

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, Product Knowledge Exchange, 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
Explain:

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

or

Refer to MP Fusion Gun Cutaway
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)

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Fusion Air Purge Gun Checklist

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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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Fusion Air Purge Gun Checklist

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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

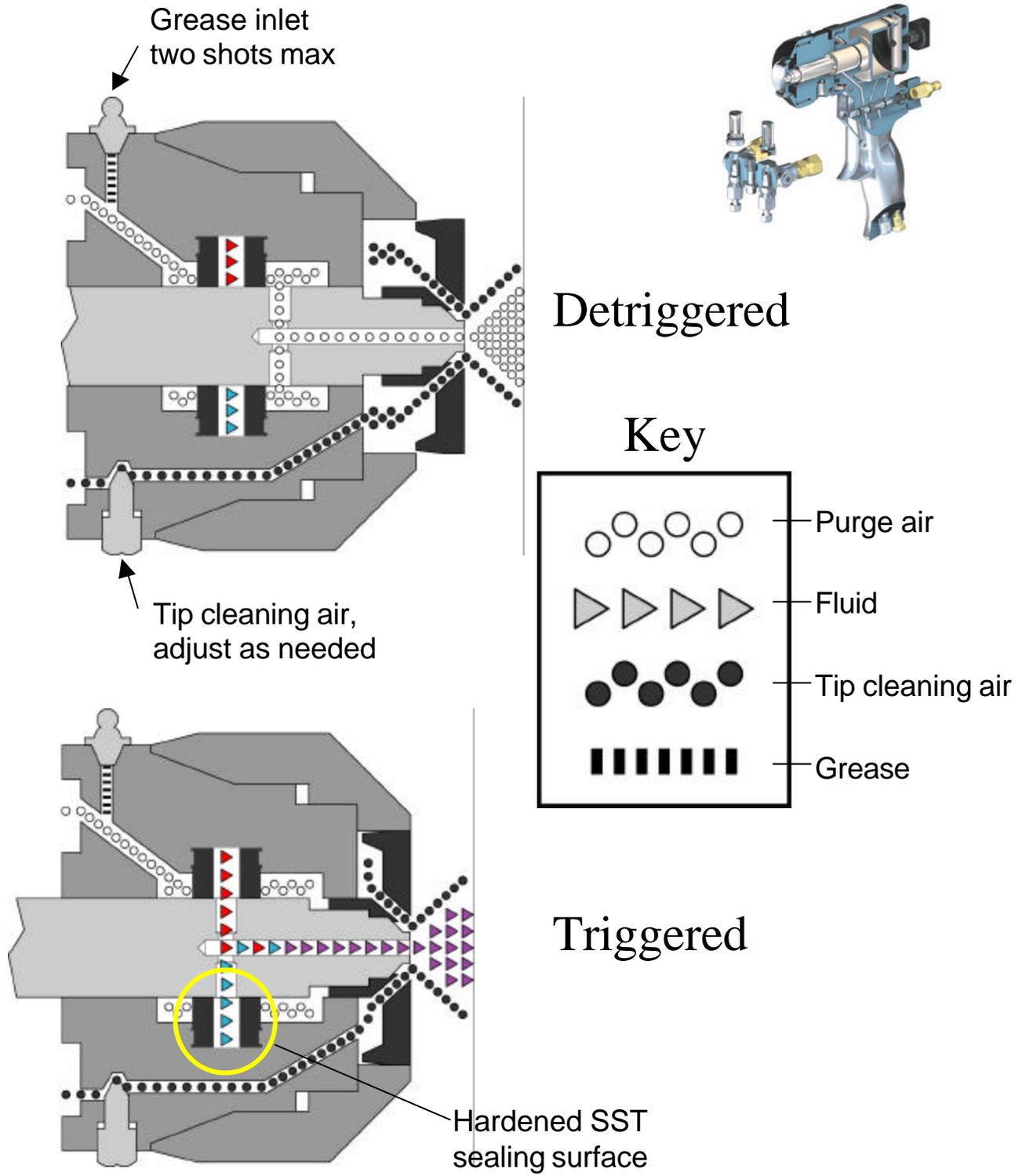
- ✍ Isocyanate very moisture sensitive, crystallizes, plugs filters, damages seals
- ✍ Keep material clean and dry, use desiccant dryers in drums
- ✍ If system not being used for 1-2 weeks purge or circulate material
- ✍ Park pump every night to immerse pump rods

