

## Phasor Diagram Verification - 3 wire system

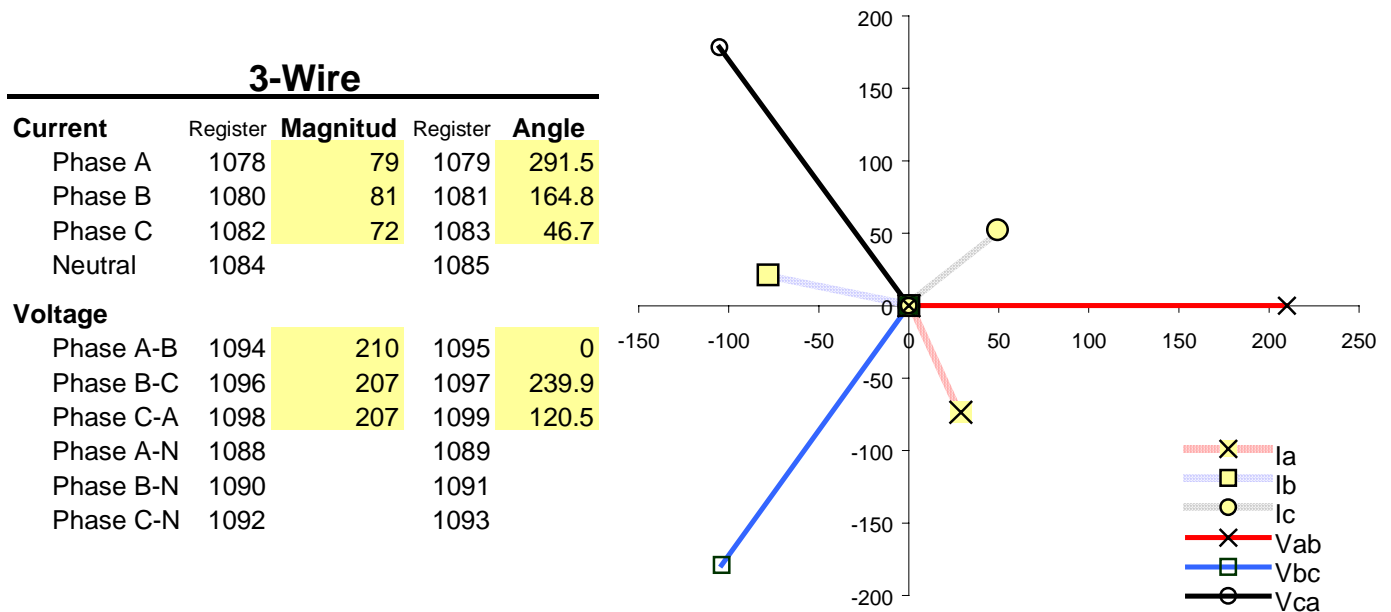
### Safety Precautions

- Work on De-Energized Gear
- NEVER short circuit the secondary of a PT
- NEVER open circuit a CT  
Use the shorting block to short circuit the leads of the CT before removing the connection from the CM.

### Procedure

1. Follow [Phasor Diagram Data Reading](#) procedure
2. Draw each of the vectors in the diagram or complete the [Phasor Diagram Creator](#) spreadsheet, 3-wire Tab

Example:



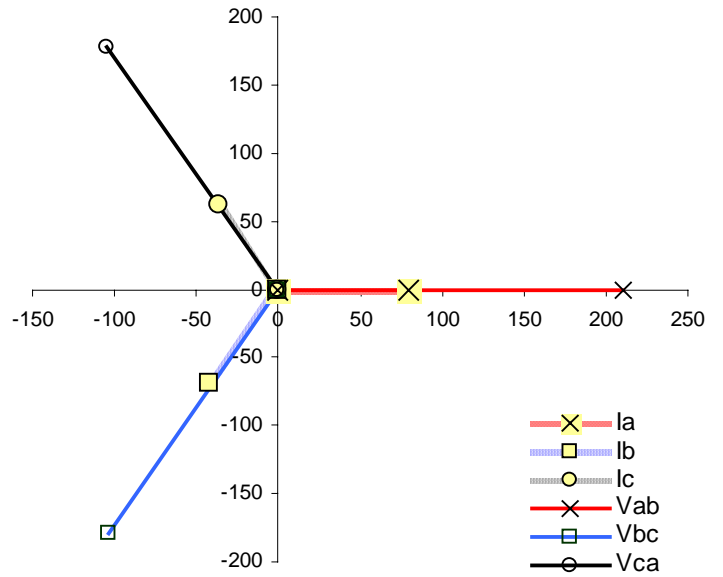
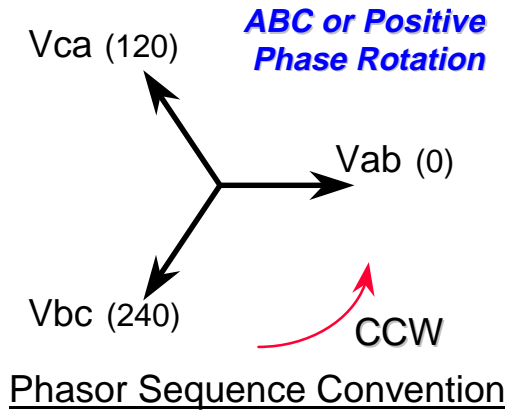
3. Determine if your system has positive or negative phase rotation and compare your diagram with the possible cases attached. Positive rotation guidelines are shown on page 2 and negative rotation guidelines on page 3.

### Note

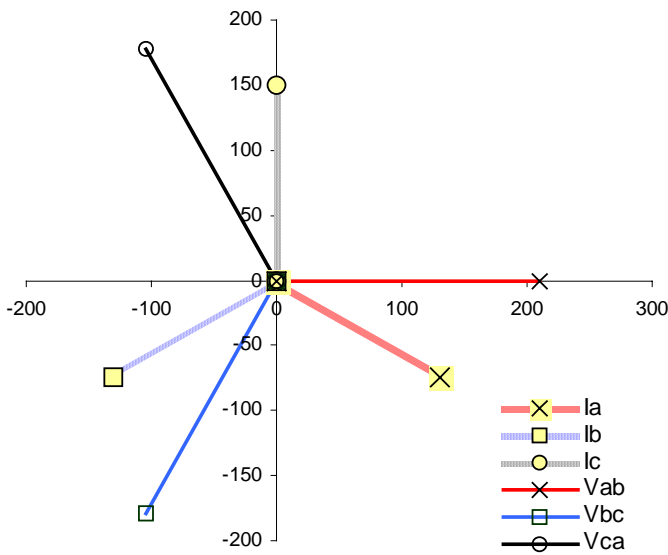
- Voltage between Va and Vb is the 0 degree reference
- ALL other phasors are referenced from these phasors

