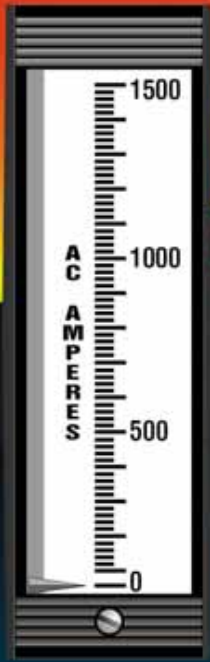


Analog Instruments



**WESCHLER
INSTRUMENTS**
DIVISION OF HUGHES CORPORATION

FAST FIND INDEX

SWITCHBOARD INSTRUMENTS

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WESCHLER INSTRUMENTS

**16900 Foltz Parkway
Cleveland OH 44149
440-238-2550
fax: 440-238-0660
email: sales@weschler.com
web: www.weschler.com**

4 1/2 and 8 3/4-inch Rectangular, Type K-241 and 261, For Commercial and Military Service

Application

Type K-241 & 261 instruments have been designed to achieve the ultimate in reliability and performance. Instruments of this class are recommended for use on electric utility switchboards and process control panels for similar industrial service.

Navy HI-Shock instruments were developed to meet the special needs of the U.S. Navy. These instruments are used almost universally for military shipboard applications. They may be used to advantage on commercial marine and industrial applications or wherever humid conditions or severe mechanical shocks are sustained.

Selection of Type K-241 & 261 instruments is indicated whenever there is a need for frequent, accurate, quick readings and where failure in an instrument circuit could affect an associated critical circuit.

Standards

Type K-241 & 261 commercial instruments comply with ANSI Standard C39.1 for 1% class switchboard instruments. HI-Shock instruments meet the stringent requirements of their associated standards (see table 1).

Features

Taut-Band Suspension

All Type K-241 & 261 instruments, except those which rotate continuously, use taut-band suspension. Instruments incorporating this feature are identified by the trademark *tbs*. The taut-band suspension instrument has certain unique advantages over the conventional pivot and jewel types:

1. It eliminates friction, giving better accuracy and almost perfect repeatability.
2. It gives top performance under adverse conditions of shock and vibration.
3. It reduces maintenance, thereby saving money throughout the lifetime of the instrument.
4. It assures longer life, reducing annual depreciation and replacement costs.
5. It has greater sensitivity, reducing power burdens on circuits being measured.

Enclosures

The window of 241 types is shatterproof polycarbonate.

The window of HI-Shock instruments is shatterproof and 241 types are chemical and scratch resistant. Bases are made from a high strength plastic with nontoxic combustion products.

Cases and hardware for all types are heavily plated to resist harsh environments.



TYPE KX-261 High Shock

Mechanisms

Type K-241 and 261 instruments are built with permanent-magnet moving-coil mechanisms for all direct current and rectifier types, as well as for those employing self-contained or external transducers. For RNS measurement of alternating current, the mechanisms use iron-vane principles. Both types are built with taut-band suspensions. The power factor meter and the synchroscope are of the rotating vane type with pivot and jewel bearings.

Full View Design

To facilitate quick, accurate reading, even under adverse conditions, all K-241 instruments feature the Westinghouse "full view" design. The window is flat, reducing light reflection to minimize the need for a non-glare surface. The dial scale is beveled so that there is no dial shadow, making it possible to read the instrument from a 60-degree angle.

High Overload Capacity

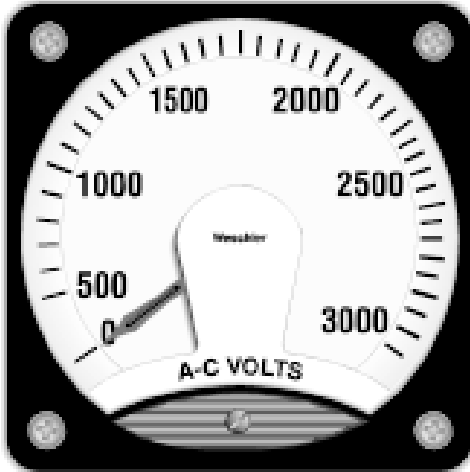
While the exact overload capacities vary with ratings, the K-241 and 261 instruments generally will withstand momentary overloads in excess of industry standards without sustaining damage. For ac instruments this overload capacity is in excess of 35 times normal current, and for dc it is in excess of 150 times. Therefore, it is permissible to select instruments to read at a preferred three-quarters scale at normal current and yet permit "pegging" the instrument during high-current transient conditions.

Sensitivity

DC instruments are available in ratings from 100 microamps up. All *tbs* mechanisms have much lower resistance than their pivot and jewel counterparts and most competitive mechanisms.

Type K-241 and K-241 High Shock

KA-241 Commercial



KX-241 High Shock



Types Available

Function	Ranges	Type Designation	Mechanism	Applicable Specification(s)
DC Microammeter	100uA to 1mA	KX-241 Com & HI, 261 Com	Permanent-magnet moving coil	ANSI C39.1-1981, MIL-M-16034A
DC Milliammeter	1mA to 1A	KX-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-M-16034A
DC Ammeter	1A to 50A	KX-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-M-16034A
DC Millivoltmeter	50mV to 1V	KX-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-M-16034A
DC Voltmeter	1V to 800V	KX-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-M-16034A
AC Milliammeter	10mA to 1A	KA-241 Com & HI, 261 Com	Iron Vane	ANSI C39.1-1981, MIL-M-16034A
AC Ammeter	1A to 20A	KA-241 Com & HI, 261 Com	Iron Vane	ANSI C39.1-1981, MIL-M-16034A
AC Voltmeter	10V to 750V	KA-241 Com & HI, 261 Com	Iron Vane	ANSI C39.1-1981, MIL-M-16034A
AC Frequency Meter	50, 60 & 400 Hz	KX-241 Com & HI	With Separate Transducer	ANSI C39.1-1981, MIL-M-16125
AC Frequency Meter	50, 60 & 400 Hz	KR3-241 Com	Self Contained Transducer	ANSI C39.1-1981
AC Frequency Meter	395-405 Hz	KR4-241 HI	Self Contained Transducer	MIL-M-23167
AC Power Factor Meter	0-1-0	KI-241 Com & HI, 261 Com	Rotating Vane	ANSI C39.1-1981, MIL-M-19261
AC Power Factor Meter	.5-1-.5	KJ-241 Com	Self Contained Transducer	ANSI C39.1-1981
AC Synchroscope	.....	KI-241 Com & HI, 261 Com	Rotating Vane	ANSI C39.1-1981, MIL-M-16104B
AC Wattmeter	.1 to 10A	KP-241 Com & HI, 261 Com & HI	Self Contained Transducer	ANSI C39.1-1981, MIL-W-19088
AC Varmeter	.1 to 10A	KP-241 Com & HI, 261 Com & HI	With External Phase Shifter	ANSI C39.1-1981
AC Varmeter	.1 to 10A	KV-241 Com & HI, 261 Com & HI	Self Contained Transducer	ANSI C39.1-1981
Rectifier Milliammeter	1mA to 1A	KC-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-V-23151
Rectifier Ammeter	1A to 17A	KC-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-V-23151
Rectifier Voltmeter	5V to 600V	KC-241 Com & HI, 261 Com	Permanent-magnet moving-coil	ANSI C39.1-1981, MIL-V-23151
Resistance Thermometer	All Popular Ranges	KX-241 Com & HI, 261 Com	Self Contained Bridge	MIL-T-15377F (NOTE 1)
Speed Indicator (Tachometer)	0-25, up to 13000 PPS	KR-241 Com & HI, 261 Com	Self Contained Transducer	ANSI C39.1-1981, MIL-T-16049
Synchrotie	0-360°	KS-241 Com, Unmounted Transmitter	Self-Synchronous	.....

Notes:

1) For readout and bridge circuit.

Specifications

Accuracy:

1% accuracy class. See AD 43-200 for accuracy of specific instruments

Case Size:

4 1/2-inch class (4 27/61 inches (11.2 cm) square).

Insulation Rating:

800 V

Shielding:

DC- 1 % influence at 50-200 gauss.
AC - 1 % influence at 15 gauss.

Scale Length:

7.1 inches (18 0 cm) for 250° rotation.

Net Weight:

3 to 5 pounds (1.4 to 2.2 kg), exclusive of accessories.

AC Burdens:

5A ac ammeter- .375 VA
AC wattmeter- 2.0 VA (current coil)
AC wattmeter- 2.5 W (potential Coil)
150V ac voltmeter- 2.4 W
For details, see Application Data 43-200.

Wiring Diagrams:

See Application Data 43-200

Further Information

Ordering Information, Styles & Ratings:
See index of this catalog
Instructions: IL 43-241
Renewal Parts: RPD 43-241

Modifications

Mechanism Dials:

Black with white marking
Fluorescent
Dual scale
Special colors, trademarks, legends etc.

Windows:

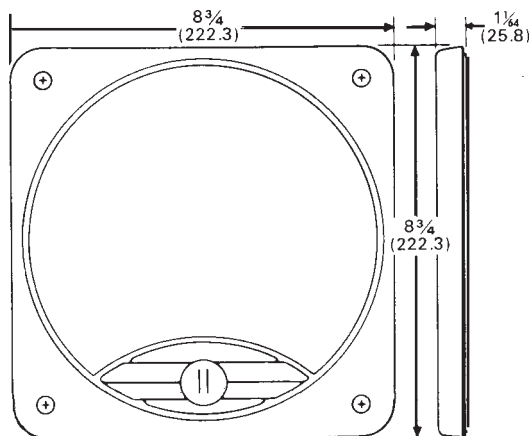
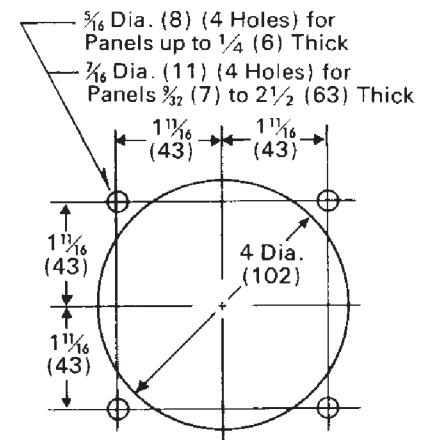
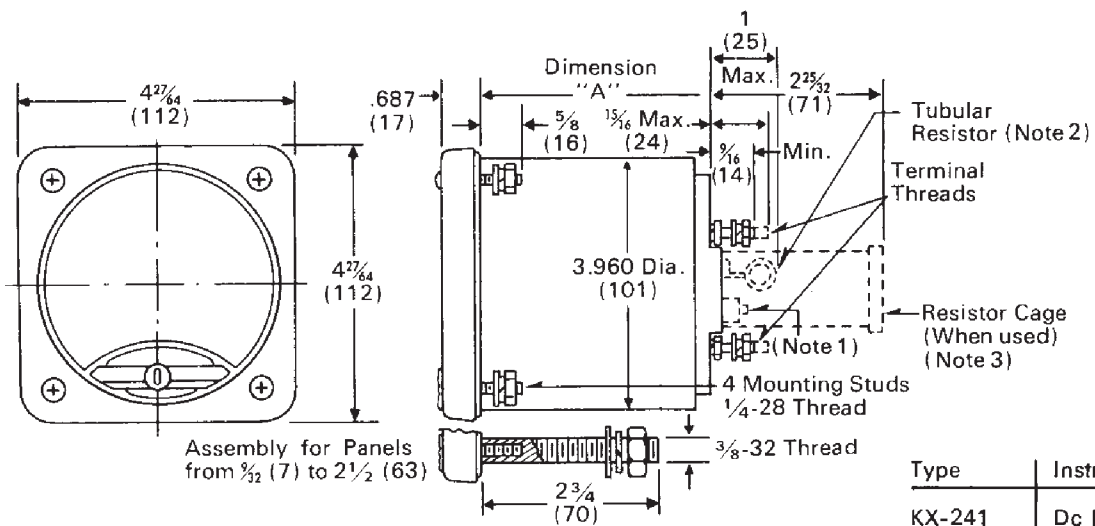
Non-glare, Shatterproof

Electrical:

Intermediate ratings
Special calibrations
Offset or suppressed Zero
Multiple rating
Special sensitivity

Mechanical:

Pusher or index pointers, Weatherproof, HI-Shock (MIL-S-901C)



Type	Instrument	Dimension	A
KX-241	Dc Instruments	2.813	(71)
KC-241	Rectifier Instruments, Except Transducer Type	2.813	(71)
KA-241	Ac Voltmeters and Ammeters	2.813	(71)
KC-241	Transformer Type Rectifier Ammeter	3.750	(95)
KR3-241	Frequency Meter	3.750	(95)
KX-241	Electrical Resistance Thermometer	3.750	(95)
KI-241	Synchroscope, Single Phase	5.312	(135)
KI-241	Power Factor Meters	5.312	(135)
KP-241	Wattmeters	5.312	(135)
KV-241	Varmeters	5.312	(135)
KJ-241	Power Factor Meters	5.312	(135)

- Note 1 – Potentiometer for factory adjustment of 150, 300 and 600 V ac voltmeters.
 Note 2 – Tubular resistor on single phase 50 and 60 Hz synchrosopes and power factor meters. (commercial grade)
 Note 3 – Resistor cage used with 400 Hz synchrosopes and power factor meters, 3 phase power factor meters, high shock power factor meters & high shock synchrosopes.

4 1/2 Inch Rectangular Type K-221 For Commercial Service

Application

Type K-221 instruments are the lowest priced of the Weschler switchboard instruments, yet they meet the same rigid performance specifications as the more expensive types. These instruments are recommended for use where they can be read from a distance of less than twelve feet. The Type K-221 is used most effectively on industrial apparatus such as mill drives, generator sets, power rectifiers and converters. It is most practical for electric utility uses such as in substations where readings are taken only occasionally, but where the ultimate in reliability is required.

This is the lowest priced instrument which should ever be used where the failure of an instrument circuit could affect an associated critical circuit. This is usually the case where current and potential transformers or transducers are shared with devices having control or protective functions.

Standards

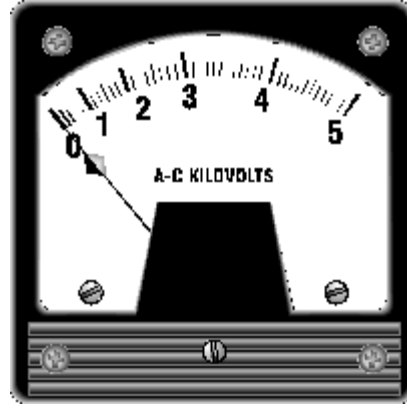
Type K-221 instruments comply with USA Standards C39.1, 1964, for 1% class switchboard instruments. In such areas as related to shock, vibration, friction, repeatability and electrical losses most K-221 types will exceed these specifications because of improvements inherent in the taut-band design.

Features

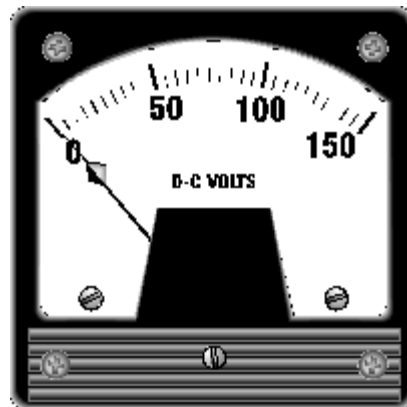
Taut-Band Suspension

All K-221 instruments except wattmeters and power factor meters use taut-band suspension. Instruments incorporating this feature are identified by the trademark **tbs**. The taut-band suspension instrument has certain unique advantages over the conventional pivot and jewel type:

1. It eliminates friction, giving better accuracy and almost perfect repeatability.
2. It gives top performance under adverse conditions of shock and vibration.
3. It permits mounting on apparatus without fear of damage in shipment.
4. It reduces maintenance, thereby saving money throughout the lifetime of the instrument.
5. It assures longer life, reducing annual depreciation and replacement costs.
6. It has greater sensitivity, reducing power burdens on circuits being measured.



KA-221 Ac Voltmeter



KX-221 Dc Voltmeter

Mechanisms

The K-221 instrument uses a core-magnet permanent magnet moving-coil mechanism for dc measurement. For direct measurement of ac current or voltage a repulsion type moving-iron mechanism is used. Both of the above have taut-band suspensions. Power factor meters and wattmeters are of the dynamometer type with pivot and jewel bearings, but may be furnished as taut-band instruments using external transducers-

High Overload Capacity while the exact overload capacities vary with ratings, the K-221 instruments, generally, will withstand momentary overloads in excess of industry standards without sustaining damage. For ac instruments this overload capacity is in excess of 35 times normal current, and for dc it is in excess of 150 times. Therefore, it is permissible

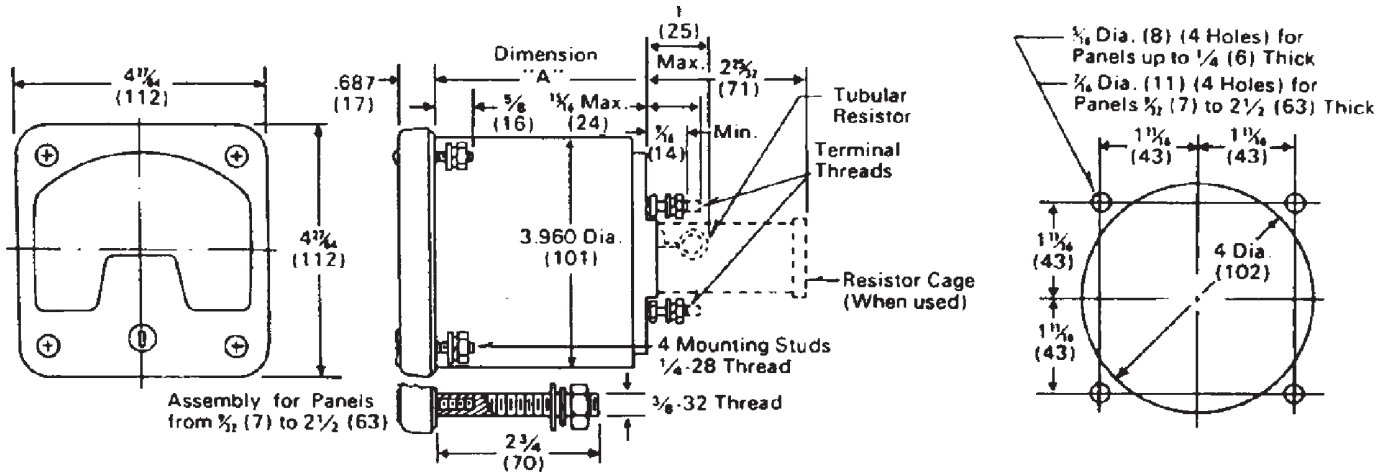
to select instruments to read at a preferred three-quarters scale at normal current and yet permit pegging, the instrument during high-current transient conditions.

Magnetic Shielding

The dc core-magnet instruments can be used in external fields up to 500 gauss. They can be mounted close to conductors carrying thousands of amperes without the necessity of installing magnetic shields.

4½-Inch Rectangular Type K-221, For Commercial Service

Outline Dimensions and Drilling Plan In Inches (Millimeters), For detailed dimensions, see Application Data 43-200,



Specifications

Accuracy: 1% of full scale deflection.

Case Size: 4½-inch class (4^{27/64}-inch square).

Insulation Rating: 800 volts.

Shielding: Magnetically shielded.

Scale Length: 4 inches for 100 degrees rotation.

Net Weight: 3 to 5 pounds, exclusive of accessories.

Burdens: 5A ac Ammeter - .44 va
AC Wattmeter
Current coil (5A) - 1.95 va
Potential coil - 3.6 va
150v ac voltmeter - 1.92 va
1ma dc - 12 ohms

For further details on burdens, see Application Data 43-200.

Modifications

Dials: Black with white marking
Fluorescent
Multi-scale
Fine line
Special colors, trademarks & legends.

Windows: Non-glare

Electrical: Intermediate rating
Special calibration
Offset or suppressed zero

Multiple rating

Special sensitivity
Accuracy to 1/2%

Mechanical: Pusher, index pointers or Knife-edge pointer.

Many additional modifications are available on special negotiation.

Types Available

Function	Ranges	Type	Mechanism Type
DC Microammeter	50ua to 1 ma	KX-221	permanent magnet moving coil
DC Milliammeter	1 ma to 1 A	KX-221	permanent magnet moving coil
DC Ammeter	1 A to 50 A	KX-221	permanent magnet moving coil
DC Millivoltmeter	50 mv to 1 V	KX-221	permanent magnet moving coil
DC Voltmeter	1 V to 750 V	KX-221	permanent magnet moving coil
Ac Milliammeter	10 ma to 1 A	KA-221	repulsion iron-vane
Ac Ammeter	1 A to 50 A	KA-221	repulsion iron-vane
Ac Voltmeter	15 V to 750 V	KA-221	repulsion iron-vane
Frequency Meter	50, 60, 400 Hz	KR3-241	self-contained transducer
Ac Wattmeter	.5 A to 10 A	KY-221	dynamometer
Ac Varmeter	5 A to 10 A	KY-221	dynamometer
Power Factor Meter	0.5 to 1 to 0.5	KJ-221	self-contained transducer
Resistance Thermometer	100 to 200°F	KX-221	self-contained transducer

Wiring Diagrams

See Application Data 43-200.
Instructions: IL 43-221

Type 252, 4½" Scale Length 1½% Accuracy

Application

Type 252 edgewise instruments were designed specifically for the nuclear power industry for use on control panels. However, they are well suited to any use where high reliability and efficient use of space are important Considerations.

These instruments incorporate into edge-wise instruments the same taut-band suspension system which is used in the highest quality Weschler portable and switch-board instruments.

They are available in types for direct measurement of standard electrical quantities, or in combination with transducers for measuring any other electrical or mechanical quantity capable of being converted into a proportional electrical quantity.

Standards

There is no published requirement in ANSI C39.1-1981 for instruments of 1½% accuracy class, however; they exceed the requirements for the 2% class specified therein, and may be calibrated to 1% initial accuracy. The type 252 instruments meet the flammability requirements of IEEE Standard 420-1973 and they have passed the seismic qualification tests under IEEE Standard 344-(1987).

Specifications

Accuracy 1½% of full scale deflection, horizontal or vertical; ±1% on special order

Waveform Compensation To 15% of third harmonic content

Momentary Overload Capacity ACA & DCA: 10x end scale ACV: 1.5x DCV: 2x

Working Voltage 1200 volts dc or peak ac, to Ground 800 volts ac rms

Shielding Magnetically shielded

Scale Length 4.5 inches (11.43 Cm)

Net Weight 1½ pounds

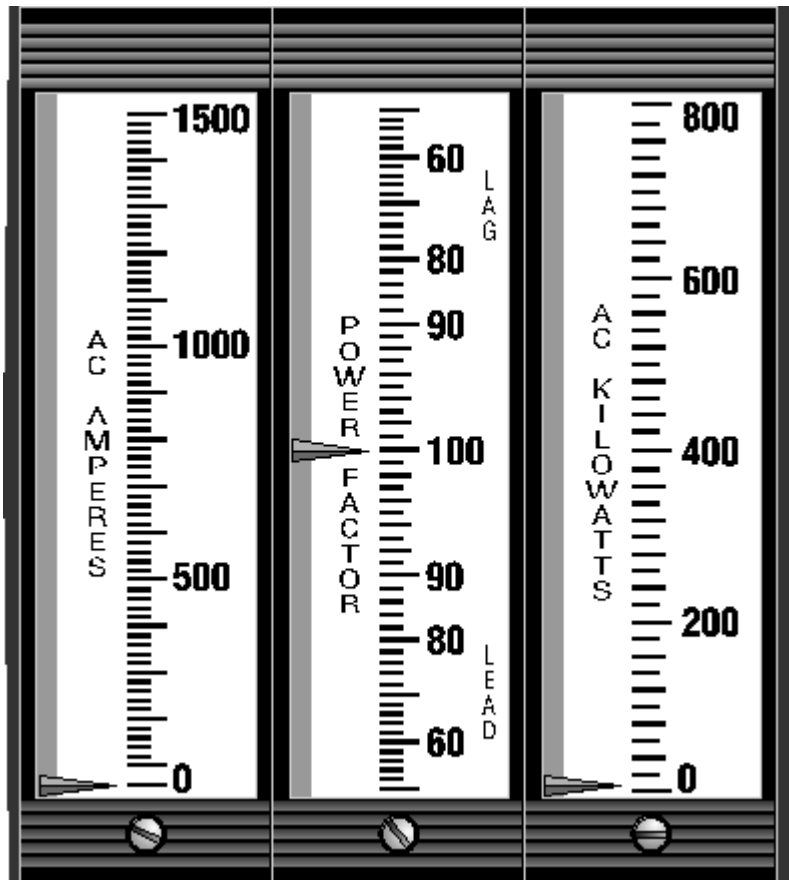
Shipping Weight 2½ pounds

Ratings (Self-Contained)

DC: 50 microamperes to 50 amperes
50 millivolts to 750 volts

Ac: 10 milliamperes to 20 amperes
5 volts to 600 volts

Transducer-type frequency meters, varmeters, wattmeters and power factor meters are available.



