

# **Kaman Instrumentation**

## ***Series 8000 NEMA*** **User Manual Supplement**

## Series 8000 NEMA -- USER MANUAL SUPPLEMENT

The NEMA package for Kaman Instrumentations *Series 8000* product line was designed for environments where industrial packaging is a must. It has the capability to hold up to two measuring channels plus a function card, display, and a power supply. This user manual supplement is meant to be used in conjunction with the KDM-8200 general instruction manual (PN 860059-001) and any function card manuals as required. Hubble connectors are provided on the box as required for cabling I/O.

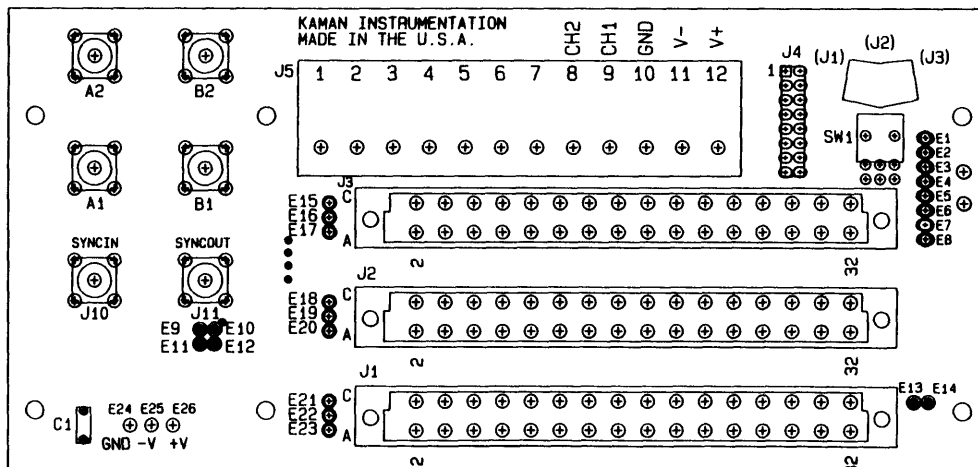
### Features:

- NEMA 12 integrity
- one or two synchronized measuring channels
- function card slot
- optional power supply
- optional display module
- 8"x8"x4" size with continuous hinge

**Warning:** The integral power supply versions of this system utilize **high voltage (120 or 240VAC)**. *Unplug the unit before opening the lid.*

### INSIDE THE NEMA

There are three slots on a motherboard designed for *Series 8000* type boards. The bottom slot (J1) always contains the measuring channel designated as a master (meaning it contains the master oscillator for the system). The second slot (J2) is designed to hold an optional second measuring channel set up in a slave configuration. The master and slave configuration is necessary so that the oscillators from the channels do not beat with one another and cause interference. The third slot (J3) is set up for a function card in the 8000. Currently either a single or dual Voltage to Current card (VC8000), Summation/Comparator card (SC8000), Dual Set Point (DSP 8000), or Dynamic Measurement card (DY8000) are available for the function card slot. Jumpers on the motherboard can be used to configure the function card slot differently but generally this is not required. If a display is not used the switch (SW1) is not functional. Reference fig. 1 for motherboard connections.



