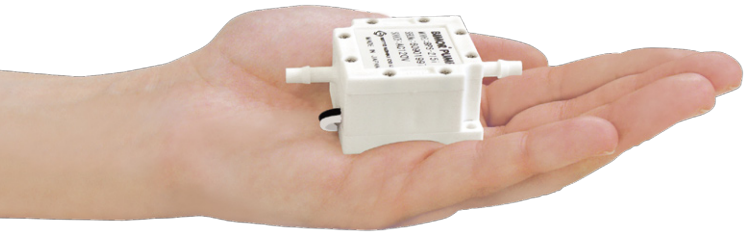
PIEZOELECTRIC PUMP

# BIMOR PUMP

Liquid Pump

## *Suitable for pumping both liquids and gases!*



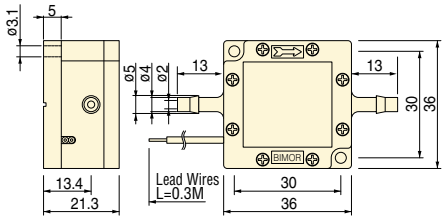
### Compact, lightweight, durable & quiet

As the Bimorph also acts as a diaphragm it has no motors or shafts or other troublesome mechanisms, and thus minimal vibrations and fewer breakdowns. The Bimor is lighter, quieter and more durable than traditional pumps.

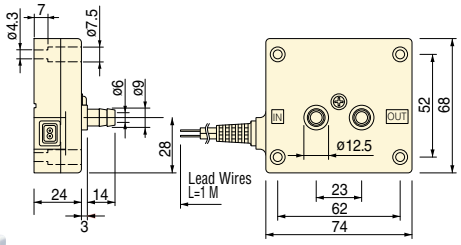
We have achieved maintenance free continuous operation for 60 months.

## *Specifications*

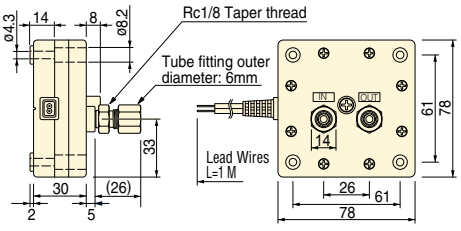
**BPS** type




**BPH** type




**BPF** type




| Model | Voltage(AC) —120V 60Hz Current (mA) | Self-priming Pressure(kPa) | FlowRate (mℓ/min) | Discharge Pressure (kPa) |
|---|---|---|---|---|
| BPS-215i | 3 | 3 | 30 | 15 |
| BPS-235G | | 1.5 | | |
| BPH-214i | 15 | 8 | 350 | 18 |
| BPH-214D | | | | |
| BPH-214E | | | | |
| BPH-214G | | 7 | | 17 |
| BPH-414i | 30 | 12 | 500 | 35 |
| BPH-414D | | | | |
| BPH-414E | | | | |
| BPH-414G | | 10 | 450 | 32 |
| BPH-474G | | | 400 | 35 |
| BPH-474P | | | | |
| BPF-465P | 30 | 10 | 400 | 35 |

### *The performance data is measured at the rated conditions.*

※1)The reference data is based on water at 25 degrees Celsius with unloaded condition.

※2)The ambient operating temperature range is from 5 to 50 degrees Celsius, the ambient liquid temperature range is from 5 to 50 degrees Celsius (non-freezing), and the ambient operating humidity range is from 35 to 85% (non-condensing). When the liquid temperature is low, the valve will be hardened. As a result, the flow rate will be decreased. This could be applied for liquids with high viscosity. The materials that will be under influence of the applied liquids or gases are the housing, liquid contact sheets, valves, and O-rings. Please confirm the suitability under any applied conditions. Any minute quantities of additives and composite materials found in certain liquids may influence the performance of the unit several months later.

※3)You may use the product at low voltage, but it will result in lower outlet pressure.

※4)Performance may be compromised by restrictive tubing/piping or mounting position of the pump in the application.

※5)The above performance data is measured at the rated condition as we described.

Note: The Bimor does not fulfill explosion-proof construction in any applications. Please install isolating transformers or similar protective devices on the wiring for your safety.

