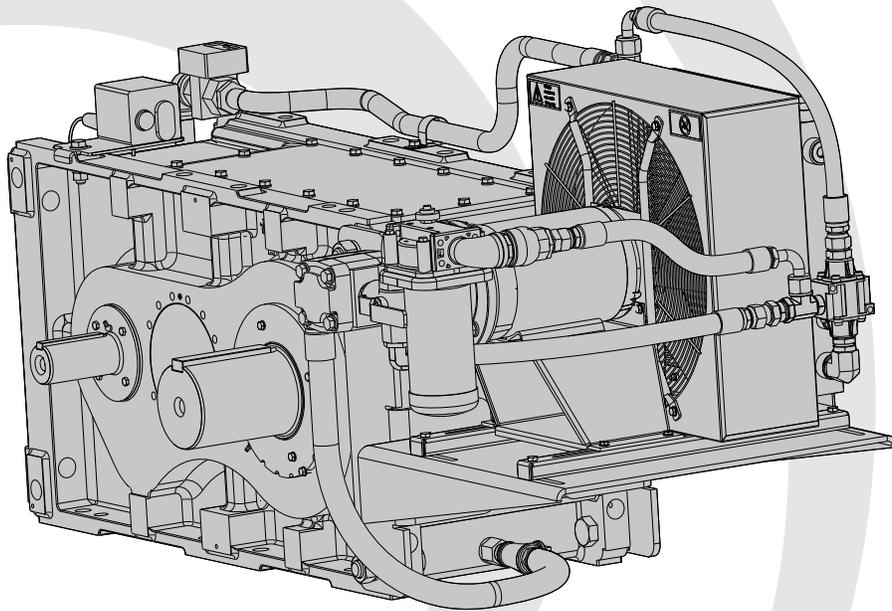


FALK™ 600 Series PA | PUMP & COOLER ASSEMBLIES (AIR/OIL)
English-Inch



600 Series PA - Air to Oil Cooler Assemblies

Type PA Pump & Cooler Assemblies With Air/Oil Heat Exchanger

This manual covers 600 Series PA Pump and Cooler Assemblies with Air/Oil heat Exchanger. 600 Series PA assemblies are designed to be mounted directly to the drive. Each assembly comes complete including suction and return hoses. Included components are: electric motor (one motor drives the pump and fan), oil pump, pump adapter and coupling, fan and fan shroud, heat exchanger, thermal bypass valve, and all hoses and fittings; see Figure 1 for component location. A oil filter with bypass valve is available. See Table 1, which provides a general description of all standard size 600 Series PA Pump and Cooler Assemblies and its components.

AVAILABLE OPTIONS

Oil Flow Indicator/Switch

An oil flow indicator/switch can be added to give a visual indication that oil is flowing thru the cooling system. It can also be wired to the main motor controls to shut the main motor off if flow thru the cooling system stops. On gear drives equipped with pressure lubrication system, wiring the flow indicator/switch to the main motor control will insure the pump is running before the main motor is started.

