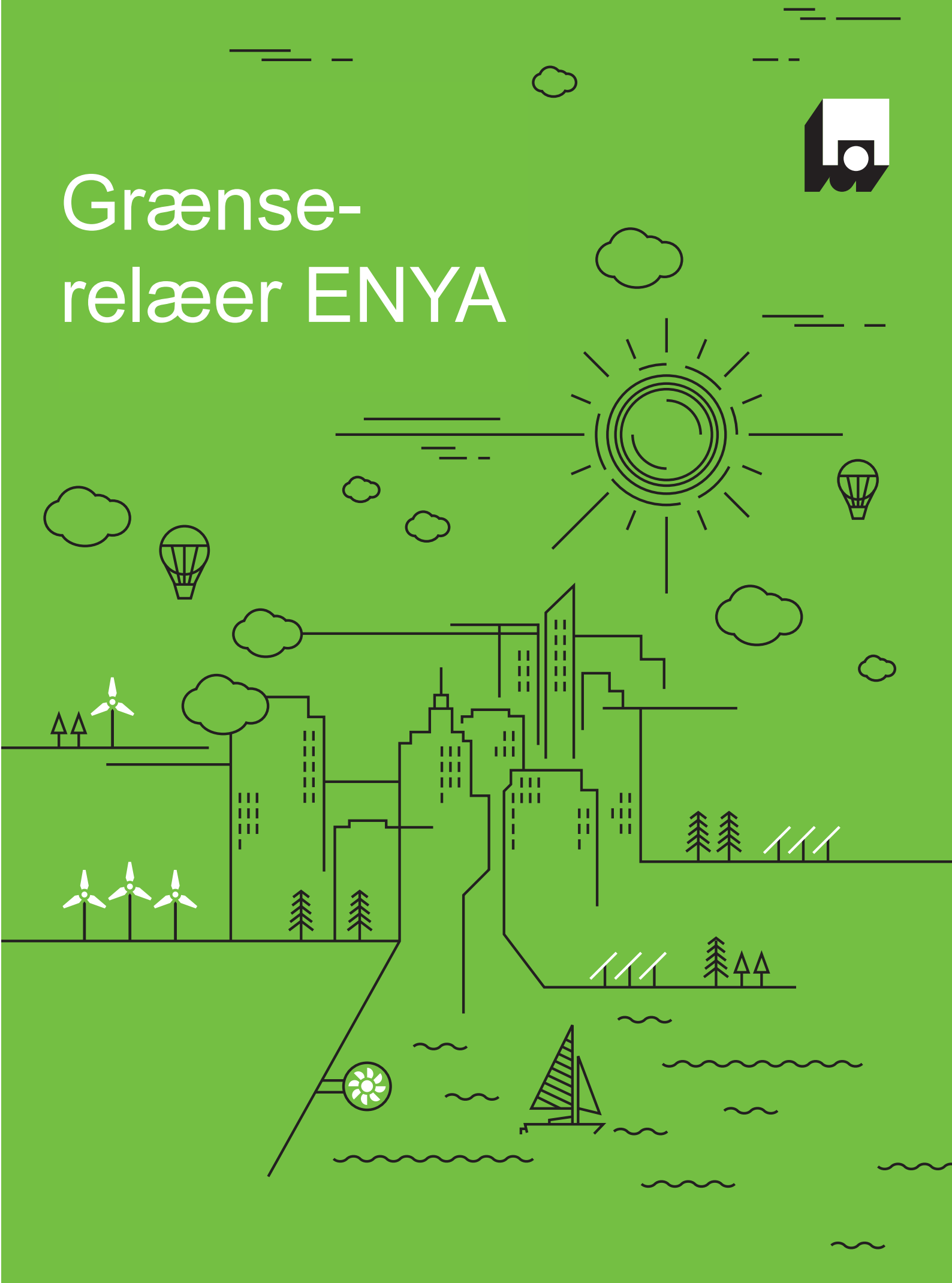
Grænse-relæer ENYA



Indholdsfortegnelse

AC current monitoring in 1-phase mains

E1IM10AACL10

Monitoring relays - ENYA series

Multifunction

1 change over contact

Width 17.5 mm

Installation design

Technical data

1. Functions
AC current monitoring in 1-phase mains with adjustable thresholds, adjustable hysteresis, adjustable tripping delay and the following functions which are selected by means of rotary switch:

OVER	Overcurrent monitoring
UNDER	Undercurrent monitoring
WIN	Monitoring the window between Min and Max
OVER+Latch	Overcurrent monitoring with fault latch
UNDER+Latch	Undercurrent monitoring with fault latch
WIN+Latch	Monitoring the window between Min and Max with fault latch

2. Time ranges

	Adjustment range
Start-up suppression time (Start):	-
Tripping delay (Delay):	0,1 to 10s

3. Indicators

Green LED ON/OFF:	indication of supply voltage
Red LED ON/OFF:	indication of failure of the corresponding threshold
Red LED flashes:	indication of tripping delay of the corresponding threshold
Yellow LED ON/OFF:	indication of output relay

4. Mechanical design
Self extinguishing plastic housing, IP rating IP40
Mounted on DIN rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	230V AC
Terminals:	Li-N
Tolerance:	-15% to +15% of U_N
Rated consumption:	5VA (0.8W)
Rated frequency:	AC 48 to 63Hz
Duration of operation:	100%
Reset time:	500ms
Wave form:	Sinus
Hold-up time:	-
Drop-out voltage:	>20% of rated voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V AC
Switching capacity:	1250VA (5A / 250V AC)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	AC sinus, 48 to 63Hz
Measuring input:	10A AC
Terminals:	Li, Lk
Overload capacity:	13A (ex 10A - distance > 5mm)
Starting current:	
1s	100A
3s	50A
Input resistance:	3mW
Switching threshold U_S:	see table ordering information or printing on the unit
Hysteresis H:	see table ordering information or printing on the unit
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% of nominal value
Adjustment accuracy:	±5% of nominal value
Repetition accuracy:	≤2% of nominal value
Voltage influence:	-
Temperature influence:	≤0.05% / °C

9. Ambient conditions

Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

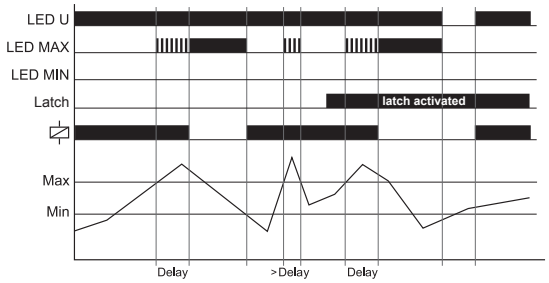
Single packing:	72g
Package of 10pcs:	655g per package

Functions

Overcurrent monitoring (OVER, OVER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is below the Max-value.
When the measured current exceeds the Max-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

OVER:
The output relay R switches into on-position again, if the current falls below the Min-value.

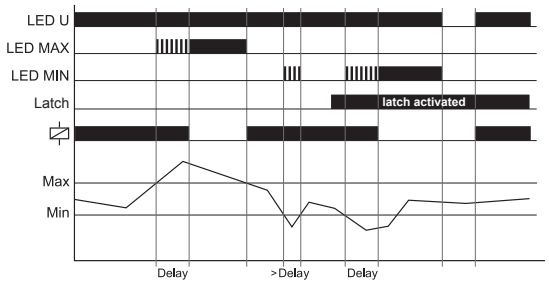
OVER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is below the Max-value.



Window function (WIN, WIN+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is within the adjusted window.
When the measured current leaves the window between Min and Max, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

WIN:
The output relay R switches into on-position again, if the current re-enter the adjusted window.

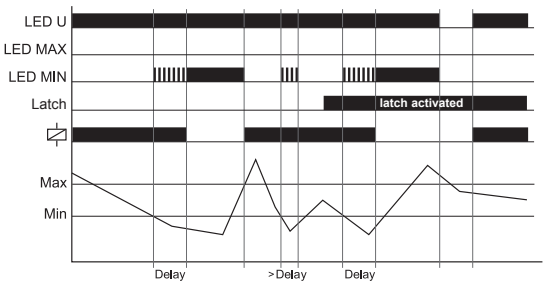
WIN+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is within the threshold values.



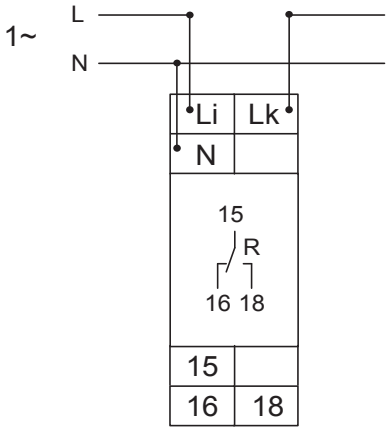
Untercurrent monitoring (UNDER, UNDER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is beyond the Min-value.
When the measured current falls below the Min-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

UNDER:
The output relay R switches into on-position again, if the current exceeds the Max-value.

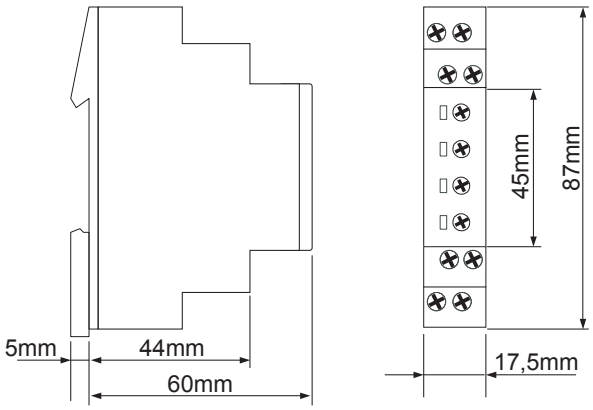
UNDER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is beyond the Min-value.



