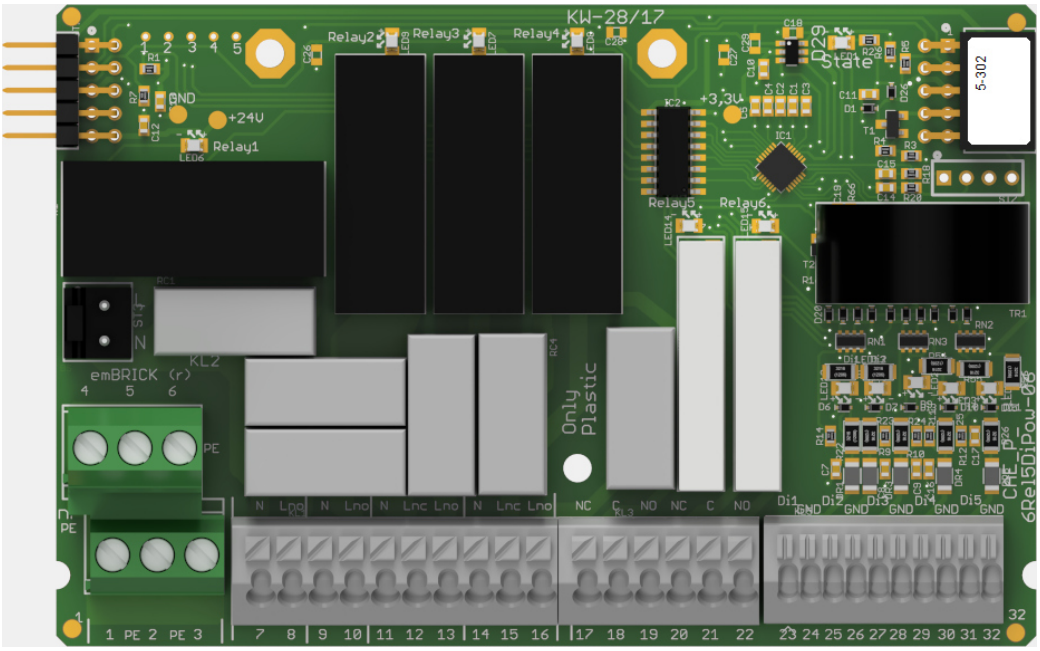
CAE_P-6Rel5DiPow-01

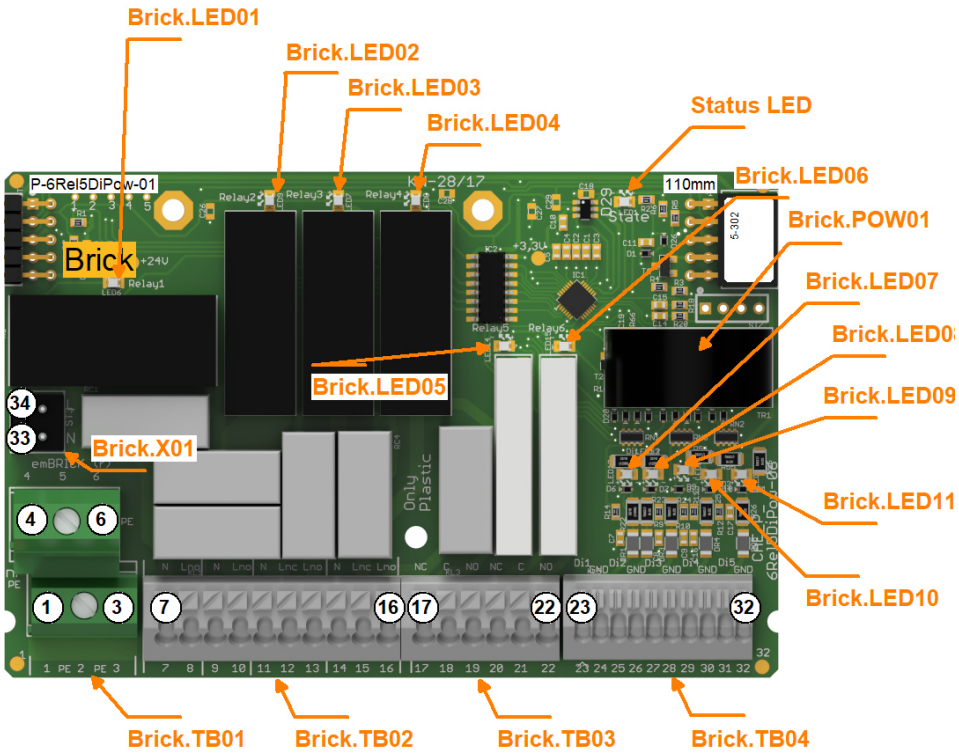


1.1 Description

ID: 5-302
Order No.: CAE_P-6Rel5DiPow-01
Terminal: push-in (≤ 0.5mm²) & screw-lift (0,14-1,5mm²)
Size: 10 eU (110mm x 72mm)
BBFCP: 1-1-1
Weight: 130g

The module includes 6 digital relay outputs, 5 n-switching inputs and 1 inductive AC-current sensor. The module has two potential free change-over relays which can switch a continouse current of 4A. Four other relays are able to supply up to 230V. 2 of these are closing and the other 2 are switch-over. Each of the supplying relay can switch up to 5A. The max. permant sum current over the supply outputs is 5A.

1.2 Connectors and Indication-/Operation-Elements



1.2.1 Connectors (X)

Hereinafter the necessary connections, connectors and there specification for operation are listed. The location of a specific connector is documented with the ID (left coloumn) in the previous Illustrations.

ID	Model	Usage	Num. of term.	Model / Series	connection	elec. usage
Brick.X01	Print Connector	power supply, internal	2	MTA-156	-	275V / 6A AC

1.2.2 Terminal block (TB)

The following Illustration the technical details for Terminal blocks are listed. The location of a specific block is documented with the ID (left coloumn) in the preavious Illustrations.

ID	Model	Model / Series	Grid	Num. of term.	connection	elec. usage
Brick.TB01	Screw Terminal	AK370	5,0mm	6	up to 1.5mm²	250V, 24A
Brick.TB02	Cage Terminal	WAGO250	3.5mm	10	up to 1.5mm²	250V, 8A
Brick.TB03	Cage Terminal	WAGO250	3.5mm	6	up to 1.5mm²	250V, 8A
Brick.TB04	Cage Terminal	WAGO250	2.5mm	10	up to 0.5mm² or 0,8mm	signal level

1.2.3 Terminal assignment

Here the assignment of individual terminals and there affilation to terminal blocks (Te block), terminal numbers (Te no.) and short description (T.desc.) aswell as there electrical function and usage are explained.
The associated mechanical and electrical properties are stated with the specific terminal block in the previous chapter. The position of a terminal is dedicated through the "Te block" and the actual terminal number (Te no.) or the therminal description (T.descr.) in the previous Illustration respectivly.
In the coloumn "usage" the technical-/ device-functional use is listed.

