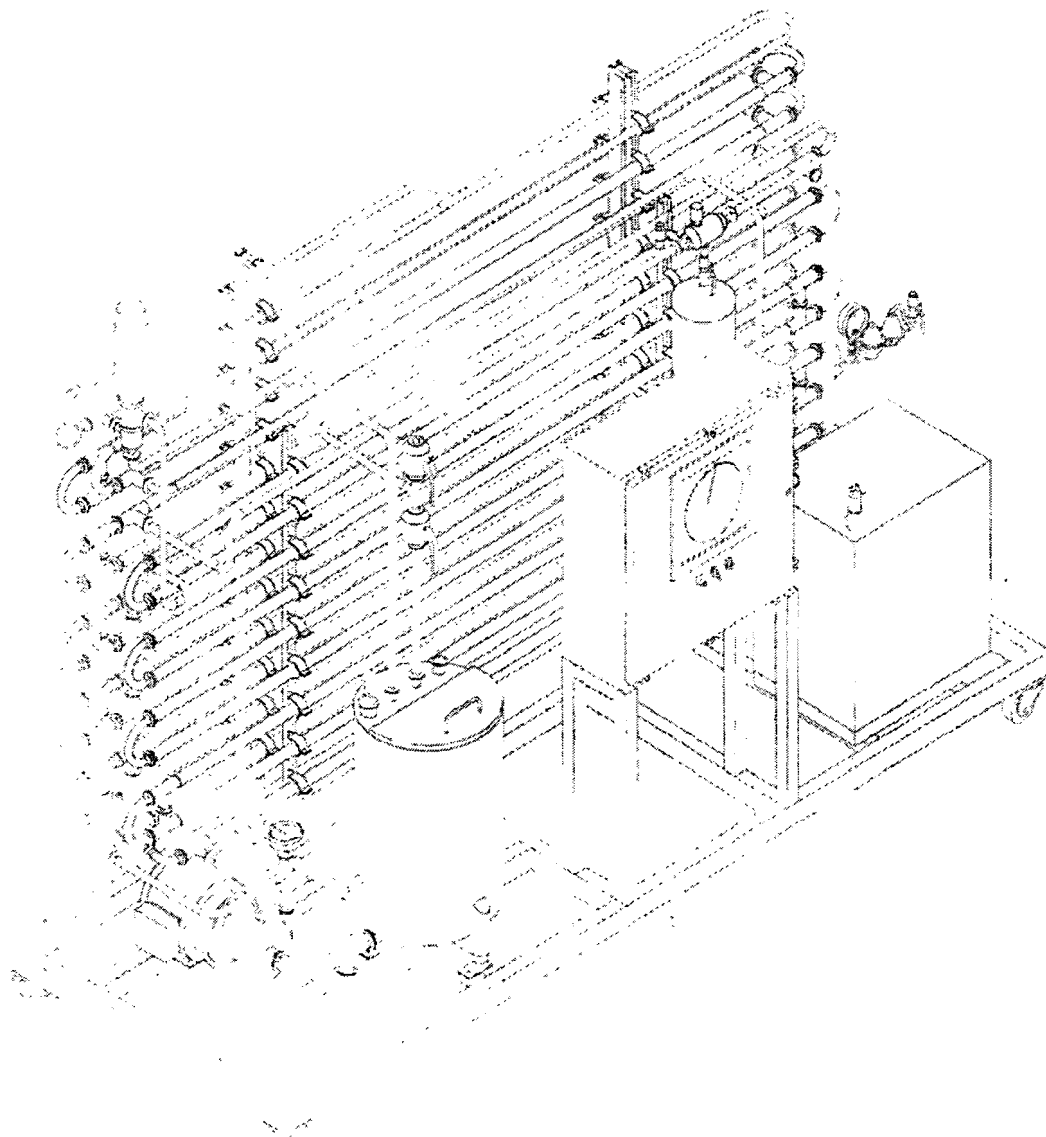




Standard Apple Cider Pasteurizer Instruction Manual



APV Standard Apple Cider Pasteurizer
Instruction Manual

1.0 INTRODUCTION

1.1 General

The purpose of this manual is to provide instructions for the safe installation, operation and maintenance of your APV Standard Apple Cider Pasteurizer.

1.2 Safety

Safe installation, operation and maintenance of the

! Warning
Read and understand the entire manual before
unpacking the equipment and installing it.

