MURCO Gas Leak Monitors / Detectors

Technical Information

&

User Instructions

Murco Limited
45 Sandycove Road
Sandycove
Co Dublin
Ireland

Telephone: (353-1) 284 6388
Fax: (353-1) 284 6389
Email: Murco@eircom.net

NOTE: These installation and user instructions must be adhered to or the correct operation of this product may be impaired resulting in danger from unobserved gas leaks.

1,2,4,6 – 1 & 2L
230V/120V
MK3

January 2000

M**URCO Gas Leak Monitors**

Contents:

INTRODUCTION

The Murco Gas Leak Monitor consists of a central control unit and 1 to 6 Remote Sensors.

1 & 2 Sensor controllers:	192mm x 100mm x 75mm wt 1.3kg
4 - 6 Sensor controllers:	260mm x 240mm x 70mm wt 2.8kg
Sensor:	110mm x 55mm x 22mm wt 80g

GENERAL SPECIFICATION

CENTRAL CONTROL UNIT

The Central Control unit is enclosed in a steel casing for direct mounting on a vertical surface. Its solid-state circuitry is mounted beneath a removable front cover. All cable entry points are through glands on the central control unit directly terminated in screw type terminal blocks. Features / outputs are as follows: -

<u>One Level Sensing Systems:</u>

- Audible warning (continuous siren) with visual indication (red LED) of sensor alerted.
- Voltage free change over relays
- Uncommitted 12 V DC @ 100mA output available to power external relays, etc. (4 - 6 Channel systems only.)

<u>Two Level Sensing Systems:</u>

Low-level Alarm:

- Visual Warning - Yellow LED
- Audible Warning - Intermittent

High-level alarm:

- Visual Warning - Red LED
- Audible Warning - Continuous

At both low and high level alarm conditions:

Voltage free relay (one each at both low and high levels)

- Uncommitted 12 V DC @ 100mA output available to power external relays, etc. (4 - 6 Channel systems only). May be used in conjunction with the no-volt relays to provide a switched 12-volt output.

Notes:

An internal alarm siren is supplied on the 1 & 2 Channel systems, however, as a factory option, a screw terminal may be supplied, allowing an external device (up to 12V DC @ 50mA maximum) to be connected.

On the 4 - 6 Channel systems, the siren is always external to the alarm panel, and a device rated up to 12V DC @ 150mA Maximum, may be connected.

On 4 - 6 Channel, two level systems only, the high-level no-volt relay may be set for Normal (relay energises on alarm condition) or Fail-Safe (normally powered relay) operation by setting Jumper JP1. Please refer to installation diagram for jumper setting detail. Also on this system is a fault reporting volt free relay, which operates in the case of a sensor fault, or power failure, etc.

REMOTE SENSOR (N-TYPE SEMICONDUCTOR)

The sensor is enclosed in its own high impact ABS casing for direct mounting. Connection of cable is made through a gland to a screw type terminal block.

Features of the sensor:

- Long-term stability. Stable characteristics eliminate need for re-calibration.
- Long life, maintenance free.
- High sensitivity, quick responses at low concentration levels.
- Excellent durability and shock proof due to its chemical and mechanical strength.

SYSTEM TECHNICAL DATA

Controller

Enclosure:	Steel
Mounting:	Wall/Bulkhead
Consumption:	1 + 2 Sensor - 45 mA / 90 mA (@ 230 V / 120V AC 50/60Hz) 3 + 4 Sensor - 90 mA / 180 mA (@ 230V / 120VAC 50/60 Hz) 5 + 6 Sensor - 150 mA / 300mA (@230 V / 120V AC 50/60 Hz)
Audio Alarm:	1/2 Sensor unit - internal 80 dB/12 V DC Sounder 4/6 Sensor unit - external 110 dB/12 V DC Sounder
Output:	Volt free relays, rated: 10 A @ 230/120 VAC - Uncommitted 12 v DC @ 100mA (4 - 6 Channel systems only)

Sensors:

The gas sensor is a solid-state sensor mainly composed of sintered tin dioxide, which detects gases through an increase in electrical conductivity when the reducing gases are absorbed on the sensors surface. The excellent stability and performance of the sensor provides unique features in gas detection. When the sensor is heated to a high temperature, e.g. 400 degrees C. Without the presence of oxygen, free electrons flow easily through the grain boundaries of the tin dioxide (Sn02-x) particles. In clean air, oxygen, which traps free electrons by its electron affinity is absorbed on to the tin dioxide particle surface forming a potential barrier in the grain boundaries. This potential barrier (eVs in air) restricts the flow of electrons, causing the electric resistance to increase.

When the sensor is exposed to an atmosphere containing reducing gases, e.g. combustible gases, CO, etc. The Tin dioxide surface absorbs these gas molecules and causes oxidation. This lowers the potential barrier, allowing electrons to flow more easily, thereby reducing the electric resistance.

The reaction between gases and surface oxygen differs depending on the sensor elements temperature and the activity of sensor materials. Various sensors are available which have different cross sensitivities by selecting the most suitable combinations of sensor temperature and activity of sensor materials.

The sensors have fast response and recovery time.

