Intelligent, AC-Input, Pulse Cleaning of Bag House Dust Collectors

Models DNC-T2310 and DNC-T2320

FEATURES

- *On-board differential pressure sensor*
- *4 - 20 mA output for DP*
- *8 character alpha-numeric display*
- *Microprocessor based control for stable timing from -40°C to 65°C*
- ***Enhanced timer option:** monitor additional devices; record dust collector data; network timers together remote network monitor; remote network control*
- *RS232 port for remote monitor and control*
- *Automatic output setup capability*
- *Expanded cycle mode allows additional dust collector controllers to expand output capabilities*
- *High pressure alarm indication*
- *Output fault detection*
- *Alarm output contacts*
- *Alarm input sensors*
- ***Pulse time:** line synchronized to eliminate 8 ms triac turn off variation per output*
- *10 A 400 V output triacs for maximum protection against output shorts; 200 VA load rating*
- *Conformally coated for protection against vibration, humidity, and contamination*
- ***Metal chassis provided:** for mounting directly into nema 4 box*
- *Timer functionally tested to eliminate field failures*
- ***Input protection:** 30 joule metal oxide varistor*
- ***One year warranty:** warranted to be free from defects in materials or workmanship for one year from date of manufacture*
- *File #E65038*

Models T2310 and T2320 are microprocessor-based bag house filter controllers which combine a ten or twenty output sequencer with a solid state differential pressure sensor. This offers a small, low-cost replacement to the separate solid state sequencer and pressure gauge combination most often used in on-demand pulse jet cleaning systems. These controllers will sense the pressure difference across the filters of a bag house and initiate a cleaning cycle when the filters start to impede the air flow. When the pressure drops to normal the controller will stop cycling.

Standard Operating Logic: The timers can operate in the following modes:

- ***Auto output:** only configured outputs will be pulsed. Output faults will be detected and indicated.*
- ***Manual output:** outputs will recycle after last output used.*
- ***Output step:** a single cleaning pulse can be initiated by pressing the output step key regardless of pressure input.*
- ***Continuous cycle:** controller will cycle indefinitely when the bypass/cycle down input is shorted.*
- ***Cycle down:** the outputs will be pulsed through a user seleced number of complete cycles when the bypass/cycle down input is shorted. This cycle will occur regardless of pressure input.*
- ***Expanded output mode:** controller will cycle to output #10 or #20, then will initiate an extended output mode via the alarm input and output terminals to NCC's DNC-T2000 series dust collector controllers. This will facilitate systems which require greater than 10 or 20 outputs.*

Standard Timer Operation Status Indication: The Timer can show the following information on its 8-character alpha-numeric display during normal operation:

- *DP from 0" to 15" water column*
- *High or Low DP Alarms*
- *Solenoid Fault Conditions*
- *Current Output being Pulsed*
- *Auxiliary Alarm Input Closures*

Upon occurance of any alarm event, the alarm status is reported on the display along with the output number that was pulsed during the time of the event.

- ***Alarm Outputs:** The isolated Alarm Output contacts will close for alarm conditions such as output faults, high pressure alarm, warm-up failure, etc. During an alarm condition, a corresponding message is displayed.*
- ***Alarm Input:** A closure across the Alarm Input terminals will be indicated on the display as well as initiate the Alarm Output.*

In addition to the standard operation of the T2310 and T2320, an enhanced operation option is available with the use of the DNC-T2300-I/O Remote Input/Output module in conjunction with the DNC-T2300-DSP Remote Annunciator Panel. The T2310 and T2320 Timers along with the DNC-T2300-I/O constitutes the Enhanced Timer system which allows the user to monitor and record the data parameters associated with a dust collector system. This system can range in size from 1 to 255 dust collectors, all reporting to a central location, the DNC-T2300-DSP.

