



March 1997

Alpha Meter

Installation Information



GENERAL

This leaflet contains general installation instructions for the following single phase and polyphase watt-hour meters: Forms 1S, 2S, 3S, 4S, 5S, 5A, 6S, 6A, 9S, 10A, 12S, 13S, 13A, 16S, 16A, 26S, 29S, 35S, 35A, 36S, and 36A.

All meters are calibrated and tested before shipment. For proper installation, accuracy, and maximum life of the meters, use the following installation procedures.

▲ WARNING

Use authorized utility procedures to install and service metering equipment. Dangerous voltages are present. Personal injury, death, or equipment damage can result if safety precautions are not followed.

Use circuit closing devices on any current transformer secondaries (Form 3S, 4S, 5S, 5A, 6S, 6A, 9S, 10A, 26S, 29S, 35S, 35A, 36S, 36A meters). Personal injury, death, or equipment damage can result if circuit closing devices are not used.

SOCKET CONNECTED INSTALLATION

1. Make sure socket and meter current class ratings are compatible before installing meter.
2. Verify correct wiring to meter socket. See wiring diagrams on following pages.
3. If lightning arrestor is present, remove paint from socket rim at point of contact with the meter lightning arrestor ground strap to insure proper grounding.
4. Install meter and verify pulse arrows in LCD are blinking if any load is applied.

NOTE: Two sets of right and left pointing arrows, one above the other, are located on the LCD, with the upper set located directly to the left of the phase indicators. The upper set of arrows indicates watt-hours and the lower set indicates alternate energy (kVARh or kVAh), if available. Right pointing arrows indicate energy delivered, left pointing indicate energy received.

5. Insure "TEST" annunciator in LCD is NOT blinking. If it is, remove meter, remove cover, turn Test Mode button so the slot is horizontal (unit out of Test mode). Reinstall meter.

BOTTOM CONNECTED INSTALLATION

1. Determine meter installation location. Make sure class and service connections are compatible before installing meter.
2. Mount bottom connected meter or bottom connected S to A adapter.

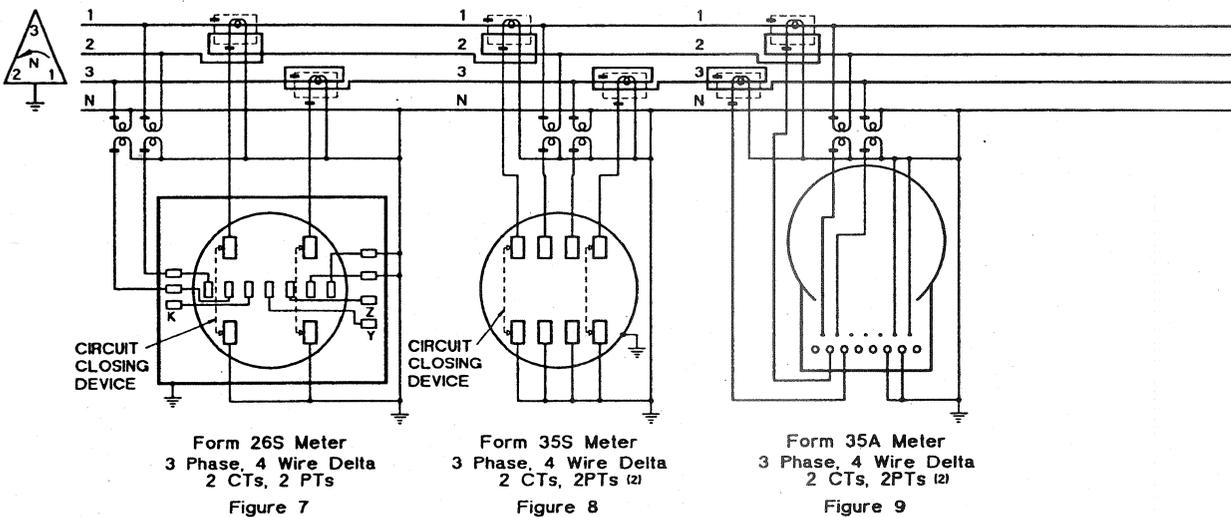
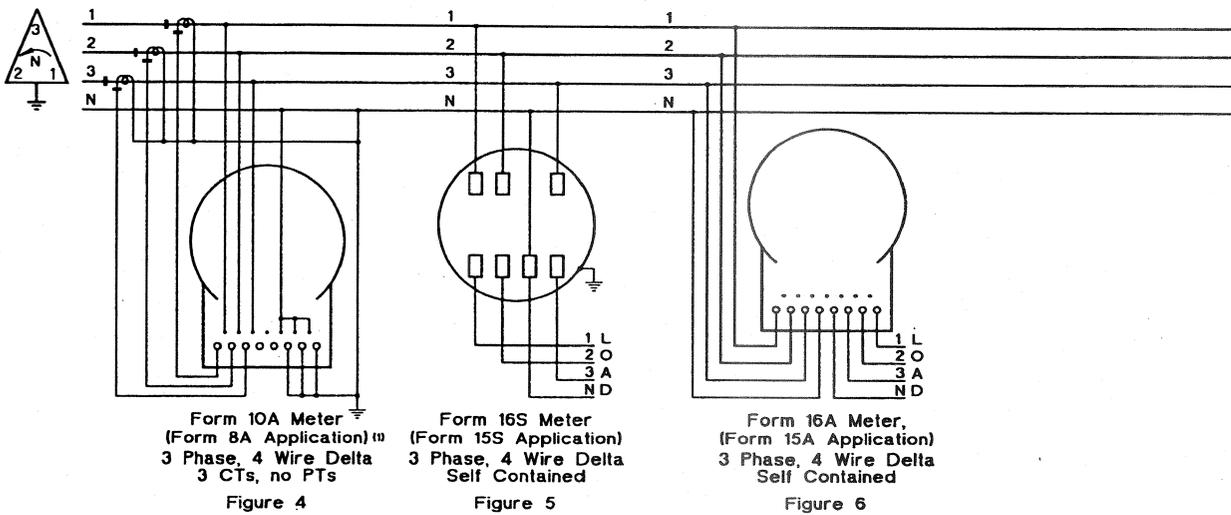
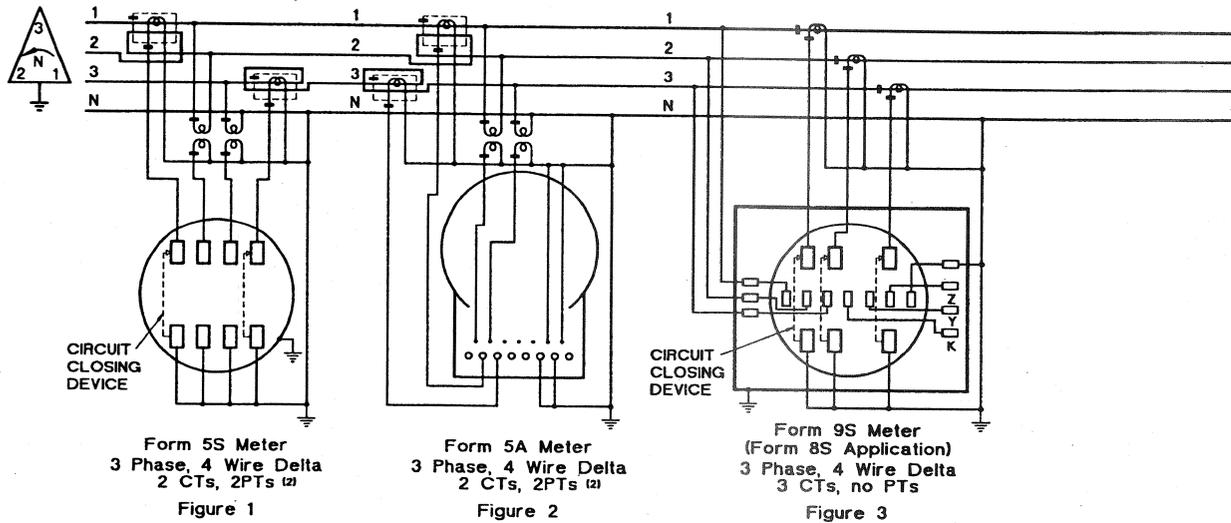
▲ WARNING

