

**INFICON SHARK™  
VACUUM PUMP**

**USER'S MANUAL**





## **Thank you for buying the INFICON SHARK Vacuum Pump!**

SHARK is a high quality two-stage rotary vacuum pump designed for fast evacuation, deep vacuum, simplified maintenance / repair, and durability. With normal use and care as prescribed in this manual, your SHARK will provide you with many years of trouble-free operation.

### **Safety First!**



**This international symbol is intended to alert the user to the presence of important operating, safety and maintenance (servicing) instructions in this Manual. As used in the Manual, it is intended to draw your attention to critical items.**

It is important to read this entire Manual and be familiar with its contents before using the machine!





### **Responsibility**

The INFICON SHARK must only be operated by a Qualified Technician who has been properly trained in the care and use of such equipment. Use of this equipment by unqualified personnel is potentially dangerous and should not be attempted.

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## 1.0 SAFETY PRECAUTIONS

- 1.1  **READ THIS MANUAL AND BECOME FAMILIAR WITH THE SPECIFICATIONS AND OPERATION OF THIS MACHINE PRIOR TO USE.**
- 1.2  **THIS EQUIPEMENT MUST ALWAYS BE OPERATED BY A QUALIFIED TECHNICIAN WHO IS FAMILIAR WITH REFRIGERANT SYSTEMS, REFRIGERANTS AND REFRIGERANT SAFETY.**
- 1.3  **TWIST OFF OIL FILL/EXHAUST CAP FROM VACUUM PUMP MASTER MOUNT AND DISCARD THE PLASTIC PLUG FITTED UNDERNEATH. DO NOT OPERATE THE PUMP WITHOUT REMOVING THE PLASTIC PLUG.**
- 1.4  **MOTOR IS FITTED WITH AN INTERNAL AUTO RESET THERMAL OVERLOAD SWITCH. IF SWITCH IS TRIPPED, THE MOTOR WHEN COOLED CAN RESTART WITHOUT ANY WARNING.**
- 1.5 **WEAR APPROPRIATE SAFETY PROTECTION APPAREL** such as gloves, eye protection and foot protection when working on refrigeration systems.
- 1.6 **DISCONNECT POWER** before moving or servicing the INFICON SHARK. Improper use or connections may cause **ELECTRICAL SHOCK** hazards. Be sure that all associated devices are properly grounded before energizing circuits.
- 1.7 **CARE MUST BE EXERCISED IF TOUCHING THE PUMP, AS CERTAIN COMPONENTS MAY BE HOT.**
- 1.8 The Exhaust Gas from the vacuum pump is composed of oil and gases entering the pump. **THE EXHAUST GAS SHOULD BE WELL VENTILATED.**
- 1.9 **NEVER OPERATE THE PUMP WITH BLOCKED OR RESTRICTED OUTLET** (exhaust), the resulting backpressure may blow out the sight glass or otherwise damage the pump.
- 1.10 **THE SHARK HAS BEEN DESIGNED TO OPERATE MOST EFFICIENTLY ON HIGH VISCOSITY SHELL TURBO OIL T32.** Other vacuum pump oils may work, but performance results may not be as stated.
- 1.11 **THE SHARK VACUUM PUMP IS NOT DESIGNED FOR PUMPING CORROSIVE, AGGRESSIVE OR EXPLOSIVE GASES, OR FOR USE IN FLAMMABLE OR EXPLOSIVE ENVIRONMENT.**

