

SOLAR SYSTEMS



PHOTON SOLARPAK
SUBDRIVE SOLARPAK
HES SOLAR SYSTEM



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FH2OTON SOLARPAK

ALL-IN-ONE-PACKAGE

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

Features

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



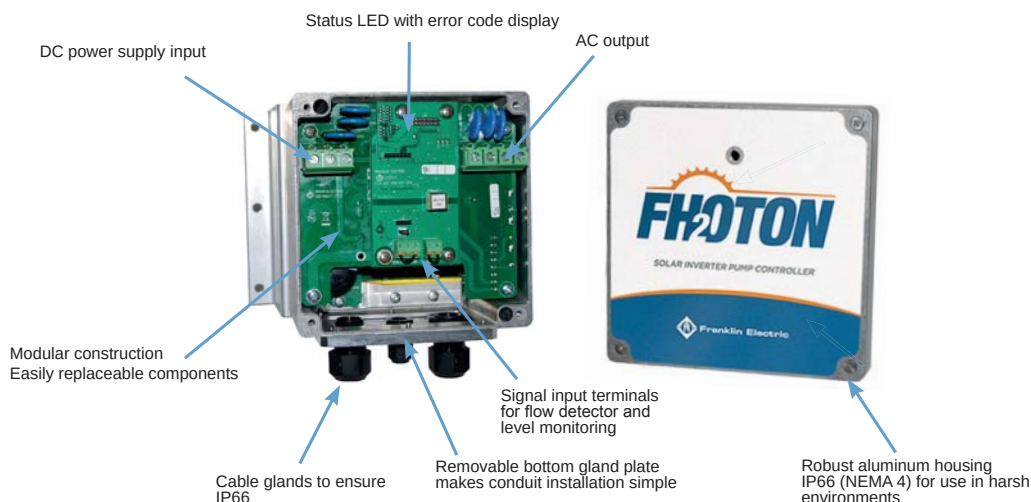
SOLARPAK CONTENTS

- Franklin Electric 4" submersible motor
- Franklin Electric 4" submersible pump
- Photon Solar controller
- Flow switch with 10 m cable
- Variety of flow rates available: 18, 25, 30, 45, 70, 100, 150, or 270 lpm
- Motor and drive ratings available: 0.55 or 1.1 kW

Drive Features

Technical Specifications

- Outside temperature: -25°C...+50°C, up to 100% humidity
- Housing protection IP 66 (NEMA 4)





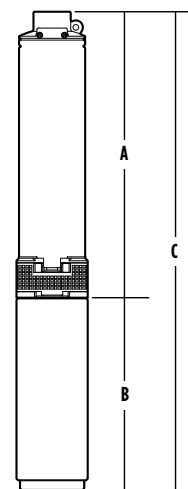
FHoton SolarPAK- Ordering Information

SolarPAK		FHoton Solar Controller		Solar Pump (BSPP)				Motor		Flow Switch (BSPP)	
Solar Kit Model	Order No.	Drive Model	Part No.	Solar Pump	Stg	LPM	Part No.	kW	Part No.	Model	Part No.
Base PAK											
FDSP-0,55kW	308 752 670	FD Solar 0,55kW N4	581 013 000 864					0,55	234 802 6700L	F21	226 019 101
FDSP-1,1kW	308 754 670	FD Solar 1,1kW N4	581 014 200 864					1,1	234 702 6700L	F21	226 019 101
Flow PAK											
FDSP-0,55kW-35	308 752 672	FD Solar 0,55kW N4	581 013 000 864	E-Tech VS 2/10	10	35	710 201 00	0,55	234 802 6700L	F21	226 019 101
FDSP-1,1kW-65	308 754 674	FD Solar 1,1kW N4	581 014 200 864	E-Tech VS 4/14	14	65	710 401 40	1,1	234 702 6700L	F21	226 019 101
Elevation PAK											
FDSP-0,55kW-65	308 752 674	FD Solar 0,55kW N4	581 013 000 864	E-Tech VS 4/7	7	65	710 400 70	0,55	234 802 6700L	F21	226 019 101
FDSP-1,1kW-100	308 754 676	FD Solar 1,1kW N4	581 014 200 864	E-Tech VS 6/9	9	100	710 600 90	1,1	234 702 6700L	F21	226 019 101

* a ~ 10 meter cable for use with the flow switch is included in the controller packaging
 ** 316 stainless steel motors available on request
 *** Motors shown above include an individual conductor lead installed in the motor. For replacement motors without a lead, use part number 2345041903S (1.1 kW)
 (a) High capacity pumps, 100 lpm and higher, in a SolarPAK are not supplied with an internal check valve.

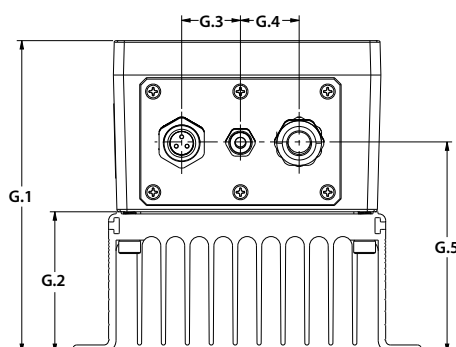
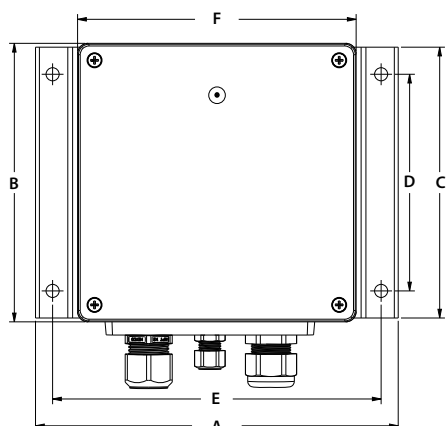
FHoton SolarPAK- Dimension

Solar Motor/Pump (PMA) Dimensions									
Solar Kit Model	LPM	kW	Stages	A [mm]	B [mm]	C [mm]	Discharge [inch]	PE Weight [Kg]	PMA Weight [Kg]
FDSP-0,55kW-35	35	0,55	10	367	270	637	1 ¼	4	14
FDSP-1,1kW-65	65	1,1	14	438	298	736	1 ¼	5,1	18,1
FDSP-0,55kW-65	65	0,55	7	343	270	613	1 ¼	3,5	13,5
FDSP-1,1kW-100	100	1,1	9	461	298	759	2"	4	17



Solar Controller Dimensions

Dimensions	A	B	C	D	E	F	G.1	G.2
[mm]	259	464	534	508	152	76	221	265



The Photon drive supports submersible and surface pumping applications

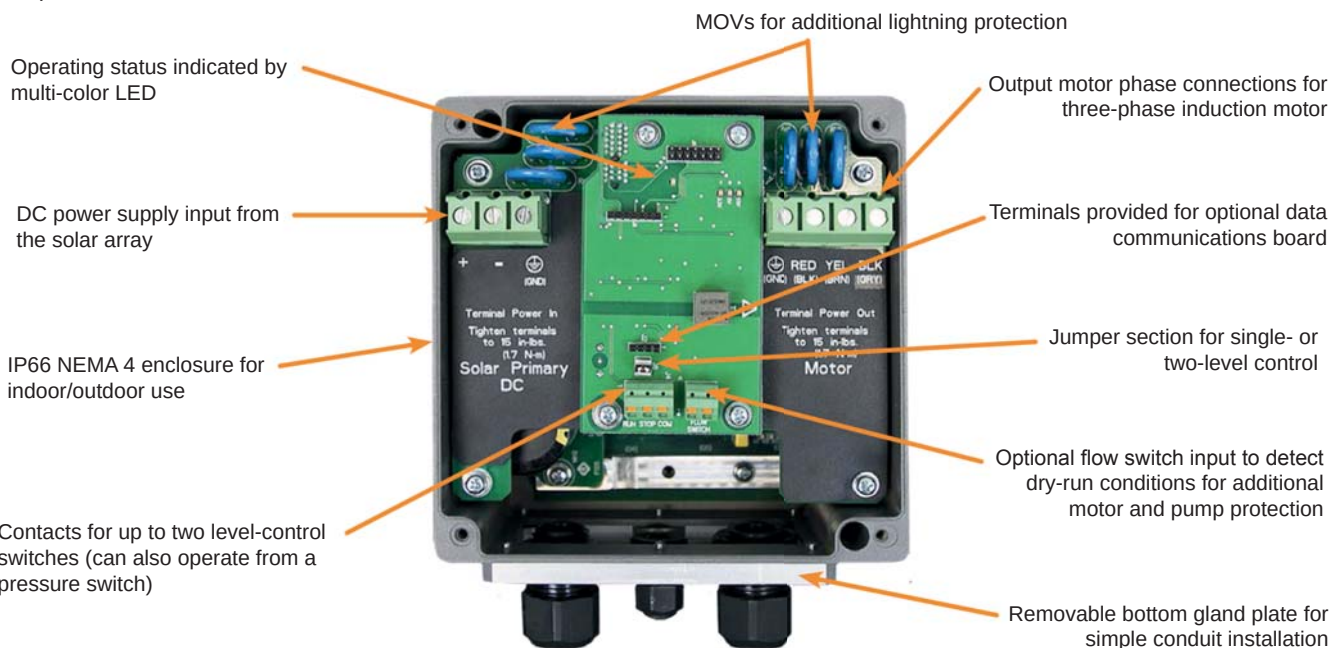
- Outside temperature: -25°C...+50°C, up to 100% humidity
- Housing protection IP 66 (NEMA 4)
- Livestock watering
- Tank/cistern filling
- Wildlife refuge and game farms
- Rural water supply for villages and homesteads
- Irrigation systems
- Fountains
- Vineyards
- Renewable energy projects
- Effluent pumping



Built-in Diagnostics & Protection

The Photon SolarPAK includes diagnostic features and built-in protection from potential harmful conditions, including:

- Surge
- Underload
- Undervoltage
- Locked pump
- Open circuit
- Short circuit
- Overheated controller
- Dry run
- Reverse polarity



FHoton Drive Model Numbers

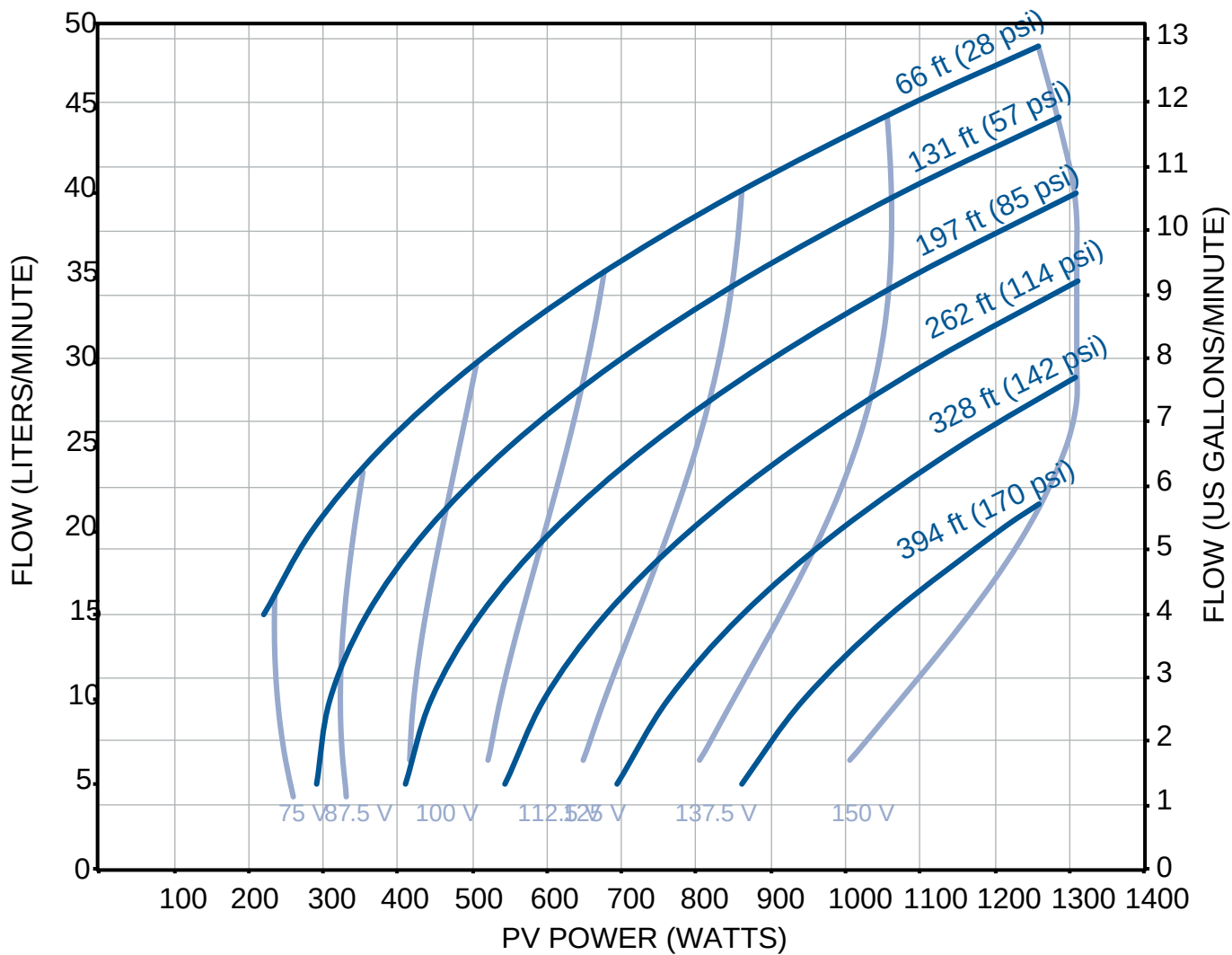
Drive Range [kW]	Tech. Data	Drive Model Number	Drive Design	Outline Size [inch / mm]
0,55	V_{IN} (DC max.): 30...210 Voc I_{IN} (DC max.): 8,7 A P_{MPP} : 1,4 kWp f_{OUT} : 30...60Hz	581 01 210 086 4		6" x 6" x 7.5" 152,5x152,5x190,5
1,1	V_{IN} (DC max.): 50...420 Voc I_{IN} (DC max.): 7 A P_{MPP} : 2,0 kWp f_{OUT} : 30...58Hz	581 01 420 068 4		9" x 9" x 7.5" 228,6x228,6x190,5



FHOTON SOLARPAK - 0.55 kW PERFORMANCE

FDSP-0.55 kW / 35

Photon Solar 0.55 kW Controller, 35 LPM 0.55 kW Pump End, 0.55 kW Motor



TDH (ft)	PV Power (Watts)											
	200	300	400	500	600	700	800	900	1000	1100	1200	1300
Flow (USGPM)												
66		5	7	8	9	9	10	11	11	12	12	
131		2	5	6	7	8	9	9	10	11	11	
197				4	5	6	7	8	9	9	10	10
262					3	4	5	6	7	8	8	9
328						1	3	4	5	6	7	8
394								2	3	4	5	

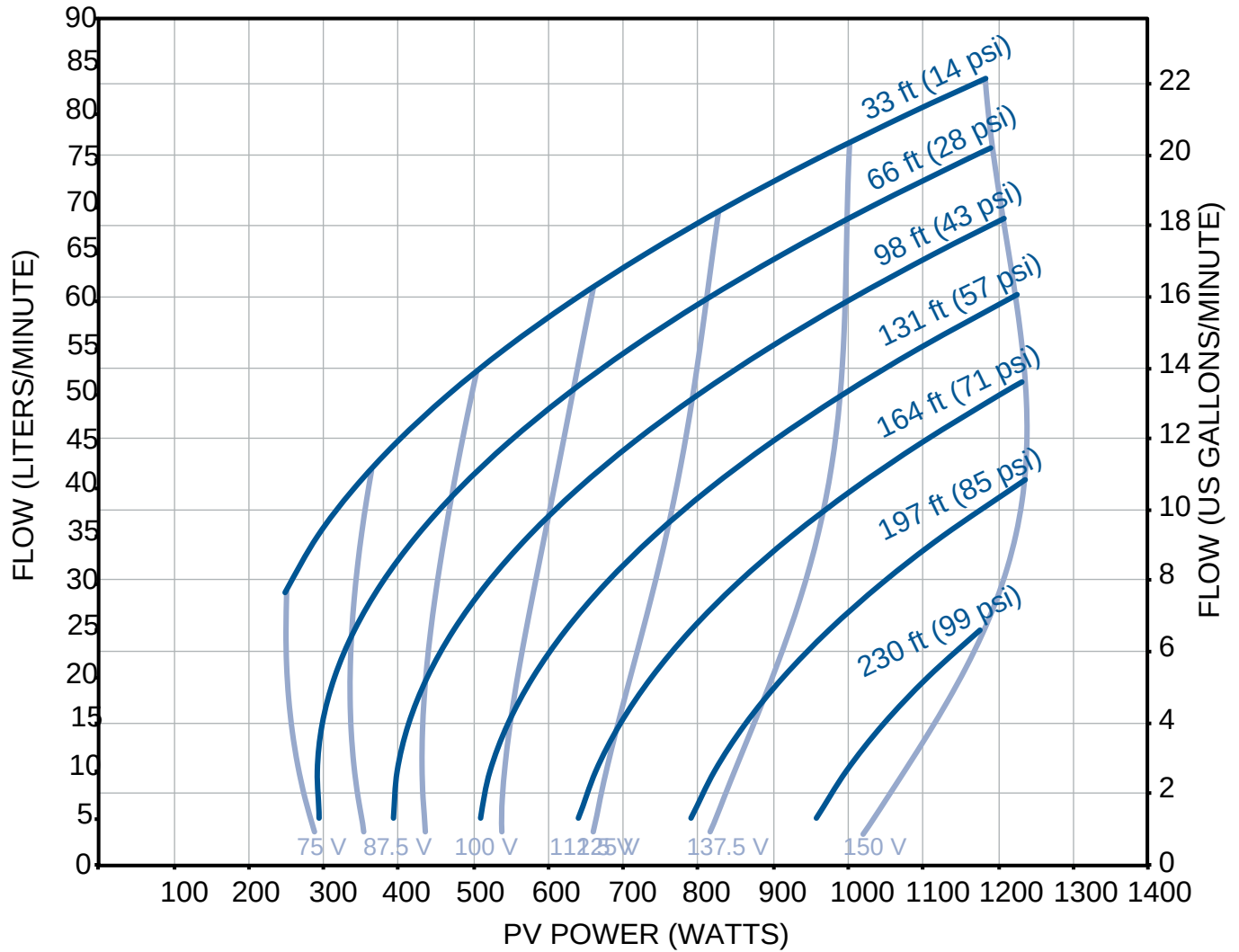
NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges



