



## AC 4 & 5 HORIZONTAL SERIES

### Sealed Metallic Centrifugal Pumps

### Installation and Maintenance Instructions

## ASSEMBLY

### PUMPS WITH MOTORS

1. No assembly required. Unpack the pump and motor and examine for any signs of shipping damage. If damage is detected, save the packaging and notify the carrier immediately.
2. Proceed to the "Installation" section of these instructions.

### PUMPS WITHOUT MOTORS

Note: Do not remove shipping plug located in suction port of the pump until the pump is completely assembled onto the motor.

1. Unpack the pump and examine for any signs of shipping damage. If damage is detected, save packaging and notify the carrier immediately.
2. Place the motor on the fan cover. Align any set screw (item 9) with key slot in motor shaft. Place the aluminum motor adapter (item 8) onto the motor rabbet. Position the slot (shaft sleeve set screw access hole) in motor adapter with the top of the motor. Line up the bolt holes in the motor adapter with the bolt holes in the motor face. Install (4) bolts and lock washers (items 10,11). Securely tighten.
3. Through the top and bottom access holes, tighten securely two of the four set screws on the shaft adapter (item 6). You will need an 1/8" Allen wrench for this.
4. Remove the screw from the shipping plug and then remove the plug from the suction port. Rotate the motor fan until you can tighten the two remaining set screws on the shaft adapter.
5. Rotate the motor fan by hand and check for impeller rubbing. If the impeller rubs loosen the shaft adapter set screws and adjust the impeller accordingly. Retighten the shaft adapter set screws.
6. Proceed to the "Installation" section of these instructions.

## INSTALLATION

### MOUNTING

Motor or base plate must be securely fastened.

### PIPING TO AND FROM THE PUMP

- Always support the piping near the pump to minimize stress and strain on the pump's casing.
- Minimize frictional losses by increasing the suction piping size by one diameter.
- Use a minimal number of bends on suction piping. Keep bends beyond a distance of ten pipe diameters from the pump.
- Install shut off valve on the suction line and flow control valve in the discharge line. Place the valves beyond a distance of ten pipe diameters from the pump.
- Ensure that the piping is leak free.
- Position the pump as close to the liquid source as possible.
- Maintain a flooded suction at all times or prime the pump and maintain prime at all times.

**⚠ CAUTION:** Suction prime must be maintained at all times.

Running the pump dry will cause damage to pump components. To protect the pump if prime is lost, use a pressure switch on the discharge, a vacuum switch on the suction, or a motor minder to monitor motor current draw.

### PUMPING LIQUIDS THAT MAY SOLIDIFY OR CRYSTALLIZE:

Add a flush system to the pump's piping to prevent accumulation of material inside the pump. Install water inlet and outlet valves as shown in Figure 1. Refer to the "Operation" section of these instructions for the flush procedure.

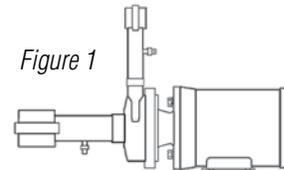


Figure 1

## MOTOR/ELECTRICAL

Only qualified personnel trained in the safe installation and operation of this equipment should install the motor. Install the motor according to National Electric Code, NEMA MG-2, IEC standards requirements and/or applicable local electrical codes. The voltage and frequency variations of the power supply should never exceed the limits established in the applicable standard. Prior to connecting to the power line, check nameplate voltage, rotation connection and ensure proper grounding. Sufficient ventilation area should be provided to insure proper operation and cooling of the motor. The motor must be installed with a suitable overload protection circuit. For three phase motors it is recommended to install a phase failure protection device. Download the motor manual from the specific motor manufacturers' website for additional information concerning motor installation, safety and maintenance instructions.

Wire the motor for clockwise rotation when facing the fan end of the motor.

**⚠ CAUTION:** Do not operate the pump to check rotation until the pump is full of liquid or damage may occur even if the motor is "bumped" to check motor rotation direction.

Check all electrical connections with the wiring diagram on the motor. Make sure the voltage, frequency, phase and amp draw comply with the supply circuit.

