

## Induction Relay Coil Selection Data

### Primary Coil:

The primary coil voltage should be chosen to match the line voltage of the control system. The 1500 Series Induction Relay can be supplied with any of the following line voltages.

| Line Voltage | Frequency (Hertz) | Max Amps (Secondary Shorted) |
|--------------|-------------------|------------------------------|
| 110-120      | 50-60             | .075                         |
| 208-240      | 50-60             | .038                         |
| 440-480      | 50-60             | .019                         |

### Secondary Coil:

Since B/W level control systems use liquid as an electrical conductor to complete the relay's secondary circuit - and since the resistance of liquid varies, it is necessary that each induction relay be equipped with a secondary coil that will operate over the resistance of the liquid it controls. The table below lists the operating characteristics of various coils available. All values are based on line voltage of 115, 230, 460 volts at 60 hertz.

### Typical Liquids:

The following recommendations are satisfactory for general use, but because the conductivity of liquids varies greatly with concentration, purity, temperature and other factors, some applications may require a different selection. A number of the products listed are produced as solids such as crystals or powders, and the relay selection is based on the normally used commercial solutions of these materials.

| Liquid Description           | Secondary Coil | Liquid Description              | Secondary Coil | Liquid Description              | Secondary Coil |
|------------------------------|----------------|---------------------------------|----------------|---------------------------------|----------------|
| Acetic Acid - up to 75%      | 90 volt        | Carbolic Acid - up to 90%       | 220 volt       | Nitric acid                     | 40 or 90 volt  |
| - 75 - 90%                   | 220 volt       | Catsup                          | 90 volt        | Orange juice                    | 90 volt        |
| Acids - General              | 40 or 90 volt  | Caustic Soda (Sodium Hydroxide) | 40 volt        | Paper stock                     | 220 volt       |
| Alkalies - General           | 40 or 90 volt  | Cement slurry                   | 220 volt       | Penicillin                      | 220 volt       |
| Alum Solutions               | 220 volt       | Chromic acid                    | 40 volt        | Phosphoric acid                 | 40 volt        |
| Aluminum Sulphate            | 90 volt        | Citric acid                     | 40 or 90 volt  | Plating solutions               | 40 or 90 volt  |
| Aluminum Hydroxide           | 90 volt        | Coffee                          | 90 volt        | Salts - chemical                | 40 or 90 volt  |
| Amino Acids                  | 90 volt        | Condensate - ordinary water     | 480 volt       | Sodium Carbonate (soda ash)     | 90 volt        |
| Ammonium Chloride            | 40 volt        | Corn syrup                      | 480 volt       | Sodium Chloride (table salt)    | 40 volt        |
| Ammonium Hydroxide (Ammonia) | 220 volt       | Corn - cream style              | 90 volt        | Sodium Hydroxide (caustic soda) | 40 volt        |
| Ammonium Sulphate            | 220 volt       | Ferrous Sulphate                | 220 volt       | Sodium Hypochlorate             | 40 volt        |
| Baby foods                   | 90 volt        | Formic acid - up to 75%         | 90 volt        | Sodium Silicate (water glass)   | 90 volt        |
| Barium Chloride              | 40 volt        | - 75 to 90%                     | 220 volt       | Soups                           | 40 volt        |
| Barium Nitrate               | 40 volt        | Hydrofluoric acid - up to 20%   | 220 volt       | Starch solutions                | 220 volt       |
| Beer                         | 90 volt        | - above 20%                     | 40 volt        | Sugar - low concentrations      | 220 volt       |
| Black liquor                 | 40 volt        | Hydrofluorsilicic acid          | 90 volt        | - high concentrations           | 360 volt       |
| Blood                        | 220 volt       | Jams & jellies                  | 360 volt       | Vinegar                         | 90 volt        |
| Borax - up to 10%            | 220 volt       | Juices - fruit & vegetable      | 40 or 90 volt  | Water - Sea                     | 40 volt        |
| - Greater than 10%           | 90 volt        | Lithium Chloride                | 40 volt        | - Ordinary potable              | 220 volt       |
| Bread dough                  | 90 volt        | Magnesium Hydroxide             | 90 volt        | - ordinary soft                 | 360 volt       |
| Buttermilk                   | 24 or 40 volt  | Mayonnaise                      | 220 volt       | - Ordinary condensate           | 480 volt       |
| Cadmium Chloride             | 40 volt        | Milk                            | 40 volt        | Zinc Chloride                   | 40 volt        |
| Cake batter                  | 220 volt       | Molasses                        | 220 volt       |                                 |                |
| Calcium Chloride             | 40 volt        | Muriatic acid                   | 40 volt        |                                 |                |
| Calcium Hydroxide            | 220 volt       | Mustard                         | 40 volt        |                                 |                |

NOTE: Maximum distance limitations for typical induction relay secondary circuits are: 220 secondary - 900 feet, 360 secondary - 350 ft, 480 secondary - 250 ft.

## B/W Controls