Use authorized utility procedures to install ground connection before wiring. Dangerous voltages are present. Personal injury, death, or equipment damage can result from wiring an ungrounded meter.

3. Wire meter with #2 (or in accordance with standard utility operating practices) wire. See wiring diagrams on the following pages. If wire diameter is larger than #2 wire, use approved adapters. External meter wiring should be consistent with the meter class rating.
4. With meter installed, verify pulse arrows in LCD are blinking if any load is applied. (See note under Socket Connected Installation concerning pulse arrow definitions.)
5. Insure "TEST" annunciator in LCD is NOT blinking. If it is, remove meter, remove cover, turn Test Mode button so the slot is horizontal (unit out of Test mode). Reinstall meter.

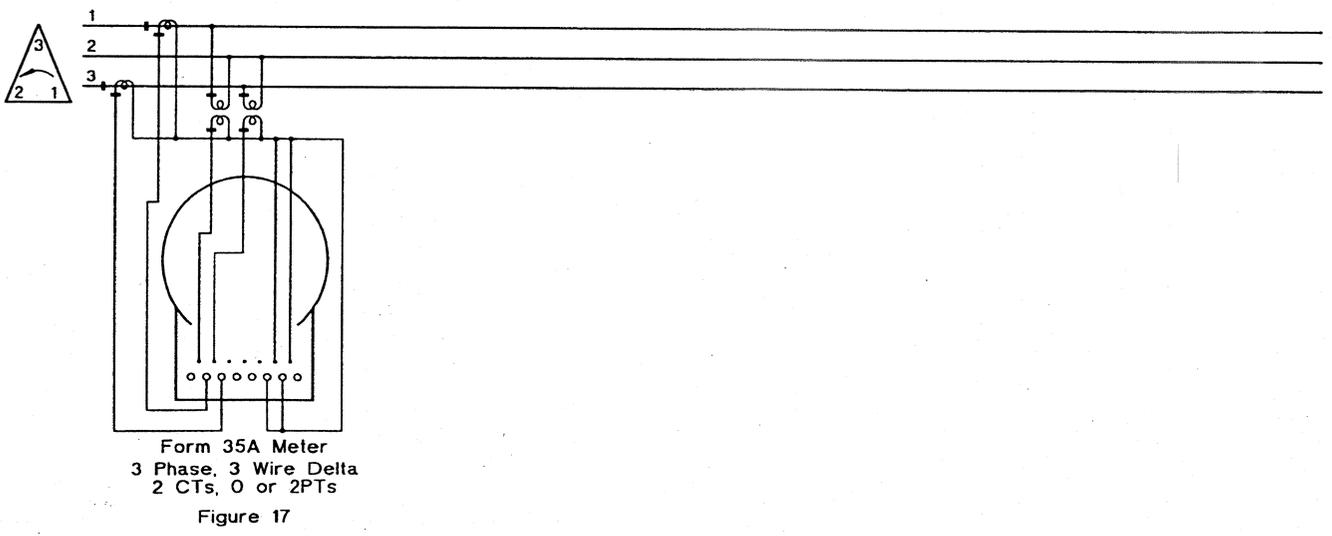
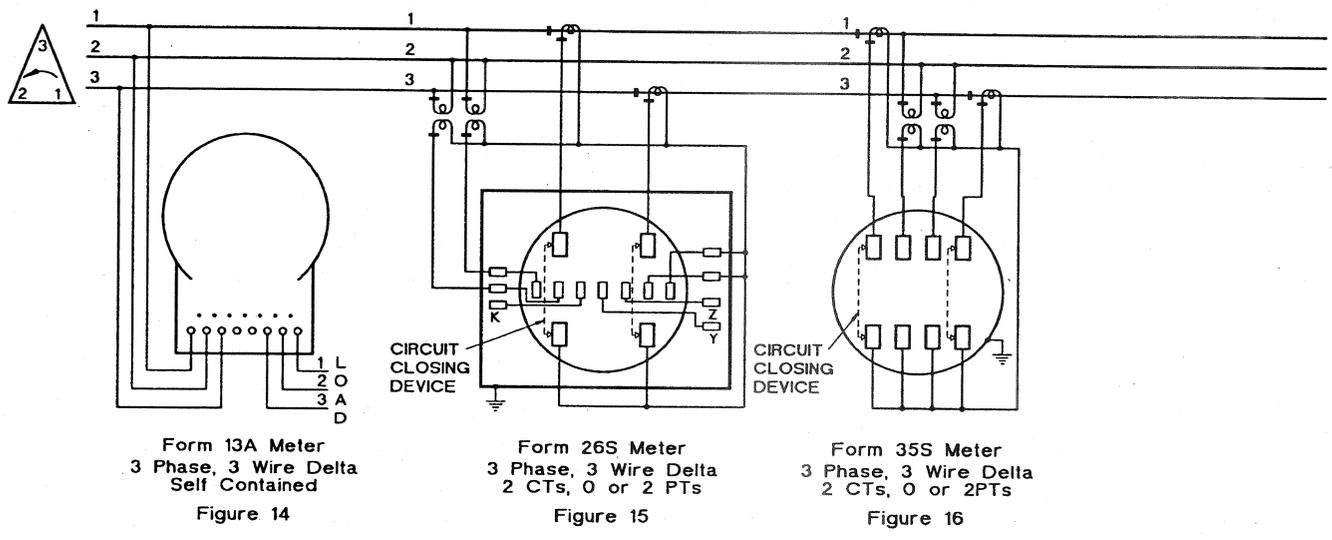
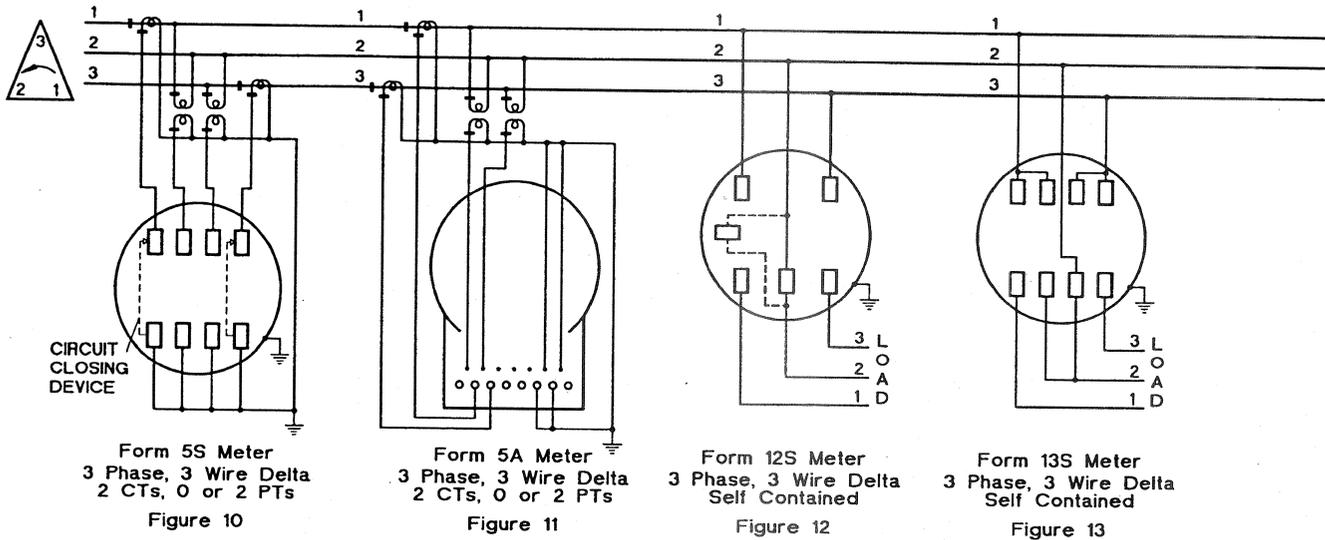
INSTALLATION WIRING :

