UNITED FIRE SYSTEMS

TRUE ADVANCED PURGE

MODEL TAP–G2

INSTALLATION, COMMISSIONING, AND USE MANUAL

Serial Number _____

Date of Installation _____ **Date of Commissioning** _____

UNITED Fire Systems
Division of UNITED Fire Protection Corporation
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Manual Part Number 33-TG2MAN-000
Revision 1.01
February 2018

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PART 1 - INSTALLATION

Mounting Location

Choose a mounting location for the True Advanced Purge (TAP) device where:

= The location is dry, clean, and indoors. The TAP is designed for indoor use only.
= Display can be conveniently observed and the function switches operated. Typical height from finished floor to center of TAP display should be 54 to 60 inches.
= The length of tubing from sprinkler purge vent assembly to TAP is less than 1000 foot maximum.
= Minimum 3 inch clearance on all sides of TAP can be maintained.
= TAP door can be fully opened.
= TAP weight (approximately 10 lbs. (4.5 kg)) can be adequately supported.
= Hissing noise from exhaust mufflers during certain operating modes will not be bothersome to personnel.

Fasteners

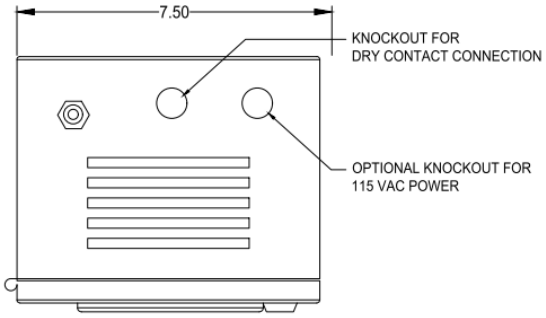
= See diagram on page 2. Choose fasteners suitable for wall material at intended location. Hole sizes indicated are intended for use with #10 hardware.

Mounting Holes

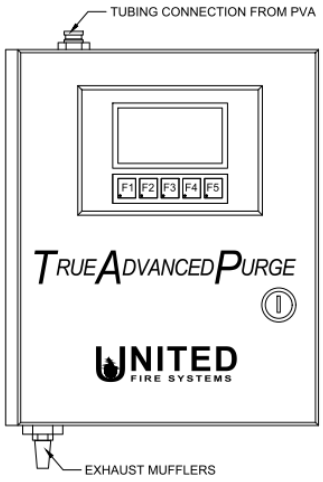
= Use full-size template (P/N 33-000004-000 included with TAP) to locate mounting holes at chosen mounting location.
= Use suitable tape to temporarily attach template to wall. Proper orientation of template is printed side out and the word "TOP" at the top.
= Transfer marks to wall using a punch or other device suitable for wall material.
= Drill holes in mounting surface at marked locations with drill appropriate for fastener size and wall material. Drill to depth required by fastener.

Mounting

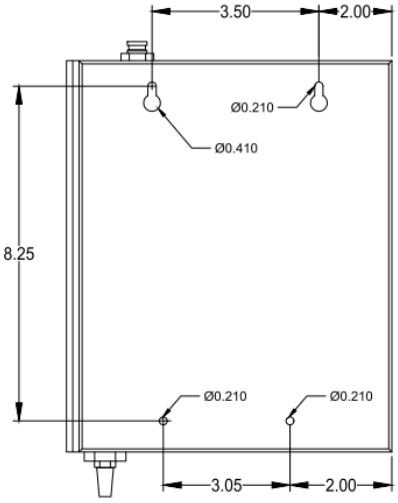
= Choose and knock out connection points for AC power raceway and optional alarm signaling connection raceway.
= Insert fasteners intended for mounting holes into mounting surface.
= Attach #10 hardware to upper holes, inserting about half-way.
= Use keyhole-shaped upper holes to hang TAP.
= Insert lower fasteners.
= Tighten all fasteners.



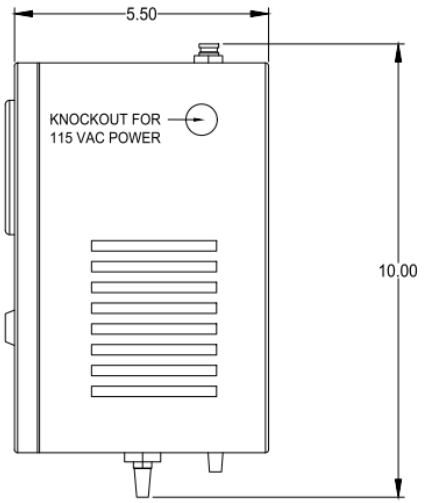
TOP



FRONT



MOUNTING DIMENSIONS
FRONT VIEW, NO DOOR



RIGHT SIDE

Supply Tubing. Supply tubing is required from the outlet purge vent assembly installed on the sprinkler piping to the inlet of the TAP.

1. The required tubing is flame-retardant, plenum-rated polyethylene, 1/4" OD, 0.17" ID. Twenty (20) feet of tubing is supplied with the TAP. UFS P/N 33-000003-050 is a 50 foot length of the same tubing. UFS P/N 33-000006-000 is a connector for splicing tubing lengths together.

