



SERIES 400N

METHANE ANALYZER OPERATIONS MANUAL



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ABOUT NYAD METHANE ANALYZER

The NYAD Series 400N Methane Analyzer has recently been modified. The major change is the addition of a new sensing element and new software version.

The new sensor is more sensitive to a group of light hydrocarbons such as methane, butane, etc. but has not been tested with hydrocarbon oils. A major requirement for most hydrocarbon analyzers is that the material being analyzed is in the gaseous state.

Before installing the new NYAD Series 400N, it is highly recommended to submit a sample to be tested for suitability to proper detection.

1. INTRODUCTION

The NYAD Series 400N Methane analyzers have the following features:

- 1) Units of measurement:
 - Concentration parts per million by volume (ppm).
(Ref. Methane)
- 2) Two adjustable alarm points.
- 3) Analog output (0-5VDC or 4-20mA) with adjustable zero and span.

2. INSTALLATION

Connect the sample line to the 1/8FNPT bulkhead fitting labeled "inlet". The inlet sample pressure should be between 50-100 psig. An orifice is installed in the internal tubing to limit the pressure to the hydrocarbon sensor. If external alarms or recording devices are to be used, then these electrical connections will have to be made. Refer to the processor board diagram for the appropriate terminal connection.

3. STARTUP ROUTINE

After power is supplied, the instrument will proceed through its startup routine with the display and indicating LED's stepping through the following sequence:

Note: Each step is displayed for about one second.

- a) All display segments ON – all LED indicators on. This tests the display and LED's to ensure all are working.
- b) "NYAD" is displayed – all LED indicators OFF.
- c) Operating System Version.
- d) "EE 1" is displayed.

On completion of the startup routine, the measured Methane concentration is displayed as ppm. If any alarm Condition exists, this will be indicated by one, or both, of the red LED's (AI 1 or AI 2). The alarm condition will indicate six seconds after the measured value is displayed.

Note: Let analyzer “warm up” for 5 to 10 minutes before taking data.

4. FRONT PANEL CONTROLS

The NYAD Model 450N Methane Analyzer has two front panel controls that allow the operator to interact with the instrument.



- 1) UP/UNITS-DOWN—This two-position momentary switch located to the left of the display has three functions:
 - a) Changes the value of set point, outputs, and constants.
 - b) Changes the calibration values.
 - c) Changes toggle function “Hi and Lo”
- 2) MODE— Momentarily pressing and releasing this switch allows the operator to access, interrogate, and reset the other major functions incorporated into this analyzer, namely, Alarm 1, Alarm 2, Output, Toggle , and Calibration.
- 3) POWER— Press to power ON/OFF.

5. SETTING ALARM POINTS

This analyzer has two adjustable alarm set points and relays as factory standard. When the measured value of the Methane concentration exceeds the set point for a sustained period of about 6 seconds, the alarm condition is activated, the SPDT relay (Alarm 1) is energized as well as the red front-panel LED indicator, AI 1.

To determine the current setting for ALARM 1, press the MODE button. The display will show AI 1 and then default to the current value. If this value is acceptable, unit will momentarily in about 6 seconds flash "DISP" and return to the current measured Hydrocarbon value.

If the current setting for ALARM 1 is not acceptable, proceed as follows:

- a) Press the UP/DOWN button. You can cycle up or down through the numbers one digit at a time to the desired values or hold for several seconds and the rate will shift to fast.

To set ALARM 2, proceed exactly as described above after pressing the MODE button to display AI 2 and its current value.

If the measured value of the Methane concentration is higher than the ALARM 1 or ALARM 2 setting, the corresponding LED will illuminate above the display and energize the alarm relay thus activating any warning devices connected to it.

The Nyad Methane analyzer is equipped with a toggle function (A1 1T and A2 2T). Set these for Hi when alarm is to detect increasing CH₄ and Lo when detecting decreasing CH₄.

To determine the current setting for A1 1T, press the MODE button until A1 1T is displayed (Hi or Lo). If this value is acceptable, unit will time out return to display.

To set A2 2T, proceed exactly as described above after pressing the MODE button to display A2 2T (Hi or Lo).

