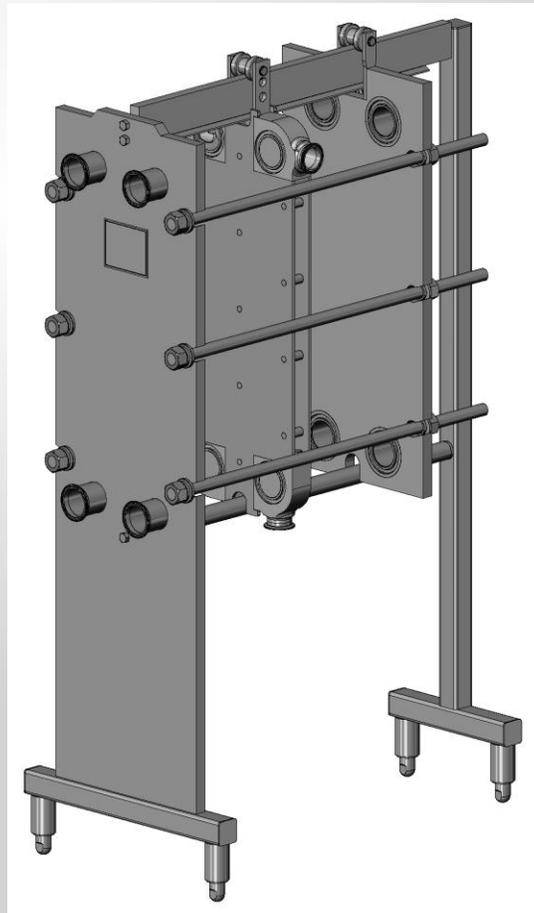




AGC Model Pro2-XP

Operation and Maintenance Manual



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Scope:

This manual is a supplement to the AGC Heat Transfer ProFlow plate heat exchanger manual. We recommend you read the ProFlow manual first because it will provide you with a basic understanding of plate heat exchangers and define the technical terms used in this manual. The information provided within this manual describes the installation, operation, and maintenance of the AGC Heat Transfer Pro2-XP and Pro2-XPB heat exchangers.

Please read this manual carefully before installing your heat exchanger. Pay particular attention to the safety instructions and the initial startup procedures. Failure to follow all safety recommendations could result in injury to the operator or cause damage to the heat exchanger.

Receiving and Inspection:

Each AGC heat exchanger is assembled and fully tested at the factory prior to shipping. Once the unit has successfully passed all tests it is prepared for shipping. Every AGC heat exchanger is thoroughly inspected to ensure it is in perfect condition before leaving the factory. Upon arrival, carefully inspect your new heat exchanger for any damage that may have occurred during shipping. If the press was damaged during shipping be sure to annotate the damage on the shipping documents and report the damage to AGC immediately. To aid you in describing where the damage may have occurred figure one shows the major components of a typical tiebolt style frame.