**fig. 1 -- Motherboard connections**

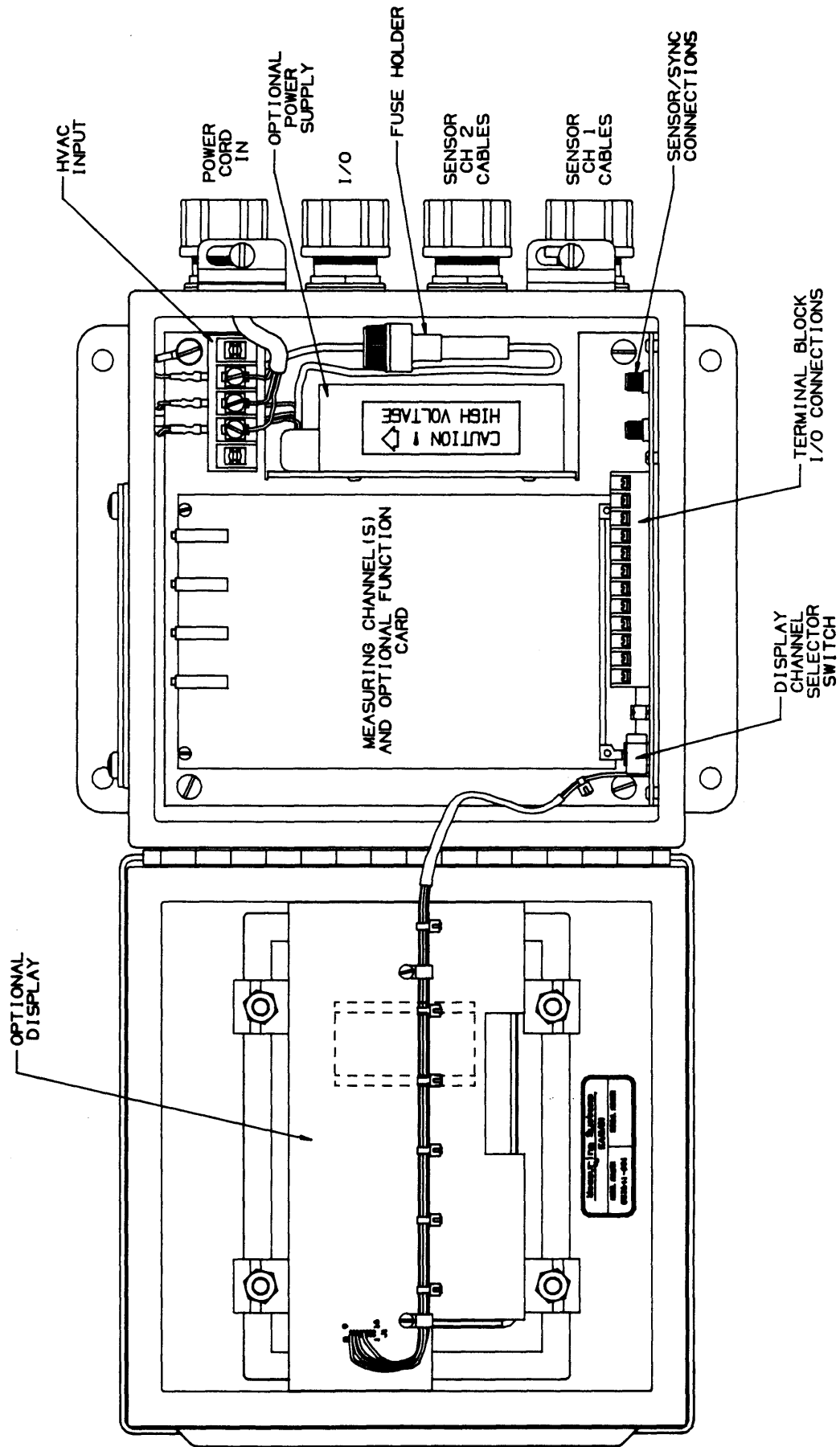


fig. 2 -- Inside the NEMA

### Adjustments

End panel adjustments required for measuring channels or function cards can easily be accessed by removing the side panel. The side panel is attached to the enclosure by four captivated screws. In all of the systems the measuring channels take up the two bottom slots and a function card may be used in the top slot. Please refer to the diagrams below and the appropriate user manual when adjustments to the modules are required.

