



switchboard watthour meters with Flexitest[®] case

descriptive
bulletin

42-200

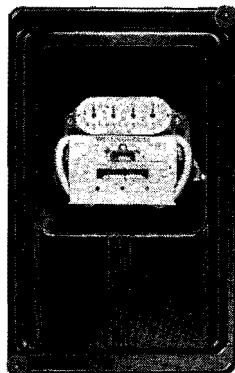
for use with instrument transformers

page 1

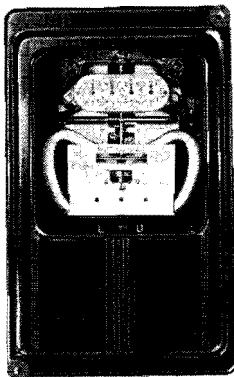
single phase

polyphase

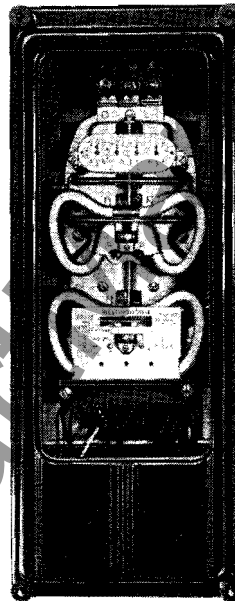
one element



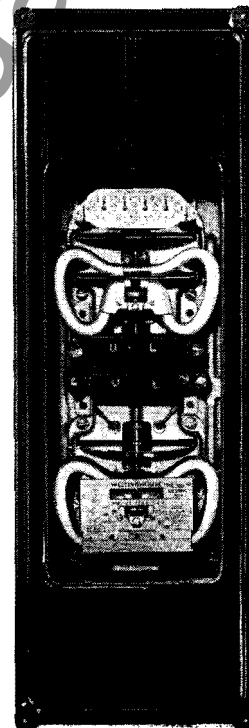
two element



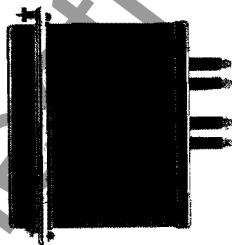
three element



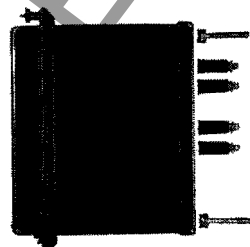
four element



semi-flush: series CB-F



projection: series CB-FP



application

Series CB-F and CB-FP switchboard meters combine a standard induction disc watthour meter with a dust-tight, all-steel welded Flexitest relay case. They are available for use with instrument transformers for any single or polyphase service and rating. These meters meet all industry standards adopted by the National Meter Committee of EEI-AEIC-NEMA. They are factory calibrated and fully compensated for Class I and II temperature errors, single phase loads up to 400% rating, and polyphase loads to 300% rating. They can be supplied with kw demand register, demand contacts for remote totalizing, and phase-shifting transformers for reactive metering, or as thermal kw, kva or ampere demand watthour meters.

■ trademark

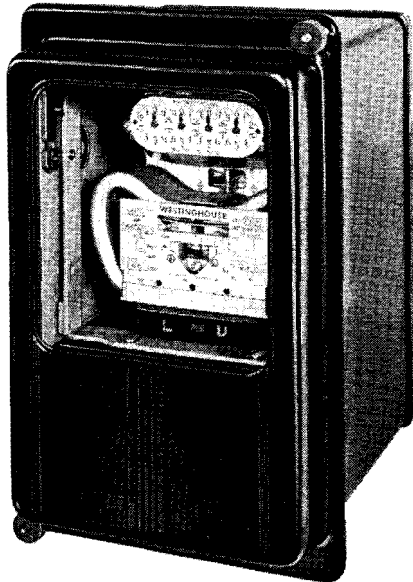
April, 1954

supersedes catalog section 42-104, pages 1-16, dated September 25, 1951
mailed to: E-43-5B; D65-5B; C29-5F,G,H,Z,J,K,L,M



