GSU 14D

Ultrasonic label fork

en 08-2015/01 50109234-03

4mm

12 - 30 V DC

4 m/s

- Ultrasonic forked sensor for universal application
- Large mouth width, hence also suitable for booklets or fan-fold flyers
- Basic version GSU 14D comparable with the previous model GSU 14

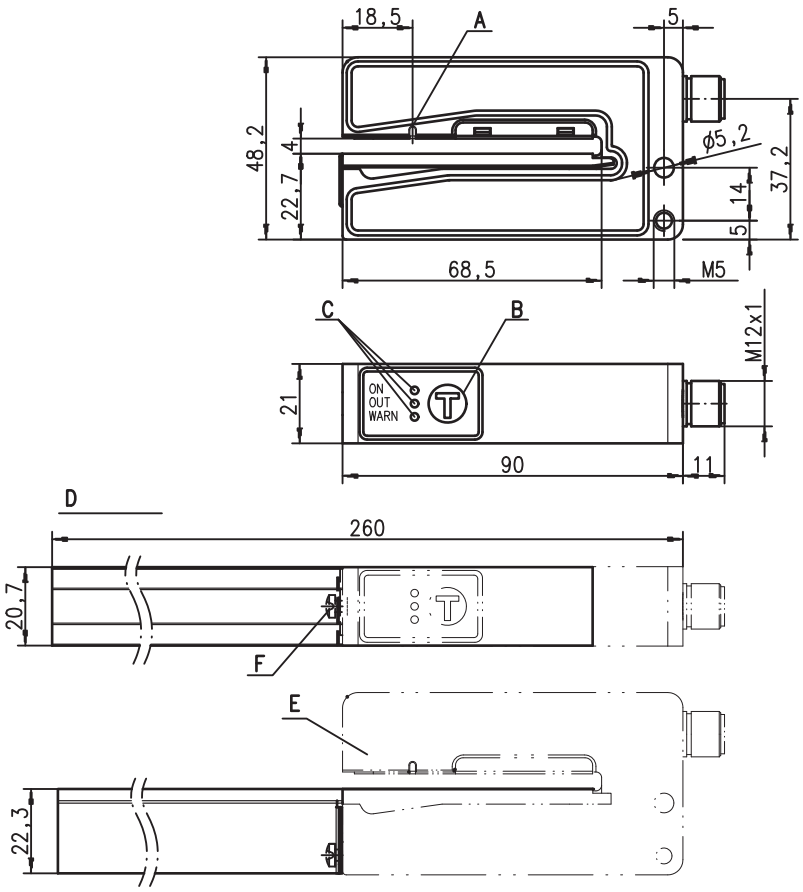
IP 65

Accessories:

(available separately)

- Carriage short (Part No. 50114055)
  As replacement for the series part.
- Extended carriage (Part No. 50114056)
  For better guiding of oversized labels.
  The rail can be shortened at any point.
- M12 connectors (KD …)
- Cable with M12 connector (K-D...)

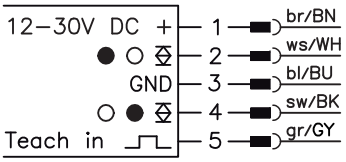
Dimensioned drawing



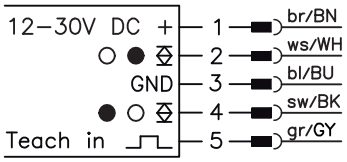
A Sensor marker (center of label tape)
B Teach-in button
C Indicator diodes (ON, OUT, WARN)
D View with extended carriage mounted
E Sensor
F Fastening screw for carriage

Electrical connection

GSU 14D/66.3-S12



GSU 14D/66D.3-S12



Specifications

Physical data

Mouth width		4mm
Mouth depth		68mm
Label length		≥ 5mm
Label width		≥ 10mm
Label gap		≥ 2mm
Conveyor speed		≤ 240m/min (4m/s)
Conveyor speed with teach-in		≤ 50m/min (0.83m/s)
Typ. response time		≤ 200µs
Repeatability [1]		± 0.2mm
Delay before start-up		≤ 300ms acc. to IEC 60947-5-2

