# HF116F-1 MINIATURE HIGH POWER RELAY

c UL us
File No.:E134517

File No.:R50154722

CQC
File No.:CQC09002031231(DC type)



## Features

- 30A switching capability
- 4kV dielectric strength (between coil and contacts)
- 3mm contact gap available
- UL insulation system: Class F available
- Environmental friendly product (RoHS compliant)
- Outline Dimensions: (50.5 x 32.9 x 36.0) mm

## CONTACT DATA

| | | |
|---|---|---|
| Contact arrangement | 1A | 2A |
| Contact resistance | 100mΩ max.(at 1A 24VDC) | |
| Contact material | $AgSnO_2$, AgCdO | |
| Contact rating (Res. load) | 30A 240VAC<br>30A 277VAC | 25A 240VAC<br>25A 277VAC |
| Max. switching voltage | 277VAC | |
| Max. switching current | 30A | 25A |
| Max. switching power | 8310VA | 6925VA |
| Mechanical endurance | $1 \times 10^7$ OPS | |
| Electrical endurance | 1H,1HT type: $1 \times 10^5$OPS (30A 240VAC, Resistive load, Room temp., 1s on 9s off)<br>2H,2HT type: $1 \times 10^5$OPS (25A 240VAC, Resistive load, Room temp., 1s on 9s off) | |

## CHARACTERISTICS

| | | |
|---|---|---|
| Insulation resistance | | 1000MΩ (at 500VDC) |
| Dielectric strength | Between coil & contacts | 4000VAC 1min |
| | Between open contacts | 2000VAC 1min |
| Operate time (at nomi. volt.) | | 30ms max.(DC type) |
| Release time (at nomi. volt.) | | 30ms max.(DC type) |
| Shock resistance | Functional | Standard:98m/s² Pulse width 11ms<br>W type:98m/s² Pulse width 6ms |
| | Destructive | 980m/s² Pulse width 6ms |
| Vibration resistance | | Standard:10H to 55Hz 1.5mm DA<br>W type:10H to 55Hz 1.0mm DA |
| Ambient temperature | | -55˚C to 70˚C |
| Humidity | | 5% to 85% RH |
| Termination | | PCB, QC, Screw |
| Unit weight | | Approx. 120g |
| Construction | | Dust protected |

**Notes:** 1) The data shown above are initial values.
2) Please find coil temperature curve in the characteristic curves below.
3) UL insulation system: Class F, Class B.

## COIL

| | |
|---|---|
| Coil power | DC type: Approx. 1.9W;<br>AC type: Approx. 2.7VA |

## COIL DATA at 23˚C

| Nominal Voltage VDC | Pick-up Voltage VDC max. | Drop-out Voltage VDC min. | Max. Voltage VDC * | Coil Resistance Ω |
|---|---|---|---|---|
| 3 | 2.25 | 0.3 | 3.3 | 4.7 x (1±10%) |
| 6 | 4.50 | 0.6 | 6.6 | 18.8 x (1±10%) |
| 12 | 9.00 | 1.2 | 13.2 | 75 x (1±10%) |
| 24 | 18.0 | 2.4 | 26.4 | 300 x (1±10%) |
| 48 | 36.0 | 4.8 | 52.8 | 1200 x (1±10%) |
| 100 | 75.0 | 10.0 | 110 | 5200 x (1±10%) |
| 110 | 82.5 | 11.0 | 121 | 6300 x (1±10%) |
| 200 | 150 | 20.0 | 220 | 21000 x (1±10%) |

| Nominal Voltage VAC | Pick-up Voltage VAC | Drop-out Voltage VAC | Max. Voltage VAC * | Coil Resistance Ω |
|---|---|---|---|---|
| 6 | 4.80 | 0.90 | 6.6 | 18.8 x (1±10%) |
| 12 | 9.60 | 1.80 | 13.2 | 75 x (1±10%) |
| 24 | 19.2 | 3.60 | 26.4 | 300 x (1±10%) |
| 48 | 38.4 | 7.20 | 52.8 | 1200 x (1±10%) |
| 120 | 96.0 | 18.0 | 132 | 5200 x (1±10%) |
| 220/240 | 176 | 33.0 | 242 | 20800 x (1±10%) |

**Notes:** * Maximum voltage refers to the maximum voltage which relay coil could endure in a short period of time.

## SAFETY APPROVAL RATINGS

| | | |
|---|---|---|
| UL/CUL | $AgSnO_2$ | 30A 277VAC<br>1.5HP 120VAC 3HP 240VAC<br>10A 120VAC Tungsten |
| | AgCdO | 30A 277VAC<br>1.5HP 120VAC 3HP 240VAC<br>10A 120VAC Tungsten<br>TV-10 120VAC |
| TÜV | | 27A 240VAC COSØ =0.8<br>25A 240VAC COSØ =0.4<br>25A 240VAC COSØ =1 |

**Notes:** 1) All values unspecified are at room temperature.
2) Only typical loads are listed above. Other load specifications can be available upon request.

