



## Centrifugal Switches for Single-Phase Motors (FKS)

At a time when electronics and automation are considered to be at the core of any industry or product, Vosseler's mechanical switches remain highly in demand due to its effectiveness in breaking off the auxiliary phase.

Vosseler's centrifugal switches (FKS) are distinctly superior with the following special features:

- extraordinary quality
- absolute reliability
- highest safety
- non-sensitive to temperatures
- favourable price

The mechanical centrifugal switch is absolutely fail-proof as it does not rely on power supply. The mechanical function simply depends on centrifugal force.

The function of the centrifugal switch is to switch off the auxiliary phase of single-phase motors, before reaching the normal running speed. For safety reasons the switch-off is proceeded at 80 % of the synchronous motor speed.

When the motor is in a standstill position, the contacts of the switch are closed. At this time, the auxiliary phase is hooked up and the motor is ready to start. When switching on the motor, the run-up is done with the main phase and the auxiliary phase simultaneously. When it reaches the breaking speed the auxiliary phase will cut off. The motor finally reaches its normal running speed without the auxiliary phase.

During run-up the motor needs high currents. Therefore the auxiliary phase is broken with relative high current as well. If capacitors are used for the auxiliary phase there will be additional high voltages. This causes very high requirements for the switching ability of the centrifugal switch. The switches manufactured by Vosseler meet these requirements excellently.

The basic set-up of the switches is identical. The fixed component with the contact device (**stator**) is connected to the auxiliary phase of the motor. The stator in fact provides the breaking function. A revolving centrifugal device (**rotor**) is fixed on the axle of the motor and activates the stator when it reaches the specified breaking speed.

Basically there are two types of stators - push-button-action and snap-action. In the **push-button-action** stator the switch is operated by pressure on to the moving contact- system. Therefore the position of the contact-system and the speed of the switching operation depends directly on the rotor.

In the **snap-action** stator, the contact-system remains initially in its basic position although the rotor is already in touch with the contact-system. Upon further influence of the rotor the contact system snaps to the second position. The advantage here is it has exactly two positions of the contact-system (open or close). The movement of the contact is very fast and independent on the rotor.

Important criteria for your consideration :

### Push-Button-Action

- simple and favourable set-up
- good contact pressures
- in certain circumstances there is a possibility that the opening and closing of the contacts may be slower.

### Snap-action

- exact, snapping switching
- by using capacitors it provides a shorter and more accurate break

### Type E 1

Snap-action with double break, radial function. Suitable for all cases. The radial function offers easy mounting and high breaking precision. Since there is no touch between the stator and rotor below and above the breaking speed, this switch is also recommended for extremely slow running-up motors.

### Type E 5

Push-button action, easy and robust set-up. Suitable for fast running-up motors. Capacitors can be used up to 80 mF. Vosseler's most cost-effective switch.

### Type E 6

Snap-action with double break, axial function. High breaking capacity and precise breaking ability. Recommended especially for faster running-up motors.

We also manufacture • Rotary Speed Switches (DZS) for Control and Steering • Starting Relays for Single-Phase Motors



