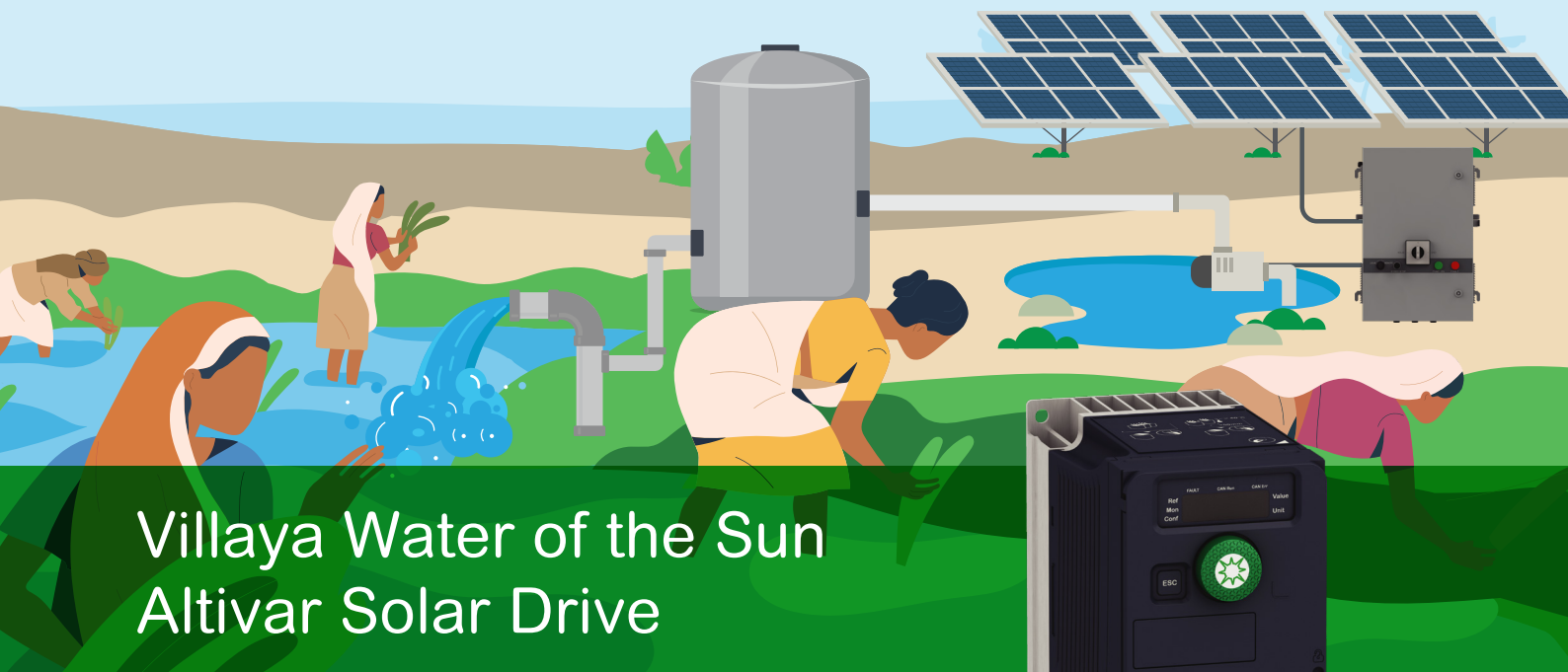
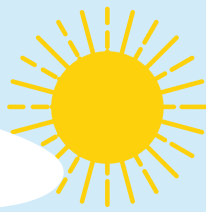




Villaya Water of the Sun Altivar Solar Drive

A smart solar powered drive for
irrigation and livelihood applications



Villaya Water of the Sun is an energy-efficient solar-powered drive solution addressing water challenges, irrigation pump de-dieselization, and agri-processing machinery. It uses the most advanced Altivar Solar variable speed drive, that runs on both solar and grid power and has a range of 0.5HP to 20HP, in conjunction with the advanced EcoStruxure™ Energy Access for Livelihood. The solution was developed to provide an economical choice for people living in rural and remote areas.

