

**PERIFLO PERISTALTIC PUMP MODELS: CT SERIES**

PUMP MODEL NO: \_\_\_\_\_ PUMP S/N: \_\_\_\_\_

**INSTRUCTION MANUAL**

This manual forms an integral part of the pump and must accompany it until its demolition. The series AMP peristaltic pump is a machine destined to work in industrial areas and as such the instruction manual must form part of the legislative dispositions and the applicable technical standards and does not substitute any installation standard or eventual additional standard.

**GENERAL SAFETY WARNING**

Pumps are machines that can present dangers due to their operating under pressure and containing numerous moving parts.

- Improper use
- Removing the protections and/or disconnecting the protection device
- The lack of inspections and maintenance

**CAN CAUSE SERIOUS DAMAGE OR INJURY**

The person in charge of safety should therefore guarantee that

- The pump is transported, installed, put in service, used, maintained and repaired by qualified personnel who should possess:

- Specific training and sufficient experience.
- Knowledge of the technical standards and applicable laws.
- Knowledge of the general national and local safety standards and also of installation.

Any work carried out on the electrical part of the pump should be authorised by the person responsible for safety. Given that the pump is destined to form part of an installation, it is the responsibility of whoever supervises the installation to guarantee absolute safety, adopting the necessary measures of additional protection.

## INDEX

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	Page number
• Equipment Identification	01
• Index	02
• Transport and storage	03
• General safety standards	04
• General description	06
• Installation	07
• Check before start-up	08
• Maintenance	09
• Removing the hose – Disassembly	09
• Installing the hose – Assembly	09
• Removing and Installing the Rotor Assembly	10
• Troubleshooting	11
• Diagram of components parts	12
• Model number convention	14
• Warranty	15

## **TRANSPORT AND STORAGE**

### TRANSPORT

- The pump is protected by cardboard packaging.
- The packaging materials are recyclable.
- During transportation, the pump is in a resting position (the hose is not compressed)

### STORAGE

- The pump should be in a resting position. (The hose should not be compressed).
- Avoid areas open to inclement weather or excessive humidity.
- For storage periods of longer than 60 days, protect the coupling surfaces (clamps, reducers, and motors) with adequate anti-oxidant products.
- Pipe spares should be stored in a dry place away from direct light.

## SAFETY STANDARD



- Instructions of this manual that may compromise safety standards are identified by this symbol.



- Instructions of this manual that may compromise electrical safety are identified by this symbol.

WARNING!

- Instructions of this manual that may compromise the proper operation of the pump, are identified with this symbol.



Do not start the pump without first having installed the front cover.



For any operation of the equipment, it is necessary to make certain that the pump is stopped and the electrical supply disconnected.



Changing the hose should be done with the pump stopped.

WARNING!

Do not exceed the nominal pressure, speed or temperature of the pump, or use the pump for applications other than that originally planned without first consulting the manufacturer.

WARNING!

Cleaning the pump, including the hose, should be done with fluids compatible with the construction of the pump and hose, and in accordance with recommended maximum temperatures.

**WARNING!**

Do not start the pump without it being properly secured to the floor.

Do not attempt to carry out any maintenance operations or dismantle the pump without first making sure that the pipes are not under pressure and are empty or isolated by proper valving.



The start system of the motor should be provided with a direction inverter, stop-go button and emergency stop button (together with the pump), in such a way that the pump can be operated with total safety.



In the case of the hose becoming stuck during removal or installation it is recommended to reverse the direction of the pump, relubricate, and then repeat the operation.



Peristaltic pumps are positive displacement devices capable of generating high pressures. To prevent a possible overload of pressure, due to for example, the accidental closure of a valve. It is advisable to fit a safety device such as a safety valve or other pressure-limiting device in the discharge piping.



Check the direction of rotation of the pump, as it is reversible it could generate pressure in the suction and compromise the safety of the installation. The circulation of the fluid should be in the same direction as the turning direction of the pump as seen from the inspection plate situated on the front cover.



