



Features

- Safety relay for monitoring emergency stop switch and safety door switch
- Internal circuit redundancy design, even if there is a single component failure, the safety function can still be maintained
- With built-in self-test function, each start and stop cycle is automatically checked
- Measure the normal action and release of the internal relay
- Contact non time delay, up to 4 safety contact outputs, manual or automatic reset
- Comply with the requirements of EN 60947-5-1 and EN 60204-1, PLe of ISO 13849-1, and SIL 3 of IEC 62061-1 .
- Pluggable screw or spring terminals are optional
- The LED light indicates the working status and power status of the internal relay

CHARACTERISTICS

| | |
|---------------------------------|---|
| Module Type | HF3701/24-xxxx |
| INPUT | |
| Nominal Voltage | 24VAC/VDC |
| Nominal voltage deviation range | -15% ~ 10% |
| Frequency range(AC) | 50Hz ~ 60Hz |
| Power consumption | 2 pole: 3.5VA / 1.7W max. |
| | 4 pole: 5.1VA / 2.4W max. |
| Wiring polarity | Yes(Pay attention to the wiring sequence) |
| Terminal type | European terminal blocks (See Annex 1) |
| OUTPUT | |
| Max. Rated Output Power | 144W(24VDC, $\tau=0ms$) 48W(24VDC, $\tau=40ms$) |
| | 1500VA(250VAC, $\cos\phi=1$) 250VA(250VAC, $\cos\phi=0.4$) |
| Operate time (at nomi.volt.) | 100ms max. |
| Release time (at nomi.volt.) | 45ms max. |
| Recovery time | 0.5s max. |
| Min. Switching Voltage | 15VDC/VAC |
| Min. switching power | 0.4W |
| Contact rating(RES.load) | 6A 24VDC/5A 230VAC |

| | | | | |
|---------------|--|--------|---------|---------|
| Terminal type | European terminal blocks (See Annex 1) | | | |
| B10d | le | 5A | 2A | 1A |
| DC13,Ue=24V | Cycles | 300000 | 2000000 | 7000000 |
| B10d | le | 5A | 3A | 1A |
| AC15,Ue=230V | Cycles | 200000 | 230000 | 380000 |

ENVIRONMENTAL AND SAFETY REGULATIONS

| | | |
|---------------------------------|---|----------------------------|
| Ambient temperature | -20 ~ 55°C | |
| Storage temperature | -40 ~ 85°C | |
| Mounting | Mode | DIN rail(35mm) |
| | Requirement | Installation location:IP54 |
| Standard compliance | IEC 60947-5-1、IEC 62061 ISO/EN 13849-1、IEC 61508 | |
| Rated impulse withstand voltage | 4kV | |
| Vibration resistance | 10Hz ~ 55Hz 1.5mm DA | |
| Rated insulation voltage | 250VAC | |
| Pollution degree | 2 | |
| Surge voltage category | III | |
| Pollution degree | Terminal | IP20 |
| | Shell | IP40 |

Safety instructions

- Please follow the safety regulations of electrical engineering, industrial safety and responsible units.
- Ignoring these safety regulations may lead to death, serious personal injury or damage to the equipment!
- Commissioning, installation, modification and renewal can only be completed by professional electrical engineers!
- Operate in a closed control cabinet conforming to IP54
- Cut off the power supply before working on the equipment!
- In emergency stop applications, a high-level control system must be used to avoid automatic restart of the equipment
- During operation, the components of the electrical switchgear may carry dangerous voltages!



HONGFA RELAY

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

2021 Rev. 1.00

- The maintenance of the equipment, especially the opening of the shell, must be completed only by the manufacturer!
- When operating the relay module, on the contact side, the operator must follow the EMC standard EN 61000-6-4 for electrical and electronic equipment, and take appropriate measures if required.
- It is necessary to provide appropriate and effective protection circuits for inductive loads (such as contactors, solenoid valves, motors, etc.). The protection circuit is connected in parallel with the load and not with the switch contact.
- When at least one of the two input channel circuits is open, the contact switches to safe mode. The module can only be opened again after both input channel circuits are open and closed.

