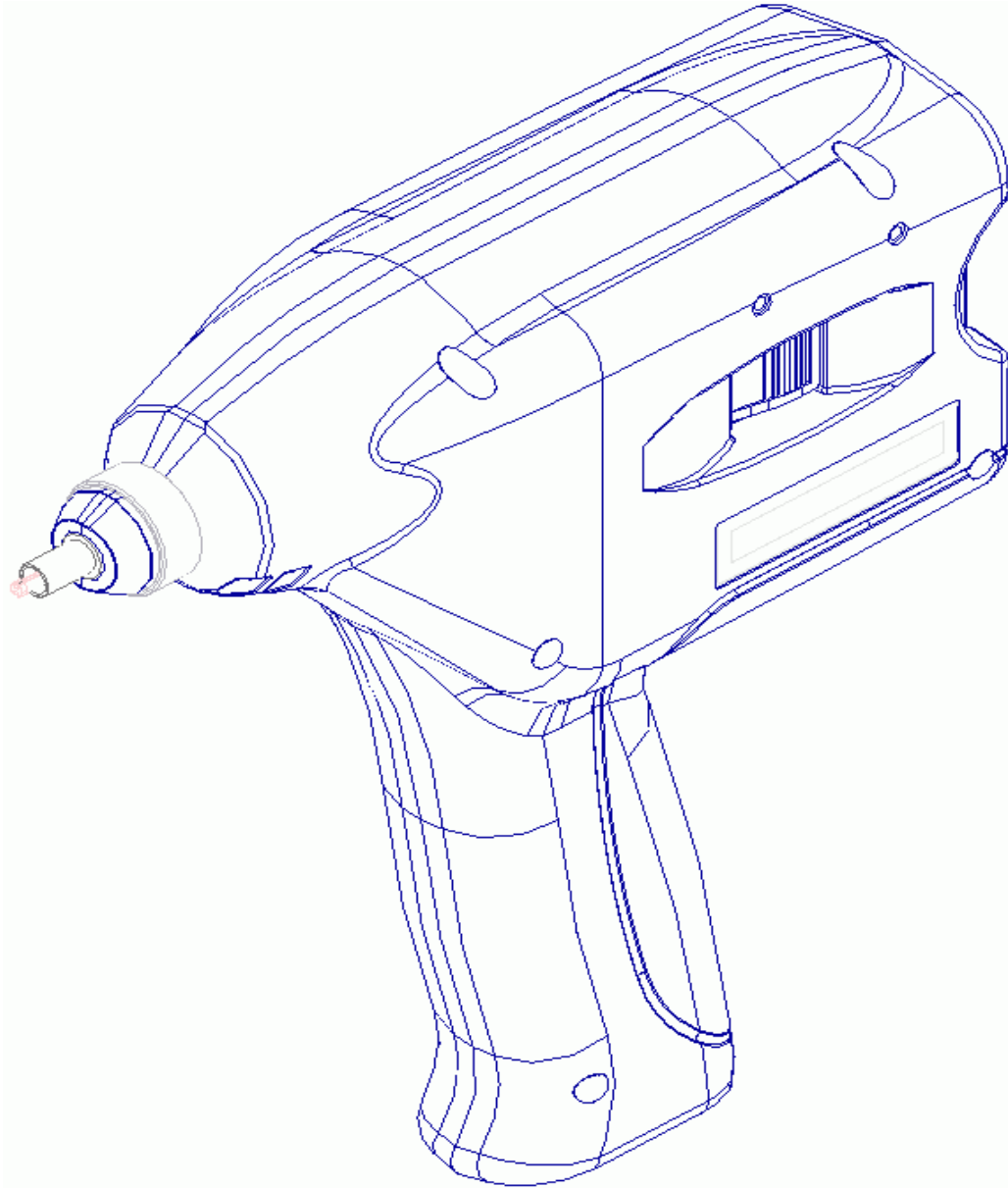




# AFC-3000

## Automated Optical Connector Ferrule Cleaner



# USER MANUAL



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## Introduction

**Congratulations** on your purchase of the AFC-3000 automatic fiber optic ferrule cleaner. We take pride in manufacturing high quality products and have put every effort into making it as useful and easy to use as possible. Should you have any comments, please forward them to the tool supplier; we will review your comments in our continuing efforts to improve in the next generation.

The **AFC-3000** (Patent Pending) is a state of the art automated cleaning device intended for optical fiber connector, and more particularly to the removal of contaminants and small particles from optical fiber connector end faces. The **AFC-3000** is compatible, using the proper tip, with SC, ST, E2000, LC and MU (PC or APC) in-adapter connectors. Its unique design provides easy cleaning of female ferrules assemblies directly on the patch panel.

## Adapters and Connectors supported

Table 1.

Adapter	Female In-Adapter	Connector	Male Adapter
 FC Adapter	 #TFC-100/F	 FC Connector	 #TFC-100/M
 ST Adapter	 #TST-100/F	 ST Connector	 #TST-100/M
 SC Adapter	 #TSC-100/F	 SC Connector	 #TSC-100/M

Also supported are **LC**, **MU**, and **E2000** male and female connectors, as well as **SMPTE 304M** (manufactured by Lemo, Canare, and others) HDTV connectors.