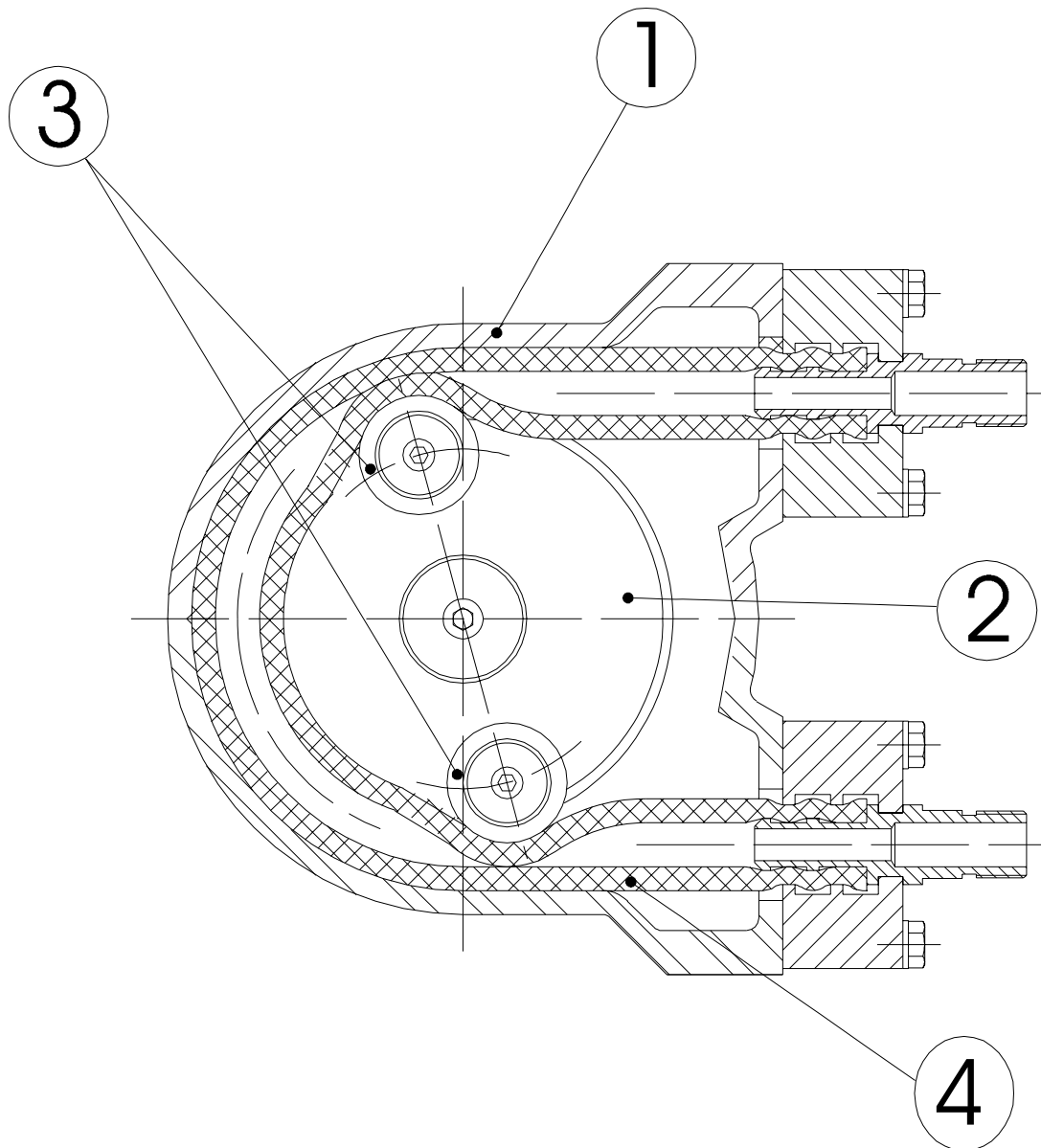
The durability of the hose may vary due to operating conditions, so the possibility of a rupture and subsequent leakage of the fluid should be anticipated. The (optional) hose leakage detection probe can be interlocked to stop the pump and/or actuate isolation valve and/or alarm.

## GENERAL DESCRIPTION

### PERISTALTIC PUMP

- **Construction of the pump.**

As shown in the figure below, the pump unit is a very simple design, robust and with very few moving parts.



The outer casing (item 1) terminates with threaded connectors. Inside the casing are found the rotor (item 2), complete with two rollers with bearings (item 3). As the rotor turns, the rollers compress the reinforced hose/tube (item 4) generating a pumping action. A change in the direction of rotation will result in a change in direction of the pumped fluid.

