

PLC INTERFACE With Leakage Current and Interference Voltage Suppression

PLC-...SO46

1. Description

PLC INTERFACE, the super thin, plug-in, and flexible modular interface system with a user-friendly jumper system, now offers an extended range of relay interfaces for applications in which high levels of interference voltage occur on the control side (coil).

Application Problem: Long Cables

This problem is familiar to almost every practical expert: relays do not drop again on a "0" signal or even pick up in extreme cases due to interference voltages on the control cables. This is often caused by long and/or poorly-laid cables. AC voltages are thus coupled from neighboring cables, which frequently exceed 10 V. Conventional coupling relays become overloaded with these undefined signals and do not demonstrate clear switching behavior.

Application Problem: Leakage Currents From AC Outputs

The same effect occurs if electronic AC outputs produce leakage currents. This is often the case for many AC voltage initiators and PLC AC output cards. Leakage currents of several mA can also adversely affect the operation of conventional relays, which remain "suspended".

Solution: PLC-...SO46 With Integrated Filter

6.2 mm (0.244 in.) and 14 mm (0.551 in.) PLC-...SO46 versions with integrated filter are now available for applications in 120 V AC or 230 V AC networks with high levels of interference voltage. This multi-level filter circuit considerably reduces interference in the control circuit and thus contributes to safe signal transmission.

The PLC-...SO46 is only supplied as a basic terminal block with filter; a relay or optocoupler is not fitted. For possible components, please refer to the Technical Data.

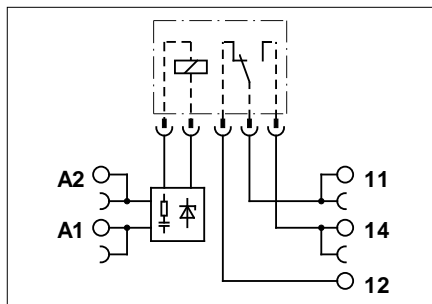


All Other PLC Advantages

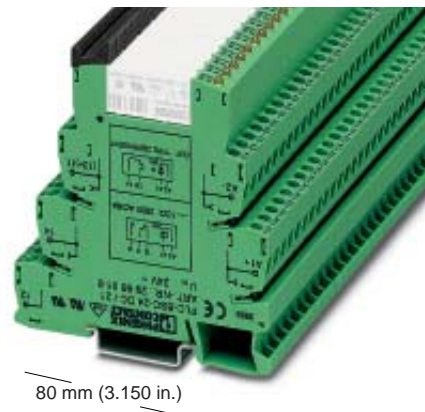
The PLC-...SO46 series also features the other advantages of the PLC range:

- Super thin 6.2 mm (0.244 in.) and 14 mm (0.551 in.) design
- Either universal SPDT or sensor version for input signals
- User-friendly, vibration-resistant, and time-saving jumper system
- Integrated input and protection circuit
- Relay or optocoupler can be quickly replaced using an engagement lever
- Either screw or spring-cage connection technology
- ...

2. Technical Data: Universal Range



Circuit diagram



PLC-B.../21/SO46

Basic terminal block with integrated filter that can be fitted with a relay or optocoupler

Housing width 6.2 mm (0.244 in.) (UL cULus provided)

¹⁾The technical data only applies to basic terminal blocks fitted with a REL-MR-60DC/21 or REL-MR-60DC/21AU

Note: Please refer to the INTERFACE catalog for assembly instructions and accessories



M 3



	solid [mm ²]	flexible [mm ²]	AWG	I [A]	U [V]
Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	*	*

* The electrical data is determined by the relay.