**CAUTION:** Step ferrules cannot be cleaned using this tool as sharp edges on the ferrule profile damage the cleaning fabric and cause cartridge failure.



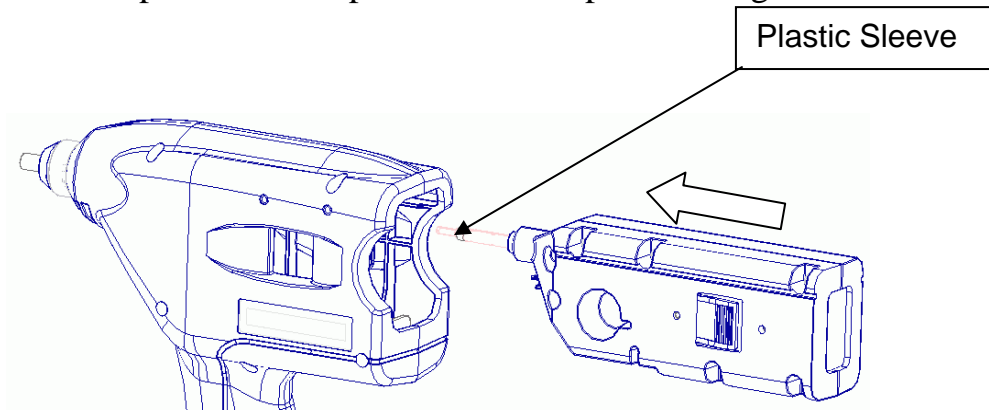
### Tool preparation

#### **Standard Cartridge (CFC-600-S)**

1. Remove batteries from cartridge packaging and follow battery installation procedures in the index of this manual.
2. Insert the cartridge slowly in the tool to prevent damaging the tip. Push all the way in until both snaps click in place. See *Figure 1*.

**CAUTION:**

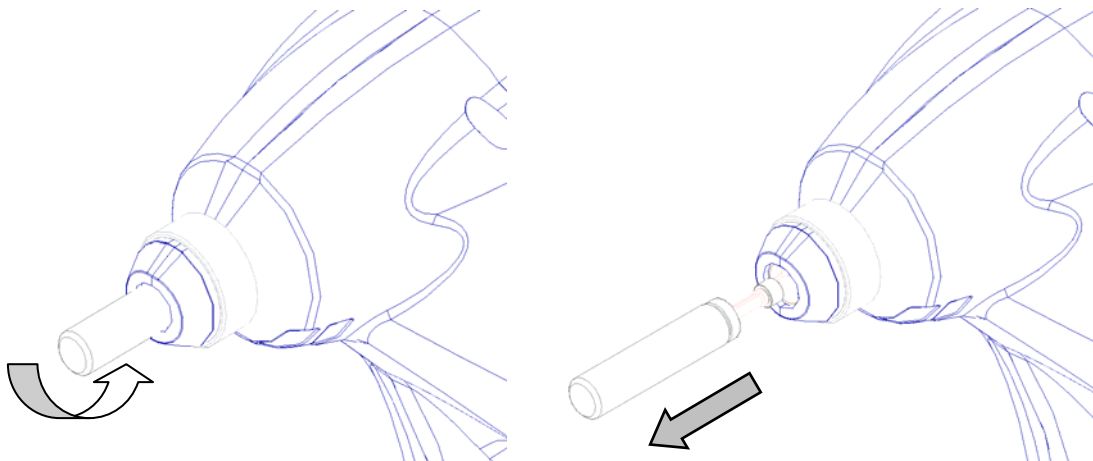
- (1) Care must be taken to ensure not to catch or snag the cleaning tip during preparation.
- (2) Do not remove plastic sleeve provided near tip of cartridge.



*Figure 1.*

3. Install the appropriate tip adapter to the **AFC-3000**.

To do this, remove the tool protector by unscrewing it counter-clockwise and then pull, being careful not to touch the cleaning tip. See *Figure 2*.