## Low power consumption & electromagnetic noise

The Bimor is driven by low energy consuming piezoelectric elements. Consequently it costs very little to run and emits virtually no electromagnetic noise.

## Simple flow rate adjustment

As the flow rate of the Bimor is proportional to the voltage and frequency, adjusting the flow rate is as simple as adjusting either one. You may use the product at the rated voltage or lower.

## Application versatility

The parts can be made of several different materials, so you can select the material appropriate to your needs, be it a liquid or gas application. The Bimor is currently employed in a variety of different fields including medicine, scientific research, and the PC and chemical industries.
The following "Examples of suitable chemical liquids and gases" should be used for reference only. Please confirm the suitability under any applied conditions by yourself.

## Applications


- For supply and drainage
- For cooling circulation
- For medical injection
- For sampling


- For pressure expansion
- For sampling (inhale)

| Model | Voltage(AC) — 230V 50Hz: Current (mA) | Self-priming Pressure(kPa) | FlowRate (mL/min) | Discharge Pressure (kPa) | Liquid Surface Materials: Housing | Liquid Contact Sheet | Valve/O-ring | Mass (g) | Examples of suitable chemical liquids and gases | Examples of unsuitable chemical liquids and gases |
|---|---|---|---|---|---|---|---|---|---|---|
| BPS-215i | 4 | 0.4 | 10 | 10 | PP | PP | IIR | 40 | Ethanol, Hydrochloric acid, Sodium carbonate, Benzaldehyde, Formalin | Xylene, Mineral oil, Carbon tetrachloride, Trichloroethylene, Toluene, Benzene |
| BPS-235G | | | | | POM | PTFE | FKM | | Ethanol, Xylene, Silicone oil, Kerosene, Toluene, Benzene | Ammonia water, Hydrochloric acid, Hydrogen peroxide, Sodium hypochlorite, Nitric acid, Sulfuric acid |
| BPH-214i | 15 | 7 | 220 | 18 | PP | PP | IIR | 140 | Ethanol, Hydrochloric acid, Sodium carbonate, Benzaldehyde, Formalin | Xylene, Mineral oil, Carbon tetrachloride, Trichloroethylene, Toluene, Benzene |
| BPH-214D | | | | | | | VMQ | | Ammonia water, Ethanol, Hydrogen peroxide, Sodium hypochlorite, Methanol | Caustic soda, Carbon tetrachloride, Silicone oil, Trichloroethylene, Toluene, Benzene |
| BPH-214E | | | | | | | EPDM | | Ammonia water, Ethanol, Hydrochloric acid, Caustic potash, Caustic soda, Methanol | Xylene, Mineral oil, Carbon tetrachloride Trichloroethylene, Toluene, Benzene |
| BPH-214G | | | | 17 | | PTFE | FKM | | Ethanol, Hydrogen peroxide, Mineral oil, Sodium hypochlorite | Acetone, Ammonia water, Glacial acetic acid, Hydrofluoric acid, Formalin |
| | | | | | | PP | IIR | 140 | Ethanol, Hydrochloric acid, Sodium carbonate, Benzaldehyde, Formalin | Xylene, Mineral oil, Carbon tetrachloride, Trichloroethylene, Toluene, Benzene |
| | | | | | | | VMQ | | Ammonia water, Ethanol, Hydrogen peroxide, Sodium hypochlorite, Methanol | Caustic soda, Carbon tetrachloride, Silicone oil, Trichloroethylene, Toluene, Benzene |
| | | | | | | | EPDM | | Ammonia water, Ethanol, Hydrochloric acid, Caustic potash, Caustic soda, Methanol | Xylene, Mineral oil, Carbon tetrachloride Trichloroethylene, Toluene, Benzene |
| | | | | | | | FKM | | Ethanol, Hydrogen peroxide, Mineral oil, Sodium hypochlorite | Acetone, Ammonia water, Glacial acetic acid, Hydrofluoric acid, Formalin |
| BPH-274G | 15 | 7 | 250 | 35 | PPS | PTFE | FKM | 170 | Ethanol, Xylene, Carbon tetrachloride, Silicone oil, Trichloroethylene | Acetone, Ammonia water, Chlorosulfonic acid, Glacial acetic acid, Hydrofluoric acid, Formalin |
| | | | | | | | FFKM FEP | | Ethanol, Chloroform, Glacial acetic acid, Benzene, Methyl ethyl ketone | Chlorosulfonic acid, Fluorine oil, CFC 112, CFC 113 |
| BPH-274P | | | | | | | | | | |
| | | | | | PFA | PTFE | FFKM FEP | 350 | Ethanol, Aqua regia, Ozone, Carbon tetrachloride, Concentrated nitric acid, Concentrated sulfuric acid, Fuming sulfuric acid | Fluorine oil, CFC 112, CFC 113 |
| BPF-265P | 15 | 7 | 250 | 35 | | | | 350 | | |

