

# Reactor Startup Checklist

## reactor/fusion training

*This checklist is for supplemental training of Graco distributors on Fusion and Reactor products. It is not a replacement for reading and understanding the manuals or other training materials.*

### *Suggested Equipment:*

- ✍ Voltmeter, ammeter, screwdrivers, pliers, adjustable wrenches, 4 mm or 5/32" hex wrench (electrical connection), thermometer, PTFE thread tape, PTFE thread sealant, electrical tape
- ✍ Equipment Manual
- ✍ Material Safety Data Sheets (MSDS), Technical Data Sheets
- ✍ Personal safety equipment

### *Installation Process*

- ✍ Connect electrical power (*check manual for wire gauge and connections*)
- ✍ Install FTS and hose, but do not cover connections, FTS just prior to whip
- ✍ Check that hose transformer tap matches hose length
- ✍ Calibrate hose, hold down F/C key and turn on power, release F/C key
- ✍ Fill B side wet cups with TSL
- ✍ Fill solvent flush reservoir with TSL
- ✍ Flush system with non-flammable solvent recommended by material supplier. Push solvent with feed pumps or jog mode if siphon feeding
- ✍ Check primary heater thermocouples for proper heat ramp-up, 120°F (50°F) set point, A&B temperature rise should match within a few degrees
- ✍ Leak test at 1000 psi (70 bar) (*explain injection hazard of high pressure -- see manual*)
- ✍ Load material with feed pumps, purge 2-3 gallons (8-12 liter)
- ✍ Start hose heating, review gun breakdown (*note high pressure injection hazard--see manual*)
- ✍ Install gun and spray (*explain gun safety operation--see manual*)

### *Explain Diagnostic Features*

- ✍ Cycle counter, reset and displacement per cycle (*see manual*)
- ✍ E24            A-B pressure imbalance, 50% of set point
- ✍ E04            Hose Fluid Temp Sensor (FTS) or primary thermocouple
- ✍ 0A             Hose power manual mode reads 0 amps
- ✍ E21 - E22     No pump pressure transducer
- ✍ .....         see full list in manual

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### Demonstrate Startup and Shutdown Procedures

#### *Startup*

- Main power on
- Set hose temp, only turn hose on, wait 15 - 30 minutes.
- Primary heaters and motor on.
- Open gun valves
- Spray

#### *Short Term Shut Down (short breaks, lunch)*

- Shut off motor and primary heaters (*okay to leave hose heat on*)
- Trigger gun, engage gun safety
- Close gun manifold valves

#### *Overnight Shutdown*

- All zones off (*use on/off buttons for each zone*)
- Park button pushed, trigger gun until pumps stop moving (*electric only*)
- Trigger gun until pumps are fully submerged (*air and hydraulic*)
- Engage gun safety, gun fluid valves off
- Grease gun with air on, two squirts max (*air purge gun only*)
- Feed pump and gun air off
- Main power off
- Check TSL level in pumps
- Check ISO flush system reservoir for color and clarity

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# Reactor Startup General Info

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### Support Information:

- ✍ Manuals, [www.graco.com](http://www.graco.com), Product Knowledge Exchange, [joereactor.com](http://joereactor.com), Graco Tech Assistance phone number (800) 543-0339
- ✍ Isocyanate safety, discuss with material supplier
- ✍ Moisture sensitivity of isocyanate, purge material if not spraying weekly
- ✍ Filter locations and cleaning methods
- ✍ Indications of inadequate supply, cavitation...A-B gauges fluctuate differently, pump knocking, motor racing
- ✍ Viscosity increases greatly at temps below 70°F (20°C), difficult to siphon feed

Refer to AP Fusion Gun Cutaway

or

Refer to MP Fusion Gun Cutaway

Explain:

- ✍ Air-fluid valving for purging
- ✍ Tip clean off air
- ✍ Grease port

Explain:

- ✍ Mechanical purge valving method
- ✍ Tip clean off air

### Suggested Spare Parts

#### FUSION Air Purge

- ✍ Spare front end
- ✍ Mix chamber
- ✍ Air cap
- ✍ Flat tips
- ✍ O-ring kit
- ✍ Side seal cartridge ( A and B)
- ✍ Check valves (includes filter screen)
- ✍ Filter screens
- ✍ Manifold fluid valve
- ✍ Fusion grease

#### REACTOR

- ✍ Transducer
- ✍ Thermocouple
- ✍ Pump seal kit
- ✍ Inlet screen
- ✍ TSL

#### FUSION Mechanical Purge

- ✍ Mix modules
- ✍ Tips
- ✍ Complete o-ring kit
- ✍ Check valve assemblies (A & B)
- ✍ Replacement filter screens (40, 60, 80 mesh)
- ✍ Purge rod kit
- ✍ Front/Rear seal kit (4 pack)
- ✍ Check valve o-ring kit
- ✍ Lubricant tube
- ✍ Clean-out drill kit (pick size)

FUSION Air Purge checklist go to next page FUSION Mechanical Purge checklist go to page 8
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# Fusion Air Purge Gun Checklist

## reactor/fusion training

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### Overview

- ✍ Review manual and safety warnings
- ✍ Review tip flow rate info in manual
- ✍ Helpful Tools: small screwdriver, adjustable wrench, needle-nose pliers
- ✍ Air inlet options
- ✍ Hose and manifold orientation options

*Disassemble Fluid section (Follow pressure relief procedure and flush gun to prevent components mixing)*

- ✍ Front air cap – tapered edge and PTFE o-ring
- ✍ Remove front ring – “A” side laser marked
- ✍ Remove side seals – spring loaded hardened SST seals
- ✍ Remove mix chamber – fluid/air path through side seals, offset for mix & spin, Step drilled on 2020 and 2929 mix chambers - hardened SST
- ✍ Remove check valves – show spring and screen, 80 mesh STD, 60 & 40 mesh opt.
- ✍ Gun flush manifold, works with air or solvent

### Disassemble air section

- ✍ Remove rear cap and safety – explain safety operation
- ✍ Remove piston – keyed
- ✍ Muffler – noise reduction only, if plugged will slow or stop valve action
- ✍ Remove back air connection – push through air valve from front
- ✍ Line of sight air passages for easy cleaning

### Assembly

- ✍ Grease everything liberally with Graco grease or TSL – isocyanate can seize threads
- ✍ Re-assemble air section
- ✍ Re-assemble fluid section – grease threads, hand tighten ring and air cap
- ✍ Connect air and fluid sections
- ✍ Connect air only, actuate gun, explain tip clean off air, ¼ turn open.
- ✍ Explain why not to over-tighten air cap – leakage potential

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### Discuss Pattern

- ✍ Round tips, drill out from gun end when pattern gets small or distorted
- ✍ Side ports, drill out if pressure stays imbalanced (very rare), can be done in place

### Shutdown

- ✍ Leave fluid connected, but depressurize by parking pump
- ✍ Close fluid shut-off valves on manifold
- ✍ With bleed-air running grease with 1-2 shots max, note mist of grease

### Maintenance every 1-4 weeks

- ✍ Completely disassemble fluid section and clean
- ✍ Check fluid o-rings and slide seal surfaces

