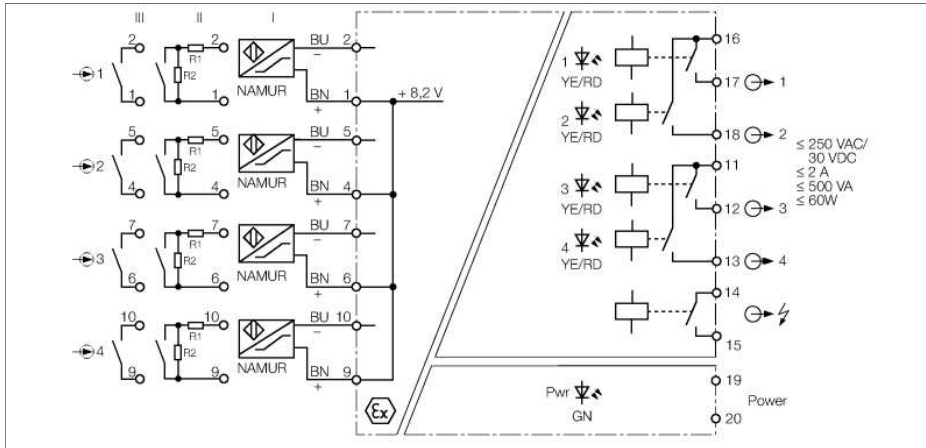


**Isolating switching amplifier  
4-channel  
IM1-451EX-R**



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

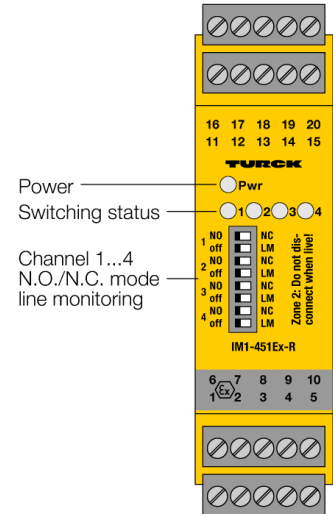
Sensors according to EN 60947-5-6 (NAMUR) can be connected to the device or potential-free contactors.

The output circuits each feature a relay with NO contact. The device also features 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. As a result the output and the alarm relay are de-energized.

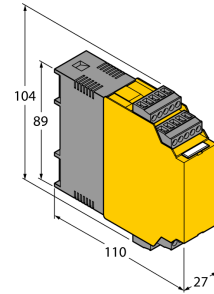


- Intrinsically safe input circuits Ex ia
- Installation in zone 2
- Application area acc. to ATEX: II (1) G, II (1) D; II G 3
- Five relay outputs (NO)
- Adjustable signal flow direction (NO/NC)
- Input circuit monitoring of wire-break/short-circuit (ON/OFF switchable)
- Common alarm output
- Removable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

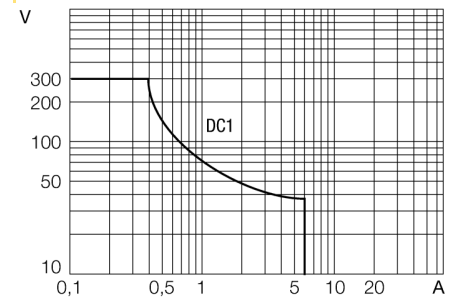
**Isolating switching amplifier  
4-channel  
IM1-451EX-R**

<b>Type code</b>	IM1-451EX-R																					
Ident no.	7541188																					
<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>Output circuits (digital)</b>	5 x relays (NO)																					
Relay switching voltage	≤ 250 VAC/120 VDC																					
Switching current per output	≤ 2 A																					
Switching capacity per output	≤ 750 VA/60 W																					
Switching frequency	≤ 10 Hz																					
Contact quality	AgNi, 3μ Au																					
<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] IIC																					
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 $L_e/C_e$	■ removable terminal blocks																					
Ex approval acc. to conformity certificate																						
Ex approval acc. to conformity certificate	TÜV 06 ATEX 552967 X																					
Application area	II 3 G																					
Protection class for belonging equipment	Ex nA nC [ic Gc] IIC T4																					
Max. output voltage $U_o$	≤ 11.3 V																					
Max. output current $I_o$	≤ 13 mA																					
Max. output power $P_o$	≤ 36 mW																					
Characteristic	linear																					
External inductance/capacitance $L_e/C_e$																						
	<table border="1"> <thead> <tr> <th>Ex ic</th> <th colspan="3">IIC</th> <th colspan="3">IIC</th> </tr> </thead> <tbody> <tr> <td><math>L_e</math> [mH]</td> <td>10</td> <td>5.0</td> <td>1</td> <td>20</td> <td>10.0</td> <td>2</td> </tr> <tr> <td><math>C_e</math> [μF]</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			IIC			$L_e$ [mH]	10	5.0	1	20	10.0	2	$C_e$ [μF]	0.91	1.0	1.5	4.3	4.9	6.8
Ex ic	IIC			IIC																		
$L_e$ [mH]	10	5.0	1	20	10.0	2																
$C_e$ [μF]	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																					

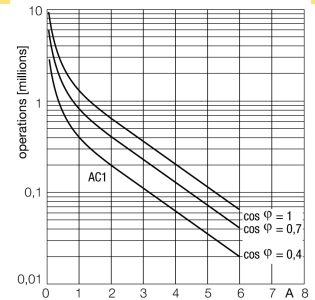
**Dimensions**



**Load curve**



**Output relay electrical lifetime**



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

---

**Mechanical Data**

Protection class	IP20
Ambient temperature	-25...+70 °C
Storage temperature	-40...+80 °C
Relative humidity	≤ 95%
Dimensions	104x 27x 110 mm
Weight	204 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	