

Mechanical Booster Pump [PRC-A/PMB-C(M) Series]

Mechanical booster pumps (a.k.a. "Roots Blowers") can be used on the inlet of primary roughing pumps, such as oil-sealed rotary vane pumps, dry pumps, scroll pumps or water ring backing pumps to improve the pumping speed in the 75 Torr to 0.75m Torr pressure range, where pumping speeds of roughing pumps often falls off dramatically.

The PRC-A Roots type pump series is designed for general purpose, semiconductor and liquid crystal display processes which require extreme cleanliness of the pump, both inside and out.

The PMB-040C & 060C models are well suited for the large volume evacuation required by vacuum heating and vacuum melting furnaces, and other large volume pumpdown work such as space simulation chambers.



PRC-006A

PMB-003C

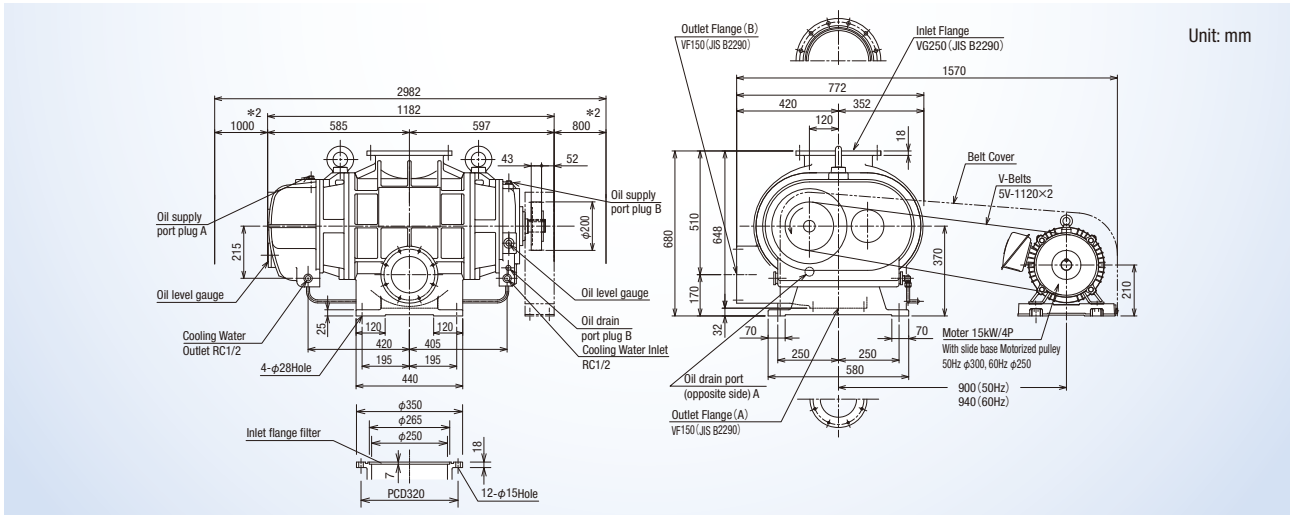
Features

- ▶ **Oil-free by Design**
These pumps use no oil in the pumping chamber resulting in stable performance even when evacuating water vapor or solvent vapors.
- ▶ **Special Surface Coating**
The pumping lobes and chamber walls are coated with a special surface coating made of strong, lightweight aluminum alloy which provides excellent corrosion resistance and surface protection inside the pump.
Abrasion and corrosion (wear and tear) inside the pump is greatly reduced.
- ▶ **Shorter Evacuation Time**
The PRC-A (atmospheric pressure operation type) and PRC-CM series are switched on at the same time as the roughing pump starts. Starting these pumps simultaneously at atmospheric pressure shortens evacuation time considerably.
- ▶ **Vertical or Horizontal Exhaust can be Configured (PMB-024C(M), 040C, 060C)**
The exhaust port location on the pump can be changed from the vertical to the horizontal direction if required.
This feature enhances design flexibility and makes very compact system layouts possible.