# PowerLogic Knowledge Base Procedure

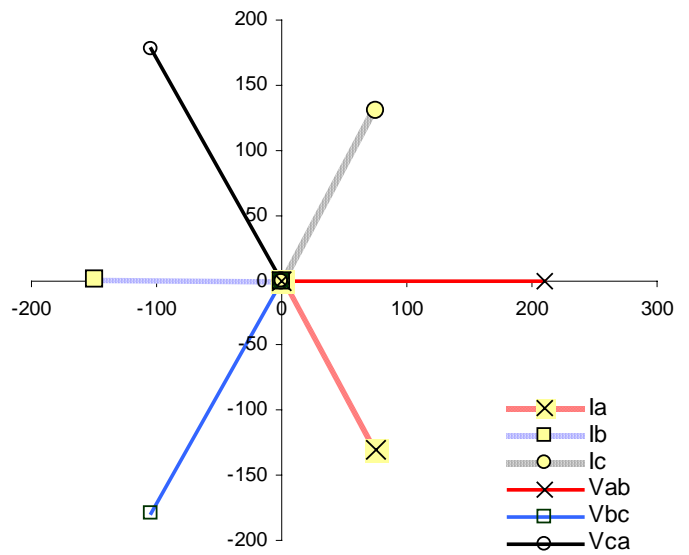
Possible Cases



**0.87 Lead PF, Capacitive Load**

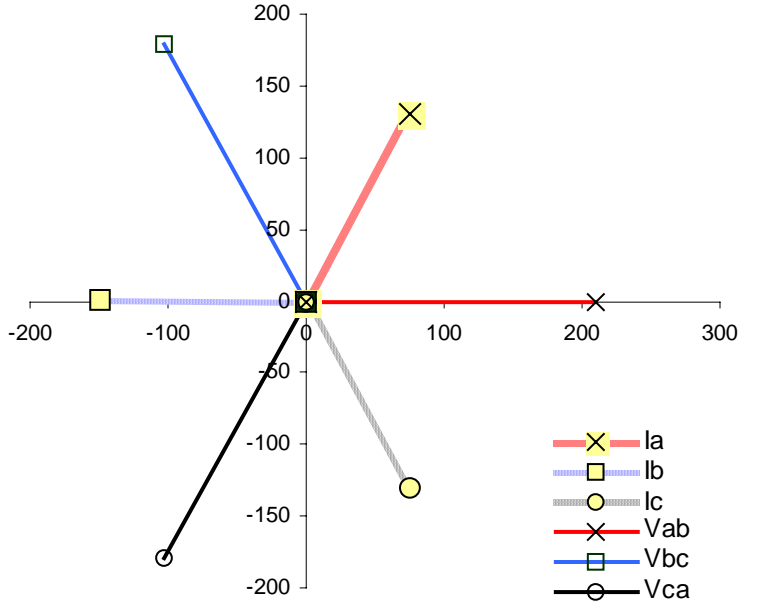
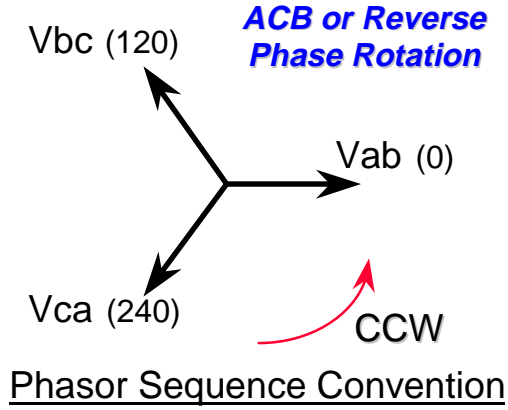


