

1 INFORMATION ON THIS DOCUMENT

1.1 Function

The present instruction manual provides information on installation, connection and safe use for the following articles: **HX ••••••••**, **HX C•**

1.2 Target audience

The operations described in this instruction manual must be carried out by qualified personnel only, who are fully capable of understanding them, and with the technical qualifications required for operating the machines and plants in which the safety devices are to be installed.


1.3 Application field


These instructions apply exclusively to the products listed in paragraph Function, and their accessories.

1.4 Original instructions

The Italian language version is the original set of instructions for the device. Versions provided in other languages are translations of the original instructions.

2 SYMBOLS USED

 This symbol indicates any relevant additional information.

 Attention: Any failure to observe this warning note can cause damage or malfunction, including possible loss of the safety function.

3 DESCRIPTION

3.1 Device description

The safety devices described in this manual are defined as non-coded, type 1 mechanical interlocking devices acc. to EN ISO 14119.

The HX series safety hinge switches are safety devices designed and manufactured to control leaf-type opening guards. The electrical switch is fully integrated inside the hinge body.

HX series safety hinge switches are designed with:

- mechanical contact block (HX •L22-•••; HX •H22-•••);
- electronic contact block with signalling LED (HX •EE1-•••).

The additional hinges have no electrical switch, and must be used only to support the weight of the guard, in conjunction with a second hinge with mechanical or electronic contact block. The additional hinges have code HX C•.

3.2 Intended use of the device

- The device described in this manual is designed to be applied on industrial machines for state monitoring of movable guards.

- The direct sale of this device to the public is prohibited. Installation and use must be carried out by qualified personnel only.


- The use of the device for purposes other than those specified in this manual is prohibited.

- Any use other than as expressly specified in this manual shall be considered unintended by the manufacturer.

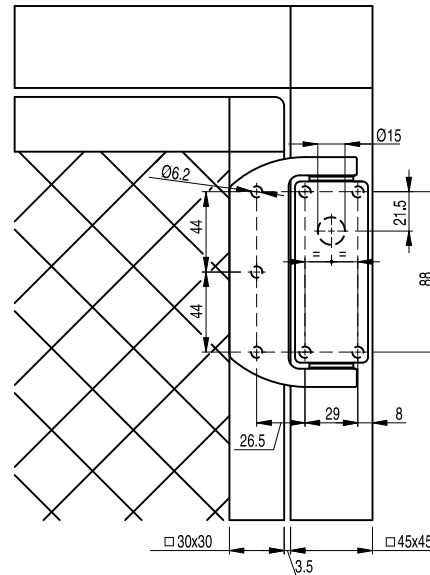
- Also considered unintended use:

- a) using the device after having made structural, technical, or electrical modifications to it;
- b) using the product in a field of application other than as described in paragraph TECHNICAL DATA.


4 INSTALLATION INSTRUCTIONS


 Attention: Installing a protective device is not sufficient to ensure operator safety or compliance with machine safety standards or directives. Before installing a protective device, perform a specific risk analysis in accordance with the key health and safety requirements in the Machinery Directive. The manufacturer guarantees only the safe functioning of the product to which this instruction manual refers, and not the functional safety of the entire machine or entire plant.

4.1 Profile drilling and safety or additional hinge fixing on 30x30 profile (movable part) and 45x45 profile (fixed part)



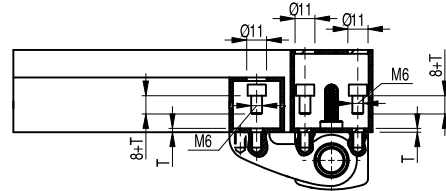
Create 7 holes with a \varnothing 6.2 mm diameter at the distances shown.

 Attention: Always affix the device with at least 7 M6 screws with resistance class 8.8 or higher, and flat seating heads. Install screws with medium resistance thread locker. The device must never be fixed with less than 7 screws.

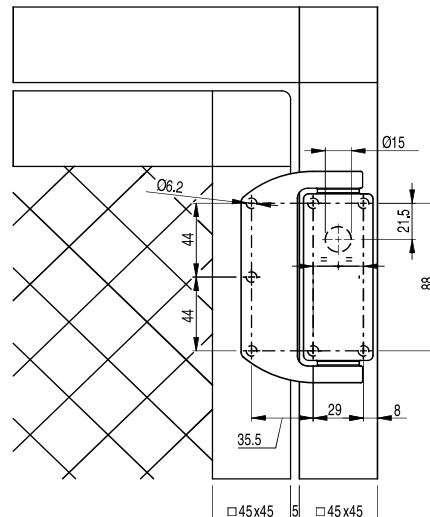
 Attention: Use only (8+T) mm length screws, where T is the thickness of the profile used to implement the guard: longer or shorter lengths can damage the hinge. As required by EN ISO 14119, the device must be fixed immovably.

