



# 4" High Efficiency Systems (HES)

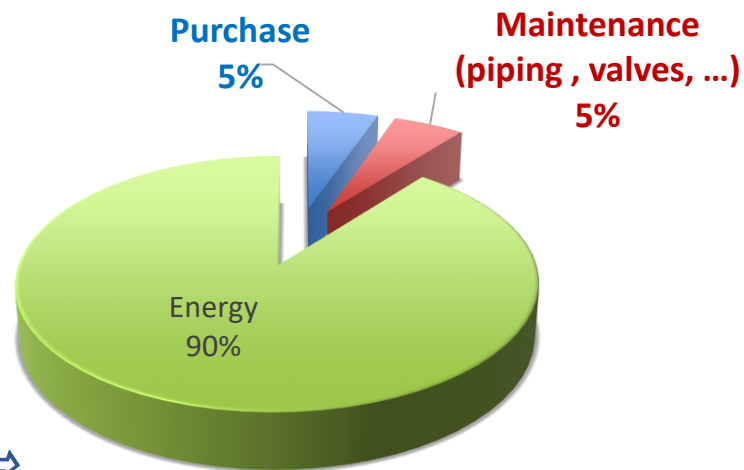




## **EUROPUMP** (European Pumps Manufacturers Association) uses new calculation method for pump equipment as *Pump Life Cycle Costs*

After analysis of all operation costs for pump equipment:

- *First investment*
- *Installation*
- *Maintenance during operation*



The biggest part in Pump Life Cycle Cost is:

⇒ **Energy (= 85% of all costs)**

# 4" High Efficiency System



## SAVINGS:

Up to 21 % energy savings compared to current asynchronous technology



## SYSTEM CONTENT:

4" Synchronous encapsulated motor, DrivE-Tech / DrivE-Tech MINI, matching output filter (400 V)



## MOTOR RATINGS:

0.55 – 7.5kW



## EXCELLENT PARTIAL LOAD BEHAVIOR:

SKU reduction, lower motor heat rise, increased lifetime



## COMMUNICATION:

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

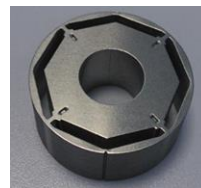
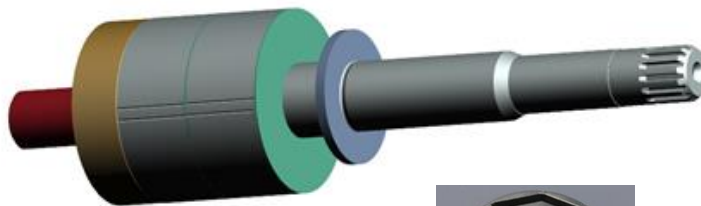
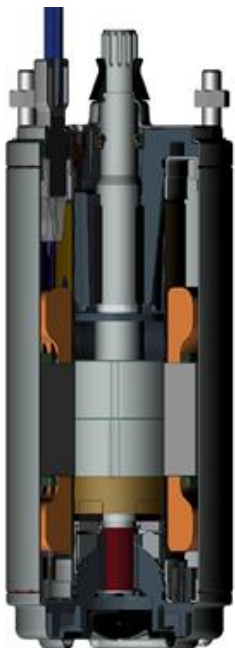




## Encapsulated 4" PM Motor



- 4" PM Synchronous Submersible NEMA motor
- 3-phase Stator Design
- Rotor: Permanent Magnet technology





## 4" PM Motors: Design



- 4" PM Standard mechanical design
- Motor fully 304SS / Optional in 316
- Hydrodynamic bearing system
- $\leq 3.0\text{kW}$  LT (4000N) design
- $\leq 7.5\text{kW}$  HT (6500N) design
- Protection IP68
- Insulation class B
- Nominal ambient  $T = \text{max. } 30^{\circ}\text{C}$
- Vertical and horizontal operation



