

ENGINEERING QUALITY AND RELIABILITY

GC804 NOVA-SENSOR ELITE

CATALYTIC COMBUSTIBLE GAS DETECTOR

SELF-CONTAINED AND EXPLOSION-PROOF



FEATURES & BENEFITS

- Catalytic sensor with excellent long term zero and sensitivity stability and high poison resistance
- 4-20 mA output for connection to external equipment
- User programmable LOW alarm and HIGH alarm settings
- Voltage-free dry contact relays for local control
- Explosion-proof approved electronics housing Class I, Group A, B, C, D
- Explosion-proof approved sensor housing - ATEX listed or ATEX and CSA listed
- Available up to IP66 rating
- Bright LCD screen displays target gas concentration in % LEL
- Magnetic switch initiates test or calibration sequence
- Built-in automatic sensor replacement/maintenance and calibration reminder
- Step-by-step on-screen calibration instructions for ease of use and maintenance
- Shipped fully assembled and pre-calibrated
- Available with wireless transmitter as an accessory with text, e-mail notifications feature
- 5 Year Warranty
- Made in USA

TYPICAL GASES

- For ALL combustible gases
- Methane
- Butane
- Propane
- Ethane
- Pentane
- Hexane
- Heptane
- Octane
- Gasoline (Petrol)
- Hydrogen
- Methanol
- Ethanol
- Acetone
- Toluene
- Isopropyl Alcohol
- Cyclohexane
- Methyl Ethyl Ketone
- Ammonia (LEL)

The SST Model GC804 Combustible Gas Detector is a highly versatile and reliable industrial gas detector designed for the toughest job and able to be used in the harshest environments. This detector uses a catalytic poison resistant sensing element which provides accurate measurements in atmospheres where traces of silicone or other poisoning agents may be present and provides excellent long-term zero and sensitivity stability. Readings are unaffected by humidity or carbon dioxide.

The bright LCD screen on the detector continuously displays the operating status and the actual concentration of gas in percentage of the Lower Explosive Limit (%LEL). This reading is converted to a standard 4-20 mA signal, which may be connected to any remote device for remote display or logging. Relay contacts are provided which are activated when the gas concentration exceeds the LOW ALARM and HIGH ALARM set points. Typical set points are adjusted by the installer upon installation and may be reset later by authorized personnel. The relays are suitable for controlling local HVAC equipment, alarm signal devices or for equipment shutdown. Fault relay contacts are also available which operate upon loss of power or internal failure of the unit.



23282 MILL CREEK DRIVE | STE. 215 | LAGUNA HILLS | CA 92653 | USA
TEL: 1-949-583-1857 | FAX: 1-949-340-6643
EMAIL: SALES@SAFETYSYS.COM | WWW.SAFETYSYS.COM

MODEL GC804 COMBUSTIBLE GAS DETECTOR

SYSTEM SPECIFICATIONS

Sensor Type:	Catalytic bead with excellent long term zero and sensitivity stability
Poison Resistance:	Highly Resistant
Gases Detected:	Most combustible gases and vapors
Sensor Life:	Typical 5+ years
Measuring Ranges:	0-100% LEL
Accuracy:	+/- 1% LEL(CH ₄)
Zero Drift:	< +/- 1/2 mV/Month
Linearity:	Effectively Linear to 100% LEL (to within 5%)
Response Time:	T ₉₀ <30 seconds
Modes:	Normal operation, set-points, calibration, set-up
Warranty:	5 years
Approvals:	Explosion-proof approved housing Class I, Division I, Groups A B C D; Class I, Zone I, AEx d IIC; Type 4X ATEX: II 2G Ex d IIC Gb

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:	Electronics -40°F to 185°F (-40°C to 85°C) Sensor -40°F to 266°F (-40°C to 130°C)
Operating Humidity:	0-100% RH, non-condensing
Ingress Protection:	IP40 to IP66

MECHANICAL SPECIFICATIONS

Dimensions:	6.4 x 5.7 x 4.3 inches (163 x 145 x 109 mm)
Weight:	4.0 lbs. (1.8 kg) Aluminum; 10.0 lbs (4.5 kg) Stainless Steel
Controller Housing:	Aluminum or Stainless Steel
Sensor Housing:	Stainless Steel



Specifications subject to change without notice.

ELECTRICAL SPECIFICATIONS

Input Power:	24 VDC nominal, 16 to 32 VDC 92 mA standby, 120 mA alarm
Relay Contact Ratings:	6 amps @ 28 VDC or 300 VAC resistive 1/8 HP @ 120/240VAC
Analog Signal:	0-20 mA (600 Ohms or less) Malfunction 0 mA Setup Mode/Calibrate 4 mA Zero Reading 4 mA 0-100% LEL 4-20 mA Over-range > 20 mA
Display:	Graphic Liquid Crystal Display Displays target gas concentration in % LEL; Flashing screen in alarm mode; Low brightness setting in power save mode
Field Connections:	4-20 mA output - three-wire shielded cable All other connections: 22 AWG (.35 mm ²) to 12 AWG (4.0 mm ²)
Wireless Communication:	Available with optional wireless transmitter with text, e-mail notification features

ORDERING INFORMATION

Part No.	Description
804-4-(Gas)	Model GC804 Combustible Gas Detector <i>Electronics in aluminum housing</i>
804-4-(Gas)-SS	Model GC804 Combustible Gas Detector <i>Electronics in stainless steel housing</i>
Accessories	
851-1-4	Rain shield, stainless steel (IP65)
851-5-4	Water spray shield
852-1-4	Dust cover, stainless steel
854-1-4	Duct mount, stainless steel
859-1-4	Gas sensor collection cone, stainless steel
858-1-4	Remote calibration adapter
857-01	Calibration kit (test gas sold separately)
10121	Spare calibration/test key
20231-2	Stainless steel tag
800-4	Standard replacement sensor
804-2-AL-(Gas)	Electronics in aluminum housing Sensor in stainless steel, CSA & ATEX listed
804-2-SS-(Gas)	Electronics in stainless steel housing Sensor in stainless steel, CSA & ATEX listed



DESIGN MANUAL
INSTALLATION • OPERATION • MAINTENANCE



MODEL GC804

**NOVA-SENSOR ELITE
COMBUSTIBLE GAS DETECTOR**

70118



23282 Mill Creek Drive, Suite 215
Laguna Hills, CA 92653 USA
+1.949.583.1857 Phone
+1.949.340.3343 Fax
www.safetysys.com
support@safetysys.com

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Quick Finder

MODEL GC804 NOVA-Sensor *ELITE*[™] Combustible Gas Detector

SAFETY INFORMATION.....	804-1
QUICK INSTALLATION GUIDE.....	804-2
TOOLS REQUIRED	804-2
GENERAL DESCRIPTION.....	804-4
SPECIFICATIONS.....	804-5
SYSTEM SPECIFICATIONS.....	804-5
ELECTRICAL SPECIFICATIONS.....	804-5
ENVIRONMENTAL SPECIFICATIONS.....	804-5
MECHANICAL SPECIFICATIONS	804-6
SELECTING A LOCATION FOR THE GAS DETECTOR.....	804-7
CONSIDERATIONS	804-7
GAS VAPOR DENSITY	804-7
GASES HEAVIER THAN AIR	804-8
GASES WITH DENSITY OF AIR	804-8
GASES LIGHTER THAN AIR.....	804-8
HIGH GAS CONCENTRATIONS	804-9
PRESENCE OF CONTAMINANTS.....	804-9
COVERAGE AREA.....	804-9
DISTANCE BETWEEN MULTIPLE SENSORS.....	804-9
HIGH WIND AREAS.....	804-9
HIGH TEMPERATURE AND CONFINED SPACES	804-10
ELECTRICAL WIRING	804-11
TERMINAL CONNECTIONS.....	804-11
POWER.....	804-11
WIRING CONSIDERATIONS.....	804-12
MAXIMUM CABLE LENGTHS	804-12
DEFAULT CONFIGURATION.....	804-13
INSTALLATION.....	804-14
1. SHIPMENT	804-14
2. TOOLS REQUIRED	804-14
3. MOUNT THE DETECTOR	804-14
4. LOOSEN THE HEX HEAD SET SCREW FROM THE COVER	804-14
5. UNPLUG THE ELECTRONICS MODULE	804-15
6. OPTIONAL: MOUNT THE REMOTE GAS SENSOR	804-15
7. CONNECT POWER AND ANALOG SIGNAL WIRING	804-17
8. CONNECT RELAY CONTACTS TO EXTERNAL EQUIPMENT.....	804-18
9. SET RELAY CONTACT JUMPERS.....	804-18
10. SETTING THE LOW ALARM LATCHING OPERATION	804-20
11. HIGH ALARM LATCHING OPERATION.....	804-21
12. APPLY POWER.....	804-22
13. CHANGING THE LOW AND HIGH ALARM SETPOINTS	804-22
14. INSTALL THE HOUSING COVER OF THE DETECTOR.....	804-24
15. PERFORM A BUMP TEST AND FUNCTIONAL CHECKOUT.....	804-24
16. INSTALL ACCESSORIES	804-24
ROUTINE OPERATION	804-25
LED INDICATOR	804-25
DISPLAY SCREEN.....	804-25
USING THE ▲MAGPOINT▲ TO CONTROL THE DETECTOR	804-26

MODE STRUCTURE	804-27
PROTECTION MODE	804-27
LOW GAS ALARM MODE.....	804-28
HIGH GAS ALARM MODE.....	804-28
FAULT MODE.....	804-29
CALIBRATION MODE.....	804-29
MAINTENANCE	804-30
FACTORY RECOMMENDED MAINTENANCE	804-30
30-DAY "BUMP" TESTS.....	804-30
90-DAY RECALIBRATION	804-31
ANNUAL VERIFICATION.....	804-31
CALIBRATION INSTRUCTIONS.....	804-32
FACTORY RECOMMENDED CALIBRATION SCHEDULE	804-32
FACTORS TO CONSIDER FOR FREQUENCY OF RECALIBRATION.....	804-32
WHEN TO RECALIBRATE THE GAS DETECTOR	804-32
TOOLS REQUIRED FOR CALIBRATION	804-33
STEP-BY-STEP CALIBRATION PROCEDURE.....	804-34
FAILED OR INCOMPLETE CALIBRATIONS	804-35
CALIBRATING THE DETECTOR TO A DIFFERENT TARGET GAS	804-36
TOOLS REQUIRED FOR CALIBRATING TO A DIFFERENT TARGET GAS	804-36
REPLACING THE ELECTRONIC MODULE	804-38
ORDERING INFORMATION.....	804-38
TOOLS REQUIRED TO REPLACE THE ELECTRONIC MODULE.....	804-38
STEPS TO REPLACE THE ELECTRONIC MODULE	804-38
MODIFYING THE DEFAULT SETTINGS.....	804-39
REPLACING THE SENSOR	804-42
ORDERING INFORMATION.....	804-42
TOOLS REQUIRED TO REPLACE THE SENSOR	804-42
STEPS TO REPLACE THE SENSOR	804-43
TROUBLESHOOTING	804-45
DISPLAY SCREEN.....	804-45
CALIBRATION FAILURE MESSAGE.....	804-45
CHECK CALIBRATION MESSAGE	804-45
DRIFTING OR UNSTABLE % LEL READINGS	804-45
FALSE ALARMS.....	804-45
SYSTEM FAULT MESSAGE AND FAULT LED LIGHT IS ON	804-46
TRANSIENT INTERFERENCE OR POWER SURGES.....	804-46
TECHNICAL SUPPORT	804-46
SPARE PARTS AND ACCESSORIES.....	804-47
REPLACEMENT SENSORS.....	804-47
REPLACEMENT ELECTRONICS MODULE	804-47
REPLACEMENT HOUSING	804-47
TEST EQUIPMENT.....	804-48
ACCESSORIES	804-48
WARRANTY	804-50
REPAIRS	804-51
ENCLOSURE DRAWING.....	804-52
WIRING DIAGRAM FOR REMOTE SENSOR	804-53
NOVA-SENSOR ELITE FACE PLATE DRAWING	804-55
DUCT MOUNT DRAWING	804-56
ROUND DUCT ASSY DRAWING.....	804-57

MODEL GC804 NOVA-Sensor *ELITE™* *Combustible Gas Detector*

SAFETY INFORMATION

Please read and understand this Design Manual **BEFORE** installing, operating, or conducting maintenance on the gas detector.

Pay close attention to important messages marked as **WARNINGS** and **IMPORTANT** throughout the Design Manual.

Failure to follow the instructions and safety precautions in this Design Manual can result in serious injury or death.

Equipment that has been repaired or modified by the user, damaged as a result of an accident, improper installation or used in an environment for which it was not intended will void the warranty.

INSTALLATION WARNINGS

Installation of the detector must only be conducted by trained and in some cases a licensed personnel.

Observe the recognized standards of the appropriate authority in the in the country concerned. Follow all appropriate standards to maintain the overall certification of the detector. Ensure all local regulations and site safety procedures are followed.

Declassify the area or disconnect the equipment from the power supply before accessing the interior of the detector. Ensure that the cover for the housing is closed tight during operation.

DO NOT open the housing/enclosure or replace the sensor in potentially hazardous atmospheres while the **POWER** is still applied to the electronics module.

DO NOT tamper, modify, repair, or disassemble the electronics module or the sensor.

DO NOT expose the detector to temperatures outside the recommended ranges as damage or failure may occur.

Every effort has been made to ensure the accuracy of this Design Manual. However, Safety Systems Technology assumes no responsibility for any errors or omissions in this document. Please report any errors or omissions found in the content of the Design Manual.

Safety Systems Technology reserve the right to change or revise this Design Manual without notice and without obligation to notify any person or organization of such changes. You may request any additional information required that is not included in the Design Manual through the local distributor or Safety Systems Technology.

QUICK INSTALLATION GUIDE

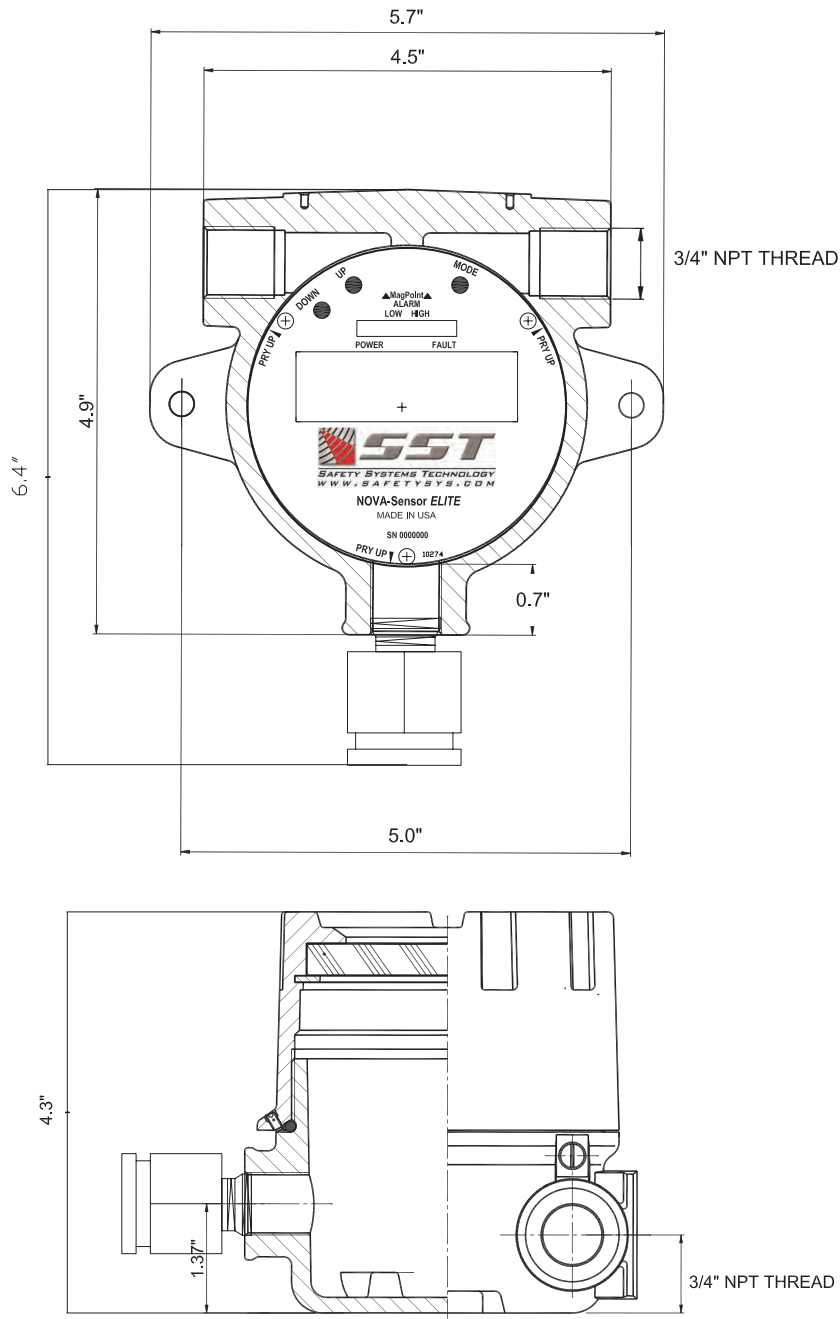
Tools Required

1.5 mm hex wrench is required for aluminum housing or 2.0 mm for stainless steel housing to remove the enclosure cover.

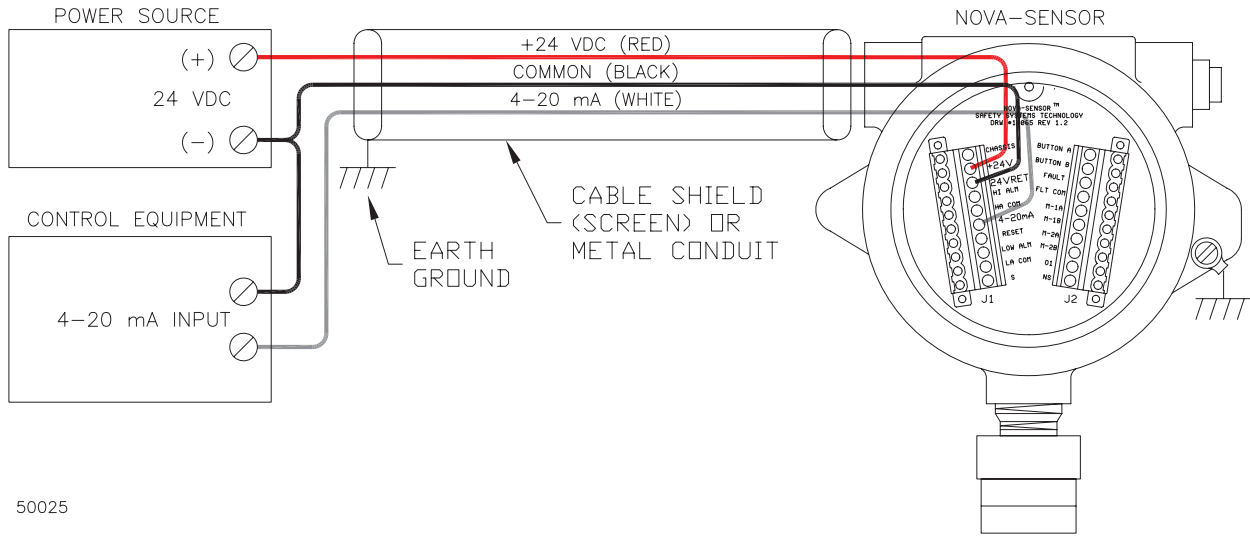
Slotted head screwdriver 1/16 inch or 1.55 mm width for terminal block connections.

Adjustable wrench for conduit or cable gland connections.

WARNING: De-classify the area to reduce the risk of ignition of hazardous atmosphere. Combustible and flammable gases and vapors are very dangerous. Extreme caution should be taken when these hazards are present.

