



# watthour meters

## single phase • polyphase

volts: 120, 240, 480  
amps: 2.5, 5, 15, 50

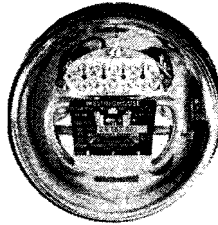
descriptive  
bulletin

42-100

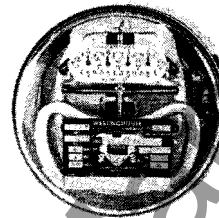
page 1

socket  
type:  
series CS

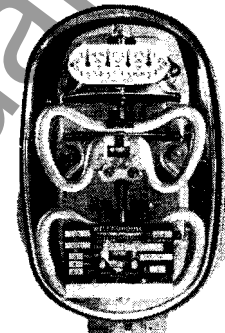
single phase:  
single element



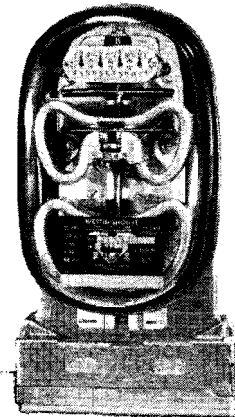
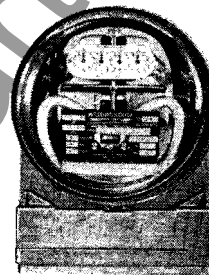
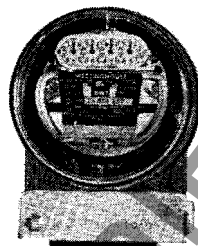
polyphase:  
two element



three element



bottom  
connected:  
series CA



**complete line** Available in all ratings for any single- or polyphase application.

**compensation** Compensated for Class I and II temperature errors and loads up to 400% rating, single phase, and to 300% rating, polyphase; factory calibrated.

**industry standards** Meet all industry standards adopted by the National Meter Committee of the Edison Electric Institute (EEI), Association of Edison Illuminating Companies (AEIC), and National Electrical Manufacturers Association (NEMA).

**accessories** All standard demand registers, demand contacts, ratchets and accessories are mechanically interchangeable without adapters.

### index

	page
design features:	
single phase	2
polyphase	4
mounting details:	6
application:	
self contained	8
transformer type	10
ratings:	14
internal wiring	16
performance data	18
dimensions	20

December, 1952

supersedes catalog section 42-110, pages 1-23, dated June 2, 1950; catalog section 42-125, pages 1-12, dated June 2, 1950; catalog section 42-210, pages 1-25, dated February 23, 1949; catalog section 42-225, pages 1-15, dated November 17, 1941  
mailed to: E43-SB; D65-SB; C29-SF,G,H,Z,J,K,L,M; classified file

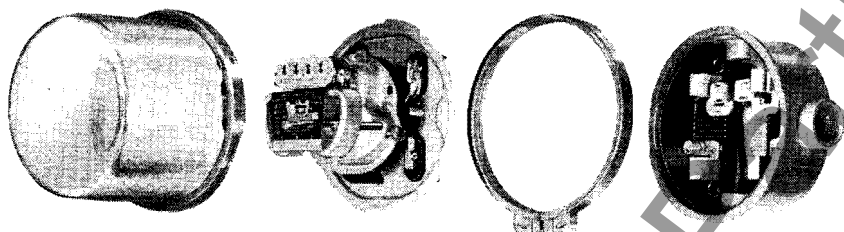


page 6

## mounting details

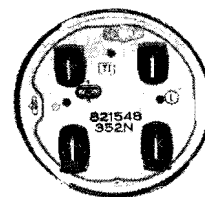
### socket-type meters: series CS

#### single phase and two element

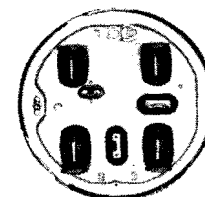


Single-phase and two-element meters take same size base plate and cover. Flanged cover slips over base plate and twists tight. Sealable screw through back of base plate locks cover in position. Grooved aluminum sealing ring (supplied with socket) clamps meter and cover securely to socket. (Socket not supplied with meter; see descriptive bulletin 42-800 for sockets.)

### typical terminal arrangements



CS, 3-wire, self-contained meter.



CS-5, self-contained network meter.  
Fifth terminal has alternate location.

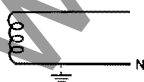


page 8

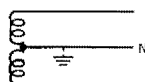
## application

### self-contained meters

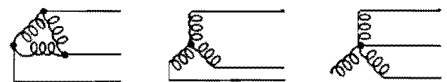
#### 1-phase, 2-wire



#### 1-phase, 3-wire



#### 3-wire, 1- 2- 3-phase or network (also 2-phase, 4-wire)



socket type ☒ ☐

**watthour meters**  
single phase • polyphase

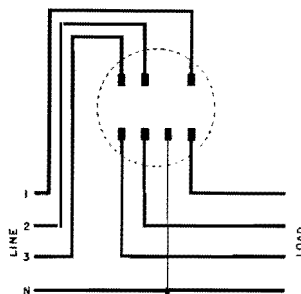
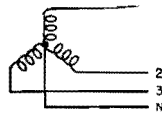
vols: 120, 240, 480  
amps: 2.5, 5, 15, 50

descriptive  
bulletin

**42-100**

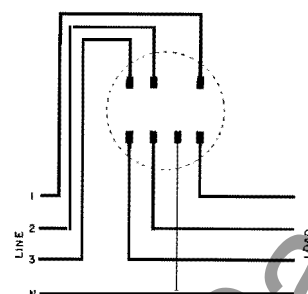
page 9

**3-phase, 4-wire, Y**



**type CS-3**

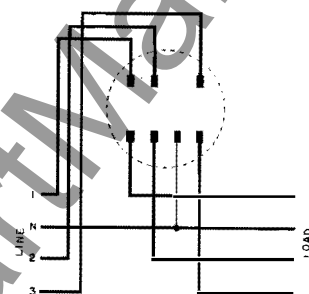
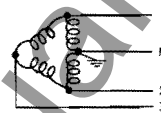
Three-element meter for use under any condition of voltage balance. Use with ST-8 trough or STU-8 high-capacity socket.