ORDERING INFORMATION

| | | | | |
|----------------------------|--|----|-----|-------|
| Type | HF3701/ | 24 | XXX | (XXX) |
| Nominal input voltage | 24: 24VAC/VDC | | | |
| Contact arrangement | 1H1D: 1 Form A + 1 Form B 2H: 2 Form A 3H1D: 3 Form A + 1 Form B 4H: 4 Form A | | | |
| Special code ¹⁾ | 013: Spring terminal output Nil: Standard | | | |

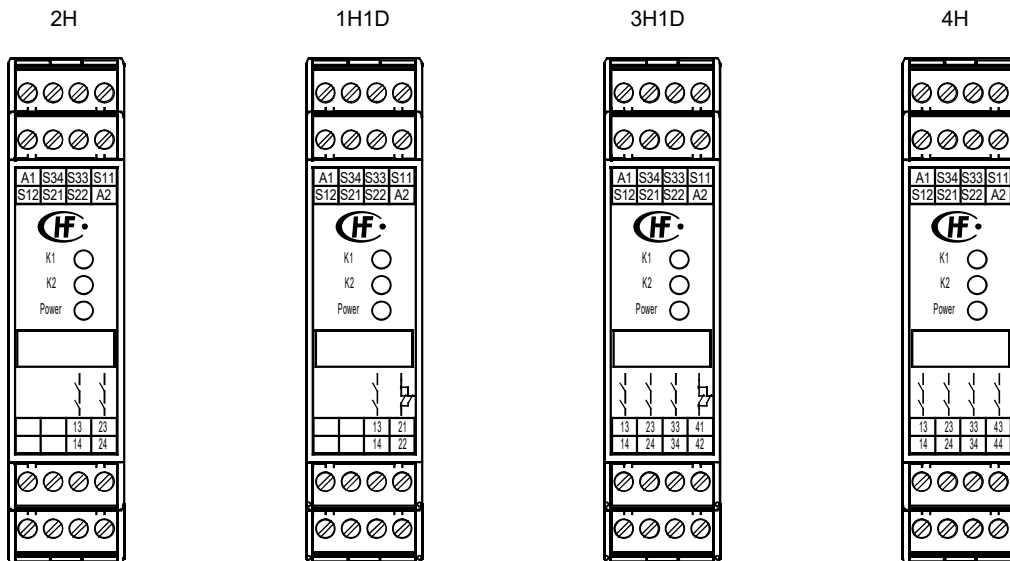
Notes: 1) The customer special requirement express as special code after evaluating by Hongfa.

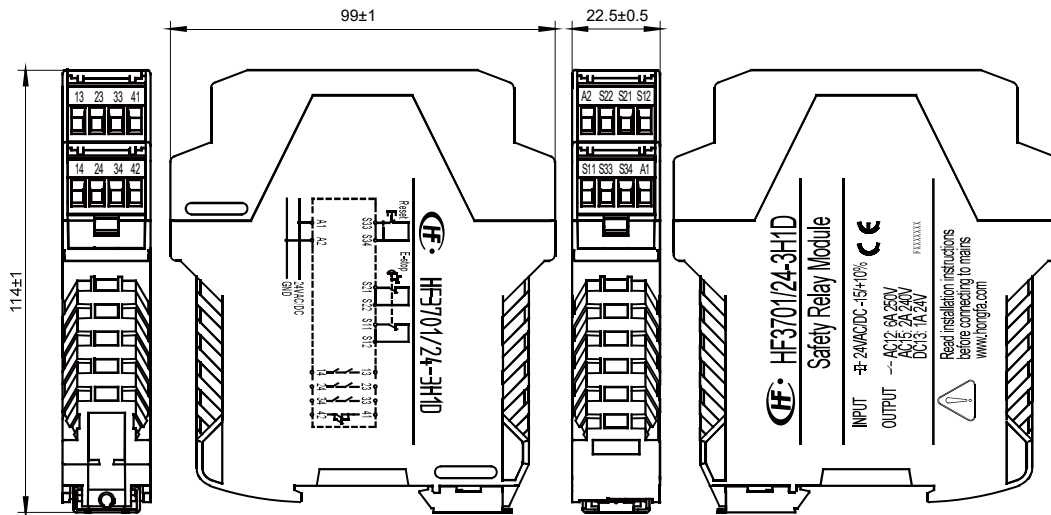
Comparison table of common models&Selection:

| Type | Function | Input Voltage | EN/ISO 13849 | IEC 62061 | Safety contacts No. | Output features | Material Number(P/N) |
|----------------|-------------------------------|---------------|--------------|-----------|---------------------|--|----------------------|
| HF3701/24-2H | Emergency stop Safety door | 24VAC/VDC | MAX PLe | SIL 3 | 2 | 2 instantaneous safety normally open contacts | 40237010022 |
| HF3701/24-1H1D | | | | | 1 | 1 instantaneous safety normally open contact 1 alarm contact (normally closed) | 40237010021 |
| HF3701/24-3H1D | | | | | 3 | 3 instantaneous safety normally open contacts 1 alarm contact (normally closed) | 40237010024 |
| HF3701/24-4H | | | | | 4 | 4 instantaneous safety normally open contacts | 40237010023 |

STRUCTURE DIAGRAM,WIRING DIAGRAM,TERMINAL FUNCTION DEFINITION

Unit: mm



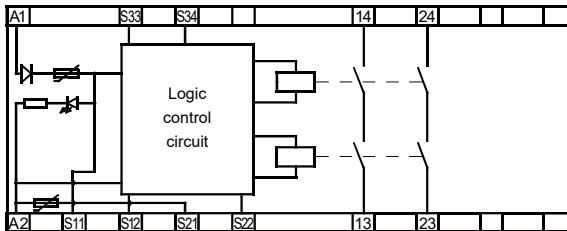


Notes: 1) The label shown in the above figure is the same as that in the typical wiring diagram (see the physical identification for details).

