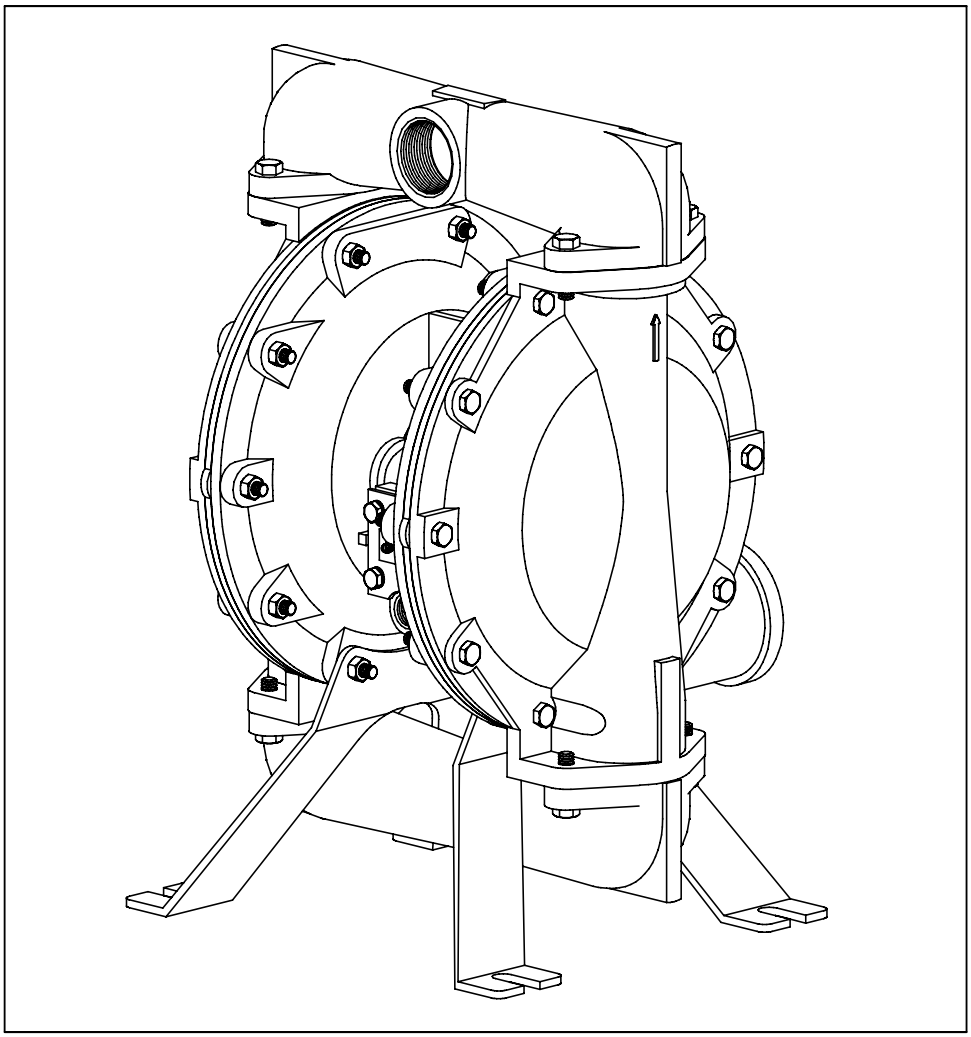
# DINO AIR
## Diaphragm Pumps

## *DA40* Air Diaphragm Pumps



Aluminum, Stainless Steel Model Figure

CE




Read all warnings and instructions in this manual.

# Contents


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# Symbol

**Warning symbol**

**⚠ Warnings**

Misuse can cause death or serious injury.

# Caution symbol

**⚠ Caution**

Misuse can cause equipment failure or damage.

## Warnings



Instructions

## EQUIPMENT MISUSE HAZARD

Misuse can cause equipment failure, damage or serious injury.

- For professional use only.
- Read all warnings and instructions in this manual. Save these instructions.
- Use equipment only for its intended purpose. Call DINO After Service Dept. for information.
- Do not alter or modify equipment. Use DINO genuine parts and accessories only.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. This equipment has maximum 8.3 bar operating pressure at maximum 8.3 bar air supply.
- Use fluids and solvents that are compatible with equipment wetted parts.
- Do not use hoses to pull equipment
- Do not lift pressurized equipment.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose hoses under the environment at over 82 degree C or below 40 degree C.
- Comply with all applicable safety regulations.

## Warnings



# TOXIC FLUID

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.



- Read MSDS's to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
- Always wear impervious gloves when spraying or cleaning equipment.
- Route exhaust away from work area, people and food. If diaphragm ruptures, fluid may be exhausted with air.



# FIRE AND EXPLOSION HAZARD

Flammable fumes, such as solvent and paint fumes, in unventilated work area can ignite or explode.



