

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. Air-cooled operation, surface treatment and atmospheric operation type are selectable as option.



PMB1200D

Features

- ▶ Possible to run with air-cooled. (Option: Inverter for air-cooled operation)
Air-cooled operation is possible in all pressure range by the inverter for air-cooled operation.
- ▶ Possible to select multiple voltage motor (either 200V class or multiple voltage)
Compatible with universal motor and optional explosion proof motor can be equipped.
- ▶ 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.

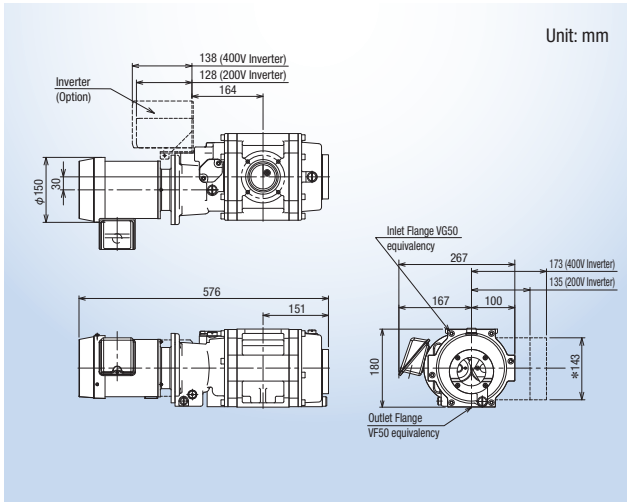
Applications

- ▶ 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

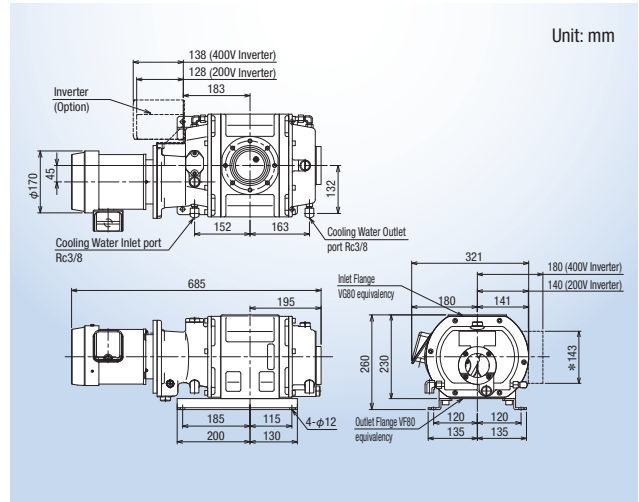
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Dimensions