FHOTON SOLARPAK - 0.55 kW PERFORMANCE

FDSP-0.55 kW / 65

Photon Solar 0.55 kW Controller, 65 LPM 0.55 kW Pump End, 0.55 kW Motor



TDH (ft)	PV Power (Watts)											
	200	300	400	500	600	700	800	900	1000	1100	1200	1300
	Flow (USGPM)											
33		9	12	14	15	17	18	19	20	21		
66		4	8	11	13	14	16	17	18	19		
98			3	7	10	12	13	15	16	17	18	
131					6	8	10	12	13	14	16	
164						4	7	9	10	12	13	
197							2	5	7	9	10	
230									3	5		

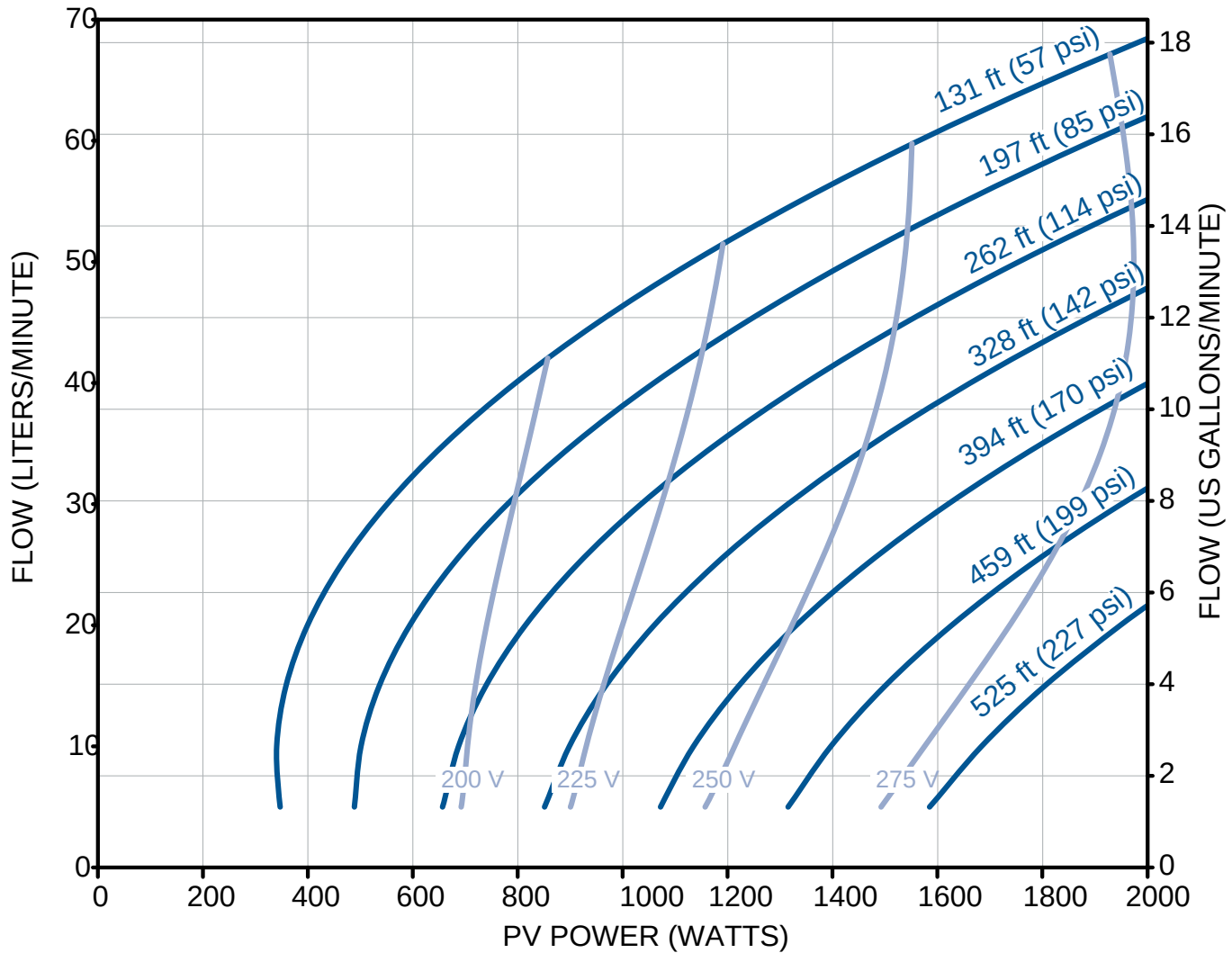
NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges



FHOTON SOLARPAK - 1.1 kW PERFORMANCE

FDSP-1.1 kW / 65

Photon Solar 1.1 kW Controller, 65 LPM 1,5 kW Pump End, 1.1 kW Motor



TDH (ft)	PV Power (Watts)									
	200	400	600	800	1000	1200	1400	1600	1800	2000
	Flow (USGPM)									
131		5	8	11	12	14	15	16	17	18
197			6	8	13	12	13	14	15	16
262				5	8	10	11	12	13	15
328					4	7	9	10	11	13
394						4	6	8	9	11
459							3	5	9	8
525								2	4	6

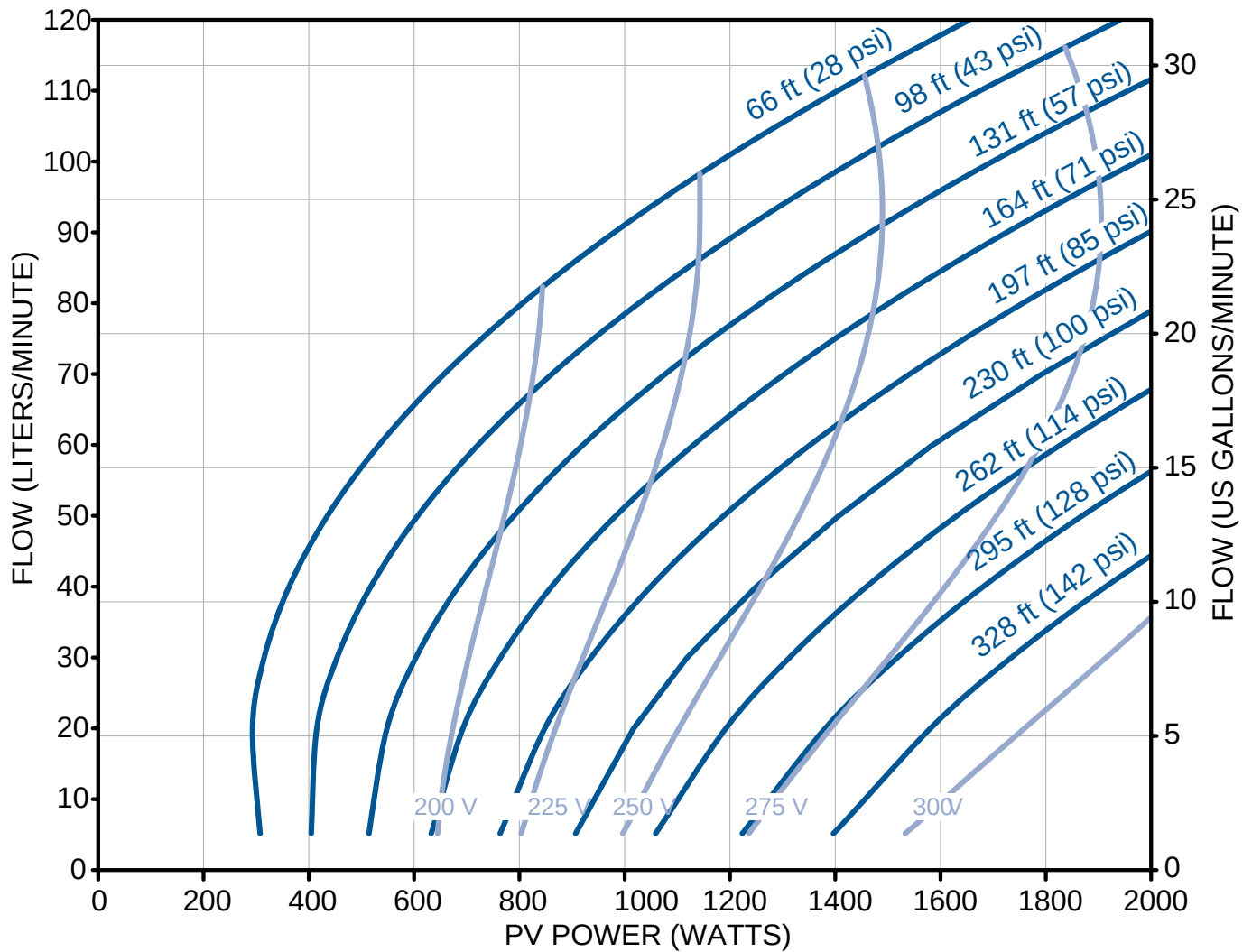
NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges



FHOTON SOLARPAK - 1.1 kW PERFORMANCE

FDSP-1.1kW / 100

Photon Solar 1.1 kW Controller, 100 LPM 1,5 kW Pump End, 1.1 kW Motor



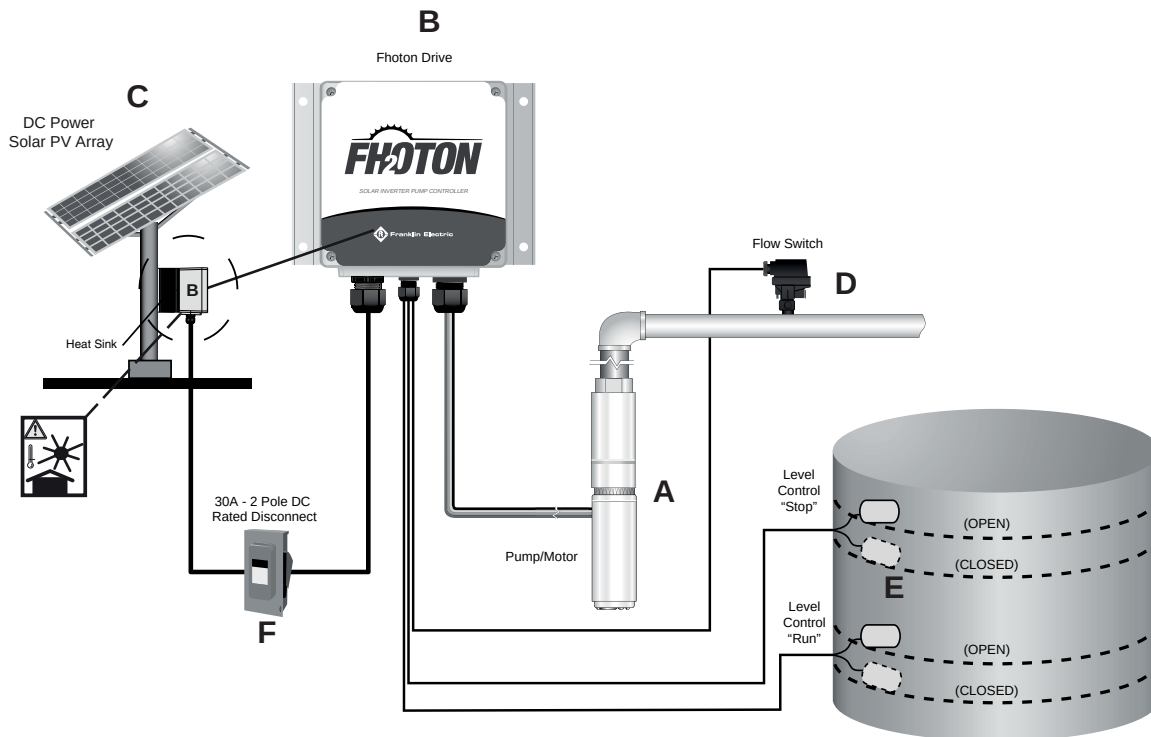
TDH (ft)	PV Power (Watts)									
	200	400	600	800	1000	1200	1400	1600	1800	2000
	Flow (USGPM)									
66		12	17	21	24	27	29	31		
98			13	17	21	24	26	28	30	
131			8	13	17	20	23	25	27	30
164				9	14	17	20	22	25	27
197				3	10	13	17	19	22	24
230					5	10	13	16	19	21
262						6	10	13	15	18
295							6	9	12	15
328							1	6	9	12

NOTE: Refer to drive specifications table in this catalog for PV source power and voltage-recommended operating ranges



FHoton Installation

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



- A. Standard Pump and Motor
- B. Fhoton Solar Drive
- C. Solar Array (not included)
- D. Flow Switch (with sensor cable)
- E. Control Switches (optional, not included)
- F. Rated DC Disconnect - Per applicable codes

0 - 11A/800V DC - 308 170 313
14 - 22A/800V DC - 308 170 325

2 Level Control Switch Operation

FHoton SolarPAK - Drive Specification

Solar Controller

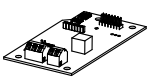
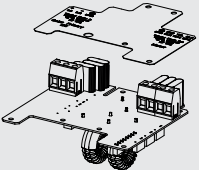
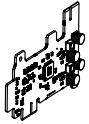
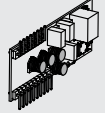
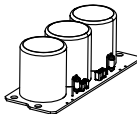
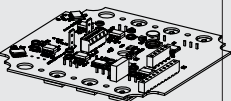
	0,55 kW Model	1,1 kW Model
Controller Model No.	581013000864-SP075HP	581014200864-SP150HP
	Output	
Max. Output Voltage	100V AC, 3-phase	200V AC, 3-phase
Max. Amps (RMS)	8.6 A, each phase	6.8 A, each phase
Output Frequency	30-60 Hz	30-60 Hz
Efficiency at Max Power	98%	98%
	PV Source	
Input Voltage at MPP	45 - 165 VDC	**190 – 330 V DC
Max. Amps Input	8.7 A DC, continuous	7 A DC, continuous
Power at MPP	Up to 1400 watts	Up to 2000 watts

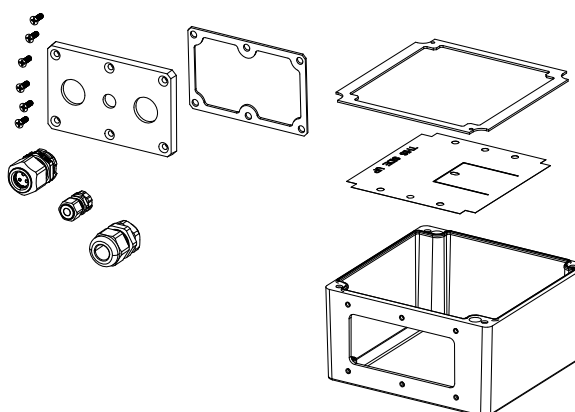
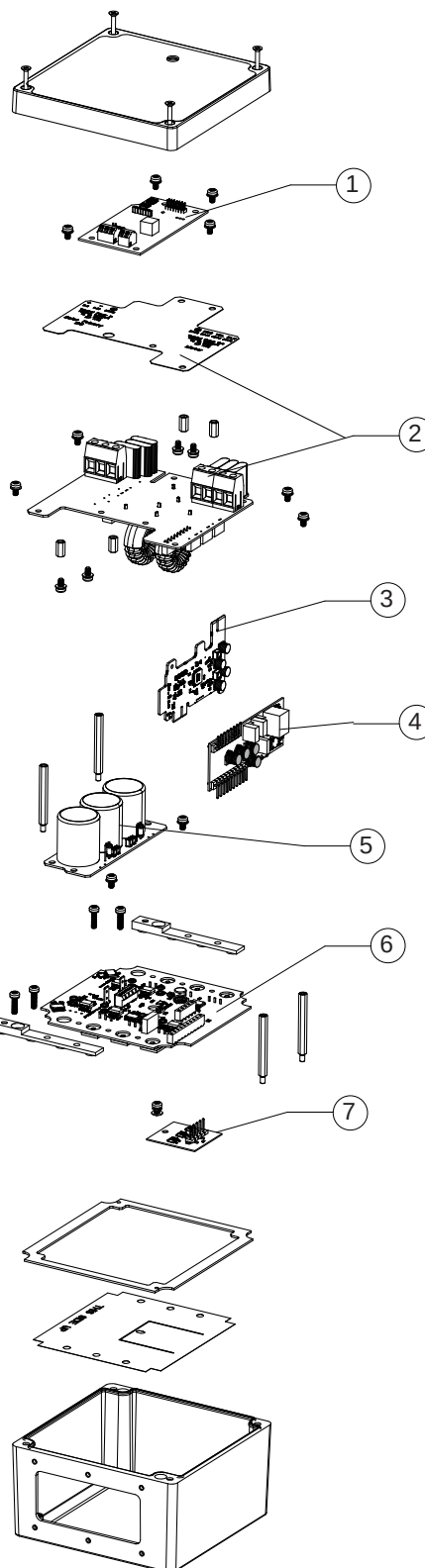
* Drive will attempt to start the pump/motor at 95 V DC, and attempt to continue operation down to 75 V DC.

** Drive will attempt to start the pump/motor at 190 V DC, and attempt to continue operation down to 150 V DC.

Absolute maximum open circuit voltage input to the controller = 420 VOC for all controller models.

FHoton Drive Spare Parts

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





All-in-One Package

The SubDrive SolarPAK is the System Solution to your solar pumping requirements. Using Franklin quality components, our technical expertise in groundwater pumping, and innovative thinking based on global market inputs, we have developed a rugged, high-output system which tackles the challenges of remote and harsh environments. No other system delivers the features, benefits, and reliability of SubDrive SolarPAK in just one package!