NOTE: THE GAS TO BE DETECTED MUST BE STATED WHEN ORDERING

NUMBERING SYSTEM

Example MGD1SC-1L

MGD	**1S**	**C**	**- 1L**
MURCO GAS DETECTOR	NUMBER OF SENSORS OR CHANNELS 1, 2,3,4,5 OR 6	GAS CLASSIFICATION A, OR C OTHERWISE DELETE LETTER AND QUOTE SPECIFIC GAS i.e ISOBUTANE, AMMONIA ETC	NUMBER OF DETECTION LEVELS - ONE OR TWO, 1L OR 2L

5. RANGE OF GASES DETECTED – (Selected Sample Only)

REFRIGERANTS

SEE LISTING ON PAGE 7.

COMBUSTIBLE GASES, INCLUDING:

HYDROGEN
METHANE
PROPANE
BUTANE
ISOBUTANE
PROPENE

TOXIC ODOROUS GASES, INCLUDING:

CARBON DIOXIDE
CARBON MONOXIDE
AMMONIA
HYDROGEN SULPHIDE

VOLATILE ORGANIC COMPOUNDS AND SOLVENTS, INCLUDING:

METHYL CHLORIDE
METHYLENE CHLORIDE
CHLOROFORM
CARBON TETRACHLORIDE
ETHYL CHLORIDE
ETHYLENE CHLORIDE
1.1.1. TRICHLORO ETHANE
1.1.2. TRICHLORO ETHANE
TRICHLORO ETHYLENE
TETRACHLOROETHYLENE
VINYL CHLORIDE
ETHYL ALCOHOL
N-OCTANE
N-HEXANE
ISOBUTANE

IF YOUR GAS IS NOT SHOWN PLEASE CHECK WITH US.

Murco Gas Leak Monitors and Alarms

RANGE OF REFRIGERANT GASES DETECTED, INCLUDING:

GAS	CLASSIFICATION	RECOMMENDED DETECTION LEVEL PPM		TOXICITY AEL/TLV PPM
HCFC		**LOW**	**HIGH**	
R22	A	100	1000	1000
R141B	A	100	1000	N/A
MIXTURES				
R401A (MP39)	A	100	1000	1000
R401B (MP66)	A	100	1000	1000
R402A (HP80)	A	100	1000	1000
R402B (HP81)	A	100	1000	1000
R403A (69S)	A	100	1000	1000
R403B (69L)	A	100	1000	1000
R405A	A	100	1000	1000
R406A (GHG12)	A	100	1000	1000
R408A (FX10)	A	100	1000	1000
R409A (FX56)	A	100	1000	1000
R411A	A	100	1000	1000
R411B	A	100	1000	1000
FX57	A	100	1000	1000
R502	A	100	1000	1000
CFC				
R11	C	100	1000	1000
R12	C	100	1000	1000
R113	C	100	1000	1000
HCFC				
R123	C	100	250	50
HFC				
R23	C	100	1000	1000
R134a	C	100	1000	1000
MIXTURES				1000
R404A (HP62, FX70)	C	100	1000	1000
R407B (KLEA 60)	C	100	1000	1000
R407B (KLEA 61)	C	100	1000	1000
R407C (KLEA 66/AC9000)	C	100	1000	1000
R410A	C	100	1000	1000
R500	C	100	1000	1000
R507	C	100	1000	1000
HYDROCARBONS				
R290 (PROPANE)	HYD	100	1000	1000
R600A (ISOBUTANE)	HYD	100	1000	1000
R1270 (PROPENE)				
AMMONIA				
R717 (NH3)	NH3	100	200	50/25

* ONE LEVEL MONITORS ARE SET AT LOW LEVEL. TWO LEVEL MONITORS ARE SET AT BOTH LOW AND HIGH LEVELS.

FOR GASES NOT LISTED ABOVE PLEASE CHECK WITH US.

INSTALLATION INSTRUCTIONS (Technical use only)

The main alarm unit and its sensor(s) should be positioned carefully to avoid mechanical damage (from moving machinery, doors, etc.) thermal extremes (close to heaters) and should not be placed unprotected in direct strong drafts/airflows and areas where water or moisture is present.

Avoid routing sensor cabling outside of premises, or between buildings via overhead cables. Also, Sensor wiring should be kept a minimum of 500mm from mains and telephone cables. (See section on sensor location)

The unit must be installed in accordance with these installation instructions to avoid any impairment of the equipment's protection or performance.

When power to the unit is switched on, there is a 3-minute delay before the system activates. This allows the sensors to warm up to the correct temperature for gas detection. On a two level unit, the green light on the alarm panel comes on after the delay, indicating that the system is ready. On a one level system the green light comes on immediately. When a unit has been off or stored for a long time the normalising period may be longer than 3 minutes. After the 3 minutes has expired alarms may activate. You may deactivate the siren until normalisation is complete. (Key switch on 2 level units, remove link on jumper JP1 in the case of a 1 level unit)

1. **Remove the front cover. Mount the control unit in a convenient position (observing the above note).**

2. **Wiring to Remote Sensors:**

Connect sensor cable lead (standard 4 wire alarm cable as specified below) to sensor terminal block CN1 on control unit positions 1,2,3 & 4. Route cable through the gland to remote sensor No.1.

Standard Sensors:

Remove lid of sensor 1 and connect the other end of the sensor cable to terminal block CN1 positions 1,2,3 & 4. Mount sensor box. Replace lid. Repeat above sequence for remaining sensors (depending on supplied system configuration.)

Please ensure that connections 1 to 4 on the sensor connect to their corresponding numbers on the terminal block in the main alarm unit, otherwise the system will not function correctly.

