

SMALL VACUUM PUMPS & SYSTEMS

CATALOG



Creating the possibilities of vacuum pump technology



ULVAC KIKO, Inc.
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ULVAC KIKO

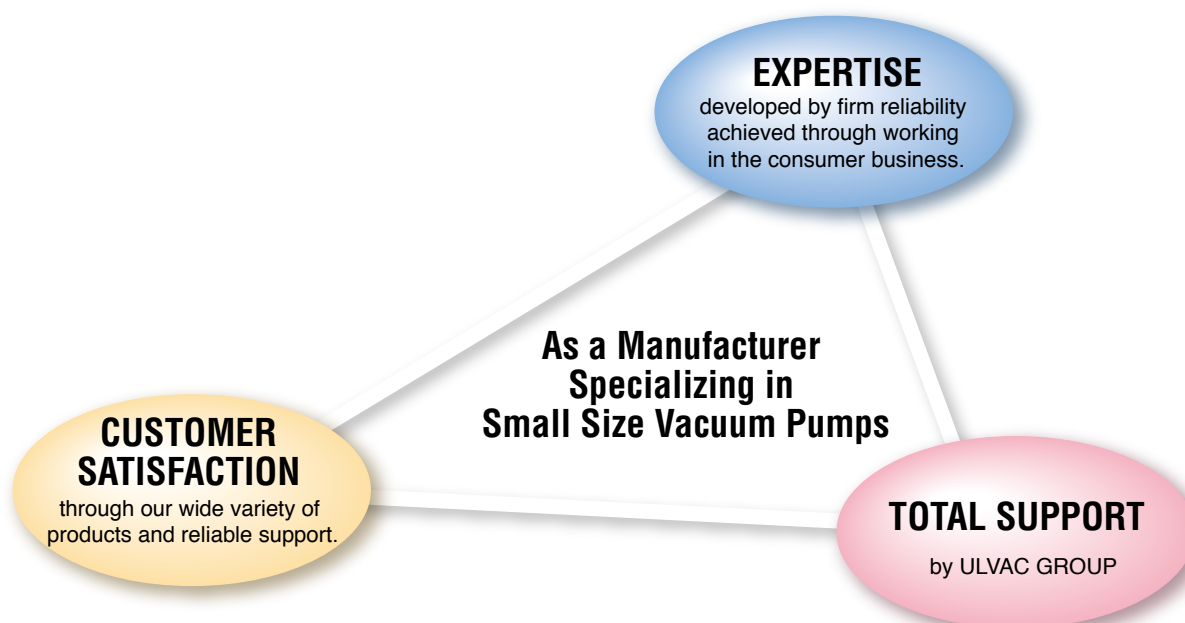
Serves a Wide Variety of Industries

ULVAC

We ULVAC KIKO provide vacuum pumping solutions for various industries and applications. We manufacture, sell and provide customer support of small vacuum pumps with high-performance, high-reliability and high-quality. We are one of the member of world leading vacuum technology group, "ULVAC GROUP"



Head Office & Factory (Miyazaki Japan)



◆ Units conversion table

Temperature

°C	°F
0	32
10	50
20	68
30	86
40	104
50	122
60	140
70	158
80	176
90	194
100	212

Pressure units

Pa	mbar	Torr
1	10^{-2}	7.5×10^{-3}
100	1	0.75
133	1.33	1
1.33×10^4	133	100
4.0×10^4	400	300
1.013×10^5	1.013×10^3	760

Dimensions

mm	Inches	Inches
3.1750	1/8	0.1250
6.3500	1/4	0.2500
9.5250	3/8	0.3750
12.70000	1/2	0.50000
19.0500	3/4	0.7500
25.4000	1/1	1.0000

Pumping speed units

	L/min	m ³ /h	cfm
L/min = L × min ⁻¹	1.0	0.06	0.035
m ³ /h = m ³ × h ⁻¹	16.67	1.0	0.589
cfm = cubic feet/min	28.32	1.699	1.0

C O N T E N T S

Dry Vacuum Pumps

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DAP-18S-DC24	8
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DA-60S	9
DAT-50D	9
DAT-100S	9
DA-20D	10
DA-40S	10
DA-41D	10
DA-81S	10
DA-60D	11
DA-120S	11
DA-121D	11
DA-241S	11
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Systems

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Vacuum Pumps Selection Guide

Dry Vacuum Pumps								
Type	Model	Pumping Speed (50/60Hz)			Ultimate Pressure			Page
		L/min	m ³ /h	cfm	Pa	mbar	Torr	
Diaphragm Type	DAP-6D	6/7	3.60×10 ⁻¹ / 4.20×10 ⁻¹	2.10×10 ⁻¹ / 2.45×10 ⁻¹	6.65×10 ³	66.5	50	8
	DAP-12S	12/14	7.20×10 ⁻¹ / 8.40×10 ⁻¹	4.20×10 ⁻¹ / 4.90×10 ⁻¹	24.0×10 ³	240	180	8
	DAP-9D-DC24	9	5.4×10 ⁻¹	3.18×10 ⁻¹	6.65×10 ³	66.5	49.9	8
	DAP-18S-DC24	18	1.08	6.35×10 ⁻¹	24.0×10 ³	2.4×10 ²	1.8×10 ²	8
	DA-30D	30/36	1.80/2.16	1.05/1.26	6.7×10 ³	67	50	9
	DA-60S	60/72	3.60/4.32	2.10/2.52	2.13×10 ³	21.3	16	9
	DAT-50D	50/55	3.00/3.30	1.75/1.93	3.3×10 ³	33	25	9
	DAT-100S	100/110	6.00/6.60	3.50/3.85	13.3×10 ³	133	100	9
	DA-20D	20/24	1.20/1.44	7.00×10 ⁻¹ / 8.40×10 ⁻¹	5.33×10 ³	53.3	40	10
	DA-40S	40/46	2.40/2.76	1.40/1.61	19.9×10 ³	199	149	10
	DA-41D	40/46	2.40/2.76	1.40/1.61	3.3×10 ³	33	25	10
	DA-81S	75/85	4.50/5.10	2.63/2.98	13.3×10 ³	133	100	10
	DA-60D	60/72	3.60/4.32	2.10/2.52	3.32×10 ³	33.2	25	11
	DA-120S	120/144	7.20/8.64	4.20/5.04	13.3×10 ³	133	100	11
	DA-121D	120/145	7.20/8.70	4.20/5.08	3.3×10 ³	33	25	11
	DA-241S	240/260	1.44×10 ¹ / 1.56×10 ¹	8.40/9.10	16.0×10 ³	160	120	11
Diaphragm Type [High Vacuum Type]	DAU-20	20/23	1.20/1.38	7.00×10 ⁻¹ / 8.05×10 ⁻¹	200	2	1.5	12
	DTU-20	20/23	1.20/1.38	7.00×10 ⁻¹ / 8.05×10 ⁻¹	200	2	1.5	12
Diaphragm Type [Anti-corrosive Type]	DTC-22	20/24	1.20/1.44	7.00×10 ⁻¹ / 8.40×10 ⁻¹	1.0×10 ³	10	7.5	13
	DTC-41	40/46	2.40/2.76	1.40/1.61	1.0×10 ³	10	7.5	13
	DTC-60	60/70	3.60/4.20	2.10/2.45	1.0×10 ³	10	7.5	13
Rocking Piston type	DOP-40D	40/44	2.40/2.64	1.40/1.61	1.2×10 ³	12	9.0	14
	DOP-80S	80/88	4.80/5.28	2.80/3.08	5.33×10 ³	53.3	40	14
	DOP-80SP	80/84	4.80/5.04	2.80/2.94	0.5MPa*	5.0bar*	3.75kTorr*	14
	DOP-120SY	120/140	7.20/8.40	4.20/4.90	8.0×10 ³	80	60	14
	DOP-181S	180/200	1.08×10 ¹ / 1.20×10 ¹	6.30/7.00	10.0×10 ³	100	75	15
	DOP-301SB	300/330	1.80×10 ¹ / 1.98×10 ¹	1.05×10 ¹ / 1.16×10 ¹	8.0×10 ³	80	60	15
	DOP-400SB	400/440	24/26.4	14/15.1	12.0×10 ³	120	90	15
	DOP-420SA	420/460	2.52×10 ¹ / 2.76×10 ¹	1.47×10 ¹ / 1.61×10 ¹	17.3×10 ³	173	130	15
Scroll Type	DIS-90	90/108	5.40/6.48	3.15/3.78	5	0.05	37.5×10 ⁻³	16
	DIS-251	250/300	1.50×10 ¹ / 1.8×10 ¹	8.75/ 1.05×10 ¹	1.6	0.016	12.0×10 ⁻³	16
	DIS-501	500/600	3.00×10 ¹ / 3.60×10 ¹	1.75×10 ¹ / 2.10×10 ¹	1	0.01	7.5×10 ⁻³	16
	DISL-101	100/120	6.00/7.20	3.5/4.2	20	0.2	150×10 ⁻³	17
	DISL-503	430/520	2.58×10 ¹ / 3.12×10 ¹	1.51×10 ¹ / 1.820×10 ¹	30	0.3	225×10 ⁻³	17
Multi-Stage Roots Type	RDA-281HA	280	16.8	9.84	≤8.0×10 ⁻²	≤8.0×10 ⁻⁴	≤6.0×10 ⁻⁴	18
	RDA-501HA	500	30	17.6	≤8.0×10 ⁻²	≤8.0×10 ⁻⁴	≤6.0×10 ⁻⁴	18

* Only for pressure

Oil-seald Rotary vacuum pumps								
Type	Model	Pumping Speed (50/60Hz)			Ultimate Pressure			Page
		L/min	m ³ /h	cfm	Pa	mbar	Torr	
Oil-Sealed Rotary Vacuum Pumps	GLD-040	40/48	2.40/2.88	1.40/1.68	0.67	6.7×10 ⁻³	5.0×10 ⁻³	19
	GLD-137AA	135/162	8.10/9.72	4.73/5.67	0.67	6.7×10 ⁻³	5.0×10 ⁻³	19
	GLD-137CC	135/162	8.10/9.72	4.73/5.67	0.67	6.7×10 ⁻³	5.0×10 ⁻³	19
	GLD-202AA	200/240	12.0/14.4	7.00/8.40	0.67	6.7×10 ⁻³	5.0×10 ⁻³	20
	GLD-202BB	200/240	12.0/14.4	7.00/8.40	0.67	6.7×10 ⁻³	5.0×10 ⁻³	20
	GLD-280A	280/336	16.8/20.2	9.9/11.9	0.67	6.7×10 ⁻³	5.0×10 ⁻³	20
	GHD-031	30/36	1.80/2.16	1.05/1.26	0.67	6.7×10 ⁻³	5.0×10 ⁻³	21
	GHD-101	100/120	6.0/7.2	3.53/4.24	0.67	6.7×10 ⁻³	5.0×10 ⁻³	21
Mechanical Booster Pump	MBS-053	833	50.0	29.2	4.0×10 ⁻²	4.0×10 ⁻⁴	3.0×10 ⁻⁴	22
Oil-Sealed Rotary Vacuum Pumps	GCD-051X	50/60	3.00/3.60	1.75/2.10	0.67	6.7×10 ⁻³	5.0×10 ⁻⁴	23
	GCD-136X	135/162	8.10/9.72	4.73/5.67	0.67	6.7×10 ⁻³	5.0×10 ⁻³	23
	GCD-201X	200/240	12.0/14.4	7.00/8.40	0.67	6.7×10 ⁻³	5.0×10 ⁻³	23

Systems								
Type	Model	Pumping Speed (50/60Hz) *			Ultimate Pressure			Page
		L/sec	m ³ /h	cfm	Pa	mbar	Torr	
Turbo Molecular Pumping System	VPT-060	60	2.16×10 ²	1.26×10 ²	0.1×10 ⁻⁴	0.1×10 ⁻⁶	0.75×10 ⁻⁷	24
Mechanical Booster Pumping System	VMR-050	13.9	5.00×10 ¹	2.92×10 ¹	4.0×10 ⁻²	4.0×10 ⁻⁴	3.0×10 ⁻⁴	25
High Vacuum Pumping Systems	VPC-051	50	1.80×10 ²	1.05×10 ²	0.7×10 ⁻³	0.7×10 ⁻⁵	0.53×10 ⁻⁵	26
	VPC-051A	50	1.80×10 ²	1.05×10 ²	0.7×10 ⁻³	0.7×10 ⁻⁵	0.53×10 ⁻⁵	26
	VPC-250F	200	7.20×10 ²	4.20×10 ²	0.1×10 ⁻³	0.1×10 ⁻⁵	0.75×10 ⁻⁶	26
	VFR-200M/X	200	7.20×10 ²	4.20×10 ²	0.1×10 ⁻³	0.1×10 ⁻⁵	0.75×10 ⁻⁶	27
	VWR-400M/X	400	1.44×10 ³	8.40×10 ²	0.1×10 ⁻³	0.1×10 ⁻⁵	0.75×10 ⁻⁶	27
	VTR-350M/X	345	1.24×10 ³	7.25×10 ²	0.1×10 ⁻³	0.1×10 ⁻⁵	0.75×10 ⁻⁶	27
	VTS-350M/X	345	1.24×10 ³	7.25×10 ²	0.1×10 ⁻³	0.1×10 ⁻⁵	0.75×10 ⁻⁶	27
Vacuum Coaters	VPC-061	50	1.80×10 ²	1.05×10 ²	1.3×10 ⁻³	1.3×10 ⁻⁵	0.98×10 ⁻⁵	31
	VPC-061A	50	1.80×10 ²	1.05×10 ²	1.3×10 ⁻³	1.3×10 ⁻⁵	0.98×10 ⁻⁵	31
	VPC-260F	200	7.20×10 ²	4.20×10 ²	1.3×10 ⁻³	1.3×10 ⁻⁵	0.98×10 ⁻⁵	31
	VPC-1100	1100	3.96×10 ³	2.31×10 ³	0.4×10 ⁻³	0.4×10 ⁻⁵	0.3×10 ⁻⁵	32
	VFR-200M/ERH	200	7.20×10 ²	4.20×10 ²	0.8×10 ⁻³	0.8×10 ⁻⁵	0.6×10 ⁻⁵	33
	VWR-400M/ERH	400	1.44×10 ³	8.40×10 ²	0.4×10 ⁻³	0.4×10 ⁻⁵	0.3×10 ⁻⁵	33
	VTR-350M/ERH	345	1.24×10 ³	7.25×10 ²	0.4×10 ⁻³	0.4×10 ⁻⁵	0.3×10 ⁻⁵	33
	VTS-350M/ERH	345	1.24×10 ³	7.25×10 ²	0.4×10 ⁻³	0.4×10 ⁻⁵	0.3×10 ⁻⁵	33
	VTR-060M/ERH	60	2.16×10 ²	1.26×10 ²	10 ⁻⁴ level	10 ⁻⁶ level	10 ⁻⁶ level	34
Sputtering Systems	RFS-201	150	5.40×10 ²	3.15×10 ²	6.6×10 ⁻⁴	6.6×10 ⁻⁶	4.95×10 ⁻⁶	35
	VTR-151M/SRF	250	9.00×10 ²	5.25×10 ²	6.6×10 ⁻⁴	6.6×10 ⁻⁶	4.95×10 ⁻⁶	36

* The described only the nominal pumping speed of the main pump.

Pump Selection Process

Below calculation and Pumping speed curves are available for selecting suitable pump

1. Calculation of Pumping time and Pumping speed.

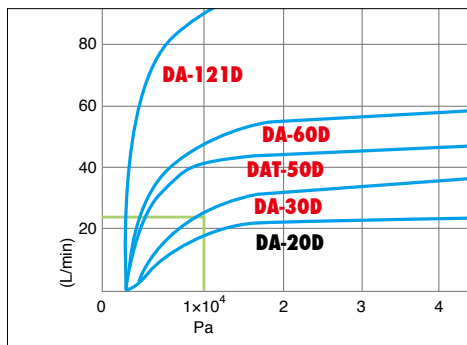
$$t = \frac{V_{\text{Tank Volume (L)}}}{S_{\text{Pumping speed (L/min)}}} \times 2.303 \log \frac{P_1 \text{ First pressure (Pa)}}{P_2 \text{ Ultimate pressure (Pa)}}$$

$$t_0 = t_1 + t_2 + t_3 + \dots$$

example 1

We want to decrease pressure from atmospheric pressure (100kPa) to 10kPa in a 50 liter tank within 5 minutes.

Which pump is suitable?



From calculation, more than 23 L/min pumping speed is required, select faster pumping speed more than DA-30D pump.

Please allow safe rate with considering pipe conductance and leak.

$$S = \frac{V}{t} \times 2.303 \log \frac{P_1}{P_2}$$

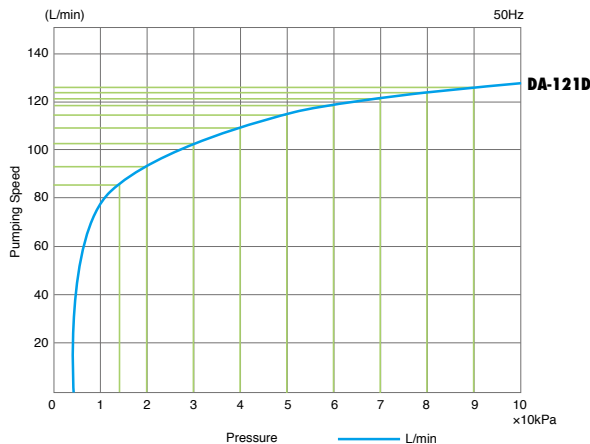
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$$S \div 23 \text{ L/min (at 10,000Pa)}$$

example 2

How long does it take to decrease pressure from atmospheric pressure (100kPa) to 13kPa in an 80 liter tank?

DA-121D is used at this case.



$$S = \frac{V}{t} \times 2.303 \log \frac{P_1 \text{ First pressure}}{P_2 \text{ Ultimate pressure}}$$

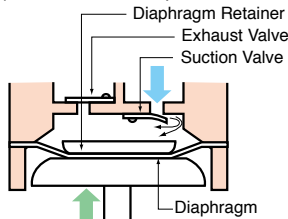
Atmospheric pressure	90kPa	$S_1=124\text{L/min}$	$t_1 = \frac{80}{124}$	$2.303 \log \frac{101325}{90000}$	$=0.08$
	90kPa × 80kPa	$S_2=123\text{L/min}$	$t_2 = \frac{80}{123}$	$2.303 \log \frac{90000}{80000}$	$=0.08$
	80kPa × 70kPa	$S_3=122\text{L/min}$	$t_3 = \frac{80}{122}$	$2.303 \log \frac{80000}{70000}$	$=0.09$
	70kPa × 60kPa	$S_4=120\text{L/min}$	$t_4 = \frac{80}{120}$	$2.303 \log \frac{70000}{60000}$	$=0.10$
	60kPa × 50kPa	$S_5=116\text{L/min}$	$t_5 = \frac{80}{116}$	$2.303 \log \frac{60000}{50000}$	$=0.13$
	50kPa × 40kPa	$S_6=111\text{L/min}$	$t_6 = \frac{80}{111}$	$2.303 \log \frac{50000}{40000}$	$=0.16$
	40kPa × 30kPa	$S_7=108\text{L/min}$	$t_7 = \frac{80}{108}$	$2.303 \log \frac{40000}{30000}$	$=0.21$
	30kPa × 20kPa	$S_8=96\text{L/min}$	$t_8 = \frac{80}{96}$	$2.303 \log \frac{30000}{20000}$	$=0.34$
	20kPa × 13kPa	$S_9=86\text{L/min}$	$t_9 = \frac{80}{86}$	$2.303 \log \frac{20000}{13000}$	$=0.40$

$$t_0 = t_1 + t_2 + \dots + t_9 = 1.59\text{min}$$

■ Movement Principles for Each Type of Vacuum Pump

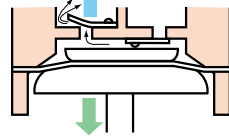
• Diaphragm Type Dry Vacuum Pump

Last process of suction
(Bottom dead center)



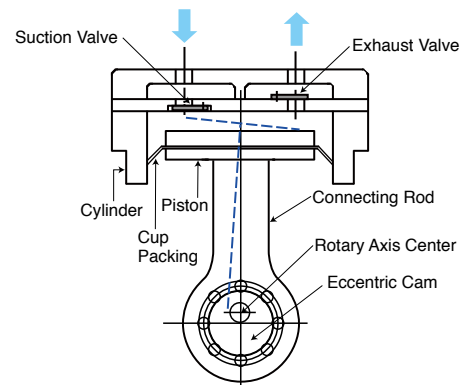
Suction Valve completely opens.
Exhaust valve keep closed.

Last process of exhaust
(Top dead center)

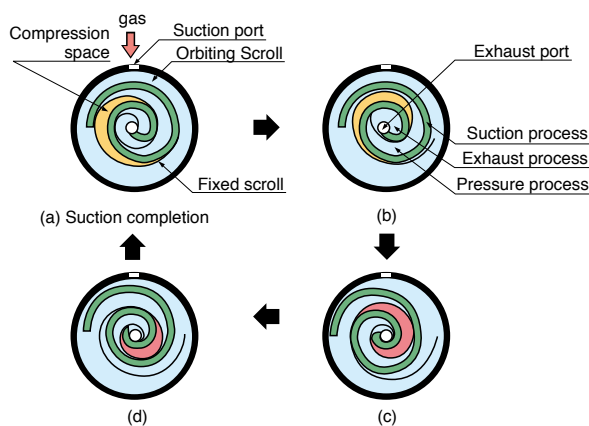


Suction Valve keeps closed
as pressed.
Exhaust valve completely open
as pressed.

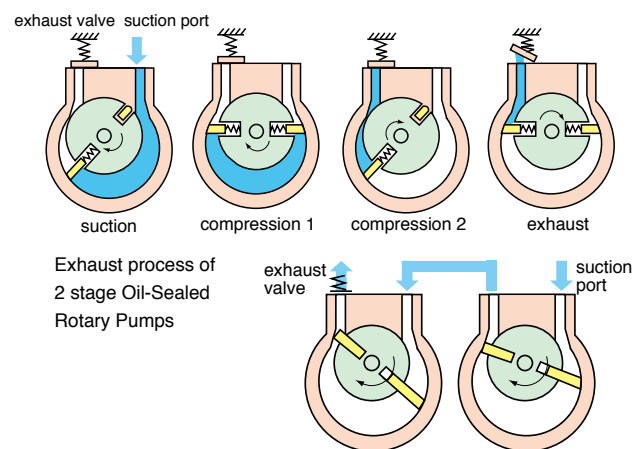
• Rocking Piston Type Dry Vacuum Pump



• Scroll Type Dry Vacuum Pump



• Oil-Sealed Rotary Pump



■ A Guide to Our Catalog

CE CE marked

TUV marked

CSA marked

cTUVus marked

cTUV marked

(compliance to U.S. and Canadian National Standards)

* cTUVus is equivalent to UL/CSA standard.

Indicates the actual pumping speed in atmospheric pressure. Some other companies show the number of nominal pumping speed. In that case you can compare the speed by increasing our rate 20 %.

When the pump achieves this ultimate pressure the pumping speed becomes 0.

Indicates the motor rating.

Basic machine weight includes the power cord.

Indicates the standard inlet, outlet diameter. For request on different sizes, please contact us.

Use the pump within this atmospheric temperature range.

Corresponding voltage and Certificate

Dry Vacuum Pumps

Diaphragm Type Dry Vacuum Pumps

DAP Series

DAP-6D DAP-12S DAP-9D-DC24 DAP-18S-DC24

Features

- Diaphragm type pump creates vacuum by reciprocating movement of rubber diaphragms.
- Pump structure creates an Oil-free environment and maintenance easy.
- DAP series is the smallest diaphragm pump from our product ranges and offers pumping speed at 6L and 12 L/min at 50Hz.

Applications

- Vacuum chucks, wafer and tip handling devices
- Vacuum tweezers, medical appliances
- Printing equipment
- Automatic packing machines
- Optical appliances
- Sterilizer

Specifications

Model	Unit	DAP-6D	DAP-12S	DAP-9D-DC24	DAP-18S-DC24
Actual pumping speed	L/min	6	12	9	18
Ultimate pressure	Pa	0.05 × 10 ²	0.05 × 10 ²	0.05 × 10 ²	0.05 × 10 ²
Motor		Single phase, 220~230V, 10W, 4P, Capacitor run	Single phase, 220~230V, 10W, 4P, Capacitor run	DC Business motor, 14W, 4P, 24V	DC Business motor, 14W, 4P, 24V
Full load current	A	0.25	0.25	1.3	1.4
Weight	kg	1.9	1.9	1.75	1.75
Inlet, outlet pipe diameter	mm	(1/4" 1/8)	(1/4" 1/8)	(1/4" 1/8)	(1/4" 1/8)
Operating temperature	°C	0 ~ 40	0 ~ 40	0 ~ 40	0 ~ 40
Overall dimensions	mm	91(W) × 163(L) × 100(H)	91(W) × 163(L) × 100(H)	83.5(W) × 165(L) × 122.8(H)	83.5(W) × 165(L) × 122.8(H)

Corresponding voltage and Certificate

Model	Voltage	Cable Code	CE Marked	TUV Marked	cTUVus Marked
DAP-6D	Single phase, 100V	AA2100000001	✓	✓	✓
DAP-6D	Single phase, 200V	AA2100000000	✓	✓	✓
DAP-12S	Single phase, 100V	AA2100000001	✓	✓	✓
DAP-12S	Single phase, 200V	AA2100000000	✓	✓	✓
DAP-9D-DC24	DC24V	AA2100000001	✓	✓	✓
DAP-18S-DC24	DC24V	AA2100000001	✓	✓	✓

Pumping speed curves

Type of Pump

DAP-12S

Actual pumping speed

The numbers show the actual pumping speed at 50 Hz. The number will increase 20% with 60 Hz.

