



## THE WATERMAKERS

When an installer sets up an SQFlex system in a remote location, he delivers water – wherever, whatever. Bringing water to places where nature doesn't, he is a WaterMaker.

All system components have been developed to optimise performance and to make installing and maintaining the system very easy. This means the WaterMaker can guarantee the customer that the water is supplied by the most reliable, flexible, cost-effective and easily maintained water supply system available.

The SQFlex system from Grundfos is the individual solution to remote water supply in extreme climates. Water where nature can't deliver.

Be a part of it, be a WaterMaker.

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GRUNDFOS SQFlex



**WATER, WHEREVER, WHATEVER**  
AN INDIVIDUAL SOLUTION TO REMOTE WATER SUPPLY

BE > THINK > INNOVATE >

GRUNDFOS 



The SQFlex system from Grundfos is more than just a pump. It's a total concept tailored to any individual requirements. By examining some variables, Grundfos and the WaterMaker can put together the perfect combination for any purpose. All they need to know is the location, the water table depth and how much water is needed, and they will be able to find the most efficient energy source for the system.

The SQFlex system means:

- B** Simple installation
- B** Reliable water supply
- B** Virtually no maintenance
- B** Cost-efficient pumping – every day!

# WATER

A cattleman in Texas, a game warden in the veldt, or someone trying to establish a plant nursery 100 miles from the nearest water-hole; the SQFlex system can provide them all with the most reliable and energy efficient water supply.





With the advances in pump technology over recent years, areas that would previously have been considered uninhabitable or not supportive of life have become viable and attractive. With the new SQFlex system, Grundfos can consolidate these areas and pioneer further into new territories: Consolidating by upgrading older unreliable pump technology, and pioneering by

providing more stable and low-maintenance pumping solutions in even more remote areas. The SQFlex system succeeds where other pump systems struggle by adapting to the characteristic weather profile of any given area. By analysing such location specific variables as average sunshine and wind speed, Grundfos makes it possible



## WHEREVER

When it comes to providing water in extreme climates – call the WaterMaker.

The WaterMaker understands just how vital a regular and reliable supply of water is to cattle ranchers, farmers, game managers, and owners of remote properties. Without it their very livelihood is in jeopardy. Installing the SQFlex system in any extreme climate, the WaterMaker assures total regularity, flexibility and reliability.

for the WaterMaker to calculate how much natural energy is available over an average season. This means only the most appropriate energy source will drive the system.

WHEREVER >



#### **SQFlex Solar**

These days, more and more businesses are choosing solar energy as the ideal, sustainable alternative. SQFlex Solar is cheap to run, reliable and virtually maintenance free – perfect for big country land management where “just out back” can mean 300 miles away! Grundfos’ solar panels are long lasting, noiseless and bill-free.

#### **SQFlex Wind**

Where wind speed prevails over sunshine hours, the SQFlex Wind is just as cost-effective and sustainable. The small but high-output wind turbine is just as cheap to run as the solar panels and is particularly suitable for open fields, valleys and landscapes where the wind blows constantly.

# WHATEVER

In the middle of nowhere, the only things you can depend upon are air and daylight. The SQFlex pump is fully operational from one or, for greater peace-of-mind, a combination of these energy sources. SQFlex Solar and Wind systems are reliable, low-maintenance and cost-effective. In addition, the systems are sustainable and totally environmentally sound.

Where water is a scarce commodity, harnessing the sun and wind to turn the local conditions to your advantage is the low-cost, flexible solution. Easily installed, SQFlex systems are tailored to meet specific needs – local weather conditions, water table depth and average usage are all examined to optimise energy consumption.

## **SQFlex Combo**

Deciding upon the energy source for an SQFlex system is not necessarily an “either/or” choice. The SQFlex Combi provides a combination of solar and wind energy: solar panels for when the sun is shining; a wind turbine for when the wind is blowing, mean even greater reliability and water whenever it's needed.