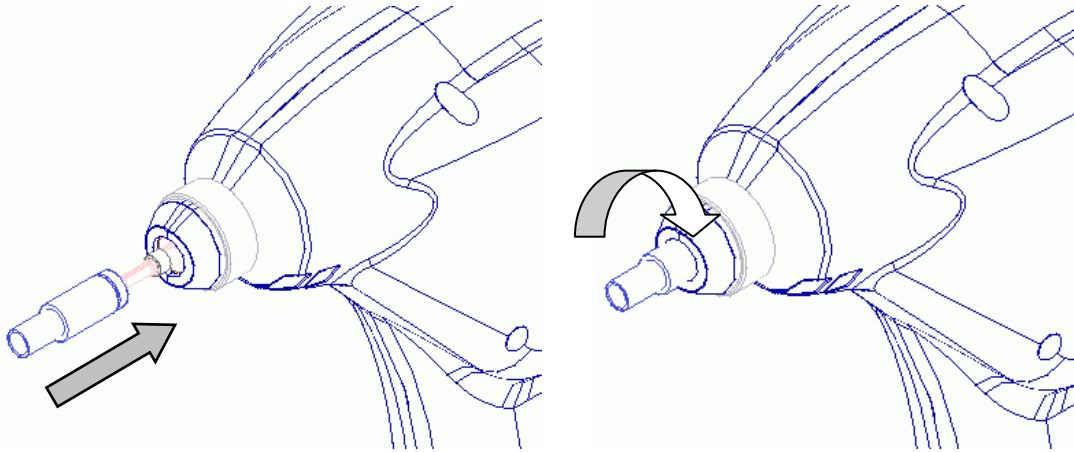


*Figure 2.*



**CAUTION:** If the cleaning tip is damaged or dirtied during this process the resulting cleaning will degrade and the cartridge may have to be replaced. Regular cleaning of the adapters should be performed to ensure quality of clean is maintained. Keep the protective cap in a safe place; you will need it to protect the gun's tip after use.

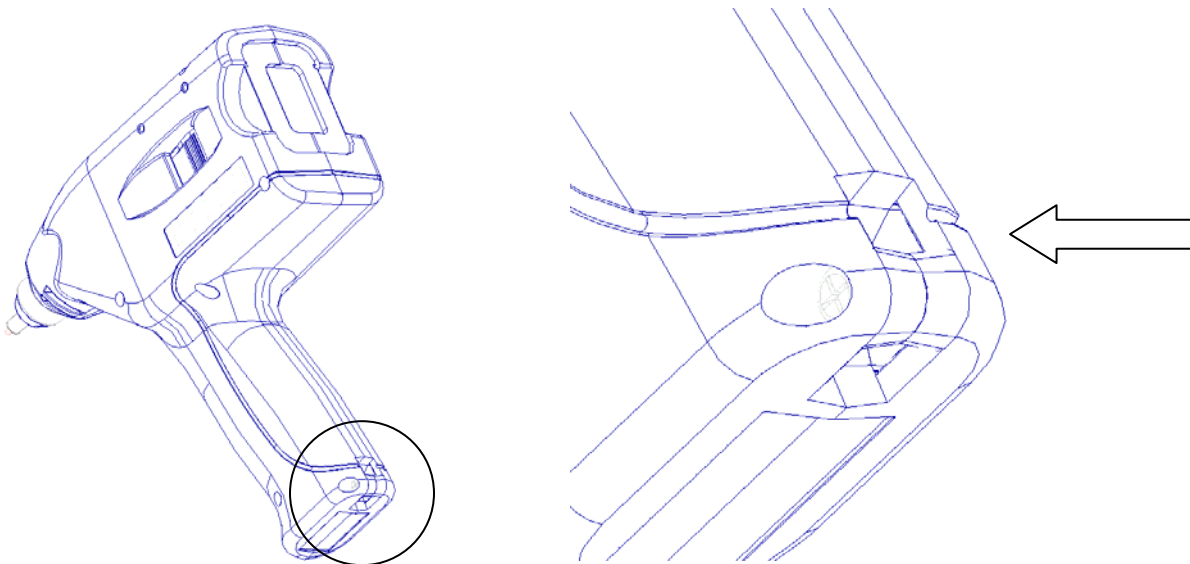
*Firmly* screw the appropriate tip adapter to the **AFC-3000** cleaning tool assembly, being careful not to touch the cleaning tip. See *Figure 3*.



*Figure 3.*

**CAUTION:** If the cleaning tip is damaged or dirtied during this process the resulting cleaning will degrade and the cartridge may have to be replaced.

A mounting hole is available for a hand strap installation:



*Figure 4.*



## OPTIONS

### Long Reach Version (CFC-600-L)

For hard to reach connectors, the long reach version of the cartridge will permit better access by distancing the tool from the panel.

### Precautions:

1. Remove the tool protector by unscrewing it counter-clockwise and then pull.
2. The **EXT-4** (Long Reach Extension) must be used with the **CFC-600-L** cartridge. It is screwed *firmly* in place at the tool extremity in the same manner as the Tip Adapter prior to inserting the cartridge.
3. The cartridge is inserted & removed in the same manner as the standard length cartridge.
4. The Tip Adapter is then screwed *firmly* to the end of the Long Reach Adapter.

NOTE: 1. Insert the cartridge slowly in the tool to prevent damaging the tip. Push all the way in until both tabs snap in place. Do not insert the cartridge before attaching the Long reach extension.  
2. It cannot be overemphasized that both the extension and the tip must be screwed down *firmly* for proper contact with the connector ferrule.