APV Standard Apple Cider Pasteurizer requires proper training of all plant operating personnel. Section 2.0, titled "Safety Instructions", should be read and understood before proceeding. This section discusses general safety practices. In addition, specific hazards are indicated by the appropriate hazard label in bold type throughout this manual.

It is the objective of APV to identify each area of potential hazard and guide workers in safe operation, service and maintenance procedures.

1.3 General Apple Cider Pasteurizer Design

APV Standard Apple Cider Pasteurizers are available in flow rates of 2, 5, and 10 GPM using either APV Plate or APV Tubular heat exchangers. These pasteurizers are designed to thermally process cider, up to 15° Brix, from 40°F to 170°F (4.4°C to 76°C) using regeneration and 185°F (85°C) hot water. The cider is held for 10 seconds in an APV holding loop and is then cooled to 40°F (4.4°C) using regeneration and 34°F (1.1°C) chilled water. The pasteurizers are assembled, wired and air tubed on a 304SS base. All product and utility piping is stainless steel and the equipment is capable of being cleaned in place (CIP).

1.4 Plate Heat Exchanger Design

Standard Apple Cider Pasteurizers designed using an APV Plate Heat Exchanger are supplied with 316 stainless steel flow plates. The plate heat exchanger is known for providing high heat transfer, and consequently high rates of heat recovery or regeneration (85% or better on clear juices). The plate heat exchanger is the preferred solution for cider which is filtered to a minimum of 1/16" without heavy pectin deposits. The maximum chloride

concentration for 316 stainless steel plate heat exchanger plates is 200 PPM at 185° F (85°C).

1.5 Tubular Heat Exchanger Design

Standard Apple Cider Pasteurizers designed using an APV Tubular Heat Exchanger offer greater flexibility. In addition to apple cider that can be processed in a plate heat exchanger, the tubular design can process a wider range of cider blends. The tubular heat exchanger offers less regeneration (77%) than the plate heat exchanger, but can process apple cider with particle sizes up to ¼" and cider with heavier pectin deposits. The tubular heat exchanger is also more resistant to attack by chlorides than the plate heat exchanger. The maximum chloride concentration for the tubular heat exchanger is 500 PPM at 185° F (85°C).

1.6 Standard Pasteurizer Components

The APV Standard Apple Cider Pasteurizer is comprised of the following standard components:

- APV Heat Exchanger (Plate or Tubular)
- APV Holding Loop
- Feed Balance Tank - 30 Gallon
- Hot Water Boiler - Natural Gas or Propane
- Pasteurized Juice Temperature Recorder
- Product & Utility Valves
- Product Pumps with Variable Frequency Drive on 2nd
- Stainless Steel Base
- Stainless Steel Piping
- Temperature and Pressure Indicators
- UL Listed Electrical Enclosure

Standard options that can be provided on an APV Standard Apple Cider Pasteurizer are listed in Section 1.9.

1.7 Receiving and Inspection

Standard Apple Cider Pasteurizers are fully assembled and inspected before shipment and are properly prepared for transportation. Upon receipt of this equipment, check all received items against the packing list for damage or missing parts. Components removed for safe shipment have been match marked for easy reassembly. **Damage or loss should be reported immediately to the carrier or insurance agent.**

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1.8 Selecting an Apple Cider Pasteurizer

Table 1.1 is used to select the proper Apple Cider Pasteurizer for your specific needs.

Use the following steps to identify the appropriate Standard Shell and Tube Hot Water Recirculation Unit model.

1. Determine cider flow rate in GPM (LPM).
2. Determine cider particulate size.
3. Note maximum CIP chloride concentration.
4. Choose either the plate or tubular heat exchanger model.

If the standard Apple Cider Pasteurizer models listed below do not meet specific requirements, call your APV representative for more information and a quotation on a Custom Apple Cider Pasteurizer. Custom pasteurizers are available in a wide range of apple cider flow rates and heating ranges. Some

typical options available on customized units include, a shell and tube hot water recirculation unit, an electric hot water heater, an apple cider feed flow meter and PLC control. Contact your APV representative for more information.