Diaphragm Type Dry Vacuum Pumps

DAP Series

DAP-6D DAP-12S DAP-9D-DC24 DAP-18S-DC24

Features

Diaphragm type pump creates vacuum by reciprocating movement of rubber diaphragms.

Pump structure creates an Oil-free environment and maintenance easy.

DAP series is the smallest diaphragm pump from our product ranges and offers pumping speed at 6L and 18 L/min at 50Hz.

Applications

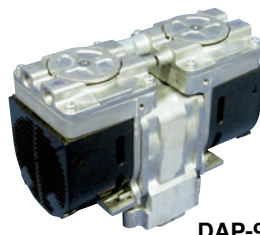
- Vacuum chucks, wafer and chip handling devices
- Vacuum tweezers, medical appliances
- Printing equipment
- Automatic packing machines
- Optical appliances
- Sterilizer



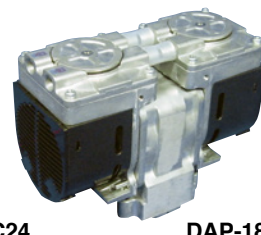
DAP-6D



DAP-12S



DAP-9D-DC24



DAP-18S-DC24

Specifications

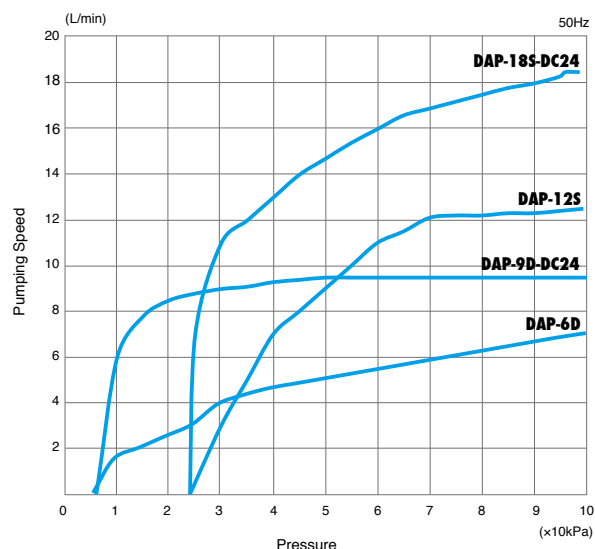
Model		DAP-6D		DAP-12S		DAP-9D-DC24	DAP-18S-DC24
	Unit	50Hz	60Hz	50Hz	60Hz	—	—
Actual pumping speed	L/min	6	7	12	14	9	18
Ultimate pressure	Pa	6.65×10^{-3}		24.0×10^{-3}		6.65×10^{-3}	24.0×10^{-3}
Motor		Single phase, 220—230V, 10W, 4P, Capacitor run		Single phase, 220—230V, 10W, 4P, Capacitor run		DC Brushless motor, 14W, 4P, 24V	DC Brushless motor, 14W, 4P, 24V
Full load current	A	0.25		0.25		1.3	1.4
Weight	kg	1.9		1.9		1.75	1.75
Inlet, outlet pipe diameter	mm	(Rc 1/8)		(Rc 1/8)		(Rc1/8)	(Rc1/8)
Ambient temperature	°C	0 – 40		0 – 40		0 – 40	0 – 40
Overall dimensions	mm	91(W) × 163(L) × 100.6(H)		91(W) × 163(L) × 100.6(H)		83.5(W) × 165(L) × 123.8(H)	83.5(W) × 165(L) × 123.8(H)

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DAP-6D	Single phase, 100V	A42910000001	—	—	—
	Single phase, 200V	A42916000000	—	—	—
	Single phase, 220—230V	A42917000000	—	—	—
DAP-12S	Single phase, 100V	A42920000001	—	—	—
	Single phase, 200V	A42926000000	—	—	—
	Single phase, 220—230V	A42927000000	—	—	—
DAP-9D-DC24	DC24V	A42930000001	✓	✓	✓
DAP-18S-DC24	DC24V	A42940000001	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 44.

Diaphragm Type Dry Vacuum Pumps

DA/DAT Series

DA-30D DA-60S DAT-50D DAT-100S

Features

Diaphragm type pump creates vacuum by reciprocating movement of rubber diaphragms.

Pump structure creates an Oil-free environment and maintenance easy. Various pumping speed and two/single stages are selectable depends on your required pressure and pumping volume.

Applications

- Vacuum chucks, wafer and chip handling devices
- Vacuum tweezers, medical appliances
- Printing equipment
- Automatic packing machines
- Optical appliances
- Semiconductor industry
- Injection molding machine



DA-30D



DA-60S



DAT-50D



DAT-100S

Specifications

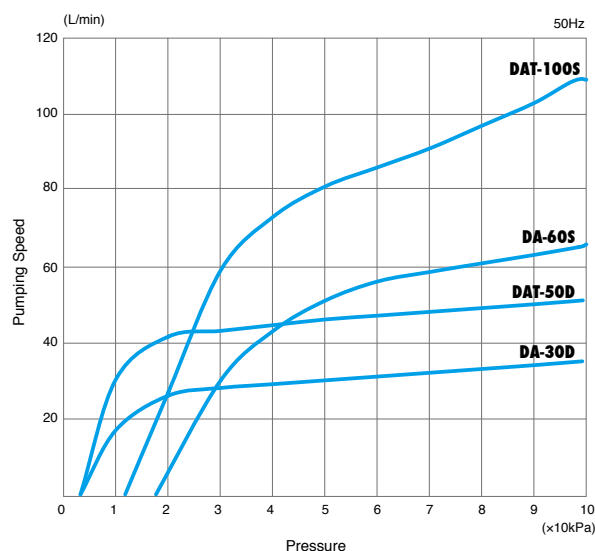
Model		DA-30D		DA-60S		DAT-50D		DAT-100S	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	30	36	60	72	50	55	100	110
Ultimate pressure	Pa	6.7×10^3		21.3×10^3		3.3×10^3		13.3×10^3	
Motor		Single phase, 200—220V, 200W, 4P, Split phase starting		Single phase, 200—220V, 200W, 4P, Split phase starting		Single phase, 200—220V, 200W, 4P, Split phase starting		Single phase, 200—220V, 200W, 4P, Split phase starting	
Full load current	A	2.8/2.6 (200/220V)	2.4/2.2 (200/220V)	2.8/2.6 (200/220V)	2.4/2.2 (200/220V)	2.8/2.6 (200/220V)	2.4/2.2 (200/220V)	2.8/2.6 (200/220V)	2.4/2.2 (200/220V)
Weight	kg	11.0		11.0		11.0		11.0	
Inlet, outlet pipe diameter	mm	O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.12 × I.D. dia.8.5 (Rc 1/4)		O.D. dia.12 × I.D. dia.8.5 (Rc 1/4)	
Ambient temperature	°C	7 – 40		7 – 40		7 – 40		7 – 40	
Overall dimensions	mm	212(W) × 278(L) × 224.5(H)		212(W) × 278(L) × 224.5(H)		150(W) × 232(L) × 305(H)		150(W) × 232(L) × 305(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DA-30D	Single phase, 100V	A42098000000	—	—	—
	Single phase, 200—220V	A42092000000	—	—	—
DA-60S	Single phase, 100V	A42108000000	—	—	—
	Single phase, 200—220V	A42102000000	—	—	—
DAT-50D	Single phase, 100V	A42158000001	—	—	—
	Single phase, 200—220V	A42152000001	—	—	—
DAT-50DA	Three phase, 200—220V	A42150000006	✓	✓	✓
DAT-100S	Single phase, 100V	A42168000001	—	—	—
	Single phase, 200—220V	A42162000001	—	—	—
DAT-100SA	Three phase, 200—220V	A42160000006	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 44.

Diaphragm Type Dry Vacuum Pumps

DA Series

DA-20D DA-40S DA-41D DA-81S

Features

Diaphragm type pump creates vacuum by reciprocating movement of rubber diaphragms.

Pump structure creates an Oil-free environment and maintenance easy. Various pumping speed and two/single stages are selectable depends on your required pressure and pumping volume.

Applications

- Vacuum chucks, wafer and chip handling devices
- Vacuum tweezers, medical appliances
- Printing equipment
- Automatic packing machines
- Optical appliances



Specifications

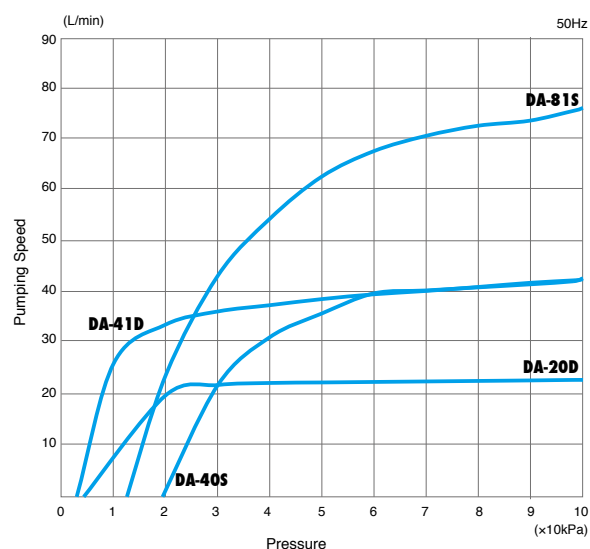
Model		DA-20DC		DA-40SC		DA-41D		DA-81S	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	20	24	40	46	40	46	75	85
Ultimate pressure	Pa	5.33×10^{-3}		19.9×10^{-3}		3.3×10^{-3}		13.3×10^{-3}	
Motor		Single phase, 220V, 60W, 4P, Capacitor run		Single phase, 220V, 60W, 4P, Capacitor run		Single phase, 220V, 100W, 4P, Capacitor run		Single phase, 220V, 100W, 4P, Capacitor run	
Full load current	A	0.8		0.8		1.2	1.25	1.2	1.25
Weight	kg	7.2		7.2		10.3		10.3	
Inlet, outlet pipe diameter	mm	O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.12 × I.D. dia.8 (G1/4)		O.D. dia.12 × I.D. dia.8 (G1/4)	
Ambient temperature	°C	7 – 40		7 – 40		0 – 40		0 – 40	
Overall dimensions	mm	118(W) × 242(L) × 178(H)		128(W) × 242(L) × 178(H)		157(W) × 336.5(L) × 217(H)		181(W) × 336.5(L) × 217(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DA-20DA	Single phase, 100V	A42078600000	✓	✓	—
DA-20DB	Single phase, 115V	A42078700000	✓	✓	—
DA-20D	Single phase, 200V	A42072000000	—	—	—
DA-20DC	Single phase, 220V	A42078800000	✓	✓	—
DA-40SA	Single phase, 100V	A42088600000	✓	✓	—
DA-40SB	Single phase, 115V	A42088700000	✓	✓	—
DA-40S	Single phase, 200V	A42082000000	—	—	—
DA-40SC	Single phase, 220V	A42088800000	✓	✓	—
DA-41D	Single phase, 100V	A42750000000	—	—	—
	Single phase, 115V	A42750000004	—	—	—
	Single phase, 200V	A42750000007	—	—	—
	Single phase, 220V	A42750000003	—	—	—
DA-81S	Single phase, 100V	A42768000000	—	—	—
	Single phase, 115V	A42760000001	—	—	—
	Single phase, 200V	A42760000004	—	—	—
	Single phase, 220V	A42760000005	—	—	—

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 45.

Diaphragm Type Dry Vacuum Pumps

DA Series

DA-60D DA-120S DA-121D DA-241S

Features

Diaphragm type pump creates vacuum by reciprocating movement of rubber diaphragms.

Pump structure creates an Oil-free environment and maintenance easy. Various pumping speed and two/single stages are selectable depends on your required pressure and pumping volume.

Applications

- Vacuum chucks, wafer and chip handling devices
- Vacuum tweezers, medical appliances
- Printing equipment
- Automatic packing machines
- Optical appliances
- Semiconductor industry



DA-60D



DA-120S



DA-121DF



DA-241SF

CE



CE



Specifications

Model		DA-60D		DA-120S		DA-121DF		DA-241SF	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	60	72	120	144	120	145	240	260
Ultimate pressure	Pa	3.32×10^{-3} *		13.3×10^{-3} *		3.3×10^{-3}		16.0×10^{-3}	
Motor		Single phase, 220V, 200W, 4P, Capacitor run		Single phase, 220V, 200W, 4P, Capacitor run		Single phase, 220—230V, 400W, 4P, Capacitor run		Single phase, 220—230V, 400W, 4P, Capacitor run	
Full load current	A	2.4		2.4		2.3	2.6/2.5 (220/230V)	2.5/2.4 (220/230V)	2.7/2.6 (220/230V)
Weight	kg	19.0		19.0		26.0		26.0	
Inlet, outlet pipe diameter	mm	O.D. dia.14 × I.D. dia.9 (G3/8)		O.D. dia.14 × I.D. dia.9 (G3/8)		O.D. dia.16 × I.D. dia.12 (G1/2)		O.D. dia.16 × I.D. dia.12 (G1/2)	
Ambient temperature	°C	7 – 40		7 – 40		0 – 40		0 – 40	
Overall dimensions	mm	156(W) × 358(L) × 238(H)		162(W) × 358(L) × 238(H)		193.5(W) × 411(L) × 285(H)		207(W) × 411(L) × 285(H)	

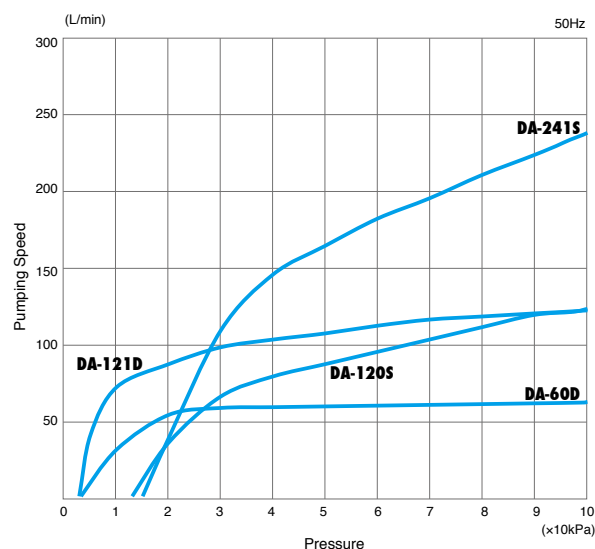
* With built-in Unloader valve.

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DA-60D	Single phase, 100V	A42118000000	—	—	—
	Single phase, 115V	A42118100000	—	—	—
	Single phase, 200V	A42110000002	—	—	—
	Single phase, 220V	A42110000004	—	—	—
DA-120S	Single phase, 100V	A42120000000	—	—	—
	Single phase, 200V	A42120000002	—	—	—
	Single phase, 220V	A42120000004	—	—	—
DA-121DC	Single phase, 100V	A42678100001	✓	✓	✓
DA-121DD	Single phase, 115V	A42678200001	✓	✓	✓
DA-121DE	Single phase, 200V	A42678300001	✓	✓	✓
DA-121DF	Single phase, 220—230V	A42678400001	✓	✓	✓
DA-241SC	Single phase, 100V	A42688100001	✓	✓	✓
DA-241SD	Single phase, 115V	A42688200001	✓	✓	✓
DA-241SE	Single phase, 200V	A42688300001	✓	✓	✓
DA-241SF	Single phase, 220—230V	A42688400001	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 45.

Diaphragm Type Dry Vacuum Pumps

DAU/DTU Series

DAU-20 DTU-20

Features

- High vacuum type diaphragm pump
- Low vibration
- High corrosion resistant (DTU-20)

Applications

- Backing pump for TMP
- Analytical equipment
- Biochemical analysis
- Gas charging
- Vacuum drying systems
- Evaporators etc



Specifications

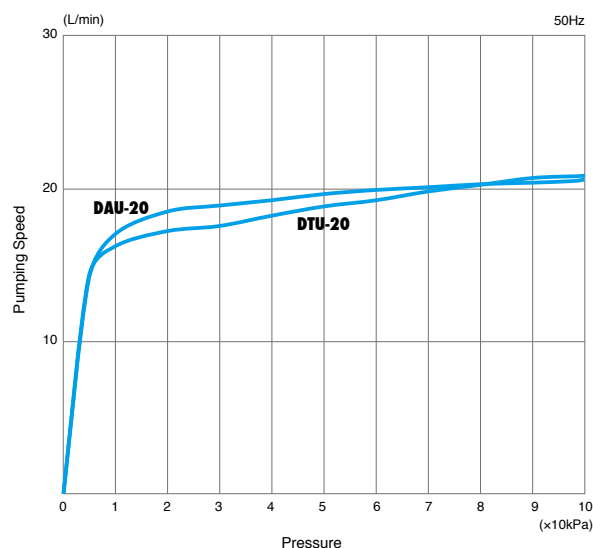
Model	Unit	DAU-20D		DTU-20D	
		50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	20	23	20	23
Ultimate pressure	Pa	200		200	
Motor		Single phase, 220V, 80W, 4P, Capacitor run		Single phase, 220V, 80W, 4P, Capacitor run	
Full load current	A	0.7	0.72	0.7	0.72
Weight	kg	7.5		7.5	
Inlet, outlet pipe diameter	mm	O.D. dia.10 × I.D. dia.6 (Rc 1/8)		O.D. dia.10 × I.D. dia.6 (Rc 1/8)	
Ambient temperature	°C	5 – 40		5 – 40	
Overall dimensions	mm	161(W) × 327(L) × 217(H)		161(W) × 327(L) × 217(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DAU-20A	Single phase, 100V	A42000110000	✓	✓	✓
DAU-20B	Single phase, 115V	A42000120000	✓	✓	✓
DAU-20C	Single phase, 200V	A42000130000	✓	✓	✓
DAU-20D	Single phase, 220V	A42000140000	✓	✓	✓
DAU-20E	Single phase, 230V	A42000150000	✓	✓	✓
DTU-20A	Single phase, 100V	A42971000000	✓	✓	✓
DTU-20B	Single phase, 115V	A42972000000	✓	✓	✓
DTU-20C	Single phase, 200V	A42973000000	✓	✓	✓
DTU-20D	Single phase, 220V	A42974000000	✓	✓	✓
DTU-20E	Single phase, 230V	A42975000000	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 46.

Diaphragm Type Dry Vacuum Pumps

DTC Series

DTC-22 DTC-41 DTC-60

Features

- All contacted parts of the gas are made of PTFE and FPM.
- Suitable for pumping out corrosive gas or organic solvent
- High vacuum down to 1000Pa
- Compact

Applications

- Rotary evaporator
- Evaporating system
- Vacuum Concentrator
- Vacuum filtration
- Exhaust of gas-transfer tube
- Vacuum drying systems
- Laser-gas circulation
- Centrifuge
- Medical/Pharmaceutical equipments
- Analytical/scientific equipments



Specifications

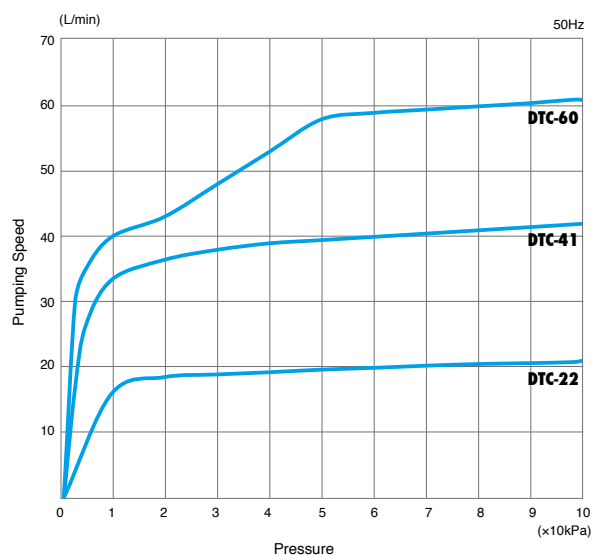
Model		DTC-22B		DTC-41		DTC-60	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	20	24	40	46	60	70
Ultimate pressure	Pa	1.0×10^3		1.0×10^3		1.0×10^3	
Motor		Single phase, 220V, 50W, 4P, Capacitor run		Single phase, 220V, 100W, 4P, Capacitor run		Single phase, 220V, 200W, 4P, Capacitor run	
Full load current	A	0.6	0.72	1.1		2.0	2.1
Weight	kg	7.3		10.3		18.0	
Inlet, outlet pipe diameter	mm	O.D. dia.10 × I.D. dia.6 (G1/4)		O.D. dia.10 × I.D. dia.6 (G1/4)		O.D. dia.14 × I.D. dia.9 (G3/8)	
Ambient temperature	°C	0 – 40		0 – 40		0 – 40	
Overall dimensions	mm	142(W) × 288.5(L) × 202(H)		155(W) × 336.5(L) × 217(H)		158(W) × 340(L) × 242(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DTC-22	Single phase, 100V	A42001700000	—	—	—
DTC-22A	Single phase, 115V	A42001900001	✓	✓	✓
DTC-22	Single phase, 200V	A42001720000	—	—	—
DTC-22B	Single phase, 220V	A42002000001	✓	✓	✓
DTC-22C	Single phase, 230V	A42002100001	✓	✓	✓
DTC-41A	Single phase, 100V	A42730000004	✓	—	—
DTC-41	Single phase, 200V	A42738200002	—	—	—
	Single phase, 220V	A42738300000	—	—	—
DTC-41B	Single phase, 230V (50Hz)	A42730000005	✓	—	—
DTC-60	Single phase, 100V	A42668000000	—	—	—
	Single phase, 115V (60Hz)	A42668100000	—	—	—
	Single phase, 200V	A42668200000	—	—	—
	Single phase, 220V	A42668300000	—	—	—

— : Not Available, ✓ : Available

Pumping speed curves



Rocking Piston Type Dry Vacuum Pumps

DOP Series

DOP-40D DOP-80S
DOP-80SP DOP-120SY

Features

Rocking type piston vacuum pump creates vacuum by reciprocating motion of cup packing inside the cylinder. Pressurized type is available for DOP-80S which can be used as a small compressor. (DOP-80SP)

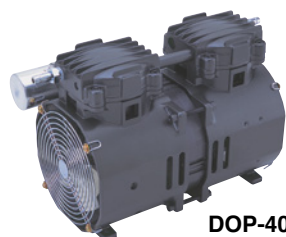
Applications

(Vacuum)

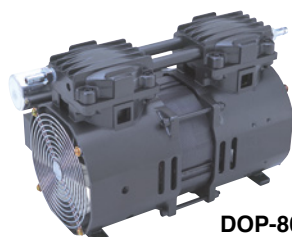
- Vacuum chuck, vacuum tweezers
- Absorption and transfer of automatic machines
- Vacuum packing printing machines
- Chip mounter
- Medical equipments
- Oxygen generator

(Pressure)

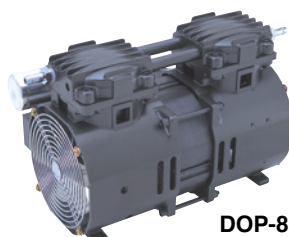
- Pressure source for automatic machines
- Air pressure unit
- Printing machine
- Otorhinolaryngology, dental unit
- Air pressure meter



DOP-40D



DOP-80S



DOP-80SP



DOP-120SY

Specifications

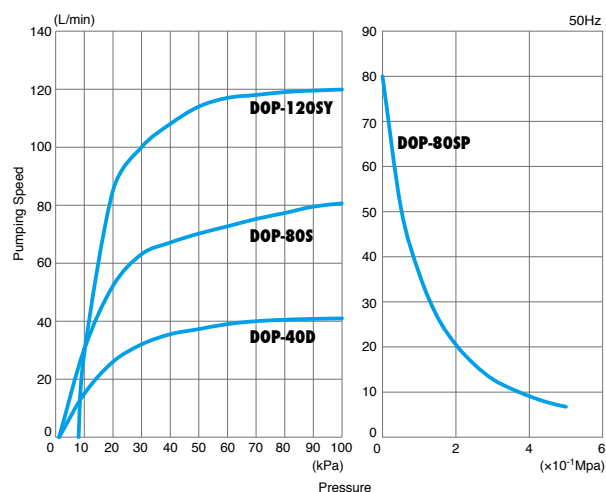
Model		DOP-40D		DOP-80S		DOP-80SP		DOP-120SY	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	40	44	80	88	80	84	120	140
Ultimate pressure	Pa	1.2×10^3		5.33×10^3		Only for pressure		8.0×10^3	
Maximum pressure	MPa	—		—		0.5		—	
Motor		Single phase, 220V, 210W, 4P, Capacitor run		Single phase, 220V, 210W, 4P, Capacitor run		Single phase, 220V, 300W, 4P, Capacitor run		Three phase, 200 – 220V, 120W, 4P	
Full load current	A	1.7	1.9	1.7	1.9	2.4	2.5	1.4/1.6 (200/220V)	1.4 (200V)
Weight	kg	7.0		7.0		9.0		6.4	
Inlet, outlet pipe diameter	mm	O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.9 × I.D. dia.5 (Rc 1/4)		O.D. dia.9 × I.D. dia.5 (Rc 1/4)		(Rc1/4)	
Ambient temperature	°C	7 – 40		7 – 40		7 – 40		7-40	
Overall dimensions	mm	160(W) × 270(L) × 179(H)		160(W) × 270(L) × 179(H)		168.5(W) × 288(L) × 181(H)		139.5(W) × 255(L) × 167(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked	cTUV Marked
DOP-40D	Single phase, 100V	A42340000000	—	—	—	—
	Single phase, 115V	A42340000001	—	—	—	—
	Single phase, 200V	A42340000002	—	—	—	—
	Single phase, 220V	A42340000003	—	—	—	—
DOP-80S	Single phase, 100V	A43268000000	—	—	—	—
	Single phase, 115V	A42360000001	—	—	—	—
	Single phase, 200V	A42360000002	—	—	—	—
	Single phase, 220V	A42360000003	—	—	—	—
DOP-80SP	Single phase, 100V	A42370000003	—	—	—	—
	Single phase, 200V	A42372000000	—	—	—	—
	Single phase, 220V	A42372200000	—	—	—	—
DOP-120SY	Three phase, 200—220V	A42811200000	✓	✓	—	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 46 – 47.

