HFS21 THREE-PHASE MOTOR CONTROL MODULE

CE

Features

- Photo isolation
- LED status indication
- Dielectric strength 4000V
- zero cross
- Built-in snubber
- Panel mount
- Environmental friendly product (RoHS compliant)

INPUT (Ta = 25°C)

Control voltage range	05D	4.5VDC to 5.5VDC
	12D	10.8VDC to 13.2VDC
	24D	21.6VDC to 26.4VDC
Must operate voltage	05D	4.2VDC
	12D	9.6VDC
	24D	19.2VDC
Must release voltage	05D	1VDC
	12D	3VDC
	24D	10VDC
Max. input current		50mA
Max. reverse protection voltage	05D	−5.5VDC
	12D	−13.2VDC
	24D	−26.4VDC
Min.switch time for motor forward and reverse operation (User offer, see time sequence diagram t2)	Normal type	300μs
	(343)Special type	30ms

OUTPUT (Ta = 25°C)

Load current range		380A10Z: 10A 380A15Z: 15A 380A25Z: 25A 380A40Z: 40A
Load voltage range		48VAC to 440VAC
Transient overvoltage		800Vpk
Max. on-state voltage drop		1.5Vr.m.s.
Min. load current		100mA
Max. leakage current		5mA
Min. off-state dv/dt		200V/μs
Turn-on delay time (integrated in module,see time sequence diagram t3)	Normal type	1/2cycle + 80ms
	(343)Special type	1/2cycle + 1ms
Max. turn-off time (see time sequence diagram t1)		1/2cycle + 1ms
Frequency range		47Hz to 63Hz
Max. surge current (10ms)		380A10Z: 100Apk 380A15Z: 150 Apk 380A25Z: 250 Apk 380A40Z: 400 Apk
Max. I^2t for fusing (10ms,A^2s)		D380A10Z: 50 D380A15Z: 112 D380A25Z: 312 D380A40Z: 800

GENERAL (Ta = 25°C)

Dielectric strength (input to output)		4000VAC,50Hz/60Hz,1min
Insulation resistance		1000MΩ (at 500VDC)
Max. capacitance (input to output)		10pF
Ambient temperature	Operating	-30°C to 80°C
	Storage	-30°C to 100°C
Ambient humidity		45% to 85% RH
Termination		Screw
Mounting model		Panel mount
Unit weight		Approx. 335g
Operating status indication		Forward: green Reverse: red

APPLICATION(Ta = 25°C)

Load current	10A	15A	25A	40A
Motor power	0.75kW	1.1kW	1.5kW	3kW
Heatsink part number	HF92B-150A			HF92B-150C
Cooling fan air flow	115CFM			

DESCRIPTION

HFS21 motor control module is a special solid state relay which is only used for reversing control and bucking-connected brake control by three phase motor.It integrates logic interlock circuit and turn-on delay circuit.According to these circuits, it can avoid destruction by phase-to-phase short circuit.As long as the switching time meet the specification, it can protect the power supply system, motor and module itself.In the meantime, the module integrates three internal snubbers, so it can absorb the peak voltage.

The module offer 05VDC,12VDC or 24VDC input control,with ouputs rated at 10Amps,15Amps,25Amps and 40Amps.

The module include a double color LED , it can indicate the running status conveniently. The modules are widely used for three phase motor control and electric actuator control, the typical application include blender control, steam valve control, flow control, wind door control, and so on.

INSTALLATION

1. When mounting the modules side by side, provide a space equivalent to the width of a single module between two adjacent modules. Otherwise , reduce the load current flow to 1/2 to 1/3 of the rated current.
2. When mounting modules on the heat sink surface , first apply a heat conductive grease to the metal back surface of the module. Press the module firmly onto the heat sink to ensure a good seal. Screw the module down to the heat sink .
3. Next , wire the screw terminals and securely tighten the screws.

PRECAUTIONS

1. Before connect a load that generates a high surge current ,such as a lamp load to the module, make sure that the module can withstand the surge current of the load.
2. The product data sheet shows the non-repetitive peak value of the surge current that flows through the module. Normally, use 1/2 of the non-repetitive peak surge current as the standard value. If a surge current exceeding that value is expected, connect a quick-acting fuse to protect the module. At the same time, I^2t value of the quick-acting fuse must be smaller than the module value.
3. In practice, if the transient voltage may be larger than 800V,a 750V varistor should be mounted to the load terminals.
4. When the module is put into use,the minimum switching time by user offer must meet this specification.
5. Please pay more attention to actual load current and ambient temperature for module selection. When the moudle is used for full load operation, we'd better install an adequate heatsink or take other effective cooling measures. When the ambient temperature is high, please refer to the follow-up characteristic curves for derating.
6. Tighten the module terminal screw properly. If the screws are not tight, the module will be damaged by heat which is generated when module turn on. Perform wiring using the tightening torque shown in the following table.

