## Monitoring voltage relay line HRN-3x and line HRN-6x



**MONITORING RELAYS** 

- serves to control supply voltage for appliances sensitive to supply tolerance, protection of the device against under/over voltage
- HRN-3x is band voltage relay, HRN-6x is over/under voltage relay. For difference pes see grach of function
- HRN-33, HRN-63 monitors voltage in range AC 48 276 V
- U max and U min can be monitored independently <u>HRN-34, HRN-64</u> - like HRN-33, but voltage range is DC 6 - 30 V
- monitoring of battery circuits (12, 24 V)
- <u>HRN-35</u> like HRN-33, but independent output relays for each voltage level - switching of other loads possible
- HRN-37, HRN-67 like HRN-33, monitors voltage in range AC 24 150 V - it is possible to monitor level of overvoltage and undervoltage independently
- adjustable time delay for all types is 0 10 s (to eliminate short voltage drops or peaks)
- voltage Umin adjusted as % of Umax
- 3-state indication LEDs indicating normal state and 2 fault states
- supply from monitored voltage (monitors level of its own supply)
- 1-MODULE, DIN rail mounting

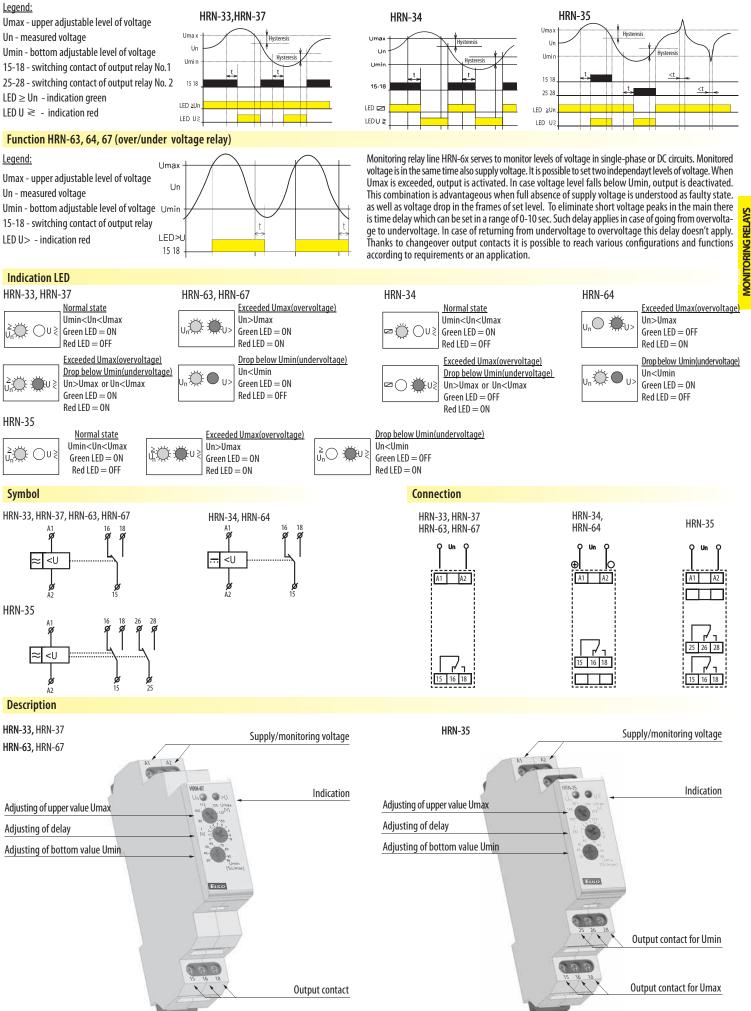
Consumption:         A C max. 1.2 VA         D C max. 1.2 VA         A C max. 1.2 VA         A C max. 1.2 VA           Upper level (Umax):         A C 160 - 276 V         D C 18-30 V         A C 160 - 276 V         A C 80-150 V           Bottom level (Umin):         30 - 95 % Umax           Max. permanent:         A C 276 V         D C 36 V         A C 276 V         A C 276 V           Peak overload < 1ms:         A C 290 V         D C 50 V         A C 290 V         A C 290 V           Time delay:         adjustable 0 - 10 s           Accuracy         adjustable 0 - 10 s           Setting accuracy (mechanical):         5 %         5 %         5 %         5 %           Peepedance on temperature:         < 1 %         < 1 %         < 1 %           Dependance on temperature:         5 %         5 %         5 %         5 %           Ioterance of limit values:         5 %         5 %         5 %         5 %         5 %           Uptut - Number of contats:         1x changeover (AgNi)         1x changeover (AgNi)         1x changeover	Technical parameters	HRN-33/ HRN-63	HRN-34/ HRN-64	HRN-35	HRN-37/ HRN-67
matrix         matrix         matrix         matrix           Generation $A (48 - 276V)$ $D (6 - 30V)$ $A (48 - 276V)$ $A (24 - 150V)$ Generation $A (16) - 270V$ $D (6 - 30V)$ $A (16) - 276V$ $A (25)V$ Bottom level (Unin): $30 - 95\%$ Unax $30 - 95\%$ Unax $30 - 95\%$ Unax $30 - 95\%$ Unax           Max_perment: $A (276V)$ $C (25)V$ $A (250V)$ $A (250V)$ Beloweled -1ms: $A (276V)$ $A (250V)$ $A (250V)$ $A (250V)$ Time delay: $A (25)V$ $A (25)V$ $A (25)V$ $A (25)V$ Setting accom (mechanica): $5\%$ $5\%$ $5\%$ $5\%$ Setting accom (mechanica): $2 - 6\% (a (1) \% / C (2 - 1) \% / C (2$	Supply and measuring				
International         Internat         International         Internationa	Terminals:	A1 - A2	A1 - A2	A1 - A2	A1 - A2
Upper level (Uma):A. (160 - 276 Y)DC 18 - 30 YA. (160 - 276 Y)A. (20 - 150 Y)Batton level (Uma):30 - 95 % Umax30 - 95 % Umax30 - 95 % Umax30 - 95 % UmaxBacton level (Uma):A. (250 Y)C. (54 Y)A. (250 Y)A. (250 Y)Peak overload < Ints:	Supply voltage:	AC 48 - 276 V	DC 6 - 30 V	AC 48 - 276 V	AC 24-150 V
Bottom level (Umin):         D. B. 95 % Umax         35 - 95 % Umax         30 - 95 % Umax         30 - 95 % Umax           Max, permanent:         A. C. 276V         D. C. SV         A. C. 276V         A. C. 276V           Peak overlaad < Ims:	Consumption:	AC max. 1.2 VA	DC max. 1.2 VA	AC max. 1.2 VA	AC max. 1.2 VA