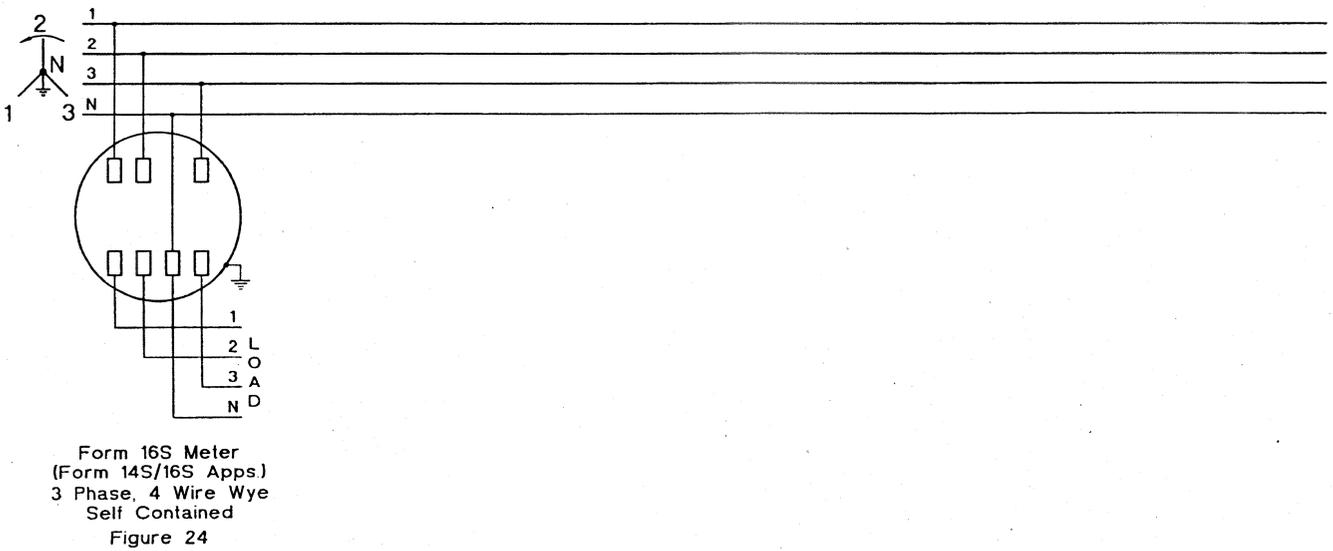
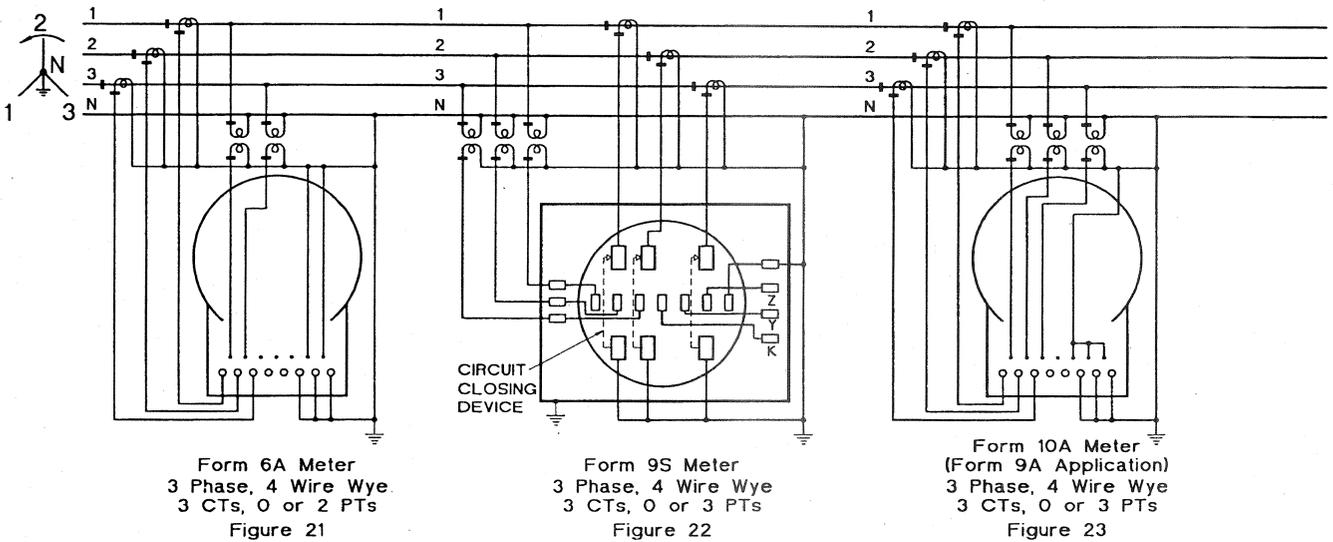
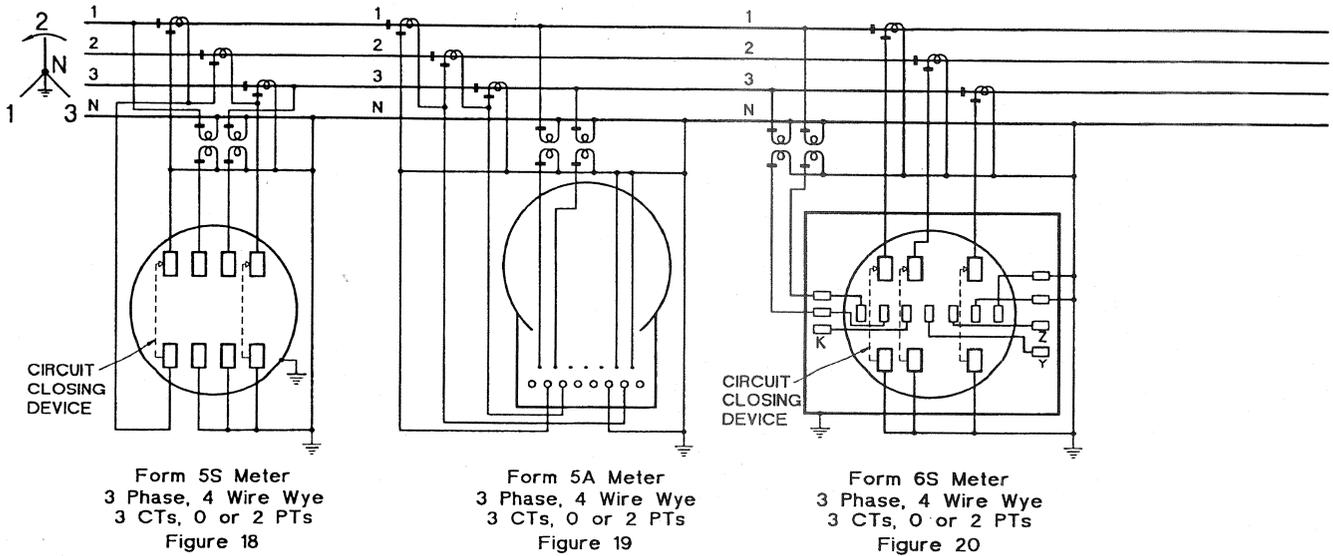
All available Alpha meter forms are listed and segregated with respect to the type of service being metered. Usage of Form 9S and 10A (in 8S and 8A applications), and Form 16S (in Form 15S application) are also shown. Form 14S/A applications are simply four wire wye services and would be metered by Form 16S/A. The more complicated wirings are shown using both PTs and CTs. The socket ground is shown for safety considerations. The neutral to ground connection is shown for example only. Actual neutral to ground connection should be performed within the operating utilities standard practice.

