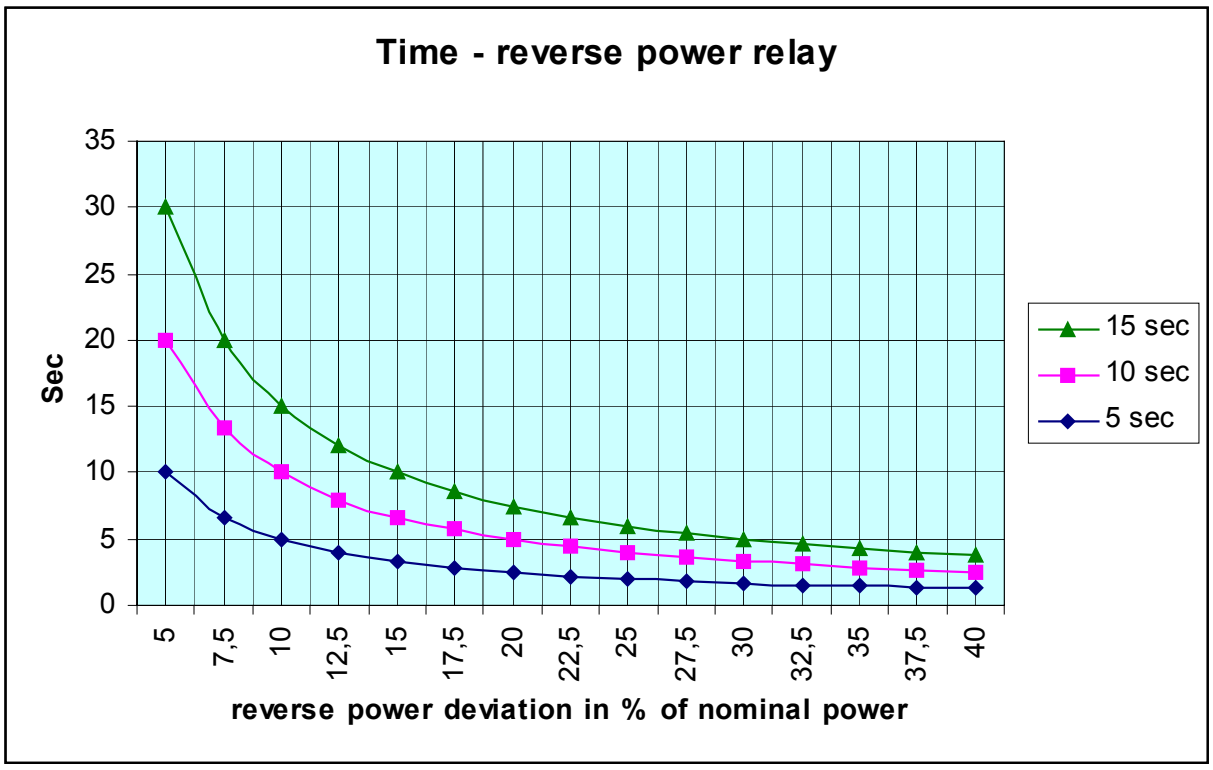
1. General

The functionality of the RMP-121D with inverse time characteristic is basically the same as for the RMP-121D with normal time characteristic.

The only difference is the timer function.

2. Timer function

The timer will work as shown in the graph below:



If the –P set point is exceeded by 10% of nominal power, the inverse timer functionality gives the same delay as the time potentiometer. If the –P set point is exceeded by 20% of nominal power, the delay will be half the value set on the time potentiometer.

The delay depends on the actual deviation from the set point and the setting of the timer potentiometer. The delay can be calculated as follows:

$$\text{Time delay} = 10 \text{ x } \frac{\text{Delay potentiometer setting}}{(-\text{P actual} \div -\text{P set point}) \text{ in percent}}$$

Example 1
Nominal generator power: 100kW
-P potentiometer set at: 10%
Delay potentiometer set at: 15 s

The power "produced" by the generator suddenly decreases to –20kW (-20% of nominal power).

$$\text{Time delay} = 10 \text{ x } \frac{\text{Delay potentiometer setting}}{(-\text{P actual} \div -\text{P set point}) \text{ in percent}} = 10 \text{ x } \frac{15 \text{ s}}{20 - 10} = 15 \text{ s}$$

Example 2
Nominal generator power: 500kW
-P potentiometer set at: 5%
Delay potentiometer set at: 10 s

The power "produced" by the generator suddenly decreases to –125kW (-25% of nominal power).

$$\text{Time delay} = 10 \text{ x } \frac{\text{Delay potentiometer setting}}{(-\text{P actual} \div -\text{P set point}) \text{ in percent}} = 10 \text{ x } \frac{10 \text{ s}}{25 - 5} = 5 \text{ s}$$

Example 3
Nominal generator power: 1000kW
-P potentiometer set at: 15%
Delay potentiometer set at: 5 s

The power "produced" by the generator decreases to –200kW (-20% of nominal power).

$$\text{Time delay} = 10 \text{ x } \frac{\text{Delay potentiometer setting}}{(-\text{P actual} \div -\text{P set point}) \text{ in percent}} = 10 \text{ x } \frac{5 \text{ s}}{20 - 15} = 10 \text{ s}$$