The SubDrive SolarPAK includes:

- Franklin Electric 4" submersible motor
- Franklin Electric 4" Solar pump
- SubDrive Solar controller
- Flow switch with 10m cable
- Variety of flow rates available in: 18, 25, 30, 45, 70, 100, 150, and 270 lpm
- Motor and drive ratings available in: 1.1 and 2.2 kW



Features

- High flow system for faster tank fill and significant water output
- Proven motor and pump technology and reliability
- Robust IP55, NEMA 3 drive enclosure minimizes impact of wildlife, insects, dust, and weather
- DC and AC power inputs with auto-switching to generator back-up
- Seven segment controller display shows real-time input watts and system status
- Remote telemetry capability through a RS-485 continuous data port
- MPPT – Max Power Point Tracking for maximizing efficiency of input power
- Soft start feature prevents water hammer and increases system life
- Allows use of new solar array or retrofit to existing array (subject to size and performance check)
- Simple installation and no required maintenance
- Built-in diagnostics and protection
- C-tick and UL approved

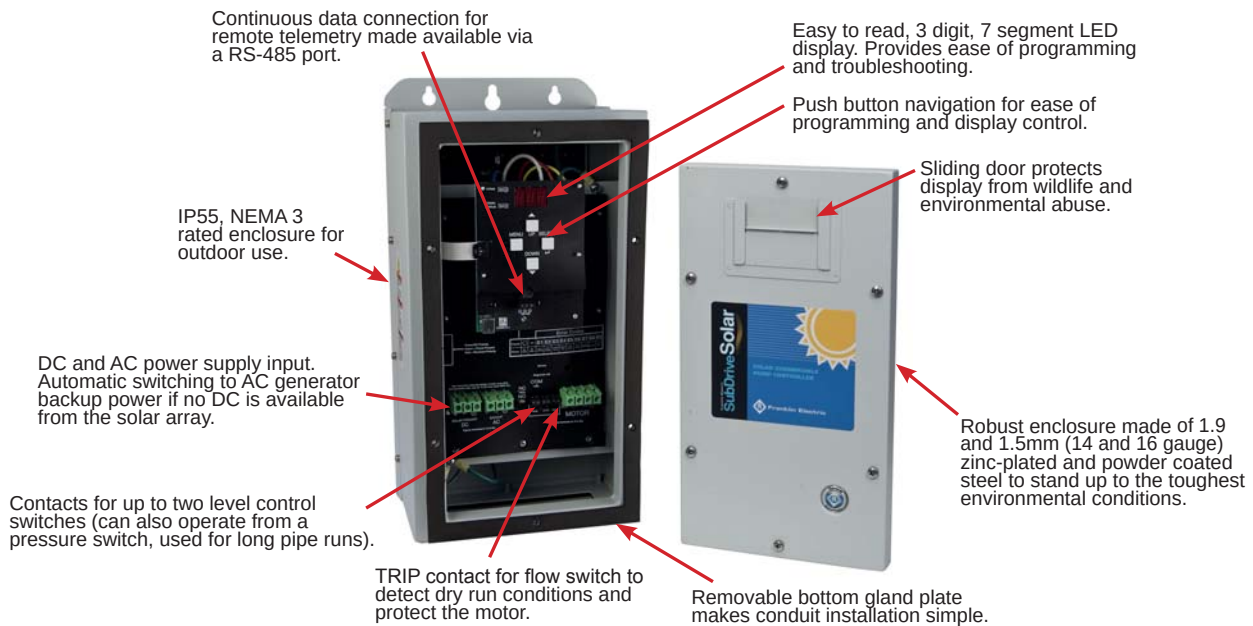
Applications

- Livestock watering
- Tank/Cistern filling
- Wildlife refuge & game farms
- Rural water supply for villages & homesteads
- Irrigation systems
- Fountains
- Vineyards
- Renewable energy projects

Built-in Diagnostics and Protection

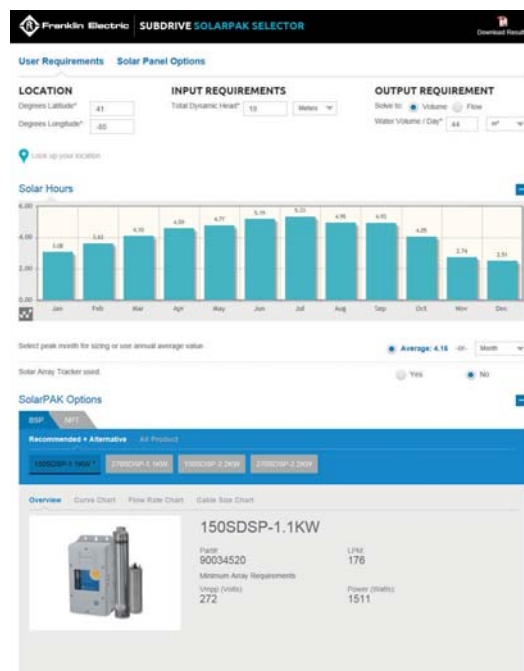
The SubDrive Solar QuickPAK products include diagnostic features and built-in protection from potentially harmful conditions.

- | | |
|----------------|-------------------------|
| • Surge | • Short circuit |
| • Underload | • Overheated controller |
| • Undervoltage | • Dry run |
| • Locked pump | • Reverse polarity |
| • Open circuit | |



SubDrive SolarPAK Selector:

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



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

The Franklin Electric SubDrive Solar Selector and other information on our series of solar products can be found on Franklin Electric's Solar Website:
www.franklin-electric.com/solar



Model Number Description

XXX SD SP - X.XKW

Motor Rating: 1.1 or 2.2 kW (1.5 or 3.0 hp)

SolarPAK

SubDrive

Pump Flow: 18, 25, 30, 45, 70, 100, 150, and 270 lpm
(5, 7, 10, 15, 25, 35, 45, and 90 USGPM)

SubDrive SolarPAK Model Numbers

SolarPAK		SubDrive Solar Controller		Solar Pump – BSPP				Motor		Flow Switch BSPP	
SolarPAK Model	Order No.	Drive Model	Part No.	LPM	Stages	Solar Pump	Part No.	kW	Part No.	Model	Part No.
18SDSP-1.1KW	90030520	SD Solar 1.1 kW N3	5870301113	18	30	18SL15S4-PEXB	90020508	1.1	2345049203S	C25	226014101
25SDSP-2.2KW	90030730	SD Solar 2.2 kW N3	5870301223	25	30	25SL15S4-PEXB	90020711	2.2	2343062604	C25	226014101
30SDSP-1.1KW	90031020	SD Solar 1.1 kW N3	5870301113	30	18	30SL15S4-PEXB	90021011	1.1	2345049203S	C25	226014101
30SDSP-2.2KW	90031030	SD Solar 2.2 kW N3	5870301223	30	18	30SL15S4-PEXB	90021011	2.2	2343062604	C25	226014101
45SDSP-1.1KW	90031520	SD Solar 1.1 kW N3	5870301113	45	15	45SL15S4-PEXB	90021511	1.1	2345049203S	C25	226014101
45SDSP-2.2KW	90031530	SD Solar 2.2 kW N3	5870301223	45	15	45SL15S4-PEXB	90021511	2.2	2343062604	C25	226014101
70SDSP-1.1KW	90032520	SD Solar 1.1 kW N3	5870301113	70	10	70SL15S4-PEXB	90022511	1.1	2345049203S	F21	226019101
70SDSP-2.2KW	90032530	SD Solar 2.2 kW N3	5870301223	70	10	70SL15S4-PEXB	90022511	2.2	2343062604	F21	226019101
100SDSP-1.1KW	90033520 ^(a)	SD Solar 1.1 kW N3	5870301113	100	10	100SL15S4-PEXB	90023511	1.1	2345049203S	F21	226019101
100SDSP-2.2KW	90033530 ^(a)	SD Solar 2.2 kW N3	5870301223	100	10	100SL15S4-PEXB	90023511	2.2	2343062604	F21	226019101
150SDSP-1.1KW	90034520 ^(a)	SD Solar 1.1 kW N3	5870301113	150	7	150SL15S4-PEXB	90024511	1.1	2345049203S	F21	226019101
150SDSP-2.2KW	90034530 ^(a)	SD Solar 2.2 kW N3	5870301223	150	7	150SL15S4-PEXB	90024511	2.2	2343062604	F21	226019101
270SDSP-1.1KW	90039020 ^(a)	SD Solar 1.1 kW N3	5870301113	270	5	270SL15S4-PEXB	90029011	1.1	2345049203S	F21	226019101
270SDSP-2.2KW	90039030 ^(a)	SD Solar 2.2 kW N3	5870301223	270	5	270SL15S4-PEXB	90029011	2.2	2343062604	F21	226019101

SolarPAK		SubDrive Solar Controller		Solar Pump – NPT				Motor		Flow Switch NPT	
SolarPAK Model	Order No.	Drive Model	Part No.	USGPM	Stages	Solar Pump	Part No.	HP	Part No.	Model	Part No.
5SDSP-1.5HP	90040520	SD Solar 1.1 kW N3	5870301113	5	30	5SL15S4-PE	90020507	1.5	2345049203S	C25	226014102
7SDSP-3.0HP	90040730	SD Solar 2.2 kW N3	5870301223	7	30	7SL2S4-PE	90020710	3.0	2343062604	C25	226014102
10SDSP-1.5HP	90041020	SD Solar 1.1 kW N3	5870301113	10	18	10SL2S4-PE	90021010	1.5	2345049203S	C25	226014102
10SDSP-3.0HP	90041030	SD Solar 2.2 kW N3	5870301223	10	18	10SL2S4-PE	90021010	3.0	2343062604	C25	226014102
15SDSP-1.5HP	90041520	SD Solar 1.1 kW N3	5870301113	15	15	15SL2S4-PE	90021510	1.5	2345049203S	C25	226014102
15SDSP-3.0HP	90041530	SD Solar 2.2 kW N3	5870301223	15	15	15SL2S4-PE	90021510	3.0	2343062604	C25	226014102
25SDSP-1.5HP	90042520	SD Solar 1.1 kW N3	5870301113	25	10	25SL2S4-PE	90022510	1.5	2345049203S	F21	226019102
25SDSP-3.0HP	90042530	SD Solar 2.2 kW N3	5870301223	25	10	25SL2S4-PE	90022510	3.0	2343062604	F21	226019102
35SDSP-1.5HP	90043520 ^(a)	SD Solar 1.1 kW N3	5870301113	35	10	35SL2S4-PE	90023510	1.5	2345049203S	F21	226019102
35SDSP-3.0HP	90043530 ^(a)	SD Solar 2.2 kW N3	5870301223	35	10	35SL2S4-PE	90023510	3.0	2343062604	F21	226019102
45SDSP-1.5HP	90044520 ^(a)	SD Solar 1.1 kW N3	5870301113	45	7	45SL2S4-PE	90024510	1.5	2345049203S	F21	226019102
45SDSP-3.0HP	90044530 ^(a)	SD Solar 2.2 kW N3	5870301223	45	7	45SL2S4-PE	90024510	3.0	2343062604	F21	226019102
90SDSP-1.5HP	90049020 ^(a)	SD Solar 1.1 kW N3	5870301113	90	5	90SL2S4-PE	90029010	1.5	2345049203S	F21	226019102
90SDSP-3.0HP	90049030 ^(a)	SD Solar 2.2 kW N3	5870301223	90	5	90SL2S4-PE	90029010	3.0	2343062604	F21	226019102

* A 10 meter (33 feet) cable for use with the flow switch is included in the controller packaging

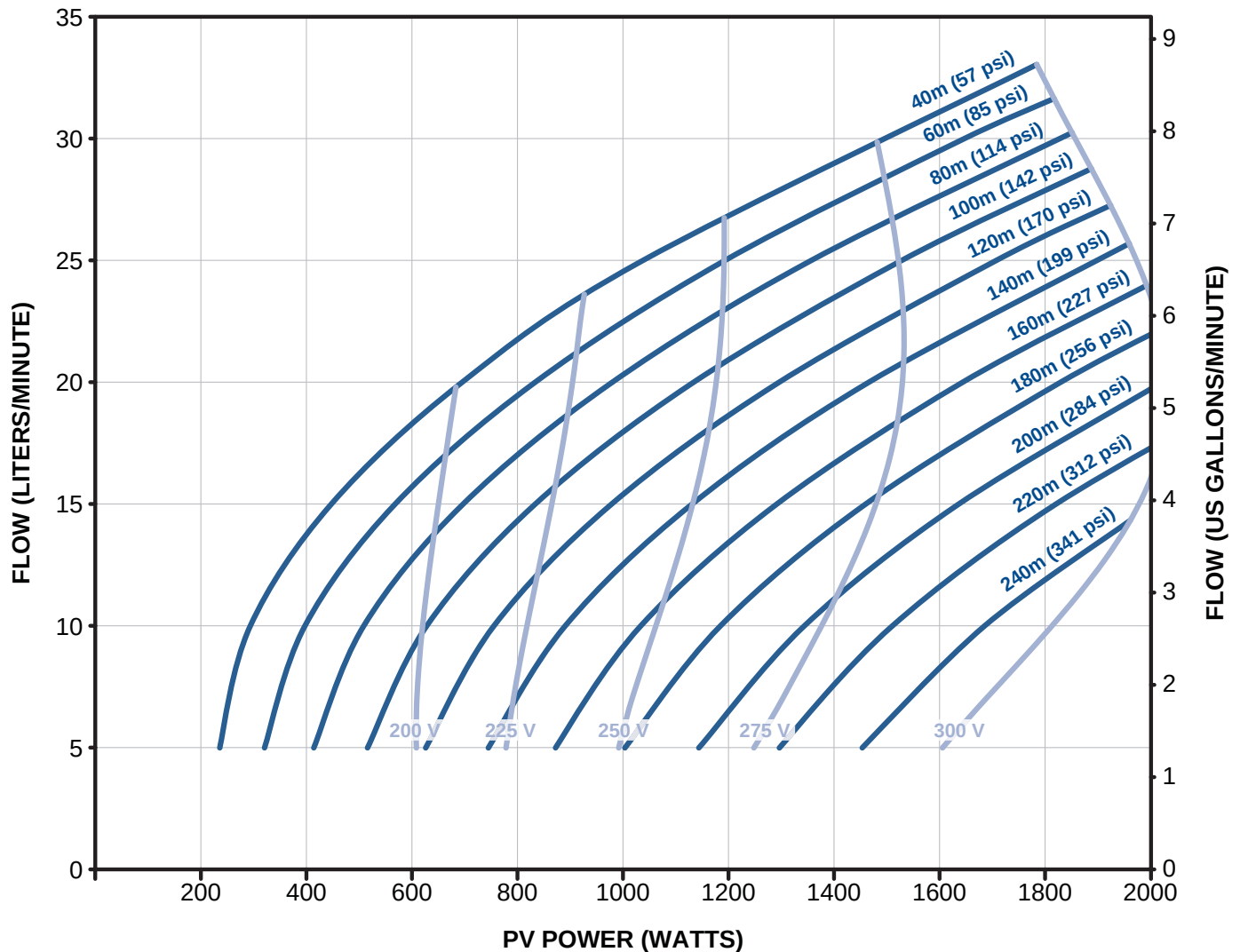
** 316SS Motors available on request

*** Motors shown above include an individual conductor lead installed in the motor. For replacement motors without a lead use part numbers:
1.5 hp / 1.1 kW (2345041903S) and 3.0 hp / 2.2 kW (2343062504)

^(a) High capacity pumps, 100 lpm (35 USGPM) and higher, in a SolarPAK are not supplied with an internal check valve.

18SDSP-1.1KW

SubDrive Solar 1.1 kW, 18 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
40		14	18	22	25	27	29	31	33	
60		10	16	19	22	25	27	30	31	
80			13	17	20	23	26	28	30	
100			9	14	18	21	24	26	28	
120				11	15	19	21	24	26	
140				7	13	16	19	22	24	
160					9	14	17	19	22	24
180					5	10	14	17	20	22
200						6	11	15	17	20
220							8	12	15	17
240								8	12	

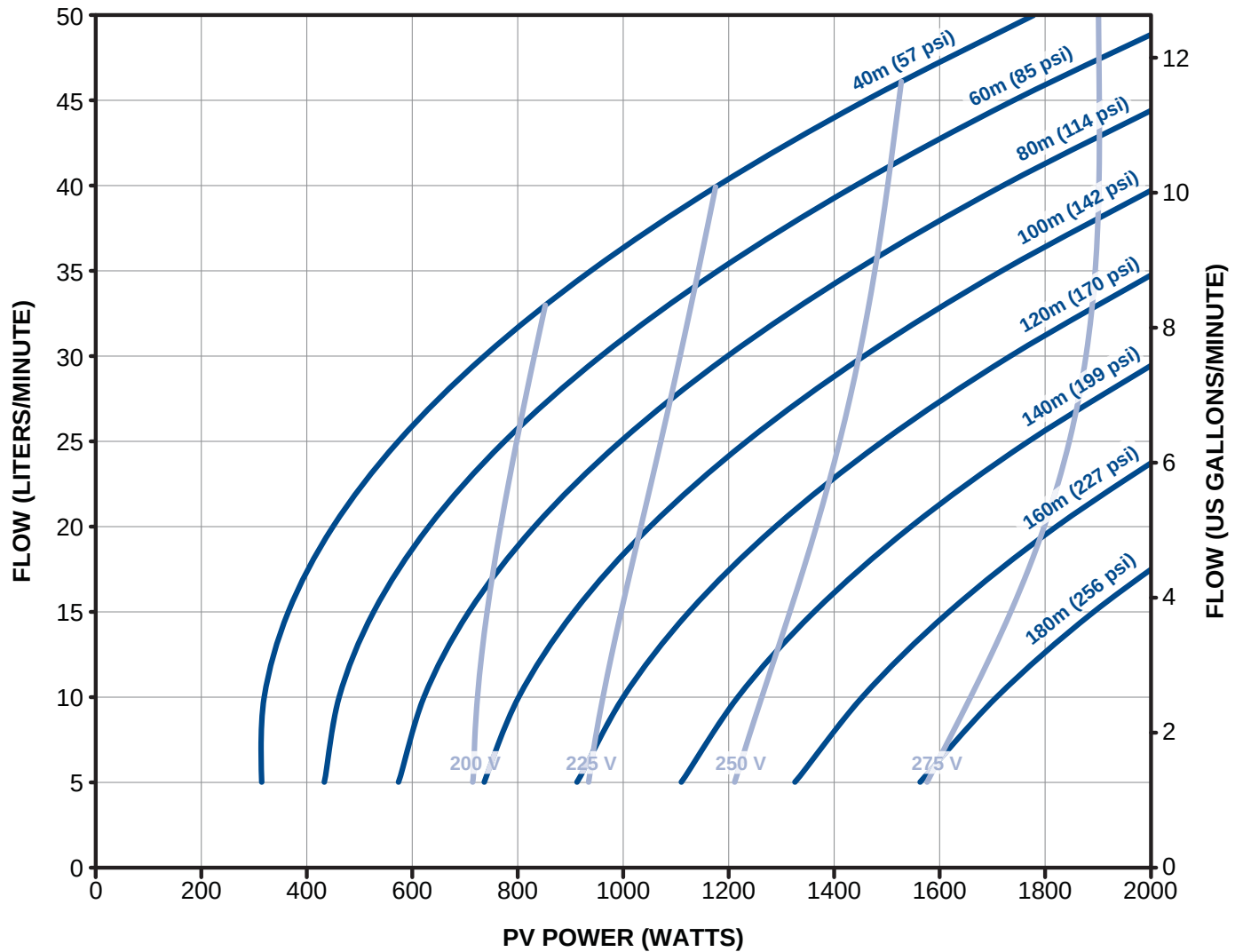
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



