

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.

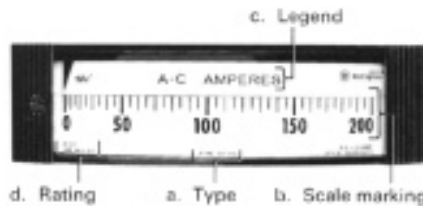
Example No. 1



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.

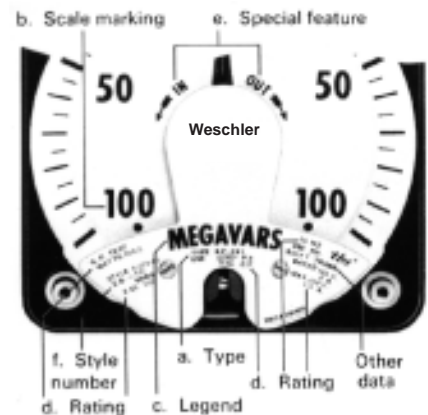
Example No. 3



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.



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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.