

Application to Air Conditioning Fans (with PID control)

Advantages of using Fuji inverters

(1) Built-in PID control function

The inverter incorporates the PID control function. By simply connecting a room temperature sensor (4 to 20mA) with the inverter, the inverter can control the air conditioner so that it keeps the room temperature at a constant level.

(2) Automatic energy-saving operation function for more energy saving

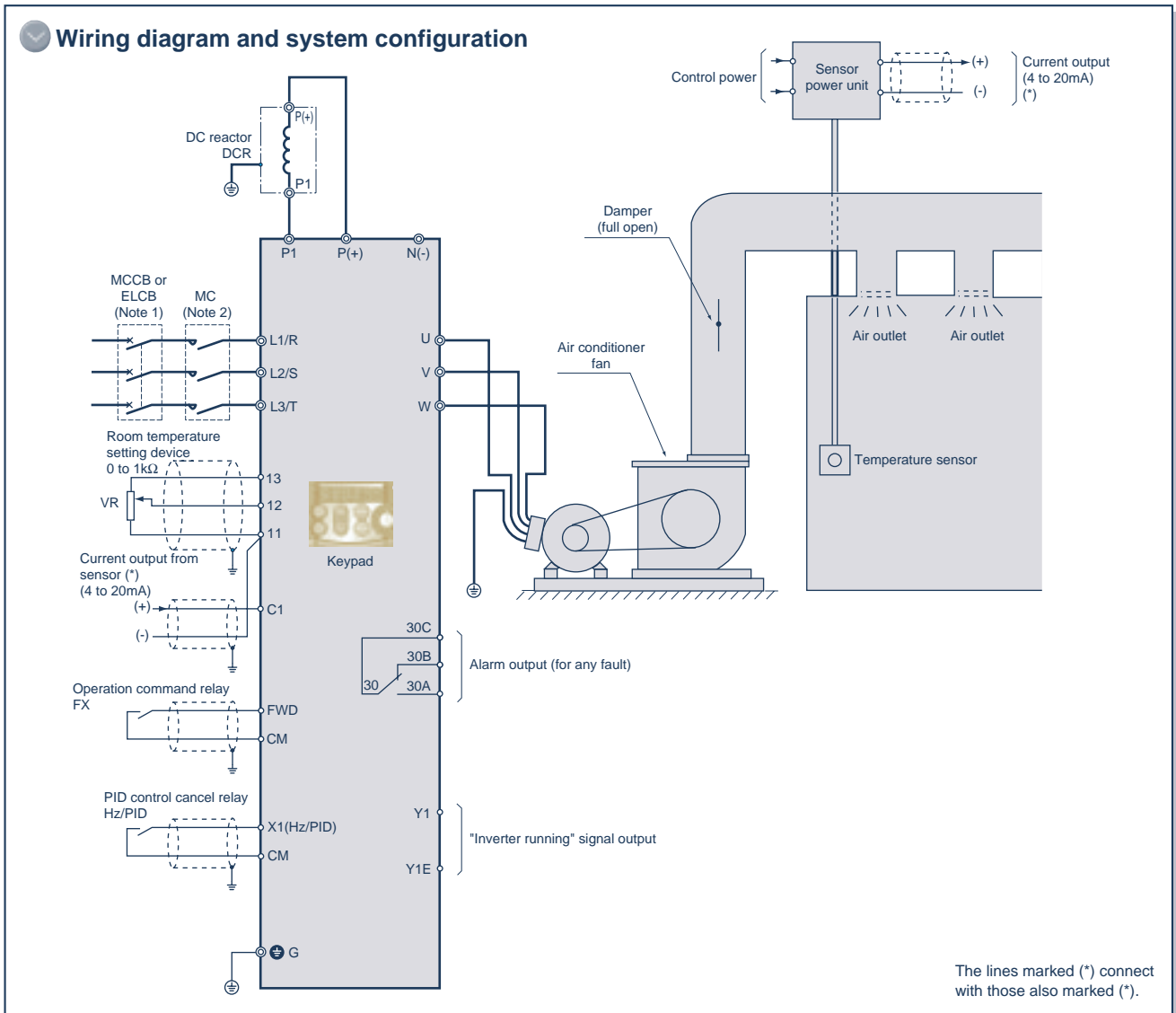
The inverter automatically sets the conditions that the motor can run with the highest efficiency according to the ever-changing fan's axial force. By minimizing the power consumption in this way, the inverter meets an increasing demand for energy saving.

