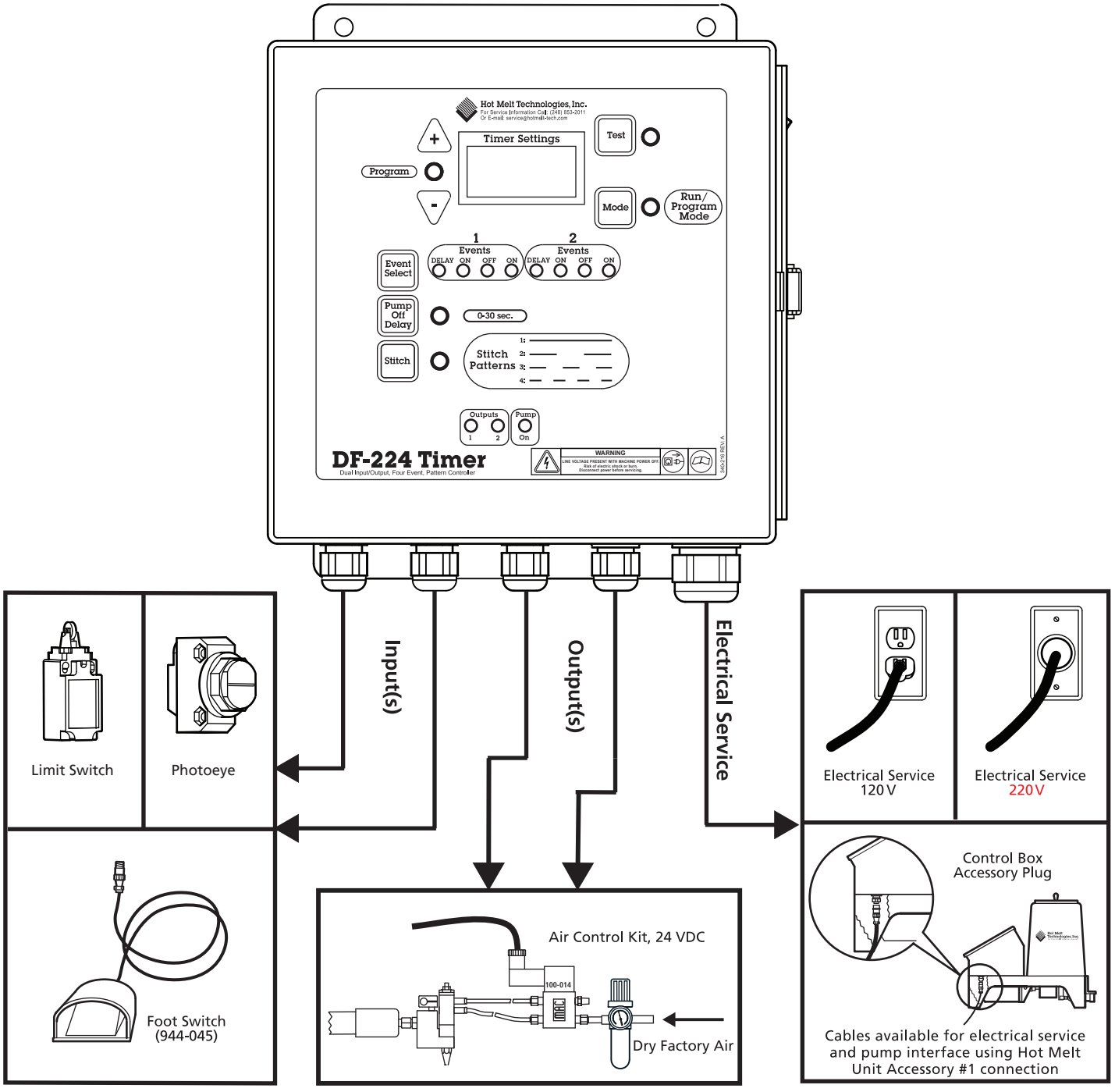
DF Series Programmable Timer

DF-224-120, 120VAC
DF-224-220, 220VAC

The DF-224 Timer is part of HMT's AutoPack® product line.
It is a dual input/output pattern control with four events per channel and a stitch pattern that can be applied to each ON event.
DF Timers come standard with six storable programs and also feature a PUMP OFF DELAY which allows the user to adjust the time that the pump remains on after the initial input signal concludes.