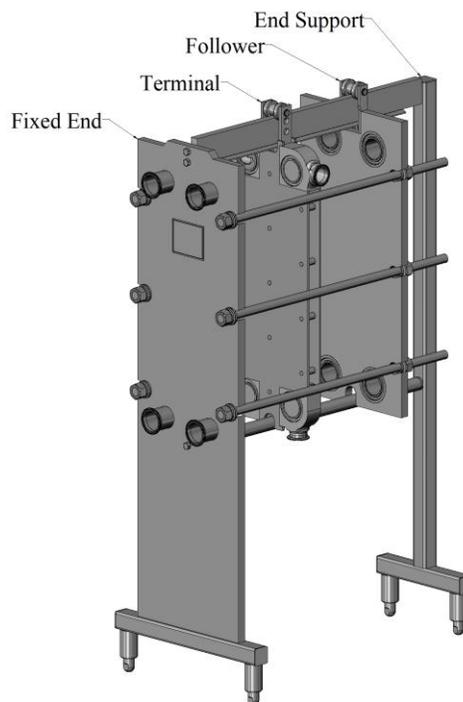


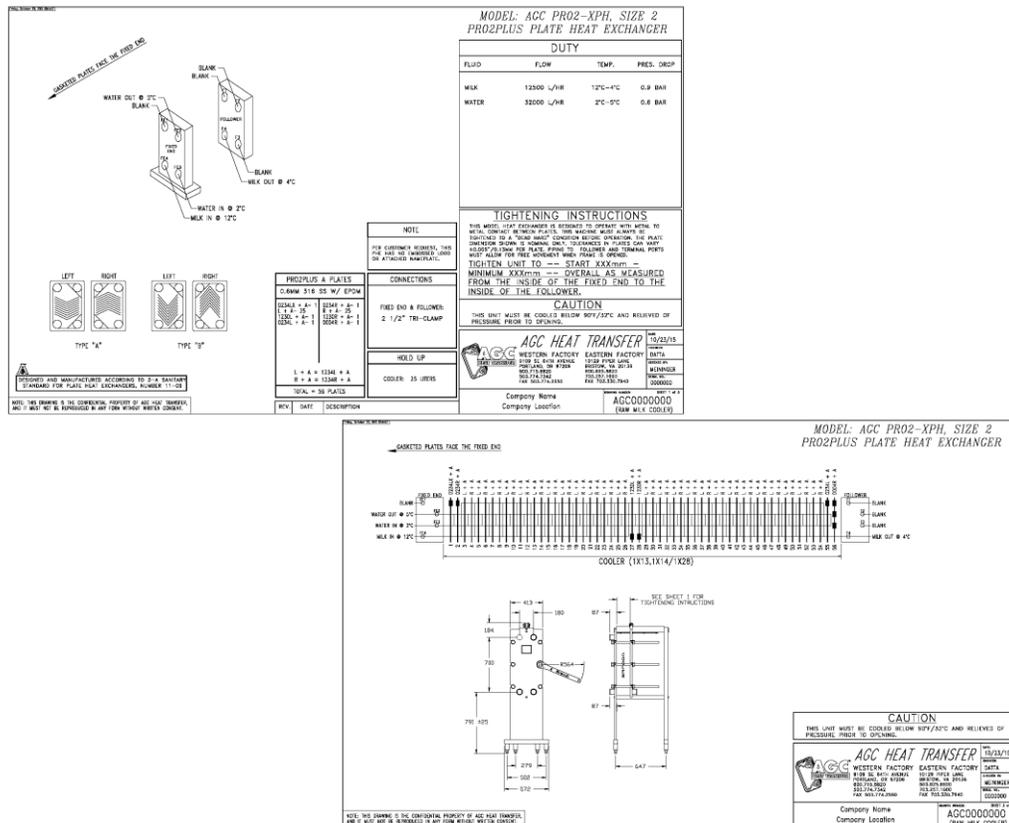
Figure 1
Major Frame Components

Typically, tiebolt style frames are shipped on a skid with the plates installed. Because the press can weigh several hundred pounds, only qualified forklift drivers should lift and position it. High leg frames such as the Pro2-XPB can be top heavy and could tip if not handled properly.

Drawing Package:

Every frame is shipped with a drawing package. This drawing package contains important information that is specific to your heat exchanger. If you cannot find the drawing package, contact AGC Heat Transfer or your local AGC distributor to obtain a replacement prior to installing the heat exchanger.

The drawing package is a collection of several important documents related explicitly to your heat exchanger. The first of these is the streaming diagram. Two copies of the streaming diagram are provided with every new heat exchanger. One copy has been laminated and is intended to be used by production and maintenance personnel when servicing the heat exchanger. The other copy should be kept on file in a safe place in the event the production copy is lost or damaged. The streaming diagram (also referred to as the drawing) describes all the characteristics of the heat exchanger. Figure 2 shows a typical two page streaming diagram.



**Figure 2
Typical Streaming Diagram**

Page one shows the unit serial number, the duty, plate type, plate count, gasket type, connection type, connection size, and the tightening dimension. If the heat exchanger has been re-streamed, a revision block will also be included.

Page two of the drawing shows how the fluids pass through the heat exchanger. If the unit is small, such as the unit in figure two, a front and side view of the heat exchanger will be shown on page two. For larger units the front and side views are shown on page three or page four.

The second document in the drawing package is a plate punching diagram. This diagram will help you identify the configuration of each plate either by the number stamped at the top of the plate or by the ports that have been opened. The ProFlow manual describes how these different types of plates are used.

The final document in the drawing package is the ProFlow manual. The ProFlow manual has information about the AGC Heat Transfer product line and a more in-depth discussion about plate heat exchangers in general.

Frame Placement:

The Pro2-XP frame should be located on a firm flat surface capable of supporting the press and all of its contents when full. If possible the frame should remain strapped to the shipping skid until it is near its final location. Once the press is positioned cut the metal bands holding it to the shipping skid and, using an appropriately sized lifting strap, carefully lift the press off the skid. The top rail can be used as a lifting point. Never lift the press by the tiebolts. These bolts are in slots and are not designed to support the weight of the frame for lifting. When locating the heat exchanger, ensure that adequate space is left around the frame for maintenance and plate installation/removal. Also include enough space to allow the AGC Fat Boy™ wrench to fully swing. See figure 3.

