Mechanical Booster Pump PRC-A Series, PMB-B, C (M) Series

Booster pumps can be used with roughing pumps, such as oil rotary pumps, dry vacuum pumps, and water sealed pumps, in order to improve the pumping speed in the 10 k-0.1 Pa range, where pumping speeds of roughing pumps often deteriorate. PMB-B series pumps are well-suited to the large volume evacuation requirements of vacuum heating furnace, vacuum melting furnace and other equipment. PRC-A & PMB-C series are roots-type vacuum pumps designed primarily for use in processes where a high level of cleanliness is required.

In addition to general use, these pumps are well-suited to semiconductor manufacturing processes, CO_2 laser processes, and other processes.

Features

- **Oil-free**
  Since no lubricating oil is used in the casing, stable performance is realized even when evacuating water vapor or solvent vapors.
- **Operation at high inlet pressure**
  Since a motor larger than the standard motor can be installed, the pumps are sufficiently applicable to systems having high gas loads, such as CO_2 laser processes.
- **Vertical or horizontal exhaust (PMB-024C (M), 040B, 060B)**
  The vertical or horizontal direction can be selected for the exhaust port on the pump. This feature provides greater system design flexibility and makes very compact designs possible.
- **Shorter evacuation time PMB-CM, PRC-A**
  Since these PRC-A (atmospheric pressure operation type) & PMB-CM series can be started at the same time as the roughing pumps, shorter evacuation times are possible when compared to the standard type mechanical booster pump.