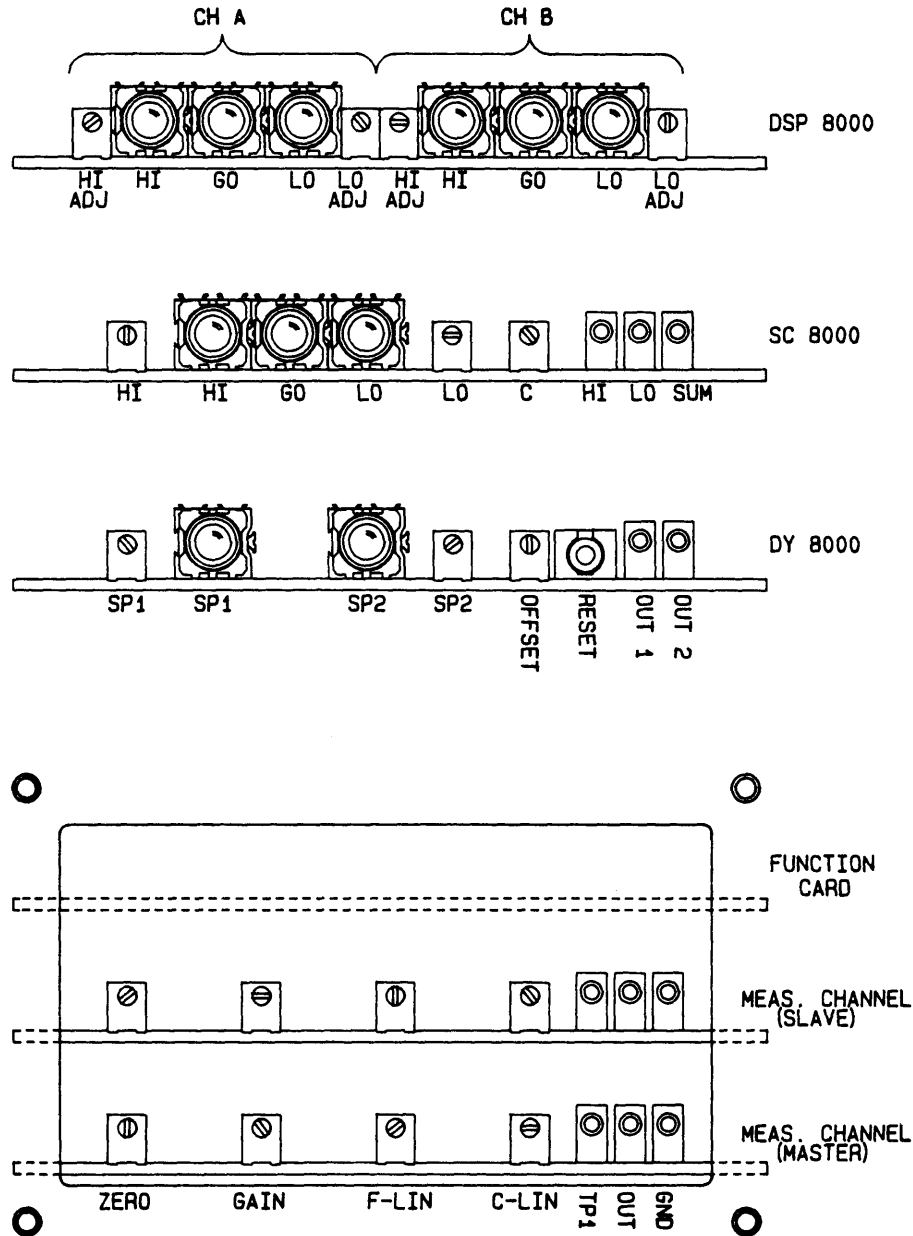


fig. 3. -- Adjustment Locations

## TERMINAL BLOCK WIRING (J5)

J5 Pin	Name	No func. card	with VC 8000	with SC 8000	with DY 8000	with DSP 8000
1	F1	---	Sync	Summed out	Out 1	CE (on -002N only)
2	I/O	---	+Vloop ext	Aux (Reset)	Reset	SPI
3	Lo 2	---	Out Lo 2	CE (Gnd)	CE	OUTLOB
4	Hi 2	---	Out Hi 2	Low setpoint	SP2	OUTLOA
5	Lo 1	---	Out Lo 1	CE (Gnd)	CE	OUTHIB
6	Hi 1	---	Out Hi 1	High setpoint	SP1	OUTHIA
7	Agnd	---	Ground	Ground	Ground	Ground
8	Vin 2	ch 2 out	ch 2 out	ch 2 out	ch 2 out	ch 2 out
9	Vin 1	ch 1 out	ch 1 out	ch 1 out	ch 1 out	ch 1 out
10	PS GND	PS GND	PS GND	PS GND	PS GND	PS GND
11	-V	-15Vin	-15Vin	-15Vin	-15Vin	-15Vin
12	+V	+15Vin	+15Vin	+15Vin	+15Vin	+15Vin

