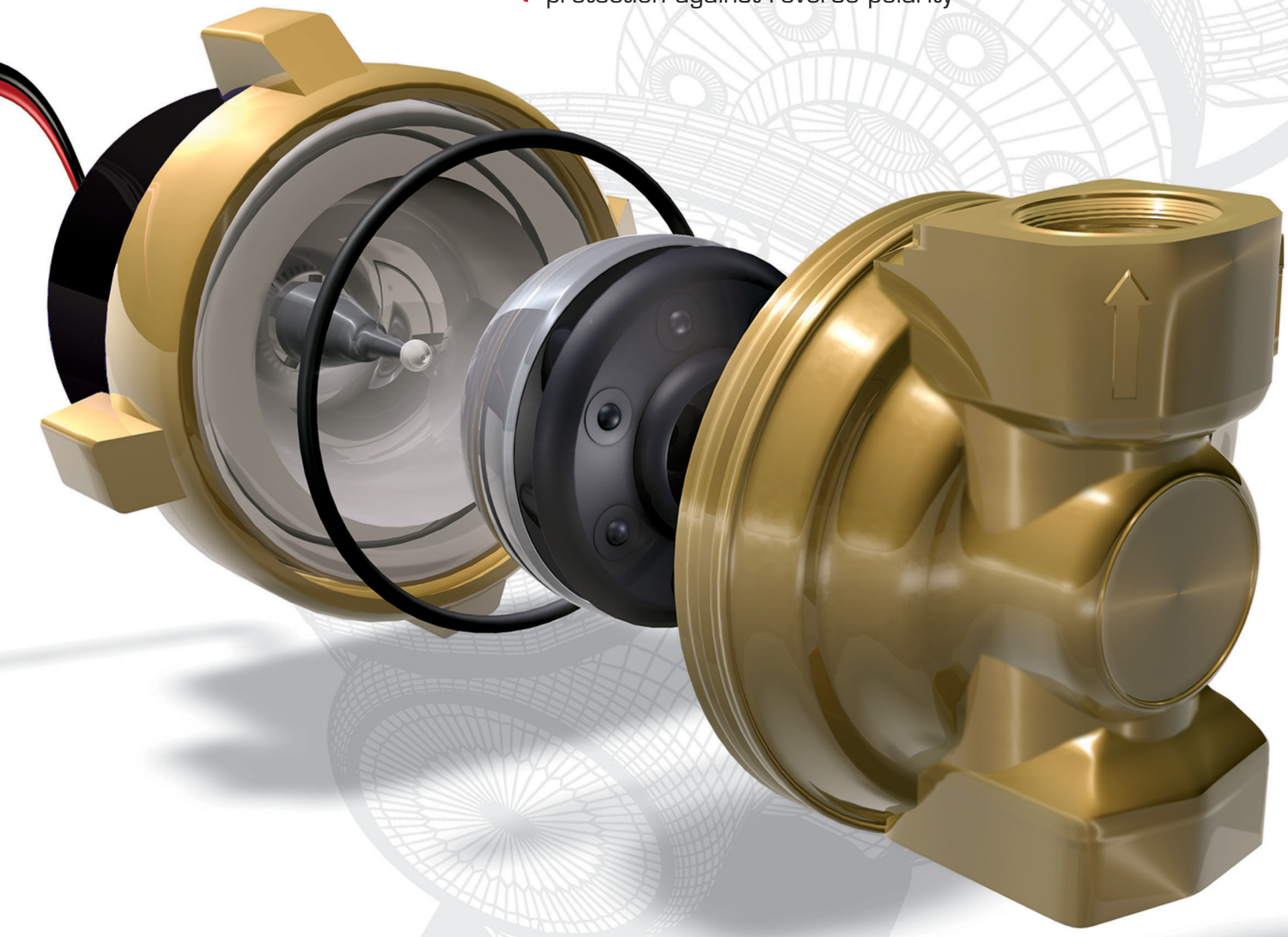
DC pumps

# ecocirc® solar

The first DC spherical motor pump for direct connection to photovoltaic panels with automatic performance optimization using MPP technology (Maximum Power Point tracking)