2. The supply tubing run begins at the purge vent assembly installed on the sprinkler piping. The required purge vent assembly is UFS Model PVA-2. Install the Model PVA-2 per the instructions in the applicable UFS NITROGEN-PAC system installation, commissioning, and maintenance manual.

3. Run tubing from the outlet of the Model PVA-2 purge vent assembly to the vicinity of the TAP. Tubing should be secured every 3 feet to the sprinkler piping or other suitable building structures with cable ties or hangers. To maintain plenum rating in required areas, use plenum-rated cable ties. The maximum length of tubing from the Model PVA-2 purge vent assembly to the TAP is 1000 feet. If desired, tubing may be run inside raceway or decorative molding in exposed areas.

4. Ensure the ends of the tubing to be attached to the push-in connectors on the Model PVA-2 purge vent assembly and the TAP are cut square, with no burrs. To attach, push tubing firmly into the push-in connector until the tubing bottoms. Gently pull on the tubing to ensure the connector has secured the tubing.

5. If necessary to release tubing from push-in connectors, simulatneously push down on tubing and the green ring on the connector. While then holding the green ring down, gently pull on the tubing until it is free from the connector.

Power Connection

DANGER

RISK OF ELECTROCUTION

Voltages and currents associated with the True Advanced Purge (TAP) device are **LETHAL**. Follow all instructions provided. Work involving power MUST be performed ONLY by qualified individuals. All required precautions to prevent contact with live electrical conductors and equipment MUST be taken. Failure to comply with these instructions is an immediate hazard with a likelihood of death or serious personal injury!

All wiring shall be in conformance with the NEC and all other applicable codes and standards.

The TAP device requires 115 VAC 60 Hz single-phase three-wire power. Current draw is approximately 1.1 amps. Power should come from a dedicated circuit breaker. Do not attempt to use a 3-wire cordset with plug to provide power from a receptacle.

Attach power conductor raceway to knockout chosen before mounting TAP. Run conductors for three-wire 115 VAC 60 Hz single-phase power through raceway. Maximum conductor size for terminals is 12 AWG. Attach power conductors to terminals as shown on page 5. Do not apply power to TAP until ready for commissioning.

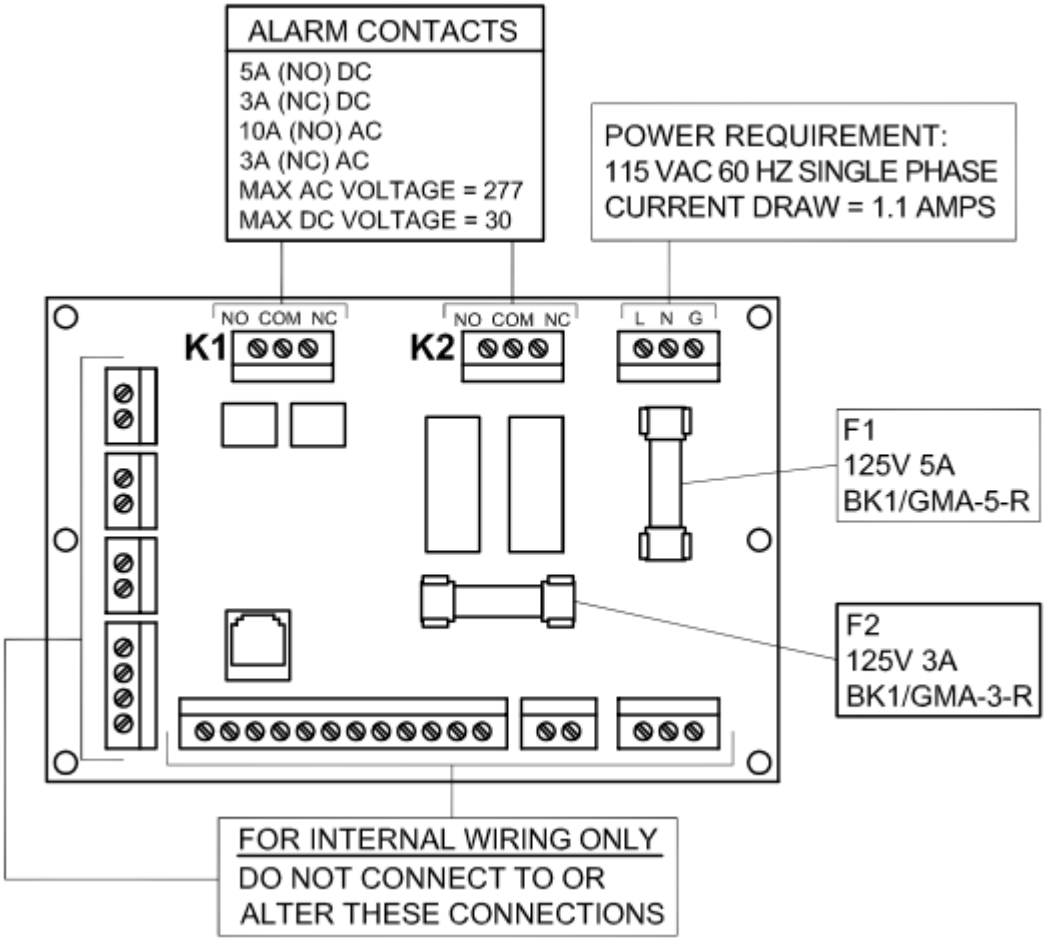
Optional Alarm Signaling Contact Connections

Two (2) SPDT volt-free contacts are supplied to permit connection to a fire detection and / or building management system. The contacts are rated at:

NO contact: 5 A max. @ 30 VDC max.
10 A max. @ 277 VAC max.

