

# Thermistor Motor protection relay MSE mecotron®



- Protects and monitors motors with integrated PTC resistor sensors
- Automatic reset
- Several sensors can be connected
- Control of bimetals
- Excellent cost / performance ratio

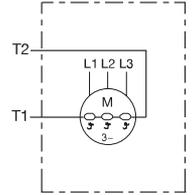
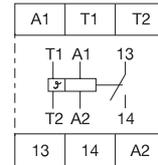
## Operation

The MSE protects and controls motors fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure directly the motor heating. Thus, a direct control is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single-phasing, high ambient temperature, and insufficient cooling.**

The relay is independent of the motor rated current and the method of starting. The PTC resistor sensors are connected in series with the terminals T1 and T2. The number of PTC sensor resistors that can be connected per measuring circuit is limited by the sum of the PTC sensor resistors of the individual resistors.

$R_G = R_1 + R_2 + R_N \leq 1,5 \text{ k}\Omega$ . Under normal operating conditions the resistance value is below the response value of the MSE. If only one of the PTC resistors heats up excessively, the output relay de-energizes. After cooling down the output relay energizes automatically.

■ Approvals: applied for.



Supply voltage	Ref. no.:
24 V AC	2 550 805 93
110...130 V AC	2 550 800 93
220...240 V AC	2 550 801 93

Accessories	Ref. no.:

### Further applications:

Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

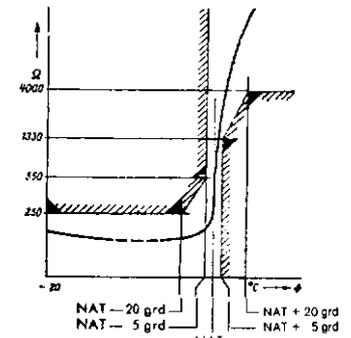
## Technical data

<b>Input circuit</b>		
Supply voltage - Power consumption	<b>A1-A2</b>	220...240 V AC - approx. 1.5 VA
Supply voltage tolerance		-15 % ... +10 %
Supply voltage frequency		50...60 Hz
Duty time		100 %
<b>Measuring circuit</b>		
Measuring input	<b>T1-T2</b>	
Total PTC resistance		$\leq 1.5 \text{ k}\Omega$
Response value (relay de-energizes)		2.7...3.7 k $\Omega$
Reset value (relay energizes)		1.7...2.3 k $\Omega$
Voltage at T1-T2, sensor not connected		approx. 20 V DC
Voltage at T1-T2, at 4000 W		< 7.5 V DC
Current between T1-T2 at 0 W		max. 2 mA
Max. cable length		off 2 x 250 m we recommend a shielded cable
<b>Output circuit</b>		Relay, 1 N/O contact, closed circuit principle
Rated voltage	VDE 0100, IEC947-1	250 V
Max. switching voltage max.		250 V AC
Rated operational current	AC 12 (ohmic)	4 A (at 230 V)
Rated operational current	AC 15 (inductive)	3 A (at 230 V)
Rated operational current	DC 12 (ohmic)	4 A (at 24 V)
Rated operational current	DC 13 (inductive)	2 A (at 24 V)
Mechanical life (max.)		30 x 10 <sup>6</sup> operations
Electrical life (max.)	(to AC 12 / 230 V / 4 A)	1 x 10 <sup>5</sup> operations
Short-circuit protection, max. fuse rating		10 A / fast, type gL
<b>General data</b>		
Rated impulse withstand voltage V <sub>imp</sub>		4 kV
Operating temperature range		-20°C ... +60°C
Storage temperature range		-40°C ... +80°C
Mounting position		any
Mounting on DIN-rail (EN 50022)		Snap-on mounting/screw mounting using adapter
Terminal capacity		2 x 16 AWG (2 x 1.5 mm <sup>2</sup> )
Weight		approx. 0.24 lb (110 g)
Dimensions (W x H x D)		22.5 x 78 x 78.5 mm

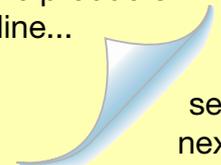
## Resistance characteristic

for one temperature sensor acc. to DIN 44 081.

NAT = rated response temperature



For more products  
in this line...



see  
next  
page.

## Thermistor Motor protection relay MSS mecotron®



- Protects and monitors motors with built-in PTC resistor sensors
- 2 supply voltage versions
- 1 SPDT contact
- 2 LEDs
- Automatic restart

### Operation

The MSS protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

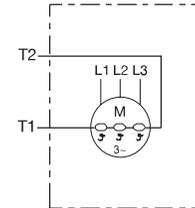
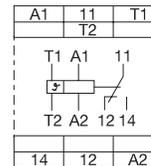
The PTC resistor sensors are connected in series with terminals T1 and T2. The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega$$

Under normal operating conditions, their resistance value is below the response value of the MSS. If only one of the PTC resistors heats up excessively, the output relay is de-energized.

It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset.

■ Approvals:



Supply voltage	Ref. no.:
24 V AC/DC	2 430 800 91
220...240 V AC	2 430 801 11
Accessories	Ref. no.:
Sealable transparent cover	3 430 005 01
Adapter for screw mounting	3 430 029 01

#### Further application possibilities:

Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

### Technical data

#### Input circuit

Supply voltage - power consumption	A1-A2	24V AC/DC	-	approx. 1.5 VA/W
	A1-A2	220...240 V AC	-	approx. 1.5 VA
Tolerance of supply voltage			-15 % ... +10 %	
Supply voltage frequency			50...60 Hz	
Duty time			100 %	

#### Measuring circuit

Measuring input	T1-T2			
Total resistance in cold state			≤ 1.5 kΩ	
Response value (relay de-energizes)			2.5...3.6 kΩ	
Reset value (relay energizes)			1.5...2.3 kΩ	
Voltage at T1-T2, opened			max. 35 V DC	
Voltage at T1-T2, at 4000 Ω			≤ 7.5 V DC	
Max. cable length, unshielded			≤ 100 m	

#### Display of operating status

Supply power "U"			LED, green
Fault tripping "F"			LED, red

#### Output circuit

Rated voltage	VDE 0100, IEC947-1	Relay, 1 SPDT contact, closed-circuit principle	250 V
Max. switching voltage max.			250 V AC
Rated switching current	AC 12 (resistive)		4 A (at 230 V)
Rated switching current	AC 15 (inductive)		3 A (at 230 V)
Rated switching current	DC 12 (resistive)		4 A (at 24 V)
Rated switching current	DC 13 (inductive)		2 A (at 24 V)
Maximum mechanical life			30 x 10 <sup>6</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)			1 x 10 <sup>6</sup> operations
Short-circuit proof, max. fuse rating			10 A / fast, operation class gL

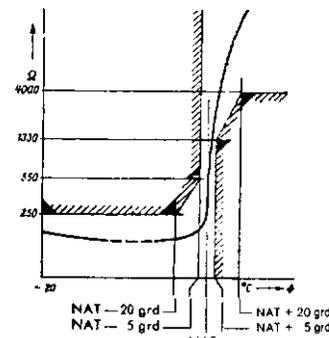
#### General data

Rated impulse withstand voltage V <sub>imp</sub>		4 kV
Operating temperature		-25°C ... +65°C
Storage temperature		-40°C ... +85°C
Mounting position		any
Mounting to DIN rail (EN 50022)		Snap-on mounting/Screw-mounting with adapter
Wire size stranded with wire end ferrule		2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight		approx. 0.33 lb (150 g)
Dimensions (W x H x D)		22.5 x 78 x 101 mm

### Resistance characteristic

of one temperature sensor to DIN 44 081.