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DF Timer Programming Example

This document illustrates the methods used to program a DF Timer.

Example: The substrate is moving at 50 ft/min and the pattern required is illustrated in the diagram below.
The following measurements are necessary to determine the On and Off times needed to program the pattern:

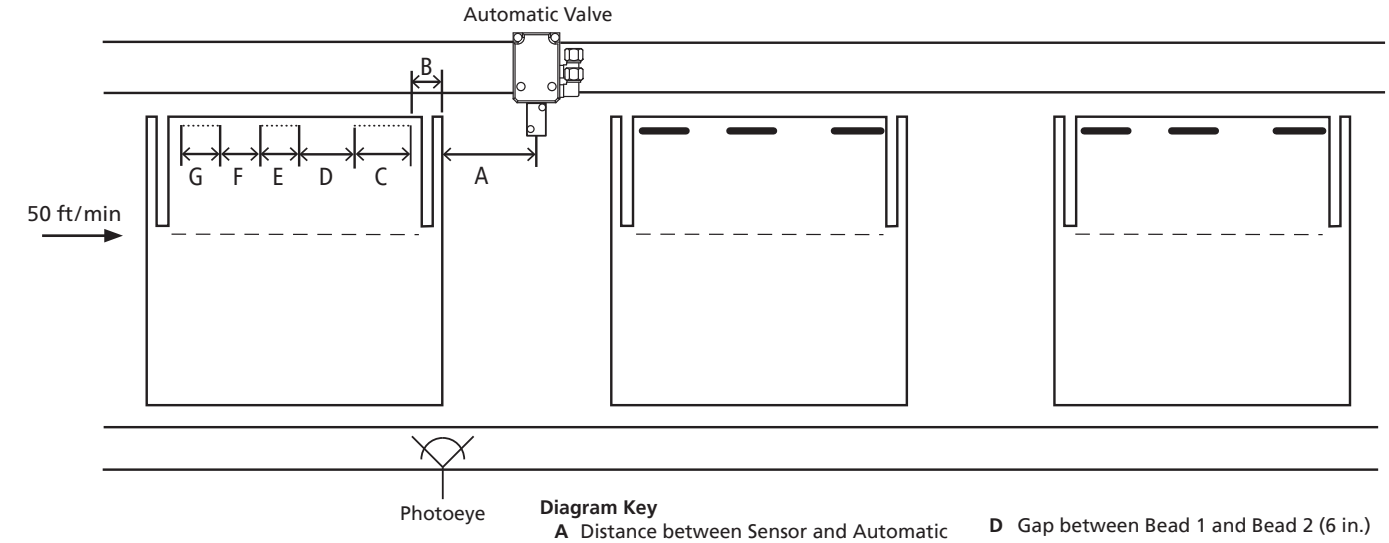


Diagram Key

- **A** Distance between Sensor and Automatic Valve (10 in.)
- **B** Distance between the Leading Edge and Bead 1 (3 in.)
- **C** Length of Bead 1 (6 in.)
- **D** Gap between Bead 1 and Bead 2 (6 in.)
- **E** Length of Bead 2 (4 in.)
- **F** Gap between Bead 1 and Bead 2 (4 in.)
- **G** Length of Bead 3 (4 in.)

1. Converting Distances into On/Off Times

Using the length of Bead 1 as an example see the equation below:

$$\frac{\text{On/Off Time ms}}{\text{(ms = milliseconds)}} = \frac{5000 \times \text{(Bead or Gap Length in.)}}{\text{Line Speed ft/min}} = \frac{5000 \times (6.0 \text{ in})}{50 \text{ ft/min}} = 600 \text{ ms}$$

All measurements were converted to On/Off times using the above equation (A = 1 s, B = 300 ms, C = 600 ms, D = 600 ms, E = 400 ms.