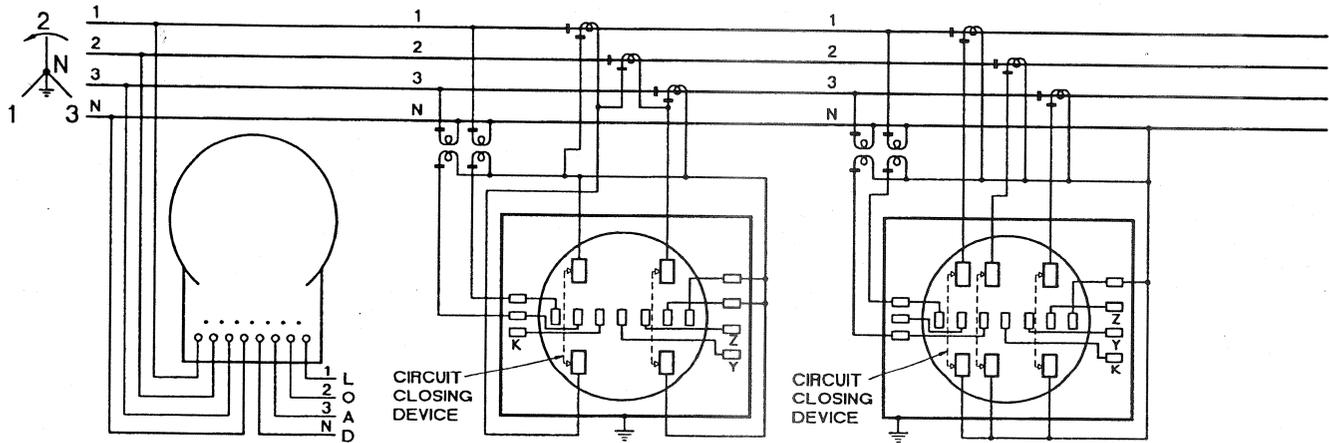


NOTES :

- (1) - Wiring is different than a Form 8A meter.
- (2) - If you use only one turn through the Line 3 current transformer (CT), the CT ratio must be reduced by one half.