**type CS-8**

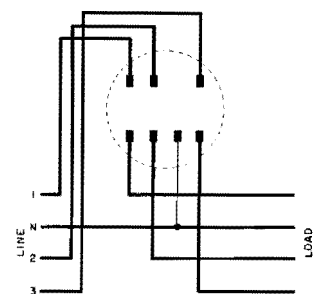
Two-and-one-half element meter for use where voltages are balanced. Use ST-8 trough or STU-8 high-capacity socket.

**3-phase, 4-wire, delta**



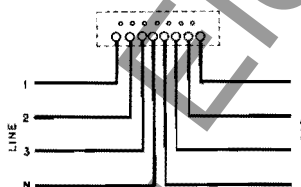
**type CS-7**

Two-element meter for use where voltages are balanced. Both potential coils are 240-volt. Use with ST-8 trough or STU-8 high-capacity socket.



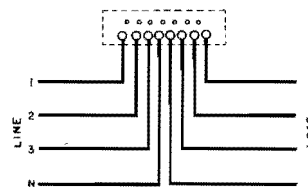
**type CS-9**

Three-element meter for use where line-to-neutral voltages are unbalanced. Needs special test setup because one element has 240-volt potential coil; other two are 120-volt. Use ST-8 trough or STU-8 high-capacity socket.



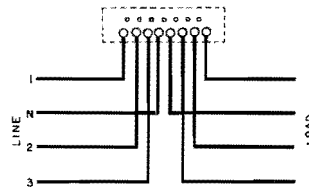
**type CA-3**

Application the same as CS-3.



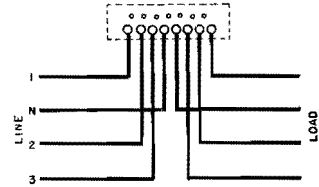
**type CA-8**

Application the same as CS-8.



**type CA-7**

Application the same as CS-7.



**type CA-9**

Application the same as CS-9.

*continued on next page*

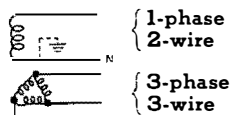
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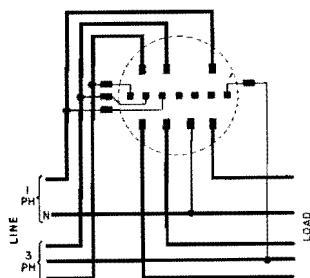
## application

### self-contained meters,

totalizing two services



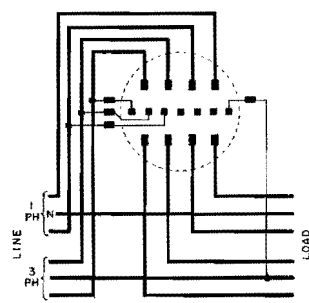
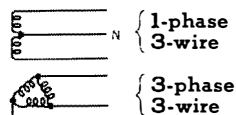
socket type ■ □



#### type CS-4

Three-element meter with one 2-wire element for single-phase, two 2-wire elements for poly-phase. Use ST-9 trough socket.

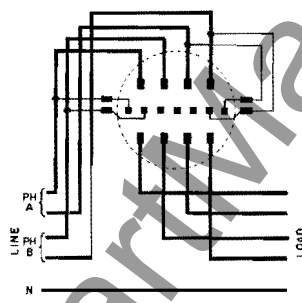
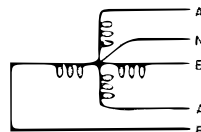
totalizing two services



#### type CS-6

Three-element meter with one 3-wire element for single-phase, two 2-wire elements for poly-phase. Use ST-10 trough socket.

2-phase, 5-wire



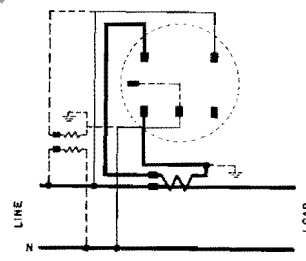
#### type CS-10

Two-element meter with 3-wire current coils. Circuit is essentially two single-phase systems with neutrals tied together. Use ST-10 trough socket.

## application

### transformer-type meters

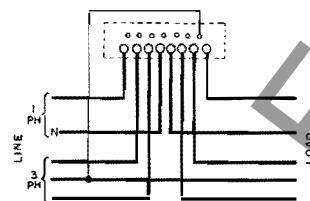
1-phase, 2-wire



#### type CS (5 terminal)

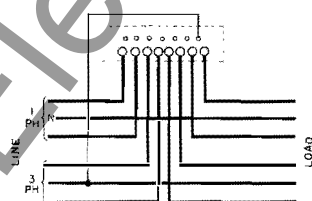
Use with one 2-wire current transformer; use S-5 round socket.

### bottom connected ■



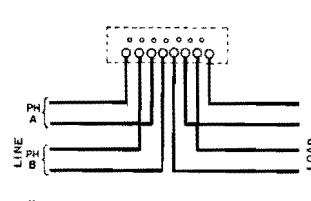
#### type CA-4

Application the same as CS-4.



#### type CA-6

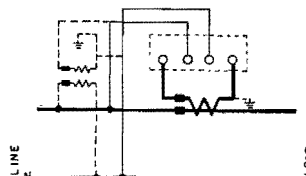
Application the same as CS-6.