## ORDERING INFORMATION

| | HF116F-1 / | 012 | D | A | -1H | T | F | W | C | (XXX) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | | | | | | | | | | |
| **Coil voltage** | **DC:** 3VDC to 200VDC<br>**AC:** 6VAC to 220VAC | | | | | | | | | |
| **Coil voltage form** | **D:** DC | **A:** AC | | | | | | | | |
| **Mounting** | **A:** Mount | **P:** PCB | **F:** Flanged | | | | | | | |
| **Contact arrangement** | **1H:**1 Form A | **2H:** 2 Form A | | | | | | | | |
| **Contact material** | **T:** $AgSnO_2$ | **Nil:** AgCdO | | | | | | | | |
| **Insulation standard** | **F:** Class F | **Nil:** Class B | | | | | | | | |
| **Contact Gap** | **W:** 3.0mm | **Nil:** Standard | | | | | | | | |
| **Capacitor** | **C:** With Capacitor(Only for AC) | **Nil:** Without Capacitor | | | | | | | | |
| **Special code**[3)] | **XXX:** Customer special requirement | **Nil:** Standard | | | | | | | | |

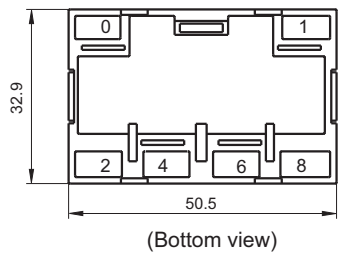
**Notes:** 1) Water cleaning or surface process is not suggested after the dust-protected relays are assembled on PCB.
2) Dust-protected relays can not be used in the environment with pollutants like $H_2S$, $SO_2$, $NO_2$, dust, etc.
3) The customer special requirement express as special code after evaluating by Hongfa.

## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

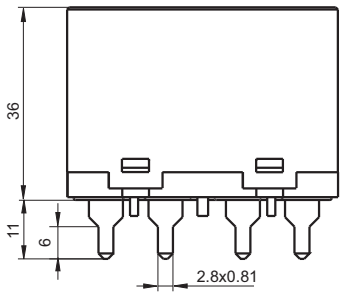
Unit: mm

Outline Dimensions

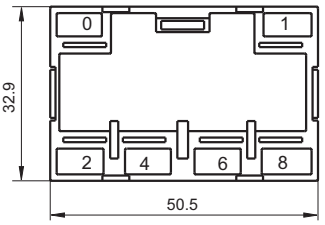
HF116F-1/□□□ -□-P-1H-□



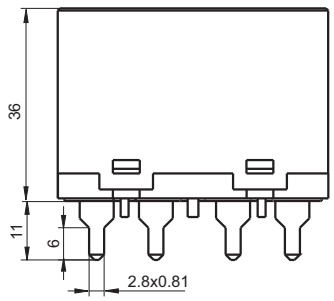

(Bottom view)




HF116F-1/□□□ -□-P-2H-□

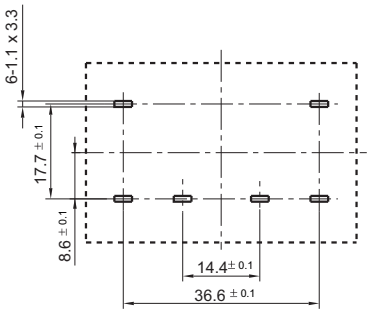



(Bottom view)




PCB Layout

(Bottom view)

