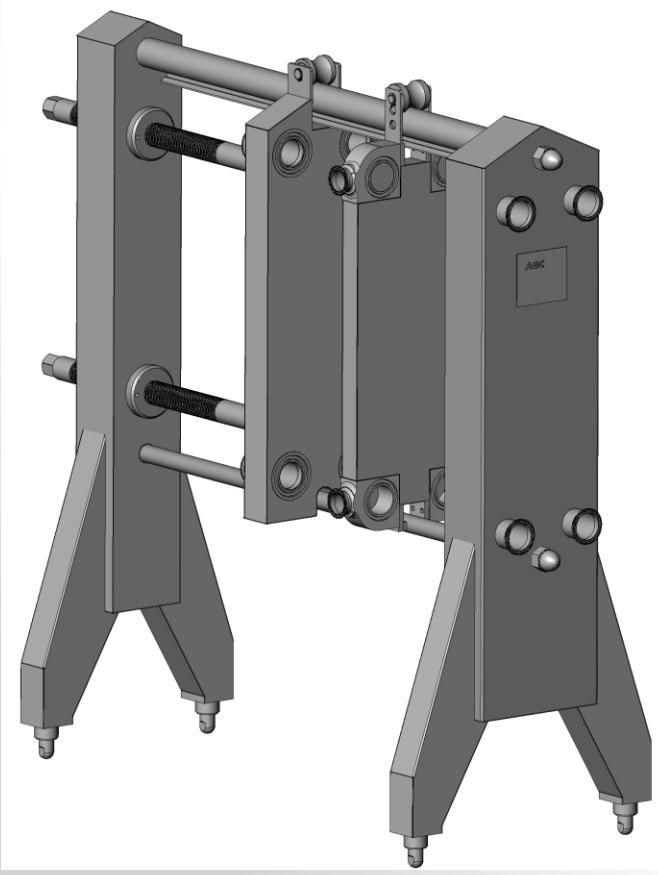
AGC™
HEAT TRANSFER

AGC Model Pro21-M

Operation and Maintenance Manual



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Scope:

This manual is intended to be a supplement to the **AGC Heat Transfer** Proflow Operation Manual. The information provided here is for the normal operation and installation of the AGC Model Pro21-M Plate Heat Exchanger. Please read and follow all safety instructions contained in this manual. Failure to follow all safety recommendations could result in serious injury to the operator or cause damage to the press. If you need additional information or spare parts for this or any other equipment built by AGC please contact your local AGC distributor.

Receiving and Inspection:

Each AGC frame is assembled and fully tested at the factory prior to shipping. After testing, the unit is prepared for shipping. When the press leaves the factory it is in perfect condition. Upon arrival, carefully inspect the frame for any damage that may have occurred during shipping. If the frame was damaged during shipping report this to AGC immediately. In most cases the frame is shipped assembled with the plates in a separate crate. Because each frame can weigh over 2,500 pounds, only qualified and licensed forklift truck drivers should lift and position the frame. Figure 1 shows the major frame components. Depending on the application, your frame may or may not be equipped with one or more terminals.

