Honeywell

ACTUATOR

LKS 160

FOR AIR DAMPERS ON MULTI-STAGE AND MODULATING BURNERS

PRODUCT HANDBOOK

APPLICATION

The LKS 160 air damper actuator is designed to be fitted to multi-stage or modulating oil and gas burners with fully closed position.

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GENERAL

DESCRIPTION

A synchronous motor powers a drive shaft and a backlash-free cam shaft via a gear reducer.

The cam shaft operates limit and auxiliary switches. The position at which one of the limit or auxiliary switches operates can be adjusted steplessly within the operating range using the associated cam disc. Manually adjustable lever-operated cams or spindle-driven cams, which can be adjusted with a screwdriver, are available.

FEATURES

Electric actuator up to 3.0 Nm

- **Drive times: 3 ... 65 sec.**
- **Variants: - clockwise or counter clockwise rotation**
  - with integrated electronic circuitry
  - shaft version
- **Position indicator**
- **Easily adjustable limit and auxiliary switches**
- **Synchronous motor**

TECHNICAL DATA

SPECIFICATION

Type overview

clockwise rotation [1]

Diagram [2]	Shaft [3]	Drive time [4]	Load torque [5]	Holding torque	Voltage [6]	Type	Remarks [7]
Nr.	Nr.	s	Nm	Nm	V		
S1	5	5	2,5	0,8	230	**LKS 160-01** A 5-5 S1	standard version
S2	5	5	2,5	0,8	230	**LKS 160-03** A 5-5 S2	standard version
S1	5	12	3	1,5	230	**LKS 160-07** A 5-12 S1	
S1	5	5	2,5	0,8	230	**LKS 160-09** A 5-5 S1	Spindle-driven cam
S7	5	30	3	3	24	**LKS 160-22** A 5-30 S7	
S7.1	5	30	3	3	110	**LKS 160-24** A 5-30 S7.1	
S6	5	34	3	3	230	**LKS 160-25** A 5-34 S6	
S1.2	5	34	3	3	230	**LKS 160-26** A 5-34 S1.2	
S1	5	12	3	1,5	230	**LKS 160-37** A 5-12 S1	
S4	5	5	2,5	0,8	230	**LKS 160-39** A 5-5 S4	
S2	5	3	1,5	0,6	230	**LKS 160-40** A 5-3 S2	
S13	5	45	3	3	230	**LKS 160-42** A 6-45 S13	Spindle-driven cam
S8.P1.1	5	34	3	3	230	**LKS 160-44** A 5-34 S8.P1.1	Potentiometer can be retrofitted
S8.P2	5	30	3	3	110	**LKS 160-55** A 5-30 S8.P2	Potentiometer can be retrofitted
S8.P4	5	45	3	3	230	**LKS 160-59** A 5-45 S8.P4	with Potentiometer, special circuit
S8.P	6	34	3	3	230	**LKS 160-63** A 6-34 S8.P	Potentiometer can be retrofitted
S8.P4.1	5	38	3	3	120	**LKS 160-65** A 5-38 S8.P4.1	Run time at 60 Hz, with Potentiometer, special circuit
S8.P3	5	30	3	3	24	**LKS 160-67** A 5-30 S8.P3	Potentiometer can be retrofitted
S8.P1.1	5	34	3	3	230	**LKS 160-68** A 5-34 S8.P1.1	Potentiometer can be retrofitted, spindle-driven cam
S8.P1	5	5	2,5	0,8	230	**LKS 160-70** A 5-5 S8.P1	
S4	5	3	1,5	0,6	230	**LKS 160-73** A 5-3 S4	
S15	5	5	2,5	0,8	230	**LKS 160-75** A 5-5 S15	For 3-stage operation
S2	5	12	3	1,5	230	**LKS 160-79** A 5-12 S2	

Legend

1) when viewing from direction A (see dimensional drawing)
2) see “Circuit diagrams”
3) see “Dimensional drawing”
4) at 50 Hz for 90°
   at 60 Hz, Drive times are about 20 % shorter
5) under nominal conditions
   under extreme conditions (e.g. +60 °C, 230V -15%) the torques will be 25% lower
6) +10% -15%; 50...60Hz
   at -15%; torque reduced by approx. 20% at undervoltage
7) Standard: Lever-operated cam

counter-clockwise rotation[1)]

