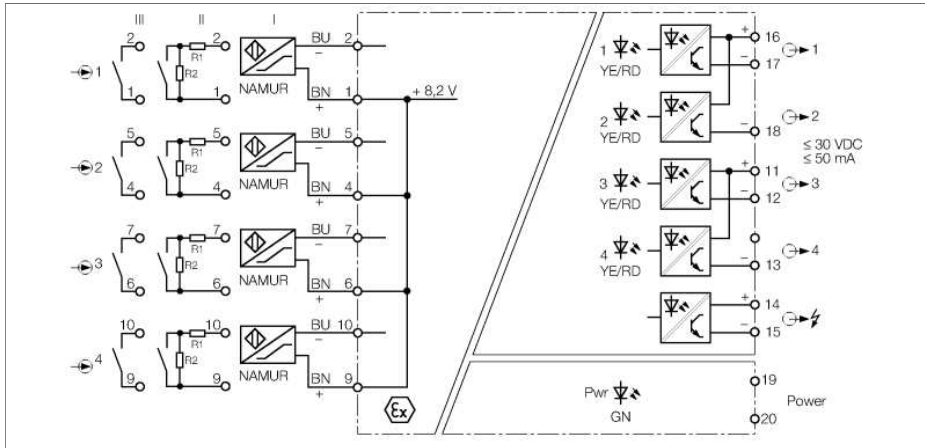


**Isolating switching amplifier  
4-channel  
IM1-451EX-T**



The 4-channel isolating switching amplifier IM1-451EX-T is equipped with an intrinsically safe input circuit.

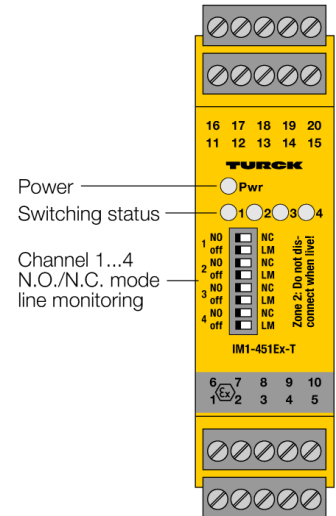
Sensors according to EN 60947-5-6 (NAMUR) can be connected to the device or potential-free contactors.

The output circuits each feature one potential-free, short circuit proof transistor and additionally a common alarm output.

Eight front panel switches are available to set the output mode separately for each channel (NO/NC mode), as well as to enable/disable wire-break (WB) and short-circuit (SC) monitoring separately.

When using mechanical contacts, wire-break and short-circuit monitoring must be switched off or the contact must be wired with resistors (II) (see circuit diagram).

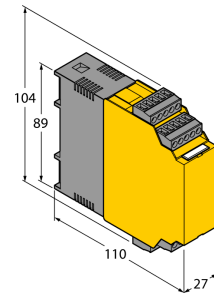
The green LED indicates operational readiness. The output switching status is indicated yellow by the two color LED. In the event of input circuit errors the dual color LED changes to red, provided the input circuit monitoring function is activated. Thereupon the output and the alarm transistor are inhibited.



- Intrinsically safe input circuits Ex ia
- Installation in zone 2
- Application area acc. to ATEX: II (1) G, II (1) D; II G 3
- Five transistor outputs, short-circuit proof, potential-free and reverse-polarity protected
- Adjustable signal flow direction (NO/NC)
- Input circuit monitoring of wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Removable terminal blocks
- Complete galvanic separation