(3) Inverter cooling fan ON/OFF control

- With activation of the inverter cooling fan ON/OFF control, the inverter automatically stops its fan when the inverter operation command is off and the heat sink temperature is low.
- The energy saving effect obtained from this function may be small when compared with the power required for air conditioner. However, it is significant when the energy is saved in the whole air conditioning system. Furthermore, this ON/OFF control is effective in eliminating the fan noise especially at night when such noise is a nuisance.

(4) Low noise for comfortable environment

Unpleasant noise from the inverter-driven motor has been nearly zeroed like the case where the motor gets its drive directly from the commercial power source.



Note 1 : Install a recommended molded-case circuit-breaker or an earth-leakage circuit-breaker (except one used only for protection against ground fault) in the primary circuit of the inverter to protect wiring. At this time, ensure that the circuit breaker capacity is equivalent to or lower than the recommended capacity.
 Note 2 : If there is a magnetic contactor or a solenoid close to the inverter, connect a surge suppressor to its coil. Keep the wiring length to a minimum.

Function code settings (recommended)

Func. code	Name	Factory setting	Recommended setting value	Remarks	
J01	PID control (Select)	0: Inactive	0: Inactive (4 to 20mA DC)	Operation without PID control	
			1: Process control use (Normal action) Set for heating.	Set for heating.	
			2: Process control use (Inverse action) Set for cooling.	Set for cooling.	
J03	P (gain)	0.100: 0.1 times	0.001 to 10.00: 0.001 to 10.00 times	Set the gain according to equipment design specifications.	
J04	I (Integration time)	0.0: 0s	0.1 to 3600: 0.1 to 3600s		
J05	D (Differentiation time)	0.0: 0s	0.1 to 600.0: 0.1 to 600.0s		
J06	(Feedback filter)	0.5: 0.5s	0.0: No filter		
E62	Terminal 13 (Function)	0: No function selection	5: PID feedback value		
E01	X1 terminal function (Select)	0: (1000) Multistep freq. selection (0 to 1 step) [SS1]	20: (1020) PID control cancel [Hz/PID]	With the terminal X1 ON, manual (keypad) operation is selected.	
F37	Load select/Auto torque boost/Energy-saving operation	1: Constant torque load	3: Energy-saving operation (Variable torque load during ACC/DEC.)		
H06	Fan stop operation	0: Inactive	1: Active (1.5kW or more)		
E20	Y1 terminal function (Select)	0: (1000) Inverter running [RUN]	0: (1000) Inverter running [RUN]		
F14	Restart mode after momentary power failure (Select)	1: Inactive (Trips without restart when power recovers.)	5: Active (Restarts at starting frequency, for low inertia load)		
F26	Motor sound (Carrier freq.)	2: 2kHz	15: 15kHz		
C01	Jump frequency 1	0.0: 0Hz	0.0 to 400.0: 0.0 to 400.0Hz	Set the value if this function is needed for the machine to be combined.	
C02		2			0.0: 0Hz
C03		3			0.0: 0Hz
C04		(Hysteresis)			3.0: 3Hz

In addition to the above codes, check if the parameter values set at the function codes F03 to F05, F07, F08, P02, P03, and P09 match the motor rated values and the machine design specifications.

Tips

(1) Possible to set PID control parameters

The optimum values for PID control function vary with the equipment and the conditions where the equipment is used. The factors for determining the optimum values include the area size to be air conditioned, adiabatic status, and the air conditioner capacity.

At first, set arbitrary values on the trial base, and then re-set the optimum values after test operation.

(2) Automatic energy-saving operation: Ideal for fans

The automatic energy-saving operation exhibits the maximum effect when used for the fan's variable torque load.

(3) Possible to output "Inverter running" signal

By assigning the Y1 terminal function to "Inverter running" at the function code E20, the transistor signal can be output by establishing continuity between the terminals Y1 and Y1E during inverter operation.

(4) Suppressing harmonics with a DC reactor

The inverter is standard-equipped with the exclusive terminals P1 and P(+) to which a DC REACTOR can be connected. For suppressing harmonics, use the optional DC REACTOR (DCR□-□□□).