Switch mode power supplies
CP-T Range

Type CP-T Switch mode
Power supplies

11

Characteristics

- Rated output voltages 24 V, 48 V DC
- Output voltage adjustable via front-face rotary potentiometer “OUTPUT Adjust”
- Rated output currents 5 A, 10 A, 20 A, 40 A
- Rated output powers 120 W, 240 W, 480 W, 960 W
- Three-phase or two-phase operation (see derating note)
- Supply range 3 x 400 – 500 V AC (3 x 340 – 575 V AC, 480 – 820 V DC)
- Typical efficiency of 93 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 °C 1)
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Redundancy unit CP-A RU offering true redundancy, available as accessory
- LEDs for status indication
- Signalling contact "13-14" (solid state) for output voltage OK
- Approvals / marks (depending on device, partly pending):

Benefits

Signalling output
The devices of the CP-T series offer a solid state output for function monitoring and remote diagnostics.

Wide input range
Wide range input optimized for world-wide applications: The CP-T power supplies can be used in 340 - 575 V AC or 480 - 820 V DC supply systems.

Adjustable output voltage
The CP-T range feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.

1) 480 W variants: -30...+70°C

CP-T Range
Ordering details


CP-T 24/5.0


CP-T 24/10.0, CP-T 48/5.0


CP-T 24/20.0, CP-T 48/10.0

Description

The CP-T range of three-phase power supply units is the youngest member of ABB's power supply family. In terms of design and functionality, the new range perfectly supplements

the existing products and extends the range appropriately. The devices can be supplied with a three-phase voltage as well as with two-phase mains. Here, ABB offers power supply units with 24 V DC and 48 V DC outputs with 5 A, 10 A, 20 A and 40 A and efficiency of up to 92 %. As in the case of all products, they are designed for an ambient temperature of up to 70 °C.

All products can be supplied within a AC supply voltage range between 340 to 575 V AC and an DC supply voltage range between 480 to 820VDC.

Ordering details

Input voltage range	Rated output voltage / current	Type	Catalog number	Weight (1 pce) kg (lb)
340-575 V AC / 480-820 V DC	24 V DC / 5 A	CP-T 24/5.0	1SVR427054R0000	0.80 (1.77)
340-575 V AC / 480-820 V DC	24 V DC / 10 A	CP-T 24/10.0	1SVR427055R0000	1.05 (2.31)
340-575 V AC / 480-820 V DC	24 V DC / 20 A	CP-T 24/20.0	1SVR427056R0000	1.75 (3.86)
340-575 V AC / 480-820 V DC	24 V DC / 40 A	CP-T 24/40.0	1SVR427057R0000	3.20 (7.05)
340-575 V AC / 480-820 V DC	48 V DC / 5 A	CP-T 48/5.0	1SVR427054R2000	1.05 (2.31)
340-575 V AC / 480-820 V DC	48 V DC / 10 A	CP-T 48/10.0	1SVR427055R2000	1.75 (3.86)
340-575 V AC /480-820 V DC	48 V DC / 20 A	CP-T 48/20.0	1SVR427056R2000	3.40 (7.50)

Ordering details - Redundancy units for decoupling of two CP-T power supply units

suitable for decoupling of two CP-24 V DC power supply units	Description	Type	Catalog number	Weight (1 pce) kg (lb)
≤ 40 V and < 5 A	2 inputs each up to 20 A and 1 output up to 40 A	CP-A RU	1SVR427071R0000	0.89 (1.96)

