



Empowering you to work smarter

UniDrive Vacuum Pump Operating Manual



Failure to follow warnings could result in death or serious injury.

**SAVE THIS MANUAL
FOR FUTURE REFERENCE**

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Use Information

Thanks for choosing NAVAC vacuum pump of high reliability (Hereinafter referred to as "the pump"). Please check carefully whether the product received is the same as you ordered and the accessories, spare parts & operating manual are attached as well. Please also check if there's any damage occurred during transportation. If needed, contact the local distributor or our sales team.

In order to maintain a stable performance level of the pump, read this operating manual carefully to fully understand the safety instructions, technical data as well as operating procedures before installation, operation, repair and maintenance of the pump.

Warning

Failure to observe the terms could result in personal injury or even death.

Notice

Failure to observe the terms could result in damage to the pump.



This warning label indicates risk of electrical shock. Disconnect the pump from the power supply before beginning with connections, repair and maintenance. Make sure the cover of junction box is properly installed before running.



This warning label indicates high temperature hazard. Do not touch the pump when the pump is in operation.

Notice

Read the operating manual carefully and follow the operating procedures. We reserve the right to modify the design and technical data of the pump without notice which may have discrepancies in the manual. Add vacuum oil as requested before starting the new pump.

Attention

In order to ensure the personal safety, read the operating manual carefully before installation, operation, repair and maintenance.

Warning

- 1). According to the technical guidelines and wiring regulations for electrical equipment, the power supply must match with the information shown on the pump nameplate and the electrical connections must be performed by a skilled electrician.
- 2). To prevent electrical hazards and sudden start-up hazard which may result in personal injury, disconnect the power supply before checking or repairing the pump.
- 3). The selected cable and motor protection switch rated current have to matches the rated current value of the motor nameplate.
- 4). The pump is strictly prohibited to pump dusty, active toxic, corrosive, flammable and explosive gases.

- 5). Do not place obstacles which may affect the ventilation of the motor and cause burn hazard and fire by abnormal temperature rise.
- 6). Please keep the exhaust port open before running the pump. There are not allowed to clog or restrict the exhaust airflow. The size of exhaust pipe absolute pressure is required not less than 1.15bar (Relative pressure not less than 0.15bar).

! Notice

- 1). If the external power supply is abruptly disconnected, wait approximately 20 seconds after restoring normal power input before restarting the pump.
- 2). The pump should only be operated within an ambient temperature range of 18-40°C. Failure to adhere to this range may result in pump malfunction.
- 3). Use a circuit breaker or fuse rated at 16A for the power socket connection of the pump.
- 4). Adhere to the recommended oil level indicated by the scale line on the pump. Overfilling with oil can lead to pump failure.
- 5). When connecting the pump to the vacuum system, the pump base can be placed horizontally on the ground or secured with bolts.
- 6). During pump operation and within 1 hour of shutdown, the pump's surface temperature may become very high. Avoid touching the pump's casing and surface to prevent burns.
- 7). Install the pump horizontally within a 10° tolerance in a stable and secure location.
- 8). Dispose of waste oil and other parts in compliance with relevant environmental protection regulations.
- 9). Install the appropriate accessory when pumping a medium containing a small amount of dust to prevent pump failure or performance degradation.
- 10). Contact us if there are special specification requirements, such as pumping flammable and explosive gases or corrosive mediums, or if special materials are needed.
- 11). Non-professionals should not disassemble the pump, which may lead to pump failure or improper operation. Contact us if disassembly is necessary.

Description

This pump is developed and used as a mass spectrometer industry equipment. It features stable running, low noise, high pumping speed during extreme vacuum.