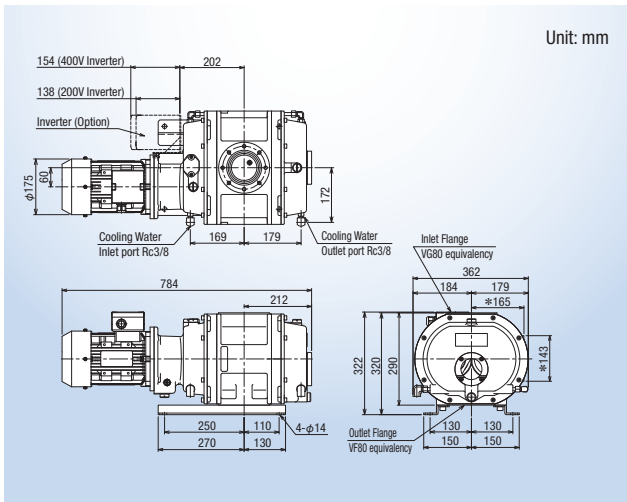
PMB100D



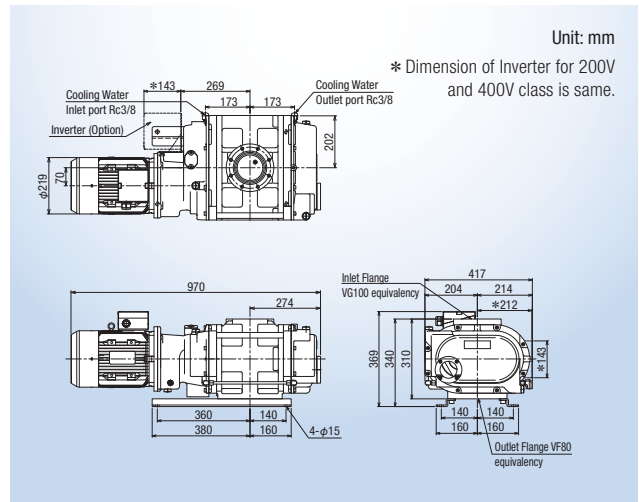
PMB300D



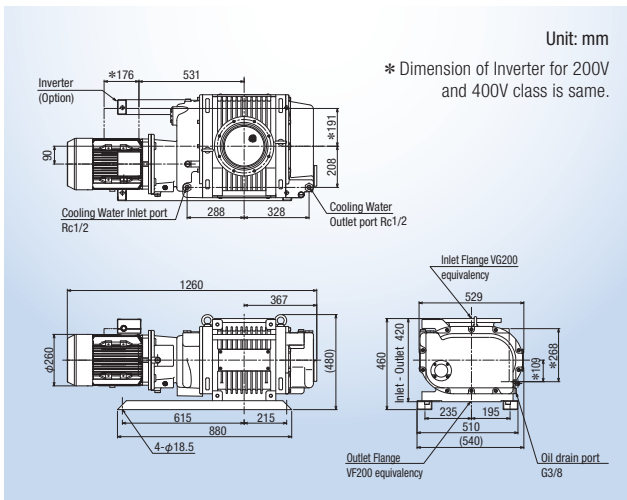
PMB600D



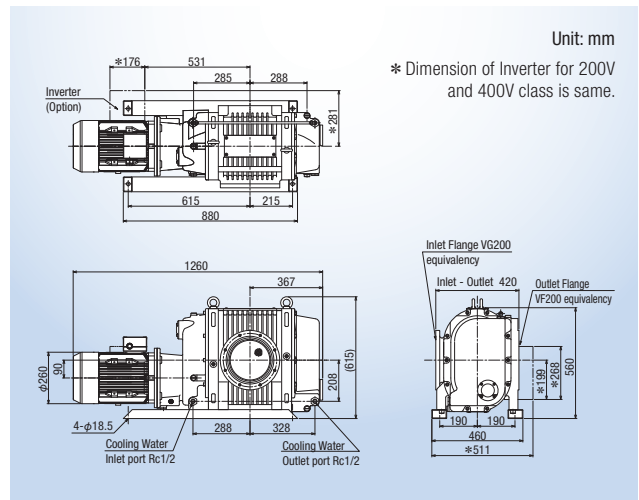
PMB1200D



PMB2400D



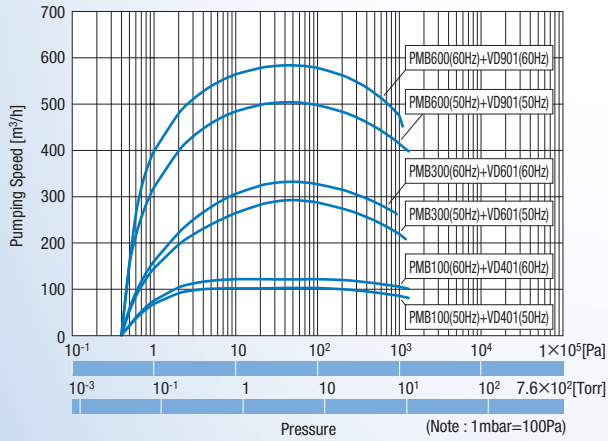
PMB2400D (Horizontal exhaust direction type)



▶ Pumping Speed Curve

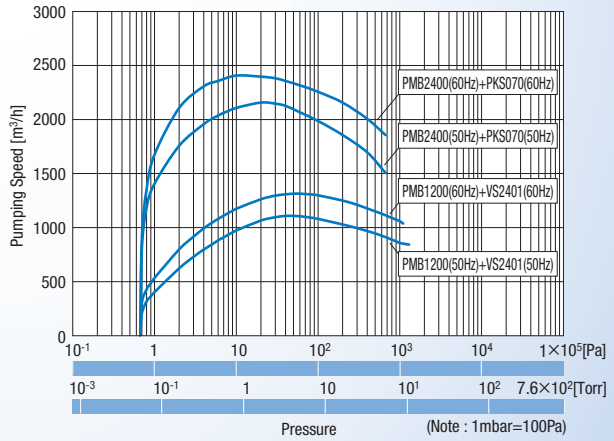
- ▶ PMB600+VD901
- ▶ PMB300+VD601
- ▶ PMB100+VD401