NAT = rated response temperature



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see  
next  
page.

## Thermistor Motor protection relay MSS mecatron®



Reset

- Configurable short-circuit monitoring of the sensor circuit
- 4 supply voltage versions
- Storage resettable
- Storage reset button
- Remote reset capability
- Short-circuit monitoring of the sensor cable
- 2 SPDT contacts
- 2 LEDs

### Operation

The MSS protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

The PTC resistor sensors are connected in series with terminals T1 and T2 (respectively T1 and T2x, without short-circuit detection). The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega$$

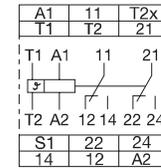
Under normal operating conditions, their resistance value is below the response value of the MSS. If only one of the PTC resistors heats up excessively, the output relay is de-energized.

■ Approvals:

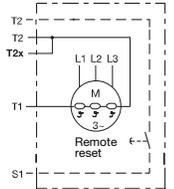
It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset.

Auto reset is achieved by a permanent link (jumper) of the terminals S1 and T2. In the case of manual reset, the reset button must be pressed.

Remote resetting is achieved by a short-time linking of the terminals S1 and T2.



jumper S1-T2  
= without storage  
Measuring circuit  
T1 - T2x  
= without short-circuit monitoring



24 V AC/DC version without electrical isolation and without PTB approval.

Supply voltage	Ref. no.:
24 V AC/DC	2 430 710 93
110...130 V AC	2 430 711 03
220...240 V AC	2 430 711 13
380...415 V AC	2 430 711 23

Accessories	Ref. no.:
Sealable transparent cover	3 430 005 01
Adapter for screw mounting	3 430 029 01

### Technical data

#### Input circuit

Supply voltage - power consumption	A1-A2	24V AC/DC	- approx. 1.2 VA/ 0.6 W
	A1-A2	110...130 V AC	- approx. 1.6 VA
	A1-A2	220...240 V AC	- approx. 1.6 VA
	A1-A2	380...415 V AC	- approx. 1.6 VA

Tolerance of supply voltage	-15 % ... +10 % (24 V DC: ± 10%)
Supply voltage frequency	50...60 Hz
Duty time	100 %

#### Measuring circuit

Measuring input	T1-T2 (T2x)
Total resistance in cold state	≤ 1.5 kΩ
Response value (relay de-energizes)	3.6 kΩ ± 5 %
Short-circuit detection	≤ 20 Ω
Reset value (relay energizes)	1.6 kΩ ± 5 %
Voltage at T1-T2 (T2x), opened	max. 6.5 V DC
Voltage at T1-T2 (T2x), at 4000 Ω	≤ 3.5 V DC
Max. cable length, unshielded	≤ 100 m at 0,75 mm <sup>2</sup> (*) 400 m at 2,5 mm <sup>2</sup> (*) (*) when using short-circuit monitoring

Remote reset	S1-T2
Max. cable length between S1 and T2	n/o contact ≤ 50 m

#### Display of operating status

Supply voltage "U"	LED, green
Fault tripping "F"	LED, red

Output circuit	11-12/14,21-22/24
Rated voltage	VDE 0100, IEC947-1 250 V
Rated switching voltage max.	250 V AC
Rated switching current	AC 12 (resistive) 4 A (at 230 V)
Rated switching current	AC 15 (inductive) 3 A (at 230 V)
Rated switching current	DC 12 (resistive) 4 A (at 24 V)
Rated switching current	DC 13 (inductive) 2 A (at 24 V)
Maximum mechanical life	30 x 10 <sup>6</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)	1 x 10 <sup>5</sup> operations
Short-circuit proof, max. fuse rating	10 A / fast, operation class gL

#### General data

Rated impulse withstand voltage V <sub>imp</sub>	4 kV
Operating temperature	-25°C ... +65°C
Storage temperature	-40°C ... +85°C
Mounting position	any
Mounting to DIN rail (EN 50022)	Snap-on mounting/ Screw mounting with adapter
Wire size stranded with wire end ferrule	2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight	approx. 0.33 lb (150 g)

### Note

24 V AC/DC version without electrical isolation and without PTB approval.

#### Further application possibilities:

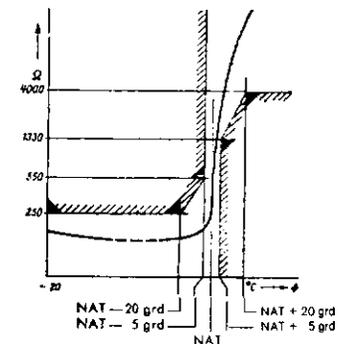
Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

### Resistance characteristic

of one temperature sensor to DIN 44 081.

NAT = rated response temperature



For more products  
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page.

Note:  
Dimensions (W x H x D), 22.5 x 78 x 101 mm

# Thermistor Motor protection relay MSS mecotron® with 2 independent sensor circuits and single evaluation



Reset

- 2 separate sensor circuits to monitor two motors, or to monitor one motor with 2 sensor circuits (prewarning and final switch off)
- Short-circuit monitoring of the sensor circuit
- Continuous supply voltage range 24...240 V AC/DC
- Storage resettable
- Storage reset button
- Remote reset capability
- 2 SPDT contacts; one each per sensor circuit
- 3 LEDs

## Operation

The MSS protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

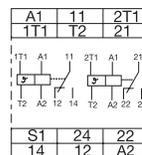
The PTC resistor sensors are connected in series with terminals T1 and T2 (respectively 2T1 and T2). The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega$$

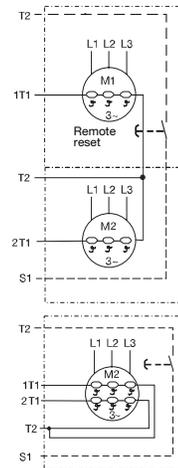
Under normal operating conditions, their resistance value is below the response value of the MSS. If only one of the PTC resistors heats up excessively, the output relay is de-energized. It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset.