## **SQFlex Back-Up**

In the rare cases when Mother Nature doesn't oblige, both solar and wind systems can fall back on generator power fuel cells or batteries. It's that simple. SQFlex keeps pumping when other systems just give up the ghost.

# THE SQFLEX SYSTEM...





**...WATER, WHEREVER, WHATEVER**



## SQFLEX SOLAR

Installing the SQFlex Solar requires no special tools as the Grundfos solar panels plug straight into the system. The SQFlex Solar is cheap to run and virtually maintenance-free.



## SQFLEX WIND

Equally cost-effective and easy to install, the SQFlex Wind is particularly suitable for open fields, valleys and landscapes where the wind blows constantly. The complicated process of converting wind energy to electrical energy has been made easy and very reliable with the addition of sophisticated components.



## SQFLEX COMBO

Two energy sources: solar panels for when the sun is shining; a wind turbine for when the wind is blowing. The benefits of the SQFlex Combo are even greater reliability and water whenever it's needed.



## SQFLEX BACK-UP

Natural energy rarely runs low, but if it ever does, both the SQFlex Solar and Wind systems can fall back on generator power, fuel cells or batteries. Integrated design makes changing between power supplies very easy.

# THE INS AND OUTS

SQFlex pumps have built-in protection features that protect the pump itself and in many cases the well. Among these features are:

- Protection against dry-running, overloading and overheating
- Automatic restart when water returns to the well or when the motor temperature returns to the safety range
- Continuous load condition and voltage monitoring



## PUMP CASING

Stainless steel for long pump life.

## HELICAL ROTOR PUMP

Based on original pumping principles, the helical rotor pump uses a few, simple components for effective pumping in high head and low flow conditions.

## DRY-RUNNING PROTECTION

This unique feature shuts down the pump if it detects water shortage. It protects the well from being over-pumped and the motor from burning out.



## CENTRIFUGAL PUMP (4")

Technology based on 30 years' experience enables high flow in shallow water conditions. Stainless steel components give high wear resistance.



### BEARINGS

Powerful carbon/ceramic bearing system ensures extreme reliability.

### MOTOR

Only one motor for the entire pump range with built-in unique features. A newly developed segmented stator provides high efficiency.

### POWER TRANSMISSION

The unique Grundfos micro frequency converter ensures power transmission to the motor.

### ANY VOLTAGE

A wide voltage range enables the motor to operate at any voltage between 30V and 300V DC or 90-240V AC, which makes installation and sizing especially easy.

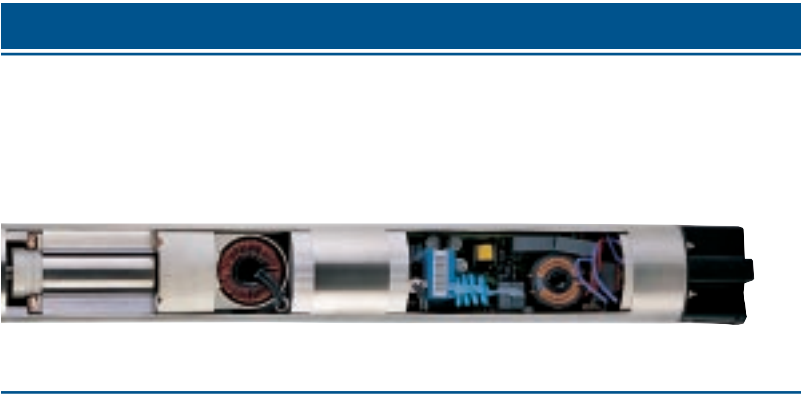


### COMMUNICATION

Two-way communication between interface box and pump eliminates the needs for additional wires.

### SYSTEM EFFICIENCY

Maximum Power Point Tracking (MPPT) means even and high system efficiency regardless of power source.





## CU 200

A user-friendly interface box that maintains two-way communication with the pump and monitors the operating conditions. Built-in diagnostics indicate faults and dry-running, display operating status power consumption and level switch input.