Max permanent         M. K. 276V         D.C. 6V         M. K. 276V         D.C. 6V         M. K. 276V         M. K. 276V           Peak orelical <inss< td="">         M. K. 220V         D.C. 50V         K. C250V         K. C250V           The delay:         adjustable 0-10s         adjustable 0-10s         adjustable 0-10s           Secting accuracy (mechanical):         S.%         S.%         S.%         S.%           Secting accuracy (mechanical):         S.%         S.%         S.%         S.%           Bependance on temperature:         &lt;.0.1%/C</inss<>	Upper level (Umax):	AC 160 - 276 V	DC 18 - 30 V	AC 160 - 276 V	AC 80-150 V
Peak overlaad <1mx:         PAC 200V         PAC 200V         PAC 200V         PAC 200V           Time dely:         adjustable 0-10s         adjustable 0-10s         adjustable 0-10s         adjustable 0-10s           Accasar         adjustable 0-10s         adjustable 0-10s         adjustable 0-10s         adjustable 0-10s           Setting accuracy (mechanical):         5 %         5 %         5 %         5 %           Beperadance on temperature:         < < 1 %	Bottom level (Umin):	30 - 95 % Umax	35 - 95 % Umax	30 - 95 % Umax	30 - 95 % Umax
Interdely:         Actuacy         Actuacy           The dely:         adjustable 0-105         adjustable 0-105           Actuacy         Construct         S%         S%           Setting accuracy (mechanical):         S%         S%         S%           Begerat accuracy         <1%	Max. permanent:	AC 276 V	DC 36 V	AC 276 V	AC 276 V
Actuacy         Section 2 (1)         Section 2 (1)<	Peak overload <1ms:	AC 290 V	DC 50 V	AC 290 V	AC 290 V
Setting accuracy (mechanical):         5 %         5 %         5 %           Repeat accuracy:         < 1 %	Time delay:	adjustable 0 - 10 s	adjustable 0 - 10 s	adjustable 0 - 10 s	adjustable 0 - 10 s
Repeat accuracy:<	<del>_</del>				
Dependance on temperature: $< 0.1\%/'C$ $< 0.1\%/'C$ $< 0.1\%/'C$ Tolerance of limit values: $5\%$ $5\%$ $5\%$ $5\%$ hysteresi (from fault normal): $2.6\%$ of adjusted value (only HRN-30) $2.6\%$ of adjusted value (only HRN-30) $2.6\%$ of adjusted value (only HRN-30)           Dutput-Number of ontacts: $1x$ changeover (AgNi) $1x$ changeover (AgNi) $1x$ changeover (AgNi)           Break unrent: $16 A / ACI$ $16 A / ACI$ $16 A / ACI$ $16 A / ACI$ Break unrent: $30A / < 3s$ $30A / < 3s$ $30A / < 3s$ $30A / < 3s$ Switch gradues; $250V$ ACI / 24V DC           Min. breaking capacity DC: $5000$ $5000$ $5000$ $5000$ $5000$ Output indication:         ref / green LED         ref / green LED         ref / green LED $ref / green LED           Mechanical life:         0.7x10^{5} 0.7x10^{5} 0.7x10^{5} 0.7x10^{5}           Sorage temperature:         -30+70^{5} -30+70^{5} -30+70^{5} -30+70^{5} -30+70^{5} -30+70^{5}$	<b>3 7 1</b>	5 %			
The control         The control <ththe control<="" th="">         The control</ththe>					<1 %
Byseersis (from fault to normal):         2-6 % of adjusted value (only HRN-33)         2-6 % of adjusted value (only HRN-37)         2-6 % of adjusted value (only HRN-37)           Dutput - Number of contacts:         1x changeover (AgNi)           Bated current:         16 A / AC1         16 A / AC1         16 A / AC1         6 A / AC1           Breaking capacity:         4000 V/ A(C1, 384 W / DC           Invisiting voltage:         30 A / < 3 s           Switching voltage:         250 V AC1 / 24 V DC           Uptput indication:         red / green LED         red / green LED         red / green LED         red / green LED           Mechanical life:         0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> Operating position:         any         any         any         any         any         any           Output indication:         0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup> 0.7x10 <sup>s</sup>		< 0.1 % / °C	< 0.1 % / ℃	< 0.1 % / °C	< 0.1 % / °C