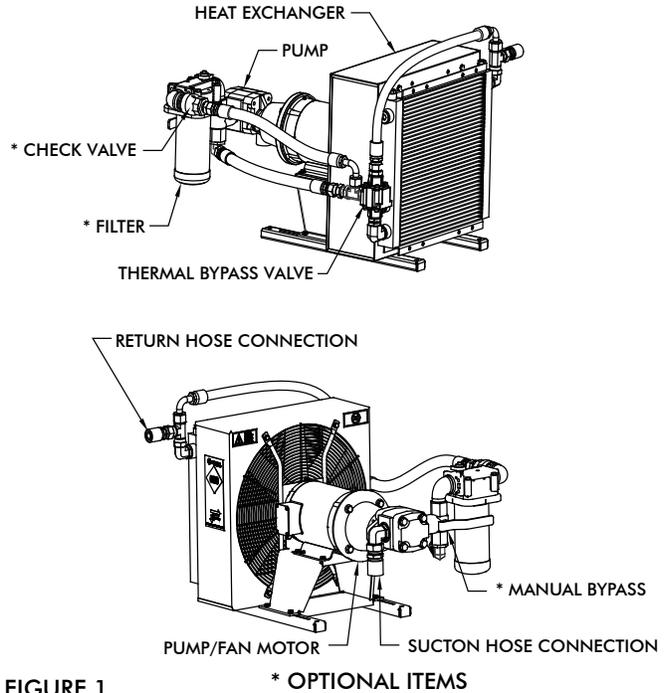


FIGURE 1

TABLE 1 — 600 Series PA Integrated Cooler Summary

Size		605		610		620		630		640		
Falk Part No.	w/o Filter	2929745		2929232		2929747		2929749		2929750		
	w/Filter	2929534		2929746		2929467		2929748		2929751		
Heat Exchanger	Radiator		Diffused Zinc Coated Aluminum		Diffused Zinc Coated Aluminum		Diffused Zinc Coated Aluminum		Diffused Zinc Coated Aluminum		Diffused Zinc Coated Aluminum	
	Fan	Material	Fiberglass Reinforced Polypropylene		Fiberglass Reinforced Polypropylene							
		Dia.	15.74"		17.95"		21.18"		25.59"		35.43"	
		Air Flow	810 SCFM		1270 SCFM		1940 SCFM		3280 SCFM		10000 SCFM	
Structure		Epoxy Plastic Powder Coated Steel		Epoxy Plastic Powder Coated Steel		Epoxy Plastic Powder Coated Steel		Epoxy Plastic Powder Coated Steel		Epoxy Plastic Powder Coated Steel		
Frame		145TCZ		145TCZ		184TCZ		213TC		213TC		
Motor Double Ended ★	Hz	50	60	50	60	50	60	50	60	50	60	
	HP	1	1.5	1	1.5	1.5	2.0	2.3	3.0	5	7.5	
	RPM	950	1140	950	1140	950	1140	950	1140	970	1160	
	Phase	3	3	3	3	3	3	3	3	3	3	
	Volts	190/380	230/460	190/380	230/460	190/380	230/460	190/380	230/460	190/380	230/460	
	Amps	4.4/2.2	5.0/2.5	4.4/2.2	5.0/2.5	5.4/2.7	6.6/3.3	8.0/4.0	9.6/4.8	21.6/10.8	25/12.5	
Oil Pump	Pump Oil Flow, gpm	4.0	4.8	6.0	7.2	12.5	15.0	14.2	17.0	23.8	28.5	
	Size	1/2" Gear		3/4" Gear,		1.5" Gear,		1.75" Gear,		2.25" Gear		
Material		Cast Iron		Cast Iron		Cast Iron		Cast Iron		Cast Iron		
Oil Filter Circuit - OPTIONAL	Oil Filter	Change Indicator	Pop-Up		Pop-Up		Pop-Up		Pop-Up		Pop-Up	
		Internal Differential Pressure Bypass, psi	30		30		30		30		30	
		Element	K25 (25 micron)		K25 (25 micron)							
Connecting Hoses	Suction Hose	Inside Diameter, in	1.25		1.25		1.5		1.5		2	
		Reducer Connection	#20 JIC (1.25")		#20 JIC (1.25")		#24 JIC (1.5")		#24 JIC (1.5")		#32 JIC (2")	
		Thread Size	1.625-12		1.625-12		1.875-12		1.875-12		2.5-12	
	Return Hose	Inside Diameter, in	1		1		1		1		1.25	
		Reducer Connection	#16 JIC (1")		#20 JIC (1.25")							
		Thread Size	1.3125-12		1.3125-12		1.3125-12		1.3125-12		1.625-12	
Thermal Bypass	Bypass Opens	140°F (60°C)		140°F (60°C)		140°F (60°C)		140°F (60°C)		140°F (60°C)		
	No-Bypass	165°F(74°C)		165°F(74°C)		165°F(74°C)		165°F(74°C)		165°F(74°C)		
	Relief Pressure	65 psi		65 psi		65 psi		65 psi		65 psi		
Weight, lb (less mounting bracket)		160		170		210		225		435		

★ Drives pump and heat exchanger fan

Temperature Switch

When gear drives equipped with 600 Series PA assemblies are started after extended idle periods, oil in the gear drive sump will not be at operating temperature, and may be at viscosities exceeding 2160 cSt (10000 SSU). Startups with oil at elevated viscosity levels may result in pump cavitation, pump motor overload, and damage to components. Where cold start conditions are anticipated a temperature switch should be used. The temperature switch is standard on all Drive One gear drives. This temperature switch should be wired to start the pump motor at acceptable viscosities in the gear drive (600 Series PA operating option two described later). The standard temperature switch has a NEMA 4 aluminum enclosure. Other types of enclosures are available at an extra charge.