Exe sensors only:

Exd sensor heads are supplied terminating in a short 4-core lead. Connections between this lead and the wiring from the control unit should be made via an Exe rated junction box. (If not supplied by Murco) resulting in an Exe sensor assembly.

Remove the lid of the junction box and connect the free end of the cable from the controller to the terminal block. Connect the cable from the sensor head to the other side of the terminal block, Ensuring that the wires from the sensor head connect to CN1 on the control unit as per the following table:

WIRE FROM SENSOR HEAD:	CN1 TERMINAL
BLUE	4
GREEN	3
YELLOW	2
RED	1

Please ensure that connections from the sensor connect to their corresponding numbers on the terminal block on the control unit, otherwise the unit will not function correctly.

Maximum Sensor Wiring Length: 230V Systems	
1 - 2 Channel Standard Units:	40 Meters 7/0.2mm Alarm Cable (Max. 3.52 Ohms / Core)
4 - 6 Channel Standard Units:	100 Meters 7/0.2mm Alarm Cable (Max. 8.8 Ohms / Core)
Exe Rated units:	20 Meters 7/0.02mm Alarm Cable (Max. 1.76 Ohms / Core)

Maximum Sensor Wiring Length: 120V Systems	
1 - 2 Channel Units:	60.9M (200 feet) 22 gauge, stranded 4 wire Alarm Cable (Max 3.52 Ohms/Wire)
4 - 6 Channel Units:	160 Meters (520 feet) 22 gauge, stranded 4 wire Alarm Cable (Max 8.8 Ohms/Wire)
Exe Rated Units:	32.2 Meters (104 feet) 22 gauge, stranded 4 wire Alarm Cable (Max 1.76 Ohms/Wire)

3. External Sounder

External Sounder and uncommitted 12 Volt DC output.
(Applies to 4 - 6 Channel systems only)

12 volt DC Sounder - connect positive lead to CN9/CN11 (1L/2L models) terminal marked +12V, negative to centre terminal marked ‘BUZZ’.

Uncommitted 12 V DC @100mA output is obtained via CN9/CN11 Terminals ‘+12V’ and ‘0V’ This output may be wired via the volt free relays to obtain a switching 12 volt DC output to drive an external relay or solenoid as follows:

Connect Terminal ‘+12V’ on CN9/CN11 to the ‘COM’ terminal of the volt free relay, and output from the 0V terminal of CN9/CN11 and either the N/O or N/C Terminals of the volt free relay, depending on whether a 12 Volt output is required during an alarm condition or while the system is on standby.

4. Voltage Free Relays.

10A @ 120/230 VAC

	Two Level Unit:	**One Level Unit:**
1 & 2 Channel Systems:	CN5: Low Level Alarm	CN4
	CN4: High Level Alarm	

4 - 6 Channel Systems:	CN10: Low Level Alarm	CN10
	CN9: High Level Alarm	
	CN12: Fault Reporting Relays	

Notes: N/O and N/C refer to contact status in standby mode.
On a two level system, A high level alarm condition on any sensor will override a low level alarm condition on another sensor.

On 4 - 6 Channel two level units, the high level relay may be set for normal or Fail-Safe operation by setting jumper JP1 on the control unit printed circuit board (Refer to Installation diagram)

Connect leads to terminal block for Common (COM) and N/O and/or N/C connections

5. Mains Connection.

Connect mains supply (using 3-core 0.75 mm, Mains Flex for 230V systems or 3 wire, 18 gauge 0.823mm sq mains flex for 120V Systems) to terminal block CN3 (on 1 & 2 channel systems), or fused terminal block mounted on base of control unit (4 - 6 channel systems), Connections L, N and E. Ensure that earth connections to the lid and base of the enclosure are maintained.

NOTE: Connection to mains supply must be via an approved readily accessible, switched and fused (2 or 5 Amp Fuse) plug and socket or as per local wiring regulations which should be within 3 meters (10 feet) of the control unit.

: The mains cable used should be of an approved type HAR or Cenelec approved or locally approved equivalent.

: If replacement of the mains fuse is required use only the appropriate type from the table below:

Control Unit Type: 230V Systems	**Fuse Rating:**
1 - 2 Channel Unit:	20mm T50mA 230V Fuse
4 - 6 Channel Unit:	20mm T160mA 230V Fuse

Control Unit Type: 120V Systems	**Fuse Rating:**
1 - 2 Channel Unit:	20mm T100mA 120V Fuse
4 - 6 Channel Unit:	20mm T315mA 120V Fuse

: The blanking plugs for cable entries should only be removed if being replaced by cable glands

: Ensure that the live and neutral conductors take the strain before the earth conductor.

LOCATION OF SENSORS

Sensors must be located within the appropriate wire lengths from the central control unit.

In all cases the sensor supplied is designed for maximum sensitivity to a particular gas.

However, in certain circumstances false alarms may be caused by the occasional presence of sufficiently high concentrations of other gaseous impurities. If such a situation is likely to arise installers should check with our Technical Department so that sensor (s) of suitable cross sensitivity can be supplied. Examples of situations where such abnormalities may arise include.

- Plant room maintenance activity involving solvent or paint fumes or refrigerant leaks.
- Plant rooms in fruit ripening/storage facilities because of accidental gas migration (bananas - ethylene, apples - carbon dioxide)
- Heavy localised exhaust fumes (carbon monoxide, dioxide) from engine driven forklifts in confined spaces or close to sensors.

A response delay is built in to the system to minimise the possibilities of false alarms.