- Ground all equipment in the work area. See Grounding instructions at page 5.
- If there is static sparking or you feel a shock, **stop operation immediately**. Do not use equipment until you identify and correct the problem.
- Keep work area ventilated. Eliminate flammable fumes, such as solvent and chemical.
- Route exhaust away from work area. Eliminate flammable sources. If diaphragm ruptures, fluid may be exhausted with air.
- Keep work area free of debris, rags and gasoline.



# FLUID HAZARD

- Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents. Failure to follow this warning can result in death, serious injury, or property damage.

## Warnings



**TOXIC FUMES HAZARD**

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin inhaled, or swallowed.

**Tighten Fasteners Before Setup**

Before using the pump for the first time, check and retorque all external fasteners. Always completely torque fluid covers before torquing manifolds. Follow Torque Instructions. Retorque after the use on the first day. Although pump use varies, a general guideline is to check and retorque fasteners every two months.

## Warnings





**FIRE AND EXPLOSION HAZARD**

The pump must be grounded. Before operating, pls read the page 3 **FIRE AND EXPLOSION HAZARD** and follow the instruction below.

Grounding reduces the risk of static sparking so the equipment must be grounded. Check local electricity regulation and follow **GROUNDING** instruction and make sure it applies to your equipment and application.

- Air and fluid hoses: Use only grounded hoses with a maximum of 150 m combined hose length to ensure grounding continuity.
- Air compressor: Follow manufacturer's recommendations.
- Solvent pails used when flushing: Follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.
- Fluid supply container: Follow local code.

## Warnings

Trapped air can cause the pump to cycle unexpectedly, which could result in serious injury from splashing.

## Warnings



**FIRE AND EXPLOSION HAZARD**

Before operating, pls read and follow the instruction on page 3 **FIRE AND EXPLOSION HAZARD.**

Make sure to properly install to exhaust the air. When pumping flammable or hazardous liquid, route exhaust to a safe place and away from people, animals, food area and flammable sources. If diaphragm ruptures, fluid may be exhausted with air. Store hazardous fluid in approved containers.

## Warnings

To relieve the pressure in the pipe when liquid relieve valve got trapped to avoid any damage or injury such as spark splash and dangerous contaminated liquid. Be sure the relieve valve is located near liquid outlet.

## ⚠ Caution

Some systems may require installation of a pressure relief valve at the pump outlet to prevent over-pressurization and rupture of the pump or hose. Thermal expansion of fluid in the outlet line can cause over-pressurization. Thermal expansion can occur when using long fluid lines exposed to sunlight or ambient heat, or when pumping from a cool to a warm area (for example, from an underground tank). Over-pressurization also can occur if the pump is used to feed fluid to a piston pump, and the intake valve of the piston pump does not close, causing fluid to back up in the outlet line.

## ⚠ Caution

The pump exhaust air may contain contaminants. Ventilate to a remote area.

1. Be sure the mounting surface can support the weight of the pump, hoses, and accessories, as well as the stress caused during operation.
2. For all mountings, be sure the pump is bolted directly to the mounting surface.
3. Rubber Foot Mounting Kit 819.4333 is available to reduce noise and vibration during operation.

# Operation

## Flush the Pump Before First Use

The pump was tested in water. If water could contaminate the fluid you are pumping, flush the pump thoroughly with a compatible solvent. See **Starting and Adjusting the Pump.**

## Starting and Adjusting the Pump

### Warnings



**TOXIC FUMES HAZARD**

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin inhaled, or swallowed. Never move or lift a pump under pressure. If dropped, the fluid section may rupture. Always follow the **Pressure Relief Procedure.**

1. Be sure the pump is properly grounded.

2. Check fittings to be sure they are tight. Use a compatible liquid thread sealant on male threads. Tighten fluid inlet and outlet fittings securely.

3. Place the suction tube (if used) in fluid to be pumped.

**NOTE:** If fluid inlet pressure to the pump is more than 25% of outlet working pressure, the ball check valves will not close fast enough, resulting in inefficient pump operation.

4. Place the end of the fluid hose into an appropriate container.

5. Close the fluid drain valve.

6. Back out the air regulator knob, and open all bleed-type master air valves.

7. If the fluid hose has a dispensing device, hold it open.

8. Slowly increase air pressure with the air regulator until the pump starts to cycle. Allow the pump to cycle slowly until all air is pushed out of the lines and the pump is primed.

If you are flushing, run the pump long enough to thoroughly clean the pump and hoses. Close the air regulator. Draw out the hose from the solvent and put it to the liquid.

## Pump Shutdown

At the end of the work shift and relieve the pressure. Follow **Pressure Relief Procedure** to avoid injury.

## Pressure Relief Procedure

### Warnings

Keep the equipment under pressurization until the pressure is manually released. In order to reduce the risk of serious injury caused by liquid pressurization, accidental spray, or liquid splash, please follow this procedure when you are in the following situations:

1. Shut off the air supply to the pump.

2. Open the dispensing valve, if used.

3. Open the fluid drain valve to relieve fluid pressure. Have a container ready to catch the drainage.

## Lubrication

It is designed to require no further lubrication for the life of the pump. Before applying lubricant, remove the pipe from air supply inlet and apply two drops of lubricant on the air supply inlet. Applying lubricant every month or every 500 hours of operation.

