GEI-52590

Fitzall™ Operating Guide
For kV™ Meter

Description

Instructions

Site Analysis Guides

Notice

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- First 6/99

FCC COMPLIANCE STATEMENT

This product generates and uses radio frequency energy. It has been tested and verified that it complies with the limits for the Code of Federal Regulations (CFR) 47, Part 15 — Radio Frequency Devices, Subparts A — General and B — Unintentional Radiators issued by the Federal Communications Commission for Class “B” digital devices. If, however, the product causes radio or television interference, notify:

Manager - Technology
General Electric Company
130 Main Street
Somersworth, NH 03878 - 3194

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Meter Form	2W-1ϕ	3W-1ϕ	3W-Net	3W-Δ	4W-Y	4W-Δ
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16S	**23**	**24,**25	**26**	**27**	**28**	**29**

Page numbers in **bold** adhere to Blondel's Theorem for optimum metering accuracy

INTRODUCTION TO GE's kV FITZALL™ METERS

kV Fitzall™ meters help minimize inventory costs by allowing only two meter forms to meter all electrical services needing three, or fewer, meter elements. In addition, with one class 20 and one class 200 meter in stock, you are prepared to meter virtually any new service – without having to search through inventory for just the right meter form and voltage, or having to wait for a special meter type to be ordered and delivered. kV Fitzall meters are rated 120 to 480 Volts, accommodating 528 Volts continuously, 575 Volts absolute maximum. The kV form 16S is also available in an extended Class 320 rating to measure load currents up to 320 Amperes directly. The kV form 9S, CL20 meter, via instrument transformers, can measure larger loads and higher voltages. Or, if you desire, a CL200 version of the 9S kV meter is available and may be used for both transformer rated and self contained installations (when used with a suitably rated and wired socket), enabling voltage input isolation if desired on 480 V, CL200 applications – without requiring CTs – and reducing inventory to one basic meter type.

MeterMate™ software adapts 3-element kV meters to an appropriate mode of operation for any 2, 3, or 4-wire service. MeterMate allows users to select the service type and number of elements that are to be active in the intended application. The kV meter site analyses and diagnostic functions are simultaneously adapted. Calibration of the meter is unaffected and will maintain accurate metering of any service type available from the choices offered in MeterMate. The final step in a Fitzall application is to mark the Fitzall™ nameplate, indicating the service type and number of active meter elements for that installation.

One of only nine connection arrangements, shown on page 5, will satisfy Blondel's theorem for all new, and many existing, installations. The kV Site Analysis guides in this document (pages 10~29) outline connections for adapting other existing installations.

Traditional metering schemes not satisfying Blondel's theorem have demonstrated acceptable commercial accuracy. *However, to fully realize the superior accuracy of electronic electricity meters, use Blondel metering solutions everywhere practical*. **Keep electrical energy the most accurately measured common commodity**.

Application / Installation Procedure:

Step 1: Install a kV Fitzall meter in a socket suitably rated and wired for the application.

(See the application guides on pages 5,6, and 10~29)

Step 2: Use MeterMate programming software (MMDOS) to fully program the meter, then use the ***P****rogram*, *ser****V****ice* commands to configure the meter appropriately and ensure proper operation for the electrical service being metered.

(See Fitzall and MeterMate - Operating Tips, on page 31)

Step 3: Mark the Fitzall nameplate to indicate the service type and number of active metering elements.

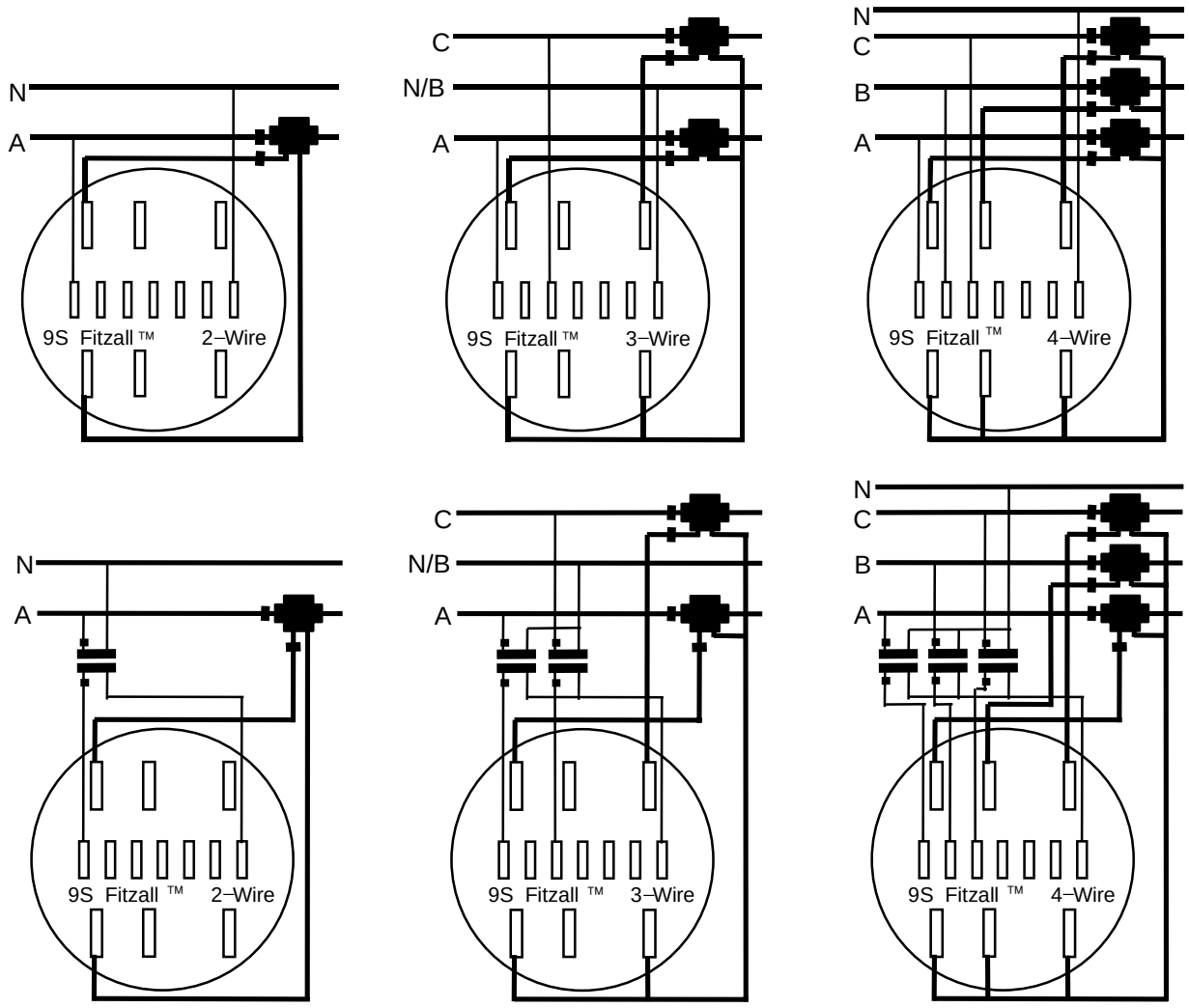
CT

VT

All applications meet BLONDEL solution requirements.

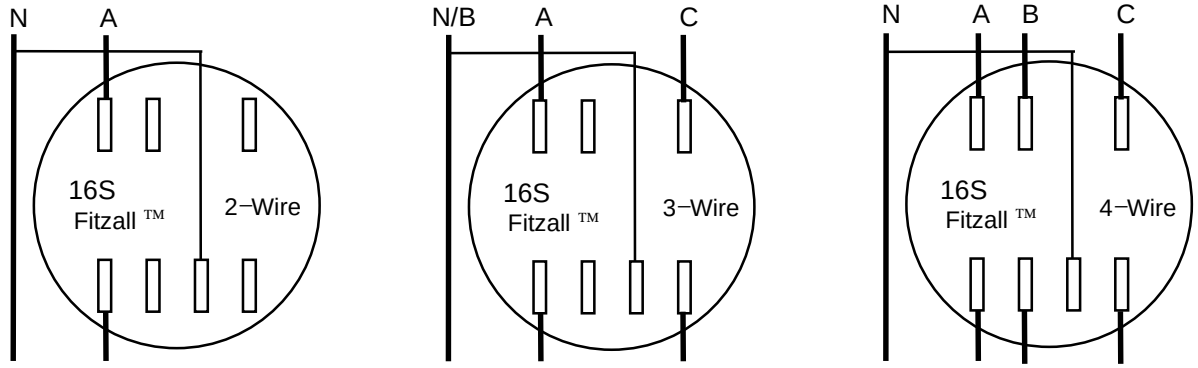
GE kV Fitzall™ Transformer Rated

9S Class 20 1,2, & 3 Phase 2,3, & 4 Wire Network, Y, & Δ



GE kV Fitzall™ Self-Contained

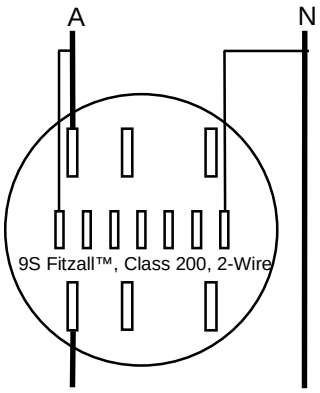
16S Class 200 or 320 1,2, & 3 Phase 2,3, & 4 Wire Network, Y, & Δ

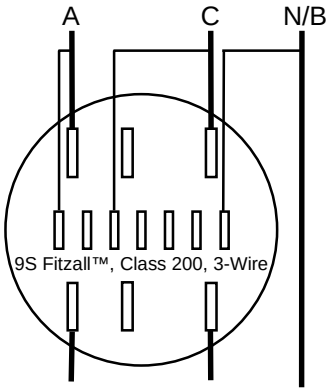


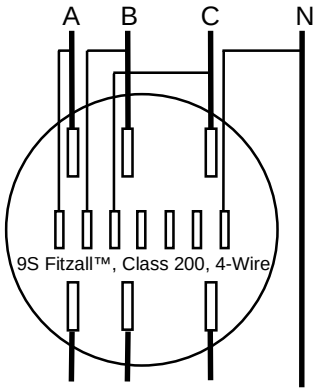
Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

All applications meet BLONDEL solution requirements.

GE kV Fitzall™ Self-Contained
(with separate voltage inputs)
9S Class 200 1,2, & 3 Phase 2,3, & 4 Wire Network, Y, & Δ

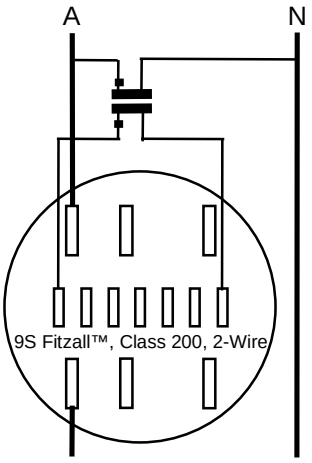


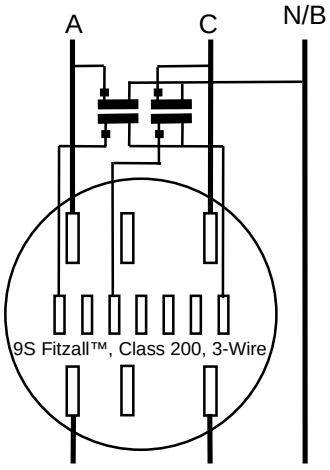


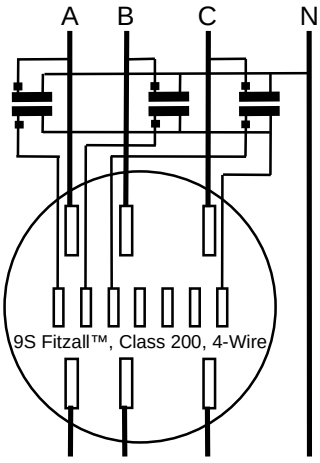


Without voltage transformers

Caution: Class 200, Form 9S kV meters must be installed in a suitably rated and wired socket







With voltage transformers

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

Fitzall™ Operation of the kV Meter

Simply choose the service type and number of active elements using MeterMate™ programming software, wire the socket appropriately for the service to be metered, and mark a special Fitzall™ nameplate to identify the intended/programmed operating mode of the kV Fitzall meter. MeterMate™ does the rest. It makes your three element GE type kV vector electricity meter use the appropriate Method of Operation (MO) from its digital signal processor's ROM repertory, ensuring proper metering and diagnostic operation for the intended application.

FORM	ELE	4W-Y	4WΔ	3W-Δ	3W-Network	3W-1ϕ	2W-1ϕ
9	3	MO 9-6	MO 9-6				
9	2-1/2	MO 36-2					
9	2	MO 45-3	MO 45-3	MO 45-0	MO 45-4	MO 45-4	
9 or 16	1					MO 2-1	MO 3-5
16	2			MO 12-0	MO 12-4	MO 12-4	
16	3	MO 16-6	MO 16-6				

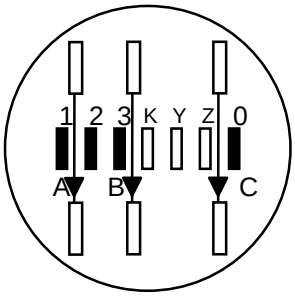
Voltage and Current Sensing Symbols

In kV socket type meters, each voltage is the potential difference between two voltage sensing blades. A solid rectangle (see diagrams below) is the symbol for a voltage sensing blade. For telling one voltage sensing blade from another, each has a number (0, 1, 2, or 3).

In kV socket type meters, each current is sensed in a conductive circuit between two blades. A line with an arrowhead on one end indicates the conductor between those two blades. The blades are symbolized by rectangular outlines. The solid arrowhead indicates the sense of positive current. To tell one current from another, each has a letter (A, B, or C.)

Some forms of kV socket type meters have blades which are utilized for voltage sensing and are part of a current sensor also. The Form 16S diagram below shows just such an arrangement. In this diagram the upper blade has the added function of being a voltage sensing blade. That is what is implied by the rectangle being solid.