#### type CA-10

Application the same as CS-10.

### bottom connected ■



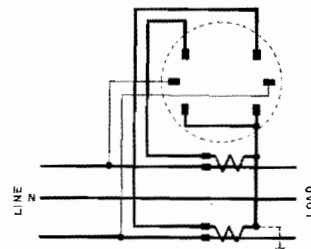
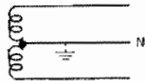
#### type CA (4 terminal)

Use with one 2-wire current transformer, same as CS.

■ diagrams are front view (for reference only)

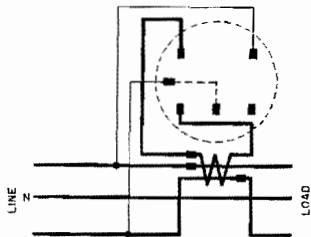
□ for complete description of sockets, see descriptive bulletin 42-800

### 1-phase, 3-wire



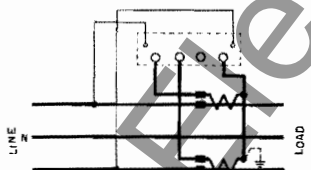
#### type CS (6 terminal)

Use with two 2-wire current transformers. Use S-6 round or STS TRANSOCKET.



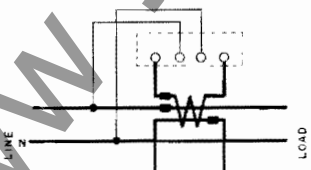
#### type CS (5 terminal)

Use with one 3-wire current transformer. Use S-5 round or STS TRANSOCKET.



#### type CA (6 terminal)

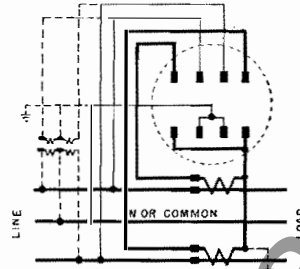
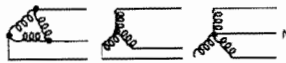
Use with two 2-wire ct's or STA TRANS-A-MOUNT. •



#### type CA (4 terminal)

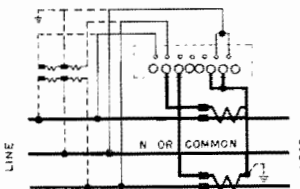
Use with one 3-wire ct.

### 3-wire, 1- 2- or 3-phase network or 2-phase, 4-wire



#### type CS-2

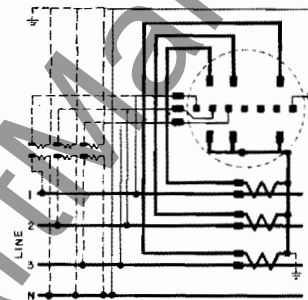
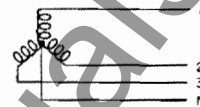
Transformer-type CS-2 can be used on any application requiring 2-element meters. For 3-wire service, use ST-2 trough or STS-2 TRANSOCKET. For 2-phase, 4-wire, use ST-2 trough socket only, without jumper across bottom terminals.



#### type CA-2

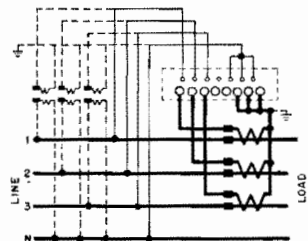
Application the same as CS-2, transformer-type, including 2-phase, 4-wire. Can use with STA-2 TRANS-A-MOUNT • for 3-wire or network service.

### 3-phase, 4-wire, Y



#### type CS-3

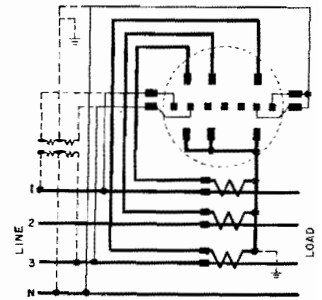
Three-element meter for use where voltages are unbalanced. Use with ST-3 trough or STS-3 TRANSOCKET.



#### type CA-3

Application the same as CS-3. Can use TRANS-A-MOUNT. •

continued on next page

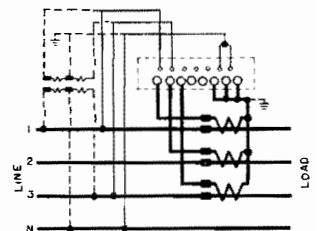


#### type CS-8

Two-and-one-half element meter for use where voltages are balanced. Use ST-3 trough or STS-8 TRANSOCKET. CS-2 can be used with three 2-wire current transformers in delta, with ST-2 trough or STS-8 TRANSOCKET.

**caution:** potential connections shown are for pt's with two high-voltage bushings. Pt's with one hv bushing must have phase wires to bushing and secondary connections changed accordingly.

continued on next page



#### type CA-8

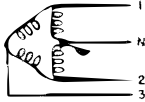
Application the same as CS-8. Can use STA-8 TRANS-A-MOUNT. •. CA-2 applies also with three 2-wire current transformers with secondaries connected in delta.



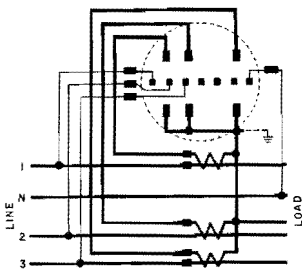
## application

### transformer-type meters,

3-phase, 4-wire, delta

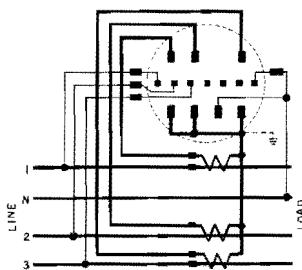


socket type ■ □



**type CS-7**

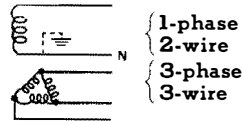
Two-element meter for use where voltages are balanced. Not suitable for use with potential transformers unless supplied with 120-volt potential coils. Use ST-3 trough or STS-3 TRANSOCKET. CS-2 can be used with one 2-wire and one 3-wire current transformer, ST-2 trough or STS-7 TRANSOCKET.



