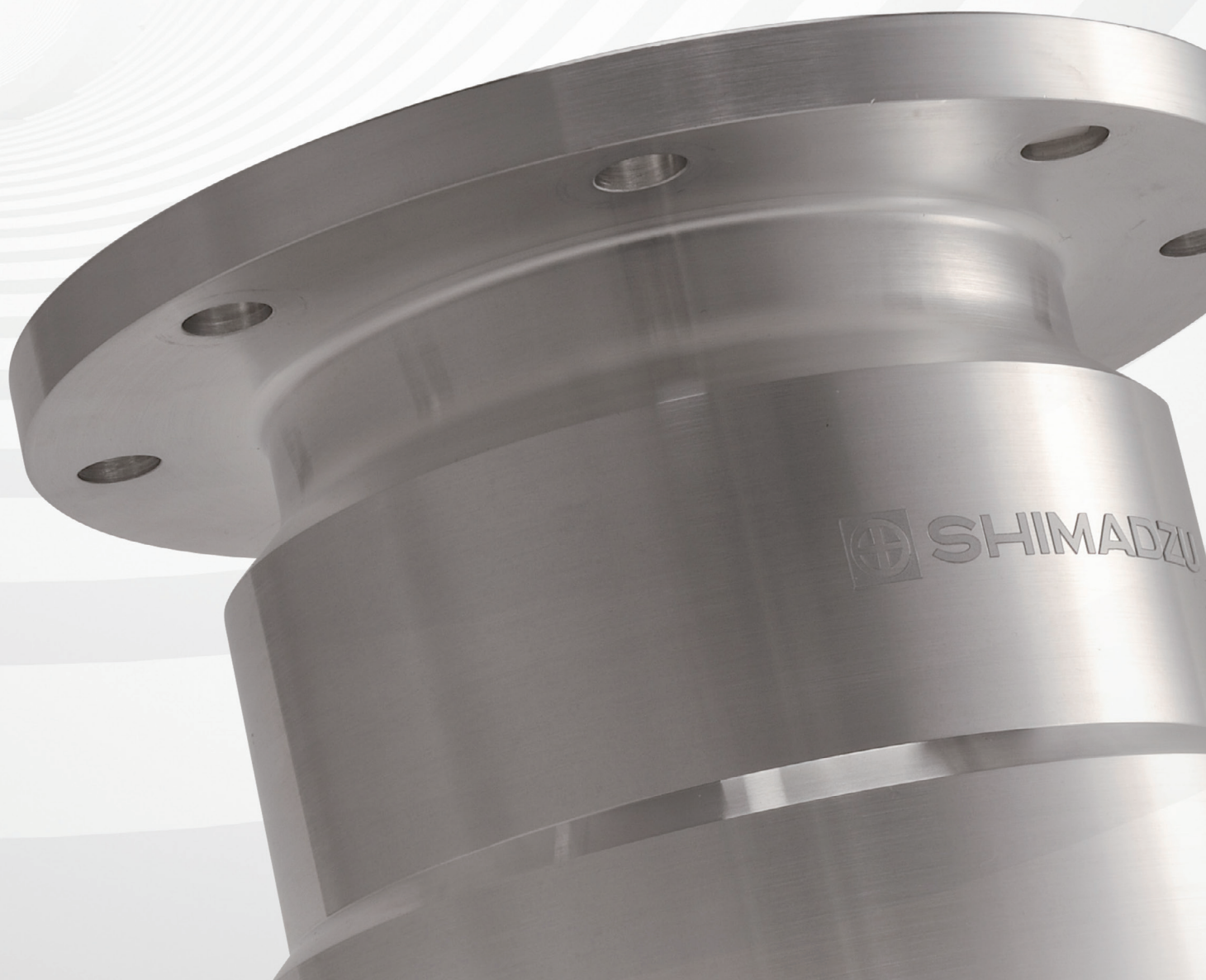


Hybrid Bearing  
**Turbo Molecular Pumps**  
**TMP-B70/TMP-B300**



# Features

## Long-life, High performance, Excellent ease of operation

- Optimization of the bearing section and the control mechanism leads to lower running cost.
- TMP-B70 and TMP-B300 have higher hydrogen compression ratio.
- Local operation available
- Mounting direction free

### Combination of magnetic and ceramic bearings

A proprietary damping mechanism is used to achieve low vibration and bearing cooling function, additionally provides high reliability and long service life.

### High backing pressure and high compression ratio for hydrogen gas

The combination of turbine blades and molecular drag pump achieves ultra high vacuum even with high backing pressure levels.

Compression ratio for hydrogen gas is

TMP-B70:  $4 \times 10^5$

TMP-B300:  $1 \times 10^5$

If used in combination with a small dry vacuum pump, such as a diaphragm pump, it can achieve ultra-high vacuum pressures.

### Integrated controller

An integrated controller makes it possible to start, stop, or reset the unit locally.

The unit can also be operated by RS-485 and remote contact signals.