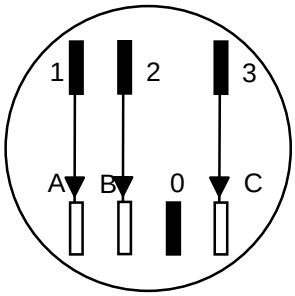
Form 9S



Fitzall™ Instantaneous Power

$$p_A = e_A \times i_A$$
$$p_B = e_B \times i_B$$
$$p_C = e_C \times i_C$$
$$p_{TOTAL} = p_A + p_B + p_C$$

Form 16S



9&16	**MO 45&12 – 0**	$e_A = [2(e_1 - e_0) - (e_3 - e_0)]/3$, $e_B = -[(e_1 - e_0) + (e_3 - e_0)]/3$, $e_C = [2(e_3 - e_0) - (e_1 - e_0)]/3$, $i_B = -(i_A + i_C)$
9&16	**MO 2 – 1**	$e_A = (e_1 - e_0)/2$, $e_B = 0$, $e_C = (e_0 - e_1)/2$, $i_B = 0$
9	**MO 36 – 2**	$e_A = e_1 - e_0$, $e_B = -[(e_1 - e_0) + (e_3 - e_0)]$, $e_C = e_3 - e_0$
9	**MO 45 – 3**	$e_A = (e_1 - e_0) - (e_2 - e_0)$, $e_B = 0$, $e_C = e_3 - e_0$, $i_B = 0$
9&16	**MO 45&12 – 4**	$e_A = e_1 - e_0$, $e_B = 0$, $e_C = e_3 - e_0$, $i_B = 0$
9&16	**MO 3 – 5**	$e_A = e_1 - e_0$, $e_B = 0$, $e_C = 0$, $i_B = 0$, $i_C = 0$
9&16	**MO 9&16 – 6**	$e_A = e_1 - e_0$, $e_B = e_2 - e_0$, $e_C = e_3 - e_0$

Using the kV Site Analysis Guides

The following kV Site Analysis guides are designed to help users correctly apply the kV Fitzall™ meter in a particular application. The numbered references below correspond to the identifying numbers on the following page.

1. Identifies this as a special Fitzall application.
2. Notes the type of meter forms that may have been used for this application in the past, and may be replaced by using the kV Fitzall meter.
3. Indicates whether most existing installations would need to be rewired or not.
4. Identifies the service type for this application.
5. Shows the CT connections from the service to the kV meter.*
6. Shows the VT connections from the service to the kV meter.*
7. Where shown, identifies this application as an application that meets the criteria of Blondel's Theorem - assuring optimum metering accuracy.
8. Phasor diagrams for the service voltages and currents, assuming unity power factor for a balanced three phase load, with A-B-C phase sequence on top and C-B-A phase sequence on the bottom.
9. Phasor diagrams for the meter voltages and currents, assuming unity power factor for a balanced three phase load, with A-B-C phase sequence on top and C-B-A phase sequence on the bottom.
10. Identifies the proper serVice command selection in MMDOS (MeterMate Meter Comm).
11. Suggests the appropriate Fitzall Nameplate markings for SERVICE and ELEMENTS.

* Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

Fitzall™ Application

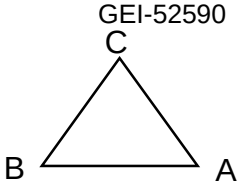
Typically replaces Form:

5S, 35S, 45S, 26S Applications

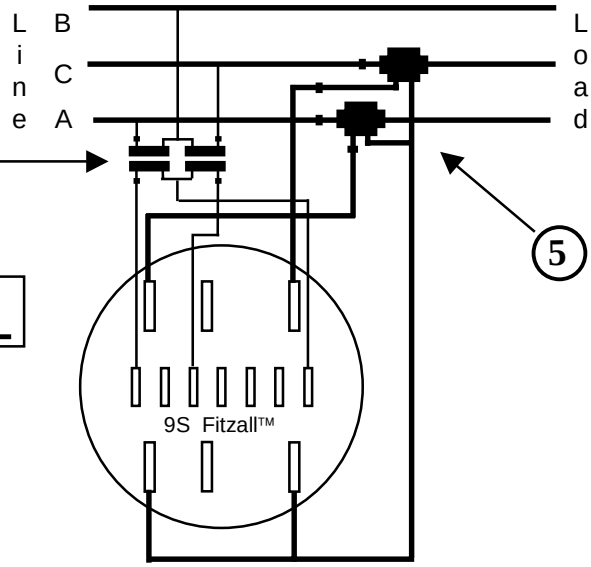
Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

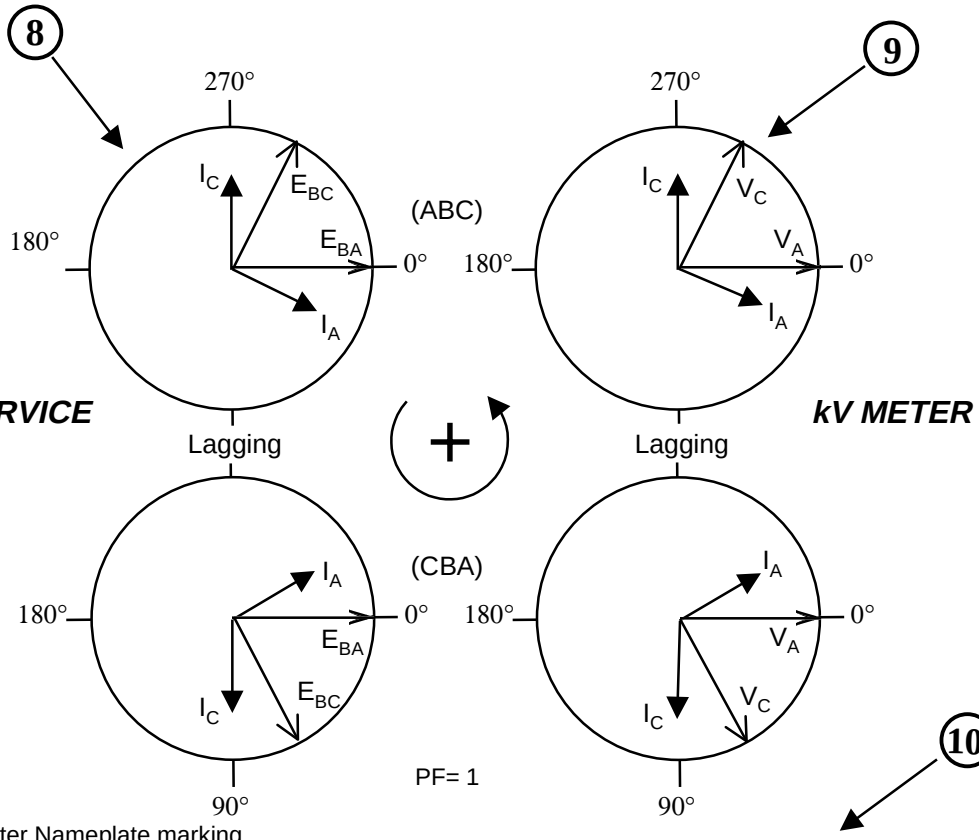
GEI-52590



3-Wire, Delta



BLONDEL solution



Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: 4Y 4Δ (3Δ) 3N 3W 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

PF= 1

MeterMate™ *serVice* Selection:

3-wire, 3-phase, 2-element

MO 45-0

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

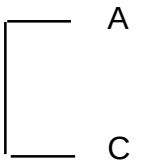
Fitzall™ Application

Typically replaces Form:

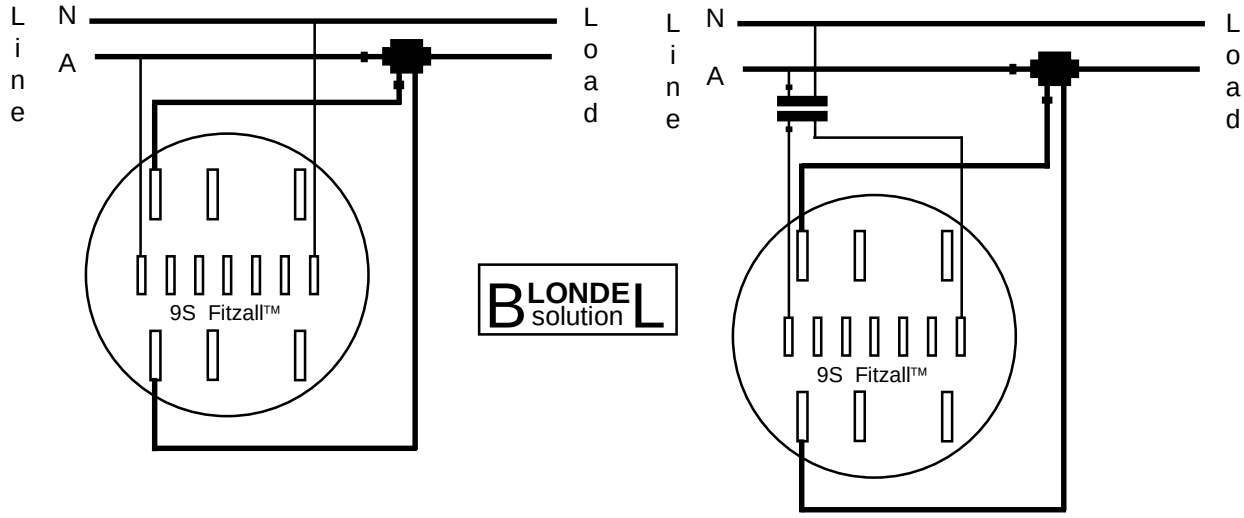
3S Applications

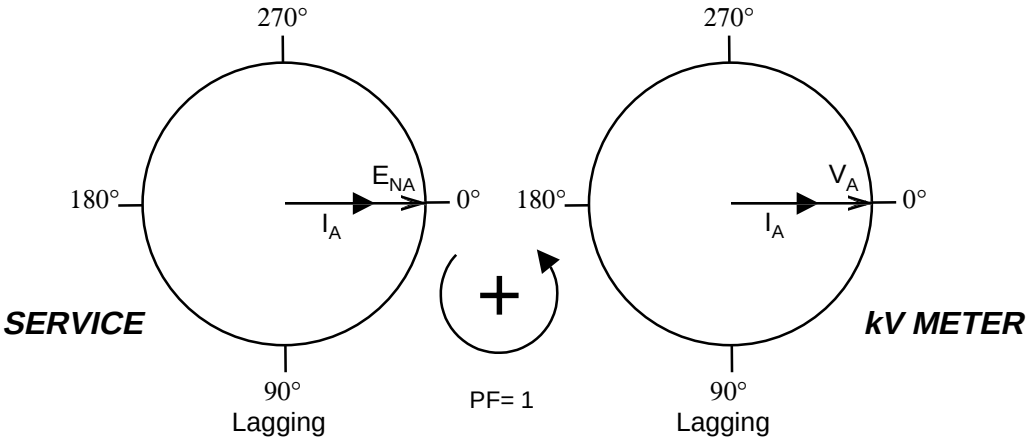
Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



2-Wire
Singlephase





SERVICE ***kV METER***

Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5
SERVICE: 4Y 4Δ 3Δ 3N 3W (2W)
ELEMENTS: 3 21/2 2 (1)
744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

2-wire, 1-phase, 1-element

MO 3-5

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

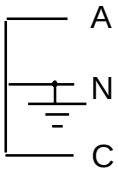
Fitzall™ Application

Typically replaces Form:

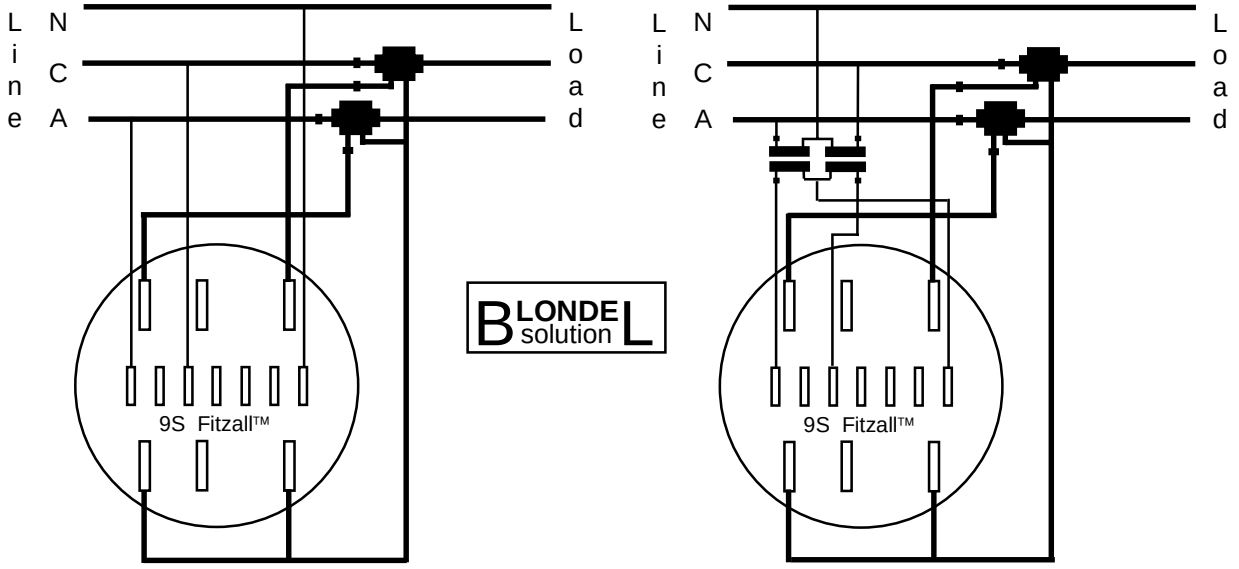
5S, 35S, & 45S Applications

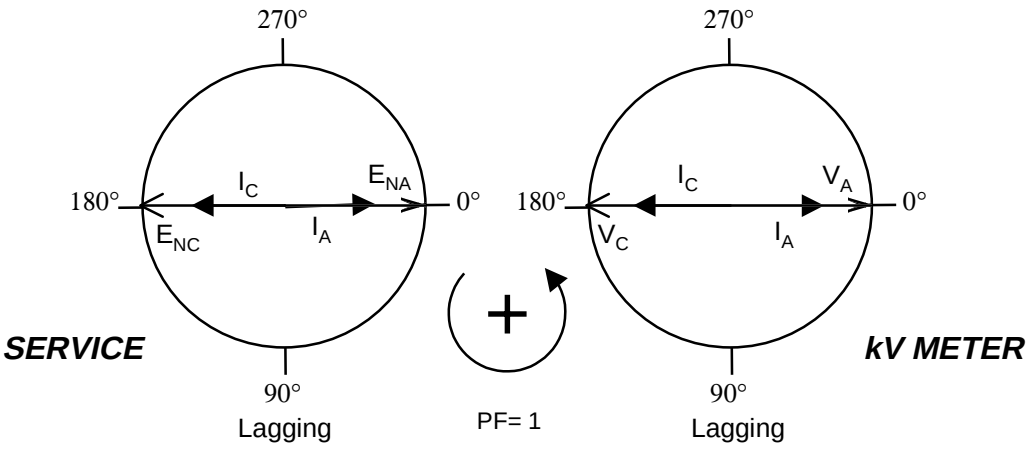
Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



