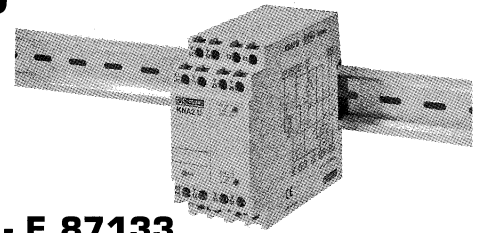


# "KNA2U" safety relay (45mm)

- "Emergency stop," "safety gate monitoring" and "safety mat" functions.
- "CE" conforming product, UL and cUL recognized
- Self-checking redundancy concept (including wiring integrity check)
- 2 "N/O" safety contacts 4 A / 250 V.
- Return loop for monitoring external contactors.



**UL - E 87133**  
**cUL - E 87133**

## Technical characteristics

### Power supply

Power supply voltage	AC: 24, 48 110 230 V 50/60 Hz DC: 24 V max. ripple: 10%
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Operating range	85 to 110% for AC supply voltage 80 to 120% for DC supply voltage
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### Accuracy

Reset time	80 ms
Response time for ES	30 ms
Max. synchronization difference between limit switch operation	500 ms

### Output Specification

Outputs	Volt-free
No. of safety circuits	2 "N/O" AgCdo contacts

Breaking capacity	1000 VA resistive at 600 operations/hr
Max. current breaking capacity	4 A resistive to 20° C (derating 20 mA / °C)

Max. voltage breaking capacity	250 VAC
Output protection requirement	6 A quick-blow fuses

### Operation and use

Max. absorbed power	5 VA in AC 3 W in DC
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On/off indication	1 power supply LED 2 input LEDs
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Electrical life	10 <sup>5</sup> operations at 1000 VA resistive
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Mechanical life	10 <sup>7</sup> operations
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Operating temperature	-10 °C to +55 °C
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Internal control voltage	24 VDC
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Immunity to interference and noise (EMC)	IEC 1000-4-5: Shock waves: Level 3
	IEC 1000-4-2: Electrostatic discharge: Level 3

	ENV 50140/204 (IEC 1000-4-3): Electromagnetic Field: Level 3
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	IEC 1000-4-4: Rapid Transients: Level 3
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Insulation Coordination	Installation category III, degree of pollution 2
Dielectric strength ; impulse voltage	IEC 255-5: 2.5 kV / 1 mA / 1 min / 50 Hz IEC 255-5/IEC 664-1: 5 kV / 0.5 J / Wave 1.2 - 50 μs

Thermoplastic casing	Self-extinguishing (UL 94)
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Protection	Casing IP 40, Terminals IP 20
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Connection	2 x 1.5 mm <sup>2</sup> multicore with ferrule
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Weight	345g (12.1 oz.)
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## Types

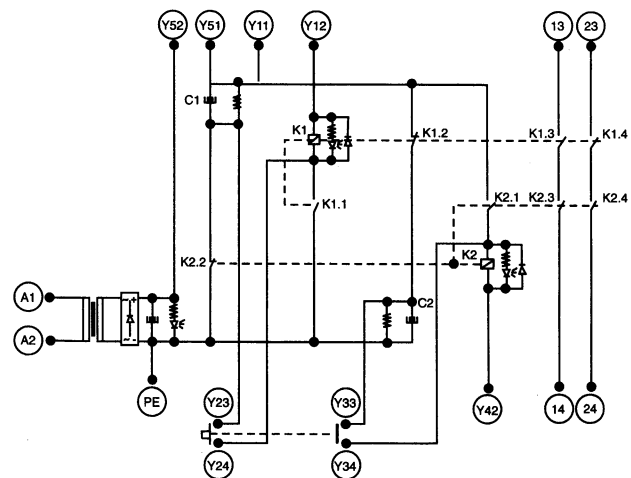
### Part numbers (and voltages):

	KNA2U
24 VDC	85 100 121
24 VAC	85 100 122
48 VAC	85 100 123
110 VAC	85 100 124
230 VAC	85 100 125

### Conformity

European "Machinery" Directive 89/392/EEC	•
European Standard EN 60204-1 (Machine safety - Electrical equipment)	•
European Standard EN 954-1 (Safety-related control system elements)	(Level 4)
European standard EN 418 (Machine safety - Emergency stop devices)	•
European standard pr EN 1088 (Machine safety - Locking & interlocking devices)	•

### Function diagram



### Key

A1 - A2	: Supply voltage: For DC, A2 is the negative pole.
Y51 - Y52	: Single channel emergency stop or wire link.
Y11 - Y12	: Channel 1 input.
Y42 - PE	: Channel 2 input.

