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**STARTING PROCESS MODELLING OF AN ASYNCHRONOUS ELECTRIC
DRIVE AT VARIOUS LAWS OF CHANGE OF FREQUENCY AND VOLTAGE**

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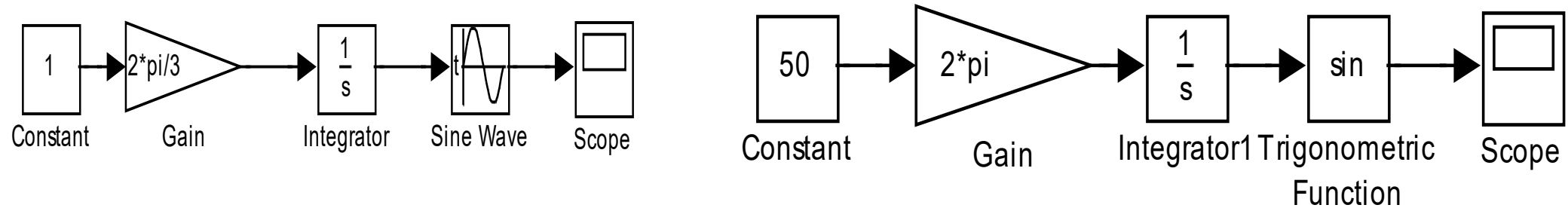
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The *task of controlling* an asynchronous motor can be divided into the following parts:

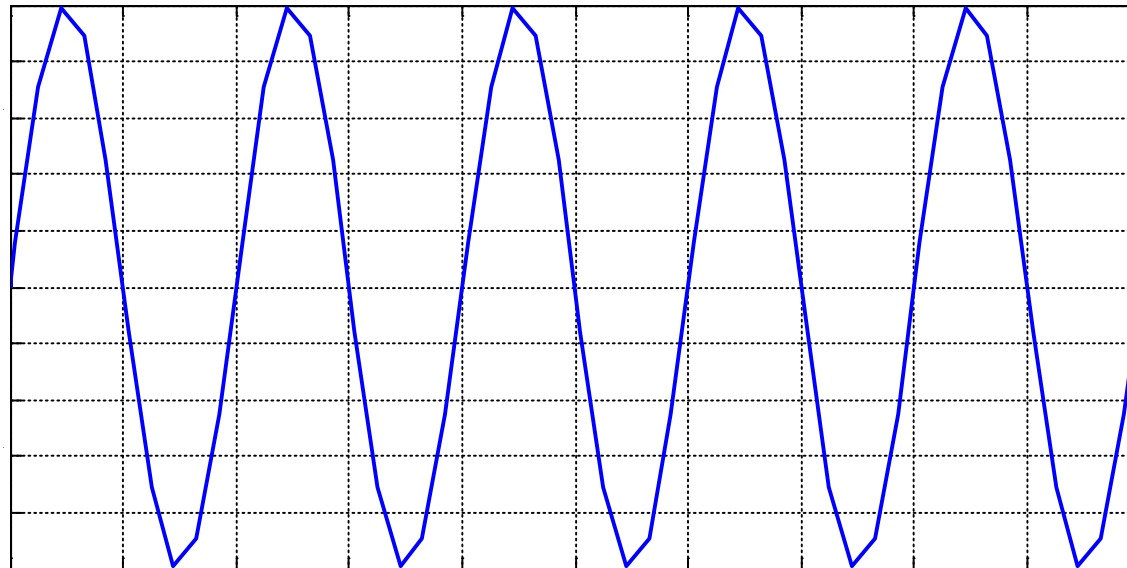
1. Implementation of a smooth start of the engine;
2. Control of the engine speed with a given frequency and a large control range.

