

# Mechanical Booster Pumping Unit [YM-VD/YM-VS Series]

ULVAC mechanical booster pumping unit contains an oil-sealed rotary vacuum pump and a mechanical booster pump in a compact frame. All the connection piping are included. The unit has an ergonomic, user friendly design allowing for easy maintenance. The ULVAC YM-VD/YM-VS Series is perfect for any application from R&D to production.



## Features

- ▶ **Compact Design**  
ULVAC mechanical booster pumping unit contains an oil-sealed rotary vacuum pump and a mechanical booster pump all in a compact frame including necessary vacuum piping.
- ▶ **Easy Maintenance**  
With a simple and efficient frame design from ULVAC, just the oil-sealed rotary vacuum pump is removed from the pump set during normal maintenance.
- ▶ **Optional Components**  
Various options are available from ULVAC including oil mist traps, mountable operational panel, vacuum switches, vacuum circuit breakers. ULVAC mechanical booster pumping unit can be customized to suit your needs.

## Applications

- ▶ Evaporation, Sputtering, Ion Plating
- ▶ Vacuum Packing, Vacuum Absorption, Vacuum Molding
- ▶ Vacuum Heat Furnace, Sintering Furnace, Blazing Furnace
- ▶ Vacuum Drying, Freeze-drying, Vacuum Air Removal
- ▶ Gas replacement, packing, vacuum heat insulation, leak tester, etc.