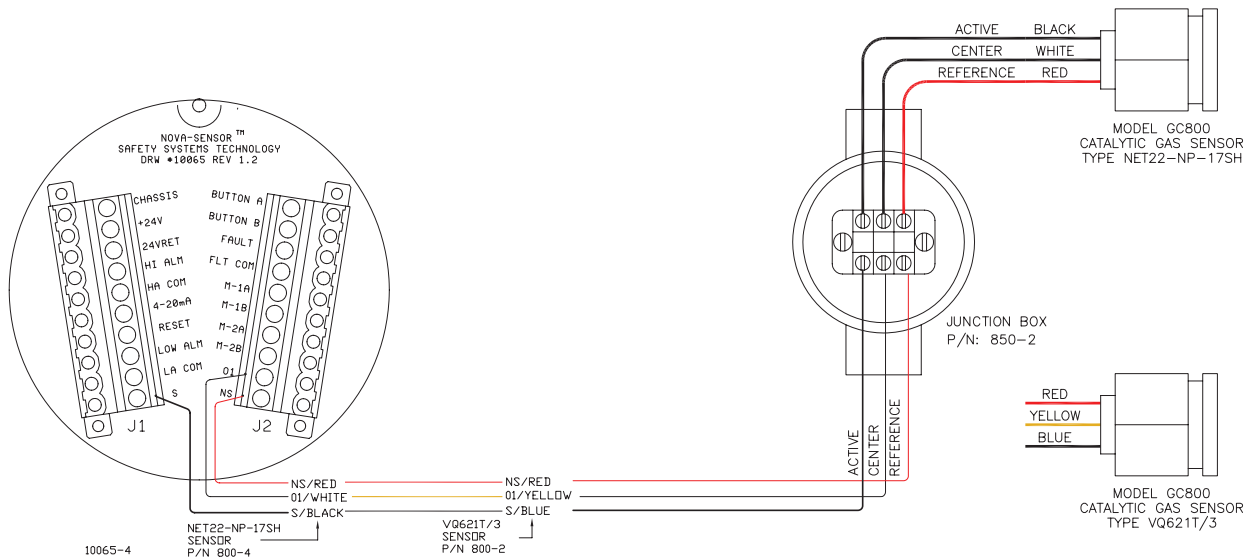


Wiring Diagram



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Wiring Diagram for Remote Sensor



GENERAL DESCRIPTION



Use the Model GC804 Combustible Gas Detector to alert personnel when a flammable gas or vapor is accumulating in a protected area. This detector uses a catalytic poison-resistant sensing element, and provides accurate measurements in atmospheres where traces of silicone or other poisoning agents may be present. Readings are unaffected by humidity or carbon dioxide.

The unit includes SST's latest NOVA-Sensor *ELITE* controller which continuously displays operating status and the actual concentration of gas in percentage of the Lower Explosive Limit (%LEL). This reading is converted to a standard 4-20 mA signal, which may be connected to any remote device for remote display or logging. Relay contacts are

provided which transfer when the gas concentration exceeds the LOW ALARM and HIGH ALARM set points. Typical set points are adjusted by the installer upon installation and may be reset later by authorized personnel. The relays are suitable for controlling local HVAC equipment, alarm signal devices or for equipment shutdown. Fault relay contacts are also available which operate upon loss of power or internal failure of the unit.

The automatic calibration sequence is initiated by activating the ▲MagPoint▲ with the Calibration/Test Key Fob on the top side of the detector housing. During calibration, step-by-step instructions are displayed on the NOVA-Sensor *ELITE* screen. There are no screwdriver or other manual adjustments required, and the calibration can be performed even in the presence of combustible gases.

SPECIFICATIONS

System Specifications

Sensor Type	Catalytic bead / pellistor with excellent long term zero and sensitivity stability
Poison Resistance	Highly Resistant
Gases Detected	Most combustible gases and vapors
Sensor Life	Typical 5+ years
Measuring Ranges	0-100% LEL (Lower Explosive Limit)
Accuracy:	+/- 1% LEL (CH ₄)
Zero Drift	<+/- 1/2 mV/Month
Linearity.....	Effectively Linear to 100% LEL (to within 5%)
Response Time	T ₉₀ <30 seconds
Modes	Normal Operation, Set-points, Calibration, Set-up
Warranty.....	5 Years
Electronics Enclosure	Class I, Division I, Groups A, B, C, D Class I, Zone I, AEx d IIC; Type 4X ATEX: II 2G Ex d IIC Gb
Gas Sensor Head.....	II 2G Ex d IIC GB

Electrical Specifications

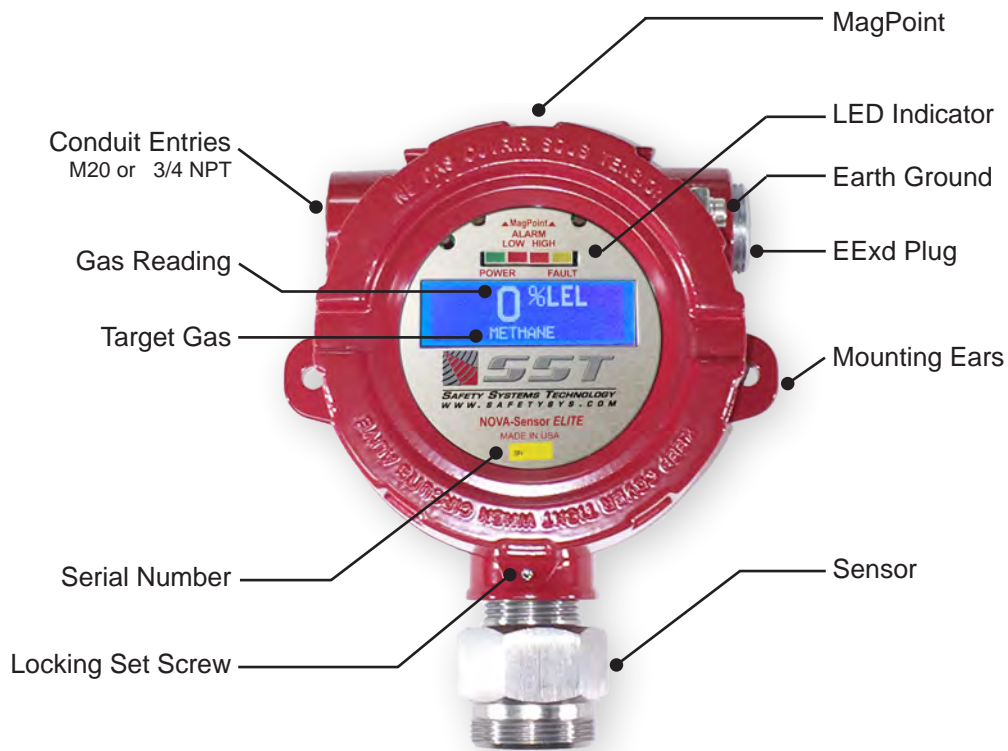
Input Power	24 VDC nominal, 16 to 32 VDC 92 mA standby, 120 mA alarm
Relay Contact Ratings	6 amps @ 28 VDC or 300 VAC resistive 1/8 HP @ 120/240 VAC
Analog Signal	0-20 mA (600 Ohms or less) Malfunction 0 mA Setup Mode/Calibrate 4 mA Zero Reading 4 mA 0-100% LEL 4-20 mA Over-range > 20 mA
Display	Heated Graphic Liquid Crystal Display Displays target gas concentration in % LEL; Flashing screen in alarm mode; Low brightness setting in power save mode
Wireless Communication	Available with optional wireless transmitter with text, e-mail notification features

Environmental Specifications

Operating Temperature	Electronics: -40°F to 185°F (-40°C to 85°C) Sensor: -40°F to 266°F (-40°C to 130°C)
Operating Humidity	0-100% RH, non-condensing
Ingress Protection	IP40 to IP66 with accessories

Mechanical Specifications

Dimensions	6.4 x 5.7 x 4.3 inches (163 x 145 x 109 mm)
Weight	4.0 lbs (1.8 kg) Aluminum 10.0 lbs (4.5 kg) Stainless Steel
Controller Housing	Aluminum or Stainless Steel
Sensor Housing.....	Stainless Steel



SELECTING A LOCATION FOR THE GAS DETECTOR

- NOTE:** The determination of the location of gas detectors should be made in accordance with any relevant local, municipal, and national standards, codes, or legislation. Seek the advice of professionals or experts with knowledge of process plant systems and/or safety and engineering personnel.

Considerations

To insure the fastest possible detection of leaking gases, the location of the sensor is important. There are no standard rules for sensor placement since the optimal placement of the sensor(s) are different for each application. The following considerations should be made when locating gas sensors:

- Sensors should be installed in an area free from wind, dust, water, flooding and vibration if possible. Weatherproof accessories are available to protect the sensor from dust and rain or splashing water. Utilize these accessories to prevent damaging the sensors.
- Clear view and access to the controller to monitor and/or reset or initiate calibration of the gas detector.
- Access to the sensor for calibration, testing, and servicing.
- Effect of wind or forced air within a location. The gas sensor will never respond if air currents blow the leaking gas away from the sensor.
- Preferred orientation of the sensor is with the porous face of the sensor pointing down. The sensor must never be installed pointing upwards.
- Gas detectors should be mounted closest to the source of a potential hazard of gas leaking.

Gas Vapor Density

Additional consideration should be made to the vapor density of the gas. The density of air is 1.0.

Any gas whose vapor density is greater than 1.0 is heavier than air. These heavier than air gasses will tend to accumulate first at the floor or ground level (assuming no air movement).

Any gas whose vapor density is less than 1.0 is lighter than air. These lighter than air gasses will tend to accumulate at the highest point in an enclosed space.

Gases Heavier than Air

For heavier than air gases, locate the sensor below the potential source of a leak or near the floor or ground for earliest detection. We recommend placing the sensor 1 foot from the ground surface to prevent plugging of the sintered metal filter on the sensor by dirt or water.

Weatherproof accessories are available to protect the sensor from dust, rain, and/or splashing water.

Typical gases heavier than air:

Combustible Gas	Density
Methanol	1.1
Propane	1.6
Ethanol	1.6
Butane	2.0
Acetone	2.0
Isopropyl Alcohol	2.1
Pentane	2.5
Hexane	3.0
Toluene	3.1
Heptane	3.5
Octane	3.9
Gasoline	3-4

Gases with Density of Air

These gases mix readily with air, locate the sensor as close to the source of a potential leak for fastest response.

Typical gases with density of air:

Combustible Gas	Density
Ethane	1.0

Gases Lighter than Air

For lighter than air gases, locate the sensor above the source of a potential leak or if within an enclosed space, at the highest point in the room. Consider obstructions that could trap a "pocket" of gas or air when locating sensors. The preferred orientation of the sensor is with the face pointing down. If necessary, it may be installed at an angle or horizontally. The sensor must never be installed pointing upwards.

An available gas collection cone accessory is available and can be utilized to allow the gas to accumulate in order to detect the gas immediately.

Typical gases lighter than air:

Combustible Gas	Density
Acetylene	0.9
Methane	0.6
Hydrogen	0.1

NOTE: Data in above tables is from reliable sources that are believed to be accurate, but is not guaranteed by Safety Systems Technology.

High Gas Concentrations

Gas detectors may be operated in high gas concentrations for short periods of time. For periods up to about 2 minutes, 10 second bursts of methane in excess of 100% LEL has no adverse effects. Prolonged exposure can result in zero drift which may be reversible by operation for a short period in air or low methane concentration (about 1%). Exposure to high concentration for longer periods will begin to destroy the detector surface, altering the zero reading and reducing the sensitivity. Whenever the sensor is exposed to high concentrations of combustible gas, the calibration should be rechecked as soon as possible.

Presence of Contaminants

Sensors may be adversely affected by prolonged exposure to certain contaminants. It can result in the loss of sensitivity and may be gradual in low concentrations, or it may be rapid at high concentrations. Materials that may adversely affect the sensors are:

- Caustic and acidic liquids and vapors
- Silicones
- Constant presence of high concentrations of hydrogen sulfide gas
- Constant presence of high concentrations of combustible gases

Sensors exposed to these contaminants usually require more frequent calibration checks than normal and may reduce the life of the sensor, requiring replacement.

The Model GC804 sensor is poison resistant. It can be used in atmospheres where traces of silicone oils, greases, phosphate esters, and sulphur based compounds may be present.

Coverage Area

Sensors should be placed closest to the possible source of a gas leak, taking into consideration the air density of the target gas. The distance of the sensor from the source of the leak will affect the response time of the detector. The farther the sensor is away from the source of the leak the more time it will take the gas to travel or accumulate for the sensor to react.

The coverage area of a single detector is a circle of 42.4 feet in diameter.

Distance Between Multiple Sensors

The factory recommended distance between multiple sensors is 30 feet, center to center.

High Wind Areas

For areas that experience high winds, the sensor may not detect any leaking gas if the air currents blow the gas away.

Locate the sensors as close to the source of the leak if possible. If necessary, a wind barrier may need to be installed or constructed around the source of the leak and the gas detector to allow the gas to accumulate for the sensor to detect.

The same should be done for indoor applications with high velocity forced air. In some cases, monitoring for gas leaks can be done through the exhaust duct. The sensor can be installed on the exhaust duct where the air passes by using a duct mount that will take sample air to monitor for leaking gas.

High Temperature and Confined Spaces

An available gas sampling block may be used to take air samples from a confined area or applications with extreme temperatures to monitor for the presence of combustible gases. Requires a vacuum pump to draw an air sample.

The detector and/or sensor should never be installed in applications with extreme temperatures as damage may occur.

The feasibility of using a gas detector in such areas must be determined by an analysis of the specific factors. Please consult with Safety Systems Technology before attempting such installation.

ELECTRICAL WIRING

The NOVA-Sensor ELITE controller/transmitter is wired in Current SOURCE configuration.

Terminal Connections

Terminal Number	Marking	Connection	Description
1	Chassis	Transient Voltage Suppressors	Connect direct to Earth Ground if severe lightning possible (Otherwise connect to 24 VRET)
2	+24V	(+) Power Input	To Power Source 16 to 32 volts DC
3	24 VRET	(-) Power Input	
4	HI ALM	Normally Open	High Alarm Relay Voltage Free Contact
5	HA COM	Common	
6	4-20 mA	Analog Output	Current Source
7	RESET	Remote Reset	Resets Latched Alarms
8	LOW ALM	Normally Open	High Alarm Relay Voltage Free Contact
9	LA COM	Common	
10	S	Sensitive	Active Pellistor
11	BUTTON A	Mode Pushbutton	Used in Custom Designed Options
12	BUTTON B	Mode Pushbutton	
13	FAULT	Open on Fault	Fault Relay Voltage Free Contact
14	FLT COM	Common	
15	M-1A	Not Used	
16	M-1B	Not Used	
17	M-2A	Not Used	
18	M-2B	Not Used	
19	01	Sensor Common	Pellistor Common
20	NS	Non-Sensitive	Non-Active Pellistor

Power

The NOVA-Sensor ELITE controller/transmitter requires a power supply of between 16 VDC and 32 VDC. A minimum supply of 16 VDC is required at the sensor, taking into account the voltage drop due to cable resistance.

Wiring Considerations

A multi-conductor cable is required.

A minimum of three conductors are required for the power and analog output. Six additional conductors are required to use the relay contacts. In general, the following rules should be observed:

- Always use the same wire type and length for all connections.
- The cable should be shielded or screened to prevent interference pickup if not installed in a metal conduit.
- The 3 individual conductors must be installed in a metal conduit that is grounded. The GC804 enclosure must also be properly grounded.
- Avoid running the cable close to high-powered cables or equipment or close to radio transmitters or antennas.
- Splices should be avoided and connections in junction boxes must be absolutely clean with terminal screws tight.
- All sensor cable connections using crimp on terminals must be crimped and SOLDERED for stable operation. Improperly terminated cables will result in corrosion, resistance changes, drift, and inaccurate calibrations.

IMPORTANT: Any electrical conduit connected to the NOVA-Sensor ELITE electronics enclosure must have a conduit seal installed within 18 inches (45.7 cm) of the enclosure.

Maximum Cable Lengths

Cable length between Controller and Sensor

The total DC resistance of the wires must be less than 3.0 ohms. The maximum cable lengths (for 3.0 ohms) for various wire sizes are listed below:

Cable Size	Maximum Cable Length (L)	
	Feet	Meters
22 AWG (.35 mm ²)	201	61
20 AWG (.50 mm ²)	294	89
18 AWG (.75 mm ²)	545	166
16 AWG (1.5 mm ²)	752	229
14 AWG (2.5 mm ²)	1,192	363
12 AWG (4.0 mm ²)	1,872	571

Cable length between 4-20 mA Controller and External Equipment

The total DC resistance of the wires must be less than 325 ohms. The maximum cable lengths (for 325 ohms) for various wire sizes are listed below:

Cable Size	Maximum Cable Length (L)	
	Feet	Meters
26 AWG (.14 mm ²)	7,736	2,359
24 AWG (.20 mm ²)	12,305	3,751
22 AWG (.35 mm ²)	21,746	6,630
20 AWG (0.5 mm ²)	31,797	9,694
18 AWG (1.0 mm ²)	59,026	17,996
16 AWG (1.5 mm ²)	81,503	24,849
14 AWG (2.5 mm ²)	129,138	39,371
12 AWG (4.0 mm ²)	202,845	61,843

DEFAULT CONFIGURATION

The Model GC804 Combustible Gas Detector is supplied with the following default configuration.

Function	Setting	Description
Sensor Type	Catalytic Bead	Pre-assembled
Signal Output	0 mA	Fault/Malfunction
	4 mA	Setup Mode / Calibrate
	4 - 20 mA	Normal Gas Measurement
	> 20 mA	Over-range
Alarm Relay 1 (Low Alarm)	20% LEL	Low Alarm Setpoint
	Contact Normally Open	Closes on alarm
	Non-Latching	Automatically resets
Alarm Relay 2 (High Alarm)	50% LEL	High Alarm Setpoint
	Contact Normally Open	Closes on alarm
	Latching (always)	Contact relay activated until manual reset
Fault Relay	Contact Normally Open	Closes on alarm

INSTALLATION

1. Shipment

Gas detectors shipped by Safety Systems Technology are fully assembled, quality tested, pre-calibrated, and packaged in special containers to protect against physical damage.

Upon receipt of the shipment, contents should be carefully removed and checked against the packing list. Contact Safety Systems Technology immediately if any damage has occurred or if there is any discrepancy in the order.

2. Tools Required

- 1.5 mm hex wrench is required for aluminum housing or 2.0 mm for stainless steel housing to remove the enclosure cover.
- Flat-head screwdriver maximum 3/16" (5 mm) width for terminal block connections
- Adjustable wrench for conduit or cable gland connections
- Multi-meter to verify voltage on the terminals

3. Mount the Detector

The detector is shipped fully assembled and pre-calibrated. Secure the detector to a wall or bracket, using bolts through the two mounting holes.

To mount to a pipe, a mounting pipe bracket accessory is available.

4. Loosen the Hex Head Set Screw from the Cover

Loosen the hex head set screw on the detector cover (a 1.5 mm hex wrench is required for aluminum housing or 2.0 mm for a stainless steel housing) and turn the cover counter-clockwise to remove.



5. Unplug the Electronics Module



Use a small screwdriver by inserting under the edge of the electronics module in the 3 locations marked “PRY UP” to loosen the module.

6. OPTIONAL: Mount the Remote Gas Sensor

For applications requiring a remote sensor, the sensor head can be removed and installed in a junction box for remote mounting.

If a junction box for remote sensor mounting is ordered from SST, it will be shipped with the required terminal blocks pre-installed.