Enhanced Timer Operation Status Indication: The Timer can show the following information on its 8 character alpha-numeric display during normal operation:

- *DP from 0" to 15" water column*
- *High or Low DP Alarms*
- *Solenoid Fault Conditions*
- *Current Output being Pulsed*
- *Auxiliary Alarm Input Closures*
- *DNC-T2300-I/O Analog Input Status*
- *DNC-T2300-I/O Alarm Input Closures*

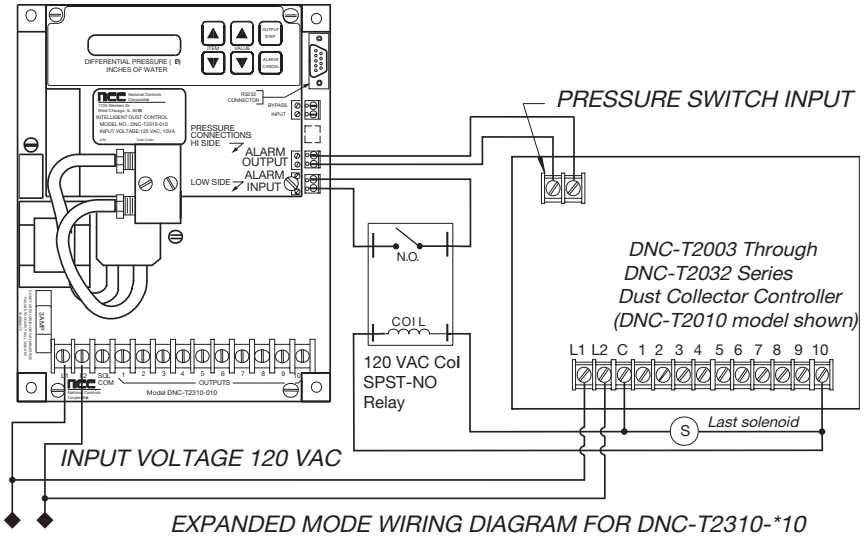
Upon occurance of any alarm event, the alarm status is reported on the display along with the output number that was pulsed during the time of the event.

RS232 Port:

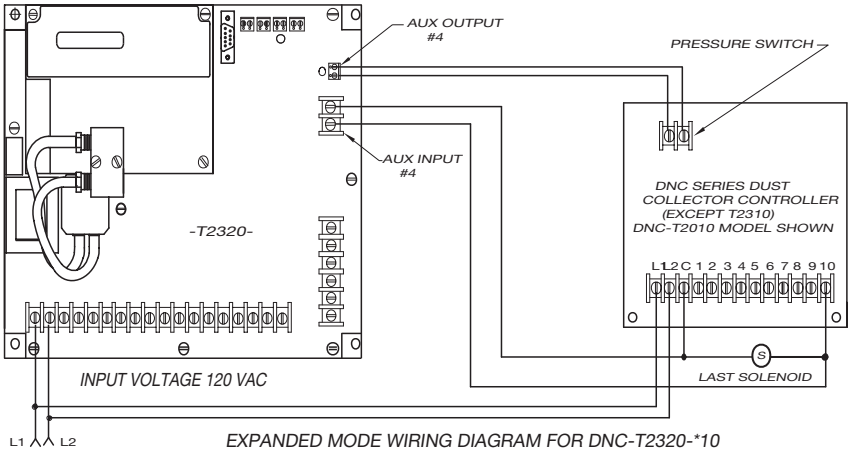
- ***Remote Terminal:*** *An ANSI type terminal is required for remote monitoring and programming of the controller. Connection to the controller is made via the RS232 port (9 pin D-Sub connector). All the functions and display status accessible from the controller are available through the ANSI terminal.*
- ***Remote I/O Interface:*** *The 2310/2320 controllers are capable of communication with the DNC-T2300-I/O board via the RS232 port. This allows the user to monitor up to three 4-20 mA analog inputs, three contact closure type inputs, and one Type J thermocouple. The I/O module is programmed via the 2310/2320 keypad and can be user defined to set alarm points from remote sensors of parameters such as emission, air flow, pressure, broken bags, fan motor current, etc. Refer to the data sheet for the DNC-T2300-I/O for additional information.*

