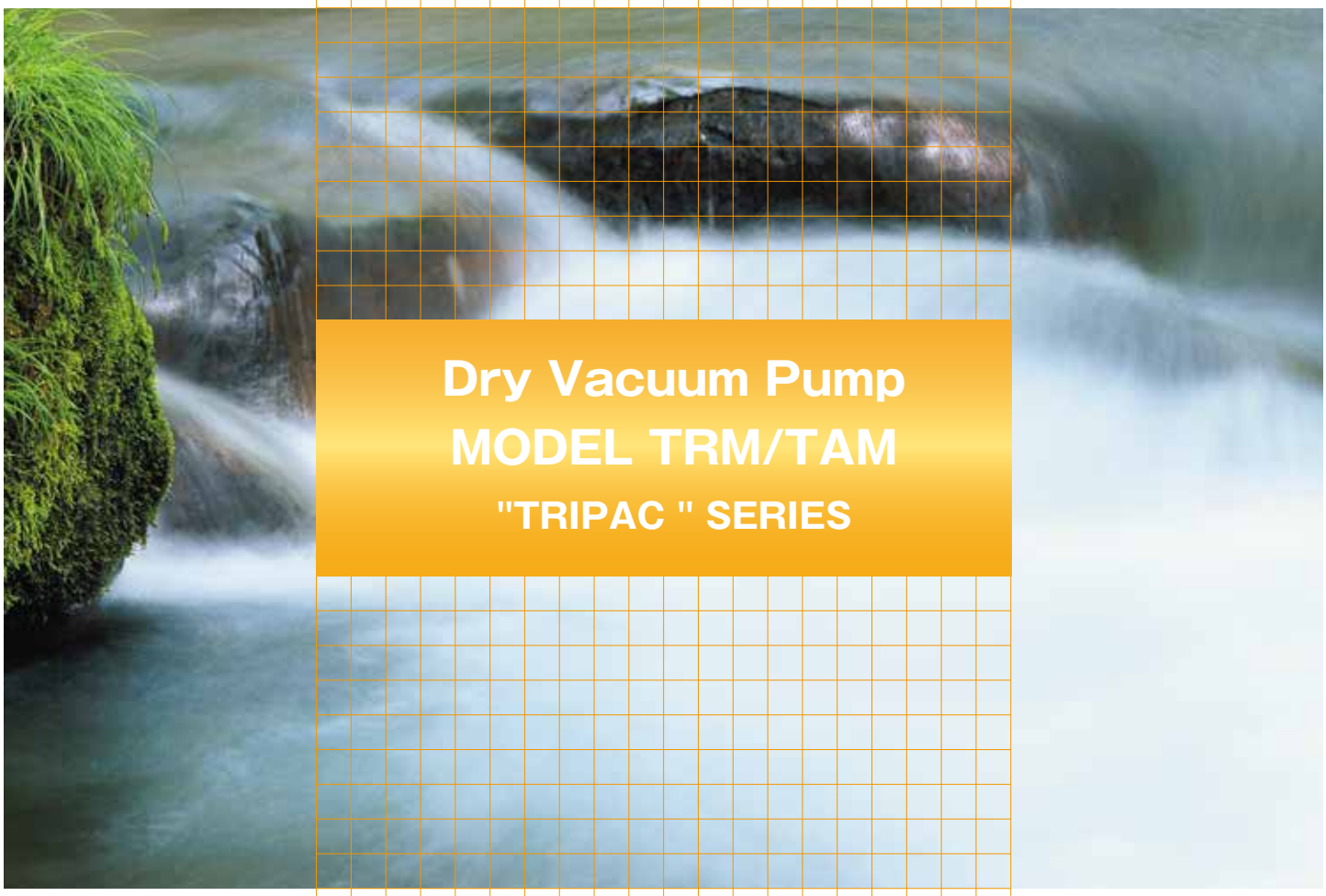
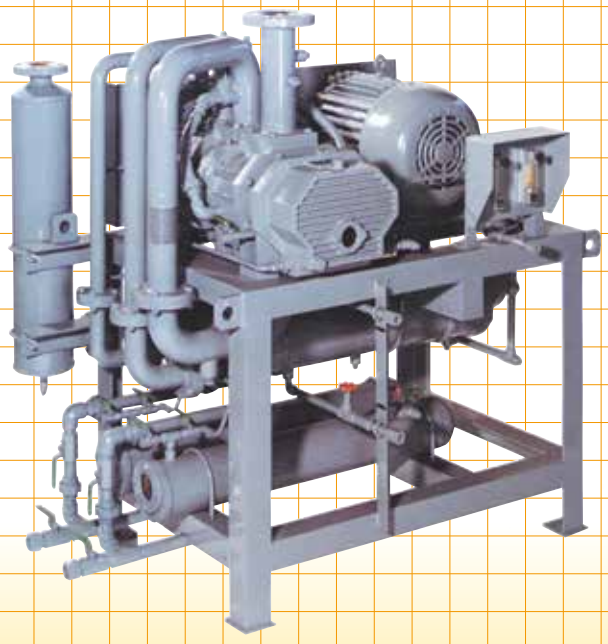
Unozawa