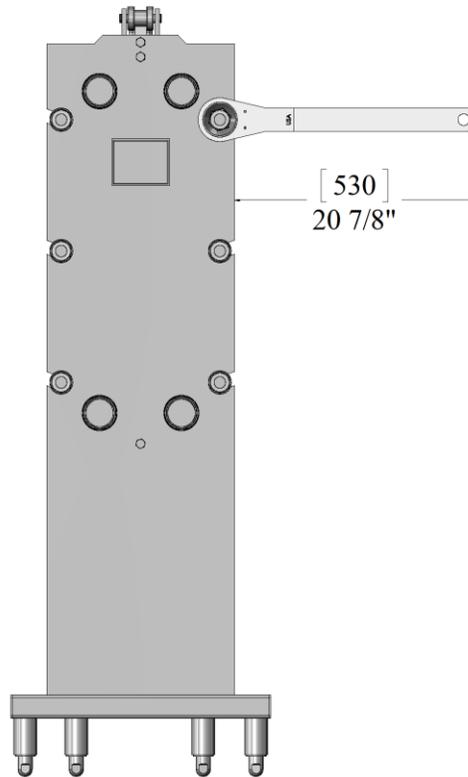


Figure 3
Wrench Space Requirement

The Pro2-XP and Pro2-XPB are equipped with adjustable ball feet. These feet are adjusted by turning the base clockwise to lower and counterclockwise to raise the press. The ball feet should be adjusted so the ports are level from side to side. Figure 4 shows a spirit level placed across the ports to establish level.

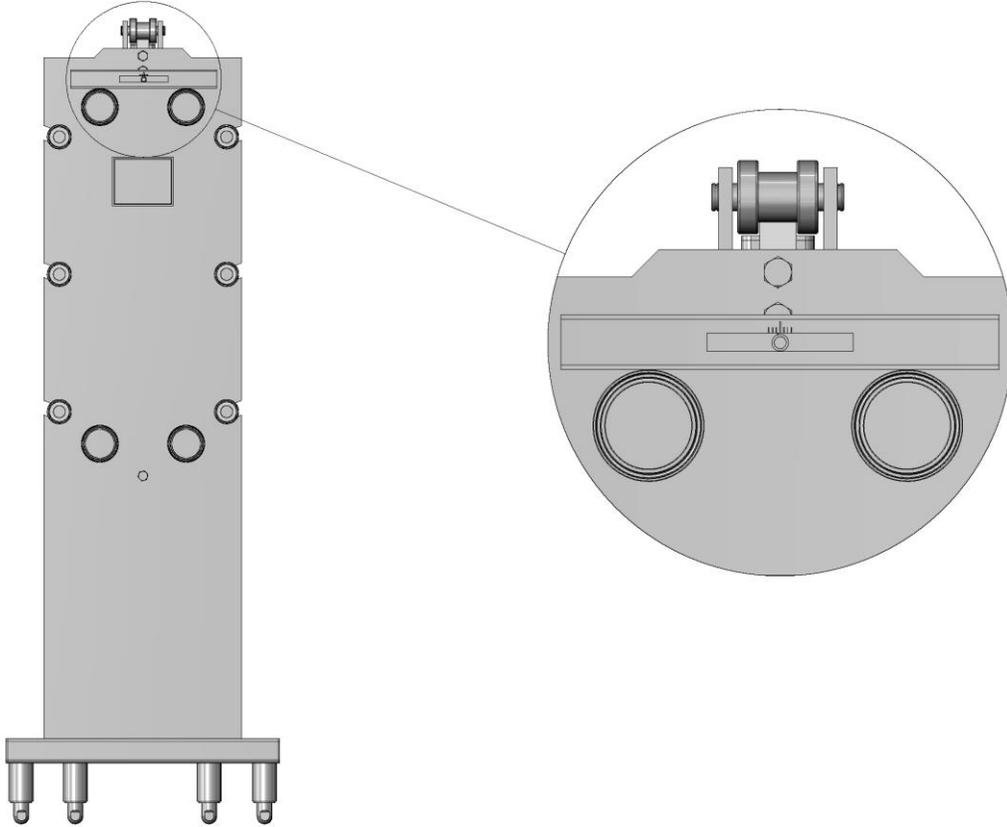


Figure 4
Port Leveling

Once the ports are level the heat exchanger should be adjusted so it will drain properly. This is done by adjusting the ball feet to establish a slope from end to end. Figure 5 shows a press adjusted to drain forward to the fixed end. Consult your onsite Plant Engineer or Project Manager to determine how much slope and which direction (toward the fixed end or follower) is appropriate for your installation.

