



We think of tomorrow

INSTRUCTION MANUAL

VIBROPET

MODEL : PET-01

ENVIRONMENTAL INSTRUMENTS CC

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CK 91/09692/23

**IMV CORPORATION**

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## I. GENERAL

### 1. Introduction

The VIBROPET is designed to be small enough for complete portability and the operation is easy enough for non-trained personal operation in field.

The VIBROPET is consisting of two major sections; a shaker section Model: PET-01 and an amplifier/oscillator section Model: PET-OA. ※

The VIBROPET is conveniently used to measure the resonant and anti-resonant frequency of a test specimen and to obtain the frequency response of the specimen in the function of vibration, carrying it to the field and installing the shaker to the machine to be tested.

### Warranty

In case of defects /faults of quality, materials as workmanship in the gurantee period, we will repair or replace such defective parts without any charges.

The gurantee period shall be 12 monthes counting from the date on which the equipment arrives at your port.

But our gurantee shall not be applied even in the gurantee period for the damage due to accident on importers handling due to wrong or unreasonable operation/driving.

### Documents for Submission

Instruction Manual	2 books (delivery time )
Factory Test Data	1 copy (delivery time)

※ NOTE: This system is not included an amplifier/oscillator Model: PET-OA.

PET-01

2. Composition

2-1 Shaker Section

Shaker	Model: PET-01	1 set
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2-2 Documents

Instruction Manual	2 books
Factory Test Data	1 copy

PET-01

### 3. Specifications

#### 3-1 System Specifications (In case an amplifier Model:PET-0A is used.)

Force Output:	1 kgf continuous duty
Max. Acceleration:	50 g
Max. Displacement:	5 mm p-p
Frequency Range:	2 ~ 12,000 Hz
Weight of Moving Element:	20 g
Power Consumption:	Approx. 100 VA at rated output

#### 3-2 Shaker Specifications (Model: PET-01)

Drive Type:	Electrodynamic Type
Force Output:	1 kgf
Max. Acceleration:	50 g
Max. Displacement:	5 mm p-p
Frequency Range:	DC ~ 12,000 Hz
Table Suspension:	Leaf Spring (Stiffness 10 kgf/cm)
Magnet:	Permanent Magnet
Cooling System:	Natural Cooling
Dimensions(W×H×D):	75×90×75 mm
Weight:	Approx. 1.5 kg with accessories