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

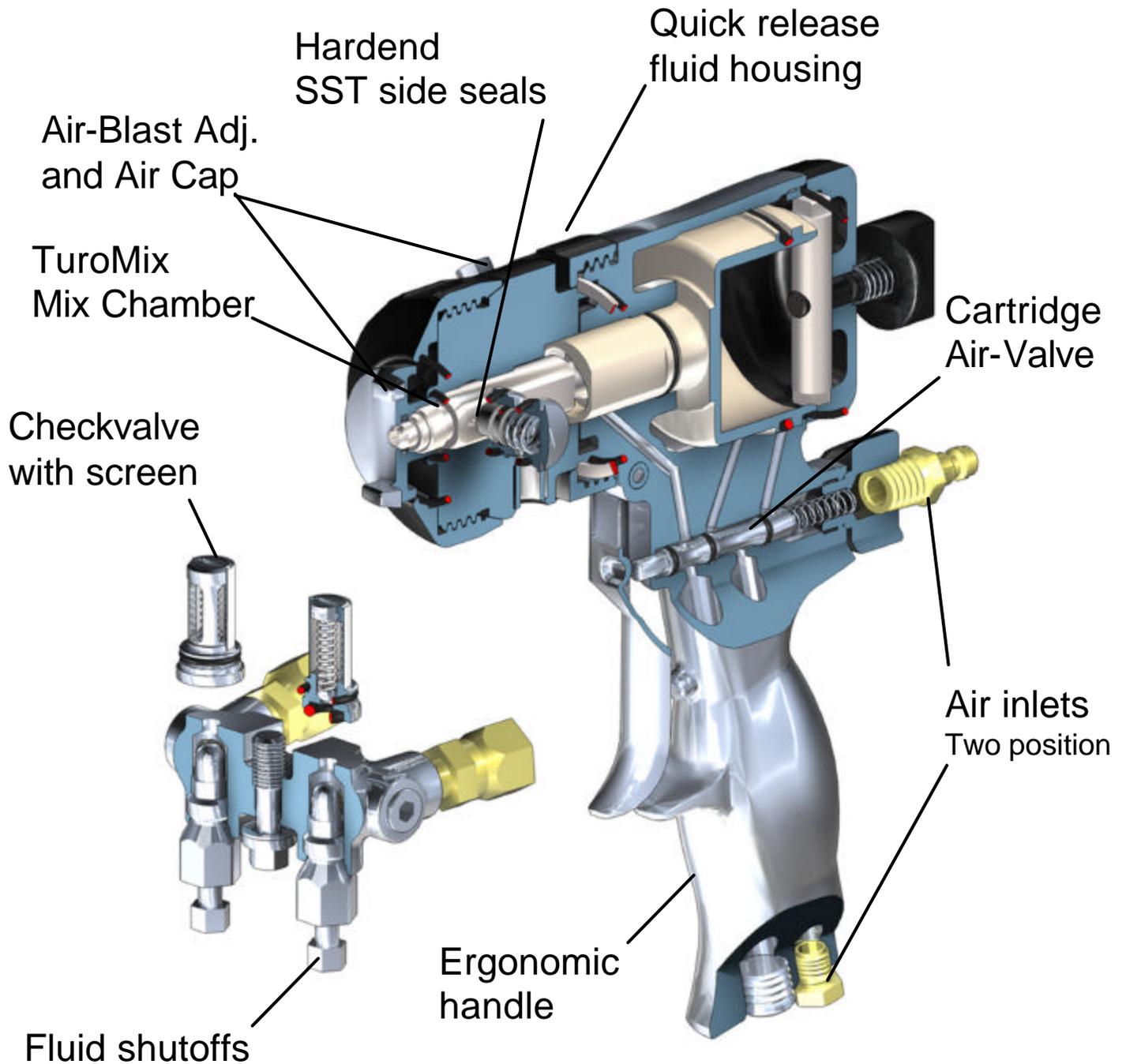
Fusion AP Air Purge Gun

cutaway view of gun operation



Fusion AP Air Purge Gun

cutaway view of gun



Fusion Mechanical Purge Gun Checklist

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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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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