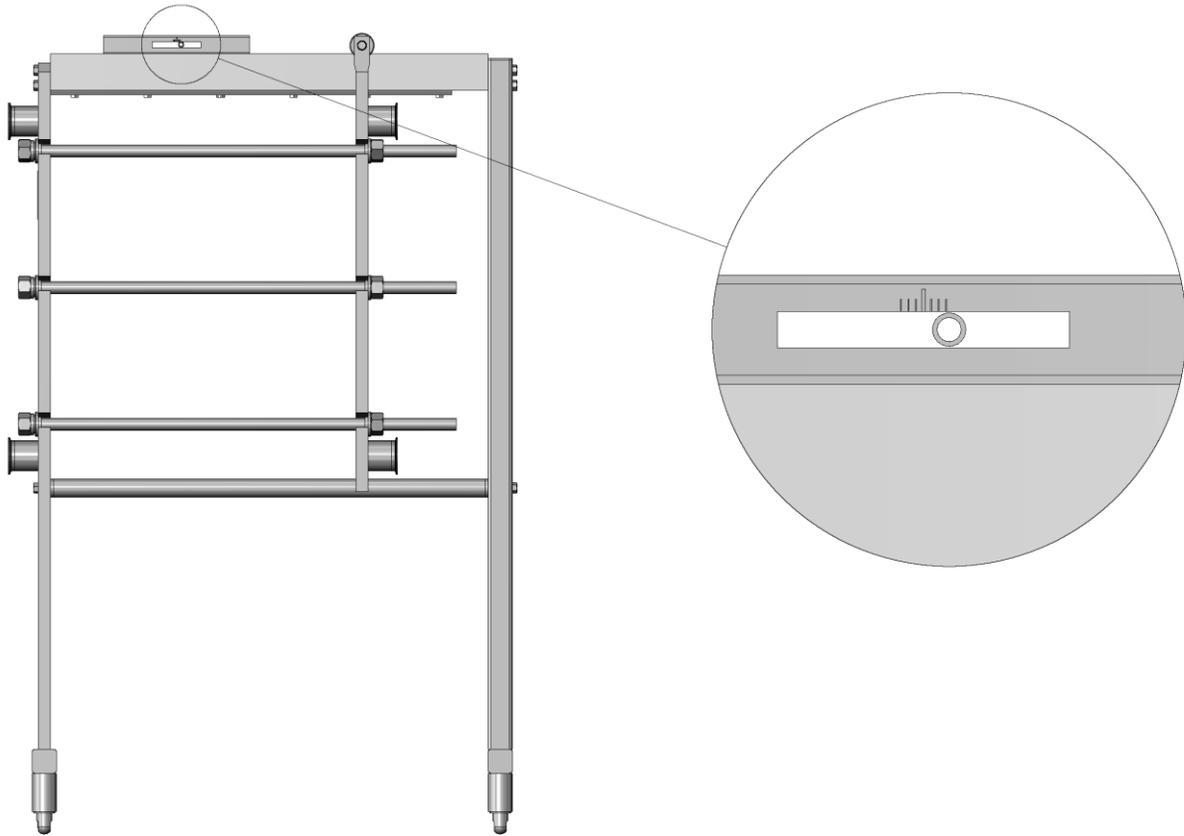


Figure 5
Frame Adjusted to Drain to Fixed End

Frame Connections:

Careful planning during the installation of your new heat exchanger will help ensure years of trouble free operation. All piping connections should be well supported and carefully aligned with the ports on the heat exchanger. Misaligned pipes, or pipes that are not properly supported, can lead to connection failures or cracks in the welded joints. When laying out a new installation, include enough breaks in the piping so service and maintenance can be completed easily. The piping connected to the follower should be configured with joints that are easy to remove so the follower can be fully retracted. This will provide enough space for clear inspection of the heat exchanger plates. The streaming diagram will show where all external connections should be made. Figure 6 shows page one of a typical streaming diagram for a multi section heat exchanger.

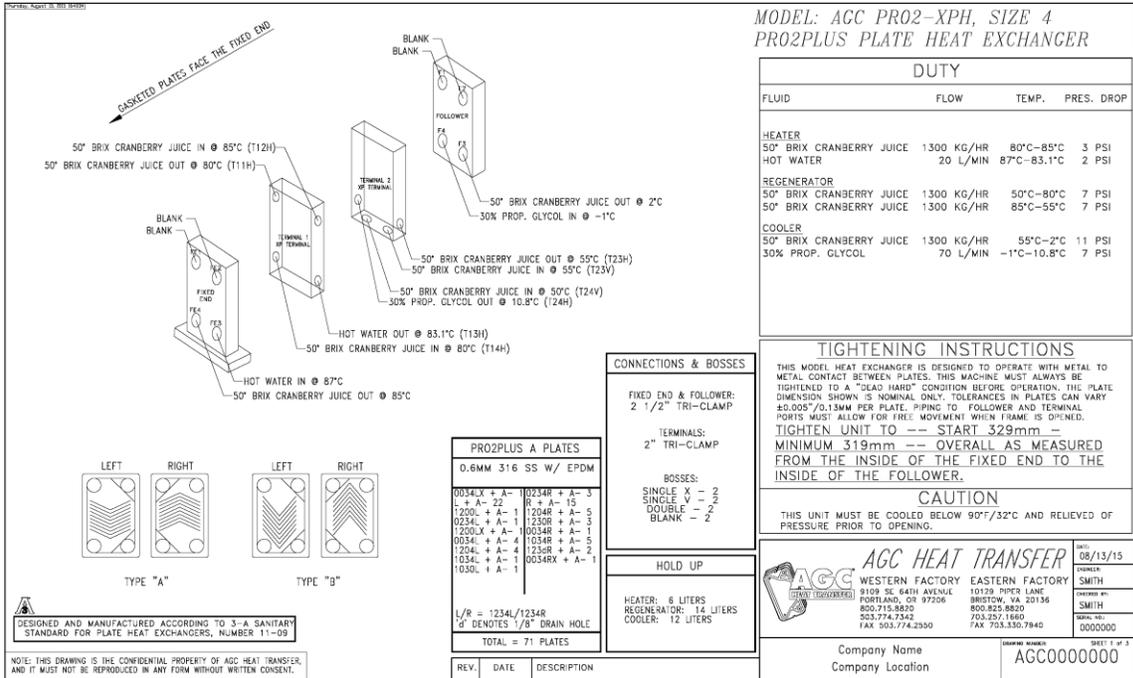
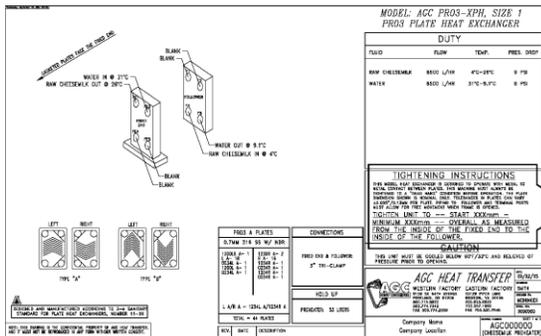