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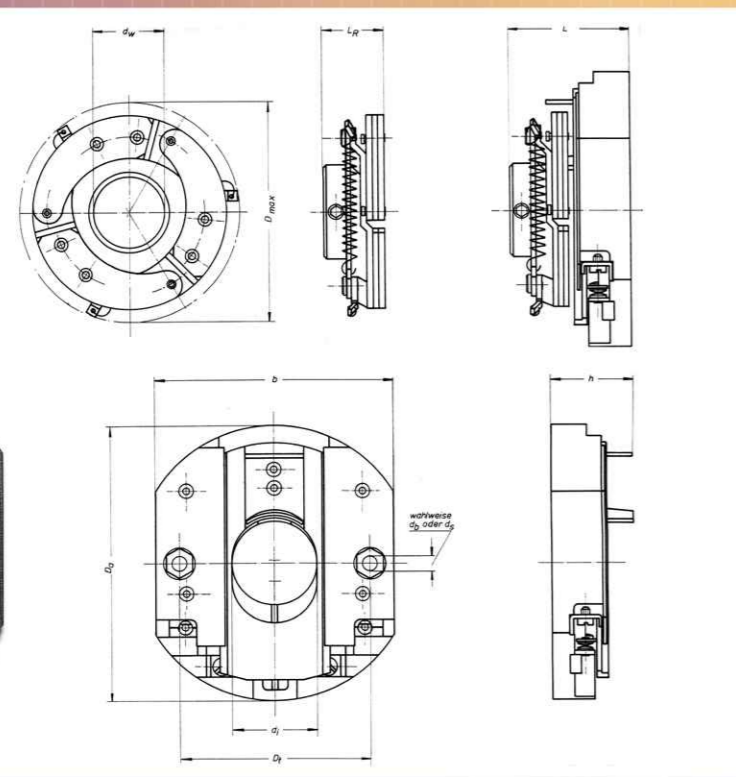


# Centrifugal Switches

## for Single-Phase Motors

Distinctly Superior. Extraordinarily Precise. Absolutely Reliable.





## Design Type E1

Vosseler's smallest range of centrifugal switches with radial switching feature has an added advantage of a non touching of stator and rotor at the start and during the running phase.

**Contacts** : Opener, 2 pairs of contacts serial, silver-cadmium plated

**Synchronous revolution speeds** : **for 50 Hz**  
 size E1 01 = 1000, 1500, 3000 rpm  
 size E1 02 & 03 = 0750, 1000, 1500, 3000 rpm

**for 60 Hz**  
 size E1 01 = 1200, 1800, 3600 rpm  
 size E1 02 & 03 = 0900, 1200, 1800, 3600 rpm  
 The effective speed in the breaking moment is 80% of the synchronous speed.

**Precision** : ± 5 % of the breaking speed

**Breaking capacity** : size E1 01 = 15 A  
 size E1 02 = 18 A  
 size E1 03 = 22 A

The breaking capacity depends on different characteristics of the motor. Therefore the specified values can vary accordingly.

**Durability** : 500.000 switching cycles

**Max. breaking sequence** : 4 per minute

**Bore holes of the rotor** : Manufactured according to ISA fitting H7. The first of the specified dimensions is the standard size.

**Sizes** : 01 = 10 13 12 08 06 05 mm  
 02 = 16 15 14 12 10 mm  
 03 = 20 22 19 18 17 mm

The following models are available. They differ in mounting of the stator component :

**Design E1 01.1 / E1 02.1 / E1 03.1**

Mounting of the stator from switch side. Stator provides normal boreholes.

