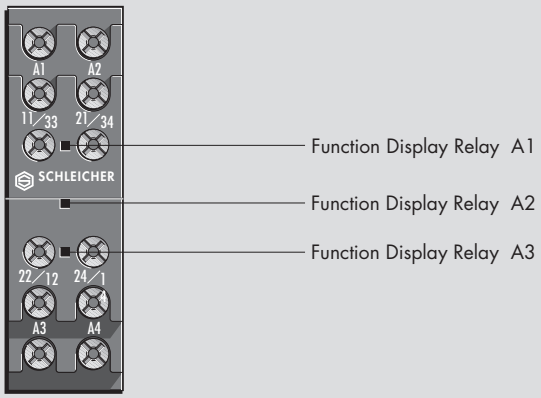
Coupling Relays

Relay Output
Relay Coils Separately Energized
Maximum of Three Relays in a 22,5 mm Housing Width
Integrated Free-Wheeling Diodes
KS 21, KS 22, KS 42 and KS 63 Without In-Rush Current

KS 11 **KS 12** **KS 21** **KS 22**
KS 32 **KS 42** **KS 53** **KS 63**



For Example

- Electrical isolation between output signals from electronic systems and users
- Coupling elements between devices and installations with different signal levels
- Intensify weak signals
- Suited for Initiator control (see General Technical Specification Points 4 to 6)

Function

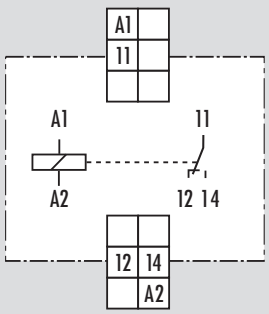
Following the application of the supply voltage the relay switches into the operating position. If the supply voltage is switched off, the relays switch again into the off position.

Notes

- The internal switching relays are controlled electronically. This guarantees the coupling relay to switch even under difficult operating conditions.
- For the DC voltage coupling elements (KS 21, KS 22, KS 42 and KS 63) there is no in-rush current when the voltage is applied.
  They are particularly suited for the control of three-wire initiators.
- An external wiring with the free-wheeling diodes or R-C-combinations is not necessary.
  The fault supression already occurs in the relay.

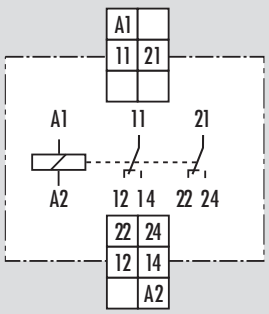
Connection Diagram

KS 11, KS 21 KS 0167/1



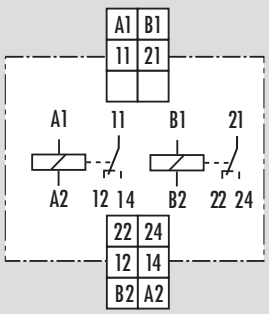
Connection Diagram

KS 12, KS 22 KS 0166/1



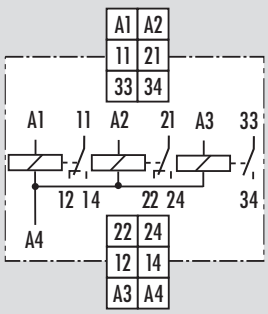
Connection Diagram

KS 32, KS 42 KS 0285/1



Connection Diagram

KS 53, KS 63 KS 0286/1



7

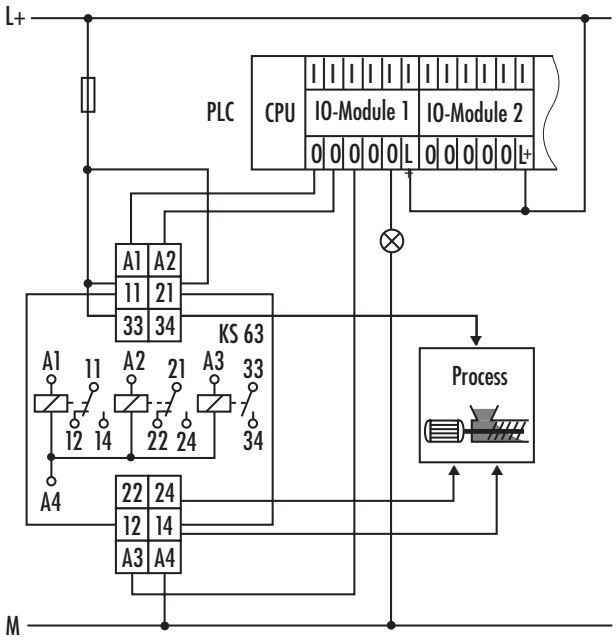
SCHLEICHER
Relays and Automation Systems