If utilized, verify that power monitors or variable frequency drives have been properly installed according to the manufacturer's instructions.

NOTE: A pump running backwards but at a greatly reduced speed.

## OPERATION

### FLOODED SUCTION SYSTEMS

1. Fully open the suction and discharge valves.
2. Start the pump and verify liquid is flowing. If there is no liquid flow, refer to the "Troubleshooting" section of these instructions.
3. Adjust the flow rate and pressure by regulating the discharge valve.

**⚠ CAUTION:** Never attempt to adjust the liquid flow with the suction valve. Limiting suction will damage pump components.

### FLUSHING SYSTEMS EQUIPPED WITH FLUSH VALVES:

1. Fully close the suction and discharge valves.
2. Connect the water supply to the water inlet valve and connect a drain hose to water outlet valve.
3. Turn on the water supply and open the inlet and outlet valves. Flush the system until the pump has been cleared of any material buildup.

(usually approximately 5 minutes).

4. Close the water inlet and outlet valves and turn off water supply.

## MAINTENANCE

### DISASSEMBLY

1. Disconnect power. Remove electrical wiring.
2. Close the suction and discharge valves and disconnect all piping.
3. Loosen and remove the nut on the V-clamp stud. Remove the V-clamp (item 2) and the impeller housing (item 1). Note V-clamp stud and discharge spout location for reassemble alignment.
4. Remove the motor fan cover and fan. Secure the motor shaft to prevent it from turning, and unthread the impeller.

NOTE: Shaft adapter threads are coated with Loctite Threadlocker #262 to prevent the impeller from spinning off if the motor is inadvertently wired for incorrect rotation. If necessary follow Loctite's recommendations for loosening the threadlocker #262.

5. Remove the seal spring retainer, spring, and the rotating seal component from the shaft adapter. Remove the backhead (item 7) from the pump. Remove the stationary part of the seal from the backhead.
6. If the motor is being replaced, proceed to step 7. If the seal is being replaced, do not loosen or remove the shaft adapter (item 6) from the motor shaft. Proceed to step 3 of the reassembly instructions
7. Remove the four bolts holding the motor adapter/mounting plate assembly (items 8 & 15) to the motor and remove the motor adapter. Loosen all four setscrews and remove the shaft adapter.
8. Inspect all parts for wear and replace as required. Note the finish on the shaft adapter where the rotating seal boot is located. If damaged or not smooth, replace the shaft adapter.

### REASSEMBLY

1. Install the shaft adapter (item 6) onto the motor shaft. Be sure one of the setscrews is protruding into the motor shaft keyway slot, but do not tighten any setscrews yet.
2. Install the motor adapter/mounting plate assembly (8 & 15) with setscrews access slots at 12 and 6 location, and tighten all four bolts.
3. Lubricate the outer boot on the stationary part of the seal with a chemically compatible lubricant, and press into the backhead (item 7) until it is fully seated. The polished seal surface should be facing away from the motor.

NOTE: To keep the polished surface of the seal face clean, use a piece of cardboard to protect the seal face during installation.

4. Insert the backhead (item 7) into the motor adapter (item 8) bore and press into place.

If the shaft adapter was not loosened or removed, go to step 5. If replacing the shaft adapter, firmly hold the backhead toward the motor, and adjust the shaft adapter until the shoulder is  $.843 (27/32)$  inches from the stationary seal face (see figure 2). Tighten all four setscrews with a T wrench through the access slots in the motor adapter.

5. Lubricate the inside of the rotating seal component with a chemically

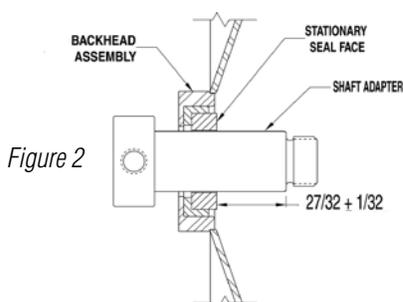


Figure 2

compatible lubricant and carefully slide it over the shaft adapter with a rotating face pointing at the motor (as shown in figure 3).

