

## Mechanical Booster Pump **PMB Series Ver.D**

By using together with dry vacuum pumps, oil rotary vacuum pumps or water-sealed vacuum pumps, mechanical booster pumps can increase pumping speed in the range between 10kPa to 0.1 Pa, where roughing pump pumping speed drops. The PMB series Ver.D is a wide use mechanical booster pump with multiple voltage motor (high efficiency). It is possible to run with air-cooled depending on use condition. And surface treatment and atmospheric operation type are selectable as option.



PMB1200D

### Features

- **Possible to run with air-cooled depending on use condition.**  
Continuous operation under 200Pa. Pumping time to reach 200Pa needs to be within 10 minutes.
- **Possible to select multiple voltage motor (either 200V class or multiple voltage)**  
Compatible with universal motor and optional explosion proof motor can be equipped. Compatible with high efficiency regulation (IE2/EPAAct).
- **Excellent corrosion resistance surface treatment (Option: T type)**  
High surface hardness and excellent corrosion resistance. The surfaces of all main parts have undergone anodic oxide coating to provide excellent corrosion resistance and surface rigidity. This can restrain scratch and corrosion inside of the pump.
- **Atmospheric pressure start type effective for pumping time shortening (option: inverter)**  
Because the pump can start at the same time of roughing pump, pumping time can be shorter comparing with standard type.

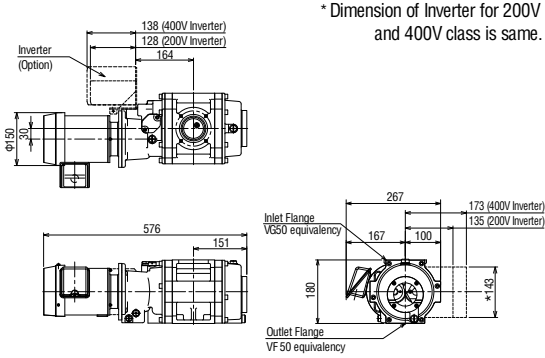
### Applications

- Evaporation, sputtering, ion plating.
- Vacuum drying, freeze drying, vacuum degassing
- Analytical instruments, leak test system
- Gas exchange, filling, vacuum insulating
- Heat treatment, melting furnace
- Other various kinds of vacuum system

Dimensions

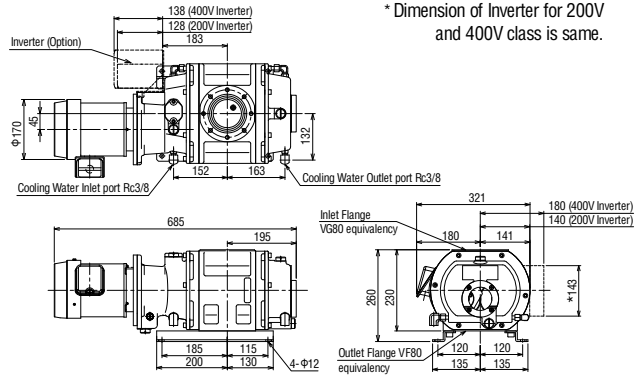
(unit: mm)

PMB100D



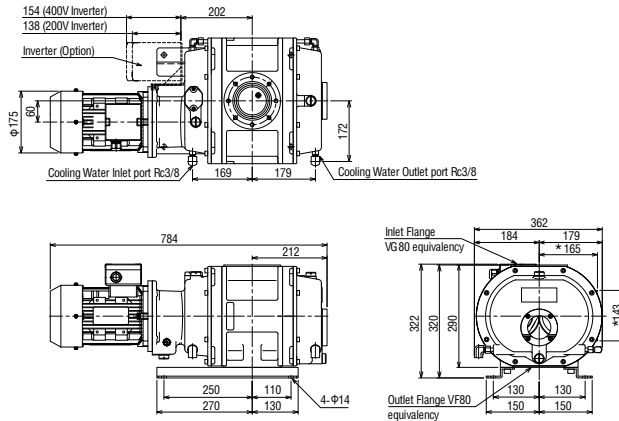
\* Dimension of Inverter for 200V and 400V class is same.