Do not use a hammer for the adjustments, unscrew the screws and adjust the device manually, then tighten it in position.


The tightening torque of the screws must be between 10 and 12 Nm.




4.2 Profile drilling and safety or additional hinge fixing on 45x45 profile (movable part) and 45x45 profile (fixed part)



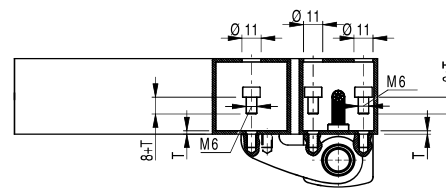
Create 7 holes with a \varnothing 6.2 mm diameter at the distances shown.

 Attention: Always affix the device with at least 7 M6 screws with resistance class 8.8 or higher, and flat seating heads. Install screws with medium resistance thread locker. The device must never be fixed with less than 7 screws.


 Attention: Use only (8+T) mm length screws, where T is the thickness of the profile used to implement the guard: longer or shorter lengths can damage the hinge. As required by EN ISO 14119, the device must be fixed immovably.

Do not use a hammer for the adjustments, unscrew the screws and adjust the device manually, then tighten it in position.

The tightening torque of the screws must be between 10 and 12 Nm.



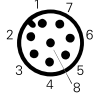
4.3 Alignment of rotary hinge axes

 Attention: Where two or more hinges are used on the same door, always check correct alignment of the rotary axes. Misalignment of the rotary axes can cause abnormal wear to internal mechanical components, with potential loss of safety function.

4.4 Electrical connections

4.4.1 Versions with mechanical contact block

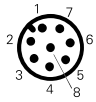
Contacts	Versions with cable	Versions with M12 connector
NC	black	1
	black-white	2
NC	red	3
	red-white	4
NO	brown	5
	blue	6
NO	purple	7
	purple-white	8
⊥	yellow/green	/



⚠ Attention: The safety circuit must be connected to the NC contacts. The NO auxiliary contacts can be used for signalling functions.

4.4.2 Versions with electronic contact block

Connection	Versions with cable	Versions with M12 connector
A1	brown	1
IS1	red	2
A2	blue	3
OS1	red-white	4
O3	black	5
IS2	purple	6
OS2	black-white	7
not connected	purple-white	8



Legend: **A1-A2** = supply **OS1-OS2** = safety outputs
IS1-IS2 = safety inputs **O3** = signalling output

⚠ Attention: The device is fitted with OSSD type solid state electronic outputs. These outputs behave differently from electromechanical contacts. Use and installation of a safety device with solid state outputs is only permitted if all characteristics of this particular type of outputs are known in detail.

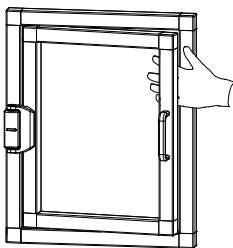
4.5 Adjustment of the switching point

Adjustment of the switching point can be carried out using a flat-head screwdriver (max. 4.5 mm), used on the screw that can be reached via the hole on the hinge axis. The switches are supplied with the adjusting screw unregistered. It is therefore the responsibility of the installer to adjust the switching point correctly. Rotating the adjusting screw clockwise reduces the switching point; rotating the screw counterclockwise increases the switching point. The switching point of the contacts indicated in the travel diagrams can be adjusted by $\pm 1^\circ$. The maximum torque that can be applied to the adjusting screw is 0.2 Nm.

	TRAVEL DIAGRAMS		
	Mechanical contact block		Electronic contact block
	HX •L22-*** (2NC+2NO)	HX •H22-*** (2NC+2NO)	HX •EE1-*** (2IS+2OS+1O3)
NC contacts opening travel	1.5°	1.5°	1.5°
OS safety outputs opening travel	1.5°	1.5°	1.5°
NO contacts closing travel	3°	0.5°	/
Positive opening travel \odot	6°	6°	/
Maximum travel	180°	180°	180°

⚠ Attention: After 1,000,000 guard openings, angular travels may increase by up to $+1.5^\circ$.