Description	Input voltage U _N
PLC interface with screw connection PLC-BSC.../21/SO46 basic terminal block for plug-in REL-MR-60DC... miniature relay, for mounting on	120 V AC 230 V AC
PLC interface with spring-cage connection PLC-BSP.../21/SO46 basic terminal block for plug-in REL-MR-60DC... miniature relay, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature relay	Gold contact Power contact

Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/21/SO46	29 80 31 9	10
PLC-BSC-230UC/21/SO46	29 80 33 5	10
PLC-BSP-120UC/21/SO46	29 80 35 1	10
PLC-BSP-230UC/21/SO46	29 80 37 7	10
REL-MR-60DC/21AU	29 61 13 4	18
REL-MR-60DC/21	29 61 11 8	18

Technical Data¹⁾

Input Data
 Nominal input voltage U_N
 Permissible range (with reference to U_N and T_u = 20°C [68°F])
 Typical release voltage
 Typical input current at U_N (50 Hz/60 Hz)
 Typical response time/release time at U_N
 Input wiring:

Output Data (when fitted with...)
 Contact version
 Contact material
 Maximum switching voltage
 Minimum switching voltage
 Limiting continuous current
 Maximum inrush current
 Minimum switching current
 Maximum shutdown power, ohmic load:

24 V DC
48 V DC
60 V DC
110 V DC
220 V DC
250 V AC

Minimum switching power

General Data
 Test voltage I/O
 Ambient operating temperature range
 Nominal operating mode
 Flammability class
 Mechanical life
 Standards/specifications

Mounting position/mounting

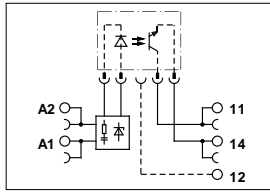
120 V AC	230 V AC
0.8...1.4	0.78...1.14
50 V AC	80 V AC
7/8 mA	8.8/10 mA
7 ms/20 ms	7 ms/20 ms

Operating indicators, bridge rectifier, filter

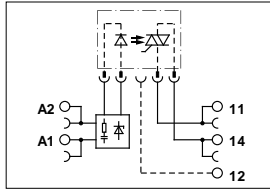
REL-MR-60DC/21	REL-MR-60DC/21AU
Single contact, 1 Form C contact	Single contact, 1 Form C contact
AgSnO	Ag alloy, hard gold-plated
250 V AC/DC	30 V AC/36 V DC
12 V AC/DC	100 mV
6 A	50 mA
On request	50 mA
10 mA	1 mA
140 W	1.2 W
20 W	-
18 W	-
23 W	-
40 W	-
1500 VA	-
120 mW	100 μW

4 kV, 50 Hz, 1 minute
 -20°C to +55°C (-4°F to +131°F)
 100% ED
 V0 according to UL 94
 2 x 10⁷ cycles
 IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 3, Surge Voltage Category III, DIN EN 50 178/VDE 0160 (in relev. parts), IEC 60 255/DIN VDE 0435 (in relev. parts), DIN VDE 0106-101: 1986-11, reinforced insulation for I/O
 Any/can be mounted without spacing

INTERFACE Relay: Resistant Against Interference Voltages and Leakage Currents PLC-...SO46



Circuit diagram for DC output



Circuit diagram for AC output

94 mm (3.701 in.)



PLC-B.../21/SO46

Basic terminal block with integrated filter that can be fitted with a relay or optocoupler

Note: Please refer to the INTERFACE catalog for assembly instructions and accessories



M 3

8

	solid [mm ²]	flexible [mm ²]	AWG	I [A]	U [V]
Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	*	*

* The electrical data is determined by the optocoupler.

Description	Input voltage U _N
PLC interface with screw connection PLC-BSC.../21/SO46 basic terminal block for plug-in OPT-60DC... miniature optocoupler, for mounting on	120 V AC 230 V AC
PLC interface with spring-cage connection PLC-BSP.../21/SO46 basic terminal block for plug-in OPT-60DC... miniature optocoupler, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature optocoupler	

Technical Data¹⁾

Input Data

Nominal input voltage U _N	
Permissible range (with reference to U _N)	
Switching level	0 signal ("L")
Typical input current at U _N (50 Hz/60 Hz)	
Typical switch-on time at U _N	
Typical switch-off time at U _N	
Input wiring:	

Output Data (when fitted with...)

Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current (refer to catalog for derating curve)	
Maximum inrush current	
Output switching	

Output wiring

Voltage drop on limiting continuous current	
Leakage current in the off state	
Maximum phase displacement (inductive load)	
Maximum load value I ² x t (t = 10 ms)	

General Data

Test voltage I/O	
Ambient operating temperature range	
Nominal operating mode	
Flammability class	
Standards/specifications	

Mounting position/mounting

Housing width 6.2 mm (0.244 in.)

(UL us provided)

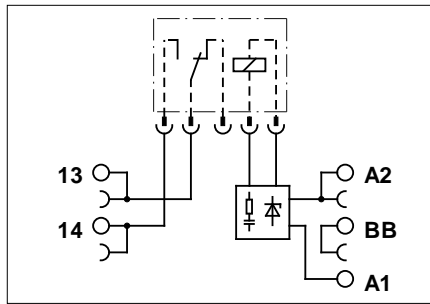
¹⁾The technical data only applies to basic terminal blocks fitted with a OPT-60DC/24DC/2, OPT-60DC/48DC/100 or OPT-60DC/230AC/1

Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/21/SO46	29 80 31 9	10
PLC-BSC-230UC/21/SO46	29 80 33 5	10
PLC-BSP-120UC/21/SO46	29 80 35 1	10
PLC-BSP-230UC/21/SO46	29 80 37 7	10
OPT-60DC/48DC/100	29 66 62 1	18
OPT-60DC/24DC/2	29 66 60 5	18
OPT-60DC/230AC/1	29 67 96 3	18

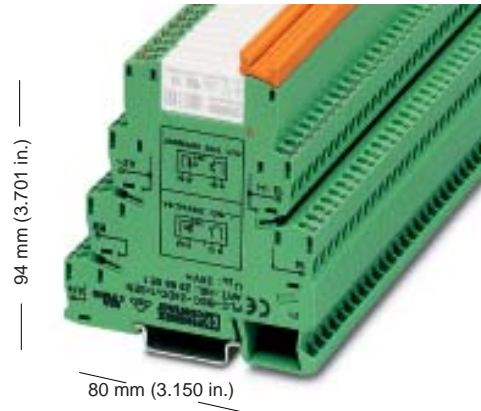
	120 V AC	230 V AC
0.85...1.1	0.85...1.1	0.8...1.1
≤ 0.4 x U _N	≤ 0.4 x U _N	≤ 0.4 x U _N
7/8 mA	8.8/10 mA	8.8/10 mA
6 ms	6 ms	6 ms
10 ms	10 ms	10 ms
Operating indicators, bridge rectifier, filter		
OPT-60DC/48DC/100	OPT-60DC/24DC/2	OPT-60DC/230AC/1
48 V DC	30 V DC	253 V AC
3 V DC	3 V DC	24 V AC
100 mA	3 A	0.75 A
-	15 A (10 ms)	30 A (10 ms)
2-wire floating ground	2-wire floating ground	2-wire floating ground
Protection against polarity reversal, Surge voltage protection	Protection against polarity reversal, Surge voltage protection	RCV circuit
< 1 V DC	< 200 mV DC	< 1 V DC
-	-	< 1 mA
-	-	cosφ = 0.5
-	-	4.5 A ² s

2.5 kV, 50 Hz, 1 minute
 -20°C to +55°C (-4°F to +131°F)
 100% ED
 V0 according to UL 94
 IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 2,
 Surge Voltage Category III
 Any/can be mounted without spacing

3. Technical Data: Sensor Version for Input Signals



Circuit diagram



PLC-B.../1/SEN/SO46

Basic terminal block with integrated filter that can be fitted with a relay or optocoupler

Housing width 6.2 mm (0.244 in.)

(UL cULus provided)

¹⁾The technical data only applies to basic terminal blocks fitted with a REL-MR-60DC/21 or REL-MR-60DC/21AU

Note: Please refer to the INTERFACE catalog for assembly instructions and accessories



M 3

8

	solid	flexible	AWG	I [A]	U [V]
Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	*	*

* The electrical data is determined by the relay.

