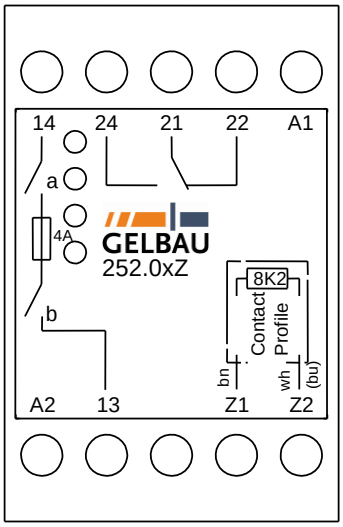
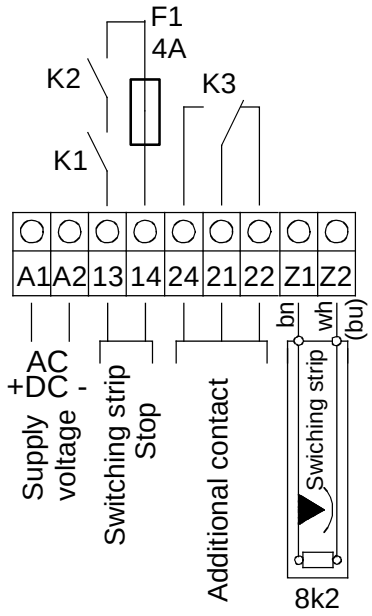
General

The resistance evaluation unit 252.0xZ is a dual safety relay designed to monitor GELBAU Contact-Duo safety switching strips with a resistance of 8.2 kΩ as an electrical termination. The 252.0xZ model series has a two-channel configuration and incorporates a control which monitors redundancy. The stop output (13, 14) comprises two force guided relays.
With an additional changeover contact (21, 22, 24), a notification contact or auxiliary contact is available.
The safety system complies with the **EN ISO 13849-1: 2008** standard and the **EN ISO 13856-2: 2013** European standard for pressure-sensitive protective devices as it applies to output switchgear.

Arrangement, connection



Wiring diagram



Function

The Contact-Duo switching strip connected to Z1, Z2 is monitored with a quiescent current. If correctly wired, the safety contact 13, 14 is closed and both green LEDs are illuminated in the operating state “Ready”.
If the Contact-Duo switching strip is actuated (compressed), both safety relays K1 and K2 assigned to it drop out and safety contact 13, 14 is opened. The red LED is illuminated.
If the quiescent current circuit between Z1, Z2 is interrupted, the yellow LED lights up. Safety contact 13, 14 is opened.
The additional changeover contact 21, 22, 24 switches simultaneously with the STOP contact and may not be used in the safety circuit!

Function table (status display)

Status of the switching strip	Red LED	Yellow LED	Green LED(2x)	Output 13, 14
Properly connected; non-actuated status			illuminated	closed
actuated (compressed)	illuminated			open
Switching strip interrupted		illuminated		open

Installation, commissioning

1. Designed for electrical cabinet installation, the housing snaps into a 35 mm top hat rail (TS 35) in accordance with DIN 50022. If control panel installation is desired, a 26-mm-wide top hat segment with two mounting holes for screwed fasteners is available.

2. The Gelbau Contact-Duo switching strip(s) with terminating resistor is (are) connected to terminals Z1 and Z2. Note that the brown conductor of the connection cable must be connected to Z1 and the white (blue) conductor of the connection cable must be connected to Z2. When multiple Contact-Duo switching strips are connected to resistance evaluation unit 252.0xZ, the individual switching strips must be connected in series (Note: Wire the conductors brown-to-brown and white-to-white, otherwise malfunctions can occur), whereby the resistor may only be installed as an electrical termination on the last switching strip.

3. The load applied to safety relay output 13, 14 may not exceed 4 A, because a 4 A slow-blow pre-fuse is installed.
   For changeover contact 21, 22, 24 the specified switching capacities must be observed (see “Technical data”).

4. The supply voltage is connected to A1 and A2. The (+) pole must be attached to A1.

The device may be installed and commissioned only by specialists with the relevant qualifications.

Troubleshooting and corrective measures

1. no LEDs light up
   Is the supply voltage correct?

2. the yellow LED is continuously illuminated
   Is the associated switching strip connected correctly or is there an interruption/break in the supply line? (Test: Connect an 8.2 kΩ resistor across Z1 and Z2 temporarily. If device is then OK ⇨ Interruption/break.)

3. the red LED is continuously illuminated
   Disconnect switching strip and check switching strip with ohmmeter (value must be about 8.2 kΩ); possible short circuit in the supply line?

4. only one of the green LEDs is dimly illuminated
   Actuate profile strip for approx. 2 seconds or switch off mains for approx. 5 seconds. If system still does not operate correctly thereafter ⇨ send device back for inspection.