### ⚠ Caution

Do not apply too much lubricant to the pump because the lubricant will infiltrate into the muffler, which would contaminate the liquid or other equipment. Over-lubrication may also cause pump damage.

## Tighten All Fasteners

Before each use, check all hoses for wear or damage and replace as necessary. Check to be sure all threaded connections are tight and leak-free.

Check and tighten fasteners, including manifold and air valve fasteners every two months at least. Although pump use varies, a general guideline is to retorque fasteners every two months.

## Maintenance Schedule

Establish a preventive maintenance schedule, based on the pump's service history. Scheduled maintenance is especially important to prevent spills or leakage due to diaphragm failure.

# Troubleshooting

## Warnings

To avoid any damage or injury. When you need to relieve the pressure, follow **Pressure Relief Procedure** on page 5.

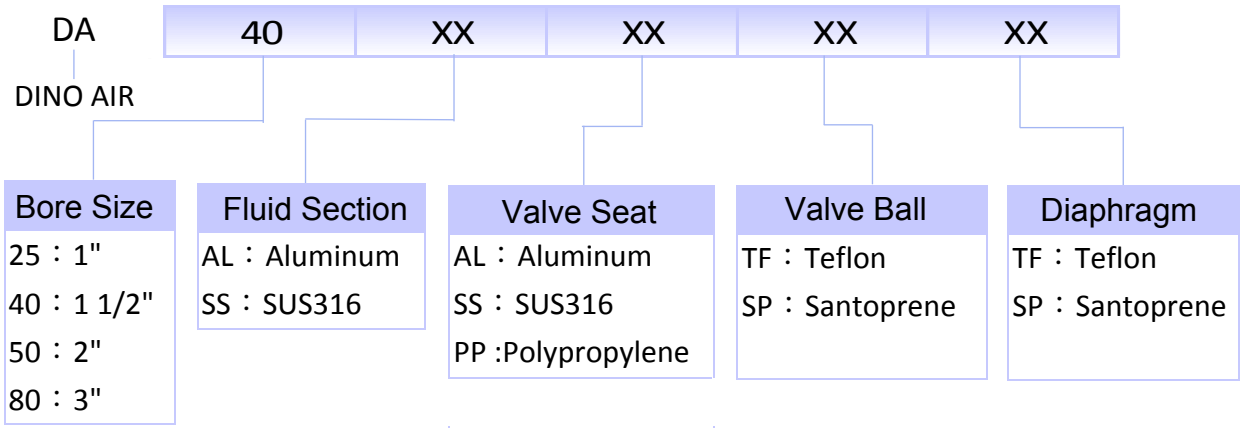
1. Relieve the pressure before checking or repairing the equipment.
2. Before disassembling the pump, check all the possible problems and causes.

| Problem | Cause | Solution |
|---|---|---|
| Pump cycles at stall or operates erratically. | Worn check valve balls | Replace. |
| Pump will not cycle, or cycles once and stops. | Air valve is stuck or dirty. | Disassemble and clean air valve. Use filtered air. |
| | Check valve ball severely worn and wedged in seat or manifold. | Replace ball and seat. |
| | Check valve ball is wedged into seat due to overpressurization. | Install pressure relief valve. |
| | Dispensing valve clogged. | Relieve pressure and clear valve. |
| Pump operates erratically. | Clogged suction line. | Inspect; clear. |
| | Sticky or leaking check valve balls. | Clean or replace. |
| | Diaphragm ruptured | Replace |
| | Restricted exhaust. | Remove restriction. |
| Air bubbles in fluid. | Suction line is loose. | Tighten. |
| | Diaphragm ruptured. | Replace. |
| | Loose manifolds, damaged seats or manifold o-rings. | Tighten manifold bolts or replace seats or o-rings.. |
| | Loose bolt. | Tighten or replace. |
| | Damaged o-ring | Replace. |
| Exhaust air contains fluid being pumped. | Diaphragm ruptured | replace. |
| | Loose diaphragm shaft bolt. | Tighten or replace. |
| | Damaged o-ring | Replace. |
| Pump leaks air externally. | Air valve gasket or air valve cover gasket damaged. | Inspect; replace. |
| | Air valve cover screws loose. | Tighten. |
| Pump leaks fluid externally through check valve balls. | Loose manifold, Manifold and seat o-rings worn out. | Tighten manifold screws or replace o-ring |

# Technical Data

Coding Description.....Refer to"Coding Description"
Pump Type.....1.5"metal air operated diaphragm pump
Material.....Refer to"Coding Description"
Weight DA40-ALXXXXXX.....24.3 kg
DA40-SSXXXXXX.....38.3 kg
Maximum air pressure.....8.3 bar
Maximum flow rate.....338 lpm
Maximum particle size.....6.4 mm
Maximum operating temperature(diaphragm/ball/o-ring)
E.P.R ..... -51°~138°C
Hytrel ..... -29°~ 66° C
N.B.R ..... -12°~ 82° C
Santoprene ..... -40°~ 107°C
Teflon ..... 4°~ 107° C
Viton ..... -40° ~ 177°C
Outline Drawing.....Refer to page 11
Performance Curve .....Refer to page 11
Sound pressure @ 70 p.s.i - 60 c.p.m .....78.6db(A)

