BMR Current controllers HJ

User and service manual

Content
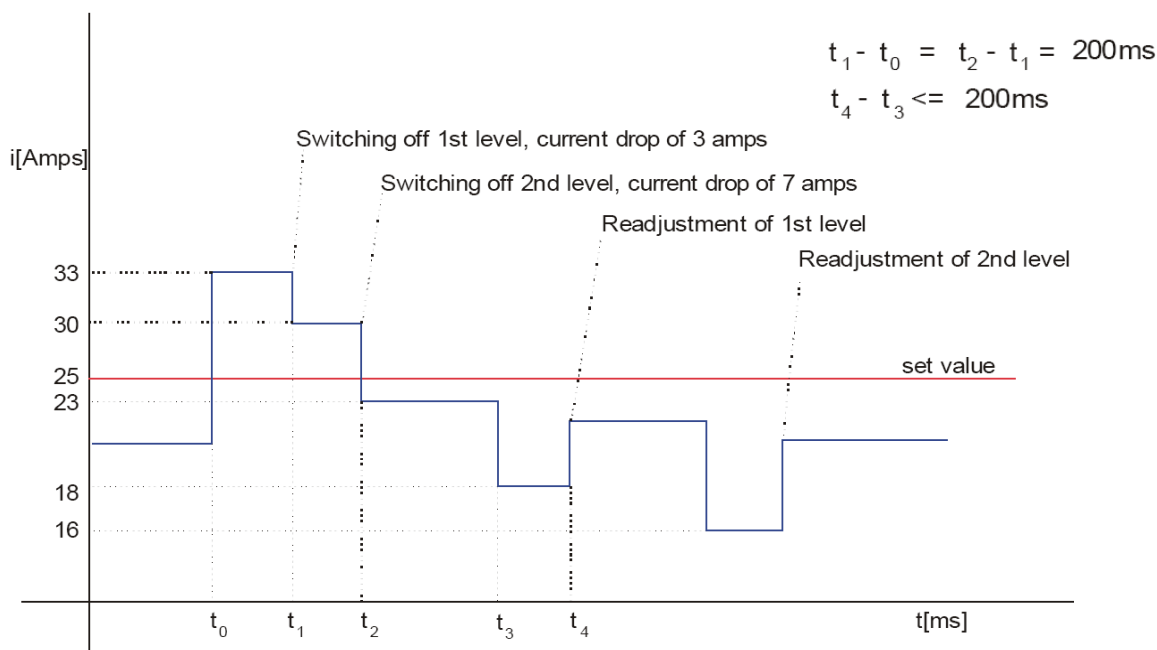
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2

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1. Device description

HJ series devices monitor current measured via measuring channels of the device and indicate current exceeding by disconnection of appropriate relay. HJ controller is available in two type ranges HJ10x, HJ30x for direct current measurement and HJ11x, HJ31x for indirect current measurement. Indirect type of HJ controller is designed for control of high currents which are measured via measuring current transformers.

2. Device function

$$t_1 - t_0 = t_2 - t_1 = 200\,\text{ms}$$
$$t_4 - t_3 <= 200\,\text{ms}$$

Switching off 1st level, current drop of 3 amps

Switching off 2nd level, current drop of 7 amps

Readjustment of 1st level

Readjustment of 2nd level

set value

Picture 1. Principle of operation

3. The principles of measurement:

Current in all three measured phases is digitalized and from measured values is by DFT (Discrete Fourier Transformation) calculated effective current value. If this value is higher than current value set by DIP switch, measurement is repeated after 200 ms and if also this calculated value is higher than set value, stage No. 1 is disconnected. During next measurement the fall of current after stage No. 1 disconnection is captured and saved.

If the value of measured current is still higher than set value, then after 3 seconds the stage No. 2 is disconnected too and fall of current is captured and saved.

Reconnection of appropriate stage is realized in the case that measured current value minus fall of current of the stage increased by 1 A is less than set current maximum.

During checking, if more than one stage was disconnected, preference is given to the first disconnected stage. In case tat above mentioned condition is not valid for this stage, another stage is sequence is being checked.

This operation procedure eliminates controller reaction on short circuits and current transient events, which are present, for example, during the motor start-up. Applied measuring method assures perfect accuracy also for currents with distortion and non-sinusoidal wave.

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3

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4. Ranges of HJ controller

Following table shows produced types of HJ controllers and their parameters. For HJ controllers with indirect current measurement the transformer ratio is defined from production on customer request.