Rocking Piston Type Dry Vacuum Pumps

DOP Series

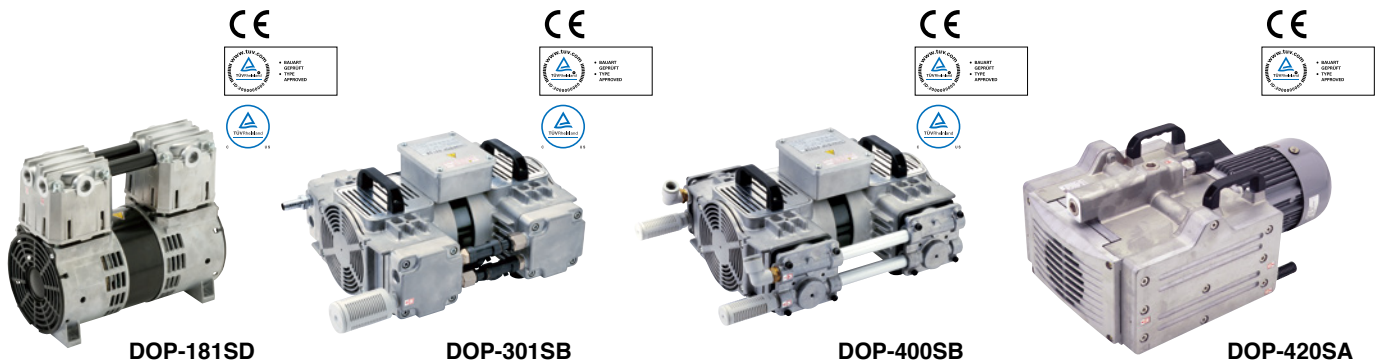
DOP-181S DOP-301SB
DOP-400SB DOP-420SA

Features

Rocking type piston vacuum pump creates vacuum by reciprocating motion of cup packing inside the cylinder. Bigger volume of pumping speed with increased number of pump heads.

Applications

- Vacuum chuck, vacuum tweezers
- Semiconductor industry (Handler, Mounter)
- FPD industry (Bonder)
- Printing machine
- Injection molding
- Adsorption and transfer



Specifications

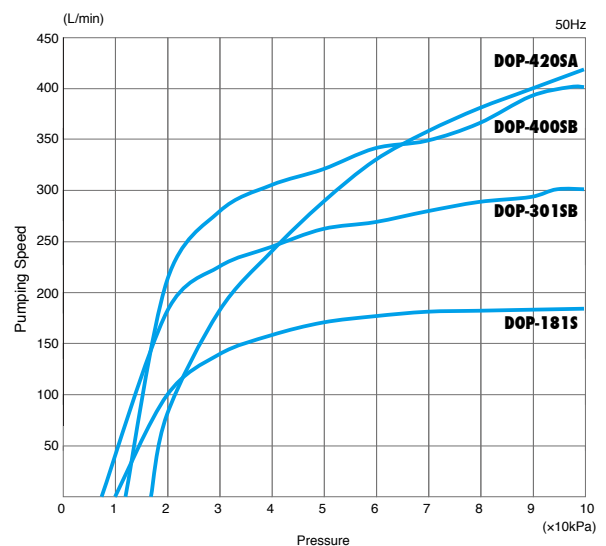
Model		DOP-181SD		DOP-301SB		DOP-400SB		DOP-420SA	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	180	200	300	330	400	440	420	460
Ultimate pressure	Pa	10.0×10^3		8.0×10^3		12.0×10^3		17.3×10^3	
Motor		Single phase, 220V, 400W, 4P		Three phase, 200 – 230V, 400W, 4P		Three phase, 200–220V, 400W, 4P		Three phase, 200V, 550W, 4P	
Full load current	A	2.9	2.6	2.1	2.5	2.4	2.8	3.5	3.1
Weight	kg	12.0		20.0		23		33.0	
Inlet, outlet pipe diameter	mm	(Rc 3/8)		O.D. dia.16 × I.D. dia.12 (Rc 1/2)		Application tube outer diameter Φ 16		O.D. dia.26 × I.D. dia.20 (Rc 3/4)	
Ambient temperature	°C	7 – 40		0 – 40		0 – 40		0 – 40	
Overall dimensions	mm	162(W) × 266(L) × 235(H)		315(W) × 443(L) × 231(H)		316(W) × 434(L) × 231(H)		310(W) × 523(L) × 253(H)	

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
DOP-181SA	Single phase, 100V	A42002310002	✓	✓	✓
DOP-181SB	Single phase, 115V	A42002320001	✓	✓	✓
DOP-181SC	Single phase, 200V	A42002330002	✓	✓	✓
DOP-181SD	Single phase, 220V	A42002340002	✓	✓	✓
DOP-181SE	Three phase, 200—220V	A42002350002	✓	✓	✓
DOP-301SB	Three phase, 200—230V	A420D0000001	✓	✓	✓
DOP-400SB	Three phase, 200—220V	A420B0000001	✓	✓	✓
DOP-420SA	Three phase, 200V	A42001600000	✓	✓	—

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 47.

Scroll Type Dry Vacuum Pumps

DIS Series Double wrap

DIS-90 DIS-251 DIS-501

Features

- Double wrap type scroll pump which consists of 1 orbiting and 2 fixed scrolls
- Operation from atmospheric pressure is possible.
- High ultimate pressure level is attainable
- Low vibration and low noise
- Maintenance cycle can be controlled by hour meter.

Applications

- Analytical equipment
- Gas recovery system
- Coating equipment
- Back pump for TMP
- Helium leak detector
- Manufacturing process for semiconductor



DIS-90



DIS-251



DIS-501

Specifications

Model			DIS-90		DIS-251		DIS-501	
		Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Nominal pumping speed		L/min	90	108	250	300	500	600
Ultimate pressure		Pa	5.0		1.6		1.0	
Motor	Single phase		Single phase, 100/115/200/230V, 150W, 4P, Capacitor start & run		Single phase, 100/115/200/230V, 400W, 4P, Capacitor start & run		Single phase, 100/115/200/230V, 600W, 4P, Capacitor start & run	
	Three phase		—		Three phase, 200/208/230/380/400/415/460V, 400W, 4P		Three phase, 200/208/230/380/400/415/460V, 600W, 4P	
Full load current	Single phase	A	2.6/1.3/1.6 (100/200/230V)	2.1/2.2/1.1/1.1 (100/115/200/230V)	4.8/2.6/2.4 (100/200/230V)	4.8/4.3/2.8/2.4 (100/115/200/230V)	8.5/4.3/3.9 (100/200/230V)	10.0/8.6/4.8/4.0 (100/115/200/230V)
	Three phase		—	—	1.6/0.9/0.9/1.0 (200/380/400/415V)	1.9/1.9/1.8/1.0 (200/208/230/460V)	2.7/1.57/1.57/1.63 (200/380/400/415V)	2.8/2.6/2.5/1.47 (200/208/230/460V)
Weight	Single phase	kg	14.0		25.0		44.0	
	Three phase		—		23.0		38.0	
Inlet, outlet pipe diameter			Inlet pipe KF-25 Outlet pipe KF-16		Inlet pipe KF-25 Outlet pipe KF-16		Inlet pipe KF-40 Outlet pipe KF-25	
Ambient temperature		°C	5 – 40		5 – 40		5 – 40	
Water vapor handling		g/day	≤ 5 (AF open)		≤ 25 (AF open)		≤ 25 (AF open)	
Overall dimensions	Single phase	mm	214(W) × 308(L) × 225(H)		252(W) × 400(L) × 336(H)		290(W) × 443(L) × 397(H)	
	Three phase		—		252(W) × 370(L) × 336(H)		292(W) × 372(L) × 397(H)	

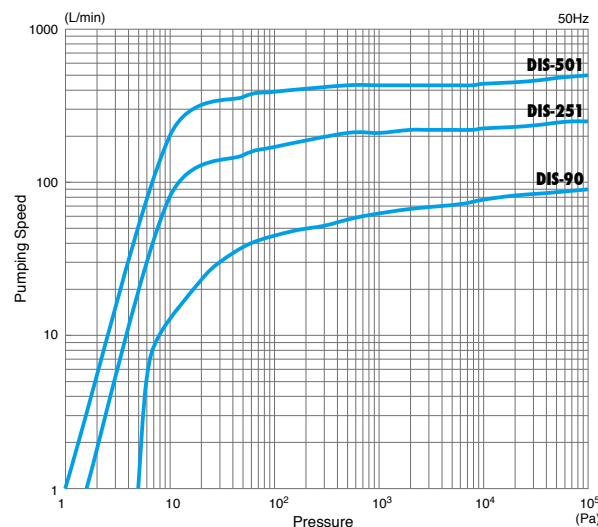
AF = Air flush

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	cTUV Marked
DIS-90	Single phase, 100—115V	A44620000001	✓	✓
	Single phase, 200—230V		✓	✓
DIS-251	Single phase, 100—115V	A44820000001	✓	✓
	Single phase, 200—230V		✓	✓
	Three phase, 200—230V	A44830000001	✓	✓
	Three phase, 380—460V		✓	✓
DIS-501	Single phase, 100—115V	A44840000001	✓	✓
	Single phase, 200—230V		✓	✓
	Three phase, 200—230V	A44850000001	✓	✓
	Three phase, 380—460V		✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 47.

Scroll Type Dry Vacuum Pumps

DISL Series

Single wrap

DISL-101 DISL-503

Features

Single wrap type scroll which consists of each 1 orbiting and fixed scroll.
Tough type scroll pump than DIS series against incoming particles and suitable for industrial use.

Applications

- Pick and transfer system
- Cleaning and drying
- Degassing / deforming
- Packaging



DISL-101



DISL-503

Specifications

Model		DISL-101		DISL-503	
	Unit	50Hz	60Hz	50Hz	60Hz
Nominal pumping speed	L/min	100	120	430	520
Ultimate pressure	Pa	20.0		30.0	
Motor		Single phase, 100/115/200/230V, 300W, 2P, Capacitor start & run		Three phase, 200/380/400/415V, 900W, 2P	Three phase, 200/208/230/460V, 1100W, 2P
Full load current	A	3.2/1.6/2.0 (100/200/230V)	3.7/3.4/1.8/1.7 (100/115/200/230V)	3.6/1.9/1.9/1.8 (200/380/400/415V)	4.2/4.1/3.9/1.95 (200/208/230/460V)
Weight	kg	15.0		36.0	
Inlet, outlet pipe diameter		Inlet pipe KF-25 Outlet pipe KF-16		KF-25	
Ambient temperature	°C	5 – 40		5 – 40	
Water vapor handling	g/day	≤ 100 (AF open)		≤ 250 (AF open)	
Overall dimensions	mm	210(W) × 360(L) × 215(H)		317(W) × 521(L) × 280(H)	

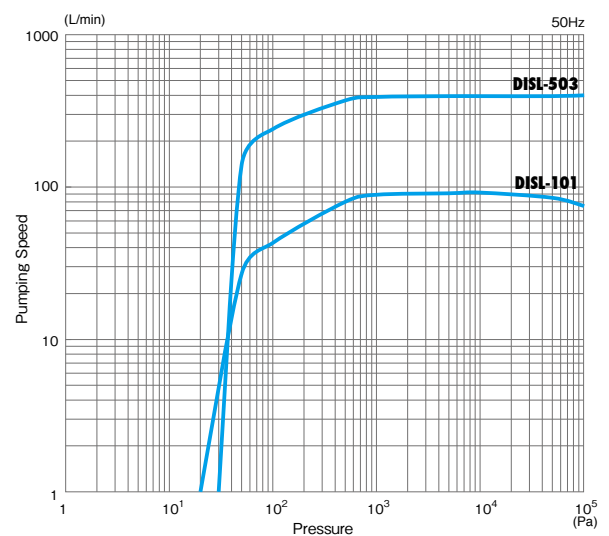
AF = Air flush

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	cTUV Marked
DISL-101	Single phase, 100—115V	A44650000001	✓	✓
	Single phase, 200—230V		✓	✓
DISL-503	Three phase, 200—230V	A44970100001	✓	✓
	Three phase, 380—460V		✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



Multi-Stage Roots Type Dry Vacuum Pump

RDA Series

RDA-281HA RDA-501HA

Features

- Large exhaust and compact size.
- Oil free pump. No oil mist exhaust and oil back flow.
- Extended lifetime because there is no contact between rotor and cylinder.

Applications

- Analytical equipment
- Gas recovery system
- Coating equipment
- Back pump for TMP
- Helium leak detector
- Manufacturing process for semiconductor



RDA-281HA



RDA-501HA

Specifications

Model			RDA-281HA	RDA-501HA
Actual pumping speed		L/min	280	500
Ultimate pressure		Pa	F.A. close $\leq 8.0 \times 10^{-2}$ F.A. open ≤ 6.0	
Moter			720W + 10W DC Motor	
Power supply		V	Single phase 100 – 115V 200 – 240V Three phase 200 – 240V	
Full load current	Single phase	A	10A/5A (100 – 115V/200 – 240V)	
	Three phase		5A (200 – 240)	
Weight		kg	38	
Inlet, outlet pipe diameter			KF-25	
Ambient temperature		°C	5 – 40	
Water capability		g/hr	≤ 300	
Overall dimensions		mm	180(W) × 588(L) × 377(H)	

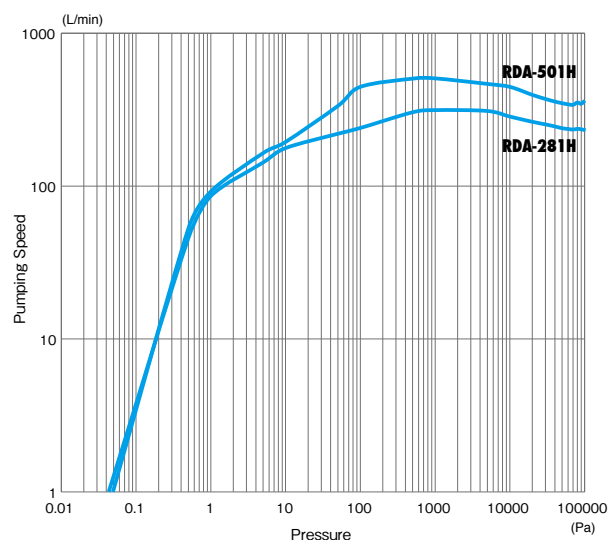
F.A. = Flush. Air.

Corresponding voltage and Certificate

Model	Voltage	Order code	CE Marked	TUV Marked	cTUVus Marked
RDA-281H	Single phase, 100—115V/200—240V	A44990100000	—	—	—
	Three phase, 200—240V				
RDA-281HA	Single phase, 100—115V/200—240V	A44991100000	✓	—	✓
	Three phase, 200—240V				
RDA-501H	Single phase, 100—115V/200—240V	A44995100000	—	—	—
	Three phase, 200—240V				
RDA-501HA	Single phase, 100—115V/200—240V	A44996100000	✓	—	✓
	Three phase, 200—240V				

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 48.

Oil-Sealed Rotary Vacuum Pumps

GLD Series

GLD-040 GLD-137AA GLD-137CC

Features

GLD series features high performance, low vibration and noise and several functions such as gas ballast valve, oil-back-flow prevention mechanism, and large sized oil level gauge. This series equips multi-voltage motor and correspondent to international standard.

Applications

- Chemical, science experiment, Analyzer and Laser system
- Vacuum pumping system
- Backing pumps for the electronic microscope
- Semiconductor equipment, sputtering equipment, vacuum evaporation equipment
- Vacuum dryer, freeze dryer



GLD-040



GLD-137AA



GLD-137CC

Specifications

Model		GLD-040		GLD-137AA		GLD-137CC	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	40	48	135	162	135	162
Ultimate pressure*	Pa	G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7	
Motor		Single phase, 200W, 4P, Multiple-range motor Capacitor start & run, 100 – 120V/200 – 240V		Three phase, 400W, 4P, Multiple-range motor 200 – 240V/380 – 460V		Single phase, 400W, 4P, Multiple-range motor Capacitor start & run, 100 – 120V/200 – 240V	
Full load current	A	4.20 (100V), 4.40 (110V) 4.60 (115V), 5.05 (120V) 2.10 (200V), 2.20 (220V) 2.30 (230V), 2.60 (240V)	3.60 (100V), 3.40 (110V) 3.40 (115V), 3.60 (120V) 1.80 (200V), 1.70 (220V) 1.70 (230V), 1.80 (240V)	2.10 (200V), 2.20 (220V) 2.30 (230V), 2.50 (240V) 1.30 (380V), 1.30 (400V) 1.40 (415V)	2.00 (200V), 1.90 (220V) 1.90 (230V), 2.00 (240V) 1.10 (380V), 1.10 (400V) 1.15 (440V), 1.20 (460V)	6.8 (100 – 120V) 3.5 (200 – 240V)	5.8 (100 – 120V) 2.9 (200 – 240V)
Oil capacity	mL	550 – 800		1,000		1,000	
Recommended oil		R-2		SMR-100		SMR-100	
Weight	kg	16.0		26.0		29.0	
Inlet port diameter	mm	KF-25		KF-25		KF-25	
Ambient temperature	°C	7 – 40		7 – 40		7 – 40	
Overall dimensions	mm	150(W) × 427(L) × 227.5(H)		170(W) × 485.5(L) × 240(H)		170(W) × 487.5(L) × 249.5(H)	

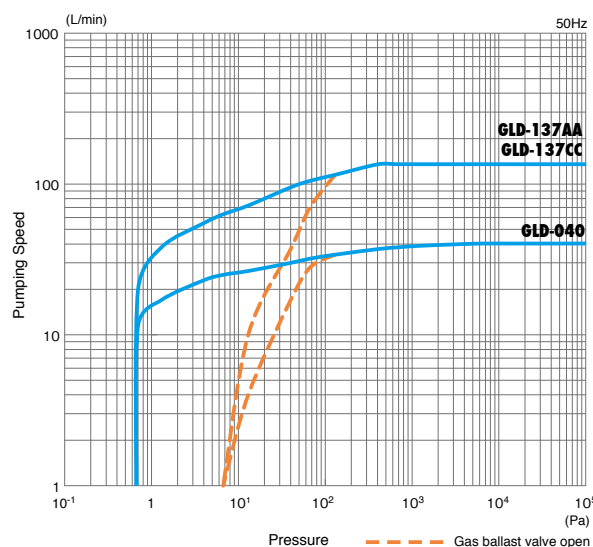
* : Ultimate pressure is measured by Pirani gauge. (In case of macleod gauge, the rate is one digit smaller than this rate.)

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
GLD-040	Single phase, 100–120V	A41840600000	✓	✓	✓
	Single phase, 200–240V	A41840800000	✓	✓	✓
GLD-137AA	Three phase, 200–240V	A46220000000	✓	✓	—
	Three phase, 380–460V	A46220100000	✓	✓	—
GLD-137CC	Single phase, 100–120V	A46230100000	✓	✓	✓
	Single phase, 200–240V	A46230400000	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 48.

Oil-Sealed Rotary Vacuum Pumps

GLD Series

GLD-202AA GLD-202BB GLD-280A

Features

GLD series features high performance, low vibration and noise and several functions such as gas ballast valve, oil-back-flow prevention mechanism, and large sized oil level gauge. This series equips multi-voltage motor and correspondent to international standard.

Applications

- Chemical science experiment, Analyzer and Laser system
- Vacuum pumping system
- Back pump for the electronic microscope
- Semiconductor equipment, sputtering equipment, vacuum evaporation equipment
- Vacuum dryer, freeze dryer



GLD-202AA



GLD-202BB



GLD-280A

Specifications

Model	Unit	GLD-202AA		GLD-202BB		GLD-280A	
		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	200	240	200	240	280	336
Ultimate pressure *	Pa	G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7	
Motor		Three phase, 550W, 4P, Multiple-range motor 200 – 240V/380 – 460V		Single phase, 550W, 4P, Multiple-range motor Capacitor start & run, 100 – 120V/200 – 240V		Three phase, 750W, 4P, Multiple-range motor 200 – 240V/380 – 460V	
Full load current	A	3.00 (200V) 3.10 (220V) 3.30 (230V) 3.60 (240V) 1.80 (380V) 1.90 (400V) 2.00 (415V)	2.70 (200V) 2.70 (220V) 2.70 (230V) 2.80 (240V) 1.50 (380V) 1.60 (400V) 1.70 (440V) 1.70 (460V)	8.2 (100-120V) 4.1 (200-240V)	7.9 (100-120V) 3.9 (200-240V)	3.6 (200V) 3.7 (220V) 4.0 (230V) 4.2 (240V) 2.1 (380V) 2.3 (400V) 2.4 (415V)	3.3 (200V) 3.2 (220V) 3.2 (230V) 3.2 (240V) 1.9 (380V) 1.9 (400V) 1.9 (440V) 2.0 (460V)
Oil capacity	mL	1,100		1,100		700 – 1,100	
Recommended oil		SMR-100		SMR-100		R-7	
Weight	kg	29.0		31.0		34.5	
Inlet port diameter	mm	KF-25		KF-25		KF-25	
Ambient temperature	°C	7 – 40		7 – 40		7 – 40	
Overall dimensions	mm	170(W) × 513.5(L) × 240(H)		170(W) × 515.5(L) × 249.5(H)		181(W) × 536(L) × 269(H)	

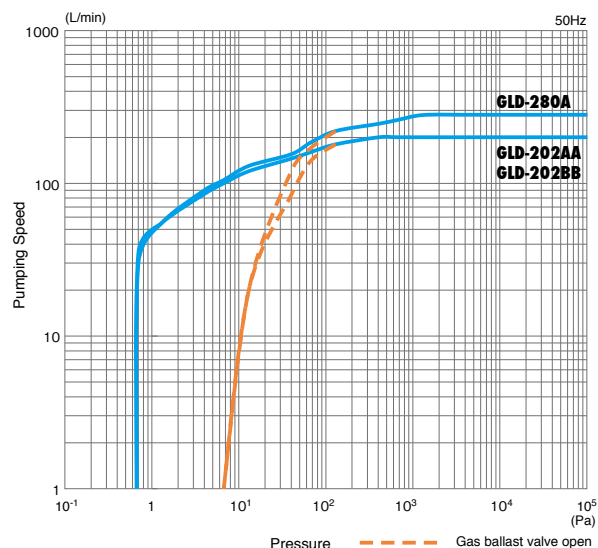
* : Ultimate pressure is measured by Pirani gauge. (In case of macleod gauge, the rate is one digit smaller than this rate.)

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
GLD-202AA	Three phase, 200–240V	A46240000000	✓	✓	—
	Three phase, 380–460V	A46240100000	✓	✓	—
GLD-202BB	Single phase, 100–120V	A46250100000	✓	✓	✓
	Single phase, 200–240V	A46250400000	✓	✓	✓
GLD-280A	Three phase, 200–240V	A46200000002	✓	✓	—
	Three phase, 380–460V	A46200100001	✓	✓	—

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 48 – 49.

