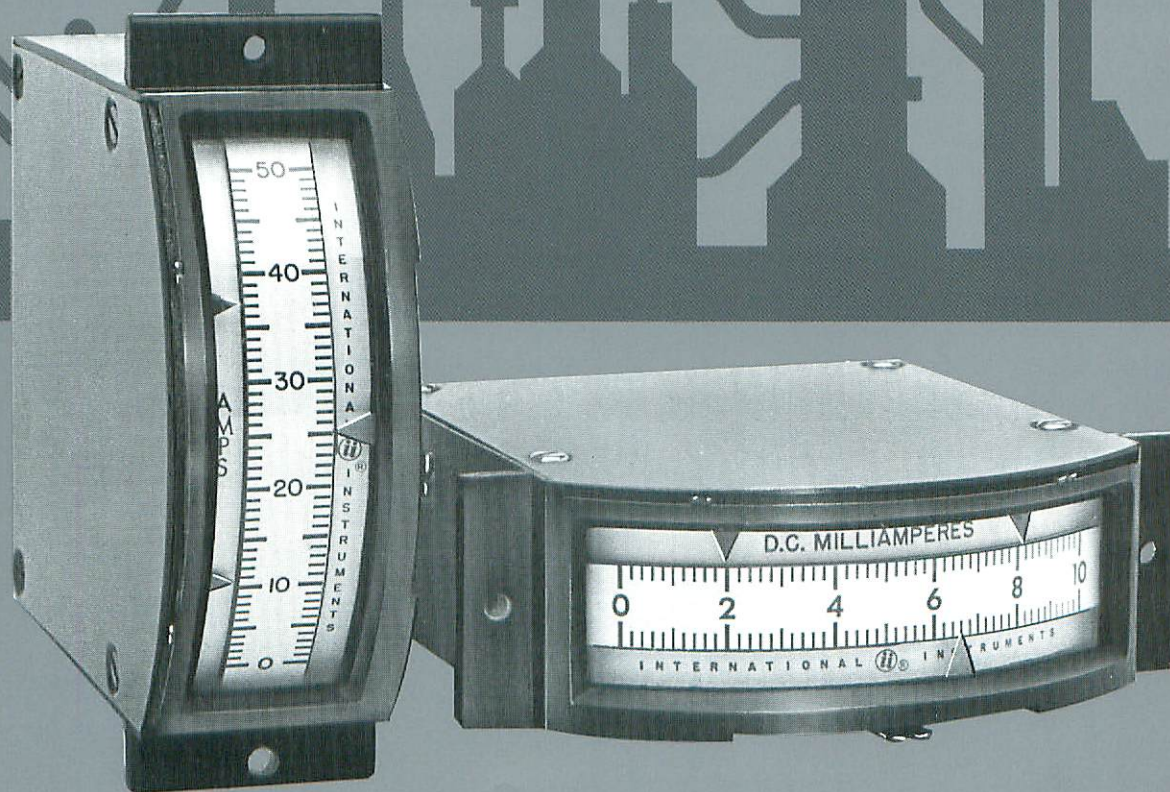


IV. Edgewise Panel Meters: Alarm/Control Models.

Low cost, solid state, contactless instruments that
offer the answer to almost any control meter requirement
... with the efficiency of compact edgewise design.



we deliver. analog. edgewise. rounds. squares. and more. on time.

**Table A: STANDARD MODELS**

Model No.	Size and weight	Description
1139	3½ inch / 8 oz.	Indicator only. No setpoints. Illuminated.
2548-2	3½ inch / 18 oz.	Double setpoint. Trigger output as above.
2602	3½ inch / 16 oz.	Indicator with control arms, photo transistors and LED lamp assemblies (short case). No setpoints.
2602-1	3½ inch / 16 oz.	Same as 2602 with single setpoint.
2602-2	3½ inch / 16 oz.	Same as 2602 with double setpoint.
2603	3½ inch / 21 oz.	Complete controller with power supply and relays (long case). No setpoints.
2603-1	3½ inch / 21 oz.	Same as 2603 with single setpoint.
2603-2	3½ inch / 21 oz.	Same as 2603 with double setpoint.

