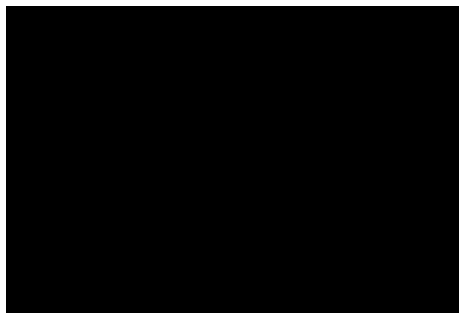
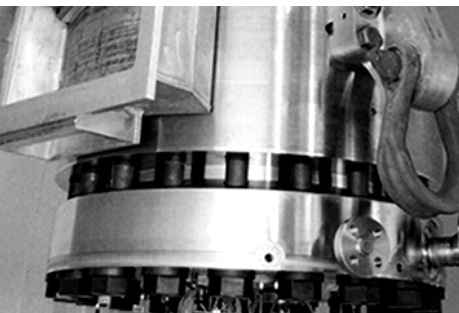


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Product Information Cards

Pop-A-Plug HX Repair Line



Smart Ram 640T Cordless Installation Tool

Solution Overview

Smart Ram 640T allows operators to quickly perform heat exchanger tube repairs without significant setup or breakdown time.

Features

- Self-contained battery-operated unit
- Long-lasting 3.0Ah Li-Ion Battery
- Info display with multi-user preset capabilities

Advantages

- Ideal for remote or confined spaces
- Ease of use – minimal set-up
- Long life – install up to 500 tube plugs on one battery
- Install with BAW or Pull-to-Pressure methods
- Battery Operated – no hydraulic lines required
- Portability - easy to transport from one site to another
- No trip hazards associated with hydraulic lines
- No pressurized equipment in confined spaces
- No leak hazards

Pop-A-Plug® Sizes

- **CPI/Perma:** V-471 to V-1212
- **P2:** P2-400 to P2-1160

Common Questions

Q: Is it intrinsically safe?

A: Smart Ram should not be used in an explosive atmosphere.

Q: How many plugs will it install on a charge?

A: Smart Rams have been used to install over 500 plugs on the same charge (~30 minutes charge time)

Q: Will my old plug positioners work?

A: Yes! Plug positioners are universally designed for all rams, provided the correct pull rod and positioning washer are used.

Q: Will the unit require maintenance or calibration?

A: No, but If unit is damaged, send back to us for repairs. Units produced 2024 or earlier show a 3 year or 10,000 cycle calibration note on their digital display – this can be ignored as the units are very robust with proper care.

Cross-sell / Up-sell Opportunity

- Pop-A-Plug Tube CPI/Perma and P2 Plugs
- ACHE Adapter
- Pop-A-Plug Tube Stabilizers
- Pop-A-Plug Removal Tool (PRT)
- Pull Rod Assemblies
- Pop-A-Plug Brushes
- Pop-A-Plug Tapered Reamers



Pop-A-Plug® CPI/Perma Medium Pressure Tube Plugs

Solution Overview

The CPI/Perma Pop-A-Plug is the premier engineered mechanical tube plug, sealing off leaking/high wall loss tubes in heat exchangers, condensers, feed water heaters, boilers, and other heat transfer units. Preferred by refineries, chemical plants, fertilizer plants, nuclear and conventional power plants around the world.

Features

- 1,000 PsiG (69 BarG) rating with 3x safety factor
- Three points of sealing contact
- Manufactured in over 40 different materials

Advantages

- Breakaway design prevents damage to tubes and tube joints
- Controlled installation, no damage to tubesheet
- Fast and efficient installation reduces unit downtime while increasing operating efficiency
- Does not require highly trained sub-contractors or techs
- Same installation force, procedure, safety, every time
- Meets ASME PCC-2 recommendations and EPRI criteria
- Lowest Lifecycle cost compared to alternative methods
- Maintains helium leak-tight seal of 1×10^{-6} cc/sec

Pop-A-Plug® Sizes

- **CPI/Perma:** V-471 to V-1944 (0.472 – 2.067", 11.99 – 52.5mm)
- **Expansion Range:** up to 0.060" (1.5mm)

Common Questions

Q: What materials does it come in?