# Mechanical Booster Pumping Unit [YM-VD/YM-VS Series]

## Specifications

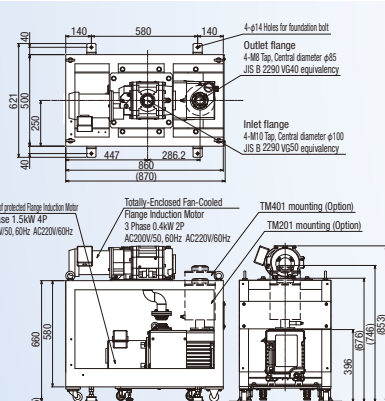
| Items                         | Model                              | YM-VD-103C           | YM-VD-103CM                                                                                                                                                                                                                                                                                                                                                                          | YM-VD-304C          | YM-VD-304CM                     | YM-VD-304A          | YM-VD-304AT                           | →                   |
|-------------------------------|------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------|---------------------|---------------------------------------|---------------------|
| Pump combination              | Mechanical booster pump            | PMB-001C             | PMB-001CM                                                                                                                                                                                                                                                                                                                                                                            | PMB-003C            | PMB-003CM                       | PRC-003A            | PRC-003A                              | →                   |
|                               | Oil rotary vacuum pump             |                      | VD301                                                                                                                                                                                                                                                                                                                                                                                |                     |                                 | VD401               | Atomospheric pressure operation model | →                   |
| Maximum pumping speed         | 50Hz                               | m <sup>3</sup> /hr   | 95                                                                                                                                                                                                                                                                                                                                                                                   |                     |                                 | 250                 |                                       | →                   |
|                               |                                    | L/min                | 1580                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                 | 4100                |                                       | →                   |
|                               |                                    | CFM                  | 55.91                                                                                                                                                                                                                                                                                                                                                                                |                     |                                 | 147.14              |                                       | →                   |
|                               | 60Hz                               | m <sup>3</sup> /hr   | 115                                                                                                                                                                                                                                                                                                                                                                                  |                     |                                 | 290                 |                                       | →                   |
|                               |                                    | L/min                | 1900                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                 | 4800                |                                       | →                   |
|                               |                                    | CFM                  | 67.69                                                                                                                                                                                                                                                                                                                                                                                |                     |                                 | 170.69              |                                       | →                   |
| Maximum suction pressure      | 50Hz                               | Pa                   | 8.5×10 <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                  | 1.0×10 <sup>5</sup> | 7.0×10 <sup>2</sup>             | 1.0×10 <sup>5</sup> | 7.0×10 <sup>2</sup>                   | 1.0×10 <sup>5</sup> |
|                               |                                    | Torr                 | 6.4×10 <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                  | 760                 | 5.3                             | 760                 | 5.3                                   | 760                 |
|                               |                                    | mbar                 | 85                                                                                                                                                                                                                                                                                                                                                                                   | 1000                | 7                               | 1000                | 7                                     | 1000                |
|                               | 60Hz                               | Pa                   | 4.5×10 <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                  | 1.0×10 <sup>5</sup> | 7.0×10 <sup>2</sup>             | 1.0×10 <sup>5</sup> | 7.0×10 <sup>2</sup>                   | 1.0×10 <sup>5</sup> |
|                               |                                    | Torr                 | 33.8                                                                                                                                                                                                                                                                                                                                                                                 | 760                 | 5.3                             | 760                 | 5.3                                   | 760                 |
|                               |                                    | mbar                 | 45                                                                                                                                                                                                                                                                                                                                                                                   | 1000                | 7                               | 1000                | 7                                     | 1000                |
| Ultimate pressure *1          | Pa                                 |                      |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 4.0×10 <sup>-1</sup>            |                     |                                       | →                   |
|                               |                                    | Torr                 |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 3.0×10 <sup>-3</sup>            |                     |                                       | →                   |
|                               |                                    | mbar                 |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 4.0×10 <sup>-3</sup>            |                     |                                       | →                   |
| Motor power (number of poles) | Mechanical booster pump            | kw (number of poles) | 0.4 (2)                                                                                                                                                                                                                                                                                                                                                                              |                     |                                 | 0.75 (2)            |                                       | →                   |
|                               |                                    | hp (number of poles) | 0.54 (2)                                                                                                                                                                                                                                                                                                                                                                             |                     |                                 | 1.0 (2)             |                                       | →                   |
|                               | Oil rotary vacuum pump             | kw (number of poles) |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 1.5 (4)                         |                     |                                       | →                   |