NOTE: Rotating seal must be completely seated against the stationary seal face.

6. Place the seal spring and spring retainer over the shaft adapter.

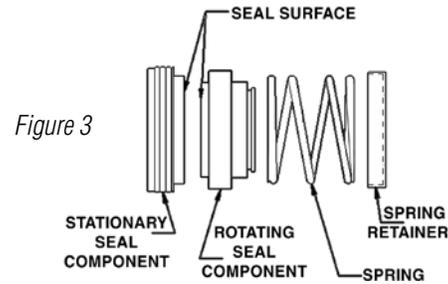


Figure 3

NOTE: To prevent spinning the impeller off in case the motor is wired for incorrect rotation, it is recommended to coat the shaft adapter threads with Loctite Threadlocker #262.

7. Holding the motor shaft firmly, thread the impeller onto the shaft adapter until it stops at the adapter shoulder.
  8. Lubricate the housing o-ring (item 3) with chemically compatible lubricant, and install onto the backhead. Install the impeller housing (item 1), the V-clamp (item 2), and the nut onto the V-clamp stud. Verify the V-clamp stud and housing discharge orientation and tighten the V-clamp. Firmly tap the V-clamp to seat it in several places and retighten the V-clamp nut.
- NOTE: Stainless Steel hardware can gall, be damaged and become very difficult to remove. To prevent galling use a lubricant like Loctite Anti-Seize or some other compatible lubricant or coating material, use a slow RPM speed to tighten and immediately stop tightening if galling is noticed. If galled remove & replace the hardware.
9. Rotate the motor shaft by hand to verify there is no rubbing. Replace the motor fan and fan cover. Reinstall the pump into the system.

## TROUBLESHOOTING

### NO OR INSUFFICIENT FLOW

1. Pump not primed.
2. Closed valve.
3. Viscosity too high.
4. Air leaks in suction piping.
5. Discharge head higher than anticipated.
6. Suction lift too high or insufficient NPSH.
7. Check for clogged suction line.
8. Motor wired for wrong rotation.

### INSUFFICIENT PRESSURE

1. Air or gas in liquid.
2. Impeller diameter too small.
3. Discharge head higher than anticipated.
4. Motor speed insufficient (too low) or motor rotation incorrect.

### LOSS OF PRIME

1. Leaking suction line.
2. Foot valve or suction opening not submerged enough.
3. Foot valve too small or leaking.
4. Air or gas in liquid.
5. Foreign matter in impeller.