Diagram 2) Nr.	Shaft 3) Nr.	Drive time 4) s	Load torque 5) Nm	Holding torque Nm	Voltage 6) V	Type	Remarks 7)
S1	5	5	2,5	0,8	230	**LKS 160-02** B 5-5 S1	standard version
S2	5	5	2,5	0,8	230	**LKS 160-04** B 5-5 S2	standard version
S1	5	3	1,5	0,6	230	**LKS 160-08** B 5-3 S2	
S1	5	5	2,5	0,8	230	**LKS 160-10** B 5-5 S1	
S2	5	3	1,5	0,6	230	**LKS 160-12** B 5-3 S2	
S6	5	34	3	3	230	**LKS 160-18** B 5-5 S2	
S2.1	5	5	2,5	0,8	230	**LKS 160-19** B 5-5 S2.1	Shaft with adapter
S3.2	5	5	2,5	0,8	110	**LKS 160-28** B 5-5 S3.2	
S4	5	5	2,5	0,8	230	**LKS 160-36** B 5-5 S4	
S13	6	34	3	3	230	**LKS 160-43** B 6-34 S13	Spindle-driven cam
S2	5	12	3	1,5	230	**LKS 160-50** B 5-12 S2	
S4	5	5	2,5	0,8	230	**LKS 160-51** B 5-5 S4	
S2	5	8	3	1,5	230	**LKS 160-52** B 5-8 S2	Other cam colours
S8.P1	5	12	3	1,5	230	**LKS 160-57** B 5-12 S8.P1	Potentiometer can be retrofitted
S4	5	12	3	1,5	230	**LKS 160-60** B 5-12 S4	
S6	5	5	2,5	0,8	230	**LKS 160-61** B 5-5 S6	
S8.P1.1	5	34	3	3	230	**LKS 160-69** B 5-34 S8.P1.1	
S6.1	5	5	2,5	0,8	110	**LKS 160-71** B 5-5 S6.1	
S4.9	5	5	2,5	0,8	230	**LKS 160-74** B 5-5 S4.9	Relays control 24 VDC
S6.2	5	65	3	3	230	**LKS 160-76** B 5-65 S6.2	
S8.P1	5	5	2,5	0,8	230	**LKS 160-77** B 5-5 S8.P1	Potentiometer can be retrofitted
S12	5	30	3	3	230	**LKS 160-78** B 5-30 S10	Face down

Legend

1) when viewing from direction A (see dimensional drawing)
2) see “Circuit diagrams”
3) see “Dimensional drawing”
4) at 50 Hz for 90°
   at 60 Hz, Drive times are about 20 % shorter
5) under nominal conditions
   under extreme conditions (e.g. +60 °C, 230V -15%) the torques will be 25% lower
6) +10% -15%; 50...60Hz
   at -15%; torque reduced by approx. 20% at undervoltage
7) Standard: Lever-operated cam

Technical Data

Housing

- impact-proof, heat-resistant synthetic material
  Colour: black

Drive motor

- reversible synchronous motor

Switch point setting

- stepless cam setting, lever-operated or spindle-driven cams; if spindle-driven, with superimposed scale

Position indicator

- scale

Connection system

- terminal blocks

Gearing

- spur gearing, maintenance-free

Drive shaft

- steel

Fitting and fastening

- Fastened from inside via tapped M 5 through-holes

PCBs

- for all electrical functions, increased conductor thickness

Mains voltage

- 230 V -15% +10% or
  110 V -15% +10%

Mains frequency

- 50 Hz or 60 Hz

Safety class

- II VDE 0631

Power consumption

- approx. 4 VA

Duty cicle

- depending on motor, 50 to 70 % in 2 minutes

Interference suppression

- N (according to VDE 0785)

Actuating angle

- max. 90°

Mounting position

- any

Protection

- IP 44, assuming appropriate cable entries and screw fastening (DIN 40050)

Cable entries

- 2 x PG9

Cable connection

- terminal block for 0.5 mm^2 (min.) and 2.5 mm^2 (max.) wire cross-section

Direction of rotation

- see “Type overview”

Torque and holding torque

- see “Type overview”