Vertical Type (Grouped)



Horizontal Type

Type 252, 4 1/2" Scale Length 1 1/2% Accuracy

Construction: All components are mounted on a plastic drawer which slides into a plastic case with a clear, curved window. The entire assembly is treated to be static free. The plastic is polycarbonate (ASTM D635) for impact strength and flame retardance.

Mechanism: The dc instrument is of the permanent magnet moving-coil type in a core magnet construction.

For ac measurement the same mechanism is used, but rectifiers and an rms network are added. This design permits the ac instrument to have a linear scale, to compensate for wave form distortion, and to be practically immune to the effects of magnetic fields from adjacent conductors regardless of their orientation.

Suspension: All type 252 instruments use taut-band suspensions. Instruments incorporating this feature are identified by the trademark *tbs*. The absence of friction in taut-band instruments creates the advantages of perfect repeatability, reduced maintenance, and lower electrical burdens. The inherent ruggedness of the design makes it a top performer under adverse conditions of shock or vibration.

Dials Pointer edge and dial markings are on the same arc so that there is no parallax error.

Mounting Instruments may be stacked horizontally or vertically. Eight edgewise vertical instruments will occupy the same panel width as three conventional instruments. Trim strips, furnished with each instrument, finish off the edge of each instrument or array. Dial cards may be interchanged to adapt from horizontal to vertical mounting or to change scales.

Modifications Available:

Internal illumination with low-voltage lamp and translucent dial.

Non-glare window

Dual scale or rating

Straight fine tubular pointer

Offset, center, or suppressed zero

Gasketed construction

Further Information

Instructions: Instruction Leaflet 43-252

Transducers: DB 43-840 & 860 Series

Burden Characteristics at 60 Hertz

Burdens on Current Transformers at 5 Amps

Instrument Rating	Impedance: Ohms	Resistance: Ohms	Reactance: Ohms	Volt-Amperes	Percent Power Factor
5amp	.024	.013	.020	0.6	54

Burden on Potential Transformers at 120 Volts

Instrument Rating	Volt-Amperes	Watts	Vars	Percent Power Factor
150 volts	.096	.096	0	100

Lamps

Lamp Type	Volts	Amps
46	6.3	0.25

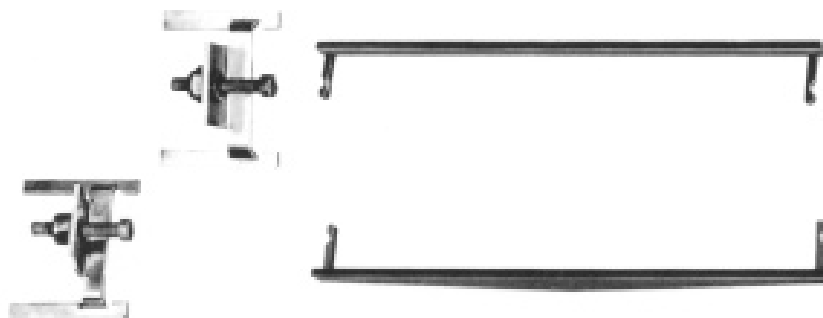


Figure 1: Mounting Material Supplied with Instrument

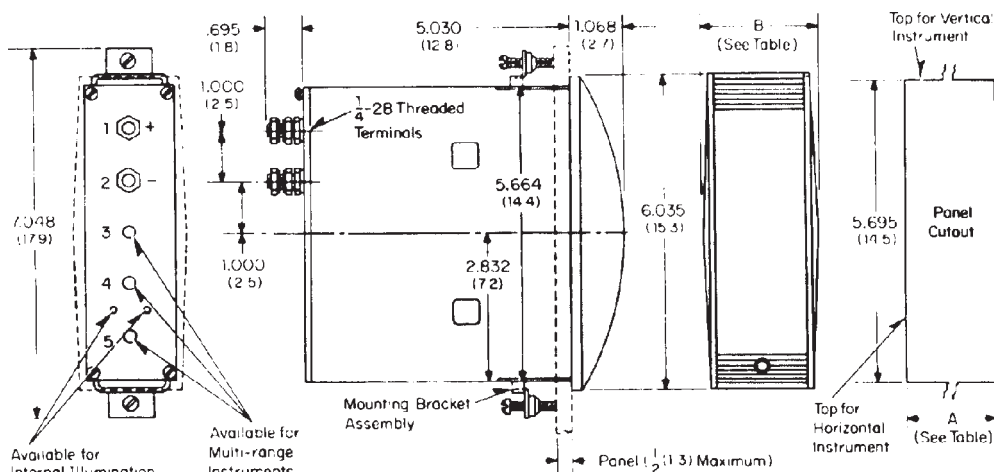


Figure 2: Outline and Drilling Dimensions, In Inches (Millimeters)

Mounting

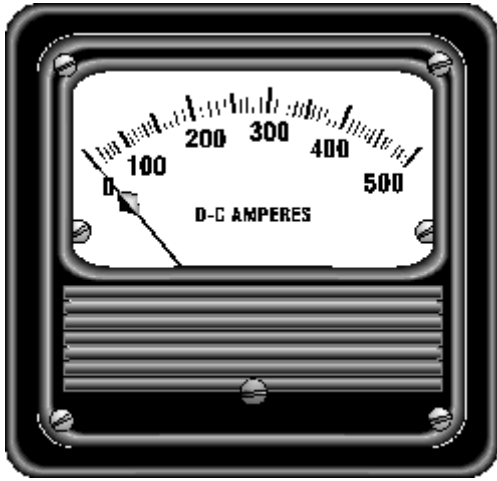
Figure 1 shows the two bracket assemblies and two trim strips which are supplied with each 252 instrument. Figure 2 illustrates how these parts are used.

Two trim strips are needed to trim either a single instrument or a stacked array.

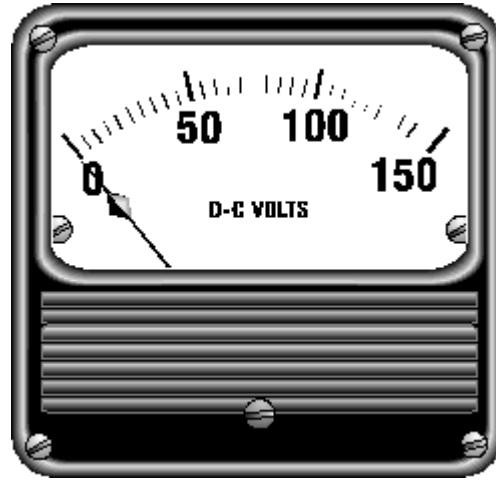
No. of Instruments	Dimensions	
	A	B
1	1.770(43)	2.166(55)
2	3.510(89)	3.896(99)
3	5.250(133)	5.620(143)
4	6.990(178)	7.356(187)
5	8.730(222)	9.086(231)
6	10.470(266)	10.816(275)
7	12.210(310)	12.546(319)
8	13.950(354)	14.276(363)

6-Inch Rectangular, Flush and Projection Mounting, Types K-251, U-251

KA-251 Ac Ammeter
(Flush Mounting)



UX-251 Dc Voltmeter
(Projection Mounting)



Application

Type K-251 instruments are an updated version of the conventional 100 degree switchboard instruments which have set the standards of performance. They have capabilities in performance, sensitivity and flexibility which cannot be met by the newer circular scale types. The K-251 type is used in two principal areas of application: The first in conventional switchboard applications where the user has a preference for reading in a limited arc; the second where there is need for sensitivity, frequency, accuracy or resolution higher than that available on 250° mechanisms.

Type 251 instruments have been designed for the maximum reliability to assure the security of any control or protective circuits into which they may be introduced.

Instruments for projection mounting are identical except for the case. They are designated as U-251.

Standards

Type 251 instruments comply with ANSI Standards C39.1-1981, for 1% class switchboard instruments. In such areas as relate to shock, vibration, repeatability and electrical losses, most 251 types will exceed these specifications because of improvements inherent in the exclusive 100 degree taut-band design.

Features

Taut-Band Suspension

All Type 251 instruments use taut-band suspension. Instruments incorporating this feature are identified by the trademark *tbs*. The taut-band suspension instrument has certain unique advantages over the conventional pivot and jewel type:

1. It eliminates friction, giving better accuracy and almost perfect repeatability.
2. It gives top performance under adverse conditions of shock and vibration.
3. It permits mounting on apparatus with out fear of damage in shipment.
4. It reduces maintenance, thereby saving money throughout the lifetime of the instrument.
5. It assures longer life, reducing annual depreciation and replacement costs.
6. It has greater sensitivity, reducing power burdens on circuits being measured.

Mechanisms

The K-251 instrument uses a core-magnet permanent-magnet moving-coil mechanism for dc measurement. For ac the mechanism is a repulsion-vane type. Both of the above are taut-band types. Power factor meters and wattmeters are of the dynamometer type, and the synchroscope and the 4-quadrant power factor meter are rotating vane. The latter two types are of pivot and jewel construction. Power factor meters and wattmeters may be furnished as taut-band instruments using external transducers.

High Overload Capacity

While the exact overload capacities vary with ratings, the Type 251 instruments generally will withstand momentary overloads in excess of industry standards without sustaining damage. For ac instruments this overload capacity is in excess of 35 times normal current; for dc it is in excess of 150 times. Therefore, it is permissible to select instruments to read at preferred three-quarters scale at a normal current and yet permit "pegging" the instrument during high current transient conditions.

Magnetic Shielding

The ac core magnet instruments can be used in external fields up to 500 gauss. They can be mounted close to conductors carrying thousands of amperes without the necessity of installing magnetic shields.

6-Inch Rectangular, Flush and Projection Mounting, Types K-251 and U-251

Specifications

- Accuracy:** 1% of full scale deflection.
- Case Size:** 6 inch rectangular
 Flush mounting 6½ inches overall
 Projection mounting 5 9/16 inches overall.

Insulation Rating: 800 volts

Shielding: Magnetically shielded

Scale Length: 5 inches for 100° rotation.

Net Weight: 4 to 6 pounds, exclusive of accessories

Burdens: 5 A Ac Ammeter-.44 va
 5 A Ac Wattmeter

(Current Coil) - 0.95 va

(Voltage Coil) - 3.60 va

150 v Ac Voltmeter - 1.92 va

1 ma Dc-12 ohms

For complete details on burdens, see Application Data 43-200.

Modifications

- Dials:** Black with white markings
 Internal incandescent illumination
 Multi-scale
 Fine-line
 Special colors, trademarks, legends

Windows: Non-glare

- Electrical:** Intermediate rating
 Special calibration
 Offset or suppressed zero
 Multiple rating
 Special sensitivity

Wiring Diagrams

See Application Data 43-200.

Further Information

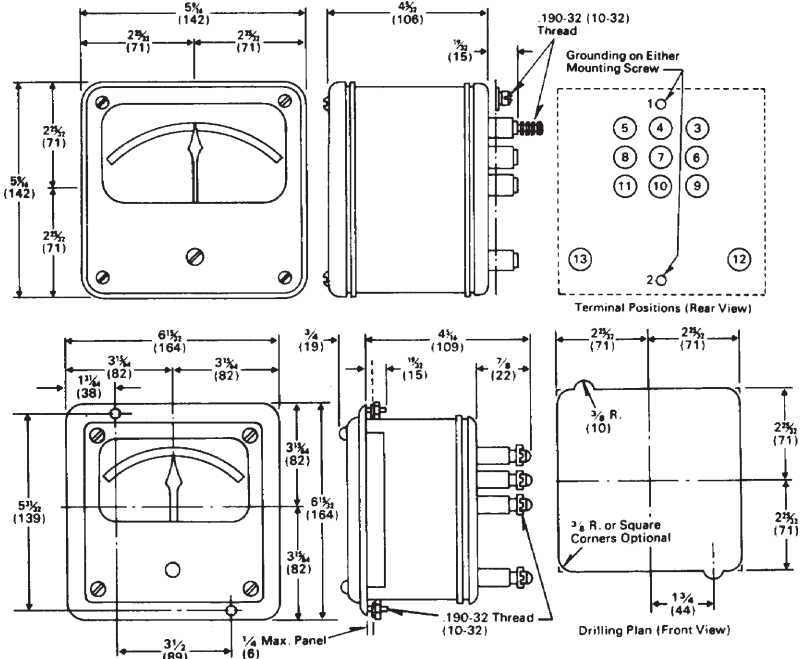
Ordering Information & Ratings:

This catalog, Switchboard Section Instructions: IL 43-251

Outline Dimensions and Drilling Plans in inches (Millimeters)

For detailed dimensions, see Application Data 43-200.

U-251 Projection Mounting



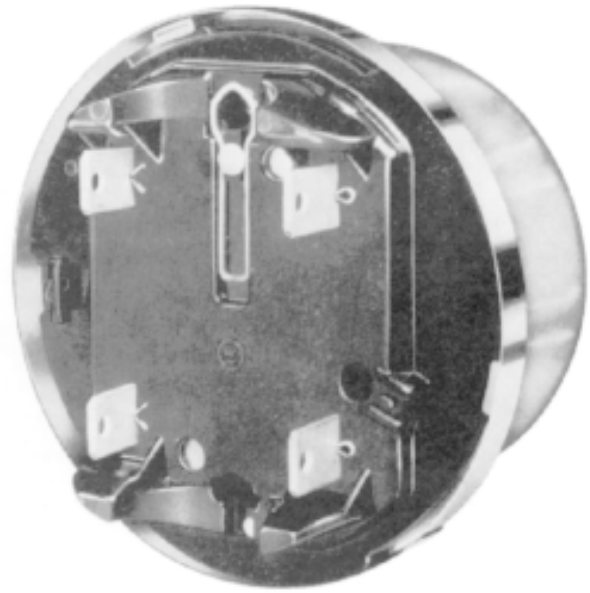
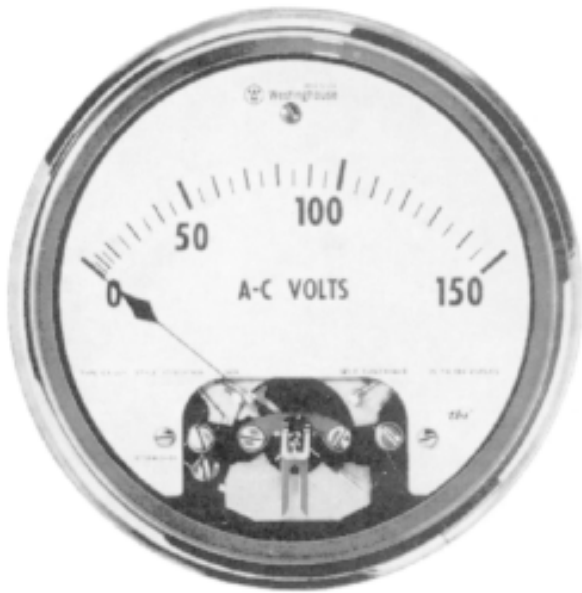
K-251 Flush Mounting

Instrument	Drill Holes
Differential Voltmeter or Ground Detector	1-2-6-8
Ac or Dc Ammeter or Voltmeter and Frequency Meter	1-2-6-8
Power Factor Meter	1-2-3-4-9-10
Illumination	12-13

Types Available

Function	Ranges	Type Designation	Mechanism
Dc Microammeter	50ua to 1ma	KX, UX-251	permanent-magnet moving-coil
Dc Milliammeter	1ma to 1a	KX, UX-251	permanent-magnet moving-coil
Dc Ammeter	1a to 50a	KX, UX-251	permanent-magnet moving-coil
Dc Millivoltmeter	50mv to 1v	KX, UX-251	permanent-magnet moving-coil
Dc Voltmeter	1v to 800v	KX, UX-251	permanent-magnet moving-coil
Ac Milliammeter	10ma to 1a	KA, UA-251	repulsion iron-vane
Ac Ammeter	1a to 50a	KA, UA-251	repulsion iron-vane
Ac Voltmeter	15v to 800v	KA, UA-251	repulsion iron-vane
Frequency Meter	normal range	KR3, UR3-251	self-contained transducer
Frequency Meter	narrow range	KX, UX-251	separate transducer
Rect. Milliammeter	.5 to 2ma	KC, UC-251	permanent-magnet moving-coil
Rect. Voltmeter	5v to 800v	KC, UC-251	permanent-magnet moving-coil
RTD Thermometer	100-200 deg.	KX, UX-251	self-contained transducer
Power Factor Meter	0.5-1-0.5	KJ, UJ-251	self-contained transducer

7-Inch Round, Types EA-251 and EX-251 Socketed Instruments



Application

Type E-251 instruments provide a Convenient, economical means of monitoring electrical power at the point of use. The instruments plug into standard watt/hour meter sockets which may be sealed off when not in use. Thus, the instruments may be plugged in for periodic use or left in place continuously. Using a watt/hour meter sealing ring makes an installation weatherproof.

Socket instruments are generally used on motors driving conveyors, mills, machine tools or pumps - applications where the motor loading is dependent upon conditions which are under the control of an operator. Intelligence from a motor load instrument at the operator's station permits him to optimize conditions.

Standards

Type E-251 instruments use the same mechanism and are made to the same manufacturing standards as the Switchboard Type K-251 which meets ANSI Standard 39.1, 1981. There is no specific ANSI standard for detachable instruments.

Features

Taut-Band Suspension

All Type E-251 instruments use taut-band suspension. Instruments incorporating this feature are identified by the trademark **tbs**. The taut-band suspension instrument has certain unique advantages over the conventional pivot and jewel type:

1. It eliminates friction, giving better accuracy and almost perfect repeatability.
2. It gives top performance under adverse conditions of shock and vibration.
3. It permits mounting on apparatus without fear of damage in shipment.
4. It reduces maintenance, thereby saving money throughout the lifetime of the instrument.
5. It assures longer life, reducing annual depreciation and replacement costs.
6. It has greater sensitivity, reducing power burdens on circuits being measured.

Mechanisms

Type EA-251 ac instruments use the repulsion iron-vane for true RMS response. Type EX-251 dc instruments have a permanent-magnet moving-coil element. Both are taut-band suspension types.

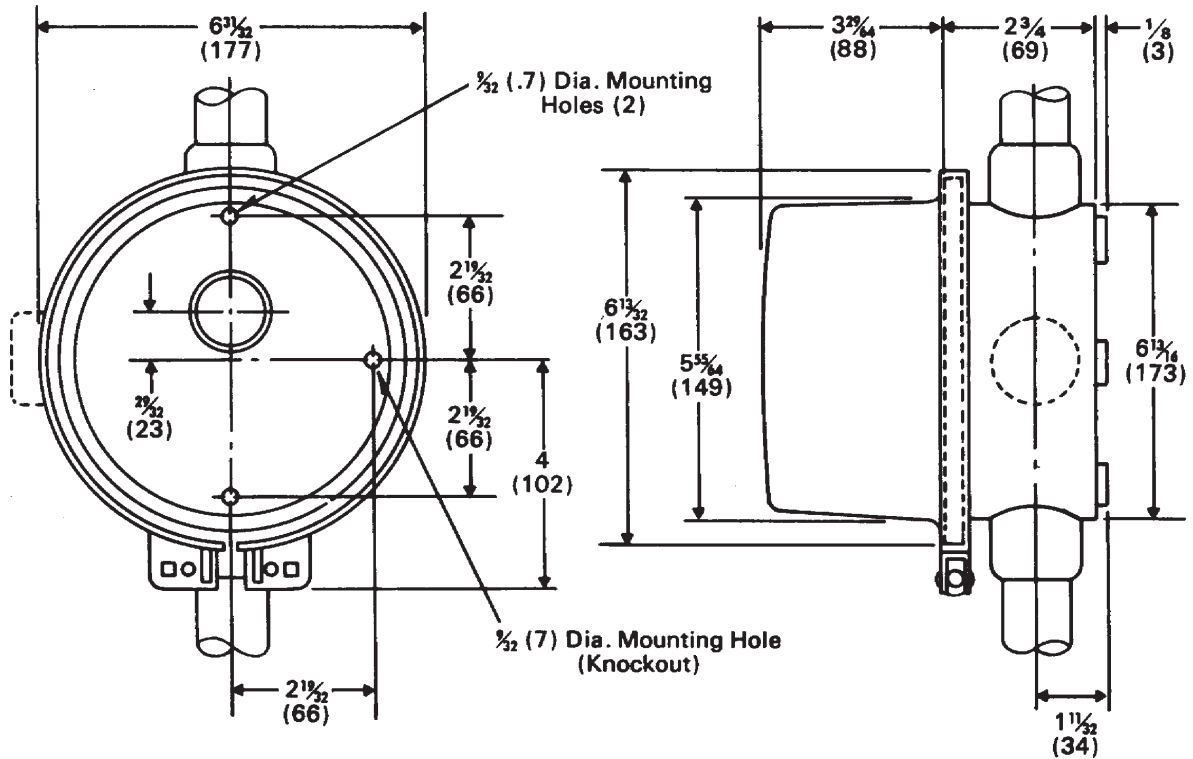
High Overload Capacity

While exact overload capacity varies with rating, the ac instruments generally will handle 35 times normal current and the dc instruments 150 times normal current on a momentary basis without sustaining damage. Therefore, it is possible to select instruments to read at a preferred three-quarters scale at normal current and yet permit "pegging" during high current transients - such as motor inrush currents,

Sockets

Any Type S 4-jaw socket may be used. Sockets may be installed in vertical or horizontal conduit runs, or on vertical or horizontal conduit stubs. They also are made in a ring type for installation in a box or panel. For use with current transformers the sockets must be of the circuit-closing type. This feature is convenient to provide circuit continuity where instruments are installed on a periodic basis.

7-Inch Round, Types EA-251 and EX-251 Socketed Instruments



Specifications

Accuracy: 1% of full scale.

Case Size: $6\frac{13}{32}$ inches overall.

Insulation Rating: 800 volts.

Shielding: Magnetically shielded.

Scale Length: 5 inches.

Net Weight: 4 to 6 pounds.

Burdens: 5a Ac Ammeter-.44 va
150v Ac Voltmeter- 1.92 va
1 ma Dc Voltmeter - 12 ohms
Voltsmeters Dc - 1000 ohms/volt

Types Available

Function	Ranges	Type Designation	Mechanism
Ac Ammeters	5a to 75a	EA-251	repulsion iron-vane
Ac Voltmeters	150,300,600	EA-251	repulsion iron-vane
Ac Wattmeters	5a, 120v	EX-251	separate transducer
Dc Voltmeters	1v to 800v	EX-251	permanent-magnet moving-coil
Dc Ammeters	50mv	EX-251	permanent-magnet moving-coil

Modifications

Calibration with transducers
Special legends
Intermediate ratings

Wiring Diagrams

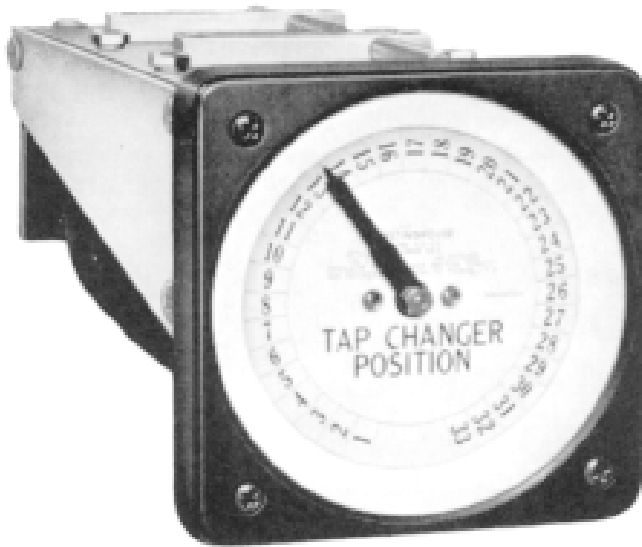
See Application Data 43-200,

Further Information

Ordering Information & Ratings:
This catalog, Switchboard section.
Instructions: IL 43-251.1

For details on burdens, see Application Data 43-200.