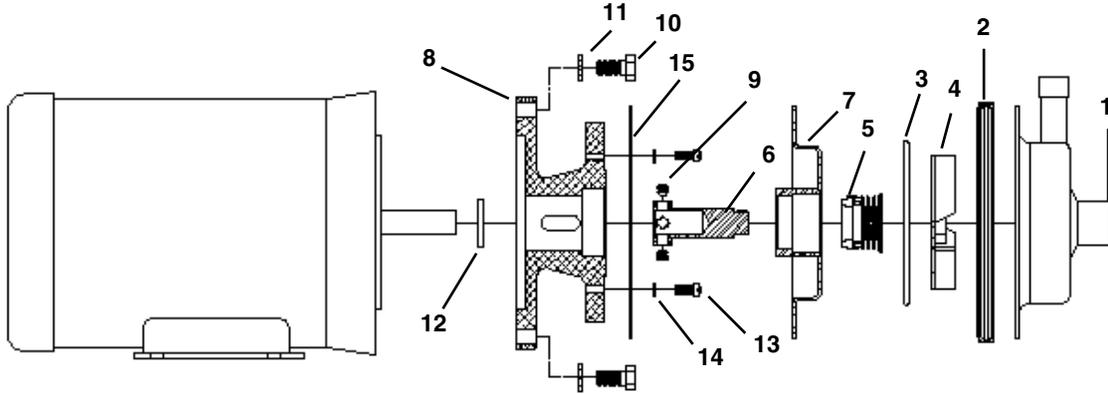
### EXCESSIVE POWER CONSUMPTION

1. Head lower than rating. Excessive flow.
2. Specific gravity or viscosity of liquid is too high.

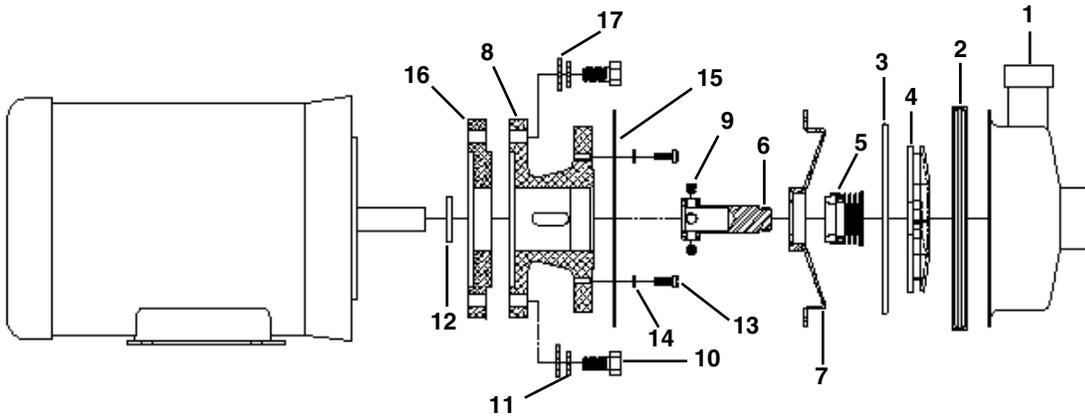
### EXCESSIVE VIBRATION

1. Loose piping or bolts.
2. Pump cavitating from improper suction or feed.

### AC4 EXPLODED VIEW



### AC5 EXPLODED VIEW



Item	Qty	Description	Part Number
		<b>Impeller Housing</b>	
		AC4STS1 - 316 SS - 3/4" x 1/2" FNPT/BSP	A102106-1
		AC4STS2 - 316 SS - 3/4" x 1/2" FNPT/BSP w/ drain & plug	A102106-2
		AC4STS3 - 316 SS - 3/4" x 1/2" ANSI 150# dimensional flanges	106923
		AC4STS4 - 316 SS - 1" x 1" ANSI 150# dimensional flanges	108454
		AC4STS5 - 316 SS - 1-1/2" x 3/4" electropolished tri-clamp fittings	108453
		AC4STS6 - 316 SS - 1-1/2" x 1" electropolished tri-clamp fittings	108453-1
		AC5STS1 - 1-1/2" x 1-1/4" standard FNPT	A102112-1
		AC5STS2 - 1-1/4" x 3/4" standard FNPT	A102113-1
		AC5STS4 - 1-1/2" x 1-1/4" standard BSP	A102112-3
		AC5STS5 - 1-1/4" x 3/4" standard BSP	A102113-2
		AC5STS7 - 1-1/2" x 1-1/2" electropolished tri-clamp fittings	108530
		AC5STS5 - 1-1/4" x 3/4" ANSI 150# dimensional flanges	107248
		AC5STS9 - 1-1/2" x 1" ANSI 150# dimensional flanges	108471
		AC5STS10 - 1-1/2" x 1-1/2" ANSI 150# dimensional flanges	108472-1
		AC5STS11 - 1-1/2" x 1" electropolished tri-clamp fittings	108469
1	1	AC5STS3 - 2" x 1-1/2" standard FNPT (high flow)	A102133-1
		AC5STS6 - 2" x 1-1/2" standard BSP (high flow)	A102133-2
		AC5STS12 - 2" x 1-1/2" ANSI 150# dimensional flanges (high flow)	108473-1
		AC5STS13 - 2" x 1-1/2" electropolished tri-clamp fittings (high flow)	108378-1
		AC5HTS1 - 1/2" x 1/4" high head FNPT	A102120-1
		AC5HTS2 - 1/2" x 1/4" high head BSP	A102120-2
		AC5HTS3 - 1/2" x 1/4" high head FNPT electropolished	A102120-3
		AC5HTS4 - 1/2" x 1/4" high head ANSI 150# dimensional flanges	108502
		AC5HTS5 - 1/2" x 1/4" high head electropolished tri-clamp fittings	108503
		AC5RTS1 - 1-1/2" x 1-1/4" recessed FNPT	A102112-2
		AC5RTS2 - 2" x 1-1/2" recessed FNPT	A102133-3
		AC5RTS3 - 1-1/2" x 1-1/4" recessed BSP	A102112-4
		AC5RTS4 - 2" x 1-1/2" recessed BSP	A102133-4
		AC5RTS5 - 1-1/2" x 1-1/2" recessed ANSI #150 dimensional flanges	108472-2
		AC5RTS6 - 2" x 1-1/2" recessed ANSI #150 dimensional flanges	108473-2
		AC5RTS7 - 1-1/2" x 1" recessed electropolished tri-clamp fittings	108469-1
		AC5RTS8 - 2" x 1-1/2" recessed electropolished tri-clamp fittings	108378-2

