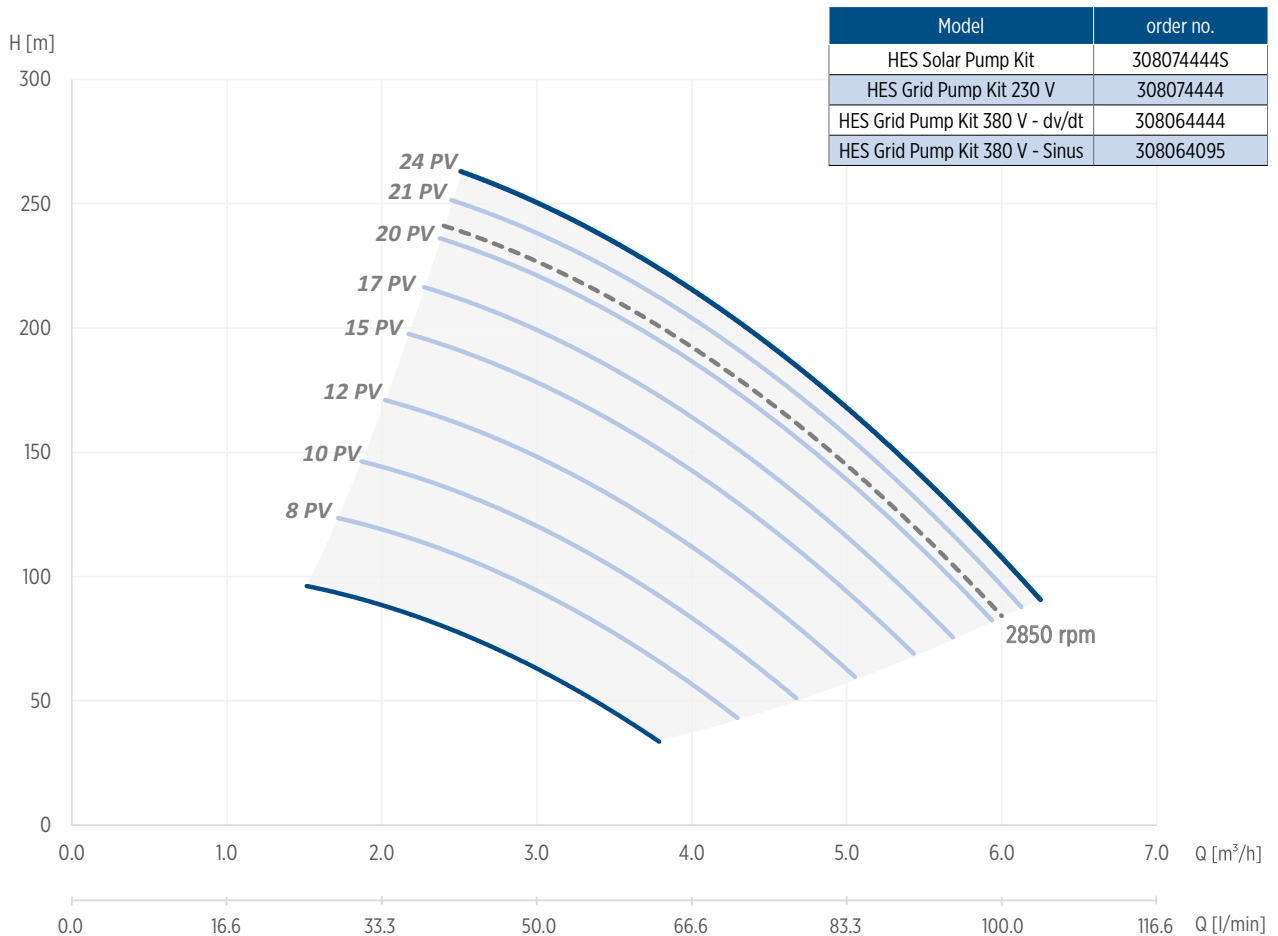


# 4" CT HIGH EFFICIENCY PUMPING KITS 3.0 - 4.0 KW

VS 4/44 - 230 V / 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> ]
	8	10	12	15	17	20	21	24	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
100	3.1	3.6	4.3	4.9	5.3	5.7	5.9	6.1	2850
110	2.8	3.3	4.1	4.7	5.1	5.5	5.8	6.0	2850
120	2.4	3.0	3.8	4.5	4.9	5.3	5.6	5.8	2850
130	1.8	2.7	3.6	4.3	4.7	5.2	5.5	5.7	2850
140		2.2	3.3	4.1	4.5	5.0	5.3	5.5	2850
150		1.6	3.0	3.8	4.3	4.8	5.1	5.2	2850
160			2.6	3.6	4.1	4.6	4.9	5.2	2850
170			2.1	3.3	3.9	4.4	4.8	5.0	2850
180				2.9	3.6	4.2	4.6	4.8	2850
190				2.6	3.3	3.9	4.3	4.5	2850
210					2.6	3.4	3.9	4.2	2850
220					2.1	3.1	3.6	3.9	2850
230						2.7	3.3	3.8	2850
240							3.0	3.3	2850
250							2.5	3.0	2850
260								2.6	2850



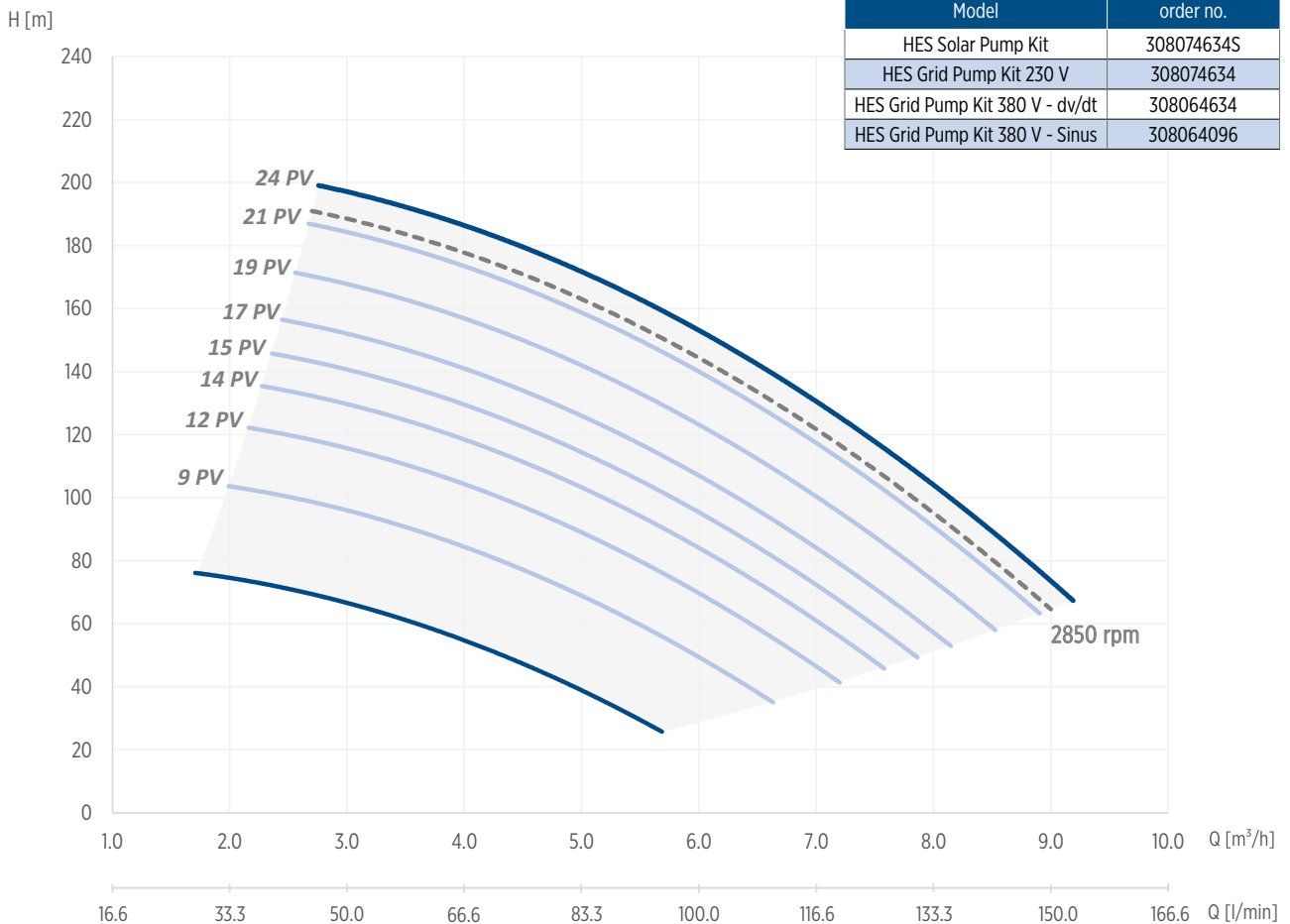


# 4" CT HIGH EFFICIENCY PUMPING KITS 3.0 - 4.0 KW

VS 6/34- 230 V / 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> ]
	9	12	14	15	17	19	21	24	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
50	6.0	6.9	7.4	7.8	8.2				2850
60	5.5	6.4	7.0	7.5	7.9	8.5	9.0	9.4	9.2
70	4.9	6.0	6.6	7.1	7.5	8.1	8.7	9.1	8.9
80	4.3	5.5	6.2	6.7	7.2	7.8	8.4	8.8	8.5
90	3.6	4.9	5.7	6.3	6.8	7.4	8.0	8.5	8.2
100	2.5	4.3	5.2	5.8	6.3	7.0	7.7	8.1	7.9
110		3.5	4.6	5.3	5.9	6.6	7.3	7.8	7.5
120		2.5	3.9	4.7	5.3	6.2	6.9	7.4	7.0
130			3.0	4.0	4.8	5.7	6.5	7.0	6.7
140				3.1	4.1	5.1	6.0	6.6	6.1
150					3.2	4.5	5.5	6.2	5.7
160					1.8	3.8	4.9	5.7	5.0
170						2.8	4.3	5.1	4.4
180							3.4	4.5	3.6
190							2.2	3.7	2.3
200								2.6	

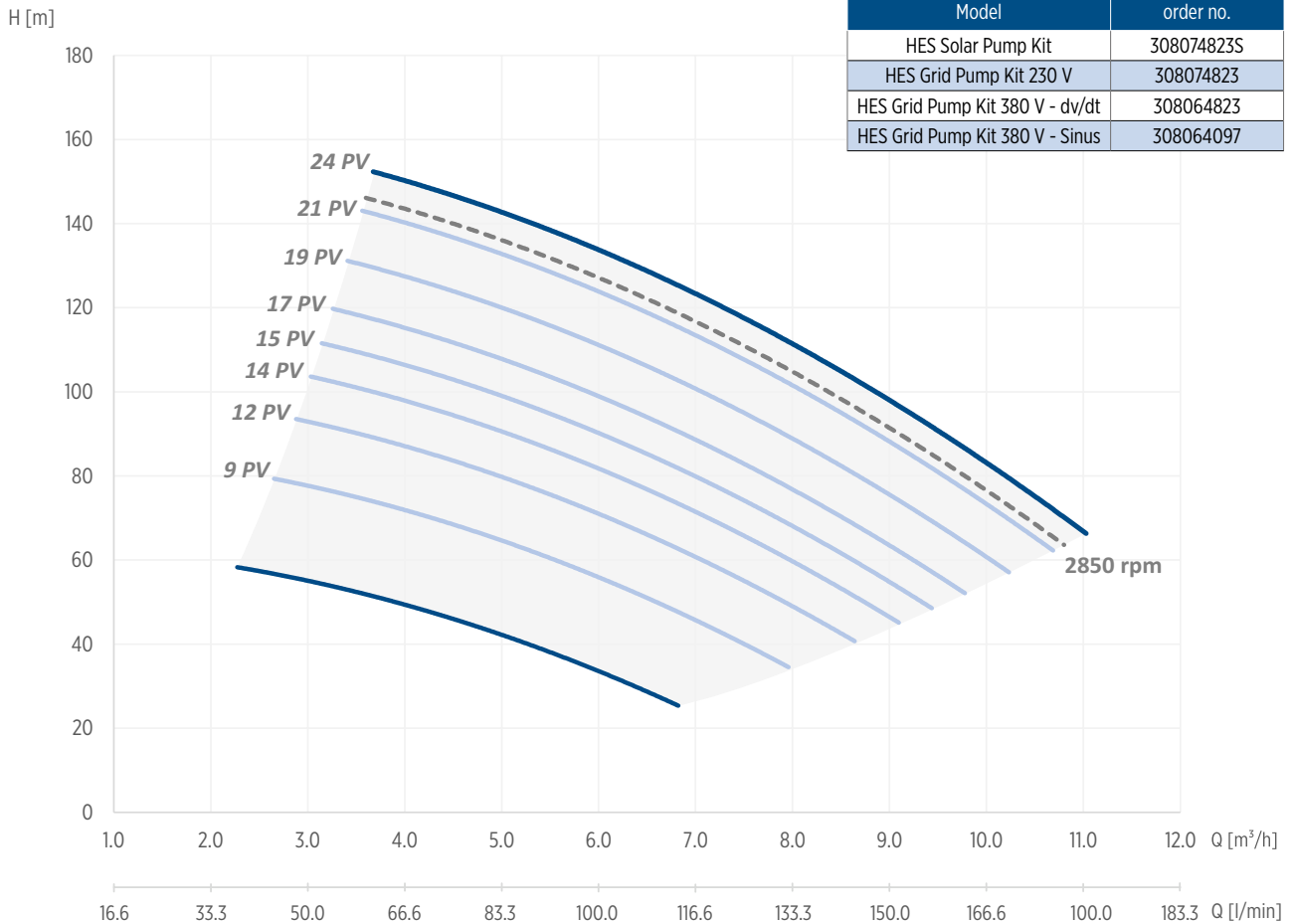


# 4" CT HIGH EFFICIENCY PUMPING KITS 3.0 - 4.0 KW

VS 8/23 - 230 V / 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> ]
	9	12	14	15	17	19	21	24	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
50	6.6	7.9	8.7	9.3					
60	5.6	7.1	8.0	8.6	9.2	10.0	10.8		11.0
70	4.3	6.1	7.1	7.8	8.5	9.4	10.2	10.8	10.4
80	2.5	5.0	6.2	7.0	7.7	8.7	9.6	10.2	9.8
90		3.5	5.1	6.0	6.9	7.9	8.9	9.6	9.1
100			3.7	4.9	5.9	7.1	8.1	8.9	8.3
110				3.4	4.7	6.1	7.3	8.1	7.5
120					3.2	5.0	6.4	7.3	6.6
130						3.6	5.3	6.4	5.5
140							4.0	5.3	4.2
150								4.0	

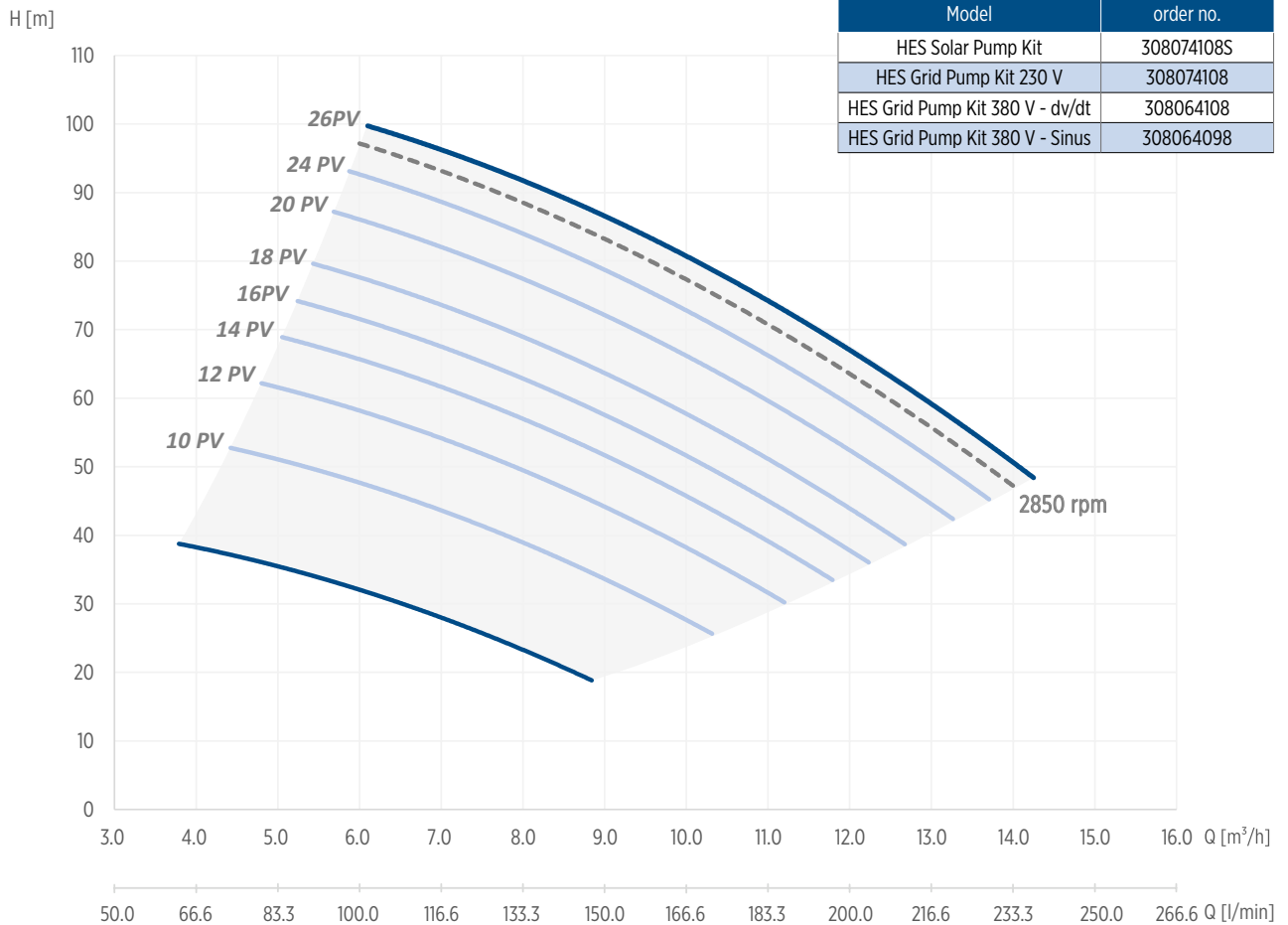


# 4" CT HIGH EFFICIENCY PUMPING KITS 3.0 - 4.0 KW

VS 10/18- 230 V / 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> ]
	10	12	14	16	18	20	24	26	
	Flow - cubic meter / hour [m <sup>3</sup> /h]								
30	9.6	11.2	12.3						
35	8.8	10.5	11.6	12.4					
40	7.8	9.7	10.9	11.7	12.5	13.5			
45	6.7	8.9	10.1	11.0	11.9	12.9	13.7		14.3
50		7.9	9.3	10.3	11.2	12.3	13.1	14.0	13.7
55		6.8	8.4	9.4	10.4	11.7	12.5	13.5	13.1
60		5.5	7.4	8.6	9.6	10.9	11.9	13.0	12.4
65			6.2	7.6	8.8	10.2	11.2	12.2	11.9
70				6.4	7.8	9.4	10.4	11.5	11.4
75				5.0	6.7	8.5	9.6	11.1	10.5
80					5.3	7.5	8.8	10.1	9.8
85						6.3	7.8	9.1	8.9
90							6.7	8.5	7.9
95								7.2	6.9
100									6.1

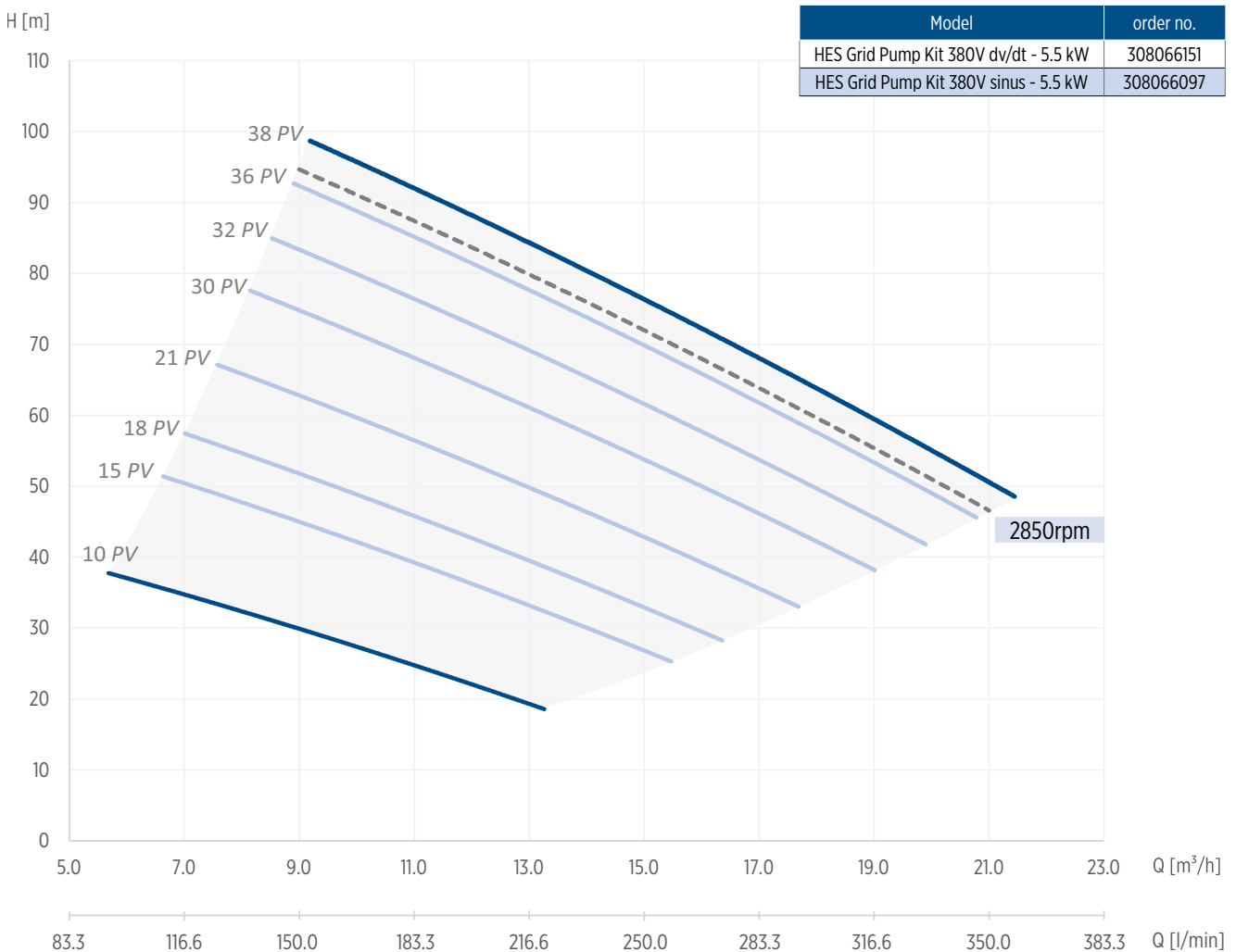


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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

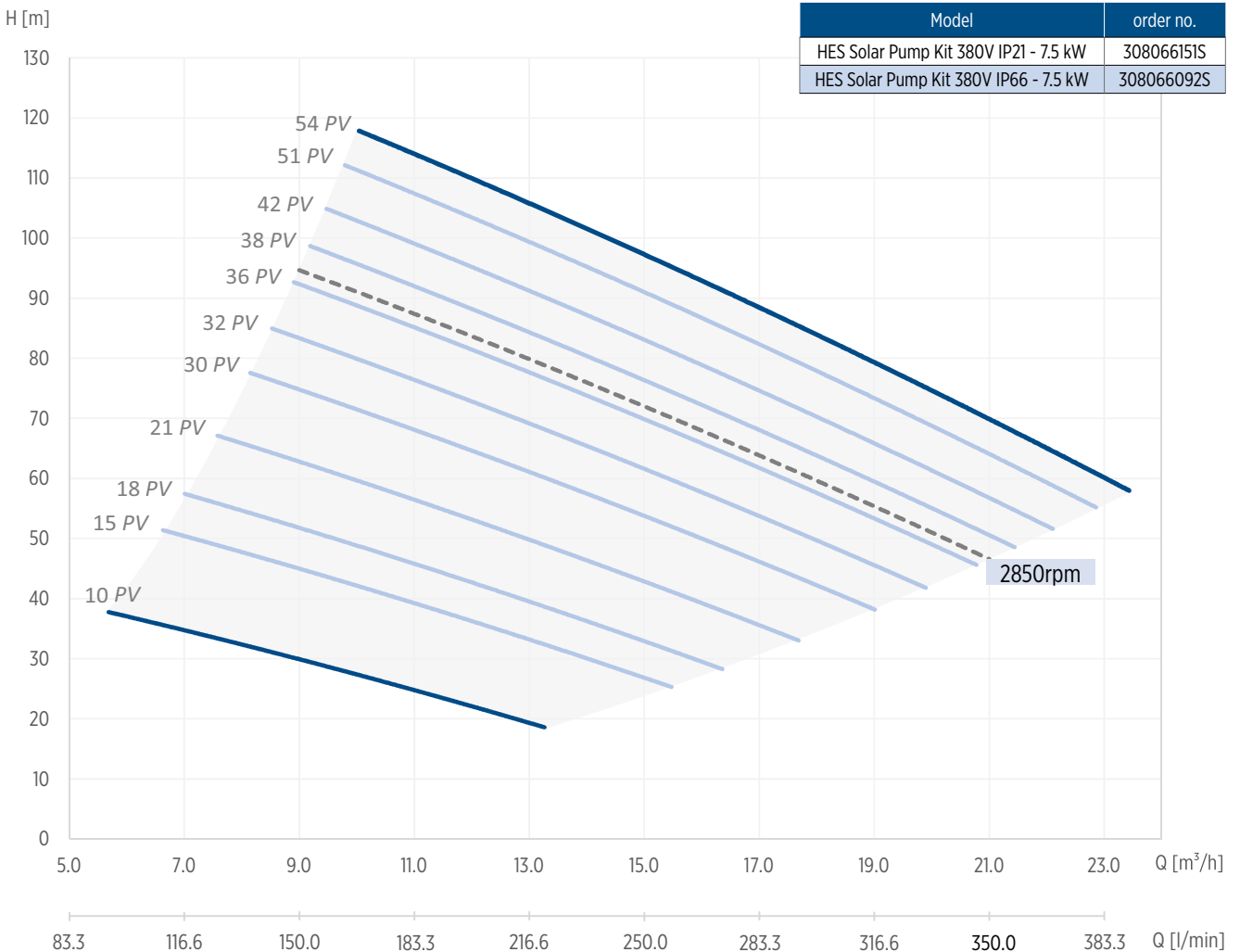


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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		