Connections



Dimensions



Ordering information

Type	Rated voltage U_N	Functions	Switching thresholds I_S	Tripping delay (Delay)	Hysteresis	Art. No.
E1IM10AACL10 230V AC	230V AC	O, U, W, O+L, U+L, W+L	Max: 10% to 100% of I_N Min: 5% to 95% of I_N	0.1 of 10s	adjustable	1340200

AC current monitoring in 1-phase mains

E1IM10AACL10

Monitoring relays - ENYA series

Multifunction

1 change over contact

Width 17.5 mm

Installation design

Technical data

1. Functions
AC current monitoring in 1-phase mains with adjustable thresholds, adjustable hysteresis, adjustable tripping delay and the following functions which are selected by means of rotary switch:

OVER	Overcurrent monitoring
UNDER	Undercurrent monitoring
WIN	Monitoring the window between Min and Max
OVER+Latch	Overcurrent monitoring with fault latch
UNDER+Latch	Undercurrent monitoring with fault latch
WIN+Latch	Monitoring the window between Min and Max with fault latch

2. Time ranges

	Adjustment range
Start-up suppression time (Start):	-
Tripping delay (Delay):	0,1 to 10s

3. Indicators

Green LED ON/OFF:	indication of supply voltage
Red LED ON/OFF:	indication of failure of the corresponding threshold
Red LED flashes:	indication of tripping delay of the corresponding threshold
Yellow LED ON/OFF:	indication of output relay

4. Mechanical design
Self extinguishing plastic housing, IP rating IP40
Mounted on DIN rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	230V AC
Terminals:	Li-N
Tolerance:	-15% to +15% of U_N
Rated consumption:	5VA (0.8W)
Rated frequency:	AC 48 to 63Hz
Duration of operation:	100%
Reset time:	500ms
Wave form:	Sinus
Hold-up time:	-
Drop-out voltage:	>20% of rated voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V AC
Switching capacity:	1250VA (5A / 250V AC)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	AC sinus, 48 to 63Hz
Measuring input:	10A AC
Terminals:	Li, Lk
Overload capacity:	13A (ex 10A - distance > 5mm)
Starting current:	
1s	100A
3s	50A
Input resistance:	3mW
Switching threshold U_S:	see table ordering information or printing on the unit
Hysteresis H:	see table ordering information or printing on the unit
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% of nominal value
Adjustment accuracy:	±5% of nominal value
Repetition accuracy:	≤2% of nominal value
Voltage influence:	-
Temperature influence:	≤0.05% / °C

9. Ambient conditions

Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

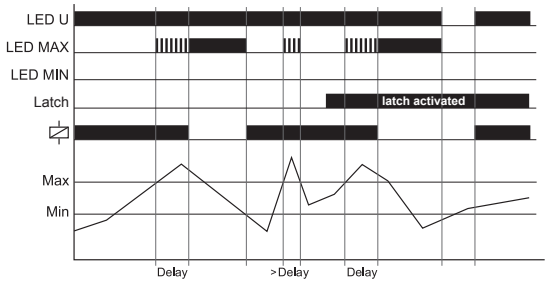
Single packing:	72g
Package of 10pcs:	655g per package

Functions

Overcurrent monitoring (OVER, OVER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is below the Max-value.
When the measured current exceeds the Max-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

OVER:
The output relay R switches into on-position again, if the current falls below the Min-value.

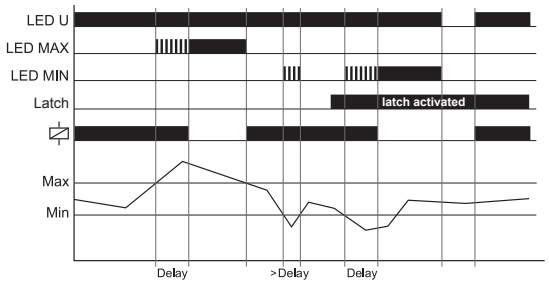
OVER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is below the Max-value.



Window function (WIN, WIN+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is within the adjusted window.
When the measured current leaves the window between Min and Max, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

WIN:
The output relay R switches into on-position again, if the current re-enter the adjusted window.

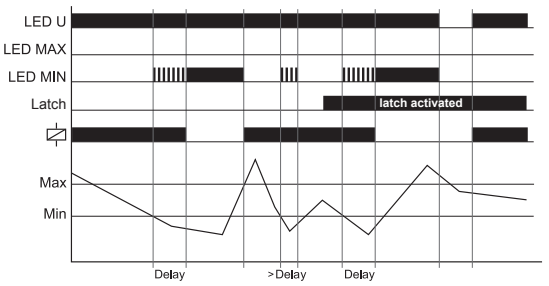
WIN+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is within the threshold values.



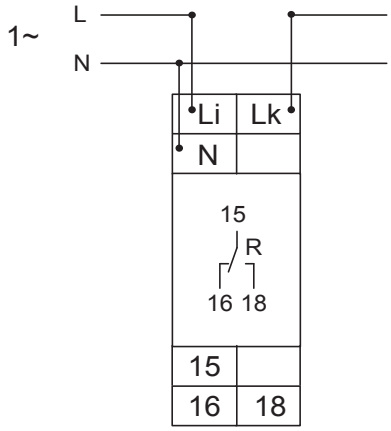
Untercurrent monitoring (UNDER, UNDER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured current is beyond the Min-value.
When the measured current falls below the Min-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

UNDER:
The output relay R switches into on-position again, if the current exceeds the Max-value.

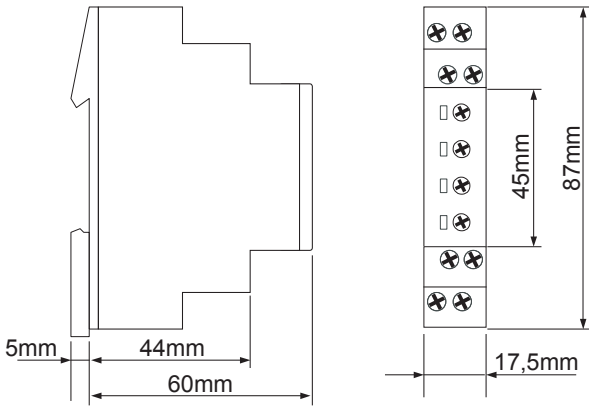
UNDER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying of the supply voltage, provided that the measured current is beyond the Min-value.



Connections



Dimensions



Ordering information

Type	Rated voltage U_N	Functions	Switching thresholds I_S	Tripping delay (Delay)	Hysteresis	Art. No.
E1IM10AACL10 230V AC	230V AC	O, U, W, O+L, U+L, W+L	Max: 10% to 100% of I_N Min: 5% to 95% of I_N	0.1 of 10s	adjustable	1340200

AC/DC current monitoring in 1-phase mains

E3IM10AL20

Monitoring relays - ENYA series

Multifunction

2 change over contacts

Width 35 mm

Installation design

Technical data

1. Functions

AC/DC current monitoring in 1-phase mains with adjustable thresholds (Min and Max), timing for start-up suppression and tripping delay separately adjustable and the following functions which are selectable by means of rotary switch:

OVER	Overcurrent monitoring
UNDER	Undercurrent monitoring
WIN	Monitoring the window between Min and Max
OVER+Latch	Overcurrent monitoring with fault latch
UNDER+Latch	Undercurrent monitoring with fault latch
WIN+Latch	Monitoring the window between Min and Max with fault latch

2. Time ranges

	Adjustment range
Start-up suppression time (Start):	0s to 10s
Tripping delay (Delay):	0,1s to 10s

3. Indicators

Green LED U/t ON/OFF:	indication of supply voltage
Green LED U/t flashes:	indication of start-up suppression time
Red min/max LED ON/OFF:	indication of failure of the corresponding threshold
Red min/max LED flashes:	indication of tripping delay of the corresponding threshold
Yellow LED ON/OFF:	indication of relay output

4. Mechanical design

Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	230V AC
Terminals:	A1-A2
Tolerance:	-15% to +15% of UN
Rated consumption:	2VA (1.2W)
Rated frequency:	AC 48 of 63Hz
Duration of operation:	100%
Reset time:	500ms
Wave form:	Sinus
Hold-up time:	-
Drop-out voltage:	>20% of the supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit

2 potential free change over contacts

Rated voltage:	250V AC
Switching capacity:	1250VA (5A / 250V AC)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage capacitiy:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measured variable:	DC or AC Sinus (16.6 to 400Hz)
Measuring input:	
100mA AC/DC	terminals K-I1(+)
1A AC/DC	terminals K-I2(+)
10A AC/DC	terminals K-I3(+)
Overload capacity:	
100mA AC/DC	800mA
1A AC/DC	3A
10A AC/DC	12A
Input resistance:	
100mA AC/DC	470mΩ
1A AC/DC	47mΩ
10A AC/DC	5mΩ
Switching thresholds:	
Max:	10% to 100% of IN
Min:	5% to 95% of IN
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% (of nominal value)
Frequency response:	-10% to +5% (16.6 to 400Hz)
Adjustment accuracy:	≤5% (of maximum scale value)
Repetition accuracy:	≤2%
Voltage influence:	-
Temperature influence:	≤0.05% / °C

9. Ambient conditions

Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2, if built in 3 (in accordance with IEC 60664-1)

10. Weight

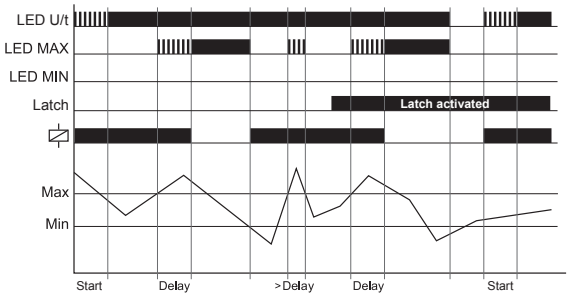
Single packing:	140g

Functions

Overcurrent monitoring (OVER, OVER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position and the set interval of the start-up suppression time (Start) begins. During this period, changes of the measured current don‘t affect the state of the output relay R. When the measured current exceeds the Max-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

OVER:
The output relay R switches into on-position again, as soon as the current falls below the Min-value.