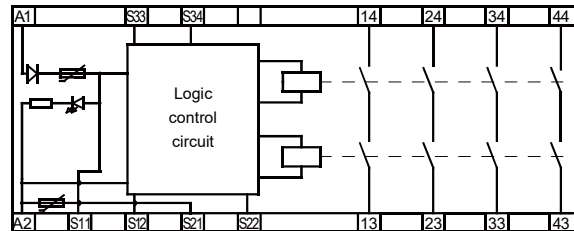
CONNECTION DIAGRAM, LOGICAL TIME SERIES DIAGRAM

Unit: mm

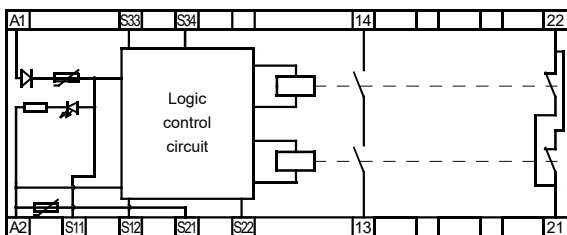
HF3701/24-2H



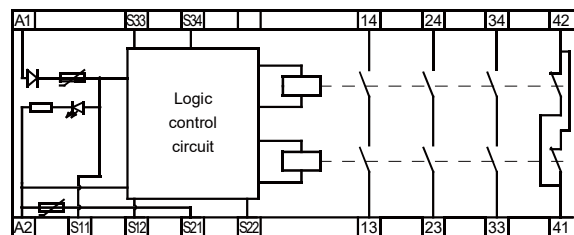
HF3701/24-3H1D



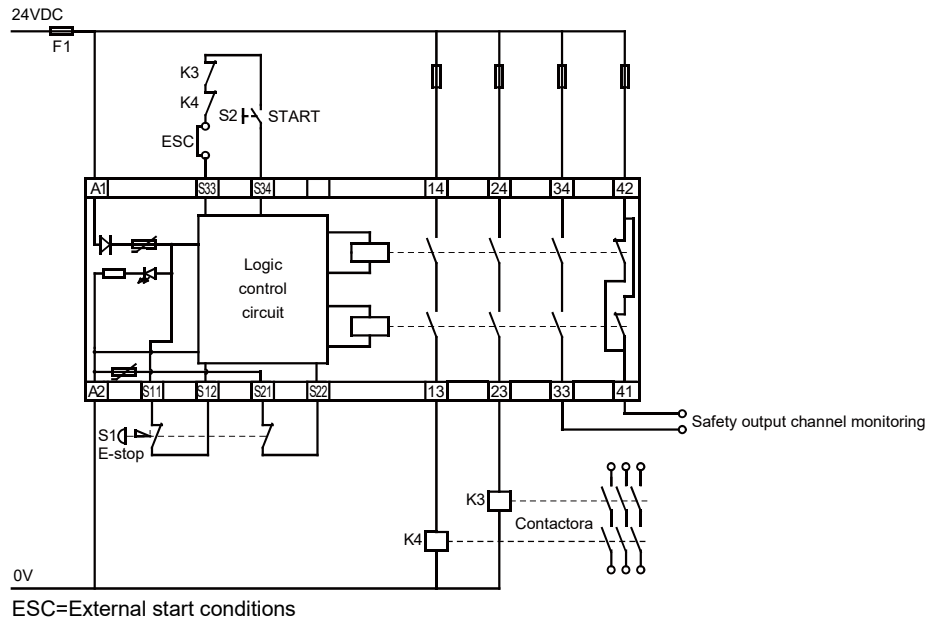
HF3701/24-1H1D



HF3701/24-4H

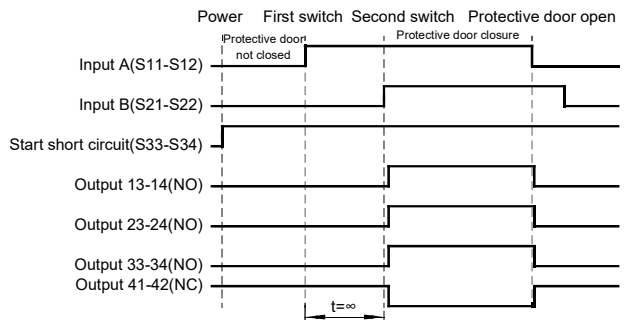
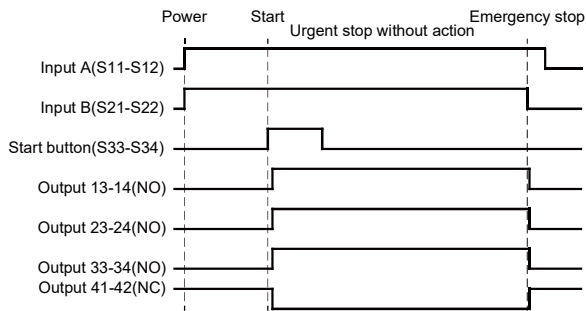


Wiring diagram connected to emergency stop button with two normally closed contacts (taking 3h1d as an example):

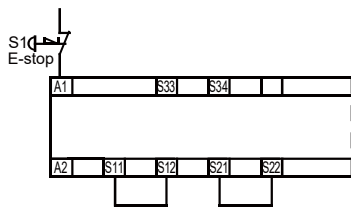


Logic sequence diagram of emergency stop function

Logic sequence diagram of safety door with auto. reset

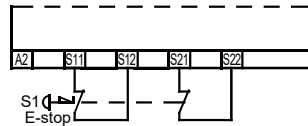


Typical example of emergency stop monitoring function:



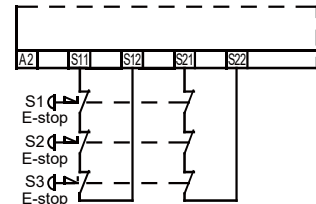
Notes:

- 1) A typical example of an e-stop monitoring function is an e-stop button with a normally closed contact.
- 2) Not all faults can be detected: the short circuit on the emergency stop button cannot be detected



Notes:

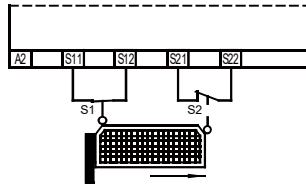
- 1) Emergency stop button with two normally closed contacts (recommended application).
- 2) Two input channels are connected to different poles. A short circuit between the two inputs can be detected.



Notes:

- 1) Multiple emergency stop buttons with two normally closed contacts (recommended application).
- 2) Two input channels are connected to different poles. Only the short circuit of 2 inputs can be detected.

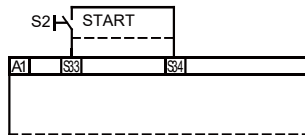
Typical example of safety door monitoring function:



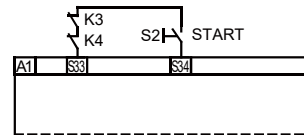
Notes:

The movable protective door connected with 2 limit switches shall be monitored, and each limit switch shall be equipped with 1 combination Contact of mode (switch S1 with normally open contact and switch S2 with normally closed contact).