Type KS-241 Sychrotie Remote Position Indicators



Application

A sychrotie system is used to indicate the position of a remote device. Basically, the system consists of a self-synchronous motor mechanically coupled to the remote device and electrically coupled to an identical motor on a local indicating instrument. Any rotation of the motor (transmitter) on the remote device is translated into an equal rotation of the indicating instrument (receiver).

Typical uses for remote position indicators are on turbine or waterwheel governors, draw or lift bridges, elevators and conveyors, liquid level floats, transformer tap changers, valve position or generator rheostats. Sychrotie equipment may also be used for remote signalling, using a manually operated transmitter.

Mechanism

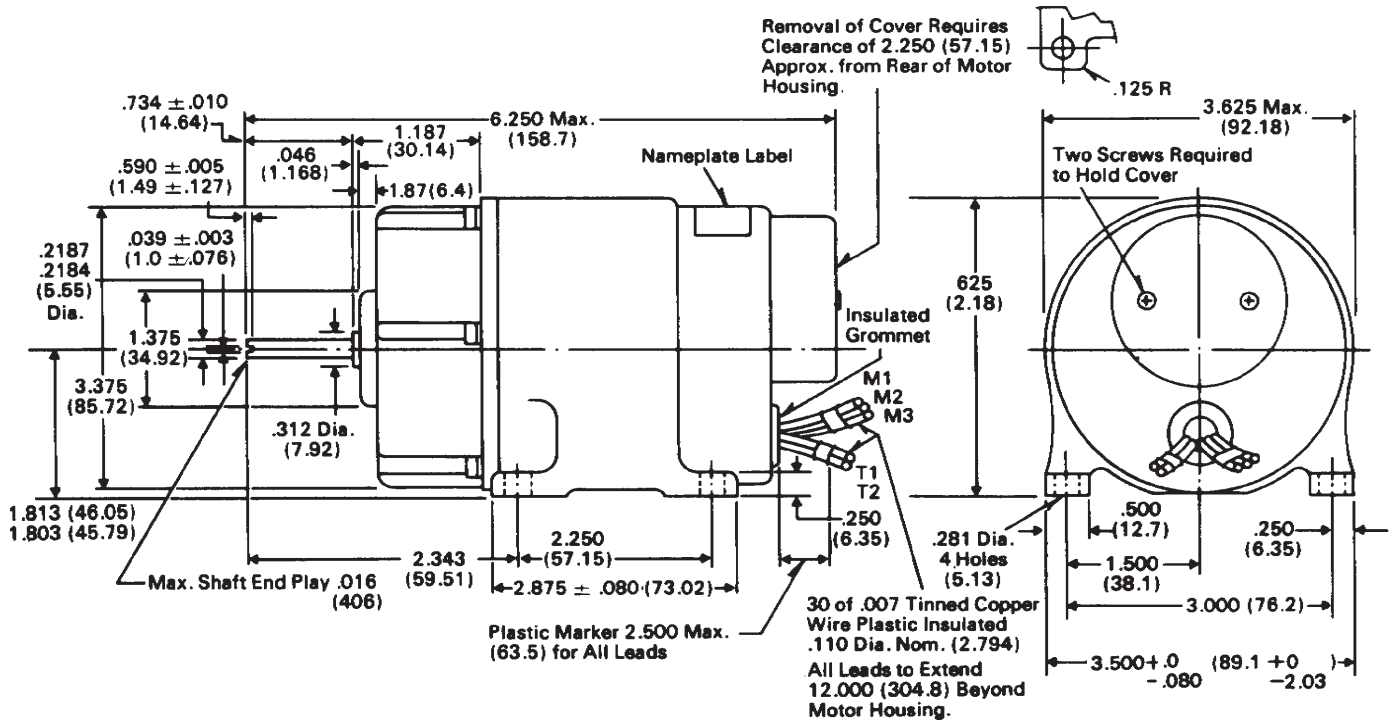
The transmitter and receiver motors are identical. Each has a single-phase rotor energized from a common source of 50/60 Hz power. The three-phase motor windings are connected solidly together. They will always attempt to find a position where the induced stator voltages balance out. Rotation of the transmitter will cause an unbalance which the receiver will compensate for by a corresponding rotation.

Types Available

Sychrotie	Transmitter motor
KS-241:	Receiver 4½" (114mm.), flush mounted.

Type KS-241 Synchrotie Remote Position Indicators

Outline Dimensions and Drilling Plan, Inches (Millimeters) See Application Data 43-200



Specifications

Maximum Speed: 200 rpm,

Accuracy: Accuracy is $\pm 1\%$. Accuracy can be adversely affected by low line voltage, excessive line resistance between transmitter and receiver, or by operating several receivers from one transmitter. (For actual conditions determine error from IL 43-249.)

Power Consumption: 60 VA, 15 watts, per motor.

Power Supply: 120 volts, 50/60 hertz

Secondary voltage: $57\frac{1}{2}$ volts.

Modifications

Dials: Black with white markings
Fluorescent

Windows: Non-glare
Shatterproof

Electrical: Multiple receivers
Differential receivers

Wiring Diagrams

See Application Data 43-200.

Further Information

Ordering Information & Ratings:
This Catalog, Switchboard Section
Instructions: IL 43-249

WATT METER SYSTEM DATA

Preferred Scales Wattmeters and Varmeters

In the interest of standardization of preferred wattmeter and varmeter scale markings for the common current and potential transformers a listing appears on this page. Such instruments may be supplied with left zero or center zero scales at the same list price.

Since wattmeter and varmeter current circuits are frequently connected in series, they should have equal current carrying capacity. This means that to assure equality the sum of the left and right end-scale values of the varmeter must be equal to or greater than the full-scale value of the wattmeter, (or the higher of the end-scale values if center or offset zero). Standard end markings and the proper scale divisions are listed in Application Data 43-200. If other combinations must be made, check with Weschler.

Scales outside the preferred ranges are available at an extra price for any current transformer secondary between .050 and 10 amps at full scale for circular scale, .100 and 20 amps for 100⁰ scale and .500 and 10 amps for Edgewise instruments.

Type 221 and 252 instruments 1000 kilowatts and over are marked in megawatts.

Center zero or offset zero varmeters are marked "IN" for left deflection and "OUT" for right deflection.

Preferred scales may be calculated for wattmeters and varmeters not listed on the charts. Scale watts must be one of the standard full scale dial markings shown on the charts or on Table A, Application Data 43-200, page 2.

3 phase, 4 wire (3 current coil)

MIN =ct ratio x pt ratio x 1.2 (Select next higher scale)

NOM =ct ratio x pt ratio x 1.5 (Select nearest scale)

MAX =ct ratio x pt ratio x 2.1 (Select next lower scale)

3 phase, 3 wire (2 current coil)

MIN =ct ratio x pt ratio x 0.8 (Select next higher scale)

NOM =ct ratio x pt ratio x 1.0 (Select nearest scale)

MAX =ct ratio x pt ratio x 1.25 (Select next lower scale)

1 phase

MIN =ct ratio x pt ratio x 0.4 (Select next higher scale)

NOM =ct ratio x pt ratio x 0.5 (Select nearest scale)

MAX =ct ratio x pt ratio x 0.62 (Select next lower scale)

Example: For 3 phase, 3 wire wattmeter with 400:5 ct and 1200:1 pt

MIN = 400/5 x 1200/1 x 0.8 = 77,000 Next higher = 80 MW

NOM = 400/5 x 1200/1 x 1.0 = 96,000 Nearest = 100 MW

MAX = 400/5 x 1200/1 x 1.25 = 120,000 Next lower = 120 MW

Note: If scale calculates to an exact listed value use it rather than the next higher or lower value.

$$1\text{ph Test Watts} = \frac{\text{Scale Watts}}{\text{CT ratio} \times \text{PT ratio} \times K}$$

Where

K = 1 1 - element

K = 2 2 - element

K = 4 2½ - element

FEATURES AND SPECIFICATIONS

20/20 Ac and Dc Custom Styled Panel Instruments

Application

20/20 instruments have neat, clean lines which harmonize with highly styled electronic components. They can be properly applied on equipment ranging from a spectrometer to a unit of power switchgear.

Readability

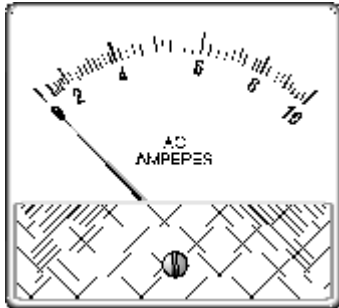
20/20 instruments were designed for maximum readability from a distance. The lance-design pointer in conjunction with the bold dial markings make this instrument the most easily read in its field.

Enclosures

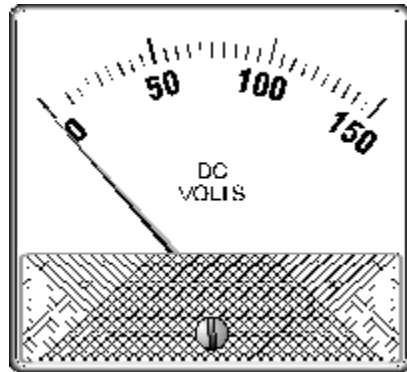
The 20/20 instrument case is made of a black Lexan plastic, dimensioned to meet the industry standards for Custom Styled Panel Instruments as defined by ANSI C39.1.

The snap-on cover is made up of a high grade Lexan plastic which will remain crystal clear in appearance. It is treated with Weschler Anti-Static

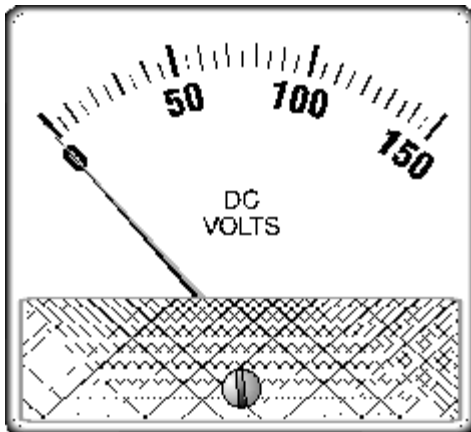
Agent to keep it dust-free, and to insure continued freedom from electrostatic effects. The side edges of the cover are also of clear plastic, allowing light to enter from any angle.



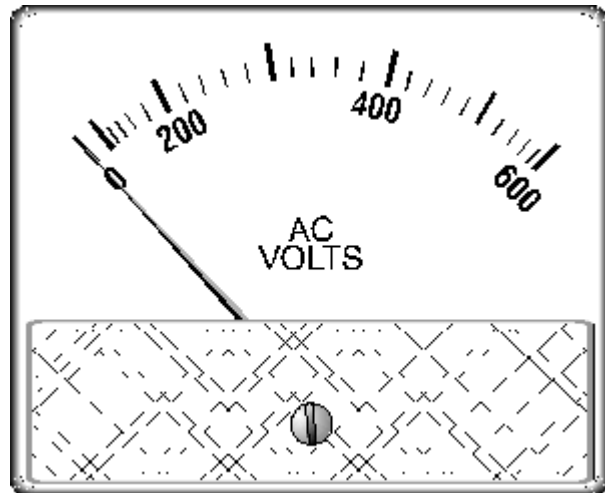
2 1/2" GA-332 Ac Ammeter



3 1/2" GX-352 Dc Voltmeter



4 1/2" GX-372 Dc Voltmeter



5 1/2" GA-382 Ac Voltmeter

Rear-of-Panel Mounting

Bezels are available for rear-of-panel mounting of each of the four sizes of instruments available.



2 1/2" G-332



3 1/2" G-352



4 1/2" G-372



5 1/2" G-382

Bezel Style Number	292B767G04	292B767G02	292B767G08	292B767G05

FEATURES AND SPECIFICATIONS

20/20 Ac and Dc Custom Styled Panel Instruments

Specifications

	2 1/2" G-332	3 1/2" G-352	4 1/2" G-372	5 1/2" G-382
Dielectric Test Level	2600 Volts	2600 Volts	2600 Volts	2600 Volts
Insulation Rating	Working voltage to ground = 800 volts peak			
Type of Pointer	Lance	Lance	Lance	Lance
Scale Arc	100 degrees	100 degrees	100 degrees	100 degrees
Scale Length	2.18"	2.82"	4.02"	4.95"
Net Weight	6 oz.	6 oz.	9 oz.	12 oz.
Shipping Weight	3 lbs.	3 lbs.	3 lbs.	3 lbs.

Performance

	Dc	Ac
Rated Accuracy in Percent of Full Scale	+ or - 2%	+ or - 2% + or - 3% (Iron Vane Rectifier)
Overshoot---Maximum	20% Max.	20% Max.
Response Time (in seconds):		
.....Microammeters below 50 ua	3.0 Sec. Max.	1.5 Sec. Max.
.....Microammeters above 50 ua	1.5 Sec. Max.	1.5 Sec. Max.
RF Ammeters		2.5 Sec. Max.

Typical Modifications Include:

Special scales and calibration.
Customer identification or trade names.
Mirror dials and knife-edge pointers.
Colored zones.
Special legends.
Center zero.
Suppressed zero.

For definition of above terms refer to ANSI Standard C39.1.

Repeatability---error not detectable.

Repeatability in most instrument applications is far more important than tracking or accuracy. Repeatability alone guarantees that precise duplication of an instrument reading can be made for a given set of conditions.

Ratings, Mechanisms, and Accuracy

Instrument	Case Size and Type				Ratings	Movement	Accuracy Class*
	2 1/2"	3 1/2"	4 1/2"	5 1/2"			
Dc Microammeters	GX-332	GX-352	GX-372	GX-382	50-800	Permanent-Magnet, Moving-Coil	+ or - 2%
Dc Milliammeters	GX-332	GX-352	GX-372	GX-382	1-800	Permanent-Magnet, Moving-Coil	+ or - 2%
Dc Ammeters, Self-Contained	GX-332	GX-352	GX-372	GX-382	1-50	Permanent-Magnet, Moving-Coil	+ or - 2%
Dc Ammeters, External Shunt	GX-332	GX-352	GX-372	GX-382	5-2500	Permanent-Magnet, Moving-Coil	+ or - 2%
Dc Millivoltmeters	GX-332	GX-352	GX-372	GX-382	20-800	Permanent-Magnet, Moving-Coil	+ or - 2%
Dc Voltmeters	GX-332	GX-352	GX-372	GX-382	1-800	Permanent-Magnet, Moving-Coil	+ or - 2%
Ac Ammeters	GA-332	GA-352	GA-372	GA-382	5-800	Repulsion, Iron Vane	+ or - 2%
Ac Ammeters, Self-Contained	GA-332	GA-352	GA-372	GA-382	1-50	Repulsion, Iron Vane	+ or - 2%
Ac Ammeters, External Transformers	GA-332	GA-352	GA-372	GA-382	20-2500	Repulsion, Iron Vane	+ or - 2%
Ac Voltmeters	GA-332	GA-352	GA-372	GA-382	1.5-600	Repulsion, Iron Vane	+ or - 2%
Rectifier Microammeters	GC-332	GC-352	GC-372	GC-382	80-800	Rectifier with Permanent Magnet,	+ or - 2%
Rectifier Milliammeters	GC-332	GC-352	GC-372	GC-382	1-20	Moving-Coil Rectifier with Permanent	+ or - 3%
Rectifier Voltmeters	GC-332	GC-352	GC-372	GC-382	3-800	Magnet, Moving-Coil Rectifier with Permanent Magnet, Moving-Coil	+ or - 3%
AC Wattmeter, with External Transducer (VP2-840)	.....	GX-352	GX-372	GX-382	5A, 120V	Permanent-Magnet, Moving-Coil	+ or - 2%
AC Varmeter, with External Transducer (VV2-841)	.....	GX-352	GX-372	GX-382	5A, 120V	Permanent-Magnet, Moving-Coil	+ or - 2%
Frequency Meter, with External Transducer (9VC2-841)	.....	GX-352	GX-372	GX-382	60, 400 Hz	Permanent-Magnet, Moving-Coil	+ or - 2%
Power Factor Meter, with External Transducer (VF2-841)	.....	GX-352	GX-372	GX-382	5A, 120V	Permanent-Magnet, Moving-Coil	+ or - 2%
Expanded Scale Voltmeter, with External Transducer (VE2-841)	.....	GX-352	GX-372	GX-382	110-130V	Permanent-Magnet, Moving-Coil	+ or - 2%
Thermometer, with External Transducer, (VT2-841)	.....	GX-352	GX-372	GX-382	0-200 degrees C	Permanent-Magnet, Moving-Coil	+ or - 2%
Tachometer, with External Transducer (VR2-841)	.....	GX-352	GX-372	GX-382	50-14,000 Pulses	Permanent-Magnet, Moving-Coil	+ or - 2%

*Accuracy class is stated in percent of full scale deflection, with the exception of the Frequency Meter and Expanded Scale Voltmeter which are 2% of span.

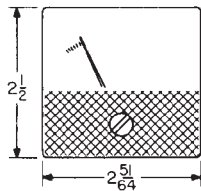
FEATURES AND SPECIFICATIONS

20/20 Ac and Dc Custom Styled Panel Instruments

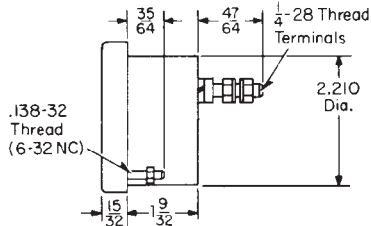
Instruments, Outline and Drilling Dimensions in Inches

Type G-332

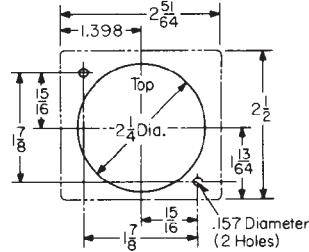
Front View



Side View



Drilling Plan Front View



Back View

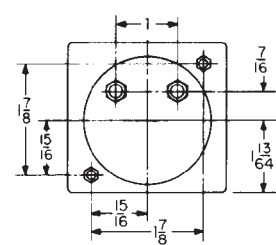
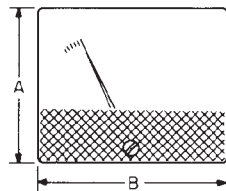


Fig. 2

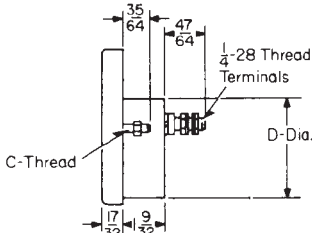
Types G-352, G-372, G-382

Polarity (+) ... (-) When Viewed From Rear (Dc Instruments Only)

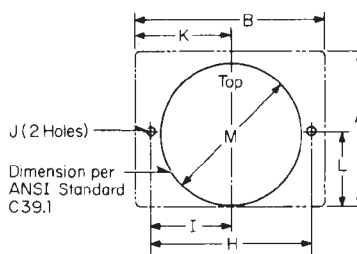
Front View



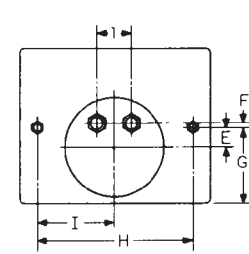
Side View



Drilling Plan Front View



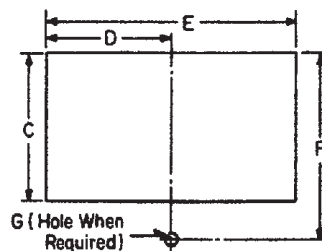
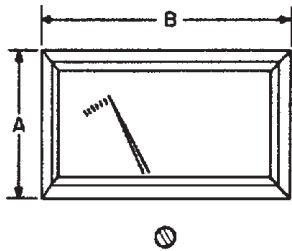
Back View



Type Dimensions in Inches

Type	A	B	C (Thread Size)	D	E	F	G	H	I	J (Dia.)	K	L	M (Dia.)
G-352	3	3 1/2	.138 - 32 (6-32)	2.21	.....	7/16	1 13/64	2 5/8	1 5/16	0.157	1 3/4	1 13/64	2 1/4
G-372	4	4 1/2	.164 - 32 (8-32)	2.79	0.08	0.568	1 19/32	3 1/2	1 3/4	0.18	2 1/4	1 19/32	3
G-382	4 1/2	5 1/2	.164 - 32 (8-32)	2.79	0.585	1/16	2 3/32	4 1/2	2 1/4	0.18	2 3/4	2 3/32	4

Instrument With Bezel, Outline and Drilling Dimensions in Inches

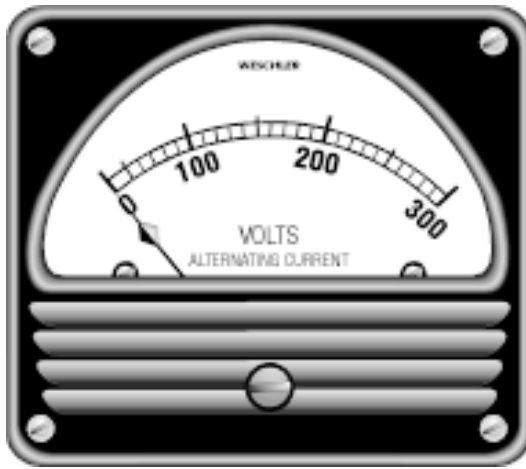


Type Dimensions in Inches

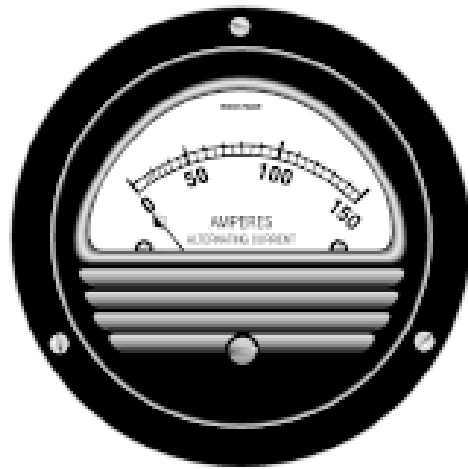
Type	A	B	C	D	E	F	G (Dia.)
G-332	1 23/32	3 1/8	1 39/64	1 1/2	3	2 9/64	9/32
G-352	2 17/64	3 55/64	2 5/32	1 55/64	3 23/32	2 39/64	9/32
G-372	2 29/32	4 31/32	2 3/4	2 13/32	4 13/16	3 9/16	3/8
G-382	3 5/16	6 1/16	3 5/32	2 61/64	5 29/32	4 1/32	3/8

FEATURES AND SPECIFICATIONS

Ac and Dc Panel Instruments Types 351, 371-3 1/2", 4 1/2" Round and Rectangular Conventional



4 1/2" RA-371 Voltmeter



4 1/2" NA-371 Ammeter



3 1/2" RA-351 Voltmeter



3 1/2" NA-351 Ammeter

Application

Weschler Types 351 and 371 meet all performance requirements of ANSI C39.1-1981 for round and rectangular panel instruments.

They employ conventional Taut Band mechanisms enclosed in black fluted cases designed to match the appearance of Westinghouse switchboard instruments and relays, and other devices used on traditionally styled control panels.