Programming Logic: The controller as supplied from the factory will require user configuration. Upon application of power the display will indicate SETUP. The operator must then configure the various operating parameters using the six key keyboard of the controller before normal cleaning operation can begin. The programmable parameters for Standard Operation as displayed are:

- ***OUTPUT***
  Auto Configuration: *will automatically sense the solenoids connected to the outputs and will only pulse those outputs during cleaning cycles.*
  Manual Configuration: *the controller will pulse each output until the last output programmed and then recycle to output #1.*
- ***LAST:*** *the number of the last output used.*
- ***LO DP:*** *Low Pressure Setpoint, the pressure at which the controller will stop its cleaning cycle.*
- ***HI DP:*** *High Pressure Setpoint, the pressure at which the controller will start its cleaning cycle.*
- ***ON:*** *Output Solenoid On Time.*
- ***OFF:*** *Off Delay Time Between Output Solenoid Activation.*
- ***ALARM:*** *High Differential Pressure Alarm Set-point, the pressure at which the controller will close its alarm contacts.*



*EXPANDED MODE WIRING DIAGRAM FOR DNC-T2310-*10*



*EXPANDED MODE WIRING DIAGRAM FOR DNC-T2320-*10*

For enhanced timer programming information, see IDC Programming Tree on page 4-6.

Additional Features: The 2310/2320 controllers also provide:

- ***4 - 20 mA Output Loop:*** *This output will provide a continuous reading from 4 -20 mA corresponding to the sensed differential pressure range of 0" to 15" water column. This is a standard feature.*
- ***24 Hour Time/Day/Month Clock:*** *The clock feature will allow a daily automatic turn on and turn off command to be implemented by the controller. It can be programmed to start and stop the cleaning cycles for up to seven events per week. This is an optional feature found on the B-series models.*

Caution:

1. Do not mount controls in high vibration areas without shock mounts.

2. Do not mount controls in areas of high dust or corrosive atmospheres without a protective enclosure.

3 Do not use a converter or inverter for the power source.

4. Do not mount control in high transient voltage areas without an isolation transformer.

5. Do not leave control box open.

6. Do not allow a local repair shop to repair the controls, as we employ some very sophisticated components that could be further damaged. For service, call us directly: 800-323-2593.

SPECIFICATIONS

FACTORY DEFAULT SETTINGS

Lo Pressure = 2" water column
HI Pressure = 4" water column
Alarm Pressure = 14" water column
Output Quantity = 10
Off Time = 15 seconds
On Time = 0.10 seconds
Output Configuration = Manual
I/O Expansion = No

INPUTS

Voltage: 105 -135 VAC, 50/60 Hz.

Maximum Ratings at 135 VAC Input Voltage:
Power Consumption: 10 VA, without loads

DNC-T2310:
Bypass Switch Open Circuit Voltage: 24 VDC
Bypass Switch Short Circuit Current: 4.3 mA
Alarm Inputs 1-3:
Open Circuit Voltage: 24 VDC
Short Circuit Current: 4.3 mA

DNC-T2320:
Bypass Switch Open Circuit Voltage: 24 VDC
Bypass Switch Short Circuit Current: 4.3 mA
Alarm Inputs 1-3:
Open Circuit Voltage: 24VDC.
Short Circuit Current: 4.3 mA
Auxiliary Input #4: 90-135 VAC, 50/60 Hz; 6.6 mA at 135 VAC

AIR PRESSURE MEASUREMENT

Sensor Type: Silicon piezoresistive transducer with dual inlets

Measurement Range: 0.0 to 15.0" of water

Accuracy: ±2% of full scale at 25°C ±6% of full scale over temperature and voltage range

Maximum Continuous Pressure: 10 psi

DISPLAY

Type: 8-character, 16-segment vacuum fluorescent display; characters .2" high, alpha-numeric

TIMING:

Solenoid ON Time Range: .01-.50 sec.

Solenoid OFF Time Range: 7 -999 sec.