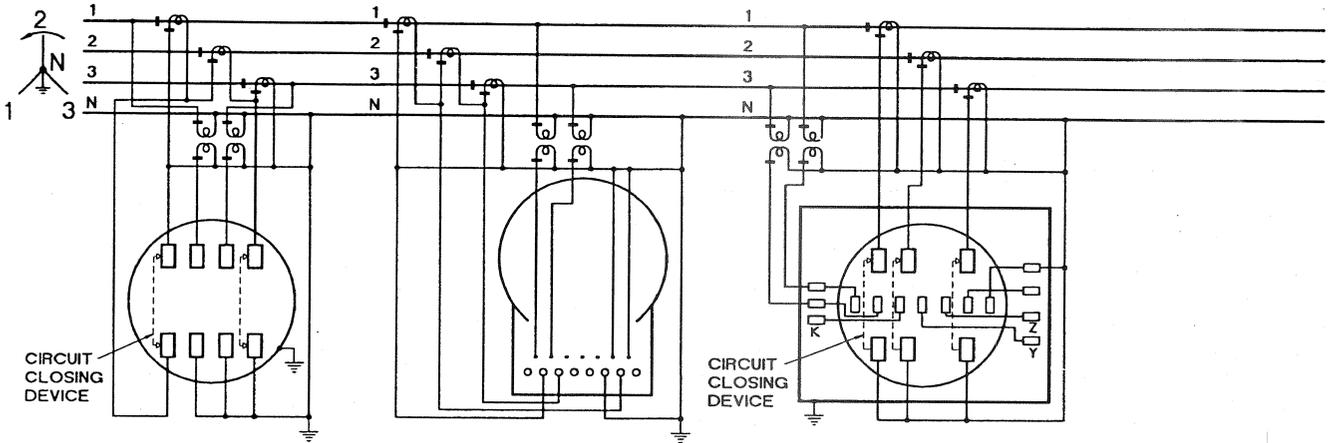




Form 16A Meter
(Form 14A/16A Apps.)
3 Phase, 4 Wire Wye
Self Contained
Figure 25

Form 26S Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 26

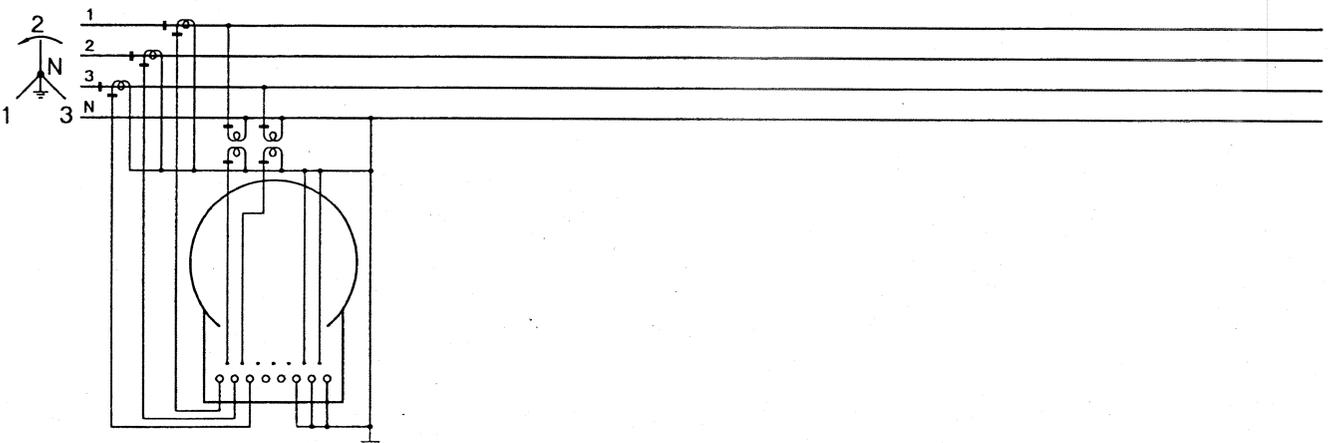
Form 29S Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 27



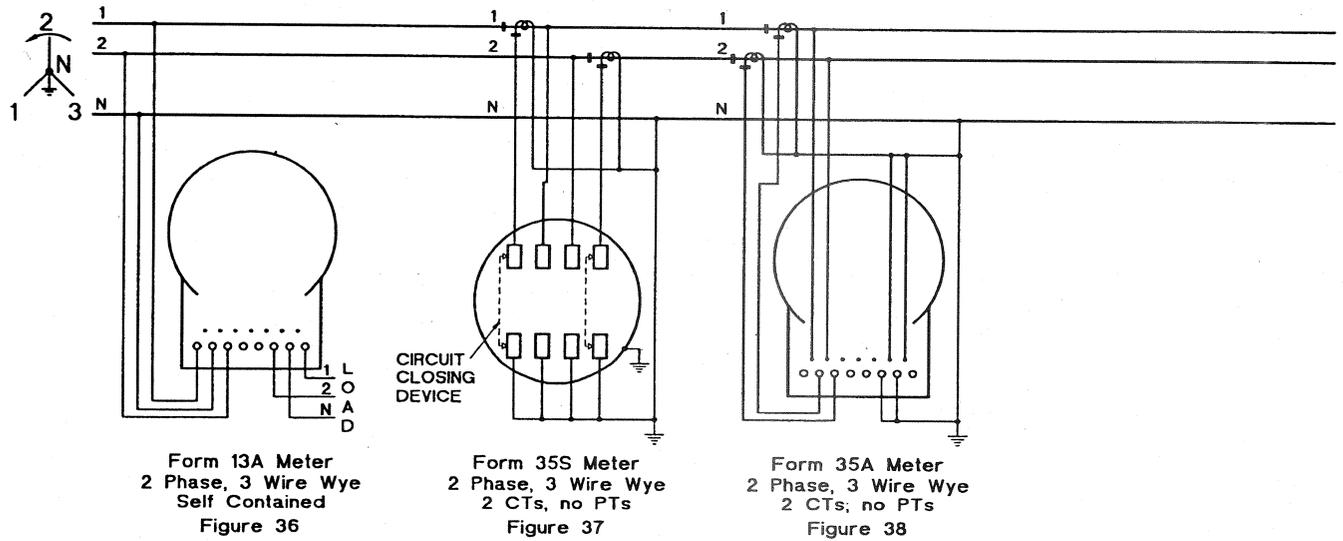
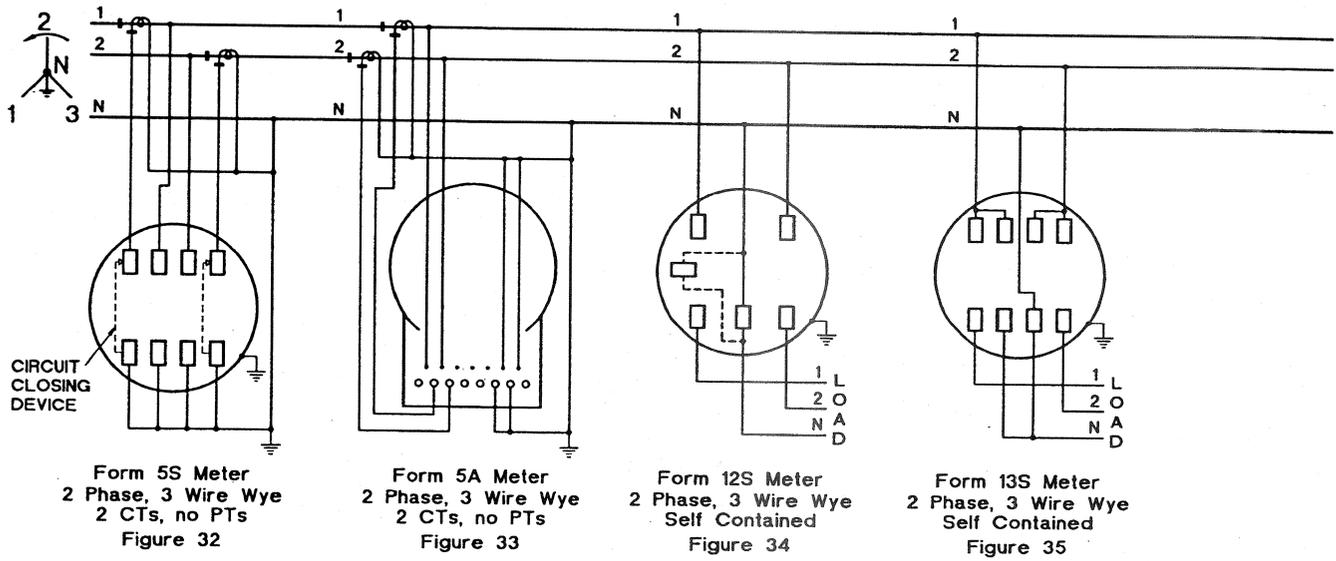
Form 35S Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 28

