VARIMETER
Reverse Power Relay
BH 9140, RP 9140

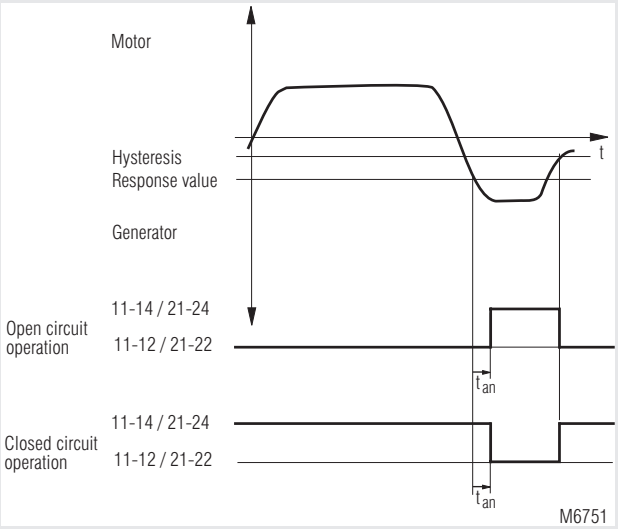
0257041

BH 9140

RP 9140

- According to IEC/EN 60 255-1
- Effective power measuring
- For single and 3-phases
- Adjustable response value 2 ... 20 % reverse power
- Hysteresis 12.5 %
- Rated current BH 9140: 5 A or 40 A
  Rated current RP 9140: 5 A
- Adjustable on delay
- Open circuit operation
- LED indication for voltage supply and contact position
- 2 changeover contacts
- As option closed circuit operation
- Width:
  BH 9140: 45 mm
  RP 9140: 70 mm

Function Diagram



Approvals and Markings

CE

Applications

The reverse power relais BH 9140 and RP 9140 monitor the direction of the energy transport in an electrical system. This could be necessary at connection points between public supply and industrial mains e. g. when operating emergancy power supplies, to avoid taht generators run as motors.

Function

The response value can be adjusted on P_R from 2 ... 20 %. The reverse power is calculated for 3p4w and 3p3w units according to the formula:

U_{star} x I_u x cos φ x response value (%)

At a setting of 20 % and cos φ = 1 this is for BH 9140 max.:
230 V x 5 A x 0.2 = 230 W
230 V x 40 A x 0.2 = 1840 W

and for RP 9140 max. :
230 V x 5 A x 0.2 = 230 W

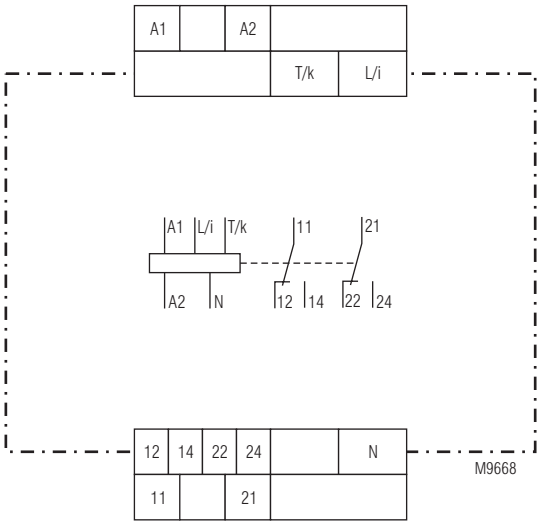
Indicators

LED green:	on, when auxiliary supply connected
LED green/red:	on, when corresponding output relay is active

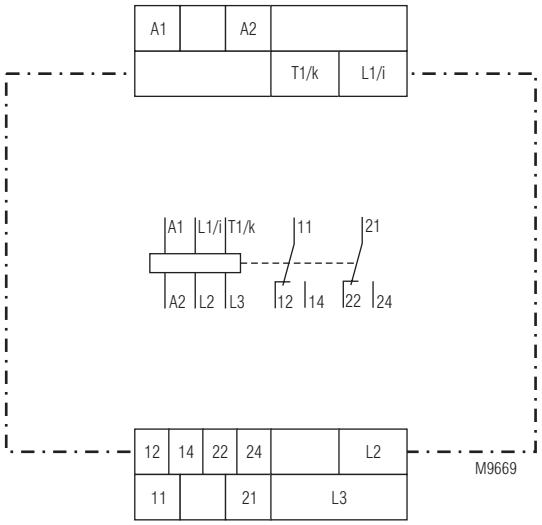
Notes

If the current is higher than the nominal current of the device an external current transformer can be used with min. 2.5 VA. The direction of the current has to be observed.