Caution: An oil pressure switch is not a recommended safety device for 600 Series PA assemblies. Gear oils have a wide range of viscosity conditions depending on the temperature and grade of the oil. This change in viscosity (temperature of the oil) has a direct affect to the operating pressure of the cooling system and a set point cannot be determined.

Oil Filter

All 600 Series PA assemblies can be equipped with an optional oil filter. The oil filter will help extend the life of the gear drive by removing contaminants from the oil. The oil filter has a element that is 90% efficient at 25 microns and a pop-up change indicator. The oil filter has a internal differential pressure bypass set to 30 psi (207 kPa). The oil filter assembly also includes a manual bypass valve to aid in changing the filter and a check valve to prevent oil from flowing backwards thru the filter.

INSTALLATION INSTRUCTIONS

WARNING: Lock out power source and remove all external loads from drive before servicing the drive or accessories.

Series 600PA's are designed to be mounted directly to the gear drive. All mounting brackets and plumbing connections are installed at the factory. If a 600 Series PA is being fitted to a existing gear drive contact the factory to obtain the brackets, suction hose, and return hose. It is not recommend to modify the factory brackets or plumbing.

Refer to the gear drive certified print for dimensions, weights, designation of components, and location of the hook-up points.

The atmosphere in the immediate area of the Pump & Cooler Assembly must be free of lint, dirt, etc. to maintain efficient operation of the assembly.

WARNING: To reduce risk of fire, electric shock, or personal injury, observe the following:

1. Switch off the main power supply and lock out before installing, servicing or making connections to the motor.
2. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and Occupational Safety and Health Act (OSHA).
3. Installation work and electrical wiring must be done by a qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
4. Motor must be securely and adequately grounded.
5. All working parts should be grounded.
6. For general cooling use only. DO NOT use if hazardous or explosive materials and vapors are present.

Installation

1. Make sure a distance equal to one half the fan diameter both in front of and in back of the cooler is free of obstructions.
2. Check if the information on the motor plate is in accordance with the actual main supply voltage, phase, and frequency.

3. Determine if gear drive is equipped with a temperature switch. Gear drives with a temperature will use option 1 for operation and all others will use option 2.
 - a. Option 1, Cooling Only: Fan/pump motor is controlled by the temperature switch. See Figure 2.

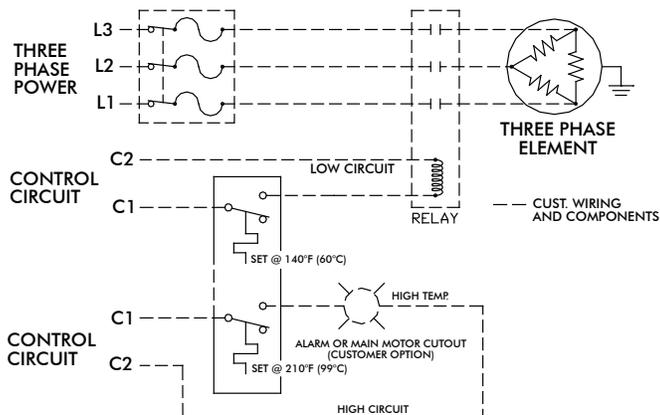


FIGURE 2

- b. Option 2, Cooling and Force Lubrication: Fan/pump motor starts before main drive motor. See Operation section for more details on each option.
4. Make all electrical connections according to option selected from step 3.
 5. Make sure all hardware, hoses, and fittings are tight.
 6. Ensure fan guard is in place.
 7. If equipped with a temperature switch the set point should be 140°F (60°C), the temperature at which the thermal bypass valve begins to open allowing oil to pass thru the cooler.

Startup

Note, never operate the oil pump dry. Fill the gear drive to capacity before starting pump. Running the pump dry can cause pump failure.

