WÖHRLE®
Stromversorgungssysteme

Technical Information

Product name
POWER-TEC 2410

Description	POWER-TEC 2410
	The slim POWER-TEC 2410 is a reliable, three phase AC input, 24 V / 240 W DIN rail mount power supply in extremely compact dimensions of 135 x 125 mm with a width of only 43 mm. It is specially designed for demanding applications in the harsh industrial automation field with an extended mains input surge immunity of up to 6 kVAC and return voltage immunity > 35 V at the output making it suitable for safe operation against back feeding loads like decelerating motors and inductors. These units will deliver up to 240 W over the full -40 °C to +60 °C ambient temperature range with only convection cooling. A Thermal Power Bonus of up to 288 W at 45 °C plus a power boost of up to 150 % for 5 s makes them suitable for powering highly inductive or capacitive loads. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL 62368-1, IEC/EN/UL 61010-1 and IEC/EN/UL/CSA 61010-2-201. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

Characteristics	
	Slim Design (43 mm) with 25° Push-In connectors
	Fast tool-less mounting and demounting
	Active Inrush Current Limitation
	2-phase AC operation 2 x 350 V to 2 x 575 V
	DC-Input Range 430 V to 815 V / 850 V 10s
	Highest Efficiency up to 94.1 %
	Full Power -40 °C / +60 °C, Boost Power 150 % / 5 s
	Thermal Power Bonus 120 % / 45 °C
	Highest Lifetime Expectancy 80,000 h / 40 °C
	DC-OK Signal
	Reduced no load power consumption 0.8 W to 1.1 W
	3-year warranty

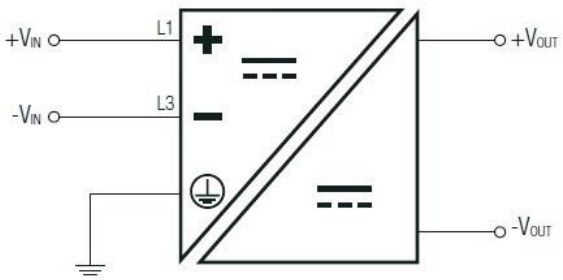
Technical Data	
Input voltage range	3 x 320-575 VAC
Output voltage nom.	24 VDC
Adjustable output voltage	24-28 VDC
Output current nom.	10 A
Efficiency[1] typ.	94.1 %
Rated output power[2]	240 W

(1) Efficiency is tested at nominal input (400/480 VAC) and full load at +25 °C ambient.
(2) Thermal Power Bonus 120 % (T_{AMB}= 45°C max.), and Boost Power 150 % / 5 sec max.; refer to "Boost Power".

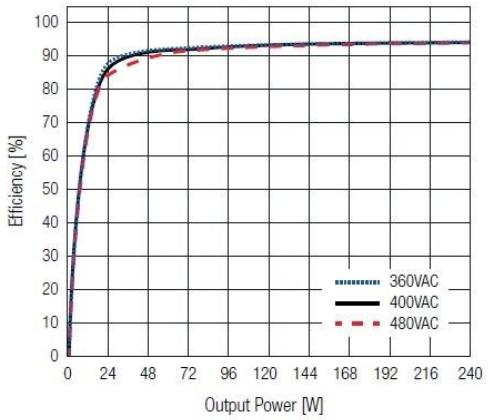
Input & Output					
	Condition			Min.	Typ.	Max.
Nominal Input Voltage	50/60 Hz			400 VAC		480 VAC
Operating Range[3]	3 phase operation			320 VAC		575 VAC
	2 phase operation			350 VAC		575 VAC
	DC operation refer to "Connections for DC-operation"		continuous	450 VDC		815 VDC
			10 s max.			850 VDC
Turn-on Voltage	prevents switching on during 1 AC operation			310 VAC		
	DC operation			440 VDC		
Turn-off Voltage	AC operation			290 VAC		
	DC operation			410 VDC		
Input Current	AC operation	400 VAC				3 x 0.7 A
		500 VAC				3 x 0.6 A
	DC operation	500 VDC				0.8 A
Inrush Current	3 AC 400 VAC, cold start					8.1 A
	3 AC 500 VAC, cold start					10.8 A
No Load Power Consumption	3 AC 400 VAC					0.8 W
	3 AC 500 VAC					1.1 W
Input Frequency Range				47 Hz		63 Hz
Nominal Output Voltage (factory set)					24 VDC	
Minimum Load				0 %		
Power Factor	full load			0.45		
Start-up time	2 & 3 phase operation, 400 VAC				37 ms	50 ms
Rise time					23 ms	30 ms
Hold-up time	400 VAC				15 ms	
	500 VAC				30 ms	
Internal Operating Frequency					65 kHz	
Ripple and Noise	20 MHz bandwidth					85 mVp-p

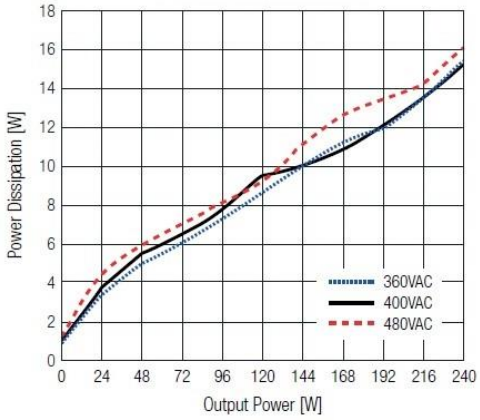
(3) The products were submitted for safety files at AC and DC-Input operation. (350 V – 575 VAC and 450 – 600 VDC) If input voltage is >500 VDC consider an external fuse according to applicable standards. 2phase operation is not included in the safety approvals. Additional tests might be necessary when the complete application has to be approved according to UL 62368-1, 61010-1 and UL 61010-2-201.

Connections for DC-operation



Efficiency vs. Load	Power Dissipation vs. Load





Additional Features		
Output Voltage Adjustability(4)	on-board potentiometer	24-28 VDC
Parallel Operation	refer to "Parallel operation to increase power rating"	100 mV typ.
DC-OK LED	LED green	output voltage ok, normal mode
	LED off	abnormal mode, no operation or failure
Signal Contact	closed	normal mode
	open	abnormal mode, no operation or failure
Signal Contact Rating	do not connect signaling contact to hazardous voltages	30 VDC / 0.1 A

(4) When input voltage is below 350 VAC, the output voltage is limited to 24 VDC. Make sure that the maximum rated output power will not be exceeded when trimming up.

Regulations		
Output Accuracy		±1.0 % max.
Line Regulation	low line to high line, full load	±0.1 % typ.
Load Regulation	0 % to 100 % load	±0.4 % typ.
Max. Capacitive Load (start-up)		20 mF
Transient Response	10-100 % load	±3.0 % typ.
	recovery time	100 ms typ.

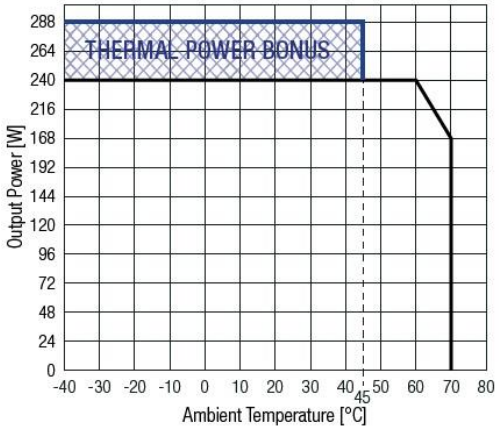
Protections			
Internal Input Fuse	DC compliant		2 x T 5 A, slow-blow
Easy Fuse Tripping			250 % / 20 ms
External Input Protection			16 A C-characteristic circuit breaker
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)	SELV output		35 VDC, latch off
Return Voltage Immunity			35 VDC
Over Voltage Category (OVC)			OVC II
Over Current Protection (OCP)	< 5 sec		>150 % of rated load current, hiccup mode, auto recovery
	< 20 ms(5)		>250 % of rated load current, hiccup mode, auto recovery
Class of Equipment			Class I with PE connection
Isolation Voltage (safety certified)(6)	tested for 1 minute	I/P to O/P	3.5 kVAC / 5 kVDC
		I/P to PE	1.6 kVAC / 2.5 kVDC
		O/P to PE	500 VAC / 700 VDC
Isolation Resistance	I/P to O/P		4.5 MΩ min.
Insulation Grade			reinforced
Earth Leakage Current	500 VAC / 60 Hz		3.5 mA max.

(5) V_{OUT} = 19 VDC min.
(6) For repeat Hi-Pot testing, reduce the time and/or the test voltage

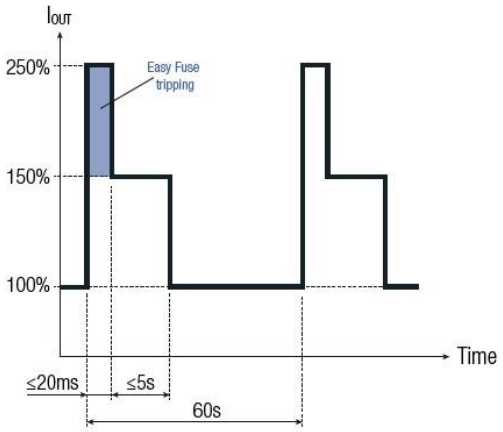
Environment			
Operating Ambient Temperature Range	@ natural convection (0.1 m/s)	with derating	-40 °C to +70 °C
		without derating	refer to “Derating Graph“
Operating Altitude[7]			5000 m
Operating Humidity	non-condensing		95 % RH max.
Pollution Degree			PD2
IP Rating			IP20
Shock	according to IEC 60068-2-27 Fa	non-operating	15 G / 11 ms, 3 times (positive/negative) in all axis
Vibration	according to IEC 60068-2-6 Fc	non-operating	5 - 8.4 Hz @ 3.5 mm deflection 8.4 -150 Hz @ 2 G, 10 cycles/axis (min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		1,015 x 10^3 hours
Design Lifetime	T_{AMB}= 40 °C @ 100 % Load		80 x 10^3 hours

(7) Recognized by safety agency for safe operation up to 5000 m. High altitude operation may impact the performance and lifetime

Derating Graph
(@ Chamber and natural convection 0.1 m/s)



Boost Power
(400 V – 480 VAC or 500 VDC; -40 °C to +60 °C max.)



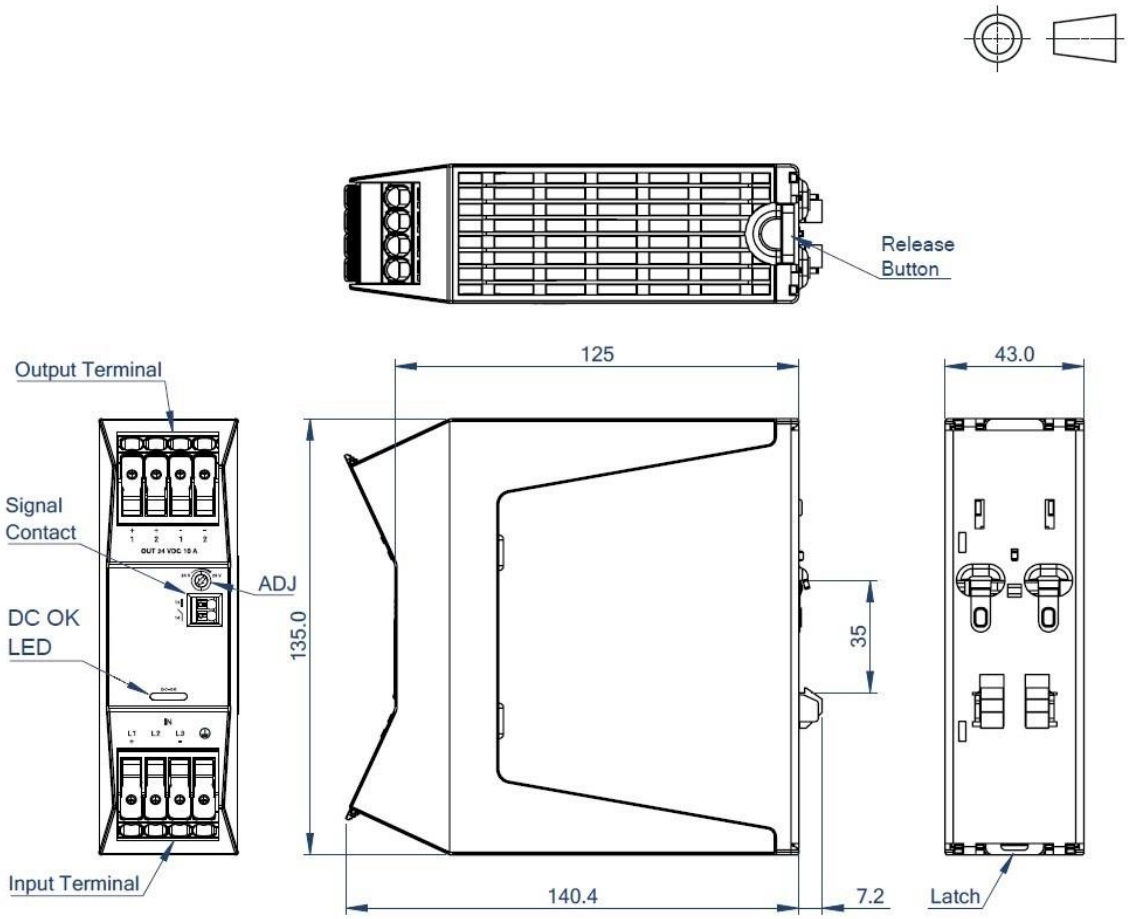
Safety & Certifications		
Certificate Type (Safety)	**Report Number**	**Standard**
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB)	24TH0201_62368-1_0	IEC62368-1:2018 3rd Edition
Audio/Video, information and communication technology equipment - Part 1: Safety requirements		EN IEC 62368-1:2020+A11:2020
Audio/Video, information and communication technology equipment - Part 1: Safety requirements	pending	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements (CB)	4TH0201_61010-1_0	IEC61010-1:2010+A1:2016 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements		EN61010-1:2010+A1:2019
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	pending	UL61010-1:2012 3rd Edition CAN/CSA-C22.2 No. 61010-1-12 3rd Edition

Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment (CB)	24TH0201_61010-2-201_0	IEC61010-2-201:2017 2nd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment		EN IEC 61010-2-201:2018
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment	pending	UL61010-2-201:2018 2nd Edition CAN/CSA-C22.2 No. 61010-2-201:2018-02-01
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-4/6-2	**Condition**		**Standard / Criterion**
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area			IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8 kV; Contact: ±6 kV		IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-1000 MHz)		IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC-Power Port: ±4 kV DC-Output Port: ±2 kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	AC-Power Port:	L1-L2, L1-L3, L2-L3: ±2.5 kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
		L1-PE,L2-PE,L3-PE: ±6 kV	
	DC-Output Port:	Vout(+) - Vout(-), DC-OK(13-14): ±1kV	
		Vout(+)-PE, Vout(-)-PE: ±2kV	
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vrms (0.15 - 80 MHz)		IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30 A/m, 50/60 Hz		EN61000-4-8:2010, Criteria A
Voltage Dips	400 VAC, 50 Hz	100 %, 5 cycles; 70 %, 10 cycles; 40 %, 25 cycles; 30 %, 25 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Voltage Interruptions	400VAC, 50Hz	100 %, 250 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Limits of Harmonic Current Emissions			EN IEC 61000-3-2:2019
Limits of Voltage Fluctuations & Flicker			EN61000-3-3:2013+A1:2017

Dimensions & Physical Characteristics		
Material	chassis	polycarbonate (UL94 V-0) / aluminum
Dimensions (HxWxD)		135.0 x 43.0 140.4 mm 5.3 x 1.7 x 5.5 inch
Weight		531 g 1.17 lbs

Dimension Drawing (mm)



Input & Output Cage Clamp [8]

Function	AWG	mm²
L1, L2, L3	24-8	0.25-6
PE ⏚	24-8	0.25-6
+1, +2 (Vout)	24-8	0.25-6
-1, -2 (Vout)	24-8	0.25-6
Wire stripping length: 12-13mm		

Push-In Signal Terminal [9]

Function	AWG	mm²
Signal (13,14)	24-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect signaling contact to hazardous voltages

(8) Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 90°C.