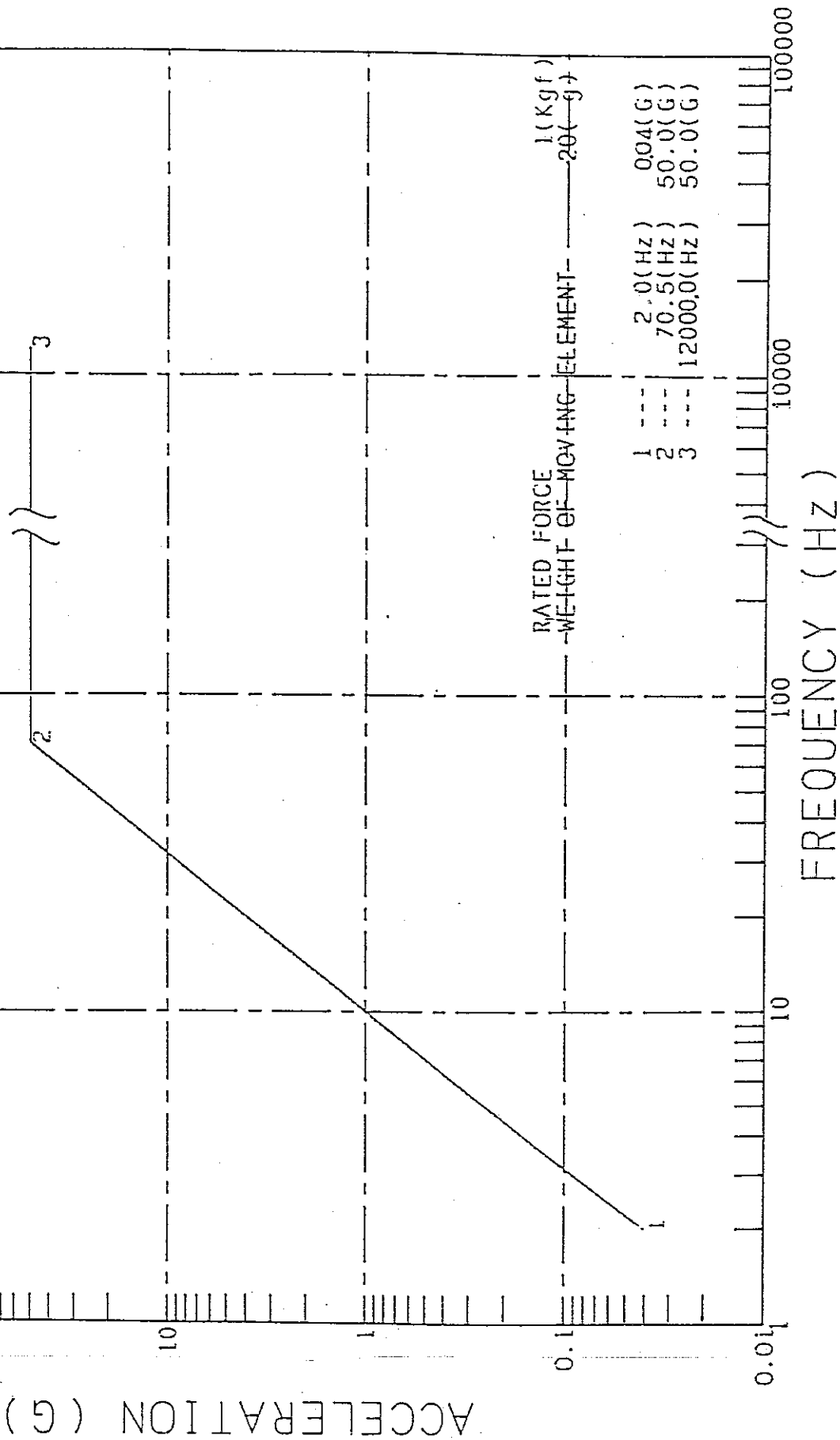
PET-01

# MAXIMUM PERFORMANCE CURVE

MODEL : PET-01

(In case an amplifier Model:PET-0A is used)

MAX. DISPLACEMENT 5 (mmP-P)  
 (MAX. VELOCITY) 110 (cm/sec)  
 MAX. ACCELERATION 50.0 (G)



RATED FORCE  
 WEIGHT OF MOVING ELEMENT

- |   |     |              |          |
|---|-----|--------------|----------|
| 1 | --- | 2.0 (Hz)     | 0.04 (G) |
| 2 | --- | 70.5 (Hz)    | 50.0 (G) |
| 3 | --- | 12000.0 (Hz) | 50.0 (G) |

1 (Kg f)  
 20 (g)

ACCELERATION (G)

FREQUENCY (HZ)

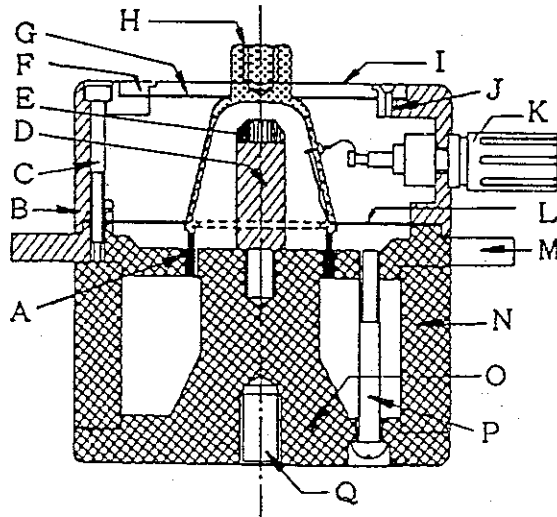
## II. SHAKER Model :PET-01

### 1. Theory of Operation

The design of the PET-01 is based upon a fundamental theory of electromagnetic induction which in practice provides the means by which the shaker moving element effects reciprocating motion.