OPTIONS AND SPECIAL ORDERS: Almost any deviation from the standard specifications detailed in this bulletin — as well as almost any new and challenging concept that falls within our product area — is available as an option or special order.

WHATEVER YOUR UNUSUAL REQUIREMENTS, call our Customer Service Dept., (203) 481-5721.

HOW TO ORDER

Establish Order No., as shown below, or call Order Dept., (203) 481-5721, and describe your requirements.

Model No.	H or V	Zero Position	Range/Scale
From Table A	Hor. or Vertical	Hor.: L, C or R (left, center, right) Vert.: T, C or B (top, center, bottom)	From Table B
2548-2	- V	- B	- DCmV 0-50

Specify Control Output (on single setpoint meters only):

On these meters (2602-1, 2603-1) control output must be specified as either "Low Signal" (ON below setpoint) or "High Signal" (ON above setpoint).

Table B: RANGES/SCALES/RESISTANCES

Model	DC Microammmeters				DC Milliammeters								DC Millivoltmeters	
	0-50	0-100	0-200	0-500	0-1	0-5	0-10	0-50	0-100	0-200	0-500	4-20	0-50	0-100
1139	N/A	2300	760	150	26	2.5	1.5	<1	<1	<1	<1	1.5	20	40
2548-2	3608	2400	867	235	78	2.6	3.4	<1	<1	<1	<1	1.5	40	80
2602/2603	4500	3500	1300	560	115	5.4	2	<1	<1	<1	<1	1.5	12.8	25.6

OTHER STANDARD RANGES AVAILABLE INCLUDE:

- DC Ammeters.** Limited ranges, internal shunt.
- AC Milliammeters and AC Ammeters.**
- AC & DC Voltmeters.** All meters 1000 ohm/volt standard, ranges available up to 100 volts. Consult factory for higher ranges and other ohm/volt sensitivities.

SPECIFICATIONS

	1139	2548-2*	2602/2603**
Accuracy (% of F.S.)	DC:2	DC:2 AC:3	DC:2 AC:3
Repeatability (% of F.S.)	In accordance with ANSI C39.1		
Overload	In accordance with ANSI C39.1		
Response time (sec. max.)	2.5		
Dielectric strength (VRMS 60 Hz/1min)	500		
Overshoot	50%		
Terminals (variations available)	Threaded studs (4-48)	Octal plug	Terminal barrier strip
Scale length-inches (mm)	2.0 (50.8)	2.7 (68.6)	2.4 (61.0)
Zero adjustment	Yes†	Yes	Yes (can be omitted)
Pointer (other colors available)	Red Delta	Red Delta	Red Lance
Weight (oz.)	8	18	2602: 16 / 2603: 21
CONTROL SPECIFICATIONS			
Power requirements	28VDC 100mA	22.5-28VDC Single arm 25mA min. Double arm 40mA min.	2602: 6-25VDC @ 20mA 2603: 115 VAC 4W
Output	N/A	2500Ω min load 6000Ω max load	2602: Photo coupler 200-400mA 2603: Relays, Contacts, 1 amp resistive @ 115VAC/28VDC
Dead band (Typ. % of F.S.)	1		
Set point accuracy (% of F.S.)	2		
Options	N/A	Mark 4600 Power Pack (115V operation, Relay output)	2602:N/A / 2603:24VDC input

* For matching Standard Meter see Product Data Bulletin II.

** For matching Standard Meter see Product Data Bulletin I.

NOTES: (1) Specifications not listed above (e.g.: shock, vibration, temperature) are typically in accordance with ANSI C39.1 (2) Illumination available for selected models. Consult factory for details.