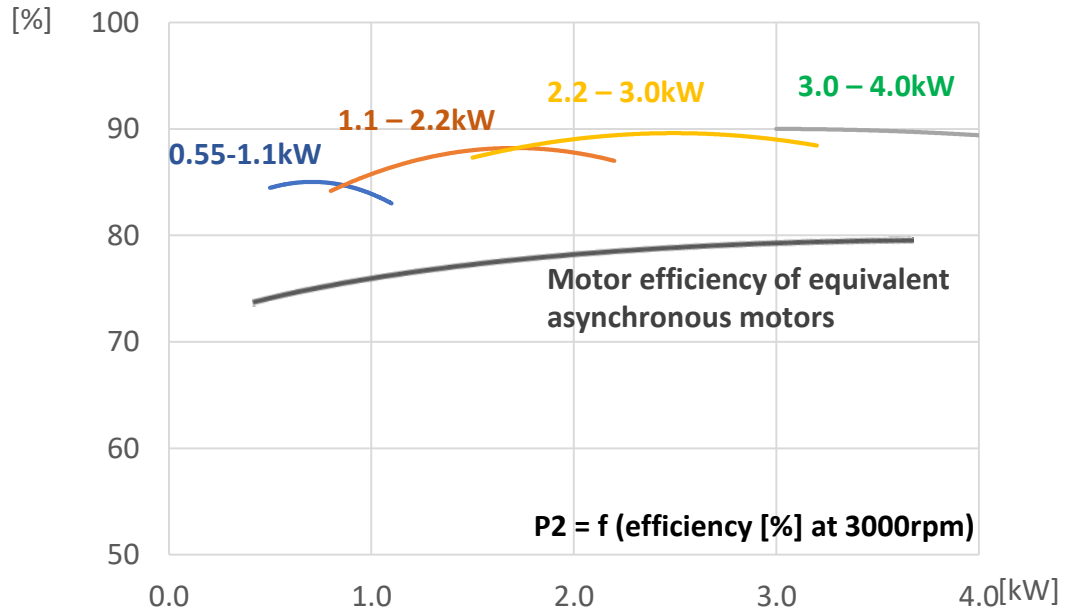
# 4" PM Motors Portfolio up to 4kW



**Up to 15 points (~21%) improved MOTOR efficiency with excellent partial load behavior**



- ⇒ Power density
- ⇒ SKU reduction



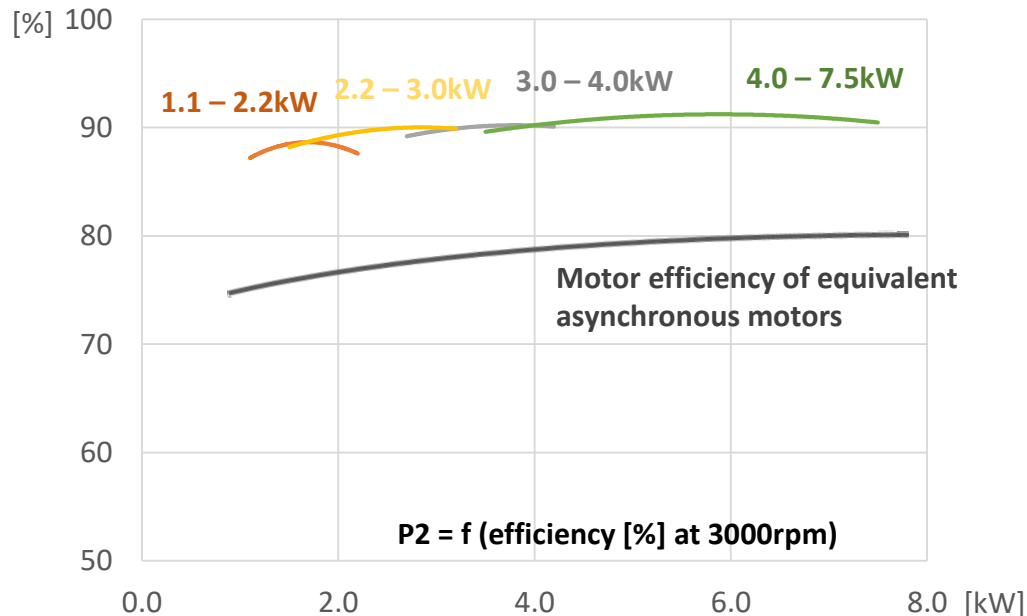
**\*For system efficiency consider 2.5% electronic losses**