A: CPI/Perma plugs are available in over 40 different materials!

Q: How many plugs come in a kit?

A: 10 plugs per kit, also comes with Go/No-Go gage, operating instructions, and a test certificate.

Q: Are they reusable?

A: No, but they are removable. The CPI/Perma Pop-A-Plug is a permanent solution but can be removed with the use of the Pop-A-Plug Removal Tool (PRT) if a customer wants to reclaim a tube later.

Q: Will the Pop-A-Plug damage the tube or tube sheet that it's plugging?

A: No, the Pop-A-Plug can be installed and removed without damaging your tubes or tubesheet joints.

Cross-sell / Up-sell Opportunity

- P2 Pop-A-Plug for higher pressure requirements
- Pop-A-Plug® Tube Stabilizers
- G-160 Tube Testers
- Installation tools:
 - Smart Ram 640T
 - PAP6600
 - PAP123RK
 - Close Quarter Ram



Pop-A-Plug® P2 High Pressure Tube Plugs

Solution Overview

Pop-A-Plug P2 tube plugging system maintains a leak tight seal under extreme thermal and pressure cycling. It reduces downtime, eliminates welding and explosives, and will not damage your tubes, tube joints or tube sheet.

Features

- Operating at pressures up to 7000 PsiG (483 BarG)
- Designed to maintain a helium leak-tight to 1×10^{-10} cc/sec.
- Available in over 35 alloys to best match your tube material
- ASME PCC-2 identifies PAP for heat exchanger tube plugging

Advantages

- Eliminates welding & need for pre-heat and post-weld stress relieving
- Breakaway ensures quick, easy and tightly controlled installation force, eliminating damage to tube joints and epoxy coated tube sheets
- Ideal for situations where tapered plugs are not appropriate:
 - Shell-side operating pressure 1.5 MPa (200 psi) or more
 - Shell-side operating temperature 205°C (400°F) or more
 - Tube-to-tubesheet joints are expanded but not welded
- Compliant with quality assurance systems including ANSI N45.2, 10 CFR 50 Appx. B, 10 CFR 21; Each lot is performance tested.
- Removable for retubing

Pop-A-Plug® Sizes

- **P2:** P2-400 to P2-1440 (0.400 – 1.460", 10.19mm – 37.1mm)
- **Expansion Range:** up to .020" (0.5mm)

Common Questions

Q: What options are there for installation tooling?

A: A variety of installation equipment is available to accommodate almost every situation: hydraulic, manual and battery driven solutions.

Q: Will the Pop-A-Plug P2 damage the tube or tube sheet that it's plugging?

A: No, the Pop-A-Plug P2 can be installed and removed without damaging your tubes or tubesheet joints.

Q: Can the Pop-A-Plug P2 and tube materials be different?

A: No. The plug and tube materials must closely match to accommodate thermal expansion and avoid problematic galvanic interaction.

Q: What is the average amount of time required to install a Pop-A-Plug P2 after the tube is prepped?

A: The average amount of time to do a full stroke and pop the breakaway is less than 15 secs.

Cross-sell / Up-sell Opportunity

- CPI/Perma Pop-A-Plug for broader expansion range
- Pop-A-Plug® Tube Stabilizers
- G-160 Tube Testers
- Installation tools:
 - Smart Ram 640T
 - PAP6600
 - PAP123RK
 - Close Quarter Ram



Pop-A-Plug® Tube Stabilizers

Solution Overview

Pop-A-Plug tube stabilizers eliminate the concern of broken tubes or loose cables causing additional catastrophic damage to the heat exchanger.

Features

- Available in rod or cable construction
- Consists of three parts, anchor, rod or cable & tip
- Bullet or wedge tip for damaged or broken tubes

Advantages

- 316SS construction to eliminate corrosion concerns
- Anchors prevent internal or external ejection
- Variable lengths for ease of installation
- Anchor installation using proven Pop-A-Plug technology
- Prevents fractured tubes from impacting adjacent tubes
- Effectively strengthens weakened tubes to prevent fracturing
- Reduces potentially harmful vibration in the bundle during operation

Pop-A-Plug® Anchor Sizes

- STA-500 to STA-940
- 0.501 – 0.96", 12.73 – 24.40mm

Common Questions

Q: When should I use cable and when should I use rods?