## **INSTALLATION**

- Installation should normally be made in a well ventilated area away from heat sources. If it is necessary to place the pump outside it should be provided with a cover to protect it from sunlight and inclement weather.
- The positioning of the pump should allow easy access for all kinds of maintenance operations.

### **Piping: Correct installation.**

#### **Suction:**

- The pump should be located as near as possible to the supply of liquid so that the suction pipe is as short and straight as possible. The suction pipe should be perfectly airtight and made of suitable material so that it does not collapse due to the internal vacuum.
  - The minimum diameter should be similar to that of the hose/tube element.
  - With viscous fluids a larger diameter is recommended.  
(Consult manufacturer or distributor).
  - The pump has automatic suction and does not need an inlet valve.
- The pump is reversible, so the suction and discharge connections are interchangeable.  
(The pump is normally piped in a manner that best adapts to the physical installation)
- It is recommendable to use a flexible connection between the piping and the pump in order to avoid the transmission of vibration to the piping.

#### **Discharge:**

- To reduce power requirements, use the straightest and shortest piping possible. The diameter should be the same as the nominal diameter of the pump, except where precise calculations of piping losses have been performed.
  - With viscous fluids a larger diameter is needed.  
(Consult the manufacturer or distributor).
- Connect the fixed piping to the pump with a length of flexible pipe to facilitate maintenance, reduce vibrations and relieve piping stress on the pump. Fix the piping firmly.
- The discharge will pulse: To avoid such effect, it is advisable to install adequate pulsation dampeners.  
(See accessories.)

## **CHECKS BEFORE SWITCHING ON THE PUMP**

- Check that the pumping equipment has not suffered any damage during transportation or storage, any damage should be notified to the supplier immediately.
  
- Check that the supply voltage is suitable for the motor.
  
- Make sure that the hose is suitable for the fluid to be pumped, that it will not be chemically affected and that the temperature of the fluid does not exceed that recommended.
  
- **Hose:** If the hose is in a resting position, then the pump has come from storage or transportation; now is the time to install the second roller. **Do not switch on the pump without the pump body cover being correctly installed.**
  
- **Rotor:** Check that the roller shafts are correctly installed. For hose working pressures up to 60 psi (position 4), or thermoplastic tube (Norpren, Tygon, and Pharmed) operations up to 30 psi (position 2), the two mounting holes are marked with an indentation. The other two holes are unmarked and are suitable for hose working pressures from 60 to 115 psi (position 8).
  
- **Lubrication:** Check that the hose/tube surface and the surface of the rollers are correctly greased. The specially formulated grease can be obtained from PERIFLO or from the authorised distributor.

Check that the protectors of the moving parts are correctly assembled.

Check that the thermal protector corresponds with that of the values on the plate on the motor.

Check that the direction of rotation is the desired one. (rotation test).

Check that the optional electrical components are connected to the control panel and test that they function correctly.

Check that a proper pressure gauge is installed in the discharge. If the application involves a highly viscous fluid or long suction piping, it is recommended that a proper absolute-pressure gauge be installed in the suction.

Check predicted working conditions to verify that flow, pressure, temperature and motor power correspond to the project.

## **MAINTENANCE**

Any work carried out on the pump must be done when the pump is stationary and disconnected from the electrical supply.

### Lubrication

Check that the hose/tube and roller surfaces are correctly greased. Add lubricant as necessary. Recommend clear Silicon grease (or other suitable lubricant) that will not damage rubber parts.

The gearbox is lubricated and sealed for life. No routine maintenance or lubrication is required.

## **REPLACING THE HOSE – DISASSEMBLY** (refer to view on Page 14)

- Isolate the pump - all valves must be closed to prevent losses of the product.
- Disconnect the suction and discharge piping.
- Dismantle the suction/discharge hose/tube collars (item 11).
- Remove the front cover plate.
- Remove the rollers by first removing the roller that is not in contact with the hose/tube. Rotate the pump until the second rotor is not contacting the hose/tube and remove the second rotor.
- Remove the tube to be replaced and separate the inserts (item 10).