3-Wire Singlephase





SERVICE ***kV METER***

Lagging PF= 1 Lagging

Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: 4Y 4Δ 3Δ 3N (3W) 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-wire, 1-phase, 2-element

MO 45-4

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

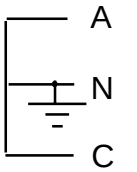
Fitzall™ Application

Typically replaces Form:

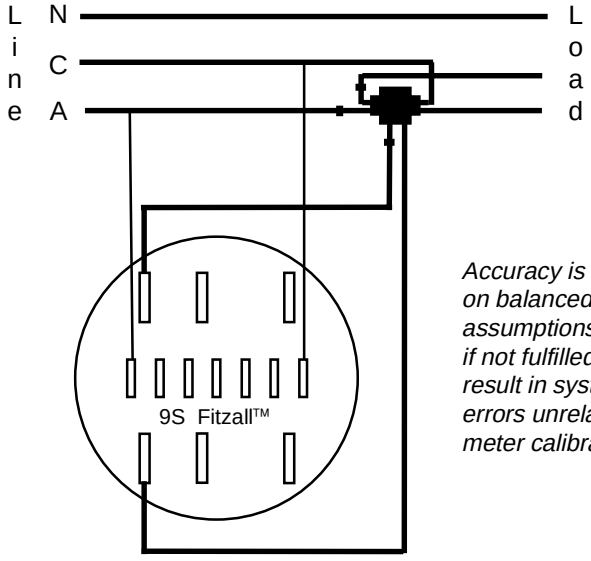
3S Applications

Using connection diagram on this page.

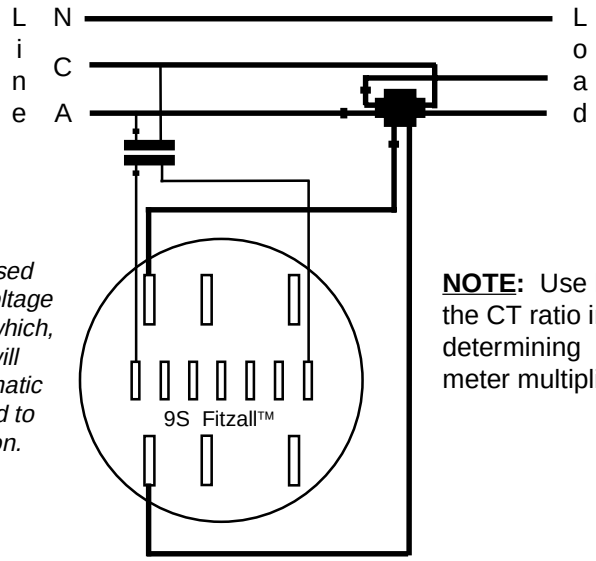
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



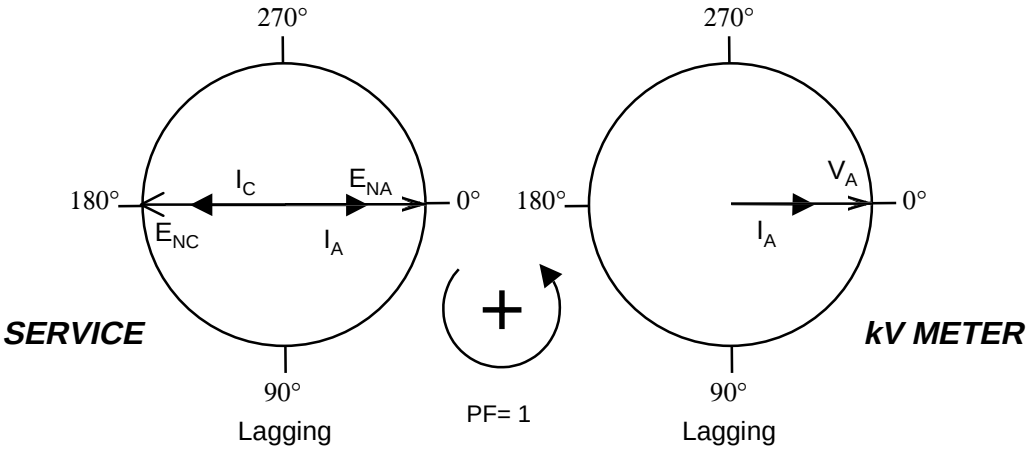
3-Wire Singlephase



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.



NOTE: Use half the CT ratio in determining meter multiplier.



Note: The three-wire circuit is summed in the transformers, thus allowing a 2-wire MeterMate serVice selection.

Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5
SERVICE: 4Y 4Δ 3Δ 3N (3W) 2W
ELEMENTS: 3 21/2 2 (1)
744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

2-wire, 1-phase, 1-element

MO 3-5

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

Fitzall™ Application

Typically replaces Form:

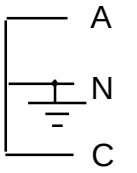
4S Applications

Using connection diagram on this page.

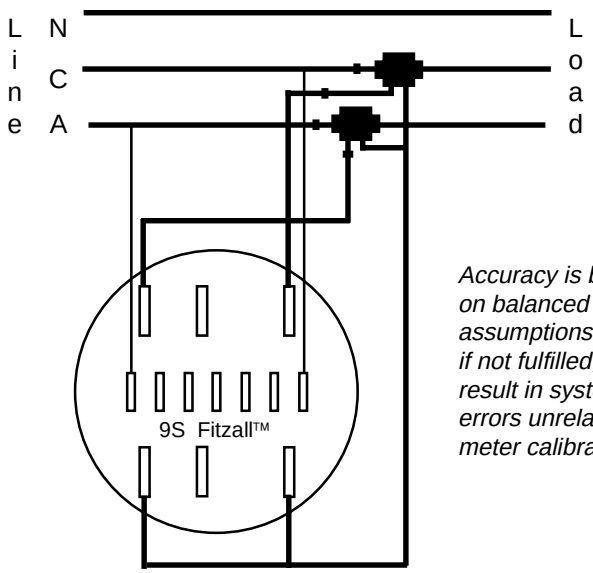
Most old installations:

☒ ***Need rewiring***

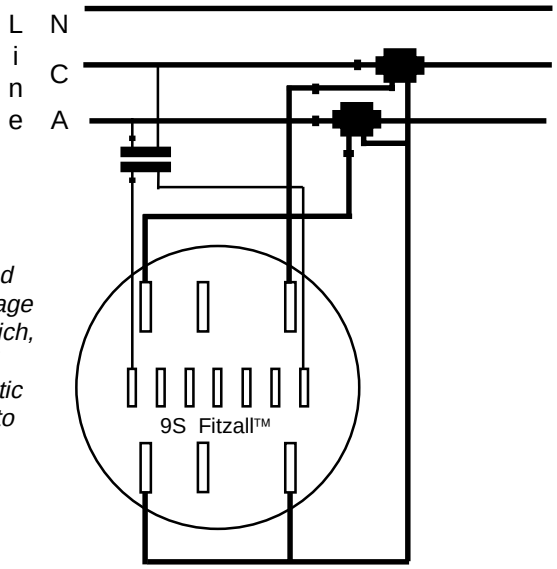
☐ ***Need no wiring change***

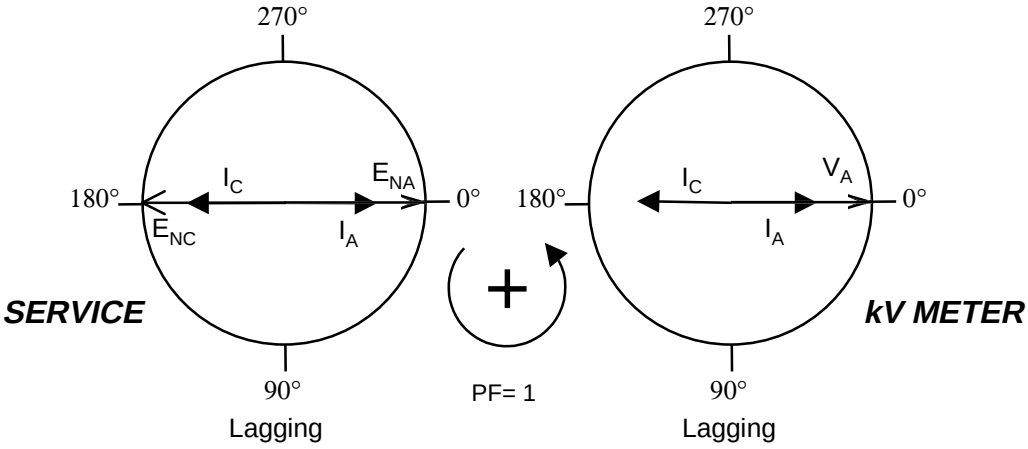


3-Wire Singlephase



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.





Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: 4Y 4Δ 3Δ 3N (3W) 2W

ELEMENTS: 3 21/2 2 (1)

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-wire, 1-phase, 1-element

MO 2-1

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

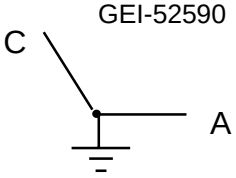
Fitzall™ Application

Typically replaces Form:

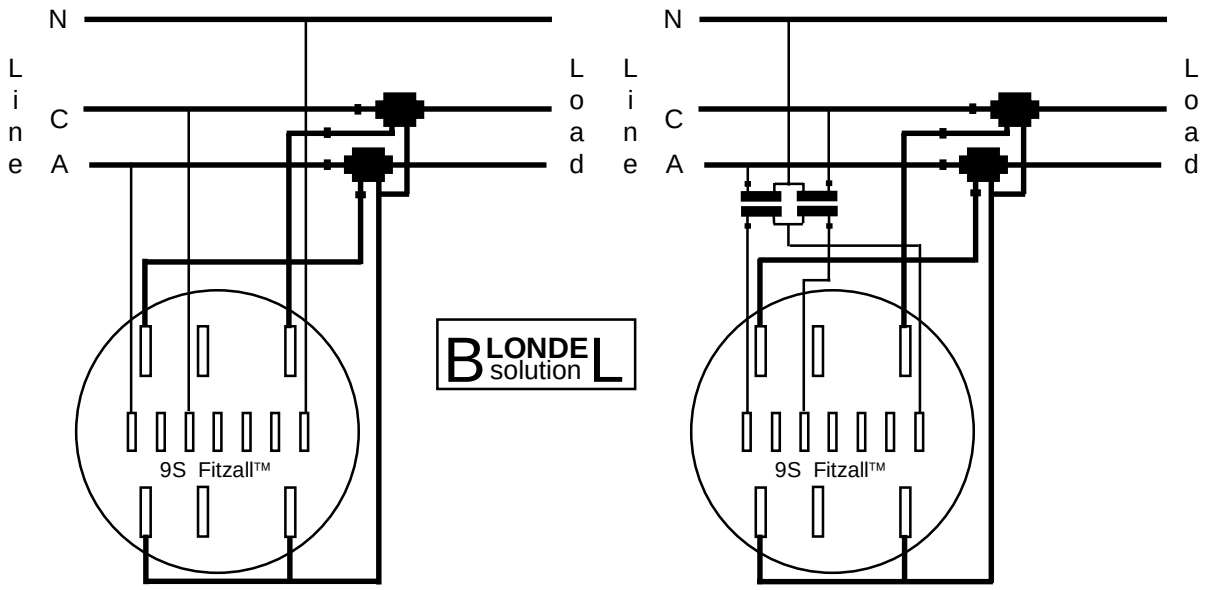
5S, 35S, 45S Applications

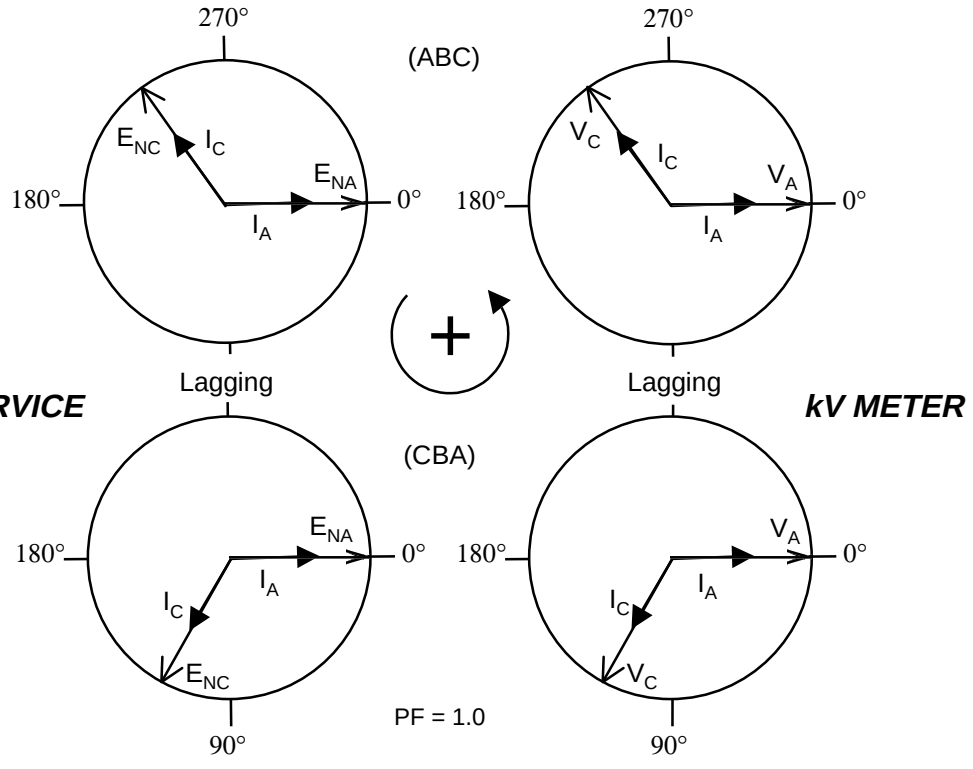
Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



Network





Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: 4Y 4Δ 3Δ (3N) 3W 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-wire, Network, 2-element

MO 45-4

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

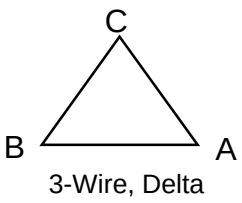
Fitzall™ Application

Typically replaces Form:

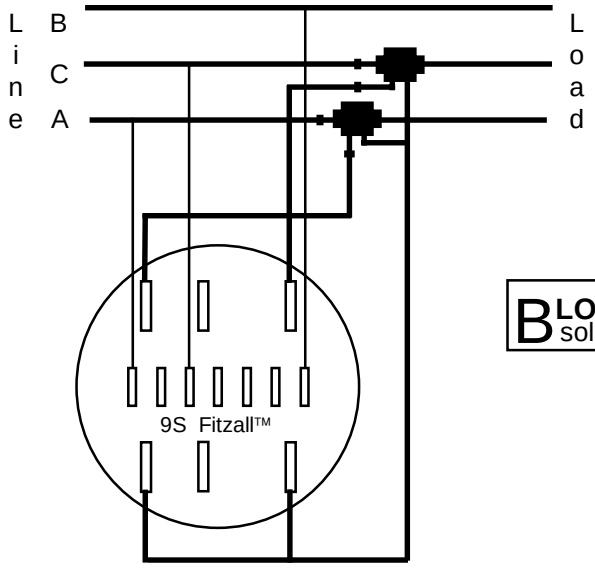
5S, 35S, 45S, 26S Applications

Using connection diagram on this page.