Wiring of automatic or manual start (reset) function:



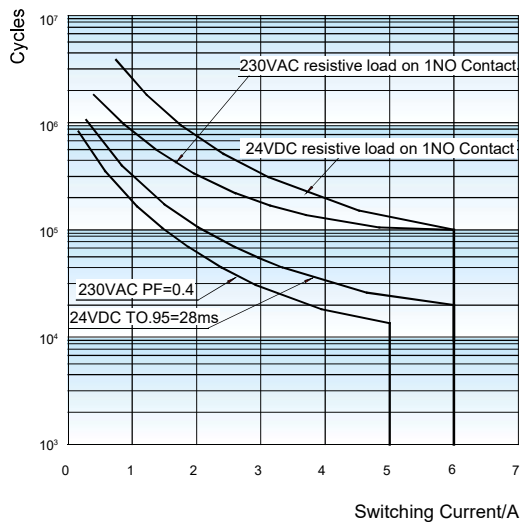
Automatic start(Reset)



Manual start(Reset)

CHARACTERISTIC CURVES

Electrical Endurance



Compliance with EN 60947-5-1 Table C2

I_e: Measured operating current

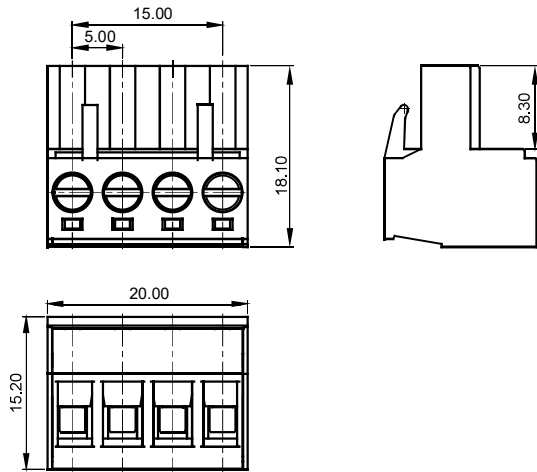
U_e: Measured operating voltage

PF: Power factor

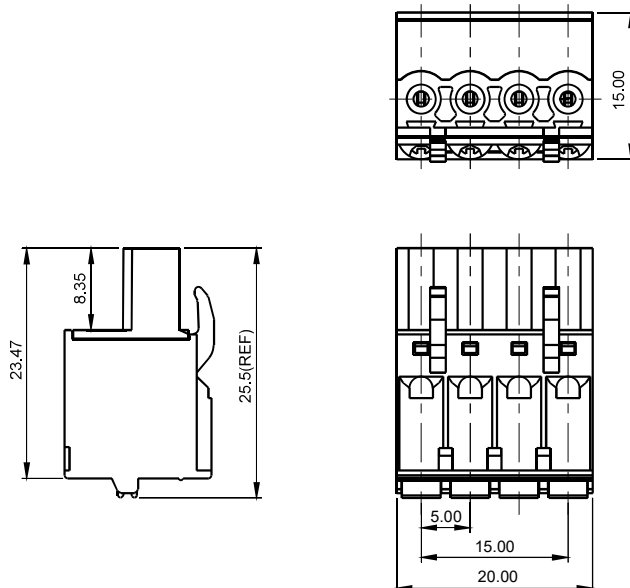
T0.95: Time required to reach 95% of rated current.

Cycle: 1s:9s(1s on: 9s off)

ANNEX 1: Terminal Characteristics



Screw connection terminal(Nominal)
 Nominal input current:15A
 Nominal input voltage:300V
 Conductor cross section:
 24-12 AWG(0.2-2.5mm²)
 Strip length:7mm
 Spacing:5.0mm (4P)
 Ambient temperature:-40~105°C
 Rated impulse withstand voltage:4kV
 Surge voltage category:III
 Pollution degree:2



Spring-cage connection terminal(013)
 Nominal input current:15A
 Nominal input voltage:300V
 Conductor cross section:
 24-16 AWG (0.2-1.5mm²)
 Strip length:8mm
 Spacing:5.0mm (4P)
 Ambient temperature:-40~105°C
 Rated impulse withstand voltage:4kV
 Surge voltage category:III
 Pollution degree:2

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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