- soft start at very low insolation
  (soft start algorithm, less than 1 Watt required)
- economical and powerful
- long life, blockage free and maintenance free
- RF suppressed
- protection against reverse polarity



LAING

simply the best · by design

# DC pumps

# ecocirc® solar

## Application

The Ecocirc solar pump can be used wherever a highly efficient circulation pump is needed without a direct connection to AC power. It can be connected directly to a photovoltaic panel and is characterized by its small size, high efficiency, very low power consumption and its MPP tracking. The shaftless spherical motor technology enables a long, maintenance free and quiet service life. Areas of application are thermal solar systems for single family homes.

## Design

The principle of the spherical motor, which was invented by Laing, is fundamentally different from conventional canned motor pumps. The only moving part in a spherical motor is a hemispherical rotor/impeller unit, which sits on an ultra-hard, wear-resistant ceramic ball. There are no conventional shaft bearings or seals. This rules out, in effect, the possibility of play in the bearings and the increase in noise associated with it. These pumps are particularly robust and give exceptionally long service. The self-realigning bearing is lubricated and cooled by the media. Maintenance is not necessary under normal conditions and even after lengthy shutdown periods a reliable start-up is virtually guaranteed. The parts exposed to the fluid are completely corrosion resistant.

## Soft start-up

The pump has been programmed for a soft start-up. When the photovoltaic panel provides sufficient power, the pump first goes through the alignment phase, turning the rotor into the position required for start-up. Then the processor waits until the built-in capacitor has recharged sufficiently. This enables a start-up with minimal power (less than one Watt). Cycling due to unsuccessful starting attempts is minimized. Even after prolonged shutdown, the pump will start reliably.

## Integrated overtemperature protection

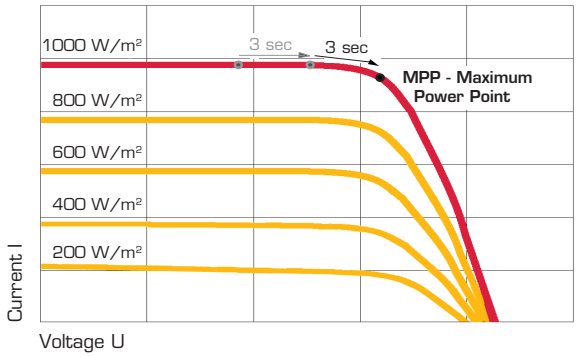
The pump comes with an integrated overtemperature safety device, which shuts the pump electronics off when reaching overtemperature. Normally the temperature of the pumped media during operation at the highest speed setting is 95° C at this point.

A complete shutdown after reaching overtemperature condition can result in adverse effects on the circulating system. Since the temperature of the electronic components is influenced by the temperature of the pumped media as well as by the speed setting, the pump will lower its speed automatically after reaching a critical temperature level in order to avoid a total shutdown. However, if the temperature continues to rise (caused e.g. by too hot pumped media), the pump will eventually shut down completely. After cooling down, the pump will restart automatically.

## Automatic performance optimization – MPP tracking

The Ecocirc DC pumps are the first and only spherical motor pumps with self-optimizing software (see diagram). Every three seconds, the processor will modify its operating point on the voltage-current curve of the PV panel to find the point of maximum performance. This is called the "Maximum Power Point" (MPP).

At this point, the pump achieves the maximum rpm and therefore the maximum performance. There is no need for a separate performance adaptation, the pump will always find its best operating point under any given light and temperature conditions by itself.