Timing Accuracy: -2 ms, +10 ms or ±1%, whichever is greater; Solenoid ON Time is synchronized to the AC line

OUTPUTS

Maximum Solenoid Output: 200 VA or W at max. duty cycle

Solenoid Output Voltage: Input voltage 2.5 VAC at 200 VA load

Solenoid Output Type: Solid state triac

Solenoid Output Short Circuit Protection:
3 AG fast acting
120 V units: 3 A/250 VAC fuse
240 V units: 1.5 A/250 VAC fuse

DNC-T2310:
Alarm Output Type: 1-FORM A relay contact
Alarm Output Rating: 3 A at 120/240 VAC

DNC-T2320:
Alarm Output Type: 1-FORM A relay contact
Alarm Output Rating: 3 A at 120/240 VAC
Aux. Output #4 Type: 1-FORM A relay contact
Aux. Output #4 Rating: 3 A at 120/240 VAC

Current Loop:
Type: 4 - 20 mA current loop, current is sourced by the controller. Signal represents 0 to 15 inches of differential pressure (DP)
Accuracy: ±.3 mA of displayed pressure

SERIAL COMMUNICATIONS

Type: RS232

Terminal Emulation: ANSI VT100

Mode: 9600 Baud, 8-Data Bits 1-Start Bit 1-Stop Bit, X ON - X OFF, No Parity

Connector: 9-Pin male IBM compatible D-SUB connector