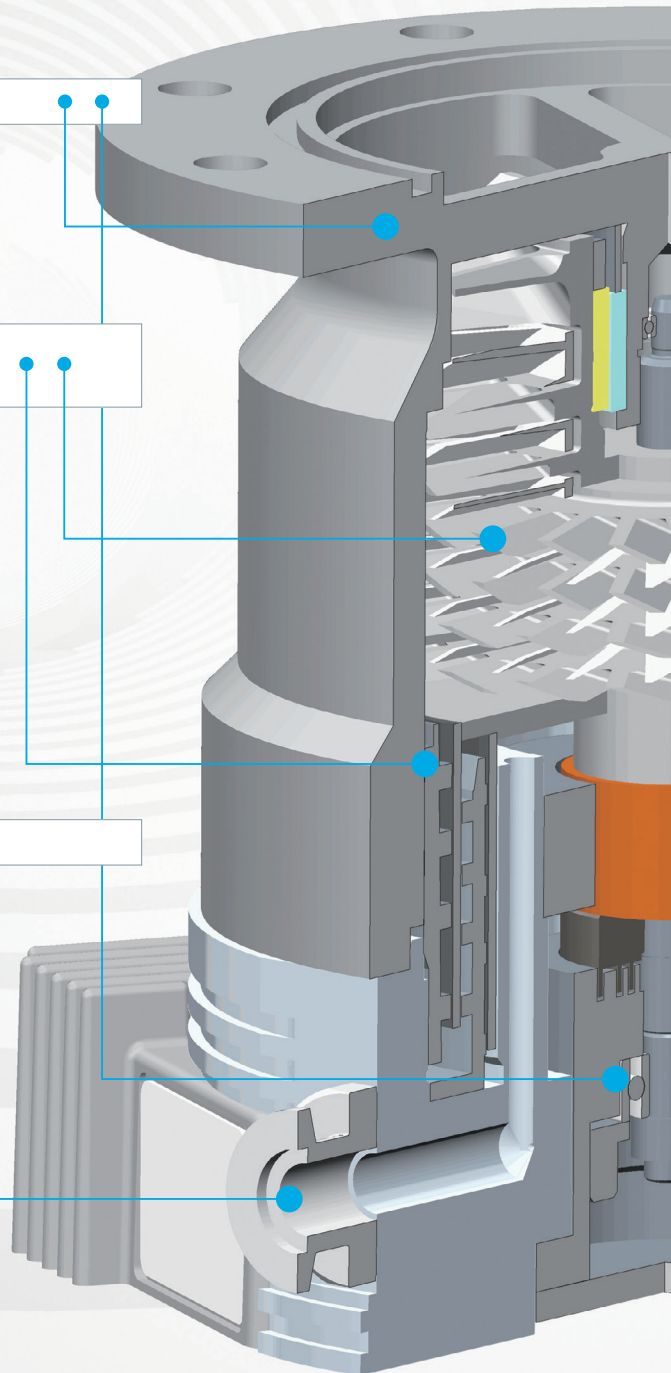
Computer communication software is also available. Input voltage is 24 V DC.

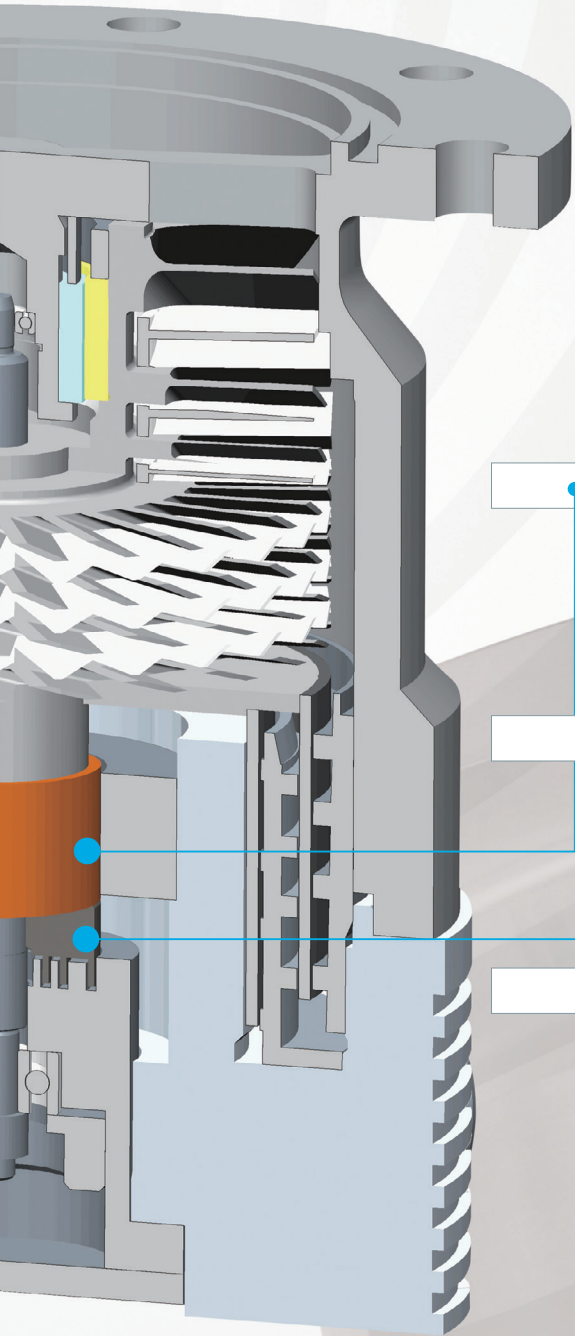


TMP-B300



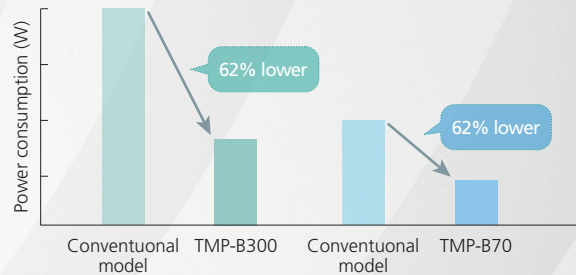
TMP-B70





### Low power consumption

This environmentally friendly series features a newly developed controller and a high-efficiency motor, which reduce power consumption.