DRY VACUUM PUMP



Dry Vacuum Pump
MODEL TRM/TAM
"TRIPAC " SERIES



UNOZAWA-GUMI IRON WORKS,LTD.

DRY VACUUM PUMP MODEL TRM/TAM

We have been manufacturing the vacuum pump model"TRM/TAM"for about 35 years. The dry vacuum pump is multi-stage Roots type. It is constructed as a three stage horizontal type with intermediate heat exchangers. The vacuum pump can be operated completely in dry condition at any suction pressure on the performance curve.

FEATURES

1 Wide operating range

This pump can be operated with wide suction pressure from atmosphere to 80 Pa~260 Pa without mechanical booster. Tri-lobe design permits stable performance at any suction pressure from atmosphere to shutt-off.

2 Clean effluent

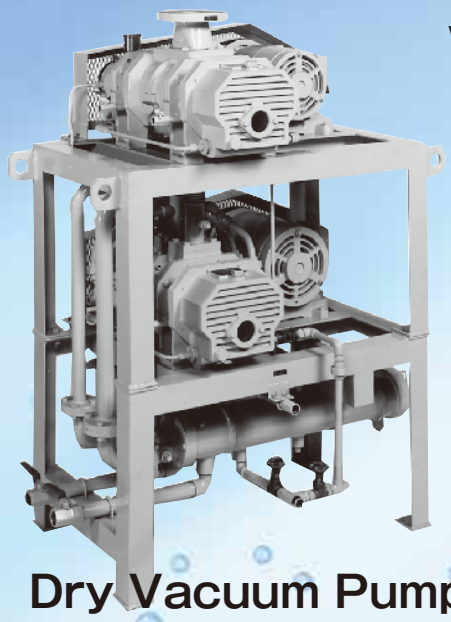
The pump is sealant-free: therefore there is no contamination of the seal fluid with the process gases, also there in no carryover of the seal fluid to the pump exhaust.

3 Safe

Leak-tight pump mechanism and dry type feature that uses no oil or sealing fluid for vacuuming limits operators exposure to leaking process gas or contaminated oil.

4 Low maintenance

The "TRM"dry vacuum pump is designed for continuous, unattended operation with infrequent maintenance.