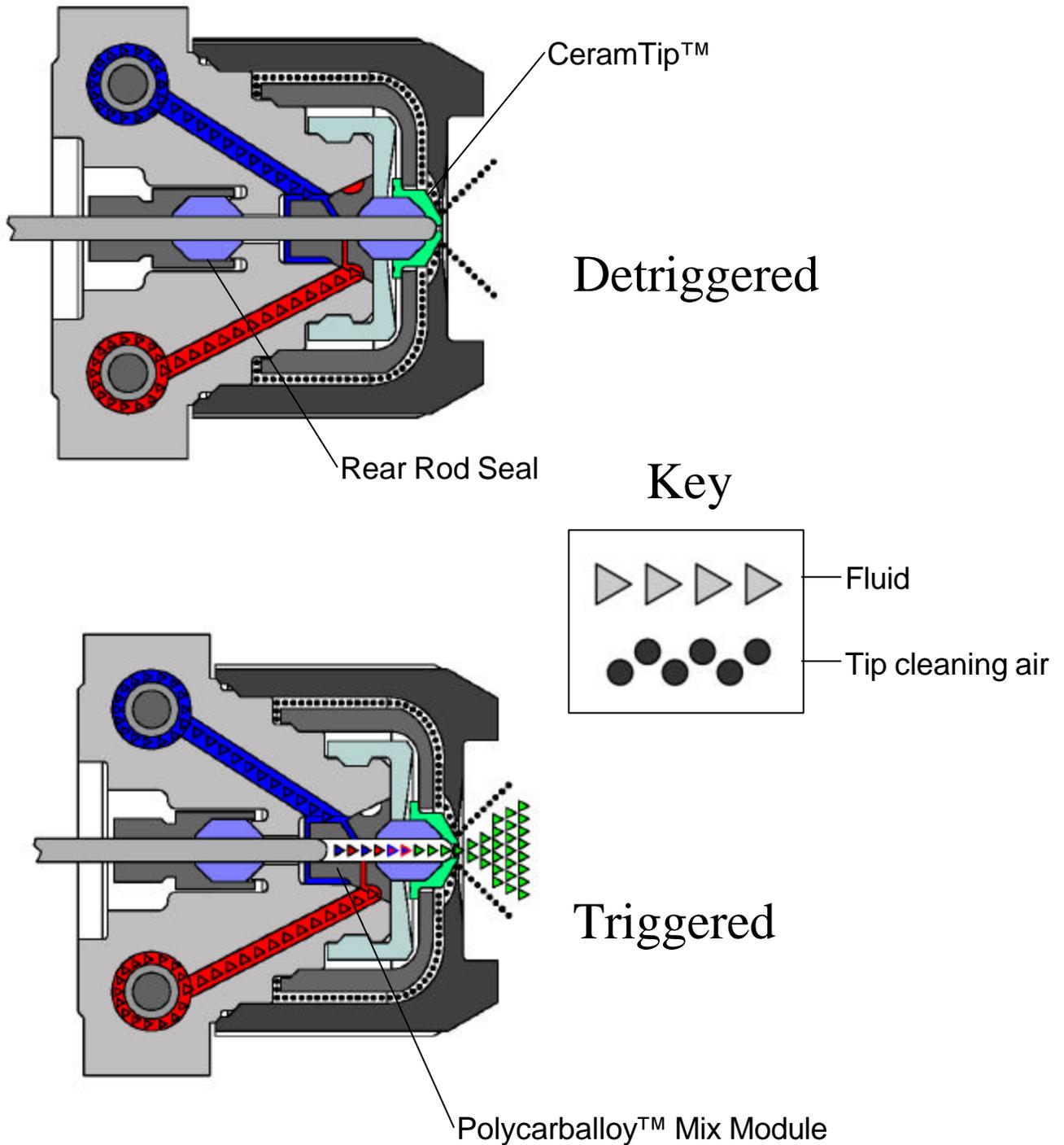
Accessories

- ✍ 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