**Model
1139**

3 1/2-inch PANEL METER AND INDICATING ANNUNCIATOR

This "internally illuminated" meter eliminates the need for auxiliary visible alarm circuitry. The pointer of the Model 1139 is coupled to standard edgewise movement with an internal lighting mechanism. When the pointer falls within a predetermined measurement range, light passes through a color filter and illuminates the translucent scale.

Standard models provide color-coded sections on the top and bottom 20% of the scale (red on top, green on bottom). Optional arrangements — available on special order — can cover any section of the scale, any color combination of red, yellow, green or white.



**Model
2547/2548**

3 1/2-inch ELECTRONIC CONTROL METERS

These versatile meters offer a wide choice of voltage and current-sensing ranges, as well as optional plug-in or built-in output modifiers to change the mode of control. With a choice of slope or trigger output, **Control Meters** are inherently adaptable to both smooth proportional and straight on-off control. The resulting line of indicating controllers is well qualified to answer the needs of the aerospace, manufacturing, process, and utility industries.

Model 2547 (slope output): Amplifier produces control signal with 4% slope, the required output for a wide range of proportional control applications.

Model 2548 (trigger output): Modified amplifier produces a clean full-amplitude output signal precisely at set point with no slope.



**Model
2602/2603**

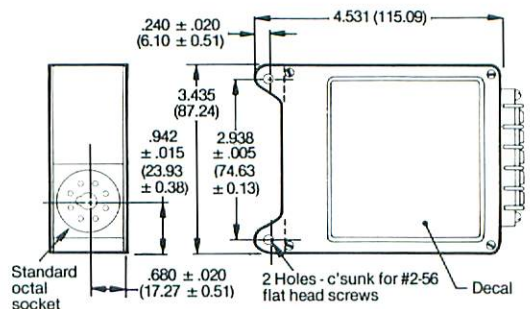
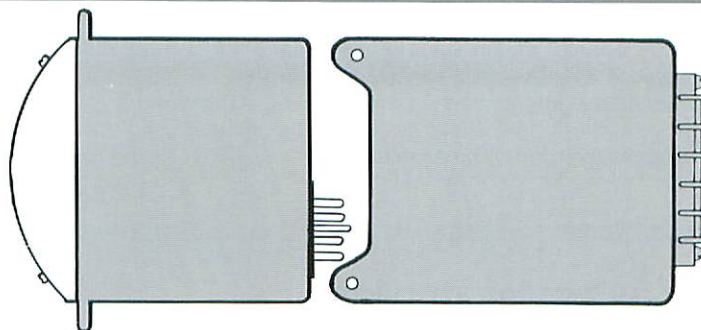
3 1/2-inch LOW-COST ELECTRONIC CONTROLLER

These economical controllers can be used to indicate, alarm, or provide on/off control for virtually any measurable variable that can be represented by an electronic signal. The heart of the instrument is the same jeweled d'Arsonval movement that has proven itself in **Control Meters** throughout the years. The economy of the instrument lies in a much simplified detection circuit that operates off line power and eliminates the necessity of an external power supply.

The many custom designs available include illuminated meters, annunciating meters with flashing white or colored scales, electronic buzzers, isolated outputs and many others. International Instruments can provide complete design services to assist in solving the most demanding applications.

Mark 4000 Power-Pac™ for use with Model 2547/2548 Control Meters

This compact plug-in module — designed to handle meter signals, power inputs and control outputs of control meters or pyrometers/controllers — incorporates a 28V DC voltage-regulated power supply. The unit plugs into the octal-base connector at the rear of the control meter housing or can be remotely connected to the meter or pyrometer by means of an accessory cable with male and female octal connectors. Consult **Engineering Department** for special terminal arrangements and other special features.