4.6 Checking the switching point

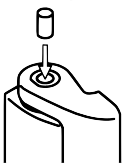


⚠ Attention: Once adjustment is complete, check that the switching point of the switch is set so that no openings are large enough to allow upper or lower limbs, or other body parts, to be inserted and reach dangerous machine parts before they are stopped, or have otherwise entered a safe state.

The dimensions of the openings on the guards, and the relative distances from the dangerous points requiring protection, must comply with the provisions of EN ISO 13857: check the switching point and, if necessary, repeat the adjustment (see paragraph ADJUSTMENT OF THE SWITCHING POINT).

ADJUSTMENT OF THE SWITCHING POINT.

4.7 Sealing the adjustment hole of the switching point



⚠ Attention: After adjusting the switching point, always seal the hole with the appropriate protection cap supplied with the device. Failing to insert the cap can allow dusts and liquids to penetrate the electrical contacts, and impair device function.

4.8 Final cleaning

Once installation is complete, use the cloth included in the pack for final hinge cleaning, for an optimal product aesthetic.

5 OPERATION

Once the hinge switch is installed on the machine and opening guard, and electrically connected (as described in paragraph "INSTALLATION INSTRUCTIONS"), opening the guard must initiate a stop of the machine and related dangerous moving elements. It must be possible to subsequently restart the machine, only once the guard is closed.

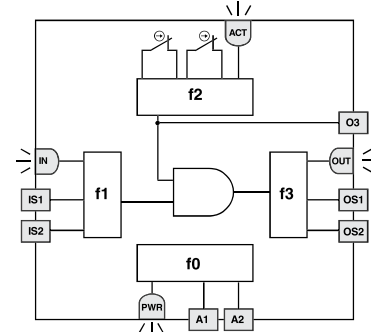
5.1 Definitions and operating states (electronic HX •EE1-*** versions only)

Device states:

- OFF: device is off, not powered.
- POWER ON: state immediately following switch on, during which the device carries out internal tests.
- RUN: state in which the device is in normal operation.
- ERROR: safety state in which the outputs are disabled. Can indicate the presence of an internal safety device failure, a short circuit between the safety outputs (OS1, OS2), a short circuit between a safety output and the ground, or a short circuit between a safety output and the supply voltage. To exit this state, the device must be restarted.

5.2 Functional description (electronic HX •EE1-*** versions only)

Following correct installation in accordance with the method described in the "INSTALLATION INSTRUCTIONS" paragraph, the safety device can be powered. The diagram below represents the 4 logic functions which interact inside the safety device.



In the initial "POWER ON" state, the safety device f0 function carries out an internal self diagnosis. When this terminates successfully, the device switches to the "RUN" state. If the test is not passed because of an internal failure, the device enters the "ERROR" state.

The "RUN" state is the normal operation state: the f1 function evaluates the state of inputs IS1, IS2; at the same time the f2 function checks closure of the contacts of the switch inside the device.

When these two conditions are given, the f3 function of the device enables the safety outputs OS1 and OS2.

The contacts of the switch inside the device of monitored not only for state, but for coherence; the contacts are generally actuated simultaneously with closure of the hinge. In the event of deactivation of just one of the two contacts, the device deactivates the safety outputs and signals a non-coherent condition of the contacts, via the ACT LED flashing green/orange. The hinge must open fully and re-close, for the safety outputs to reactivate.

The device inputs are also normally actuated simultaneously, and so are monitored both for state and coherence. In the event of deactivation of just one of the two inputs, the device deactivates the safety outputs and signals a non-coherent condition of the inputs via the IN LED flashing green/orange. In order to reactivate the safety outputs, both inputs have to be deactivated and subsequently reactivated.

In the RUN state, function f0 carries out internal test cycles in order to identify any failures. Detection of any internal error switches the device to the "ERROR" state (PWR LED continuously red) which deactivates immediately the safety outputs.