Available Types

- Microammeters (dc, rectifier)
- Milliammeters (dc, ac, radio frequency)
- Ammeters (dc, ac, radio frequency)
- Millivoltmeters (dc)
- Voltmeters (dc, ac, rectifier)
- Frequency Meters (transducer type ac)
- Wattmeters (transducer type ac)
- Varmeters (transducer type ac)
- Motor Load Indicators (ammeter, wattmeter, in-phase current)
- Power Factor Meter (transducer type ac)

Features

High Torque To Weight Ratio: Insures rapid, accurate readings with high damping and minimum frictional effect.

Easy To Read Scales: Linear on dc. Virtually linear above 10% of full scale on ac.

Self Shielding: DC types are magnetically shielded and calibration is unaffected regardless of material or thickness of mounting panel. AC types incorporate an internal coil-shield.

Specifications

	3 1/2"		4 1/2"	
	X, C, and T 351	A 351	X, C, and T 371	A 371
Peak working voltage to ground	800 volts	800 volts	800 volts	800 volts
Dielectric test level	2600 volts	2600 volts	2600 volts	2600 volts
Type of pointer	Lance	Spade	Lance	Spade
Scale length	2.4"	2.06"	3.2"	2.8"
Scale arc	100 degrees	85 degrees	100 degrees	85 degrees
Net weight	7 oz.	8 oz.	12 oz.	12 oz.
Shipping weight	3 lbs.	3 lbs.	3 lbs.	3 lbs.

FEATURES AND SPECIFICATIONS

Ratings, Mechanisms, and Accuracy

Instrument	Case and Type Range		Range	Mechanism	Accuracy
	3 1/2"	4 1/2"			
Dc Microammeters	RX, NX 351	RX, NX 371	20 to 800	Permanent-Magnet Moving-Coil	± 2%
Dc Milliammeters	RX, NX 351	RX, NX 371	1 to 800	Permanent-Magnet Moving-Coil	± 2%
Dc Ammeters, Self-Contained	RX, NX 351	RX, NX 371	1 to 50	Permanent-Magnet Moving-Coil	± 2%
Dc Ammeters, Shunt Type	RX, NX 351	RX, NX 371	15 to 1000	Permanent-Magnet Moving-Coil	± 2%
Dc Millivoltmeters	RX, NX 351	RX, NX 371	50 to 500	Permanent-Magnet Moving-Coil	± 2
Dc Voltmeters	RX, NX 351	RX, NX 371	1 to 800	Permanent-Magnet Moving-Coil	± 2%
Ac Milliammeters	RA, NA 351	RA, NA 371	5 to 500	Moving Iron	± 2%
Ac Ammeters, Self-Contained	RA, NA 351	RA, NA 371	1 to 50	Moving Iron	± 2%
Ac Ammeters, Transformer Type	RA, NA 351	RA, NA 371	20 to 3000	Moving Iron	± 2%
Ac Voltmeters	RA, NA 351	RA, NA 371	1.5 to 800	Moving Iron	± 2%
Rectifier Microammeters	RC, NC 351	RC, NC 371	100 to 500	Rectifier with Permanent-Magnet Moving-Coil	± 2 - ±3%
Rectifier Milliammeters	RC, NC 351	RC, NC 371	1 to 10	Rectifier with Permanent-Magnet Moving-Coil	± 2 - ±3%
Rectifier Voltmeters	RC, NC 351	RC, NC 371	5 to 600	Rectifier with Permanent-Magnet Moving-Coil	± 2 - ±3%
Radio Frequency Milliammeters*	RT, NT 351	RT, NT 371	10 to 800	Permanent-Magnet Moving-Coil	± 2%
Radio Frequency Ammeters, Self-Contained*	RT, NT 351	RT, NT 371	1 to 20	Permanent-Magnet Moving-Coil	± 2%
Radio Frequency Ammeters, External Type*	RT, NT 351	RT, NT 371	.....	Thermocouple w / Permanent-Magnet Moving-Coil	± 2%
Frequency Meters	RX, NX 351	RX, NX 371	50-60 Cy.	Permanent-Magnet Moving-Coil	± 2%
Wattmeters	RX, NX 351	RX, NX 371	1-10A 120-480 V	Permanent-Magnet Moving-Coil	± 2%
Varmeters	RX, NX 351	RX, NX 371	1-10 A 120-480 V	Permanent-Magnet Moving-Coil	± 2%
Motor Load Indicators, Ammeter Type	RA, NA 351	RA, NA 371	5 A	Moving Iron	± 2%
Motor Load Indicators, Wattmeter Type	RA, NA 351	RA, NA 371	.1-10 A	Permanent-Magnet Moving-Coil	± 2%
Motor Load Indicators, In-Phase Current Type .....	.....	RX 371	5 A	Permanent-Magnet Moving-Coil	± 2%
Motor Load Indicators, Dc Ammeter Type	RX, NX 351	RX, NX 371	50 mV	Permanent-Magnet Moving-Coil	± 2%
Ac Wattmeter with External Transducer (VP2-840) ...	RX, NX 351	RX, NX 371	5 A, 120 V	Permanent-Magnet Moving-Coil	± 2%
Ac Varmeter with External Transducer (VV2-840)	RX, NX 351	RX, NX 371	5 A, 120 V	Permanent-Magnet Moving-Coil	± 2%
Frequency Meter with External Transducer (VC2-841)	RX, NX 351	RX, NX 371	60, 400 Hz	Permanent-Magnet Moving-Coil	± 2%
Power Factor Meter with External Transducer (VF2-841)	RX, NX 351	RX, NX 371	5 A, 120 V	Permanent-Magnet Moving-Coil	± 2%
Suppressed Zero Voltmeter with External Transducer (VE2-841)	RC, NC 351	RC, NC 371	110-130 V	Permanent-Magnet Moving-Coil	± 2%
Thermometer with External Transducer (VT2-841) ...	RX, NX 351	RX, NX 371	0-200 ° C	Permanent-Magnet Moving-Coil	± 2%

*Scales per FCC 73.39.

Application Data

Ac Panel Instruments

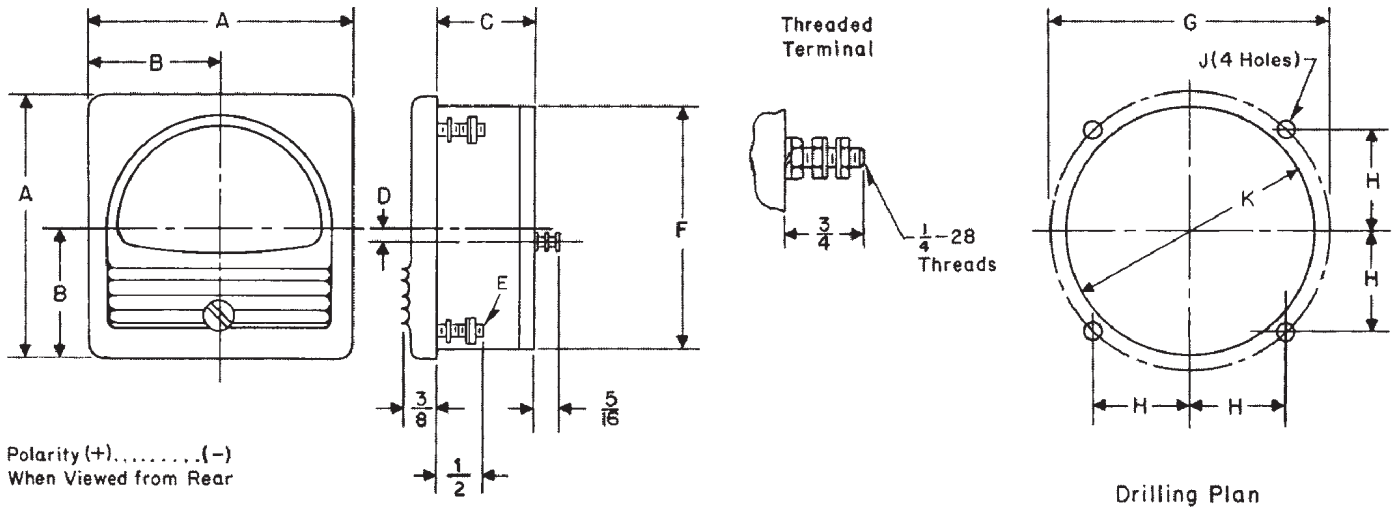
Approximate Loss (Volt-Amperes) at 60 Hz

Full Scale Rating	20/20		Full Scale Rating	20/20		Full Scale Rating	20/20	
	Conventional	Conventional		Conventional	Conventional		Conventional	Conventional
10-800 mA	1 vA max.	1 vA max.	2 V (moving iron)	3 vA max.	3 vA max.	100 V (moving iron)	3 vA max.	3 vA max.
1-3 A	1 vA max.	1 vA max.	3 V (moving iron)	3 vA max.	3 vA max.			
5 A	1vA max.	1 vA max.	5 V (moving iron)	3 vA max.	3 vA max.	150 V (moving iron)	3 vA max.	3 vA max.
8 A	1vA max.	1 vA max.	8 V (moving iron)	3 vA max.	3 vA max.	200 V (moving iron)	3 vA max.	3 vA max.
10 A	1 vA max.	1 vA max.	10 V (moving iron)	3 vA max.	3 vA max.	300 V (moving iron)	3 vA max.	3 vA max.
15 A	1 vA max.	1 vA max.				500 V (moving iron)	3 vA max.	3 vA max.
20 A	1 vA max.	1 vA max.	15 V (moving iron)	3 vA max.	3 vA max.	600 V (moving iron)	3 vA max.	3 vA max.
30 A	2 vA max.	2 vA max.	20 V (moving iron)	3 vA max.	3 vA max.			
50 A	2 vA max.	2 vA max.	30 V (moving iron)	3 vA max.	3 vA max.			
			50 V (moving iron)	3 vA max.	3 vA max.			
1.5 V (moving iron)	3 vA max.	3 vA max.	80 V (moving iron)	3 vA max.	3 vA max.			

FEATURES AND SPECIFICATIONS

Ac and Dc Panel Instruments

Rectangular Type (R-351, R-371) Outline Drilling Dimensions



Polarity (+).....(-)
When Viewed from Rear

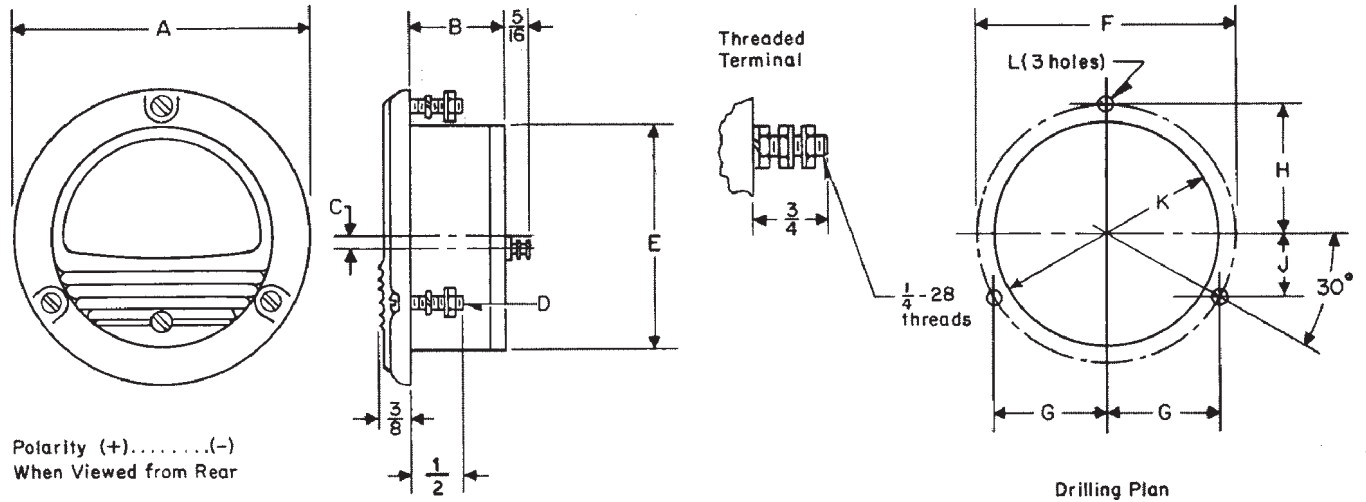
Drilling Plan

Type	Instrument	Standard Terminal*	Dimension in Inches									
			A	B	C	D	E (Thread Size)	F	G	H	J Dia.	K
RA-351	Ac Voltmeters, Ac Milliammeters, and Ac Ammeters through 20 Amps	Threaded Type	3	1 1/2	1 19/32	.170**	.112 to 40 (4-40)	2.795	3.182	1 1/8	1/8	2 13/16
RA-351	Ac Ammeters 30 through 50 Amps	Threaded Type	3	1 1/2	1 5/8	.170**	.112 to 40 (4-40)	2.795	3.182	1 1/8	1/8	2 13/16
RC-351 RX-351	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type	3	1 1/2	1 1/8	.156**	.112 to 40 (4-40)	2.795	3.182	1 1/8	1/8	2 13/16
RT-351	All Thermocouple Types	Threaded Type	3	1 1/2	1 1/4	.156**	.112 to 40 (4-40)	2.795	3.182	1 1/8	1/8	2 13/16
RX-351	Dc Millivoltmeters and Self-Contained Above 10 Amps	Threaded Type	3	1 1/2	1 1/8	.156**	.112 to 40 (4-40)	2.795	3.182	1 1/8	1/8	2 13/16
RX-371	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type	3 31/32	1 63/64	1 1/2	.156***	.138 to 32 (6-32)	3 25/32	4.240	1 1/2	3/16	3 13/16
RA-371 RT-371	All	Threaded Type	3 31/32	1 63/64	1 1/2	.156***	.138 to 32 (6-32)	3 25/32	4.240	1 1/2	3/16	3 13/16
RX-371	Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps	Threaded Type	3 31/32	1 63/64	1 1/2	.156***	.138 to 32 (6-32)	3 25/32	4.240	1 1/2	3/16	3 13/16

*All terminals are spaced 1/2 inch on each side of vertical centerline.
**Terminals located above centerline.
***Terminals located below centerline.

FEATURES AND SPECIFICATIONS Ac and Dc Panel Instruments

Round Type (N-351, N-371) Outline and Drilling Dimensions



Type	Instrument	Standard Terminal*	Dimension in Inches										
			A	B	C	D Thread Size	E	F	G	H	J	K	L Dia.
NA-351	Ac Voltmeters, Ac Milliammeters, and Ac Ammeters through 20 Amps	Threaded Type	3 1/2	1 19/32	.170**	.138 to 32 (6-32)	2.795	3.16	1.368	1.58	0.79	2 13/16	0.15
NA-351	Ac Ammeters 30 through 50 Amps	Threaded Type	3 1/2	1 5/8	.170**	.138 to 32 (6-32)	2.795	3.16	1.368	1.58	0.79	2 13/16	0.15
NC-351 NX-351	All (Except Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type	3 1/2	1 1/8	.156**	.138 to 32 (6-32)	2.795	3.16	1.368	1.58	0.79	2 13/16	0.15
NT-351	All Thermocouple Types	Threaded Type	3 1/2	1 1/4	.156**	.138 to 32 (6-32)	2.795	3.16	1.368	1.58	0.79	2 13/16	0.15
NX-351	Dc Millivoltmeters and Self-Contained Ammeters Above 10 Amps	Threaded Type	3 1/2	1 1/8	.156**	.138 to 32 (6-32)	2.795	3.16	1.368	1.58	0.79	2 13/16	0.15
NX-371	All (Except Dc Milliammeters and Self-Contained Dc Ammeters Above 10 Amps)	Threaded Type	4.562	1 1/2	.156***	.164 to 32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16
NA-371 NT-371	All	Threaded Type	4.562	1 1/2	.156***	.164 to 32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16
NX-371	Dc Millivoltmeters and Self-Contained Dc Ammeters Above 10 Amps	Threaded Type	4.562	1 1/2	.156***	.164 to 32 (8-32)	3 25/32	4.126	1.786	2.063	1.032	3 13/16	3/16

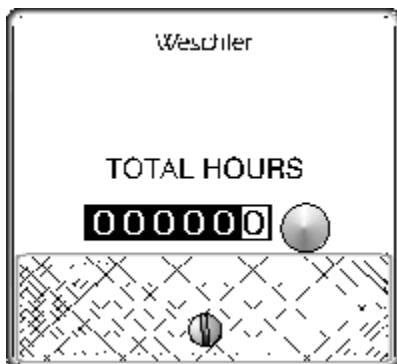
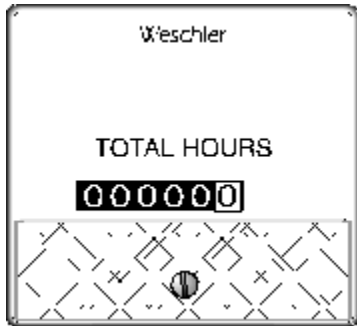
*All terminals are spaced 1/2 inch on each side of vertical centerline.

**Terminals located above centerline.

***Terminals located below centerline.

FEATURES AND SPECIFICATIONS

Elapsed Time Meters



Application

Weschler GH and BH elapsed time meters indicate the total time that a particular circuit is energized. They are used for maintenance scheduling of electrical equipment (including diesel generators, motors, welders, and radio and television transmitters) and tube replacement programs.

Each consists of synchronous motor and cyclometer type register. When energized by the circuit being monitored, the motor drives the register (which has six digit wheels) to indicate up to 99,999.9 hours or minutes as a highly visible numerical strip across the center of the dial.

BH-351 meters are housed in an attractive molded case and diecast cover assembly which matches the appearance of Weschler conventional panel instruments. They can be mounted from either the front or back of the panel, and are available with or without reset knob.

Type GH-332 and GH-352 meters have a similar mechanism housed in a thermosetting case with a clear acrylic plastic cover. They are identical in appearance with Weschler 20/20 custom panel instruments. They harmonize with most other modern panel mounted components. A bezel kit is used for rear-of-panel mounting. The bezel mounted meters may be illuminated from behind the panel.

Specifications

Insulation Rating:
working voltage to ground - 800V.

Range: 0-99,999.9 hours or minutes.

Net Weight: 1 pound.

Shipping Weight: 2 pounds.

Available Ratings

Register Indication	Volts	Frequen Hertz
0-99,999.9 hours	120	50
0-99,999.9 hours	120	60
0-99,999.9 hours	240	60
0-99,999.9 hours	480	60
0-99,999.9 minutes	120	60

Replacement Information and Ordering Guide

Correct and complete information is necessary to provide modern replacement instruments for obsolete or damaged units in the field. Without accurate dial and mask data it is not possible to guarantee that the replacement device will actually perform its intended purpose.

The following definitions will help in "reading" the data on existing instruments:

- A. Dial - the face of the instrument on which the scale, legend and calibration data are printed.
- B. Mask- on circular scale (250°) instruments the mask contains the legend and calibration data.
- C. End scale rating (E.S. = the electrical value required to bring pointer from zero to the furthest end of the scale).
- D. Full scale rating (F.S. = the electrical value required to sweep pointer the entire scale length).

Note: For example a 100-0-100 MA rating has end scale value of 100 MA and a full scale value of 200 MA.

Ordering information must contain the following data:

- A. Type (i.e., KX-241, UY-25, VX-252, etc.)
- B. Scale marking (numerals)
- C. Legend (words or abbreviations describing what these numerals pertain to)
- D. Rating (electrical value(s) required to operate the instrument) this should include references to CT, PT used, and frequency.
- E. Special features - (black dial, colored zones, non-glare glass, etc.)
- F. Style number, shop order number or general order numbers referenced on mask or dial.
- G. Nameplate data (recorders, auxiliary devices)

Note: Any other data of any sort printed on the dial or mask should be included.

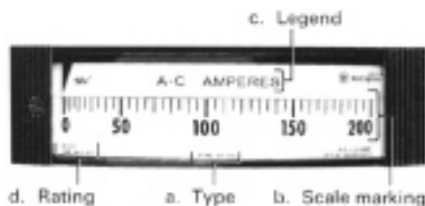
Example No. 1



Ordering information should read as follows:

Replacement for - Type KC-241, 0-60 scale, with legend RPM X1000, rating ES = 10 VAC IMA NOM, shop order 5-24605, with red zone between 50 and 60 on dial.

Example No. 2



Ordering information should read as follows:

Replacement for Type HC-252, 0-200 scale, AC AMPERES legend, rated 5A used with 200/5CT, 60 Hz, style number 644B015A19.

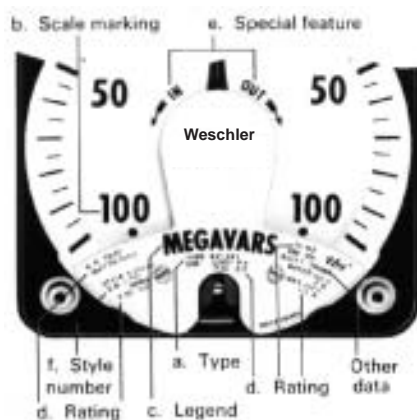
Example No. 3



Ordering information should read as follows:

Replacement for KP-241, 100-0-100 scale, MEGAVARS legend, rated 5A, 120V max, 7.5A, 1 50V, 2el 2cc, Sphtwatts 260.5 use with 1200/1 at, 50 Hz, marked in on left and out on right, used with phase shifting transformer.

Cover removed, to show dial and mask data markings for accurate ordering information.



Replacement Information and Ordering Guide

Replacement of Obsolete and/or Active Instruments for use with Existing Auxiliary Equipment for many applications the measurement of ac quantities requires an indicator, which is usually a dc volt, millivolt or milliampere device to perform the readout function, and a transducer which converts the ac signal to a dc output, These can be:

- a. Frequency meters
- b. Wattmeters
- c. Varmeters
- d. Power factor
- e. Temperature indicators
- f. Voltmeters
- g. Ammeters
- h. Motor load indicators

Two factors are very important to consider when applying and/or replacing these "combination" instruments:

1. The devices are usually calibrated together to achieve maximum accuracy of the "package" or "combination".
2. The instrument/indicator internal circuit very often is matched, and becomes part of the auxiliary devices circuitry.

When (1) and (2) are performed to make a measurement, the indicator and auxiliary device are serialized, i.e., the same serial number is placed on the auxiliary device nameplate as on the indicator scale. A note is usually placed on the scale or nameplate, "Use with _____ Serial # _____."

When replacing the indicator or the auxiliary device it is necessary to either:

Replace the entire package in the case of obsolete equipment or

Return the "operating" or working device to the factory or repair shop so the replacement device can be calibrated with the other.

Note: There are some applications where the above procedure must be followed for dc measurements/replacement. The key or clue is the *serial number match*.

Replacement of Scale Plates or Scale Changes on Obsolete and/or Active Instruments

Before ordering replacement dials for existing instruments, the sales office should be consulted for obsolescence and status of availability of renewal parts.

Once the device or type designation is obsolete, complete replacement instruments must be ordered as outlined under "Replacement Instruments."

A. Dc Instruments

The majority of dc devices have a constant scale distribution and the calibration points fall on the same points on the dial from instrument to instrument.

Ordering replacement dials is straightforward, i.e., a description is enough.

B. Ac Instruments

Ac devices can have either a constant or nonrepetitive distribution, depending upon the type of measurement being made. The following have constant distributions:

1. Instruments used with external transducers with linear outputs, unserialized.
2. Synchroscopes
3. Ac rectifier milliammeters, ammeters and voltmeters above 50 volts ac.

The same instructions apply for these as do for dc instruments.

The following ac devices do not have a constant scale distribution (non-linear) and the calibration or cardinal points on the dial, are in different positions from instrument to instrument, **even of the same style number:**

1. Ac voltmeters
2. Ac ammeters
3. Watt and varmeters
4. Frequency meters
5. Power factor meters
6. Serialized indicators with transducers or auxiliary devices

When ordering replacement dials for these devices, it is necessary to:

- A. Send in the old dial with order or/
- B. Send in a photocopy of the old dial with a table of graduation degree positions.