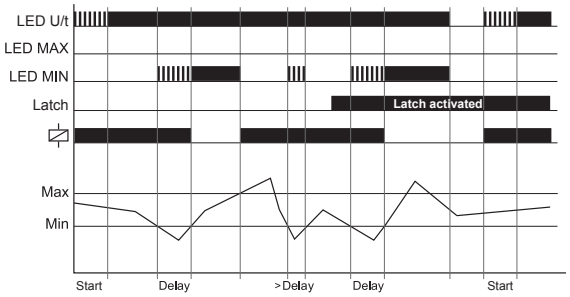
OVER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying the supply voltage, provided that the measured current is below the Max-value after the interval of the start-up suppression time has expired.



Undercurrent monitoring (UNDER, UNDER+Latch)
When the supply voltage U is applied, the output relay R switches into on-position and the set interval of the start-up suppression time (Start) begins. During this period, changes of the measured current don‘t affect the state of the output relay R.
When the measured current falls below the Min-value, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

UNDER:
The output relay R switches into on-position again, as soon as the current exceeds the Max-value.

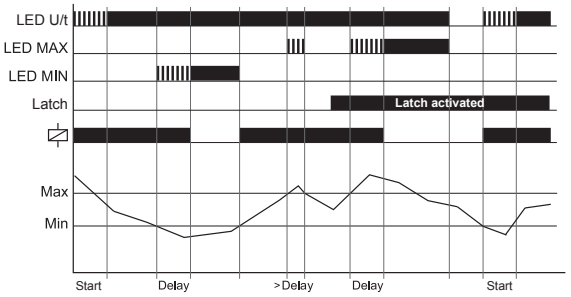
UNDER+Latch:
The output relay R switches only into on-position again by interrupting and re-applying the supply voltage, provided that the measured current is beyond the Min-value after the interval of the start-up suppression time has expired.



Window function (WIN, WIN+Latch)
When the supply voltage U is applied, the output relay R switches into on-position and the set interval of the start-up suppression time (Start) begins. During this period, changes of the measured current don‘t affect the state of the output relay R. When the measured current leaves the window between Min and Max, the output relay R switches into off-position after the interval of the tripping delay (Delay) has expired.

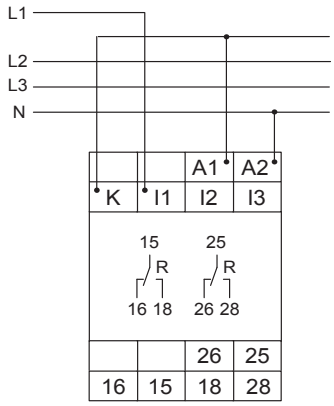
WIN:
The output relay R switches into on-position again, as soon as the measured current reenter the adjusted window.

WIN+Latch:
The output relay R switches only into on-position again by interrupting and re-applying the supply voltage, provided that the measured current is within the threshold values after the interval of the start-up suppression time has expired.

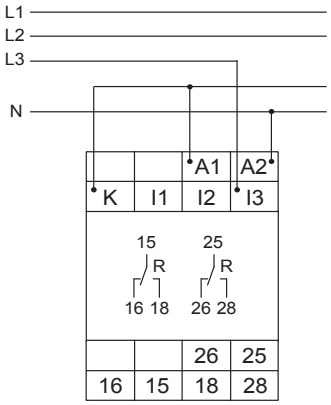


Connections

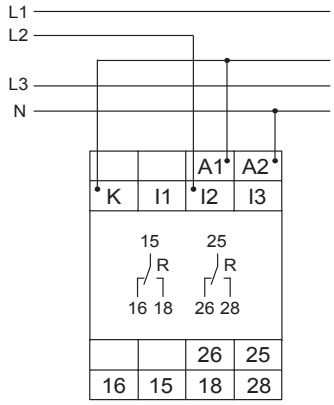
Measuring range 100mA, supply voltage 230V AC



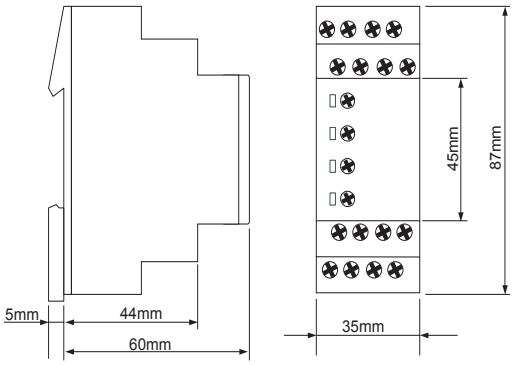
Measuring range 10A, supply voltage 230V AC



Measuring range 1A, supply voltage 230V AC



Dimensions



Ordering Informations

Types	Rated voltage U_N	Functions	Switching thresholds I_S	Part. No.
E3IM10AL20	230V	O, U, W O+L, U+L, W+L	Max. 10% to 100% ofI_N Min. 5% to 95% of I_N	1341200

AC/DC voltage monitoring in 1-phase mains

E1UM230V01

Monitoring relays - ENYA series

Multifunction

1 change over contact

Width 17.5 mm

Installation design

Technical data

1. Functions
AC/DC voltage monitoring in 1-phase mains with adjustable threshold and hysteresis.

UNDER	Undervoltage monitoring
WIN	Monitoring the window between Min and Max

2. Time ranges

	Adjustment range
Start-up suppression time (Start):	-
Tripping delay (Delay):	-

3. Indicators

Green LED ON/OFF:	indication of supply voltage
Red LED ON/OFF:	indication of failure of the corresponding threshold
Yellow LED ON/OFF:	indication of output relay

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	(= measuring voltage)
Terminals:	
230V a.c.	E-F3
24V a.c.	E-F2
24V d.c.	E-F1(+)
Rated voltage U_N:	see table ordering information or printing on the unit
Tolerance:	-25% to +20% of U_N
Rated consumption:	
230V a.c.	10VA (0.6W)
24V a.c.	1.3VA (0.8W)
24V d.c.	0.6W
Rated frequency:	a.c. 48 to 63Hz
Duration of operation:	100%
Reset time:	500ms
Wave form:	d.c., a.c. Sinus
Hold-up time:	-
Drop-out voltage:	determined by undervoltage detection (see measured circuit)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V a.c.
Switching capacity:	1250VA (5A / 250V)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	d.c. or a.c. Sinus, 48 to 63Hz
Measuring input:	(= supply voltage)
Terminals:	
230V a.c.	E-F3
24V a.c.	E-F2 The distance between the devices must be greater than 5mm.
24V d.c.	E-F1(+)
Overload capacity:	120% of U_N
Input resistance:	-
Switching threshold U_S:	see table ordering information or printing on the unit
Hysteresis H:	see table ordering information or printing on the unit
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% of nominal value
Adjustment accuracy:	±5% of nominal value
Repetition accuracy:	≤2% of nominal value
Voltage influence:	-
Temperature influence:	≤0,05% / °C

9. Ambient conditions

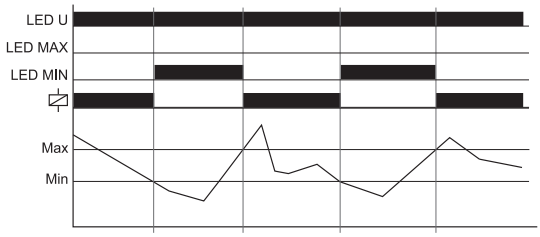
Ambient temperature:	-25 to +55°C (in accordance with IEC 60068-1)
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

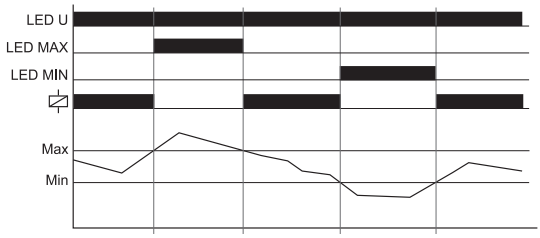
Single packing :	75g
Package of 10pcs:	684g per package

Functions

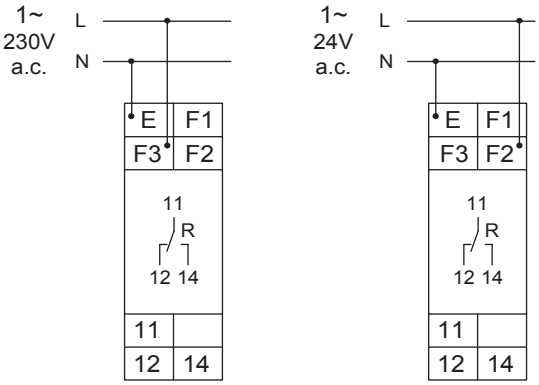
Undervoltage monitoring (UNDER)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured voltage is beyond the Min-value.
When the measured voltage falls below the Min-value, the output relay R switches into off-position. The output relay R switches into on-position again, if the voltage exceeds the Max-value.

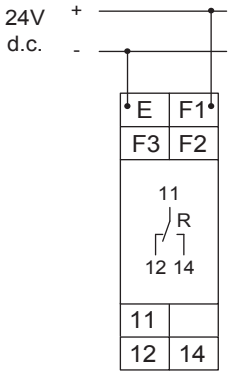


Window function (WIN)
When the supply voltage U is applied, the output relay R switches into on-position, if the measured voltage is within the adjusted window.
When the measured voltage left the window between Min and Max, the output relay R switches into off-position. The output relay R switches into on-position again, if the voltage re-enter the adjusted window.