Technical Features

Altivar Solar Drive from 0.5HP to 20HP



Auto MPPT - Our intelligent algorithm detects solar panel parameters accurately and efficiently, saving time in configuring the Drive



A low operating voltage range, allows for extended pumping hours, early in the morning and late in the evening



Offers safe pump operation with built-in protections like dry pump protection, pump overload, tank-full detection, over-voltage and under-voltage fault protection



Comes in 3 input voltage ranges:

- 150-374 Vdc or single phase 200Vac (0.5 to 3 HP)
- 150-374 Vdc or three phase 200Vac (4 to 20 HP)
- 280-778 Vdc or three phase 400Vac (0.5 to 20 HP)



Dual supply - Changeover alternatively from Solar to Grid and vice versa



Fully integrated with Cybersecured EcoStruxure Energy Access for Livelihood



Control the pump from anywhere, anytime using our remote ON/OFF feature. Simply use SMS or the EcoStruxure Energy Access for Livelihood platform



The Antijam function enables auto pump cleaning through forward and reverse movement. It's easy to configure and activate at any time

Benefits



Maximum solar utilization: Harvests maximum solar energy to run the pump for maximum duration by controlling speed of the motor based on available power from the solar panel



Wide DC voltage range: The Altivar Solar Drive can start operating early in the day and run late during evenings for extended duration



Remote operation: The flexibility to remotely switch ON/OFF the pump provides convenience to farmers who are located far away from their farms



Reduce operational risk: Built in pump-specific features such as dry run protection and antijam functions protects and keeps the pump running



Save energy costs and maximize productivity: The Altivar Solar Drive can connect alternatively to both the grid and a solar PV source, ensuring efficient water pumping even during cloudy days and at night



Sustainable solution: Offers an eco-friendly solar pumping solution that harnesses the power of the sun without CO₂ emissions

Applications



Irrigation



Domestic
water supply



Fish farming



Livestock



Swimming pool



Fountain

Facts

771 million

people around the world lack access to clean water

Source: [water.org](https://www.water.org), 2021

1/3

of people's time in remote villages without access to energy, spent on managing their water needs

Source: [water.org](https://www.water.org), 2021

1/2

of water projects fail due to lack of community involvement

Source: [water.org](https://www.water.org), 2021

1Kg of CO₂ equivalent per kWh

Green House Gas emissions per volume of water using diesel pumpsets for irrigation