Remove the Sensor Head

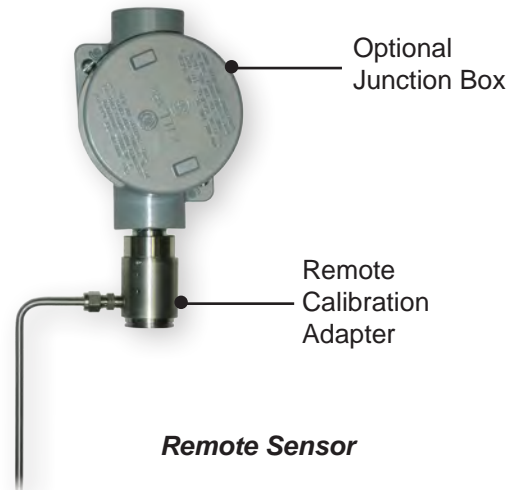
1. Remove the sensor wiring connected to the terminal block inside the housing. Using a flat-head screwdriver, loosen the following terminal connections:

Terminal Number	Marking	NET22-NP-17SH Sensor (Standard)	VQ21T/3 Sensor
10	S	Black	Blue
19	01	White	Yellow
20	NS	Red	Red

2. Unscrew the sensor head by turning it counter-clockwise and remove it completely from the main enclosure.
3. Install the sensor head onto the junction box.
4. Wire the sensor head onto the terminal blocks of the junction box.

Install the Remote Sensor

1. Install the remote sensor at the desired location. Preferred orientation of the sensor head is with the porous metal sensing face pointed downward. Never point the sensor face upward to insure that no moisture or dust collects on the sensor face to reduce sensitivity and damage the sensor.
2. Install the accessories. For lighter than air gases, consider using a gas collection cone. Other weather protection accessories are available to protect the sensor from rain, dust, and splashing water.

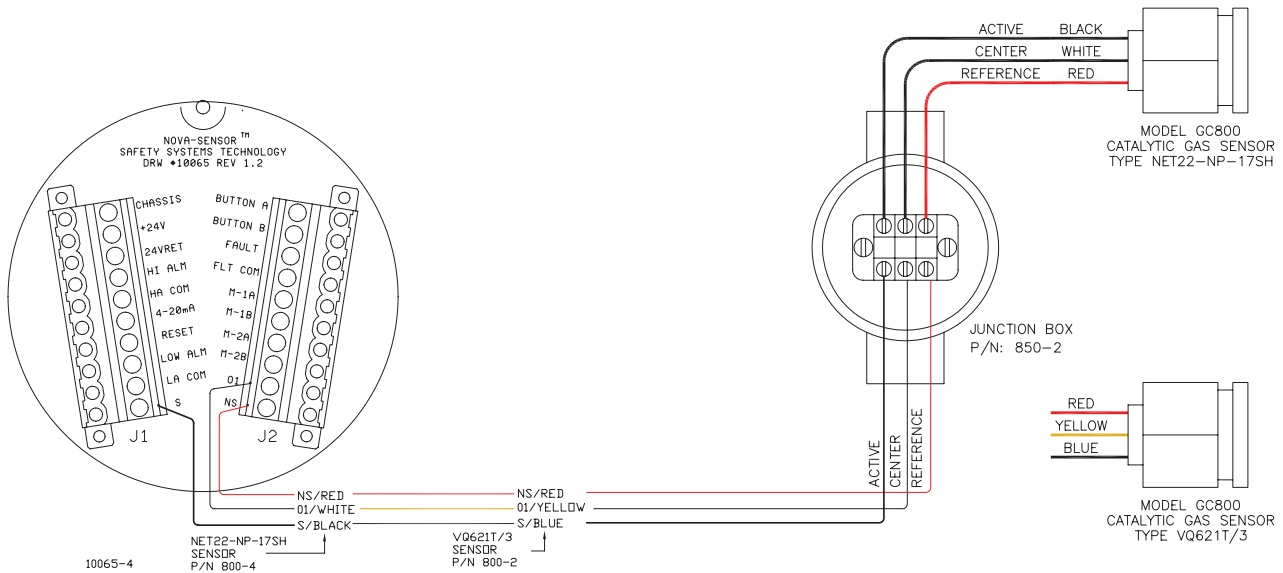


For remote sensor applications, a remote calibration adapter is recommended. A tygon or stainless steel tubing can be connected to the remote calibration adapter to deliver calibration test gas to the sensor without having to access the sensor directly.

Connect the Remote Sensor to the Electronics Module

WARNING: Failure to wire the sensor properly can damage the sensor. Note the wire color and the terminal connections.

1. Connect the 3 wires from the sensor head to the terminal blocks on the main enclosure.



Terminal Number	Marking	NET22-NP-17SH Sensor (Standard)	VQ21T/3 Sensor
10	S	Black	Blue
19	01	White	Yellow
20	NS	Red	Red

Three conductors are required between the sensor and the NOVA-Sensor ELITE electronics module. All 3 conductors must be same wire type and length .

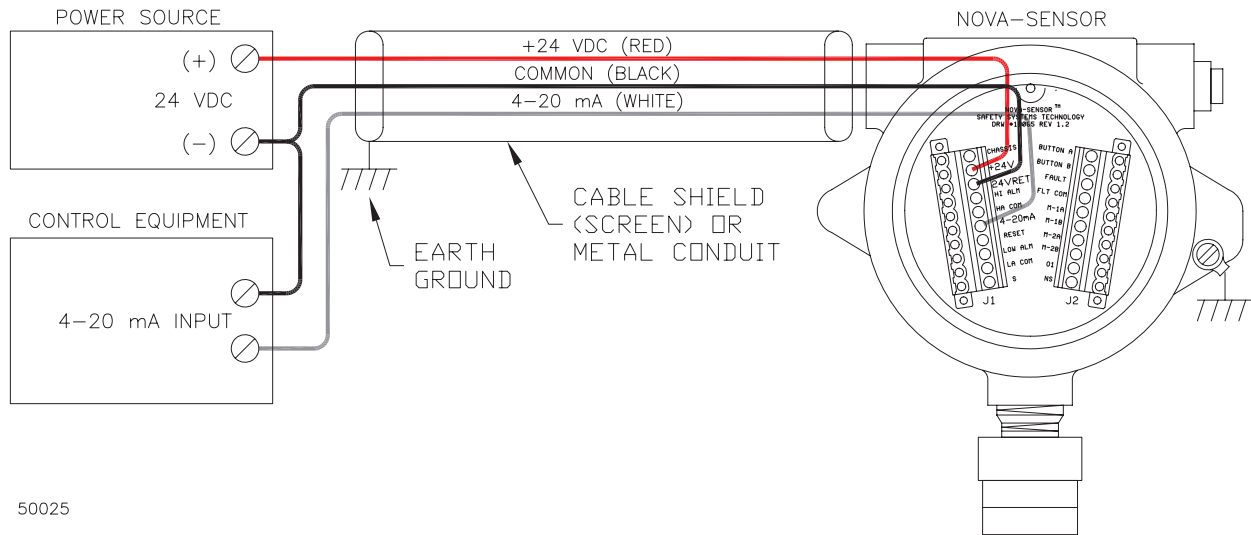
The cable/wires should be installed in a metal conduit or be shielded or screened cable with shield/screen connected to CHASSIS screw inside the electronics housing.

Avoid running the cable close to high powered cables or equipment or close to radio transmitters or antennas.

Splices should be avoided and connections in junction boxes must be absolutely clean with terminal screws tight. All sensor cable connections using crimp on terminals must be crimped and soldered for stable operation. Improperly terminated cables will result in corrosion, resistance changes, drift, and inaccurate calibrations.

For lighter than air gases, the remote sensor should be mounted at the highest point in the ceiling. For heavier than air gases, the remote sensor should be mounted 1 foot from the ground surface or below the potential source of a leak.

IMPORTANT: Any electrical conduit connected to the NOVA-Sensor ELITE electronics enclosure must have a conduit seal installed within 18 inches (45.7 cm) of the enclosure.



50025

7. Connect Power and Analog Signal Wiring

WARNING: The determination of the location of gas detectors should be made in accordance with any relevant local, municipal, and national standards, codes, or legislation. Seek the advice of professionals or experts with knowledge of process plant systems and/or safety and engineering personnel.

A typical installation is shown in the drawing above. This setup uses three wires between the NOVA-Sensor ELITE and the associated control modules. These wires carry the 24 VDC operating power for the sensor, and transmit the 20 mA signal to the controls.

The wires should be shielded (screened) or installed in a metal conduit to prevent undesirable noise pickup.

Note that the black wire shown in the drawing provides the return path for both the 24 volt operating power and the 4-20 mA analog output.

IMPORTANT: Any electrical conduit connected to the NOVA-Sensor ELITE electronics enclosure must have a conduit seal installed within 18 inches (45.7 cm) of the enclosure.

8. Connect Relay Contacts to External Equipment

The internal alarm and fault relay contacts can be used to provide signals to other pieces of equipment.

Typical applications would be to activate audible and visual alarm signals to alert personnel in the local area. Or these contacts may be used to shut down critical equipment or to report conditions to a data logging system. These contacts may be set to either normally open (NO) or normally closed (NC) as described below.

Default Settings

The gas detector is shipped with the internal alarm relay contacts set to Normally Open and the fault alarm relay contacts set to Opens on Fault.

Terminal Connections

Connect 2 wires between the external equipment and each of the below listed terminal pairs.

Terminal Markings	Description
LOW ALM & LA COM	Contact transfers when LOW Alarm setpoint is reached
HI ALM & HA COM	Contact transfers when HIGH Alarm setpoint is reached
FAULT & FLT COM	Contact transfers when detector in FAULT condition

9. Set Relay Contact Jumpers

LOW ALARM Relay

Jumpers on the detector electronics module located on the lower most circuit board, allow the LOW ALARM relay contacts to be set as normally open or normally closed.

Default Setting

The default factory setting for the LOW ALARM relay contacts is set to **NORMALLY OPEN**.

Normally Open

The gas detector is shipped with the jumpers connecting the 2 NO pins together.

Contacts will be OPEN when there is no gas alarm, and will CLOSE when a low gas alarm is detected.



Low Alarm Jumper

Normally Closed

To change the default relay contact factory setting from Normally Open to Normally Close, remove the jumper plug from the NO pins and reinstall on NC pins to set this contact to be Normally Closed.

Contacts will be CLOSED when there is no gas alarm, and will OPEN when a low gas alarm is detected.

HIGH ALARM Relay

Jumpers on the detector electronics module located on the lower most circuit board, allow the HIGH ALARM relay contacts to be set as normally open or normally closed.

Default Setting

The default factory setting for the HIGH ALARM relay contacts is set to **NORMALLY OPEN**.

Normally Open

The gas detector is shipped with the jumpers connecting the 2 NO pins together.

Contacts will be OPEN when there is no gas alarm, and will CLOSE when a high gas alarm is detected.

Normally Closed

To change the default relay contact factory setting from Normally Open to Normally Close, remove the jumper plug from the NO pins and reinstall on NC pins to set this contact to be Normally Closed.

Contacts will be CLOSED when there is no gas alarm, and will OPEN when a high gas alarm is detected.



High Alarm Jumper

Fault Relay Contacts

Jumpers on the detector electronics module located on the lower most circuit board, allow fault relay contacts to be set as OPEN ON FAULT or CLOSED ON FAULT.

Default Setting

The default factory setting for the fault relay contacts is set to **OPEN ON FAULT**.

Open on Fault

The gas detector is shipped with the jumpers connecting the 2 **OF (Open on Fault)** pins together.

The fault relay contacts will be CLOSED when there is NO FAULT detected in the gas detector.

The fault relay contact will OPEN when any internal fault condition occurs in the gas detector.

The fault relay contacts will also open if the 24 volt DC power supply to the detector is interrupted.

Close on Fault

To change the default fault relay contact factory setting from OPEN ON FAULT to CLOSE ON FAULT, remove the jumper plug from the **CF (Closed on Fault)** and reinstall on **OF (Open on Fault)**.

The fault relay contacts will be CLOSED when any internal fault condition occurs in the gas detector.



Fault Jumper

The fault relay contacts will also CLOSED if the 24 volt DC power supply to the detector is interrupted.

IMPORTANT: There are two additional factory installed jumpers at the positions marked "TOX." DO NOT remove or change these jumpers nor move them, as they are required for proper operation of this detector.

10. Setting the Low Alarm Latching Operation

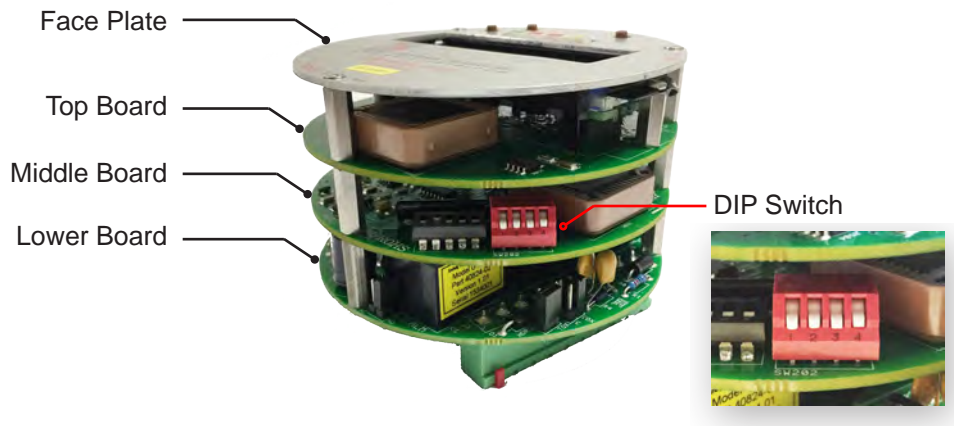
The gas detector has two alarm setpoints, a LOW ALARM and a HIGH ALARM. The relay contacts are activated at each stage when the setpoints are reached.

The LOW ALARM relay contact can either be set for NON-LATCHING or LATCHING.

Default Setting

The gas detector factory setting for the LOW ALARM relay contact is set for NON-LATCHING.

The setting can be verified by looking at the DIP SWITCH located on the middle board. The DIP SWITCH has a number of switches numbered from 1 to 4.



DIP SWITCH # 4 sets the LOW ALARM to NON-LATCHING or LATCHING.

For NON-LATCHING operation, DIP SWITCH # 4 is set to the DOWN position.

For LATCHING operation, DIP SWITCH # 4 is set to the UP position.

IMPORTANT: The DIP SWITCH has 3 other switches, # 1, #2, and #3. These settings are preset at the factory to match the factory calibration of your NOVA-Sensor *ELITE* electronic module. DO NOT alter these switches unless you are calibrating the detector to a different target gas. Refer to Recalibration Instructions in this manual.

Non-Latching Operation

This is the factory default setting for the LOW ALARM relay contact setpoint. When the LOW ALARM relay contact is set for **NON-LATCHING**, the relay contact is activated when the LOW ALARM setpoint is reached.

The LOW ALARM relay contact automatically **RESETS** whenever the gas level falls below LOW ALARM the setpoint.

To verify this setting, look at the DIP SWITCH located on the middle board of the NOVA-Sensor *ELITE* electronics module of the gas detector. The **DIP SWITCH # 4** will be set to the **DOWN** position.

Latching Operation

To change the LOW ALARM relay contact to **LATCHING**, locate the DIP SWITCH on the middle board of the electronics module.

Set **DIP SWITCH # 4** to the **UP** position to set the LOW ALARM relay contact to **LATCHING**.

When the LOW ALARM relay contact is set for LATCHING, the relay contact is activated when the LOW ALARM setpoint is reach.

The LOW ALARM relay contact **REMAINS** activated even when the gas level falls below the LOW ALARM setpoint. The LOW ALARM must be reset to return the gas detector to normal operation.

To **CLEAR** or **RESET** the LOW ALARM and return the gas detector to normal operation, **ACTIVATE** the **▲MagPoint▲** by placing the KEY FOB on the top side of the detector housing.

11. High Alarm Latching Operation

Default Setting

The HIGH ALARM is **ALWAYS** set to LATCHING and cannot be set to Non-Latching mode.

When the HIGH ALARM setpoint is reached, the HIGH ALARM relay contact is activated.

The HIGH ALARM relay contact **REMAINS** activated even when the gas level falls below the HIGH ALARM setpoint. The HIGH ALARM must be reset to return the gas detector to normal operation.

12. Apply Power

WARNING: Verify that there are NO combustible gases present before power to the gas detector is turned on.

A source of 24 volt DC is required to power the detector.

Activate Power

Activate the source of 24 volt DC operating power for the detector.

Verify Power

Use a multi-meter to verify that voltage is available at terminals marked +24V and 24VRET.

Install the Electronics Module

Plug the NOVA-Sensor ELITE electronics module into the connectors in the enclosure.

Push down on the 3 screw head to be sure the module is completely pushed into the connectors.

At this time, do not install the housing cover.

Powering Up

Once the electronic module is installed, the LCD will display the following:

- GC804 followed by software version number
- Sensor Warmup...(countdown) 60 to 0 seconds
- 0% LEL Methane (or other gas name, set by factory)
- The green LED POWER indicator will blink slowly to indicate the unit is fully operational

13. Changing the LOW and HIGH Alarm Setpoints

Once the gas detector is fully operational, the LOW and HIGH alarm setpoints can be changed at this time.

Default Settings

The default factory settings for the gas detector is set for:

- **20% LEL** for LOW ALARM
- **50% LEL** for HIGH ALARM

Verify the LOW and HIGH Alarm Setpoints

There are two ways to verify the alarm setpoints:

- Momentarily apply the ▲ **MagPoint** ▲ Key Fob on the top side of the enclosure
- Or depress the “MODE” pushbutton located on the top of the faceplate of the NOVA-Sensor *ELITE* controller.

The LCD screen will then display the LOW ALARM and HIGH ALARM setpoints:

- “20% LEL LOW ALARM SET”
- “50% LEL HIGH ALARM SET”

Changing the LOW ALARM Setpoint

Locate the two pushbutton on the top of the faceplate of the electronics module marked “**DOWN**” and “**UP**.”

The LOW ALARM setpoint can be set lower or higher than the current LOW ALARM setpoint on the detector. If the LOW ALARM setpoint is currently set at 20% LEL:

- Press the “**DOWN**” pushbutton to lower the setpoint by one digit. Holding the “DOWN” button will decrease number by increments of 2 digits.
- Press the “**UP**” pushbutton to increase the setpoint by one digit. Holding the “UP” button will decrease the number by increments of 2 digits.

Once you have selected the LOW ALARM setpoint, the unit will then switch to the HIGH ALARM settings after a few seconds.

If no changes are required to the HIGH ALARM setpoints, the system will cycle to confirm the LOW ALARM and HIGH ALARM setpoints.

To change the LOW ALARM setpoint once more, press the “**DOWN**” or “**UP**” button and the system will cycle through the process again.

Changing the HIGH ALARM Setpoint

Locate the two pushbutton on the top of the faceplate of the electronics module marked “**DOWN**” and “**UP**.”

Press the “**DOWN**” or “**UP**” button.

The system will cycle through the settings to change the LOW ALARM setpoint first. If no changes are required, the system will switch to the HIGH ALARM setpoint within a few seconds.

The HIGH ALARM setpoint can be set lower or higher than the current HIGH ALARM setpoint on the detector. If the HIGH ALARM setpoint is currently set at 50% LEL:

- Press the “**DOWN**” pushbutton to lower the setpoint by one digit. Holding the “DOWN” button will decrease number by increments of 2 digits.
- Press the “**UP**” pushbutton to increase the setpoint by one digit. Holding the “UP” button will decrease the number by increments of 2 digits.

Once the HIGH ALARM setpoint is set, the system will display the LOW and HIGH ALARM setpoints on the LCD screen.

14. Install the Housing Cover of the Detector

At this time, the gas detector is fully functional.

Apply the Housing Cover. Twist the cover until you have a tight fit.

Secure the cover by using your Allen hex wrench on the lock located just on the edge of the cover.