Figure 6
Typical Streaming Diagram

Notice that all ports have labels that clearly state what is to be connected to each one.

Normal Operation:

The Pro2-XP series of heat exchangers are tiebolt style frames. This means the press is closed by using 6 tiebolts to compress the plates. It is important for each tiebolt to take an equal share of the load. After your heat exchanger is in place you should check the compressed dimension. The dimension for your heat exchanger is listed on the first page of your streaming diagram. Figure 7 shows where the tightening dimension is located on the drawing.



TIGHTENING INSTRUCTIONS

THIS MODEL HEAT EXCHANGER IS DESIGNED TO OPERATE WITH METAL TO METAL CONTACT BETWEEN PLATES. THIS MACHINE MUST ALWAYS BE TIGHTENED TO A "DEAD HARD" CONDITION BEFORE OPERATION. THE PLATE DIMENSION SHOWN IS NOMINAL ONLY. TOLERANCES IN PLATES CAN VARY ±0.005"/0.13MM PER PLATE. PIPING TO FOLLOWER AND TERMINAL PORTS MUST ALLOW FOR FREE MOVEMENT WHEN FRAME IS OPENED.

TIGHTEN UNIT TO -- START XXXmm --
MINIMUM XXXmm -- OVERALL AS MEASURED FROM THE INSIDE OF THE FIXED END TO THE INSIDE OF THE FOLLOWER.

Figure 7
Tightening Instructions

Most new plate packs will seal at the start dimension. As the plates and gaskets wear it may be necessary to compress or close the press slightly more. You should never exceed the minimum dimension shown on the streaming diagram. If your press is closed to the minimum dimension and leaks are noticed contact AGC Heat Transfer for technical assistance. Closing the press beyond the minimum dimension could cause permanent damage to the plates, frame, or both. When measuring the compressed dimension it is a good practice to take the measurement in several locations on the inside of the fixed end and follower as shown in figure 8.

