OPERATING AND INSTALLING THE ENERGY HARVESTING GENERATOR

Cherry's Energy Harvesting generator transforms mechanical energy into electrical energy. The operation and installation are described here to help you to implement it in your application.

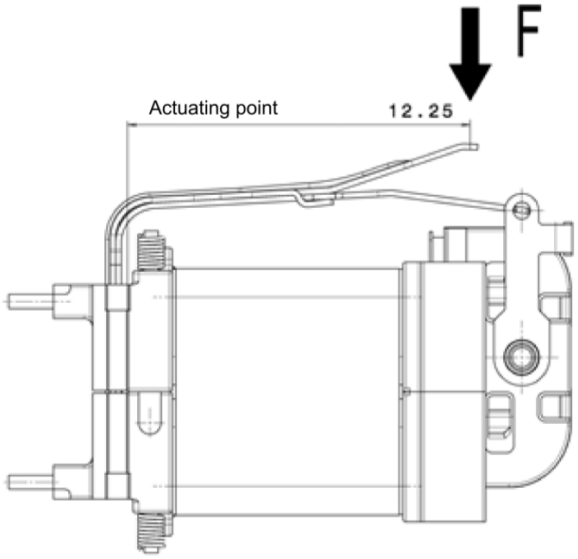
1 Function

1.1 Actuating the generator

The Energy Harvesting generator, available separately or inside Cherry's Energy Harvesting switches, consists of a coil and a magnet block.

When actuated, a mechanical force (F) acts vertically on the end of the generator's lever. A patented mechanism causes the magnetic block to move down abruptly (switching) and a positive pulse is created by reversing the polarity of the coil. When the lever is released, the system returns to the initial position (resetting) by means of the mechanism and a negative pulse is created.

The energy produced is used for transmitting a radio signal.



All dimensions in mm

Fig. 1 Actuating point

1.2 Force travel diagram

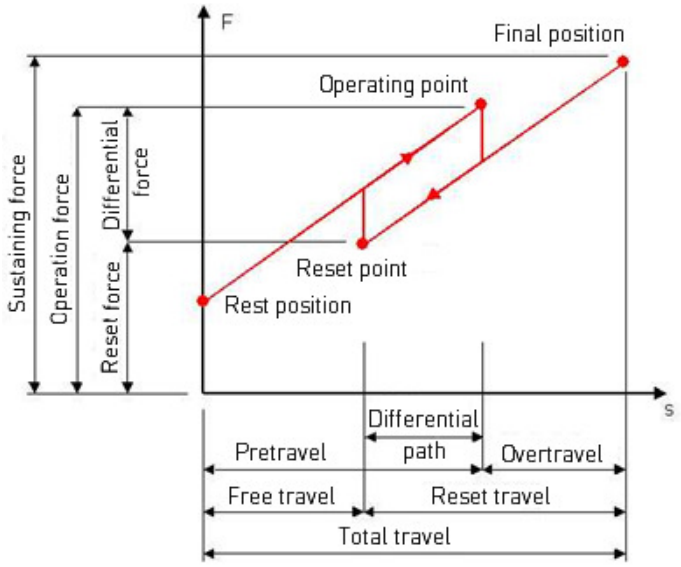


Fig. 2 Force travel diagram of the basic curve when actuating the generator

1.3 Switching pulse

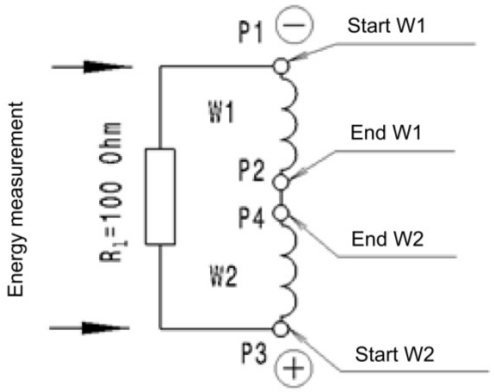


Fig. 3 Equivalent circuit diagram: Positive pulse when switching (W2) and negative pulse when resetting (W1).

1.4 Voltage time diagram

The following diagrams show the voltage curve of circuits at room temperature with a resistive load of 100 Ω.