15. Perform a Bump Test and Functional Checkout

The gas detector has been pre-calibrated to the desired target at the factory, and no further calibration will normally be required when it is initially installed.

As a final check to be sure that the NOVA-Sensor *ELITE* controller and gas sensor is working properly, factory recommends to conduct a “Bump Test” and briefly expose the gas sensor to a weak concentration of a combustible gas.

By most definitions, a “BUMP TEST” is a brief exposure of the sensor to gas in order to verify that the sensor responds and the instrument alarms function accordingly. The BUMP TEST, by this definition, does not check the accuracy of the instrument.

! NOTE: When performing a Bump Test, DO NOT use or apply pure gas to the catalytic sensor. The high concentration of the pure gas will shorten the life of the sensor.

The BUMP TEST could be performed by using the 50% LEL gas mixture used for calibrating the sensor.

The gas detector is now fully operational.

16. Install Accessories

If you purchased any weatherproof or other related accessories, install them at this time.

ROUTINE OPERATION

The Model GC804 NOVA-Sensor *ELITE* Combustible Gas Detector is designed to provide protection of personnel and property from gas leaks 24 hours a day, 7 days a week with no regular intervention required.

LED Indicator

Located right above the LCD screen are 4 colored LED indicators:

- POWER - Green LED
- LOW (alarm) - Red LED
- HIGH (alarm) - Red LED
- FAULT - Yellow LED



Normal Operation

The POWER LED indicator slowly flashes a green light indicating normal operation of the gas detector.

Low Alarm Mode

The LOW LED indicator is activated and produces a rapid flashing red light when the LOW ALARM setpoint is reached. The LED indicator turns off when the gas reading drops below the LOW ALARM setpoint when set to non-latching. The LED indicator will remain flashing if the LOW ALARM setpoint is set to latching and will only turn-off when the alarm is reset.

High Alarm Mode

The HIGH LED indicator is activated and produces a rapid flashing red light when the HIGH ALARM setpoint is reached. The LED indicator will remain flashing until the alarm is reset.

System Fault

The FAULT LED indicator is activated and produces a rapid flashing yellow light when a system FAULT or malfunction is detected. The LED indicator will remain flashing until the fault is resolved.

Display Screen

The NOVA-Sensor *ELITE* features a high-performance, low power consumption, wide operating temperature Graphic Liquid Crystal Display with numeric display of the % LEL, PPM, or % by VOL as well as the name of the target gas. The LCD is heated to ensure continuous operation in extreme temperatures.

Energy-save Mode

During normal operation the instrument display is dimmed within five seconds of inactivity to conserve power. It will still be visible even if the gas detector is located outdoors in bright sunlight.

The LCD screen will continue to display the actual concentration of the target gas.

Low Alarm Mode

When the LOW ALARM setpoint is reached, the display will return to full brightness and flash rapidly to signal an alarm is occurring.

High Alarm Mode

When the HIGH ALARM setpoint is reached, the display will continue to flash rapidly. Since the HIGH ALARM setpoint is always set on latching, the display will continue to flash until the gas reading falls below the HIGH ALARM setpoint and the alarm is reset.

System Fault Mode

When a fault or malfunction is detected, the display will flash rapidly and “SYSTEM FAULT” will also flash on the screen.

Using the ▲MagPoint▲ to Control the Detector

The ▲MagPoint▲ Key Fob is used as a tool to allow the end-user to communicate with the NOVA-Sensor *ELITE* controller/transmitter.

One Key Fob is supplied and shipped with the gas detector. Additional ▲MagPoint▲ Key Fob can be ordered through the factory. P/N: 10121

Activating the ▲MagPoint▲ Key Fob

Look through the window on the front of the enclosure and note the ▲MagPoint▲ marking at the upper edge of the viewing window.

The ▲ symbol points to the top side of the main housing where the magnet on the key fob will signal the required actions from the electronics inside.

Hold the magnet on the top side of the enclosure and watch for the screen brightness to increase when the magnet is in the proper location for activation.



▲MagPoint▲ Key Fob Functions

The ▲MagPoint▲ Key Fob allows the user to do the following:

- View the LOW ALARM and HIGH ALARM setpoints
- Reset the LOW ALARM and HIGH ALARM if set on LATCHING
- Enter Calibration Mode

Viewing the LOW and HIGH ALARM Setpoints

- Apply the ▲MagPoint▲ Key Fob on the top side of the gas detector for ONE second and remove.
- The screen will return to full brightness and display the LOW ALARM and HIGH ALARM setpoints for approximately eight seconds.

Activating Calibration Mode

- Apply the ▲MagPoint▲ Key Fob on the top side of the gas detector for FIVE seconds and the screen will display “HOLD FOR CALIBRATION MODE.” Continue to apply the key fob for another FIVE seconds until the gas detector enters Calibration Mode.
- Once the gas detector enters Calibration Mode, follow the on-screen instructions and continue with the calibration. For step-by-step calibration instructions, please see the Calibration section of this manual.
- To CANCEL the Calibration Mode, apply the ▲MagPoint▲ Key Fob twice on the top edge of the gas detector. If there is inactivity or no calibration gas is detected, the system will return to normal operation within FIVE minutes.



Mode Structure

The NOVA-Sensor *ELITE* has 5 operating modes:

1. Protection Mode
2. Low Gas Alarm Mode
3. High Gas Alarm Mode
4. Fault Mode
5. Calibration Mode

Protection Mode

This is the normal operating mode, and the NOVA-Sensor *ELITE* will be in this mode when all conditions are normal. The lighted blue background on the display screen will be dimmed to conserve power, but the digital display of the actual concentration of the target gas will be readable, even if the detector is located outdoors in bright sunlight. The green POWER indicator will be illuminated, and will occasionally blink as a confirmation that the detector is continuing to check the area for gas.

In protection mode, all relay contacts are in the normal, non-alarm and non-fault condition, and the detector will transmit a 4.0 mA signal to any connected external equipment.

Activate the ▲MagPoint▲ on the top side of the enclosure to:

- Restore the screen illumination to full brightness
- Display the gas concentration that will activate the LOW ALARM
- Display the gas concentration that will activate the HIGH ALARM
- The detector will then return to normal operation.

Low Gas Alarm Mode

When gas is starting to accumulate in the protected area, the following occur:

- The present gas concentration is displayed. The screen will remain at half brightness during this time
- The 4-20 mA signal to external equipment increases to report the present gas concentration
- When gas concentration reaches the low alarm set point, the SCREEN FLASHES and the red LOW ALARM indicator also flashes.
- The low alarm relay is activated

NOTE: A typical application might use this LOW ALARM relay contact to activate an exhaust fan to try to remove the leaking gas from this location.

- If gas concentration goes down below the LOW ALARM set point, the red LED alarm indicator for the LOW ALARM is extinguished and the screen stops flashing, but remains at full brightness until the gas concentration returns to zero.

IMPORTANT: If the red LED alarm indicator and the screen do not stop flashing when the gas concentration is below the low alarm set point, the detector has been configured with a latching low alarm. In that case, you must activate the ▲MagPoint▲ on the top side of the detector to cancel the low alarm and return the detector to the protection mode. The low alarm may also be canceled from a remote location if a reset function has been installed in your detector.

- At zero gas concentration, the screen returns to half brightness and the detector returns to normal protection operation.

High Gas Alarm Mode

If the gas concentration continues to increase above the low alarm setpoint, the following occur:

- The present gas concentration is displayed, the SCREEN FLASHES and the LOW ALARM LED indicator will continue to flash during this time due to the low gas alarm
- The 4-20 mA signal to external equipment increases to report the present gas concentration
- When gas concentration reaches the HIGH ALARM set point, the red HIGH ALARM LED indicator also flashes.
- The high alarm relay is activated

NOTE: A typical application might use this HIGH ALARM relay contact to shut down all electrical equipment in the protected area and activate evacuation alarm signals to alert personnel.

- A high gas alarm condition is ALWAYS locked in or “LATCHED” in the detector, and the high alarm indicator and the screen will continue to flash even after the gas concentration has returned to zero.

- Activate the ▲ **MagPoint** ▲ on the top side of the detector to cancel the high alarm and return the detector to the Protection Mode. The high alarm may also be canceled from a remote location if the reset function has been installed in your detector.

Fault Mode

The NOVA-Sensor *ELITE* is designed to continually monitor its own operation and to alert personnel when it is not functioning properly. This condition is reported as a FAULT. When a fault condition is active, the following occur:

- The SCREEN FLASHES and displays SYSTEM FAULT, and the yellow FAULT LED indicator flashes (if failure is not due to power source failing)
- The 4-20 mA signal to external equipment decreases to 2.0 mA or 0.0 mA
- The fault relay contact to external equipment changes state

! WARNING: While in FAULT mode the NOVA-Sensor ELITE might not be able to report an alarm condition. The source of fault conditions should be corrected as **■ soon as possible for safety reasons.**

CALIBRATION MODE

During the Calibration Mode, the system provides a step-by-step on-screen calibration instructions to ensure proper calibration of the gas detector. The calibration can be performed by one person with the gas detector operating in the hazardous area. No manual adjustments are required for calibration.

During Calibration Mode, the analog output of the gas detector will be at 4.0 mA, the LOW ALARM and HIGH ALARM will be suppressed, and neither any of the alarm relay contacts will be activated.

The gas detector will not return to normal operation until the Calibration Mode is completed, cancelled, or aborted.

MAINTENANCE

Factory Recommended Maintenance

The NOVA-Sensor ELITE controller/transmitter has been designed with very little to no required maintenance. Depending on your application and safety guidelines in your facility, additional maintenance may be necessary to ensure the installed equipment are functioning properly.

Periodic maintenance should be performed per the manufacturer's recommendations and instructions. Factory recommended regular maintenance schedule is as follows:

- 90-day Recalibration
- Annual Verification

Optional maintenance:

- 30-day "Bump" Tests

Maintenance intervals should be independently established through a documented procedure such as a maintenance log maintained by plant/safety personnel or third party testing services.

30-Day "Bump" Tests

We recommend that a short performance test be performed at least every 30 days to verify that your NOVA-Sensor *ELITE* is operational. This is commonly called a Bump Test in the industry. During this test, you expose the detector to a small amount of test gas, just enough to see that the sensor is reading the gas concentration. It is not necessary to perform a complete recalibration of the detector.

WARNING: During the bump test all of the detector's outputs (analog and relay contacts) may be activated. Before starting, notify affected personnel and bypass any shutdowns if required.

You may use calibrating test gas (50% LEL) or any other test gas at any concentrations less than 100% LEL.

IMPORTANT: Do not use gas from a cigarette lighter, butane or propane fuel, or any other gases at high concentrations, as these will considerably shorten the life of the gas sensor head.

Expose the sensor head to the bump gas. Watch for the concentration readings to be displayed on the detector screen. You do not need to continue beyond this point, you just want to be sure that there is a response. If you have test gas with concentrations higher than the alarm trip points, you may leave the gas on until they activate if desired.

90-Day Recalibration

The gas detector has been pre-calibrated to the desired target gas at the factory, and no further calibration will normally be required when it is initially installed.

Under normal operating conditions, SST gas detectors should be recalibrated every 90 days. However, the change in calibration over time is a function of how much “background” gas is present during normal operation, and how often the detector is exposed to higher concentrations. When the gas sensor is initially installed, we recommend that the calibration be checked on a more frequent basis to determine how much the calibration is changing. To check, expose the detector to the same calibration gas as was used for the original calibration. Use the data taken over several tests to determine how often you should recalibrate the detector to keep the desired accuracy.

Automatic Recalibration Reminder

The NOVA-Sensor ELITE controller/transmitter has a built-in automatic Recalibration Reminder. 90-days after the last calibration of the detector was made, the message “CHECK CALIBRATION” will be displayed on the screen.

This will not effect the normal operation, and the NOVA-Sensor will continue in normal protection mode using the existing calibration data. However, the calibration data should be refreshed as soon as practical, using the instructions in the Calibration section of this manual.

Annual Verification

Factory recommends a system verification should be performed at least annually to verify wiring, terminal connections and stability of mounting for all integral safety equipment including but not limited to:

- Power supplies
- Field detection devices
- Control modules
- Audible and visual alarm devices
- Installed accessories

CALIBRATION INSTRUCTIONS

Calibration will take care of changes in sensor performance and drift. The automatic calibration procedure provides the NOVA-Sensor *ELITE* with reference points needed to accurately measure gas levels.

Factory Recommended Calibration Schedule

Under normal operating conditions, the factory recommends recalibrating the gas sensor every 90 days.

Factors to Consider for Frequency of Recalibration

The gas detector may require more frequent or less frequent recalibration based on your application. When the gas detector is initially installed, it is recommended to verify the reading on the detector every 30 days. Any constant reading +/- 4% LEL may indicate the sensor sensitivity has changed and requires recalibration. This is due to the function of how much “background” gas is present during normal operation, and how often the detector is exposed to higher concentrations.

Sensors exposed to “background” gas during normal operation will affect the sensitivity of the sensor and will require more frequent calibration.

When to Recalibrate the Gas Detector

The following lists when to recalibrate the gas detector:

- Every 90 days after the last calibration
- Constant reading of +/- 4 or any negative reading
- Constant exposure to combustible gas will affect the sensitivity of the sensor and require the sensor to be recalibrated more frequently
- After exposure to high concentrations of combustible gas
- After a gas leak has occurred triggering the LOW ALARM or HIGH ALARM setpoints of the gas detector

! NOTE: The calibration can be performed by one person with the gas detector operating in the hazardous area. No manual adjustments are required for calibration.

During the calibration procedure, clean air as well as calibrated test gas are applied to the detector. If clean air cannot be assured, you may need to “purge” the sensor with clean air from a gas bottle.

Tools Required for Calibration

IMPORTANT: Calibration gas with a concentration of exactly one-half of the rated full scale of the NOVA-Sensor ELITE mixed with air is required for the calibration procedure (e.g. 50% LEL balance air calibration gas for a 100% LEL combustible gas sensor).

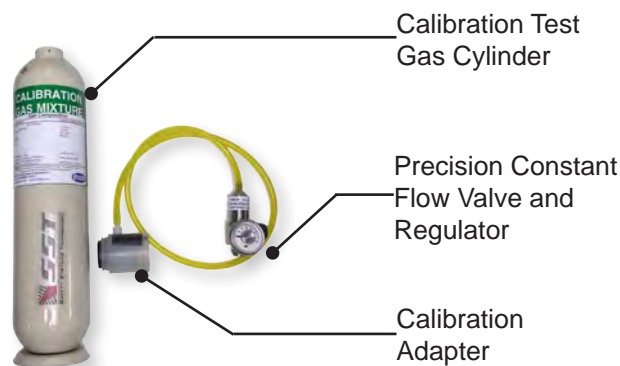
WARNING: Ensure you have enough calibration gas in the cylinder. If calibration gas cylinder is low, there may not be enough gas in the cylinder to accurately calibrate the detector. Calibration will not be correct if insufficient gas is used during the calibration procedure.

The following are required to recalibrate the gas detector:

- A cylinder of 50% LEL, balance air calibration gas
- OPTIONAL: A cylinder of clean air will be required if there are “background” gases or clean air cannot be assured.
- Calibration Kit which includes a precision constant flow valve and regulator, tubing, calibration adapter and carrying case for two cylinders of gas. Calibration test gas is sold separately. See below for ordering information.

Calibration Parts and Ordering Information

SST Part #	Description
857-01	Model 857 Calibration Kit (test gas sold separately) Complete kit includes calibration adapter, flow regulator and carrying case for two cylinders of calibration test gas
866-1S	Calibration adapter cup
857-02	Methane 50% LEL (balance air)
857-03	Propane 50% LEL (balance air)
857-04	Hydrogen 50% LEL (balance air)
857-05	Butane 50% LEL (balance air)
857-06	Butadiene 50% LEL (balance air)
857-07	Ethane 50% LEL (balance air)
857-08	Pentane 50% LEL (balance air)
857-85	Zero air 0% LEL
857-(Gas)	For other gases, please specify gas upon ordering



Step-by-Step Calibration Procedure

During the Calibration Mode, the 4-20 mA output is set to 2 mA and the relay outputs will not be activated.

The Model GC804 will respond to almost any combustible gas or vapor. Make sure to use a calibration test gas that matches the target gas the gas detector is supposed to detect. If the gas detector is supposed to detect Methane gas leaks, make sure the calibration test gas is Methane.

IMPORTANT: The gas detector has been pre-calibrated at the factory. The user has the option to recalibrate the gas detector after installation. When calibrating the gas detector, verify the target gas that the gas detector has been calibrated to. The gas detector LCD screen will display that target gas. Use of a calibration test gas different than the target gas will result in inaccurate reading. Follow the on-screen calibration instructions during calibration. The unit will specify the calibration gas required.

Zero Calibration

1. If clean air cannot be assured and there are “background” gases to set the ZERO, use a cylinder of clean source of zero gas or compressed air.
2. Remove the weather protection or any accessory(ies) from the sensor before applying the zero gas.
3. Enter Calibration Mode by applying and holding the ▲MagPoint▲ Key Fob on the top side of the gas detector for approximately 10 seconds.
4. The screen will display “HOLD FOR CALIBRATION MODE”.
5. The screen will then display “TO START CALIBRATION RELEASE NOW” and remove the ▲MagPoint▲ Key Fob.
6. The screen will display “CALIBRATION MODE” and “SETTING ZERO...WAIT.”
7. Apply the Zero Gas at this time. If Zero Gas is not required, let the system Set the Zero and wait. DO NOT apply the Calibration Gas at this time.

WARNING: If the sensor is exposed to any combustible gases during this step, the calibration will not correct. Any presence of combustible gas in the background or applying the combustible test gas at this point will result in incorrect readings.

8. Once the Zero calibration is set the screen will display “CHECK GAS PRESSURE AND APPLY 50% LEL (GAS).” Zeroing is complete and saved at this point.

Span Calibration

9. Check the gas pressure on your test gas cylinder to ensure you have enough gas to complete the calibration.

IMPORTANT: If calibration gas cylinder pressure is low, there may not be enough gas in the cylinder to accurately calibrate the detector. Abort the Calibration Mode immediately by placing the ▲MagPoint▲ Key Fob on the top side of the detector twice. Calibration will not be correct if you continue the calibration procedure with insufficient gas.

10. Apply the required test gas at this time.

NOTE: You have 5 minutes to apply the calibration test gas. If the system does not detect any calibration test gas during this time, the system will abort the calibration mode and the previous calibration data will be used.

11. The screen will display “GAS DETECTED...WAIT”

12. The screen will display “REMOVE GAS...WAIT.” Remove the test gas at this time.

13. The screen will display “CALIBRATION COMPLETE.”

14. Once the calibration is complete, the gas detector will return to normal operation.

15. Reinstall the weather protection or other accessory(ies).

Failed or Incomplete Calibrations

During the Calibration Mode, the NOVA-Sensor ELITE will wait for up to 5 minutes for gas to be applied during Zero and Span Calibration.

If no gas is detected during this time period, the system will abort the calibration mode and use the previous calibration data and the gas detector will return to normal operation.

Causes of Failed or Incomplete Calibrations

- No test gas is reaching the gas sensor.

Check for any blockage in the porous metal filter on the opening of the gas sensor. Debris, dust, or mud could be blocking the sensor. Weather protection accessories are available to protect the sensor and should be used to prevent any damage to the sensor.

- Gas sensor is damaged.

Exposure to water, silicones or other “poisoning” substances can damage the sensor. If the sensor is unable to detect the calibration test gas, the sensor may have been damaged and must be replaced.

- Gas sensor has reduced sensitivity.

Extended exposure to high concentration of combustible gas over a very long time period will affect the sensor and will no longer calibrate. Replacement of the sensor is required.

- Calibration test gas applied during Zero calibration

Applying the calibration test gas during Zero calibration will result in negative displays and inaccurate readings.

- Calibration test gas applied too late.