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design features



The Flexitest case assembly consists of a watt-hour meter framed in a detachable unit chassis, test switch assembly and the case itself.

case Welded sheet steel, form-stamped and bonderized, painted and oven-baked with the highest quality non-chip black paint. All mounting hardware is completely concealed from view. Circuit connections are made to insulated terminals at back of case.

watt-hour meter Essentially a CS or CA meter element with many of the same standard parts and all of these same proven features:

- bayonet-mounted register with gold-plated precision-milled gears

- surge-protected permanent magnet

- ball-and-jewel lower bearing

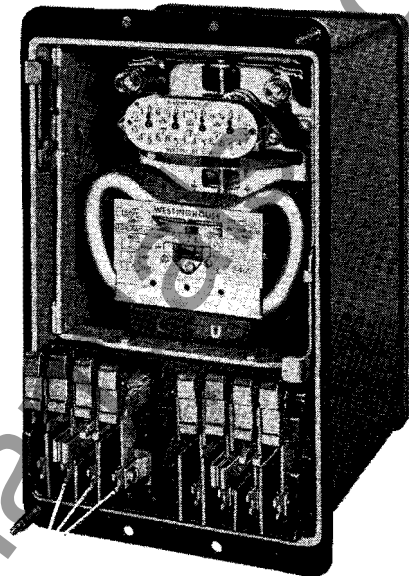
- bonderized electromagnet with one-piece laminations

test switch assembly Provides for up to 10 high-capacity, self-aligning knife blade test switches. Each blade is anchored to a hinged jaw mounted on a molded base. Stationary contact jaws are made of a special tempered copper to maintain high contact pressure. Four element meters for totalizing two circuits have a separate test switch assembly for each circuit. (see diagrams on page 5).

watt-hour
meter
element

test
switch
assembly

test lugs for
clip-on leads



Cover is easily removed by loosening captive thumbnuts. All meter adjustments (shown below) are accessible from the front. Insulating barriers prevent accidental contact when opening knife switches.

light-load
adjustment

potential in-
dicating lamps

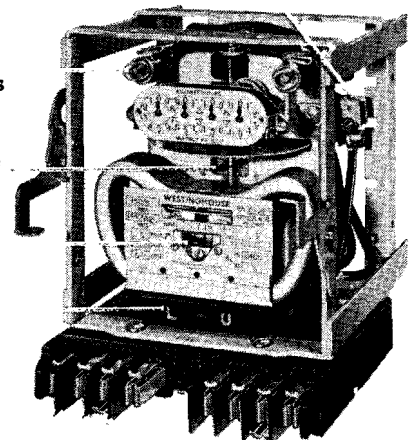
phase-balance
adjustment

full-load
adjustment

power-factor
adjustment

insulating
barriers

molded block



Watt-hour meter in its welded strip steel framework chassis is removable as a unit without interrupting service in any way. Cam-action latches hold meter in place and double as handles for removing meter.

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for use with instrument transformers

