Overview

XW Series E-Stops

Interlock Switches

Enabling Switches

HS3A Non-contact RFID Safety Switches

Key features:

- RFID non-contact interlock switch, Category 4 and PLe (EN/ISO 13849-1) compliant.
- The sensor head with built-in safety function (redundant solid state output with internal monitoring) eliminates the need for a designated safety module.
- RFID ensures detection of slow-moving, open, sliding, and rattling doors.
- Multicode and unicode sensor heads are available. Unicode sensor head (one sensor head corresponds to one actuator) prevents tampering with the use of an unassigned spare actuator.
- Sensor head can be installed in 5 directions.
- Degree of protection IP67. Actuator IP67, IP69K (Note)

Note: IP69K is a degree of protection specified by Deutsches Institüt für Normung (DIN), DW 40050 Part 9 for hot and high-pressure water.





Interlock Switch (Sensor Head)





Part Numbers

HS3A Non-contact RFID Safety Switches

Outputs	Туре	Part Number
Safety output: 2	Multicode	HS3A-H21M4
Monitor output: 1	Unicode	HS3A-H21U4

Accessories

Name		Part Number	Remarks	
Actuator		HS9Z-ZH31	Actuator for both multicode and unicode sensor heads. Supplied with two M5 × 10 mounting screws (stainless steel)	
Terminal Plug (For serial connection)			HS9Z-H3TP	Used on Y-branch connector when connecting two or more switches in series.
Y-branch Connector (For serial connection)		HS9Z-H3YD	Used when connecting two or more switches in series. Plug connector: 8-pin (switch side), 5-pin (cable side)	
M12 Dive	۲	5-pin, 5m	HS9Z-H3F505	Used when connecting two or more switches in series.
Connection Cable	For connecting two or more switches in series	5-pin, 10m	HS9Z-H3F510	5-pin plug connector is provided at one end.
	۲	8-pin, 5m	HS9Z-H3F805	Used when connecting a single switch.
	For connecting a single switch	8-pin, 10m	HS9Z-H3F810	8-pin plug connector is provided at one end.
M12 Plug Connection Cable (For serial connection) 5- 5- 5-		5-pin, 5m	HS9Z-H3F5M05	Used when connecting two or more switches in series.
		5-pin, 10m	HS9Z-H3F5M10	5-pin plug connectors are provided at both ends.
Sac balaw for an avample of economics required when connecting N number of US2A quitches in parios				

HS3A non-contact interlock switch (HS3Z-H21□4): N pcs.

Y-branch connector (HS9Z-H3YD): N pcs.

Actuator (HS9Z-ZH31): N pcs. Terminal plug (HS9Z-H3TP): 1 pc. M12 plug connection cable, open end (HS9Z-H3F5): 1 pc. M12 plug connection cable, plug connectors at both ends (HS9Z-H3F5M): N-1 pcs.





Specifications

Operating Temperature-20 to +55°C (no freezing)Relative Humidity5 to 80% (no condensation)Storage Temperature-25 to +70°CPollution Degree3Performance Level (PL)e (EN ISO 13849-1)Safety Category4 (EN ISO 13849-1)Safety Category3 (EN 62061)Degree of ProtectionInterlock Switch (sensor head)ProtectionInterlock Switch (sensor head)Rated Voltage (UT)24V DC ±15%Current Consurve80mA (at no load)Dielectric Strever500V ACSafety OutputSafety OutputSafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current per safety output: 400 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current per safety output: 400 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current per safety output: 400 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current per safety output: 400 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current; 200 mAMonitor OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current; 200 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current; 200 mASafety OutputSemiconductor output, P-channel Output voltage: Max: UB (VJ, Min:: UB-15 [V] Maximum output current; 200 mA<	Applicable Standards		EN60947-5-3 (IFA approval) EN954-1 EN ISO13849-1 EN62061 GS-ET-14 (IFA approval) UL508 (UL listed) CSA C22.2 No.14 (c-UL listed)		
Relative Humidity5 to 80% (no condensation)Storage Temperature-25 to +70°CPollution Degree3Sensor ClassificationPDF-M (EN60947-5-3)Performance Level (PL)e (EN ISO 13849-1)Safety Category4 (EN ISO 13849-1)Safety Category3 (EN 62061)Degree of ProtectionInterlock Switch (sensor head)ProtectionInterlock Switch (sensor head)Rated Voltage (UP)24 V D £ 15%Current Consurvi80mA (at no load)Dielectric Strety500V ACCurrent ConsurviSafety OutputSafety OutputSemiconductor output, P-channel Output voltage: Max: UB [V], Min:: 0.8-UB [V] Maximum output current per safety output: 400 mASpecificationsTurn-on DistanceSasured Turn-on Distance (Saer)Semiconductor output, P-channel Output voltage: Max: UB [V], Min:: 0.8-UB [V] Maximum output current: 200 mAPresponse TimeAssured Turn-on Distance (Saer)Solon (non-identical enabling input state at IA/IB) 150 ms (non-identical enabling input state at IA/IB) 300 ms (short-circuit or cross-circuit at O4/0B, or internal error)Shock Resistaru-0erating extremes: 300 m/s ¹ (11 ms)Vibration Resistaru-0erating extremes: 300 m/s ¹ (11 ms)Vibration Resistaru-10 to 55 Hz, amplitude 0.5 mmWeight (approx.)HI2 plug connection cable, 8-pinWeight (approx.)HI2 plug connection cable, 8-pinWeight (approx.)HI2 plug connection cable, 8-pinWeight (approx.)System Manual (CD-R0M)	Operating Tem	perature	–20 to +55°C (no freezing)		
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Weight (approx.) 400g (HS3A-H21□□) Attachment System Manual (CD-ROM)	Cable		M12 plug connection cable, 8-pin		
Attachment System Manual (CD-ROM)	Weight (appro	x.)	400g (HS3A-H21		
	Attachment		System Manual (CD-ROM)		