Applying the calibration test gas beyond the 5 minute time limit will cause the system to abort the Calibration Mode. Recalibrate the gas detector.

CALIBRATING THE DETECTOR TO A DIFFERENT TARGET GAS

The Model GC804 Combustible Gas Detector will respond to almost any combustible gas or vapor. However, the gas detector is calibrated to the target gas to ensure accurate readings. The existing gas calibration is displayed on the detector screen.

The user has the option to recalibrate the gas detector to a different target gas. For example, if the gas detector was originally purchased to detect Methane leaks but now has to detect Butane, it has to be recalibrated using Butane test gas.

Tools Required for Calibrating to a Different Target Gas

The following are required to recalibrate the gas detector to a different target gas:

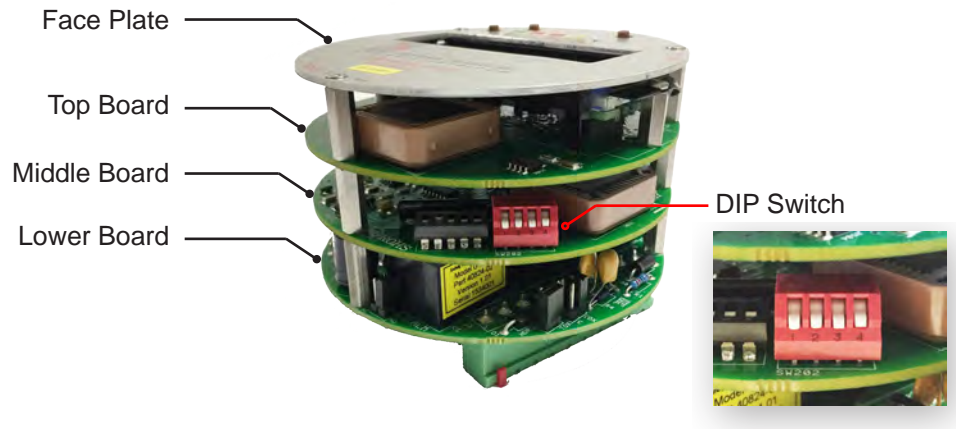
- A cylinder of 50% LEL, balance air of the new target gas
- OPTIONAL: A cylinder of clean air will be required if there are “background” gases or clean air cannot be assured. DO NOT use Nitrogen to purge the sensor, false reading may result!
- Calibration Kit which includes a precision constant flow valve and regulator, tubing, calibration adapter and carrying case for two cylinder of gas. The Calibration Kit is sold separately. See below for ordering information.
- 1.5 mm hex wrench to remove the enclosure cover for an aluminum housing or 2.0 mm for a stainless steel housing
- Slotted head screwdriver 1/16 inch or 1.55 mm width

Steps to Calibrate the Gas Detector to a New Target Gas

WARNING: Access to the interior of the gas detector or removal of the NOVA-Sensor ELITE controller/transmitter must only be conducted by trained personnel.

WARNING: De-classify the area to reduce the risk of ignition of hazardous atmosphere. Combustible and flammable gases and vapors are very dangerous. Extreme caution should be taken when these hazards are present.

1. De-classify the area. Power to the gas detector can be left on.
2. Remove the housing cover. Open the housing cover by using the hex wrench to unlock the set screw on the cover. Twist the cover all the way until it is completely off.
3. Remove the electronics module. Use a small screwdriver by inserting under the edge of the electronics module in the 3 locations marked “PRY UP” to loosen the module.
4. Change the DIP SWITCH settings on the electronics module to select a new target gas. Locate the DIP SWITCH in the middle board to change the target gas for the detector as follows:



Target Gas	Switch 1	Switch 2	Switch 3
Butane	Up	Up	Down
Ethane	Up	Down	Up
Hydrogen	Down	Up	Down
Methane	Down	Down	Down
Pentane	Down	Up	Up
Propane	Up	Down	Down
Other*	Up	Up	Up

* When “Other” is selected, the display will read “User Selected Target.”

If new target gas is not listed above, the “Other” setting can be used. As an option, you can return the electronics module to the factory to install a customized firmware update to display the actual name of the user selected target gas.

5. Reinstall the electronics module to the housing and wait until the unit powers up.
6. Confirm the new target gas is displayed on the screen.
7. Install the housing cover. Twist the cover until you have a tight fit and use the Allen wrench to lock the set screw on the cover.
8. Recalibrate the gas detector to the new target gas. SEE “Step-by-Step Calibration Procedure”.

REPLACING THE ELECTRONIC MODULE

WARNING: Access to the interior of the gas detector or removal of the NOVA-Sensor *ELITE* controller/transmitter must only be conducted by trained personnel.

WARNING: De-classify the area to reduce the risk of ignition of hazardous atmosphere. Combustible and flammable gases and vapors are very dangerous. Extreme caution should be taken when these hazards are present.

The NOVA-Sensor *ELITE* controller/transmitter is located within the gas detector housing. Contact the factory to order a new NOVA-Sensor *ELITE* replacement module for the gas detector.

Ordering Information

SST Part #	Description
40804-32	Replacement plug-in NOVA-Sensor <i>ELITE</i> Combustible Gas electronic module. Specify target gas upon ordering.

NOTE: Replacement electronics module is shipped with factory default settings. Confirm the current settings on your existing electronics module prior to replacement.

Tools Required to Replace the Electronic Module

The following are required to replace the electronic module:

- 1.5 mm hex wrench to remove the enclosure cover for an aluminum housing or 2.0 mm for a stainless steel housing
- Slotted head screwdriver 1/16 inch or 1.55 mm width

Steps to Replace the Electronic Module

1. De-classify the area. Power to the gas detector can be left on.
2. Remove the housing cover. Open the housing cover by using the Allen wrench to unlock the set screw on the cover. Twist the cover all the way until it is completely off.
3. Remove the existing electronics module. Use a small screwdriver by inserting under the edge of the electronics module in the 3 locations marked "PRY UP" to loosen the module.
4. Modify the factory settings on the replacement electronics module if necessary. There are 4 settings that can be made on the electronics module. Copy the DIP SWITCH settings and the suitcase jumper for the LOW ALARM relay, HIGH ALARM relay, and the FAULT relay from the OLD electronics module to the NEW module.

Or SEE "Modifying the Default Settings on Your Replacement Electronics Module" below.
5. Install the new NOVA-Sensor *ELITE* electronics module in the housing.
6. Close the housing cover. Twist the cover tight.
7. Use the hex wrench to lock the set screw on the housing cover.

Modifying the Default Settings

To modify the factory default settings on your replacement electronics module, follow the following instructions.

1. Set Relay Contact Jumpers

Jumpers on the detector electronics module located on the lower most circuit board, allow relay contacts to be set as normally open or normally closed.

Default Setting

The default factory setting for the relay contacts is set to NORMALLY OPEN.

Normally Open

The gas detector is shipped with the jumpers connecting the 2 NO pins together.

Contacts will be OPEN when there is no gas alarm, and will CLOSE when a low or high gas alarm is detected.

Normally Closed

To change the default relay contact factory setting from Normally Open to Normally Close, remove the jumper plug from the NO pins and reinstall on NC pins to set this contact to be Normally Closed.

Contacts will be CLOSED when there is no gas alarm, and will OPEN when a low or high gas alarm is detected.

Fault Relay Contacts

Jumpers on the detector electronics module located on the lower most circuit board, allow fault relay contacts to be set as OPEN ON FAULT or CLOSED ON FAULT.

Default Setting

The default factory setting for the fault relay contacts is set to **OPEN ON FAULT**.

Open on Fault

The gas detector is shipped with the jumpers connecting the 2 **OF (Open on Fault)** pins together.

The fault relay contacts will be CLOSED when there is NO FAULT detected in the gas detector.

The fault relay contact will OPEN when any internal fault condition occurs in the gas detector.

The fault relay contacts will also open if the 24 volt DC power supply to the detector is interrupted.

Close on Fault

To change the default fault relay contact factory setting from OPEN ON FAULT to CLOSE ON FAULT, remove the jumper plug from the **CF (Closed on Fault)** and reinstall on **OF (Open on Fault)**.

The fault relay contacts will be CLOSED when any internal fault condition occurs in the gas detector.

The fault relay contacts will also CLOSED if the 24 volt DC power supply to the detector is interrupted.

IMPORTANT: There are two additional factory installed jumpers at the positions marked "TOX." DO NOT remove or change these jumpers nor move them, as they are required for proper operation of this detector.

2. Setting the Low Alarm Latching Operation

The gas detector has two alarm setpoints, a LOW ALARM and a HIGH ALARM. The relay contacts are activated at each stage when the setpoints are reached.

The LOW ALARM relay contact can either be set for NON-LATCHING or LATCHING.

Default Setting

The gas detector factory setting for the LOW ALARM relay contact is set for NON-LATCHING.

The setting can be verified by looking at the DIP SWITCH located on the middle board. The DIP SWITCH has a number of switches numbered from 1 to 4.

DIP SWITCH # 4 sets the LOW ALARM to NON-LATCHING or LATCHING.

For NON-LATCHING operation, DIP SWITCH # 4 is set to the DOWN position.

For LATCHING operation, DIP SWITCH # 4 is set to the UP position.

IMPORTANT: The DIP SWITCH has 3 other switches, # 1, #2, and #3. These settings are preset at the factory to match the factory calibration of your NOVA-Sensor *ELITE* electronic module. DO NOT alter these switches unless you are calibrating the detector to a different target gas. Refer to Recalibration Instructions in this manual.

Non-Latching Operation

This is the factory default setting for the LOW ALARM relay contact setpoint. When the LOW ALARM relay contact is set for **NON-LATCHING**, the relay contact is activated when the LOW ALARM setpoint is reached.

The LOW ALARM relay contact automatically **RESETS** whenever the gas level falls below LOW ALARM the setpoint.

To verify this setting, look at the DIP SWITCH located on the middle board of the NOVA-Sensor *ELITE* electronics module of the gas detector. The **DIP SWITCH # 4** will be set to the **DOWN** position.

Latching Operation

To change the LOW ALARM relay contact to **LATCHING**, locate the DIP SWITCH on the middle board of the electronics module.

Set **DIP SWITCH # 4** to the **UP** position to set the LOW ALARM relay contact to **LATCHING**.

When the LOW ALARM relay contact is set for LATCHING, the relay contact is activated when the LOW ALARM setpoint is reach.

The LOW ALARM relay contact REMAINS activated even when the gas level falls below the LOW ALARM setpoint. The LOW ALARM must be reset to return the gas detector to normal operation.

To CLEAR or RESET the LOW ALARM and return the gas detector to normal operation, **ACTIVATE** the ▲MagPoint▲ by placing the KEY FOB on the top side of the detector housing.

3. High Alarm Latching Operation

Default Setting

The HIGH ALARM is **ALWAYS** set to LATCHING and cannot be set to Non-Latching mode.

When the HIGH ALARM setpoint is reached, the HIGH ALARM relay contact is activated.

The HIGH ALARM relay contact REMAINS activated even when the gas level falls below the HIGH ALARM setpoint. The HIGH ALARM must be reset to return the gas detector to normal operation.

To CLEAR or RESET the HIGH ALARM and return the gas detector to normal operation, **ACTIVATE** the ▲MagPoint▲ by placing the KEY FOB on the top side of the detector housing.

REPLACING THE SENSOR

! WARNING: Access to the interior of the gas detector, removal of the NOVA-Sensor *ELITE* controller/transmitter and replacing the sensor must only be conducted by trained personnel.

! WARNING: De-classify the area to reduce the risk of ignition of hazardous atmosphere. Combustible and flammable gases and vapors are very dangerous. Extreme caution should be taken when these hazards are present.

The sensor used with the NOVA-Sensor *ELITE* controller/transmitter have no serviceable parts. The sensor must be replaced when it has reached the end of their operational life.

Ordering Information

SST Part #	Description
800-4	Model GC804-4 standard replacement sensor, catalytic type, stainless steel, ATEX listed. <i>Use only to replace sensors marked NET22-NP-17SH.</i>
800-2	Model GC804-2 replacement sensor, catalytic type, stainless steel, ATEX and CSA listed. <i>Use only to replace sensors marked VQ21T/3.</i>

! WARNING: Order the correct replacement sensor for your unit. These sensors cannot be interchanged. Failure to install the correct item may damage the sensor.
 ■ To ensure the correct sensor is ordered, please contact the factory and provide the Serial Number of your existing unit.

! WARNING: Handle sensors with care as they may contain corrosive solutions. Do not tamper or in any way disassemble the sensor. Do not expose to temperatures outside the recommended range. Do not expose sensor to organic solvents or flammable liquids. Dispose sensors in an environmentally safe manner. Disposal should be according to local waste management requirements and environmental guidelines or legislation. You may return sensors to Safety Systems Technology clearly marked for environmental disposal.

Tools Required to Replace the Sensor

The following are required to replace the sensor:

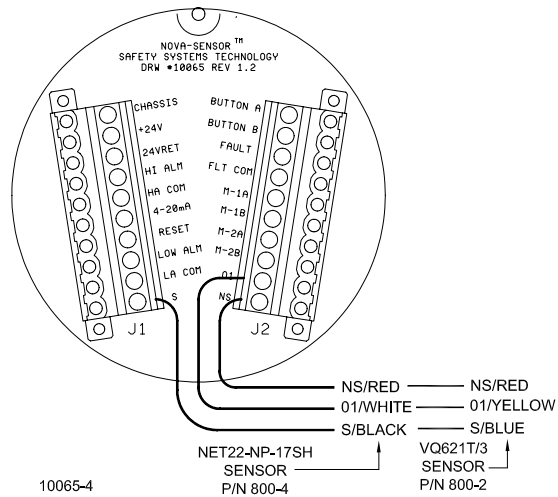
- 1.5 mm hex wrench is required for aluminum housing or 2.0 mm for stainless steel housing to remove the enclosure cover. Remove any weather protection or accessory(ies) installed on the sensor
- Slotted head screwdriver 1/16 inch or 1.55 mm width

Steps to Replace the Sensor

1. De-classify the area. Power to the gas detector can be left on.
2. Remove the housing cover. Open the housing cover by using the Allen wrench to unlock the set screw on the cover. Twist the cover all the way until it is completely off.
3. Remove the existing electronics module. Use a small screwdriver by inserting under the edge of the electronics module in the 3 locations marked "PRY UP" to loosen the module. Set it aside.
4. Remove the sensor wiring connected to the terminal block inside the housing. Using a flat-head screwdriver, loosen the following terminal connections:

Terminal Number	Marking	NET22-NP-17SH Sensor (Standard)	VQ21T/3 Sensor
10	S	Black	Blue
19	01	White	Yellow
20	NS	Red	Red

5. Turn the sensor head counter clockwise. If necessary, use a wrench to remove the sensor from the detector housing.
6. Connect the wiring of the new sensor to the terminal blocks as follows:



Terminal Number	Marking	NET22-NP-17SH Sensor (Standard)	VQ21T/3 Sensor
10	S	Black	Blue
19	01	White	Yellow
20	NS	Red	Red

7. Re-install the new NOVA-Sensor *ELITE* electronics module in the housing.
8. The electronics module will power up.
If the new sensor is not detected, remove the electronics module and verify the wiring is connected properly.
9. Close the housing cover. Twist the cover tight.
10. Use the Allen wrench to lock the set screw on the housing cover.
11. Calibrate the new sensor. SEE "Calibration Instructions" section of this manual.

TROUBLESHOOTING

CAUTION: All repairs shall only be performed at a Safety Systems Technology facility and by its authorized service personnel. Failure to comply will invalidate the warranty on the gas detector.

Disconnect or inhibit external alarm wiring before troubleshooting the unit, which might send the detector into alarm.

Display Screen

A non-functioning LCD display may indicate damage. Send the electronics module to the factory for repair or replacement. SEE "REPAIRS" section of this manual for instructions.

Calibration Failure Message

This fault will occur if the detector is placed in the Calibration Mode and no calibration test gas has been applied within five minutes. The system will use the previous calibration data and will return to normal operation.

Recalibrate the detector to ensure the proper operation of the detector.

Check Calibration Message

The display shows "CHECK CALIBRATION." This would indicate that the sensor head has lost some sensitivity, resulting in display values of less than 0% LEL.

Perform a recalibration procedure to correct this. If the recalibration does not result in a 0% LEL reading, the sensor head has probably been damaged. Replace the sensor head.

Drifting or Unstable % LEL Readings

Drifting or unstable % LEL readings may result from loose wires. Check the 3 wires connecting the sensor to the electronics module inside the housing. Screw terminals, crimped connectors or wire nuts on these wires must be extremely tight to maintain the low resistance connections between the head and the electronics.

Also check the jumper on the two "C" pins of the electronics module to be sure that the jumper plug is securely seated on the pins.

False Alarms

If you are having an "unreasonable" number of false alarms, verify the gas concentration near the gas detector using a personal gas monitor. If there is no gas or very little gas, recalibrate the gas detector. Extended exposure to combustible gas will require recalibration of the gas sensor.

In some cases, false alarms may be the result of the sensor head losing sensitivity and the system has tried to compensate by increasing the amplifier sensitivity. If this is the case, the sensor should be replaced and a new calibration performed.

System Fault Message and Fault LED Light is On

There are several factors that may trigger a system fault:

- A problem with the power supply. The 24 volt DC power supplied to the detector may be less than 16 volts or greater than 32 volts. Replace or service the power supply.
- The sensor may have failed. This may indicate the sensor has been damaged. Check to make sure the wiring inside the enclosure has not been disconnected or damaged. If the sensor is damaged, replace the sensor.
- An internal failure has occurred in the electronics module. Replace the electronics module and send to factory for repairs.

Transient Interference or Power Surges

Transient voltage suppressors in the NOVA-Sensor ELITE protect the electronics from transients that may be induced into the field wiring during operation.

The terminal marked CHASSIS inside the enclosure is factory connected to the 24VRET terminal to complete the suppression path.

In areas where there are sever high energy transients, including those caused by lightning, you may get more effective transient suppression by removing the factory jumper and connecting the CHASSIS terminal to the earth grounding screw inside the detector enclosure.

! WARNING: The above change can be made only if the enclosure is firmly connected to earth ground and the voltage measured between the earth ground screw and the 24VRET terminal is not greater than the 2.0 volts DC.

Technical Support

Headquarters

Safety Systems Technology, Inc.
23282 Mill Creek Drive, Suite 215
Laguna Hills, CA 92653
U.S.A.

Phone Numbers

1.866.507.2264 Toll-free (USA only)
+1.949.583.1857 Main
+1.949.340.6643 FAX

E-Mail Addresses

techalert@safetysys.com Technical Support
sales@safetysys.com Sales

SPARE PARTS AND ACCESSORIES

To order spare parts and/or accessories, please contact the nearest Safety Systems Technology's authorized distributor or Safety Systems Technology Customer Care Department and provide the following information:

- Part number
- Description
- Quantity

Replacement Sensors

800-4	Model GC804-4 standard replacement sensor, catalytic type, stainless steel, ATEX listed. <i>Use only to replace sensors marked NET22-NP-17SH.</i>
800-2	Model GC804-2 replacement sensor, catalytic type, stainless steel, ATEX and CSA listed. <i>Use only to replace sensors marked VQ21T/3.</i>

Replacement Electronics Module

40804-32	Model GC804-4 NOVA-Sensor <i>ELITE</i> replacement electronics module. <i>Use only with sensors marked NET22-NP-17SH.</i>
40802-32	Model GC804-4 NOVA-Sensor <i>ELITE</i> replacement electronics module. <i>Use only with sensors marked VQ21T/3.</i>

To order a replacement module, the exact part number (Part) from the label on your existing electronics module or the serial number (SN) visible through the NOVA-Sensor *ELITE* window MUST be provided.