Output         Number of contacts:         Ix changeover (ApNi)         Ix changeover (ApNi)         Ix changeover (ApNi)         Ix changeover (ApNi)           Rated current:         16 A / AC1         16 A / AC1         16 A / AC1         16 A / AC1           Breaking capacity:         4000 VA / AC1, 384 W / DC           Breaking capacity:         30 A / < 3 s	Tolerance of limit values:	5 %		5 %	5 %
Reted current:         Tak / AC1         Tak / AC1         Tak / AC1         Tak / AC1           Breaking capacity:         4000 VA / AC1, 384 W / DC           Inrush current:         30 A / < 3 s	Hysteresis (from fault to normal):	2 - 6 % of adjusted value (only HRN-33)	2 - 6 % of adjusted value (only HRN-34)	2 - 6 % of adjusted value	2 - 6 % of adjusted value (only HRN-37)
Braking capacity:         4000 VA / AC1, 384 W / DC         4000 VA / AC1, 384 W / DC           Invisit current:         30 A / < 3s	Output - Number of contacts:	1x changeover (AgNi)	1x changeover (AgNi)	1x chang. for each level of voltage,(AgNi)	1x changeover (AgNi)
Inrush current:         30 A / < 3 s         30 A / < 3 s         30 A / < 3 s           Switching voltage:         250 V AC1 / 24 V DC	Rated current:	16 A / AC1	16 A / AC1	16 A / AC1	16 A / AC1
Switching voltage:         250 V AC1 / 24 V DC         250 V AC1 / 24 V DC         250 V AC1 / 24 V DC           Min. breaking capacity DC:         500 mW	Breaking capacity:	4000 VA / AC1, 384 W / DC	4000 VA / AC1, 384 W / DC	4000 VA / AC1, 384 W / DC	4000 VA / AC1, 384 W / DC
Min. breaking capacity DC:         S00 mW         S00 mW         S00 mW         S00 mW           Output indication:         red / green LED         red / green LED         red / green LED         red / green LED           Mechanical life:         3x10 <sup>7</sup> 3x10 <sup>7</sup> 3x10 <sup>7</sup> 3x10 <sup>7</sup> Electrical life (AC1):         0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> Oher information Operating temperature:         -20+55 <sup>S</sup> C         -20	Inrush current:	30 A / < 3 s	30 A / < 3 s	30 A / < 3 s	30 A / < 3 s
Defermine         Defermine         Defermine         Defermine           Output indication:         red / green LED         red / green LED         red / green LED           Mechanical life:         3x10 <sup>7</sup> 3x10 <sup>7</sup> 3x10 <sup>7</sup> Bectrical life (AC1):         0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> Other information Operating temperature:         -20+55 <sup>°</sup> C         -20+55 <sup>°</sup> C         -20+55 <sup>°</sup> C           Storage temperature:         -20+55 <sup>°</sup> C         -20+55 <sup>°</sup> C         -20+55 <sup>°</sup> C           Storage temperature:         -20+50 <sup>°</sup> C         -20+55 <sup>°</sup> C         -20+55 <sup>°</sup> C           Storage temperature:         -30+70 <sup>°</sup> C         -30+70 <sup>°</sup> C         -20+55 <sup>°</sup> C           Storage temperature:         -30+70 <sup>°</sup> C         -30+70 <sup>°</sup> C         -20+55 <sup>°</sup> C           Electrical strength:         4 kV (supply- output)         4 kV (supply- output)         4 kV (supply- output)           Operating position:         amy         any         any         any           Mounting:         DIN rail EN 60715         DIN rail EN 60715         DIN rail EN 60715           Protection degree:         III.         III.         III.         III.           Pollution degree:         Solid wire max.1x 2.5 or 2x1.5, with sleeve max.1x 2.5 or 2x1.5, with slee	Switching voltage:	250 V AC1 / 24 V DC	250 V AC1 / 24 V DC	250 V AC1 / 24 V DC	250 V AC1 / 24 V DC