## 2.0 SPECIFICATIONS

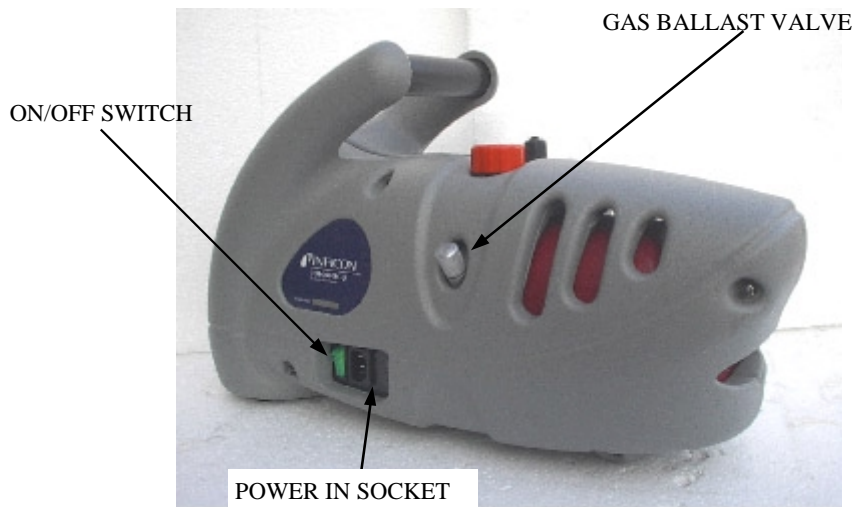
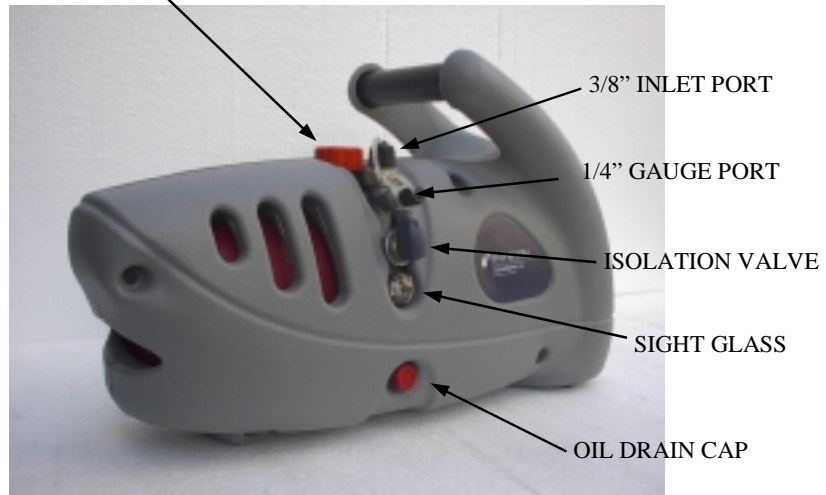
| Ref |                          | Model VNR172-1 (110/120v)                       | Model VNR152-3 (220/240v)                      |
|-----|--------------------------|---|--|
| 2.1 | Free Air Displacement:   | 6 cfm (170 Liters / Minute)                     | 150 liters / minute (5.2 cfm)                  |
| 2.2 | Motor:                   | 1/3 HP (250w) AC: 1685 RPM                      | 250 w (1/3 HP) AC: 1370 RPM                    |
| 2.3 | Ultimate Vacuum (PP):    | < 15 microns                                    | < 15 microns                                   |
| 2.4 | Oil Capacity:            | 0.90 Quarts (0.95 Liters)                       | 0.95 Liters (0.90 Quarts)                      |
| 2.5 | Port flare sizes:        | 1/4" SAE and 3/8"SAE                            | 1/4"SAE and 3/8"SAE                            |
| 2.6 | Oil Operating Temp.      | 122°F - 158°F (50°C - 70°C)                     | 50°C - 70°C (122°F - 158°F)                    |
| 2.7 | Ambient* Operating Temp: | 50°F - 104°F (10°C - 40°C)                      | 10°C - 40°C (50°F - 104°F)                     |
| 2.8 | Dimensions (L x W x H):  | 19.6" x 7.1" x 12.3"<br>(49.8 x 18.1 x 31.3 cm) | 49.8 x 18.1 x 31.3 cm<br>(19.6" x 7.1"x 12.3") |
| 2.9 | Weight:                  | 24 lbs (10.9Kgs)                                | 10.9Kgs. (24 lbs.)                             |

\*Ambient Operating Temperature is dependent on the type of oil used. The ambient temperature listed above is the general operating temperature when using INFICON approved High Viscosity Shell Turbo Oil T32.

## 3.0 FEATURES

- 3.1 **INTERNAL OIL PUMP** – The SHARK incorporates a built-in oil pump; it's purpose is to provide lubrication to the bearings and seals enhancing the life of the vacuum pump.
- 3.2 **ANTI-SUCK BACK ON INLET** – As the pump is shut down, the air break on top of the pump is exposed to atmosphere and the pump will self-vent eliminating the possibility of oil suck back. For this reason the pump must not be over filled with oil.
- 3.3 **ISOLATION VALVE** – Allows the pump to shut off while still connected to the system. In the "open" position the pump is open to the system being evacuated. In the "closed" position the pump is isolated from the system. This valve is also user adjustable so should a leak occur it can be easily rectified.
- 3.4 **GAS BALLAST** –The function is to allow condensable vapors (i.e. water) to be discharged through the pump to atmosphere instead of accumulating in oil reservoir.
- 3.5 **LARGE OIL CAPACITY** ensures pump lasts longer and a high vacuum is maintained even at high ambient temperatures.
- 3.6 **FAN** offers positive air-cooling that channels air over motor and vacuum pump casing. This not only prevents overheating but maintains the temperature at a controlled level.
- 3.7 **REPLACEABLE VACPAK VACUUM CARTRIDGE** allows the technician to repair the vacuum pump without any hassles.
- 3.8 **EXHAUST** acts as combined exhaust, demister and oil filler.

COMBINATION EXHAUST / DEMISTER / OIL FILLER



#### 4.0 START-UP PROCEDURE



THE SHARK IS SHIPPED WITHOUT OIL IN ITS RESERVOIR...  
**DO NOT START PUMP WITHOUT ADDING OIL!**



TWIST OFF OIL FILL/EXHAUST CAP FROM VACUUM PUMP MASTER MOUNT AND DISCARD THE PLASTIC PLUG FITTED UNDERNEATH.  
**DO NOT OPERATE** THE PUMP WITHOUT REMOVING THE PLASTIC PLUG.