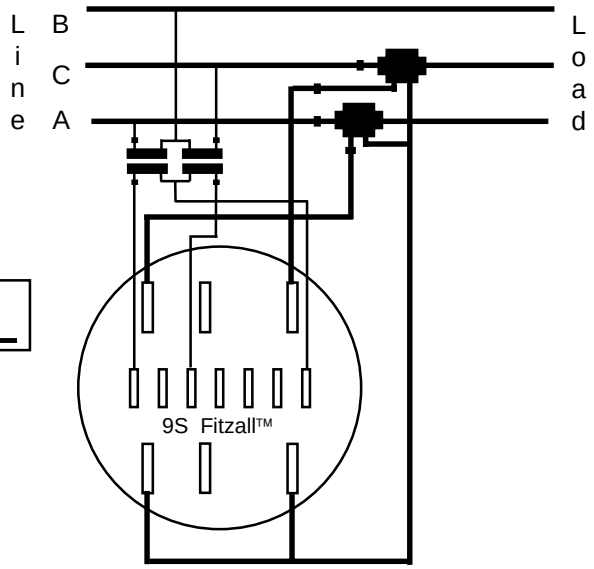
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

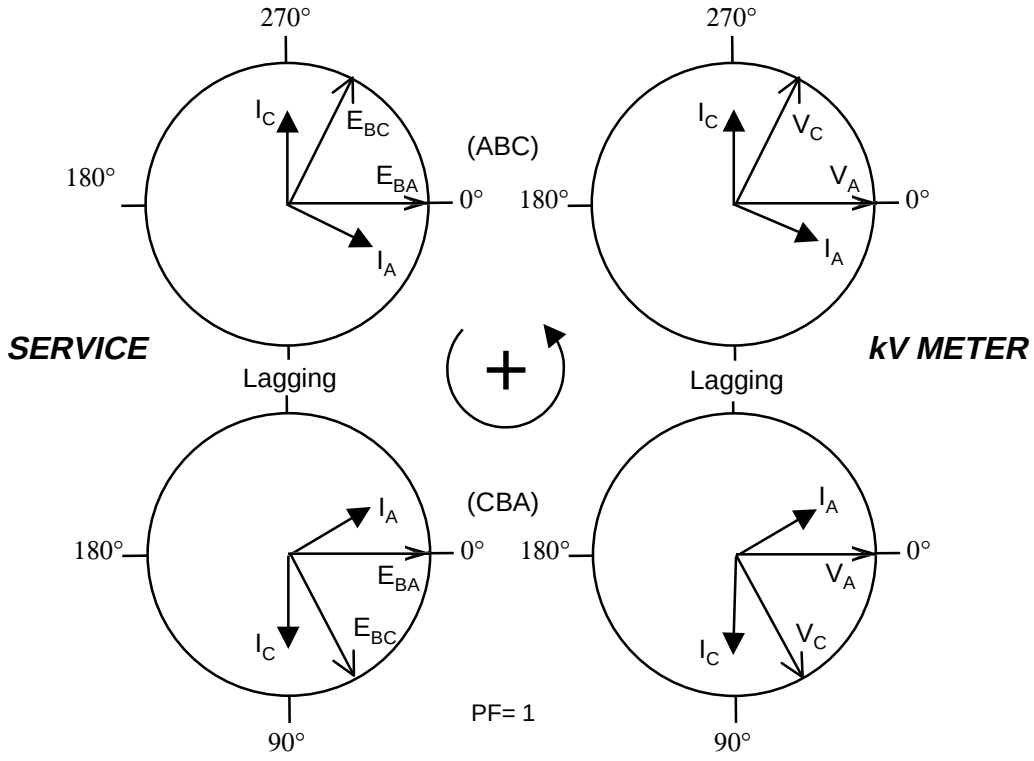


3-Wire, Delta



BLONDEL solution





Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: 4Y 4Δ (3Δ) 3N 3W 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-wire, 3-phase, 2-element

MO 45-0

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

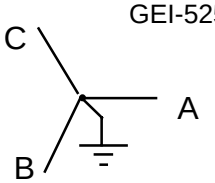
Fitzall™ Application

Typically replaces Form:

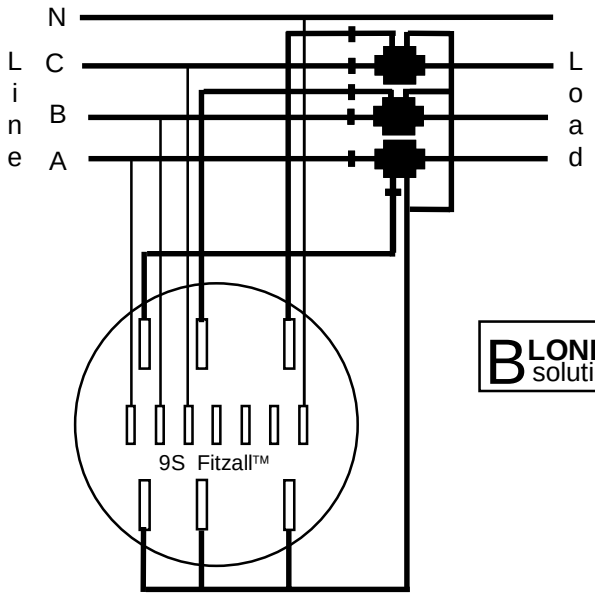
9S Applications

Using connection diagram on this page.

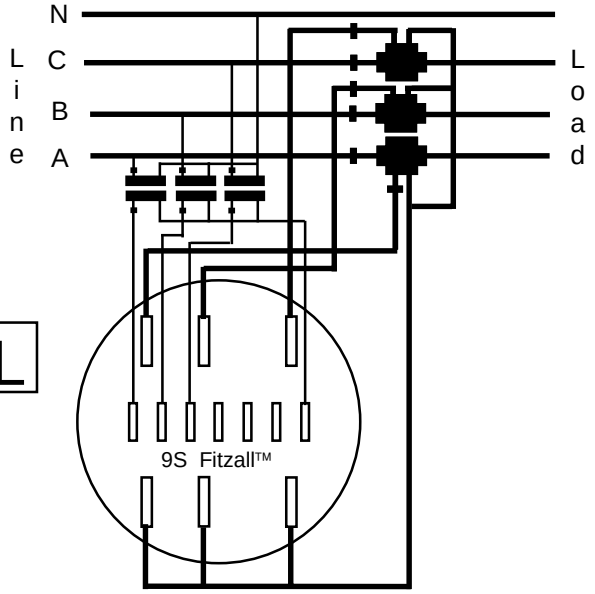
Most old installations: ☐ ***Need rewiring*** ☒ ***Need no wiring change***

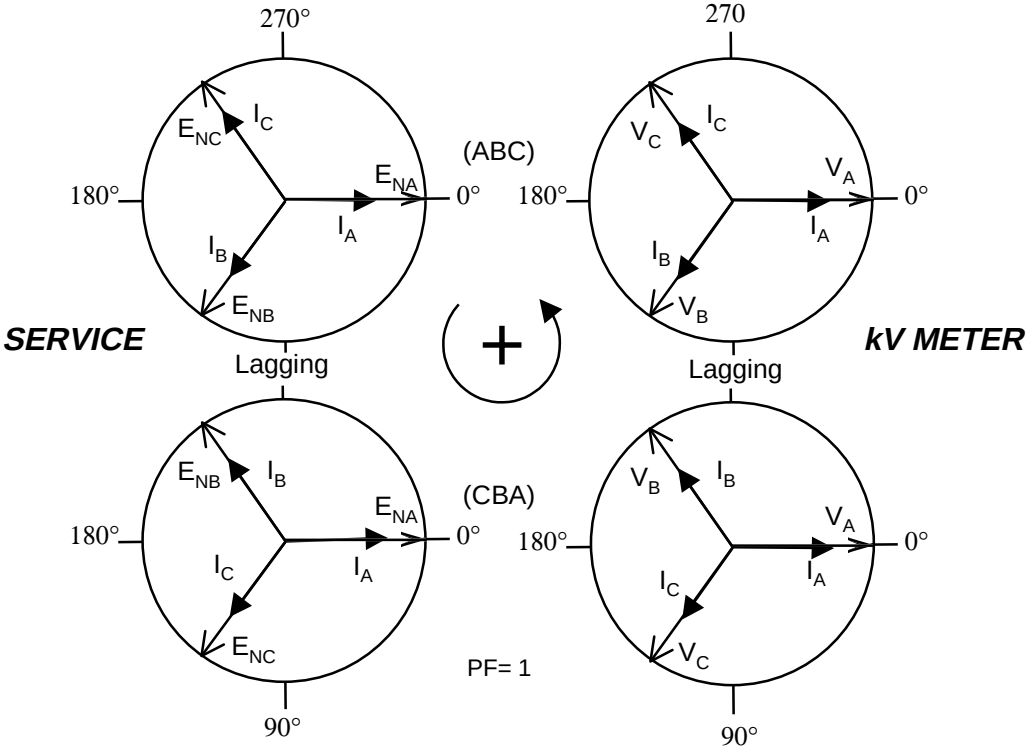


4-Wire, Wye



BLONDEL solution





SERVICE + ***kV METER***

PF= 1

Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: (4Y) 4Δ 3Δ 3N 3W 2W

ELEMENTS: (3) 21/2 2 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-Element Automatic

MO 9-6

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

GEI-52590

kV Site Analysis

Form 9S *(Transformer Rated)*

Fitzall™ Application

Typically replaces Form:

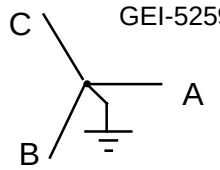
6S, 7S, 29S, 36S Applications

Using connection diagram on this page.

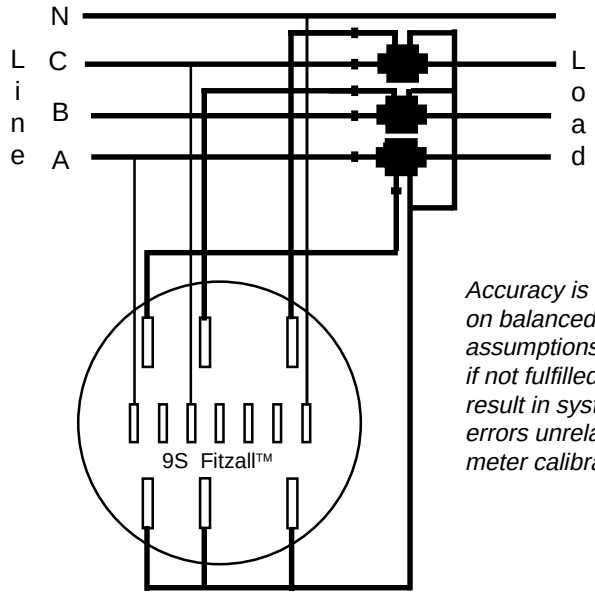
Most old installations: ☒ ***Need rewiring*** *

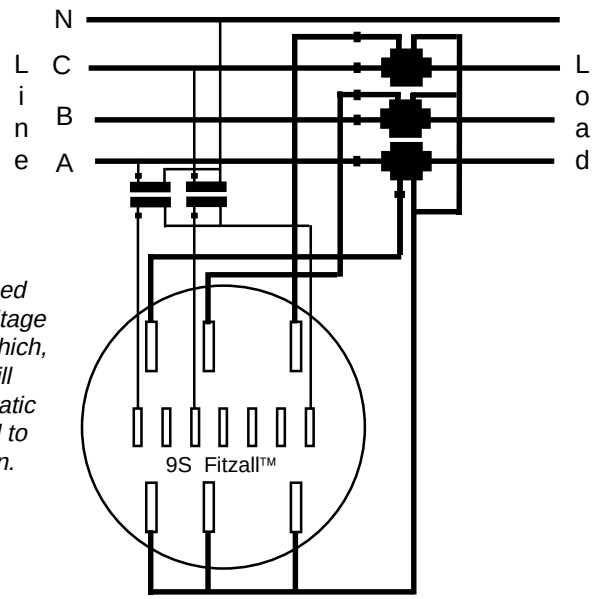
☐ ***Need no wiring change***

*(Except 29S)