A: Cable should be used to stabilize weakened or damaged tubes and rods should be used to stabilize broken tubes.

Q: Why do I have to anchor the stabilizers?

A: Stabilizers are anchored to prevent the cable or rods from migrating out of the tube which can cause personnel injury or additional equipment damage.

Q: Can the anchors be used as tube plugs?

A: No, the anchors are not leak tested and must also handle any stabilizer vibration that could affect it's leak tightness.

Q: Do the tube plugs and stabilizer anchors use the same installation equipment?

A: Yes, the stabilizer anchors and the tube plugs will use the same installation ram and associated equipment. Note – the anchors will use a different sized plug positioner than the P2 plugs for the same tube.

Cross-sell / Up-sell Opportunity

- Installation equipment
- Pop-A-Plug tube plugs used in conjunction with stabilizer anchors.



PAP6600 Ram Package (Small Ram)

Solution Overview

Small Ram utilizes a compact, lightweight and easy to use design. Hydraulically operated, can be used in explosive environments, ideal for chemical/refinery plants with explosive environment concerns.

Features

- Operates on shop air supply – 40 to 125 PsiG (2.7 to 8.6 BarG)
- Controlled, repeatable installation reduces operator fatigue
- Manufactured in ISO 9001:2015 registered facility

Advantages

- Easy to use
- Hydraulically install PAP in minutes
- Intrinsically safe, can be used in explosive environments
- Pump features rugged glycerin-filled 10,000 PsiG pressure gauge
- Safely install plug sizes from 0.471" up to 1.336" (11.99mm to 33.93mm)

Pop-A-Plug® Sizes

- **CPI/Perma:** V-471 to V-1212
- **P2:** P2-400 to P2-1160

Common Questions

Q: What plugs that the PAP600 Ram could install?

A: For CPI plug, V471 to V1212. For P2, P2400 to P21160.

Q: Will my Smart Ram plug positioners work?

A: Yes! Plug positioners are universally designed for all rams, provided the correct pull rod and positioning washer are used.

Q: Is it easy to use the PAP6600 Ram Package?

A: Yes! Please refer to our Installation Procedure DC1220.

Q: Can I use PAP6600 Ram as brushing tool?

A: No. PAP6600 Ram is designed to install Pop-A-Plug. It is not an electric drill.

Q: Is it intrinsically safe?

A: Yes, PAP6600 Ram can be used in an explosive atmosphere.

Cross-sell / Up-sell Opportunity

- Pop-A-Plug Tube CPI/Perma and P2 Plugs
- Pop-A-Plug Tube Stabilizers
- Pop-A-Plug Removal Tool (PRT)
- Pull Rod Assemblies
- Pop-A-Plug Brushes
- Pop-A-Plug Tapered Reamers



PAP123RK Ram Package (Medium Ram)

Solution Overview

PAP123RK medium hydraulic air operated ram assembly performs heat exchanger repair and covers our entire range of standard Pop-a-Plugs from 0.472" to 2.067".

Features

- Compact and easy to use
- Operates on plant air supply of 40 to 125 PsiG (2.7-8.6 BarG)
- Able to install our entire range of both CPI/Perma and P2 Pop-a-Plugs
- 3" of stroke

Advantages

- Compact and easy to use
- Streamlined cylindrical design
- 12 Ton Ram Assembly
- Install with BAW or Pull-to-Pressure methods
- Can be used for Through-the-Tube Plugging, up to 40' tube lengths (6' tube lengths for RCH123)
- Portable – easy to transport from one site to another
- Controlled, repeatable installation force

Pop-A-Plug® Sizes

- **CPI/Perma:** V-471 to V-1944
- **P2:** P2-400 to P2-2000

Common Questions

Q: Is the medium ram a lot larger than the small ram?

A: While the medium ram is longer, it has a smaller horizontal profile.

Q: Are the pull rod assemblies the same for the medium ram and the small ram?

A: The medium ram pull rods are specific for the medium ram and are not interchangeable.

Q: Does the medium ram use the same hydraulic pump and hose assembly as the small ram?

A: Yes, both ram assemblies utilize the same pump and hose assembly.