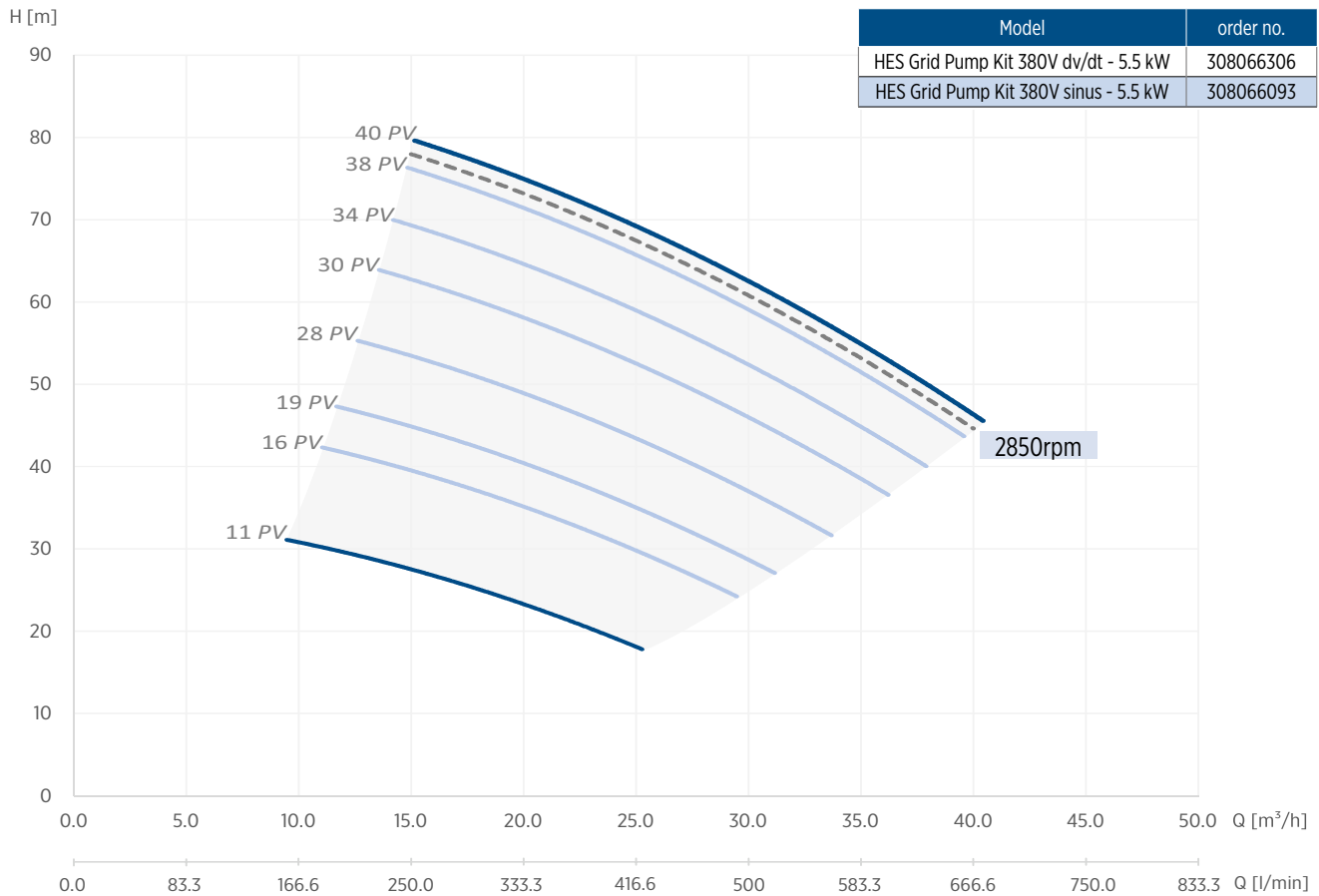


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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	

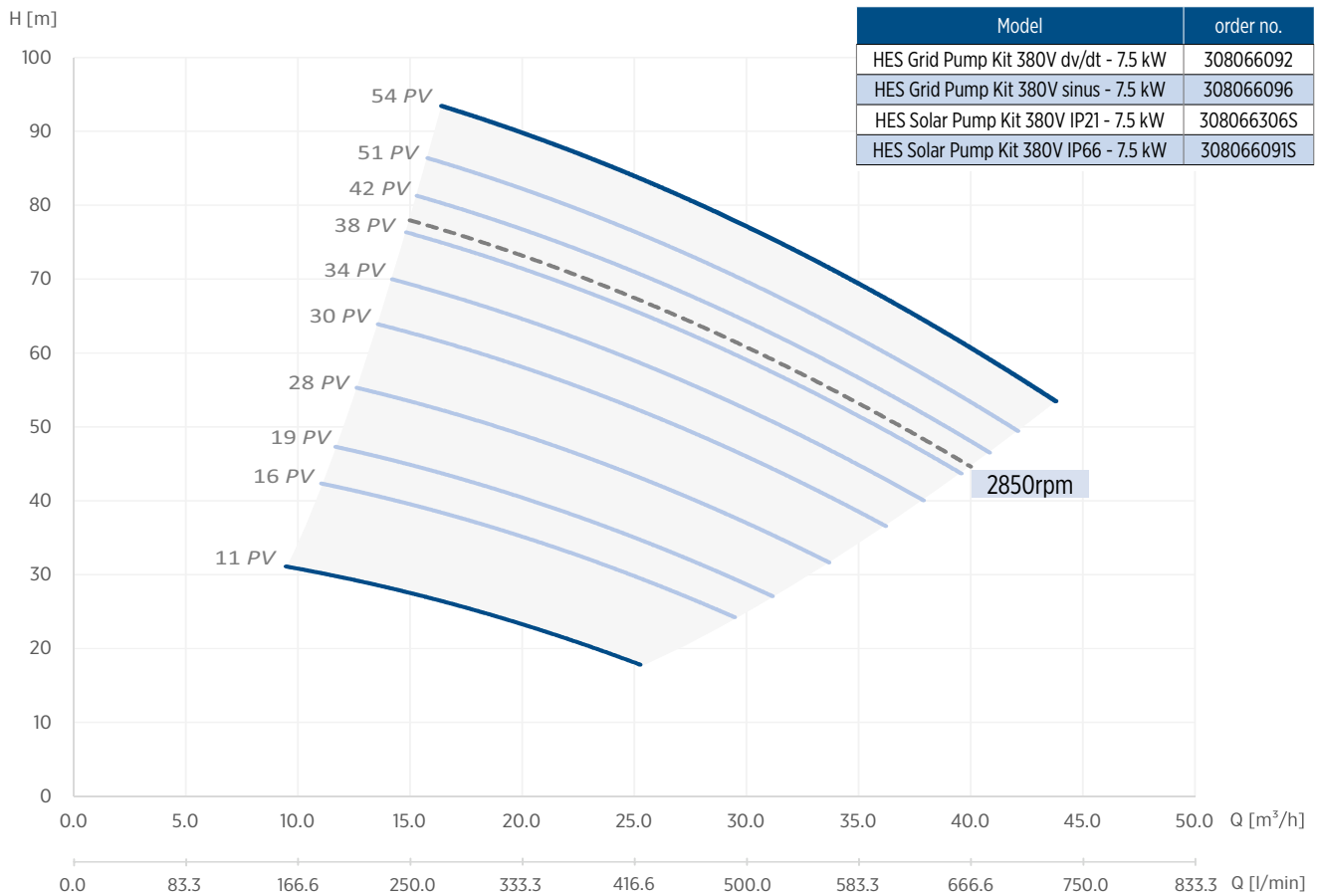


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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									
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		

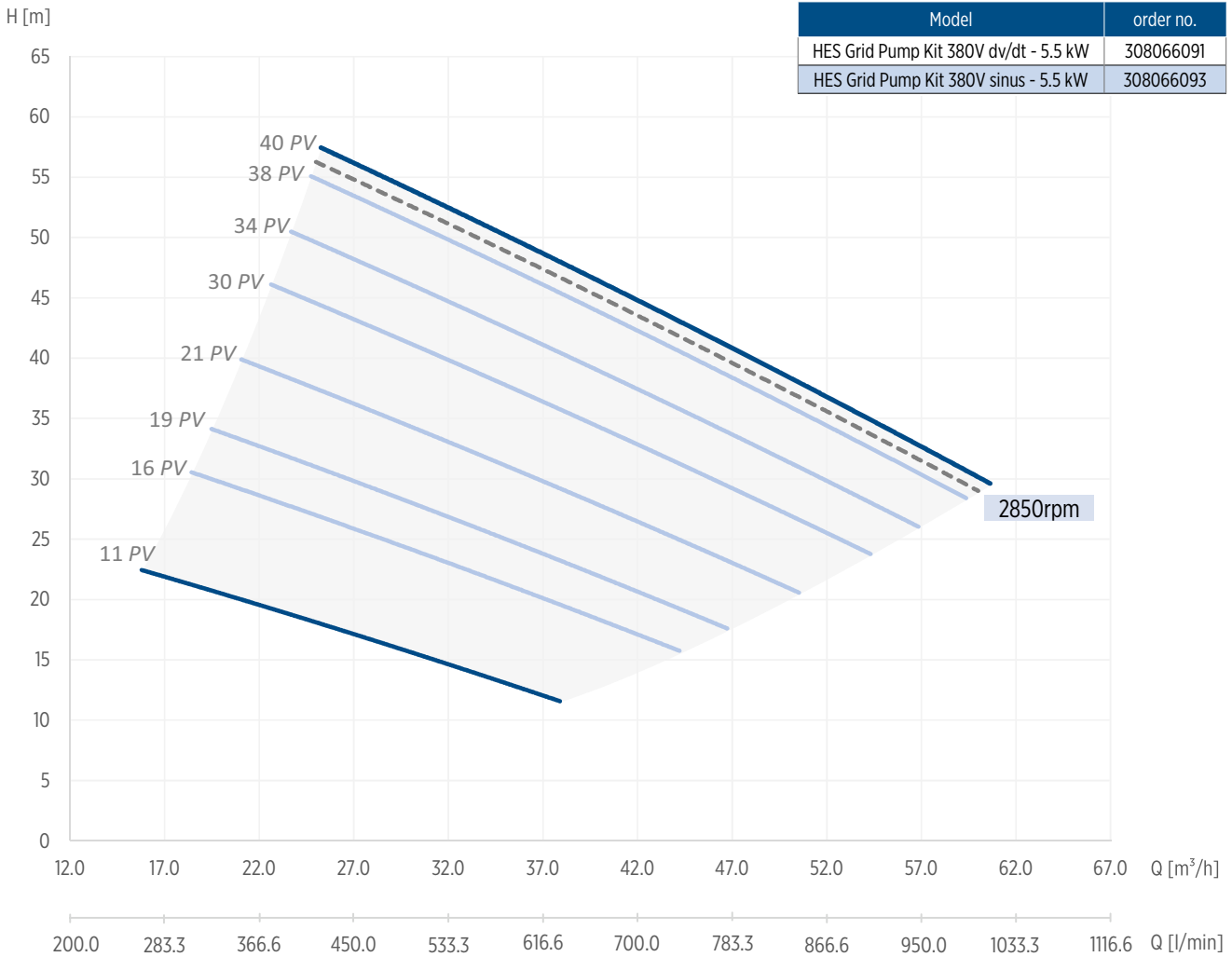


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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



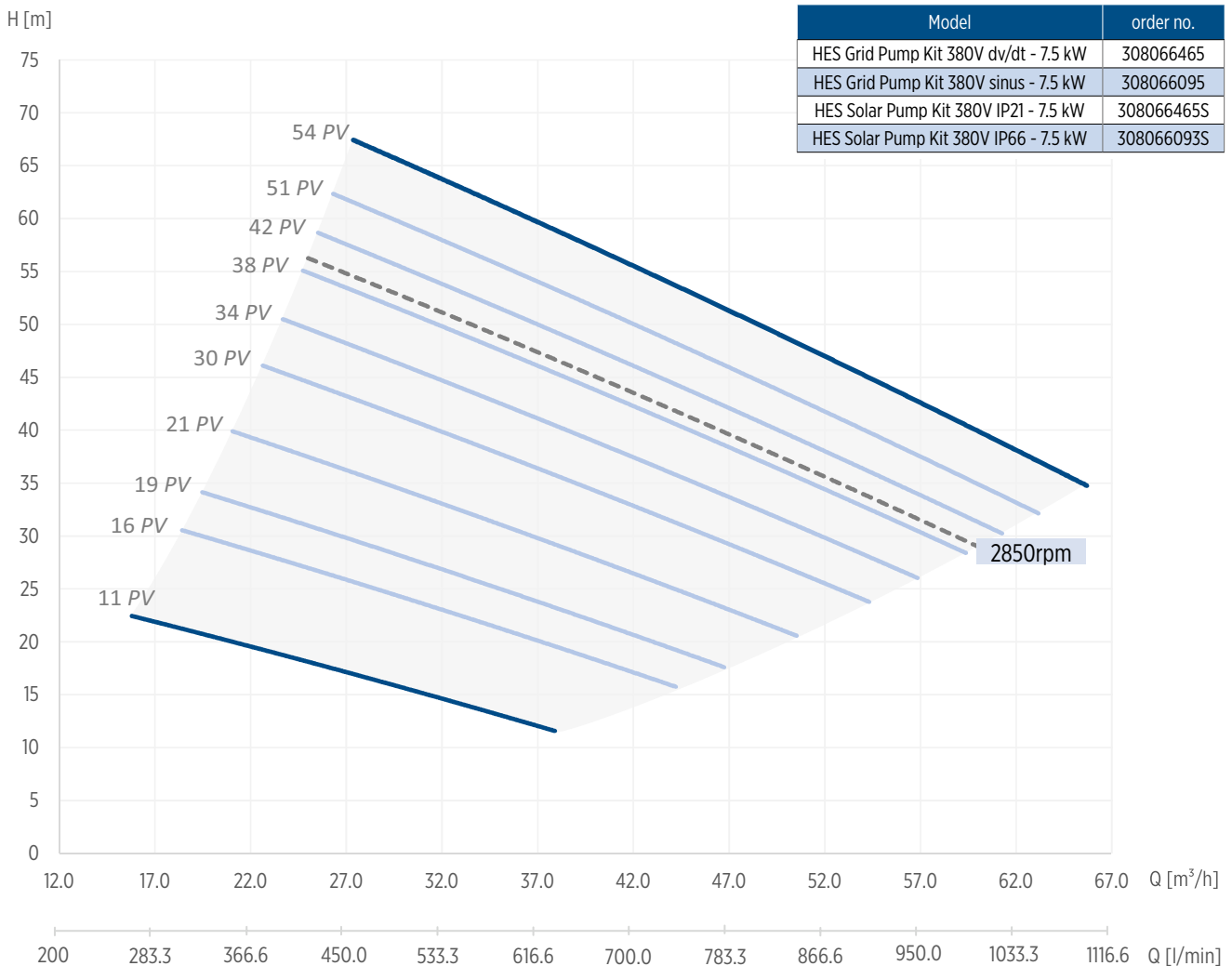


# 4" CT HIGH EFFICIENCY PUMPING KITS 4.0 - 7.5 KW

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	



# 6" CT HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with energy savings up to 15 %\*

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- Up to 15 % improved motor efficiency (system up to 11 %) with 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
- Power factor corrected input (No power compensation needed)
- Significant lower motor heat rise (Increased lifetime)

### EASY INSTALLATION

- Easy system set-up due tailored pre-settings, user interface and own Franklin Electric software

### INCREASED LIFETIME

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

### CONNECTIVITY

- Communication ModBus (RS485 and Ethernet)

### FULLY SUPPORTED

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



### PACKAGED DEAL



- 6" encapsulated synchronous submersible NEMA motor
- Variable frequency drive
- Matching output filter



\* in comparison to asynchronous technology

# 6" CT HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with encapsulated Permanent Magnet motor

## SPECIFICATION

- Motor range: 4.0 – 11.0 kW / 13.0 – 22.0 kW / 26.0 – 45.0 kW (100 Hz - 3000 rpm)  
4.6 – 12.7 kW / 15.0 – 25.0 kW / 30.0 – 51.7 kW (120 Hz - 3600 rpm)
- System Power Supply: 380 - 400 / 460 V ± 10 %
- System Supply Frequency: 50/60 Hz ± 6 %
- Motors installation orientation: Vertical / horizontal (shaft end heightened)
- Protection:
 

motor:	IP68, insulation class F
drive:	IP66/54/21
filter:	IP54/00

## 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

## APPLICATIONS



Find the right High Efficiency System with the Franklin Electric Online Selection Tool including payback calculator → <https://fehighefficiency.franklinwater.eu/>

# 6" CT HIGH EFFICIENCY SYSTEM

## 6" HES KITS

### 6" HES KITS (6" PM 304SS motor 380 V - VFD - DV/DT filter)\*

High Efficiency System		Controller			Pump (BSPP)				Motor		Output Filter			
HES Model	Part no.	Drive Model	Part no.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	[kW]	[V]	Part no.	Filter type	Part no.	IP
6HES 380 4.0-7.5 kW IP21	308 080 016	100 16A	314 000 108	21	-	-	-	-	11	380	236 080 1461	dv/dt	314 005 101	00
6HES 380 4.0-7.5 kW IP66	308 080 216	100X 16A	314 000 109	66	-	-	-	-	11	380	236 080 1461	dv/dt	314 005 110	54
6HES 380 9.3-11 kW IP21	308 080 023	100 23A	314 000 101	21	-	-	-	-	11	380	236 080 1461	dv/dt	314 005 101	00
6HES 380 9.3-11 kW IP66	308 080 223	100X 23A	314 000 105	66	-	-	-	-	11	380	236 080 1461	dv/dt	314 005 110	54
6HES 380 13-15 kW IP21	308 084 031	100 31A	314 000 199	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 102	00
6HES 380 13-15 kW IP66	308 084 231	100X 31A	314 000 200	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 111	54
6HES 380 18.5 kW IP21	308 084 038	100 38A	314 000 102	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 102	00
6HES 380 18.5 kW IP66	308 084 238	100X 38A	314 000 106	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 111	54
6HES 380 22 kW IP21	308 084 046	100 46A	314 000 131	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 103	00
6HES 380 22 kW IP66	308 084 246	100X 46A	314 000 159	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005 112	54
6HES 380 26-30 kW IP21	308 086 061	100 61A	314 000 103	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 103	00
6HES 380 26-30 kW IP66	308 086 261	100X 61A	314 000 107	66	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 112	54
6HES 380 37 kW IP21	308 086 087	100 87A	314 000 104	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 104	00
6HES 380 37 kW IP54	308 086 287	100 87A IP54	314 000 120	54	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 118	54
6HES 380 45 kW IP21	308 086 010	100 105A	314 000 132	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 137	00
6HES 380 45 kW IP54	308 086 210	100 105A IP54	314 000 201	54	-	-	-	-	45	380	236 086 1461	dv/dt	314 005 124	54

### 6" HES KITS (6" PM 304SS motor 380 V - VFD - SINUS filter)\*

High Efficiency System		Controller			Pump (BSPP)				Motor		Output Filter			
HES Model	Part no.	Drive Model	Part no.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	[kW]	[V]	Part no.	Filter type	Part no.	IP
6HES 380 4.0-7.5 kW Sin IP21	308 080 116	100 16A	314 000 108	21	-	-	-	-	11	380	236 080 1461	Sinus	314 005 105	00
6HES 380 4.0-7.5 kW Sin IP66	308 080 316	100X 16A	314 000 109	66	-	-	-	-	11	380	236 080 1461	Sinus	314 005 117	54
6HES 380 9.3-11 kW Sin IP21	308 080 123	100 23A	314 000 101	21	-	-	-	-	11	380	236 080 1461	Sinus	314 005 106	00
6HES 380 9.3-11 kW Sin IP66	308 080 323	100X 23A	314 000 105	66	-	-	-	-	11	380	236 080 1461	Sinus	314 005 113	54
6HES 380 13-15 kW Sin IP21	308 084 131	100 31A	314 000 199	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 106	00
6HES 380 13-15 kW Sin IP66	308 084 331	100X 31A	314 000 200	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 115	54
6HES 380 18.5 kW Sin IP21	308 084 138	100 38A	314 000 102	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 107	00
6HES 380 18.5 kW Sin IP66	308 084 338	100X 38A	314 000 106	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 115	54
6HES 380 22 kW Sin IP21	308 084 146	100 46A	314 000 131	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 107	00
6HES 380 22 kW Sin IP66	308 084 346	100X 46A	314 000 159	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 139	54
6HES 380 26-30 kW Sin IP21	308 086 161	100 61A	314 000 103	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 108	00
6HES 380 26-30 kW Sin IP66	308 086 361	100X 61A	314 000 107	66	-	-	-	-	45	380	236 086 1461	Sinus	314 005 116	54
6HES 380 37 kW Sin IP21	308 086 187	100 87A	314 000 104	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 109	00
6HES 380 37 kW Sin IP54	308 086 387	100 87A IP54	314 000 120	54	-	-	-	-	45	380	236 086 1461	Sinus	314 005 138	54
6HES 380 45 kW Sin IP21	308 086 110	100 105A	314 000 132	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 109	00
6HES 380 45 kW Sin IP54	308 086 310	100 105A IP54	314 000 201	54	-	-	-	-	45	380	236 086 1461	Sinus	314 005 138	54

\* Non-stock items; kits with 316SS Motors 308 08x xxx "B"  
kits with motor brackets Cast Iron Powder coated 308 08x xxx "D"; for lead lengths > 120 m please consult Franklin Electric.