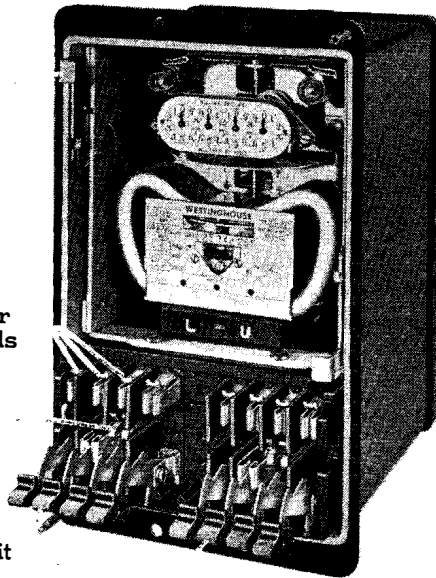
page 3

cam-action
latch

test lugs for
clip-on leads

current
test jacks

short-circuit
switches



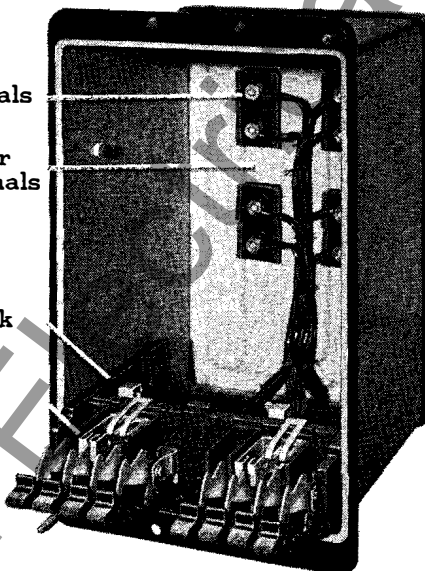
Knife blade test switches in each lead provide maximum test flexibility. When switch in load-side current lead is opened, test jack preserves service continuity. Line-side switch shorts across when opened.

base terminals

provision for
extra terminals

molded block

insulating
barriers

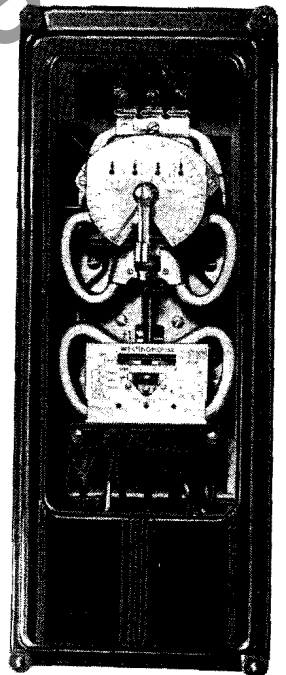


Case remains in place with all wiring intact. Insulated terminals float in place to allow easy alignment with holes drilled in switchboard. Extra terminals can be added for contact devices.

demand meters

indicating kw demand meters

Switchboard watthour meters can be supplied with RW and RW-2 indicating kw demand registers. See descriptive bulletin 42-300 for full information; refer to price list 42-020 for style numbers, prices.



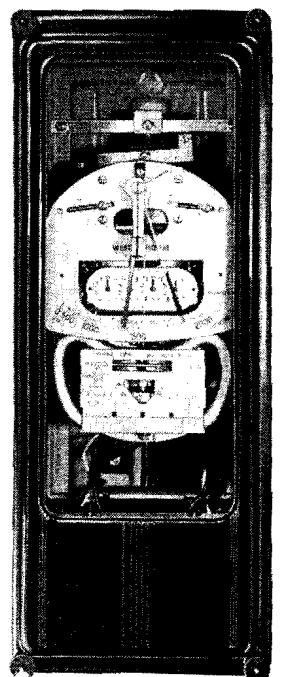
type CB-3FW

thermal demand watthour meters

Thermal demand watthour meters can be supplied in Flexitest cases:

demand service	meter series
kw	CBH-F
kva	KCB-F
ampere	QCB-F

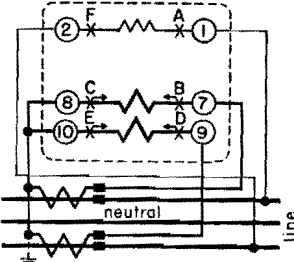
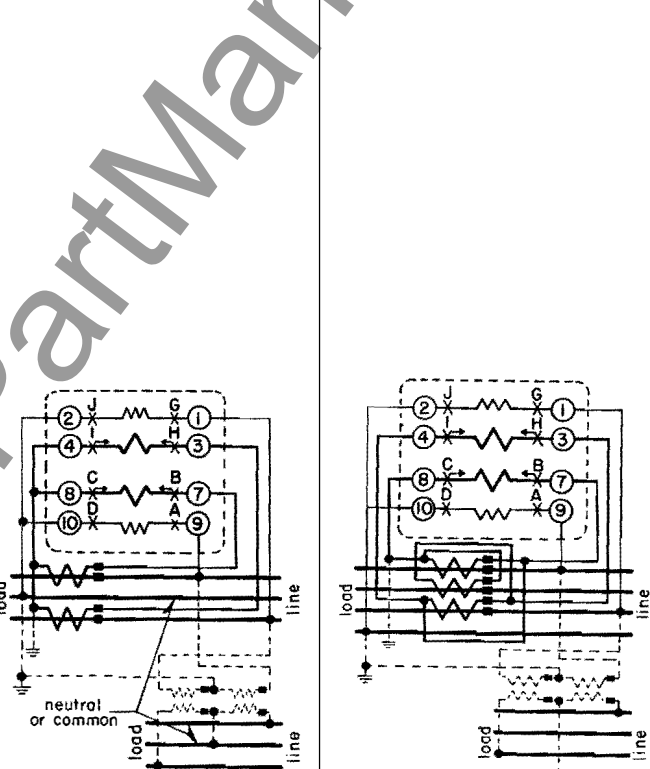
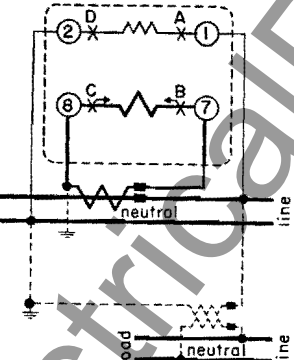
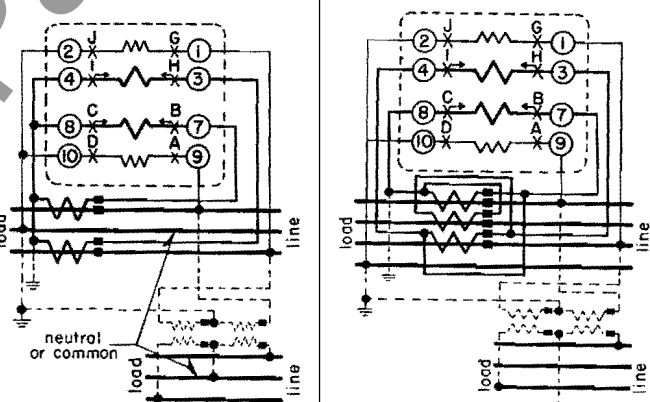

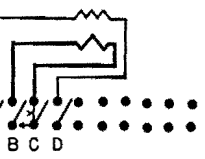
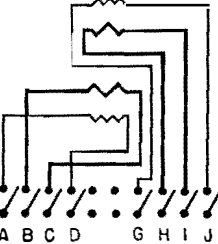
See descriptive bulletin 42-350 for more information. Refer to nearest Westinghouse sales office for types and ratings available.



type QCB-3F



selector guide: circuit diagrams

meter type:	CB-F	CB-2F
no. of elements	1-element	2-element
service	1 phase, 3 wire 1 phase, 2 wire	1,2,3 phase, 3 wire and network 3 phase, 4 wire Y
wiring diagrams (rear view)	<p data-bbox="461 646 542 674">3 wire</p> 	
connections for potential transformers (when used)	<p data-bbox="461 1010 542 1037">2 wire</p> 	
test switch locations (front view)	<p data-bbox="461 1499 542 1526">3 wire</p>  <p data-bbox="461 1766 542 1793">2 wire</p> 	

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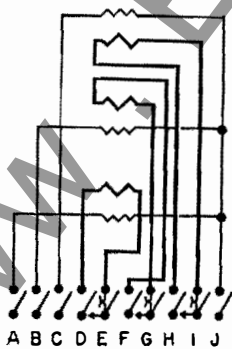
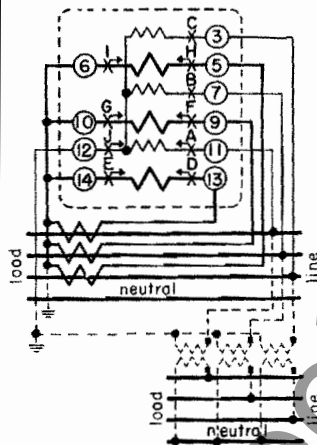
for use with instrument transformers