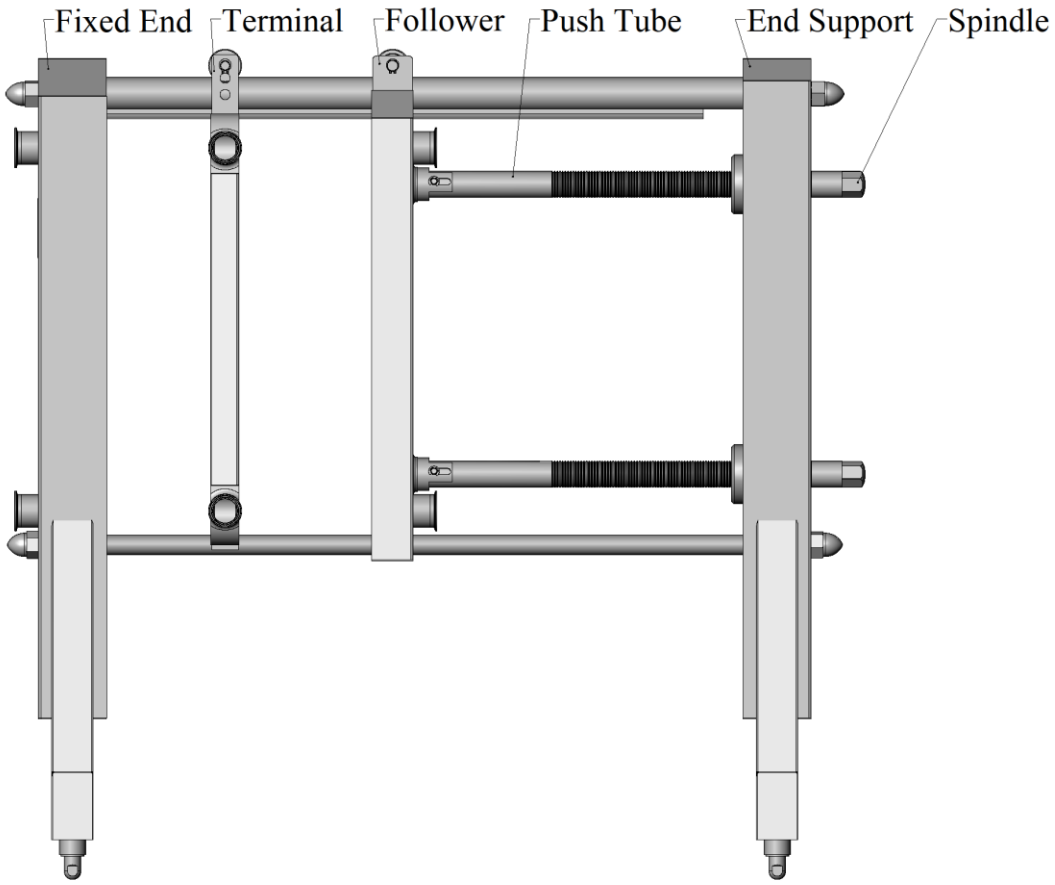

Figure 1
Major Frame Components

Locate the drawing package that was shipped with your frame. This drawing package contains important information specific to your frame. If your frame was delivered without a drawing package, contact AGC or your local AGC distributor for a replacement package prior to installing the frame.

Frame Placement:

The Pro21-M frame should be located on a firm flat surface capable of supporting the press and all of its contents when full. Ensure that adequate space is left around the frame for maintenance and plate installation/removal. The drawing package will show the clearance required for the spindle shafts to be fully retracted. This is the required minimum dimension for the end support.

Each frame is equipped with adjustable ball feet to compensate for minor floor variations. To adjust the ball foot height, turn the base of the foot clockwise to raise and counterclockwise to lower. **CAUTION**: Never exceed the maximum port height dimension shown on the streaming diagram. If this dimension is exceeded, the leg could disengage from the socket and the frame could tip.

When moving the frame, the top rail can provide a good lifting point. However, when using the top rail as a lifting point, exercise caution to prevent damaging the plate hanger. Do not attempt to lift a frame using the port nozzles as a lifting point. Lifting a frame by the port nozzles could crack the nozzles causing leaks. Moving a frame that is fully populated with plates is not recommended.

Normal Operation:

The Model Pro21-M Plate Heat Exchanger is a twin spindle manual closure press. The closing force is developed by turning the two spindle screws on the end support (see figure 2). The spindle screws have a hex machined on the end to accommodate the AGC Fatboy™ wrench. This wrench is sized specifically to provide an efficient means for opening and closing of the Pro21-M press. As with all plate heat exchangers, the unit must be cooled below 90º F and relieved of all internal pressure before opening. **Failure to follow this safety warning could result in serious injury to the operator or damage to the heat exchanger.**

