# Evaluation unit CES-AZ-AES-01B/ CES-AZ-UES-01B

- 1 read head can be connected ►
- 2 safety outputs (relay contacts with ⊳ 2 internally connected NO contacts per output)
- Start button and feedback loop can be ⊳ connected
- **Plug-in connection terminals**
- Category 4 / PL e according to EN ISO 13849-1



For possible combinations see page 24

#### **Unicode evaluation**

Each actuator is unique. The evaluation unit detects only the actuator that has been taught-in. Additional actuators can be taught-in. Only the last actuator taught-in is detected. New actuators are taught-in by fitting a jumper.

#### **Multicode evaluation**

Every actuator is detected by the evaluation unit.

#### **Guard lock monitoring**

Evaluation units in the series CES-AZ make it possible to use read heads with integrated guard locking for the personal protection during overtravelling machine movements. For suitable read heads, please refer to the combinations table on page 24.

#### Category according to EN ISO 13849-1

Due to two redundant safety paths (relay contacts) with 2 internal, monitored NO contacts per safety path, suitable for:

Category 4 / PL e according to

EN ISO 13849-1 Each safety path is independently safe.

#### LED display

STATE	Status LED
DIA	Diagnostics LED
OUT	Status safety output

### **Evaluation unit CES-AZ-AES-01B**





according to DIN EN 50022-35





#### **Additional connections**

- TST Input for self-test
- 01 Monitoring output (semiconductor)
- Diagnostics output DIA
- Y1, Y2 Feedback loop
- S
  - Start button connection

Important: The plug-in connection terminals are not included and must be ordered separately.

#### **Ordering table**

Series	Category and PL according to EN ISO 13849-1	Number of read heads	Туре	Order no. / item
CES-AZ-AES-01B Unicode	up to 4 / PL e	1		<b>104 770</b> <sup>1) 3)</sup> CES-AZ-AES-01B
CES-AZ-AES-01B-EX Unicode	up to 4 / PL e	1	ATEX 2)	<b>105 142</b> <sup>2) 3)</sup> CES-AZ-AES-01B-EX
CES-AZ-UES-01B Multicode	up to 4 / PL e	1		<b>105 139</b> <sup>1)</sup> CES-AZ-UES-01B
Connection set for evaluation unit CES-AZES-01B			Plug-in Screw terminals	<b>104 756</b> CES-EA-TC-AK04-104756

1) BG approval pending

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2) EX II (3) G [Ex nL] IIC (zone 2 gases), the evaluation unit is only allowed to be used outside potentially explosive atmospheres.