- 4.1 Place pump on flat surface **REMOVE** Oil Filler cap and the Filter Elements from Combination Exhaust Fitting.
- 4.2 Pour oil SLOWLY to avoid OVERFLOW AND SPILL. Fill up to the center of the sight glass with INFICON approved HIGH VISCOSITY SHELL TURBO OIL T32 (Part No. VS4011)  
**NOTE:** Oil level will rise when the pump warms up & reaches the operating temperature. Check oil level when warm & adjust if required. **DO NOT OVERFILL.**
- 4.3 REFIT Filter Elements and Oil Fill cap, ensure the high density (thin) disc is on top. Any oil spill should be wiped with a clean dry cloth.
- 4.4 REMOVE Cap from one of the inlet ports and turn the Isolation Valve to "OPEN" position.
- 4.5 Turn power switch ON.
- 4.6 Let the SHARK run in order to warm-up and when it is running smoothly, turn the Isolation Valve to "CLOSED" position and REPLACE cap on the inlet port.
- 4.7 Turn power switch OFF and CONNECT to system.



**PRIOR TO CONNECTING THE SHARK TO AN AC/R SYSTEM, REMOVAL OF REFRIGERANT FROM THE SYSTEM IS NECESSARY; WE RECOMMEND THE XTRACT-R FOR THIS PURPOSE. DAMAGE TO THE PUMP MAY OCCUR IF EVACUATION IS STARTED WHILE THE SYSTEM IS UNDER HIGH PRESSURE.**

- 4.8 If a vacuum gauge is being used REMOVE cap from one of the inlet ports, and ATTACH it to the intake.
- 4.9 Make sure fittings and connections are tight.
- 4.10 Turn the Isolation Valve to "OPEN" position.
- 4.11 Turn power switch ON.
- 4.12 "OPEN" Gas Ballast valve for a few minutes to help bring pump up to its normal operational temperature sooner.



**IT IS VITALLY IMPORTANT THAT THE PUMP HAS REACHED ITS NORMAL OPERATIONAL TEMPERATURE (50°C-70°C / 122°F-158°F) BEFORE ANY CONDENSABLE VAPORS ARE PUMPED. FAILURE TO DO THIS MAY CONTAMINATE THE OIL AND DAMAGE THE PUMP.**

- 4.13 The SHARK is **NOW READY TO EVACUATE** air conditioning and refrigeration systems.

**NOTE:** If a system leak test needs to be done, it is recommended to keep the pump running after the isolation valve is closed.

Under no circumstances should the fittings on the vacuum pump be used for refrigerant transfer, as damage will occur to the valve.

## 5.0 USING THE GAS BALLAST

- 5.1 The Gas Ballast valve allows a controlled amount of air to enter the compression cycle, diluting the condensable vapor (i.e. water), then exhausting it out of the compression chamber **before it condenses and accumulates in oil reservoir**.

***For Example:** In a wet system, the partial pressure of water increases as the pump removes the air. When the partial pressure of the water vapor of the system gas reaches its Saturation Vapor Pressure (SVP) during the compression cycle of the pump, it condenses back into a liquid, mixes with the oil, and the pump WILL NOT achieve vacuum better than the SVP of the water. This is because the water evaporates from the oil on the suction cycle and then re-condenses back into the oil during the compression cycle. However, if you reduce the partial pressure of the water vapor during the pump's compression cycle with a measured and controlled amount of non-condensable gas, the water vapor WILL NOT reach its SVP during compression and will therefore be discharged from the pump. The gas ballast allows a controlled amount of atmospheric gas into the compression cycle of the pump, thus "diluting" the water vapor that is being compressed and exhausting it out of the compression chamber before it condenses.*

- 5.2 The Gas Ballast valve can be opened or closed at any time during pump operation. It can also be "OPENED" as follows:

5.2.1 During start-up will aid the pump in reaching its normal operational temperature sooner as a cold pump will more easily condense vapor.

5.2.2 During the evacuation process will minimize the effect of vapor condensing within the pump, but it may slightly reduce ultimate vacuum. If ultimate vacuum is required, the Gas Ballast may be "closed" during the evacuation process.

5.2.3 During shut down will allow pump to purge condensable vapors.

- 5.3 The Gas Ballast valve is located on the opposite side of the Isolation Valve of the vacuum pump. Normal operating condition is about two turns counter-clockwise, at which a slight "popping" noise occurs. Open valve several turns before closing down to required control position. The valve when shut down must only be finger tight otherwise the precision valve seat may get damaged.



## 6.0 SHUT DOWN PROCEDURE

- 6.1 CLOSE the manifold valve between the pump and the system.
- 6.2 Turn the Isolation Valve to "CLOSED" position and remove hoses from inlet.
- 6.3 "OPEN" Gas Ballast valve for a few minutes before shut down. This allows the pump to purge condensable vapors.
- 6.4 Turn power switch OFF.
- 6.5 Turn Isolation Valve to "OPEN" position for a few seconds to relieve any vacuum inside pump.
- 6.6 If necessary, drain oil while the pump is warm.

## 7.0 MAINTENANCE



**DISCONNECT SHARK FROM POWER SUPPLY BEFORE CARRYING OUT ANY MAINTENANCE.**

### 7.1 CHANGING OIL



**THE OIL MUST BE CHANGED WHEN CONTAMINATED**

Evacuation of most used systems results in some contamination of the oil, causing deposits of sludge containing water and acids. These substances will corrode your pump. Changing the oil will remove damaging substances and will enhance the life of the vacuum pump.