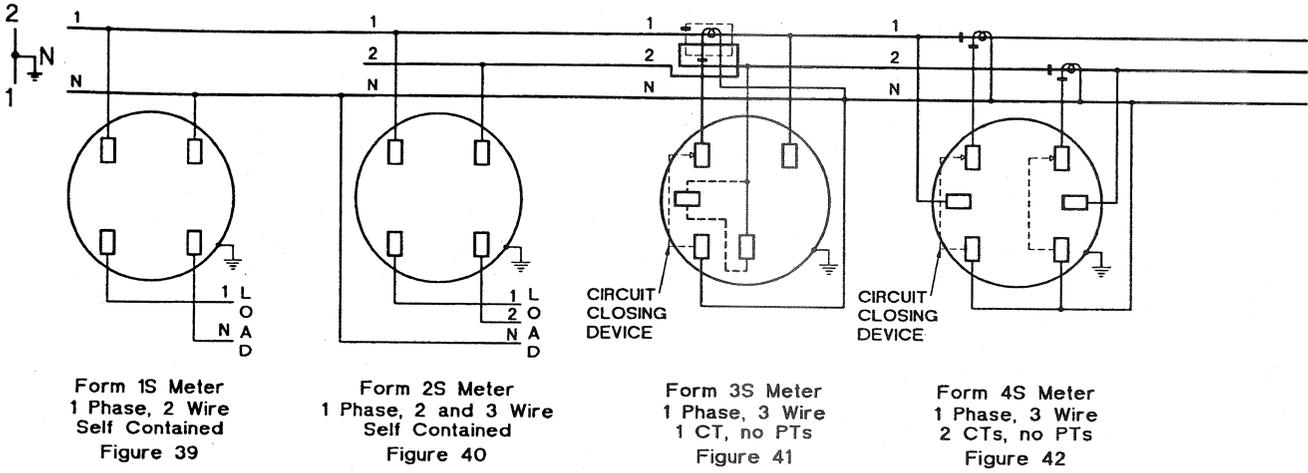
Form 35A Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 29

Form 36S Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 30



Form 36A Meter
3 Phase, 4 Wire Wye
3 CTs, 0 or 2 PTs
Figure 31





⚠ WARNING

Do not disassemble the meter chassis or the electronic module from the meter chassis with power present. Doing so could expose you to dangerous voltages, resulting in personal injury, death, or equipment damage.

BATTERY INSTALLATION / REPLACEMENT

Time-of-use meters are typically shipped with battery installed and connected. However, if battery is requested to be shipped disconnected, separately, or as a replacement, see Alpha meter technical manual (TM42-2180) for procedures.

NOTICE

It is important that the battery not be connected unless the meter has been powered for at least 1 minute from the AC line within the last hour. After connecting the battery, the display should be checked with line power on the meter to verify proper operation (i.e. scrolling from one display quantity to the next). Failure to follow the correct sequence for battery connection can result in early battery discharge and/or the register being left inoperative.

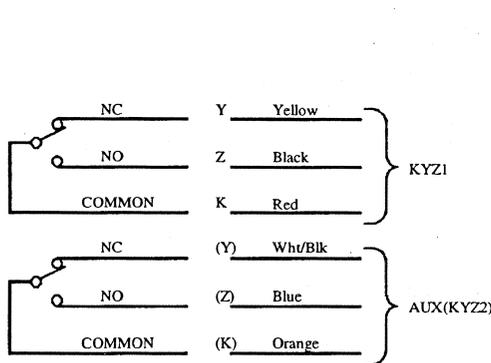


Figure 43

RELAY OPTION BOARD COLOR CODING

Two relay option boards are available with high voltage solid state relays. One has two Form C relays and 6 output leads (Figure 43). The other has 6 output relays and 12 output leads (Figure 44). In either case there is approximately 24-inches of cable exiting the meter. Disregard any/all lead colors not known to have the respective option.

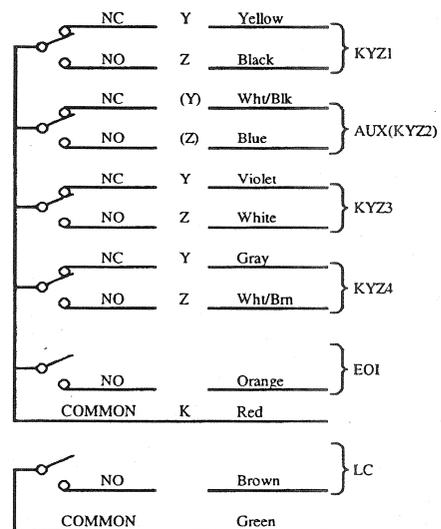


Figure 44

This equipment complies with the limits for a Class B computing device pursuant to subpart J of Part 15 of FCC Rules.