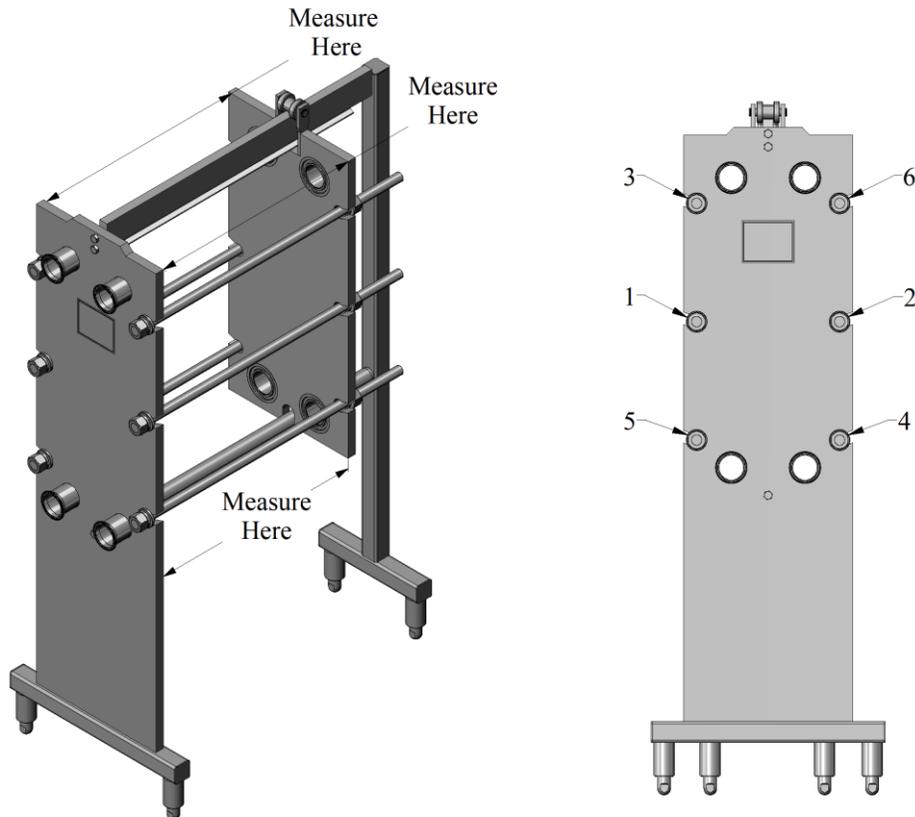


Figure 8
Tightening Location and Sequence

Measure top and bottom as well as front and back. The heat exchanger is designed to operate at its top efficiency when it is closed to a metal to metal condition. This means the rubber plate gaskets are fully compressed and the plate's contact points are fully engaged with each adjacent plate. In this condition, the plate gap is uniform and the plates are fully supported. To maintain this condition all tiebolts should be tightened equally and in sequence. Following the sequence shown in figure 8, tighten each tiebolt in small increments so the follower remains parallel to the fixed end. As the press approaches the start dimension smaller increments at each bolt will make for easier closing.

After the press is closed and all connections are made to the heat exchanger the unit is ready to be pressure checked. Consult the onsite plant engineer or project manager for the correct procedure on pressure testing the press.

Opening the Heat Exchanger:

Before opening this or any other heat exchanger you must verify the temperature in the unit is below 90°F (32C) and that the unit has been relieved of all internal pressure. Failure to follow this safety warning could result in serious injury to the operator or damage to the plates and gaskets. All pipes/connections should be disconnected from the heat exchanger before the tiebolts are loosened.

Prior to opening the press, inspect the tiebolts to ensure they are free from dirt or excessive dust and that grease is on each one. Opening or closing the tiebolts without lubrication may cause serious permanent damage to the tiebolt. As with closing, when opening a Pro2 frame it is important for the follower to remain parallel with the fixed end. Small increments on each bolt will make the process easier and prevent damage to the press or any of its parts. The tiebolts should be loosened using the same sequence as for tightening. See figure 8 for the bolt sequence. As previously stated, the closer the unit is to the minimum dimension the more torque will be required on the Fat Boy™ wrench so small increments at each bolt will make opening easier and will prevent overloading one bolt. Once the plates are completely uncompressed, the tiebolts can be lifted from their slots. Handle the tiebolts with care so the threads are not damaged. The follower can now be moved back toward the end support and the plates can be inspected or removed.

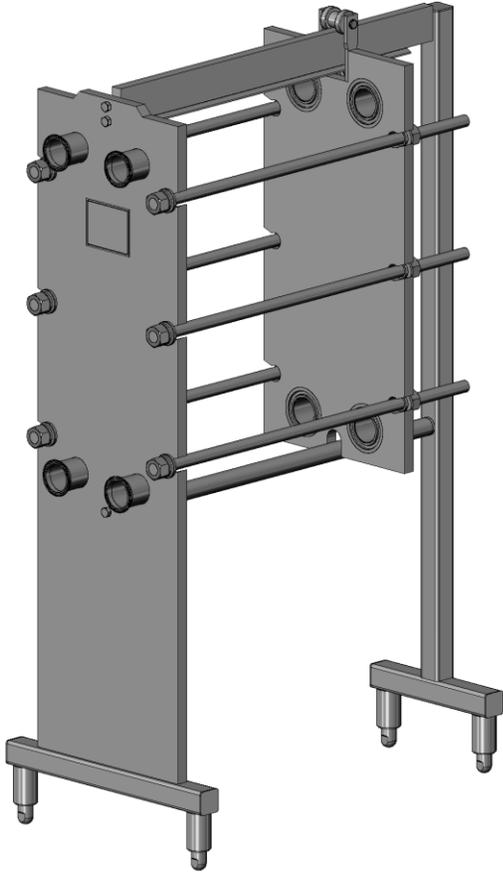
Operator Maintenance:

All AGC Heat Transfer heat exchangers are designed to require minimal operator maintenance. As long as the unit is operated within the pressure and temperature limits the only maintenance required is routine cleaning, lubrication and inspection. We recommend the unit be leak checked annually using the PlateCheck™ field service provided by AGC Heat Transfer. This service is performed onsite by factory trained service engineers. The PlateCheck™ service provides a thorough inspection of all parts of the heat exchanger. After the service is completed, a detailed written report is provided on the condition of the heat exchanger. This preventative maintenance service greatly reduces unscheduled down time by keeping the heat exchanger in peak operating condition.