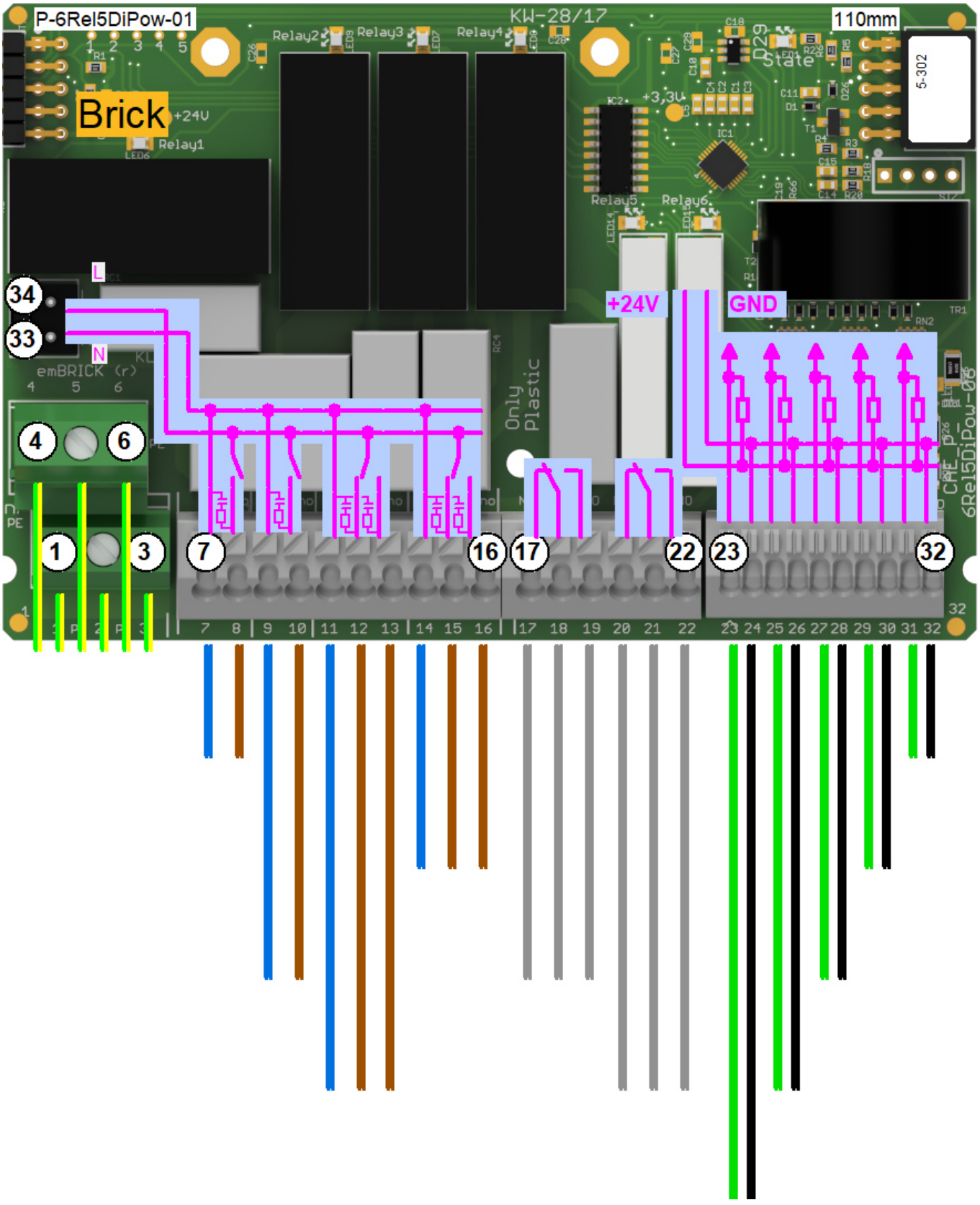
Te block	Te no.	T. descr.	Function	Usage
Brick			ind. transformer	AC Current Input
Brick.TB01	1	PE	Protective earth	-
Brick.TB01	2	PE	Protective earth	-
Brick.TB01	3	PE	Protective earth	-
Brick.TB01	4	PE	Protective earth	-
Brick.TB01	5	PE	Protective earth	-
Brick.TB01	6	PE	Protective earth	-
Brick.TB02	7	N	Neutral, Consumer	Relay 1
Brick.TB02	8	Lno	Relay, normally open contact, power switching 230V	Relay 1
Brick.TB02	9	N	Neutral, Consumer	Relay 2
Brick.TB02	10	Lno	Relay, normally open contact, power switching 230V	Relay 2
Brick.TB02	11	N	Neutral, Consumer	Relay 3
Brick.TB02	12	Lnc	Relay, normally close contact, power switching	Relay 3
Brick.TB02	13	Lno	Relay, normally open contact, power switching 230V	Relay 3
Brick.TB02	14	N	Neutral, Consumer	Relay 4
Brick.TB02	15	Lnc	Relay, normally close contact, power switching	Relay 4
Brick.TB02	16	Lno	Relay, normally open contact, power switching 230V	Relay 4
Brick.TB03	17	NC	Relay, normally close contact, isolated	Relay 5
Brick.TB03	18	C	Relay, change over contact, isolated	Relay 5
Brick.TB03	19	NO	Relay, normally open contact, isolated	Relay 5
Brick.TB03	20	NC	Relay, normally close contact, isolated	Relay 6
Brick.TB03	21	C	Relay, change over contact, isolated	Relay 6
Brick.TB03	22	NO	Relay, normally open contact, isolated	Relay 6
Brick.TB04	23	IN	Input for ext. floating contact	Di1
Brick.TB04	24	GND	Ground	Di1
Brick.TB04	25	IN	Input for ext. floating contact	Di2
Brick.TB04	26	GND	Ground	Di2
Brick.TB04	27	IN	Input for ext. floating contact	Di3
Brick.TB04	28	GND	Ground	Di3
Brick.TB04	29	IN	Input for ext. floating contact	Di4
Brick.TB04	30	GND	Ground	Di4
Brick.TB04	31	IN	Input for ext. floating contact	Di5
Brick.TB04	32	GND	Ground	Di5
Brick.X01	33	N	Power Injection	-
Brick.X01	34	L	Power Injection	-