40804-03	Replacement PC board and plug-in terminal blocks.
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Replacement Housing

20440-01	Replacement housing with window, aluminum
20441-01	Replacement housing with window, stainless steel
870-020	Pipe mounting adapter

Test Equipment

857-01	Model 857 Calibration Kit (test gas sold separately) Complete kit includes calibration adapter, flow regulator and carrying case for two cylinders of calibration test gas
866-1S	Calibration adapter cup
857-02	Methane 50% LEL (balance air)
857-03	Propane 50% LEL (balance air)
857-04	Hydrogen 50% LEL (balance air)
857-05	Butane 50% LEL (balance air)
857-06	Butadiene 50% LEL (balance air)
857-07	Ethane 50% LEL (balance air)
857-08	Pentane 50% LEL (balance air)
857-85	Zero air 0% LEL
857-(Gas)	For other gases, please specify gas upon ordering

Accessories

Accessories for Model GC804-4. Order from this list with sensors marked NET22-NP-17SH:

851-5-4	Waterspray shield
852-1-4	Dust cover
853-1-4	Gas sensor sampling block
854-1-4	Duct mounting assembly, aluminum 5 inch sampling tube
859-1-4	Gas collection cone
858-1-4	Remote calibration adapter

Accessories for Model GC804-2. Order from this list with sensors marked VQ21T/3:

851-5-2	Waterspray shield
852-1-2	Dust cover
853-1-2	Gas sensor sampling block
854-1-2	Duct mounting assembly, aluminum 5 inch sampling tube
859-1-2	Gas collection cone
858-1-2	Remote calibration adapter

Other accessories:

10121	▲ MagPoint ▲ Key Fob
862-1	Calibration certificate
20231-2	Stainless steel tag

Junction Boxes for Remote Sensor Installation

850-2	Mounts on end of conduit run. For Group B, C, D locations. UL and CSA approved.
850-98	With wall mounting flange. For Group A, B, C, D locations.
850-99	With wall mounting flange. For Group C, D locations.
850-4	Mounts on end of conduit run. For Group B, C, D locations. UL, CSA, ATEX, and IEC approved.

Power Supplies

NOTE: The required power supply is based on the number of gas detector units and other devices installed. Contact the factory to determine the appropriate power supply for your application.

NEMA4 weatherproof enclosure for use in non-hazardous locations. 120/240 VAC input.

35501-17 24 VDC @ 1.7 amps DC Output

35501-34 24 VDC @ 3.4 amps DC Output

35501-63 24 VDC @ 6.3 amps DC Output

35503-07 24 VDC @ 1.7 amps Output w/ 7 amp-hour backup battery provides up to 24 hours reserve power

Rated explosion-proof for Class I Group C or D hazardous locations.

35502-06 24 VDC @ 0.6 amps DC Output

WARRANTY

Safety Systems Technology, Inc. warrants the Model GC804 to be free of defects in materials or workmanship under normal use and will repair or replace any unit that is found to be defective for five years after the date of manufacture. Gas detection elements that are damaged by exposure to poisoning contaminants, incorrect hookup, abuse, accident, or abnormal operating conditions are not covered by this warranty.

Defective or damaged equipment must be shipped to Safety Systems Technology accompanied by a detailed description of any issue.

Safety Systems Technology reserves the right to make the final determination of the nature of and responsibility for defective or damaged equipment. Equipment that has been repaired or modified by the user, damaged as the result of an accident, incorrectly installed or used in an application or environment for which it was not intended is not covered by this warranty. Safety Systems Technology's responsibility under this warranty shall be limited to the repair or replacement of the defective equipment at its option when it is returned to the factory transportation prepaid. The defective unit will be repaired or replaced free of charge to the customer and returned transportation prepaid. In all cases, this warranty is limited to the cost of the equipment.

To determine the warranty expiration date, look for the serial number (SN) visible through the viewing window on the electronics enclosure. The first 2 digits of the serial number are the year of manufacture and the next 2 digits are the week of manufacture. As an example, for number SN1242001, the product was manufactured in the 24th week of year 2012 (October 19, 2012). The warranty would expire 5 years from that date on October 18, 2017.

REPAIRS

All equipment requiring repair must be shipped to Safety Systems Technology accompanied by a Return Material Authorization (RMA) form. The form can be downloaded through SST's website at www.safetysys.com.

1. The following information is required:

- Model Number or Part Number
- Serial Number
- Brief description of the problem
- Contact information
- Complete shipping address for the return of the repaired items

2. Contact Safety Systems Technology to obtain an RMA number at:

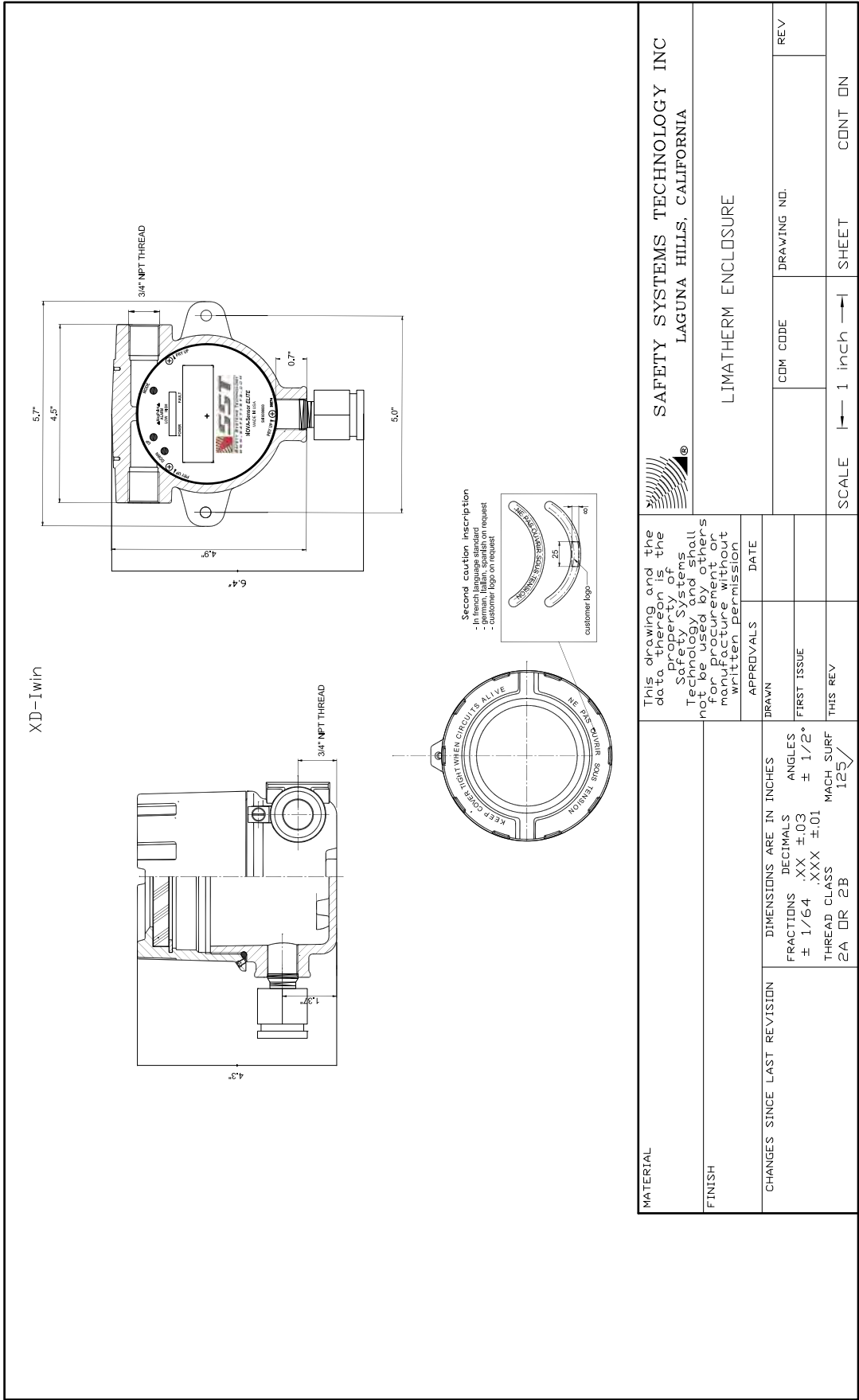
+1.949.583.1857 Main
+1.866.507.2264 Toll-free number (USA only)
or via e-mail at techalert@safetysys.com

3. Ship the unit(s) prepaid to with a copy of the RMA form inside the package:

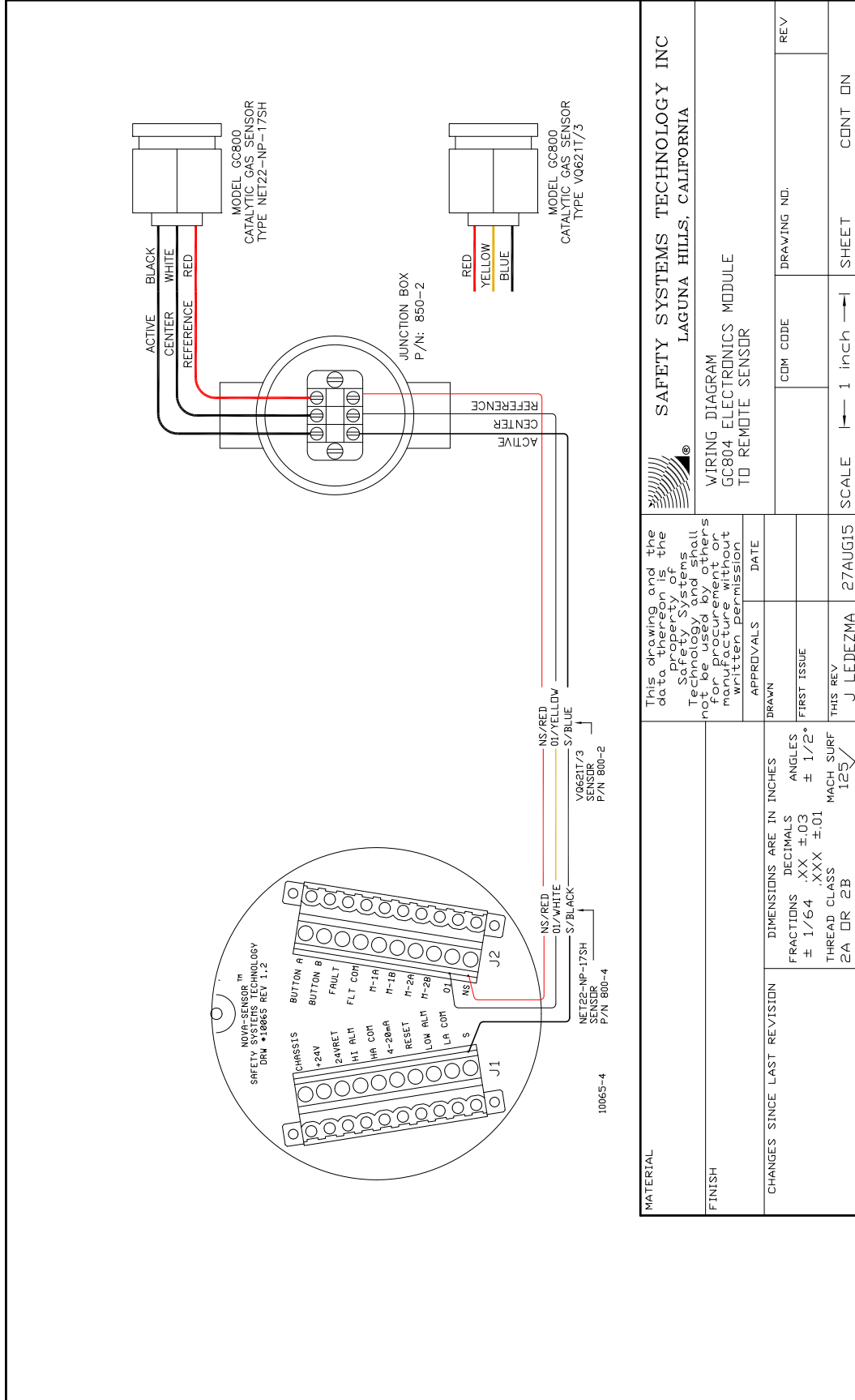
**Safety Systems Technology
Attention: Repair Department
23282 Mill Creek Drive, Suite 215
Laguna Hills, California 92653
U.S.A.
+1.949.583.1857 Phone**

Upon receipt of your equipment, a repair estimate will be sent to you and repairs will be made only after your authorization. Repair and shipping costs will be invoiced to account holders or charged to a credit card.

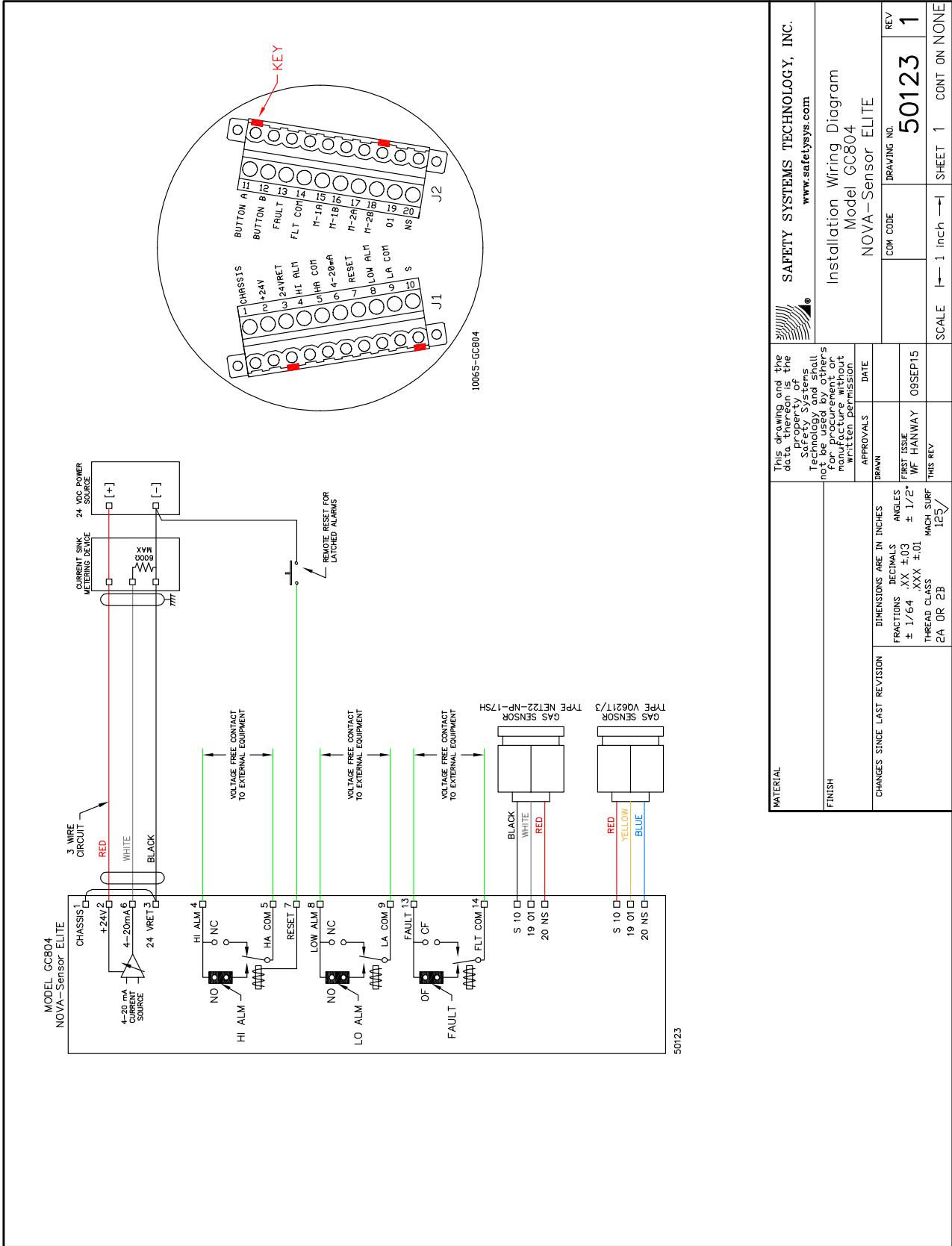
ENCLOSURE DRAWING



WIRING DIAGRAM FOR REMOTE SENSOR



<p>MATERIAL</p>		<p>This drawing and the data hereby of the Safety Systems Technology and shall not be used by others for procurement or manufacturing without written permission.</p>		<p>SAFETY SYSTEMS TECHNOLOGY INC LAGUNA HILLS, CALIFORNIA</p>	
<p>FINISH</p>		<p>APPROVALS</p>		<p>WIRING DIAGRAM GC804 ELECTRONICS MODULE TO REMOTE SENSOR</p>	
<p>CHANGES SINCE LAST REVISION</p>		<p>DRAWN</p>		<p>CDM CODE</p>	
<p>DIMENSIONS ARE IN INCHES</p>		<p>DATE</p>		<p>DRAWING NO.</p>	
<p>FRACTIONS DECIMALS ANGLES ± 1/64 .XXX ±.01 ± 1/2°</p>		<p>FIRST ISSUE</p>		<p>REV</p>	
<p>THREAD CLASS MACH. SURF 2A OR 2B 125/</p>		<p>THIS REV J LEDEZMA 27AUG15</p>		<p>SCALE 1 inch = 1 SHEET CONT ON</p>	



<p>SAFETY SYSTEMS TECHNOLOGY, INC. www.safetysys.com</p>	
<p>Installation Wiring Diagram Model GC804 NOVA-Sensor ELITE</p>	
<p>APPROVALS</p>	<p>DATE</p>
<p>DRAWN</p>	<p>DATE</p>
<p>FIRST ISSUE WF HANWAY</p>	<p>09SEP15</p>
<p>THIS REV</p>	<p>1</p>
<p>DRAWING NO.</p>	<p>50123</p>
<p>COM CODE</p>	<p>NOVA-Sensor ELITE</p>
<p>SCALE</p>	<p>1 inch = 1 inch</p>
<p>SHEET</p>	<p>1</p>
<p>CONT ON</p>	<p>NONE</p>

