



PTO-Driven Compressor Kit

Operating Instructions

Applies to the Pneumax model

80-SP

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OPERATING INSTRUCTIONS

MULTIPLE USES

A pumper equipped with a Pneumax compressed air foam unit can be operated in several pumping modes; water only, foam solution without compressed air, compressed air foam and compressed air only for support operations such as operating air tools, filling rescue air bags, etc. It is possible to pump foam solution from one discharge while pumping compressed air foam from another, or varying foam consistencies (expansion ratios) from different discharges simultaneously.

NOTE: Monitor compressor instruments during any and all operations.

WATER PUMPING OPERATIONS

All unit operations begin with pumping water. Follow the instructions provided in the apparatus manuals for operations involving pumping water. For water only operations, the compressor PTO shift control should be in the “OFF” position, which disengages the air compressor.

CAUTION: Running the unit with a dry fire pump can cause damage to the pump and air compressor system.

FOAM SOLUTION OPERATIONS

Follow the instructions above for water pumping operations. Turn on the foam proportioner to inject foam concentrate into the water stream. Refer to the foam proportioner operation manual for instructions in the proper operation of the installed proportioning system.

COMPRESSED AIR FOAM OPERATIONS

Follow the instructions above for foam solution operations. Safe operations dictate the presence of foam concentrate in the water stream prior to the injection of compressed air. If foam concentrate is not present, a condition known as “slug flow” will occur, where unmixed water and air is discharged through a nozzle in an erratic manner.

Discharge pressures for compressed air foam operations typically range between 80 and 120 PSI in a flow state. Set water discharge pressure at the desired level.

NOTE: Compressed air foam does not have the hydraulic characteristics of plain water or foam solution. Therefore, standard pump hydraulics practices do not apply to CAFS operations.

COMPRESSED AIR FOAM OPERATIONS (continued)

- Engage the air compressor by moving the PTO switch to the “ON” position. Move the Auto Sync controls to the AUTO / RUN positions. Air pressure as shown on the air pressure gauge should rise to within plus or minus 5% of the water discharge pressure. The Auto Sync system will balance the air and water pressures + or - 5% throughout a range of 40 PSI up to 150 PSI.
- Set proportioner at 0.2% - 0.4% for normal Class A combustibles. Proportioning rates are dictated by the type and brand of foam concentrate used and the tactical objective.
- Open desired discharge valve(s) by moving the handle approximately ½ from the closed position. The foam expansion ratio is set by controlling the amount of foam solution entering the discharge stream. High solution flows restrict the amount of air admitted and result in lower expansion or “wet” foam. To produce higher expansion or “drier” foam, simply gate back the amount of solution admitted.
- Fully open the air valve(s) to the desired discharges. Adjust the solution flow to produce the desired foam consistency.

Foam is formed during the transition through the hose. To produce acceptable finished foam, sufficient hose length must be provided on the discharge. Refer to Table 1 for minimum hose lengths for CAFS operations.

WARNING

Nozzle reaction force is significantly increased at the time the nozzle valve is opened in compressed air foam operations. **OPEN CAFS NOZZLES SLOWLY!**

SHUT-DOWN PROCEDURE

- Close air valve(s)
- Turn off Foam proportioner
- Flow clear water through discharge hose(s) until no bubbles are present
- Close discharge valve(s)
- Move the air compressor PTO switch to the “OFF” position

After the compressor PTO is disengaged, the system will vent itself, creating an audible hiss as compressed air is evacuated from the pressure vessel / sump.

CAUTION: Allow system to bleed down the pressures for approximately 2-3 minutes prior to re-engaging. Otherwise, re-engagement may cause engine to stall.

COMPRESSED AIR ONLY OPERATION

- Follow instructions for water pumping operations without opening discharge valves. Air compressor cooling is via water that is circulated by the fire pump through the compressor cooler and returned back to the booster tank. Compressed air only operation time is limited by the amount of available cooling water. The water in the booster tank will eventually become heat saturated and ineffective at cooling the air compressor. **Watch the compressor temperature gauge closely!** Compressor system overheat is also indicated by the panel mounted warning light and alarm.
- After engaging the fire pump, ensure that the water pressure as shown on the panel mounted master pressure gauge rises. Engage the air compressor PTO and move the Auto Sync controls to the RUN / FIXED positions. Air pressure will rise to the preset pressure setting on the air compressor, approximately 150 PSI with the engine throttled-up. For lower operating pressures, move the Auto Sync controls to the RUN / AUTO positions and use the engine throttle to control the air pressure.
- Connect the air discharge hose to the fitting on the pump operator's panel and open the air supply valve.

Extended compressed air only operations necessitate connection of an external water source to the pump inlet and closing of the tank to pump valve for proper compressor cooling. In this case, cooling water will flow into the booster tank at 10-20 GPM, eventually overflowing the tank.

WARNINGS

- Compressed air can be dangerous. Read and understand the operating instructions for the Pneumax compressed air foam unit and individual components prior to operating.
- **DO NOT** use the compressed air foam unit as an air source for SCBA or any breathing air supply.
- Discharge outlets that are capped, hose lines that are valved and charged and the air compressor sump may contain compressed air. Relieve all pressure **BEFORE** attempting to remove any caps, fittings, nozzles, or to perform maintenance to prevent serious personal injury.
- Nozzle reaction force is significantly increased at the time the nozzle valve is opened in compressed air foam operations. **OPEN CAFS NOZZLES SLOWLY!**

Operating the compressed air foam unit with water and compressed air pumped through a discharge without foam concentrate will create a potentially dangerous condition known as “Slug Flow”; where unmixed pockets of water and air are passed through the nozzle, causing erratic nozzle reaction.

For compressed air foam operations, use only fire hose that is rated at 200 PSI or higher working pressure.

The unit operator should have a thorough understanding of “Boyle’s Law” (The law of compressed gases) prior to operating the compressed air foam unit.

HOW IT WORKS

The air compressor used in this application is an oil flooded rotary screw type. Rotary screw air compressors are very common in industrial applications. This type of compressor injects oil into itself, where it lubricates, seals, cools, and silences the compressor. The oil is then entrained into the air discharge from the compressor. This air/oil mixture is discharged into a sump tank where most of the oil separates from the air. The oil is then sent via hydraulic hose to a combination cooler/filter unit. It is cooled to remove compression and friction heat, filtered, and sent to the oil injection port on the compressor. The cycle is then repeated.

The oil mist that remains in the air stream is recovered by an air/oil separator system. This system recovers the oil mist in a spin-on cartridge that has a siphon tube that picks-up the recovered oil for return to the air compressor.

The compressor's air output is controlled by a modulating inlet valve. The inlet valve is opened and closed by the Auto Sync pressure control system.

The compressor cooling system circulates water from the fire pump through the compressor oil cooler and back to the tank to remove heat from the compressor oil system. The compressor oil temperature should not exceed 250° F. If this occurs, check the water supply, pump prime, restrictions in the cooling water system and for low oil level in the sump.

The air compressor (air end) is driven via a transmission power take-off. It is important to ensure that there is a water supply from the fire pump whenever the engine is running. Pump and/or compressor damage may result from running the pump dry.

AIR COMPRESSOR SYSTEM SERVICE AND MAINTENANCE

Excessive heat build-up and oil system contamination are the most common causes of compressor system problems and premature wear. With proper operation and maintenance, the compressor system should far outlast the vehicle it is mounted on. Adherence to the following guidelines will prevent potentially costly damage.