Electrical data

Operating voltage U_B [2]		12VDC (-5%) … 30VDC (incl. residual ripple)
Residual ripple		≤ 15% of U_B
Open-circuit current		≤ 80mA
Switching output [3]	…/66	2 push-pull switching outputs pin 4: PNP switching in the gap, NPN switching on the label pin 2: PNP switching on the label, NPN switching in the gap
	…/66D	2 push-pull switching outputs pin 4: PNP switching on the label, NPN switching in the gap pin 2: PNP switching in the gap, NPN switching on the label
Signal voltage high/low		≥ (U_B-2V)/≤ 2V
Output current		≤ 100mA
Capacitive load		≤ 0.5µF

Indicators

Green LED	ready
Green LED flashing	teach-in activated
Yellow LED	switching point in the label gap
Red LED	teaching error / function error

Mechanical data

Housing	diecast zinc, painted
Color	red/black
Weight	270g
Ultrasonic transducer	piezoceramic [4]
Connection type	M12 connector, 5-pin

Environmental data

Ambient temp. (operation/storage)	0°C … +60°C/-40°C … +70°C
Protective circuit [5]	1, 2
VDE safety class	III
Degree of protection	IP 65
Standards applied	IEC 60947-5-2
Certifications	UL 508, C22.2 No.14-13 [2] [6]

Options

Teach-in input

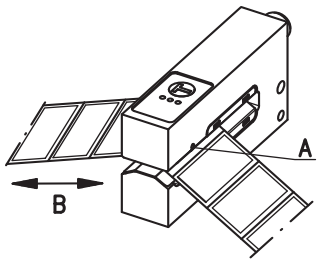
Active/Not active	≥ 8V/≤ 2V
Input resistance	15kΩ

1) Depending on conveyor speed, label length and spacing between labels
2) For UL applications: for use in class 2 circuits according to NEC only
3) The push-pull switching outputs must not be connected in parallel
4) The ceramic material of the ultrasonic transducer contains lead zirconium titanate (PZT)
5) 1=polarity reversal protection, 2=short circuit protection for all outputs
6) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

Order guide

Selection table Order code ➔ Equipment ↓		GSU 14D/66.3-S12 Part no. 50126781	GSU 14D/66D.3-S12 Part no. 50126782	GSU 14D/66D.31-S12 Part no. 50126783
Switching output (presetting)	light switching (signal in the label gap)	●		
	dark switching (signal on the label)		●	●
Connection	M12 connector, 5-pin	●	●	●
Function	comparable predecessor model GSU 14	●	●	●
	with warning output, *easyTeach* and ALC function			
Carriage	short	●	●	
	long			●

Marking on the sensor



A Label center position
B Label run

Remarks

Intended use:
The ultrasonic label forks are ultrasonic sensors for contactless detection of the gap between two consecutive labels on a carrier tape.

Operate in accordance with intended use!

- This product is not a safety sensor and is not intended as personnel protection.
- The product may only be put into operation by competent persons.
- Only use the product in accordance with the intended use.

- To achieve high repeatability, the label tape must be slightly under tension.
- Align the label tape according to the sensor's marker "Label center position" (see also marking on sensor).
- The label material used determines the achievable precision and the reliability of gap detection!
- Light switching: signal in the label gap.
- Dark switching: signal on the label.