SPECIFICATIONS:

Input:	105-125 volts AC, 50-60 Hz.
Power Output to Meter:	28 Volts DC ±5%, 60 mA max.
Operating Temperature:	+14 to +140°F (-10 to +60°C)
Relay Output:	Isolated contacts, SPDT, 5 amp at 120 volts AC or 28 volts DC, each relay.
Case:	Semi-dull black finish metal, dust-proof commercial construction.
Terminals:	Control-meter connection-female octal-base. Meter signal, power input, and control output-screw-terminal strip.

Power-Pac Mark No.	No. of Arms to Control Meter	Output Device	Type of Output
4000-110*	One Arm	One SPDT Relay	Isolated Contacts SPDT 5 amp at 120 VAC or 28 VDC
4000-210*	Two Arms	Two SPDT Relays	Isolated Contacts SPDT 5 amp at 120 VAC or 28 VDC
4000-113*	One Arm	One DPDT Relay	Isolated Contacts DPDT 3 amp at 120 VAC or 28 VDC
4000-213*	Two Arms	Two DPDT Relays	Isolated Contacts DPDT 3 amp at 120 VAC or 28 VDC
4000-310*	One or Two	None	None — Power Supply Only

*On 4000-series modules for pyrometers, add "J" for iron/constantan thermocouple, or "K" for chromel/alumel.

Custom Meters and Meter Movements from the specialists in High-Performance Edgewise Technology

International Instruments mounts and calibrates meters in customer supplied bases, or mounts and ships movements in plastic containers for installation by the customer.

Exclusive cantilevered coil construction produces torque to weight ratios on the order of four times greater than conventional edgewise movements of similar size.

Single, through-pivot shaft, used instead of stub shafts attached to two sides of the coil, eliminates pivot

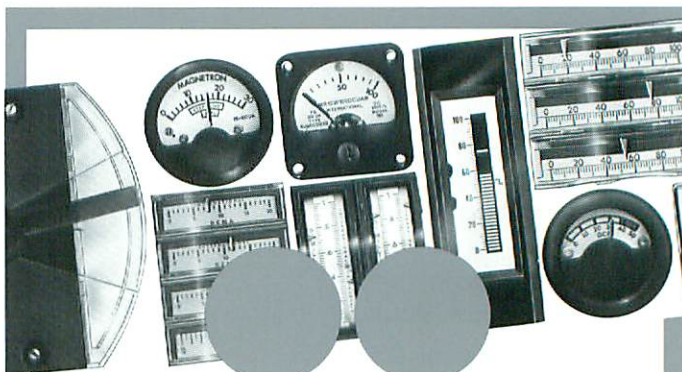


misalignment and helps maintain linearity and repeatability. Effective coil positioning permits longer pointer arms, special pointer shapes and even meter relay flags.

Dual and triple meter movements. Two or three movements can be mounted on a single base. Applications often require that two or three related signals be compared at a single control station, sometimes with the additional requirement that two of the units be tracked in unison. Difficult . . . but easily handled by **ii** movements.

Long pointer movements. Permit shorter reading arcs. Previously discussed cantilevered coil construction allows flatter edgewise presentation and reduces reading errors near scale extremities.

Custom control alarm systems. International Instruments is recognized as a leader in control and alarm instrumentation. Many of the control packages designed around customers' specialized requirements include solid-state devices, with or without meters.



Who we are . . .

International Instruments, the world's leading manufacturer of edgewise panel meters, was founded in 1947 with the purpose of developing a series of analog instruments that realized the full potential of the flat, stackable, compact edgewise style of meter.

Today we offer a complete edgewise family of panel meters, alarm/control devices and electronic display instruments, supplemented by a special line of ruggedized miniature meters and the innovative Flat-Pak® line of "space-saver" meters.

ii has been a member of the Prime Technology group of companies since 1984. Applications assistance is immediately available from the factory or a comprehensive network of distributors, representatives and agents strategically located throughout the world.

For further information . . .