Oil-Sealed Rotary Vacuum Pumps

GHD Series

GHD-031 GHD-101

Features

- Wide range voltage motor and correspond to CE, cTUVus
- Magnet coupling for no oil leakage from shaft seal and realized longer lifetime.
- Integrated check valve below the inlet port for backflow prevention.

Applications

- Helium leak detector
- Analytical equipment (GC/MS, ICP/MS, LC/MS)
- Laboratory experiment



GHD-031B



GHD-101D

Specifications

Model	Unit	GHD-031B		GHD-101D	
		50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	30	36	100	120
Ultimate pressure*	Pa	0.67		G.V. Closed : 0.67 G.V. Open : 6.7	
Motor		Single phase, 200 – 240V, 100W, 2P, Capacitor run		Single phase, 220 – 240V	
Full load current	A	0.94 (200V) 0.84 (240V)	1.02 (200V) 1.03 (240V)	2.5	2.7
Oil capacity	mL	370		1,000	
Recommended oil		R-2		R-2	
Weight	kg	9.3		22.0	
Inlet port diameter	mm	KF-16		KF-25	
Ambient temperature	°C	7 – 40		7 – 40	
Overall dimensions	mm	120(W) × 288.5(L) × 163(H)		150(W) × 413.5(L) × 234.5(H)	

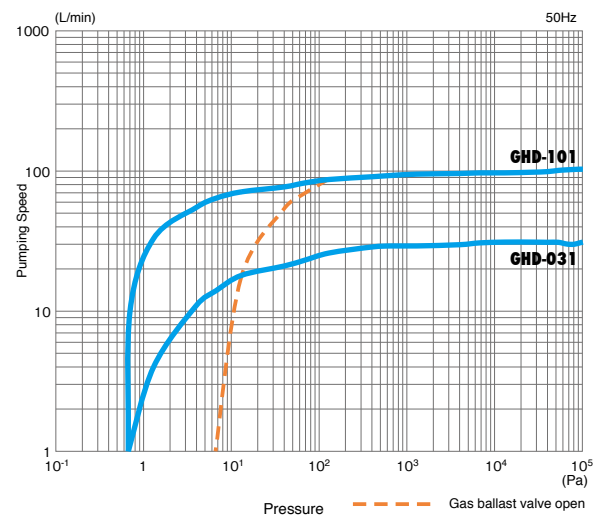
* : Ultimate pressure is measured by Pirani gauge.
(In case of macleod gauge, the rate is one digit smaller than this rate.)

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
GHD-031A	Single phase, 100–120V	A41000311002	✓	✓	✓
GHD-031B	Single phase, 200–240V	A41000322002	✓	✓	✓
GHD-101A	Single phase, 100V	A41000904000	✓	✓	✓
GHD-101B	Single phase, 115–120V	A41000915000	✓	✓	✓
GHD-101C	Single phase, 200V	A41000925000	✓	✓	✓
GHD-101D	Single phase, 220–230V	A41000935000	✓	✓	✓

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 49.

Mechanical Booster Pump

MBS Series

MBS-053

Features

- Lower power consumption
- No oil leakage by adoption of magnet coupling
- Compact size and light weight
- Pumping can be started from atmospheric pressure.
- Correspondable to both 100V and 200V series voltage by switching inside driver circuit.

Applications

- Ideal main pump to support pumping speed of backing pump



MBS-053

Specifications

Model	Unit	MBS-053
Actual pumping speed ^{*1}	m ³ /h	50
Ultimate pressure ^{*2}	Pa	4.0×10^{-2}
Motor		DC Brushless motor, 200W
Power supply		Single phase, 100 – 120V / 200 – 240V (50/60Hz)
Motor speed	r/min	3500
Current	A	1.2 (100V)/0.8 (200V) (At ultimate pressure) 4.33 (100V)/2.54 (200V) (At maximum load)
Power consumption	W	50 (At ultimate pressure) 250 (At maximum load)
Oil capacity	mL	70
Recommended oil		SMR-200
Weight	kg	11.0
Inlet pipe diameter		JIS VG-40
Outlet pipe diameter		JIS VF-40
Backing pump		Oil rotary vacuum pump 130 – 240L/min
Ambient temperature	°C	0 – 40
Overall dimensions	mm	167(W) × 410(L) × 130(H)

* 1 : Pumping speed varies depends on pumping speed of backing pump.

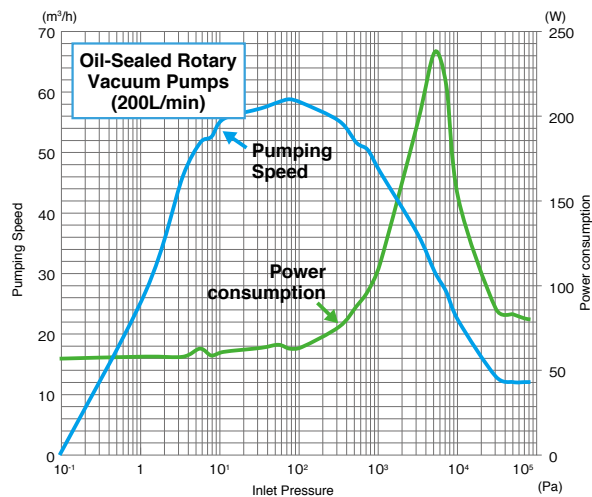
* 2 : Measured by ionization vacuum gauge. Ultimate pressure varies depends on ultimate pressure of backing pump.

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
MBS-053	Single phase, 100–120V	A41000800501	✓	✓	—
	Single phase, 200–240V	A41000810502	✓	✓	—

— : Not Available, ✓ : Available

Pumping speed curves



* : Significantly increases pumping speed in a pressure range where pumping speed of backing pump often drops.

* Further details can be found on our website. Outside drawing appears in Page 49.

Oil-Sealed Rotary Vacuum Pumps

GCD Series

GCD-051X GCD-136X GCD-201X

Features

GCD Series, direct drive, oil rotary vacuum pump is corrosion resistant for toxic and corrosive gases which is ideal for chemical, pharmaceutical applications.

Surface of gas contacted parts are coated with hard plating. Three different sizes are available from 50L to 200L/min

Applications

- Semiconductor industry
- Chemical industry
- Post chemical-treatment drying
- Pharmaceutical industry



GCD-051X



GCD-136X



GCD-201X

Specifications

Model		GCD-051X		GCD-136X		GCD-201X	
	Unit	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Actual pumping speed	L/min	50	60	135	162	200	240
Ultimate pressure*	Pa	G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7		G.V. Closed : 0.67 G.V. Open : 6.7	
Motor		Single phase, 220 – 230V, 200W, 4P Split phase starting		Single phase, 220V, 400W, 4P Capacitor start & run		Shingle phase, 220V, 550W, 4P Capacitor start & run	
Full load current	A	2.4/2.5 (220/230V)	2.0	3.6	2.8	3.6	3.3
Oil capacity	mL	500 – 800		1,000		1,100	
Recommended oil		SO-M		SO-M		SO-M	
Weight	kg	14.1		25.4		29.4	
Inlet port diameter	mm	KF-25		KF-25		KF-25	
Ambient temperature	°C	7 – 40		7 – 40		7 – 40	
Overall dimensions	mm	165.5(W) × 419(L) × 222.7(H)		170(W) × 493(L) × 241.1(H)		170(W) × 541.5(L) × 241.1(H)	

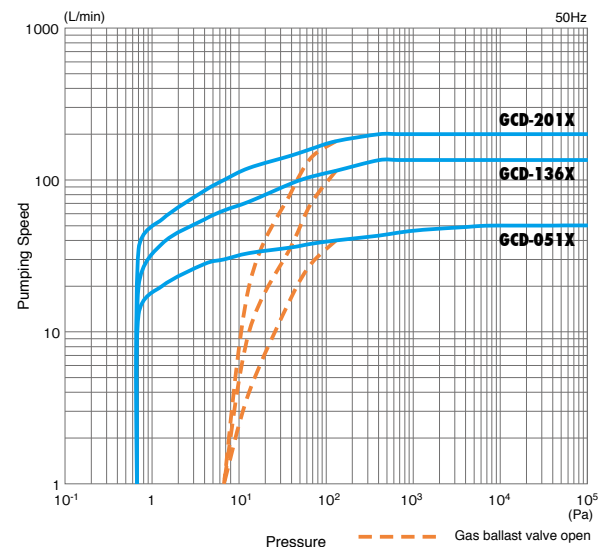
* : Ultimate pressure is measured by Pirani gauge. (In case of macleod gauge, the rate is one digit smaller than this rate.)

Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
GCD-051X	Single phase, 100V	A41778000001	—	—	—
	Single phase, 200V	A41778100000	—	—	—
	Single phase, 220-230V	A41778200000	—	—	—
GCD-136X	Single phase, 100V	A41780000006	—	—	—
	Single phase, 200V	A41780000001	—	—	—
	Single phase, 220V	A41780000002	—	—	—
	Three phase, 200V	A41780000003	—	—	—
GCD-201X	Single phase, 100V	A41790000001	—	—	—
	Single phase, 200V	A41790000005	—	—	—
	Single phase, 220V	A41790000002	—	—	—
	Three phase, 200V	A41790000007	—	—	—

— : Not Available, ✓ : Available

Pumping speed curves



* Further details can be found on our website. Outside drawing appears in Page 49.

Turbo Molecular Pumping System

VPT Series

VPT-060

Features

1. Completely dry pumping unit
2. Compact installation space

Applications

- Analytical/scientific equipments
- Medical/Pharmaceutical equipments
- Suitable for clean vacuum environment

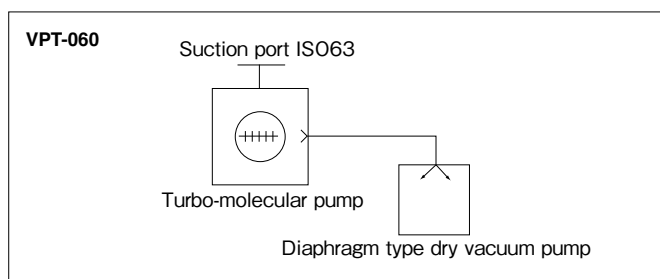


VPT-060

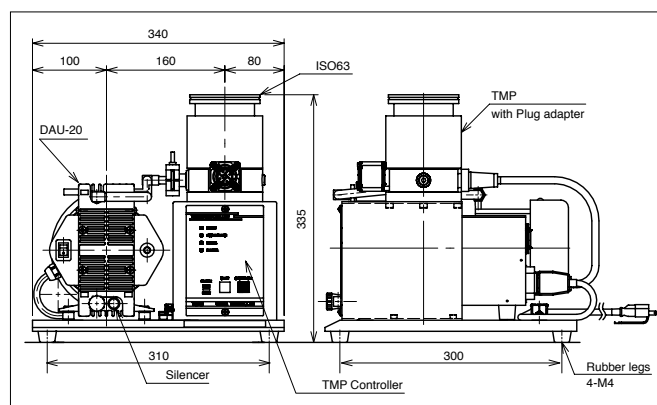
Specifications

Model	VPT-060
Ultimate pressure	10^{-5} Pa
Main pump	Turbo molecular pump (air cooling) 60L/sec
Backing pump	Diaphragm type dry vacuum pumps 20L/min
Inlet flange	ISO63 (Option : KF-40)
Power required	Single phase, 50/60Hz, 220V, 0.32kVA
Weight	17kg
Overall dimensions	340mm(W) × 340mm(D) × 355mm(H)
Order Code	A53021000502

Exhaust System Drawing



Outside drawing



Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
VPT-060	Single phase, 100V	A53021000000	—	—	—
	Single phase, 220V	A53021000502	—	—	—

— : Not Available, ✓ : Available

* Further details can be found on our website.

Mechanical Booster Pumping Systems

VMR Series

VMR-050

Features

1. Pumping speed can be increased significantly in the pressure range where backing pump pumping speed is decreased.
2. Compact installation space
3. Pumping can be started with a start button from atmospheric pressure to ultimate pressure.

Applications

- Rotary evaporator
- Centrifugal evaporator
- Vacuum filtration

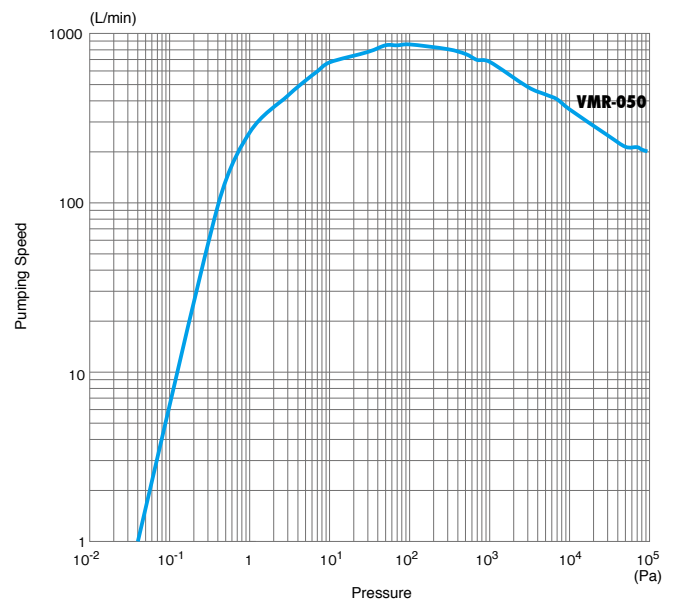


VMR-050

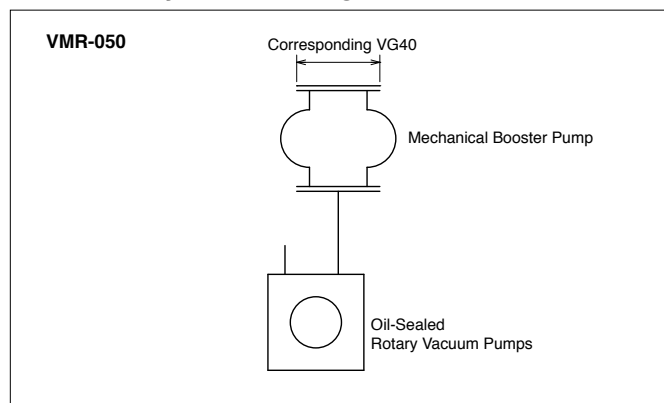
Specifications

Model	VMR-050	
Ultimate pressure	4.0×10 ⁻² Pa	
Main pump	Mechanical booster pump 833 L/min (at 100Pa)	
Backing pump	Oil rotary vacuum pump 200 L/min	
Inlet flange	VG-40	
Power required	Single phase, 50/60Hz, 100 – 120V/200 – 240V, 1.5kVA	
Weight	42kg	
Overall dimensions	100–120V	241.4mm(W) × 532mm(D) × 399mm(H)
	200–240V	241.4mm(W) × 581mm(D) × 399mm(H)

Pumping speed curve



Exhaust System Drawing

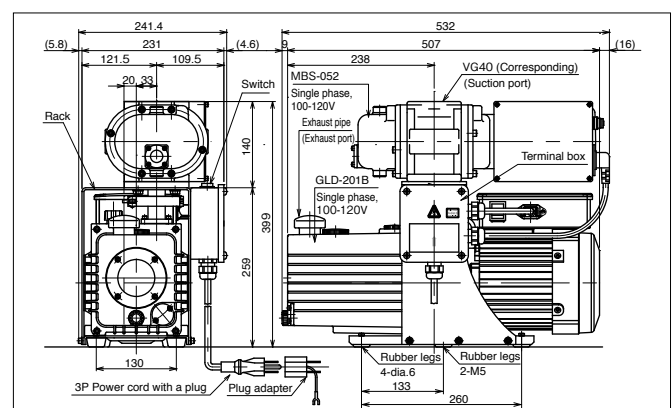


Corresponding voltage and Certificate

Model	Voltage	Order Code	CE Marked	TUV Marked	cTUVus Marked
VMR-050	Single phase, 100–120V	A43510000002	—	—	—
	Single phase, 200–240V	A43520000002	—	—	—

— : Not Available, ✓ : Available

Outside drawing



High Vacuum Pumping Systems

VPC Series

VPC-051 VPC-051A VPC-250F

Features

1. Compact installation space
2. Vacuum chamber can be opened without stopping a main pump.
3. Air-cooled type oil diffusion pump is used and cooling water is not necessary.
4. Main pump is protected by an automatic leak valve in case of a power failure.
5. Easy to move by installed caster

Applications

- Analytical equipment
- Laboratory experiment
- Vacuum evaporation equipment



VPC-051



VPC-051A



VPC-250F

Specifications

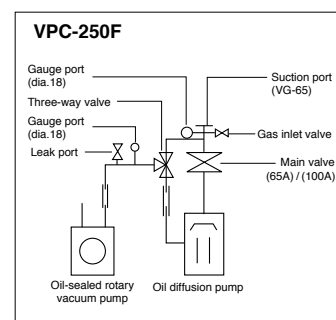
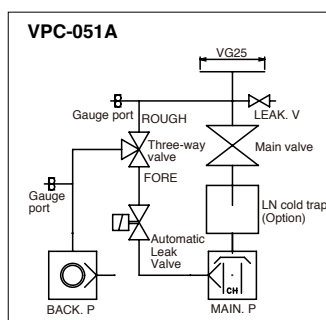
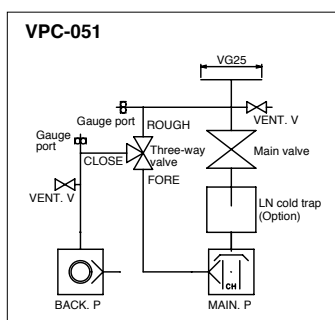
Model	VPC-051	VPC-051A	VPC-250F
Ultimate pressure	7.0×10^{-4} Pa 1.5×10^{-4} Pa (LN ₂)	7.0×10^{-4} Pa 1.5×10^{-4} Pa (LN ₂)	10^{-4} Pa 10^{-5} Pa (LN ₂)
Main pump	Oil diffusion pump (air cooling) 50 L/sec	Oil diffusion pump (air cooling) 50 L/sec	Oil diffusion pump (air cooling) 200 L/sec
Backing pump	Oil rotary vacuum pump 20 L/min	Oil rotary vacuum pump 20 L/min	Oil rotary vacuum pump 100 L/min
Main valve	25A Butterfly valve	25A Butterfly valve	65A Butterfly valve
Sub valve	Three way valve	Three way valve	Three way valve
Inlet flange	VG-25	VG-25	VG-65
Power required	Single phase, 50/60Hz, 100V, 0.63kVA	Single phase, 50/60Hz, 100V, 0.63kVA	Single phase, 50/60Hz, 100V, 1.35kVA
Weight	20kg	20kg	55kg
Overall dimensions	350mm(W) × 320mm(D) × 461mm(H)	350mm(W) × 320mm(D) × 461mm(H)	530mm(W) × 537mm(D) × 735mm(H)
Order Code	A43032000000	A43042000000	A43060000000

* : Ionization vacuum gauge · Pirani vacuum gauge · LN cold trap · Conversion flange · Oil mist trap are options.

Oil diffusion pump

Model	DPF-050	DPF-200
Ultimate pressure	10^{-5} Pa	10^{-5} Pa
Maximum evacuation capacity	50 L/sec	200 L/sec
Critical back-pressure	13 Pa	20 Pa
Required power	Single phase, 50/60Hz, 100V, 0.25kW	Single phase, 50/60Hz, 100V, 0.45kW
Recommended oil	SY 20 cc	SX 70 cc
Weight	1.8 kg	5.0 kg
Inlet flange	VG-25	VG-65
Outlet flange	dia.14mm	dia.27mm
Cooling method	air cooling	air cooling

Exhaust System Drawing



* Further details can be found on our website.

High Vacuum Pumping Systems

DEPOX Series

VFR-200M/X VWR-400M/X VTR-350M/X VTS-350M/X

Features

1. Easy to move by installed caster
2. System safeness is ensured with installed adjuster.
3. Vacuum chamber can be opened without stopping a main pump.
4. Optional parts (Vacuum gauge) can be installed to the same rack.

Applications

- Analytical equipment
- Laboratory experiment
- Vacuum evaporation equipment



VFR-200M/X



VWR-400M/X



VTR-350M/X



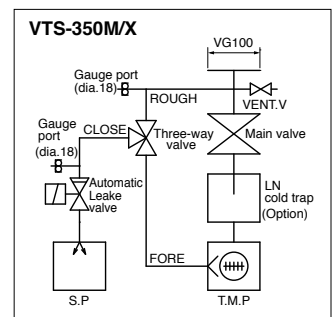
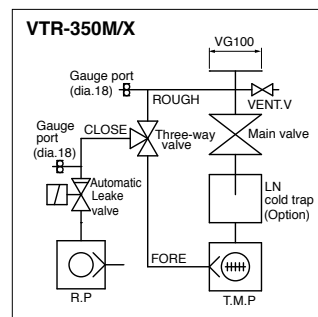
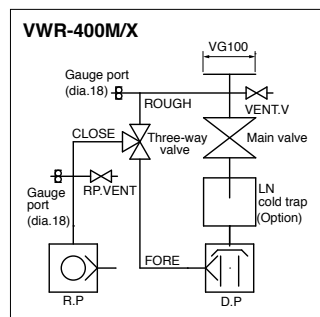
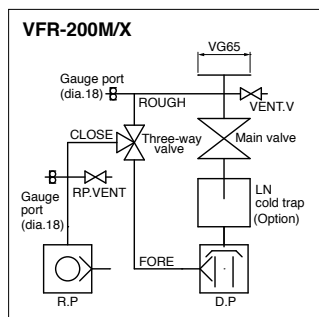
VTS-350M/X

Specifications

Model	VFR-200M/X	VWR-400M/X	VTR-350M/X	VTS-350M/X
Ultimate pressure	10 ⁻⁴ Pa 10 ⁻⁵ Pa (LN ₂)	10 ⁻⁴ Pa 10 ⁻⁵ Pa (LN ₂)	10 ⁻⁴ Pa 10 ⁻⁵ Pa (LN ₂)	10 ⁻⁴ Pa 10 ⁻⁵ Pa (LN ₂)
Main pump	Oil diffusion pump (air cooling) 200L/sec	Oil diffusion pump (water cooling) 400L/sec	Turbo molecular pump (air cooling) 345L/sec	Turbo molecular pump (air cooling) 345L/sec
Backing pump	Oil rotary vacuum pump 100L/min	Oil rotary vacuum pump 200L/min	Oil rotary vacuum pump 200L/min	Scroll pump 250L/min
Main valve	65A Butterfly valve	100A Butterfly valve	100A Butterfly valve	100A Butterfly valve
Sub valve	Three way valve	Three way valve	Three way valve	Three way valve
Inlet flange	VG-65	VG-100	VG-100	VG-100
Power required	Single phase, 50/60Hz, 100V, 1.4kVA	Single phase, 50/60Hz, 100V, 1.6kVA	Single phase, 50/60Hz, 100V, 1.4kVA	Single phase, 50/60Hz, 100V, 0.9kVA
Weight	120kg	140kg	140kg	135kg
Overall dimensions	730mm(W) × 584mm(D) × 804mm(H)	730mm(W) × 673mm(D) × 804mm(H)	730mm(W) × 584mm(D) × 804mm(H)	730mm(W) × 584mm(D) × 804mm(H)
Order Code	A43500100000	A43500300000	A43500600000	A43501200000

* : Ionization vacuum gauge · Pirani vacuum gauge · LN cold trap · Conversion flange · Oil mist trap are options.

Exhaust System Drawing



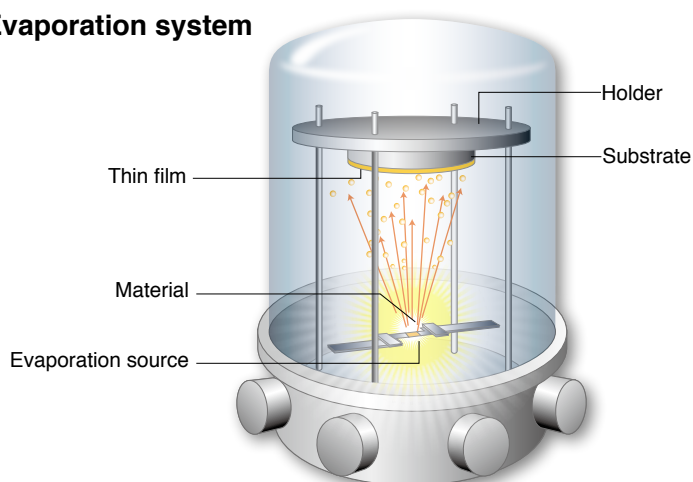
* Further details can be found on our website.

● Vacuum coating method basics

1. Vacuum evaporation principle (Resistance heating method)

Vacuum evaporation is a method used to create thin films by the condensation and deposition of vaporized atoms and molecules directly from an evaporation source (materials such as compounds or metals) onto a compatible workpiece surface by heating the evaporation source in a high vacuum environment.

