

## LEADER IN VACUUM PUMP TECHNOLOGY

### GENERAL INFORMATIONS

Liquid ring vacuum pumps are in class of positive displacement pumps. Using the expansion and reduction principle in the cell of impeller blade, they vacuum the gases with a liquid ring. If the appropriate liquid is selected (generally water) all the gases and vapours are moved. Maximum reached vacuum level of liquid ring vacuum pumps are limited by evaporation pressure of the working liquid.

Because of their working conditions are in liquid, they are useful for applications which include moisture like filtration, drying, refrigeration and distillation. The shaft sealing is assured by standard mechanical seal.

The rotor, dynamically balanced, is supported by ball bearings. The direction of the rotation is clockwise, when looking from the motor on the pump. Using the coupling or directly is driven by an electrical motor.



### WORKING PRINCIPLE

Liquid ring vacuum pumps are suction pumps. While the moving part, (the shaft and the impellers) which are mounted eccentric from the center axis of the pump casing. As the rotor, the shaft and the impellers turn the liquid in the pump casing forced outwards by centrifugal force. A liquid ring forms along the body wall. Because of the eccentricity of the rotor the cells between pump casing and the rotor blades are filled with liquid at different amounts. The cells which are in the top position are completely filled with liquid and as the impeller rotates through half a revolution the liquid is replaced by gas. As rotation continues the liquid forces the gas through the discharge port. This cycle is repeated for each cell of the impeller and results in a steady flowing source of vacuum.

## APPLICATION AREAS



### LIQUID RING VACUUM PUMPS

**GÜCÜM PUMP** and Machine Industry Co. is the leader and pioneer of the vacuum pump technology in Turkey. The company has been manufacturing liquid ring vacuum pumps since 1970. Gücüm liquid ring vacuum pumps were experienced in different working conditions of thousands of industrial applications and they work as quiet, reliable with minimum maintenance and long working life.



## DON'T LIMIT YOUR POWER

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Dilovası/Kocaeli

- ✓ Able to pump every kind of gases and vapours.
- ✓ Vacuum pressure up to 33 mbar absolute.
- ✓ Able to handle liquid together with gas.
- ✓ Works quiet and reduced vibration.
- ✓ Oil-free, no need to lubrication.
- ✓ High efficiency and minimum maintenance.
- ✓ Operating and investment costs are low.
- ✓ Service liquid does not let the pump heats much.
- ✓ There is no leakage with mechanical seal design pumps.
- ✓ Can be used for different applications with proper selection of construction materials and service liquid.

PART NAME	MATERIALS		
	Standard Construction	Special Construction	Stainless Steel Construction
Inlet&Outlet Casing	GG 25 Cast Iron	GG 25 Cast Iron	AISI 304 Stainless Steel AISI 316 Stainless Steel
Casing	GGG 60 Spherical Cast Iron ST 37 Steel	GGG 60 Spherical Cast Iron ST 37 Steel	AISI 316 Stainless Steel
Impeller	G CuSn9 Bronze	AISI 316 Stainless Steel	G CuSn9 Bronze AISI 316 Stainless Steel
Shaft	AISI 420 Stainless Steel	AISI 316 Stainless Steel	AISI 316 Stainless Steel AISI 316 Stainless Steel
Interm Plate	GGG 60 Spherical Cast Iron AISI 304 Stainless Steel	GGG 60 Spherical Cast Iron AISI 304 Stainless Steel	AISI 316 Stainless Steel AISI 316 Stainless Steel
Mechanical Seal	Grafitte Carbon/SiC/Viton		

## TECHNICAL SPECIFICATIONS

TYPE	Inlet & Outlet	Absolute	mbar	400	200	100	80	60	40	33	Service Liquid
		Torr	Torr	300	150	75	60	45	30	25	
		Vacuum	mmHg	-460	-610	-685	-700	-715	-730	-735	
		Power	Speed	Suction Capacity ( m³/h )							
(kW)	( rpm )										

### CLOSE COUPLED VACUUM PUMPS

GMVP 120/030	G 1"	0.75	2900	25	24	23	22	20	18	15	4
GMVP 120/050	G 1"	1.5	2900	52	50	45	40	36	30	25	6
GMVP 145/050	G 1,5"	2,2	2900	80	78	72	66	62	52	45	8
GMVP 145/080	G 1,5"	4	2900	110	112	109	105	100	88	70	10
GMVP 200/055	DN 40	2.2	1450	72	74	80	78	77	75	65	13
GMVP 200/065	DN 40	3	1450	105	106	110	108	107	100	80	15
GMVP 200/085	DN 40	4	1450	134	137	141	140	132	115	95	16
GMVP 230/090	DN 50	5.5	1450	190	193	195	190	185	175	165	18
GMVP 230/120	DN 50	5.5	1450	220	228	230	227	220	205	185	20
GMVP 270/110	DN 65	7.5	1450	280	282	280	275	270	240	205	23
GMVP 270/155	DN 65	11	1450	382	364	347	332	312	280	270	25