If there is no internal power supply you will need to supply +15V and -15V @ 200mA per side and PS GND to pins 10,11,and 12 per the above chart. Note that pin 1 is all the way to the left (square pin) on the diagram. The measuring channel outputs are available on pins 8 and 9. If you have a specific function card the outputs are as listed above. You can consult the function card manual for more information.

## SENSOR CONNECTIONS

The sensors are generally connected the following way:

	Active Coil	Inactive coil (if appl.)
Ch 1 sensor	A1 SMA	B1 SMA
Ch 2 sensor	A2 SMA	B2 SMA

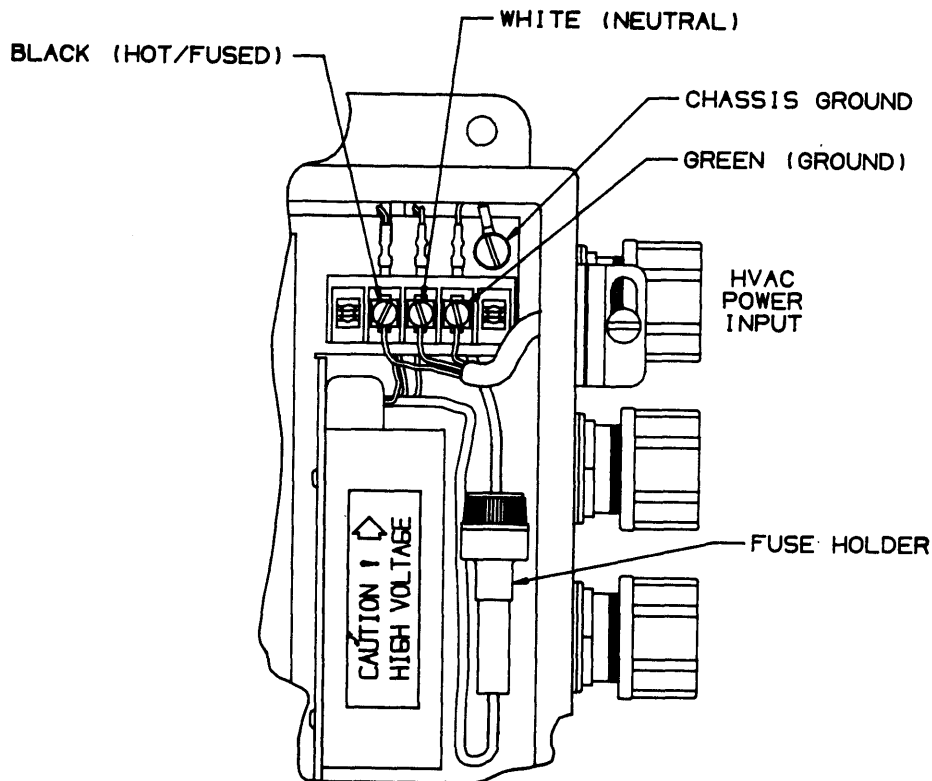
### POWER SUPPLY OPTION (PN 853639 or PN 853641 only)

The power supply is set up for 105 to 132 VAC @ 47-420 Hz and will supply +15V and -15V at up to 200mA per side. The power supply is fused with a 1/2 amp fuse. The -001E models are available with 216 to 265 VAC input @ 50-440Hz with a 1/4 amp fuse.

### Changing the Power Cord

**Warning:** The integral power supply versions of this system utilize **high voltage** (120 or 240VAC). *Unplug the unit before opening the lid.*

The terminal block on the baseplate is provided for convenience if it is necessary to change the power cord. You may find it convenient to remove the baseplate from the unit when changing the power cord. Figure 3 below shows the wiring locations as the unit is wired from the factory. The black lead is the fused AC input, the white lead is the AC neutral input, and the Green lead is wired to the chassis ground.