# Coding Description



# Parts

## Air Section Part List

| Ref. | Description | Qty. | Part NO. | Mat. |
|---|---|---|---|---|
| 101 | Body | 1 | DA-94744 | AL |
| ★102 | O-ring | 2 | DA-Y325-24 | NR |
| 103 | Sleeve | 1 | DA-94528 | AC |
| ★104 | Retaining Ring | 2 | DA-Y145-26 | C |
| 105 | Screw Lockwasher | 8 | DA-93860 | C |
| | Cap Screw | 8 | DA-Y6-42-T | SS |
| 106 | Lockwasher | 8 | DA-Y14-416-T | SS |
| 107 | Plate | 2 | DA-93707-1 | SS |
| ★108 | Gasket w/ notch | 1 | DA-92878 | NR |
| 109 | Piston | 1 | DA-92011 | AC |
| ★110 | U-CUP | 1 | DA-Y186-51 | NR |
| 111 | Spool | 1 | DA-92005 | AL |
| 112 | Washer(ZN) | 5 | DA-92877 | Z |
| ★113 | O-ring | 5 | DA-Y325-214 | NR |
| ★114 | O-ring | 6 | DA-Y325-126 | NR |

| Ref. | Description | Qty. | Part NO. | Mat. |
|---|---|---|---|---|
| 115 | Scer(ZN) | 4 | DA-92876 | Z |
| 116 | Scer(ZN) | 1 | DA-92006 | Z |
| ★117 | Gasket | 1 | DA-92004 | NR |
| 118 | Pilot Rod | 1 | DA-93309-2 | C |
| ★119 | O-ring | 4 | DA-93075 | U |
| 120 | Scer | 3 | DA-115959 | Z |
| 121 | Sleeve Bushing | 2 | DA-98723-2 | CO |
| ★122 | O-ring | 2 | DA-94820 | U |
| ★123 | Screw | 4 | DA-Y154-41 | C |
| 126 | Pipe Plug | 1 | DA-Y227-5-L | C |
| 127 | 90 Street Elbow | 1 | DA-Y43-5-C | C |
| 128 | Pipe Plug | 1 | DA-Y227-2-L | C |
| 197 | Bulton Head Screw | 2 | DA-94987 | SS |
| 198 | Bulton Head Screw | 1 | DA-94987-1 | SS |
| 201 | Muffler | 1 | DA-350-568 | AL.C |
| 231 | Pipe Plug | 2 | DA-Y17-51-S | SS |

Material
(AC) = Acetal
(AL) = Aluminum
( C ) = Carbon Steel
(CO) = Copper
(GPS) = Glass filled Polyphenylene Sulfide (NR) = N.B.R
(SP) = Santoprene
(SS) = Stainless Steel
(TF) = PTFE
( U ) = Polyurethane
( V ) = Viton
( Z ) = Zinc

★Parts included in Air Section Repair Kit (DA637118-C)

Refer to page 9 **Part Exploded Drawing** for above parts.

## Fluid Section Part List

| Diaphragm"7" | | | Diaphragm"8" | | | O-ring"3" | | | O-ring"19" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Part NO. | Qty. | Mat. | Part NO. | Qty. | Mat. | Part NO. | Qty. | Mat. | Part NO. | Qty. | Mat. |
| DA-94615-A | 2 | SP | | | | DA-Y325-16 | 4 | NR | DA-Y325-230 | 4 | NR |
| DA-94617 | 2 | TF | DA-94616 | 2 | SP | DA-Y328-16 | 4 | TF | DA-Y327-230 | 4 | VT |
| | | | | | | | | | DA-Y220-230 | 4 | TF |

