INSTRUCTION MANUAL

TECHNICAL SPECIFICATION

Type	Axial
Manifold	Aluminum Alloy
Crankcase	Aluminum Alloy
Bearing	Double Bearing
Lubrication	85W90 Pre-Sealed
Self suction	NO
Inlet Connector	3/4" NH Garden Hose
Outlet Connector	M22x1.5-14mm

GENERAL SAFETY INFORMATION

The pump is designed to pump non-flammable or non-explosive fluids. These pumps are intended to pump clean filtered water only.

- Do not operate in or around an explosive environment.
- Always wear safety glasses or goggles and appropriate clothing.

- Do not allow children to operate the pump.
- Never point the high-pressure discharge at a person, any part of the body or animals.

Do not operate gasoline engines in a confined area and always have adequate ventilation.

- Do not exceed the pump specifications in speed or pressure.
- Do not alter the pump from the manufacturers design.

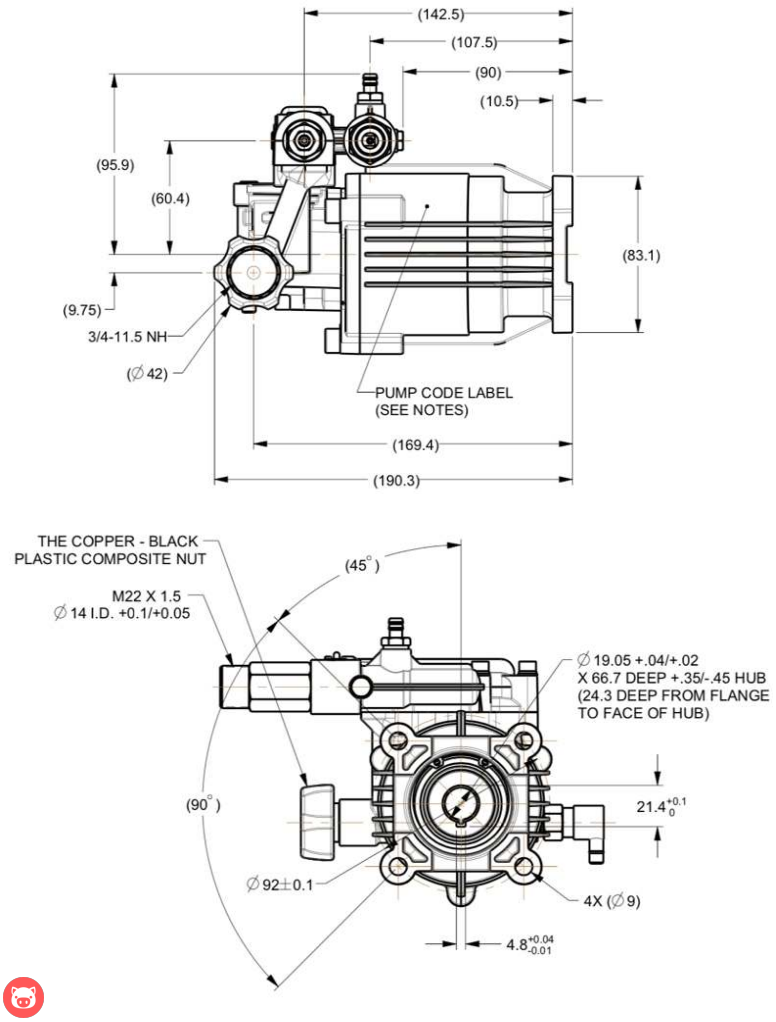
INSTALLATION DIRECT DRIVE PUMPS

1. Install the shaft key into the keyway and apply a light coating of anti-seize on the engine shaft.
2. Align the two key ways and push the pump completely onto the engine.
3. Install all bolts and tighten evenly.
4. Remove protection cap of outlet and unloader valve.
5. Install the appropriate water inlet fitting (3/4”-11.5 NH).
6. Connect the water supply hose and outlet (M22x1.5-14 Hose or adapter) and high-pressure discharge hose/spray gun.
7. Turn on the water supply.
8. Open the spray gun to purge the system of any air.
9. Start the engine.
10. Adjust the engine speed at rated 3,400 RPM will get best performance.
11. Open gun trigger check if pump is working well and installation and connection are all good.