1.9 Standard options

The following standard options are available on the APV Standard Apple Cider Pasteurizer:

1. Air compressor with air tank
2. Air Cooled Glycol Chiller
3. Balance Tank Level Control
4. Pressure Tube Hot Water Recirculation Unit
5. Ice Builder
6. SR15S Stainless Steel Plate Heat Exchanger Frame

APPLE CIDER PASTEURIZER	PLATE HEAT EXCHANGER MODELS			TUBULAR HEAT EXCHANGER MODELS		
	MODEL	PPAC-02	PPAC-05	PPAC-10	PTAC-02	PTAC-05
Apple Cider Flowrate @ 40°F	2 GPM (8 LPM)	5 GPM (19 LPM)	10 GPM (38 LPM)	2 GPM (8 LPM)	5 GPM (19 LPM)	10 GPM (38 LPM)
Hot Water Flowrate @ 185°F	4 GPM (15 LPM)	10 GPM (38 LPM)	20 GPM (76 LPM)	8 GPM (30 LPM)	12 GPM (46 LPM)	40 GPM (152 LPM)
Heating BTU's	19,000	47,000	94,000	30,000	75,000	150,000
Maximum Particle Size	< 1/16" (1.5mm)			< 1/4" (6mm)		
Minimum Heat Regeneration	85%			77%		
Max CIP Chloride Concentration	200 PPM @ 185°F (85°C)			500 PPM @ 185°F (85°C)		

TABLE 1.1

2.0 SAFETY INSTRUCTIONS

2.1 General Statement

APV Standard Apple Cider Pasteurizers are designed and built with due consideration and care for generally accepted safety standards. However, like any mechanical device, proper and safe performance of this equipment depends upon using sound and prudent operating, maintenance and servicing procedures under properly trained supervision.

For your protection, and the protection of others, learn and always follow the safety rules outlined in this section. Observe warning signs on machines and act accordingly. Form safe working habits by reading the rules and abiding by them. Keep this booklet handy and review it from time to time to refresh your understanding of the rules.

2.2 Hazard Level Identification

Definitions for identifying the various hazard levels shown on warning labels or to indicate proper safety procedures in the instruction manual are provided in the following labels.

! Danger

The use of the word "Danger" always signifies an immediate hazard with a high likelihood of severe personal injury or death if instructions, including recommended precautions, are not followed.

! Warning

The use of the word "Warning" signifies the presence of hazards or unsafe practices that could result in severe personal injury or death if instructions, including recommended precautions, are not followed.

! Caution

The use of the word "Caution" always signifies possible hazards that could result in minor personal injury or damage to product or property if instructions, including recommended precautions, are not followed.

2.3 Operating Zone

An operating zone should be established around the Apple Cider Pasteurizer. A brightly painted guard rail or warning stripe should define the zone. Only the operator or other authorized personnel should be allowed within the operating zone when control circuits are energized or the unit is operating. No tools or other equipment should be kept within the operating zone. Refer to paragraph 3.3 for space requirements.

2.4 Pressure and Temperature Ratings

MAXIMUM DESIGN WORKING PRESSURE		MAXIMUM DESIGN WORKING TEMPERATURE	
PRODUCT SIDE	WATER SIDE	PRODUCT SIDE	WATER SIDE
100 PSIG (6.8 bar)	50 PSIG (3.4 bar)	250°F (121°C)	250°F (121°C)

TABLE 2.1

Pressure and temperature ratings for APV Standard Apple Cider Pasteurizers are listed below in Table 2.1. These equipment ratings must not be exceeded at any time during startup or operation of the unit.

2.5 Installation

Utility sources, such as water, steam, electric, air and hydraulic, should be installed by trained and authorized personnel only. Installations must comply with all applicable codes and standards, including those established by the general industry standards of OSHA.

2.6 Safety Instructions

Before Starting a Unit

Be certain that all necessary guards and safety devices are installed and operating properly. This includes safety screens or pressure relief devices.

Be sure all personnel are clear of the unit.

Remove (from the operating zone) any materials, tools or other foreign objects that could cause injury to personnel or damage the unit.

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3.9 Utility Requirements

Utility requirements for the Standard Apple Cider Pasteurizers are listed in Table 3.1. The data in Table 3.1 is a guide only to the maximum expected utility requirements for a Standard Apple Cider Pasteurizer.