Part number code

G	S	U	1	4	D		/	6	6	D	.	3	1	-	S	1	2

Operating principle

GSU	Ultrasonic forked sensors

Series

14D	Series 14, generation D

Housing

free	Diecast zinc, painted silver

Switching output type (pin 4)

6	Push-pull

Switching output type (pin 2)

6	Push-pull

Switching output function

D	Pin 4: PNP switching on the label, NPN switching in the gap
	Pin 2: PNP switching in the gap, NPN switching on the label
free	Pin 4: PNP switching in the gap, NPN switching on the label
	Pin 2: PNP switching on the label, NPN switching in the gap

Teach-in

3	Teach-in by means of control button on the sensor

Equipment

1	With extended carriage
K	Customer-specific design
YN	Customer-specific design

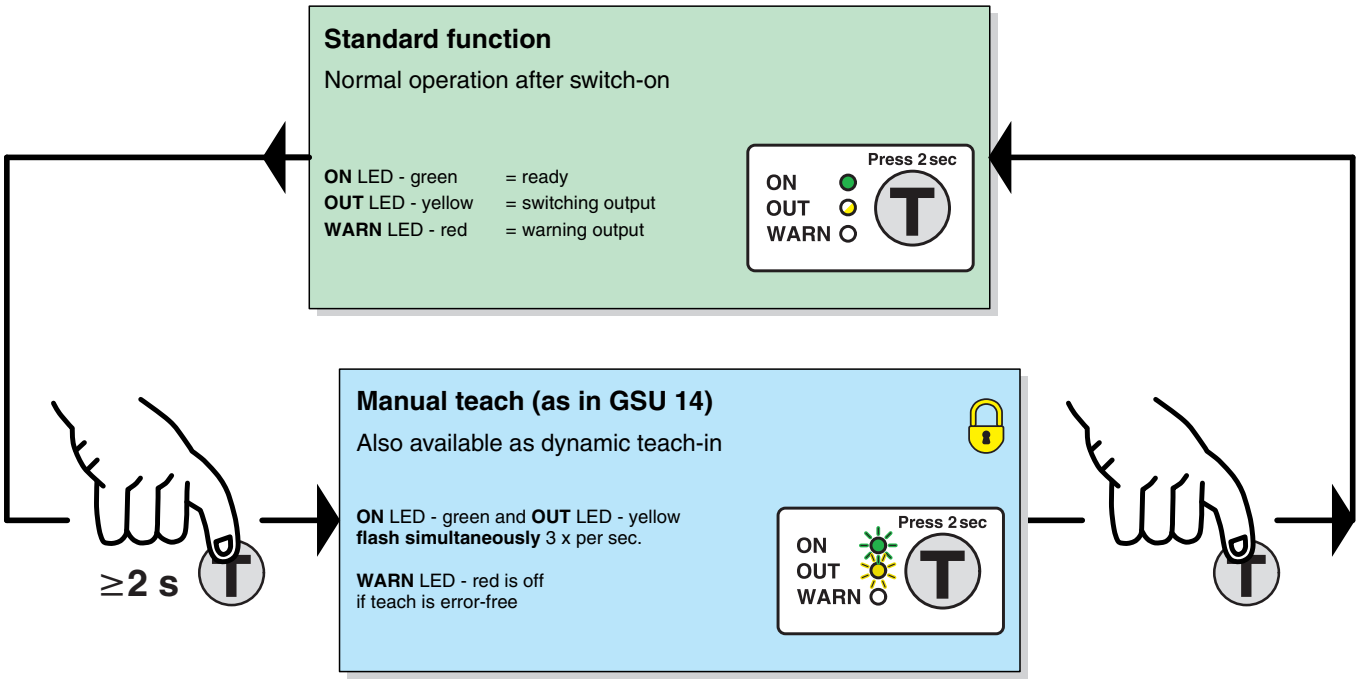
Connection technology

S12	M12 connector, 5-pin

Overview of device functions

Basic functions	GSU 14D
Directly comparable to GSU 14	✔
Universal application (paper, transparent foil, metalized foil)	✔
Suitable for booklets and fan-fold flyers	✔
Maximum conveyor speed up to 240 m/min (4 m/s)	✔
Typ. response time ≤ 200 µs	✔
1 adjustable switching output (light or dark switching function)	-
2 switching outputs	✔
Special functions	
Manual teach-in	✔
easyTeach	-
Online optimization of the switching threshold by ALC (auto level control)	-
Warning display on the device	✔
Warning output for indicating teach or function errors	-

Overview of operating structure



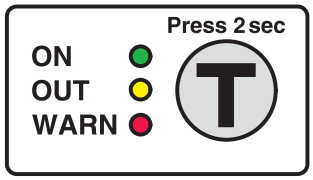
= function lockable through constant application of U_B on the teach input

Standard function

During operation the sensor is always in this function. The sensor detects label gaps with high precision and speed. This is indicated by the yellow LED and the switching output.