1.2.4 LED Indications

ID	Type	Specification	Type / Usage
Brick.LED01	SMD-LED	green	Shows state of Relay 1
Brick.LED02	SMD-LED	green	Shows state of Relay 2
Brick.LED03	SMD-LED	green	Shows state of Relay 3
Brick.LED04	SMD-LED	green	Shows state of Relay 4
Brick.LED05	SMD-LED	green	Shows state of Relay 5
Brick.LED06	SMD-LED	green	Shows state of Relay 6
Brick.LED07	SMD-LED	green	Shows if low-level is present on Di1
Brick.LED08	SMD-LED	green	Shows if low-level is present on Di2
Brick.LED09	SMD-LED	green	Shows if low-level is present on Di3
Brick.LED10	SMD-LED	green	Shows if low-level is present on Di4
Brick.LED11	SMD-LED	green	Shows if low-level is present on Di5
Brick.StateLED	SMD-LED	yellow	communicationstate Brick

1.3 Input-/Output Scheme

The following diagram shows the adaption of the control unit. To avoid overlapping, some wires are displayed interrupted and dashed.



1.4 Technical Data

1.4.1 Digital Inputs

The control unit has the following digital inputs / switch inputs:

Identifier	Di1
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 1,5 kOhm
High Volt.	> 30 kOhm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

Identifier	Di2
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 1,5 kOhm
High Volt.	> 30 kOhm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

Identifier	Di3
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 1,5 kOhm
High Volt.	> 30 kOhm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

Identifier	Di4
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 1,5 kOhm
High Volt.	> 30 kOhm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

Identifier	Di5
Type	Input for ext. isolated contact, NPN switching against GND
Low Volt.	< 1,5 kOhm
High Volt.	> 30 kOhm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

1.4.2 Digital Outputs

The control unit has the following digital outputs / switching outputs:

Identifier	Relay 1
Type	Relay, normally open contact, power switching 230V
max. Switching Volt.	250V AC
max. Switching Cur.	10A AC, Contact 16A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Schrack, RT33L024
Remark	with snubber

Identifier	Relay 2
Type	Relay, normally open contact, power switching 230V
max. Switching Volt.	250V AC
max. Switching Cur.	8A AC, contact 10A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Takamisawa, JS24N-K
Remark	with snubber

Identifier	Relay 3
Type	Relay, change over contact, power switching 230V
max. Switching Volt.	250V AC
max. Switching Cur.	8A AC, contact 10A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Takamisawa, JS24N-K
Remark	with snubber

Identifier	Relay 4
Type	Relay, change over contact, power switching 230V
max. Switching Volt.	250V AC
max. Switching Cur.	8A AC, contact 10A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Takamisawa, JS24N-K
Remark	with snubber