**type CS-9**

Three-element meter for use under any condition of voltage balance. Needs special test setup because one element has 240 volt potential coil; other two are 120 volt. Used with three current transformers of equal ratio. Not suitable for potential transformers. Use ST-9 trough or STS-9 TRANSOCKET.

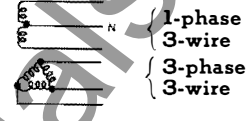
totalizing two services



**type CS-4**

Three-element meter, one 2-wire element for single phase, two 2-wire elements for polyphase. Used with three 2-wire current transformers. Not suitable for potential transformers unless supplied with 120-volt potential coils. Use ST-9 trough socket. CS-3 can be used with three 2-wire current transformers and 3 potential transformers. Use with ST-3 socket.

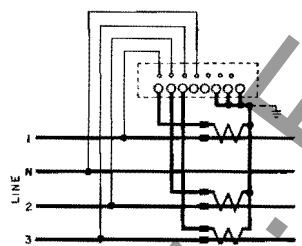
totalizing two services



**type CS-6**

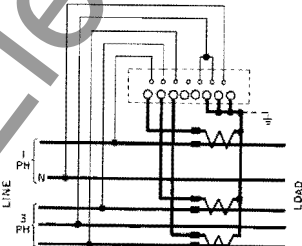
Three-element meter, one 3-wire element for single phase, two 2-wire elements for polyphase. Use with four 2-wire current transformers. Not suitable for potential transformers unless supplied with 120-volt potential coils. Use ST-10 trough socket. CS-4 can be used with one 3-wire and two 2-wire current transformers, ST-9 trough socket. CS-3 can be used with one 3-wire and two 2-wire current transformers and 3 potential transformers. Use ST-3 socket.

bottom connected ■



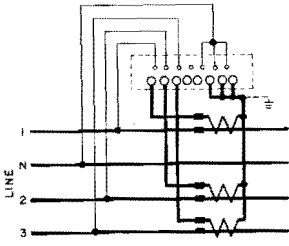
**type CA-7**

Application the same as CS-7. Can use STA-9 TRANS-A-MOUNT. CA-2 applies also with one 2-wire and one 3-wire current transformer. Can use STA-7 TRANS-A-MOUNT.



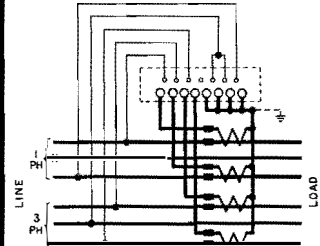
**type CA-9**

Application the same as CS-9. Can use STA-3 TRANS-A-MOUNT.



**type CA-4**

Application the same as CS-4. CA-3 applies also with three 2-wire current transformers.



**type CA-6**

Application the same as CS-6. CA-4 can be used with one 3-wire and two 2-wire current transformers. CA-3 applies also with one 3-wire and two 2-wire current transformers.

■ diagrams are front view (for reference only)

□ for complete description of sockets, see descriptive bulletin 42-800

● TRANS-A-MOUNT mountings are described in descriptive bulletin 42-800

**watthour meters**  
**single phase • polyphase**

descriptive  
bulletin

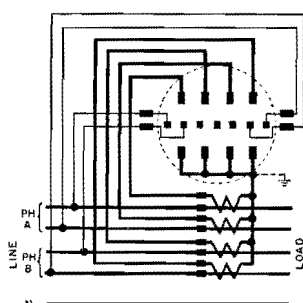
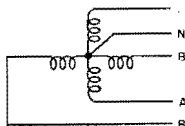
**42-100**

*volts: 120, 240, 480*

*amps: 2.5, 5, 15, 50*

page 13

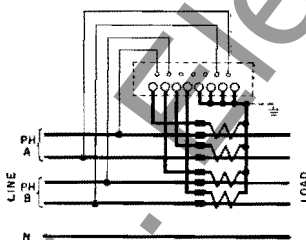
**2-phase, 5-wire**



**type CS-10**

Two-element meter used with four 2-wire current transformers. Use ST-10 trough socket. Not suitable for use with potential transformers unless supplied with 120-volt potential coils.

CS-2 can be used with two 3-wire current transformers. Use ST-2 trough socket.



**type CA-10**

Application the same as CS-10. CA-2 can be used with two 3-wire current transformers.

**standard ratings**

Standard ratings available are listed on pages 14, 15. For style numbers, prices and complete ordering information, see price list 42-020. Refer to nearest Westinghouse sales office for ratings other than those listed.

**voltage** For operation at other than rated voltage, refer to performance curves on page 18, this bulletin.

**frequency** All meters listed are for 60-cycle application; 50-cycle meters are available on request.

**sockets**

Meters are sold without sockets. For complete description and listing of available sockets, TRANSOCKET meter sockets and TRANS-A-MOUNT meter mountings, see descriptive bulletin 42-800; for style numbers, prices and ordering information, see price list 42-020.

**accessories**

Meters can be supplied with the following standard accessories. (For complete description, see descriptive bulletin 42-900 and price list 42-020):

**cyclometer registers** Can be supplied with all single- or polyphase meters. Price list 42-020 lists style numbers for single-phase meters with cyclometer registers.

**five-dial registers** Can be supplied with all watthour meters.

**rachets** To prevent reverse rotation. Can be supplied separately or on new meters.

**demand contacts** Standard register-mounted demand contact devices can be supplied with all meters except those with demand registers.

