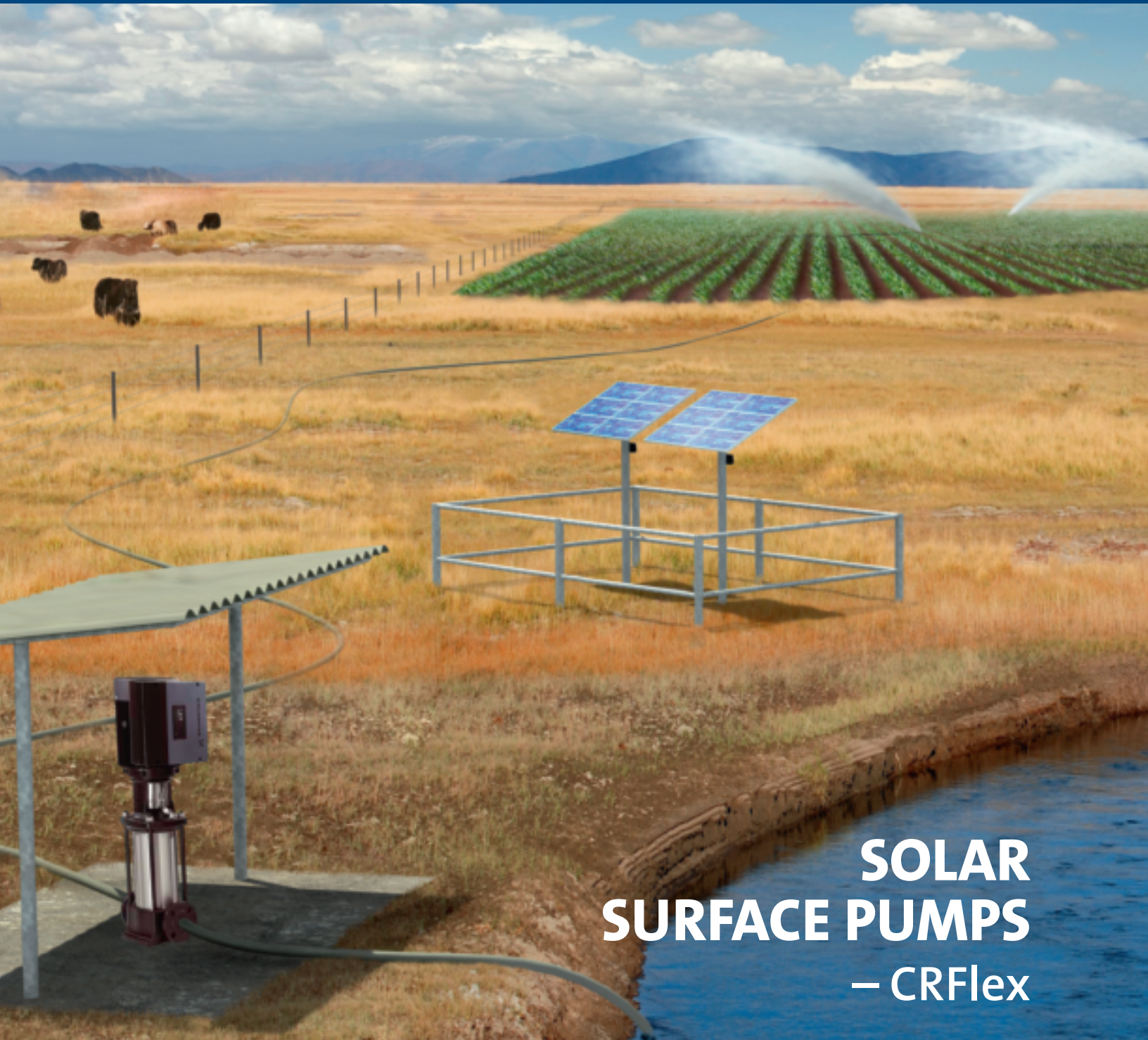


GRUNDFOS
SOLAR SURFACE PUMPS – CRFLEX



**SOLAR
SURFACE PUMPS**
– CRFlex



Working with the resources at hand for water supply security

Grundfos solar surface pumps provide the perfect sustainable, reliable and cost-efficient alternative to irregular water supply solutions in remote locations, or for highly specific applications anywhere.

These pumps provide individual solutions to water problems where conventional water supply systems fail or simply cannot reach. Although the initial investment including solar panel is higher, the operating cost is minimal.



Tailored pump and energy source

Grundfos has developed the MGFlex motor for optimal performance using solar power, for surface pump applications. In addition to solar panels, Grundfos solar surface pumps can be run from the grid or a generator.

With variable speed operation and motor protection built in as standard, Grundfos solar surface pumps offer

- Easy installation
- Virtually no maintenance
- Low cost and highly-efficient pumping

Focus on lifecycle costs

The initial upfront investment on a Grundfos surface solar pumping solution is higher than for conventional water supply systems, but this is where the comparison stops.