BPS type

BPH type

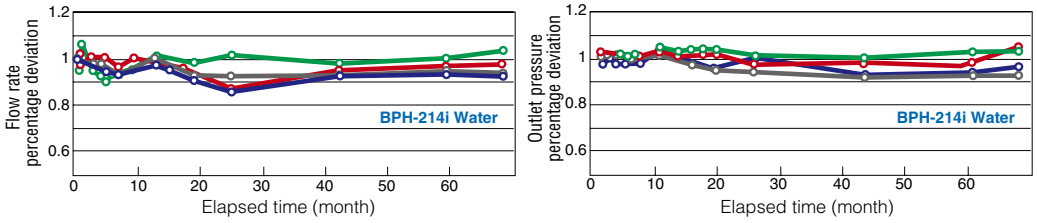
BPF type

### Material Description

EPDM ··· Ethylene Propylene Rubber
FEP····· Fluoroethylene Propylene
FFKM···· Fluorine Rubber (Perfluoro)
FKM····· Fluorine Rubber
IIR ····· Butyl Rubber
POM ····· Polyacetal
PFA ····· Fluororesin (Perfluoroalkoxy)
PP ····· Polypropylene
PPS ····· Polyphenylene Sulphide
PTFE ···· Tetrafluororesin (Polytetrafluoroethylene)
VMQ ···· Dimethyl Silicon Rubber