■ Approvals:

Auto reset is achieved by a permanent link (jumper) of the terminals S1 and T2. In the case of manual reset, the reset button must be pressed. Remote resetting is achieved by a short-time linking of the terminals S1 and T2.



jumper S1-T2  
= without storage



Supply voltage	Ref. no.:
24 V...240 AC/DC	2 430 710 02

Accessories	Ref. no.:
Sealable transparent cover	3 430 005 01
Adapter for screw mounting	3 430 029 01

## Technical data

Input circuit	
Supply voltage - power consumption	<b>A1-A2</b> 24...240 V AC/DC - approx. 1.1 VA / W (24 V) approx. 5.7 VA / W (240 V)
Tolerance of supply voltage	-15 % ... +10 %
Frequency of AC supply	15...400 Hz
Duty time	100 %

Measuring circuit	
Measuring input	<b>1T1-T2, 2T1-T2</b>
Total resistance in cold state	≤ 1.5 kΩ per sensor circuit
Response value (relay de-energizes)	3.6 kΩ ± 5%
Short-circuit detection	≤ 20 Ω
Reset value (relay energizes)	1.6 kΩ ± 5%
Voltage at xT1-T2, opened	max. 6.5 V DC
Voltage at xT1-T2, at 4000 Ω	≤ 3.5 V DC
Max. cable length, unshielded	≤ 100 m at 0.75 mm <sup>2</sup> 400 m at 2.5 mm <sup>2</sup>
Remote reset	<b>S1-T2</b> n/o contact
Max. cable length between S1 and T2	≤ 50 m

Display of operating status	
Supply voltage "U"	LED, green
Fault tripping sensor circuit 1 "F1" / sensor circuit 2 "F2"	LED, red / LED, red

Output circuit	
Rated voltage	<b>13-14 / 21-22</b> 250 V
Rated switching voltage max.	VDE 0100, IEC947-1 250 V AC
Rated switching current	AC 12 (resistive) 4 A (at 230 V)
Rated switching current	AC 15 (inductive) 3 A (at 230 V)
Rated switching current	DC 12 (resistive) 4 A (at 24 V)
Rated switching current	DC 13 (inductive) 2 A (at 24 V)
Maximum mechanical life	30 x 10 <sup>6</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)	1 x 10 <sup>5</sup> operations
Short-circuit proof, max. fuse rating	10 A / fast, operation class gL

General data	
Rated impulse withstand voltage Vimp	4 kV
Operating temperature	-25°C ... +65°C
Storage temperature	-40°C ... +85°C
Mounting position	any
Mounting to DIN rail (EN 50022)	Snap-on mounting/ Screw mounting with adapter
Wire size stranded with wire end ferrule	2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight	approx. 0.33 lb (150 g)
Dimensions (W x H x D)	22.5 x 78 x 101 mm

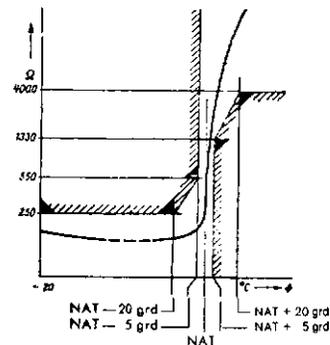
**Further application possibilities:**  
Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

## Resistance characteristic

of one temperature sensor to DIN 44 081.

NAT = rated response temperature



For more products  
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next  
page.

## Thermistor Motor protection relay MSS mecotron® with configurable non-volatile storage in case of failure



Reset/  
Test

- Configurable Non-volatile storage (Retentivity) in case of failure
- Short-circuit monitoring of the sensor circuit
- Continuous supply voltage range 24...240 V AC/DC
- Storage resettable
- Storage reset button
- Remote reset capability
- Short-circuit monitoring of the sensor cable
- 2 output contacts: 1 n/o and 1 n/c contact
- 2 LEDs

### Operation

The MSS protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

The PTC resistor sensors are connected in series with terminals T1 and T2 (respectively T1 and T2X, without short-circuit detection). The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

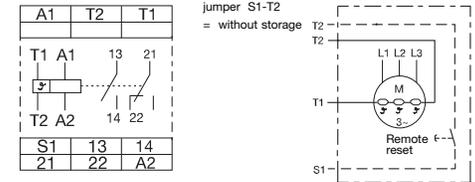
$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega.$$

Under normal operating conditions, their resistance value is below the response value of the MSS. If only one of the PTC resistors heats up excessively, the output relay is de-energized. It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset. Auto reset is achieved by a permanent link (jumper)

■ Approvals:

of the terminals S1 and T2. In the case of manual reset, the reset button must be pressed.

Remote resetting is achieved by a short-time linking of the terminals S1 and T2.



Supply voltage	Ref. no.:
24 ...240 AC/DC	2 430 720 04

Accessories	Ref. no.:
Sealable transparent cover	3 430 005 01
Adapter for screw mounting	3 430 029 01

### Technical data

Input circuit		
Supply voltage - power consumption	<b>A1-A2</b>	24...240 V AC/DC - approx. 1.5 VA / W (24 V) approx. 1.5 W (240 V DC) approx. 3.3 VA (240 V AC/ 60 Hz)
Tolerance of supply voltage		-15 % ... +10 %
Frequency of AC supply		15...400 Hz
Duty time		100 %
Measuring circuit		
Measuring input	<b>T1-T2</b>	
Total resistance in cold state		≤ 1.5 kΩ
Response value (relay de-energizes)		3.6 kΩ ± 5%
Short-circuit detection		≤ 20 Ω
Reset value (relay energizes)		1.6 kW ± 5%
Voltage at xT1-T2, opened		max. 6.5 V DC
Voltage at xT1-T2, at 4000 Ω		≤ 3.5 V DC
Max. cable length, unshielded		≤ 100 m at 0.75 mm <sup>2</sup> 400 m at 2.5 mm <sup>2</sup>
Remote reset	<b>S1-T2</b>	n/o contact
Max. cable length between S1 and T2		≤ 50 m
Display of operating status		
Supply voltage "U"		LED, green
Fault tripping "F"		LED, red
Output circuit		
Rated voltage	<b>13-14,21-22</b>	2 Relays, 1 n/o + 1 n/c, closed-circuit principle
Rated voltage	VDE 0100, IEC947-1	250 V
Max. switching voltage max.		250 V AC
Rated switching current	AC 12 (resistive)	4 A (at 230 V)
Rated switching current	AC 15 (inductive)	3 A (at 230 V)
Rated switching current	DC 12 (resistive)	4 A (at 24 V)
Rated switching current	DC 13 (inductive)	2 A (at 24 V)
Maximum mechanical life		30 x 10 <sup>5</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)		1 x 10 <sup>5</sup> operations
Short-circuit proof, max. fuse rating		10 A / fast, operation class gL
General data		
Rated impulse withstand voltage V <sub>imp</sub>		4 kV
Operating temperature		-25°C ... +65°C
Storage temperature		-40°C ... +85°C
Mounting position		any
Mounting to DIN rail (EN 50022)		Snap-on mounting/ Screw mounting with adapter
Wire size stranded with wire end ferrule		2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight		approx. 0.33 lb (150 g)
Dimensions (W x H x D)		22.5 x 78 x 101 mm

### Further application possibilities:

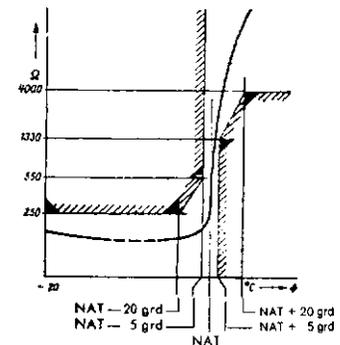
Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

### Resistance characteristic

of one temperature sensor to DIN 44 081.

NAT = rated response temperature



For more products  
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page.

