

PROPOSAL

SOLAR SUBMERSIBLE WATER PUMP

in
Mali



IIAN TECH CO., LTD.



Wilo-Actun OPTI-MS



Application

Raw water intake:

- Drinking water supply from deep wells
- Gardening/Irrigation
- Livestock

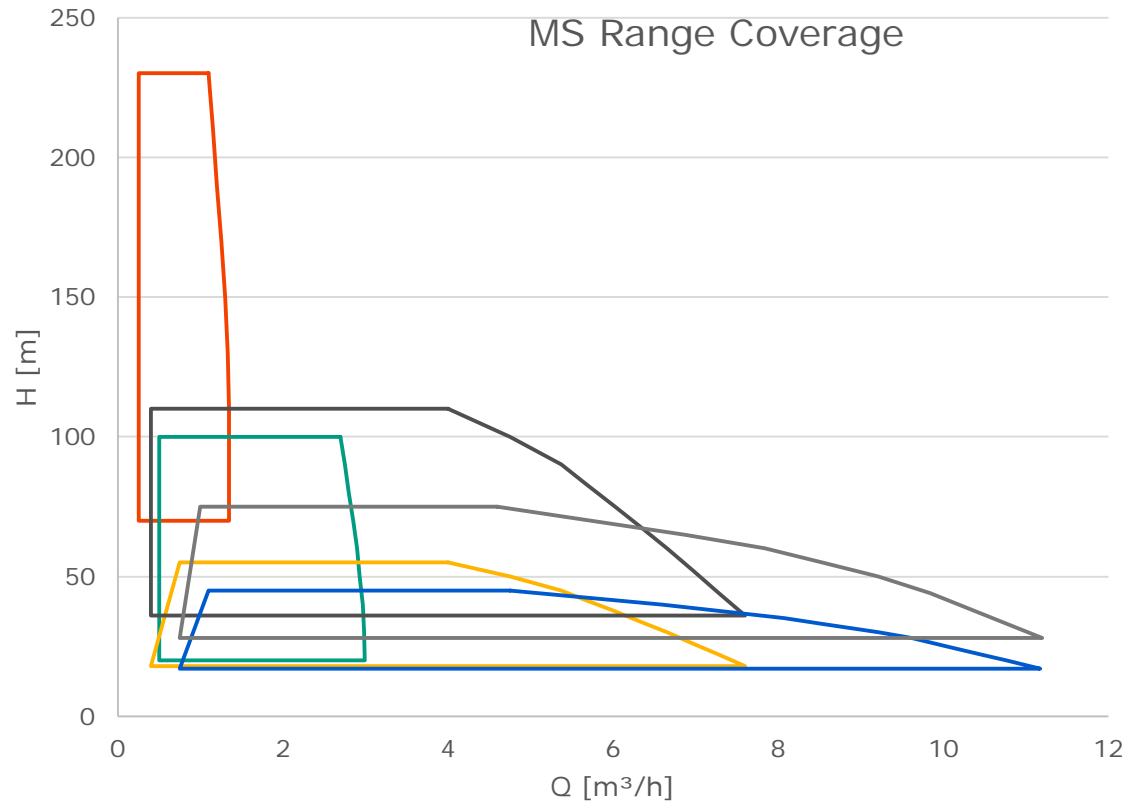
Technical execution

- Premium solution with integrated inverter
- High efficient helical rotor or centrifugal pump
- High efficient AC permanent magnet motor
- Sophisticated dynamic MPPT algorithm for highest water output
- AC and DC power supply possible
- Integrated safety functions
- Signal cable for switches (float/pressure/etc.) without necessity of control panel