Time axis: Output average of 1,000 samples, 0 to 10 ms
Amplitude axis: Output voltage in volts

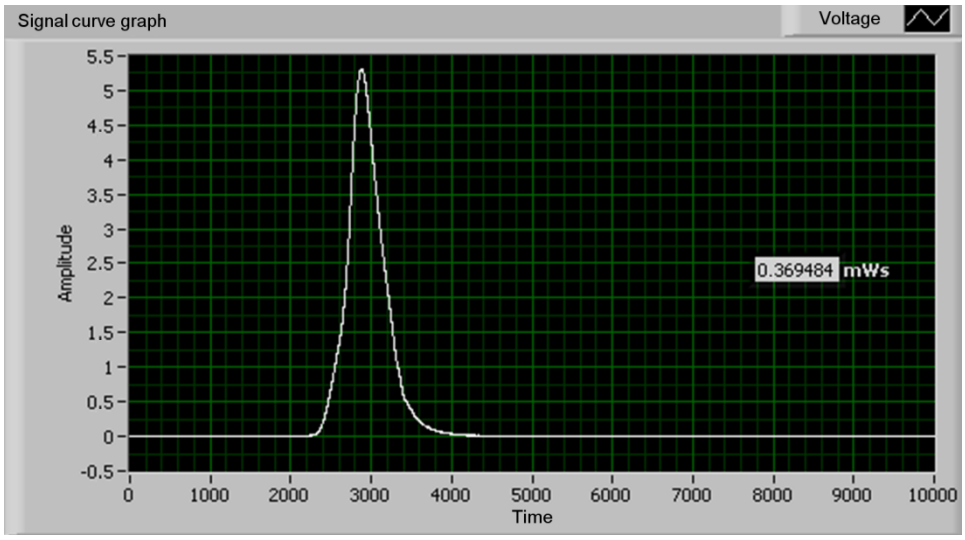


Fig. 4 Switching pulse

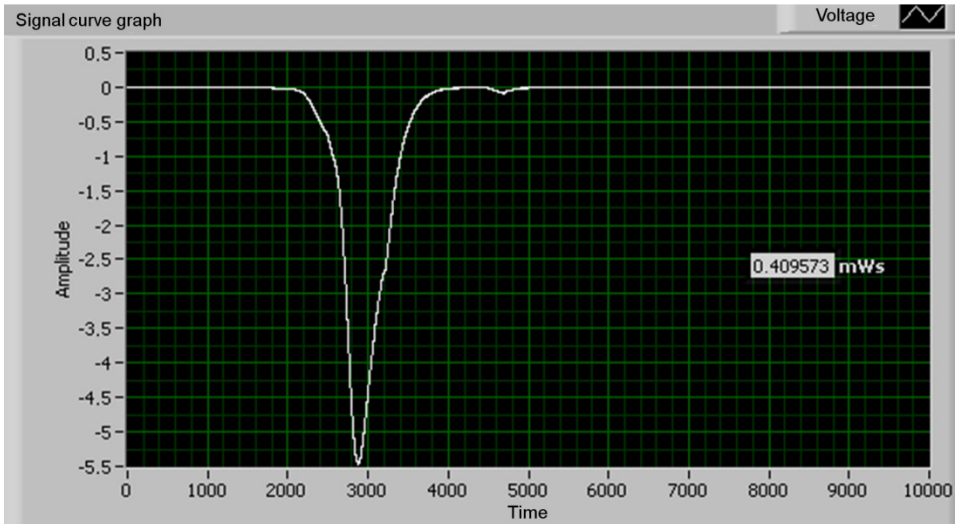


Fig. 5 Resetting pulse

1.5 Impact of the ambient temperature

The ambient temperature affects the conductivity of copper and the energy changes accordingly. The ambient temperature and energy output are inversely related.

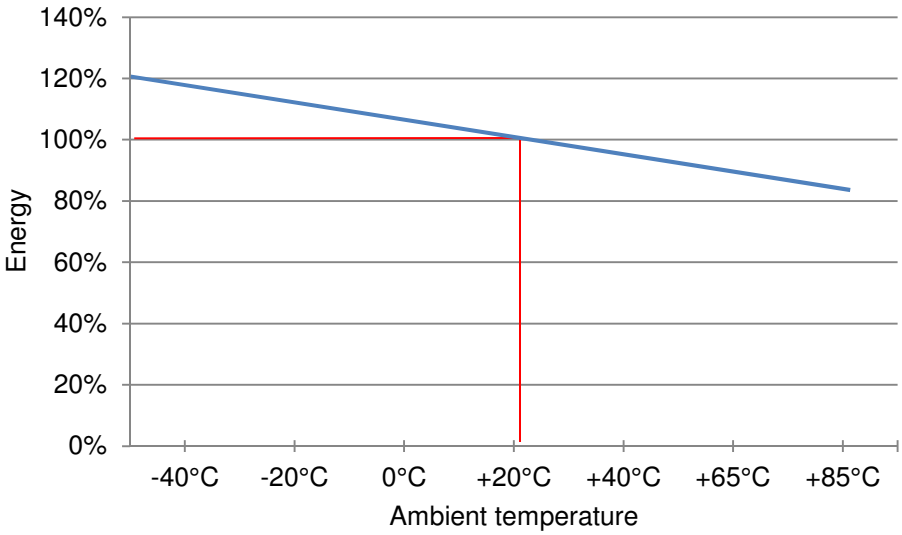


Fig. 6 Curve of the energy generated at different temperatures.
Load = 100 Ω, actuating speed = 0.1 m/s.

