



## AUTOMATED EQUIPMENT LLC

MODEL AFD-280, AFD-280U  
*Fry Dispensers*  
*Domestic English Version*  
COMPREHENSIVE SERVICE MANUAL  
P/N 203456 REV B



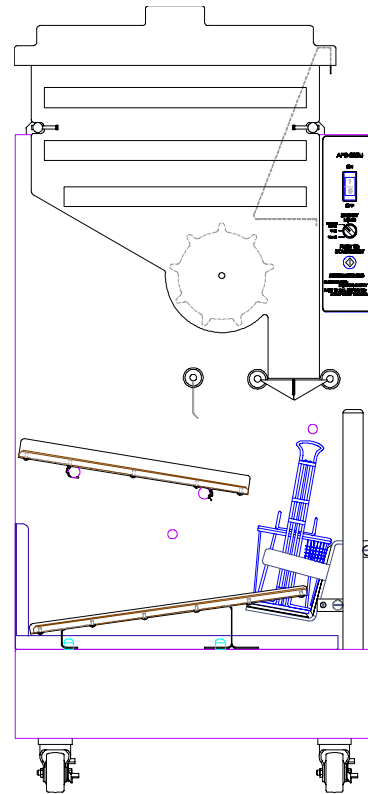
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## INTRODUCTION

The Fry Dispenser is a compact automated system that replaces manual basketing of fries and the equipment that goes with it. The Fry Dispenser automatically weighs 12 ounce (350 gm), 16 ounce (450 gm) or 24 ounce (700 gm) loads of frozen french fries and dispenses them into the fry baskets.

The Fry Dispenser's Hopper holds 42 lbs. (19 kg) of frozen fries prior to Basket Loading. A rotating Dispenser Drum inside the Hopper transfers the frozen fries onto the Accumulator Doors where an electronic Load Cell accurately weighs the French Fries. Empty Fry Baskets are manually placed on the Upper Guide. The Fry Baskets slide under the Accumulator Doors where French Fries are dispensed into them. The Basket Lift then lowers the filled Fry Baskets onto the Lower Guide where the Fry Baskets wait to be picked up by a crew person.

The Fry Dispenser is usually positioned to the right of an existing fry station and requires 28 linear inches (72 cm) of floor space. 10 modified Fry Baskets are provided with this equipment.

**NOTE:** This equipment is manufactured in the U.S., therefore all hardware measurements are in English, and the metric conversions stated are approximate.

## HAZARD COMMUNICATION STANDARD

**(HCS)** The procedures in this manual may include the use of chemical products. These chemical products will be highlighted with boldface letters followed by the abbreviation (HCS) in the text portion of the procedure. See the HCS Manual for the appropriate Material Safety Data Sheets (MSDS).

## IMPORTANT

**This equipment is only to be installed in locations where use and maintenance is restricted to trained personnel.**

**This equipment must be placed on a horizontal surface with a tilt of less than 2 degrees.**

## SPECIFICATIONS

**The Fry Dispenser consists of the following components:**

- Fry Dispenser AFD-280/U
- 10 Fry Baskets (Modified)

Optional Equipment:

- Replacement/Extra Fry Baskets

**Electrical Requirements:** *Ratings depend on product destination requirements.*

120 VAC, 4 Amp, 60 Hertz

220 ±10% VAC, 2.0 Amp, 50 Hertz

240 ±10% VAC, 2.0 Amp, 50 Hertz

## Other Ratings:

Noise Emissions: < 70 dB(A)

Maximum Altitude: 6000 ft. (1525 meters)

Maximum Humidity: 95% non-condensing

Ambient Temperature: 4° - 60°C (40° - 140°F)

## Date of Manufacture:

The manufacturing date is encoded into the serial number identification label on the side panel of the fry dispenser.

*Example: s/n AFDR9612C00000 indicates a manufacturing date of 12-96 or December 1996.*

## Space Requirements:

Clear floor space near fry vat at least 28 inches (72 cm) wide and 24 inches (60 cm) deep. Basket Handles will extend to 29 inches (74 cm)

## Fry Dispenser:

Bulk storage of 42 lbs. (19 kg) of frozen French Fries

Electrically and pneumatically (air) driven.

Equipped with swivel casters.

Holds up to 7 Fry Baskets.

Disassembles for cleaning.

## FCC STATEMENT

**WARNING:** This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

**WARRANTY**

Automated Equipment LLC (hereinafter “AELLC”), warrants the purchased product to be free from manufacturing defects in material and workmanship under normal use and conditions for the period and component specified below:

<u>Components covered</u>	<u>Term</u>
Electronic Circuit Board Assemblies	1 year
Electrical and Mechanical Moving Parts	1 year
Structural frame work or enclosures	1 year
Crew removable components:	
• Drip Tray	90 days
• Guide Assemblies & Slides	90 days
• Lift Saddle Assembly	90 days
• Hopper, Hopper Lid, Diverter	90 days
• Drum	90 days
• Fryer Baskets	90 days
• Power Cord	90 days

**The Warranty period commences on the date of shipment from AELLC for the Frozen Product Dispenser and/or Dispenser Accessories (hereinafter “Product”).**

EXCEPT AS OTHERWISE PROVIDED HEREIN AELLC MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED AND SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

AELLC shall not be liable for any direct, indirect, consequential damages (including damages for loss of business profits, business interruption, loss of business information and the like) arising out of the use of or inability to use the Product.

THIS WARRANTY IS VOID IF THE PRODUCT IS NOT FUNCTIONING CORRECTLY DUE TO ABUSE OR NEGLIGENCE BY THE PURCHASER, ITS EMPLOYEES, AGENTS, OR OTHER REPRESENTATIVES EITHER BY BREAKING, BENDING, MISUSE, ABUSE, DROPPING, ALTERATION, IMPROPER MAINTENANCE OR ANY OTHER FORM OF NEGLIGENCE OR IMPROPER USAGE. THIS WARRANTY DOES NOT COVER DAMAGE TO THE PRODUCT CAUSED BY NATURAL CAUSES SUCH AS LIGHTNING, ELECTRICAL CURRENT FLUCTUATIONS, FLOOD, FIRE, TORNADOES, OR OTHER ACTS OF GOD. AELLC WILL INVOICE PURCHASER FOR REPAIRS MADE NECESSARY BY THE HEREIN LISTED CAUSES.

This warranty is governed by the substantive laws of Minnesota, U.S.A., without giving effect to the conflict of law provisions.

This warranty is non-transferable and applies only to the original Purchaser.

**REQUESTING SERVICE, ASSISTANCE, OR PARTS**

**WARRANTY SERVICE**

Warranty service must be initiated by calling AELLC's Technical Support Hot Line at 1-800-248-2724 (U.S./Canada) or 651-385-2273 to establish all warranty requests.

AELLC Technical Support personnel will determine the cause of failure and provide the appropriate resolution. If replacement parts are required, parts will be provided by AELLC or by an authorized Service Support Center/Parts Distributor.

**NON-WARRANTY SERVICE**

Service is normally conducted by customer appointed personnel, or by contracting a local service agent. Service fees are in accordance with industry standards.

Replacement parts are available through local Service Support Center/Parts Distributors or direct from AELLC by calling 1-800-248-2724 (U.S./Canada) or 651-385-2273 in the event a local distributor is not available.

AELLC's Technical Support Hot Line is available for telephone assistance providing AELLC product technical support, parts and parts information, and service agent referral. Contact AELLC's Technical Support Hot Line at 1-800-248-2724 (U.S./Canada) or 651-385-2273.

Record the following information for your records:

\_\_\_\_\_  
Date of Installation

\_\_\_\_\_  
Service Agency Telephone

\_\_\_\_\_  
Serial Number

When repairing this unit, use only replacement parts supplied by AELLC, or supplied by an AELLC Factory Authorized Parts Distributor. Use of replacement parts other than those supplied by AELLC or by an AELLC Factory Authorized Parts Distributor will void the warranty.

All shipping charges are F.O.B. AELLC, and are subject to change without notice. Prices will be those in effect at the time of shipment.

Automated Equipment LLC reserves the right to make suitable substitutions in materials, depending upon their availability.

**WARNING!**

**Only trained and/or qualified personnel should perform service to this equipment.**

**Service functions described in this manual could cause irreversible damage to the equipment and/or injury to personnel if performed improperly.**

**If the power cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.**

## SAFETY

Here are some guidelines for operating and maintaining the AFD280/U Dispenser:

- Disconnect the Dispenser Power Cord from the wall outlet before inspecting.
- Inspect the Dispenser on a regular basis to identify problems before they occur.
- Keep the Dispenser clean.
- Keep hands away from the Accumulator Doors and Dispenser Drum while the Dispenser is operating:
- Fryer Baskets may be hot.
- Do NOT roll the Dispenser to the back sink for cleaning, this will cause unnecessary wear on the Dispenser.
- If the supply cord is damaged it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.
- DO NOT SPRAY DOWN THE DISPENSER WITH WATER. It is not sealed against jetting water and contamination may get into sensitive components. This will void the warranty

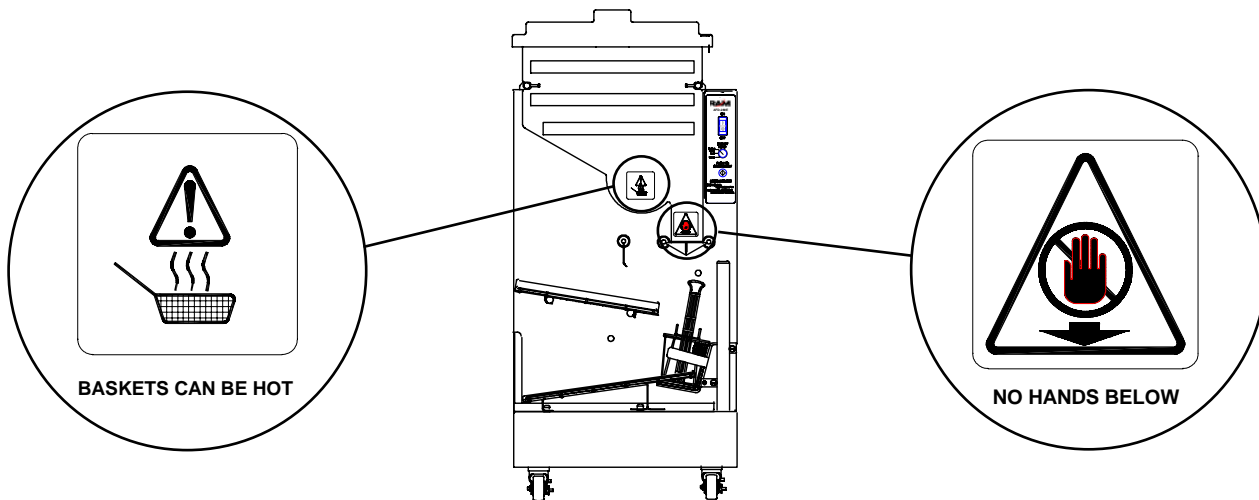
**WARNING!**  
**Only trained and/or qualified personnel should perform  
service to this equipment.**

## INTERNATIONAL SAFETY LABELING

International Safety Labeling is represented with the below symbols. The labels are affixed to the Hopper to clearly indicate areas that could be harmful to the operator of the Dispenser.

These safety issues are:

1. **BASKETS CAN BE HOT:** Baskets should always be picked up by the provided handle.
2. **NO HANDS BELOW:** Hands should not be placed near or below the Accumulator doors while the Dispenser is energized.





## PRODUCT MODEL AND REVISION IDENTIFICATION

The Switch Control Panel on the front of the dispenser will clearly indicate the Model Number of the Fry Dispenser being either an **AFD-280** or an **AFD-280U**.

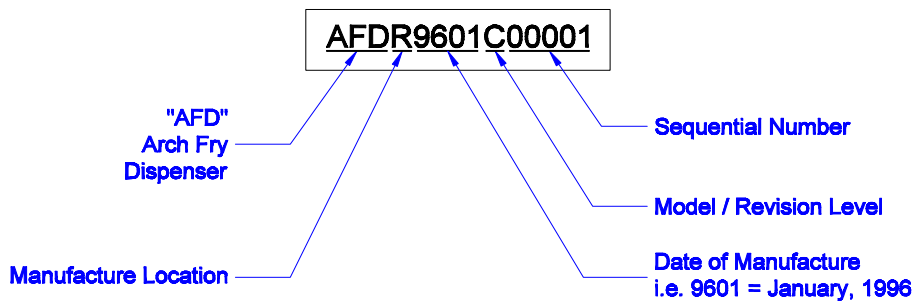
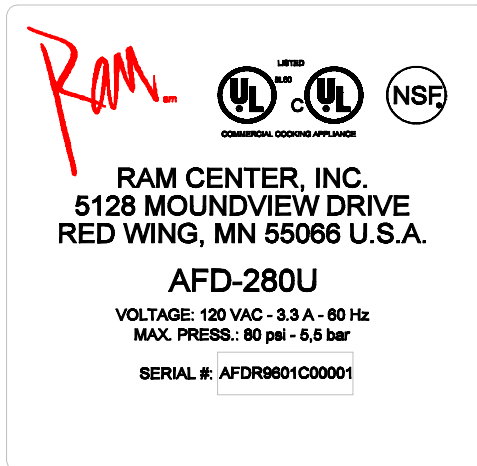
The AFD-280 is indicated by the Serial Number of the Unit having a letter **"C"** in the serial number sequence.

Example: AFDR9602**C**00000

There were some AFD-280U dispensers built with the AFD-280U cabinet and AFD-280 internal parts. They can be identified by having 6 screws holding the back door in place.

The AFD-280U is indicated by the Serial Number of the Unit having a letter **"D"**, **"E"** or **"F"** in the serial number sequence.

Serial Numbers and Model Identification can be found on the Data Label, located on the right side of the Dispenser.



## Sequence of Operations

### Power Up

When the dispenser is turned on, two separate processes begin. One is the compressor charging (if required), and the other is the internal self test. The self test takes less than one second. The dispenser then waits until the compressor reaches operating pressure before starting the main cycle. During this phase, the dispenser will not attempt to move or actuate anything. A detailed timeline follows.

NOTE: The times given in the "Typical Time" column are based on a typical AFD-280/U running normally. Except for the Time outs, they may vary. The times given are cumulative, that is they are the time from power up.

Typical Time	Event	Response
0 sec.	Power Switch Turned <b>ON</b>	Amber Light in power switch turns on. Dispenser begins self test. Controller Display shows all segments lit. If reservoir is below operating pressure, compressor starts. You may hear a hiss from the regulator drain tube until the drain valve closes.
1 sec.	Self Test Completes	Controller shows normal display, unless self test fails. If self test fails, all display segments will be lit, all display segments will be off, or display will show Error #9, depending on the failure.
4 sec.	Lift Cylinder Times out	If the lift has not been detected in the down position, Error #3 will occur.
15 sec.	Drain Valve closes	Hiss from beneath dispenser stops. Pressure gauge begins to climb.
35 sec.	Operating Pressure Reached	Air Present switch activates (input L6 on controller board). Dispenser raises lift, and opens stopgate, then initiates the main cycle. The Pressure Gauge will stop climbing at 30 PSI, but the compressor will continue running.
1 min. - 2 min.	Air Present Times out	If the Air Present switch has not activated, an Error #1 will occur.
2 min. 35 sec.	Maximum Pressure Reached	Compressor turns off.

### Normal Weighing Cycle

The function of the fry dispenser is to dispense pre-weighed amounts of fries into baskets. The weighing cycle is triggered when the selector switch is in the automatic modes, or when the restart button is pressed in the single mode.

NOTE: The times given in the "Typical Time" column are based on typical AFD-280/U operations. The times given are cumulative, they are the time from the start of the cycle.

Typical Time	Event	Response
	Weighing Cycle Triggered	Weighing must wait for the accumulator doors to close. During a normal cycle, they will be closed before the weighing cycle is triggered.
0 sec.	Accumulator Doors Closed	After the accumulator doors close, the dispenser waits 2 seconds for the load cell to stabilize.
2 sec.	Initial Reading	After the load cell has stabilized, the dispenser takes an initial reading. If the reading shows that the accumulator doors are empty, or near empty, this reading is used as the zero reference. If the reading shows significant weight, part or all of the weighing cycle will be skipped.
	Start Drum Motor	The drum motor is turned on at full speed until the load cell indicates that the weight of fries is within a quarter of a pound of the desired weight.
10 sec.	Half speed.	The drum motor will begin a pulsing movement designed to slowly deliver fries to the accumulator doors. This improves the accuracy of the weighing.
15 sec.	Full Weight	When the load cell reads full weight, the drum motor stops. The dispenser waits an additional 2 seconds for the load cell to stabilize.
17 sec.	Stable Weight	If the load cell reading remains within tolerance, the weighing sequence ends.
40 sec.	Weighing Time-out	If the dispenser has been unable to attain the target weight, the drum motor stops and the dispenser gives a low fries indication. (Slow blink of the Start/Reset button)
130 sec.	Weighing Retry	If the weighing sequence times out, the dispenser restarts the weighing cycle after 90 seconds.

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### **Normal Basket Cycle (High Production Rates)**

The dispenser automatically places pre-weighed loads of french fries into fryer baskets. This process runs together with the weighing cycle described in the previous sections. The basket cycle may be triggered by the dispenser itself (in the automatic modes) or by the restart button (in the single mode). The following timeline gives the sequence of operations when there are two or less baskets on the lower guide.

NOTE: The times given in the "Typical Time" column are based on typical AFD-280/U operations. The times given are cumulative, they are the time from the start of a cycle.

Typical Time	Event	Response
	Basket Cycle Triggered	A basket will not be filled unless the weigh cycle is completed and a basket is detected. The basket cycle may be triggered at any time (indicated by a steady green light on the restart button), but will be immediately suspended until this condition is met. During continuous operation, the basket cycle will be triggered immediately when the lift is up.
0 sec.	Basket Detected at lift	The lift sensor detects a basket. The dispenser waits one second to ensure the basket has settled into the lift.
1 sec.	Basket Settled	The stopgate closes. Between this time, and the time that the lift goes down, removing the basket from the lift saddle will cause an error #4. The basket usually enters the lift at about the time the weighing cycle begins. This can vary considerably depending on the use of the dispenser. However, the basket cycle can't continue until a load of fries is ready. The following timeline assumes that the weighing cycle started at the same time as the basket cycle.
18 sec.	Fries Ready	When the weighing cycle has completed, the accumulator doors open and close twice, and then remain open.
20 sec.	Fries Dispensed	During this time, the dispenser ignores input from the lift sensor. If the guide sensor detects a basket, the lift saddle does not go down. The accumulator doors remain open for 5 seconds then close, and the weigh cycle is triggered.
22 sec.	Lift down	The lift down switch closes, indicating the lift saddle is down. From this point, if the lift sensor detects something, error #4 will occur. The accumulator doors close, and the weighing cycle is triggered.
24 sec.	Lift time-out	If the lift down switch closes before 1.6 seconds, error #2 will occur. If the lift down switch does not close within 4.4 seconds, error #3 will occur.
25 sec.	Guide sensor time-out	If the guide sensor has not detected the basket, error #5 will occur. This usually indicates that the basket has stopped short of the sensor or is stuck in the lift saddle.
22 sec.	Basket detected on lower guide	The guide sensor detects the basket, the dispenser waits 1.5 seconds to ensure the basket has cleared the lift saddle.
23.5 sec.	Basket clears the lift	The lift saddle goes up.
25.5 sec.	Lift Up	The lift up switch closes, indicating the lift saddle is up. The stopgate opens.
27.5 sec.	Lift time-out	If the lift up switch closes before 1.6 seconds, error #2 will occur. If the lift up switch does not close within 4.4 seconds, error #3 will occur.

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### **Normal Basket Cycle (Low Production Rates)**

At low production rates, the dispenser “stages” baskets of fries. The basket cycle is similar to high production, the dispenser senses when the lower guide is full, and alters the cycle accordingly. The object is to have fries available as soon as possible in case of a sudden demand. To do this, the dispenser continues the cycle until there are three full baskets on the lower guide, one full basket in the lift, and one load of fries waiting in the accumulator doors.

NOTE: The times given in the “Typical Time” column are based on typical AFD-280/U operations. The times given are cumulative, they are the time from the start of the cycle.

Typical Time	Event	Response
0 sec.	Basket Removed from lower guide	When the guide sensor indicates that the lower guide is no longer full, the lift saddle goes down. This should take between 1.6 and 4.4 seconds, if it does not, an error #2 or #3 will occur. During this time the dispenser ignores input from the lift sensor.
2 sec.	Lift down	The lift down switch closes, indicating the lift saddle is down. From this point, if the lift sensor detects something, error #4 will occur. The accumulator doors close, and the weighing cycle is triggered.
4 sec.	Lift time-out	If the lift down switch closes before 1.6 seconds, error #2 will occur. If the lift down switch does not close within 4.4 seconds, error #3 will occur.
5 sec.	Guide sensor time-out	If the guide sensor has not detected the basket, error #5 will occur. This usually indicates that the basket has stopped short of the sensor or is stuck in the lift saddle.
2 sec.	Basket detected on lower guide	The guide sensor detects the basket, the dispenser waits 1.5 seconds to ensure the basket has cleared the lift saddle.
3.5 sec.	Basket clears the lift	The lift saddle goes up.
5.5 sec.	Lift Up	The lift up switch closes, indicating the lift saddle is up. The stopgate opens.
7.5 sec.	Lift time-out	If the lift up switch closes before 1.6 seconds, error #2 will occur. If the lift up switch does not close within 4.4 seconds, error #3 will occur.
5.5	Basket Cycle Triggered	A basket will not be filled unless the weigh cycle is completed and a basket is detected. The basket cycle may be triggered at any time (indicated by a steady green light on the restart button), but will be immediately suspended until this condition is met. During continuous operation, the basket cycle will be triggered immediately when the lift is up.
7 sec.	Basket Detected at lift	The lift sensor detects a basket. The dispenser waits one second to ensure the basket has settled into the lift.
8 sec.	Basket Settled	The stopgate closes. Between this time, and the time that the lift goes down, removing the basket from the lift saddle will cause an error #4. The basket usually enters the lift at about the time the weighing cycle begins. This can vary considerably depending on the use of the dispenser. However, the basket cycle can't continue until a load of fries is ready. The following timeline assumes that the weighing cycle started at the same time as the basket cycle.
	Fries Ready	When the weighing cycle has completed, the accumulator doors open and close twice, and then remain open.
10 sec.	Fries Dispensed	During this time, the dispenser ignores input from the lift sensor. If the guide sensor detects a basket, the lift saddle does not go down. The accumulator doors remain open for 5 seconds then close, and the weigh cycle is triggered.
15 sec.	Staging Time-out	The accumulator doors close and the weigh cycle is triggered.

### **Continuous Dispensing**

The AFD-280/U dispenser has two automatic mode settings, 1.0 lb.(450gm) And 1.5 lb.(700gm). In the continuous modes, a new basket cycle is automatically started at the end of each basket cycle. The green restart button is constantly lit.

Automatic cycling will continue until there are three filled baskets on the lower guide. The dispenser will automatically maintain three filled baskets on the lower guide. When a filled basket is removed, a new cycle will start to replace that basket .

## Single Basket Mode

In the single mode, the dispenser will fill baskets only on demand. A basket cycle is initiated by pressing the green restart push-button. When pressed, the button will light and remain lit until the basket cycle is completed. Both the basket cycle and the weighing cycle are triggered by pressing the push-button. If the accumulator doors are empty, the dispenser will weigh a load of fries. From this point, the cycle proceeds normally; weighing the fries, filling the basket, and transferring them to the lower guide. When the lift reaches the bottom, a new weighing cycle is triggered. Unlike the continuous modes, when the lift reaches the top, the green restart light will go out and the basket cycle will stop. The weighing cycle will complete, but the new load of fries will be kept in the accumulator doors until the push-button is pressed again. This mode of operation is most useful during the slow hours of the day. It allows the crew to remove several of the baskets, and never have more than one load of fries “staged”.

## Fries Low/Bridging

If the dispenser is unable to weigh a full load of fries within 40 seconds, the dispenser will give a “Low Fries” indication (Start/Reset push-button flashes slowly). The “Low Fries” indication can actually be caused by several conditions:

1. The most common condition is the hopper being empty, or nearly empty. In this case, refill the hopper with Frozen French Fries to resume operation.
2. Occasionally, an air pocket of fries can form around the dispenser drum. This can occur when fries above the drum lock together, forming a “bridge”. The drum then dispenses all the fries under the bridge, and is unable to dispense any more. Fry bridging is resolved by gently stirring the fries around by hand to collapse the bridge. Bridging of fries usually occurs when a large number of fries are kept in the hopper for several hours, and have been allowed to partially thaw.
3. The low fries indication can be caused by a mechanical failure of the drum, motor, weighing system, or a tripped circuit breaker.

When a “Low Fries” condition occurs:

1. The restart light will begin flashing slowly (about one flash per second).
2. The drum will stop turning.
3. A waiting basket will not be filled (even with a partial load of fries in the accumulator doors).
4. The lift will remain in the up position (a clear difference between a “low fries” and “error” condition).  
The drum stops for two reasons. First, to reduce the risk to the crew who will be refilling the hopper. Second, to minimize crew interaction. The dispenser will retry the weighing again in 90 seconds, this is to minimize crew interaction. The expected behavior when the hopper is empty; 40 seconds of drum halted, 40 seconds turning, 90 seconds halted, and so on.

After refilling the hopper, press the start/reset push-button and the following events occur:

1. The restart light will stop flashing.
2. There will be a two second pause (for load cell stabilization).
3. The weighing cycle will restart.  
Without pressing the start/reset button, the weighing process will automatically resume after a 90 second period. The restart light will stop flashing after the dispenser succeeds in receiving a full load.

## Error Mode

There are several ways that the normal cycle can be interrupted. Each way represents something that will prevent the dispenser from functioning, or may present a hazard to crew or equipment. In these cases, when the dispenser detects such a condition, it will halt operation and allow the crew to correct the problem.

The sequence when an error is detected is as follows:

1. The restart light begins flashing quickly (about five times per second).
2. The error code appears on the Diagnostic display of the Controller Board (see next section).
3. The drum motor stops turning.
4. The stopgate and accumulator doors close.
5. The lift goes down.

The dispenser will remain in this mode until restarted. After the problem has been corrected, the dispenser can be restarted by pressing the restart push-button. The restart light will stop flashing, the lift will go up, and both the weighing cycle and basket cycles will resume.

**NOTE: Should the restart button not stop flashing when pressed, the air present switch is not registering. In this case, the compressor system should be investigated. Error #1 should be displayed on the controller board.**

## The Diagnostic Displays

The AFD-280 controller has two displays that can be used to identify and correct most problems with the dispenser. These are the I/O Point LED's (**L**ight **E**mitting **D**iodes), and the Service interface. The displays are detailed in the following sections. Examples of their use appear in the sections on diagnosing problems with the different subsystems.

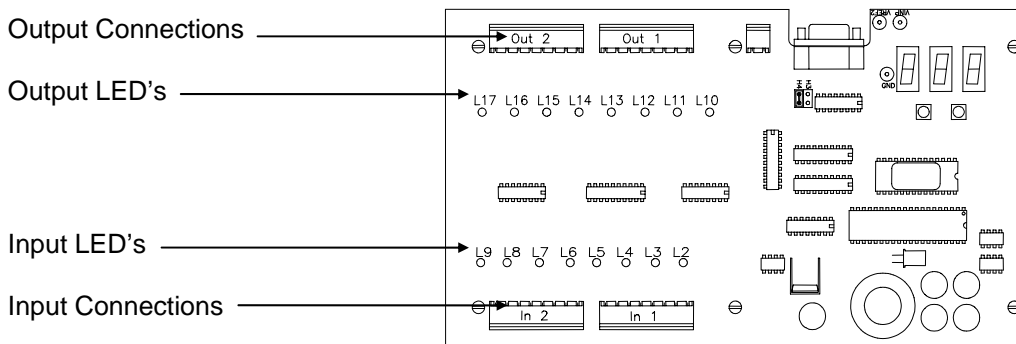
### Input - Output LED Indicators

On the bottom and top of the controller are the inputs and outputs for the controller (In1, In2, Out1, Out2, etc.).

The inputs are located across the bottom of the controller, and are numbered right to left. Each input is optically isolated, and has an LED (**L**ight **E**mitting **D**iode) connected to it. The LED is lit when the input is active.

The outputs are located across the top of the controller, and are numbered right to left. Each output is optically isolated, and has an LED connected to it. The LED is lit when the output is active.

If an output LED is lit, and the corresponding device is not actuated, there is a problem with that device, with the wiring, or with the controller's driver circuit.

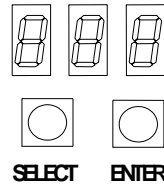


Refer to page 71 and 72 for a list of the input and output LED's (**L**ight **E**mitting **D**iodes) for each controller board used.

## The Service Interface.

On the upper right corner of the controller circuit board is the service interface. The service interface consists of three LED alpha numeric displays and two push-buttons.

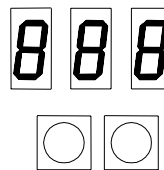
The left push-button is called the “**SELECT**” function button, it is used to SELECT a function to be entered or cancel functions in progress. The right push-button is called the “**ENTER**” function button, it is used to ENTER a selected function. The Service Interface is illustrated below:



The following sections discuss the operations of the service interface.

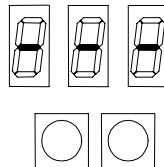
## Power Up

During power up, the controller performs a display segment test. The display will briefly show all eights, as shown below, for this test. During the segment test the controller will also run a test on it's memory and program. Should these tests fail, the controller will stop, leaving the segment test on the display. Normally, the segment test will flash briefly, then the normal operation display will appear.



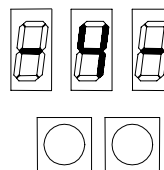
## Normal Operation

During Normal Operation, the display will show a series of horizontal bars, as shown below. This display indicates that all tests have passed, no errors have occurred, and no function is in use. If the controller does not give this display shortly after power up, there is a problem.



## Error Mode

When an error occurs, the START/RESET button will flash rapidly (5 times per second) and the lift will go down. Normally, an error condition can be cleared by pressing the START/RESET button. If an error persists or occurs too often, you may need to know what error is occurring. When an error occurs, the center digit of the display is replaced with an error code. The example below is displaying error code 4.



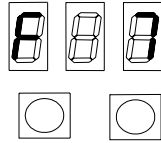
Explanation of the error codes will be found in the troubleshooting section of this manual.

## Selecting a Function

The controller has functions to observe, adjust and test the operations of the dispenser. Functions are accessed using the following procedure.