The *purpose of the work* is to develop a model for studying the process of starting an induction motor at various frequencies and voltages using the MATLAB/Simulink software package

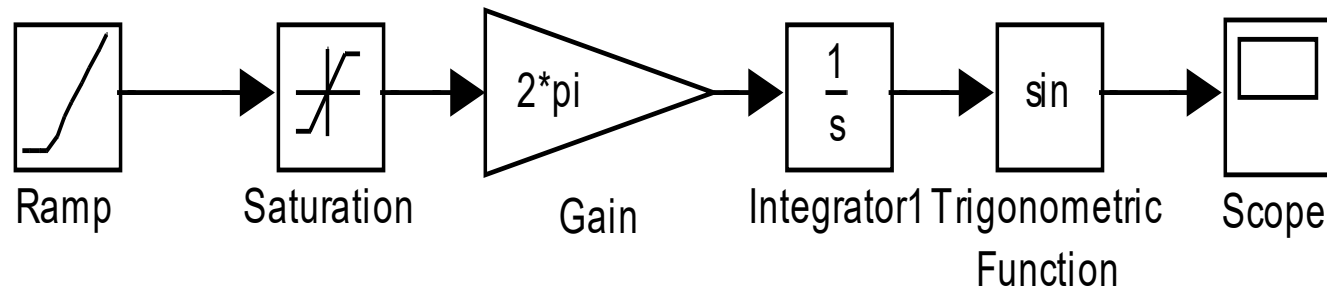
Models for the study of sinusoidal signals