1.6 Impact of the actuating speed

A higher actuation speed increases the energy yield and reduces the service life of the generator. Contact the factory for more details.

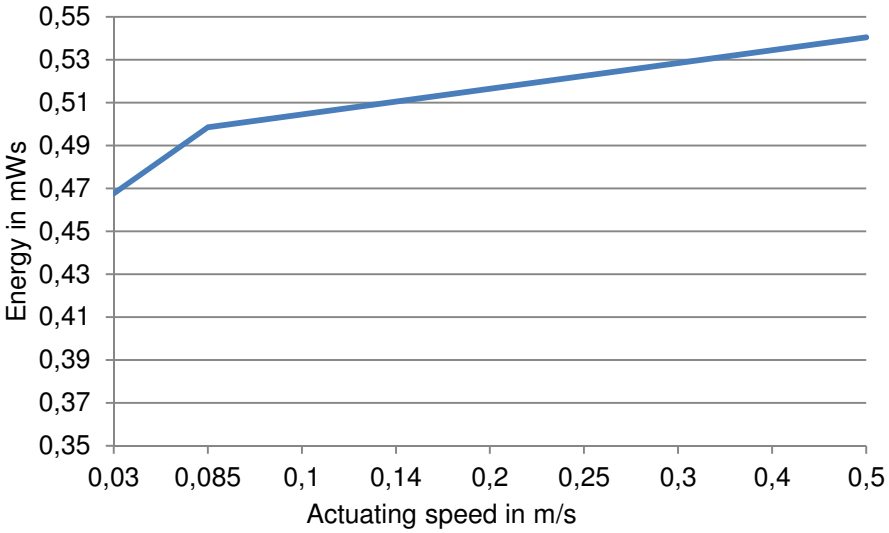
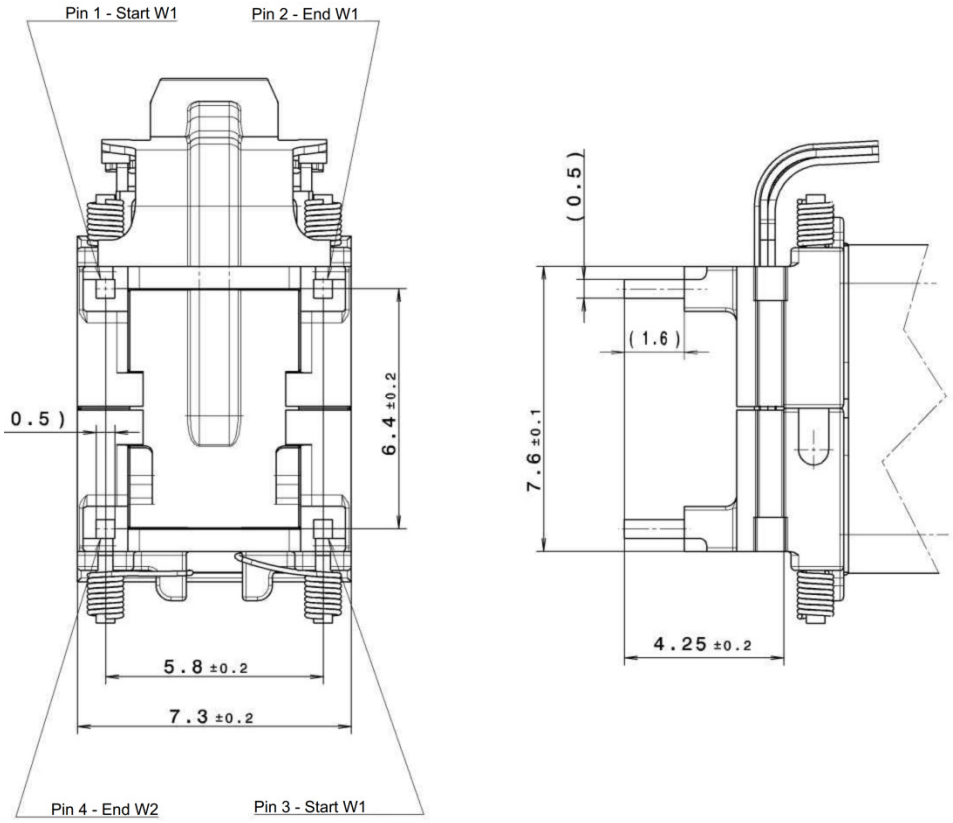


Fig. 7 Curve of the energy generated at different actuating speeds
Load = 100 Ω, ambient temperature = 23 °C.