# 4" PM Motors Portfolio up to 7.5kW



**Up to 13 points (~14%) improved MOTOR efficiency with excellent partial load behavior**

- ⇒ Power density
- ⇒ SKU (motors in stock) reduction



**\*For system efficiency consider 2.5% electronic losses**

# 4" PM Motors: Performances



MDL	3-Phase Performance Data 100Hz 220V									
	P <sub>N</sub> [kW]	Thrust F [N]	U <sub>N</sub> [V]	n [min-1]	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]
2340716700L	0,55	4000	220	3000	1,8	1	85,1	0,95	1,8	1
	0,75	4000	220	3000	2,4	1	85,6	0,97	2,4	1
	1,1	4000	220	3000	3,8	1	83,5	0,99	3,3	1
2340726700L	1,1	4000	220	3000	3,4	1	86,4	0,96	3,5	1
	1,5	4000	220	3000	4,8	1	88,0	0,97	4,8	1
	2,2	4000	220	3000	7,0	1	87,0	0,99	6,9	1
2340736700L	2,2	4000	220	3000	6,9	1	90,3	0,96	7,1	1
	3,0	4000	220	3000	9,4	1	90,2	0,97	9,5	1
2340743421L	3,0	6500	220	3000	10,2	1	90,7	0,94	11,7	1
	3,7	6500	220	3000	12,0	1	91,0	0,96	12,0	1
	4,0	6500	220	3000	13,0	1	91,0	0,97	12,7	1
2340663421L	4,0	6500	380	3000	7,3	1	90,7	0,95	12,7	1
	5,5	6500	380	3000	9,7	1	91,0	0,95	17,5	1
	7,5	6500	380	3000	13,1	1	90,5	0,96	23,9	1





## 4" HES: VFD Features $\leq 4.0\text{kW}$




### Drive-Tech MINI (MP)



- Enclosure rating IP66
- Runs standard ASM & PM synchronous motors
- Multiple control modes
- Motor Soft start
- Motor-/ Application protection
- PFC (Power Factor Correction) - Input
- BLUETOOTH 4.0 connectivity & ModBUS RTU

### Drive-Tech MP



- 
- AC & DC supply (Multi Power – „MP“) for Solar
  - 4x analog inputs (4-20mA / 0-10V)
  - 2x digital outputs





## VACON 100




## 4" HES: VFD Features $\geq 5.5\text{kW}$

- Enclosure rating IP21 & IP66
- Runs standard ASM & PM synchronous motors
- Multiple control modes
- Franklin Electric designed Start-up Guide for easy set-up with tailored pre-settings
- Motor Soft start & application protection features
- Multiple communication methods (ModBUS RTU,...)

## VACON 100X



- 
- Direct DC feeding for solar applications
  - 2x analog inputs (4-20mA)
  - 6x DI & 2x RO (relay output)



## 4" HES Portfolio $\leq 4.0\text{kW}$ (VFD + 4" PM Motor + VS 4" Pump)

220V Grid : 1-phase (3phase) IN / 3-phase OUT

### 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.
0,55 - 1,1 kW	308071126	Drive-Tech MINI 2.011	002149112	1	26	4" VS 1/26	602012601050063	1,1	2340716700L
	308071220			2	20	4" VS 2/20	602022001050063		
	308071414			4	14	4" VS 4/14	602041401050063		
1,1 - 2,2 kW	308072227	Drive-Tech MINI 2.015	002149152	2	27	4" VS 2/27	602022701050063	2,2	2340726700L
	308072427			4	27	4" VS 4/27	602042701050063		
	308072613			6	13	4" VS 6/13	602061301060063		
2,2 - 3,0 kW	308073619	Drive-Tech 3.030 MP	314000161	6	19	4" VS 6/19	602061901060063	3,0	2340736700L
3,0 - 4,0 kW	308074444	Drive-Tech 3.030 MP	314000161	4	44	4" VS 4/44	602044401050063	4,0	2340746700L
	308074634			6	34	4" VS 6/34	602063401060063		
	308074823			8	23	4" VS 8/23	602082301060063		
	308074108			10	18	4" VS 10/18	602121801060063		





## 4" HES Portfolio $\leq 4.0\text{kW}$ (VFD + Output Filter + 4" PM Motor + VS 4" Pump)

### 380V Grid : 3-phase IN / 3-phase OUT

#### PACKAGES 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	Sta- ges	Pump	Part No.	P <sub>N</sub> [kW]	Part No.	Type	Part No.
1.1 - 2.2 kW	308062227	Drive-Tech MINI 4.011	314000162	2	27	4" VS 2/27	602022701050063	2,2	2340626700L	dV/dt	314005134
	308062427			4	27	4" VS 4/27	602042701050063				
	308062613			6	13	4" VS 6/13	602061301060063				
2.2 - 3.0 kW	308063619	Drive-Tech MINI 4.022	314000163	6	19	4" VS 6/19	602061901060063	3,0	2340636700L	dV/dt	314005134
3.0 - 4.0 kW	308064444	Drive-Tech MINI 4.040	314000164	4	44	4" VS 4/44	602044401050063	4,0	2340643421L	dV/dt	314005134
	308064634			6	34	4" VS 6/34	602063401060063				
	308064823			8	23	4" VS 8/23	602082301060063				
	308064108			10	18	4" VS 10/18	602121801060063				