1. There is a sight gauge provided on the oil reservoir/sump. The oil level should be at approximately halfway up the window. Check the oil on level ground, prior to system start up. If the system has recently been run, wait 10 minutes after shutdown for the oil to stabilize before checking the oil level. The compressor uses common hydraulic oil. This oil is classified by an ISO standard as ISO 68 viscosity and is sold under various trade names. Many are sold as “anti wear” hydraulic oil and are available from auto parts or lubricating oil suppliers.
2. The oil should be changed after the first 30 hours of system operation. After that, the oil should be changed annually. There is a drain plug located at the bottom of the sump. The oil fill cap is located on top of the unit.
3. Change the compressor system oil filter at the same time as the oil is changed. The spin-on filter cartridge is a Donaldson hydraulic oil filter. Call Pneumax for replacement elements.
4. Run the compressor for 2 minutes after changing the oil, then re-check the oil level and add oil as necessary. **DO NOT OVERFILL.**
5. Visually inspect the compressor oil system weekly for signs of leaks. Check the air compressor Poly Chain drive for proper tension and signs of wear monthly or more frequently as dictated by the amount of use.
6. Inspect the compressor air intake filter and clean or replace as necessary. The environment in which the unit operates will determine the frequency of air filter service and replacement. In any situation, replace no less frequently than yearly.
7. Replace the oil / air separator cartridge every 24 months, or if the unit’s oil consumption suddenly increases. A sudden increase may be caused by a hole in the internal media of the cartridge allowing oil to carry through and discharge with the compressed air. Call Pneumax for replacement separator cartridges.
8. Completely drain the water from the compressor oil cooler in cold weather to prevent freeze damage.

AIR COMPRESSOR SYSTEM SERVICE AND MAINTENANCE (cont.)

Maintenance Schedule

	Check oil level and for oil leaks	Change Compressor Oil	Change Oil Filter	Change Separator Cartridge
Daily or After Each Use	X			
Annually		X	X	
Every 24 Months				X

Inspect the air compressor air intake filter monthly and change as necessary.

MAINTENANCE ITEMS

<p>AIR FILTER CO85005 (Pneumax part # 2030043)</p> <p>HYDRAULIC FILTER WD 920 (Pneumax part # 2030058)</p> <p>SEPARATOR FILTER</p> <p>Boss Compressor LB 1374/2 (Pneumax part # 2030015)</p> <p>Ingersoll Compressor LB 962/2 (Pneumax part # 2030050)</p>
<p>HYDRAULIC OIL</p> <p>ISOAUW68 Anti-Wear, Low-Foaming, Anti-Foaming</p>

CAFS NOZZLE / FLOW RATE / HOSE COMBINATIONS

NOZZLES

Compressed air foam can be discharged through various types and sizes of nozzles. Fog nozzles break down the bubble structure of the foam, resulting in a “wetter” or reduced expansion foam. Similarly, when utilizing smooth bore nozzles with a given hose diameter, smaller tips will discharge “wetter” foam.

FOAM CONCENTRATE RATIOS

Proportioner settings of 0.2% and 0.3% are typically adequate to produce compressed air foam that is formed in a hoseline and used on Class A combustibles. Higher settings will result in a “drier” appearing foam. Lower settings may result in “slug flow” or discharge pulsation caused by insufficient foam concentrate in solution to form foam in the hoseline.

For Class B or other type foam ratio settings, follow the instructions provided by the foam concentrate manufacturer.

HOSE

Utilize fire hose that is rated by the hose manufacturer for use with CAFS. Since the foam is formed during its transition through the hoseline, it is important to utilize the minimum recommended hose lengths, unless a static mixer is utilized. There is significantly less friction and head loss with compressed air foam as compared to water or foam solution. Hence, effective fire streams can be achieved with longer hose lays. Refer to the Suggested Guidelines for the Production of Mid-Range Compressed Air Foam.

NOTE

Compressed air foam systems have the ability to produce a foam of shaving cream consistency. This type of foam is typically suited for defensive operations such as exposure protection, barriers or fuels pretreatment. While this type of foam is highly stable and possesses a long drain time, it is essential to ensure that the foam will release sufficient water to extinguish a fire in a direct attack situation.

SUGGESTED GUIDELINES FOR THE PRODUCTION OF MID-RANGE COMPRESSED AIR FOAM

1" HOSE DIAMETER JACKETED

1 GPM to 1 CFM

½" Tip Solution Flow: 15 GPM Air Flow: 15 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 35' to over 400'

2 GPM to 1 CFM

½" Tip Solution Flow: 30 GPM Air Flow 15 CFM

Disch Pressure: 100-150 PSI

Min/Max Hose Length:35'to over 400'

1 GPM to 1 CFM

¾" Tip Solution Flow: 20 GPM Air Flow: 20 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 35' to over 200'

2 GPM to 1 CFM

¾" Tip Solution Flow: 40GPM Air Flow: 20 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length:35' to over 200'

1-1/2" HOSE DIAMETER

1 GPM to 1 CFM

1" Tip Solution Flow: 30-40GPM Air Flow: 30-40CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 100' to over 800'

2 GPM to 1 CFM

1" Tip Solution Flow: 60-80GPM Air Flow: 30-40CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 100' to over 800'

1 GPM to 1 CFM

1-3/8" Tip Solution Flow: 50-60 GPM Air Flow: 50-60 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 100' to over 800'

2 GPM to 1 CFM

1-3/8" Tip Solution Flow: 90-120 GPM Air Flow: 50-60 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 100' to over 800'

1-3/4" HOSE DIAMETER

1 GPM to 1 CFM

1" Tip Solution Flow: 30-40 GPM Air Flow: 30-40CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose Length: 100' to over 1400'

2 GPM to 1 CFM

1" Tip Solution Flow: 60-90 GPM Air Flow: 30-50 CFM

Disch. Pressure: 100-150 PSI

Min/Max Hose length: 100' to over 1400'

1-3/8" Tip Solution Flow: 50-90 GPM Air Flow: 50-80 CFM

Disch. Pressure: 110-150 PSI

Min/Max Hose Length: 100' to over 700'

NOTE. With 1-3/4" hose lengths of 100'-250', up to 90-120 GPM of water and 40-100 CFM of air may be utilized as a highly effective initial attack flow.

System flows are very flexible. The flow of any discharge can vary according to the situation and conditions

It is possible to make the discharge stream wetter or drier by changing the amount of solution or air in the hose

The stream can also vary by changing the tip size at the nozzle

- The bigger the diameter tip the drier the foam
- The smaller the diameter tip the wetter the foam

MASTER STREAM

1" Tip Solution Flow: 90-120 GPM Air Flow: 60-80 CFM

1-3/8" Tip Solution Flow: 100-150 GPM Air Flow: 70-100 CFM

1-1/2" Tip Solution Flow: 120-200 GPM Air Flow: 80-120 CFM

1-3/4" Tip Solution Flow: 180-250 GPM Air Flow: 120-150 CFM

2" Tip Solution Flow: 250-450 GPM Air Flow: 200 CFM

Disch. Pressure: 120-150 PSI

NOTE: Typical master stream operations utilize lower foam expansion ratios ("wetter" foam) for increased foam density and longer stream reach.

