



### Features

- Safety relay modules for monitoring emergency stop switches, safety electromagnetic switches, safety light grids, and safety door switches;
- Redundant design of internal circuits, even if a single component fails, the safety function can still be maintained;
- With built-in self-detection function, each start and stop cycle automatically detects the normal action and release of the internal relay;
- Non-delayed contacts, up to 4 safety contacts output, manual or automatic reset;
- Meet the requirements of EN 60947-5-1 and EN60204-1, the safety performance level can reach the PL e level of EN ISO 13849-1, meet the requirements of EN IEC 62061 safety integrity SIL 3, and meet the requirements of EN 61508 SIL 3;
- Pluggable screw terminals or spring-loaded terminals are optional.

## CHARACTERISTICS

INPUT	
Nominal voltage	24VAC/DCC
Nominal voltage deviation range	-15% ~ 10%
Frequency range(AC)	50Hz ~ 60Hz
Power consumption	2 Poles:≤3.5VA/1.7W
	4 Poles:≤5.1VA/2.4W
wiring polarity	Polar(pay attention to wiring polarity)
Terminal type	Terminal block(See Annex)
OUTPUT	
Max. Rated output power	144W(24VDC,τ=0ms) 144W(24VDC,τ=40ms)
	1500VA(250VAC,cosφ=1) 1200VA(250VAC,cosφ=0.4)
Operating time (@rated voltage)	≤100ms
Release time (@rated voltage)	≤45ms
Recovery Time	≤0.5s
Minimum switching voltage	15VDC/VAC
Minimum switching power	0.4W
contact load(Res. load)	6A 24VDC/5A 230VAC

Terminal type		Terminal block(See Annex)		
Mechanical endurance		10 <sup>7</sup> OPS (Operate frequency72000OPS/h)		
B10d	le	6A	3A	1A
DC13,Ue=24V	Cycles	300000	2000000	7000000
B10d	le	5A	3A	1A
AC15,Ue=250V	Cycles	200000	230000	380000

### ENVIRONMENTAL AND SAFETY REGULATIONS

Ambient temperature		-20~55°C
Storage temperature		-20~85°C
Mounting	Mode	DIN35mm
	Requirement	Installation location:IP54
Standard compliance		EN 60947-5-1、 EN IEC 62061 EN ISO 13849-1、 EN 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 result in death, serious personal injury or damage to equipment!
- Commissioning, installation, modification and update can only be done by professional electrical engineers!
- Operate in a closed control cabinet that meets IP54
- Turn 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
- Dangerous voltages may be present on the components of electrical switchgear during operation!



## Safety instructions

- The maintenance of the equipment, especially the opening of the casing, must only be done 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
- A suitable and effective protection circuit needs to be provided for inductive loads (such as contactors, solenoid valves, motors, etc.); the protection circuit is connected in parallel with the load and not in parallel with the switch contacts.
- When at least one of the two input channel circuits is opened, the contacts switch to safe mode; the module can only be opened again after both input channel circuits are opened and closed.

## ORDERING INFORMATION

Type	HFGA3/	B-	7H1D-	U24	(XXX)
Product features	B: Basic function+start monitoring				
Contact arrangement	7H1D: 7 form A+1 form B				
Nominal voltage	U24: 24VAC/DC				
Special code	Nil: Standard		XXX: Customer special requirement		

Notes: Special requirements of customers will be expressed as special codes after being evaluated by hongfa; such as: 013 characteristic number is the spring type terminal model.