### Housekeeping

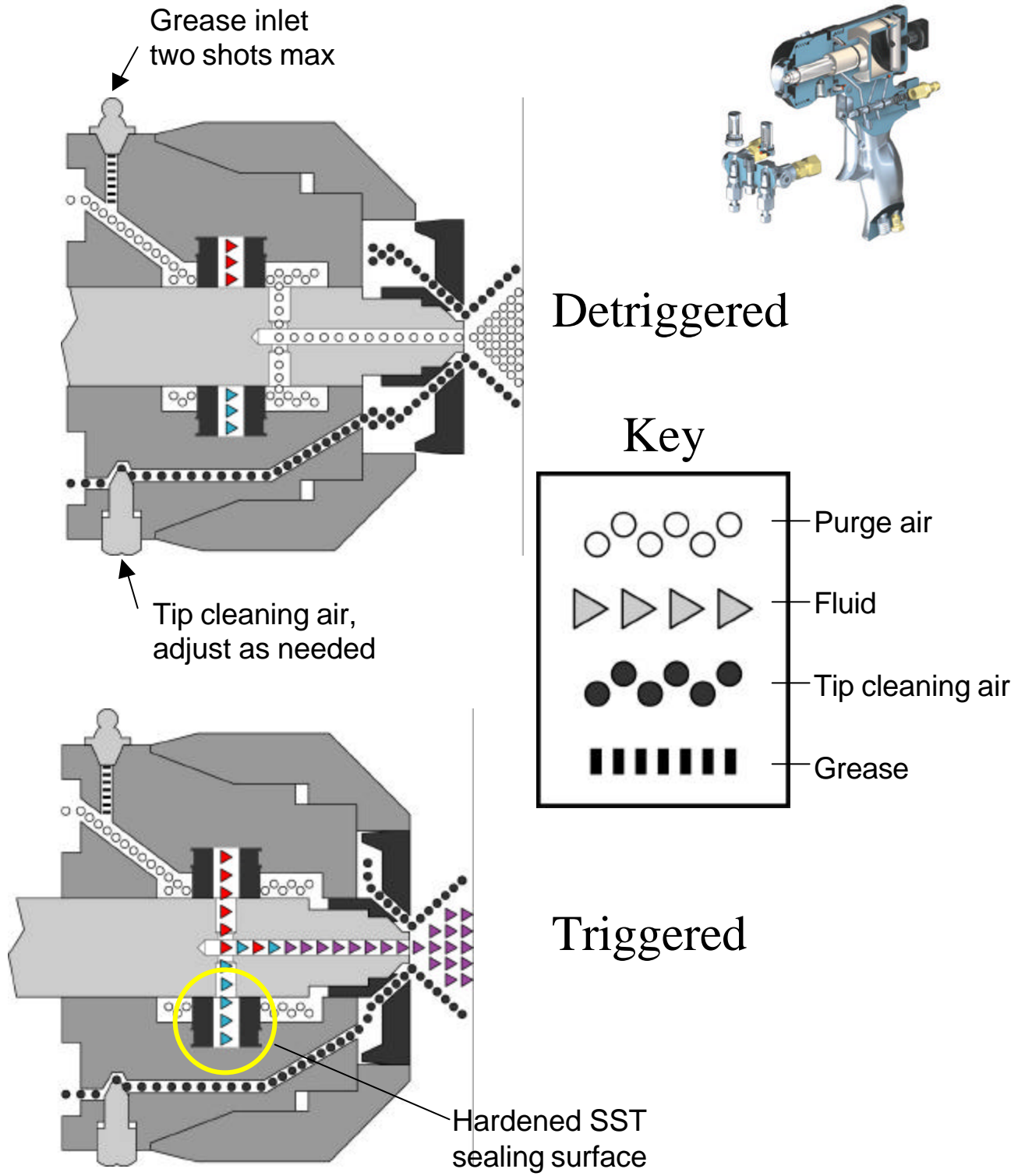
- ✍ Isocyanate very moisture sensitive, crystallizes, plugs filters, damages seals
- ✍ Keep material clean and dry, use desiccant dryers in drums
- ✍ If system not being used for 1-2 weeks purge or circulate material
- ✍ Park pump every night to immerse pump rods

### Accessories

- ✍ Optional tips (flat tips require different mix module and air cap)
- ✍ Gun cover, Tyvek
- ✍ Gun flush manifold
- ✍ Hose circulation manifold
- ✍ Suggested spare parts list