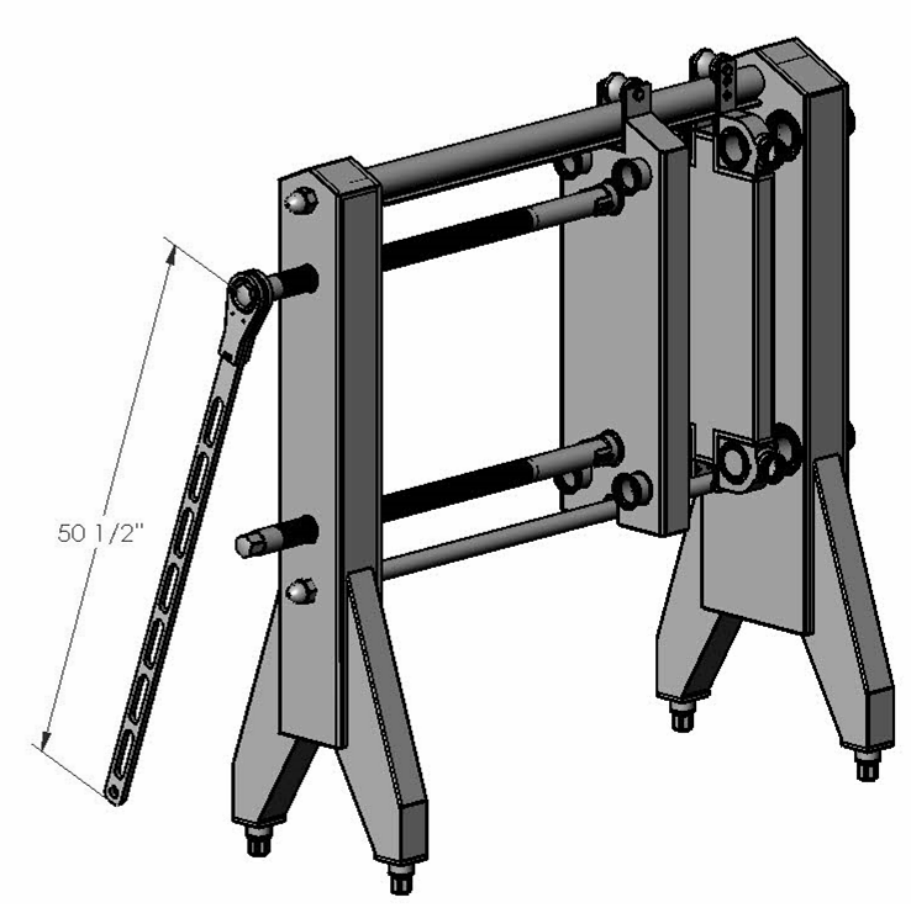

Figure 2
Open/Close Space Requirement

Closing the Frame:

After all the plates and any terminals are installed into the frame it can be closed. Refer to the streaming diagram that was provided with the heat exchanger to determine the proper plate configuration and piping requirements. Figure 3 shows where this information is listed on the drawing. Note: The dimensions for each frame will be listed on the streaming diagram shipped with that frame.

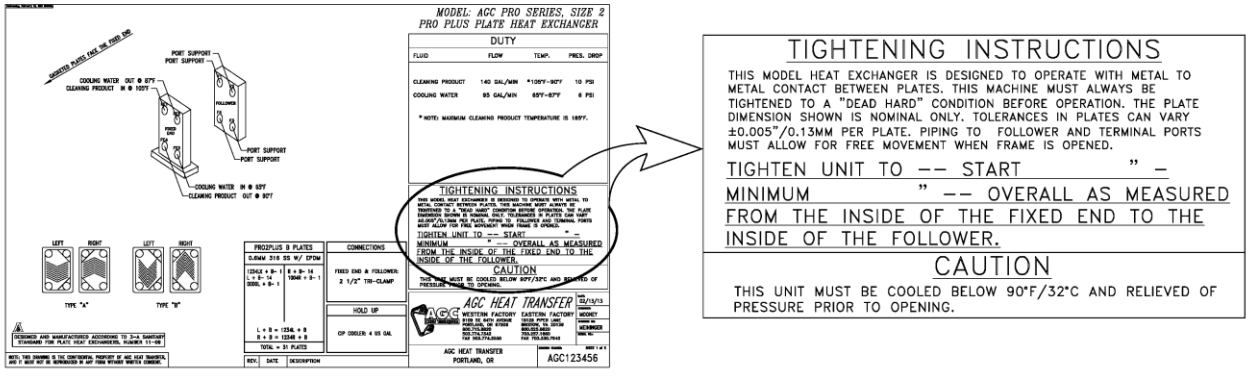

Figure 3
Streaming Diagram Sample

To close the frame, turn the spindle screws clockwise. It is important when closing the press that each screw shares the load equally. At no time should the screws be engaged at drastically different lengths. This could cause damage to the plates or to the spindle screws. When checking the heat exchanger closed dimension, it is important to check in two locations as shown in figure 4.