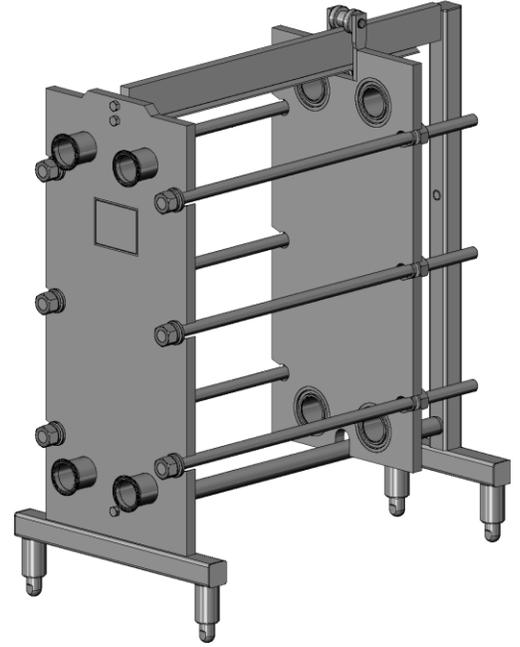
Model Features:

The Pro2-XP frame is offered in 2 different leg heights. Figure 9 shows each of the models. Regardless of the model chosen, each Pro2 frame will accept the AGC Pro2 heat exchanger plate and one or more AGC terminal(s).

The Pro2-XP and Pro2-XPH are solid stainless steel frames. Both models conform to current 3A sanitary standards. The factory installs ports at all eight locations (4 on the fixed end and 4 on the follower) on both models of these frames. The unused ports are capped using sanitary caps and clamps. This makes it very easy to expand the heat exchanger onsite to increase capacity or to add other processes to the frame. The only difference between the -XP and -XPH frames is the height of the port centers. The -XPH frame is the high leg version. Both frames are equipped with adjustable ball feet.



Pro2-XPB



Pro2-XP

Figure 9
Pro2 Tiebolt Frame Assemblies

Parts List:

Replacement parts for any AGC Pro2 frame can be ordered from AGC Heat Transfer or from your local AGC Distributor. Most parts are in stock and can be shipped within 24 hours from the time we receive your order. Some parts have been revised so it is important to have your unit's model and serial number available when placing an order for spare or replacement parts. All models of the Pro2 heat exchangers have some parts that are common as well as model specific parts. The following parts diagrams are separated by model when appropriate. Most of the field replaceable parts are listed in this manual. If the part you need is not listed on the following pages contact your local AGC distributor or the AGC Heat Transfer Factory.

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

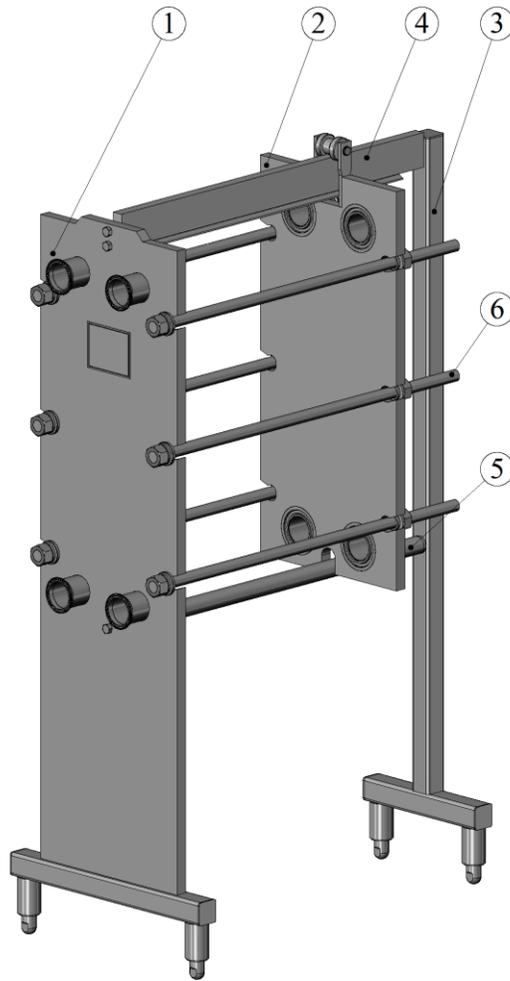
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Item	Part Name	Part Number	Quantity
1	Pro2-XP Fixed End	11012230	1
2	Pro2-XP Follower	11012140	1
3	Pro2-XP End Support	11012225	1
4	Pro2-XP Upper Rail	See Fig 11	1
5	Pro2-XP Lower Rail	See Fig 11	1
6	Pro2-XP Tie Bolt	See Fig 12	6