Dry Vacuum Pump
"TRM/TAM"Series

APPLICATION

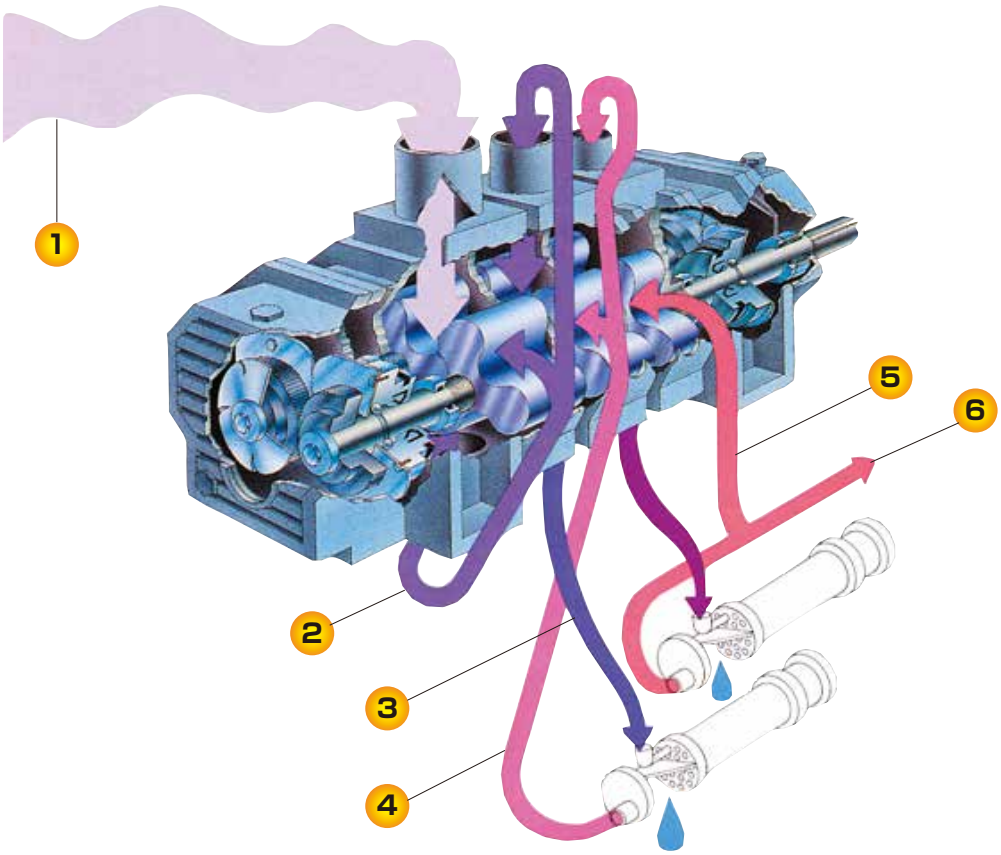
Vacuum distillation,
Medical devices,
Solvent recovery,
Evaporation,
Drying,
Vacuum refrigeration,
Polymer processing,
Pharmaceutical & Food industry,
Special gases in Chemical industry.

The intermediate heat exchangers insure easy solvent recovery. The all pump components are equipped together on a common frame. The pumping speed is from 2 ㎥ /min to 21 ㎥ /min. Depending on customer's request, the special design vacuum pump is available with material of stainless steel, ductile cast iron, and also high design pressure. "TAM " series is combination model of dry vacuum pump and mechanical booster. By the use of mechanical booster, pumping speed and ultimate pressure can be increased as required.

[TRIPAC] DRY VACUUM PUMP

PRINCIPLE

The vacuum pump has 3 stages internally and each stage is constructed with a Roots type pump.
The pump consists of two rotors having a three-lobe shape
and mounted to parallel shafts, while keeping a slight clearance against the inside wall of casing,
and also between rotors. The compression function is as follows.



1. The suction gas into the inlet of vacuum pump is compressed by rotation of rotors.
2. The discharged gas is divided into two portions, one portion of gas flows into back-flow cooling port and another portion flows into second stage.
3. The discharged gas from second stage is transferred into cooler.
4. A part of cooled gas flows into back-flow cooling port of second stage. The other part of gas is transferred to third stage.
5. The discharged gas from third stage is transferred into cooler. A part of cooled gas flows into back-flow cooling port of third stage.
6. The other part of gas is discharged to atmosphere.

Inert gas purge

It is possible to provide the inert gas purge system to prevent process gas entering bearings and gear casing.