C. Special situations

Some instruments have special scale distributions to suit particular applications and the calibration data is specified at the time of order entry. In these instances, the same steps as those immediately above, for non-linear dials, must be followed.

Note: In the case of serialized indicator/transducer or auxiliary combinations, the entire "package" must be returned.

D. Scale Changes on Watt and Var Meters

Change of scale reading on watt and var meters very often are accompanied by changes in current transformer ratios.

If the change in scale is not directly proportional to the change in CT ratio, a

re-calibration of the instrument is necessary and the device must be returned to the factory or repair shop for change-out of current coils.

The following examples will illustrate the procedure to follow:

Example 1 . Existing KP-241 three phase three wire 120V 5A nominal rating CT = 100/5 PT = 4/1 Scale = 0-80KW.

The CT has been changed to 150/5 and the scale change requested is 0-120 Kw.

Using the three phase three wire "Scale Selector" chart in the "Special Data" section reveals that the scale change is directly proportional to the CT change and only a scale plate change is required.

Example 2. Existing KP-241 three phase four wire 120V 5A Nominal rating CT = 2000/5 PT = 350/1 Scale = 0-200MW

The CT and PT remain the same yet the scale change requested is 0-250 MW.

The change in scale without a proportional CT change requires a re-calibration of instrument circuitry as well as a scale change.

The instrument must be returned to the factory or repair shop and the price must be negotiated for the re-calibration.

Note:

Equating the **single phase test watts** (SPTW) is another approach that can be used to determine the necessity for re-calibration.

A formula for determining SPTW is:

$$\text{SPTW} = \frac{\text{Scale in Watts}}{\text{CT} \times \text{PT} \times \text{K}}$$

K = 1 for single phase

K = 2 for three phase three wire

K = 4 for three phase four wire

If the SPTW, before the scale change, equals that determined with the new scale then only a dial change is required.

Scale Selector Chart Wattmeters and Varmeters, Single Phase 2-Wire
Single Phase Test Range: 400-625 Watts

Current Transformer Ratio		System Voltage														
		120	240	480	600	2400	4200	4800	7200	8400	12Kv	14.4Kv	24Kv	34.5Kv	46Kv	69Kv
		Potential Transformer Ratio														
		None	2:1	4:1	5:1	20:1	35:1	40:1	60:1	70:1	100:1	120:1	200:1	300:1	400:1	600:1
25:5	Min	2	4	8	10	40	70	80	120	150	200	250	400	600	800	1200
	Nom	2.5	5	10	12	50	90	100	150	175	250	300	500	750	1000	1500
	Max	3	6	12	15	60	100	120	180	200	300	350	600	900	1200	1800
50:5	Min	4	8	16	20	80	150	160	250	300	400	500	800	1200	1600	2500
	Nom	5	10	20	25	100	175	200	300	350	500	600	1000	1500	2000	3000
	Max	6	12	25	30	120	200	250	350	400	600	750	1200	1800	2500	3500
75:5	Min	6	12	25	30	120	250	250	400	450	600	750	1200	1800	2500	4000
	Nom	7.5	15	30	40	150	250	300	450	500	750	900	1500	2500	3000	4500
	Max	9	18	35	45	180	300	350	500	650	900	1000	1800	2500	3500	5000
100:5	Min	8	16	35	40	160	300	350	500	600	800	1000	1600	2500	3500	5000
	Nom	10	20	40	50	200	350	400	600	700	1000	1200	2000	3000	4000	6000
	Max	12	25	50	60	250	400	500	750	800	1200	1500	2500	3500	5000	7500
150:5	Min	12	25	50	60	250	450	500	750	900	1200	1500	2500	4000	5000	7500
	Nom	15	30	60	75	300	500	600	900	1000	1500	1800	3000	4500	6000	9000
	Max	18	35	75	90	350	650	750	1000	1200	1800	2000	3500	5000	7500	10MW
200:5	Min	16	35	65	80	350	600	650	1000	1200	1600	2000	3500	5000	6500	10
	Nom	20	40	80	100	400	700	800	1200	1500	2000	2500	4000	6000	8000	12
	Max	25	50	100	120	500	800	1000	1500	1750	2500	3000	5000	7500	10MW	15
300:5	Min	25	50	100	120	500	900	1000	1500	1750	2500	3000	5000	7500	10	15
	Nom	30	60	120	150	600	1000	1200	1800	2000	3000	3500	6000	9000	12	18
	Max	35	75	150	180	750	1200	1500	2000	2500	3500	4500	7500	10MW	15	20
400:5	Min	35	65	150	160	650	1200	1500	2000	2500	3500	4000	6500	10	15	20
	Nom	40	80	160	2000	800	1500	1600	2500	3000	4000	5000	8000	12	16	25
	Max	50	100	200	250	1000	1750	2000	3000	3500	5000	6000	10MW	15	20	30
600:5	Min	50	100	200	250	1000	1750	2000	3000	3500	5000	6000	10	15	20	30
	Nom	60	120	250	300	1200	2000	2500	3500	4000	6000	7000	12	18	25	35
	Max	75	150	300	350	1500	2500	3000	4500	5000	7500	9000	15	20	30	45
800:5	Min	65	150	300	350	1500	2500	3000	4000	5000	6500	8000	15	20	30	40
	Nom	80	160	300	400	1600	3000	3000	5000	6000	8000	10MW	16	25	30	50
	Max	100	200	400	500	2000	3500	4000	6000	7000	10MW	12	20	30	40	60
1200:5	Min	100	200	400	500	2000	3500	4000	6000	7000	10	12	20	30	40	60
	Nom	120	250	500	600	2500	4000	5000	7500	8000	12	15	25	35	50	75
	Max	150	300	600	750	3000	5000	6000	9000	10MW	15	17.5	30	45	60	90
1500:5	Min	120	250	500	600	2500	4500	5000	7500	9000	12	15	25	40	50	75
	Nom	150	300	600	750	3000	5000	6000	9000	10MW	15	18	30	45	60	90
	Max	180	350	750	900	3500	6500	7500	10MW	12	18	20	35	50	75	100
2000:5	Min	160	350	650	800	3500	6000	6500	10	12	16	20	35	50	65	100
	Nom	200	400	800	1000	4000	7000	8000	12	15	20	25	40	60	80	120
	Max	250	500	1000	1200	5000	8000	10MW	15	17.5	25	30	50	75	100	120
3000:5	Min	250	500	1000	1200	5000	9000	10	15	17.5	25	30	50	75	100	150
	Nom	300	600	1200	1500	6000	10MW	12	18	20	30	35	60	90	120	180
	Max	350	750	1500	1800	7500	12	15	20	25	35	45	75	100	150	200
4000:5	Min	350	650	1500	1600	6500	12	15	20	25	35	40	65	100	150	200
	Nom	400	800	1600	2000	8000	15	16	25	30	40	50	80	120	160	250
	Max	500	1000	2000	2500	10MW	17.5	20	30	35	50	60	100	150	200	300
5000:5	Min	400	800	1600	2000	8000	16	16	25	30	40	50	80	120	260	250
	Nom	500	1000	2000	2500	10MW	20	20	30	35	50	60	100	150	200	300
	Max	600	1200	2500	3000	12	25	25	35	40	60	75	120	180	250	350
6000:5	Min	500	1000	2000	2500	10	17.5	20	30	40	50	60	100	150	200	300
	Nom	600	1200	2500	3000	12	20	25	35	45	60	75	120	180	250	50
	Max	750	1500	3000	3500	15	25	30	45	50	75	90	150	200	300	450

Scale Selector Chart

Wattmeters and Varmeters
3 Phase 3-Wire

Scale Selector Chart Wattmeters and Varmeters, 2 Current Coil Polyphase 3-Phase 3-Wire

Single Phase Test Range: 400-625 Watts

Current Transformer Ratio		System Voltage														
		120	240	480	600	2400	4200	4800	7200	8400	12Kv	14.4Kv	24Kv	34.5Kv	46Kv	69Kv
		Potential Transformer Ratio														
		None	2:1	4:1	5:1	20:1	35:1	40:1	60:1	70:1	100:1	120:1	200:1	300:1	400:1	600:1
25:5	Min	4	8	16	20	80	150	160	250	300	400	500	800	1200	1600	2500
	Nom	5	10	20	25	100	175	200	300	350	500	600	1000	1500	2000	3000
	Max	6	12	25	30	120	200	250	350	400	600	750	1200	1800	2500	3500
50:5	Min	8	16	35	40	160	300	350	500	600	800	1000	1600	2500	3500	5000
	Nom	10	20	40	50	200	350	400	600	700	1000	1200	2000	3000	4000	6000
	Max	12	25	50	60	250	400	500	750	800	1200	1500	2500	3500	5000	7500
75:5	Min	12	25	50	60	250	450	500	750	900	1200	1500	2500	4000	5000	7500
	Nom	15	30	60	75	300	500	600	900	1000	1500	1800	3000	4500	6000	9000
	Max	18	35	75	90	350	650	750	1000	1200	1800	2000	3500	5000	7500	10MW
100:5	Min	16	35	70	80	350	600	700	1000	1200	1750	2000	3500	5000	7000	10
	Nom	20	40	80	100	400	700	800	1200	1500	2000	2500	4000	6000	8000	12
	Max	25	50	100	125	500	800	1000	1500	1750	2500	3000	5000	7500	10MW	15
150:5	Min	25	50	100	120	500	800	1000	1500	1750	2500	3000	5000	7500	15	20
	Nom	30	60	120	150	600	1000	1200	1800	2000	3000	3500	6000	9000	15	25
	Max	35	75	150	180	750	1200	1500	2000	2500	3500	4000	7500	10MW	20	30
200:5	Min	35	65	150	140	650	1200	1500	2000	2500	3500	4000	6500	10	15	20
	Nom	40	80	150	200	800	1500	1500	2500	3000	4000	5000	8000	12	15	25
	Max	50	100	200	250	1000	1750	2000	3000	3500	5000	6000	10MW	15	20	30
300:5	Min	50	100	200	250	1000	1750	2000	3000	3500	5000	6000	10	15	20	30
	Nom	60	120	250	300	1200	2000	2500	3500	4000	6000	7000	12	18	25	35
	Max	75	150	300	350	1500	2500	3000	4500	5000	7500	9000	15	20	30	45
400:5	Min	65	150	300	350	1500	2500	3000	4000	4500	6500	8000	15	20	30	40
	Nom	80	150	300	400	1500	3000	3000	5000	5000	8000	10MW	15	25	30	50
	Max	100	200	400	500	2000	3500	4000	6000	7000	10MW	12	20	30	40	60
600:5	Min	100	200	400	500	2000	3500	4000	6000	7000	10	12	20	30	40	60
	Nom	120	250	500	600	2500	4000	5000	7000	8000	12	15	25	35	50	70
	Max	150	300	600	750	3000	5000	6000	9000	10MW	15	18	30	45	60	90
800:5	Min	150	300	600	650	3000	4500	6000	8000	9000	15	16	30	40	60	80
	Nom	150	300	600	800	3000	5000	6000	10MW	12MW	16	20	30	50	60	100
	Max	200	400	800	1000	4000	7000	8000	12	12	20	20	40	60	80	120
1200:5	Min	200	400	800	1000	4000	7000	8000	12	15	20	25	40	60	80	120
	Nom	250	500	1000	1200	5000	8000	10MW	15	17.5	25	15	50	70	100	150
	Max	300	600	1200	1500	6000	10MW	12	18	20	30	17.5	60	90	120	180
1500:5	Min	250	500	1000	1200	5000	9000	10	15	17.5	25	30	50	75	100	150
	Nom	300	600	1200	1500	6000	10MW	12	18	20	30	35	60	90	120	180
	Max	350	750	1500	1800	7500	12	15	20	25	35	45	75	100	150	200
2000:5	Min	350	650	1500	1600	6500	12	15	20	25	35	40	65	100	150	200
	Nom	400	800	1500	2000	8000	15	15	25	30	40	50	80	120	150	250
	Max	500	1000	2000	2500	10MW	17.5	20	30	35	50	60	100	150	200	300
3000:5	Min	500	1000	2000	2500	10	17.5	20	30	35	50	60	100	150	200	300
	Nom	600	1200	2500	3000	12	20	25	35	40	60	70	120	180	250	350
	Max	750	1500	3000	3500	15	25	30	40	50	75	90	150	200	300	450
4000:5	Min	650	1500	3000	3500	15	25	30	40	45	65	80	150	200	300	400
	Nom	800	1500	3000	4000	16	30	30	50	50	80	100	160	250	300	500
	Max	1000	2000	4000	5000	20	35	40	60	70	100	120	200	300	400	600
5000:5	Min	800	1600	3500	4000	16	30	35	50	60	80	100	160	250	350	500
	Nom	1000	2000	4000	5000	20	35	40	60	70	100	120	200	300	400	600
	Max	1200	2500	5000	6000	25	40	50	75	80	120	150	250	350	500	750
6000:5	Min	1000	2000	4000	5000	20	35	40	60	70	100	120	200	300	400	600
	Nom	1200	2500	5000	6000	25	40	50	70	80	120	150	250	350	500	700
	Max	1500	3000	6000	7500	30	50	60	90	100	150	180	300	450	600	900

Scale Selector Chart Wattmeters and Varmeters, 3 Current Coil 3-Phase 4-Wire
Single Phase Test Range: 313-521 Watts

		System Voltage											
		208	480	4160	7274	8320	12.47 Kv	14.56 Kv	25 Kv	34.5 Kv	46 Kv	69 Kv	
Current Transformer Ratio		Line To Neutral											
		120	277	2400	4200	4800	7200	8400	14.4 Kv	20.125 Kv	27.6 Kv	40.25 Kv	
		Potential Transformer Ratio											
		None	2.4:1	20:1	35:1	40:1	60:1	70:1	120:1	175:1	240:1	350:1	
25:5	Min	K	7	15	125	250	250	400	450	750	1200	1500	2500
	Nom		8	17.5	150	300	300	500	600	1000	1500	2000	3000
	Max		10	20	200	350	400	600	700	1200	1800	2500	3500
50:5	Min	I	15	30	250	450	500	800	900	1500	2500	3000	4500
	Nom		17.5	35	300	600	600	1000	1200	2000	3000	4000	6000
	Max		20	45	400	700	800	1200	1200	2500	3500	5000	7000
75:5	Min	L	20	45	400	700	750	1200	1500	2500	3500	4500	7000
	Nom		25	65	500	800	1000	1500	1750	3000	4000	6000	9000
	Max		30	70	600	1000	1200	1800	2000	3500	5000	7500	10MW
100:5	Min	O	25	60	500	900	1000	1500	1750	3000	4600	6000	9000
	Nom		35	70	600	1200	1200	2000	2500	4000	6000	8000	12MW
	Max		40	90	800	1200	1600	2500	2500	5000	7000	10MW	12
150:5	Min	W	40	90	750	1500	1500	2500	3000	4500	700	9000	15
	Nom		50	100	1000	1750	2000	3000	3500	6000	8000	12MW	17.5
	Max		60	120	1200	2000	2500	3500	4000	7500	10MW	15	20
200:5	Min	A	50	120	1000	1750	2000	3000	3500	6000	9000	12	17.5
	Nom		70	150	1200	2500	2500	4000	4500	8000	12MW	15	25
	Max		80	180	1600	2500	3000	5000	5000	10MW	12	20	25
300:5	Min	T	75	175	1500	3000	3000	4500	6000	9000	15	18	30
	Nom		100	200	2000	3500	4000	6000	7000	12MW	17.5	25	35
	Max		120	250	2500	4000	5000	7500	8000	15	20	30	40
400:5	Min	T	100	250	2000	3500	4000	6000	7000	12	17.5	25	35
	Nom		120	300	2500	4500	5000	7500	9000	15	25	30	45
	Max		160	350	3000	5000	6000	10MW	10MW	20	25	40	50
600:5	Min	S	150	350	3000	6000	6000	9000	12	18	30	40	60
	Nom		200	450	4000	7000	8000	12MW	15	25	35	50	70
	Max		250	500	5000	8000	10MW	15	17.5	30	40	60	80
800:5	Min		200	500	4000	7000	8000	12	15	25	35	50	70
	Nom		250	600	5000	9000	10MW	15	17.5	30	45	60	90
	Max		300	750	6500	10MW	12	20	20	40	50	80	100
1200:5	Min		300	700	6000	12	12	18	25	40	60	75	120
	Nom		400	800	7500	15	15	25	30	50	70	90	150
	Max		500	1000	10MW	17.5	20	30	35	60	80	120	175
1500:5	Min		400	900	7500	15	15	25	30	45	70	90	150
	Nom		500	1000	10MW	17.5	20	30	35	60	80	120	175
	Max		600	1200	12	20	25	35	40	75	100	150	200
2000:5	Min		500	1200	10	17.5	20	30	35	60	90	120	175
	Nom		700	1500	12	25	25	40	45	80	120	150	250
	Max		800	1800	16	25	30	50	50	100	120	200	250
3000:5	Min		750	1750	15	30	30	45	60	90	150	180	300
	Nom		1000	2000	20	35	40	60	70	120	175	250	350
	Max		1200	2500	25	40	50	75	80	150	200	300	400
4000:5	Min		1000	2500	20	35	40	60	70	120	175	250	350
	Nom		1200	3000	25	45	50	75	90	150	250	300	450
	Max		1600	3500	30	50	60	100	100	200	250	400	500
5000:5	Min		1500	3000	25	45	50	80	90	150	250	300	450
	Nom		1750	3500	30	60	60	100	120	200	300	400	600
	Max		2000	4500	40	75	80	120	120	250	350	500	700
6000:5	Min		1500	3500	30	60	60	90	120	180	300	400	600
	Nom		2000	4500	40	70	80	120	150	250	350	500	700
	Max		2500	5000	50	80	100	150	175	300	400	600	800

Scale Selector Chart Wattmeters and Varmeters, 3 Current Coil 3-Phase 4-Wire
Single Phase Test Range: 313-521 Watts

		System Voltage										
		92	115	138	161	196	230	260	287	345	460	
		Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	
		55.2	69	80.5	92	115	138	161	172.5	207	276	
		Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	Kv	
Current Transformer Ratio		480:1	600:1	700:1	800:1	1000:1	1200:1	1400:1	1500:1	1800:1	2400:1	
25:5	Min	3000	4000	4500	5000	7000	7500	9000	10MW	12MW	13MW	M
	Nom	K 4000	5000	6000	7000	8000	10MW	12MW	12	15	20	
	Max	5000	6000	7000	8000	10MW	12	12	15	20	25	
50:5	Min	6000	8000	9000	10MW	15	15	17.5	20	25	30	E
	Nom	I 8000	10MW	12MW	12	17.5	20	25	25	30	40	
	Max	10MW	12	12	16	20	25	25	30	35	50	
75:5	Min	9000	12	15	15	20	25	30	30	35	45	G
	Nom	L 12MW	15	17.5	20	25	30	35	35	45	60	
	Max	15	18	20	25	30	35	40	40	50	75	
100:5	Min	12	15	17.5	20	25	30	35	40	45	60	A
	Nom	O 15	20	25	25	35	40	45	50	60	80	
	Max	20	25	25	30	40	50	50	60	75	100	
150:5	Min	18	25	30	30	40	45	60	60	70	90	W
	Nom	W 25	30	35	40	50	60	70	75	90	120	
	Max	30	35	40	50	60	75	80	90	100	150	
200:5	Min	25	30	35	40	50	60	70	75	90	120	A
	Nom	A 30	40	45	50	70	80	90	100	120	150	
	Max	40	50	50	65	80	100	100	120	150	200	
300:5	Min	40	45	60	60	75	90	120	120	150	180	T
	Nom	T 50	60	70	75	100	120	150	150	175	250	
	Max	60	75	80	100	120	150	175	175	200	300	
400:5	Min	50	60	70	80	100	120	150	150	180	250	T
	Nom	T 60	75	90	100	120	150	175	200	250	300	
	Max	80	100	100	120	160	200	200	250	300	400	
600:5	Min	80	90	120	120	150	180	250	250	300	400	S
	Nom	S 100	120	150	150	200	250	300	300	350	500	
	Max	120	150	175	200	250	300	350	350	450	600	
800:5	Min	100	120	150	160	200	250	300	300	400	500	
	Nom	120	150	175	200	250	300	350	400	500	600	
	Max	150	200	200	250	300	400	450	500	600	800	
1200:5	Min	150	180	250	250	300	400	450	450	600	750	
	Nom	200	250	300	300	400	500	600	600	750	900	
	Max	240	300	350	400	500	600	700	750	900	1200	
1500:5	Min	180	250	300	300	400	450	600	600	700	900	
	Nom	250	300	350	400	500	600	700	750	900	1200	
	Max	300	350	400	500	600	750	800	900	1000	1500	
2000:5	Min	250	300	350	400	500	600	700	750	900	1200	
	Nom	300	400	450	500	700	800	900	1000	1200	1500	
	Max	400	500	500	650	800	1000	1000	1200	1500	2000	
3000:5	Min	400	450	600	600	750	900	1200	1200	1500	1800	
	Nom	500	600	700	750	1000	1200	1500	1500	1750	2500	
	Max	600	750	800	1000	1200	1500	1750	1750	2000	3000	
4000:5	Min	500	600	700	800	1000	1200	1500	1500	1800	2500	
	Nom	600	750	900	1000	1200	1500	1750	2000	2500	3000	
	Max	800	1000	1000	1200	1600	2000	2000	2500	3000	4000	
5000:5	Min	600	800	900	1000	1500	1500	1750	2000	2500	3000	
	Nom	800	1000	1200	1200	1750	2000	2500	2500	3000	4000	
	Max	1000	1200	1200	1600	2000	2500	2500	3000	3500	5000	
6000:5	Min	800	900	1200	1200	1500	1800	2500	2500	3000	4000	
	Nom	1000	1200	1500	1500	2000	2500	3000	3000	3500	5000	
	Max	1200	1500	1750	2000	2500	3000	3500	3500	4500	6000	

Dc Circular Scale

Taut Band Suspension

Dc 100° Scale

Taut Band Suspension

Dc Edgewise

Taut Band Suspension

Detachable Instruments

Socket Mounting
Taut Band Suspension

Type....
Size....
Scale Arc....
Standard Specification....
Accuracy Class....