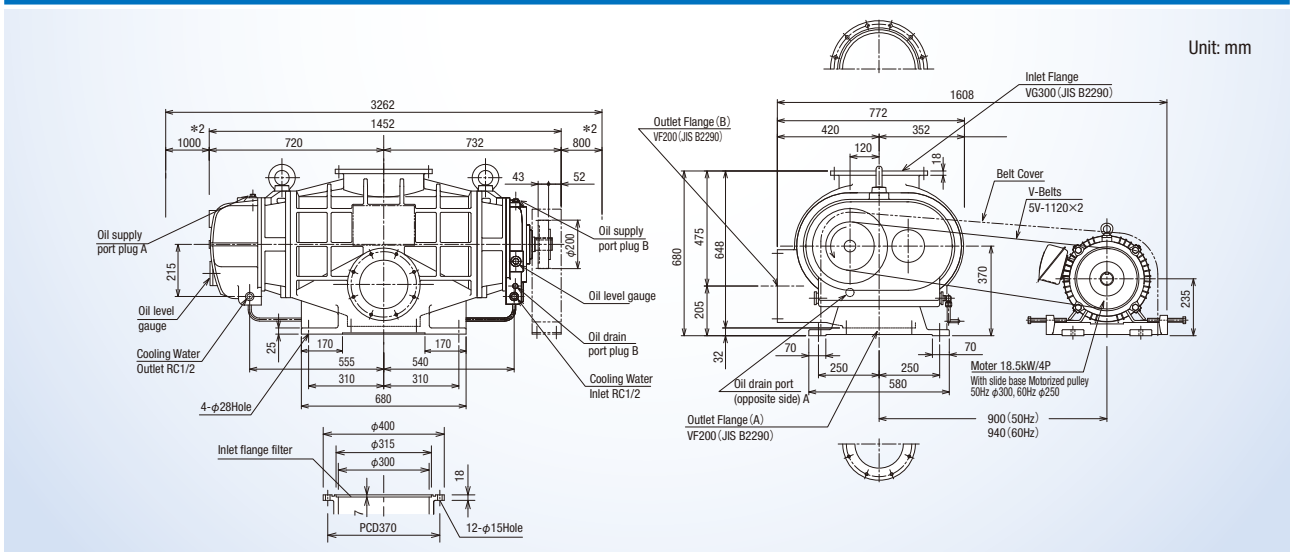
Applications

- ▶ Evaporation, sputtering, ion plating
- ▶ Vacuum drying, freeze drying and outgassing
- ▶ Scientific instrumentation, leak test systems
- ▶ Gas exchange, gas filling and vacuum insulation
- ▶ Vacuum heating furnace, vacuum melting furnace
- ▶ Large process systems and space simulation chambers

PMB-040C



PMB-060C



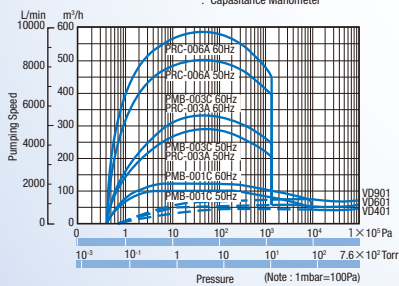
*2 Minimun space necessary for maintenance.

▶ Pumping Speed Curve

- ▶ PMB-001C
- ▶ PMB-003C
- ▶ PRC-003A
- ▶ PRC-006A

Pumping Speed (JIS B8316/1985)

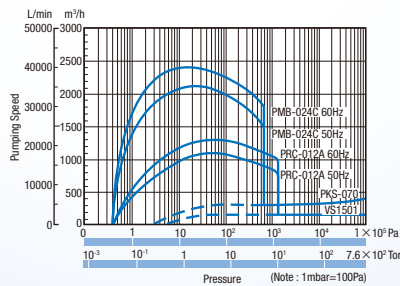
Type : PMB-001C, 003C, PRC-003A, 006A
 Forepump : PMB-001C: VD401
 PMB-003C, PRC-003A: VD601
 PRC-006A: VD901
 Power : AC220V 50/60Hz 3φ
 Oil : ULVOIL R-4
 Gauge : Pirani
 : Capacitance Manometer



- ▶ PRC-012A
- ▶ PMB-024C

Pumping Speed (JIS B8316/1985)

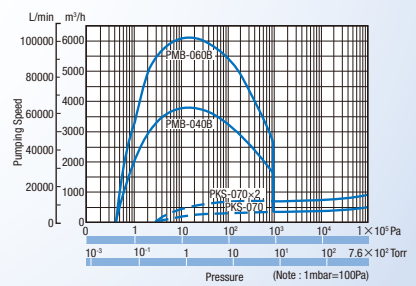
Type : PRC-012A, PMB-024C
 Forepump : PRC-012A: VS1501
 PMB-024C: PKS-070
 Power : AC200V 50/60Hz 3φ
 Oil : ULVOIL R-4
 Gauge : Pirani
 : Capacitance Manometer



- ▶ PMB-040C
- ▶ PMB-060C

Pumping Speed (JIS B8316/1985)

Type : PMB-040C, 060C
 Forepump : PMB-040C: PKS-070
 PMB-060C: PKS-070x2
 Power : AC200V 50/60Hz 3φ
 Oil : ULVOIL R-7
 Gauge : Pirani
 : Capacitance Manometer