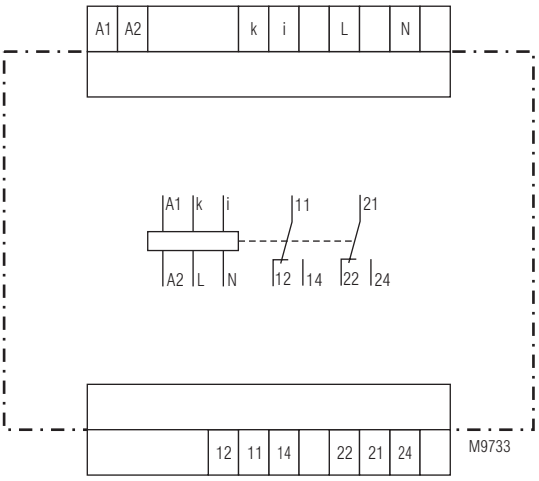
Circuit Diagrams



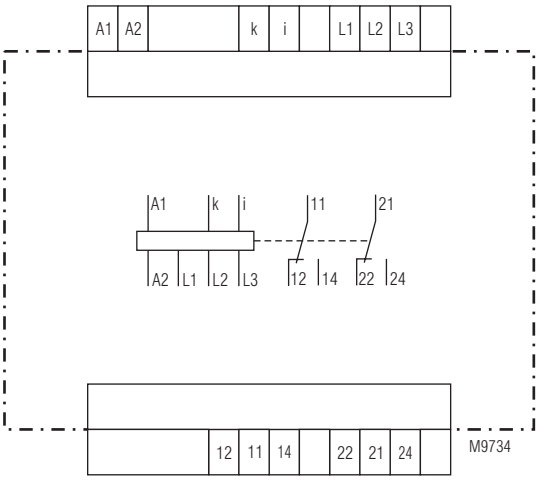
BH 9140: Version for single- and 3-phase connection with N



BH 9140: Version for 3-phase connection without N



RP 9140: Version for single- and 3-phase connection with N



RP 9140: Version for 3-phase connection without N

Connection Terminals

Terminal designation	Signal description
A1 / A2	Auxiliary voltage
i / k	Current path
L1, L2, L3, N	Measuring voltage
11, 12, 14	Changeover contact relay 1
21, 22, 24	Changeover contact relay 2

Technical Data

Measuring Ciruit

Voltage

Nominal voltage U_N	
L1-N:	AC 110, 230 V
L1-L2-L3:	3 AC 110, 230, 400, 440 V
max. overload:	1.1 U_N
Current	
Nominal current:	5 A / (40 A only for BH 9140)
max. overload:	15 A
Power	
Response value:	2 ... 20 % reverse power
Hysteresis:	12.5 % of set response value
Frequency range:	45 ... 65 Hz
On delay t_{an}:	adjustable 0.2 ... 10 s

Auxiliary Circuit

Auxiliary voltage A1, A2:	AC 110, 230, 400, 440 V, DC 24 V*) *) only for BH 9140
Voltage range:	0.8 ... 1.1 U_H
Frequency range:	45 ... 65 Hz
Nominal consumption:	< 4 VA

Output

Contacts:	2 changeover contacts	
Thermal current I_{th}:	2 x 5 A	
Switching capacity		
according to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
according to DC 13:	1 A / DC 24 V	IEC/EN 60 947-5-1
Electrical life		IEC/EN 60 947-5-1
at 3 A, AC 230 V cos φ = 1	2 x 10^5 switching cycles	
Permissible		
switching frequency:	1800 switching cycle/H	
Short circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	30 x 10^6 switching cycles	

General Data

Nominal operating mode:	continuous operation
Temperature range	
Operation:	- 20 ... + 60 °C
Storage:	- 20 ... + 60 °C
Altitude:	< 2,000 m
Clearance and creepage distance	
Overvoltage category:	III
Rated impulse voltage / pollution degree	IEC/EN 60 664-1
Aux. voltage / measuring voltage:	4 kV / 2
Aux. voltage / measuring current:	4 kV / 2
Meas. voltage / meas. current:	4 kV / 2 (only for RP 9140)
Auxiliary voltage / contacts:	4 kV / 2
Measuring inputs / contacts:	4 kV / 2
Contacts 11,12,14 / 21,22,24:	4 kV / 2

Technical Data

EMC

Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation		
80 MHz ... 2.7 MHz:	10 V / m	IEC/EN 61 000-4-3
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge		
between		
wires for power supply:	1 kV	IEC/EN 61 000-4-5
between wire and ground:	2 kV	IEC/EN 61 000-4-5
HF wire guided:	10 V	IEC/EN 61 000-4-6
Interference suppression		
at UH = AC:	Limit value class B	EN 55 011
at UH = DC:	Limit value class A*)	

*) The device is designed for the usage under industrial conditions (Class A, EN 55011). When connected to a low voltage public system (Class B, EN 55011) radio interference can be generated. To avoid this, appropriate measures have to be taken.