PMB300D



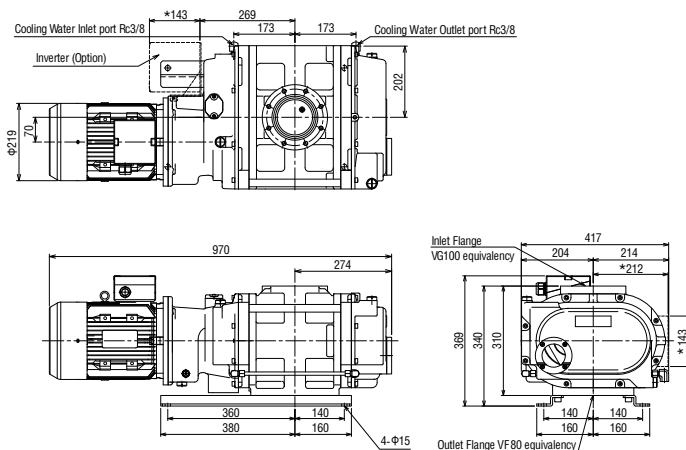
\* Dimension of Inverter for 200V and 400V class is same.

PMB600D



\* Dimension of Inverter for 200V and 400V class is same.

PMB1200D



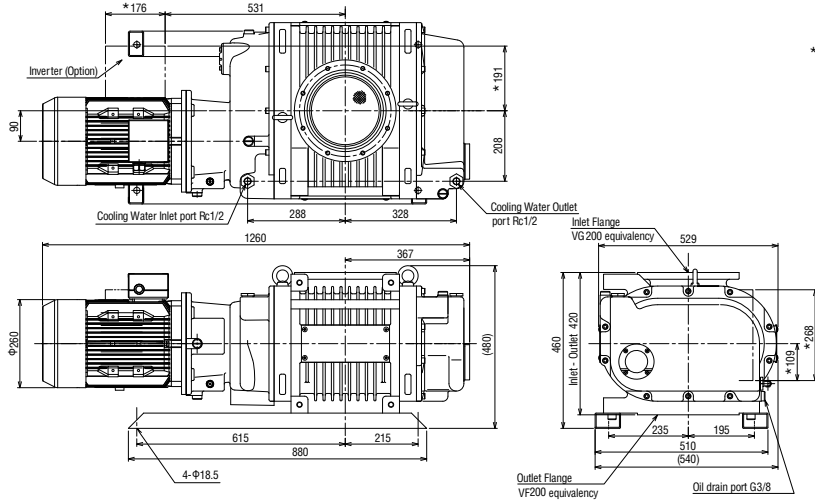
\* Dimension of Inverter for 200V and 400V class is same.

# Mechanical Booster Pump PMB Series Ver.D

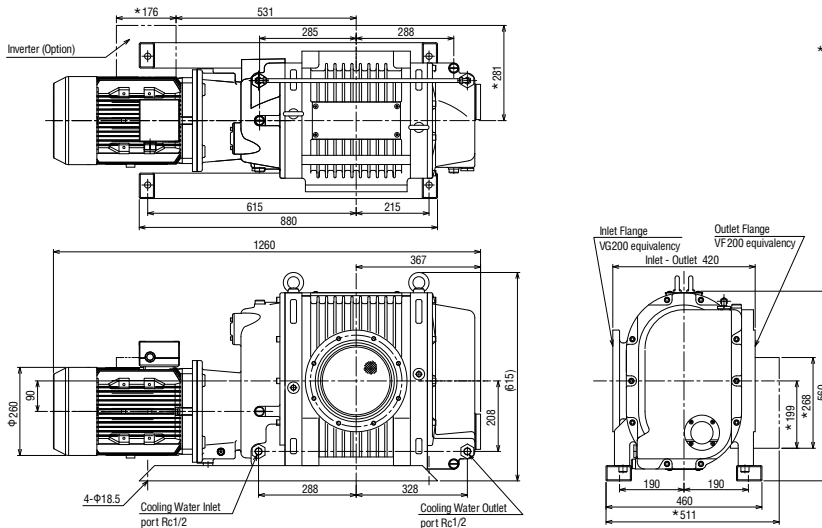
## Dimensions

(unit: mm)

### PMB2400D



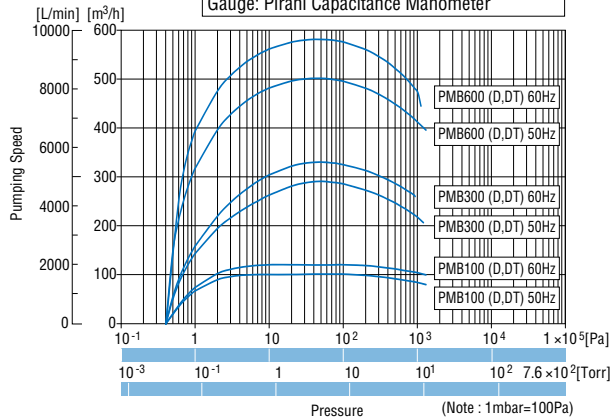
### PMB2400D (Horizontal exhaust direction type)