For further detail on products, options or special orders, or for additional mechanical data and engineering drawings, call and ask for Customer Service:

(203) 481-5721

If it is more convenient, you may also contact **ii** through the following TWX and FAX numbers. You may also write to the address listed beneath our signature.

TWX: 710-452-3092

FAX: 203-481-8937

Product Data Bulletins available from **ii**

Order by Bulletin Number:

- I** — Edgewise Meters: Standard Models.
- II** — Edgewise Meters: Single/Dual Models.
- III** — Edgewise Meters: Mil. Spec. Models.
- IV** — Edgewise Meters: Alarm/Control Models.
- V** — Electronic Controllers and Indicators.
- VI** — Square & Rounds (Ruggedized/Mil.)
- VII** — Flat-Pak® Meters.
- VIII** — Full Line (Short Form) Catalog.



INTERNATIONAL INSTRUMENTS

A Prime Technology Company

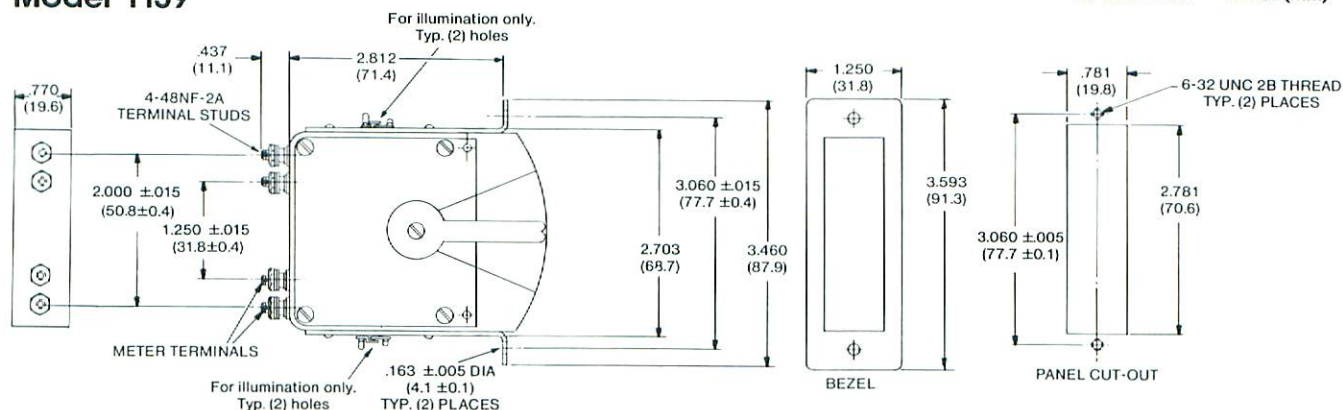
P.O. Box 185, Twin Lakes Road, North Branford, Connecticut 06471 • Telephone: (203) 481-5721/TWX: 710-452-3092/FAX: (203) 481-8937