Item	Qty	Description	Part Number
2	1	<b>V-Clamp</b>	
			J102947
3	1	<b>O-Ring</b>	
		FKM (AC4)	J102946
		EPDM (AC4)	J103004
		Buna (AC4 FDA compliant)	108213
		PTFE (AC4)	J103042
		FKM (AC5)	J102960
		EPDM (AC5)	J103003
		Buna (AC5 FDA compliant)	108214
		PTFE (AC5)	J103043
4	1	<b>Impeller</b>	
		400 - 4.00" x 1/4" standard (AC5STS)	A102114-1
		420 - 4.25" x 1/4" standard (AC5STS)	A102114-2
		450 - 4.50" x 1/4" standard (AC5STS)	A102114-3
		470 - 4.75" x 1/4" standard (AC5STS)	A102114-4
		400 - 4.00" x 1/4" standard electropolished (AC5STS)	108445-1
		420 - 4.25" x 1/4" standard electropolished (AC5STS)	108445-2
		450 - 4.50" x 1/4" standard electropolished (AC5STS)	108445-3
		470 - 4.75" x 1/4" standard electropolished (AC5STS)	108445-4
		408 - 4.00" x 3/8" standard (AC5STS high flow)	A102114-9
		428 - 4.25" x 3/8" standard (AC5STS high flow)	A102114-10
		458 - 4.50" x 3/8" standard (AC5STS high flow)	A102114-11
		478 - 4.75" x 3/8" standard (AC5STS high flow)	A102114-12
		408 - 4.00" x 3/8" standard electropolished (AC5STS high flow)	108445-5
		428 - 4.25" x 3/8" standard electropolished (AC5STS high flow)	108445-6
		458 - 4.50" x 3/8" standard electropolished (AC5STS high flow)	108445-7
		478 - 4.75" x 3/8" standard electropolished (AC5STS high flow)	108445-8
		300 - 3.00" x 1/2" recessed (AC4STS/AC5RTS)	A102105-1
		320 - 3.25" x 1/2" recessed (AC4STS/AC5RTS)	A102105-2
		350 - 3.50" x 1/2" recessed (AC4STS/AC5RTS)	A102105-3
		370 - 3.75" x 1/2" recessed (AC5RTS)	A102105-4
		450 - 4.50" x 1/2" recessed (AC5RTS)	A102105-5
		300 - 3.00" x 1/2" recessed electropolished (AC4STS/AC5RTS)	108444-1
		320 - 3.25" x 1/2" recessed electropolished (AC4STS/AC5RTS)	108444-2
		350 - 3.50" x 1/2" recessed electropolished (AC4STS/AC5RTS)	108444-3
		370 - 3.75" x 1/2" recessed electropolished (AC5RTS)	108444-4
		450 - 4.50" x 1/2" recessed electropolished (AC5RTS)	108444-5
		450 - 4.50" x 1/8" high head (AC5HTS)	A102183-1
		475 - 4.75" x 1/8" high head (AC5HTS)	A102183-1
		450 - 4.50" x 1/8" high head electropolished (AC5HTS)	A102183-2
475 - 4.75" x 1/8" high head electropolished (AC5HTS)	108446		
5	1	<b>Seal</b>	
		3/4" Carbon/Ceramic/FKM seal	J102957-1
		3/4" Carbon/Ceramic/EPDM seal	J102957-2
		3/4" Carbon/Ceramic/Buna seal (FDA compliant)	108073
		3/4" Carbon/Ceramic/Kalrez seal	J103081
		3/4" Silicon Carbide/Silicon Carbide/FKM seal	J103066
		3/4" Silicon Carbide/Silicon Carbide/EPDM seal	J103067
6	1	<b>Shaft Adapter w/ Set Screws</b>	
		56C frame	A102895
		71-B14 frame	A102896
		80 frame (AC5 only)	A102897
		90 frame (AC5 only)	A102898
7	1	<b>Backhead</b>	
		AC4	A102110-1
		AC5	A102121-1
8	1	<b>Motor Adapter</b>	
		56C frame	M102049-1
		71-B14 frame	M102049-2
		80 frame (AC5 only)	M102049-3
		90 frame (AC5 only)	M102049-4
9	4	<b>1/4-20 x 1/4" Cup Point Set Screw</b>	
			J100220
10	4	<b>Hex Head Cap Screw</b>	
		3/8-16 x 1" (56C frame)	J100114
		M6 x 25 mm (71-B14 & 80 frame)	J103456
		M8 x 40 mm (90 frame)	J102760