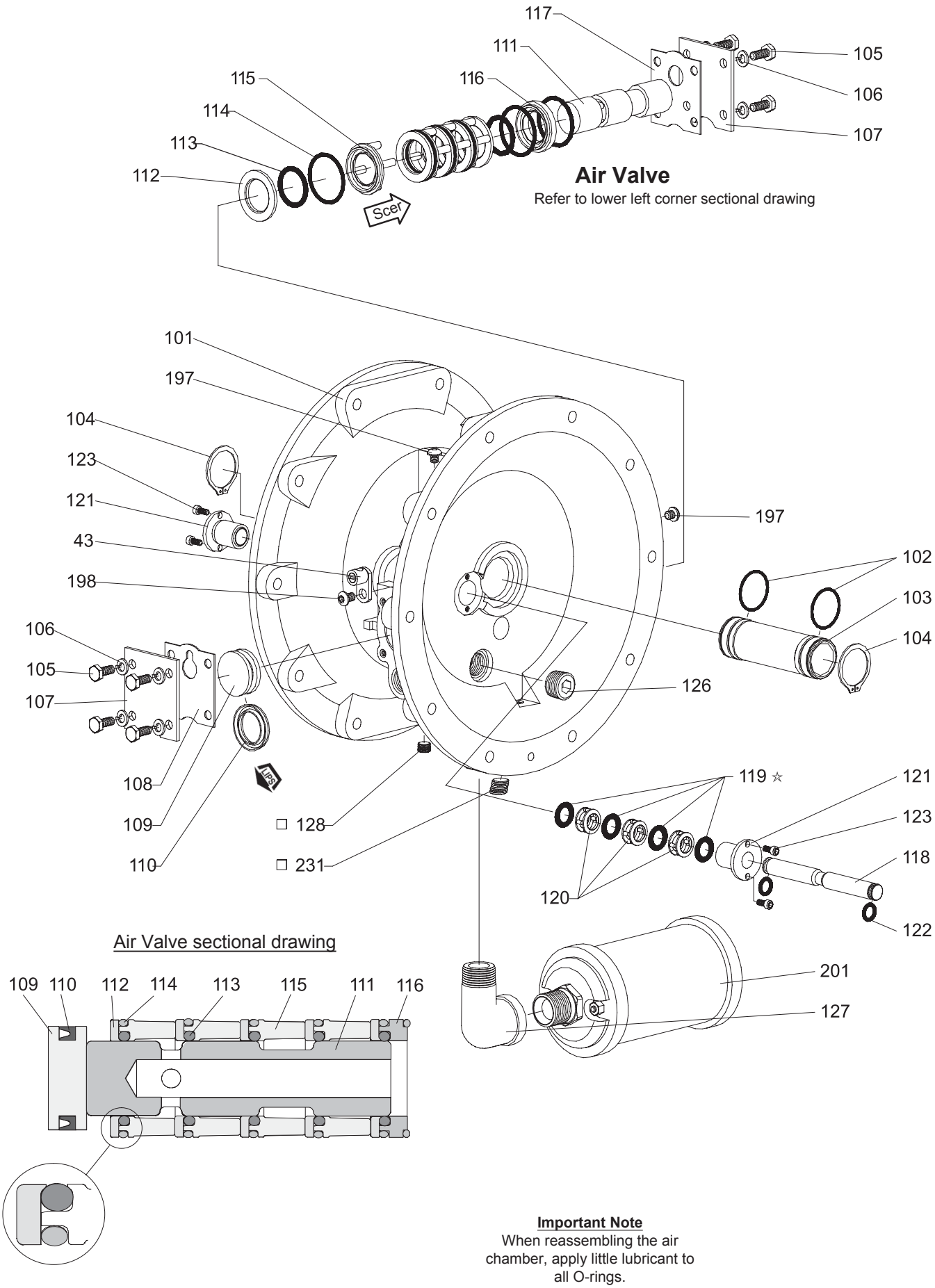
| Ref. | Description | Qty. | Aluminum | | Stainless Steel | | Seat"21" | | | Ball"22" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Part NO. | Mat. | Part NO. | Mat. | Part NO. | Qty. | Mat. | Part NO. | Qty. | Mat. |
| 6 | Plate(fluid side) | 2 | DA-92752 | C | DA-92775 | SS | DA-92760 | 4 | AL | DA-92757-A | 4 | SP |
| 15 | Fluid Cap | 2 | DA-92750 | AL | DA-92773 | SS | DA-92776 | 4 | SS | DA-92757-4 | 4 | TF |
| 16 | Manifold | 2 | DA-92749 | AL | DA-92774 | SS | DA-92924 | 4 | PP | | | |
| | | | | | | | | | | | | |