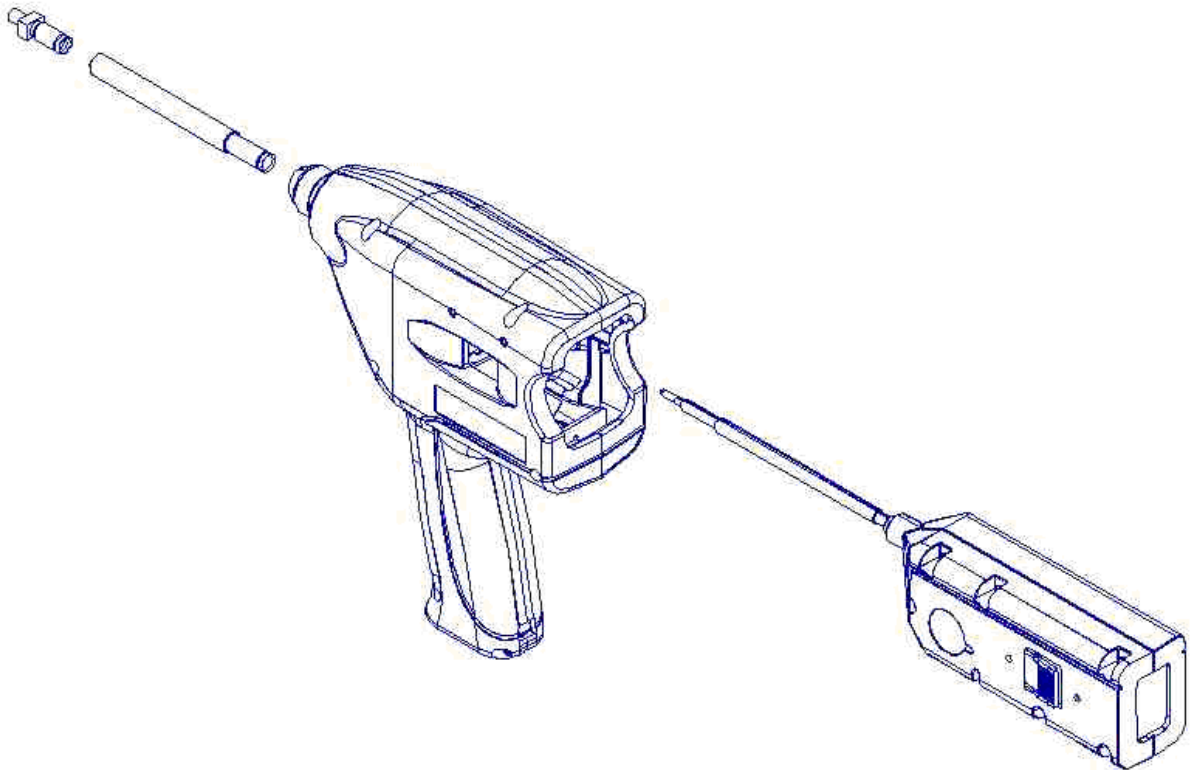


Figure 5.



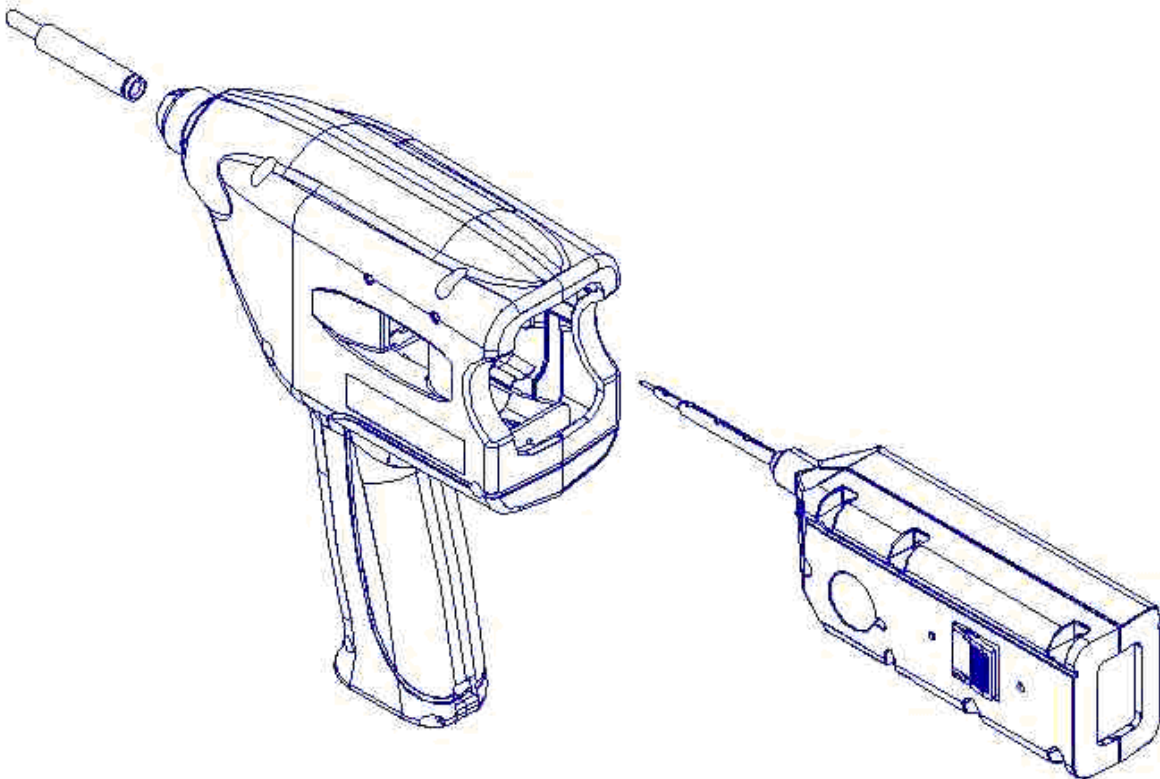
### 1.25mm LC Version (CFC-600-LC)

This can also be used for **MU** in-adapter cleaning, as well as for **SMPTE 304M** HDTV connectors

For High Density **LC** connectors, the **LC** version of the cartridge must be used.