1. Press the “**SELECT**” function button the number of times as the function number desired. Each time you press the “**SELECT**” button the display will show the function code for the function that is ready to be “ENTERED”.

The example below shows Function 7 (decrease 1.0 lb (450gm). loads). The Function Button was depressed 7 times.



**NOTE:** If the display is left in the above mode, the display will return to Normal Operation after a few seconds. This is a safety feature to prevent functions from being selected by accident.

2. When the display shows the desired function number, press the “**ENTER**” button to enter the selected function.

Pressing the “**SELECT**” function button again will close the function.

Pressing the “**ENTER**” function button again will advance the function to the next level of the selected function.

Further features of each function will be explained in the descriptions of the functions.



## Function Reference for 1.0 software

### Function List

The following is a complete list of the available functions.

Number	Function Name	Description
1	restart function	Same as Restart Button on front panel.
2	display last error	Shows the code for the last error that occurred.
3	weigh disable	Toggles the weighing cycle on and off.
4	tare function	Sets the default zero to the current A/D value. Be sure doors are empty.
5	calibrate	Accepts a 1.0 lb (450gm). reference weight, and sets the 1.0 and 1.5 lb. targets.
6	adjust 1.0 up	Adjusts the 1.0 lb (450gm). target upward in increments of 3 (about 1 oz.).
7	adjust 1.0 down	Adjusts the 1.0 lb (450gm). target downward in increments of 3 (about 1 oz.).
8	adjust 1.5 up	Adjusts the 1.5 lb (700gm). target upward in increments of 3 (about 1 oz.).
9	adjust 1.5 down	Adjusts the 1.5 lb (700gm). target downward in increments of 3 (about 1 oz.).
10	watchdog test	Locks up the program so that the watchdog timer fires. Invokes error #8.
11	load cell readout	Displays the current reading from the load cell (live display).
12	actuate lift	Moves the lift up and down. Displays the time in tenths of a second.
13	actuate doors	Opens and closes the accumulator doors.
14	actuate stopgate	Opens and closes the stop gate.
15	actuate drum	Turns the drum motor on and off.
16	actuate light	Turns the restart light on and off.
17	restore defaults	Clears the error log and sets programmed default weighing parameters.
18	clear errors	Clears the error log.
19	error counts	Reads out the error log.
20	parameters	Reads out the current calibrated weighing parameters.

### **Function 1 - Restart**

Returns immediately to the normal display. This function serves the same purpose as the restart button on the front panel. Provides a means of restarting the dispenser from the back of the dispenser.

### **Function 2 - Display Last Error**

Displays the error number of the last error. This allows the dispenser to be restarted after an error, and then find out what the error was while the dispenser is in service. Exit using either the select or enter button.

### **Function 3 - Disable Weighing**

Pressing enter button immediately returns the display to normal. Turns the weighing process on and off. This is used for testing the mechanical systems. Inhibits the dispenser from dispensing and weighing fries. Commonly used for testing the mechanical systems, or diagnosing / calibrating the load cell. If weighing is not turned back on, it will be automatically restarted the next time the dispenser power is cycled.

### **Function 4 - Tare**

Pressing enter button immediately returns the display to normal. Establishes a new zero point for the load cell. Before entering this function, be sure that the accumulator doors are empty. This can be accomplished by disabling the weighing (**Function 3**), and running a basket through to make the dispenser drop the fries into the basket.

### **Function 5 - Calibrate**

**NOTE: For accurate calibration, tare the weighing system (Function 4) before calibrating.**

Displays the word "CAL" on the display. Clean off the accumulator doors and apply a 1.0 pound (450gm) reference weight (Four 1/4# Patties for example). Wait at least 10 seconds for the load cell to stabilize, then press the enter button again. The display will return to normal. This function uses the reading for the 1 lb (450gm) reference weight to calculate the target weights for the 1.0 lb (450gm) and 1.5 lb (700gm) loads.

### **Function 6 - Adjust 1.0 target upward**

Displays the current target value for use when weighing 1.0 lb. (450gm) loads. The default value is 51. Pressing the enter button causes the value to increase by 3 each time it is pressed. This corresponds to approximately 1 oz. (25 gm). When the desired value is reached, press the select button to close the function.

## **Function 7 - Adjust 1.0 target downward**

Displays the current target value for use when weighing 1.0 lb. (450gm) loads. The default value is 51. Pressing the enter button causes the value to decrease by 3 each time it is pressed. This corresponds to approximately 1 oz. (28 gm). When the desired value is reached, press the select button to close the function.

## **Function 8 - Adjust 1.5 target upward**

Displays the current target value for use when weighing 1.5 lb. (700gm) loads. The default value is 77. Pressing the enter button causes the value to increase by 3 each time it is pressed. This corresponds to approximately 1 oz. (28 gm). When the desired value is reached, press the select button to close the function.

**NOTE:** Adjusting the target weight above 1.5 lb (700gm) is **NOT** recommended for proper cooking.

## **Function 9 - Adjust 1.5 target downward**

Displays the current target value for use when weighing 1.5 lb. (700gm) loads. The default value is 77. Pressing the enter button causes the value to decrease by 3 each time it is pressed. This corresponds to approximately 1 oz. (28 gm). When the desired value is reached, press the select button to close the function.

## **Function 10 - Watchdog test**

The controller has an internal timer that resets in the event that an electrical surge causes the controller circuitry to freeze. During normal operation, the controller program signals the timer several times per second to prevent it from firing. This function tests the timer by locking up the program so the watchdog timer fires. When this function is selected, nothing will happen for approximately 1.5 seconds, then the controller will reset. You will see the segment test flash by, and then display error #8 (Watchdog Timer Fired).

**NOTE:** This function causes a Watchdog Timer Error, and will be recorded in the error log.

To prevent confusion, you may want to clear the error log (Function 18) after using this function.

## **Function 11 - Load Cell Readout**

Displays the current load cell reading. This is the raw value (it is not compensated for any offset or calibration), and is used to test the load cell. This is a live display and changes constantly with the load cell input. The value should read between 30 -100. Pressing the select button closes the function.

## **Function 12 - Actuate Lift**

Displays the time required for the last lift actuation in tenths of a second (e.g. 23 means 2.3 seconds). When this function is entered, the stopgate will close (to prevent baskets from falling). Each time the enter button is pressed, the controller will change the state of the output (L15) that drives the lift (if it is off it will turn it on, if it is on it will turn it off). After the lift completes it's move, the display will change to show the time that the lift took for that actuation. This function is used to test the lift cylinder, lift cylinder switches, and to measure/adjust the lift speeds. If the dispenser is in an error condition this function will require the Start/Reset button to be pressed after entering this function. Lift cylinder speeds should be between 2.2 and 2.6 seconds. If the cylinder speeds are faster than 1.6 seconds or slower than 4.4 seconds, a system error will be generated.

## **Function 13 - Actuate Doors**

Display remains "F13". Each time the enter button is pressed, the controller will change the state of the output (L16) that drives the Accumulator Doors (if it is off it will turn it on, if it is on it will turn it off). This function is used to test the accumulator door cylinder, and adjust the accumulator door speeds.

## **Function 14 - Actuate Stopgate**

Display remains "F14". Each time the enter button is pressed, the controller will change the state of the output (L17) that drives the Stopgate (if it is off it will turn it on, if it is on it will turn it off). This function is used to test the stopgate cylinder, and adjust the stopgate speeds.

## **Function 15 - Actuate Drum**

Display remains "F15". Each time the enter button is pressed, the controller will change the state of the output (L10) that drives the Dispenser Drum Motor (if it is off it will turn it on, if it is on it will turn it off). This function is used to test the Drum Motor.

## **Function 16 - Actuate Light**

Display remains "F16". Each time the enter button is pressed, the controller will change the state of the output (L11) that drives the Restart Light (if it is off it will turn it on, if it is on it will turn it off). This function is used to test the Restart Light.

## **Function 17 - Restore Defaults**

This function restores the 1 lb (450gm), 1.5 lb (700gm), and tare values to programmed default factory values. These will change when the Tare and Calibrate functions are performed (In fact they are preferred, as they will tailor your weighing parameters to your actual load cell instead of the defined "typical load cell"). This function is intended to be a general purpose function, which will restore the memory state of the dispenser to what it was when it was first powered on. This function also clears the error log. Function 20 will display the specific calibration values.

## **Function 18 - Clear Errors**

This function sets each of the counts in the error log to zero. This can be done at any time, as it has no effect on any other operations. We recommend that this be done periodically to prevent records of occasional errors from building up (even a perfectly running dispenser will get occasional errors from improper handling) and confusing a service tech at a time when the error log could be useful. In any case, errors should be cleared after every service call to prevent the errors invoked during the call from causing confusion in the future.

## **Function 19 - Error Counts**

Displays the word "Err". Each time the Enter button is pressed, it moves to the next error count. When the last count is passed, the display returns to normal mode. The error counts are displayed in numerical order. Error number 9 is not included (error number 9 indicates a memory failure, and therefore renders any history meaningless). For example, if you saw this sequence of displays:

```
"Err"  
" 0"  
" 0"  
" 1"  
" 3"  
" 2"  
" 0"  
" 21"  
" 0"  
" _ _ "
```

This would indicate that, since the last time the errors were cleared, there had been 1 error 3, 3 error 4's, 2 error 5's, and 21 error 7's. This would indicate a problem with the lift up switch.

## **Function 20 - Parameters**

Displays the word "Con". Each time the enter button is pressed, it moves to the next weighing parameter. When all three parameters have been displayed, the display returns to the normal mode.

The weighing parameters are (in order of appearance):

1. The 1.0 lb (450gm). target: This is the number of digitizer steps equal to 1.0 lb (450gm). The default value is 51.
2. The 1.5 lb (700gm). target: This is the number of digitizer steps equal to 1.5 lb (700gm). The default value is 77.
3. Default tare: This is the value that the dispenser uses for zero when it first powers up. The default value is 77. If the load cell has been calibrated, or the loads adjusted, these may be slightly different. For details see the section on operation/calibration of the load cell.

## Expanded Function Reference for 2.x software

The following is a complete list of the available functions.

Number	Function Name	Description
1	restart function	Same as Restart Button on front panel.
2	display last error	Shows the code for the last error that occurred.
3	weigh disable	Toggles the weighing cycle on and off.
4	tare function	Sets the default zero to the current A/D value. Be sure doors are empty.
5	calibrate	Accepts a 1.0 lb (450gm). reference weight, and sets the 1.0 and 1.5 lb. targets.
6	adjust 1.0 up	Adjusts the 1.0 lb (450gm). target upward in increments of 1 (about 1 oz./25gm).
7	adjust 1.0 down	Adjusts the 1.0 lb (450gm). target downward in increments of 1 (about 1 oz./25gm).
8	adjust 1.5 up	Adjusts the 1.5 lb (700gm). target upward in increments of 1 (about 1 oz./25gm).
9	adjust 1.5 down	Adjusts the 1.5 lb (700gm). target downward in increments of 1 (about 1 oz./25gm).
10	watchdog test	Locks up the program so that the watchdog timer fires. Invokes error #8.
11	load cell readout	Displays the current reading from the load cell (live display).
12	actuate lift	Moves the lift up and down. Displays the time in tenths of a second.
13	actuate doors	Opens and closes the accumulator doors.
14	actuate stopgate	Opens and closes the stop gate.
15	actuate drum	Turns the drum motor on and off.
16	actuate light	Turns the restart light on and off.
17	restore defaults	Clears the error log and sets programmed default weighing parameters.
18	clear errors	Clears the error log.
19	error counts	Reads out the error log.
20	parameters	Reads out the current calibrated weighing parameters.
21	adjust .75 up	Adjusts the .75 lb (350 gm) target upward in increments of 1 (about 1 oz./25gm).
22	adjust .75 down	Adjusts the .75 lb (350gm). target downward in increments of 1 (about 1 oz./25gm).
23	.75 control	Changes the .75 lb (350gm).position from single to automatic.
24	bypass mode	Used to temporarily bypass inoperative sensors or lift switches.
25	select units	Select weight units; US or International.
26	exercise mode	Used to "break in" replaced componets.
27	revision level	Displays EPROM revision level.
28	segment test	Verifies that all the display segments are functional.

Note: Functions that are the same as 1.0 software do not appear in this section.

### **Function 6 - Adjust 1.0 target upward**

Displays the current target value for use when weighing 1 lb. (16 oz.), (450gm) loads (in ounces or grams, depending on units setting of F25). The default value is 16 oz. (450gm). Pressing the enter button causes the value to increase by 1 ounce (25gm) each time it is pressed. When the desired value is reached, press the select button to close the function.

### **Function 7 - Adjust 1.0 target downward**

Displays the current target value for use when weighing 1 lb. (16 oz.), (450gm) loads (in ounces or grams, depending on units setting of F25). The default value is 16 oz. (450gm). Pressing the enter button causes the value to decrease by 1 ounce (25gm) each time it is pressed. When the desired value is reached, press the select button to close the function.

### **Function 8 - Adjust 1.5 target upward**

Displays the current target value for use when weighing 1.5 lb. (24 oz.), (700gm) loads (in ounces or grams, depending on units setting of F25). The default value is 24 oz. (700gm). Pressing the enter button causes the value to increase by 1 ounce (25gm) each time it is pressed. When the desired value is reached, press the select button to close the function.

**NOTE:** Adjusting the target weight above 1.5 lb (700gm) is **NOT** recommended for proper cooking.

### **Function 9 - Adjust 1.5 target downward**

Displays the current target value for use when weighing 1.5 lb. (24 oz.), (700gm) loads (in ounces or grams, depending on units setting of F25). The default value is 24 oz. (700gm). Pressing the enter button causes the value to decrease by 1 ounce (25gm) each time it is pressed. When the desired value is reached, press the select button to close the function.

**Function 17 - Restore Defaults**

**Note:** Function 17 will reset the units to “US” units. If international units are preferred, Function 25 must be performed.

This function recalls the .75 lb./350 gm., 1 lb./450 gm., 1.5 lb./700 gm., and tare values to programmed default factory values. These will change when the Tare and Calibrate functions are performed. This function is intended to be a general purpose function, which will restore the memory state of the dispenser to what it was when it was first powered on. This function also clears the error log. Function 20 will display the specific calibration values.

**Function 19 - Error Counts**

Displays the “Err” when the function is first entered.

Each time the Enter button is pressed, it moves to display the next error and counts. When the last error count is passed the display returns to the normal mode.

The error counts are displayed in numerical order. Error 9 is not recorded.

For example, if you saw this sequence of displays:

“Err”  
“1. 0”  
“2. 0”  
“3. 1”  
“4. 3”  
“5. 2”  
“6. 0”  
“7. 21”  
“8. 0”

This would indicate that since the last time the errors were cleared, there had been:

1 error #3, 3 error #4's, 2 error #5's, and 21 error #7's.

**Function 20 - Parameters**

Displays the word “Con”. Each time the enter button is pressed, it moves to the next weighing parameter. When all parameters have been displayed, the display returns to the normal mode.

The weighing parameters are (in order of appearance):

1. Switch position #1 target - the number of digitizer steps that represents .75lb/350gm. The default value is 38/39.
2. Switch position #2 target - the number of digitizer steps that represents 1.0lb/450gm. The default value is 51/50.
3. Switch position #3 target - the number of digitizer steps that represents 1.5lb/700gm. The default value is 77/78.
4. Default tare - the value that the dispenser uses for zero when it first powers up. The default value is 40/40 (30-100 acceptable).

If the load cell has been calibrated, or the loads adjusted, these may be slightly different. For details see the section on operation/calibration of the load cell.

**Function 21 - Adjust Switch Position #1 UP**

Displays the current target value (in ounces or grams, depending on units setting of F25) for use when weighing 3/4 lb. (12 oz.), (350 gm) loads. The default value for switch position #1 is 12 oz. (350 gm.). Pressing the enter key causes the value to increase by 1 oz. (25 gm.), with each activation. When the desired value is reached, press the select key to close the function and set the value.

**Function 22 - Adjust Switch Position #1 DOWN**

Displays the current target value (in ounces or grams, depending on units setting of F25) for use when weighing .75 lb. (12 oz.), (350 gm) loads. The default value for switch position #1 is 12 oz. (350 gm.). Pressing the enter key causes the value to decrease by 1 oz. (25 gm.), with each activation. When the desired value is reached, press the select key to close the function and set the value.

**Function 23 - Position #1 Control Status**

Entering this function displays “AU” or “SL”. The “AU” display indicates that switch position #1, .75lb. (350gm.) is set to function in the automatic mode just like the other two selector switch positions. Pressing the enter button will now toggle the display between “AU” and “SL”. When the display indicates “SL”, pressing the select button again will set the #1 selector switch position to single mode and close the function.

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### **Function 24 - Bypass Mode Enable (volatile setting)**

Entering this function the display will read either “nor” , **Bypass mode disabled** or “bYP”, **Bypass mode enabled**. When the Bypass mode is enabled the dispenser will ignore any error conditions and cycle in the single mode only. A basket will dispense each time the control panel reset button is pressed. The selector switch will select the load sizes in all three positions. This function is volatile, meaning that the bypass mode will disable when the power is turned off. This function is designed to allow usage of the fry dispenser even when there is a problem with a component or an adjustment until service can be performed on the dispenser. Bypass Mode is further identified by double flashing of the reset button.

### **Function 25 - Select Weight Units “US” or “In”**

Entering this function permits selection of ounces or grams as the weighing units. Pressing the enter button will toggle the display between ounces “US” and grams “In” (international) for the weight units. Pressing the select button sets the displayed weight units for dispenser operations.

### **Function 26 - Exercise Mode (volatile setting)**

When the dispenser is in the exercise mode, all systems will continuously cycle. The display will read out the lift speed each time the lift traverses. The exercise mode is designed to “break in” a replaced component and allow simple adjustments to the lift speeds. The exercise mode is volatile and will reset when the dispenser power is turned off.

### **Function 27 - Display EPROM Revision Level**

Entering this function displays the revision level of the installed EPROM.

### **Function 28 – Segment Test**

Verifies that all the display segments are functional. The display segments will illuminate in a moving display.

## Error Definitions

When an error occurs, the light in the restart button begins flashing rapidly (about 5 flashes per second) and the lift goes down. In most cases, this signals the need for a minor adjustment or a component has been assembled improperly. If the cause is not immediately apparent, the error code can be read from the display on the controller. The error code will be displayed on the controller, unless a function is being used, until the restart button is pressed. If the restart button has been pressed, you can find out what the last error was by using the display last error function (Function #2). You can also look at the counts of the errors using Function #19 (this is useful if errors are occurring frequently).

**NOTE: If no error is displayed, but the restart light is flashing slowly, the system is indicating that it is unable to achieve a full load of fries. This usually means that the hopper is empty. If it is not, refer to the section on diagnosing the weighing system.**

The following table is a summary of the errors, below are detailed explanations of the errors and their possible causes.

Number	Error Name	Definition
1	AIR LOSS	Operating Pressure has dropped below 20 PSI (1.4 BAR.)
2	LIFT SPEED	The lift is moving too fast (time is less than 1.6 seconds)
3	LIFT TIME	The lift is moving too slow (time is more than 4.4 seconds)
4	LIFT SENSOR	An error has occurred involving the lift optical sensor.
5	GUIDE SENSOR	An error has occurred involving the guide optical sensor.
6	LIFT DOWN SWITCH	An error has occurred involving the lift down switch.
7	LIFT UP SWITCH	An error has occurred involving the lift up switch.
8	WATCHDOG	The watchdog timer fired (abnormal reset)
9	NVRAM	Checksum error for the non-volatile storage.

If the display remains blank, or remains with all segments on (888), the EPROM and/or controller board is defective.

### Error #1 - Air Loss

The Air Present Switch, located on the filter/regulator, is not registering **(L6)**.

Possible causes:

- The drain valve on the filter/regulator did not close properly, preventing the compressor from reaching operating pressure. If this occurs, the compressor will run continuously and air will be leaking from the drain tube beneath the dispenser. Clean or replace the water trap bowl.
- The filter/regulator water trap bowl is damaged. Replace the water trap bowl.
- The air present switch is set too high. The air present switch should be adjusted to close (L6 on) at 20 PSI (1.4 bar) and open (L6 off) at 18 PSI (1.2 bar).
- There is an air leak in the dispenser plumbing, preventing the compressor from reaching operating pressure. If this occurs, the compressor will run continuously and you may hear air hissing from the site of the air leak.
- The pressure at the filter/regulator is set too low, below 20 PSI (1.4 bar). Operating pressure is 30 PSI (2.1 bar).
- Something is blocking the airflow in the air lines (debris or a kink in the line). Dispenser may operate intermittently. Monitor the pressure gauge on the filter/regulator. If the pressure drops below 20 PSI (1.4 bar) during operation, this is a possible cause.
- The compressor pressure switch (mounted on the top of the air reservoir) is set too low. This can be checked by turning the filter/regulator adjustment knob fully clockwise. The filter/regulator pressure gauge is now monitoring pressure in the air reservoir. The compressor pressure switch should be set to turn on at 40 PSI (2.8 bar) and off at 60 PSI (4.2 bar). Adjust filter/regulator pressure to 30 PSI (2.1 bar) when complete.
- The compressor is not running. If the pressure in the reservoir is below 40 PSI (2.8 bar) the compressor should be running. If it is not, either the air compressor, the compressor pressure switch, or the AC wiring is faulty.
- The connection between the air present switch and the controller board is faulty. Verify wiring is not loose or damaged.
- The air present switch has failed. Adjust or replace the air present switch.

## **Error #2 - Lift Speed**

The controller board has received a signal from lift up switch or lift down switch, after it has set the lift saddle in motion, but before it is expected. (Lift saddle cylinder speeds must be between 1.6 and 4.4 seconds).

Possible causes:

- The filter/regulator air pressure is set too high. Verify the filter/regulator gauge indicates 30 PSI (2.1 bar).
- The lift saddle speeds are too fast and an adjustment is required.
- The lift saddle is not installed.
- Manifold is Defective.

## **Error #3 - Lift Time-out**

The controller board has set the Lift Saddle in motion, and not received a signal from the opposite end switch within 4.5 seconds. (Lift saddle cylinder speeds must be between 1.6 and 4.4 seconds).

Possible causes:

- The filter/regulator pressure is set too low. Verify the filter/regulator gauge indicates 30 PSI (2.1 bar).
- The lift saddle cylinder speeds are too slow and adjustment is required.
- The upper guide is installed incorrectly (backwards), and is blocking the lift saddle.
- The lower guide is installed incorrectly.
- Something is blocking the lift saddle.
- A lift switch is improperly positioned or loose, preventing it from detecting the lift saddle cylinder. This can be verified by looking at the inputs for the lift switches (L4 & L5) on the controller board.
- The connection between either the lift down, or lift up switch and the controller board is broken. Check for loose or damaged switch wiring.
- Either the lift down, or lift up switch has failed.
- Lift Saddle shoulder screws are damaged, missing or loose.
- The Lift Saddle Cylinder has failed.
- Manifold is defective.
- The lift cylinder airline is kinked.

## **Error #4 - Lift Sensor Error**

The Lift Sensor is not properly detecting a basket with the lift saddle in the up position. Or the Lift Sensor is detecting a basket with the lift saddle in the down position.

Possible causes:

- Someone has bumped or removed a basket from the lift saddle during the basket cycle.
- The Lift Sensor has picked up a highly reflective object in the environment.
- Shortening on the lift sensor.
- The connection between the Lift Sensor and the Controller Board is faulty.
- Lift Sensor range needs adjustment.
- Incorrect baskets are being used.
- The Lift Sensor has failed.



## **Error #5 - Guide Sensor Error**

The Guide Sensor has failed to detect a basket leaving the lift saddle.

Possible causes:

- The basket is stuck in the lift saddle.
- The basket was removed from the lift saddle instead of the Lower Guide.
- The connection between the Guide Sensor and the Controller board is broken.
- Guide Sensor range needs adjustment.
- The Guide Sensor has failed.
- Incorrect baskets are being used.
- The lower guide is installed incorrectly.
- The lower guide is out of alignment with guide sensor.

## **Error #6 - Lift Down Switch Error**

The Lift Down Switch has turned on while the lift saddle is up, or turned off while the lift saddle is down.

Possible causes:

- The Lift Down Switch is improperly positioned.
- The Lift Down Switch is loose in it's mounting.
- The connection between the Lift Down Switch and the controller board is faulty.
- The Lift Down Switch has failed.
- The mounting strap is too tight causing the switch to stay on.

## **Error #7 - Lift Up Switch Error**

The Lift Up Switch has turned on while the lift saddle is down, or turned off while the lift saddle is up.

Possible causes:

- The Lift Up Switch is improperly positioned.
- The Lift Up Switch is loose in it's mounting.
- Something has pushed the lift saddle cylinder out of position.
- The air pressure is too low and the weight of the lift saddle has pushed the lift saddle cylinder out of position.
- The connection between the Lift Up Switch and the controller board is faulty.
- The Lift Up Switch has failed.
- The Lift Saddle Cylinder is leaking air.
- The Lift Saddle Cylinder has failed.
- The mounting strap is too tight causing the switch to stay on.

## **Error #8 - Watchdog or Abnormal Reset**

The controller board has reset itself while the power was on.

Possible causes:

- Someone executed function #10 (Watchdog timer test).
- Someone cycled the power quickly.  
**(Ensure the switch remains off for at least 15 seconds when cycling power).**
- There is excessive electrical interference.
- The 24 volt dc power supply is failing or wiring has shorted or opened.  
Verify 24 volt dc power supply indicates 24.5 volts dc  $\pm 2$ .

## **Error #9 - NVRAM Checksum Error**

NVRAM – Non Volatile Random Access Memory.

The controller board keeps a code in it's memory that tells whether the stored data is good or not. This error indicates that the data in the memory is not good. The error history and calibration constants are kept in this memory, and will not be valid if this error occurs.

**NOTE: Because the error history is kept in the NVRAM, this error is not recorded.**

**NOTE: This error will only happen during power up.**

**NOTE: This may occur when replacing the controller board or EPROM software chip.**

Possible causes:

- The NVRAM is failing. The controller board and EPROM have to be replaced.
- If the segment display remains blank, or displays 888, the EPROM is defective.

## Calibrations and Adjustments

### Load Cell Calibration

- Disable the Drum Motor: **Select F3** and press the **ENTER** button.
- Inspect to see that no part of the Hopper is touching the Accumulator Doors. Remove the Hopper from the Fry Dispenser.
- Verify the Accumulator Doors are empty and that the Shaft Collars are not touching the Dispenser cabinet.
- **Select** and **Enter** the Load Cell Readout Function (**F11**), the load cell reading should be between 20 & 100. Place a 1.0 pound (450gm) weight on the Accumulator Doors (Four-1/4lb. patties, or 1lb. butter) the load cell reading should go up. If the reading does not go up the load cell is defective. Remove the weight from the Accumulator Doors.
- **Select** and **Enter** the RESTORE DEFAULTS Function (**F17**). This clears the error log and sets programmed default weighing parameters.  
*Note: For International units of measure: Select Function 25. "US" on display. Press Enter again to change to "IN". Press Select to save the change.*
- **Select** and **Enter** the TARE Function (**F4**). This sets the Tare value.
- **Select** and **Enter** the Calibrate Function (**F5**). The word "**CAL**" will appear on the display.
- Place a 1.0 pound (450gm) weight on the Accumulator Doors (Four-1/4lb. patties, or 1lb. butter).
- Wait 10 seconds for the load cell to settle: Press **Enter** again, this sets and closes the Calibration function.
- Remove the 1.0 lb (450gm) weight.
- **Turn the power switch off.**
- Reinstall the Hopper on the Dispenser and fill it with Fries.

### Compressor Pressure Control Switch

- The turn On and turn Off pressure set points of the Pressure Control Switch can be monitored by the pressure gauge on the Pressure Regulator.
- Increase the Pressure Regulator Setting to maximum by pulling up the control knob and turning it fully clockwise. Now the Air Pressure Gauge is monitoring the Air Reservoir pressure directly.
- Slowly vent the air pressure from the Air Reservoir with the Pressure Release Valve and observe the compressor turn on pressure setting (40 psi./2.8 bar). While the system is recharging, observe the compressor turn Off pressure (60 psi./4.2 bar).
- Adjustments for the Pressure Control Switch are located inside the switch protective cover. The brass set screw adjusts both the turn on and turn off set points. The black plastic set screw adjusts only the turn off set point. Turning these screws clockwise will increase the set point and turning counter clockwise will decrease the set point.
- Reset the Air Pressure Regulator to 30 psi (2.1 bar) after checking the Pressure Control Switch calibration. Lock the adjustment by pushing the control knob back down into the lock position. After a few basket cycles, check the pressure setting again.

### Pressure Regulator

Adjust the Pressure Regulator Setting to 30 psi (2.1 bar) by pulling up the control knob and turning it clockwise to increase or counter clockwise to decrease the pressure. Lock the adjustment by pushing the control knob back down into the lock position. After a few basket cycles, check the pressure setting again.

## Air Present Switch

The Air Present Switch is part of the Pressure Regulator Assembly.

To check the settings:

- Lower the Pressure Regulator Setting by pulling up the control knob and slowly turning it counter clockwise to decrease the system air pressure while observing the LED (**L6**) on the controller board. The LED should go **OFF** at 18 psi (1.2 bar).
- Raise the Pressure Regulator Setting by slowly turning the control knob clockwise to increase the system air pressure while again observing LED (**L6**) on the controller board. The LED should go **ON** at 20 psi (1.4 bar).

To make an adjustment:

- Remove the allen head cover screw or paper cover, from the bottom center of the Air Present Switch.
- Insert the allen wrench back into the access hole and turn the adjustment set screw clockwise to increase the setting, or counter clockwise to decrease the setting.
- DO NOT re-install the allen head cover screw, if applicable.
- Reset the Pressure Regulator to 30 psi. (2.1 bar) and lock the adjustment by pushing the control knob back down into the lock position. After a few basket cycles, check the pressure setting again.

## Power Supply

- With a D.C. Voltmeter, measure the output of the power supply at the Red and Black wire terminals.
- If necessary, adjust the Vout potentiometer in the power supply for 24.5 Volts D.C.

## Manifold Air Flows

### **Stop Gate opening and closing speeds:**

See page 40, 60 and 62 for adjusting screw location.

- To activate the Stopgate **Select** function **F14** on the Controller Board and press the **Enter** button. Successive activation of the **Enter** button will cycle the Stop Gate.  
**Note:** The Stopgate can also be activated by depressing the manual "poppet" valve on the solenoid.
- Adjust: Stop Gate Open "**B**" adjustment for 1 second opening speed (Cylinder Extended, Gate Open ).
- Adjust: Stop Gate Close "**A**" adjustment for 1 second closing speed (Cylinder Retracted, Gate Closed ).
- Lock the settings by lightly tightening the locking nuts.
- Press the **Select** button to close the function.