## Other Part List

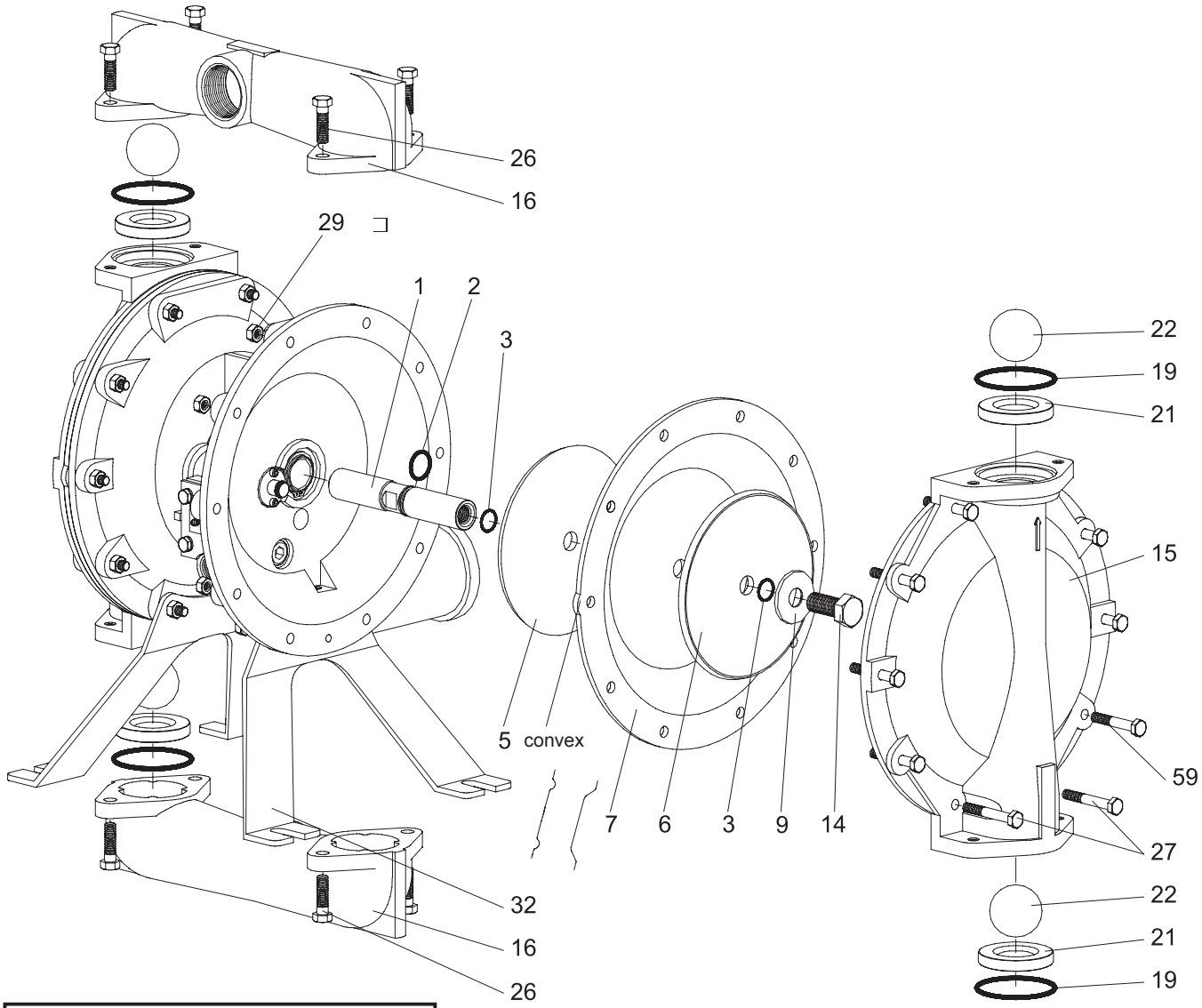
| Ref. | Description | Qty. | Aluminum | | Stainless Steel | | Ref. | Description | Qty. | Part NO. | Mat. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Part NO. | Mat. | Part NO. | Mat. | | | | | |
| 5 | Plate(air side) | 2 | DA-92752 | C | DA-92775 | SS | 1 | Rod | 1 | DA-98720-1 | C |
| 26 | Bolt | 8 | DA-Y6-66-C | C | DA-Y6-66-T | SS | 2 | O-ring | 1 | DA-Y330-117 | NR |
| 27 | Bolt | 4 | DA-Y6-510-C | C | DA-Y6-510-T | SS | 9 | Washer | 2 | DA-93065 | SS |
| 29 | Nut | 20 | DA-Y12-5-C | C | DA-Y12-5-S | SS | 14 | Screw | 2 | DA-Y5-107-T | SS |
| 32 | Leg | 2 | DA-92759 | C | DA-92759-1 | SS | 43 | Ground Lug | 1 | DA-93004 | CO |
| 59 | Bolt | 16 | DA-93608 | C | DA-Y6-59-T | SS | | | | | |

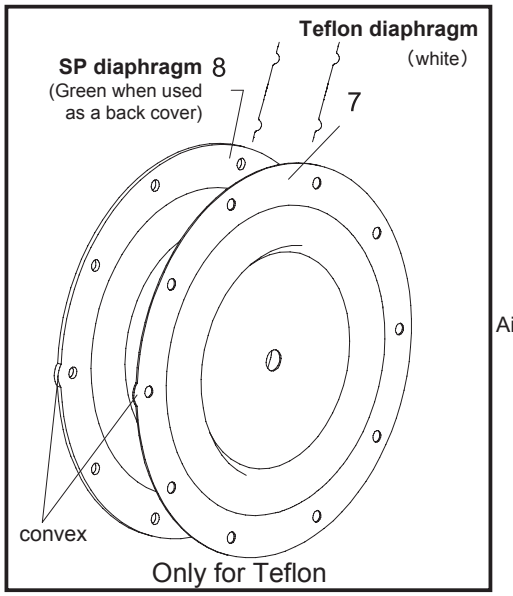
Refer to page 10 **Part Exploded Drawing** for above parts.

