

# Temperature controller, 4-channel



<b>Identification</b>	Type	TR-1-6218 4-channel
	Part-No.	716218
<b>Use/Area of application</b>		
Description	The temperature controller has 4 separate channels. The semiconductor outputs are clocked to the set setpoint value (pulse width modulation). The sensors are monitored via a centralised alarm for sensor break and short circuit. The status output is an isolated semiconductor output. One LED per channel lights up when the controller is operational (no malfunction present).	
<b>Access (analog)</b>		
Measurement input	PT1000 (DIN EN 60751)	
Sensor current	0.5 mA	
Measuring range	-40 °C to 85 °C	
Protection device	Varistor, low-pass	
<b>Load Side</b>		
Switching voltage	AC 230 V ± 40 % DC 250 V ± 20 % clocked	
Switching current	max. 10 A per canal	
Protection device output	Varistor	
Function	The output is clocked to the setpoint value (pulse width modulation)	
Switching frequency	with duty factor 01:01 1.2 Hz	
Protection device output	Varistor	
Setpoint value, channel 1	8 °C (setpoint-value clocking -2K to +2K)	
Setpoint value, channel 2	8 °C (setpoint-value clocking -2K to +2K)	
Setpoint value, channel 3	26 °C (setpoint-value clocking -2K to +2K)	
Setpoint value, channel 4	26 °C (setpoint-value clocking -2K to +2K)	
<b>Input digital (positive clocking)</b>		
Signal characteristic curve	"0" signal:	DC 0 ... 6 V
	"1" signal:	DC 10 ... 30 V
Protection device Input	Varistor	

# Temperature controller, 4-channel

## Status output

Output	The output is switched through when there are no sensor malfunctions.
Switching voltage	DC 5-30 V
Switching current	max. 50 mA
Status Indication	1 yellow LED per channel sensor operational 1 green LED supply voltage

## General

Supply voltage	DC 24 V
Voltage range	DC 16.8 – 30.0 V
Current Consumption per LED	max. 20 mA
Installation postition	Horizontal Distance to next device: min. 100 mm Ventilation slots: top and bottom
Termination	spring terminal: single stranded 0.5 – 2.5 mm <sup>2</sup> ; fine stranded 0.5 – 2.5 mm <sup>2</sup>
Protection class	IP 20
Galvanic isolation I/O	AC 2.5 kV to outputs AC 1.5 kV to all other circuits
Clearance/creep. dist. (contol/load side)	≥ 1.6 mm
Dimensions (w × h × d)	210.0×120.0×74.0 mm
Weight (kg/piece)	1.100 (kg/piece)
Operation temperature range	-40 °C – 70 °C (+85 °C 10 min)
Storage temperature range	-40 – 85 °C
Relative humidity	100 % brief condensation

## Miscellaneous

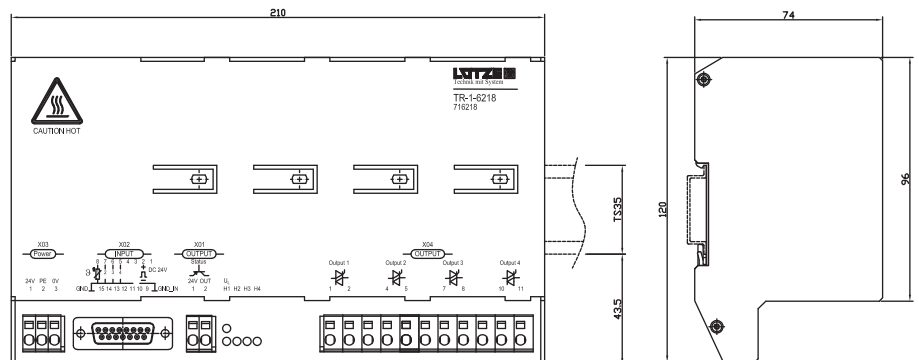
Standards	Electronic equipment on railway vehicles: EN 50155 Electromagnetic compatibility: EN 50121-3-2 Insulation coordination: EN 50124-1 Vibrations and shocks: EN50155/61373
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The standard applicable to this product is dependent on the version available for development. The standards applicable to this product are available on request.