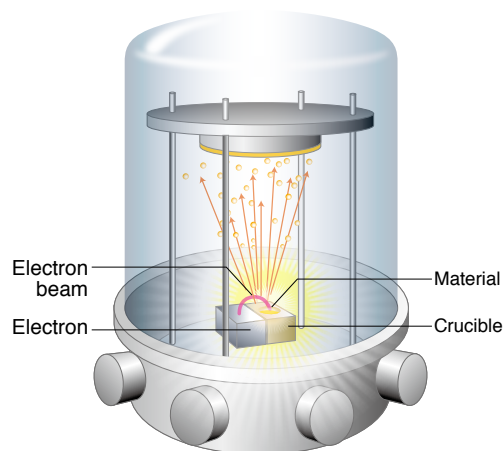
■ Evaporation system



2. Vacuum evaporation principle (Electron beam method)

Electron beam evaporation is a method used to create thin films by the condensation and deposition of vaporized atoms and molecules directly from an evaporation source (materials such as compounds or metals) onto a compatible workpiece surface by irradiating and heating the evaporation source with an electron beam in a high vacuum environment.

Electron beam vacuum evaporation is widely used because it can easily deposit high-melting point material, and allows deposition material to be thinly deposited at a high rate.



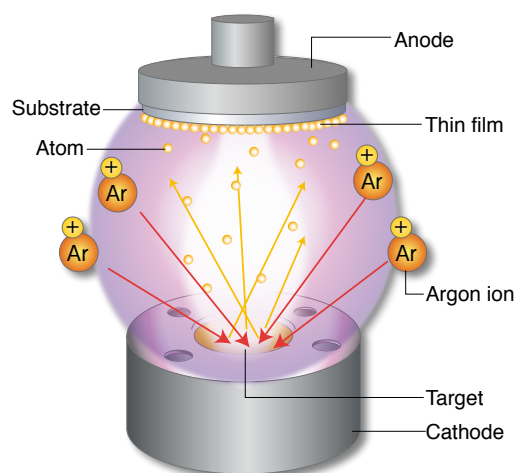
3. Sputtering method principle

Sputtering is a process whereby cathode surface atoms are ejected due to the bombardment of the cathode surface (target) by fast moving positive ions. The phenomenon of sputtering is a method for creating thin films.

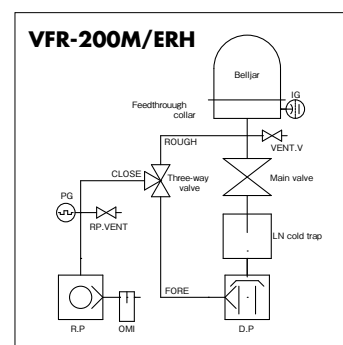
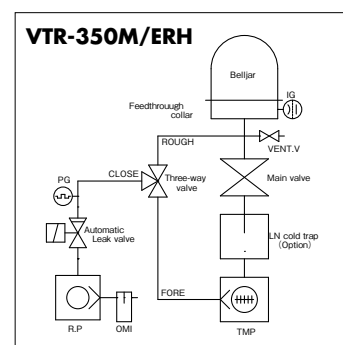
With basic sputtering, first argon plasma is introduced in order to create argon (Ar) ions. Momentum exchange occurs between the Ar ions flying about the target surface of a base material. The target atoms (thin film material) then adhere to the substrate.

A characteristic of the sputtering method is that the atoms of the target material have momentum and so dense films are possible even for environments with fairly high gas pressure (about 1 to 0.1Pa). Moreover, heating is unnecessary, meaning, it is a technology that allows films to be made even for materials with high melting points.

■ Sputtering system

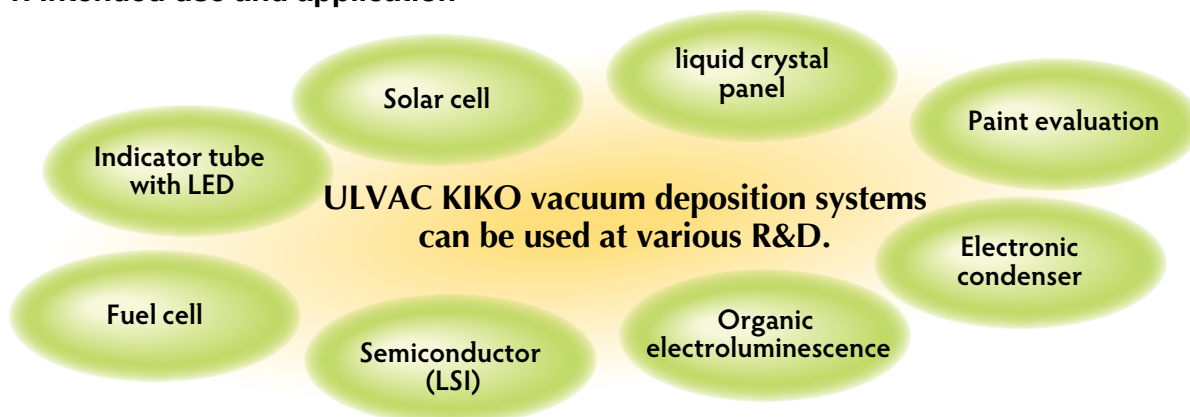


■ Exhaust System Drawing

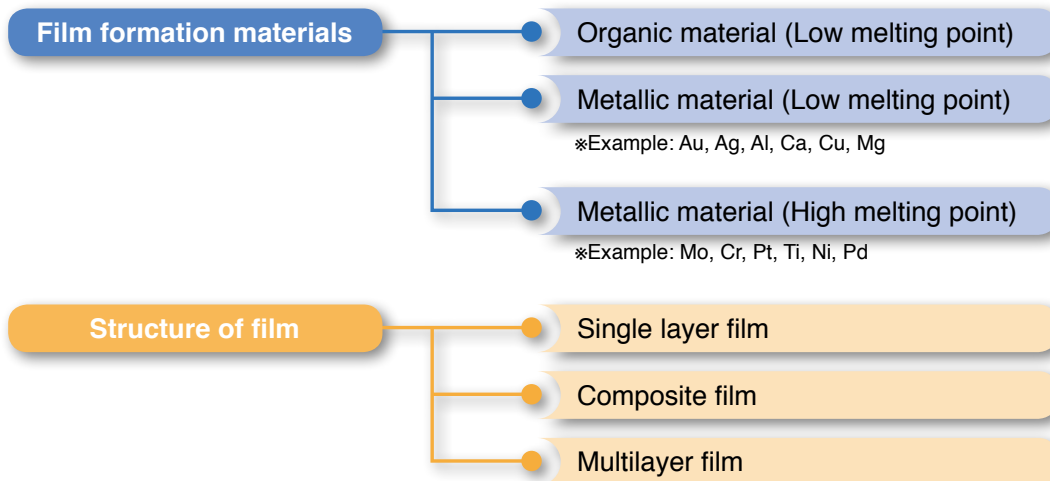


● Vacuum Coater Selection Guide

1. Intended use and application



2. Film formation materials / film thickness / substrate size



Substrate size, amount

		Vacuum coater (Resistance heating)				Sputtering	
		VPC-061/061A	DEPOX series VPC-260F	VPC-1100	VTR-060M/ERH	RFS-201	VTR-151M/SRF
Film formation materials	Organic material (Low melting point)	○				-	
	Metallic material (Low melting point)	✓				✓	
	Metallic material (High melting point)	△				✓	
Structure of film	Single layer film	✓				✓	
	Composite film	-	○			-	
	Multilayer film	-	○	✓	○	-	✓
	Standard number of film layers (Max.※)	1	1 (4)	3 (5)	1 (3)	1	3
Substrate size	Recommended size (Max.)	sq.25mm (sq.50mm)	sq.50mm (sq.140mm)	sq.50mm (sq.220mm)	sq.50mm (sq.120mm)	dia.80mm	dia.50.8mm

※ : Optional

✓ : Possible ○ : Possible with option △ : Difficult - : Impossible

· Substrate size may be fluctuated depends on customers conditions such as the number of electrodes, mounting position, material and pressure.

● Resistance heating evaporation sources

Evaporation sources to heat the evaporation source material are offered in boat, filament, and crucible types.

You have to choose the evaporation source depending on the type and shape of intended film deposition materials.

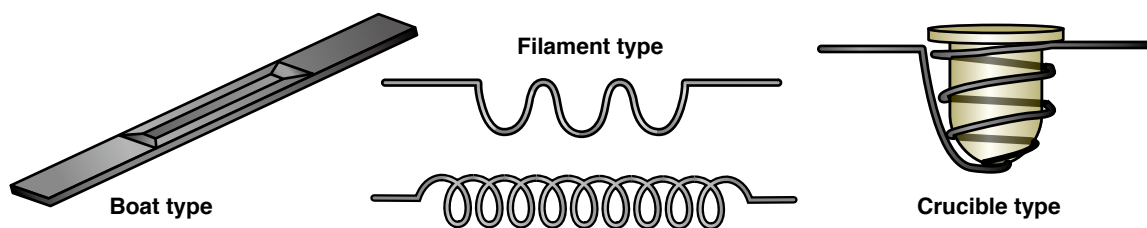
● Example for materials

Ag / Al / Au / Cu / Dy / Ni / Pt / Ti / Alq3 / NPB / LiF, etc.

✳️ Electron beam method is recommended for the material with a high melting point.

✳️ Deposition conditions may differ depends on specifications, shapes, etc.

■ Resistance heating evaporation source



● Precautions when installing sputtering equipment

Sputtering equipment utilizes high-frequencies and therefore falls under the laws and regulations in each country.

Kindly check the laws and regulations before installation.



Vacuum Coater

VPC Series

VPC-061 VPC-061A VPC-260F

Features

1. Compact installation space
2. Easy viewable through glass belljar and easy maintenance
3. Vacuum chamber can be opened without stopping a main pump.
4. Main pump is protected by an automatic leak valve in case of a power failure.

Applications

- Basic R&D for Electronic material, Semiconductor, solar cell
- R&D of thin film for layer and organic EL



VPC-061



VPC-061A



VPC-260F

Specifications

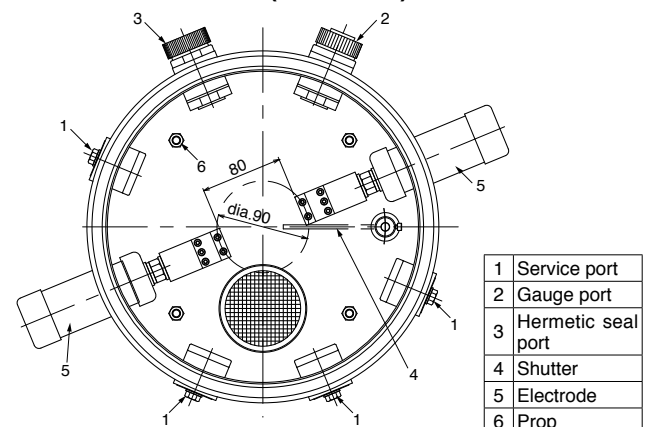
Model	VPC-061	VPC-061A	VPC-260F
Ultimate pressure	1.3×10 ⁻³ Pa 6.6×10 ⁻⁴ Pa (LN ₂)	1.3×10 ⁻³ Pa 6.6×10 ⁻⁴ Pa (LN ₂)	1.3×10 ⁻³ Pa 6.6×10 ⁻⁴ Pa (LN ₂)
Evacuation time	4.0×10 ⁻³ Pa/20min 1.3×10 ⁻³ Pa/20min (LN ₂)	4.0×10 ⁻³ Pa/20min 1.3×10 ⁻³ Pa/20min (LN ₂)	4.0×10 ⁻³ Pa/20min 1.3×10 ⁻³ Pa/20min (LN ₂)
Bell jar size	Glass belljar (dia.150mm × 200mm(H))	Glass belljar (dia.150mm × 200mm(H))	Glass belljar (dia.300mm × 300mm(H))
Substrate electrode distance	Max 100mm	Max 100mm	Max 200mm
Evaporation electrode structure	1 point	1 point	1 point
Evaporation power supply	0 – 10V 150A (Max)	0 – 10V 150A (Max)	0 – 10V 150A (Max)
Main pump	Oil diffusion pump (Air cooling) 50L/sec	Oil diffusion pump (Air cooling) 50L/sec	Oil diffusion pump (Air cooling) 200L/sec
Backing pump	Oil rotary vacuum pump 20 L/min	Oil rotary vacuum pump 20 L/min	Oil rotary pump 100 L/min
Liquid Nitrogen trap	Equipped	Equipped	Equipped
Automatic leak valve	–	Equipped	Option
Control system	Manual control	Manual control	Manual control
Weight (Body)	28kg	32kg	75kg
(Power supply)	40kg	40kg	40kg
Overall dimensions (Body)	434mm(W) × 422mm(D) × 673mm(H)	434mm(W) × 422mm(D) × 673mm(H)	530mm(W) × 550mm(D) × 1135mm(H)
(Power supply)	480mm(W) × 435.3mm(D) × 149mm(H)	480mm(W) × 435.3mm(D) × 149mm(H)	480mm(W) × 435.3mm(D) × 149mm(H)
Power required (Body)	Single phase, 50/60Hz, 100V, 0.63kVA	Single phase, 50/60Hz, 100V, 0.63kVA	Single phase, 50/60Hz, 100V, 1.35kVA
(Power supply)	Single phase, 50/60Hz, 200V, 1.5kVA	Single phase, 50/60Hz, 200V, 1.5kVA	Single phase, 50/60Hz, 200V, 1.5kVA
Order Code	A43182000000	A43192000000	A43210000000

Optional Parts

(for VPC-260F, * : It can be used for VPC-061 and VPC-061A)

Electrode structure options	<ul style="list-style-type: none"> 2 points switch 2 points 3 points switch 	<ul style="list-style-type: none"> 3 points 1 point + 2 points switch 2 points + 2 points
Feed through collar	16 ports (Side 16)	
Vacuum chamber	<ul style="list-style-type: none"> Bell jar holder Bell jar cover* 	<ul style="list-style-type: none"> Metal Bell jar
Accessories for inner vacuum chamber	<ul style="list-style-type: none"> Sample holder* Adhesion shield plate Electrode partition Gauge port set Hermetic port set Sealing flange set 	<ul style="list-style-type: none"> UFC070 Adapter KF-25 Adapter Gas introduction port Carbon electrode set Substrate heating device 350 degrees C
System exterior	<ul style="list-style-type: none"> Deposition controller 	<ul style="list-style-type: none"> Control panel
Vacuum gauge	<ul style="list-style-type: none"> Pirani vacuum gauge* 	<ul style="list-style-type: none"> Ionization vacuum gauge*
Pumping system	<ul style="list-style-type: none"> Automatic leak valve for Oil rotary vacuum pump 	

Vacuum chamber (VPC-260F)



* Further details can be found on our website.

High Speed Vacuum Coater

VPC Series

VPC-1100

Features

1. Effective system with high pumping down performance
 - 10^{-4} Pa from atmospheric pressure in 10 minutes
 - Cooling water can be stopped after 15 minutes from the system is shut down.
2. Scalable functions with various options
 - Multi-layer deposition and co-deposition are available with additional evaporation power supply.
3. Compact and easy mobility
4. EB Deposition is available as optional.

Applications

- Basic R&D for Electronic material, Semiconductor, solar cell
- R&D of thin film for layer and organic EL

Standard Specifications

Model	VPC-1100
Ultimate pressure	4.0×10^{-4} Pa 1.3×10^{-4} Pa (LN ₂)
Evacuation time	4.0×10^{-3} Pa / 10min 10^{-4} Pa / 10min (LN ₂)
Bell jar size	dia.390mm × 350mm(H)
Substrate electrode distance	Max 300mm
Evaporation electrode structure	3 points switch (source length : 100mm)
Evaporation power supply	0 – 10V 150A (Max)
Vacuum system	Oil diffusion pump (Water cooling) 1100L/sec Oil rotary vacuum pump 200L/min × 2 Liquid Nitrogen trap
Control system	Manual control
Vacuum gauge	Pirani vacuum gauge "GP-1G"
Power required	Three phase 200V 5.0 kVA Single phase 100V 1.0 kVA
Water requirement	1.5L/min (Water temperature : 20 degrees C, Water pressure : 200 – 300kPa (gauge pressure))
Weight	313kg
Overall dimensions (W) × (D) × (H)	1235mm × 836mm × 2155mm
Accessories	Three phase 200V Cable 4m Single phase 100V Cable 4m
Order Code	A4325000000

* Optional parts in the picture are not equipped.

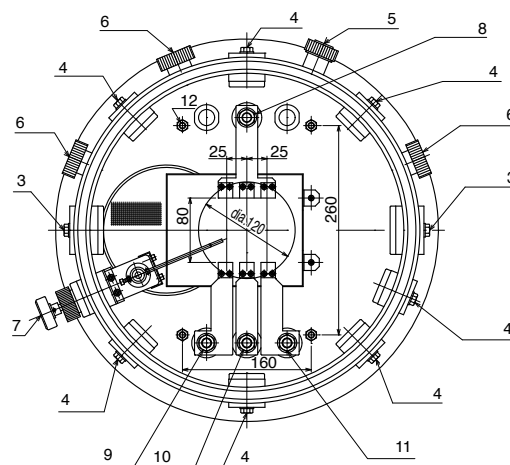


VPC-1100

Optional Parts

Special components	<ul style="list-style-type: none"> ● Evaporation Electrode SEREM "PSE-150C" ● Deposition Controller ● Film thickness sensor ● Ionization vacuum gauge ● Electron beam evaporation source
Special parts	<ul style="list-style-type: none"> ● Deposition shield plate ● Electrode partition ● Water cooling metal bell-jar ● UFC070 flange ● Oil mist trap ("OMI-200" "OMT-200A") ● Sample holder ● Side/back panel ● Additional shutter ● Evaporation source/power supply for EB ● Flow switch, Substrate heating device ● Gas introduction port for service port ● System rack, Carbon electrode
Electrode structure options	<ul style="list-style-type: none"> ● Evaporation electrode 1 point + 2 points switch ● 2 points + 2 points switch ● 2 points + 3 points switch

Vacuum chamber



1	Plate	7	Shutter
2	Filter	8	Electrode COM
3	Service port (L)	9	Electrode 1
4	Service port (S)	10	Electrode 2
5	Gauge port.1	11	Electrode 3
6	Hermetic seal port.3 pcs.	12	Prop

* Further details can be found on our website.

Vacuum Coater

DEPOX Series

VFR-200M/ERH VWR-400M/ERH VTR-350M/ERH VTS-350M/ERH

Features

1. Deposition system for metal and organic material
2. Variable combination is available for pumping unit.
3. High scalable functions
4. Enhanced safeness and reliability
5. Multi-layer deposition and co-deposition(Max: 4 layers) are available with additional evaporation power supply and electrode.
6. Easy viewable through glass bell jar and easy maintenance

Applications

- Basic R&D for Electronic material, Semiconductor, solar cell
- R&D of thin film for layer and organic EL



VFR-200M / ERH



VWR-400M / ERH*

* : Optional parts added.



VTR-350M / ERH



VTS-350M / ERH

Specifications

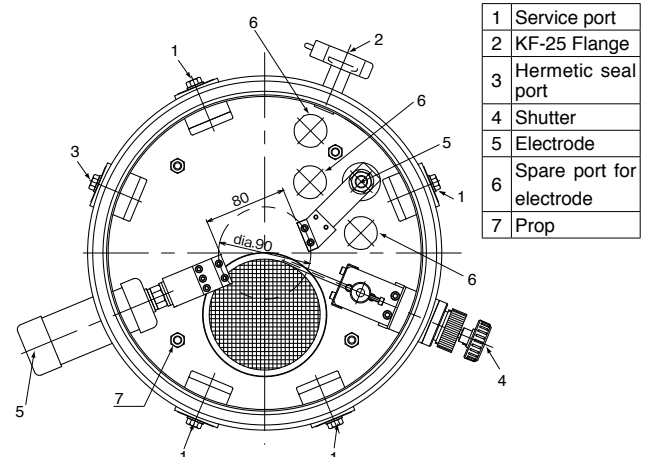
Model	VFR-200M / ERH	VWR-400M / ERH	VTR-350M / ERH	VTS-350M / ERH
Ultimate pressure	8.0×10^{-4} Pa (6.0×10^{-4} Pa LN ₂)	4.0×10^{-4} Pa (3.0×10^{-4} Pa LN ₂)	4.0×10^{-4} Pa (2.0×10^{-4} Pa LN ₂)*1	4.0×10^{-4} Pa (2.0×10^{-4} Pa LN ₂)*1
Evacuation time	4.0×10^{-3} Pa/15min (3.0×10^{-3} Pa/15min LN ₂)	4.0×10^{-3} Pa/10min (3.0×10^{-3} Pa/10min LN ₂)	4.0×10^{-3} Pa/10min (3.0×10^{-3} Pa/10min LN ₂)*1	4.0×10^{-3} Pa/10min (3.0×10^{-3} Pa/10min LN ₂)*1
Bell jar size	dia.300mm × 300mm(H)	dia.300mm × 300mm(H)	dia.300mm × 300mm(H)	dia.300mm × 300mm(H)
Substrate electrode distance	Max 200mm	Max 200mm	Max 200mm	Max 200mm
Evaporation electrode structure (source length)	1 point (100mm)	1 point (100mm)	1 point (100mm)	1 point (100mm)
Evaporation power supply	0 – 10V 150A (Max)	0 – 10V 150A (Max)	0 – 10V 150A (Max)	0 – 10V 150A (Max)
Main pump	Oil diffusion pump (Air cooling) 200L/sec	Oil diffusion pump (Water cooling) 400L/sec	Turbo molecular pump 345L/sec	Turbo molecular pump 345L/sec
Backing pump	Oil rotary pump 100L/min	Oil rotary pump 200L/min	Oil rotary pump 200L/min	Scroll pump 250L/min
In-line trap	OMI-100	OMI-200	OMI-200	–
Vacuum gauge	ISG1 (WP-01/M-34)	ISG1 (WP-01/M-34)	ISG1 (WP-01/M-34)	ISG1 (WP-01/M-34)
Weight	145kg	148kg	165kg	160kg
Overall dimensions (W) × (D) × (H)	(Body)	730mm × 603mm × 1161mm	731mm × 730mm × 1161mm	730mm × 584mm × 1161mm
	(Power supply)	480mm × 435.3mm × 149mm	480mm × 435.3mm × 149mm	480mm × 435.3mm × 149mm
Power required	(Body)	Single phase 100V 1.4kVA	Single phase 100V 1.6kVA	Single phase 100V 1.4kVA
	(Power supply)	Single phase 200V 1.5kVA	Single phase 200V 1.5kVA	Single phase 200V 1.5kVA
Order Code	A43504100000	A43504300000	A43504600000	A43505200000

*1 : LN₂ trap is optional.

Optional Parts

Electrode structure options	<ul style="list-style-type: none"> 2 points switch 2 points simultaneously 3 points switch 3 points simultaneously 	<ul style="list-style-type: none"> 1 point + 2 points switch 2 points switch + 2 points switch 2 points switch + 1 point + 1 point
Feed through collar	20 ports (Side 16, Bottom 4) (300 x 100H)	
Vacuum chamber	<ul style="list-style-type: none"> Bell jar holder Bell jar cover 	<ul style="list-style-type: none"> Metal Bell jar
Accessories for inner vacuum chamber	<ul style="list-style-type: none"> Sample holder Adhesion shield plate Electrode partition Gauge port set Hermetic port set Sealing flange set 	<ul style="list-style-type: none"> UFC070 Adapter KF-25 Adapter Gas introduction port Carbon electrode set Substrate heating device 350 degrees C
System exterior	<ul style="list-style-type: none"> Elevating device Side panel, Back panel Deposition controller 	<ul style="list-style-type: none"> Control panel Side panel for control panel Back panel for control panel
Pumping system	Automatic leak valve for Oil rotary vacuum pump (VFR-200M/ERH, VWR-400M/ERH)	

Vacuum chamber



* Further details can be found on our website.