### TWO STAGE VACUUM PUMPS

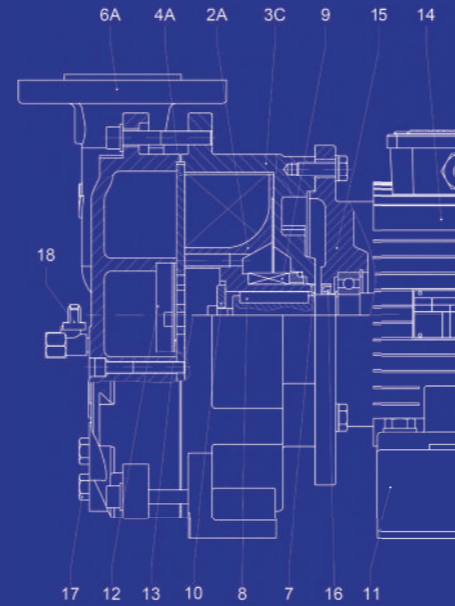
GMP 145/080	DN 32	3	1450	54	54	54	53	48	40	30	6
GMP 185/080	DN 40	4	1450	105	108	105	97	85	70	50	12
GVP 200/120	DN 40	5,5	1450	150	155	145	140	130	110	90	14
GVP 200/170	DN 40	5,5	1450	180	190	190	185	165	140	110	16
GVP 230/120	DN 50	11	1450	260	270	270	250	215	190	175	30
GVP 230/160	DN 50	11	1450	330	350	345	325	290	240	200	35
GVP 230/220	DN 50	15	1450	370	420	450	430	360	300	250	45
GMP 230/120	DN 50	11	1450	270	280	280	260	220	190	175	30
GMP 230/160	DN 50	11	1450	330	350	350	340	300	240	200	35
GMP 230/200	DN 50	15	1450	390	440	440	420	360	290	225	40
GMP 250/160	DN 65	15	1450	430	460	470	450	390	330		40
GMP 250/200	DN 65	18,5	1450	490	530	540	520	440	360		45
GMP 250/240	DN 65	22	1450	540	590	610	590	500	400		50
GVP 275/160	DN 80	18,5	1450	620	650	610	590	485	420		50
GVP 275/220	DN 80	22	1450	730	760	740	700	590	500		60
GVP 275/260	DN 80	30	1450	820	860	840	790	680	550		65

### SINGLE STAGE VACUUM PUMPS

GMVT 275/220	DN 100	15	1450	630	640	620	580	540	450		50
GMVT 275/260	DN 100	18,5	1450	710	730	710	680	630	550		55
GMVT 275/300	DN 100	22	1450	800	830	810	785	720	650		60
GMVT 410/260	DN 125	30	980	1100	1115	1050	1015	950	880		85
GMVT 410/320	DN 125	37	980	1350	1365	1330	1310	1260	1200		90
GMVT 410/400	DN 125	45	980	1670	1700	1700	1690	1670	1600		100
GMPT 520/400	DN 200	55	735	2100	1900	1600					150
GMPT 520/530	DN 200	75	735	2800	2600	2100					170
GMPT 520/600	DN 200	90	735	3600	3350	2700					210

The values expressed for the suction capacity are valid for the compression of dry air from suction pressure to atmospheric pressure ( 1013 mbar ) using water at 15 °C as service liquid. The tolerance of curves is ±10%.

## SECTIONAL DRAWINGS AND PART LISTS

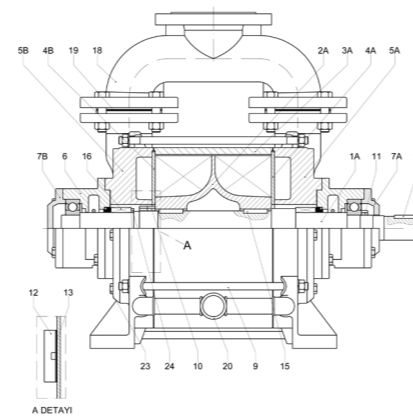


### CLOSE COUPLED VACUUM PUMP

- 2A Impeller
- 3C Casing with plate
- 4A Plate
- 6A Inlet & outlet casing
- 7 Impeller spacer
- 8 Impeller key
- 9 Mechanical seal
- 10 Impeller cover
- 11 Baseplate
- 12 Valve cover
- 13 Valve
- 14 Electrical motor
- 15 Motor flange
- 16 Gasket
- 17 Plug
- 18 Drain valve