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



- ▶ PMB2400+PKS-070
- ▶ PMB1200+VS2401

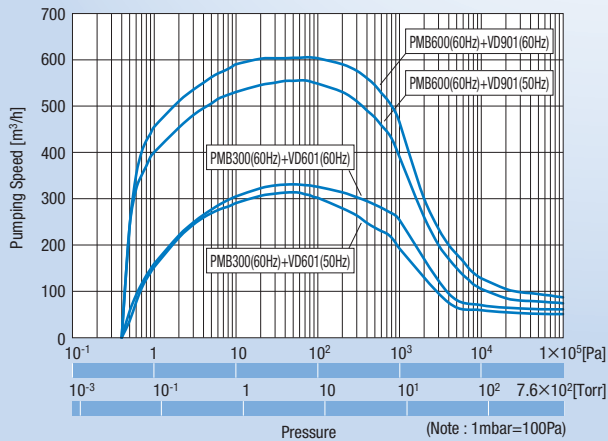
Pumping Speed (JIS B 8316/1985)
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 Gauge: Pirani Capacitance Manometer



Inveter (Water-cooled)

- ▶ PMB600+VD901
- ▶ PMB300+VD601

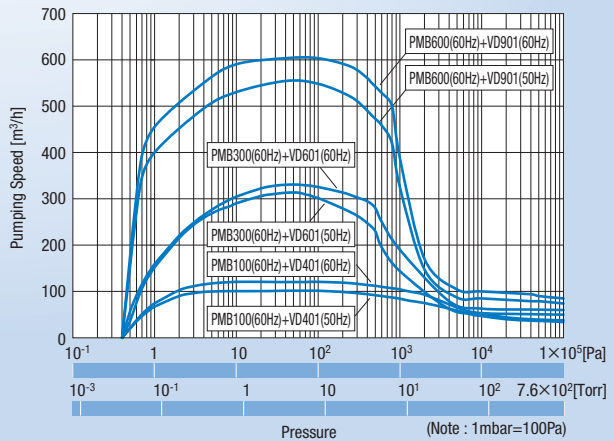
Pumping Speed (JIS B 8316/1985)
 Backing Vacuum pump: Standard Oil: ULVOIL R-4
 Gauge: Pirani Capacitance Manometer



Inveter (Air-cooled)

- ▶ PMB600+VD901
- ▶ PMB300+VD601
- ▶ PMB100+VD401

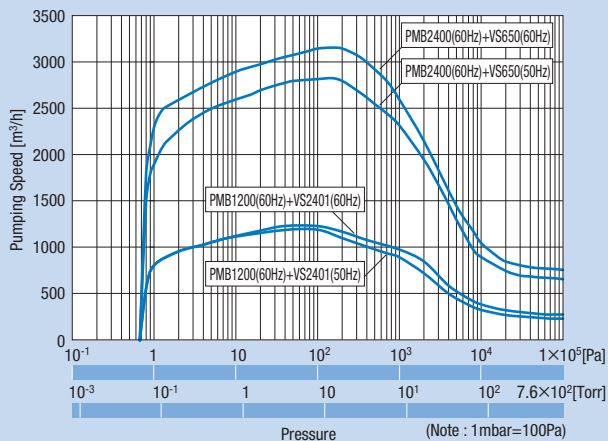
Pumping Speed (JIS B 8316/1985)
 Backing Vacuum pump: Standard Oil: ULVOIL R-7
 Gauge: Pirani Capacitance Manometer



Inveter (Water-cooled)

