



High-response Frequency-to-Voltage (F/V) Converter

FV-1300

The FV-1300 high-speed F/V converter has an excellent response rate, converting each period of frequency signals proportional to rpm or velocity, into voltage or current signals at a very high speed.

The FV-1300 can measure and record transient phenomenon that occurs in rotational speed, flow rate, frequency fluctuations, and so on, such as rotation startup characteristics of engines and motors and minute rotational variations during stable rotation.

High-precision and multifunctional capabilities have been achieved by adopting a digital signal processor (DSP) in the computation section.

ONO SOKKI

High-speed F/V Converter with a Performance Level and Functions That Are at the Top of Its Class

Seven Features to Meet the Needs of Engineers

1 Fast-response of 7.6 μ s

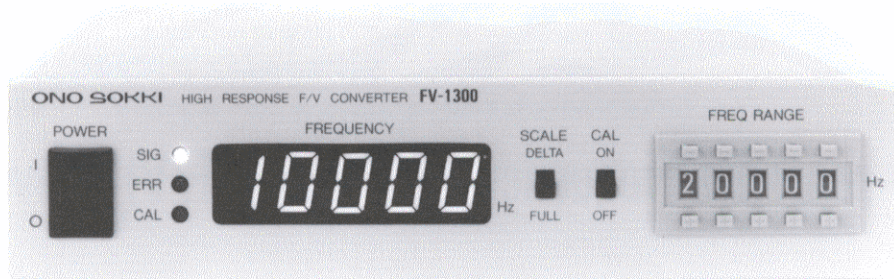
Outputs voltage and current signals 7.6 microseconds after one period of pulse signals is input. This high-response rate is at the top of its class.

2 High-resolution output by 16-bit D/A converter

The digital signal processor (DSP) instantaneously processes the internal processing, and converts the signal to an analog signal (voltage/current) at the final output section. The output thus obtained has good stability and high resolution.

3 Flexible measurement span

You can set the FV-1300's frequency range on a 1 Hz basis. This enables the FV-1300 to accept a far greater output voltage compared to when a conventional range that switches in about 10 steps is used, and means that the FV-1300 does not damage the dynamic ranges of measuring instruments.



4 Deviation output function

This function is helpful when you want to measure and magnify the rotational variation component of a rotating object. The center frequency can be set on a 1 Hz basis, so that you can measure minute variations in rotation with reliability.

5 Moving average function

This function calculates and outputs an average of 16 periods worth of input signals, and is effective when input signals fluctuate or when a smooth analog signal is desired.

6 Isolated input

An isolated input amplifier, which is resistant against common mode noises, has been adopted. There is no need to prepare separate isolators, thereby resulting in a possible cost-reduction.

7 Input frequency at a glance

Since the FV-1300 has a frequency counter, it is very easy to read the input signal frequency.

A Wide Range of Applications - Rotating Equipment Control, Deviation Detection, etc.!

Example: Measuring startup characteristics of an induction motor

It is possible to measure the variations caused by the absorption by the load in motors with a load. Motors without a load on the other hand, start up smoothly.

Without load

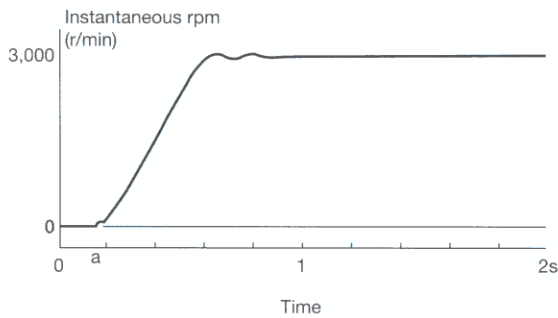
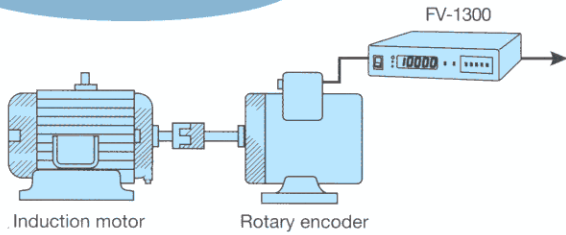