Actuator

85.2



Supplied with two mounting screws (M5 \times 10).



Y-branch Connector HS9Z-H3YD Plug Socket

42.5



<u>.</u>



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Overview

HS3A

Specifications





Plug	Connection	Cable
HS97	'-H3FR	

1332-113FD				
Pin	Wire	Legend	l Description	
1	White	IB Enabling input (channel 2)		
2	Brown	UB	Power supply (24V DC)	
3	Green	0A	Safety output (channel 1)	
4	Yellow	OB	Safety output (channel 2)	
5	Gray	OUT Monitoring output		
6	Pink	IA	Enabling input (channel 1)	
7	Blue	0V	0V	
8	Red	RST	Reset input for hardware	

HS97-H3FS

1002-1101 0				
Pin	Wire	Legend		
1	Brown	UB		
2	White	0A		
3	Blue	0V		
4	Black	OB		
5	Gray	RST		

Wiring Diagram

When using a single HS3A

When using a single HS3A, connect as shown in the figure below (Note). The OUT output can be connected to a control system, to a PLC for example, as a monitoring output.

The HS3A can be reset via the RST input. To reset, apply 24V DC for at least 3 seconds. When not using the RST input, connect the RST input to OV.



For details of HR2S-301P safety relay module, see the instruction sheet.

Note: Safety performance of the actual system is determined by performing a risk assessment on the entire system. Depending on the risk level the system may entail, K1 and K2 need to be monitored to prevent serious accidents.





Note: The time required for the safety output to turn off after the actuator moves outside the operating distance of the HS3A switch.

Interlock Switches

Enabling Switches

Safety Control Relays





Non-Contact Safety Switches

When using two or more HS3A in series

A maximum of 20 can be connected in series.

Pay attention to the contact resistance at the connection points.

The HS3A switches can be connected in series using plug connection cables and Y-branch connectors as shown in the figure below (Note). When any of the HS3A switches detects that the safety guard is open, or when a failure has occurred on any of the switches, the system tuns off the machine. However, the external control system cannot detect which safety guard is open or where a failure has occurred.

The HS3A can be reset via the RST input. To reset, apply 24V DC for at least 3 seconds. When not using the RST input, connect the RST input to OV.

Safety Output Response Time

: Safety output ON t_{off} Output OFF time t, Error/actuator removed Actuator removed (Note) Note: The time Failure Missing signal IA/IB Non-identical input at IA/IB Short-circuit or cross-circuit at OA/OB, or internal fault t (ms) t_{∽"}=t0+ 400 ms t_{off}=t0+ 360 ms ŧ, t_{off}=t_o+ 250 ms

required for the safety output to turn off after the actuator moves outside the operating distance of the HS3A switch.

XW Series E-Stops

Overview



Operation Distance and Response Time

When installing the HS3A, ensure the safety of the door opening area by paying attention to the operation distance (Table 1) and response time (Table 2) shown below.

Table 1: Operation Distance 1

Distance	Value (mm)		
Distance	Min.	Тур.	Max.
Turn-on distance	—	15 ²	—
Assured turn-on distance Sa0	13	—	—
Switching hysteresis	1.5	2.5	—
Assured turn-off distance Sar	—	—	58

1. When the off-center displacement of the interlock switch (sensor head) and actuator is 0 mm. 2

When surface-mounted on aluminum. When using by embedding in metal, pay attention to the operation distance affected by the metal. In non-metallic environment, the typical turn-on distance increases to 30mm.

Table 2: Response Time

Hesponse IIMe	When connecting a single switch (max.)	260 ms (actuator removed)
		150 ms (missing enabling input IA/IB)
		150 ms (non-identical enabling input state at IA/IB)
		300 ms (short-circuit or cross-circuit at OA/OB, or internal fault)
	When connecting two or more switches (max.)	360 ms (actuator removed)
		250 ms (missing signal enabling input IA/IB)
		400 ms (non-identical enabling input state at IA/IB)
		400 ms (short-circuit or cross circuit at OA/OB or internal fault)

Note: To ensure safety, both safety outputs (OA and OB) must always be evaluated. Singlechannel use of the safety outputs as shown below leads to a reduction of safety category stipulated in EN954-1.