### Precautions:

1. The cartridge is inserted & removed in the same manner as the standard length cartridge.
2. *Firmly* screw the **TLC-100F** or **TLC-100M** (LC Tip Adapter, female or male, respectively), or the **TLM-100M** (**SMPTE 304M**, a.k.a. "**Lemo**", male Tip Adapter), to the **AFC-3000** cleaning tool assembly, being careful not to touch the cleaning tip. See *Figure 6*.



*Figure 6.*

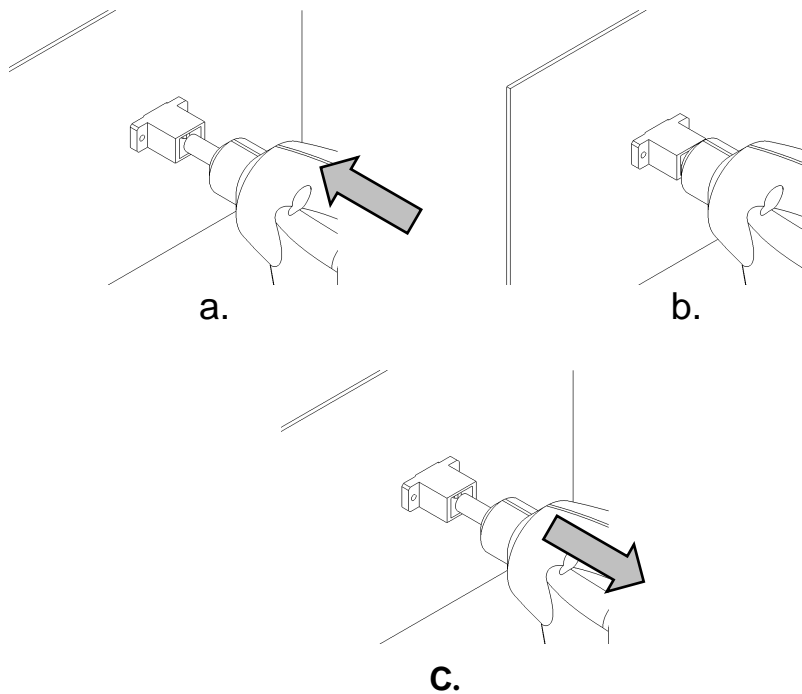


## How to use the AFC-3000

### A. Thru-the-Adapter Cleaning

Being careful not to touch the cleaning tip,

- a) Insert the tool into the connector adapter, and then push the **AFC-3000** *perpendicularly* into the connector adapter. When the appropriate gun tip is sufficiently inserted, the cleaning process starts automatically and an operation sound can be heard.
- b) Keep the pressure and alignment constant during the complete automated cleaning cycle.
- c) After 3 seconds the motor will stop. The cleaning cycle is finished. Gently remove the tool.



*Figure 7.*

Note: Make sure that the full stroke of the tool adapter is reached and maintained during operation.  
Make sure to have good batteries in the gun.

**CAUTION:** Do not turn or tilt the AFC-3000 during operation as it may damage the fiber, the connector or the cleaning tip.





With ST, SC and E2000 connectors, be sure the adapter tip (**TST-100F**, **TSC-100F** or **TE2K100F**) is well aligned with ST/SC/E2000 keys. The SC and E2000 tips have a rectangular swivel part that must be aligned correctly for insertion. See examples of SC and ST in Figure 8.

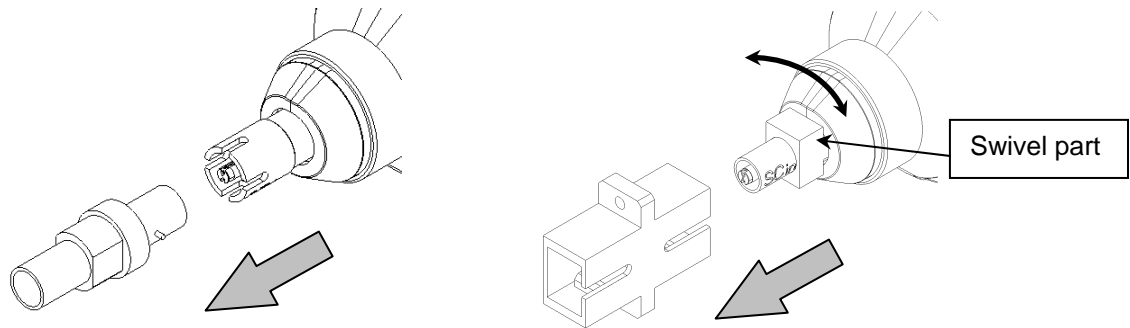


Figure 8.

## B. Direct Ferrule Cleaning

This method is for use directly on connector ferrules (male connectors). For **SMPTE 304M** connectors, see part C below.