## Thermistor Motor protection relay MSS mecotron® with 3 sensor circuits and total evaluation, with configurable non- volatile storage in case of failure



Reset/  
Test

- Total evaluation of up to 3 sensor circuits
- Short-circuit monitoring of the sensor circuit
- Continuous supply voltage range 24...240 V AC/DC
- Configurable non-volatile storage
- Storage resettable
- Remote reset capability
- 2 output contacts: 1 n/o and 1 n/c contact
- Autoreset
- 4 LEDs

### Operation

The MSS protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

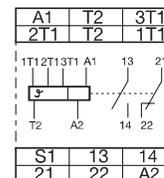
The PTC resistor sensors are connected in series with terminals T1 and T2 (respectively T1 and T2X, without short-circuit detection). The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega$$

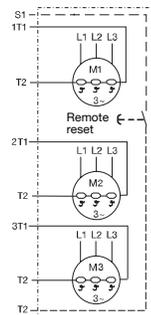
Under normal operating conditions, their resistance value is below the response value of the MSS. If only one of the PTC resistors heats up excessively, the output relay is de-energized. It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset.

■ Approvals: 

Auto reset is achieved by a permanent link (jumper) of the terminals S1 and T2. In the case of manual reset, the reset button must be pressed. Remote resetting is achieved by a short-time linking of the terminals S1 and T2.



jumper S1-T2  
= without storage



	Supply voltage	Ref. no.:
	24 ...240 AC/DC	2 430 720 05
	Accessories	Ref. no.:
	Sealable transparent cover	3 430 005 01
	Adapter for screw mounting	3 430 029 01

### Technical data

#### Input circuit

Supply voltage - power consumption	A1-A2	24...240 V AC/DC - approx. 1.5 VA / W (24 V) approx. 1.5 W (240 V DC) approx. 3.3 VA (240 V AC/ 60 Hz)
Tolerance of supply voltage		-15 % ... +10 %
Frequency of AC supply		15...400 Hz
Duty time		100 %

#### Measuring circuit

Measuring inputs	1T1, 2T1, 3T1-T2	3 sensor circuits
Total resistance in cold state		≤ 1.5 kΩ
Response value (relay de-energizes)		3.6 kΩ ± 5%
Short-circuit detection		≤ 20 Ω
Reset value (relay energizes)		1.6 kΩ ± 5%
Voltage at xT1-T2, opened		max. 6.5 V DC
Voltage at xT1-T2, at 4000 Ω		≤ 3.5 V DC
Max. cable length, unshielded		≤ 100 m at 0.75 mm <sup>2</sup> 400 m at 2.5 mm <sup>2</sup>
Remote reset	S1-T2	n/o contact
Max. cable length between S1 and T2		≤ 50 m

#### Display of operating status

Supply voltage "U"		LED, green
Fault tripping sensor circuits 1"F1" / 2"F2" / 3"F3"		each one LED, red

#### Output circuit

Rated voltage	VDE 0100, IEC947-1	250 V
Rated switching voltage max.		250 V AC
Rated switching current	AC 12 (resistive)	4 A (at 230 V)
Rated switching current	AC 15 (inductive)	3 A (at 230 V)
Rated switching current	DC 12 (resistive)	4 A (at 24 V)
Rated switching current	DC 13 (inductive)	2 A (at 24 V)
Maximum mechanical life		30 x 10 <sup>6</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)		1 x 10 <sup>6</sup> operations
Short-circuit proof, max. fuse rating		10 A / fast, operation class gL

#### General data

Rated impulse withstand voltage Vimp		4 kV
Operating temperature		-25°C ... +65°C
Storage temperature		-40°C ... +85°C
Mounting position		any
Mounting to DIN rail (EN 50022)		Snap-on mounting/ Screw mounting with adapter
Wire size stranded with wire end ferrule		2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight		approx. 0.33 lb (150 g)
Dimensions (W x H x D)		22.5 x 78 x 101 mm

#### Further application possibilities:

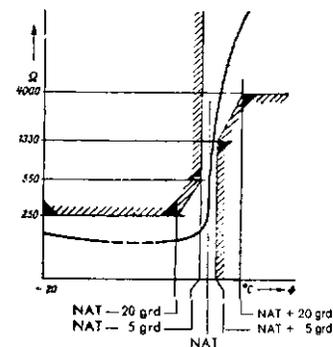
Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

### Resistance characteristic

of one temperature sensor to DIN 44 081.

NAT = rated response temperature



For more products  
in this line...

see  
next  
page.

# Thermistor Motor protection relay MSN mecotron® with 6 sensor circuits and total evaluation, with configurable non-volatile storage



Reset/  
Test

- Total evaluation of up to 6 sensor circuits
- Short-circuit monitoring of the sensor circuit
- Continuous supply voltage range 24...240 V AC/DC
- Configurable non-volatile storage
- 2 Storages resettable
- Remote reset capability
- Autoreset
- Storage reset and test button
- 2 output contacts: 1 n/o and 1 n/c contact
- 7 LEDs

## Operation

The MSN protects and monitors motors that are fitted with PTC resistor sensors. The temperature sensors are incorporated in the starter windings and measure temperature rise. Thus, good protection is guaranteed under the following operating conditions: **heavy duty, high switching frequency, single phasing, high operating temperature, insufficient cooling.**

The relay is independent of motor rated current, insulation class, and method of starting.

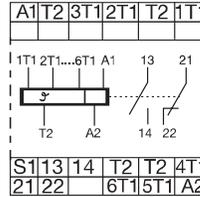
The PTC resistor sensors are connected in series with terminals T1 and T2 (respectively T1 and T2X, without short-circuit detection). The number of PTC resistor sensors that can be connected to the measuring circuit is limited by the sum of PTC resistor sensors of the individual resistor.

$$R_G = R_1 + R_2 + R_N \leq 1.5 \text{ k}\Omega$$

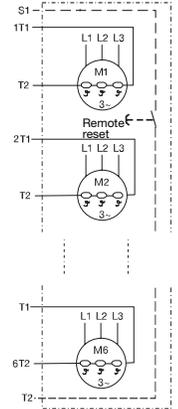
Under normal operating conditions, their resistance value is below the response value of the MSN. If only one of the PTC resistors heats up excessively, the output relay is de-energized. It is again energized automatically after the PTC resistor sensor has cooled down in the case of auto reset. Auto reset is achieved by a permanent link (jumper)

■ Approvals:

of the terminals S1 and T2. In the case of manual reset, the reset button must be pressed. Remote resetting is achieved by a short-time linking of the terminals S1 and T2.



