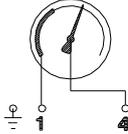
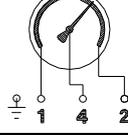
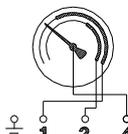
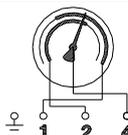
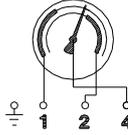
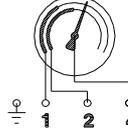


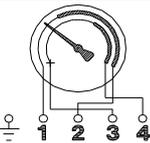
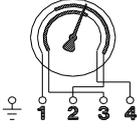
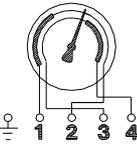
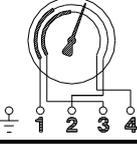
Table 2

Magnetic snap-action contact

single contact		
Switching operations	Clockwise pointer motion	Contact designation
	Switching functions	Magnetic snap-action contact
	Contact closes when specified value is exceeded	1.1
	Contact opens when specified value is exceeded	1.2
	Contact switches i.e., one contact point opens, another closes simultaneously when specified value is exceeded	1.3
double contact		
	1st and 2nd contacts close when specified values are exceeded	1.11
	1st contact closes 2nd contact opens when specified values are exceeded	1.12
	1st contact opens 2nd contact closes when specified values are exceeded	1.21
	1st and 2nd contact opens when specified values are exceeded	1.22
triple contact		
	1st contact opens 2nd contact closes 3rd contact opens when specified values are exceeded	1.212

The connection terminals are labelled in accordance with the above table .

Table 3**Magnetic snap-action contact with separate circuit**

Switching operations	double contact	
	Clockwise pointer motion	Contact designation
	Switching functions	Magnetic snap-action contact
	1st and 2nd contacts close when specified value is exceeded	1. 1.1
	1st contact closes 2nd contact opens when specified value is exceeded	1. 1.2
	1st contact opens 2nd contact closes when specified value is exceeded	1. 2.1
	1st and 2nd contacts open when specified value is exceeded	1. 2.2

The connection terminals are labelled in accordance with the above table

2) Limit value switches with inductive alarm contacts to DIN 19234 (Namur)

Inductive alarm contacts operate without physical contact and with very little effect on the mechanical pressure measuring system. They do not cause any electrical contact problems such as electric contact erosion, welding or excessive electrical contact resistance.

Inductive alarm contacts are used in applications where high reliability and a high frequency of switching operations, i.e. a long service life, are required.

Advantages of the inductive alarm contact

- Contact making without physical contact ensures a long service life
- Little effect on the display
- Universal application, including in filled gauges
- Insensitive to aggressive atmospheres (encapsulated electronics, contact making without physical contact)
- Explosion protected, usable in zones 1 and 2

Operating principle

The inductive alarm contact basically consists of the control head (initiator) with completely encapsulated electronics fitted to the specified value pointer and the mechanical structure with the moving control lug. The control lug is moved by the instrument pointer (actual value pointer).

The control head is supplied with DC.

As the control lug enters the gap in the control head, the internal resistance of the former increases (attenuated condition - the initiator is highly resistant). The resulting change in current intensity is the input signal for the switching amplifier of the control unit.

Explosion protection

Pressure gauges with inductive alarm contacts and external control unit can be used in hazardous areas (zone 1 and zone 2). The following specified control units are to be installed outside of the ex-range e.g. in an instrument panel.

Control units for inductive contacts

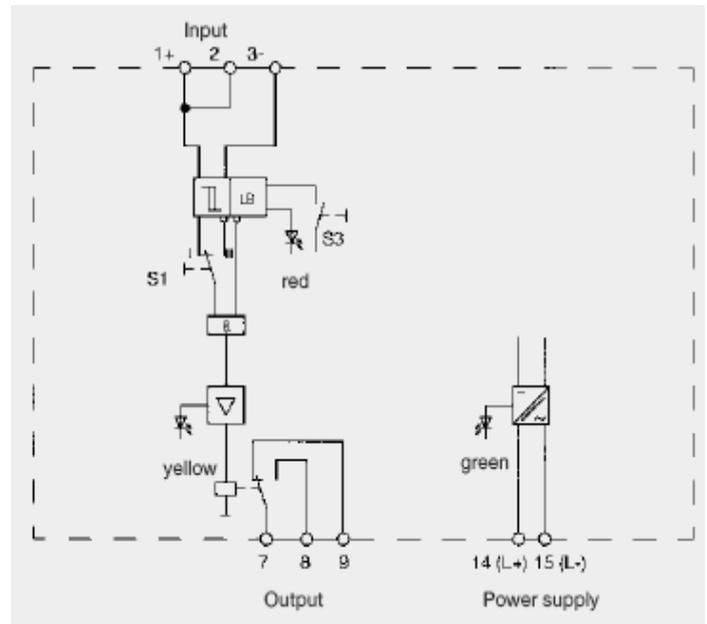
Ex-certified versions

Control unit model: EZE01X001002 (KFA6-SR2-Ex 1.W)