Description	Input voltage U _N
PLC interface with screw connection PLC-BSC.../1/SEN/SO46 basic terminal block for plug-in REL-MR-60DC... miniature relay, for mounting on	120 V AC 230 V AC
PLC interface with spring-cage connection PLC-BSP.../1/SEN/SO46 basic terminal block for plug-in REL-MR-60DC... miniature relay, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature relay	Gold contact Power contact

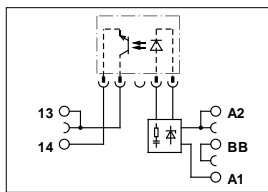
Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/1/SEN/SO46	29 80 32 2	10
PLC-BSC-230UC/1/SEN/SO46	29 80 34 8	10
PLC-BSP-120UC/1/SEN/SO46	29 80 36 4	10
PLC-BSP-230UC/1/SEN/SO46	29 80 38 0	10
REL-MR-60DC/21AU	29 61 13 4	18
REL-MR-60DC/21	29 61 11 8	18

Technical Data¹⁾

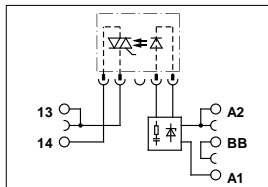
Input Data	
Nominal input voltage U _N	
Permissible range (with reference to U _N and T _u = 20°C [68°F])	
Typical release voltage	
Typical input current at U _N (50 Hz/60 Hz)	
Typical response time/release time at U _N	
Input wiring:	
Output Data (when fitted with...)	
Contact version	
Contact material	
Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current	
Maximum inrush current	
Minimum switching current	
Maximum shutdown power, ohmic load:	24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 250 V AC
Minimum switching power	
General Data	
Test voltage I/O	
Ambient operating temperature range	
Nominal operating mode	
Flammability class	
Mechanical life	
Standards/specifications	
Mounting position/mounting	

120 V AC	230 V AC
0.8...1.4	0.78...1.14
50 V AC	80 V AC
7/8 mA	8.8/10 mA
7 ms/20 ms	7 ms/20 ms
Operating indicators, bridge rectifier, filter	
REL-MR-60DC/21	REL-MR-60DC/21AU
Single contact, 1 Form A contact	Single contact, 1 Form A contact
AgSnO	Ag alloy, hard gold-plated
250 V AC/DC	30 V AC/36 V DC
12 V AC/DC	100 mV
6 A	50 mA
On request	50 mA
10 mA	1 mA
140 W	1.2 W
20 W	-
18 W	-
23 W	-
40 W	-
1500 VA	-
120 mW	100 μW
4 kV, 50 Hz, 1 minute	
-20°C to +55°C (-4°F to +131°F)	
100% ED	
V0 according to UL 94	
2 x 10 ⁷ cycles	
IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 3, Surge Voltage Category III, DIN EN 50 178/VDE 0160 (in relev. parts), IEC 60 255/DIN VDE 0435 (in relev. parts), DIN VDE 0106-101: 1986-11, reinforced insulation for I/O	
Any/can be mounted without spacing	

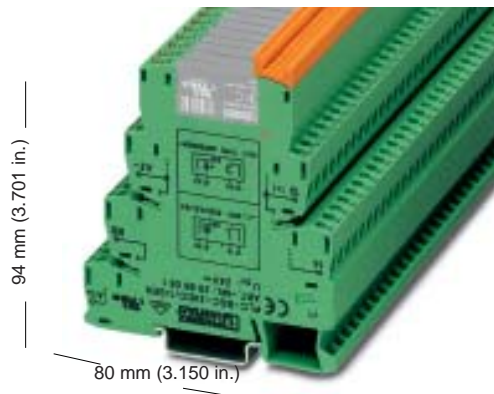
INTERFACE Relay: Resistant Against Interference Voltages and Leakage Currents PLC-...SO46



Circuit diagram for DC output



Circuit diagram for AC output



Note: Please refer to the INTERFACE catalog for assembly instructions and accessories



M 3



	solid [mm ²]	flexible AWG	I [A]	U [V]
Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	* * *

* The electrical data is determined by the optocoupler.