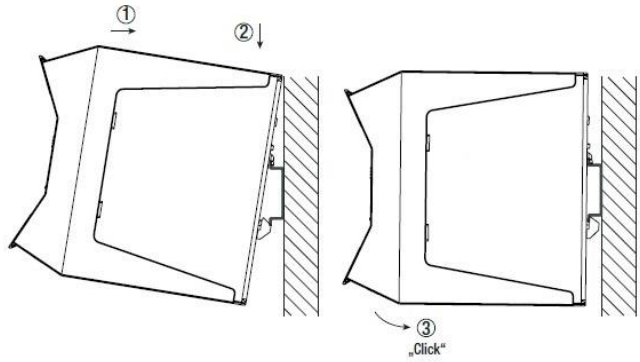
(9) Ferrules are required for flexible cable.

Tolerance: ±0.5mm

Installation & Application

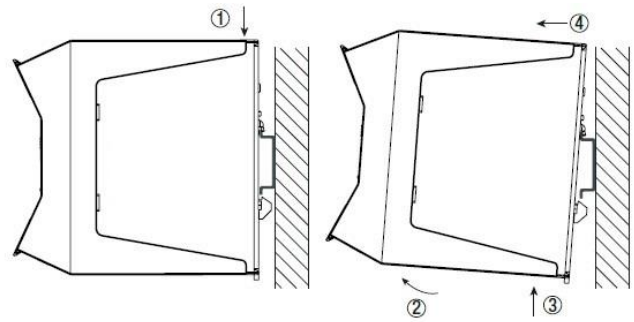
Mounting Instruction
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



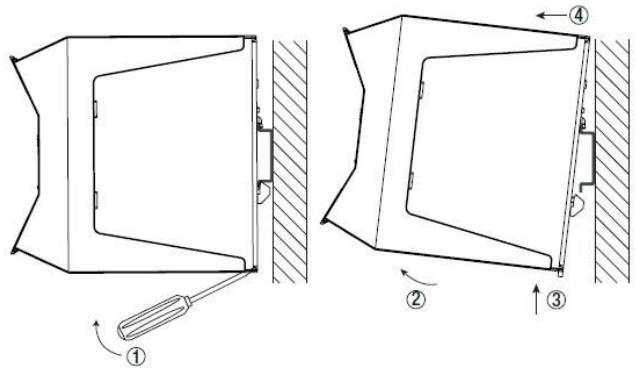
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

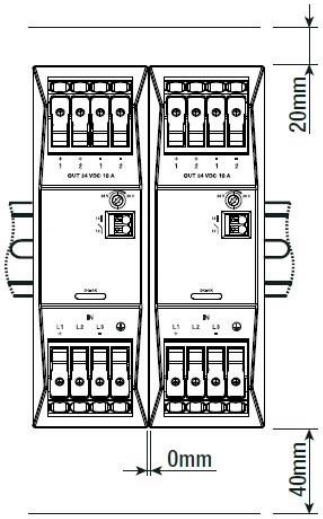
Release Option 2 (by using a screwdriver)



1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Installation & Application

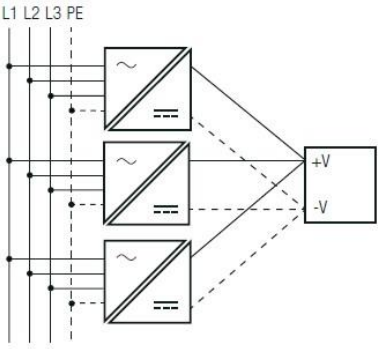
Installation Instructions



To ensure sufficient convection cooling, keep a distance of 20 mm above and 40 mm below the device. For vertical installation, the device must be installed with the input terminal facing downwards. A gap between the units is not required.

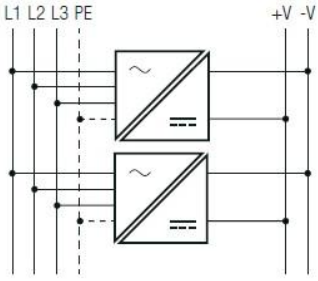
Parallel operation to increase power rating

1. Adjust each power supply to the exact same output voltage with same load and cooling conditions.
2. Use the same wire length and cable cross-section for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
3. Do not use power supplies in parallel in mounting orientations other than the standard mounting orientation (input terminals on the bottom of the unit) or in any other condition where a derating of the output current is required (e.g. above 60 °C, …).
4. Pay attention that leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

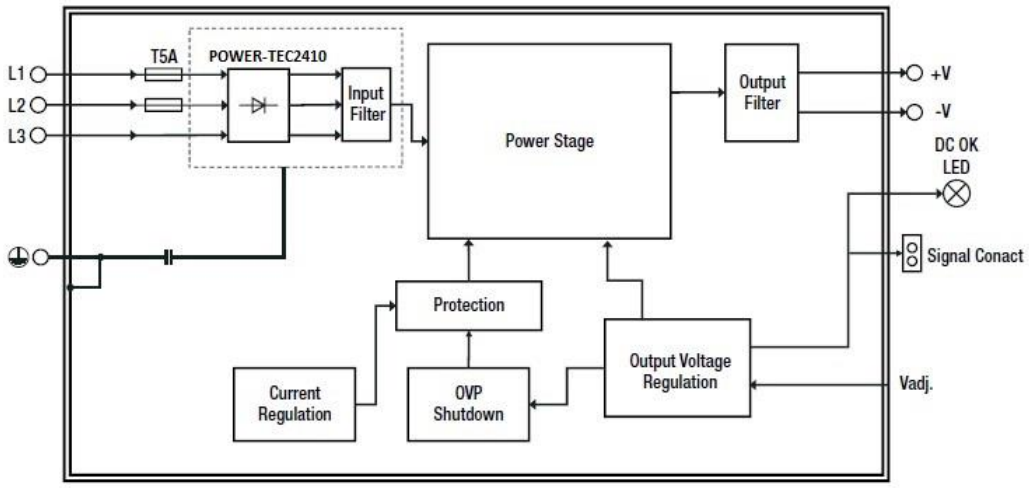


Phase redundancy

If one phase fails, operation is still guaranteed. (2-phase operation)



Block Diagram



Packaging Information		
Packaging Dimension (LxWxH)	cardboard box	175 x 166 x 59 mm
Packaging Quantity		1 pc
Storage Temperature Range		-40 °C to +85 °C
Storage Humidity	non-condensing	85 % RH max.

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Stromversorgungssysteme

Technical Information

Product name
POWER-TEC 2420

Description	POWER-TEC 2420
	The slim POWER-TEC 2420 is a reliable, three phase AC input DIN rail mount power supply with 24 V output in extremely compact dimensions of 135 x 155.7 mm with a width of only 52 mm. It is specially designed for demanding applications in the harsh industrial automation field with an extended mains input surge immunity of up to 6 kVAC and return voltage immunity >35 V at the output making it suitable for safe operation against back feeding loads like decelerating motors and inductors. The power supply will deliver up to 480 W over the full -40°C to +60°C ambient temperature range with only convection cooling. A Thermal Power Bonus of up to 576 W at 45 °C plus a power boost of up to 150 % for 5 s makes them suitable for powering highly inductive or capacitive loads. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL 62368-1, IEC/EN/UL 61010- 1 and IEC/EN/UL/CSA 61010-2-201. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

Characteristics	
	Slim Design (52 mm) with 25° Push-In connectors
	Fast tool-less mounting and demounting
	PFC >0.9 and Active Inrush Current Limitation
	DC Input Range 430 V to 815 V / 850 V 10 s
	Highest Efficiency up to 95.3 %
	Full Power -40 °C / +60 °C, Boost Power 150 % / 5 s
	Thermal Power Bonus 120 % / 45 °C
	Battery Charging & Parallel Operation
	Highest Lifetime Expectancy 80,000 h / 40 °C
	DC-OK Signal
	Reduced no load power consumption 1.9 W – 3 W
	Extended surge immunity 2.5 kV / 6 kV
	3-year warranty

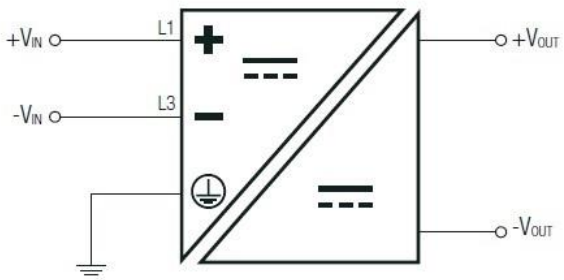
Technical Data	
Input voltage range	3 x 320-575 VAC
Output voltage nom.	24 VDC
Adjustable output voltage	24-28 VDC
Output current nom.	20 A
Efficiency(1) typ.	95 %
Rated output power(2)	480 W

(1) Efficiency is tested at nominal input (400/480 VAC) and full load at +25 °C ambient.
(2) Thermal Power Bonus 120 % (T_{AMB}= 45 °C max.), and Boost Power 150 % / 5 sec max.; refer to "Boost Power".

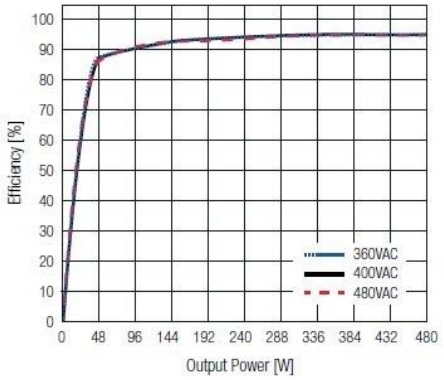
Input & Output					
	Condition		Min.	Typ.	Max.
Nominal Input Voltage	50/60 Hz		400 VAC		480 VAC
Operating Range(3)	3 phase operation(4)		320 VAC		575 VAC
	2 phase operation, max. P_{OUT}= 340 W		350 VAC		480 VAC
	DC input	continuous	450 VDC		815 VDC
	refer to "Connections for DC-operation"	10 s max.			850 VDC
Turn-on Voltage	prevents switching on during 1 AC operation		310 VAC		
	DC operation		440 VDC		
Turn-off Voltage	AC operation		280 VAC		
	DC operation		395 VDC		
Input Current	AC operation	400 VAC			3 x 0.8 A
		500 VAC			3 x 0.7 A
	DC operation	500 VDC			1.0 A
Inrush Current	3 AC 400 VAC, cold start				10 A
	3 AC 500 VAC, cold start				15 A
No Load Power Consumption	3 AC 400 VAC				1.9 W
	3 AC 500 VAC				2 W
Input Frequency Range			47 Hz		63 Hz
Nominal Output Voltage (factory set)				24 VDC	
Minimum Load			0 %		
Power Factor	full load		0.9		
Start-up time	2 & 3 phase operation, 400 VAC			98 ms	112 ms
Rise time				3.5 ms	7 ms
Hold-up time	400 VAC			15 ms	
	500 VAC			29 ms	
Internal Operating Frequency				83 kHz	
Ripple and Noise	20 MHz bandwidth				85 mVp-p

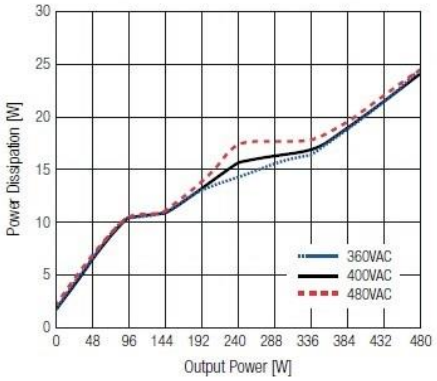
(3) The products were submitted for safety files at AC and DC-Input operation. (350 V – 575 VAC and 450 – 600 VDC) If input voltage is >500 VDC consider an external fuse according to applicable standards. 2phase operation is not included in the safety approvals. Additional tests might be necessary when the complete application has to be approved according to UL 62368-1, 61010-1 and UL 61010-2-201.
(4) Output power derating for Line-input of less than 3 AC 350 VAC (derate linearly from 100 % at 350 VAC to 90 % at 3 AC 320 VAC)

Connections for DC-operation



Efficiency vs. Load	Power Dissipation vs. Load

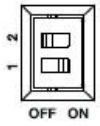
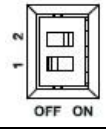




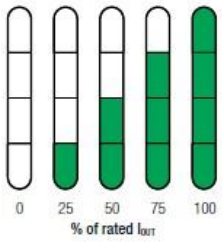
Additional Features		
Output Voltage Adjustability[5]	on-board potentiometer	24-28 VDC
Parallel Load Share Mode		refer to „DIP-SWITCH SETTINGS“
Battery Charging Mode	DIP-Switch 2 “ON” Battery charging is limited to T_{AMB} max. 60 °C, to maintain reliability	130 % continuous
		150 % for 7.5 s
		250 % for 20 ms
Load Indication LED	LED green, refer to “Load Indication LED“	normal mode
	LED off	abnormal mode, no operation or failure
DC-OK LED	LED green	output voltage ok, normal mode
	LED off	abnormal mode, no operation or failure
Signal Contact	closed	normal mode
	open	abnormal mode, no operation or failure
Signal Contact Rating	do not connect signaling contact to hazardous voltages	30 VDC / 0.1 A

(5) When input voltage is below 350 VAC, the output voltage is limited to 24 VDC. Make sure that the maximum rated output power will not be exceeded when trimming up.