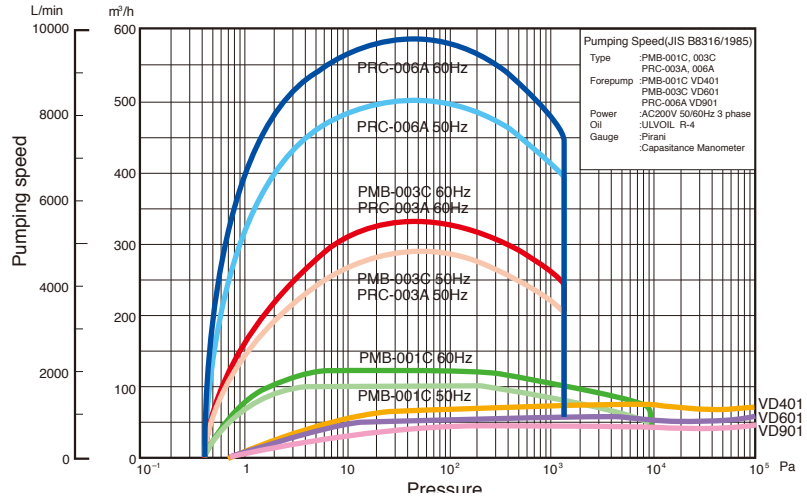
Specifications

Item		Model	PMB-001C, CM	PMB-003C, CM	PRC-003A	PRC-006A	PRC-012C	PMB-024C, CM	PMB-040B	PMB-060B
Actual pumping speed*1 m^3/h (L/min)		50 Hz	95 (1580)	280 (4670)	280 (4670)	500 (8330)	1000 (16700)	2000 (33300)	3800 (63300)	6200 (103300)
		60 Hz	115 (1920)	330 (5500)	330 (5500)	600 (10000)	1200 (20000)	2400 (40000)		
Maximum suction pressure*2 Pa		50 Hz	9.3×10^3	1.2×10^3		1.3×10^3		8.0×10^2	1.3×10^3 (within 5 min. at startup)	
		60 Hz	6.2×10^3	9.3×10^3		1.1×10^3		6.7×10^2	8.0×10^2 (during continuous operation)	
Maximum allowable differential pressure *2 Pa		50 Hz	8.0×10^3	4.0×10^3		7.3×10^3		5.6×10^3	–	–
		60 Hz	5.6×10^3	3.3×10^3		6.0×10^3		4.7×10^3		
Ultimate pressure*3		Pa	4.0×10^{-1}				6.7×10^{-1}			
Allowable drive pressure*4		Pa	~1.0×10^5 (PRC-A [atmospheric pressure operation models], PMB-CM)							
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)
Oil*6			ULVOIL R-4							
Oil capacity*7		L	0.35	0.7		1.5	1.9	4.5 (2.8)	6.5	6.5
Cooling water	Cooling method		Air cooling	Both air and water cooling	Water cooling					
	Primary side pressure	MPa	–	0.3					0.1-0.2	
	Inlet/outlet differential pressure	MPa	–	0.05	0.01			0.05		
	Cooling water volume	L/min	–	2		3	24			
	Cooling water temperature	°C	–	5-30						
Suction port diameter JIS B2290			Corresponds to VG50	Corresponds to VG80			Corresponds to VG100	Corresponds to VG200	Corresponds to VG250	Corresponds to VG300
Exhaust port diameter JIS B2290			Corresponds to VF50	Corresponds to VF80				Corresponds to VF200	Corresponds to VF150	Corresponds to VF200
External dimensions		L x W x H mm	271 x 580 x 180	290 x 656 x 260	296 x 565 x 260	356 x 619 x 320	406 x 756 x 340	540 x 1237 x 470	764 x 1230 x 707	764 x 1470 x 707
Weight*8		kg	23 (24)	46 (48)	51 (54)	86 (90)	118 (123)	260 (272)	950, without motor	1150, without motor
Standard backing pump			VD401	VD601		VD901	VS1501	PKS-070		PKS-070 x 2
Options			–	1.5 kW (2) motor	atomospheric pressure operation models		1.1 kW (2) motor	11 kW (2) motor	Bypass valve, piping	
			Separate exhaust port for lubrication chamber						–	

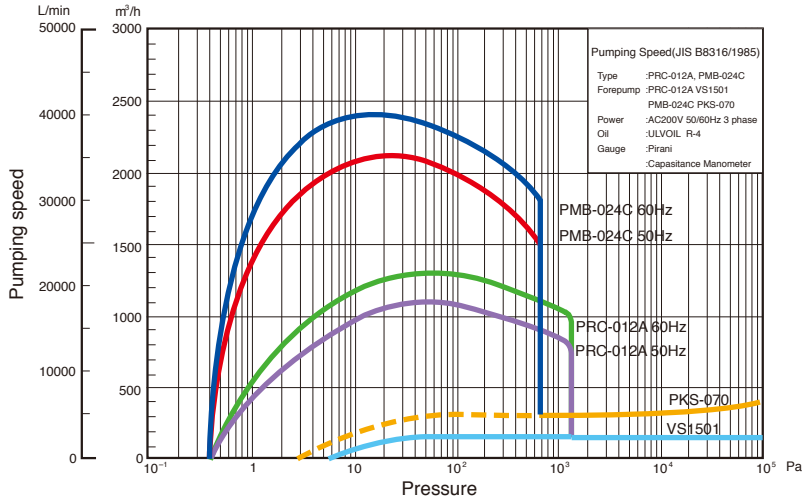
Note) SI units are used in this catalog. The following conversion can be used for non-SI units.
Ultimate pressure: 4.0 x 10^{-1} Pa = 3.0 x 10^{-3} Torr
Pressure: 0.05/0.1/0.2/0.3 MPa = 0.5/0.1/2/3kgf/cm^2
**1 Measurement value at 13 Pa*
**2 When the optional large capacity motor is attached, a greater inlet pressure and larger pressure differential is possible. (Only PMB-003C, PMB-024C)*
**3 Measured with a Pirani gauge (standard backing pump and oil were used.) The value would be 4.0 x 10^{-2} Pa when measured with a McLeod vacuum gauge.*
**4 With the PMB-024CM, do not allow the repeated pumping operation time from atmospheric pressure to vacuum (≥655Pa) to exceed 5 minutes. Also, allow an interval of at least 5 minutes before starting the next pumping operation.*
**5 AC200V 50/60 Hz, AC220V 60 Hz, 3 phase*
**6 Other oil types are available, upon request*
**7 Oil capacities in ( ) are for models with the horizontal exhaust direction specification.*
**8 Weights in ( ) are for CM and PRC-A atmospheric pressure operation models.*