**Isolating switching amplifier  
4-channel  
IM1-451EX-T**

**Dimensions**



<b>Type code</b>	IM1-451EX-T																												
Ident no.	7541189																												
<b>Nominal voltage</b>	Universal voltage supply unit																												
Operating voltage	20...250 VAC																												
Frequency	40...70 Hz																												
Operating voltage range	20...125 VDC																												
Power consumption	≤ 3 W																												
<b>NAMUR</b>	EN 60947-5-6																												
No-load voltage	8.2 VDC																												
Short-circuit current	8.2 mA																												
Input resistance	1 kΩ																												
Cable resistance	≤ 50 Ω																												
Switch-on threshold:	1.55 mA																												
Switch-off threshold:	1.75 mA																												
Wire breakage threshold	≤ 0.1 mA																												
Short-circuit threshold	≥ 6 mA																												
<b>Semiconductor output circuit(s)</b>																													
Output circuits (digital)	5 x transistor (potential-free, short-circuit protected)																												
Switching voltage	≤ 30 VDC																												
Switching current per output	≤ 50 mA																												
Switching frequency	≤ 3000 Hz																												
Voltage drop	≤ 2.5 V																												
<b>Galvanic separation</b>																													
Test voltage	2.5 kV																												
<b>Ex approval acc. to conformity certificate</b>	TÜV 04 ATEX 2604																												
Application area	II (1) G, II (1) D																												
Protection type	[Ex ia Ga] IIC ; [Ex ia Da] IIIC																												
Max. output voltage $U_o$	≤ 11.3 V																												
Max. output current $I_o$	≤ 13 mA																												
Max. output power $P_o$	≤ 36 mW																												
Rated voltage	250 V																												
Characteristic	linear																												
Internal inductance/capacitance $L_i/C_i$	$L_i = 100 \mu\text{H}$ , $C_i = 1,1 \text{ nF}$																												
External inductance/capacitance $L_o/C_o$	■ removable terminal blocks																												
Ex approval acc. to conformity certificate	TÜV 06 ATEX 552967 X																												
Application area	II 3 G																												
Protection class for belonging equipment	Ex nA [nL] IIC T4																												
Max. output voltage $U_o$	≤ 11.3 V																												
Max. output current $I_o$	≤ 13 mA																												
Max. output power $P_o$	≤ 36 mW																												
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External inductance/capacitance $L_o/C_o$	<table border="1"> <thead> <tr> <th>Ex ic</th> <th colspan="3">IIC</th> <th colspan="3">IIB</th> </tr> </thead> <tbody> <tr> <td><math>L_o</math></td> <td>10</td> <td>5,0</td> <td>1</td> <td>20</td> <td>10,0</td> <td>2</td> </tr> <tr> <td>[mH]</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td><math>C_o</math> [<math>\mu\text{F}</math>]</td> <td>0,91</td> <td>1,0</td> <td>1,5</td> <td>4,3</td> <td>4,9</td> <td>6,8</td> </tr> </tbody> </table>	Ex ic	IIC			IIB			$L_o$	10	5,0	1	20	10,0	2	[mH]							$C_o$ [ $\mu\text{F}$ ]	0,91	1,0	1,5	4,3	4,9	6,8
Ex ic	IIC			IIB																									
$L_o$	10	5,0	1	20	10,0	2																							
[mH]																													
$C_o$ [ $\mu\text{F}$ ]	0,91	1,0	1,5	4,3	4,9	6,8																							
<b>MTTF</b>	150 years acc. to SN 29500 (Ed. 99) 40 °C																												
<b>Indication</b>																													
Operational readiness	green																												
Switching state	yellow																												
Error indication	red																												

**Isolating switching amplifier  
4-channel  
IM1-451EX-T**

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**Mechanical Data**

Protection class	IP20
Ambient temperature	-25...+70 °C
Storage temperature	-40...+80 °C
Relative humidity	≤ 95%
Dimensions	104x 27x 110 mm
Weight	189 g
Mounting instruction	For mounting on DIN rail or mounting panel
Housing material	Polycarbonate/ABS
Electrical connection	4 x 5-pole removable terminal blocks, reverse polarity protected, screw connection
Terminal cross-section	1 x 2.5 mm <sup>2</sup> / 2 x 1.5 mm <sup>2</sup>
Tightening torque	0.5 Nm

**Accessories**

Type code	Ident no.	Description	Dimension drawing
IM-CC-5X2BU/2BK	7504031	Cage clamp terminals for IM modules (Ex devices; width 27 mm); 2 blue/2 black, 5-pin	