DIP-SWITCH SETTINGS

	DIP1	DIP2	
Single Mode (Factory set) Power Boost Mode available	OFF	OFF	
Parallel Load Share Mode Angled output characteristic for load sharing. Voltage drop from 0 to nom. I_{OUT}: 1.2 V	ON	OFF	
Charging Mode Current Limitation strictly at nominal current. Use for Battery charging	OFF	ON	
Not allowed!	ON	ON	

LOAD INDICATION LED
4 LEDs displaying actual and target current of rated output current.



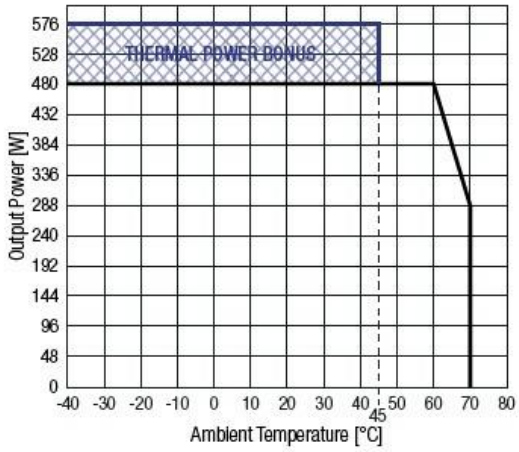
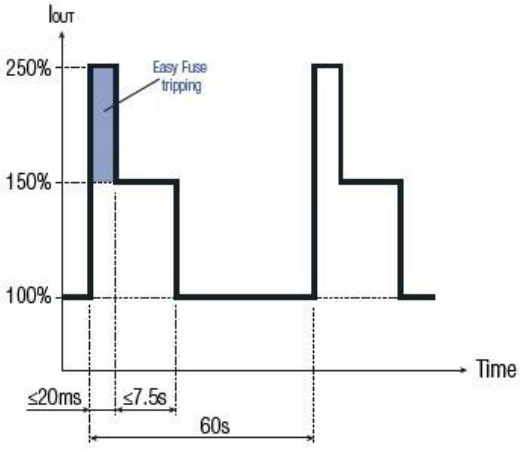
Regulations		
Output Accuracy		±1.0 % max.
Line Regulation	low line to high line, full load	±0.1 % typ.
Load Regulation	0 % to 100 % load	±0.3 % typ.
Max. Capacitive Load (start-up)		40 mF
Transient Response	10-100 % load	±3.0 % typ.
	recovery time	100 ms typ.

Protections			
Internal Input Fuse	DC compliant		2 x T 5 A, slow-blow
Easy Fuse Tripping			250 % / 20 ms
External Input Protection			16 A C-characteristic circuit breaker
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)	SELV output		35 VDC, latch off
Return Voltage Immunity			35 VDC max.
Over Voltage Category (OVC)			OVC II
Over Current Protection (OCP)	< 5 sec		>150 % of rated load current, hiccup mode, auto recovery
	< 20 ms(6)		>250 % of rated load current, hiccup mode, auto recovery
Class of Equipment			Class I with PE connection
Isolation Voltage (safety certified)(7)	tested for 1 minute	I/P to O/P	3.5 kVAC / 5 kVDC
		I/P to PE	1.6 kVAC / 2.5 kVDC
		O/P to PE	500 VAC / 700 VDC
Isolation Resistance	I/P to O/P		4.5 MΩ min.
Insulation Grade			reinforced
Earth Leakage Current	500 VAC / 60 Hz		3.5 mA max.

(6) V_{OUT} = 19 VDC min.
(7) For repeat Hi-Pot testing, reduce the time and/or the test voltage

Environment			
Operating Ambient Temperature Range	@ natural convection (0.1 m/s)	with derating	-40 °C to +70 °C
		without derating	refer to “Derating Graph“
Operating Altitude(8)			5000 m
Operating Humidity	non-condensing		95 % RH max.
Pollution Degree			PD2
IP Rating			IP20
Shock	according to IEC 60068-2-27 Fa	non-operating	15 G / 11 ms, 3 times (positive/negative) in all axis
Vibration	according to IEC 60068-2-6 Fc	non-operating	5 - 8.4 Hz @ 3.5 mm deflection 8.4 -150 Hz @ 2 G, 10 cycles/axis (min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		705 x 10^3 hours
Design Lifetime	T_{AMB}= 40 °C @ 100 % Load		80 x 10^3 hours

(8) Recognized by safety agency for safe operation up to 5000 m. High altitude operation may impact the performance and lifetime

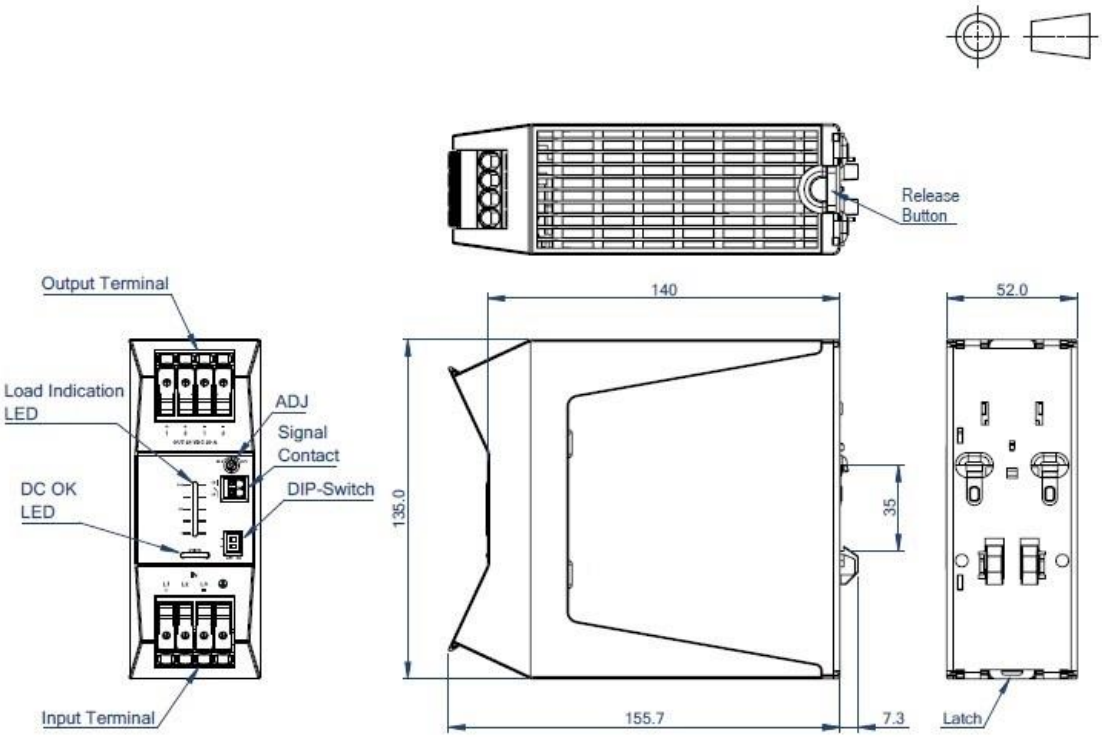
Derating Graph (@ Chamber and natural convection 0.1 m/s)	**Boost Power** (400 V – 480 VAC or 500 VDC; -40 °C to +60 °C max.)
	

Safety & Certifications		
Certificate Type (Safety)	**Report Number**	**Standard**
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB)	24TH0201_62368-1_0	IEC62368-1:2018 3rd Edition
Audio/Video, information and communication technology equipment - Part 1: Safety requirements		EN IEC 62368-1:2020+A11:2020
Audio/Video, information and communication technology equipment - Part 1: Safety requirements	pending	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements (CB)	4TH0201_61010-1_0	IEC61010-1:2010+A1:2016 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements		EN61010-1:2010+A1:2019
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	pending	UL61010-1:2012 3rd Edition CAN/CSA-C22.2 No. 61010-1-12 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment (CB)	24TH0201_61010-2-201_0	IEC61010-2-201:2017 2nd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment		EN IEC 61010-2-201:2018
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment	pending	UL61010-2-201:2018 2nd Edition CAN/CSA-C22.2 No. 61010-2-201:2018-02-01
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-4/6-2	Condition		Standard / Criterion
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area			IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8 kV; Contact: ±6 kV		IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-1000 MHz)		IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC-Power Port: ±4 kV DC-Output Port: ±2 kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	AC-Power Port:	L1-L2, L1-L3, L2-L3: ±2.5 kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
		L1-PE,L2-PE,L3-PE: ±6 kV	
	DC-Output Port:	Vout(+) - Vout(-), DC-OK(13-14): ±1 kV	
		Vout(+)-PE, Vout(-)-PE: ±2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vrms (0.15 - 80 MHz)		IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30 A/m, 50/60 Hz		EN61000-4-8:2010, Criteria A
Voltage Dips	400 VAC, 50 Hz	100 %, 5 cycles; 70 %, 10 cycles; 40 %, 25 cycles; 30 %, 25 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Voltage Interruptions	400 VAC, 50 Hz	100 %, 250 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Limits of Harmonic Current Emissions			EN IEC 61000-3-2:2019
Limits of Voltage Fluctuations & Flicker			EN61000-3-3:2013+A1:2017

Dimensions & Physical Characteristics		
Material	chassis	polycarbonate (UL94 V-0) / aluminum
Dimensions (HxWxD)		135.0 x 52.0 x 155.7 mm 5.3 x 2.0 x 6.1 inch
Weight		768 g 1.69 lbs

Dimension Drawing (mm)



Input & Output Cage Clamp [9]

Function	AWG	mm²
L1, L2, L3	24-8	0.25-6
PE ⏚	24-8	0.25-6
+1, +2 (Vout)	24-8	0.25-6
-1, -2 (Vout)	24-8	0.25-6
Wire stripping length: 12-13mm		

Push-In Signal Terminal [10]

Function	AWG	mm²
Signal (13,14)	24-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect signaling contact to hazardous voltages

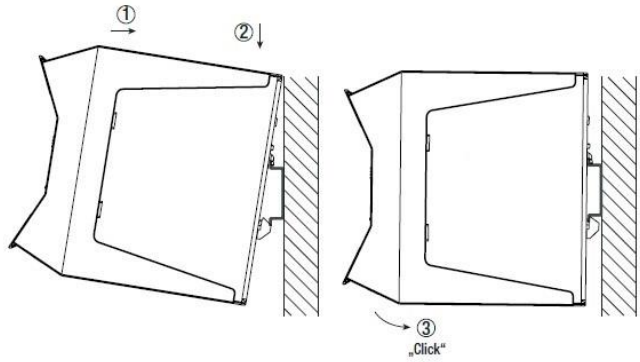
(9) Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 90°C.
(10) Ferrules are required for flexible cable.

Tolerance: ±0.5 mm

Installation & Application

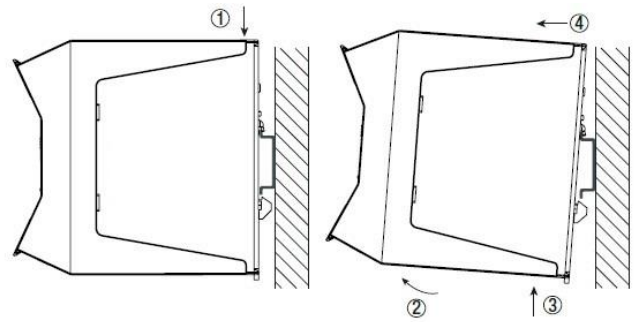
Mounting Instruction
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



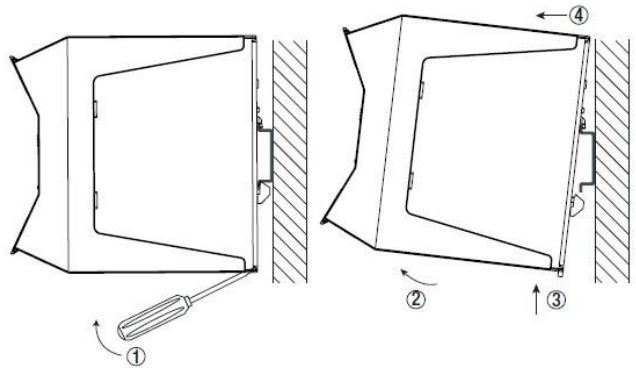
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

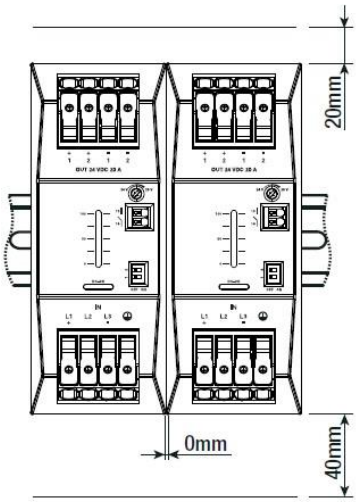
Release Option 2 (by using a screwdriver)



1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Installation & Application

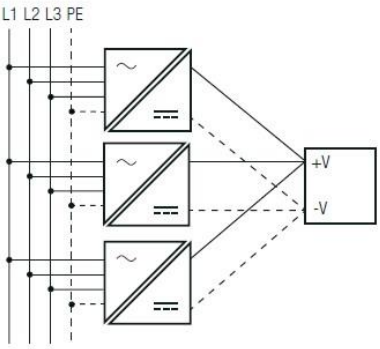
Installation Instructions



To guarantee sufficient convection cooling, keep a distance of 20 mm above and 40 mm below the device. For vertical mounting the device should be installed with the input terminal on the bottom. No space between supplies is required.