It is sometimes difficult to determine the number and location of sensors, as there is no hard and fast rule. However, there are a number of simple guidelines which help to make the decision easier. Most standards normally recommend some degree of "overkill" to ensure adequate redundancy.

The two methods of locating sensors are, Point Detection, where sensors are located near the most likely sources of leakage and Perimeter Detection, where sensors completely surround the hazardous area (which could also be point monitors). The size and nature of the site will help to decide which of these methods is the most appropriate to use, but the factors to bear in mind are: -

Any sensor which is to be used for detecting a gas with vapour density greater than 1 (i.e. heavier than air) should be located near ground level. Some examples of such gases would be butane, LPG (Calor gas) and xylene.

Conversely, for any lighter than air gases, such as hydrogen, methane, ammonia etc., the sensor needs to be located higher-up, perhaps under the roof space for a location indoors. (NB. At very low temperatures, such as in a refrigerated cold store, ammonia gas becomes heavier than air).

In the open, environmental conditions take on more importance. Sensors need to be located downstream of the prevailing winds and weather shields fitted to protect against rain and snow. Tropical rain can splash more than 30cms off the ground so sensors for heavy gases like LPG should be raised accordingly. Take into account the wind effects of buildings, tanks and other obstructions and remember that gas can collect in roof voids, pits and trenches.

Locations requiring the most protection in an industrial plant would be around gas boilers, compressors, pressurised storage tanks, cylinders or pipelines. Most vulnerable are valves, gauges, flanges, T-joints, filling or draining connections etc. Sensors should be positioned a

little way back from any high-pressure parts to allow gas clouds to form. Otherwise any leakage of gas is likely to pass by in a high-speed jet and not be detected by the sensor.

We can supply sensors in a special housing for use in vent pipes or air ducts or where pressure or moisture may be a problem. (Refer to vent pipe sensor housing or sensor protective housing
data sheet)

For refrigerants the UK standard BS4434: 1995 contains the under listed helpful guidelines:

Area of coverage: A detector can normally cover an area of about 36m2 provided it is mounted near ceiling level or near floor level depending on the refrigerant density.

Machinery rooms: It is recommended that detectors are sited above or to both sides of compressors or other non-static parts of the system or down wind of such equipment in the direction of continuously operating ventilation extractors. Where there are deep beams and lighter than air refrigerants it is recommended that the detectors are mounted between pairs of beams and also on the underside of the beams.

Perhaps the most important point of all is not to try and economise by using the minimum number of sensors possible. A few extra sensors could make all the difference if a gas leak occurs!

CALIBRATION

All units purchased with the correct sensors are fully set up during manufacture and do not require re-calibration. However, when local regulations require calibration on site a calibration kit can be supplied (See detailed calibration Instructions)

COMMISSIONING

When the sensors and alarm unit have been installed, switch on mains power.
There is an approximate three-minute power up delay while the sensors stabilise. After this period, the green power on LED will light. The unit is now ready to detect gas leaks.

When power to the unit is switched on, there is a 3-minute delay before the system activates. This allows the sensors to warm up to the correct temperature for gas detection. On a two level unit, the green light on the alarm panel comes on after the delay, indicating that the system is ready. On a one level system the green light comes on immediately. When a unit has been off or stored for a long time the normalising period may be longer than 3 minutes. After the 3 minutes has expired alarms may activate. You may deactivate the siren until normalisation is complete. (Key switch on 2 level units, remove link on jumper JP1 in the case of a 1 level unit)

You may check the operation of each sensor by introducing a small amount of the relevant gas to it. The appropriate LED will light and alarm or sounder will activate. This condition will continue until all traces of the gas have disappeared, when the unit will automatically return to

standby condition with only the green power LED showing and will again be ready to detect the presence of the gas.

No user intervention is required on a unit with automatic reset, if an alarm condition occurs clearing the gas from around the sensors will reset the unit.

In the case of a unit with manual reset, the unit will have to be reset by pressing the "Reset" button (gas must first be cleared from around the sensors, then after around 30 seconds the alarm can be reset manually.)

USER INSTRUCTIONS

The Murco Gas Monitor having been installed in accordance with the installation instructions is ready to monitor the chosen air space and detect gas leaks at the pre-set level.

The unit must be installed in accordance with the instructions to avoid any impairment of the equipments function.

When power to the unit is switched on, there is a 3-minute delay before the system activates. This allows the sensors to warm up to the correct temperature for gas detection. On a two level unit, the green light on the alarm panel comes on after the delay, indicating that the system is ready. On a one level system the green light comes on immediately. When a unit has been off or stored for a long time the normalising period may be longer than 3 minutes. After the 3 minutes has expired alarms may activate. You may deactivate the siren until normalisation is complete. **(Key switch on 2 level units, remove link on jumper JP1 in the case of a 1 level unit)**

Each of the sensors also has a green light to indicate that power is present.

To minimise false alarms, the system has a built in delay, between the arrival of gas at the sensor unit, and an alarm occurring. For one level units this delay is approximately 3 minutes. For two level units, this delay is 10-15 seconds before a low level alarm, and 25-30 seconds on a high level alarm. This delay can be deactivated in a one level unit by moving the link at position JP1 to the off position. (See technical installation drawing)

SYSTEM CHECKING

It is advisable to check operation of the Alarm regularly by exposing the sensor(s) to a test concentration of the appropriate gas.