Pumping Speed Curve

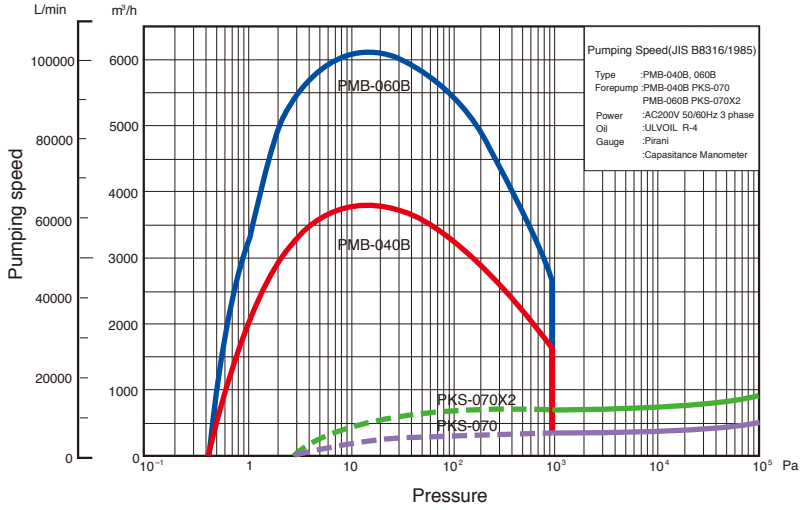
PMB-001C
PMB-003C
PRC-003A
PRC-006A



PRC-012A
PMB-024C

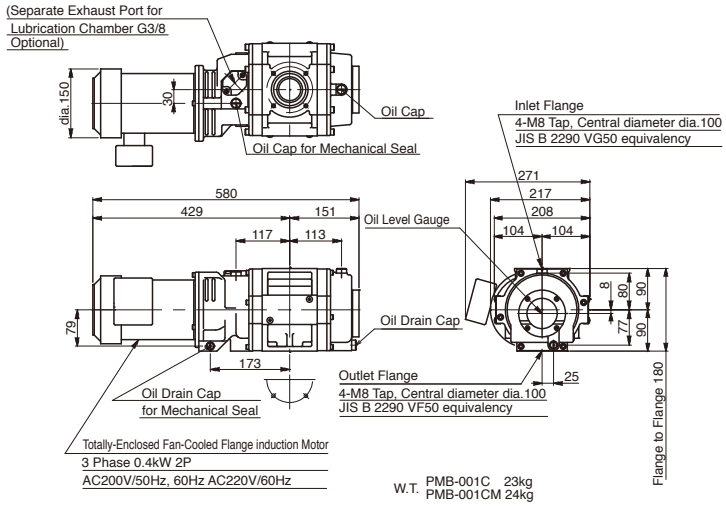


PMB-040B
PMB-060B