Drive times

- 3 to 65 sec for 90°

Limit and auxiliary switches

- max. 7
  operation with adjustable cam discs, cams coloured in normal way:
  - blue fully closed position
  - orange low load
  - red high load
  - black spare switches for additional functions
- switching voltage
  AC 24....230 V
- switching capacity
  with inductive loads 250 VA

Ambient temperature

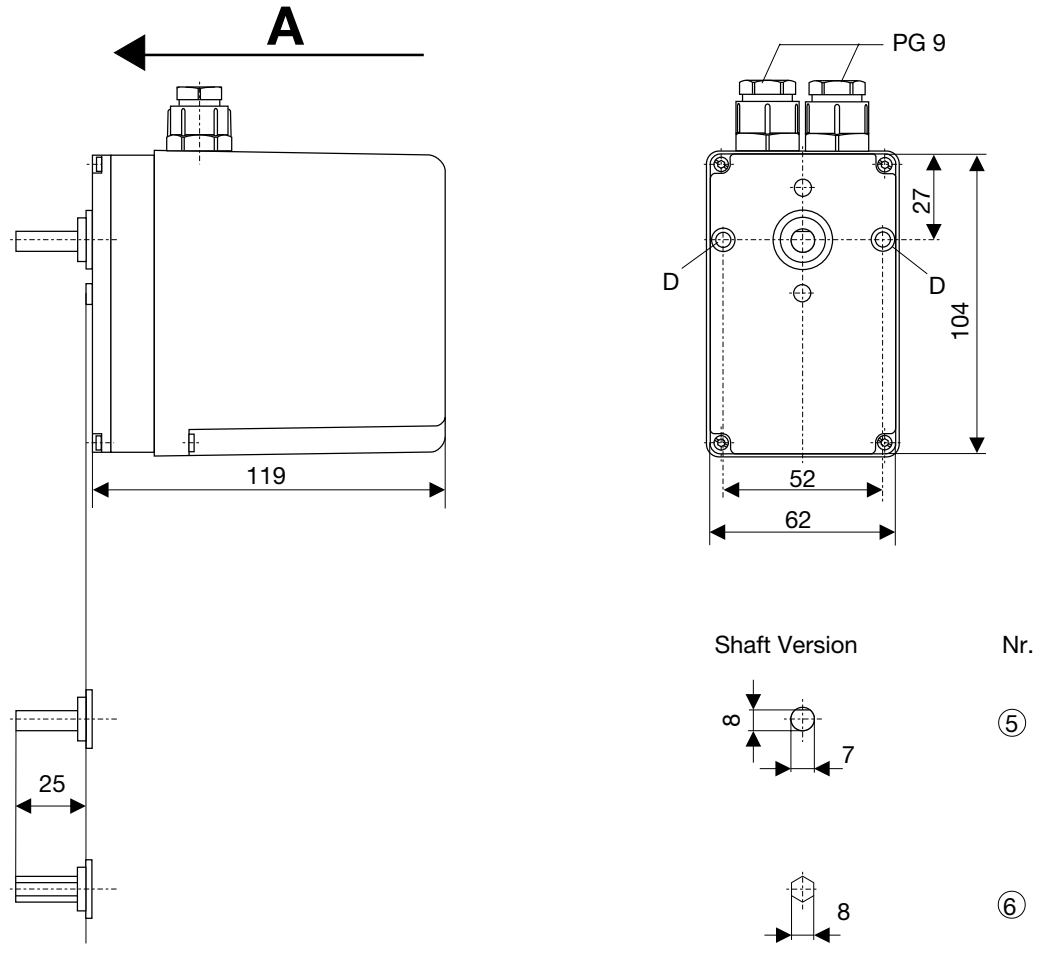
- operation 0 ... +60° C
- transport and storage -20 ... +60° C

Condensation, icing and exposure to water not permitted

Weight

- approx. 610g

DIMENSIONAL DRAWING



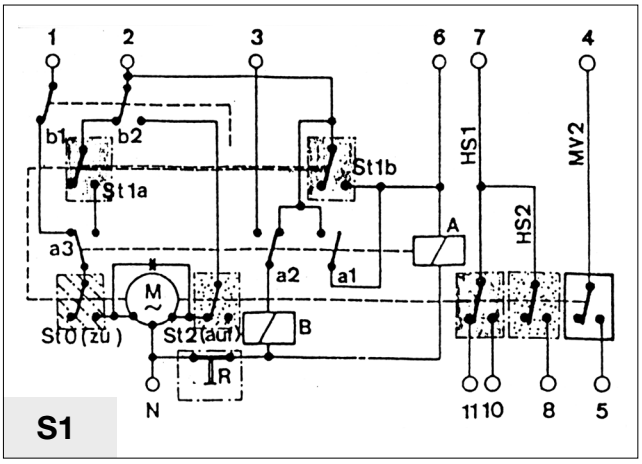
D) Fixing hole
through-hole 5,2 mm inside dia