Type	Number of channels	Groups (outputs) per channel	Measurement	Current setting	Maximum controlled current
HJ 101	1	1	direct	in steps of 1 A	100 A
HJ 102	1	2	direct	in steps of 1 A	100 A
HJ 103	1	3	direct	in steps of 1 A	100 A
HJ111	1	1	indirect	in steps of 4 A	1024 A
HJ112	1	2	indirect	in steps of 4 A	1024 A
HJ113	1	3	indirect	in steps of 4 A	1024 A
HJ303	3	1	direct	in steps of 1 A	100 A
HJ306	3	2	direct	in steps of 1 A	100 A
HJ313	3	1	indirect	in steps of 4 A	1024 A
HJ316	3	2	indirect	in steps of 4 A	1024 A

4.1. Type range HJ 10x and HJ 11x

Type range HJ10x, HJ11x measures current in all three phases and has available one control channel with possibility to control up to three electrical appliances groups. If set current is overrun in any of measured phases, first electrical appliance group will be disconnected. Device records level of dropping current strength which is used for reconnection level calculation. If the current overruns again, another group will be disconnected after 3 seconds. Reconnection of appropriate stage is realized in the case that measured current value goes under the set current level which is decreased minus dropping current strength of the stage and minus 1 A. This type range is designed for application with majority of three-phase electrical appliances.

4.2. Type range HJ 30x and HJ 31x

Type range HJ30x, HJ31x measures current in all three phases and has available three independent control channels (one per each phase) with possibility to control up to two electrical appliances groups per channel. If set current overrun in the first phase, first electrical appliance group will be disconnected in the first control channel. Device records level of dropping current strength which is used for reconnection level calculation. If the current overruns again, another group at the same control channel will be disconnected after 3 seconds. Reconnection of appropriate stage is realized in the case that measured current value goes under the set current level which is decreased minus dropping current strength of the stage and minus 1 A. This type range is designed for application with majority of single-phase electrical appliances.

5. Installation and setting

Installation of the modules is very easy. Device is designed to be installed on DIN rail with size of six standard DIN modules.
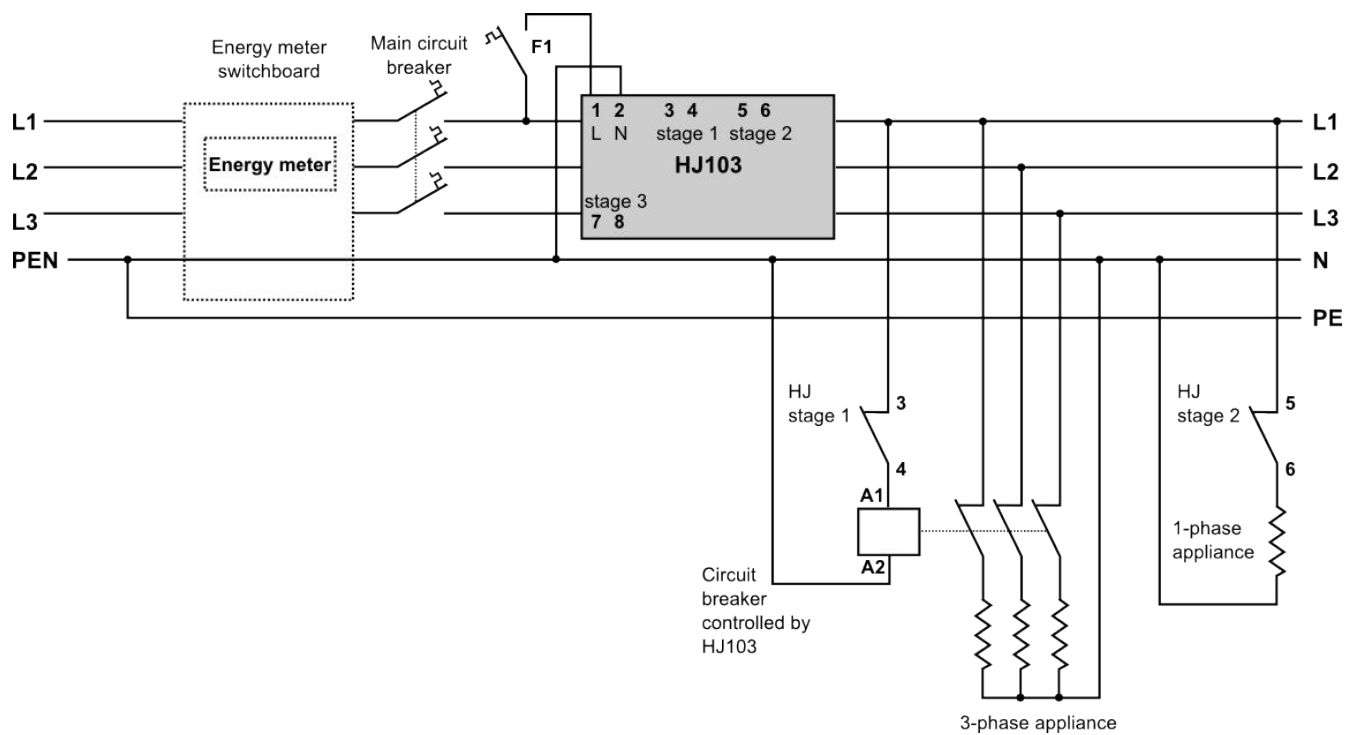
1. Install the device close to the main circuit breaker and thread output cables from main circuit breaker through inlets marker as L1, L2 and L3.