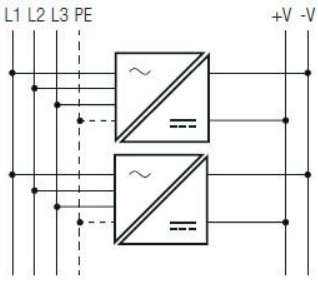
Parallel operation

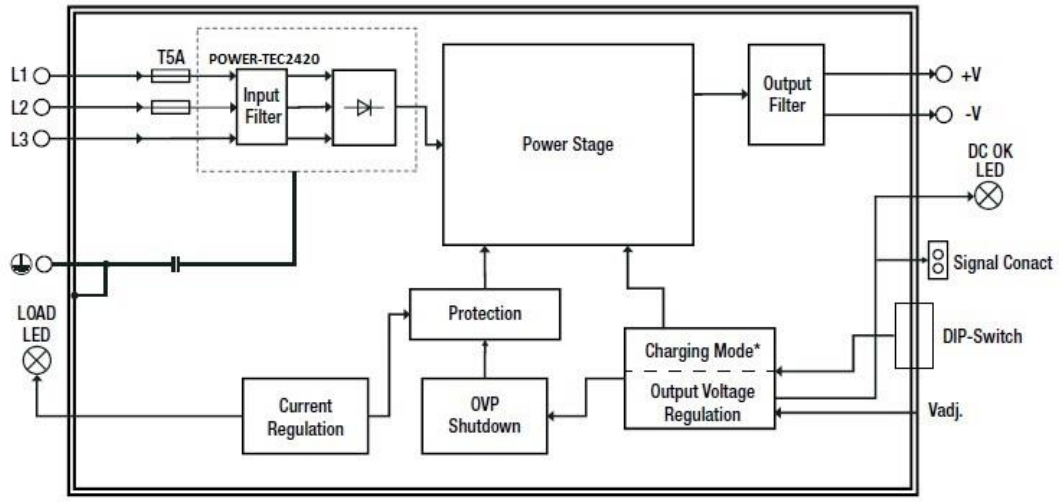
1. Make sure that the DIP-Switch 1 is “ON” to get into the Parallel Load sharing mode.
2. Adjust each power supply to the exact same output voltage with same load and cooling conditions.
3. Use the same wire length and cable cross-section for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
4. Do not use power supplies in parallel in mounting orientations other than the standard mounting orientation (input terminals on the bottom of the unit) or in any other condition where a derating of the output current is required (e.g. above 60°C, …).
5. Pay attention that leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.



Phase redundancy

If one phase fails, operation is still guaranteed. (2-phase operation)



Block Diagram


Packaging Information		
Packaging Dimension (LxWxH)	cardboard box	180 x 175 x 70 mm
Packaging Quantity		1 pc
Storage Temperature Range		-40 °C to +85 °C
Storage Humidity	non-condensing	85 % RH max.

WÖHRLE®
Stromversorgungssysteme

Technical Information

Product name
POWER-TEC 2440

Description	POWER-TEC 2440
	The slim POWER-TEC 2440 is a reliable, three phase AC input DIN rail mount power supply with 24 V output in extremely compact dimensions of 135 x 155.7 mm with a width of only 80 mm. It is specially designed for demanding applications in the harsh industrial automation field with an extended mains input surge immunity of up to 6 kVAC and return voltage immunity >35 V at the output making it suitable for safe operation against back feeding loads like decelerating motors and inductors. These units will deliver up to 960 W over the full -40 °C to +60 °C ambient temperature range with only convection cooling. A Thermal Power Bonus of up to 1056 W at 45 °C plus a power boost of up to 150 % for 5 s makes them suitable for powering highly inductive or capacitive loads. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL 62368-1, IEC/EN/UL 61010- 1 and IEC/EN/UL/CSA 61010-2-201. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

Characteristics	
	Slim Design (80 mm) with 25° Push-In connectors
	Fast tool-less mounting and demounting
	PFC >0.9 and Active Inrush Current Limitation
	DC Input Range 430 V to 815 V / 850 V 10 s
	Highest Efficiency up to 96.9 %
	Full Power -40 °C / +60 °C, Boost Power 150 % / 5 s
	Thermal Power Bonus 120 % / 45 °C
	Battery Charging & Parallel Operation
	Highest Lifetime Expectancy 80,000 h / 40 °C
	DC-OK Signal
	Reduced no load power consumption 1.8 W – 3.3 W
	Extended surge immunity 2.5 kV / 6 kV
	3-year warranty

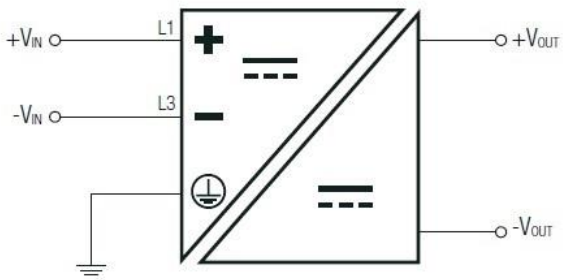
Technical Data	
Input voltage range	3 x 320-575 VAC
Output voltage nom.	24 VDC
Adjustable output voltage	24-28 VDC
Output current nom.	40 A
Efficiency(1) typ.	96 %
Rated output power(2)	960 W

(1) Efficiency is tested at nominal input (400/480 VAC) and full load at +25 °C ambient.
(2) Thermal Power Bonus 110 % (T_{AMB}= 45 °C max.), and Boost Power 150 % / 5 sec max.; refer to "Boost Power".

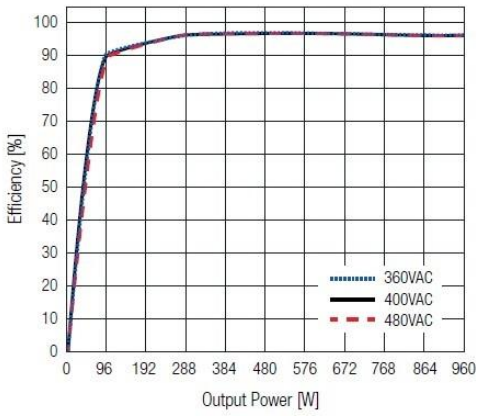
Input & Output					
	Condition		Min.	Typ.	Max.
Nominal Input Voltage	50/60 Hz		400 VAC		480 VAC
Operating Range(3)	3 phase operation(4)		320 VAC		575 VAC
	2 phase operation, max. P_{OUT}= 600 W		350 VAC		480 VAC
	DC input	continuous	450 VDC		815 VDC
	refer to "Connections for DC-operation"	10 s max.			850 VDC
Turn-on Voltage	prevents switching on during 1 AC operation		300 VAC		
	DC operation		424 VDC		
Turn-off Voltage	AC operation		290 VAC		
	DC operation		410 VDC		
Input Current	AC operation	400 VAC			3 x 1.6 A
		500 VAC			3 x 1.4 A
	DC operation	500 VDC			2.1 A
Inrush Current	3 AC 400 VAC, cold start				5 A
	3 AC 500 VAC, cold start				5 A
No Load Power Consumption	3 AC 400 VAC				1.8 W
	3 AC 500 VAC				2.1 W
Input Frequency Range			47 Hz		63 Hz
Nominal Output Voltage (factory set)				24 VDC	
Minimum Load			0 %		
Power Factor	full load		0.9		
Start-up time	2 & 3 phase operation, 400 VAC			695 ms	810 ms
Rise time				5 ms	10 ms
Hold-up time	400 VAC			15 ms	
	500 VAC			29 ms	
Internal Operating Frequency				83 kHz	
Ripple and Noise	20 MHz bandwidth				85 mVp-p

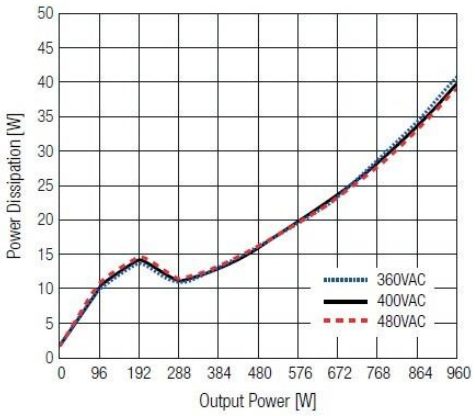
(3) The products were submitted for safety files at AC and DC-Input operation. (350 V – 575 VAC and 450 – 600 VDC) If input voltage is >500 VDC consider an external fuse according to applicable standards. 2phase operation is not included in the safety approvals. Additional tests might be necessary when the complete application has to be approved according to UL 62368-1, 61010-1 and UL 61010-2-201.
(4) Output power derating for Line-input of less than 3 AC 350 VAC (derate linearly from 100 % at 350 VAC to 90 % at 3 AC 320 VAC)

Connections for DC-operation



Efficiency vs. Load	Power Dissipation vs. Load

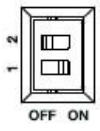
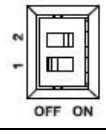
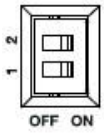




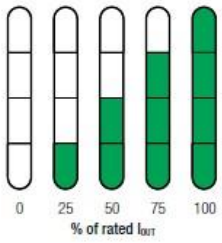
Additional Features		
Output Voltage Adjustability(5)	on-board potentiometer	24-28 VDC
Parallel Load Share Mode		refer to „DIP-SWITCH SETTINGS“
Battery Charging Mode	DIP-Switch 2 “ON” Battery charging is limited to T_{AMB} max. 60 °C, to maintain reliability	130 % continuous
		150 % for 6 s
		250 % for 20 ms
Load Indication LED	LED green, refer to “Load Indication LED“	normal mode
	LED off	abnormal mode, no operation or failure
DC-OK LED	LED green	output voltage ok, normal mode
	LED off	abnormal mode, no operation or failure
Signal Contact	closed	normal mode
	open	abnormal mode, no operation or failure
Signal Contact Rating	do not connect signaling contact to hazardous voltages	30 VDC / 0.1 A

(5) When input voltage is below 350 VAC, the output voltage is limited to 24 VDC. Make sure that the maximum rated output power will not be exceeded when trimming up.

DIP-SWITCH SETTINGS

	DIP1	DIP2	
Single Mode (Factory set) Power Boost Mode available	OFF	OFF	
Parallel Load Share Mode Angled output characteristic for load sharing. Voltage drop from 0 to nom. I_{OUT}: 1.2 V	ON	OFF	
Charging Mode Current Limitation strictly at nominal current. Use for Battery charging	OFF	ON	
Not allowed!	ON	ON	

LOAD INDICATION LED
4 LEDs displaying actual and target current of rated output current.



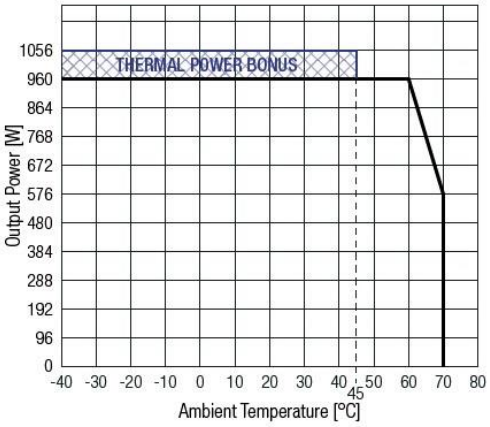
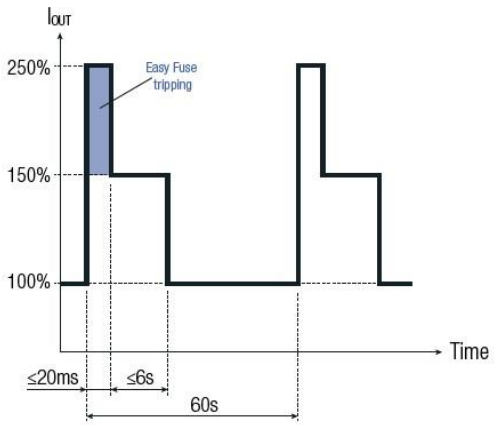
Regulations		
Output Accuracy		±1.0 % max.
Line Regulation	low line to high line, full load	±0.1 % typ.
Load Regulation	0 % to 100 % load	±0.3 % typ.
Max. Capacitive Load (start-up)		40 mF
Transient Response	10-100 % load	±3.0 % typ.
	recovery time	100 ms typ.

Protections			
Internal Input Fuse	DC compliant		2 x T 5 A, slow-blow
Easy Fuse Tripping			250 % / 20 ms
External Input Protection			16 A C-characteristic circuit breaker
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)	SELV output		35 VDC, latch off
Return Voltage Immunity			35 VDC max.
Over Voltage Category (OVC)			OVC II
Over Current Protection (OCP)	< 5 sec		>150 % of rated load current, hiccup mode, auto recovery
	< 20 ms(6)		>250 % of rated load current, hiccup mode, auto recovery
Class of Equipment			Class I with PE connection
Isolation Voltage (safety certified)(7)	tested for 1 minute	I/P to O/P	3.5 kVAC / 5 kVDC
		I/P to PE	1.6 kVAC / 2.5 kVDC
		O/P to PE	500 VAC / 700 VDC
Isolation Resistance	I/P to O/P		4.5 MΩ min.
Insulation Grade			reinforced
Earth Leakage Current	500 VAC / 60 Hz		3.5 mA max.