**potential indicating lamps** Supplied on all polyphase transformer-type meters. Can be supplied with self-contained meters.

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

**demand registers** All meters can be supplied with either indicating (type RW) or cumulative (type RW-2) kw demand registers; see descriptive bulletin 42-300.

**ratings**

Standard ratings available are listed below. Style numbers, list prices and complete ordering information are given in price list 42-020.

meter identification		self-contained ratings			transformer-type ratings		
type	service	volts	amp	kw	volts	amp	kw
<b>CS</b> <b>CA</b>	Single-phase. Note: 2-wire meters are supplied for either 120 or 240 volts, 3-wire meters for 240 volts only and combination 2-3-wire meters for both 120 and 240 volts	120	5	0.6	120	2.5	0.3□
		120	15	1.8	120	5	0.6□
		120	50	6	120	5	
		240	5	1.2	240	2.5	0.6□
		240	15	3.6	240	5	1.2□
		240	50	12	240	5	
<b>CS-2</b> <b>CA-2</b>	2-element, 3-wire, 1- 2- or 3-phase (also 2-phase, 4-wire, see application chart)	120	5	1.2	120	2.5	0.6□
		120	15	3.6	120	2.5	
		120	50	12	120	5	1.2□
					120	5	
		240	5	2.4	240	2.5	1.2□
		240	15	7.2	240	2.5	
		240	50	24	240	5	2.4□
					240	5	
		480	5	4.8	480	2.5	2.4□
		480	15	14.4	480	2.5	
		480	50	48	480	5	4.8□
					480	5	
<b>CS-3</b> <b>CA-3</b>	3-element, 3-phase, 4-wire Y	120	5	1.8	120	2.5	.9□
		120	15	5.4	120	2.5	
		120	50	18	120	5	1.8□
					120	5	
		240	5	3.6	240	2.5	1.8□
		240	15	10.8	240	2.5	
		240	50	36	240	5	3.6□
					240	5	
<b>CS-4</b> <b>CA-4</b>	3-element, totalizing 3-phase, 3-wire and 1-phase, 2-wire	3-ph	1-ph	3-ph	1-ph	3-ph	1-ph
		240	120	2.5	5	1.8	
		240	120	7.5	15	5.4	
		240	120	25	50	18	
		240	240	5	5	3.6	
		240	240	15	15	10.8	
		240	240	50	50	36	
		480	240	2.5	5	3.6	
		480	240	7.5	15	10.8	
		480	240	25	50	36	

□ **secondary-rated meters.** These are supplied with registers corresponding to meter kw capacity without transformers; reading must be multiplied by transformer ratios.

**primary-rated meters.** These are supplied with registers of kw capacity corresponding to primary capacity. Transformer ratio must be supplied on order to insure proper register.



**watthour meters**  
single phase • polyphase

descriptive  
bulletin

**42-100**

volts: 120, 240, 480

amps: 2.5, 5, 15, 50

page 15

**meter identification**

**self-contained ratings**

**transformer-type ratings**

type	service	volts			amp		kw	volts			amp	kw
<b>CS-5</b> <b>CA-5</b>	2-element, 3-wire and network	120			5		1.2					
		120			15		3.6					
		120			50		12					
		240			5		2.4					
		240			15		7.2					
		240			50		24					
		480			5		4.8					
		480			15		14.4					
		480			50		48					
		600			5		6					
		600			15		18					
		600			50		60					
<b>CS-6</b> <b>CA-6</b>	3-element, totalizing 3-phase, 3-wire and 1-phase, 3-wire	3-ph	1-ph	3-ph	1-ph			3-ph	1-ph	3-ph	1-ph	
		240	120/240	5	5	3.6		240	120/240	5	5	3.6□
		240	120/240	15	15	10.8		240	120/240	5	5	
		240	120/240	50	50	36						
		480	120/240	2.5	5	3.6		480	120/240	2.5	5	3.6□
		480	120/240	7.5	15	10.8		480	120/240	2.5	5	
		480	120/240	25	50	36						
<b>CS-7</b> <b>CA-7</b>	2-element, 3-phase, 4-wire, delta	240		5		2.4		240		2.5		1.2□
		240		15		7.2		240		2.5		
		240		50		24		240		5		2.4□
								240		5		
<b>CS-8</b> <b>CA-8</b>	2½-element, 3-phase, 4-wire, Y	120		5		1.8		120		2.5		0.9□
		120		15		5.4		120		2.5		
		120		50		18		120		5		1.8□
								120		5		
		240		5		3.6		240		2.5		1.8□
		240		15		10.8		240		2.5		
		240		50		36		240		5		3.6□
								240		5		
<b>CS-9</b> <b>CA-9</b>	3-element, 3-phase, 4-wire, delta	240		5		3.6		240		2.5		1.8□
		240		15		10.8		240		2.5		
		240		25		18		240		5		3.6□
								240		5		
<b>CS-10</b> <b>CA-10</b>	3-element, 2-phase, 5-wire	240		5		2.4		240		2.5		1.2□
		240		15		7.2		240		2.5		
		240		50		24		240		5		2.4□
								240		5		

self-contained only (use CS-2 or CA-2 for network service)