## Pumping Speed Curve

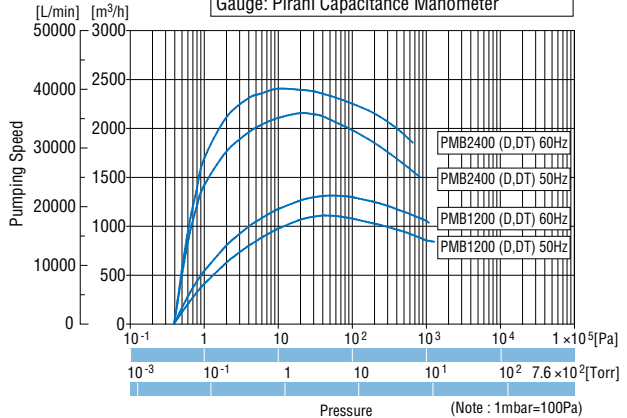
- PMB100D
- PMB300D
- PMB600D

Pumping Speed (JIS B 8316/1985)  
Backing Vacuum pump: Standard Oil: ULVOIL R-4  
Gauge: Pirani Capacitance Manometer



- PMB1200D
- PMB2400D

Pumping Speed (JIS B 8316/1985)  
Backing Vacuum pump: Standard Oil: ULVOIL R-4  
Gauge: Pirani Capacitance Manometer



**Specifications**

Model *1		PMB100D	PMB300D	PMB600D	PMB1200D	PMB2400D	
Maximum pumping speed *2	50Hz	m <sup>3</sup> /h	95	280	500	1000	2000
		L/min	1580	4670	8330	16667	33330
		CFM	56	165	294	590	1178
	60Hz	m <sup>3</sup> /h	115	330	600	1200	2400
		L/min	1920	5500	10000	20000	40000
		CFM	68	194	353	706	1413
Maximum suction pressure	50Hz	Pa	9.3 × 10 <sup>3</sup>	1.2 × 10 <sup>3</sup>	1.3 × 10 <sup>3</sup>	8.0 × 10 <sup>2</sup>	
		Torr	69	9	10	6	
		mbar	93	12	13	8	
	60Hz	Pa	6.2 × 10 <sup>3</sup>	9.3 × 10 <sup>2</sup>	1.1 × 10 <sup>3</sup>	6.7 × 10 <sup>2</sup>	
		Torr	46	7	8.2	5	
		mbar	62	9.3	11	6.7	
Maximum allowable differential pressure	50Hz	Pa	8.0 × 10 <sup>3</sup>	4.0 × 10 <sup>3</sup>	7.3 × 10 <sup>3</sup>	5.6 × 10 <sup>3</sup>	
		Torr	60	30	54.7	42.1	
		mbar	80	40	73	56	
	60Hz	Pa	5.6 × 10 <sup>3</sup>	3.3 × 10 <sup>3</sup>	6.0 × 10 <sup>3</sup>	4.7 × 10 <sup>3</sup>	
		Torr	42	25	45	35.3	
		mbar	56	33	60	47	
Ultimate Pressure *3		Pa	4.0 × 10 <sup>-1</sup>		6.7 × 10 <sup>-1</sup>		
		Torr	3.0 × 10 <sup>-3</sup>		5.0 × 10 <sup>-3</sup>		
		mbar	4.0 × 10 <sup>-3</sup>		6.7 × 10 <sup>-3</sup>		
Allowable drive pressure		Pa	-1.0 × 10 <sup>5</sup> (atmospheric pressure start type)				
		Torr	-760 (atmospheric pressure start type)				
		mbar	-10000 (atmospheric pressure start type)				
Motor *4	kW (poles)		0.4 (2)	0.75 (2)	2.2 (2)	3.7 (2)	7.5 (2)
	HP (poles)		0.54 (2)	1.0 (2)	2.95 (2)	4.96 (2)	10(2)
	200V class	50Hz	200V				-
		60Hz	200V/220V				-
Multiple voltage	50Hz	220V-240V/380V-415V				200V-240V/380V-415V	
	60Hz	208V-240V/380V-460V				200V-240V/380V-460V	
Oil *5		ULVOIL R-4					
Oil capacity		L	0.35	0.7	1.5	1.9	4.0
Cooling method *6		Air-cooling		Air-cooling/Water-cooling			
Cooling water	Primary side pressure	MPa	-	0.3			
		psi	-	43.5			
	Inlet/outlet differential pressure	MPa	-	0.05			
		psi	-	1.45			
	Volume	L/min	-	2	3		
Temperature	°C	-	5-30				
	°F	-	41-86				
Inlet connection JIS-B-2290		VG50/KF50 or ISO63F (optional)	VG80/ISO80F or 100F (optional)	VG100/ISO100F (optional)	VG200/ISO200F (optional)		
Outlet connection JIS-B-2290		VF50/KF50 or ISO63F (optional)	VF80/ISO80F or 100F (optional)	VF200/ISO200F (optional)			
Dimensions WxDxH		mm	267×576×180	321×685×260	362×784×320	417×970×340	520×1260×460
Weight *7		kg	26	51	82	115	260
Standard roughing pump			VD401	VD601	VD901	VS2401	PKS-070
Applicable standard *8		CE, cTUVus					
Option		Surface treatment, Adapter flange, Explosion proof motor *9, Atmospheric pressure start type (Inverter), Lubrication oil, Lubrication chamber evacuation, Horizontal exhaust direction type (PMB2400D only)					
Atmospheric pressure start type Inverter specification/voltage		I2/200V-240V (50Hz/60Hz) I4/380V-480V (50Hz/60Hz)					