CP-T Range
Technical data

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Type			CP-T 24/5.0	CP-T 24/10.0	CP-T 24/20.0	CP-T 24/40.0
Input circuit				**L1, L2, L3**		
Rated input voltage U_{in}				3 x 400-500 V AC		
Input voltage range				340-575 V AC		
				480-820 V DC		
Frequency range AC				47-63 Hz		
Typical input current			0.36 A	0.65 A	1.1 A	1.72 A
Typical power consumption			135 W	270 W	538 W	1058 W
Inrush current limiting			10 A	20 A		30 A
Power failure buffering time				min. 20 ms		min. 15 ms
Internal input fuse	per phase		2 A / 600 V AC		T3.15 A / 500 V AC	T 5 A / 500 V AC
Recommended backup fuse				3 pole miniature circuit breaker ABB Type S203		
Power factor correction (PFC)				Yes, passive		
Discharge current		towards PE		< 3.5 mA		
		input / output		< 0.25 mA		
Indication of operational states						
Output voltage	OUTPUT OK: green LED			output voltage OK		
	OUTPUT LOW: red LED			output voltage too low		
Output circuit				**L+, L+, L-, L-**		
Rated output voltage				24 V DC		
Tolerance of the output voltage				0...+1 %		
Adjustment range of the output voltage				22.5-28.5 V DC		
Rated output power			120 W	240 W	480 W	960 W
Rated output current I_r	Ta ≤ 60 °C		5 A	10 A	20 A	40 A
Derating of the output current	60 °C < Ta ≤ 70 °C			2.5 %/°C		3.5 %/°C
Signalling contact		13-14		solid state (max. 60 V DC, 0.3 A)		
for output voltage OK		Threshold		17.6-19.4 V		
		Isolation voltage		500 V DC		
Mininum fuse rating to achieve short-circuit protection		13-14		≥ 60 V DC, ≤ 0.3 A fast-acting		
Maximum deviation with	load change statical		±1 %	±1 % (single mode)		
			-	± 5 % (parallel mode)		
	change of output voltage within the input voltage range			± 0.5 %		
Control time	at nominal load			< 2 ms		
Starting time after applying		at Ir		max. 1 s		
the supply voltage		with 3500 µF		max. 1.5 s		
Rise time		at nominal load		max. 150 ms		
		with 3500 µF		max. 500 ms		
Fall time				max. 150 ms		
Residual ripple and switching peaks	BW = 20 MHz			100 mV		80 mV
Parallel connection			not supported	configurable, to increase power, up to 2 devices, reduction: (number of devices x I_r) x 0.9		to increase power, up to 2 devices, reduction:(number of devices x I_r) x 0.9, use active current balancing
Series connection			not supported	yes, to increase voltage, max. 2 devices		
Resistance to reverse feed				approx. 35 V		
Output circuit - No-load, overload and short-circuit behavior						
Characteristic curve of output				combined U/I characteristic curve and hiccup mode	U/I- or Hiccup-mode adjustable	hiccup / fold back behavior
Short-circuit protection				continuous short-circuit proof		
Short-circuit behavior				current limiting		
Overload protection				hiccup mode		
No-load protection				continuous no-load stability		
Overtemperature protection				yes, automatic recovery after temperature went down		
Starting of capacitive loads			3500 µF	7000 µF	7000 µF	7000 µF
General data						
Efficiency			typ. 89 %	typ. 90 %		typ. 92 %
Duty time				100%		
Dimensions (W x H x D)			74.3 x 124 x 118.8 mm [2.92 x 4.88 x 4.68 in]	89 x 124 x 118.8 mm [3.5 x 4.88 x 4.68 in]	150 x 124 x 118.8 mm [5.91 x 4.88 x 4.68 in]	275.8 x 124 x 118.8 mm [10.86 x 4.88 x 4.68 in]
Weight			0.78 kg (1.72 lb)	1.045 kg (2.30 lb)	1.657 kg (3.653 lb)	3.275 kg (7.220 lb)
Material of housing				Metal		
Mounting				DIN rail (IEC EN 60715), snap-on mounting without any tool		
Mounting position				horizontal		
Minimum distance to other units	horizontal / vertical			25 mm / 25 mm (0.98 in / 0.98 in)		

