F A successful application

Case name	Shihlin SF series inverters on air compressor				
Department	FA engineer group	Date	2012-01-15	Page	2
Product	SF series				

Brief introduction of air compressor

Air compressor, is the most commonly used aerodynamic power supply equipment in mining industries. The screw air compressor is driven by a pair of male and female rotors (or screws) that are meshed with each other in parallel, so that the air between the rotor slots continuously generates periodic volume changes, and the air is sucked along the rotor axis. The side is conveyed to the output side to make the whole process of suction, compression and exhaust of the screw air compressor. The air compress and unloading control mode is the intake valve switch control mode, that is, the valve is closed when the pressure reaches the upper limit, and the compressor enters the light load operation; when the pressure reaches the lower limit, the valve is opened, and the compressor enters the full load operation. (The screw structure is shown in Figure 1.)

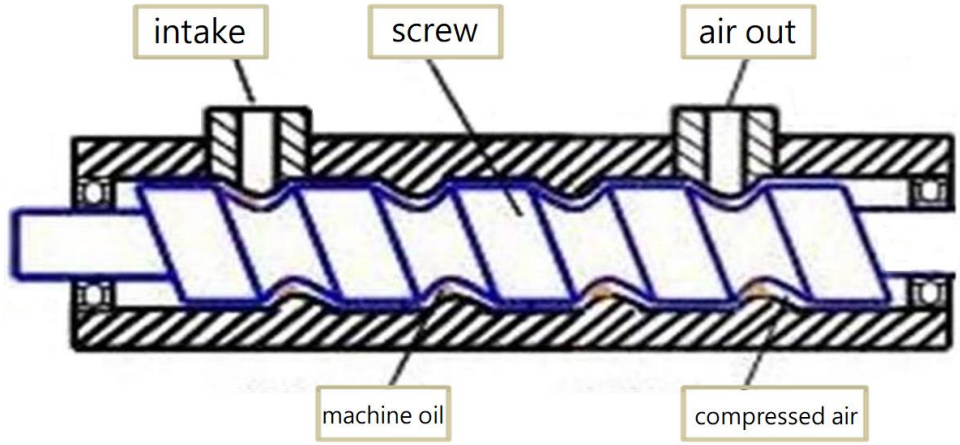


Figure1

Working principle

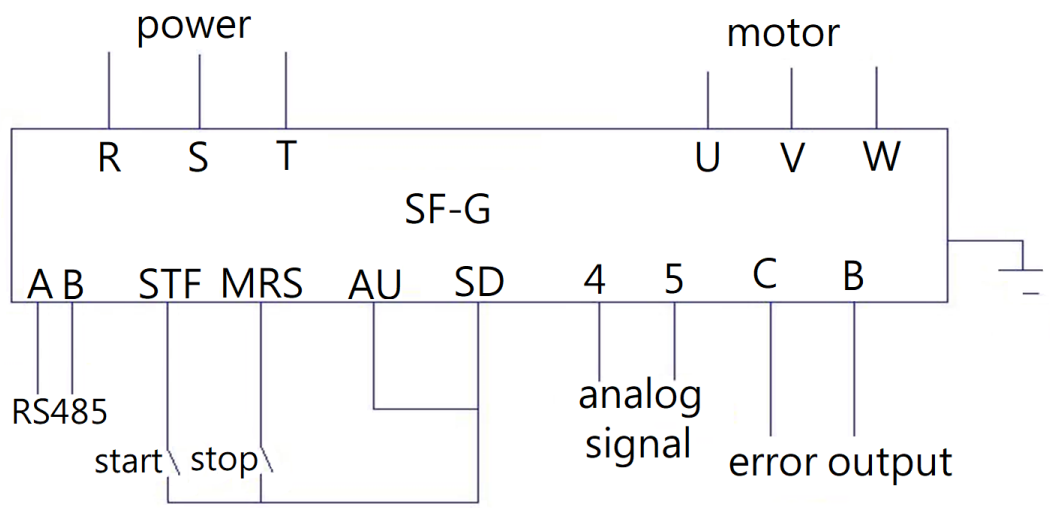
In the air compressor control system, the pressure sensor installed on the air outlet pipe at the rear end of the air compressor is used to control the pressure of the air compressor. When the air compressor is started, the loading solenoid valve is in the closed state, the loading cylinder does not actuate, and the inverter drives the motor to run at no load for a period of time (the controller can be arbitrarily set, here set to 2S), then the loading solenoid valve is opened and the air compressor is running on load. When the air compressor starts running, if the back-end equipment uses a large amount of gas, and the pressure of the compressed gas in the gas storage tank and the rear-end pipeline does not reach the upper pressure limit, the controller activate and load the valve, open the intake port, and the motor load Run, continuously producing compressed air to the rear line. If the gas equipment at the back end

stopped using gas, the pressure of the compressed gas in the rear end pipeline and the gas storage tank gradually increases. When the pressure upper limit value is reached, the pressure sensor sends an unloading signal, and the loading solenoid valve stops working, the air inlet and filter is turned off and the motor is running at the lower limit frequency (usually set to 25HZ).

Requirements

1. The air compressor specialized controller is used with a high-precision signal response inverter to adjust the inverter output frequency, output current, voltage, frequency and power monitoring. The constant pressure control is done completely.
2. The inverter has Modbus communication protocol to communicate with air compressor controller .
3. The inverter start by an external I/O signal, and the output frequency comes from the 4~20mA current signal of the control system. The system reads the real-time power, current, voltage and other information of the inverter through communication.
4. The customer's motor power is 380V/37KW. It is generally recommended to use the inverter SF-040-45K/37KG.

Wiring diagram



Parameter setting

number	description	default	setting
P.1	Upper limit	120	50
P.2	Lower limit	0	25
P.7	Acceleration time	20	20
P.8	Deceleration time	20	15
P.13	Start up frequency	0.5	5
P.33	Communication protocol	1	0
P.36	Inverter station number	0	1
P.65	Restart function select	0	4
P.67	Restart times	0	10
P.68	Restart waiting time	6	0.1
P.79	Operation mode	0	2

Note points during the debugging process

a: Make sure the motor is in the right direction

b: Whether the starting current, running current and electric heat accumulation are stable (P.161=6 voltage monitoring to see if the value increases, the value is ideal for stable $\leq$0.5)