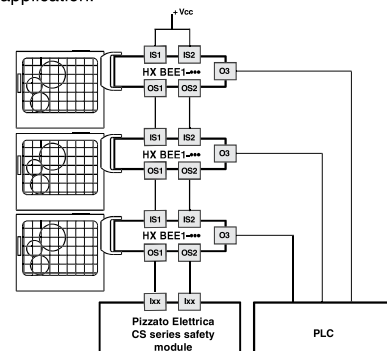
The "ERROR" state can be reached also where short-circuits between the safety outputs (OS1, OS2), or a short circuit of an output towards ground or towards the supply voltage, are identified. In this case also, the F3 function deactivates the safety outputs and the error state is indicated by the OUT LED flashing red.

The O3 signalling output activates during the "RUN" state, in conjunction with closure of the contacts inside the hinge, independently of the state of the IS1 and IS2 inputs. The state of this output is displayed via the ACT LED.

5.3 Connection in series with safety modules (electronic HX •EE1-*** versions only)

It is possible to install multiple cascade-connected devices, up to a maximum of 32 units, whilst maintaining safety category 4 / PL e according to EN ISO 13849-1 and integrity level SIL CL 3 according to EN 62061.

Check that the PFH and MTTF_d values of the system consisting of the cascade of devices and the entire safety circuit meet the requirements of the SIL/PL level requested by the application.



For this connection type, the following warnings must be observed.

- Connect the inputs of the first device in the chain to the supply voltage.
- The outputs of the last device in the chain must be connected to the safety circuit of the machine.
- Where a safety module is used, check that the properties of safety outputs OS1/OS2 are compatible with the safety module inputs (see paragraph ELECTRICAL DATA).
- Respect the stray capacitance limits on the output lines indicated in the electrical data (see paragraph ELECTRICAL DATA)
- Check that the response time of the series meets the requirements of the safety function to be implemented.
- The activation time of the series must be calculated taking into account the response time of every single device.

5.4 Operating states (electronic HX •EE1-*** versions only)

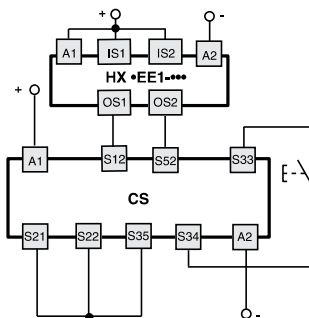
PWR LED	OUT LED	IN LED	ACT LED	Sensor state	Description
O	O	O	O	OFF	Device switched off.
orange	O	O	O	POWER ON	Internal tests upon activation.
green	*	O	*	RUN	Device with inactive inputs.
green	*	green	*	RUN	Activation of the inputs.
green	*	blinking green/orange	*	RUN	Input incoherence. Recommended action: check for presence and/or wiring of inputs.
green	O	*	O	RUN	Open safety hinge.
green	*	*	green	RUN	Device not actuated (guard closed). O3 signalling output active.
green	O	*	blinking green/orange	RUN	Intermediate device actuation phase. Recommended action: open guard fully, and close.
green	green	green	green	RUN	Activation of the inputs. Device not actuated (guard closed) and safety outputs active.
green	blinking red	*	*	ERROR	Error on outputs. Recommended action: check for any short circuits between the outputs, outputs and ground or outputs and power supply, then restart the device.
red	*	*	*	ERROR	Internal error. Recommended action: restart the sensor. If the failure persists, replace the device.

Legend: O = off * = indifferent

5.5 Interfacing (electronic HX •EE1-*** versions only)

Connections with CS AR-08*** safety modules

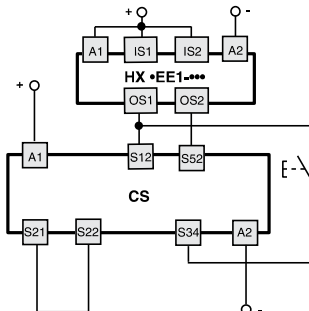
Input configuration with monitored start
2 channels / Category 4 / up to SIL 3 / PL e



Connections with CS AR-05*** / CS AR-06*** safety modules

Input configuration with manual start (CS AR-05***)
or monitored start (CS AR-06***)

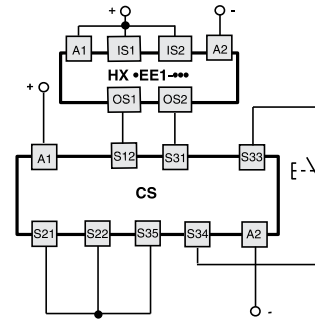
2 channels / Category 4 / up to SIL 3 / PL e



Connections with CS AT-0**** / CS AT-1**** safety modules

Input configuration with monitored start

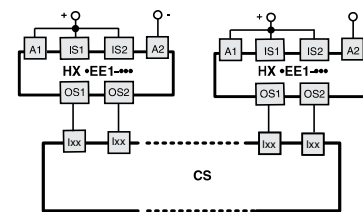
2 channels / Category 4 / up to SIL 3 / PL e



Connections with CS MF****0, CS MP****0 safety modules

The connections vary according to the program of the module

Category 4/ up to SIL 3 / PL e



Caution: if all OS safety outputs are connected directly to a safety contactor, we recommend using fast switching diodes connected in parallel to the contactor coils.

