



# FIXED DISPLACEMENT PISTON PUMP

## SERIES 22PE, 23PE, & 24FXG

### INSTALLATION TIPS AND PROCEDURES

#### OIL RECOMMENDATIONS

A good quality anti-foaming petroleum based fluid with anti-emulsion and anti-wear additives is recommended. Muncie does not promote specific manufacturer's brands of oil. Oil viscosity reference: Cold climate 105 SUS (22 cST), Med. climate 170 SUS (37 cST), Hot climate 225 SUS (46 cST). During cold weather, oil may thicken and not flow properly into the pump resulting in cavitation damage. Allow oil to warm up at slow speed. Your oil supplier should be consulted for your application needs.

Do not use automatic transmission fluid (ATF), biodegradable oil, or fire resistant fluids due to the poor lubricating properties.

#### FILTRATION

Because design and operation of a piston pump is considerably different than that of a normal gear pump, filtration and contamination control must be drastically improved for optimum product life and performance. Disregarding this portion of the system can lead to catastrophic pump failure and inadequate system performance. Below is a guideline on contamination levels and operating pressures. Most new oils will need to be filtered to meet this requirement.

Pressure PSI (BAR)	ISO Contamination Class	Filtration Bx = 75
< 2,900 (200)	19/16	25
< 4,350 (300)	18/15	20
> 4,350 (300)	17/14	10

Inlet side filtration should not be used because of possible high vacuum conditions to the pump. Types of fluid, duty cycles, pump displacement and operating speeds determine proper filtration requirements.

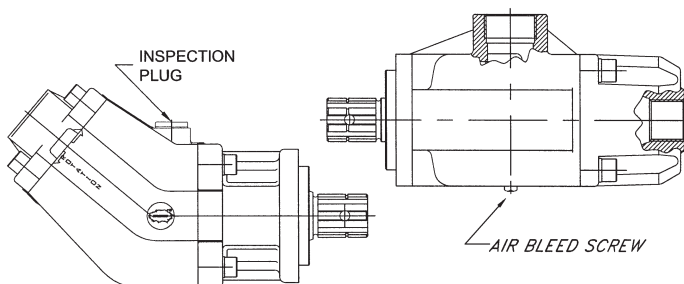
#### PUMP MOUNTING AND INSTALLATION

The pump can be mounted in any position with the input shaft horizontal. (It will be difficult to fill the 24FXG Series pump case with oil when the inspection plug is positioned downward.) Make sure the mounting bolts and connections are tight prior to startup. The reservoir oil level should be higher than the pump inlet. This will enhance inlet feed conditions and initial pump priming.

#### OTHER INSTALLATION TIPS

- When routing and plumbing the inlet side of the pump, avoid sharp bends of any type. Smooth sweeps will help prevent restrictions to the pump.
- Cycle system under no load conditions to purge any entrained air.
- Change the filter element after the first 40 hours of service. Regular maintenance thereafter.

#### PUMP LAYOUT HOSE SIZES & PORTING



Hose should follow SAE guidelines for appropriate type and size needed for the given flow rate (velocity) and function. Careful consideration should be made on the inlet hose size. The inlet hose should be an SAE 100R4 type.

#### Approximate System Flow vs. Inlet Hose size

Approx. GPM (LPM):	4.5 (17)	8 (30)	12 (45)	17 (65)	32 (120)
Inlet Hose Size In. (mm):	3/4 (19)	1 (25)	1 1/4 (32)	1 1/2 (38)	2 (50)

All ports are British Standard Pipe (BSPP), **DO NOT USE NPT OR SAE ADAPTERS IN THE PUMP PORTS.** Correct fittings are available from Muncie Power Products to convert from the BSPP ports to either barbed ends for inlet hose or to JIC 37 deg. connections.