Time characteristic of the sinusoidal function

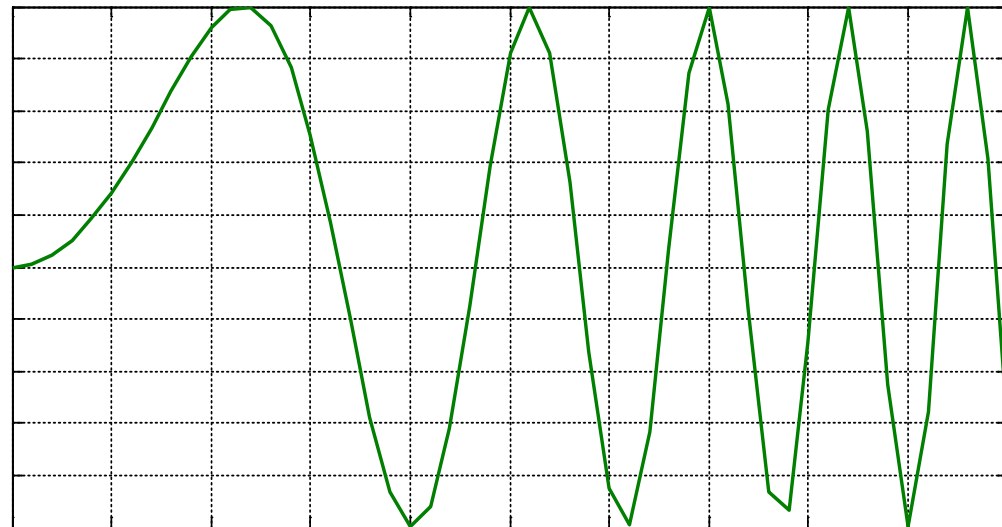


Model for changing a given frequency value in accordance with a linear law

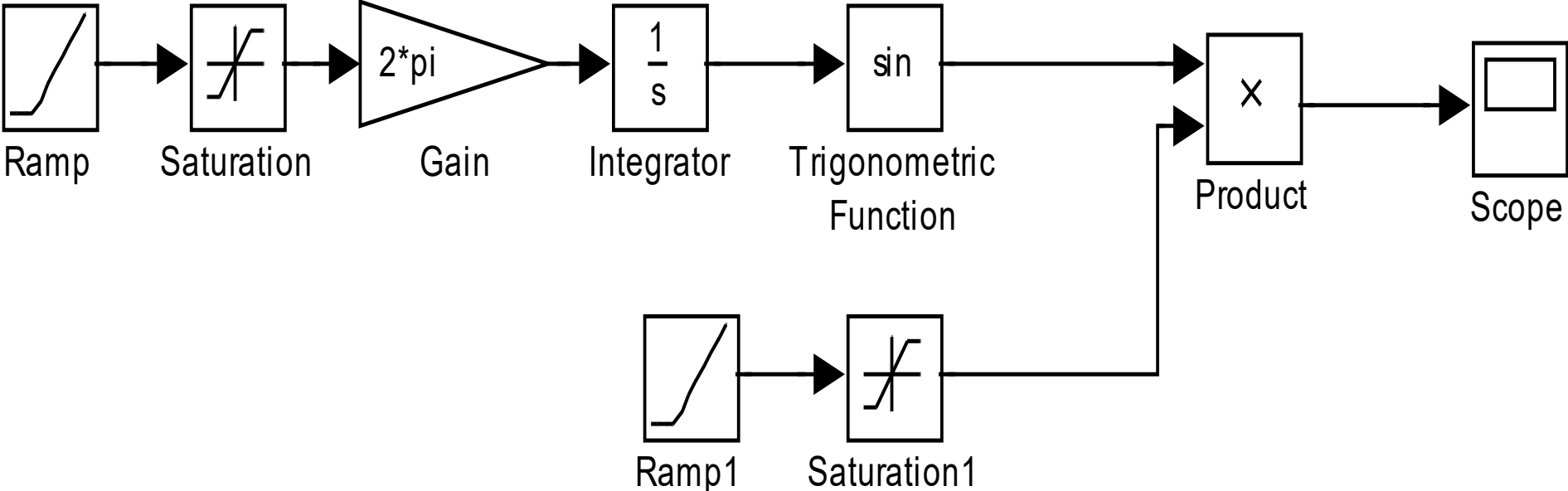


$$\text{Slope} = \frac{460}{0.07} = 6571$$

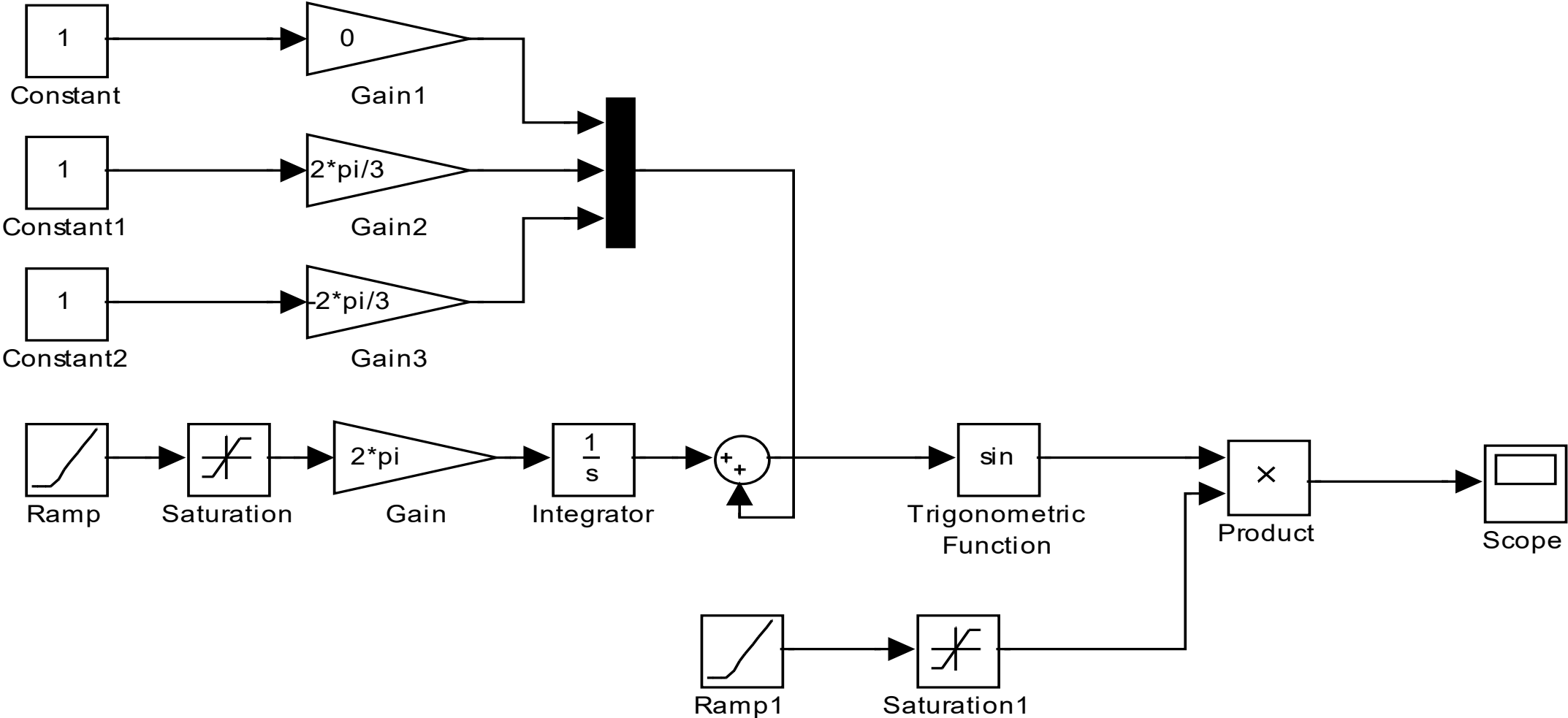
Sinusoidal waveform that varies in frequency