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CB-3F

3-element

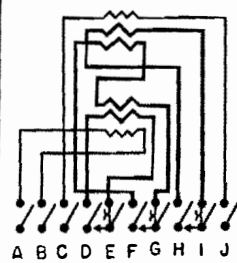
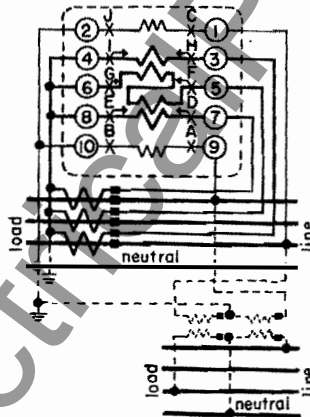
3 phase, 4 wire Y



CB-8F

2½-element

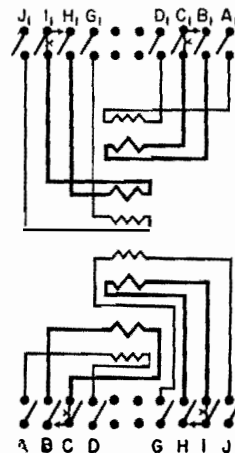
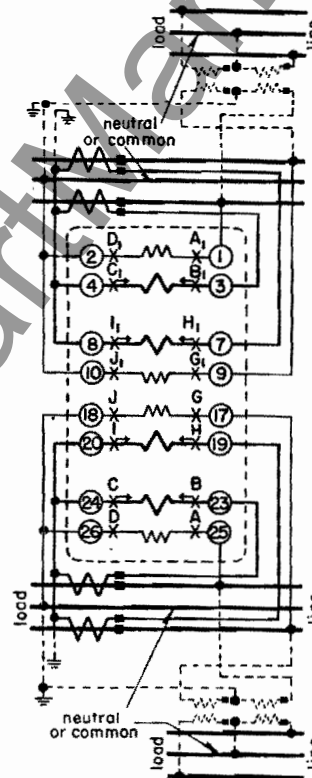
3 phase, 4 wire Y



CB-32F

4-element
(two 2-element meters)

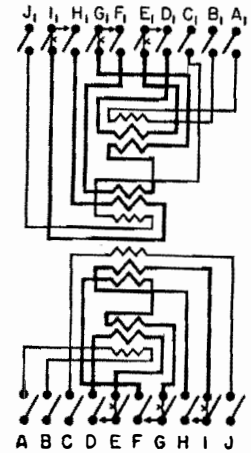
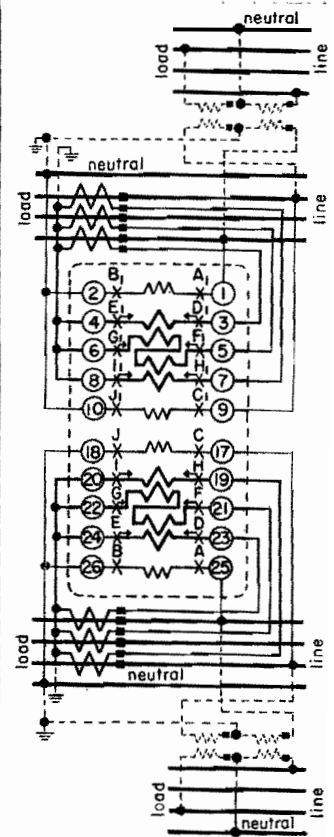
totalizing:
3 phase, 3 wire



CB-38F

4-element
(two 2½-element meters)

totalizing:
3 phase, 4 wire Y



**ratings**

for style numbers, list prices and ordering information: refer to price list 42-020.