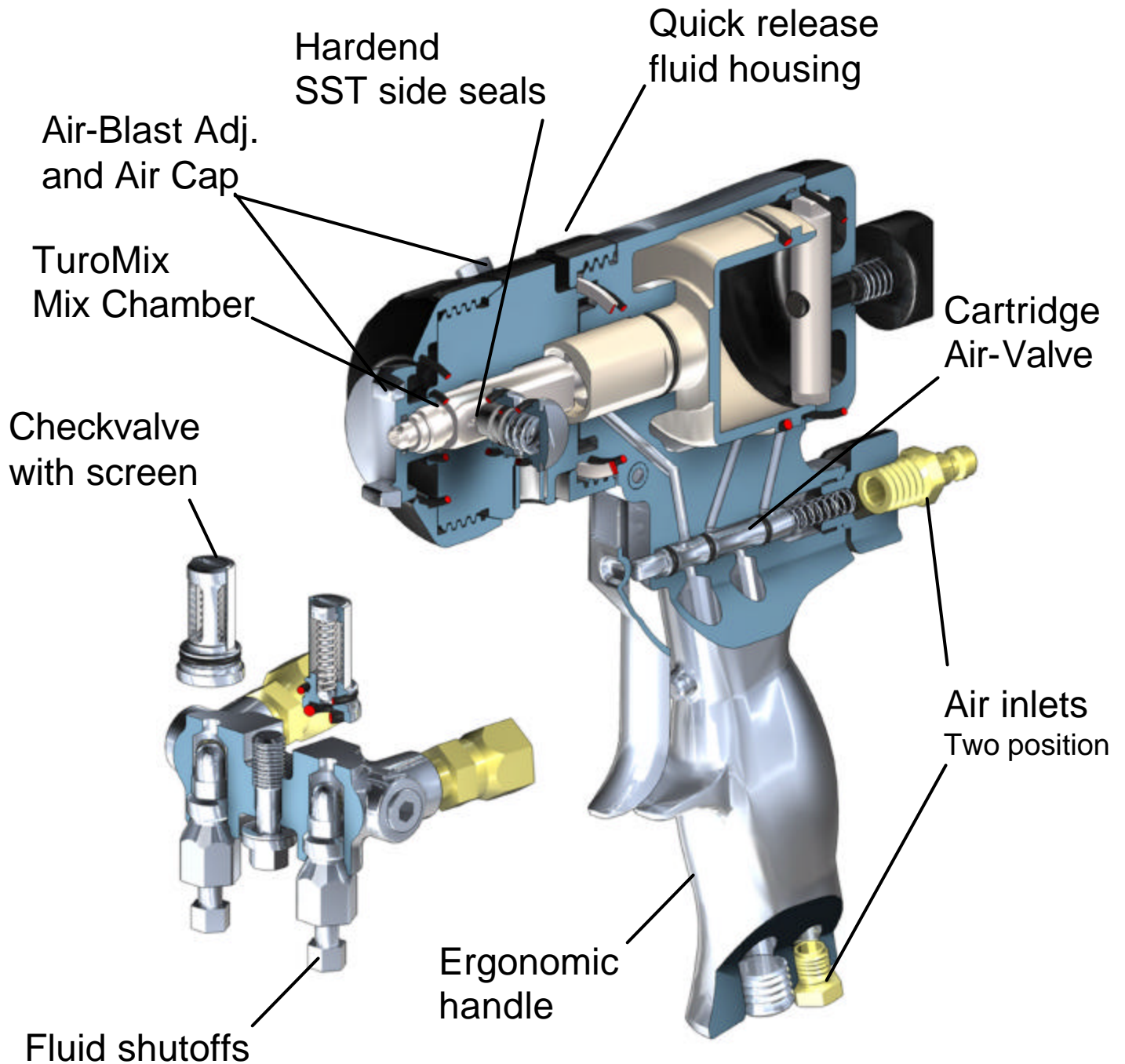
# Fusion AP Air Purge Gun

## cutaway view of gun operation



# Fusion AP Air Purge Gun

cutaway view of gun



# Fusion Mechanical Purge Gun Checklist

## reactor/fusion training

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### Overview

- ✍ Review manual and safety warnings
- ✍ Review mix module and tip flow rate info in manual
- ✍ Helpful tools: small screwdriver, adjustable wrench
- ✍ Air inlet options
- ✍ Fluid hose and manifold orientation options