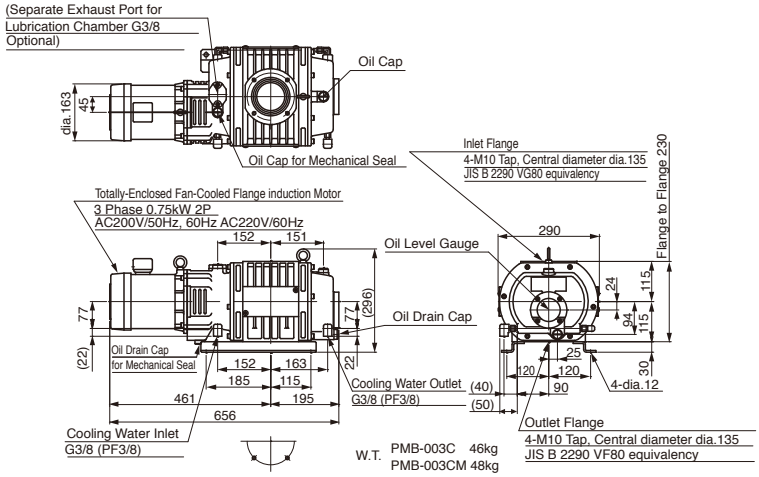


Mechanical Booster Pump PRC-A Series, PMB-B, C (M) Series

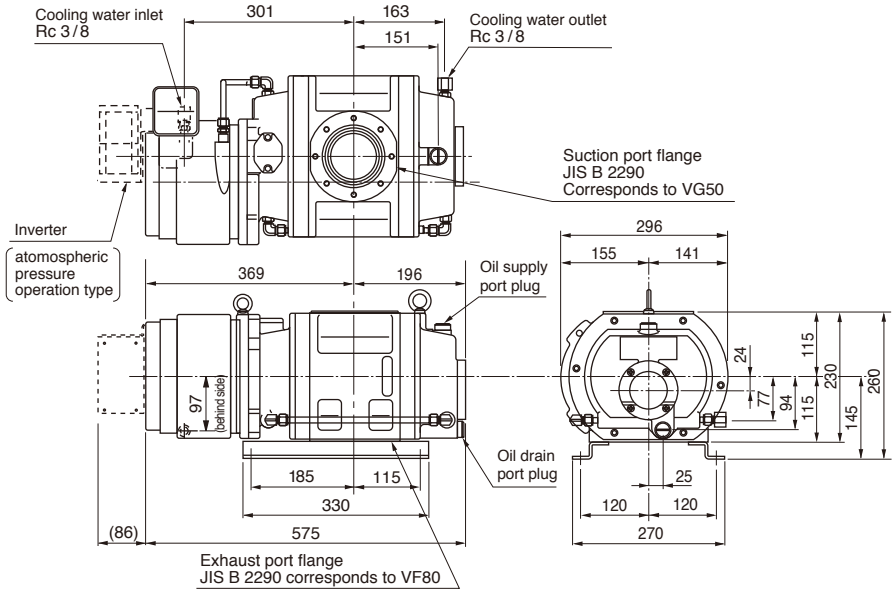
PMB-001C (M)



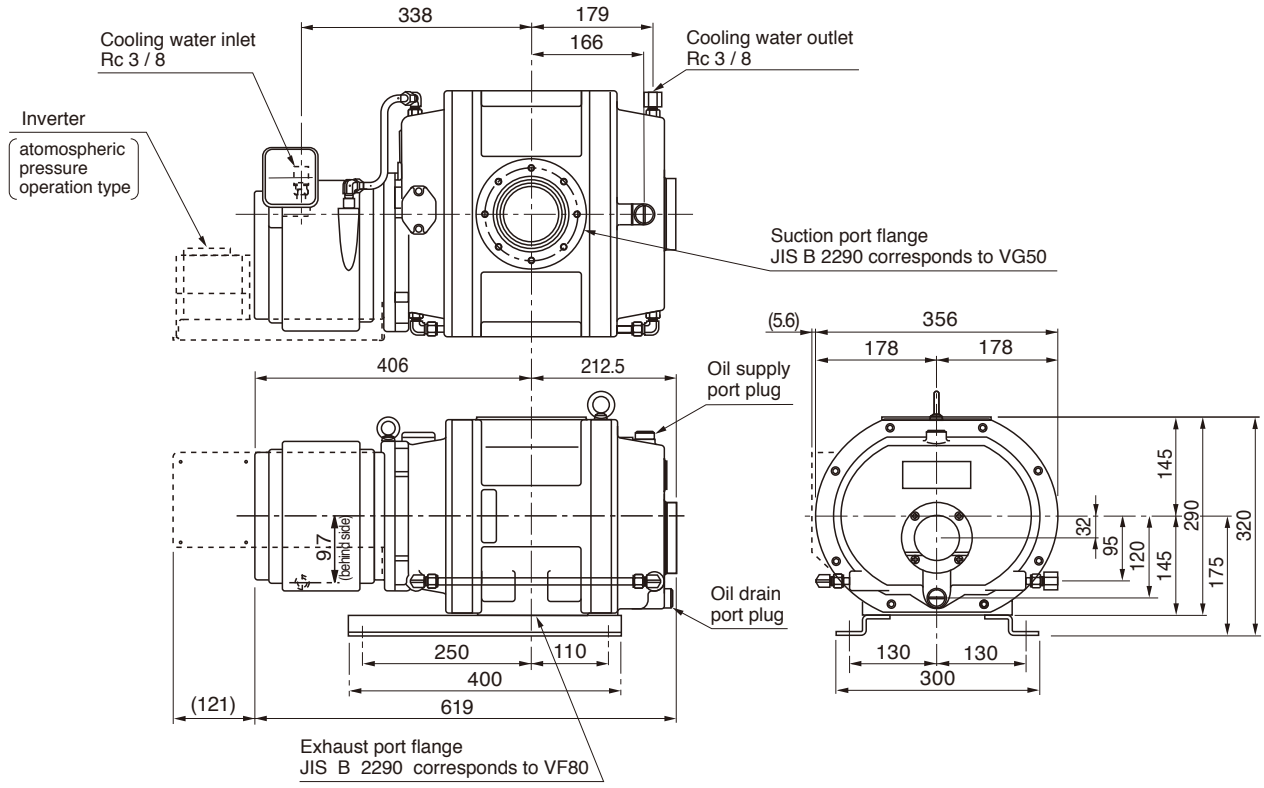
PMB-003C (M)