2. Getting Started/Selecting a Program:

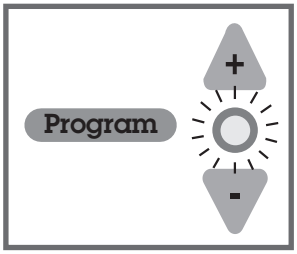
DF Timers can store up to six different programs.

a) This example requires the timer to operate in LATCH MODE. To set the timer to LATCH MODE place the jumper in the LATCH position on the Microprocessor Board. For more information please refer to the Jumper Configuration Page.

b) Connect the timer to an appropriate power source and turn the timer on.

c) Press the MODE button to initiate PROGRAM MODE (the Program LED will illuminate).

d) Using the +/- buttons (shown on the right) select a program 1 – 6.



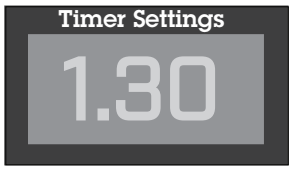
3. Programming the Delay:

The Delay represents the time required for the leading edge of the substrate to pass between the photoeye and the automatic valve, plus the time between the leading edge and Bead 1.

a) Make sure the timer is in PROGRAM MODE (timer will revert to RUN MODE after 10 sec. of inactivity in PROGRAM MODE).

b) Press the EVENT SELECT button. The DELAY LED will illuminate.

c) Using the +/- buttons adjust the DELAY to 1.30 s (A+B).



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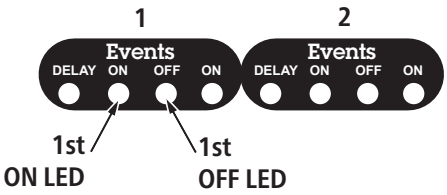
4. Programming Bead 1:

DF Timers can store up to six different programs.

a) Make sure the timer is in PROGRAM MODE.

b) Press the EVENT SELECT button until the first ON LED illuminates.

c) Using the +/- buttons adjust the first ON to 600ms = .600.



5. Programming the Gap between Beads:

a) Make sure the timer is in PROGRAM MODE.

b) Press the EVENT SELECT button until the first OFF LED illuminates.

c) Using the +/- buttons adjust the first OFF to 600ms = .600.

6. Programming a Stitch:

*The maximum stitch setting per ON event is 50**

Since the lengths of Bead 2 and Bead 3 are equal to the length of the Gap between the two Beads, a stitch can be programmed. DF Timers can be programmed for a stitch containing up to 50 beads and 49 gaps of equal length (#50 Stitch Pattern), or no stitch at all (#1 Stitch Pattern).
This particular example requires a #2 Stitch Pattern.

a) Make sure the timer is in PROGRAM MODE.

b) Add the ON Times for Bead 2 and 3 along with the Gap between Bead 2 and 3. In this example the value is 1.20 sec.
(E + F + G = 1.20 s).

c) Press the EVENT SELECT button until the second ON LED illuminates.

d) Using the +/- buttons adjust the second ON to 1.20 s.

e) Press the STITCH button until the second ON LED illuminates.

f) Using the +/- buttons select Stitch pattern 2.

***The minimum time per bead in a stitch pattern is 10ms. The maximum STITCH setting will be limited by the duration of the ON event the STITCH is being applied to.**

7. Programming the Pump Off Delay:
If the input does not sense an event for the duration of time programmed for the Pump Off Delay the Pump/Motor will shut off.

a) Make sure the timer is in PROGRAM MODE.

b) Press the PUMP OFF DELAY button.

c) Using the +/- buttons select a setting between 0–30 seconds.

8. Pattern Testing and Run Mode:

a) Make sure the timer is in RUN MODE.

b) Press the TEST to run one program cycle.

c) If the program is correct and the timer is in RUN MODE, begin operation.