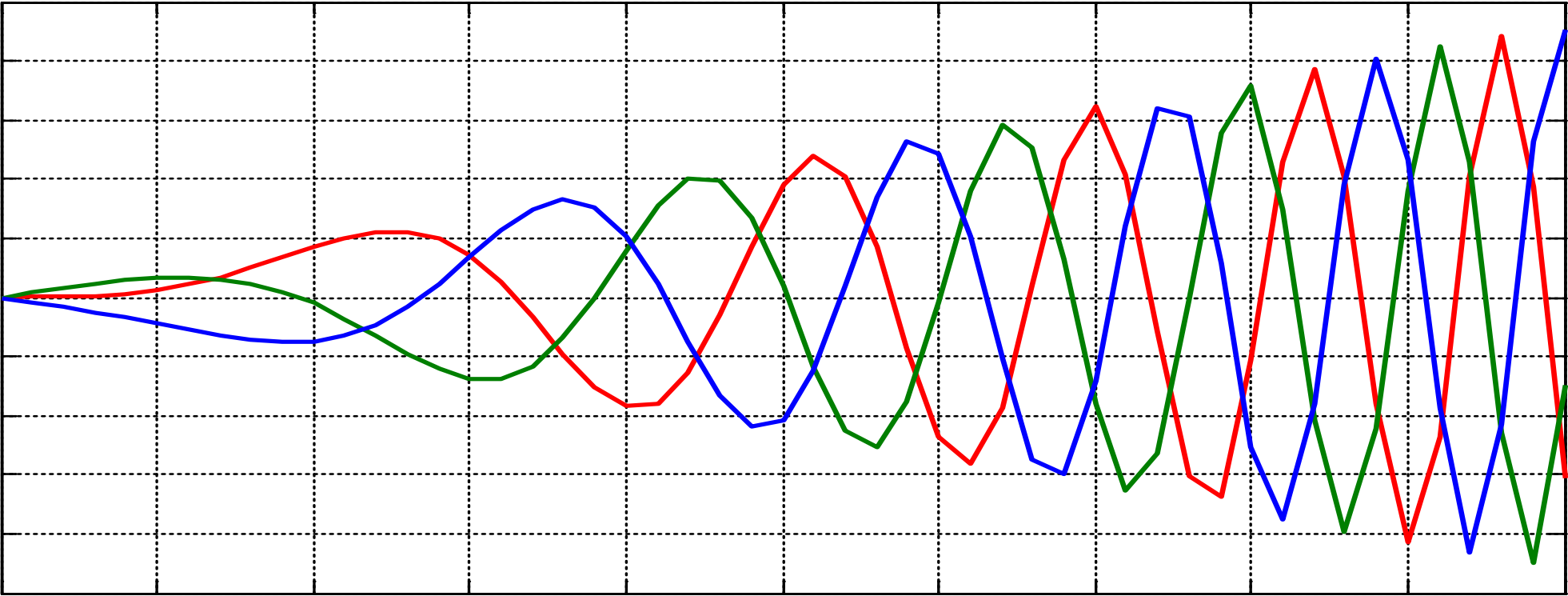
Model of the process of changing the frequency and voltage of the power source