(6) V_{OUT} = 19 VDC min.
(7) For repeat Hi-Pot testing, reduce the time and/or the test voltage

Environment			
Operating Ambient Temperature Range	@ natural convection (0.1 m/s)	with derating	-40 °C to +70 °C
		without derating	refer to “Derating Graph“
Operating Altitude(8)			5000 m
Operating Humidity	non-condensing		95 % RH max.
Pollution Degree			PD2
IP Rating			IP20
Shock	according to IEC 60068-2-27 Fa	non-operating	15 G / 11 ms, 3 times (positive/negative) in all axis
Vibration	according to IEC 60068-2-6 Fc	non-operating	5 - 8.4 Hz @ 3.5 mm deflection 8.4 -150 Hz @ 2 G, 10 cycles/axis (min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		680 x 10^3 hours
Design Lifetime	T_{AMB}= 40 °C @ 100 % Load		80 x 10^3 hours

(8) Recognized by safety agency for safe operation up to 5000 m. High altitude operation may impact the performance and lifetime

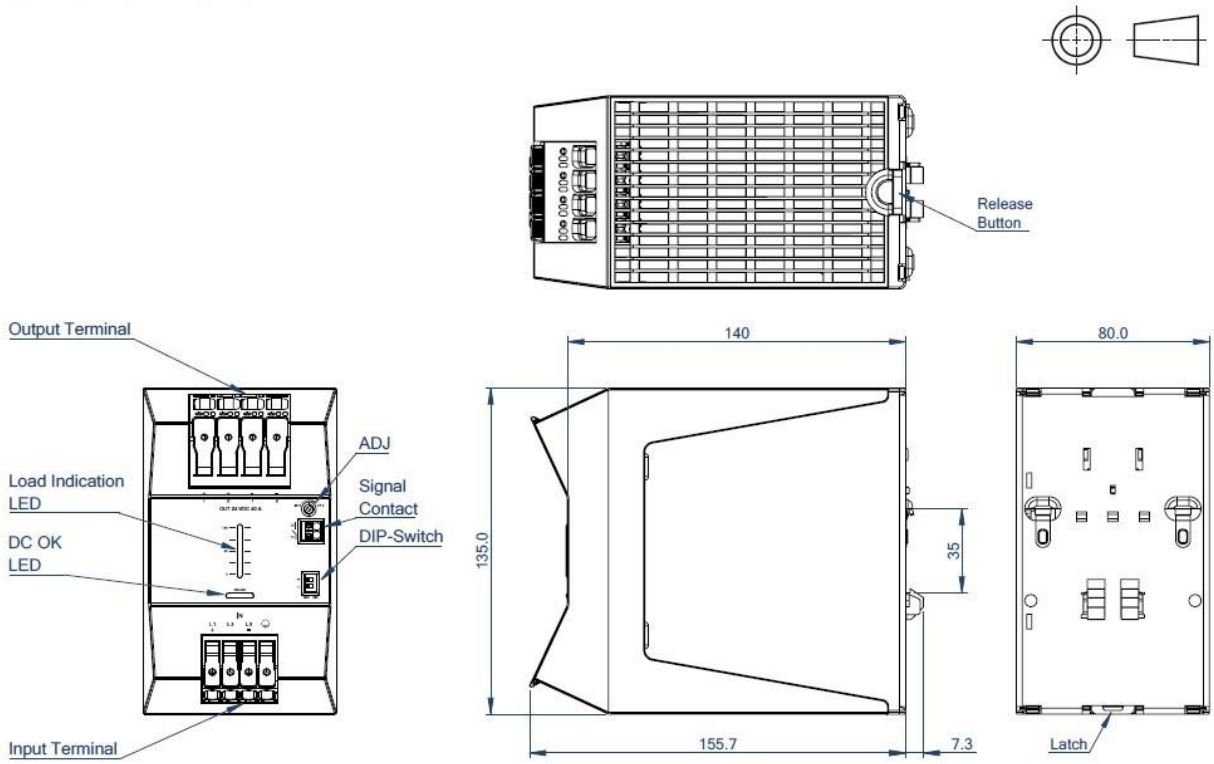
Derating Graph (@ Chamber and natural convection 0.1 m/s)	Boost Power (400 V – 480 VAC or 500 VDC; -40 °C to +60 °C max.)
	

Safety & Certifications		
Certificate Type (Safety)	**Report Number**	**Standard**
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB)	24TH0201_62368-1_0	IEC62368-1:2018 3rd Edition
Audio/Video, information and communication technology equipment - Part 1: Safety requirements		EN IEC 62368-1:2020+A11:2020
Audio/Video, information and communication technology equipment - Part 1: Safety requirements	pending	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements (CB)	4TH0201_61010-1_0	IEC61010-1:2010+A1:2016 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements		EN61010-1:2010+A1:2019
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	pending	UL61010-1:2012 3rd Edition CAN/CSA-C22.2 No. 61010-1-12 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment (CB)	24TH0201_61010-2-201_0	IEC61010-2-201:2017 2nd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment		EN IEC 61010-2-201:2018
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment	pending	UL61010-2-201:2018 2nd Edition CAN/CSA-C22.2 No. 61010-2-201:2018-02-01
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-4/6-2	Condition		Standard / Criterion
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area			IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8 kV; Contact: ±6 kV		IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-1000 MHz)		IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC-Power Port: ±4 kV DC-Output Port: ±2 kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	AC-Power Port:	L1-L2, L1-L3, L2-L3: ±2.5 kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
		L1-PE,L2-PE,L3-PE: ±6 kV	
	DC-Output Port:	Vout(+) - Vout(-), DC-OK(13-14): ±1 kV	
		Vout(+)-PE, Vout(-)-PE: ±2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vrms (0.15 - 80 MHz)		IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30 A/m, 50/60 Hz		EN61000-4-8:2010, Criteria A
Voltage Dips	400 VAC, 50 Hz	100 %, 5 cycles; 70 %, 10 cycles; 40 %, 25 cycles; 30 %, 25 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Voltage Interruptions	400 VAC, 50 Hz	100 %, 250 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Limits of Harmonic Current Emissions			EN IEC 61000-3-2:2019
Limits of Voltage Fluctuations & Flicker			EN61000-3-3:2013+A1:2017

Dimensions & Physical Characteristics		
Material	chassis	polycarbonate/aluminum
Dimensions (HxWxD)		135.0 x 80.0 x 155.7 mm 5.3 x 3.15 x 6.1 inch
Weight		1140 g 2.51 lbs

Dimension Drawing (mm)



Input & Output Cage Clamp [9]

Function	AWG	mm²
L1, L2, L3	24-8	0.25-6
PE ⏚	24-8	0.25-6
Wire stripping length: 12-13mm		
+1, +2 (Vout)	18-4	0.75-25mm²
-1, -2 (Vout)	18-4	0.75-25mm²
Wire stripping length: 18-20mm		

Push-In Signal Terminal [10]

Function	AWG	mm²
Signal (13,14)	24-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect signaling contact to hazardous voltages

[9] Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 90°C.

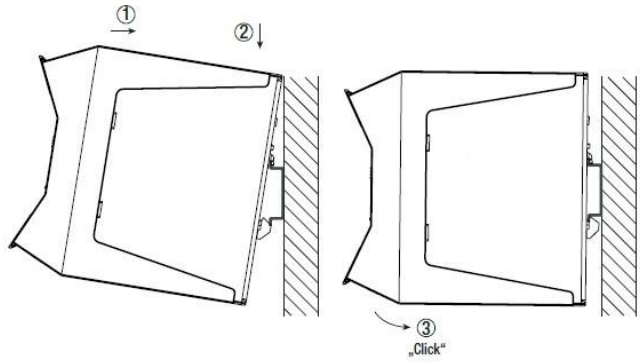
[10] Ferrules are required for flexible cable.

Tolerance: ±0.5mm

Installation & Application

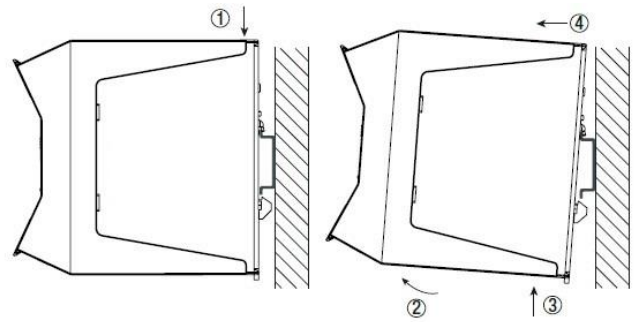
Mounting Instruction
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



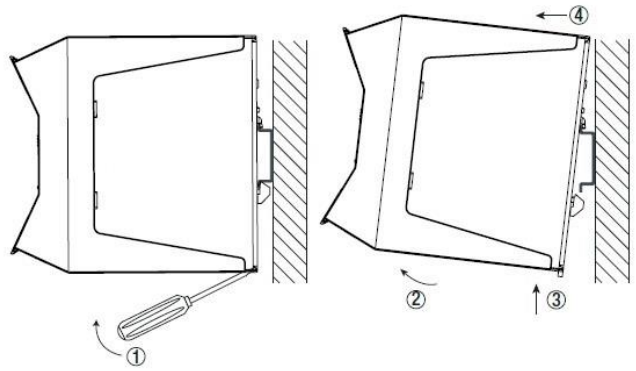
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Release Option 2 (by using a screwdriver)

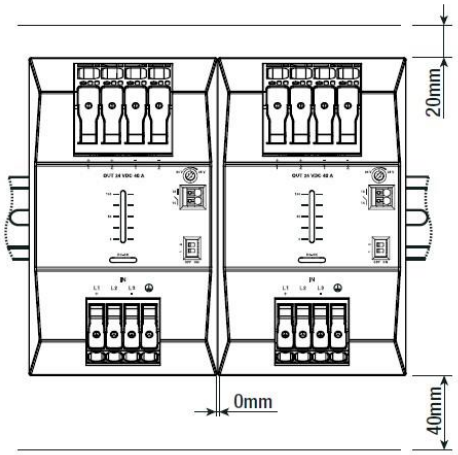


1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Installation & Application

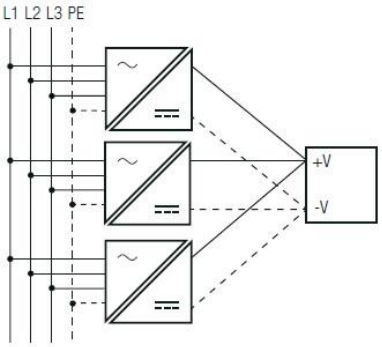
Installation Instructions

To guarantee sufficient convection cooling, keep a distance of 20 mm above and 40 mm below the device. For vertical mounting the device should be installed with the input terminal on the bottom. No space between supplies is required.



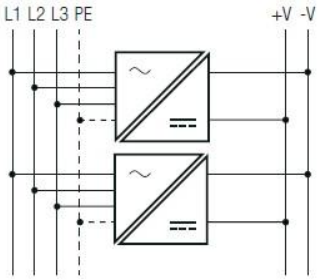
Parallel operation

1. Make sure that the DIP-Switch 1 is “ON” to get into the Parallel Load sharing mode.
2. Adjust each power supply to the exact same output voltage with same load and cooling conditions.
3. Use the same wire length and cable cross-section for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
4. Do not use power supplies in parallel in mounting orientations other than the standard mounting orientation (input terminals on the bottom of the unit) or in any other condition where a derating of the output current is required (e.g. above 60°C, …).
5. Pay attention that leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

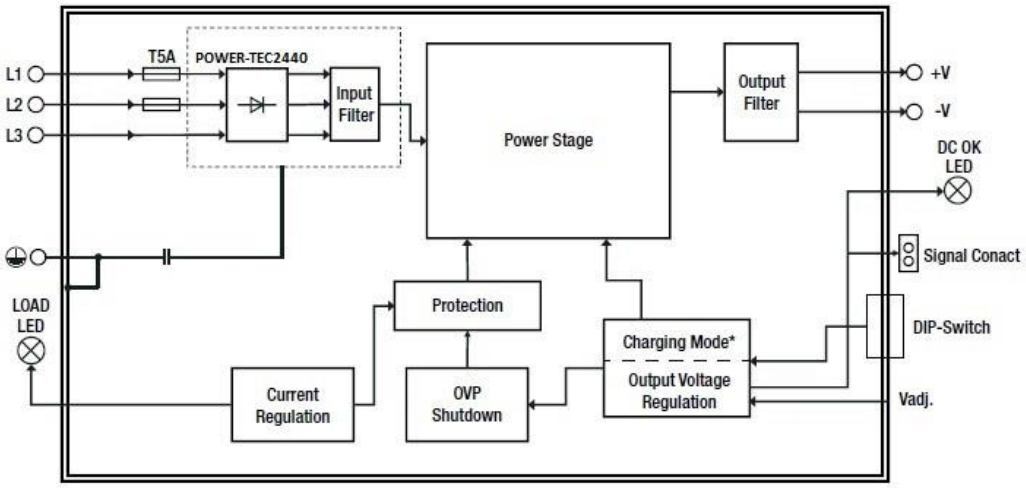


Phase redundancy

If one phase fails, operation is still guaranteed. (2-phase operation)



Block Diagram



Packaging Information		
Packaging Dimension (LxWxH)	cardboard box	180 x 175 x 96 mm
Packaging Quantity		1 pc
Storage Temperature Range		-40 °C to +85 °C
Storage Humidity	non-condensing	85 % RH max.

WÖHRLE®
Stromversorgungssysteme

Technical Information

Product name
POWER-TEC 4810

Description	POWER-TEC 4810
	The slim POWER-TEC 4810 is a reliable, three phase AC input DIN rail mount power supply with 48 V output in extremely compact dimensions of 135 x 155.7 mm with a width of only 52 mm. It is specially designed for demanding applications in the harsh industrial automation field with an extended mains input surge immunity of up to 6 kVAC and return voltage immunity >35 V at the output making it suitable for safe operation against back feeding loads like decelerating motors and inductors. The power supply will deliver up to 480 W over the full -40°C to +60°C ambient temperature range with only convection cooling. A Thermal Power Bonus of up to 576 W at 45 °C plus a power boost of up to 150 % for 5 s makes them suitable for powering highly inductive or capacitive loads. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL 62368-1, IEC/EN/UL 61010- 1 and IEC/EN/UL/CSA 61010-2-201. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

Characteristics	
	Slim Design (52 mm) with 25° Push-In connectors
	Fast tool-less mounting and demounting
	PFC >0.9 and Active Inrush Current Limitation
	DC Input Range 430 V to 815 V / 850 V 10 s
	Highest Efficiency up to 95.3 %
	Full Power -40 °C / +60 °C, Boost Power 150 % / 5 s
	Thermal Power Bonus 120 % / 45 °C
	Battery Charging & Parallel Operation
	Highest Lifetime Expectancy 80,000 h / 40 °C
	DC-OK Signal
	Reduced no load power consumption 1.9 W – 3 W
	Extended surge immunity 2.5 kV / 6 kV
	3-year warranty

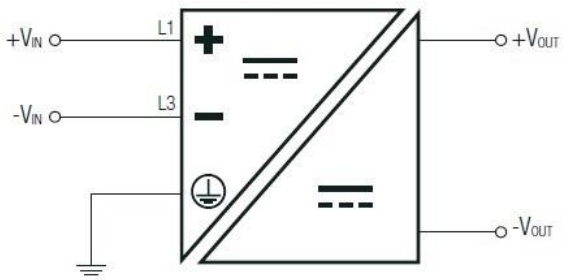
Technical Data	
Input voltage range	3 x 320-575 VAC
Output voltage nom.	48 VDC
Adjustable output voltage	48-56 VDC
Output current nom.	10 A
Efficiency[1] typ.	94 %
Rated output power[2]	480 W

(1) Efficiency is tested at nominal input (400/480 VAC) and full load at +25 °C ambient.
(2) Thermal Power Bonus 120 % (T_{AMB}= 45 °C max.), and Boost Power 150 % / 5 sec max.; refer to "Boost Power".