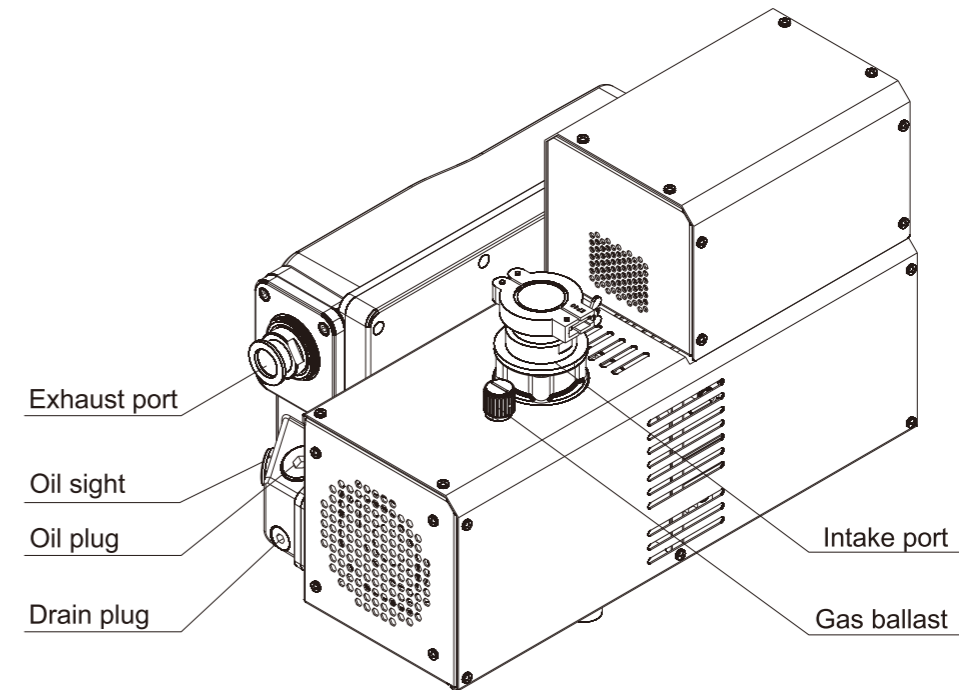


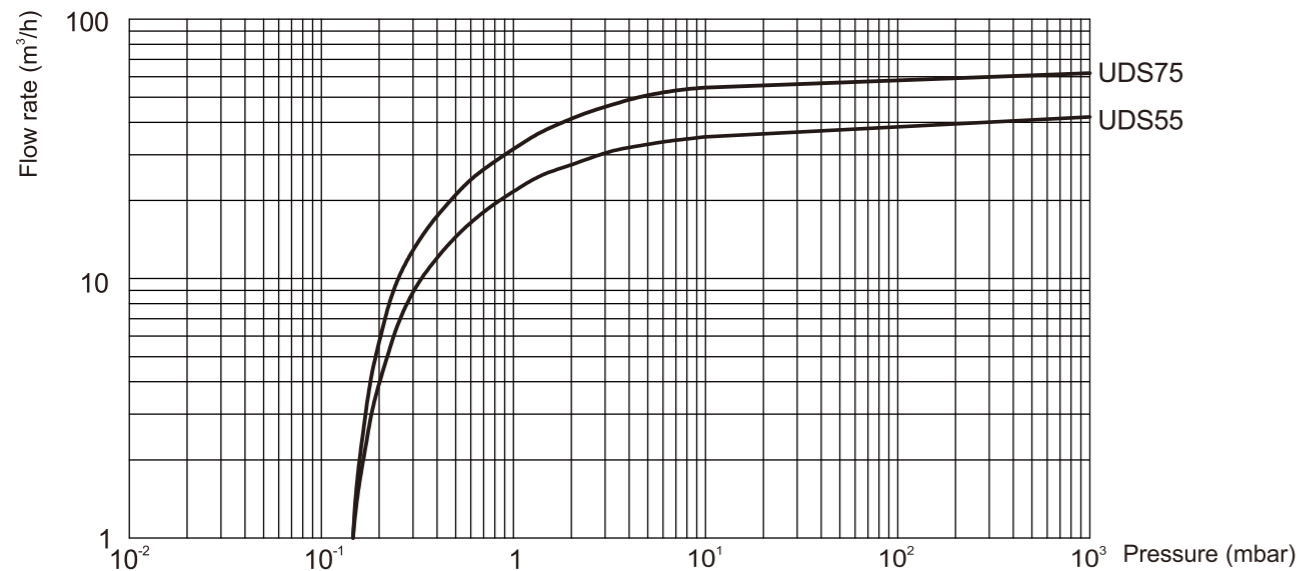
Fig.1

Technical Parameters

Model			UDS55	UDS75
Displacement	60Hz	m ³ /h	47	62
Ultimate Pressure		Pa	15	15
Power Supply			220V/50-60Hz	220V/50-60Hz
Power Rating		kW	1.5	1.5
Inlet and Exhaust Port			KF40/25	KF40/25
Oil Capacity		L	2.5	2.5
Motor Speed	60Hz	rpm	1400	1800
Ambient Temperature		°C	10 - 40	10 - 40
Noise		dB	≤63	≤65
Weight		lbs	121	121
Dimension(L*W*H)		in	21.5x12.7x14.6	21.5x12.7x14.6

Table 1

Pumping speed characteristics



Dimension

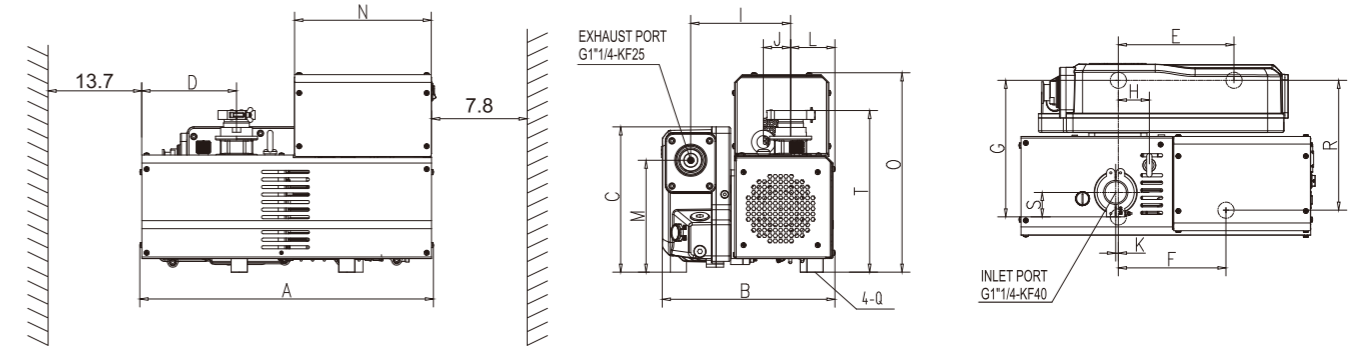


Fig.2

Unit: inch

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Q	R	S	T
UDS55	21.5	12.7	10.6	6.9	8.5	7.9	9.3	2.3	7.3	2	0.2	3.3	8.2	10	14.6	M8	9.5	1.8	11.8
UDS75	21.5	12.7	10.6	6.9	8.5	7.9	9.3	2.3	7.3	2	0.2	3.3	8.2	10	14.6	M8	9.5	1.8	11.8

Table 2

Transport and Packaging

! Warning

Do not move the pump while it's operating.

! Notice

- 1). Any negligence can result in damage to the pump. Handle with care during transportation. When moving the pump, ensure it is positioned horizontally to prevent oil overflow.
- 2). Dispose of packaging materials in compliance with environmental protection regulations.

Inspect and Maintenance

! Warning

- 1). All inspections and maintenance procedures must adhere to safety protocols. Trained professionals should conduct all tasks.
- 2). When dealing with hazardous substances, identify the type of hazard first and follow relevant safety regulations. If a potential hazard persists, the pump must be decontaminated before any maintenance is performed.

! Notice

For the UDS75 pump startup, allow 15 seconds for the pump to initiate.