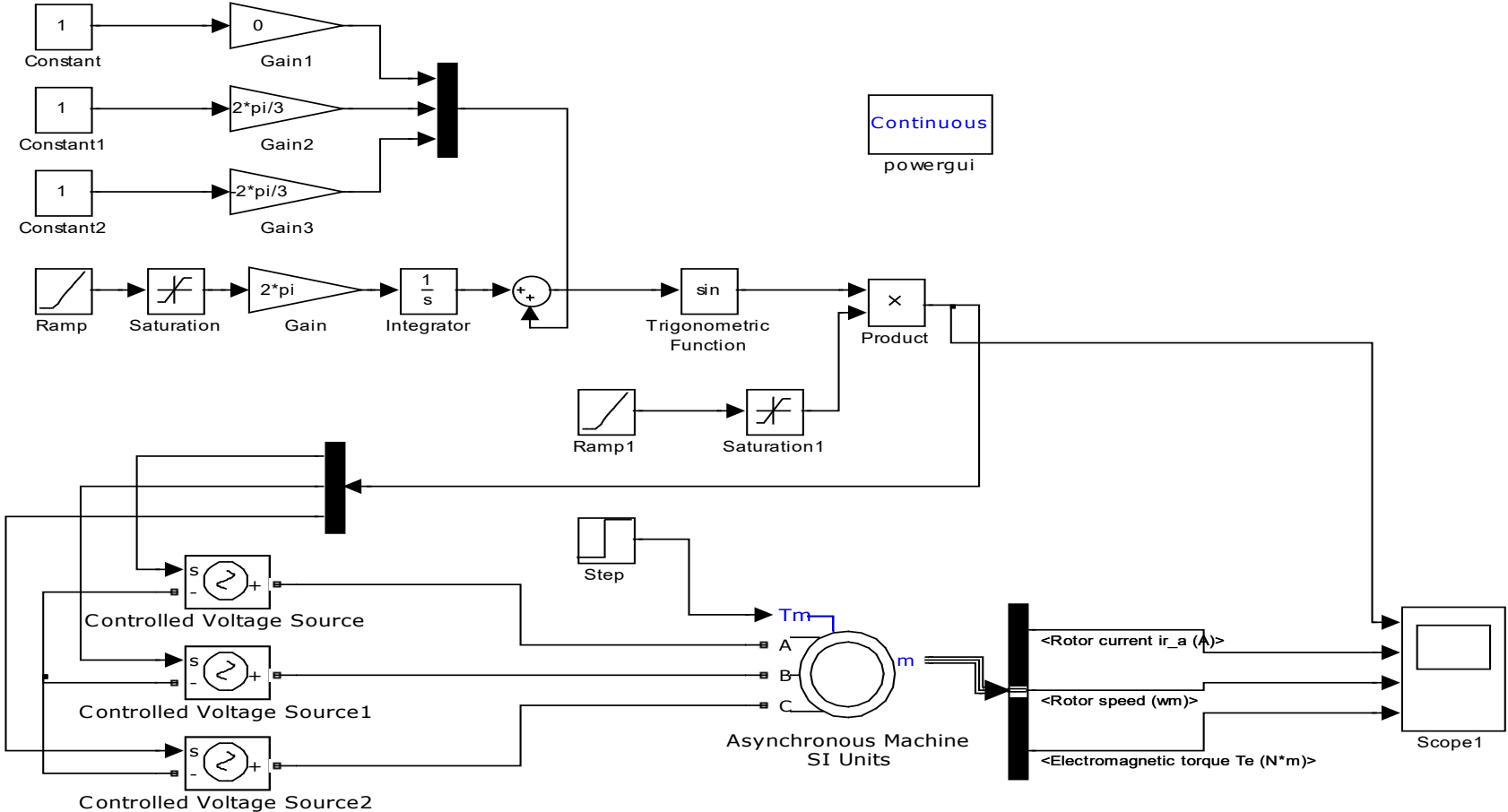
Model of the process of changing frequency and voltage using a three-phase power supply