KX-241
4 1/2" Square
250°
ANSI C39.1
1%

KX-261
8 3/4" Square
250°
ANSI C39.1
1%

Navy HI-Shock
KX-241
4 1/2" Square
250°
MIL-M-16034A
1 1/2%

KX-221
4 1/2" Square
100°
ANSI C39.1
1%

KX-251
6 1/2" Square
100°
ANSI C39.1
1%

UX-251
5 1/2" Square
100°
ANSI C39.1
1%

VX-252
6" x 1 3/4"
60°
1 1/2%

HX-252
6" x 1 3/4"
60°
1 1/2%

EX-251
7" Round
100°
ANSI C39.1
1%

Notes:



	Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Notes:
Dc Microammeter self-contained	50 uA 100 uA 200 uA 500 uA 750 uA	409C610A25 691B673A09 691B673A10 691B673A12 691B673A13	292B655A29 691B689A26 691B689A27 691B689A29 691B689A30	671B419A09 671B419A10 671B419A12 671B419A13	291B689A12 291B689A13 291B689A14 291B689A16	291B394A12 291B394A13 291B394A14 291B394A16	291B394A24 291B394A25 291B394A26 291B394A28	644B651A10 644B651A11 644B651A12 644B651A13	644B650A10 644B650A11 644B650A12 644B650A13	Order by description Same as corresponding rating of Type KX-251 Ammeter uses circuit-closing type S 4-jaw socket. Voltmeter uses any type S 4-jaw socket.	
Dc Milliammeter self-contained	1 mA 2 mA 3 mA 5 mA 10 mA 20 mA 50 mA 200 mA 500 mA	691B687A09 691B687A10 691B687A11 691B687A12 691B687A13 691B687A14 691B687A16 691B687A17	691B689A09 691B689A10 691B689A11 691B689A12 691B689A13 691B689A14 691B689A16 691B689A17	671B419A25 671B419A26 671B419A27 671B419A28 671B419A29 671B419A30 671B419A32 671B419A33	291B692A09 291B692A10 291B692A11 291B692A12 291B692A14 291B692A16 291B692A18 291B692A21 291B692A24	291B399A09 291B399A10 291B399A11 291B399A12 291B399A14 291B399A16 291B399A18 291B399A21 291B399A24	291B398A09 291B398A10 291B398A11 291B398A12 291B398A14 291B398A16 291B398A18 291B398A21 291B398A24	606B419A09 606B419A10 606B419A11 606B419A12 606B419A14 606B419A16 606B419A18 606B419A21 606B419A24	606B432A09 606B432A10 606B432A11 606B432A12 606B432A14 606B432A16 606B432A18 606B432A21 606B432A24	Order by description Same as corresponding rating of Type KX-251	
Dc Ammeter self-contained	2 A 5 A 15 A 20 A	714B443A11 714B443A13 714B443A16 714B443A17	691B692A27 691B692A29 691B692A32 691B692A33	671B422A11 671B422A13 671B422A16 671B422A17	291B697A11 291B697A14 291B697A17 291B697A18	291B406A11 291B406A14 291B406A17 291B406A18	291B407A11 291B407A14 291B407A17 291B407A18	606B421A10 606B421A11 606B421A15 606B421A14	606B425A10 606B425A11 606B425A15 606B425A13	Order by description Same as corresponding rating of Type KX-251	
Dc Ammeter for external 50 mV shunts	10 A 15 A 25 A 50 A 75 A 100 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 1000 A 1500 A 4000 A	691B671A12 691B671A13 691B671A14 691B671A15 691B671A16 691B671A17 691B671A18 691B671A19 691B671A20 691B671A21 691B671A22 691B671A23 691B671A24 691B671A26 691B671A27 691B671A31	Use style number for generic scale and specify dial marking information	671B420A10 671B420A11 671B420A12 671B420A13 671B420A14 671B420A15 671B420A16 671B420A17 671B420A18 671B420A19 671B420A20 671B420A21 671B420A22 671B420A24 671B420A25 671B420A29	291B690A10 291B690A11 291B690A12 291B690A13 291B690A14 291B690A15 291B690A16 291B690A17 291B690A18 291B690A19 291B690A20 291B690A21 291B690A22 291B690A24 291B690A25 291B690A29	291B395A10 291B395A11 291B395A12 291B395A13 291B395A14 291B395A15 291B395A16 291B395A17 291B395A18 291B395A19 291B395A20 291B395A21 291B395A22 291B395A24 291B395A25 291B395A29	291B396A10 291B396A11 291B396A12 291B396A13 291B396A14 291B396A15 291B396A16 291B396A17 291B396A18 291B396A19 291B396A20 291B396A21 291B396A22 291B396A24 291B396A25 291B396A29	606B623A14 606B623A15 606B623A16 606B623A17 606B623A18 606B623A19 606B623A20 606B623A21 606B623A22 606B623A23 606B623A24 606B623A25 606B623A26 606B623A28 606B623A29 606B623A33	606B624A14 606B624A15 606B624A16 606B624A17 606B624A18 606B624A19 606B624A20 606B624A21 606B624A22 606B624A23 606B624A24 606B624A25 606B624A26 606B624A28 606B624A29 606B624A33	Order by description Same as corresponding rating of Type KX-251	
Dc Ammeter for external shunt (Generic Scale)	50 mV 100 mV	691B671A09 691B671A10 Calibrated for standard lead resistance .065 ohm. If used with any other resistance between zero and .13 ohm, the error due to lead resistance will not exceed .13% for 50 mV, or .03% for the 100 mV instrument.	691B692A11 691B692A12	671B420A34 671B420A35	291B696A10 291B696A11	291B405A10 291B405A11	291B405A25 291B405A26	606B623A38 606B623A39	606B624A38 606B624A39	Order by description Same as corresponding rating of Type KX-251	Specify shunt rating and scale markings

Dc Circular Scale
Taut Band Suspension

Dc 100° Scale
Taut Band Suspension

Dc Edgewise
Taut Band Suspension

Detachable Instruments
Socket Mounting
Taut Band Suspension

Type.....
Size.....
Scale Arc.....
Standard Specification.....
Accuracy Class.....

KX-241
4 1/2" Square
250°
ANSI C39.1
1%

KX-261
8 3/4" Square
250°
ANSI C39.1
1%

Navy HI-Shock
KX-241
4 1/2" Square
250°
MIL-M-16034A
1 1/2%

KX-221
4 1/2" Square
100°
ANSI C39.1
1%

KX-251
6 1/2" Square
100°
ANSI C39.1
1%

UX-251
5 1/2" Square
100°
ANSI C39.1
1%

VX-252
6" x 1 3/4"
60°
1 1/2%

HX-252
6" x 1 3/4"
60°
1 1/2%

EX-251
7" Round
100°
ANSI C39.1
1%

Notes:



	Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Notes:
Dc Ammeter with adjustable lead compensation	50 mV	691B671A36	691B692A09	291B696A14	291B405A14	291B405A29	644B121A09	644B122A09	
	100 mV	691B671A37	691B692A10	291B696A15	291B405A15	291B405A30	644B121A10	644B122A10	
Dc Millivoltmeter self-contained	50 mV	714B449A09	714B462A09	1957233	1957237	606B623A09	606B624A09	Order by description Same as corresponding rating of Type KX-251	
	100 mV	714B449A10	714B462A10	.....	.....	1957234	1957238	606B623A10	606B624A10
	200 mV	714B449A11	714B462A11	.....	.....	1957235	1957239	606B623A11	606B624A11
	500 mv	714B449A12	714B462A12	.....	291B696A17	1957236	1957240	606B623A12	606B624A12	
Dc Voltmeter self-contained	1 V	606B413A22	606B454A22	Order by description Same as corresponding rating of Type KX-251	
	2 V	691B672A09	691B690A09	671B421A09	291B695A09	291B404A09	291B403A09	606B413A09	606B454A09		
	5 V	691B672A10	691B690A10	671B421A10	291B695A10	291B404A10	291B403A10	606B413A10	606B454A10		
	8 V	691B672A11	691B690A11	671B421A11	291B695A11	291B404A11	291B403A11	606B413A11	606B454A11		
	10 V	691B672A38	.....	.....	291B695A12	291B404A12	291B403A12	606B413A12	606B454A12
	15 V	691B672A12	691B690A12	671B421A12	291B695A13	291B404A13	291B403A13	606B413A13	606B454A13		
	30 V	691B672A13	691B690A13	671B421A13	291B695A14	291B404A14	291B403A14	606B413A14	606B454A14		
	80 V	691B672A14	691B690A14	671B421A14	291B695A16	291B404A16	291B403A16	606B413A16	606B454A16		
	100 V	691B672A37	.....	671B421A21	291B695A17	291B404A17	291B403A17	606B413A17	606B454A17	
	150 V	691B672A15	691B690A15	671B421A15	291B695A18	291B404A18	291B403A18	606B413A18	606B454A18		
	300 V	691B672A16	691B690A16	671B421A16	291B695A19	291B404A19	291B403A19	606B413A19	606B454A19		
	600 V	691B672A18	691B690A18	671B421A18	291B685A20	291B404A20	291B403A20	606B413A20	606B454A20		
	800 V	691B672A19	691B690A19	671B421A19	291B695A21	291B404A21	291B403A21	606B413A23	606B454A23		
	Dc Voltmeter self-contained Zener type suppressed zero	200-300 V	714B450A14		
Dc Ground Detector for use with separate resistors	.5-0-.5 mA	691B673A34	691B689A38	671B421A38	291B687A11	291B392A11	291B392A22	External Resistors are contained in circular scale Modifications Section

Ac Circular Scale
Taut Band Suspension

Ac 100° Scale
Taut Band Suspension

Ac Edgewise
Taut Band Suspension

Detachable Instruments
Socket Mounting
Taut Band Suspension

	Type.... Size.... Scale Arc.... Standard Specification.... Accuracy Class....	KA-241 4 1/2" Square 250° ANSI C39.1 1%	KA-261 8 3/4" Square 250° ANSI C39.1 1%	Navy Hi-Shock KA-241 4 1/2" Square 250° MIL-M-16034A 1 1/2%	KA-221 4 1/2" Square 100° ANSI C39.1 1%	KA-251 6 1/2" Square 100° ANSI C39.1 1%	UA-251 5 1/2" Square 100° ANSI C39.1 1%	VC-252 6" x 1 3/4" 60° 1 1/2%	HC-252 6" x 1 3/4" 60° 1 1/2%	EA-251 7" Round 100° ANSI C39.1 1%	Notes:
	Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Milliammeter 25-200 Hz self-contained	10 mA 100 mA 500 mA	291B460A29 291B460A32 291B460A34	291B642A29 291B642A32 291B642A34	291B465A29 291B465A32 291B465A34	291B674A10 291B674A13 291B674A15	291B494A10 291B494A13 291B494A15	291B494A22 291B494A25 291B494A27	644B655A09 644B655A12 644B655A14	644B654A09 644B654A12 644B654A14	Order by description Same as corresponding rating of Type KA-251	
Ac Ammeter for use with current transformer 5 amp full scale 60 Hz	25 A 40 A 50 A 60 A 75 A 100 A 150 A 200 A 300 A 400 A 500 A 600 A 800 A 1000 A 1200 A 1500 A 1600 A 2000 A 2500 A 3000 A 4000 A 5000 A	291B461A12 291B461A14 291B461A15 291B461A16 291B461A17 291B461A19 291B461A20 291B461A21 291B461A23 291B461A24 291B461A25 291B461A26 291B461A27 291B461A28 291B461A29 291B461A30 291B461A36 291B461A31 291B461A32 291B461A33 291B461A34 291B461A35	Use style number for generic scale and specify scale marking information	291B466A12 291B466A14 291B466A15 291B466A16 291B466A17 291B466A19 291B466A20 291B466A21 291B466A23 291B466A24 291B466A25 291B466A26 291B466A27 291B466A28 291B466A29 291B466A30 291B466A36 291B466A31 291B466A32 291B466A33 291B466A34 291B466A35	291B672A12 291B672A14 291B672A15 291B672A16 291B672A17 291B672A19 291B672A20 291B672A21 291B672A23 291B672A24 291B672A25 291B672A26 291B672A27 291B672A28 291B672A29 291B672A30 291B672A36 291B672A31 291B672A32 291B672A33 291B672A34 291B672A35	291B499A12 291B499A14 291B499A15 291B499A16 291B499A17 291B499A19 291B499A20 291B499A21 291B499A23 291B499A24 291B499A25 291B499A26 291B499A27 291B499A28 291B499A29 291B499A30 291B499A36 291B499A31 291B499A32 291B499A33 291B499A34 291B499A35	291B500A12 291B500A14 291B500A15 291B500A16 291B500A17 291B500A19 291B500A20 291B500A21 291B500A23 291B500A24 291B500A25 291B500A26 291B500A27 291B500A28 291B500A29 291B500A30 291B500A36 291B500A31 291B500A32 291B500A33 291B500A34 291B500A35	644B014A12 644B014A14 644B014A15 644B014A16 644B014A17 644B014A18 644B014A19 644B014A20 644B014A21 644B014A22 644B014A23 644B014A24 644B014A25 644B014A26 644B014A27 644B014A28 644B014A29 644B014A30 644B014A31 644B014A32	644B015A12 644B015A14 644B015A15 644B015A16 644B015A17 644B015A18 644B015A19 644B015A20 644B015A21 644B015A22 644B015A23 644B015A24 644B015A25 644B015A26 644B015A27 644B015A28 644B015A29 644B015A30 644B015A31 644B015A32	671B399A11 671B399A12 671B399A13 671B399A14 671B399A15 671B399A16 671B399A17 671B399A18 671B399A19 671B399A20 671B399A21 671B399A22 671B399A23 671B399A24 671B399A25 671B399A26 671B399A27	
Ac Ammeter 5 A, for use with current transformer 25-200 Hz	Generic Scale	291B460A26	292B642A26	.....	291B671A22	291B497A22	291B498A22	644B014A08	644B015A08	.....	Specify CT ratio and scale marking information
Ac Ammeter 25-200 Hz self-contained	5A 8A 10A 15A 20A 25A 30A 40A 50A	291B460A21 291B460A22 291B460A23 291B460A24 291B460A25	292B642A21 292B642A22 292B642A23 292B642A24 292B642A25	291B465A21 291B465A22 291B465A23 291B465A24 291B465A25	291B671A13 291B671A14 291B671A15 291B671A16 291B671A17 291B671A18 291B671A19 291B671A20 291B671A21	291B497A13 291B497A14 291B497A15 291B497A16 291B497A17 291B497A18 291B497A19 291B497A20 291B497A21	291B498A13 291B498A14 291B498A15 291B498A16 291B498A17 291B498A18 291B498A19 291B498A20 291B498A21	606B424A11 606B424A16 606B424A12 606B424A17 606B424A13	606B458A11 606B458A16 606B458A12 606B458A17 606B458A13	671B396A09 671B396A10 671B396A11 671B396A13 671B396A16	
Ac Voltmeter 50-60 Hz self-contained	30 V 150 V 300 V 600 V	..... 291B460A09 291B460A10 291B460A11	..... 291B642A09 291B642A10 291B642A11	..... 291B465A09 291B465A10 291B465A11	..... 291B675A18 291B675A10 291B675A11 291B675A12	..... 291B495A11 291B495A13 291B495A14 291B495A15	..... 291B495A26 291B495A28 291B495A29 291B495A30	..... ..... 606B618A09 606B618A10 606B618A11	..... ..... 606B619A09 606B619A10 606B619A11	..... ..... 671B397A09 671B397A10 671B397A11	

Ac Circular Scale
Taut Band Suspension

Ac 100° Scale
Taut Band Suspension

Ac Edgewise
Taut Band Suspension

Detachable Instruments
Socket Mounting
Taut Band Suspension

Type....
Size....
Scale Arc....
Standard Specification....
Accuracy Class....

KA-241
4 1/2" Square
250°
ANSI C39.1
1%

KA-261
8 3/4" Square
250°
ANSI C39.1
1%

Navy HI-Shock
KA-241
4 1/2" Square
250°
MIL-M-16034A
1 1/2%

KA-221
4 1/2" Square
100°
ANSI C39.1
1%

KA-251
6 1/2" Square
100°
ANSI C39.1
1%

UA-251
5 1/2" Square
100°
ANSI C39.1
1%

VC-252
6" x 1 3/4"
60°
1 1/2%

HC-252
6" x 1 3/4"
60°
1 1/2%

EA-251
7" Round
100°
ANSI C39.1
1%

Notes:



	Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Voltmeter for use with potential transformer 50-60 Hz	300 V	291B462A14	.....	.....	291B673A17	291B496A17	291B496A28	.....	.....	.....	150 V Endscale
	600 V	291B462A09	.....	291B467A09	291B673A11	291B496A11	291B496A22	644B018A10	644B019A10	671B398A10	"
	3000 V	291B462A10	.....	291B467A10	291B673A12	291B496A12	291B496A23	644B018A11	644B018A11	671B398A11	"
	5000 V	291B462A11	.....	291B467A11	291B673A13	291B496A13	291B496A24	644B018A14	644B019A14	671B398A12	143 V Endscale
	9000 V	.....	.....	.....	291B673A15	291B496A15	291B496A26	644B018A14	644B019A14	671B398A14	150 V Endscale
	5.25 kV	.....	.....	.....	.....	.....	.....	644B018A12	644B019A12	.....	"
	15 kV	291B462A12	.....	291B467A12	.....	.....	.....	644B018A12	644B019A12	.....	125 V Endscale
18 kV	291B462A13	.....	.....	291B673A18	291B496A16	291B496A27	644B018A16	644B019A16	.....	150 V Endscale	
Ac Voltmeter scale not listed above Use with potential transformer 25-100 Hz	125 V	291B460A15	.....	.....	.....	291B495A20	291B495A35	.....	.....	.....
	143 V	291B460A08	292B642A08	.....	.....	291B495A19	291B495A34	.....	.....	.....
	150 V	291B460A12	292B642A12	291B465A12	291B675A13	291B495A17	291B495A32	.....	.....	.....
Ac Voltmeter electrically suppressed zero (Zener) 25-1000 Hz		KC-241	KC-241		KC-221	KC-251	UC-251	VC-252	HC-252		
	90-130 V	714B461A09	714B503A09	.....	670B125A13	670B123A13	Order By Description	670B121A13	670B122A13		
	100-140 V	714B461A10	714B503A10	.....	670B125A10	670B123A10		670B121A10	670B122A10		
	110-130 V	714B461A12	714B503A12	.....	670B125A09	670B123A09		670B121A09	670B122A09		
	105-125 V	714B461A17	714B503A14	.....	.....	.....		.....	.....
.....		
Ac Voltmeter expanded scale (Zener) 25-1000 Hz	0-110--130 V	691B229A10	691B230A10	.....	.....	.....	.....	.....	.....	.....
Ac Voltmeter electrically suppressed zero (Zener) 400 Hz				KC-241 MIL-V-23151							
	430-470 V	.....	.....	717B216A14	.....	.....	.....	.....	.....	.....
Ac Voltmeter Rectifier self-contained 20-10,000 Hz	5 V	714B317A09	714B320A09	671B424A09	291B694A10	291B401A10	291B402A10	.....	.....	.....
	20 V	714B317A11	714B320A11	671B424A11	291B694A14	291B401A14	291B402A14	.....	.....	.....
	50 V	714B317A12	714B320A12	671B424A12	291B694A17	291B401A17	291B402A17	.....	.....	.....
	150 V	714B317A14	714B320A14	671B424A14	291B694A20	291B401A20	291B402A20	.....	.....	.....
Resistance Thermometer self-contained 120 volt, 60 Hz		KX-241	KX-261	KX-241 MIL-T-2867B	KX-221	KX-251	UX-251				
	0-150°C	714B466A10	714B504A10	714B466A30	292B820A10	292B893A10	292B893A26	.....	.....	.....	For use with 10 ohm copper coil
	0-200°C	714B466A11	714B504A11	714B466A31	292B820A11	292B893A11	292B893A27	.....	.....	.....
	0-200°F	714B466A12	714B504A12	714B466A32	292B820A12	292B893A12	292B893A28	.....	.....	.....
	20-140°C	714B466A17	.....	.....	.....	.....	.....	.....	.....	.....
.....		
Resistance Thermometer 20 Vdc	0-150°C	409C610A33	292B658A10	.....	291B688A11	291B393A11	291B393A22	.....	.....	.....	For use with 10 ohm copper coil

Ac Circular Scale
Taut Band Suspension

Ac 100° Scale
Taut Band Suspension

Ac Edgewise
Taut Band Suspension

Detachable Instruments
Socket Mounting
Taut Band Suspension

Type....	KX-241	KX-261	Navy HI-Shock KX-241	KX-221	KX-251	UX-251	VR3-252	HR3-252	EX-251	Notes:	
Size....	4 1/2" Square	8 3/4" Square	4 1/2" Square	4 1/2" Square	6 1/2" Square	5 1/2" Square	6" x 1 3/4"	6" x 1 3/4"	7" Round		
Scale Arc....	250°	250°	250°	100°	100°	100°	60°	60°	100°		
Standard Specification....	ANSI C39.1	ANSI C39.1	MIL-T-2867B	ANSI C39.1	ANSI C39.1	ANSI C39.1			ANSI C39.1		
Accuracy Class....	1%	1%	1 1/2%	1%	1%	1%	1 1/2%	1 1/2%	1%		
Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.		
Frequency Meter 120 volt self-contained	59-61 Hz	KR3-241 714B538A15	KR3-261 714B505A15	KX-241	KR3-221 670B406A15	KR3-251 670B401A15	UR3-251 670B402A15	670B408A15	670B409A15	Order by description	
	58-62 Hz	714B538A16	714B505A16	.....	670B406A14	670B401A14	670B402A14	670B408A14	670B409A14	
	55-65 Hz	714B538A09	714B505A09	.....	670B406A13	670B401A13	670B402A13	670B408A13	670B409A13	
	50-70 Hz	714B538A10	714B505A10	.....	670B406A12	670B401A12	670B402A12	670B408A12	670B409A12	
	45-55 Hz	714B538A11	714B505A11	.....	670B406A09	670B401A09	670B402A09	670B408A09	670B409A09	
	45-65 Hz	714B538A12	714B505A12	.....	670B406A11	670B401A11	670B402A11	670B408A11	670B409A11	
	350-450 Hz	714B538A13	714B505A13	.....	670B406A16	670B401A16	670B402A16	670B408A16	670B409A16	
Frequency Meter 120 volt, with external transducer	55-65 Hz	.....	.....	KX-241 MIL-M-16125 291B270A10	.....	.....	.....	.....	.....
	350-450 Hz	.....	.....	291B270A13	.....	.....	.....	.....	.....
Power Factor Meter 5A, 60Hz 1ph 120 V	.5 - 1 - .5 (Lag - Lead)	KJ-241	KJ-261	.....	KJ-221	KJ-251	UJ-251	VX-252	HX-252	HX and VX-252 supplied with external transducer type VF2-841
		775B221A09	775B265A09	.....	775B232A09	775B258A09	775B752A09	.....	.....
		775B221A11 775B221A14	775B265A11 775B265A14	775B232A11 775B232A14	775B258A11 775B258A14	775B752A11 775B752A14	671B379A09	671B379A25	
		775B221A13	775B265A13	.....	775B232A13	775B258A13	775B752A13	.....	.....
Power Factor Meter 5A, 120 V, 60Hz	0 - 1 - 0 (Lag - Lead)	KI-241	KI-261	KI-241 MIL-S-16104	.....	KI-25	UI-25	.....	.....
		186A236A01 186A237A01	186A242A01 186A241A01	292B703A18 292B703A30	.....	409C631A16 409C631A24	409C631A17 409C631A25	.....	.....
Synchroscope Self-Contained	Slow - Fast	186A235A01	186A243A01	292B703A09	.....	409C631A10	409C631A11	.....	.....
		186A662A01	186A659A01	.....	.....	.....	.....	.....	.....
		.....	.....	292B703A10	.....	.....	.....	.....	.....

Ac Circular Scale
Taut Band Suspension

Ac 100° Scale
Taut Band Suspension

Ac Edgewise
Taut Band Suspension

Detachable Instruments
Socket Mounting
Taut Band Suspension

Type.....
Size.....
Scale Arc.....
Standard Specification.....
Accuracy Class.....

KP241
4 1/2" Square
250°
ANSI C39.1
1%



KP261
8 3/4" Square
250°
ANSI C39.1
1%



**Navy HI-Shock
KP241**
4 1/2" Square
250°
MIL-M-16034A
1 1/2%



KY221
4 1/2" Square
100°
ANSI C39.1
1%



KY251
6 1/2" Square
100°
ANSI C39.1
1%



UY251
5 1/2" Square
100°
ANSI C39.1
1%



VX252
6" x 1 3/4"
60°
1 1/2%



HX252
6" x 1 3/4"
60°
1 1/2%



EX251
7" Round
100°
ANSI C39.1
1%



Notes:

	Scale Rating	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Wattmeter 50-60 Hz 1 element, 1 phase	5A 120 V	409C711A18	292B888A20	409C685A20	1957484	1730456	1876663	714B607A09	714B611A09	Order by description	VX and HX-252 and EX-251 Wattmeters supplied with external transducer type VP2-840. Others are self-contained.
2 elem., 1 ph., 3 w. or 2 elem., 3 ph., 3 w.	120 V	409C711A37	292B889A40	409C685A40	.....	.....	.....	714B607A10	714B611A10		
2 elem., 1 ph., 3 w. or 2 elem., 3 ph., 3 w.	480 V	265C081A39	.....	.....	.....	.....	.....	.....	.....
2 1/2 elem., 3 ph., 4 w.	120 V	409C711A57	292B890A59	409C685A59	1957486	1730479	1876686	714B607A11	714B611A11		
Ac Varmeter With separate phase shifter 50-60 Hz											
2 elem., 3 ph., 3 w. 60 Hz	5A 120V	409C711A62	292B889A30	409C685A62	1957488	1730481	.....	.....	.....	.....
Three phase types include MV-832 Phase Shifter.											
Ac Varmeter 50-60 Hz		KV-241	KV-261								
2 elem., 3 ph., 3 w.	5A 120 V	205C094A19	718B390A21	.....	.....	.....	.....	714B607A26	.....	.....	VX and HX-252 and EX-251 Varmeters supplied with external transducer type VV2-840.
2 1/2 elem., 3 ph., 4 w.		205C094A47	718B394A20	.....	.....	.....	.....	714B607A27	.....	.....