Jumper S1-T2  
= without storage

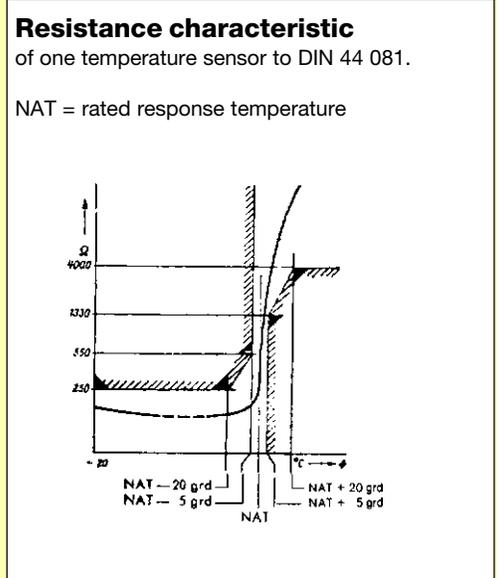


Supply voltage	Ref. no.:
24 V...240 AC/DC	2 450 025 01
Accessories	Ref. no.:
Sealable transparent cover	3 430 005 01
Adapter for screw mounting	3 430 029 01

Technical data	
<b>Input circuit</b>	
Supply voltage - power consumption	<b>A1-A2</b> 24...240 V AC/DC - approx. 1.5 VA / W (24 V) approx. 1.5 W (240 V DC) approx. 3.3 VA (240 V AC/ 60 Hz)
Tolerance of supply voltage	-15 % ... +10 %
Frequency of AC supply	15...400 Hz
Duty time	100 %
<b>Measuring circuit</b>	
Measuring inputs	<b>1T1, 2T1,... 6T1-T2</b> 6 sensor circuits
Total resistance in cold state	≤ 1.5 kΩ per sensor circuit
Response value (relay de-energizes)	3.6 kΩ ± 5%
Reset value (relay energizes)	1.6 kΩ ± 5%
Voltage at xT1-T2, opened	max. 6.5 V DC
Voltage at xT1-T2, at 4000 Ω	≤ 3.5 V DC
Max. cable length, unshielded	≤ 100 m at 0.75 mm <sup>2</sup> 400 m at 2.5 mm <sup>2</sup>
Remote reset	<b>S1-T2</b> n/o contact
Max. cable length between S1 and T2	≤ 50 m
<b>Display of operating status</b>	
Supply voltage "U"	LED, green
Fault tripping sensor circuit 1...6 "F1"..."F6"	LED, red
<b>Output circuit</b>	
Rated voltage	VDE 0100, IEC947-1 250 V
Rated switching voltage max.	250 V AC
Rated switching current	AC 12 (resistive) 4 A (at 230 V)
Rated switching current	AC 15 (inductive) 3 A (at 230 V)
Rated switching current	DC 12 (resistive) 4 A (at 24 V)
Rated switching current	DC 13 (inductive) 2 A (at 24 V)
Maximum mechanical life	30 x 10 <sup>8</sup> operations
Maximum electrical life (acc. to AC 12 / 230 V / 4 A)	1 x 10 <sup>5</sup> operations
Short-circuit proof, max. fuse rating	10 A / fast, operation class gL
<b>General data</b>	
Rated impulse withstand voltage V <sub>imp</sub>	4 kV
Operating temperature	-25°C ... +65°C
Storage temperature	-40°C ... +85°C
Mounting position	any
Mounting to DIN rail (EN 50022)	Snap-on mounting/ Screw mounting with adapter
Wire size stranded with wire end ferrule	2 x 14 AWG (2 x 2.5 mm <sup>2</sup> )
Weight	approx. 0.51 lb (230 g)
Dimensions (W x H x D)	45 x 78 x 101 mm

**Further application possibilities:**  
Temperature monitoring of equipment fitted with PTC resistor sensors, e.g.:

- Machine roller bearings
- Hot-air ventilators
- Oil
- Air
- Heating installations

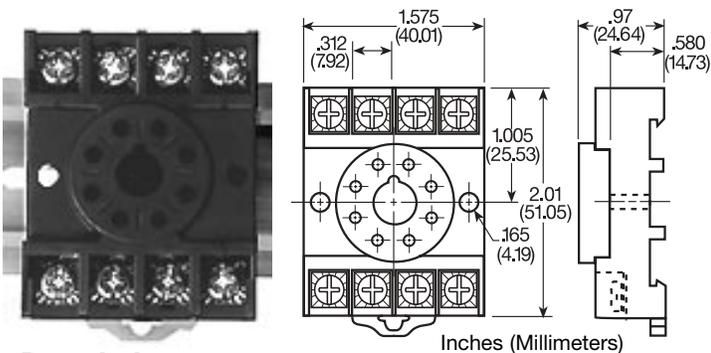




## Accessories-Motor Protectors

### DIN Rail or Surface Mount Sockets

#### 8 Pin Octal Socket

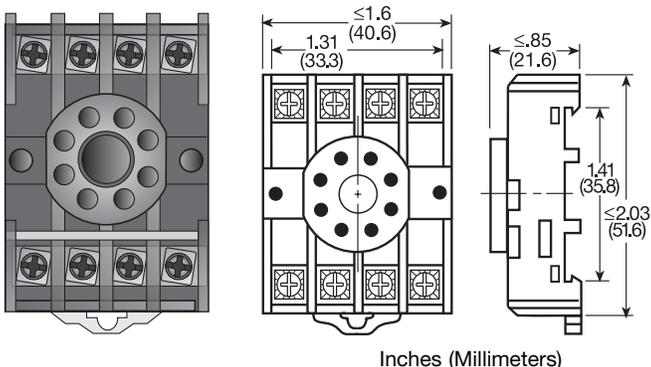


#### Description

8 pin DIN rail or surface mount socket. Y OT08 is rated at 10 A at 600 V AC and has screw terminals. Y OT08PC is rated at 10 A at 300 V AC and has pressure clamp terminals. For use with AWG 12 to 22 (3.2 to 0.33 mm<sup>2</sup>) wire sizes.

Part Number	Rating	Termination
Y OT08	600 V AC	Screws
Y OT08PC	300 V AC	Pressure Clamps

#### 8 Pin Octal Socket



#### Description

May be surface mounted with two #6 (M 3.5 x 0.6) screws or snaps onto a 35 mm DIN rail by means of a spring mechanism which also allows for easy removal. Screw terminals with captive wire clamps accept up to two #14 AWG (2.45 mm<sup>2</sup>) wires. Rated 10 A at 300 V AC.

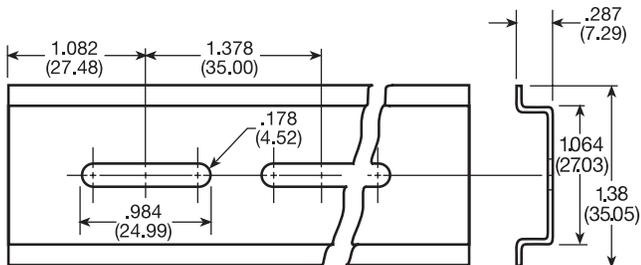
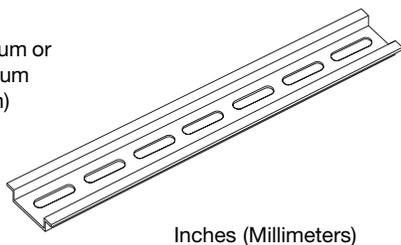
P/N: Y NDS 8

### DIN Rail

#### Description

Industry standard 35 mm aluminum or steel DIN rail. Y C103PM aluminum rail is available in 36 in. (91.4 cm) lengths. 17322005 steel rail is available in 78 in. (2 m) lengths.

P/N: Y C103PM (Al)  
17322005 (Steel)



### Hold-Down Brackets

#### Description

Securely mounts plug in controls in any position. Also provides protection against vibration. Select the Y PSC8 for use with Y NDS8 socket. Comes in sets of two.