- ▶ PMB2400+VS650
- ▶ PMB1200+VS2401

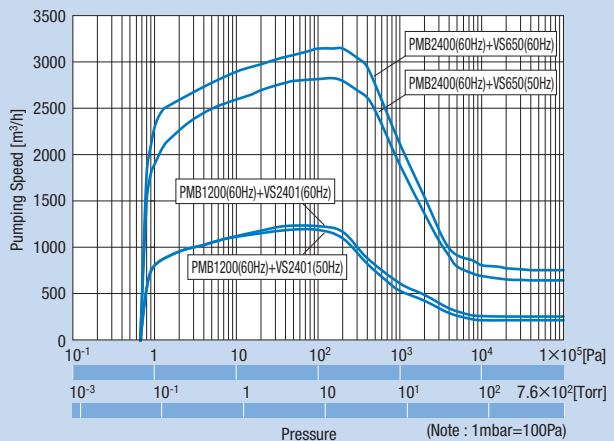
Pumping Speed (JIS B 8316/1985)
 Backing Vacuum pump: Standard Oil: ULVOIL R-4
 Gauge: Pirani Capacitance Manometer



Inveter (Air-cooled)

- ▶ PMB2400+VS650
- ▶ PMB1200+VS2401

Pumping Speed (JIS B 8316/1985)
 Backing Vacuum pump: Standard Oil: ULVOIL R-7
 Gauge: Pirani Capacitance Manometer



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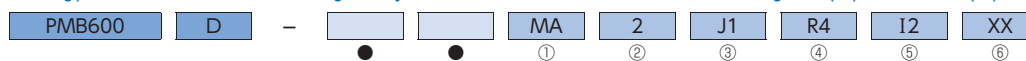
Specifications

Model *1		PMB100D	PMB300D	PMB600D	PMB1200D	PMB2400D	
Maximum pumping speed	50Hz	m ³ /h	95	280	500	1000	2500/2000
		L/min	1580	4670	8330	16667	41667/33330
		CFM	56	165	294	590	1472/1178
	60Hz	m ³ /h	115	330	600	1200	3100/2400
		L/min	1920	5500	10000	20000	51667/40000
		CFM	68	194	353	706	1825/1413
Maximum suction pressure	50Hz	Pa	9.3 × 10 ³	1.2 × 10 ³	1.3 × 10 ³	—	2.0 × 10 ³ /8.0 × 10 ²
		Torr	69	9	10	—	15/6
		mbar	93	12	13	—	20/8
	60Hz	Pa	6.2 × 10 ³	9.3 × 10 ²	1.1 × 10 ³	—	1.5 × 10 ³ /6.7 × 10 ²
		Torr	46	7	8.2	—	11/5
		mbar	62	9.3	11	—	15/6.7
Maximum allowable differential pressure	50Hz	Pa	8.0 × 10 ³	4.0 × 10 ³	7.3 × 10 ³	—	3.5 × 10 ³ /5.6 × 10 ³
		Torr	60	30	54.7	—	26.3/42.1
		mbar	80	40	73	—	35/56
	60Hz	Pa	5.6 × 10 ³	3.3 × 10 ³	6.0 × 10 ³	—	3.0 × 10 ³ /4.7 × 10 ³
		Torr	42	25	45	—	22.6/35.3
		mbar	56	33	60	—	30/47
Ultimate Pressure *2	Pa	4.0 × 10 ⁻¹	—	—	6.7 × 10 ⁻¹	—	
	Torr	3.0 × 10 ⁻³	—	—	5.0 × 10 ⁻³	—	
	mbar	4.0 × 10 ⁻³	—	—	6.7 × 10 ⁻³	—	
Allowable drive pressure	Pa	to 1.0 × 10 ⁵ (atmospheric pressure start type)					
	Torr	to 760 (atmospheric pressure start type)					
	mbar	to 10000 (atmospheric pressure start type)					
	—	—					
Motor *3	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 V	50Hz	200	—	—	—	—
		60Hz	200/220	—	—	—	—
Multiple voltage V	50Hz	220 to 240/380 to 415	—	—	—	200 to 240/380 to 415	
	60Hz	208 to 240/380 to 460	—	—	—	200 to 240/380 to 460	
Oil *4		ULVOIL R-4	—	—	—	—	
Oil capacity	L	0.35	0.7	1.5	1.9	4.0	
Cooling method *5		Air-cooled	Air-cooled / Water-cooled	—	—	—	
Cooling water	Primary side pressure	MPa	—	0.3	—	—	
		psi	—	43.5	—	—	
	Inlet/outlet differential pressure	MPa	—	0.05	—	—	
		psi	—	7.25	—	—	
	Volume	L/min	—	2	—	3	
Temperature *6	°C	—	5-30	—	—	—	
	°F	—	41-86	—	—	—	
Inlet port (JIS-B-2290)		VG50/KF50 or ISO63F (optional)	VG80/ISO80F or 100F (optional)	—	VG100/ISO100F (optional)	VG200/ISO200F/ISO200K (optional)	
Outlet port (JIS-B-2290)		VF50/KF50 or ISO63F (optional)	VF80/ISO80F or 100F (optional)	—	VF200/ISO200F (optional)	VF200/ISO200F (optional)	
Dimensions W × D × H	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 *8		VD401	VD601	VD901	VS2401	VS650/PKS-070	
Applicable standard *9		CE / cTUVus	—	—	—	—	
Option		Surface treatment, Adapter flange, Explosion proof motor, Atmospheric pressure start type (Inverter) *10, Lubrication oil *4, Lubrication chamber evacuation, Horizontal exhaust direction type (PMB2400D only)					
Atmospheric pressure start type Inverter *10 specification / voltage		I2, A2/200V to 240V (50Hz/60Hz) I4, A4/380V to 480V (50Hz/60Hz)					

