- Short-circuit current is measured by the inputs L1 and L3 (5 A or 1 A). The current threshold of the inputs can be set to 0.5...6 In.
- Earth-fault current is measured by the input L2 (5 A or 1 A). The current threshold of the input can be set to 0.05...0.6 In.

For details, refer to Chapter 4. Connection diagram.

When an arc occurs, the Q2 circuit breaker is operated via the semiconductor output HSO1.

In alternative 2, the semi-conductor output HSO2 is used as a circuit-breaker failure protection output. If the feeder circuit breaker Q2 for some reason is unable to break the fault current within 100 ms after the trip operation, the circuit breaker Q1 on the transformer primary side is opened via output HSO2.

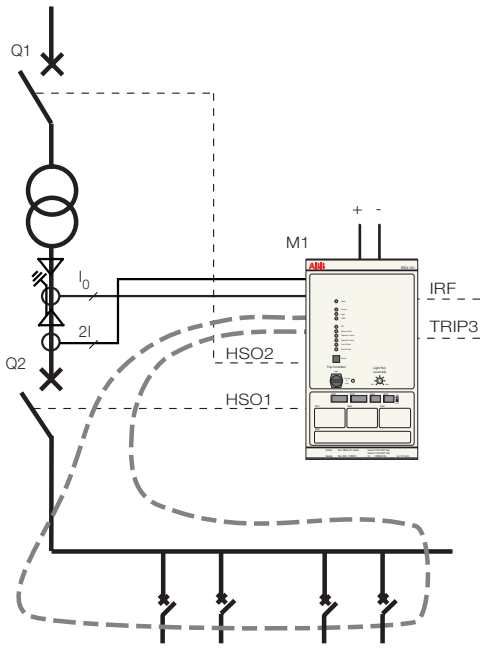

Fig. 10.2.-11 Example 11

Settings of central unit M1:

- Alternative 1:

SG1 = 1001 0100 SG2 = 0000 0000 SG3 = 00000 SG4 = 01011

HSO2 is not used as CBFP, that is, HSO2 operates at the same time as HSO1.

- Alternative 2:

SG1 = 1001 0100 SG2 = 0000 0000 SG3 = 10000 SG4 = 01011

HSO2 is used as CBFP, time delay 100 ms.

11. Technical data

Table 11.-1 Current input

Rated current	1 A / 5 A
Continuous load current	4 A / 20 A
Momentary current for 1 s	100 A / 500 A
Dynamic current withstand, half-wave value	250 A/ 1250 A
Input impedance	<100 mΩ/ <20 mΩ
Rated frequency	50 / 60 Hz

Table 11.-2 Outputs

Trip contacts HSO1 and HSO2:	
Rated voltage	250 V DC/AC
Continuous carry	1.5 A
Make and carry for 0.5 s	30 A
Make and carry for 3 s	15 A
Breaking capacity for DC, when the control circuit time constant L/R <40 ms, at 48/110/220 V DC	5 A/3 A/1 A
Trip contact TRIP3:	
Rated voltage	250 V DC/AC
Continuous carry	5 A
Make and carry for 0.5 s	30 A
Make and carry for 3 s	15 A
Breaking capacity for DC, when the control circuit time constant L/R <40 ms, at 48/110/220 V DC	5 A/3 A/1 A
Signal contacts IRF:	
Rated voltage	250 V DC/AC
Continuous carry	5 A
Make and carry for 0.5 s	10 A
Make and carry for 3 s	8 A
Breaking capacity for DC, when the control circuit time constant L/R <40 ms, at 48/110/220 V DC	1 A/0.25 A/0.15 A

Table 11.-3 Control input

Reset input RESET:	
Control voltages:	
Rated voltages and operating ranges	U_n = 24/48/60/110/220/250 V DC 18...300 V DC U_n = 110/120/220/ 240 V AC 18...265 V AC
Not active, when control voltage	< 9 V DC, 6 V AC
Control current	1.5...20 mA
Minimum pulse length	1 s

Table 11.-4 Circuit-breaker failure protection CBFP

Selectable operate time delays	150 ms / 100 ms
Operate time accuracy:	
HSO2	±5% of setting value
TRIP3	±5% of setting value +5...15 ms

Table 11.-5 Power supply

Relay types REA101-AAA, REA101-AAAG:	
• U_{aux} rated	U_r = 110/120/220/240 V AC U_r = 110/125/220/250 V DC
• U_{aux} variation	85...110% U_r (AC) 80...120% U_r (DC)
Relay types REA101-CAA, REA101-CAAG:	
• U_{aux} rated	U_r = 24/48/60 V DC
• U_{aux} variation	80...120% U_r DC

Table 11.-6 Power consumption

Power consumption of relay under quiescent/ operating conditions	~9 W / ~12 W
Maximum port output power	~19 W
Maximum number of extension units/port	5
Maximum power consumption with 10 extension units connected	<50 W

Table 11.-7 Sensor fiber

Maximum length without splices or with one splice	60 m
Maximum length with two splices	50 m
Maximum length with three splices	40 m
Service temperature range	-35...+80°C
Smallest permissible bending radius	50 mm

Table 11.-8 Connection cable

Maximum length[a]	40 m

a. Total length of the connection chain between the central unit and extension units

Table 11.-9 Optolink communication

Maximum length of signal transfer fiber:	
• Plastic	40 m
• Glass[a]	2000 m

a. For more details, refer to Chapter 13. Appendix A: Glass fiber optolink connection.