- 7.1.1 Poor vacuum reading or a gray or milky appearance usually indicates oil contamination. If the vacuum pump is pumping condensable vapors, it may be necessary to change the oil after each process so that the pump does not stand idle with contaminated oil.
- 7.1.2 To change oil REMOVE the Oil Drain cap and DRAIN OIL into a suitable receptacle, this process is easier if the vacuum pump is tilted slightly.
- 7.1.3 Turn power switch ON momentarily with the inlet port open, thus removing any residual oil.
- 7.1.4 REPLACE the Oil Drain cap when the flow of oil has stopped.
- 7.1.5 REMOVE Oil Fill cap and FILL the oil reservoir with **NEW INFICON** approved high viscosity Shell Turbo Oil T32 or equivalent up to the center of the sight glass. The oil level will rise when the pump warms up and is operating under vacuum conditions. The oil level should be checked later and adjusted as required.

7.1.6 REPLACE Oil Fill cap, then turn power switch ON and check for any oil leakage.

**NOTE:** Remove Filter elements before pouring oil to avoid spilling on them. Replace dirty or oil soaked elements (Part No. VS4017). When replacing, ensure inside of Combination Exhaust Demister is dry and the high density (thin) disc is on top.

7.1.7 DISPOSE of waste oil in accordance with local regulations.

**NOTE: OIL UNDERNEATH THE HOUSING COULD BE CAUSED BY CARELESS FILLING AND SPILL OVER. THIS WILL NOT BE COVERED BY WARRANTY (SEE 8.0 TROUBLE SHOOTING UNDER OIL LEAKING)**

## 7.2 REPLACING VACPAK VACUUM CARTRIDGE

7.2.1 Turn power switch OFF and DISCONNECT power lead cord.

7.2.2 DRAIN the oil.

7.2.3 REMOVE the casing (4 screws).

7.2.4 REMOVE the 6 screws retaining the oil box and LIFT the oil box away from the pump.

7.2.5 Using a 6 mm Allen Key, UNDO the 3 long bolts that hold the cartridge in place and LIFT the cartridge away from the pump.

7.2.6 REPLACE the o-rings that seal the cartridge ports to the pump body and fit new rubber cross to coupling .

7.2.7 Hold the new cartridge in place and fit the three long bolts, tighten them sequentially.

7.2.8 Replace oil box O-ring and refit the oil box in position.

7.2.9 REFIT the casing.

7.2.10 REFILL pump with fresh oil and test as in "start up procedure" section 4.0.

### **7.3       SERVICING ISOLATION VALVE**

The Isolation valve is adjustable or user replaceable. Should any internal leak develop, slacken off the locking nut and remove cone valve. Inspect for any damage on cone valve surface and master mount mating face. If there are no score marks apply vacuum grease. Refit the cone valve into position by turning a few times on either direction to ensure safe entry of o-ring. Apply a drop of locktite 222 to the lock nut thread, tighten by hand and secure with spanner half a turn.

If the valve cone is scored further tightening of lock nut may be needed to overcome an internal leak of the valve. However, if mating faces are badly worn or scored, valve cone and/or master mount may need replacement.

### **7.4       SERVICING EXHAUST DEMISTER**

Filter Elements (Part No. VS4017) must be replaced periodically or immediately if dirt or oil soaked. When replacing filter elements ensure high density (thin) disc is on top.

### **7.5       MEASURING VACUUM**

The performance of the SHARK vacuum pump can be checked, by measuring its ability to achieve a good "ultimate vacuum". To do this you need to connect a vacuum gauge to one of the pump's inlet ports.

- 7.5.1    Connect the Electronic or Mercury Gauge to one of the pump's inlets. Make sure that all connections are secured and vacuum tight.
- 7.5.2    Switch on the SHARK and allow it to warm up before taking a reading from the gauge. Remember, contaminated or dirty oil will have an effect on the ultimate vacuum as will the type of gauge used.

## 8.0 TROUBLESHOOTING

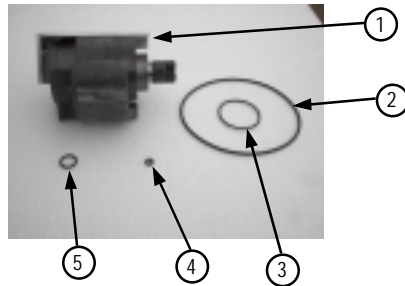
| PROBLEM   | CAUSE  | ACTION   |
|---|--|--|
| Failure to Start                                  | Power Disconnected or switch off<br>Isolation valve Closed<br>Line Voltage<br>Electrical Failure<br>Burnt Motor<br>Motor Internal Thermal overload activated or inoperative<br>Pump Seizure                | Connect to power source / switch on<br>Open isolation valve<br>Check local voltage<br>Check motor / switch<br>Replace Motor<br>Switch on after cooling if still inoperative<br>replace motor.<br>Repair pump or replace cartridge  |
| Poor Vacuum                                       | Isolation Valve Closed<br>Poor Hose connection or System Leaks<br>Flapper Valve Broken<br>Low Oil Level<br>Oil Contaminated<br>Pump worn out or damaged<br>Oil type used unknown<br>Gas Ballast Valve Open | Open Isolation Valve<br>Check all vacuum connections<br>Replace both flapper valves<br>Add or Change Oil<br>Change Oil<br>Replace cartridge<br>Replace with Shell Turbo Oil T32 or equivalent grade oil<br>Close Gas Ballast Valve |
| Oil Milky Color                                   | Excess Water Vapor mixture in oil<br>Oil Contaminated  | Open Gas Ballast<br>Change Oil   |
| Oil Dark Color                                    | Oil Burnt or Contaminated  | Flush out with Oil / Change Oil  |
| Oil Leaking                                       | Seals Hardened or worn<br>Oil mist accumulated from exhaust running within casing<br>Careless oil filling  | Service Pump / New Seals<br>Occurs in normal use, cleaning may be warranted, monitor sight glass or open case to check<br>Wipe housing & pump with a dry cloth   |
| Pump Noisy  | Loosen pump housing screws<br>Flapper Valve Broken<br>Oil level too low<br>Pump worn out<br>Worn coupling  | Tighten with socket spanner<br>Replace both Flapper Valves<br>Add / Replace Oil<br>Replace cartridge<br>Replace coupling unit  |
| Not Holding Deep Vacuum (when pump is turned off) | Isolation Valve Open or leaking (user adjustment is possible)<br>System Leaking<br>Gas Ballast Valve Open  | Air enters system via pump when turned off. Close Isolation valve before stopping pump.<br>Leak check system and vacuum lines (allow for some pressure rise due to system residual gas)<br>Close Gas Ballast Valve.                |