## Comments

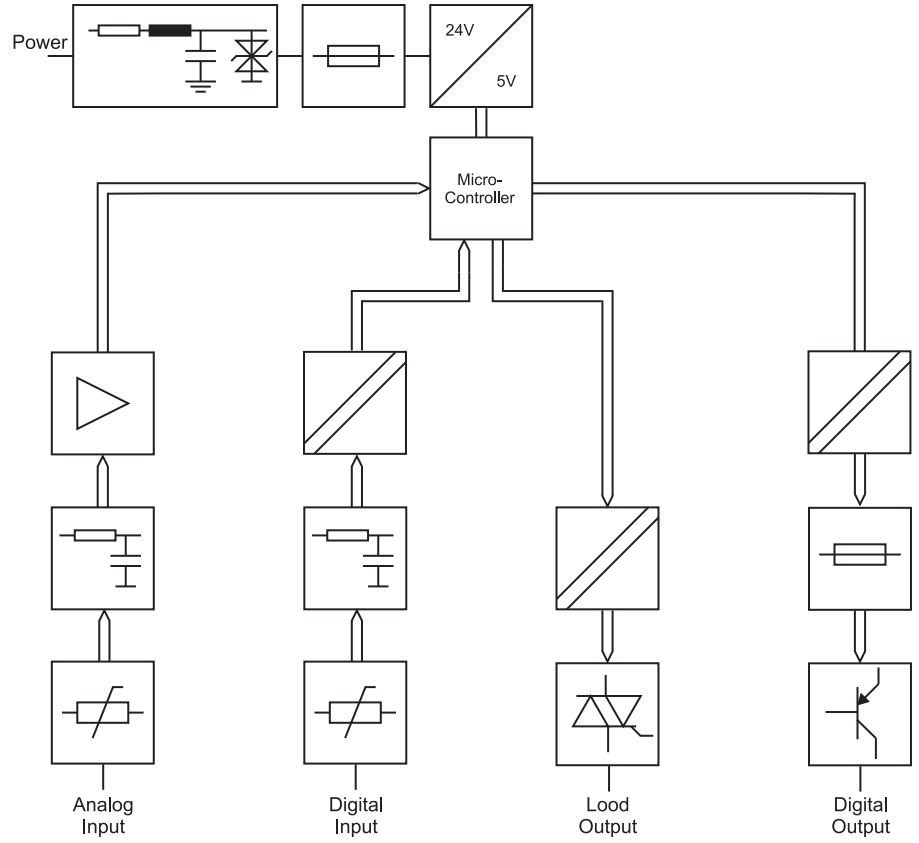
The temperature controller may only be operated with a protective conductor connected. In the event of a fault (short circuit, sensor break) the channel affected is deactivated and the status output disabled. The other channels continue to operate.

## Dimensions



# Temperature controller, 4-channel

Circuit diagram



# Temperature controller



<b>Identification</b>	Type	TR-6-2029
	Part-No.	762029
<b>Use/Area of application</b>		
Description	The temperature controller has 4 separate channels. The semiconductor outputs are clocked to the set setpoint value (pulse width modulation). The sensors are monitored via a centralised alarm for sensor break and short circuit. The status output is an isolated semiconductor output. One LED per channel lights up when the controller is operational (no malfunction present).	
<b>Access (analog)</b>		
Measurement input	PT1000 (DIN EN 60751)	
Sensor current	1.0 mA	
Protection device	Suppressor diode	
<b>Load Side</b>		
Switching voltage	Channel 1-4: DC 16.8–30 V (supplied by $U_B$ )	
Switching current	max. 50 mA	
Protection device output	Suppressor diode	
Function	The output is clocked to the setpoint value (pulse width modulation)	
Switching frequency	with duty factor 01:01 25 Hz	
Protection device output	Suppressor diode	
Setpoint value, channel 1	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 2	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 3	26 °C (setpoint-value clocking 24 °C to 28 °C)	
Setpoint value, channel 4	26 °C (setpoint-value clocking 24 °C to 28 °C)	
<b>Status output</b>		
Output	The output is switched through and the LED lights up when there are no sensor malfunctions.	
Switching voltage	DC 5-30 V	
Switching current	max. 50 mA	
Status Indication	LED yellow	