## IO 100

A very simple and easy-to-use system and with cable terminal connections interface. Controlled by a manual on/off switch.

## IO 101

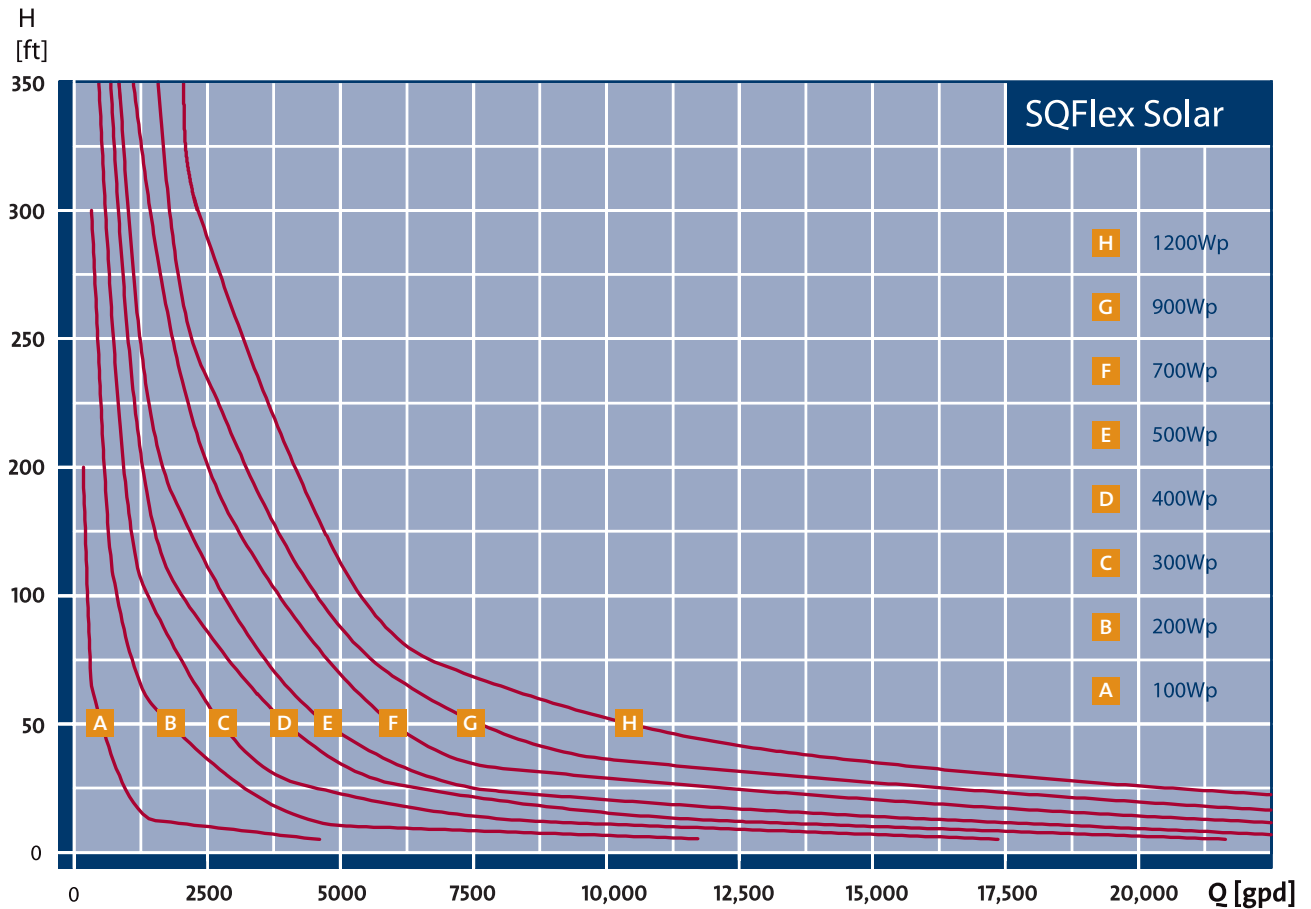
Acts as interface for powering back-up supplies, providing automatic change-over. For instance when changing from generator to solar energy, the solar panels automatically power the system as soon as the fuel tank runs dry.