ENVIRONMENTAL

Operating Temperature Range: -40° to 65°C

Environmental Protection: Conformal coating for humidity and vibration

Contact factory for additional information

ORDERING INFORMATION

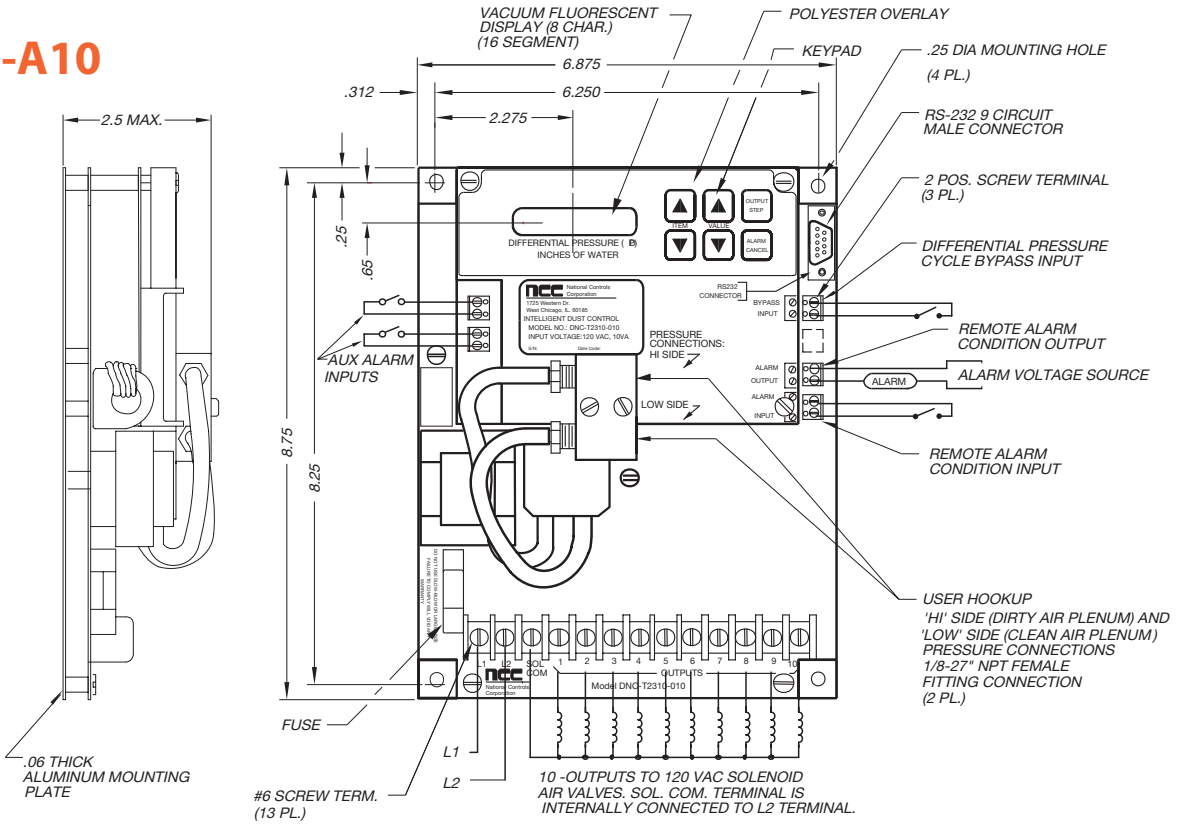
OUTPUTS	DESCRIPTION	AUX. INPUTS	INPUT VOLTAGE	OFF TIME	PART NUMBER
10	4-20 mA Loop	3	105 to 135 VAC	7 to 999 sec.	DNC-T2310-A10
10	4-20 mA Loop and 24 hr. clock	1	105 to 135 VAC	7 to 999 sec.	DNC-T2310-B10
10	4-20 mA Loop	3	210 to 270 VAC	7 to 999 sec.	DNC-T2310-A220
10	4-20 mA Loop and 24 hr. clock	1	210 to 270 VAC	7 to 999 sec.	DNC-T2310-B220
20	4-20 mA Loop	4*	105 to 135 VAC	7 to 999 sec.	DNC-T2320-A10
20	4-20 mA Loop and 24 hr. clock	2*	105 to 135 VAC	7 to 999 sec.	DNC-T2320-B10
20	4-20 mA Loop	4*	210 to 270 VAC	7 to 999 sec.	DNC-T2320-A220
20	4-20 mA Loop and 24 hr. clock	2*	210 to 270 VAC	7 to 999 sec.	DNC-T2320-B220
10	4-20 mA Loop in NEMA 4X box	3	105 to 135 VAC	7 to 999 sec.	DNC-T2310-KIT
20	4-20 mA Loop in NEMA 4X box	4*	105 to 135 VAC	7 to 999 sec.	DNC-T2320-KIT