Adjustment of the Auto-Sync Air Balancing System

Colored hoses and fittings are supplied with the compressor kit for the average installation. The schematic is color coded to simplify installation. This also makes future service issues easier to resolve, provided suggested hose colors are used.

CAFS retrofit kits and any other system shipped as separate components will need calibrating after installation.

Note: Before you make any adjustments, make sure the oil level in the sump is correct, and the air lines do not have leaks or obstructions. Do not adjust the Auto-Sync components to compensate for problems elsewhere in the CAF system.

Always start by adjusting UNLOAD mode, then FIXED, then AUTO.

Auto-Sync

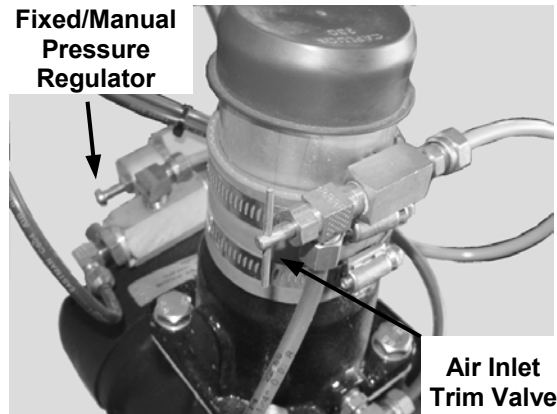
1. UNLOAD Mode Adjustment

1. Set the controls on the Auto-Sync control panel to FIXED and UNLOAD. (UNLOAD for electric valves)



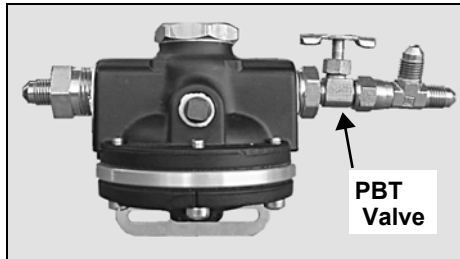
Manual Valve Control

2. Close all air discharges.
3. Locate the Air Inlet Trim Valve (AITV), near the air inlet on the compressor.



Compressor adjustment points

4. Turn the AITV valve clockwise until it is completely closed, then open it three full turns.
5. Locate the Piloted Balance Valve (PBTV), and turn the needle valve counterclockwise to full open.



Piloted Balance Trim Valve (PBTV)

6. Start the fire pump, and with the engine at idle, establish water flow through a discharge or tank recirculation.
7. Engage the PTO.

Caution: Do not engage the PTO above 1000 engine RPM.

8. With 80-SP systems, the main pressure gauge should read approximately 40 PSI with all discharges closed. Some systems may read lower. This is acceptable.

2. FIXED Mode Adjustment

The usual pressure for a newly installed PTO retrofit kit is about 110 PSI. It must be adjusted to 150 PSI.

1. Locate the Fixed/Manual Pressure Regulator on the compressor and loosen the lock nut on the adjustment screw.
2. Place the controls on the Auto-Sync control panel to FIXED and RUN. Wait until the compressor pressure stabilizes.
3. The target operating pressure is 145-150 PSI. Monitor the air pressure reading as you adjust the regulator screw. Give the system several seconds to stabilize between adjustments, and make partial turns of the screw to avoid overshooting the target pressure.
 - Turning the screw IN (CW) will increase pressure.
 - Turning the screw OUT (CCW) will decrease pressure.
4. After the desired fixed pressure is achieved, tighten the lock nut.
5. Verify that the fixed regulator is performing properly by varying the engine speed as you watch the air pressure gauge. The pressure should remain steady at the setting you made. Repeat steps 2 through 4 if needed.

Turn the control to UNLOAD and back to RUN (To UNLOAD and back to FIXED for electric valves). The air pressure should rise to the fixed pressure. It may overshoot and drop back to the target pressure, but that is normal.

After the FIXED mode is adjusted, proceed to AUTO mode adjustment.

3. AUTO Mode Adjustment

The pressure for the FIXED mode must have been correctly set before you attempt to adjust the AUTO mode.

1. Make sure the fire pump is operating at 100 PSI at the main discharge, with minimal flow.
2. Place the controls on the Auto-Sync control panel to AUTO and RUN.
3. Read the main air pressure and water discharge pressure gauges.
4. The air pressure reading should be equal or up to 5% higher than the water pressure. If the readings are in this range, go to step 7 and verify the operation at other pressures.
5. If the air pressure is not within +5% of the water pressure, adjust it as follows:
 - If the air pressure is too high, turn the AITV clockwise in 1/2 turn increments to close it, checking air and water pressure after each 1/2 turn.
 - If the air pressure is too low, turn the AITV counterclockwise 1/2 turn to open it and check pressures. If the air pressure is still too low, open the valve another 1/2 turn and check the pressures again.

Do not open the Air Inlet Trim Valve more than this. Use the PBTV if the pressure remains too low.

6. If the air pressure remains too low, close the needle valve on the Piloted Balance Trim Valve (PBTV) one full turn clockwise and check the pressure gauges.

Repeat closing the PBTV one full turn until the air pressure is equal to or up to 5% higher than the water pressure.

If the air pressure is too high after a full-turn of the PBTV, turn the Air Inlet Trim Valve clockwise to lower the pressure until the air pressure is equal to or up to 5% higher than the water pressure.

7. Verify the Auto-Sync system settings by varying the fire pump discharge pressure and monitoring the water and air pressure gauges. The air pressure should rise and fall with the water pressure, matching it within 5%.

Pressures should match at static pressure only. It is normal for the pressures to be unmatched when flowing water, air, or solution.