- a) Hold the connector to be cleaned steadily in one hand.
- b) Grasp the gun with the other hand and *carefully* place the adapter tip over the ferrule of the connector to be cleaned.
- c) Press the gun against the connector with sufficient force to cause the motor to be activated. Maintain steady pressure until the motor stops automatically.
- d) After 3 seconds the motor will stop. The cleaning cycle is finished. Gently remove the tool.

## C. **SMPTE 304M** Ferrule Cleaning

This method is for use on all varieties of **SMPTE 304M** *male* connectors, as well as for most varieties of *female* connectors as long as *the ferrule guides are removed first*. (In the case of female **SMPTE 304M** connectors, some manufacturers, such as Winchester, use a non-standard-length ferrule, thereby requiring a special adapter tip for the gun (still in development). Please make certain that the ferrule length in the female connector is the same as that in the male connector before using the **TLM-100M** tip on the female connector.)

- a) Hold the connector to be cleaned steadily in one hand.
- b) Grasp the gun with the other hand and *carefully* place the adapter tip over one of the two ferrules of the connector to be cleaned.
- c) Press the gun against the connector with sufficient force to cause the motor to be activated. Maintain steady pressure until the motor stops automatically.



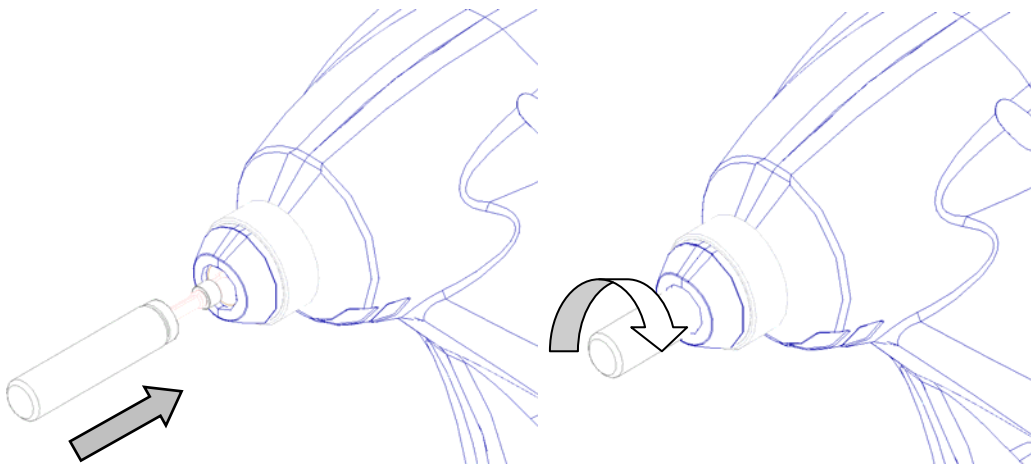
- d) After 3 seconds the motor will stop. The cleaning cycle is finished. Gently remove the tool.
- e) Repeat steps b through d for the second ferrule.
- f) On the female connector, replace the ferrule guides, being careful not to make contact with the ferrule tips during this operation.

## Maintenance

### *Protection While Not in Use*

The **AFC-3000** needs to be maintained in a clean environment and free of dust and grease. Whenever the **AFC-3000** is not in use, the metal protective cap **TP-100** (optional – to be used only with the **CFC-600-S** and **CFC-600-LC** cartridges.) should be screwed on the **AFC-3000**. See *Figure 9*.

In lieu of this cap, one of the tips and/or the **EXT-4** extension should be left on the gun with the provided plastic protective cap firmly pressed over the end.



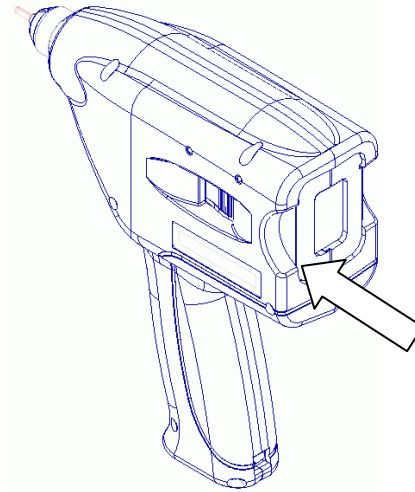
*Figure 9.*

Providing the **AFC-3000** is used and protected while not in use as prescribed, it will run for years without needing any other maintenance than replacing the cartridge and batteries as needed.