INSTALLATION AND OPERATION

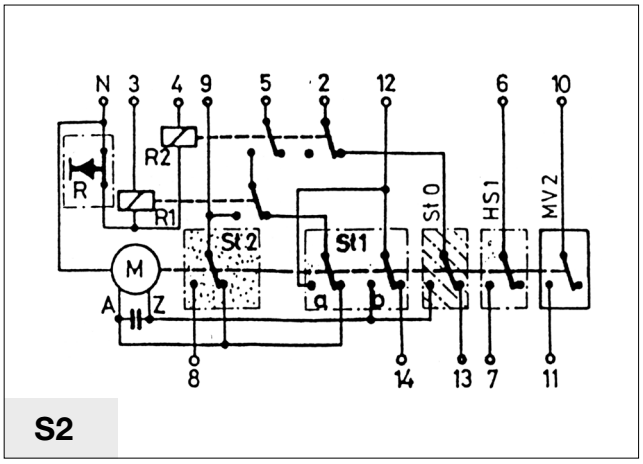
INSTALLATION AND FINAL CHECKOUT

- **The regulations and standards applicable in each particular case must be observed.**
- **Installation and commissioning must only be carried out by qualified technicians.**
- **Electrical wiring must comply with national and local regulations.**
- **Always lay the burner ignition cable separately and as remotely as possible from the device and other cables.**
- **Carefully check all cabling and wiring prior to commissioning.**
- **Disconnect the actuators completely from the power supply when working close to terminals and connections.**
- **Screw the housing cover securely in place to provide shock-hazard protection on the actuator and all electrical connections.**
- **Electromagnetic emissions must be checked on a case by case basis.**

CIRCUIT DIAGRAMS



S1



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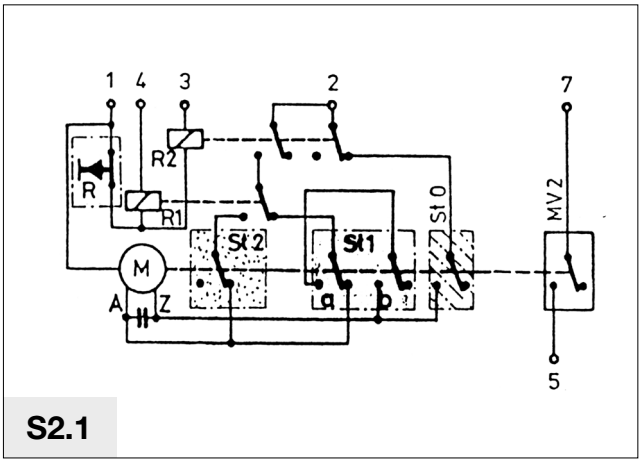
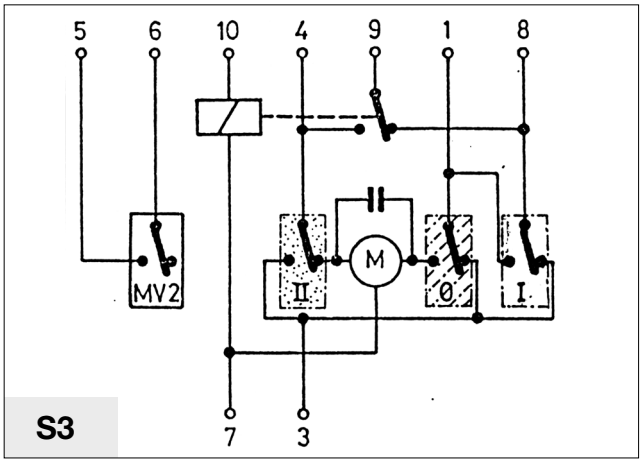