## **INSTALLING THE HOSE - REASSEMBLY**

- Clean the internal surfaces of the pump body.
- Inspect the rollers and roller shafts, checking that there is no damage to the pressure surfaces and that the rollers turn freely. If the pump is being set up for the first time, see paragraph Rotor in the section CHECKS BEFORE SWITCHING ON THE PUMP.
- Install the connecting inserts into each hose end.
- Install the hose in the pump body, lubricating the body, the hose, the roller shafts, and the surface of the rollers with grease. Recommend clear Silicon grease (or other suitable lubricant) that will not damage rubber parts.
- Install the tightening collars that fasten the hose and its connections to the pump body.
- Install the rollers. (refer to removal procedure above)
- Install the front cover.
- Install suction and discharge piping.

**Removing and Installing the Rotor/Rotor Shaft and Rotor Shaft Seals**

- Remove the screw securing the rotor to the gearbox shaft (item 17), the washer and the front shaft seal gasket. Carefully slide the rotor off of the shaft. (this is a keyed shaft connection)
- The rotor shaft seal o'ring and the rear shaft seal gasket can now be accessed for removal, inspection and replacement as necessary. Lubricate the o'ring liberally with silicon grease prior to reinstalling. The seal carrier can be inspected, removed and/or replaced as necessary by pressing from the housing.
- Rotor shafts can be removed by removing the rear retaining nut and pressing the shaft out of the rotor. Reinstall by pressing the shaft through the rotor and securing with the retaining nut.
- Insure that the rear shaft seal gasket and rotor shaft seal are properly installed. Lubricate the shaft with silicon grease and carefully slide the rotor onto the gearbox shaft, making sure that the keyway is properly aligned. Replace the front shaft seal gasket, washer and retaining screw.