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Range Coverage

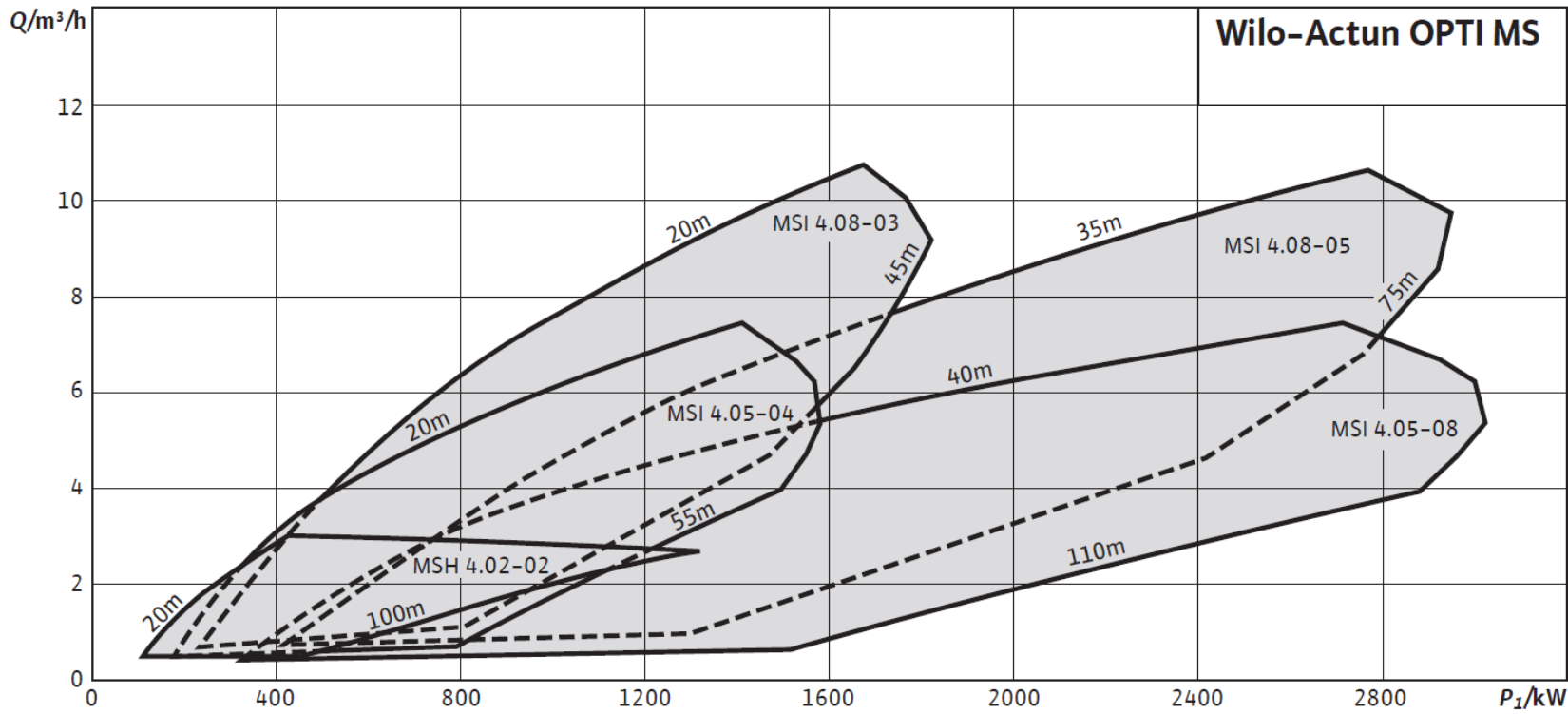


- Opti MSH4.01-03
- Opti MSH4.02-02
- Opti MSI4.05-04
- Opti MSI4.08-03
- Opti MSI4.05-08
- Opti MSI4.08-05



Wilo-Actun Opti MS

Range Coverage



Wilo Actun Opti MS Advantages

Features	Customer benefits
High hydraulic efficiency	Optimized Water Output
AC permanent magnet motor with high efficiency	
Highly sophisticated dynamic Maximum Power Point Tracking (MPPT) function	
No external control panel needed	Easy installation, commissioning and servicing
Fully autonomous operation	
Pump, motor and hydraulic components can be easily disassembled, power cables are removable	
High grade materials used; EN 1.4301/AISI 304, EPDM, AISI 316 hard-chromed helical rotor	Maximized pump life and operational reliability
State-of-the-art resin and encapsulated stator made of stainless steel AISI 304	
Mechanical seal to protect the motor	
Kingsbury thrust bearing	
Built-in protection against overheating, overloading, dry running, over and under voltages	