MATERIAL

FINISH

CHANGES SINCE LAST REVISION

DIMENSIONS ARE IN INCHES

FRACTIONS DECIMALS ANGLES

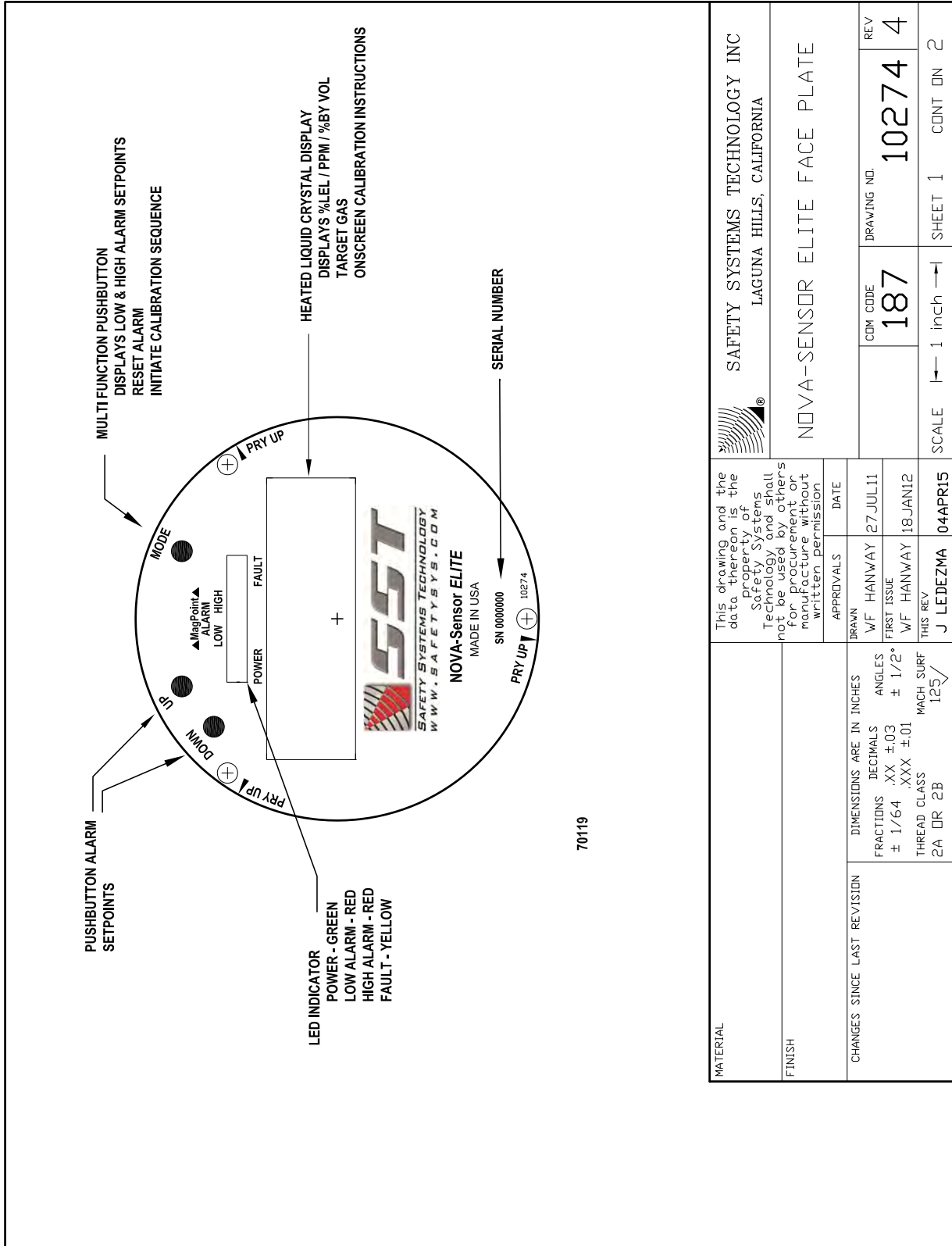
± 1/64 .XX ±.03 ± 1/2°

THREAD CLASS .XXX ±.01

2A OR 2B MACH SURF 125/

50123

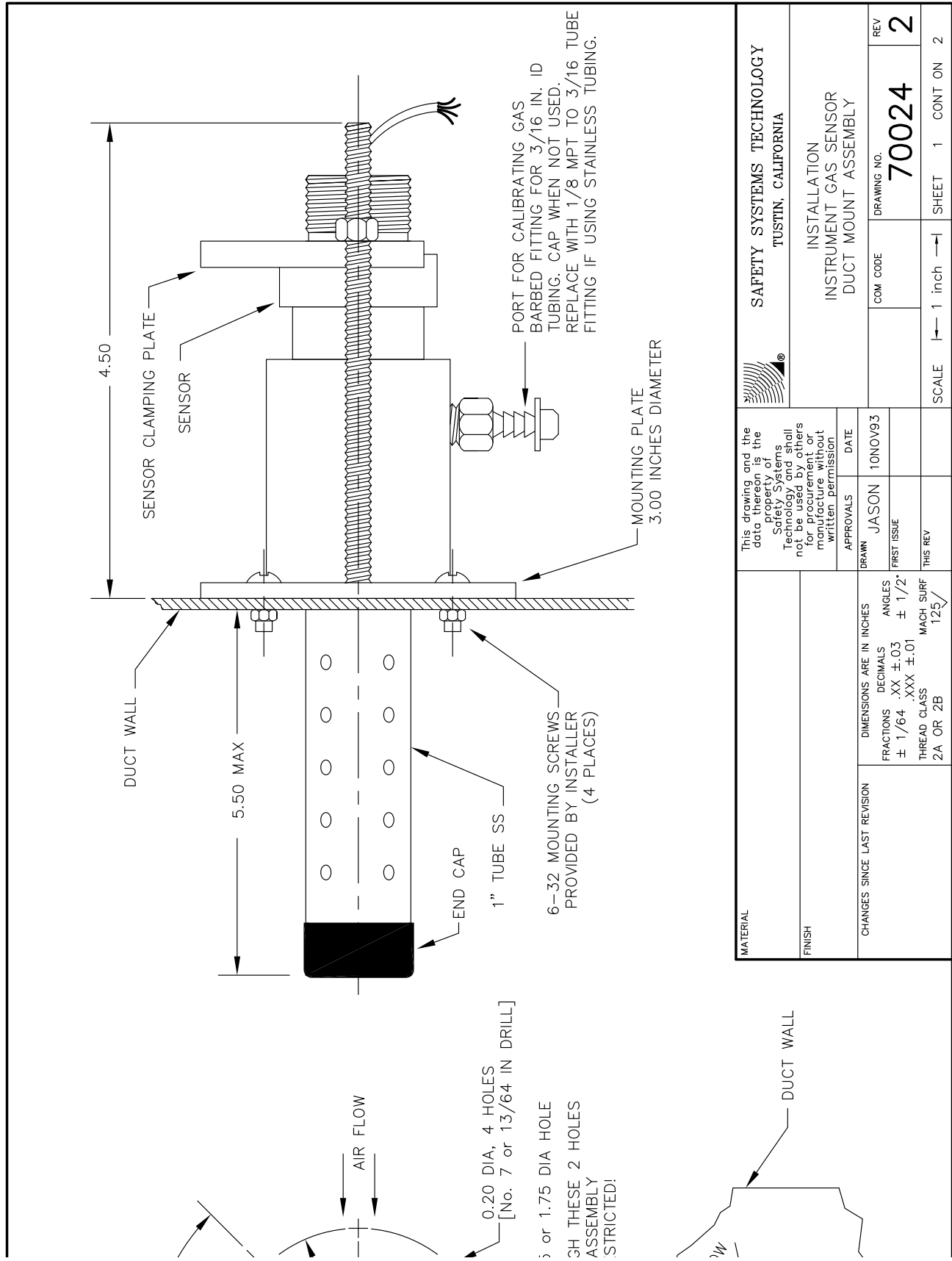
NOVA-SENSOR ELITE FACE PLATE DRAWING



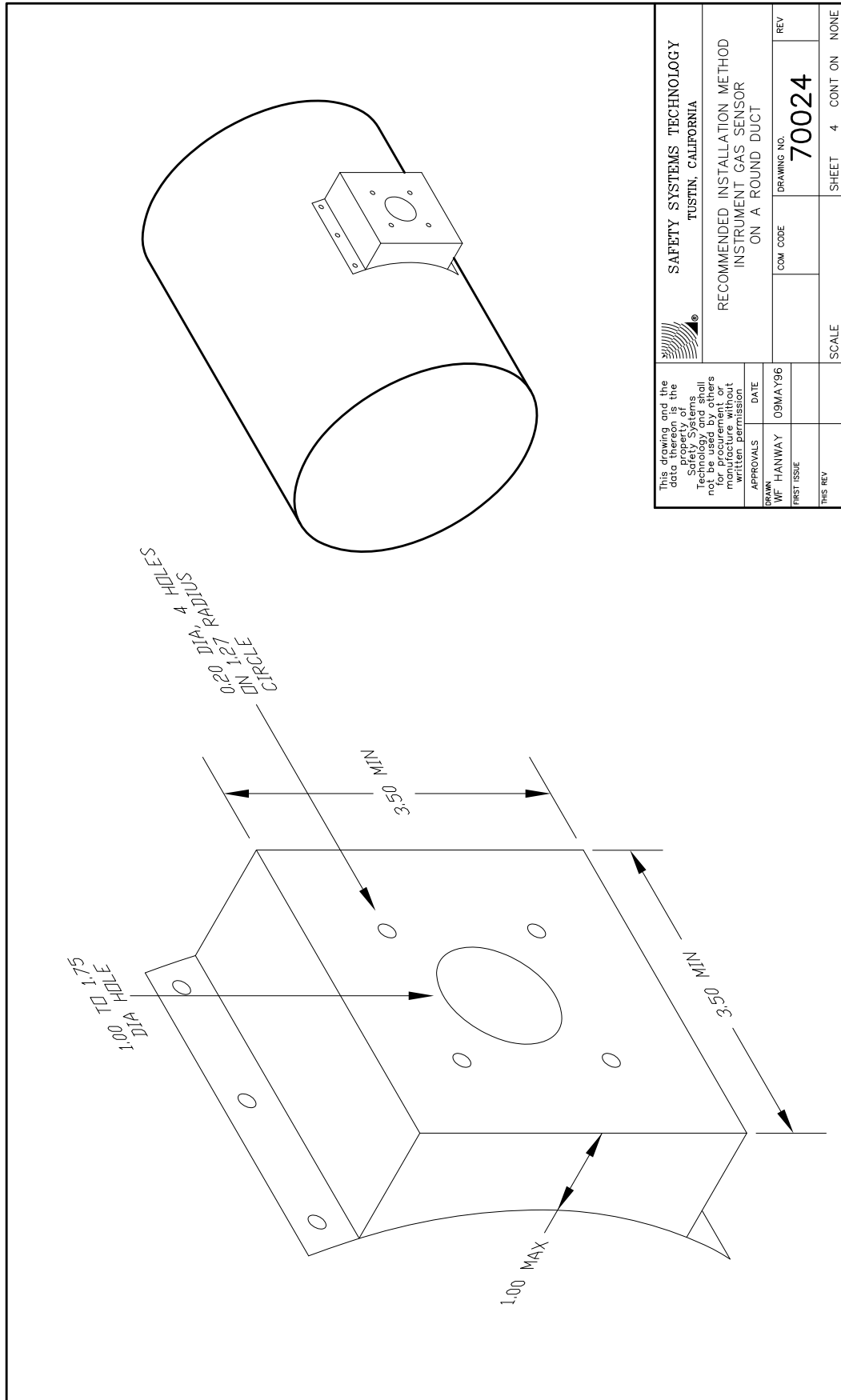
70119

MATERIAL	SAFETY SYSTEMS TECHNOLOGY INC LAGUNA HILLS, CALIFORNIA		
	NOVA-SENSOR ELITE FACE PLATE		
FINISH	APPROVALS	DATE	
	DRAWN WF HANWAY	27 JUL 11	
CHANGES SINCE LAST REVISION	FRACTIONS	DECIMALS	ANGLES
	± 1/64	.XX ±.03	± 1/2°
	THREAD CLASS	.XXX ±.01	MACH SURF
	2A OR 2B		125/
COM CODE	187	DRAWING NO.	10274
SCALE	1" = 1 inch	SHEET	1
REV		CONT	ON 2

DUCT MOUNT DRAWING



ROUND DUCT ASSY DRAWING



This drawing and the data thereon is the property of Safety Systems Technology and shall not be used by others for procurement or manufacturing without written permission.	APPROVALS	DATE	SAFETY SYSTEMS TECHNOLOGY TUSTIN, CALIFORNIA	
	WF HANWAY FIRST ISSUE	09MAY96	COM CODE	RECOMMENDED INSTALLATION METHOD INSTRUMENT GAS SENSOR ON A ROUND DUCT
THIS REV			SCALE	DRAWING NO. 70024
			SHEET	REV 4 CONT ON NONE



[1] **EC-TYPE EXAMINATION CERTIFICATE**

[2] **Component intended for use on/in equipment or protective system
intended for use in potentially explosive atmospheres
Directive 94/9/EC**

[3] EC-Type Examination Certificate number:

CESI 01 ATEX 066 U

[4] Component: Gas detectors type NET....

[5] Manufacturer: **NEMOTO ENVIRONMENTAL TECNOLOGY s.r.l. (N.E.T. s.r.l.)**

[6] Address: Via A. Manzoni, 19
20010 Pogliano Milanese (MI) - Italy

[7] This component and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] CESI, notified body n. 0722 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this component has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of components intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report n. EX-A1/027148.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:


EN 50014: 1997 + A1..A2

EN 50018: 2000

[10] The sign "U" placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

[11] This EC-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified component in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this component. These are not covered by this certificate.

[12] The marking of the component shall include the following:

 **H 2 G EEx d IIC**

This certificate may only be reproduced in its entirety and without any change, schedule included.

date September 17th, 2001 – traslation issued on September 19th, 2001

prepared CERT – M. Balaz

approved CERT – U. Colombo

CESI

CENTRO ELETTROTECNICO SPERIMENTALE ITALIANO

Business Unit Certificazione

Il Responsabile

page 1/3

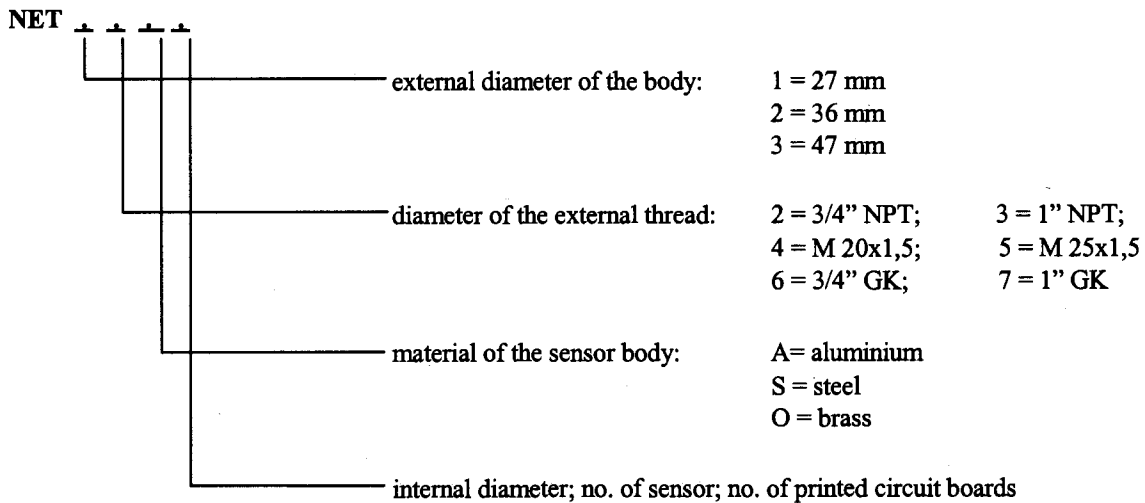
[13]

Schedule

[14] **EC-TYPE EXAMINATION CERTIFICATE n. CESI 01 ATEX 066 U**

[15] **Description of component**

The gas detectors type NET.... are identified by a code as follow:



A complete identification of the subjected apparatus is reported in the documents annexed to this EC type examination certificate.

Electrical characteristics

- Rated supply voltage: 5 V
- Maximum supply current: 200 mA

[16] **Report n. EX-A1/027148**

Routine tests

The manufacturer shall carry out the routine tests prescribed at clause 24 of EN 50014 Standard.

Descriptive documents (prot. EX-A1/027173)

- Document	no. ST718 rev. 6	(4 pages)	dated	13.02.2001
- Document	Tabella 1	(2 pages)	dated	26.02.2001
- Drawing	no. NET ME CE 002	(3 pages)	dated	17.09.2001
- Drawing	no. NET ME CE 001	(3 pages)	dated	17.09.2001
- Document	Manuale d'uso	(3 pages)	dated	26.02.2001
- Document	Attestato di conformità del componente		dated	26.02.2001

One copy of all documents is kept in CESI files.

This certificate may only be reproduced in its entirety and without any change, schedule included.

[13]

Schedule

[14] **EC-TYPE EXAMINATION CERTIFICATE n. CESI 01 ATEX 066 U**

[17] **Schedule of limitations**

The gas detectors type NET.... shall be used with an operating temperature of $-20 \div +80$ °C.

[18] **Essential Health and Safety Requirements**

Assured by compliance to the Standards indicated at page 1.



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEX Scheme visit www.iecex.com

Certificate No.: **IECEX CES 12.0009X** issue No.:0 Certificate history:

Status: **Current**

Date of Issue: **2012-06-15** Page 1 of 4

Applicant: **N.E.T. S.r.l.**
Via Legnano 2
I-20010 Cornaredo (MI)
Italy

Electrical Apparatus: **Gas detectors, series NET 1, 2 or 3**
Optional accessory:

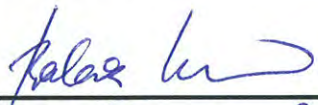
Type of Protection: **Flameproof enclosures 'd', Dust ignition protection by enclosure 't'**

Marking: **Ex d IIC T6 or T5 Gb
Ex tb IIIC T85°C or T100°C Db
IP65**

Approved for issue on behalf of the IECEX Certification Body: Mirko Balaz

Position: Head of IECEX CB

Signature:
(for printed version)


15-6-2012

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEX Website](http://www.iecex.com).

Certificate issued by:

CESI
Centro Elettrotecnico
Sperimentale Italiano S.p.A.
Via Rubattino 54
20134 Milano
Italy

CESI
CESI S.p.A.
Testing & Certification Division
Business Area Certification
Il Responsabile

Fiorenzo Bregani



IECEX Certificate of Conformity

Certificate No.: IECEx GES 12.0009X

Date of Issue: 2012-06-15

Issue No.: 0

Page 2 of 4

Manufacturer: **N.E.T. S.r.l.**
Via Legnano 2
I-20010 Cornaredo (MI)
Italy

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2007-04 Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
[IT/CES/ExTR12.0009/00](#)

Quality Assessment Report:
[IT/CES/QAR08.0001/04](#)



IECEx Certificate of Conformity

Certificate No.: IECEx CES 12.0009X

Date of Issue: 2012-06-15

Issue No.: 0

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Gas detectors series NET 1,2 or 3 are devices used for the detection of flammable or toxic gases. They are manufactured with a flameproof enclosure inside which are installed the sensing element and any electronic circuitry for the signal amplification or transmission.

The equipment is provided with a multi-core cable permanently connected to (non detachable) that through a sealed bushing allows connection to external circuits for supply/measure.

The gas detectors type NET2 and type NET3 may be equipped with a device (GD adapter) for the dust ingress protection of the sintered element. In this configuration the Db Equipment Protection Level is assigned to the gas detector.

Electrical characteristics:

- Maximum supply voltage: 30 Vdc
- Maximum absorbed current: 400 mA
- Maximum dissipated power: 0,7 W (type NET1 and NET2) and 1,4 W (type NET3)
- Ambient temperature range: from -40 /-30 /-20°C to +50 /+55 / +60°C
- Degree of protection (IEC 60529): IP 65 (only model with GD Adapter).

The ambient temperature values above reported represent the upper and lower limits of the applicable temperature range, taking into account the constructional (type of resin and dissipated power) and functional (sensing element) characteristics of the gas detectors, as specified in in the Manufacturer's documents.

CONDITIONS OF CERTIFICATION: YES as shown below:

- The supply cable of the gas detector must be protected against mechanical damages caused by impact or friction.
- User side connection of the supply cable must be in a safe area or be protected by one of the types of protection listed in IEC 60079-0 standard.
- The installation of the gas detector shall guarantee the equipotential bonding and metal continuity of the enclosure.
- The gas detectors series NET are designed for stationary installation and shall not be used for portable applications.
- The flamepaths are specified in the manufacturer drawings. For information regarding the dimensions of the flameproof joints the manufacturer shall be contacted.
- The conditions of the installation of the equipment are included within the safety instructions. For a safe use these mounting instructions are to be followed precisely.
- In case of use with enclosure subject of a separate certification for a type of protection listed in IEC 60079-0 standard, the coupling enclosure/gas detector shall not affect the type of protection of the enclosure. The requested degree of protection IP shall be guaranteed.