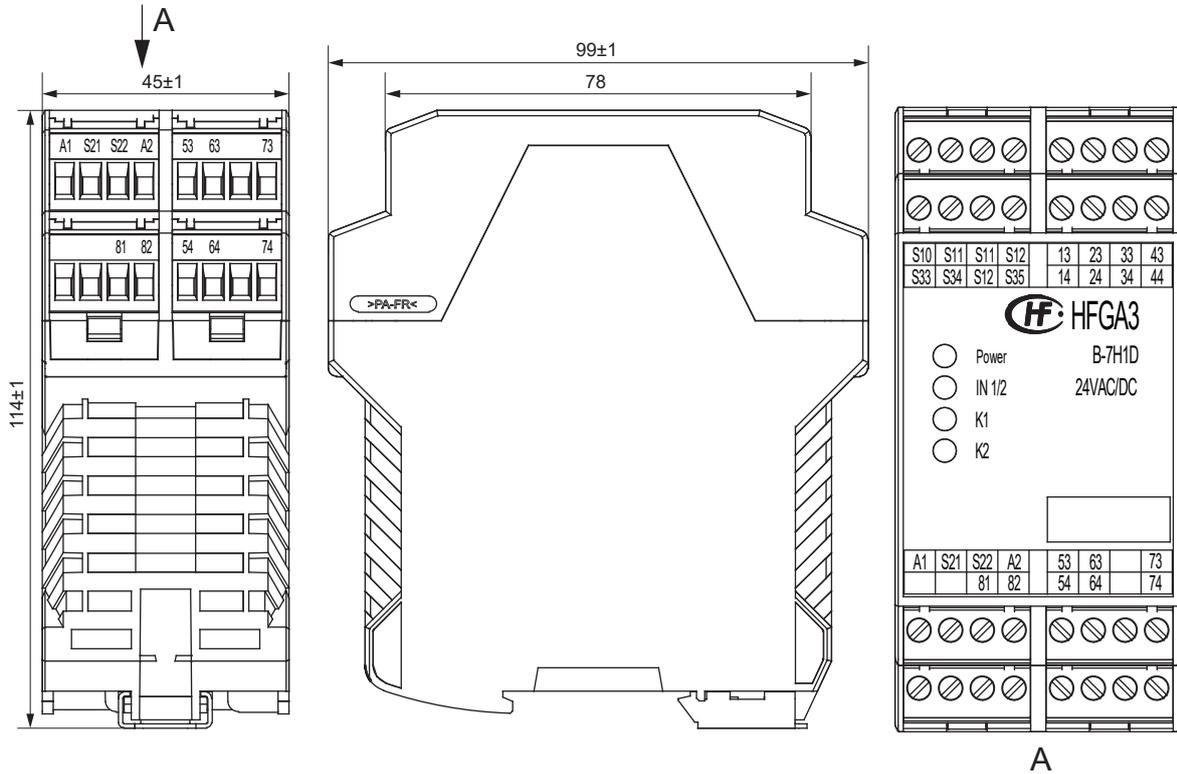
## Selection Guide

Type	Input device								Output contact			Reset mode
	Emergency stop switch	Safety door	Enable switch	Safety carpet	safety light grids	Non-contact safety door switch (OSSD)	Electromagnetic switch	Two hand control switch	Safety contact	time delay contact	Auxiliary contact	
HFGA1/A-1H1D-U24	√	√	√	√	—	—	—	—	1	—	1	Automatic/manual
HFGA1/A-2H-U24	√	√	√	√	—	—	—	—	2	—	0	Automatic/manual
HFGA1/A-3H1D-U24	√	√	√	√	—	—	—	—	3	—	1	Automatic/manual
HFGA1/A-4H-U24	√	√	√	√	—	—	—	—	4	—	0	Automatic/manual
HFGA1/B-1H1D-U24	√	√	√	√	—	—	—	—	1	—	1	Automatic/manual Start monitoring
HFGA1/B-2H-U24	√	√	√	√	—	—	—	—	2	—	0	Automatic/manual Start monitoring
HFGA1/B-3H1D-U24	√	√	√	√	—	—	—	—	3	—	1	Automatic/manual Start monitoring
HFGA1/B-4H-U24	√	√	√	√	—	—	—	—	4	—	0	Automatic/manual Start monitoring
HFGA1/C-3H1D-U24	√	√	√	√	√	√	√	—	3	—	1	Automatic/manual
HFGA1/D-2H-U24	√	√	√	√	√	√	√	—	2	—	0	Automatic/manual Start monitoring
HFGA1/E-3H1D-U24	√	√	√	√	—	—	—	√	3	—	1	Automatic/manual
HFGA1/G-4H1D-U24	触点扩展模块								4	—	1	Automatic/manual
HFGA3/B-7H1D-U24	√	√	√	√	√	√	—	—	7	—	1	Automatic/manual Start monitoring

Note: "Gray section" indicates models that are not included in the current series.