CP-T Range
Technical data

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Type			CP-T 24/5.0	CP-T 24/10.0	CP-T 24/20.0	CP-T 24/40.0
Degree of protection	housing / terminals		IP20 / IP20			
Protection class			I			
Electrical connection - input circuit / output circuit						
Wire size						
	fine-strand with wire end ferrule		0.2-4 mm² (24-11 AWG)			Input circuit L1, L2, L3: 0.2-4 mm² (24-11 AWG) Output circuit L+, L+, L-, L-: 0.5-10 mm² (20-8 AWG) Signalling circuit: 0.2-4 mm² (24-11 AWG)
	fine-strand without wire end ferrule		0.2-6 mm² (24-10 AWG)			Input circuit L1, L2, L3: 0.2-6 mm² (24-11 AWG) Output circuit L+, L+, L-, L-: 0.5-16 mm² (20-6 AWG) Signalling circuit: 0.2-6 mm² (24-10 AWG)
	rigid		0.2-6 mm² (24-10 AWG)			Input circuit L1, L2, L3: 0.2-6 mm² (24-11 AWG) Output circuit L+, L+, L-, L-: 0.5-16 mm² (20-6 AWG) Signalling circuit: 0.2-6 mm² (24-10 AWG)
Stripping length			8 mm (0.31 in)			
Tightening torque	input / output		1 Nm / 0.6 Nm			1 Nm / 1.8 Nm
Environmental data						
Ambient temperature range	operation		-40...+70 °C		-30…+70 °C	-40...+70 °C
	rated load		-40...+70 °C		-30…+70 °C	-40...+70 °C
	storage		-40…+85 °C			
Damp heat (cyclic) (IEC/EN 60068-2-30)			95 % without condensation			
Vibration (sinusoidal) (IEC/EN 60068-2-6)			10-500 Hz, 2G, each along X, Y, Z axes 6 min / cycle			
Shock (half-sine) (IEC/EN 60068-2-27)			Half sine wave, 15G, 11 ms, 3 axes, 6 Faces, 3 times for each face			
Isolation data						
Rated insulation voltage U_i	input circuit / output circuit		3 kV AC			
	input / PE		1.5 kV AC			
Pollution degree			2			
Standards						
Product standard			EN 61204-3			
Low Voltage Directive			2006/95/EN			
EMC directive			2004/108/EN			
RoHS directive			2002/95/EN			
Electrical safety			EN 60950-1, UL 60950-1, UL 508, EN 61558-1, EN 61558-2-17; EN 60204-1			
Protective low voltage			SELV			
Electromagnetic compatibility						
Interference immunity to			IEC/EN 61000-6-2			
electrostatic discharge	IEC/EN 61000-4-2		Level 4 (air discharge 15 kV / contact discharge 8 kV)			
radiated, radio-frequency, electromagnetic field		IEC/EN 61000-4-3	Level 3 (10 V/m)			
electrical fast transient/burst	IEC/EN 61000-4-4		Level 4 (4 kV / 2.5 kHz)	Level 4 (4 kV / 5 kHz)		
surge	IEC/EN 61000-4-5		L-L Level 3 (2 kV) / L-PE Level 4 (4 kV)			
conducted disturbances, induced by radio-frequency fields		IEC/EN 61000-4-6	Level 3 (10 V)			
power frequency magnetic fields		IEC/EN 61000-4-8	Level 4 (30 A/m)			
voltage dips, short interruptions and voltage variations		IEC/EN 61000-4-11	dips: >95 % 0.5 ms / >30 % 0.5 ms interruptions: >95 % 250 ms			
Interference emission			IEC/EN 61000-6-3			
high-frequency radiated	IEC/CISPR 22, EN 55022		Class B			
high-frequency conducted	IEC/CISPR 22, EN 55022		Class B			
limits for harmonic current emissions	IEC/EN 61000-3-2		Class A			

Approvals and marks on page 11.3.

CP-T Range
Technical data

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Type			CP-T 48/5.0	CP-T 48/10.0	CP-T 48/20.0
Input circuit				**L1, L2, L3**	
Rated input voltage U_{in}				3 x 400-500 V AC	
Input voltage ranget				340-575 V AC	
				480-820 V DC	
Frequency range AC				47-63 Hz	
Typical input current			0.65 A	1.1 A	1.72 A
Typical power consumption			264 W	535 W	1050 W
Inrush current limiting				20 A	30 A
Power failure buffering time				min. 20 ms	min. 15 ms
Internal input fuse	per phase		2 A / 600 V AC	T3.15 A / 500 V AC	T 5 A / 500 V AC
Power factor correction (PFC)				yes, passive	
Discharge current		towards PE		< 3.5 mA	
		input / output		< 0.25 mA	
Indication of operational states					
Output voltage	OUTPUT OK: green LED			output voltage OK	
	OUTPUT LOW: red LED			output voltage too low	
Output circuit				**L+, L+, L-, L-**	
Rated output voltage				48 V DC	
Tolerance of the output voltage				0...+1 %	
Adjustment range of the output voltage				47-56 V DC	
Rated output power			240 W	480 W	960 W
Rated output current I_r	$T_a \leq 60$ °C		5 A	10 A	20 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C			2.5 %/°C	3.5 %/°C
Maximum deviation with	load change statical			±1 % (single mode)	
				± 5 % (parallel mode)	
	change of output voltage within the input voltage range			±0.5 %	
Control time	at rated load			< 2 ms	
Starting time after applying the supply voltage		at I_r		max. 1 s	
		with 7000 µF		max. 1.5 s	
Rise time		at rated load		max. 150 ms	
		with 7000 µF		max. 500 ms	
Fall time				max. 150 ms	
Residual ripple and switching peaks	BW = 20 MHz			100 mV	80 mV
Parallel connection				configurable, to increase power, up to 2 devices, reduction: (number of devices x I_r) x 0.9	to increase power, up to 2 devices, reduction: (number of devices x I_r) x 0.9, use active current balancing
Series connection				yes, to increase voltage, max. 2 devices	
Resistance to reverse feed			approx. 35 V	approx. 63 V	approx. 63 V
Output circuit - No-load, overload and short-circuit behavior					
Characteristic curve of output			combined U/I and hiccup mode	U/I or hiccup mode, configurable	hiccup mode / fold back behavior
Short-circuit protection				continuous short-circuit proof	
Short-circuit behavior				current limiting	
Overload protection				hiccup mode	
No-load protection				continuous no-load stability	
Over temperature protection				yes, automatic recovery after temperature went down	
Starting of capacitive loads				7000 µF	
General data					
Efficiency				typ. 91 %	typ. 93 %
Duty time				100%	
Dimensions (W x H x D)			89 x 124 x 118.8 mm [3.5 x 4.88 x 4.68 in]	150 x 124 x 118.8 mm [5.91 x 4.88 x 4.68 in]	275.8 x 124 x 118.8 mm [10.86 x 4.88 x 4.68 in]
Weight			1.045 kg (2.30 lb)	1.657 kg (3.653 lb)	3.275 kg (7.22 lb)
Material of housing				Metal	
Mounting				DIN rail (IEC EN 60715), snap-on mounting without any tool	
Mounting position				horizontal	
Minimum distance to other units	horizontal / vertical			25 mm / 25 mm (0.98 in / 0.98 in)	
Degree of protection	housing / terminals			IP20 / IP20	
Protection class				I	

