SMAW Currents and Polarities
DC - Direct Current

Current or amperage travels in one direction only, negative to positive, where the electrode can be either + or - and the work or ground being opposite, - or +.

Advantages
- more electrodes are DC compatible
- more versatility with regards to operating characteristics given a choice between Straight Polarity (electrode -) or Reverse Polarity (electrode +)

Disadvantages of DC
- combination AC/DC machines are more expensive

- arc blow, or magnetic fields that disrupt the stability of the arc, can be formed.
Direct Current Reverse Polarity - DCRP

- Electrode (positive +)  Ground (negative -)
  - most common
  - 2/3 of heat at electrode
  - 1/3 of heat at work
  - deep penetration which is good for thicker material or tight fit ups where weld penetration is more difficult than with a gap

Direct Current Straight Polarity - DCSP

- Electrode (negative -)  Ground (positive +)
  - least common
  - 2/3 or heat at work
  - 1/3 of heat at electrode
  - shallow penetration which is good for thinner material or poor fit ups or large gaps where weld penetration is not beneficial because “burn through” may occur. (melting or blowing through work)
AC - Alternating Current

The current or amperage reverses direction of flow 120 times per second (cycle of + to -, and back to + 60 times per second)

Advantages of AC

- machines that are AC only are less expensive

- magnetic fields do not disrupt the stability of the arc (arc blow)

Disadvantages of AC

- specific AC electrodes often have to be used

- less versatility without options of making electrode + or - and ground + or - for different operating characteristics (see DC polarity)
SMAW Currents and Polarities

**DC - __________________**

Current or amperage travels in __________________, negative to positive, where the electrode can be either + or - and the work or ground being opposite, - or +.

**Advantages**

- more __________________ are DC compatible more with regards to ____________ characteristics given a choice between Straight Polarity (electrode ___) or Reverse Polarity (electrode ___)

**Disadvantages of DC**

- combination AC/DC machines are more ____________

- ________________, or magnetic fields that disrupt the stability of the arc, can be formed.
Direct Current Reverse Polarity - DCRP
- Electrode (________)       Ground (__________)

- _______ common

- _____ of heat at electrode

- _____ of heat at work

- ________ penetration which is good for ________ material or _________ fit ups where weld penetration is more difficult than with a gap

Direct Current Straight Polarity - DCSP
- Electrode (________)       Ground (__________)

- _________ common

- 2/3 of heat at ________

- 1/3 of heat at ________

- ________ penetration which is good for ________ material or _________ fit ups or large ________ where weld penetration is not beneficial because “________________” may occur. (melting or blowing through work)
AC - Alternating Current

The current or amperage ___________ direction of flow 120 times per second (cycle of + to -, and back to + 60 times per second)

Advantages of AC

- machines that are AC only are ________ expensive

- magnetic fields ___________ disrupt the stability of the arc (arc blow)

Disadvantages of AC

- specific ________________ often have to be used

- __________________ without options of making electrode + or - and ground + or - for different operating characteristics (see DC polarity)