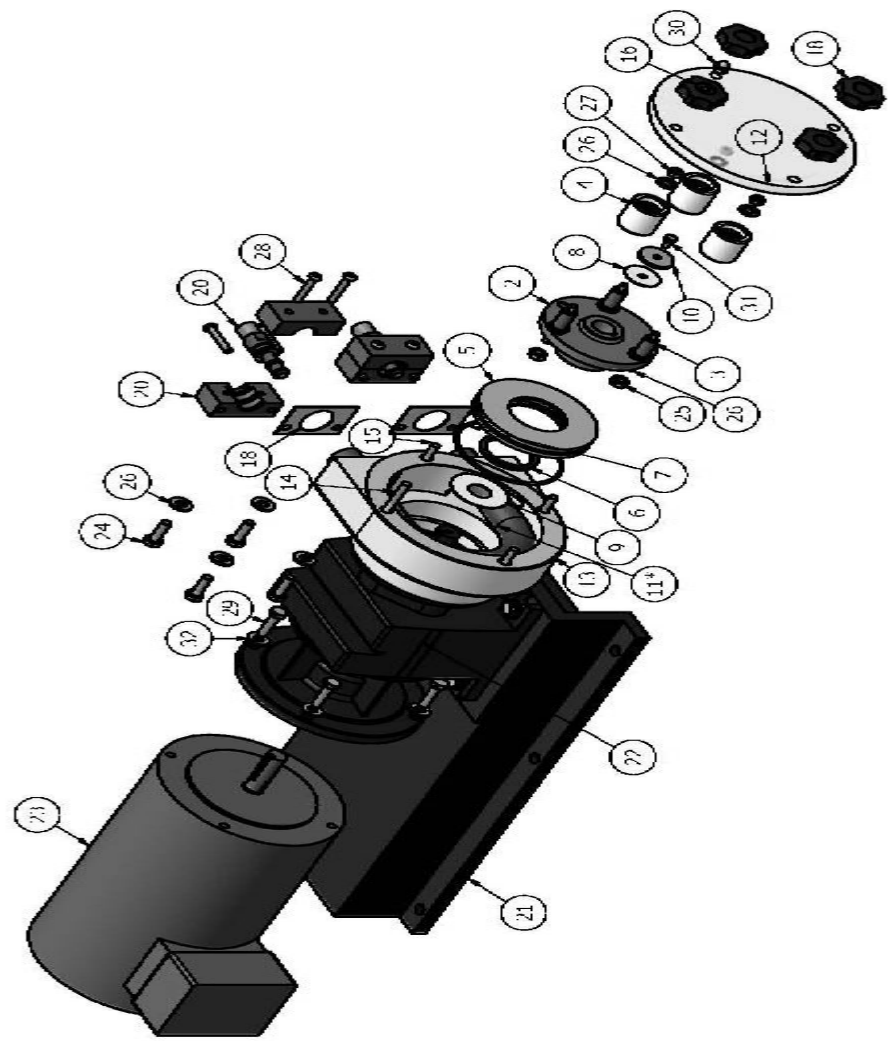
### 5.3. PROBLEMS, CAUSES AND SOLUTIONS

PROBLEM	POSSIBLE CAUSE	SOLUCIÓN
<b>Elevated temperature</b>	Hose with no lubricant Elevated temperature of product Poor suction conditions  Rollers not turning properly  Excessive pumping speed	Use special lubricant from PERIFLO Reduce pumping temperature Check for obstructions Recalculate sections and lengths Check rollers shaft mounting  Reduce velocity of pump
<b>Reduction of capacity/pressure</b>	Suction or discharge valve closed. Hose insufficiently compressed  Rupture of the hose (the product leaks to the casing) Partial obstruction of suction piping Insufficient product amount in suction reservoir Insufficient diameter of suction piping Excessive length of suction pipe High viscosity of product  Entry of air via the suction connections High pulsation on suction	Open valves Check rollers shaft mounting  Replace drive hose Clean piping Fill or stop Increase pipe size/reduce pump speed Shorten suction piping Reduce viscosity Increase diameter of piping Confirm that the pump is suitable  Tighten connections and accessories Mount antipulsation equipment Reconsider application (speed etc.)
<b>Vibrations in pump and piping</b>	The piping is not correctly fixed together Excessive pumping speed  Insufficient diameter of piping Baseplate of pump loose Elevated pulsation of pump	Refix piping Reduce the speed of the pump  Increase pipe diameter Anchor the baseplate firmly Install pulsation dampening equipment in suction and/or discharge piping
<b>Short life of the hose</b>	Chemical attack  High speed of pump High pumping temperature High working pressure  Abnormal elevation of temperature Unsuitable lubricant Insufficient quantity of grease Cavitation of the pump	Confirm compatibility of the hose with the pumped fluid and the cleaning fluid Reduce speed of pump Reduce temperature of product Reduce speed of pump Increase discharge pipe size Check rollers shaft mounting/lubrication Use lubricant from PERIFLO Top up lubricant Reconsider suction conditions
<b>Stretching of the hose inside the pump</b>	Insufficient grease High suction pressures (>40 psi) Hose full of sediment Brackets insufficiently tightened	Top up lubricant Reduce suction pressure Clean hose Retighten brackets

Parts List				
ITEM	QTY	CT 10 PART	CT 13 PART	DESCRIPTION
1	1	102.00.01CT	102.00.01CT	Housing
2	1	102.00.03D	102.00.03D	Rotor
3	2/3	102.00.04SS	102.00.04SS	Roller Shaft
4	2/3	102.00.09D	N/A	Roller D37 - CI 10 Tube
4	2/3	N/A	103.00.06D	Roller D36 - CT 13 Tube
4	7/3	102.00.06B	N/A	Roller D32 - CI 10/13 Hose
5	1	102.00.60	102.00.60	Seal Carrier
6	1	102.00.61	102.00.61	Inner O Ring
7	1	102.00.62	102.00.62	Outer O-Ring
8	1	102.00.64	102.00.64	Front Shaft Seal
9	1	102.00.63	102.00.63	Rear Shaft Seal
10	1	102.00.13SS	102.00.13SS	Rotor Washer
11*	1	Inse/Tube	Inse/Tube	Per Application
12	1	102.00.08	102.00.08	Front Cover
13	1	102.99.20	102.99.20	Cover Gasket
14	1	102.00.07	102.00.07	Long Stud
15	3	102.00.14	102.00.14	Short stud
16	1	102.00.26	102.00.26	Blind Pommel
17	3	102.00.25	102.00.25	Pommel
18	2	102.99.20	102.99.20	Connection Gasket
19	1	102.00.23D	102.00.11D	Press Flange Tube
19	2	102.00.11D	103.00.11D	Press Flange - Hose
20	1	102.00.18	103.00.18	PVC Connection
20	1	102.00.17	103.00.17	Stainless Connection
20	2	102.00.20	103.00.20	PVC Cam Lock Connection
21	1	101.00.25PP	101.00.25PP	Poly Baseplate
22	1	Reducer	Reducer	Per Application
23	1	Motor	Motor	Per Application
24	4	102.99.28	102.99.28	M8 x 25 HHCS
25	2/3	102.99.10	102.99.10	M8 Nylock Nut
26	16/18	102.99.07	102.99.07	M8 Flat Washer
27	7/3	102.00.65	102.00.65	M6 Nylock Nut
28	8	102.99.29	102.99.29	M6 x 45 BHCS
29	4	102.99.30	102.99.30	3/8-16 x 1-1/4 ILLCS
30	1	102.99.06	102.99.06	M8 Acorn Nut
31	1	102.99.07	102.99.07	M6 x 16 ILLCS
32	4	102.99.27	102.99.27	M10 Flat Washer
33	1	102.00.68	102.00.68	Sealing Washer
34	4	102.99.31	102.99.31	M8 x 45 HHCS
35*	1	102.99.17	102.99.17	Grease Tube