1. Fill cooler core with oil from core outlet by removing bypass hose. Vent core to aid in filling. Fill gear drive with oil to level indicated on dip stick.
2. Start the oil pump and verify the correct rotation. Refer to drawings and rotation arrows on the side of the heat exchanger for the correct rotation. Incorrect rotation of the oil pump will result in no flow of oil for gear drive cooling and pressure lubrication system (when equipped).
3. Run the motor long enough to purge any air that might be in the lube system.
4. After the air is purged and there is a good flow of oil, shut off the motor and let sit for approximately 5 minutes.
5. Re-check the oil level in the gear drive.
6. Add additional oil as needed before starting gear drive. Some oil will have filled the cooler oil lines.

OPERATION

Never exceed the maximum allowable temperature and/or pressure ratings of any of the components. The maximum allowable viscosity for the oil pump is 2160 cSt (10,000 SSU, see Table 2). This does not apply to a Drive One gear drive

TABLE 2 — Oil Temperature & Viscosity

Oil	Temperature	Viscosity
AGMA 5 (ISO 220)	50°F (10°C)	2160 cSt
AGMA 6 (ISO 320)	60°F (15.6°C)	2160 cSt

because of the standard temperature switch. Consult the factory if temperature switch is not used.

Any instructions or directions that are provided on the certified drawings supersede this manual.

There are two options for operating the 600 Series PA assemblies. Option one requires a temperature sensing device. Option two is for a 600 Series PA assembly that is used for cooling and forced lubrication. All options shall have a maximum gear drive oil sump temperature of 200°F (93°C). A maximum gear drive shutdown temperature of 210°F (99°C) shall be used.

NOTE: synthetic oils are designed to operate at higher temperatures than conventional gear oils. Consult with oil manufacture for the recommended maximum operating

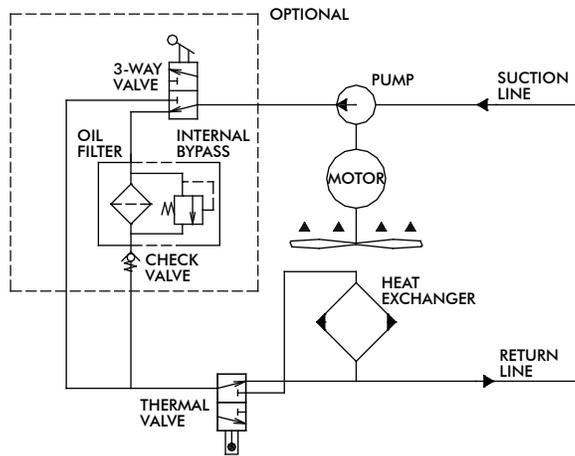


FIGURE 3

temperature of the oil.

A schematic for the 600 Series PA is shown in Figure 3.

Option 1, Cooling Only

Gear drives that have a 600 Series PA assembly for cooling only will have an internal splash lubrication system. Oil is circulated through the 600 Series PA assembly to remove heat from the oil and provide oil filtration if equipped with optional filter. A temperature switch is used to start the fan/oil pump motor when the oil sump temperature reaches 140°F (60°C). At this temperature the thermal bypass valve will begin to open routing some of the oil through the cooler. At 165°F (74°C) the thermal bypass valve will fully open routing all of the oil through the cooler.

Option 2, Cooling and Force Lubrication

Some gear drives require force lubrication to the bearings and/or to the gear mesh(s). These gear drives will have external and/or internal lubrication lines distributing cooled oil from the 600 Series PA assembly to the components that require force lubrication.

The oil pump in the 600 Series PA assembly for this option **MUST** be started before the gear drive is started. A rule of thumb is to have the lube pump operating for approximately 2 minutes before the gear drive is started. The time the lube pump is in operation before the gear drive is started can be adjusted. The minimum time should be that where there is a full flow of lube oil and all air has been purged from the 600 Series PA assembly. After proper flow of lube oil is verified, the gear drive can be started.

The lube oil will bypass the cooler through the thermal bypass valve when the oil temperature is below 140°F (60°C). When the oil reaches 140°F (60°C) the thermal bypass valve will begin to open routing some of the oil through the cooler. At 165°F (74°C) the thermal bypass valve will fully open routing all of the oil through the cooler.

Monitor operation and temperatures when the system is operating at normal running conditions. Log the temperatures and monitor through time. Any sudden increase in temperature in the gear drive sump oil can be an indication of a problem with the lubrication system or gear drive. Check for a dirty cooler, proper operation of the cooling fan and oil pump.