Identifier	Relay 5
Type	Relay, change over contact, isolated
max. Switching Volt.	250V AC
max. Switching Cur.	5A AC, Contact 6A
max. Perm. Current	3A AC
nom. Cycles	see datasheet
Component	FTR, LYCA024V
Remark	-

Identifier	Relay 6

Type	Relay, change over contact, isolated
max. Switching Volt.	250V AC
max. Switching Cur.	5A AC, Contact 6A
max. Perm. Current	3A AC
nom. Cycles	see datasheet
Component	FTR, LYCA024V
Remark	-

1.4.3 Analog Inputs

The control unit has the following analogue inputs / measuring inputs:

Identifier	Pow1
Type	Current Sensor
Range	0 ... 20A peak
Input/Load Resistor	-
Resolution	0.5%
Accuracy	2%
Linearity	1%
Filter	-
Linearization	-
Model / Series	ind. transformer
Remark	4% ripple

1.4.4 Power Supply (injected from external)

The control unit requires the following electrical supply from external:

Description	Brick.Output supply
Information	Output Supply from extern
Voltage	230V AC
max. Current	5A AC/DC
Inactive Current	< 1mA
Frequency	
Remark	

1.4.5 User Notes

• Blinking behavior StateLED:
Each Morse code is 3 seconds long!
not initialized = flashing continuously at approx. 5Hz

no communication = short-long-short
too little communication = short-short-short
disturbed communication = short-long-long
OK = continuous flashing at approx. 1Hz (0.6-1.5Hz)

1.4.6 Developer Notes

• Current measurement is only active when one wire (L or N) is carried through the current sensor only one time.

• Make sure that the GND of the analog signals is connected to the 0V terminal. Otherwise the measurement will reduce precision.

• On the backside of the PCB the contacts are touchable, so you have to keep the PCB in a housing.

• The 2 potential-free relays (Relay 5 + 6) have to operate on the same voltage level 230VAC or 24VAC or 24VDC. A mixture of different voltage levels is not allowed.

• This module support relay contacts. For the two potential free depending on the electrical application, the user has to install sufficient additional components to fulfill the EMC standards and the requirements of the relay producer (see relay datasheet), especially when driving inductive/capacitive or high inrush current loads. The other four have inbuild RC Parts on the Board.

1.4.7 Technican Notes

• A calibration has to be done in the applications software.
for current measurement range = 1
0,5Aeff = 275 digit, 1Aeff = 550 digit
for current measurement range = 0
1Aeff = 50 digit, 5Aeff = 250 digit, 10Aeff = 500 digit

• After every communication all inputs will be updated

• To stabilize the measurement results, they should be filtered in the application

1.5 Process Data Image

1.5.1 Outgoing Process Data (from bus master to this brick)

Byte	Function	rCAssign
00	Relais 6 .. .. Relais 1 MR: Measurement Range (0 = 20 Ap; 1 = 2 Ap)	... + eB_B0, 0, ... + eB_B0, 5, ... + eB_B0, 6, ...

1.5.2 Incoming Process Data (from this brick to the bus master)

Byte	Function	rCAssign
0, 1	Analog-Input 1	...+eB_W0,0,...
2	digital status of the analog input	...+eB_B2,0,...
	Digital Input 1	...+eB_B2,1,...
	Digital Input 2	...+eB_B2,2,...
	Digital Input 3	...+eB_B2,3,...
	Digital Input 4	...+eB_B2,4,...
	Digital Input 5	...+eB_B2,5,...
		...+eB_B2,6,...
		...+eB_B2,7,...

1.6 History

On the following page you will find a list of changes that have been made to the product.

1.6.1 History

Date	Entry scope (HW, SWappl, SWapi, Release)	Entry type (enhancement, improvement, bugfix, release)	Version	Status (development, implemented, tested)	Responsible	Reason for the modification	Items of modification	Impact for (end-)customer	Comment	Location in model/source
xxxx-xx-xx		Release	0.99	Tested	NSt					

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