### ***Replacing the cartridge and the batteries***

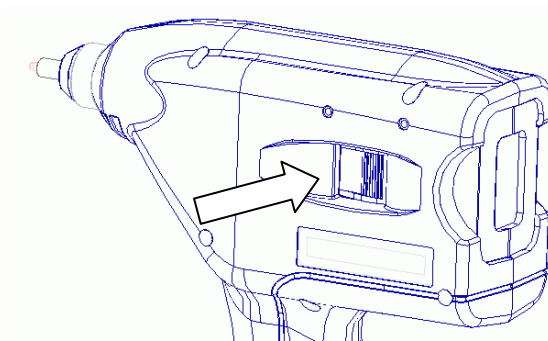
When you run out of cleaning fiber, you will see a red warning around the spool through the window in the cartridge. Also, the feed spool allows no more unwinding; the fiber is fixed on it:



*Figure 10.*

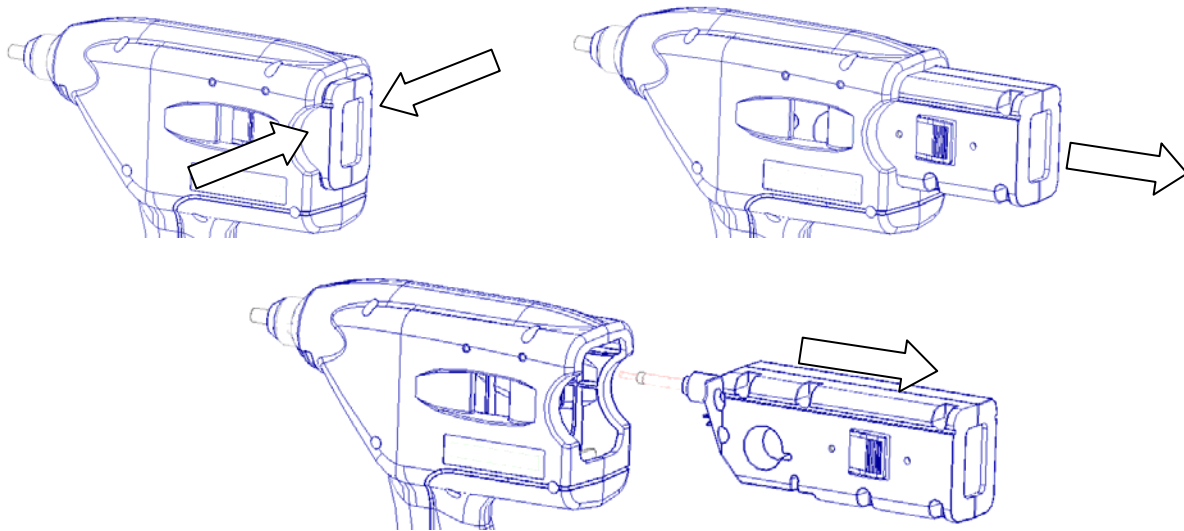
This red sign notifies you that it is time to change the cartridge and batteries.

To replace either item, you need to remove the cartridge from the gun by pressing on both retaining tabs placed on either side of the gun:



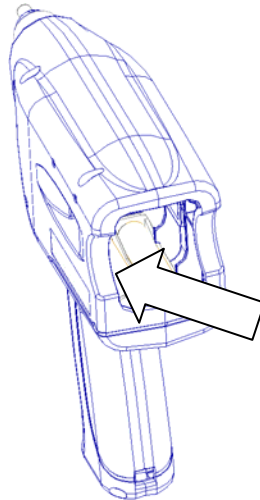
*Figure 11.*

Once the retaining tabs released, the cartridge should come out a bit. Gently pull on the cartridge by pulling on either side of it until it comes out:



*Figure 12.*

The batteries should now be reachable inside the gun:



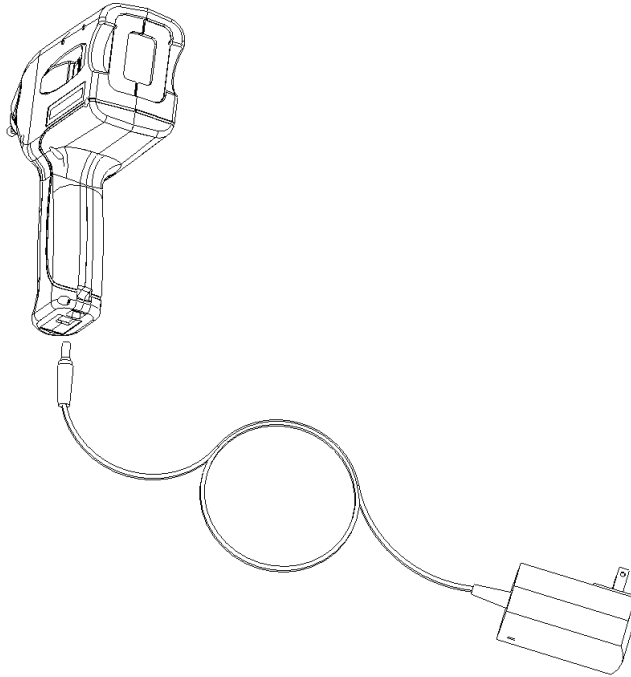
*Figure 13.*

**Note:** The two Alkaline batteries need to be changed every time the cartridge is replaced.  
See page 16 for correct battery installation procedure.



## ***Rechargeable batteries***

Rechargeable batteries option is available with the **AFC-3000**. A specific charger is available to recharge the NiMH batteries. Note that the wall adapter is only for batteries recharge and will not permit operation of the **AFC-3000** without battery assistance. Use the connector at the end of the tool's handle for recharging the batteries.



*Figure 14.*

**CAUTION:** Do not use the charger with alkaline or non-rechargeable batteries or injury could occur. The battery charger should only be used with rechargeable batteries.