CP-T Range
Technical data

Data at T_a = 25 °C, U_{in} = 3 x 400 V AC and rated values, unless otherwise indicated

Type			CP-T 48/5.0	CP-T 48/10.0	CP-T 48/20.0
Wire size	fine-strand with wire end ferrule		0.2-4 mm² (24-11 AWG)		0.2-4 mm² (24-11 AWG) / 0.5-10 mm² (20-6 AWG)
	fine-strand without wire end ferrule		0.2-6 mm² (24-10 AWG)		
	rigid				
Stripping length			8 mm (0.31 in)		
Tightening torque	input / output		1 Nm / 0.6 Nm		1 Nm / 1.8 Nm
Environmental data					
Ambient temperature range		operation	-40…+70 °C	-30…+70 °C	-40…+70 °C
		rated load	-40…+70 °C	-30…+60 °C	-40…+70 °C
		storage	-40…+70 °C	-40…+85 °C	-40…+70 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)			95 % without condensation		
Vibration (sinusoidal) (IEC/EN 60068-2-6)			10-500 Hz, 2G, each along X, Y, Z axes 6 min / cycle		
Shock (half-sine) (IEC/EN 60068-2-27)			Half sine wave, 15G, 11 ms, 3 axes, 6 Faces, 3 times for each face		
Isolation data					
Rated insulation voltage U_i	input circuit / output circuit		3 kV AC		
	input / PE		1.5 kV AC		
Pollution degree			2		
Standards					
Product standard			IEC/EN 61204-3		
Low Voltage Directive			2006/95/EC		
EMC directive			2004/108/EC		
RoHS directive			2002/95/EC		
Electrical safety			EN 60950-1, UL 60950-1, UL 508, EN 61558-1, EN 61558-2-17; EN 60204-1		
Protective low voltage			SELV		
Electromagnetic compatibility					
Interference immunity to			IEC/EN 61000-6-2		
electrostatic discharge	IEC/EN 61000-4-2		Level 4 (air discharge 15 kV / contact discharge 8 kV)		
radiated, radio-frequency, electromagnetic field		IEC/EN 61000-4-3	Level 3 (10 V/m)		
electrical fast transient/burst	IEC/EN 61000-4-4		Level 4 (4 kV / 5 kHz)		
surge	IEC/EN 61000-4-5		L-L Level 3 (2 kV) / L-PE Level 4 (4 kV)		
conducted disturbances, induced by radio-frequency fields		IEC/EN 61000-4-6	Level 3 (10 V)		
power frequency magnetic fields		IEC/EN 61000-4-8	Level 4 (30 A/m)		
voltage dips, short interruptions and voltage variations		IEC/EN 61000-4-11	dips: >95 % 0.5 ms / >30 % 0.5 ms interruptions: >95 % 250 ms		
Interference emission			IEC/EN 61000-6-3		
high-frequency radiated	IEC/CISPR 22, EN 55022		Class B		
high-frequency conducted	IEC/CISPR 22, EN 55022		Class B		
limits for harmonic current emissions	IEC/EN 61000-3-2		Class A		

