

**JUMO GmbH & Co. KG**  
 Delivery address: Mackenrodtstraße 14,  
 36039 Fulda, Germany  
 Postal address: 36035 Fulda, Germany  
 Phone: +49 661 6003-0  
 Fax: +49 661 6003-607  
 e-mail: mail@jumo.net  
 Internet: www.jumo.net

**JUMO Instrument Co. Ltd.**  
 JUMO House  
 Temple Bank, Riverway  
 Harlow, Essex CM 20 2TT, UK  
 Phone: +44 1279 635533  
 Fax: +44 1279 635262  
 e-mail: sales@jumo.co.uk  
 Internet: www.jumo.co.uk

**JUMO PROCESS CONTROL INC.**  
 885 Fox Chase, Suite 103  
 Coatesville PA 19320, USA  
 Phone: 610-380-8002  
 1-800-554-JUMO  
 Fax: 610-380-8009  
 e-mail: info@JumoUSA.com  
 Internet: www.JumoUSA.com



# Isolating amplifier and supply isolator

Isolating unit for standard signals  
 and power supply unit for 2-wire transmitters

for mounting on: **C rail 35mm x 7.5mm**      **EN 50 022**  
**C rail 15mm**                                      **EN 50 045**  
**G rail**    **EN 50 035**



## Brief description

The isolating amplifier/supply isolator TT-45/4 ... is used for isolating standard signals and as a power supply for 2-wire transmitters. It provides the supply for the transmitter, isolates the signal and passes it on to the output. The TT-45/4 ... provides a high degree of isolation between input and output and between input and supply.

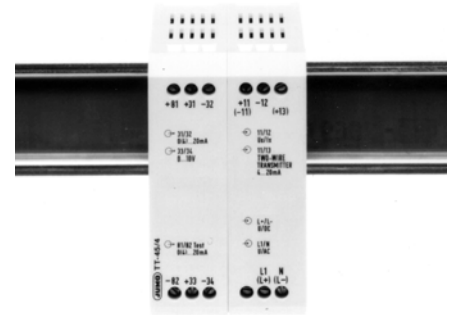
A working voltage up to 600V DC or AC rms is permissible on the input side (test voltage 3700V) in accordance with EN 61 010 Part 1, pollution degree 2 and overvoltage category II. The measurement input is factory-calibrated; there is a choice of the standard signals 0 – 10V and 0(4) – 20mA.

The TT-45/4 ... is built into a polycarbonate housing that can be readily clipped onto three different types of rail.

The isolating amplifiers permit close-up mounting, to save installation space.

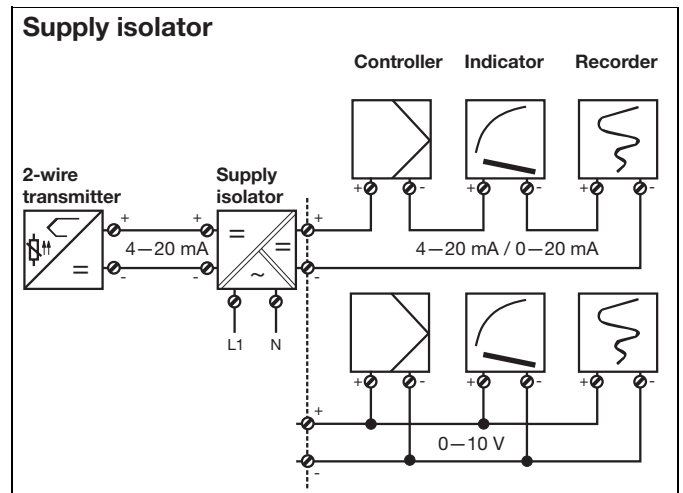
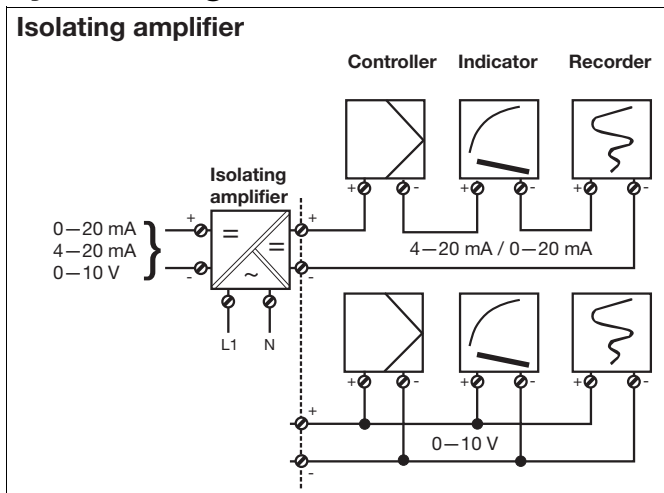
Applications of the isolating amplifier/supply isolator are:

- power supply for 2-wire transmitters and for isolating standard signals
- protection of connected electronic equipment from impermissibly high working voltages
- provision of floating output signals
- avoidance of ground loops
- conversion of standard signals, e. g. 0 – 10V input to 4 – 20mA output



TT-45/4 ...