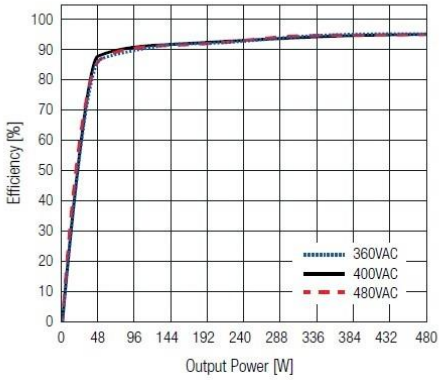
Input & Output					
	Condition		Min.	Typ.	Max.
Nominal Input Voltage	50/60 Hz		400 VAC		480 VAC
Operating Range[3]	3 phase operation[4]		320 VAC		575 VAC
	2 phase operation, max. P_{OUT}= 340 W		350 VAC		480 VAC
	DC input	continuous	450 VDC		815 VDC
	refer to "Connections for DC-operation"	10 s max.			850 VDC
Turn-on Voltage	prevents switching on during 1 AC operation		310 VAC		
	DC operation		440 VDC		
Turn-off Voltage	AC operation		280 VAC		
	DC operation		395 VDC		
Input Current	AC operation	400 VAC			3 x 0.8 A
		500 VAC			3 x 0.7 A
	DC operation	500 VDC			1.0 A
Inrush Current	3 AC 400 VAC, cold start				10 A
	3 AC 500 VAC, cold start				15 A
No Load Power Consumption	3 AC 400 VAC				2.4 W
	3 AC 500 VAC				3 W
Input Frequency Range			47 Hz		63 Hz
Nominal Output Voltage (factory set)				48 VDC	
Minimum Load			0 %		
Power Factor	full load		0.9		
Start-up time	2 & 3 phase operation, 400 VAC			98 ms	112 ms
Rise time				3.5 ms	7 ms
Hold-up time	400 VAC			15 ms	
	500 VAC			29 ms	
Internal Operating Frequency				83 kHz	
Ripple and Noise	20 MHz bandwidth				85 mVp-p

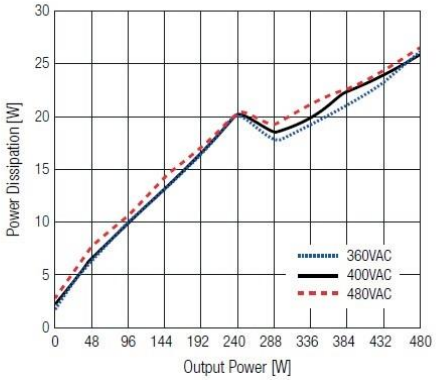
(3) The products were submitted for safety files at AC and DC-Input operation. (350 V – 575 VAC and 450 – 600 VDC) If input voltage is >500 VDC consider an external fuse according to applicable standards. 2phase operation is not included in the safety approvals. Additional tests might be necessary when the complete application has to be approved according to UL 62368-1, 61010-1 and UL 61010-2-201.
(4) Output power derating for Line-input of less than 3 AC 350 VAC (derate linearly from 100 % at 350 VAC to 90 % at 3 AC 320 VAC)

Connections for DC-operation



Efficiency vs. Load	Power Dissipation vs. Load

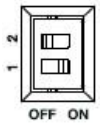
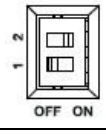
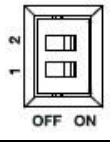




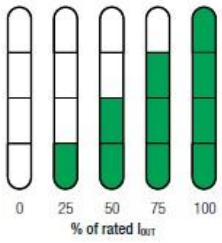
Additional Features		
Output Voltage Adjustability(5)	on-board potentiometer	48-56 VDC
Parallel Load Share Mode		refer to „DIP-SWITCH SETTINGS“
Battery Charging Mode	DIP-Switch 2 “ON” Battery charging is limited to T_{AMB} max. 60 °C, to maintain reliability	130 % continuous
		150 % for 7.5 s
		250 % for 20 ms
Load Indication LED	LED green, refer to “Load Indication LED“	normal mode
	LED off	abnormal mode, no operation or failure
DC-OK LED	LED green	output voltage ok, normal mode
	LED off	abnormal mode, no operation or failure
Signal Contact	closed	normal mode
	open	abnormal mode, no operation or failure
Signal Contact Rating	do not connect signaling contact to hazardous voltages	60 VDC / 0.1 A

(5) When input voltage is below 350 VAC, the output voltage is limited to 48 VDC. Make sure that the maximum rated output power will not be exceeded when trimming up.

DIP-SWITCH SETTINGS

	DIP1	DIP2	
Single Mode (Factory set) Power Boost Mode available	OFF	OFF	
Parallel Load Share Mode Angled output characteristic for load sharing. Voltage drop from 0 to nom. I_{OUT}: 1.2 V	ON	OFF	
Charging Mode Current Limitation strictly at nominal current. Use for Battery charging	OFF	ON	
Not allowed!	ON	ON	

LOAD INDICATION LED
4 LEDs displaying actual and target current of rated output current.



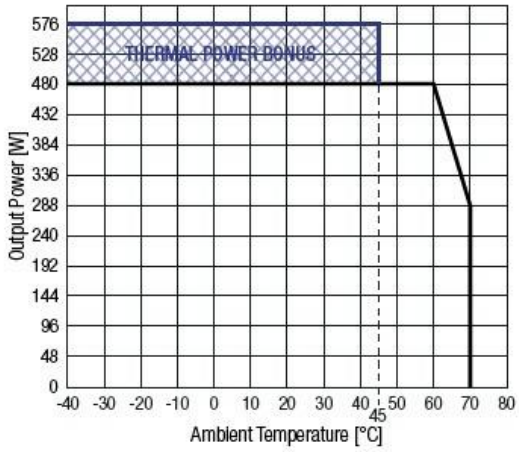
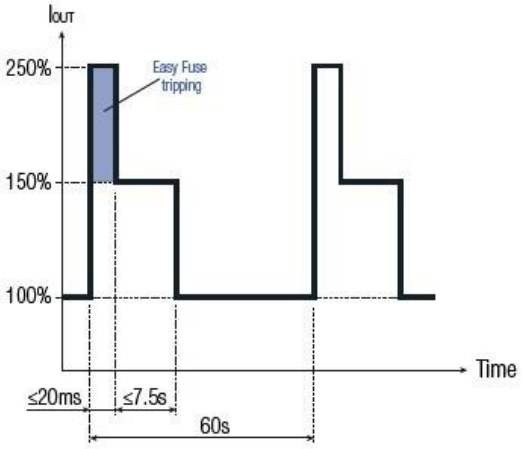
Regulations		
Output Accuracy		±1.0 % max.
Line Regulation	low line to high line, full load	±0.1 % typ.
Load Regulation	0 % to 100 % load	±0.3 % typ.
Max. Capacitive Load (start-up)		20 mF
Transient Response	10-100 % load	±3.0 % typ.
	recovery time	100 ms typ.

Protections			
Internal Input Fuse	DC compliant		2 x T 5 A, slow-blow
Easy Fuse Tripping			250 % / 20 ms
External Input Protection			16 A C-characteristic circuit breaker
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)	SELV output		59.8 VDC, latch off
Return Voltage Immunity			63 VDC max.
Over Voltage Category (OVC)			OVC II
Over Current Protection (OCP)	< 5 sec		>150 % of rated load current, hiccup mode, auto recovery
	< 20 ms(6)		>250 % of rated load current, hiccup mode, auto recovery
Class of Equipment			Class I with PE connection
Isolation Voltage (safety certified)(7)	tested for 1 minute	I/P to O/P	3.5 kVAC / 5 kVDC
		I/P to PE	1.6 kVAC / 2.5 kVDC
		O/P to PE	500 VAC / 700 VDC
Isolation Resistance	I/P to O/P		4.5 MΩ min.
Insulation Grade			reinforced
Earth Leakage Current	500 VAC / 60 Hz		3.5 mA max.

(6) V_{OUT} = 19 VDC min.
(7) For repeat Hi-Pot testing, reduce the time and/or the test voltage

Environment			
Operating Ambient Temperature Range	@ natural convection (0.1 m/s)	with derating	-40 °C to +70 °C
		without derating	refer to “Derating Graph“
Operating Altitude(8)			5000 m
Operating Humidity	non-condensing		95 % RH max.
Pollution Degree			PD2
IP Rating			IP20
Shock	according to IEC 60068-2-27 Fa	non-operating	15 G / 11 ms, 3 times (positive/negative) in all axis
Vibration	according to IEC 60068-2-6 Fc	non-operating	5 - 8.4 Hz @ 3.5 mm deflection 8.4 -150 Hz @ 2 G, 10 cycles/axis (min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		705 x 10^3 hours
Design Lifetime	T_{AMB}= 40 °C @ 100 % Load		80 x 10^3 hours

(8) Recognized by safety agency for safe operation up to 5000 m. High altitude operation may impact the performance and lifetime

Derating Graph (@ Chamber and natural convection 0.1 m/s)	**Boost Power** (400 V – 480 VAC or 500 VDC; -40 °C to +60 °C max.)
	

Safety & Certifications		
Certificate Type (Safety)	**Report Number**	**Standard**
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Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment	pending	UL61010-2-201:2018 2nd Edition CAN/CSA-C22.2 No. 61010-2-201:2018-02-01
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-4/6-2	Condition		Standard / Criterion
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area			IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8 kV; Contact: ±6 kV		IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-1000 MHz)		IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC-Power Port: ±4 kV DC-Output Port: ±2 kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	AC-Power Port:	L1-L2, L1-L3, L2-L3: ±2.5 kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
		L1-PE,L2-PE,L3-PE: ±6 kV	
	DC-Output Port:	Vout(+) - Vout(-), DC-OK(13-14): ±1 kV	
		Vout(+)-PE, Vout(-)-PE: ±2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vrms (0.15 - 80 MHz)		IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30 A/m, 50/60 Hz		EN61000-4-8:2010, Criteria A
Voltage Dips	400 VAC, 50 Hz	100 %, 5 cycles; 70 %, 10 cycles; 40 %, 25 cycles; 30 %, 25 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
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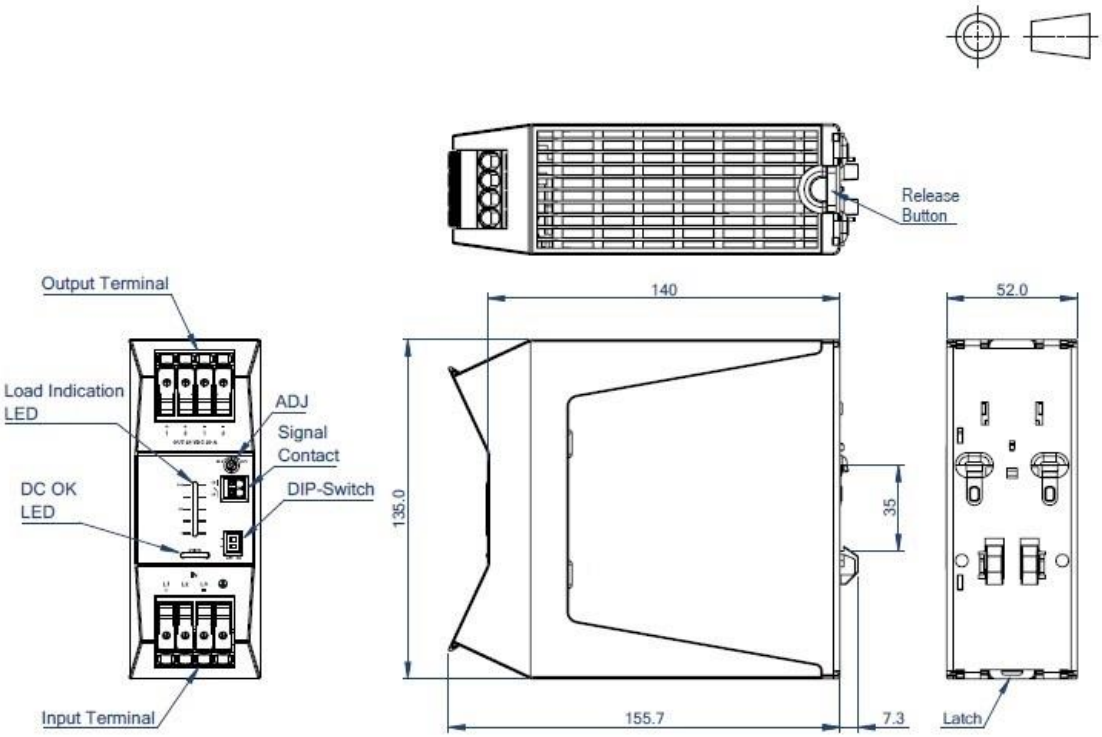
Limits of Harmonic Current Emissions			EN IEC 61000-3-2:2019
Limits of Voltage Fluctuations & Flicker			EN61000-3-3:2013+A1:2017

Dimensions & Physical Characteristics		
Material	chassis	polycarbonate (UL94 V-0) / aluminum
Dimensions (HxWxD)		135.0 x 52.0 x 155.7 mm 5.3 x 2.0 x 6.1 inch
Weight		768 g 1.69 lbs

Dimension Drawing (mm)



Input & Output Cage Clamp [9]

Function	AWG	mm²
L1, L2, L3	24-8	0.25-6
PE ⏚	24-8	0.25-6
+1, +2 (Vout)	24-8	0.25-6
-1, -2 (Vout)	24-8	0.25-6
Wire stripping length: 12-13mm		

Push-In Signal Terminal [10]

Function	AWG	mm²
Signal (13,14)	24-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect signaling contact to hazardous voltages

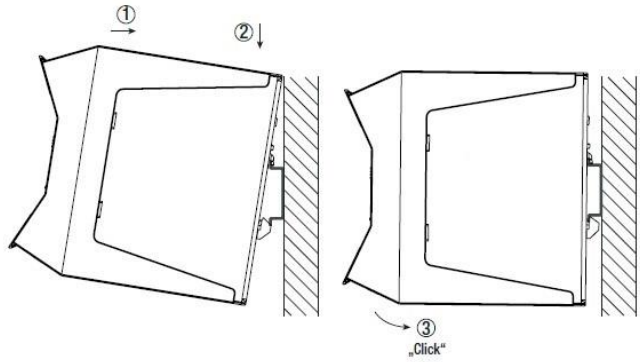
(9) Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 90°C.
(10) Ferrules are required for flexible cable.