**internal wiring** diagrams are front view (for reference only)

socket type	CS	CS-2	CS-3	CS-4	CS-5
self contained	<p>2-wire</p> <p>combination 2-3-wire</p>				
transformer type	<p>3-wire</p> <p>2-wire</p>				
bottom connected	CA	CA-2	CA-3	CA-4	CA-5
self contained	<p>2-wire</p> <p>combination 2-3-wire</p>				
transformer type	<p>2-wire</p> <p>3-wire</p>				
notes	<p>Standard single-phase meter. Combination 2-3-wire self-contained meters come wired for 2-wire, 120 volt, with potential coils in parallel and one current coil disconnected and bridged. Self-contained 6-terminal CA (not shown) is like transformer type.</p>	<p>Standard 2-element meter. CS-2 self-contained and transformer-type and CA-2 transformer-type can be used as wired on 1, 2, or 3-phase service. CA-2 self-contained must be ordered with 8 terminals for 2-phase, 4-wire.</p>	<p>Standard 3-element meter. CS-3 self-contained and transformer-type and CA-3 self-contained have one side of each potential coil tied together. CA-3 transformer-type has all potential leads brought out separately.</p>	<p>Three-element meter for totalizing 3-phase, 3-wire and 1-phase, 2-wire from separate sources. Two elements for poly-phase load have one side of each potential coil tied together except on CA-4 transformer type. Third element for single-phase is separate.</p>	<p>Standard 2-element, 3-wire network meter. Internally similar to CS-2 and CA-2 meters. Terminal arrangements similar to single-phase CS and CA.</p>

**watthour meters**  
single phase • polyphase

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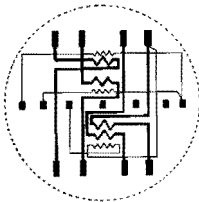
**42-100**

volts: 120, 240, 480

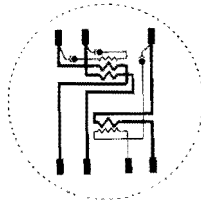
amps: 2.5, 5, 15, 50

page 17

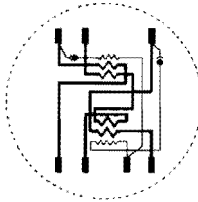
**CS-6**



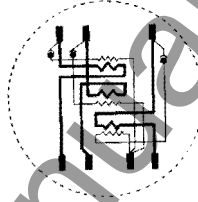
**CS-7**



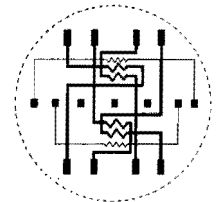
**CS-8**



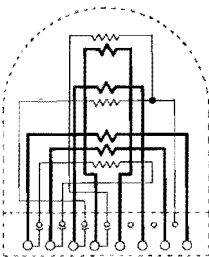
**CS-9**



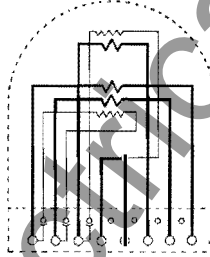
**CS-10**



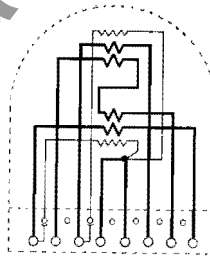
**CA-6**



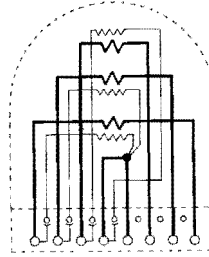
**CA-7**



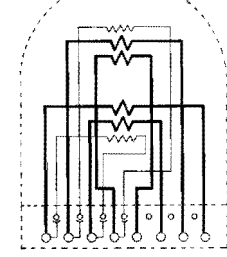
**CA-8**



**CA-9**



**CA-10**



Three-element meter for totalizing 3-phase, 3-wire and 1-phase, 3-wire from separate sources. Similar to CS-4 and CA-4 except single-phase element has 3-wire electromagnet. Slightly different terminal arrangements from CS-4 or CA-4.

Two-element meter for 3-phase, 4-wire, delta service. One element has 2-wire, 240-volt electromagnet; other has 3-wire, 240-volt electromagnet.

Two and one-half element meter for 3-phase, 4-wire Y service. Meter has two elements with 3-wire current coils. One half of each current coil is tied together to form in effect a third current element.

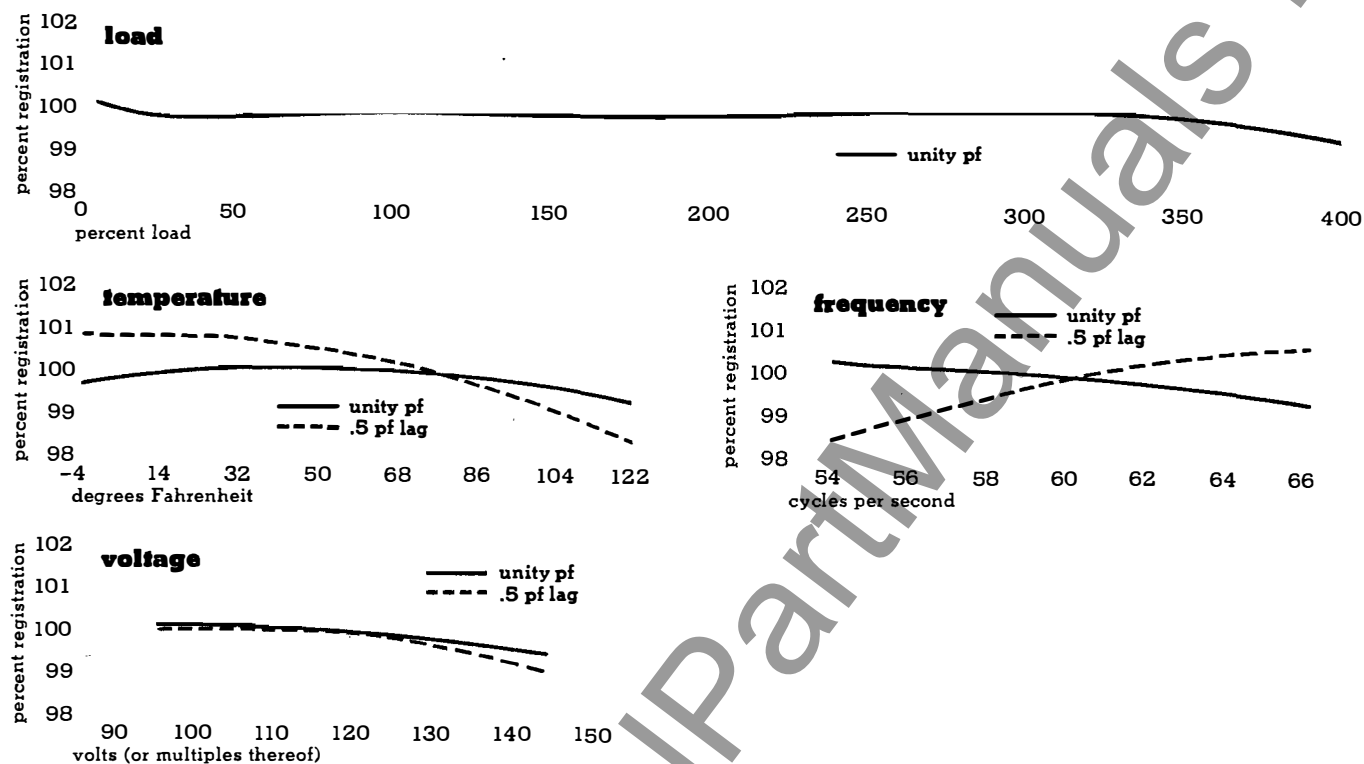
Three-element meter for 3-phase, 4-wire delta service. Two elements have 120-volt potential coils; third element has 240-volt potential coil. Current windings of 120-volt coils have twice current rating of 240-volt coil to make watt ratings of elements equal.

