CLAIMS

[Claim 1]

A flow rate regulating valve comprising:

a valve body for opening and closing a fluid flow path provided in a body; and

an actuator unit configured to move the valve body, wherein

the actuator unit includes:

a drive motor;

a slider moved by a rotation of the motor;

a cylindrical body attached to the slider; and

a shaft interlocked with the cylindrical body and fixed to the valve body at a distal end thereof,

wherein

the motor is a stepping servomotor, and has a pressing control function for moving the valve body in a closing direction at a continuous rated torque or below until a torque value becomes equal to or higher than a set value by a closed loop based on a signal of an encoder, and

detection of a closed position is performed by means of the pressing control function.

[Claim 2]

The flow rate regulating valve according to claim 1, wherein the slider and the cylindrical body are unitized.

[Claim 3]

The flow rate regulating valve according to claim 1 or 2, wherein the motor further has a position control function for controlling a position by the closed loop based on the signal of the encoder, and a speed control function for controlling the rotating speed of a rotary shaft of the motor, and

setting of a predetermined opening is performed by the position control function and the speed control function.

[Claim 4]

The flow rate regulating valve according to any one of claims 1 to 3, wherein torque abnormality of the motor is determined by the torque control function when detecting the closed position and when setting the predetermined opening.

[Claim 5]

A fluid control apparatus comprising:

a plurality of lines each having a flow rate regulating valve, an opening of which is set to a prescribed value, wherein each of the flow rate regulating valves of the plurality of lines corresponds to the flow rate regulating valve according to any one of claims 1 to 4, and wherein an amount of operation of the motor of the each of the flow rate regulating valves is monitored by a monitoring apparatus connected via a communication device.

CLAIMS

1. A flow rate regulating valve comprising:

a valve body for opening and closing a fluid flow path provided in a body;

an actuator unit configured to move the valve body, wherein the actuator unit includes:

a drive motor;

a slider moved by a rotation of the motor;

a cylindrical body attached to the slider; and

a shaft interlocked with the cylindrical body and fixed to the valve body at a distal end thereof, and

a spring which is arranged on a lower surface of the slider and presses the shaft downward,

wherein the motor is a stepping servomotor, and can move the valve body in a closing direction at a continuous rated torque or below until a torque value becomes equal to or higher than a set value by a closed loop based on a signal of an encoder, and

a closed position of the valve body can be detected, and

wherein the slider and the cylindrical body are unitized.

2. The flow rate regulating valve according to claim 1, wherein the motor can control a position of the valve body by the closed loop based on the signal of the encoder, and can control a rotating speed of a rotary shaft of the motor, and

setting of a predetermined opening is performed by control of the position of the valve body and the speed of the rotary shaft.

3. The flow rate regulating valve according to claim 1, wherein the motor performs a detection of the closed position of the valve body and the setting of a predetermined opening degree by means of a detection of an abnormal torque value.

4. The flow rate regulating valve according to claim 2, wherein the motor performs a detection of the closed position of the valve body and the setting of the predetermined opening degree by means of a detection of an abnormal torque value.