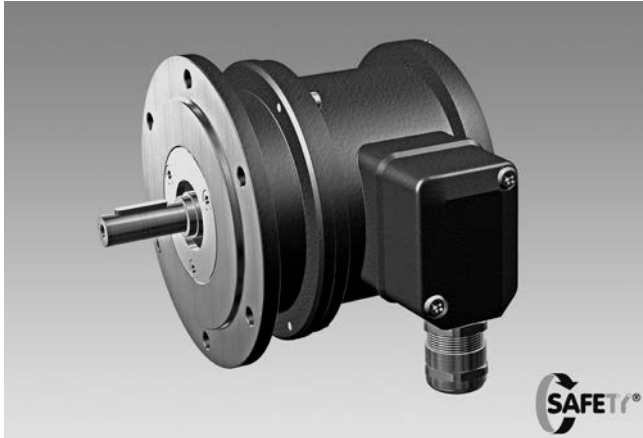


# Speed switches

## Electronic speed switch

### 1 or 3 adjustable switching speeds

ES 90, ES 93



ES 93

#### Features

- Electronic speed monitoring
- Circuit breaker with up to three selectable threshold speeds
- ES 90: Relay output with isolated changeover contact
- ES 93: Three independent transistor outputs, adjusting  $\pm 10\%$  above 1000 rpm

#### Optional

- ES 90, ES 93: As integrated speed switch type ESL for combination with encoders and/or tachogenerators
- ES 93: Relay module ES 93 R with three relay outputs with isolated changeover contacts

#### Technical data - electrical ratings

Switching accuracy	$\pm 4\%$ ( $\leq 1500$ rpm) $\pm 2\%$ ( $> 1500$ rpm)
Switching hysteresis	$\approx 30\%$ of switching speed
Switching delay time	$\leq 40$ ms
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

#### ES 90

Switching outputs	1 output, speed control
Output switching capacity	$\leq 6$ A / 250 VAC $\leq 1$ A / 48 VDC
Minimum switching current	100 mA

#### ES 93

Voltage supply	12 VDC $\pm 10\%$
Consumption w/o load	$\leq 5$ mA
Switching outputs	3 outputs, speed control
Current each output	40 mA (DC)

#### Technical data - mechanical design

Size (flange)	$\varnothing 103/105$ mm
Shaft type	$\varnothing 11$ mm solid shaft
Flange	EURO flange B10
Protection DIN EN 60529	IP 55
Operating torque	$\leq 2$ Ncm
Rotor moment of inertia	0.125 kgcm <sup>2</sup>
Admitted shaft load	$\leq 150$ N axial $\leq 250$ N radial
Materials	Housing: aluminium die-cast Shaft: stainless steel
Operating temperature	-20...+85 °C
Weight approx.	1.3 kg
Connection	Terminal box

#### ES 90

Speed (n)	$\leq 6000$ rpm
Range of switching speed (ns)	650...6000 rpm

#### ES 93

Speed (n)	$\leq 5000$ rpm
Range of switching speed (ns)	200...5000 rpm

# Speed switches

## Electronic speed switch

### 1 or 3 adjustable switching speeds

ES 90, ES 93

#### Part number

ES 90

Switching speed (ns)  
... 650...6000 rpm

ES 93

Switching speed (ns)  
... 200...5000 rpm

#### Accessories

##### Mounting accessories

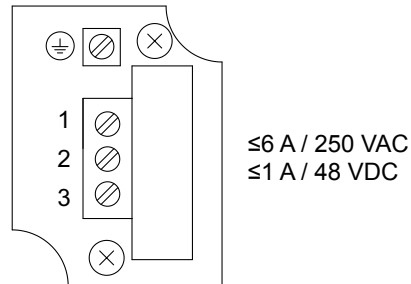
K 35	Spring washer coupling for solid shaft $\varnothing 6...12$ mm
K 50	Spring washer coupling for solid shaft $\varnothing 11...16$ mm
K 60	Spring washer coupling for solid shaft $\varnothing 11...22$ mm