Troubleshooting Guide

Applies to all Pneumax CAFSystems

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Troubleshooting

Compressor System

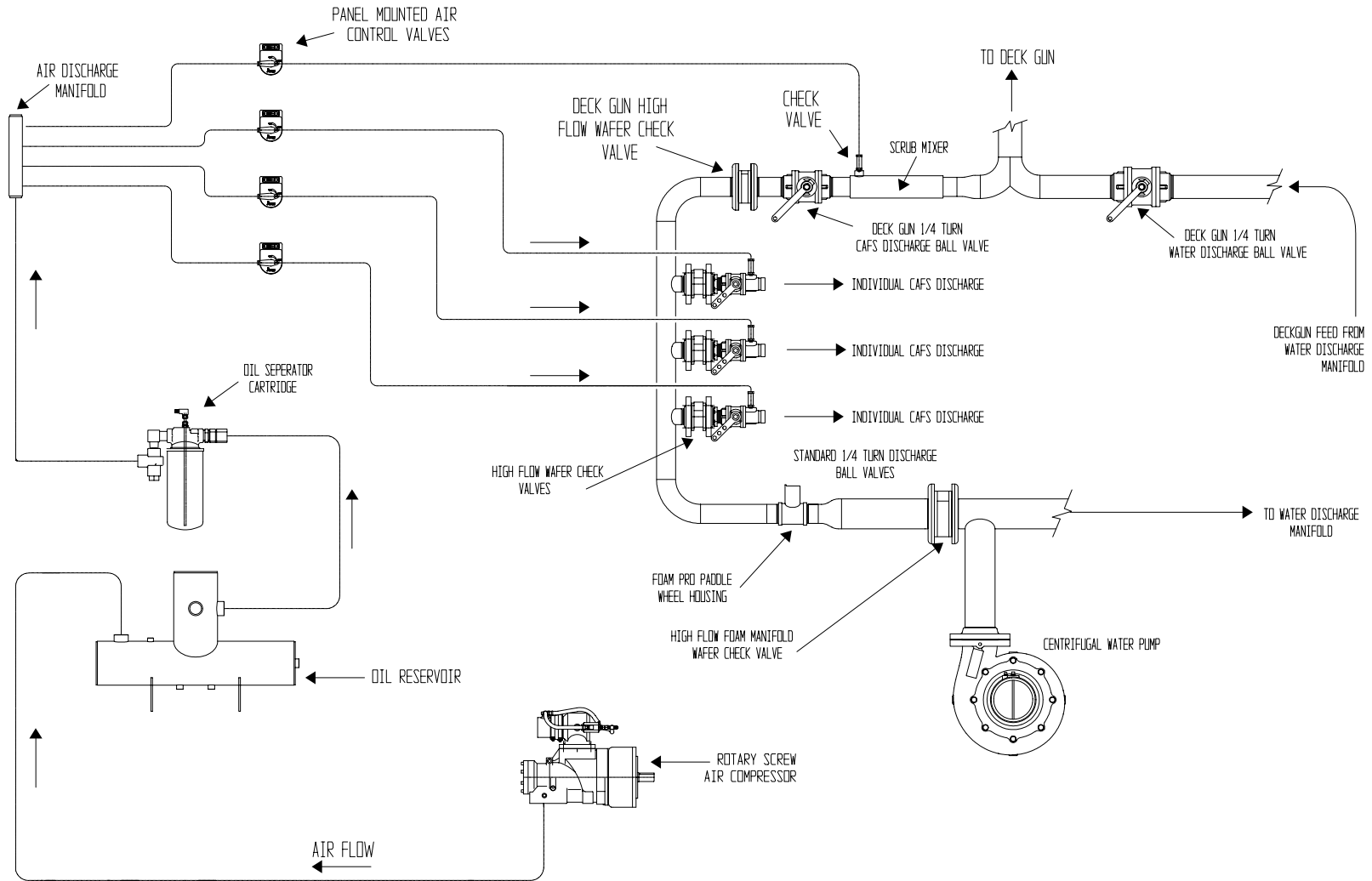
Observed Symptom	Probable cause	Suggested fix
Lack of air pressure from compressor		
Compressor not engaging	Lack of air supply to clutch (for air-clutch systems)	Repair air leak or re-establish air supply
	No PTO engagement	Confirm OK TO PUMP light is on, if not check wiring for damage or disconnected wire, check PTO.
Compressor engaging. No air supply to discharges or insufficient air supply.	Auto-Sync switches not in correct position.	Confirm 40 PSI in UNLOAD position (200 CFM systems) and 50+ in run position. Smaller compressors have lower UNLOAD pressures. Verify when in FIXED/RUN whether pressure reflects 145-150 PSI
	(electric valves) Verify there is power to the air solenoid and check operation of solenoid.	Air discharge solenoid not working Repair/replace solenoid Air solenoid working - leak between solenoid and discharge. Repair leak.
	Air check valve defective	Replace or correct installation.
	Trim valve out of adjustment	Refer to trim valve instructions
	Restricted minimum pressure valve	Clean rust or debris from valve
	Air plumbed before discharge valve seal	Relocate to discharge side of discharge valve
	Incorrect air line size	Size according to discharge and replace line with correct size.
	System functioning correctly, pressure gauge reading obviously incorrect.	Gauge malfunction, air line detached
FIXED has pressure but AUTO has no pressure	No water supply to balance valve.	Check line for proper installation, with no kinks or obstructions. Refer to trim valve instructions.
Air discharge pressure too high	Red hose circuit (compressed air control) has leak or is disconnected.	Repair leak or attach hose

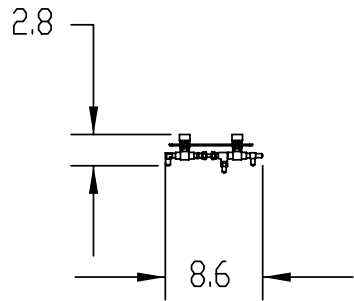
Observed Symptom	Probable cause	Suggested fix
System overheating	Inadequate water flow through cooler	Ensure adequate water flow through pump Check Y strainer for obstruction, clean and reinstall Drain and flush cooler water tubes
	Adequate water flow through cooler.	On-board tank used for cooling for a prolonged period - water too hot to effectively cool the compressor. Locate source of lower temperature water.
		Low compressor oil level: Check oil level - Adjust level to half of the sight glass on level surface.
		Check the hydraulic lines for kinks Change oil filters
		Temperature sending unit and or gauge circuit malfunction. Check wire connections at sending unit
High Oil Consumption	Overfull compressor oil	Adjust level to half of the sight glass on level surface.
	Excess of 200 CFM air flow (on 200 CFM systems)	Back down RPM's and flow CAFS to relieve pressure, then recheck
	Air/oil Separator Filter torn or damaged (could be caused by air flow of higher than 200CFM)	Replace Air/Oil Separator Filter System being operated at higher than capacity
"Excessive" compressor bleed down time on shutoff	Systems vary in bleed down time.	If Auto-Sync is operating correctly, and compressor output is within spec, do nothing.
Engine stalls upon compressor engagement	Engaging compressor while under load	Allow compressor to bleed down before re-engagement
	Running system without flowing air causes oil to accumulate in compressor acting like hydraulic pump	Bleed down air, restart compressor, and move air
	Underrated engine horsepower	Raise engine RPM
	Auto-Sync in FIXED/RUN setting	Engage in AUTO/UNLOAD, then switch to FIXED/RUN
	High oil level	Check oil level, adjust level to half of the sight glass with vehicle parked on a level surface
	Compressor locked up	Repair/replace compressor

Observed Symptom	Probable cause	Suggested fix
Compressor locked up	High oil level (compressor is flooded) Sump fire Low oil level or no oil	Check oil level, adjust level to half of the sight glass with vehicle parked on a level surface Check system and repair Check system and repair
Air flow meter stuck at "0" CFM Air flow meter stuck at high CFM	Magnet uncoupled in meter	Turn air flow on and off to re-couple Move large amounts of air out discharge and turn air flow on and off to re-couple
Poor foam (wet or dry) or no foam (assuming air pressure to discharges is OK) Discharge hose shaking (slug flow)	Using wetting agent and not foam concentrate. Foam proportioning control turned too low. Foam proportioning control OFF or turned too low, foam tank empty.	Use foam concentrate Increase amount of concentrate delivered to manufacturer recommended amount. Make sure proportioner is turned on, foam supply valve is open, foam tank has concentrate, Y strainer is clean, and supply line is connected to injector.
	Foam proportioner ON, setting correct, and tank has foam concentrate, but not providing foam solution.	Refer to foam proportioner manufacturer's instructions for detailed calibration and troubleshooting instructions
Foam in the water system (when proportioner turned off)	Foam concentrate was poured into the on-board water tank Foam manifold drain lines not isolated from water drain lines Cooler line plumbed from foam manifold Foam manifold check valve defective	Flush tank and pump with clean water, refill Isolate to separate drain valve Relocate line to discharge side of pump Rebuild/replace check valve
Water in compressor oil/air	Leaking inside cooler Freeze damage Defective air check valves Missing air check valves for discharges	Isolate cooler and check for leaks, replace if needed, check drain Replace or check Install check valves