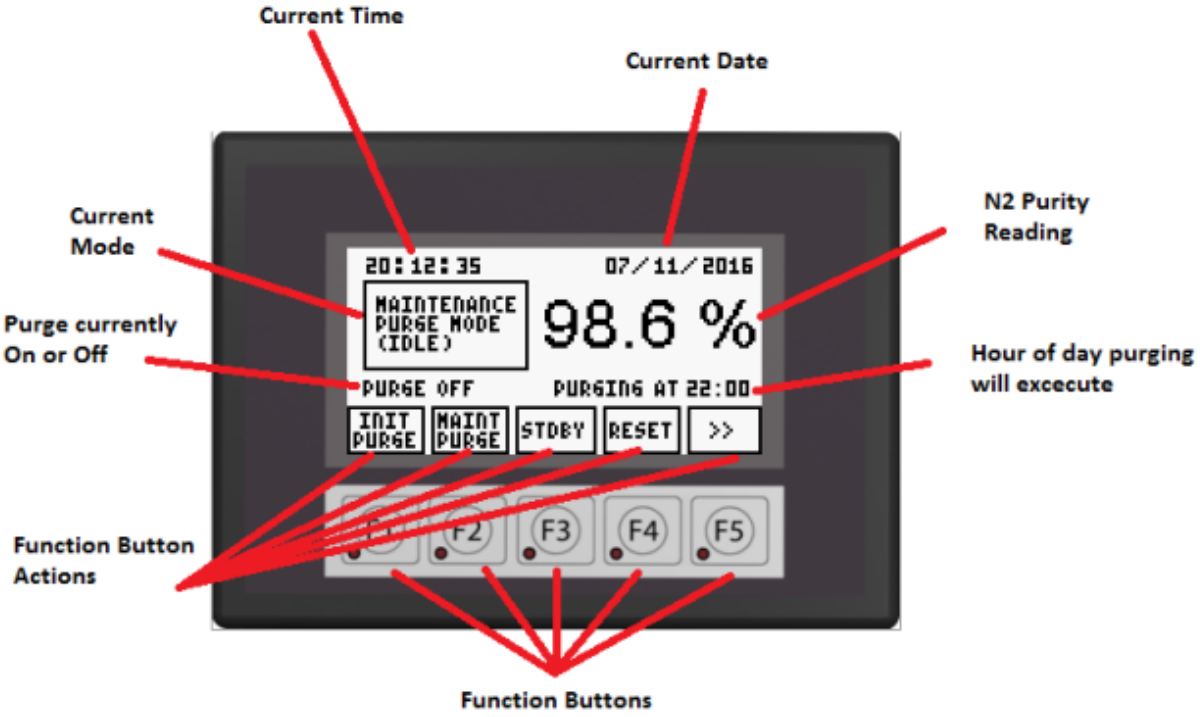
NC contact: 3 A max. @ 30 VDC max.
10 A max. @ 277 VAC max.

Attach raceway at indicated conduit outlet. Maximum conductor size for terminals is 12 AWG. Attach conductors to terminal strips per diagram on page 5.


ALARM CONTACTS
5A (NO) DC
3A (NC) DC
10A (NO) AC
3A (NC) AC
MAX AC VOLTAGE = 277
MAX DC VOLTAGE = 30
POWER REQUIREMENT:
115 VAC 60 HZ SINGLE PHASE
CURRENT DRAW = 1.1 AMPS
NO COM NC
K1
NO COM NC
K2
L N G
F1
125V 5A
BK1/GMA-5-R
F2
125V 3A
BK1/GMA-3-R
FOR INTERNAL WIRING ONLY
DO NOT CONNECT TO OR
ALTER THESE CONNECTIONS