## 6" CT HIGH EFFICIENCY SYSTEM

### 3- MOTOR PERFORMANCE DATA 380 V / 100 HZ

System model number	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>	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub>
308 080 X16	4	15500	380	3000	9.2	1	87.1	0.95	12.7	1
	5.5				11	1	89.8	0.95	17.5	1
	7.5				14.1	1	90.9	0.95	23.9	1
308 080 X23	9.3	15500	380	3000	17.2	1	91.2	0.95	29.6	1
	11				20.5	1	90.9	0.95	35.0	1
308 084 X31	13	15500	380	3000	25.3	1	91.4	0.95	41.4	1
	15				28.3	1	91.8	0.95	47.7	1
308 084 X38	18.5	15500	380	3000	34.1	1	92.1	0.95	58.9	1
308 084 X46	22	15500	380	3000	40.7	1	92.0	0.95	70.0	1
308 086 X61	26	27500	380	3000	51.2	1	92.3	0.95	82.8	1
	30				57.8	1	92.5	0.95	95.5	1
308 086 X87	37	27500	380	3000	71.3	1	92.1	0.95	117.8	1
308 086 X10	45	27500	380	3000	90	1	90.8	0.95	143.2	1

### 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*	

\*please consult Franklin Electric, \*\*must be verified according to PLC requirement

# 6" CT HIGH EFFICIENCY SOLAR SYSTEM

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency  
Less panels, more water respectively
- MPPT algorithm maximizes system performance
- Solar drive available in IP21/54 and IP66 enclosure rating
- AC and DC power source compatible

### CONNECTIVITY

- Communication ModBus (RS485 and Ethernet)

### PACKAGED DEAL



- 6" encapsulated 304SS synchronous submersible NEMA motor
- Variable frequency drive
- Matching output filter
- Flow switch

### FULLY SUPPORTED

- Fully technical support  
Professionals and Field Service Engineers



## SPECIFICATION

- Motor range: 4.0 – 11.0 kW / 13.0 – 22.0 kW / 26.0 – 45.0 kW (100 Hz - 3000 rpm)  
4.6 – 12.7 kW / 15.0 – 25.0 kW / 30.0 - 51.7 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 - 800 V DC / 380 - 400 V AC
- AC System Supply Frequency: 50/60 Hz  $\pm$  6 %
- Motors installation orientation: Vertical / horizontal (shaft end heightened)

# 6" CT HIGH EFFICIENCY SOLAR SYSTEM

## 6" HES SOLAR KITS

### 6" HES SOLAR KITS (6" PM 304SS motor 380 V - VFD - DV/DT filter - flow switch)\*

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter		
HES Model	Part no.	Drive Model	Part no.	IP	m <sup>3</sup> /h	Stages	Pump	Part no.	[kW]	[V]	Part no.	Filter type	Part no.	IP
6HES 380 4.0-7.5 kW IP21	308 080 016S	100 16A	314000108	21	-	-	-	-	11	380	236 080 1461	dv/dt	314 005 101	00
6HES 380 4.0-7.5 kW IP66	308 080 216S	100X 16A	314000109	66	-	-	-	-	11	380	236 080 1461	dv/dt	314 005110	54
6HES 380 9.3-11 kW IP21	308 080 023S	100 23A	314000101	21	-	-	-	-	11	380	236 080 1461	dv/dt	314 005101	00
6HES 380 9.3-11 kW IP66	308 080 223S	100X 23A	314000105	66	-	-	-	-	11	380	236 080 1461	dv/dt	314 005110	54
6HES 380 13-15 kW IP21	308 084 031S	100 31A	314000199	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005102	00
6HES 380 13-15 kW IP66	308 084 231S	100X 31A	314000200	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005111	54
6HES 380 18.5 kW IP21	308 084 038S	100 38A	314000102	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005102	00
6HES 380 18.5 kW IP66	308 084 238S	100X 38A	314000106	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005111	54
6HES 380 22 kW IP21	308 084 046S	100 46A	314000131	21	-	-	-	-	22	380	236 084 1461	dv/dt	314 005103	00
6HES 380 22 kW IP66	308 084 246S	100X 46A	314000159	66	-	-	-	-	22	380	236 084 1461	dv/dt	314 005112	54
6HES 380 26-30 kW IP21	308 086 061S	100 61A	314000103	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005103	00
6HES 380 26-30 kW IP66	308 086 261S	100X 61A	314000107	66	-	-	-	-	45	380	236 086 1461	dv/dt	314 005112	54
6HES 380 37 kW IP21	308 086 087S	100 87A	314000104	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005104	00
6HES 380 37 kW IP54	308 086 287S	100 87A IP54	314000120	54	-	-	-	-	45	380	236 086 1461	dv/dt	314 005118	54
6HES 380 45 kW IP21	308 086 010S	100 105A	314000132	21	-	-	-	-	45	380	236 086 1461	dv/dt	314 005137	00
6HES 380 45 kW IP54	308 086 210S	100 105A IP54	314000201	54	-	-	-	-	45	380	236 086 1461	dv/dt	314 005124	54

### 6" HES SOLAR KITS (6" PM 304SS motor 380 V - VFD - SINUS filter - flow switch)\*

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter		
HES Model	Part no.	Drive Model	Part no.	IP	m <sup>3</sup> /h	Stages	Pump	Part no.	[kW]	[V]	Part no.	Filter type	Part no.	IP
6HES 380 4.0-7.5 kW Sin IP21	308 080 116S	100 16A	314 000 108	21	-	-	-	-	11	380	236 080 1461	Sinus	314 005 105	00
6HES 380 4.0-7.5 kW Sin IP66	308 080 316S	100X 16A	314 000 109	66	-	-	-	-	11	380	236 080 1461	Sinus	314 005 117	54
6HES 380 9.3-11 kW Sin IP21	308 080 123S	100 23A	314 000 101	21	-	-	-	-	11	380	236 080 1461	Sinus	314 005 106	00
6HES 380 9.3-11 kW Sin IP66	308 080 323S	100X 23A	314 000 105	66	-	-	-	-	11	380	236 080 1461	Sinus	314 005 113	54
6HES 380 13-15 kW Sin IP21	308 084 131S	100 31A	314 000 199	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 106	00
6HES 380 13-15 kW Sin IP66	308 084 331S	100X 31A	314 000 200	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 115	54
6HES 380 18.5 kW Sin IP21	308 084 138S	100 38A	314 000 102	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 107	00
6HES 380 18.5 kW Sin IP66	308 084 338S	100X 38A	314 000 106	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 115	54
6HES 380 22 kW Sin IP21	308 084 146S	100 46A	314 000 131	21	-	-	-	-	22	380	236 084 1461	Sinus	314 005 107	00
6HES 380 22 kW Sin IP66	308 084 346S	100X 46A	314 000 159	66	-	-	-	-	22	380	236 084 1461	Sinus	314 005 139	54
6HES 380 26-30 kW Sin IP21	308 086 161S	100 61A	314 000 103	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 108	00
6HES 380 26-30 kW Sin IP66	308 086 361S	100X 61A	314 000 107	66	-	-	-	-	45	380	236 086 1461	Sinus	314 005 116	54
6HES 380 37 kW Sin IP21	308 086 187S	100 87A	314 000 104	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 109	00
6HES 380 37 kW Sin IP54	308 086 387S	100 87A IP54	314 000 120	54	-	-	-	-	45	380	236 086 1461	Sinus	314 005 138	54
6HES 380 45 kW Sin IP21	308 086 110S	100 105A	314 000 132	21	-	-	-	-	45	380	236 086 1461	Sinus	314 005 109	00
6HES 380 45 kW Sin IP54	308 086 310S	100 105A IP54	314 000 201	54	-	-	-	-	45	380	236 086 1461	Sinus	314 005 138	54

\* Non-stock items; kits with 316SS Motors 308 08x xxx "B"; kits with WW motor - brackets Cast Iron Powder coated 308 08x xxx "D"; for lead lengths > 120 m please consult Franklin Electric.

## 6" CT HIGH EFFICIENCY SOLAR SYSTEM

### 3~ MOTOR PERFORMANCE DATA 380 V / 100 HZ

system model no.	$P_N$ [kW]	Thrust F [N]	$U_N$ [V]	$n$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_A / I_N$	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A / T_N$
308 080 X16S	4	15500	380	3000	9.2	1	87.1	0.95	12.7	1
	5.5				11	1	89.8	0.95	17.5	1
	7.5				14.1	1	90.9	0.95	23.9	1
308 080 X23S	9.3	15500	380	3000	17.2	1	91.2	0.95	29.6	1
	11				20.5	1	90.9	0.95	35.0	1
308 084 X31S	13	15500	380	3000	25.3	1	91.4	0.95	41.4	1
	15				28.3	1	91.8	0.95	47.7	1
308 084 X38S	18.5	15500	380	3000	34.1	1	92.1	0.95	58.9	1
308 084 X46S	22	15500	380	3000	40.7	1	92.0	0.95	70.0	1
308 086 X61S	26	27500	380	3000	51.2	1	92.3	0.95	82.8	1
	30				57.8	1	92.5	0.95	95.5	1
308 086 X87S	37	27500	380	3000	71.3	1	92.1	0.95	117.8	1
308 086 X10S	45				90	1	90.8	0.95	143.2	1

### CONTROL MODES AND NECESSARY SENSOR TECHNOLOGIES

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



# 8" REW HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with energy savings up to 8 %\*

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

- Up to 8 % improved motor efficiency\* with excellent partial load behaviour (SKU reduction)\*
- One-stop shop and perfectly matching components guarantee first-class performance/efficiency
- Power factor corrected input (No power compensation needed)
- Significant lower motor heat rise (Increased lifetime)
- Easy system set-up due tailored pre-settings, user interface and own Franklin Electric software
- Communication ModBus (RS485 and Ethernet, optional Profibus)

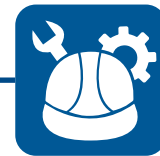


### INCREASED LIFETIME

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

### FULLY SUPPORTED

- Easy system commissioning due to integrated start-up wizard with tailored pre settings.
- Fully supported by the Technical Support Professionals and Field Service Engineers



### PACKAGED DEAL



- 8" rewindable synchronous submersible NEMA motor
- Variable frequency drive
- Matching output filter

### APPLICATIONS



\* in comparison to asynchronous technology

# 8" REW HIGH EFFICIENCY SYSTEM

## SPECIFICATION

- Motor range: 75 / 100 / 130 kW (100 Hz - 3000 rpm)  
86.3 / 115 / 150 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 -460 V ± 10 %
- System Power Supply Frequency: 50/60 Hz ±6 %
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Motors installation orientation: Vertical / horizontal (shaft end heightened)
- Protection:        motor: IP68, insulation class Y  
                         drive: IP21/54  
                         filter: IP21/54

## OPTIONS



- Special Voltages
- Higher-graded material: 316SS, 904L
- Retrofittable PT 100 temperature sensor  
VFD PT100 Plug-in card necessary (order no. 308 170 202)
- Sinus output filters in IP54 and IP00
- Plug-in card 6x DI/DO (order no. 308 170 201)
- Plug-in card 1x AI & 2x AO (order no. 308 170 206)
- Plug-in card Profibus (order no. 308 170 203)

## 8" HES KITS

### 8" HES KITS (8" PM WW motor 400 V - VFD - DV/DT filter)\*

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter		
HES Model	Order No.	Drive Model	Part No.	IP	m³/h	Stages	Pump	Part No.	[kW]	[V]	Part No.	Filter type	Part No.	IP
8HES 400 75 kW IP21	308014001	100 140A	314000116	21	-	-	-	-	75	400	2630145311	dv/dt	314005130	00
8HES 400 75 kW IP54	308014201	100 140A IP54	314000113	54	-	-	-	-	75	400	2630145311	dv/dt	314005124	54
8HES 400 100 kW IP21	308016001	100 205A	314000117	21	-	-	-	-	100	400	2630165311	dv/dt	314005119	00
8HES 400 100 kW IP54	308016201	100 205A IP54	314000114	54	-	-	-	-	100	400	2630165311	dv/dt	314005125	54
8HES 400 130 kW IP21	308018001	100 261A	xxx	21	-	-	-	-	130	400	2630185311	dv/dt	xxx	00
8HES 400 130 kW IP54	308018201	100 261A IP54	xxx	54	-	-	-	-	130	400	2630185311	dv/dt	xxx	54

### 8" HES KITS (8" PM WW motor 400 V - VFD - SINUS filter)\*

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter		
HES Model	Order No.	Drive Model	Part No.	IP	m³/h	Stages	Pump	Part No.	[kW]	[V]	Part No.	Filter type	Part No.	IP
8HES 400 75 kW Sin IP21	308014101	100 140A	314000116	21	-	-	-	-	75	400	2630145311	Sinus	314005121	00
8HES 400 75 kW Sin IP54	308014301	100 140A IP54	314000113	54	-	-	-	-	75	400	2630145311	Sinus	314005127	54
8HES 400 100 kW Sin IP21	308016101	100 205A	314000117	21	-	-	-	-	100	400	2630165311	Sinus	314005122	00
8HES 400 100 kW Sin IP54	308016301	100 205A IP54	314000114	54	-	-	-	-	100	400	2630165311	Sinus	314005128	54
8HES 400 130 kW Sin IP21	308018101	100 261A	xxx	21	-	-	-	-	130	400	2630185311	Sinus	xxx	00
8HES 400 130 kW Sin IP54	308017301	100 261A IP54	xxx	54	-	-	-	-	130	400	2630185311	Sinus	xxx	54

\* Kits with WW motor - brackets Cast Iron Powder coated



## 8" REW HIGH EFFICIENCY SYSTEM

### MOTOR PERFORMANCE DATA 400 V / 100 HZ

HES model no.	$P_N$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_A/I_N^*$ [A]	$\eta$ [%]	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	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	0.95	296	1
	100	45	3000	178	1	92.7	0.95	319	1
308 018 X01	75	45	3000	125	1	93.8	0.97	239	1
	93	45	3000	153	1	93.7	0.97	296	1
	110	45	3000	186	1	93.3	0.97	350	1
	130	45	3000	225	1	92.6	0.96	414	1

### MOTOR PERFORMANCE DATA 500 V / 100 HZ

HES model no.	$P_N$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_A/I_N^*$ [A]	$\eta$ [%]	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	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
308 028 X01	75	45	3000	102	1	93.8	0.96	239	1
	93	45	3000	124	1	93.7	0.96	296	1
	110	45	3000	151	1	93.3	0.96	350	1
	130	45	3000	183	1	92.6	0.96	414	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.



Find the right High Efficiency System with the Franklin Electric Online Selection Tool including payback calculator <https://fehighefficiency.franklinwater.eu/>

# 8" REW HIGH EFFICIENCY SYSTEM

## MOTOR PERFORMANCE DATA 480 V / 120 HZ

HES model no.	P <sub>N</sub> [kW/HP]	P <sub>MAX</sub> [kW/HP]	Thrust F [kN]	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>MAX</sub> [A]	I <sub>A</sub> /I <sub>MAX</sub> * [A]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
308 014 X01	45 / 60	52 / 70	45	3600	74	1	93.3	0.96	137	1
	55 / 74	63 / 84	45	3600	91	1	93.3	0.96	167	1
	67 / 90	77 / 103	45	3600	112	1	93.0	0.96	204	1
	75 / 100	86 / 115	45	3600	128	1	92.5	0.96	229	1
308 016 X01	75 / 100	86 / 115	45	3600	129	1	93.5	0.95	229	1
	83 / 111	95 / 127	45	3600	143	1	93.3	0.95	252	1
	93 / 125	107 / 143	45	3600	162	1	93.0	0.95	284	1
	100 / 134	115 / 154	45	3600	178	1	92.7	0.95	305	1
308 018 X01	75 / 100	86 / 116	45	3000	125	1	93.8	0.97	239	1
	93 / 125	107 / 143	45	3000	153	1	93.7	0.97	296	1
	110 / 134	127 / 170	45	3000	186	1	93.3	0.97	350	1
	130 / 174	150 / 200	45	3000	225	1	92.6	0.96	414	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
Q - Flow	No (Optional)	mandatory			
	P	mandatory	mandatory		
	H	mandatory		mandatory	
P - pressure	No (Optional)	Yes*	mandatory		
	Q	mandatory	mandatory		
	H		mandatory	mandatory	
H - level	No (Optional)	Yes*		mandatory	mandatory*
	Q	mandatory		mandatory	
	P		mandatory	mandatory	
Direct mode	No	Yes**	No	No	mandatory*
Manual mode	No				Yes*

\* please consult Franklin Electric  
 \*\* needs to be evaluated to PLC

# 8" REW HIGH EFFICIENCY SOLAR SYSTEM

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY IN SOLAR APPLICATIONS

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency  
Less panels, more water respectively
- Solar drive available in IP00/21 enclosure rating
- AC and DC power source compatible
- MPPT algorithm maximizes system performance



### CONNECTIVITY

- Communication ModBus (RS485 and Ethernet)

### PACKAGED DEAL



- 8" rewindable synchronous submersible NEMA motor
- Variable frequency drive
- Matching output filter
- Flow switch

### FULLY SUPPORTED

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



## SPECIFICATION

- Motor range: 37 - 130 kW (100 Hz - 3000 rpm)
- System Power Supply: 400 - 800 V DC
- AC System Supply Frequency: 50 - 60 Hz  $\pm$  6%
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Motors installation orientation: Vertical / horizontal (shaft end heightened)
- Protection:
 

motor:	IP68, insulation class Y
drive:	IP00/21
filter:	IP00

\* in comparison to asynchronous technology

# 8" REW HIGH EFFICIENCY SOLAR SYSTEM

## 8" HES SOLAR KITS

### 8" HES SOLAR KITS (8" PM WW motor 400 V - VFD - DV/DT filter - flow switch)\*

High Efficiency System		Controller			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.	IP	Part no.	Model
8HES Solar 400 75 kW IP21	308 014 002S	100 140A	314 000 116	21	-	-	-	-	75	400	263 014 5311	dv/dt	314 005 130	00	226 019 101	F21
8HES Solar 400 100 kW IP21	308 016 002S	100 205A	314 000 117	21	-	-	-	-	100	400	263 014 5311	dv/dt	314 005 119	00	226 019 101	F21
8HES Solar 400 130 kW IP21	308 018 002S	100 261A	xxx	21	-	-	-	-	130	400	263 018 5311	dv/dt	xxx	00	226019101	F21

### 8" HES SOLAR KITS (8" PM WW motor 400 V - VFD - SINUS filter - flow switch)\*

High Efficiency System		Controller			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.	IP	Part no.	Model
8HES Solar 400 75 kW Sin IP21	308 014 102S	100 140A	314000116	21	-	-	-	-	75	400	263 014 5311	Sinus	314 005 121	00	226 019 101	F21
8HES Solar 400 100 kW Sin IP21	308 016 102S	100 205A	314000117	21	-	-	-	-	100	400	263 016 5311	Sinus	314 005 122	00	226 019 101	F21
8HES Solar 400 130 kW Sin IP21	308 018 102S	100 261A	xxx	21	-	-	-	-	130	400	263 018 5311	Sinus	xxx	00	226019101	F21

\* Kits with WW motor - brackets Cast Iron Powder coated

Non-stock items, more ratings and IP54 kits on demand

For lead lengths > 120 m please consult Franklin Electric

## MOTOR PERFORMANCE DATA 400 V / 100 HZ

HES model no.	P <sub>N</sub> [kW]	Thrust F [kN]	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>N</sub> [A]	I <sub>A</sub> /I <sub>N</sub> * [A]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
308 014 X01 S	75	45	3000	128	1	92.5	0.96	239	1
308 016 X01 S	100	45	3000	178	1	92.7	0.95	319	1
<b>308 018 X01 S</b>	<b>130</b>	<b>45</b>	<b>3000</b>	<b>225</b>	<b>1</b>	<b>92.6</b>	<b>0.96</b>	<b>414</b>	<b>1</b>

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 & slot card	Flow switch (digital)
Solar	-	-	-	-	Yes*	mandatory

\* please consult Franklin Electric

# 10" REW HIGH EFFICIENCY SYSTEM

Packaged Submersible Borehole System with energy savings up to 7%\*

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY

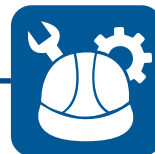
- Up to 7% improved motor efficiency\* with excellent partial load behaviour (SKU reduction)\*
- One-stop shop and perfectly matching components guarantee first-class performance/efficiency
- Power factor corrected input (No power compensation needed)
- Significant lower motor heat rise (Increased lifetime)
- Easy system set-up due tailored pre-settings, user interface and own Franklin Electric software
- Communication ModBus (RS485 and Ethernet)



### INCREASED LIFETIME

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

### FULLY SUPPORTED



- Easy system commissioning due to integrated start-up wizard with tailored pre settings.
- Fully supported by the Technical Support Professionals and Field Service Engineers

### PACKAGED DEAL



- 10" rewindable synchronous submersible motor
- Variable frequency drive
- Matching output filter

### APPLICATIONS



\* in comparison to asynchronous technology

# 10" REW HIGH EFFICIENCY SYSTEM

## SPECIFICATION

- Motor range: 200 - 250 kW (100 Hz - 3000 rpm), 230 - 290 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 V / 460 V ±10 % (50 Hz)
- System Supply Frequency: 50 Hz - 60 Hz ±2 %
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Motors installation orientation: Vertical / horizontal (shaft end heightened) - 250 kW motors may not be installed horizontally
- MPPT algorithm maximizes system performance
- Protection:
  - motor: IP68, insulation class Y
  - drive: IP00
  - filter: IP00

## OPTIONS



- Special Voltages
- IP54 electronics
- Higher-graded material: 316SS, 904L
- Sinus output filters
- Retrofitable PT 100 temperature sensor  
VFD PT100 Plug-in card necessary (order no. 308 170 202)
- Plug-in card 6x DI/DO (order no. 308 170 201)
- Plug-in card PT100 (order no. 308 170 202)
- Plug-in card 1x AI & 2x AO (order no. 308 170 206)
- Plug-in card Profibus (order no. 308 170 203)

## 10" HES KITS

### 10" HES KITS (10" PM WW motor 400 V - VFD - DV/DT 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	Part no.	IP
10HES 400 190 kW IP00	308 028 002	Drive 100 385A	314 000 203	00	-	-	-	-	200	380	264 028 5311	dv/dt	314 005 166	00
10HES 400 200 kW IP00	308 028 001	Drive 100 460A	314 000 202	00	-	-	-	-	200	380	264 028 5311	dv/dt	314 005 166	00
10HES 400 250 kW IP00	308 029 001	Drive 100 520A	314 000 204	00	-	-	-	-	250	380	264 029 5311	dv/dt	314 005 167	00

### 10" HES KITS (10" PM WW motor 400 V - VFD - SINUS 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	Part no.	IP
10HES 400 190 kW Sin IP00	308 028 102	Drive 100 385A	314 000 203	00	-	-	-	-	200	380	264 028 5311	Sinus	314 005 168	00
10HES 400 200 kW Sin IP00	308 028 101	Drive 100 460A	314 000 202	00	-	-	-	-	200	380	264 028 5311	Sinus	314 005 168	00
10HES 400 250 kW Sin IP00	308 029 101	Drive 100 520A	314 000 204	00	-	-	-	-	250	380	264 029 5311	Sinus	314 005 169	00

\* Kits with WW motor - brackets Cast Iron Powder coated/stator 304SS





## 10" REW HIGH EFFICIENCY SYSTEM

### MOTOR PERFORMANCE DATA 400 V / 100 HZ

HES model no.	$P_N$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_A/I_N^*$ [A]	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A/T_N^*$ [Nm]
308 028 ***	150	60	3000	284	1	94.0	0.90	478	1
	185	60	3000	354	1	93.8	0.91	589	1
	200	60	3000	389	1	93.6	0.91	637	1
308 029 ***	200	60	3000	377	1	94.5	0.91	637	1
	220	60	3000	423	1	94.3	0.92	701	1
	250	60	3000	497	1	93.8	0.93	796	1

### MOTOR PERFORMANCE DATA 460 V / 120 HZ

HES model no.	$P_N$ [kW]	$P_{max}$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_{MAX}$ [A]	$I_A/I_{MAX}^*$ [A]	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A/T_N^*$ [Nm]
308 028 ***	150	173	60	3600	284	1	94.0	0.90	478	1
	185	213	60	3600	354	1	93.8	0.91	589	1
	200	230	60	3600	389	1	93.6	0.91	637	1
308 029 ***	200	230	60	3600	377	1	94.5	0.91	637	1
	220	253	60	3600	423	1	94.3	0.92	701	1
	250	287	60	3600	497	1	93.6	0.93	796	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 & slot card
Q - Flow	No (Optional)	mandatory			Optional
	P	mandatory	mandatory		
	H	mandatory		mandatory	
P - pressure	No (Optional)	Yes*	mandatory		mandatory*
		mandatory	mandatory		
H - level	No (Optional)	Yes*		mandatory	mandatory*
	Q	mandatory		mandatory	
Direct mode	No	Yes**	No	No	mandatory*
Manual mode	No			Yes*	

\* please consult Franklin Electric

\*\* need to be evaluated to PLC

# 10" REW HIGH EFFICIENCY SOLAR SYSTEM

## FEATURES & BENEFITS

### SUPERIOR EFFICIENCY IN SOLAR APPLICATIONS

- One-stop shop and perfectly matching components guarantee first-class performance/efficiency  
Less panels, more water respectively
- Solar drive available in IP00 enclosure rating
- AC and DC power source compatible
- MPPT algorithm maximizes system performance



### PACKAGED DEAL



- 10" rewindable synchronous submersible motor
- Variable frequency drive
- Matching output filter
- Flow switch (Solar systems)

### FULLY SUPPORTED

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



## SPECIFICATION

- Motor range: 190 - 250 kW (100 Hz - 3000 rpm), 230 - 290 kW (120 Hz - 3600 rpm)
- System Power Supply: 400 - 800 V (min. starting voltage 440 V)
- Frequency: 30 - fN
- Nominal ambient temperature: motor: 30 °C, electronics: 50 °C (> 40 °C with derating)
- Motors installation orientation: Vertical / horizontal (shaft end heightened) - 250kW motors may not be installed horizontally
- Protection:
  - motor: IP68, insulation class Y
  - drive: IP00
  - filter: IP00

## 10" HES SOLAR KITS

### 10" HES SOLAR KITS (10" PM WW motor 400 V - VFD - DV/DT 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	Part no.	IP
10HES Solar 400 190 kW IP00	308 028 002S	Drive 100 385A	314 000 203	00	-	-	-	-	200	380	264 028 531I	dv/dt	314 005 166	00
10HES Solar 400 200 kW IP00	308 028 001S	Drive 100 460A	314 000 202	00	-	-	-	-	200	380	264 028 531I	dv/dt	314 005 166	00
10HES Solar 400 250 kW IP00	308 029 001S	Drive 100 520A	314 000 204	00	-	-	-	-	250	380	264 029 531I	dv/dt	314 005 167	00

### 10" HES SOLAR KITS (10" PM WW motor 400 V - VFD - SINUS 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	Part no.	IP
10HES Solar 400 190 kW Sin IP00	308 028 102S	Drive 100 385A	314 000 203	00	-	-	-	-	200	380	264 028 531I	Sinus	314 005 168	00
10HES Solar 400 200 kW Sin IP00	308 028 101S	Drive 100 460A	314 000 202	00	-	-	-	-	200	380	264 028 531I	Sinus	314 005 168	00
10HES Solar 400 250 kW Sin IP00	308 029 101S	Drive 100 520A	314 000 204	00	-	-	-	-	250	380	264 029 531I	Sinus	314 005 169	00

\* Kits with WW motor - brackets Cast Iron Powder coated

# 10" REW HIGH EFFICIENCY SOLAR SYSTEM



## SOLAR PUMP KITS 400 V

P <sub>N</sub> [kW]	For panel mount	
	VFD IP00 & dV/dt IP00 filter	VFD IP00 & Sinus IP00 filter
190	308 028 002S	308 028 102S
200	308 028 001S	308 028 101S
250	308 029 001S	308 029 101S

## CONTROL MODES AND NECESSARY SENSOR TECHNOLOGIES

process reference	control reference	flow meter	pressure sensor	level sensor	PT100 sensor & slot card	Flow switch (digital)
Solar					Yes*	mandatory

\* please consult Franklin Electric



# SYSTEM COMPONENTS

4" 3~ Encapsulated Permanent magnet motor .....	54
6" 3~ Encapsulated Permanent magnet motor .....	62
8" Rewindable Permanent magnet motor .....	67
10" Rewindable Permanent magnet motor .....	73
Submersible Borehole pumps .....	78
Variable Speed Drives (VFD) .....	81
Output Filter .....	86
Accessories .....	93

# 4" 3~ ENCAPSULATED PERMANENT MAGNET 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
  - Suitable for use in water with increased salinity
  - Drinking water approvals
- 
- Motor ratings: 0.55 - 3.0 kW; Thrust load; 4 kN
  - Motor ratings: 3.0 - 7.5 kW; Thrust load: 6.5 kN
  - Voltage: 220 V / 380 V (100 Hz - 3000 rpm; 120 Hz - 3600 rpm)
  - Voltage tolerance:  $\pm 10\% U_N$
  - 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
  - Motors installation orientation: Vertical / horizontal (shaft end heightened)
  - All motors with factory installed leads:  $\leq 2.2$  kW: 1.50 m;  $\geq 3$  kW: 2.50 m, special lead lengths on request