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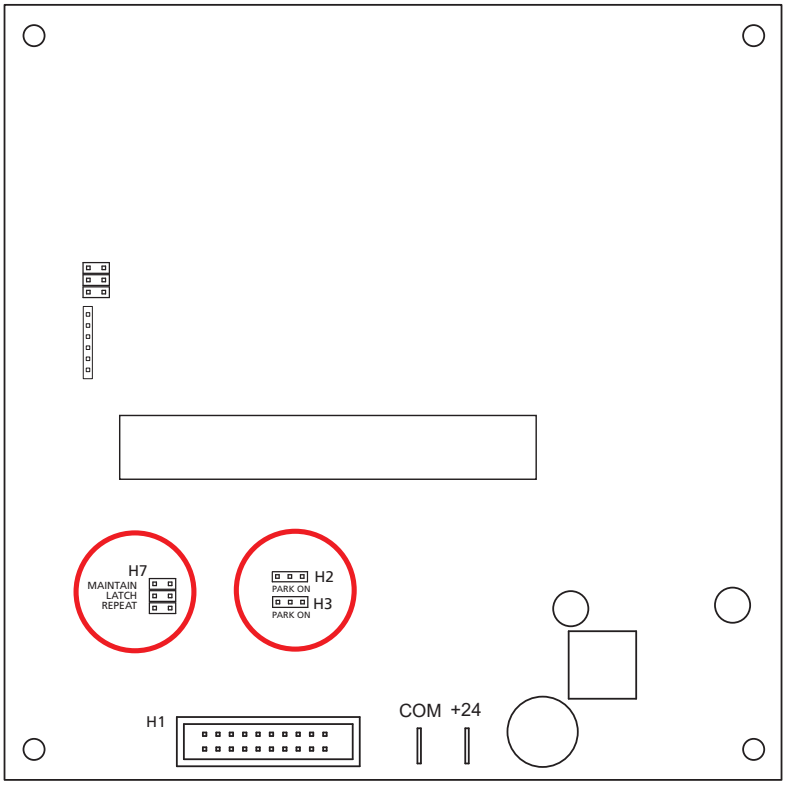
Jumper Configuration

Microprocessor Board



H7 MAINTAIN / LATCH / REPEAT	**Maintain Mode:** Timer will output pattern once while input signal is present. If input signal is lost the pattern will end.
H7 MAINTAIN / LATCH / REPEAT	**Latch Mode:** Timer will output pattern once upon reception of an input signal. A maintained input signal is not required for a complete pattern cycle.
H7 MAINTAIN / LATCH / REPEAT	**Repeat Mode:** Timer will begin pattern output upon reception of an input signal. As long as the signal is maintained the programmed pattern will repeat.
H2 PARK ON / **H3** PARK ON	**High Speed Signal Sensitivity:** Configured for high speed inputs. This includes photoelectric sensors, proximity switches, etc... All inputs have a 50 mA limitation.
H2 PARK ON / **H3** PARK ON	**Low Speed Signal Sensitivity:** Configured for low speed inputs. This includes limit switches and other mechanical actuators.