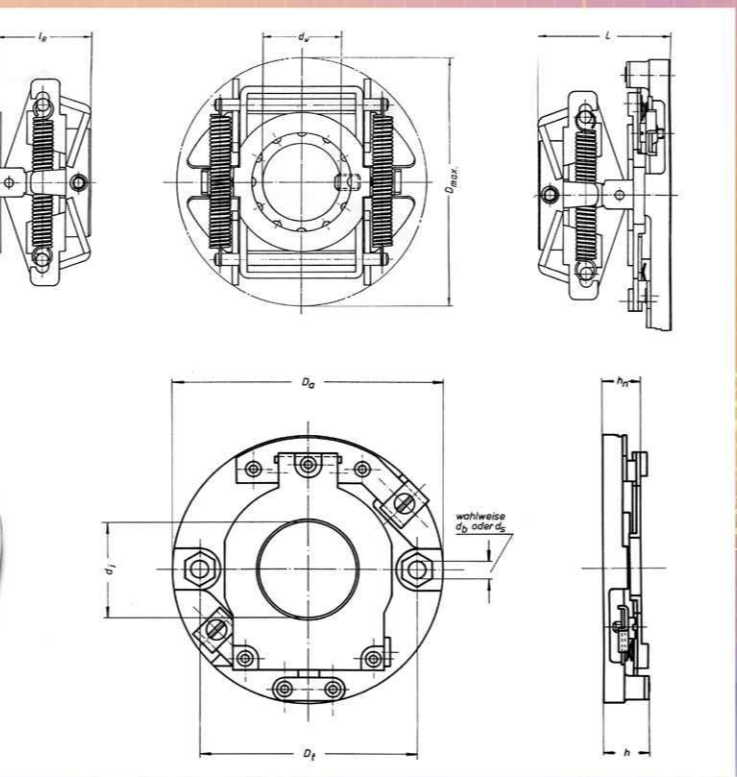
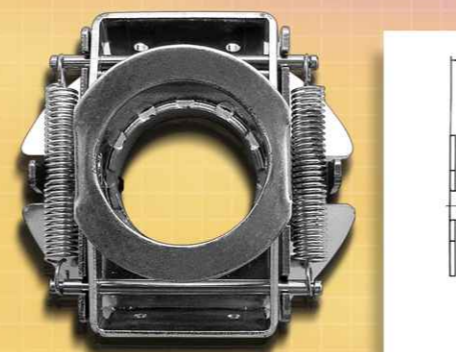
**Design E1 01.2 / E1 02.2 / E1 03.2**

Mounting of the stator from outside of the motor. Stator provides threads.

**Note**

The stator has to be mounted centrally to the axis. Keep specified distance (L) between stator and rotor. Before mounting, slide of the stator has to be in basic position (contacts closed).

	Dmax	d <sub>w</sub>	LR	R <sub>a</sub>	D <sub>t</sub>	d <sub>i</sub>	d <sub>b</sub>	d <sub>s</sub>	a	b	h	L
01	40	6-13	15	22	34	14	4,2	M 4	26	47	15	27 ±1
02	52	10-16	15	29	44	17	4,2	M 4	33	58	19	29 ±1
03	62	17-22	15	38	52	23	4,2	M 4	38	65	22	29 ±1



## Design Type E5

Push-button switching axial – Vosseler's most simple and cost-effective switch.

**Contacts** : Opener, 1 pair of contacts (size 07), 2 pairs of contacts parallel (size 08), silver-cadmium plated

**Synchronous revolution speeds** : **for 50 Hz** = 1000, 1500, 3000 rpm  
**for 60 Hz** = 1200, 1800, 3600 rpm  
 The effective speed in the breaking moment is 80% of the synchronous speed.

**Precision** : ± 5 % of the breaking speed

**Breaking capacity** : size E5 07 = 16 A  
 size E5 08 = 20 A

The breaking capacity depends on different characteristics of the motor. Therefore the specified values can vary accordingly.

**Durability** : 500.000 switching cycles

**Max. breaking sequence** : 4 per minute

**Bore holes of the rotor** : Manufactured according to ISA fitting H7. The first of the specified dimensions is the standard size.

**Sizes** : 07 = 16 15 14 12 10 mm  
 08 = 20 22 19 18 17 mm

The following models are available. They differ in mounting of the stator component :

**Design E5 07.1 / E5 08.1**

Mounting of the stator from switch side. Stator provides normal boreholes.