## 3~ 304SS / 316SS MODEL NUMBERS 220 V / 100 & 120 HZ

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Thrust F [N]	f [Hz]	Digit 1 - 6	Digit 7 - 10	
					Standard 304SS	Standard 316SS
					Single pack with lead*	Single pack with lead*
0.55 - 1.1	220	4000	100	234 071	6721L	6821L
			120	234 051		
1.1 - 2.2	220	4000	100	234 072	6721L	6821L
			120	234 052		
2.2 - 3.0	220	4000	100	234 073	6721L	6821L
			120	234 053		
3.0 - 4.0	220	6500	100	234 074	3421L	3521L
			120	234 054		

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

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Thrust F [N]	f [Hz]	Digit 1 - 6	Digit 7 - 10	
					Standard 304SS	Standard 316SS
					Single pack with lead*	Single pack with lead*
1.1 - 2.2	380	4000	100	234 062	6721L	6821L
2.2 - 3.0	380	4000	100	234 063	6721L	6821L
3.0 - 4.0	380	6500	100	234 064	3421L	3521L
4.0 - 7.5	380	6500	100	234 066	3421L	3521L

\* Lead lengths Motors "L" : with pre-mounted cable 1.5m/ 6500N- 2,5m

## 4" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

### MOTOR PERFORMANCE DATA 220 V / 100 HZ

System model no.	Motor model no.	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]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
308 071 001	234 071 ***	0.55	4000	220	3000	1.8	1	85.1	0.95	1.8	1
		0.75				2.4		85.6	0.97	2.4	
		1.1				3.8		83.5	0.99	3.5	
308 072 001	234 072 ***	1.1	4000	220	3000	3.4	1	86.4	0.96	3.5	1
		1.5				4.8		88.0	0.97	4.8	
		2.2				7.0		87.0	0.99	7.0	
308 073 001	234 073 ***	2.2	4000	220	3000	6.9	1	90.3	0.96	7.0	1
		3.0				9.4		90.2	0.97	9.6	
308 074 001	234 074 ***	3.0	6500	220	3000	10.2	1	90.7	0.94	9.6	1
		3.7				12.0		91.0	0.96	11.8	
		4.0				13.0		91.0	0.97	12.7	

### MOTOR PERFORMANCE DATA 220 V / 120 HZ

System model no.	Motor model no.	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]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
	234 051 ****	0,55	4000	220	3600	2,0	1	85,1	0,95	1,8	1
		0,75				2,6		85,6	0,97	2,4	
		1,1				3,8		83,5	0,99	3,5	
	234 052 ****	1,1	4000	220	3600	4,1	1	86,4	0,94	3,5	1
		1,5				5,0		88,0	0,95	4,8	
		2,2				7,1		87,0	0,96	7,0	
	234 053 ****	2,2	4000	220	3600	6,9	1	90,3	0,96	7,0	1
		3,0				9,4		90,2	0,97	9,6	
	234 054 ****	3,0	6500	220	3600	9,7	1	90,7	0,94	9,6	1
		3,7				11,5		91,0	0,96	11,8	
		4,0				12,5		91,0	0,97	12,7	

### MOTOR PERFORMANCE DATA 380 V / 100 HZ

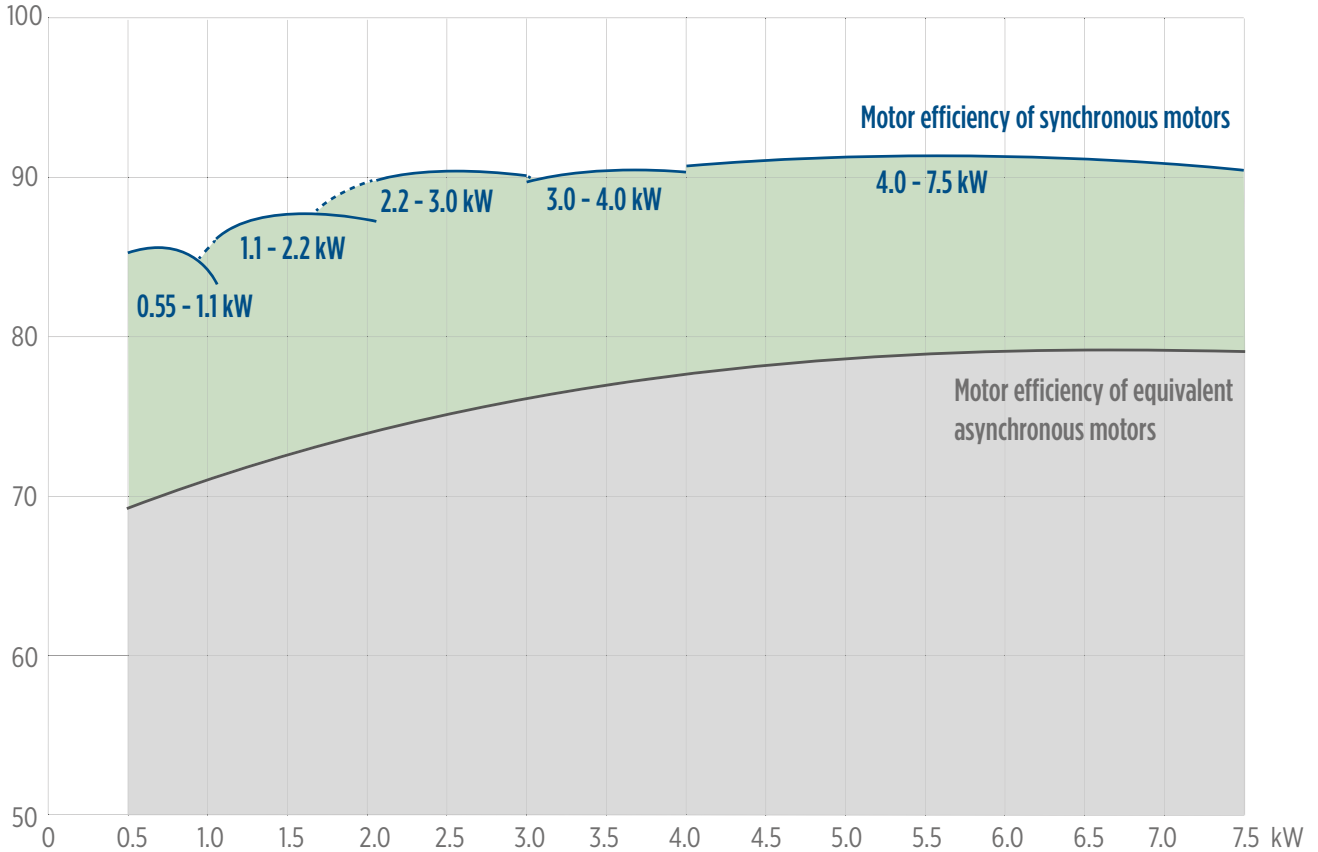
System model no.	Motor model no.	P <sub>N</sub> [kW]	Thrust F [N]	U <sub>N</sub> [V]	n [min <sup>-1</sup> ]	I <sub>N</sub> [A]	I <sub>A</sub> /I <sub>N</sub> [A]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
308 062 00X	234 062 ***	1.1	4000	380	3000	2.2	1	86.4	0.95	3.5	1
		1.5				2.8		88.0	0.96	4.8	
		2.2				4.0		87.0	0.97	7.0	
308 063 00X	234 063 ***	2.2	4000	380	3000	4.0	1	89.6	0.95	7.0	1
		3.0				5.4		90.0	0.97	9.6	
308 064 00X	234 064 ***	3.0	6500	380	3000	5.7	1	89.7	0.96	9.6	1
		3.7				6.7		90.2	0.97	11.8	
		4.0				7.3		90.2	0.98	12.7	
308 066 00x	234 066 ***	4.0	6500	380	3000	7.3	1	90.7	0.95	12.7	1
		5.5				9.7		91.0	0.95	17.5	
		7.5				13.1		90.5	0.96	23.9	

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.

# 4" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## EFFICIENCY CURVE AT 3000 RPM

efficiency [%] Motor  $\eta$  220 (380) V / 100 Hz [%] = f (P2 [kW])



## MOTOR LEADS / ELECTRICAL CONNECTION 3~ MOTORS

3- PM motors	Motor lead*			
	0.55 - 7.5 kW			
	$\emptyset$ [mm]	B [mm]	B1 [mm]	H [mm]
		3 x 1.5 + 1G 1.5	16.8	10.7
	L [m]	304SS / 316SS		
	1.50	310 178 501		
	2.50	310 113 502		
	5	310 113 505		
	10	310 113 510		
	15	310 113 515		
	20	310 113 520		

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



# 4" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## WINDING RESISTANCE 220 V / 100 HZ

$P_N$ [kW]	$U_N$ [V]	Stator Ref.	U - V (Ohm)	Rotor Ref.
0.55 - 1.1	220	327 460 ***	7.7 - 8.14	178 172 901
1.1 - 2.2	220	327 461 ***	2.30 - 2.40	178 172 903
2.2 - 3.0	220	327 462 ***	1.45 - 1.54	178 172 904
3.0 - 4.0	220	327 463 ***	0.78 - 0.82	178 173 921

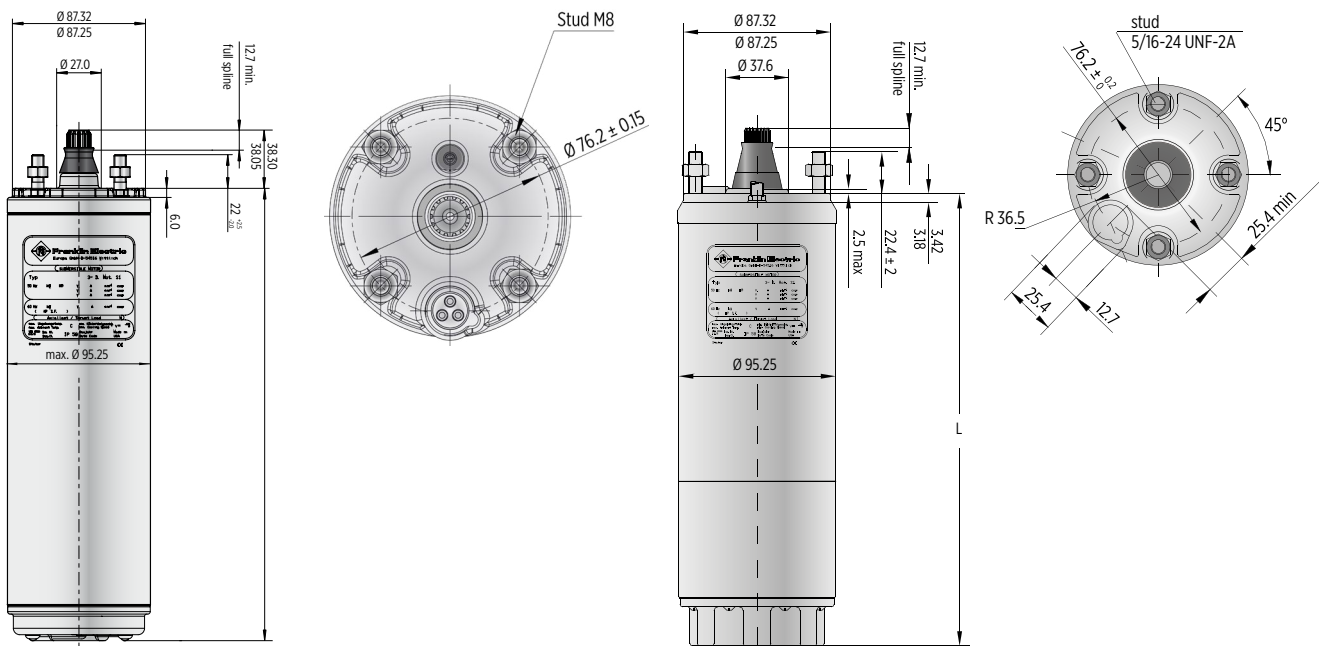
## WINDING RESISTANCE 380 V / 100 HZ

$P_N$ [kW]	$U_N$ [V]	Stator Ref.	U - V (Ohm)	Rotor Ref.
1.1 - 2.2	380	327 451 ***	8.0 - 8.4	178 172 903
2.2 - 3.0	380	327 452 ***	4.4 - 4.62	178 172 904
3.0 - 4.0	380	327 453 ***	2.7 - 2.9	178 173 921
4.0 - 7.5	380	327 454 ***	1.88 - 2.07	178 141 901

## MOTOR DIMENSIONS

0.55 - 3.0 kW [4000 N]

3.0 - 7.5 kW [6500 N]



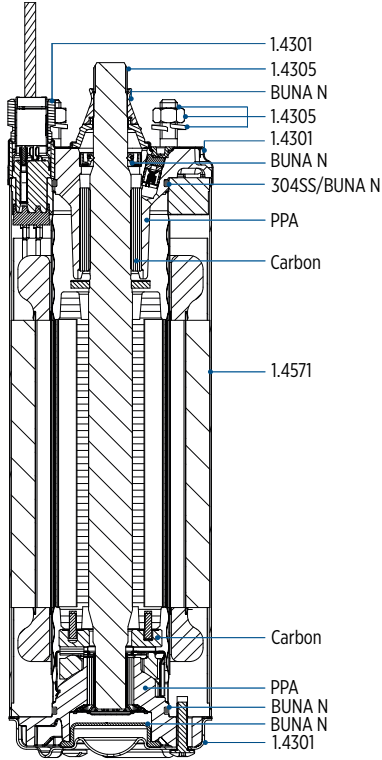
$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	L [mm]	M [kg]	Motor with lead in single pack	
					[mm]	[kg]
0.55 - 1.1	220	4000	218	5.2	530 x 100 x 110	6
1.1 - 2.2	220	4000	263	7.2	530 x 100 x 110	8
2.2 - 3.0	220	4000	353	9.2	560 x 100 x 110	10
3.0 - 4.0	220	6500	429	15.2	560 x 100 x 110	16
1.1 - 2.2	380	4000	263	7.2	560 x 100 x 110	8
2.2 - 3.0	380	4000	353	9.2	560 x 100 x 110	10
3.0 - 4.0	380	6500	429	15.2	796 x 100 x 110	16
7.5	380	6500	531	19.8	796 x 100 x 110	20

tolerances according to NEMA MG 1-18.388

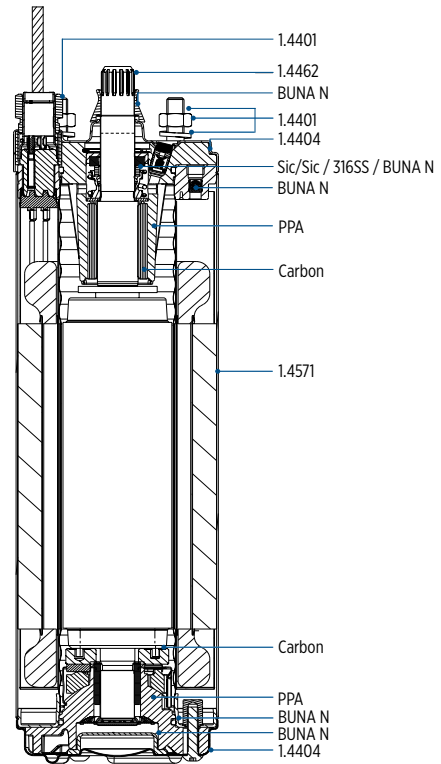
# 4" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## MOTOR MATERIALS 4000 N

304SS

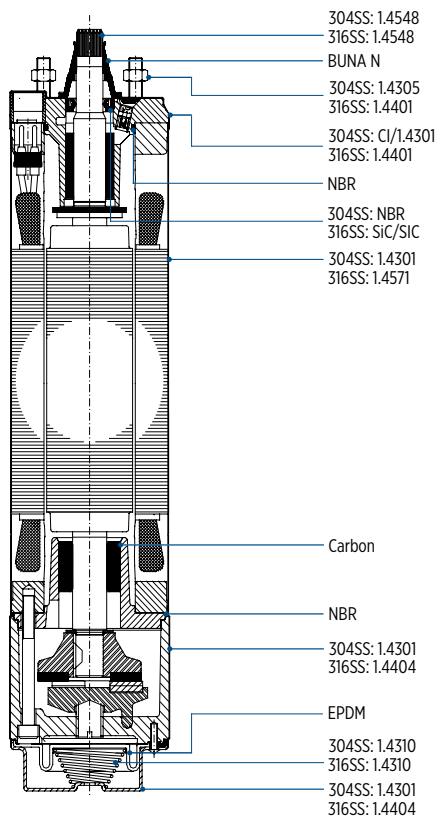


316SS



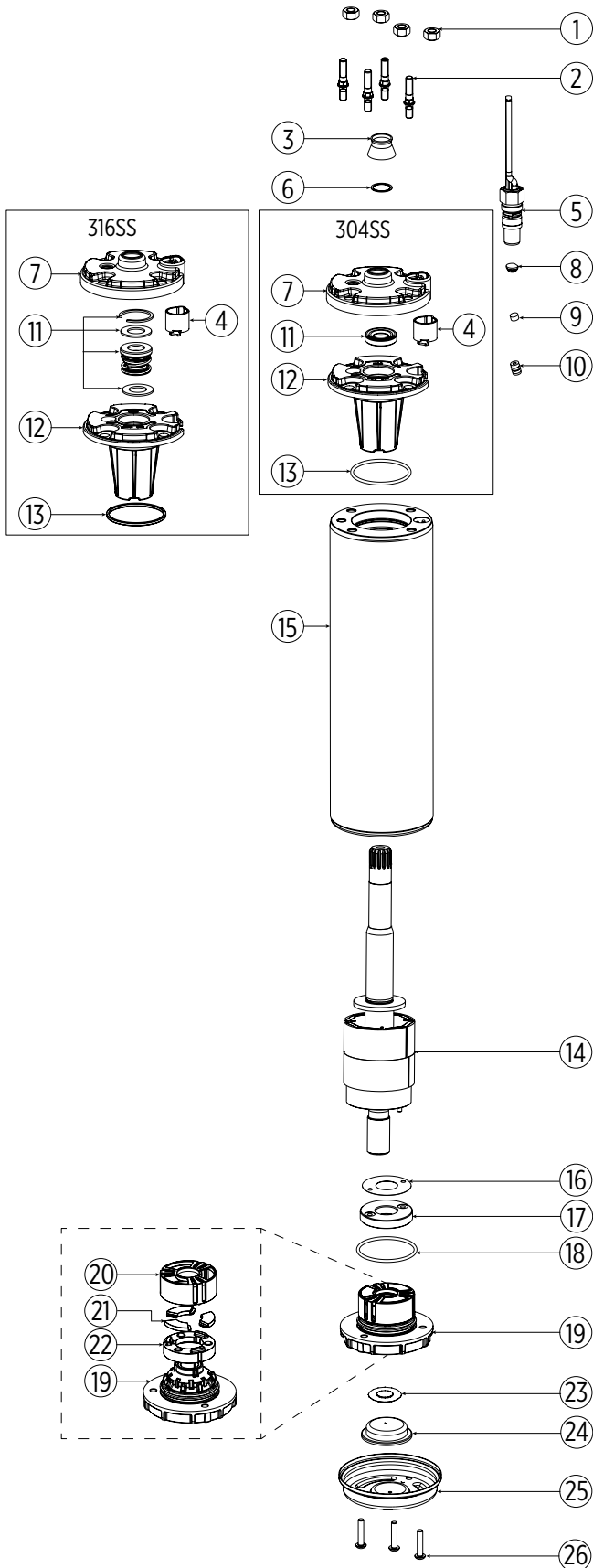
## MOTOR MATERIALS HIGH THRUST 6500 N

304SS / 316SS



# 4" 3~ ENCAPSULATED PM MOTOR SPARE PARTS 0.55 - 3.0 KW / 4000 N

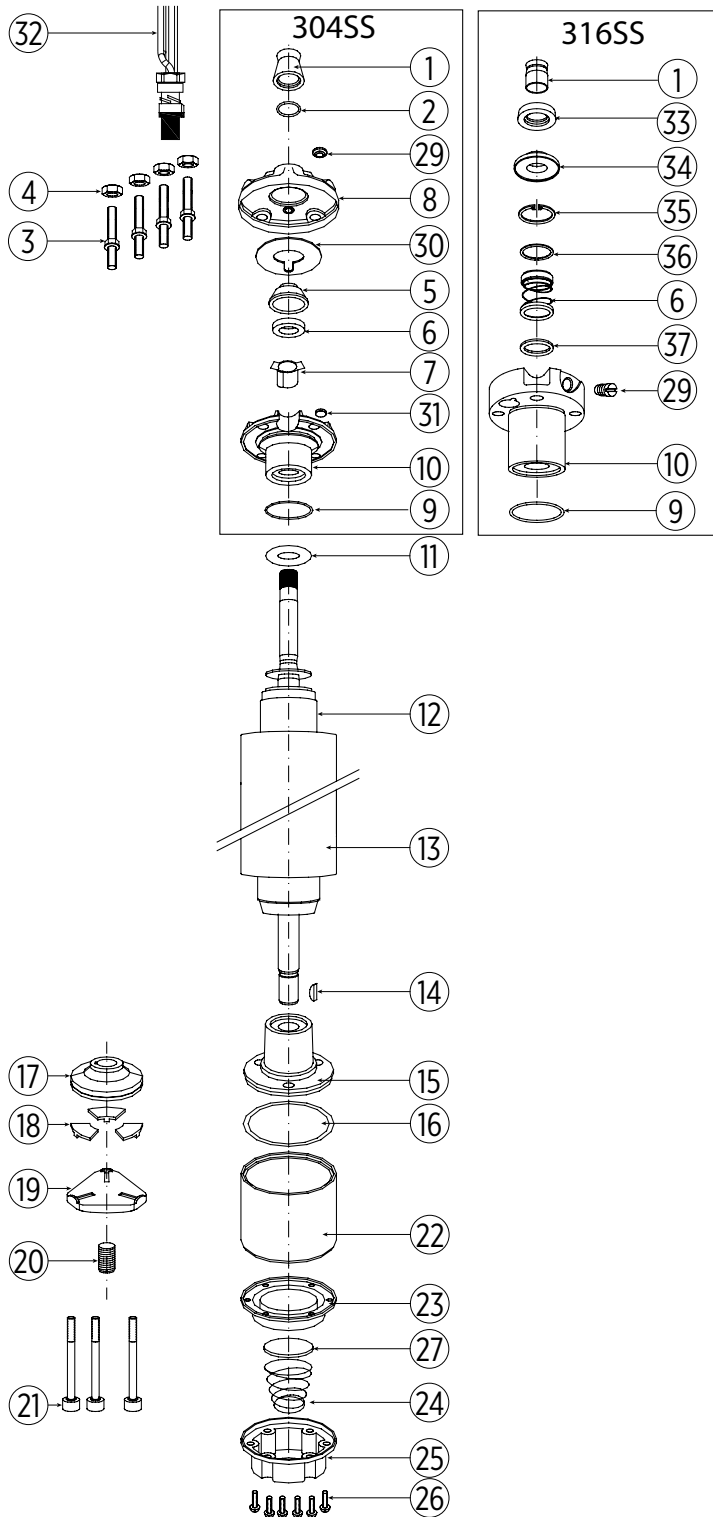
## MOTOR PARTS DESCRIPTION



Pos.	Part Description	Qty.	Part number
1	nut M8	4	Kit C
2	stud M8	4	Kit C
3	protector (spline)	1	Kit B
4	connector boss	1	Kit A1 151820103
5	motor lead	1	→ see page 56
6	washer	1	Kit B
7	top endbell, cover 304SS	1	Kit A 150262151
	top endbell, cover 316SS	1	Kit A 150262251
8	plug	1	Kit B
9	filter	1	Kit B
10	valve	1	Kit A
11	shaft seal	1	Kit B
12	top endbell	1	Kit A
13	O-ring	1	Kit B
14	rotor	1	→ see page 61
15	stator	1	→ see page 61
16	level washer	1	Kit A
17	thrust disc assy	1	Kit A
18	O-ring	1	Kit B
19	bottom endbell	1	Kit A2
20	bearing cage	1	Kit A
21	segments	3	Kit A
22	rocking disc	1	Kit A
23	diaphragm washer	1	Kit B 151314101
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~ ENCAPSULATED PM MOTOR SPARE PARTS 3.0 - 7.5 kW / 6500 N

## 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 61
13	stator	1	→ see page 61
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	adjusting screw	1	151 048 102
21	screws	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	screws	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 56
33	sand slinger (316SS)	1	Kit B
34	seal cover (316SS)	1	Kit B
35	ring	1	Kit B
36	spring ring	1	Kit B
37	support disc seal	1	Kit B

## 4" 3~ ENCAPSULATED PM MOTOR SPARE PARTS

### OVERVIEW SPARE PARTS KITS 4000 N

$P_N$ [kW]	0.55 - 3.0 kW	including positions	order no.
Kit A1	upper end bell 304SS	4, 7 - 13	308 462 901
	upper end bell 316SS		308 462 951
Kit A2	lower end bell incl. thrust bearing kit 4000N	16 - 22	308 464 911
Kit B	seal kit Standard 304SS	3, 6, 8, 9, 11, 13, 18, 23	308 650 201
	seal kit Standard 316SS		308 650 251
Kit C	fastener kit 304SS	1, 2, 26	308 656 201
	fastener kit 316SS		308 656 251