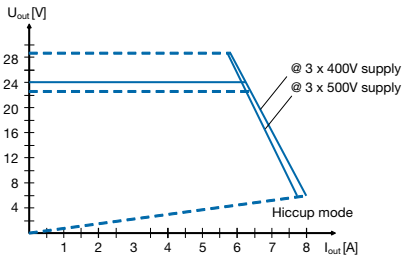
Approvals and marks on page 11.3.

CP-T Range
Technical diagrams
Approximate dimensions

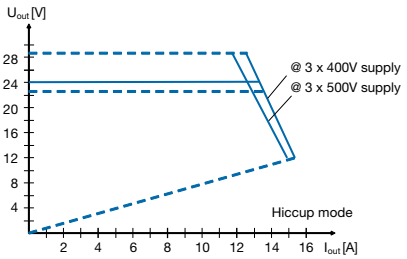
Technical diagrams

dimensions in mm

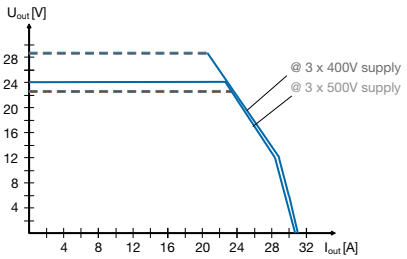
Output curve at T_U = 25 °C



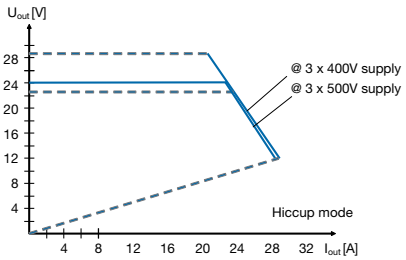
CP-T 24/5.0



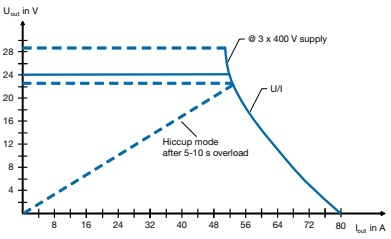
CP-T 24/10.0



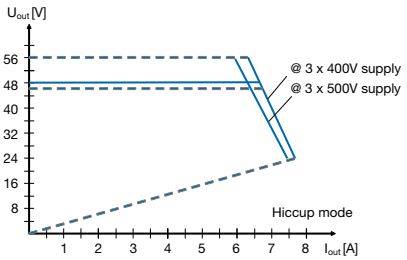
CP-T 24/20.0 U/I curve



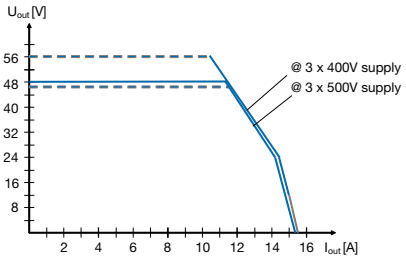
CP-T 24/20.0 Hiccup mode



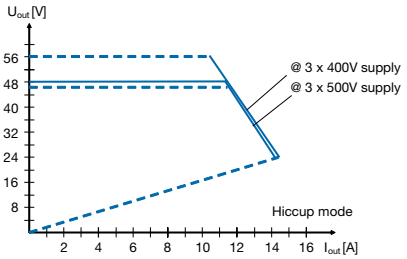
CP-T 24/40.0



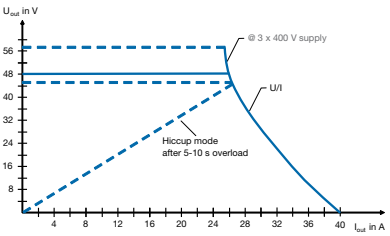
CP-T 48/5.0



