

# HFE20

# MINIATURE HIGH POWER LATCHING RELAY



File No.:E134517



File No.: 40031831



File No.: CQC14002113728



## Features

- 20A switching capacity
- Low height 15.7mm
- UL insulation class: F class
- TV-8 rating certified
- Inrush current capacity up to 500A/2ms and 320A/2ms (Contact material: W+AgSnO<sub>2</sub> and AgSnO<sub>2</sub>)
- Product in accordance to IEC 60335-1 available

**RoHS compliant**

## CONTACT DATA

Contact arrangement	1A, 1B, 1C
Contact resistance 1)	20mΩ max. (at 1A 24VDC)
Contact material	AgSnO <sub>2</sub> , W+AgSnO <sub>2</sub>
Contact rating	1A,1B: 16A 250VAC, 1 x 10 <sup>5</sup> OPS (Resistive, at 85°C, 1s on 9s off) 1A,1B: 20A 250VAC, 2 x 10 <sup>4</sup> OPS (Resistive, at 70°C, 1s on 9s off) 1A,1B: 1.5HP 250VAC 6 x 10 <sup>3</sup> OPS (Motor, at 40°C, 0.5s on 0.5s off) 1A,1B: 8A 220VAC COSØ=0.4, 1x10 <sup>5</sup> OPS (Inductive, at 85°C, 1s on 9s off) HFE20-1/X-1HD: 3300W 277VAC, 2 x 10 <sup>4</sup> OPS (Electronic rectifier, at 40°C, 1s on 9s off) 1C: 16A 250VAC, 5 x 10 <sup>4</sup> OPS (Resistive, at 85°C, 1s on 9s off)
Max. switching voltage	277VAC
Max. switching current	20A
Max. switching power	4000VA
Mechanical endurance	1 x 10 <sup>6</sup> OPS
Electrical endurance	See "Contact rating"

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

## SAFETY APPROVAL RATINGS

UL/CUL	1A	Resistive:20A 250VAC 70°C Resistive:16A 250VAC 85°C Motor:1.5HP 250VAC 40°C Fluorescent lamp (without compensation): 1800W 120VAC 40°C Fluorescent lamp (with compensation): 1800W 120VAC 40°C Incandescent lamp:1800W 120VAC 40°C
	1C	NO:20A 250VAC 70°C 16A 250VAC 85°C NC:16A 250VAC 85°C
VDE	1A	20A 250VAC(COSØ=1) 70°C 16A 250VAC(COSØ=1) 85°C 8A 250VAC(COSØ=0.4) 85°C
	1C	16A 250VAC(COSØ=1) 85°C

Notes: Only typical loads are listed above, other load specifications can be available upon request.

## COIL

Rated power	Single coil latching: Approx 400mW Double coils latching: Approx 600mW
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## CHARACTERISTICS

Insulation resistance	1000MΩ (at 500VDC)	
Dielectric strength	Between coil & contacts	4000VAC 1min
	Between open contacts	1000VAC 1min
Creepage distance	8mm	
Surge voltage(Between coil & contacts)	10000V	
Set time (at nomi. volt.)	10ms max.	
Reset time (at nomi. volt.)	10ms max.	
Shock resistance	Functional	98m/s <sup>2</sup>
	Destructive	980m/s <sup>2</sup>
Vibration resistance	10Hz to 55Hz 1.5mm DA	
Humidity	5% to 85% RH	
Ambient temperature	-40°C to 85°C	
Termination	coil termination	PCB
	Load termination	PCB
Unit weight	Approx. 13g	
Construction	Plastic sealed, Flux proofed	

Notes: The data shown above are initial values.



HONGFA RELAY

ISO9001、IATF16949、ISO14001、OHSAS18001、IECQ QC 080000 CERTIFIED

2021 Rev. 1.00

## COIL DATA

at 23°C

### Single coil latching

Nominal Voltage VDC	Set / Reset Voltage VDC 1)2) max.	Pulse Duration ms min.	Coil Resistance x (1±10%) Ω
3	2.4	50	22.5
5	4.0	50	62.5
6	4.8	50	90
9	7.2	50	202.5
12	9.6	50	360
24	19.2	50	1440

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

2) The above set voltage, reset voltage are the test value for relay without load. Please use 1~1.5 times of rated voltage to drive the relay for your application.