### TWO STAGE VACUUM PUMP

- 1A Shaft
- 2A First impeller
- 2B Second impeller
- 3A First casing
- 3B Second casing
- 4A Suction plate
- 4B Discharge plate
- 5A First intermediate plate
- 5B Second intermediate plate
- 6A Suction casing
- 6B Discharge casing
- 7 Bearing carrier
- 8A Bearing cover
- 8B Bearing end cover
- 10 Tie rod
- 11 Impeller nut
- 12 Bearing nut
- 13 Impeller spacer
- 15 First impeller key
- 16 Second impeller key
- 17 Coupling key
- 19 Mechanical seal
- 21 Branch pipe
- 22 Gasket
- 23 Plug
- 24 Mechanical seal spacer
- 25 Drain valve



### SINGLE STAGE VACUUM PUMP

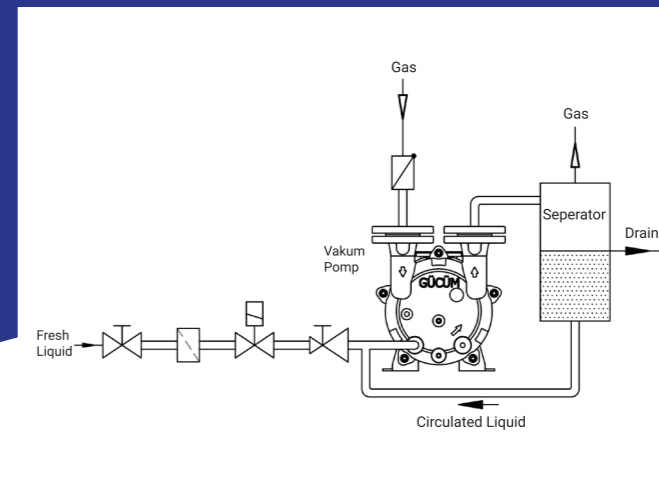
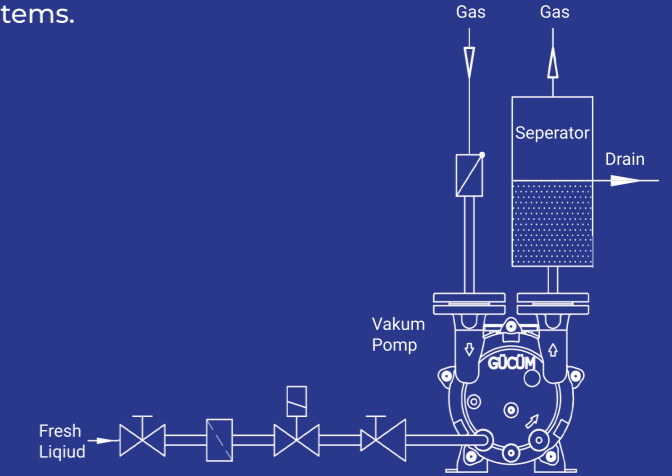
- 1A Shaft
- 2A Impeller
- 3A Casing
- 4A Suction plate
- 4B Discharge plate
- 5A Suction casing
- 5B Discharge casing
- 6 Bearing carrier
- 7A Bearing cover
- 7B Bearing end cover
- 9 Tie rod
- 10 Impeller nut
- 11 Bearing nut
- 12 Valve cover
- 13 Valve
- 14 Coupling key
- 15 Impeller key
- 16 Mechanical seal
- 18 Branch pipe
- 19 Gasket
- 20 Service liquid connection
- 23 Plug
- 24 Mechanical seal spacer

## SERVICE LIQUID SYSTEM

Pump must supplied with service liquid to remove the heat created during compression of the gases and to make the liquid ring uninterrupted. Generally water is selected for service liquid. To have better efficiency from the pump service liquid must be as cool as possible. Below is some service liquid systems.

### a) ONCE THROUGH NO RECOVERY SYSTEM :

Service liquid is not used again. All the required service liquid is supplied from a plant. If the supplied service liquid is pressurized pressure regulator must be used to regulate the pressure before liquid entering the pump.



### b) PARTIAL RECIRCULATION :

Service liquid is the mix of the liquid from the plant and from separator. The amount of the supplied liquid from the plant is adjusted according to the discharged liquid temperature.

### c) TOTAL RECIRCULATION :

At this system all the liquid separated from the gas in the separator tank is used as service liquid again. Heated liquid inside the pump must be cooled by the heat exchanger before entering the pump.

- Shut-off Valve
- Pressure Reducing Valve
- Heat Exchanger
- Non-return valve
- Solenoid Valve
- Strainer