※ Compared to our conventional model when in no load condition

### Low heat-generation motor

Reducing heat generated from the motor helps prevent the bearing temperature from increasing and extends the service life.

### Labyrinth seal prevents backflow (TMP-B300)

This seal helps ensure a clean vacuum by preventing the grease (base oil) used in the ceramic bearing from diffusing.

### Mountable in any orientation

The pump unit can be mounted in vertical, horizontal, diagonal, or inverted orientation.



TMP-B300 (ISO100K)

# Specifications

## TMP-B70



This product is certified as Shimadzu's Eco-Products Plus. 36% reduction in product weight, 69% reduction in product volume, 91% reduction in footprint (Compared with conventional Shimadzu's products)

Turbo molecular pump model		TMP-B70		
Cooling method		Natural convection	Forced air	Water (Note 1)
Ultimate pressure (Note 3)	After baking	(Note 2)	10 <sup>-8</sup> Pa order (Note 3)	10 <sup>-8</sup> Pa order (Note 3)
	Non-baking	10 <sup>-6</sup> Pa order	10 <sup>-6</sup> Pa order	10 <sup>-6</sup> Pa order
Pumping speed (Note 4)	N <sub>2</sub>	70 L/s	70 L/s	70 L/s
	He	60 L/s	60 L/s	60 L/s
	H <sub>2</sub>	49 L/s	49 L/s	49 L/s
Pumping speed (NW 40)	N <sub>2</sub>	41 L/s	41 L/s	41 L/s
	He	46 L/s	46 L/s	46 L/s
	H <sub>2</sub>	42 L/s	42 L/s	42 L/s
Compression ratio	N <sub>2</sub>	> 1×10 <sup>9</sup>	> 1×10 <sup>9</sup>	> 1×10 <sup>9</sup>
	He	4×10 <sup>7</sup>	4×10 <sup>7</sup>	4×10 <sup>7</sup>
	H <sub>2</sub>	4×10 <sup>5</sup>	4×10 <sup>5</sup>	4×10 <sup>5</sup>
Critical backing pressure (N <sub>2</sub> gas, 87,000rpm)		1400 Pa	1400 Pa	1400 Pa
Maximum allowable continuous backing pressure (Note 5)	N <sub>2</sub>	300 Pa (ambient ≤25°C)	900 Pa (ambient ≤25°C)	900 Pa (ambient ≤25°C)
		200 Pa (ambient ≤30°C)	600 Pa (ambient ≤35°C)	600 Pa (ambient ≤40°C)
Maximum allowable N <sub>2</sub> gas throughput at continuous pumping		15 SCCM (ambient 25°C) 10 SCCM (ambient 30°C)	40 SCCM (ambient 25°C) 30 SCCM (ambient 35°C)	40 SCCM (ambient 25°C) 30 SCCM (ambient 40°C)
Weight	DN 63CF (ICF 114)	5.0 kg	5.2 kg	5.1 kg
	VG 65	3.3 kg	3.5 kg	3.4 kg
	ISO 63K	3.0 kg	3.2 kg	3.1 kg
	KF 40	3.1 kg	3.3 kg	3.2 kg
Bearing type		Magnetic bearing and ceramic ball bearing		
Inlet flange		DN 63CF (ICF 114), VG 65, ISO 63K, KF 40		
Outlet flange		KF 16		
Rotated speed		87 000 rpm		
Start-up time (up to 80 %)		1.7 minutes		
Mounting position		In any desired direction		
Noise [by Shimadzu's measurement method]		48 dB(A) or less		
Admissible ambient magnetic field	Radial direction	3 mT		
	Axial direction	15 mT		
Input electric power	Voltage	24 V DC ± 5 %		
	Maximum power	120 W		

Note 1: Water temperature : ≥ dew point, 5 - 25°C Flow rate : 1.25 L/min

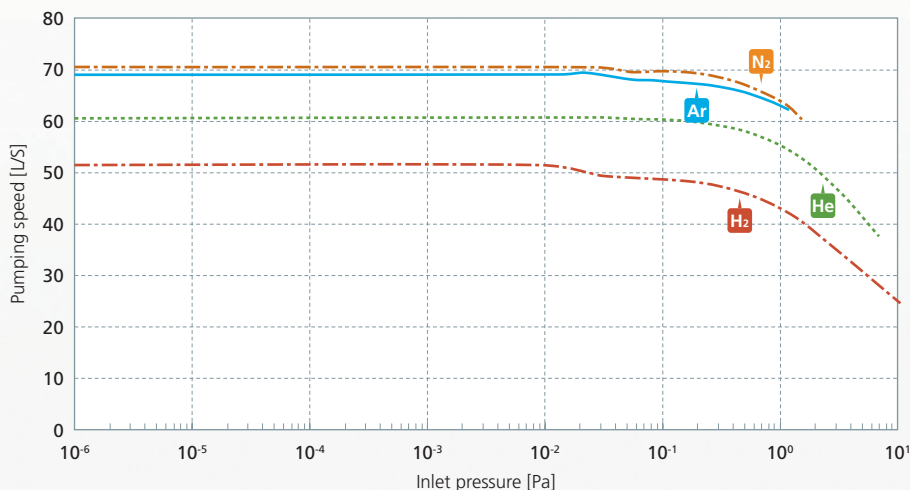
Note 2: Cannot bake with natural convection.

Note 3: Only pumps with a CF flange can be baked. When baked by a two-stage oil-sealed rotary pump.