S2.1



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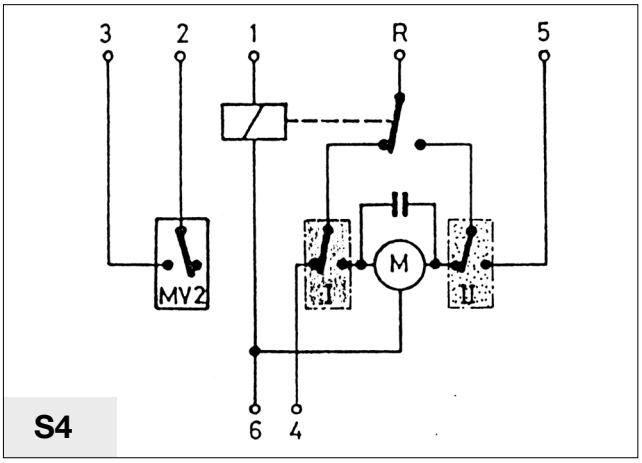

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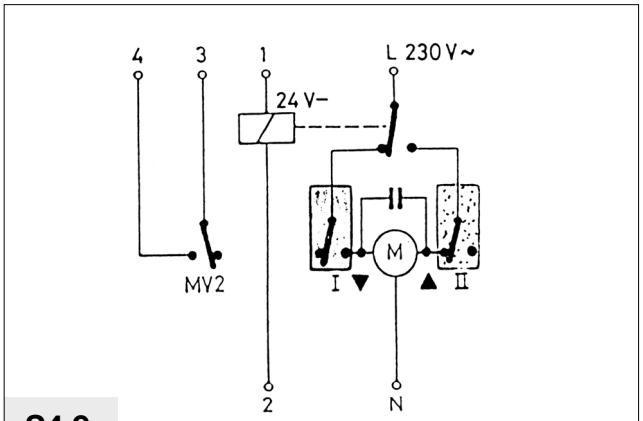

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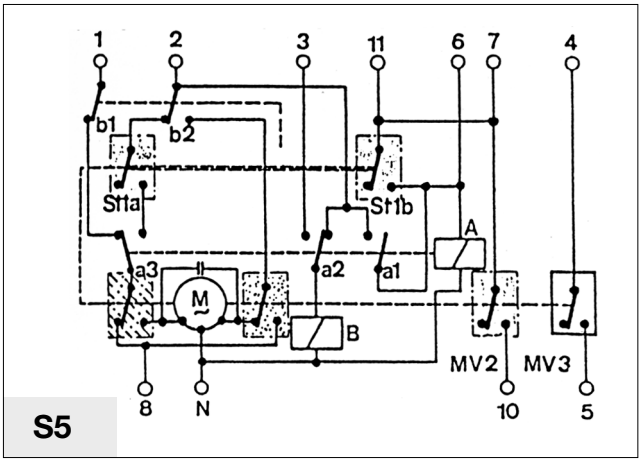

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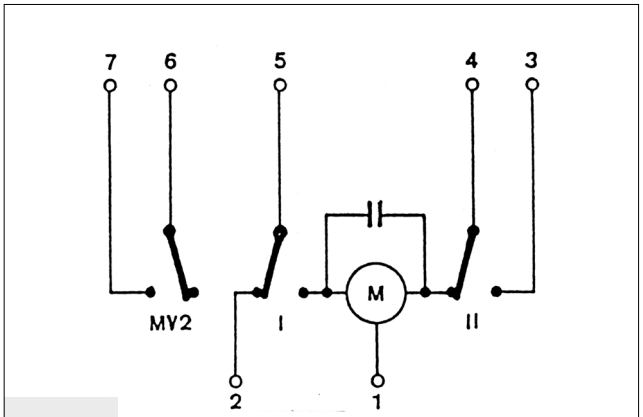
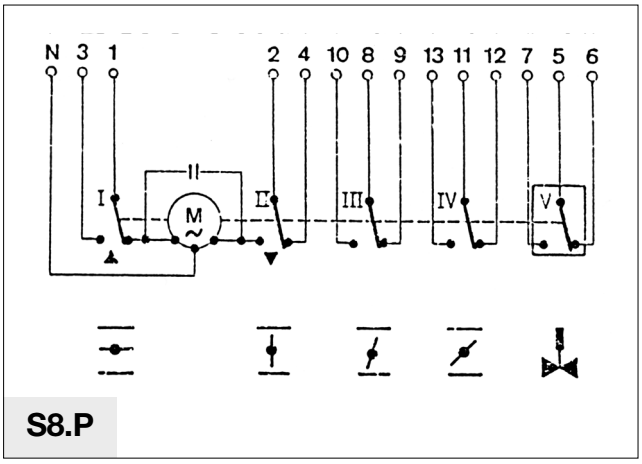
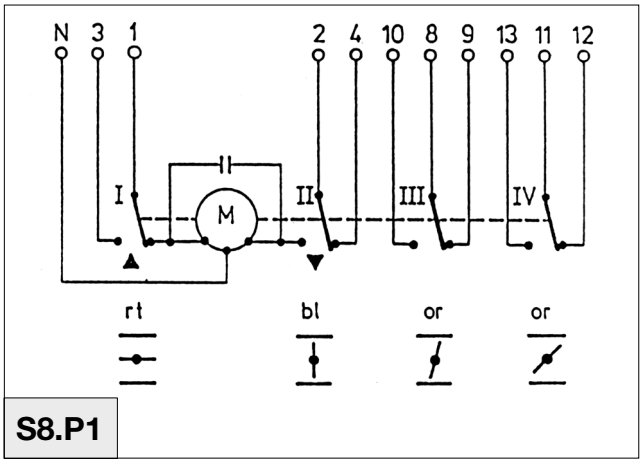