Wilo-MS Control Optional Control Panel for OPTI-MS

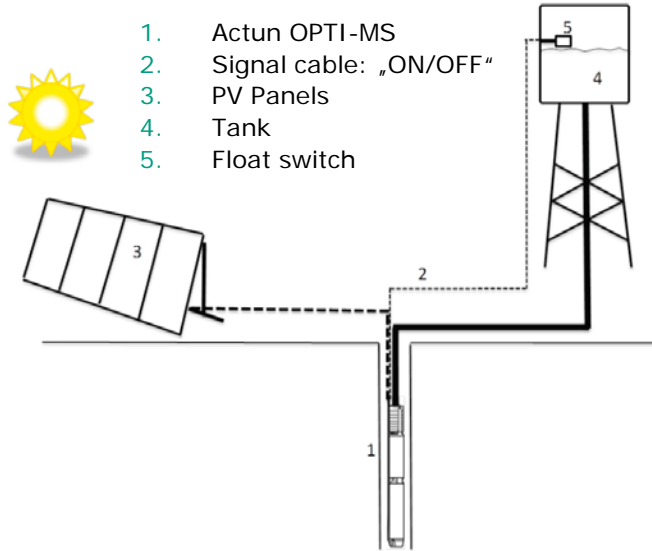
The optional external control module offers following features*:

- Provide **remote monitoring and control functions**
- Monitor the electric parameters (current, power, voltage)
- Record and store all the alarms related to the working hours
- Connect a pressure or a flow sensor to control the pump performances
- Connect a pressure or float switch
- Provide a digital alarm output for remote control
- IP 55 protection degree for installation in humid and dusty environments
- The IIAN TECH's ISC products fully control pump and diode generators

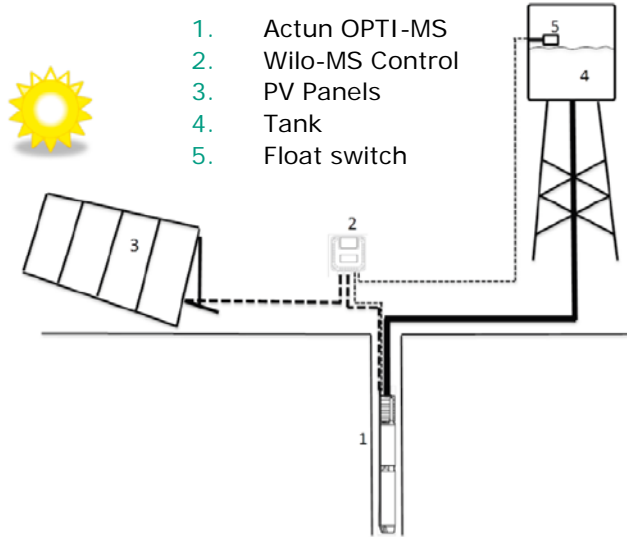


*The control module does not influence the overall pump performance and water output, MPPT functionality is implemented within the pump's integrated inverter

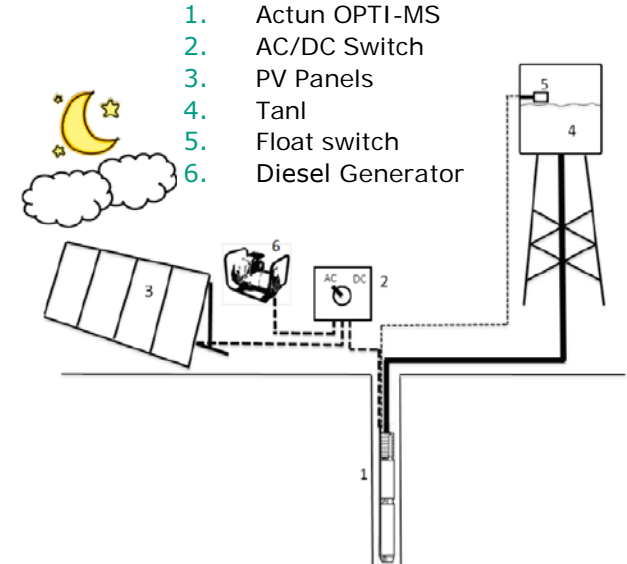
Different system approaches



Without control module



With control module



Using an auxiliary generator

Wilo-Actun OPTI-QS



Application

Raw water intake:

