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FLJ-ACO1
## Oscillator Adaptor
for FLJ-D Series

FEATURES

- **Output 2.5Vms ±0.5% accuracy**
- **500mV ~ 20Vp-p wide amplitude range**
- **Single inline small package**

GENERAL DESCRIPTION

FLJ-ACO1 is an accessory used with the FLJ-D1, D2 and DC filters to build a digitally programmable oscillator. The oscillator is controlled with 3 digits of BCD logic input. The setting method, set frequency accuracy and TC depend on the filters which are to be used with this FLJ-ACO1, but the specifications related to output voltage such as output voltage accuracy, stability and amplitude TC are determined by the FLJ-ACO1. The output voltage is trimmed internally to provide 2.5Vrms ±0.5% output.

MECHANICAL DIMENSIONS
INCHES (mm)

PIN SECTION
0.02×0.01 (0.5×0.25)
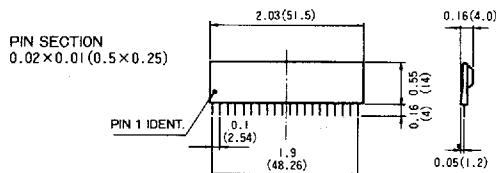
FLJ-D1 FOR LOWER FREQUENCY (Fig. 4)
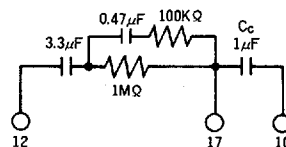
FLJ-DC FOR LOWER FREQUENCY (Fig. 5)
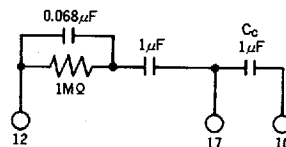
Note: FLJ-D1 or FLJ-DC with 5000pF of Cext for lower than 10Hz oscillation, use one of these circuits.

OUTPUT VOLTAGE ADJUSTMENT (Fig. 6)
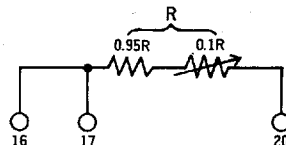
PIN CONNECTIONS

PIN	FUNCTION	PIN	FUNCTION
1	Rq	11	OUTPUT PROTECTION
2	LOOP OUTPUT	12	COMPENSATION 1
3	GND	13	SUB (-90°) OUTPUT
4	+15V Supply	14	COMPENSATION 3
5	-15V Supply	15	MAIN OUTPUT
6	NC	16	-Vref IN
7	NC	17	COMPENSATION 2
8	NC	18	OUTPUT RANGE 1
9	NC	19	OUTPUT RANGE 2
10	Cext	20	-Vref OUT

DO NOT CONNECT NC PINS
PIN 14 SHOULD BE LEFT OPEN NORMALLY.

GND +15V -15V

★1. Over Voltage Protection

SPECIFICATIONS

Typical at 25 °C, with ±15V power supplies unless otherwise specified.

ABSOLUTE RATINGS	
Power Supply Voltage (±Vs)	±18V
Signal Input (Pin 13)	±Vs
Detector Input (Pin 15)	±Vs

OUTPUT	
Output Voltage	2.5Vrms normal *1
Voltage Range ≦100kHz	500mVrms to 2.5Vrms
≦ 50kHz	500mVrms to 20Vp-p
Voltage Set Accuracy	±0.5% max.
Amplitude TC	100 ppm/°C
Output Resistance	5Ω max.
Distortion	0.01%@10kHz
Sub Output	−90°phase of Main

FREQUENCY	
Frequency Range	100Hz to 100kHz *2
Frequency Set Error	±0.1%
Setting Method	BCD 3 digits

POWER SUPPLIES & ENVIRONMENT	
Supply Voltage	±15V ±10%
Supply Current	+14mA, −24mA
Operating Temperature Range	−20°C to 70°C
Storage Temperature Range	−30°C to 80°C
Operating/Storage Humidity	10% to 95%/80% RH

*1. 20V p-p with pin connections, other voltage output ranges are available with the use of external components.
*2. Expandable to wider range with the use of external components

TYPICAL CONNECTION (Fig. 3)

Note 1. Open SW1 and SW2 for 2.5VrmS output. Close SW1 and SW2 for 20Vp-p output.
2. Two Cext are required for FLJ-DC.

TECHNICAL NOTES

1. Oscillation frequency range varies depending on the Digital Tuneable Filter to be used with FLJ-ACO1.
   - FLJ-D1   1 Hz ~ 1.599 KHz
   - FLJ-D2   100 Hz ~ 159.9 KHz
   - FLJ-DC   Determined by external capacitors

   Any model can be used connected as shown in Figure 3 to get the performance that meets the values shown in the specification table.

2. FLJ-DC needs two external capacitors. The relationship between capacitance and oscillation frequency fc is:

$$fc = \frac{N}{20 \cdot Cext} \qquad \begin{array}{l} fc: Hz, \; Cext: \mu F \\ N: Digital\ Number \end{array}$$

   For example, once Cext of 0.005 µF and N of 1000 are given, fc shall be 10 KHz. Therefore, with N of 1 to 1599, fc can be set at any frequency of 10 Hz to 15.99 KHz range with BCD logic inputs.

3. Expansion to higher frequency range: The maximum frequency is 50 KHz for 20V p-p output even if FLJ-D2 is used. Connect pin 11 of both FLJ-DC and FLJ-ACO1 together to expand the oscillation frequency range to higher levels. Up to 100 KHz of frequency range is obtained for 20V p-p amplitude even though distortion ratio is slightly derated as the protection circuit in FLJ-ACO1 works. Up to 159.9 KHz of oscillation shall be available for 2.5 Vrms output with the same connection.

4. Distortion at lower frequency range shall be improved with the addition of a few external components.
   a. With the FLJ-D1 connect as shown in Figure 4. As little as 0.01% distortion can be attained at 4 Hz oscillation.
   b. With the FLJ-DC, Cext = 5000 pF connect as shown in Figure 5. Distortion at 10 Hz shall be improved to 0.005%.

5. Adjustment of output voltage: Normal 2.5 Vrms output voltage is obtained with SW1 of Figure 3 open and 20V p-p is obtained with SW1 closed. For other output voltage, follow Figure 6 and the following equation.

$$R = \frac{1111}{Vo(rms)} \; (K\Omega)$$

   The range of Vo is 0.5 Vrms to 20V p-p.

ORDERING INFORMATION	
MODEL NO.	DESCRIPTION
FLJ-ACO1	Oscillator adapter for FLJ-D Series filters