**fig. 4 -- AC Power Cord Connections**

### **DISPLAY OPTION (PN 853640 or PN 853641 only)**

With the display option a window kit is set up with a display card attached to it. The display has a capability to display 3 1/2 digits with 1 count accuracy or 4 1/2 digits with 4 count accuracy. It will be pre-set up to read in either volts or engineering units (if you need to change parameters on the display you will need to reference 860041-001, Integral RMS/DC Display Card manual. The switch in the upper right corner (SW1) on the motherboard is used to switch between channel 1 output, channel 2 output, and the F1 output from the function card.

### **EXTERNAL SYNCH CONNECTORS**

If due to beat note interference with other nearby sensors it is necessary to synchronize this box with other boxes, you can do it by connecting the sync out connector (J11) of one box to the sync in (J10) of another box. One box needs to contain the master oscillator and the other boxes must all be configured as slaves. If this has not been preconfigured at the factory you will need to do the following:

- 1** configure the measuring channels in the second box as slave units by setting the master measuring channel to be a slave (reference the instruction manual for the measuring channel).
- 2** connect a cable between J11 of the master system and J10 of the slave system. KAMAN PN 851494-F0XX where XX is the length (max 25 ft) is the recommended cable to use for this.

### **Warranty and Repair**

These systems are warranted to be free from defects in material and workmanship for a period of one year from date of shipment. This warranty is invalidated by unauthorized modification or repair. In the event of a malfunction, please call for return authorization:

Industrial Products Service Department  
**Kaman Instrumentation Corporation**  
(719) 599-1919

For further details on the warranty, please refer to **Kaman Instrumentation Warranty Number 7**, included with the shipping invoice.