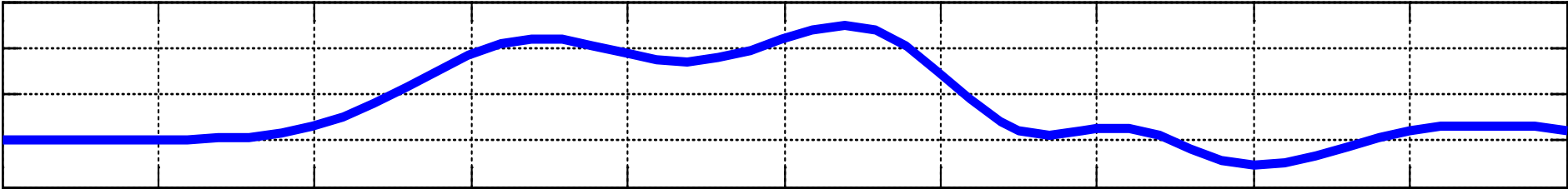
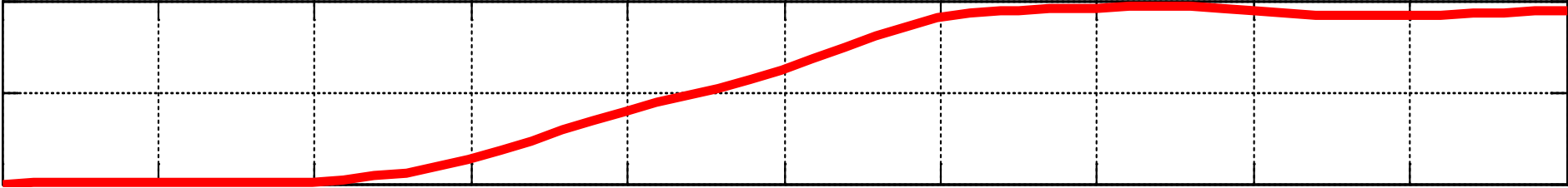
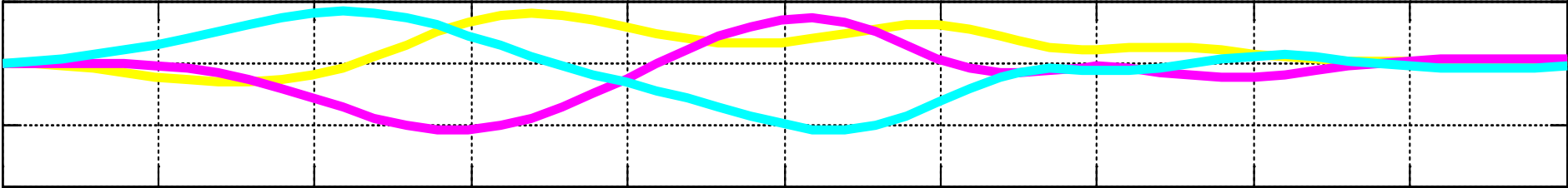
Time characteristics of three-phase voltage with frequency and voltage changes