Q: Can the medium ram be used for Through-the-Tube Plugging, what is the maximum length of tube?

A: The medium ram assembly can be used for Through-the-Tube plugging of HX up to 60' in length.

Cross-sell / Up-sell Opportunity

- Pop-A-Plug Tube Plugs
- Pull Rod Assemblies
- Pop-A-Plug Brushes
- Pop-A-Plug Tapered Reamers
- Through-the-Tube Plugging with CPI Plugs



Smart Ram 640T ACHE Adapter

Solution Overview

Eliminate the cost, hassle, and difficulty of welding in tapered pins – instead, use Curtiss-Wright EST Group's Smart Ram to install Pop-A-Plugs!

Features

- Working pressures to 7000 PsiG (480 BarG)
- Helium leak tight to 1×10^{-10} cc/sec
- 12" (30.5 cm) extension length

Advantages

- Lowest installed cost compared to other methods
- Installed plugs will not leak or eject under pressure
- No hot work permits or welding required
- Return units to service as fast as $1/10^{\text{th}}$ the time of welding
- Precise and uniform plug installation
- No damage:
 - Header box plug threads
 - Tubes
 - Tube joint or tubesheet
- No foreign material left after installation

Pop-A-Plug® Sizes

- **CPI/Perma:** V-471 to V-1212
- **P2:** P2-400 to P2-1160

Common Questions

Q: Will I need to use a different type of Pop-A-Plug for ACHE units?

A: No, the same Pop-A-Plugs can be used on ACHE applications.

Q: Is setting the Smart Ram 640T to a pull-to-pressure configuration difficult?

A: A pull-to-pressure configuration can be set up in a few short steps.

Q: Do I need to purchase separate breakaways for the ACHE adapter?

A: No, each ACHE adapter will come with a fixed pulling stud.

Q: Do I need a different ACHE adapter for different materials (i.e. C, S, B)?

A: ACHE adapters will be size specific regardless of material.

Q: Does EST Group offer other tools for ACHE applications?

A: Yes, we can provide extended tools for all ACHE needs.

Cross-sell / Up-sell Opportunity

- Smart Ram 640T
- Pop-A-Plug CPI/Perma Plug
- Pop-A-Plug P2
- G-160 Tube Testing Tool
- Plug Removal Tool



G-160 Tube Testers

Solution Overview

Early detection of leaking tubes in heat exchangers, boilers and condensers is essential to avoiding costly downtime.

Features

- Rapidly detect leaks while providing a safer environment for plant personnel
- Safely test up to 10 tubes per minute
- Patented gripper design provides added safety
- High-quality neoprene seals
- Fully protected gauges – analog & digital available

Advantages

- Early detection of leaking tubes
- Avoiding costly downtime
- Patent-pending gripper
- Operates with compressed air
- Interchangeable Seal & Washer Sets
- Ergonomic design with push-button air injection valve
- Lightweight aluminum construction (1.9lbs. / 0.9kg. ea.)

Size Range (Incremental size Seal/Washer sets)

- 0.27" – 2.50" (6.9mm – 63.5mm)

Common Questions

Q: Will the system also work with Air Cooled Heat Exchangers?

A: Yes, with the extended support tube and an ACHE Backup Washer set.

Q: Why is there a GSAREG and or GSA1610 on my quote?

A: For GSA0028N to GSA0047N Seal/Washer sets. Smaller support tubes are needed (2x) for tube ID's .28-.50". (7.1mm-12.7mm) These require use of a regulated air supply for a maximum 60 PsiG / 4.14 BarG test pressure.

Q: Are the grippers required?

A: No, not for GSA-0050N to GSA0112N.

Yes, for GSA0115N and larger the use of support tubes GSA1612 to GSA1614 with Grippers is mandatory. Seal/washer sets starting with GSA0126 and larger have code NS at the end of the part number.

Q: What the maximum air test pressure?

A: For GSA0050N and larger 125 PsiG / 8.62 BarG 2.50.

Cross-sell / Up-sell Opportunity

- GSA Seals
- Gripper Assembly
- Support rod extensions
- GSA-REG (0.28" – 0.50")



Thank You

Contact our sales team to request a sales quote, place your order, or get more information on EST Group's Products and Services

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