3) UL approval pending



# **EUCHNER**

# Technical data evaluation unit CES-AZ-AES-01B

Deremeter		Value		Unit
Farameter	min.	typ.	max.	Unit
Housing material		Plastic PA6.6		
Dimensions		114 x 99 x 22.5		mm
Weight		0.2		kg
Ambient temperature at $U_{p} = DC 24 V$	-20	-	+55	°C
Atmospheric humidity, not condensing	-	-	80	%
Degree of protection		IP20		
Degree of contamination		2		
Installation	DIN ra	il 35 mm according to EN 500	22-35	
Number of read heads		1 read head per evaluation unit		
Connection (plug-in screw terminals/coded)	0.14	-	2.5	mm <sup>2</sup>
Operating voltage U <sub>c</sub> (regulated, residual ripple $< 5 \%$ )	21	24	27	V DC
For the approval according to $\mathfrak{M}_{\mathfrak{m}}$ the following applies	Operation with UL-c	lass 2 power supply only, or e	quivalent measures	
Current consumption L (with relay energized) <sup>1)</sup>	-	150	-	mA
External fuse (operating voltage [].)	0.25	-	8	A
Safety contacts	2 (relay	vs with internally monitored co	ntacts)	
Switching current (relay outputs)	2 (1014			
- At switching voltage AC/DC 21 60 V	1		300	
At switching voltage AC/DC E 20.1/	1	-	1000	mA
At switching voltage AC/DC 5 50 V	10	-	4000	
- AL SWITCHING VOILAGE AC 5 230 V (160 V ATEX)	10	-	2000	
Switching load according to 🕲	Max. AC	30 V, class 2 / max. DC 60 V	, class 2	
External fuse (safety circuit) according to EN 60269-1	6 A gG or	6 A circuit breaker (characteris	stic B or C)	
Utilization category acc. to EN 60947-5-1	AC	C-12 60V 0.3A / DC-12 60V 0.	3A	
	A	AC-12 30V 4A / DC-12 30V 4A	A	
- For ATEX version	AC	C-12 60V 0.3A / DC-12 60V 0.	3A	_
		AC-12 30V 4A / DC-12 30V 4A	1	
	А	C-15 160V 2A / DC-13 24V 3	A	
Classification according to EN 60947-5-3		PDF-M		
Rated insulation voltage U <sub>i</sub>		250		V
Rated impulse withstand voltage U <sub>imp</sub>		4		kV
Rated conditional short-circuit current		100		A
Resilience to vibration		In acc. with EN 60947-5-2		
Mechanical operating cycles (relays)		10 x 10 <sup>6</sup>		
Switching delay from state change <sup>2)</sup>	-	-	210	ms
Time difference (between the switching points of the two relays)	-	-	25	ms
Current via feedback loop Y1/Y2	5	8	10	mA
Permissible resistance via feedback loop	-	-	600	Ω
Ready delay <sup>3)</sup>	-	10	12	S
Dwell time 4)	3	-	-	S
Switching frequency max. <sup>5)</sup>	-	-	0.25	Hz
Repeat accuracy R according to EN IEC 60947-5-3		≤ 10		%
Monitoring outputs (diagnostics DIA, door monitoring output				
01, semiconductor output, p-switching, short-circuit protected)				
- Output voltage	0.8 x U <sub>B</sub>	-	U <sub>B</sub>	V DC
- Max. load	-	-	20	mA
Start button input S, test input ISI			_	
- Input voltage LOW	0	-	2	V DC
HIGH	15	-	U <sub>B</sub>	
- Input current HIGH	5	8	10	mA
EMC protection requirements	In acc. with EN 60947-5-3			
Reliability figures according to EN ISO 13849-1		1		
as a function of the switching current at 24 V DC	≤ 0.1 A	≤ 1 A	≤ 3 A	
Category		4		
Performance level (PL)	е			
PFH <sub>d</sub>	1.9 x 10 <sup>8</sup>			
Mission time		20		years
Number of switching cycles/year	760 000	153000	34 600	

1) Without taking into account the load currents on the monitoring outputs. 2) Corresponds to the risk time according to EN 60947-5-3. This is the maximum switch-off delay for the safety outputs following removal of the actuator. In case of EMC interference in excess of the requirements in accordance with EN 60947-5-3, the switch-off delay can increase to max. 250 ms. After a brief actuation < 0.25 s, the switch-on delay can increase to max. 3 s if this is followed immediately by further actuation.

3) After the operating voltage is switched on, the relay outputs are switched off and the door monitoring contact is set LOW during the ready delay. For the visual indication of the delay, the green STATE LED flashes at a frequency of approx. 15 Hz.

4) The dwell time is the time that the actuator must be inside or outside the operating distance.

5) In case of monitoring with feedback loop, the actuators must remain outside the operating distance, e.g. with a door open, until the feedback circuit is closed.

Subject to technical modifications; no responsibility is accepted for the accuracy of this information.

# **Evaluation unit CES-AZ-AES-02B**

- 2 read heads can be connected
- 2 safety outputs (relay contacts with ⊳ 2 internally connected NO contacts per output)
- Start button and feedback loop can be ⊳ connected
- **Plug-in connection terminals** Þ
- Category 4 / PL e according to ⊳ EN ISO 13849-1



For possible combinations see page 24

#### **Unicode evaluation**

Each actuator is unique. The evaluation unit detects only the actuator that has been taught-in. Additional actuators can be taught-in. Only the last actuator taught-in is detected. New actuators are taught-in by fitting a jumper.

#### **Multicode evaluation**

Every actuator is detected by the evaluation unit.

#### **Guard lock monitoring**

Evaluation units in the series CES-AZ make it possible to use read heads with integrated guard locking for the personal protection during overtravelling machine movements. For suitable read heads, please refer to the combinations table on page 24.

#### Category according to EN ISO 13849-1

Due to two redundant safety paths (relay contacts) with 2 internal, monitored NO contacts per safety path, suitable for:

Category 4 / PL e according to

EN ISO 13849-1 Each safety path is independently safe.