### **Accumulator Door opening and closing speeds:**

See page 40, 60 and 62 for adjusting screw location.

- To activate the Accumulator Doors **Select** function **F13** on the Controller Board and press the **Enter** button. Successive activation of the **Enter** button will cycle the Accumulator Doors open and closed.  
**Note:** The Stopgate can also be activated by depressing the manual "poppet" valve on the solenoid.
- Adjust: Accumulator Door Open "**B**" adjustment for 1/2 second opening speed (Cylinder Extended).
- Adjust: Accumulator Door Close "**A**" adjustment for 1 second closing speed (Cylinder Retracted).
- Lock the settings by lightly tightening the locking nuts.
- Press the **Select** button to close the function

## Lift Saddle speed adjustments.

See page 40, 60 and 62 for adjusting screw location.

### **Normal Conditions:**

- Lift Saddle can be actuated by **Selecting** function **F12** on the Controller Board and pressing the **Enter** Button. The 3 digit display will then display the last speed from memory. Subsequent pressings of the **Enter** Button will activate the Lift Saddle (up or down) and display the traverse speed in 1/10ths seconds, i.e. a display of 24 = 2.4 seconds.
- Adjust the Lift Speed Up adjustment on the Manifold Block for an up speed of 2.2 - 2.6 seconds. Turn the lift up speed screw clockwise to decrease and counter clockwise to increase the lift up speed.
- Adjust the Lift Saddle down speed with the exhaust needle valve at the bottom of the Manifold Block for a down speed of 2.2 - 2.6 seconds.
- Lock the setting by lightly tightening the locking nut, then re-check the down speed time.

### **From an Error Condition:**

Function 12 has the ability to check lift speeds even with the Dispenser in a system error condition.

With a system error, the following routine and diagnostics can be performed:

- **Select F12 - "Enter"** Enters the test mode, displays last lift speed
- **Push Start/Reset button** Resets system error while in test mode
- **Push "Enter"** Changes lift state, displays actuated lift speed
- **Push "Enter"** Changes lift state, displays actuated lift speed

**Note:** Other diagnostics which can be observed:

- Verification of Lift Down (L5) and Lift Up (L4) switches
- Observation of L15, (Raise Lift)

## Optical Sensors

**Lift Sensor** activation is indicated by the illumination of LED **L2** on the Controller Board.

**Guide Sensor** activation is indicated by the illumination of LED **L3** on the Controller Board.

### **Checking/ Adjusting Sensitivity:**

- Cover the Optical Sensor with your hand.  
The LED associated with the Sensor should illuminate on the Controller Board.
- Verify the Sensor Sensitivity:  
The Sensor Indicator LED should remain on until your hand is Midway between the Ultem runners of the Upper or Lower guides.
- Adjust the Sensitivity / Gain control if necessary:  
Clockwise to increase, Counter clockwise to decrease.
- The Guide Sensor can further be checked by putting three baskets on the lower guide. The upper rim of the basket should be in the middle of the sensor. If the basket rim is too high or too low, adjust the tabs at the bottom of the right guide support.
- The Lower Guide Sensor **L3** should also be ON when 3 baskets are on the Lower Guide.

## **Stopgate Linkage**

To check the adjustment:

- Turn the Dispenser power OFF and release air pressure in the Reservoir by pulling up the ring on the Safety Relief Valve at the top of the Air Reservoir.
- Manually retract (close) the Stopgate Air Cylinder.
- Observe the angle between the Stopgate and the Upper Guide, it should be 90 degrees.

To make an adjustment:

- Loosen the Jam Nut at the end of the Cylinder Shaft.
- Screw the Cylinder Shaft in or out of the Linkage until the angle is 90 degrees.
- Tighten the Jam Nut onto the Linkage to lock this setting.

## **Accumulator Door Linkage**

To check the adjustment:

- Turn the Dispenser power OFF and release air pressure in the Reservoir by pulling up the ring on the Safety Relief Valve at the top of the Air Reservoir.
- Close the Accumulator Doors by fully retracting the Cylinder Shaft. Push the Linkage Block toward the Air Cylinder with your finger and observing the Accumulator Doors closing with an approximate 1/8" (3 mm) clearance gap.

To make an adjustment:

- Loosen the Jam Nut at the end of the Cylinder Shaft.
- Adjust the clearance by screwing the Cylinder Shaft in or out of the Linkage Block to attain the proper Accumulator Door clearance.
- Lock the setting by tightening the Jam Nut onto the Linkage Block.

## Lift Cylinder Switches

To check the adjustment:

- Turn the Dispenser Mode Switch to the Single Position.
- Remove the Saddle from the Lift.
- Press the Start / Reset push-button. The Dispenser will go into an error condition.
- Manually raise and lower the Lift Cylinder and observe L4 (Lift Up) and L5 (Lift Down) on the Controller Board:
  - With the Lift Cylinder fully extended (up), L4 should be illuminated and stay illuminated as the Lift Cylinder is slowly lowered approximately 1/4" -1/2" (6 mm – 13 mm).
  - Observe L4 for a single switch closure in its operating range (1/4"- 1/2" (6 mm – 13 mm) from raised), blinking on and off as the Lift Cylinder is lowered indicates a fault.
  - With the Lift Cylinder fully retracted (down), L5 should be illuminated and stay illuminated as the Lift Cylinder is slowly raised approximately 1/4" - 1/2" (6 mm – 13 mm).
  - Observe L5 for a single switch closure in its operating range (1/4"-1/2" (6 mm – 13 mm) from lowered), blinking on and off as the Lift Cylinder is raised indicates a fault.

To make an adjustment:

- Remove the Lift Cylinder Cap.
- Remove the Cylinder Cover Nut and Cylinder Cover.
- Observe the Upper Lift Cylinder Switch and securing strap.
- The Lower Lift Cylinder Switch is accessible from the Side Access Plate on the AFD-280 and from the rear of the Dispenser on the AFD-280U
- Loosen the lock nut and allen head screw on the securing strap and adjust the position of the Cylinder Switch for proper operation. The Lift Cylinder Switches also have LED's mounted on them to assist in positioning them. This LED illuminates at the same time as the LED's on the Controller Board.
- Lightly tighten the allen head screw when finished. Over tightening can destroy the switch. Tighten the lock nut.
- Install the Lift Cylinder Cover, Cover Nut, Lift Cylinder Cap and Saddle Assembly.
- Restart the Fry Dispenser.

## Verification of Load Cell A-D Converter

Procedure:

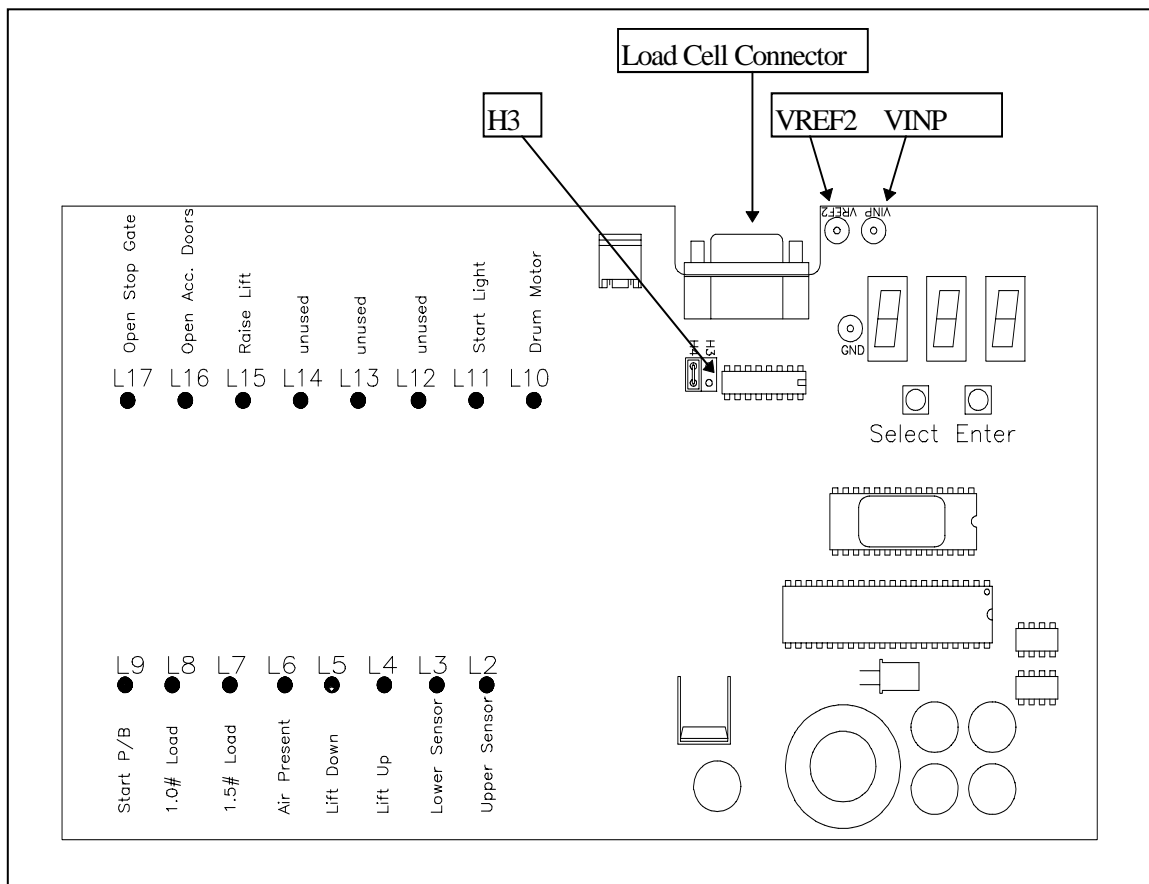
1. Turn the Dispenser power **OFF**.
2. Wait 10-15 seconds and disconnect the Load Cell Connector.
3. Turn the Dispenser power **ON**.
4. Select **Function 11** and press **Enter**.  
-Observe the digital display, it should read **000 to 005**.
5. Bridge connection **H3** with a jumper, screwdriver, or shorting connector.  
-Observe the digital display, it should read **000 to 001**.
6. With **H3** bridged, also bridge between **VINP** and **VREF2** with another jumper, or screwdriver.  
-Observe the digital display, it should read **128**.
7. Turn the Dispenser power **OFF**, wait 10-15 seconds, and re-connect the Load Cell Connector.
8. If the readings do not match this test the Load Cell Analog to Digital conversion circuitry is faulty and the controller board needs to be replaced.

**Note:** This procedure validates correct operation of the Load Cell Analog to Digital conversion circuitry **only**.

This procedure **does not** validate the Load Cell or Load Cell wiring.

### **WARNING:**

Load Cell damage may occur if the Load Cell connector is connected or disconnected while the Dispenser power is **ON**.

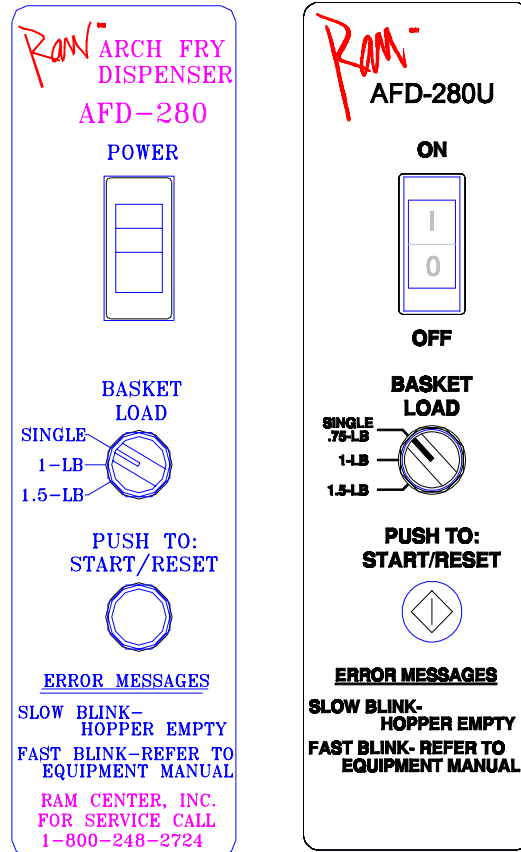




# AFD280, 280U Comprehensive Service Manual

AFD-280 , 280U System Functions and Operation

The following switches and buttons are located on the Operator Panel:



## Power Switch

Supplies electrical power to the Arch Fry Dispenser. Illuminates when the Arch Fry Dispenser has power.

## Load Select Switch

Three Position Switch that allows the operator to select Basket Load weights and control dispenser operation.

- **SINGLE:** Stops automatic Fry Basket loading.  
Press the Start/Reset Button to dispense only 1 Fry Basket of Fries; pre-set to 1.5 lb (700gm).  
**NOTE:** With 2.x e-prom installed the SINGLE position is pre-set to 3/4 lb (350gm).
- **1.0 LB (450gm):** Position for continual dispensing of 1 lb (450gm) Basket Loads.
- **1.5 LB (700gm):** Position for continual dispensing of 1.5 lb (700gm) Basket Loads.

## Start/Reset Button

Press to start the loading of a single Fry Basket when the Load Select Switch is set for SINGLE.

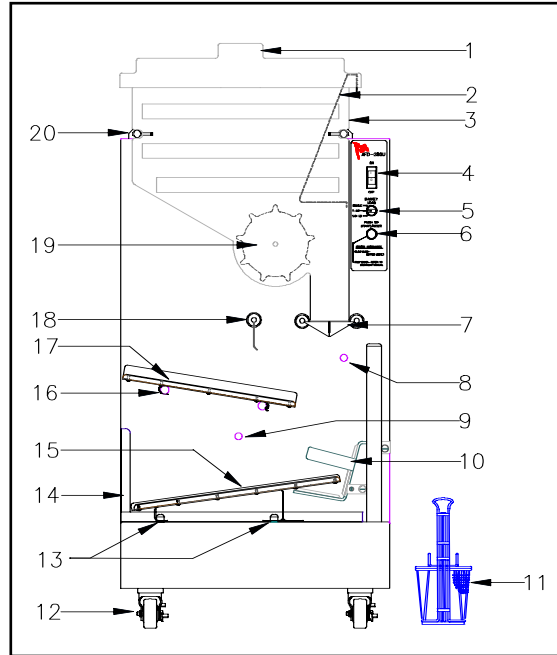
Press for automatic loading of Fry Baskets when the Load Select Switch is set for 1 or 1.5 lb. (450 or 700gm) loads.

Press to reset a System Error.

# AFD280, 280U Comprehensive Service Manual

## Major Assemblies, AFD-280

### AFD-280, Front View

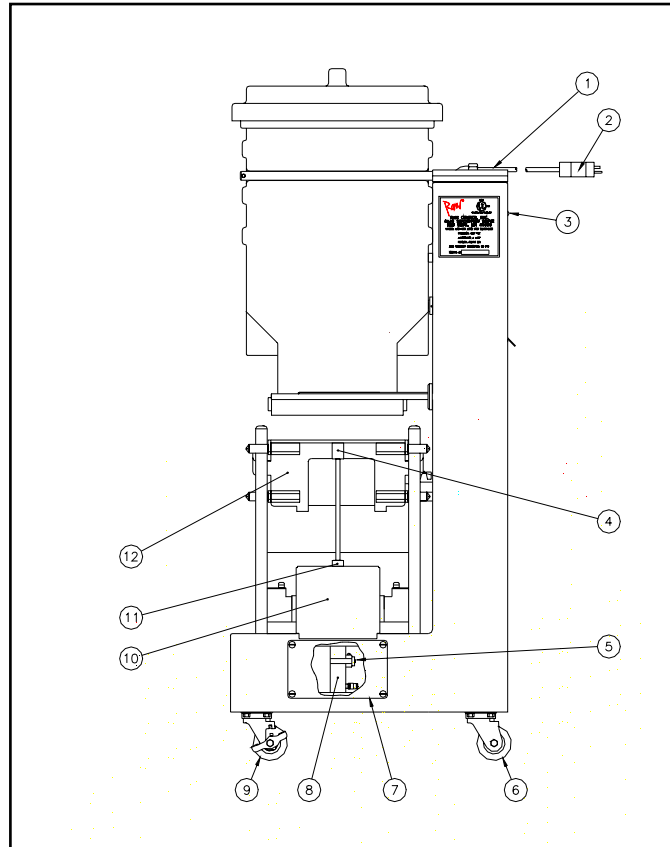


AFD-280 Front View

ITEM	P/N	DESCRIPTION	NO.	FUNCTION
1	202364	Hopper Lid	1	Cover for the Fry Hopper.
2	219129	Fry Diverter	1	Funnels fries to the Accumulator Doors area.
3	202368	Hopper	1	Holds frozen fries for dispensing into baskets.
4	213400	On / Off Switch with circuit breaker	1	On / Off Switch and A.C. circuit breaker.
5	215607	Selector Switch	1	Selects fry load sizes and Dispenser operation.
6	215606 290771 216489	Start / Reset Push-button Switch Lens Only Bulb Only	1	Starts single basket cycle and resets system error.
7	---	Accumulator Doors Assembly	--	<i>See assembly illustration.</i>
8	202038	Lift Sensor	1	Senses baskets in the Saddle when the Lift is raised.
9	202038	Guide Sensor	1	Senses baskets leaving the saddle and when the lower guide is full.
10	---	Saddle Assembly	--	<i>See assembly illustration</i>
11	216258	Fry Basket	10	Receives fries from Dispenser.
12	216596	Front Casters with Brakes	2	Allows moving the Dispenser for cleaning & locking position.
13	290687	Locator Pins	2	Holds Drip Pan and Lower Guide in Place
14	202780	Drip Pan	1	Collects shortening and other waste materials.
15	202779 220494 290000	Lower Guide Assembly Lower Guide Ultem Runners Runner Mounting Screws	-- 2 12	Entire Assembly Basket slide rails. Runner mounting screws. (6 screws per Ultem)
16	---	Upper Guide Support Bars, (See Assembly Illustrations)	2	Secures the Upper Guide in the proper orientation.
17	220490 202476 202219 202044 202359 290000	Upper Guide Assembly(centered pin) -Fillister Screw (centered pin) Upper Guide Assembly (offset pin) -Fillister Screw (offset pin) Upper Guide Ultem Runners Runner Mounting Screws	-- 2 -- 2 2 10	<b>No Longer Available</b> Locates Upper Guide Position. (centered Guide) Entire Assembly. Locates Upper Guide Position. (offset Guide) Basket slide rails. Runner mounting screws. (5 screws per Ultem)
18	---	Stopgate Assembly	--	<i>See assembly illustration</i>
19	202366	Drum	1	Dispenses fries to the Accumulator Doors area.
20	220515 220520	Hopper Support Bar, left Hopper Support Bar, right	1 1	Holds the Hopper in proper orientation.

# AFD280, 280U Comprehensive Service Manual

## AFD-280 Side View

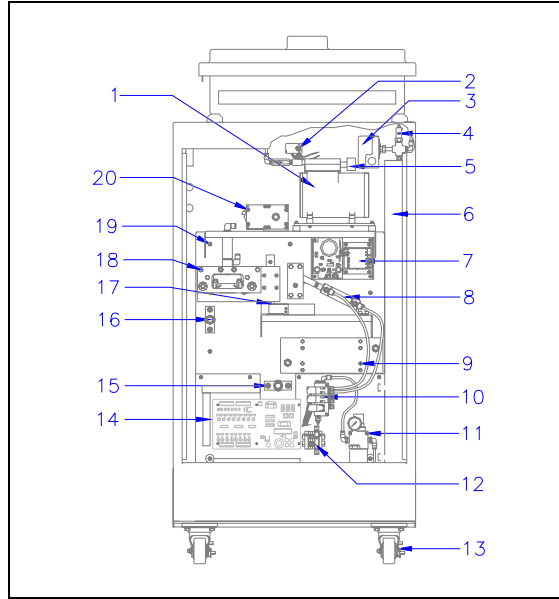


AFD-280 Side View

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	216692 202586 213942	Power Cord Strain Relief Washer Nut	1	Waterproof power cord inlet.
2	202172	Molded Power Plug	1	Connects the Dispenser to the wall outlet.
3	213129	10-32 x 3/8" Machine Screw	1	Mounting Hardware for Rear Door
4	220507	Lift Cylinder Cap	1	Mounts to the end of the Lift Cylinder shaft.
5	202194 202516	Lift Cylinder Switch Lift Switch Sensor Band	2 2	Detects lift cylinder down position. Holds lift switch in place
6	216595	Rear Caster	2	Allows the dispenser to be moved for cleaning.
7	220491 202077	Side Access Plate Screws	1 4	Permits access to lower portion of lift cylinder. Secures access plate to dispenser chassis.
8	202055 202517 213369	Lift Cylinder Lift Cylinder Lower Nut Airline Fitting, 1/8" NPT M X 1/4"OD	1 1 1	Raises and lowers the lift saddle.
9	216596	Front Caster with Brake	2	Allows dispenser movement and locks position.
10	220496	Lift Cylinder Cover	1	Protective cover for lift cylinder.
11	220497	Lift Cylinder Cover Nut	1	Secures protective cover.
12	---	Lift Saddle Assembly	--	See assembly illustration

# AFD280, 280U Comprehensive Service Manual

## AFD-280 Rear View

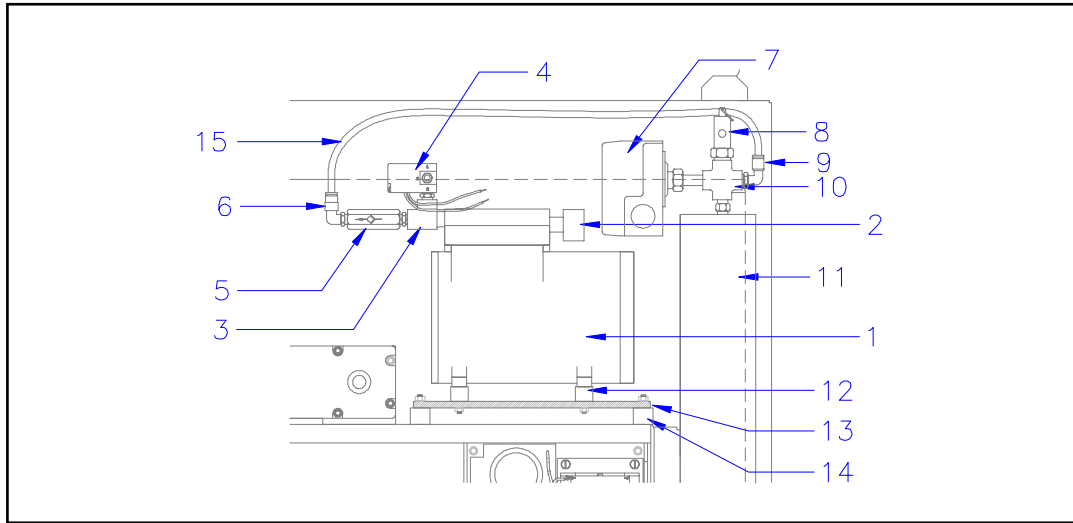


## AFD-280 Rear View

ITEM	P/N	DESCRIPTION	FUNCTION
1	202061 202190 202766 202765	Air Compressor, Ramped Valve, 110V, 60 Hz Air Compressor, Ramped Valve, 220V, 50 Hz Air Compressor, Ramped Valve, 220V, 60 Hz Air Compressor, Ramped Valve, 100V, 50/60 Hz	Provides compressed air for Dispenser operations.
2	---	Run "T" Assembly ( <b>No Longer Available</b> )	Head pressure vent system.
3	202196	Compressor Pressure Control Switch	Control compressor: On at 40 psi, Off at 60 psi.
4	202197	Pressure Relief Valve	Over pressure protection.
5	202199 219262	Compressor Air Inlet Filter Filter Media only	Filters air going into the compressor Filter media only.
6	202861 202062	Air Reservoir Assembly Mounting Clamps	Stores system compressed air. Secures Air Reservoir to Dispenser chassis.
7	216044 202179 213509 213432	Power Supply, International Power Stand Off Screw Washer	Provides 24.5 VDC for system operation.
8	----	Stopgate Assembly	<i>See assembly illustration</i>
9	----	Upper Guide Support / Alignment Assembly	Upper guide support fixture and alignment. <i>See assembly illustration</i>
10	202582	Pneumatic Manifold Assembly	<i>See assembly illustration</i>
11	202051	Pressure Regulator Assembly	Regulates System Air Pressure at 30 psi. <i>See assembly illustration</i>
12	202449 216485	Din Rail Terminal Assembly Circuit Breaker	Wiring terminal assembly. <i>See assembly illustration</i> 1.5 Amp Drum Motor circuit breaker.
13	216595	Rear Caster	Allows Dispenser to be moved for cleaning.
14	290626 290063	Plus Controller Board E-prom	Controls Dispenser electrical functions. Programs the controller board.
15	202038	Lower Guide Optical Sensor	Detects baskets at the Lower Guide.
16	202038	Basket Lift Optical Sensor	Detects baskets in the Lift Saddle when lift is raised.
17	290685	Load Cell replacement kit, including mounting hardware (1/4-20 x 5/8 cap screws and 1/4" lock washers)	Detects the weight of the Accumulator Assembly.
18	----	Accumulator Doors/ Load Cell Assembly	<i>See assembly illustration</i>
19	202057	Accumulator Door Air Cylinder Assembly	Pneumatic cylinder to operate the accumulator doors.
20	----	Drum Motor Assembly	<i>See assembly illustration</i>
Not Shown	202377	Tubing Replacement Kit	Kit to replace all the pneumatic tubing

## AFD-280 Compressor Assembly, Style "A"

## AFD280, 280U Comprehensive Service Manual

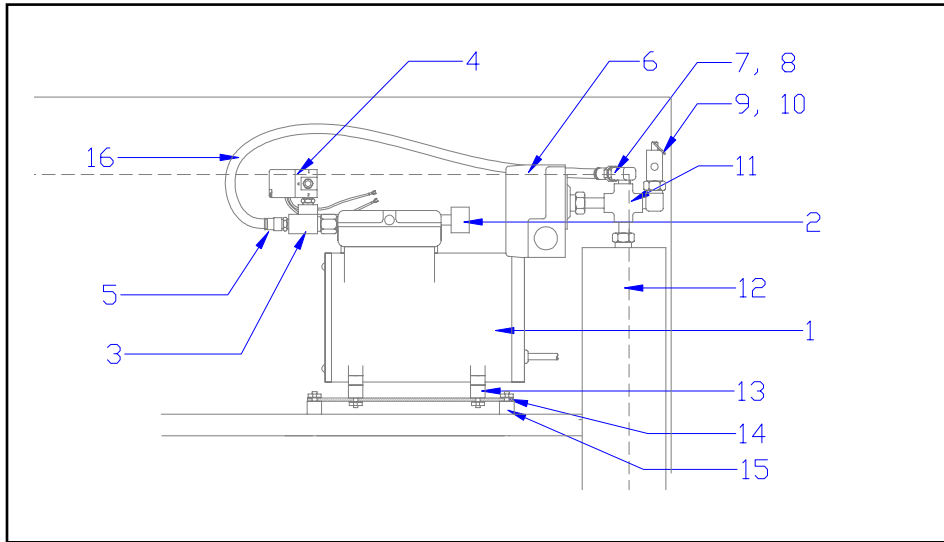


AFD-280 Compressor Assembly Style "A"

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	--- 202061 202190 202766 202765 203281	Air Compressor Air Compressor, Ramped Valve, 110V, 60 Hz Air Compressor, Ramped Valve, 220V, 50 Hz Air Compressor, Ramped Valve, 220V, 60 Hz Air Compressor, Ramped Valve, 100V, 50/60 Hz Ramped Valve Upgrade Kit	1 -- -- -- --	Compressed air source for Dispenser operations. <b>Note:</b> Pressure Control Switch must be reset for 40-60 psi. (2.8-4.1Bar) operation.
	203296	Run "T" Elimination Kit	1	Compressor Upgrade kit: <b>Note:</b> Must have Run "T" Elimination kit installed and <b>Pressure Control Switch</b> reset for 40-60 psi. (2.8-4.1Bar) operation.
			1	Tubing and fittings to replace Run "T" assembly. <b>Note:</b> Must have Ramped Valve Compressor and the Pressure Control Switch must be reset for 40-60 psi
2	202199 219262	Air Inlet Filter Assembly Filter media only.	1 1	Compressor air inlet filter. Replaceable filter media.
3	---	Run "T" Assembly ( <b>No Longer Available</b> )	1	Head Pressure Venting System. <b>Replace with 203296</b>
4	---	Airflow Bypass Solenoid ( <b>No Longer Available</b> )	--	Part of Run "T" Assembly, Item 3
5	202243	Check Valve	1	Part of Run "T" Assembly, Item 3
6	213477	Airline Fitting, 90°, 1/4" Push Tube	1	Part of Run "T" Assembly, Item 3
7	202196	Pressure Control Switch	1	Compressor Control Switch. See <b>Note</b> in item 1.
8	202197	Pressure Relief Valve	1	Part of Reservoir Assembly
9	213477	Airline Fitting, 90°, 1/4" Push Tube	1	Part of Reservoir Assembly
10	291324 291322	4-Way fitting Nipple fitting, hex, 1/4" NPT	1	Part of Reservoir Assembly
11	202861	Air Reservoir Assembly	1	Compressed air storage.
12	202065	Compressor Vibration Mounting	4	Vibration isolation.
13	220512	Compressor Mounting Plate	1	Mounting plate for compressor.
14	202091	Compressor Vibration Mounting	4	Vibration isolation.
15	202878	Airline, 1/4 X 24"	24"	Airline from compressor to reservoir.