\*1 No surface treatment (standard model). Optional surface treatment (Alumite) is available (PMB\*\*\*DT model).  
 \*2 Performance of these pumps could change depending on roughing pump. Above data is based on standard roughing pump.  
 \*3 Measured by Pirani vacuum gauge. It will be about 4.0×10<sup>-2</sup>Pa when measured by MacLeod vacuum gauge.  
 \*4 Either 200V class or multiple voltage motor is selectable. Multiple voltage motor is not available with explosion proof motor.  
 \*5 Synthetic (R-7000) or fluorine oil (J25F) is selectable as option

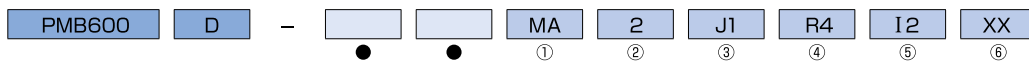
\*6 Water cooling is not required when operating under following condition.  

Model	Continuous running pressure	Time to reach continuous running pressure
PMB300D	< 530 Pa (3.9 Torr, 5.3 mbar)	< 10 minutes
PMB600D	< 200 Pa (1.5 Torr, 2.0 mbar)	< 10 minutes
PMB1200D	< 200 Pa (1.5 Torr, 2.0 mbar)	< 10 minutes
PMB2400D	< 100 Pa (0.75 Torr, 1.0 mbar)	< 5 minutes

\*7 Weight of D and DT model is same.  
 \*8 Complied with cTUVus recognition when water cooling operation (except PMB100D) is selected and optional inverter (atmospheric pressure operation) is not mounted from the factory.  
 \*9 Pressure proof explosion-resistant flange motor (D2G4) and increased safety explosion-resistant motor (EG3) indoor type are selectable as option.

**Model Explanation**

E.g.) PMB600D Without surface coating/ Totally enclosed external fan motor/ 200V class/ JIS flange/ Oil (R-4) / with Inverter (I2)



<p><b>Pump head option</b></p> <ul style="list-style-type: none"> <li>● Surface treatment None: Without (std) T: Surface treatment</li> <li>● Evacuation direction None: Vertical (std) H: Horizontal (PMB2400D only)</li> </ul>	<p><b>External option</b></p> <ul style="list-style-type: none"> <li>① Motor kind MA: Totally enclosed external fan motor (std) MD: Explosion-protection (indoor) MF: Flame-proof (indoor)</li> <li>② Motor voltage 2: 200V class (std) 4: Multiple 9: Other (specied voltage)</li> <li>③ Inlet / outlet ange J1: JIS (std) A1: Inlet ISO (adapter) A2: Inlet / outlet ISO (adapter)</li> <li>④ Oil R4: Mineral oil (R-4: std) S7: Synthetic oil (R-7000) F1: Fluorinated oil (J25F)</li> <li>⑤ Inverter (Atmosphere start type) XX: None (std) I2: 200V class I4: 400V class ⑥ Lubrication chamber evacuation XX: None (std) B1: With port</li> </ul>
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