Y23 - Y24 - Y33 - Y34	: Dual line validation
13 14 ; 23 - 24	: Safety contact.

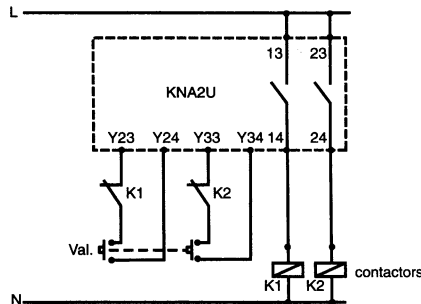
### Control Devices:

Depending on the application and the degree of safety required, KNA2U can accept:

- Emergency stop push-button with 1 or 2 channels.
- Limit sensors (switches) with 1 or 2 channels.
- Pressure-sensitive mats.
- 3-wire DC inductive proximity sensors.

### Return loop (immediate relay):

The return loop can be wired on one or both validation lines. Opposite: example with auxiliary contacts for K1 and K2 contactors in loops Y23 - Y24 and Y33 - Y34



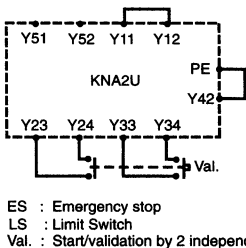
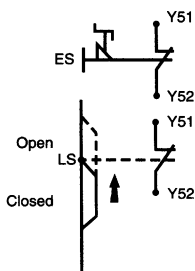
### Examples of use:

#### Single channel control: for "Emergency stop" and "Guard monitoring"

- No redundancy in the input circuit.
- Integrity of both inputs not assured.
- Detection of earth fault.
- Detection of short-circuits on the Validation line.
- The emergency stop and limit switch may be wired in series.

Control device

Safety relay

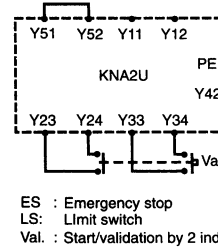
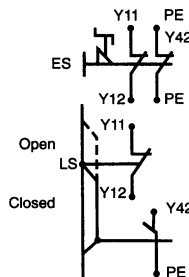


#### 2-channel control (independent channels): for "Emergency stop" and "Guard monitoring"

- Redundancy built into input circuit.
- Integrity of both input channels assured.
- Detection of earth fault.
- Detection of short-circuits on the Validation line.
- The emergency stop and limit switch may be wired in series.

Control device

Safety relay

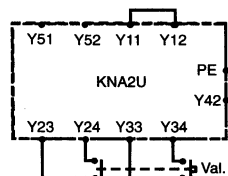
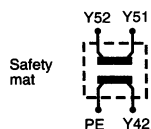


#### Pressure-sensitive mats

- Integrity of channels assured.
- Detection of line and earth faults.
- Detection of short-circuits on the Validation line.

Control device

Safety relay



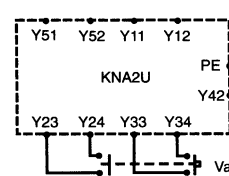
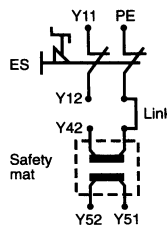
Val. : Start/validation by 2 independent contacts

#### Pressure-sensitive mats & Emergency Stop

- Integrity of channels assured.
- Detection of line and earth faults.
- Detection of short-circuits on the Validation line.

Control device \*

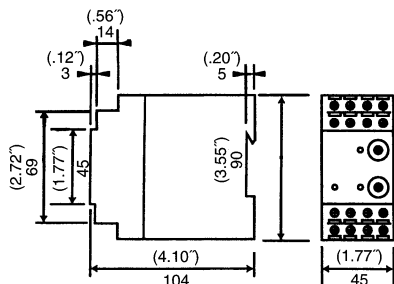
Safety relay



ES : Emergency stop  
Val. : Start/validation by 2 independent contacts

\*Note:  
It is possible to connect the limit switches in series with the emergency stop and the safety mat.

#### Dimensions: mm (inches)



#### Mounting - Removing