## 9.0 PARTS AND ACCESSORIES

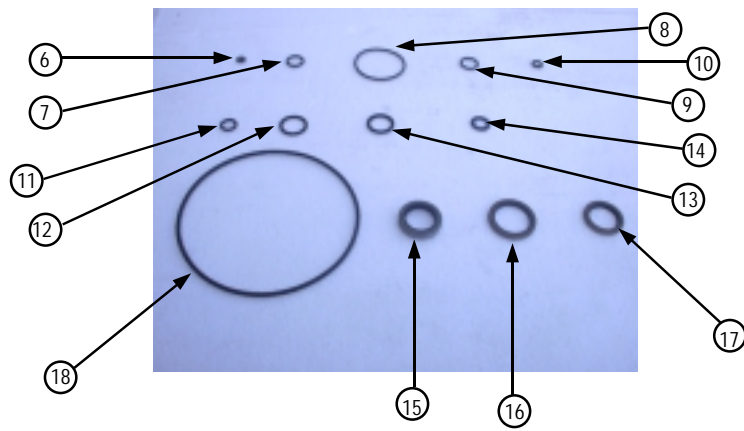
**NOTE:** When ordering parts indicate the Catalogue Number as spare parts are available in the form of kits only. Individual parts are shown for the purpose of identification of parts in a kit.

### Maintenance Kits:

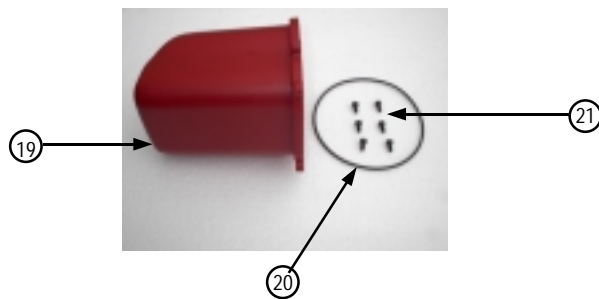
| REF | CAT. NO. | PART NO. | ITEM                              | QTY |
|-----|----------|----------|-----------------------------------|-----|
|     | VS4002   |          | VACPAK CARTRIDGE ASSEMBLY KIT     |     |
| 1   |          |          | VACPAK CARTRIDGE ASSEMBLY         | 1   |
| 2   |          | VC2027   | O RING (oil box)                  | 1   |
| 3   |          | VC2032   | O RING (master mount & cartridge) | 1   |
| 4   |          | VC2033   | O RING (master mount gas ballast) | 1   |
| 5   |          | VC2031   | O RING (master mount inlet port)  | 1   |



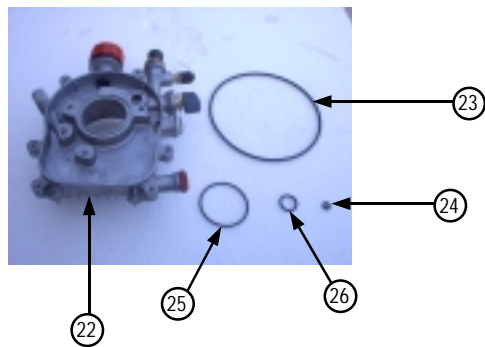
| REF | CAT.NO. | PART NO. | ITEM                              | QTY |
|-----|---------|----------|-----------------------------------|-----|
|     | VS4003  |          | MASTER MOUNT SEAL KIT             |     |
| 6   |         | VC2033   | O RING (master mount gas ballast) | 1   |
| 7   |         | VC2031   | O RING (master mount inlet port)  | 1   |
| 8   |         | VC2032   | O RING (master mount & cartridge) | 1   |
| 9   |         | VC2028   | O RING (suction fittings)         | 1   |
| 10  |         | VC2030   | O RING (gas ballast valve)        | 1   |
| 11  |         | VC2029   | O RING (spool valve assembly)     | 1   |
| 12  |         | VD5036   | GASKET, OIL BREATHER              | 1   |
| 13  |         | VD5036   | GASKET, OIL INDICATOR             | 1   |
| 14  |         | VD5037   | GASKET, OIL DRAIN PLUG            | 1   |
| 15  |         | VC2001   | OIL SEAL 1 STAGE CYLINDER - OUTER | 1   |
| 16  |         | VC2002   | OIL SEAL 1 STAGE CYLINDER - INNER | 1   |
| 17  |         | VC2003   | OIL SEAL 2 STAGE CYLINDER - INNER | 1   |
| 18  |         | VC2027   | O RING (oil box)                  | 1   |