|                               |                                    | hp (number of poles) |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 2.0 (4)                         |                     |                                       | →                   |
| Motor                         | Mechanical booster pump            |                      | Totally enclosed fan cooled motor                                                                                                                                                                                                                                                                                                                                                    |                     |                                 | Canned motor        |                                       | →                   |
|                               | Oil rotary vacuum pump             |                      | Drip-proof protected flange motor                                                                                                                                                                                                                                                                                                                                                    |                     |                                 |                     |                                       | →                   |
| Oil                           | Mechanical booster pump            | Capacity(L)          | 0.35                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                 | 0.7                 |                                       | →                   |
|                               |                                    | Standard oil         |                                                                                                                                                                                                                                                                                                                                                                                      |                     | ULVOIL R-4                      |                     |                                       | →                   |
|                               | Oil rotary vacuum pump             | Capacity(L)          |                                                                                                                                                                                                                                                                                                                                                                                      |                     | 1.0 to 2.5                      |                     |                                       | →                   |
|                               |                                    | Standard oil         |                                                                                                                                                                                                                                                                                                                                                                                      |                     | ULVOIL R-7                      |                     |                                       | →                   |
| Cooling method                | Mechanical booster pump            |                      | Air cooled                                                                                                                                                                                                                                                                                                                                                                           |                     | Air cooled/Water cooled         |                     | Water cooled                          | →                   |
|                               | Oil rotary vacuum pump             |                      |                                                                                                                                                                                                                                                                                                                                                                                      |                     | Air cooled                      |                     |                                       | →                   |
|                               | Primary side pressure              |                      | —                                                                                                                                                                                                                                                                                                                                                                                    |                     | 0.1 to 0.3MPa (14.5 to 43.5psi) |                     |                                       | →                   |
|                               | Inlet/outlet differential pressure |                      | —                                                                                                                                                                                                                                                                                                                                                                                    |                     | 0.05MPa≤ (7.25psi≤)             |                     | 0.01MPa≤ (1.45psi≤)                   | →                   |
|                               | Cooling water temperature          |                      | —                                                                                                                                                                                                                                                                                                                                                                                    |                     | 5 to 30°C (41 to 86°F)          |                     |                                       | →                   |
|                               | Cooling water volume               | L/min                | —                                                                                                                                                                                                                                                                                                                                                                                    |                     | 2.0≤                            |                     |                                       | →                   |
| Inlet size                    | JIS B 2290                         |                      | Corresponds to VG50                                                                                                                                                                                                                                                                                                                                                                  |                     |                                 | Corresponds to VG80 |                                       | →                   |
| Outlet size                   | JIS B 2290                         |                      |                                                                                                                                                                                                                                                                                                                                                                                      |                     |                                 | Corresponds to VG40 |                                       | →                   |
| Weight                        | kg                                 |                      | 145                                                                                                                                                                                                                                                                                                                                                                                  | 150                 | 175                             | 180                 | 185                                   | →                   |
| Standard Accessories          |                                    |                      | —                                                                                                                                                                                                                                                                                                                                                                                    |                     |                                 |                     |                                       | →                   |
| Options                       |                                    |                      | ① Oil return mechanism A or B ② Timing leak valve ③ Cooling-water sensor ④ Oil drain valve ⑤ Control box ⑥ Terminal block box ⑦ Voltage except 200V/50Hz-60Hz, 220V/0Hz ⑧ Fluorine oil ⑨ Oil mist trap (Low or high loads) ⑩ Vacuum pipe with gauge port and leak port ⑪ Motor (Totally enclosed fan cooled motor, Pressure/explosion proof and increased safety explosion motor) *3 |                     |                                 |                     |                                       | →                   |