\*Recommended Spares

## CT10/13 PUMP ASSEMBLY



3-Roller version shown

## CT16/19 PUMP ASSEMBLY

Parts List				
ITEM	QTY	CT 16 PART	CT 19 PART	DESCRIPTION
1	1	101.00.01CT	101.00.01CT	Housing
2	1	101.00.13D	101.00.13D	Rotor
3	2	101.00.04SS	101.00.04SS	Roller Shaft
4	2/3	N/A	105.00.07D	Roller D48 - Tube
4	2/3	101.00.08D	N/A	Roller D50 - Tube
4	2/3	101.00.07D	N/A	Roller D42 - Hose
5	2/3	101.00.05SS	101.00.05SS	Trust Washer-M12
6	1	101.00.60	101.00.60	Seal Carrier
7	1	102.00.67	102.00.67	Inner O-Ring
8	1	102.00.62	102.00.62	Outer O-Ring
9	1	102.00.64	102.00.64	Front Shaft seal
10	1	102.00.63	102.00.63	Rear shaft Seal
11	1	102.00.13SS	102.00.13SS	Rotor Washer
12*	1	Hose/Tube	Hose/Tube	Per Application
13	1	101.00.46	101.00.46	Front Cover
14	1	102.99.21	102.99.21	Cover Gasket
15	1	102.00.07	102.00.07	Long Stud
16	3	102.00.14	102.00.14	Short Stud
17	1	102.00.26	102.00.26	Blind Pommel
18	3	102.00.25	102.00.26	Pommel
19	2	102.99.23	102.99.23	Connection Gasket
20	1	101.00.23D	101.00.22D	Press Flange - Tube
20	2	101.00.22D	N/A	Press Flange - Hose
21	2	101.00.17	105.00.17	PVC Connection
21	1	101.00.16	105.00.16	Stainless Connection
21	1	101.00.20	105.00.20	PVC Cam-Lock Connection
22	1	101.00.25PP	101.00.25PP	Poly Baseplate
23	1	Reducer	Reducer	Per Application
24	1	Motor	Motor	Per Application
25	6/7	102.99.27	102.99.27	M10 Flat Washer
26	4/6	101.00.33	101.00.33	M10 Nylock Nut
27	4	102.99.32	102.99.32	M8 x 25 SHCS
28	8	101.99.40	101.99.40	M8 x 45 BHCS
29	4	102.99.99	102.99.99	M8 Flange Nut
30	4	102.99.30	102.99.30	3/8-16 x 1-1/4 HHCS
31	1	102.99.06	102.99.06	M8 Acorn Nut
32	1	102.00.68	102.00.68	Sealing Washer
33	1	102.99.02	102.99.02	M6 x 16 HHCS
34	4	102.99.10	102.99.10	M8 Nylock Nut
35	4	102.99.31	102.99.31	M8 x 45 HHCS
36	16	102.99.07	102.99.07	M8 Flat Washer
37*	1	102.99.12	102.99.12	Grease Lube

**2-Roller version shown**

\* Recommended Spares

## Periflo CT Series Peristaltic Pump Selection & Availability

Sample Model No. 

CT10	NR	8	S	A	065	C	TV	VS	L		
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Position No.