ACCESSORY	DIMENSIONS	PART NUMBER
NEMA 4 Enclosure - Steel	10" x 8" x 4"	BOX-A1008-CHNF
NEMA 4 Enclosure - Steel	12" x 10" x 5"	BOX-A1210-CHNF
NEMA 4 Window Enclosure - Fiberglass	12" x 10" x 6"	BOX-A1210-CHSC
Pilot Lamp	NEMA 4 Rated Red Light	ASL-00RED-NEMA-4
ON/OFF Switch	NEMA 4 Rated w Legend Plate	MSW-0DPST-001

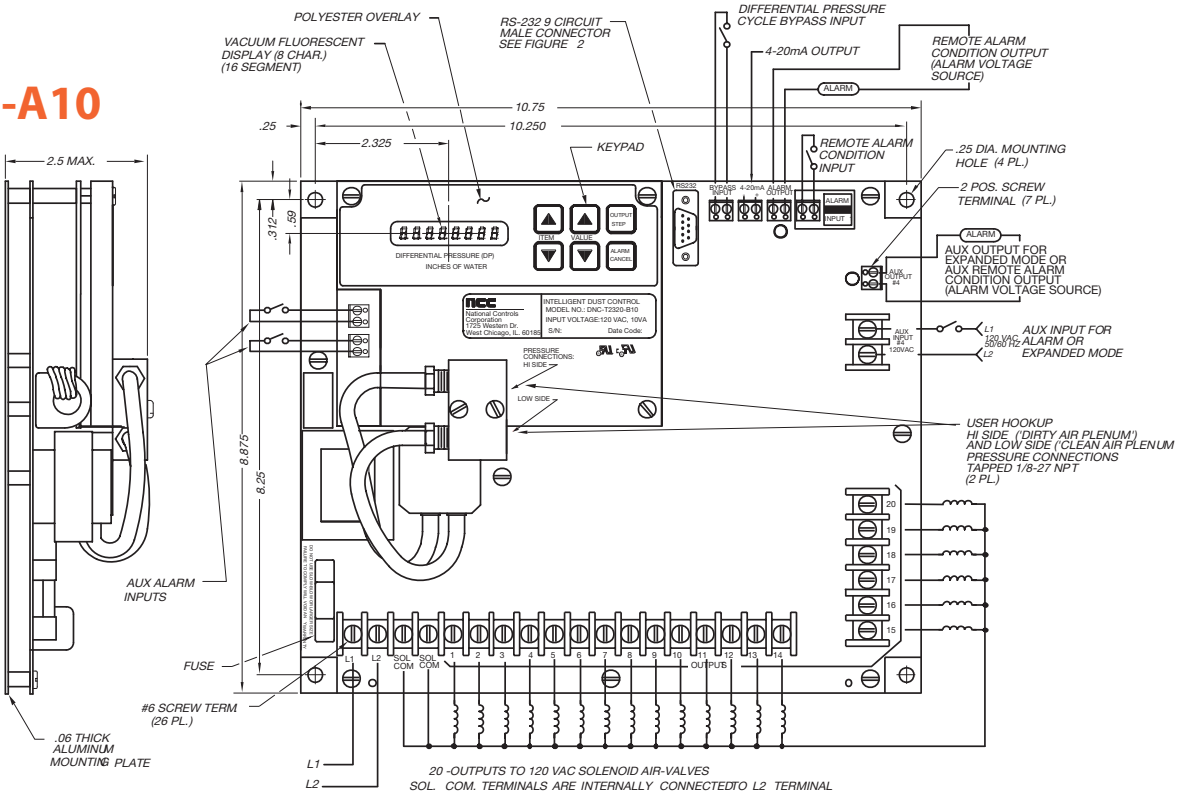
** When unit is configured for expanded mode operation, input #4 is not available*