S6

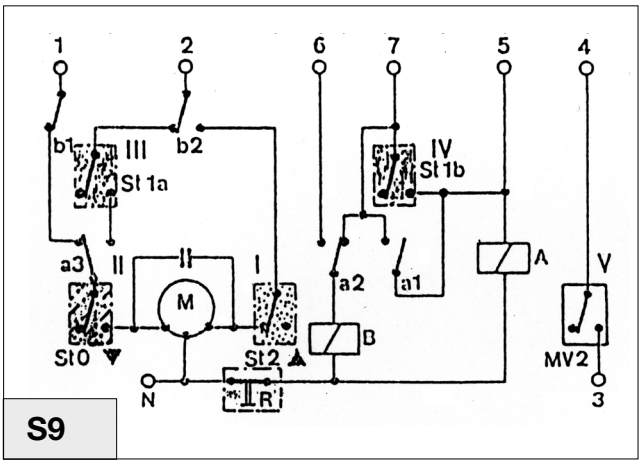
CIRCUIT DIAGRAMS



S8.P



S8.P1



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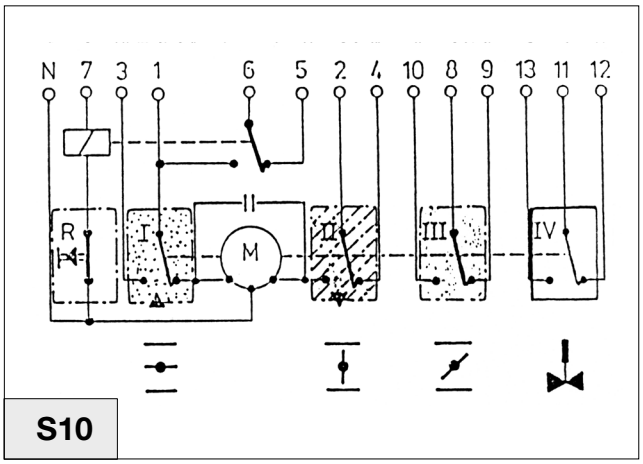

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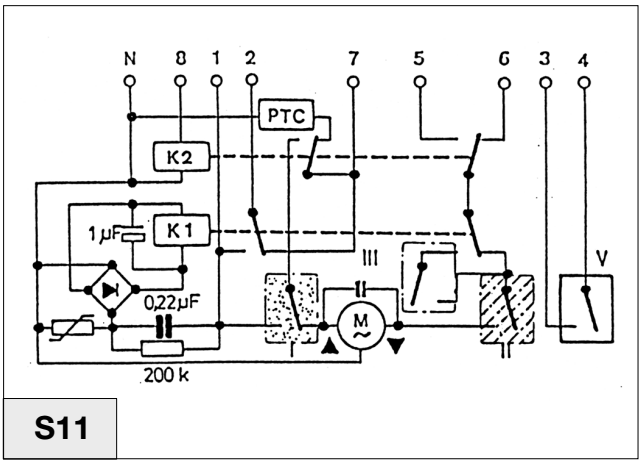