6.1 Routine checking

Inspection	Period
Oil level	Every day
Pump noise	Every day
Oil mist filter	Running in one year in Corrosion-free environment or appear oil oil mist
Floating ball	Operating for 1500~3000 hours or emerging oil fog
Gas ballast cartridge	One year
Anti-suckback plate	One year or the vacuum failed
Intake air filter	One year
Oil filter	Running in one year in cleaning environment or after the oil change
Clean fan cover	One year
Change the oil	Running in one year in cleaning environment
Wiring checking	One year

Table 3

6.2 Maintenance

6.2.1 Check the oil level

- (1) The oil level shall be always kept between position MAX and MIN of oil sight glass during operation (refer to Fig. 7). Add oil when the oil level is lower than position MIN and discharge oil by removing the oil drain plug (refer to Fig. 2) when the oil level is above position MAX.
- (2) Check the oil color. Replace the oil if the color is other than clear and transparent.

6.2.2 Check the pump's noise

The pump noise shall be continuous and stable during operation. If any abnormal noise is found, refer to Table 4 Troubleshooting.

6.2.3 Oil change

- (1) Change the oil when the pump is switched off and cooled down.
- (2) Remove the oil drain plug (Fig. 2) and drain the used oil into a suitable receptacle. When the flow of oil stops, screw on the oil drain plug and start the pump shortly (10 seconds). Switch off the pump, remove the plug again and drain the residual oil. Screw on the oil drain plug (Check O-ring, replace it if necessary). Remove the oil fill plug (Fig. 2) and fill in fresh pump oil which is specified or provided by the manufacturer.
- (3) After oil changing, handle the used oil stored in an assigned container according to local relevant environmental laws and regulations.

6.2.4 Regularly check fan cover and motor fan

Regularly clean the fan cover and motor fan. Clean them by compressed air and reinstall them properly before pump operation.

Troubleshooting

Fault	Possible Reason	Remedy
Pump cannot start	1. Wiring is malfunctioning.	1. Check and repair wiring.
	2. Operation voltage is abnormal.	2. Make sure the voltage is within rated voltage's tolerance of $\pm 10\%$.
	3. Motor is malfunctioning.	3. Replace the motor.
	4. Overload protector is active.	4. Check the ambient temperature or pumped gases temperature.
	5. Oil temperature is below 10°C	5. Increase the ambient temperature.
	6. Pump is jammed.	6. Repair the pump.
	7. Out of operating for long.	7. Repair the pump.
	8. Oil is too viscous.	8. Change the oil.
	9. Exhaust filter or exhaust line is clogged.	9. Replace the filter or clean the exhaust line.
	10. Pump inner parts are damaged.	10. Repair the pump.
Pump cannot reach ultimate pressure.	1. Vacuum system configuration is unreasonable.	1. Choose a suitable pump.
	2. Vacuum system leak.	2. Check the system.
	3. Measuring technique or gauge is unsuitable.	3. Use correct measuring technique and gauge. Measure the pressure directly at pump's intake port.
	4. Poor lubrication.	
	4.1 Oil filter is obstructed.	4.1 Change the oil filter.
	4.2 Oil is unsuitable.	4.2 Change the oil.
	4.3 Oil channel is obstructed.	4.3 Clean the channel.
Pumping speed is too low.	4.4 Oil is insufficient.	4.4 Add the oil to the level as requested.
	5. Anti-suckback oil valve is malfunctioning.	5. Repair anti-suckback oil valve.
	6. Intake line is dirty.	6. Clean vacuum lines.
	7. Floating ball components return oil valve is malfunctioning.	7. Repair floating ball components return oil valve.
	1. Intake port line is clogged.	1. Clean the intake port line.
	2. Connecting lines are too narrow or too long.	2. Use adequately wide and short connecting lines.
	3. Exhaust line is clogged.	3. Keep exhaust port line unobstructed.
Noise is abnormal.	4. Oil mist filter is clogged.	4. Change the oil mist filter.
	5. Anti-suckback oil valve is malfunctioning.	5. Repair anti-suckback oil valve.
	1. Operation voltage is abnormal.	1.1 Check the power supply, switches and wiring connection. 1.2 Make sure the voltage is within rated voltage's tolerance of $\pm 10\%$.
	2. Foreign matters entering into the pump.	2. Repair the pump.
	3. The oil level of the pump is too low.	3. Add the oil to the level as requested.
	4. The pump inner parts are damaged.	4. Disassembly and replace the parts.