Description	Input voltage U _N
PLC interface with screw connection PLC-BSC.../1/SEN/SO46 basic terminal block for plug-in OPT-60DC... miniature optocoupler, for mounting on	120 V AC 230 V AC
PLC interface with spring-cage connection PLC-BSP.../1/SEN/SO46 basic terminal block for plug-in OPT-60DC... miniature optocoupler, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature optocoupler	

Technical Data¹⁾

Input Data

Nominal input voltage U _N	
Permissible range (with reference to U _N)	
Switching level	0 signal ("L")
Typical input current at U _N (50 Hz/60 Hz)	
Typical switch-on time at U _N	
Typical switch-off time at U _N	
Input wiring:	

Output Data (when fitted with...)

Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current (refer to catalog for derating curve)	
Maximum inrush current	
Output switching	

Output wiring

Voltage drop on limiting continuous current	
Leakage current in the off state	
Maximum phase displacement (inductive load)	
Maximum load value I ² x t (t = 10 ms)	

General Data

Test voltage I/O	
Ambient operating temperature range	
Nominal operating mode	
Flammability class	
Standards/specifications	

Mounting position/mounting

PLC-B.../1/SEN/SO46

Basic terminal block with integrated filter that can be fitted with a relay or optocoupler

Housing width 6.2 mm (0.244 in.) (UL us provided)

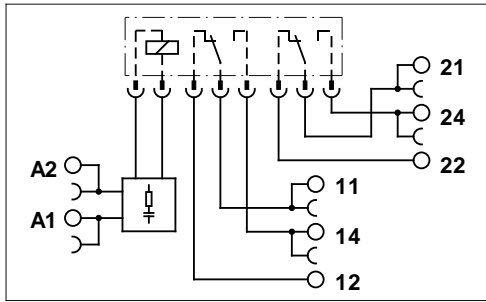
¹⁾The technical data only applies to basic terminal blocks fitted with a OPT-60DC/24DC/2, OPT-60DC/48DC/100 or OPT-60DC/230AC/1

Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/1/SEN/SO46	29 80 32 2	10
PLC-BSC-230UC/1/SEN/SO46	29 80 34 8	10
PLC-BSP-120UC/1/SEN/SO46	29 80 36 4	10
PLC-BSP-230UC/1/SEN/SO46	29 80 38 0	10
OPT-60DC/48DC/100	29 66 62 1	18
OPT-60DC/24DC/2	29 66 60 5	18
OPT-60DC/230AC/1	29 67 96 3	18

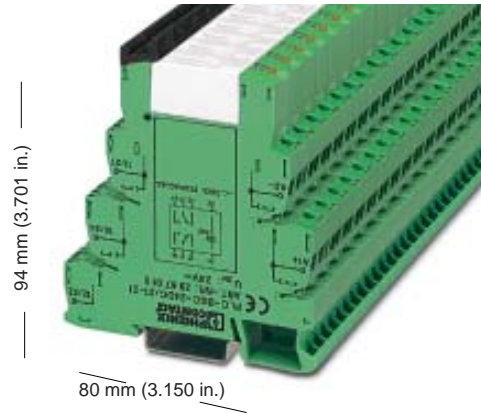
120 V AC	230 V AC	
0.85...1.1	0.8...1.1	
≤ 0.4 x U _N	≤ 0.4 x U _N	
7/8 mA	8.8/10 mA	
6 ms	6 ms	
10 ms	10 ms	
Operating indicators, bridge rectifier, filter		
OPT-60DC/48DC/100	OPT-60DC/24DC/2	OPT-60DC/230AC/1
48 V DC	30 V DC	253 V AC
3 V DC	3 V DC	24 V AC
100 mA	3 A	0.75 A
-	5 A (10 ms)	30 A (10 ms)
2-wire floating ground	2-wire floating ground	2-wire floating ground
Protection against polarity reversal,	Protection against polarity reversal,	RCV circuit
Surge voltage protection	Surge voltage protection	
≤ 1 V DC	≤ 200 mV DC	< 1 V AC
-	-	< 1 mA
-	-	cosφ = 0.5
-	-	4.5 A ² s