The shaker generates vibration force by locating a current-carrying movable wire, i.e., the drive coil, in the high-flux density air gap in the stationary magnetic structure (permanent magnet). Since the direction of the generated force is reversed when the direction of the current in the drive coil is reversed, AC current input to the drive coil effects vibratory motion. Thus, the alternating characteristics of the drive coil input in conjunction with the magnetic field, causes reciprocating movement of the entire moving element assembly, forcing the drive coil to move in and out the air gap within limits imposed by available voltage. Since the shaker is incorporating a permanent magnet to maintain a constant flux density in the air gap, the generated force is proportional to the root-mean-square value of the sinusoidal current in the drive coil.

### 2. Construction



PET-01

A: Driving Coil  
B: Top Cover  
C: Top Cover Mounting Screw (Hexagon-headed Socket)  
D: Stopper (M3 L30)  
E: Stopper Head  
F: Spring Junk Ring  
G: Leaf Spring (diaphragm)  
H: Table (M6 herisert inserted)  
I: Dust Cover  
J: Screw (M3 L6)  
K: Input Terminal  
L: Leaf Spring (diaphragm)  
M: Yoke Plate  
N: Magnet  
O: Center Pole  
P: Screw (M4 L40)  
Q: Threaded Hole (M8 P1.25 D15)

## 2-1 Moving Element

The moving element is consisting of a table (H), a driving coil (A) and a leaf spring (G).

The table has light weight and rigid construction to allow high transmissibility of force generated in the driving coil and to enable high frequency performance avoiding the first major resonance.

The driving coil is wound around the cylindrical surface of the table bottom. The driving coil is composed of a conductor of copper wire which is insulator-coated on the surface, and solidarized to the table by adhesive material.

The table is supported a couple of leaf springs (diaphragms) at the top and bottom. The stiffness is 10 kgf/cm in the moving axis. The radial motion (cross-talk) is restricted at the top and bottom by the springs.

PET-01



## 2-2 Magnetic Circuit

The magnetic fluxes are created by the permanent magnet (N) so that the strong magnetic flux crosses air gap and the driving coil (A) of the moving element. The air gap is a circle between the yoke plate (H) and the center pole (O).