*Disassemble fluid section (Follow pressure relief procedure and flush gun to prevent components mixing)*

- ✍ Remove air cap (No o-rings or adjustment needed to seal the air cap)
- ✍ Remove tip retainer
- ✍ Remove tip (tips can be swapped or cleaned without relieving the gun fluid pressure)
- ✍ Remove front packing, relieve pressure, trigger gun with safety off
- ✍ Remove mix module nut (air cap can be used as a tool)
- ✍ Remove mix module, trigger gun with safety off (drill out impingement ports, discuss resin holes are angled, and 1313 and 1818 have stepped bores requiring two drill sizes to clean)

### Polycarballoy Mix Module Cross Section

Mix Modules:  
XF1313  
XF1818  
MF1818



All Other Mix Modules

- ✍ Remove check valve assemblies (check screens and springs)
- ✍ Remove fluid housing from gun handle (be sure to pull housing straight off gun handle to prevent bending the purge rod, also show rear seal nut and 2 o-rings for clean-off air)
- ✍ Adjust rear packing (push fluid housing onto purge rod “backwards” when rod is through packing, tighten packing finger tight plus ¼ turn)

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# Fusion Mechanical Purge Gun Checklist

## reactor/fusion training

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### *Disassemble Air Section*

- ✍ Remove safety assembly (discuss that safety allow some purge rod movement when actuated)
- ✍ Remove keyed piston (If user wants to disassemble purge rod from piston, leave piston in gun, unscrew purge rod, then remove piston)
- ✍ Muffler (for noise reduction, if gun is actuating slowly, muffler may be plugged)
- ✍ Remove back air connection, push trigger air valve out from front

### *Assembly*

- ✍ Apply Graco grease to all threads and external surfaces Isocyanate can seize threads
- ✍ Re-assemble air section (back purge rod out 1-2 turns before re-assembling fluid section)
- ✍ Re-assemble fluid section
- ✍ Put mix module on rod, trigger gun to pull module into fluid housing
- ✍ Hold trigger and assemble mix module nut. Tighten finger tight + 1/12-1/6 turn with wrench or air cap
- ✍ Push front packing onto rod
- ✍ Place tip onto front packing
- ✍ Assemble tip retainer finger tight +1 notch
- ✍ Assemble air cap
- ✍ Adjust purge rod ( rod should be backed off of tip 1/8-1/4 turn)

### *Pattern Options*

- ✍ Tips offered in two types round, (RTM070), and Flat (FTM438)
- ✍ Standard Vs Direct impingement Modules (MR and MF Vs XF and XF)
- ✍ Use appropriate module and tip combinations (only spray round tips with MR or XR modules, only spray flat tips with MF or XF modules)

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### *Shutdown*

- ✍ Leave fluid connected, but depressurize by parking pump
- ✍ Close fluid shut-off valves on manifold
- ✍ For overnight shutdown – engage safety
- ✍ For more than 24 hour shutdown – flush gun

### *Maintenance every 1-4 weeks*

- ✍ Completely disassemble fluid section and clean
- ✍ Inspect check valve assemblies