Item	Qty	Description	Part Number
11	4	<b>Lock Washer</b>	
		3/8" (56C)	J100115
		5/16" (90 frame only)	J101282
		1/4" (71-B14 & 80 frame)	J100672
12	1	<b>Slinger Ring</b>	
		56C Frame	M102064-1
		71-B14 Frame	M102064-2
		80 Frame (AC5 only)	M102064-3
		90 Frame (AC5 only)	M102064-4
13	4	<b>Cap Screw Fillister Head (all)</b>	
			J100932
14	4	<b>#10 Lock Washer (all)</b>	
			J100824
15	1	<b>Mounting Plate</b>	
			J103389-1
16	1	<b>Metric Motor Adapter</b>	
		90 Frame only	M102129
17	4	<b>Flat Washer - 5/16"</b>	
		90 Frame only	J101293

## WARRANTY

Finish Thompson, Inc (manufacturer) warrants this pump product to be free of defects in materials and workmanship for a period of one year from date of purchase by original purchaser. If a warranted defect, which is determined by manufacturer's inspection, occurs within this period, it will be repaired or replaced at the manufacturer's option, provided (1) the product is submitted with proof of purchase date and (2) transportation charges are prepaid to the manufacturer. Liability under this warranty is expressly limited to repairing or replacing the product or parts thereof and is in lieu of any other warranties, either expressed or implied. This warranty does not apply to normal wear of the product or components. This warranty does not apply to products or parts broken due to, in whole or in part, accident, overload, abuse, chemical attack, tampering, or alteration. The warranty does not apply to any other equipment used or purchased in combination with this product.

The manufacturer accepts no responsibility for product damage or personal injuries sustained when the product is modified in any way. If this warranty does not apply, the purchaser shall bear all cost for labor, material and transportation.

Manufacturer shall not be liable for incidental or consequential damages including, but not limited to process down time, transportation costs, costs associated with replacement or substitution products, labor costs, product installation or removal costs, or loss of profit. In any and all events, manufacturer's liability shall not exceed the purchase price of the product and/or accessories.

### Warranty Registration

Thank you for your purchase of this quality Finish Thompson product. Be sure to take a minute to register your pump at [Finishthompson.com/warranty](http://Finishthompson.com/warranty). Simply provide the model number, serial number and a few other pieces of information.

## CHEMICAL REACTION DISCLAIMER

The user must exercise primary responsibility in selecting the product's materials of construction, which are compatible with the fluid(s) that come(s) in contact with the product. The user may consult Finish Thompson, Inc. (manufacturer) and a manufacturer's representative/distributor agent to seek a recommendation of the product's material of construction that offers the optimum available chemical compatibility.