#### LED display

STATE	Status LED
DIA	Diagnostics LED
OUT	Status safety output

## **Evaluation unit CES-AZ-AES-02B**









#### **Additional connections**

- Input for self-test TST
- 01, 02 Monitoring outputs (semiconductor)
- DIA Diagnostics output
- Y1, Y2 Feedback loop
- S
  - Start button connection

Important: The plug-in connection terminals are not included and must be ordered separately.

## **Ordering table**

Series	Category and PL according to EN ISO 13849-1	Number of read heads	Туре	Order no. / item
CES-AZ-AES-O2B Unicode	up to 4 / PL e	2		<b>104 775</b> CES-AZ-AES-02B
CES-AZ-UES-02B Multicode	up to 4 / PL e	2		<b>105 140</b> CES-AZ-UES-02B
Connection set for evaluation unit CES-AZES-02B			Plug-in Screw terminals	<b>104 771</b> CES-EA-TC-AK06-104771

1) BG approval pending

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# Technical data evaluation unit CES-AZ-AES-02B

Devementer		Value		Unit
Farameter	min.	typ.	max.	Unit
Housing material		Plastic PA6.6		
Dimensions		114 x 99 x 45		mm
Weight		0.25		kg
Ambient temperature at U <sub>n</sub> = DC 24 V	-20	-	+55	°C
Atmospheric humidity, not condensing	-	-	80	%
Degree of protection		IP20		
Degree of contamination		2		
Installation	DIN r	rail 35 mm according to FN 500	)22-35	
Number of read heads	Ma	ax. 2 read heads per evaluation	unit	
Connection (plug-in screw terminals/coded)	0.14	-	25	mm <sup>2</sup>
Operating voltage U (regulated, residual ripple $< 5$ %)	21	24	27	V DC
For the approval according to $\mathfrak{M}_{\mathfrak{B}}$ , the following applies	Operation with LIL	-class 2 nower supply only or e	equivalent measures	
Current consumption L (with relay energized) <sup>1)</sup>		150		mΔ
External fuse (operating voltage [])	0.4		8	Δ
Safaty contacts	2 (rol	ave with internally monitored co	Intacts)	
Switching current (relay outputs)	2 (10)			
At switching voltage AC/DC 21 60 V	1		200	
	1	-	500	mA
- At switching voltage AC/DC 5 30 V	10	-	4000	
- At switching voltage AC 5 230 V	10	-	2000	
Switching load according to 🐵	Max. A	C 30 V, class 2 / max. DC 60 V	, class 2	
External fuse (safety circuit) according to EN 60269-1	6 A gG o	r 6 A circuit breaker (characteri	stic B or C)	
Utilization category acc. to EN 60947-5-1	Ą	C-12 60V 0.3A / DC-12 60V 0.	3A	
		AC-12 30V 6A / DC-12 30V 6A	Ą	
Classification according to EN 60047.5.2		AC-15 250V 2A / DC-15 24V 5	A	
Classification according to EN 00947-5-5		250		
Rated insulation voitage U		230		V 10/
Rated impulse withstand voitage U <sub>imp</sub>		4		KV
Rated conditional short-circuit current				A
Resilience to vibration		In acc. with EN 60947-5-2		
Nechanical operating cycles (relays)		10 X 10°		
Switching delay from state change <sup>27</sup>			200	
- 2 activated actuators	-	-	290	ms
- 1 activated actuator	-	-	210	
relays (with 2 activated actuators)	-	-	25	ms
Manual start operating mode				
Duration of operation of start button	250			
Start button response delay	230	200	200	ms
Current via foodback loop V1 V2	5	200	10	m۸
Parmiscible resistance via feedback loop	5	0	600	
	-	10	10	52
Ready delay of	-	10	12	S
Dwell tille "	3	-	- 0.25	S
Switching frequency max. "	-	- 10	0.25	HZ
Repeat accuracy K according to EN IEC 60947-5-3		≤ 10		<u>%</u>
Monitoring outputs (diagnostics DIA, release 0102, semi- conductor output p-switching short circuit-protected)				
- Output voltage	0.8 v 11		П	VDC
- Max load	0.0 x 0 <sub>B</sub>		20	mΔ
Start hutton input S, tast input TST	-	-	20	
Input voltage	٥		2	
	15	-		V DC
	10	Q	U <sub>B</sub>	m٨
EMC protection requirements	5		10	
Paliability figures according to EN ISO 12940 1		III acc. WILLI EIN 00947-3-3		
reliability ligures according to EN ISU 13849-1	<014	< 1 A	< 2 A	
as a function of the switching current at 24 V DC	≤ U.1 A	≤ L A	≤ 3 A	
Calegory	4			
	e 1.0.10°			
PrH <sub>d</sub>	1.9 × 10°			
Mission time	70000	20	24.000	years
Number of switching cycles/year	/60000	153000	34 600	

1) Without taking into account the load currents on the monitoring outputs.