- Intended for instruments having one inductive contact incorporated
- Alarm circuit certified intrinsically safe [EEx ia] IIC to EN 50 227 and NAMUR
- Provides 1 SPDT relay output contact
- LED indicating circuit status (green), relay output (yellow) and lead breakage (red)
- Case surface-mounting type form D (see p. 6)

Note

Directions of action adjustable by sliding switch S1:
 OPEN CIRCUIT CAUSES ALARM: switch S1 in position I
 CLOSED CIRCUIT CAUSES ALARM: switch S1 in position II
 CONTINUITY DETECTION: switch S3 in position I

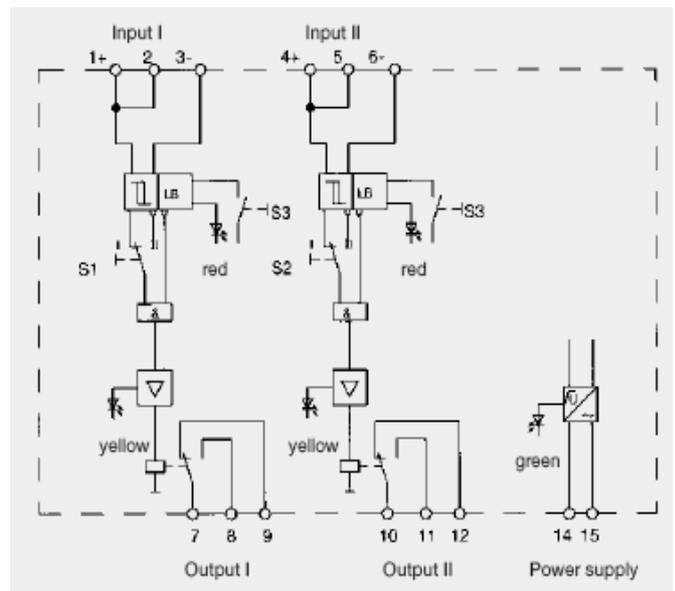


Control unit model: EZE01X002002 (KFA6-SR2-Ex 2.W)

- Intended for 1 instrument having two or two instruments having one each contact incorporated
- Alarm circuit certified intrinsically safe [EEx ia] IIC to EN 50 227 and NAMUR
- Provides 2 SPDT relay output contacts
- LED indicating circuit status (green), 2 x relay output (yellow) and 2 x lead breakage (red)
- Case surface-mounting type form F (see p. 6)

Note

Directions of action adjustable by sliding switches S1 and S2:
 OPEN CIRCUIT CAUSES ALARM: switch S1 and S2 in position I
 CLOSED CIRCUIT CAUSES ALARM: switch S1 and S2 in pos. II
 CONTINUITY DETECTION: switch S3 in position I