P/N: Y PSC8

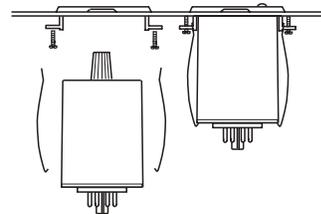
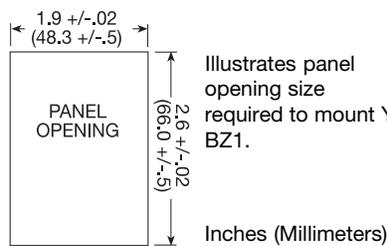
### Panel Mount Kit

#### Description

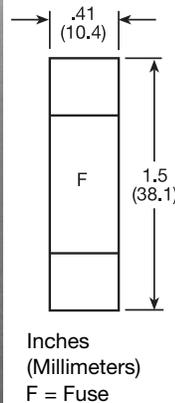
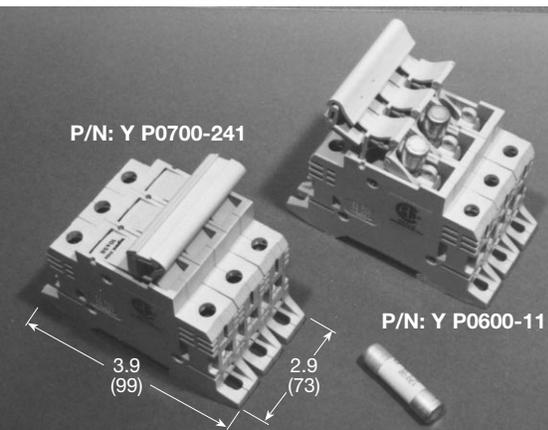
Provides an easy method of through-the-panel mounting of Entelec SSAC 8 or 11 pin plug-in timers, flashers, and other controls. May be mounted in panels up to 0.125 in. (3.2 mm) thick. Includes two clamps and two screws.



P/N: Y BZ1



### Three Phase Fuse Block/Disconnect



#### Description

Three phase fuse block disconnect designed for use with HRC midget fuses [1.5 x .41 in. (38.1 x 10.4 mm)] rated up to 25 A at 600 V AC. Surface or 35mm DIN rail mountable. 3.9 x 2.9 x 2.2 in. (99 x 73.7 x 55.9 mm)

Part Number	Description
Y P0700 241	Fuse Block
Y P0600 11	Fuse

#### Midget Fuse

Fast acting fuse for use with voltage monitors. Rated 2 A at 500 V AC. 1.5 x .41 in. (38.1 x 10.4 mm)

### Female Quick Connect Terminals



#### Description

These 0.25 in. (6.35 mm) female terminals are constructed with an insulator barrel to provide strain relief. L = 0.83 (21.1) W = 0.3 (7.6) Inches (Millimeters)

Part Number	Wire Size
Y P1015 13	AWG 10/12 (5.3/3.2 mm <sup>2</sup> )
Y P1015 64	AWG 14/16 (2.5/1.3 mm <sup>2</sup> )
Y P1015 14	AWG 18/22 (0.93/0.33 mm <sup>2</sup> )

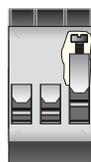
# Mechanical Outline and Accessories for mecotron® Monitoring Relays



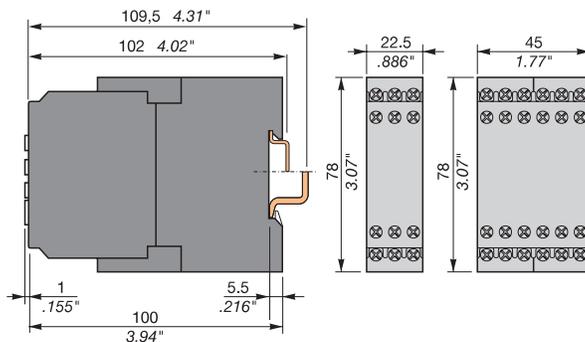
**ESS**  
22.5 mm



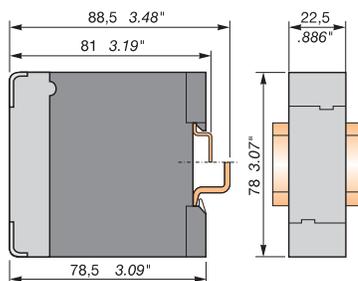
**ESN**  
45 mm



**S and N Series:**  
Screw Connection



**PFE**  
22.5 mm



**E Series:**  
Screw Connection

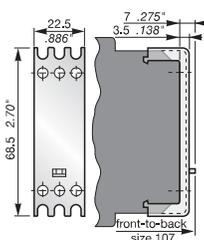


On the S Series, terminals with cable guides greatly simplify installation. This also applies to wire end ferrules with insulating collars.

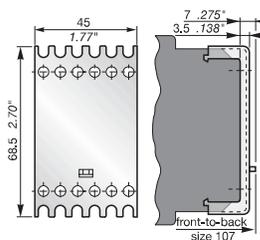
## Accessories

### Sealable covers

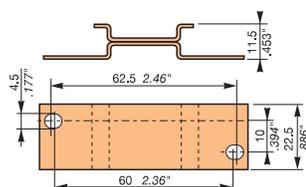
**P/N: 3 430 005 01**  
Sealable cover for mecotron series 22.5 mm wide



**P/N: 3 440 005 01**  
Sealable cover for mecotron series 45 mm wide



### Adapter for screw mounting

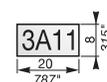


In 22.5 mm width **P/N: 3 430 029 01**  
In 45 mm width **P/N: 3 440 029 01**

### Marker label



**P/N: 4 366 017 01**



## Standards and approvals for measuring and monitoring relays

### mecotron® measuring and monitoring relays

The mecotron® range has been designed and developed taking into consideration all relevant standards for measuring and monitoring relays.

Product standard: IEC 255 part 6  
 Electromagnetic compat.: 93 / 68 / EWG  
 Low-voltage directive: 93 / 68 / EWG

Mechanical shock resistance: IEC 68 part 2-6: 10 G  
 Environmental tests: IEC 68 part 2-30: 24 h cycle, 55°C, 93% rel, 96 h  
 Isolation tests:  
 Overvoltage category: III to VDE 0110, IEC 664; C to IEC 255-5  
 Pollution category: III to VDE 0110, IEC 664; C to IEC 255-5

Test voltage: 2.5 kV / 50 Hz / 1 min. between all isolated circuits

EMC tests: EN 50082-2  
 ESD: IEC 1000-4-2, EN 61000-4-2 level 3 (6 kV / 8 kV)  
 HF radiation resistance: IEC 1000-4-3, EN 61000-4-3 level 3 (3 V / m)  
 Burst: IEC 1000-4-4, EN 61000-4-4 level 3 (2 kV 5 k Hz)  
 Surge: IEC 1000-4-5, EN 61000-4-5 level 4 (2 kV L-L)  
 HF line emission: IEC 1000-4-6, EN 61000-4-6 level 3 (10 V)

Rated impulse withstand voltage VDE 0110, IEC 664 between all isolated circuits: 4 kV / 1.2 - 50 µs

#### Special standards and tests

*mecotron® PFN, PVN, ASN, EFN, LWN, PFS, PFE, PBE, PVE and ASS*

Rated insulation voltage to VDE 0110, IEC 947-1 between supply and Measuring and output circuit: 500 V

*mecotron® ESN and SRN*

Rated insulation voltage to VDE 0110, IEC 947-1 between all isolated circuits: 400 V

*mecotron® ESS, SRS, MSS, MSE, and MSN*

Rated insulation voltage VDE 0110, IEC 947-1 between supply and Measuring and output circuit: 250 V

*mecotron® IWN AC*

Product norm: IEC 255 part 6 to VDE 0413 part 2  
 Rated insulation voltage VDE 0110, IEC 947-1 between supply and Measuring and output circuit: 400 V

*mecotron® IWN DC*

Rated insulation voltage VDE 0110, IEC 947-1 between measuring and supply circuit: 320 V  
 between output circuit and other circuits: 400 V

### Entrelec SSAC measuring and monitoring relays

Entrelec SSAC products have been designed, developed, and tested in accordance with all relevant norms and standards.