## OUTLINE DEMENSIONS, WIRING ID DIAGRAM

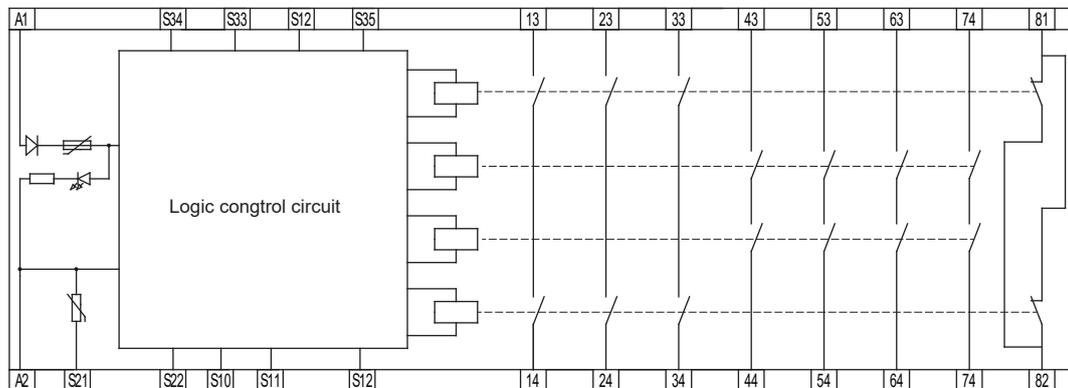
Unit: mm



Remarks: The labels shown in the above figure are the same as those of the typical wiring diagram (see the actual identification for details)