# AFD280, 280U Comprehensive Service Manual

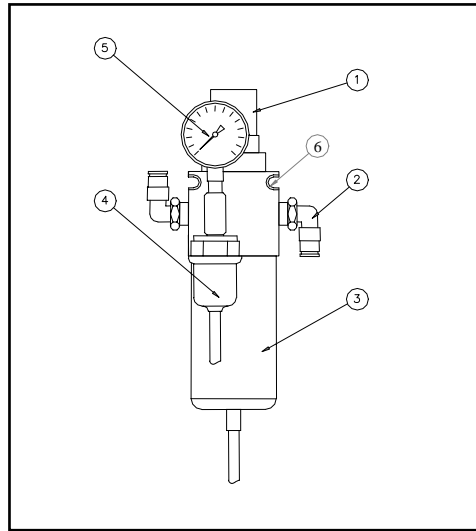
## AFD-280 Compressor Assembly, Style "B"



AFD-280 Compressor Assembly, Style "B"

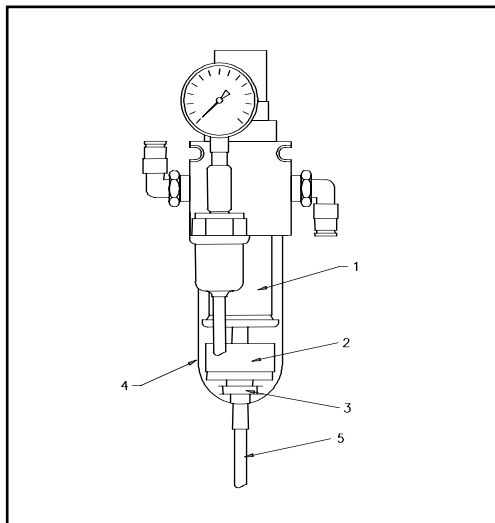
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1		Air Compressor	1	
	202061	Air Compressor, Ramped Valve, 110V, 60 Hz	--	Compressed air source for Dispenser operations.
	202190	Air Compressor, Ramped Valve, 220V, 50 Hz	--	<b>Note:</b> Pressure Control Switch must be reset for 40-60 psi. (2.8-4.1Bar) operation.
	202766	Air Compressor, Ramped Valve, 220V, 60 Hz	--	
	202765	Air Compressor, Ramped Valve, 100V, 50/60 Hz	--	
	203281	Ramped Valve Upgrade Kit	1	Compressor Upgrade kit: <b>Note:</b> Must have Run "T" Elimination kit installed and <b>Pressure Control Switch</b> reset for 40-60 psi. (2.8-4.1Bar) operation.
	203296	Run "T" Elimination Kit	1	Tubing and fittings to replace Run "T" assembly. <b>Note:</b> Must have Ramped Valve Compressor and the Pressure Control Switch must be reset for 40-60 psi
2	202199	Air Inlet Filter Assembly	1	Compressor air inlet filter.
	219262	Filter media only.	1	Replaceable filter media.
3	---	Run "T" Assembly ( <b>No Longer Available</b> )	1	Head Pressure Venting System. <b>Replace with 203296</b>
4	---	Airflow Bypass Solenoid ( <b>No Longer Available</b> )	--	Part of Run "T" Assembly, Item 3
5	213478	Airline Fitting, Straight, 3/8" Push Tube (1/4" NPT male)	--	Part of Run "T" Assembly, Item 3
6	202196	Pressure Control Switch	--	Compressor Control Switch (On at 40 psi, 2.8 Bar, Off at 60psi, 4.1 Bar)
7	216493	1/4" Push Tube Fitting 3/8" (1/4" NPT Female)	--	Part of Reservoir Assembly
8	291321	Elbow, 90°	--	Part of Reservoir Assembly
	202243	Check valve	--	Part of Reservoir Assembly
9	202197	Pressure Relief Valve		Part of Reservoir Assembly
10	291321	Elbow, 90°	--	Part of Reservoir Assembly
11	291324	4-Way Fitting	--	Part of Reservoir Assembly
12	202861	Air Reservoir Assembly	1	Compressed air storage.
13	202065	Compressor Vibration Mounting	4	Vibration isolation.
14	220512	Compressor Mounting Plate	1	Mounting plate for compressor.
15	202091	Compressor Vibration Mounting	4	Vibration isolation.
16	202482	Airline, 3/8 X 24"	24"	Airline from compressor to reservoir.

**AFD-280 Pressure Regulator Assembly**



**Pressure Regulator Assembly p/n 202051**

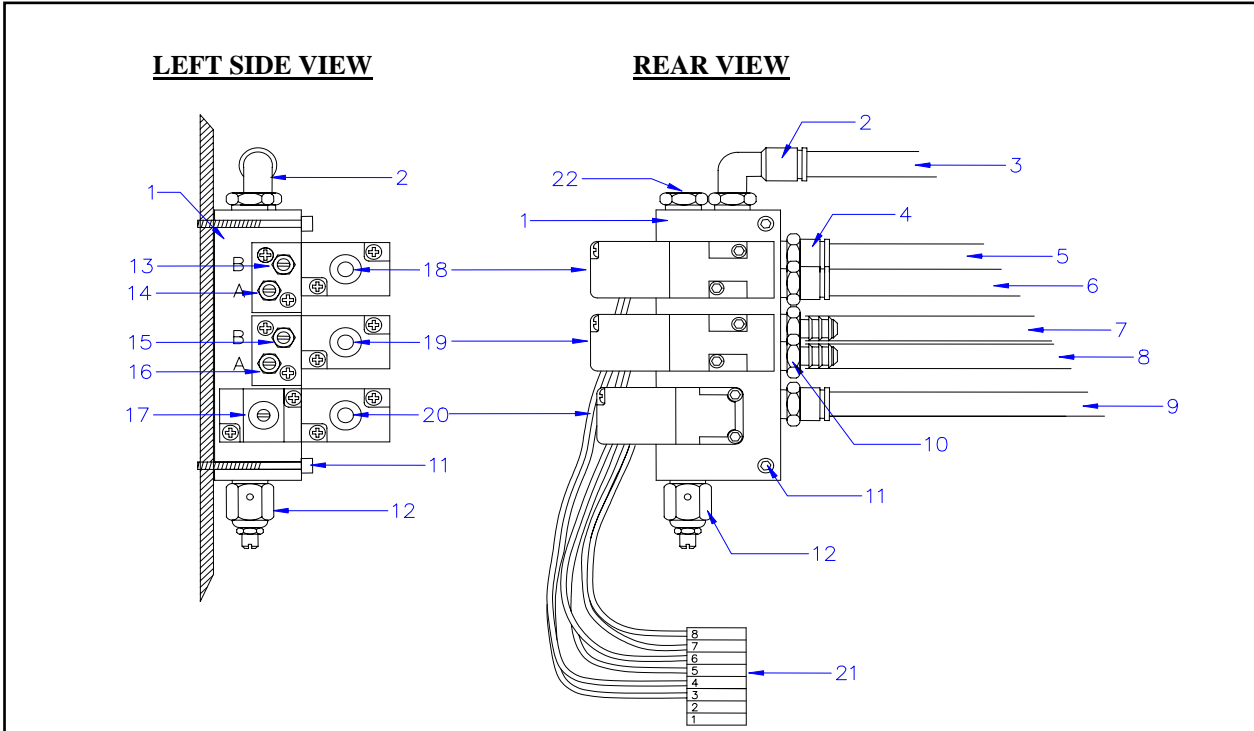
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	---	Pressure control knob.	--	Pull up to unlock, turn to increase or decrease system pressure. Set for 30 psi. <i>Part of Pressure Regulator Assembly</i>
2	213477	Airline fitting, 90° ¼" Push Tube	2	Airline Connection.
3	---	Filter Bowl Cover Shield.	--	Safety cover for the Filter Bowl. <i>Part of Pressure Regulator Assembly.</i>
4	202604	Air Present Switch	1	Senses system operating pressure, adjusted for 20 psi On.
5	202606	Air Pressure Gauge	1	Indicates regulator pressure setting.
6	213372	Regulator Mounting Screws	2	Secures the regulator to the back panel.
----	202051	Pressure Regulator Assembly	1	Complete Filter Regulator assembly.



ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202614	Filter Media Replacement Kit	1	Removes contaminants from system air pressure.
2	---	Float Valve	--	<i>Part of Pressure Water Trap Bowl Assembly.</i>
3	---	Drain Filter	--	<i>Part of Pressure Water Trap Bowl Assembly.</i>
4	202245	Water Trap Bowl and Drain Fitting	1	Collects and drains moisture from system air pressure.
5	202480	Drain Tube, 5/16" X 4 1/2"	4.5"	Drains water from pressure regulator.
----	202051	Pressure Regulator Assembly	1	Complete Filter Regulator assembly.

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## AFD-280 Manifold Assembly

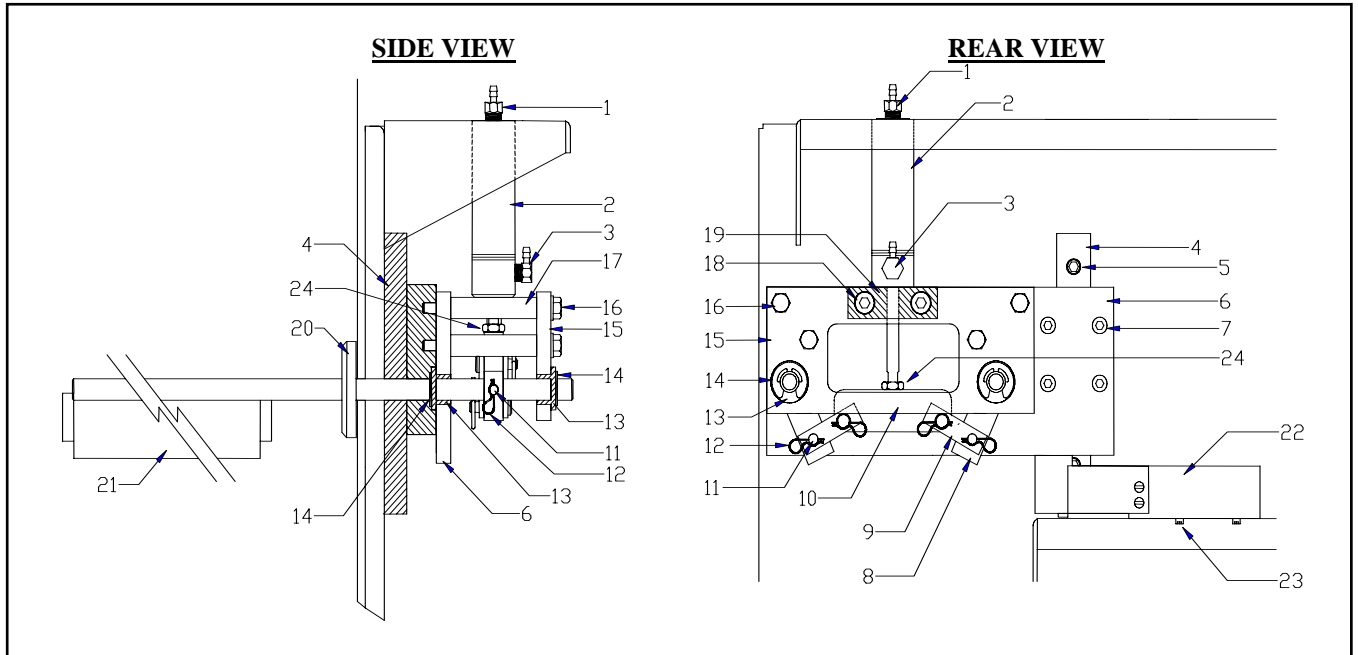


### Manifold Assembly p/n 202054 (replace with p/n 202582)

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1		Pneumatic Manifold Assembly Replace with part number 202582 and 2 screws part number 213372.	1	Distributes airflow to pneumatic cylinders.
2	213318	Airline Fitting, 90°, ¼" Push Tube, 1/8" NPT	1	Airline connection.
3	213320	Manifold Compressed Airline Input	1	Airline from the Pressure Regulator.
4	213369	Airline Fitting, Straight, ¼" Push Tube, 1/8" NPT	3	Airline connection.
5	202479	Manifold Output, <b>OPEN Stopgate</b>	1	BLUE Airline to top Stopgate Cylinder fitting.
6	202478	Manifold Output, <b>CLOSE Stopgate</b>	1	RED Airline to bottom Stopgate Cylinder fitting.
7	202481	Manifold Output, <b>OPEN Accumulator Doors</b>	1	CLEAR airline to top Accumulator Cylinder fitting.
8	202481	Manifold Output, <b>CLOSE Accumulator Doors</b>	1	CLEAR airline to bottom Accumulator Cylinder fitting.
9	213320	Manifold Output, <b>RAISE Lift Cylinder</b>	1	OPAQUE airline to fitting at bottom of Lift Cylinder.
10	203282	Airline Fitting, ¼"-Barbed	2	Airline connection.
11	213372	Allen Head Cap Screws, 10-32 x 2"	2	Secures Manifold Assembly to Dispenser chassis.
12	203294	Adjustable Vent, <b>LOWER Lift Cylinder</b>	1	Controls the DOWN SPEED of the Lift Cylinder.
13	202090	Airflow Adjustment, <b>Stopgate OPEN "B"</b>	1	Controls the opening speed of the Stopgate Cylinder.
14	202090	Airflow Adjustment, <b>Stopgate CLOSE "A"</b>	1	Controls closing speed of the Stopgate Cylinder.
15	202090	Airflow Adjustment, <b>Accumulator OPEN "B"</b>	1	Controls the opening speed of the Accumulator Doors.
16	202090	Airflow Adjustment, <b>Accumulator CLOSE "A"</b>	1	Controls the closing speed of the Accumulator Doors.
17	202021	Airflow Adjustment, <b>Lift Cylinder UP speed</b>	1	Controls the Lift Speed of the Lift Cylinder.
18	219010	Manifold Solenoid & manual activator. SV3	1	Activates the Stopgate airflow for OPEN & CLOSE.
19	219010	Manifold Solenoid & manual activator. SV2	1	Activates the Accumulator Doors airflow for OPEN & CLOSE.
20	219009	Manifold Solenoid & manual activator. SV1	1	Activates airflow to the Lift Cylinder to raise UP.
21	215468	Electrical Connector, 8 position.	1	Connects Solenoid Wiring to the Controller Board Outputs.
22	202242	Manifold Vent	1	Exhausts manifold intermittent air pressures.



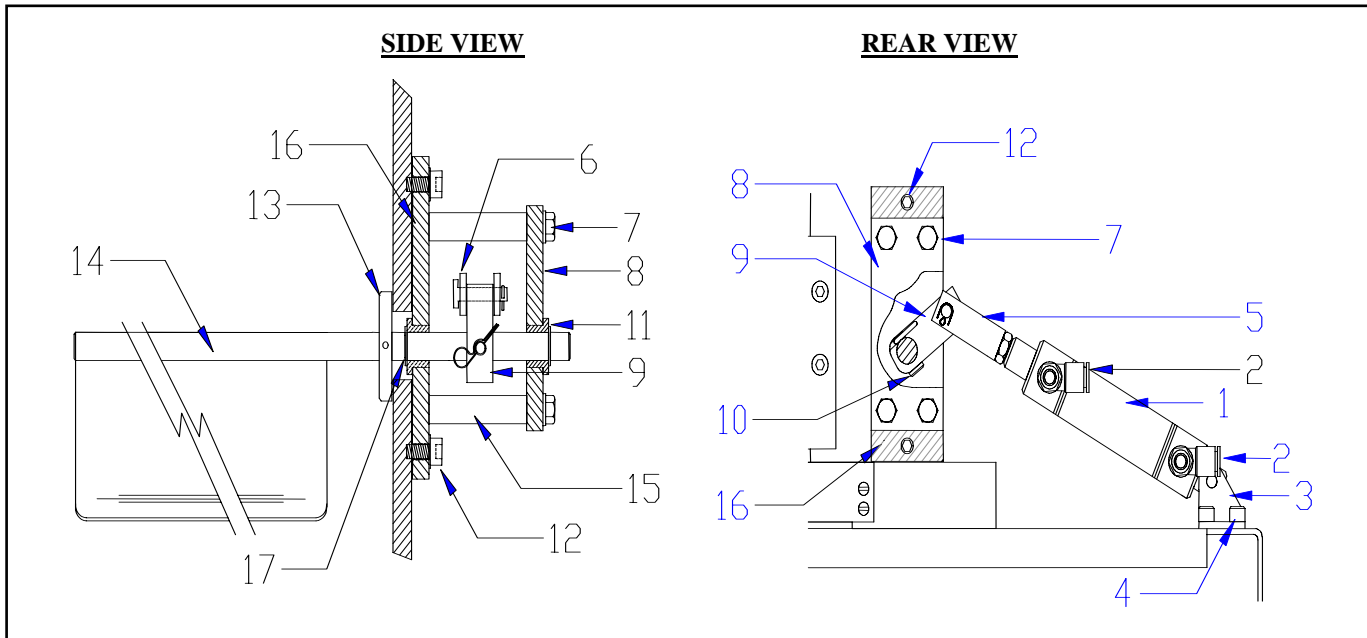
**AFD-280 Accumulator Doors / Load Cell Assembly**



**Accumulator Doors / Load Cell Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	203282	Straight Fitting, 1/8 NPT Male-1/4 In. Barb	1	Airline fitting.
2	202057	Accumulator Doors Air Cylinder	1	Pneumatic actuator, opens and closes doors.
3	203283	90° Barbed Fitting Assembly:	1	Airline fitting assembly.
	203290	- 90° Elbow, 1/8 NPT Male to 10-32 - Barbed Fitting, 10-32 Male-1/8 In. Barb	1	
4	202068	Slide Rail	1	Allows Accumulator Assembly Motion / Sensing.
5	202073	Screws, Socket Head Cap 1/4-20 X 3/4"	3	Attaches Slide Rail to Dispenser Chassis.
6	220457	Carriage Plate	1	Attaches Accumulator Assembly to Slide Rail.
7	202173	Screws, M6 x 16mm	4	Secures Carriage Plate to Slide Rail
8	220464	Door Linkage	2	Accumulator Door Linkage.
9	220463	Connector Link	2	Interconnects Cylinder and Door Linkages.
10	220462	Cylinder Link	1	Linkage attached to end of Cylinder Shaft.
11	202082	Clevis Pin, 1/4" X 1"	6	Secures Linkages together.
12	202081	Hairpin Clip	6	Secures Clevis Pins.
13	213422	Flange Bearing	4	Bearing for Accumulator Door Shafts.
14	213356	Retaining Ring, E-Clip, 1/2"	4	Secures Accumulator Door Shafts.
15	220458	Bearing Plate	1	Part of Accumulator Door Chassis.
16	202048	Screws, Allen Head Cap 1/4-20 X 3 1/2"	4	Secures Accumulator Chassis Assembly.
	213142	Lock Washer, 1/4"	4	
17	220461	Tie Rod	4	Spacer for Accumulator Chassis.
18	202045	Screw, Flat Head, 1/4-20 X 1"	4	Secures Cylinder Plate to Accumulator Chassis.
19	220459	Cylinder Plate	1	Air Cylinder Mounting Plate.
20	220499	Shaft Collar	2	Protects inner Dispenser cabinet from contamination.
	202214	Shaft Collar Set Screw, 8-32 X 1/2"	1	Secures Shaft Collar to Shaft
21	220480	Accumulator Door, Left ( <i>not shown</i> )	1	Accumulator door and shaft weldment, left hand.
	220475	Accumulator Door, Right	1	Accumulator door and shaft weldment, right hand.
22	290685	Load Cell (includes mounting hardware)	1	Detects weight of French Fries.
23	213143	Screws, Socket Head Cap, 1/4-20 X 1/2"	2	Secures Load Cell to Dispenser Chassis.
	213142	Lock Washers, 1/4"	2	
24	202901	Accumulator Cylinder Jam Nut, 5/8" - 18	1	Locks Cylinder Shaft adjustment.

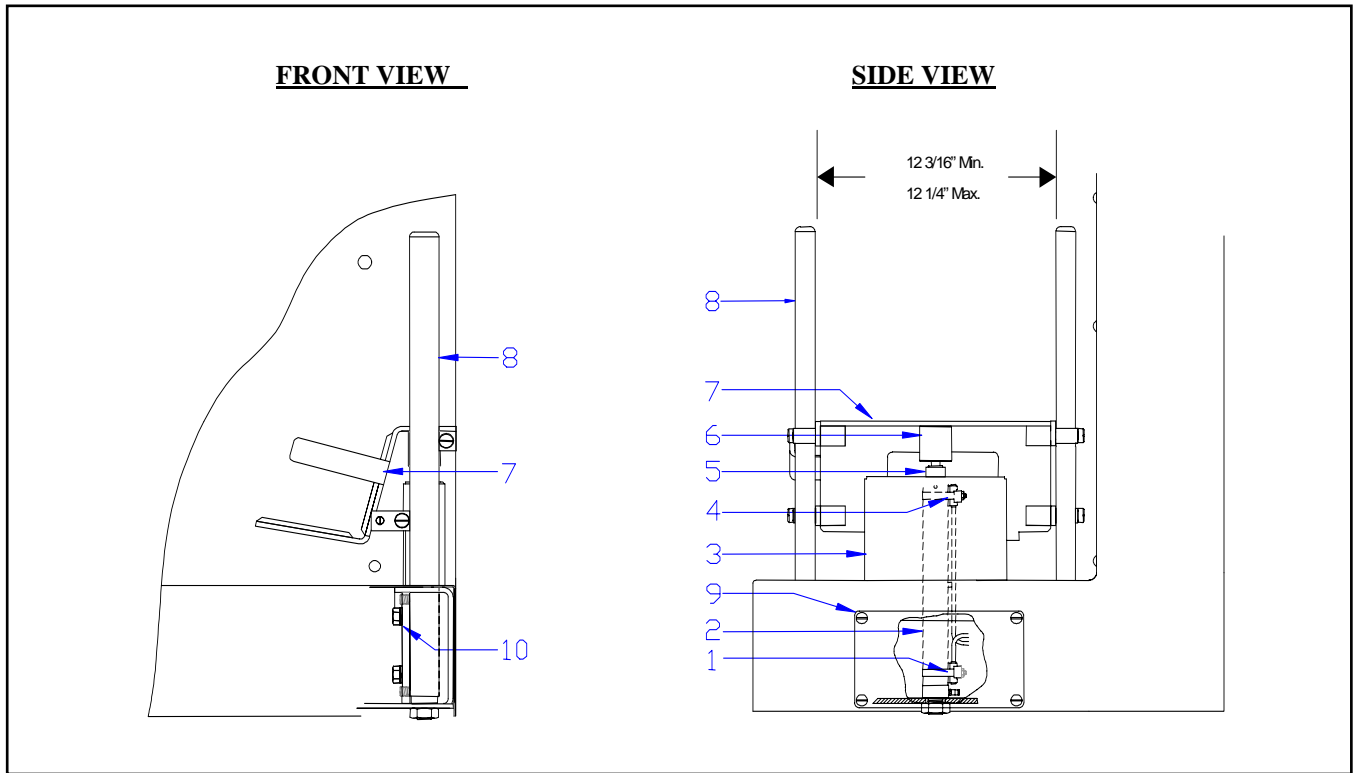
**AFD-280 Stopgate Assembly**



**Stopgate Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202056	Air Cylinder	1	Pneumatic actuator for the Stopgate.
2	213318	Airline Fitting, ¼" Push type elbow	2	Airline connection.
3	n/a	Mounting Bracket, part of item #1	--	Secures the Pneumatic Cylinder to the Dispenser chassis.
4	213143	Socket Head Cap Screw, ¼-20 X ½"	4	Secures mounting bracket to the Dispense chassis.
5	202970 203092	Cylinder Linkage and Clevis Pin Cotter Pin	1 1	Linkage attached to Air Cylinder Shaft. Secures Clevis Pin.
6	n/a	Clevis Pin, part of item #5	--	Secures Shaft Linkage to Door Linkage.
7	202176 213142	Bolt, ¼-20 X 3" Lock Washer, ¼"	4 4	Secures Outer and Inner Bearing Plates together.
8	220466	Outer Bearing Plate	1	Mounting for Stopgate assembly.
9	220498	Stopgate Shaft Linkage	1	Linkage attached to Stopgate Door Shaft.
10	202082 202081	Clevis Pin, ¼" X 1" Hairpin Clip	1 1	Secures Linkage to Stopgate Door Shaft. Secures the Clevis Pin.
11	213422	Flange Bearings	2	Bearings for Stopgate Door Shaft.
12	202073 213142	Socket Head Cap Screw, ¼-20 X ¾" Lock Washer, ¼"	2 2	Secures Stopgate Assembly to the Dispenser chassis.
13	220499 202214	Shaft Collar Shaft Collar Set Screw, 8-32 X ½"	1 1	Protects Dispenser inner cabinet from contamination. Secures the Shaft Collar to the Stopgate Shaft.
14	220505	Stopgate Weldment	1	Welded Stopgate Door and Shaft assembly.
15	220461	Spacer Tie Rod	4	Provides proper spacing between the Bearing Plates.
16	202175	Inner Bearing Plate	1	Mounting for Stopgate assembly.
17	213356	Retaining ring, E-Clip, ½"	2	Secures Stopgate Shaft to Bearing Plates.

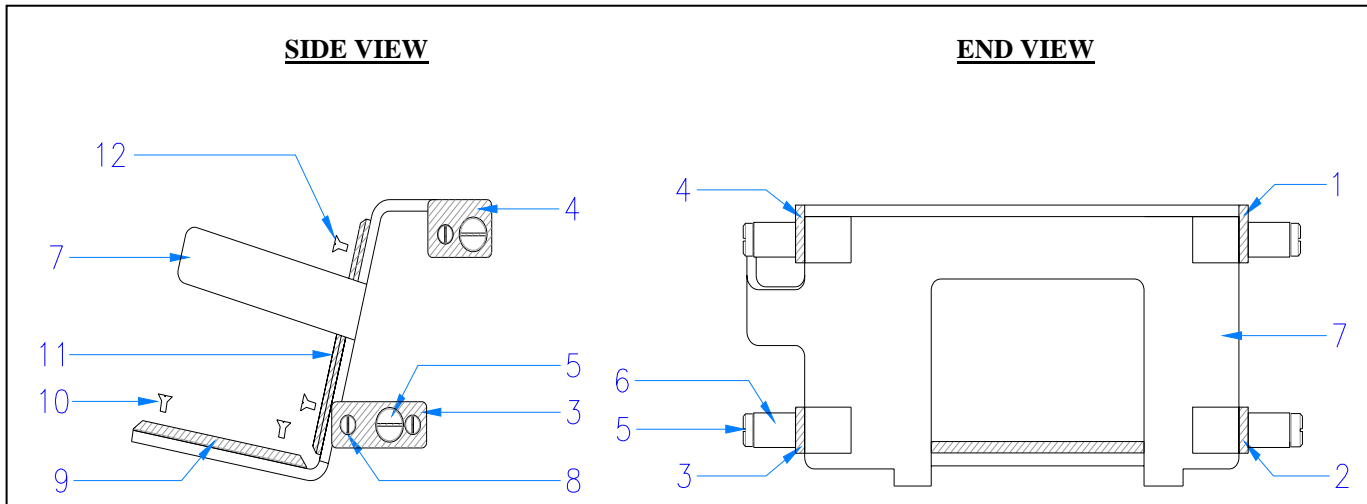
**AFD-280 Lift Cylinder Assembly**



**Lift Cylinder Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202194	Lower Lift Cylinder Switch	1	Detects when the lift is in the down position.
	202516	Lift Cylinder Switch Mounting Strap	1	Secures the switch to the cylinder.
2	202055	Lift Cylinder	1	Pneumatic cylinder which actuates the lift.
	202517	Lift Cylinder Mounting Nut, 3/4 -16	1	Secures the Lift Cylinder to the Dispenser chassis.
	213369	Airline Fitting, 1/8" NPT M X 1/4"OD	1	Airline connection.
3	220496	Lift Cylinder Cover, <b>AFD-280</b>	1	Protective cover for the Lift Cylinder.
4	202194	Upper Lift Cylinder Switch	1	Detects when the lift is in the up position.
	202516	Lift Cylinder Switch Mounting Strap	1	Secures the switch to the cylinder.
5	220497	Lift Cylinder Cover Nut	1	Secures the Lift Cylinder Cover to the Dispenser.
6	220507	Lift Cylinder Cap, AFD-280 Screw On	1	Attaches to Lift Cylinder Shaft, contacts Lift Saddle.
7	202782	Lift Saddle Assembly	1	Transports the Baskets to the Lower Guide.
8	220456	Saddle Post	2	Guides the Lift Saddle
	220491	Lift Cylinder Access Plate	1	Provides access to the lower Lift Cylinder Components.
10	202046	Screws, 10-32 X 3/4"	4	Secures the access plate to the Dispenser body.
	202066	Bolts, 1/2 -13 X 1 1/2" , <b>AFD-280</b>	4	Secures the Saddle Posts to the Dispenser chassis.
213264	Lock Washer, 1/2"	4		

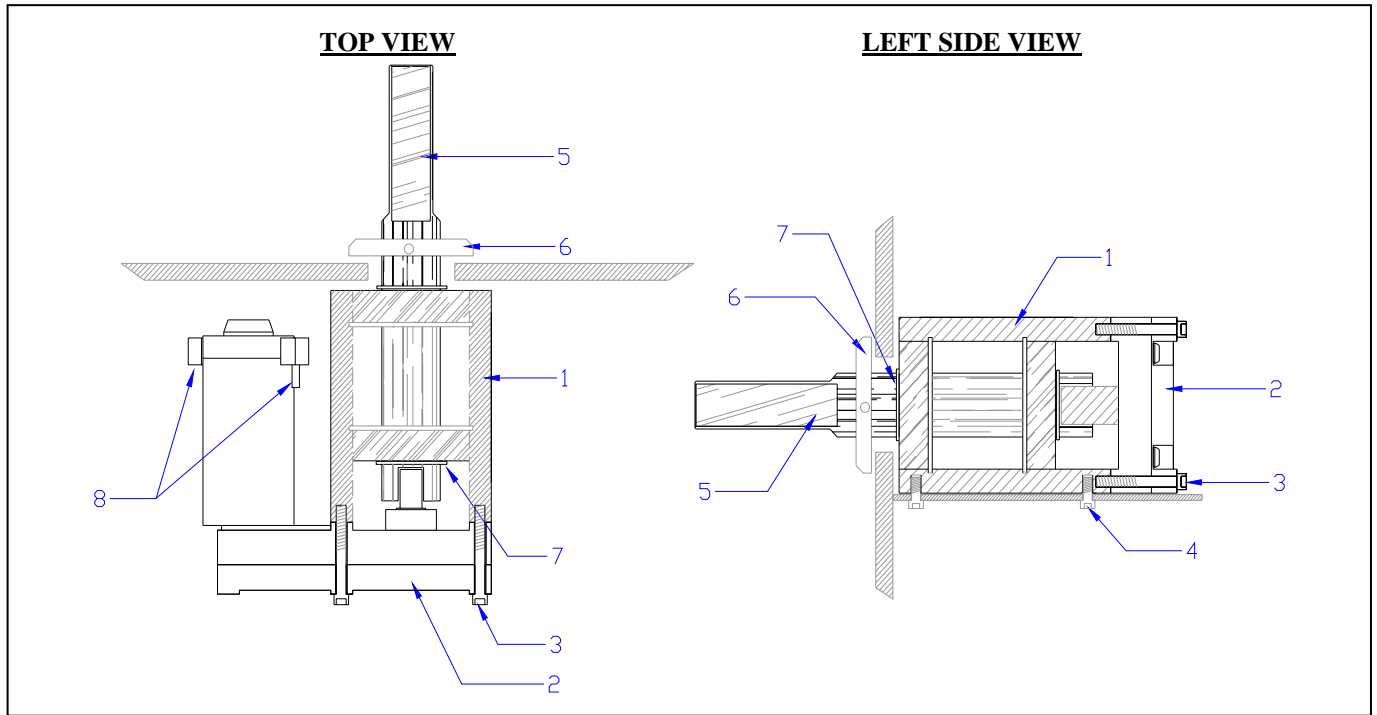
**AFD-280 Saddle Assembly**



**AFD-280 Assembly Number 202782**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	220468	Right Upper Wear Strip	1	Wear surface against the Guide Post.
2	220469	Right Lower Wear Strip	1	Wear surface against the Guide Post.
3	220469	Left Lower Wear Strip	1	Wear surface against the Guide Post.
4	220467	Left Upper Wear Strip	1	Wear surface against the Guide Post.
5	202064	Shoulder Bolt	4	Secures Guide Rollers to Saddle Assembly. Stainless Steel.
6	217810	Guide Roller	4	Roller for Saddle Assembly against the Guide Posts.
7	217805	Lift Saddle Weldment	1	Metal body of the Lift Saddle Assembly.
8	202046	Flat Head Screw, 10-32 X 3/4"	6	Secures Wear Strips to Lift Saddle. Stainless Steel.
9	220472 or 202762	Saddle Slide, 5" length, 4 3/8" hole spacing Saddle Slide, 4 3/4" length, 3 1/2" hole spacing	2	Wearable sliding surface for Baskets to slide on. The correct part number is determined by the length of the strip and the hole spacing..
10	202047	Flat Head Screw, 10-32 X 1/2"	4	Secures Saddle Slides to the Lift Saddle.
11	220473	Splash Shield	1	Contains splashed materials within the Dispenser .
12	202047	Flat Head Screw, 10-32 X 1/2"	5	Secures Splash Shield to Lift Saddle.