## Durability

**Longevity test :** Sample A Sample B Sample C Sample D



# BIMOR PUMP

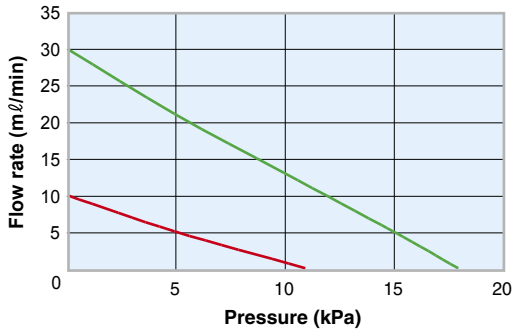
Liquid Pump

## Flow Rate Characteristic

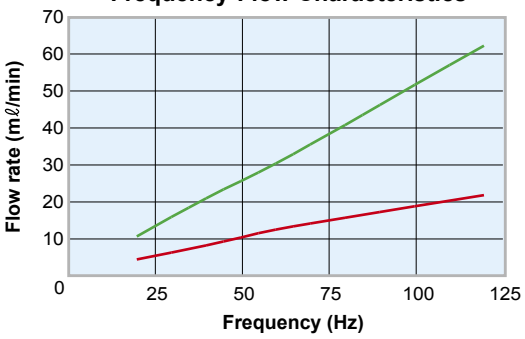
### BPS series

120V 60Hz type　230V 50Hz type

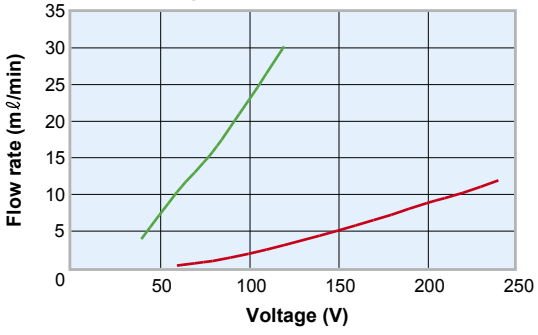
**Pressure-Flow Characteristics**




**Frequency-Flow Characteristics**



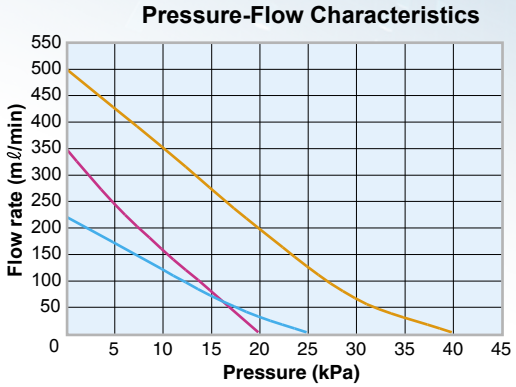

**Voltage-Flow Characteristics**



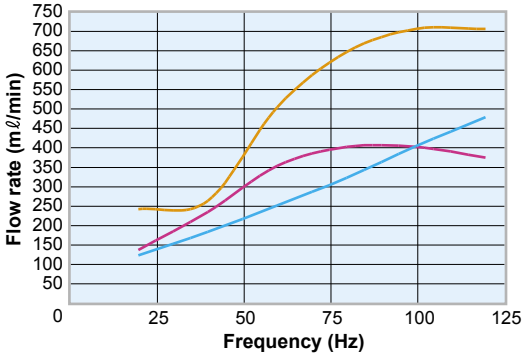

### BPH series

(BPH-414i) 120V 60Hz type　(BPH-214i) 120V 60Hz type　(BPH-214i) 230V 50Hz type

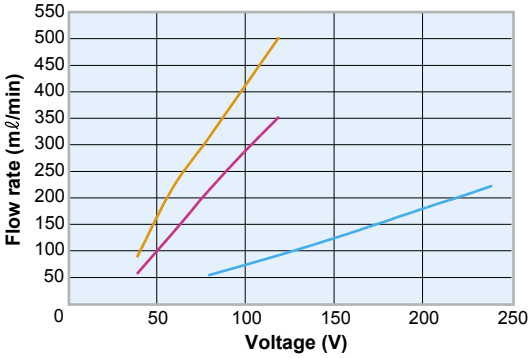
**Pressure-Flow Characteristics**




**Frequency-Flow Characteristics**




**Voltage-Flow Characteristics**

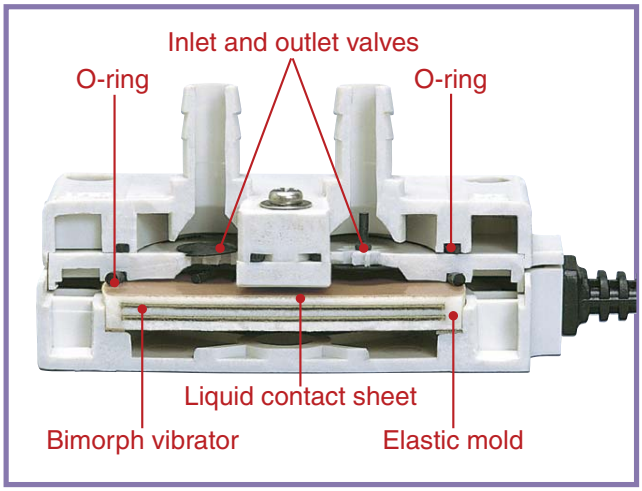


# The Next Step in Pump Miniaturization

### <Revolutionary piezoelectric bimorph technology>

The Bimor's driving force, the bimorph, comprises two parallel piezoelectric wafers. Their nature is to expand or contract depending on the direction of the voltage. Therefore when an alternating current is applied, one wafer expands then contracts while the other contracts then expands, causing the bimorph to bend. Repeating the cycle creates the pumping action.

## Cross section




## Principle / Structure

"The Bimor pump" uses the displacement operation of the piezoelectric bimorph vibrator as the direct source of the pumping action.