PART 2 - USE

I. Screen Layout



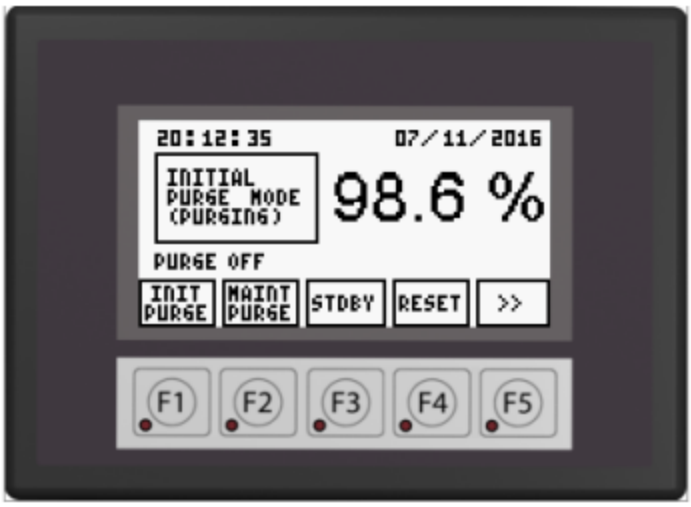
IMPORTANT NOTES:

1. All times indicated on all screens are in 24-hour (military time) format.

2. Current Time, appearing on Home Screen 1 and Home Screen 2, is factory set to Coordinated Universal Time (UTC). Local time conversions for the USA are:

	STANDARD	DAYLIGHT
EASTERN	UTC MINUS 5 HOURS	UTC MINUS 4 HOURS
CENTRAL	UTC MINUS 6 HOURS	UTC MINUS 5 HOURS
MOUNTAIN	UTC MINUS 7 HOURS	UTC MINUS 6 HOURS
PACIFIC	UTC MINUS 8 HOURS	UTC MINUS 7 HOURS
ALASKA	UTC MINUS 9 HOURS	UTC MINUS 8 HOURS
HAWAII	UTC MINUS 10 HOURS	N / A

II. Home Screen 1



Function Keys and Descriptions

F1 - INIT PURGE = Operating F1 manually places TAP into **Initial Purge** mode. This mode purges pressurized air from sprinkler system piping, allowing the NITROGEN-PAC sprinkler corrosion inhibiting system connected to the sprinkler valve to replace the air with 98% purity nitrogen. **Initial Purge** mode sequence is:

A. TAP purges for a user-settable time period. Factory default is 1435 minutes (23 hours 55 minutes).
B. TAP automatically enters **Nitrogen Sampling** mode for a user-settable time period. Factory default is 5 minutes.
C. If **Nitrogen Sampling** value is **less** than user-settable N2 purity threshold, cycle automatically repeats from A. Factory defaut of user-settable purity threshold is 97%.
D. If **Nitrogen Sampling** value is **equal to or greater than** user-settable purity threshold, TAP automatically enters **Maintenance Purge** mode.
E. If cycle repeats from A to C for 21 days, TAP activates **N2 LEVEL NOT MET** alarm. See page 9.

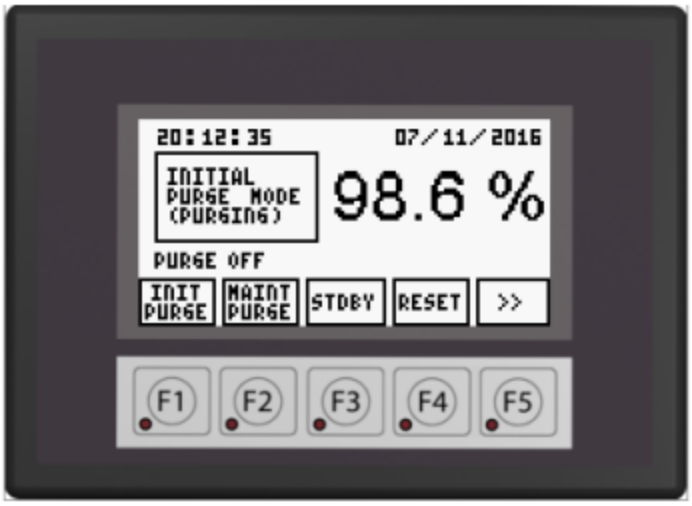
IMPORTANT! When multiple TAPs are associated with a single NITROGEN-PAC system, actuate no more than one (1) TAP Initial Purge at the same time. Refer to NITROGEN-PAC system instructions for proper Initial Purge actuation sequence.

F2 - MAINT PURGE = Manually places TAP into **Maintenance Purge** mode. This mode purges 98% purity nitrogen that has absorbed moisture from inside of the pipe. When power is initially applied to the TAP, **Maintenance Purge** is the default mode. Maintenance Purge mode sequence is:

A. TAP automatically enters **Maintenance Purge** mode every 24 hours at the same user-settable time. Factory default time is 0100 UTC (24-hour time format).
B. TAP purges for a user-settable time period. Factory default is 60 minutes (1 hour).

IMPORTANT! When multiple TAPs are associated with a single NITROGEN-PAC system, the start times of automatic Maintenance Purge modes should be staggered at minimum 2 hour intervals.