The total cost of owning a pump system over the product's entire lifetime is about much more than just the purchase price – it is the total sum of not only the costs but also the benefits of having a long-term business relationship with Grundfos.

The lifecycle costs of a Grundfos surface solar pumping solution will be considerably lower than with other water supply systems, because you can save substantial sums on reduced maintenance costs – and no energy costs. Other more intangible cost-reducing factors include correct system sizing, high pump efficiency and performance, technical advice, service and reliable logistics.

Flexibility and security for your application

A solar surface pump offers unparalleled flexibility for small, rural communities. Following the initial investment, it is important that costs are kept low for typical users of these pumping systems.

Which pump you select for your Grundfos solar surface pumping solution depends on your application. Grundfos CR pumps and MTR float pumps run from the MGFlex motor will cover most usual applications, although in principle other Grundfos pumps can also be used.

Typical applications in rural or remote areas:

- Small-scale irrigation
- Livestock and fish farming
- Water supply for remote villages

Extracting groundwater and delivering it to the crop via drip irrigation is an example of highly efficient water use. Remote villages far removed from the grid benefit from a stable water supply.

Applications for homes or businesses in rural areas or towns:

- Pressure boosting in the house
- Swimming pools

Perhaps a relevant application for your solar surface pump is a pressure boosting system indoors using Grundfos CR pumps, ensuring reliable pressure at the tap. Swimming pool applications remove the need for cable installations outdoors.

OEM applications

In addition, the MGFlex motor for solar surface pumping solutions is available to OEMs for installation in all manner of other applications. However, it is important that you first check with your Grundfos representative for technical feasibility and possible consequences for warranty coverage.



IRRIGATION



LIVESTOCK WATERING



WATER TRANSFER



**QUALITY
INSIDE/
OUT**

Solar surface pumps driven by the Grundfos **MGFlex motor** have built-in protection features that protect the pump itself





- **Wide voltage range**

The wide voltage range of the high-efficiency MGFlex motor for DC or AC voltage operating at high efficiency makes pump sizing and selection extremely easy.

- **Use with solar, grid or generator**

The MGFlex motor developed by Grundfos for solar energy can also be run from the grid or a generator.

- **Maximum system efficiency**

The motor will continuously optimise the speed according to the input power available. This is called Maximum Power Point Tracking (MPPT) and operates only when the pump is connected to DC supply.

- **Variable speed power transmission**

The unique Grundfos frequency converter ensures variable-speed power transmission to the motor.

- **Built-in motor protection**

The motor is protected against overloading and overheating, and load condition and voltage is monitored continuously.

- **High reliability**

Powerful carbon/ceramic bearings ensure high reliability.

- **Dry Running Protection**

Being a surface pump, dry running protection can be ensured by proper piping design or the use of an optional contact sensor at the inlet.

Solar surface pumps offer tangible benefits

- **Easy installation**

Solar surface pumps can be tailored to your application and local conditions.

Supplied as a plug-and-go solution, the system is remarkably easy to install and use under even the most difficult conditions.

- **Virtually no maintenance**

The built-in protection features for the pump motor as well as the frequency drive ensure a low maintenance solar surface pumping solution.

- **Cost-efficient pumping**

Designed for continuous as well as intermittent operation, solar surface pumps are especially suitable for where cost is all-important. Once the initial investment in the solar surface pump solution is made, operating costs are minimal.

Solar panels available in two sizes

The GF solar panels are selected especially for MG solar surface pump motor unit and are available in two sizes:



Product name	GF80
Solar Panel Type	Multi-crystalline Solar Cells
Peak Power (P_{max})	80 Watt
Voltage (V_{mp})	33.3 Volt
Current (I_{mp})	2.40 Amp
Open Circuit Voltage	41.5 Volt
Short Circuit Current	2.60 Amp
Solar Panels Features	4 By-Pass Diodes
Connector Type	MC 3
Approval	UL Approved and IEC tested
Warranty Efficiency	90% at 10 years and 80% at 25 years



Product name	GF100TF
Solar Panel Type	A-Si Thin Film Module
Peak Power (P_{max})	100 Watt
Voltage (V_{mp})	70 Volt
Current (I_{mp})	1.43 Amp
Open Circuit Voltage	96 Volt
Short Circuit Current	1.70 Amp
Solar Panels Features	By-Pass Diodes
Connector Type	MC 3
Approval	UL Approved and IEC tested
Warranty Efficiency	90% at 10 years and 80% at 25 years



CRFlex systems optimised for solar power

The CRFlex is developed by Grundfos to get the most out of the sun. It incorporates a 2-pole motor with an integrated frequency converter that enables the MGFlex motor to run at high efficiency over a wide speed range.

- Power input (P1) of 70W – 1250W
- Motor speed range 1000 – 3400RPM
- Maximum input current of 5A
- Enclosure class IP 54

The motor is compatible to both DC and AC voltage supply.