MECHANICAL DATA

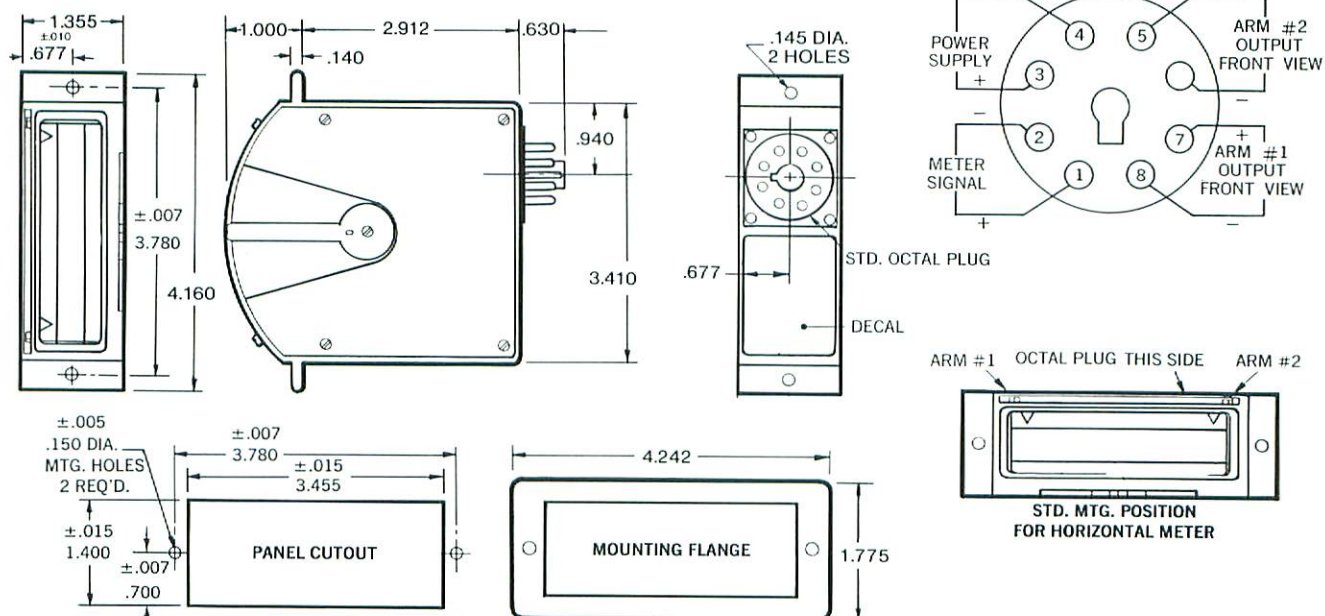
All dimensions nominal and subject to change without notice. Please request latest mechanical data from factory before preparing buying specifications or critical engineering drawings. (See back cover.)

Model 1139

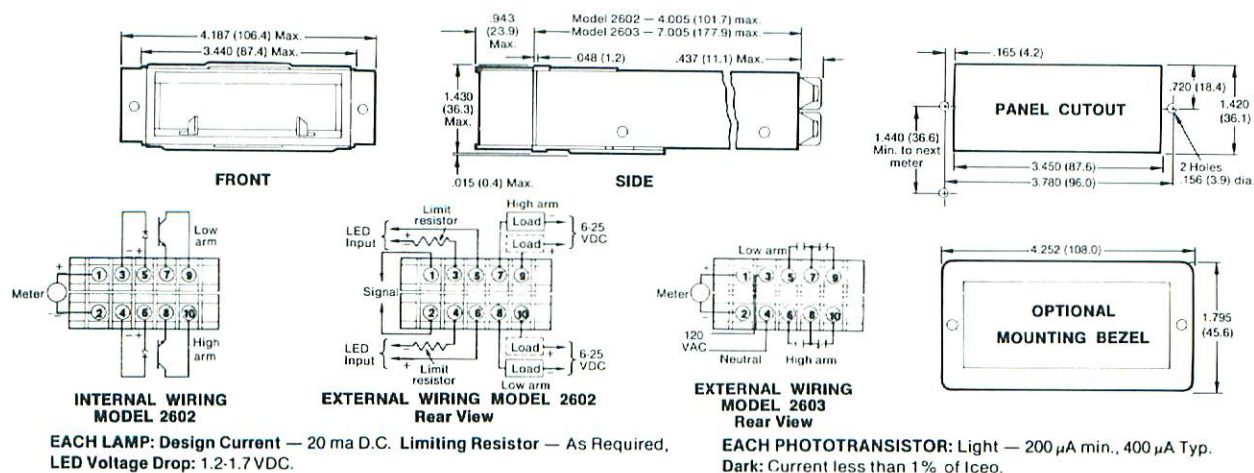
All dimensions — inches (mm)