## LEVEL SWITCH

Save energy as you save water. With a level switch inside the storage tank connected to the CU 200 control unit, the pump knows when the tank is full and shuts itself off.

# SQFLEX PERFORMANCE

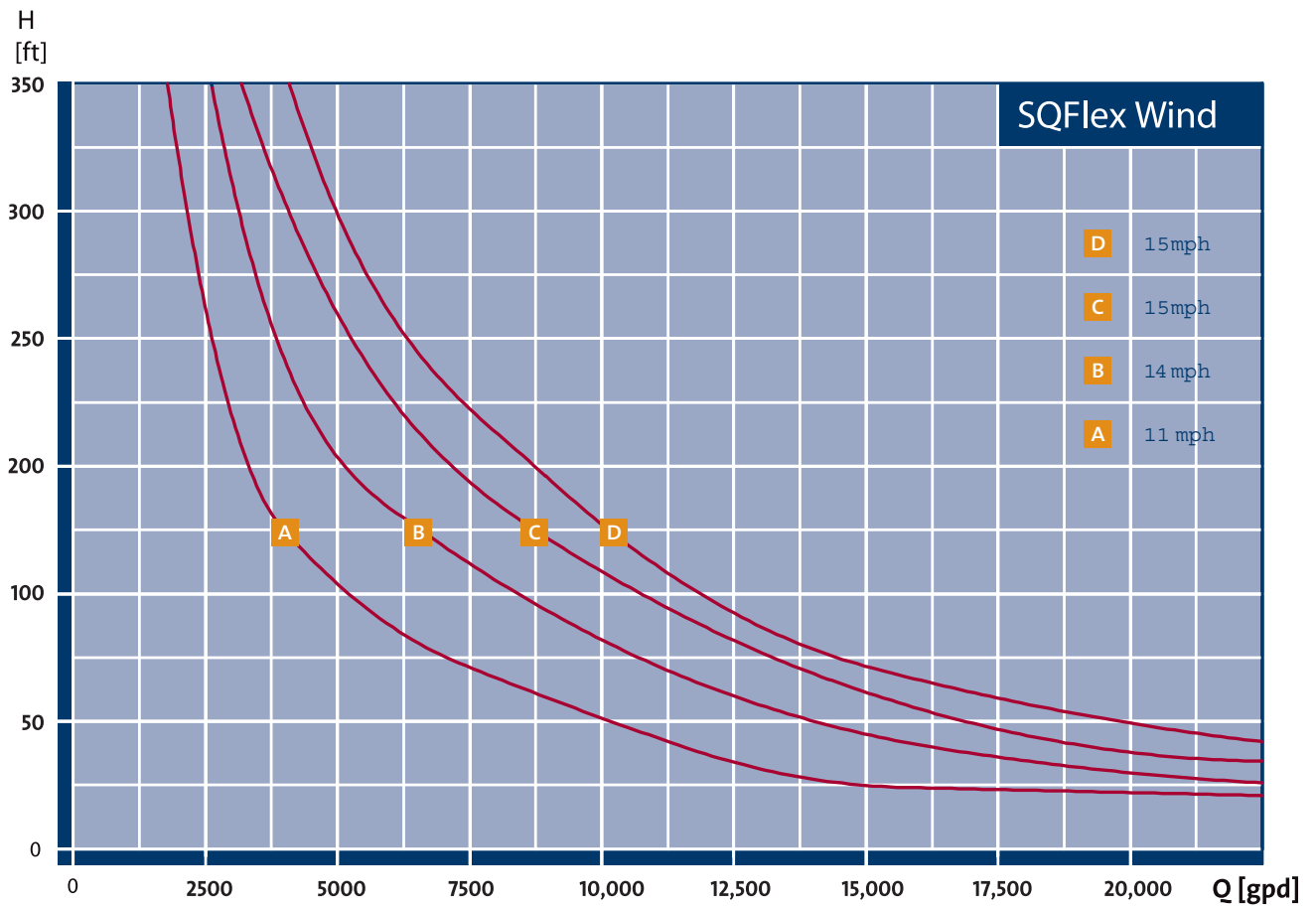


The SQFlex Solar performance curves are based on:

- Irradiation on a tilted surface
- $H_t = 6 \text{ kWh/m}^2 \text{ day}$
- $20^\circ$  tilt angle
- Ambient temperature at  $30^\circ\text{C}$
- $20^\circ$  northern latitude
- 120V DC



The complete SQFlex pump range consists of 7 different pump sizes: 4 centrifugal and 3 helical rotor pumps. All pumps are fitted with the same motor which, together with the new sizing tools, makes system sizing simple.



The SQFlex Wind performance curves are based on:

- Average wind speed
- Calculations according to Weibull's factor  $k = 2$
- Continuous operation over 24 hours

# SQFLEX SYSTEM SIZING-HARDCOPY

Sizing an SQFlex system is easy using either the hardcopy version or the WinCAPS CD-ROM. The two sizing systems are designed in much the same user-friendly way.

Before starting to size the system you need to determine 3 things:

location

total head

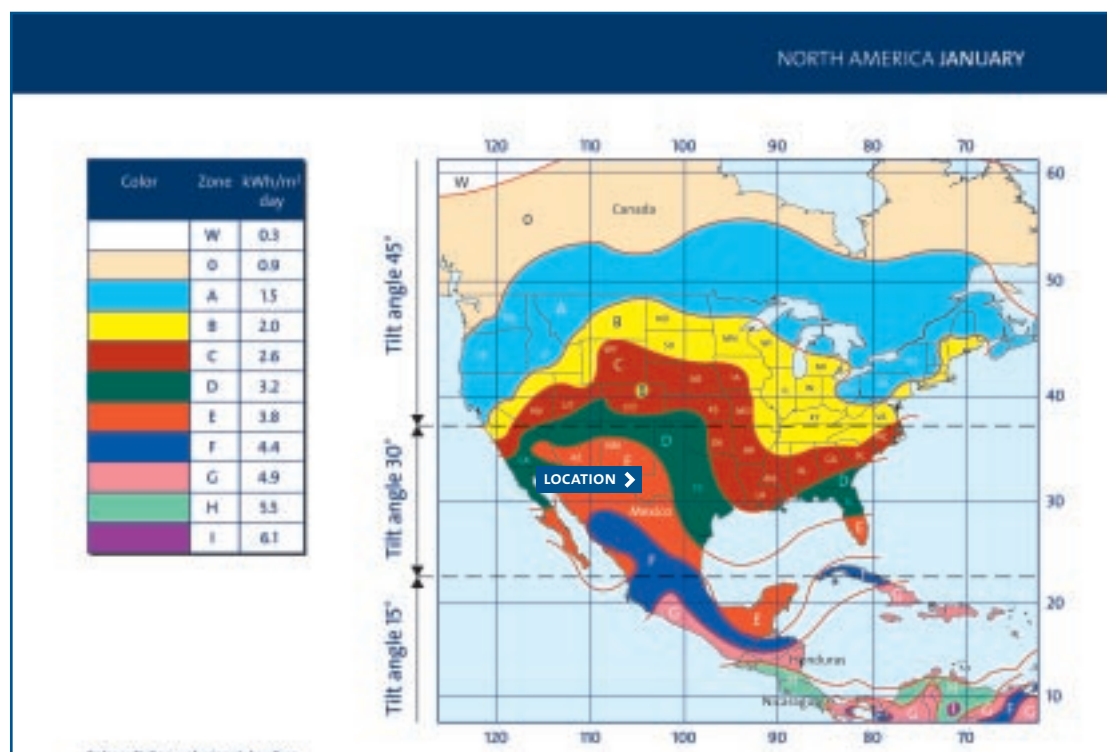
required water quantity per day

Now you are ready to select the most suitable system.