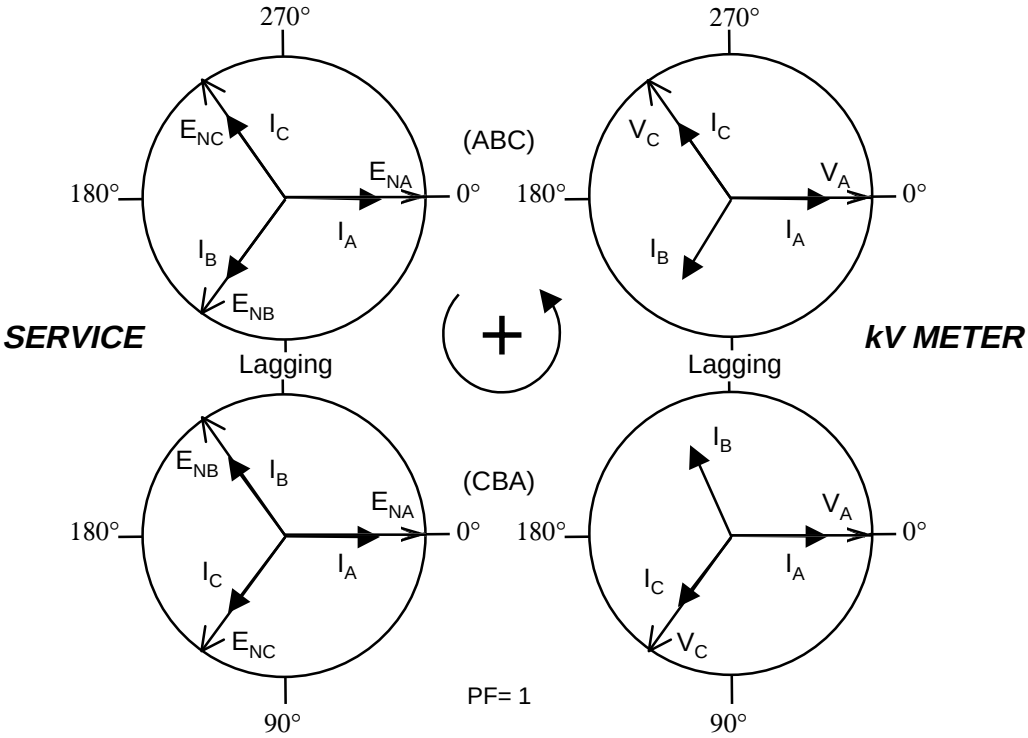


4-Wire, Wye





Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.



Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: (4Y) 4Δ 3Δ 3N 3W 2W

ELEMENTS: 3 (21/2) 2 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

4-wire, wye, 2-1/2-element

MO 36-2

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

GEI-52590

kV Site Analysis

Form 9S *(Transformer Rated)*

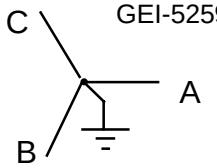
Fitzall™ Application

Typically replaces Form:

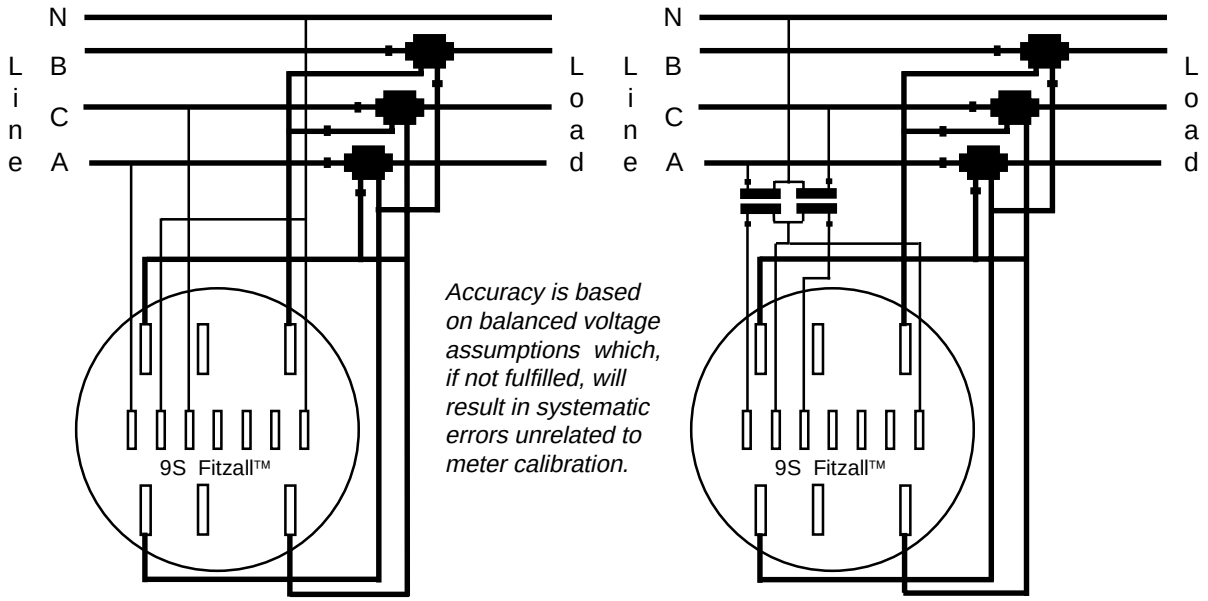
5S, 35S, 45S Applications

Using connection diagram on this page.

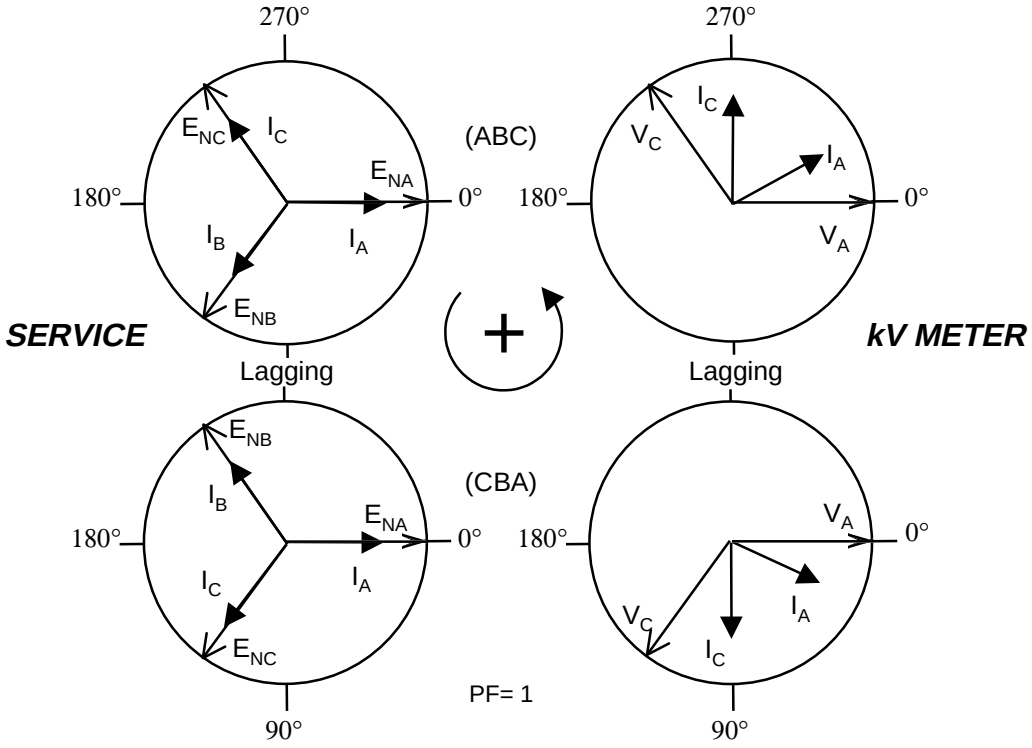
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



4-Wire, Wye



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.



SERVICE + ***kV METER***

Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: (4Y) 4Δ 3Δ 3N 3W 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

4-wire, wye, 2-element

MO 45-3

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

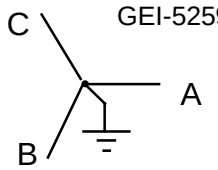
Fitzall™ Application

Typically replaces Form:

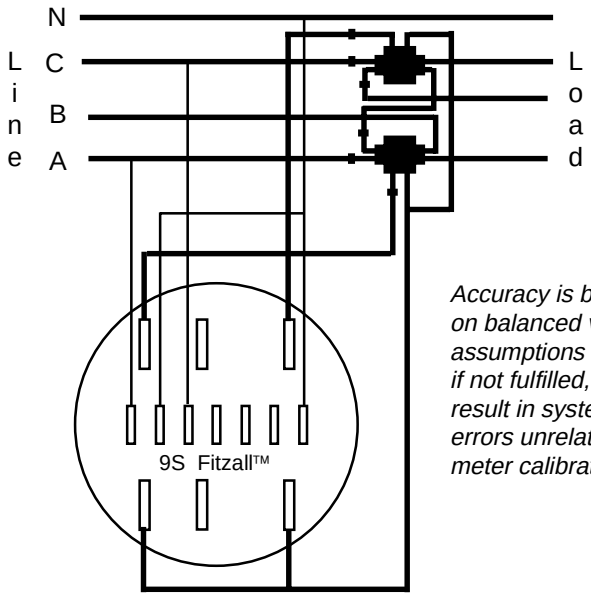
5S, 35S, 45S Applications

Using connection diagram on this page.

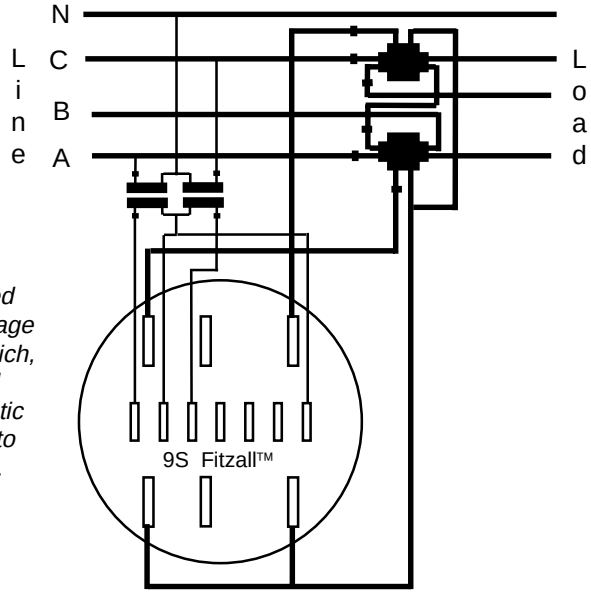
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

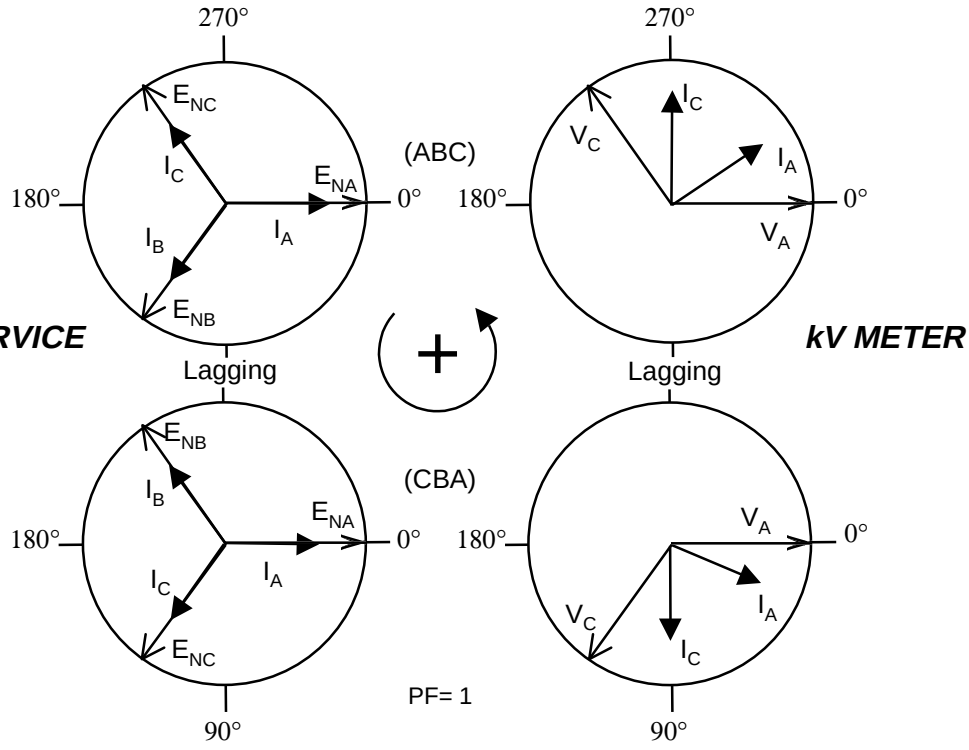


4-Wire, Wye



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.