Tolerance: ±0.5 mm

Installation & Application

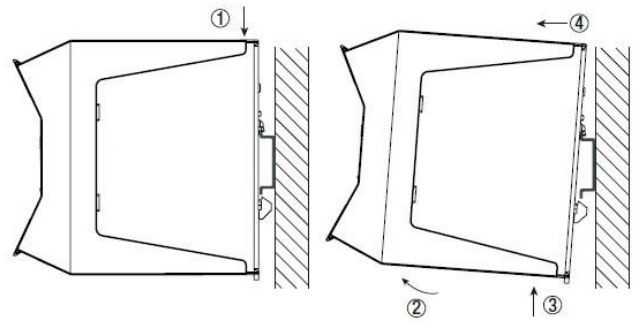
Mounting Instruction
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



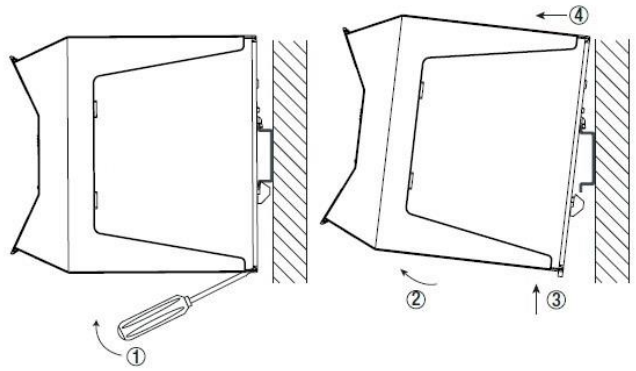
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

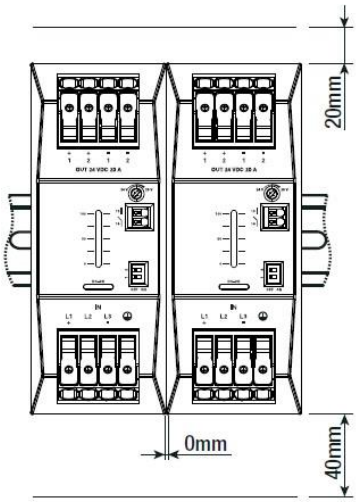
Release Option 2 (by using a screwdriver)



1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Installation & Application

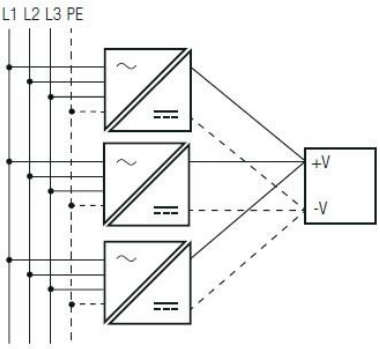
Installation Instructions



To guarantee sufficient convection cooling, keep a distance of 20 mm above and 40 mm below the device. For vertical mounting the device should be installed with the input terminal on the bottom. No space between supplies is required.

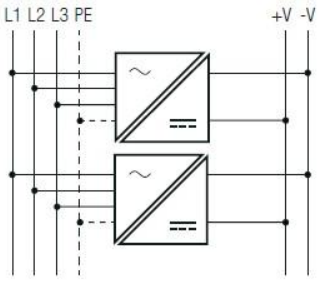
Parallel operation

1. Make sure that the DIP-Switch 1 is “ON” to get into the Parallel Load sharing mode.
2. Adjust each power supply to the exact same output voltage with same load and cooling conditions.
3. Use the same wire length and cable cross-section for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
4. Do not use power supplies in parallel in mounting orientations other than the standard mounting orientation (input terminals on the bottom of the unit) or in any other condition where a derating of the output current is required (e.g. above 60°C, …).
5. Pay attention that leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

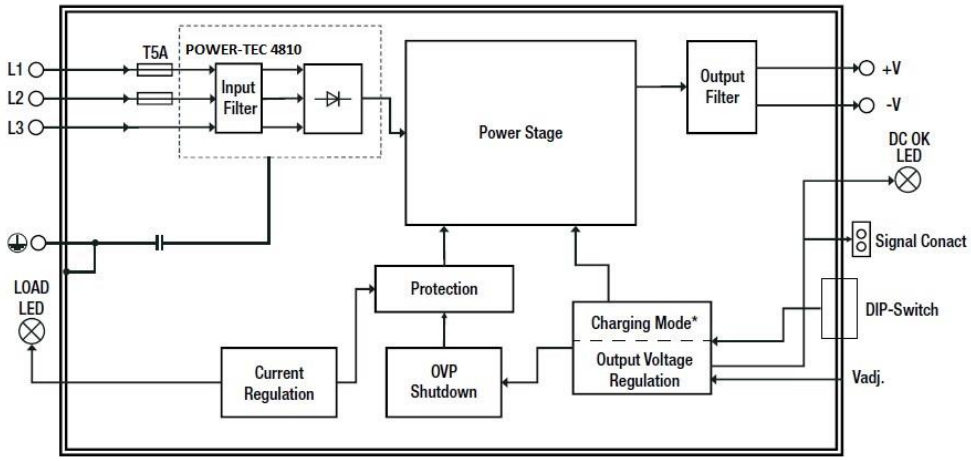


Phase redundancy

If one phase fails, operation is still guaranteed. (2-phase operation)



Block Diagram



Packaging Information		
Packaging Dimension (LxWxH)	cardboard box	180 x 175 x 70 mm
Packaging Quantity		1 pc
Storage Temperature Range		-40 °C to +85 °C
Storage Humidity	non-condensing	85 % RH max.

WÖHRLE®
Stromversorgungssysteme

Technical Information

Product name
POWER-TEC 4820

Description	POWER-TEC 4820
	The slim POWER-TEC 4820 is a reliable, three phase AC input DIN rail mount power supply with 48 V output in extremely compact dimensions of 135 x 155.7 mm with a width of only 80 mm. It is specially designed for demanding applications in the harsh industrial automation field with an extended mains input surge immunity of up to 6 kVAC and return voltage immunity >35 V at the output making it suitable for safe operation against back feeding loads like decelerating motors and inductors. These units will deliver up to 960 W over the full -40 °C to +60 °C ambient temperature range with only convection cooling. A Thermal Power Bonus of up to 1152 W at 45 °C plus a power boost of up to 150 % for 5 s makes them suitable for powering highly inductive or capacitive loads. The unique and innovative modern design with 25° push-in connectors allows easy tool-less installation or replacement. The product is certified according to the global safety standards IEC/EN/UL 62368-1, IEC/EN/UL 61010- 1 and IEC/EN/UL/CSA 61010-2-201. Electromagnetic radiated and conducted emissions are compliant to heavy industrial EN 61000-6-4 Class B emission standard and EN 61000-6-2 immunity standard.

Characteristics	
	Slim Design (80 mm) with 25° Push-In connectors
	Fast tool-less mounting and demounting
	PFC >0.9 and Active Inrush Current Limitation
	DC Input Range 430 V to 815 V / 850 V 10 s
	Highest Efficiency up to 96.9 %
	Full Power -40 °C / +60 °C, Boost Power 150 % / 5 s
	Thermal Power Bonus 120 % / 45 °C
	Battery Charging & Parallel Operation
	Highest Lifetime Expectancy 80,000 h / 40 °C
	DC-OK Signal
	Reduced no load power consumption 1.8 W – 3.3 W
	Extended surge immunity 2.5 kV / 6 kV
	3-year warranty

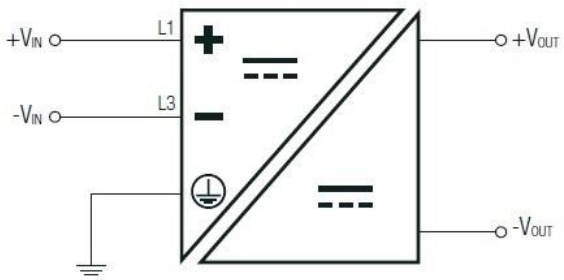
Technical Data	
Input voltage range	3 x 320-575 VAC
Output voltage nom.	48 VDC
Adjustable output voltage	48-56 VDC
Output current nom.	20 A
Efficiency(1) typ.	96 %
Rated output power(2)	960 W

(1) Efficiency is tested at nominal input (400/480 VAC) and full load at +25 °C ambient.
(2) Thermal Power Bonus 120 % (T_{AMB}= 45 °C max.), and Boost Power 150 % / 5 sec max.; refer to "Boost Power".

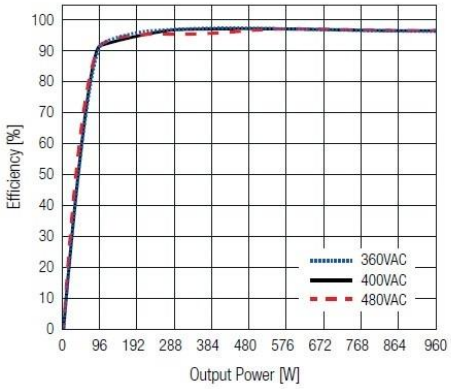
Input & Output					
	Condition			Min.	Typ.	Max.
Nominal Input Voltage	50/60 Hz			400 VAC		480 VAC
Operating Range(3)	3 phase operation(4)			320 VAC		575 VAC
	2 phase operation, max. P_{OUT}= 600 W			350 VAC		480 VAC
	DC input refer to "Connections for DC-operation"		continuous	450 VDC		815 VDC
			10 s max.			850 VDC
Turn-on Voltage	prevents switching on during 1 AC operation			300 VAC		
	DC operation			424 VDC		
Turn-off Voltage	AC operation			290 VAC		
	DC operation			410 VDC		
Input Current	AC operation	400 VAC				3 x 1.6 A
		500 VAC				3 x 1.4 A
	DC operation	500 VDC				2.1 A
Inrush Current	3 AC 400 VAC, cold start					5 A
	3 AC 500 VAC, cold start					5 A
No Load Power Consumption	3 AC 400 VAC					2.5 W
	3 AC 500 VAC					3.3 W
Input Frequency Range				47 Hz		63 Hz
Nominal Output Voltage (factory set)					48 VDC	
Minimum Load				0 %		
Power Factor	full load			0.9		
Start-up time	2 & 3 phase operation, 400 VAC				695 ms	810 ms
Rise time					5 ms	10 ms
Hold-up time	400 VAC				15 ms	
	500 VAC				29 ms	
Internal Operating Frequency					83 kHz	
Ripple and Noise	20 MHz bandwidth					85 mVp-p

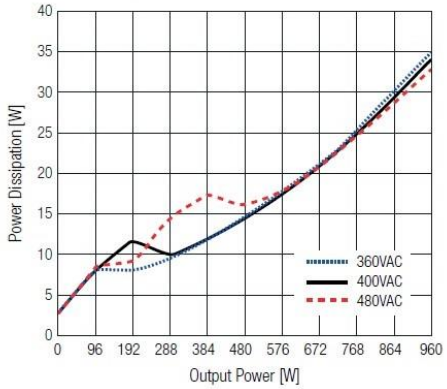
(3) The products were submitted for safety files at AC and DC-Input operation. (350 V – 575 VAC and 450 – 600 VDC) If input voltage is >500 VDC consider an external fuse according to applicable standards. 2phase operation is not included in the safety approvals. Additional tests might be necessary when the complete application has to be approved according to UL 62368-1, 61010-1 and UL 61010-2-201.
(4) Output power derating for Line-input of less than 3 AC 350 VAC (derate linearly from 100 % at 350 VAC to 90 % at 3 AC 320 VAC)

Connections for DC-operation



Efficiency vs. Load	Power Dissipation vs. Load

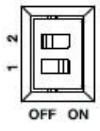
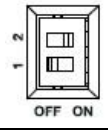




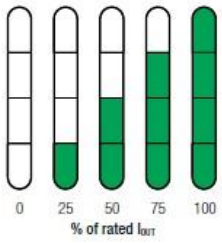
Additional Features		
Output Voltage Adjustability[5]	on-board potentiometer	48-56 VDC
Parallel Load Share Mode		refer to „DIP-SWITCH SETTINGS“
Battery Charging Mode	DIP-Switch 2 “ON” Battery charging is limited to T_{AMB} max. 60 °C, to maintain reliability	130 % continuous
		150 % for 6 s
		250 % for 20 ms
Load Indication LED	LED green, refer to “Load Indication LED“	normal mode
	LED off	abnormal mode, no operation or failure
DC-OK LED	LED green	output voltage ok, normal mode
	LED off	abnormal mode, no operation or failure
Signal Contact	closed	normal mode
	open	abnormal mode, no operation or failure
Signal Contact Rating	do not connect signaling contact to hazardous voltages	60 VDC / 0.1 A

(5) When input voltage is below 350 VAC, the output voltage is limited to 48 VDC. Make sure that the maximum rated output power will not be exceeded when trimming up.

DIP-SWITCH SETTINGS

	DIP1	DIP2	
Single Mode (Factory set) Power Boost Mode available	OFF	OFF	
Parallel Load Share Mode Angled output characteristic for load sharing. Voltage drop from 0 to nom. I_{OUT}: 1.2 V	ON	OFF	
Charging Mode Current Limitation strictly at nominal current. Use for Battery charging	OFF	ON	
Not allowed!	ON	ON	

LOAD INDICATION LED
4 LEDs displaying actual and target current of rated output current.



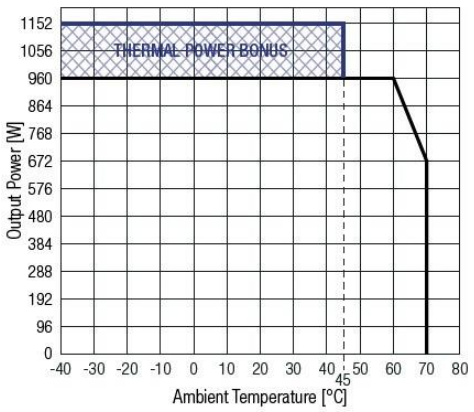
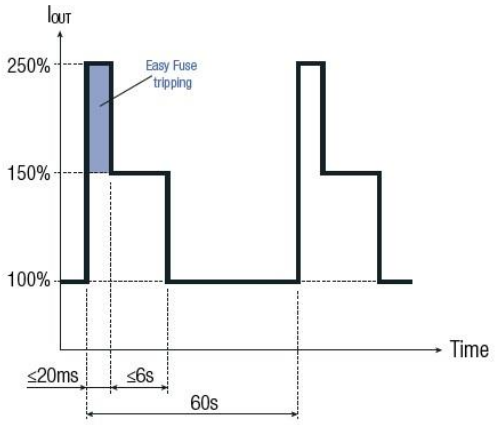
Regulations		
Output Accuracy		±1.0 % max.
Line Regulation	low line to high line, full load	±0.1 % typ.
Load Regulation	0 % to 100 % load	±0.3 % typ.
Max. Capacitive Load (start-up)		20 mF
Transient Response	10-100 % load	±3.0 % typ.
	recovery time	100 ms typ.

