

Westinghouse



Type 45 Circular Chart Recording Instruments

For Load and Voltage Survey
Switchboard or Portable

Application

Type 45 circular chart recorder is a rugged, accurate, low-cost instrument for making a permanent record of ac current or voltage.

The switchboard type matches other Westinghouse switchboard components in appearance. It can be flush or projection mounted. The enclosure is weather proof.

For portable use, the recorder is housed in a hammertone gray enameled weatherproof case with rubber feet and a carrying handle. Retractable brackets, with keyhole and horizontal slots, are located on the top and bottom to permit hanging and leveling from screws in a wall or line pole.

Standards

The Type 45 recorder complies with requirements of ASA Standard C 39.2 for recording instruments. Accuracy is 2%, with 1% optional.

Mechanism

The electrical measuring element is a high-torque (suppressed-zero on the voltmeter) attraction-iron movement. The moving element is mounted on ball bearings for permanent, friction-free operation and ruggedness. A torque limiter prevents pen damage from sudden overloads.

The mechanism is self-shielded with adjustable magnetic damping. Standard response time is 1.5 seconds. A pneumatic damping device is available for extreme conditions.

Electric Chart Drive

The standard drive uses a 120 volt, 60 cycle synchronous motor, with a 24-hour or 7-day chart speed utilizing the standard gears furnished. Special gears can be provided for 3-day chart speed. Special motors are available for 240 or 480 volts, 60 cycles; 120 volts, 50 cycles; or 120/240 volts, 60 cycles.

On portable dual-range recorders with 2:1 ratio, the motor voltage is switched by the range changing switch. On other than the 2:1 ratio, the motor leads are brought out to separate terminals for 120 volts only.

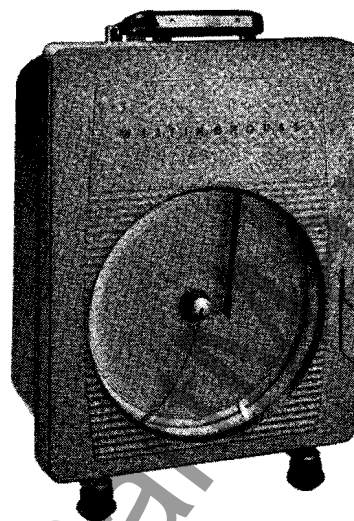
Hand-wound Clock Drive

An optional 8-day spring-driven clock may be substituted for the electric drive. 24-hour or 7-day rotation is selected with a shift lever.

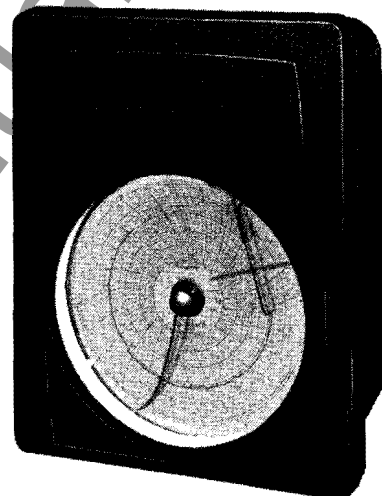
Carry-Over Clock Drive

A second option combines a synchronous motor drive with a self-winding, spring-driven clock in parallel, so that the recorder will continue to rotate during a power outage. Upon restoration of power, the clock spring will accumulate reserve at the rate of one hour of reserve for each two hours of operation. Speeds are the same as for the

Weatherproof Portable Type
(V-Pen Inking)



Switchboard Mounting Type
(Sealed Inking)



synchronous motor types, as are the voltage options.

Inking Systems Sealed Inking

On switchboard recorders, the sealed inking system is generally preferred. It consists of a sealed plastic ink sac with a flexible tube feeding ink to the pen. The ink supply is normally sufficient for one year of service. For use below +40°F, the recorder must be equipped with a heater and a thermostat and special low temperature ink must be used.

The sealed inking system is also preferred on portable recorders, except where the recorder is to be stored or transported at temperatures below 32°F.

V-Pen Inking

The pen is a V-shaped channel which holds enough ink to produce several chart records. Recommended practice is to re-ink with a dropper whenever charts are changed.

If portable recorders are to be transported or stored at temperatures below +32°F, the V-pen system with special low temperature ink may be used without auxiliary heating. The V-pen is also available on switchboard mounted recorders using normal temperature ink for the +32°F to 120°F range.

Charts

Charts are 7 inches in diameter with an effective scale length of $2\frac{3}{16}$ inches. They

are held in place by an arbor nut attached to the chart drive. A pen lifter facilitates chart removal. An optional one revolution cut-off prevents chart retracing.

Ratings

Ac Ammeters: 2.5, 5, 10, 20 or triple range 2.5/5/10 and 5/10/20. A switch is used for range changing.

Ac Voltmeters: Suppressed zero 90-140, 180-280, 360-560, and 450-700 volts. Certain combinations of these ranges are built as double-range instruments. A toggle switch is used for range changing.

Accessories

Illumination by means of a 4-watt fluorescent lamp for units with 120 volt or hand-wound clocks.

Key lock for cover latch.

Conversion kits to modernize older recorders.