Meter Nameplate marking

Mult by _____ VTR _____:1 CTR _____:5

SERVICE: (4Y) 4Δ 3Δ 3N 3W 2W

ELEMENTS: 3 21/2 (2) 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

4-wire, wye, 2-element

MO 45-3

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

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kV Site Analysis

Form 9S *(Transformer Rated)*

Fitzall™ Application

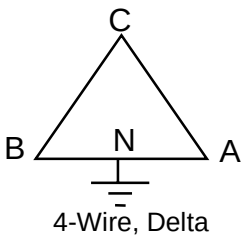
Typically replaces Form:

8S & 9S Applications

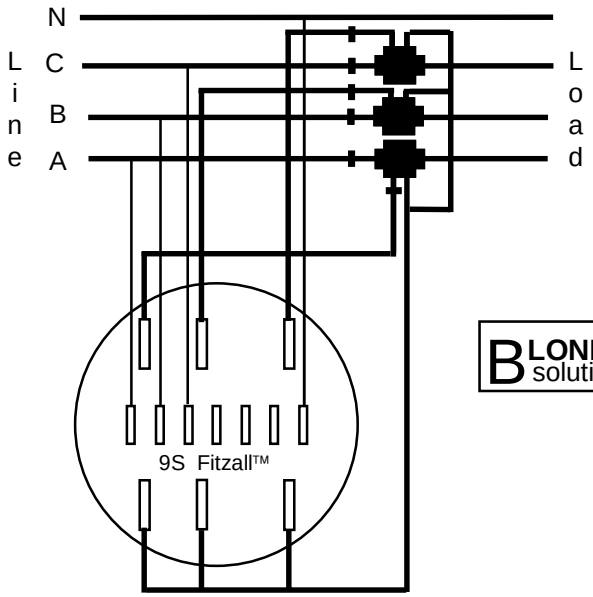
Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** *(8S & VT's)*

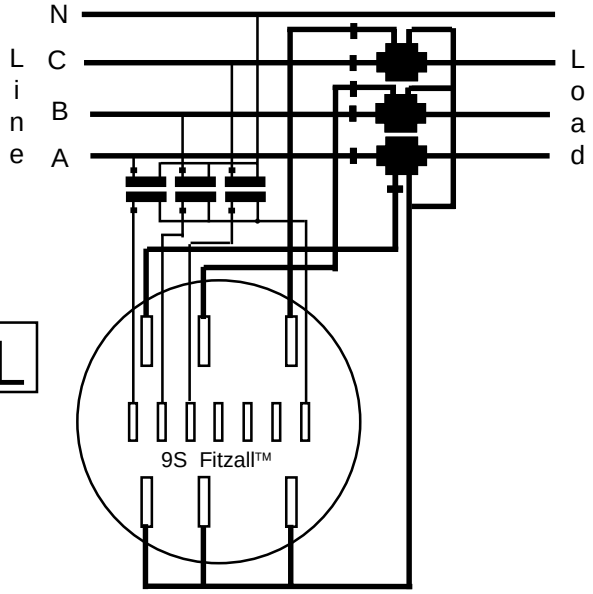
☒ ***Need no wiring change***

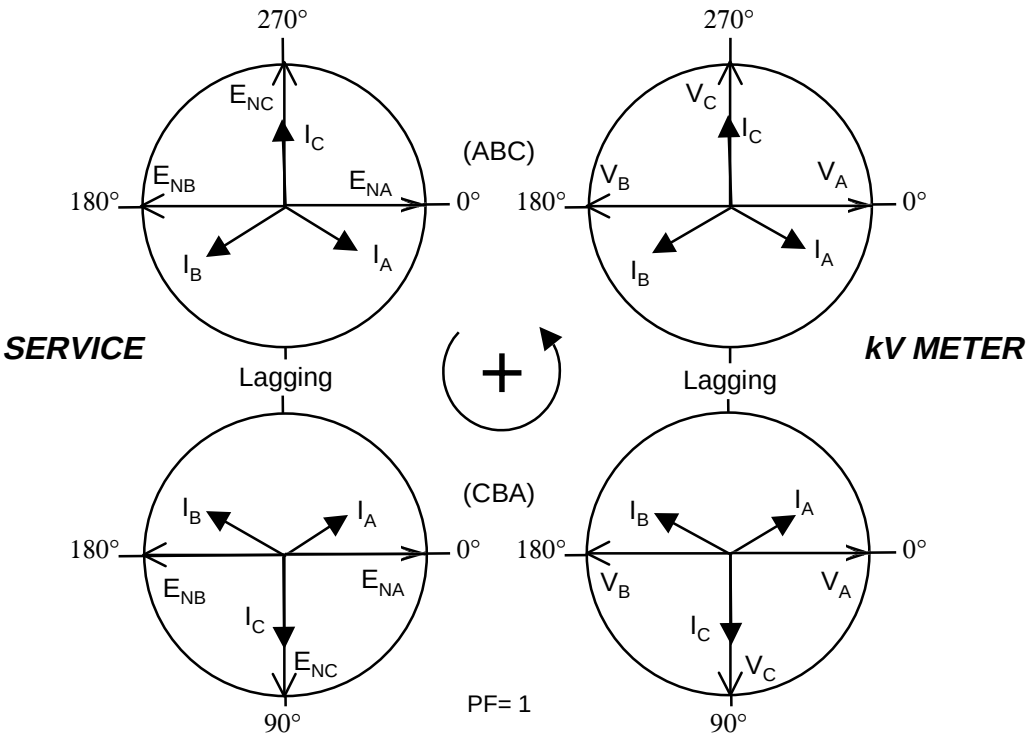


4-Wire, Delta



BLONDEL solution





Meter Nameplate marking

Mult by _____ VTR_____:1 CTR _____:5

SERVICE: 4Y (4Δ) 3Δ 3N 3W 2W

ELEMENTS: (3) 21/2 2 1

744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

3-Element Automatic

MO 9-6

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

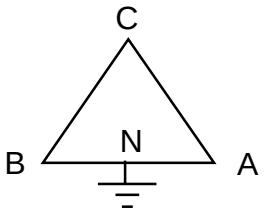
Fitzall™ Application

Typically replaces Form:

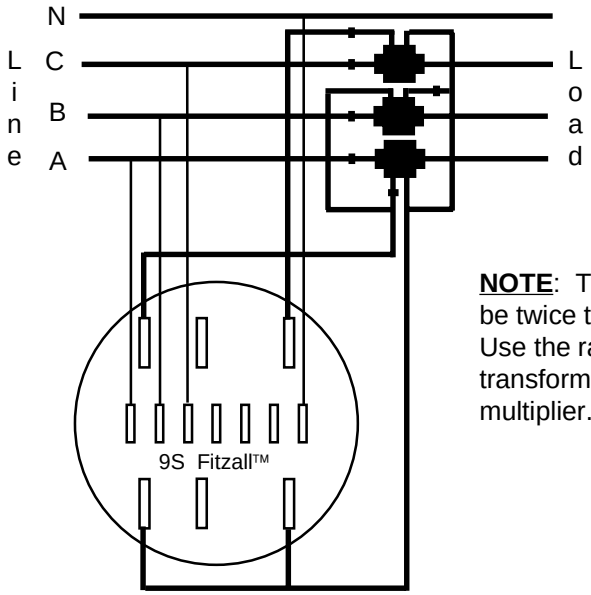
5S, 45S & 26S Applications

Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

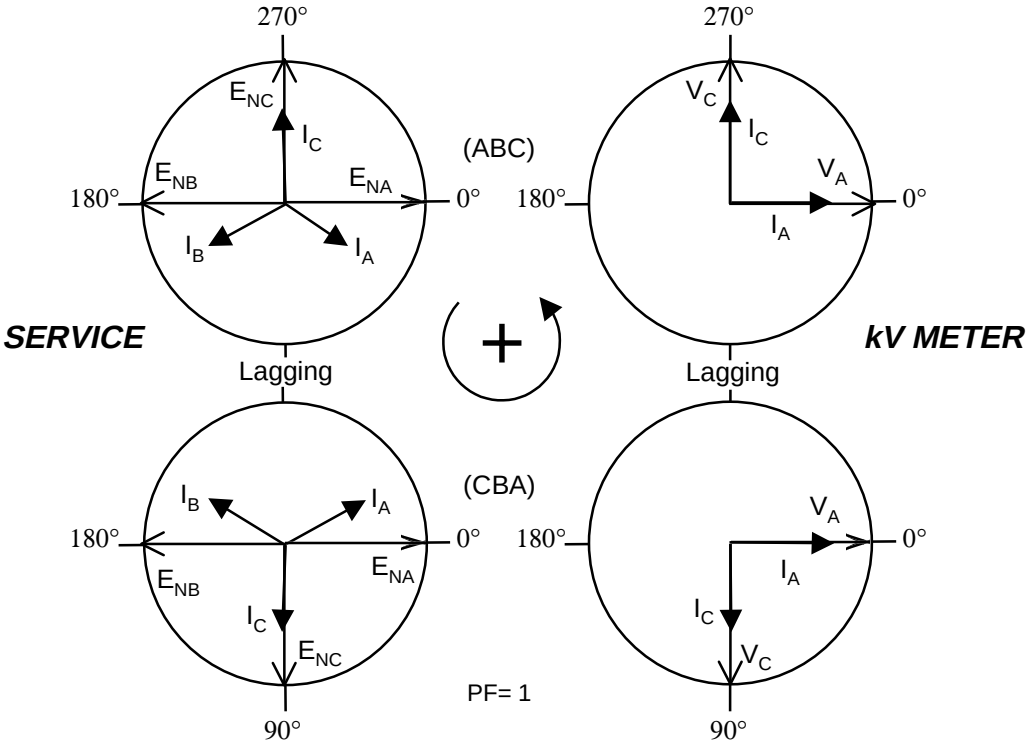


4-Wire, Delta



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.

NOTE: The CTs in lines A & B must be twice the ratio of the CT in line C. Use the ratio of CT in line C as the transformer factor in determining the multiplier.



Meter Nameplate marking

Mult by _____ VTR_____:1 CTR _____:5
SERVICE: 4Y (4Δ) 3Δ 3N 3W 2W
ELEMENTS: 3 21/2 (2) 1
744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

4-wire, delta, 2-element

MO 45-3

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

Form 9S *(Transformer Rated)*

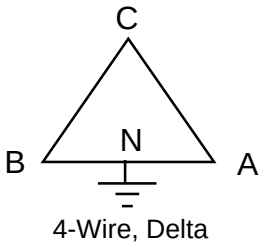
Fitzall™ Application

Typically replaces Form:

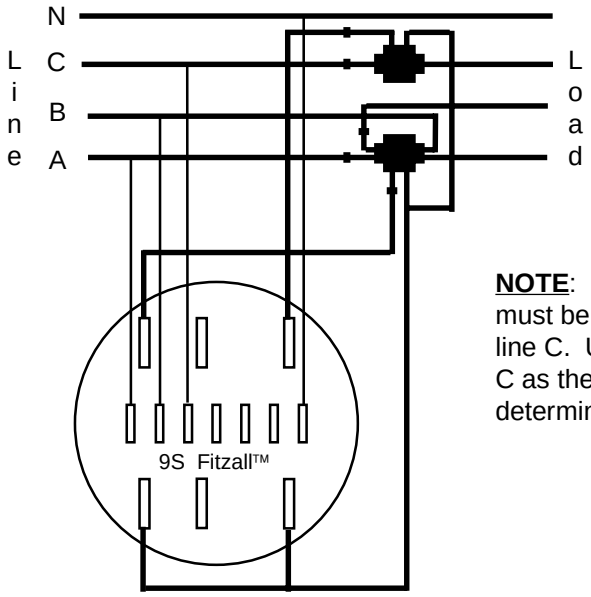
5S, 45S & 26S Applications

Using connection diagram on this page.

Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

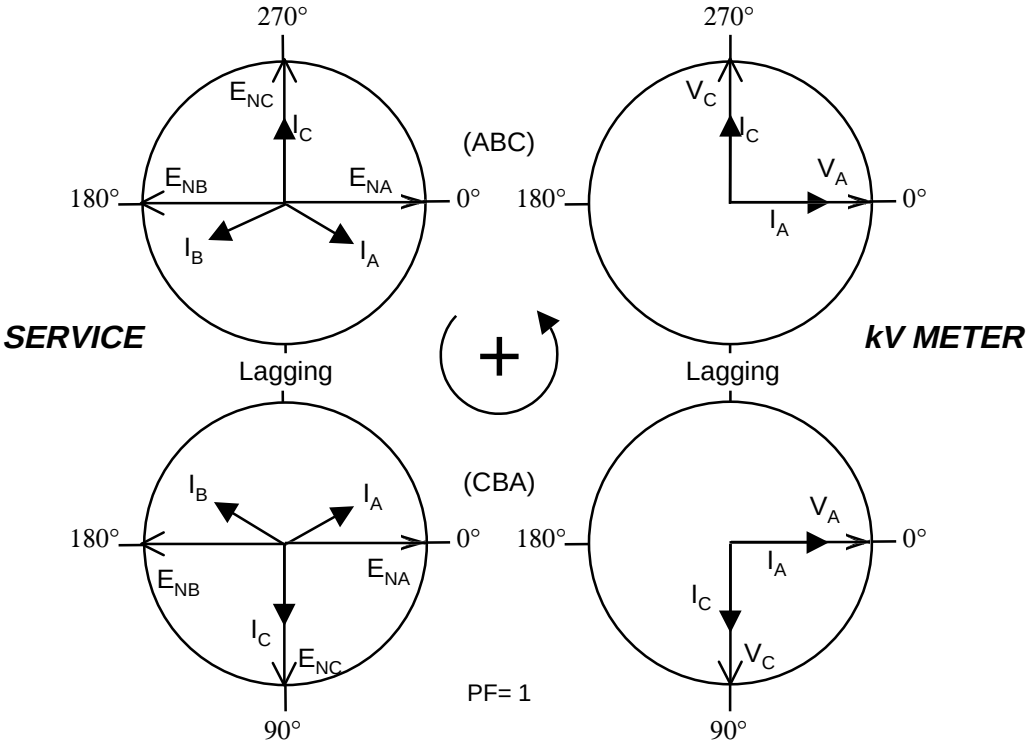


4-Wire, Delta



Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.

NOTE: The CT in lines A & B must be twice the ratio of the CT in line C. Use the ratio of CT in line C as the transformer factor in determining the multiplier.



Meter Nameplate marking

Mult by _____ VTR_____:1 CTR _____:5
SERVICE: 4Y (4Δ) 3Δ 3N 3W 2W
ELEMENTS: 3 21/2 (2) 1
744x9_____ CL 20 120-480V TA 2.5 Kt 0.3

MeterMate™ *serVice* Selection:

4-wire, delta, 2-element

MO 45-3

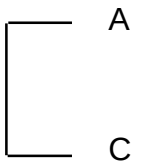
Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

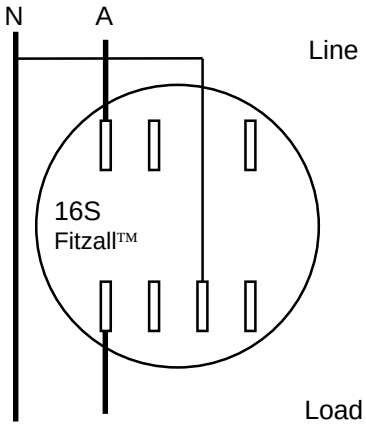
Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
1S Applications
Using connection diagram on this page.