**Unity PF, Resistive Load**

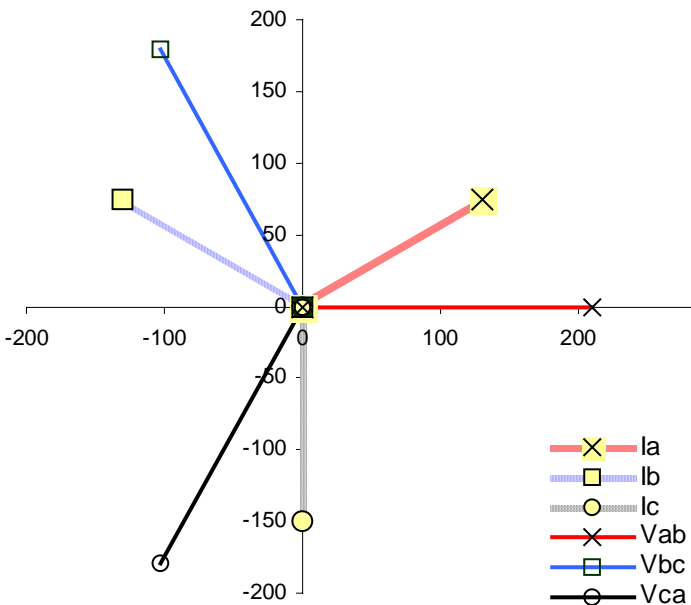


**0.87 Lag. PF, Inductive Load**

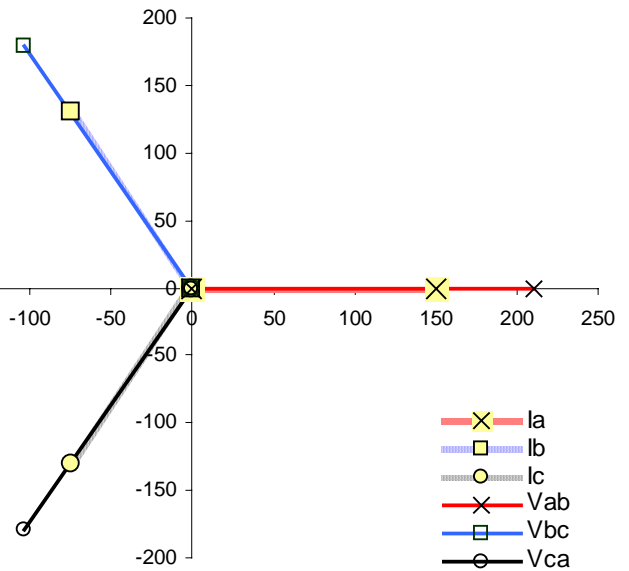
# PowerLogic Knowledge Base Procedure



**0.87 Lead PF Capacitive Load**



**Unity PF, Resistive Load**



**0.87 Lag. PF, Inductive Load**

## PowerLogic Knowledge Base Procedure

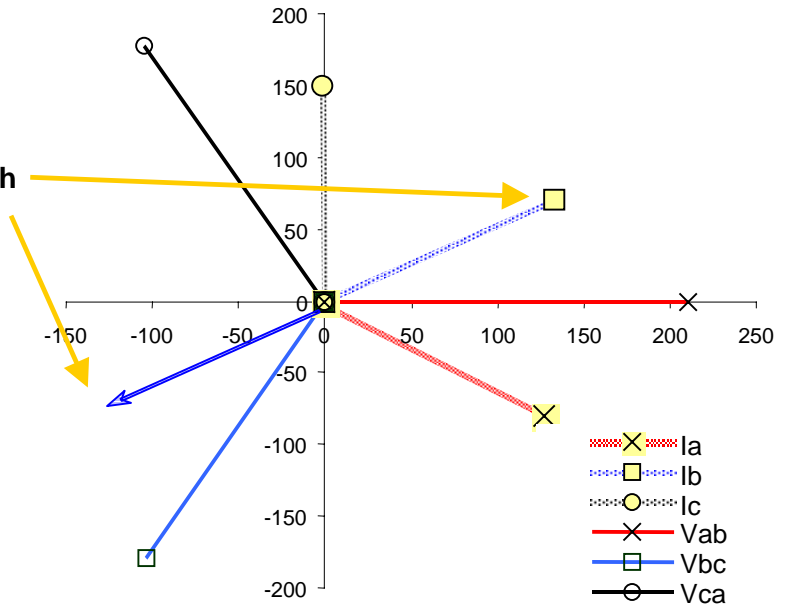
4. Use the following rules to match your system to one of the possible cases

- To change phasor direction: revert polarity of PT/CT

Example:

The polarity of CT phase b is reversed

**Reversing the polarity of the CT will correct the phasor with a shift of 180 degrees**

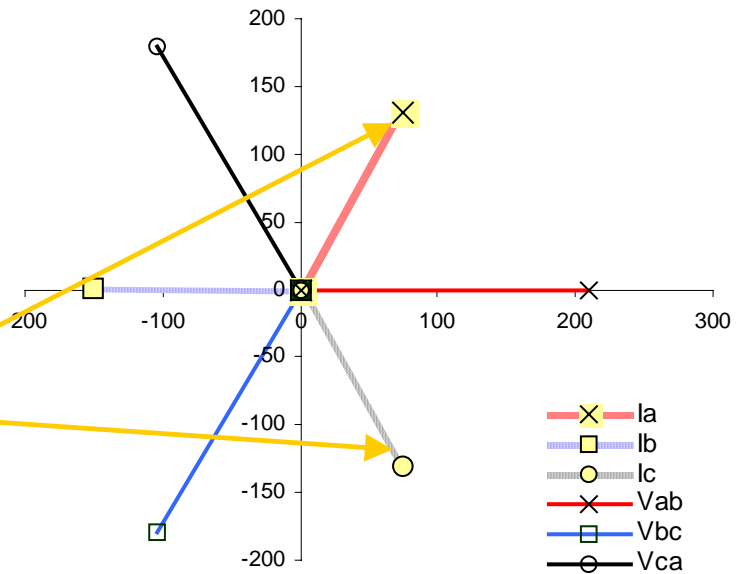


- To change phases: swap CT/PT

Example:

The leads from the CTs for A and C phases were swapped on the input terminals of the circuit monitor

**Swapping the phase A&C CT leads on the current input terminal of the circuit monitor will correct this condition**



- Do one change at a time
- Repeat [Checking Meter Readings](#) procedure after you finish changing connections

## PowerLogic Knowledge Base Procedure

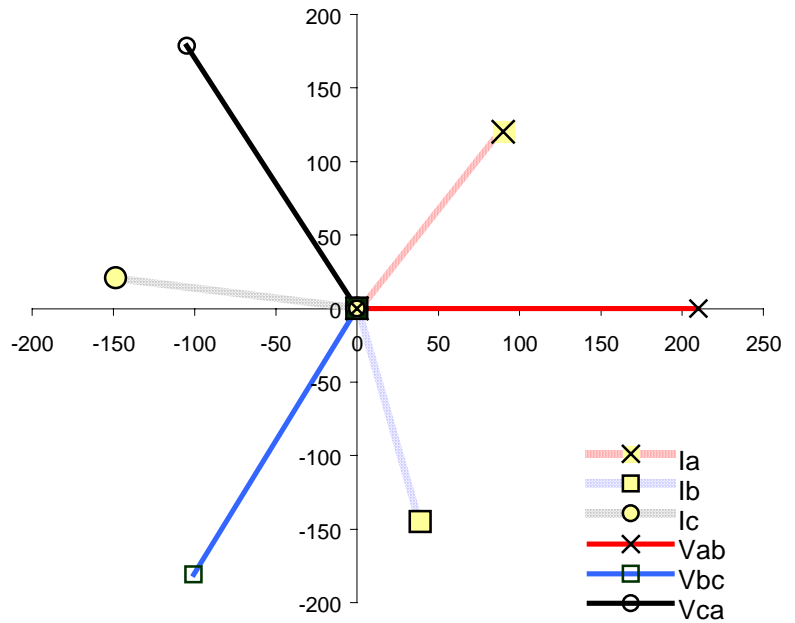
### Examples of Voltage swaps (Positive Sequence)

A swapped with B, B swapped with C, C swapped with A

| <b>3-Wire</b> |          |          |          |       |
|---------------|----------|----------|----------|-------|
| Current       | Register | Magnitud | Register | Angle |
| Phase A       | 1078     | 150      | 1079     | 53.2  |
| Phase B       | 1080     | 150      | 1081     | 285   |
| Phase C       | 1082     | 150      | 1083     | 172   |
| Neutral       | 1084     |          | 1085     |       |

| <b>Voltage</b> |          |          |          |       |
|----------------|----------|----------|----------|-------|
|                | Register | Magnitud | Register | Angle |
| Phase A-B      | 1094     | 210      | 1095     | 0     |
| Phase B-C      | 1096     | 207      | 1097     | 240.9 |
| Phase C-A      | 1098     | 207      | 1099     | 120.4 |
| Phase A-N      | 1088     |          | 1089     |       |
| Phase B-N      | 1090     |          | 1091     |       |
| Phase C-N      | 1092     |          | 1093     |       |