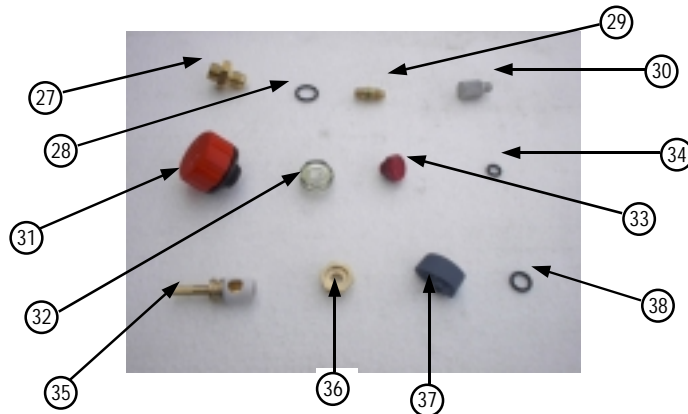
| REF | CAT.NO. | PART NO. | ITEM                           | QTY |
|-----|---------|----------|--------------------------------|-----|
|     | VS4004  |          | OIL BOX KIT                    |     |
| 19  |         | VD5010   | OIL BOX                        | 1   |
| 20  |         | VC2027   | O RING (oil box)               | 1   |
| 21  |         | VC2014   | SCREW - M5* 10 SOCKET HEAD CAP | 6   |



| REF | CAT.NO. | PART NO. | ITEM                              | QTY |
|-----|---------|----------|-----------------------------------|-----|
|     | VS4005  |          | MASTER MOUNT ASSEMBLY KIT         |     |
| 22  |         |          | MASTER MOUNT ASSEMBLY             |     |
| 23  |         | VC2027   | O RING (oil box)                  | 1   |
| 24  |         | VC2033   | O RING (master mount gas ballast) | 1   |
| 25  |         | VC2032   | O RING (master mount & cartridge) | 1   |
| 26  |         | VC2031   | O RING (master mount inlet port)  | 1   |



| REF | CAT.NO. | PART NO. | ITEM                                      | QTY |
|-----|---------|----------|---|-----|
|     | VS4006  |          | MASTER MOUNT FITTINGS KIT                 |     |
| 27  |         | VD5007   | FITTINGS - INLET (3/8" TO 3/8" BSPT)      | 1   |
| 28  |         | VC2028   | O RING (suction fittings)                 | 1   |
| 29  |         | VD5008   | FITTING - INLET (1/4" FLARE TO 1/8" BSPT) | 1   |
| 30  |         | VD5013   | VALVE - BALLAST                           | 1   |
| 31  |         | VS4016   | COMBINATION EXHAUST/DEMISTER/OIL FILLER   | 1   |
| 32  |         | VC2004   | OIL INDICATOR                             | 1   |
| 33  |         | VC2005   | OIL DRAIN PLUG                            | 1   |
| 34  |         | VC2030   | O RING (gas ballast valve)                | 1   |
| 35  |         | VD5021   | VALVE - SPINDLE & SLEEVE                  | 1   |
| 36  |         | VD5022   | VALVE NUT                                 | 1   |
| 37  |         | VD5027   | KNOB : BLUE                               | 1   |
| 38  |         | VC2029   | O RING (spool valve assembly)             | 1   |

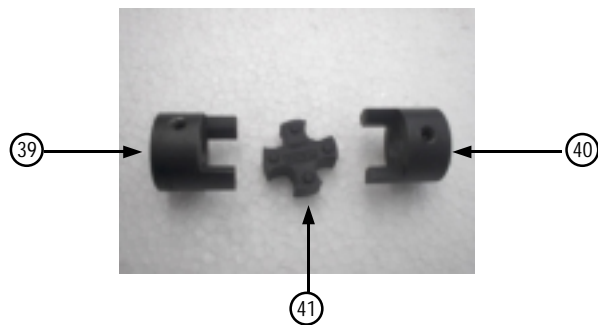


| REF | CAT.NO. | PART NO. | ITEM          | QTY |
|-----|---------|----------|---------------|-----|
|     | VC2053  |          | FAN BLADE KIT |     |

