



# OPTIDRIVE™ IP<sup>2</sup> SOLARPUMP

Dedicated AC Drive for pumping applications isolated from the commercial grid using photovoltaic arrays (PV)



0.75kW – 250kW / 1HP – 400HP  
185 – 410Vdc / 345 – 800Vdc input

# Applications:

Watering, irrigation, agriculture, swimming pools, water supplies, water treatment and others.

Maximum power point tracking (MPPT) algorithm significantly boosts system efficiency

Dedicated pumping features to support your application needs

Extended DC operative voltage range  
345-800Vdc HV  
185-410Vdc LV



## Key Features

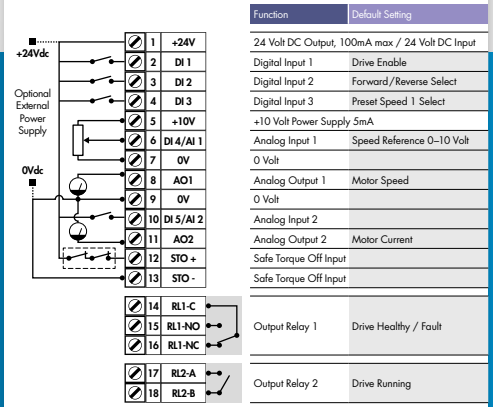
- **Maximum power point tracking (MPPT)** algorithm continuously adapts the system load for maximum system output power under varying conditions of irradiance and temperature. MPPT is the best choice for getting the maximum pumping delivery from your PV array under all conditions.
- **Extended DC operative voltage range**, 345–800Vdc HV, 185–410Vdc LV which increases the system operational time per day and reducing unnecessary stoppages caused by the low array voltages present during dawn and dusk.
- **Advanced pump protection functions**, dry run protection, pipe-burst detection, pump clean function and pump stir function. These protection functions are designed for a reliable system whilst reducing the risk of damage to the pump.
- **Pipe-Fill function**, allows a configurable period for the pipe to fill slowly before operating normally and pipe-burst detection can be activated.
- **Remote monitoring**. All data can be accessed using Modbus RTU or BACnet MSTP communications on board or Ethernet pluggable option modules.
- **3 different methods for PID Sleep and wake up**. An optional external irradiance sensor could be selected to re-start the pump when sufficient energy is available from the sun.
- **Dual supply mode**. The P2 Solar pump can be powered by a DC voltage coming from PV arrays or the traditional commercial grid.
- **PLC integrated** to customize the more demanding applications where the user may need to control for example, valve actuators or monitor system water pressure to stop the drive above defined limits. The on-board PLC provides a high degree of flexibility.
- **Compatibility with all types of motors**, the P2 Solar Pump is compatible with AC induction motors, Permanent Magnet (PM) motors, Synchronous Reluctance (SynRM) motors, Brushless DC (BLDC) motors.
- **Digital inputs for tank high water level and well low water detection**, forcing the drive to stop when the destination tank is full or the water well is empty. Configurable delays can be programmed on the start/stop commands to work with the float switches to overcome the effects of waves on the water
- **Second analog input for pressure monitoring**, this can be used just to monitor system pressure locally or remotely or for pressure regulation.
- **Irradiance level can be monitored on the drive display** with the use of an external sensor (not supplied)
- **Available in different IP enclosures IP20, IP55, IP66**