Note 4: Without protective net. Pumping speed for N<sub>2</sub> is 68 L/s with a protective net

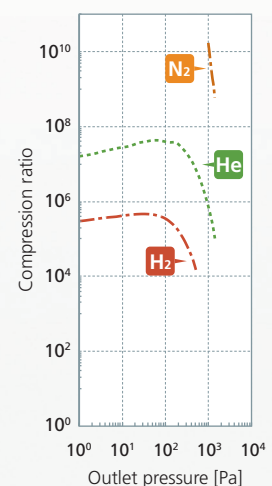
Note 5: Maximum allowable outlet pressure in which the pump can be operated continuously when inlet pressure is ultimate pressure.

### Pumping speed curve



Note : Without a protective net

### Compression ratio curve



# TMP-B300



This product is certified as Shimadzu's Eco-Products Plus.  
 58% reduction in power consumption, 72% reduction in product weight, 73% reduction in product volume, 79% reduction in footprint  
 (Compared with conventional Shimadzu's products)

Turbo molecular pump model		TMP-B300		TMP-B300L
Cooling method		Natural convection	Forced air	Water (Note 1)
Ultimate pressure (Note 3)	After baking	(Note 2)	10 <sup>-8</sup> Pa order (Note 3)	10 <sup>-8</sup> Pa order (Note 3)
	Non-baking	10 <sup>-6</sup> Pa order	10 <sup>-6</sup> Pa order	10 <sup>-6</sup> Pa order
Pumping speed (Note 4)	N <sub>2</sub>	280 L/s	280 L/s	280 L/s
	He	270 L/s	270 L/s	270 L/s
	H <sub>2</sub>	220 L/s	220 L/s	220 L/s
Compression ratio	N <sub>2</sub>	> 1×10 <sup>9</sup>	> 1×10 <sup>9</sup>	> 1×10 <sup>9</sup>
	He	7×10 <sup>6</sup>	7×10 <sup>6</sup>	7×10 <sup>6</sup>
	H <sub>2</sub>	1×10 <sup>5</sup>	1×10 <sup>5</sup>	1×10 <sup>5</sup>
Critical backing pressure(N <sub>2</sub> gas, 60,000rpm)		1300 Pa	1300 Pa	1300 Pa
Maximum allowable continuous backing pressure (Note 5)	N <sub>2</sub>	100 Pa (ambient ≤ 35°C)	1000 Pa (ambient ≤ 25°C) 930 Pa (ambient ≤ 35°C)	1300 Pa (ambient ≤ 40°C)
Maximum allowable N <sub>2</sub> gas throughput at continuous pumping		10 SCCM (ambient 25°C) 4 SCCM (ambient 35°C)	100 SCCM (ambient 25°C) 40 SCCM (ambient 35°C)	240 SCCM (ambient ≤ 40°C)
Weight	DN 100CF (ICF152)	9.4 kg	9.7 kg	10.1 kg
	VG 100	6.3 kg	6.6 kg	7.0 kg
	ISO 100K	6.0 kg	6.3 kg	6.7 kg
Bearing type		Magnetic bearing and ceramic ball bearing		
Inlet flange		DN 100CF, VG 100, ISO 100K		
Outlet flange		KF 16		
Rotated speed		60 000 rpm		
Start-up time (up to 80 %)		3.5 minutes		
Mounting position		In any desired direction		
Noise [by Shimadzu's measurement method] (Note 6)		50 dB(A) or less		
Admissible ambient magnetic field	Radial direction	3 mT		
	Axial direction	15 mT		
Input electric power	Voltage	24 V DC ± 5 %		
	Maximum power	180 W		

Note 1: Water temperature : ≥ dew point, ≤ 28°C Flow rate : 1 L/min

Note 2: Cannot bake with natural convection.

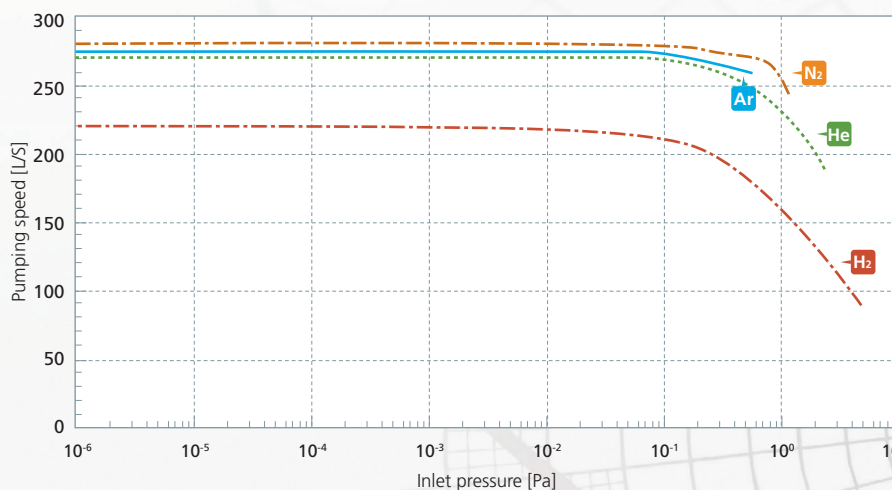
Note 3: Only pumps with a CF flange can be baked. When baked by a two-stage oil-sealed rotary pump.

Note 4: Without protective net. Pumping speed for N<sub>2</sub> is 260 L/s with a protective net.

Note 5: Maximum allowable outlet pressure in which the pump can be operated continuously when inlet pressure is ultimate pressure.