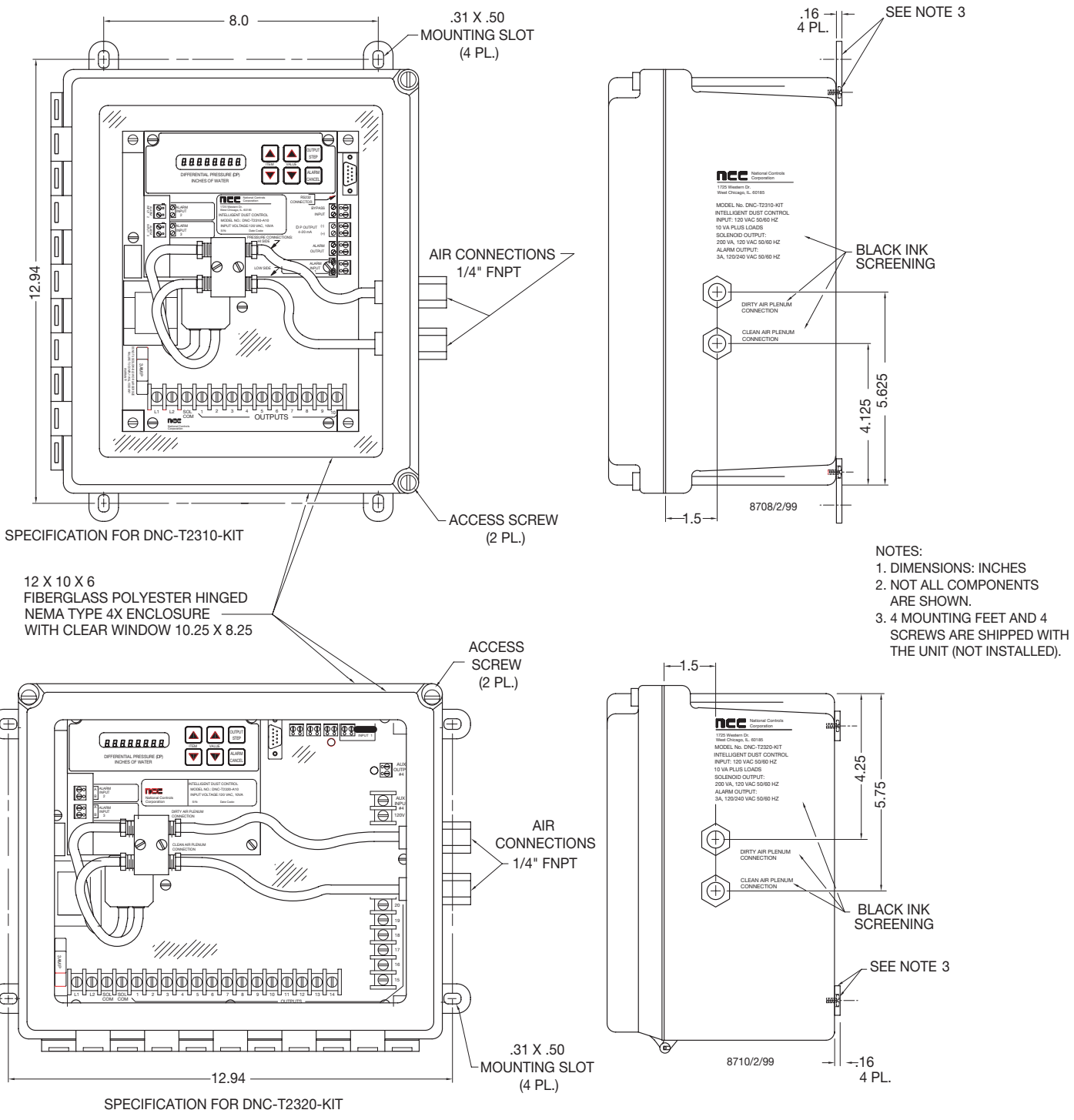
AMETEK NCC offers NEMA 4 type enclosures for mounting our controls. These enclosures are made of heavy gauge steel or fiberglass and have a continuous hinge cover. All seams are continuously welded. The finish is gray hammer-tone enamel inside and out, over phosphatized surfaces for steel units, smooth gray finish for fiberglass units.