frequency All meters are for 60 cycles. Meters for 25 or 50 cycles can be supplied on request.

kw rating Meters can be supplied *secondary-rated*, according to meter capacity without instrument transformers, or *primary rated* if transformer ratios are specified on order.

mounting All meters can be supplied for either semi-flush or projection mounting. Projection case meters (-FP) come supplied with hardware for thick or thin panels up to 1½ in. Hardware for thicker panels can be supplied on request.

standard projection case Meters can be supplied in standard projection cases with all-glass covers for match-up purposes.

meter		rating		
type	service	volts	amp	kw □
CB-F	1-element	120	5.0	0.6
	1-phase, 2 wire	240	5.0	1.2
	1-element 1 phase, 3 wire	240	5.0	1.2
CB-2F	2-element	120	2.5	0.6
	1,2,3 phase, 3 wire		5.0	1.2
	and network			
	3 phase, 4 wire Y	240	2.5	1.2
CB-3F			5.0	2.4
		480	2.5	2.4
			5.0	4.8
CB-3F	3-element	120	2.5	0.9
	3 phase, 4 wire Y		5.0	1.8
CB-8F	2½-element	120	2.5	0.9
	3 phase, 4 wire Y		5.0	1.8
CB-32F	4-element	120	2.5	1.2
	totalizing two		5.0	2.4
	3 phase, 3 wire			
	circuits	240	2.5	2.4
CB-38F			5.0	4.8
		480	2.5	4.8
			5.0	9.6
CB-38F	4-element	120	2.5	1.8
	totalizing two		5.0	3.6
CB-38F	3 phase, 4 wire Y			
	circuits			

□ secondary rating: without instrument transformers

accessories

potential indicating lamps: Standard with all polyphase transformer-type meters.

meter accessories

refer to price list 42-020 for style numbers, prices

contact devices: For operating remote impulse totalizing equipment. Can be supplied with all meters except those with RW or RW-2 demand registers.

note: CB-3FW meters with demand contacts or for use with phase-shifting transformers are supplied with the 20-switch case used for four-element meters.

phase-shifting transformers: Can be supplied with all meters for registering reactive volt-ampere hours.

ratchets: To prevent reverse rotation. Can be supplied separately for field installation or mounted on new meters.

cyclometer registers and five-dial clock-type registers: Available on all switchboard meters.

register bracket: Available for mounting register close to cover glass for easy visibility when meter is mounted near floor level.

Flexitest case accessories

refer to *Protective Relay price list 41-020* for style numbers, prices

ten-circuit test plug: Fits directly into stationary contact jaws of meter chassis for easy testing. Each knife blade connects to a binding post.

ammeter test plug: For inserting in current test jacks of test switch assembly without removing meter.

blank identification cards: For inserting in recessed slots on back of each knife-blade switch handle.