## Drive Specification

Input Ratings	Supply Voltage	185–410Vdc 345–800Vdc	
	Phase Imbalance	3% Maximum allowed N/A	
	Inrush Current	< rated current	
	Power Cycles	120 per hour maximum, evenly spaced	
Output Ratings	Output Power	230V: 0.75-75kW (1-100HP) 400V: 0.75-250kW	
	Overload Capacity	110% for 60 seconds	
	Output Frequency	0 – 500Hz, 0.1Hz resolution	
	Typical Efficiency	> 98%	
Ambient Conditions	Temperature	Storage: –40 to 60°C Operating: –10 to 50°C	
	Altitude	Up to 1000m ASL without derating Up to 2000m maximum UL Approved Up to 4000m maximum (non UL)	
	Humidity	95% Max, non condensing	
	Vibration	Sinusoidal Vibration Conforms to IEC 60068-2-6 Random Vibration Conforms to IEC 60068-2-64 10 - 57Hz @ 0.075mm Pk 57 - 150Hz @ 1g Pk	
Enclosure	Ingress Protection	IP20, IP55, IP66	
Programming	Keypad	Built-in keypad as standard Optional remote mountable keypad	
	Display	Built-in multi language OLED (IP55 & IP66) 7 Segment LED (IP20)	
	PC	OptiTools Studio	
Control Specification	Control Method	ECO Vector Control PM Vector Control BLDC Vector Control Synchronous Reluctance Vector Control	
	PWM Frequency	4–32kHz Effective	
	Stopping Mode	Ramp to Stop: User Adjustable 0.01–600 secs Coast to Stop	
	Skip Frequency	Single point, user adjustable	
Fieldbus Connectivity	Setpoint Control	Analog Signal	MPPT 0 to 10 Volts 10 to 0 Volts –10 to +10 Volts 0 to 20mA 20 to 0mA 4 to 20mA 20 to 4mA
		Digital	Motorised Potentiometer (Keypad) Modbus RTU BACnet MS/TP
	Built-in	BACnet MS/TP	BACnet Application Specific Controller 9.6 - 76.8 kbps selectable Data Format: 8N1, 8N2, 8O1, 8E1
		Modbus RTU	9.6 - 115.2 kbps selectable 8N1, 8N2, 8E1, 8O1
	Optional	Other	PROFIBUS DP (DPV1) PROFINET IO DeviceNet EtherNet/IP EtherCAT Modbus TCP

I/O Specification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer	
	Programmable Inputs	5 Total as standard (Optional additional 3) 3 Digital (Optional additional 3) 2 Analog / Digital Selectable	
	Digital Inputs	Opto - Isolated 8 – 30 Volt DC, internal or external supply Response time < 4ms	
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < 1% full scale Parameter adjustable scaling and offset	
	PTC Input	Motor PTC / Thermistor Input Trip Level : 2.5kΩ	
	Programmable Outputs	4 Total (Optional additional 3) 2 Analog / Digital 2 Relays (Optional additional 3)	
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 5A	
	Analog Outputs	0 to 10 Volt 0 to 20mA 4 to 20mA	
	Application Features	PID	In-built MPPT mode MPPT Optimisation Dual PID Set-point
Pump Features		Pipe-Fill function Pipe Burst detection Dry Run detection Blocked Pump detection/clean Pump Stir	
Maintenance & Diagnostics	Fault Memory	Last 4 Trips stored with time stamp	
	Data Logging	Logging of data prior to trip for diagnostic purposes: Output Current Drive Temperature DC Bus Voltage	
	Maintenance Indicator	Maintenance Indicator with user adjustable maintenance interval Onboard service life monitoring	
	Monitoring	Hours Run Meter Resettable & Non Resettable kWh meters Cooling Fan Run Time	
Standards Compliance	Low Voltage Directive	2014/35/EU	
	EMC Directive	2014/30/EU	
	Additional Conformance	UL, cUL, EAC, RCM	
	Marine Certification	DNV Type Approval	
	Environmental Conditions	Designed to meet IEC 60721-3-3, in operation: IP20 Drives: 3S2/3C2 IP55 & 66 Drives: 3S3/3C3	
	Environmental Class	Conformal Coated PCBs. Suitable for use in the following environments: IP20: 3C2, 3S2 IP55 & IP66: 3C3, 3S3	

## Connection Diagram



NOT TO SCALE



Size	IP20						IP66			IP55					
	2	3	4	5	6A	6B	8	2	3	4	4	5	6	7	8
mm Height	221	261	418	486	614	726	974	257	310	360	450	540	865	1280	1334
mm Width	110	131	172	233	286	330	444	188	211	240	171	235	330	330	444
mm Depth	185	205	240	260	320	320	423	172	235	271	252	270	332	358	423
kg Weight	1.8	3.5	9.2	18.1	32	43	124.5	3.5	6.6	9.5	11.5	23	55	89	TBC