DISCLAIMER OF WARRANTIES

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, REPRESENTATIONS, OR WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OTHER THAN THOSE SPECIFICALLY SET OUT BY ANY EXISTING CONTRACT BETWEEN THE SELLER AND BUYER. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF SELLER. THE CONTENTS OF THIS INFORMATION LEAFLET SHALL NOT BECOME PART OF OR MODIFY ANY SUCH PRIOR OR EXISTING AGREEMENT.

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```

----- READING INTRODUCTION ----- 1.20 -----
TER ID:      0306174500      Program ID:   405
ACCOUNT:     TE717510       Programmer ID: 0000
Register Type: AIR          Register Firmware: 000169 01 C
File: DIAGREAD

```

```

----- KH INFORMATION -----
Kh:      001.800 Wh per rev      Pulses/Revolution (P/R): 24
Ke:      000.075 Wh per pulse    Demand Decimal Places:   2
Kd:      000.300 W per pulse     Energy Decimal Places:   0
                                           Transformer Factor: 1

```

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----- DEMAND DEFINITIONS AND SPECIAL FEATURES -----
Demand Interval:      15 Min      Cumulative Demand Type:   AT RESET
Subinterval:         15 Min      kWh Electronic Detent On: Yes
Test Interval:       15 Min      kVARh Electronic Detent On: Yes
Test Subinterval:    15 Min      Reverse Power Flow Test:  Yes
Demand Overload:     00.00
Demand Forgiveness Time: 0 Min
Demand Reset Lockout Time: 0 Min

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----- RELAY OPTIONS -----
Relay Function: KYZ      Threshold: 999.99

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----- QUANTITIES METERED -----
Display Function: DMD
Quantities
Metered: A) kW-Del and an additional Total kVARh quantity
Demand = kW-Del

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----- DISPLAY CONTROL -----
Display Hold Time:      6 Sec      Leading Zeros on Metered Quan.: Yes
Energy Display Digits: 5          Lock Warning Signal on Display: No
Demand Display Digits: 5          Additional Disp Items Selectable: 28
Item Labels in Normal Mode: Yes
Item Labels in Alt. Mode: Yes
Item Labels in Test Mode: Yes

```

```

----- NORMAL DISPLAY -----
DIS ID      DIS ID
SEQ NO. NAME      SEQ NO. NAME
-----
1 888 Complete LCD test      3 2 Maximum kW-Del
2 1 Total kWh-Del           4 3 Total kVARh-Del

```

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----- ALTERNATE DISPLAY -----
DIS ID      DIS ID
SEQ NO. NAME      SEQ NO. NAME
-----
1 888 Complete LCD test      7 106 Power outage count
2 101 ACCOUNT: 1            8 107 Time left subint
3 102 Kh                    9 201 PB Total kWh-Del
4 103 Program ID           10 202 PB Maximum kW-Del
5 104 Subint - Interval    11 203 Total kVARh-Del
6 105 Demand reset count   12 204 Pulses/revolution

```

----- TEST		DISPLAY -----	
S ID		DIS ID	
Q NO. NAME		SEQ NO. NAME	
-----		-----	
1	888 Complete LCD test	4	803 Pulse count kWh-Del
2	801 Subint - Interval	5	804 Pres Int Dmd kW-Del
3	802 Time left subint	6	805 Maximum kW-Del

----- READING INTRODUCTION ----- 1.20 -----

METER ID: 0306174600	Program ID: 405
COUNT: TE717510	Programmer ID: 0000
Register Type: A1R	Register Firmware: 000169 01 C
File: DIAGREAD	

----- KH INFORMATION -----

Kh: 001.800 Wh per rev	Pulses/Revolution (P/R): 24
Ke: 000.075 Wh per pulse	Demand Decimal Places: 2
Kd: 000.300 W per pulse	Energy Decimal Places: 0
	Transformer Factor: 1

----- DEMAND DEFINITIONS AND SPECIAL FEATURES -----

Demand Interval: 15 Min	Cumulative Demand Type: AT RESET
Subinterval: 15 Min	kWh Electronic Detent On: Yes
Test Interval: 15 Min	kVARh Electronic Detent On: Yes
Test Subinterval: 15 Min	Reverse Power Flow Test: Yes
Demand Overload: 00.00	
Demand Forgiveness Time: 0 Min	
Demand Reset Lockout Time: 0 Min	

----- RELAY OPTIONS -----

Relay Function: KYZ	Threshold: 999.99
---------------------	-------------------

----- QUANTITIES METERED -----

Display Function: DMD
 Quantities
 Metered: A) kW-Del and an additional Total kVARh quantity
 Demand = kW-Del

----- DISPLAY CONTROL -----

Display Hold Time: 6 Sec	Leading Zeros on Metered Quan.: Yes
Energy Display Digits: 5	Lock Warning Signal on Display: No
Demand Display Digits: 5	Additional Disp Items Selectable: 28
Item Labels in Normal Mode: Yes	
Item Labels in Alt. Mode: Yes	
Item Labels in Test Mode: Yes	

----- NORMAL DISPLAY -----

DIS ID	DIS ID
SEQ NO. NAME	SEQ NO. NAME
1 888 Complete LCD test	3 2 Maximum kW-Del
2 1 Total kWh-Del	4 3 Total kVARh-Del

----- ALTERNATE DISPLAY -----

DIS ID	DIS ID
SEQ NO. NAME	SEQ NO. NAME
1 888 Complete LCD test	7 106 Power outage count
2 101 ACCOUNT: 1	8 107 Time left subint
3 102 Kh	9 201 PB Total kWh-Del
4 103 Program ID	10 202 PB Maximum kW-Del
5 104 Subint - Interval	11 203 Total kVARh-Del
6 105 Demand reset count	12 204 Pulses/revolution

----- TEST DISPLAY -----

S ID
Q NO. NAME

DIS ID
SEQ NO. NAME

1 888 Complete LCD test
2 801 Subint - Interval
3 802 Time left subint

4 803 Pulse count kWh-Del
5 804 Pres Int Dmd kW-Del
6 805 Maximum kW-Del

----- READING INTRODUCTION ----- 1.20 -----
 METER ID: 0306174700 Program ID: 405
 ACCOUNT: TE717510 Programmer ID: 0000
 Register Type: A1R Register Firmware: 000169 01 C
 File: DIAGREAD

----- KH INFORMATION -----
 Kh: 001.800 Wh per rev Pulses/Revolution (P/R): 24
 Ke: 000.075 Wh per pulse Demand Decimal Places: 2
 Kd: 000.300 W per pulse Energy Decimal Places: 0
 Transformer Factor: 1

----- DEMAND DEFINITIONS AND SPECIAL FEATURES -----
 Demand Interval: 15 Min Cumulative Demand Type: AT RESET
 Subinterval: 15 Min kWh Electronic Detent On: Yes
 Test Interval: 15 Min kVARh Electronic Detent On: Yes
 Test Subinterval: 15 Min Reverse Power Flow Test: Yes
 Demand Overload: 00.00
 Demand Forgiveness Time: 0 Min
 Demand Reset Lockout Time: 0 Min

----- RELAY OPTIONS -----
 Relay Function: KYZ Threshold: 999.99

----- QUANTITIES METERED -----
 Display Function: DMD
 Quantities
 Metered: A) kW-Del and an additional Total kVARh quantity
 Demand = kW-Del

----- DISPLAY CONTROL -----
 Display Hold Time: 6 Sec Leading Zeros on Metered Quan.: Yes
 Energy Display Digits: 5 Lock Warning Signal on Display: No
 Demand Display Digits: 5 Additional Disp Items Selectable: 28
 Item Labels in Normal Mode: Yes
 Item Labels in Alt. Mode: Yes
 Item Labels in Test Mode: Yes

----- NORMAL DISPLAY -----

DIS ID	DIS ID
SEQ NO. NAME	SEQ NO. NAME
1 888 Complete LCD test	3 2 Maximum kW-Del
2 1 Total kWh-Del	4 3 Total kVARh-Del

----- ALTERNATE DISPLAY -----

DIS ID	DIS ID
SEQ NO. NAME	SEQ NO. NAME
1 888 Complete LCD test	7 106 Power outage count
2 101 ACCOUNT: 1	8 107 Time left subint
3 102 Kh	9 201 PB Total kWh-Del
4 103 Program ID	10 202 PB Maximum kW-Del
5 104 Subint - Interval	11 203 Total kVARh-Del
6 105 Demand reset count	12 204 Pulses/revolution

----- TEST DISPLAY -----	
DIS ID	DIS ID
SEQ NO. NAME	SEQ NO. NAME
1 888 Complete LCD test	4 803 Pulse count kWh-Del
2 801 Subint - Interval	5 804 Pres Int Dmd kW-Del
3 802 Time left subint	6 805 Maximum kW-Del

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----- PROGRAM PROFILE ----- 0.91 -----
Program ID: 001                               Display Options: ABBST001
Description: ABB STD A1R, 15 Min              Demand Decimal Places: 2
Plus Users: 1,2,3,4,5,6,7,8,9,10            Energy Decimal Places: 0
Program Function: DMD
Constants: USE FACTORY DEFAULTS

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```

----- KH INFORMATION -----
Demand Decimal Places: 2
Energy Decimal Places: 0