# Temperature controller

## General

Supply voltage	DC 24 V
Voltage range	DC 16.8 – 30.0 V
Current Consumption per LED	45 mA
Termination	spring terminal single stranded 0.8 – 2.5 mm <sup>2</sup> ; fine stranded 0.8 – 2.5 mm <sup>2</sup>
Protection class	IP 20
Galvanic isolation I/O	DC 500 V
Dimensions (w x h x d)	22.5x80.0x84.0 mm
Weight (kg/piece)	0.072 (kg/piece)
Operation temperature range	-40 – 70 °C
Storage temperature range	-40 – 80 °C
Rated insulation voltage	50 V
	Contamination level 2
	Over voltage category I

## Miscellaneous

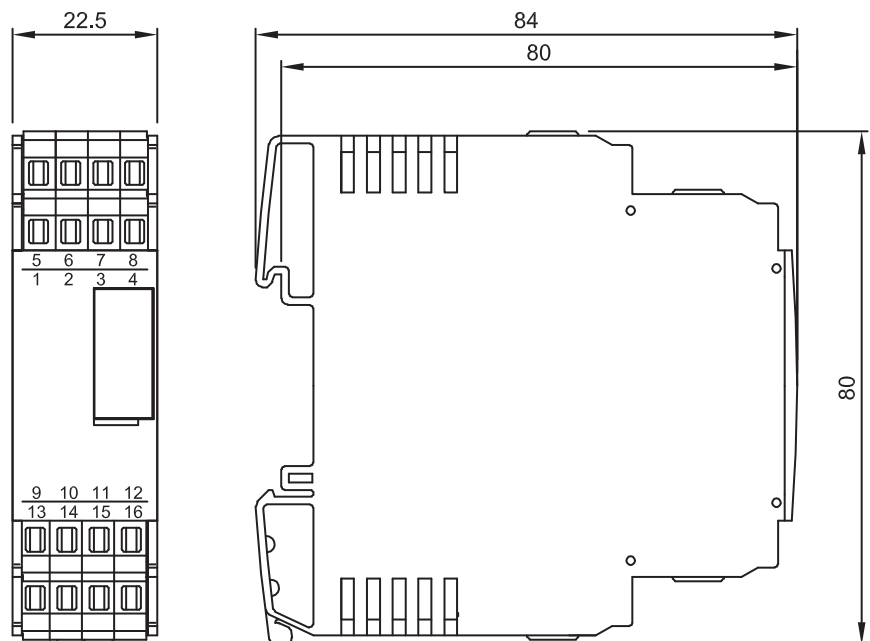
Standards	Electronic equipment on railway vehicles: EN 50155 Electromagnetic compatibility: EN 50121-3-2 Insulation coordination: EN 50124-1 Vibrations and shocks: EN50155/61373
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## Comments