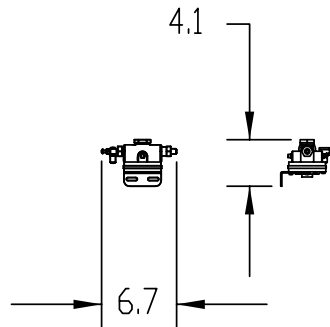
Observed Symptom	Probable cause	Suggested fix
Clutch smoking	Engaging in RUN position Slight air leak from solenoid to clutch High RPM engagement Not allowing compressor to bleed down before engaging clutch again Contaminated clutch disc	Engage in AUTO/UNLOAD only Repair air leak Engage in lower RPM Allow for bleed down Clean or replace
Safety pop off valve opening at low pressure	Auto-Sync system out of balance Sump fire damaged pop off valve	Adjust the Auto-Sync system, making sure to not open the trim valve on the compressor more than 3 turns. Check system for other damage and replace valve
Safety pop off valve repeatedly opening	Trim valve or inlet completely open	Refer to trim valve instructions

Basic Compressed Air Foam System (CAFS) Schematic



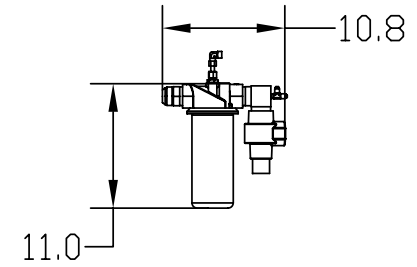


AUTO-SYNC CONTROL

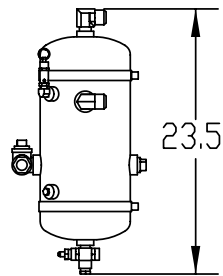
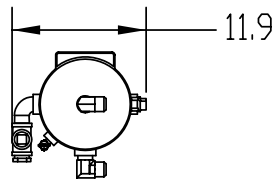


BALANCE VALVE

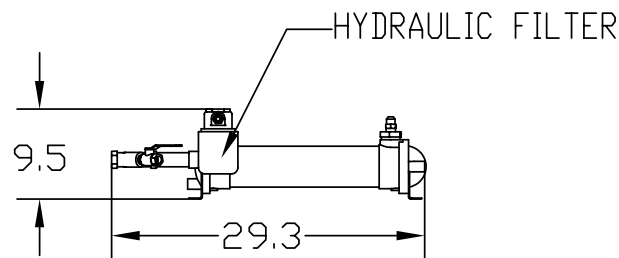
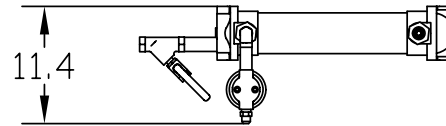
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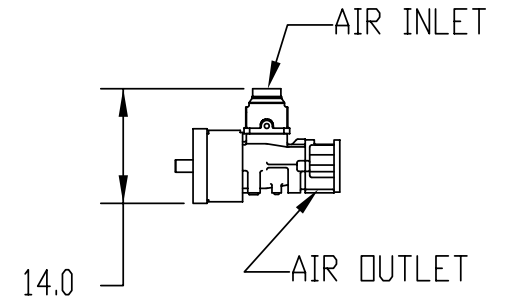
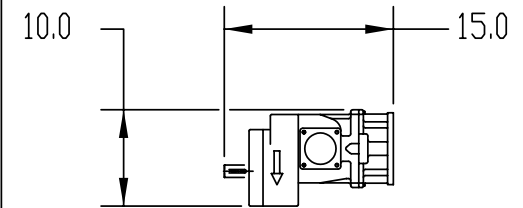
SEPARATOR FILTER



RESERVOIR



COOLER



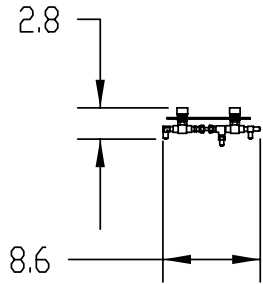
COMPRESSOR

DIMENSIONS APPROXIMATE AND SUBJECT TO CHANGE WITHOUT NOTICE

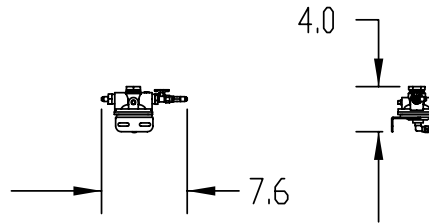
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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±1/16
ANGULAR ±.5
TWO PLACE DECIMAL ±.030
THREE PLACE DECIMAL ±.010
MATERIAL --

DRAWN		NAME	DATE	PNEUMAX 80-SP	8557 N. 78TH AVE PEDRIA, AZ 85345 623-979-3398 FAX- 623-979-6949
DO NOT SCALE DRAWING		PFW	4/21/2004		
FINISH	--	SIZE DWG. NO.		A	S0048
WEIGHT				XXX	SHEET 1 OF 1

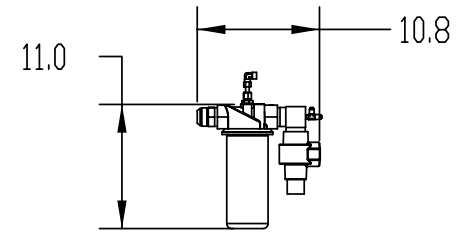


AUTO-SYNC CONTROL

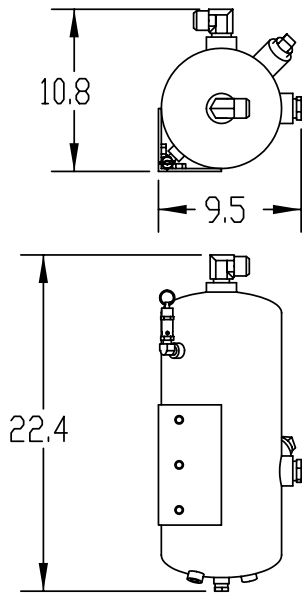


BALANCE VALVE

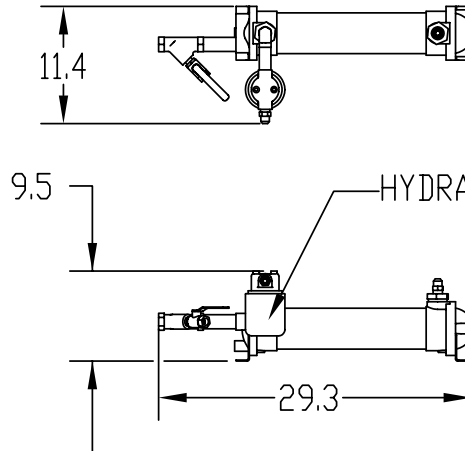
REV.	DESCRIPTION	DATE	ECO



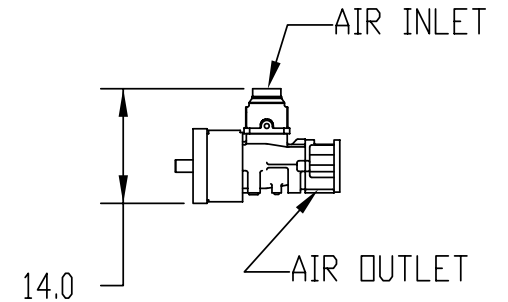
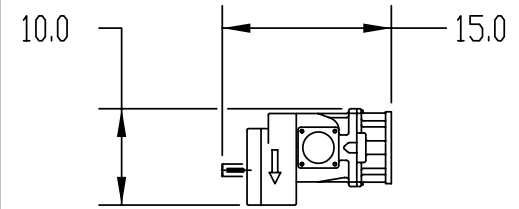
SEPARATOR FILTER