UTILITY REQUIREMENTS		PLATE HEAT EXCHANGER MODELS			TUBULAR HEAT EXCHANGER MODELS		
		PPAC-02	PPAC-05	PPAC-10	PTAC-02	PTAC-05	PTAC-10
Water Make-up supplied at 20 psig (1.4 kg/cm ²) minimum	US gpm	5	5	5	5	5	5
	lpm	19	19	19	19	19	19
Chilled Water supplied at 34°F (1.1°C) and 45 psig (3 kg/cm ²)	US gpm	7	16	36	8	16	26
	lpm	27	61	137	30	61	99
Hot Water supplied at 185°F (85°C) and 20 psig (1.4 kg/cm ²)	US gpm	4	10	20	8	12	40
	lpm	15	38	76	30	46	152
Hot Water Boiler Rating	BTU/hr	19,000	47,000	94,000	30,000	75,000	150,000
	kw	5.5	14	29	8.8	22	44
Electrical 230/460VAC 3 phase 50/60 Hz	hp	3	3	3	3	3	3
	kw	2.2	2.2	2.2	2.2	2.2	2.2
Instrument Air, dry & oil free, supplied at 100 psig (7 kg/cm ²)	cfm	1	1	1	1	1	1
	m ³ /hr	1.7	1.7	1.7	1.7	1.7	1.7
Natural Gas (Note 1)	cfm	43	113	150	75	113	225
	m ³ /hr	73	192	255	127	192	382
Propane (Note 1)	lb/hr	2	5.2	6.9	3.5	5.2	10.3
	kg/hr	0.9	2.4	3.1	1.6	2.4	4.7
Pasteurizer Volume	US Gal	4.5	6.5	9	15	27	67
	Liters	17	25	34	55	102	254

Table 3.1

Note 1 - Select the utility requirement for either Natural Gas or Propane, depending on boiler gas supply.

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APPLE CIDER PASTEURIZER WITH PLATE HEAT EXCHANGER						
MODEL NUMBER	STANDARD EQUIPMENT					
	Heat Exchanger HE1301B	Balance Tank TK1101A	Feed Pump PP1104C	Holding Loop HL1300N	Flow Diversion Valve PV1306E	Boiler B1003N
PPAC-02	SR15	30 Gal	3 HP 2 x 1.5	1" OD 10	1" T/C	19,000 BTU/HR
PPAC-05	SR15	30 Gal	3 HP 2 x 1.5	1" OD 10	1" T/C	47,000 BTU/HR
PPAC-10	SR15	30 Gal	3 HP 2 x 1.5	1.5" OD 10	1" T/C	94,000 BTU/HR
PTAC-02	SDT - C - 25.4 x 19	30 Gal	3 HP 2 x 1.5	1" OD 10	1" T/C	30,000 BTU/HR
PTAC-05	SDT - C - 38.1 x 25.4	30 Gal	3 HP 2 x 1.5	1" OD 10	1" T/C	75,000 BTU/HR
PTAC-10	SDT - C - 50.8 x 38.1	30 Gal	3 HP 2 x 1.5	1.5" OD 10	1" T/C	150,000 BTU/HR