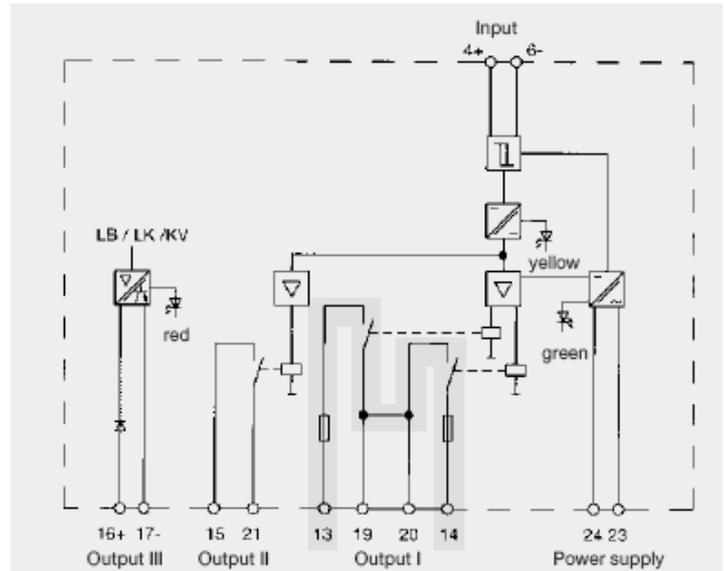
Fail safe control unit

Model 831 **SN** and **S1N**, respectively, are "fail safe" model-approved versions intended for services where operational safety codes, e.g. such as issued by TÜV, require the use of specially approved components. This contact provides together with the model-approved control unit **model 904.30** a self-monitoring and fail-safe alarm circuit.

Voltage breakdown, failure of components, wire interruption or short circuit will always de-energise the output relay.

Model EZE01X013002 (KFA6-SH-Ex 1 [Ex ia] IIC)

- Failsafe circuit control unit
- Intended for instruments having one SN- or S1N-type contact incorporated
- Alarm circuit certified intrinsically safe [Ex ia] IIC
- 1 safety directed relay output, 1 accelerating output and 1 passive transistor error message output
- LED indicating circuit status (green), relay output (yellow) and lead breakage as well as short circuit (red)
- Case surface-mounting type form E (see p. 6)



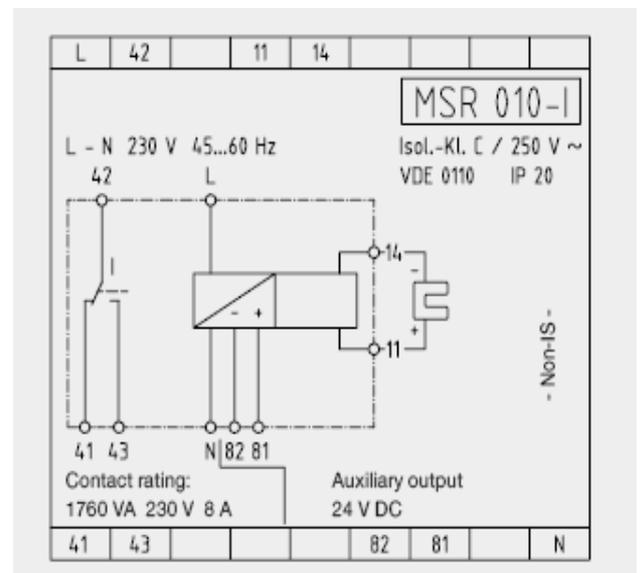
Control units for inductive contacts

Non-Ex-certified versions

(Connection examples see p. 6)

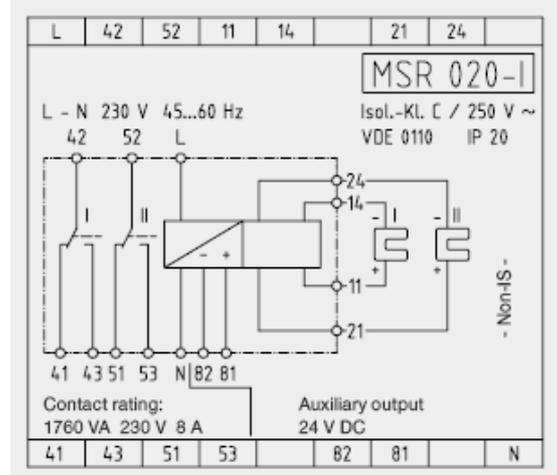
Control unit model: EZE02X001001 (Typ 904.25 MSR 010-I)

- Intended for instruments having one inductive contact
- Provides 1 SPDT relay output contact
- Surface mounting enclosure of form C (see p. 6)



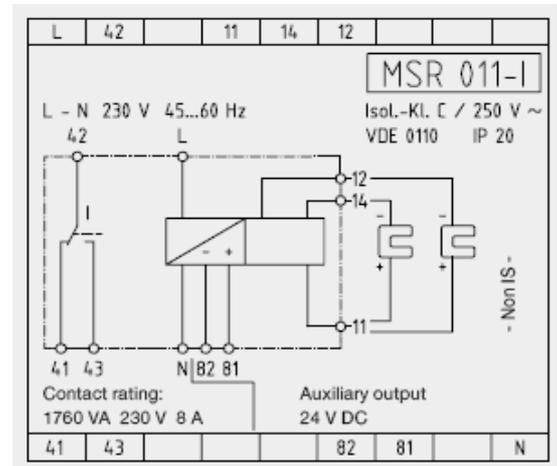
Control unit model: EZE02X002002 (Typ 904.26 MSR 020-I)