*Typical Current-Voltage-curve of a photovoltaic panel. By employing MPP tracking every three seconds, the Ecocirc DC pumps always automatically achieve maximum performance at any given insolation.*

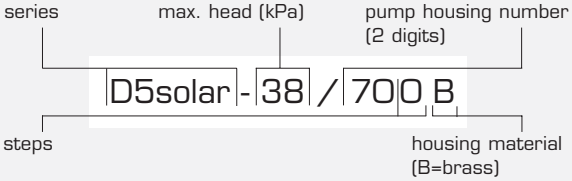
## Technical Data

| | |
|---|---|
| Motor design | Electronically commutated spherical motor with permanent magnet rotor/impeller |
| Voltage | 8 - 24 Volt |
| Power consumption* | min. start-up power consumption less than 1 Watt, max. power consumption 22 Watts |
| Current draw | 0,25 - 1,46 A |
| Acceptable media | domestic hot water, heating water, water/glycol mixtures, other media on request**. |
| Insulation class | IP 42 / Class F |

| Pump housing material | Brass | Noryl |
|---|---|---|
| Max. system pressure | 1 Mpa (10 bar) | 0,15 MPa (1,5 bar) |
| Max. system temperature*** | -10 to + 95°C | +/- 0 to + 60°C |
| Weight | 0,7 kg | 0,35 kg |

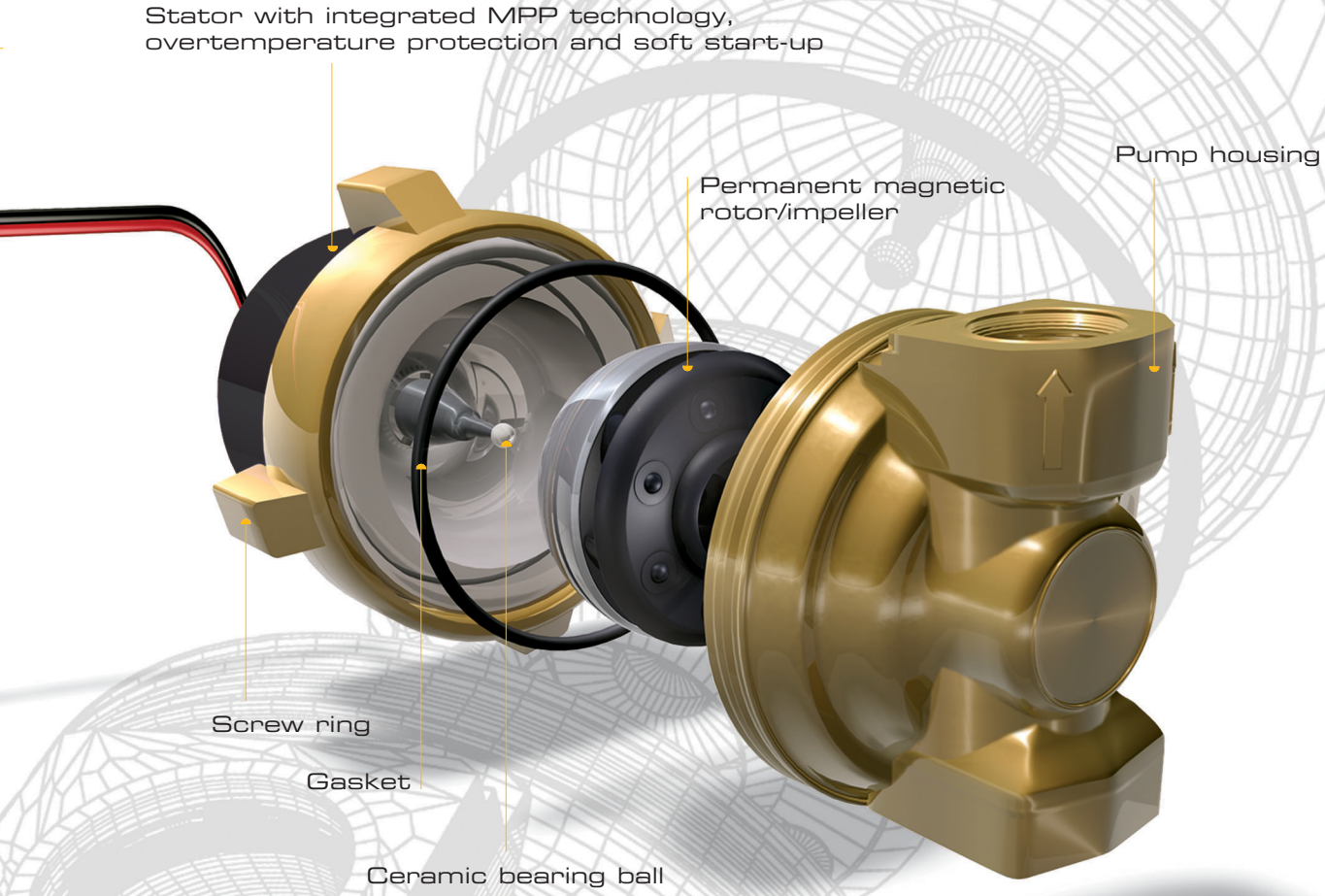
* Power consumption and start may vary in different installations
** please check pump performance with more than 20 % glycol
*** non-freezing