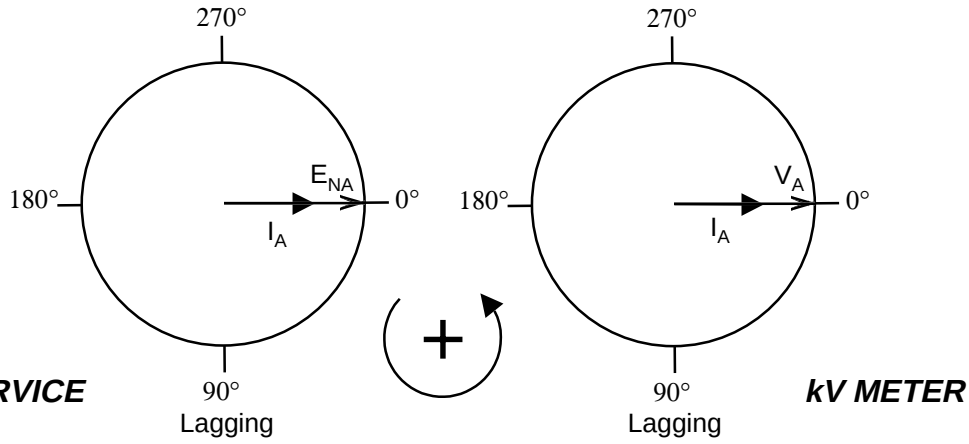
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



2-Wire
Singlephase



BLONDEL solution



PF = 1.0

Meter Nameplate marking

Mult by _____
SERVICE: 4Y 4Δ 3Δ 3N 3W (2W)
ELEMENTS: 3 2 (1)
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

2-wire, 1-phase, 1-element

MO 3-5

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

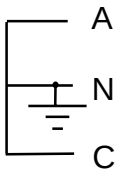
GEI-52590

kV Site Analysis

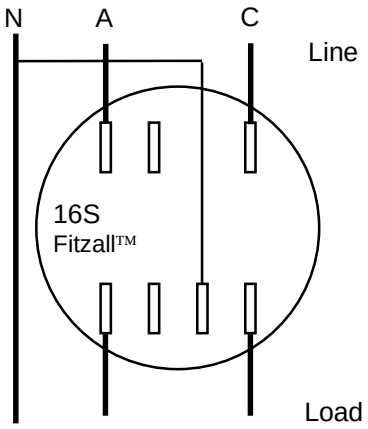
Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
12S, 13S, & 26S Applications
Using connection diagram on this page.

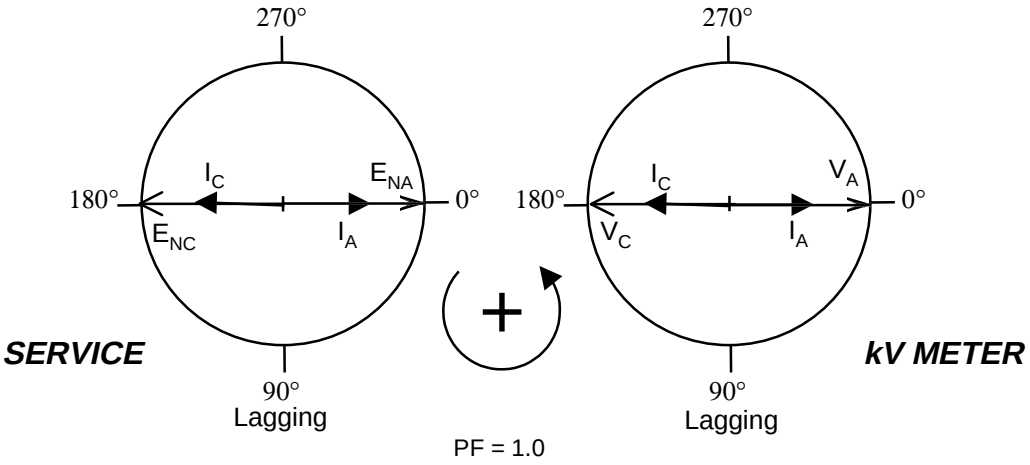
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



3-Wire
Singlephase



BLONDEL solution



PF = 1.0

Meter Nameplate marking

Mult by _____
SERVICE: 4Y 4Δ 3Δ 3N (3W) 2W
ELEMENTS: 3 (2) 1
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-wire, 1-phase, 2-element

MO 12-4

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

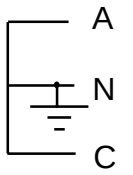
GEI-52590

kV Site Analysis

Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
2S Applications
Using connection diagram on this page.

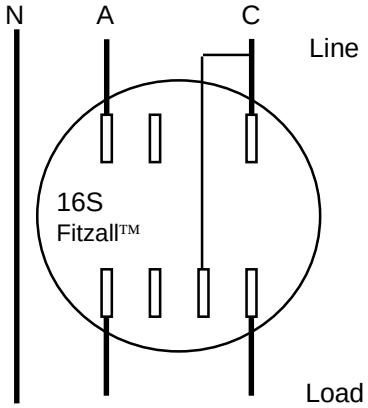
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***

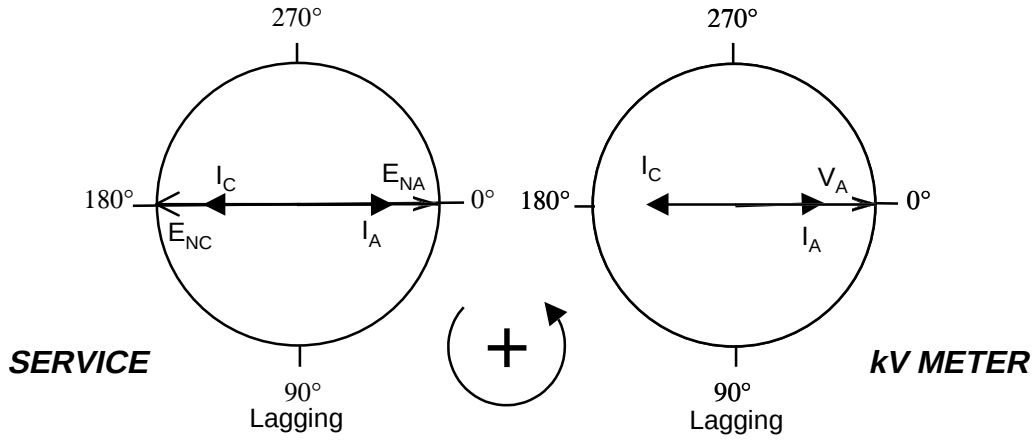


3-Wire
Singlephase

NOT Recommended for new installations --Use 2-element Blondel Solution.

Accuracy is based on balanced voltage assumptions which, if not fulfilled, will result in systematic errors unrelated to meter calibration.





PF = 1.0

Meter Nameplate marking

Mult by _____
SERVICE: 4Y 4Δ 3Δ 3N (3W) 2W
ELEMENTS: 3 2 (1)
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-wire, 1-phase, 1-element

MO 2-1

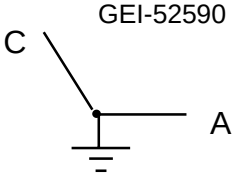
Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

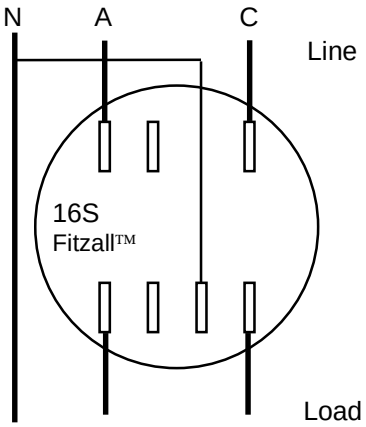
Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
12S,13S, & 26S Applications
Using connection diagram on this page.

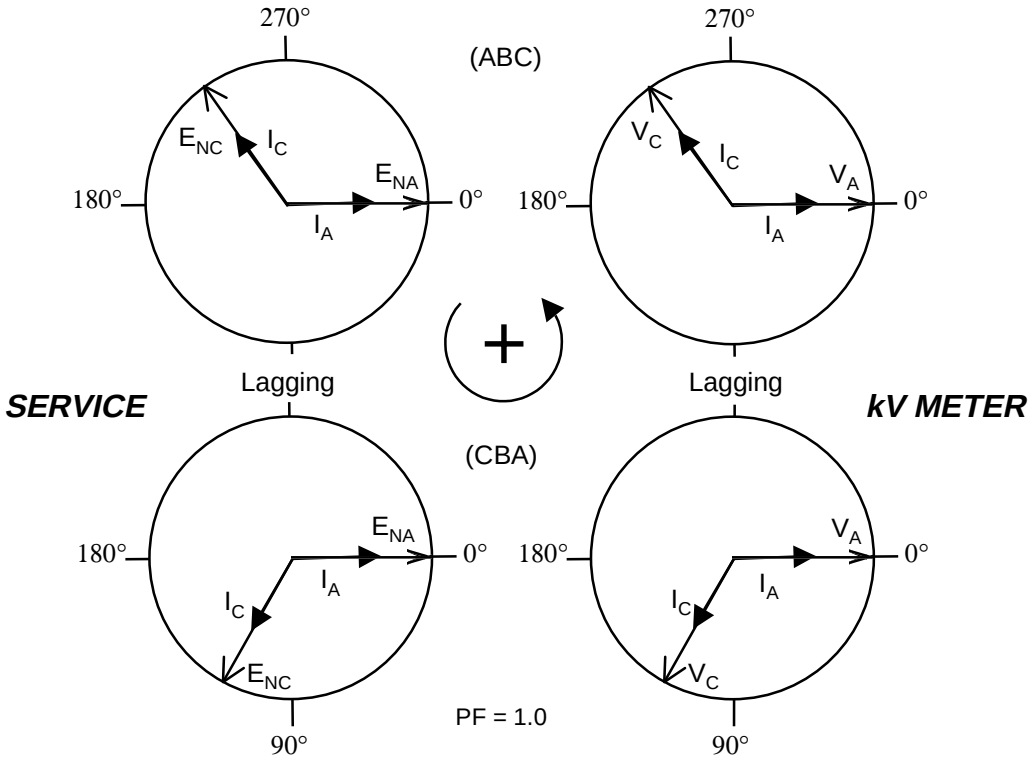
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



Network



BLONDEL solution



Meter Nameplate marking

Mult by _____
SERVICE: 4Y 4Δ 3Δ (3N) 3W 2W
ELEMENTS: 3 (2) 1
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-wire, Network, 2-element

MO 12-4

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

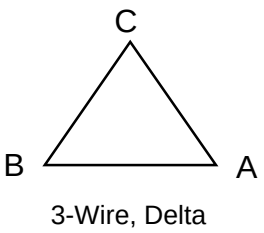
GEI-52590

kV Site Analysis

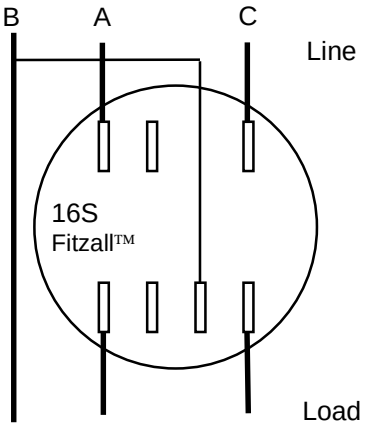
Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
12S, 13S, & 26S Applications
Using connection diagram on this page.

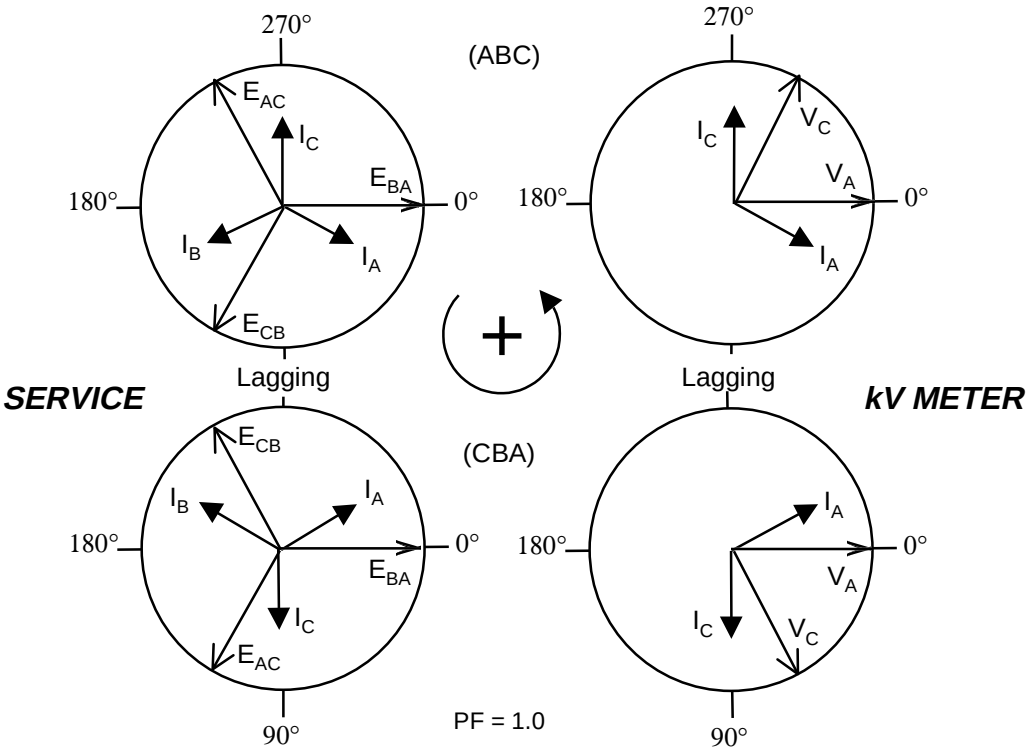
Most old installations: ☒ ***Need rewiring*** ☐ ***Need no wiring change***



3-Wire, Delta



BLONDEL solution



Meter Nameplate marking

Mult by _____
SERVICE: 4Y 4Δ (3Δ) 3N 3W 2W
ELEMENTS: 3 (2) 1
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-wire, 3-phase, 2-element

MO 12-0

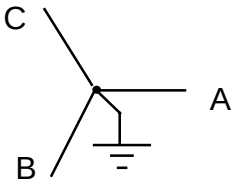
Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

kV Site Analysis

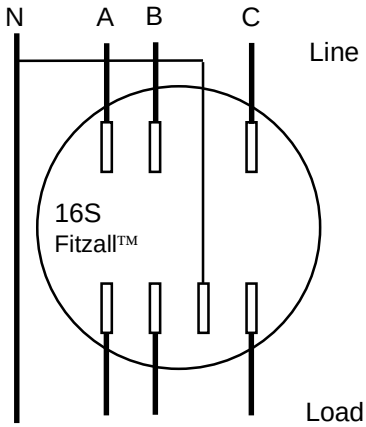
Form 16S *(Self-Contained)*
Fitzall™ Application

Typically replaces Form:
14S & 16S Applications
Using connection diagram on this page.

