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*Instruction Manual*  
Model 4999  
Terminal Box

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## **1. INTRODUCTION**

The Model 4999 Terminal Box is intended for use with Geokon Vibrating Wire Sensors with or without Thermistors. Various models are available:

- Model 4999-11-4S for up to 8 VW Sensors with Thermistors
- Model 4999-11-8S for up to 8 VW Sensors with Thermistors
- Model 4999-16VTS for up to 16 VW Sensors with Thermistors
- Model 4999-32VTS for up to 32VW Sensors with Thermistors
- Model 4999-32VWS for up to 32 VW Sensors only. (Without Thermistors)

The Terminal Box makes it easy to manually connect a Readout Box (GK401, GK403 or GK404), to a multiplicity of vibrating wire sensors by means of by means of color-coded terminal posts, mounted below the rotary switches on the face panel of the Terminal Box, to which the flying leads (patch cord) of the readout box can be clipped. The rotary switch is used to select which “channel” or sensor is being read by the Readout Box.

The cables from the sensors are passed into the Terminal Box interior through nylon cord grips mounted on the bottom or side of the enclosure. The nylon cord grips provide strain relief to the cables and also have a rubber grommet that tightens onto the cable and seals it from water ingress. It is important that any unused cable entries be sealed off by tightening the unused nylon cord grips onto the white plastic plugs provided for that purpose.

The sensors are protected from over-voltages by means of Gas Discharge Tubes mounted on the terminal boards. An earth ground lug is provided on the outside of the enclosure for connection to an earth ground rod.

The Terminal Box is a NEMA 4X style enclosure, environmentally protected (splash proof) by means of a hinged cover that has a seamless “foamed-in-place” gasket that is pressed firmly against the enclosure when the two clamps holding the cover are closed. The Terminal Box itself is made from fiberglass reinforced polyester.

Polyester mounting brackets with bolt-holes, on top and bottom of the Terminal Box, allow it to be bolted to any vertical surface.

A Wiring Diagram is attached to the inside of the hinged cover.

## **2. MOUNTING THE TERMINAL BOX**

The Terminal Box should be mounted to a flat vertical surface using the holes in the mounting brackets, or “feet”, at the top and bottom of the enclosure. For the over-voltage surge protection to be effective the earth ground lug on the outside of the Terminal Box needs to be connected by a thick copper wire to a good earth ground. This can be a copper rod driven into the ground or, metal objects, such as plumbing pipes, or electrical conduits, etc, which are themselves well grounded. Copper earth grounding rods and ground wire straps are available as accessories.

## **3. CONNECTING THE SENSORS TO THE TERMINAL BLOCKS**

The Terminal Box uses spring-loaded, poke-home type terminal blocks.

Pass the sensor cable through the nylon cord grip into the inside of the Terminal Box and connect to the appropriate 5-position, spring-loaded terminal block, following the instructions of the appropriate wiring diagram. Refer to the wiring diagram fixed to the inside of the cover, or to the wiring diagram in Section 4 of this manual. When using the spring type terminals, to make the connection depress the orange spring lever, poke the bare wire into the adjacent hole and then release the spring. Check that a good connection has been made by tugging on the lead wire.

## 4. WIRING DIAGRAMS

### Model 4999-11-4S

#### 4 Vibrating Wire Gages with 4 Thermistors

#### FRONT PANEL

Connect the patch cord (flying leads) for a GK-403 or GK-404 as follows:

Boot Color	Switch Plate Post Label
Red	Gage +
Black	Gage -
White	Thermistor
Green	Thermistor
Blue	Cable Shield

#### TERMINAL BOARD WIRING

Attach the various gage cable wires to the terminal blocks in the order below.

Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color
1H	1	Red	5H	3	Red
1L		Black	5L		Black
2H		White	6H		White
2L		Green	6L		Green
S		Shield	S		Shield
3H	2	Red	7H	4	Red
3L		Black	7L		Black
4H		White	8H		White
4L		Green	8L		Green
S		Shield	S		Shield

## Model 4999-11-8S

### 8 Vibrating Wire Gages with 8 Thermistors

#### FRONT PANEL

Connect the patch cord (flying leads) for a GK-403 or GK-404 as follows:

Boot Color	Switch Plate Post Label
Red	Gage +
Black	Gage -
White	Thermistor
Green	Thermistor
Blue	Cable Shield

#### TERMINAL BOARD WIRING

Attach the various gage cable wires to the terminal strips in the order below.

Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color
1H	1	Red	9H	5	Red
1L		Black	9L		Black
2H		White	10H		White
2L		Green	10L		Green
S		Shield	S		Shield
3H	2	Red	11H	6	Red
3L		Black	11L		Black
4H		White	12H		White
4L		Green	12L		Green
S		Shield	S		Shield
5H	3	Red	13H	7	Red
5L		Black	13L		Black
6H		White	14H		White
6L		Green	14L		Green
S		Shield	S		Shield
7H	4	Red	15H	8	Red
7L		Black	15L		Black
8H		White	16H		White
8L		Green	16L		Green
S		Shield	S		Shield

## Model 4999-16VTS

### 16 Vibrating Wire Gages with 16 Thermistors

#### FRONT PANEL

Connect the patch cord (flying leads) for a GK-403 or GK-404 as follows:

Boot Color	Switch Plate Post Label
Red	Gage +
Black	Gage -
White	Thermistor
Green	Thermistor
Blue	Cable Shield

**Note:** To read positions 9 through 16 the first switch on the face panel (1-8) must be set to "9-16."

#### TERMINAL BOARD WIRING

Attach the various gage cable wires to the terminal strips in the order below.

Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color
1H	1	Red	9H	5	Red	17H	9	Red	25H	13	Red
1L		Black	9L		Black	17L		Black	25L		Black
2H		White	10H		White	18H		White	26H		White
2L		Green	10L		Green	18L		Green	26L		Green
S		Shield	S		Shield	S		Shield	S		Shield
3H	2	Red	11H	6	Red	19H	10	Red	27H	14	Red
3L		Black	11L		Black	19L		Black	27L		Black
4H		White	12H		White	20H		White	28H		White
4L		Green	12L		Green	20L		Green	28L		Green
S		Shield	S		Shield	S		Shield	S		Shield
5H	3	Red	13H	7	Red	21H	11	Red	29H	15	Red
5L		Black	13L		Black	21L		Black	29L		Black
6H		White	14H		White	22H		White	30H		White
6L		Green	14L		Green	22L		Green	30L		Green
S		Shield	S		Shield	S		Shield	S		Shield
7H	4	Red	15H	8	Red	23H	12	Red	31H	16	Red
7L		Black	15L		Black	23L		Black	31L		Black
8H		White	16H		White	24H		White	32H		White
8L		Green	16L		Green	24L		Green	32L		Green
S		Shield	S		Shield	S		Shield	S		Shield

## Model 4999-32VTS

### 32 Vibrating Wire Gages with 32 Thermistors

#### Front Panel

Connect the patch cord (flying leads) for a GK-403 or GK-404 as follows:

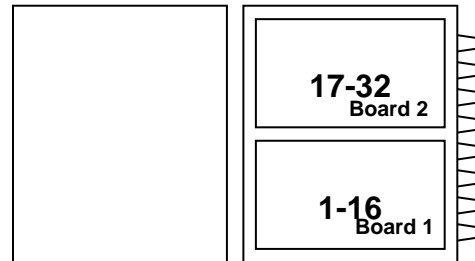
Boot Color	Switch Plate Post Label
Red	Gage +
Black	Gage -
White	Thermistor
Green	Thermistor
Blue	Cable Shield

Note: To read positions 9 through 16 the first switch (1-8) must be set to "9-16."

To read positions 17 through 24 the first switch must be set to "17-24."

To read positions 25 through 32 the first switch must be set to "25-32."

Terminal Board Wiring: There are two terminal boards mounted to the lower plate. Wire the first 16 gages and thermistors to the Board 1 as indicated in the drawing. Wire gages and thermistors 17 through 32 to the Board 2.