KS 11 | KS 12 | KS 21 | KS 22 | KS 32 | KS 42 | KS 53 | KS 63

Application Example

A 1064

Conversion of the PLC Output Performance

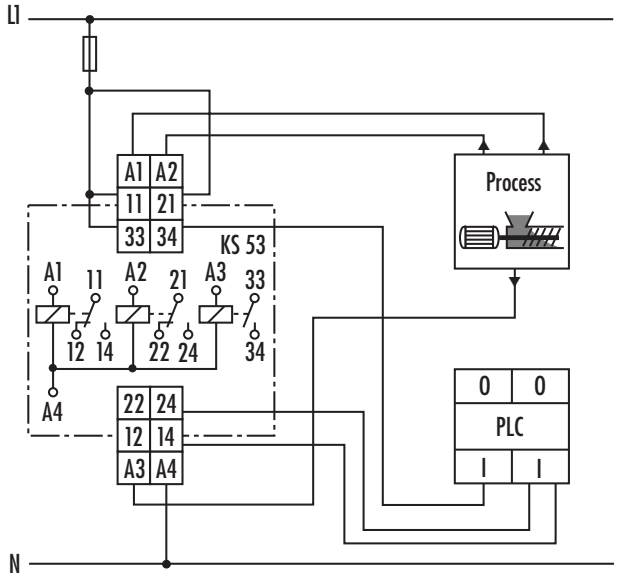


The outputs of the PLC systems have a limited loading capability only. If a higher performance is needed, coupling relays must be used. The coupling relays convert the weak performances of the PLC outputs to the needed performances within the process. The use of this coupling relays saves place in the cabinet.

Application Example

A 1065

Adaptation of the Voltage Levels to a PLC.



In the process, different voltage levels are made available. In order to adapt these levels to the PLC, coupling relays are used. Because of their electrical isolation, the coupling relays simultaneously offer a good protection against the over voltage at the PLC inputs.