6 INSTRUCTIONS FOR PROPER USE

6.1 Installation



Attention: Installation must be carried out by qualified staff only. The OS1 and OS2 safety outputs of the device must be connected to the safety circuit of the machine. The signalling output O3 is not a safety output and may not be used individually in a safety circuit to determine safe state of guard closed.

- Do not stress the device with unintended, or greater than intended, bending and torsion.
- Do not modify the device for any reason.
- Do not exceed the tightening torques specified in the present manual.
- The device carries out an operator protection function. Any inadequate installation or tampering can cause serious injuries and even death, property damage, and economic losses.
- These devices must not be bypassed, removed, turned or disabled in any other way.
- If the machine where the device is installed is used for a purpose other than that specified, the device may not provide the operator with efficient protection.
- The safety category of the system (according to EN ISO 13849-1), including the safety device, also depends on the external components connected to it and their type.
- Before installation, make sure the device is not damaged in any part.
- Avoid excessive bending of connection cables in order to prevent any short circuits or power failures.
- Do not paint or varnish the device.
- Do not drill the device.
- Do not use the device as a support or rest for other structures, such as raceways, sliding guides or similar.
- Before commissioning, make sure that the entire machine (or system) complies with all applicable standards and EMC directive requirements.
- Do not apply excessive force to the device once it has reached the end of its actuation travel.
- Do not exceed the maximum actuation travel.
- The fitting surface of the device must always be smooth and clean.
- The documents necessary for a correct installation and maintenance are always available in the following languages: English, French, German and Italian.
- Should the installer be unable to fully understand the documents, the product must not be installed and the necessary assistance may be requested (see paragraph SUPPORT).
- For HX •EE1-*** versions with electronic outputs: before commissioning the machine, and periodically, check for correct switching of the outputs and correct operation of the system comprising the device and associated safety circuit.
- For HX •EE1-*** versions with electronic outputs: in proximity of the device, do not carry out arc welding, plasma welding, or any other process that may generate electromagnetic fields of intensity higher than the limits prescribed by the standards, even when the device is off. Where welding operations are to be carried out in the proximity of a previously installed device, it must first be moved away from the work area.
- Always attach the following instructions to the manual of the machine in which the device is installed.
- These operating instructions must be kept available for consultation at any time and for the whole period of use of the device.

6.2 Do not use in the following environments

- In environments where continual changes in temperature cause the formation of condensation inside the device.
- In environments where the application causes collisions, impacts or strong vibrations to the device.
- In environments containing explosive or inflammable gases or dusts.
- In environments where ice can form on the device.
- In environments containing strongly aggressive chemicals, where the products used coming into contact with the device may impair its physical or functional integrity.

6.3 Mechanical stop

⚠ Attention: The door must always be provided with an independent end-limit mechanical stop at limit of travel. The hinge must never be responsible for stopping the door at the limit of travel, both when opening and closing.

6.4 Maintenance and functional tests

⚠ Attention: Do not disassemble or try to repair the device. In case of any malfunction or failure, replace the entire device.

⚠ Attention: In case of damages or wear it is necessary to change the whole device. Correct operation cannot be guaranteed when the device is deformed or damaged.

- The installer is responsible for establishing the sequence of functional tests to which the device is to be subjected before the machine is started up and during maintenance intervals.
- The sequence of the functional tests can vary depending on the machine complexity and circuit diagram, therefore the functional test sequence detailed below is to be considered as minimal and not exhaustive.

