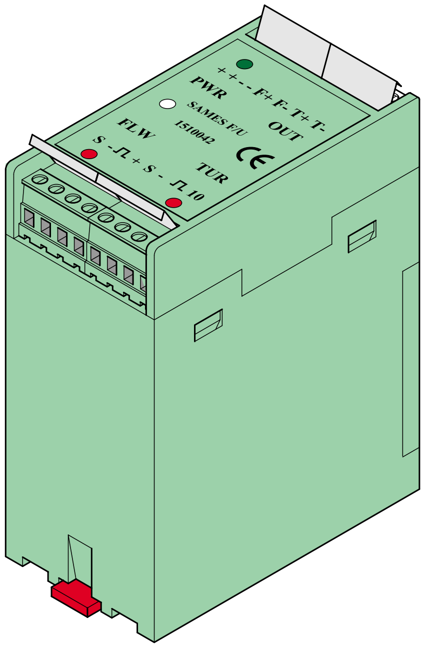
From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS

A partir du 1/02/17, SAMES Technologies SAS devient SAMES KREMLIN SAS

SAMES KREMLIN



User manual

Frequency-to-Voltage Converter
F / U - 1 510 042

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Frequency-to-Voltage Converter
F / U - 1 510 042

1. Foreword

The SAMES F/U 1510042 converter is manufactured in accordance with the European electromagnetic compatibility directive "89/336/CEE".

This compliance is presumed through reference to the following specifications:
- Standard EN 50081-2 (emission, industrial environment)
- Standard EN 50082-2 (immunity, industrial environment).

For details of use, see § 4 page 6: Wiring Diagrams in this user manual.

The 1510042 converter replaces the 1500557 version but has a different flow range:
- 1510042 - 500 / 1000 / 1500 / 2000 cc / min.
- 1500557 - 500 / 1000 / 2000 cc / min.

2. Operation

The SAMES F/U converter is designed to:
- power the flowmeter and convert the pulses received from this toothed-wheel sensor into a DC voltage (0-10 V) in order to obtain an analogue measurement of the paint flow,
- provide power and convert the pulses from the phonic speed sensor of a turbine into a DC voltage (0-10 V) in order to obtain an analogue measurement of the rotation speed,
- provide the power supply (10 V) for the movement position sensors (potentiometers).

2.1. Paint Flow Measurement

There are four flow measurement calibres:
- 500 cc maximum with a minimum of 40 cc (for bell cup machines).
- 1000 cc maximum with a minimum of 80 cc (for reciprocating or bell cup machines).
- 1500 cc maximum with a minimum of 120 cc (for reciprocating or bell cup machines).
- 2000 cc maximum with a minimum of 160 cc (for reciprocating machines).

The module provides a DC voltage that is in proportion to the measured flow with a maximum value of 10 Volts (+/- 0.1 V) for the maximum flow.

A period measurement is carried out in view of the low frequencies involved (146 Hz for 500 cc) and also to enhance sensitivity and accuracy. The maximum response time is 100 ms for low flow values.

The flowmeter must be in a dual-signal (or exclusive) configuration for two signals each coming from two sensors with a 90° phase shift.
NOTE: The paint circuit (flowmeter + converter) can be set to a 3000 cc/mn configuration. In this case, configure the flowmeter in single-signal mode and set the switches to 1500 cc/mn.

2.2. Turbine Speed Measurement

The microphone signal is amplified, then the frequency is measured with the help of a counter.
There are three possible configurations:
- 50 krpm with one pulse per rotation - for example PPH 605 - 607 - 308,
- 50 krpm with two pulses per rotation - for example PPH 508 - 307 - 405,
- 15 krpm with one pulse per rotation - for example SRV 037 - 038 - 039.

The module provides a DC voltage that is in proportion to the measured speed with a maximum value of 10 V (+/- 0.1 V) for the maximum speed. The microcontroller analyses the derivative (+/-) of the speed making it possible to ignore any spurious noise when the turbine is not moving.