### OVERVIEW SPARE PARTS KITS MOTORS 6500 N

$P_N$ [kW]	upper end bell (Pos. 10)	lower end bell (Pos. 15)	Upthrust washer (Pos. 11)
3.0 - 7.5	308 233 509 - 304SS	177 379 921	308 268 104
	3.0 - 4.0kW - 177 390 957 - 316SS		3.0 - 4.0kW - 308 747 101
	4.0 - 7.5kW - 177 390 959 - 316SS	177 379 901	4.0 - 7.5kW - 275 540 163
Kit A	thrust bearing kit 6500N	incl. pos. 17, 18	308 700 301
Kit B	seal kit 304SS	incl. pos. 1, 2, 6, 9, 16, 23, 29, 31	308 900 351
	seal kit 316SS	incl. pos. 6, 9, 16, 23, 34, 36	308 900 302
Kit D	fastener kit 304SS	incl. pos. 3, 4, 21, 26	308 658 351
	fastener kit 316SS		308 658 301

### SPARE PARTS STATOR AND ROTOR 220 V

$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	Model no. Motor	Model no. Stator	Model no. Rotor
0.55 - 1.1	220	4000	234 071 ****	305 491 951	178 172 901 K
1.1 - 2.2	220	4000	234 072 ****	305 491 952	178 172 903 K
2.2 - 3.0	220	4000	234 073 ****	305 491 953	178 172 904 K
3.0 - 4.0	220	6500	234 074 ****	305 491 957	178 173 921 K

### SPARE PARTS STATOR AND ROTOR 380 V

$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	Model no. Motor	Model no. Stator	Model no. Rotor
1.1 - 2.2	380	4000	234 062 ****	305 491 954	178 172 903 K
2.2 - 3.0	380	4000	234 063 ****	305 491 955	178 172 904 K
3.0 - 4.0	380	6500	234 064 ****	305 491 958	178 173 921 K
7.5	380	6500	234 066 ****	305 491 959	178 141 921 K



Youtube tutorial 4 CT motor cable mounting: <https://youtu.be/tHFNfUByt3s>

# 6" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## BENEFITS & FEATURES

- Double-flange 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 liquid lubricated thrust bearing for 100 % maintenance free operation
- Field replaceable lead using Franklin's exclusive Water Bloc technology
- Pressure-equalizing diaphragm, spring pre-loaded
- SandFighter™ sealing system with SIC mechanical seal and sand slinger
- High efficiency electrical design for low operation costs
- All motors manufactured in ISO 9001 certified plants and 100% tested
- Drinking water approvals



## STANDARD SPECIFICATION

- Ratings: 4 - 45 kW (100 Hz - 3000 rpm)
- Thrust load: 15.5 kN: 4 - 22 kW, 27.5 kN: 26 - 45 kW
- System Supply Voltage: 380 V (100 Hz)
- Voltage Tolerance:  $\pm 10\% U_N$
- Nominal ambient temperature: 30 °C  
4 - 22 kW: with 0.16 m/s cooling flow; > 22 kW: with 0.5 m/s cooling flow
- Protection IP68 and insulation class F
- Standard Motor: WW- Water well Design (Stator 304SS / Castings - CI Powder coated)
- Frequency of starts: 20 starts/hour (with min. 3 minutes resting time), equally distributed
- Motors installation orientation: Vertical / horizontal (shaft end heightened)
- Rotation counter clock wise facing shaft end (Rotation reversible)
- All motors with factory installed leads

## OPTIONS

- Higher-graded materials: 304SS, 316SS
- Retrofittable PT 100 temperature sensor (VFD PT100 Plug-in card necessary, order no. 308 170 202)
- Special lead lengths
- High Thrust design 45 kN
- 120 Hz electrical design



## 3~ DOL 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		
				WW**	304SS	Standard 316SS
				Single pack with pre-installed lead*	Single pack with pre-installed lead*	Single pack with pre-installed lead*
4 - 11	380	15.500	236 080	9561	1461	1561
13 - 22	380	15.500	236 084	9561	1461	1561
26 - 45	380	27.500	236 086	9561	1461	1561

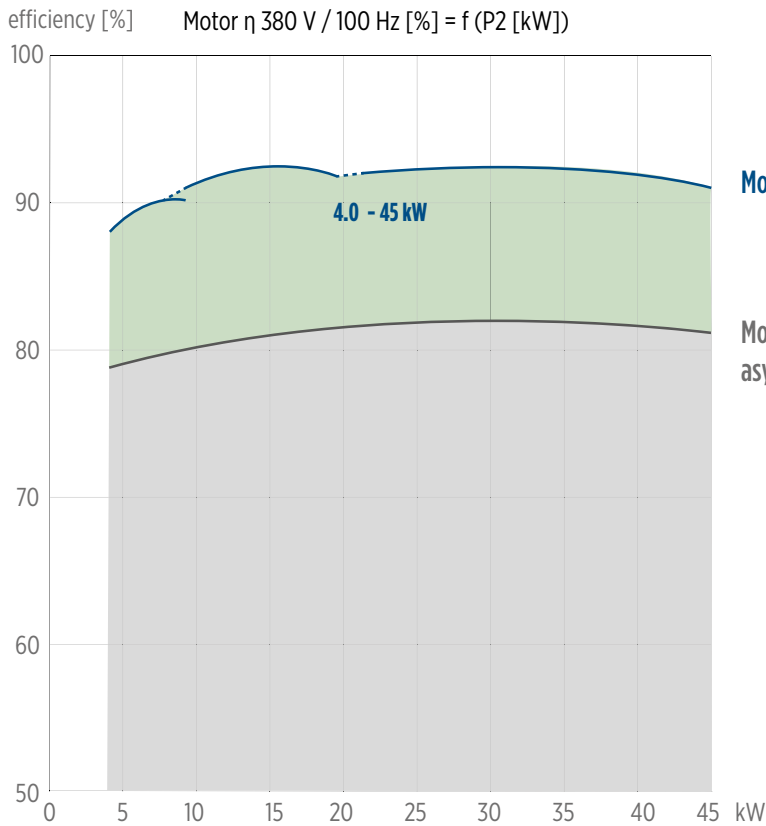
\* with 4 m motor short lead

\*\* WW (Water well)- Stator 304SS / Castings - CI Powder coated (see page material description in the catalog)



# 6" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## EFFICIENCY CURVE AT 3000 RPM



Motor efficiency of synchronous motors

Motor efficiency of equivalent asynchronous motors

## 3~ MOTOR PERFORMANCE DATA 380 V / 100 HZ

motor model no.	$P_N$ [kW]	Thrust F [N]	$U_N$ [V]	n [min <sup>-1</sup> ]	$I_N$ [A]	$I_A / I_N$	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A / T_N$
236 080 xxxx	4	15500	380	3000	9.2	1	87.1	0.95	12.7	1
	5.5				11.0	1	89.8	0.95	17.5	1
	7.5				14.1	1	90.9	0.95	23.9	1
236 080 xxxx	9.3	15500	380	3000	17.2	1	91.2	0.95	29.6	1
	11				20.5	1	90.9	0.95	35.0	1
236 084 xxxx	13	15500	380	3000	25.3	1	91.4	0.95	41.4	1
	15				28.3	1	91.8	0.95	47.7	1
236 084 xxxx	18.5	15500	380	3000	34.1	1	92.1	0.95	58.9	1
236 084 xxxx	22	15500	380	3000	40.7	1	92.0	0.95	70.0	1
236 086 xxxx	26	27500	380	3000	51.2	1	92.3	0.95	82.8	1
	30				57.8	1	92.5	0.95	95.5	1
236 086 xxxx	37	27500	380	3000	71.3	1	92.1	0.95	117.8	1
236 086 xxxx	45	27500	380	3000	90.0	1	90.8	0.95	143.2	1

# 6" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## ELECTRICAL CONNECTION AND MOTOR LEADS 3~ DOL

4G4 mm <sup>2</sup>	3 x 8.4 + 1G 8.4 mm <sup>2</sup>	Electrical connection								
		<table border="1"> <thead> <tr> <th>U</th> <th>V</th> <th>W</th> <th>PE</th> </tr> </thead> <tbody> <tr> <td>brown</td> <td>grey</td> <td>black</td> <td>yellow/green</td> </tr> </tbody> </table>	U	V	W	PE	brown	grey	black	yellow/green
U	V	W	PE							
brown	grey	black	yellow/green							

Motor lead*							
4 - 22 kW							
Ø [mm <sup>2</sup> ]	C [mm]	B [mm]	H [mm]	L [m]	WW	31655	
4G4	32	19	7	4	310 125 004	310 125 504	
26 - 45 kW							
Ø [mm <sup>2</sup> ]	C [mm]	B [mm]	B1 [mm]	B1 [mm]	H [mm]	WW	31655
3x8.4+1G8.4	32	29.5	19.5	19.5	8.9	310 145 004	310 145 504

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

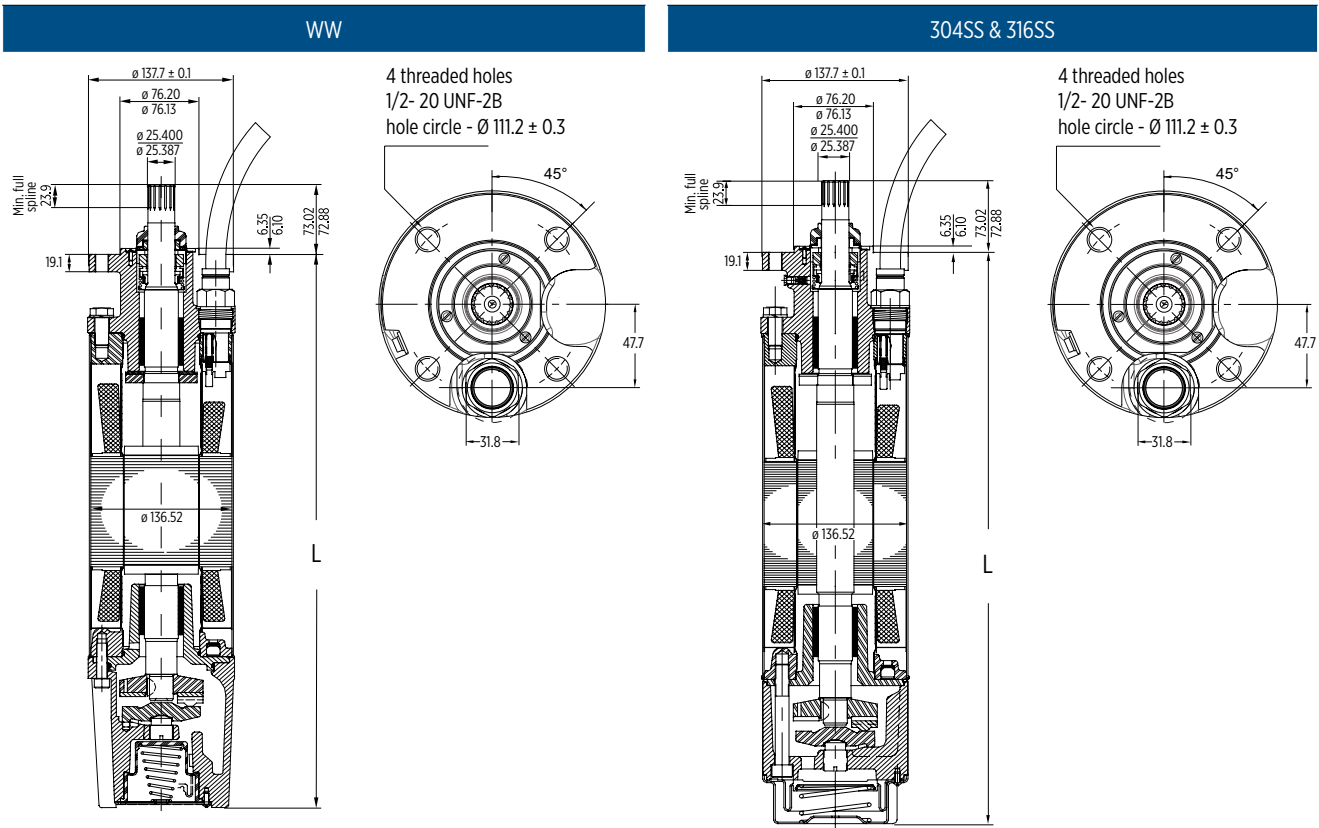
## WINDING RESISTANCE 380 V / 100 HZ

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Stator Ref.	U - V [Ohm]*	Rotor Ref.
4 - 11	380	327 245 ...	0.86	178 130 921
13 - 22	380	327 250 ...	0.33	178 130 923
26 - 45	380	327 257 ...	0.19	178 130 925



# 6" 3~ ENCAPSULATED PERMANENT MAGNET MOTOR

## MOTOR DIMENSIONS AND MATERIALS



### MOTOR DIMENSIONS

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Thrust F [N]	WW	304SS/316SS	M [kg]	Motor with lead in single pack		Motor packing
			L [mm]	L [mm]		B x H x L [mm]	[kg]	
4 - 11	380	15.500	634,5	625,2	43,0	155 x 340 x 800	45	
13 - 22	380	15.500	793,5	784,2	57,4	155 x 340 x 1070	61	
26 - 45	380	27.500	1020,5	1011,2	78,0	155 x 340 x 1070	84	

Tolerances according to NEMA MG 1-18.388

### MOTOR MATERIAL DESCRIPTION

Part	WW	304SS	316SS
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	EPDM	EPDM	EPDM
Shaft end*	1.4021	1.4021	1.4462
Diaphragm	EPDM	EPDM	EPDM
Lead	EPR	EPR	EPR

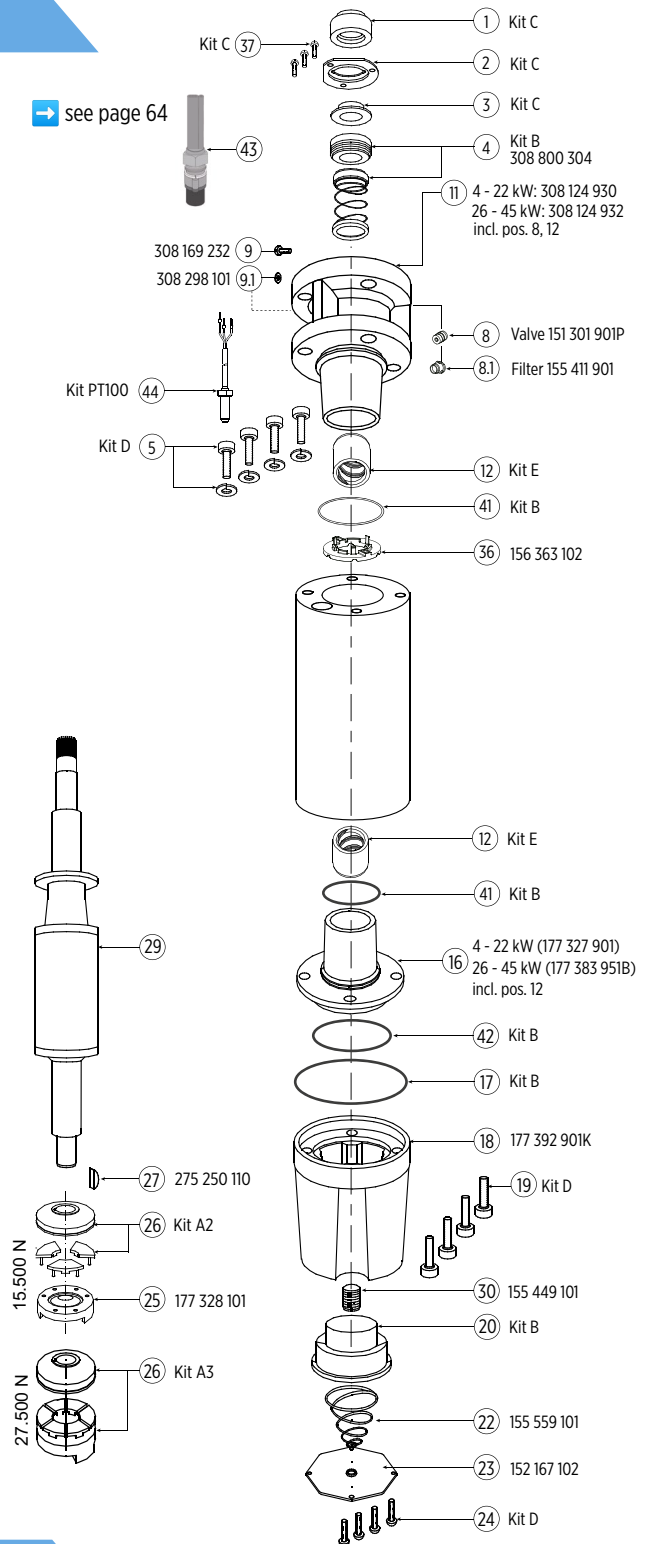
\* running change to 1.4462 (WIP)

# 6" 3~ ENCAPSULATED PM MOTOR SPARE PARTS WATER WELL

## MOTOR PARTS DESCRIPTION

Kit	part description	incl. positions	order no.
Kit A2 15.500N	Thrust bearing kit up to 22 kW	26	308 750 120
Kit A3 27.500N	Thrust bearing kit 26 - 45 kW	26	308 750 120
Kit B1	Seal kit	4, 17, 20, 41, 42	308 800 125
Kit C1	Slinger kit	1, 2, 3, 37	308 725 101
Kit D1	Screw kit	5, 19, 24	308 659 121
Kit E1*	Radial bearing kit up to 22 kW	12	308 678 103
Kit E2	Radial bearing kit 26 - 45 kW	12	308 678 110
PT100 Kit		44	see page 100

\* Kit without rotor shaft sleeves, flange replacement bushings are unfinished



## SPARE PARTS STATOR AND ROTOR WW 380 V / 100 HZ

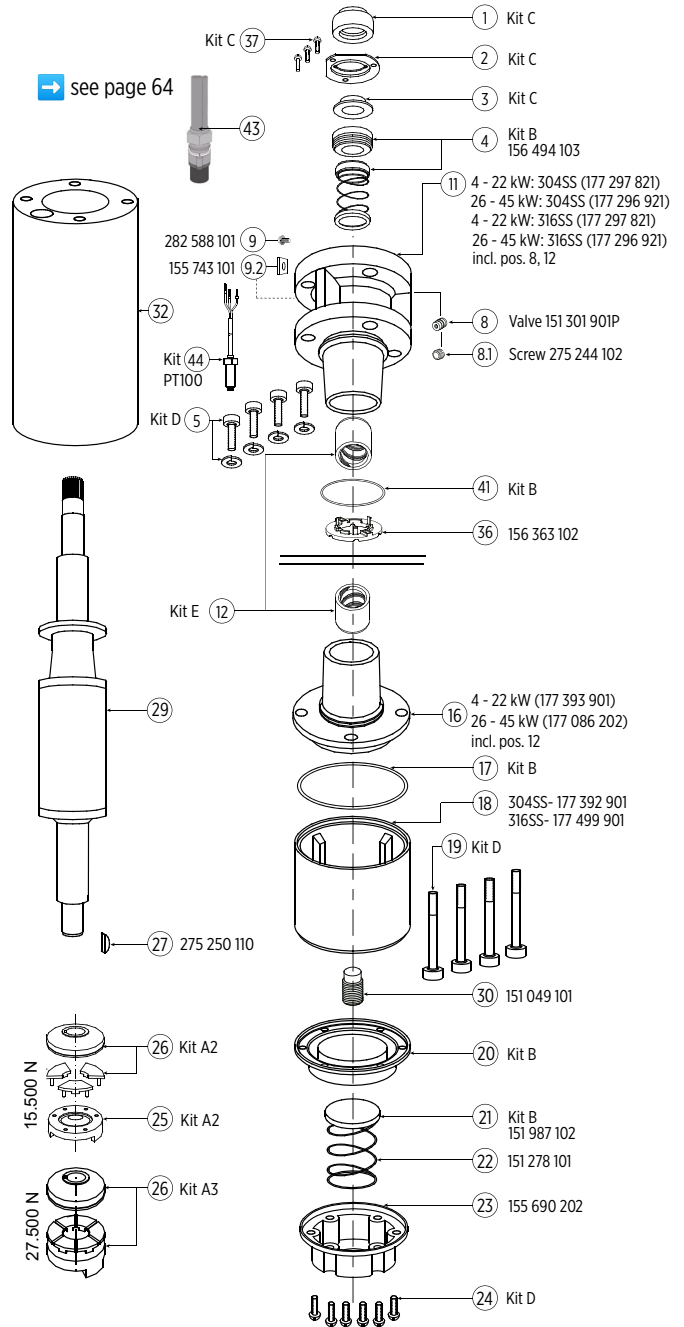
$P_N$ [kW]	$U_N$ [V]	Thrust F [N]	Motor Model No.	Stator Model No.	Rotor
4 - 11	380	15.500	236 080 9561	327 245 963K	178 130 901K
13 - 22	380	15.500	236 084 9561	327 250 963K	178 130 903K
26 - 45	380	27.500	236 086 9561	327 257 963K	178 130 905K

# 6" 3~ ENCAPSULATED PM MOTOR SPARE PARTS 304SS / 316SS

## MOTOR PARTS DESCRIPTION

Kit	part description	incl. positions	order no.
Kit A2	Thrust bearing kit 15.500 N	26	308 750 120
Kit A3	Thrust bearing kit 27.500 N	26	308 750 200
Kit B3	Seal kit	4, 17, 20, 21, 41, 44	308 800 250
Kit C3	Slinger kit	1, 2, 3, 37	308 725 150
Kit D5	Screw kit	5, 19, 24	308 659 155
Kit E1*	Radial bearing kit up to 22 kW	12	308 678 103
Kit E2	Radial bearing kit 26 - 45 kW	12	308 678 110
PT100 Kit		44	see page 100

\* Kit without rotor shaft sleeves, flange replacement bushings are unfinished



## SPARE PARTS STATOR AND ROTOR 304SS / 316SS 380 V / 100 HZ

P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Thrust F [N]	Motor Model No.		Stator Model No.	Rotor
			WW	316SS		
4 - 11	380	15.500	236 080 1461	236 080 1561	327 245 983K	178 130 921K
13 - 22	380	15.500	236 084 1461	236 084 1561	327 250 983K	178 130 923K
26 - 45	380	27.500	236 086 1461	236 086 1561	327 257 983K	178 130 925K

# 8" REWINDABLE PERMANENT MAGNET MOTOR

## BENEFITS & FEATURES

- 8" double flange NEMA mounting design
- High efficiency electrical design for low operation costs
- SandFighter™ sealing system with SIC mechanical seal and sand slinger
- Factory filled with Franklin's FES93 motor fill solution for frost protection down to -15 °C storage temperature
- Drinking water approvals
- Stainless steel splined shaft
- Liquid lubricated radial bearings and High capacity Kingsbury type 45 kN thrust bearing for 100 % maintenance free operation
- Pressure-equalizing diaphragm, spring pre-loaded



## STANDARD SPECIFICATION

- Ratings: 75 / 100 / 130 kW (100 Hz - 3000 rpm, 120 Hz - 3600 rpm)
- Max. storage temperature - 15 °C to + 60 °C
- Standard motor with PE2/PA winding insulation
- Nominal ambient temperature: 30 °C with 0.5 m/s cooling flow
- System Supply Voltage: 400 V (100 Hz) / 460 V (120 Hz)
- Voltage Tolerance:  $\pm 10\% U_N$
- Protection IP68
- Standard Motor: WW- Water well Design (Stator 304SS / Castings - CI Powder coated)
- Motor protection: DIN 61947-4-1
- Frequency of starts: 10 starts/ hour (with min. 3 minutes resting time), equally distributed
- DOL-start
- All motors with factory installed leads, motor lead length: 6 m
- Motors installation orientation: Vertical / horizontal (shaft end heightened)
- Rotation counter clock wise facing shaft end (rotation reversible)

## OPTIONS

- Higher-graded materials: 316SS, 904L
- Special voltages
- Retrofittable PT 100 temperature sensor (VFD PT100 Plug-in card necessary, order no. 308 170 202)
- Special lead lengths



$P_N$ [kW]	400V / 100 Hz WW * Motor model number	400V / 100 Hz 316SS Motor model number	400V / 100 Hz 904L Motor model number
75	263 014 5311	263 014 6311	263 014 7311
100	263 016 5311	263 016 6311	263 016 7311
130	263 018 5311	263 018 6311	263 018 7311

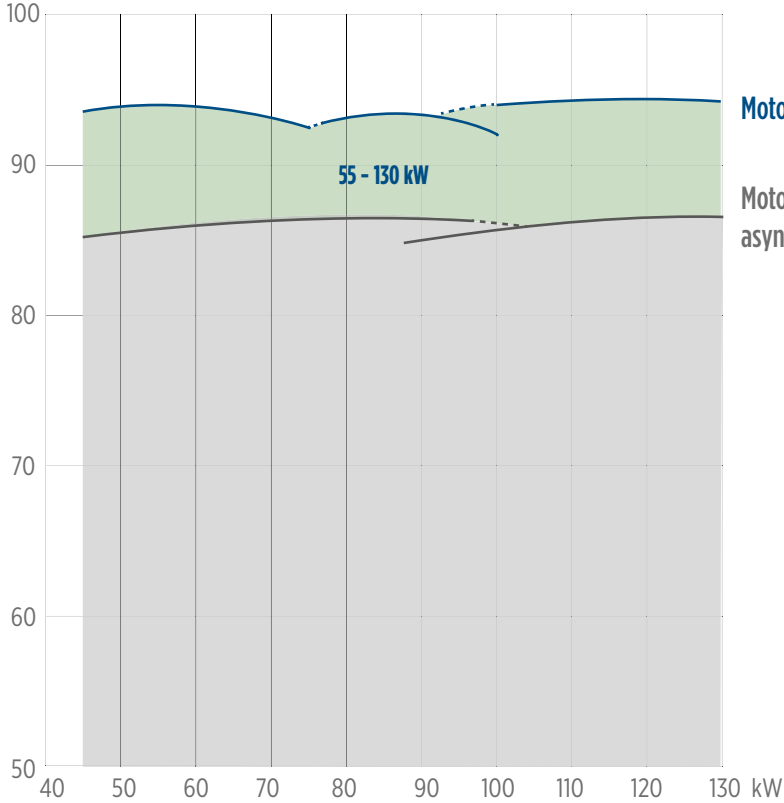
\* WW (Water well)- Stator 304SS / Castings - CI Powder coated (see page material description in the catalog)



# 8" REWINDABLE PERMANENT MAGNET MOTOR

## EFFICIENCY CURVE AT 3000 RPM

efficiency [%] Motor  $\eta$  400 V / 100 Hz [%] = f (P2 [kW])



Motor efficiency of synchronous motors

Motor efficiency of equivalent asynchronous motors

## MOTOR PERFORMANCE DATA 400 V / 100 HZ

motor model no.	$P_N$ [kW]	Thrust F [kN]	$n_n$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_M/I_N^*$ [A]	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_M/T_N^*$ [Nm]
263 014 xxxx	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	0.96	213	1
	75	45	3000	128	1	92.5	0.96	239	1
263 016 xxxx	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	0.95	296	1
	100	45	3000	178	1	92.7	0.95	319	1
263 018 xxxx	75	45	3000	125	1	93.8	0.97	239	1
	93	45	3000	153	1	93.7	0.97	296	1
	110	45	3000	186	1	93.3	0.97	350	1
	130	45	3000	225	1	92.6	0.96	414	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.