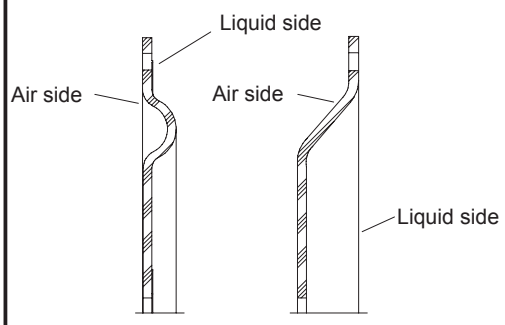
**Important Note**
When reassembling the air valve section,make sure that the Scer leg(115)does not block the inner hole.

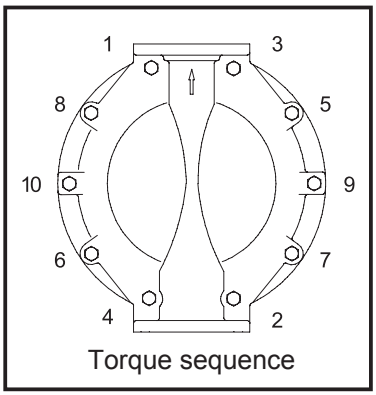



**Important Note**
When reassembling the air chamber, apply little lubricant to all O-rings.

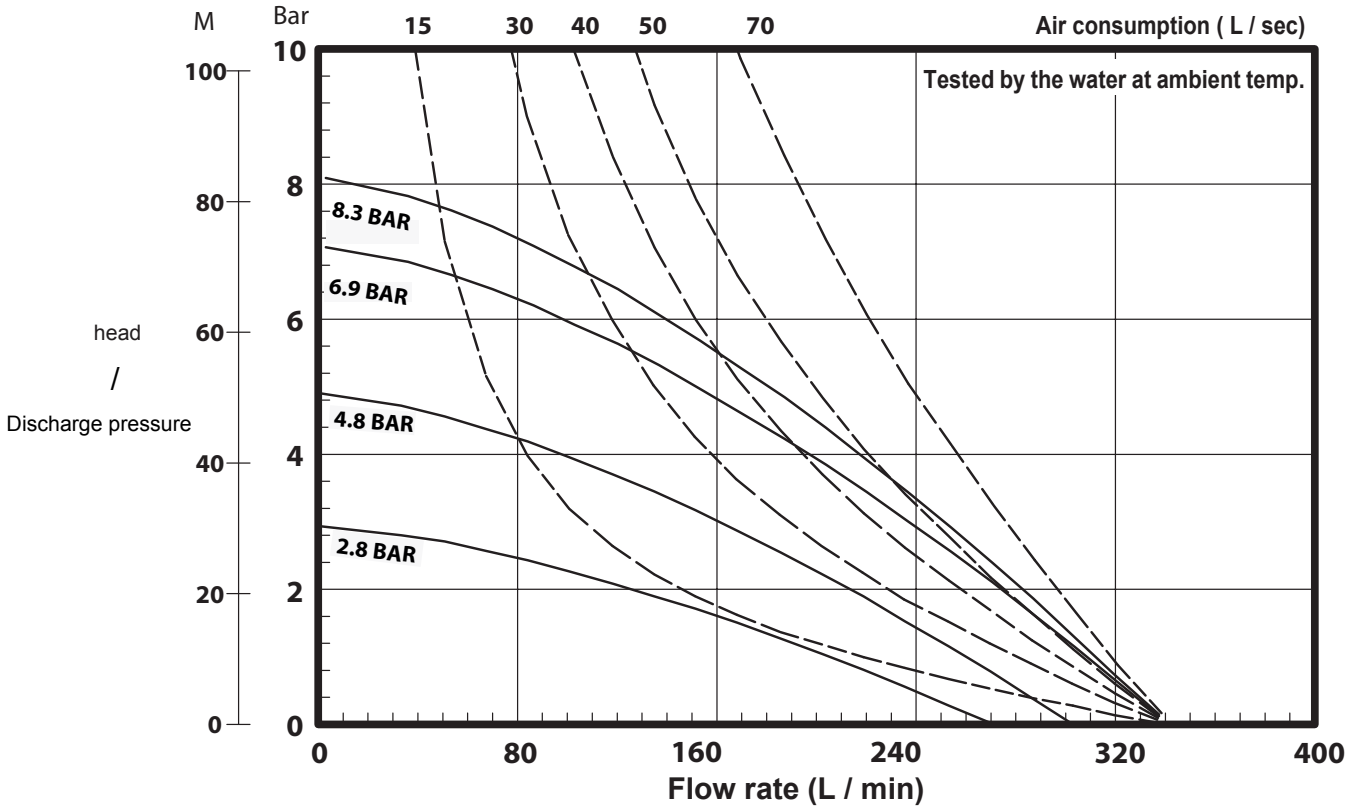

26
16
29
1
2
3
22
19
21
15
5
convex
59
7
6
3
9
14
27
32
16
26
22
21
19


Teflon diaphragm
(white)
SP diaphragm
(Green when used
as a back cover)
8
7
convex
Only for Teflon

