

## Effective measurement of the moisture content of the plastic mass coming out of the filter press.

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**Abstract:** In this article, the effectiveness of measuring the moisture content of the viscous mass coming out of the filter press using arduino uno and the FC-28 sensor was determined and a scheme was developed.

The moisture content of the plastic mass coming out of the filter press is important in the production technology of porcelain products. If the moisture content of the plastic mass is less or more than the specified amount during the forming and drying processes, these processes will be adversely affected. Usually, the slicker is compressed in a filter press and brought to the desired moisture content. Humidity is important for the forming process, the filter press allows for moisture in the range of 18-24%. If the humidity exceeds it, it will affect the quality of the mass, i.e. the shape of the dough. In many production enterprises, the moisture content of plastic mass is determined by special chemical processes in the laboratory for a certain period of time. This creates interruptions in the production process. In this situation, the use of moisture measuring devices is an effective method.

In moisture measurement, the device and automatic systems increase the time intensity. Individual moisture measurement does not require laboratory equipment and a separate inspector. This will further increase the economic efficiency. The moisture content of the mass coming out of the filter press is not uniform, there are certain differences between them. The reason for this is that the pressure is not the same and the disk fabric is not in good condition. By means of plunger pumps, the slicker is driven under pressure to the filter press machine. As a result of high pressure, fabrics become unusable faster. This leads to uneven moisture content. If we do this with Arduino Uno and a humidity sensor, the performance will be even better.

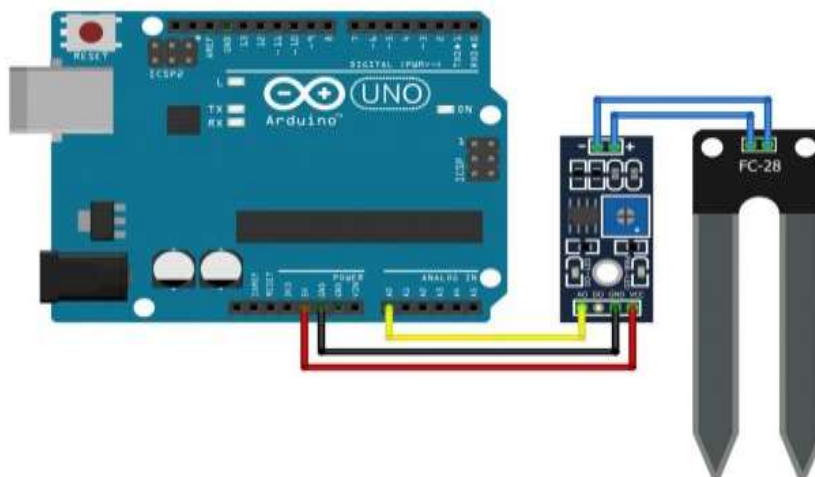
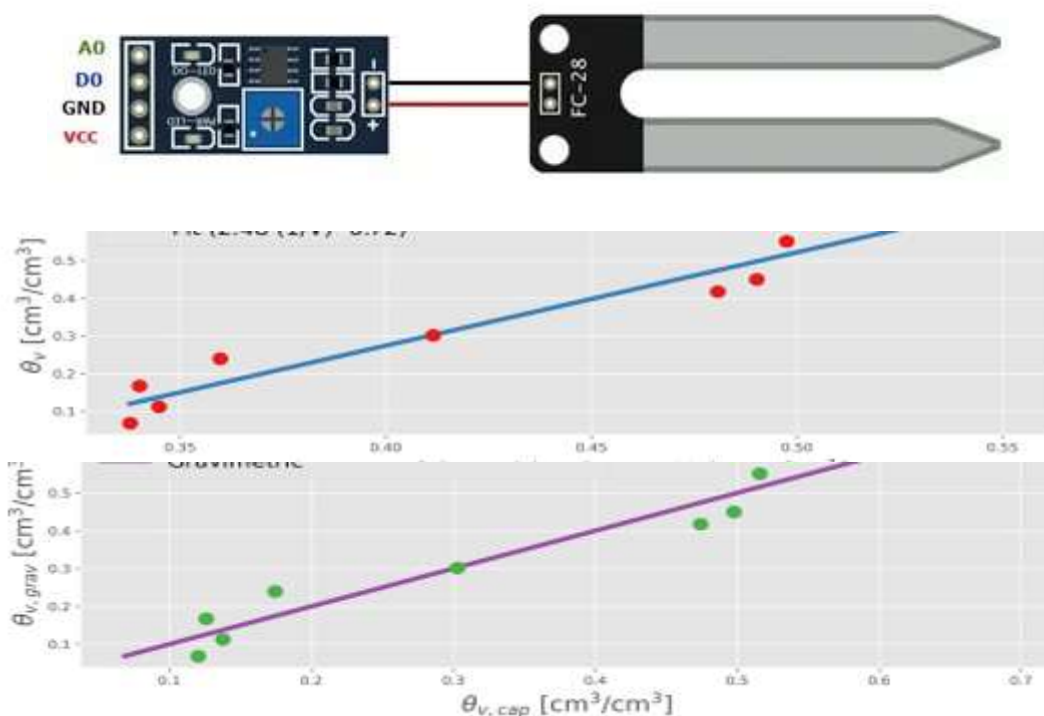