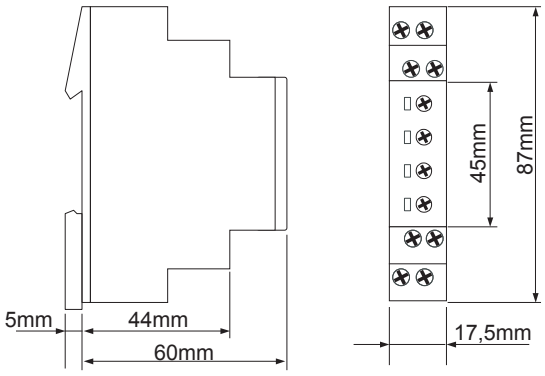


Connections





Dimensions



Voltage monitoring in 3-phase mains

E1PF400VSY01

Monitoring relays - ENYA series

Monitoring of phase sequence and phase failure

Monitoring of asymmetry

Connection of neutral wire optional

Supply voltage = measuring voltage

1 change over contact

Width 17.5mm

Installation design

Technical data

1. Functions
Monitoring of phase sequence, phase failure and asymmetry with adjustable asymmetrie, connection of neutral wire optional.

2. Time ranges

	Adjustment range
Tripping delay:	fixed, approx. 100ms

3. Indicators

Green LED ON:	indication of supply voltage
Yellow LED ON/OFF:	indication of relay output

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
1 x 0.5 to 2.5mm^2 with/without multicore cable end
1 x 4mm^2 without multicore cable end
2 x 0.5 to 1.5mm^2 with/without multicore cable end
2 x 2.5mm^2 flexible without multicore cable end

5. Input circuit

Supply voltage:	(= measured voltage)
Terminals:	(N)-L1-L2-L3
Rated voltage UN:	see table ordering information or printing on the unit
Tolerance:	-30% to +30% of U_N
Rated consumption:	8VA (0.8W)
Rated frequency:	AC 48 to 63Hz
Duty cycle:	100%
Reset time:	500ms
Hold-up time:	-
Drop out voltage:	>20% of the supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V AC
Switching capacity:	1250VA (5A / 250V AC)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	3(N)~, sinus, 48 to 63Hz
Measuring input:	(= supply voltage)
Terminals:	(N)-L1-L2-L3
Overload capacity:	determined by tolerance specified for supply voltage
Input resistance:	-
Asymmetry:	5% ... 25%
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% (of nominal value)
Adjustment accuracy:	≤5%
Repetition accuracy:	±2%
Voltage influence:	-
Temperature influence:	≤0.05% / °C

9. Ambient conditions

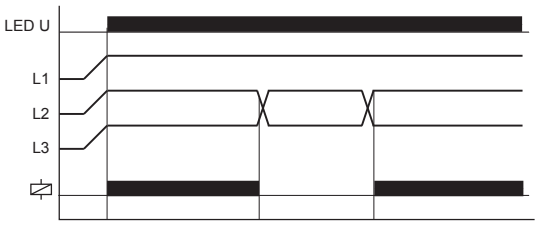
Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

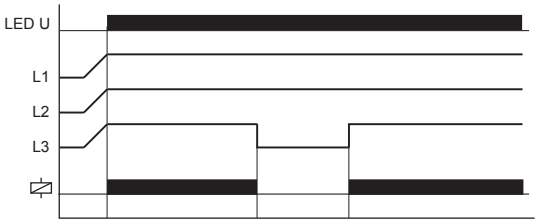
Single packing:	72g
Packing of 10pcs:	670g per Package

Functions

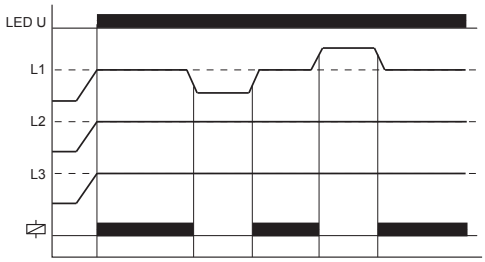
Phase sequence monitoring
When all the phases are connected in the correct sequence and the measured asymmetry is less than the fixed value, the output relay switches into on-position (yellow LED illuminated). When the phase sequence changes, the output relay switches into off-position (yellow LED not illuminated).



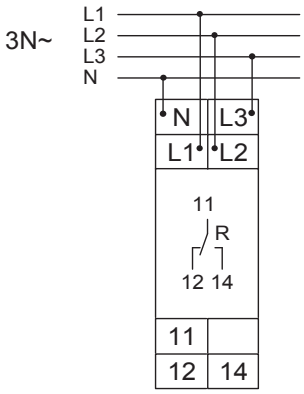
Überwachung Phasenausfall
Das Ausgangsrelais R fällt ab (gelbe LED leuchtet nicht), wenn eine der Phasen ausfällt.



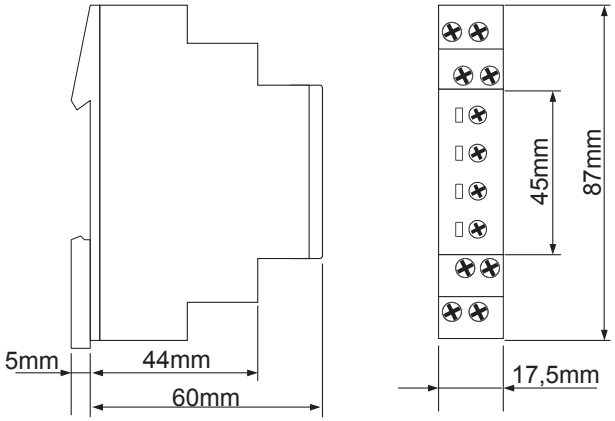
Asymmetry monitoring
The output relay R switches into off-position (yellow LED not illuminated) when the asymmetrie exceeds the value set at the ASYM-regulator. Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection.



Connections



Dimensions



Ordering information

Types	Rated voltage U_N	Switching thresholds	Part. No. (PQ 1)	Part. No. (PQ 10)
E1PF400VSY01	3(N)~ 400/230V	Asymmetrie 5%...25%	1340300	1340300A

E3YM230VS20

Monitoring relays - ENYA series

Multifunction

Monitoring of phase failure

Monitoring of phase sequence selectable

Connection of neutral wire optional

2 change over contacts

Width 35 mm

Installation design

Technical data

1. Functions
Voltage monitoring in 3-phase and 1-phase mains with adjustable thresholdes, adjustable tripping delay, monitoring of phase sequence and phase failure and the following functions which are selectable by the means of rotary switch:

UNDER	Undervoltage monitoring
UNDER+SEQ	Undervoltage monitoring and monitoring of phase sequence
WIN	Monitoring the window between Min and Max
WIN+SEQ	Monitoring the window between Min and Max and monitoring of phase sequence

2. Time ranges

	Adjustment range	
Start-up suppression time:	-	
Tripping delay:	0s	30s

3. Indicators

Red LED ON/OFF:	indication of failure of the corresponding threshold
Red LED flashes:	indication of tripping delay of the orresponding threshold
Yellow LED ON/OFF:	indication of relay output

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminals capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 bis 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	(= measured voltage)
Terminals:	(N)-L1-L2-L3
Rated voltage U_N:	see table ordering information or printing on the unit
Tolerance:	-30% to +30% of U_N
Rated consumption:	5.5VA (1W)
Rated frequency:	AC 48 bis 63Hz
Duty cycle:	100%
Reset time:	500ms
Hold-up time:	-
Drop out voltage:	>20% of supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
2 potential free change over contacts

Rated voltage:	250V AC
Switching capacity:	1250VA (5A / 250V)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching capacity:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	3(N)~, sinus, 48 to 63Hz
Measuring input:	(= supply voltage)
Terminals:	(N)-L1-L2-L3
Overload capacity:	determined by tolerance specified for supply voltage
Input resistance:	-
Swiching treshold:	
Max:	80%...130% of U_N
Min:	70%...120% of U_N
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% of nominal value
Adjustment accuracy:	≤5% of maximum scale value
Repetition accuracy:	≤2%
Voltage influence:	-
Temperature influence:	≤0,05% / °C

9. Ambient conditions

Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2, if built in 3 (in accordance with IEC 60664-1)

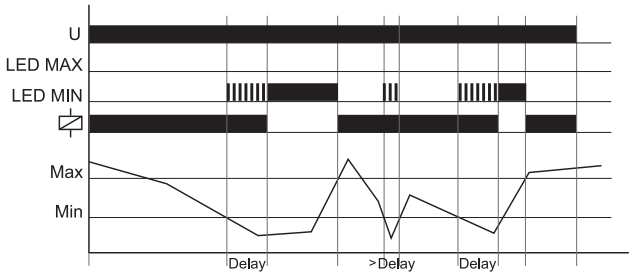
10. Weight

Single packing:	107g

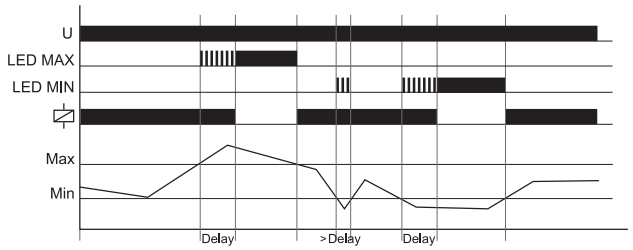
Functions

For all functions the LED's Min and Max are flashing alternating (the relay is fallen off), when the minimum value for the measured voltage was chosen to be greater than the maximum value.
If a failure already exists when the device is activated, the output relay remains in off-position and the LED for the corresponding threshold is illuminated.
The device includes seperately every phase voltage (L-N) and monitors it according to the selected function (UNDER or WINDOW).

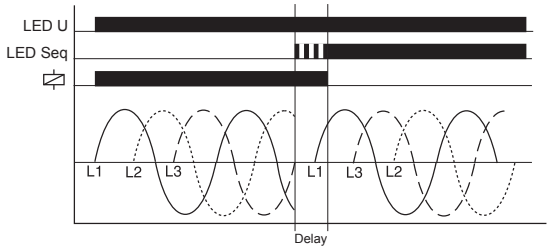
Undervoltage monitoring (UNDER, UNDER+SEQ)
When the measured voltage (one of the phase voltages) falls below the value adjusted at the Min-regulator, the set interval of the tripping delay (Delay) begins (red LED Min flashes). After the interval has expired (red LED Min illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the Max-regulator.