RE-CALIBRATION

The system is long term stable and routine re-calibration is not necessary unless required by local regulation. (For procedure refer to technical manual)

UNIT OPERATION

Idle: Only the green light on the panel is on. No gas is present.

If the green light is off, power to the unit has been interrupted. Refer to the faultfinding guide.

ALARM CONDITION

One Level System:

One or more red lights on the panel turn on. The siren and the volt free relays operate. This indicates gas at one or more sensors at a level higher than the preset alarm point.

Two Level Systems:

Low Alarm: One of more yellow lights on the panel turn on. The sounder operates intermittently, and the low alarm volt free relay operates: this indicates presence of a low level of gas on one or more sensors.

High Alarm: One or more Red Lights on the panel turn on. The sounder operates continuously, and the High alarm volt free relay operates: this indicates presence of a High level of gas on one or more of the sensors.

For the purpose of system maintenance, The siren may be disabled temporarily, on two level units, by turning off the key-switch on the unit. On one level units this is achieved by setting a jumper on the control unit printed circuit board. The location of this is shown on the Installation Drawing (Separate one for 1 - 2 and 4 - 6 channel units) position JP1. Remove the link to disable the alarm

RESETTING AN ALARM CONDITION:

On one level units all of which have automatic reset no user intervention is required. The unit will reset shortly after the gas dissipates. (All one level systems reset automatically)

On two level units, low-level alarm conditions will reset automatically when the gas dissipates. High level alarm conditions require a manual reset (By pressing the reset button) Please note that a high alarm condition can only be reset 30-60 seconds after the gas clears from around the sensors.

FAULT FINDING GUIDE: (Technician use only)

Alarm Panel:

Symptom: No lights displayed on panel.

Cause:
1. Power failure (check supply)
2. Tripped circuit breaker or blown fuse on electrical supply
2. Blown fuse at the electrical supply on the controller PCB board.
3. Two Level unit only: Has unit warmed up? (This takes 3-4 minutes after power is switched on.)

Symptom: Red Light is on, but no alarm condition is active. i.e No siren and no relay operation after 3 minutes.

Cause:
1. Make sure the siren has not been deactivated (Key switch on 2 level units, link on jumper JP1 on 1 level units removed)
2. This indicates a wiring or sensor fault (call service provider). If these are in order the calibration pot may have been adjusted and may need to be reset. Check with us for instructions.

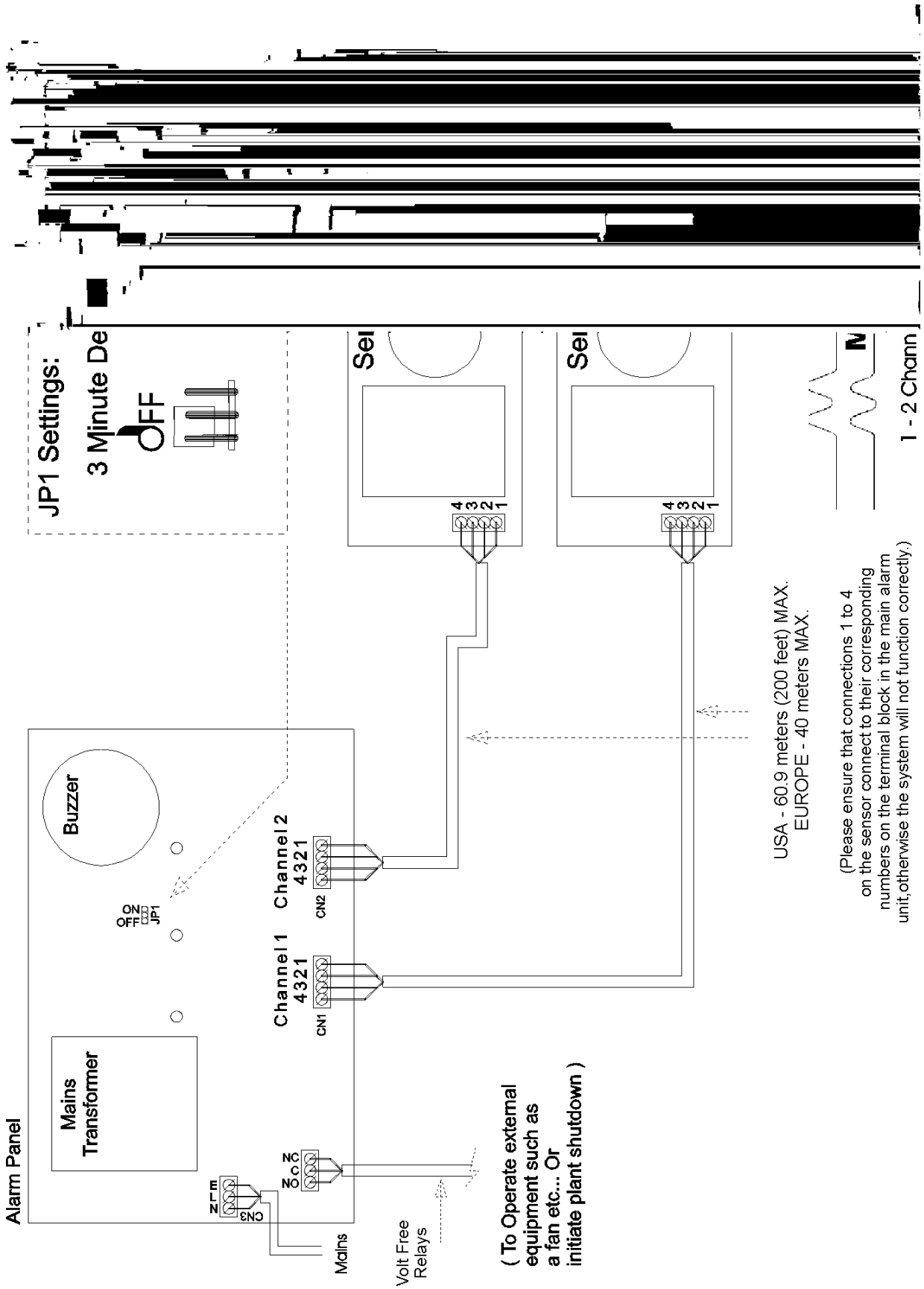
Sensor:

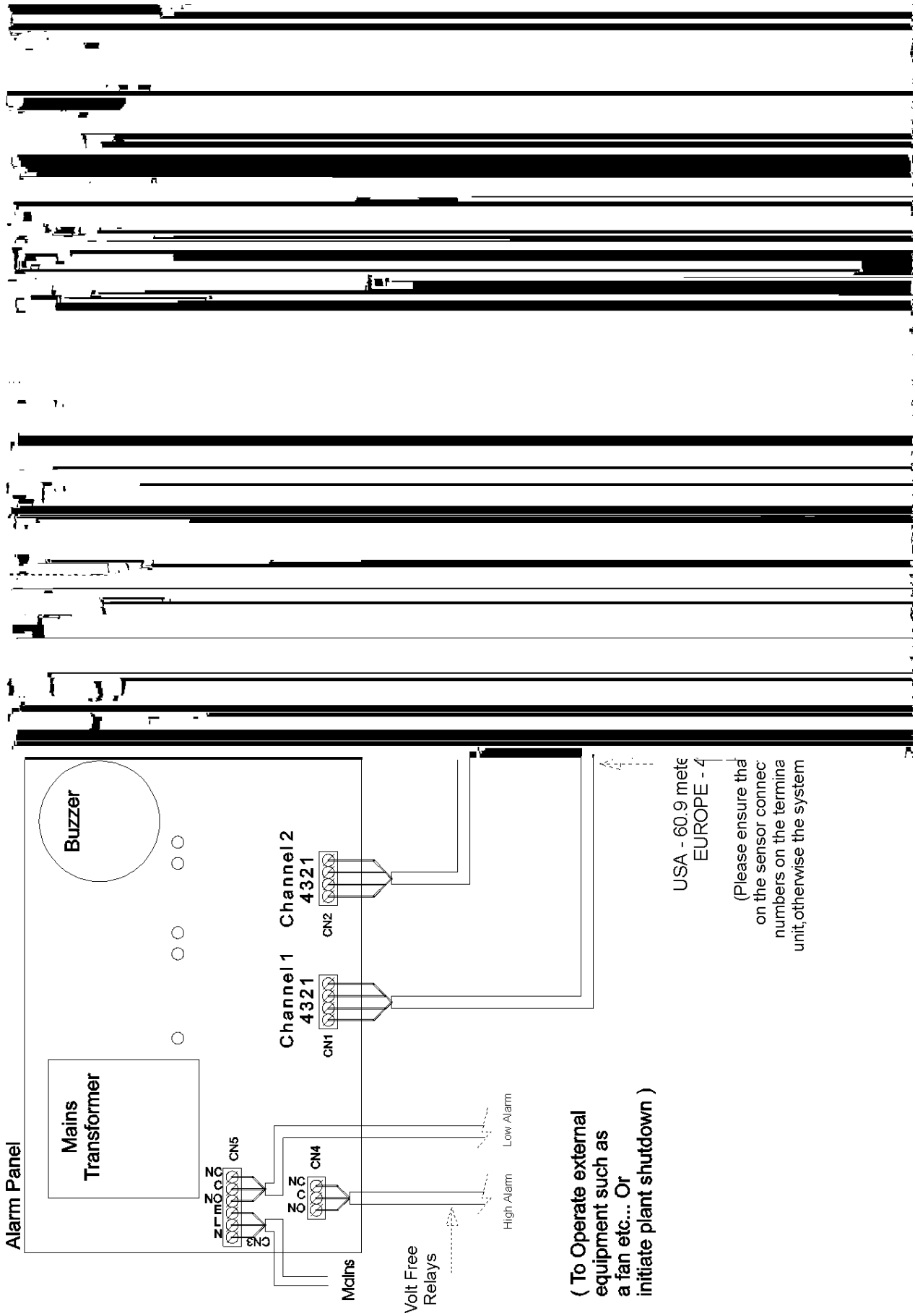
Symptom: Green light on sensor is off.