Figure 10

Pro2-XP Frame Components

Pro2-XP Upper Rail



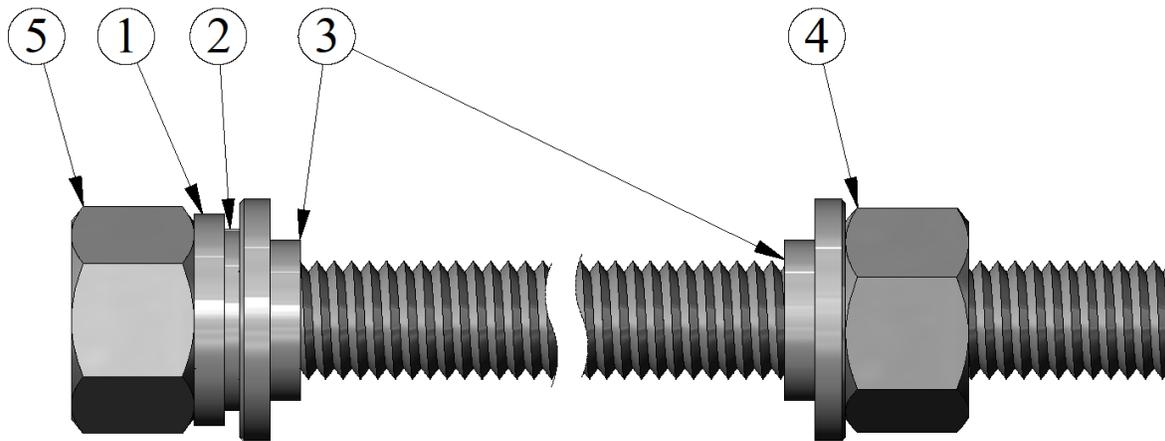
Pro2-XP Lower Rail



Rail Size	Rail Length	Upper Rail	Bottom Rail
1	12" [305]	11012191	11024083
2	24" [610]	11012192	11024084
3	36" [915]	11012193	11024085
4	48" [1220]	11012194	11024086
5	60" [1525]	11012195	11024087
6	72" [1830]	11012196	11024088

Figure 11

Pro2-XP Rail Options



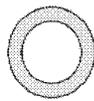
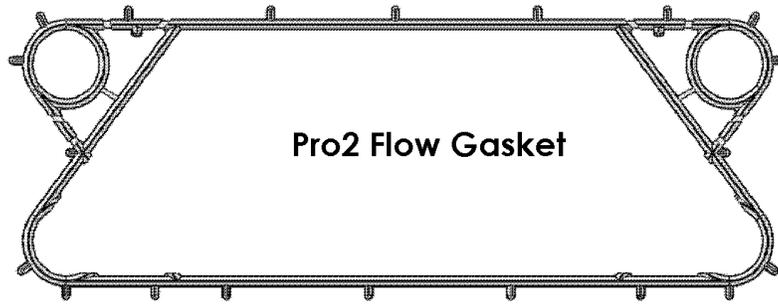
Item	Part Name	Part Number	Quantity
1	Pro2-XP Thrust Washer	11012185	1
2	Pto2-XP Thrust Bearing	11012186	1
3	Pro2-XP Tie Bolt Bushing	11012144	2
4	Pro2-XP Silicone Bronze Hex Nut	30000232	1
5	Pro2-XP Tie Bolt Base	See Chart	1

Pro2-XP Tie Bolt Size Chart

Size	Length	Base P/N	Assembly P/N
1	12" [305]	11012177	11012171
2	24" [610]	11012178	11012172
3	36" [915]	11012179	11012173
4	48" [1220]	11012180	11012174
5	60" [1525]	11012181	11012175
6	72" [1830]	11012182	11012176

Figure 12

Pro2-XP Tie Bolt Assembly



**Die Cut Pro2
Port Gasket**



**Molded Pro2
Port Gasket**

Description	Part Number
Pro2 Flow Gasket EPDM	AGPRO201E
Pro2 Flow Gasket NBR	AGPRO201N
Pro2 End Gasket EPDM	AGPRO202E
Pro2 End Gasket NBR	AGPRO202N
Pro2 Port Gasket EPDM	AGPRO203E
Pro2 Port Gasket NBR	AGPRO203N

Figure 13

Pro2-XP Plate and Frame Gaskets

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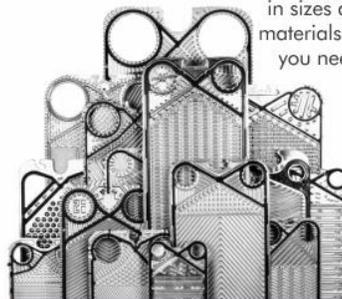
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materials that
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