### Double coils latching

Nominal Voltage VDC	Set / Reset Voltage VDC 1)2) max.	Pulse Duration ms min.	Coil Resistance x (1±10%) Ω
3	2.4	50	15+15
5	4.0	50	42+42
6	4.8	50	60+60
9	7.2	50	135+135
12	9.6	50	240+240
24	19.2	50	886+886

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

2) The above set voltage, reset voltage are the test value for relay without load. Please use 1~1.5 times of rated voltage to drive the relay for your application.

## ORDERING INFORMATION

<b>Type</b>	HFE20 - 3 /12 -1D S T -L2 -R (XXX)	
<b>Version</b>	1: 5mm pin 2: 3.5mm pin 3: 2.5mm pin	
<b>Coil voltage</b>	3, 5, 6, 9,12, 24 VDC	
<b>Contact arrangement</b> <sup>1)</sup>	1D: 1 Form B 1H: 1 Form A 1Z: 1 Form C (Only for HFE20-1, HFE20-2)	
<b>Construction</b> <sup>2)</sup>	S: Plastic sealed Nil: Flux proofed	
<b>Contact material</b>	T: AgSnO2 D: W+AgSnO2(Only for HFE20-1/□□ -1H, UL certification only)	
<b>Coil type</b>	L1: Single coil latching	L2: Double coils latching
<b>Polarity</b>	R: Reverse polarity	Nil: Positive polarity
<b>Special code</b> <sup>3)</sup>	XXX: Customer special requirement	

Notes: 1) 1H means that relay is on the "reset" status when delivery; 1D means that relay is on the "set" status when delivery. We prior to recommend

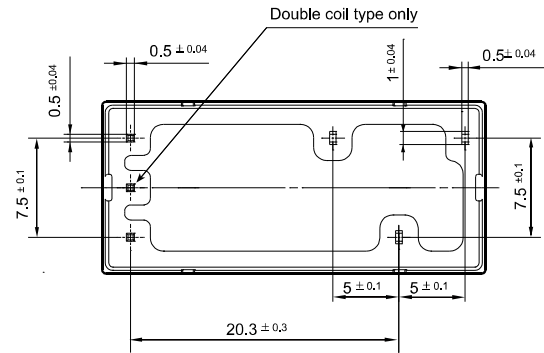
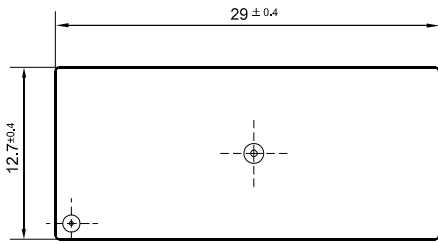
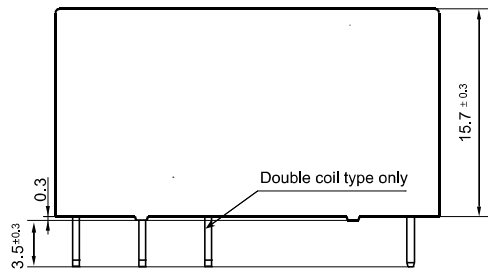
1 Form B unless otherwise specially required by customer (except the pre-make version HFE20-1/□□-1H□D).

2) If water cleaning is required after the relay is assembled on PCB, please contact us for suggestion about suitable parts.

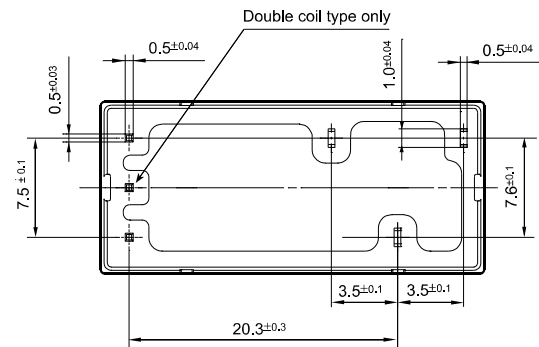
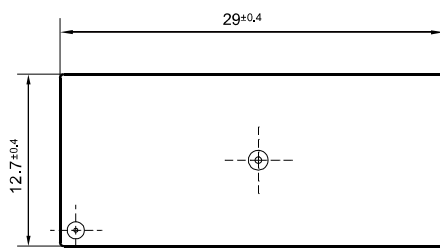
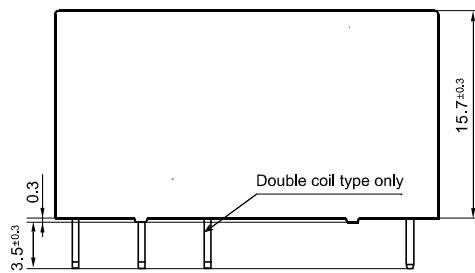
3) The customer special requirement express as special code after evaluating by Hongfa. e.g. (359) stands for lamp load; e.g. (399) stands for special polarity(See Wiring Diagram).