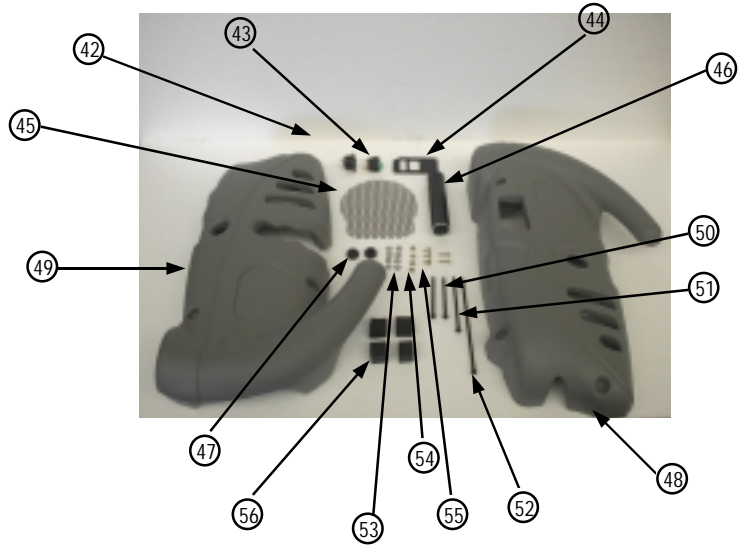




| REF | CAT.NO. | PART NO. | ITEM                 | QTY |
|-----|---------|----------|----------------------|-----|
|     | VS4007  |          | COUPLING KIT         |     |
| 39  |         | VC2009   | COUPLING - PUMP END  | 1   |
| 40  |         | VC2008   | COUPLING - MOTOR END | 1   |
| 41  |         | VC2010   | RUBBER - CROSS       | 1   |



| REF | CAT.NO. | PART NO. | ITEM                                  | QTY |
|-----|---------|----------|---------------------------------------|-----|
|     | VS4008  |          | PUMP HOUSING KIT                      |     |
| 42  |         | VC2036   | SOCKET - IEC PANEL MOUNT              | 1   |
| 43  |         | VC2037   | SWITCH - ON/OFF SPST 125/250V         | 1   |
| 44  |         | VD5017   | PANEL - ELECTRICS                     | 1   |
| 45  |         | VD5016   | GRILLE - MOTOR                        | 1   |
| 46  |         | VD5018   | HANDLE                                | 1   |
| 47  |         | VC2040   | FOOT - RUBBER                         | 2   |
| 48  |         | VD5014   | HOUSING, ELECTRICS                    | 1   |
| 49  |         | VD5015   | HOUSING, VALVE SIDE                   | 1   |
| 50  |         | VC2017   | SCREW - M5* 75 SOCKET HEAD CAP        | 2   |
| 51  |         | VC2018   | SCREW M5* 100 SOCKET HEAD CAP         | 1   |
| 52  |         | VC2019   | SCREW - M5* 170 SOCKET HEAD CAP       | 1   |
| 53  |         | VC2020   | WASHER FLAT ROUND M5 BLACK            | 8   |
| 54  |         | VC2021   | NUT NYLOCK ZINC PLATED                | 4   |
| 55  |         | VC2022   | SCREW - 8 - 15* 12 mm XR ST NEEDLE PT | 3   |
| 56  |         | VC2050   | RUBBER PACKING                        | 4   |



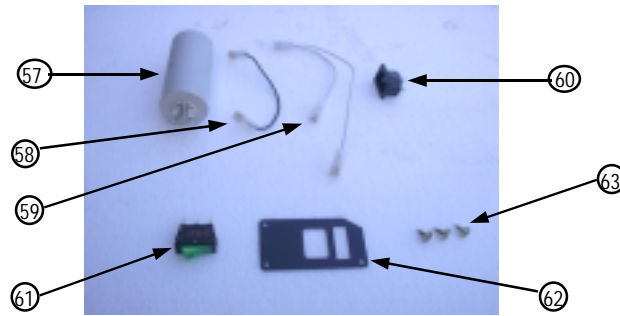
| REF | CAT.NO. | PART NO. | ITEM                                     | QTY |
|-----|---------|----------|--|-----|
|     | VS4016  |          | COMBINATION EXHAUST/DEMISTER/OIL FILLER  |     |
|     | VS4017  |          | FILTER ELEMENT KITS FOR EXHAUST/DEMISTER |     |



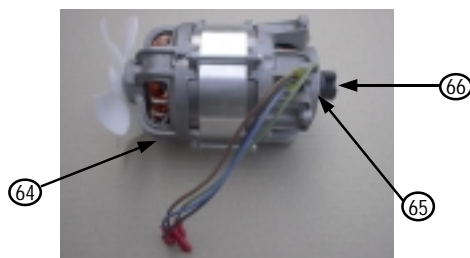
| REF | CAT.NO. | PART NO. | ITEM                             | QTY |
|-----|---------|----------|----------------------------------|-----|
|     | VS4011  |          | OIL, VACUUM PUMP - SHARK 1 LITRE |     |



| MODEL: VNR172 - 1 FOR USA (110v) |         |          |   |     |
|----------------------------------|---------|----------|---|-----|
| REF                              | CAT.NO. | PART NO. | ITEM                                      | QTY |
|                                  | VS4010  |          | ELECTRICAL KIT - 110v                     |     |
| 57                               |         | VC2011   | CAPACITOR: 50uF, 425V, 50Hz               | 1   |
| 58                               |         | VD5024   | WIRE - ACTIVE SOCKET TO SW (BLACK)        | 1   |
| 59                               |         | VD5026   | WIRE - NEUTRAL - SOCKET TO CAP/SW (WHITE) | 1   |
| 60                               |         | VC2036   | SOCKET—IEC PANEL MOUNT                    | 1   |
| 61                               |         | VC2037   | SWITCH - ON/OFF SPST 125/250V             | 1   |
| 62                               |         | VD5017   | PANEL - ELECTRICS                         | 1   |
| 63                               |         | VC2022   | SCREW - 8 - 15* 12 mm XR ST NEEDLE PT     | 3   |