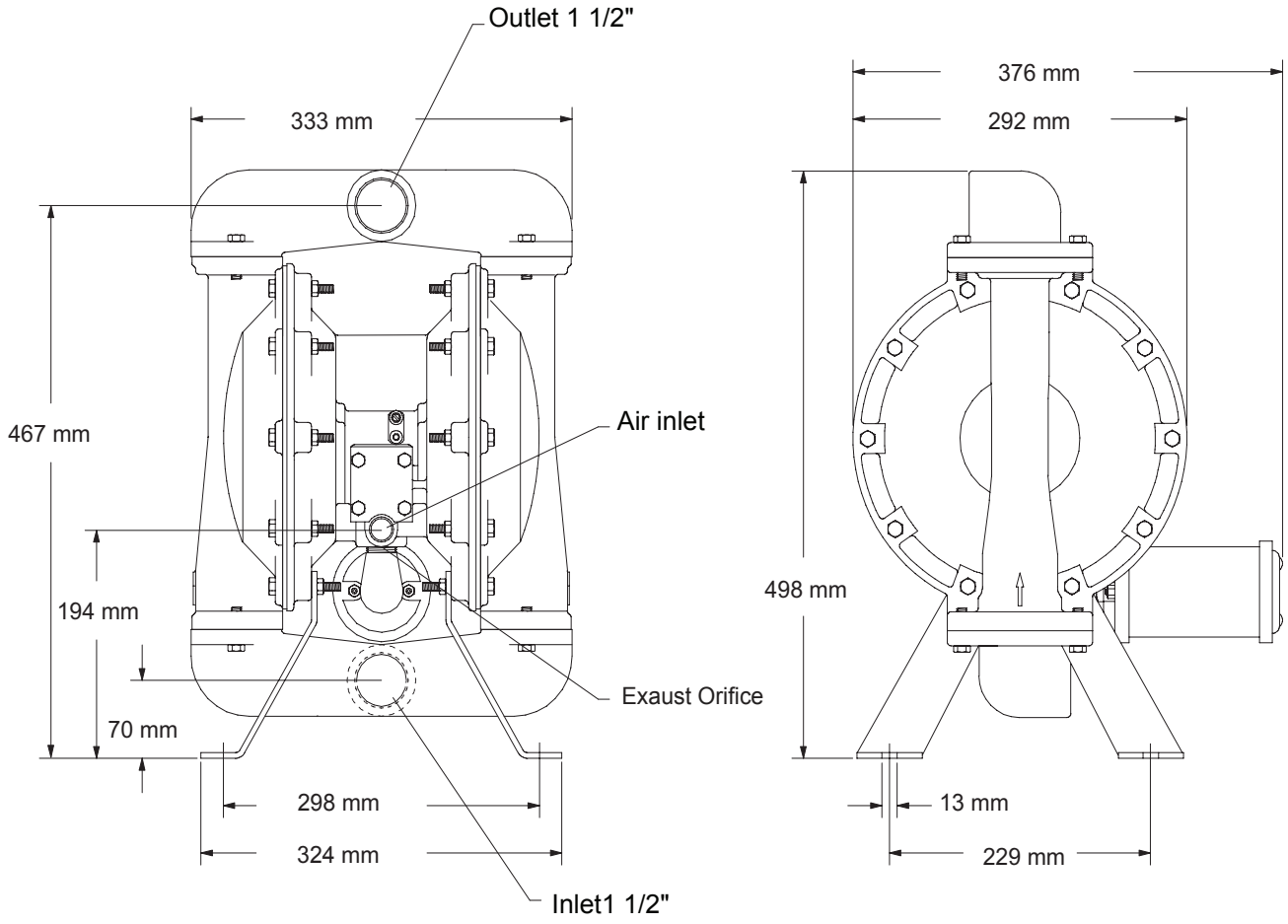

Liquid side
Air side
Air side
Liquid side
Diaphragm sectional drawing


1
3
8
5
10
9
6
7
4
2
Torque sequence

## Performance Curve




## Outline Drawing



# Customer Services/Guarantee

## Customer Services

If you require spare parts, please contact your local distributor, providing the following details:

- Pump Model
- Type
- Serial Number
- Date of First Order

## GUARANTEE

All DINO pumps are warranted to the original user against defects in workmanship or materials under normal use (rental use excluded) for one year after purchase date. This warranty does not cover failure of parts due to normal wear and damage or failure arises from natural disasters and misuse.

Parts determined by DINO to be defective in material or workmanship will be repaired or replaced.

## LIMITATION OF LIABILITY

To the extent allowable under applicable law, DINO's liability for consequential damages is expressly disclaimed. DINO's liability in all events is limited and shall not exceed the purchase price.

## WARRANTY DISCLAIMER

DINO has made an effort to illustrate and describe the products in the enclosed brochure accurately; however, such illustrations and descriptions are for the sole purpose of identification and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustration or descriptions.

## PRODUCT SUITABILITY

Many regions, states and localities have codes and regulations governing the sale, construction, installation and/or use of products for certain purposes, which may vary from those in neighboring areas. While DINO attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchasing and using a product, please review the product application as well as the national and local codes and regulations, and be sure that product, installation, and use complies with them.