Screw name	Recommend tightened torque
Input screw	0.58 N·m to 0.98 N·m
Output screw	0.98 N·m to 1.37 N·m

7. It's recommended to use the matched heatsink by Hongfa, When a user need use home-made heatsink, it's needed to ensure that the module base temperature does not exceed 85°C.
8. Please do not use the relay beyondthe descriptions in the data sheet. If it is a must to use it beyond descriptions, please contact Hongfa for more technical support.

ORDERING INFORMATION

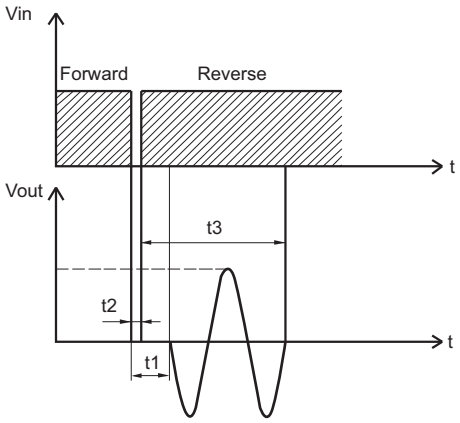
HFS21 / 24D- 380 A 25 Z- Y L 3 (XXX)

Type				
Input voltage	**05D**: 5VDC	**12D**: 12VDC	**24D**: 24VDC	
Load voltage	**380**: 380V			
Load voltage form	**A**: AC			
Load current	**10**: 10A	**15**: 15A	**25**: 25A	**40**: 40A
Zero cross function	**Z**: Zero cross turn on			
Varistor protection	**Y**: With Varistor protection	**Nil**: Without varistor protection		
LED indicator	**L**: With LED			
Output number	**3**: Three			
Customer special code	**(343)**: Electric actuator special use type	**Nil**: Normal type		