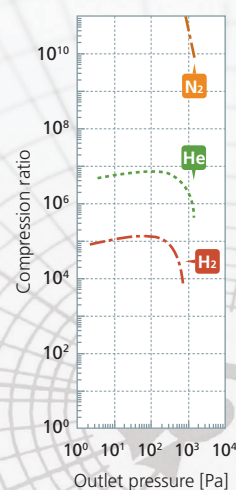
Note 6: Measured for the ISO flange model.

## Pumping speed curve



Note : Without a protective net

## Compression ratio curve



# Dimensions

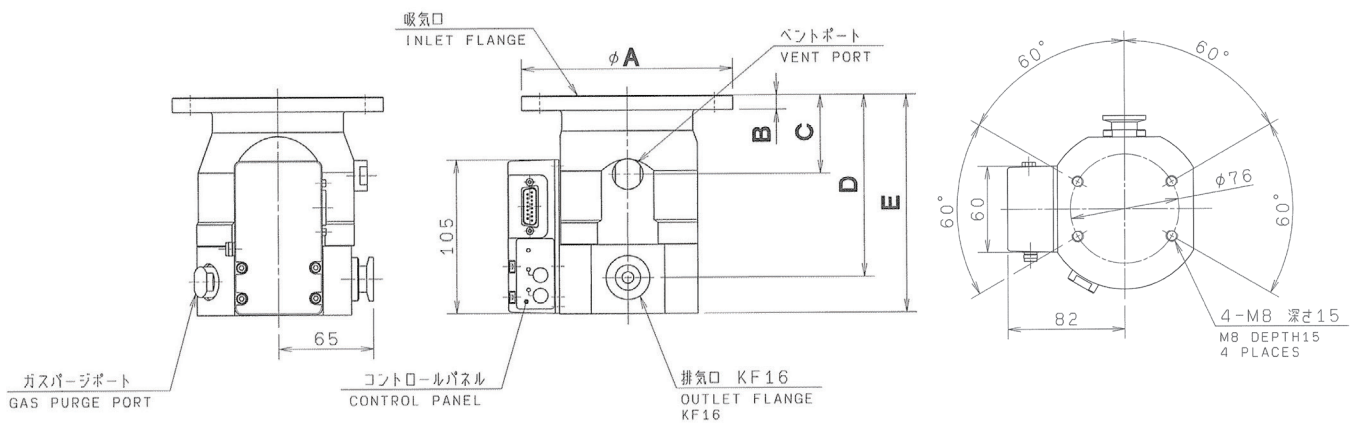
Dimensions do not include accessories.

## TMP-B70

(units: mm)

Inlet flange	øA	B	n-ød	P.C.D.	C	D	E
DN 63CF (ICF114)	114.3	17	8-ø8.4	ø92.2	72	142.2	167.2
VG 65	145	10	4-ø12	ø120	53.8	124.5	149
ISO 63K	95	12	-	-	53.8	124.5	149
KF 40	55	-	-	-	72.8	143	168

Dimensions E is the same regardless of the cooling method.

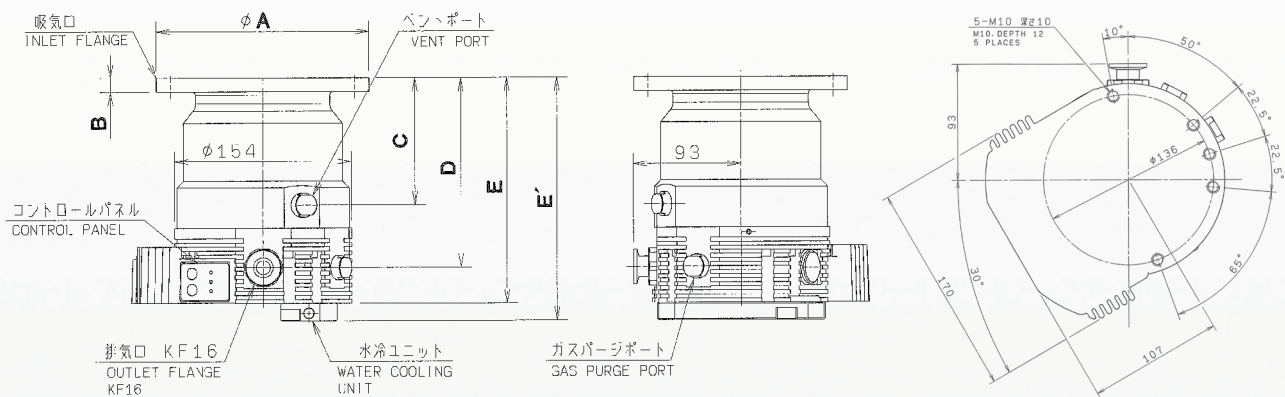


## TMP-B300

(units: mm)

Inlet flange	øA	B	n-ød	P.C.D.	C	D	E	E'
DN 100CF (ICF152)	152.4	19.5	16-ø8.5	ø130.3	122	176	207	222
VG 100	185	12	8-ø12	ø160	110	164	195	210
ISO 100K	130	12	-	-	110	164	195	210

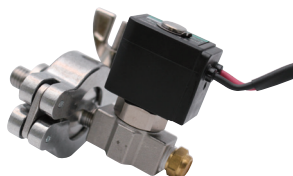
The E dimension depends on the cooling method. (E : Air cooling, E' : Water cooling)



# Accessories

## Venting valve

The venting valve is connected to the venting port on the casing of the main pump unit, and is used to inject venting gas when stopping the pump to restore atmospheric pressure inside the pump. It then prevents oil vapor of the backing pump from diffusing back toward the inlet port. By using the interface cable, power can be supplied from the controller.