Table 11.-10 Setting range

Current setting steps In x	0.5, 1.0, 1.5, 2.5, 3.0, 5.0, 6.0
Neutral current setting steps In x	0.05, 0.10, 0.15, 0.25, 0.3, 0.5, 0.6
Operation accuracy	± 5% of the setting value or ±2% of In

Table 11.-11 Total operate times

HSO1 and HSO2	≤2.5 ms
TRIP3	<15 ms

Table 11.-12 Environmental tests

Specified service temperature range	-10...+55°C
Transport and storage temperature range	-40...+70°C
Operation in dry heat conditions	According to IEC 60068-2-2
Operation in dry cold conditions	According to IEC 60068-2-1
Damp heat test cyclic	According to IEC 60068-2-30 r.h. >95%, t = 20...55°C
Storage temperature test	According to IEC 60068-2-48

Table 11.-13 Enclosure

Degree of protection, IEC 60529	IP 20
Weight	~ 4.6 kg

Table 11.-14 Insulation tests

Dielectric tests according to IEC 60255-5	2 kV, 50 Hz, 1 min.
Impulse voltage test according to IEC 60255-5	5 kV, 1.2/50 µs, 0.5 J
Insulation resistance according to IEC 60255-5	>100 MΩ, 500 V DC

Table 11.-15 Electromagnetic compatibility tests

EMC immunity test level meets the requirements listed below:	
1 MHz burst disturbance test according to IEC 60255-22-1, class III:	
• Common mode	2.5 kV
• Differential mode	1 kV
Electrostatic discharge test according to IEC 61000-4-2, class IV and ANSI/IEEE C37.90.3-200:	
• For contact discharge	8 kV
• For air discharge	15 kV
Radio-frequency electromagnetic field disturbance test according to IEC 61000-4-3 and IEC 60255-22-3:	
Amplitude-modulated:	
• Frequency f	80...1000 MHz
• Field strength E	10 V/m (rms)
Pulse-modulated:	
• Frequency f	900 MHz
• Field strength E	10 V/m (rms)

Table 11.-15 Electromagnetic compatibility tests (Continued)

Radio frequency disturbance test according to IEC 61000-4-6 and IEC 60255-22-6:	
• Conducted, common mode	10 V, 150 kHz...80 MHz
Fast transient disturbance tests according to IEC 60255-22-4 and IEC 61000-4-4	4 kV
Surge immunity test according to IEC 61000-4-5 and IEC 60255-22-5:	
Aux. voltage input, trip outputs:	
• Line-to-line	2 kV
• Line-to-earth	4 kV
Signal contacts (IRF), current inputs, RESET input:	
• Line-to-line	1 kV
• Line-to-earth	2 kV
Electromagnetic emission tests according to EN 55011 and IEC 60255-25:	
• Conducted RF emission (mains terminal)	EN 55011, class A, IEC 60255-25
• Radiated RF emission	EN 55011, class A, IEC 60255-25
SWC tests according to ANSI/IEEE C37.90.1-2002:	
• Oscillatory tests	2.5 kV
• Fast transient test	4 kV
Power frequency (50 Hz) magnetic field according to IEC61000-4-8	300 A/m, continuous
Voltage dips and short interruptions according to IEC 61000-4-11:	30%/10 ms 60%/100 ms 60%/1000 ms >95%/5000 ms

Table 11.-16 CE approval

Complies with the EMC directive 89/336/EEC and the LV directive 73/23/EEC	EN 50263 EN 60255-6

Table 11.0.-1 Mechanical tests

Vibration tests (sinusoidal) according to IEC 60255-21-1	class 1
Shock and bump test according to IEC 60255-21-2	class 1
Seismic tests according to IEC 60255-21-3	class 2

12. Order information

12.1. REA 10_ units

Table 12.1.-1 Order numbers

Arc protection relay REA 101 U_n = 110…240 V AC U_n = 110…250 V DC	REA101-AAA[a]
Arc protection relay REA 101 U_n = 24…60 V DC	REA101-CAA[a]
Arc protection relay REA 101 with optolink connectors for glass fiber U_n = 110…240 V AC U_n = 110…250 V DC	REA101-AAAG[a]
Arc protection relay REA 101 with optolink connectors for glass fiber U_n = 24…60 V DC	REA101-CAAG[a]
Rear plate protective cover	1MRS 060196
Mounting kit for semi-flush mounting	1MRS 050254
Mounting kit for surface mounting	1MRS 050240
Mounting kit for connecting cases together	1MRS 050241
Mounting kit for 19" rack	1MRS 050258
Extension unit REA 103	REA103-AA
Extension unit REA 105	REA105-AA
Extension unit REA 107	REA 107-AA

a. Includes mounting kit 1MRS 050209 for flush mounting.

12.2. Fiber sensors

Table 12.2.-1 Pre-manufactured fiber sensors

Length	**Order number**
5 m ±3%	1MRS 120512.005
10 m ±3%	1MRS 120512.010
15 m ±3%	1MRS 120512.015
20 m ±3%	1MRS 120512.020
25 m ±3%	1MRS 120512.025
30 m ±3%	1MRS 120512.030
40 m ±3%	1MRS 120512.040
50 m ±3%	1MRS 120512.050
60 m ±3%	1MRS 120512.060

Table 12.2.-2 Accessories for manufacturing fiber sensors

Sensor fiber 100 m	1MSC 380018.100
Sensor fiber 300 m	1MSC 380018.300
Sensor fiber 500 m	1MSC 380018.500
ST connector	SYJ-ZBC 1A1
ST splice adapter	SYJ-ZBC 1A2
ST fiber termination kit	1MSC 990016