Technical specifications

Housing:

Material:	Polyamide 6.6-RF
Protection class:	**IP20**
Dimensions:	45 x 75 x 120 mm (W x H x D) Snap system for 35-mm TS mounting rail according to DIN EN 50022
Weight:	390 g

AC connection voltages:

Model: **252.00Z**:		
Nominal operating voltage:	230 VAC	-15% +10%
Nominal frequency:	50 Hz	40 - 60 Hz
Model: **252.01Z**:		
Nominal operating voltage:	115 VAC	-15% +10%
Nominal frequency:	50 Hz	40 - 60 Hz
Model: **252.04Z**:		
Nominal operating voltage:	24 VAC	-15% +10%
Nominal frequency:	50 Hz	40 - 60 Hz
Power consumption:		max. 3VA

Power supply VDE 0551 galvanically isolated

DC connection voltages:

Model **252.06Z**:		
Nominal operating voltage:	24 VDC	-15% +10%
Permissible residual ripple:		max. 10%
Power consumption:		max. 3W

Power supply galvanically isolated (DC/DC converter)

Technical details subject to change

Switching strip input (Z1, Z2):

Terminal voltage upon interruption:	8 VDC
Terminal voltage upon actuation:	< 4 VDC
Terminal voltage in non-actuated state:	approx. 5 VDC
Sensor quiescent current:	approx. 0.6 mA
Switch point upon actuation:	< 5.5 kΩ
Switch point upon interruption:	> 11.5 kΩ
Switching strip termination:	**8.2 kΩ resistor**

max. connectable switching strip length:	100 m
max. connecting cable length:	50 m
min. cross-section of the connection cable:	0.5 mm^2

Safety relay terminals 13, 14:

Type of contact	two relays with 1 NOC each in series **-force guided-**
Loading capacity	**max. 4 A** (integrated slow-blow 4 A fuse)

Drop out time: Delay between actuation of switching strip and relay signal output: **max. 15 ms**

Relay contact data (13, 14):

Nominal operating current

NOC	2A DC13 24V
NOC	3A AC15 250V

According to the IEC947-5-1 standard

Relay contact data (21, 22, 24):

Nominal operating current

NCC	1.25A DC13 24V
NOC	1.25A DC13 24V
NCC	2A AC15 250V
NOC	2A AC15 250V

According to the IEC947-5-1 standard

Contact service life	mech.: 3 x 10^7 switch cycles
Contact service life	electr.: 2 x 10^5 switch cycles at max. power

Permissible temperature range: -20° to + 55° C

Acoustic noise: < 35 dB (A)

Category: **3**

Standards:

Accepted according to: **-EN ISO 13849-1: 2008**
Performance Level: **PL: e**

Accepted according to: **-EN 62061: 2005**
Safety Integrity Level: **SIL: 3**

EC Conformity Declaration

according to 2006/42/EC, Annex II, no. 1 A

CE

Manufacturer:

Gelbau GmbH & Co. KG
Grandkaule 8 – 10
53859 Niederkassel, Germany

Ms. Yvonne Riem is duly authorised to compile the technical documentation.

Ms. Yvonne Riem
Gelbau GmbH & Co. KG
Grandkaule 8 – 10
53859 Niederkassel, Germany

We hereby declare that the type of the following safety relays:

252.0xZ

serial numbers: 0011 to 9999....

meets the requirements of Performance Level "e" / Category 3 according to EN ISO 13849-1: 2008 and Safety Integrity Level (SIL) 3 according to EN 62061: 2005 and conforms to all applicable provisions of the **EC Machine Directive 2006/42/EC**.

The type of the safety relays is also in conformance with all applicable provisions of the following EC directives: **EMC Directive 2004/108/EC**

Notified body:

TÜV NORD CERT GmbH
ID number: 0044
Am TÜV 1
30519 Hanover, Germany

EC type examination certificate no.: 44 205 10 378898

The following harmonised standards were applied:

EN ISO 13849-1:2008	Safety of machinery - Safety-related components of control systems, requirements relative to Performance Level
EN 62061:2005	Functional safety of safety-related electrically / electronically / programmable requirements relative to SIL
EN ISO 13856-2: 2013	"Pressure-sensitive protective devices" in sub-areas, relative to the output switching system
EN 60947-1:2004	Low-voltage switching devices – Part 1: General rules
EN61000-3-2:4/2006 +A1:7/2009+A2:7/2009	Electromagnetic Compatibility (EMC)
EN 61000-3-3:9/2008	Electromagnetic Compatibility (EMC)
EN 61000-6-2:2005	Electromagnetic Compatibility (EMC) Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3:1/2007	Electromagnetic Compatibility (EMC) Part 6-2: Generic standards – Emission standard for residential, commercial and light industrial environments

Notes:
The user may opt to interconnect switching strip profiles/evaluation unit combinations by means of a Pepperl & Fuchs model Z965/071859 Zener barrier.

Niederkassel, 04.11.2015

Jürgen Menz
General Manager