<b>Position</b> <small>Model</small>	<b>1</b>	<b>Pump Model - CT</b>	<b>10</b>	<b>13</b>	<b>16</b>	<b>19</b>	<b>22</b>
<b>Position</b> <small>Hose Material</small>	<b>2</b>	NR - Natural Rubber BN - Buna EP - EPDM HY - Hypalon NF - Natural Rubber Food Grade BF - Buna Food Grade Norprene Tube Tygon Tube					
<b>Position</b> <small>Discharge Pressure</small>	<b>3</b>	2 - 30 PSI (Max Tube) 5 - 115 PSI (Max Hose)					
<b>Position</b> <small>Inserts</small>	<b>4</b>	S - Stainless Steel MNPT V - PVC MNPT K - PVDF MNPT C - PVC Camlock T - Tri-clamp					
<b>Position</b> <small>Orientation</small>	<b>5</b>	A - Right (Standard) B - Down C - Left D - Up					
<b>Position</b> <small>Speed</small>	<b>6</b>	___ - Specify 3 digit pump speed See price list for standard speeds					
<b>Position</b> <small>Horsepower</small>	<b>7</b>	X - None (no motor provided) A - 1/4 HP B - 1/3 HP C - 1/2 HP D - 3/4 HP E - 1 HP F - 1 1/2 HP					
<b>Position</b> <small>Motor Enclosure</small>	<b>8</b>	00 - None (no motor provided) T1 - TEFC 115/1/60 T3 - TEFC 230-460/3/60 TV - TENV 230-460/3/60 X1 - XP 112/1/60 X3 - XP 230-460/3/60 XV - XP Inverter Rated 230-460/3/60 WV - Washdown Rated 203-460/3/60					
<b>Position</b> <small>Accessories</small>	<b>9</b>	3 - 3 Roller Assembly L - Leak Detector T - Installed Tach Ring VS - Installed VFD (specify type) C - Installed Control Interface Box					
<b>Position</b> <small>Accessories</small>	<b>10</b>						

**PERIFLO WARRANTY****ChemTUFF PUMPS**

Seller warrants ChemTUFF equipment (and its component parts) of its own manufacture against defects in materials and workmanship under normal use and service for three (3) years from the date of shipment. This warranty shall not apply to products, which require repair or replacement due to normal wear and tear, or to products which are subjected to accident, misuse, or improper maintenance. This warranty extends only to the original buyer. Seller does not warrant accessories or components that are not manufactured by Seller. However, to the extent possible, Seller agrees to assign to Buyer its rights under the original manufacturer's warranty, without recourse to Seller. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment, and the date of purchase) within thirty (30) days of the discovery of such defect during the warranty period. No claim more than 30 days after the expiration of the warranty period shall be valid.

Seller's sole obligation under this warranty shall be to repair or replace any products that Seller determines, in its discretion, to be defective. Seller reserves the right either to inspect the products in the field, or have the products promptly returned to Seller for inspection prior to any attempted repairs, or have the products sent to a factory authorized service center designated by Seller, and Buyer shall prepay all shipping expenses. Seller shall not be liable for any loss or damage to goods in transit, nor will any warranty claim be valid unless the returned goods are received intact and undamaged as a result of shipment. Repaired or replaced material returned to customer will be shipped F.O.B., Seller's factory. Seller will not give Buyer credit for parts or equipment returned to Seller, and will not accept delivery of any such parts or equipment, unless Buyer has obtained Seller's approval in writing.

The warranty extends to repaired or replaced parts of Seller's manufacture for ninety (90) days or for the remainder of the original warranty period applicable to the equipment or parts being repaired or replaced. This warranty applies only to the repaired or replaced part, and is not extended to the product or any other component of the product being repaired.

Seller may substitute new equipment or improved part(s) of any equipment judged defective without further liability. All repairs or services performed by Seller, which are not covered by this warranty; will be charged in accordance with Seller's standard prices then in effect.