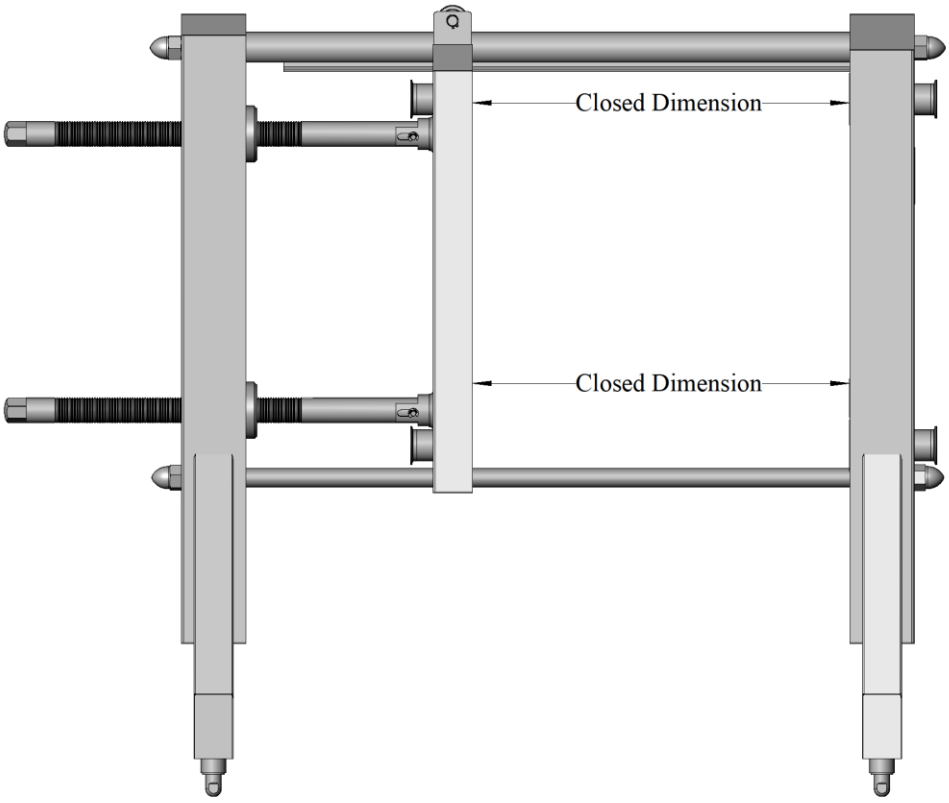

Figure 4
Tightening Dimension

The heat exchanger should be pressure tested to check for leaks. If the pressure check passes, the frame is ready to be put into service.

Opening the Frame:

To open the frame, rotate the spindle screws counterclockwise. As with closing, alternate between each spindle to ensure even opening. The follower will move back as the plate pack expands to its uncompressed state. As the spindles retract, the pushtubes may disengage from the spindles. This could allow the pushtube to rotate about the supporting pin causing the push-tube to swing down (see figure 5). Caution should be exercised when opening the frame to prevent injury by the pushtube.