30SDSP-1.1kW

SubDrive Solar 1.1 kW, 30 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
40		18	26	32	36	40	44	47	50	
60			19	26	31	35	39	43	46	49
80			8	19	25	30	34	38	41	44
100				10	18	24	29	33	36	40
120					10	18	23	27	31	35
140						9	16	21	26	29
160							8	15	20	24
180								7	13	18

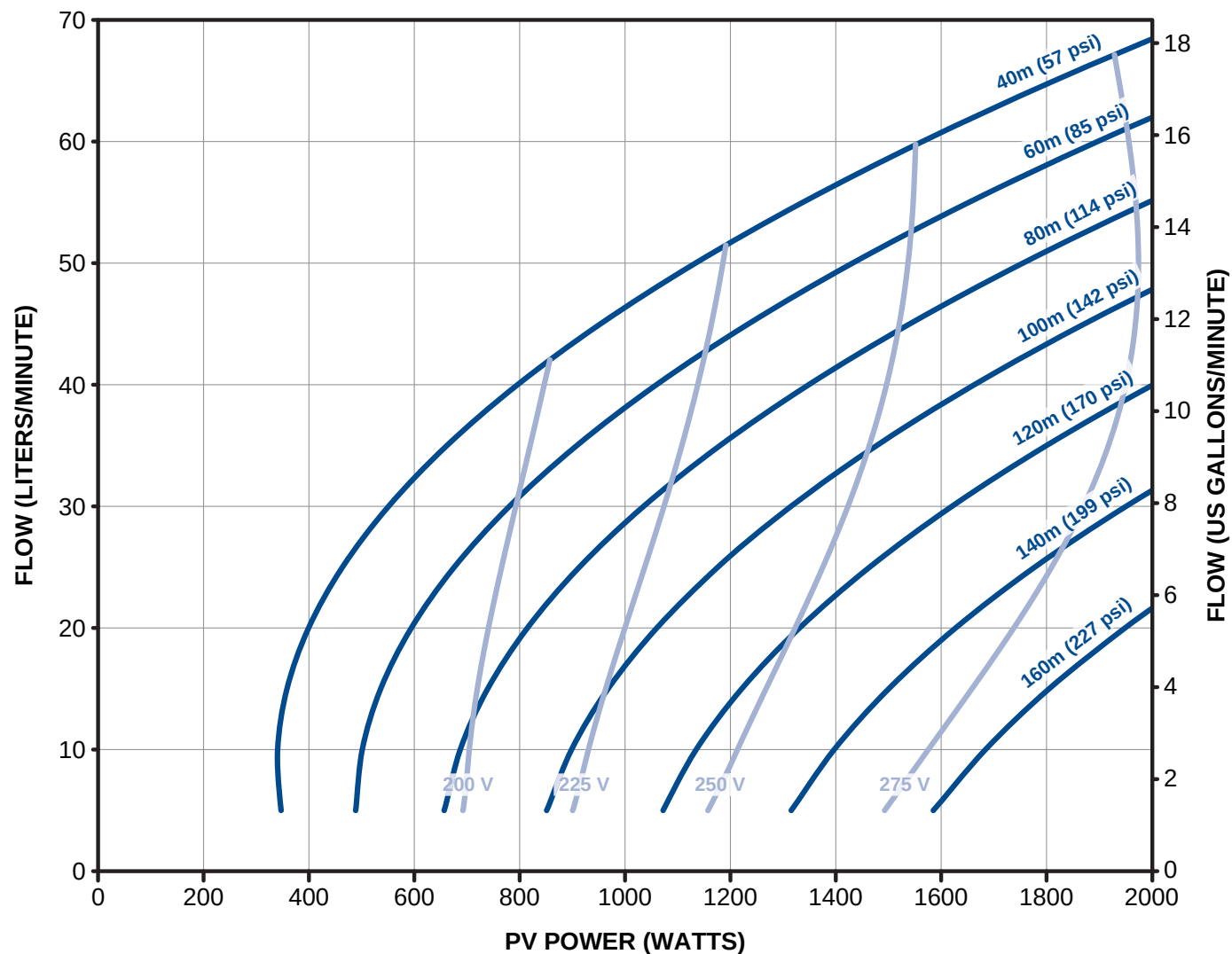
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



45SDSP-1.1kW

SubDrive Solar 1.1 kW, 45 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
40		20	32	40	46	52	56	61	65	68
60			21	31	48	44	49	54	58	62
80				19	29	36	41	46	51	55
100					17	26	33	38	43	48
120						14	23	30	35	40
140							10	19	35	31
160								6	15	22

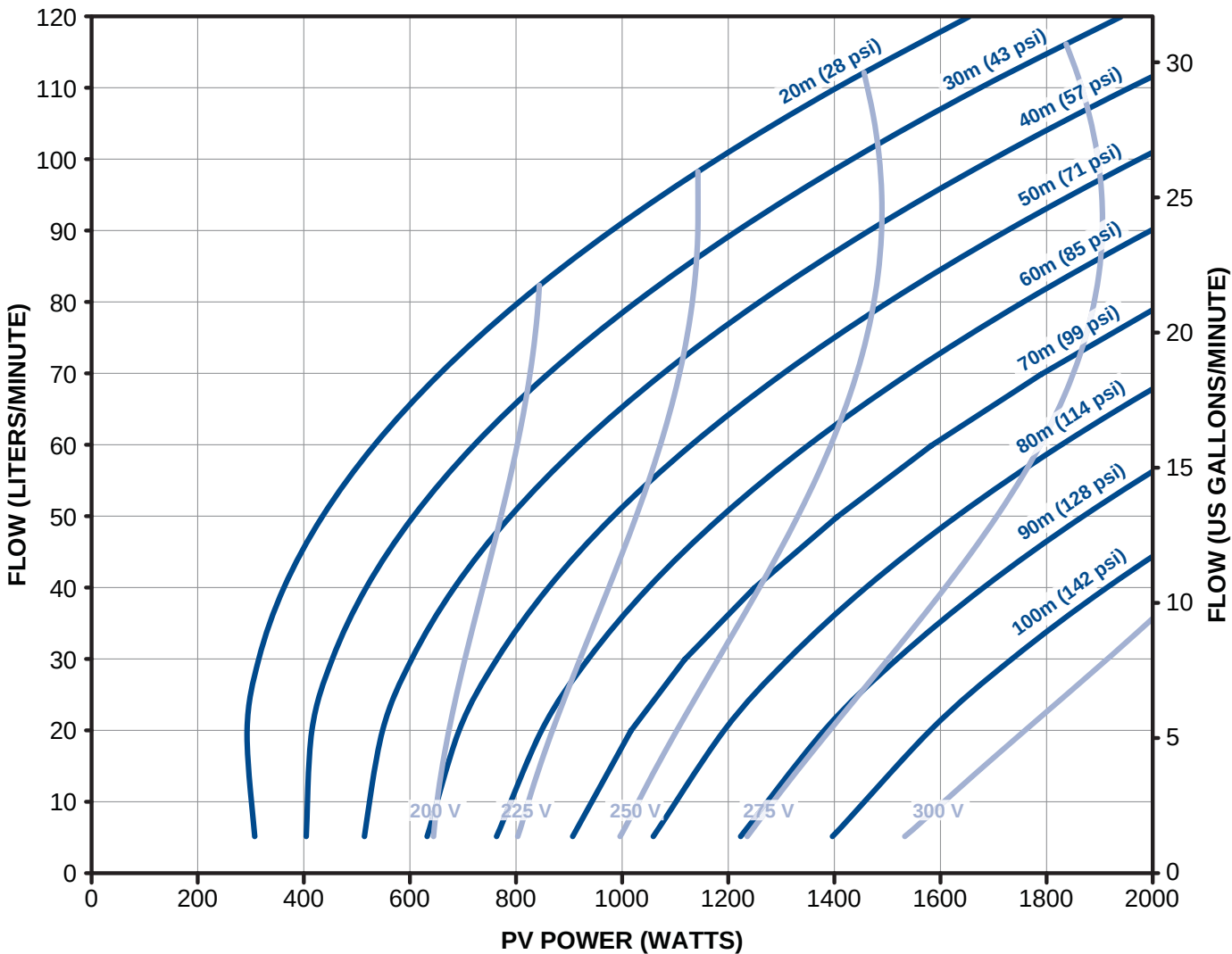
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



70SDSP-1.1kW

SubDrive Solar 1.1 kW, 70 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
20		46	66	80	92	102	110	118		
30			49	66	78	89	98	107	115	
40			30	51	65	77	87	96	104	112
50				34	52	64	75	85	93	101
60				13	36	51	63	73	82	91
70					18	36	50	61	71	80
80						21	36	48	58	68
90							22	35	46	56
100							5	22	34	45

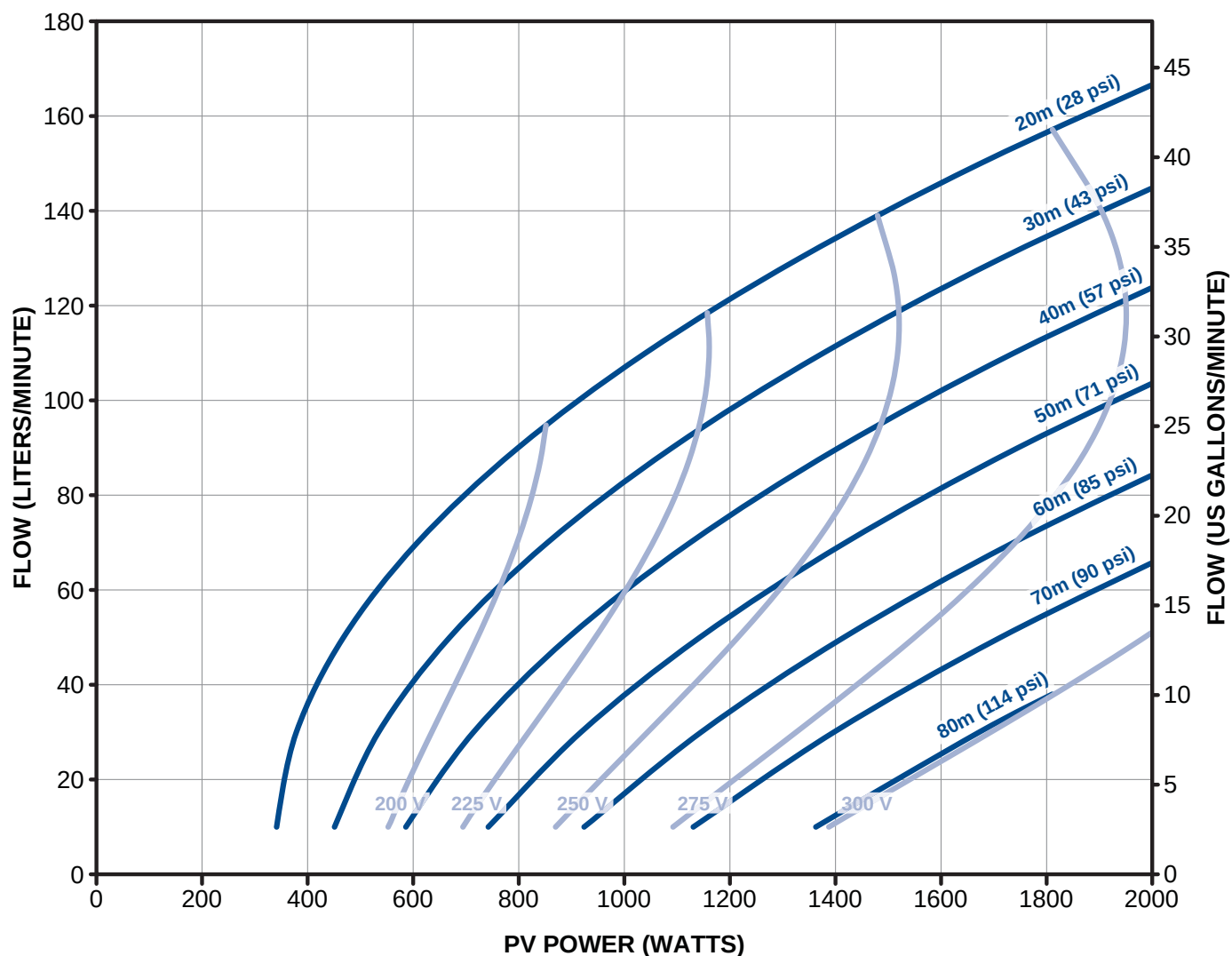
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



100SDSP-1.1kW

SubDrive Solar 1.1 kW, 100 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
20		36	69	90	107	122	135	146	157	166
30			41	65	83	98	112	124	135	145
40			13	40	60	76	90	102	114	124
50				17	38	55	68	81	93	104
60					17	35	49	62	74	85
70						15	30	43	55	66
80							13	25	37	

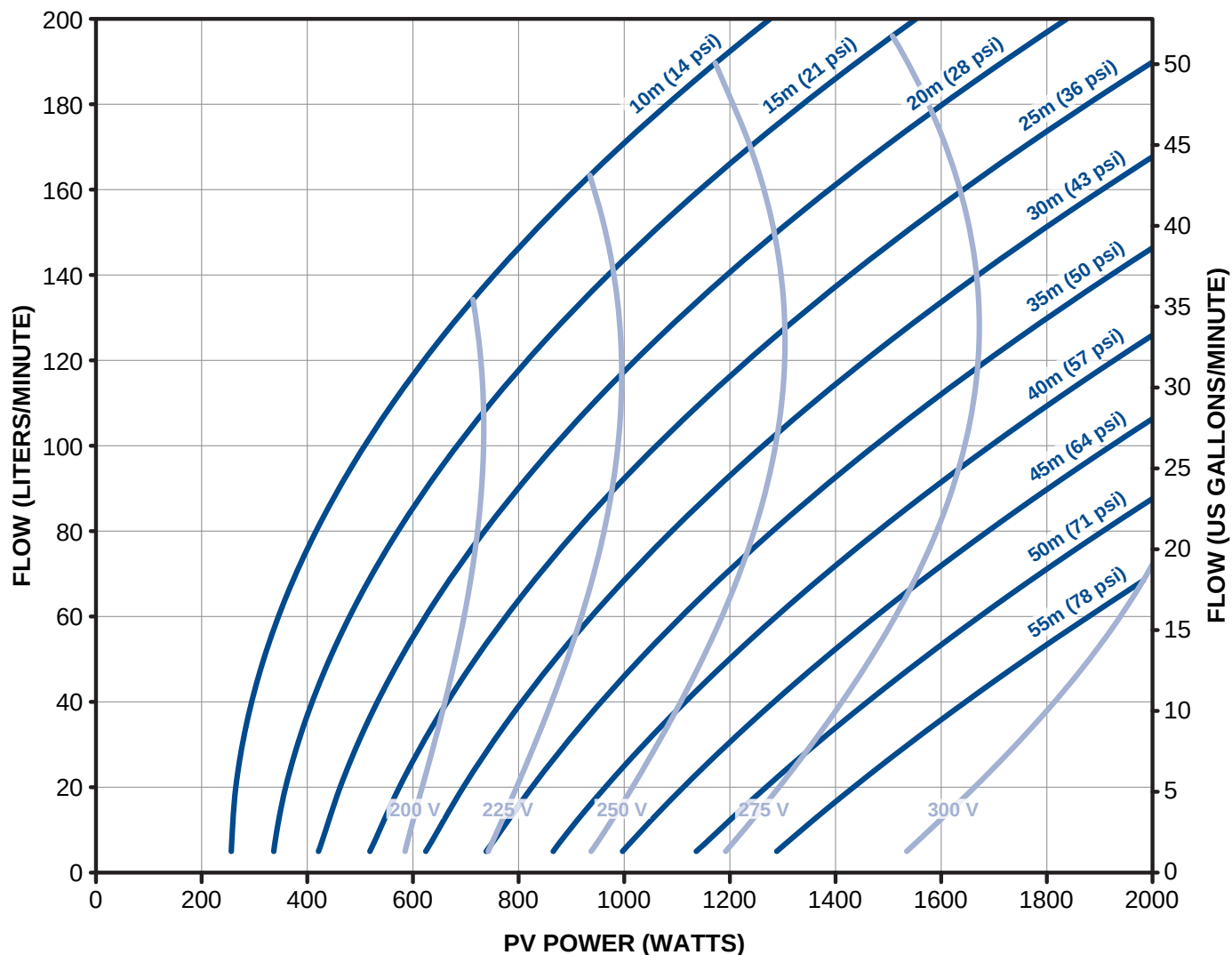
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



150SDSP-1.1kW

SubDrive Solar 1.1 kW, 150 lpm Pump End, 1.1 kW Motor



PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
10		77	117	146	172	193				
15		38	86	118	144	165	186			
20			55	90	118	141	162	180	197	
25			27	64	93	116	138	157	175	190
30				40	69	93	115	134	152	168
35				16	47	71	93	113	130	147
40					25	50	72	91	110	126
45						30	53	72	90	107
50						12	35	54	71	88
55							18	36	54	