## 4" HES Portfolio $\leq 7.5\text{kW}$ (VFD + Output Filter + 4" Motor + VS 4"-6" Pump)

380V Grid : 3-phase IN / 3-phase OUT



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

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter	
Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	[V]	Part No.	Type	Part No.
15/21 4HES 380 5.5kW	308066151	100 F 12A	314000198	21	15	21	4" VS 15/21	602152101060063	7,5	380	2340663421L	dV/dt	314005134
30/06 4HES 380 5.5kW	308066306				30	6	6" VS 30/06	ETH11300150					
46/05 4HES 380 5.5kW	308066091				46	5	6" VS 46/05	ETH11460140					
46/05 4 HES 380 7.5kW	308066465	100 F 16A	314000108	21	46	5	6" VS 46/05	ETH11460140	7,5	380	2340663421L	dV/dt	314005101
30/06 4HES 380 7.5kW	308066092				30	6	6" VS 30/06	ETH11300150					

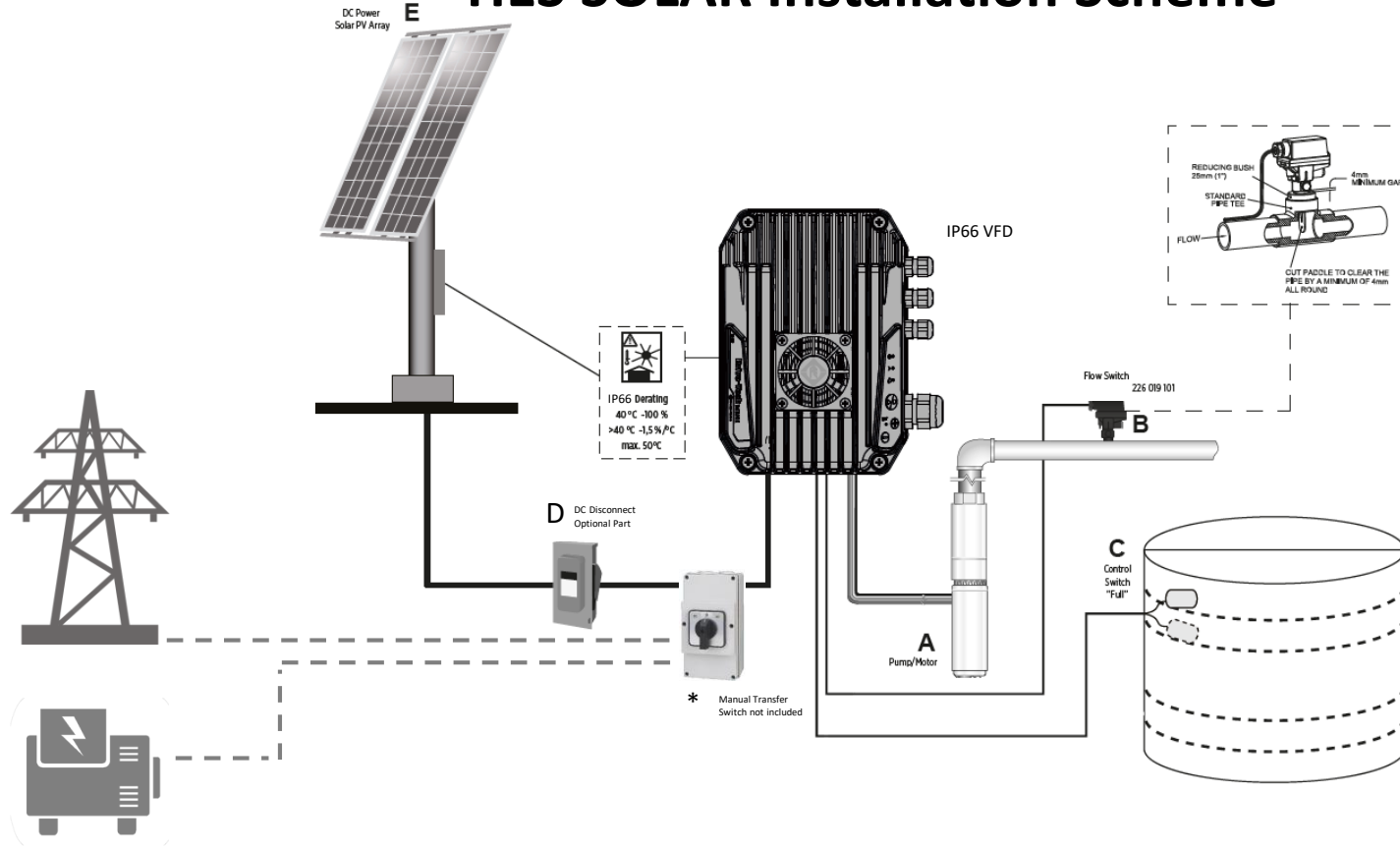
### 4" HES PUMPING PAK (4"PM MOTOR 380V - VFD - SINE FILTER - PUMP)

