

# Monitoring unit ALS197 for bucket elevators

Rotary speed and alignment in combination depending ATEX 100

- Driven by microcontroller
- Rotary speed- and alignment monitoring in one unit
- Difference rotary speed monitoring
- Automatic actual rotary speed registration/storage
- Electronical start-up delay
- Differenced, direct or delayed alarming
- Storage of alarms
- For connection of one up to five sensors
- For inductive or optomagnetical misalignment sensors
- Easiest mounting
- Easiest operation
- zonefree assembly



Bucket elevators are the most dangerous machines in mills, feed mills, grain silos etc. No other machine is statistically regarded as dangerous as a bucket elevating system. Already in 1979, when there were no safety regulations for bucket elevator systems, **Agromatic** had the aim to completely control this machine. The latest result of extensive tests and developments is the present unit ALS197.

The electronical unit ALS197 is driven by a microcontroller and is made for all requested varieties of combination for the safety control of elevators, no matter if simple rotary speed monitor, alignment monitor or combined unit for rotary speed and alignment for single, double or triple elevators. Inductive as well as opto-magnetical sensors can be connected to the ALS197. The ALS197 can be started internally or externally. The ALS197 meets all necessary safety regulations. All sensors connected to the ALS197 are continuously controlled regarding wire, correct sensors operations, breakage and short circuit.

Automatic registration and storage of the actual rotary speed. Differential, direct or (up to 30 s) delayed alarm for rotary speed and alignment with storage of the alarm values.

## Technical data:

Connection voltage:	24VAC/DC (Art No:2011) / 230VAC (Art No: 2012) (others on request)
Housing:	For installation in control panel: Standard DIN 35 rail housing (IP20) For general mounting: Top-mounted housing (IP65)
Dimensions:	Standard: L 100mm, B 73mm, D 114mm (top-mounted housing see datasheet)
Range of temperature:	Operation: -20°C up to +50°C; Storage: -20°C up to +50°C
Rotary speed monitoring:	Range: 20 up to 5000 RPM; tolerance: 0 up to 50%; alarm delay: 0 up to 30 s
Alignment monitoring:	Signal integration 2 s; alarm delay: 0 up to 30 s
Connection capacity:	1 up to 5 sensors
Start of monitoring:	Internal or external by 12 -250VAC or DC (internal electrical isolation)
Alarming:	Each one electrically isolated relay contact 2A/250V for rotary speed-/alignment alarm



Right of technical and dimensional changes in the sense of progress reserved at all times

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## Sensors



**Application for zone separation 20/22 ATEX** Ex II 1/2 D  
 IP65 T 90°C without LED Ex II 1/3 D IP 65 T 90°C with LED  
 EG EC-type examination certificate : BVS 03 ATEX E116

### ASLS2000 PNP NC for operating at ATEX zone 20/21 or 20/22

Opto-magnetical safety sensor for misalignment monitoring of the elevator or conveyor belt (two sensors per monitoring needed). No adjustment necessary. No mechanical wearing parts. Fiberglass sensor rod with rod breakage protection. Intrinsically safe version for direct use in zone 20.

Integrated thermofuse  
 Connection voltage 10 - 35 V DC  
 Signal output PNP NC max. 200mA  
 LED display of function  
 Protection class IP65  
 Length of connection cable 1.5m

**Art No 2119 for zoneseparation 20/21**

**Art No 2120 for zoneseparation 21/22 with LED**



### ASIQ80 CE50 PNP NC for ATEX zone 22

High quality inductive sensor for misalignment monitoring of the conveyor buckets (two sensors for each misalignment monitoring are needed).