##### Relay module for ES 93

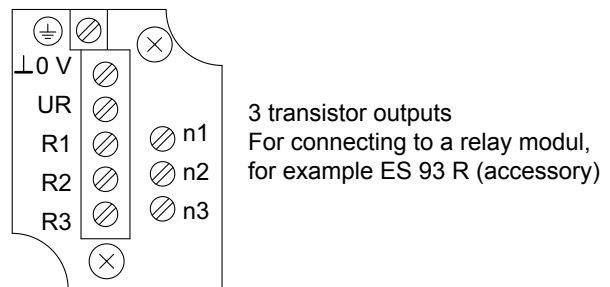
ES 93 R	Relay modul
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#### Terminal assignment

##### View A - Connecting terminal ES 90



##### View A - Connecting terminal ES 93



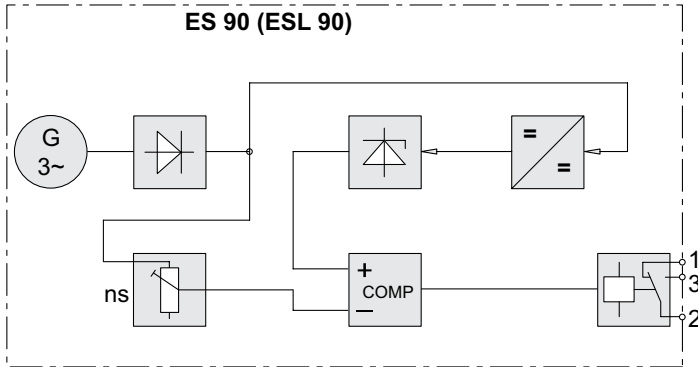
# Speed switches

## Electronic speed switch

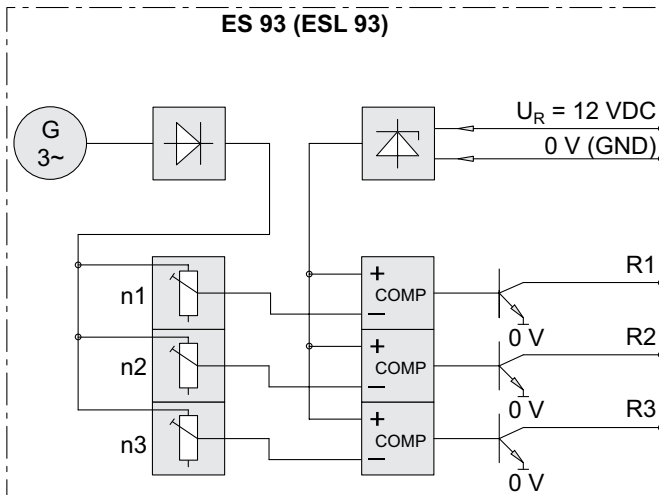
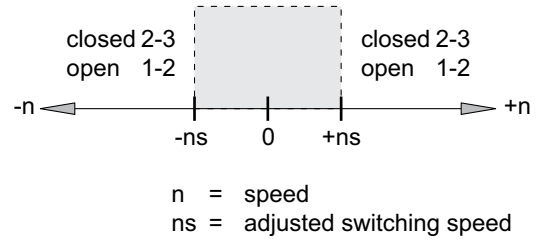
### 1 or 3 adjustable switching speeds

#### ES 90, ES 93

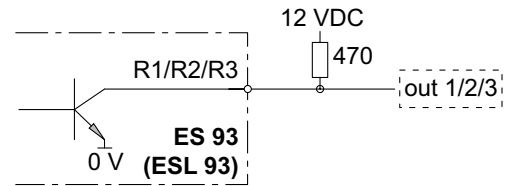
##### Block circuit diagram



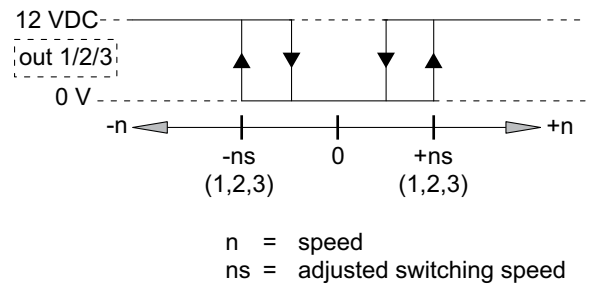
##### Switching characteristics



##### Recommended output circuit



##### Switching characteristics



# Speed switches

## Electronic speed switch

### 1 or 3 adjustable switching speeds

ES 90, ES 93

#### Dimensions