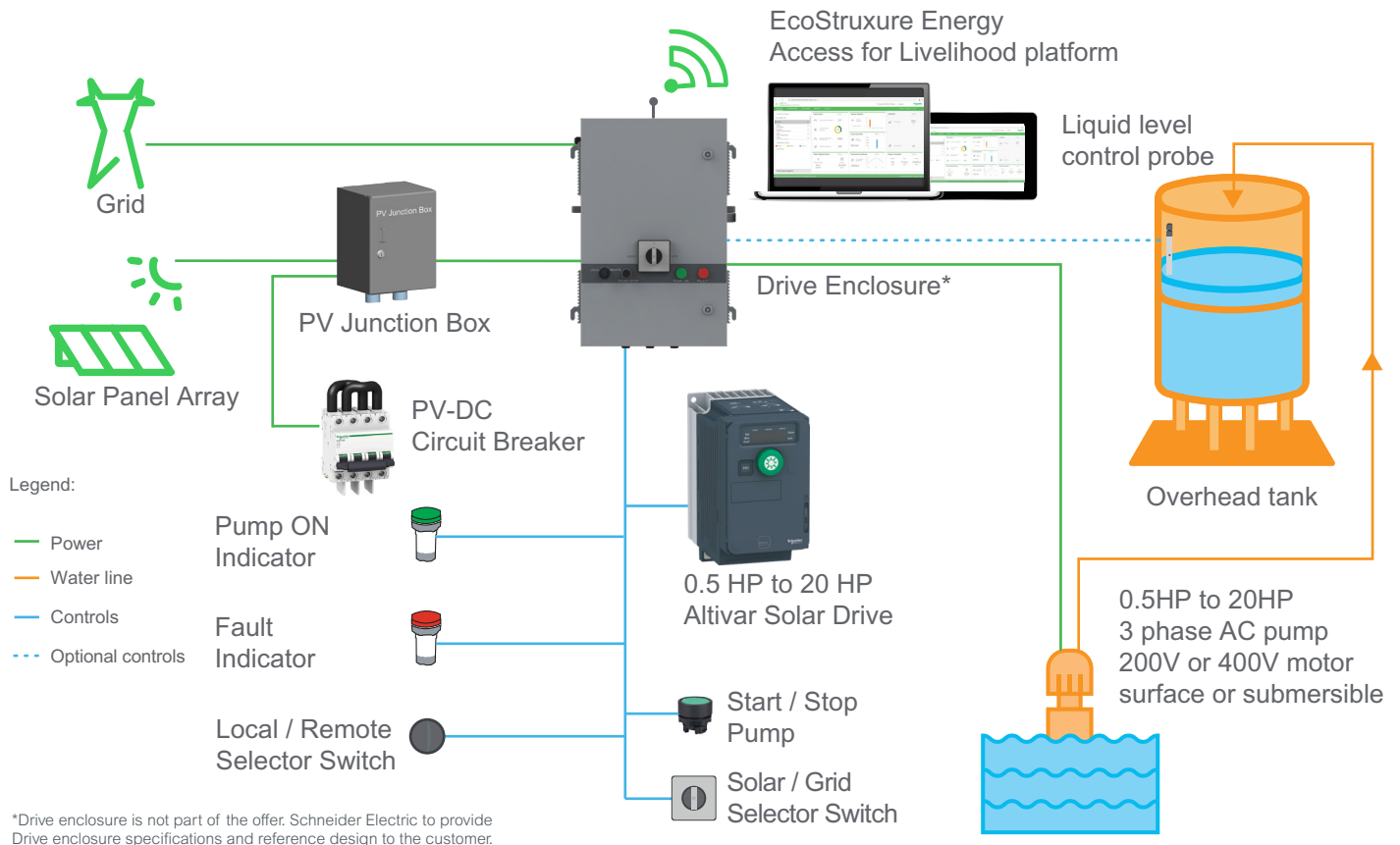
Source: GIZ (2016), FAO

70 to 80%

of the total electricity usage in farms for irrigation pumping

Source: *Agricultural Resource Management*, 2016

System Architecture



EcoStruxure™ Energy Access for Livelihood

Advanced remote monitoring, Remote ON/OFF through SMS

Apps, Analytics and Services

Remote monitoring of performance through online portal and cloud



Real-time monitoring of the impact metrics, system status, site utilization, revenue collected, water output, CO₂ offset, clean energy produced, alerts and reports



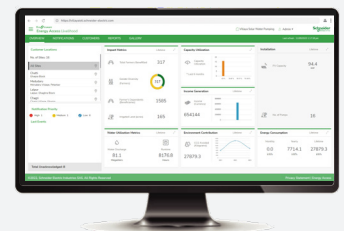
Open and cybersecured platform to monitor the system performance