2) Corresponds to the risk time according to EN 60947-5-3. This is the maximum switch-off delay for the safety outputs following removal of the actuator. In case of EMC interference in excess of the requirements in accordance with EN 60947-5-3, the switch-off delay can increase to max. 430 ms. After a brief actuation < 0.4 s, the switch-on delay can increase to max. 3 s if this is followed immediately by further actuation.

3) After the operating voltage is switched on, the relay outputs are switched off and the monitoring outputs are set LOW during the ready delay. For the visual indication of the delay, the green STATE LED flashes at a frequency of approx. 15 Hz.

4) The dwell time is the time that the actuator must be inside or outside the operating distance.

5) In case of monitoring with feedback loop, the actuators must remain outside the operating distance, e.g. with a door open, until the feedback circuit is closed.



# **Evaluation unit CES-AZ-AES-04B**

- 4 read heads can be connected
- 2 safety outputs (relay contacts with 2 internally connected NO contacts per output)
- Start button and feedback loop can be connected
- Plug-in connection terminals
- Category 4 / PL e according to EN ISO 13849-1



For possible combinations see page 24

#### Unicode evaluation

Each actuator is unique. The evaluation unit detects only the actuator that has been taught-in. Additional actuators can be taught-in. Only the last actuator taught-in is detected. New actuators are taught-in by fitting a jumper.

#### **Multicode evaluation**

Every actuator is detected by the evaluation unit.

#### **Guard lock monitoring**

Evaluation units in the series CES-AZ make it possible to use read heads with integrated guard locking for the personal protection during overtravelling machine movements. For suitable read heads, please refer to the combinations table on page 24.

#### Category according to EN ISO 13849-1

Due to two redundant safety paths (relay contacts) with 2 internal, monitored NO contacts per safety path, suitable for:

Category 4 / PL e according to

EN ISO 13849-1 Each safety path is independently safe.

#### LED display

STATE	Status LED
DIA	Diagnostics LED
OUT	Status safety output

#### Evaluation unit CES-AZ-AES-04B



AES-04B



### **Block diagram**



### Additional connections

- TST Input for self-test
- 01...04 Monitoring outputs (semiconductor)
- **DIA** Diagnostics output
- **Y1, Y2** Feedback loop
- S Start button connection

**Important**: The plug-in connection terminals are not included and must be ordered separately.

#### **Ordering table**

Series	Category and PL according to EN ISO 13849-1	Number of read heads	Туре	Order no. / item
CES-AZ-AES-04B Unicode	up to 4 / PL e	4		<b>104 780</b> CES-AZ-AES-04B
CES-AZ-UES-04B Multicode	up to 4 / PL e	4		<b>105 141</b> CES-AZ-UES-04B
Connection set for evaluation unit CES-AZES-04B			Plug-in Screw terminals	<b>104 776</b> CES-EA-TC-AK08-104776