Installation behind separation glass with proper installation. With shielded connecting cable length 1.5m, integrated thermo fuse  
 Connection voltage 10-35 V AC/DC  
 Signal output PNP NC max. 200mA  
 Switching distance adjustable from 10 - 50mm  
 LED display of function

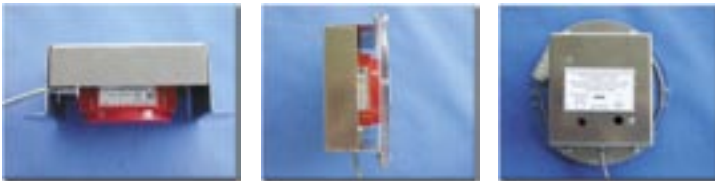
Dimensions 80x80x50mm

**Art No: 4084 Sensor only**

**Art No: 4085 Sensor with installation**

**clamp (Zone 22)**

**Art No: 3714 Extension : separation plate with sealing. (Please order separately)**



### Application in ATEX zone 22

Ex II 3D IP67 T80°C X  
 zone separation 20/22 with separation plate

### ASI12 CE4 PNP NC for ATEX zone 2 and 22

with shielded connection cable 1.5m  
 Inductive rotary speed sensor. Sensing the rotary speed at the bottom-/drive shaft (end of shaft, keynut or at outcoming part at shaft like head of a screw). Completely supplied with 2 installation nuts.

Connection voltage 10-35V DC  
 Signal output PNP NC max. 200 mA  
 Switching distance max. 4mm  
 LED display of function

Diameter 12mm (M12x1mm)  
 Integrated thermo fuse.

**Art No: 4006**

### ASI18 CE8 PNP NC for ATEX zone 2 and 22

with shielded connecting cable 1.5m  
 Inductive rotary speed sensor for not round running shafts. Sensing the rotary speed at the bottom-/drive shaft (end of shaft, keynut or at outcoming part at shaft like head of a screw). Completely supplied with 2 installation nuts.

Connection voltage 10-35V DC  
 Signal output PNP NC max. 200 mA  
 Switching distance max. 8mm  
 Diameter 18mm (M18x1.5mm)  
 integrateds thermo fuse,

**Art No: 4023**



### Application in ATEX zone 22

Ex II 3 D IP67 T 80°C X

### Application in ATEX zone 2

Ex II 3 G EExnA II T5 X

## Sets of units

Unit sets are the easiest way to find the correct devices for the different applications. The necessary connection wires and assembly parts (screws etc.) are not included in our delivery. Please choose for zone 20/21 or 22 depending on your explosion requirement sheet.



### Rotary speed monitor - motion detector ALS197/D (Zone 22)

Art No: 2021 for 230 V AC application

Art No: 2022 for 24 V AC/DC application

Single rotary speed - motion detector with inductive rotary speed sensor. Electrical start-up delay, automatic registration of the actual rotary speed in the range of 20-5000 RPM, adjustable tolerance (switching range) 1 - 50%, direct or delayed alarm adjustable from 1 s up to 30 s, sensor monitoring.

Use: All applications of rotary speed- and motion monitoring.



### Differential speed monitor ALS197/D/D (Zone 22)

Art No: 2023 for 230 V AC application

Art No: 2024 for 24V AC/DC application

(1 ALS197, 2 ASI12 CE4 PNP NC)

2-way speed sensor for differential speed control



### Alignment sensor ALS197/S (Zone 22) (bucket scanning)

Art No: 2025 for 230 V AC application

Art No: 2026 for 24 V AC/DC application

(1 ALS197, 2 ASI12 CE4 PNP NC with installation clamp.)

Single alignment sensor with 2 inductive misalignment sensors. Electrical start-up delay, direct or delayed alarm, adjustable 1 sec. to 30 sec., sensor monitoring.

Application: single conveyors with metal buckets.



### Alignment sensor ALS197/SO (Zone 20/22) (belt scanning)

Art No: 2031 for auxiliary voltage 230 V AC

Art No: 2032 for auxiliary voltage 24 V AC/DC

(1 ALS197, 2 ASLS2000 PNP NC)

Single alignment sensor with 2 opto - magnetical alignment sensors. Electrical start-up delay, direct or delayed alarm, adjustable 1 sec. to 30 sec. sensor monitoring. Application: all kinds of conveyors, also with plastic buckets



### Rotary Speed- /Alignment Monitor ALS197/D/S (Zone 22) (bucket scanning)

Art No: 2027 for auxiliary voltage 230V AC

Art No: 2028 for auxiliary voltage 24 V AC/DC

(1 ALS197, 2 ASI12 CE4 PNP NC with protection, 1 ASI12 CE4 PNP NC)

Rotary-/alignment monitor with 2 inductive alignment monitors and one speed sensor.