Single monitoring platform for multiple agri solutions



Remote ON/OFF of the pump

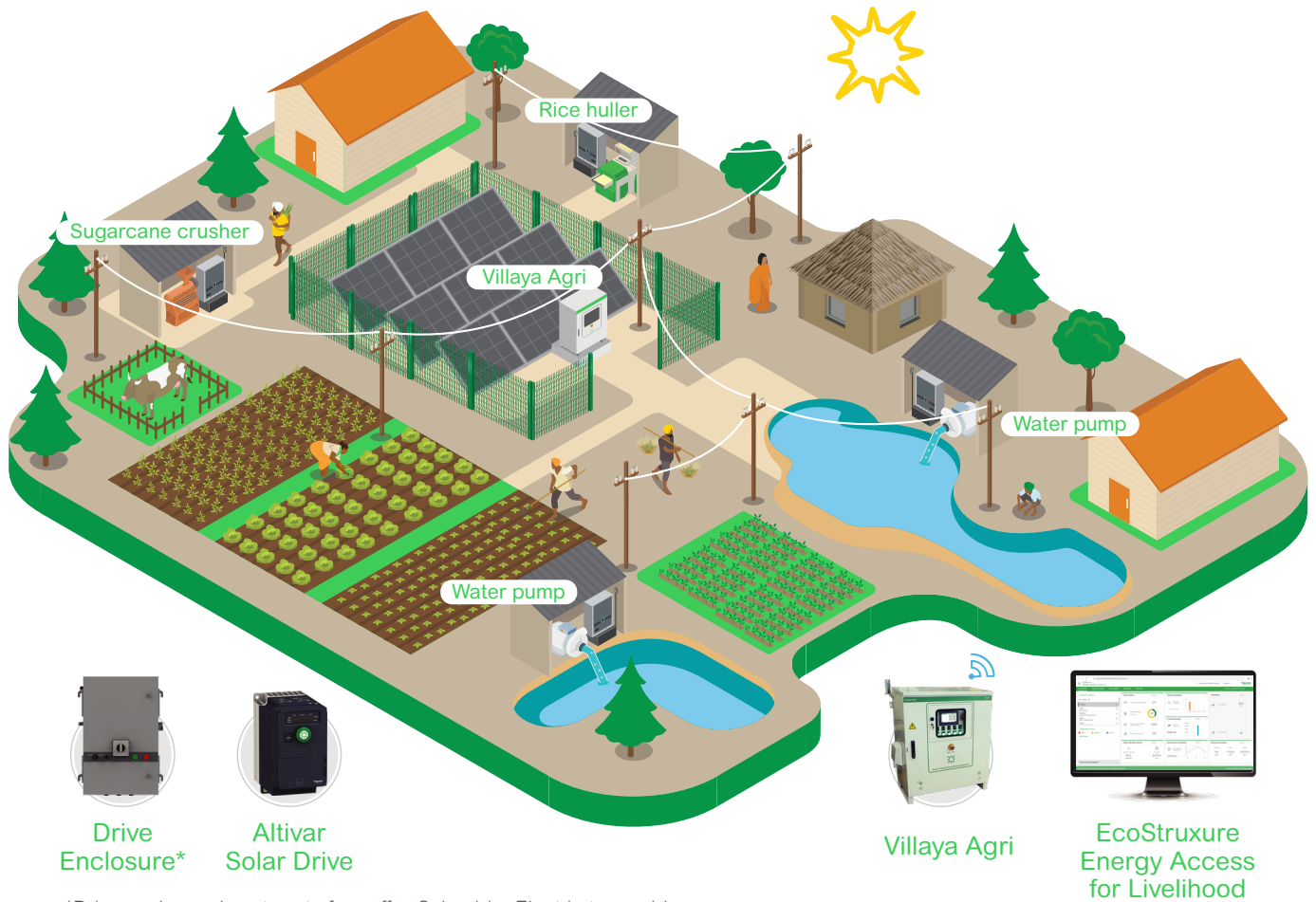


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Villaya Agri and EcoStruxure™ Energy Access for Livelihood

Maximize productive usage of solar energy for socio-economic development



*Drive enclosure is not part of an offer. Schneider Electric to provide Drive enclosure specifications and reference design to the customer.



A centralized solar energy solution with battery-free operations powering productive agricultural loads



The solution maximizes the solar capacity utilization while lowering capex and optimizing operational cost



A prewired solution with “Smart energy allocation” that efficiently manages multiple agri-processing loads



It can power four agri-loads or four solar water pumping solutions at the same time using a centralised solar solution



EcoStruxure Energy Access for Livelihood captures the key impact metrics enabling sustainable and scalable business model

Technical Specifications and Commercial References

Reference (1)	Motor		Altivar Solar Drive	
	Power indicated on rating plate (1)		Max. continuous output current (1)	Weight
	kW	HP	A	kg/lb
Single-phase supply voltage: 200...240 V 50/60 Hz, with integrated EMC filter (2) (3)				
ATV320U04M2C412	0.37	0.5	3.3	1.000/2.204
ATV320U06M2C412	0.55	0.75	3.7	1.100/2.425
ATV320U07M2C412	0.75	1	4.8	1.100/2.425
ATV320U11M2C412	1.1	1.5	6.9	1.600/3.527
ATV320U15M2C412	1.5	2	8	1.600/3.527
ATV320U22M2C412	2.2	3	11	1.600/3.527
Three-phase supply voltage: 200...240 V 50/60 Hz, without integrated EMC filter				
ATV320U30M3C412	3.0	4.0	13.7	2.200/4.850
ATV320U40M3C412	4.0	5.0	17.5	2.200/4.850
ATV320U55M3C412	5.5	7.5	27.5	3.500/7.716
ATV320U75M3C412	7.5	10.0	33	3.600/7.937
ATV320D11M3C412	11.0	15.0	54	6.800/14.991
ATV320D15M3C412	15.0	20.0	66	6.900/15.212
Three-phase supply voltage: 380...500 V 50/60 Hz, with integrated EMC filter (2) (3)				
ATV320U04N4C412	0.37	0.5	1.5	1.200/2.646
ATV320U06N4C412	0.55	0.75	1.9	1.200/2.646
ATV320U07N4C412	0.75	1	2.3	1.200/2.646
ATV320U11N4C412	1.1	1.5	3	1.300/2.866
ATV320U15N4C412	1.5	2	4.1	1.300/2.866
ATV320U22N4C412	2.2	3	5.5	2.100/4.630
ATV320U30N4C412	3	4	7.1	2.100/4.630
ATV320U40N4C412	4	5	9.5	2.200/4.850
ATV320U55N4C412	5.5	7.5	14.3	2.200/4.850
ATV320U75N4C412	7.5	10.0	17.0	2.200/4.850
ATV320D11N4C412	11.0	15.0	27.7	6.800/14.991
ATV320D15N4C412	15.0	20.0	33.0	6.900/15.211