2.3. Configuration

Calibres are selected (maximum flow and turbine type) using the DIP switches on the printed circuit board. There are four of these switches for flow and four more for the turbine.

Access to these configuration switches is gained via the door located on top of the module.

2.4. Monitoring

Monitoring LEDs indicate input status. There is one LED for each input. Status is indicated as follows:

- lit up steady: calibre saturated,
- flashing: input OK, receiving (flashing frequency = 250 ms),
- OFF: below minimum frequency or no pulse.

The different thresholds defining LED status are determined by calibre selection.

2.5. 10 V Reference

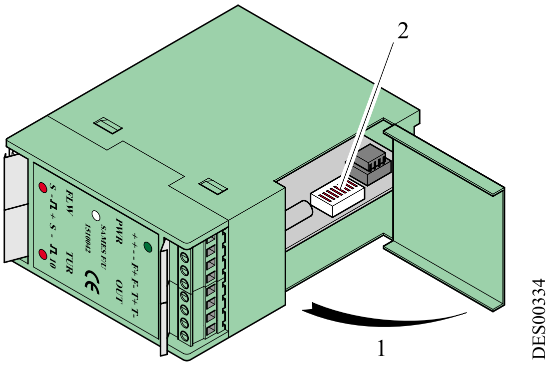
A 0-10 V reference voltage to power the potentiometers is included on the module, with I max. = 10 mA (sized for 4 potentiometers of 5 kΩ).

2.6. Reset

A white reset button is included on the front side to restart the microprocessor in the event of jamming.

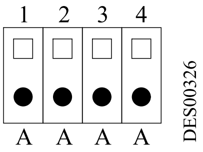
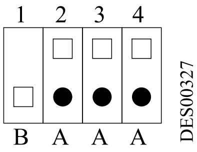
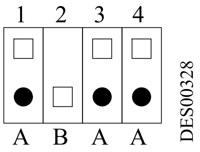
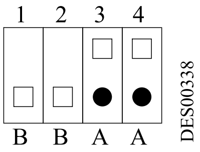
3. Equivalence Tables

3.1. Changing Frequency



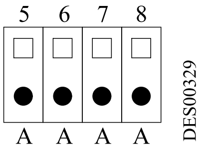
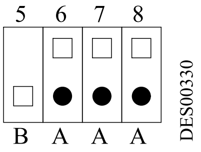
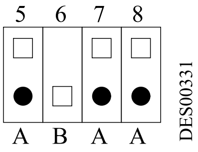
1	Module door
2	Mini switches

3.2. Paint Flow Frequencies

LED	Cal 500 cc	Cal 1000 cc	Cal 1500 cc	Cal 2000 cc
Lit up steady	146 Hz	292 Hz	438 Hz	584 Hz
Flashing	10 to 146 Hz	20 to 292 Hz	30 to 438 Hz	40 to 584 Hz
OFF	10 Hz	20 Hz	30 Hz	40 Hz
Switches				

if the flowmeter sensor is in the single-signal position, the 1500 cc/mn setting corresponds to 3000 cc/mn.