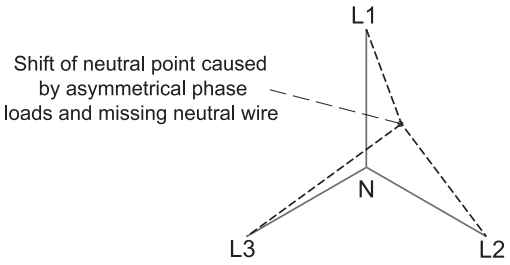
Windowfunction (WIN, WIN+SEQ)
The output relay R switches into on-position (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the Min-regulator. When the measured voltage (one of the phase voltages) exceeds the value adjusted at the Max-regulator, the set interval of tripping delay (Delay) begins (red LED Max flashes). After the interval has expired (red LED Max illuminated) the output relay R switches into off-position (yellow LED not illuminated). The output relay switches into on-position again (yellow LED illuminated) when the measured voltage falls below the value adjusted at the Max-regulator (red LED Max not illuminated). When the measured voltage (one of the phase voltage) falls below the value adjusted at the Min-regulator, the set interval of tripping delay (Delay) begins again (red LED Min flashes). After the interval has expired (red LED Min illuminated), the output relay R switches into off-positon (yellow LED not illuminated).



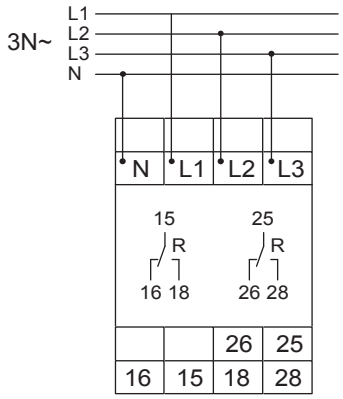
Phase sequence monitoring (SEQ)
Phase sequence monitoring is selectable for all functions.
In single phase circuit, the phase sequence monitoring must be disconnected.
If a change in phase sequence is detected (red LED SEQ illuminated), the output relay R switches into off-position after the set interval of tripping delay (Delay) has expired (yellow LED not illuminated).

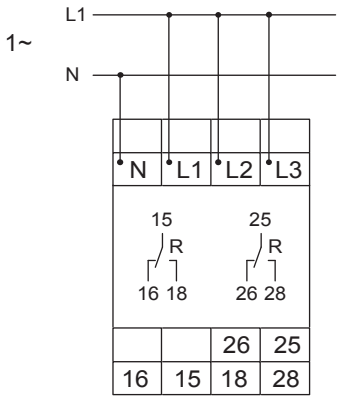


Neutral wire break
The device monitors every phase (L1, L2 and L3) against the neutral wire N.
A shift of neutral point occurs by an asymmetrical phase load if the neutral wire breaks in the power line. If one of the phase voltages exceeds the value adjusted at the trip point, the set interval of tripping delay (Delay) begins (red LED Min or Max flashes). After the interval has expired (red LED Min or Max illuminated), the output relay switches into off-position (yellow LED not illuminated).

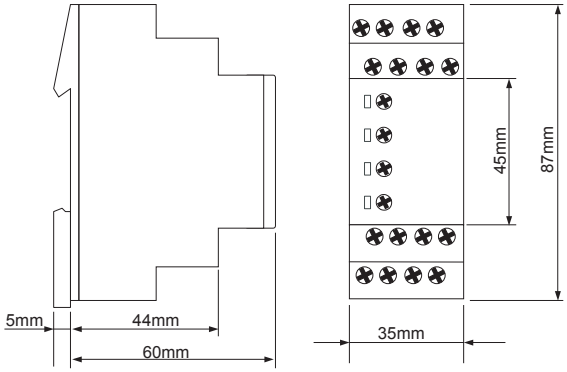


Connections





Dimensions



Ordering information

Type	Rated voltage U_N	Part. No.
E3YM230VS20	3(N)-230/132V	1341406

Voltage monitoring in 3- and 1-phase mains

E3YM400VSY20

Monitoring relays - ENYA series

Multifunction

Monitoring of phase failure and asymmetry

Monitoring of phase sequence selectable

Connection of neutral wire optional

2 change over contacts

Width 35 mm

Installation design

Technical data

1. Functions
Voltage monitoring in 3-phase and 1-phase mains with adjustable thresholdes, adjustable tripping delay, monitoring of phase sequence, phase failure, asymmetry with adjustable asymmetry and the following functions which are selectable by means of rotary switch:

UNDER	Undervoltage monitoring
UNDER+SEQ	Undervoltage monitoring and monitoring of phase sequence
WIN	Monitoring the window between Min and Max
WIN+SEQ	Monitoring the window between Min and Max and monitoring of phase sequence

2. Time ranges

	Adjustment range	
Start-up suppression time:	-	
Tripping delay:	0s	30s

3. Indicators

Red LED ON/OFF:	indication of failure of the corresponding threshold
Red LED flashes:	indication of tripping delay of the corresponding threshold
Yellow LED ON/OFF:	indication of relay output

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminals capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 bis 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Supply voltage:	(= measured voltage)
Terminals:	(N)-L1-L2-L3
Rated voltage U_N:	see table ordering information or printing on the unit
Tolerance:	-30% to +30% of U_N
Rated consumption:	11VA (1.2W)
Rated frequency:	AC 48 bis 63Hz
Duty cycle:	100%
Reset time:	500ms
Hold-up time:	-
Drop out voltage:	>20% of supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

6. Output circuit
2 potential free change over contacts

Rated voltage:	250V a.c.
Switching capacity:	1250VA (5A / 250V a.c.)
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching capacity:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

7. Measuring circuit

Measuring variable:	3(N)~, sinus, 48 to 63Hz
Measuring input:	(= supply voltage)
Terminals:	(N)-L1-L2-L3
Overload capacity:	determined by tolerance specified for supply voltage
Input resistance:	-
Swiching treshold:	
Max:	80% ...130% of U_N
Min:	70% ...120% of U_N
Asymmetry:	5% ... 25% of U_N , OFF
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	4kV

8. Accuracy

Base accuracy:	≤5% of nominal value
Adjustment accuracy:	≤5% of maximum scale value
Repetition accuracy:	≤2%
Voltage influence:	-
Temperature influence:	≤0,05% / °C

9. Ambient conditions

Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

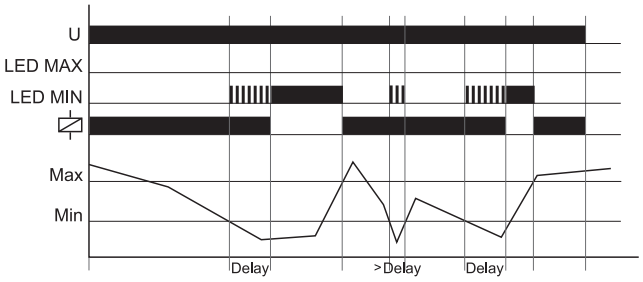
10. Weight

Single packing:	107g

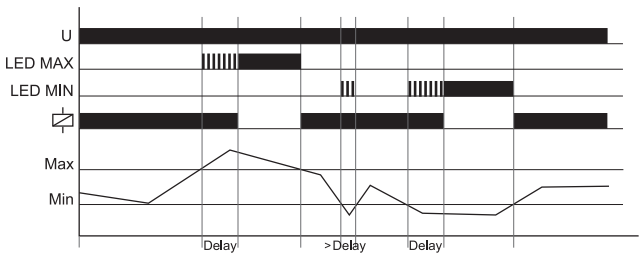
Functions

For all functions the LED's Min and Max are fl ashing alternating (the relay is fallen off), when the minimum value for the measured voltage was chosen to be greater than the maximum value.
If a failure already exists when the device is activated, the output relay remains in off-position and the LED for the corresponding threshold is illuminated.
The device includes seperately every phase voltage (L-N) and monitors it according to the selected function (UNDER or WINDOW).

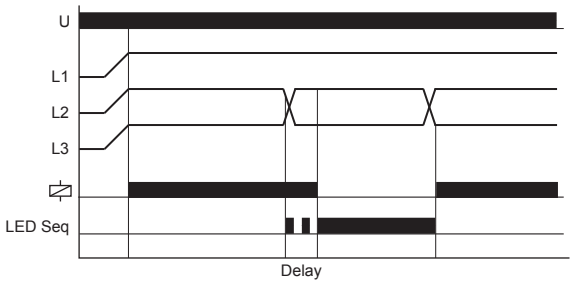
Undervoltage monitoring (UNDER, UNDER+SEQ)
When the measured voltage (one of the phase voltages) falls below the value adjusted at the Min-regulator, the set interval of the tripping delay (Delay) begins (red LED Min fl ashes). After the interval has expired (red LED Min illuminated), the output relay R switches into off-position (yellow LED not illuminated). The output relay R switches into on-position again (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the Maxregulator.



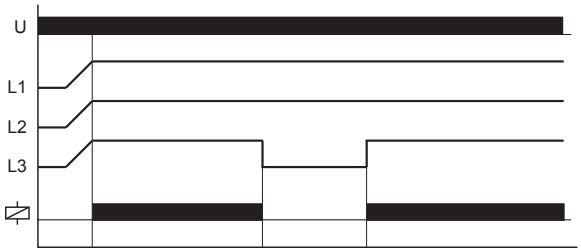
Window function (WIN, WIN+SEQ)
The output relay R switches into on-position (yellow LED illuminated), when the measured voltage (all phase voltages) exceeds the value adjusted at the Min-regulator. When the measured voltage (one of the phase voltages) exceeds the value adjusted at the Max-regulator, the set interval of tripping delay (Delay) begins (red LED Max fl ashes). After the interval has expired (red LED Max illuminated) the output relay R switches into off-position (yellow LED not illuminated). The output relay switches into on-position again (yellow LED illuminated) when the measured voltage falls below the value adjusted at the Max-regulator (red LED Max not illuminated). When the measured voltage (one of the phase voltage) falls below the value adjusted at the Min-regulator, the set interval of tripping delay (Delay) begins again (red LED Min fl ashes). After the interval has expired (red LED Min illuminated), the output relay R switches into off-positon (yellow LED not illuminated).