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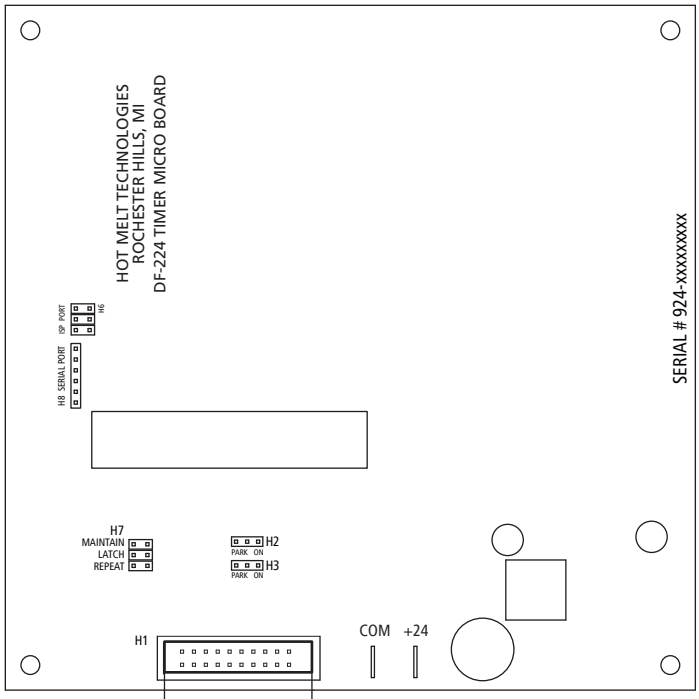
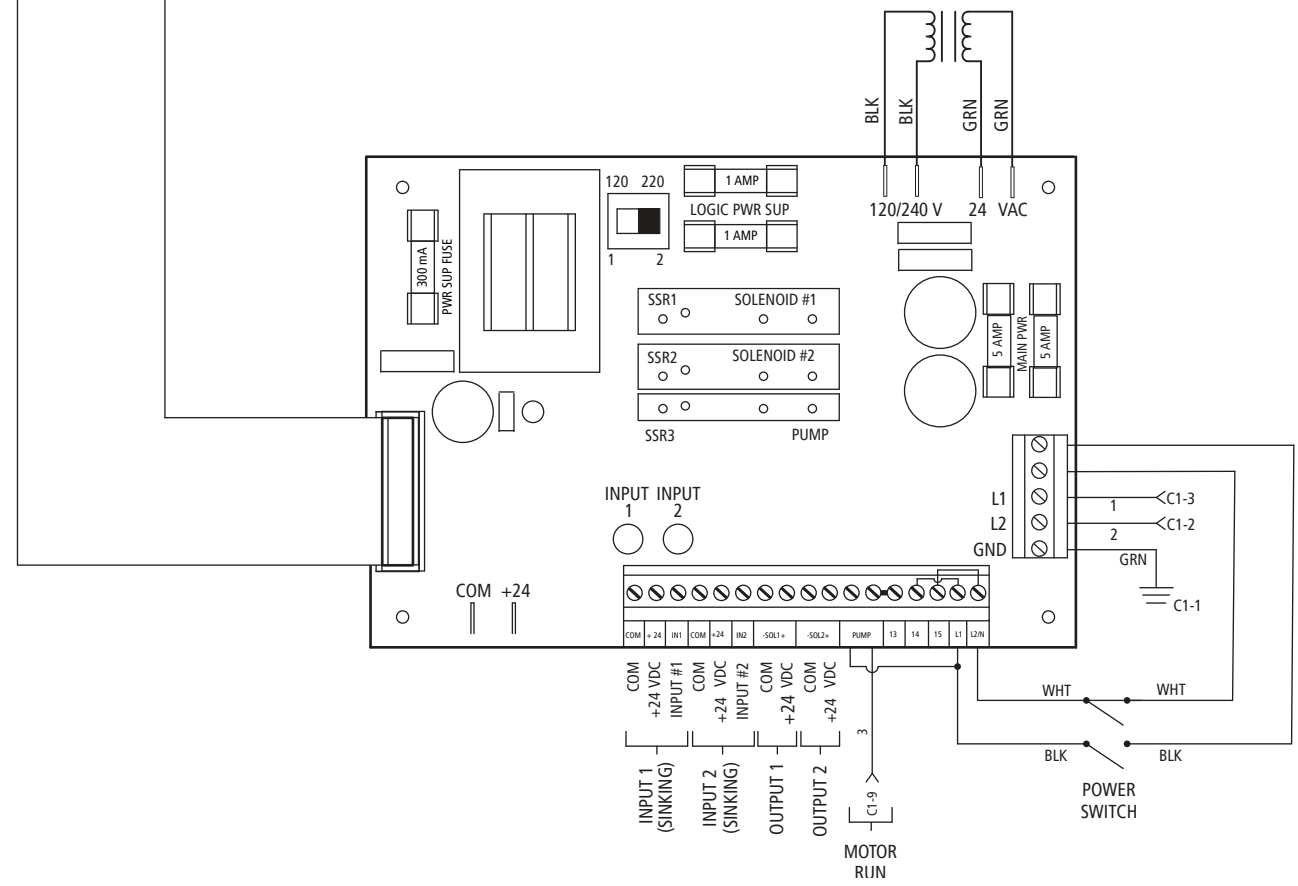