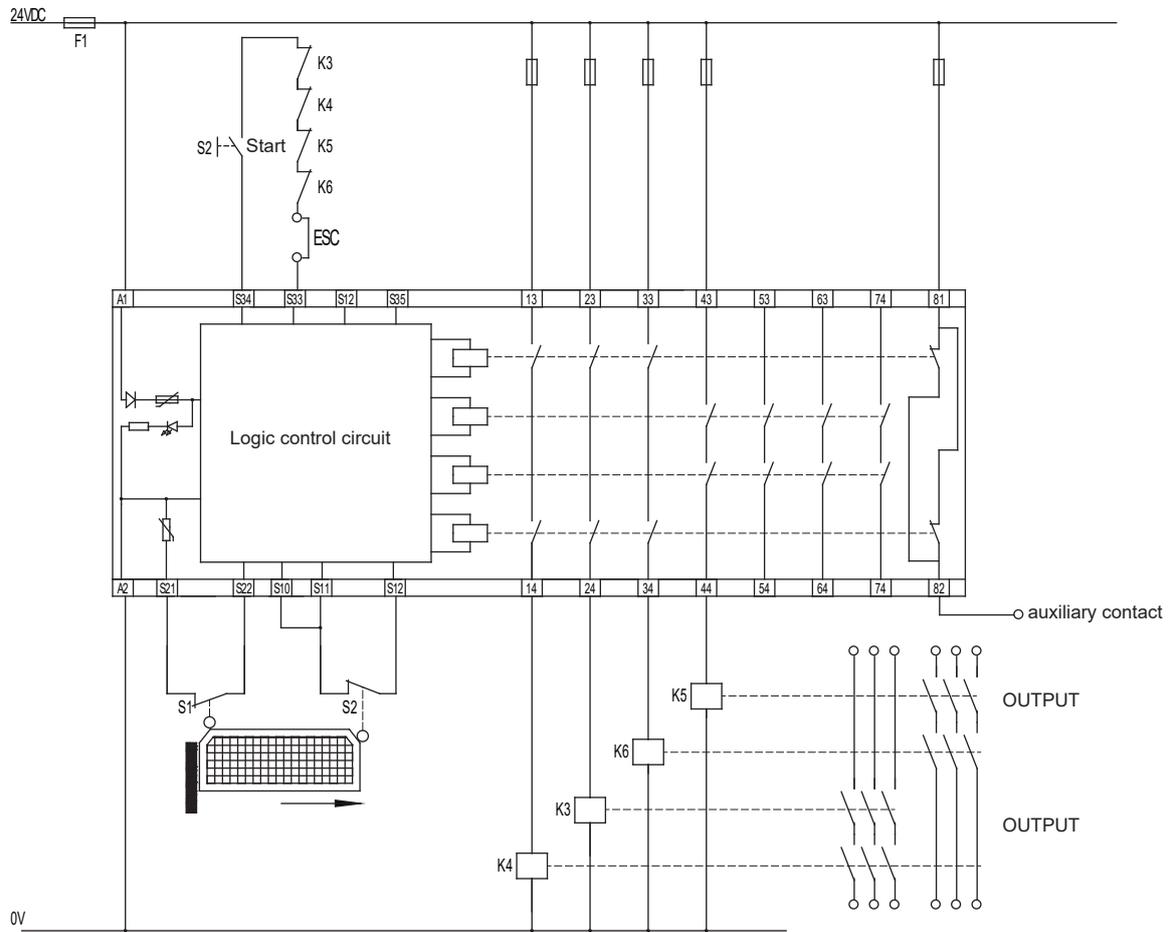
## WIRING DIAGRAM, LOGICAL TIME SERIES DIAGRAM

HFGA3/B-7H1D-U24

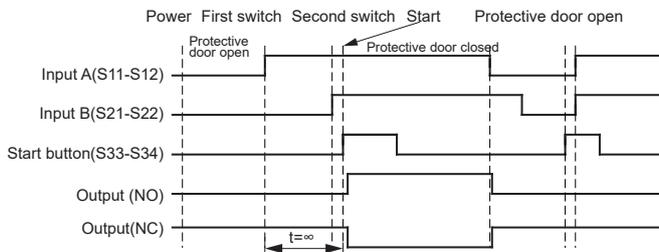


# WIRING DIAGRAM, LOGICAL TIME SERIES DIAGRAM

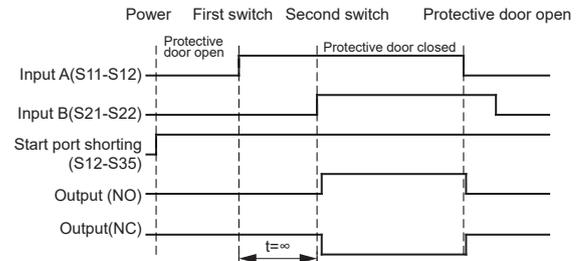
Example of wiring for safety gate monitoring with cross-short circuit monitoring



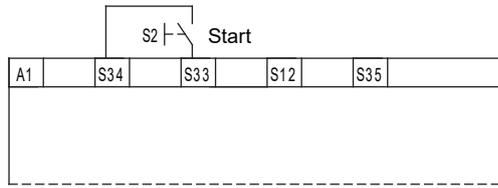
Logical timing diagram with emergency stop function with start-up monitoring



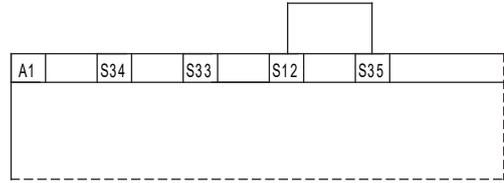
Logical timing diagram with automatic start of safety gate monitoring



# WIRING DIAGRAM, LOGICAL TIME SERIES DIAGRAM

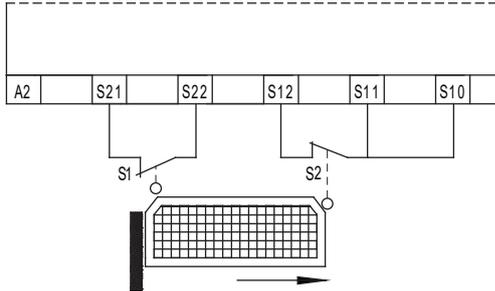


Manual start (with start monitoring)

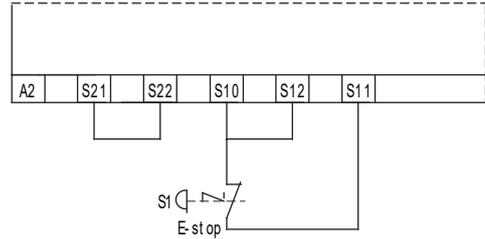


Autostart

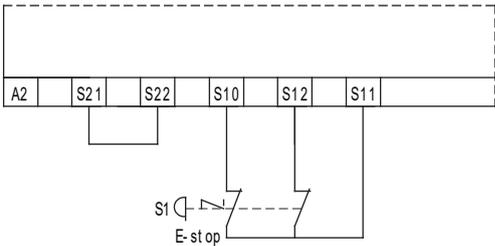
Example of wiring for safety gate monitoring with cross-short circuit monitoring



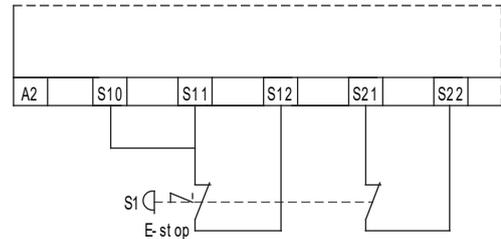
Wiring example for single-channel emergency stop switch monitoring (downgraded use)



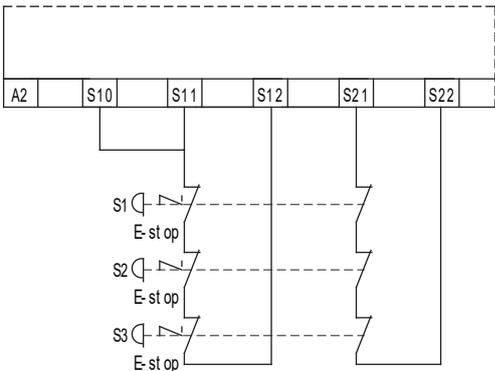
Example of wiring for emergency stop switch monitoring without cross-short circuit monitoring