Attach the gage cable wires to the terminal strips in the order below:

Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color
1H	1 or 17	Red	9H	5 or 21	Red	17H	9 or 25	Red	25H	13 or 29	Red
1L		Black	9L		Black	17L		Black	25L		
2H		White	10H		White	18H		White	26H		White
2L		Green	10L		Green	18L		Green	26L		Green
S		Shield	S		Shield	S		Shield	S		Shield
3H	2 or 18	Red	11H	6 or 22	Red	19H	10 or 26	Red	27H	14 or 30	Red
3L		Black	11L		Black	19L		Black	27L		Black
4H		White	12H		White	20H		White	28H		White
4L		Green	12L		Green	20L		Green	28L		Green
S		Shield	S		Shield	S		Shield	S		Shield
5H	3 or 19	Red	13H	7 or 23	Red	21H	11 or 27	Red	29H	15 or 31	Red
5L		Black	13L		Black	21L		Black	29L		Black
6H		White	14H		White	22H		White	30H		White
6L		Green	14L		Green	22L		Green	30L		Green
S		Shield	S		Shield	S		Shield	S		Shield
7H	4 or 20	Red	15H	8 or 24	Red	23H	12 or 28	Red	31H	16 or 32	Red
7L		Black	15L		Black	23L		Black	31L		Black
8H		White	16H		White	24H		White	32H		White
8L		Green	16L		Green	24L		Green	32L		Green
S		Shield	S		Shield	S		Shield	S		Shield

## Model 4999-32VWS

### 32 Vibrating Wire Gages

#### FRONT PANEL

Connect the patch cord (flying leads) for a GK-403 or GK-404 as follows:

Boot Color	Switch Plate Post Color
Red	Red (Gage +)
Black	Black (Gage -)
Blue	Blue (Cable Shield)

NOTE: Gages connected to positions 1 through 16 on the terminal board are selected with the left hand rotary switch. Gages connected to positions 17 through 32 on the terminal board are selected with the right hand rotary switch.

To read positions 1 through 8: Connect patch cord clip leads to the posts labeled "1-8."

To read positions 9 through 16: Connect patch cord clip leads to the posts labeled "9-16."

To read positions 17 through 24: Connect patch cord clip leads to the posts labeled "17-24."

To read positions 25 through 32: Connect patch cord clip leads to the posts labeled "25-32."

### TERMINAL BOARD WIRING

Attach the various gage cable wires to the terminal strips in the order below.

Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color	Label	Gage Number	Gage Wire Color
1H	1	Red	9H	9	Red	17H	17	Red	25H	25	Red
1L		Black	9L		Black	17L		Black	25L		Black
2H	2	Red	10H	10	Red	18H	18	Red	26H	26	Red
2L		Black	10L		Black	18L		Black	26L		Black
S	1 & 2	Shield	S	9 & 10	Shield	S	17 & 18	Shield	S	25 & 26	Shield
3H	3	Red	11H	11	Red	19H	19	Red	27H	27	Red
3L		Black	11L		Black	19L		Black	27L		Black
4H	4	Red	12H	12	Red	20H	20	Red	28H	28	Red
4L		Black	12L		Black	20L		Black	28L		Black
S	3 & 4	Shield	S	11 & 12	Shield	S	19 & 20	Shield	S	27 & 28	Shield
5H	5	Red	13H	13	Red	21H	21	Red	29H	29	Red
5L		Black	13L		Black	21L		Black	29L		Black
6H	6	Red	14H	14	Red	22H	22	Red	30H	30	Red
6L		Black	14L		Black	22L		Black	30L		Black
S	5 & 6	Shield	S	13 & 14	Shield	S	21 & 22	Shield	S	29 & 30	Shield
7H	7	Red	15H	15	Red	23H	23	Red	31H	31	Red
7L		Black	15L		Black	23L		Black	31L		Black
8H	8	Red	16H	16	Red	24H	24	Red	32H	32	Red
8L		Black	16L		Black	24L		Black	32L		Black
S	7 & 8	Shield	S	15 & 16	Shield	S	23 & 24	Shield	S	31 & 32	Shield

## **5. SPECIFICATIONS**

### **Tripolar Plasma Surge Arrestor**

Nominal DC Breakdown Voltage: 230V

Surge Life: 400 (10/1000 ms pulse @ 500 A)

Maximum Surge Current: 10 kA per side (8/20  $\mu$ s pulse)

Insulation Resistance: 10000 M $\Omega$

Operating Temperature: -65 to +125° C

### **Bipolar Plasma Surge Arrestor**

Nominal DC Breakdown Voltage: 300V

Surge Life: 1000 (10/1000  $\mu$ s pulse @ 500 A)

Maximum Surge Current: 20 kA (8/20  $\mu$ s pulse)

Insulation Resistance: 10000 M $\Omega$

Operating Temperature: -65 to +125° C