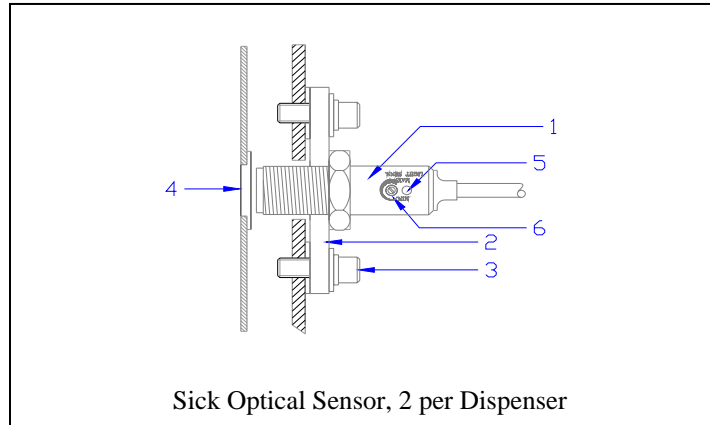
**AFD-280 Drum Motor Assembly**



**Drum Motor Assembly**

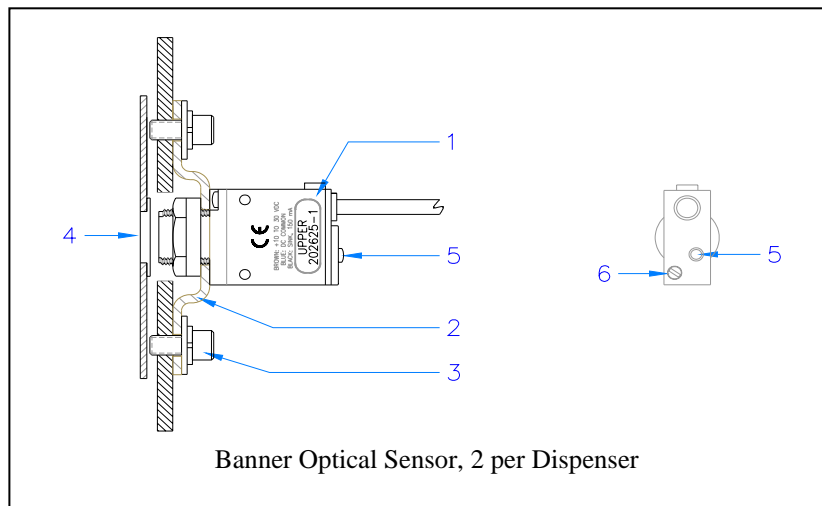
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	215228	Drum Motor Bearing Block	1	Bearing, Bearing Housing Assembly
2	292546	Drum Motor / Gear Box Assembly	1	24 VDC Gearmotor
3	213136	Socket Head Cap Screws, 10-32 x 1-1/4"	4	Secures Drum Motor to Bearing Block
4	213143 213142	Socket Head Cap Screws, 1/4-20 x 1/2" Lock Washer 1/4"	4 4	Secures Bearing Block to Dispenser Chassis.
5	220511	Drum Motor Shaft	1	Turns the Drum in the Hopper.
6	220508 202072	Drum Motor Shaft Collar Shaft Collar Set Screw	1 1	Prevents contamination of Dispenser cabinet.
7	213911	Retaining ring, E-clip	2	Secures Drum Shaft.
8	-----	Drum Motor Electrical Connections	2	DC Gearmotor power input connections.

**AFD-280 Optical Sensors**



Optical Sensor (Sick Electro Optics) (No longer available. Use Banner sensor)

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202038	Optical Sensor, SICK	2	Sensor for Lift and Guide Basket detection locations.
2	220492	Sensor Mounting Bracket	2	Mounts / Locates the Optical Sensor.
3	213143	Bolt ¼ -20 X ½"	4	Secures Mounting Bracket to Dispenser Back Panel.
	213142	Lock Washer, ¼"	4	
	213141	Flat Washer ¼"	4	
4	202619	Sensor Window Kit	2	Sensor protective window.
5	---	Sensor Output LED Indicator	--	Turns ON with object detection.
6	---	Sensitivity / Gain Adjustment	--	Gain Adjustment.

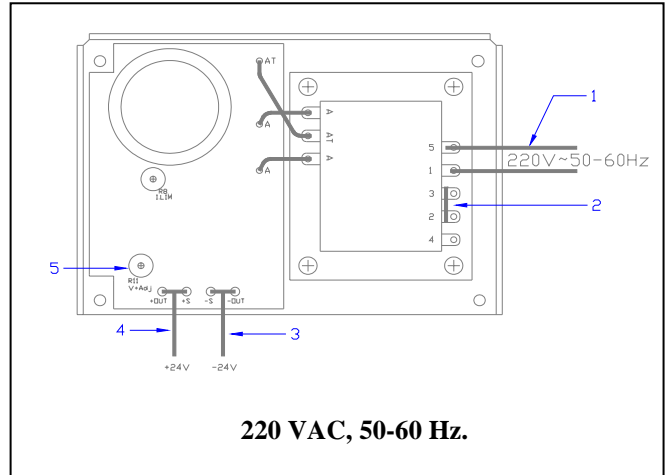
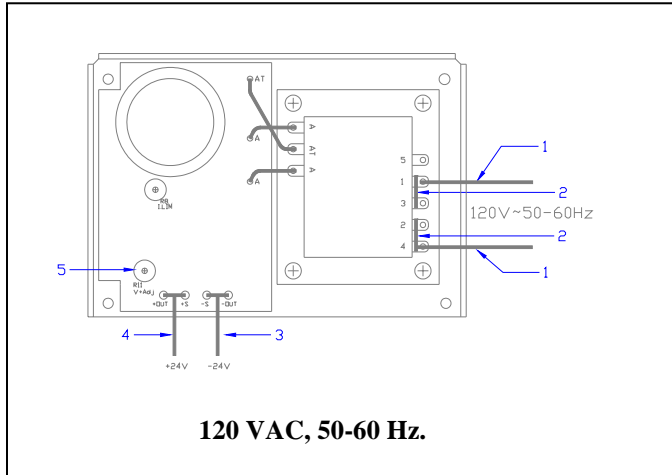


Optical Sensor (Banner)

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202038	Optical Sensor, Banner	2	Sensor for Lift and Guide Basket detection locations.
2	220492	Sensor Mounting Bracket	2	Mounts / Locates the Optical Sensor.
3	213143	Bolt ¼ -20 X ½"	4	Secures Mounting Bracket to Dispenser Back Panel.
	213142	Lock Washer, ¼"	4	
	213141	Flat Washer ¼"	4	
4	202619	Sensor Window Kit	2	Sensor protective window.
5	---	Sensor Output LED Indicator	--	Turns ON with object detection.
6	---	Sensitivity / Gain Adjustment	--	Gain Adjustment.

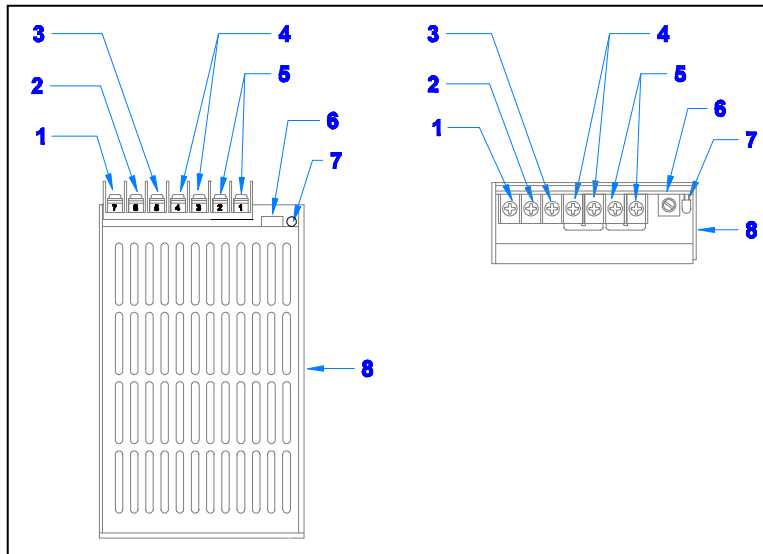
# AFD280, 280U Comprehensive Service Manual

## AFD-280 24.5 Volt Power Supplies



### Linear Power Supply p/n 216044

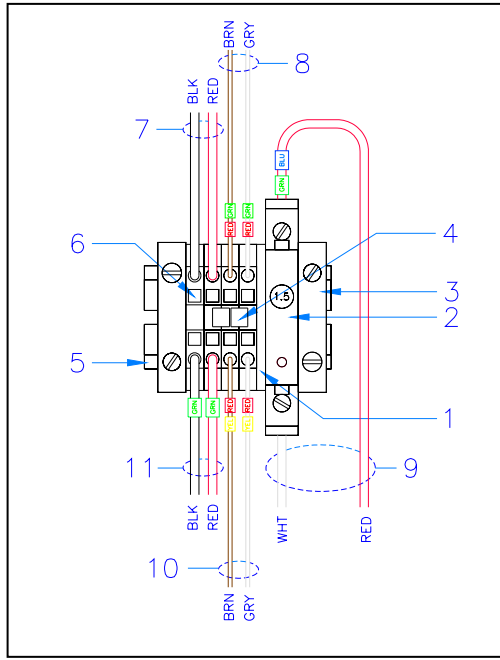
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	--	AC Line Input	--	AC Line Voltage
2	--	Jumper Wire	--	Transformer jumper.
3	--	VDC Negative Output	--	24 VDC Negative output connection.
4	--	VDC Positive Output	--	24 VDC Positive output connection.
5	--	Vout Adjustment Potentiometer	--	Adjusts Power Supply DC Output to 24.5 VDC
---	216044	Power Supply, International Power, 3.6 A	1	24.5 VDC Power Supply
----	215473	2 Position Connector Plug	1	Connects Power to Controller Board



### Switching Power Supply p/n 202493 (No longer available, call for information)

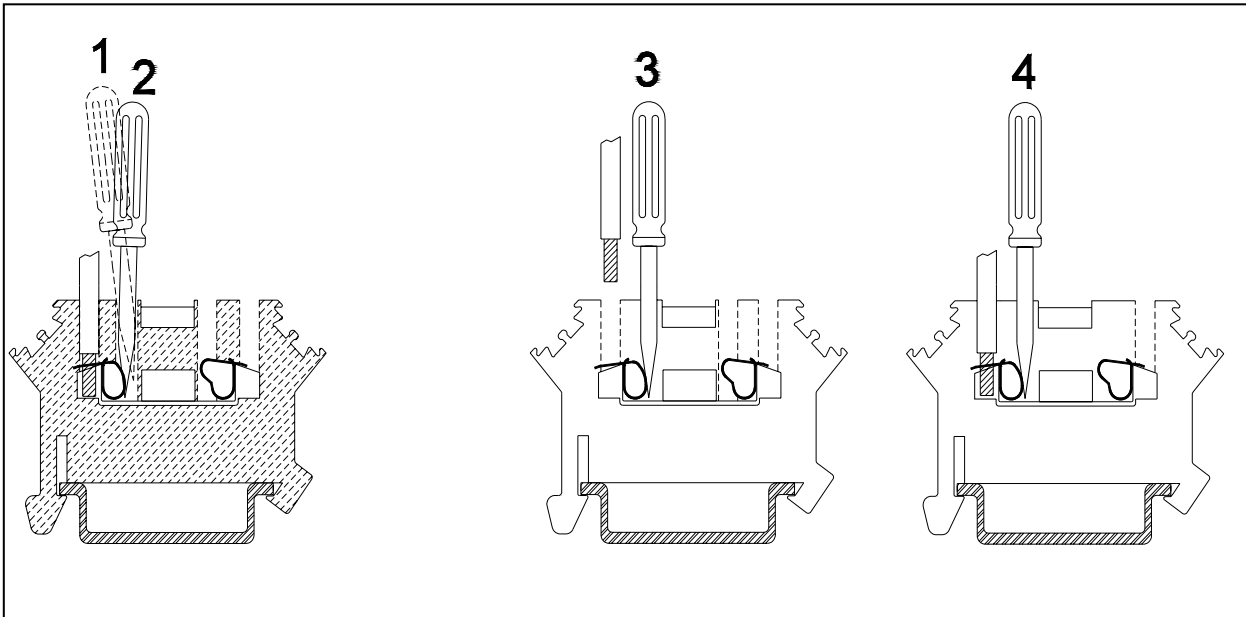
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	---	A.C. Power Supply, Line Input	--	AC Line Connection Point.
2	---	A.C. Power Supply, Line Input	--	AC Line Connection Point.
3	---	Power Supply Ground Connection	--	Power Supply AC Ground Connection.
4	---	D.C. V- Output	--	Negative DC output connection point.
5	---	D.C. V+ Output	--	Positive DC output connection point.
6	---	Vout adjustment.	--	24.5 VDC voltage output adjustment potentiometer.
7	---	Output Indicator LED	--	LED is ON when VDC is present at output terminals.
8	---	Power Supply, ETA, 3.2A	1	Power Supply, 24.5 VDC output, 95-240 VAC input.
----	215473	2 Position Connector Plug	1	Connects Power to Controller Board

**AFD280, 280U Comprehensive Service Manual**  
**AFD-280 Din Rail Terminal , Circuit Breaker Assembly**



**DIN Rail Terminal Assembly**

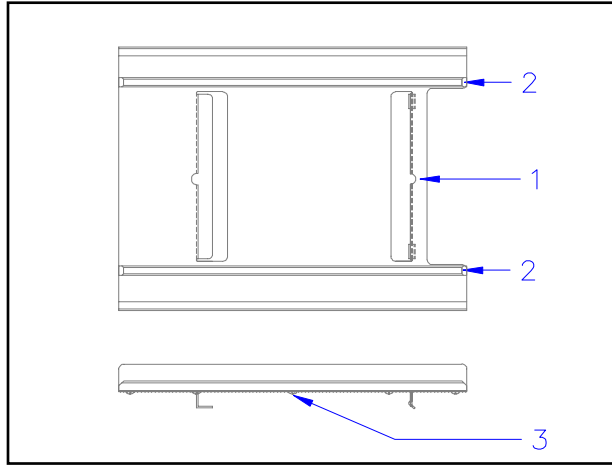
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202036	Terminal End Plate	1	Electrical isolation.
2	216485	Circuit Breaker, 1.5 A, Thermal	1	Drum Motor protection.
3	213605	Din Rail End Anchor	2	Secures Din Rail components together.
4	202035	Jumper Clip, 15A	2	Configures terminal wiring inter-connections.
5	213373 213182	Din Rail Truss Head Screw, 8-32 X 3/8"	1 2	Mount for Din Rail components. Secures Din Rail Mount to Dispenser Chassis.
6	202033 202034	Grounding Terminal Block, Green Isolated Terminal Block, Grey	1 3	Grounded wiring terminals. Isolated wiring terminals.
7	---	Wiring from 24.5 VDC Power Supply	--	<i>Dispenser wiring harness.</i>
8	---	Wiring to Lift Optical Sensor	--	<i>Dispenser wiring harness.</i>
9	---	Drum Motor Wiring	--	<i>Dispenser wiring harness.</i>
10	---	Lower Guide Optical Sensor Wiring	--	<i>Dispenser wiring harness.</i>
11	---	24.5 VDC to Controller Board	--	<i>Dispenser wiring harness.</i>





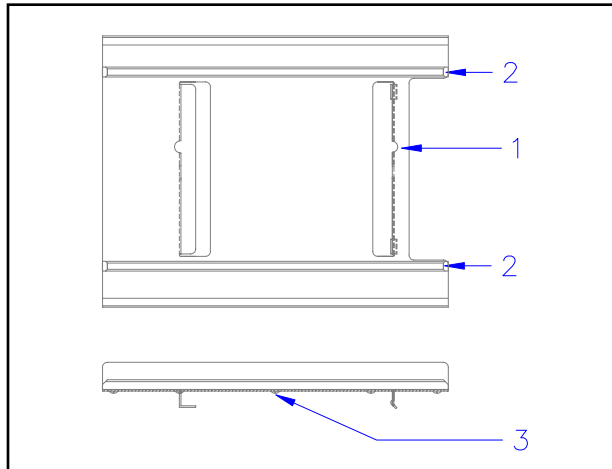
## AFD-280 Upper Guide Assembly

**Note:** The first 175 units manufactured in 1995 have centered pin guides. Newer units have the offset pin guides.



### **Upper Guide Assembly, Centered Pin (Item 1) p/n 220490 (No longer available. Shown for reference only)**

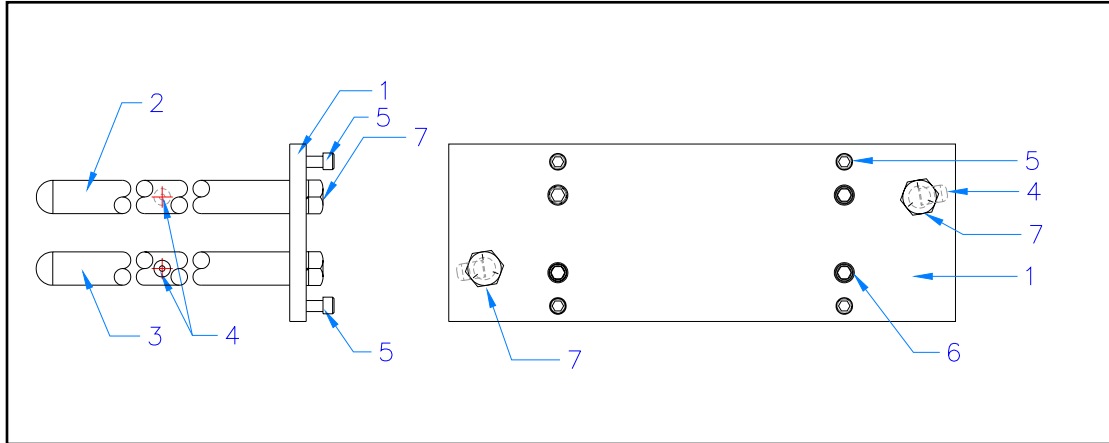
ITEM	P/N	DESCRIPTION	NO.	DETAILS
2	220489	Basket Runners, Ultem	2	Slide runners for baskets.
3	290000	Ultem Screws	16	Mounting screws for the Ultem runners.



### **Upper Guide Assembly, Offset Pin (Item 1) p/n 202219**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
2	202359	Basket Runners, Ultem	2	Slide runners for baskets.
3	290000	Ultem Screws	10	Mounting screws for the Ultem runners.

**AFD-280 Upper Guide Support Assembly**



**Note:** The first 175 units manufactured in 1995 have centered pin guides. Newer units have the offset pin guides.

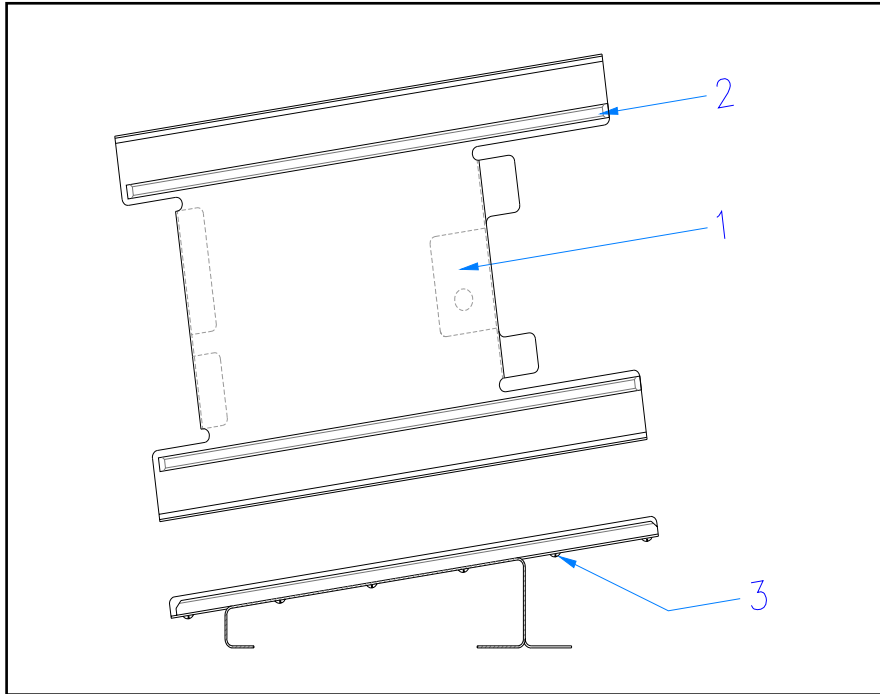
**AFD-280, Centered Guide Pin, (Item 4)**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	220503	Upper Guide Post Mounting Plate	1	Guide Post Mount
2	220501	Upper Guide Post <b>(No Longer Available)</b>	1	Post to which the Upper Guide is mounted.
3	220502	Upper Guide Post <b>(No Longer Available)</b>	1	Post to which the Upper Guide is mounted.
4	202476	Fillister Head Screw , 5/16- 18 x 1/2 ”	2	Locates Upper Guide on Mounting Posts
5	202073	Socket Head Cap Screw, 1/4-20 X 3/4”	4	Adjusts Mounting Plate positioning.
6	213539	Socket Head Cap Screw, 1/4-20 X 1”	4	Secures Mounting Plate to Dispenser Chassis
	213142	Lock Washer, 1/4”	4	
7	202174	Socket Head Bolt, 1/2” X 1-1/4”	2	Secures Upper Guide Posts to Mounting Plate
	213264	Lock Washer, 1/2”	2	

**AFD-280 Offset Guide Pin, (Item 4)**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	220503	Upper Guide Post Mounting Plate	1	Guide Post Mount
2	202218	Upper Guide Post	1	Post to which the Upper Guide is mounted.
3	202218	Upper Guide Post	1	Post to which the Upper Guide is mounted.
4	202044	Fillister Head Screw ,1/4-20 X 1/2”	2	Locates Upper Guide on Mounting Posts
5	202073	Socket Head Cap Screw, 1/4-20 X 3/4”	4	Adjusts Mounting Plate positioning.
6	213539	Socket Head Cap Screw, 1/4-20 X 1”	4	Secures Mounting Plate to Dispenser Chassis
	213142	Lock Washer, 1/4”	4	
7	202174	Socket Head Bolt, 1/2-13 x 1-1/4”	2	Secures Upper Guide Posts to Mounting Plate
	213264	Lock Washer, 1/2”	2	

**AFD-280 Lower Guide**



**Lower Guide Assembly p/n 202779 (Item 1)**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
2	220494	Basket Runners, Ultem	2	Slide runners for baskets.
3	290000	Mounting Screws	12	Mounting Screws

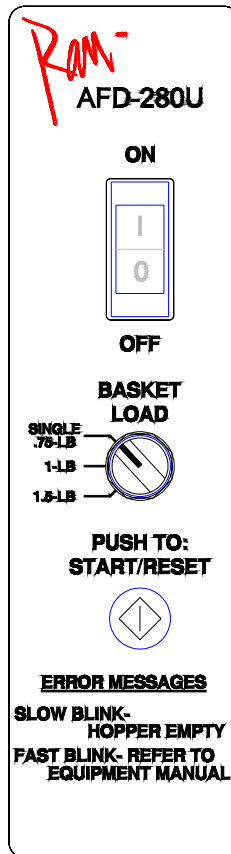
## AFD-280U Product Changes

2.x e-prom

### Front Panel Operations Customization

Operational characteristics of the AFD-280U Fry Dispenser can be customized using the front panel controls.

#### Configure Switch Position #1 for Automatic Dispensing



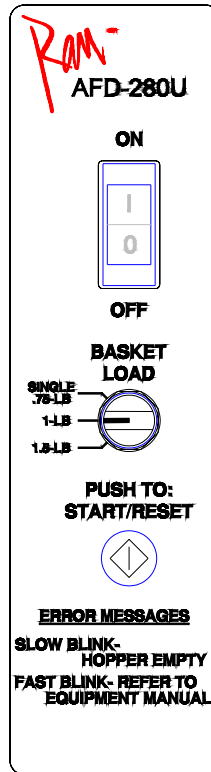
- Turn the dispenser off. **Wait 15 seconds.**
- Select Position #1, SINGLE / .75-LB.(350 gm)
- Hold in the RESET BUTTON
- While holding in the reset button, turn the Fry Dispenser power ON ( I ).

This modification to the dispenser operation is non-volatile: This setting does not change when the dispenser power is turned off. In order to return the dispenser to position #1 being single mode, the procedure must be performed again.

## Configure “Bypass” Mode Operation

In the event of an internal component failure causing repeated system errors, this “BYPASS” mode of operation can be selected to allow usage of the Fry Dispenser.

When the “BYPASS” mode is activated, a SINGLE basket of fries will be dispensed at the selected weight. Basket weight will be determined by the Load Cell, therefore the weight SELECTION switch can be utilized.



- Turn the dispenser off. **Wait 15 seconds.**
- Select Position #2, 1-LB. (450 gm)
- Hold in the RESET BUTTON
- While holding in the reset button, turn the Fry Dispenser power ON ( I ). “BYPASS MODE” is indicated by double flashing of the Reset Button.

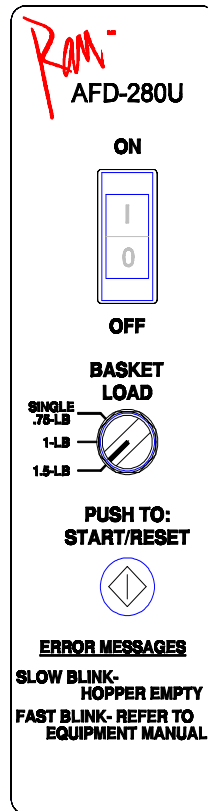
This modification to the dispenser operation is temporary: When the Fry Dispenser power is turned OFF ( O ), the dispenser resets to normal operations when the power is turned ON ( I ) again.

### NOTE:

**ALWAYS ALLOW 15 SECONDS BEFORE TURNING THE FRY DISPENSER POWER SWITCH ON AFTER BEING TURNED OFF.**

## Exercise Mode Operation

Exercise Mode provides a means of testing and breaking in mechanical components. When the dispenser is put into Exercise mode it runs all of the mechanical components in sequence. While it is running, it maintains the last lift cylinder actuation time on the controller display.



- Turn the dispenser off. **Wait 15 seconds.**
- Select Position #3 (1.5 LB./ 700 gm)
- Hold in the RESET BUTTON
- While holding in the reset button, turn the Fry Dispenser power ON ( **I** ). Exercise mode is indicated by the dispenser going into motion with the Reset Button dark. Wait a couple seconds for the controller to power up before releasing the reset button.

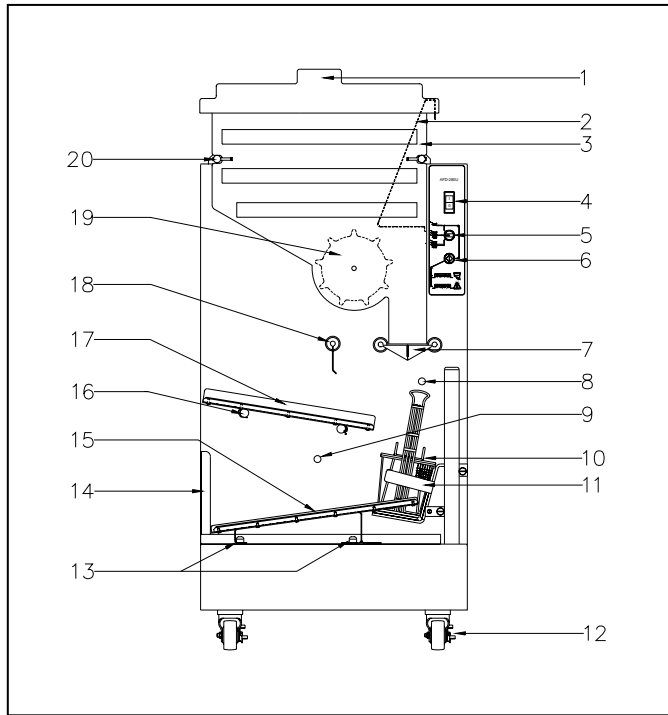
This modification to the dispenser operation is temporary: When the Fry Dispenser power is turned OFF ( **O** ), the dispenser resets to normal operations when the power is turned ON ( **I** ) again.