Notes:

(1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value (see derating curves in the Installation Manual).

(2) Drives supplied with category C2 integrated EMC filter. This filter can be disconnected.

(3) Drives are supplied with an EMC plate, for assembly by the customer.



*Altivar Solar Drive is RoHS and REACH compliant

- Transparent environment information
- Lifecycle analysis, compliant with ISO14025
- Circular instructions

*In progress

Recommended configuration of Solar Water Pumping System with 200/400V Motors - Shallow Well (Surface) ⁽¹⁾ ⁽²⁾

Altivar Solar Drive	Solar Water Pumping System	Solar Panel Array Capacity (Wp)	Individual Solar Panel Capacity (Wp)	No of Solar panels, Configuration	Motor Capacity (HP / Voltage)	Max. Total dynamic Head (mts)	Min. Water Discharge
ATV320U22M2C412	3HP	2700	380	8 (8S, 1P)	3HP, 200V	10	267300
						20	132300
ATV320U40N4C412	5HP	4800	380	13 (13S, 1P)	5HP, 400V	10	475200
						20	235200
						30	168000
ATV320U55N4C412	7.5HP	6750	425	16 (16S, 1P)	7.5HP, 400V	10	668250
						20	330750
						30	236250
ATV320U75N4C412	10HP	9000	380	26 (13S, 2P)	10HP, 400V	10	891000
						20	441000
						30	315000
ATV3200D11N4C412	15HP	13500	425	32 (16S, 2P)	15HP, 400V	20	661500
						30	472500
						50	283500
						70	189000
ATV3200D15N4C412	20HP	18000	420	45 (15S, 3P)	20HP, 400V	30	630000
						50	378000
						70	252000
						100	162000

Recommended configuration of Solar Water Pumping System with 200/400V Motors - Deep Well (Submersible) ⁽¹⁾ ⁽²⁾

Altivar Solar Drive	Solar Water Pumping System	Solar Panel Array Capacity (Wp)	Individual Solar Panel Capacity (Wp)	No of Solar panels, Configuration	Motor Capacity (HP / Voltage)	Max. Total dynamic Head (mts)	Min. Water Discharge
ATV320U22M2C412	3HP	3000	380	8 (8S, 1P)	3HP, 200V	30	105000
						50	63000
						70	42000
ATV320U40N4C412	5HP	4800	380	13 (13S, 1P)	5HP, 400V	50	100800
						70	67200
						100	43200
ATV320U55N4C412	7.5HP	6750	425	16 (16S, 1P)	7.5HP, 400V	50	141750
						70	94500
						100	60750
ATV320U75N4C412	10HP	9000	380	26 (13S, 2P)	10HP, 400V	50	189000
						70	126000
						100	81000
ATV3200D11N4C412	15HP	13500	425	32 (16S, 2P)	15HP, 400V	70	189000
						100	121500
						120	114750
						150	90450
ATV3200D15N4C412	20HP	18000	420	45 (15S, 3P)	20HP, 400V	100	162000
						120	153000
						150	120600
						200	90000

Notes:
(1) The above table is based on one standard setup. The water discharge will vary depending on the pump chosen
(2) Water output figures are on a clear sunny day with three times tracking of SPV panel, under the Average Daily Solar Radiation condition of 7.15 kWh/ sq.m. on the surface of PV array (i.e. coplanar with the SPV modules)
(3) Solar Panel Array - S: Number of solar panels in series, P: Number of parallel strings

Firmware Update and Service expertise
Thanks to our global network of service experts, our customers have the possibility of upgrading the drive's firmware and modernizing its hardware to extend the drives lifetime. As part of our circular ambition we are currently deploying a global take-back platform for End of Use products which are either refurbished to "as good as new" state in our agreed repair centers, or dismantled and recycled.