

## Electronic circuit breaker with thermomagnetic characteristic **ECONOMY SMART**



### General Data

Nominal input voltage	12 / 24 / 48 Vdc
Output channels	2 / 4 / 8
Tripping current	1 - 6 A / 2 - 10 A
Thermomagnetic characteristic	
Ambient temperature	-25 °C to +70 °C
Protection index	IP 20
Efficiency typ.	99 %

### Advantages

Adjustable tripping current for each output channel via current selector switch
Ability to turn-on high load capacitance at each channel
Sequential and load-dependent switching-on of channels
Comprehensive single-channel-diagnostics and remote switching on/off of each output channel via 2-wire-interface
LED signalisation and remote request for each output channel
Group alarm contact

### Applications

ECONOMY SMART circuit breakers with a thermomagnetic characteristic represent an economical alternative to the classic circuit breaker. They also ensure reliable tripping even in the case of high line resistance. This makes the circuit breakers ideal for use in standard machine production. The electronic circuit breaker distributes and monitors the load current over several current circuits. Overloads and short circuits on an output are reliably recognized. The electronics permit brief current peaks and switch longer overloads off. The rated current for each output can be individually set with a current selector switch accessible from the front. The outputs are activated depending on the time delay and load to avoid an overload current. If the rated current is exceeded for a certain amount of time, the output will be switched off automatically and can be reactivated after a waiting time (thermal relaxation) using the pushbutton or the remote signal input S1. The pushbutton can also be used to switch the output manually. It is possible to read out the state of each output using the three signal contacts. The state of each output is also indicated with a multi-colored LED.

### Standards

Electronic circuit breaker  
UL 508, UL 2367

Safety:  
EN 60950-1, EN 50178,  
EN/IEC 60204-1

EMC:  
EN 61000-6-2, EN 61000-6-3

Safety extra-low voltage (SELV/PELV):  
IEC 60364-4-41 (DIN VDE 0100-410)

CE acc. to 2004/108/EG (EMC-Directive)

### Approvals



UL 2367 (E-File: E356250)UL 508 (E-File: E219022)GL

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## Electronic circuit breaker with thermomagnetic characteristic **ECONOMY SMART**

Typ		PM-0712-200-0	PM-0712-400-0	PM-0724-120-0	PM-0724-200-0
Electrical data	Input				
	Input rated voltage	12 Vdc	12 Vdc	24 Vdc	24 Vdc
	Input voltage range	10 - 16 Vdc	10 - 16 Vdc	18 - 30 Vdc	18 - 30 Vdc
	Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
	Required input voltage for turning-on of outputs	10.5 V (Turn-off Threshold 10 V)	10.5 V (Turn-off Threshold 10 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)
	Max. total input current	20 A	40 A	12 A	20 A
	Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
	Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
	Stand-by current	44 mA @ 12 V	44 mA @ 12 V	35 mA @ 24 V	35 mA @ 24 V
	Power losses in stand-by mode	0.53 W @ 12 V	0.53 W @ 12 V	0.84 W @ 24 V	0.84 W @ 24 V
Output					
Output rated voltage	12 Vdc	12 Vdc	24 Vdc	24 Vdc	
Output rated current	2 x 2 - 10 A	4 x 2 - 10 A	2 x 1 - 6 A	2 x 2 - 10 A	
Maximum voltage drop between input and output	200 mV @ 2 x 10 A	200 mV @ 4 x 10 A	120 mV @ 2 x 6 A	200 mV @ 2 x 10 A	
Initialization time of module	250 ms	250 ms	250 ms	250 ms	
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	
Waiting periode after switch-off of an output	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	
Max. power losses	5.3 W @ 2 x 10 A	10 W @ 4 x 10 A	2.5 W @ 2 x 6 A	5.5 W @ 2 x 10 A	
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %	
Internal output fuse	15 A	15 A	15 A	15 A	
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc	
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed	
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed	
Signaling					
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	
Signal input S1	DC 12-24 V (On/Off/Reset)	DC 12-24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	
Signal output S2	DC 12 V, max. 25 mA (status output channels)	DC 12 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	
Signal output S3	DC 12 V, max. 25 mA (Common signalling output)	DC 12 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	
Approvals					
Approvals	-	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	
Environment					
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	
Derating	-	-	-	-	
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection	
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm	
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm	
Safety and protection					
Protection index	IP 20	IP 20	IP 20	IP 20	
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection	
Degree of pollution	2	2	2	2	
Order numbers					
Order Number	<b>PM-0712-200-0</b>	<b>PM-0712-400-0</b>	<b>PM-0724-120-0</b>	<b>PM-0724-200-0</b>	