- Drinking water supply from deep wells
- Gardening/ Small Irrigation
- Livestock

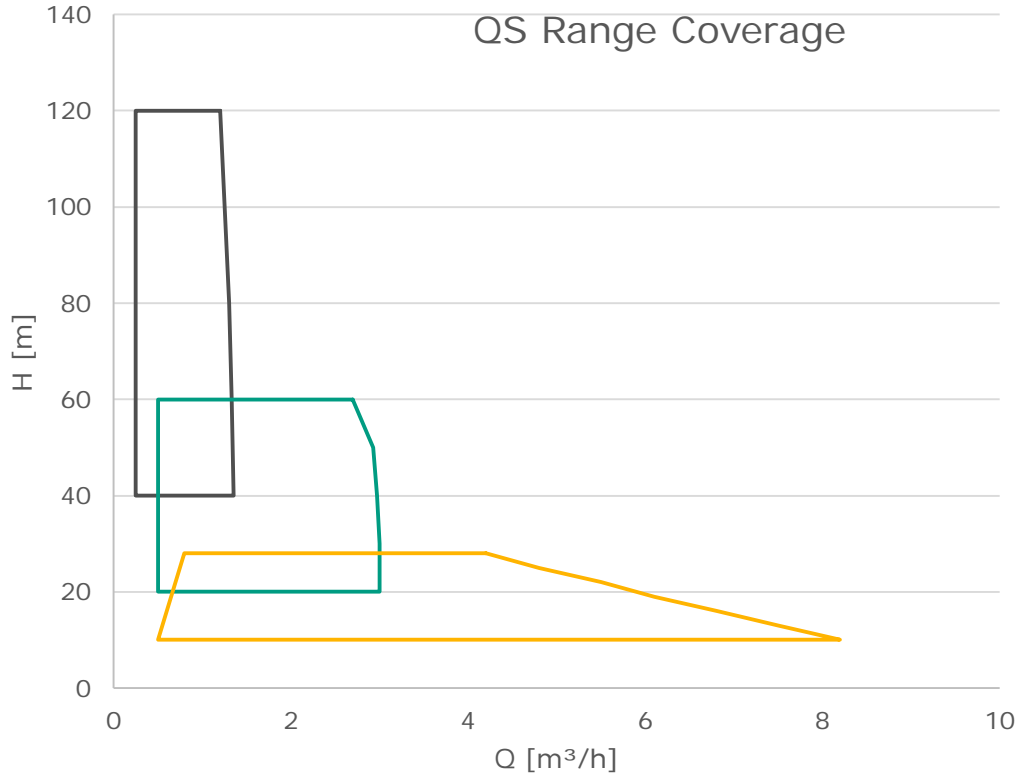
Technical execution

- Premium solution with integrated inverter
- High efficient helical rotor or centrifugal pump
- High efficient AC permanent magnet motor
- Sophisticated dynamic MPPT algorithm for highest water output
- Integrated safety functions
- Connection for switches (float/pressure/etc.) via optional stop module



Wilo-Actun OPTI-QS

Range coverage



- Opti QSH4.01-02
- Opti QSH4.02-01
- Opti QSI4.06-04



Advantages of internal inverter operation












Following advantages are relevant for internal inverter operation of MS and QS

- Ideal matching between motor and inverter technology
- Risk of overheating and sudden temperature changes drastically reduced by water cooling in the well. Inverter life time significantly improved vs external one
- No risk of water infiltration due to complete resin filling
- No need for expensive additional output filters which would create voltage losses and heat when cables are too long
- No need for expensive shielded cables
- No more risk of theft and damage by people and animals
- Our experience shows that internal inverters life time can reach up to 10 times the one of an external inverter
- Easy commissioning; whereas wrong commissioning being the biggest origin for mistakes leading to faulty operation
- Spare parts are available, repairing is supported by service manual