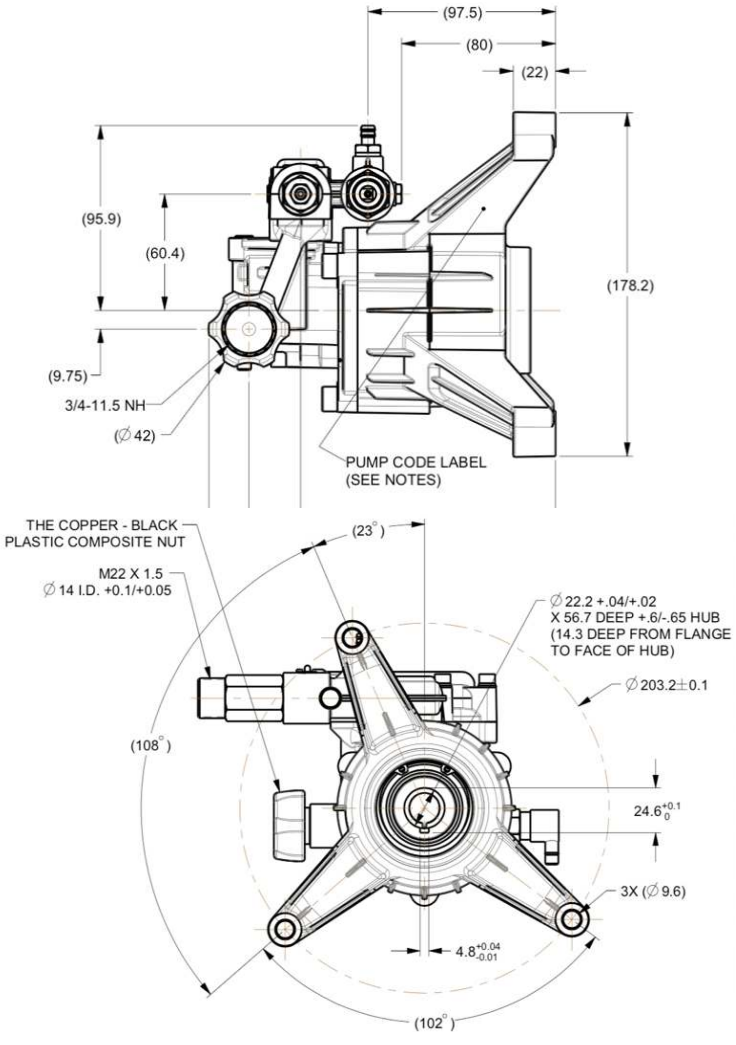
NOTE:

Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Assembly drawing for ***HORIZONTAL*** Pump

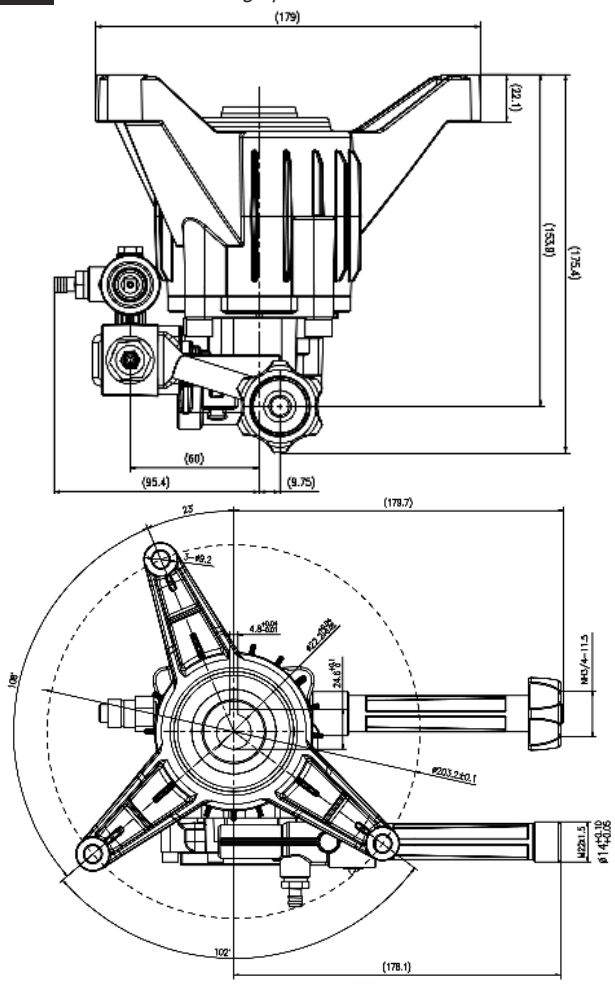


Assembly drawing for ***REAR SIDE INLET VERTICAL*** Pump



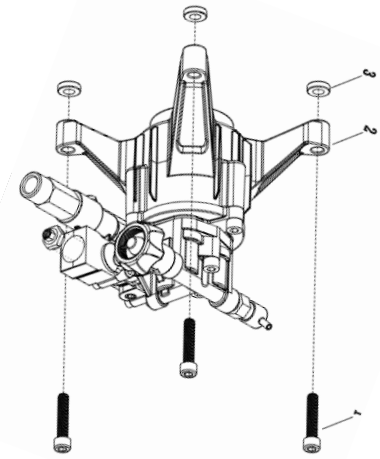
Assembly drawing for ***FRONT SIDE INLET VERTICAL*** Pump

NOTE: *If the inlet/outlet is blocked by the front frame cover, please modify or remove the front frame cover to provide good clearance for the high pressure outlet connection.*



Washer Bolt for ***VERTICAL*** Pump

1. Blot
2. Blot hole
3. Washer



TIPS:

When your engine shaft length is longer from the engine flange (PTO) to the shaft end, when you set up the engine shaft and pump, you will find the gap between the pump boss and the engine bottom or flange.