Drain tank

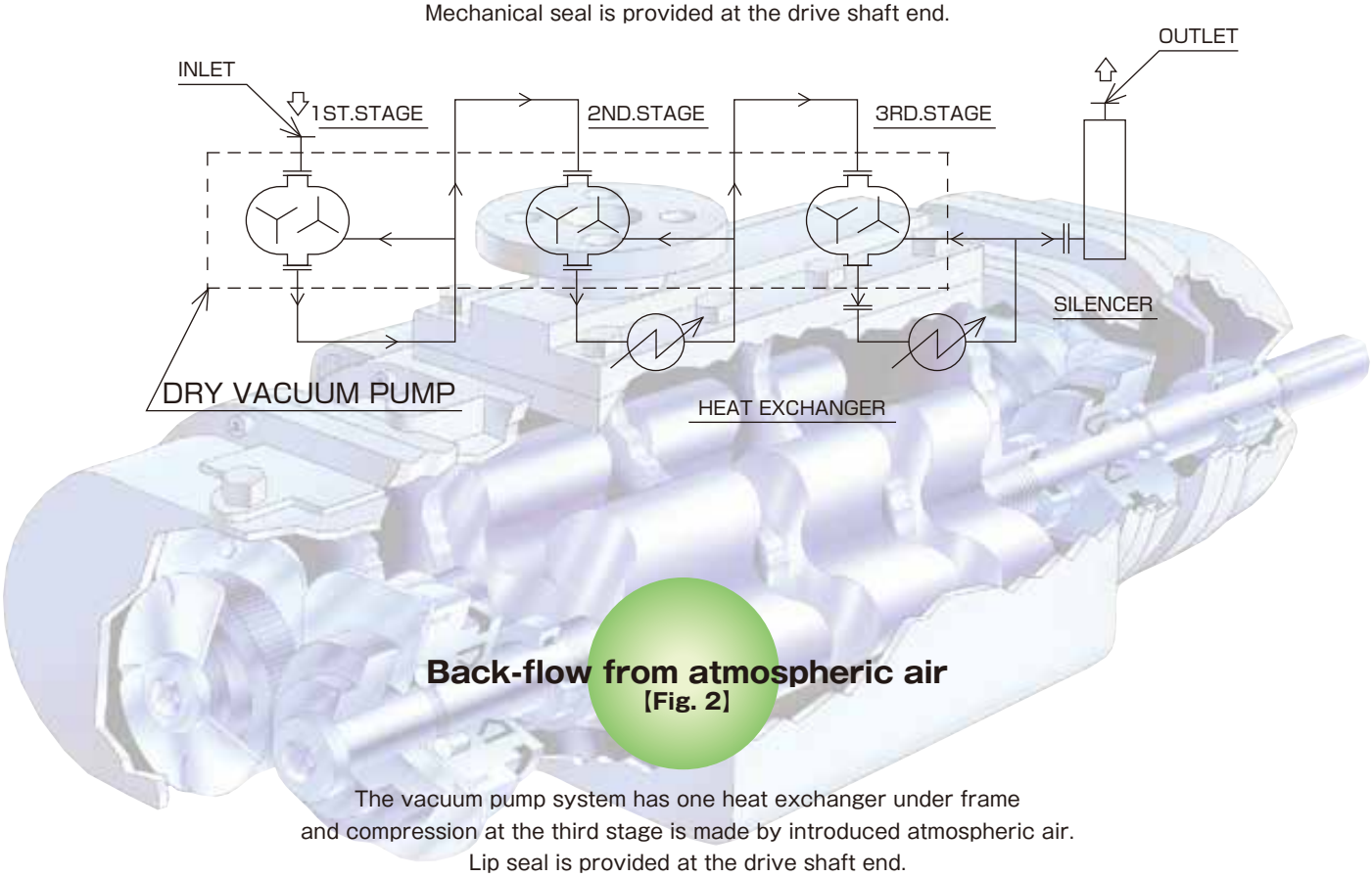
The drain tanks can be installed under heat exchanger.
The drain tanks works for condensate collection and removal from pump system.

