

# HF170F-S

# MINIATURE HIGH POWER RELAY



File No.:E133481



File No.:R 50384178



File No.:CQC18002198581  
CQC17002175164



## Features

- 2 Main contact +1 Auxiliary contact
- Detection of main contact welding makes it possible to construct a safety circuit(according to IEC 61810-3)
- Contact gap: 3.6 mm (Main contact),1.0 mm(Auxiliary contact)  
Auxiliary contact: Min.0.5mm(When main contact welded)
- Low coil holding voltage contributes to saving energy of equipment
- Fully compliant to the short circuit current test of IEC 62955
- UL insulation system: Class F
- Applicable to AC charging station,solar photovoltaic inverter
- Outline dimensions: (36×30×40)mm

**RoHS compliant**

## CONTACT DATA

Contact arrangement	2A, 2A1B	
Contact resistance (initial)	Main contact	10mΩ max.(6VDC 20A)
	Auxiliary contact	100mΩ max.(6VDC 1A)
Contact material	Main contact	AgSnO <sub>2</sub>
	Auxiliary contact	AgNi
Contact rating (resistance)	Main contact	40A 277VAC
	Auxiliary contact	1A 277V AC, 1A 30VDC
Max. Switching voltage	Main contact	480VAC
	Auxiliary contact	277VAC, 30VDC
Max. Switching current	Main contact	40A
	Auxiliary contact	1A
Max. Switching main	Main contact	11080VA
	Auxiliary contact	277VA/30W
Min. switching load <sup>2)</sup> (Auxiliary contact)		NC: 100mA 12VDC NC(Gold plated): 10mA 12VDC
Mechanical endurance		1×10 <sup>6</sup> ops
Electrical endurance	NO	* 277VAC 35A, cosφ=0.8, Inductive load, 85°C, 1s on 9s off, 3×10 <sup>4</sup> ops * 277VAC 40A, Resistive load, 85°C, 1s on 9s off, 1×10 <sup>4</sup> ops 277VAC, making10A loading 40A breaking10A, Resistive load, 85°C, 1s on 9s off, 5×10 <sup>4</sup> ops
	NC	277VAC 1A, Resistive load, 85°C, 1s on 9s off, 10×10 <sup>4</sup> ops 30VDC 1A, Resistive load, 85°C, 1s on 9s off, 10×10 <sup>4</sup> ops

**Notes:** 1) The data shown above are initial values.

2) Load with symbol \*,wired according to IEC 61810-1 Table 16 diagram.

3) Min. switching load is reference value, applicable to normal temperature, humidity and pressure environment. Please perform the confirmation test with the actual load before usage since reference value may change according to switching frequencies, environmental conditions and expected life cycles.

## CHARACTERISTICS

Insulation resistance		1000MΩ(500VDC)
Dielectric strength	Between open Main contacts	2000VAC 1min
	Between Main contact and Auxiliary contact	5000VAC 1min
	Between Main contact sets	5000VAC 1min
	Between coil & Auxiliary contacts	2000VAC 1min
	Between coil & Main contacts	5000VAC 1min
	Between open Auxiliary contacts	1000VAC 1min
	Operate time (at rated. volt.)	30ms max.
Release time (at rated. volt.)		10ms max.
Temperature rise		70K max.(Contact load current 40A, Applied voltage of coil 100% rated voltage for 100 ms holding voltage of coil 60% rated voltage, at 85°C)
Shock resistance	Functional	98m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Vibration resistance		10Hz to 55Hz 1.0mm DA
Humidity		5% to 85%RH
Ambient temperature		-40°C to 85°C
Termination		PCB
Unit weight		Approx. 75g
Construction		Flux proofed

**Notes:** 1) The data shown above are initial values.



HONGFA RELAY

ISO9001, IATF16949, ISO14001, ISO45001, IECQ QC 080000, ISO/IEC 27001 CERTIFIED

2024 Rev. 2.00

## COIL DATA at 23℃

### Standard type

Nominal Voltage VDC	Pick-up Voltage VDC max.	Drop-out Voltage VDC min.	Max. Voltage VDC <sup>1)</sup>	Coil Resistance Ω
6	4.5	0.3	6.6	19.1×(1±10%)
9	6.75	0.45	9.9	43.1×(1±10%)
12	9	0.6	13.2	76.6×(1±10%)
24	18	1.2	26.4	306.4×(1±10%)
48	36	2.4	52.8	1225.5×(1±10%)