Indicators:

ON LED - green	Constantly ON when operating voltage is applied.
OUT LED - yellow	Indicates the switching signal. LED is ON if the sensor detects label gaps. The display is independent of the output setting.
WARN LED - continuous red light	OFF: error-free operation. ON: teaching error caused by unfavorable label material.
WARN LED - flashing red	Short-circuit at the switching output. The output is switched to tri-state until the error is rectified.



Operation

The teach button must be pressed for at least 2 seconds to operate the device. The button can be electrically disabled to prevent accidental operation.

Sensor adjustment (teach-in) via teach button

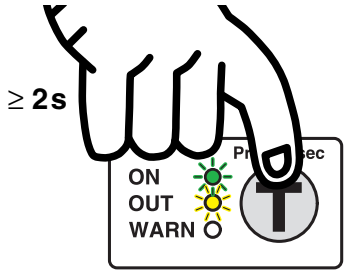
Teach while label tape is passing through (dynamic)

Preparation: Insert label tape into the sensor.

- **Press the teach button until green and yellow LEDs flash simultaneously.**
- **Release teach button.**
- **Advance the label tape through the sensor.**
- **Press the button briefly once more to terminate the teach event, the sensor goes into standard mode.**

3 … 7 label gaps should be advanced through the sensor in order to achieve stable switching points.

If the teach event is faulty (e.g. unfavorable material combination, uneven transport, jittering during transport), the red LED illuminates. Repeat the teach event. If the fault cannot be rectified, the label material cannot be detected with the GSU 14D.

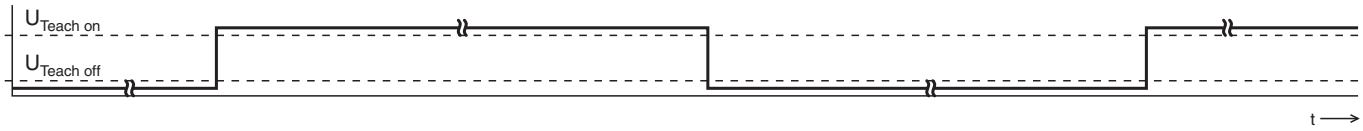


The **green** and the **yellow** LEDs flash **simultaneously** approx. **3** x per sec.

Sensor adjustment (teach-in) via teach input

Teach while label tape is passing through (dynamic)

Preparation: Insert the label tape in the correct position in the sensor (align the middle of the tape to the sensor marking).



After switching on the supply voltage and after the delay before start-up has concluded (≤ 300 ms), the teach button on the device can be operated.	High level on the teach-in input triggers the teach event. Advance 3 … 7 labels through the sensor. Sensor remains in teach as long as the high signal is applied.	The edge transition (1 -> 0) terminates the teach event. The sensor is in normal operation again.	A rising edge triggers a new teach event.
	At the same time the teach button is disabled with the first rising edge (0 -> 1). **Attention**: **The button remains disabled as long as voltage is supplied to the sensor (until the sensor is switched off).**	The button remains disabled until the sensor is switched off.	The button remains disabled until the sensor is switched off.

The red LED illuminates if a teaching error occurs (e.g. the label cannot be reliably detected due to insufficient signals).

Regardless of the state, the green LED illuminates upon conclusion of the teach event; the yellow LED indicates the current switching state.

Locking the teach button via the teach input

The teach button is disabled with the **first rising edge** (0 -> 1) on the teach input.

Attention: The button remains disabled until the sensor is switched free of voltage (disabled).