II. Home Screen 1 (continued)



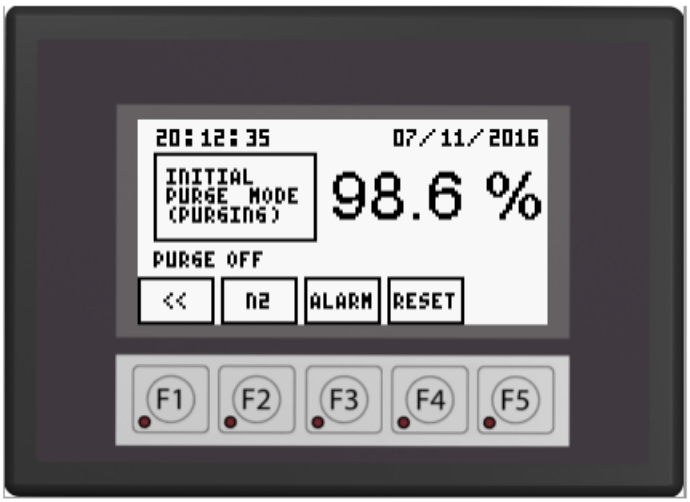
Function Keys and Descriptions (continued)

F3 - STDBY = Places TAP into **Standby** mode. This is the TAP's normal mode, with no purging or sampling occurring, and no alarms present.

F4 - RESET = Takes the device out of **Standby** mode and places it into **Initial Purge** mode.

F5 - >> = Navigates ahead to **Home Screen 2** - see below.

III. Home Screen 2



Function Keys and Descriptions

F1 - << = Navigates back to **Home Screen 1** - see above.

F2 - N2 = Manually places TAP into **Nitrogen Sampling** mode. Pressurized gas from the sprinkler system piping is sent the sensor to determine nitrogen purity, expressed in percent concentration.

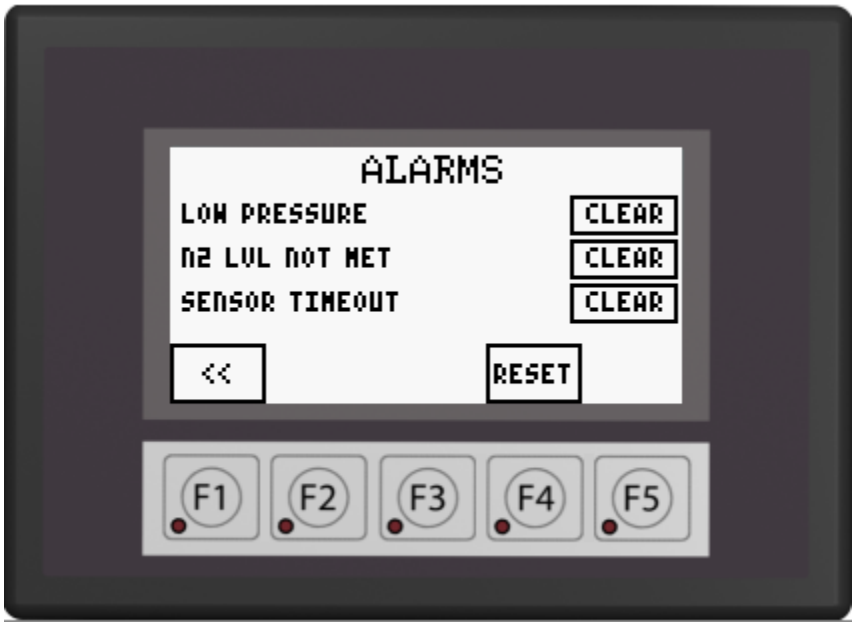
F3 - ALARM = Navigates ahead to **ALARMS** screen.

F4 - RESET = Takes TAP out of **Standby** mode and places it into **Initial Purge** mode.

F5 - (NO LABEL) = Navigates to **Password** screen, permitting access to System Setup - see page 10.

IV. ALARMS Screen

This screen indicates the status of the three possible alarms. If any of the three alarms are active, the screen flashes RED, the alarm signaling contacts transfer, and the TAP enters **Standby** mode.



Alarms

LOW PRESSURE Alarm - The TAP periodically tests the integrity of the supply tubing by verifying the presence of gas pressure at the supply tubing inlet. An alarm signal occurs upon loss of pressure, as from a kinked, clogged, or broken sampling tube.

N2 LEVEL NOT MET Alarm - **Initial Purge** mode is used to bring the nitrogen purity in the sprinkler piping from 78% to 98%. An alarm signal occurs if the nitrogen purity value after 21 days of **Initial Purge** does not reach the set threshold. The factory default threshold is 97%.

SENSOR TIMEOUT Alarm - An alarm signal will occur if the unit's electronics lose communication with the nitrogen purity sensor.

Function Keys and Descriptions

F1 - << = Navigates back to the previous **Home Screen 2**. - see page 8.
F2 - No function.
F3 - No function
F4 - RESET = Removes TAP from **Standby** mode and places into **Initial Purge** mode.
F5 - No function.

V. Password Screen

This screen permits restricted access to Setup screens, where various parameters can be set by the user from factory default values. Setup screens should be accessed only by trained personnel. Ensure password is available only to those personnel who need to alter system parameters, Obtain password from UNITED Fire Systems. Password is five (5) numerical characters.