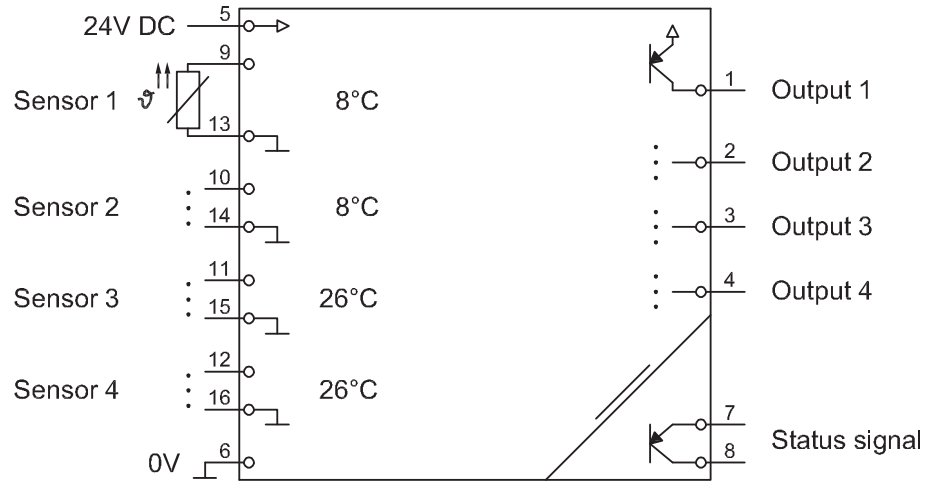
In the event of a fault (short circuit, sensor break) the channel affected is deactivated (output 0 V) and the status output disabled. The other channels continue to operate.

## Dimensions



# Temperature controller

Circuit diagram



# Temperature controller



<b>Identification</b>	Type	TR-6-2031
	Part-No.	762031
<b>Use/Area of application</b>		
Description	The temperature controller has 4 separate channels. The semiconductor outputs are clocked to the set setpoint value (pulse width modulation). The sensors are monitored via a centralised alarm for sensor break and short circuit. The status output is an isolated semiconductor output. One LED per channel lights up when the controller is operational (no malfunction present).	
<b>Access (analog)</b>		
Measurement input	PT1000 (DIN EN 60751)	
Sensor current	1.0 mA	
Protection device	Suppressor diode	
<b>Load Side</b>		
Switching voltage	Channel 1-4: DC 16.8–30 V (supplied by $U_B$ )	
Switching current	max. 50 mA	
Protection device output	Suppressor diode	
Function	The output is clocked to the setpoint value (pulse width modulation)	
Switching frequency	with duty factor 01:01 25 Hz	
Protection device output	Suppressor diode	
Setpoint value, channel 1	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 2	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 3	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 4	8 °C (setpoint-value clocking 6 °C to 10 °C)	
<b>Status output</b>		
Output	The output is switched through and the LED lights up when there are no sensor malfunctions.	
Switching voltage	DC 5-30 V	
Switching current	max. 50 mA	
Status Indication	LED yellow	

# Temperature controller

## General

Supply voltage	DC 24 V
Voltage range	DC 16.8 – 30.0 V
Current Consumption per LED	45 mA
Termination	spring terminal single stranded 0.8 – 2.5 mm <sup>2</sup> ; fine stranded 0.8 – 2.5 mm <sup>2</sup>
Protection class	IP 20
Galvanic isolation I/O	DC 500 V
Dimensions (w x h x d)	22.5x80.0x84.0 mm
Weight (kg/piece)	0.072 (kg/piece)
Operation temperature range	-40 – 70 °C
Storage temperature range	-40 – 80 °C
Rated insulation voltage	50 V
	Contamination level 2
	Over voltage category I