2 Soldering

2.1 Contacts



All dimensions in mm

Fig. 8 Pin assignment; see also equivalent circuit diagram (Fig. 3)

2.2 Soldering notes

The generator is designed for automatic soldering.

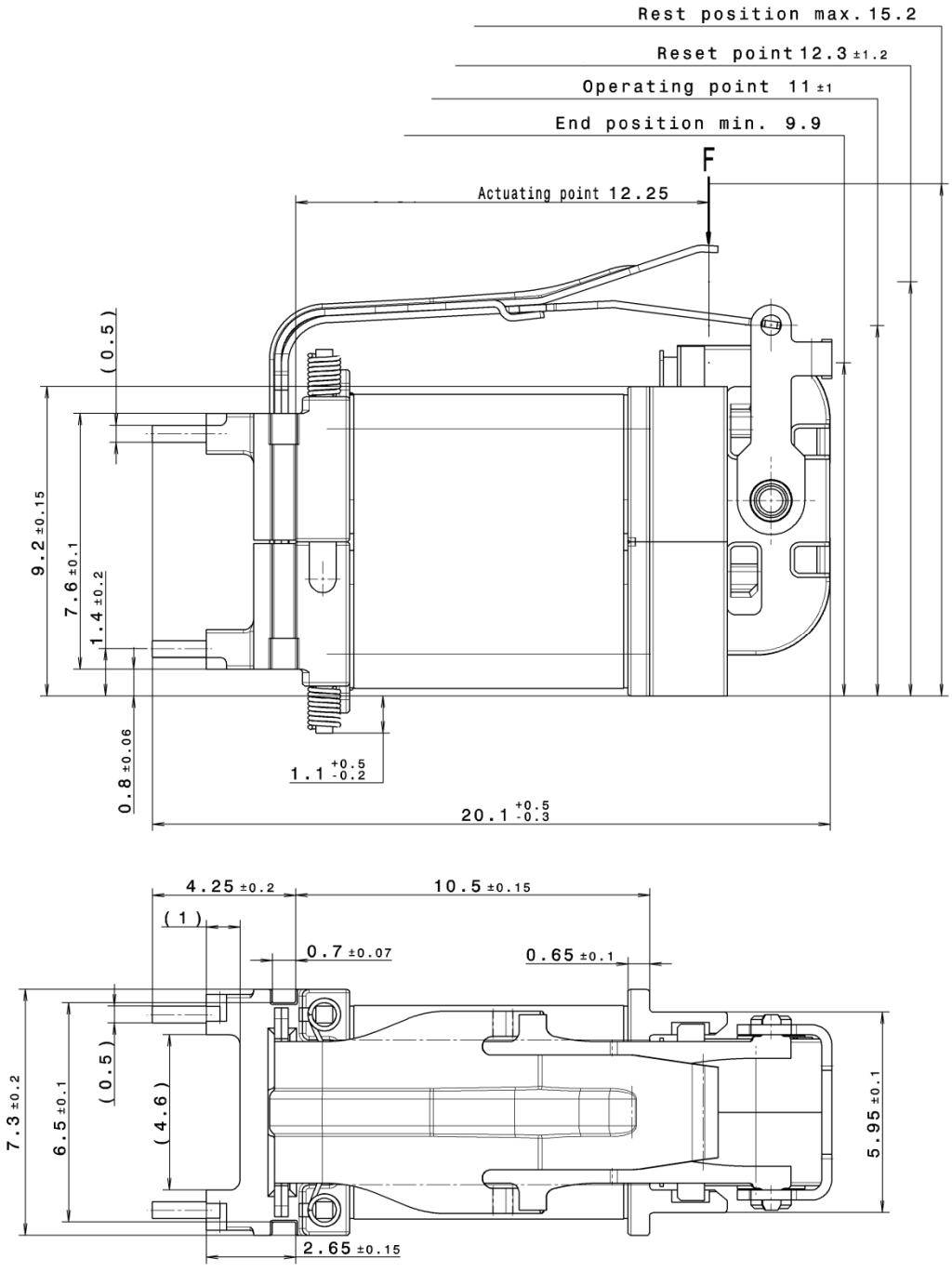
The following parameters for soldering with microdrop fluxing were specified by the supplier EBSO (EBSO 300 SPA 300 F, M00-0378):

Processing temperature	290 °C
Soldering time	2 seconds
Solder	SAC305
Fluxing agent	Lonco RF 800

If you would like to use another soldering technique (e.g. hand soldering), please contact the factory.