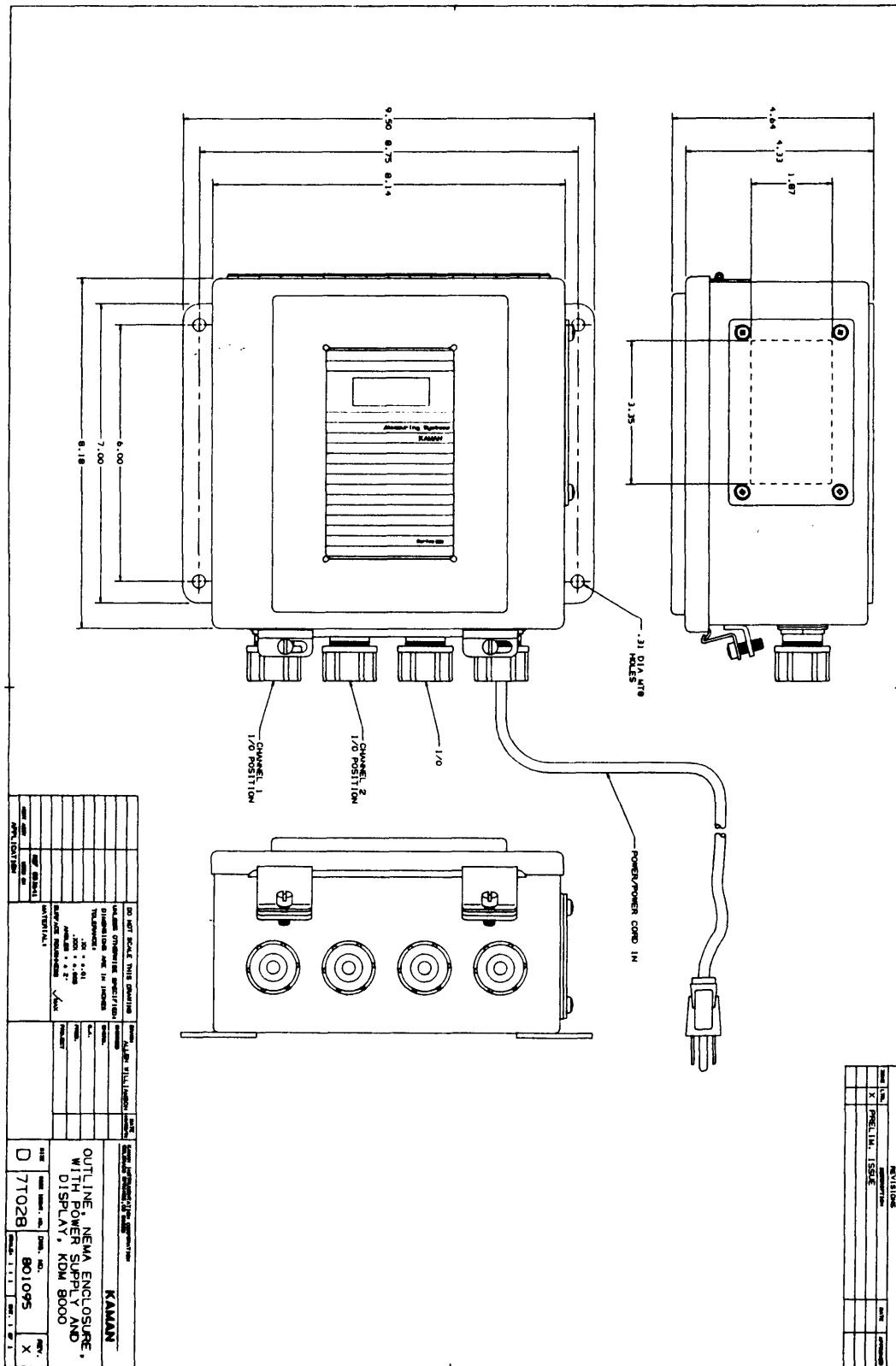


fig. 5 -- Reference Dimensions



## HOW TO ORDER NEMA SYSTEMS

You need to specify the chassis, measuring channel/sensor combinations, and any function cards required.

### Chassis:

<u>Part no.</u>	<u>Chassis type</u>
853638-001	Standard NEMA
853639-001	NEMA with internal 120VAC power supply
853640-001	NEMA with display
853641-001	NEMA w/ 120VAC PS and display
853639-001E	NEMA with internal 240VAC power supply
853641-001E	NEMA w/ 240VAC PS and display

### Measuring channels:

<u>Part No.</u>	<u>Sensor mil(mm)</u>	<u>Std. Range</u>	<u>Vout. V</u>	<u>Std Target</u>
853464-010N	.5U1	20(.5)	2.000	Aluminum
853624-D010N	.5UM	20(.5)	2.000	4130SS
853465-F010N	1U1	40(1)	.400	Aluminum
853466-D010N	1U2	40(1)	.400	4130SS
853467-F010N	2UB1	80(2)	.800	Aluminum
853468-F010N	2S1	80(2)	.800	Aluminum
853469-D010N	2U2	80(2)	.800	4130SS
853470-F010N	3U1	120(3)	1.200	Aluminum
853471-F010N	4S1	160(4)	1.600	Aluminum
853472-F010N	6U1	240(6)	2.400	Aluminum
853473-D010N	6U2	240(6)	2.400	4130SS
853474-F010N	15U1	600(15)	.600	Aluminum
853475-F010N	15U2	600(15)	.600	4130SS
853476-F010N	30U1	1200(30)	1.200	Aluminum
853477-F010N	30U2	1200(30)	1.200	4130SS

- Notes:
- 1) all cable lengths are 10ft. standard
  - 2) See General Catalog for more sensor information
  - 3) Typical offset is 10% of range
  - 4) High Temp Sensors (1100<sup>o</sup>F) available on request

### FUNCTION MODULES

<u>Part No.</u>	<u>Function</u>	<u>Comments</u>
853486-001	Voltage to Current(1ch)	0-5V in=4-20mA out
853486-002	Voltage to Current(2ch)	0-5V in=4-20mA out
853550-001	Summation/Comparator	C-(A+B) thickness
853550-001	Comparator only	one channel Limits
853659-001	Dynamic card (DY 8000)	P-P or RMS out
853699-001N	Dual Set Point (DSP 8000)	Open Collector outputs
853699-002N	Dual Set Point (DSP 8000)	Opto Isolated outputs