- Intended for 1 instrument having two contacts or two instruments each having one contact
- Provides 2 SPDT relay output contacts
- Surface mounting enclosure of form C (see below)



Control unit model: EZE02X002003 (Typ 904.27 MSR 011-I)

- Intended for 2-point (HI-LO) interval switch for control circuits with contacts of configuration model 831.12
- Provides 1 SPDT relay output contact
- Surface mounting enclosure of form C (see below)



Dimensions of control units for inductive contacts

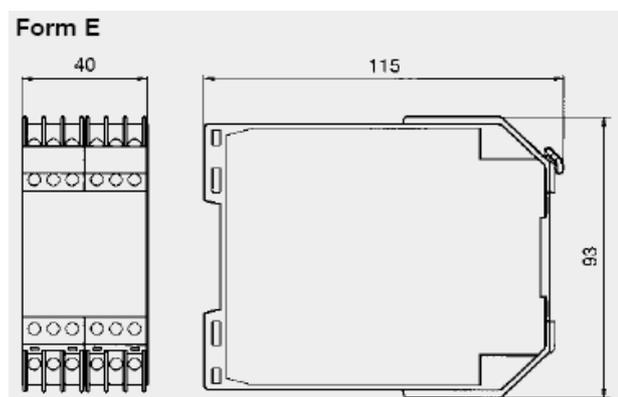
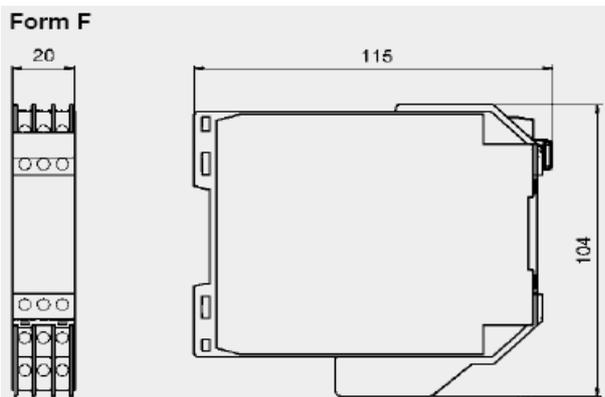
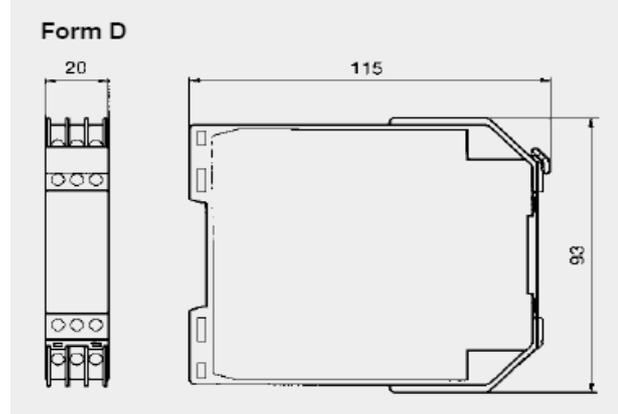
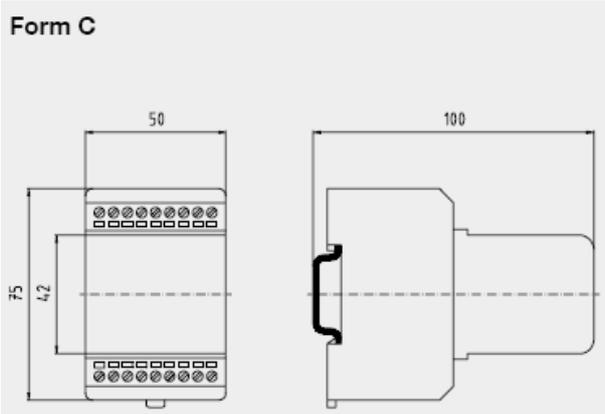
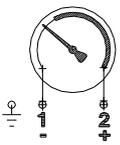
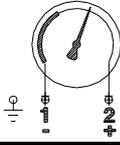