DF-224 Timer Schematic 120VAC
Electrical Service from ASU

CONNECTOR IDENTIFICATION	
C1	Hot Melt Unit Interface Cable



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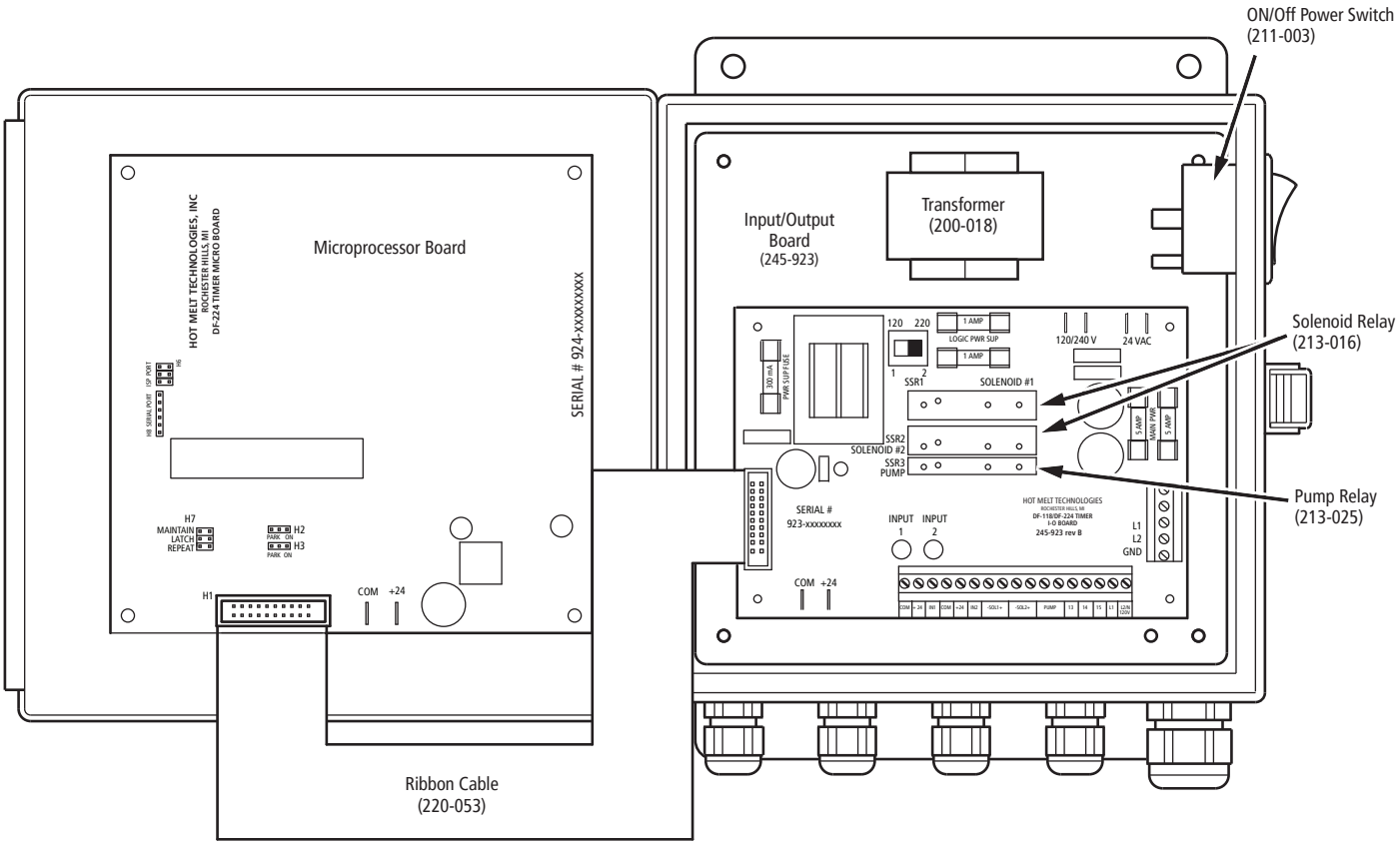
DF-224 Timer 120/220 VAC Electrical Components with Fuse and Relay Chart



MOTOR CONTROL BOARD			
FUSE	DESCRIPTION	REPLACE WITH	PART NO
F1	Pwr Sup Fuse	300 mA	214-063
F2/F2B	Logic Pwr Fuse	1 A	214-101
F3/F3B	Main Pwr Fuse	5 A	214-105

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