Function Keys and Descriptions

F1 - ESC = Navigates back to **Home Screen 2** - see page 8.
F2 - SHF = Shifts cursor to the right.
F3 - UP = Increments the password digit at the cursor location.
F4 - DWN = Decrements the password digit at the cursor location.
F5 - ENT = Press to proceed when entered password is correct. When the correct password has been entered, the screen displays:

Function Keys and Descriptions

F1 - No function.
F2 - No function.
F3 - No function.
F4 - No function.
F5 - >> = Navigates ahead to **Setup - N2 Purity Threshold** screen - see page 11.

VI. Setup - N2 Purity Threshold Screen

Function Keys and Descriptions

F1 - << = Navigates back to **Home Screen 2** - see page 8.
F2 - No function.
F3 - (NO LABEL) = Permits changing the **N2 PURITY THRESHOLD** - see below.
F4 - REST DEF = Restores **N2 PURITY THRESHOLD** to factory default of 97%.
F5 - >> = Navigates ahead to **Setup - Test Mode and Calibration** screen - see page 12.

When F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Home Screen 2** - see page 8.
F2 - SHF = Shifts cursor to the right.
F3 - UP = Increments the **N2 PURITY THRESHOLD** digit at the cursor location.
F4 - DWN = Decrements the **N2 PURITY THRESHOLD** digit at the cursor location.
F5 - ENT = Press to proceed when entered **N2 PURITY THRESHOLD** is correct. Display returns to **Setup - N2 Purity Threshold** screen.

VII. Setup - Test Mode and Calibration Screen

This screen allows two separate modes to be entered:

1. **Test** mode - Permits quick field testing of the TAP's solenoid valves and N2 purity sensor, by abbreviating each mode's cycle sequence.
2. **Sensor Calibration** mode - Permits adjustment of the sensor's calibration if a calibrated gas mixture is used for sensor verification.

Function Keys and Descriptions

F1 - << = Navigates back to **Setup - N2 Purity Threshold** screen - see page 11.

F2 - (NO LABEL) = Enters / Exits **Test** Mode.

F3 - (NO LABEL) = Permits changing the N2 Calibration **OFFSET**.

F4 - REST DEF = Restores N2 Calibration **OFFSET** value to factory default of **RAW**.

F5 - >> = Navigates ahead to **Setup - Initial Purge** screen - see page 15.

Test Mode - When in **Test** mode, the TAP mode sequence times are:

Initial Purge = 2 minutes.
Nitrogen Sampling after Initial Purge = 1 minute.
Maintenance Purge = 1 minute.
Nitrogen Sampling for Display = 1 minute.
Time between nitrogen samples = 2 minutes.

VII. Setup - Test Mode and Calibration Screen (continued)

Sensor Calibration Mode - The TAP sensor is factory-calibrated, and should require no field adjustment. The raw N2 sensor calibration value is 95.00%. A certified gas mixture of 98.00% nitrogen and 2.00% oxygen applied to the TAP inlet should result in a 98.0% display. If adjustment is desired, the OFFSET value adds / subtracts from the RAW value to give the desired CAL value. The CAL value is then displayed, and is used in the **Initial Purge** sequence.

Example 1

1. Certified gas 98.00% N2 and 2.00% O2 is applied to the TAP inlet.
2. TAP calibration value is factory default of CAL = **RAW**.
3. TAP Display value is 98.0%
4. **OFFSET** should remain at 0.00%. CAL = **RAW**.
5. TAP Display value remains 98.0%.

Example 2 - Illustrated Above

1. Certified gas 98.60% N2 and 1.4% O2 is applied to the TAP inlet.
2. Initial TAP calibration value is factory default of CAL = **RAW**.
3. TAP Display value is 95.0%.
4. **OFFSET** value is adjusted to 3.60%. CAL now equals **RAW** plus 3.60%.
5. After offset value adjustment, TAP Display value is 98.6%.

VII. Setup - Test Mode and Calibration Screen (continued)

When F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Setup - N2 Purity Threshold** screen - see page 11.

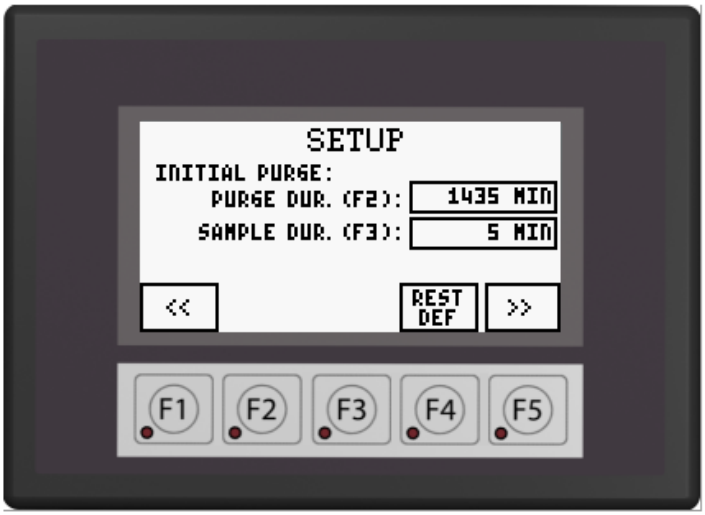
F2 - SHF = Shifts cursor to the right.