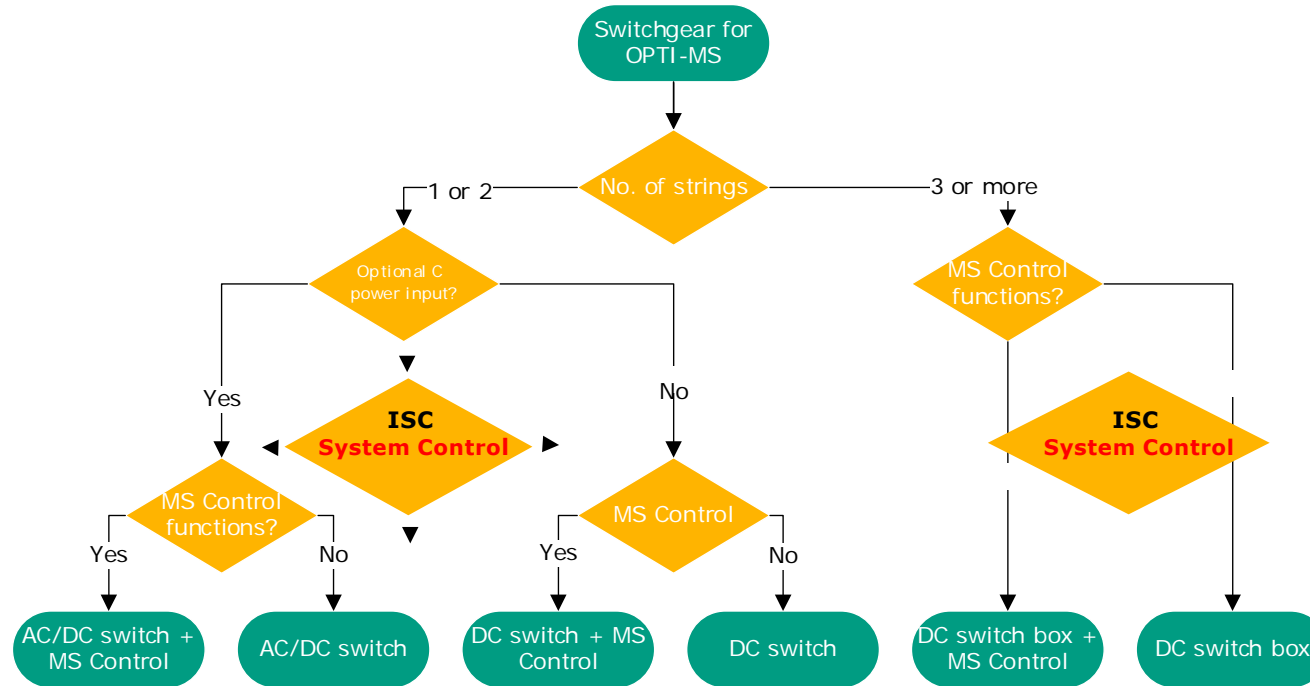


Accessories for Opti MS/QS

Article Number	Description	Comment	Picture
6083075	DC switch box 1 PV string	DC switch box for operation with 1 string	 
6083076	DC switch box 2 PV strings	DC switch box for operation with 2 strings	
6083065	DC switch box 3 PV strings	DC switch box for operation with 3 strings	
6083066	DC switch for solar system	Simple DC switch for 1 string without protection	
6083067	Fuse 10x38, 16A, 1000VDC for DC switch box	Fuses to be used in DC switch boxes (2 per string)	
6083068,9	MC4 Female Connector MC4 Male Connector	Connectors for proper connection of panels and DC switch box	
6000000	ISC (Iian Tech System Controller)	Control Solar power, AC, Battery or Fuel Generator	
6083071	PV wire black 4mm ²	Cable for connection of PV panels to DC switch box	 
6083072	PV wire red 4mm ²	Cable for connection of PV panels to DC switch box	
6083070	Photovoltaic Panel Poly 270 Wp	Standard panel at competitive price, no German COO	  
6083073	AC/DC switch for solar system	For hybrid operation with AC and DC sources	
6083074	Wilo-MS Control	Control Module for MS	
6083077	Wilo-QS Stop Module	Stop Module for OPTI QS including Surge protection	