MAINTENANCE

WARNING: Lock out power source and remove all external loads from drive before servicing the drive or accessories.

Maintenance of the heat exchanger includes cleaning of the inside and outside of the cooler. External cleaning of the heat exchanger can be done by washing with water, blowing with compressed air, or using a degreasing agent and a high pressure washing system. When using compressed air or a high pressure washing system, carefully point the spray parallel to the fins to avoid damage.

For internal cleaning of the heat exchanger connect the cooler to a closed circuit and flush the inside with perchlorethylene. After cleaning flush the heat exchanger with oil before reconnecting to the lube oil system.

Maintenance of the oil filter consists of replacing the filter element. The filter assembly has a pop up dirty filter indicator and internal bypass valve. The dirty filter indicator may indicate a dirty filter during cold startup due to pumping high viscosity oil. Monitor indicator after gear drive reaches normal operating temperatures. Refer to manufacturer's bulletin for further maintenance procedures.

For detailed maintenance instructions and specifications on other components such as motor, oil pump, thermo valve, etc, refer to the product manufacturer's literature.

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

THIS PAGE INTENTIONALLY LEFT BLANK

World Class Customer Service

For more than 100 years, the dedicated people of Rexnord have delivered excellence in quality and service to our customers around the globe. Rexnord is a trusted name when it comes to providing skillfully engineered products that improve productivity and efficiency for industrial applications worldwide. We are committed to exceeding customer expectations in every area of our business: product design, application engineering, operations, and customer service.

Because of our customer focus, we are able to thoroughly understand the needs of your business and have the resources available to work closely with you to reduce maintenance costs, eliminate redundant inventories and prevent equipment down time.

Rexnord represents the most comprehensive portfolio of power transmission and conveying components in the world with the brands you know and trust.

Rexnord, Drive One, Ultramite, Steelflex, TA Taper and Renew are registered trademarks of Rexnord Industries, LLC. Falk is a trademark of Rexnord. All rights reserved.

WORLDWIDE CUSTOMER SERVICE

AUSTRALIA

Rexnord Australia Pty. Ltd.
Picton, New South Wales
Phone: 61-2-4677-3811
Fax: 61-2-4677-3812

Falk-Rexnord Australia Pty Ltd
Broadmeadow NSW Australia
Phone: 61-2-4962-8000
Fax: 61-2-4962-8001

BRAZIL

Rexnord Correntes Ltda.
Sao Leopoldo - RS
Phone: 55-51-579-8022
Fax: 55-51-579-8029

CANADA

Rexnord Canada Ltd.
Scarborough, Ontario
Phone: 1-416-297-6868
Fax: 1-416-297-6873

CHINA

Rexnord China
Shanghai, China
Phone: 86-21-62701942
Fax: 86-21-62701943

EUROPE

Rexnord NV/SA
Mechelen, Belgium
Phone: 32-15-443811
Fax: 32-15-443860

Rexnord Kette GmbH
Betzdorf, Germany
Phone: 49-2741-2840
Fax: 49-2741-284-385

LATIN AMERICA

Rexnord International, Inc.
Milwaukee, Wisconsin
Phone: 1-414-643-2366
Fax: 1-414-643-3222
E-mail: international2@rexnord.com

MEXICO

Rexnord S A de C V
Mexico DF, Mexico
Phone: 52-55-9140-3500
Fax: 52-55-9140-3550

SINGAPORE

Rexnord International, Inc.
Singapore City, Singapore
Phone: 65-6338-5622
Fax: 65-6338-5422

UNITED STATES

Customer Service
Phone: 1-866-REXNORD
(1-866-739-6673)
E-mail: rexnord(state)@rexnord.com
Example: rexnordohio@rexnord.com

ALL COUNTRIES NOT LISTED

Rexnord International
Milwaukee, Wisconsin
Phone: 1-414-643-2366
Fax: 1-414-643-3222
E-mail: international1@rexnord.com



Rexnord Industries, LLC 3001 West Canal Street, Milwaukee, WI 53208-4200 USA
Phone: 414-342-3131 Fax: 414-937-4359 Web: www.rexnord.com

© 2009 Rexnord Industries LLC

161-315 03/2009 Delzer Litho Printed in USA