Two-element meter for 2-phase, 5-wire service. Each electromagnet has 3-wire current winding.

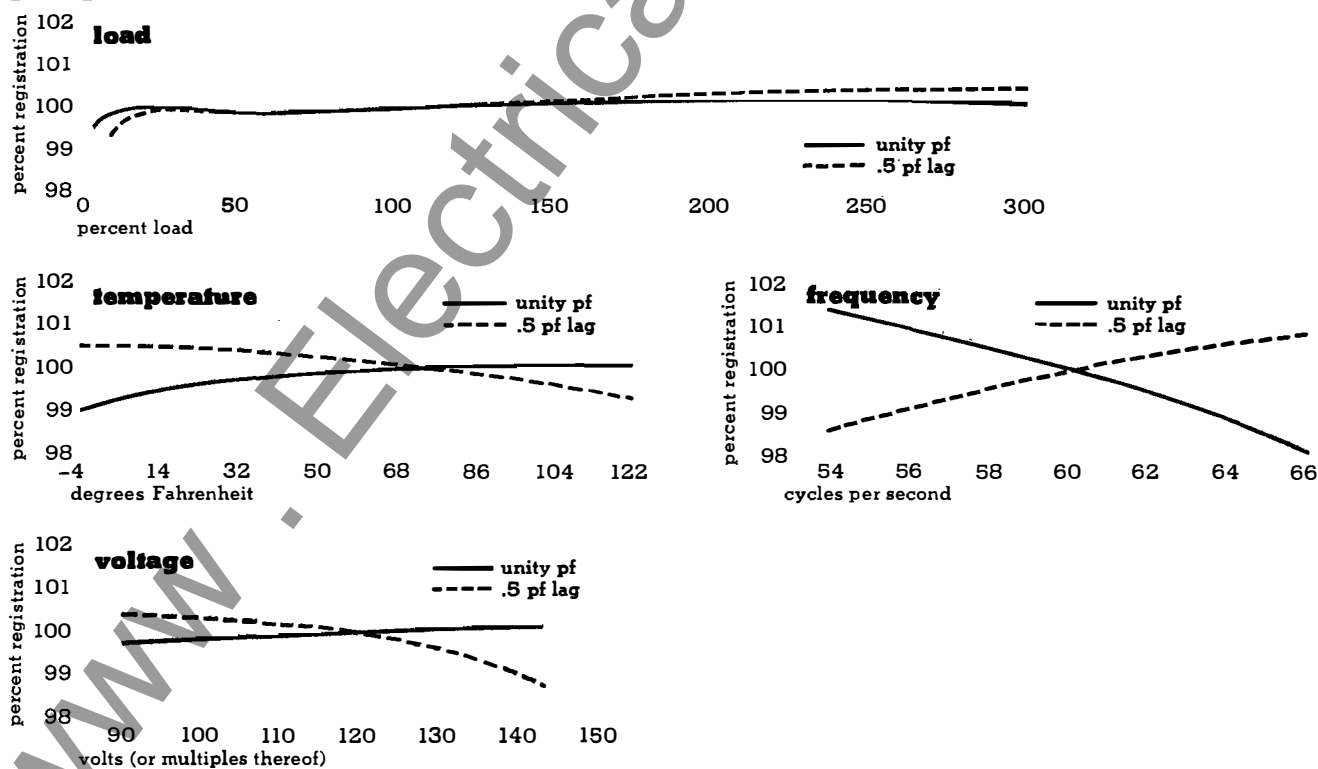


## performance data

### single-phase meters



### polyphase meters



**watthour meters**  
single phase • polyphase

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**42-100**

volts: 120, 240, 480  
amps: 2.5, 5, 15, 50

page 19

**general data**

for 5-amp, 120-volt, 60-cycle meters with 2-wire current coils	single phase	polyphase ♦	
		2 element	3 element
starting watts	1.5	3	4.5
rpm at meter rating	30	30	30
watthour constant (Kh)	1/3	2/3	1
volt-amperes of voltage-coil circuit:			
without potential indicating lamps	10.0	8.2	8.2
with potential indicating lamps	....	8.3	8.3
volt-amperes of current-coil circuit	0.32	0.29	0.29
watts loss in voltage-coil circuit per element:			
without potential indicating lamps	1.5	1.5	1.5
with potential indicating lamps	....	1.7	1.7
watts loss in current-coil circuit per element	0.18	0.16	0.16
power factor of voltage-coil circuit:			
without potential indicating lamps	0.15	0.18	0.18
with potential indicating lamps	....	0.21	0.21
power factor of current-coil circuit	0.56	0.55	0.55
full-load adjustment range	80 to 120%	80 to 120%	80 to 120%
light-load adjustment range	90 to 110%	85 to 120%	85 to 120%