Outline Dimensions

HFE20-1



HFE20-2

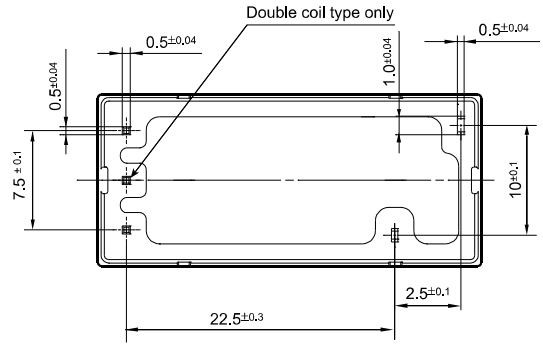
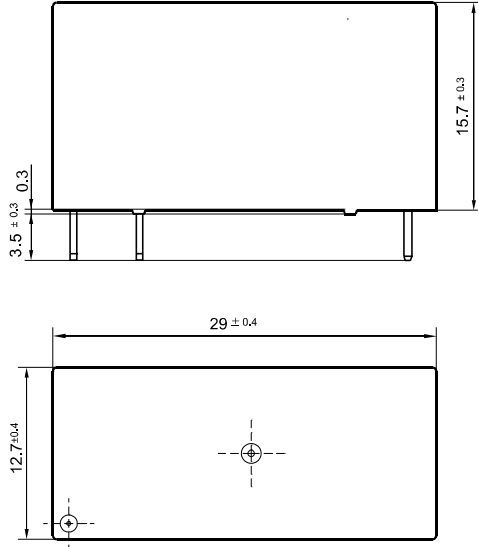


# OUTLINE DIMENSIONS AND WIRING DIAGRAM

Unit: mm

## Outline Dimensions

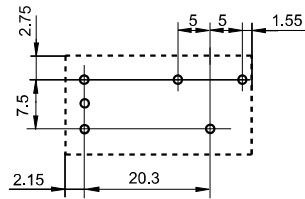
HFE20-3



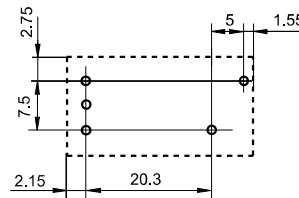
## PCB Layout (Bottom view)

HFE20-1

1 Form C

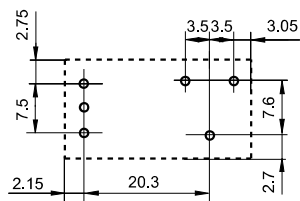


1 Form A, 1 Form B

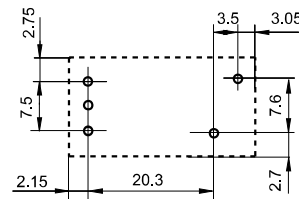


HFE20-2

1 Form C

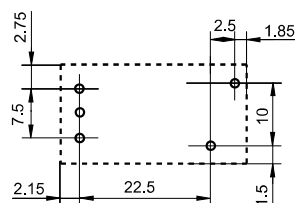


1 Form A, 1 Form B



HFE20-3

1 Form A, 1 Form B



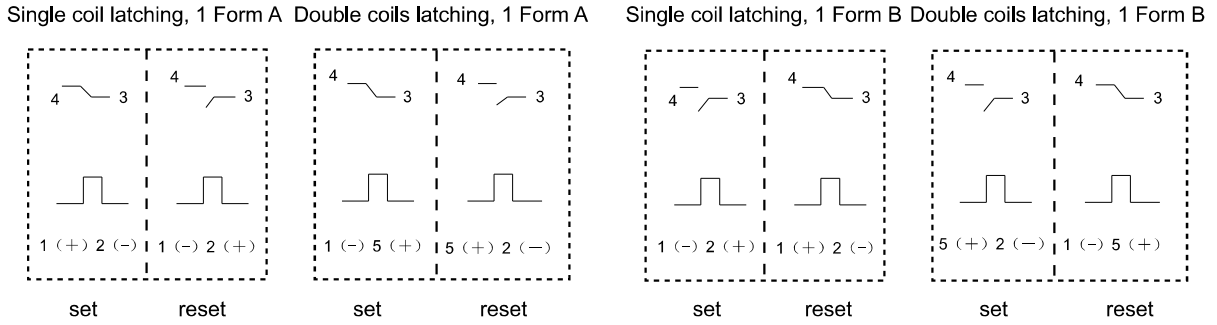
Remark: 1) In case of no tolerance shown in outline dimension: outline dimension  $\leq 1\text{mm}$ , tolerance should be  $\pm 0.2\text{mm}$ ; outline dimension  $> 1\text{mm}$  and  $\leq 5\text{mm}$ , tolerance should be  $\pm 0.3\text{mm}$ ; outline dimension  $> 5\text{mm}$ , tolerance should be  $\pm 0.4\text{mm}$ .