## Miscellaneous

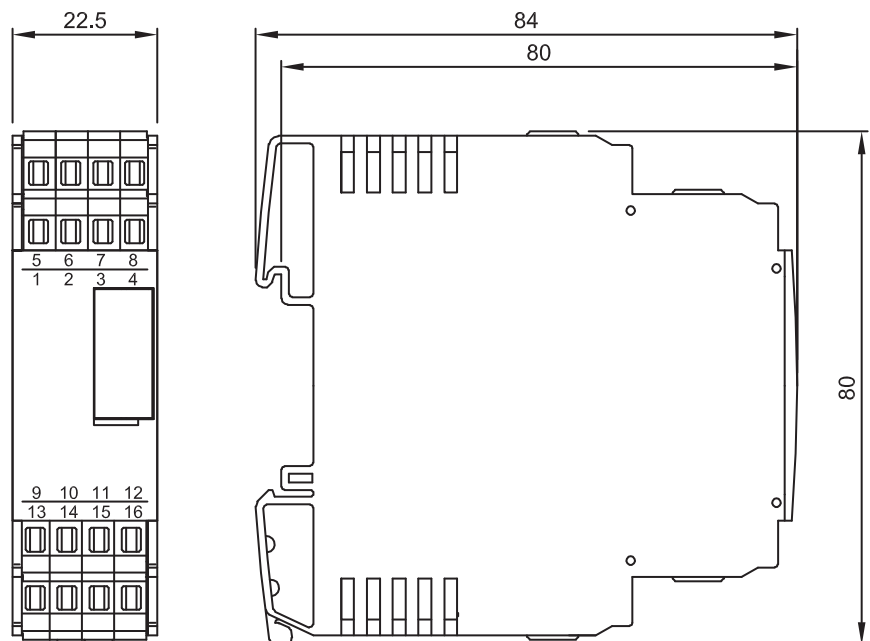
Standards	Electronic equipment on railway vehicles: EN 50155 Electromagnetic compatibility: EN 50121-3-2 Insulation coordination: EN 50124-1 Vibrations and shocks: EN50155/61373
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## Comments

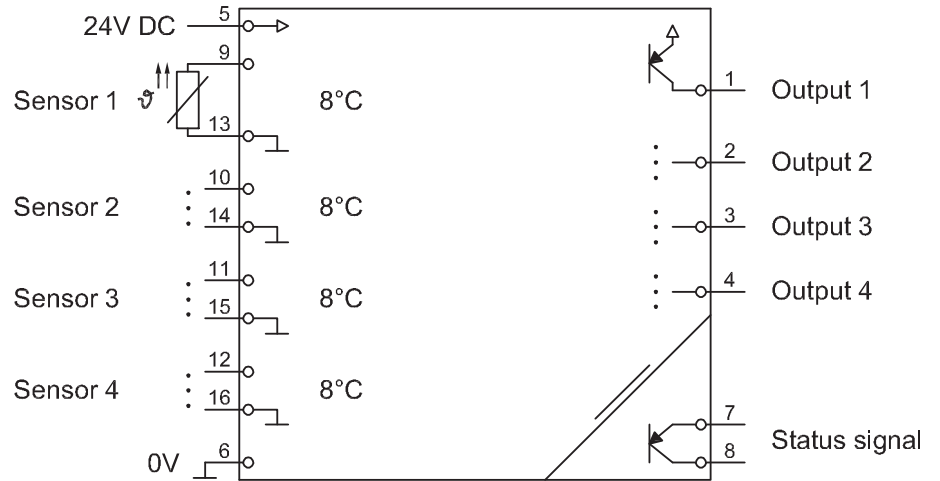
In the event of a fault (short circuit, sensor break) the channel affected is deactivated (output 0 V) and the status output disabled. The other channels continue to operate.