2.5 kV, 50 Hz, 1 minute
 -20°C to +55°C (-4°F to +131°F)
 100% ED
 V0 according to UL 94
 IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 2,
 Surge Voltage Category III
 Any/can be mounted without spacing

4. Technical Data: Universal SPDT Version



Circuit diagram



Note: Please refer to the INTERFACE catalog for assembly instructions and accessories

M 3	solid	flexible	AWG	I [A]	U [V]
	[mm ²]				

Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	*	*
* The electrical data is determined by the relay.					

Description	Input voltage U _N
PLC interface with screw connection PLC-BSC.../21-21/SO46 basic terminal block for plug-in REL-MR-110DC... miniature relay, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature relay	Gold contact Power contact

Technical Data¹⁾

Input Data	
Nominal input voltage U _N	
Permissible range (with reference to U _N and T _u = 20°C [68°F])	
Typical release voltage	
Typical input current at U _N (50 Hz/60 Hz)	
Typical response time/release time at U _N	
Input wiring:	
Output Data (when fitted with...)	
Contact version	
Contact material	
Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current	
Maximum inrush current	
Minimum switching current	
Maximum shutdown power, ohmic load:	24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 250 V AC
Minimum switching power	
General Data	
Test voltage I/O	
Ambient operating temperature range	
Nominal operating mode	
Flammability class	
Mechanical life	
Standards/specifications	
Mounting position/mounting	

PLC-BSC...21-21/SO46

Basic terminal block with integrated filter that can be fitted with a relay

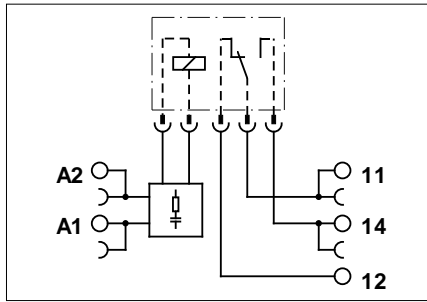
Housing width 14 mm (0.244 in.) us provided)

¹⁾The technical data only applies to basic terminal blocks fitted with a REL-MR-110DC/21-21 or REL-MR-110DC/21-21AU

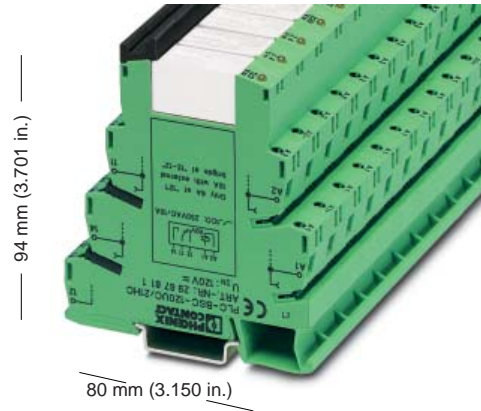
Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/21-21/SO46	29 80 41 6	10
PLC-BSC-230UC/21-21/SO46	29 80 42 9	10
REL-MR-110DC/21-21AU	29 61 22 8	18
REL-MR-110DC/21-21	29 61 20 2	18