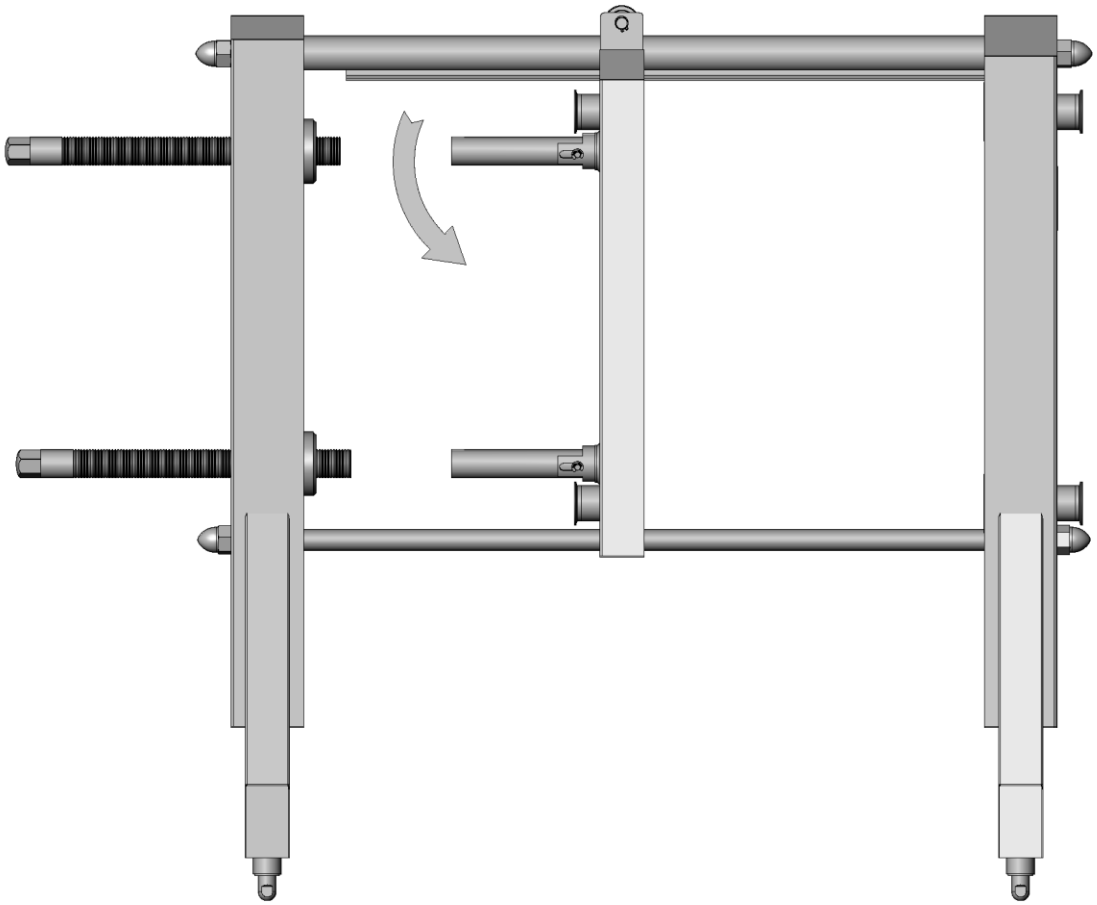

Figure 5
Pushtube Swing

When retracting the spindles, it is recommended to back the spindles out only to the point that the plates can be removed.

Upgrading a Manual Frame:

AGC offers a fully automatic end support that could be added to your Pro21-M frame. If you are upgrading a manual frame by installing the AGC Model Pro21-H end support it will be necessary to remove the manual end support. The procedure described here is a basic overview of the steps necessary to complete this task. It is assumed that the persons performing this work are qualified in the safe handling of heavy machine components. Great caution must be exercised when removing the component parts of the Pro21. The follower is the heaviest component, weighing in excess of 400 pounds, and could cause serious injury if mishandled.

Prior to opening the frame all pressure should be relieved and the frame must be cooled to a safe opening temperature. After the frame is cooled below 90° F the plates, terminals if any, and follower must be removed. To remove the terminals and follower, the frame should be stood upright on flat stable ground. The terminals are held in place by one stainless steel support pin.

Removing the Terminal:

1. Support the weight of the terminal with rigging suitable to support 500 lbs. At the factory a cinch-type sling and a forklift truck are used. The cinch strap is placed approximately in the center of the terminal and then a forklift is used to lift the terminal slightly. The roller pin is then removed. The port nozzles are not suitable lifting points. Attempting to lift the terminal by the nozzles could damage the nozzles.
    a. To remove the roller pin first remove the circlip and set collars.
    b. Slide the pin out of the roller.
    c. Tilt the terminal bottom until the terminal clears the bottom rail.
    d. Lower the terminal until the hanger clears the top rail.
2. Repeat step one above for all other terminals.
3. The procedure for removing the follower is similar to removing the terminals. As with the terminals, the port nozzles are not suitable lifting points. Attempting to lift the follower by the nozzles could damage the nozzles causing internal leaks in the follower.
4. Using rigging capable of supporting 500 lbs, support the weight of the follower. As with the terminals, a cinch strap is used to support the follower.
    a. Lift the follower enough to remove the support pins. Once the support pins and rollers are removed, tilt the bottom of the follower enough to slide it over the bottom rail.
    b. Remove the follower from the frame.

The next step is to remove the manual end support. This is accomplished by laying the frame on its side supported by blocks. One set of blocks should be 18½" tall. The other should be 24⅜" tall. The shorter blocks will support the fixed end. The larger blocks should be placed under each rail.

Once the frame is supported on the ground, the end support can be removed by removing the two large acorn nuts holding the rails. Using a forklift carefully slide the end support off the rails.