Degree of protection:		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0 behaviour according to UL subject 94	
Vibration resistance:	Amplitude 0.35 mm Frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection BH 9140		
Load terminals:	1 x 10 mm² solid or 1 x 6 mm² stranded wire with sleeve	
Stripping length:	11 mm	
Fixing torque:	max. 1,2 Nm	
Wire fixing:	Box terminals with self-lifting wire protection and Plus-minus terminal screws M4	
Control terminal:	1 x 4 mm² solid or 2 x 1.5 mm² stranded wire with sleeve or 1 x 2.5 mm² stranded wire with sleeve DIN 46 228-1/-2/-3/-4	
Stripping length:	10 mm	
Fixing torque:	max. 0.8 Nm	
Wire fixing:	Box terminals with self-lifting wire protection and Plus-minus terminal screws M3.5	
Wire connection RP 9140		
Fixed screw terminal (S):	0.34 ... 4 mm² solid or 0.34 ... 1.5 mm² stranded wire with sleeve	
Stripping length:	7 mm	
Fixing torque:	max. 0.5 Nm	
Wire fixing RP 9140:	Flat screws M2.5 box terminals with wire protection	
Mounting:	DIN rail	IEC/EN 60 715
Weight:		
BH 9140:	430 g	
RP 9140:	250 g	

Dimensions

Width x heigh x depth:	
BH 9140:	45 x 84 x 118 mm
RP 9140:	70 x 90 x 71 mm

Standard Types

BH 9140.12/001 3 AC 400 V 5 A AC 230 V 10 s
Article number: 0060919
- open circuit operation
- 3-phase connection without neutral
- Response value: 2 ... 20 %
- Nominal voltage U_N: 3 AC 400 V
- Nominal current: 5 A
- Auxiliary voltage U_H: AC 230 V
- On delay: 0.2 ... 10 s
- Width: 45 mm

RP 9140.12/201 3 AC 400 V 5 A AC 230 V 10 s
Article number: 0061258
- Open circuit operation
- 3-phase connection without neutral
- Response value: 2 ... 20 %
- Nominal voltage U_N: 3 AC 400 V
- Nominal current: 5 A
- Auxiliary voltage U_H: AC 230 V
- On delay: 0.2 ... 10 s
- Width: 70 mm

Variants

_ _ 9140.12 / _ _ _

- 0 single-phase connection with neutral
- 1 3-phase connection without neutral

- 0 open circuit operation
- 1 closed circuit operation

- 0 current path not galvanic separation (only available for BH 9140)
- 2 current path galvanic separation (only available for RP 9140)

BH: 45 mm width
RP: 70 mm width

Ordering example for variants

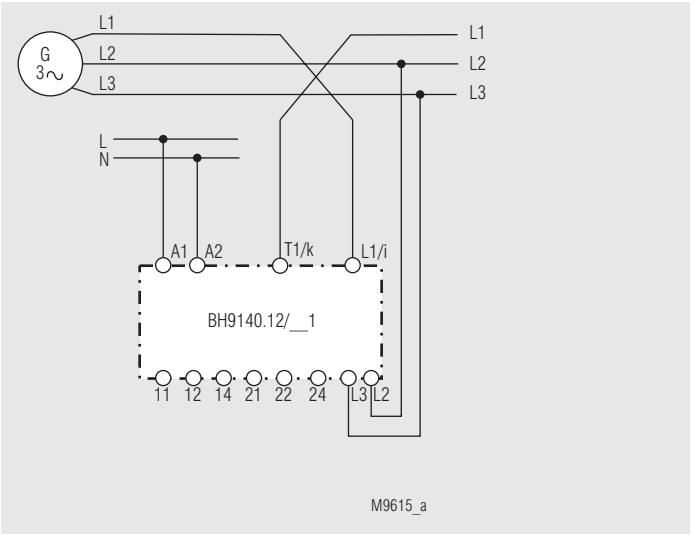
_ _ 9140 .12 /_ _ _ 3 AC 400 V 5 A AC 230 V 10 s