The following example shows how the hardcopy version was used to select the correct SQFlex system for a person in Central Texas.

The map shows how particular locations belong to various zones, and this is marked by different colours to make it easier to read. From the map, it is possible to ascertain two important details: the zone and solar panel tilt angle.

Our location is situated in Zone I, and the solar panel tilt angle is 15°.



Now, it is possible to choose the relevant sizing chart according to the given zone and colour. Here's where the total head and water requirements are used to select the correct pump and number of solar panels.

### North America

#### SQFlex - Performance m<sup>3</sup>/day

Zone	Solar radiation	Total Head [m]												No. of Solar panels GF 4				
		5	10	15	20	25	30	35	40	50	60	70	80		90	100	110	120
ZONE I tilt angle 15°	30	4	2.5	2	1.8	1.7	1.6	1.4	1.2	1.1	0.9							4
	SQF 5A-6		SQF 2.5-2			SQF 0.6-2												
	50	25	15	12	7	5.5	4.9	4.5	4	3.5	3	2.7	2.5					8
	SQFLEX PUMP TYPE		SQF 2.5-2			SQF 1.2-2			SQF 0.6-2									
	60	35	25	22	17	15.5	10	8	7	5	4.5	3						12
	SQF 5A-6		SQF 2.5-2			SQF 1.2-2			SQF 0.6-2									
75	50	37	25	13	12													

With a required total head of 40 m, and a daily water requirement of 7 m<sup>3</sup>, the correct pump is an SQFlex 2.5-2. Furthermore, the number of solar panels necessary to power this SQFlex system is 8, corresponding to 344 Wp.

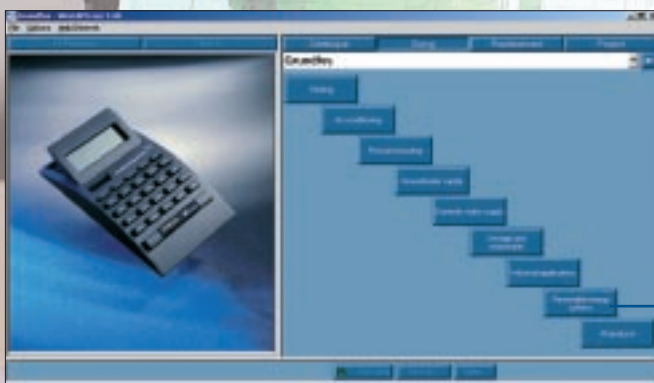
As shown, sizing an SQFlex system for installation is very easy. By referring to two very easy-to-read documents, selecting the suitable system dimensions takes a matter of minutes using the hardcopy version.

# SQLFLEX SYSTEM SIZING – WINCAPS

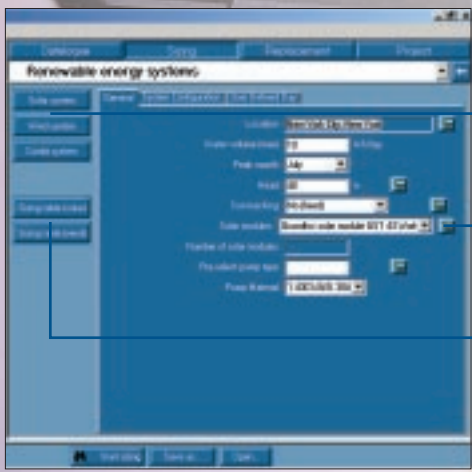
Grundfos' Windows based Computer Aided Product Selection CD-ROM (WinCAPS) is a resource used to dimension systems and for general information on our products. It includes an extensive catalogue of all Grundfos pumps and systems as well as detailed product data.