6. CHANGE ALARM POINTS

If the current setting for ALARM 1 is not acceptable, proceed as follows:

- a) Set the left-most of the 4 digits in the display by pressing the UP button. You can only cycle up through the numbers, so if you pass the number desired continue cycling UP as the numbers will repeat.
- b) When the first digit is acceptable, press the DOWN button momentarily and the cursor will shift to the next digit to the right. Cycle the numbers with the UP button until reaching the desired value.
- c) Press the DOWN button to move the cursor to the next digit to the right and repeat the process as described above until all four digits display the desired setting for ALARM 1.
- d) To place this value into memory, press the MODE switch.

Note that decimal points do not appear: alarm setpoints and value for OUTPUT, CALIBRATION, FREQUENCY OFFSET and other functions can only be set using discrete numbers.

To set ALARM 2, proceed exactly as described above, after pressing the MODE button to display AI 2 and its current value. If the measured value of CH4 concentration is higher than the ALARM 1 or ALARM 2 setting, the corresponding LED will illuminate above the display and energize the alarm relay, thus activating any warning devices connected to it.

7. SETTING ANALOG OUTPUT (“OUT”)

The NYAD Series 400N analyzer features a 0-5 VDC and 4-20mA analog output as factory standard. This signal is linearly proportional to ppm CH4. To change span values from those set at the factory, these values must first be displayed.

EXAMPLE:

As an example, assume we wish to set the output span to range as follows:

<u>Output</u>	<u>ppm CH4</u>
(oPHi) 5 volts	500
(oPLo) 0 volts	0

- a) Display the current settings by pressing the MODE switch and cycling through AI 1, AI 2, A1 1T, A2 2T to OUTPUT. The display will read "oPLo" and then show the current value of HC concentration corresponding to the Lo end of the analog output when the MODE button is pushed.
- b) If this displayed value is 0, you may accept it by pressing MODE switch. If you wish to change the setting, proceed as described in Section 6, SETTING ALARM POINTS. Set the desired value using the UP/DOWN switch to cycle the numbers.
- c) Press the MODE switch. The display will now read "oPHi" and then show the concentration corresponding to the Hi end (5 VDC) of the analog output scale when the MODE is pushed. If the desired value reached, the unit will momentarily in 6 seconds return to display.
- d) If you wish to change the setting, set the desired value by using the UP/DOWN switch as previously described.

8. CALIBRATION

The Methane sensor and its digital signal processor are inherently stable and will maintain their calibration over an extended period of time with minimal maintenance. We recommend that the calibration is checked at least once a year.

Zero (nitrogen) and Span calibration gases must be applied to the analyzer sample inlet to check its calibration. To supply gas from a pressurized bottle, a pressure regulator, needle valve and flow meter will be needed.

- a) The concentration of the span gas (methane) should be between 80% to 100% of full scale (1,000 ppm).
- b) The inlet pressure should be between 50 and 100 psig.
- c) The sensor should be powered for at least 5 minutes before checking its calibration.
- d) Next, attach the span gas to the inlet fitting and start the flow of span gas. After the reading is equilibrated, press the MODE button. The display will pass through the alarm and output screens and show CAL. The CAL light is now on. This value should be that observed in paragraph (a).
- e) Press the MODE button. CAL will show, then the value of the Methane concentration in the span gas will be displayed.
- f) Use the up/down switch to change the value to correspond to value of the know cal gas.

The analyzer is now calibrated and ready to be placed into service. A monthly calibration cycle is recommended. To abort the procedure, press MODE.

NOTE: The calibration menu items have a time out interval which returns them to the display mode after about 6 seconds.

9. DEFAULT VALUES

Series 400N Methane Analyzers are preset at the factory with the following standard values:

<u>Function</u>	<u>ppmv</u>
AI 1	500
AI 2	1,000
Output (oPHi)	1,000
Output (oPLo)	00

These settings have been shown by experience to be most used by our customers. However, any of them can be changed from the front panel of the analyzer to values most suitable for your application.

10. REFERENCE TABLE

REFERENCE TABLE	
AL 1	Dry Relay Contact - Alarm 1
AL 2	Dry Relay Contact - Alarm 2
A1 1t	Toggle AL 1 "Hi or Lo"
A2 2t	Toggle AL 2 "Hi or Lo"
oPHi	Analog Output "Hi"
oPLo	Analog Output "Lo"
CAL	Calibration Function
No HC	Sensor not detecting Methane
EroP	Operator Error

Specifications

Model Numbers MTA-420N (OEM), MTA-430N (Rack Mount), MTA-440N (Panel Mount), MTA-450N (Nema 4), MTA-470N (NEMA 7)