F3 - UP = Increments the **OFFSET** digit at the cursor location.

F4 - DWN = Decrements the **OFFSET** digit at the cursor location.

F5 - ENT = Press to proceed when entered **OFFSET** is correct. Display returns to **Setup - Test Mode and Calibration** screen.

VIII. Setup - Initial Purge Screen



Function Keys and Descriptions

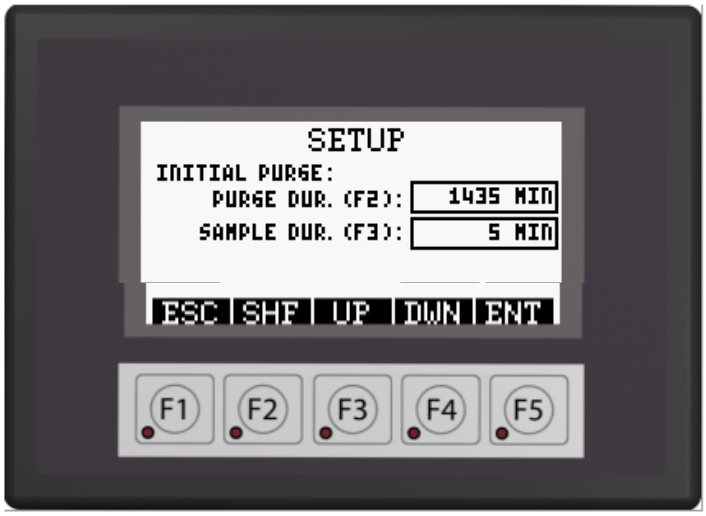
F1 - << = Navigates back to **Setup - Test Mode and Calibration** screen - see page 12.

F2 - (NO LABEL) = Permits changing the **PURGE DURATION**. Factory default is 1435 minutes (23 hours 55 minutes).

F3 - (NO LABEL) = Permits changing the N2 **SAMPLE DURATION**. Factory default is 5 minutes.

F4 - REST DEF = Restores **PURGE DURATION** and **SAMPLE DURATION** values to factory defaults.

F5 - >> = Navigates ahead to **Setup - Maintenance Purge** screen - see page 16.



When either F2 or F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Setup - Initial Purge** screen.

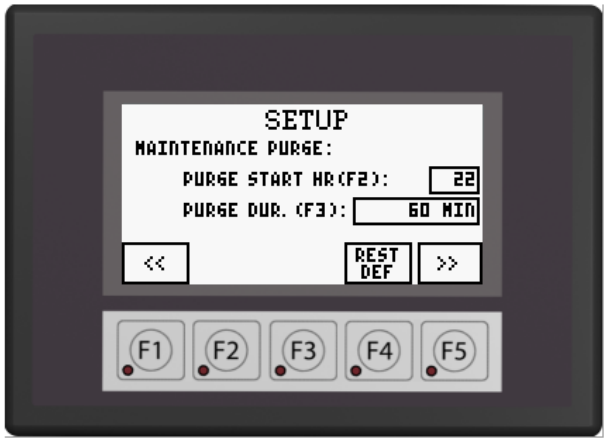
F2 - SHF = Shifts cursor to the right.

F3 - UP = Increments the digit at the cursor location.

F4 - DWN = Decrements the digit at the cursor location.

F5 - ENT = Press to proceed when entered value is correct. Display returns to **Setup - Initial Purge** screen.

IX. Setup - Maintenance Purge Screen



Function Keys and Descriptions

F1 - << = Navigates back to **Setup - Initial Purge** screen - see page 15.

F2 - (NO LABEL) = Permits changing the Maintenance **PURGE START HOUR**. Format is 24-hour time. Factory default is 01.

F3 - (NO LABEL) = Permits changing the Maintenance **PURGE DURATION**. Factory default is 60 minutes.

F4 - REST DEF = Restores **PURGE START HOUR** and **PURGE DURATION** values to factory defaults.

F5 - >> = Navigates ahead to **Setup - N2 Sampling for Display** screen - see page 17.

When either F2 or F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Setup - Maintenance Purge** screen.

F2 - SHF = Shifts cursor to the right.

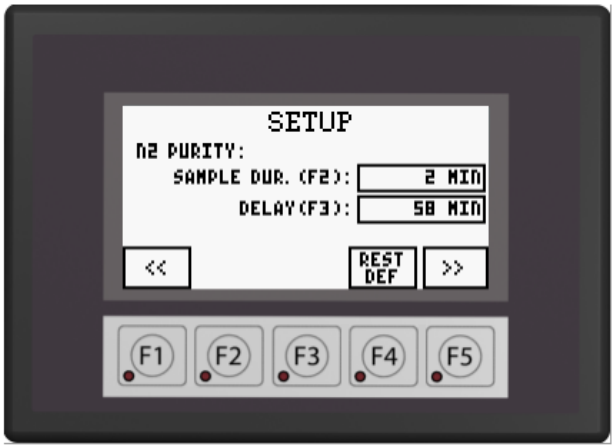
F3 - UP = Increments the digit at the cursor location.