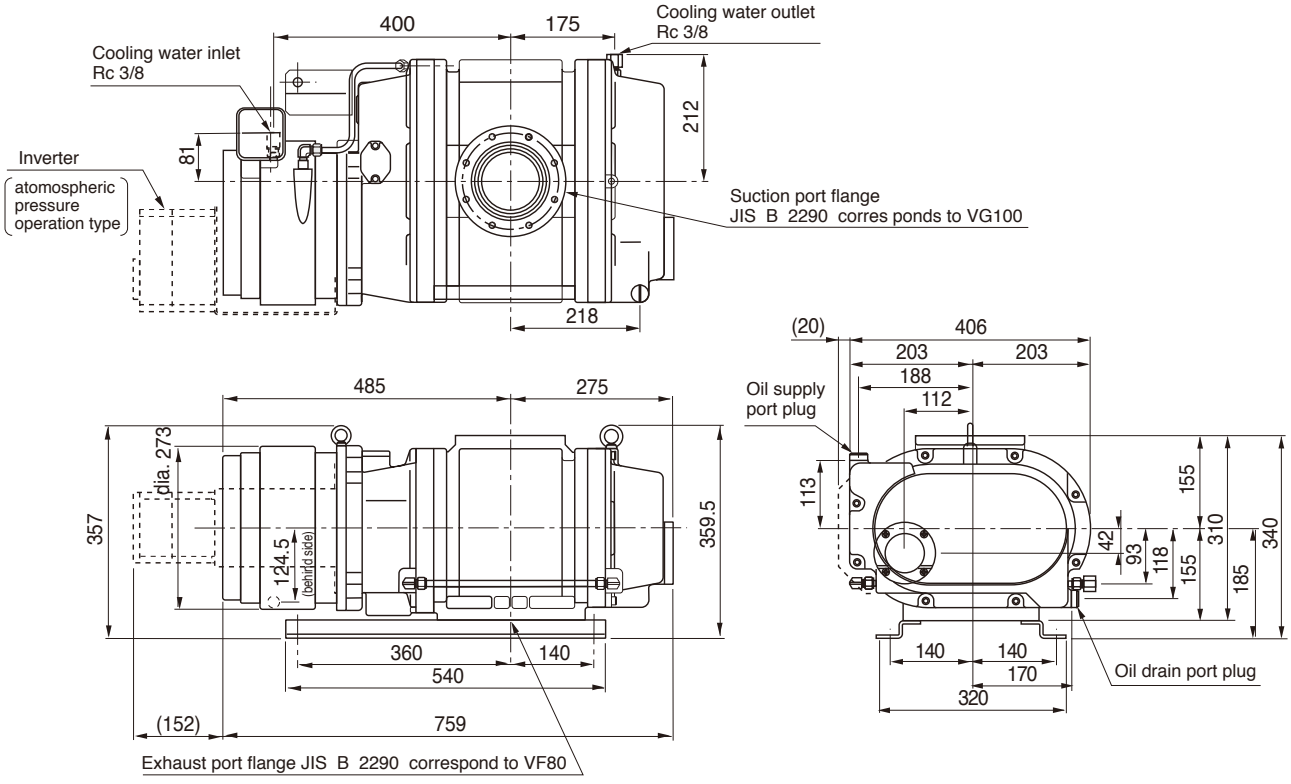
PRC-003A
(atmospheric pressure operation type)