Then you need to put the washer into the gap, between your original engine flange and pump boss, then screw up the bolt for some engines, need washers for all three pump bosses.

OPERATION TIPS

Water Supply:

1. Make sure the water supply is clean. Debris can cause excess pump wear and reduce performance.

2. An insufficient water supply will damage your pump. Make sure the water supply is steady and is 20% over the rated flow of your pump. Use a stopwatch to time how long it takes to fill a 5-gallon bucket with your garden hose.

3. The water supply garden hose must have an inside diameter of at least 5/8". If the hose is more than 100 ft. long, the diameter must be at least 3/4".

4. Never use a reservoir tank as a water source. Drawing water out of a tank may cause pump cavitation and damage to your pump. This pressure washer is designed for a pressurized water source such as a city water faucet. However, the water source pressure must not exceed 115 psi (8 bar). Always use a flexible rubber hose for your water supply. Do not use rigid piping.

TROUBLESHOOTING GUIDE

Symptom	Possible Cause(s)	Corrective Action
Low Pressure	Worn nozzle	Replace nozzle, of proper size
	Belt slippage	Tighten or replace; use correct belt
	Air leak in inlet plumbing	Disassemble, reseal and reassemble
	Relief valve studk, partially plugged or improperly adjusted valve seat worn	Clean, adjust relief valve; check for worn and dirty valve seats. Kit available
	Inlet suction strainer clogged or improperly sized	Clean. Use adequate size. Check more frequently
	Worn packing. Abrasives in pumped fluid or severe cavitation. Inadequate water	Install proper filter. Suction at inlet manifold must be limited to lifting less than 20 feet of water or -8.5 PSI vacuum
	Fouled or dirty inlet or discharge valves	Clean inlet and discharge valve assemblies
	Worn inlet, discharge valve block or dirty	Replace worn valves, valve seats and/or discharge hose
	Leaky discharge hose	
Oil leak between crankcase and pumping section	Worn rod oil seals	Replace crankcase piston rod seals
Frequent or premature failure of the packing	Cracked, damaged or worn plunger	Replace plungers
	Overpressure to inlet manifold	Reduce inlet pressure
	Material in the fluid being pumped	Install proper filtration on pump inlet plumbing
	Excessive pressure and/or temperature of fluid being pumped	Check pressures and fluid inlet temperature; be sure they are within specified range
	Running pump dry	Do not run pump without water
Pump runs but produces no flow	Pump is not primed	Flood suction then restart pump
Pump fails to prime	Air is trapped inside pump	Disconnect discharge hose from pump. Flood suction hose, restart pump and run pump until all air has been evacuated
Pump looses prime, chattering noise, pressure fluctuates	Air leak in suction hose or inlet	Remove suction line and inspect it for a loose liner or debris lodged in hose. Avoid all unnecessary bends. Do not kink hose
	Clogged suction strainer	Clean strainer
Low pressure at nozzle	Unloader valve is by-passing	Make sure unloader is adjusted property and by-pass seat is not leaking
	Incorrect or worn nozzle	Make sure nozzle is matched to the flow and pressure of the pump. If the nozzle is worn, replace
	Worn packing or valves	Replace packing or valves
Pressure gauge fluctuates	Valves worn or blocked by foreign bodies	Clean or replace valves
	Packing worn	Replace packing
Pump runs extremely rough, pressure very low	Inlet restrictions and/or air leaks.	Clean out foreign material
	Stuck inlet or discharge valve	Replace worn valves
Slight leak, oil leaking in the area of crankshaft	Worn crankshaft seal or improperly installed oil seal o-ring	Remove oil seal retainer and replace damaged 0-ring and/or seals
	Bad bearing	Replace bearing
Water leakage from under manifold	Worn packing or cracked plunger	Install new packing or plunger
Excessive play in the end of the crankshaft pulley	Worn main bearing from excessive tension on drive belt	Replace crankcase bearing and/or tension drive belt
Water in crankcase	Humid air condensing into water inside the crankcase	Change oil intervals
	Worn packing and/or cracked plunger	Replace packing. Replace plunger
Loud knocking noise in pump	Cavitation or sucking air	Check water supply is turned on
	Pulley loose on crankshaft	Check key and tighten set screw
	Broken or worn bearing	Replace bearing