STYLE LISTINGS

20/20

CONVENTIONAL

Type.
 Size.
 Scale Length.....
 Standard Specification.
 Accuracy Class....

GX-332
 2-1/2"
 2.18"
 ANSI C39.1
 2%



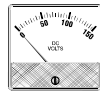
Style No.

GX-352
 3-1/2"
 2.82"
 ANSI C39.1
 2%



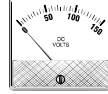
Style No.

GX-372
 4-1/2"
 4.02"
 ANSI C39.1
 2%



Style No.

GX-382
 5-1/2"
 4.95"
 ANSI C39.1
 2%



Style No.

RX-351
 Rectangular
 3-1/2"
 2.4"
 ANSI C39.1
 2%



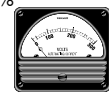
Style No.

NX-351
 Round
 3 1/2"
 2.4"
 ANSI C39.1
 2%



Style No.

RX-371
 Rectangular
 4 1/2"
 3.2"
 ANSI C39.1
 2%



Style No.

NX-371
 Round
 4 1/2"
 3.2"
 ANSI C39.1
 2%



Style No.




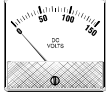




Notes

	Rating, Scale	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.		
Dc Microammeter	50 uA 80 uA 100 uA 150 uA 200 uA 300 uA 500 uA 800 uA	606B592A09 606B592A10 606B592A11 606B592A12 606B592A13 606B592A14 606B592A15 606B592A16	606B598A09 606B598A10 606B598A11 606B598A12 606B598A13 606B598A14 606B598A15 606B598A16	606B605A09 606B605A10 606B605A11 606B605A12 606B605A13 606B605A14 606B605A15 606B605A16	606B605A09 606B605A10 606B605A11 606B605A12 606B605A13 606B605A14 606B605A15 606B605A16	291B554A12 409C534A15 409C534A19 409C534A10 409C534A11 409C534A12 409C534A13 409C534A14	291B554A23 409C534A27 409C534A21 409C534A22 409C534A23 409C534A24 409C534A25 409C534A26	291B290A11 409C569A14 409C569A08 409C569A09 409C569A10 409C569A11 409C569A12 409C569A13	291B290A23 409C569A26 409C569A20 409C569A21 409C569A22 409C569A23 409C569A24 409C569A25		
Dc Milliammeter	1 mA 1.5 mA 2 mA 3 mA 5 mA 8 mA 10 mA 15 mA 20 mA 30 mA 50 mA 80 mA 100 mA 150 mA 200 mA 300 mA 500 mA 800 mA	606B591A09 606B591A10 606B591A11 606B591A12 606B591A13 606B591A14 606B591A15 606B591A16 606B591A17 606B591A18 606B591A19 606B591A20 606B591A21 606B591A22 606B591A23 606B591A24 606B591A25 606B591A26	606B599A09 606B599A10 606B599A11 606B599A12 606B599A13 606B599A14 606B599A15 606B599A16 606B599A17 606B599A18 606B599A19 606B599A20 606B599A21 606B599A22 606B599A23 606B599A24 606B599A25 606B599A26	606B604A09 606B604A10 606B604A11 606B604A12 606B604A13 606B604A14 606B604A15 606B604A16 606B604A17 606B604A18 606B604A19 606B604A20 606B604A21 606B604A22 606B604A23 606B604A24 606B604A25 606B604A26	606B604A09 606B604A10 606B604A11 606B604A12 606B604A13 606B604A14 606B604A15 606B604A16 606B604A17 606B604A18 606B604A19 606B604A20 606B604A21 606B604A22 606B604A23 606B604A24 606B604A25 606B604A26	670B954A09 670B954A10 670B954A11 670B954A12 670B954A13 670B954A14 670B954A15 670B954A16 670B954A17 670B954A18 670B954A19 670B954A20 670B954A21 670B954A22 670B954A23 670B954A24 670B954A25 670B954A26	409C531A08 409C531A09 409C531A10 409C531A11 409C531A12 409C531A13 409C531A14 409C531A15 409C531A16 409C531A17 409C531A18 409C531A19 409C531A20 409C531A21 409C531A22 409C531A23 409C531A24 409C531A25	409C531A32 409C531A33 409C531A34 409C531A35 409C531A36 409C531A37 409C531A38 409C531A39 409C531A40 409C531A41 409C531A42 409C531A43 409C531A44 409C531A45 409C531A46 409C531A47 409C531A48 409C531A49	409C565A08 409C565A09 409C565A10 409C565A11 409C565A12 409C565A13 409C565A14 409C565A15 409C565A16 409C565A17 409C565A18 409C565A19 409C565A20 409C565A21 409C565A22 409C565A23 409C565A24 409C565A25	409C565A32 409C565A33 409C565A34 409C565A35 409C565A36 409C565A37 409C565A38 409C565A39 409C565A40 409C565A41 409C565A42 409C565A43 409C565A44 409C565A45 409C565A46 409C565A47 409C565A48 409C565A49	All self-contained milliammeters above 15 mA full scale are shunted internally, and have a terminal drop of 50 mV at full scale.
Dc Ammeter self-contained	1 A 1.5 A 2 A 3 A 5 A 8 A 10 A 15 A 20 A 30 A 50 A	606B590A09 606B590A10 606B590A11 606B590A12 606B590A13 606B590A14 606B590A15 606B590A16 606B590A17 606B590A18 606B590A19	606B597A09 606B597A10 606B597A11 606B597A12 606B597A13 606B597A14 606B597A15 606B597A16 606B597A17 606B597A18 606B597A19	606B603A09 606B603A10 606B603A11 606B603A12 606B603A13 606B603A14 606B603A15 606B603A16 606B603A17 606B603A18 606B603A19	606B603A09 606B603A10 606B603A11 606B603A12 606B603A13 606B603A14 606B603A15 606B603A16 606B603A17 606B603A18 606B603A19	670B952A09 670B952A10 670B952A11 670B952A12 670B952A13 670B952A14 670B952A15 670B952A16 670B952A17 670B952A18 670B952A19	409C530A08 409C530A09 409C530A10 409C530A11 409C530A12 409C530A13 409C530A14 409C530A15 409C530A16 409C530A17 409C530A18	409C530A32 409C530A33 409C530A34 409C530A35 409C530A36 409C530A37 409C530A38 409C530A39 409C530A40 409C530A41 409C530A42	409C568A08 409C568A09 409C568A10 409C568A11 409C568A12 409C568A13 409C568A14 409C568A15 409C568A16 409C568A17 409C568A18	409C568A32 409C568A33 409C568A34 409C568A35 409C568A36 409C568A37 409C568A38 409C568A39 409C568A40 409C568A41 409C568A42	Self-contained ammeters are shunted internally and have a terminal drop of 50 mV at full scale.
Dc Ammeter for use with 50 mV external shunt	15 A 20 A 30 A 25 A 50 A 75 A 80 A 100 A 150 A 200 A 250 A 300 A 400 A 500 A 600 A 800 A 1.0 kA	606B602A11 606B602A12 606B602A13 606B602A14 606B602A15 606B602A16 606B602A17 606B602A18 606B602A19 606B602A20 606B602A21 606B602A22 606B602A23 606B602A24	606B609A11 606B609A12 606B609A13 606B609A14 606B609A15 606B609A16 606B609A17 606B609A18 606B609A19 606B609A20 606B609A21 606B609A22 606B609A23 606B609A24	606B611A11 606B611A12 606B611A13 606B611A14 606B611A15 606B611A16 606B611A17 606B611A18 606B611A19 606B611A20 606B611A21 606B611A22 606B611A23 606B611A24	606B611A11 606B611A12 606B611A13 606B611A14 606B611A15 606B611A16 606B611A17 606B611A18 606B611A19 606B611A20 606B611A21 606B611A22 606B611A23 606B611A24	670B953A11 670B953A12 670B953A13 670B953A14 670B953A15 670B953A16 670B953A17 670B953A18 670B953A19 670B953A20 670B953A21 670B953A22 670B953A23 670B953A24	409C530A20 409C530A21 409C530A22 409C530A23 409C530A24 409C530A25 409C530A26 409C530A27 409C530A28 409C530A29 409C530A30 409C530A31 409C530A32 409C530A33 409C530A34 409C530A35 409C530A36	409C530A48 409C530A49 409C530A50 409C530A51 409C530A52 409C530A53 409C530A54 409C530A55 409C530A56 409C530A57 409C530A58 409C530A59 409C568A20 409C568A21 409C568A22 409C568A23 409C568A24 409C568A25 409C568A26 409C568A27 409C568A28 409C568A29 409C568A30 409C568A31 409C568A32 409C568A33 409C568A34 409C568A35 409C568A36	409C568A48 409C568A49 409C568A50 409C568A51 409C568A52 409C568A53 409C568A54 409C568A55 409C568A56 409C568A57 409C568A58 409C568A59 409C568A60 409C568A61 409C568A62 409C568A63 409C568A64 409C568A65 409C568A66 409C568A67 409C568A68 409C568A69 409C568A70	Calibrated for standard lead resistance .065 ohm.	

STYLE LISTINGS

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CONVENTIONAL

	Type.....	GX-332	GX-352	GX-372	GX-382	RX-351	NX-351	RX-371	NX-371	Notes
	Size.....	2 1/2"	3 1/2"	4 1/2"	5 1/2"	Rectangular	Round	Rectangular	Round	
	Scale Length.....	2.18"	2.82"	4.02"	4.95"	3 1/2"	3 1/2"	4 1/2"	4 1/2"	
	Standard Specification.....	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	ANSI C39.1	
	Accuracy Class.....	2%	2%	2%	2%	2%	2%	2%	2%	
										
	Rating, Scale	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Dc Ammeter for use with 50 or 100 mV external shunt (scale not listed in above sec)	50 mV	606B602A34	606B609A34	606B611A34	670B953A34	409C534A50	409C534A55	409C569A50	409C569A63	Full scale dial marking to suit shunt. When ordering, specify full scale dial marking desired, shunt current and millivolt rating, and shunt lead resistance.
	100 mV	606B602A35	606B609A35	606B611A35	670B953A35	409C615A08	409C615A24	409C622A08	409C622A24	
Dc Millivoltmeter	50 mV	606B595A11	606B596A11	606B608A11	670B957A11	409C534A32	409C534A41	409C569A32	409C569A41	Specify source impedance; not required if used with shunt.
	100 mV	606B595A13	606B596A13	606B608A13	670B957A13	409C534A33	409C534A42	409C569A33	409C569A42	
	200 mV	606B595A15	606B596A15	606B608A15	670B957A15	409C534A34	409C534A43	409C569A34	409C569A43	
	500 mV	606B595A17	606B596A17	606B608A17	670B957A17	409C534A35	409C534A44	409C569A35	409C569A44	
Dc Voltmeter	1 V	606B593A09	606B601A09	606B607A09	670B956A09	409C532A09	409C532A36	409C570A09	409C570A36	1,000 ohms per volt.
	1.5 V	606B593A10	606B601A10	606B607A10	670B956A10	409C532A10	409C532A37	409C570A10	409C570A37	
	2 V	606B593A11	606B601A11	606B607A11	670B956A11	409C532A11	409C532A38	409C570A11	409C570A38	
	3 V	606B593A12	606B601A12	606B607A12	670B956A12	409C532A12	409C532A39	409C570A12	409C570A39	
	5 V	606B593A13	606B601A13	606B607A13	670B956A13	409C532A13	409C532A40	409C570A13	409C570A40	
	8 V	606B593A14	606B601A14	606B607A14	670B956A14	409C532A14	409C532A41	409C570A14	409C570A41	
	10 V	606B593A15	606B601A15	606B607A15	670B956A15	409C532A15	409C532A42	409C570A15	409C570A42	
	15 V	606B593A16	606B601A16	606B607A16	670B956A16	409C532A16	409C532A43	409C570A16	409C570A43	
	20 V	606B593A17	606B601A17	606B607A17	670B956A17	409C532A17	409C532A44	409C570A17	409C570A44	
	30 V	606B593A18	606B601A18	606B607A18	670B956A18	409C532A18	409C532A45	409C570A18	409C570A45	
	50 V	606B593A19	606B601A19	606B607A19	670B956A19	409C532A19	409C532A46	409C570A19	409C570A46	
	75 V	606B593A27	606B601A27	606B607A27	670B956A27	.....	.....	.....	.....
	80 V	606B593A20	606B601A20	606B607A20	670B956A20	409C532A20	409C532A47	409C570A20	409C570A47	
	100 V	606B593A21	606B601A21	606B607A21	670B956A21	409C532A21	409C532A48	409C570A21	409C570A48	
	150 V	606B593A22	606B601A22	606B607A22	670B956A22	409C532A22	409C532A49	409C570A22	409C570A49	
	200 V	606B593A23	606B601A23	606B607A23	670B956A23	409C532A23	409C532A50	409C570A23	409C570A50	
	300 V	606B593A24	606B601A24	606B607A24	670B956A24	409C532A24	409C532A51	409C570A24	409C570A51	
	400 V	.....	.....	.....	.....	409C532A28	409C532A55	.....	.....
	500 V	606B593A25	606B601A25	606B607A25	670B956A25	409C532A25	409C532A52	409C570A25	409C570A52	
	600 V	409C532A27	409C532A54	409C570A26	409C570A53	

STYLE LISTINGS

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CONVENTIONAL

Type.....
 Size.....
 Scale Length.....
 Standard Specification.....
 Accuracy Class.....

GC-332
 2 1/2"
 2.18"
 ANSI C39.1
 3%

GC-352
 3 1/2"
 2.82"
 ANSI C39.1
 3%

GC-372
 4 1/2"
 4.02"
 ANSI C39.1
 3%

GC-382
 5 1/2"
 4.95"
 ANSI C39.1
 3%

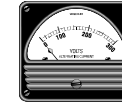
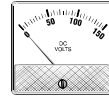
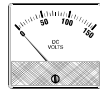
RC-351
 Rectangular
 3 1/2"
 2.4"
 ANSI C39.1
 3%

NC-351
 Round
 3 1/2"
 2.4"
 ANSI C39.1
 3%

RC-371
 Rectangular
 4 1/2"
 3.2"
 ANSI C39.1
 3%

NC-371
 Round
 4 1/2"
 3.2"
 ANSI C39.1
 3%

Notes



Rating, Scale

Style No.

Style No.

Style No.

Style No.

Style No.

Style No.

Style No.

Style No.




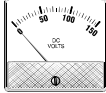




	Rating, Scale	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Notes	
Ac Microammeter Rectifier Type	100 uA	644B287A10	644B290A10	644B293A10	670B959A10	409C539A17	409C539A37	409C566A17	409C566A37		
	150 uA	644B287A11	644B290A11	644B293A11	670B959A11	409C539A18	409C539A38	409C566A18	409C566A38		
	200 uA	644B287A12	644B290A12	644B293A12	670B959A12	409C539A19	409C539A39	409C566A19	409C566A39		
	300 uA	644B287A13	644B290A13	644B293A13	670B959A13	.....	.....	.....	.....
	500 uA	644B287A14	644B290A14	644B293A14	670B959A14	.....	.....	.....	.....
25-10,000 Hz	800 uA	644B287A15	644B290A15	644B293A15	670B959A15	
Ac Milliammeter Rectifier Type	1 mA	644B288A09	644B291A09	644B294A09	670B958A09	409C539A09	409C539A29	409C566A09	409C566A29		
	1.5 mA	644B288A10	644B291A10	644B294A10	670B958A10	409C539A10	409C539A30	409C566A10	409C566A30		
	2 mA	644B288A11	644B291A11	644B294A11	670B958A11	409C539A11	409C539A31	409C566A11	409C566A31		
	3 mA	644B288A12	644B291A12	644B294A12	670B958A12	.....	.....	.....	.....
	5 mA	644B288A13	644B291A13	644B294A13	670B958A13	.....	.....	.....	.....
25-10,000 Hz	8 mA	644B288A14	644B291A14	644B294A14	670B958A14	409C539A12	409C539A32	409C566A12	409C566A32		
	10 mA	644B288A15	644B291A15	644B294A15	670B958A15	.....	.....	.....	.....
	15 mA	644B288A16	644B291A16	644B294A16	670B958A16	.....	.....	.....	.....
	20 mA	644B288A17	644B291A17	644B294A17	670B958A17	.....	.....	.....	.....
	Ac Voltmeter Rectifier Type Self- Confined 25-10,000 Hz	3 V	644B289A09	644B292A09	644B295A09	670B960A09	409C535A09	409C535A33	409C567A09	409C567A33	1,000 ohms per volt.
		5 V	644B289A10	644B292A10	644B295A10	670B960A10	409C535A10	409C535A34	409C567A10	409C567A34	
		8 V	644B289A11	644B292A11	644B295A11	670B960A11	
		10 V	644B289A12	644B292A12	644B295A12	670B960A12	409C535A11	409C535A35	409C567A11	409C567A35	
		15 V	644B289A13	644B292A13	644B295A13	670B960A13	
		20 V	644B289A14	644B292A14	644B295A14	670B960A14	409C535A12	409C535A36	409C567A12	409C567A36	
30 V		644B289A15	644B292A15	644B295A15	670B960A15	.....	.....	.....	.....
50 V		644B289A16	644B292A16	644B295A16	670B960A16	409C535A13	409C535A37	409C567A13	409C567A37		
80 V		644B289A17	644B292A17	644B295A17	670B960A17	.....	.....	.....	.....
100 V		644B289A18	644B292A18	644B295A18	670B960A18	409C535A14	409C535A38	409C567A14	409C567A38		
Suppressed Zero Ac Voltmeter with VE2-841 transducer	150V	644B289A19	644B292A19	644B295A19	670B960A19	409C535A15	409C535A39	409C567A15	409C567A39		
	200 V	644B289A20	644B292A20	644B295A20	670B960A20	.....	.....	.....	.....
	300 V	644B289A21	644B292A21	644B295A21	670B960A21	409C535A16	409C535A40	409C567A16	409C567A40		
	500 V	644B289A22	644B292A22	644B295A22	670B960A22	.....	.....	.....	.....
	600 V	.....	.....	.....	.....	409C535A17	409C535A41	409C567A17	409C567A41
	110-130 volt, 25-1000Hz	606B235A09	606B236A09	606B237A09	606B247A09	606B247A25	606B248A09	606B248A25	Accuracy 0.4% of mid-scale value. approximate Rms compensated.	
110-130 volt, Dc	606B235A11	606B236A11	606B237A11	606B247A11	606B247A27	606B248A11	606B248A27			

STYLE LISTINGS

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CONVENTIONAL

Notes

		Type..... Size..... Scale Length..... Standard Specification..... Accuracy Class.....	GA-332 2 1/2" 2.18" ANSI C39.1 2%	GA-352 3 1/2" 2.82" ANSI C39.1 2%	GA-372 4 1/2" 4.02" ANSI C39.1 2%	GA-382 5 1/2" 4.95" ANSI C39.1 2%	RA-351 Rectangular 3 1/2" 2.06" ANSI C39.1 2%	NA-351 Round 3 1/2" 2.06" ANSI C39.1 2%	RA-371 Rectangular 4 1/2" 2.8" ANSI C39.1 2%	NA-371 Round 4 1/2" 2.8" ANSI C39.1 2%	
											
Rating, Scale		Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Milliammeter self-contained	5 mA	606B924A09	606B927A09	606B930A09	670B946A09	291B272A26	291B272A09	291B294A26	291B294A09		
	10 mA	606B924A11	606B927A11	606B930A11	670B946A11	291B272A27	291B272A10	291B294A27	291B294A10		
	20mA	606B924A13	606B927A13	606B930A13	670B946A13	291B272A28	291B272A11	291B294A28	291B294A11		
	50 mA	606B924A15	606B927A15	606B930A15	670B946A15	291B272A29	291B272A12	291B294A29	291B294A12		
	100mA	606B924A17	606B927A17	606B930A17	670B946A17	291B272A30	291B272A13	291B294A30	291B294A13		
	150mA	606B924A18	606B927A18	606B930A18	670B946A18	.....	.....	291B294A33	291B294A16	
25-500 Hz	200 mA	606B924A19	606B927A19	606B930A19	670B946A19	291B272A31	291B272A14	291B294A31	291B294A14		
	500 mA	606B924A21	606B927A21	606B930A21	670B946A21	291B272A32	291B272A15	291B294A32	291B294A15		
	800 mA	606B924A22	606B927A22	606B930A22	670B946A22	.....	.....	.....	.....
Ac Ammeter self-contained	1 A	606B923A09	606B926A09	606B929A09	409C676A25	409C676A25	409C676A09	409C693A25	409C693A09		
	1.5 A	606B923A10	606B926A10	606B929A10	409C676A26	409C676A26	409C676A10	409C693A26	409C693A10		
	2 A	606B923A11	606B926A11	606B929A11	409C676A27	409C676A27	409C676A11	409C693A27	409C693A11		
	25-500 Hz	3 A	606B923A12	606B926A12	606B929A12	409C676A28	409C676A28	409C676A12	409C693A28	409C693A12	
		5 A	606B923A13	606B926A13	606B929A13	409C676A29	409C676A29	409C676A13	409C693A29	409C693A13	
		8 A	606B923A14	606B926A14	606B929A14	409C676A30	409C676A30	409C676A14	409C693A30	409C693A14	
	10 A	606B923A15	606B926A15	606B929A15	409C676A31	409C676A31	409C676A15	409C693A31	409C693A15		
	15 A	606B923A16	606B926A16	606B929A16	409C676A36	409C676A36	409C676A20	.....	409C693A20	
	20 A	606B923A17	606B926A17	606B929A17	409C676A32	409C676A32	409C676A16	409C693A32	409C693A16		
	30 A	606B923A18	606B926A18	606B929A18	409C676A33	409C676A33	409C676A17	409C693A33	409C693A17		
50 A	606B923A19	606B926A19	606B929A19	409C676A34	409C676A34	409C676A18	409C693A34	409C693A18			
Ac Ammeter for use with external current transformers	20 A	644B637A09	644B638A09	644B639A09	291B280A09	291B280A09	291B281A09	291B292A09	291B293A09	20/5 CT ratio	
	25 A	644B637A31	644B638A31	644B639A31	.....	.....	.....	291B292A32	291B293A32	25/5 CT ratio
	30 A	644B637A10	644B638A10	644B639A10	291B280A10	291B280A10	291B281A10	291B292A10	291B293A10	30/5 CT ratio	
	40 A	644B637A11	644B638A11	644B639A11	291B280A11	291B280A11	291B281A11	291B292A11	291B293A11	40/5 CT ratio	
	50 A	644B637A12	644B638A12	644B639A12	291B280A12	291B280A12	291B281A12	291B292A12	291B293A12	50/5 CT ratio	
5 amp full scale	60 A	644B637A13	644B638A13	644B639A13	291B280A13	291B280A13	291B281A13	291B292A13	291B293A13	60/5 CT ratio	
	75 A	644B637A32	644B638A32	644B639A32	291B280A26	291B280A26	291B281A26	291B292A31	291B293A31	75/5 CT ratio	
25-500 Hz	80 A	644B637A14	644B638A14	644B639A14	291B280A14	291B280A14	291B281A14	291B292A14	291B293A14	80/5 CT ratio	
	100 A	644B637A15	644B638A15	644B639A15	291B280A15	291B280A15	291B281A15	291B292A15	291B293A15	100/5 CT ratio	
	150 A	644B637A16	644B638A16	644B639A16	291B280A16	291B280A16	291B281A16	291B292A16	291B293A16	150/5 CT ratio	
	200 A	644B637A17	644B638A17	644B639A17	291B280A17	291B280A17	291B281A17	291B292A17	291B293A17	200/5 CT ratio	
	300 A	644B637A18	644B638A18	644B639A18	291B280A18	291B280A18	291B281A18	291B292A18	291B293A18	300/5 CT ratio	
	400 A	644B637A19	644B638A19	644B639A19	291B280A19	291B280A19	291B281A19	291B292A19	291B293A19	400/5 CT ratio	
	500 A	644B637A20	644B638A20	644B639A20	291B280A20	291B280A20	291B281A20	291B292A20	291B293A20	500/5 CT ratio	
	600 A	644B637A21	644B638A21	644B639A21	291B280A21	291B280A21	291B281A21	291B292A21	291B293A21	600/5 CT ratio	
	800 A	644B637A22	644B638A22	644B639A22	291B280A22	291B280A22	291B281A22	291B292A22	291B293A22	800/5 CT ratio	
	1.0 kA	644B637A23	644B638A23	644B639A23	291B280A23	291B280A23	291B281A23	291B292A23	291B293A23	1000/5 CT ratio	
	1.2 kA	644B637A24	644B638A24	644B639A24	291B280A29	291B280A29	291B281A29	291B292A24	291B293A24	1200/5 CT ratio	
	1.5 kA	644B637A25	644B638A25	644B639A25	291B280A24	291B280A24	291B281A24	291B292A25	291B293A25	1500/5 CT ratio	
	1.6 kA	644B637A26	644B638A26	644B639A26	291B280A30	291B280A30	291B281A30	291B292A26	291B293A26	1600/5 CT ratio	
	2.0 kA	644B637A27	644B638A27	644B639A27	291B280A25	291B280A25	291B281A25	291B292A27	291B293A27	2000/5 CT ratio	
	2.5 kA	644B637A28	644B638A28	644B639A28	291B280A31	291B280A31	291B281A31	291B292A29	291B293A29	2500/5 CT ratio	
	3.0 kA	644B637A29	644B638A29	644B639A29	291B280A32	291B280A32	291B281A32	291B292A30	291B293A30	3000/5 CT ratio	

STYLE LISTINGS

20/20

CONVENTIONAL

Type.....
Size.....
Scale Length.....
Standard Specification.....
Accuracy Class.....