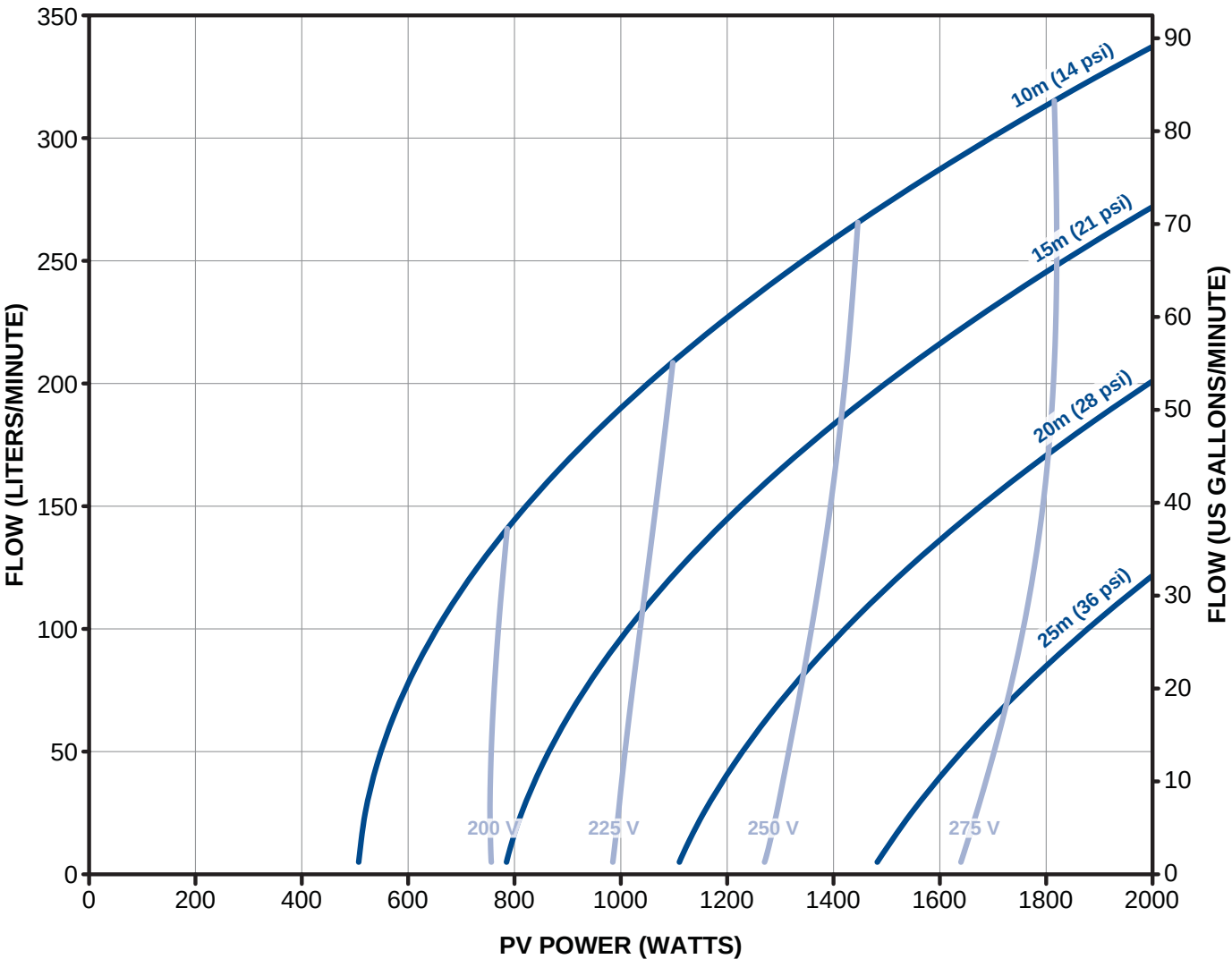
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



270SDSP-1.1kW

SubDrive Solar 1.1 kW, 270 lpm Pump End, 1.1 kW Motor



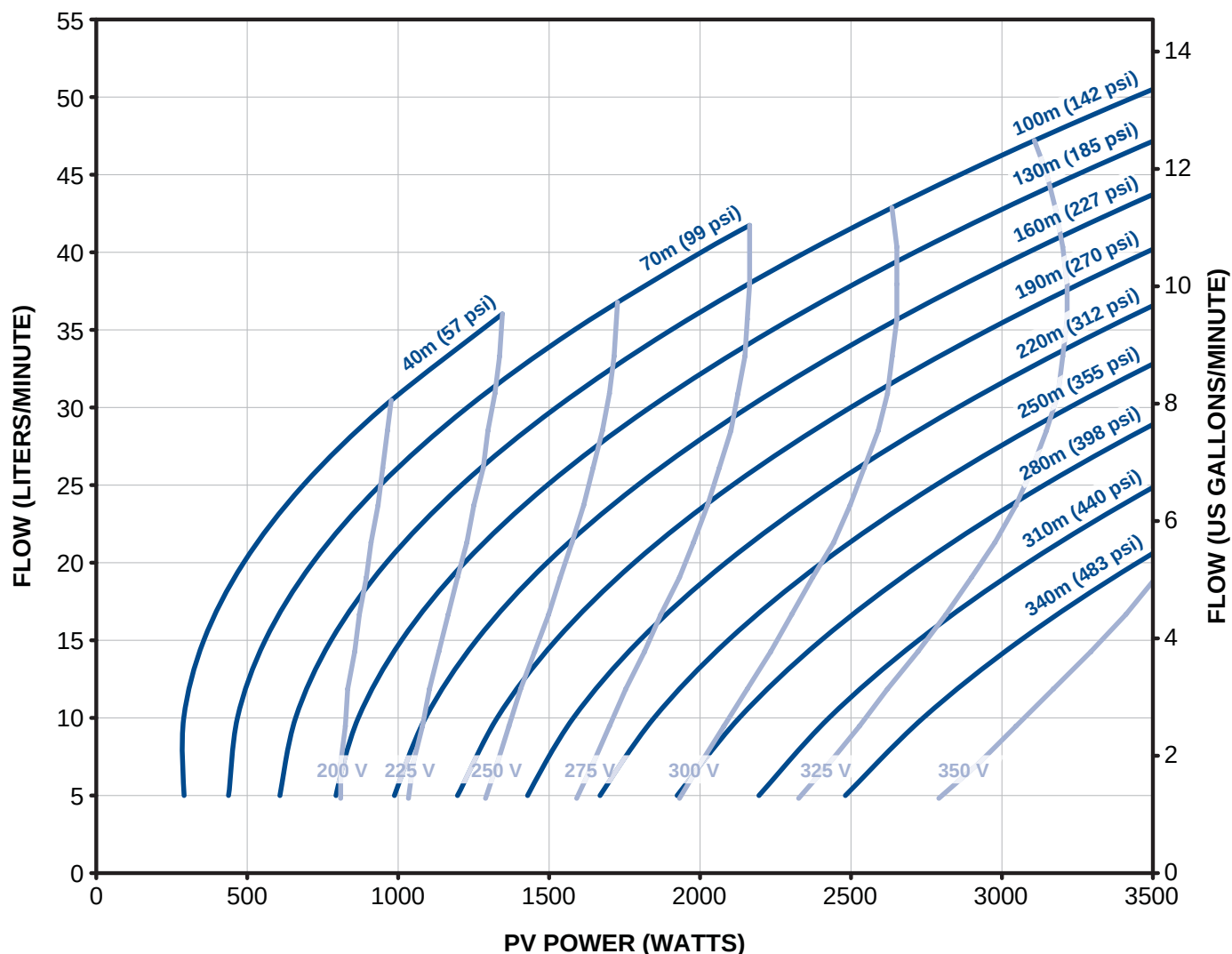
PV Power (Watts)										
	200	400	600	800	1000	1200	1400	1600	1800	2000
Head (m)										
10			78	145	190	227	260	289	314	344
15				18	97	145	184	217	246	272
20						45	95	137	171	202
25								40	85	122

* 1 bar = 10.2 meters of head
**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



25SDSP-2.2kW

SubDrive Solar 2.2 kW, 25 lpm Pump End, 2.2 kW Motor



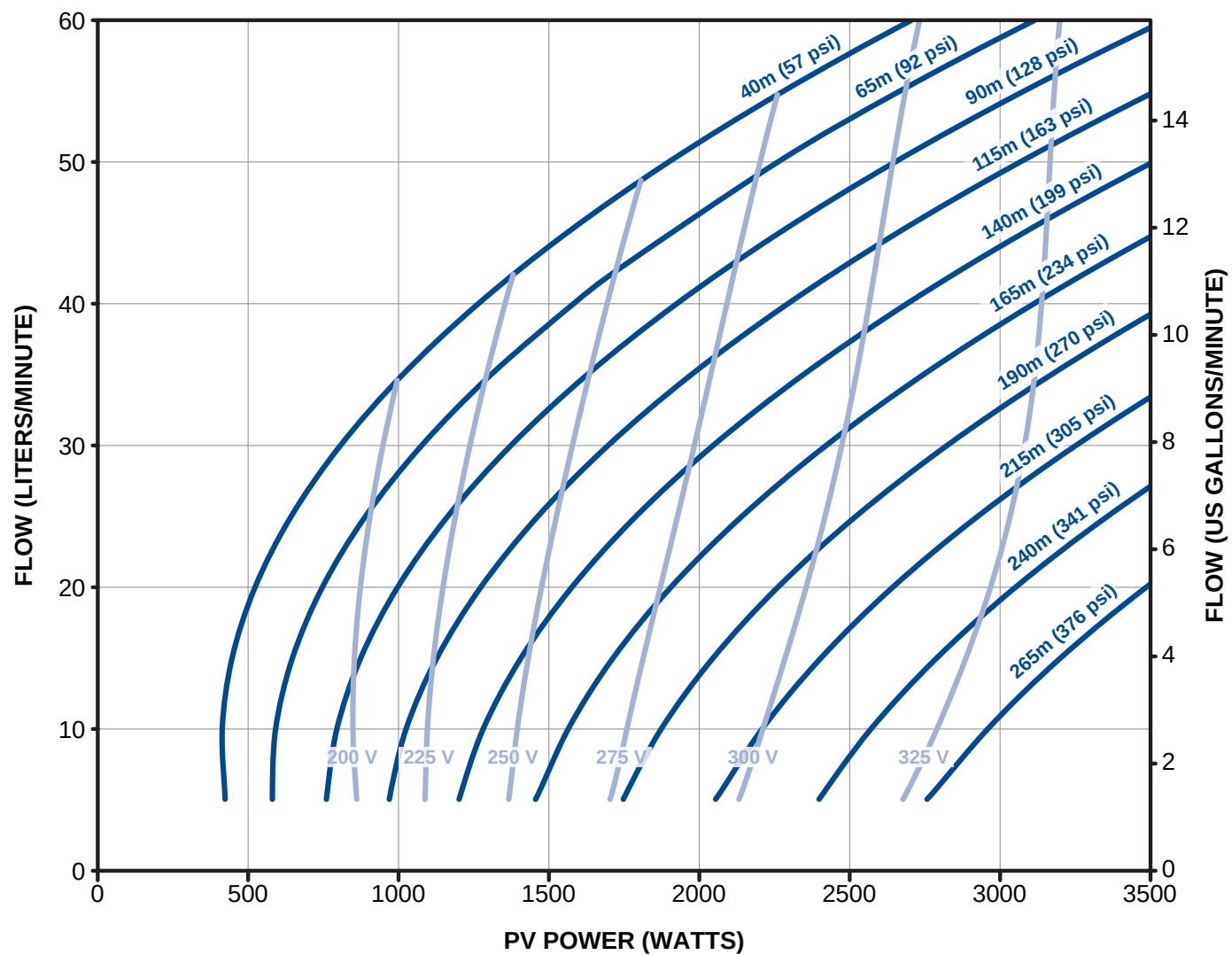
PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
40	26	31	34									
70	21	26	30	34	37	40	43					
100	14	21	26	30	33	36	39	42	44	46	48	50
130		15	21	25	29	32	35	38	40	43	45	47
160		6	15	20	24	28	31	34	37	39	41	44
190			7	14	19	23	27	30	33	35	38	40
220				8	14	19	22	26	29	32	34	37
250					7	13	18	21	25	28	30	33
280						7	12	17	20	23	26	29
310							6	11	15	19	22	25
340								5	10	14	18	21

* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges

30SDSP-2.2kW

SubDrive Solar 2.2 kW, 30 lpm Pump End, 2.2 kW Motor



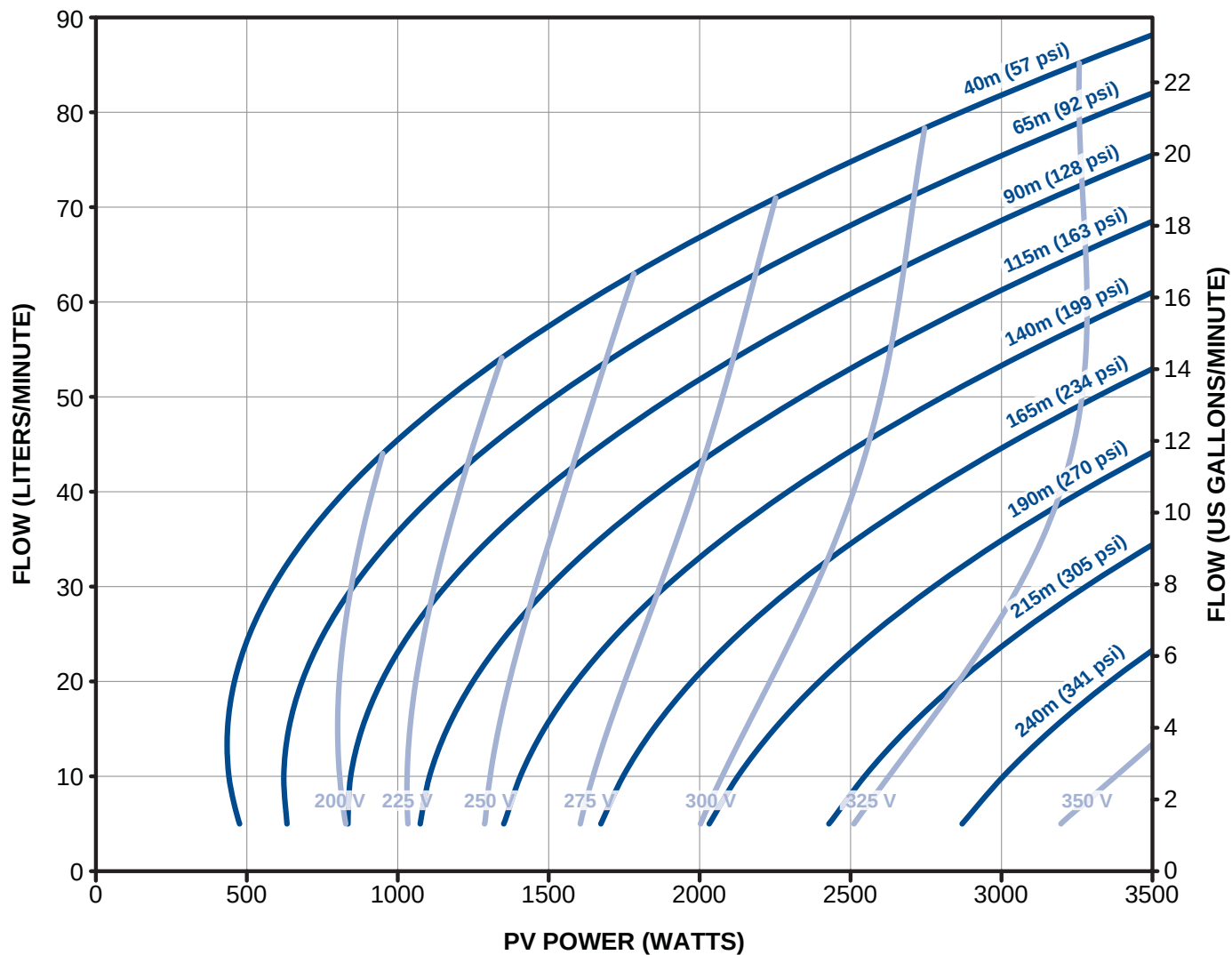
PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
40	28	35	40	44	48	51	55	58	60			
65	20	28	34	39	43	46	50	53	56	59		
90	5	20	27	33	37	41	45	48	51	54	57	59
115		8	19	26	31	35	39	43	46	49	52	55
140			8	18	24	29	33	37	41	44	47	50
165				7	16	22	27	31	35	38	42	45
190					5	14	20	25	29	33	36	39
215							11	17	22	26	30	34
240								8	14	19	23	27
265									5	11	16	20

* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



45SDSP-2.2kW
SubDrive Solar 2.2 kW, 45 lpm Pump End, 2.2 kW Motor



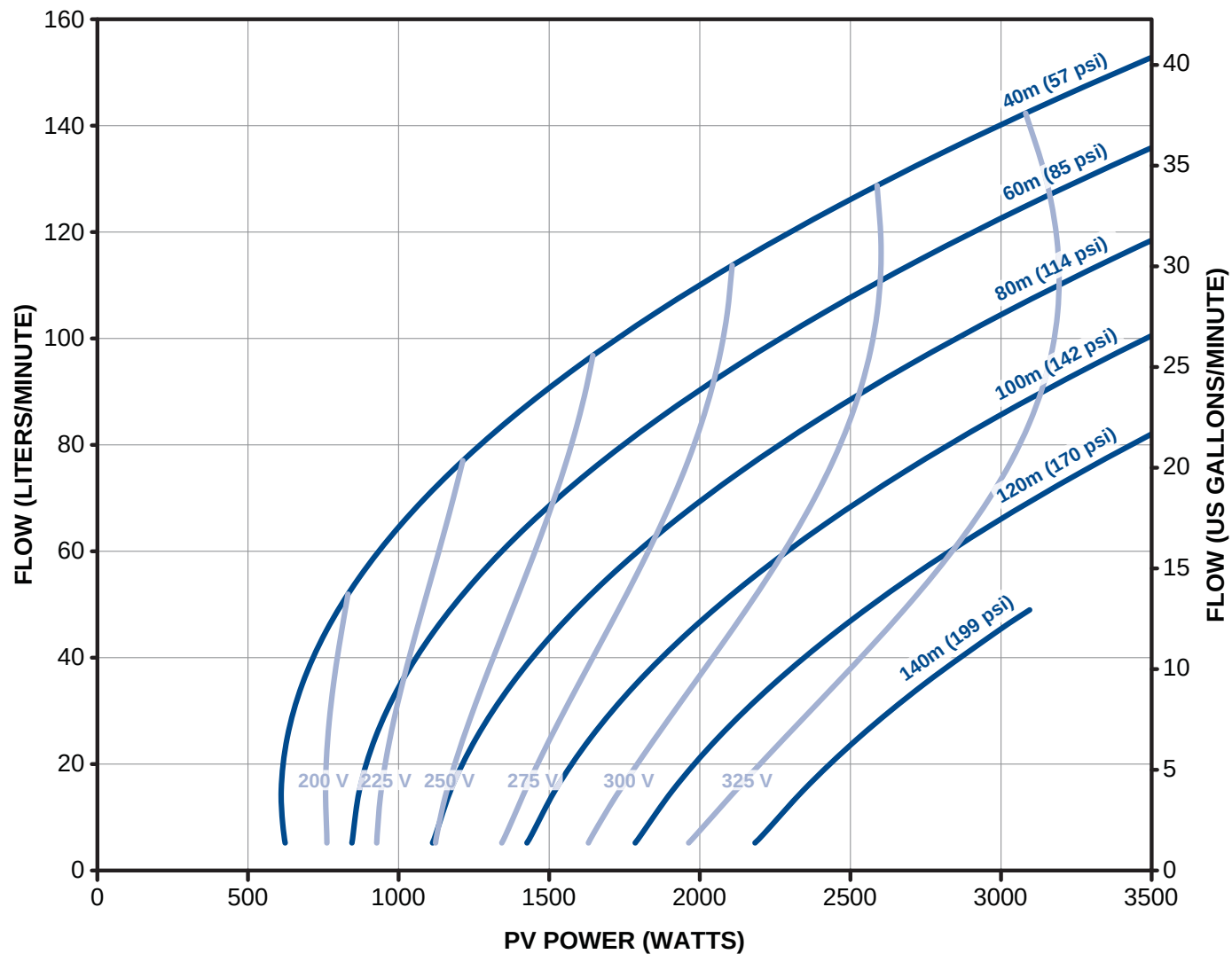
PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
40	38	46	52	58	63	67	71	75	78	82	85	88
65	25	36	44	50	55	60	64	68	72	76	79	82
90		23	33	41	46	52	56	61	65	69	72	76
115			20	30	37	43	48	53	57	61	65	68
140				16	26	33	39	44	49	54	57	61
165					10	21	28	34	40	45	49	53
190							15	23	30	35	40	44
215								8	17	24	30	34
240										10	17	24

* 1 bar = 10.2 meters of head
**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



70SDSP-2.2kW

SubDrive Solar 2.2 kW, 70 lpm Pump End, 2.2 kW Motor



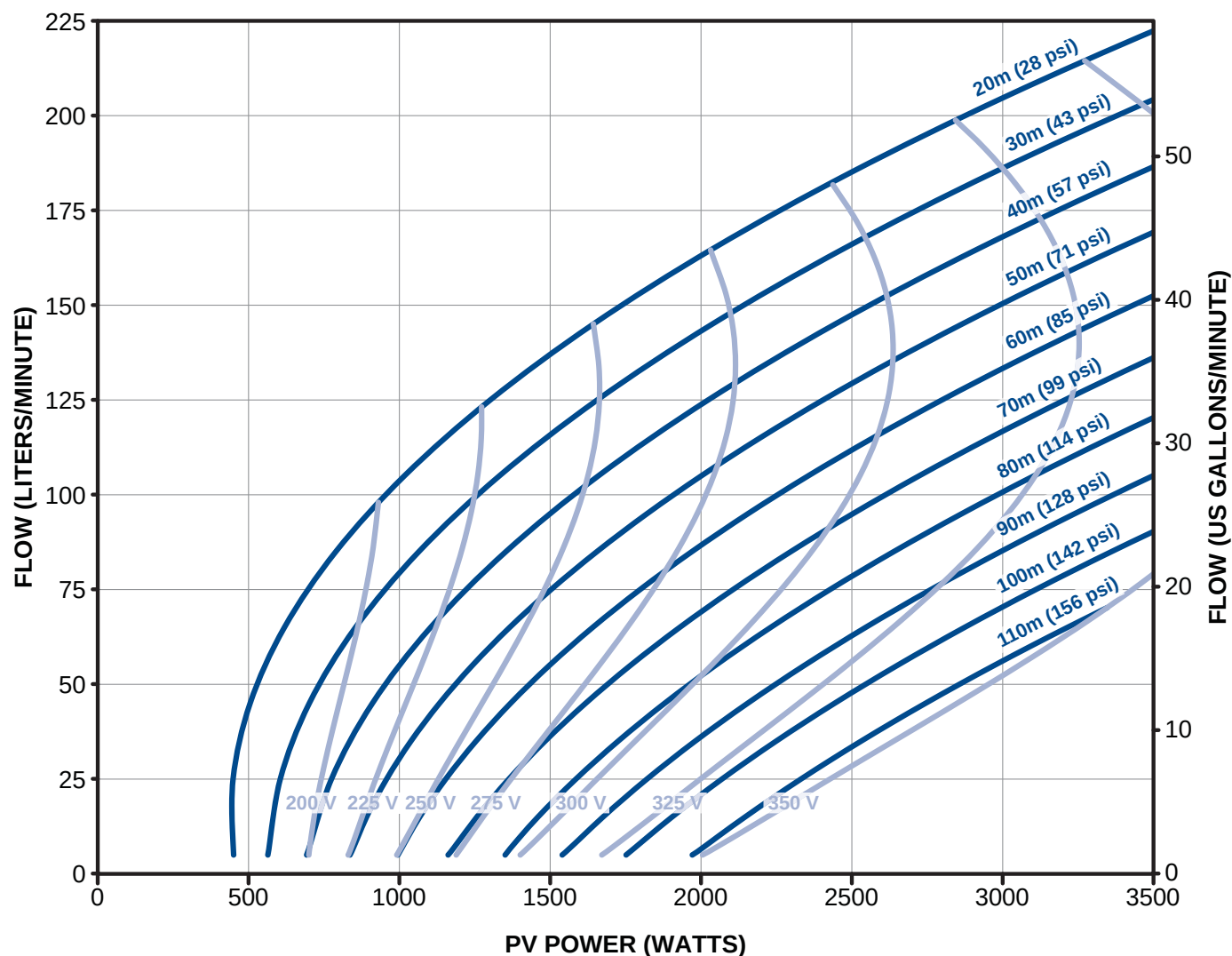
PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
40	45	65	79	91	102	110	118	126	133	140	147	153
60		34	54	68	80	91	99	108	116	122	130	136
80			24	43	58	70	79	88	97	105	112	118
100				13	33	46	58	68	77	86	94	101
120						21	35	47	57	66	74	82
140							10	24	36	45		

* 1 bar = 10.2 meters of head
**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



100SDSP-2.2kW

SubDrive Solar 2.2 kW, 100 lpm Pump End, 2.2 kW Motor



PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
20	82	104	122	137	151	163	175	185	195	205	214	222
30	53	80	100	116	130	143	155	166	177	186	195	205
40	20	55	77	95	110	124	136	147	158	168	178	186
50		30	56	75	91	105	118	130	140	150	160	170
60			35	55	73	86	100	112	123	134	143	152
70			15	36	54	70	83	95	106	117	126	136
80				19	36	52	66	79	90	101	111	120
90					20	36	50	63	75	85	95	105
100						21	35	48	59	70	81	90
110							21	34	45	56	66	

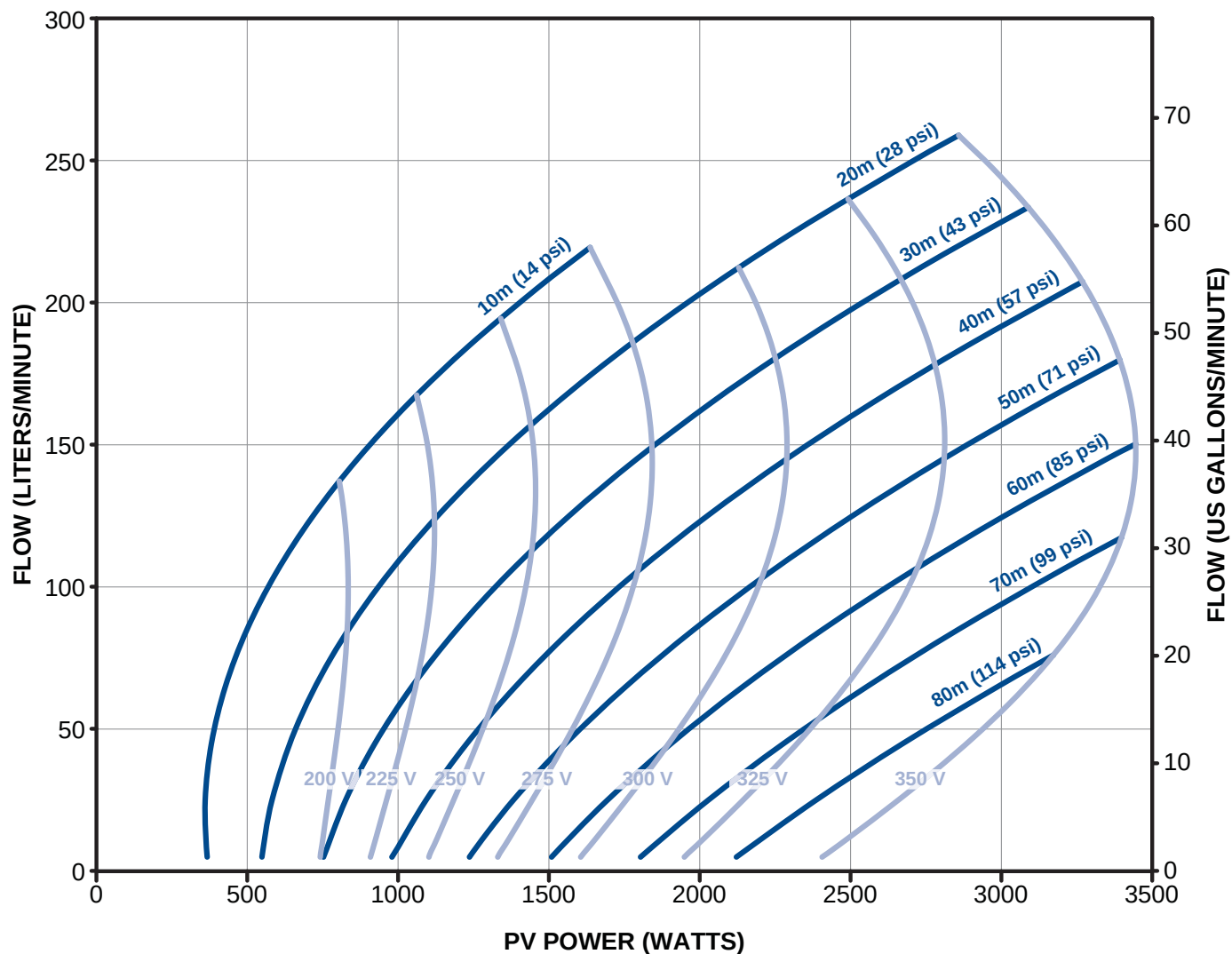
* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



150SDSP-2.2kW

SubDrive Solar 2.2 kW, 150 lpm Pump End, 2.2 kW Motor



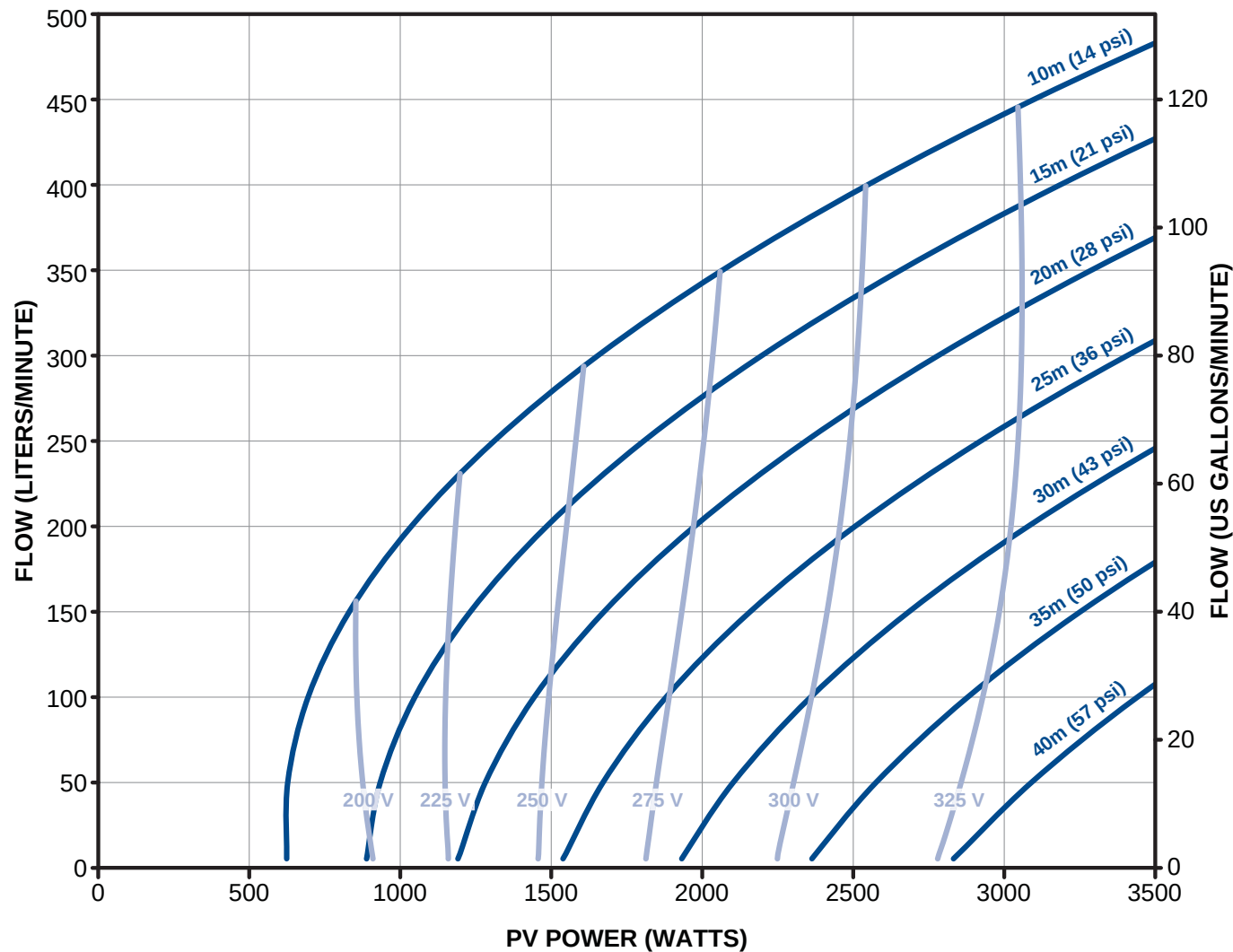
PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
10	130	162	187	209								
20	70	109	139	162	184	204	221	237	253			
30		58	92	119	142	162	180	198	214	229		
40			48	78	102	124	143	160	176	192	207	
50				39	65	86	107	125	141	157	172	
60					31	53	73	92	109	124	140	
70						23	43	61	79	94	109	
80							15	34	50	65		

* 1 bar = 10.2 meters of head

**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges

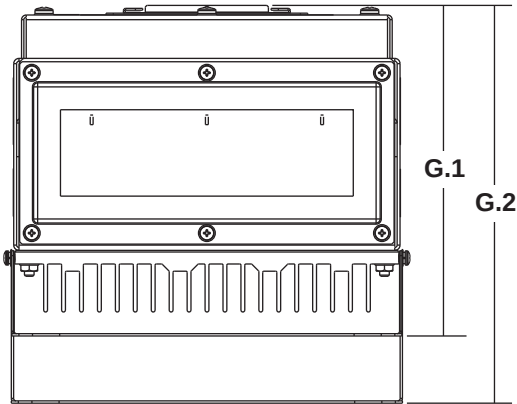
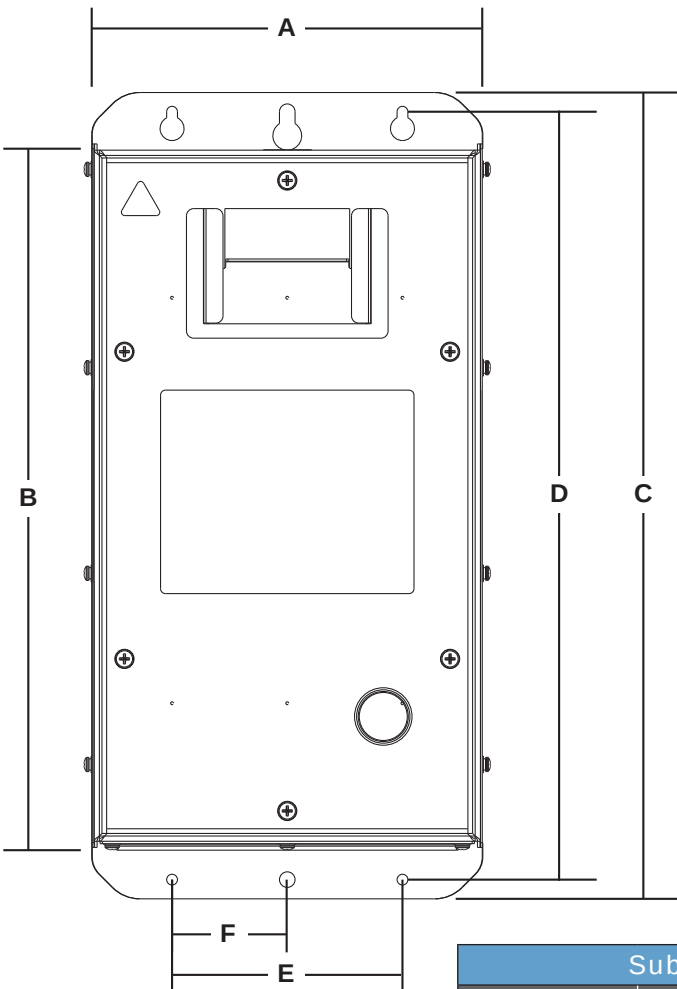