Mechanical Booster Pump [PRC-A/PMB-C(M) Series]

Specifications

Model		PMB-001C,CM	PMB-003C,CM	PRC-003A	PRC-006A	PRC-012A	PMB-024C,CM	PMB-040C	PMB-060C
Actual pumping speed *1	50Hz	m ³ /h	95	280	500	1000	2000	3800	6200
		L/min	1580	4670	8330	16700	33300	63300	103300
		CFM	56	165	294	590	1176	2235	3648
	60Hz	m ³ /h	115	330	600	1200	2400	3800	6200
		L/min	1920	5500	10000	20000	40000	63300	103300
		CFM	68	194	353	706	1413	2235	3648
Maximum suction pressure *2	50Hz	Pa	9.3×10 ³	1.2×10 ³	1.3×10 ³		8.0×10 ²		
		Torr	69	9	10		6		
		mbar	93	12	13		8		
	60Hz	Pa	6.2×10 ³	9.3×10 ²	1.1×10 ³		6.7×10 ²	8.0×10 ²	
		Torr	46	7	8.2		5	6	
		mbar	62	9.3	11		6.7	8	
Maximum allowable differential pressure *2	50Hz	Pa	8.0×10 ³	4.0×10 ³	7.3×10 ³		5.6×10 ³		—
		Torr	60	30	55		42		
		mbar	80	40	73		56		
	60Hz	Pa	5.6×10 ³	3.3×10 ³	6.0×10 ³		4.7×10 ³		
		Torr	42	25	45		35		
		mbar	56	33	60		47		
Ultimate pressure *3	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 *4 (with PRC-A atmospheric pressure operation type and PMB-CM)	Pa	—			to 1.0×10 ⁵		—		
	Torr	—			to 760		—		
	mbar	—			to 1000		—		
Motor *5	kw(number of poles)	0.4 (2)	0.75 (2)	2.2 (2)	3.7 (2)	7.5 (2)	15 (4)	18.5 (4)	
	HP(number of poles)	0.54 (2)	1.0 (2)	2.95 (2)	4.96 (2)	10.0 (2)	20.1 (4)	24.8 (4)	
Oil *6		ULVOIL R-4						ULVOIL R-7	
Oil capacity *7	L	0.35	0.7	1.5	1.9	4.0 (2.2)	8.0		
Cooling water	Cooling method		Air cooled	Both air and water cooled	Water cooled				
	Primary side pressure	MPa	—		0.3			0.1 to 0.3	
		psi	—		43.5			14.5 to 43.5	
	Inlet/outlet differential pressure	MPa	—		0.05	0.01		0.05	
		psi	—		7.25	1.45		7.25	
	Cooling water volume	L/min	—			2	3		10
Cooling water temperature	°C	—			5 to 30				
	°F	—			41 to 86				
Inlet port diameter JIS B2290		Corresponds to VG50		Corresponds to VG80		Corresponds to VG100	Corresponds to VG200	Corresponds to VG250	Corresponds to VG300
Outlet port diameter JIS B2290		Corresponds to VF50		Corresponds to VF80			Corresponds to VF200	Corresponds to VF150	Corresponds to VF200
External dimensions W×D×H	mm	271×580×180	290×656×260	296×565×260	356×619×320	406×759×340	540×1237×470	772×1182×680	772×1452×680
Weight *8	kg	22 (23)	46 (48)	51 (54)	86 (90)	118 (123)	260 (272)	970 without motor	1110 without motor
Standard backing pump		VD401	VD601	VD901	VS1501	PKS-070		PKS-070x2units	
Options		—		1.5kw (2P) motor	Atmospheric pressure operation type		11kw (2P) motor	—	
		—		Separate exhaust port for bearing lubrication chamber			—		

*1 Measurement value at 13Pa.

*2 When the optional large capacity motor is mounted, a greater inlet pressure and larger pressure differential is possible. (Only PMB-003C, PMB-024C)

*3 Measured with a Pirani gauge. (With standard backing pump and oil.)

*4 With the PMB-024CM, the repeated pumpdown time from atmospheric pressure to 5 Torr should not exceed 5 minutes. Also, allow a 5 minutes interval between successive pumpdowns.

*5 AC200V 50Hz/60Hz, 220V/60Hz, 3phase. Other voltage is available upon request.

*6 Other oil types are available, upon request.

*7 Oil capacities in () are for models with the horizontal exhaust direction type.

*8 Weights in () are for PMB-CM and PRC-A atmospheric pressure operation models.

▶ Pressure/explosion proof and increased safety explosion motors are not available for the PRC-A series.

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