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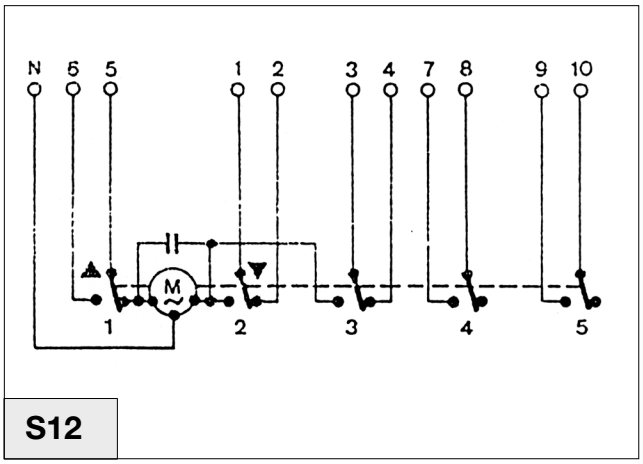

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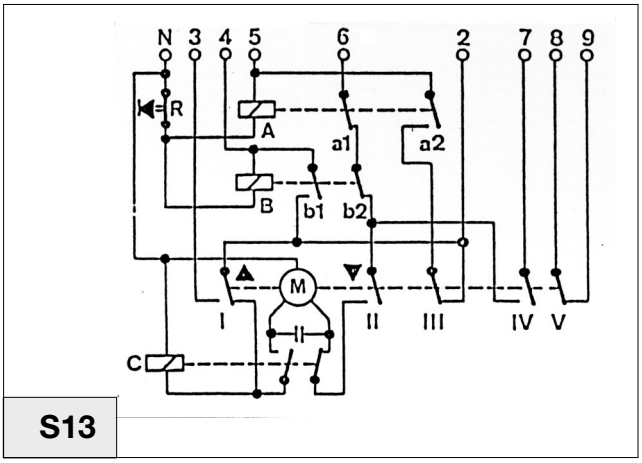

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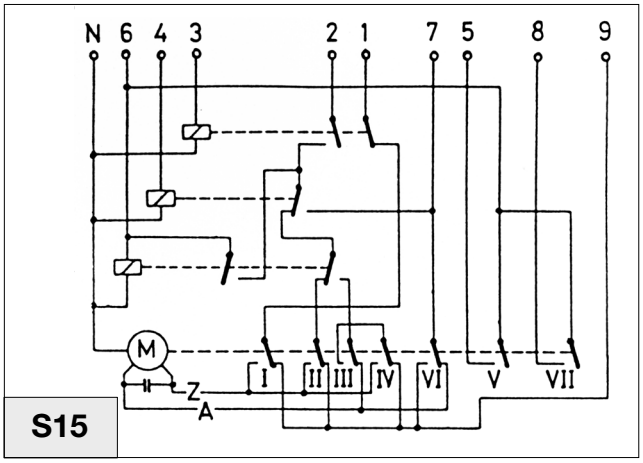

S15

VARIOUS

STANDARDS AND APPROVALS

Conformity

- In accordance with EU Directives 73/23/EU and 93/68/EU. Conforms to
  EN 60730 – 1 : 1991 A1 and A11 : 1991
  EN 60730 – 2 – 5 : 1991

ORDERING INFORMATION

Not for creation of new type

LKS 160-09 B 5 - 30 S3.P1.1

Circuit version

Drive time for 90°

3s (1,5 Nm)	22s (3,0 Nm)
5s (2,5 Nm)	34s (3.0 Nm)
8s (3,0 Nm)	45s (3.0 Nm)
12s (3.0 Nm)	65s (3.0 Nm)

Type of drive shaft

5 Standard shaft Ø 8, one side bevelled to 7 mm
6 Special shaft, e.g. hexagonal

Direction of rotation

A clockwise
B counter-clockwise

Model

Series

ACCESSORIES

Potentiometer - retrofit set for actuators without relays (90° = ca 1kΩ) **ZPN 160-01**

Potentiometer - retrofit set for actuators with relays (90° = ca 1kΩ) **ZPN 160-06**

Other versions on request

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