- On delay
- Auxiliary voltage
- Nominal current
- Nominal cvoltage
- Variant on request
- Contacts
- BH: 45 mm width
  RP: 70 mm width

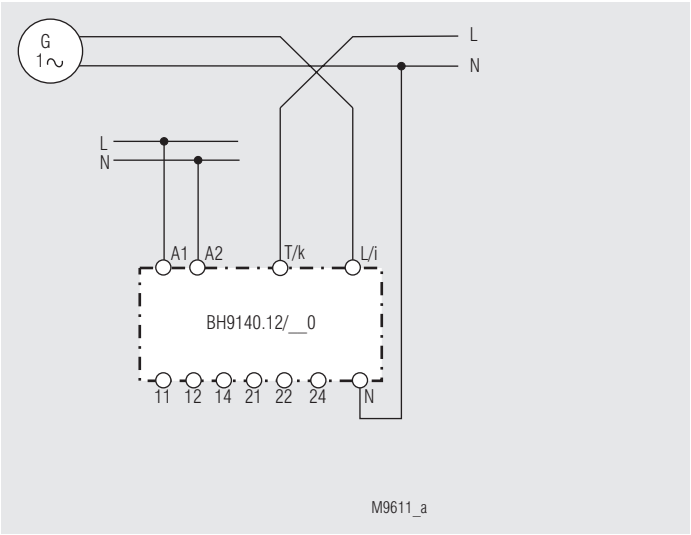
Setting Facilities

Response value
Reverse power: 2 ... 20 %
On delay: 0.2 ... 10 s

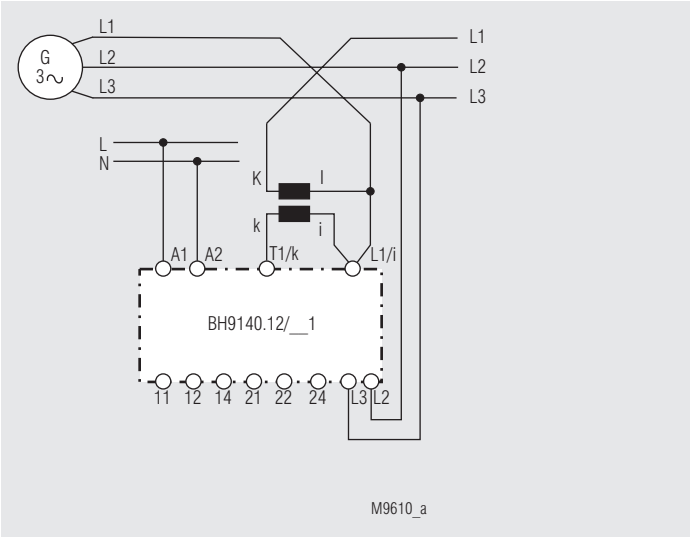
Connection Examples BH 9140



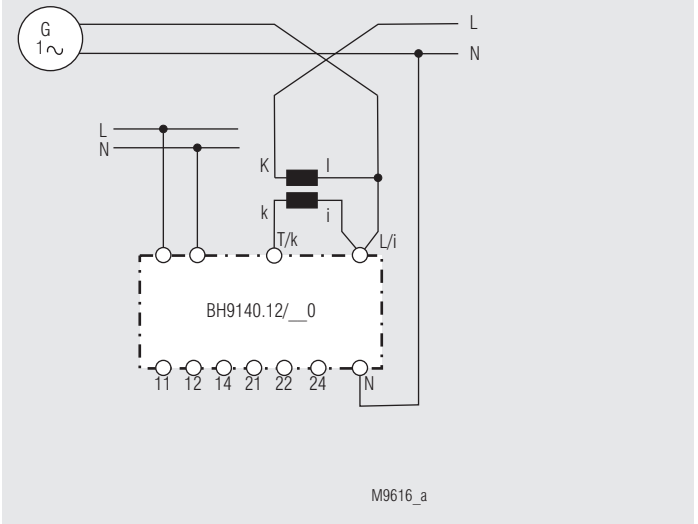
For 3-phase connection without N



For single or 3-phase connection with N



For 3-phase connections with current transformer (external).