TABLE 3.2

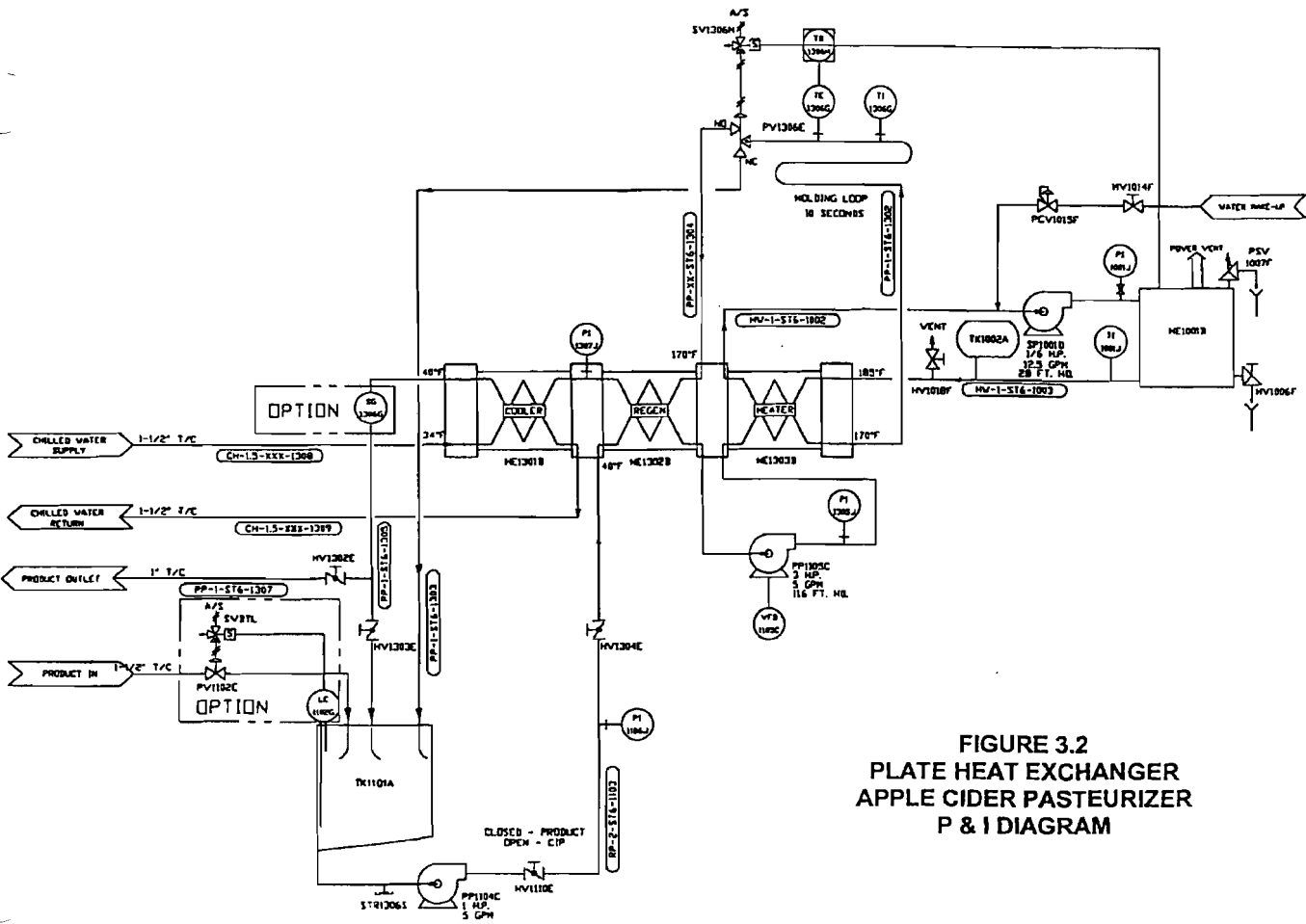


FIGURE 3.2
PLATE HEAT EXCHANGER
APPLE CIDER PASTEURIZER
P & I DIAGRAM

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STANDARD APPLE CIDER PLATE HEAT EXCHANGER PASTEURIZER WEIGHTS AND DIMENSIONS										
MODEL	DIMENSIONS					WEIGHT			VOLUMES	
		Width A	Length B	Height C	Panel D*		Dry	Flooded		Flooded
PPAC-02	ft in (M)	4'6" (1.4)	8'6" (2.6)	6'0" (1.85)	2'6" (0.76)	lbs (kg)	1900 (864)	2200 (1000)	US Gal (Liters)	4.5 (17)
PPAC-05	ft in (M)	4'6" (1.4)	8'6" (2.6)	6'0" (1.85)	2'6" (0.76)	lbs (kg)	2000 (910)	2300 (1046)	US Gal (Liters)	6.5 (25)
PPAC-10	ft in (M)	4'6" (1.4)	8'6" (2.6)	6'0" (1.85)	2'6" (0.76)	lbs (kg)	2100 (955)	2400 (1091)	US Gal (Liters)	9 (34)

TABLE 3.3A

* Minimum clearance for panel door opening

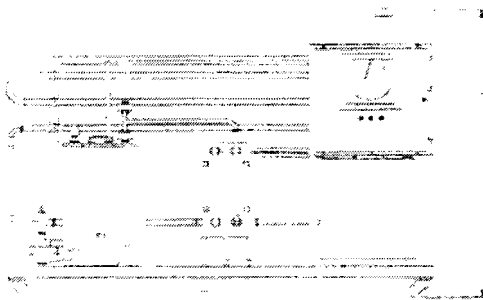


FIGURE 3.3.1A
PLATE HEAT EXCHANGER
APPLE CIDER PASTEURIZER
ELEVATION VIEW

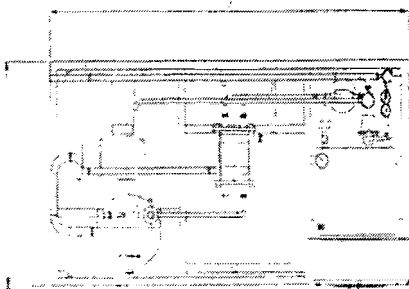


FIGURE 3.3.2A
PLATE HEAT EXCHANGER
APPLE CIDER PASTEURIZER
PLAN VIEW