- *1 No surface treatment (standard model). Optional surface treatment (Alumite) is available (PMB***DT model).
- *2 Measured by Pirani vacuum gauge. It will be about 4.0×10⁻²Pa when measured by MacLeod vacuum gauge.
- *3 Either 200V class or multiple voltage motor is selectable. Multiple voltage motor is not available with explosion proof motor.
- *4 ULVOIL (R-7) is standard oil for air-cooled operation. ULVOIL (R-7) or synthetic (R-7000) or fluorine oil (J25F) is selectable as option.
- *5 Air-cooled operation is possible in all pressure range in the case of inverter equipped type. Specify the type when air-cooled operation is required. Air-cooled operation is not possible in the case of the inverter for water-cooled operation. More than 1 hour operation in 300Pa to 4000Pa range could be cause of damage in the case of the PMB600D, 1200D and 2400D. Select water-cooled type in that case.
- *6 Make sure no condensation if cooling water temperature is low.
- *7 Weight of D and DT model is same.
- *8 Performance of these pumps could change depending on roughing pump. Above data is based on standard roughing pump. Ultimate pressure is 0.67Pa in case standard roughing pump is GR series.
- *9 Complied with cTUVus standard when water-cooled operation (except PMB100D) is selected and optional inverter (atmospheric pressure operation) is not directly equipped to the pump.
- *10 It may cause inverter damage by vibration when the pump is directly mounted on the roughing pump. Select the pump with inverter not equipped.

Model explanation

E.g. PMB600D Without surface coating / Totally enclosed external fan motor / 200V class / JIS flange / Oil (R4) / with Inverter (I2)



Pump head option

- Surface treatment
None : Without (std)
T : Surface treatment
- Evacuation direction
None : Vertical (std)
H : Horizontal (PMB2400D only)

External option

- ① Motor kind
MA : Totally enclosed external fan motor (std)
MD : Explosion-protection (indoor)
MF : Flame-proof (indoor)
- ② Motor voltage
2 : 200V class (std)
4 : Multiple
9 : Other (specified voltage)

- ③ Inlet / outlet flange
J1 : JIS (std)
A1 : Inlet ISO-F (adapter)
A2 : Inlet / outlet ISO-F (adapter)
A3 : Inlet ISO-K (adapter) (PMB2400D only)
- ④ Oil
R4 : Mineral oil (R-4: std)
R7 : Mineral oil (R-7)
S7 : Synthetic oil (R-7000)
F1 : Fluorinated oil (J25F)

- ⑤ Inverter (Atmosphere start type)
XX : None (std)
I2 : 200V class (Water cooled)
I4 : 400V class (Water cooled)
A2 : 200V class (Air cooled)
A4 : 400V class (Air cooled)
- ⑥ Lubrication chamber evacuation
XX : None (std)
B1 : With port

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