F4 - DWN = Decrements the digit at the cursor location.

F5 - ENT = Press to proceed when entered value is correct. Display returns to **Setup - Maintenance Purge** screen.

IMPORTANT! When multiple TAPs are associated with a single NITROGEN-PAC system, the start times of automatic Maintenance Purge modes should be staggered at minimum 2 hour intervals.

X. Setup - N2 Purity Sampling for Display Screen



Function Keys and Descriptions

F1 - << = Navigates back to **Setup - Maintenance Purge** screen - see page 16.

F2 - (NO LABEL) = Permits changing the **SAMPLE DURATION** - the length of time the sampling valve is kept open. Factory default is 2 minutes.

F3 - (NO LABEL) = Permits changing the **DELAY** - the length of time between samples. Factory default is 58 minutes.

F4 - REST DEF = Restores **SAMPLE DURATION** and **DELAY** values to factory defaults.

F5 - >> = Navigates ahead to **Setup - Tubing Integrity** screen - see page 18.

When either F2 or F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Setup - N2 Purity Sampling for Display** screen.

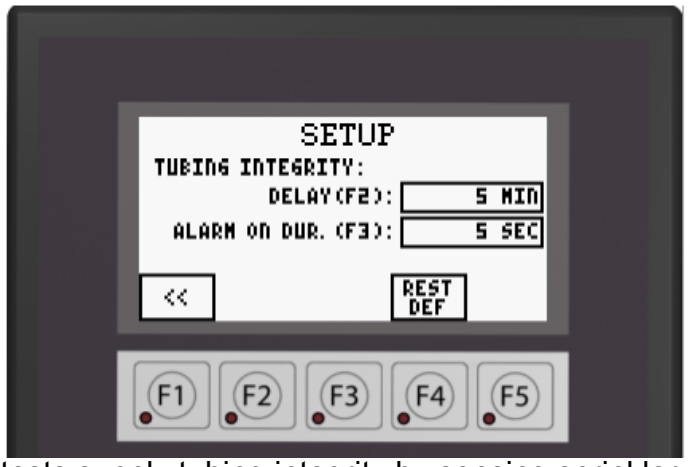
F2 - SHF = Shifts cursor to the right.

F3 - UP = Increments the digit at the cursor location.

F4 - DWN = Decrements the digit at the cursor location.

F5 - ENT = Press to proceed when entered value is correct. Display returns to **Setup - N2 Purity for Sampling** screen.

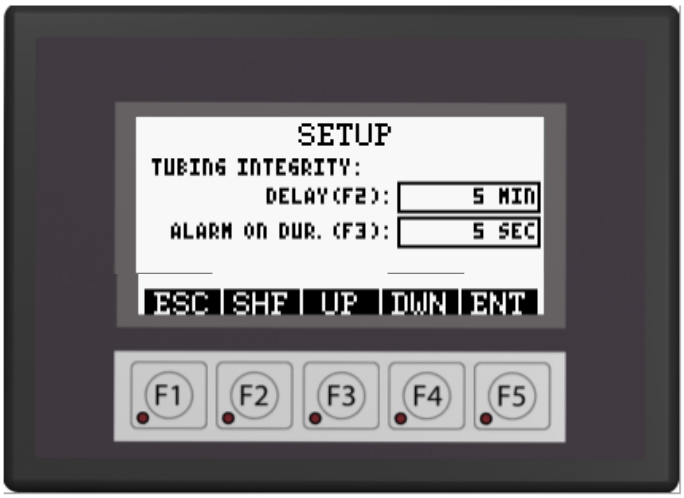
XI. Setup - Tubing Integrity Test Screen



The TAP automatically tests supply tubing integrity by sensing sprinkler system gas pressure with purging solenoid valves closed. The test is delayed after closure of both purging solenoid valves by the specified interval. If pressure switch does not sense gas pressure after the specified duration, a **LOW PRESSURE** alarm occurs.

Function Keys and Descriptions

F1 - << = Navigates back to **Setup - N2 Purity for Sampling Display** screen - see page 17.
F2 - (NO LABEL) = Permits changing the **DELAY** after completion of a purging cycle until tubing integrity test is conducted. Factory default is 5 minutes.
F3 - (NO LABEL) = Permits changing the **ALARM ON DURATION** - the length of time that the pressure switch must not sense gas pressure for a **LOW PRESSURE** alarm to occur. Factory default is 5 seconds.
F4 - REST DEF = Restores **DELAY** and **ALARM ON DURATION** values to factory defaults.
F5 - No function.



When either F2 or F3 is pressed, the Function Keys and Descriptions change to:

F1 - ESC = Navigates back to **Setup - Tubing Integrity Test** screen.
F2 - SHF = Shifts cursor to the right.
F3 - UP = Increments the digit at the cursor location.
F4 - DWN = Decrements the digit at the cursor location.
F5 - No function.

NOTE: To exit **Setup**, press F1 repeatedly until arriving at **Home Screen 1**.

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