2. Connect break-type contacts K1 – K6 (according to the module) connect to control signal terminals of contactor circuit.

3. Set value of controlled current on the DIP switch according to table on device front panel. Resultant value is sum of particular DIP switch values at position ON. For example 25 A level equals combination 16 + 8 + 1.

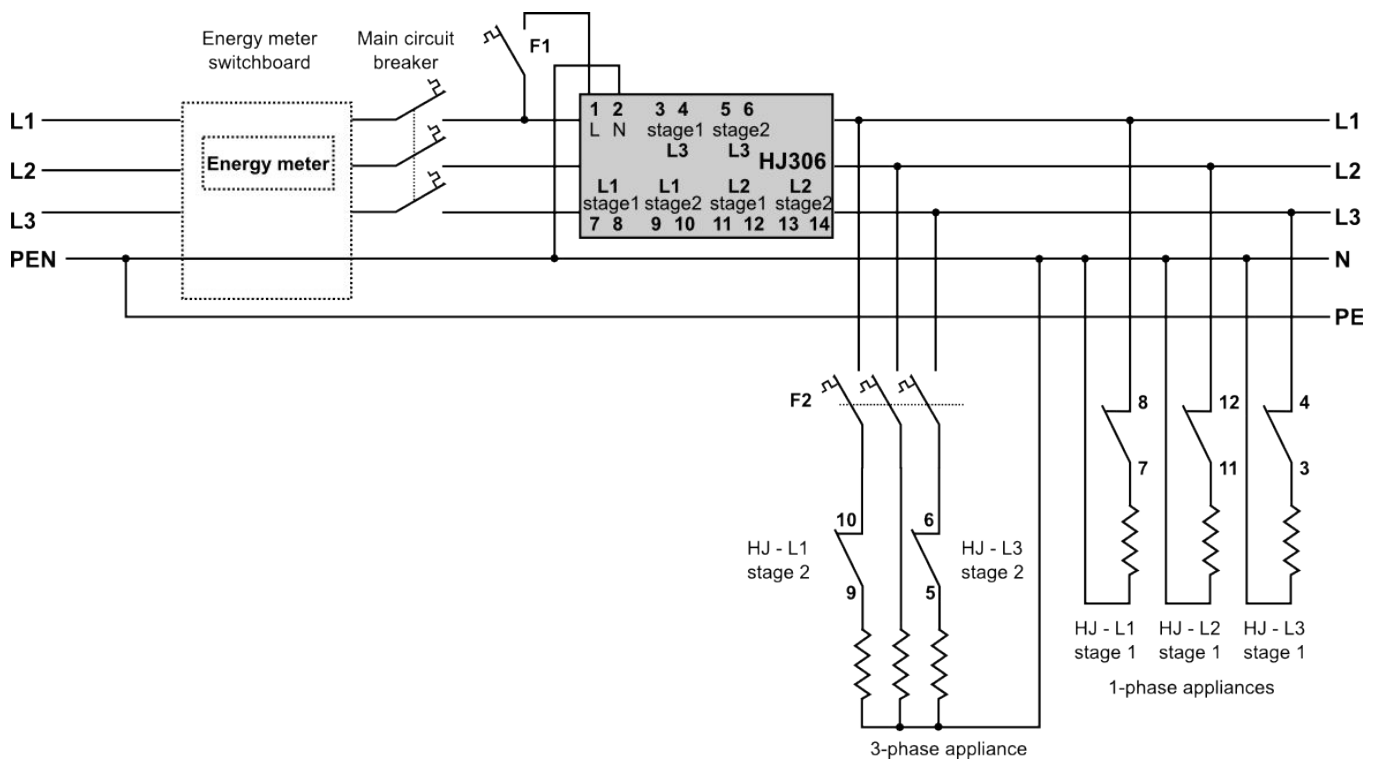4. Connect power supply voltage 230 VAC / 50 Hz to terminals No. 1 and 2.

⚠ **Caution:**

This device is not designed to protect electrical circuits against the short-circuit and it does not react this way.

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4

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6. Connection diagrams

Picture 2. Connection diagram of HJ1xx range

Picture 3. Connection diagram of HJ3xx range

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5

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7. Technical parameters

Parameter	Value
Supply voltage	230 V AC 50 Hz (+10%,-15%)
Frequency	50/60 Hz
Measuring range for direct measurement	3 x 100 A
Measuring range for indirect measurement	3 x 5 A
Power consumption	1.5 VA
Switching power of relay contacts	230 VAC / 3A
Temperature limit	0°C to +70°C
Weight	500 g
Dimensions	6 DIN rail modules
Protection degree	IP20 rear cover / IP40 front panel

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6

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