3 Installation instructions

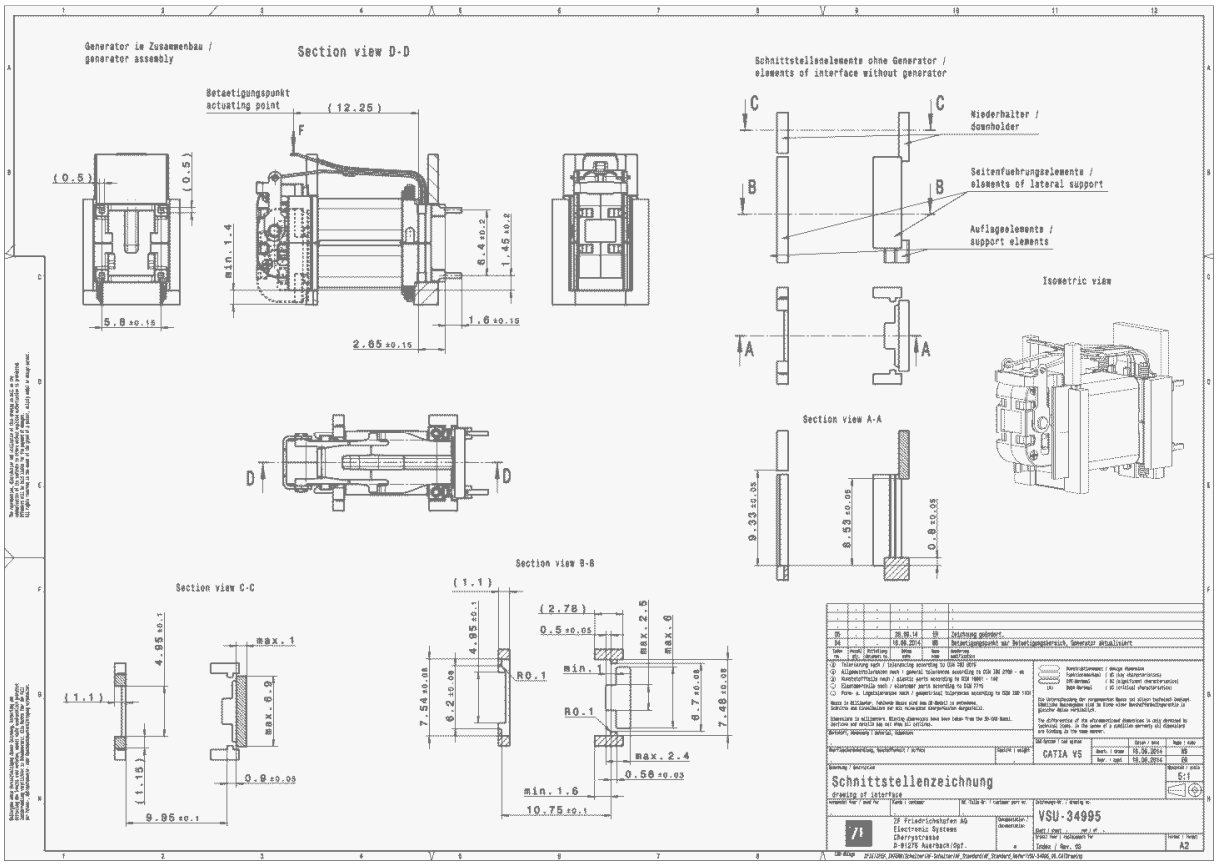
3.1 Physical dimensions of the energy harvesting generator



All dimensions in mm

Fig. 9 Generator dimensions

3.2 Dimensions with interface elements

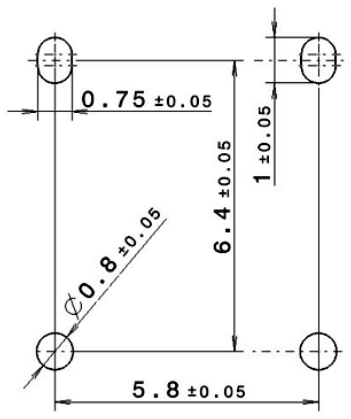


All dimensions in mm

Fig. 10 Interface elements drawing

We recommend contacting the factory when using the generator only. The drawing is available upon request.

3.3 Drilling pattern



All dimensions in mm

Fig. 11 Drilling pattern

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