VTR Series

VTR-060M/ERH

Features

1. Compact installation space
2. Turbo molecular pump installed
3. High vacuum exhaust can be started with switch operation.
4. Various options available such as multi-layer film deposition, substrate rotation etc.
5. Ideal for the deposition of low-melting-point metal

Applications

- Basic R&D for Electronic material, Semiconductor, solar cell
- R&D of thin film for layer and organic EL



VTR-060M/ERH

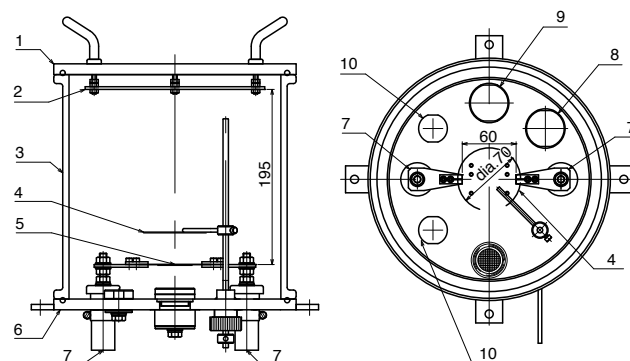
Specifications

Model	VTR-060M/ERH	
Ultimate pressure	1.5×10^{-3} Pa	
Evacuation time	4.0×10^{-3} Pa/20min	
Chamber size	dia. 236mm x 250mm(H)	
Substrate electrode distance	195mm	
Evaporation electrode structure	1 point	
Evaporation power supply	0 – 10V 80A(MAX)	
Main pump	Turbo Molecular Pump (Air cooling) 60L/sec	
Backing pump	Oil rotary pump 20L/min	
Oil mist trap	OMT-050A	
Weight	(Body)	50kg
	(Power supply)	24kg
Overall dimensions (W) x (D) x (H)	(Body)	428mm x 438mm x 713mm
	(Power supply)	480mm x 435.3mm x 149mm
Power required	(Body)	Single phase, 50/60Hz, 100V, 0.6kVA
	(Power supply)	Single phase, 50/60Hz, 100V, 0.8kVA
Order Code	A53502000000	

Optional Parts

Electrode structure options	<ul style="list-style-type: none"> • 2 points switch • 2 points simultaneously • 3 points switch
Accessories for inner vacuum chamber	<ul style="list-style-type: none"> • Holder A (dia 200mm) • Holder B (dia 200mm M4 tap) • CRTM (CRTS) with water cooling piping • Electrodes basic set • Carbon electrode set • Substrate heating device 350 degrees C • Substrate heating device 650 degrees C • Substrate rotation (Axial) • KF16 Gauge port (dia 18)
System exterior	• System rack
Vacuum gauge	• Vacuum gauge set (ISG1/SH-2/SPU)
Evaporation power supply	• Single phase 200V 1.5kVA 0-10V 150A (Max)

Vacuum chamber



1	Top cover	8	Service port with Sealing flange Additional KF flange port
2	Sample holder (Optional parts)	9	Service port with Sealing flange Additional Film thickness sensor
3	Glass chamber	10	Sealing flange Additional Electrode
4	Shutter		
5	Evaporation source		
6	Base plate		
7	Electrode		

* Further details can be found on our website.

High frequency Sputtering System

RFS Series

RFS-201

Features

1. Compact and easy mobility
2. High speed pumping is attainable with TMP.
3. Introduction gas can be controlled continuously with flow control valve.
4. Suitable for pre-sputtering
5. High accurate thin film

Applications

- Basic R&D for basic material, high melting material, insulating material and semiconductor material

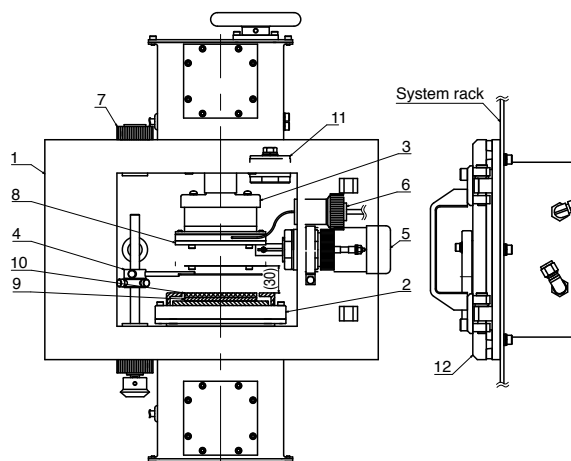
Specifications

Model	RFS-201	
Vacuum performance	Ultimate Pressure	6.6×10^{-4} Pa
	Evacuation time	6.6×10^{-3} Pa/5min
Vacuum chamber	Vacuum chamber	Metal chamber (200mm (W) × 250mm (D) × 170mm (H))
	Cathode	dia.80mm, 1way
	Standard target	dia.80mm × t1 – 5mm
	Effective area of sputtering	dia.50mm
	Sputtering speed	SiO ₂ , More than 20nm/min at deposition
	Film thickness distribution	SiO ₂ , within ±8% at dia.50mm
	Substrate heating temperature	Max 350 degrees C
	Substrate electrode distance	30mm – 50mm (Variable)
Exhaust system	Main pump	Oil diffusion pump (Water cooling) 150L/sec
	Liquid Nitrogen trap	Option
	Backing pump	Oil rotary pump 100L/min
	Oil-mist trap	OMT-100A
Operation system	Main valve	Clapper valve
	Sub valve	Three ways valve
	Automatic leak valve	Option
	Control	Manual control
Control system	RF power supply	Max 300W (Variable : 0 – 300W)
	Pirani vacuum gauge	G-TRAN
	Ionization vacuum gauge	Option
Setup	Overall dimensions, Weight	764mm(W) × 723mm(D) × 1648mm(H) 260kg
Order Code	A43261000000	

Utility

Power required	Single phase, 50/60Hz, 200V, 2.8kVA
Ground terminal	A grade (ground resistance/10Ω or less)
Water requirement	5.0L/min [Water temperature : Less than 25 degrees C, Water pressure : 200 – 300kPa (gauge pressure)]

Vacuum chamber



1	Chamber
2	Taeret electrode
3	Substrate electrode
4	Shutter
5	Current guide terminal
6	Thermocouple introduction terminal
7	Gauge port
8	Sample holder
9	Backing plate
10	Target
11	Service port
12	Front door

Optional Parts

● Liquid Nitrogen trap
● Ionization vacuum gauge
● Magnetron
● In line trap (OMI-100)
● Turbo molecular pump
● DC power supply
● Automatic leak valve for oil rotary pump

* Further details can be found on our website.

High frequency magnetron Sputtering System

SCOTT Series

VTR-151M/SRF

Features

1. Parallel-plate type RF magnetron discharge method
2. Turbo molecular pump is used for main pumping.
3. Multiple deposition is available by dia.2 inch , 3 cathodes.
4. All gauges are installed in the rack.
5. Sputtering speed 30nm/min (SiO₂) is available by magnetron sputtering.
6. Easy handling for substrate exchange and maintenance from top cover open style
7. Reactive sputtering is available as optional.

Applications

- Basic R&D for basic material, high melting material, insulating material and semiconductor material



SCOTT-C3

*Optional parts added

Specifications

Model	VTR-151M/SRF (SCOTT-C3)	
Vacuum performance	Ultimate Pressure	6.6×10 ⁻⁴ Pa
	Evacuation time	6.6×10 ⁻³ Pa/5min
Vacuum chamber	Vacuum chamber	Metal chamber (dia.310mm × 160mm (H))
	Cathode	dia.2inch, 3ways
	Standard target	dia.2inch(dia.50.8mm) × t1mm
	Effective area of sputtering	dia.25mm
	Sputtering speed	SiO ₂ , More than 30nm/min at deposition
	Film thickness distribution	SiO ₂ , within ±10% at dia.25mm
	Substrate heating temperature	Max 350 degrees C
Exhaust system	Substrate electrode distance	50mm - 90mm (Variable : Half fixed)
	Main pump	Turbo molecular pump (250L/sec)
	Backing pump	Oil rotary pump 200L/min
	Oil-mist trap	OMT-200A
Operation system	Main valve	Butterfly valve
	Sub valve	Three ways valve
	Automatic leak valve	Option
	Control	Manual control
Control system	RF power supply	Max 300W (Variable: 0 – 300W)
	Pirani vacuum gauge	GP-1GRY
	Ionization vacuum gauge	ISG1/SH2-1
Setup	Overall dimensions, Weight	
	1081mm(W) × 853mm(D) × 1104mm(H) 400kg	
Order Code		A43411000000

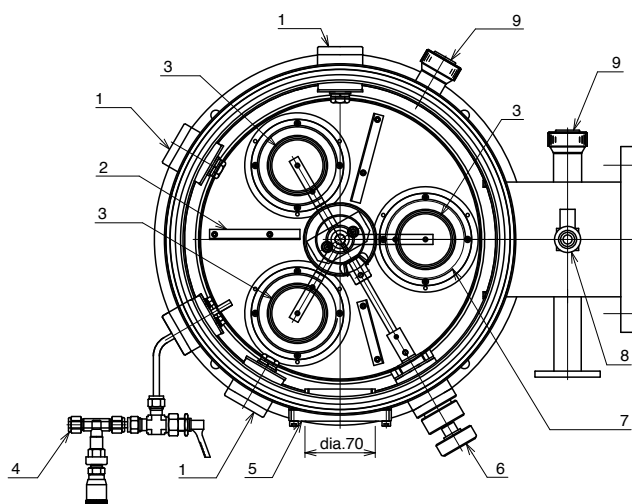
Optional Parts

- Substrate heating 600 degrees C (Water cooling chamber)
- Mass flow controller
- In line trap (OMI-200)
- DC power supply
- Introduction gas (2,3 lines)
- Automatic leak valve for oil rotary pump

Utility

Power required	Single phase, 50/60Hz, 200V, 3.5kVA
Ground terminal	A grade (ground resistance/10Ω or less)
Water requirement	2.0L/min [Water temperature : Less than 25 degrees C, Water pressure : 200kPa (gauge pressure)]

Vacuum chamber



1	Sealing flange
2	Electrode partition
3	Cathode
4	Gas introduction
5	Viewport
6	Shutter handle
7	Shutter
8	Vent valve
9	Gauge port

* Further details can be found on our website.

Vacuum Coater Optional Parts Guide

✓ : Standard △ : Optional correspondence - : Unavailable

Model		VTR-350M/ERH	VTS-350M/ERH	VFR-200M/ERH	VWR-400M/ERH	VPC-1100	VPC-260F	VPC-061	VPC-061A	VTR-060M/ERH	VTR-151M/SRF	RFS-201
Oil diffusion pump		-	-	✓	✓	✓	✓	✓	✓	-	-	✓
Turbo molecular pump		✓	✓	-	-	△	△	-	-	✓	✓	△
Electrode structure options	1point	✓	✓	✓	✓	-	✓	✓	✓	✓	-	-
	2 points switch	△	△	△	△	-	△	-	-	△	-	-
	2 points simultaneously	△	△	△	△	-	△	-	-	△	-	-
	3 points switch	△	△	△	△	✓	△	-	-	△	-	-
	3 points simultaneously	△	△	△	△	-	△	-	-	-	-	-
	1 point + 2 points switch	△	△	△	△	△	△	-	-	-	-	-
	2 points switch + 2 points switch	△	△	△	△	△	△	-	-	-	-	-
	2 points switch + 3 points switch	-	-	-	-	△	-	-	-	-	-	-
	EB deposition of 1 point	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	EB deposition of 4 points	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	EB deposition of 1 point and evaporation electrode 1 point	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	EB deposition of 1 point and evaporation electrode 2 points switch	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	EB deposition of 4 points switch and evaporation electrode 1 point	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	EB deposition of 4 points switch and evaporation electrode 2 points switch	△※3	△※3	-	△※3	△※2	-	-	-	-	-	-
	Conventional cathode electrode	-	-	-	-	-	-	-	-	-	-	✓
Vacuum chamber	Magnetron cathode electrode	-	-	-	-	-	-	-	-	-	✓	△
	Glass bell jar	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-
	Metal bell jar (with water cooling tube)	△	△	△	△	△	△	-	-	△	-	-
Feed through collar	Metal chamber	△	△	-	△	-	-	-	-	-	✓	✓
	3 ports	-	-	-	-	-	-	✓	✓	-	-	-
	7 ports	-	-	-	-	-	-	-	-	✓	-	-
	8 ports	-	-	-	-	-	✓	-	-	-	✓	✓
	12 ports	✓	✓	✓	✓	-	-	-	-	-	-	-
	16 ports	-	-	-	-	-	△	-	-	-	-	-
	20 ports	△	△	△	△	✓	-	-	-	-	-	-
Bell jar holder		△	△	△	△	-	△	-	-	-	-	-
Bell jar cover		△	△	△	△	✓	△	△	△	✓	-	-
Elevating device		△※1	△※1	△※1	△※1	✓	△※1	-	-	-	-	-
Substrate heating device		△	△	△	△	△	△	-	-	△	✓	✓
Sample holder		△	△	△	△	△	△	△	△	△	✓	✓
Electrode partition		△	△	△	△	△	△	-	-	△	✓	-
Adhesion shield plate		△	△	△	△	△	△	△	△	△	✓	-
Substrate rotation (Axial)		△※3	△※3	-	△※3	-	-	-	-	△	-	-
Gauge port set		△	△	△	△	△	△	-	-	-	△	△
Hermetic seal port set		△	△	△	△	△	△	-	-	-	△	△
Sealing flange set		△	△	△	△	△	△	-	-	-	△	△
UFC070 Adapter		△	△	△	△	△	△	-	-	-	△	-
KF-25 Adapter		△	△	△	△	△	△	-	-	-	△	-
Additional shutter		△	△	△	△	△	△	-	-	-	-	-
Gas introduction port (1 line)		△	△	△	△	△	△	-	-	-	✓	✓
Gas introduction port (2 lines)		-	-	-	-	-	-	-	-	-	△	△
Gas introduction port (3 lines)		-	-	-	-	-	-	-	-	-	△	△
Carbon electrode set		△	△	△	△	△	△	-	-	△	-	-
Evaporation Electrode SEREM "PSE-150C"		✓	✓	✓	✓	✓	✓	✓	✓	✓※4	-	-
Sputtering power supply	RF power supply	-	-	-	-	-	-	-	-	-	✓	✓
	DC power supply	-	-	-	-	-	-	-	-	-	△	△
Oil-mist Trap		△	-	△	△	△	△	△	△	✓	✓	✓
In-line Trap		✓	-	✓	✓	△	△	-	-	-	△	△
Liquid Nitrogen trap		△	△	✓	✓	✓	✓	✓	✓	-	-	△
Pirani Vacuum Gauge		✓	✓	✓	✓	✓	△	△	△	△	✓	✓
Ionization Vacuum Gauge		✓	✓	✓	✓	△	△	△	△	△	✓	△
Deposition Controller		△	△	△	△	△	△	-	-	△	-	-
System rack		-	-	-	-	△	-	-	-	△	-	-
Control rack		△	△	△	△	△	△	△	△	△	-	-
Side panel		△	△	△	△	△	-	-	-	-	✓	✓
Back panel		△	△	△	△	△	-	-	-	-	✓	✓
Automatic leak valve for Oil rotary vacuum pump		✓	✓	△	△	△	△	-	✓	△	△	△

※1 : Bell jar cover is required separately. ※2 : Metal bell jar is necessary. ※3 : Metal chamber is necessary ※4 : Power required Single phase 50/60Hz 100V

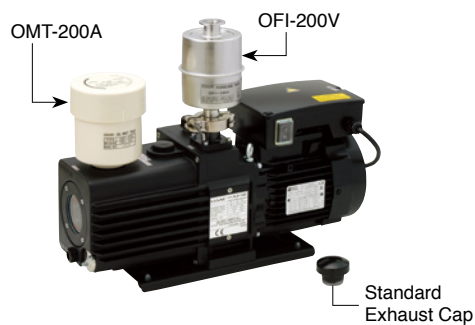
Attachment of Oil Rotary Vacuum Pump Optional parts

Suction and Exhaust Trap

GLD-137CC+OMT-200A



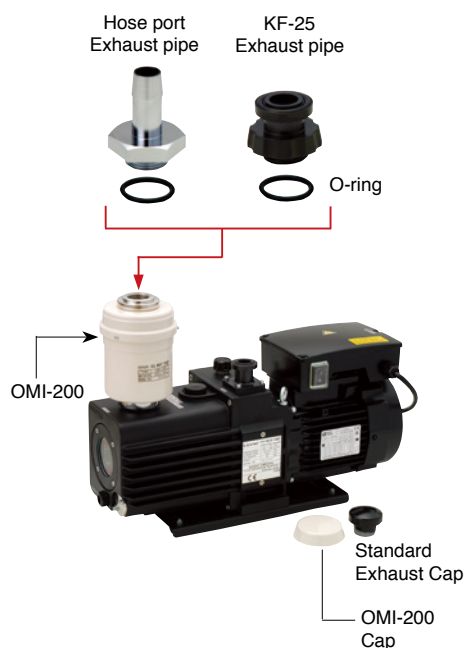
GLD-137CC+OMT-200A+OFI-200V



GCD-136X+OMC-200



GLD-137CC+OMI-200+KF-25 Exhaust pipe

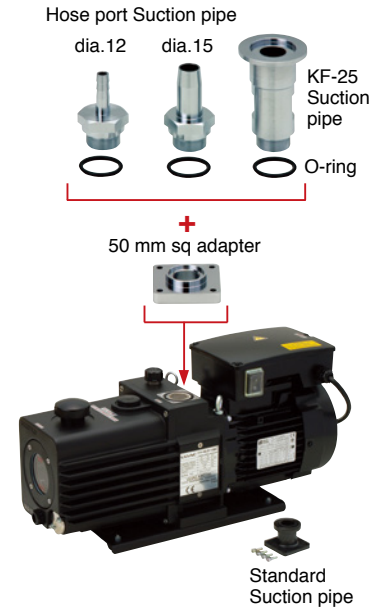


Suction and Exhaust Pipe

GLD-137CC+Selectable Suction pipe

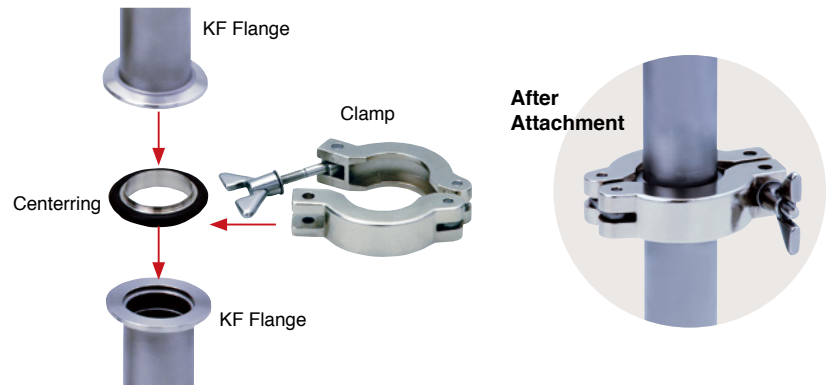


GLD-137CC+Selectable Suction pipe

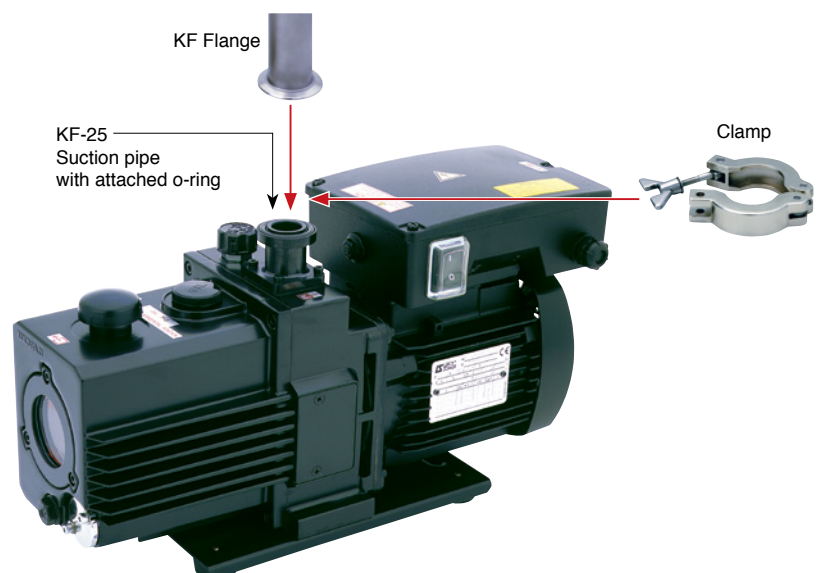


KF Flange Attachment Process

Standard Composition



Unnecessary case of Centring



Optional Parts

Accessories for Oil Rotary Vacuum Pumps

Fore-line Trap (Inlet filter)

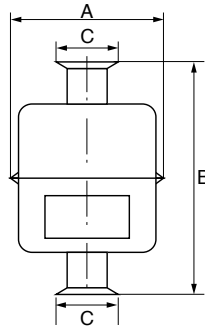
Units: mm.

Models	Applications	Applicable models *	A	B	C	Order Code
※OFI-050C	Prevent counter flow of oil diffusion	50L/min or less	dia. 74	114	KF-25	A44280000000
※OFI-200C	Prevent counter flow of oil diffusion	200L/min or less	dia. 99	150	KF-25	A44290000000
※OFI-050V	Prevent particles into vacuum pumps	50L/min or less	dia. 74	114	KF-25	A44300000000
※OFI-200V	Prevent particles into vacuum pumps	200L/min or less	dia. 99	150	KF-25	A44310000000

KF-25 clamp needed for installation.

※: Filters are non-replaceable due to closed type.

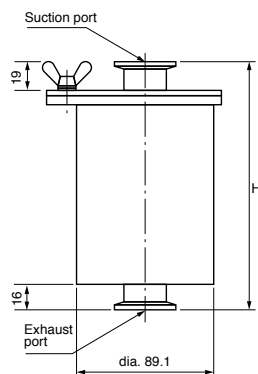
★: Pumping speed of applicable models is at 50Hz.



Vacuum Pump Suction and Exhaust Filter

This filter can trap acidic gas, oil mist effectively by using ion-exchanged resin fiber. Filter can be placed both vacuum and exhaust side and filter can be replaceable.

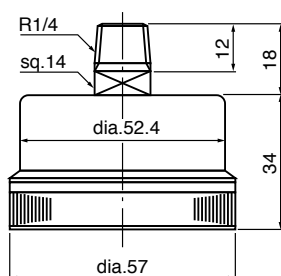
Models	Filter system	Applicable models	Pressure range	Ambient temperature	Ambient humidity	Suction port	Exhaust port	Height	Order Code
SGT-100	Out · In · Pass	500L/min or less	0.1MPa	7 ~ 40°C	85% (non condensing)	KF-25	KF-25	154mm	A54051010000
SGT-200						KF-40	KF-40	234mm	A56052020000



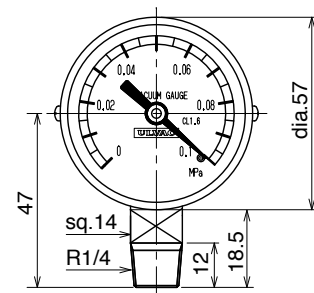
Bourdon Tube Vacuum Gauge

The scale is indicated in units of MPa showing the absolute pressure. Select one of two models, 1. ADT or 2. AT, according to the attached directions.

1. ADT type



2. AT type



Optional Parts

Vacuum Pump Oil

• SMR-100



Models	Can size	Order Code
SMR-100 Mineral oil	1 L (2 × 500ml cans)	A49130000000
	4L can	A49130100000
	18L can	A49130200000

• SO-M



Models	Can size	Order Code
SO-M Synthetic oil	1L can	A49140000000
	4L can	A49140100000
	18L can	A49140200000

• R-2 / R-7



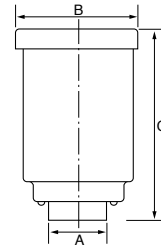
Models	Can size	Order Code
ULVOIL R-2 Synthetic oil	1L can	A40340000001
	4L can	A49150100000
	20L can	A49150200000
ULVOIL R-7 Synthetic oil	2.2L can	A49150300000
	8L can	A49150800000
	20L can	A49150400000

Oil-mist Trap

Units: mm.

Models	Applicable models	A	B	C	Order Code
OMT-050A △	GLD-040, GHD-031	G3/4	dia.65	93	A49020000000
OMT-100A △	GHD-101	G1	dia.113	135	A49030000000
OMT-200A △	GLD-137AA, GLD-137CC GLD-202AA, GLD-202BB	G1	dia.113	135	A49040000000

△ : Filter replaceable

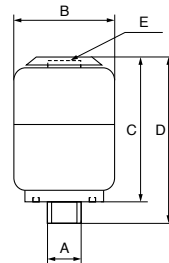


In-line Trap (Piping connection type oil-mist trap)

Units: mm.

Models	Applicable models	A	B	C	D	E	Order Code
OMI-100 *△	GLD-040⊙, GHD-031⊙, GHD-101	G1	dia.94	167	177	G1	A49050000000
OMI-200 *△	GLD-137AA, GLD-137CC GLD-202AA, GLD-202BB	G1	dia.116	167	178	G1	A49060000000

△ : Filter replaceable * : In-line type ⊙ : Adapter for Oil-mist Trap is necessary.



Adapter for Oil-mist Trap

This Adapter is required to adjust screw diameter from G3/4 to G1.

Type of Adapter	Applicable models	Adaptive oil-mist traps	Order Code
G 3/4 male × G1 female	GLD-040, GHD-031	OMI-100 OMT-100A	A40900000103

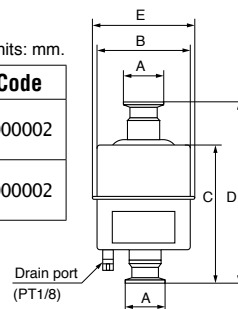


Oil-mist Separator (Anti-corrosive type)

Units: mm.