Product standards: EN50082-2, EN61010-1  
 Electromagnetic compatibility: 89/336/EEC  
 Low-voltage directive: 93/68/EEC  
 Low-voltage directive tests: EN61010-1

#### CE Conditions of Acceptability

Products Containing DIP Switches:  
 Power must be removed from the unit when a switch position is changed.

Products with Solid-State Outputs:  
 Loads rated above 1 A, must be evaluated for CE use when used with solid-state output products.

#### UL and CSA Approvals

When UL/CSA approvals are indicated, Entrelec SSAC products are UL Recognized\* (UL Listed\*\* for DLM and WVM Series) and CSA Certified under the file numbers listed below. These products are tested to the requirements of UL508 - Industrial Control Equipment. CSA Certified products are tested to the requirements of C22.2 Number 14 - Industrial Control Equipment.

Agency	Standard Number	File Number
Underwriters Laboratories (UL)	UL 508	E57310
Canadian Standards Association (CSA)	C22.2 Number 14	LR57415

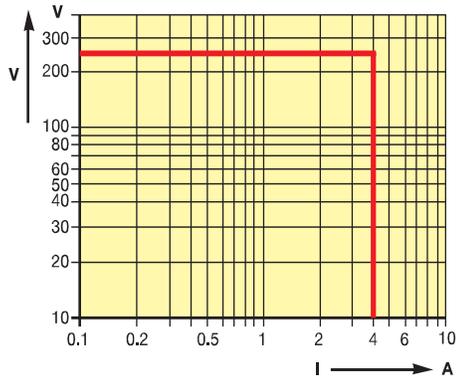
\*UL's Component Recognition Service covers the testing and evaluation of component products that are incomplete or restricted in performance capabilities. These components will later be used in complete end-products or systems Listed by UL.

\*\*The UL Listed Mark on a product indicates that samples of that complete product have been tested by UL to nationally recognized Safety Standards and found to be free from reasonably foreseeable risk of fire, electric shock, and related hazards.

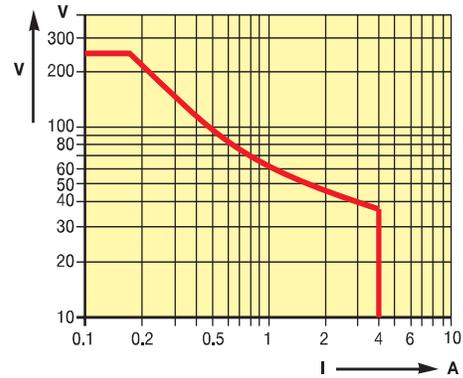
## Load limit curves

### Load limit curves for the mecotron®-S series (22.5 mm) and the mecotron®-E series (22.5 mm)

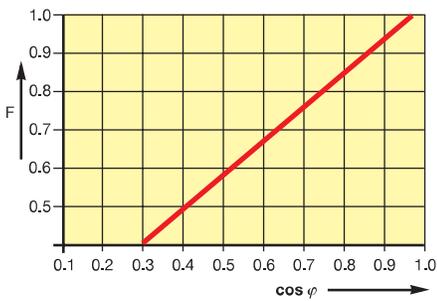
AC load (resistive)



DC load (resistive)

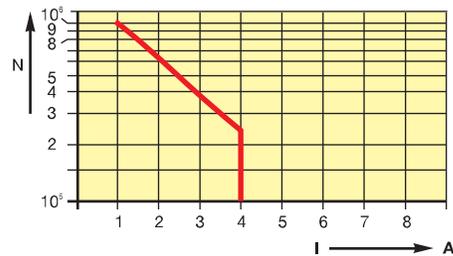


Reduction factor at inductive AC load



Reduction factor F  
at inductive load

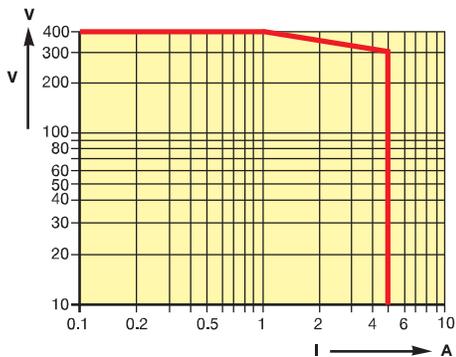
Contact life/ no. of operations



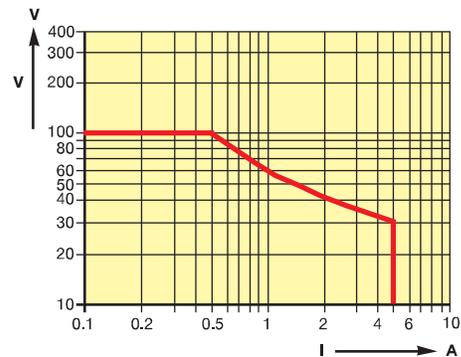
Contact life/  
no. of operations N  
220 V 50 Hz I AC  
360 operations/h

### Load limit curves for the mecotron®-N series (45 mm)

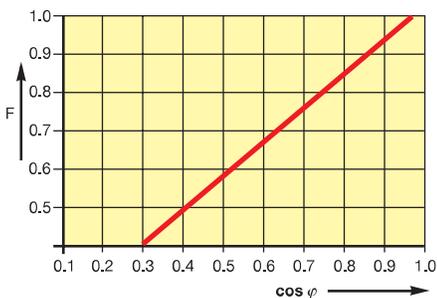
AC load (resistive)



DC load (resistive)