**NOTE: ALWAYS ALLOW 15 SECONDS BEFORE TURNING THE FRY DISPENSER POWER SWITCH “ON ( I )” AFTER BEING TURNED “OFF ( O )”.**

# AFD280, 280U Comprehensive Service Manual

## Major Assemblies, AFD-280U

### AFD-280U Front View

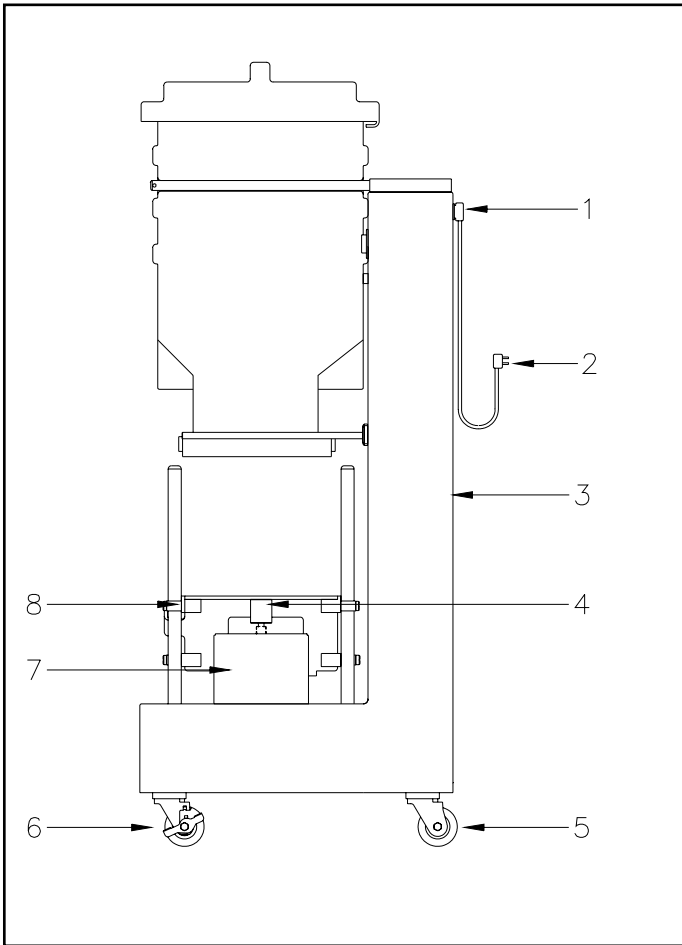


### **AFD-280U Front View**





ITEM	P/N	DESCRIPTION	NO.	FUNCTION
1	202364	Hopper Lid	1	Cover for the Fry Hopper.
2	219129	Fry Diverter	1	Funnels fries to the Accumulator Doors area.
3	202368	Hopper	1	Holds frozen fries for dispensing into baskets.
4	202381	On / Off Switch with circuit breaker	1	On / Off Switch and A.C. circuit breaker.
5	215607	Selector Switch	1	Selects fry load sizes and Dispenser operation.
6	215606	Start / Reset Push-button Switch	1	Starts single basket cycle and resets system error.
	216489	Bulb Only	1	
	290771	Button Lens Only	1	
7	---	Accumulator Doors Assembly	--	<i>See assembly illustration.</i>
8	202038	Lift Optical Sensor	1	Senses baskets in the Saddle when the Lift is raised.
9	202038	Guide Optical Sensor	1	Senses baskets exiting the Lift and on Lower Guide. Kit to replace both sensor windows
	202619	Window Replacement Kit	1	
10	216258	Fry Basket	10	Receives fries from Dispenser.
11	202782	Saddle Assembly	1	<i>See assembly illustration</i>
12	216596	Front Casters with Brakes	2	Allows moving the Dispenser for cleaning & locking position.
13	290687	Locator Pin	2	Holds Drip Pan and Lower Guide in place
14	202780	Drip Pan	1	Collects shortening and other waste materials.
15	202779	Lower Guide Assembly	1	Complete Lower Guide Assembly. Basket slide rails. Runner mounting screws. (6 screws per Ultem)
	220494	Lower Guide Ultem Runners	2	
	290000	Runner Mounting Screws	12	
16	202218	Upper Guide Support Bars	2	Secures the Upper Guide in the proper orientation.
17	202219	Upper Guide Assembly (offset pin)	1	Complete Upper Guide assembly. Locates Upper Guide Position. (offset Guide) Basket slide rails. Runner mounting screws. (5 screws per Ultem)
	202044	Fillister Screw	2	
	202359	Upper Guide Ultem Runners	2	
	290000	Runner Mounting Screws	10	
18	----	Stopgate Assembly	--	<i>See assembly illustration</i>
19	202366	Drum	1	Dispenses fries to the Accumulator Door area.
20	202884	Hopper Support Bar, left	1	Holds the Hopper in proper orientation.
	202885	Hopper Support Bar, right	1	
	290533	Hopper Support Bar Screws	4	

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## AFD-280U Side View



Rear Access Door hardware Item #3

Item	Description	Part Number	Qty
	U-Clip (mounts on dispenser)	202892	2
	Retaining Washer (holds 202585 in place)	202539	2
	Machine screw 10-32 x 1"	202585	2
	Pocket Pull door handle	202523	2

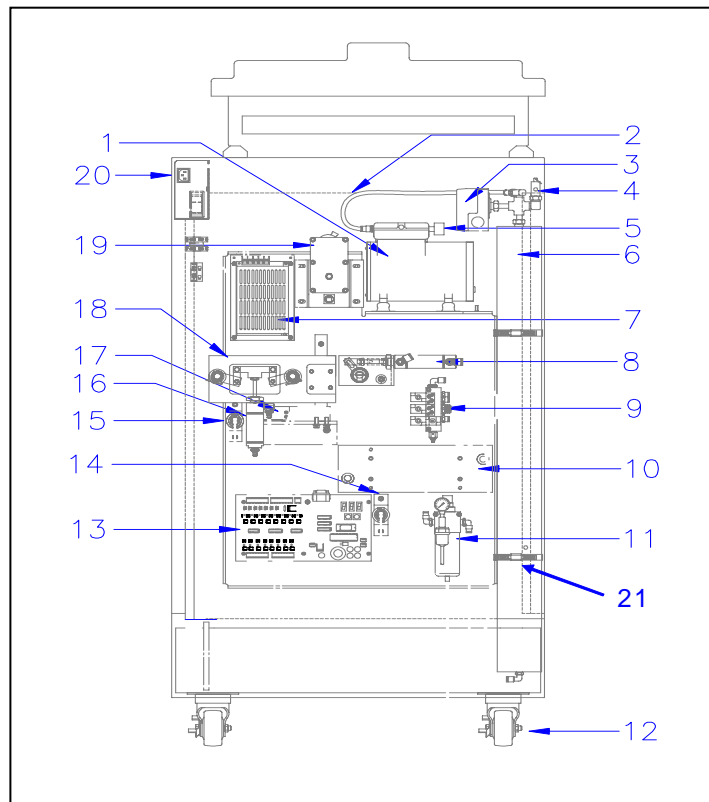
## AFD-280U Side View

ITEM	P/N	DESCRIPTION	NO.	FUNCTION
1	202881	Power Cord Inlet	1	Connector for Power Cord.
2	203425 202946 202942 202950	Inlet Power Cord, USA, Japan Inlet Power Cord, European Inlet Power Cord, Great Britain Inlet Power Cord, Australia	1	Provides electrical power from wall outlet. Plugs into power cord inlet.
2	202172 202790 202354	Hard-wired Power Cord, USA, Japan Hard-wired Power Cord, European Hard-wired Power Cord, Australia	1	Provides electrical power form wall outlet. Hard-wired power cords.
2	290311 290308 290312	Kit, Power Cord, USA, Japan Kit, Power Cord, European Kit, Power Cord, Australia		Power cord kit that converts from power cord inlet to hard-wired power cords. For more information see replacement part procedures at <a href="http://www.schwanstech-aed.com">http://www.schwanstech-aed.com</a>
3	202890 202523 202585 202539 202892	Back panel Handles Screws Retainer (Plastic) Nut (U-clip)	1 2 2 2 2	Removable cover for internal access. Hand holds for Back Panel Secures the Back Panel to the machine Holds screws to Back Panel Attachment point for screws
4	202518	Lift Cylinder Cap, Adjustable	1	Attaches to Lift Cylinder Shaft, contacts the Saddle.
5	216595	Rear Caster	1	Allows Dispenser movement for cleaning.
6	216596	Front Caster with brake.	1	Allows Dispenser movement, locks position.
7	202513 220497	Lift Cylinder Cover Lift Cylinder Cover Nut	1 1	Lift Cylinder protective cover. Secures the Lift Cylinder Cover.
8	202782	Lift Saddle Assembly	1	Carries baskets from the Upper to the Lower Guide.



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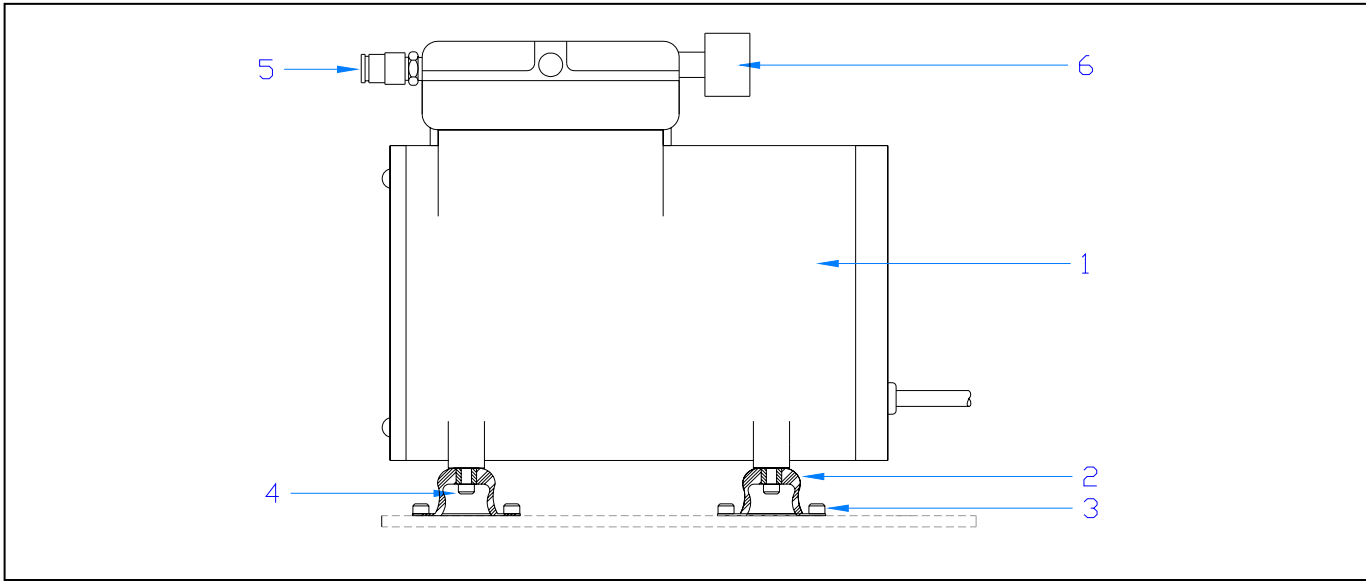
## AFD-280U Rear View



**AFD-280U Rear View**

ITEM	P/N	DESCRIPTION	NO.	FUNCTION
1	202061 202190 202766 202765	Air Compressor, Ramped Valve, 110V/60Hz Air Compressor, Ramped Valve, 220V/50Hz Air Compressor, Ramped Valve, 220V/60Hz Air Compressor, Ramped Valve, 110V/50-60Hz	1	Compressed air source for Dispenser operations.
2	202878	Airline, 1/4" x 24"	24"	Connects Compressor to Air Reservoir.
3	202196	Compressor Control Switch	1	Controls Compressor, On at 40 psi, Off at 60 psi.
4	202197	Pressure Relief Valve	1	Over pressure safety valve for Air Reservoir.
5	202199 202614	Air Inlet Filter Filter Media only	1 1	Filters air entering the Air Compressor. Replaceable filter media.
6	202861	Air Reservoir Assembly	--	<i>See assembly illustration</i>
7	202793	Power Supply, 24.5 VDC	1	Provides D.C. power for Dispenser operations.
8	202900	Stopgate Assembly	--	<i>See assembly illustration</i>
9	202582	Manifold Assembly	--	<i>See assembly illustration</i>
10	-----	Upper Guide Support Assembly	--	<i>See assembly illustration</i>
11	202051	Air Regulator Assembly	--	<i>See assembly illustration</i>
12	216595	Rear Casters	2	Allows Dispenser movement for cleaning.
13	290626 290063	Plus Controller Board E-prom	1 1	Controls Dispenser electrical functions. Programs the controller board.
14	202038	Lower Guide Optical Sensor	1	Senses baskets exiting the Lift and when the Lower Guide is full.
15	202038	Lift Optical Sensor	1	Senses baskets in the Saddle when the Lift is raised.
16	202057	Accumulator Doors Air Cylinder	1	Pneumatic actuator for the Accumulator Doors.
17	290685	Load Cell	1	Senses the weight of the fries.
18	-----	Accumulator Door Carriage Assembly	--	<i>See assembly illustration</i>
19	-----	Drum Motor Assembly	--	<i>See assembly illustration</i>
20	202881	Power Cord Inlet	1	Connects the Dispenser to the wall outlet power.
21	202062	Air Reservoir Mounting Straps	2	Secures Air Reservoir to chassis.

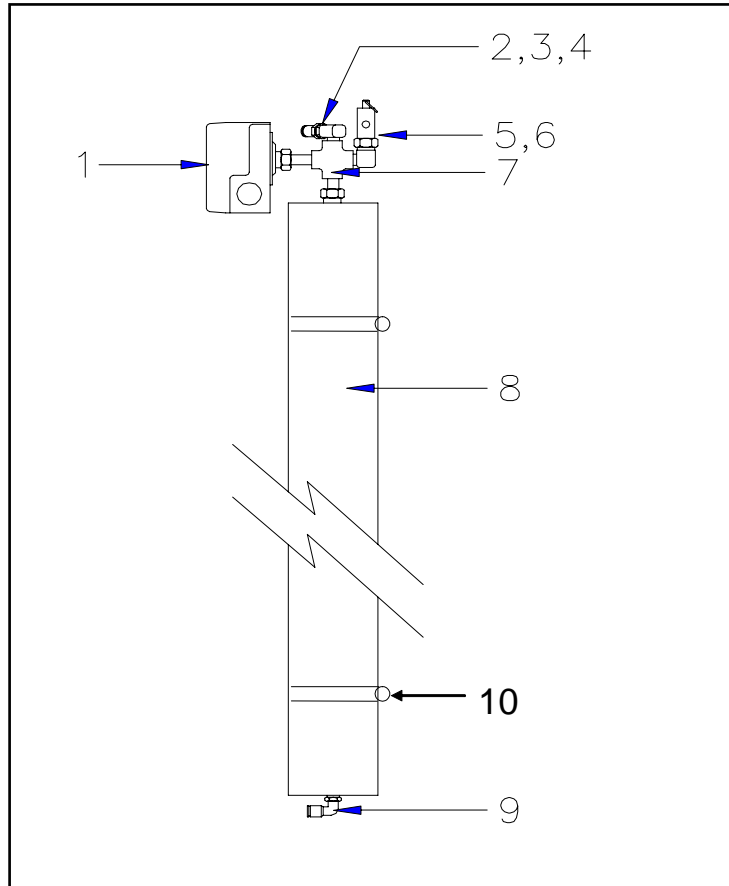
**AFD-280U Compressor Assembly**



**AFD-280U Compressor Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202061 202765 202190 202766	Air Compressor, 110 VAC, 60 Hz Air Compressor, 100 VAC, 50-60 Hz Air Compressor, 220 VAC, 50 Hz Air Compressor, 220 VAC, 60 Hz	1 1 1 1	Provides compressed air for Dispenser pneumatic system.
2	202857	Bubble Shock Mount	4	Provides vibration isolation.
3	202858	Socket head cap screw, 8-32 X 1/4"	8	Secures Shock Mounts to Dispenser chassis.
4	213509 213432	Socket head cap screw, 8-32 X 1/2" Lock Washer, #8	4 4	Secures Shock Mount to Compressor Lock washer for cap screw.
5	215465	Push fitting, 1/4" tube - 1/4 NPT	1	Attaches 1/4" airline to the Air Compressor.
6	202199 219262	Air Filter Assembly with Filter Media Filter Media only	1 1	Filters air entering the Air Compressor. Replaceable filter media.

**AFD-280U Air Reservoir Assembly**

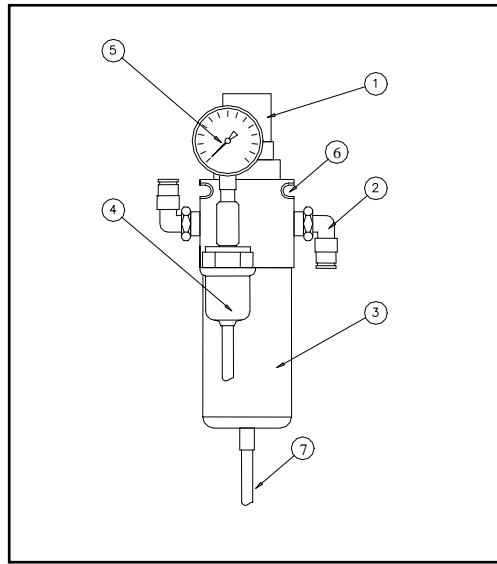


**AFD-280U Air Reservoir Assembly**

ITEM	P/N	DESCRIPTION	Number	DETAILS
---	202861	Air Reservoir Assembly		Stores Compressed Air for Dispenser Operations.
1	202196	Pressure Control Switch		<i>Part of Air Reservoir Assembly</i> Set for On at 40 psi (2.8 Bar) Off at 60 psi (4.1 Bar).
2	215465	¼" Push Tube Fitting		<i>Part of Air Reservoir Assembly</i>
3	202243	Check Valve		<i>Part of Air Reservoir Assembly</i>
4	291321	90° Elbow		<i>Part of Air Reservoir Assembly</i>
5	202197	Pressure Relief Valve		<i>Part of Air Reservoir Assembly</i>
6	291321	90° Elbow		<i>Part of Air Reservoir Assembly</i>
7	291324	Branch T Fitting		<i>Part of Air Reservoir Assembly</i>
8	----	Pressure Tank		<i>Part of Air Reservoir Assembly</i>
9	213477	90°, ¼" Push Tube Fitting		<i>Part of Air Reservoir Assembly</i>
10	202062	Mounting Straps	2	Secures Air Reservoir to the chassis.

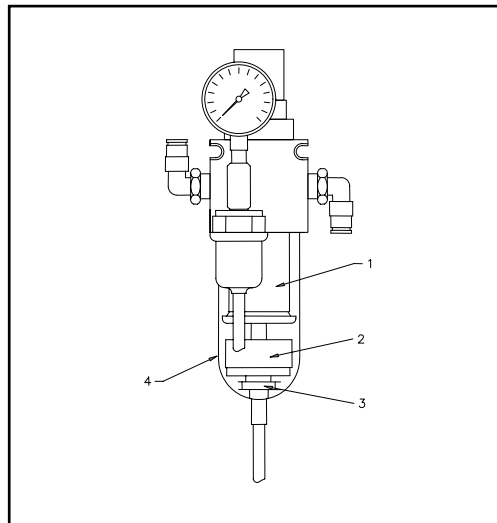
# AFD280, 280U Comprehensive Service Manual

## AFD-280U Air Pressure Regulator Assembly



### AFD-280U Air Pressure Regulator Assembly, p/n 202051

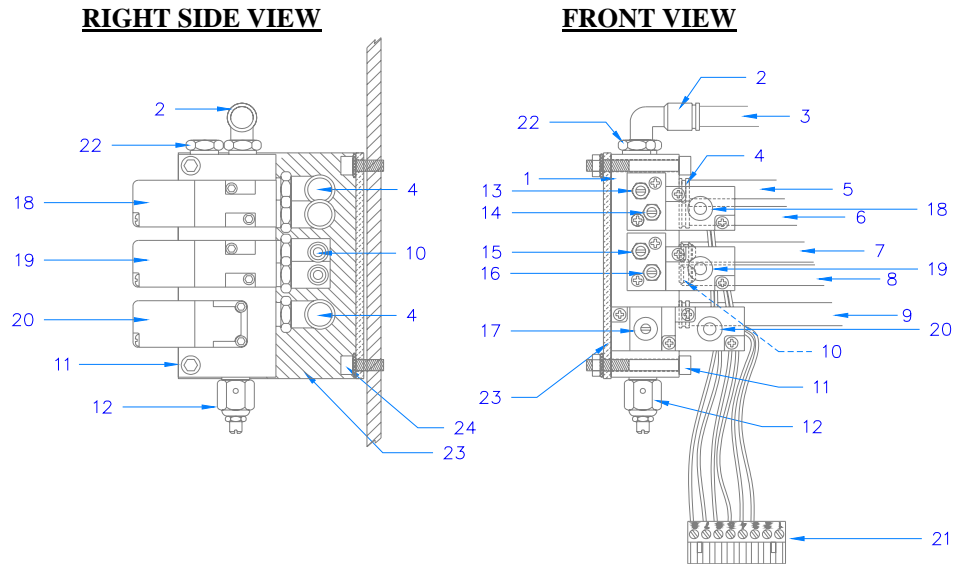
ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	---	Pressure control knob.	--	Pull up to unlock, turn to increase or decrease system pressure. Set for 30 psi. <i>Part of Pressure Regulator Assembly</i>
2	213477	Airline fitting, 90° 1/4" Push Tube	2	Airline Connection.
3	---	Filter Bowl Cover Shield.	--	Safety cover for the Filter Bowl. <i>Part of Pressure Regulator Assembly.</i>
4	202604	Air Present Switch	1	Senses system operating pressure, adjusted for 20 psi On.
5	202606	Air Pressure Gauge	1	Indicates regulator pressure setting.
6	213372	Regulator Mounting Screws	2	Secures the regulator to the back panel.
7	202480	Drain Line, 5/16" x 10"	10"	Water drain line.
----	202051	Pressure Regulator Assembly	1	Complete Filter Regulator assembly.



ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202614	Filter Media Replacement Kit	1	Removes contaminants from system air pressure.
2	---	Float Valve	--	<i>Part of Pressure Regulator Assembly.</i>
3	---	Drain Filter	--	<i>Part of Pressure Regulator Assembly.</i>
4	202245	Water Trap Bowl and Drain Fitting	1	Collects and drains moisture from system air pressure.
---	202051	Pressure Regulator Assembly	1	Complete Filter Regulator assembly.

### AFD-280U Manifold Assembly "Style A"

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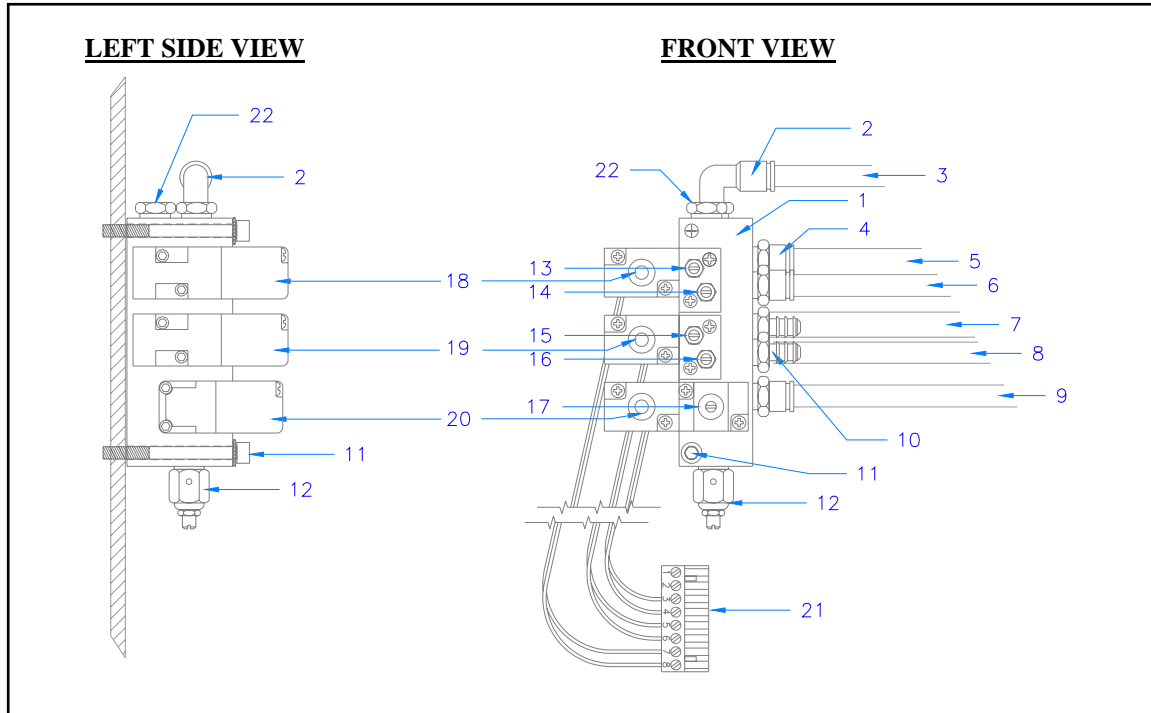


**AFD-280U Manifold Assembly “Style A”, p/n 202054 (replace with p/n 202582)**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202582	Pneumatic Manifold Assembly	1	Distributes airflow to pneumatic cylinders.
2	213318	Airline Fitting, 90°, 1/4” Push Tube	1	Airline connection.
3	202572	Manifold Compressed Air Input	1	GREEN Airline from the Pressure Regulator.
4	213318	Airline Fitting, 90°, 1/4” Push Tube	3	Airline connection.
5	202479	Manifold Output, <b>OPEN Stopgate</b>	1	BLUE Airline to bottom Stopgate Cylinder fitting.
6	202478	Manifold Output, <b>CLOSE Stopgate</b>	1	RED Airline to top Stopgate Cylinder fitting.
7	202481	Manifold Output, <b>OPEN Accumulator Doors</b>	1	CLEAR airline to top Accumulator Cylinder fitting.
8	202573	Manifold Output, <b>CLOSE Accumulator Doors</b>	1	YELLOW airline to bottom Accumulator Cylinder fitting.
9	213320	Manifold Output, <b>RAISE Lift Cylinder</b>	1	OPAQUE airline to fitting at bottom of Lift Cylinder.
10	203282	Airline Fitting, 1/4” OD-Barbed	2	Airline connection.
11	213518	Allen Head Cap Screws, 10-32 X 1 1/2”	2	Secures Manifold Assembly to Mounting Bracket (23).
12	203294	Airflow adjustment, <b>Lift Cylinder DOWN</b>	1	Controls the DOWN SPEED of the Lift Cylinder.
13	202090	Airflow Adjustment, <b>Stopgate OPEN “B”</b>	1	Controls the OPENING SPEED of the Stopgate Cylinder.
14	202090	Airflow Adjustment, <b>Stopgate CLOSE “A”</b>	1	Controls CLOSING SPEED of the Stopgate Cylinder.
15	202090	Airflow Adjustment, <b>Accumulator OPEN “B”</b>	1	Controls the OPENING SPEED of the Accumulator Doors.
16	202090	Airflow Adjustment, <b>Accumulator CLOSE “A”</b>	1	Controls the CLOSING SPEED of the Accumulator Doors.
17	202021	Airflow Adjustment, <b>Lift Cylinder UP speed</b>	1	Controls the UP SPEED of the Lift Cylinder.
18	219010	Manifold Solenoid & manual activator.	1	Switches the Stopgate airflow for OPEN & CLOSE.
19	219010	Manifold Solenoid & manual activator.	1	Switches the Accumulator Doors airflow for OPEN & CLOSE.
20	219009	Manifold Solenoid & manual activator.	1	Opens airflow to the Lift Cylinder to raise UP. Lift Cylinder DOWN is controlled by (12).
21	215468	Electrical Connector, 8 position.	1	Connects Solenoid Wiring to the Controller Board Outputs.
22	202242	Manifold Vent	1	Exhausts manifold intermittent air pressures.
23	----	Manifold Mounting Bracket	1	Mounting for the Manifold Assembly
24	213143 213142	Allen Head Cap Screws Star Washers	2 2	Secures Mounting Bracket to Dispenser chassis.