Figure 1. Arduino uno and FC-28 humidity sensor connection diagram

Today, the Arduino platform is used in many different fields. Arduino's open source platform is very easy to use and its pins are easy to find. Therefore, it has become convenient for users to use it. There are several types of Arduino Uno, and the difference from other types of Arduino Uno is the processor, microcontroller, digital and analog outputs. to Arduino using connectors



**Figure 2. Graph of humidity measurement using the FC-28 sensor.**

is connected. Two of the three connectors are (VCC) and Ground (GND). The third output is the We Get Show (SIG). They transmit the humidity level analogically to the Arduino based on the potential difference. The sensor oxidizes quickly due to its metallicity. To prevent oxidation, it is recommended to turn off the power from time to time. The greater the moisture in the plastic mass, the better the contact. Electricity is carried out, the resistance drops, the level of contact in the signal increases. Analog values may vary depending on the supply voltage and the analog pins of the microcontroller. If the sensor is constantly charged, its sensitive elements will quickly begin to rust. The greater the humidity of the plastic mass, the faster corrosion occurs. The sensor has the ability to work with digital mode and analog connection options. FC-28 is mainly used for small plastic masses. It includes a comparator and a potentiometer to control the sensitivity of the sensor and set the limit value when connected to the digital output. The output signal can be digital and analog. The percentage of moisture of the plastic mass is calculated, from which then we display them in the port monitor. We can create a circuit diagram. Main technical features:

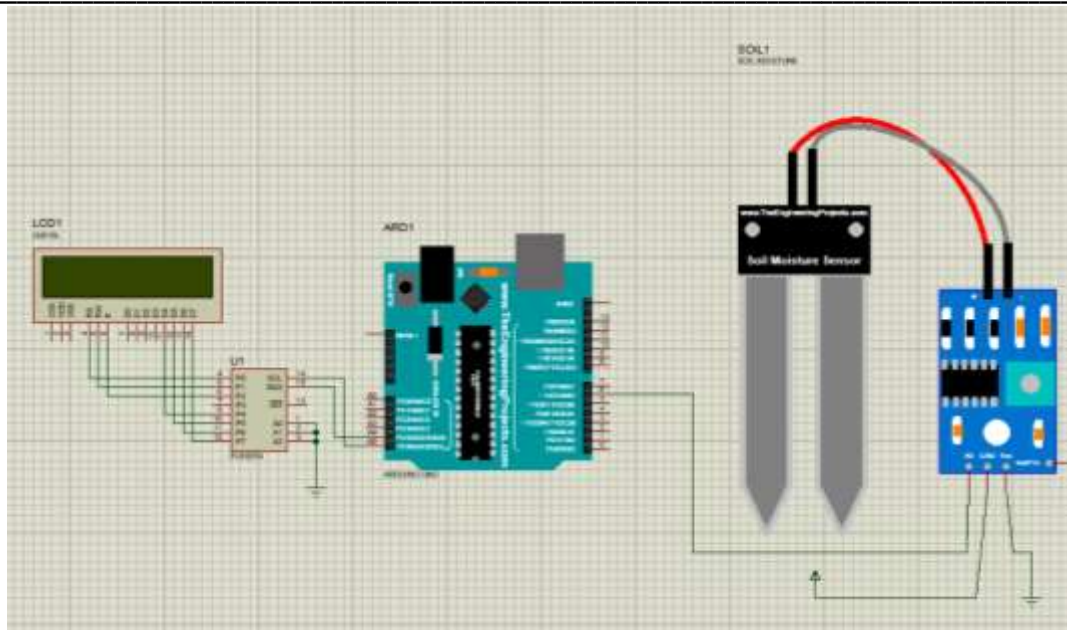


Figure 3. Schematic of arduino uno and FC-28 measuring humidity in the Proteus program  
Power supply: 3 - 5V. Specified humidity: - 80%  $\pm$  5%. Set temperature: 0 - 50°  $\pm$  2%. Research frequency:  
 $\leq$  1Hz

As can be seen from the results and characteristics, it is easy and economical to control many quantities and processes in the fine ceramics industry with the help of the Arduino system. Especially, the fact that they have a very high maximum power saving of 5 volts is also very useful from the point of view of technical safety.

#### References.

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2. Tarleton, E. S. W., R. J. (2007). Solid/liquid separation - equipment selection and process design. Elsevier. ISBN 978-0-080-46717-7.