The SQLFlex System sizing tool is a new addition to WinCAPS. The sizing tool is quick and easy to use and includes a full overview of all SQLFlex systems.

This is the opening page of WinCAPS. To use the SQLFlex System sizing tool, simply follow the steps below.



◀ CLICK ON THE RENEWABLE ENERGY SYSTEMS BUTTON HERE

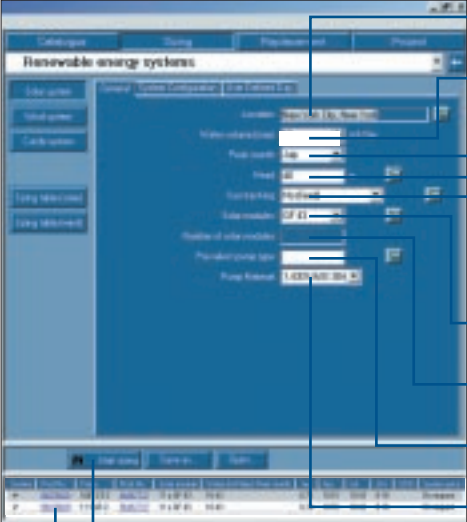


◀ YOU CAN CHOOSE EITHER A SOLAR, WIND OR COMBI SYSTEM

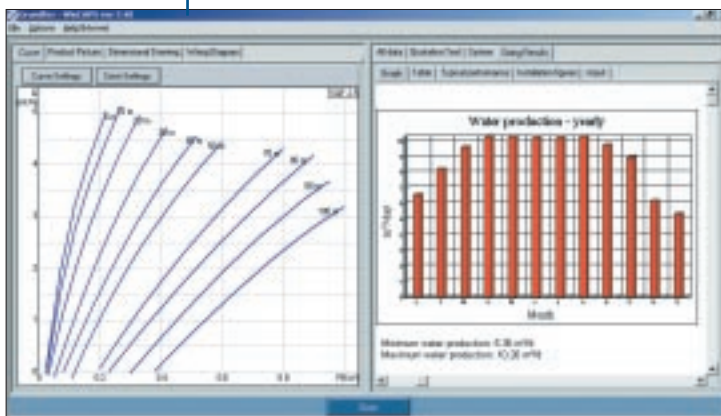
◀ YOU CAN ACCESS SCREENS THAT ALLOW YOU TO ENTER MORE DETAILED INFORMATION ABOUT HEAD, CABLE LOSS, TILT ANGLE OF SOLAR PANELS, ETC.

◀ YOU CAN PRINT SIZING TABLES FOR EITHER SOLAR OR WIND SYSTEMS BY CLICKING ON ONE OF THE SIZING TABLE BUTTONS

Having selected the relevant system (in this case SQFlex Solar), the program is almost ready to calculate the exact configuration. First you must enter your relevant data into the following parameters:



- ← YOUR GEOGRAPHICAL LOCATION
- ← THE REQUIRED WATER VOLUME PER DAY IN PEAK SEASON
- ← WHEN YOUR WATER REQUIREMENT IS AT ITS PEAK
- ← THE TOTAL DYNAMIC WATER LEVEL
- ← SELECT YOUR CHOICE OF SOLAR MODULE MOUNTING
- ← SELECT SOLAR MODULE TYPE FROM THE LIST
- ← IF YOU KNOW THE SYSTEM BUT NOT THE WATER VOLUME
- ← SELECT SPECIFIC PUMP TYPE IF REQUIRED
- ← SELECT PUMP MATERIAL
- ← ONCE DATA HAS BEEN ENTERED CLICK ON "START SIZING"
- ← ONCE FINALISED, OUTPUT DATA IS DISPLAYED HERE



Welcome to the Grundfos WinCAPS sizing tool – an easy way to the precise SQFlex system. Order your WinCAPS CD-ROM from your local Grundfos office, or go to [www.grundfos.com](http://www.grundfos.com)



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