CONFIGULATIONS

There are two kind of system of back-flow cooling for the third stage.
In the system 【Fig. 1】, the third stage compression is made by
cooled internal gas through heat exchanger.
h the system 【Fig. 2】, the compression is made by introduction of atmospheric air

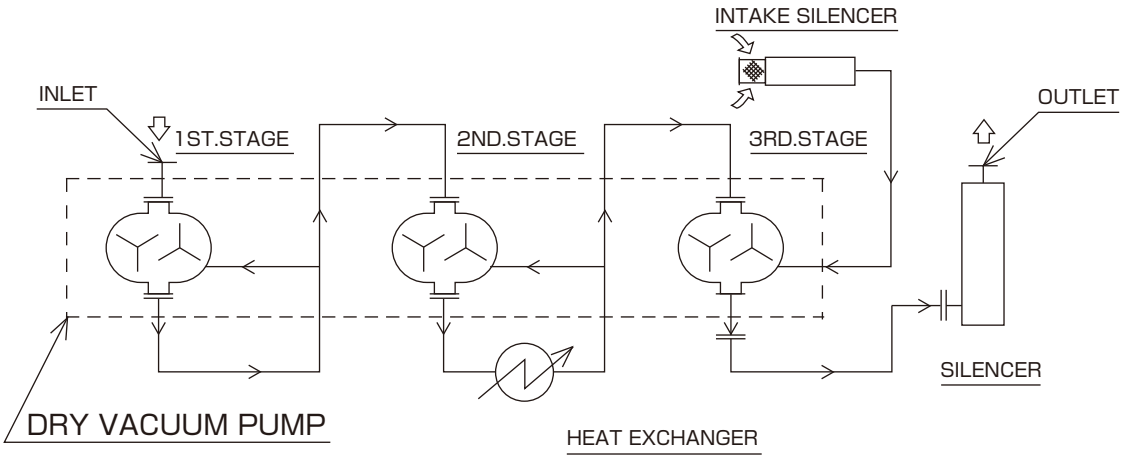
Back-flow from cooled internal gas
【Fig.1】

The vacuum pump system has 2 sets of heat exchanger under frame
and compression at the third stage is made by cooled internal gas through heat exchanger.
Mechanical seal is provided at the drive shaft end.



Back-flow from atmospheric air
【Fig. 2】

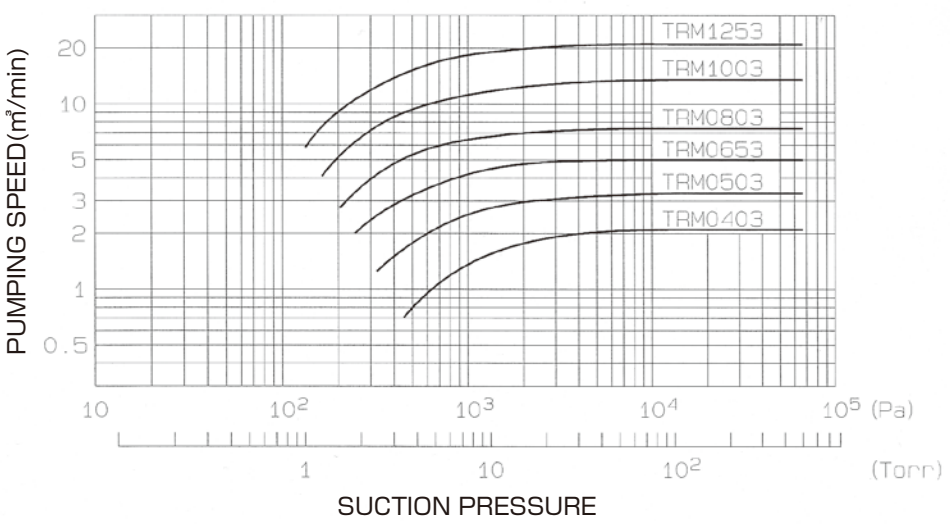
The vacuum pump system has one heat exchanger under frame
and compression at the third stage is made by introduced atmospheric air.
Lip seal is provided at the drive shaft end.