```

```

----- DEMAND DEFINITIONS AND SPECIAL FEATURES -----
Demand Interval: 15 Min                      Cumulative Demand Type: AT RESET
Subinterval: 15 Min                          Exponential Demand Response: No
Test Interval: 15 Min                        kWh Electronic Detent On: Yes
Test Subinterval: 15 Min                     kVARh Electronic Detent On: Yes
Demand Overload: 00.00                       Reverse Power Flow Test: No
Demand Forgiveness Time: 0 Min
Demand Reset Lockout Time: 0 Min

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----- RELAY OPTIONS -----
Relay Function: KYZ                          Threshold: 00.00
Use Dedicated KYZ Relays: Yes

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----- QUANTITIES METERED -----
Display Function: DMD
Quantities
Metered: A) kW-Del and an additional Total kVARh quantity
Demand = kW-Del
Trigger Unit-of-Measure for
Threshold based Load Control: NONE

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```

----- DISPLAY CONTROL -----
Display Hold Time: 6 Sec                     Leading Zeros on Metered Quan.: No
Energy Display Digits: 5                     Lock Warning Signal on Display: No
Demand Display Digits: 5                     Additional Disp Items Selectable: 23
Item Labels in Normal Mode: Yes
Item Labels in Alt. Mode: Yes
Item Labels in Test Mode: Yes

```

```

----- NORMAL DISPLAY -----
DIS ID          DIS ID
SEQ NO. NAME    SEQ NO. NAME
-----
1 888 Complete LCD test

```

```

----- ALTERNATE DISPLAY -----
DIS ID          DIS ID
SEQ NO. NAME    SEQ NO. NAME
-----
1 888 Complete LCD test          11 21 Demand reset count
2 1 Total kWh-Del                12 22 Comm session count
3 2 Maximum kW-Del               13 30 Kh
4 3 Cumulative kW-Del            14 31 Subint - Interval
5 4 Total kVARh-Del              15 32 Program ID
6 11 PB Total kWh-Del            16 40 Pulse count kWh-Del
7 12 PB Maximum kW-Del           17 41 Pres Int Dmd kW-Del

```

8	13	PB Cumulative kW-Del	18	42	Prev Int Dmd kW-Del
9	14	PB Total kVARh-Del	19	43	Time left subint
10	20	Power outage count			

DIS ID		TEST		DISPLAY	
SEQ NO.	NAME	DIS ID	SEQ NO.	NAME	
1	900	Pulse count kWh-Del	5	905	Time left subint
2	901	Total kWh-Del	6	906	Pres Int Dmd kW-Del
3	902	Maximum kW-Del	7	907	Prev Int Dmd kW-Del
4	904	Total kVARh-Del			

ALPHA METER STATISTICS REPORT

Cust Name: TIKA INC Box Date: 05/24/2000
 Gen Order# TPA2294 000001 Mfg Order# M828590 Cust Order# C213370

Form: Class: CL20 TA: 2.5 TV: 120 Kh: 1.800 P/R: 24
 Style: P3202000 Type: A1R

Serial Number	LFL	LPF	MFL	MPF	RFL	RPF	CVARFL
KZG003061745	99.997	99.970	99.997	100.030	100.027	100.003	100.037
KZG003061746	99.980	100.030	100.007	100.050	100.003	100.020	100.012
KZG003061747	99.977	100.020	99.997	100.033	100.003	100.017	100.026
Mean	99.984	100.007	100.000	100.038	100.011	100.013	100.025
Std Deviation	0.009	0.026	0.005	0.009	0.011	0.007	0.010