Wiring Diagram (Bottom view)

HFE20-3

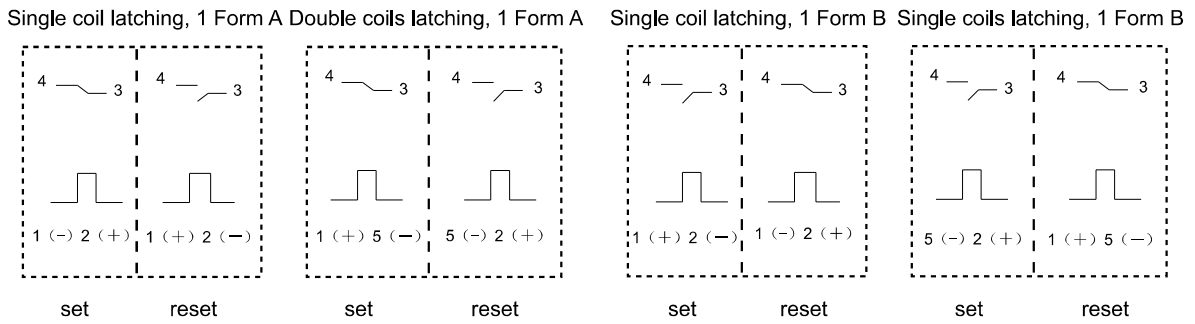


Positive polarity



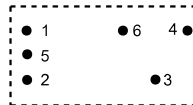
Wiring Diagram (Bottom view)

Reverse polarity

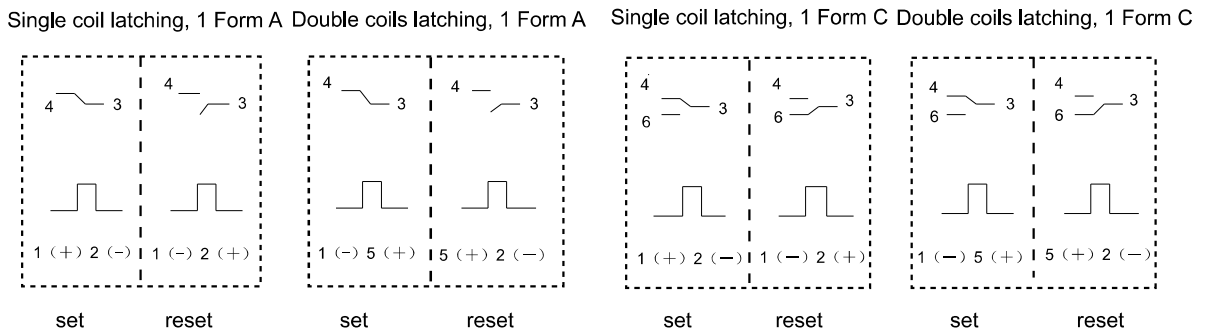


Wiring Diagram (Bottom view)

HFE20-1  
HFE20-2

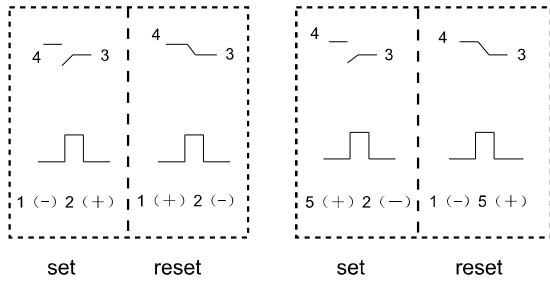


Positive polarity



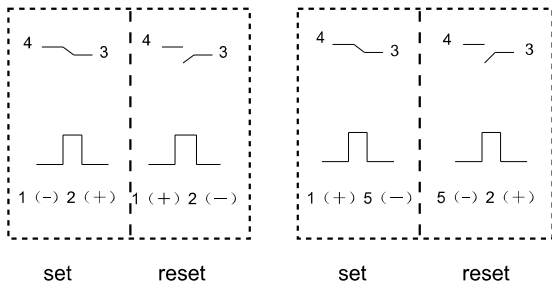
Wiring Diagram (Bottom view)