**Notes:** 1)The data shown above are initial values.  
2)Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

## COIL

Coil power	Approx.1.88W
Holding voltage	35% to 110%U <sub>N</sub> (at 23℃) 40% to 60%U <sub>N</sub> (at 85℃)

**Notes:** 1)The coil holding voltage is the voltage applied to coil 100ms after the rated voltage.  
2)To avoid overheating and burning, the coil can not be consistently applied to with voltage larger than maximum holding voltage.

## SAFETY APPROVAL RATINGS

UL/CUL	NO AgSnO <sub>2</sub>	277VAC, 35A, Resistive load, 85℃ 277VAC, 40A, Resistive load, 85℃ 277VAC, Making 10A Loading 40A Breaking 10A, Resistive load, 85℃
	NC AgNi	277VAC, 1A, Resistive load, 85℃ 30VDC, 1A, Resistive load, 85℃
TÜV	NO AgSnO <sub>2</sub>	277VAC, 35A, Inductive load cosφ=0.8, 85℃ 277VAC, 40A, Resistive load, 85℃ 277VAC, Making 10A Loading 40A Breaking 10A, Resistive load, 85℃
	NC AgNi	277VAC, 1A, Resistive load, 85℃ 30VDC, 1A, Resistive load, 85℃
CQC	NO AgSnO <sub>2</sub>	277VAC, 35A, Resistive load, 85℃ 277VAC, 40A, Resistive load, 85℃ 277VAC, Making 10A Loading 40A Breaking 10A, Resistive load, 85℃
	NC AgNi	277VAC, 1A, Resistive load, 85℃ 30VDC, 1A, Resistive load, 85℃

**Notes:** 1) All values unspecified are at room temperature.  
2) Only some typical rating are listed above.If more details are required,please contact us.

## ORDERING INFORMATION

Type	HF170F-S /	12	-2H	1D	T	F	(XXX)
Coil voltage	6,9,12, 24,48VDC						
Main contact arrangement	2H: 2 Form A						
Auxiliary contact arrangement	1D: 1 Form B Nil: Standard						
Contact material	T: AgSnO <sub>2</sub>						
Insulation standard	F: Class F						
Special code <sup>3)</sup>	XXX: Customer special requirement Nil: Standard 991 : Auxiliary contact gold plated						

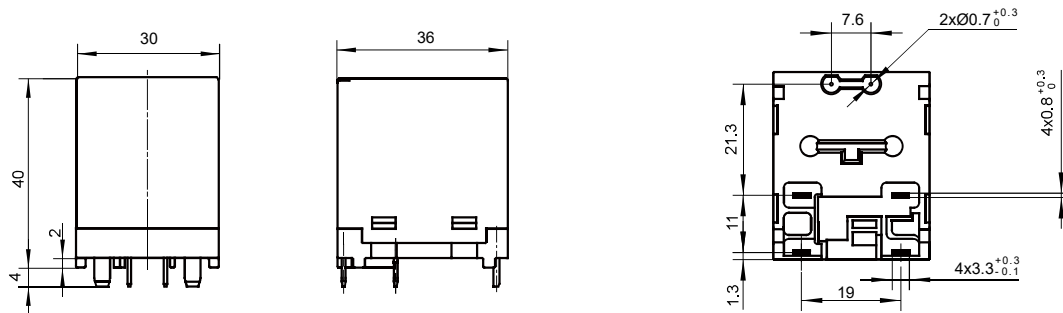
**Notes:** 1) Water cleaning or surface process is not suggested after the flux-proofed relays are assembled on PCB.  
2) Please avoid using the relay in an environment containing organic silicon,otherwise the entry of organic silicon into the relay may acceleration contact failure.If there are harmful substances and elements such as water vapor,H<sub>2</sub>S,SO<sub>2</sub>,NO<sub>2</sub>,Cl,P,etc.In the use of environmental gases, it may lead to increased contact resistance and poor contact during the use of relays.In the above situations,please control the materials or use plastic sealed type and arrange relevant tests to confirm.  
3) The customer special requirement express as special code after evaluating by Hongfa.  
4) IEC 62955 Test Sequence E: 9.11.2.3 a) 440 VAC, I<sub>p</sub>≥1.1 kA, I<sup>2</sup>t≥1.2 kA<sup>2</sup>s(In≤16 A, Inc=3000A) + 9.11.2.2 440 VAC, Im=500 A. Test Sequence F: 9.11.2.3 b) 440 VAC, Im=500A + 9.11.2.3 c)440VAC, I<sub>p</sub>≥1.1 kA, I<sup>2</sup>t≥1.2 kA<sup>2</sup>s(In≤16 A, Inc=3000A).  
5) IEC 62752 Test Sequence E: 9.9.2.4 a) 440 VAC, I<sub>p</sub>≥1.02 kA, I<sup>2</sup>t≥2.5 kA<sup>2</sup>s(In≤16 A, Inc=1500A) + 9.9.2.2 440 VAC, Im=100 A. Test Sequence F: 9.9.2.4 b) 440 VAC, Im=100A + 9.9.2.4 c)440VAC, I<sub>p</sub>≥1.02 kA, I<sup>2</sup>t≥2.5 kA<sup>2</sup>s(In≤16 A, Inc=1500A).

# OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

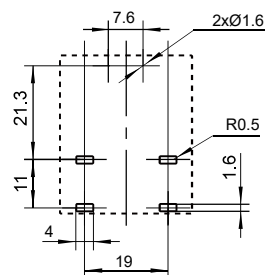
Unit: mm

## Outline Dimensions

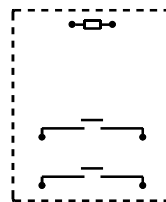
2H:



PCB Layout  
(Bottom view)

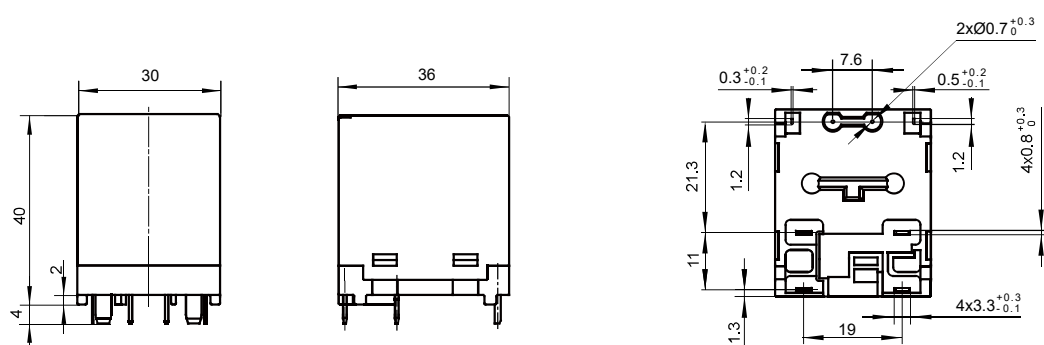


Wiring Diagram  
(Bottom view)



## Outline Dimensions

2H1D(with Auxiliary contact):

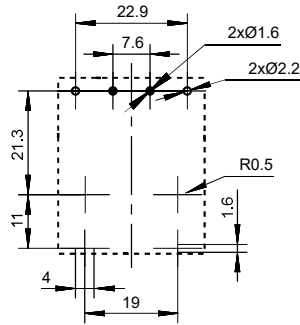


## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

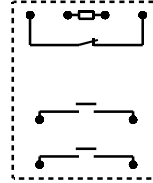
Unit: mm

2H1D(with Auxiliary contact):

PCB Layout  
(Bottom view)



Wiring Diagram  
(Bottom view)



- Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should be  $\pm 0.4\text{mm}$ .  
2) The tolerance without indicating for PCB layout is always  $\pm 0.1\text{mm}$ .

### Disclaimer

The specification is for reference only. See to "Terminology and Guidelines" for more information. Specifications 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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