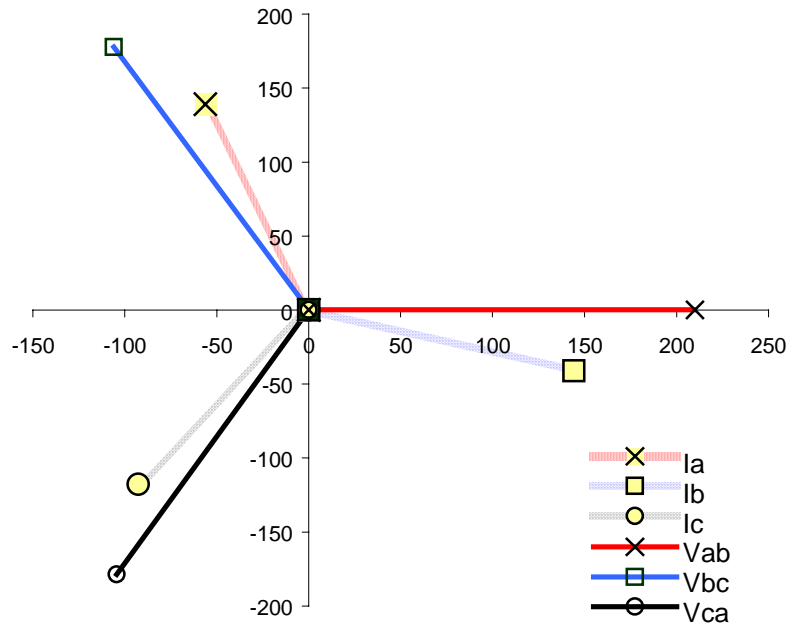


Voltage swaps: A swapped with B

| <b>3-Wire</b> |          |          |          |       |
|---------------|----------|----------|----------|-------|
| Current       | Register | Magnitud | Register | Angle |
| Phase A       | 1078     | 150      | 1079     | 112   |
| Phase B       | 1080     | 150      | 1081     | 344.1 |
| Phase C       | 1082     | 150      | 1083     | 231.8 |
| Neutral       | 1084     |          | 1085     |       |

| <b>Voltage</b> |          |          |          |       |
|----------------|----------|----------|----------|-------|
|                | Register | Magnitud | Register | Angle |
| Phase A-B      | 1094     | 210      | 1095     | 0     |
| Phase B-C      | 1096     | 207      | 1097     | 120.8 |
| Phase C-A      | 1098     | 207      | 1099     | 239.7 |
| Phase A-N      | 1088     |          | 1089     |       |
| Phase B-N      | 1090     |          | 1091     |       |
| Phase C-N      | 1092     |          | 1093     |       |



## PowerLogic Knowledge Base Procedure

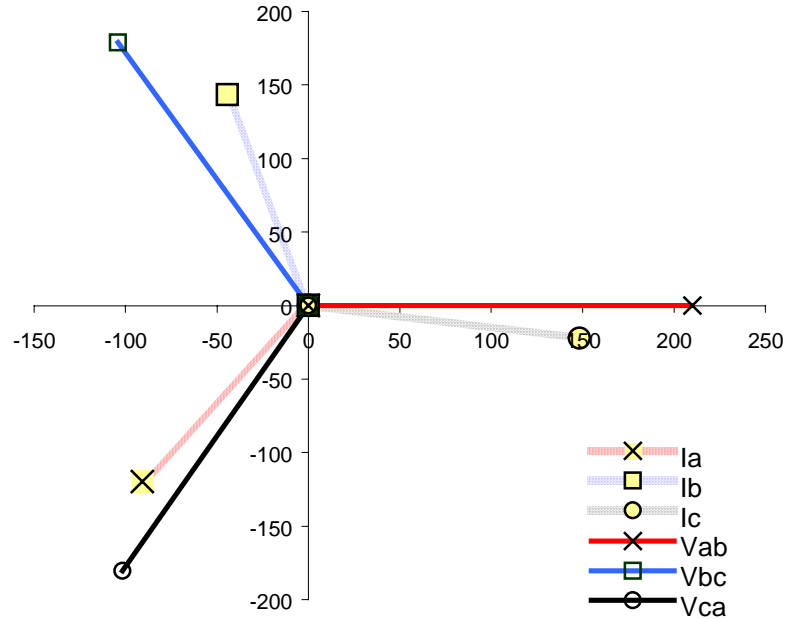
### Examples of Voltage swaps (Positive Sequence)- Continued

Voltage swaps: A swapped with C

| <b>3-Wire</b> |          |          |          |       |
|---------------|----------|----------|----------|-------|
| Current       | Register | Magnitud | Register | Angle |
| Phase A       | 1078     | 150      | 1079     | 232.8 |
| Phase B       | 1080     | 150      | 1081     | 107.2 |
| Phase C       | 1082     | 150      | 1083     | 351.5 |
| Neutral       | 1084     |          | 1085     |       |

| <b>Voltage</b> |          |          |          |       |
|----------------|----------|----------|----------|-------|
|                | Register | Magnitud | Register | Angle |
| Phase A-B      | 1094     | 210      | 1095     | 0     |
| Phase B-C      | 1096     | 207      | 1097     | 120.2 |
| Phase C-A      | 1098     | 207      | 1099     | 240.6 |
| Phase A-N      | 1088     |          | 1089     |       |
| Phase B-N      | 1090     |          | 1091     |       |
| Phase C-N      | 1092     |          | 1093     |       |