## Model names



# Design

## DC pumps Ecocirc solar





D5solar-38/700 B


D5solar-38/100 B


D5solar-38/830 N


D5solar-38/810 N


D5solar-38/790 N

## ecocirc® solar DC pumps

| Model | Part number | Pump housing material | Max. system temperature | Housing design / Length Others | Connection | Product category |
|---|---|---|---|---|---|---|
| D5solar-38/700 B | 60 00 403 | Brass | 95° C | Inline / 65mm | 1/2" female thread | C |
| D5solar-38/100 B | 60 00 413 | | | Inline / 110mm / RV+KV* | 1 1/4" male thread** | |
| D5solar-38/830 N | 60 00 423 | Noryl | 60° C | Angled housing | 1/2" male thread | |
| D5solar-38/810 N | 60 00 433 | | | Angled housing | 1/2" hosebarb thread | |
| D5solar-38/790 N | 60 00 443 | | | Angled housing | 3/4" hosebarb thread | |

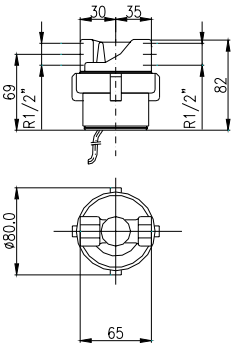
* integrated check valve and ball valve
** for connection to 3/4" union components. Housing has additionally a 1/2" female connection

## ecocirc® solar Accessories, components and spare parts

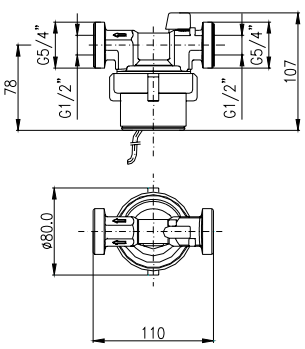
| Model | Part number | Description | Product category |
|---|---|---|---|
| D5solar-38/000 | 60 00 490 | Replacement motor for D5 solar incl. gasket | C |
| F 72 | 95 00 732 | Rotor/Impeller incl. gasket for Ecocirc solar D5 | |
| MW C | 95 00 041 | Mounting plate for Ecocirc solar D5 with Noryl pump housing | |