270SDSP-2.2kW
SubDrive Solar 2.2 kW, 270 lpm Pump End, 2.2 kW Motor

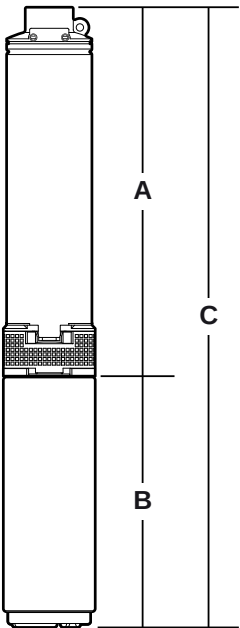


PV Power (Watts)												
	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500
Head (m)												
10	125	192	240	279	312	342	370	395	420	441	463	482
15		82	155	203	242	276	307	334	360	384	406	428
20			38	114	163	204	239	270	297	323	347	370
25					71	123	165	200	230	258	285	310
30						23	80	122	160	190	220	245
35								35	80	118	150	180
40										35	74	110

* 1 bar = 10.2 meters of head
**Refer to Drive Specifications table on page 18 for PV source power and voltage recommended operating ranges



SubDrive Solar Controller Dimensions								
	A	B	C	D	E	F	G.1	G.2
Centimeters	25.9	46.4	53.4	50.8	15.2	7.6	22.1	26.5
Inches	10.2	18.3	21.0	20.0	6.0	3.0	8.7	10.4



Solar PMA Dimensions															
lpm	USGPM	kW	hp	Stages	A		B		C		Discharge	PE Weight		PMA Weight	
					mm	inches	mm	inches	mm	inches		kg	lbs	kg	lbs
18	5	1.1	1.5	30	866	34.1	298	11.7	1164	45.8	1 1/4"	9	19	22	48
30	10	1.1	1.5	18	642	25.3	298	11.7	940	37.0	1 1/4"	7	16	20	45
45	15	1.1	1.5	15	521	20.5	298	11.7	819	32.2	1 1/4"	7	15	20	44
70	25	1.1	1.5	10	488	19.2	298	11.7	786	30.9	1 1/4"	5	10	18	39
100	35	1.1	1.5	10	508	20.0	298	11.7	806	31.7	2"	5	11	18	40
150	45	1.1	1.5	7	593	23.3	298	11.7	891	35.1	2"	7	16	20	45
270	90	1.1	1.5	5	575	22.6	298	11.7	873	34.4	2"	7	15	20	44
25	7	2.2	3	30	866	34.1	408	16.1	1274	50.2	1 1/4"	9	20	28	61
30	10	2.2	3	18	645	25.3	408	16.1	1053	41.4	1 1/4"	7	16	26	57
45	15	2.2	3	15	521	20.5	408	16.1	929	36.6	1 1/4"	7	15	25	56
70	25	2.2	3	10	488	19.2	408	16.1	896	35.3	1 1/4"	5	10	23	51
100	35	2.2	3	10	508	20.0	408	16.1	916	36.1	2"	5	11	24	52
150	45	2.2	3	7	593	23.3	408	16.1	1001	39.4	2"	7	16	26	57
270	90	2.2	3	5	575	22.6	408	16.1	983	38.7	2"	7	15	25	56

Note: Maximum diameter across cable guard is 99.1 mm (3.90") on all models.

SubDrive Solar Controller Specifications

			1.1 kW model	2.2 kW model
Controller Model No.			5870301113	5870301223
General				
Output voltage, max			200 V AC, 3-phase	200 V AC, 3-phase
Max Amps (RMS)			6.8 A, each phase	12.5 A, each phase
Output Frequency			30-58 Hz	30-68 Hz
Efficiency at Max Power			96%	96%
PV Source				
Input Voltage, at mpp			190* – 330 V DC	190* – 330 V DC
Max Amps Input			7 A DC, continuous	12 A DC, continuous
Power at mpp			Up to 2000 watts	2000 – 3500 watts
Alternate AC Generator				
Input voltage			230 V AC, single-phase	230 V AC, single-phase
Max Amps (RMS)			16 A	25 A
Power and VA capability			Follow Instruction Manual for proper Generator Sizing Data	Follow Instruction Manual for proper Generator Sizing Data
For Use With				
Franklin Electric Motor			2345049203S**	2343062604**
SubDrive Solar Pumps (BSPP)	lpm	Stages		
	18	30	90020508	N/A
	25	30	N/A	90020711
	30	18	90021011	90021011
	45	15	90021511	90021511
	70	10	90022511	90022511
	100	10	90023511	90023511
	150	7	90024511	90024511
	270	5	90029011	90029011
SubDrive Solar Pumps (NPT)	USGPM	Stages		
	5	30	90020507	N/A
	7	30	N/A	90020710
	10	18	90021010	90021010
	15	14	90021510	90021510
	25	10	90022510	90022510
	35	10	90023510	90023510
	45	8	90024510	90024510
	90	5	90029010	90029010
Controller Size			L X W X D	L X W X D
Centimeters			(53.34 X 25.87 X 21.87cm)	(53.34 X 25.87 X 26.31cm)
Inches			(21.00" X 10.19" X 8.61")	(21.00" X 10.19" X 10.36")
Controller Weight				
			19 kg (41 lbs)	22 kg (47 lbs)
Operating Conditions				
Temperature Range			-25 °C to 50 °C (40 °C max when using AC generator)	-25 °C to 50 °C (40 °C max when using AC generator)
Relative Humidity Range			0 to 100% Condensing	0 to 100% Condensing

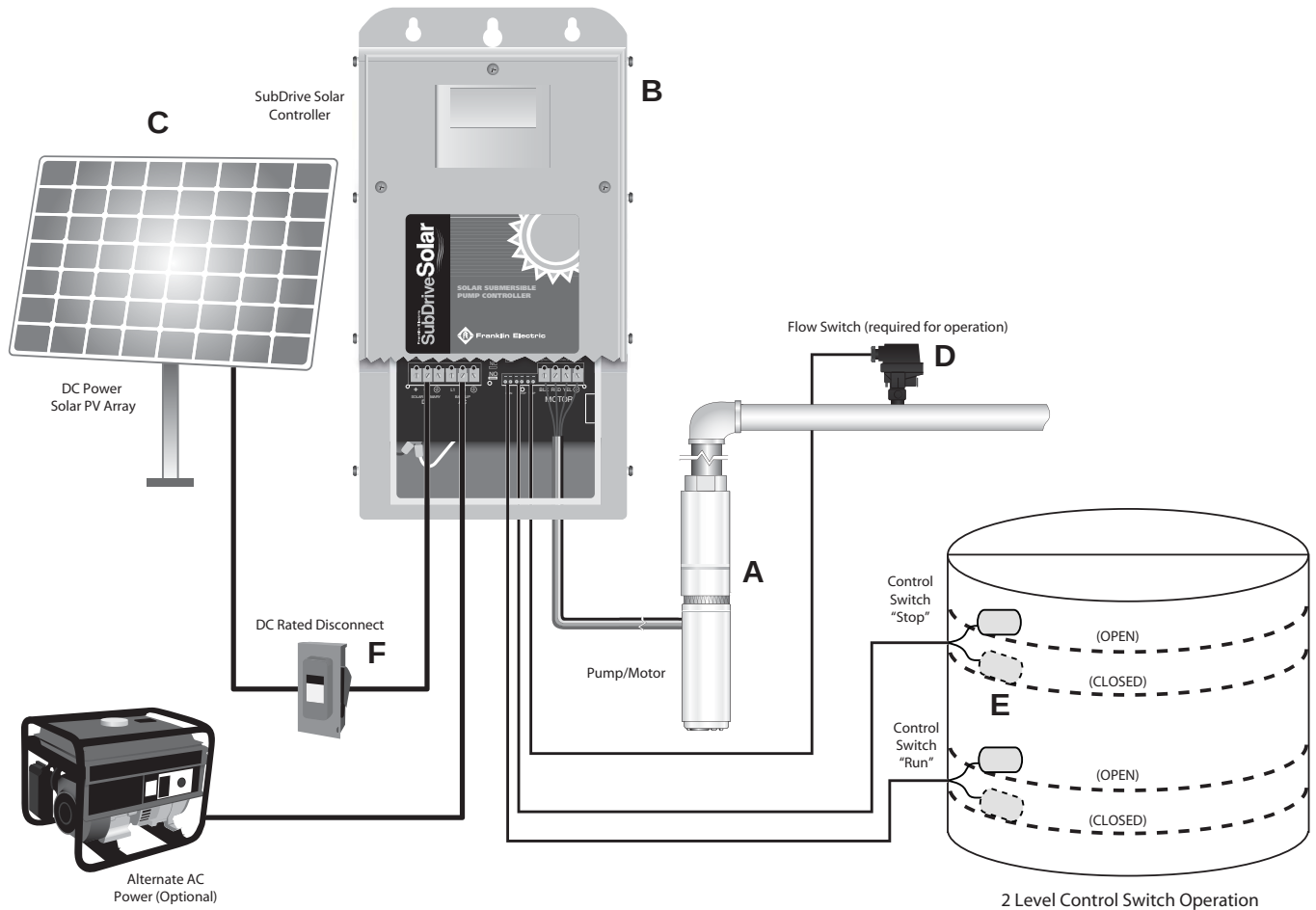
* Drive will attempt to start the pump/motor at 190 V DC, and attempt to continue operation down to 150 V DC. The recommended Vmpp minimum for the system's solar

PV array is 225 Vmpp. Maximum open circuit voltage input to the controller = 410 Voc.

** Motors shown above include an individual conductor lead installed in the motor. For replacement motors without a lead use part numbers:

1.5 hp / 1.1 kW (2345041903S) and 3.0 hp / 2.2 kW (2343062504)

Quick Installation Guide



- A. Pump and Motor (not included)
- B. SubDrive Solar Controller
- C. Solar Array (not included)
- D. Flow Switch (with sensor cable)
- E. Control Switches (optional, not included)
- F. DC Rated Disconnect - Per applicable codes
 - 0 - 11A/800V DC - 308 170 313
 - 14 - 22A/800V DC - 308 170 325

6" High Efficiency Solar System

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

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



System Product advantages:

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

System Technical Specification:

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

System Options:

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

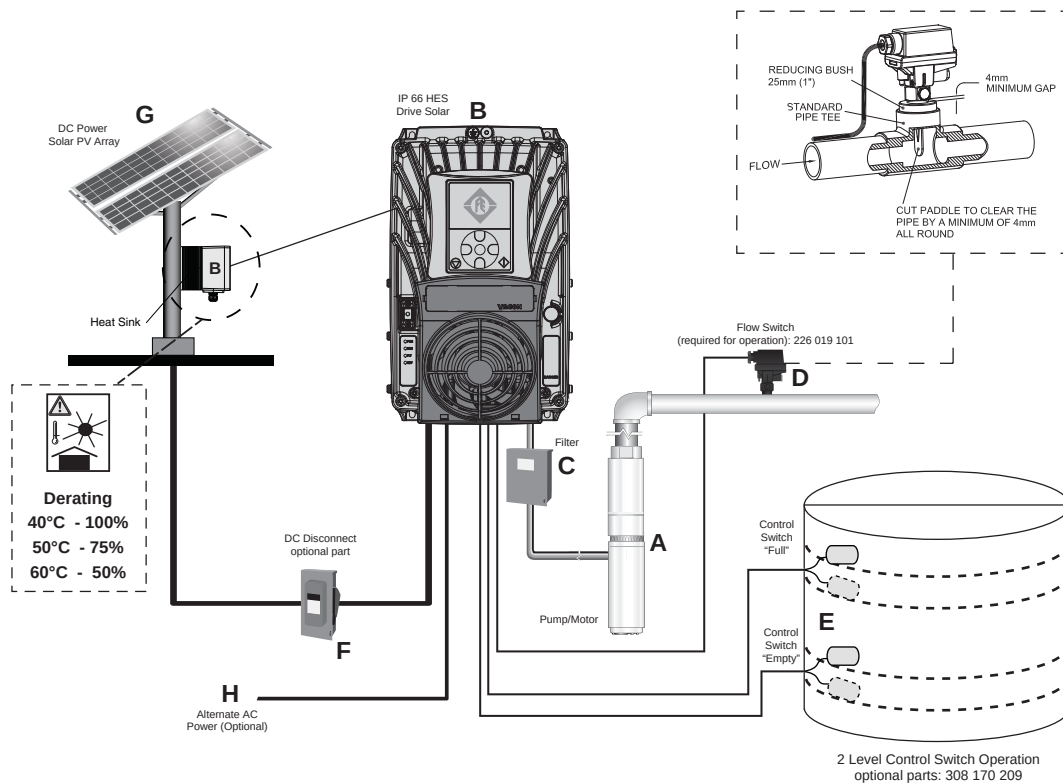
Model Numbers

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

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

*Non-stock items

For lead length > 120m please consult Franklin Electric



- A. High Efficiency Motor and Pump
- B. IP66 HES Drive Solar
- C. OutputFilter
- D. Flow Switch (226 019 101)
- E. Level Control Switch (not included- serarate order 308 170 209)
- F. DC Disconnect, not included- separate order:
0 - 11A/800V DC - 308 170 313
14 - 22A/800V DC - 308 170 325
- G. Solar Array (not included)
- H. AC Alternative Power supply (not included)

Control modes and necessary sensor technologies

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

*please consult Franklin Electric

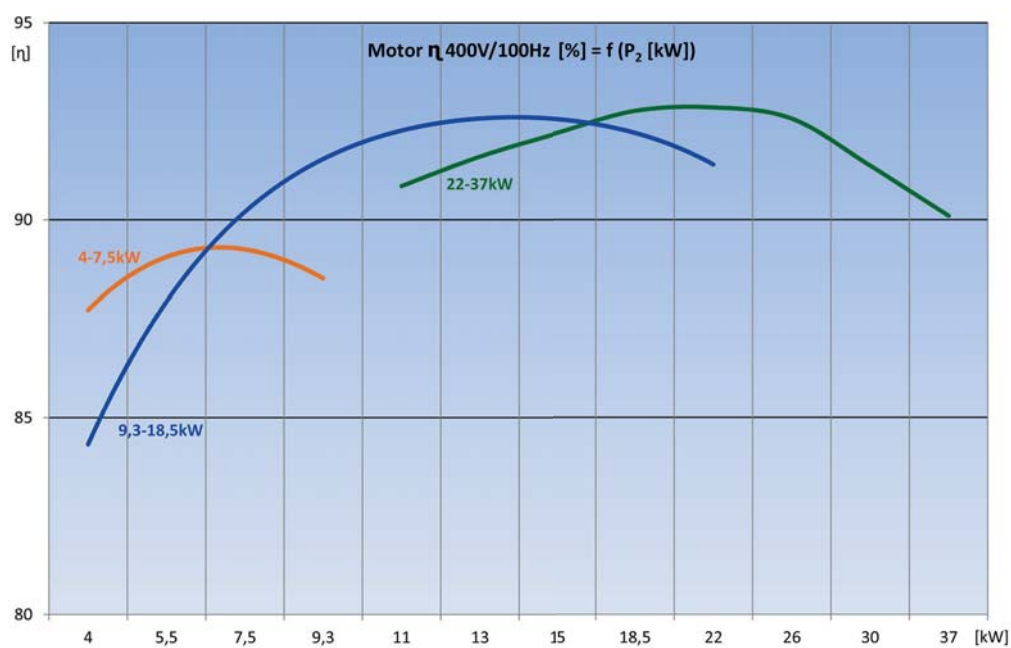


System Performance Data 400V-50Hz / 460V/60Hz

400V-50Hz / 460V-60Hz	P_N [kW]	Thrust F [kN]	n_N [min ⁻¹]	I_N [A]	I_A / I_N^* [A]	η [%]	PF [cos ϕ]	T_N [Nm]	T_A / T_N^* [Nm]
308 010 X16S	4	15,5	3000 / 3600	8	1	88	0,95	12,9	1
	5,5	15,5	3000 / 3600	10	1	89	0,95	17,5	1
	7,5	15,5	3000 / 3600	13	1	89,5	0,95	23,8	1
308 014 X23S	9,3	15,5	3000 / 3600	18	1	91,5	0,95	29,6	1
	11	15,5	3000 / 3600	20	1	92	0,95	35	1
308 014 X38S	13	15,5	3000 / 3600	23	1	92,5	0,95	41,5	1
	15	15,5	3000 / 3600	26	1	92,5	0,95	46,1	1
	18,5	15,5	3000 / 3600	32	1	92	0,95	59	1
308 016 X61S	22	27,5	3000 / 3600	39	1	93	0,95	70	1
	26	27,5	3000 / 3600	46	1	92,5	0,95	82,6	1
	30	27,5	3000 / 3600	54	1	91,5	0,95	95,5	1

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



High Efficiency Motor

Motor Features:

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

Motor Technical Specification:

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

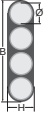
Motor Options:

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



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

Motor Short Leads*

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

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

*Cables are designed for submerged operation.

Motor Drop Lead

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

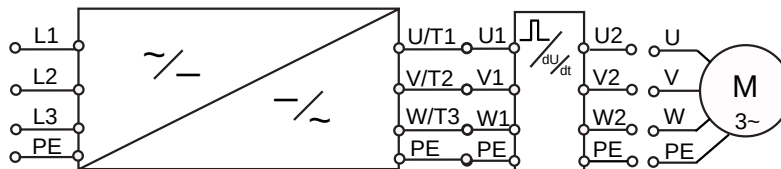
P _N [kW]	cable size mm², copper wire - 90°C rated insulation						
	4	6	10	16	25	35	50
4	160	250	410	-	-	-	-
5,5	140	200	340	530	-	-	-
7,5	100	150	250	390	-	-	-
9,3	75	110	190	300	460	-	-
11	65	100	160	260	400	-	-
13	55	85	140	220	340	460	-
15	-	70	120	190	300	400	-
18,5	-	60	100	160	240	320	440
22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

For lead length > 120m please consult Franklin Electric.