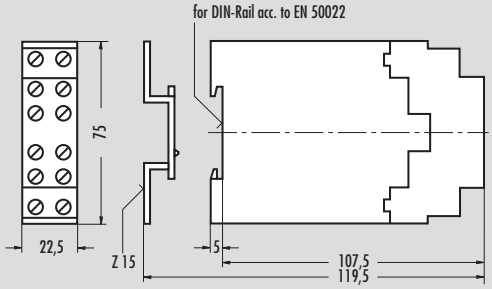
Function Diagram

FD 0051 W1

Coupling Relays of the KS range

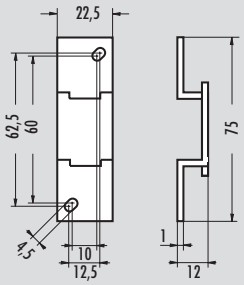
Dimension Diagram

K 1-14



Accessory

Adaptor Z 15



Order Example

KS 53 24 to 28 V AC/DC

Type — Rated Voltage

7

TECHNICAL DATA

		KS 11	KS 21
FUNCTION According to DIN VDE 0435 Sec. 110:04.89 Point 2.1		Switching Relay	Switching Relay
Function Display		1 LED green	1 LED green
Function Diagram		FD 0051 W1	FD 0051 W1
POWER SUPPLY			
Rated Voltage U_N	V DC		
Rated Voltage U_N	V AC/DC	**12 / 24 / 42 / 48**	**12 - 14 / 24 - 28 / 60 / 110 / 220**
Rated Consumption at 50 Hz and U_N (AC)	VA	1,2 / 1,1 / 1,1 / 1,4	
Rated Consumption at 50 Hz and U_N (AC)	W	1,1 / 1,0 / 1,0 / 1,2	
Rated Consumption DC	W	1,0 / 1,0 / 0,8 / 1,0	1,1 / 0,9 / 1,1 / 0,9 / 1,3
In-Rush Current	A/ms	0,3/1 / 0,3/0,5 / 0,3/0,4 / 0,3/0,4	
Rated Voltage U_N	V AC/DC	**110 - 120 / 220 - 240**	
Rated Consumption at 50 Hz and U_N (AC)	VA	1,7 / 1,9	
Rated Consumption at 50 Hz and U_N (AC)	W	1,4 / 1,6	
Rated Consumption DC	W	1,1 / 1,6	
In-Rush Current	A/ms	0,3/0,2 / 0,2/0,1	
Rated Frequency	Hz	50 to 60	
Operating Voltage Range		0,8 to 1,1 x U_N	0,8 to1,1 x U_N
CONTROL SWITCHING RELAY			
Release Value	% U_N	≥ 15	≥ 15
Permissible Parallel Load		yes	yes
Internal One-Way Rectifier		no	no
Average Value of the Error		Diagram 4, Page i.11	Diagram 4, Page i.11
OUTPUT CIRCUIT			
Contact Type		1 Changeover	1 Changeover
Contact Material		Ag - Alloy; Gold - Plated	Ag - Alloy; Gold - Plated
Switching Voltage U_n	V AC/DC	230/230	230/230
Maximum Rated Current I_n per Contact	A	≤ 5	≤ 5
Application Category acc. to EN 60947–5–1:1991		AC–15: U_e 230 V AC, I_e 2 A DC–13: U_e 24 V DC, I_e 2 A	AC–15: U_e 230 V AC, I_e 2 A DC–13: U_e 24 V DC, I_e 2 A
Short-Circuit Protection Max. Fuse Class gG	A	6	6
Permissible Switching Fequency	Switching Cycle/h	3600	3600
Mechanical Lifetime	Switching Cycles	30 x 10^6	30 x 10^6
Response Time t_A	ms	10	7
Release Time t_R	ms	13	3
GENERAL DATA			
Creepage and Clearance Distances Between Circuits			
According to DIN VDE 0110-1:04.97: Rated Withstand Voltage	kV	4	4
Over Voltage Category		III	III
Contamination Level		3 Outside,2 Inside	3 Outside, 2 Inside
Design Voltage	V	250	250
Test Voltage U_{eff} 50 Hz acc. to DIN VDE 0110-1, Table A.1	kV	2,2	2,2
Protection Class Housing/Terminals acc. to DIN VDE 0470 Sec. 1:11.92		IP 30/IP 20	IP 30/IP 20
Radiated Noise		EN 50081–1:03.93, –2:03.94	EN 50081–1:03.93, –2:03.94
Noise Immunity		EN 50082–2:1995	EN 50082–2:1995
Ambient Temperature, Working Range	°C	- 20 to+ 60	- 20 to + 60
Dimension Diagram		K 1-14	K 1-14
Connection Diagram		KS 0167/1	KS 0167/1
Weight	kg	0,1	0,1
Accessory		Adaptor Z 15	Adaptor Z 15
GENERAL TECHNICAL SPECIFICATIONS		Page i.11	Page i.11

7

KS 32

Switching Relay
2 LED green
FD 0051 W1

12 - 13	24 - 28	42 - 48	60
1,6	1,8	1,8	1,8
1,2	1,0	1,2	1,2
1,2	1,0	1,2	1,2
1,5/0,7	1/0,7	0,8/0,7	0,7/0,6

110 - 127	220 - 240
4,1	7,4
1,2	1,2
0,6/0,4	0,5/0,4

50 to 60
0,8 to 1,1 x U_N

≥ 15
yes
no
Diagram 4, Page i.11

2 Changeover
Ag Cd O
250/127
≤ 5
AC–15: U_e 230 V AC, I_e 2 A
DC–13: U_e 24 V DC, I_e 2 A
6
3600
20 x 10^6
10
13

4
III
3 Outside,2 Inside
250
2,2
IP 30/IP 20
EN 50081–1:03.93, –2:03.94
EN 50082–2:1995

-20 to+ 60
K 1-14
KS 0285/1
0,12
Adaptor Z 15

Page i.11

KS 42

Switching Relay
2 LED green
FD 0051 W1

12 - 14	24 - 28	42 - 60
1,0	1,0	1,0

0,8 to 1,1 x U_N

≥ 15
yes
no
Diagram 4, Page i.11

2 Changeover
Ag Cd O
250/127
≤ 5
AC–15: U_e 230 V AC, I_e 2 A
DC–13: U_e 24 V DC, I_e 2 A
6
3600
20 x 10^6
7
3

4
III
3 Outside,2 Inside
250
2,2
IP 30/IP 20
EN 50081–1:03.93, –2:03.94
EN 50082–2:1995

-20 to + 60
K 1-14
KS 0285/1
0,12
Adaptor Z 15

Page i.11

KS 53

Switching Relay
3 LED green
FD 0051 W1

12 - 13	24 - 28	42 - 48	60
2,4	2,7	2,7	2,7
1,8	1,5	1,8	1,8
1,8	1,5	1,8	1,8
1,5/0,7	1/0,7	0,8/0,7	0,7/0,6

110 - 127	220 - 240
6,2	12,2
2,0	2,2
1,5/0,08	2,8/0,02

50 to 60
0,8 to 1,1 x U_N

≥ 15
yes
no
Diagram 4, Page i.11

2 Changeover, 1 Normallly Open
Ag Cd O
250/127
≤ 5
AC–15: U_e 230 V AC, I_e 2 A
DC–13: U_e 24 V DC, I_e 2 A
6
3600
20 x 10^6
10
13