High Efficiency System		Controller			Pump (BSPP)				Motor			Output Filter	
Model	Order No.	Drive Model	Part No.	IP	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	[V]	Part No.	Type	Part No.
15/21 4HES 380 5.5kW-SIN	308066097	100 F 12A	314 000 198	21	15	21	4" VS 15/21	602152101060063	7,5	380	2340663421L	sinus	314005135
30/06 4HES 380 5.5kW-SIN	308066093				30	6	6" VS 30/06	ETH11300150					
46/05 4HES 380 5.5kW-SIN	308066094				46	5	6" VS 46/05	ETH11460140					
46/05 4 HES 380 7.5kW-SIN	308066095	100 F 16A	314 000 108	21	46	5	6" VS 46/05	ETH11460140	7,5	380	2340663421L	sinus	002347011
30/06 4HES 380 7.5kW-SIN	308066096				30	6	6" VS 30/06	ETH11300150					



## 4" High Efficiency System Solar

# HES SOLAR Installation Scheme





# 4" HES SOLAR: Portfolio $\leq 4.0\text{kW}$ (VFD + 4" Motor + VS 4" Pump)

**220V Solar : 1-phase (3-phase) IN / 3-phase OUT**

## PACKAGES SOLAR PUMP KITS



High Efficiency System		Photon™ Solar Controller		Solar Pump (BSPP)				Motor		
Model	Order No.	Drive Model	Part No.	m <sup>3</sup> /h	Stages	Pump	Part No.	P <sub>N</sub> [kW]	U <sub>N</sub> [V]	Part No.
0,55 - 0,75 kW	308071119S	DTm Solar 2.005 MP	314000165	1	19	4" VS 1/19	602011901050063	1,1	3x 220V	2340716700L
0,55 - 1,1 kW	308071126S	DTm Solar 2.011 MP	314000166	1	26	4" VS 1/26	602012601050063	1,1	3x 220V	2340716700L
	308071220S			2	20	4" VS 2/20	602022001050063			
	308071414S			4	14	4" VS 4/14	602041401050063			
1,1 - 2,2 kW	308072227S	DTm Solar 2.015 MP	314000167	2	27	4" VS 2/27	602022701050063	2,2	3x 220V	2340726700L
	308072427S			4	27	4" VS 4/27	602042701050063			
	308072613S			6	13	4" VS 6/13	602061301060063			
2,2 - 3,0 kW	308073619S	Drive-Tech 3.030 MP	314000161	6	19	4" VS 6/19	602061901060063	3,0	3x 220V	2340736700L
3,0 - 4,0 kW	308074444S	Drive-Tech 3.030 MP	314000161	4	44	4" VS 4/44	602044401050063	4,0	3x 220V	2340743421L
	308074634S			6	34	4" VS 6/34	602063401060063			
	308074823S			8	23	4" VS 8/23	602082301060063			
	308074108S			10	18	4" VS 10/18	602121801060063			



# 4" HES SOLAR: Portfolio up to 7.5kW (VFD + Output Filter + 4" Motor + VS 4"-6" Pump)



**380V Solar: 3-phase IN / 3-phase OUT**

## 4" HES SOLAR PUMPING PAK

High Efficiency System		Solar Controller			Solar Pump (BSPP)				Motor	Output Filter	Flow switch	
Model	Order No.	Drive Model	Part No.	IP	m3/h	Stages	Pump	Part No.	Part No.	Filter type	Part No.	Part No.
15/21 4HES 380 7,5kW-Solar	308066151S	100 IND 16A	314000171	21	15	21	4" VS 15/21	602152101060063	2340663421L	dv/dt	314005101	226019101
30/06 4HES 380 7,5kW-Solar	308066306S			21	30	6	6" VS 30/06	ETH11300150				
46/05 4HES 380 7,5kW-Solar	308066465S			21	46	5	6" VS 46/05	ETH11460140				
15/21 4HES 380 7,5kW-Solar	308066092S	100 X 16A	314000109	66	15	21	4" VS 15/21	602152101060063	2340663421L	dv/dt	314005101	226019101
30/06 4HES 380 7,5kW-Solar	308066093S			66	30	6	6" VS 30/06	ETH11300150				
46/05 4HES 380 7,5kW-Solar	308066091S			66	46	5	6" VS 46/05	ETH11460140				





End