- Perform the following sequence of checks before the machine is commissioned and at least once a year (or after a prolonged shutdown):

- 1) Open the guard while the machine is moving. The machine must stop immediately. The stopping time of the machine must be always shorter than the time required by the operator for opening the guard and reaching the dangerous parts.
- 2) Try to start the machine while the guard is open. The machine must not start.
- 3) All external parts must be undamaged.
- 4) If the device is damaged, replace it completely.
- 5) The device must be securely locked to the door; make sure that none of the machine operator's tools can be used to disconnect the actuator from the door.
- 6) The device has been created for applications in dangerous environments, therefore it has a limited service life. Although still functioning, after 20 years from the date of manufacture the device must be replaced completely. The date of manufacture is placed next to the product code (see paragraph MARKINGS).

6.5 Wiring

⚠ Attention: Check that the supply voltage is correct before powering the device.

- Keep the charge within the values specified in the electrical operation categories.
- Only connect and disconnect the device when the power is off.
- Do not open the device for any reason.
- For electronic HX •EE1-••• versions with electronic contact block only: discharge static electricity before handling the product by touching a metal mass connected to earth. Any strong electrostatic discharge could damage the device.
- For electronic HX •EE1-••• versions with electronic contact block only: power the safety switch and the other devices connected to it from a single SELV source and in accordance with the applicable standards.
- Always connect the protection fuse (or equivalent device) in series with the power supply for each device.
- Always connect the protection fuse (or equivalent device) in series to the safety electrical contacts.
- During and after the installation do not pull the electrical cables connected to the device.
- For devices with integrated cable, the free end of the cable (if it does not have a connector) must be properly connected inside a protected housing. The cable must be adequately protected from cuts, impacts, abrasion, etc.

6.6 Additional prescriptions for safety applications with operator protection functions

Provided that all previous requirements for the devices are fulfilled, for installations with operator protection function additional requirements must be observed.

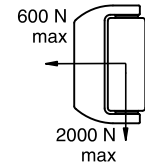
- The utilization implies knowledge of and compliance with following standards: EN 60947-5-3, EN ISO 13849-1, EN 62061, EN 60204-1, EN ISO 14119, EN ISO 12100.

6.7 Limits of use

- Use the device following the instructions, complying with its operation limits and the standards in force.
- The devices have specific application limits (min. and max. ambient temperature, mechanical endurance, IP protection degree, etc.) These limitations are met by the device only if considered individually and not as combined with each other.
- The manufacturer's liability is to be excluded in the following cases:
 - 1) Use not conforming to the intended purpose;
 - 2) Failure to adhere to these instructions or regulations in force;
 - 3) Fitting operations not carried out by qualified and authorized personnel;
 - 4) Omission of functional tests.
- For the cases listed below, before proceeding with the installation contact our technical assistance service (see paragraph SUPPORT):
 - a) In nuclear power stations, trains, airplanes, cars, incinerators, medical devices or any application where the safety of two or more persons depend on the correct operation of the device;
 - b) Applications not contemplated in this instruction manual.

6.8 Max. forces and loads

The device is designed to resist a maximum force of 2000 N in the vertical direction, and 600 N in the horizontal direction, regardless of usage conditions.

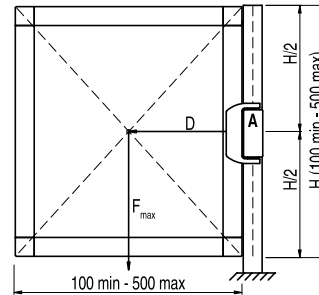


⚠ Attention: Never exceed the loads listed above under any circumstances.

i The maximum loads have been verified by a fatigue test of one million operating cycles with a 90° opening angle. One operation cycle means two movements, one to close and one to open contacts.

- Where two or more hinges are installed on the same door, the total weight of the door must never be greater than 2.000 N.
- Where a single hinge is installed on the same door, the total weight of the door must never be greater than 500 N.
- When installing on doors with a base or height greater than 500 mm, always use at least two hinges from the HX series.
- When installing on doors with a base or height greater than 1600 mm, always use at least three hinges from the HX series. Always install the two additional door hinges first: The safety hinge must be installed last, so that the weight of the door is supported primarily by the two additional hinges.

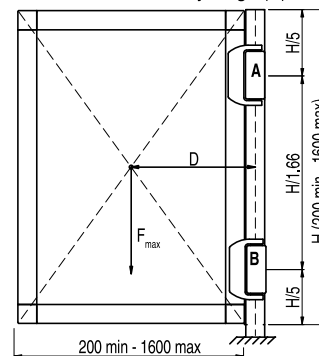
6.8.1 Solution for safety hinge (A)



$$F_{max} (N) = 50,000/D (mm)$$

⚠ Attention: When installing on doors larger than 500 mm, always use at least one additional hinge.