RESERVOIR



COOLER



COMPRESSOR

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ±1/16
 ANGULAR ±.5
 TWO PLACE DECIMAL ±.030
 THREE PLACE DECIMAL ±.010

MATERIAL --

NAME	DATE
PFW	1/25/2006
DO NOT SCALE DRAWING	
FINISH	--

PNEUMAX
 8557 N. 78TH AVE
 PEORIA, AZ 85345
 623-979-3398
 FAX: 623-979-6949

80-SP

SIZE DWG. NO. S0071

WEIGHT: XXX

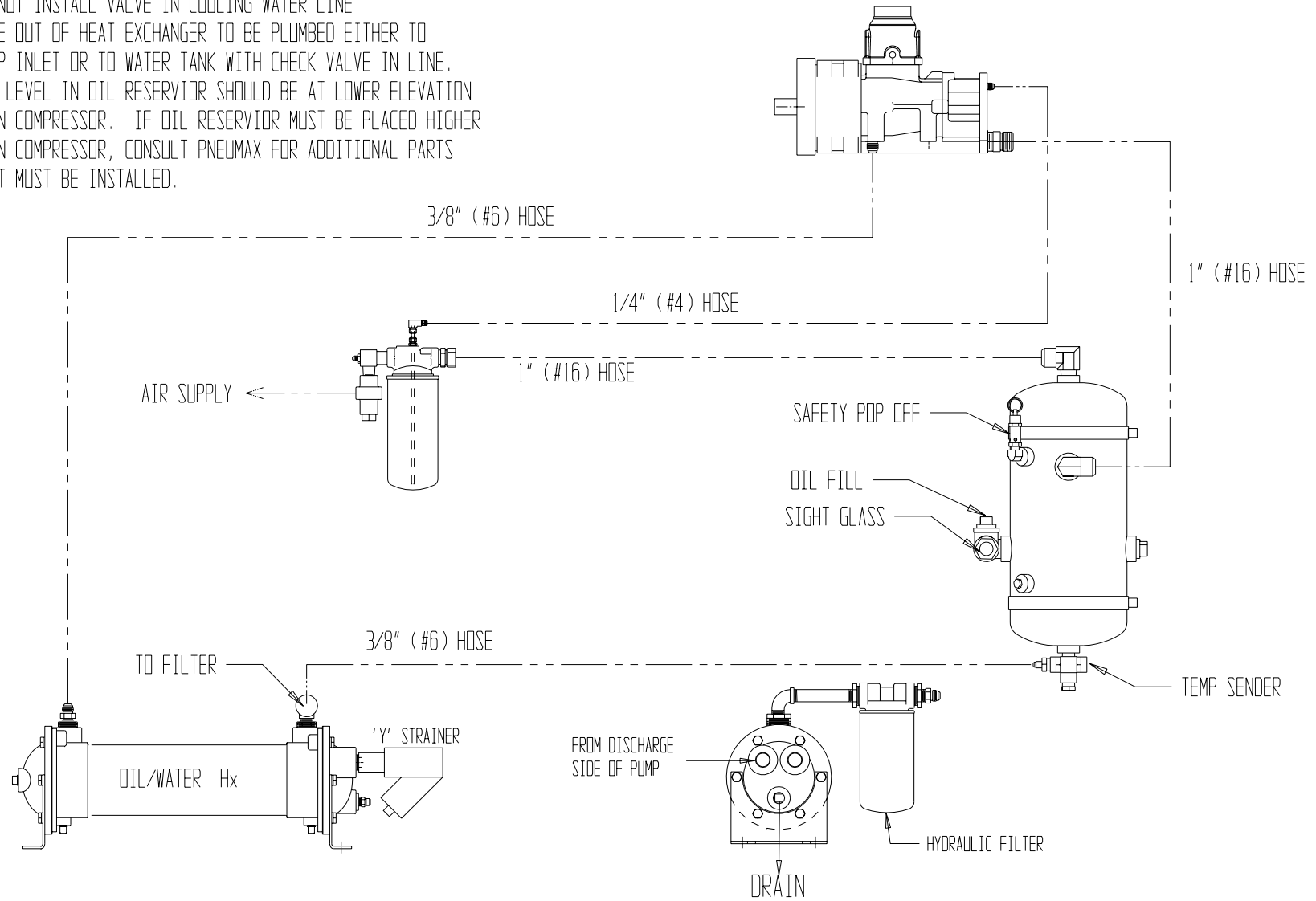
SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL
 THE INFORMATION CONTAINED IN THIS
 DRAWING IS THE SOLE PROPERTY OF
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 IN PART OR AS A WHOLE WITHOUT THE
 WRITTEN PERMISSION OF PNEUMAX, INC.
 IS PROHIBITED.

NOTES:

1. USE HYDRAULIC HOSE ONLY
2. DO NOT INSTALL VALVE IN COOLING WATER LINE
3. LINE OUT OF HEAT EXCHANGER TO BE PLUMBED EITHER TO PUMP INLET OR TO WATER TANK WITH CHECK VALVE IN LINE.
4. OIL LEVEL IN OIL RESERVIOR SHOULD BE AT LOWER ELEVATION THAN COMPRESSOR. IF OIL RESERVIOR MUST BE PLACED HIGHER THAN COMPRESSOR, CONSULT PNEUMAX FOR ADDITIONAL PARTS THAT MUST BE INSTALLED.

REV	DESCRIPTION	DATE	ECR #
-	----	--/--/----	-----



8557 N. 78TH AVE.
 PEORIA, AZ 85345
 623-979-3398
 FAX: 623-979-6949

DO NOT SCALE DRAWING
 TOLERANCE UNLESS OTHERWISE SPECIFIED
 .XX +/- 0.030 1/X +/- 1/16
 .XXX +/- 0.010 ANGLES +/- 0.5°

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SIZE	WEIGHT	SHEET	DRAWN
A	---	1 of 1	04/27/2004 RBC
USED IN: 80-SP, SCABG			