DRY VACUUM PUMP MODEL TRM

Performance table

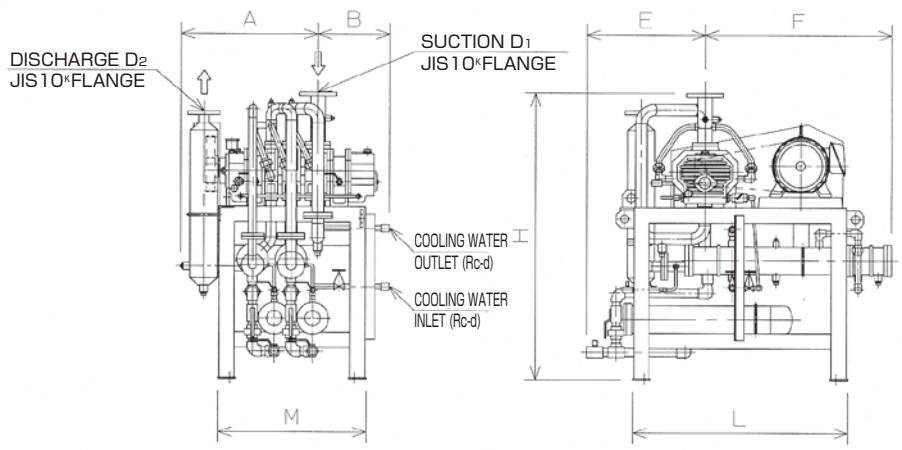
MODEL	SUCTION D_1 (mm)	DISCHARGE D_2 (mm)	PUMPING SPEED (m^3/min)	MOTOR (kw)	COOLING WATER CAPACITY (Lit/min)
TRM0403	40	25	2.1	3.7	10
TRM0503	50	32	3.3	5.5	15
TRM0653	65	40	5.0	7.5	20
TRM0803	80	50	7.4	11	25
TRM1003	100	65	14	22	35
TRM1253	125	80	21	30	45



Dimension

MODEL	A	B	E	F	H	L	M	d
TRM0403	525	275	500	800	1180	890	560	1/2
TRM0503	570	300	500	800	1200	910	620	1/2
TRM0653	620	310	525	885	1400	1070	660	1/2
TRM0803	725	320	525	1050	1435	1100	750	1/2
TRM1003	960	380	540	1060	1650	1200	1010	3/4
TRM1253	1100	450	650	1160	1920	1360	1190	3/4

(mm)

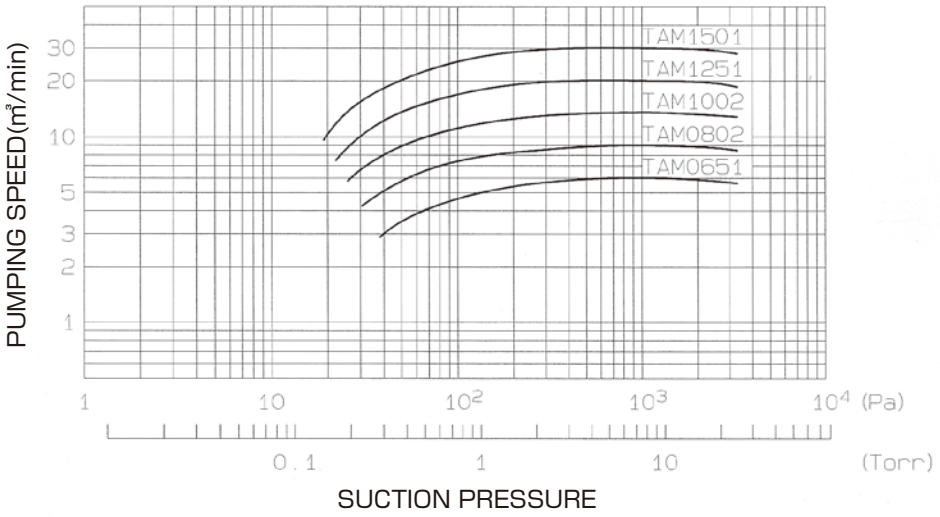


Dimensions may change without any notice.