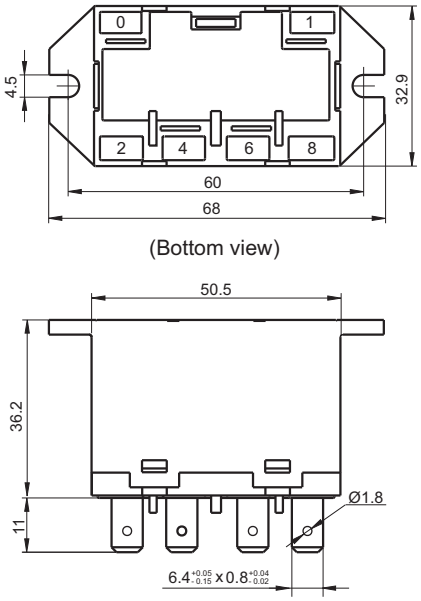


## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

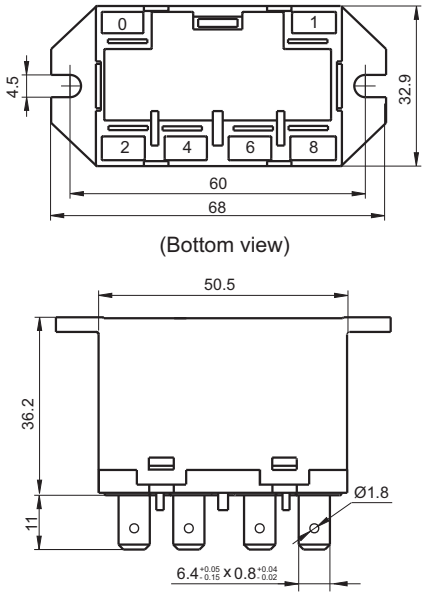
Unit: mm

### Outline Dimensions

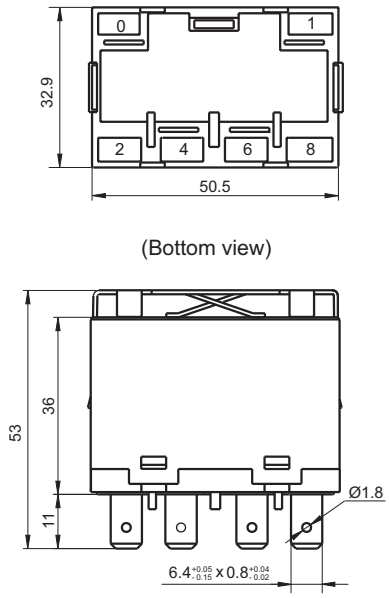
HF116F-1/□□□ -□ -F-1H-□



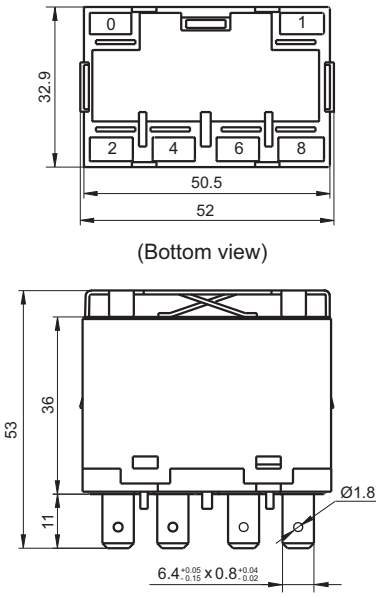

HF116F-1/□□□ -□ -F-2H-□



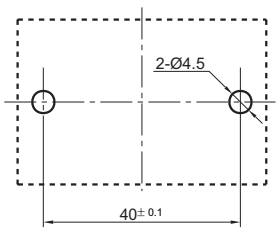

HF116F-1/□□□ -□ -A-1H-□




HF116F-1/□□□ -□ -A-2H-□




### Mounting Holes




Remark: 1) In case of no tolerance shown in outline dimension: outline dimension ≤1mm, tolerance should be ±0.2mm; outline dimension >1mm and ≤5mm, tolerance should be ±0.3mm; outline dimension >5mm, tolerance should be ±0.4mm.

2) The tolerance without indicating for PCB layout is always ±0.1mm.

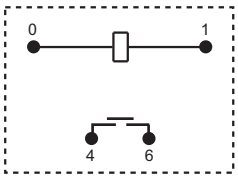
## OUTLINE DIMENSIONS, WIRING DIAGRAM AND PC BOARD LAYOUT

Unit: mm

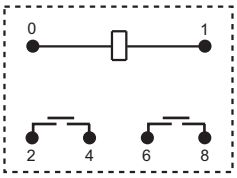
Wiring Diagram

(Bottom view)

1 Form A

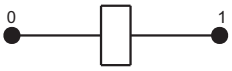



2 Form A

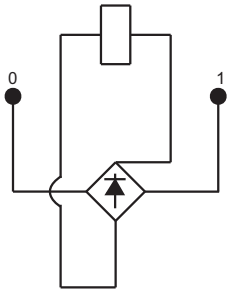



Coil Inner Circuit

DC operation coil

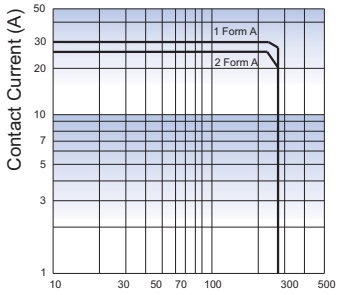



AC operation coil



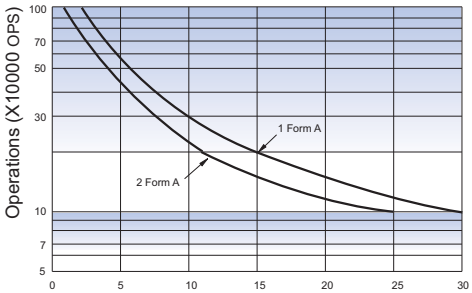

## CHARACTERISTIC CURVES

MAXIMUM SWITCHING POWER



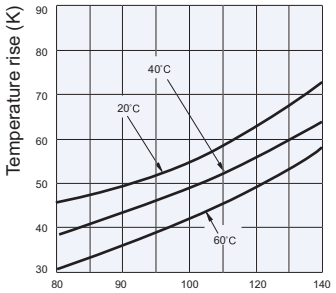

Contact Voltage (V)

ENDURANCE CURVE




Contact Current (A)

COIL TEMPERATURE RISE




Percentage Of Nominal Coil Voltage

**Test conditions:**

250VAC, Resistive load, Room temp.,
1s on 9s off

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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