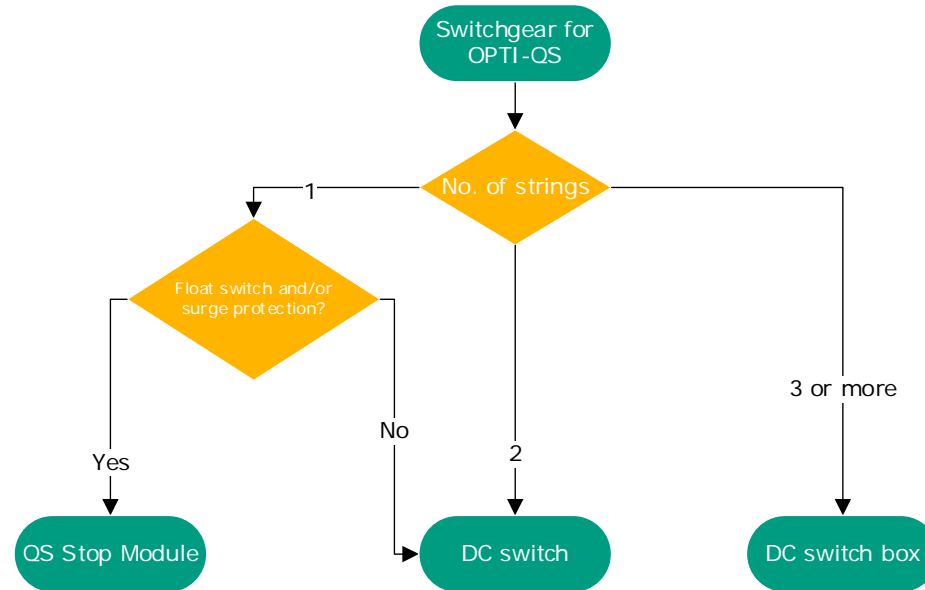
OPTI-MS

Switchgear recommendation



OPTI-QS

Switchgear recommendation



Solar sizing software

Highly sophisticated sizing software offers precise selection of solar systems based upon following parameters (among others):

- Location
- Working period (seasonal or yearly average)
- Required daily water output
- Dynamic head
- Panel type (individual specification possible)

Report features:

- Typical duty point
- Hourly and daily delivery for each month
- Easy readjustment via panel quantity

1. INSTALLATION SITE

Location
Solen, Boule du Moulin, Burkina Faso

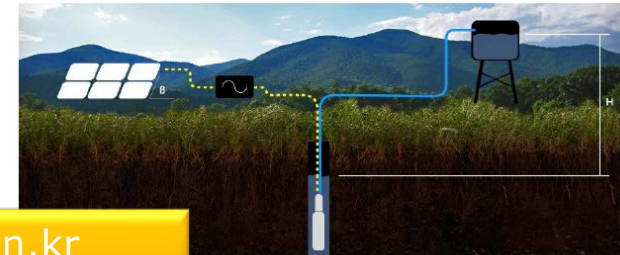
Latitude: 12.15464 Longitude: -4.08485 Altitude (M): 318 GMT: -05

Selected months for operation: JUN FEB MAR APR MAY JUN JUL AUG SEP OCT

Average daily solar irradiance [kWh/m ² /day] for latitude tilted panels	5.91	6.41	6.26
Max daily ambient temperature [°C]	32.23	34.66	36.95
Min daily ambient temperature [°C]	19.15	20.84	23.98
Average daily temperature [°C]	25.09	27.75	30.47

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2. SYSTEM PARAMETERS



Constant head curves

Dynamic Head	78	m	
Pipe specs	Length	0 m	
	Internal Diameter	75 mm	
	90° Curves	0	
	Check Valves	0	
	Valves	0	
	Cable specs	Motor Cable Length	40 m
	Admitted Power Losses	4 %	