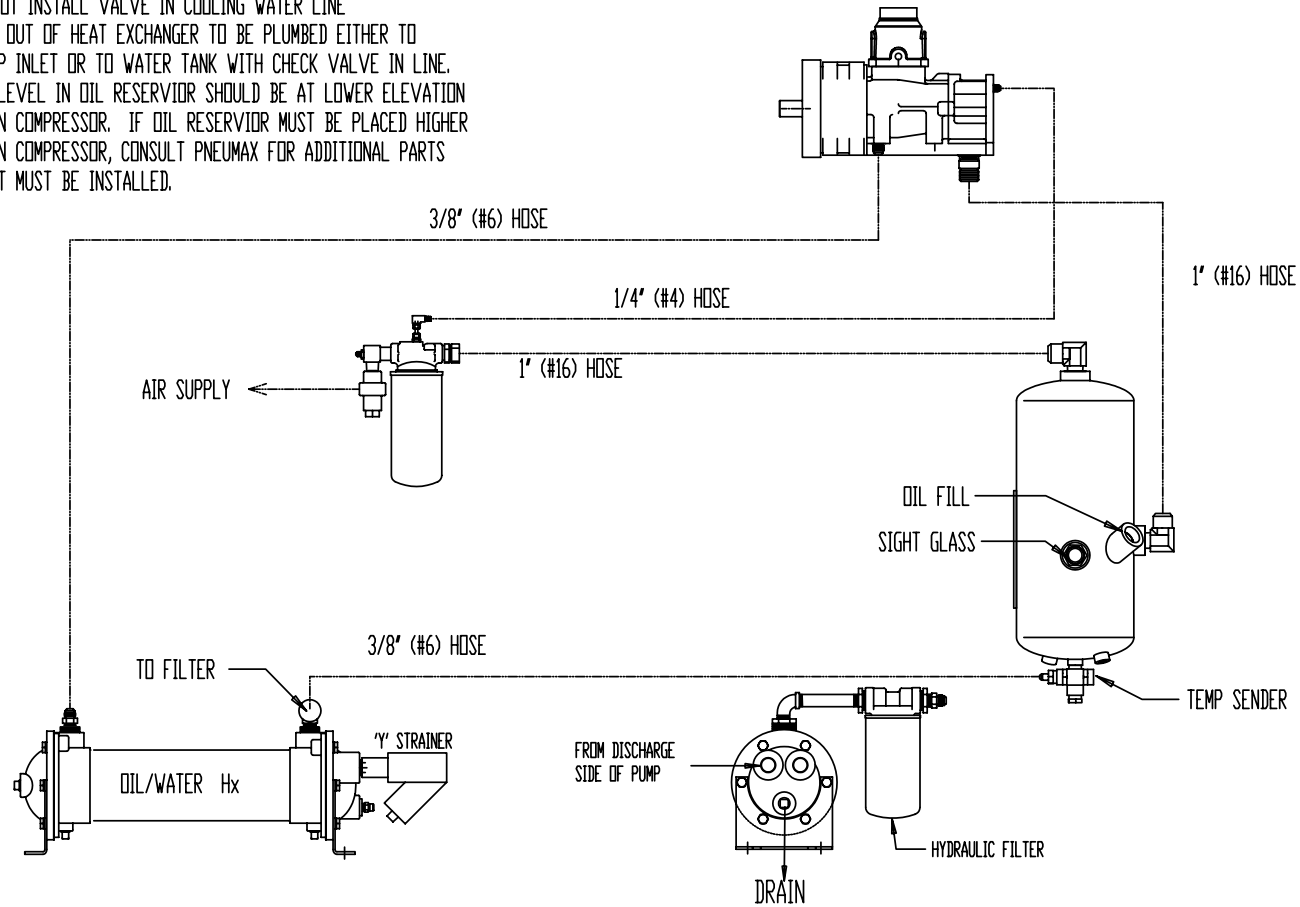
HYDRAULIC SCHEMATIC
 80-SP

DWG NO.
 314054

REV	DESCRIPTION	DATE	ECR #
-	----	--/--/----	-----

NOTES:

1. USE HYDRAULIC HOSE ONLY
2. DO NOT INSTALL VALVE IN COOLING WATER LINE
3. LINE OUT OF HEAT EXCHANGER TO BE PLUMBED EITHER TO PUMP INLET OR TO WATER TANK WITH CHECK VALVE IN LINE.
4. OIL LEVEL IN OIL RESERVIOR SHOULD BE AT LOWER ELEVATION THAN COMPRESSOR. IF OIL RESERVIOR MUST BE PLACED HIGHER THAN COMPRESSOR, CONSULT PNEUMAX FOR ADDITIONAL PARTS THAT MUST BE INSTALLED.



8557 N. 78TH AVE.
 PEORIA, AZ 85345
 623-979-3398
 FAX: 623-979-6949

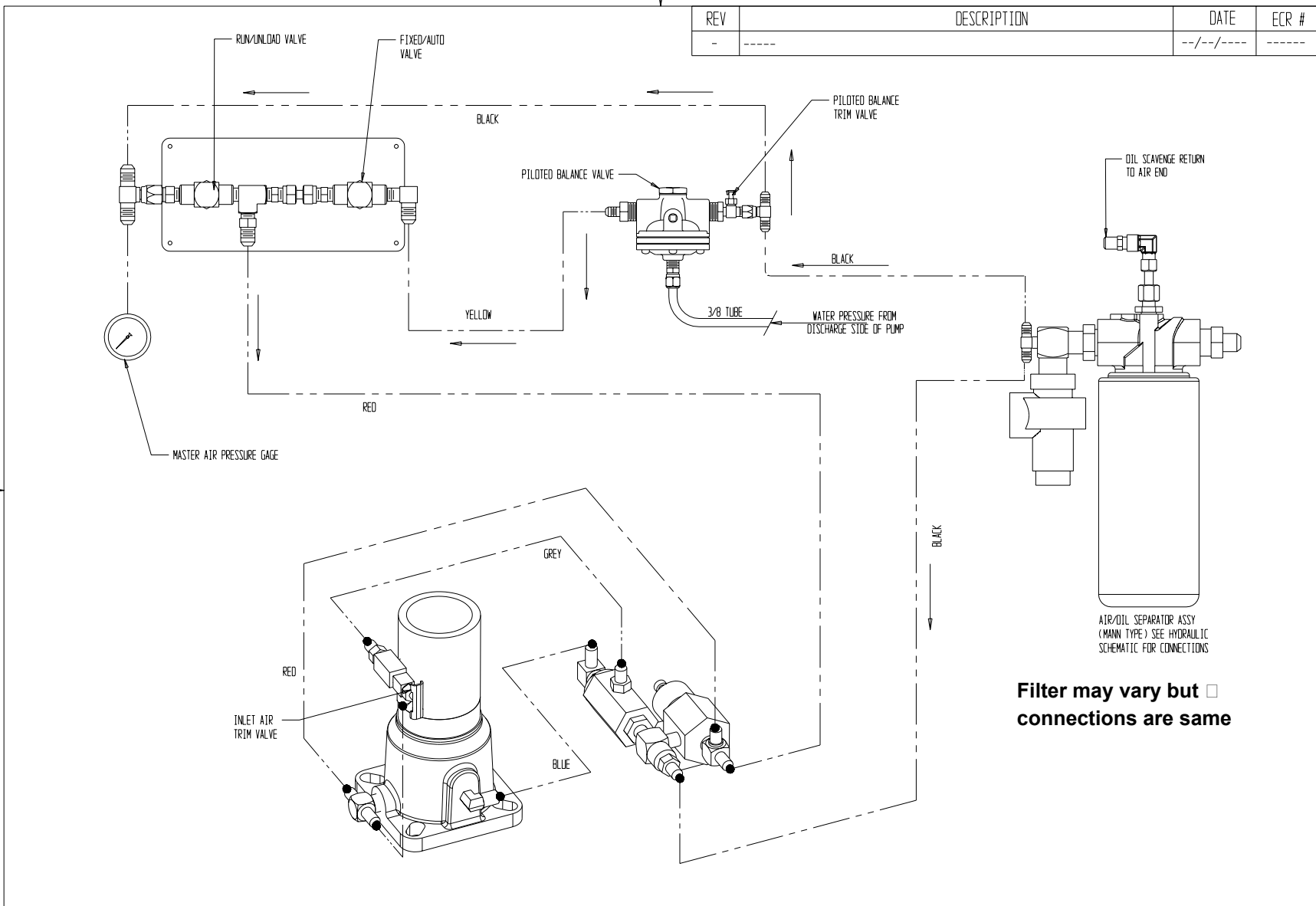
DO NOT SCALE DRAWING
 TOLERANCE UNLESS OTHERWISE SPECIFIED
 .XX +/- 0.030 1/X +/- 1/16
 .XXX +/- 0.010 ANGLES +/- 0.5°