The Pro21-H end support can now be installed by carefully sliding the end support onto the rails. After the end support is on the rails the acorn nuts can be replaced. The top rail is tightened down hard, however the **bottom rail is tightened only enough to ensure the frame**

members are parallel. Over-tightening the bottom rail will damage the rail cladding and prevent the frame from operating properly.

Operator Maintenance:

The unit is designed to operate reliably with little operator maintenance. However, when servicing the frame observe all lockout/tagout regulations prescribed by your company. In addition, you should **NEVER OPEN THE PRESS WHEN IT IS PRESSURIZED OR WHEN HOT**. The press must be cooled below 90° F prior to opening.

Press Monthly Lube/Inspection:

1. Lockout/Tagout the voltage supply to the press.
2. Inspect the spindle shafts for signs of wear.
3. Apply food grade grease to the exposed threads of the spindle shaft.
4. Inspect the plate pack for signs of leaks.
5. Inspect port connections for signs of leaks.
6. If no problems are found remove lockout/tagout device and return press to service.

Parts List:

Replacement parts for the Model Pro21-M can be ordered from AGC or your local AGC distributor. Most parts are in stock and can be shipped within 24 hours from time of order. Some components have had engineering revisions, so when ordering spare parts be sure to have your unit specific information available.

Contact information is provided below or visit our website for more information:

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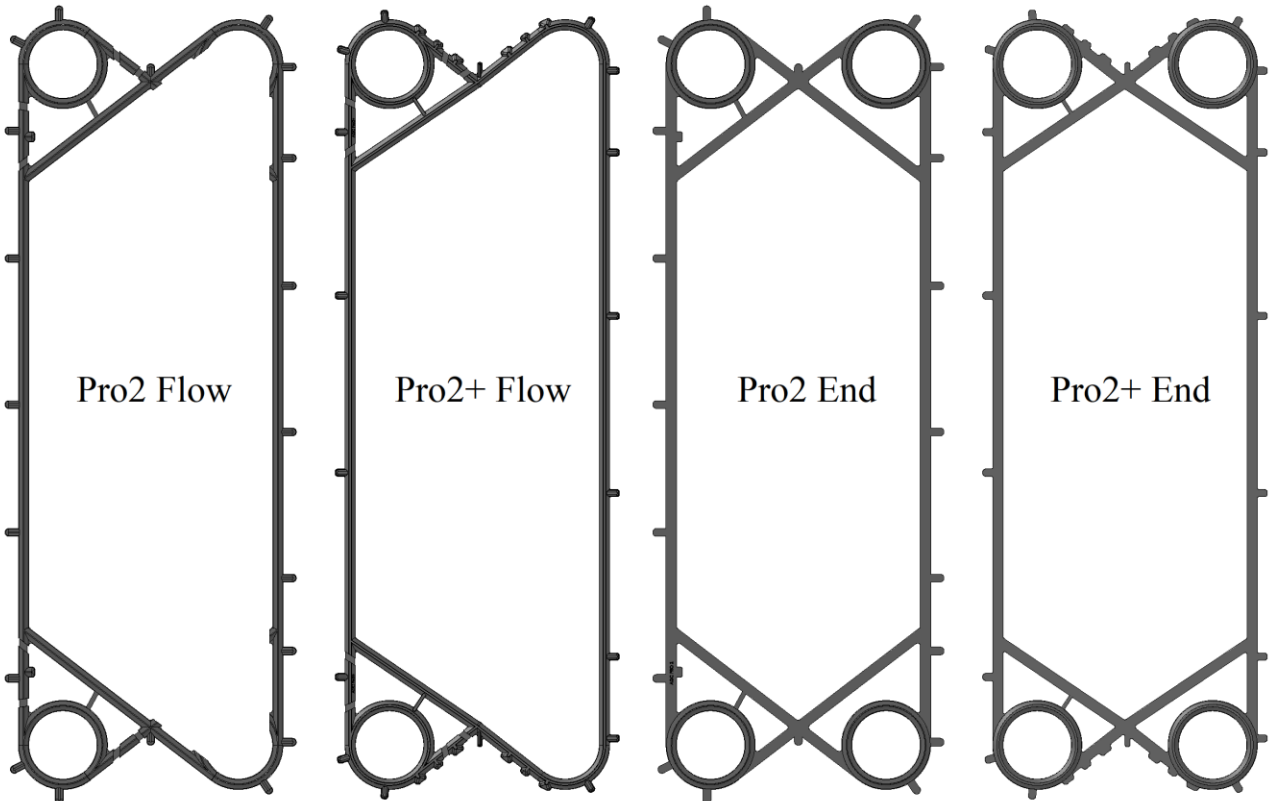
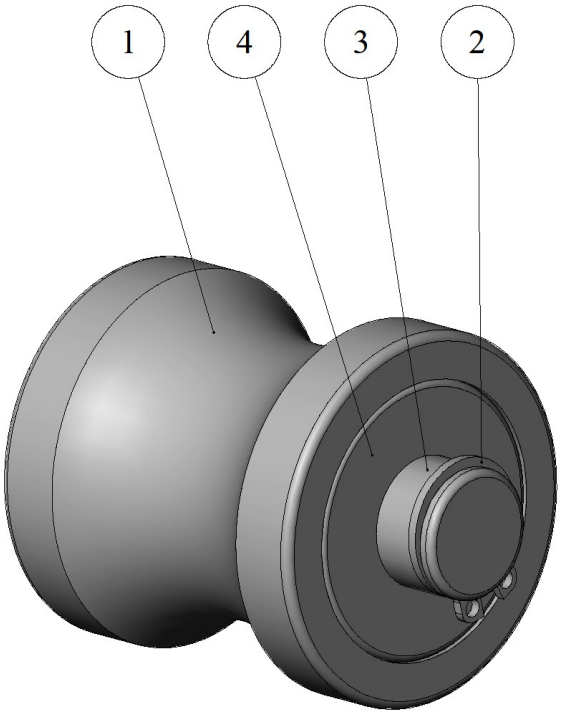