Fault	Possible Reason	Remedy
Pump get shotted than usually observed.	1. Poor ventilation.	1. Improve ventilation environment.
	2. The fan is damaged.	2. Change the fan.
	3. Pumped gas temperature is too high.	3. Add cold trap at intake port.
	4. Poor lubrication.	
	4.1 The oil filter or exhaust line is clogged.	4.1 Replace oil filter or clean the exhaust line.
	4.2 Oil is unsuitable.	4.2 Change the oil.
	4.3 Oil channel is obstructed.	4.3 Clean the channel.
	4.4 Oil is insufficient.	4.4 Add the oil to the level as requested.
	5. The condensator is dirty.	5. Clean the condensator.
Oil in the intake line or in vacuum vessel.	6. Ambient temperature is too high.	10. Repair the pump.
	1. Oil comes from the vacuum system.	1. Check the vacuum system.
	2. Anti-suckback valve spring is obstructed.	2. Replace anti-suckback valve spring.
	3. Anti-suckback valve plate is obstructed.	3. Replace anti-suckback valve plate.
Vacuum pressure in system rises too fast when pump stops.	4. Oil level is high.	4. Drain the excess oil.
	1. Vacuum system leak.	1. Check the system.
Too much oil in the exhaust port.	2. Anti-suckback valve is malfunctioning.	2. Repair anti-suckback valve.
	1. Too much oil in the pump.	1. Drain some oil.
	2. Continuous operation under high pressure in the intake port	2. Shorten exhaust time.
Sealing surface leak	3. Oil mist filter is obstructed.	3. Replace oil mist filter.
	1. The seal is damaged.	1. Replace the seal.
	2. Seal ring is damaged.	2. Replace the seal ring.

Table 4

8. Warranty

UDS Series vacuum pumps have one year guarantee from the date of purchase. Spare parts will be provided free of charge within the period of guarantee in condition that the pump is operated according to the operating manual. The following failures will be charged for repair:

- 1) Malfunction caused by nature disasters or artificial factors.
- 2) Malfunction caused by special operating environment.
- 3) Damage of wear parts.
- 4) Malfunction caused by abnormal operation or incorrect use indentified by our engineers Before the pump is delivered to our company for maintenance, it is required to acquire the information if the pump is contaminated (and which kind of pollutants) or hazardous substances exist inside the pump. Without receiving this statement in advance, the pump will be returned to the address of the sender.

9. Accessories

To ensure the stability of the pump, it is recommended to use genuine spare parts and accessories provide by the manufacture if you need further assistance, please contact us. The accessories below are for your selection:

- 1) Wear parts. Check the exploded view and spare parts list to select the required spare parts with corresponding item numbers.
- 2) Intake port/exhaust port other than default one.
- 3) Dust filter.