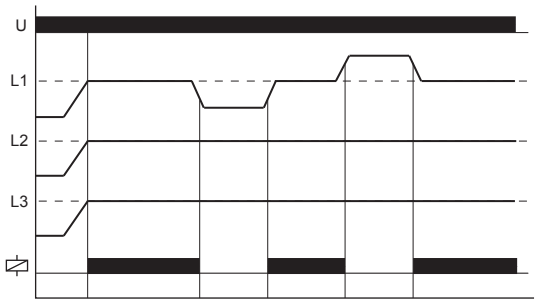
Phase sequence monitoring (SEQ)
Phase sequence monitoring is selectable for all functions.
In single phase circuit, the phase sequence monitoring must be disconnected. If a change in phase sequence is detected (red LED SEQ illuminated), the output relay R switches into off-position after the set interval of tripping delay (Delay) has expired (yellow LED not illuminated).



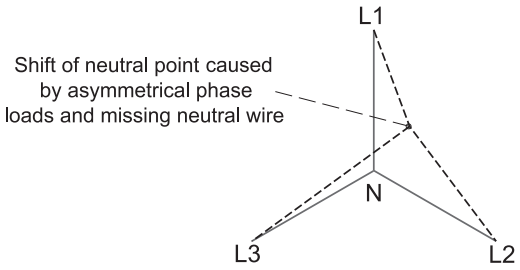
Phase failure monitoring
The output relay R switches into off-position (yellow LED not illuminated), when one of the three phases fails.



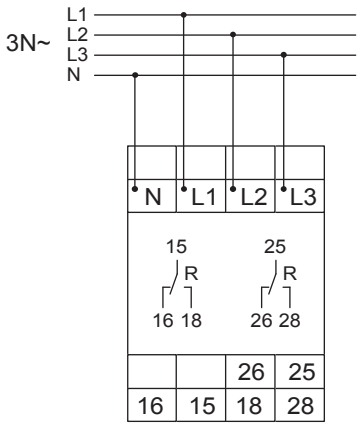
Asymmetry monitoring
The output relay R switches into off-position (yellow LED not illuminated) when the asymmetry exceeds the value set at the ASYM-regulator. Reverse voltages of a consumer (e.g. a motor which continues to run on two phases only) do not effect the disconnection.

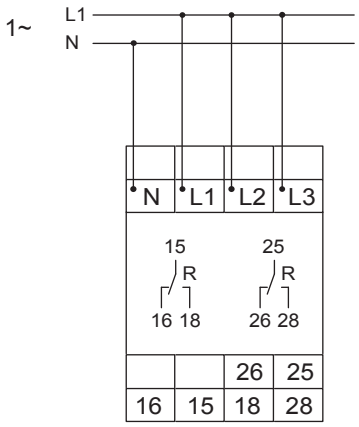


Neutral wire break
The device monitors every phase (L1, L2 and L3) against the neutral wire N.
A shift of neutral point occurs by an asymmetrical phase load if the neutral wire breaks in the power line. If one of the phase voltages exceeds the value adjusted at the trip point, the set interval of tripping delay (Delay) begins (red LED Min or Max flashes). After the interval has expired (red LED Min or Max illuminated), the output relay switches into off-position (yellow LED not illuminated).

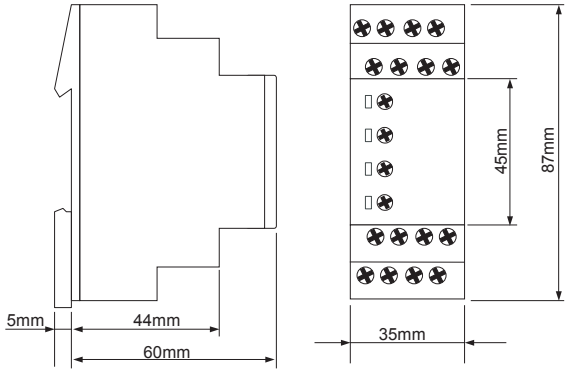


Connections





Dimensions



Ordering information

Type	Rated voltage U_N	Functions	Switching threshold U_S	Tripping delay (Delay)	Part No.
E3YM400VSY20	3(N)~400/230V	U, W, U+S, W+S	Max: 80% to 130% of U_N Min: 70% to 120% of U_N Asymmetry: 5%...25%	0s to 30s	1341408

Level monitoring of conductive liquids

E3LC10 230V AC

Monitoring relays - ENYA series

Multifunction

Secure isolation of the measuring circuit

1 change over contacts

Width 35mm

Installation design

Technical data

1. Functions
Level monitoring of conductive liquid with adjustable sensitivity and the following functions which are selectable by means of rotary switch:

Pump up	pump up or minimum monitoring
Pump down	pump down or maximum monitoring

2. Time ranges

	Adjustment range
Tripping delay (Delay ON):	fixed 5s
Turn-off delay (Delay OFF):	fixed 5s

3. Indicators

Green LED ON:	indication of supply voltage
Yellow LED ON/OFF:	indication of output relay

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:

1 x 0.5 to 2.5mm²	with/without multicore cable end
1 x 4mm²	without multicore cable end
2 x 0.5 to 1.5mm²	with/without multicore cable end
2 x 2.5mm² flexible	without multicore cable end

5. Input circuit

Terminals:	A1-A2
Rated voltage U_N:	230V a.c.
Tolerance:	-15% of +10% of U_N
Rated consumption:	2VA (1.0W)
Rated frequency:	a.c. 48 to 63Hz
Duty cycle:	100%
Reset time:	500ms
Hold-up time:	-
Drop-out voltage:	>30% of supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V a.c.
Switching capacity:	1250VA a.c.1 B300/P300 (in accordance with IEC 60947-5-1) therm. constant current 5A
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

7. Measuring circuit

Measuring input:	conductive probes (Type SK1, SK2, SK3)
Terminals:	E1-E2-E3
Sensitivity:	5 to 100kΩ (200µS to 10µS)
Threshold:	5 to 100kΩ
Sensor voltage:	12V a.c.
Sensor current:	max. 330µA
Wiring distance (capacity of cable 100nF/km):	
	max. 1000m (set value <50%) max. 100m (set value 100%)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

8. Accuracy

Base accuracy:	-
Adjusting accuracy:	-
Repetition accuracy:	-
Voltage influence:	-
Temperature influence:	-

9. Ambient conditions

Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

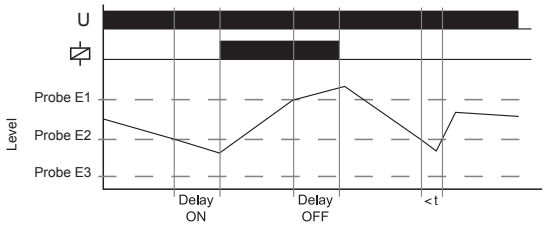
Single packing:	140g

11. General data

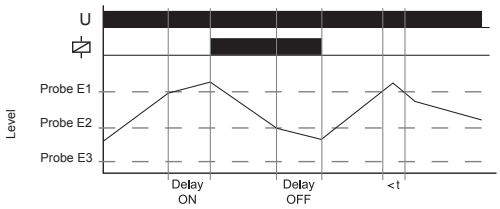
Parallel function:	yes, up to 5 relais

Functions

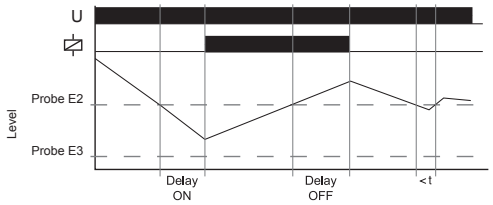
Pump up
Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the air-fluid level falls below the minimum probe E2 the interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the maximum probe E1, the interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



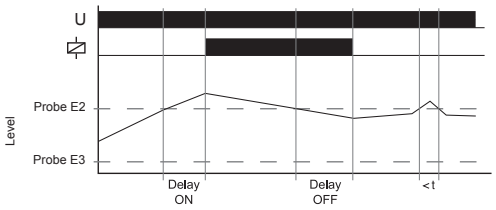
Pump down
Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3.
When the maximum probe E1 gets moistened the interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level falls below the minimum probe E2, the interval of turn-off delay (Delay OFF) begins. After the expiration of the interval, the output relays R switches into off-position (yellow LED not illuminated).



Minimum monitoring (Pump up)
Connection the probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the air-fluid level falls below the probe E2 the interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the probe E2, the interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



Maximum monitoring (Pump down)
Connection of probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the probe E2 gets moistened the interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level sinks below the probe E2, the interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



Note

Use cables with low capacity for wiring the probes especially with extended wiring length.

Following processes are suggested for the adjustment:

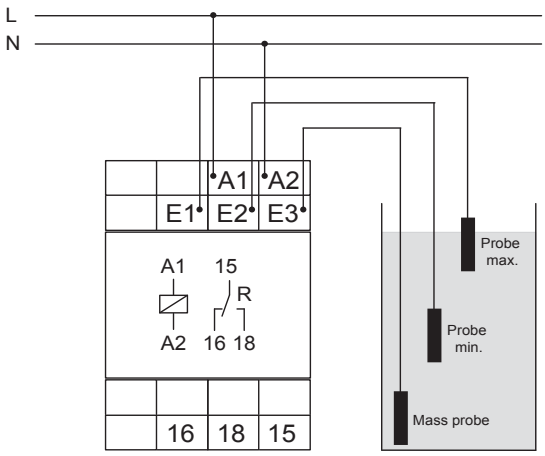
The function selector switch must be in position pump down.