# Dimensional drawings for Ecocirc® solar DC pumps

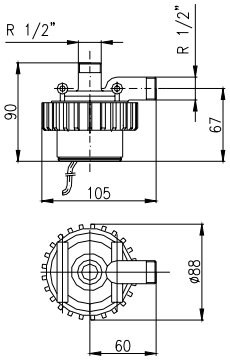
All dimensions in mm unless rated



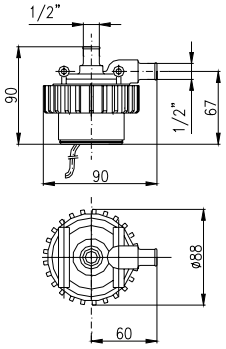

D5solar-38/700 B



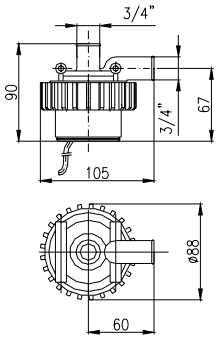

D5solar-38/100 B




D5solar-38/830 N




D5solar-38/810 N



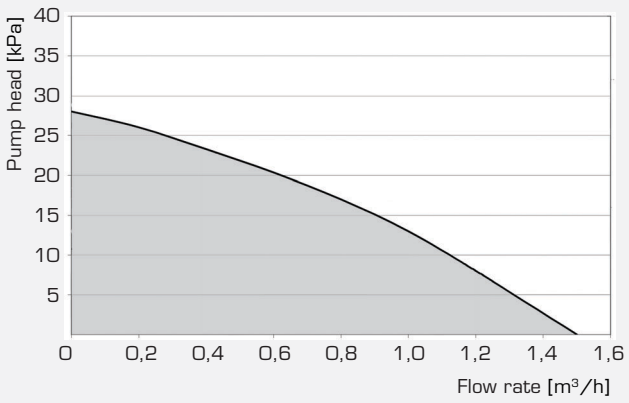

D5solar-38/790 N

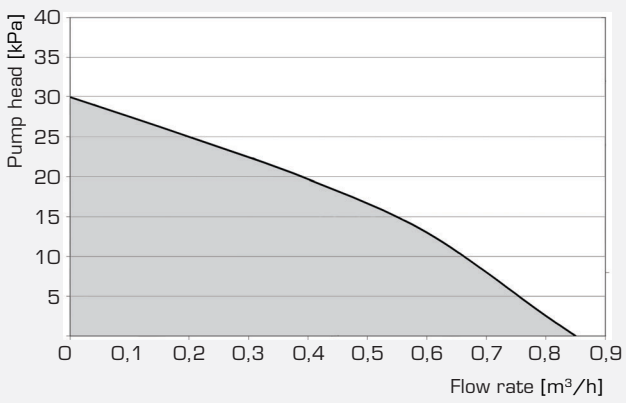
## Pump curves

At 12 Volt, min. start-up power consumption less than 1 Watt (12 Volt panel),
max. power consumption approx. 22 Watt;

D5solar-38/700 B

D5solar-38/100 B

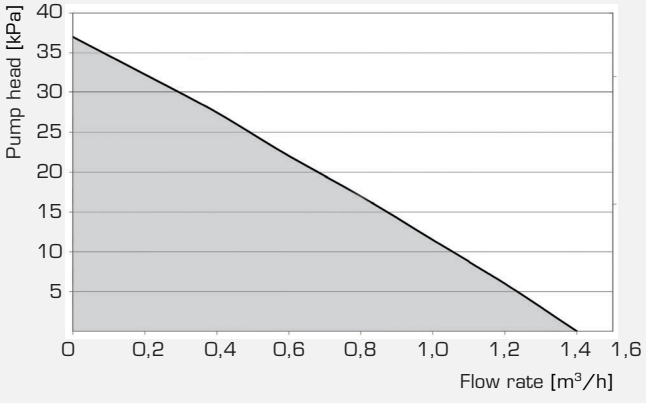


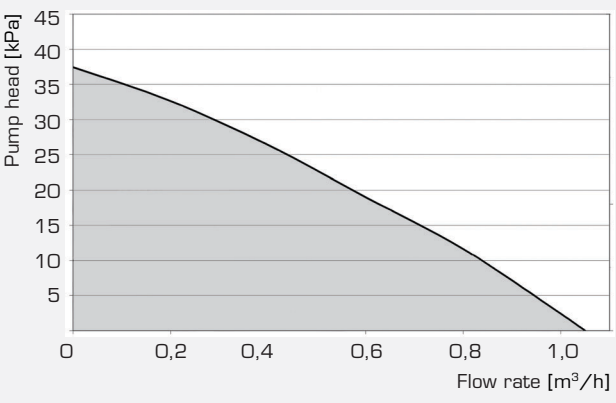




D5solar-38/830 N

D5solar-38/790 N

D5solar-38/810 N

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