PRC-006A (atmospheric pressure operation type)

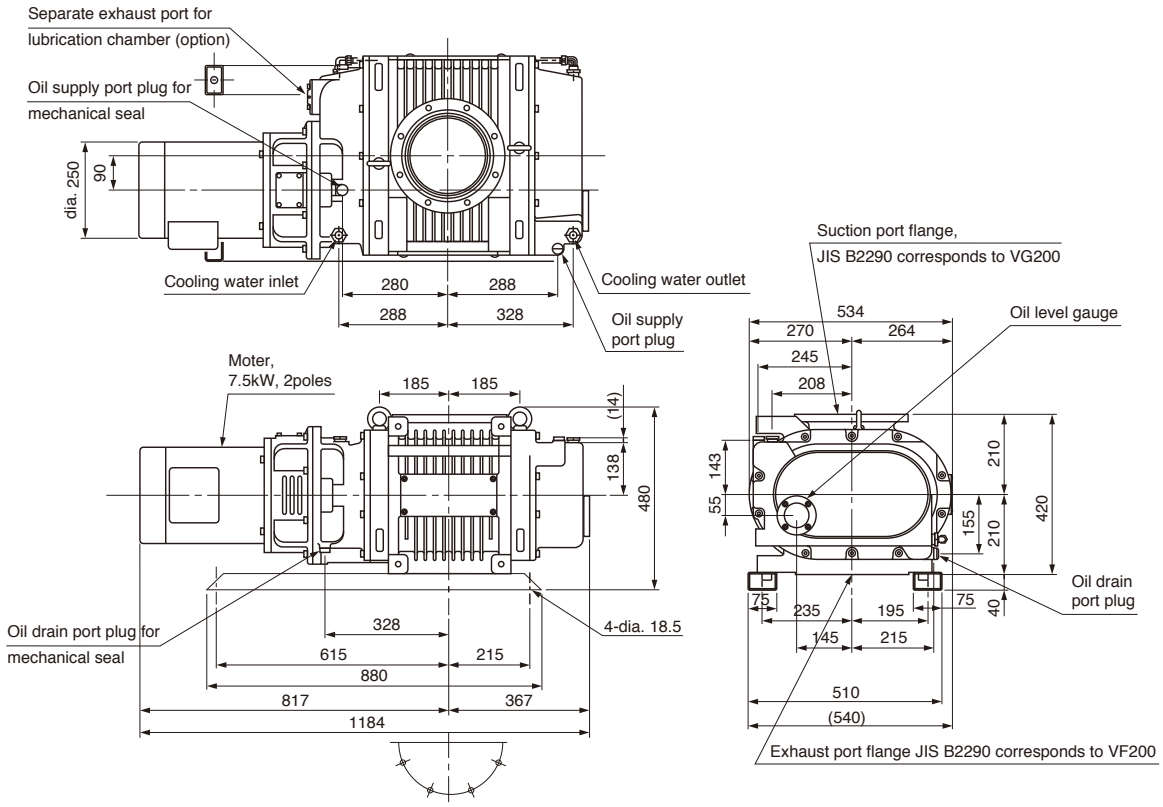


PRC-012A (atmospheric pressure operation type)