## Baking heater

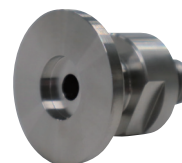
Discharging gases by controlling temperature at high vacuum side of a pump casing to 85 °C helps to reach lower pressure in shorter time. Please switch the baking heater ON/OFF by the customer.



## Gas purge adapter

When evacuating heavier gases such as argon, the prevention of dust entering into a bearing by N<sub>2</sub> purge reduces the influence on a bearing.

※A flowmeter is NOT included. Please use a flowmeter with an adjustment valve.



## Cooling options

Use an air cooling fan or a water cooling unit in the following cases.

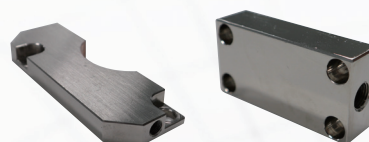
- » If ambient temperature becomes high (TMP-B70: >30°C, TMP-B300: >35°C)
- » If gas is supplied from inlet,
- » If the backing pressure is high,
- » If a baking heater is used,

## Air cooling fan

An air cooling fan can receive power from connector on the controller. It is possible to install an air cooling fan by the customer.



## Water cooling unit



## Example of installation

Venting valve

Air cooling fan

Gas purge adapter



TMP-B70 (VG 65)

Baking heater

Water cooling unit



TMP-B70 (DN 63CF)

This figure is an example.

# Display unit with power supply: EI-DPS240

## Features

- Easy connection just only connecting TMP cable
- Display panel with excellent visibility
- Intuitive operation
- A vacuum gauge can be connected  
Vacuum pressure is indicated by receiving 0-10 VDC voltage which correspond to logarithm of pressure.
- Convenient interlock functions

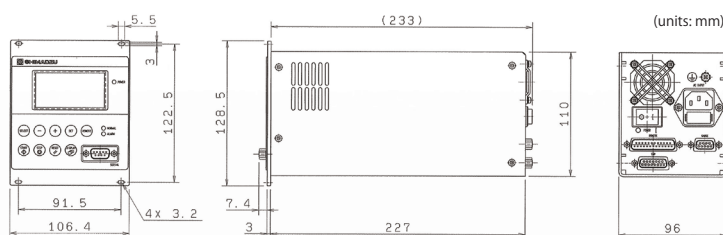


Delayed start-up of TMP	EI-DPS240 sends start signal to a backing pump, then starts the TMP in a preset time.
TMP start-stop which interlocked vacuum gauges	EI-DPS240 sends start signal to a backing pump, then starts the TMP after a measured pressure reaches a preset value. EI-DPS240 stops the backing pump and the TMP when the measured pressure exceeds a preset value.

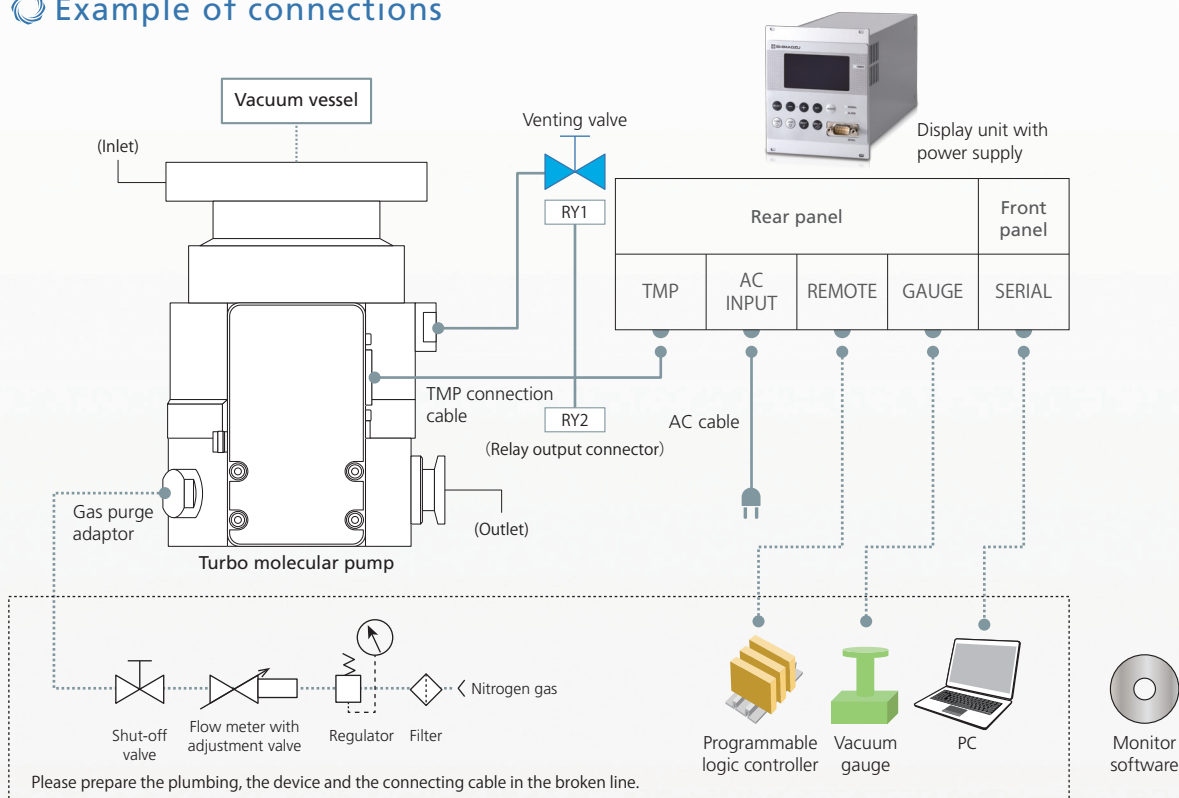
## Specifications

Items	Details
Model	EI-DPS240
Input voltage	100-240 V AC (+10 %/-15 %) Single-phase 50/60 Hz
Power consumption	Maximum 280 VA
Weight	2.0 kg

## Dimensions



## Example of connections





# Power supply set

## Features

- Simple configuration without pressure control and interlock functions.
- Connect the interface cable to supply 24 VDC to the turbo molecular pump.