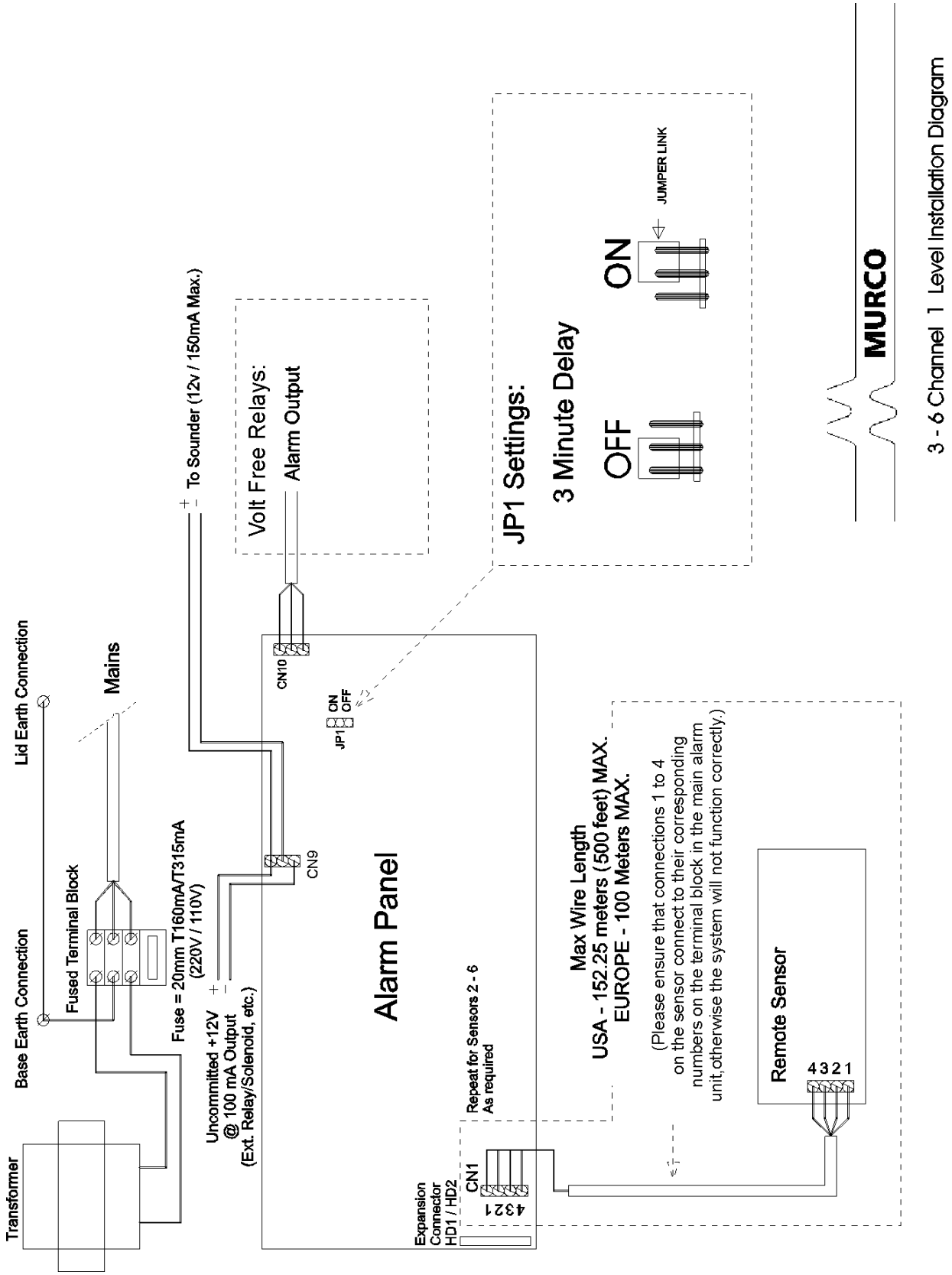
Cause: This may indicate a wiring fault between the controller and sensor or a sensor fault. Check power supply to the controller. Check connections between the controller and the sensor to ensure that the wires from positions 1 to 4 on the sensor are connected to the corresponding 1-4 on the controller. (See "Wiring Remote Sensors").