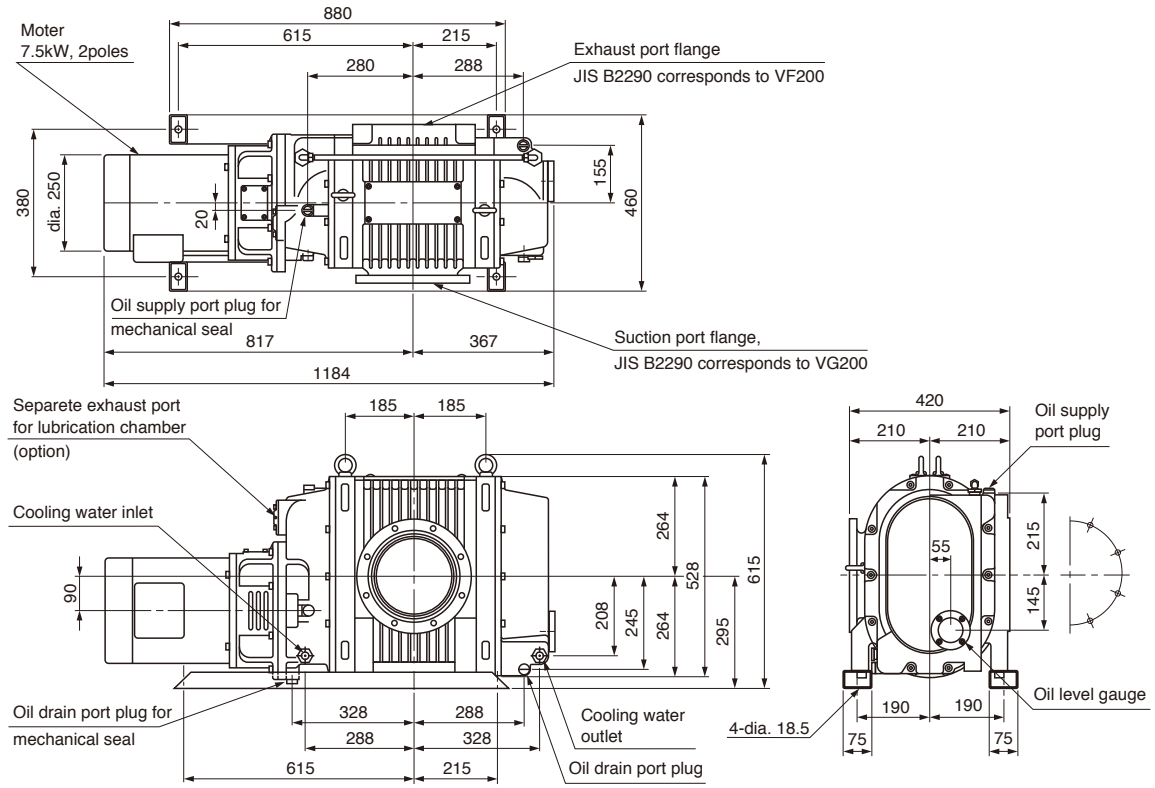


Mechanical Booster Pump PRC-A Series, PMB-B, C (M) Series

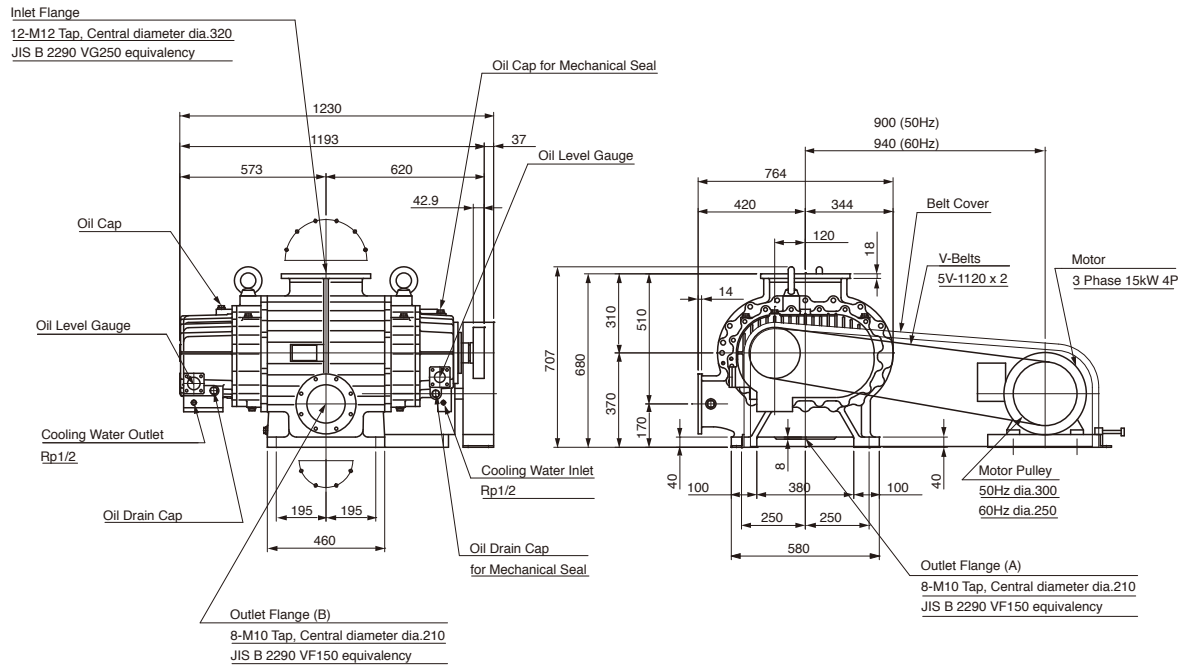
PMB-024 (M) Vertical Exhaust Model