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## AFD-280U Manifold Assembly “Style B”

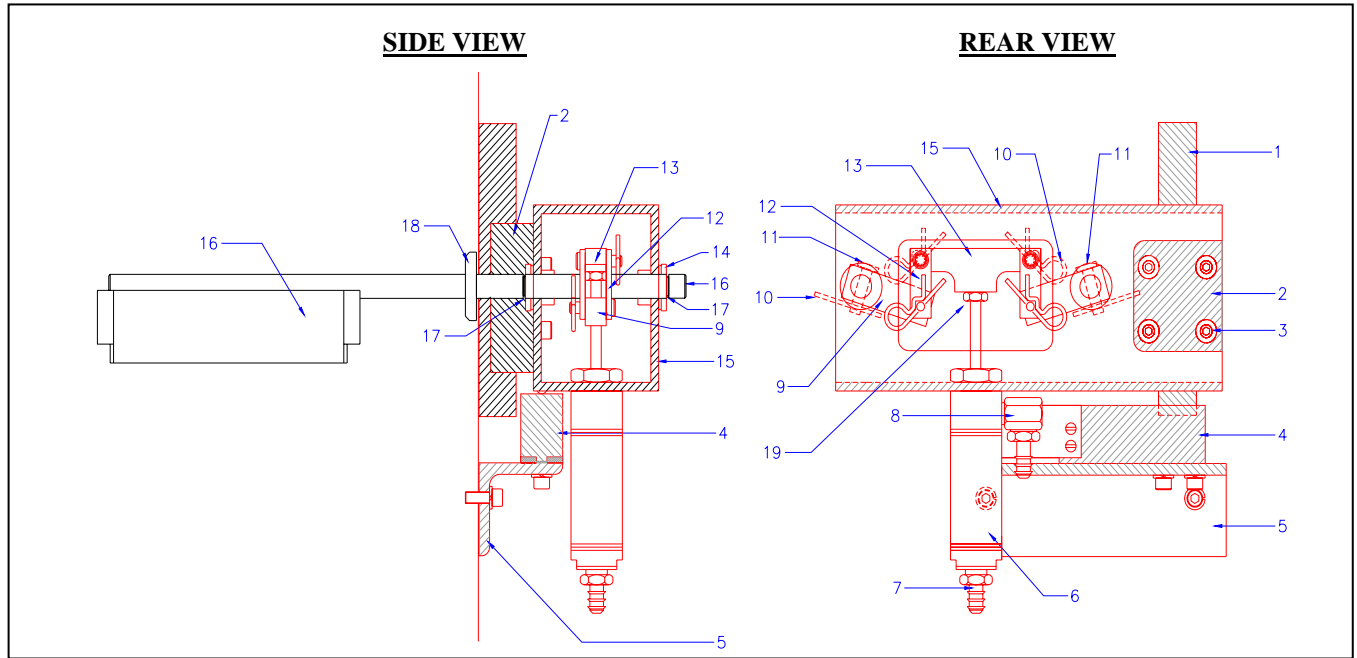


AFD-280U Manifolds Assembly “Style B”, p/n 202582)

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202582	Pneumatic Manifold Assembly	1	Distributes airflow to pneumatic cylinders.
2	213318	Airline Fitting, 90°, 1/4” Push Tube	1	Airline connection.
3	202572	Manifold Compressed Air Input	1	GREEN Airline from the Pressure Regulator.
4	213369	Airline Fitting, Straight, 1/4” Push Tube	3	Airline connection.
5	202479	Manifold Output, <b>OPEN Stopgate</b>	1	BLUE Airline to bottom Stopgate Cylinder fitting.
6	202478	Manifold Output, <b>CLOSE Stopgate</b>	1	RED Airline to top Stopgate Cylinder fitting.
7	202481	Manifold Output, <b>OPEN Accumulator Doors</b>	1	CLEAR airline to top Accumulator Cylinder fitting.
8	202573	Manifold Output, <b>CLOSE Accumulator Doors</b>	1	YELLOW airline to bottom Accumulator Cylinder fitting.
9	213320	Manifold Output, <b>RAISE Lift Cylinder</b>	1	OPAQUE airline to fitting at bottom of Lift Cylinder.
10	203282	Airline Fitting, 1/4”-Barbed	2	Airline connection.
11	213372	Allen Head Cap Screws, 10-32 X 2”	2	Secures Manifold Assembly to Mounting Bracket (23).
12	203294	Airflow adjustment, <b>Lift Cylinder DOWN</b>	1	Controls the DOWN SPEED of the Lift Cylinder.
13	202090	Airflow Adjustment, <b>Stopgate CLOSE “A”</b>	1	Controls CLOSING SPEED of the Stopgate Cylinder.
14	202090	Airflow Adjustment, <b>Stopgate OPEN “B”</b>	1	Controls the OPENING SPEED of the Stopgate Cylinder.
15	202090	Airflow Adjustment, <b>Accumulator CLOSE “A”</b>	1	Controls the CLOSING SPEED of the Accumulator Doors.
16	202090	Airflow Adjustment, <b>Accumulator OPEN “B”</b>	1	Controls the OPENING SPEED of the Accumulator Doors.
17	202021	Airflow Adjustment, <b>Lift Cylinder UP speed</b>	1	Controls the UP SPEED of the Lift Cylinder.
18	219010	Manifold Solenoid & manual activator.	1	Switches the Stopgate airflow for OPEN & CLOSE.
19	219010	Manifold Solenoid & manual activator.	1	Switches the Accumulator Doors airflow for OPEN & CLOSE.
20	219009	Manifold Solenoid & manual activator.	1	Opens airflow to the Lift Cylinder to raise UP. Lift Cylinder DOWN is controlled by (12).
21	215468	Electrical Connector, 8 position.	1	Connects Solenoid Wiring to the Controller Board Outputs.
22	202242	Manifold Vent	1	Exhausts manifold intermittent air pressures.

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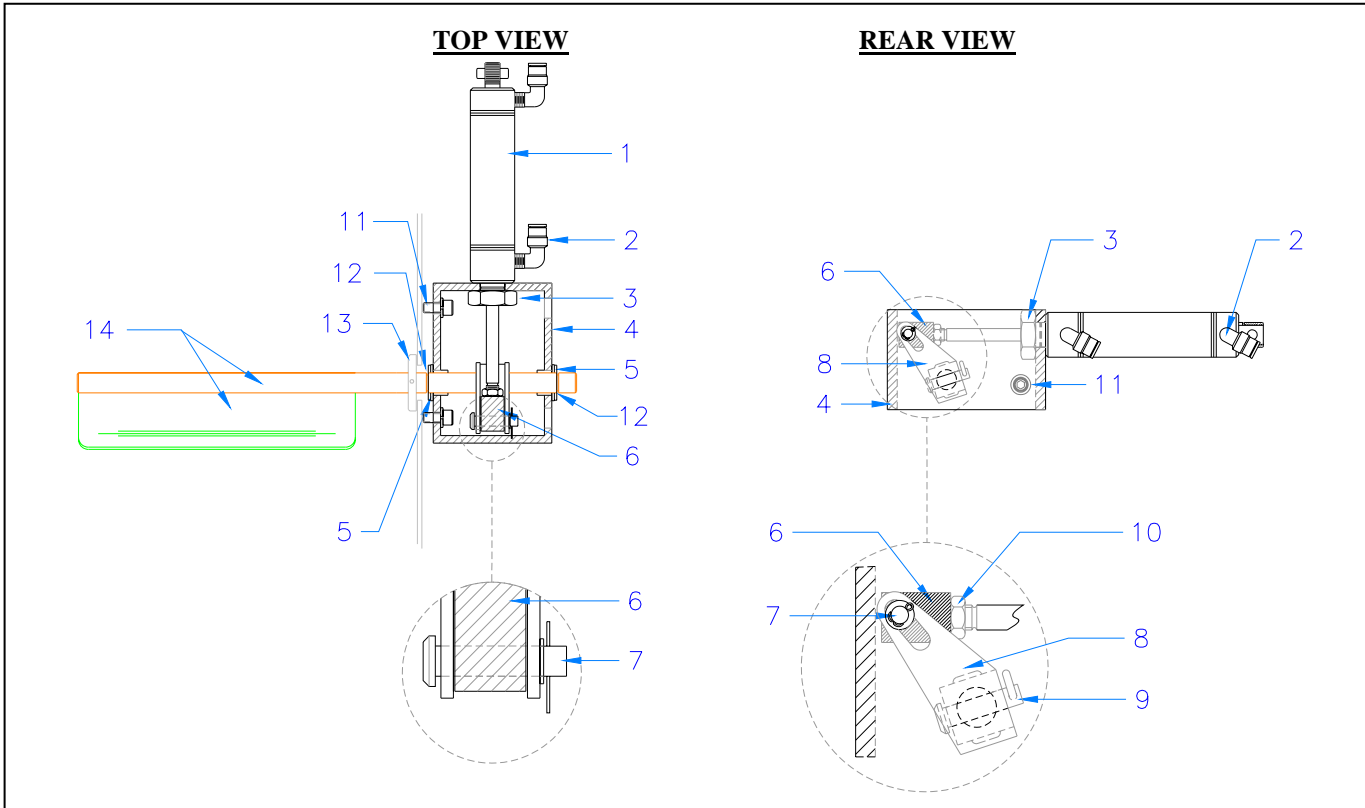
## AFD-280U Accumulator Doors / Load Cell Assembly



### Accumulator Doors / Load Cell Assembly

ITEM	P/N	DESCRIPTION	No.	DETAIL
1	202068	Slide Rail	1	Allows Accumulator Assembly Motion / Sensing
2		Slide Rail Mount		Attaches Accumulator Assembly to Slide Rail
3	203097 213142	Slide Rail Mounting Bolts Lock Washers	4 4	M6-1.0 x 16 Zinc Plated
4	290685 213143 213142	Load Cell Bolts Lock Washers	1 2 2	Detects Weight of French Fries ¼-20 X ½" ¼" Zinc Plated
5	202908 213143 213142	Load Cell Mounting Bracket Bolts Lock Washers	1 2 2	Secures Load Cell to Chassis ¼-20 X ½" ¼" Zinc Plated
6	202057	Accumulator Doors Cylinder	1	Pneumatically Operates the Accumulator Doors
7	203282	Straight Barbed Fitting	1	1/8" NPT Barbed Airline Fitting
8	203283 203290	90° Barbed Fitting Assembly: - 90° Elbow - Barbed Fitting	1 1	1/8" NPT to 10-32 UNC 90° Fitting 10-32 UNC Barbed Airline Fitting
9	220464	Door Shaft Link	2	Actuator Linkage Connection Secured to the Door Shaft
10	202081	Hairpin Clip	6	Secures Clevis Pins
11	202082	Clevis Pin, ¼ X 1"	6	Secures Linkages
12	220463	Connector Link	4	Actuator Linkage Interconnection Link
13	220462	Center Link	1	Linkage attached to Pneumatic Cylinder
14	202974 202975	Flange Bearing Nylon Washer	4 4	Bearing for Accumulator Door Shafts Flange Bearing Spacer
15	202898	Machined Chassis Extrusion	1	Machined Accumulator Chassis
16	220480	Accumulator Door Weldment, Left	1	Accumulator Door and Shaft
17	213356	E-Clip	2	Secures Accumulator Door Shaft within Accumulator Assembly
<i>not shown</i>	220475	Accumulator Door Weldment, Right	1	Accumulator Door and Shaft
	213356	E-Clip	2	Secures Accumulator Door Shaft within Accumulator Assembly
18	220499 202214	Shaft Collar, 1 per shaft Shaft Collar Set Screw, 8-32 X ½"	2 2	Protects inner Dispenser cabinet from contamination. Secures Shaft Collar to shaft.
19	202901	Cylinder Shaft Jam Nut, 5/8" X ½"	1	Locks Cylinder Shaft adjustment.

**AFD-280U Stopgate Assembly**

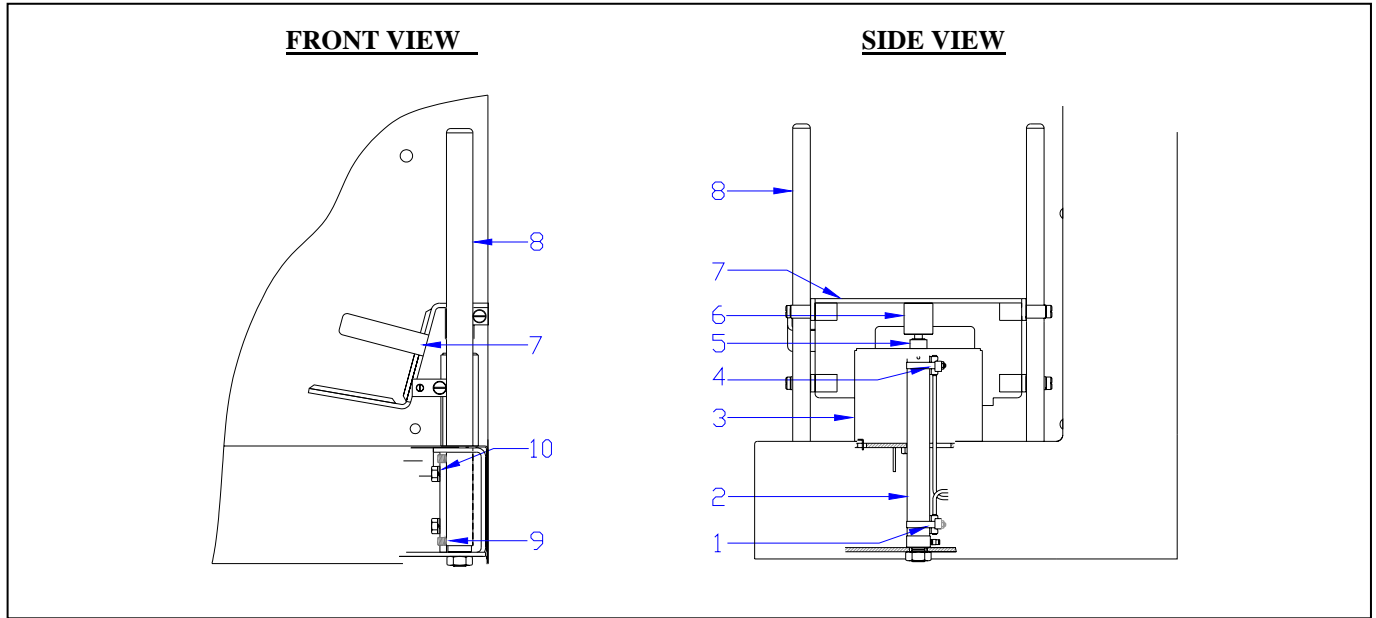


**Stopgate Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202902	Air Cylinder Assembly ( <i>Items 1 &amp; 2</i> )	1	Pneumatic actuator for the Stopgate.
2	213318	¼" Push Tube Fitting, 90° elbow	2	Airline connection.
3	202901	Air Cylinder Jam Nut	1	Secures Air Cylinder to Chassis.
4	202864	Machined Chassis Extrusion	1	Chassis machined from extrusion.
5	202974	Flange Bearing	2	Bearing for Stopgate shaft.
	202975	Washer	2	Spacer.
6	203000	Air Cylinder Shaft End Block	1	Connects Air Cylinder to Stopgate Linkage.
7	202082	Clevis Pin	1	Secures Linkage to End Block.
	203092	Cotter Pin	1	
	203093	Flat Washer	1	
8	203090	Stopgate Actuator Linkage	1	Linkage attached to Stopgate shaft.
7 & 8	290676	Kit, Stopgate Linkage		Stopgate linkage repair kit.
9	202082	Clevis Pin	1	Secures Linkage to Stopgate shaft.
	202081	Hairpin Clip	1	
10	202901	Cylinder Shaft Jam Nut,	1	Secures and adjusts Air Cylinder shaft to End Block.
11	213145	Socket Head Cap Screw, ¼-20 X 5/8	2	Secures Stopgate Chassis Assembly to the Dispenser panel.
	213142	Lock Washer, ¼"	2	
12	213356	E-Clip	2	Secures Stopgate shaft to assembly.
13	220499	Shaft Collar	1	Protect Dispenser inside from contaminants.
	202214	Shaft Collar Set Screw	1	Secure Shaft Collar to Shaft.
14	220505	Stopgate Weldment	1	Stopgate welded assembly.



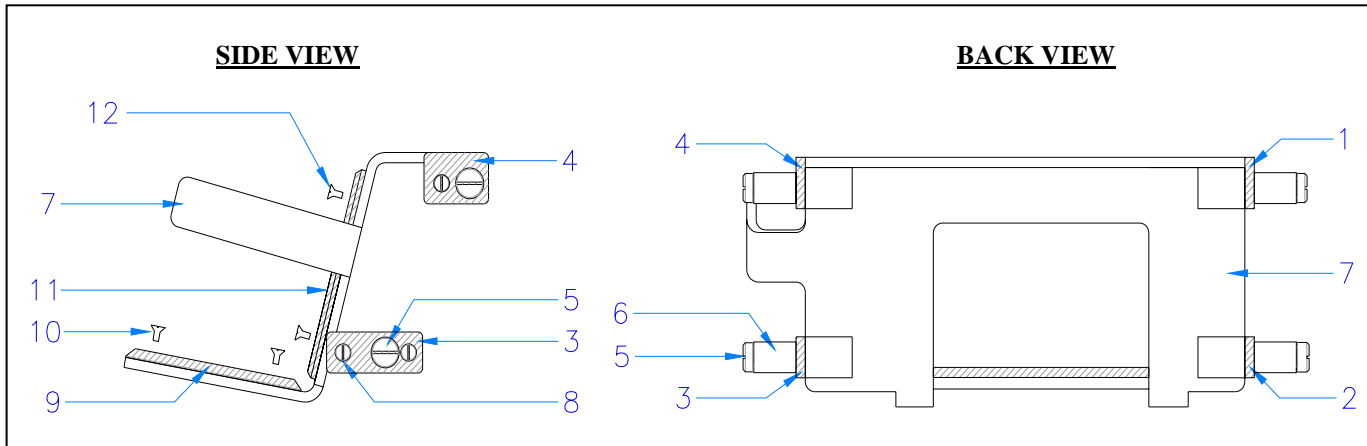
**AFD-280U Lift Cylinder Assembly**



**Lift Cylinder Assembly**

ITEM	PART NUMBER	DESCRIPTION	NO.	DETAILS
1	202194	Lift Cylinder Down Switch	1	Detects when the Lift Cylinder is down.
	202516	Switch Mounting Strap	1	Secures the Lift Switch
2	202055	Lift Cylinder	1	Pneumatic Actuator for the Lift Saddle
	202517	Jam Nut, 3/4-16 UNC	1	Secures the Cylinder to the chassis.
	213369	Airline Fitting, 1/8" NPT M X 1/4"OD	1	Airline connection.
3	202194	Lift Cylinder Up Switch	1	Detects when the Lift Cylinder is up.
	202516	Switch Mounting Strap	1	Secures the Lift Switch
4	202513	Lift Cylinder Shield	1	Protective cover for the Lift Cylinder.
5	220497	Shield Nut	1	Secures the Lift Cylinder Shield.
6	202518	Lift Cylinder Cap	1	Attaches to Lift Cylinder Shaft, contacts Lift Saddle.
7	202782	Lift Saddle Assembly	1	Transports the baskets to the Lower Guide.
8	220456	Saddle Post	2	Guides the Lift Saddle
9	202293	Saddle Post Set Screw, 1/2 X 1/2"	4	Saddle Post alignment adjustment.
10	202174	Bolt, 1/2-13 X 1 1/4"	4	Secures the Saddle Post to the chassis.
	213264	Washer, 1/2"	4	

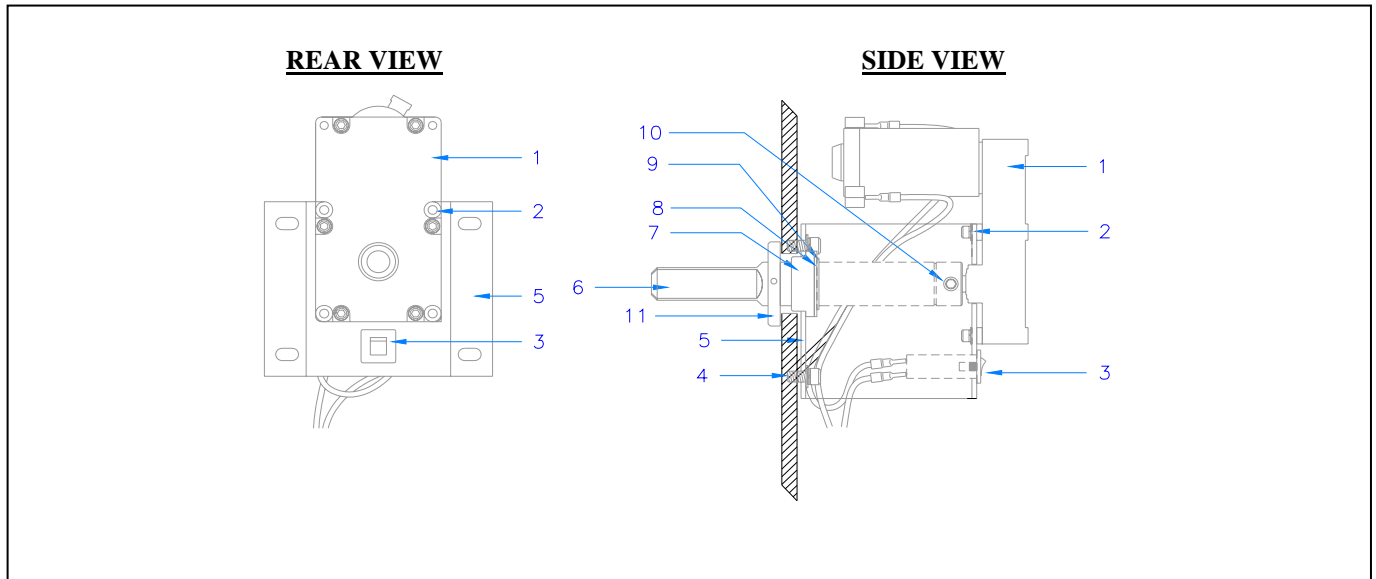
**AFD-280U Saddle Assembly**



**Saddle Assembly p/n 202782**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	220468	Right Upper Wear Strip	1	Wear surface against the Guide Post.
2	220469	Right Lower Wear Strip	1	Wear surface against the Guide Post.
3	220469	Left Lower Wear Strip	1	Wear surface against the Guide Post.
4	220467	Left Upper Wear Strip	1	Wear surface against the Guide Post.
5	202064	Shoulder Bolt	4	Secures Guide Rollers to Saddle Assembly. Stainless Steel.
6	217810	Guide Roller	4	Roller for Saddle Assembly against the Guide Posts.
7	202761	Lift Saddle Weldment	1	Metal body of the Lift Saddle Assembly.
8	202046	Flat Head Screw, 10-32 X 3/4"	6	Secures Wear Strips to Lift Saddle. Stainless Steel.
9	202762	Saddle Slide, 4 3/4" length, 3 1/2" hole spacing	2	Wearable sliding surface for Baskets to slide on.
10	202047	Flat Head Screw, 10-32 X 1/2"	4	Secures Saddle Slides to the Lift Saddle.
11	220473	Splash Shield	1	Contains splashed materials within the Dispenser .
12	202047	Flat Head Screw, 10-32 X 1/2"	5	Secures Splash Shield to Lift Saddle.

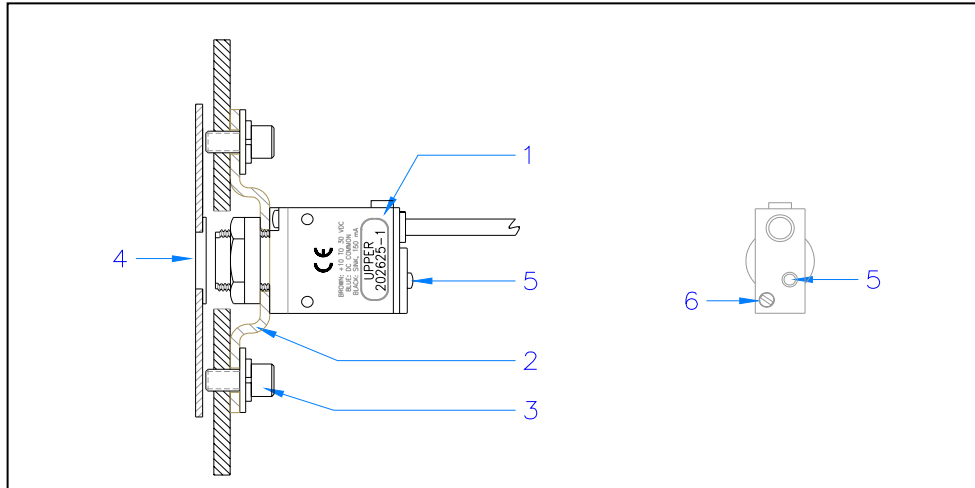
**AFD-280U Drum Motor Assembly**



**Drum Motor Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	292546	Drum Motor / Gear Reducer	1	24 VDC Drive Motor for the Drum Shaft
2	213136	Bolt, 10-32 X 1 1/4"	4	Secures Drum Motor to Chassis
	213140	Lock Washer, #10	4	Secures Drum Motor to Chassis
3	203445	Circuit Breaker <b>Elimination Kit</b>	1	Removes circuit breaker from circuit.
4	213143	Bolt, 1/4-20 X 1/2"	4	Secures Drum Motor Chassis to Back Panel
	213142	Lock Washer, 1/4"	4	Secures Drum Motor Chassis to Back Panel
	213141	Flat Washer, 1/4"	4	Secures Drum Motor Chassis to Back Panel
5	202797	Drum Motor Mounting Chassis	1	Assembly Chassis
6	203380	Drum Shaft	1	Turns the Drum in the Hopper
7	202895	Flange Bearing	1	Bearing for the Drum Shaft
8	202896	Washer	1	Washer / Spacer
9	213911	Retaining Ring	1	Secures the Flange Bearing
10	290653	Set Screw, 3/8-24 X 3/8"	2	Secures the Drum Shaft to the Motor Shaft
	203284	Applied LocTite, thread locking compound	2	Secures the Set Screws
11	220508	Drum Motor Shaft Collar	1	Protects inner Dispenser cabinet from contamination.
	202072	Shaft Collar Set Screw	1	Secures the Shaft Collar to the shaft.

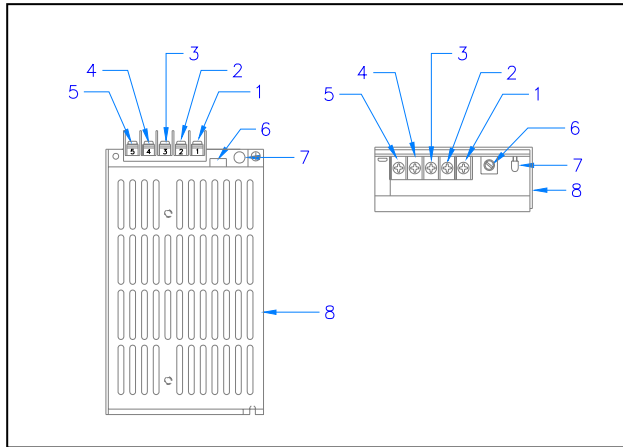
**AFD-280U Optical Sensors**



**Optical Sensor p/n 202038**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	202038	Optical Sensor, Banner	2	Sensor for Lift and Guide Basket detection locations.
2	220492	Sensor Mounting Bracket	2	Mounts / Locates the Optical Sensor.
3	213143	Bolt ¼ -20 X ½"	4	Secures Mounting Bracket to Dispenser Back Panel.
	213142	Lock Washer, ¼"	4	
	213141	Flat Washer ¼"	4	
4	202619	Sensor Window Kit	2	Sensor protective window.
5	---	Sensor Output LED Indicator	--	Turns ON with object detection.
6	---	Sensitivity / Gain Adjustment	--	Gain Adjustment.

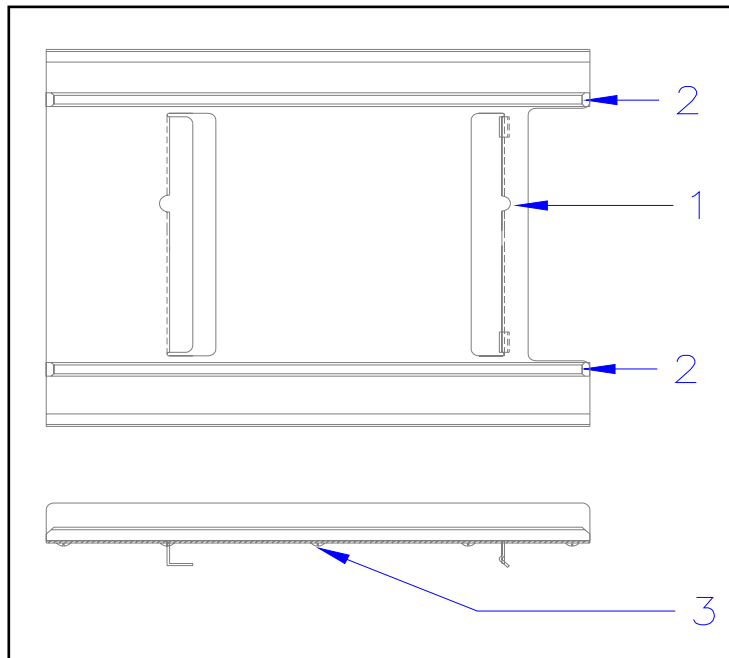
**AFD-280U 24.5 Volt Power Supply**



**Switching Power Supply p/n 202793**

ITEM	P/N	DESCRIPTION	NO	DETAILS
1	---	D.C. V+ Output	--	Positive DC output connection point.
2	---	D.C. V- Output	--	Negative DC output connection point.
3	---	Power Supply Ground Connection	--	Power Supply AC Ground Connection.
4	---	A.C. Power Supply, Line Input	--	AC Line Connection Point.
5	---	A.C. Power Supply, Line Input	--	AC Line Connection Point.
6	---	Vout adjustment.	--	DC voltage output adjustment potentiometer.
7	---	Output Indicator LED	--	LED is ON when 24 VDC is present at output terminals.
8	202793	Power Supply, ETA, 2.1A	1	Power Supply , 24.5 VDC output, 95-240 VAC input.
----	215473	2 Position Connector Plug	1	Connects Power to Controller Board
----	291294	Fuse	1	Protects the power supply.

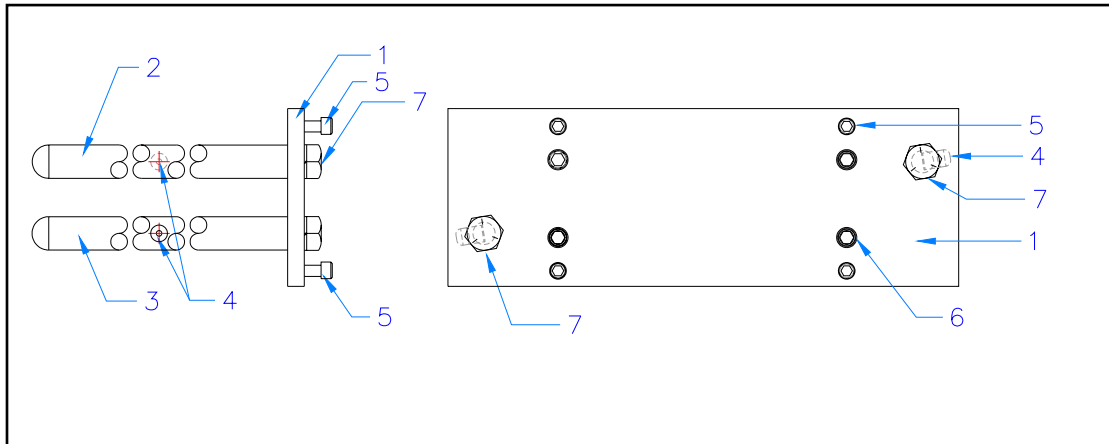
**AFD-280U Upper Guide Assembly**



**Upper Guide Assembly, Offset Pin (item #1) p/n 202219**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
2	202359	Basket Runners, Ultem	2	Slide runners for baskets.
3	290000	Ultem Screws	10	Mounting screws for the Ultem runners.