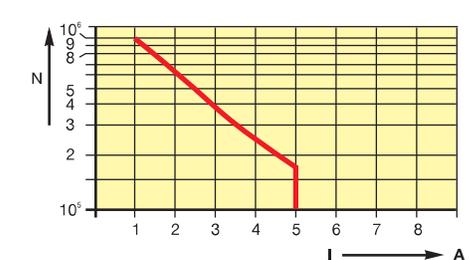


Reduction factor at inductive AC load

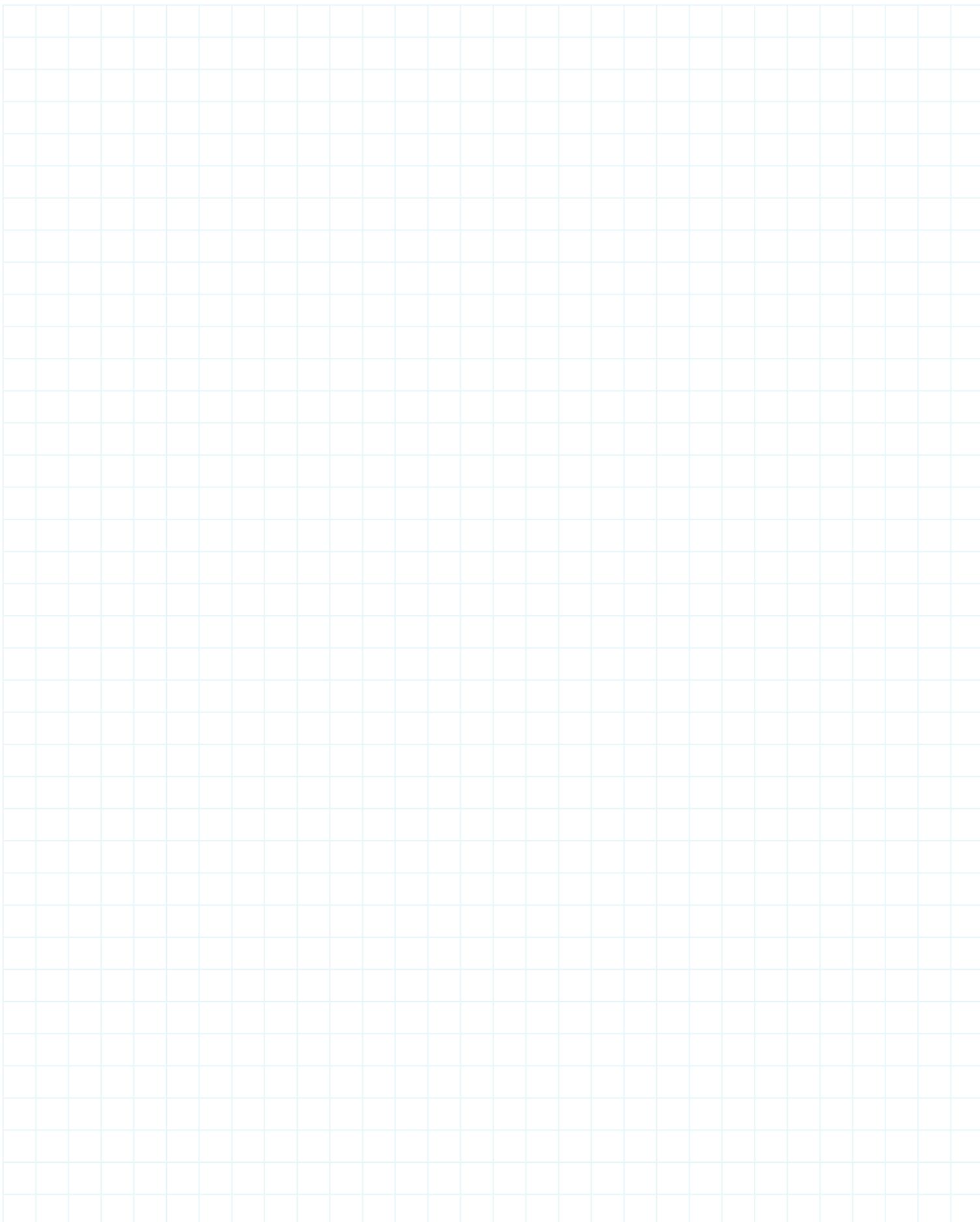


Reduction factor F  
at inductive load

Contact life/ no. of operations



Contact life/  
no. of operations N  
220 V 50 Hz I AC  
360 operations/h



# Current sensors



## Current Monitoring Selection Guide

### Directions:

- 1.) Select the style of product packaging you require.
- 2.) For general features, control, and specific ratings, reference the table below.
- 3.) Find the product name and catalog page number in each column.

For complete product specifications, reference the catalog pages.

## Sensing/Control Relays



AC/DC version w/selectable over or undercurrent; relay output.



AC/DC current trip points as low as 3mA; adjustable hysteresis; relay output.



Adjustable, AC over & undercurrent trip points w/ selectable response modes.



Selectable AC over or undercurrent; adjustable trip point & delay.

### General Features:

DIN Rail Mounting  
Surface Mounting  
Screw Terminals  
Quick Connects

#### SRN

Page 1484

•  
w/adaptor  
•

#### SRS

Page 1486

•  
w/adaptor  
•

#### ECSW

Pages 1488-1489

•  
•

#### ECS

Page 1487

•  
•

### Output:

DPDT Relay  
SPDT Relay  
SPST Solid State

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### Monitored Current:

AC  
DC  
Three Phase

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### Supply Voltage:

24 VAC  
24 ... 240 V AC/DC  
42 ... 48 V AC  
110 ... 130 V AC  
220 ... 240 V AC  
380 ... 415 V AC  
12 & 24 V DC  
3 ... 50 V DC

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### Trip Range(s):

Fixed  
Adjustable  
3 mA ... 1 A  
0.3 ... 15 A  
2 ... 45 A fixed / 2... 20 adjustable  
0 ... 50 A  
0.5 ... 50 A  
1 ... 11 K  $\Omega$   
10 ... 110 K  $\Omega$

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### Delay(s):

Trip  
Inrush

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### Indicator LED(s):

Output ON/OFF  
Supply ON/OFF  
Fault(s)  
Timing

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### Dimensions:

in

1.77 x 3.07 x  $\leq$  3.98

0.886 x 3.07 x  $\leq$  3.98

2.50 x 3.50 x 1.75

(W x H x D) mm

45 x 78 x  $\leq$  101

22.5 x 78 x  $\leq$  101

63.5 x 88.9 x 44.5

#### SRN

Page 1484

#### SRS

Page 1486

#### ECSW

Pages 1488-1489

#### ECS

Page 1487

# Current Monitoring Selection Guide

## Analog Output

## Insulation Monitor



Low cost AC current switch; direct connection to digital PLC input; sinking or sourcing.



Current transducer; linear output proportional to the RMS AC current



Monitor AC current flow with visual indication up to 500 feet from source.



Monitor insulation resistance between ungrounded AC power and earth ground conductors.



Monitor insulation resistance between ungrounded DC power and earth ground conductors.

**TCS**

Page 1490  
w/adaptor

•

•

Current Switch  
1 A Solid State

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Self-Powered (AC)

Self-Powered

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**TCSA**

Page 1491  
w/adaptor

•

•

Linear Output  
4 to 20 mA

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Loop Powered

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**LCS/LPM**

Page 1493

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**IWN (AC)**

Page 1494

w/adaptor

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**IWN (DC)**

Page 1495

w/adaptor

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(2) L+L- Fault

•

2.0 x 2.0 x 1.75

50.8 x 50.8 x 44.5

0.98 x 1.51 x 0.46

24.89 x 38.35 x 11.68

1.77 x 3.07 x ≤ 3.98

45 x 78 x ≤ 101

**TCS**

Page 1490

**TCSA**

Page 1491

**LCS/LPM**

Page 1493

**IWN (AC)**

Page 1494

**IWN (DC)**

Page 1495