## Part Numbers:

Description	Parts number
Gun	AFC-3000
Cartridge (2.5mm short version)	CFC-600-S
Cartridge (2.5mm long version)	CFC-600-L
Cartridge (1.25mm version)	CFC-600-LC
FC Female Tip	TFC-100F
SC Female Tip	TSC-100F
ST Female Tip	TST-100F
E2000 Female Tip	TE2K-100F
LC Female Tip	TLC-100F
MU Female Tip	TMU-100F
FC Male Tip	TFC-100M
SC Male Tip	TSC -100M
ST Male Tip	TST -100M
E2000 Male Tip	TE2K-100M
LC Male Tip	TLC-100M
MU Male Tip	TMU-100M
<b>SMPTE 304M</b> Male Tip	TLM-100M
4-inch Extension (use with CFC-600-L)	EXT-4
Tip Protector	TP-100
International Power Supply (6V) with 2 rechargeable AA Batteries	PFC-100



# Specifications

## AFC-3000 GENERAL CLEANER SPECIFICATIONS

	Value	Unit	Specifications
Connector	Component type	-	Optical Connector
	Package	-	FC, ST, SC, E2000, LC, MU (PC or APC); SMPTE 304M
	Ferrule Diameter	mm	2.5, 2.0, and 1.25
	Type		Female (In-Adapter)
Adapter	Component type	-	Optical Adapter
	Package	-	FC, ST, SC, E2000, LC, MU (PC or APC)
	Sleeve Material	-	Zirconia, SS, Carbon Fiber
Facility	Test Facility Standard Ambient Operating Temperature	°C	0 to 50
	Test Facility Ambient relative humidity	% RH	0 to 95
Electrical supply	Electrical Supply	Vdc	3
	Current	Amp	0.5
	Standard Battery type	-	2 AA Alkaline
	Power Supply for rechargeable battery	-	6V DC, 2A
	Rechargeable type battery	-	NiMH
	Battery charge monitoring	-	None
Operation	Time of cleaning, nominal	sec	3*
	Action	-	Momentary
	Number of rotation of the tip per cleaning, min	#	2
Tool Ergonomics	Height	in	6.5
	Width	in	2
	Length	in	7.5
	Weight	oz/kg	16/0.5
	Tool form-factor and handle type	-	Wire Wrap Tool
	Portability	-	Strap or Cord Access
	Field portability	-	Yes
	Operation	-	One Hand
Cartridge (CFC-600S)	Height	in	2
	Width	in	1.5
	Length	in	7
	Battery location		Installed in tool under Cartridge
	Cycle	#	600
Environ mental	Packaging		Splash Proof
	Storage/Shipment	°C	-40 to 70
	Drop test	-	1 meter on concrete each corner
Standards	Telcordia		GR-2923-CORE

\* at 15°C to 30°C



## Appendix

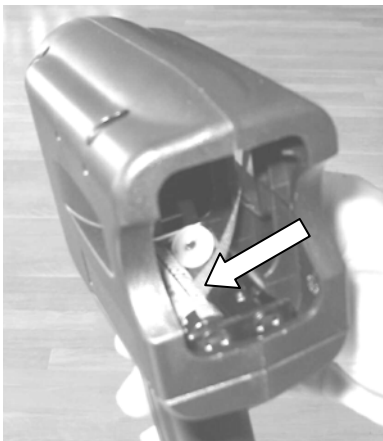
### *Battery Installation Procedure*



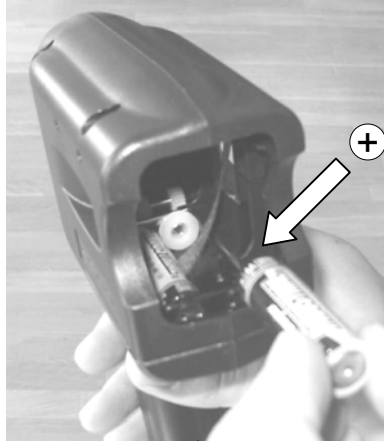
1 Install the first battery in the left position with positive pole outwards.



2 Once the negative pole is in place, push the battery down in final position.



3 Make sure the red ribbon is below the first battery.



4 Install the 2<sup>nd</sup> battery with the negative pole outwards.



5 Once the positive pole is in place, push the battery down in final position.



6 The AFC-3000 is ready to receive the cartridge.





## Proper Installation of Adapter Tips Into the EXT-4 Extension



1 TSC-100F tip *firmly* screwed into the EXT-4 extension



2 TSC-100F tip *not fully* screwed into the EXT-4 extension

For proper operation of the **AFC-3000**, it is essential that the cartridge be snapped firmly into the gun, and that the tips and the **EXT-4** extension (if used) be firmly screwed into the gun. In particular, the user should make certain that tips be screwed fully into the **EXT-4** (if used). It has been noted that in some cases a bit of resistance may be felt as the tip is nearing the end of its insertion into the extension. This does not mean that the user should stop continuing to screw the tip in. Unless the tip is flush with the **EXT-4** as shown, the cleaning cartridge will not make proper contact with the connector ferrule.