Switch Amplifier

for limit switches with inductive contact KHA-SH-Ex1 in safety circuit – intrinsically safe –

SIL 3

ARMANO

T09-000-041

Application

This switch amplifier is suitable for intrinsically safe applications. The device transmits binary signals of SN / S1N proximity sensors from potentially explosive areas to safe areas. To ensure safe operation, the device has an additional protective circuit.

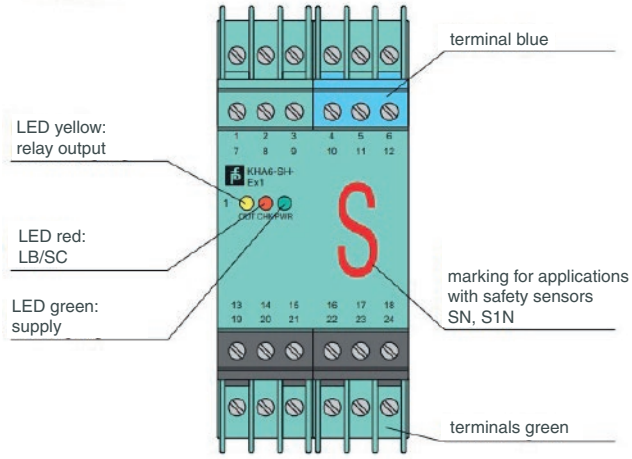
The proximity sensor or the switch controls a safety output with three normally open contacts (one in series with both output relays for the safety function), a standard output with one normally open contact and an error message output with one normally open contact. Line breaks (LB) and line short circuits (SC) of the inputs are constantly monitored.

In the event of a fault, the fault output is activated while outputs I and II drop out.

For safety applications up to SIL 3, output I must be used.
For safety applications up to SIL 2, outputs I and II can be used.

Construction

Front view



Function

For a mechanical contact, in contrast to the SN/S1N series proximity sensor, a 10 kΩ resistor must be connected across the contact in addition to a 1.5 kΩ resistor in series.

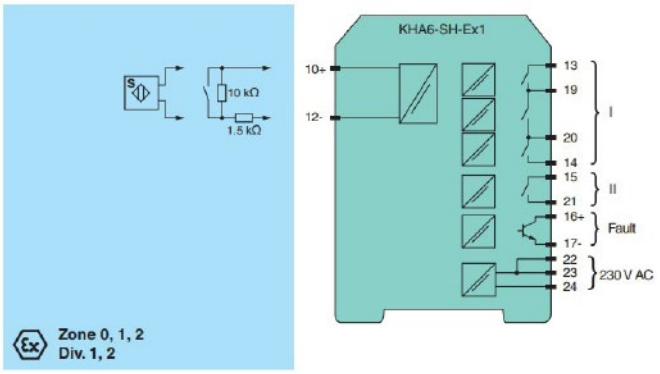
The input (terminals 10, 12) shall generally be operated with potential-free (passive) transducers only.

Single-channel safety-related disconnections up to SIL 3 must be carried out via terminals 13, 14. The centre tap (terminals 19, 20) can additionally be used for a safety-related redundant disconnection.

If the device is used for safety applications, the specifications in the test documents have to be regarded. Output III error message provides a 1-signal when the control circuit is interrupted (LB) or short-circuited (SC).

The device (housing type E) has integrated terminals.

Connection



ARMANO Messtechnik GmbH
Location Beierfeld • Am Gewerbepark 9 • 08344 Grünhain-Beierfeld
Tel.: +49 3774 58 – 0 • Fax: +49 3774 58 – 545 • mail@armano-beierfeld.com
Location Wesel • Manometerstraße 5 • 46487 Wesel-Ginderich
Tel.: +49 2803 9130 – 0 • Fax: +49 2803 1035 • mail@armano-wesel.com

08/22
Pel / SWü

Switch Amplifiers

for limit switches with inductive contact KHA-SH-Ex1 in safety circuit – intrinsically safe –

SIL 3

Technical Data

General data	signal type	binary input	
	supply		
	connection	terminals 22, 23, 24	
	rated voltage	85...253 V AC, 45...65 Hz	
	rated current	30 mA ±5 mA	
	power dissipation	2.2 W	
	power consumption	≤ 2.3 W	
Input	connection	terminals 10+, 12–	
	open circuit voltage / short circuit current	approx. 8.4 V DC / approx. 11.7 mA	
	line resistance	≤ 50 Ω, please regard cable capacitances and inductances in ex areas	
	switching point		
	relay de-energised	I < 2.1 mA and I > 5.9 mA	
	relay energised	2.8 mA < I < 5.3 mA	
	response delay	≤ 1 ms	
Output	connection	output I output II output III	terminals 13, 14 terminals 15, 21 terminals 16+, 17–
	output I	signal, safety-related, relay	
	output I, II		
	contact load	253 V AC / 1 A / cos φ ≥ 0.7; 24 V AC / 1 A ohmic load	
	mechanical life	50 x 10^6 switching cycles	
	output II	signal, not safety-related, relay	
	output III	error message, not safety-related; electronic output, passive	
	rated voltage	10...30 V DC	
	signal level	1-signal: (L+) –2.5 V (7 mA, short-circuit proof 0-signal: blocked output (residual current ≤ 10 µA)	
Transfer characteristics	switching frequency	5 Hz	
Conformity with directives	electromagnetic compatibility	directive 2014/30/EU	EN 61326-1:2013
	Machinery Directive	directive 2006/42/EC	EN/ISO 13849-1:2015
Conformity	electromagnetic compatibility	NE 21:2011	
	degree of protection	IEC 60529:2001	
Ambient conditions	ambient temperature	–20 / +60 °C (253 – 333 K)	
Mechanical data	degree of protection	IP20	
	weight	approx. 280 g	
	dimensions	40 x 93 x 115 mm, housing type E	

Data for the application in connection with Ex areas

EU Type Examination Certificate	PTB 00 ATEX 2043, more certificates see www.pepperl-fuchs.com	
	group, category, ignition protection type	II (1)GD [Ex ia] IIC [circuit(s) in zone 0/1/2]
	input	Ex ia
	voltage U_o	9.56 V
	current I_o	16.8 mA
	power P_o	41 mW (linear characteristic curve)
Supply	maximum safety voltage U_m	253 V AC / DC (Caution! The rated voltage can be lower.)
	ignition protection type	[Ex ia]
Output	contact load	253 V AC / 1 A / cos φ ≥ 0.7; 24 V AC / DC 1 A ohmic load
	maximum safety voltage U_m	output I and II: 253 V AC / DC (Caution! U_m is no rated voltage.)
Galvanic isolation	input / output input / supply	safe galvanic isolation according to EN 50020, voltage peak value 375 V
Conformity with directives	directive 2014/34/EU	EN 60079-0:2012+A11:2013, EN 60079-11:2012
General information	Please regard, where applicable, EU Type Examination Certificates, statements and declarations of conformity and operating instructions. For information see www.pepperl-fuchs.com	