Model DNC-T2310-A10



Model DNC-T2320-A10





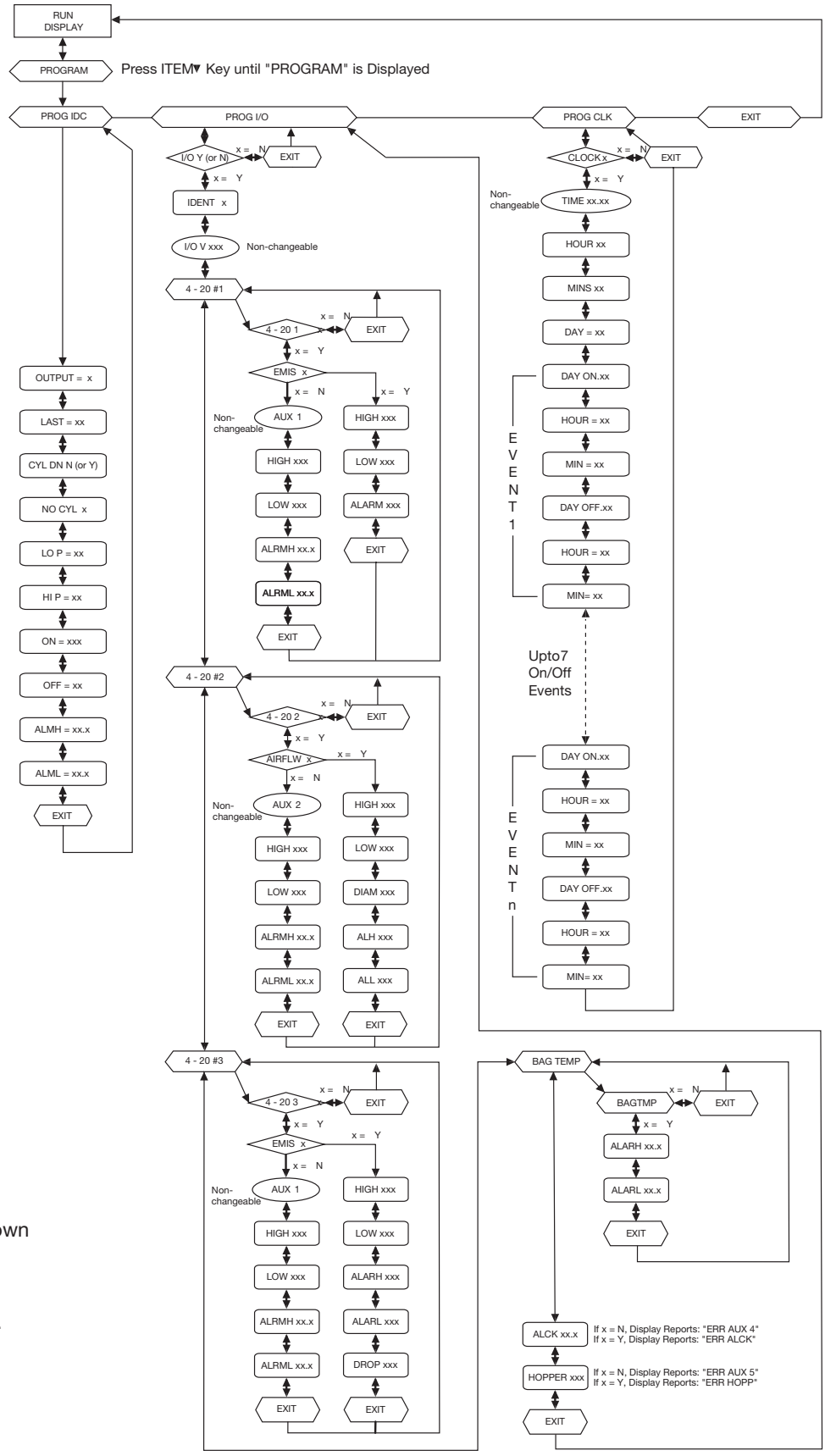
NOTES:
1. DIMENSIONS: INCHES
2. NOT ALL COMPONENTS ARE SHOWN.
3. 4 MOUNTING FEET AND 4 SCREWS ARE SHIPPED WITH THE UNIT (NOT INSTALLED).

Product Overview: The models DNC-T2310-KIT and DNC-T2320-KIT are microprocessor-based, 10/20 output sequencer, reverse air bag house filter controllers. Each is housed in a NEMA 4X fiberglass enclosure which has a clear window for monitoring the controller's display. The enclosure dimensions are 12 inches high by 10 inches wide and 6 inches deep. The door is hinged in the left for the 2310-KIT and the bottom for the 2320-KIT, and can be opened by loosening two screws located on the side opposite the hinge.

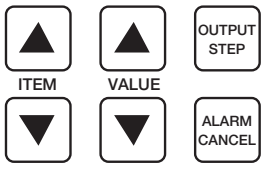
Air connections are made by mounting to the 1/4-inch NPT female connectors on the right side of the unit. Connectors are labeled as DIRTY AIR PLENUM CONNECTION or the high pressure side of the filter, and CLEAN AIR PLENUM CONNECTION which is the low pressure side of the filter. Holes must be made in the enclosure to connect conduit fittings for electrical power to the controller.

For operation of the controls, refer to specifications on page 4-3.

IDC Programming Tree



Display Keypad



Use the ▲ and ▼ **Item Keys** to navigate within the Programming Tree. The ▲ Key moves up the Tree. The ▼ Key moves down the Tree.

Use the ▲ and ▼ **Value Keys** to select Program Options, or change parameters. The ▲ Key increments value. The ▼ Key decrements value