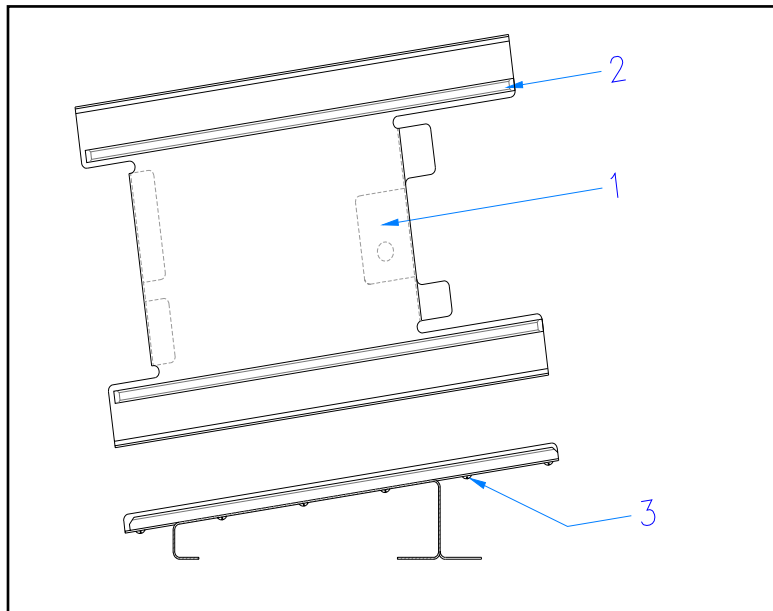
**AFD-280U Upper Guide Support Assembly**



**Upper Guide Support Assembly**

ITEM	P/N	DESCRIPTION	NO.	DETAILS
1	220503	Upper Guide Post Mounting Plate	1	Guide Post Mount
2	202218	Upper Guide Post	1	Post to which the Upper Guide is mounted.
3	202218	Upper Guide Post	1	Post to which the Upper Guide is mounted.
4	202044	Fillister Head Screw, 1/4-20 X 1/2"	2	Locates Upper Guide on Mounting Posts
5	202073	Socket Head Cap Screw, 1/4-20 X 3/4"	4	Adjusts Mounting Plate positioning.
6	213539 213142	Socket Head Cap Screw, 1/4-20 X 1" Lock Washer, 1/4"	4 4	Secures Mounting Plate to Dispenser Chassis
7	202174 213264	Socket Head Bolt, 1/2" X 1-1/4" Lock Washer, 1/2"	2 2	Secures Upper Guide Posts to Mounting Plate

**AFD-280U Lower Guide Assembly**

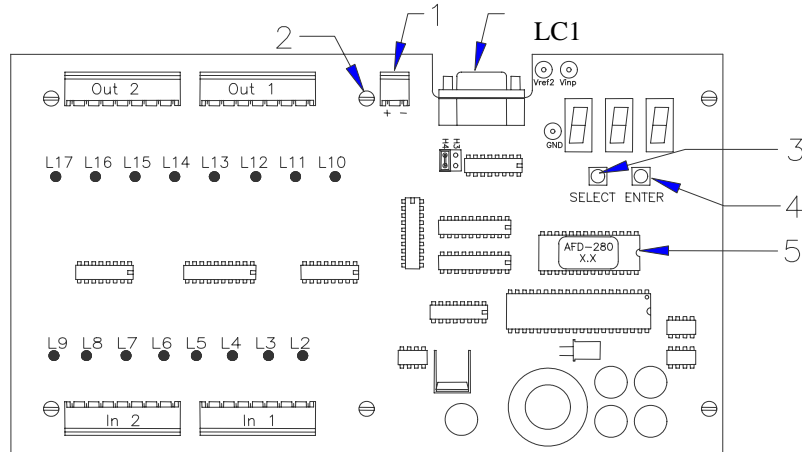


**Lower Guide Assembly (item #1) p/n 202779**

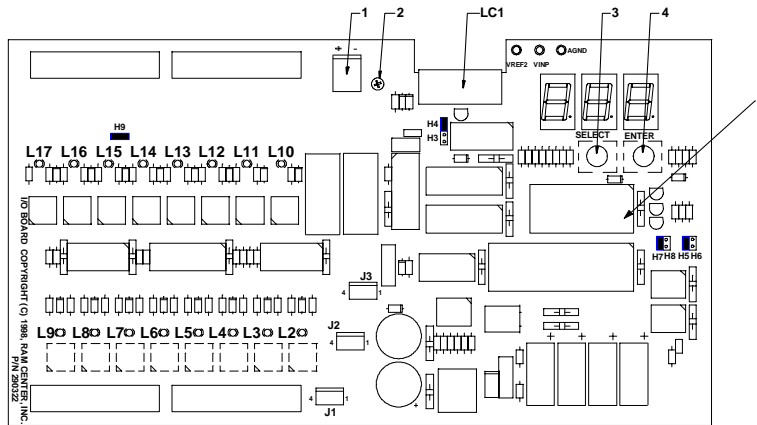
ITEM	P/N	DESCRIPTION	NO.	DETAILS
2	220494	Basket Runners, Ultem	2	Slide runners for baskets.
3	290000	Mounting Screws	12	Mounting Screws

Controller Boards

**Controller Board 202032**



**Controller Board 290322**



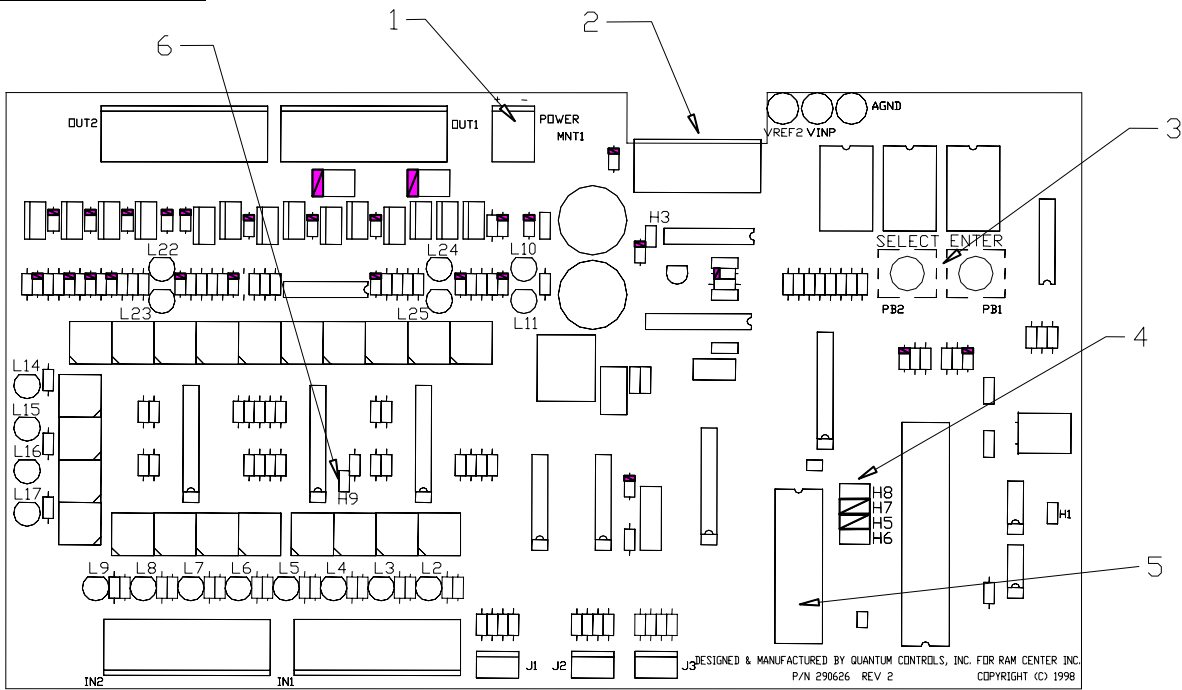
ITEM	DESCRIPTION	ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Power Input 24 VDC	L2	Lift Optical Sensor	L10	Rotate Drum
2	Grounding Screw	L3	Guide Optical Sensor	L11	Lamp; Start/Reset push-button
3	Select Button	L4	Lift Up	L12	Not Used
4	Enter Button	L5	Lift Down	L13	Not Used
5	E-PROM	L6	Air Present Switch	L14	Not Used
LC1	Weight Sensor Connector	L7	Load Selector; 1.5lb setting	L15	Solenoid Valve; Lift Cylinder
J1	Not Used	L8	Load Selector; 1.0lb setting	L16	Solenoid Valve; Accumulator Doors
J2	Not Used	L7&L8	Both OFF = Single Mode	L17	Solenoid Valve; Stopgate
J3	Not Used	L9	Start/Reset push-button	H9	Remove Jumper

**WIRING CONNECTORS FOR CONTROLLER BOARD**

215468	Electrical connector, 8 position	Connects to Input and Output connectors on board.
215473	Electrical connector, 2 position	Connects to DC power connector on board.

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## Controller Board 290626



Item	Description	Item	Description	Item	Description
1	Power Input 24 VDC	L2	Lift Optical Sensor	L11	Start Light
2	Weight Sensor Connection	L3	Guide Optical Sensor	L14	Unused
3	Function Buttons	L4	Lift Up	L15	Raise lift
4	EPROM Configuration	L5	Lift Down	L16	Open Accumulator Doors
5	Software EPROM	L6	Air Present	L17	Open Stopgate
6	Electric mode jumper *Remove for AFD-280/U	L7	Load Selector; 1.5lb setting	L22	Unused
J1	Unused	L8	Load Selector; 1.0lb setting	L23	Unused
J2	Unused	L9	Restart Switch	L24	Unused
J3	Unused	L10	Rotate Drum	L25	Unused

### SOFTWARE E-PROM SELECTION

DISPENSER MODEL	SOFTWARE DESCRIPTION	*STANDANRD CONTROLLER BOARD	PLUS CONTROLLER BOARD
		*PART NUMBER 290322	PART NUMBER 290626
AFD-280	*AFD-280 1.0A	*	*
	*AFD-280/U 2.1	*	*
	<b>AFD-280/U 2.2 (Current software)</b>	<b>290063</b>	<b>290063</b>
AFD-280U	*AFD-280/U 2.1	*	*
	<b>AFD-280/U 2.2 (Current software)</b>	<b>290063</b>	<b>290063</b>

\* Not available/obsolete

X Not compatible

### JUMPER SELECTION

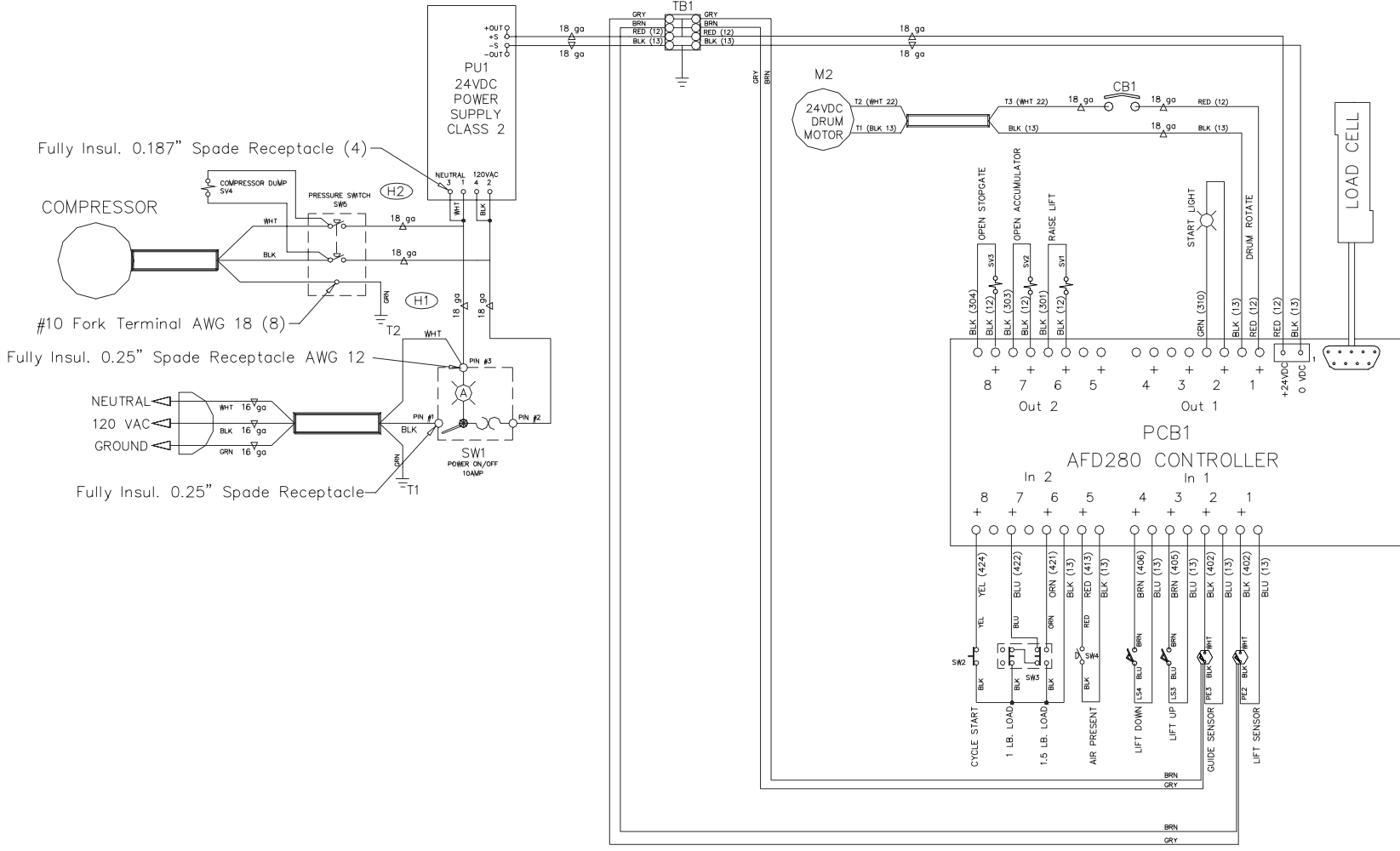
	H1	H3	H5	H6	H7	H8	H9
<b>AFD-280</b>			<b>X</b>		<b>X</b>		
<b>AFD-280U</b>			<b>X</b>		<b>X</b>		

**X = jumper installed**



Electrical Schematics

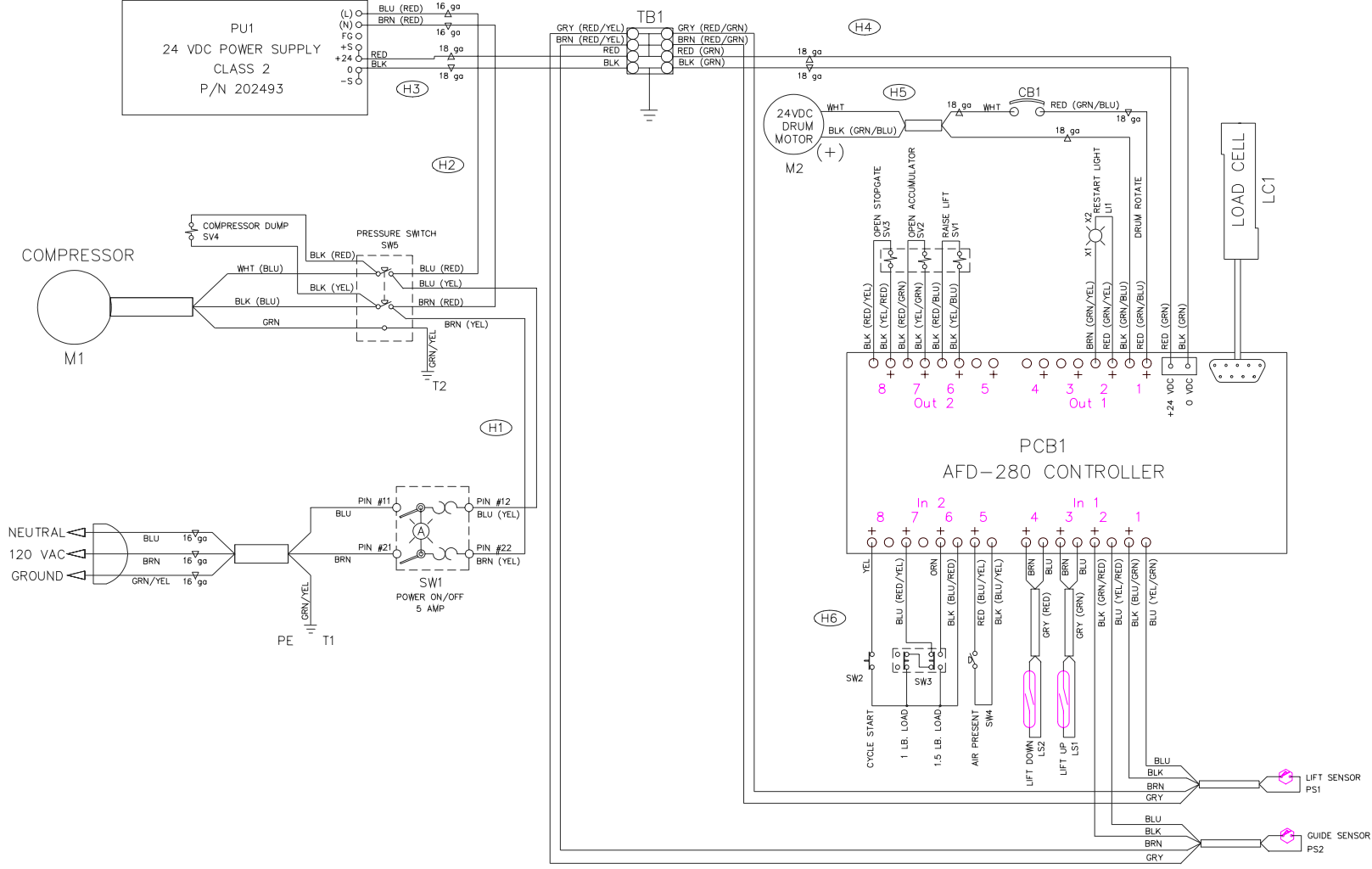
AFD-280, Electrical Schematic



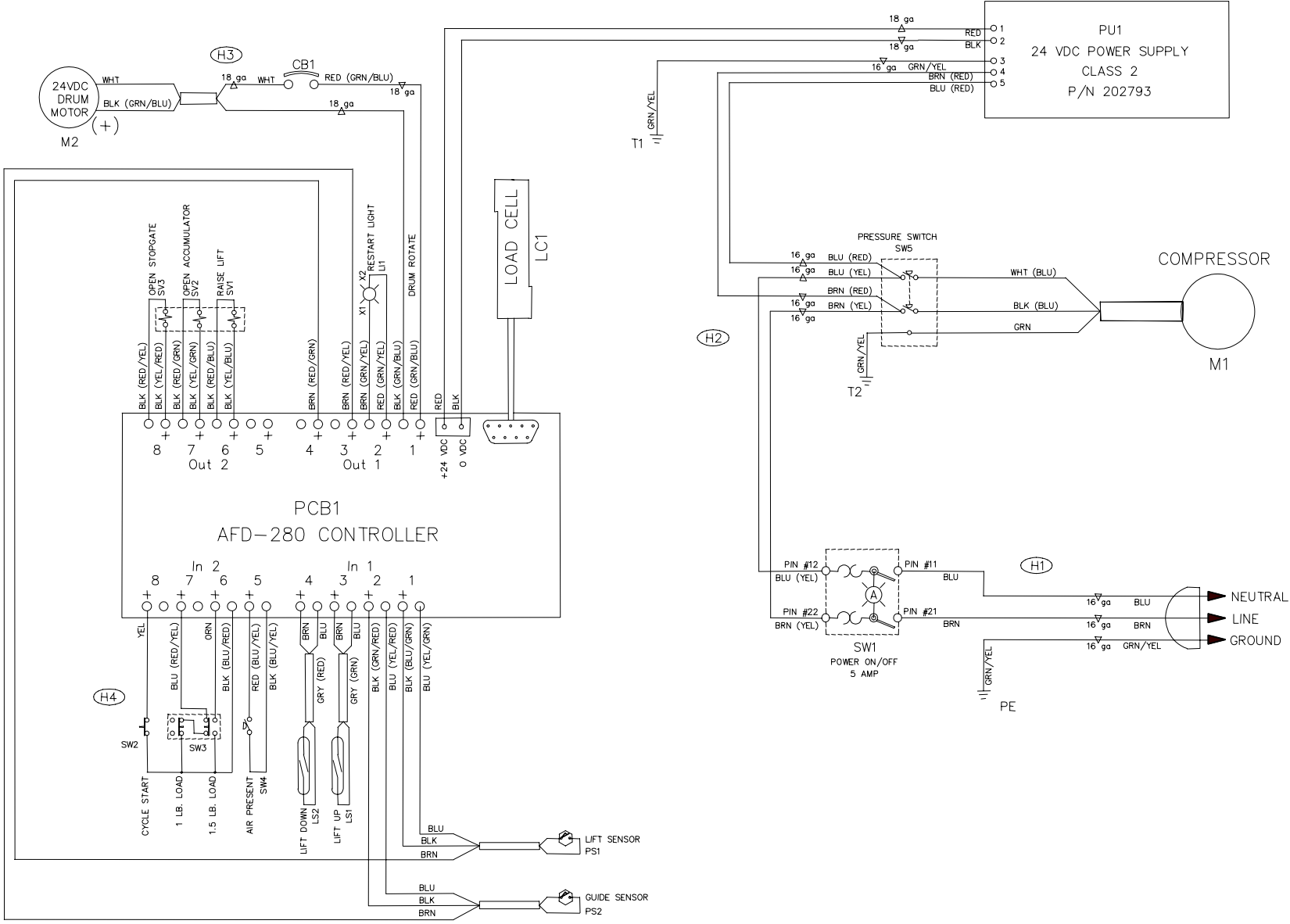
# AFD280, 280U Comprehensive Service Manual

## AFD-280U Electrical Schematic

AFD-280U cabinet and AFD-280 internal components.

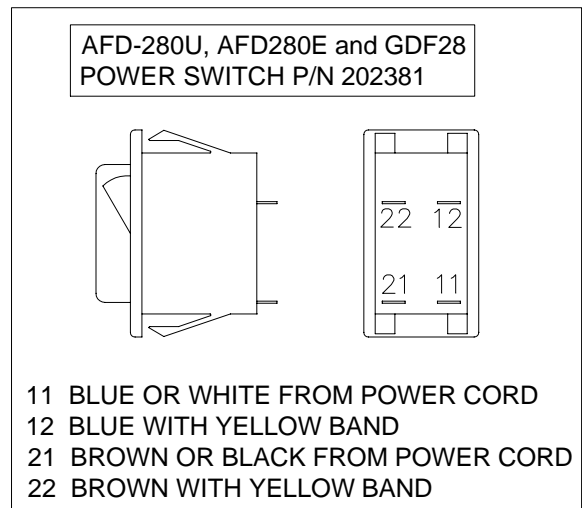
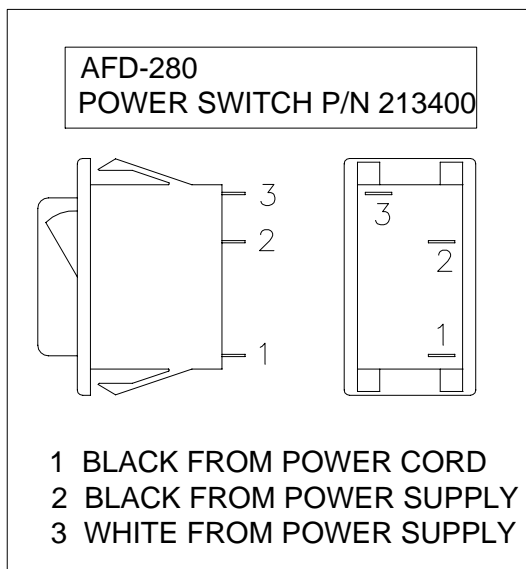
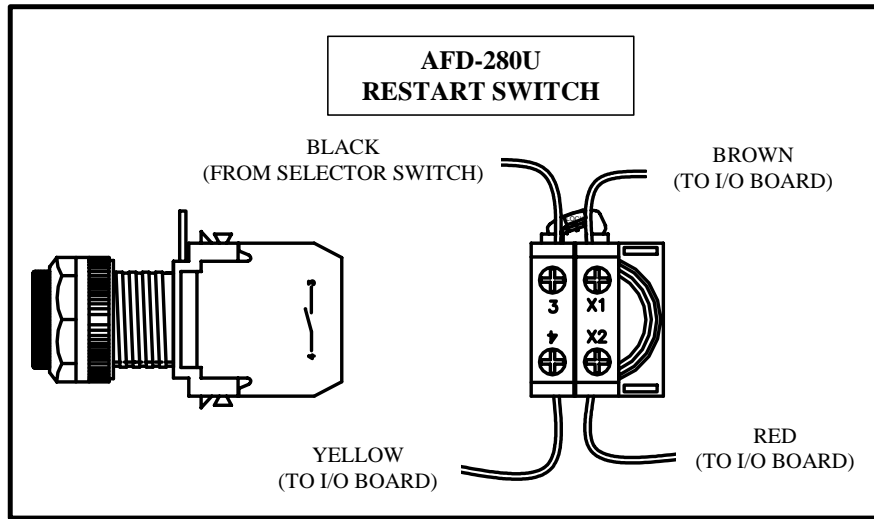
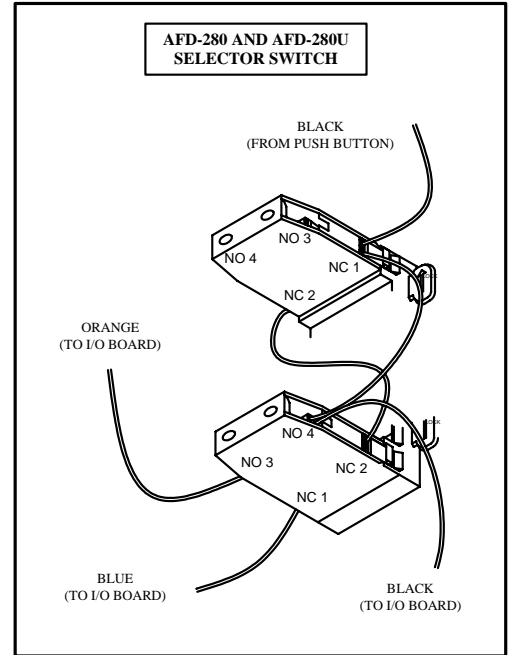
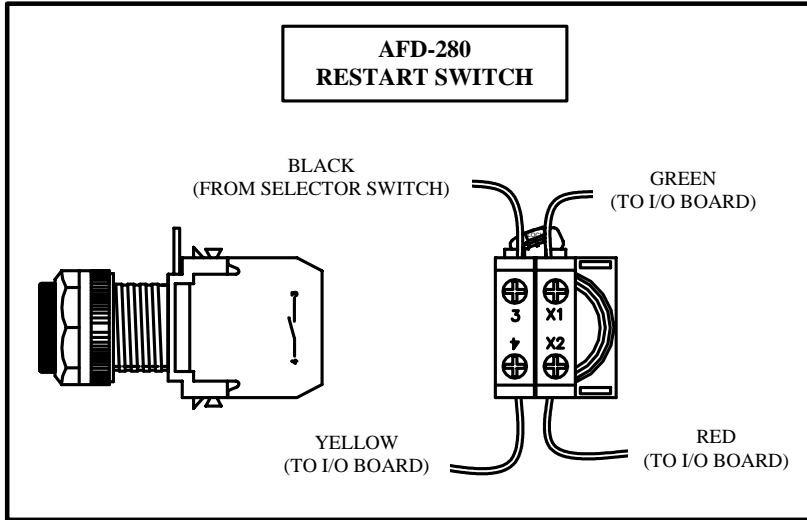


AFD-280U Electrical Schematic

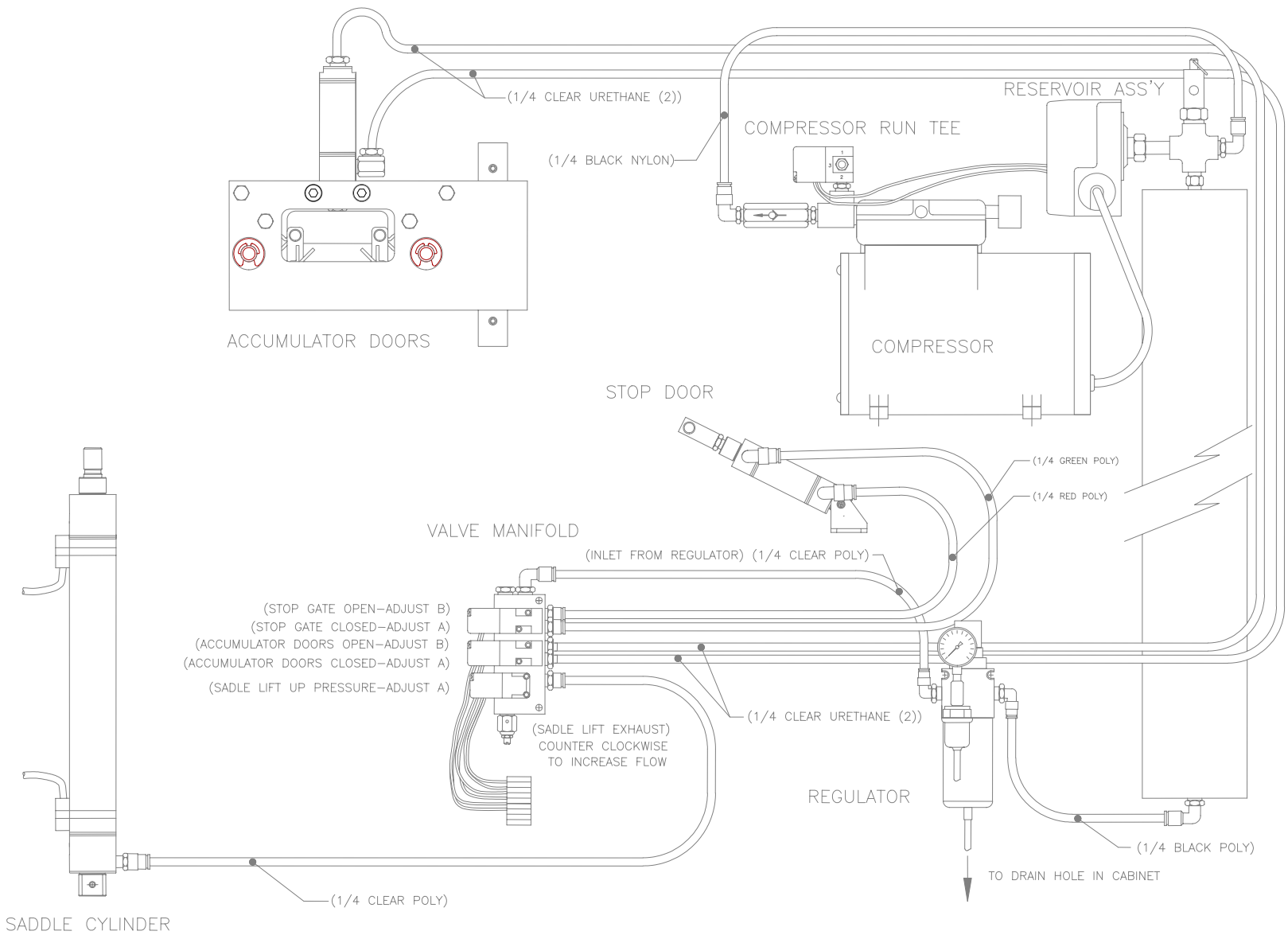




Switch Wiring



**AFD-280 Pneumatic Diagram**



# AFD280, 280U Comprehensive Service Manual

## AFD-280U Pneumatic Diagram

AFD-280U cabinet and AFD-280 internal components