Models	Applicable models	A	B	C	D	E	Order Code
OMC-050 ◇	GCD-051X (Anti-corrosive)	KF-25	dia.66	116	148	dia.74	A44260000002
OMC-200 ◇	GCD-136X, GCD-201X (Anti-corrosive)	KF-25	dia.90	140.5	173	dia.99	A44270000002

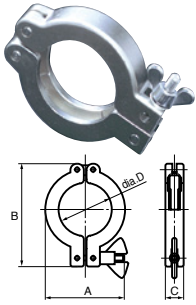
◇ : Chemical type (KF-25 clamp needed for installation)



Optional Parts

units : mm.

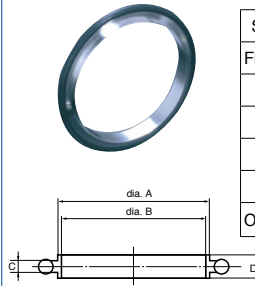
■ Clamp (Material : Aluminium)



Standard	SCK-1016	SCK-1025	SCK-1040
Flange size	KF-16	KF-25	KF-40
A	45	55	70
B	61	72	90
C	16	17.5	16
dia.D	22	32	47
Order Code	A49510100000	A49510200000	A49510300000

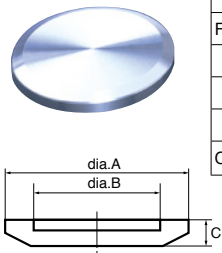
* A shape of SCK-1025 is different from the left figure and photograph.

■ Centerring (Material : SUS304)



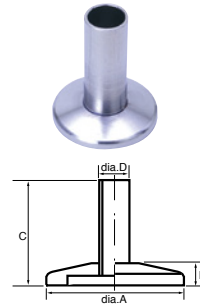
Standard	SCK-2016	SCK-2025	SCK-2040
Flange size	KF-16	KF-25	KF-40
dia.A	17	26	41
dia.B	16	24	39
C	3.9	3.9	3.9
D	8	8	8
Order Code	A49510400000	A49510500000	A49510600000

■ Blank Flange (Material : SUS304)



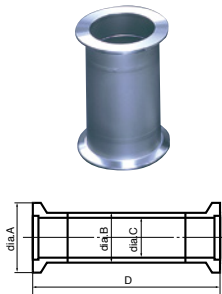
Standard	SCK-4016	SCK-4025	SCK-4040
Flange size	KF-16	KF-25	KF-40
dia.A	30	40	55
dia.B	17.2	26.2	41.2
C	6	6	6
Order Code	A49510700000	A49510800000	A49510900000

■ Nozzle (Material : SUS304)



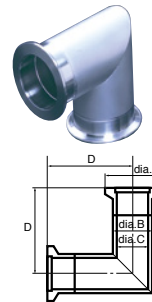
Standard	SCK-2512	SCK-2518
Flange size	KF-25	KF-25
dia.A	40	40
B	6	6
C	35	35
dia.D	12	18
Order Code	A49511000000	A49511100000

■ Nipple (Material : SUS304)



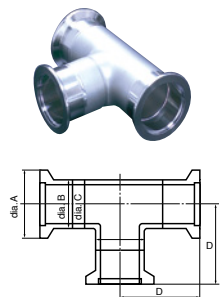
Standard	SCK-5016	SCK-5025	SCK-5040
Flange size	KF-16	KF-25	KF-40
dia.A	30	40	55
dia.B	20.0	27.2	42.7
dia.C	16	24	39
D	60	100	100
Order Code	A49511200000	A49511300000	A49511400000

■ Elbow (Material : SUS304)



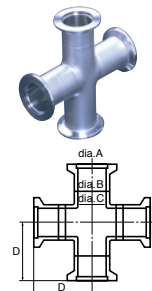
Standard	SCK-6016	SCK-6025	SCK-6040
Flange size	KF-16	KF-25	KF-40
dia.A	30	40	55
dia.B	20.0	27.2	42.7
dia.C	16	24	39
D	40	50	65
Order Code	A49511500000	A49511600000	A49511700000

■ Tee (Material : SUS304)



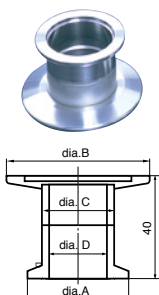
Standard	SCK-7016	SCK-7025	SCK-7040
Flange size	KF-16	KF-25	KF-40
dia.A	30	40	55
dia.B	20.0	27.2	42.7
dia.C	16	24	39
D	40	50	65
Order Code	A49511800000	A49511900000	A49512000000

■ Cross (Material : SUS304)



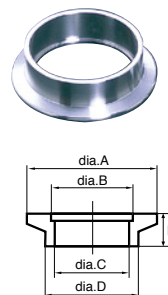
Standard	SCK-8016	SCK-8025
Flange size	KF-16	KF-25
dia.A	30	40
dia.B	20.0	27.2
dia.C	16	24
D	40	50
Order Code	A49512100000	A49512200000

■ Reducer (Material : SUS304)



Standard	SCK-9025	SCK-9040
Flange size	KF-16/25	KF-25/40
dia.A	30	40
dia.B	40	55
dia.C	20.0	27.2
dia.D	16	24
Order Code	A49512600000	A49512700000

■ KF Flange (Material : SUS304)



Standard	SCK-3016	SCK-3025	SCK-3040
Flange size	KF-16	KF-25	KF-40
dia.A	30	40	55
dia.B	17.2	26.2	41.2
Connected pipe	dia.20 t = 2	20A 10S	32A 10S
dia.C	16	24	39
dia.D	20.0	27.2	42.7
E	10	20	20
Order Code	A49512300000	A49512400000	A49512500000

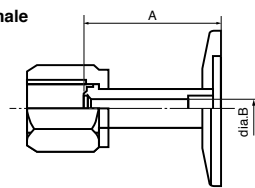
Optional Parts

Accessories for Oil Rotary Vacuum Pumps

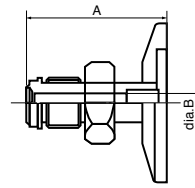
units : mm.

■ VCR Adapters (Material : Joint = SUS316, Flange = SUS304)

Female



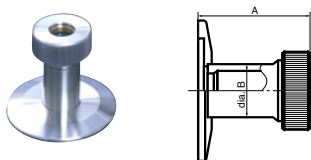
Male



Female	Standard	SCA-1614-F	SCA-1638-F	SCA-1612-F	SCA-2514-F	SCA-2538-F	SCA-2512-F
	Flange size	KF-16	KF-16	KF-16	KF-25	KF-25	KF-25
	Tube diameter	1/4 inch	3/8 inch	1/2 inch	1/4 inch	3/8 inch	1/2 inch
	VCR fitting size	1/4 inch	1/2 inch	1/2 inch	1/4 inch	1/2 inch	1/2 inch
	A	35.8	42.1	40.6	35.8	40.6	40.6
	dia.B	3.0	7.1	10.2	4.6	7.1	10.2
	Order Code	A49514000000	A49514100000	A49514200000	A49514300000	A49514400000	A49514500000

Male	Standard	SCA-1614-M	SCA-1638-M	SCA-1612-M	SCA-2514-M	SCA-2538-M	SCA-2512-M
	Flange size	KF-16	KF-16	KF-16	KF-25	KF-25	KF-25
	Tube diameter	1/4 inch	3/8 inch	1/2 inch	1/4 inch	3/8 inch	1/2 inch
	VCR fitting size	1/4 inch	1/2 inch	1/2 inch	1/4 inch	1/2 inch	1/2 inch
	A	35.8	42.1	40.6	35.8	40.6	40.6
	dia.B	3.0	7.1	10.2	4.6	7.1	10.2
	Order Code	A49513400000	A49513500000	A49513600000	A49513700000	A49513800000	A49513900000

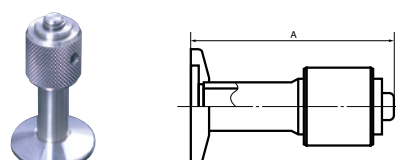
■ Gauge port (Material : SUS304)



Standard	SCO-1025	SCO-1040
Flange size	KF-25	KF-40
Pipe diameter	dia.15	dia.15
A	74	58
dia.B	25	25
Order Code	A49512800000	A49512900000

Standard	SCO-2025	SCO-2040
Flange size	KF-25	KF-40
Pipe diameter	dia.18	dia.18
A	74	58
dia.B	28	28
Order Code	A49513000000	A49513100000

■ Leak port (Material : SUS304)



Standard	SCO-3016	SCO-3025
Flange size	KF-16	KF-25
A	65	66.5
Order Code	A49513200000	A49513300000

■ Flexible tube (Material : SUS316)



Standard	Flange size (mm)	Order Code
STK-016-250	KF-16/250	A49514600000
STK-016-500	KF-16/500	A49514700000
STK-016-1000	KF-16/1000	A49514800000
STK-025-250	KF-25/250	A49514900000
STK-025-500	KF-25/500	A40570000160
STK-025-1000	KF-25/1000	A49515100000
STK-040-250	KF-40/250	A49515200000
STK-040-500	KF-40/500	A49515300000
STK-040-1000	KF-40/1000	A49515400000

■ Rubber Vacuum Hose



• It covers each meter up to 10 meters. (at the most)

Size (I.D. × O.D.)	Adaptable hose port	Order Code
6 × 18	dia.8	A40900000107
7.5 × 20	dia.9*	A40900000109
9 × 24	dia.11, dia.12	A40900000111
12 × 30	dia.15	A40900000113
15 × 36	dia.16*, dia.18	A40900000117
18 × 42	dia.20, dia.22	A40900000202
25 × 50	dia.27	A40900000204

* This hose is not suitable for some of the vacuum pumps.
Please kindly consult in this case.

Optional Parts

Suction and Exhaust Pipes for Oil Rotary Vacuum Pumps

Suction Pipes

Type	Product	Material	Order Code	GHD-031	GLD-040 GCD-051X	GHD-101 GLD-137AA GLD-137CC GLD-202AA GLD-202BB GCD-136X GCD-201X	Photo number
Hose port type	Hose port suction pipe (dia.8 × M20)	BS + plate	A49420100001		▲ + ⑩	▲ + ⑪	①
	Hose port suction pipe (dia.12 × M20)	BS + plate	A49420200001		▲ + ⑩	▲ + ⑪	②
	Hose port suction pipe (dia.15 × M20)	BS + plate	A49420300001		▲ + ⑩	▲ + ⑪	③
	Hose port suction pipe (dia.18 × M20)	BS + plate	A49420400001		▲ + ⑩	▲ + ⑪	④
	Hose port suction pipe (dia.22 × M20)	BS + plate	A49420500001		▲ + ⑩	▲ + ⑪	⑤
	Hose port suction pipe (dia.27 × 40 mm sq)	ZDC + plate	A41068010133		▲		⑥
	Hose port suction pipe (dia.27 × 50 mm sq)	ZDC + plate	A41328010072			▲	⑦
For GHD-031 only	Hose port suction pipe for GHD-031 (dia.12)	BS + plate	A41624010391	▲			⑧
	Hose port suction pipe for GHD-031 (dia.18)	BS + plate	A41696010020	▲			⑨
KF-25 type	KF-25 suction pipe (KF-25 × M20)	BS + plate	A49421100001		▲ + ⑩	▲ + ⑪	⑩
	KF-25 suction pipe (KF-25 × 40 mm sq)	PPS	A49421300001		✓		⑪
	KF-25 suction pipe (KF-25 × 50 mm sq)	PPS	A49421200001			✓	⑫
1/4 screw type	A-type suction pipe (R1/4-L20 Male × M20)	BS + plate	A49421700001		▲ + ⑩	▲ + ⑪	⑬
	B-type suction pipe (R1/4 Female × M20)	BS + plate	A49421800001		▲ + ⑩	▲ + ⑪	⑭
	C-type suction pipe (R1/4-L10 Male × M20)	BS + plate	A49421900001		▲ + ⑩	▲ + ⑪	⑮
Adapter	40 mm sq Adapter (M20 Female)	ZDC + plate	A41430010021		▲		⑯
	50 mm sq Adapter (M20 Female)	ZDC + plate	A41218010011			▲	⑰

✓ : Standard type

▲ : Replaceable (no Adapters necessary) ▲ + ⑩ : Replaceable (40 mm sq Adapter required) ▲ + ⑪ : Replaceable (50 mm sq Adapter required)

Suction Pipes



Exhaust Pipes



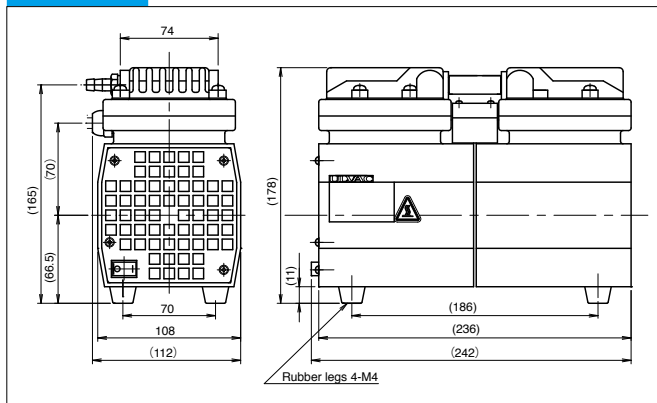
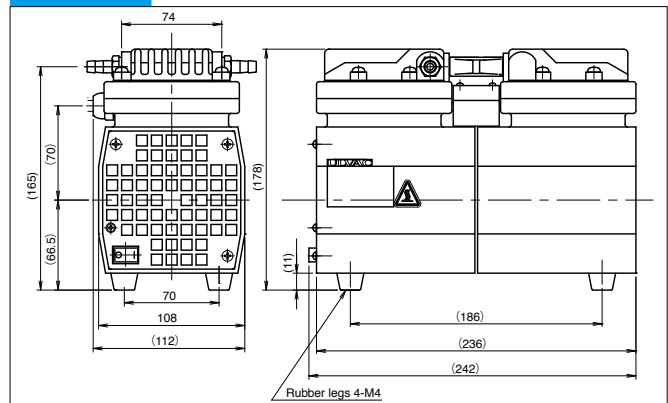
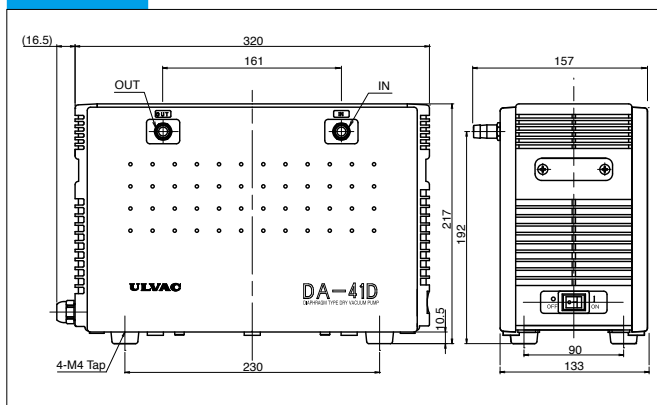
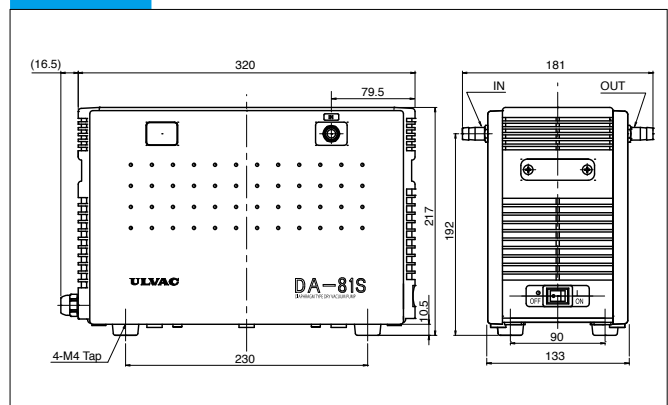
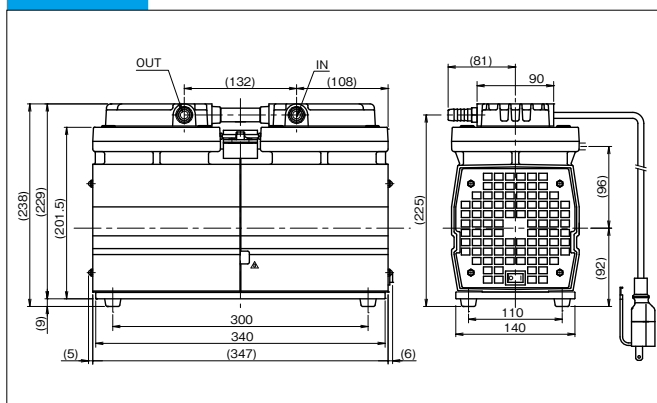
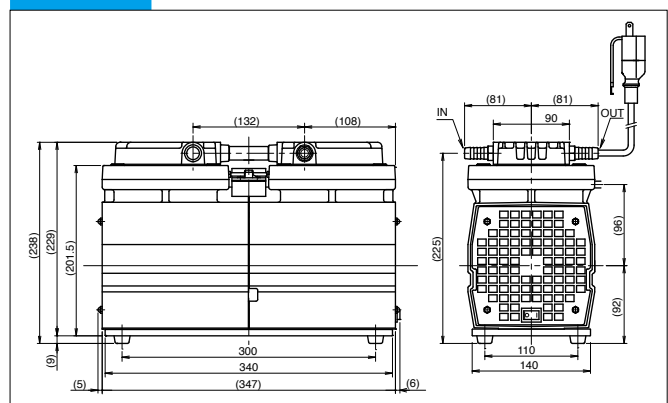
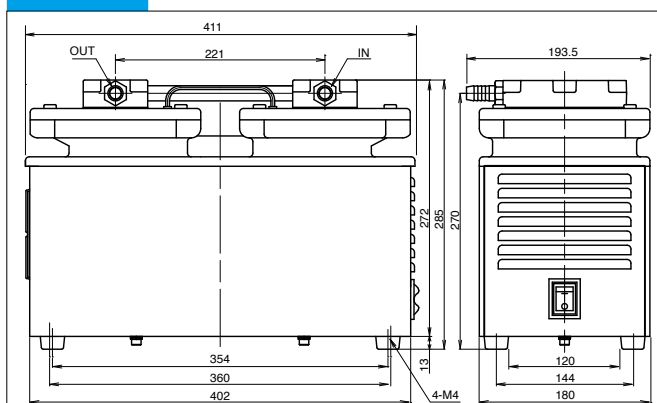
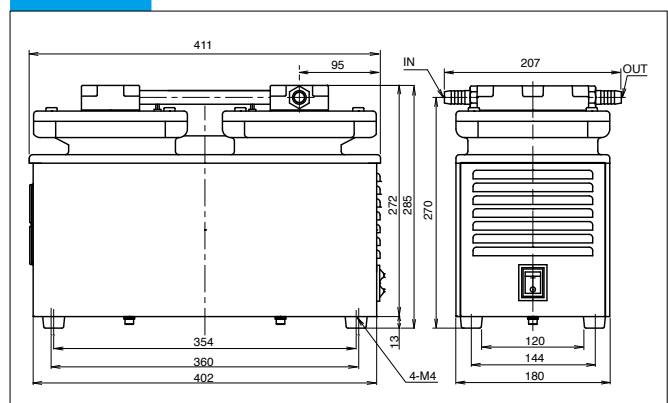
Exhaust Pipes

Type	Product	Material	Order Code	GLD-040	GHD-031	GHD-101 GLD-137AA GLD-137CC GLD-202AA GLD-202BB	GCD-051X	GCD-136X GCD-201X	Photo number
Hose port type	Hose port exhaust pipe (dia.15 × G3/4)	BS + plate	A49430200001	▲	▲		▲		⑱
	Hose port exhaust pipe (dia.18 × G3/4)	BS + plate	A49430300001	▲	▲		▲		⑲
	Hose port exhaust pipe (dia.27 × G1)	BS + plate	A49430000001			▲		▲*	⑳
KF flange type	KF-25 exhaust pipe (KF-25 × G3/4)	PPS	A49430500001	▲	▲		✓		㉑
	KF-25 exhaust pipe (KF-25 × G1)	PPS	A49430600001			▲		✓	㉒
	KF-16 exhaust pipe (G3/4)	BS + plate	A41624010161		▲				
Exhaust pipe	Exhaust pipes Assy (G3/4)	PA	A42105010241	✓	✓		▲		
	Exhaust pipes Assy (G1)	PA	A42092010630			✓		▲*	

* Remarks: Different anti-corrosive quality as standard exhaust pipes.

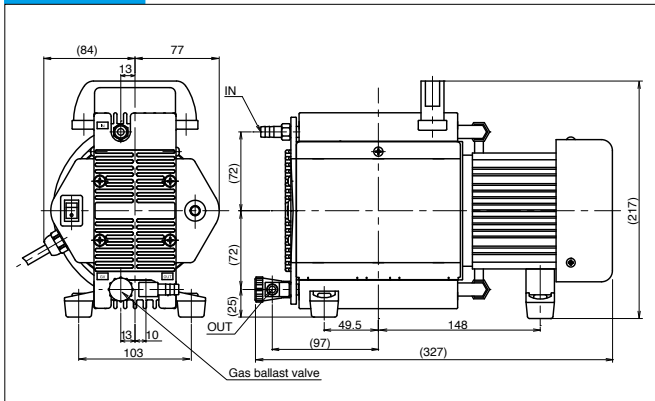
✓ : Standard type ▲ : Replaceable (no Adapters necessary)

All size unit is mm

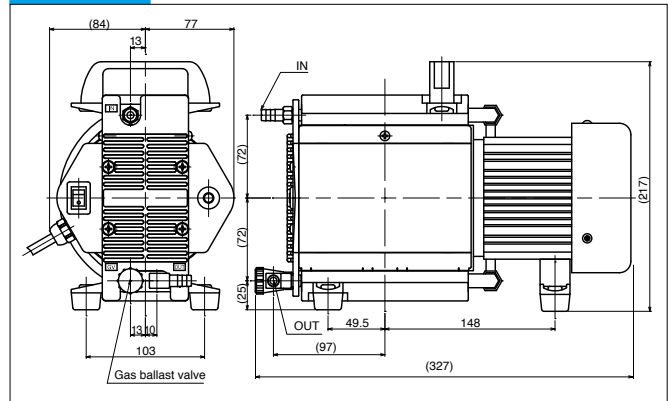
Dry pump DA-20D (see p.10)**Dry pump DA-40S** (see p.10)**Dry pump DA-41D** (see p.10)**Dry pump DA-81S** (see p.10)**Dry pump DA-60D** (see p.11)**Dry pump DA-120S** (see p.11)**Dry pump DA-121D** (see p.11)**Dry pump DA-241S** (see p.11)

Outline Drawings

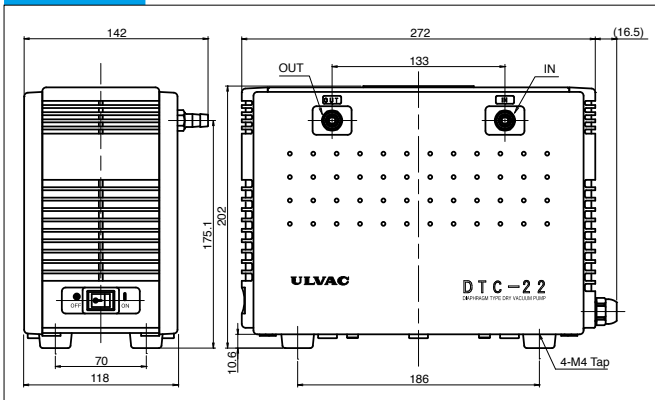
Dry pump DAU-20 (see p.12)



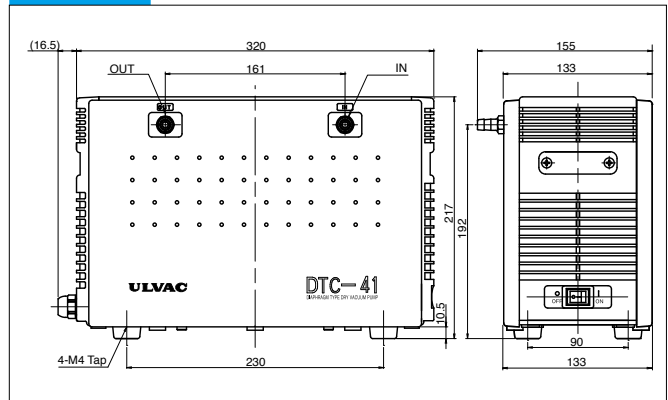
Dry pump DTU-20 (see p.12)