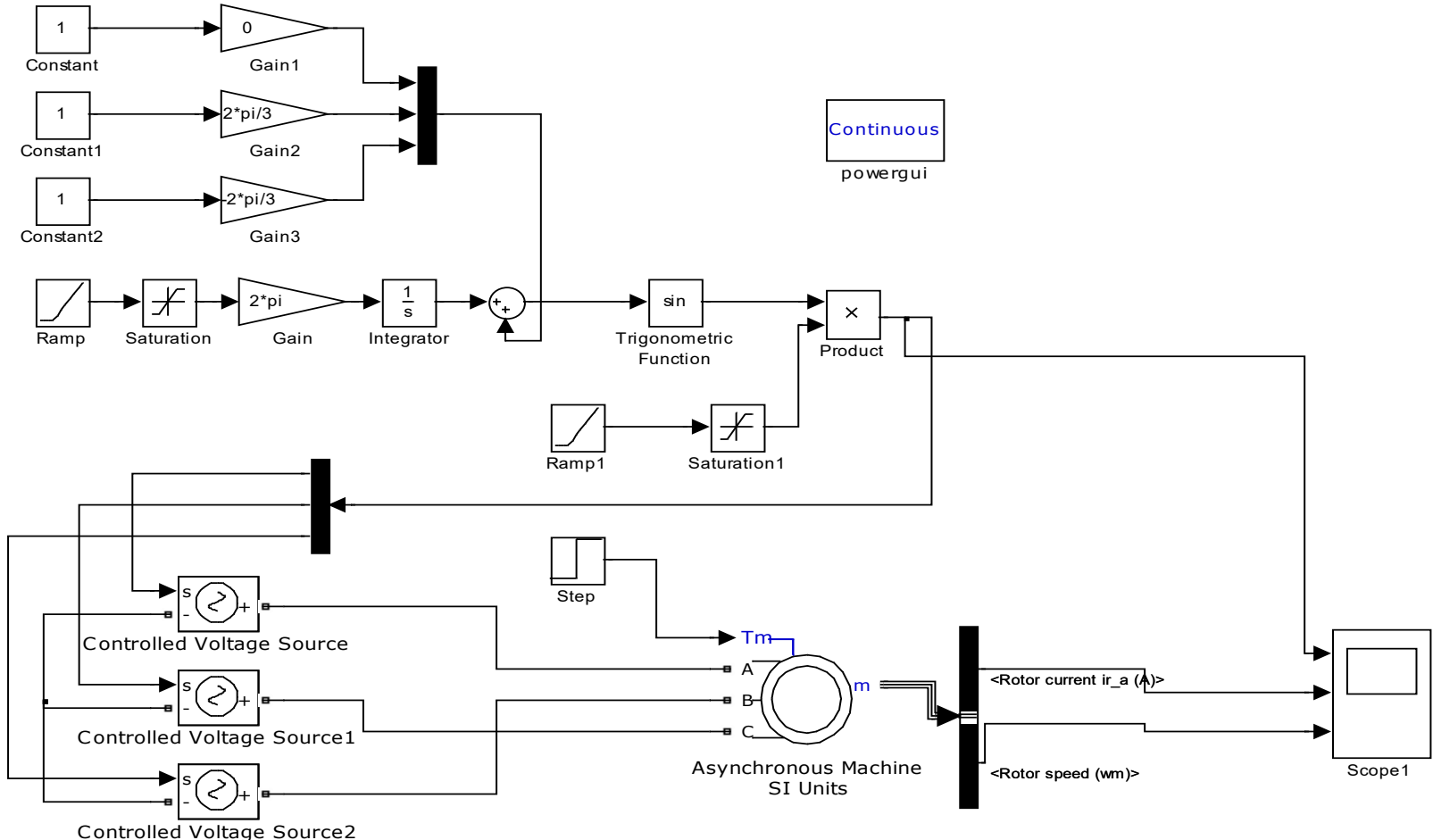
Model of the starting process of an asynchronous motor