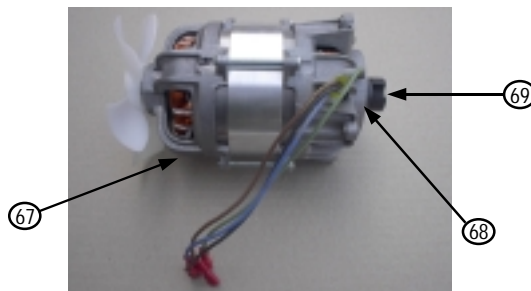
| REF | CAT.NO. | PART NO. | ITEM                                  | QTY |
|-----|---------|----------|---------------------------------------|-----|
|     | VS4009  |          | MOTOR & COUPLING KIT - 110v           |     |
| 64  |         | VC2013   | MOTOR: 115v,60Hz,250W,1PH & FAN BLADE | 1   |
| 65  |         | VC2008   | COUPLING - MOTOR END                  | 1   |
| 66  |         | VC2010   | RUBBER - CROSS                        | 1   |



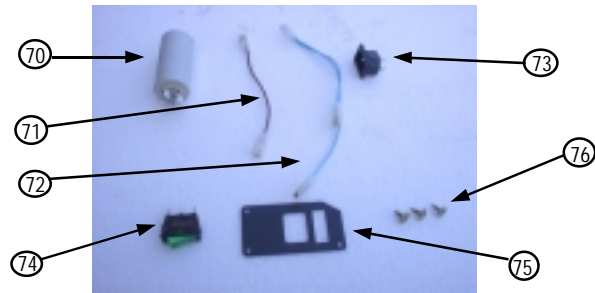
| REF | CAT.NO. | PART NO. | ITEM                           | QTY |
|-----|---------|----------|--------------------------------|-----|
|     | VD5030  | USA ONLY | CORD SET: IEC TO USA PLUG 110v |     |



| MODEL: VNR152 - 3 FOR EUROPE (230v) |        |        |   |   |
|-------------------------------------|--------|--------|---|---|
|                                     | VS4012 |        | MOTOR & COUPLING KIT - 230v / 240v      |   |
| 67                                  |        | VC2051 | MOTOR: 230v/240v, 50Hz, 1PH & FAN BLADE | 1 |
| 68                                  |        | VC2008 | COUPLING - MOTOR END                    | 1 |
| 69                                  |        | VC2010 | RUBBER - CROSS                          | 1 |



| REF | CAT.NO. | PART NO. | ITEM                                     | QTY |
|-----|---------|----------|--|-----|
|     | VS4013  |          | ELECTRICAL KIT - 220/240v                |     |
| 70  |         | VC2012   | CAPACITOR: 12UF, 470V, 50Hz              | 1   |
| 71  |         | VD5023   | WIRE - ACTIVE SOCKET TO SW (BROWN)       | 1   |
| 72  |         | VD5025   | WIRE - NEUTRAL - SOCKET TO CAP/SW (BLUE) | 1   |
| 73  |         | VC2036   | SOCKET—IEC PANEL MOUNT                   | 1   |
| 74  |         | VC2037   | SWITCH - ON/OFF SPST 125/250V            | 1   |
| 75  |         | VD5017   | PANEL - ELECTRICS                        | 1   |
| 76  |         | VC2022   | SCREW - 8 - 15* 12 mm XR ST NEEDLE PT    | 3   |



|  |        |           |                                  |  |
|--|--------|-----------|----------------------------------|--|
|  | VD5035 | EURO ONLY | CORD SET : IEC TO EURO PLUG 230v |  |
|--|--------|-----------|----------------------------------|--|



## 10.0 WARRANTY

- 11.1 INFICON warrants your SHARK Vacuum Pump to be free from defects of materials or workmanship for one year from the date of purchase. INFICON does not warrant any machine that has been subjected to misuse, negligence, accident, repaired or altered by anyone other than INFICON.
- 11.2 Inficon's liability is limited to machines returned to INFICON, transportation prepaid, not later than thirty (30) days after the warranty period expires, and which INFICON judges to have malfunctioned because of defective material or workmanship. INFICON'S liability is limited to, at its option, repairing or replacing the defective machine or part.
- 11.3 This WARRANTY is in lieu of all other warranties, express or implied, whether of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE or otherwise. All such other warranties are expressly disclaimed.
- 11.4 INFICON shall have no liability in excess of the price paid to INFICON for the machine plus return transportation charges prepaid. INFICON shall have no liability for any incidental or consequential damages. All such liabilities are EXCLUDED.
- 11.5 INFICON and or it's Agents have the right to charge for costs incurred for incorrectly diagnosed customer warranty claims.

## NOTES



Laboratory Accurate. Toolbox Tough.™

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