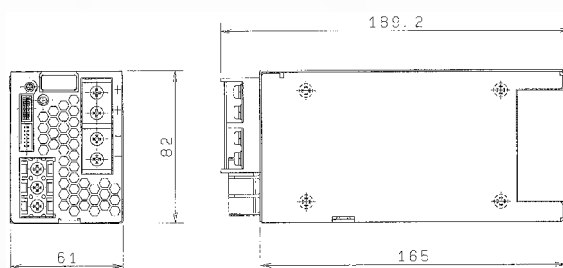
- Power supply set
- Interface cable (accessory)

A minimum 24 V DC 120 W power supply is required when using TMP-B70. Also a minimum 24 V DC 180 W power supply is required when using TMP-B300.  
An AC cable is included.

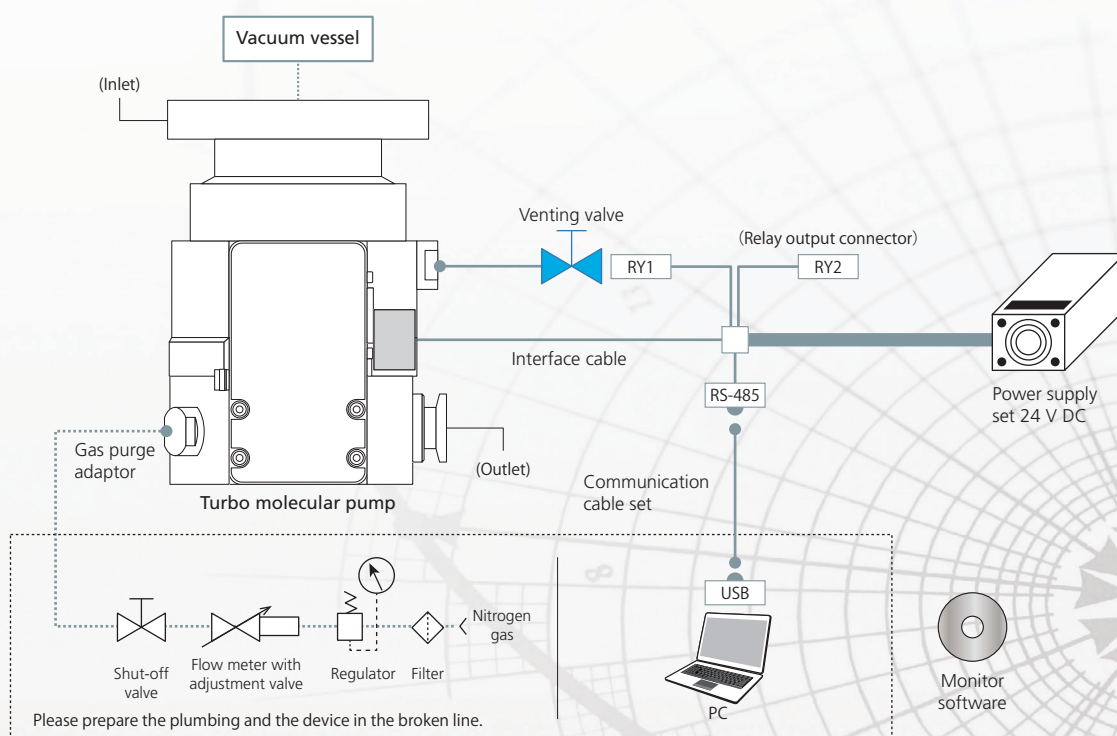
## Specifications

Items		Details
Input	Voltage	85~265 V AC or 120~330 V DC
	Frequency	Single-phase 50/60 Hz
Output	Voltage	24 V DC
	Maximum power	336 W
Operating temperature		-10~+70 °C
Weight		1.0 kg

## Dimensions



## Example of connections



# Main unit and accessories

## TMP-B70

Regardless of the cooling method, the P/N is common.

Description	Remarks	P/N
TMP-B70, DN 63CF (ICF114)	Inlet flange: DN 63CF (ICF114)	263-48111-01
TMP-B70, VG 65	Inlet flange: VG 65	263-48111-02
TMP-B70, ISO 63K	Inlet flange: ISO 63K	263-48111-03
TMP-B70, KF 40	Inlet flange: KF 40	263-48111-06



\*The pictures above show a pump with an air cooling fan (accessory).

## TMP-B300

**For natural convection or Forced air cooling method**

Description	Remarks	P/N
TMP-B300, DN 100CF (ICF152)	Inlet flange: DN 100CF (ICF152)	263-18740-01
TMP-B300, VG 100	Inlet flange: VG 100	263-18740-02
TMP-B300, ISO 100K	Inlet flange: ISO 100K	263-18740-03

**For water cooling method**

Description	Remarks	P/N
TMP-B300L, DN 100CF (ICF152)	Inlet flange: DN 100CF (ICF152)	263-48356-01
TMP-B300L, VG 100	Inlet flange: VG 100	263-48356-02
TMP-B300L, ISO 100K	Inlet flange: ISO 100K	263-48356-03



\*The pictures above show a pump with an air cooling fan (accessory).