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

Electrical Connection

DOL

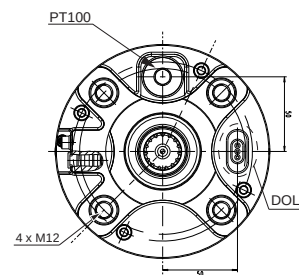
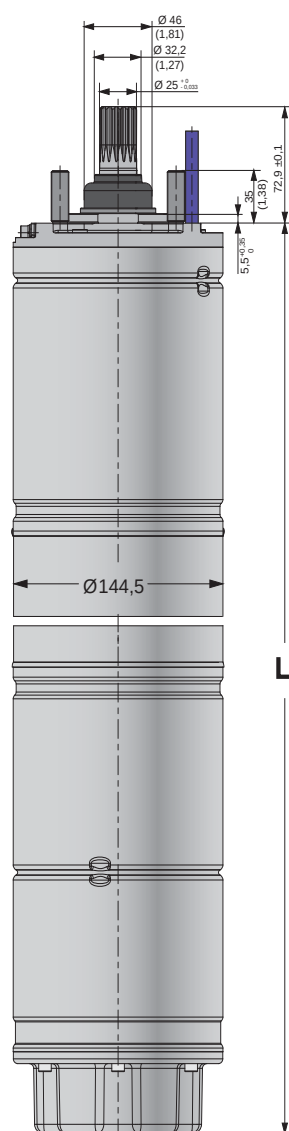


U	V	W	PE
brown	grey	black	yellow/green



Motor Design

304SS / 316SS / 904L



Construction Materials

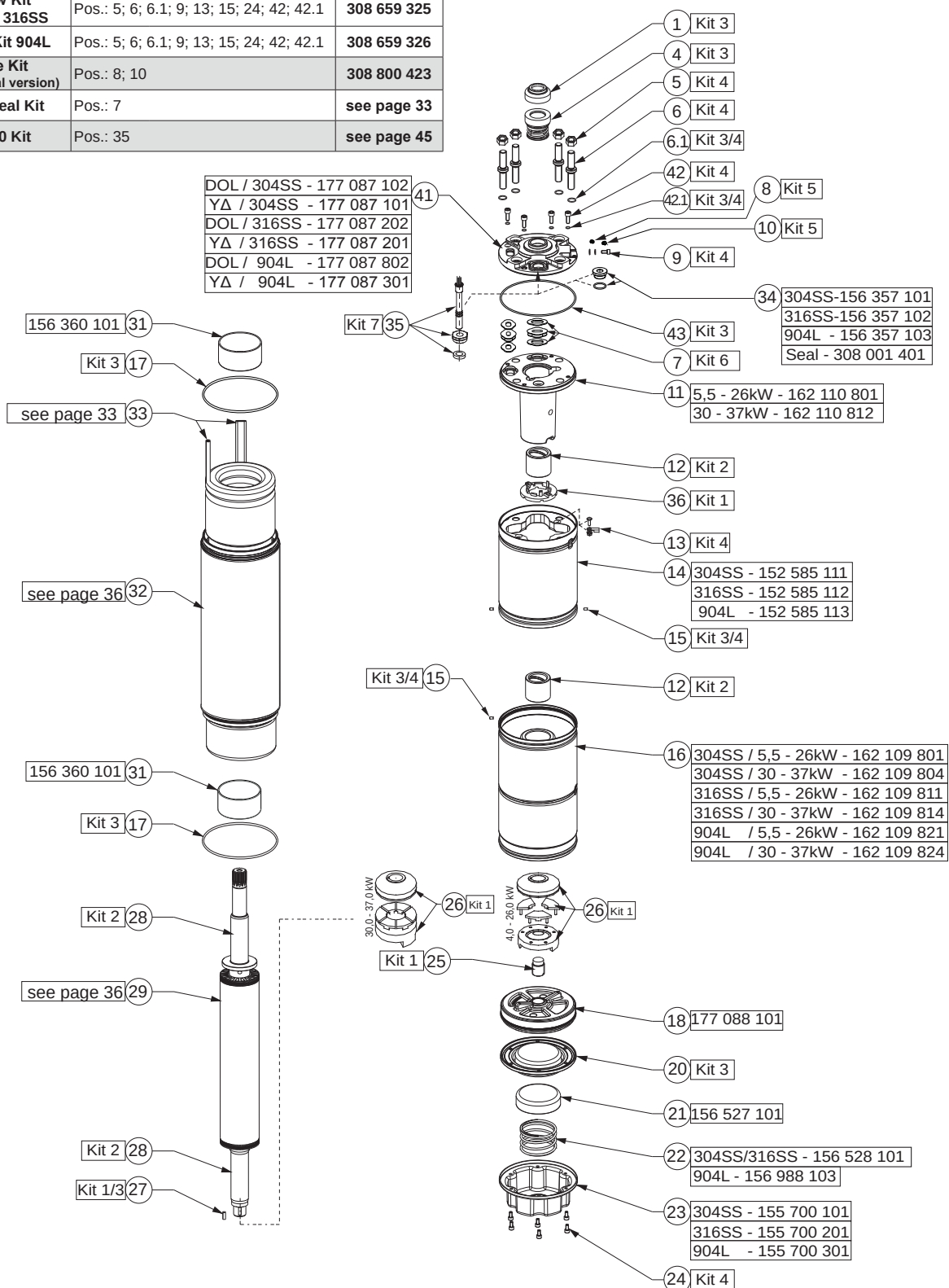
Component	304SS	316SS	904L
Shaft Extensions	1.4021	1.4462	1.4462
Slinger	NBR	NBR	NBR
Seal	SiC/SiC	SiC/SiC	SiC/SiC
End bell, NEMA	1.4308	1.4408	1.4539
Stator Shell	1.4301	1.4571	1.4539
Diaphragm	EPDM	EPDM	EPDM
Diaphragm Cover	1.4301	1.4404	1.4539

Motor Lengths and Weights

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

Motor Spare Parts 304SS / 316SS / 904L

Kit 1	Thrust Bearing Kit	4-18,5kW	Pos.: 17; 25; 26; 27; 36	308 750 301
		22-37kW		308 750 302
Kit 2	Radial Bearing Kit	4-18,5kW	Pos.: 12; 28	308 750 401
		22-37kW		308 750 403
Kit 3	Seal Kit 304SS / 316SS / 904L	Pos.: 1; 4; 6.1; 15; 17; 20; 34; 42.1, 43		308 800 422
Kit 4	Screw Kit 304SS / 316SS	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 325
	Screw Kit 904L	Pos.: 5; 6; 6.1; 9; 13; 15; 24; 42; 42.1		308 659 326
Kit 5	Valve Kit (all Material version)	Pos.: 8; 10		308 800 423
Kit 6	Lead Seal Kit	Pos.: 7		see page 33
Kit 7	PT100 Kit	Pos.: 35		see page 45



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

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

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

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

Insulation resistance (20°C / 500 VDC)

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

Motor Repair Instructions

Pictured Repair Instructions 304SS / 316SS / 904L	308 018 624
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Variable Speed Drive (VFD)

VFD Features:

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



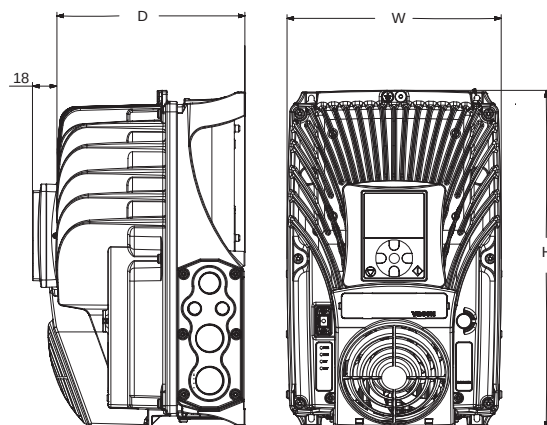
VFD Technical Specification:

Technical Data		
Power supply	Input voltage U_{IN}	400 - 840V DC
	Input frequency f_{IN}	30 - 65Hz
	Starts per hour	20 ; with min 3min rest period
Motor connection	Output voltage	0 - U_N
	Output current	I_N at rated Ambient temperature (40°C) Overload: IP66: $1,5 \times I_N$ (1min/10min) IP21: $1,1 \times I_N$
	Output frequency	0- f_N , resolution 0,01Hz
Performance	Efficiency	97,5%
Control characteristics	Switching frequency	3,6 6 kHz; default setting 4 kHz
Ambient conditions	Operation temperature	-10°C...+50°C (>40°C with derating) - 40°C optional for IP66
	Storage temperature	-40°C+70°C
	Altitude	3000m (>1000m with derating)
EMC	Immunity & Emissions	Complies with EN 61800-3, Category C2 - first and second environment
Communication	RS 485	Standard: Modbus
	Ethernet	Standard: Modbus
I/O connections	Digital Input (DI)	6x
	Analog Input (AI)	2x
	Analog Output (AO)	1x
	Relay Output (RO)	2x (change-over contact)

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

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

IP66



VFD Model Numbers and Dimensions 400V-50Hz / 460V/60Hz IP66 up to 30kW

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

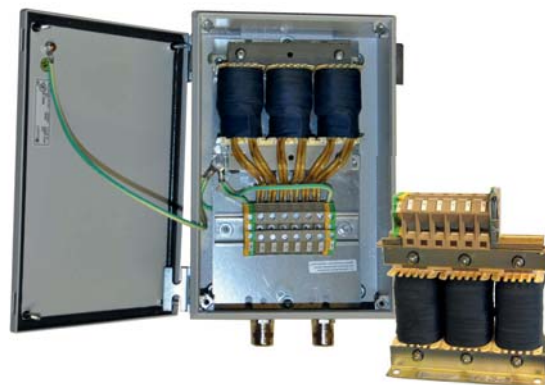
VFD Options:

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

Output Filter

Output Filter Features:

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



Output Filter Technical Specification:

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

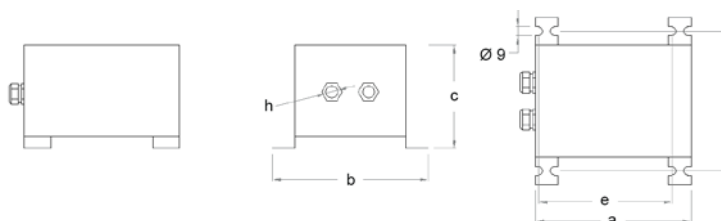
Output Filter Options:

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

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

System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal [mm²]	clamping torque [Nm]
			a	b	c	e	f				
308 010 216 308 014 223	314 005 110	23	300	260	135	250	230	2x24-35	8	2,5 - 16	2,5 - 5,0
308 014 238	314 005 111	38	300	260	135	250	230	2x24-35	12	2,5 - 35	2,5 - 5,0
308 016 261	314 005 112	61	450	360	215	400	330	2x32-42	22	2,5 - 35	2,5 - 5,0

Filter outlines

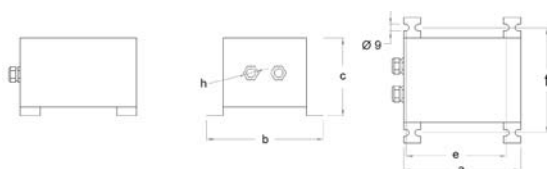


400/500V du/dt Sinus Filter Model Data - Protection Class IP54

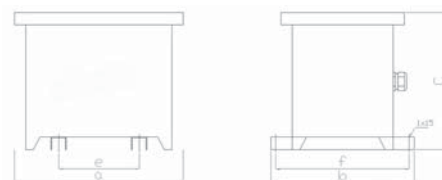
System model number	Filter order code	I _N [A]	Dimensions [mm]					cable Ø [mm]	weight [kg]	terminal [mm²]	clamping torque [Nm]
			a	b	c	e	f				
308 010 316	314 005 117	16	300	300	215	250	330	2x24-35	34	2,5 - 35	2,5 - 5
308 014 323*	314 005 113	23	520	480	480	240	440	2x24-35	75	2,5 - 35	2,5 - 5
308 014 338*	314 005 115	38	660	560	590	310	520	2x24-35	100	16 - 50	3 - 6
308 016 361*	314 005 116	72	660	560	590	310	520	2x38-48	110	16 - 50	3 - 6

*Floor mount

Wall mount outlines



Floor mount outlines





SS Pump

For any pump support please refer to:
<http://www.etechpumps.com>



Accessories

Termination Kit 4"

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

Kit- Type	Mod. Number	Description
Standard	308 090 901	without . Strain relief Attention: Limited shelf life of Resin and Hardener



Double Plug Lead for Termination Kit

Required for use of lead termination kit 308 090 901. Connected between termination kit and 4" motor.

- PSC / 2-wire / 3-wire Motors and 3 ~ Motors up to 2,2kW
- Material: Connector- Ni plated brass; Lead: rubber
- 3 wire lead with ground
- Max. current 16 amps.
- Approvals: KTW



Mod. No.	PSC / 3 - wire / 3-Phase
309 111 401	3X1,5+1G1,5mm ² 2,5 m - without . Strain relief

4" Corrosion protection in aggressive water

Application:

Wells with extremely high levels of chlorides and other elements in combination with high temperatures will aggressively attack and corrode nearly any type of metal, including stainless steel. Typical severe applications are geothermal wells and mine wells, and applications with low service times.

Material Specification: GG25





Lead Termination Kit 1,5 - 10mm²

- 3M Quality
 - 4 wire
 - 1,5 - 10mm²
 - up to 1,1kV
- Part number: 308 090 921**



Motor Filling Liquid

Filling liquid 5 L FES92

4" Encapsulated	→	FES93	8" Encapsulated Standard	→	FES91
6" Encapsulated Standard	→	FES91	8" Encapsulated HighTemp75	→	FES92
6" Encapsulated HighTemp90	→	FES92	Rewindable	Std. Async.	→ FES93
				PM. Syncr.	→ FES93



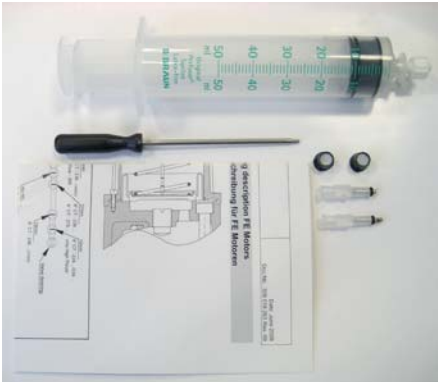
**Part number:
308 353 941**

FES91	FES92	FES93

Motor Filling Kit

This kit contains all necessary tools to check and replenish Franklin Electric submersible motors with FES 91, 92 or 93 filling liquid (fill solution/concentrate must be ordered separately).

Part number: 308 726 103



Accessories

Couplings

Application

Franklin Electric offers this line of motor-pump couplings for maximum customer convenience in matching the Franklin motor to a variety of pump shafts. Couplings are designed to transmit the pump thrust to the motor in order to provide maximum benefits from the Franklin internal thrust bearing construction.

Hardened stainless steel spacer discs in the 4" and 6" couplings assure positive bearing between motor and pump shafts, and assure full support for downward thrust created by the pump.

8" couplings DO NOT contain hardened spacer discs, since the motor shaft itself is hardened.



4" Motor - Pump couplings

Application: Allow connection of pump to motors shaft.

Specification:

- Material: 304 / 316 SS
- NEMA standard measuring on motor shaft
- separation washer between motor & pump shafts

Coupling 1	304			Coupling Insert only (316SS)
	151 551 911			151 970 102
	Dimension D Max. / Min.	Dimension N Max. / Min.	Dimension H Max. / Min.	
	19,075 / 19,063	4,838 / 4,788	20,70 / 20,53	

Coupling 2	316SS
	308 712 904
	Dimension D Max. / Min.
	17,50 / 17,48
	Technical drawing of a coupling part. The drawing shows a cross-section of a cylindrical component with a central hole. The outer diameter is labeled as $\varnothing 22.62 \pm 0.05$. The inner diameter is labeled as $\varnothing 13.79 \pm 0.03$. The length of the central hole is labeled as 28.6 ± 0.4. The total length of the component is labeled as 41.3 ± 0.4. A chamfer is shown on the right end with a 30-degree angle. The dimension D is indicated as the diameter of the central hole.

6" Motor – Pump Couplings

Application:

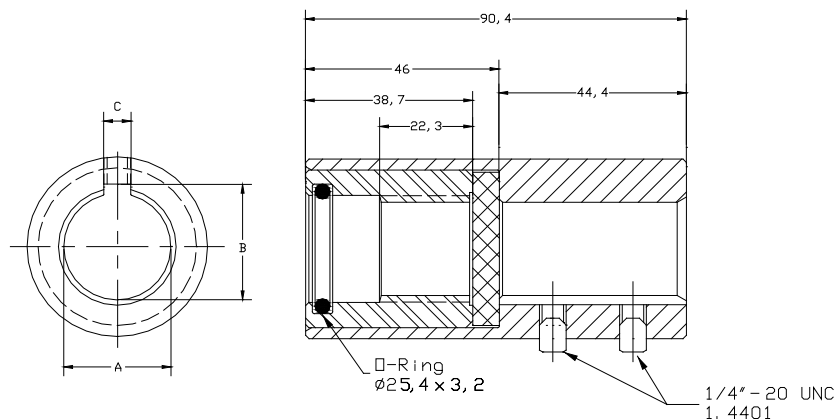
Allow connection of pump to motors shaft.

Specification:

- Material: 304 / 316 SS
- NEMA standard measuring on motor shaft
- separation washer between motor & pump shafts

Outline Drawing:

6" Couplings



Ordering information

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

Accessories

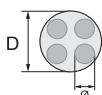


PT100 Rewindable Motors

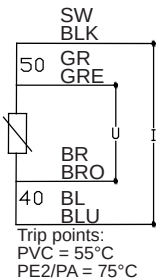
Application

- Fitted into the upper end bell flange
- Measures the temperature of the filling liquid
- Conductor with a resistance proportional to the temperature
- Allows monitoring the temperature continuously

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



	Ø [mm²]	D [mm]	Lead Lengths [m]		304/316	904L
PT 100	4X0,5	8	10	Mod.- No.:	308 016 501	308 016 522
PT 100	4X0,5	8	20	Mod.- No.:	308 016 502	-
PT 100	4X0,5	8	30	Mod.- No.:	308 016 503	-
PT 100	4X0,5	8	50	Mod.- No.:	308 016 505	308 016 526



Flow Paddle Switch

The flow switch utilizes the force of liquid flow to propel its paddle and to detect the incoming flow or movement of the existing liquid in the pipe. A required Part of the 6" High Efficiency Solar System.



Mod.Nb.: 226 019 101

Level Switch

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



Mod.Nb.: 308 170 209

DC Disconnect

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

- 0 - 11A/800V DC - 308 170 313
- 14 - 22A/800V DC - 308 170 325



Pressure Switch SubDrive Constant- pressure Controller

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

Mod.Nr.: 223 995 901



This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin, light gray lines. The grid covers the entire area of the page, leaving no margins or other markings. There are 20 columns and 20 rows of squares, creating a total of 400 square units.

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