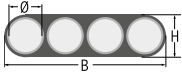
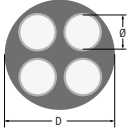
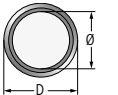
# 8" REWINDABLE PERMANENT MAGNET MOTOR

## MOTOR PERFORMANCE DATA 500 V / 100 HZ

motor model no.	P <sub>N</sub> [kW]	Thrust F [kN]	n <sub>N</sub> [min <sup>-1</sup> ]	I <sub>N</sub> [A]	I <sub>A</sub> /I <sub>N</sub> * [A]	η [%]	cos phi	T <sub>N</sub> [Nm]	T <sub>A</sub> /T <sub>N</sub> * [Nm]
263 024 xxxx	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	0.95	213	1
	75	45	3000	103	1	92.5	0.95	239	1
263 026 xxxx	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
263 028 xxxx	75	45	3000	102	1	93.8	0.96	239	1
	93	45	3000	124	1	93.7	0.96	296	1
	110	45	3000	151	1	93.3	0.96	350	1
	130	45	3000	183	1	92.6	0.96	414	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.

## MOTOR LEADS 400 V\* DOL

lead	kW	∅ [mm <sup>2</sup> ]	B / H [mm]		length [m]	Qty.	lead model no.	lead seal kit 304/316 model no.	Lead seal kit 904L model no.
	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
	130	3RD 1X35 + Ground lead 1x35	D	15,3	6	1	308 710 151	308 660 641	308 660 642

Lead opening seal kit		qty.	model no.
8" Rew	WW / 316SS	1	308 660 617
	904L	1	308 660 625

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

# 8" REWINDABLE PERMANENT MAGNET MOTOR

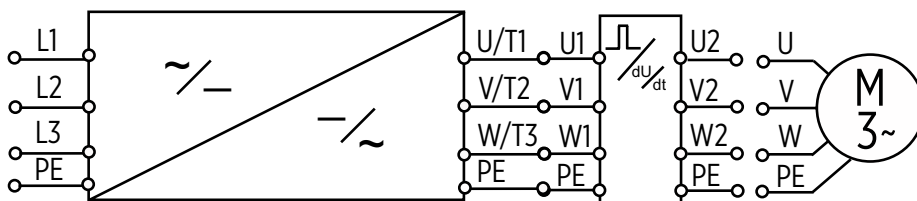
MOTOR DROP LEADS 400 V / 100 HZ - 460 V / 120 HZ

P <sub>N</sub> [kW]	cable size [mm <sup>2</sup> ], 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

For lead lengths > 120 m please consult Franklin Electric.

Further potential energy savings due to more conservative lead sizing (< 3 % voltage drop) at 50 °C ambient.

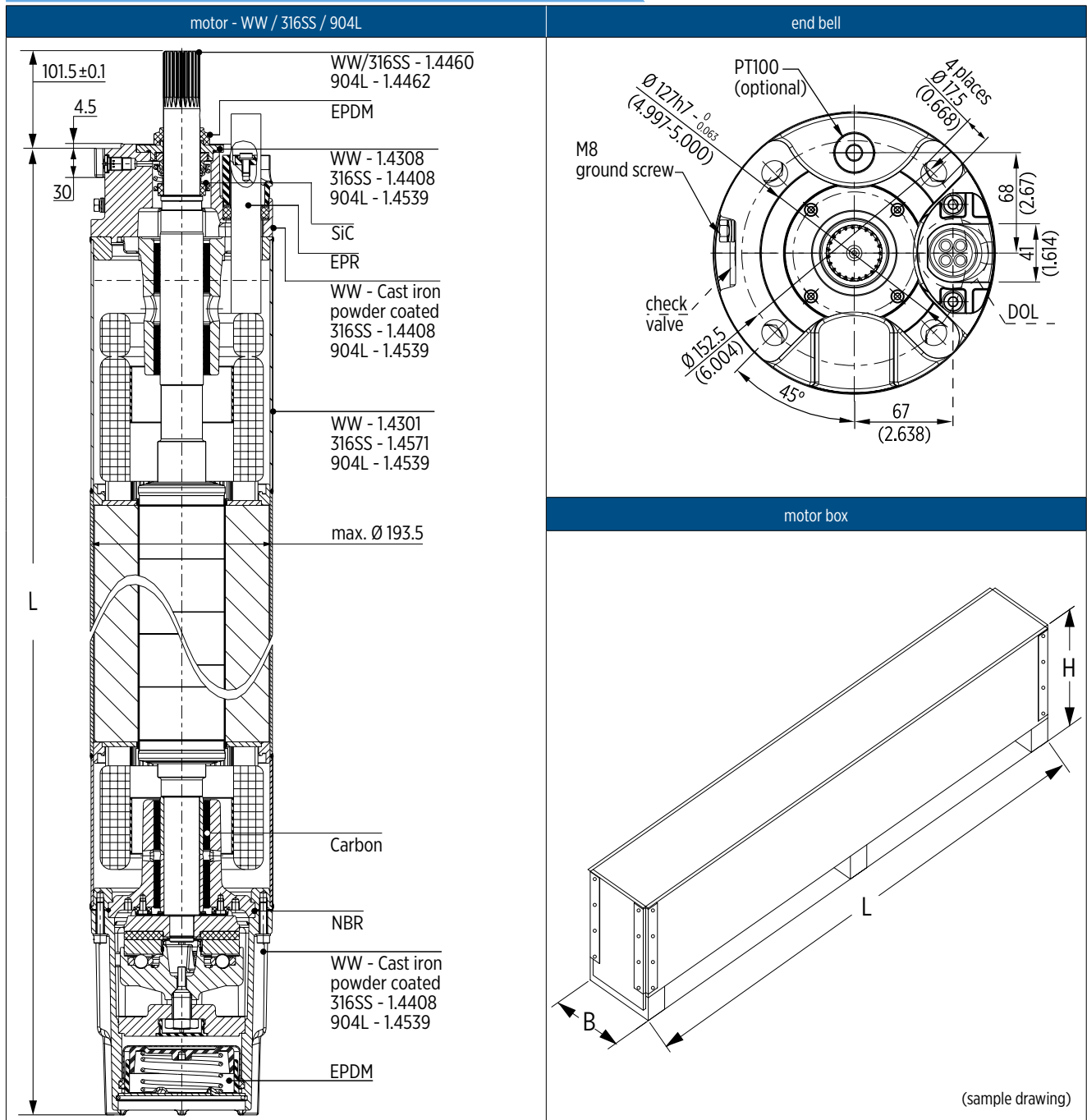
## ELECTRICAL CONNECTIONS DOL



U	V	W	PE
brown	grey	black	yellow/green

# 8" REWINDABLE PERMANENT MAGNET MOTOR

## MOTOR DIMENSIONS AND MATERIALS



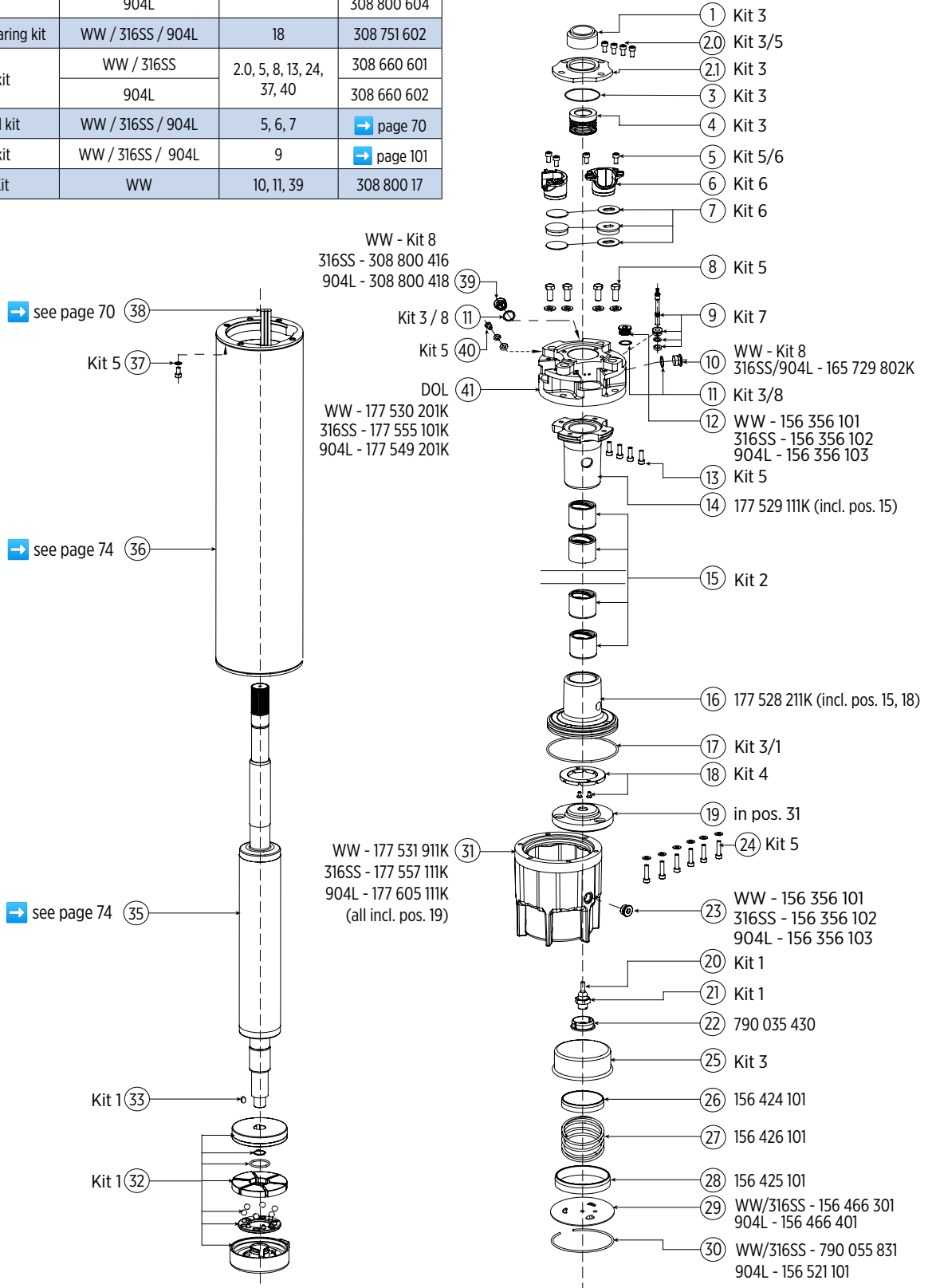
## MOTOR WEIGHTS 304SS / 316SS / 904L

P [kW]	motor lengths L [mm]	motor weights [kg]		motor shipping size [mm]		
		without packaging	incl. packaging	B	H	L
75	1205	150	179	301	448	1596
100	1316	169	198			1596
130	1482	204	236			1996



# SPARE PARTS 8" REWINDABLE PERMANENT MAGNET MOTOR

Kit	Kit description	materials	incl. positions	order no.
1	Thrust bearing kit	WW / 316SS / 904L	17, 20, 21, 32, 33	308 750 601
2	Radial bearing kit	WW / 316SS / 904L	15	308 751 603
3	seal kit	WW / 316SS	1-4, 11, 17, 25	308 800 603
		904L		308 800 604
4	Up-thrust bearing kit	WW / 316SS / 904L	18	308 751 602
5	Screw kit	WW / 316SS	2.0, 5, 8, 13, 24, 37, 40	308 660 601
		904L		308 660 602
6	Lead seal kit	WW / 316SS / 904L	5, 6, 7	→ page 70
7	PT100 kit	WW / 316SS / 904L	9	→ page 101
8	Valve Kit	WW	10, 11, 39	308 800 17



# SPARE PARTS 8" REWINDABLE PERMANENT MAGNET MOTOR

## STATOR AND ROTOR MODEL NUMBERS WW / 316 SS - 400 V / 100 HZ

P [kW]	Stator (incl. windings and 6 m motor lead)			rotor	
	U <sub>N</sub> [V]	DOL [PE2/PA]		motors starting 08/2017	motors up to 07/2017
		motors starting 08/2017	motors up to 07/2017		
75	400 V	327 154 702K	327 154 901K	161 123 811K	161 123 801K
100	400 V	327 155 702K	327 155 901K	161 123 812K	161 123 802K
130	400 V	327 156 701K	-	161 123 814K	-

## WINDING SPECIFICATION

P [kW]	U <sub>N</sub> [V]	Model no. winding kit	Turns per coil	Wire diameter Ø [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	0.167
	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	0.167
	500	327 144 999	17	2.5/3.8 (2GR II)			350	0.213	0.213
130	400	327 156 999	20	2.3/3.2/3.5 (4GR II)	PE2/PA	Parallel Y	486	0.115	0.121
	500								

## 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 WW / 316SS / 904L (model no. 308 018 697)

# 10" REWINDABLE PERMANENT MAGNET MOTOR

Rewindable motors with best class winding wires

## BENEFITS & FEATURES

- 10" double flange mounting design
- Factory filled with Franklin's FES93 motor fill solution, for frost protection down to -15 °C storage temperature
- High capacity Kingsbury type liquid lubricated 60 kN thrust bearing and radial bearings for 100 % maintenance free operation
- Pressure-equalizing diaphragm, spring pre-loaded
- Stainless Steel keyed shaft
- SandFighter™ sealing system with SIC mechanical seal and sand slinger
- High efficiency electrical design for low operation costs
- Drinking water approvals

## STANDARD SPECIFICATION

- Motor range: 200 - 250 kW (100 Hz - 3000 rpm), 230 - 290 kW (120 Hz - 3600 rpm)
- Max. storage temperature - 15 °C to + 60 °C
- Standard motor with PE2/PA winding insulation
- Nominal ambient temperature: 30 °C with 0.5 m/s cooling flow
- System Supply Voltage: 400 V (100 Hz) / 460 V (120 Hz)
- Voltage Tolerance:  $\pm 10\% U_N$
- Protection IP68
- Standard Motor: WW- Water well Design (Stator 304SS / Castings - CI Powder coated)
- Motor protection: DIN 61947-4-1
- Frequency of starts: 10 starts/ hour (with min. 3 minutes resting time), equally distributed
- Motor lead length: 6 m
- Motors installation orientation: Vertical / horizontal (shaft end heightened) - 250 kW motors may not be installed horizontally
- Rotation counter clock wise facing shaft end (rotation reversible)
- All motors with factory installed leads

## OPTIONS

- Higher-graded materials: 316SS and 904L
- Special voltages
- Retrofittable PT 100 temperature sensor  
VFD PT100 Plug-in card necessary (order no. 308 170 202)



## MOTOR MODEL NUMBERS

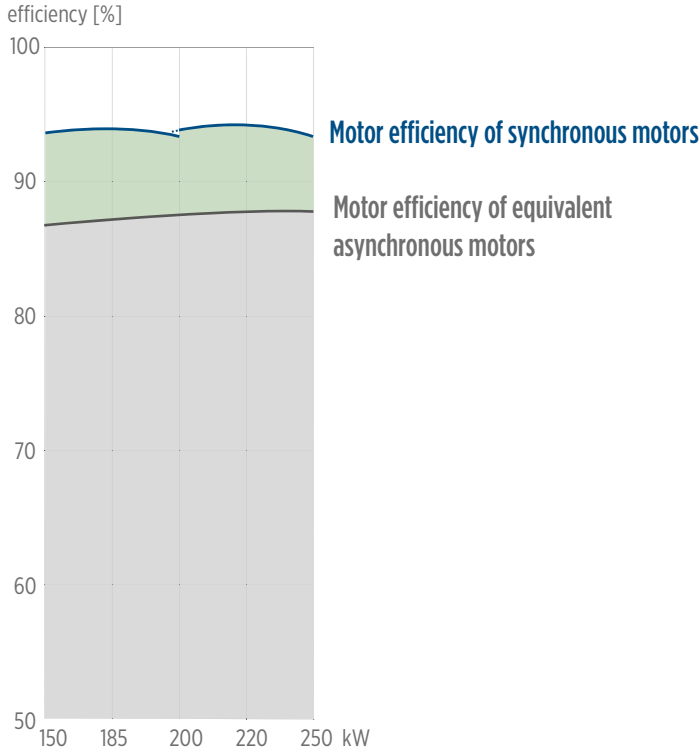
$P_N$ [kW]	$U_N$ [V]	400V / 100 Hz WW * Motor model number	400V / 100 Hz 316SS Motor model number	400V / 100 Hz 904L Motor model number
200	400	264 028 5311	264 028 6311	264 028 7311
250	400	264 029 5311	264 029 6311	264 029 7311

\* WW (Water well)- Stator 304SS / Castings - CI Powder coated (see page material description in the catalog)

# 10" REWINDABLE PERMANENT MAGNET MOTOR

## EFFICIENCY CURVE AT 3000 RPM

Motor  $\eta$  400 V / 100 Hz [%] = f (P2 [kW])



## MOTOR PERFORMANCE DATA 400 V / 100 HZ

HES model no.	$P_N$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_N$ [A]	$I_A/I_N^*$ [A]	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A/T_N^*$ [Nm]
264 028 5311	150	60	3000	284	1	94.0	0.90	478	1
	185	60	3000	354	1	93.8	0.91	589	1
	200	60	3000	389	1	93.6	0.91	637	1
264 029 5311	200	60	3000	377	1	94.5	0.91	637	1
	220	60	3000	423	1	94.3	0.92	701	1
	250	60	3000	497	1	93.8	0.93	796	1

## MOTOR PERFORMANCE DATA 460 V / 120 HZ

HES model no.	$P_N$ [kW]	$P_{max}$ [kW]	Thrust F [kN]	$n_N$ [min <sup>-1</sup> ]	$I_{MAX}$ [A]	$I_A/I_{MAX}^*$ [A]	$\eta$ [%]	cos phi	$T_N$ [Nm]	$T_A/T_N^*$ [Nm]
264 028 5311	150	173	60	3600	284	1	94.0	0.90	478	1
	185	213	60	3600	354	1	93.8	0.91	589	1
	200	230	60	3600	389	1	93.6	0.91	637	1
264 029 5311	200	230	60	3600	377	1	94.5	0.91	637	1
	220	253	60	3600	423	1	94.3	0.92	701	1
	250	287	60	3600	497	1	93.6	0.93	796	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.

# 10" REWINDABLE PERMANENT MAGNET MOTOR

## MOTOR LEADS 10" REWINDABLE PERMANENT MAGNET MOTORS\*

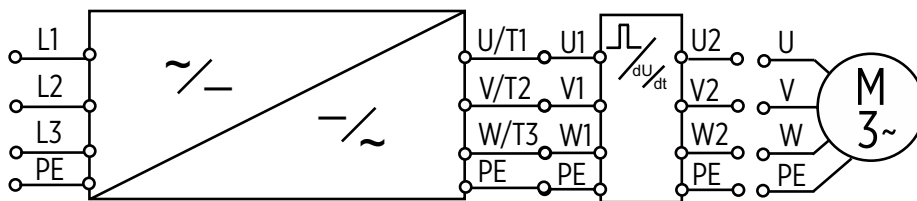
lead	$P_N$ [kW]	$U_N$ [V]	$\emptyset$ [mm <sup>2</sup> ]	D [mm]	lengths [m]	qty.	lead set model no. (3 single wire lead)	lead seal kit model no.
	all ratings	400	3 x 1X70	20.7	6	1	308 711 100	308 660 740

ground lead (optional)	$\emptyset$ [mm <sup>2</sup> ]	D [mm]	lengths [m]	qty.	lead model no.
	1G35	15.3	6	1	308 056 506

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

Lead opening seal kit		qty.	model no.
10" Rew	WW / 316SS	1	308 660 715
	904L	1	308 660 730

## ELECTRICAL CONNECTION DOL



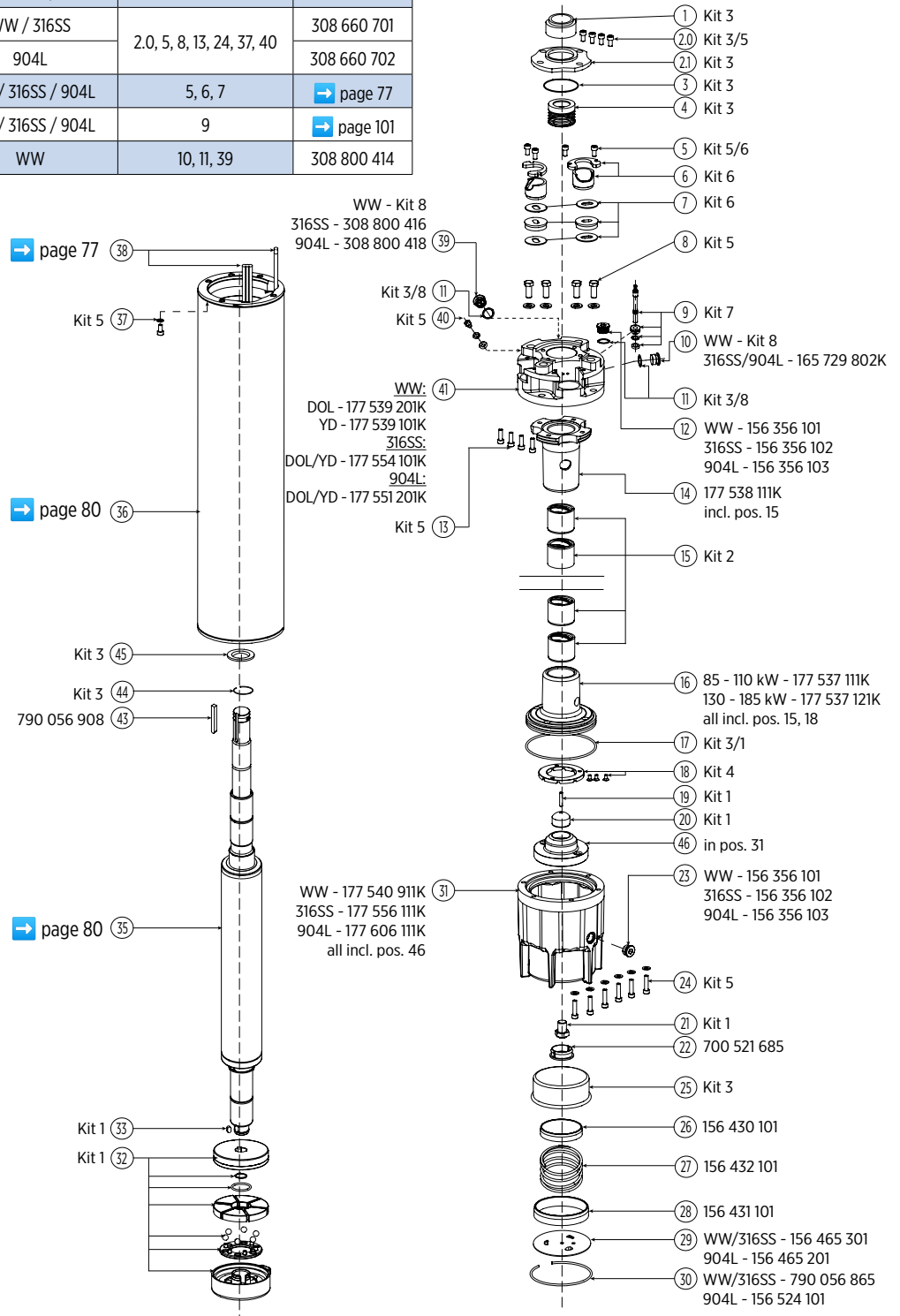
U	V	W	PE
brown	grey	black	yellow/green



# 10" REWINDABLE PERMANENT MAGNET MOTOR

## 10" REWINDABLE PERMANENT MAGNET MOTORS SPARE PARTS

Kit	Kit description	materials	including positions	order no
1	Thrust bearing kit	WW / 316SS / 904L	17, 19, 20, 21, 32, 33	308 750 701
2	Radial bearing kit	WW / 316SS / 904L	15	308 751 701
3	seal kit	WW / 316SS	1-4, 11, 17, 25	308 800 703
		904L		308 800 704
4	Up-thrust bearing kit	WW / 316SS / 904L	18	308 751 702
5	Screw kit	WW / 316SS	2,0, 5, 8, 13, 24, 37, 40	308 660 701
		904L		308 660 702
6	Lead seal kit	WW / 316SS / 904L	5, 6, 7	→ page 77
7	PT100 kit	WW / 316SS / 904L	9	→ page 101
8	Valve Kit	WW	10, 11, 39	308 800 414



# 10" REWINDABLE PERMANENT MAGNET MOTOR

## MODEL NUMBERS 400 V STATOR AND ROTOR - WW/316SS

$P_N$ [kW]	$U_N$ [V]	Stator (incl. winding and 6m motor lead)	Rotor
200	400	327 640 931	10000005599K
250	400	327 641 931	10000005857K

## WINDING DATA 400 V

$P_N$ [kW]	$U_N$ [V]	Model No. Winding kit	Turns per coil	Wire diameter [mm]	Type of Isolation	Groups connection	Total wire length [m]	Resistance coil [ $\Omega$ ]	Resistance Dol (U1-V1 [ $\Omega$ ])
200	400	327 640 999	7 - 7	2.4 / 3.7 / 3.9	PE2/PA	Parallel Star	780	0,0305	0,0305
250	400	327 641 999	6 - 6	3.0 / 4.5 / 4.8	PE2/PA	Parallel Star	560	0,0265	0,0265

## INSULATION RESISTANCE (20 °C / 500 V DC)

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 $\Omega$

## MOTOR REPAIR INSTRUCTION

- Pictured repair instructions WW / 316SS / 904L (model no. 10000006792)



# SUBMERSIBLE BOREHOLE PUMPS

Franklin Electric offers a wide array of submersible pumps with flows up to 540 m<sup>3</sup>/h and heads up to 700 m. They perfectly match the permanent magnet motors of the High Efficiency systems. The submersible pumps feature proven components, withstand the harshest environments and provide superior performance for numerous applications.