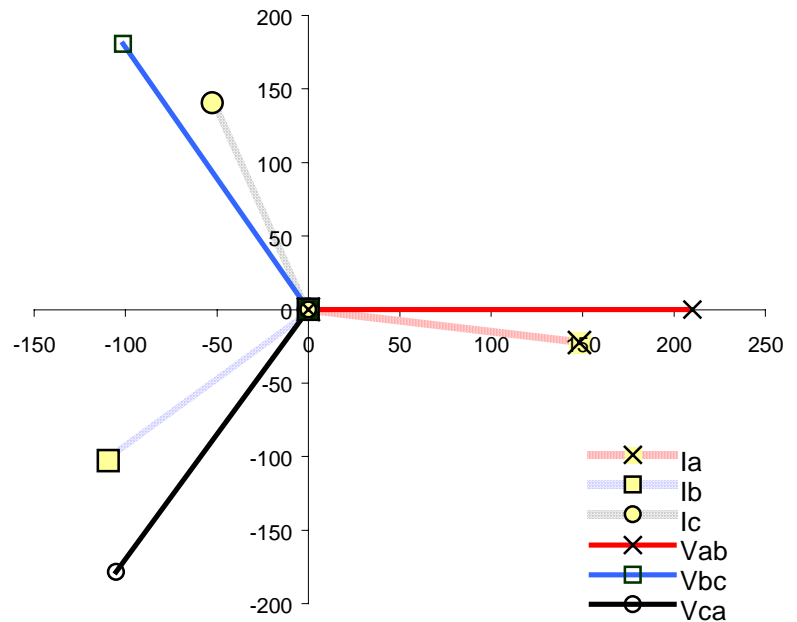


Voltage swaps: B swapped with C

| <b>3-Wire</b> |          |          |          |       |
|---------------|----------|----------|----------|-------|
| Current       | Register | Magnitud | Register | Angle |
| Phase A       | 1078     | 150      | 1079     | 351.4 |
| Phase B       | 1080     | 150      | 1081     | 223.2 |
| Phase C       | 1082     | 150      | 1083     | 110.5 |
| Neutral       | 1084     |          | 1085     |       |

| <b>Voltage</b> |          |          |          |       |
|----------------|----------|----------|----------|-------|
|                | Register | Magnitud | Register | Angle |
| Phase A-B      | 1094     | 210      | 1095     | 0     |
| Phase B-C      | 1096     | 207      | 1097     | 119.3 |
| Phase C-A      | 1098     | 207      | 1099     | 239.5 |
| Phase A-N      | 1088     |          | 1089     |       |
| Phase B-N      | 1090     |          | 1091     |       |
| Phase C-N      | 1092     |          | 1093     |       |



## PowerLogic Knowledge Base Procedure

### *Examples of Voltage swaps (Positive Sequence) - Continued*

Voltage swaps: A swapped with C, C swapped with B, B swapped with A

| <b>3-Wire</b> |          |          |          |       |
|---------------|----------|----------|----------|-------|
| Current       | Register | Magnitud | Register | Angle |
| Phase A       | 1078     | 150      | 1079     | 170.8 |
| Phase B       | 1080     | 150      | 1081     | 42    |
| Phase C       | 1082     | 150      | 1083     | 289.9 |
| Neutral       | 1084     |          | 1085     |       |

| <b>Voltage</b> |          |          |          |       |
|----------------|----------|----------|----------|-------|
|                | Register | Magnitud | Register | Angle |
| Phase A-B      | 1094     | 210      | 1095     | 0     |
| Phase B-C      | 1096     | 207      | 1097     | 239.2 |
| Phase C-A      | 1098     | 207      | 1099     | 119.3 |
| Phase A-N      | 1088     |          | 1089     |       |
| Phase B-N      | 1090     |          | 1091     |       |
| Phase C-N      | 1092     |          | 1093     |       |