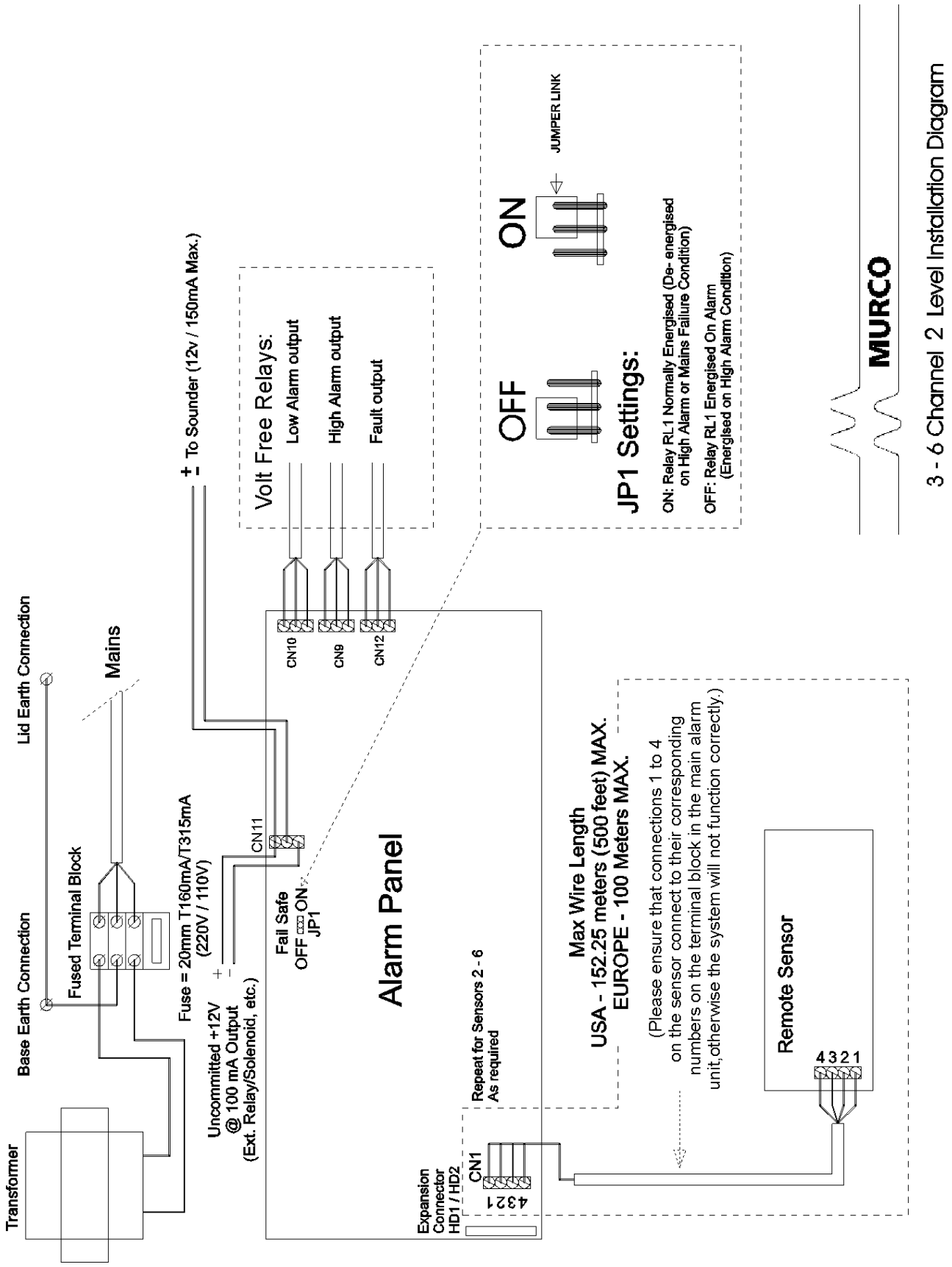
On a 4 to 6 channel unit check that the sensor fuse on the particular sensor connection position in the controller is not blown.

If the fault is not cleared then the sensor has been damaged.


JP1 Settings:
3 Minute De
OFF
Sel
Sel
1 - 2 Chann
Alarm Panel
Buzzer
ON
OFF
JP1
Channel 2
4321
CN2
Channel 1
4321
CN1
Mains
Transformer
NC
C
NO
CN3
Mains
Volt Free
Relays
(To Operate external
equipment such as
a fan etc... Or
initiate plant shutdown)
USA - 60.9 meters (200 feet) MAX.
EUROPE - 40 meters MAX.
(Please ensure that connections 1 to 4
on the sensor connect to their corresponding
numbers on the terminal block in the main alarm
unit,otherwise the system will not function correctly.)


Alarm Panel
Buzzer
Mains Transformer
Channel 1 4321
CN1
Channel 2 4321
CN2
CN3
CN4
CN5
NC
C
NO
Mains
Volt Free Relays
Low Alarm
High Alarm
(To Operate external equipment such as a fan etc... Or initiate plant shutdown)
USA - 60.9 mete
EUROPE - 4
(Please ensure tha
on the sensor connec
numbers on the termina
unit,otherwise the system


Transformer
Base Earth Connection
Lid Earth Connection
Mains
Fused Terminal Block
Fuse = 20mm T160mA/T315mA
(220V / 110V)
Uncommitted +12V
@ 100 mA Output
(Ext. Relay/Solenoid, etc.)
To Sounder (12v / 150mA Max.)
Volt Free Relays:
Alarm Output
CN10
CN9
JP1
ON
OFF
Alarm Panel
Expansion
Connector
HD1 / HD2
CN1
4321
Repeat for Sensors 2 - 6
As required
Max Wire Length
USA - 152.25 meters (500 feet) MAX.
EUROPE - 100 Meters MAX.
(Please ensure that connections 1 to 4
on the sensor connect to their corresponding
numbers on the terminal block in the main alarm
unit,otherwise the system will not function correctly.)
Remote Sensor
4321
JP1 Settings:
3 Minute Delay
ON
OFF
JUMPER LINK
MURCO
3 - 6 Channel 1 Level Installation Diagram


Transformer
Base Earth Connection
Lid Earth Connection
Mains
Fused Terminal Block
Fuse = 20mm T160mA/T315mA
(220V / 110V)
Uncommitted +12V
@ 100 mA Output
(Ext. Relay/Solenoid, etc.)
+ -
CN11
Fail Safe
OFF ON
JP1
+ - To Sounder (12v / 150mA Max.)
Volt Free Relays:
Low Alarm output
High Alarm output
Fault output
CN10
CN9
CN12
Alarm Panel
Expansion
Connector
HD1 / HD2
CN1
4321
Repeat for Sensors 2 - 6
As required
Max Wire Length
USA - 152.25 meters (500 feet) MAX.
EUROPE - 100 Meters MAX.
(Please ensure that connections 1 to 4
on the sensor connect to their corresponding
numbers on the terminal block in the main alarm
unit,otherwise the system will not function correctly.)
Remote Sensor
4321
OFF
ON
JUMPER LINK
JP1 Settings:
ON: Relay RL1 Normally Energised (De- energised
on High Alarm or Mains Failure Condition)
OFF: Relay RL1 Energised On Alarm
(Energised on High Alarm Condition)
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3 - 6 Channel 2 Level Installation Diagram