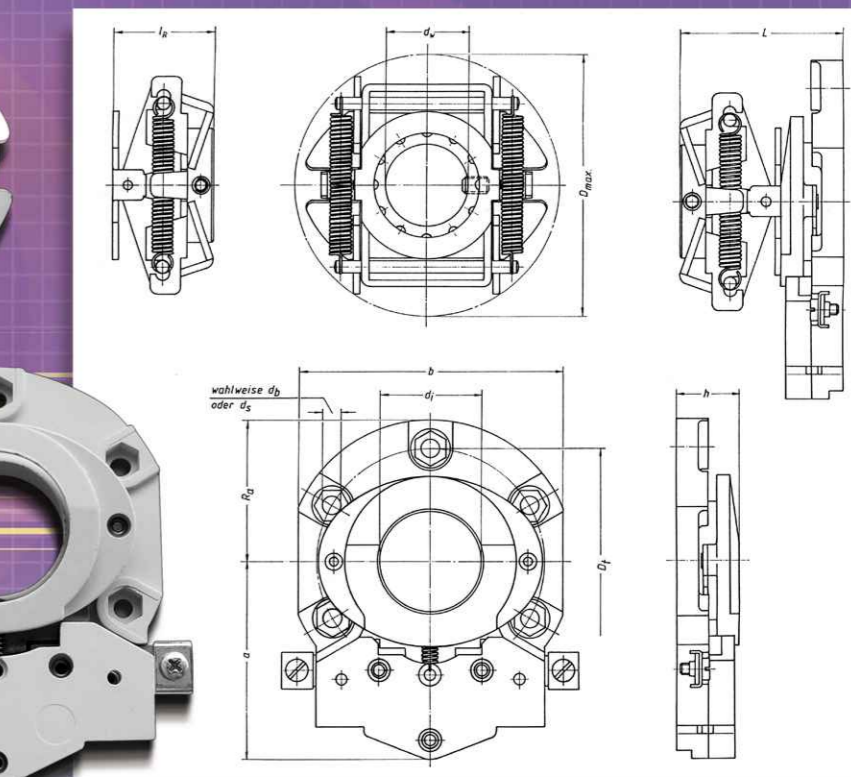
**Design E5 07.2 / E5 08.2**

Mounting of the stator from outside of the motor. Stator provides threads.

**Note**

The stator has to be mounted centrally to the axis. Keep specified distance (L) between stator and rotor.

	Dmax	d <sub>w</sub>	LR	D <sub>a</sub>	D <sub>t</sub>	d <sub>i</sub>	d <sub>b</sub>	d <sub>s</sub>	h	h <sub>n</sub>	L
07	52	10-22	23	55	44	17	4,2	M 4	11	9	30 ±1
08	61	17-22	24	65	52	23	4,2	M 4	11	9	30 ±1



## Design Type E6

Snap-action switching axial – high breaking capacity and precise breaking ability.

**Contacts** : Opener, 2 pairs of contacts serial, tungsten plated

**Synchronous revolution speeds** : **for 50 Hz** = 1000, 1500, 3000 rpm  
**for 60 Hz** = 1200, 1800, 3600 rpm  
 The effective speed in the breaking moment is 80% of the synchronous speed.

**Precision** : ± 5 % of the breaking speed

**Breaking capacity** : size E6 12 = 22 A  
 size E6 13 = 25 A

The breaking capacity depends on different characteristics of the motor. Therefore the specified values can vary accordingly.

**Durability** : 500.000 switching cycles

**Max. breaking sequence** : 4 per minute

**Bore holes of the rotor** : Manufactured according to ISA fitting H7. The first of the specified dimensions is the standard size.

**Sizes** : 12 = 20 22 19 18 17 mm  
 13 = 25 27 24 22 mm

The following models are available. They differ in mounting of the stator component :

**Design E6 12.1 / E6 13.1**

Mounting of the stator from switch side. Stator provides normal boreholes.

**Design E6 12.2 / E6 13.2**

Mounting of the stator from outside of the motor. Stator provides threads.

**Note**

The stator has to be mounted centrally to the axis. Keep specified distance (L) between stator and rotor. During mounting avoid hits to the bearing shield.

	Dmax	d <sub>w</sub>	LR	R <sub>a</sub>	D <sub>t</sub>	d <sub>i</sub>	d <sub>b</sub>	d <sub>s</sub>	a	b	h	L
12	61	17-22	24	32,5	52	23	4,2	M 4	45	60	14	36 ±1
13	70	22-27	28	38	62	28	4,2	M 4	53	70	16	42 ±1