## System diagrams



## Technical data

### Input (isolating amplifier)

Input signal	DC current	DC voltage
Shortest span	1 mA, $R_i = 300\Omega$	100 mV, $R_i > 500k\Omega$
Longest span	100 mA, $R_i = 3\Omega$	50 V, $R_i = 10k\Omega/V$
Ranges	0 – 20 mA, $R_i = 15\Omega$ 4 – 20 mA, $R_i = 15\Omega$	0 – 10 V/ $R_i = 100k\Omega$

### Input (supply isolator for 2-wire transmitter)

Voltage at transmitter	$\geq 15V$ DC at 20 mA
Lead resistance	$R_{lead} = \frac{15V - U_B}{20mA}$ $U_B =$ operating voltage of the 2-wire transmitter connected
Current limiting	$22mA \leq I \leq 25mA$
Range	4 – 20 mA, $R_i = 15\Omega$
Transfer characteristic	linear
Transfer error	$\leq 0.1\%^{1}$

### Output

	DC current	DC voltage
Output signal	proportional DC current: 0(4) – 20 mA convertible	proportional DC voltage: 0 – 10 V
Load resistance		$\geq 2k\Omega$
Current limiting	$22mA \leq I \leq 24mA$	
Burden	$\leq 750\Omega$	
Burden error	$\leq 0.1\% / 750\Omega^{1}$	
Note	Voltage and current output can be used simultaneously. In this case, the burden is $\leq 400\Omega$ and the load resistance $\geq 4k\Omega$ .	
Monitoring of output current	Through built-in interlock diode, without interrupting the output circuit. The internal resistance of the meter must not exceed 20 $\Omega$ .	
Calibration accuracy	$\leq 0.2\%^{1}$	
Ripple	$\leq 0.2\%^{1}$	
Response time	$\leq 300msec^{1}$	
Supply voltage error	$\leq 0.05\%^{1}$	

### Electrical data

Supply voltage (auxiliary power)	230V/115V AC +10/-15%, 48 – 63Hz (selected by solder links)	24V DC +/-15%
Power consumption at rated conditions: - as isolating amplifier - as supply isolator	2.5VA 3.2VA	2.7VA 3.4VA
Electrical isolation	EN 61 010 Part 1, with pollution degree 2 and overvoltage category II, up to a working voltage of 600V DC or AC rms between input and output and between input and supply test voltage: 3700V working voltage to EN 61 010 Part 1, between output and supply up to 300V DC or AC voltage rms (only with 230/115V AC).	
Electrical connection	by screw terminals for solid or stranded wire, 2.5 mm <sup>2</sup> max. conductor cross-section	
EMC - interference emission - noise immunity	EN 61 326 Class B general requirements	

<sup>1</sup> All errors in % refer to the full-scale value

**Housing**

Material	polycarbonate
Protection	IP20 to DIN 40 050
Mounting	on C rail or G rail
Operating position	vertical
Weight	
- with 230/115V AC	350g
- with 24V DC	210g

**Ambient conditions**

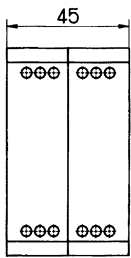
Ambient temperature range	-10 to +55°C
Ambient temperature error	≤ 0.2% per 10°C
Storage temperature range	-20 to +70°C
Climatic conditions	rel. humidity < 75% annual mean, no condensation

**Connection diagram**

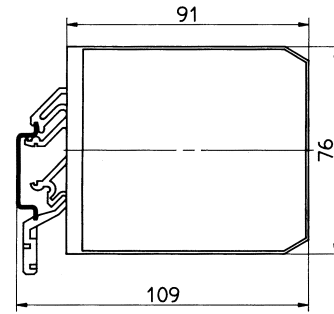
<p>TT-45/4 ...</p>	<b>Connection for</b>	<b>Terminals</b>		
	Supply as per nameplate	L1 line N neutral	AC	
		L + L -	DC	
	<b>Analog inputs</b>			
	Voltage	11+ 12-	$U_x$	
	Current	11+ 12-	$I_x$	
	2-wire transmitter 4 – 20mA 15V DC at 20mA	11- 13+	$\text{lead resistance} \leq \frac{15V - U_B}{20\text{mA}}$ $U_B$ : minimum operating voltage of the 2-wire transmitter connected	
	<b>Analog outputs</b>			
	Voltage 0 – 10V	33+ 34-	$R_{\text{load}} \geq 2\text{k}\Omega$	
	Current 0(4) – 20mA	31+ 32-	$R_{\text{burden}} \leq 750\Omega$	
Service meter (current output only)	81+ 82-	$R_i \leq 20\Omega$		

## Dimensions

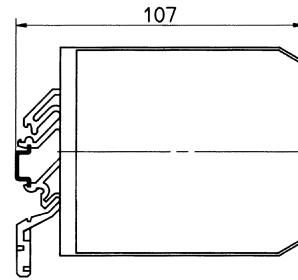
TT-45/4 ...



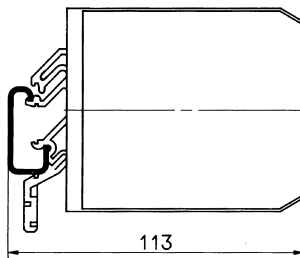
C rail 35mm x 7.5mm EN 50 022



C rail 15mm EN 50 045



G rail 35mm EN 50 035



## Order details:

### (1) Basic version

TT-45/4 Isolating amplifier and supply isolator  
size: 45mm x 76mm x 91mm (W x H x D)

(2) Input	
x	052 0 – 20mA
x	053 4 – 20mA
x	063 0 – 10V
x	999 configuration to customer specification (please specify in plain text)
(3) Output	
x	14 0 – 20mA/0 – 10V
x	15 4 – 20mA/0 – 10V
x	99 configuration to customer specification (please specify in plain text)
(4) Supply	
x	02 230V AC +10/-15%, 48 – 63Hz
x	04 115V AC +10/-15%, 48 – 63Hz
x	07 24V DC ±15%

Order code

Order example