## OVERVIEW FEATURES SUBMERSIBLE BOREHOLE PUMPS

### Built-in check valve

to protect the pump against water hammer risk

Aluminium oxide guide journal sleeve

**Stainless Steel impellers and diffusers**

VS 6"-8": Radial / Semiaxial design  
VSC: Semiaxial design

**Floating neck ring**

VS 6"-8": PPS or PTFE  
VSC 8"-10": NBR  
VSC 12": PTFE

**Diffusers**

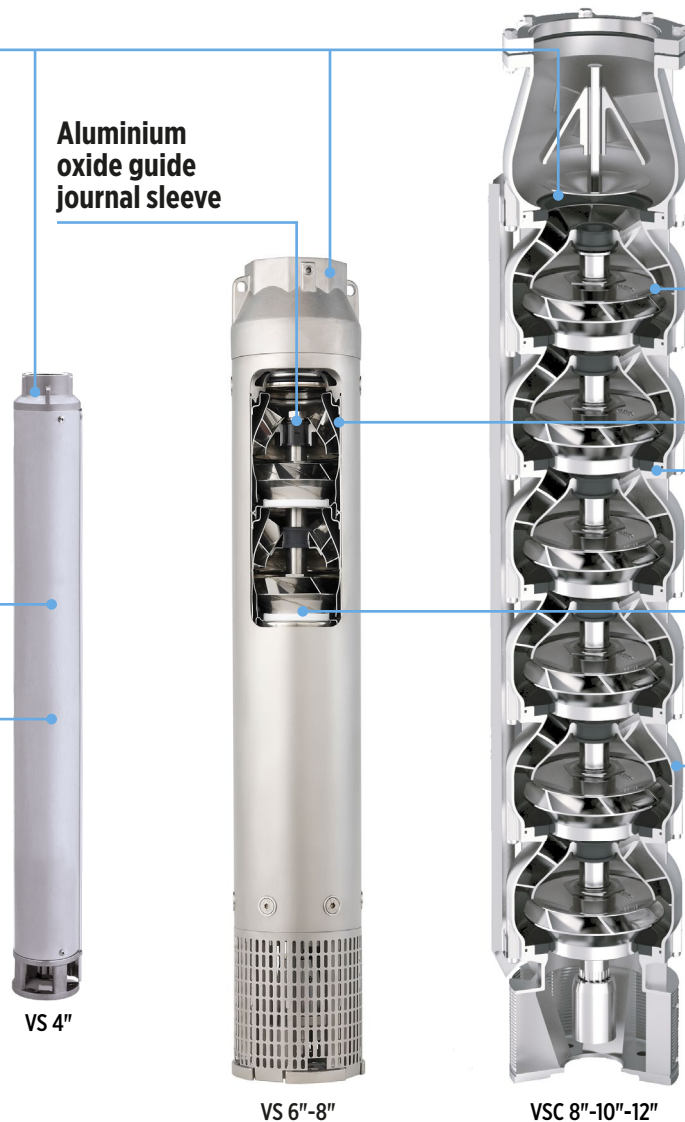
in Noryl

**Floating impellers**

in Polycarbonate

**Casted Stainless Steel diffusers and impellers**

for high corrosion and abrasion resistance



VS 4"

VS 6"-8"

VSC 8"-10"-12"

## PERFORMANCE TABLE

pump diameter	pump model	motor		pump at 50 Hz	
		[kW]	[HP]	flow up to [m <sup>3</sup> /h]	head up to [m]
4"	VS 1-2-3	0.37 - 3.0	0.5 - 4.0	4.2	259
	VS 4-6	0.37 - 5.5	0.5 - 7.5	9	278
	VS 7-8-10-15	0.75 - 7.5	1.0 - 10	24	277
6"	VS 14	4.0 - 30	5.5 - 40	18	684
	VS 19	4.0 - 37	5.5 - 50	27	700
	VS 30	3.7 - 55	5.0 - 75	40	690
	VS 46	3.0 - 55	4.0 - 75	55	548
	VS65	3.7 - 55	5.0 - 75	75	425

pump diameter	pump model	motor		pump at 50 Hz	
		[kW]	[HP]	flow up to [m <sup>3</sup> /h]	head up to [m]
8"	VS 14	4.0 - 30	5.5 - 40	18	684
	VS 19	4.0 - 37	5.5 - 50	27	700
	VS 30	3.7 - 55	5.0 - 75	40	690
	VS 46	3.0 - 55	4.0 - 75	55	548
	VS 65	3.7 - 55	5.0 - 75	75	425
6"/8"/10"	VSC 114	7.5 - 150	10 - 200	144	578
	VSC 132	9.3 - 185	12.5 - 250	168	546
	VSC 156	9.3 - 185	12.5 - 250	192	500

# SUBMERSIBLE BOREHOLE PUMPS

## VS4 SUBMERSIBLE PUMP



### FEATURES & BENEFITS

- Compact, reliable and suited to operate in horizontal or vertical position
- Designed to operate efficiently with Franklin Electric submersible motors / NEMA Standard motor adapter
- Hydraulic design enhances overall efficiency thus reducing energy consumption and making the pumping systems more cost effective
- 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
- Suitable for chemically and mechanically non aggressive liquids

### OPTIONS

- Cooling shroud



### STANDARD SPECIFICATION

- Models: VS 1-2-3-4-6-7-8-10-15
- Flow: up to 24 m<sup>3</sup>/h (50 Hz)
- Head: up to 278 m (50 Hz)
- Outlet diameter:  
1" ¼ for VS 1-2-3-4,  
2" for VS 6-7-8-10-15
- 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
- Rotation: counter clockwise when looking into the discharge
- Vertical or horizontal operation



## VS6 SUBMERSIBLE PUMP



### FEATURES & BENEFITS

- Stainless Steel impellers and diffusers for corrosion resistance
- Heavy duty Stainless Steel structure for improved stiffness / permanent alignment of components (increased run time / trouble-free operation).
- Floating neck ring in PPS (models 14-19-25) or PTFE (models 30-46-65) for higher resistance at temperature variations
- Reinforced version with double welded rings
- Compact, reliable and suited to operate in horizontal position
- Built-in check valve to protect the pump against water hammer risk
- Hydraulic design enhances overall efficiency thus reducing energy consumption and making the pumping systems more cost effective
- Built-in check valve to protect the pump against water hammer risk
- Heavy duty cast suction and discharge brackets
- Bushings in Aluminum Oxide for higher mechanical performance
- Bearings in EPDM, with drinking water certification approvals

### STANDARD SPECIFICATION

- Models: VS 14-19-25-30-46-65
- Flow: up to 80 m<sup>3</sup>/h (50 Hz) / 100 m<sup>3</sup>/h (60 Hz)
- Head: up to 700 m (50 Hz / 60 Hz)
- Water temperature range:  
Min. -5° C  
Max. +90 °C (+60 °C for pumps with NBR parts)
- Maximum allowable amount of sand: 100 g/m<sup>3</sup>
- Vertical or horizontal operation


### OPTIONS

- Higher-graded material: 316SS (N), 904L (R)
- Double cable guard
- Discharge heads:  
Rp2"/Rp3" VS 14/19  
Rp4" VS 25/30/46/65
- Motor adapter: 6x4 and 6x8 for I and N versions
- Pump with NBR rubber parts



## SUBMERSIBLE BOREHOLE PUMPS

### VS8 SUBMERSIBLE PUMP

STAINLESS STEEL **304**
OPTIONAL STAINLESS STEEL **316**
OPTIONAL STAINLESS STEEL **904L**


#### FEATURES & BENEFITS

- Designed to operate efficiently with Franklin Electric submersible motors / NEMA Standard motor adapter
- Built-in check valve and over size pump shaft
- Stainless Steel components for durability and robustness, assuring longevity and trouble-free operation
- Stainless Steel impellers and diffusers for corrosion resistance
- Thick solid Stainless Steel shell to maintain alignment
- Heavy duty cast suction and discharge brackets
- Motor adapter and discharge head may be removed without disturbing the impeller / diffuser stack
- Many design technical features make this pump range very compact and extremely reliable to ensure applications in the most complex and severe conditions.
- Easy maintenance without the need of special tools
- Bushings is Aluminum Oxidde for higher mechanical performance
- Bearings in EPDM, with drinking water certification approvals

#### STANDARD SPECIFICATION


- Models: VS 78-97
- Flow: up to 120 m<sup>3</sup>/h (50 Hz) / up to 160 m<sup>3</sup>/h (60 Hz)
- Head: up to 500 m (50 Hz) / 524 m (60 Hz)
- Water temperature range: Min. -5° C, Max. +90 °C (+60 °C for pumps with NBR parts)
- Maximum allowable amount of sand: 100 g/m<sup>3</sup>
- Vertical or horizontal operation



#### OPTIONS

- Higher-graded material: 316SS (N), 904L (R)
- Double cable guard
- Discharge head adapter: Rp4" or Rp6" for I and N version
- Pump with NBR rubber parts

### VSC 8-10-12 SUBMERSIBLE PUMP

STAINLESS STEEL **304**  
CF8 / 304SS
OPTIONAL STAINLESS STEEL **316**  
CF8M / 316SS
OPTIONAL STAINLESS STEEL **DUPLEX**


#### FEATURES & BENEFITS

- Robust, compact and reliable design
- The hydraulics are designed to enhance the overall efficiency thus reducing energy consumption and making the pumping systems more cost effective
- Built-in check valve to protect the pump against water hammer
- Cast Stainless Steel impellers and diffusers for high corrosion and abrasion resistance

#### STANDARD SPECIFICATION

- Models:  
8": VSC 114 - 132 - 156  
10": VSC 204 - 264 - 304  
12": VSC 360 - 420 - 420A
- Flow:  
8": up to 192 m<sup>3</sup>/h (50 Hz)  
10": up to 348 m<sup>3</sup>/h (50 Hz)  
12": up to 540 m<sup>3</sup>/h (50 Hz)
- Head:  
8": up to 473 m (50 Hz)  
10": up to 484 m (50 Hz)  
12": up to 337 m (50 Hz)
- Maximum allowable amount of sand: 100 g/m<sup>3</sup>
- Water temperature range: from -5 °C to +60 °C
- Rotation: counter clockwise when looking into the discharge
- Operation in vertical or horizontal position



#### OPTIONS




- CF8M/316 & Duplex version
- Double cable guard
- Trimmed impellers



## VARIABLE SPEED DRIVES (VFD)

- Support of induction and permanent magnet motors
- Top class protection enclosure class
- Bluetooth Connectivity (VFD type Drive-Tech MINI; up to 4 kW)
- Mobile App (with VFD type Drive-Tech MINI)
- Franklin Electric Start-up Guide for easy set-up with tailored pre-settings



		Drive-Tech MINI	Drive-Tech MP
Suitable HES		4"	4"
Enclosure	Protection Degree	IP66	IP65
Performance	Efficiency	97.5 %	97.5 %
Solar Version			
Power Supply	Input Voltage $U_{IN}$	$\leq 2,2$ kW: 90 - 265 V / 90 - 400 V DC $\geq 3,0$ kW: 190 - 520 V AC	$\leq 2,2$ kW: 90 - 265 V / 90 - 400 V DC $\geq 3,0$ kW: 160 - 850 V DC
		380 - 500V ; -10 % to +10 % 400 - 840 V DC	380 - 500V ; -10 % to +10 % 400 - 840 V DC
	Input frequency $f_{IN}$	50 - 60 Hz (+/- 2 %)	50 - 60 Hz (+/- 2 %)
	Starts per hour	20; with min. 3 min rest period	20; with min. 3 min rest period
Motor connection	Output voltage	0 - $U_N$	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 $I_N$	$I_N$ at rated ambient temperature (40 °C)
	Output frequency	0 - $f_N$ resolution 0,01 Hz	0 - $f_N$ resolution 0,01 Hz
Control characteristics	Switching frequency	2 - 8 kHz, default setting: 4 kHz	2 - 8 kHz, default setting: 4 kHz
Ambient conditions	Operation temperature	-10 to 50 °C (> 40 °C with derating) - 40°C optional for IP66	-10 to 50 °C (> 40 °C with derating)
	Altitude	Max. altitude at rated current: 3000 m (> 1000 m with derating)	Max. altitude at rated current: 3000 m (> 1000 m with derating)
EMC	Immunity & Emissions	Complies with EN61800-3, Category C2 - first and second environment	Complies with EN61800-3, Category C2 - first and second environment
Communication	RS 485	Standard: ModBus RTU	Standard: ModBus RTU
	Ethernet	Standard: Modbus	Standard: Modbus
	Bluetooth	SMART (4.0) for monitoring and programming	SMART (4.0) for monitoring and programming
I/O connections	Digital Input (DI)	4x	4x
	Analog Input (AI)	4 x (2 x 4-20 mA / 2 x 0-10 V DC)	4 x (2 x 4-20 mA / 2 x 0-10 V DC / 4-20 mA)
	Analog Output (AO)		
	Digital Output (DO)	2x	2x
	Relay Output (RO)		2x (change-over contact)
Kit	Included components	motor mounting kit wall mounting kit	motor mounting kit 4-20 mA (0-16 Bar) Pressure transducer
Options	Options	4-20 mA (0-16 Bar) Pressure transducer 002852211	wall mounting kit 14211021



	VFD 100 X	VFD 100
Suitable HES	6"	6" / 8" / 10"
Protection Degree	IP66	IP 00/21 (optional IP54)
Efficiency	97.5 %	97.5 %
Solar Version	✔	✔
Input Voltage $U_{IN}$	380 - 500 V ; -10 % to +10 % 400 - 840 V DC - min starting voltage 440 V	380 - 500 V ; -10 % to +10 % 400 - 840 V DC - min starting voltage 440 V
	380 - 500 V ; -10 % to +10 % 400 - 840 V DC	
Input frequency $f_{IN}$	47 - 65 Hz	47 - 65 Hz 50 - 60 Hz (+/- 2%)
Starts per hour	20; with min. 3 min rest period	20; with min. 3 min rest period
Output voltage	0 - $U_N$	0 - $U_N$
Output current	$I_N$ at rated ambient temperature (40 °C) Overload: 1,5 x $I_N$ (1 min / 10 min)	$I_N$ at rated ambient temperature (40 °C) Overload: 1,1 x $I_N$
Output frequency	0 - $f_N$ resolution 0.01 Hz	0 - $f_N$ resolution 0.01 Hz
Switching frequency	2 - 8 kHz, default setting: 4 kHz 3,6 to 6 kHz; default setting: 4 kHz	3,6 to 6 kHz; default setting: 4 kHz
Operation temperature	-10 °C to +50 °C (>40 °C with derating) - 40°C optional for IP66	-10 °C to +50 °C (>40 °C with derating)
Altitude	Max. altitude at rated current: 3000 m (> 1000 m with derating)	Max. altitude at rated current: 3000 m (> 1000 m with derating)
Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment	Complies with EN 61800-3, Category C2 - first and second environment
RS 485	Standard: ModBus RTU	Standard: ModBus RTU
Ethernet	Standard: Modbus	Standard: TCP / IP
Bluetooth	-	-
Digital Input (DI)	6x	6x
Analog Input (AI)	2x	2x
Analog Output (AO)	1x	1x
Digital Output (DO)		
Relay Output (RO)	2x (change-over contact)	2x (change-over contact)
Included components	-	-
Options	Plug-in card 6x DI/DO (order no. 308 170 201) Plug-in card PT100 (order no. 308 170 202) Plug-in card 1x AI & 2x AO (order no. 308 170 206) Plug-in card Profibus (order no. 308 170 203) Replacement Battery VFD IP66	Plug-in card 6x DI/DO (order no. 308 170 201) Plug-in card PT100 (order no. 308 170 202) Plug-in card 1x AI & 2x AO (order no. 308 170 206) Plug-in card Profibus (order no. 308 170 203) Replacement Battery (order no. 308 170 205)

## VARIABLE FREQUENCY DRIVES (VFD)

### VFD for 4" HES

Drive model no.	Drive type	IP	V AC I <sub>N</sub> [V]	V DC I <sub>N</sub> [V]	V OUT [V]	I <sub>N</sub> [A]	Dimensions W x H x D [mm]	Weight [kg]
002149112	Drive-Tech MINI 2.011	66	1 x 190 - 265	-	3 x 230	5	150x 130 x 211	2.8
002149152	Drive-Tech MINI 2.015	66	1 x 190 - 265	-	3 x 230	8	150x 130 x 211	2.8
314000162	Drive-Tech MINI 4.011	66	3 x 190 - 520	-	3 x 380 - 460	4	150x 130 x 211	2.8
314000163	Drive-Tech MINI 4.022	66	3 x 190 - 520	-	3 x 380 - 460	6	150x 130 x 211	2.8
314000164	Drive-Tech MINI 4.040	66	3 x 190 - 520	-	3 x 380 - 460	10.5	150x 130 x 211	2.8
314000165	Drive-Tech MINI Solar 2.005 MP	66	1 x 190 - 265	90 - 400	3 x 230	3	150x 130 x 211	2.8
314000166	Drive-Tech MINI Solar 2.011 MP	66	1 x 190 - 265	90 - 400	3 x 230	5	150x 130 x 211	2.8
314000167	Drive-Tech MINI Solar 2.015 MP	66	1 x 190 - 265	90 - 400	3 x 230	8	150x 130 x 211	2.8
314000161	Drive-Tech 3.030 MP	65	3 x 190 - 520	160 - 850	3 x 190 - 520	14	260 x 180 x 260	8.2
314000108	100 16A	21	3 x 380 - 500	400 - 850	3x 380 - 460	16	144 x 419 x 214	10.0
314000109	100 X 16A	66	3 x 380 - 500	400 - 850	3x 380 - 460	16	233 x 368 x 214	14.9

### VFD for 6" HES

Drive model no.	Drive type	IP	V AC I <sub>N</sub> [V]	V DC I <sub>N</sub> [V]	V OUT [V]	I <sub>N</sub> [A]	Dimensions W x H x D [mm]	Weight [kg]
314000108	100 16A	21	3 x 380 - 500	400 - 850	3x 380 - 460	16	144 x 419 x 214	10
314000101	100 23A	21	3 x 380 - 500	400 - 850	3x 380 - 460	23	144 x 419 x 214	10
314000199	100 31A	21	3 x 380 - 500	400 - 850	3x 380 - 460	31	144 x 419 x 214	10
314000102	100 38A	21	3 x 380 - 500	400 - 850	3x 380 - 460	38	195 x 557 x 229	20
314000131	100 46A	21	3 x 380 - 500	400 - 850	3x 380 - 460	46	195 x 557 x 229	20
314000103	100 61A	21	3 x 380 - 500	400 - 850	3x 380 - 460	61	195 x 557 x 229	20
314000104	100 87A	21	3 x 380 - 500	400 - 850	3x 380 - 460	87	237 x 660 x 259	37.5
314000132	100 105A	21	3 x 380 - 500	400 - 850	3x 380 - 460	105	237 x 660 x 259	37.5
314000109	100X 16A	66	3 x 380 - 500	400 - 850	3x 380 - 460	16	233 x 368 x 214	14.9
314000105	100X 23A	66	3 x 380 - 500	400 - 850	3x 380 - 460	23	233 x 368 x 214	14.9
314000200	100X 31A	66	3 x 380 - 500	400 - 850	3x 380 - 460	31	233 x 368 x 214	14.9
314000106	100X 38A	66	3 x 380 - 500	400 - 850	3x 380 - 460	38	350 x 500 x 236	31.5
314000159	100X 46A	66	3 x 380 - 500	400 - 850	3x 380 - 460	46	350 x 500 x 236	31.5
314000107	100X 61A	66	3 x 380 - 500	400 - 850	3x 380 - 460	61	350 x 500 x 236	31.5
314000120	100 87A IP54	54	3 x 380 - 500	400 - 850	3x 380 - 460	87	237 x 660 x 259	37.5
314000201	100 105A IP54	54	3 x 380 - 500	400 - 850	3x 380 - 460	105	237 x 660 x 259	37.5

### VFD for 8" HES

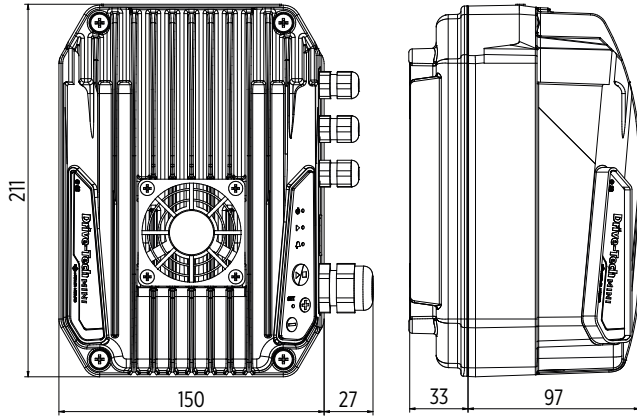
Drive model no.	Drive type	IP	V AC I <sub>N</sub> [V]	V DC I <sub>N</sub> [V]	V OUT [V]	I <sub>N</sub> [A]	Dimensions W x H x D [mm]	Weight [kg]
314000116	100 140A	21	3 x 380 - 500	400 - 850	3x 380 - 460	140	290 x 966 x 343	66
314000117	100 205A	21	3 x 380 - 500	400 - 850	3x 380 - 460	205	290 x 966 x 343	66
314000118	100 310A	00	3 x 380 - 500	400 - 850	3x 380 - 460	310	480 x 971 x 365	104
314000113	100 140A IP54	54	3 x 380 - 500	400 - 850	3x 380 - 460	140	290 x 966 x 343	66
314000114	100 205A IP54	54	3 x 380 - 500	400 - 850	3x 380 - 460	205	290 x 966 x 343	66
314000115	100 310A IP54	54	3 x 380 - 500	400 - 850	3x 380 - 460	310	480 x 1150 x 365	108

### VFD for 10" HES

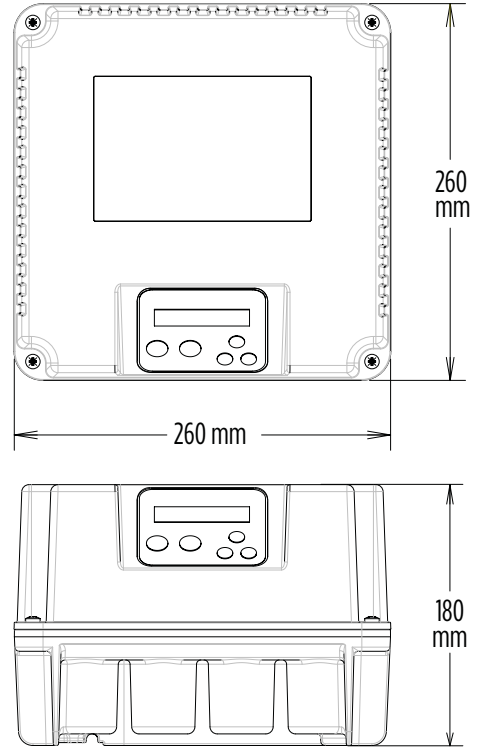
Drive model no.	Drive type	IP	V AC I <sub>N</sub> [V]	V DC I <sub>N</sub> [V]	V OUT [V]	I <sub>N</sub> [A]	Dimensions W x H x D [mm]	Weight [kg]
314000202	100 385A	00	3 x 380 - 500	400 - 850	3x 380 - 460	385	480 x 840 x 365	104
314000203	100 460A	00	3 x 380 - 500	400 - 850	3x 380 - 460	460	508 x 980 x 525	205
314000204	100 520A	00	3 x 380 - 500	400 - 850	3x 380 - 460	520	508 x 980 x 525	205

# VARIABLE FREQUENCY DRIVES (VFD)

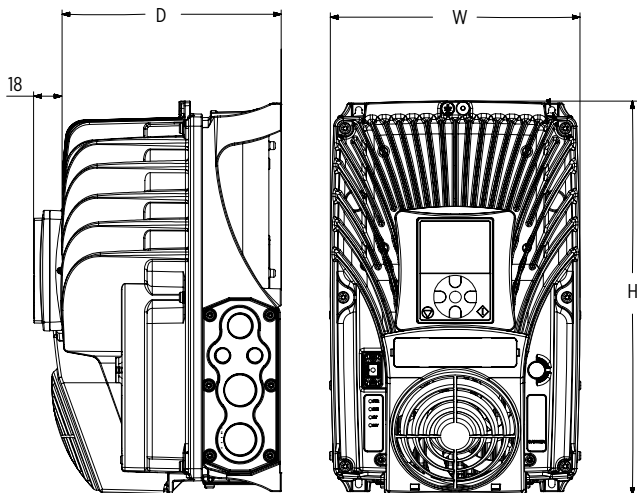
VFD DrivE-Tech MINI



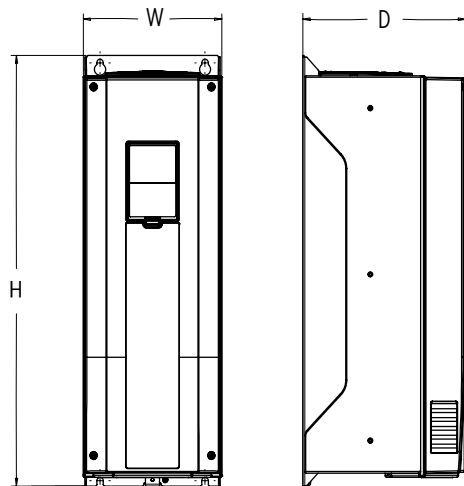
VFD DrivE-Tech MP



VFD 100X

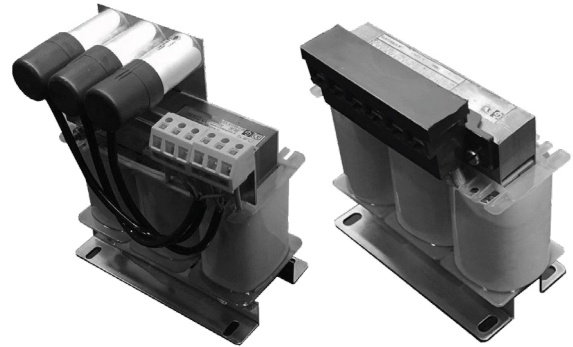


VFD 100



# OUTPUT FILTER

- Various filter available (4"/10": IP00, 6"/8": IP00/54)
- 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
- dV/dt filter for lead lengths up to 120 m (for lead lengths >120 m please consult Franklin Electric)
- Sinus filter in IP00/54 for lead length >120 m and special applications on request



## DV/DT OUTPUT FILTER 400/500 V 4" HES

Protection Class IP00*										
System model no.	Filter order no.	I <sub>N</sub> [A]	Dimensions [mm]							weight [kg]
			A	B (B1)	C	D	E	F	G	
308 062 001	314005134	14	120	67	115	100	60	5	5.5	2.7
308 063 001										
308 064 001										

**IP00 dv/dt filter outlines**

**IP00 dv/dt filter wiring**

**filter connection plan**

Protection Class IP00*														
System model no.	I <sub>N</sub> [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque		
		a	b	c	n1	n2	d	e		main	PE	main	PE	
										[mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[Nm]	[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	

**IP00 dv/dt filter outlines**

**dv/dt filter connection plan**

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



# OUTPUT FILTER

## SINUS OUTPUT FILTER 400/500 V 4" HES

Protection Class IP00\*

Filter order number	I <sub>N</sub> [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

<p><b>IP00 Sinus filter outlines</b></p>	<p><b>IP00 Sinus filter wiring</b></p>	<p><b>Sinus filter connection plan</b></p>
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\*For IP54 rating the recommended enclosure size is 20 liter.