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Typ	PM-0724-240-0	PM-0724-400-0	PM-0724-400-2	PM-0748-200-0
<b>Electrical data</b>				
<b>Input</b>				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	48 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	32 - 58 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	35 Vdc
Max. total input current	24 A	40 A	40 A	20 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 68 V
Stand-by current	35 mA @ 24 V	35 mA @ 24 V	35 mA @ 24 V	
Power losses in stand-by mode	0.84 W @ 24 V	0.84 W @ 24 V	0.84 W @ 24 V	
<b>Output</b>				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	48 Vdc
Output rated current	4 x 1 - 6 A	4 x 2 - 10 A	4 x 2 - 10 A	2 x 2 - 10 A
Maximum voltage drop between input and output	120 mV @ 4 x 6 A	200 mV @ 4 x 10 A	200 mV @ 2 x 10 A	
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 20 s (overload)
Max. power losses	4.2 W @ 4 x 6 A	10 W @ 4 x 10 A	10 W @ 4 x 10 A	
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	58 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
<b>Signaling</b>				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	15 - 58 Vdc (On / Off / Reset)
Signal output S2	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S2": 24 Vdc, 20 mA, short circuit proof, status report of outputs
Signal output S3	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S3": 24 Vdc, 20 mA, short circuit proof; high = OK, low = min. one channel tripped
<b>Approvals</b>				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
<b>Environment</b>				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
<b>Safety and protection</b>				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
<b>Order numbers</b>				
Order Number	<b>PM-0724-240-0</b>	<b>PM-0724-400-0</b>	<b>PM-0724-400-2</b>	<b>PM-0748-200-0</b>

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Mechanical data	Typ	Mounting position	Terminals signalling, 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "1"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "1"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 881	Output terminals ("1"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Weight	Dimension picture (in mm)							
								A	B	C	D	E	F	G	
	PM-0712-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	①	90	45	45	3	3.5	91.5	99
	PM-0712-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	②	90	45	45	3	3.5	91.5	99
	PM-0724-120-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	③	90	45	45	3	3.5	91.5	99
	PM-0724-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	④	90	45	45	3	3.5	91.5	99
	PM-0724-240-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	⑤	90	45	45	3	3.5	91.5	99
	PM-0724-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	⑥	90	45	45	3	3.5	91.5	99
	PM-0724-400-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.20 kg	⑦	90	45	45	3	3.5	91.5	99
	PM-0748-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.14 kg	⑧	90	45	45	3	3.5	91.5	99
	PM-0748-200-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.14 kg	⑨	90	45	45	3	3.5	91.5	99
	PM-0748-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.14 kg	⑩	90	45	45	3	3.5	91.5	99
	PM-0748-400-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.14 kg	⑪	90	45	45	3	3.5	91.5	99
	PC-0724-800-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.40 kg	⑫	127	63.5	42	3	116.5	124	-
	PC-0724-800-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	1) max. 6 mm <sup>2</sup>	1) max. 2,5 mm <sup>2</sup>	0.40 kg	⑬	127	63.5	42	3	116.5	124	-
	PC-0748-800-0	horizontal for standard rail DIN TS35	2) max. 2,5 mm <sup>2</sup>	2) max. 2,5 mm <sup>2</sup>	2) max. 6 mm <sup>2</sup>	2) max. 2,5 mm <sup>2</sup>	0.40 kg	⑭	127	63.5	42	3	116.5	124	-
	PC-0748-800-2	horizontal for standard rail DIN TS35	2) max. 2,5 mm <sup>2</sup>	2) max. 2,5 mm <sup>2</sup>	2) max. 6 mm <sup>2</sup>	2) max. 2,5 mm <sup>2</sup>	0.40 kg	⑮	127	63.5	42	3	116.5	124	-

### Dimension pictures