PMB-024 (M) Horizontal Exhaust Model

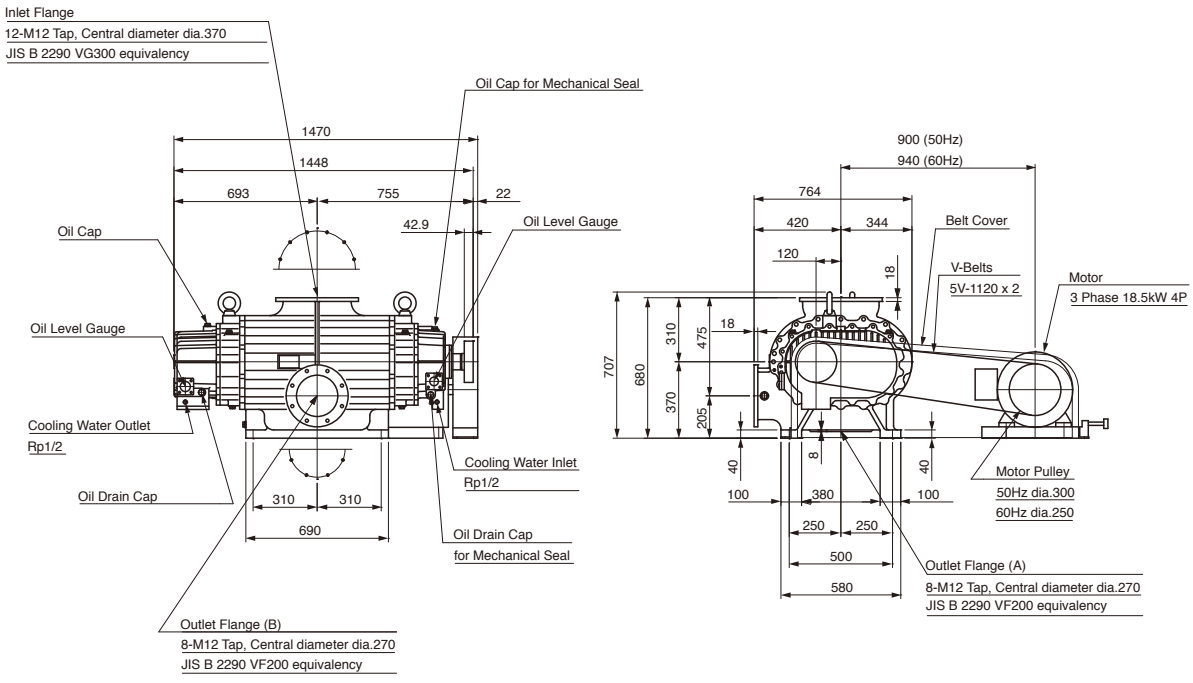


PMB-040B



Note) Maintenance space; 290

PMB-060B



Note) Maintenance space; 3700