Table 4**Technical data: inductive alarm contact**

type of protection EEx ia IIC T6	Standard feature at DIN EN 60947-5-6 (NAMUR)	Safety feature at DIN EN 60947-5-6 (NAMUR)	Standard feature at DIN EN 60947-5-6 (NAMUR)	Safety feature at DIN EN 60947-5-6 (NAMUR)
For Normal diameter	100		160	
Proximity sensor typ	SJ 2 - N	SJ 2 - SN	SJ 3,5 - N	SJ 3,5 - SN
Operating voltage	5 ... 25 V			
Effective gap length	2 mm	2 mm	3,5 mm	3,5 mm
Switching frequency	0 ... 5000 Hz	0 ... 5000 Hz	0 ... 3000 Hz	0 ... 3000 Hz
Self-capacitance	30 nF	30 nF	50 nF	30 nF
Self-inductance	100 µH	100 µH	250 µH	100 µH
Nominal voltage	8 VDC			
Current consumption	≥ 3 mA (active freely area)		≤ 1 mA (active area alive)	
Accuracy	approx. 0,5% of the full scale value			
Setting range	280° max.			
Ingress protection	IP 67			
Case	plastic			
Connection type	Litze „LIFYW“ 0,5 m lg.; 0,06 mm ²	Litze „LIFYW“ 0,5 m lg.; 0,06 mm ²	Litze „LIY“ 0,5 m lg.; 0,14 mm ²	Litze „LIY“ 0,5 m lg.; 0,14 mm ²
Temperatur range	-25 °C bis 100 °C	-40 °C bis 100 °C	-25 °C bis 100 °C	-40 °C bis 100 °C
EC- type test certificate	PTB 99 ATEX 2219 X ZELM 03 ATEX 0128X	PTB 00 ATEX 2049 X ZELM 03 ATEX 0128X	PTB 99 ATEX 2219 X ZELM 03 ATEX 0128X	PTB 00 ATEX 2049 X ZELM 03 ATEX 0128X

Table 5**Inductive contact:**

single contact			
switching operations ¹⁾	If the pointer of measuring instrument turns clockwise, it takes the control vane when specified value is exceeded.	switching function	contact designation
	disengages from sensor	Contact makes (NO-normally open)	3.1
	merges with sensor	Contact breaks (NC-normally closed)	3.2

- 1) Small line means : control vane inside control head, control circuit opens.
Thick line means : control vane outside control head, control circuit closes

Table 6

Inductive contact:

double contact			
	1st and 2nd contacts disengages from sensor	1st and 2nd contact make	3.11
	1st disengages from sensor 2nd merges with sensor	1st contact makes 2nd contact breaks	3.12
	1st merges with sensor 2nd disengages from sensor	1st contact breaks 2nd contact makes	3.21
	1st and 2nd contacts merges with sensor	1st and 2nd contact breaks	3.22

Wiring terminals are identified as per above wiring schemes.

3) Limit value switches (electronic-contacts)

General

Electronic limit value switches in pointer-type measuring instruments are equipped with electrical distance sensors (proximity sensors).

The output signal is governed by the presence or absence of a control vane moved by the actual value pointer in the magnetic field of the proximity sensor.

Mode of operation

The electrical distance sensors (proximity sensors), used in our electronic contacts are simple two wire or three wire DC switches.

We use proximity sensors which are also called slot sensors due to the slot design. The electromagnetic field is concentrated between two axially opposed coils. The switch operates when the aluminium control vane moved by the actual value pointer enters into the space or slot between the two coils. The signal is transmitted without a time lag analogous to the movement of the actual value pointer.

The switching behaviour of the PNP switches used in these contacts is normally defined as a “closer”, this means:

control vane outside the slot sensor – the contact is open - the output is not active

control vane inside the slot sensor – the contact is closed - the output is active

Tabelle 9

Electronic-contact

double contact			
switching operations	If the pointer of measuring instrument turns clockwise, it takes the control vane when specified value is exceeded.	switching function	contact designation
<p>switching function 3.11 pnp</p>	1st and 2nd contacts disengages from sensor	1st and 2nd contact make	3.11E
<p>switching function 3.12 pnp</p>	1st disengages from sensor 2nd merges with sensor	1st contact makes 2nd contact breaks	3.12E
<p>switching function 3.21 pnp</p>	1st merges with sensor 2nd disengages from sensor	1st contact breaks 2nd contact makes	3.21E
<p>switching function 3.22 pnp</p>	1st and 2nd contacts merges with sensor	1st and 2nd contact breaks	3.22E

Wiring terminals are identified as per above wiring schemes.