IECEx Certificate of Conformity

Certificate No.: IECEx CES 12.0009X

Date of Issue: 2012-06-15

Issue No.: 0

Page 4 of 4

EQUIPMENT(continued):

The various type of gas detector series NET are identified by the following code:

NET x y z

x - Type of the detector body: 1, 2 or 3

y - External thread connection: 2= 3/4" NPT; 3=1" NPT; 4=M20x1,5 (*); 5=M25x1,5 (*)

z - Detector body version and material:

A = aluminium, standard version;

S = stainless steel AISI 303, standard version;

1 = stainless steel AISI 303, perforated cap version (NET3);

2 = stainless steel AISI 316, standard version (NET3);

3 = stainless steel AISI 316, perforated cap version (NET3);

4 = stainless steel AISI 303, round, small version (NET2);

5 = aluminium, round, small version (NET2);

6 = stainless steel AISI 303, round version (NET1 – NET2);

7 = aluminium, round version (NET1 – NET2).

(*) only for type NET3

The different types of sensing elements and / or electronic circuitry installed within the flameproof enclosure are given in, are detailed in the Manufacturer's documents.

Gas detectors series NET are provided with a supplementary label plate on which, in addition to electrical parameters of the sensing element, is also specified the type of gas for which they are used.

The temperature class and/or the maximum surface temperatures are reported in the following table:

Type of sensor body	NET 1	NET 2		NET 3	
Max. power inside sensor body	≤ 0.7W	≤ 0.7W		≤ 1.4W	
Max. ambient temperature	Gb	Gb	Db	Gb	Db
+ 60 °C	T6	T5	T100°C	T5	T100°C
+ 55 °C	-	T6	T85°C	T6	T85°C
+ 50 °C	-	T6	T85°C	T6	T85°C

The marking label shows the temperature class and/or the maximum surface temperatures in function of the ambient temperature range assigned to the unit.



PHYSICAL TECHNICAL TESTING INSTITUTE

Ostrava-Radvanice



EC-Type Examination Certificate

- (1)
(2) **Equipment or Protective Systems Intended for use
in Potentially Explosive Atmospheres
Directive 94/9/EC**

- (3) EC-Type Examination Certificate Number:

FTZÚ 07 ATEX 0002U

- (4) Component: **Model XD-SI, universal instrument housing**

- (5) Manufacturer: **Limatherm, S.A.**

- (6) Address: **ul. Tarnowska 1, 34-600 Limanowa, Poland**

- (7) This Component and any of acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

- (8) The Physical Technical Testing Institute, notified body number 1026 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.


The examination and test results are recorded in confidential Report N°
07/0002 dated January 2007

- (9) Compliance with Essential Health and Safety Requirements has been assured by compliance with:
EN 60079-0:2006; EN 60079-1:2004; EN 61241-0:2006; EN 61241-1:2004

- (10) The sign „U” placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certification may be used as a basis for certification of an equipment or protective system.

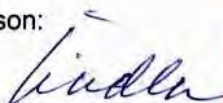
- (11) This EC-TYPE EXAMINATION CERTIFICATE relates only to design, examination and testing of the specified component in accordance to the directive 94/9/EC. If applicable, further requirements of the Directive apply to the manufacture and supply of this component.

- (12) The marking of the component shall include following:

 **I M 2 Ex d I
II 2G Ex d IIC
II 2D Ex tD**

This EC-Type Examination Certificate is valid till: **31 March 2012**

Responsible person:


Dipl. Ing. Šindler Jaroslav
Head of certification body



Date of issue: 07 March 2007

Number of pages: 4
Number of pages: 1/4

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PHYSICAL TECHNICAL TESTING INSTITUTE

Ostrava-Radvanice

(13)

Schedule

(14) **EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U**

(15) Description of Component:

XD-SI universal instrument housing is designed to accommodate different electronics instruments or devices for working in hazardous areas with flammable gases, vapours and dusts. The housing and cover are made as stainless steel investment casting.

There are three flameproof joints in XD-SI instrument body:

- On the cover is used thread M100x2/6H;
- D₂, D₃ on the conduit openings for cable gland (various type of threaded holes);
- D₁ on process opening for thermowell (D₁ - various type of threaded holes).

The cover is locked by screw with hex socket using hex spanner. Each cover is sealed with "O" ring. The unused holes can be blinded with a certified stopping plug.

(16) Report No. : 07/0002

(17) Schedule of Limitations:

- 17.1 -50°C < T_{serv} > 150°C for connection head with "O" ring made from VQM rubber (silicone)
- 17.2 IP protection 66 ÷ 68 – is depend on applied cable gland. (IP 68 – deep 1 m).
- 17.3 Max. dissipation power for temperature class are as follow:

Max. power dissipation (W)				
T _{amb}	Temperature class T6 85°C	Pztr (W)	Temperature class T5 100°C	Pztr (W)
		For all variety of enclosures position horizontally/vertically		For all variety of enclosures position horizontally/vertically
40°C	Δ θ ≤ 40 K	14,7 / 14,3	Δ θ ≤ 55 K	21,8 / 21,4
55°C	Δ θ ≤ 25 K	8,3 / 8,1	Δ θ ≤ 40 K	14,7 / 14,3
70°C	Δ θ ≤ 10 K	2,3 / 2,3	Δ θ ≤ 25 K	8,3 / 8,1
85°C	N.A.	- / -	Δ θ ≤ 10 K	2,3 / 2,3

(18) Essential Health and Safety Requirements:

Covered by standards mentioned in (9) of this certificate.

Responsible person: _____

Dipl. Ing. Sindler Jaroslav
Head of certification body



Date of issue: 07 March 2007

Page: 2/4

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PHYSICAL TECHNICAL TESTING INSTITUTE
Ostrava-Radvanice

(13)

Schedule

(14) **EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U**

(19)

LIST OF DOCUMENTATION

- Application manual N-L3625 dated 18.12.2006
- Catalogue sheets for model: XD-SI dated 03.2007
- Drawings N°: 2-Z-L3586 dated 03.01.2007
- Stainless Steel Specification: 1.4301 AISI 304
1.4541 AISI 321
1.4401 AISI 316
- Silicone rubber specification ELASTOSIL R701/40-R701/80

Responsible person:

Dipl. Ing. Šindler Jaroslav
Head of certification body



Date of issue: 07 March 2007

Page: 3/4

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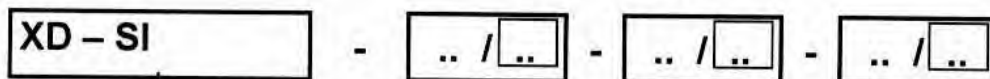
(13)

Schedule

(14) EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U

(20)

TYPE KEY



TYPE OF INSTRUMENT HOUSING

SYMBOL OF CONDUIT THREAD D₃ - D₂
M2 = M20x1,5 6H
M24 = M24x1.5 6H
M25 = M25x1.5 6H
G2 = G ½, BSP ½
G3 = G ¾, BSP¾
N2 = ½ NPTmod – modified ac. to OIT-17/03
N3 = ¾ NPTmod – modified ac. to OIT-17/03
PD = plugged
Notice:
Type: "size of thread / PD" if thread is plugged ex. M2/PD, etc.

SYMBOL OF PROCESS THREAD D₁
M2 = M20x1,5 6H
M24 = M24x1.5 6H
M25 = M25x1.5 6H
M27 = M27x2 6H
G2 = G ½, BSP ½
G3 = G ¾, BSP¾
N2 = ½ NPTmod – modified ac. to OIT-17/03
N3 = ¾ NPTmod – modified ac. to OIT-17/03
PD = plugged
Notice:
Type: "size of thread / PD" if thread is plugged ex. M2/PD, etc.





(1) **Supplement No. 1 to
EC-Type Examination Certificate**

(2) **Equipment or Protective Systems Intended for use
in Potentially Explosive Atmospheres
Directive 94/9/EC**

(3) EC-Type Examination Certificate Number:

FTZÚ 07 ATEX 0002U

(4) Component: **Model XD-SI, universal instrument housing**

(5) Manufacturer: **Limatherm, S.A.**

(6) Address: **ul. Tarnowska 1, 34-600 Limanowa, Poland**

(7) This supplement of certificate is valid for: - new model **XD-SIwin** (variant) – extension of series
- extension of Tserv for XD-SI serie


(8) Modification of certified component and any of its approved variants are specified in documentation, a list of which is mentioned in the schedule of this certificate.

(9) This supplement to type examination relates only to design, examination and testing of the specified component in accordance to the directive 94/9/EC. If applicable, further requirements of the Directive apply to the manufacture and supply of this component.

(10) Safety requirements of modified parts were fulfilled by satisfying of following standards:

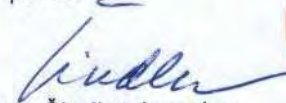
EN 60079-0:2006; EN 60079-1:2007; EN 61241-0:2006; EN 61241-1:2004

(11) Marking of component shall contain symbols:

 **I M 2 Ex d I
II 2G Ex d IIC
II 2D Ex tD A21**


(12) This type examination certificate is valid till: **31.03.2012**

Responsible person:


Dipl. Ing. Šindler Jaroslav
Head of certification body



Date of issue: 14.01.2009


Number of pages: 3
Page: 1/3

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**Physical Technical Testing Institute
Ostrava-Radvanice**

(13)

Schedule

(14)

**Supplement No. 1 to
EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U**

(15) Description of Component:

- XD-SI win enclosure is alternatively designed with the cover with a window.
- Further is changed a lock screw from M3x6 to M4x8 on the housing XD-SI and XD-SI win.
- It is introduced additional "O" ring made from fluoroelastomer FKM, for temperature range of XD-SI housing from -20°C to +200°C.

(16) Report No. : 07/0002-D1

(17) Schedule of limitations:

17.1 T_{serv} : -20°C to +200°C for XD-SI enclosure (fluoroelastomer rubber FKM)

T_{serv} : -20°C to +85°C for XD-SIwin (fluoroelastomer rubber FKM)

T_{serv} : -50°C to +85°C for XD-SIwin (silicone rubber VQM)

17.2 The conditions, mentioned in the main document are valid in whole range.

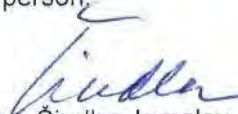
17. Max power dissipation (W):

Max. power dissipation (W)						
T _{amb}	Temperature class T6 85°C	Pztr (W)		Temperature class T5 100°C	Pztr (W)	
		Cover with window Horizontally / Vertically			Cover with window Horizontally / Vertically	
40°C	Δ θ ≤ 40 K	20,0 / 15,0		Δ θ ≤ 55 K	29,0 / 24,0	
55°C	Δ θ ≤ 25 K	11,0 / 8,5		Δ θ ≤ 40 K	20,0 / 15,0	
70°C	Δ θ ≤ 10 K	3,6 / 3,1		Δ θ ≤ 25 K	11,0 / 8,5	
85°C	N.A.	- / -		Δ θ ≤ 10 K	3,6 / 3,1	

(18) Essential Health and Safety Requirements:

Covered by standards mentioned in (10) of this supplement.

Responsible person:


Dipl. Ing. Šindler Jaroslav
Head of certification body



Date of issue: 14.01.2009

Number of pages: 3
Page: 2/3

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Physical Technical Testing Institute
Ostrava-Radvanice

(13)

Schedule

(14)


Supplement No. 1 to
EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U

(19)

LIST OF DOCUMENTATION

- Application manual No. N-L3625 dated 28.11.2008
- Data sheet-type XD-SI dated 09.09.2008
- Data sheet-type XD-SI win dated 09.09.2008
- Drawings No.: 2-Z-L3586 dated 27.08.2008
- Drawings No.: 2-Z-L4029 dated 09.09.2008
- Compound data sheet VR1-fluoroelastomer FKM
- Composition and technical information about Soda lime glass

Responsible person:


Dipl. Ing. Sindler Jaroslav
Head of certification body



Date of issue: 14.01.2009

Number of pages: 3

Page: 3/3

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Physical Technical Testing Institute
Ostrava-Radvanice



Supplement No. 2 to EC-Type Examination Certificate

Equipment or Protective Systems Intended for use
in Potentially Explosive Atmospheres
Directive 94/9/EC

(3) EC-Type Examination Certificate Number:

FTZÚ 07 ATEX 0002U

(4) Component: **Model XD-SI, XD-SIwin Instrument Housing**

(5) Manufacturer: **Limatherm, S.A.**

(6) Address: **ul.Tarnowska 1, 34-600 Limanowa, Poland**

(7) This supplement of certificate is valid for: - prolongation of certificate validity


(8) Modification of certified component and any of its approved variants are specified in documentation, a list of which is mentioned in the schedule of this certificate.


(9) This supplement to type examination relates only to design, examination and testing of the specified component in accordance to the directive 94/9/EC. If applicable, further requirements of the Directive apply to the manufacture and supply of this component.


(10) Safety requirements of modified parts were fulfilled by satisfying of following standards:

EN 60079-0:2009 EN 60079-1:2007 EN 60079-31:2009

(11) Marking of component shall contain symbols:

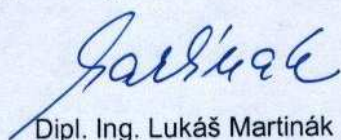
 **I M2 Ex d I Mb**

 **II 2G Ex d IIC Gb**

 **II 2D Ex t IIC Db**

(12) This type examination certificate is valid till: **05.09.2017**

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of certification body



Date of issue: 05.09.2012

Number of pages: 2
Page: 1/2

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Physical Technical Testing Institute
Ostrava-Radvanice

(13)

Schedule

(14)

Supplement No. 2 to
EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U

(15) Description of Component:

Subject of this supplement is prolongation of certificate validity of newest standards.
Flameproof housing without changes.

(16) Report No. : 07/0002-D2 (2 pages)

(17) Schedule of limitations:

- 17.1 The special conditions described in main document and the supplement No.1 are valid in all whole range.
- 17.2 Equipment tested for lower mechanical strength for mines area (I M2 Ex d I Mb) 4J.
- 17.3 Maximum design gaps of flameproof joints are smaller than maximum permitted gaps according to standard. Verified values of design gaps are mentioned in documentation.

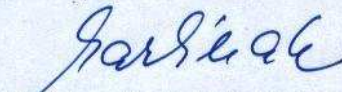
(18) Essential Health and Safety Requirements:

- 18.1 Covered by standards mentioned in (10) of this supplement
- 18.2 The additional test with sealing material were made according to the standard EN 60079-0 and related.

(19) LIST OF DOCUMENTATION

Title:	Drawing No.:	Date:
Application Manual	N-L3625	15.11.2011
XD-SI Data sheet	--	15.11.2011
XD-SI	2-Z-L3586	09.02.2012 - rev. c
XD-SIwin	2-Z-L4029	09.02.2012 - rev. b

Responsible person:


Dipl. Ing. Martinák Lukáš
Head of certification body



Date of issue: 05.09.2012

Page: 2/2

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Physical Technical Testing Institute
Ostrava – Radvanice



Supplement No. 3 to EC-Type Examination Certificate

(1)

(2)

Equipment or Protective Systems Intended for Use
in Potentially Explosive Atmospheres
(Directive 94/9/EC)

(3) EC-Type Examination Certificate Number:

FTZÚ 07 ATEX 0002U

(4) Component: **Universal instrument housing type XD-SI, XD-SIwin and XD-SILwin**

(5) Manufacturer: **Limatherm, S.A.**

(6) Address: **ul. Tarnowska 1, 34-600 Limanowa, Poland**

(7) This supplement of certificate is valid for:

- modification of certified component
- verification according to new standards
- prolongation of certificate validity

(8) Modification of certified component and any of its approved variants are specified in documentation, a list of which is mentioned in schedule of this certificate.

(9) This supplement to type examination relates only to design, examination and testing of the specified component in accordance to the directive 94/9/EC. If applicable, further requirements of the Directive apply to the manufacture and supply of this component.

(10) Safety requirements of modified parts were fulfilled by satisfying of the following standards:

EN 60079-0:2012; EN 60079-1:2007; EN 60079-31:2009

(11) Marking of component shall contain symbols:



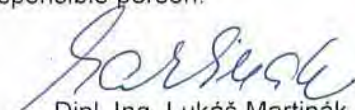
I M2 Ex d I Mb

II 2G Ex d IIC Gb

II 2D Ex tb IIIC Db

(12) This type examination certificate is valid till: **30.09. 2019**

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 05.09.2014

Page: 1/3

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FTZÚ, s.p., Pikartská 1337/7, 716 07 Ostrava-Radvanice, Czech Republic,
tel +420 595 223 111, fax +420 596 232 672, ftzu@ftzu.cz, www.ftzu.cz



**Physical Technical Testing Institute
Ostrava – Radvanice**

(13)

Schedule

(14)

**Supplement No. 3 to
EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U**

(15) Description of Component:

Modification of the Universal instrument housing consists of:

- 1) Change the thickness of circlip from 2 mm to 3 mm in types of housing with window;
- 2) Using only M and NPT threads for thread holes D₁; D₂; D₃ and the length of NPT threads was changed from 13mm to 16,2mm;
- 3) Introducing new type of housing XD-SILwin.

The types of the Universal instrument housing are recertified according to standards EN 60079-0:2012; EN 60079-1:2007 and EN 60079-31:2009.

(16) Report No.: 07/0002-3

(17) Schedule of Limitations:

17.1 Service temperature according to housing type and used sealing ring:

Housing type	Tserv.	
	VQM rubber	FKM rubber
XD- SI	-50°C to +150°C	-20°C to +200°C
XD- SIwin, XD-SILwin	-50°C to +85°C	-20°C to +85°C

17.2 IP protection 66 – 68 is depend on applied cable gland (max. IP 68 / deep =1 m);

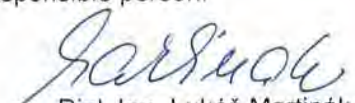
17.3 Max. number, size and position of apertures – see (19) of this supplement;

17.4 The enclosure with Ex component certificate shall be applicated only by assumption of filling requests of the standard EN 60079-1:2009 cl.D.3.10;

17.5 The type static pressure test (four times the reference pressure):

- type XD- SI; XD-SIwin – 41 bar;
- type XD-SILwin – 34 bar.

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 05.09.2014

Page: 2/3

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Ostrava – Radvanice

(13)

Schedule

(14)

Supplement No. 3 to
EC-Type Examination Certificate N° FTZÚ 07 ATEX 0002U

17.6 Max. dissipation power for temperature class are as follow:

Max. power dissipation (W)				
T _{amb}	Temperature class T6 85°C	Pztr (W)	Temperature class T5 100°C	Pztr (W)
		For all variety of enclosures position horizontally/vertically		For all variety of enclosures position horizontally/vertically
40°C	Δ 0≤40 K	20,0 / 15,0	Δ 0≤55 K	29,0 / 24,0
55°C	Δ 0≤25 K	11,0 / 8,5	Δ 0≤40 K	20,0 / 15,0
70°C	Δ 0≤10 K	3,6 / 3,1	Δ 0≤25 K	11,0 / 8,5
85°C	N.A.	--	Δ 0≤10 K	3,6 / 3,1

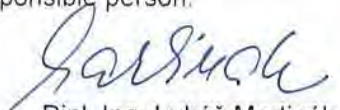
(18) Essential Health and Safety Requirements:

Covered by standards mentioned in (10) of this supplement of certificate.

(19) List of Documentation:

Title	Drawing No.	Date	Revision
Application manual	N-L3625	11.09.2012	
Datasheet	XD-SI	11.09.2012	
Drawing No.: XD-SI	2-Z-L3586	09.02.2012	rev.c
Drawing No.: XD-SIwin	2-Z-L4029	09.02.2012	rev.b
Drawing No.: XD-SILwin	2-Z-L4266	08.11.2012	

Responsible person:


Dipl. Ing. Lukáš Martinák
Head of Certification Body



Date of issue: 05.09.2014

Page: 3/3

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Headquarters:

Safety Systems Technology, Inc.
23282 Mill Creek Drive
Suite 215
Laguna Hills, CA 92653 USA
+1.866.507.2264 Toll-Free (USA Only)
+1.949.583.1857 Phone
+1.949.340.3343 Fax
www.safetysys.com

Sales

sales@safetysys.com

Technical Support

techalert@safetysys.com