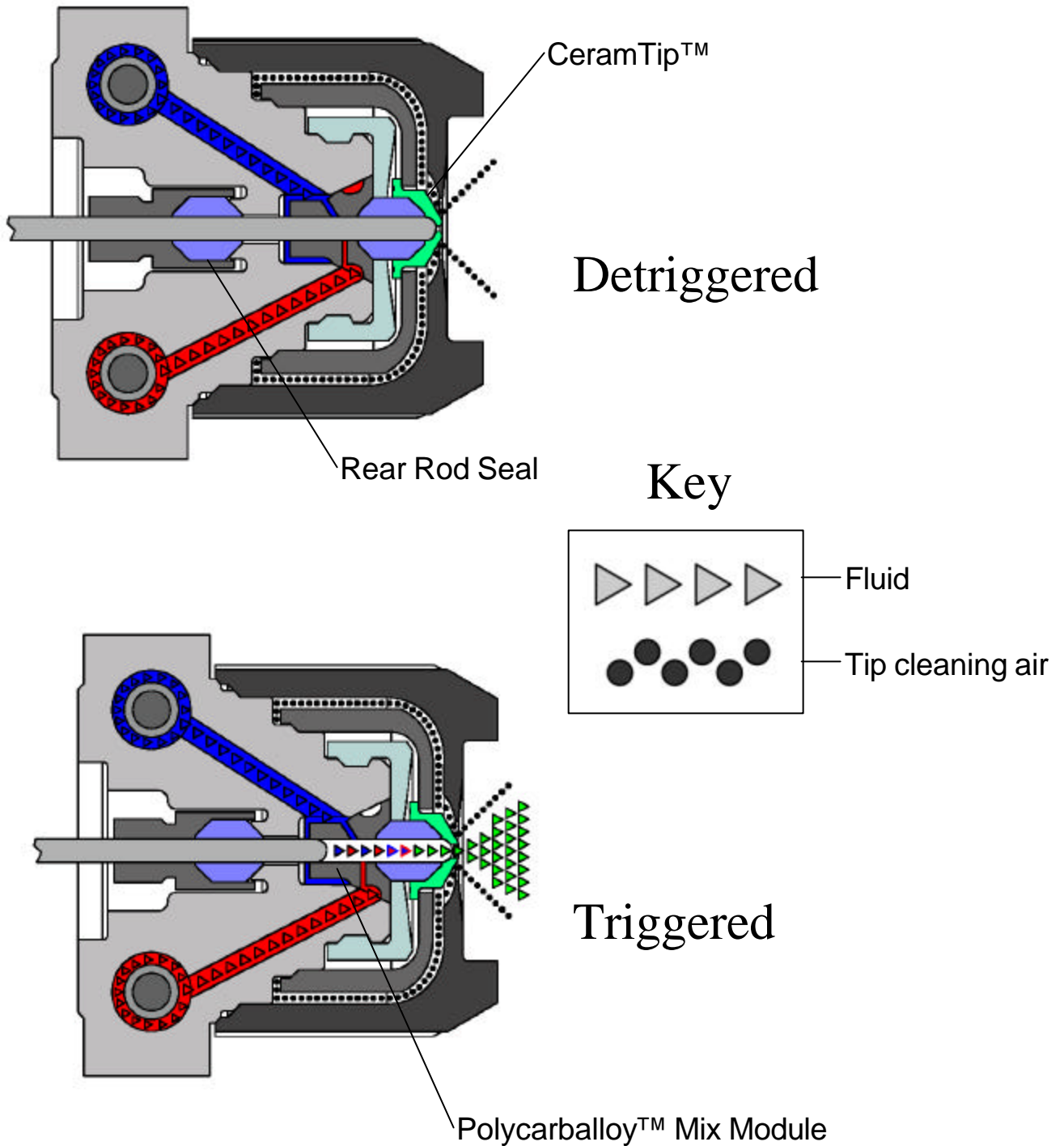
### *Accessories*

- ✍ Gun cover
- ✍ Gun flush manifold
- ✍ Hose circulation manifold
- ✍ Suggested spare parts list
- ✍ Competitive hose manifold gun mounting adapter (allows competitive hose set to spray Fusion gun)
- ✍ Graco hose manifold competitive gun mounting adapter (allows Graco hose set to spray competitive guns)
- ✍ Solvent flush kit

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# Fusion MP Mechanical Purge Gun

cutaway view of gun operation



# Fusion MP Mechanical Purge Gun

cutaway view of gun

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