\*1: Measured by pirani vacuum gauge \*2: Water cooling is required in continuous operation at a pressure higher than 530Pa (4Torr).

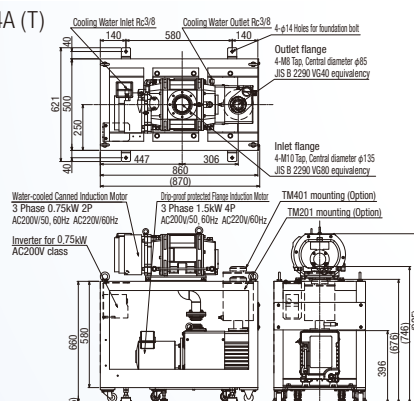
\*3: Explosion proof option is only applicable with motor. Other electric system (optional timing leak valve, cooling-water sensor, control box, terminal block box) does not meet explosion proof specification.

## Dimensions

YM-VD-103C (M)

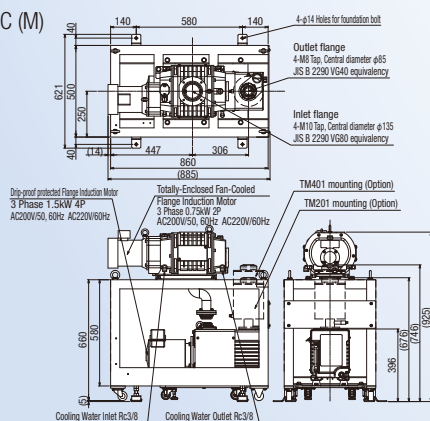


YM-VD-304A (T)

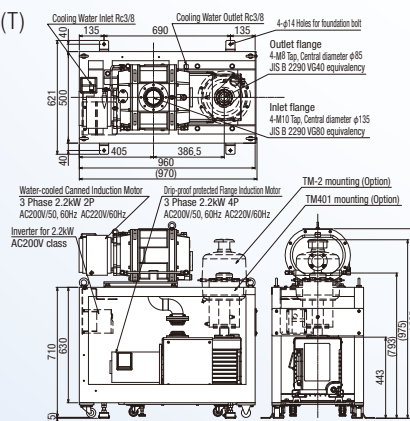


Unit: mm

YM-VD-304C (M)



YM-VD-606A (T)