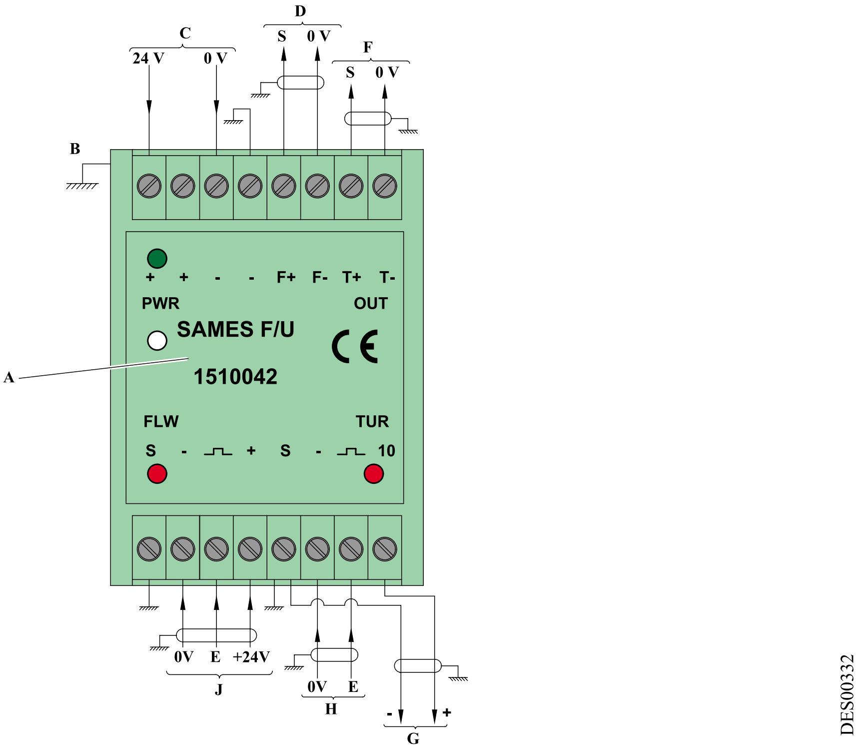
3.3. Turbine Speed Frequencies

LED	50 krpm PPH 508 - 307 - 405	50 krpm PPH 605 - 607 - 308	15 krpm SRV 037 - 038 - 039
Lit up steady	1670 Hz	833 Hz	500 Hz
Flashing	8 to 1670 Hz	4 to 833 Hz	3 to 500 Hz
OFF	8 Hz	4 Hz	3 Hz
Switches			

Note: Caution: these values may vary according to component tolerance.

4. Wiring Diagram

(In accordance with EMC directive No. 89/336)

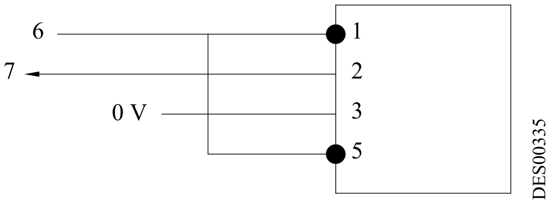


A	Frequency-to-voltage converter, P/N 1510042
B	Earthing braid 20 x 2
C	Converter power supply
D	0 - 10 V output - paint flow
F	0 - 10 V output - turbine speed
G	0 - 10 V / 10 mA output available for power supply for potentiometer, PLC, etc.
H	Microphone signal
J	Flowmeter signal

Reminder: input and output cables must be shielded.

5. Appendix

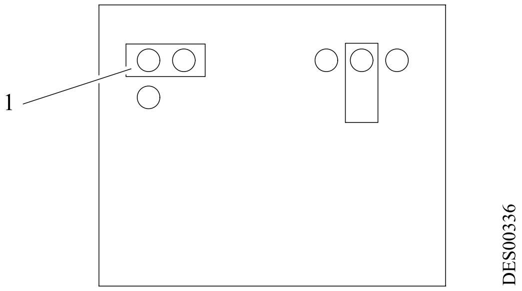
Wiring of KUPPERS sensor, P/N HDS2S1.EX.



6	Umax 30 V
7	Signal feedback

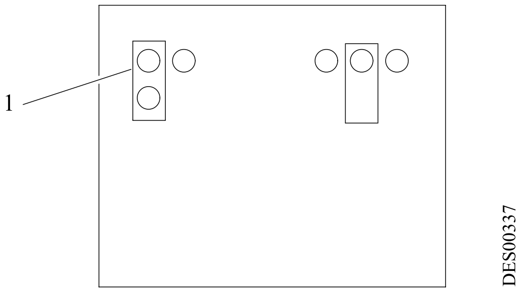
Sensor configuration (open the sensor cover).

Dual signal (usual configuration)



1	Strap

Single signal



1	Strap