Speed function as ALS197/D, alignment function as ALS197/S.

Application: single conveyors with metal buckets.



### Rotary Speed- /Alignment Monitor ALS197/D/SO (Zone 20/22) (belt scanning)

Art No: 2027 for auxiliary voltage 230V AC

Art No: 2028 for auxiliary voltage 24 V AC/DC

(1 ALS197, 2 ASLS2000 PNP NC , 1 ASI12 CE4 PNP NC)

Rotary-/alignment monitor with 2 opto - magnetical alignment sensors and one inductive speed sensor. Speed function as ALS197/D, alignment function as ALS197/S.

Easiest assembly and adjustment.

Application: all kinds of conveyors, also with plastic buckets.



### Rotary Speed-/Double-Alignment Monitor ALS197/D/SO/SO (Zone 20/22) (belt scanning)

Application also for double conveyors

Art No: 2035 for auxiliary voltage 230V AC

Art No: 2036 for auxiliary voltage 24 V AC/DC

(1 ALS197, 4 ASLS2000 PNP, 1 ASI12 CE4 PNP NC)

OR

### ALS197/D/S/S (Zone 22) (bucket scanning)

(1 ALS197, 4 ASI12 CE4 PNP NC with mountingbow, 1 ASI12 CE4 PNP NC)

Speed-/alignment monitor with 4 opto -magnetical or inductive alignment sensors and one inductive speed monitor.

speed function as ALS197/D,

alignment function as ALS197/S.

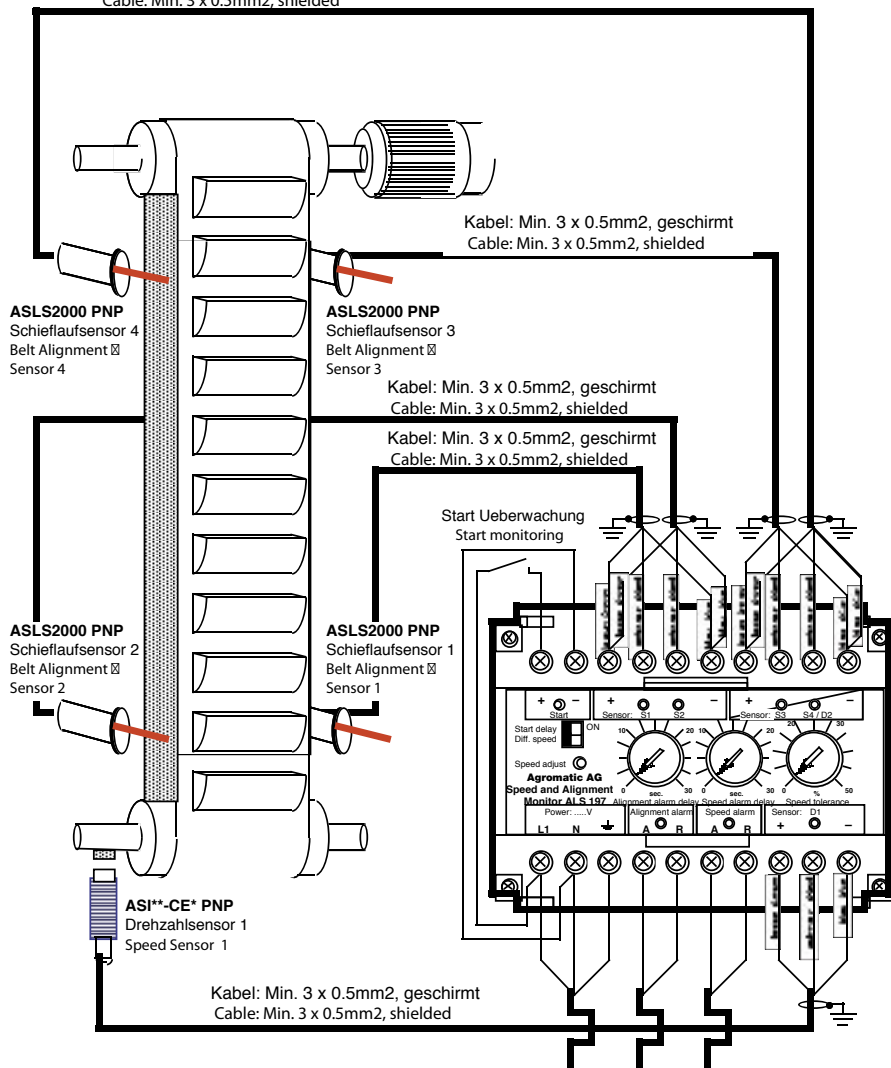
Application: all kinds of conveyors, also with plastic buckets for opto-magnetical sensors. With inductive sensors only single conveyors with metal buckets.