Solar panel specs

Panel Model: Nistic 2009110100 250WPCLY

Tilt Angle: 12°

Panel Specifications:

Wp	250 W
Msp	30.4 MDC
Voc	37.3 MDC
Imp	8.27 A
NOCT	48 °C
TC	-0.43 %/K
Orientation	South

Typical OPTI-MS solar package

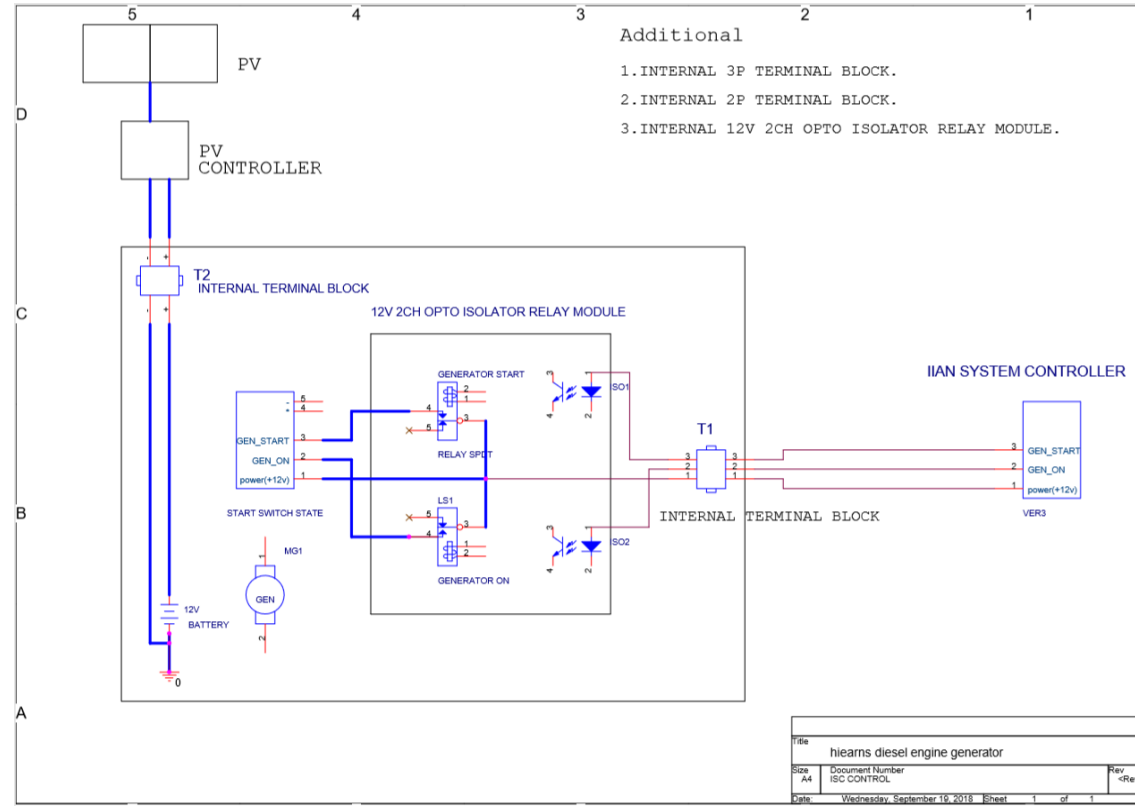
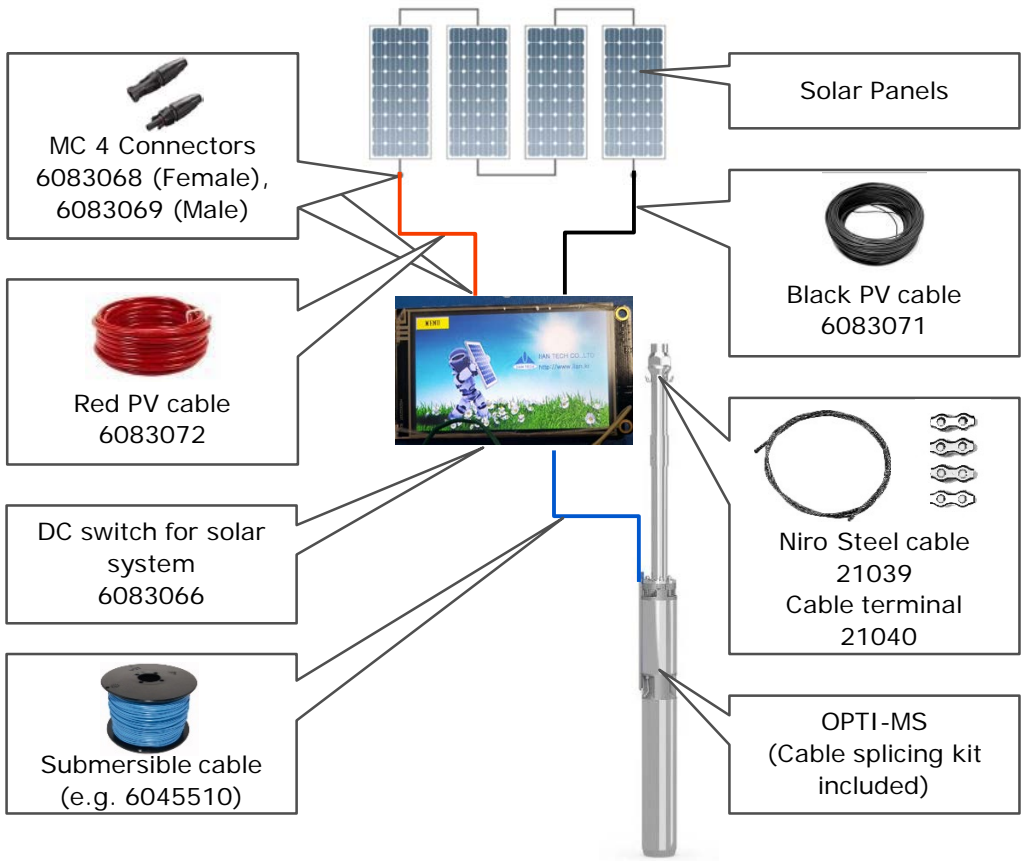