- 110 – 415VDC, PE
- 1 x 220 – 240V, -10%/+6%, 50/60Hz, PE



Solar surface CR pumps with the MGFlex motor, from an installation in South Africa

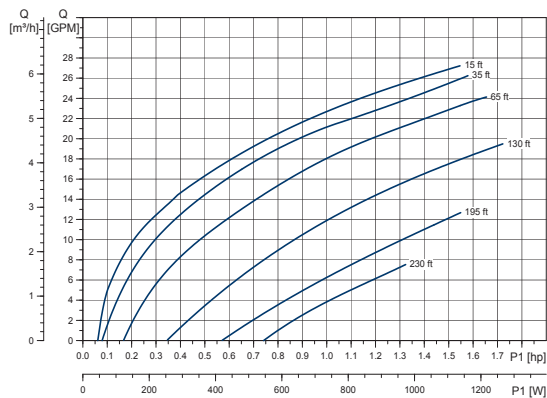




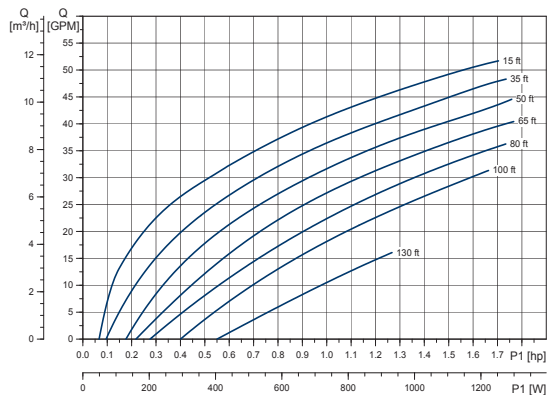
Performance curves

The following examples of performance curves show the MGFlex motor paired with the three most suitable CR pumps. This provides the best pump efficiency.

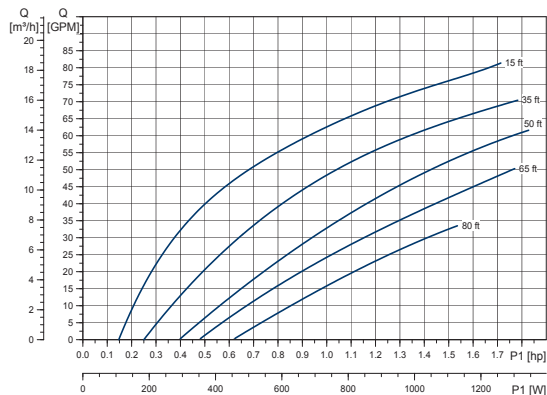
CRflex 3-9



CRflex 5-5



CRflex 10-2



Technical data

Power supply to pump	110 – 415VDC, PE 1 x 220 – 240V, -10%/+6%, 50/60Hz, PE
Energy source	Solar Module Generator Grid
Start/Stop control	Digital input to control the start/stop of the motor
Sensor connection	The motor electronics allows one external sensor connection. The motor can supply max 24VDC 40mA to this connected device.
Power Switch on/off or from DC to AC	Maximum 4 times per hour
Ambient Temperature	During operation: -4°F to +104°F (-20°C to +40°C) During storage/transport: -40°F to +140°F (-40°C to +60°C)
Relative humidity	Maximum 95%
Motor protection	Built-in motor protection against - overvoltage and undervoltage - overload - over-temperature
Leaking current	< 3.5 mA
Power factor	0.97
Earth-leakage circuit breaker	If the pump/motor is connected to an earth-leakage circuit breaker (ELCB) is as an additional protection, this circuit breaker shall detect AC fault currents, pulsating DC fault currents and smooth DC fault currents.
Installation outdoor	The motor/pump must be installed under shield to avoid direct sunlight, rain, hail and snow.
Enclosure class	IP 54
Insulation class	F (IEC 85)
EMC Compatibility	EN 61 800-3
Sound pressure level	< 63 db(A)
Marking	CE

Specify your solar surface pump online

You can draw on a wide range of expert knowledge, documentation, installation and service information via Grundfos' online sizing tool WebCAPS at www.grundfos.com

Grundfos Renewables

Innovative technology and nature hand in hand.

Human existence and business prosperity in remote locations depend largely on the availability of clean water to people, livestock and crops. But in many parts of the world reliable power can be in just as short supply as the water.

Instead of working against nature, you can work with it – for the benefit of you, your business and the environment in general. Turn harsh conditions into your advantage by using the sun or the wind to create power for your water supply system

You can count on quick and efficient service from you local Grundfos dealer/installer and quick delivery of spare parts no matter where in the world you are. We have a close-knit service network with own service organisation in more than 40 countries combined with hundreds of Grundfos Service Partners, installers, and dealers worldwide, so whenever you need us, we'll be there to assist you.

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