Single coil latching, 1 Form B Double coils latching, 1 Form B

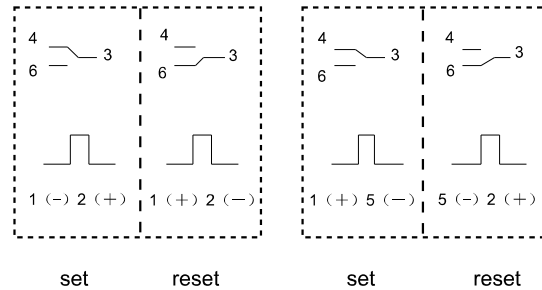


Reverse polarity

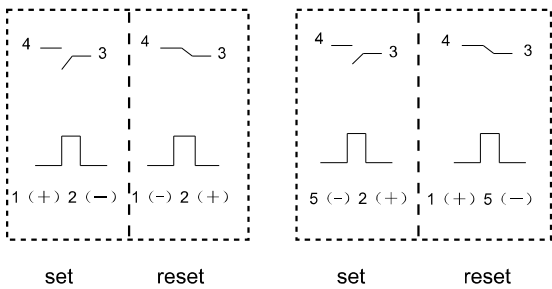
Single coil latching, 1 Form A Double coils latching, 1 Form A



Single coil latching, 1 Form C Double coils latching, 1 Form C

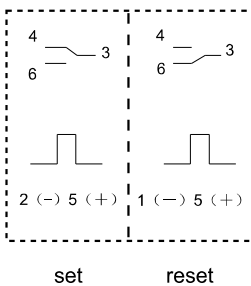


Single coil latching, 1 Form B Double coils latching, 1 Form B



**(399): Special polarity**

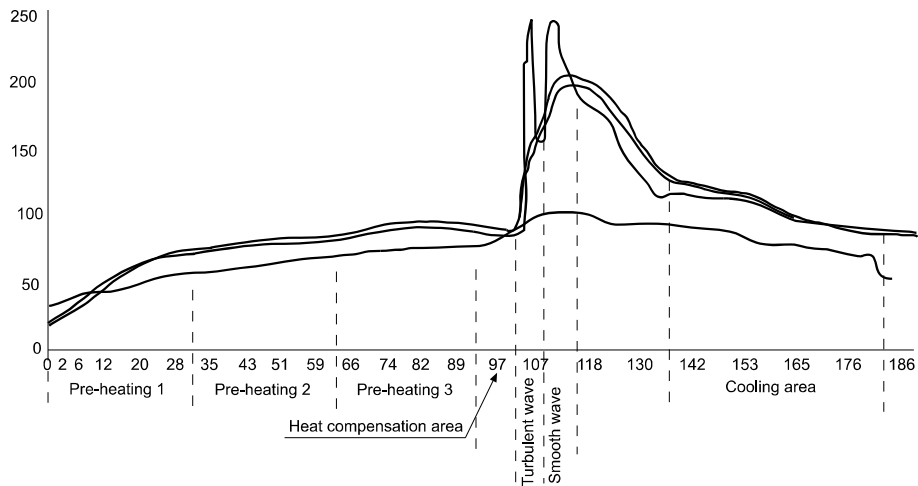
Double coils latching



## CAUTIONS

1. Latching relay is on the "reset" or "set" status when delivery, with the consideration of shock risen from transit and relay mounting, relay would be changed to "set" or "reset" status, therefore, when application ( connecting the power supply), please reset the relay to "set" or "reset" status on request.
2. In order to maintain "set" or "reset" status, energized voltage applied across the coil should reach the rated voltage, impulse width should be 5 times more than "set" or "reset" time. Do not energize voltage to "set" coil and "reset" coil simultaneously. And also long energized time (more than 1 min) should be avoided.
3. The recommended soldering temperature range is  $250\pm 10^{\circ}\text{C}$  with the duration of 2~5s. It is not suggested to apply reflow soldering method, if it is required indeed, please contact with our technicians. It is general required that the wave soldering temperature at  $250^{\circ}\text{C}$  shall not more than 2s. the below chart is the wave soldering temperature distribution chart we recommended for your reference.

Wave soldering temperature distribution chart



## Disclaimer

The specification is for reference only. 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.