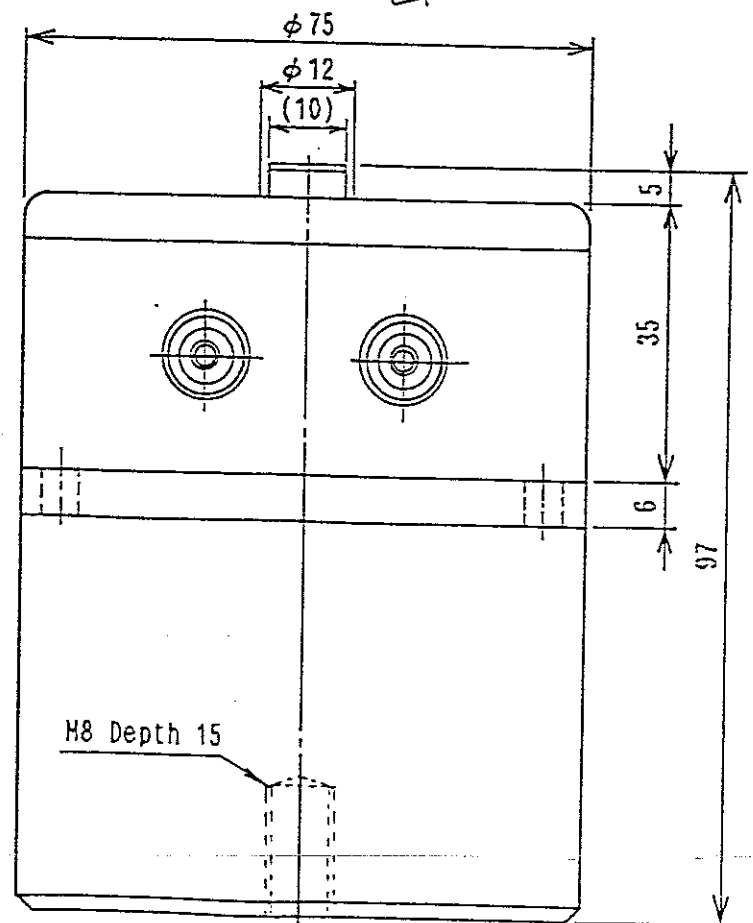
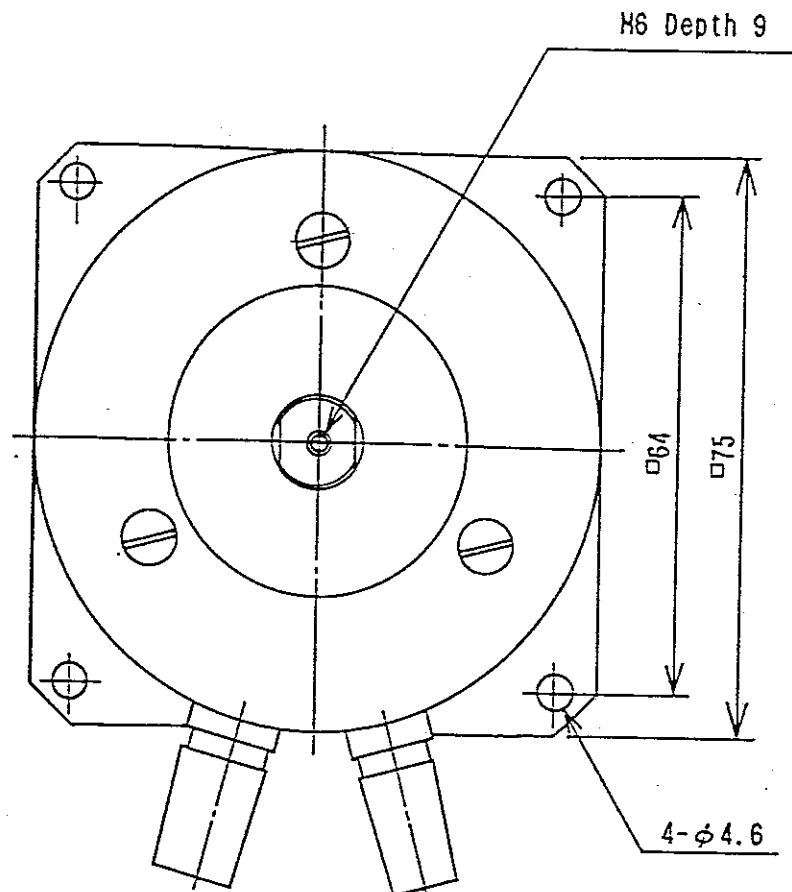
## 2-3 Aux. Support

The standard VIBROPET is incorporating an auxiliary support assembly to support a load of 0.5 to 5kg in the case to mount a specimen on to the table.

## 2-4 Protective Design

In order to protect the table against over-travel exceeding the rated displacement, a mechanical stopper (D and E) is provided just under the table top.

PET-01



OUTSIDE VIEW OF VIBROPET (MODEL: PET-01)

### CAUTIONS

1. The shaker must be installed free from dust and metal chips. Especially, it should be away from metal powders. They will cause mechanical troubles.
2. The shaker must be free from high humidity and water drips. A low insulation resistance of coils due to such circumstances will cause machine troubles.
3. The table position must be kept at its neutral position statically, even with a load on the table. The deviated table position will make a full displacement operation impossible.
4. The abrupt change of exciting frequency should be avoided.

FACTORY TEST DATA

VIBROPET

MODEL : PET-01

Inspection Date: 5th July, 1994.  
Serial No. 400381-2  
Inspected by: N. Hira

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1. Inspection for Number of Q'ty

Good

2. Visual Check

Dimensions

Good

Weight

Good

Color

Good

3. Performance Check

Max. Force Output: More than 1 kgf at 100 Hz

Good

Max. Acceleration: 50 g at 100 Hz

Good

Max. Displacement: 5 mm p-p at 20 Hz

Good

Spring Stiffness: 10 kgf/cm