120 V AC	230 V AC
0.78...1.4	0.78...1.14
16 V AC	60 V AC
6/7 mA	8.5/10 mA
7 ms/10 ms	7 ms/10 ms
Operating indicators, bridge rectifier, filter	
REL-MR-110DC/21-21	REL-MR-110DC/21-21AU
Single contact, 2 Form C contacts	Single contact, 2 Form C contacts
AgNi	AgNi + 5 μ Au
250 V AC/DC	30 V AC/36 V DC
5 V AC/DC	100 mV
6 A	50 mA
On request	50 mA
10 mA	1 mA
140 W	1.2 W
100 W	-
60 W	-
44 W	-
60 W	-
1500 VA	-
50 mW	100 μW
4 kV, 50 Hz, 1 minute	
-20°C to +55°C (-4°F to +131°F)	
100% ED	
V0 according to UL 94	
3 x 10 ⁷ cycles	
IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 3, Surge Voltage Category III, DIN EN 50 178/VDE 0160 (in relev. parts), IEC 60 255/DIN VDE 0435 (in relev. parts), DIN VDE 0106-101: 1986-11, reinforced insulation for I/O	
Any/can be mounted without spacing	

5. Technical Data: Universal Version for High Continuous Load Currents



Circuit diagram



PLC-BSC...21HC/SO46

Basic terminal block with integrated filter that can be fitted with a relay

Note: Please refer to the INTERFACE catalog for assembly instructions and accessories

M 3	8	solid	flexible	AWG	I [A]	U [V]
		[mm ²]				

Connection data	0.14 - 2.5	0.14 - 2.5	26 - 14	*	*
* The electrical data is determined by the relay.					

Description	Input voltage U _N
PLC interface with screw connection	
PLC-BSC...21HC/SO46 basic terminal block for plug-in REL-MR-110DC... miniature relay, for mounting on	120 V AC 230 V AC
Suitable plug-in miniature relay	Power contact

Housing width 14 mm (0.244 in.) us provided)

¹⁾The technical data only applies to basic terminal blocks fitted with a REL-MR-110DC/21HC

Type	Order No.	Pcs. Pkt.
PLC-BSC-120UC/21HC/SO46	29 80 43 2	10
PLC-BSC-230UC/21HC/SO46	29 80 44 5	10
REL-MR-110DC/21HC	29 61 33 8	18

Technical Data¹⁾

Input Data	
Nominal input voltage U _N	
Permissible range (with reference to U _N and T _U = 20°C [68°F])	
Typical release voltage	
Typical input current at U _N (50 Hz/60 Hz)	
Typical response time/release time at U _N	
Input wiring:	

Output Data (when fitted with...)	
Contact version	
Contact material	
Maximum switching voltage	
Minimum switching voltage	
Limiting continuous current	
Maximum inrush current	
Minimum switching current	
Maximum shutdown power, ohmic load:	24 V DC 48 V DC 60 V DC 110 V DC 220 V DC 250 V AC
Minimum switching power	

General Data	
Test voltage I/O	
Ambient operating temperature range	
Nominal operating mode	
Flammability class	
Mechanical life	
Standards/specifications	

Mounting position/mounting

¹⁾ Input wiring depends on the type

120 V AC	230 V AC
0.85...1.4	0.78...1.14
16 V AC	60 V AC
6/7 mA	8.5/10 mA
7 ms/10 ms	7 ms/20 ms
Operating indicators, bridge rectifier, filter	

REL-MR-110DC/21HC	
Single contact, 1 Form C contact	
AgNi	
250 V AC/DC	
12 V AC/DC	
10 (6) A ²⁾	
16 A	
100 mA	
240 (144) W ²⁾	
58 W	
48 W	
50 W	
80 W	
2500 (1500) VA ²⁾	
1.2 W	

4 kV, 50 Hz, 1 minute
-20°C to +55°C (-4°F to +131°F)
100% ED
V0 according to UL 94
3 x 10 ⁷ cycles
IEC 60 664/IEC 60 664 A/DIN VDE 0110, degree of pollution 3, Surge Voltage Category III, DIN EN 50 178/VDE 0160 (in relev. parts), IEC 60 255/DIN VDE 0435 (in relev. parts), DIN VDE 0106-101: 1986-11, reinforced insulation for I/O
Any/can be mounted without spacing

²⁾The values in brackets are for connections 12. If connections 12 are jumpered, the values in brackets are valid.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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