TIME SEQUENCE DIAGRAM, OUTLINE DIMENSIONS AND WIRING DIAGRAM

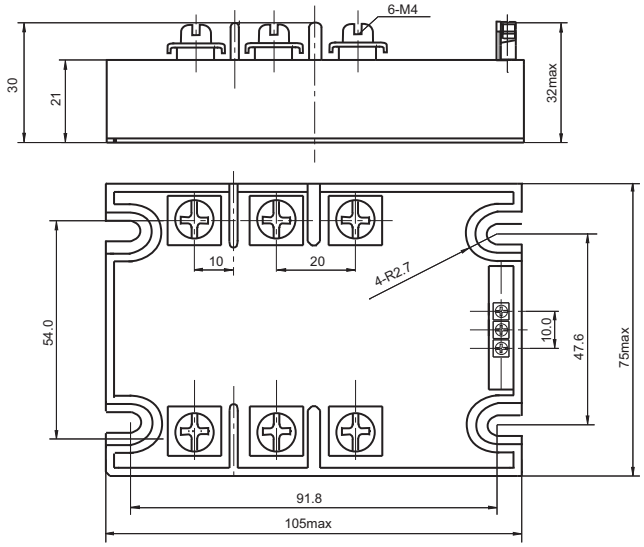
Unit: mm

Time Sequence Diagram

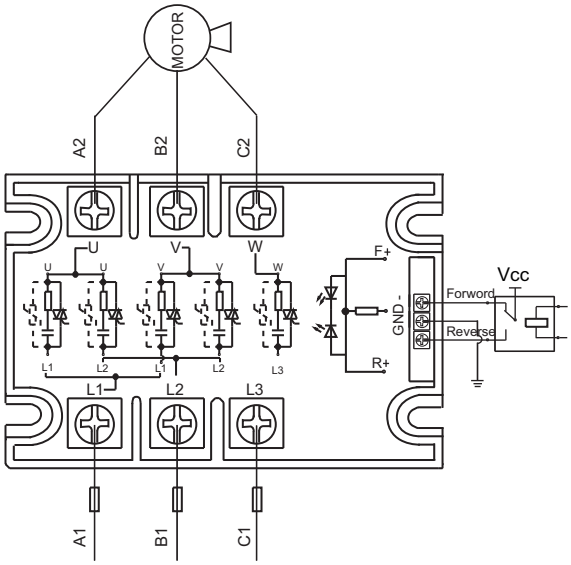


Notes:
t1: turn-off time
t2: Switching time
t3: Turn-on delay time

Outline Dimensions

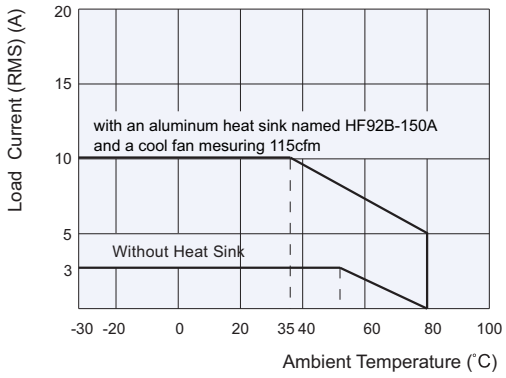


Wiring Diagram

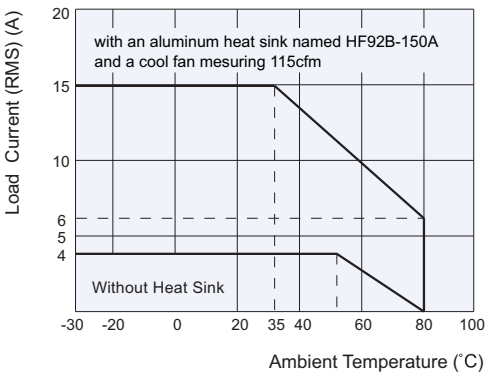


CHARACTERISTIC CURVES

Max. Load Current vs. Ambient Temp. (10A)

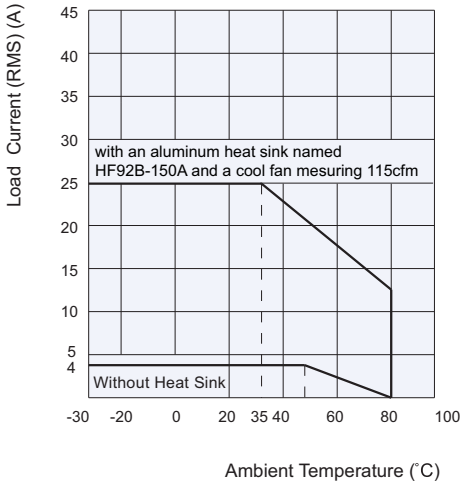


Max. Load Current vs. Ambient Temp. (15A)

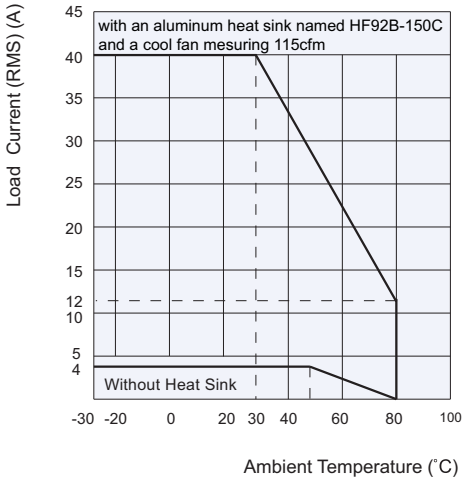


CHARACTERISTIC CURVES

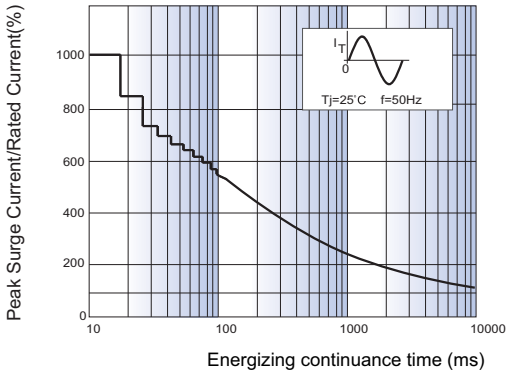
Max. Load Current vs. Ambient Temp. (25A)



Max. Load Current vs. Ambient Temp. (40A)



Max. Permissible Non-repetitive
Peak Surge Current rate vs. Continuance time



Disclaimer

This datasheet is for the customers' reference. All the specifications are subject to change without notice.
We could not evaluate all the performance and all the parameters for every possible application. Thus the user should be in a right position to choose the suitable product for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the user's responsibility to determine which product should be used only.

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