However neither manufacturer nor agent shall be liable for product damage or failure, injuries, or any other damage or loss arising out of a reaction, interaction or any chemical effect that occurs between the materials of the product's construction and fluids that come into contact with the product's internals.

Call our toll free Technical Service Hot Line, 1-800-888-3743, if you have any questions regarding product operation or repair.

## SAFETY PRECAUTIONS FOR ATEX PUMPS

-  **WARNING:** Proper materials of construction must be chosen for the fluid being pumped. Improper material selection could lead to pump failure and leakage. This is the responsibility of the end user.
-  **WARNING:** ATEX pumps must have a power monitor, flow switch, pressure switch or similar device installed to protect against running dry, closed discharge valve, major leaks, and possible sources of ignition due to motor bearing failure. Any of these conditions could lead to a rise in surface temperature of the pump. The device must be set to stop the pump within three seconds of a fault.
-  **WARNING:** The pump must be checked for leaks on a regular basis. If leaks are detected, the pump must be repaired or replaced immediately.
-  **WARNING:** The pump must be cleaned on a regular basis to avoid dust buildup greater than 5mm.

### Temperature Classification

Pump temperature is completely dependent on operating conditions. Pump will transfer heat from the piping system, motor, and fluid. These items must be considered as a system when assessing an ATEX application.

# EU Declaration of Conformity

Manufactured by:

Finish Thompson, Inc.  
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FINISH THOMPSON INC.



1026

**II 2GD**  
**Ex h IIC TX Gb**  
**Ex h IIIC TX Db**  
**FTZU 05 A127-05**

This declaration applies to Finish Thompson **AC Series pumps**.

Finish Thompson declares under our sole responsibility that the product listed above conforms to the relevant provisions of EU directive **2014/34/EU of 26 February 2014** for equipment and protective systems intended for use in potentially explosive atmospheres, and is certified for safe use in **Atmosphere Group IIC/IIIC category 2 areas**.

This product has used the following harmonized standards to verify conformance:

Non-electrical equipment for potentially explosive atmospheres: **EN ISO 80079-36:2016**  
Basic Methods and Requirements.

Non-electrical equipment intended for use in potentially explosive atmospheres: **EN ISO 80079-37:2016**  
Protection by construction safety "ch." and control of ignition source "bh"

**This product must not be used in areas other than specified above. If in doubt consult an authorized distributor, or refer to the manufacturer Finish Thompson.**

Approved by:

Date: 5/5/2017



**FINISH THOMPSON INC.**  
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## EU Declaration of Conformity



Finish Thompson Inc. hereby declares that the following machine(s) fully comply with the applicable health and safety requirements as specified by the EU Directives listed. The product may not be taken into service until it has been established that the drive motor for the centrifugal pump complies with the provisions of all relevant EU Directives. The complete product complies with the provisions of the EC Directive on machinery safety provided motors carry CE marking.

This declaration is valid provided that the devices are fully assembled and no modifications are made to these devices.

**Type of Device:**

Centrifugal Pumps

**Models:**

AC/AK/AV - 400/500/600/800	GP-11/22/32	VKC-5.5/6/6H/7/8/10
DB-3/4/5/5.5/6/6H/7/8/9/10/11/15/22	MSKC	SP-10/11/15/22
KC-3/4/5/5.5/6/6H/8/10/11/22/32	MSVKC	
UC-1516/1516L/1518/1518L/2110/3158/326/326H/328/436/438/4310H/326H/4310H/6410		

**EU Directives:**

Machinery Safety (2006/42/EC)

**Applied Harmonized Standards:**

EN ISO 12100

EN 809

Manufacturer: Finish  
Thompson Inc.  
921 Greengarden Road  
Erie, Pennsylvania 16501-1591 U.S.A

Signed,

\_\_\_\_\_  
President

1 August 2016

Person(s) Authorized to Compile Technical File: Finish Thompson GmbH  
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Tech Service: 800-888-3743  
P/N J103334, Rev. 20, 4/5/2019