#### PUMP INLET

Due to the nature of design and operation of a piston pump, care must be taken to prevent operation at high vacuum conditions. The piston pump is more susceptible to damage and premature wear than a typical gear pump due to design, tighter tolerances, and numerous contact surfaces. Inlet line velocity should not exceed four feet per second. Pressurizing reservoir to approx. 3-5 PSI can help decrease chances of high vacuum conditions and cavitation damage in most cases.

All inlet connections must be air tight to prevent the possibility of drawing air into the inlet oil and to prevent the draining of oil out of the inlet line when off.

#### SYSTEM PROTECTION

To protect hydraulic system from pressure spikes a standard high quality in-line relief valve must be used (typically installed in directional valve).

#### TEMPERATURE RANGE

Maximum temperature should not exceed 180° F (82° C). See oil recommendations for typical operating range.

#### PUMP ROTATION

On all pumps the large port is the inlet and the smaller port is the discharge. All 22PE & 23PE Series are bi-rotational and rotation is not an issue. All 24FXG Series pumps are uni-rotational and proper rotation is critical. To determine actual rotation view arrows cast into the rear cover.

#### START UP PROCEDURES

With the system installation complete and the reservoir filled with clean oil, the following is recommended.

- On the 24FXG Series remove the inspection plug, oil should run out. Fill case with clean oil if the oil does not flow out. On the 22PE & 23PE Series remove the air bleed plug until a steady oil stream runs out. If no oil comes out, loosen the inlet fitting at the pump, pressurize the reservoir until a steady stream of oil is noticed, tighten fitting and air bleed with stream still running if possible.
- Start vehicle and let engine idle with pump running at no load for approximately five minutes to purge air out and flush out contaminants. Look for leaks or any other problems.
- Do not run pump longer than 30 seconds if it does not prime itself.
- Cycle cylinder or motor functions under no load (do not bottom or dead head) to fill with oil and to purge air from the system. Monitor oil level and refill as needed. Watch for leaks or any other problems.
- Once system is filled and air purged, set relief valve(s) as needed.

## TROUBLESHOOTING

	Probable Cause	Possible Remedy
External Leakage	a. Seal failure. b. Porosity in casting.	a. Replace seal. b. Replace casting.
Leakage at fitting	a. Cracked or damaged flange or fittings. b. Damaged or defective flange threads.	a. Replace flange or fitting b. Replace housing
Loss in Pump RPM	a. Power source is too small for pump. b. Engine RPM too low.	a. Review pump HP requirements, use larger power source. b. Review PTO% and operating RPM.
Pump fails to respond	a. Pump does not prime. b. Tank fluid level too low. c. Fluid inlet line clogged. d. Air leak in suction line. e. Fluid viscosity too heavy. f. Broken pump shaft or internal parts.	a. Bleed air from system. b. Add fluid/check level, suction line must always be submerged below oil level. c. Clean strainer of all foreign material. d. Tighten and seal connections/replace seals. e. Use lighter viscosity fluid if appropriate for climate. f. Replace damaged parts.
Pump not developing pressures	a. Relief valve setting too low. b. Relief valve sticking open. c. Free recirculation of fluid to tank.	a. Reset relief valve. b. Check for contamination, malfunctioning valve. c. Check plumbing, directional or bypass valve
Noisy or Erratic Operation	a. Air leak at pump inlet line. b. Housing and mounting cap separated. c. Undersize, restricted or clogged inlet line. d. Excessive pump RPM (cavitation). e. Worn Bearings. f. Tank inlet not submerged at all times.	a. Tighten or repair as necessary. b. Check bolts for proper torque. c. Clean, repair, or resize. d. Reduce RPM to max. recommendations. e. Disassemble and replace. f. Check level/refill. Modify tank design to keep submerged.
Seal Failure	a. Excessive inlet pressure. b. Possible internal component failure.	a. Decrease inlet pressure. b. Replace damaged parts.