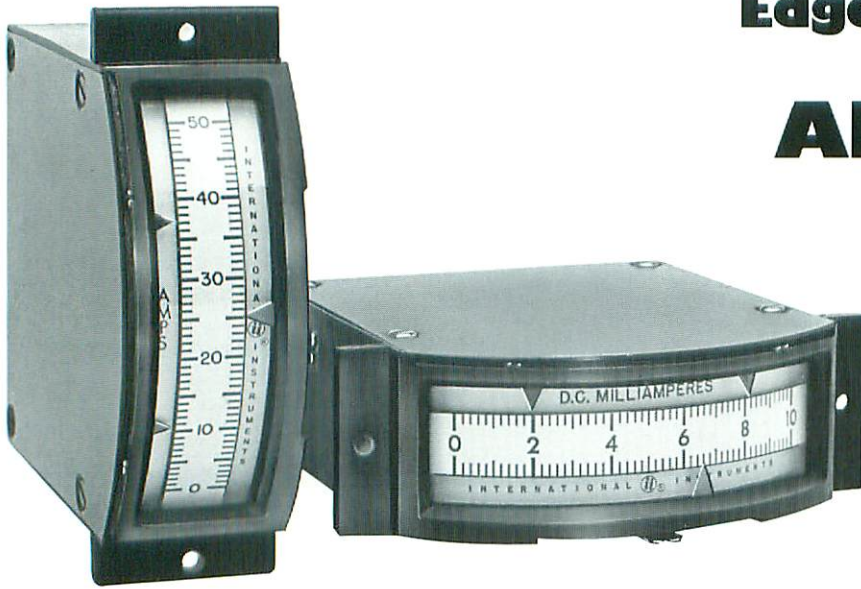


Model 2547/2548




Model 2602/2603






Edgewise Panel Meters: Alarm/Control Models.

- Space-saving edgewise design, high density data presentation.
- Economical, solid state, contactless instrumentation.
- The answer to virtually any control meter requirement.

Edgewise meters from International Instruments are the industry's most comprehensive line of space-saving flush-stacking instruments. This bulletin presents Alarm/Control Models only. Other bulletins provide showings of standard models, switchboard class, single/dual scale models and special mil. spec. instruments. (See **Product Data Bulletins** from  on back cover.)

These Alarm/Control units offer indicator and alarm performance as well as on/off control for virtually any input signal. The family of instruments is designed to answer the needs of the aerospace, military, process control and utility industries.

- **External zero adjust** is mounted at the front of all instruments.

- **Fluorescent red pointers** combine with bi-level design to produce instruments of maximum readability, even in high density panels that stack many meters side by side.
- **Zero position** is left for horizontal meters, bottom for vertical meters, all other positions optional.
- **D'Arsonval movements**, employing highly poished jewels and Alnico V magnets, produce torque-to-weight ratios (meter efficiency) four times greater than those offered by conventional movements.
- **Illumination**. Although ambient light sources are normally sufficient when using  high-visibility scales, internal white or red illumination is available on special order.
- **Standard scale faces** have a white background with black markings. (White-on-black or other color combinations available on special order.)

ADVANTAGES

- **Space-saving**. Edgewise unit takes up about one-third the space required by conventional meters.
- **Flush-stacking**. Side-by-side or top-to-bottom.
- **Ease of comparative readout**. Maximum information compacted into minimal panel area.
- **Graphic display that is easier to take in at a glance**. Choice of horizontal or vertical presentation offers more meaningful presentation of right/left or high/low information.
- **Internal shielding** against magnetic interaction permits stacking without limit.
- **Bi-level scales** reduce the incidence of parallax reading error.
- **Horizontal and vertical format** available in all models.

INTERCHANGEABLE SCALES

(Available only with Models 2547/2548)

New scales slide into place and align for calibration in seconds without removing the meter from the panel. The anti-parallax bi-level scale is retained and the center scale is replaced by a "track" that accepts slide-in blanks. Six blank scales are included with each meter ordered.