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SIZE	WEIGHT	SHEET	DRAWN
A	--- LBS	1 of 1	
USED ON:			

HYDRAULIC SCHEMATIC
 80SP WITH NEW SUMP

DWG NO.
 314066

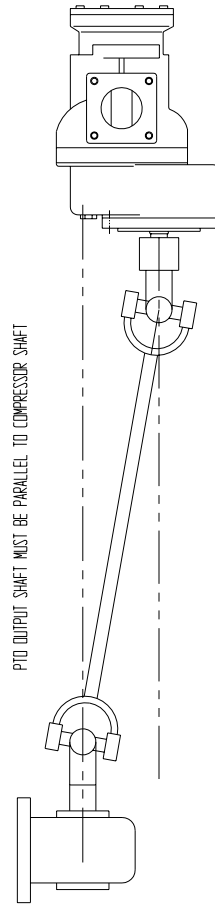
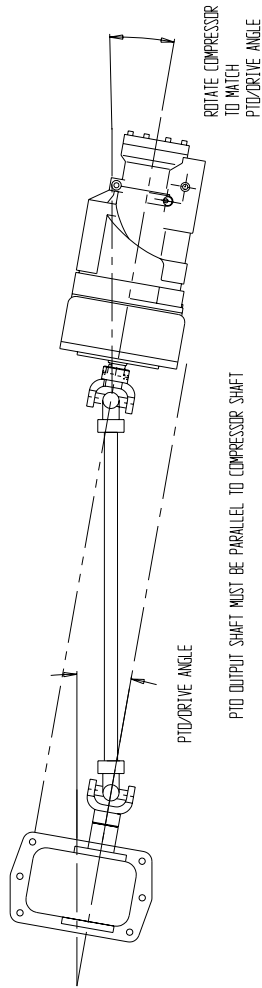
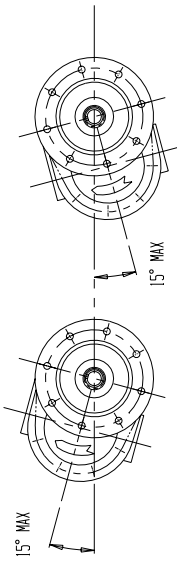


REV	DESCRIPTION	DATE	ECR #
-	----	--/--/----	-----

Filter may vary but connections are same

	8557 N. 78TH AVE. PEORIA, AZ 85345 623-979-3398 FAX: 623-979-6949	DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE SPECIFIED .XX +/- 0.030 1/X +/- 1/16 .XXX +/- 0.010 ANGLES +/- 0.5°	This print is the property of Pneumax, Inc. and is loaned to you subject to return on demand unless otherwise agreed to in writing by Pneumax, Inc. Its contents are confidential and must not be copied or submitted to third parties for use or examination.	SIZE	WEIGHT	SHEET	DRAWN	AIR SCHEMATIC 80 CFM W/ MANUAL AUTO-SYNC	DWG NO.
				A	--- LBS.	1 of 1	12/17/2002 DRB		314035
				USED ON: 80-P					

REV	DESCRIPTION	DATE	ECR #
-		--/--/----	----



	8557 N. 78TH AVE. PEDRIA, AZ 85345 623-979-3398 FAX: 623-979-6949	DO NOT SCALE DRAWING TOLERANCE UNLESS OTHERWISE SPECIFIED XX \pm 0.030 .XXX \pm 0.010 ANGLES \pm 0.5°	This print is the property of Pneumax, Inc. and is loaned to you subject to return on demand unless otherwise agreed to in writing by Pneumax, Inc. Its contents are confidential and must not be copied or submitted to third parties for use or examination.	SIZE A WEIGHT 1 of 1 SHEET 1 of 1 DRAWN 5/29/2002 DRB USED ON: PTO ORDER SYSTEMS	COMPRESSOR INSTALLATION ANGLES	DWG NO. 314021
--	--	---	--	--	-----------------------------------	-------------------

CONDITIONAL **1-YEAR** WARRANTY POLICY

PNEUMAX warrants, to the original Buyer only, that products and parts manufactured by PNEUMAX will be free from defects in material and workmanship under normal use and service for a period of one (1) year from the date the product is first placed in service, or one and one-half (1-1/2) years from the date of shipment by PNEUMAX, whichever period shall be the first to expire; provided the Buyer notifies PNEUMAX, in writing, of the defect in said product within the warranty period, and said product is found by PNEUMAX to be nonconforming with the aforesaid warranty. When required in writing by PNEUMAX, defective products must be promptly returned by Buyer to PNEUMAX at PNEUMAX' plant at Peoria, Arizona, or at such other place as may be specified by PNEUMAX, with transportation and other charges prepaid. A **Returned Material Authorization (RMA)** is required for all products and parts and may be requested by phone, fax or mail. The aforesaid warranty excludes any responsibility or liability of PNEUMAX for:

- (a) damages or defects due to accident, abuse, misuse, abnormal operating conditions, negligence, accidental causes, or improper maintenance, or attributable to written specifications or instructions furnished by Buyer;
- (b) defects in products manufactured by others and furnished by PNEUMAX hereunder, it being understood and agreed by the parties that the only warranty provided for such products shall be the warranty provided by the manufacturer thereof which, if assignable, PNEUMAX will assign to Buyer, if requested by Buyer;
- (c) any product or part, altered, modified, serviced or repaired other than by PNEUMAX, without its prior written consent; and
- (d) the cost of dismantling, removing, transporting, storing, or insuring the defective product or part and the cost of reinstallation.
- (e) normal wear items (including, but not limited to belts, hoses, check valves, packing, strainers, filters, light bulbs, anodes, intake screens, mechanical seals, etc.).

This warranty is subject to PNEUMAX' Conditions of Sale (detailed on PNEUMAX Invoice) as currently in effect all of which are herein incorporated and by this reference made a part hereof.

All other warranties are excluded, whether express or implied by operation of law or otherwise, including all implied warranties of merchantability or fitness for purpose. PNEUMAX shall not be liable for consequential or incidental damages directly or indirectly arising or resulting from the breach of any of the terms of this limited warranty or from the sale, handling, or used of any PNEUMAX product or part. PNEUMAX' liability hereunder, either for breach of warranty or for negligence, is expressly limited at PNEUMAX' option:

- (A) to the replacement at the agreed point of delivery of any product or part, which upon inspection by PNEUMAX or its duly authorized representative, is found not to conform to the limited warranty set forth above, or
- (B) to the repair of such product or part, or
- (C) to the refund or crediting to buyer of the net sales price of the defective product or part.

Buyer's remedies contained herein are exclusive of any other remedy otherwise available to Buyer.

Pneumax, Inc.
8557 N 78th Ave
Peoria, AZ 85345
www.pneumaxcafs.com