9.1 UDS55/75 Exploded view

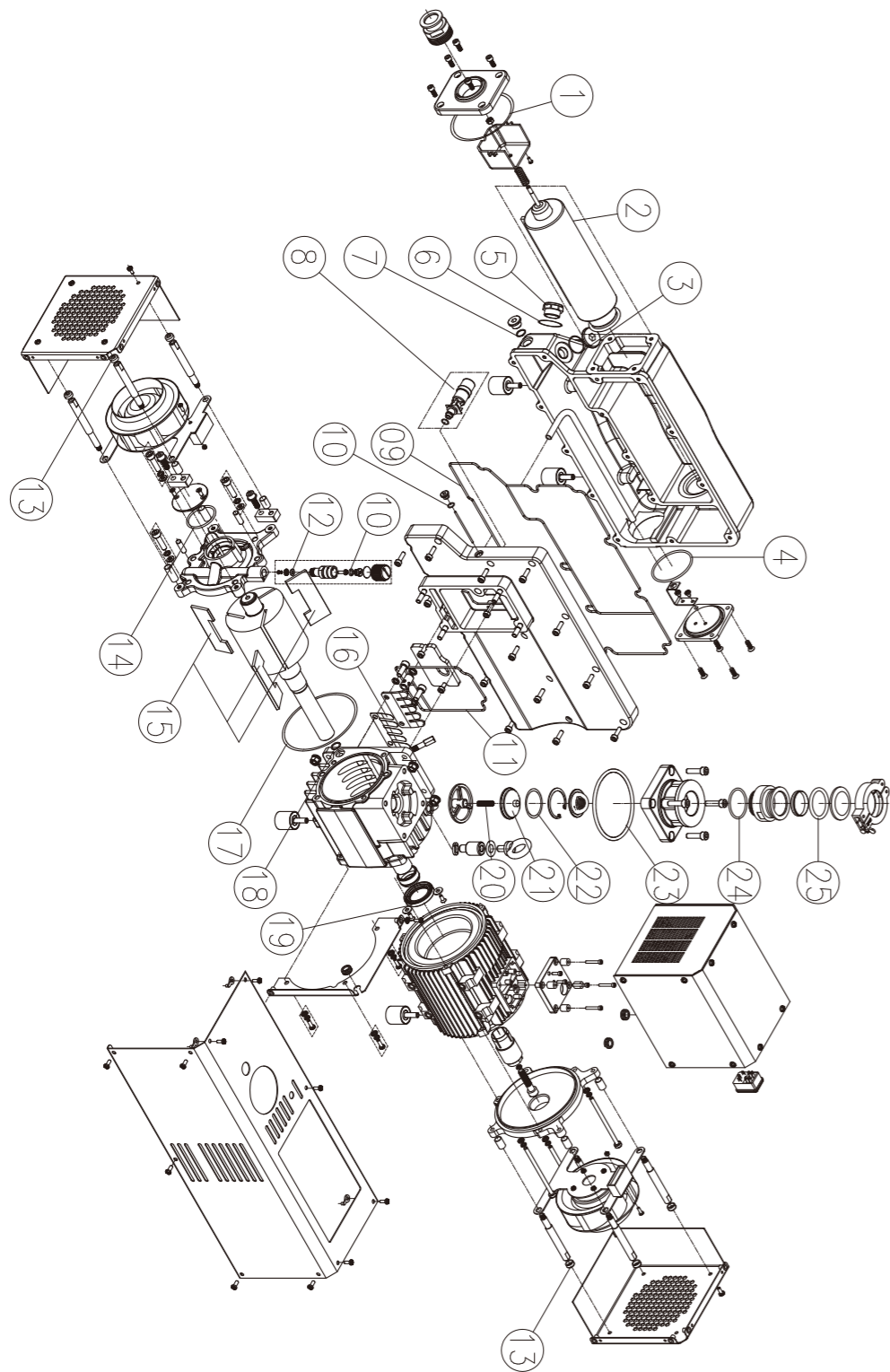


Fig.4

9.2 UDS55/75 Spare parts list

Item No.	Description	Qty
1	O-ring	1
2	Oil mist filter	1
3	O-ring	1
4	O-ring	1
5	Oil sight	1
6	Washer	1
7	O-ring	1
8	Floating ball	1
9	O-ring	1
10	O-ring	2
11	O-ring	1
12	O-ring	1
13	Rubber pad	8
14	O-ring	1
15	Vane	3
16	Exhaust valve	1
17	O-ring	1
18	O-ring	1
19	Seal	1
20	Spring	1
21	Anti-suckback plate	1
22	O-ring	1
23	O-ring	1
24	O-ring	1
25	O-ring	1

Table 5

Remark: 1) Please refer to the exploding drawing for the relationships of each spare parts
We reserve the right to modify the design and specified data in this operating manual without notice.