switchboard watthour meters

with Flexitest case

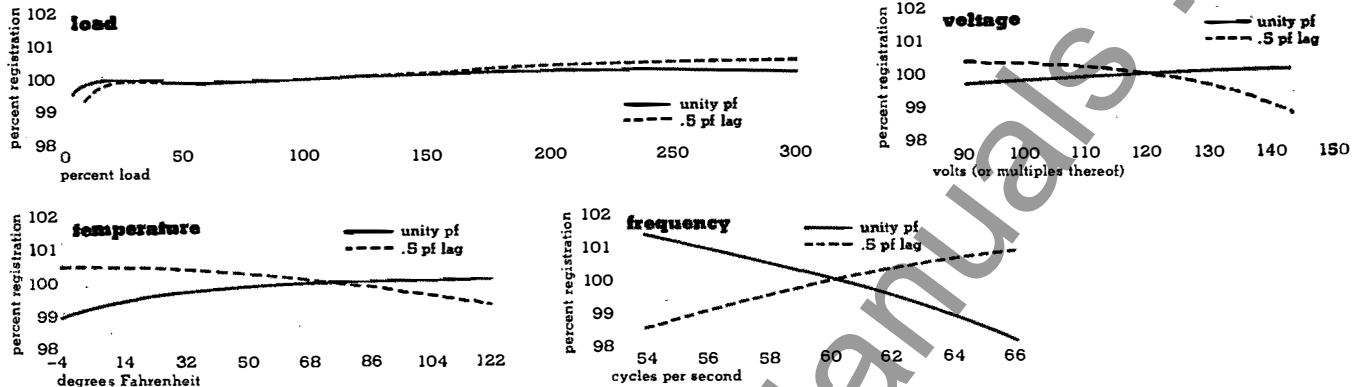
for use with instrument transformers

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performance data polyphase meters*



general data

for 5-amp, 120-volt, 60-cycle meters
with 2-wire current coils

		single phase	polyphase (with potential indicating lamps)		
			2-element	3-element	4-element
starting watts		1.5	3.0	4.5	6.0
rpm at meter rating		30	30	30	30
watthour constant (Kh)		1/3	2/3	1	4/3
voltage-coil circuit	volt-amperes	10.0	8.3	8.3	8.3
	watts loss, per element	1.5	1.7	1.7	1.7
	power factor	0.15	0.21	0.21	0.21
current-coil circuit	volt-amperes	0.32	0.29	0.29	0.29
	watts loss, per element	0.18	0.16	0.16	0.16
	power factor	0.56	0.55	0.55	0.55
adjustment range	full-load	80 to 120%	80 to 120%	80 to 120%	80 to 120%
	light-load	90 to 110%	85 to 120%	85 to 120%	85 to 120%

shipping weights and dimensions for reference only

type of meter	no. in box	domestic		export (ocean)			case dimensions, in.		
		weight, lb		weight, lb			length	width	height
		net	gross	net	legal	gross			
one-element: type CB-F	1	10	15	10	15	30	16	11	14
two-element: types CB-2F, CB-8F	1	13½	19	13½	19	34	16	11	14
three-element: type CB-3F	1	20	29	20	29	48	24	14	15
four-element: types CB-32F, CB-38F	1	28	35	28	35	57	28	14	15

* for single-phase meter curves, see descriptive bulletin 42-100



dimensions

for reference only

case dimensions

front view

side view

panel cut-out dimensions

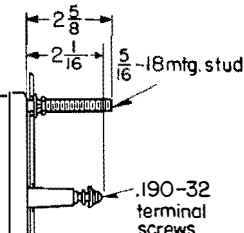
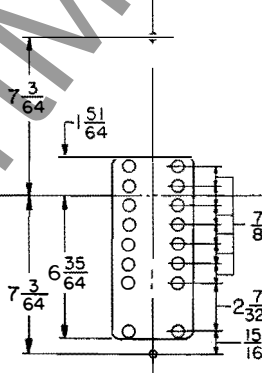
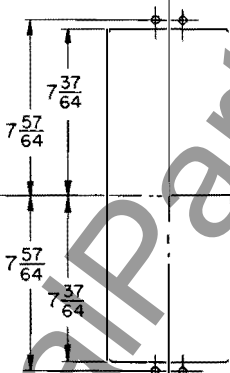
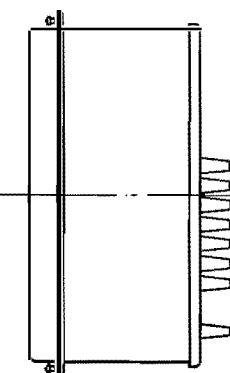
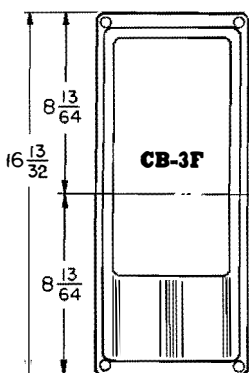
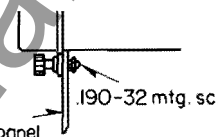
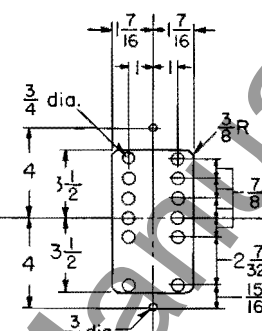
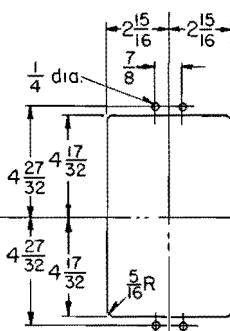
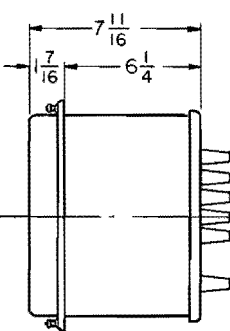
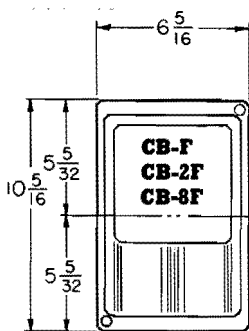
semi-flush*