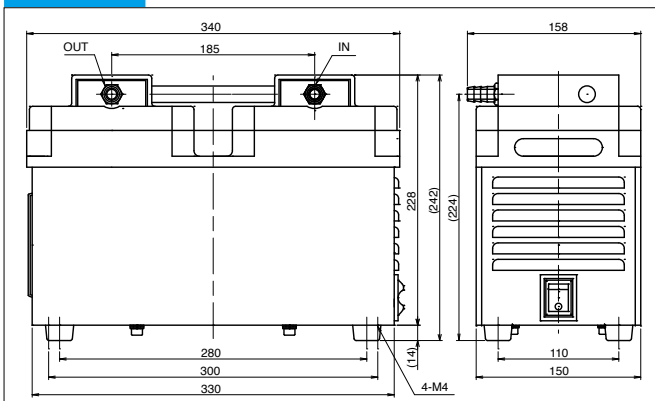
Dry pump DTC-22 (see p.13)



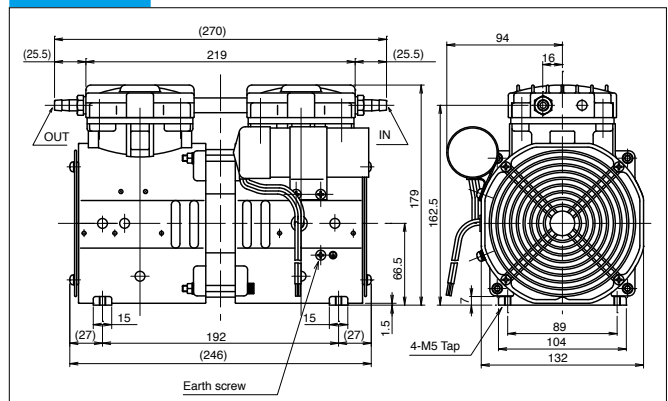
Dry pump DTC-41 (see p.13)



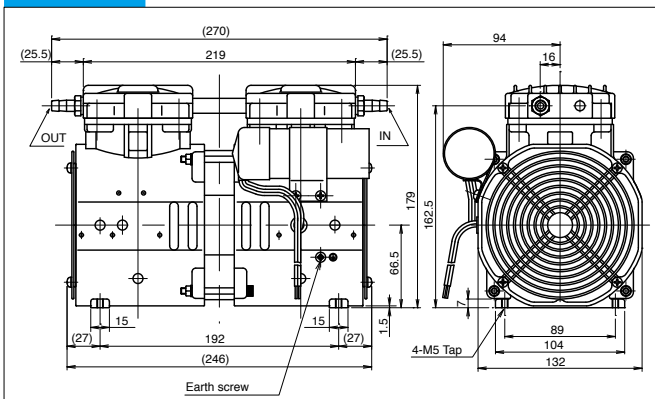
Dry pump DTC-60 (see p.13)



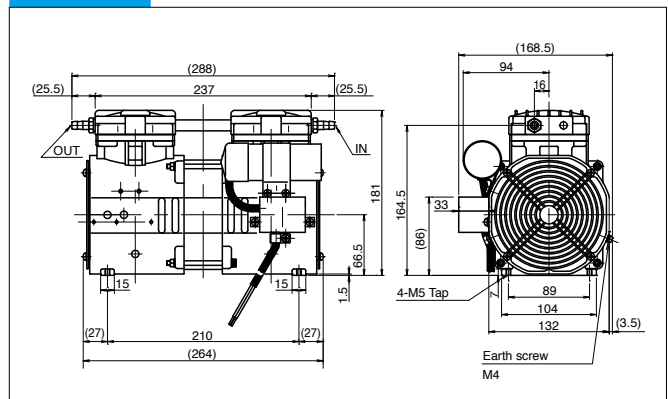
Dry pump DOP-40D (see p.14)



Dry pump DOP-80S (see p.14)

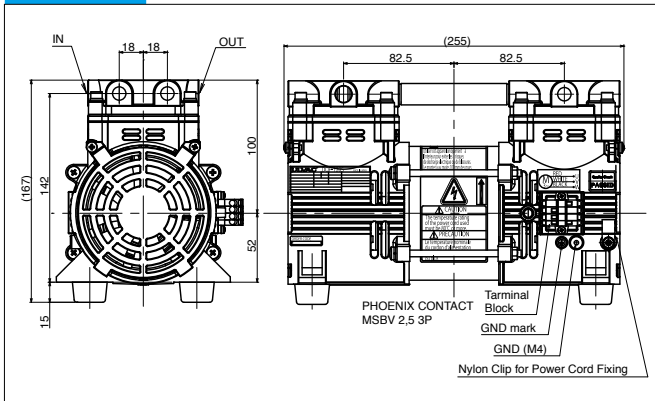


Dry pump DOP-80SP (see p.14)

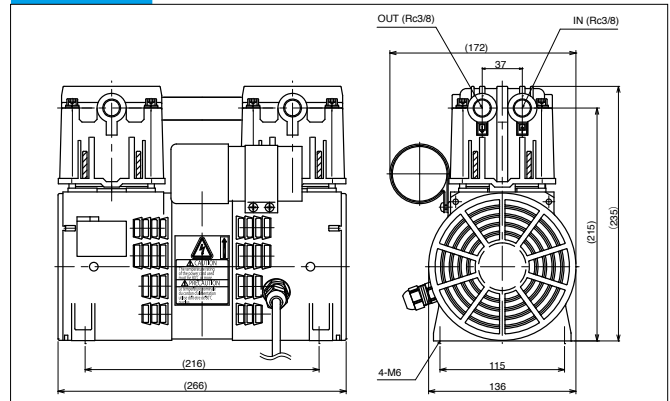


All size unit is mm

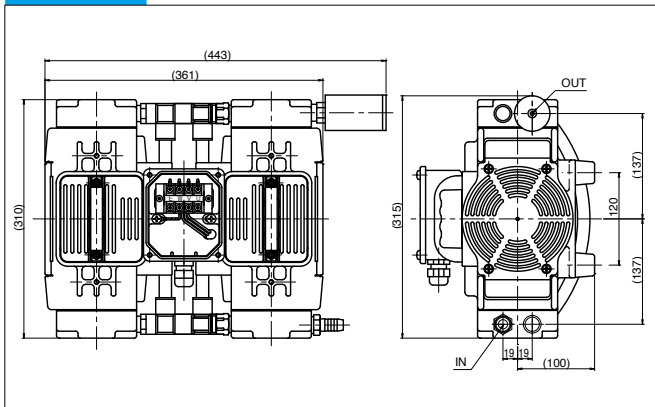
Dry pump **DOP-120SY** (see p.14)



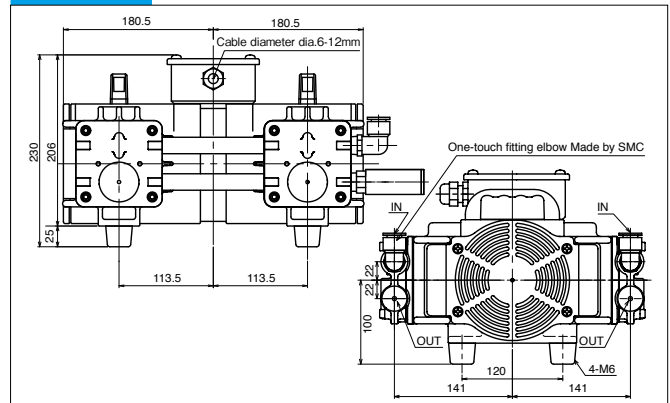
Dry pump **DOP-181SA** (see p.15)



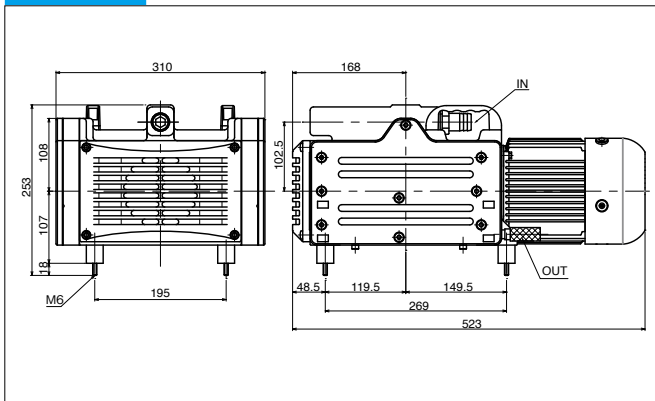
Dry pump **DOP-301SB** (see p.15)



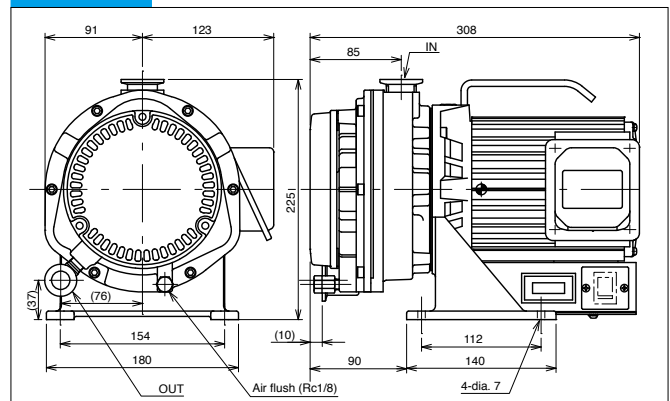
Dry pump **DOP-400SB** (see p.15)



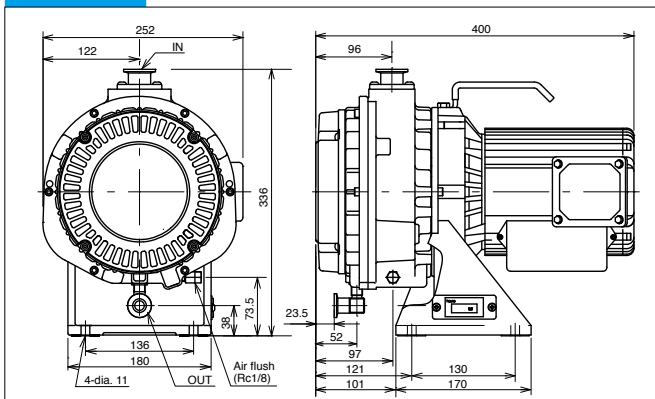
Dry pump **DOP-420SA** (see p.15)



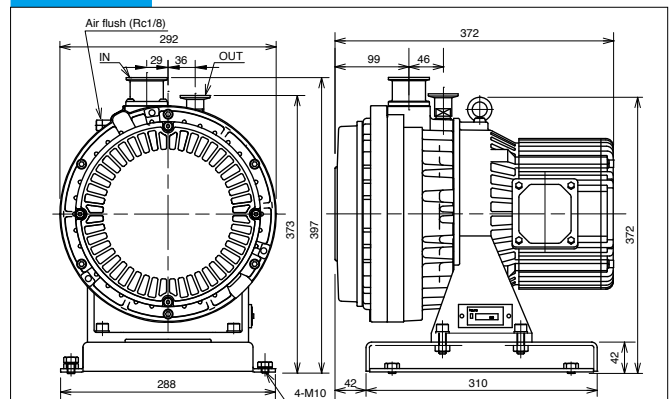
Dry pump **DIS-90** (see p.16)



Dry pump **DIS-251** [Single phase] (see p.16)

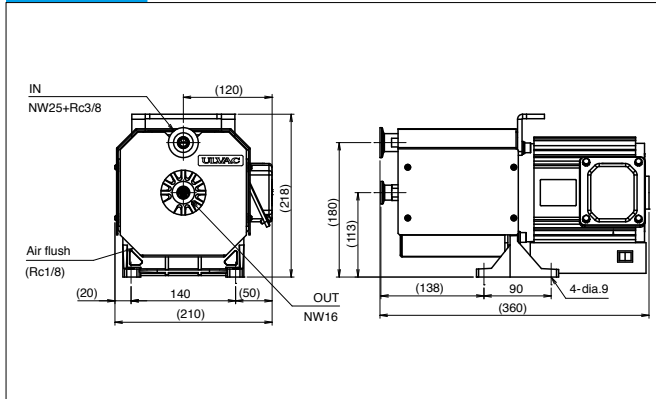


Dry pump **DIS-501** [Three phase] (see p.16)

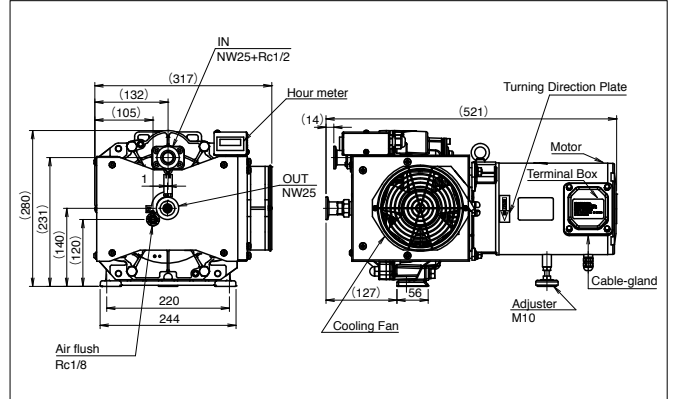


Outline Drawings

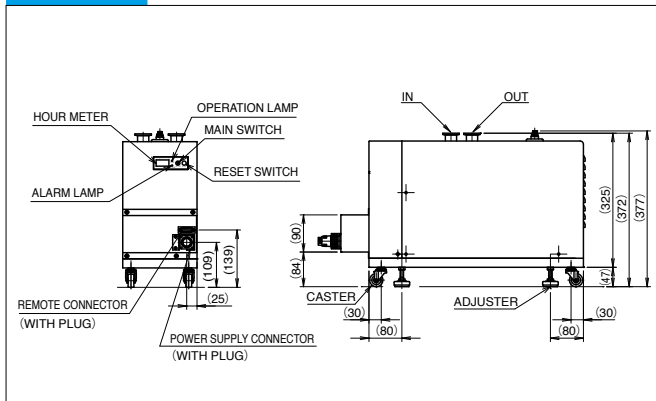
Dry pump **DISL-101** (see p.17)



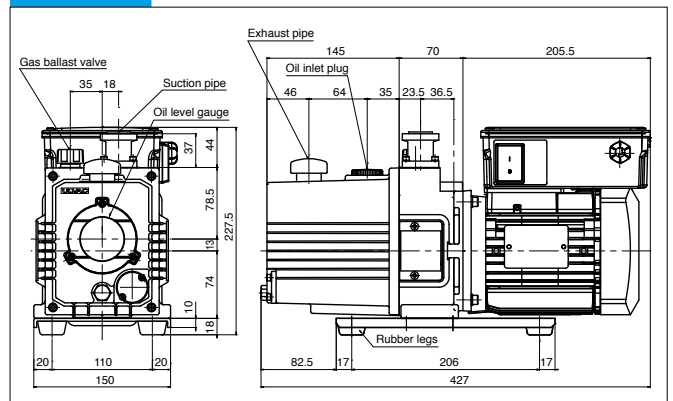
Dry pump **DISL-503** (see p.17)



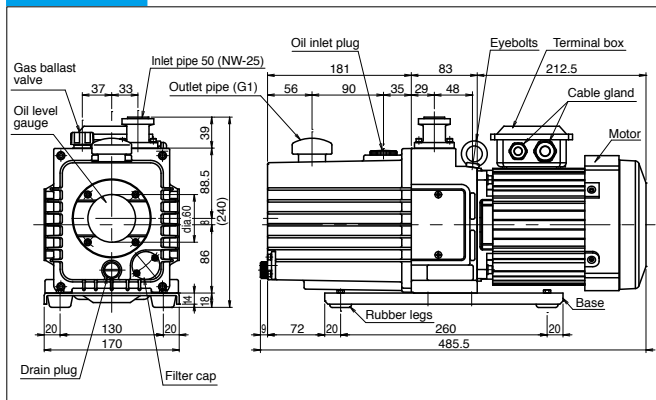
Oil pump **RDA-281HA/501HA** (see p.18)



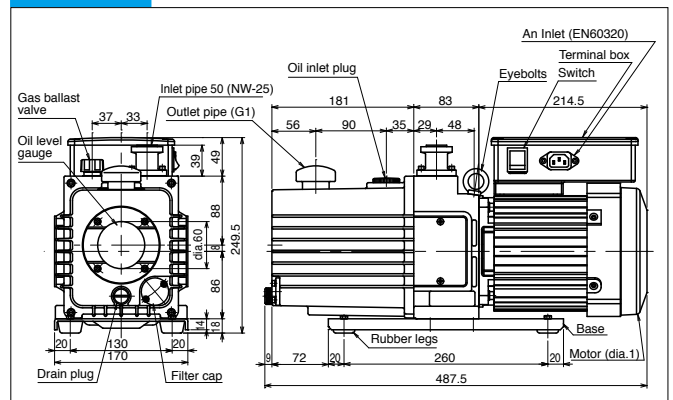
Oil pump **GLD-040** (see p.19)



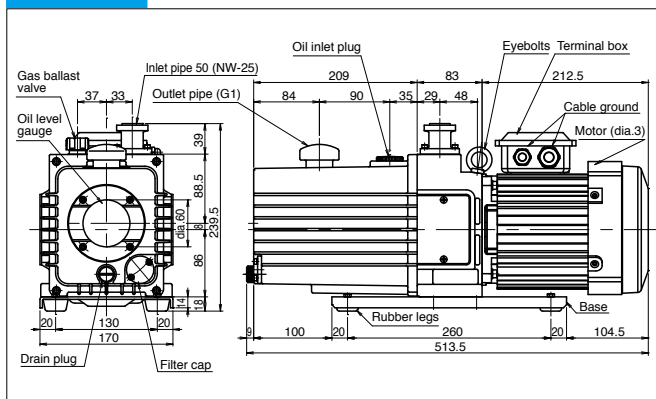
Oil pump **GLD-137AA** (see p.19)



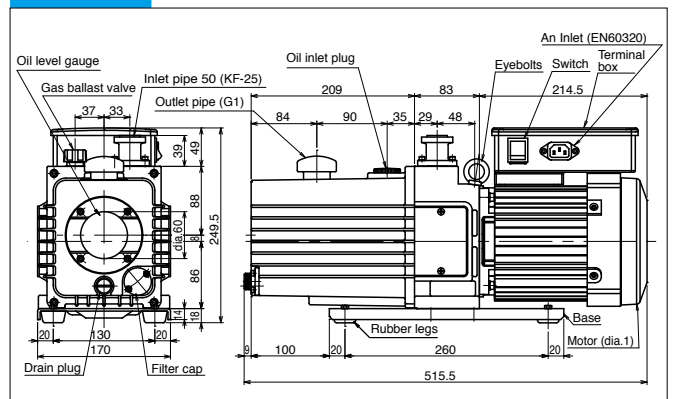
Oil pump **GLD-137CC** (see p.19)



Oil pump **GLD-202AA** (see p.20)

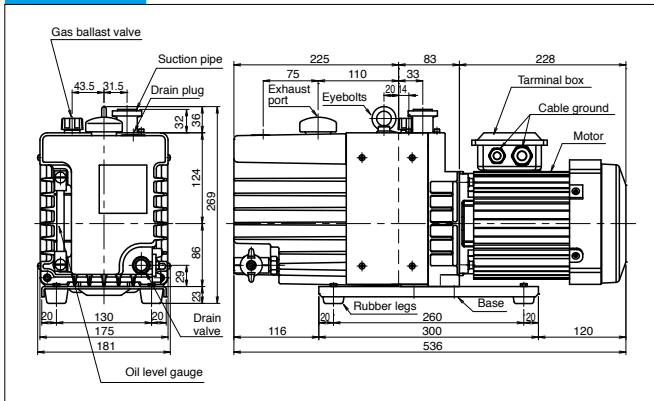


Oil pump **GLD-202BB** (see p.20)

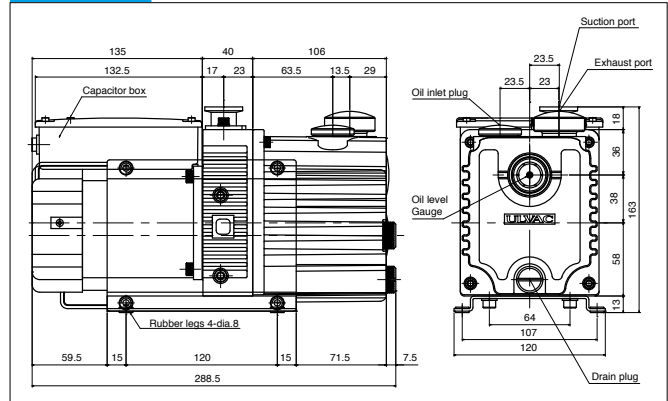


All size unit is mm

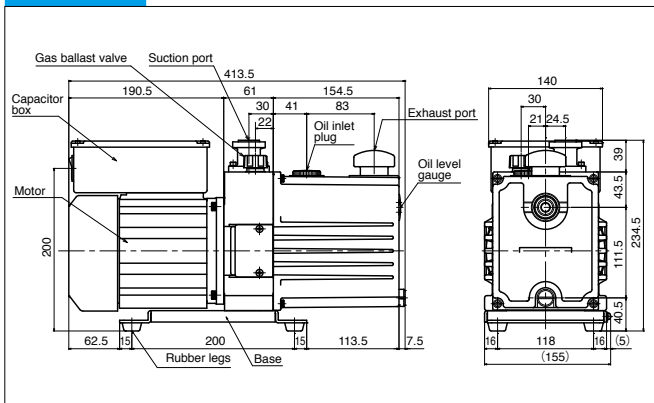
Oil pump **GLD-280A** (see p.20)



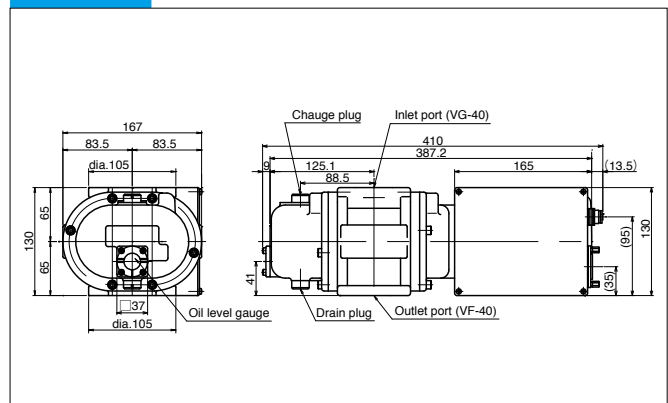
Oil pump **GHD-031** (see p.21)



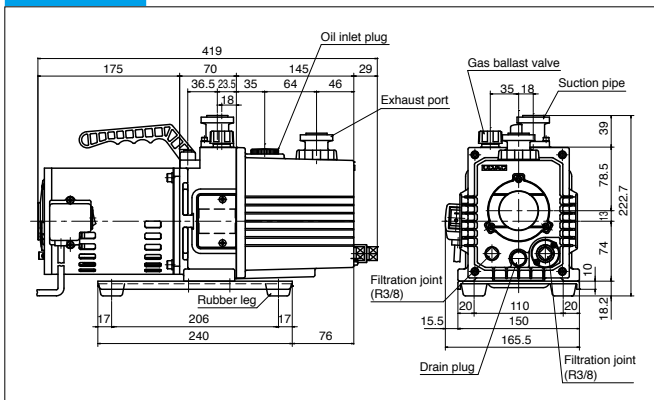
Oil pump **GHD-101** (see p.21)



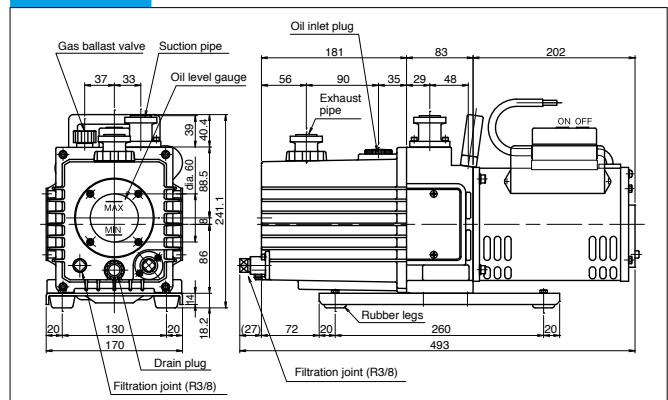
Oil pump **MBS-053** (see p.22)



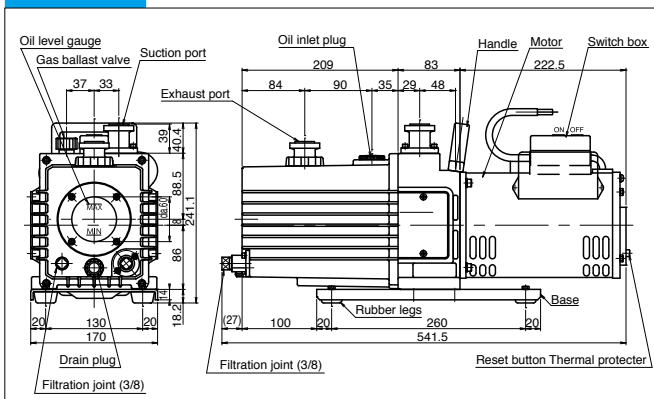
Oil pump **GCD-051X** (see p.23)



Oil pump **GCD-136X** (see p.23)



Oil pump **GCD-201X** (see p.23)



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