GA-332
2 1/2"
2.18"
ANSI C39.1
2%

GA-352
3 1/2"
2.82"
ANSI C39.1
2%

GA-372
4 1/2"
4.02"
ANSI C39.1
2%

GA-382
5 1/2"
4.95"
ANSI C39.1
2%

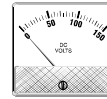
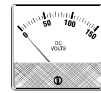
RA-351
Rectangular
3 1/2"
2.4"
ANSI C39.1
2%

NA-351
Round
3 1/2"
2.4"
ANSI C39.1
2%

RA-371
Rectangular
4 1/2"
3.2"
ANSI C39.1
2%

NA-371
Round
4 1/2"
3.2"
ANSI C39.1
2%

Notes











	Rating, Scale	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Ammeter for use with current transformer scale not listed in previous section 5 amp full scale 25-500 Hz	scaled to match current transformer	644B637A40	644B638A40	644B639A40		409C676A35	409C676A19	409C693A35	409C693A19	Specify current transformer ratings ¹
Ac Voltmeter self-contained 25-125 Hz	10 V 15 V 20 V 30 V 50 V	606B925A14 606B925A15 606B925A16 606B925A17 606B925A18	606B928A14 606B928A15 606B928A16 606B928A17 606B928A18	606B931A14 606B931A15 606B931A16 606B931A17 606B931A18	670B947A14 670B947A15 670B947A16 670B947A17 670B947A18	409C677A41 409C677A42 409C677A43 409C677A44 409C677A45	409C677A13 409C677A14 409C677A15 409C677A16 409C677A17	409C692A41 409C692A42 409C692A43 409C692A44 409C692A45	409C692A13 409C692A14 409C692A15 409C692A16 409C692A17	
	80 V 100 V 150 V 200 V 300 V	606B925A19 606B925A20 606B925A21 606B925A22 606B925A23	606B928A19 606B928A20 606B928A21 606B928A22 606B928A23	606B931A19 606B931A20 606B931A21 606B931A22 606B931A23	670B947A19 670B947A20 670B947A21 670B947A22 670B947A23	409C677A46 409C677A47 409C677A48 409C677A49 409C677A50	409C677A18 409C677A19 409C677A20 409C677A21 409C677A22	409C692A46 409C692A47 409C692A48 409C692A49 409C692A50	409C692A18 409C692A19 409C692A20 409C692A21 409C692A22	
	500 V 600 V	606B925A24 606B925A25	606B928A24 606B928A25	606B931A24 606B931A25	670B947A24 670B947A25	..... 409C677A56	..... 409C677A28	409C692A51 409C692A55	409C692A23 409C692A27	
Ac Voltmeter for use with potential transformers 25-100 Hz	300 V 600 V 3 kV 5 kV 6 kV	644B511A08 644B511A09 644B511A10 644B511A11 644B511A12	644B512A08 644B512A09 644B512A10 644B512A11 644B512A12	644B513A08 644B513A09 644B513A10 644B513A11 644B513A12	670B948A08 670B948A09 670B948A10 670B948A11 670B948A12	..... 186A329A21 186A329A22 186A329A23 186A329A25	..... 186A329A09 186A329A10 186A329A11 186A329A13	186A330A24 186A330A21 186A330A22 186A330A23 186A330A25	186A330A12 186A330A09 186A330A10 186A330A11 186A330A14	Transformer Ratio 2:1 4:1 20:1 35:1 40:1 Volts Rating 150 150 150 143 150
Ac Voltmeter scale not listed in section above 150 volts full scale	scaled to match potential transformer	644B511A13	644B512A13	644B513A13	670B948A13	186A329A24	186A329A12	186A330A26	186A330A13	For other than 150 volts full scale, consult factory. Specify "Similar to style number" shown, and give potential transformer type and rating, and scale desired.

STYLE LISTINGS

20/20

CONVENTIONAL

Type..... Size..... Scale Length..... Standard Specification..... Accuracy Class.....	20/20				CONVENTIONAL				Notes	
	GX-332 2 1/2" 2.18" ANSI C39.1 2%	GX-352 3 1/2" 2.82" ANSI C39.1 2%	GX-372 4 1/2" 4.02" ANSI C39.1 2%	GX-382 5 1/2" 4.95" ANSI C39.1 2%	RX-351 3 1/2" 2.4" ANSI C39.1 2%	NX-351 3 1/2" 2.4" ANSI C39.1 2%	RX-371 4 1/2" 3.2" ANSI C39.1 2%	NX-371 4 1/2" 3.2" ANSI C39.1 2%		
Rating, Scale	 Style No.	 Style No.	 Style No.	 Style No.	 Style No.	 Style No.	 Style No.	 Style No.	Transducer Size: 5 3/4"x3"x4 7/8"	
Motor Load Indicator Ac Ammeter Type 5 amp full scale 0-150% scale	Type A Type B	GX-332 606B923A31 606B923A30	GX-352 606B926A31 606B926A30	GA-372 606B929A31 606B929A30	GA-382 670B944A31 670B944A30	RA-351 291B280A33 291B280A28	NA-351 291B281A33 291B281A28	RA-371 291B292A37 291B292A28	NA-371 291B293A33 291B293A28	Legend "PERCENT MOTOR LOAD". Type A has red zone 100-150%. Type B has green zone 0-100%, yellow 100-125%, and red zone 125-150%. For use with variable ratio current transformer (doughnut type). Current transformers not included.
Current transformer primary equals motor full load amperes x 1.5.										
Motor Load Indicator Ac Wattmeter Type with VP2-840 transducer 120 volt, 5 amp 0-150% scale 17 B	1 ph, Type A 1 ph, Type B 3 ph, 3 w, Type A 3 ph, 3 w, Type B	GX-332 606B231A11 606B231A09 606B231A12 606B231A10	GX-352 606B232A11 606B232A09 606B232A12 606B232A10	GX-372 606B233A11 606B233A09 606B233A12 606B233A10	GX-382 606B234A11 606B234A09 606B234A12 606B234A10	RX-351 715B355A09 715B355A10 715B355A11 715B355A12	NX-351 715B355A25 715B355A26 715B355A27 715B355A28	RX-371 715B356A09 715B356A10 715B356A11 715B356A12	NX-371 715B356A25 715B356A26 715B356A27 715B356A28	For calibration in actual motor horsepower, specify current transformer ratio and watts or current and power factor at 5/4, 4/4, 3/4, and 1/2 load.
Single phase indicators are calibrated to 500 watts secondary full scale. Three phase indicators to 1,000 watts. Current transformer primaries are calculated to develop calibrated watts at 150% of motor full load. When single ratio current transformers are used the transducer must be calibrated to a specific full scale watts. Specify full scale watts input to transducer or specify current and potential transformer ratio along with full motor performance data. For 240 volts or for 480 volts, single phase wattmeters only, consult factory for price.										
Motor Load Indicator Ac In-Phase Current Type with VW2-841 transducer 120/240/480 volt 5 amp full scale	Type A Type B	GX-332 715B345A09 715B345A10	GX-352 715B346A09 715B346A10	GX-372 715B347A09 715B347A10	GX-382 715B348A09 715B348A10	SELF CONTAINED MODELS Type A Type B Special 0-160%		RC-371 291B331A23 291B331A24 291B331A22	NC-371 291B331A12 291B331A13 291B331A11	A single phase wattmeter may be used in a reversed lead connection through a doughnut transformer to measure three phase motor loads.
Motor Load Indicator Ac In-Phase Current Type Selfcontained 5 amp full scale 240/480 volts 0-150% full scale										
Calibrated for average motor performance. Current transformer primary equals motor full load amperes x 1.5. Power factor .86 at full load. For other values, see AD 43-300.										
Motor Load Indicator Dc Ammeter Type 50 mV full scale 0-150% scale	Type A Type B	GX-332 715B349A09 715B349A10	GX-352 715B350A09 715B350A10	GX-372 715B351A09 715B351A10	GX-382 715B352A09 715B352A10	RX-351 715B353A09 715B353A10	NX-351 715B353A25 715B353A26	RX-371 715B354A09 715B354A10	NX-371 715B354A25 715B354A26	
When available 50 mV shunt ratings do not match 150% of motor full load current within the desired accuracy limits, a 100 mV shunt with a series resistor should be used. Otherwise an intermediate rating millivoltmeter may be ordered. Consult factory for pricing.										
Resistance Thermometer RTD Type with VT2-841 transducer 120 volt, 60 Hz	0-100 degrees C 0-150 degrees C 0-200 degrees C	GX-352 715B320A09 715B320A10 715B320A11	GX-372 715B322A09 715B322A10 715B322A11	GX-382 715B324A09 715B324A10 715B324A11	RX-351 715B316A09 715B316A10 715B316A11	NX-351 715B316A25 715B316A26 715B316A27	RX-371 715B318A09 715B318A10 715B318A11	NX-371 715B318A25 715B318A26 715B318A27	For use with copper temperature detector coils, 10 ohms at 25 degrees C. (Not furnished.)

STYLE LISTINGS

20/20

CONVENTIONAL

Type.....
Size.....
Scale Length.....
Standard Specification.....
Accuracy Class.....

GX-352
3 1/2"
2.82"
ANSI C39.1
2%

GX-372
4 1/2"
4.02"
ANSI C39.1
2%

GX-382
5 1/2"
4.95"
ANSI C39.1
2%

RX-351
3 1/2"
2.4"
ANSI C39.1
2%

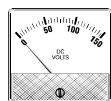
NX-351
3 1/2"
2.4"
ANSI C39.1
2%

RX-371
4 1/2"
3.2"
ANSI C39.1
2%

NX-371
4 1/2"
3.2"
ANSI C39.1
2%




Notes

Transducer Size:
5 3/4"x3"x4 7/8"







	Rating, Scale	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	Style No.	
Ac Wattmeter with VP2-840 transducer 5 amp, 120 volt	1 ph, 60 Hz	714B457A09	714B458A09	714B459A09	606B223A09	606B223A23	606B224A09	606B224A23	Listed styles will have preferred scales listed on page 24-28. For any other rating between 0.5 and 10 amperes, order similar to these styles.
	3 ph, 3 w, 60 Hz	714B457A21	714B458A21	714B459A21	606B223A13	606B223A27	606B224A13	606B224A27	
	3 ph, 4 w, 60 Hz	714B457A33	714B458A33	714B459A33	606B223A17	606B223A31	606B224A17	606B224A31	For 240 volts, consult factory.
	1 ph, 400 Hz	714B457A10	714B458A10	714B459A10	606B223A10	606B223A24	606B224A10	606B224A24	
	3 ph, 3 w, 400 Hz	714B457A22	714B458A22	714B459A22	606B223A14	606B223A28	606B224A14	606B224A28	For 480 volts, single phase wattmeters only, consult factory.
	3 ph, 4 w, 400 Hz	714B457A34	714B458A34	714B459A34	606B223A18	606B223A32	606B224A18	606B224A32	
Specify scale range, P.T. ratio, and C.T. ratio									
Ac Varmeter with VV2-840 transducer 5 amp, 120 volt	1 ph, 60 Hz	714B457A14	714B458A14	714B459A14	606B223A11	606B223A25	606B224A11	606B224A25	For 480 volts, single phase wattmeters only, consult factory.
	3 ph, 3 w, 60 Hz	714B457A26	714B458A26	714B459A26	606B223A15	606B223A29	606B224A15	606B224A29	
	3 ph, 4 w, 60 Hz	714B457A37	714B458A37	714B459A37	606B223A19	606B223A33	606B224A19	606B224A33	Specify C.T. and P.T. connections and ratios as well as scale marking.
	1 ph, 400 Hz	714B457A15	714B458A15	714B459A15	606B223A12	606B223A26	606B224A12	606B224A26	
	3 ph, 3 w, 400 Hz	714B457A27	714B458A27	714B459A27	606B223A16	606B223A30	606B224A16	606B224A30	Specify C.T. and P.T. connections and ratios as well as scale marking.
	3 ph, 4 w, 400 Hz	714B457A38	714B458A38	714B459A38	606B223A20	606B223A34	606B224A20	606B224A34	
Specify scale range, P.T. ratio, and C.T. ratio									
Frequency Meter with VC2-841 transducer 120 volt	55-65 Hz	671B896A11	671B899A11	671B901A11	671B253A11	671B253A27	671B255A11	671B255A27	Accuracy + or - 2% of span. For 240 volts, consult factory.
	50-70 Hz	671B896A12	671B899A12	671B901A12	671B253A12	671B253A28	671B255A12	671B255A28	
	45-55 Hz	671B896A13	671B899A13	671B901A13	671B253A13	671B253A29	671B255A13	671B255A29	Accuracy 3% from 1 to 2 amperes. 2% from 2 to 5 amperes. For 240 volt or 3 phase 208 volt, consult factory.
	45-65 Hz	671B896A15	671B899A15	671B901A15	671B253A15	671B253A31	671B255A15	671B255A31	
	350-450 Hz	671B896A18	671B899A18	671B901A18	671B253A18	671B253A34	671B255A18	671B255A34	
Power Factor Meter with VF2-841 transducer 50-100-50%	1 ph, 120 volt	691B642A09	691B643A09	691B644A09	714B508A09	714B508A25	714B509A09	714B509A25	Accuracy 3% from 1 to 2 amperes. 2% from 2 to 5 amperes. For 240 volt or 3 phase 208 volt, consult factory.
	3 ph, 3 w, 120 volt	691B642A11	691B643A11	691B644A11	714B508A11	714B508A27	714B509A11	714B509A27	
	3 ph, 4 w (120/208Y)	691B642A13	691B643A13	691B644A13	714B508A13	714B508A29	714B509A13	714B509A29	

STYLE LISTINGS CONVENTIONAL

	Type..... Size..... Scale Arc..... Standard Specification Accuracy Class	RT-351 Rectangular 3 1/2" 2.4" ANSI C39.1 2%	NT-351 Round 3 1/2" 2.4" ANSI C39.1 2%	RT-371 Rectangular 4 1/2" 3.2" ANSI C39.1 2%	NT-371 Round 4 1/2" 3.2" ANSI C39.1 2%	Notes
						
	Rating, Scale	Style No.	Style No.	Style No.	Style No.	
Ammeter Radio Frequency Type, self- contained	1 A	409C549A09	409C549A43	409C572A08	409C572A43	
	1.5 A	409C549A10	409C549A44	409C572A09	409C572A44	
	2 A	409C549A11	409C549A45	409C572A10	409C572A45	
	3 A	409C549A12	409C549A46	409C572A11	409C572A46	
	5 A	409C549A13	409C549A47	409C572A12	409C572A47	
square law scale	8 A	409C549A14	409C549A48	409C572A13	409C572A48	
	10 A	409C549A15	409C549A49	409C572A14	409C572A49	
	15 A	409C549A16	409C549A50	409C572A15	409C572A50	
	20 A	409C549A17	409C549A51	409C572A16	409C572A51	
Ammeter Radio Frequency Type, self- contained	1 A	409C549A21	409C549A55	409C572A21	409C572A55	
	1.5 A	409C549A22	409C549A56	409C572A22	409C572A56	
	2 A	409C549A23	409C549A57	409C572A23	409C572A57	
	3 A	409C549A24	409C549A58	409C572A24	409C572A58	
	5 A	409C549A25	409C549A59	409C572A25	409C572A59	
linear expanded scale	8 A	409C549A26	409C549A60	409C572A26	409C572A60	
	10 A	409C549A27	409C549A61	409C572A27	409C572A61	
	15 A	409C549A28	409C549A62	409C572A28	409C572A62	
	20 A	409C549A29	409C549A63	409C572A29	409C572A63	
*	scale to suit thermo- couple	409C549A38	409C549A39	409C572A38	409C572A39	Order thermocouple from section below
		* Ammeter Radio Frequency Type for use with external thermocouple square law scale				





Price includes ammeter and one pair of style number 1337 832 five-foot leads. Instrument and thermocouple must be calibrated as a unit to insure accuracy within + or - 2% of full scale dial marking.

	Type..... Size..... Scale Arc..... Standard Specification Accuracy Class	RT-351 Rectangular 3 1/2" 2.4" ANSI C39.1 2%	NT-351 Round 3 1/2" 2.4" ANSI C39.1 2%	RT-371 Rectangular 4 1/2" 3.2" ANSI C39.1 2%	NT-371 Round 4 1/2" 3.2" ANSI C39.1 2%	Notes
						
	Rating, Scale	Style No.	Style No.	Style No.	Style No.	
**	scale to suit thermo- couple	409C549A33	409C549A34	409C572A33	409C572A34	Order thermocouple from section below
		** Ammeter Radio Frequency Type or use with external thermocouple Linear expanded scale				

Price includes ammeter and one pair of style number 1337 832 five-foot leads. Instrument and thermocouple must be calibrated as a unit to insure accuracy within + or - 2% of full scale dial marking.


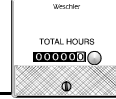

External Thermocouple	Rating	Style No.		Rating	Style No.	
		1 A	1.5 A		10 A	15 A
Air Type for Radio	1 A	878 638		10 A	878 647	
Frequency	1.5 A	878 639		15 A	878 648	
Ammeter	2 A	878 640		20 A	878 649	
	3 A	878 642		25 A	878 650	
	5 A	878 644		30 A	878 651	
	8 A	878 646		50 A	878 654	

CONVENTIONAL

	Type..... Size..... Scale Arc..... Standard Specification Accuracy Class	RT-351 Rectangular 3 1/2" 2.4" ANSI C39.1 2%	NT-351 Round 3 1/2" 2.4" ANSI C39.1 2%	RT-371 Rectangular 4 1/2" 3.2" ANSI C39.1 2%	NT-371 Round 4 1/2" 3.2" ANSI C39.1 2%	Notes
						
	Rating, Scale	Style No.	Style No.	Style No.	Style No.	
Milliammete Radio Frequency Type	10 mA	409C550A09	409C550A37	409C571A08	409C571A37	
	20 mA	409C550A10	409C550A38	409C571A09	409C571A38	
	50 mA	409C550A11	409C550A39	409C571A10	409C571A39	
	100 mA	409C550A12	409C550A40	409C571A11	409C571A40	
	150 mA	409C550A13	409C550A41	409C571A12	409C571A41	
square law scale	200 mA	409C550A14	409C550A42	409C571A13	409C571A42	
	300 mA	409C550A15	409C550A43	409C571A14	409C571A43	
	500 mA	409C550A16	409C550A44	409C571A15	409C571A44	
	800 mA	409C550A17	409C550A45	409C571A16	409C571A45	
Milliammete Radio Frequency Type	10 mA	409C550A23	409C550A51	409C571A23	409C571A51	
	20 mA	409C550A24	409C550A52	409C571A24	409C571A52	
	50 mA	409C550A25	409C550A53	409C571A25	409C571A53	
	100 mA	409C550A26	409C550A54	409C571A26	409C571A54	
	150 mA	409C550A27	409C550A55	409C571A27	409C571A55	
linear expanded scale	200 mA	409C550A28	409C550A56	409C571A28	409C571A56	
	300 mA	409C550A29	409C550A57	409C571A29	409C571A57	
	500 mA	409C550A30	409C550A58	409C571A30	409C571A58	
	800 mA	409C550A31	409C550A59	409C571A31	409C571A59	

STYLE LISTINGS

ELAPSED TIME

Elapsed Time	Type..... Size.....	GH-332 2 1/2"	GH-352 3 1/2"	BH-351 3 1/2"	Notes:
					
Description	Rating	Style No.	Style No.	Style No.	
Total Hours Non-Reset Type	120 volts, 60 Hz 240 volts, 60 Hz*	671B375A09 671B375A10	671B376A09 671B376A10	291B474A09 291B474A10	Type BH-351 may be mounted in front or rear of panel without special fittings. For rear-of-panel mounting type, order listed style number "with rear-of-panel" mounting. Weschler will ship a standard listed style and will provide the bezel if required described as: For Type GH-332: Bezel Style No. 292B767G04 For Type GH-352: Bezel Style No. 292B767G02
0-99,999.9 Hours	480 volts, 60 Hz 120 volts, 50 Hz	671B375A11 671B375A12	671B376A11 671B376A12	291B474A11 291B474A12 291B474A10	
Total Minutes Non-Reset Type 0-99,999.9 Minutes	120 volts, 60 Hz 240 volts, 60 Hz*	671B375A13 671B375A14	671B376A13 671B376A14	291B927A09	
Total Hours Reset Type 0-9,999.9	120 volts, 60 Hz 240 volts, 60 Hz*	671B375A25 671B375A26	671B376A25 671B376A26	291B474A17 291B474A19	
HoursTotal Minutes Reset Type 0-9,999.9 Minutes	480 volts, 60 Hz 120 volts, 50 Hz 120 volts, 60 Hz 240 volts, 60Hz*	671B375A27 671B375A28 671B375A29 671B375A30	671B376A27 671B376A28 671B376A29 671B376A30	291B474A20 291B474A18 291B927A21	

* 240 volt units may be operated at 208 volts.

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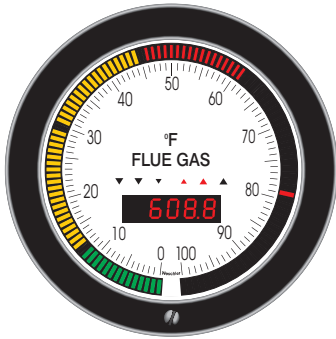
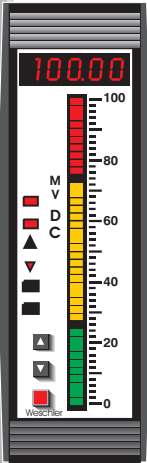


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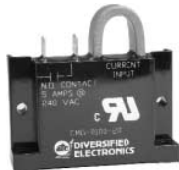
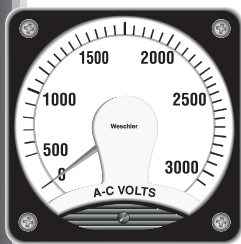
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