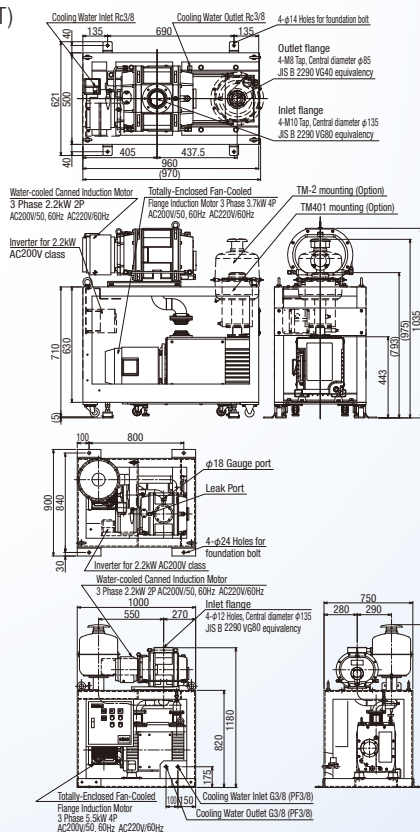


## Specifications

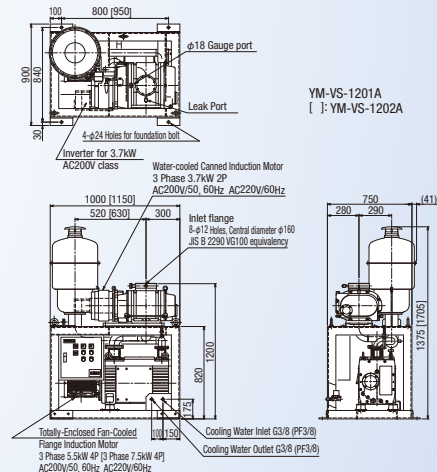
|   | YM-VD-606A                                                                                                                                                                                                                                                                                                       | YM-VD-606AT                                                     | YM-VD-609A                      | YM-VD-609AT                                                     | YM-VS-600A                           | YM-VS-1201A          | YM-VS-1202A         |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------|--------------------------------------|----------------------|---------------------|
| → | PRC-006A                                                                                                                                                                                                                                                                                                         | PRC-006A<br><small>Atmospheric pressure operation model</small> | PRC-006A                        | PRC-006A<br><small>Atmospheric pressure operation model</small> | PRC-006A                             | PRC-012A             | PRC-012A            |
| → | VD601                                                                                                                                                                                                                                                                                                            |                                                                 | VD901                           |                                                                 | VS1501                               |                      | VS2401              |
| → | 450                                                                                                                                                                                                                                                                                                              | 490                                                             | 500                             | 550                                                             | 550                                  | 850                  | 1000                |
| → | 7500                                                                                                                                                                                                                                                                                                             | 8170                                                            | 8330                            | 9170                                                            | 9200                                 | 14200                | 16700               |
| → | 264.86                                                                                                                                                                                                                                                                                                           | 288.40                                                          | 294.29                          | 323.72                                                          | 323.72                               | 500.29               | 588.58              |
| → |                                                                                                                                                                                                                                                                                                                  | 520                                                             |                                 | 600                                                             | 660                                  | 1000                 | 1200                |
| → |                                                                                                                                                                                                                                                                                                                  | 8670                                                            |                                 | 10000                                                           | 11000                                | 16700                | 20000               |
| → |                                                                                                                                                                                                                                                                                                                  | 306.06                                                          |                                 | 353.15                                                          | 388.46                               | 588.58               | 706.29              |
| → | 1.0×10 <sup>3</sup>                                                                                                                                                                                                                                                                                              | 1.0×10 <sup>5</sup>                                             | 1.3×10 <sup>3</sup>             | 1.0×10 <sup>5</sup>                                             | 1.2×10 <sup>3</sup>                  |                      | 1.3×10 <sup>3</sup> |
| → | 7.5                                                                                                                                                                                                                                                                                                              | 760                                                             | 10                              | 760                                                             | 9.0                                  |                      | 10                  |
| → | 10.0                                                                                                                                                                                                                                                                                                             | 1000                                                            | 13                              | 1000                                                            | 12.0                                 |                      | 13                  |
| → | 1.0×10 <sup>3</sup>                                                                                                                                                                                                                                                                                              | 1.0×10 <sup>5</sup>                                             | 1.1×10 <sup>3</sup>             | 1.0×10 <sup>5</sup>                                             | 9.3×10 <sup>2</sup>                  |                      | 1.1×10 <sup>3</sup> |
| → | 7.5                                                                                                                                                                                                                                                                                                              | 760                                                             | 8.3                             | 760                                                             | 7.0                                  |                      | 8.3                 |
| → | 10.0                                                                                                                                                                                                                                                                                                             | 1000                                                            | 11                              | 1000                                                            | 9.3                                  |                      | 11                  |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 4.0×10 <sup>-1</sup>            |                                                                 |                                      | 6.7×10 <sup>-1</sup> |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 3.0×10 <sup>-3</sup>            |                                                                 |                                      | 5.0×10 <sup>-3</sup> |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 4.0×10 <sup>-3</sup>            |                                                                 |                                      | 6.7×10 <sup>-3</sup> |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 2.2 (2)                         |                                                                 |                                      |                      | 3.7 (2)             |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 2.95 (2)                        |                                                                 |                                      |                      | 4.96 (2)            |
| → |                                                                                                                                                                                                                                                                                                                  | 2.2 (4)                                                         |                                 | 3.7 (4)                                                         |                                      | 5.5 (4)              | 7.5 (4)             |
| → |                                                                                                                                                                                                                                                                                                                  | 2.95 (4)                                                        |                                 | 4.96 (4)                                                        |                                      | 7.47 (4)             | 10 (4)              |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 | Canned motor                                                    |                                      |                      |                     |
| → | Drip-proof protected flange motor                                                                                                                                                                                                                                                                                |                                                                 |                                 | Totally enclosed fan cooled motor                               |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 1.5                             |                                                                 |                                      |                      | 1.9                 |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 | ULVOIL R-4                                                      |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  | 2.5 to 4.0                                                      |                                 |                                                                 |                                      | 8.0 to 10.5          |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 | ULVOIL R-7                                                      |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 | Water cooled                                                    |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  | Air cooled                                                      |                                 |                                                                 |                                      | Water cooled         |                     |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 | 0.1 to 0.3MPa (14.5 to 43.5psi) |                                                                 |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  | 0.01MPa≤ (1.45psi≤)                                             |                                 |                                                                 |                                      | 0.05MPa≤ (7.25psi≤)  |                     |
| → |                                                                                                                                                                                                                                                                                                                  | 2.0≤                                                            |                                 | 5 to 30°C (41 to 86°F)                                          |                                      |                      |                     |
| → |                                                                                                                                                                                                                                                                                                                  | Corresponds to VG80                                             |                                 |                                                                 | 4.0                                  |                      | 5.0                 |
| → |                                                                                                                                                                                                                                                                                                                  | Corresponds to VG40                                             |                                 |                                                                 | Corresponds                          | Corresponds to VG100 |                     |
| → | 260                                                                                                                                                                                                                                                                                                              | 265                                                             | 285                             | 290                                                             | G3                                   | G4                   | G4                  |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 |                                                                 | 515                                  | 550                  | 630                 |
| → |                                                                                                                                                                                                                                                                                                                  |                                                                 |                                 |                                                                 |                                      | Oil mist trap        |                     |
| → | ①Oil return mechanism A or B ②Timing leak valve ③Cooling-water sensor ④Oil drain valve ⑤Control box<br>⑥Terminal block box ⑦Voltage except 200V/50Hz-60Hz, 220V/0Hz ⑧Fluorine oil ⑨Oil mist trap (Low or high loads)<br>⑩Vacuum pipe with gauge port and leak port ⑪Motor (Totally enclosed fan cooled motor) *2 |                                                                 |                                 |                                                                 | ①Vacuum switch ②Vacuum release valve |                      |                     |