No	Description	Remarks	P/N	
			TMP-B70	TMP-B300
1	Air cooling fan	Directly attached to side of pump body (Note 1)	263-46375	263-44455
		Directly attached to bottom of pump body (Note 1)	263-46375-01	
2	Water cooling unit	Directly attached to side of pump body	263-46386	
		Directly attached to bottom of pump body		263-44914-02
3	Venting Valve	Normally close	263-91168	
4	Gas purge adapter	KF 10	263-45673-01	
5	Baking heater, B70, 100 V	Only for CF flange model, 100 V AC, 65 W (Note 2)	263-46382-01	
	Baking heater, B70, 230 V	Only for CF flange model, 230 V AC, 65 W (Note 2)	263-46382-02	
	Baking heater, B300, 100 V	Only for CF flange model, 100 V AC, 200 W (Note 2)		263-44652-01
	Baking heater, B300, 230 V	Only for CF flange model, 230 V AC, 200 W (Note 2)		263-44652-02
6	Clamp for outlet	KF 16	035-06032-01	
7	Centerring ring for outlet	KF 16	035-06032-12	
8	Clamp for inlet	For KF 40	263-46333	
9	Single claw clamp for inlet	4-M8	263-90540-01	
		8-M8		263-90540-02
10	Double claws clamp for inlet	4-M10	263-90541	
11	Monitor software TypeB	For TMP-B70/TMP-B300	263-45722	

(Note 1) Please select according to mounting position of an air cooling fan.

(Note 2) Please use a baking heater together with an air cooling fan or a water cooling unit. In case of using 200 V AC, please select for 230 V AC.

When using EI-DPS240 (Note 3)

No	Description	Remarks	P/N
20	EI-DPS240	For use in Japan	263-48164
		For use in except Japan	263-48164-01
21	AC cable JU	Power supply cable for use in Japan and North America	071-60821-08
	AC cable EU	Power supply cable for use in Europe	071-60825-51
	AC cable CN	Power supply cable for use in China	071-60827-05
22	Connecting cable for TMP, 1MT	Connecting cable for EI-DPS240 and TMP With conector for venting valve Length : 1m, 3m, 5m, 7m, 10m	263-91228-01
	Connecting cable for TMP, 3MT		263-91228-03
	Connecting cable for TMP, 5MT		263-91228-05
	Connecting cable for TMP, 7MT		263-91228-07
	Connecting cable for TMP, 10MT		263-91228-10

When using power supply set (Note 3)

No	Description	Remarks	P/N
30	Power supply set DC24V JU, 1MT	Input voltage: 100-240 V AC With a 100 V AC plug for use in Japan and North America	263-44497-01
	Power supply set DC24V JU, 3MT		263-44497-03
	Power supply set DC24V JU, 5MT		263-44497-05
	Power supply set DC24V EU, 1MT		263-44497-51
	Power supply set DC24V EU, 3MT		263-44497-53
	Power supply set DC24V EU, 5MT		263-44497-55
31	Interface cable, 1MT	Connecting cable for Power supply set and TMP With connectors for RS485 and venting valve Length: 1m, 2m, 3m, 5m	263-44408-01
	Interface cable, 2MT		263-44408-02
	Interface cable, 3MT		263-44408-03
	Interface cable, 5MT		263-44408-05
32	Interface connector	Connector for 24 V DC supply and communications D-sub 15 pin female with connector hood	263-45677
33	Communication cable set, 1MT	USB-RS485 coverter and RS485 communication cable Length: 1m, 3m, 5m	263-45678-01
	Communication cable set, 3MT		263-45678-03
	Communication cable set, 5MT		263-45678-05

(Note 3) Please contact Shimadzu about a power supply and a cable specifications for use outside Japan.

## Turbo Molecular Pump Service Network

Enquiries received by the TMP Group, Quality Assurance Department, are handled via our rapid response service network. To allow our overseas customers to use these products with complete confidence, turbo molecular pump service sites have been established at the locations below.

### JAPAN

#### SHIMADZU CORPORATION

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PHONE: 82-31-283-0242 FAX: 82-31-283-0263

### TAIWAN

#### SHIMADZU TAIWAN INDUSTRIAL MACHINERY CO.,LTD.

3F, No.122-7, Zhonghua Rd., Hukou Township, Hsinchu Country 30352, Taiwan (R.O.C.)  
PHONE: 886-3-5986008 FAX: 886-3-5986006

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#### Shimadzu Industrial Equipment USA SANTA CLARA OFFICE

2340-C Walsh Avenue, Santa Clara, CA95051, U.S.A.  
PHONE: 1-408-566-0960 FAX: 1-408-566-0961

#### AUSTIN SUPPORT CENTER

9210 Cameron Road, Suite 900, Austin, TX78754, U.S.A.  
PHONE: 1-512-339-6007 FAX: 1-512-339-6202

### ISRAEL

#### ISI LTD.

32 Shaham St., Amargad House, Kiryat Matalon, Petah-Tikva, Israel  
PHONE: 972-3-9232202 FAX: 972-3-9229750

### CHINA

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PHONE: 86-21-2201-3816 FAX: 86-21-2201-3800

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Gleiwitzer Strasse 8, 85386 Eching, Germany  
PHONE: 49(89)319-0103 FAX: 49(89)319-01050

### RUSSIA

#### CRYOSYSTEMS INCORPORATED

Nagorny Pr.7 117105, Moscow, Russia  
PHONE: 7-495-543-7360 FAX: 7-495-543-7361



This product is certified as Shimadzu's Eco-Products Plus.



The Sanjo Works has been certified under ISO 14001:2004 Environmental Management System.



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