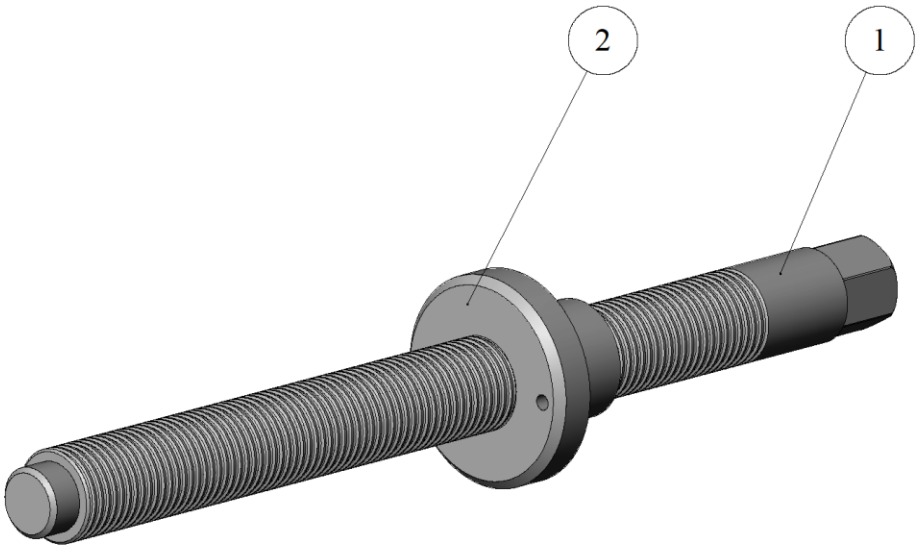
Gasket Type	NBR Part Number	EPDM Part Number
Pro2 Flow	AGPRO201N	AGPRO201E
Pro2+ Flow	AGPRO2P01N	AGPRO2P01E
Pro2 End	AGPRO202N	AGPRO202E
Pro2+ End	AGPRO2P02N	AGPRO2P02E
Pro2 Port	AGPRO203N	AGPRO203E