Turn the sensitivity controller slowly clockwise from min to max until the relais switches into on-position. (probes must be in dipped state)

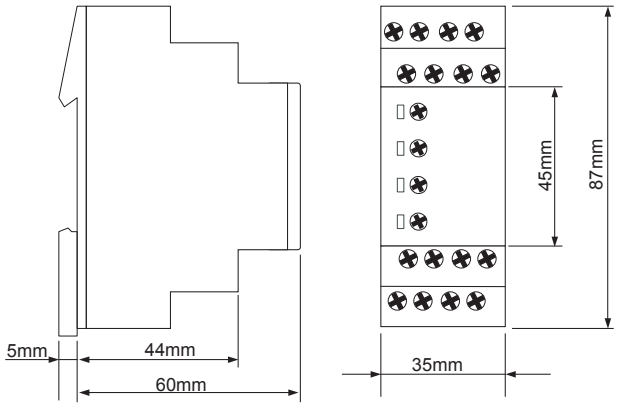
The moistened probes should be taken out of the liquid to control if the relais switches into off-position. If the relais doesn‘t switch into off-position, turn the sensitivity controller slightly back to min. (counter clockwise)

Set the function selector switch to desired position.
(either pump up or pump down)

Connections



Dimensions



Ordering information

Types	Rated voltage U_N	Delay ON	Delay OFF	Part. No.
E3LC10 230V AC	230V a.c.	fixed, 5s	fixed, 5s	1341505

Level monitoring of conductive liquids

E3LM10

Monitoring relays - ENYA series

Multifunction

Secure isolation of the measuring circuit

1 change over contacts

Width 35mm

Installation design

Technical data

1. Functions
Level monitoring of conductive liquid, timing for tripping delay and turn-off delay seperatly adjustable and the following functions which are selectable by means of rotary switch:

Pump up	pump up or minimum monitoring
Pump down	pump down or maximum monitoring

2. Time ranges

	Adjustment range
Tripping delay (Delay ON):	0.5s to 10s
Turn-off delay (Delay OFF):	0.5s to 10s

3. Indicators

Green LED ON:	indication of supply voltage
Yellow LED ON/OFF:	indication of output relay

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-rail TS 35 according to EN 60715
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20
Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without multicore cable end
- 1 x 4mm² without multicore cable end
- 2 x 0.5 to 1.5mm² with/without multicore cable end
- 2 x 2.5mm² flexible without multicore cable end

5. Input circuit

Terminals:	A1-A2
Rated voltage U_N:	see table ordering information or printing on the unit
Tolerance:	-15% of +10% of U_N
Rated consumption:	2VA (1.0W)
Rated frequency:	AC 48 to 63Hz
Duty cycle:	100%
Reset time:	500ms
Hold-up time:	-
Drop-out voltage:	>30% of supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

6. Output circuit
1 potential free change over contact

Rated voltage:	250V AC
Switching capacity:	1250VA AC1 B300/P300 (in accordance with IEC 60947-5-1) therm. constant current 5A
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

7. Measuring circuit

Measuring input:	conductive probes (Type SK1, SK2, SK3)
Terminals:	E1-E2-E3
Sensitivity:	0.25 to 100kΩ (4mS to 10µS)
Sensor voltage:	12V AC
Sensor current:	max. 7mA
Wiring distance (capacity of cable 100nF/km):	
	max. 1000m (set value <50%)
	max. 100m (set value 100%)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

8. Accuracy

Base accuracy:	-
Adjusting accuracy:	-
Repetition accuracy:	-
Voltage influence:	-
Temperature influence:	-

9. Ambient conditions

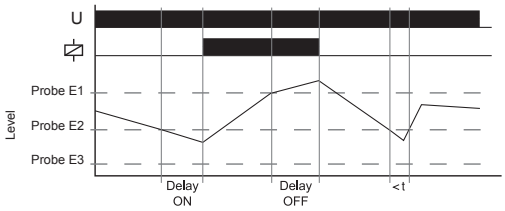
Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2 (in accordance with IEC 60664-1)

10. Weight

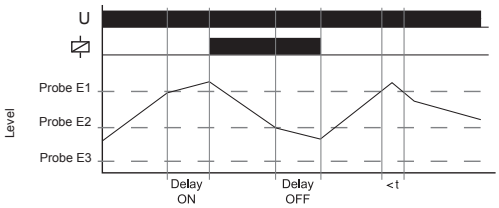
Single packing:	140g

Functions

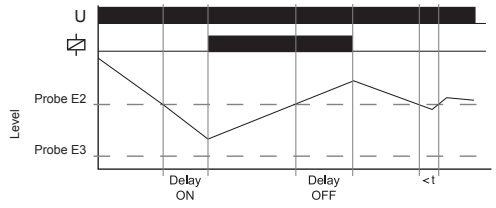
Pump up
Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the air-fluid level falls below the minimum probe E2 the set interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the maximum probe E1, the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



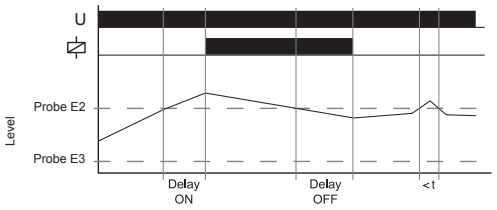
Pump down
Connection of the probe rods E1, E2 and E3. Alternatively the electrically conducting container can be connected in lieu of the test probe E3.
When the maximum probe E1 gets moistened the set interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level falls below the minimum probe E2, the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval, the output relays R switches into off-position (yellow LED not illuminated).



Minimum monitoring (Pump up)
Connection the probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the air-fluid level falls below the probe E2 the set interval of tripping delay (Delay ON) begins. After the expiration of the interval, the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level again rises above the probe E2, the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



Maximum monitoring (Pump down)
Connection of probe rods E2 and E3 (bridge E1-E3). Alternatively the electrically conducting container can be connected in lieu of the test probe E3. When the probe E2 gets moistened the set interval of tripping delay (Delay ON) begins. After the expiration of the interval the output relays R switches into on-position (yellow LED illuminated). When the air-fluid level sinks below the probe E2, the set interval of turn-off delay (Delay OFF) begins. After the expiration of the interval the output relays R switches into off-position (yellow LED not illuminated).



Note

Use cables with low capacity for wiring the probes especially with extended wiring length.

Following processes are suggested for the adjustment:

The existent time delay should be to minimum (0,5s).

The function selector switch must be in position pump down.

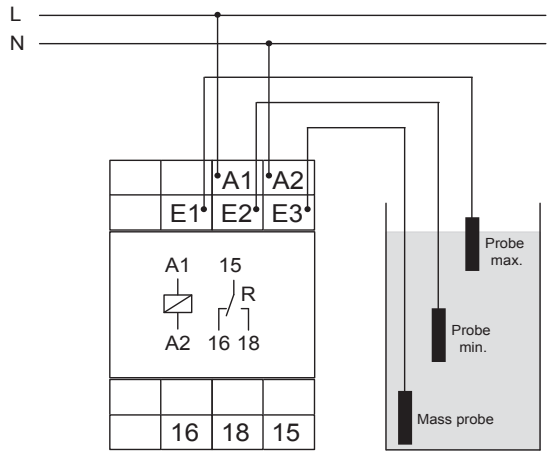
Turn the sensitivity controller slowly clockwise from min to max until the relais switches into on-position. (probes must be in dipped state)

The moistened probes should be taken out of the liquid to control if the relais switches into off-position. If the relais doesn‘t switch into off-position, turn the sensitivity controller slightly back to min. (counter clockwise)

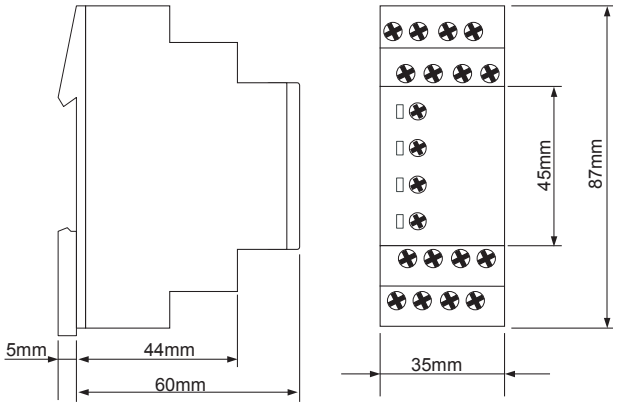
Set the existent time delay to desired value to fade out a short term moisten the probes by waves in the liquid.

Set the function selector switch to desired position.
(either pump up or pump down)

Connections



Dimensions



Ordering information

Types	Rated voltage U_N	Delay ON	Delay OFF	Part. No.
E3LM10	230V	0.5s to 10s	0.5s to 10s	1341500

Tripping unit for temperature monitoring

E3TF01

Monitoring relays - ENYA series

of the motor winding with and without short circuit monitoring of the thermistor line

(selectable by means of terminals)

Optional evaluation of one thermal contact

Test function with integrated reset key

Rated isolated voltage on the sensor circuit up to 690V

1 change over contact

Width 35mm

Installation design

Technical data

1. Functions
Temperature monitoring of the motor winding (max. 6 PTC) with fault latch for temperature sensors in accordance with DIN 44081, short circuit monitoring of the thermistor line (selectable by means of terminals), integrated test/reset key.