Figure 1

With load

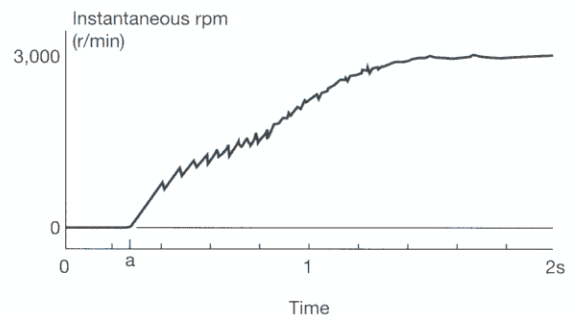
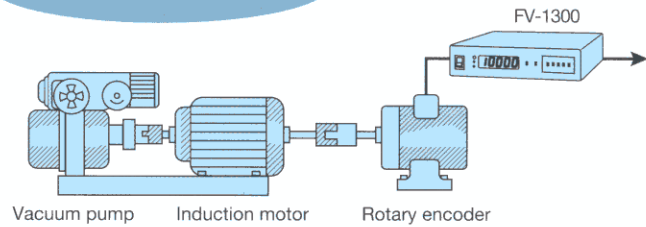


Figure 2

Example: Measuring variations in rotation of a diesel engine

Normal combustion

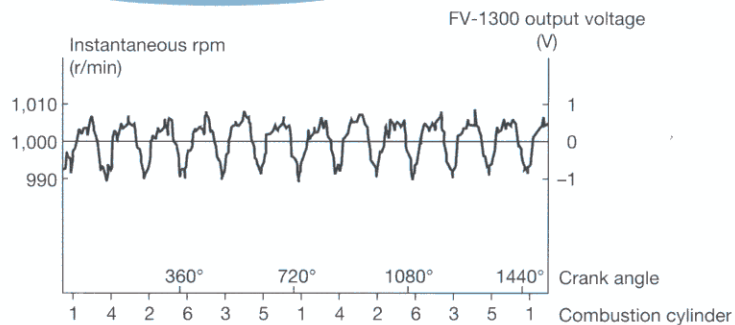
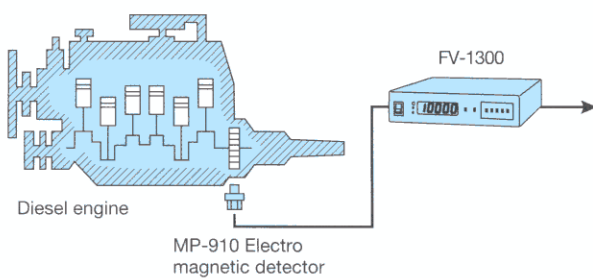


Figure 3

The measured data in Figures 3 and 4 show the variation in rotation when an electromagnetic detector is attached to the starter ring gear of a 6-cylinder diesel engine. Figure 3 shows the case of normal combustion, whereby each cylinder combusts once for every two rotations of the crank shaft, causing the rotation to vary. Figure 4 shows the data when the cylinder No.1 misfires. The deviation output function allows minute variation in rotation to be output with greater amplitude. (The data in Figures 3 and 4 were output with 1000 Hz of center frequency and a deviation setting of 5%.)