Example of wiring for emergency stop switch monitoring with cross-short circuit monitoring

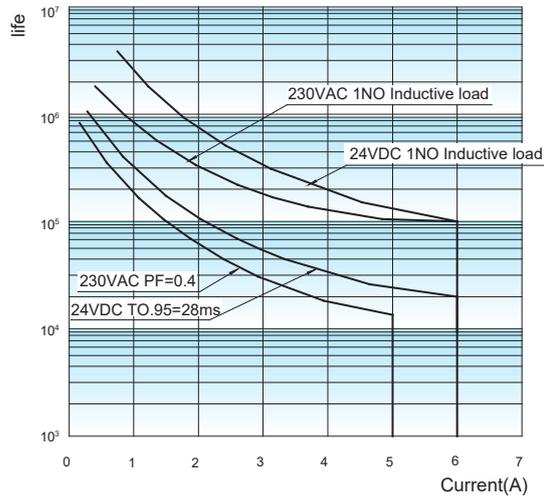


Wiring example for multi-stop emergency stop switch monitoring with cross-short circuit monitoring



## PERFORMANCE CURVE

Electrical durability



Complies with EN 60947-5-1 table C2

I<sub>e</sub>: Measured working current

U<sub>e</sub>: Measured working voltage

PF: Power Factor

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

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

### Annex 1: Terminal Parameter Table

Plug-in screw terminal block plugs (regular)



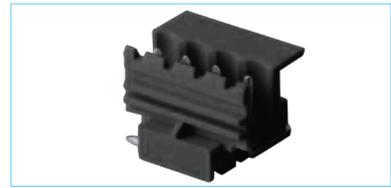
Rated current	15A
Rated voltage	300V
Conductor Cross Section	28-12 AWG (0.2-2.5mm <sup>2</sup> )
striping Length	7mm
Pitch	5.0mm (4P)
Ambient temperature	-40~105℃
Rated Withstand Pulse Voltage	4kV
Surge voltage category	III
Pollution degree	2

Plug-in spring-connected terminal plug (013)



Rated current	15A
Rated voltage	300V
Conductor Cross Section	28-12 AWG (0.2-2.5mm <sup>2</sup> )
striping Length	7mm
Pitch	5.0mm (4P)
Ambient temperature	-40~105℃
Rated Withstand Pulse Voltage	4kV
Surge voltage category	III
Pollution degree	2

Plug-in spring connection terminal socket

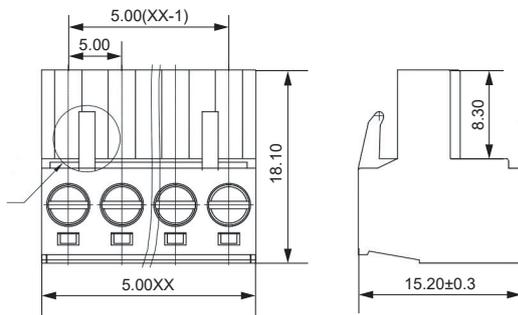


Rated current	15A
Rated voltage	300V
Conductor Cross Section	/
striping Length	/
Pitch	5.0mm (4P)
Ambient temperature	-40~105℃
Rated Withstand Pulse Voltage	4kV
Surge voltage category	III
Pollution degree	2

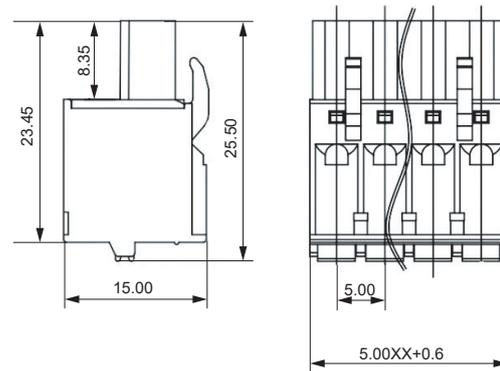
## OUTLINE DIMENSIONS

Unit: mm

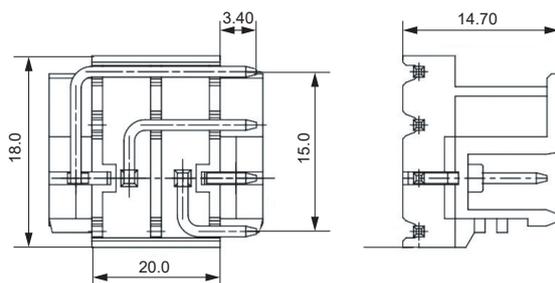
Plug-in screw terminal block plugs (regular)



Plug-in spring-connected terminal plug (013)



Plug-in spring connection terminal socket



### 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.