**shipping weights and dimensions**

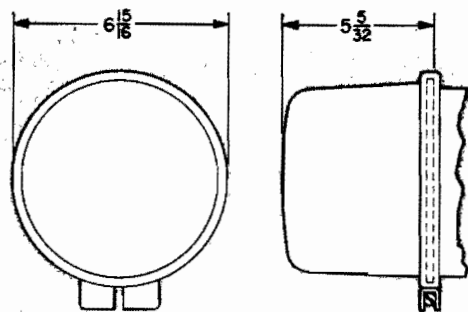
for reference only

type of meter	no. in box	domestic		export (ocean)			case dimensions, in.		
		weight, lb		weight, lb			length	width	height
CS	1	6¾	7¾	6¾	7¾	20	15	13	12
	4	27	30	27	30	48	21	19	11
CS-2, CS-5, CS-7, CS-8, CS-10	1	7	9	7	9	25	15	13	20
CS-3, CS-4, CS-6, CS-9	1	12	18	19	18	44	20	15	20
CA	1	7½	10	7½	10	20	15	14	14
	4	30	32½	30	32½	48	20	15	9
CA-2, CA-5, CA-7, CA-8, CA-10	1	9½	14	9½	14	27	15	14	14
CA-3, CA-4, CA-6, CA-9	1	13½	28	20	28	46	20	15	15

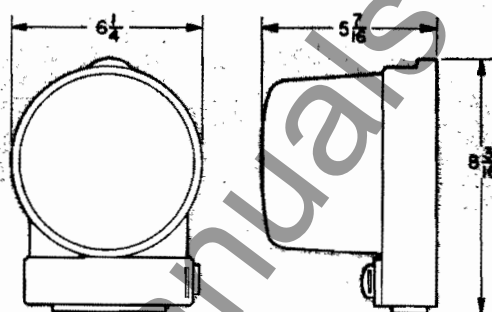


**dimensions**

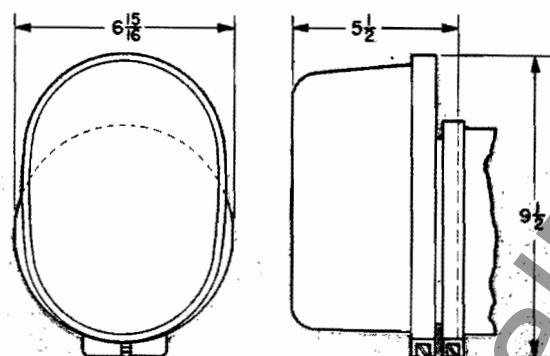
for reference only



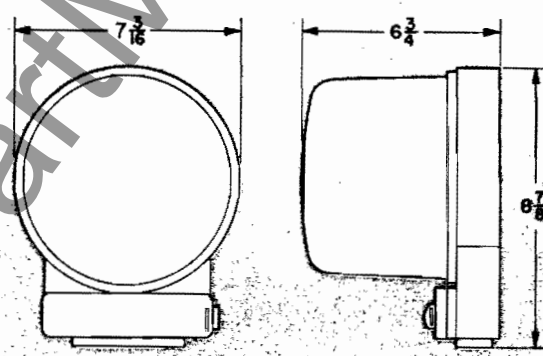
**CE, CE-2, CE-5, CE-7, CE-8, CE-10**



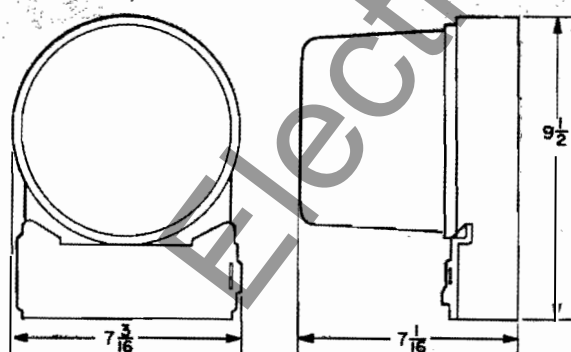
**CA**



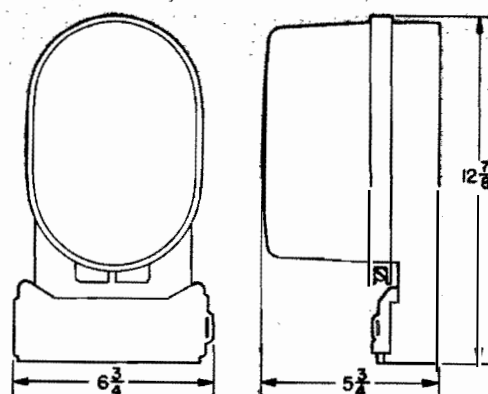
**CE-3, CE-4, CE-6, CE-9**



**CA-5**



**CA-2, CA-7, CA-9, CA-10**



**CA-3, CA-4, CA-6, CA-8**

**further information** prices, style numbers, ordering information  
sockets, TRANSOCKETS, TRANS-A-MOUNTS  
kw demand registers  
other accessories

price list 42-020  
descriptive bulletin 42-800  
descriptive bulletin 42-300  
descriptive bulletin 42-900