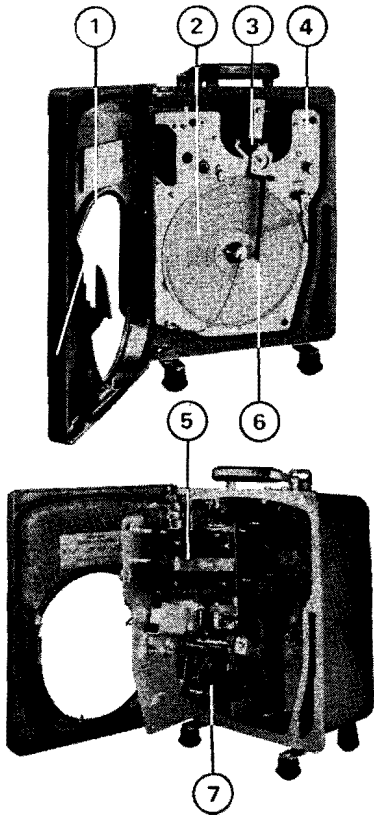
Recommended Combinations

For best overall performance, Type 45 recorders should be ordered with the combination of ink, pen and heaters listed for the temperatures to be experienced.

In the case of switchboard types, the temperature is that of the room in which the recorder is to be used. For portable types, the temperature is that at which the recorder will be transported or stored, unless it is given several hours to warm up to room temperature before use.

Type 45 Circular Chart
Recording Instruments

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- ① Latch With Optional Key Lock

② 7" Chart

③ Ball Bearing Mechanism

④ Swinging Panel For Access To Mechanism

⑤ Measuring Element

⑥ Inking System (V-Pen or Sealed)
- ⑦ Clock Mechanism (Electric, Spring Wound, or Carryover)

Further Information

List Price: PL 43-400
Charts: 43-400 A WE A Application Data
Construction: IL 43-450
Instructions:
Recorder - IL 43-450
Cut-off Device - IL 43-450.1
V-Pen Conversion - IL 43-450.2
Accessories, Supplies: PL 43-400
Transformers:
Switchboard - PL 44-020

Power Consumption

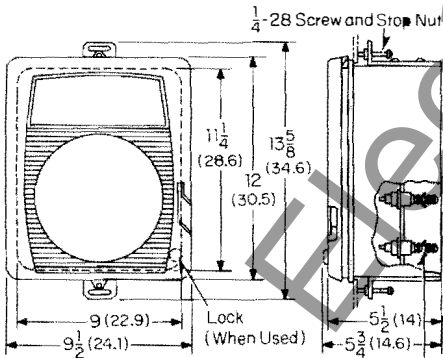
Type or Description	At Rating	Watts	Vars	Volt-Amperes	Percent Power Factor
Ammeter, 0-5 amps Voltmeter, 90-140 volts	5 amps	.9	4	4.1	22
	120 volts	10.3	3.1	10.7	96
Chart Drive Motor Heater	120 volts	4.0	5.7	7.0	57
	120 volts	15.0

Recommended Combinations

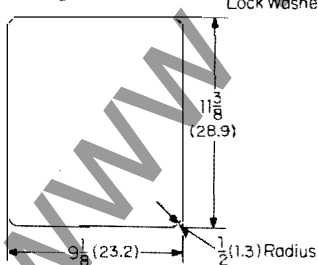
Recorder Type	Temperature Range	Inking System	Ink Type	Auxiliary Heater
Switchboard	+30°F to +90°F	sealed V-pen	normal temperature normal temperature	no no
	-40°F to +30°F and +90°F to +120°F	sealed V-pen	extreme temperature extreme temperature	yes no
Portable	+30°F to +90°F	sealed V-pen	normal temperature normal temperature	no no
	-40°F to +30°F and +90°F to +120°F	sealed V-pen	not recommended extreme temperature	... no

Outline Dimensions and Drilling Plan in Inches (Centimeters)

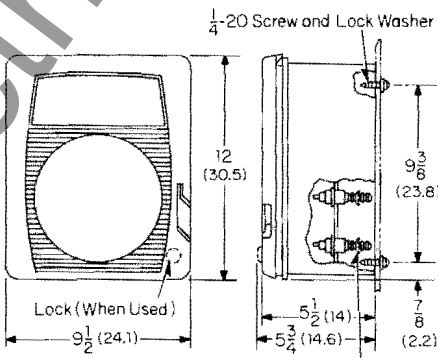
Switchboard Flush Mounting



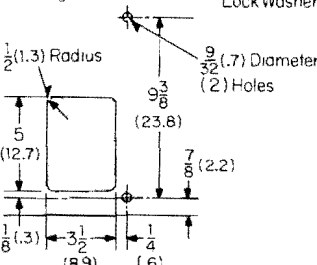
Drilling Plan



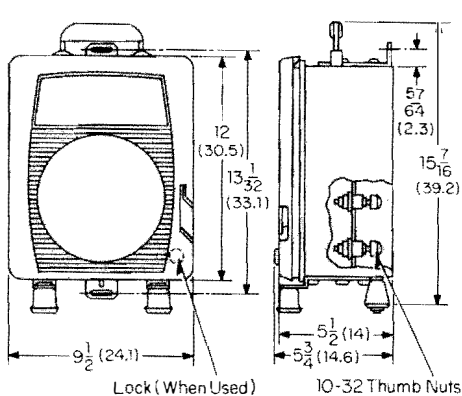
Switchboard Projection Mounting



Drilling Plan



Portable and Pole Mounting



Net Weight 14 Pounds (6.4 Kg)
Shipping Weight 25 Pounds (11.4 Kg)