Mechanical life: $3x10^7$ $3x10^7$ $3x10^7$ $3x10^7$ $3x10^7$ Electrical life (AC1): $0.7x10^5$ $0.7x10^5$ $0.7x10^5$ $0.7x10^5$ Other information Operating temperature: $-20+55^{\circ}C$ $-20+55^{\circ}C$ $-20+55^{\circ}C$ Storage temperature: $-30+70^{\circ}C$ $-30+70^{\circ}C$ $-30+70^{\circ}C$ Electrical strength: $4^{\rm kV}$ (supply - output) $4^{\rm kV}$ (supply - output) $4^{\rm kV}$ (supply - output)Operating position: $0^{\rm m}$ $0^{\rm m}$ $0^{\rm m}$ $0^{\rm m}$ Mounting:DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715Protection degree:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelOvervoltage cathegory:III.III.III.III.III.Pollution degree: $30^{\rm solid}$ wire max.1x 2.5 or 2x1.5, with sleeve max.1x 2.	Min. breaking capacity DC:	500 mW	500 mW	500 mW	500 mW
International Nation         Internation         Internation         Internation           Electrical life (AC1):         0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> 0.7x10 <sup>5</sup> Other information Operating temperature:         -20+55 °C         -20+55 °C         -20+55 °C         -20+55 °C           Storage temperature:         -30+70 °C         -30+70 °C         -30+70 °C         -30+70 °C           Electrical strength:         4 kV (supply - output)           Operating position:         0 any         any         any         any         any           Mounting:         DIN rail EN 60715         DIN rail EN 60715         DIN rail EN 60715         DIN rail EN 60715           Protection degree:         IIP 40 from front panel         IP 40 from front panel         IP 40 from front panel         IP 40 from front panel           Pollution degree:         2         2         2         2         2         2           Max. cable size (mm <sup>2</sup> ):         solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x 2.5         solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x 2.5         solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x 2.5         solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x 2.5         solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x 2.	Output indication:	red / green LED	red / green LED	red / green LED	red/ green LED
Other information         Operating temperature:         -20+55 °C	Mechanical life:	3x10 <sup>7</sup>	3x10 <sup>7</sup>	3x10 <sup>7</sup>	3x10 <sup>7</sup>
Storage temperature:-30+70 °C-30+70 °C-30+70 °C-30+70 °CElectrical strength:4 kV (supply - output)4 kV (supply - output)4 kV (supply - output)4 kV (supply - output)Operating position:anyanyanyanyMounting:DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715Protection degree:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelOvervoltage cathegory:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5g0 x 17.6 x 64 mm, see page 157-15990 x 17.6 x 64 mm, see page 157-159Weight:61 g73 g85 g61 g	Electrical life (AC1):	0.7x10⁵	0.7x10 <sup>5</sup>	0.7x10 <sup>5</sup>	0.7x10 <sup>5</sup>
Electrical strength:4 kV (supply - output)4 kV (supply - output)4 kV (supply - output)Operating position:anyanyanyanyMounting:DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715Protection degree:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelOvervoltage cathegory:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max.	Other information Operating temperature:	-20 +55 °C	-20 +55 °C	-20 +55 °C	-20 +55 °C