6.8.2 Solution for safety hinge (A) and additional hinge (B)

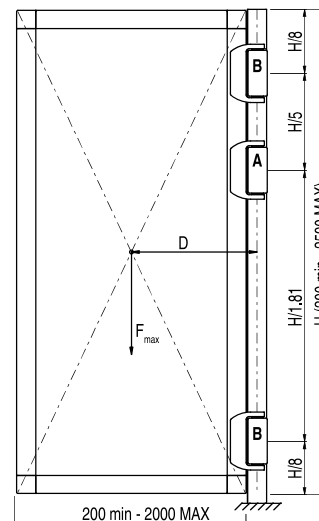


$$F_{max} (N) = 400,000/D (mm)$$

⚠ Attention: When installing on doors larger than 1600 mm, always use at least two additional hinges.

⚠ Attention: The safety hinge can only be combined with one or more hinges of the HX series. The use of whichever other hinge does not guarantee the correct operation of the safety device.

6.8.3 Solution for safety hinge (A) and two additional hinges (B)



$$F_{max} (N) = 500,000/D (mm)$$

⚠ Attention: Never install on doors larger than 2000 mm (base) or 2500 mm (height).

⚠ Attention: The safety hinge can only be combined with one or more hinges of the HX series. The use of whichever other hinge does not guarantee the correct operation of the safety device.

i Legend:

- F_{max}:** Force exerted by the weight of the door (N)
 - D:** Distance from the centre of gravity of the door to the axis of the hinge (mm)
 - A:** Safety hinge
 - B:** Additional hinge
- All values in the drawings are in mm.

7 MARKINGS

The outside of the device is provided with external marking positioned in a visible place. Marking includes:

- Producer trademark
- Product code
- Batch number and date of manufacture. Example: A16 HX1-123456. The batch's first letter refers to the month of manufacture (A=January, B=February, etc.). The second and third letters refer to the year of manufacture (18 = 2018, 19 = 2019, etc...).

8 TECHNICAL DATA

8.1 Housing

Metal housing, polished, AISI 316L stainless steel.
Protection degree: IP67 acc. to EN 60529
IP69K acc. to ISO 20653
(Protect electrical cables from direct high pressure and temperature jets)

8.2 General data

Versions with mechanical and electronic contact blocks
SIL level (SIL CL): Up to SIL 3 acc. to EN 62061
Performance Level (PL): Up to PL e acc. to EN ISO 13849-1
Safety category: Up to cat. 4 acc. to EN ISO 13849-1
Mission time: 20 years
Max. operating altitude: 2000 m
Max. actuation frequency: 600 operating cycles/hour
Mechanical endurance: 1 million operating cycles
Max. actuation speed: 90°/s
Min. actuation speed: 2°/s
Mounting position: any
Storage temperature: -40°C ... +70°C

Versions with mechanical contact block HX **22-***:

Safety parameters: B10d: 5,000,000
Positive opening force: 0.65 Nm

Versions with electronic contact block HX •EE1-***:

MTTFd (single channel): 2413 years
PFH_d: 1.24E-09
DC: High

8.3 Electrical data and operating temperature

Versions with mechanical contact block HX **22-***:

Rated impulse withstand voltage Uimp: 4 kV
1000 A acc. to EN 60947-5-1
Conditional short circuit current: 3
Pollution degree: 3

		Cable 9x0.34 mm ²	M12 connector 8-pole	
Ambient temperature	Cable, fixed installation	-25°C ... +80°C	-25°C ... +80°C	
	Cable, flexible installation	-5°C ... +80°C	-5°C ... +80°C	
	Cable, mobile installation	/	/	
Electrical data	Thermal current I _{th}	3 A	2 A	
	Rated insulation voltage U _i	250 Vac	30 Vac 36 Vdc	
	Protection against short circuits (fuse)	3 A 500 V type gG	2 A 500 V type gG	
	Utilization category DC13	24 V	2 A	2 A
		125 V	0.4 A	/
		250 V	0.3 A	/
	Utilization category AC15	24 V	3 A	2 A
120 V		3 A	/	
250 V		3 A	/	

Versions with electronic contact block HX •EE1-***:

Rated operating voltage U_e: 24 Vdc (-15% ... +10%) SELV
Rated operating current I_e: 0.25 A
Minimum operating current: 0.5 mA
Maximum switching load: 6 W
Consumption at U_e voltage: < 1 W
Rated impulse withstand voltage Uimp: 1.5 kV
Resettable internal protection fuse: 1.1 A
Overvoltage category: III

Electrical data of IS1/IS2 safety inputs

Rated operating voltage U_e: 24 Vdc
Rated current consumption: 5 mA

Electrical data of OS1/OS2 safety outputs

Rated operating voltage U_e: 24 Vdc
Output type: PNP
Maximum current per output I_e: 0.25 A
Short circuit detection: Yes
Overcurrent protection: Yes
Duration of the deactivation impulses at the safety outputs: < 300 μs
Permissible capacitance between outputs: < 200 nF
Permissible capacitance between output and ground: < 200 nF

Electrical data of O3 signalling output

Rated operating voltage U_e: 24 Vdc
Output type: PNP
Maximum current per output I_e: 0.1 A
Short circuit detection: No
Overvoltage protection: Yes

Actuation data

Response time upon inputs deactivation:
- Typical 7 ms
- Maximum 12 ms

Response time on door opening:

- Typical 7 ms
- Maximum 12 ms

		Cable 8x0.34 mm ²	M12 connector 8-pole
Ambient temperature	Cable, fixed installation	-25°C ... +70°C	-25°C ... +70°C
	Cable, flexible installation	-5°C ... +70°C	-5°C ... +70°C
	Cable, mobile installation	/	/
Electrical data	Thermal current I _{th}	0.25 A	0.25 A
	Rated insulation voltage U _i	32 Vdc	32 Vdc
	Protection against short circuits (fuse)	1A type F	1A type F
	Utilization category DC12	24 V	0.25 A

8.4 Compliance with standards

EN 60947-5-1, EN 60947-1, EN 60204-1, EN ISO 14119, EN ISO 12100, EN 60529, ISO 20653, IEC 61508-1, IEC 61508-2, IEC 61508-3, EN ISO 13849-1, EN ISO 13849-2, EN 62061, EN 61326-1, EN 61326-3-1, EN 61326-3-2, UL 508, CSA 22.2 No.14

8.5 Compliance with directives

Machinery Directive 2006/42/EC, EMC Directive 2014/30/UE, RoHS Directive 2011/65/UE

9 SPECIAL VERSIONS ON REQUEST

Special versions of the device are available on request.

The special versions may differ substantially from the indications in this instruction sheet.

The installer must ensure that he has received written information from the support service regarding installation and use of the special version requested.

10 DISPOSAL

At the end of service life product must be disposed of properly, according to the rules in force in the country in which the disposal takes place.

11 SUPPORT

The device can be used for safeguarding people's physical safety, therefore in case of any doubt concerning installation or operation methods, always contact our technical support service:

Pizzato Elettrica Srl
Via Torino, 1 - 36063 Marostica (VI) - Italy
Telephone +39.0424.470.930
E-mail tech@pizzato.com
www.pizzato.com

Our support service provides assistance in Italian and English

12 EC CONFORMITY DECLARATION

I, the undersigned, as a representative of the following manufacturer:

Pizzato Elettrica Srl, Via Torino, 1 - 36063 Marostica (VI) - Italy
hereby declare that the product is in conformity with whatever prescribed by the 2006/42/EC Machine Directive. The complete version of the present conformity declaration is available on our website www.pizzato.com
Marco Pizzato

DISCLAIMER:

Subject to modifications without prior notice and errors excepted. The data given in this sheet are accurately checked and refer to typical mass production values. The device descriptions and its applications, the fields of application, the external control details, as well as information on installation and operation, are provided to the best of our knowledge. This does not in any way mean that the characteristics described may entail legal liabilities extending beyond the "General Terms of Sale", as stated in the Pizzato Elettrica general catalogue. Customers/users are not absolved from the obligation to read and understand our information and recommendations and pertinent technical standards, before using the products for their own purposes. Taking into account the great variety of applications and possible connections of the device, the examples and diagrams given in the present manual are to be considered as merely descriptive; the user is deemed responsible for checking that the specific application of the device complies with current standards. This document is a translation of the original instructions. In case of discrepancy between the present sheet and the original copy, the Italian version shall prevail. The present manual may not be reproduced, in whole or in part, without the prior written permission by Pizzato Elettrica.

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