1) BG approval pending

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# **EUCHNER**

# Technical data evaluation unit CES-AZ-AES-04B

Demonstern		Value		11
Parameter	min.	tvp.	max.	Unit
Housing material		Plastic PA6 6		
Dimensions		114 × 00 × 45		mm
Dimensions		114 x 99 x 45		
weight		0.25		Kg
Ambient temperature at $U_{\rm B} = DC 24 V$	-20	-	+55	°C
Atmospheric humidity, not condensing	-	-	80	%
Degree of protection		IP20		
Degree of contamination		2		
Installation	DIN ra	ail 35 mm according to EN 500	22-35	
Number of read heads	Ма	x. 4 read heads per evaluation	unit	
Connection (plug-in screw terminals/coded)	0.14	-	25	mm <sup>2</sup>
Operating voltage II (regulated residual ripple $< 5\%$ )	21	24	2.0	V DC
$\sum_{B} \frac{1}{1000} 1$	Operation with Ill			V DC
	Operation with OL-	class 2 power supply only, or e	quivalent measures	
Current consumption $I_B$ (with relay energized) <sup>1</sup> /	-	150	-	mA
External fuse (operating voltage U <sub>B</sub> )	0.4	-	8	A
Safety contacts	2 (rela	ays with internally monitored co	ntacts)	
Switching current (relay outputs)				
- At switching voltage AC/DC 21 60 V	1	-	300	
At switching voltage AC/DC 5 30 V	10		4000	mA
At switching voltage AC 5 50 V	10	-	4000	
- AL SWITCHING VOLAGE AC 5 250 V	10	-	2000	
Switching load according to 🕲	Max. AC	C 30 V, class 2 / max. DC 60 V,	class 2	
External fuse (safety circuit) according to EN 60269-1	6 A gG or	6 A circuit breaker (characteris	tic B or C)	
Utilization category acc. to EN 60947-5-1	A	C-12 60V 0.3A / DC-12 60V 0.3	BA	
		AC-12 30V 6A / DC-12 30V 6A		
		AC-15 230V 2A / DC-13 24V 3/	ł	
Classification according to EN 60947-5-3		PDF-M		
Rated insulation voltage U		250		V
Rated impulse withstand voltage U		4		kV
Rated conditional short-circuit current		100		A
Paciliance to vibration		In acc. with EN 609475.2		
Machanical appreting surgles (releva)		10 x 106		
Switching dolou from ototo change?		10 x 10-		
Switching delay from state change <sup>2</sup>				
- 4 activated actuators	-	-	450	
- 3 activated actuators	-	-	370	ms
- 2 activated actuators	-	-	290	1115
- 1 activated actuator	-	-	210	
Time difference between the switching points of the two			25	
relays (with 4 activated actuators)	-	-	25	ms
Manual start operating mode				
- Duration of operation of start button	250	_	-	
- Start button response delay	-	200	300	ms
Ourrent via foodback loop V1 V/2	F	200	10	
	5	0	10	
Permissible resistance via feedback loop	-	-	600	Ω
Ready delay <sup>3)</sup>	-	10	12	S
Dwell time 4)	3	-	-	S
Switching frequency max. <sup>5)</sup>	-	-	0.25	Hz
Repeat accuracy R according to EN IEC 60947-5-3		≤ 10		%
Monitoring outputs (diagnostics DIA, release 0102, semi-				
conductor output, p-switching, short circuit-protected)				
- Output voltage	0.8 x U <sub>p</sub>	-	Up	V DC
- Max. load	-	-	20	mA
Start button input S test input TST				
	0		2	
	15	-	ے ا	V DC
	10	-	U <sub>B</sub>	
- Input current HIGH	5	8	10	mA
EMC protection requirements		In acc. with EN 60947-5-3		
Reliability figures according to EN ISO 13849-1				
as a function of the switching current at 24 V DC	≤ <b>0.1</b> A	≤ 1 A	≤ 3 A	
Category		4		
Performance level (PL)		е		
PFH.	1 9 v 108			
Mission time		20		Vearc
Number of switching cycles /year	760.000	153000	3/1600	30015
TRATINGE OF SWILLING CYCICS/ YEAR	,00000	100000	JTUUU	1

1) Without taking into account the load currents on the monitoring outputs. 2) Corresponds to the risk time according to EN 60947-5-3. This is the maximum switch-off delay for the safety outputs following removal of the actuator. In case of EMC interference in excess of the requirements in accordance with EN 60947-5-3, the switch-off delay can increase to max. 750 ms. After a brief actuation < 0.8 s, the switch-on delay can increase to max. 3 s if this is followed immediately by further actuation.

3) After the operating voltage is switched on, the relay outputs are switched off and the monitoring outputs are set LOW during the ready delay. For the visual indication of the delay, the green STATE LED flashes at a frequency of approx. 15 Hz.

4) The dwell time is the time that the actuator must be inside or outside the operating distance.

5) In case of monitoring with feedback loop, the actuators must remain outside the operating distance, e.g. with a door open, until the feedback circuit is closed.

Subject to technical modifications; no responsibility is accepted for the accuracy of this information.