## Dimensions

YM-VD-609A (T)



YM-VS-1201A、YM-VS-1202A



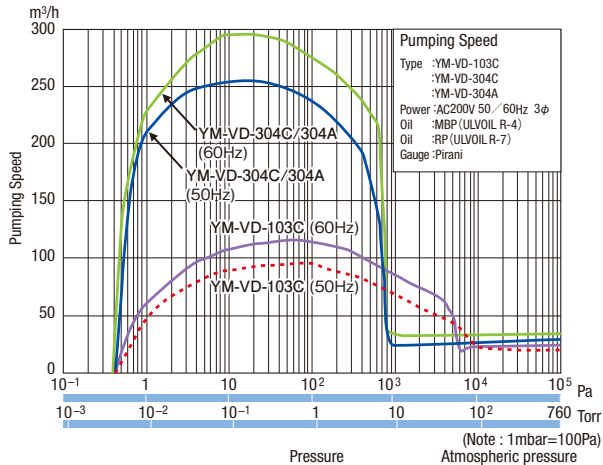
Unit: mm

YM-VS-600A

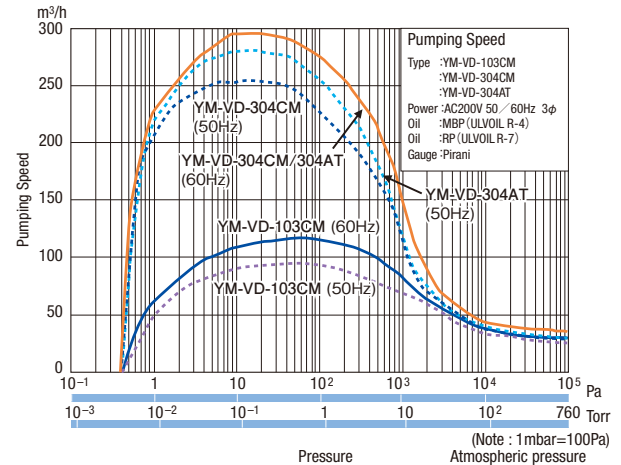
# Mechanical Booster Pumping Unit [YM-VD/YM-VS Series]

## Pumping Speed Curves

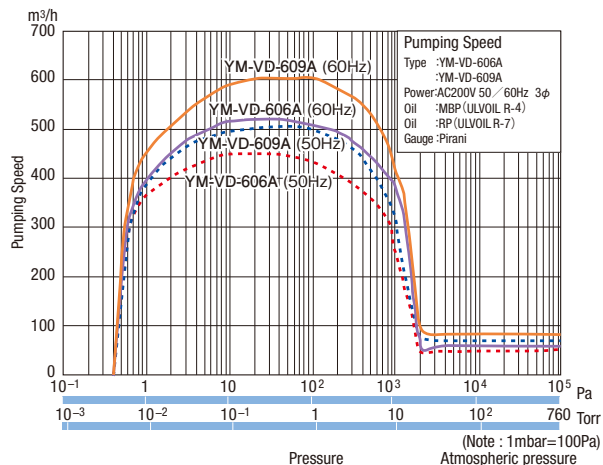
### YM-VD-103C, 304C, 304A



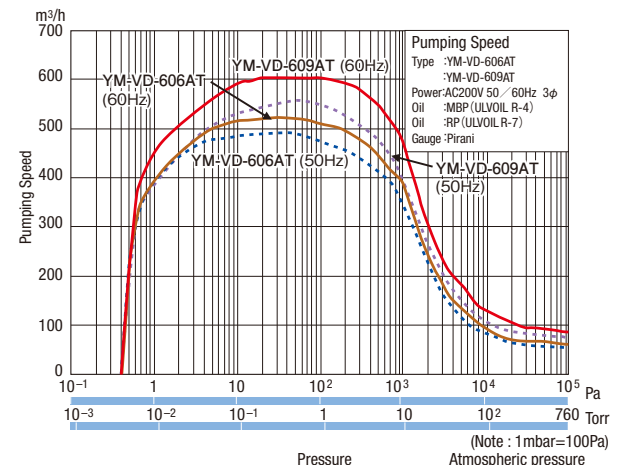
### YM-VD-103CM, 304CM, 304AT



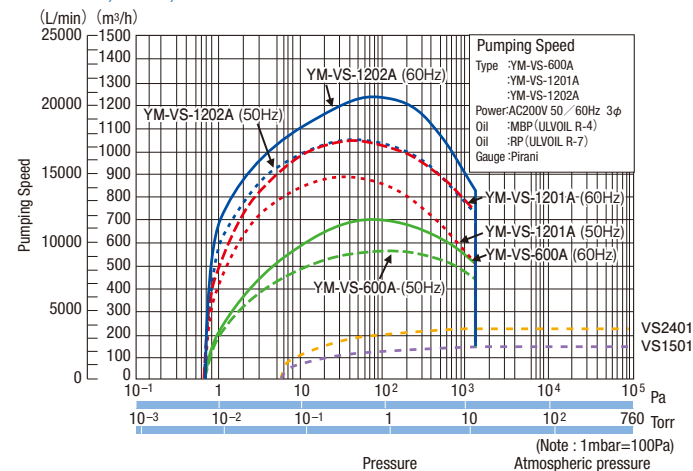
### YM-VD-606A, 609A



### YM-VD-606AT, 609AT



### YM-VS-600A, 1201A, 1202A



ULVAC, Inc. Components Division

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