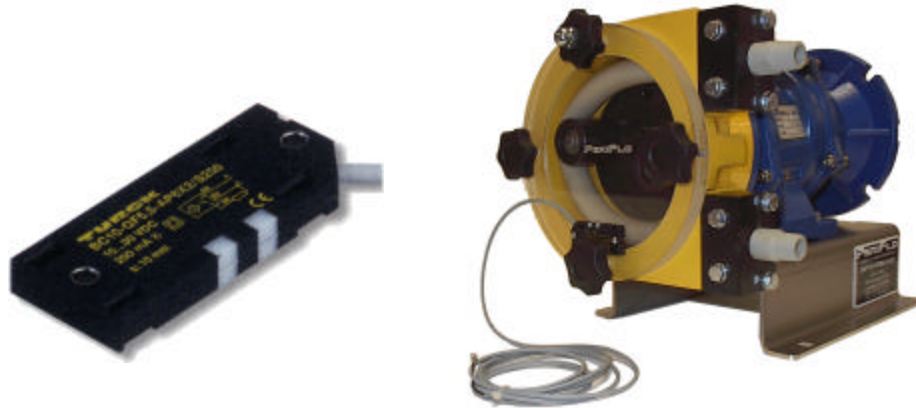
THIS WARRANTY IS THE SOLE WARRANTY OF SELLER AND SELLER HERBY EXPRESSLY DISCLAIMS AND BUYER WAIVES ALL OTHER WARRANTIES EXPRESSED, IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Seller's sole obligation under this warranty shall be, at its option; to repair replace any equipment (or its component parts) which has a defect covered by this warranty, or to refund the purchase price of such equipment or part. Under the terms of this warranty, Seller shall not be liable for (a) consequential, collateral, special or liquidated losses or damages; (b) equipment conditions caused by normal wear and tear, abnormal conditions of use, accident, neglect, or misuse of said equipment; (c) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than the seller; (d) mishandling, or other similar conditions; (e) any loss, damage, or expense relating to or resulting from replacing defective equipment; (f) any labor costs or charges incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are repaired or replaced by Seller; (g) any expense of shipment of equipment or repaired or replacement parts; or (h) any other loss, damage or expense of any nature.

**CONDITIONS OF WARRANTY:**

If Buyer is in default (including, but not limited to, the failure of Buyer to maintain current account with Seller) under the Order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended and the original warranty period will not be extended.

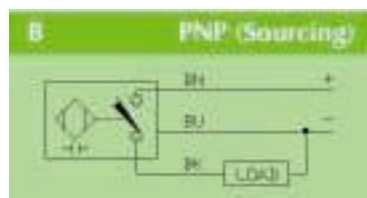
# HOSE LEAK DETECTOR – PCS101

## AMP/CT 10, 13, 16 & 19



### 3-Wire DC Normally Open Sensor 10-30VDC, Short Circuit and Overload Protected

<b>Specifications</b>	
Enclosure	IEC IP67 NEMA 1,3,4,6,13
Housing	Molded Polypropylene
Potentiometer	Yes
Ripple	<10%
Differential Travel (Hysteresis)	2-20%
Voltage Drop	<1.8V @ 200mA
Overload Trigger Current	>220mA
Continuous Load Current	<200mA
Leakage Current	<100uA
No-Load Current	15mA
Reverse Polarity Protection	Yes
Wire-Break Protection	Yes
Operating Temperature	-25 to +70C
Shock	30g, 11ms
Vibration	55Hz, 1mm Amplitude All 3 Planes
Reapeatability	<2% Rated Distance
LED "POWER ON"	Green



Brown (+)  
Blue (-)  
Black (load)



**Subject: TUNING THE LEAK DETECTOR #PCS101**

The Periflo leak detector is a capacitance switch with adjustable sensitivity. It is designed to monitor leaks THROUGH the pump cover before the product leaks out of the pump. Only a very small amount of liquid will cause the switch to trip.

The switch has two LED indicator lights: Green indicates power is supplied to the switch and yellow indicates the switch has detected a leak. Switches are factory-tuned so that they can detect a leak while ignoring the roller as it turns.

Temperature, humidity, dust and other environmental conditions at the installation or during shipment can cause the switch to lose calibration and require re-tuning.

The sensitivity adjustment screw (potentiometer) is located along the left edge of the switch. It requires a small jewelers or instrumentation flat head screwdriver. Turning the screw **CLOCKWISE INCREASES THE SENSITIVITY**.

**TUNING:** The Periflo leak detector screw should be turned CW to increase sensitivity to the point that it detects the roller as the pump runs (Yellow LED turns on). The screw should then be turned ½ turn counter-clockwise until the Yellow LED just turns off.

**ELECTRICAL RATING:**

The switch is a 3-wire 10-30VDC rated capacitance-type.  
Normally open (N.O.) PNP (sourcing).  
Less than 100  $\mu$ A leakage current  
Max load current: 200 mA  
Enclosure rated IP67 (NEMA 4)