projection†

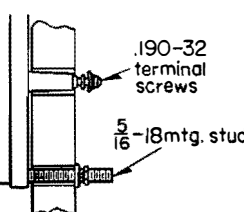
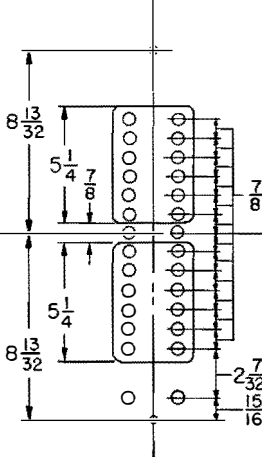
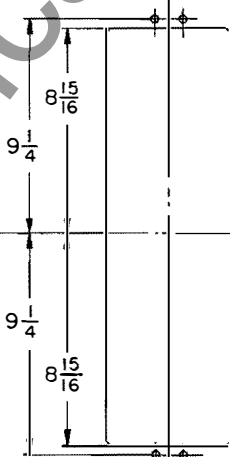
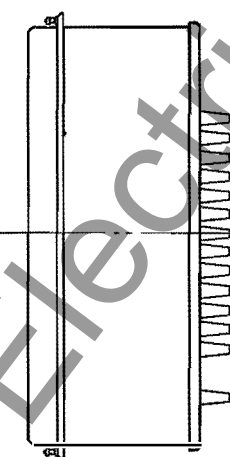
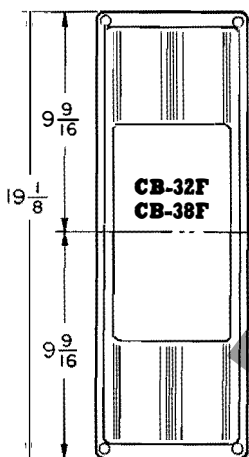
mounting hardware

for semi-flush mounting

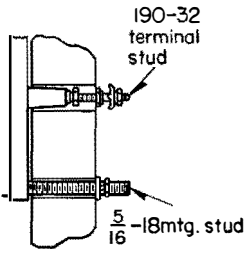
for projection mounting



thin panel



thick panel (up to 1 1/2 in.)



extra thick panel (over 1 1/2 in.)

* Cut out panel. Drill 4 holes for mounting screws.

† Drill 2 holes for mounting studs. Thin panels—cut out panel. Thick panels—drill terminal holes as needed.

further information

prices, style numbers, ordering information
kw demand registers
thermal demand watthour meters
meter accessories
instructions
renewal parts

price list 42-020
descriptive bulletin 42-300
descriptive bulletin 42-350
descriptive bulletin 42-900
instruction leaflet 42-104.3
renewal parts data 42-104.1

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