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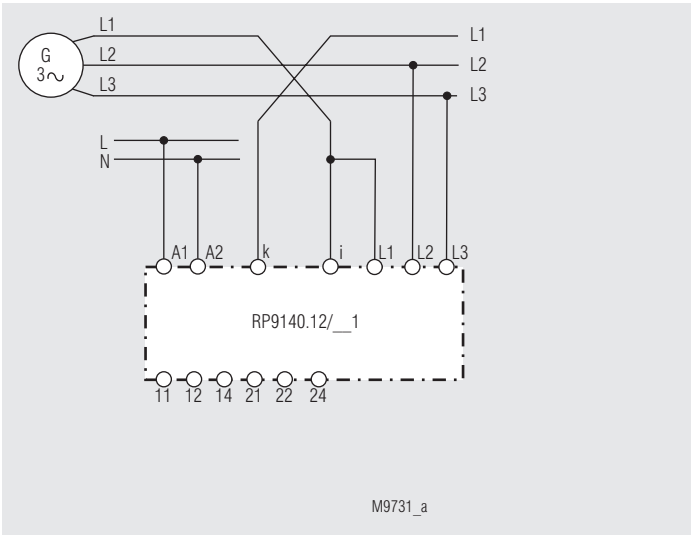

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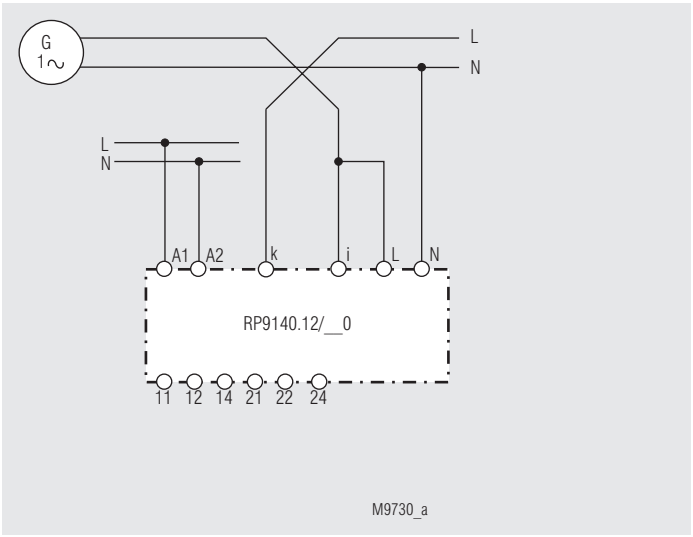

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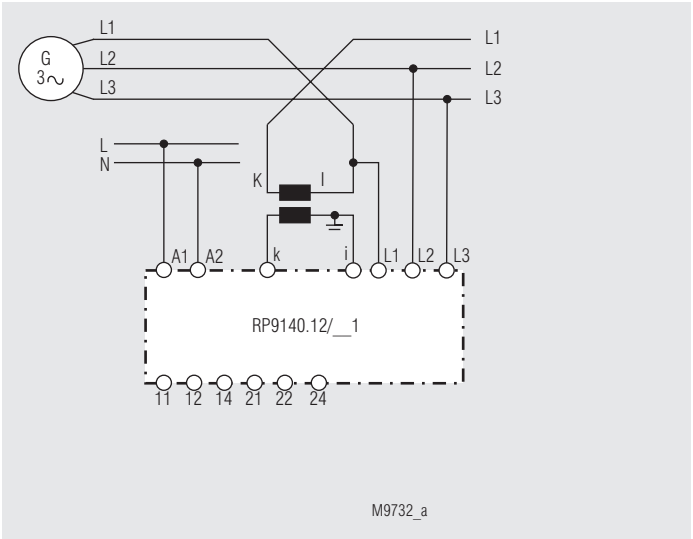

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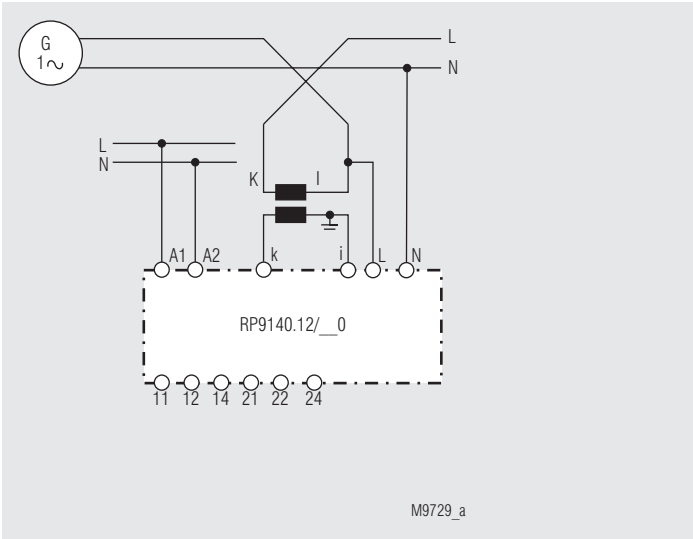

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