Pro2 Plate and Frame Gaskets



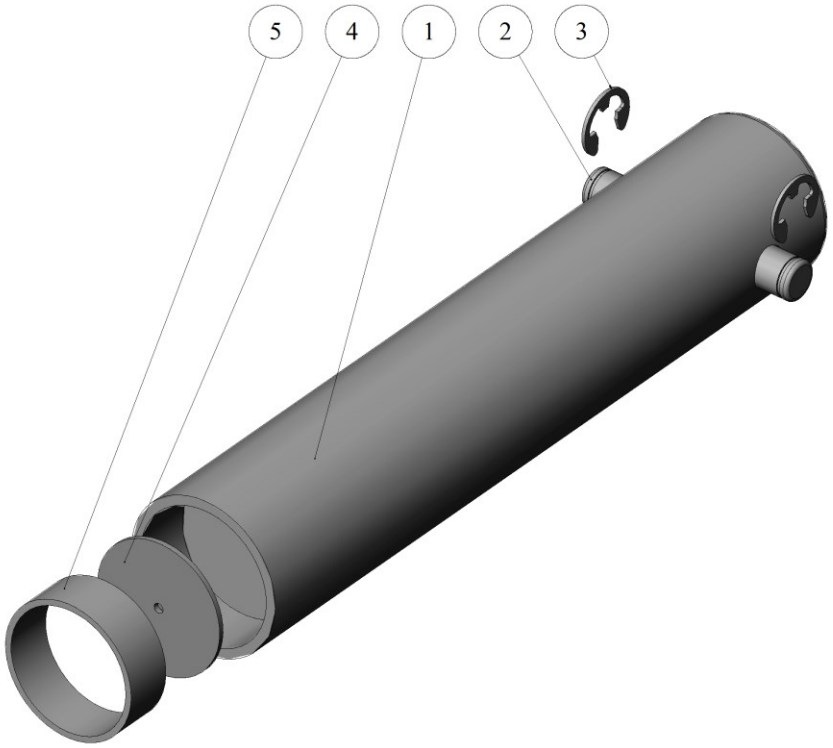
Item	Quantity	Part Number	Description
1	1	11110436	Pro21 Follower Roller
2	2	5100-87H	Stainless Steel Snap Ring
3	1	11012653	Pro21 Roller Pin
4	2	SSR14-2RS	Stainless Steel Ball Bearing

Pro21 Follower Roller Assembly
(AGC P/N 11110497)



Item	Quantity	Part Number	Description
1 (a)	1	11110484	Pro21 Spindle 22 Inch nominal length
1 (b)	1	11110501	Pro21 Spindle 32 Inch nominal length
2	1	11110403	Pro21 Spindle Thrust Nut

Pro21 Spindle Nut Assembly



Item	Quantity	Part Number	Description
1 (a)	1	11110525	Pushtube Base 10 Inch (nominal length)
1 (b)	1	11110526	Pushtube Base 14 Inch (nominal length)
1 (c)	1	11110527	Pushtube Base 18 Inch (nominal length)
2	1	11110482	Pushtube Pin
3	2	395133-50H	Stainless Steel E-Ring Retainer
4	1	11110483	Pro21 Pushtube Thrust Disk
5	1	11110485	Pro21 Pushtube Retainer Ring

Complete Pushtube Assembly	Part Number
10 Inch Overall Length	11110520
14 Inch Overall Length	11110521
18 Inch Overall Length	11110522

Pro21 Push Tube Assembly

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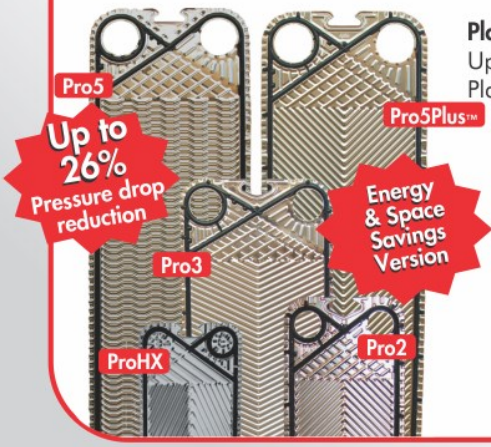

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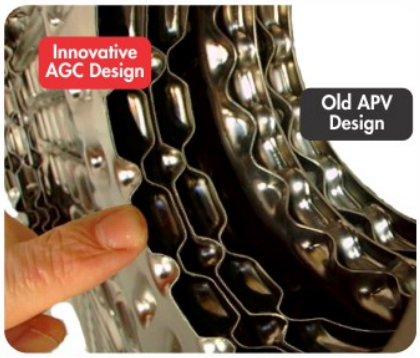
AGC Snap-in Gasket



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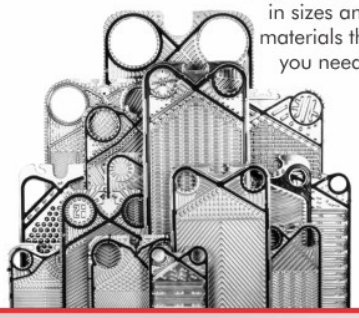

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