DRY VACUUM PUMP MODEL TAM(TRM+Mechanical Booster)

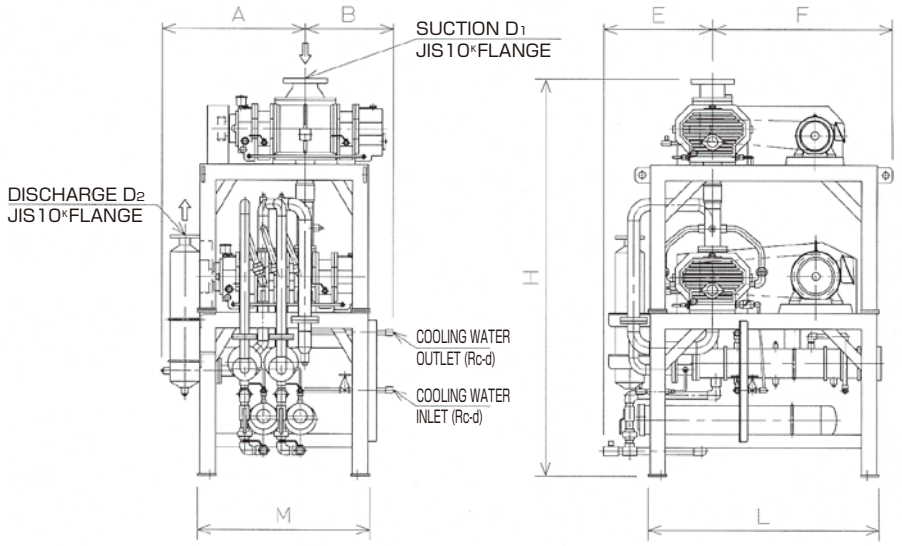
Performance table

MODEL	SUCTION D_1 (mm)	DISCHARGE D_2 (mm)	MECH. BOOSTER MODEL	PUMPING SPEED (m^3/min)	MOTOR (kw)	DRY VACUUM PUMP MODEL	MOTOR (kw)	COOLING WATER CAPACITY (Lit/min)
TAM0651	65	25	TRA0651	6.0	2.2	TRM0403	3.7	15
TAM0802	80	32	TRA0802	9.0	3.7	TRM0503	5.5	20
TAM1002	100	40	TRA1002	13.5	3.7	TRM0653	7.5	25
TAM1251	125	50	TRJ1251	20	5.5	TRM0803	11	30
TAM1501	150	65	TRJ1501	30	7.5	TRM1003	22	40



Dimension

MODEL	A	B	E	F	H	L	M	d
TAM0651	575	350	500	825	1630	1020	700	1/2
TAM0802	650	350	500	825	1650	1020	760	1/2
TAM1002	680	420	525	875	1900	1120	820	1/2
TAM1251	750	425	1170	890	1945	1640	800	1/2
TAM1501	965	480	1190	910	2200	1720	1020	3/4



Dimensions may change without any notice.

Unozawa Products

1.Rotary blower(Roots type)
2.Rotary vacuum pump(Roots type)
3.Dry Vacuum pump
4.Mechanical booster
5.Water ring Vacuum pump

Inquiries

When inquiring about Unozawa Dry vacuum pump,
please furnish the following information:

1. Application:	Vacuum distillation, Solvent recovery, Vacuum drying etc.
2. Specification:	Pumping speed, Suction pressure, Suction gas temperature, Ultinate vacuum pressure
3. Handling gas:	Gas name,Corrosiveness
4. Condition of installation:	Indoor or Outdoor
5. Driver and Utillity:	Motor type, Voltage, Frequency, Cooling water temperature, Cooling water pressure
6. Accessories&Spare parts:	Required or not
7. Painting color:	(Unozawa standard color is munsell 5B-4/1.5)

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