Art No: 2029 for auxiliary voltage 230V AC

Art No: 2030 for auxiliary voltage 24 V AC/DC

**ALS197/D/SO/SO**  
**Verkabelungs- und Anschlussplan**  
**Wiring- and Connecting Diagram**

Kabel: Min. 3 x 0.5mm<sup>2</sup>, geschirmt  
 Cable: Min. 3 x 0.5mm<sup>2</sup>, shielded



**Principle Construction / Installation**

Stromversorgung  
 gem. Typenschild  
 Power Supply  
 acc. to typical plate

Alarm Kontakte  
 (offen bei Alarm und Power OFF)  
 Alarm Contacts  
 (open if Alarm or Power OFF)

**Classifications - Ordering Specifications**  
 (For sets please see specifications inside)

**Single units:**

Art No:	Type	Voltage	
2011	ALS197	230V AC	Elektronic unit, configured acc. your requirements (D, D/D, S, SS, DS, DSS, SO, DSO, DSOSO)*
2012	ALS197	24VDC	Elektronic unit, configured acc. your requirements (D, D/D, S, SS, DS, DSS, SO, DSO, DSOSO)*
4006	ASI12 CE4 PNP NC	10-35V	Rotary sensor switching distance 4mm
4023	ASI18 CE8 PNP NC	10-35V	Rotary sensor switching distance 8mm
4084	ASIQ80 CE50 PNP NC	10-35V	Alignment sensor switching distance 10-60mm
4085	ASIQ80 CE50 PNP NC	10-35V	with mountingbow ATEX
4086	ASIQ80 CE50 PNP NC	10-35V	with mountingbow ATEX and separationplate
2902	Mountingbow		ATEX breakage protection housing for art 4084 sensor
3714	Separationplate		ATEX separation glas (zone separation) for alignment sensor art 4084 with sealing
2119	ASLS2000	10-35V	Alignment sensor for application in zone 20/21
2120	ASLS2000LED	10-35V	Alignemnt sensor for application in zone 20/22

\* Attention: D = rotary speed, DD = Double or differential speed, S = Alignment (inductive), SS = Double rotary speed, DS = Combination Rotary speed-alignment (inductive), DSS = Combination rotary speed-double rotary speed (below/top inductive), SO = alignment with ASLS2000 Z20/22 sensor, DSO = Combination rotary speed-alignment with ASLS2000 (zone20), DSOSO = Combination Rotary speed -double alignment with ASLS2000 zone 20/22 sensor (below/top)

**Further applications**

further applications for the ALS197 units are e.g. the monitoring of transportation belts, roller mills, gears of all kind.

**Double elevator with fix base shaft**

For this application we exclusively recommend the **Rotaryspeed / double alignment ALS197/D/SO/SO (belt scanning) Art No: 2035/2036**

In this composition the sensors can easily be fixed into the separationwall of the elevator. Adjustment of the sensors is not necessary. With this version the best possible surveillance of the double elevator is warranted.

**Recommendation:** For elevators with height > 20m only use double alignment sensors.

**Assembly material: separation glas**

Attention one unit needed for each inductive sensor (ASIQ80 CE50 PNP NC)

Please order separately. Range of



supply: separation glas Ø150mm, complete with sealingring. Holes are the same as for mountingbow of sensor.

**Art No: 3714**



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**Safety devices**  
**ATEX zone specification**  
**we look forward to advising you.**