Units PPM (Parts Per Million)

Standard

Display 4 Digit LCD, 0.5" High
Alarm Dual Dry Relay Contacts (SPDT 1A@120V)
Analog Output 0-5VDC or 4-20mA (Adjustable zero and span)
Power 120/220VAC 50/60 Hz, 1W Max
Memory Non-Volatile Data Memory
Inlet 1/8" FNPT
Calibration Auto Calibration

Options

Audible Alarm
Digital Output RS232, RS485
Power 12V

Sensor

Range 0 to 10,000 ppmv
Accuracy +/- 0.5%
Response Time 20 seconds diffusion time
Operating Humidity 0 to 95% RH non-condensing
Inlet Pressure 100 psig Max
Operating Temperature 0 to 50 degrees C
Sensor Life in Air 8 years
Sensor Warranty 2 Years
Calibration Gas Methane gas (1,000 ppmv)
Calibration Interval Once a month

Enclosures

O.E.M. 5.75"W x 6.75"H x 2.4"D
NEMA-4 9.5"W x 6.25"H x 3.5"D
PANEL MOUNT 10"W x 5.25"H x 11.5"D
RACK MOUNT 19"W x 5.25"H x 11.5"D

WARRANTY

WARRANTY TERMS

Nyad, Inc. warrants to the original consumer purchaser that all parts used in the construction or fabrication of the Nyad Equipment will be free from defects in materials and factory workmanship, under normal use and service for **five years** from the date of delivery.

Warranty coverage provides the necessary repairs or parts replacement found by Nyad, Inc. to be defective due to bad workmanship or faulty materials.

LIMITATIONS OF WARRANTY

The Nyad Equipment is restricted to inspection (FOB the Factory) before warranty is determined, unless other arrangements have been made by Nyad and the original consumer purchaser.

This warranty does not apply to routine service/maintenance, calibrations, repairs and replacement of the hydrocarbon sensor and with manufacturer's recommendation, or replacements made necessary by fire or water damage, or accident to or improper installation by others, alteration, misuse or abuse to the Nyad Equipment.

This warranty does not cover labor charges or cost incurred for time and expense by other service agencies or personnel involved in maintaining the Nyad Equipment.

Application of this Warranty is further conditioned upon the following:

Installation. The Nyad Equipment must be properly installed in accordance with Nyad's installation procedures and instructions.

Proper Maintenance and Operation. The Nyad Equipment must be properly maintained and operated in accordance with Nyad's maintenance and operating procedures. All service parts must be acquired from Nyad or its authorized representative.

No Alteration. The Nyad Equipment must not have been modified or altered from its original conditions at the date of delivery or installation.

Failure to comply with any of these conditions will void this Warranty.

RETURN POLICY

Before returning any items (except for recalibration service and repairs) you must call (925) 270-3971 8:00 a.m. – 5:00 p.m. PST. Monday through Friday for approval.

Product may be returned for a full refund/credit within 30 days from the date that Nyad originally shipped and must be returned in their original new condition. Exceptions for special order. Returns for special orders will have 30% restocking fee and must be approved.

Items returned in damaged or altered conditions which cannot be resold as new will have a 30% restocking fee.

All returned items are subject to inspection for use and damage before credit is issued. Returns may incur additional charges if product is returned in damaged conditions.

Manufacture Warranty/Defective Claims - You may return product to us for rework, exchange and/or request a full refund/credit. Request must be made from the original purchaser. Upon receipt of a returned item, Nyad will evaluate and determine the warranty claim.

Damaged Items – It is your responsibility to inspect your packages for damages/defect on delivery. If product is damaged in transit to you, we must be notified immediately (within 24 hours) so that we can submit a claim the our freight carrier.

Lost Packages – Lost Packages must be reported within 30 days of shipment date and verification from the freight carrier that product has not been delivered.

Please contact or email us for further important instructions on filing a lost or damaged package claim.

TECHNICAL SUPPORT

Nyad, Inc. will offer Technical Support via telephone or email. All technical support shall be related to the Nyad Equipment only. Any other technical issues involving other products and services to the Nyad Equipment will not be the responsibility of Nyad, Inc.; however, our technical support team will offer their best knowledge and support involved in the Nyad Equipment.

Warranty/Technical Support:

Ph (925) 270-3971 ext 4
Contact: Dorothy Natividad
Email: Dorothy@nyad.com
www.nyad.com