## Dimensions



# Temperature controller

Circuit diagram



# Temperature controller



<b>Identification</b>	Type	TR-6-2088
	Part-No.	762088
<b>Use/Area of application</b>		
Description	The temperature controller has 4 separate channels. The semiconductor outputs are clocked to the permanently set setpoint value (pulse width modulation). The sensors are monitored via a centralised alarm for sensor break and short circuit. The status output is an isolated semiconductor output. An LED lights up when the controller is operational (no malfunction present).	
<b>Access (analog)</b>		
Measurement input	PT1000 (DIN EN 60751)	
Sensor current	1.0 mA	
Protection device	Suppressor diode	
<b>Load Side</b>		
Switching voltage	(Channel 1–4 DC 16.8–30 V (supplied by $U_B$ ))	
Switching current	(Channel 1–4) max. 50 mA	
Protection device output	Suppressor diode	
Function	The output is clocked to the setpoint value (pulse width modulation)	
Switching frequency	with duty factor 01:01 0.6 Hz	
Protection device output	Suppressor diode	
Setpoint value, channel 1	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 2	8 °C (setpoint-value clocking 6 °C to 10 °C)	
Setpoint value, channel 3	26 °C (setpoint-value clocking 24 °C to 28 °C)	
Setpoint value, channel 4	26 °C (setpoint-value clocking 24 °C to 28 °C)	
<b>Status output</b>		
Switching voltage	DC 5-30 V	
Switching current	max. 50 mA	
Status Indication	LED yellow - The output is switched through and the LED lights up when there are no malfunctions.	
<b>General</b>		

# Temperature controller

Voltage range	DC 16.8 – 30.0 V
Nominal voltage $U_N$	DC 24 V
Rated current (at $U_N$ )	45 mA
Termination	spring terminal single stranded 0.8 – 2.5 mm <sup>2</sup> ; fine stranded 0.8 – 2.5 mm <sup>2</sup>
Protection class	IP 20
Galvanic isolation I/O	DC 500 V
Dimensions (w x h x d)	22.5x80.0x84.0 mm
Weight (kg/piece)	0.072 (kg/piece)
Operation temperature range	-40 – 70 °C
Storage temperature range	-40 – 80 °C
Rated insulation voltage	50 V
	Contamination level 2
	Over voltage category I

## Miscellaneous

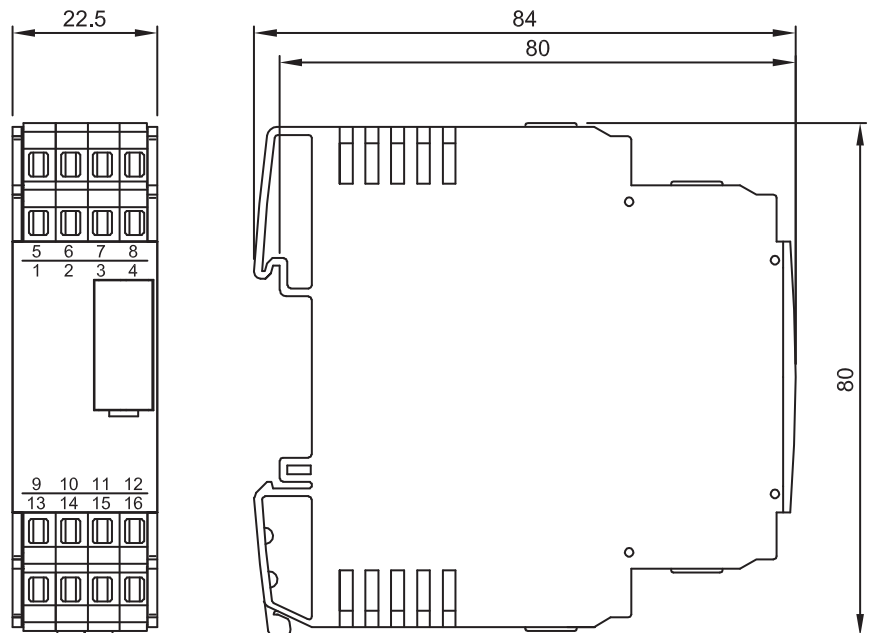
Standards	Electronic equipment on railway vehicles: EN 50155 Electromagnetic compatibility: EN 50121-3-2 Insulation coordination: EN 50124-1 Vibrations and shocks: EN50155/61373
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## Comments

In the event of a fault (short circuit, sensor break) the channel affected is deactivated (output 0 V) and the status output disabled. The other channels continue to operate.

## Dimensions



# Temperature controller

## Circuit diagram