Operating position:anyanyanyanyMounting:DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715Protection degree:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelOvervoltage cathegory:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve m	Storage temperature:	-30 +70 °C	-30 +70 °C	-30 +70 °C	-30 +70 °C
Nounting:DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715DIN rail EN 60715Protection degree:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelOvervoltage cathegory:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5	Electrical strength:	4 kV (supply - output)	4 kV (supply - output)	4 kV (supply - output)	4 kV (supply - output)
Modularity:IP 40 from front panelIP 40 from front panelIP 40 from front panelIP 40 from front panelProtection degree:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wi	Operating position:	any	any	any	any
Notection degree:III.III.III.III.Pollution degree:2222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max.1x2.5solid wire max.1x 2.5 or 2x1.	Mounting:	DIN rail EN 60715	DIN rail EN 60715	DIN rail EN 60715	DIN rail EN 60715
Pollution degree:222Max. cable size (mm²):solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5solid wire max.1x 2.5 or 2x1.5, with sleeve max. 1x2.5Dimensions:90 x 17.6 x 64 mm, see page 157-15990 x 17.6 x 64 mm, see page 157-15990 x 17.6 x 64 mm, see page 157-159Weight:61 g73 g85 g61 g	Protection degree:	IP 40 from front panel	IP 40 from front panel	IP 40 from front panel	IP 40 from front panel
Nation regree.Image: Constraint of the co	Overvoltage cathegory:	III.	III.	III.	III.
with sleeve max. 1x2.5           Dimensions:         90 x 17.6 x 64 mm, see page 157-159         90 x 17.6 x 64 mm, see pag	Pollution degree:	2	2	2	2
Weight:         61 g         73 g         85 g         61 g	Max. cable size (mm <sup>2</sup> ):	,		,	,
nught by by by	Dimensions:	90 x 17.6 x 64 mm, see page 157-159	90 x 17.6 x 64 mm, see page 157-159	90 x 17.6 x 64 mm, see page 157-159	90 x 17.6 x 64 mm, see page 157-159
	Weight:	61 g	73 g	85 g	61g
		EN 60255-6, EN 61010-1	EN 60255-6, EN 61010-1	EN 60255-6, EN 61010-1	-

## **Function description HRN-3x**

Monitoring relay series HRN-3 monitores level of voltage in single – phase circuits. Monitored voltage serves also as supply voltage. It is possible to set two independayt levels of voltage, when exceeded the output is activated. HRN-33 and HRN-34 – in normal state the output relay is permanently switched. It switches off when there is a below or above deflection. This combination of linkage of the output relay is advantageous when the full failure of supply (monitored) voltage is considered to be a faulty state in the same way as a decrease of voltage within the set level. Output relay is in both situations always switched off. Differently HRN-35 version uses independayt relay for each level, in normal state it is switched off. If the upper level is exceeded (for example overvoltage) 1 relay switches on, when the bottom level (e.g. undervoltage) is exceeded 2 relay switches. It is thus possible to see the particular faulty state. To eliminate short peaks in the main the time delay, which is possible to be set in range 0 - 10 s, is used. It functions when changing from normal to faulty state and prevents unavailing pulsation of the output relay caused by parasitive peaks. Time delay doesn 't apply when changing from faulty to normal state, but hysteresis (1-6% depends on the voltage setting) apply. Thanks to changeover contacts it is possible to get other configurations and functions according to actual requirements of the application.



## Function HRN-33, 34, 35, 37 (band voltage relay)



ELKO