4
III
3 Outside,2 Inside
250
2,2
IP 30/IP 20
EN 50081–1:03.93, –2:03.94
EN 50082–2:1995

-20 to + 60
K 1-14
KS 0286/1
0,14
Adaptor Z 15

Page i.11

KS 63

Switching Relay
3 LED green
FD 0051 W1

12 - 14	24 - 28	42 - 60
1,5	1,5	1,5

0,8 to 1,1 x U_N

≥ 15
yes
no
Diagram 4, Page i.11

2 Changeover, 1 Normallly Open
Ag Cd O
250/127
≤ 5
AC–15: U_e 230 V AC, I_e 2 A
DC–13: U_e 24 V DC, I_e 2 A
6
3600
20 x 10^6
7
3

4
III
3 Outside,2 Inside
250
2,2
IP 30/IP 20
EN 50081–1:03.93, –2:03.94
EN 50082–2:1995

-20 to + 60
K 1-14
KS 0286/1
0,14
Adaptor Z 15

Page i.11

TECHNICAL DATA

		KS 12	KS 22
FUNCTION According to DIN VDE 0435 Sec.110:04.89 Point 2.1		Switching Relay	Switching Relay
Function Display		1 LED green	1 LED green
Function Diagram		FD 0051 W1	FD 0051 W1
POWER SUPPLY			
Rated Voltage U_N	V DC		**12 - 14** | **24 - 28**
Rated Voltage U_N	V AC/DC	**12** | **24** | **42** | **48**	
Rated Consumption at 50 Hz and U_N (AC)	VA	1,2 | 1,1 | 1,1 | 1,4	
Rated Consumption at 50 Hz and U_N (AC)	W	1,1 | 1,0 | 1,0 | 1,2	
Rated Consumption DC	W	1,0 | 1,0 | 0,8 | 1,0	1,1 | 0,9
In-Rush Current	A/ms	0,3/1 | 0,3/0,5 | 0,3/0,4 | 0,3/0,4	
Rated Voltage U_N	V DC		**60** | **110 - 127** | **230**
Rated Voltage U_N	V AC/DC	**110 - 120** | **220 - 240**	
Rated Consumption at 50 Hz and U_N (AC)	VA	1,7 | 1,9	
Rated Consumption at 50 Hz and U_N (AC)	W	1,4 | 1,6	
Rated Consumption DC	W	1,1 | 1,6	1,1 | 0,9 | 1,3
In-Rush Current	A/ms	0,3/0,2 | 0,2/0,1	
Rated Frequency	Hz	50 to 60	–
Operating Voltage Range		0,8 to 1,1 x U_N	0,8 to 1,1 x U_N
CONTROL SWITCHING RELAY			
Release Value	% U_N	≥ 15	≥ 15
Permissible Parallel Load		yes	yes
Internal One-Way Rectifier		no	yes
Average Value of the Error		Diagram 4, Page i.11	Diagram 4, Page i.11
OUTPUT CIRCUIT			
Contact Type		2 Changeover	2 Changeover
Contact Material		Ag - Alloy; Gold - Plated	Ag - Alloy; Gold - Plated
Switching Voltage U_n	V AC/DC	250/300	250/300
Maximum Rated Current I_n per Contact	A	≤ 5	≤ 5
Application Category acc. to EN 60947–5–1:1991		AC–15: U_e 230 V AC, I_e 2 A DC–13: U_e 24 V DC, I_e 2 A	AC–15: U_e 230 V AC, I_e 2 A DC–13: U_e 24 V DC, I_e 2 A
Short-Circuit Protection Max. Fuse Class gG	A	6	6
Permissible Switching Fequency	Switching Cycle/h	3600	3600
Mechanical Lifetime	Switching Cycles	30×10^6	30×10^6
Response Time t_A	ms	10	6
Release Time t_R	ms	13	8
GENERAL DATA			
Creepage and Clearance Distances Between Circuits		4	4
According to DIN VDE 0110-1:04.97: Rated Withstand Voltage	kV	III	III
Over Voltage Category		3 Outside,2 Inside	3 Outside,2 Inside
Contamination Level		250	250
Design Voltage	V	2,2	2,2
Test Voltage U_{eff} 50 Hz acc. to DIN VDE 0110-1, Table A.1	kV	IP 30/IP 20	IP 30/IP 20
Protection Class Housing/Terminals acc. to DIN VDE 0470 Sec. 1:11.92		EN 50081–1:03.93, –2:03.94	EN 50081–1:03.93, –2:03.94
Radiated Noise		EN 50082–2:1995	EN 50082–2:1995
Noise Immunity			
Ambient Temperature, Working Range	°C	-20 to+ 60	-20 to + 60
Dimension Diagram		K 1-14	K 1-14
Connection Diagram		KS 0166/1	KS 0166/1
Weight	kg	0,12	0,12
Accessory		Adaptor Z 15	Adaptor Z 15
GENERAL TECHNICAL SPECIFICATIONS		Page i.11	Page i.11

7