2. Time ranges

	Adjustment range
Start-up suppression time (Start):	-
Tripping delay (Delay):	-

3. Indicators

Green LED ON:	indication of supply voltage
Red LED ON/OFF:	indication of failure

4. Mechanical design
Self-extinguishing plastic housing, IP rating IP40
Mounted on DIN-Rail TS 35 according to EN 50022
Mounting position: any
Shockproof terminal connection according to VBG 4 (PZ1 required), IP rating IP20. Tightening torque: max. 1Nm
Terminal capacity:
- 1 x 0.5 to 2.5mm² with/without mulitcore cable end
- 1 x 4mm² without mulitcore cable end
- 2 x 0.5 to 1.5mm² with/without mulitcore cable end
- 2 x 2.5mm² flexible without mulitcore cable end

5. Input voltage

Supply voltage:	230V AC
Terminals:	A1-A2
Rated voltage Un:	see table ordering information or printing on the unit
Tolerance:	-15% to +10% of Un
Rated consumption:	1,3VA (1W)
Rated frequency:	AC 48 to 63Hz
Duty cycle:	100%
Reset time:	250ms
Residual ripple for DC:	50ms
Drop-out voltage:	>30% of the supply voltage
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

6. Output circuit
1 potential free change over contact

Terminals:	11-12-14
Rated voltage:	250V AC
Switching capacity:	1250VA AC1 B300/P300 (in accordance with IEC 60947-5-1); therm. constant current 5A
Fusing:	5A fast acting
Mechanical life:	20 x 10^6 operations
Electrical life:	2 x 10^5 operations at 1000VA resistive load
Switching frequency:	max. 6/min at 1000VA resistive load (in accordance with IEC 60947-5-1)
Overvoltage category	III. (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

7. Measuring circuit

Terminals:	T1-T2 or T1-T3
Initial resistance:	<1.5kΩ
Response value (relay in off-position):	≥3.6kΩ
Release value (relay in on-position):	≤1.65kΩ
Disconnection (short circuit thermistor):	yes at T1-T2 no at T1-T3
Measuring voltage T1-T2:	≤7.5V at R ≤4.0kΩ (in accordance with EN 60947-8)
Overvoltage category:	III (in accordance with IEC 60664-1)
Rated surge voltage:	6kV

8. Control contact R

Function:	connection of an external reset key
Loadable:	no
Line length R1-R2:	max. 10m (twisted pair)
Control pulse length:	min. 50ms
Reset:	potential free normally open contact, terminals R1-R2

Note: The terminals R2-T2 are internal affiliated with each other!!

9. Accuracy

Base accuracy:	±5%
Adjustment accuracy	-
Repetition accuracy:	≤1%
Voltage influence:	-
Temperature influence:	≤0.15% / °C

10. Ambient conditions

Ambient temperature:	-25 to +55°C
Storage temperature:	-25 to +70°C
Transport temperature:	-25 to +70°C
Relative humidity:	15% to 85% (in accordance with IEC 60721-3-3 class 3K3)
Pollution degree:	2, if built in 3 (in accordance with IEC 60664-1)

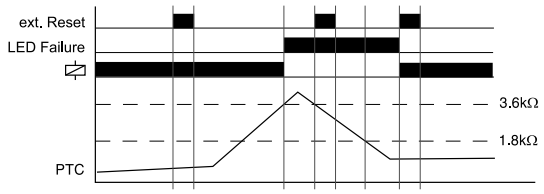
11. Weight

Single packing:	137,20g

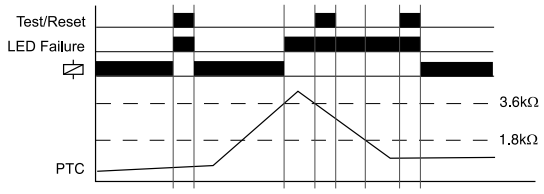
Functions

Temperature monitoring of the motor winding with fault latch
If the supply voltage U is applied (green LED illuminated) and the cumulative resistance of the PTC-circuit is less than 3.6kΩ (standard temperature of the motor), the output relay switches into on-position.
Pressing the test/reset key under this conditions forces the output relay to switch into off-position. It remains in state as long as the test/reset key is pressed and thus the switching function can be checked in case of fault. The test function is not effective by using an external reset key.
When the comulative resistance of the PTC-circuit exceeds 3.6kΩ (at least one of the PTCs has reached the cut-off temperature), the output relay switches into off-position (red LED illuminated).
The output relay switches into on-position again (red LED not illuminated), if the cumulative resistance drops below 1.65kΩ by cooling down of the PTC and either a reset key (internal or external) was pressed or the supply voltage was disconnected and re-applied.

Application of an external Reset

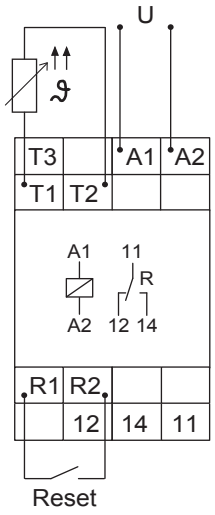


Application of internal Test/Reset - key

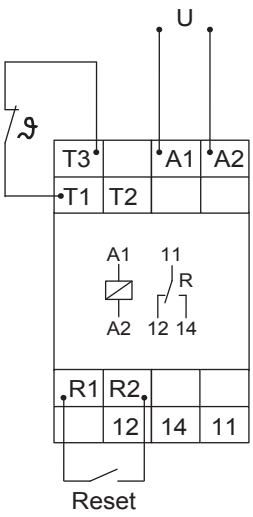


Connections

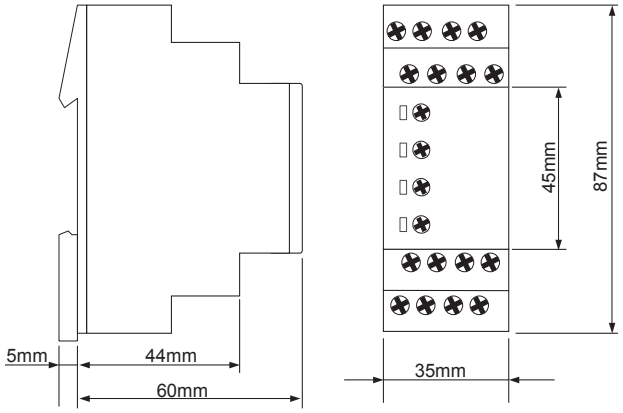
Monitoring temperature sensors



Monitoring thermal contact

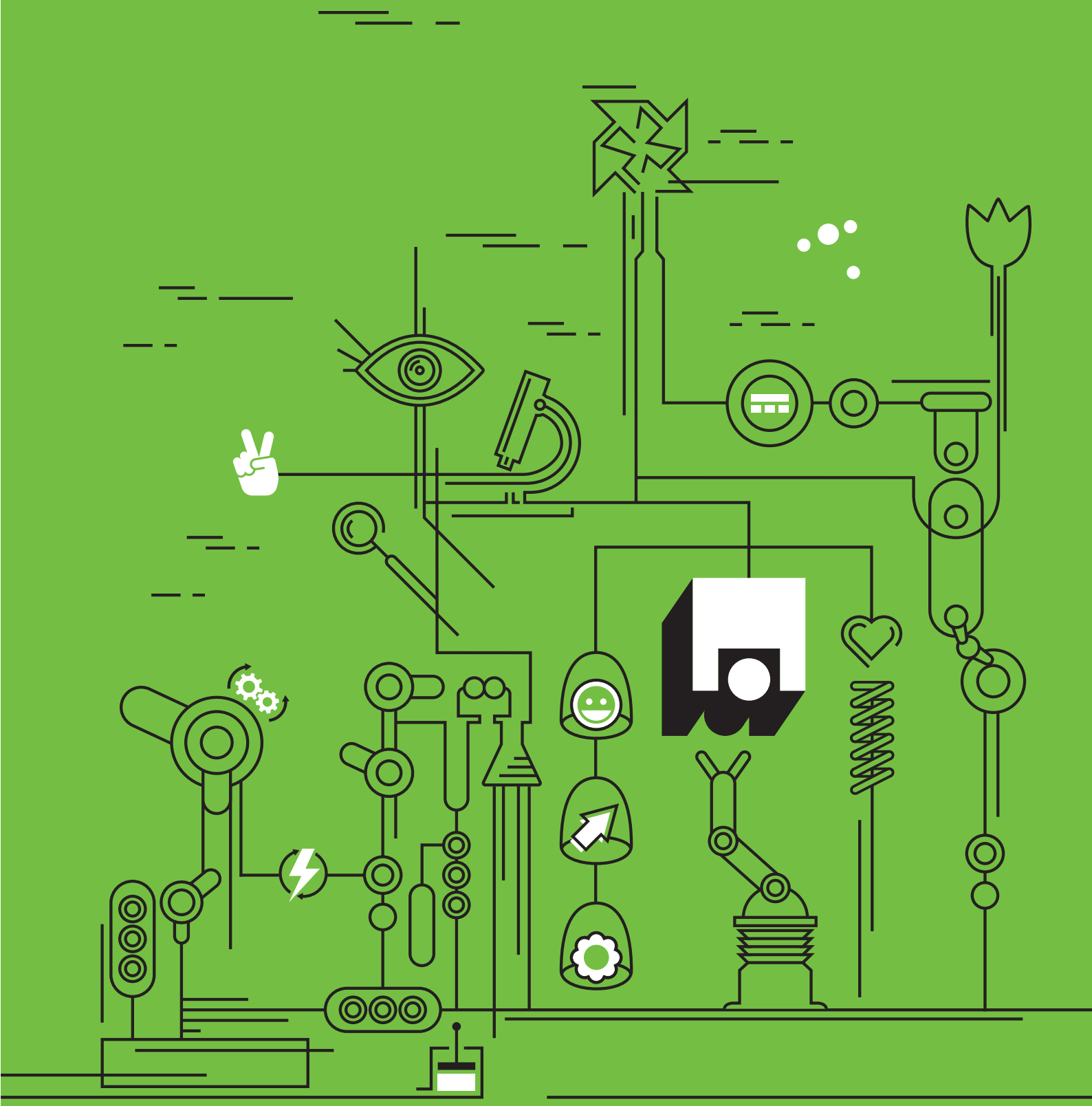


Dimensions



Ordering Informations

Types	Rated voltage U_N	LEDs	Part. No.
E3TF01	230V	U, falure	1341600



For contact data of your local distributor please visit
http://www.tele-online.com/en/organization/distribution/

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