CP-T 48/10.0 U/I curve



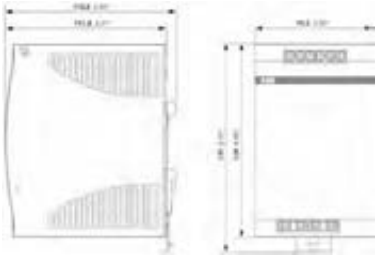
CP-T 48/10.0 Hiccup mode



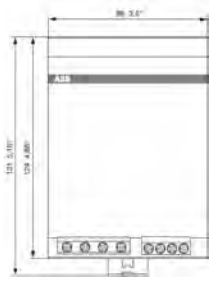
CP-T 48/20.0

Approximate dimensions

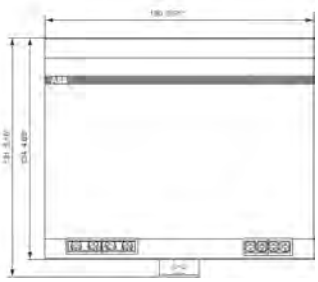
dimensions in mm



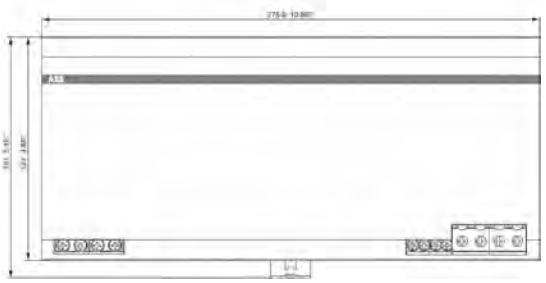
CP-T 24/5.0



CP-T 24/10.0, CP-T 48/5.0



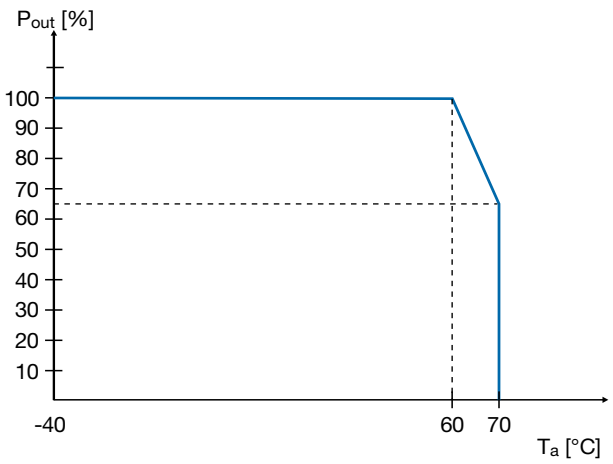
CP-T 24/20.0, CP-T 48/10.0



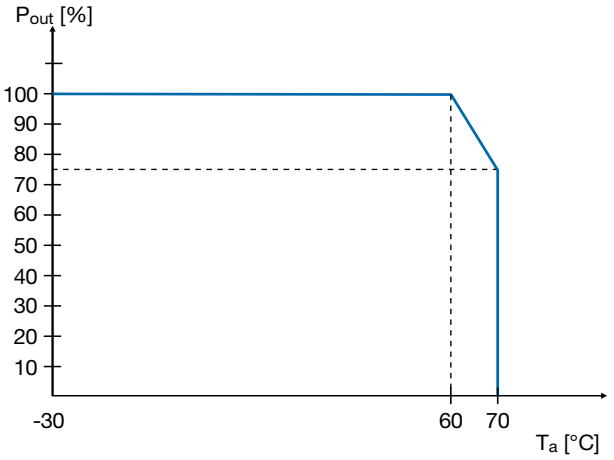
CP-T 24/40.0, CP-T 48/20.0

CP-T Range
Technical diagrams

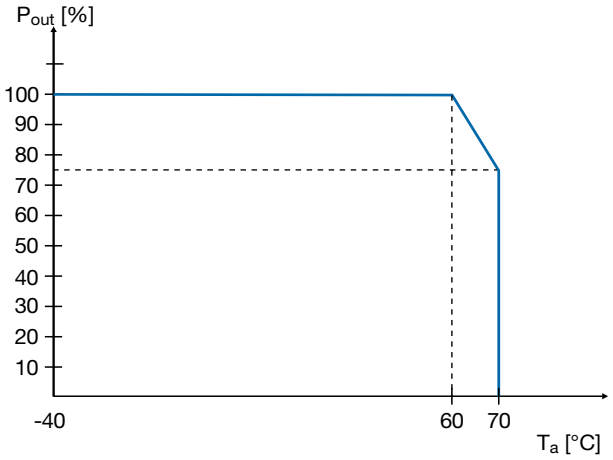
Temperature curve at rated load



CP-T 24/40.0, CP-T 48/20.0



CP-T 24/20.0, CP-T 48/10.0



CP-T 24/10.0, CP-T 24/5.0, CP-T 48/5.0