# OUTPUT FILTER

DV/DT OUTPUT FILTER 380/500 V 6" HES



Output Filter dV/dt High Efficiency System 380 / 500 V - protection class IP00														
System model no.	Filter order code	I <sub>N</sub> [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]
308 080 016 308 080 023	314 005 101	24	125	92	161	55	100	5	15	2,5	1.5 - 16	1.5 - 16	2.5 - 3.0	2.5 - 3.0
308 080 031 308 080 038	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
308 084 046 308 084 061	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
308 086 087	314 005 104	88	190	116	238	67	170	8	30	8	25 - 50	M10	6 - 8	46 - 50
308 086 010	314 005 137	105	240	139	335	75	185	10	-	14	150	M10	25 - 30	46 - 50

Output Filter dV/dt High Efficiency System 380 / 500 V Model Data - Protection Class IP54														
System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f	main [mm <sup>2</sup> ]			PE [mm <sup>2</sup> ]	main [Nm]	PE [Nm]	
308 080 216 308 080 223	314 005 110	24	325	354	227	242	330	2x23-33.5	10	1.5 - 16	1.5 - 16	2.5 - 3.0	2.5 - 3.0	
308 084 231 308 084 238	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	
308 084 246 308 086 261	314 005 112	62	325	354	227	242	330	2x29-40.0	18	1.5 - 35	1.5 - 35	3.2 - 3.7	3.2 - 3.7	
308 086 287	314 005 118	88	405	654	227	242	330	2x35-46.0	37	35	35	3.2 - 3.7	3.2 - 3.7	
308 086 210	314 005 124*	105	550	560	550	137-289	520	6x23-35.5	52	95	M10	15 - 20	46 - 50	

\*Floor mount

**IP00 dV/dt filter outlines**

**IP54 filter outlines wall mount**

**IP54 filter outlines floor mount**

**connection plan**

# OUTPUT FILTER

## SINUS OUTPUT FILTER 380/500 V 6" HES



Output Filter Sinus High Efficiency System 380/500V Model Data - Protection Class IP00

System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[Nm]	[Nm]
308 080 116	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
308 080 123 308 084 131	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
308 084 138 308 086 146	314 005 107	46	300	222	351	131	250	10	34	25 - 50	25 - 50	6 - 8	23 - 25
308 086 161	314 005 108	72	360	276	410	127	264	10	56	25 - 50	25 - 50	6 - 8	23 - 25
308 086 187 308 086 110	314 005 109	105	360	276	413	127	264	10	57	35 - 95	M10	15 - 20	46 - 50

Output Filter Sinus High Efficiency System 380/500V Model Data - Protection Class IP54

System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
										[mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[Nm]	[Nm]
308 080 316	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
308 080 323	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
308 084 331 308 084 338	314 005 115*	38	770	610	620	450	570	2x23-33.5	65	10	10	1.5 - 1.8	1.5 - 1.8
308 084 346	314 005 139*	46	770	610	620	450	570	2x23-35.5	76	10	10	1.5 - 1.8	1.5 - 1.8
308 086 361	314 005 116*	72	770	610	620	450	570	2x35-46	112	25 - 50	25 - 50	6 - 8	23 - 25
308 086 387 308 086 310	314 005 138*	105	770	610	620	357-509	570	6x23-35.5	167	95	M10	15-20	46-50

\*Floor mount

**IP00 Sinus filter outlines**

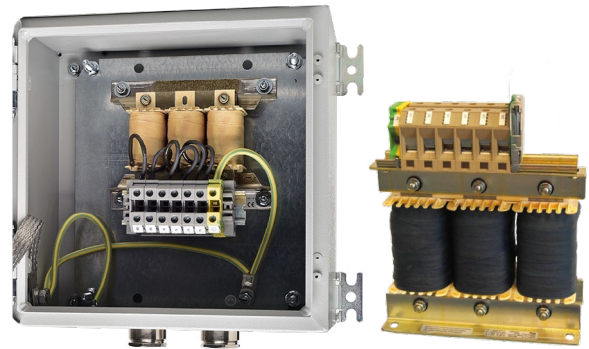
**IP54 filter outlines wall mount**

**IP54 filter outlines wall mount**

**Sinus filter connection plan**

# OUTPUT FILTER

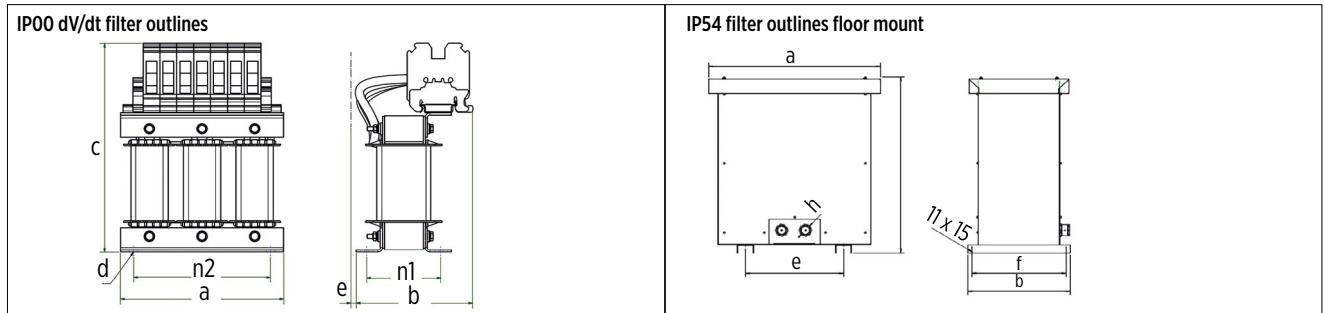
## DV/DT OUTPUT FILTER 400/500 V 8" HES



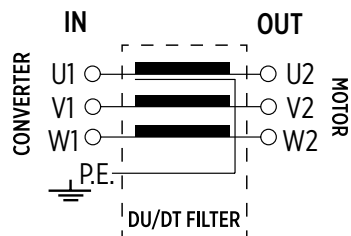
400/500V dV/dt output filter High Efficiency System - protection class IP00*														
System model no.	Filter order code	$I_N$ [A]	Dimensions [mm]							weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d	e		main	PE	main	PE
											[mm <sup>2</sup> ]		[Nm]	
308 014 001	314 005 130	140	240	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 High Efficiency System - protection class IP54*													
System model no.	Filter order code	$I_N$ [A]	Dimensions [mm]					cable $\varnothing$ [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f			main	PE	main	PE
										[mm <sup>2</sup> ]		[Nm]	
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



dV/dt filter connection plan



# OUTPUT FILTER

## SINUS OUTPUT FILTER 400/500 V 8" HES



400/500V Sinus output filter High Efficiency System - protection class IP00\*

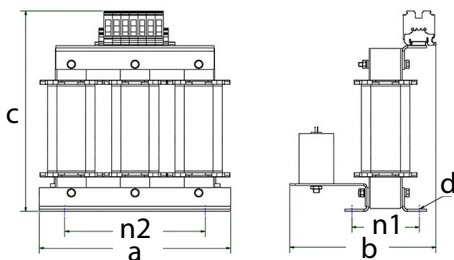
System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm <sup>2</sup> ]		[Nm]	
308 014 101	314 005 121	140	360	311	440	157	264	10	75	50 - 150	M10	25 - 30	46 - 50
308 016 101	314 005 122	205	420	335	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

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

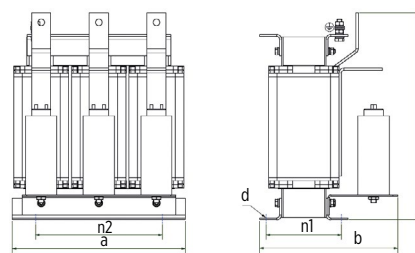
System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						cable Ø [mm]	weight [kg]	terminal		clamping torque	
			a	b	c	e	f	main			PE	main	PE	
								[mm <sup>2</sup> ]			[Nm]			
308 014 301	314 005 127*	140	770	610	620	450	570	6x23 - 33.5	140	50 - 150	M10	25 - 30	46 - 50	
308 016 301	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

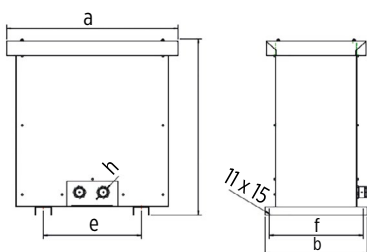
IP00 Sinus filter outlines 314 005 121/122



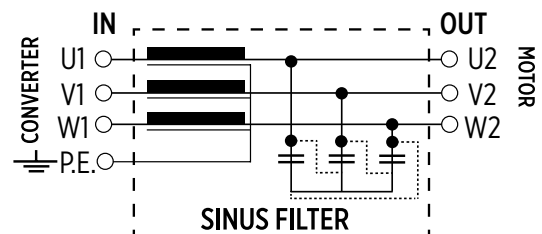
IP00 filter outlines 314 005 123



IP54 Sinus filter outlines floor mount



Sinus filter connection plan



# OUTPUT FILTER

## DV/DT OUTPUT FILTER IP00 10" HES



System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm <sup>2</sup> ]		[Nm]	
308 028 001	314 005 166	460	300	224	296	143	250	11x22	40	40x10 / M 12	M 10	65 - 80	46 - 50
308 029 001	314 005 167	650	300	260	347	143	250	11x22	50	40x10 / M 12	M 12	65 - 80	79 - 85

**IP00 dV/dt filter outlines**

**dV/dt filter connection plan**

## 10" SINUS OUTPUT FILTER IP00





System model no.	Filter order code	I <sub>N</sub> [A]	Dimensions [mm]						weight [kg]	terminal		clamping torque	
			a	b	c	n1	n2	d		main	PE	main	PE
										[mm <sup>2</sup> ]		[Nm]	
308 028 101	314 005 168	460	480	460	523	212	356	13 x 20	190	40 x 10 / M 12	M 12	65 - 80	79 - 85
308 029 101	314 005 169	590	480	490	523	212	356	13 x 20	225	50 x 10 / M 12	M 12	65 - 80	79 - 85

**IP00 filter outlines mount**


**Sinus filter connection plan**

## ACCESSORIES

### CORROSION PROTECTION 4" MOTORS


Description	Model no.		
<ul style="list-style-type: none"> <li>For use in more aggressive media</li> <li>Mounting on the bottom of the motors</li> <li>Material: GG 25</li> </ul> <p>System of operation: Wells with extremely high levels of chlorides and other elements combined with high temperatures will attack almost any type of metal, including stainless steel. When in contact with a more noble metal, the less noble metal becomes the anode of a galvanic cell. Oxidation occurs at the anode. It slowly dissolves (sacrificial anode), leaving the more noble metal unaffected. The result is a longer service life of the motor/pump unit in more aggressive media.</p>	4000 N: 308 250 914 6500 N: 308 250 913		
		4000N	6500N

### DC DISCONNECT

Description	Model no.	[A]	[V DC]	
To disconnect the drive even under load safely from the solar generator, Franklin Electric offers suitable DC disconnect switches for different power ratings.	308 170 313	0 - 11 A	800	
	308 170 325	12 - 22 A	800	

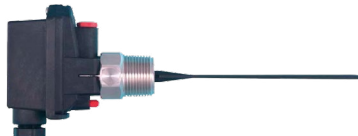
### DOUBLE PLUG LEAD 4" MOTOR DESIGN

- Connected between termination kit and 4" motor, required for use of lead termination kit.
- Max. current: 18 Ampere in air at max. 50 °C ambient temperature, 23 Ampere submersed in water at max. 30 °C ambient temperature
- Max. voltage: 750 V AC


Model no.	Description	Material	
310 111 001	3x1.5 / 1G 1.5 mm <sup>2</sup> 1.50 m - w/o strain relief	304SS	
310 111 501		316SS	
310 111 002	3x1.5 / 1G 1.5 mm <sup>2</sup> 2.50 m - w/o strain relief	304SS	
310 111 502		316SS	
310 112 001	3x1.5 / 1G 1.5 mm <sup>2</sup> 1.50 m - with strain relief	304SS	
-		316SS	
310 112 002	3x1.5 / 1G 1.5 mm <sup>2</sup> 2.50 m - with strain relief	304SS	
-		316SS	

## ACCESSORIES


### FLOW PADDLE SWITCH

Description	Model no.	
<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</li> <li>Connection: G1"</li> </ul>	226 019 101	


### INLINE FLOW SWITCH

Description	Model no.	
<ul style="list-style-type: none"> <li>The Inline Flow Switch operates magnetically.</li> <li>The piston within the switch body should be a free fit and spring back to its off position as soon as flow stops.</li> <li>For flow rates up to 4 m<sup>3</sup>/h</li> <li>Connection: G1"</li> </ul>	226 014 101	

### LEVEL SWITCH

Description	Model no.	
A level switch is a device used to detect the level of liquid within a tank.	308 170 209	

### LEAD TERMINATION KIT 4"

Description	Model no.		
<p>This proven, robust solution makes it possible to establish a detachable connection to the drop cable or to reuse it when the pump is used temporarily (frequent change of location, motor replacement, etc.). Especially under field conditions, this flexible and safe solution offers great advantages over conventional fixed connections. (Attention: Resin and hardener have a limited durability).</p> <ul style="list-style-type: none"> <li>Max. Current: 18 Amp. in air (Max. ambient temperature: 50 °C)</li> <li>Max. Current: 23 Amp. immersed in water (Max. ambient temperature: 30 °C)</li> <li>Max. Voltage: 750 V AC</li> </ul>	Standard 304SS	308 090 901	
	316SS	308 090 911	
	Strain Relief 304SS	308 090 902	



# ACCESSORIES

## MOTOR FILLING KIT

Description	Model no.	
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	

## MOTOR FILLING LIQUID

Description	FES92	FES91	FES93
5 l motor filling liquid FES92 model no. 308 353 941 			

motor type	required motor filling
4" encapsulated motor Standard / PM motor	FES93
6" encapsulated Standard / PM motor	FES91
6" encapsulated High Temp motor	FES92

motor type	required motor filling
8" encapsulated Standard motor	FES91
8" encapsulated High Temp 75 motor	FES92
6"/8"/10"/12" rewindable Standard / PM motor	FES93

## MOTOR/PUMP CONNECTION SCREWS

	Motor type	Material	L / L <sub>T</sub> [mm]	Thread type	F [mm]	Model no.
	6" CT	316SS	38.1	1/2-20UNF	19	308 659 318
	8" REW	316SS	70	M16	24	308 659 327
	10" REW	316SS	80	M20	30	308 659 319

# ACCESSORIES

## MOTOR/PUMP COUPLINGS

- Motor-pump couplings for matching Franklin Electric motors 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

Description	Dimensions	
<ul style="list-style-type: none"> <li>4" motor/pump coupling</li> <li>NEMA Standard measuring on motor shaft</li> <li>separate washer between motor and pump shafts</li> <li>Material: 304SS / 316SS</li> </ul>	<p>151 551 911</p>	<p>308 712 904</p>

Model no.	Coupling Material DIN (AISI)	Dimension D [mm] Max. / Min.	Dimension N [mm] Max. / Min.	Dimension H [mm] Max. / Min.
151 551 911	304SS	19.075 / 19.063	4.838 / 4.788	20.70 / 20.53
308 712 904	316SS	17.50 / 17.48		

### 6" Motor/pump couplings

Description	Dimensions	
<ul style="list-style-type: none"> <li>6" motor/pump coupling</li> <li>NEMA Standard measuring on motor shaft</li> <li>separate washer between motor and pump shafts</li> <li>Material: 304SS / 316SS</li> </ul>		

Model 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 (304SS)	19.075 / 19.063	20.70 / 20.52	4.84 / 4.79
151 935 922	1.4401 (316SS)			
151 935 910	1.4005 (304SS)	20.025 / 20.013	22.76 / 22.60	6.05 / 6.00
151 935 927	1.4401 (316SS)			
151 935 908	1.4005 (304SS)	22.025 / 22.013	25.53 / 25.32	8.03 / 7.98
151 935 928	1.4401 (316SS)			
151 935 901	1.4005 (304SS)	22.250 / 22.238	24.54 / 24.36	6.43 / 6.38
151 935 921	1.4401 (316SS)			
151 935 906	1.4005 (304SS)	25.025 / 25.013	28.70 / 28.30	8.03 / 7.98
151 935 926	1.4401 (316SS)			
151 935 909	1.4005 (304SS)	25.425 / 25.413	27.74 / 27.56	6.43 / 6.38
151 935 929	1.4401 (316SS)			

# ACCESSORIES

## 8" Motor/pump couplings

Description	Dimensions
<ul style="list-style-type: none"> <li>Material: 304SS / 316SS</li> <li>NEMA standard measuring on motor shaft</li> <li>Separation washer between motor and pump shaft</li> </ul>	

Model 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 (304SS)	25.425 / 25.413	28.27 / 28.17	6.38 / 6.32
156 563 921	1.4404 (316SS)			
156 563 902	1.4005 (304SS)	30.188 / 30.175	33.73 / 33.63	7.96 / 7.91
156 563 922	1.4404 (316SS)			
156 563 903	1.4005 (304SS)	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 (304SS)	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 (304SS)	19.085 / 19.063	20.70 / 20.52	4.84 / 4.79
156 563 906	1.4005 (304SS)	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 (304SS)	22.250 / 22.238	24.54 / 24.36	6.43 / 6.38
156 563 908	1.4005 (304SS)	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

# ACCESSORIES

## PT 100 SENSOR FOR 6" ENCAPSULATED MOTORS

- The PT100 is a precision platinum wire resistor that is specified occasionally as a temperature input for process control equipment.
- Including complete instructions for easy field installation
- 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.
- 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 with 54- 61 Nm.

Kit no.	motor types	screw material	wire insulation	Ø [mm <sup>2</sup> ]	D [mm]	lead length [m]	
305 327 903	6" all ratings	1.4571	rubber	3x0.5	6.4	10	<p>The technical drawing shows a circular sensor head with three internal holes. Dimension D is the diameter of the head, and Ø is the diameter of the holes. The photograph shows a blue jacketed lead with a brass screw head. The graph plots resistance [Ω] on the y-axis (0 to 200) against temperature [°C] on the x-axis (0 to 200), showing a linear relationship. The wiring diagram shows three wires: grey, brown, and black, with a resistor symbol labeled 'S' connected between the grey and brown wires.</p>

## PT 100 SENSOR 6" CT PM - TRIP SETTINGS


6" CT PM Motor rating [kW]	Ambient [°C]	Cooling flow past the motor [m/s]	Max. trip temperature / resistance setting (for standard lead length)
11	30	0,2	47 °C / 121,3 Ω
22	30	0,2	
45	30	0,5	

Youtube tutorial PT100 installation encapsulated motors: <https://youtu.be/S7y7h7KEYMo>

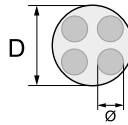
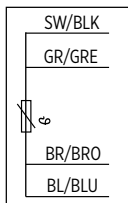
## PT 100 SENSOR FOR 8"/10" PM REWINDABLE MOTORS

- Continuous monitoring of the temperature of the filling liquid
- Can be retrofitted at rewindable 8", 10" PM motors; fitted into the upper end bell flange
- The PT100 is a conductor with a resistance proportional to the temperature.
- Including complete instructions for easy field installation

Ø [mm²]	D [mm]	lead length [m]	Kit no. 8"/10"	
			WW/316SS	904L
4x0.5	8	10	308 016 401	308 016 422
4x0.5	8	20	308 016 402	-
4x0.5	8	30	308 016 403	-
4x0.5	8	50	308 016 405	308 016 426



Trip points: 8" REW PM Motor: 55 °C  
Trip points: 10" REW PM Motor: 65 °C





 Youtube tutorial PT100 installation rewindable motors: <https://youtu.be/KIT6UrgmJac>

## SPLICING KIT

- 4-wire, up to 1.2 kW
- Connection kits for cable extensions with cable connection sleeves for cable cross-sections up to 95 mm<sup>2</sup>.
- Suitable for all common cable materials
- High electrical insulation values and mechanical strength
- Long durability
- Quick and easy assembly
- Components: Transparent plastic shell, ready-to-mix cast resin, insulation tape, assembly instruction

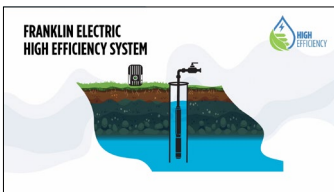
Splicing Kit	Model no.	for cross-sections up to [mm²]	L [mm]	Ø [mm]	H [mm]	Max. cable Ø [mm]
Splicing Kit 10	308 090 930	1.5 - 10	190	36	50	26
Splicing Kit 25	308 090 931	10 - 25	260	47	63	34
Splicing Kit 50	308 090 932	25 - 50	360	55	75	43
Splicing Kit 95	308 090 933	50 - 95	400	70	95	48





## CATALOG REVISION CHANGE NOTICE

Rev. No.	Changes	Page
01	Performance curves adjusted	4/5, 56, 63, 69, 76
	Motor model no. adjusted	12, 13, 15, 54
	Kit descriptions adjusted	12
	Model numbers for output filters added	13
	3600 rpm adjusted for 120 Hz version, System power supply > 3 kW adjusted to 160 - 850 V DC	14
	MVPT changed to MPPT	38, 50
	130 kW systems added	43, 46, 68, 69, 70
	Model numbers of HES model no. adjusted, 130 kW HES Solar Kits added	46
	Motor rating adjusted to 7.5 kW	54
	Stator and rotor model no. adjusted	57, 61
	"PF" exchanged by "cos phi"	all
02	6" CT motor material adjusted in "package deal" description	34
	Material description adjusted to WW (Water well) for all motors with CI/Powder coated castings and 304SS stator shell	all
	Motor model numbers of 4" motors 380 V / 100 Hz adjusted	9, 10, 54
	Explosion drawing / kit part list 6" CT / 8" Rew / 10" Rew adjusted (radial bearing parts)	66, 67, 73
	Performance curves adjusted (l/min added)	16-33
03	Motor model numbers of 110 - 130 kW 8" HES updated	42
	Product pictures updated	Cover, 11, 34, 41, 47
	Performance data 10" HES updated	49
	6" CT PM motor packing sizes updated	65
	PT100 added in 6" CT WW / 304SS / 316SS explosion drawing	66 / 67
	VFD input/output in specification table adjusted	84
04	8" Rew PM system and motor rating range adjusted to 75 - 130 kW	41-44 / 68-70
	add 4" CT PM Motors 220V / 120Hz model numbers and perf. data	54 / 55
	6HES 380 26-30 kW IP66 correction of filter number: replace filter 314 005 113 with 314 005 112	36 / 39
	update packaging sizes of the 8" and 10" Rewindable PM motors	72 / 78
	update 4" HT PM 6500N Motors spare parts (drawing, description and kits)	60 / 61
	update PT100 Sensor data for PM Submersible Motors	100/101
	update drawing 8" Rew PM Motor	72
	update drawing 10" Rew PM Motor	78
update 4" HES du/dt Filter model numbers	12/13/88/89	



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