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TEC2000 Control Improvements With Version 1.7

As compared to the 1.6 version, the following indicates the additions, deletions or changes associated with the 1.7 version.

1 The "WEEKLY LOG" has been eliminated. Desirable features of this log have been incorporated into the "EVENT LOG"

2 The "EVENT LOG" has been revised as follows.

2.1 A data record will be created when an event begins (either alarm or fill). This was a feature of the Weekly Log.

2.2 A data record will be created when the event ends. This was also a feature of the Weekly Log.

2.2.1 The fill event end is defined by the termination of the fill cycle, either normally by the controller when the high level fill setting is achieved, or by user intervention by pressing the fill stop key.

2.2.2 The alarm event end is defined as the point at which the alarm is cleared by the user.

NOTE: With version 1.6, the printer driver operates in this manner where alarm events are concerned. However, the 1.6 printer driver does not print when fill events occur.

2.3 The liquid usage value has been added to the "EVENT LOG" record.

NOTE: The version 1.6 printer output includes this value.

2.4 Data records will continue to be recorded at the programmed Event Log Period interval as it is currently, regardless of event status.

2.5 The "Event Log Period" and the "Printout time" have been consolidated. Changing the "Printout Time" with the "Interface" key on the keypad also alters the "LOGPER" value returned when the "LOGPER?" query command is used via the PC interface. Changing the "Event Log Period" ("LOGPER") with a PC, also alters the value displayed at the "Printout Time" display via the "Interface Key" on the keypad.

NOTE: Keep in mind that the unit will not be available to respond to PC commands when the printer driver is activated from the keypad. This remains unchanged from version 1.6.

3 The Printer driver has been revised as follows.

3.1 The printed data line/record is identical to the data record recorded in the “EVENT LOG” including the unit ID.

3.2 The printer header has been revised to reflect the change above to the printed data line.

3.3 The driver will print a record at the beginning and ending of all events as described above for the “EVENT LOG”.

3.4 Data records will continue to be printed at the programmed Printout time interval as it is currently, regardless of event status.

4 The “Printout time” and the “Event Log Period” have been consolidated as described above.

In essence, the “EVENT LOG” and the “Printer Driver” create redundant records when the printer driver is activated.

5 The “EVENT TABLE” records now include event codes as described in the user manual. With 1.6 and earlier versions, these were inadvertently left off.

6 Three additional programmable parameters have been added to the “Maintenance Menu”.

6.1 A user defined “Bypass Temp” value.

6.1.1 Allowing this parameter to be determined by the user will prevent dumping LN2 on the floor through the bypass valve.

6.1.2 The default value for this parameter is -100°C (The fixed value from version 1.6).

6.2 A user defined “Bypass Time Dly” value.

6.2.1 Allowing this parameter to be user defined will allow tailoring of the bypass feature to meet the system requirements.

6.2.2 The default value for this parameter is 5 minutes.

6.2.3 Allowable values are from 1 to 99 minutes.

6.3 OFAF MASTER

6.3.1 This allows the unit to be designated as the master unit in the new One Fill All Fill network capability.

7 A 30-second fill cycle is allowed when LN2 level is at or above the high-level fill setting and the “Fill Start” key is pressed. This allows the fog to be cleared when the unit is full.

8 One Fill All Fill network capability.

8.1 Detailed below is the method of setup and operation for the One-Fill-All-Fill network system.

8.1.1 The network is setup similar to a daisy chain network, except a custom cable connects the “Master” unit to the first slave unit in the chain. The remaining slave units are connected using the existing daisy chain kit listed in the user manual. This kit contains a RJ45 Jack Tee and a 14’ RJ45 flat cable in a standard reverse connected configuration. These are standard computer network items.

8.1.2 The last two digits of the device I.D. are used to address each slave unit and must be unique for every slave in the network.

8.1.3 The slave units must be configured with printer off and baud rate of 9600. The OFAF MASTER maintenance menu selection (detailed above) is set to NO.

8.1.4 The master unit will interrogate a slave unit every 50 milliseconds Regardless of the number of slave units that are actually out on the network. It will attempt to interrogate 100 units, so the full interrogation of the network will take up to 5 seconds. Therefore, there is a maximum of 5 seconds latency from when a slave unit indicates a ONE-FILL-ALL-FILL condition to when the “FILL 1” command is broadcast.

8.1.5 The master will have OFAF MASTER set to YES in the maintenance menu. The printer option is removed. The baud rate is fixed at 9600. The unit I.D. is irrelevant.

8.2 The Master unit will broadcast “FILL 1” under the following (2) conditions:

8.2.1 It received a response from a slave unit indicating detection of ONE-FILL-ALL-FILL.

8.2.2 The master unit has detected ONE-FILL-ALL-FILL condition in its own unit.

8.3 Upon broadcasting the “FILL 1” command, the master will act just as it would act if it received the “FILL 1” command.

8.4 As with 1.6 and earlier versions, the slaves will initiate a fill cycle when they receive the “FILL 1” command if the level is below the high level fill set point.

8.5 If the LN2 level falls below low level point, the ONE-FILL-ALL-FILL condition will occur within 5 seconds.

8.6 If Manual Fill Start is pressed when level is below the high level fill setting, there will be a 60-second delay before the ONE-FILL-ALL-FILL condition will be set. This allows for clearing the fog in one unit without initiating filling of the other units on the network.

8.7 If the Manual Fill Start is pressed when unit is above high-level fill set point (fog clearing cycle), the ONE-FILL-ALL-FILL condition will not be generated.

9 **Fog clearing and One-Fill-All-Fill interactions.**

9.1 The 30-second interval for fog clearing of a “full” unit starts at the time that the fill valve is opened (which may be some time after the fill start key was pressed if hot gas bypass is installed).

9.2 The 60-second delay for the one-fill-all-fill condition after the fill start key-press on a unit that is not full starts when fill valve is opened. This again may be some time after the key-press if the hot gas bypass is installed.