Actual quantities and lengths depending on customer requirement/specification!

Qty	Article number	Description	Comment
1	6082887	OPTI-MSH4.02-02	Pump selected by performance chart or selection software
4	6083070	Photovoltaic Panel Poly 270 Wp	Depending on demand, please use online calculation tool for sizing or simplified calculation
1	6083066	DC switch for solar system	Simple DC switch for 1 string without protection
3	6083068	MC4 Female Connector	2 female connectors per string necessary, additional quantity as spare
3	6083069	MC4 Male Connector	2 male connectors per string necessary, additional quantity as spare
30 m	6083071	PV wire black 4mm ²	PV cable necessary for proper connection, two colors for identification of polarization
30 m	6083072	PV wire red 4mm ²	PV cable necessary for proper connection
30 m	e.g. 6045510	Submersible Cable	Submersible cable for connection of DC switch box and pump



Typical OPTI-MS solar package



Typical OPTI-QS solar package

Actual quantities and lengths depending on customer requirement/specification!



Qty	Article number	Description	Comment
1	6082887	OPTI-QSH4.02-01	Pump selected by performance chart or selection software
4	6083070	Photovoltaic Panel Poly 270 Wp	Depending on demand, please use use online calculation tool for sizing or simplified calculation
1	6083077	Wilo-QS Stop Module	Stop module with surge protection, recommended, branding pending
3	6083068	MC4 Female Connector	2 female connectors per string necessary, additional quantity as spare
3	6083069	MC4 Male Connector	2 male connectors per string necessary, additional quantity as spare
30 m	6083071	PV wire black 4mm ²	PV cable necessary for proper connection, two colors for identification of polarization
30 m	6083072	PV wire red 4mm ²	PV cable necessary for proper connection
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Typical OPTI-QS solar package