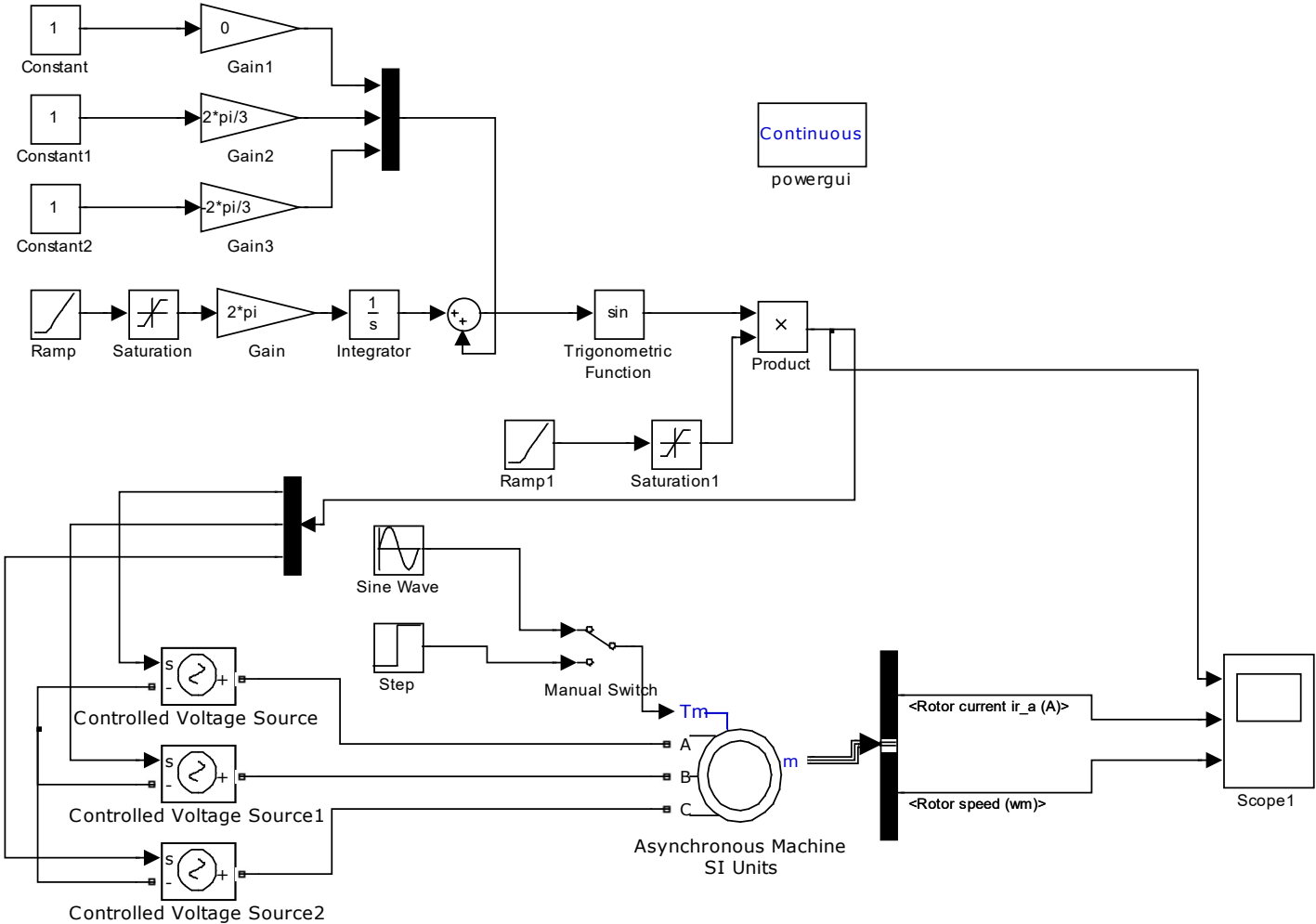
**Time characteristics of the starting process
of the asynchronous motor**



Simulink model of an asynchronous drive with a fixed frequency under different laws of voltage change



Modelling of an asynchronous drive with a fixed frequency in various laws of voltage change



CONCLUSION

1. In the MATLAB/Simulink/SimPowerSystems software package, an engine start model with a change in the frequency value was developed, which took into account changes in frequency and voltage according to various laws.
2. A model has been developed that provides a study of the process of starting an asynchronous drive with different laws of voltage change at a fixed frequency. The process of the smooth start of asynchronous electric drives with different laws of voltage change at a constant frequency is implemented using the proposed models.
3. The article presents studies of models of an asynchronous motor with parameters 5HP 460V 60 Hz, 1750 RPM. The developed models make it possible to conduct research taking into account changes in the static torque for various motors since the static torque on the motor shaft determines the laws of voltage and frequency changes. According to the obtained characteristics, it is possible to analyze the process of starting an asynchronous motor