## PUMP SPECIFICATIONS

PUMP MODEL	GPM (LPM) @ 1,000 RPM	DISPL. CU IN (CC)	MIN RPM	MAX RPM	MAX CONT. PSI (BAR)	APP. WT. LBS. (KG)	INLET BSSP (IN)	OUTLET BSSP (IN)
22PEV014	4.23 (16)	0.976 (16)	400	2400	4785 (330)	22.22 (10.1) UNI 23.76 (10.8) DIN	1	1
22PEV019	5.63 (21.3)	1.30 (21.3)	400	2400	4785 (330)	22 (10) UNI 23.54 (10.7) DIN	1	1
22PEV025	7.05 (26.7)	1.63 (26.7)	350	2400	4785 (330)	21.78 (9.9) UNI 23.32 (10.6) DIN	1	1
22PEV030	8.45 (32)	1.95 (32)	350	2400	4785 (330)	21.34 (9.7) UNI 23.1 (10.5) DIN	1	1
22PEH040	10.57 (40)	2.44 (40)	400	2400	5800 (400)	22.88 (10.4) UNI 23.32 (10.6) DIN	1¼	1
22PEH050	13.21 (50)	3.05 (50)	400	2400	4785 (330)	22.88 (10.4) UNI 23.32 (10.6) DIN	1¼	1
22PEH060	15.85 (60)	3.66 (60)	300	2100	4200 (290)	22.88 (10.4) UNI 23.32 (10.6) DIN	1¼	1
22PEV070	18.49 (70)	4.27 (70)	400	2000	4350 (300)	38.5 (17.5) DIN	1½	1
22PEV080	21.14 (80)	4.88 (80)	400	2000	4350 (300)	38.5 (17.5) DIN	1½	1
22PEV090	23.78 (90)	5.49 (90)	400	2000	4350 (300)	38.5 (17.5) DIN	1½	1
22PEV100	26.42 (100)	6.1 (100)	400	2000	4350 (300)	38.5 (17.5) DIN	1½	1
23PE4141	10.8 (41) + 10.8 (41)	2.5 (41) + 2.5 (41)	400	2000	4350 (300)	38.94 (17.7) DIN	1½	1
23PE5141	13.5 (51) + 10.8 (41)	3.1 (51) + 2.5 (41)	400	2000	4350 (300)	38.94 (17.7) DIN	1½	1
23PE5151	13.5 (51) + 13.5 (51)	3.1 (51) + 3.1 (51)	400	2000	4350 (300)	38.94 (17.7) DIN	1½	1
24FXG016	4.46 (16.9)	1.03 (16.9)	300	3000	6525 (450)	13.86 (6.3) UNI 15.18 (6.9) DIN	¾	½
24FXG025	6.82 (25.8)	1.57 (25.8)	300	3000	6525 (450)	13.86 (6.3) UNI 15.18 (6.9) DIN	¾	½
24FXG034	9.27 (35.1)	2.14 (35.1)	300	3000	6525 (450)	23.1 (10.5) DIN	1	¾
24FXG047	12.71 (48.1)	2.93 (48.1)	300	2500	6525 (450)	23.1 (10.5) DIN	1	¾
24FXG064	16.99 (64.3)	3.92 (64.3)	300	2500	6525 (450)	29.7 (13.5) DIN	1¼	1
24FXG084	22.46 (85)	5.19 (85)	300	2000	5800 (400)	29.7 (13.5) DIN	1¼	1
24FXG108	28.53 (108)	6.59 (108)	300	2000	5075 (350)	29.7 (13.5) DIN	1¼	1
24FXG130	34.40 (130.2)	7.94 (130.2)	300	2000	3625 (250)	39.6 (18) DIN	1½	1

Operating Temperature Range: -13° F to 180° F. (-25° C to 82° C). Recommended Oil Viscosity: 78–220 SUS (15–46 cSt), 5,000 SUS (1,000 cSt) max. startup. Filtration: 10 Micron return line filtration recommended.



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