Misfiring at cylinder No. 1

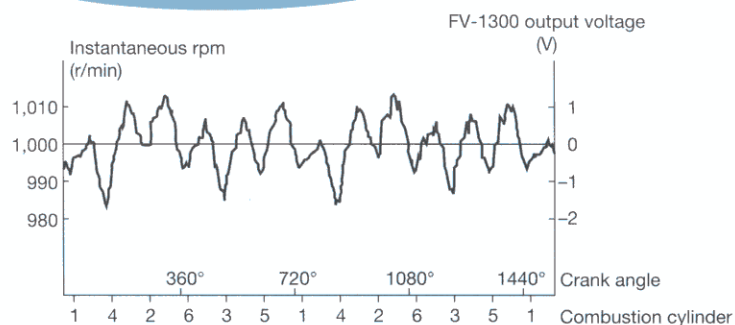


Figure 4

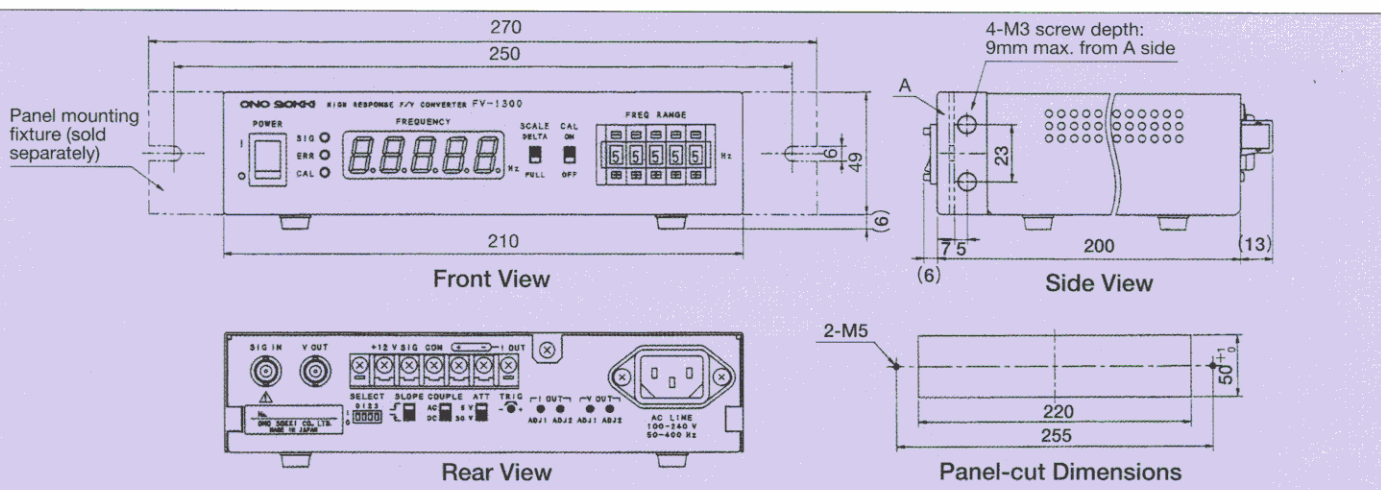
Specifications

- Conversion method : Period computation
- Response : 1 period of input frequency: + 7.6 μ s
- Input configuration : Isolated single-ended input (The potential difference between common and ground on the housing, should be 42 V DC max.)
- Input frequency range : 1 to 20,000 Hz
- Input voltage range : 0.3 Vp-p to 30 Vp-p AC, ± 0.3 V to ± 30 V DC; Trigger level adjustment range: -30 V to +30 V
- Input terminals : Type C02 (BNC) and terminal block (M3)
- Frequency range : Full-scale output mode: The maximum frequency can be set between 1 and 20,000 Hz on a 1 Hz basis.
Deviation output mode: Center frequency can be set between 2 and 19,801 Hz on a 1 Hz basis.
Deviation setting range: ± 1 , ± 5 , ± 10 , $\pm 20\%$
(Cannot be set if the maximum input frequency exceeds 20 kHz due to deviation setting.)
- Frequency display : Five digits in green 7 segments; display interval: 1 second
- Output signal (voltage) : Full-scale output: 0 to 10 V ; Deviation output: 0 ± 5 V
- Output signal (current) : Full-scale output: 0 to 16 mA (factory setting) or 4 to 20 mA
Deviation output ; 8 ± 8 mA or 12 ± 8 mA
- Output terminals : Type C02 (BNC) for voltage output; Terminal block for current output
- D/A resolution : 16 bits (counter frequency: 20 MHz)
- Output error (excluding offset) : Full-scale output mode ; $\pm 0.1\%$ of FS (voltage), $\pm 0.7\%$ of FS (current)
Deviation output mode ; ± 0.5 to $\pm 5\%$ of FS (voltage), ± 3 to $\pm 10\%$ of FS (current)
(Differs depending on the center frequency and deviation range settings.)
- Power supply for sensor : +12 V ($\pm 10\%$) or a maximum of 100 mA/ Ripple: maximum of 20 mVp-p

General Specifications

- Power supply : 100 to 240 V AC/ 50-400 Hz (continuous), approx. 13 VA
- Ambience : 0 to 40°C/ 0 to 80% R.H. (with no condensation)
- Weight : Approx. 1.1 kg
- External dimensions : 210(W) \times 49(H) \times 200(D) mm (excluding protrusions)

Outer Dimensions



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*Outer appearance and specifications are subject to change without prior notice.

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