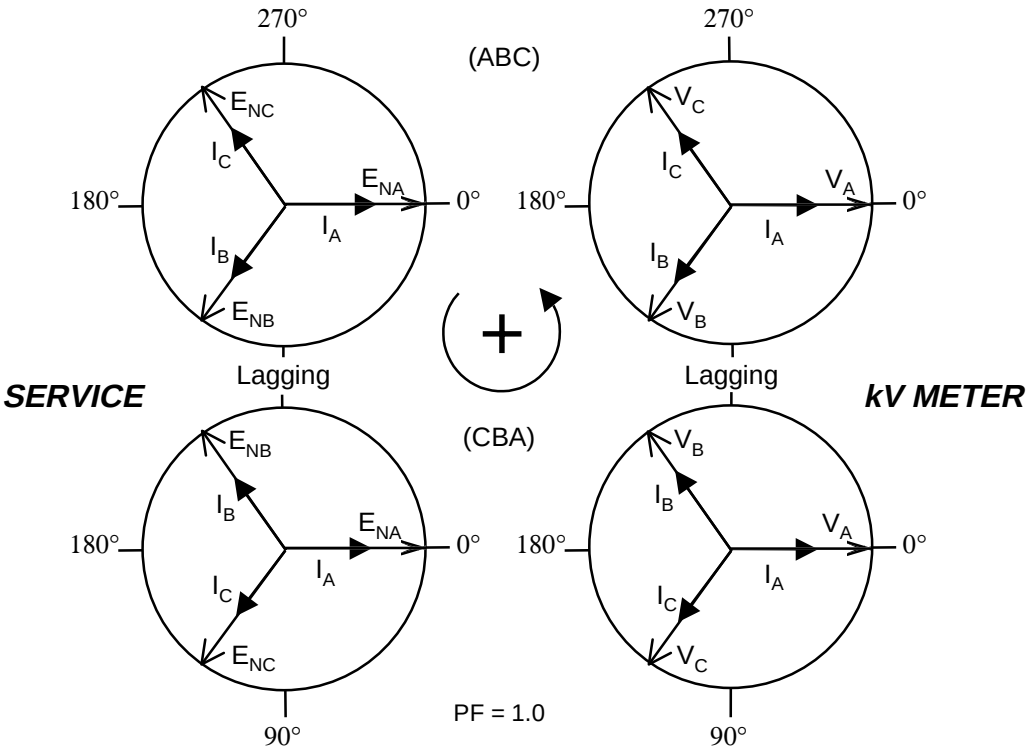
Most old installations: ☐ ***Need rewiring*** ☒ ***Need no wiring change***



4-Wire, Wye



BLONDEL solution



Meter Nameplate marking

Mult by _____
SERVICE: (4Y) 4Δ 3Δ 3N 3W 2W
ELEMENTS: (3) 2 1
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-Element Automatic

MO 16-6

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

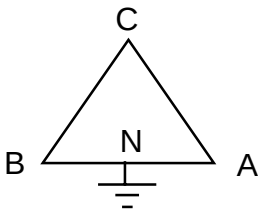
kV Site Analysis

Form 16S *(Self-Contained)*
Fitzall™ Application

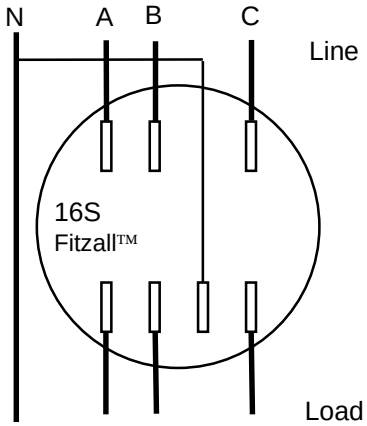
Typically replaces Form:
15S & 17S Applications
Using connection diagram on this page.

Most old installations: ☐ ***Need rewiring*** ☒ ***Need no wiring change***

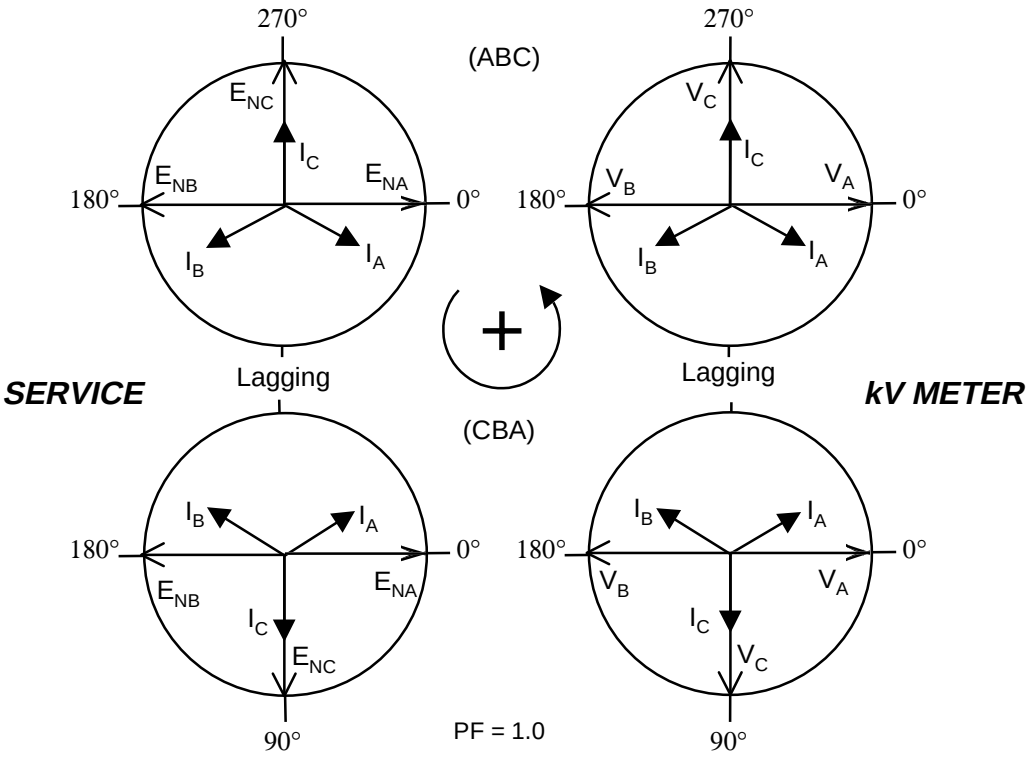
GEI-52590



4-Wire, Delta



BLONDEL solution



Meter Nameplate marking

Mult by _____
SERVICE: 4Y (4Δ) 3Δ 3N 3W 2W
ELEMENTS: (3) 2 1
744x4_____ CL 200 120-480V TA 30 Kt 3.0

MeterMate™ *serVice* Selection:

3-Element Automatic

MO 16-6

Note: Actual installation procedures, materials, equipment, and connections must conform to applicable codes and standards.

GE Meter

kV Site Genie™ Worksheet

Meter #: _____

Site: _____

_____

_____

Service: _____

Service Display: _____

Data File Name: _____._____

Complete Path: _____

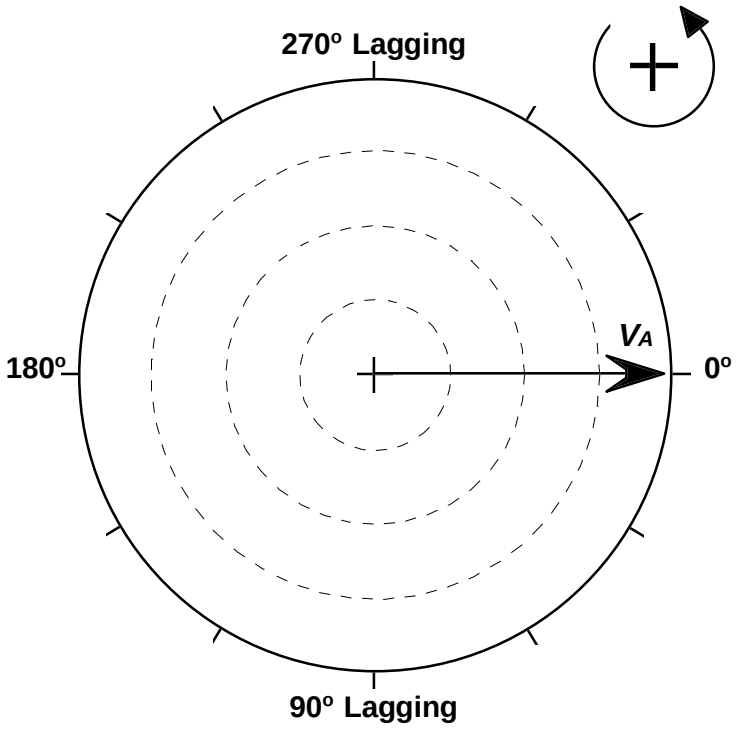
FUNDAMENTAL PHASORS

	A	B	C	
Voltage Angle	0.0			º Lagging
Voltage				Volts
Current Angle				º Lagging
Current				Amperes

Distortion Power: _____ %

Diagnostic Counts

D1	
D2	
D3	
D4	
D5T	
D5A	
D5B	
D5C	
D6	
D7	
D8	



Meter Display Status

Fill-in Lit Arrows

A Blinking

B Off - Blinking

C Off - Blinking

Ca _____

_____

Er _____

Fitzall and MeterMate Software
Operating Tips

•Using MeterMate Meter Comm (MMDOS), make sure you program the kV meter first before using the **Program**, **serVice**, commands to set the appropriate service type and number of active metering elements. MeterMate software will only allow the **serVice** command to be performed on programmed meters. (An exception allows meters that are to be electronically "sealed" - a special "write protected" state of the meter - to have the **serVice** command executed on unprogrammed meters. MMDOS determines this by the status of the "SealFlag" parameter in the MMDOS.INI file.)

•There is no need to change the **serVice** setting from Automatic, 3-element for installation on 4-wire services, wye or delta, where all 3 elements of the meter are active. It may be best to leave the meter on Automatic, 3-element so that it may be flexibly applied to both 4-wire wye and delta services with only a lower nameplate change, no reprogramming required.

•If you are operating the meter as a 2 1/2 element meter on a transformer rated 4-wire wye service, make sure you set the **serVice** type correctly (4-wire wye, 2.5 element). If left on Automatic, 3-element in this scenario (no B phase potential applied to the meter), the meter will only provide 2/3rds registration for balanced three phase loads. This type of situation may be easily detected by noting that the B phase potential indicator on the meter's LCD will be blinking, and if enabled, the CA 000400 (low potential) message will appear in the display. In a Fitzall meter correctly configured for this application (4-wire wye, 2.5 element) the B phase potential indicator is simply blank since the meter understands that no B phase potential is supposed to be present. Most (if not all) other Fitzall applications would provide correct metering values if wired per Application Guides in this document even if the **serVice** was inadvertently left on Automatic, 3-element. Only the diagnostic capabilities of the meter would be ineffective. *To ensure proper operation of both the revenue calculations and diagnostic operation of the kV Fitzall meter, it is important to make sure the **serVice** type is set appropriately, as indicated on the application guide pages of this document.*

•When you perform the **Program**, **serVice**, commands in MMDOS, the service type that first appears highlighted on the computer screen is the currently active service setting in the meter.

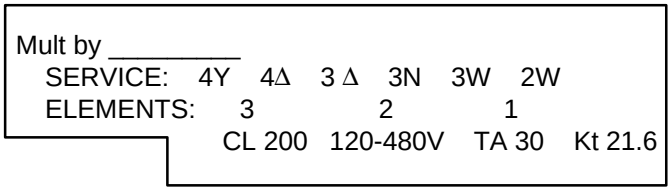
•Different applications may require different diagnostic test tolerance thresholds to be set. As with any kV meter application (Fitzall or not), to avoid erroneous or meaningless diagnostic caution messages from appearing in the display, make sure that only the relevant diagnostics are enabled and set with tolerance thresholds that make sense for the specific application at hand. To allow the use of a common program, MeterMate Meter Comm (MMDOS) allows independent setting of the Site Genie™ diagnostics for "on-site" modifications as needed, using the **Program**, **reConfig**, **Sitegenie**, and **Diagnostic** or **Parameters** commands.

Lower Nameplate Retrofits

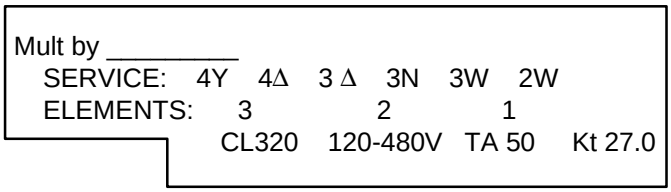
Replacement lower nameplates are available and useful for when a kV Fitzall meter is moved from one service to a different type of service, or when a standard nameplate version of a Fitzall capable kV meter (any 3-element kV meter) is to be installed in a new Fitzall application. Catalog numbers are shown below, along with a sketch of what the nameplate looks like.

The cutout in the lower left corner allows the meter catalog number to show from the original nameplate.

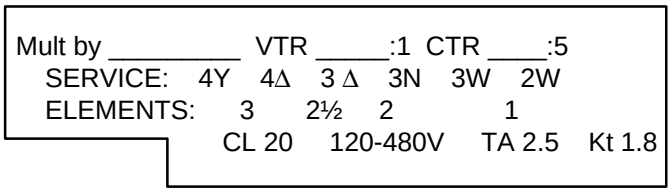
9938366001 CL200



9938366002 CL320



9938366003 CL20



9938366004 CL150 (A-Base)