Protections			
Internal Input Fuse	DC compliant		2 x T 5 A, slow-blow
Easy Fuse Tripping			250 % / 20 ms
External Input Protection			16 A C-characteristic circuit breaker
Short Circuit Protection (SCP)			hiccup mode, auto recovery
Over Voltage Protection (OVP)	SELV output		59.8 VDC, latch off
Return Voltage Immunity			63 VDC max.
Over Voltage Category (OVC)			OVC II
Over Current Protection (OCP)	< 5 sec		>150 % of rated load current, hiccup mode, auto recovery
	< 20 ms(6)		>250 % of rated load current, hiccup mode, auto recovery
Class of Equipment			Class I with PE connection
Isolation Voltage (safety certified)(7)	tested for 1 minute	I/P to O/P	3.5 kVAC / 5 kVDC
		I/P to PE	1.6 kVAC / 2.5 kVDC
		O/P to PE	500 VAC / 700 VDC
Isolation Resistance	I/P to O/P		4.5 MΩ min.
Insulation Grade			reinforced
Earth Leakage Current	500 VAC / 60 Hz		3.5 mA max.

(6) V_{OUT} = 19 VDC min.
(7) For repeat Hi-Pot testing, reduce the time and/or the test voltage

Environment			
Operating Ambient Temperature Range	@ natural convection (0.1 m/s)	with derating	-40 °C to +70 °C
		without derating	refer to “Derating Graph“
Operating Altitude(8)			5000 m
Operating Humidity	non-condensing		95 % RH max.
Pollution Degree			PD2
IP Rating			IP20
Shock	according to IEC 60068-2-27 Fa	non-operating	15 G / 11 ms, 3 times (positive/negative) in all axis
Vibration	according to IEC 60068-2-6 Fc	non-operating	5 - 8.4 Hz @ 3.5 mm deflection 8.4 -150 Hz @ 2 G, 10 cycles/axis (min-max-min); 1 octave/min
MTBF	according to EN/IEC 61709 (SN29500)		680 x 10^3 hours
Design Lifetime	T_{AMB}= 40 °C @ 100 % Load		80 x 10^3 hours

(8) Recognized by safety agency for safe operation up to 5000 m. High altitude operation may impact the performance and lifetime

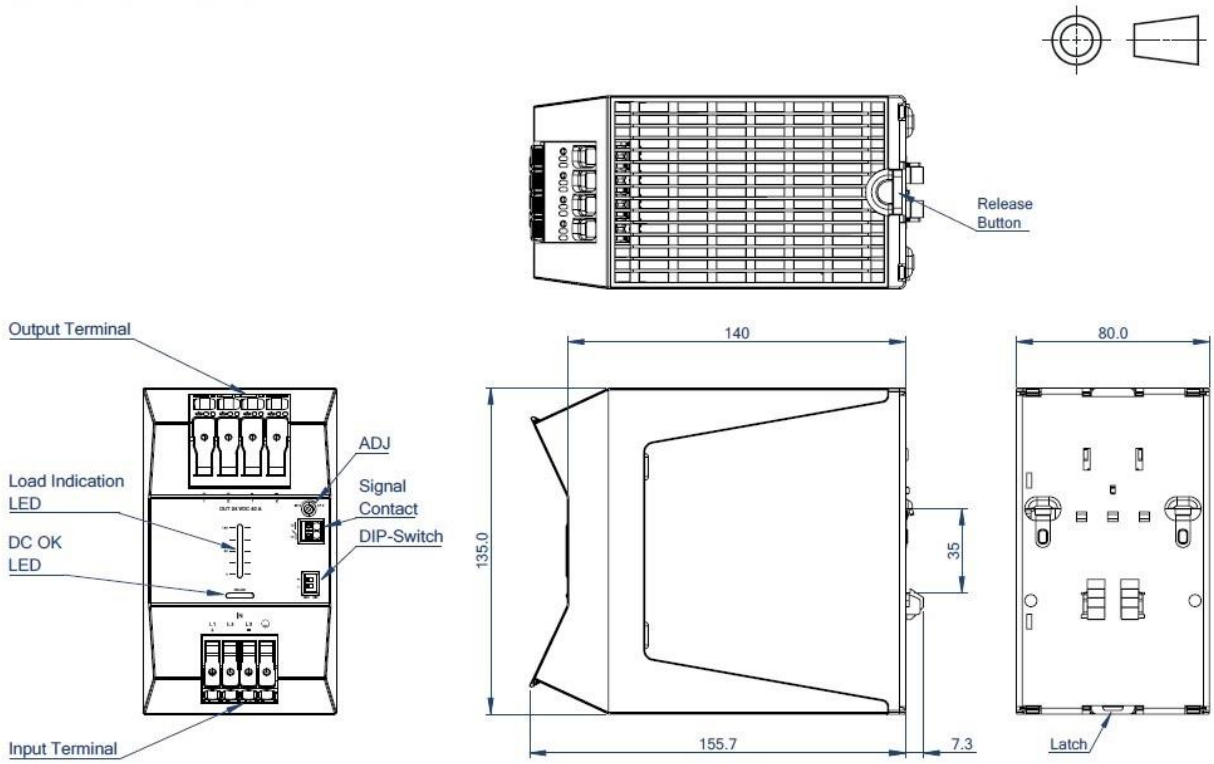
Derating Graph (@ Chamber and natural convection 0.1 m/s)	Boost Power (400 V – 480 VAC or 500 VDC; -40 °C to +60 °C max.)
	

Safety & Certifications		
Certificate Type (Safety)	**Report Number**	**Standard**
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB)	24TH0201_62368-1_0	IEC62368-1:2018 3rd Edition
Audio/Video, information and communication technology equipment - Part 1: Safety requirements		EN IEC 62368-1:2020+A11:2020
Audio/Video, information and communication technology equipment - Part 1: Safety requirements	pending	UL62368-1:2019 3rd Edition CAN/CSA-C22.2 No. 62368-1-19 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements (CB)	4TH0201_61010-1_0	IEC61010-1:2010+A1:2016 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements		EN61010-1:2010+A1:2019
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 1: General Requirements	pending	UL61010-1:2012 3rd Edition CAN/CSA-C22.2 No. 61010-1-12 3rd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment (CB)	24TH0201_61010-2-201_0	IEC61010-2-201:2017 2nd Edition
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment		EN IEC 61010-2-201:2018
Electrical Equipment For Measurement, Control, and Laboratory Use; Part 2-201: Particular requirements for control equipment	pending	UL61010-2-201:2018 2nd Edition CAN/CSA-C22.2 No. 61010-2-201:2018-02-01
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance according to IEC/EN61000-6-4/6-2	Condition		Standard / Criterion
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments			IEC/EN61000-6-2:2019
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential area			IEC/EN 61000-6-3:2021
ESD Electrostatic discharge immunity test	Air: ±8 kV; Contact: ±6 kV		IEC61000-4-2:2008, Criteria A EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	10 V/m (80-1000 MHz)		IEC/EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC-Power Port: ±4 kV DC-Output Port: ±2 kV		IEC/EN61000-4-4:2012, Criteria A
Surge Immunity	AC-Power Port:	L1-L2, L1-L3, L2-L3: ±2.5 kV	IEC/EN61000-4-5:2014+A1:2017, Criteria A
		L1-PE,L2-PE,L3-PE: ±6 kV	
	DC-Output Port:	Vout(+) - Vout(-), DC-OK(13-14): ±1 kV	
		Vout(+)-PE, Vout(-)-PE: ±2 kV	
Immunity to conducted disturbances, induced by radio-frequency fields	10 Vrms (0.15 - 80 MHz)		IEC61000-4-6:2013, Criteria A EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	30 A/m, 50/60 Hz		EN61000-4-8:2010, Criteria A
Voltage Dips	400 VAC, 50 Hz	100 %, 5 cycles; 70 %, 10 cycles; 40 %, 25 cycles; 30 %, 25 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Voltage Interruptions	400 VAC, 50 Hz	100 %, 250 cycles	IEC61000-4-11:2004+A1:2017, Criteria B
Limits of Harmonic Current Emissions			EN IEC 61000-3-2:2019
Limits of Voltage Fluctuations & Flicker			EN61000-3-3:2013+A1:2017

Dimensions & Physical Characteristics		
Material	chassis	polycarbonate/aluminum
Dimensions (HxWxD)		135.0 x 80.0 x 155.7 mm 5.3 x 3.15 x 6.1 inch
Weight		1140 g 2.51 lbs

Dimension Drawing (mm)



Input & Output Cage Clamp [9]

Function	AWG	mm²
L1, L2, L3	24-8	0.25-6
PE ⏚	24-8	0.25-6
Wire stripping length: 12-13mm		
+1, +2 (Vout)	18-4	0.75-25mm²
-1, -2 (Vout)	18-4	0.75-25mm²
Wire stripping length: 18-20mm		

Push-In Signal Terminal [10]

Function	AWG	mm²
Signal (13,14)	24-16	0.25-1.5
Wire stripping length: 8-9mm		

Do not connect signaling contact to hazardous voltages

[9] Use flexible (stranded wire) or solid cables with above wire cross-section is recommended.
Use copper conductors designed for an operating temperature of at least 90°C.

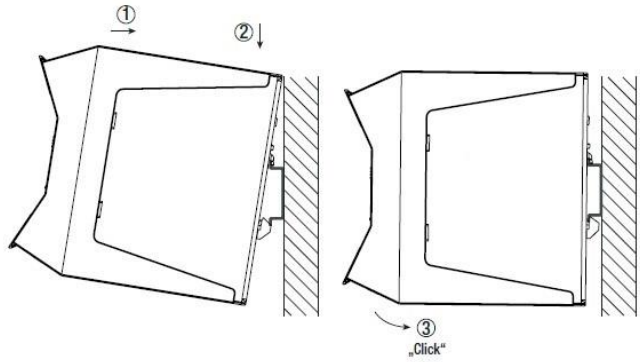
[10] Ferrules are required for flexible cable.

Tolerance: ±0.5mm

Installation & Application

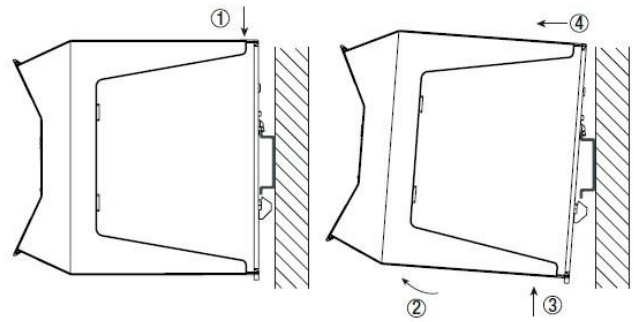
Mounting Instruction
Mounting Rail: Standard TS35 DIN Rail in accordance with EN 60715.

Mounting



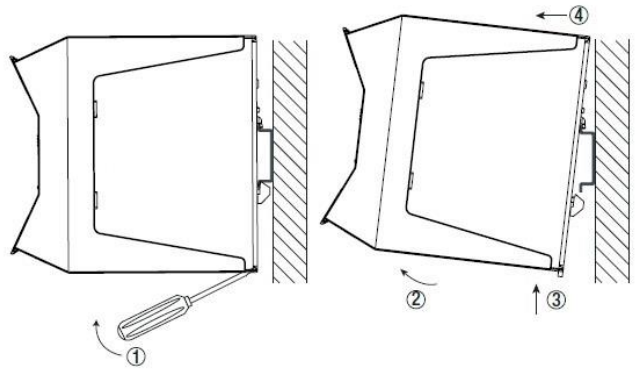
1. Place the device on the DIN rail with a slight upward tilt. Snap the device into the DIN rail.
2. Now tilt the device downwards until it reaches the lower part of the DIN rail.
3. Press the lower part of the device firmly against the rail until the device locks into position on the DIN rail.
4. To make sure it is securely locked in place, give the device a gentle shake.

Release Option 1 (tool-less)



1. Press the unlock button on the top of the device to release the latch from the rail.
2. While pushing the button, slightly tilt the device forward.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Release Option 2 (by using a screwdriver)

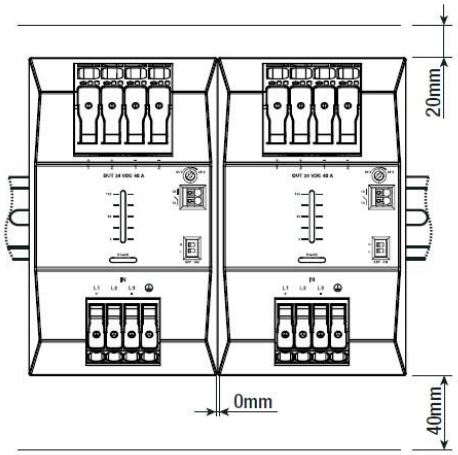


1. Pull the DIN rail latch by using a screwdriver OUT of the device and HOLD it.
2. Tilt the bottom of the device OUT.
3. Pull the device away from the DIN rail by pushing it up.
4. Remove the power supply completely from the rail.

Installation & Application

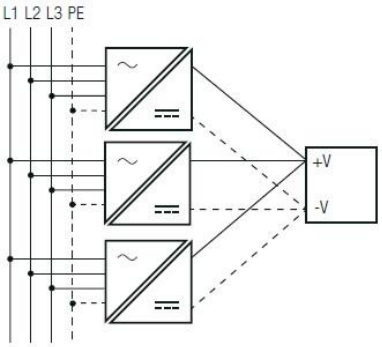
Installation Instructions

To guarantee sufficient convection cooling, keep a distance of 20 mm above and 40 mm below the device. For vertical mounting the device should be installed with the input terminal on the bottom. No space between supplies is required.



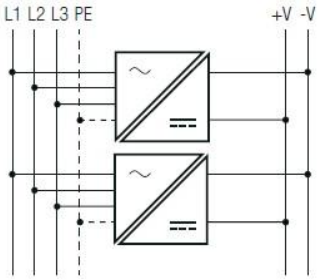
Parallel operation

1. Make sure that the DIP-Switch 1 is “ON” to get into the Parallel Load sharing mode.
2. Adjust each power supply to the exact same output voltage with same load and cooling conditions.
3. Use the same wire length and cable cross-section for each power supply (star connection) and energize all units at the same time to avoid triggering overload protection.
4. Do not use power supplies in parallel in mounting orientations other than the standard mounting orientation (input terminals on the bottom of the unit) or in any other condition where a derating of the output current is required (e.g. above 60°C, …).
5. Pay attention that leakage current, EMI, inrush current, harmonics will increase when using multiple power supplies.

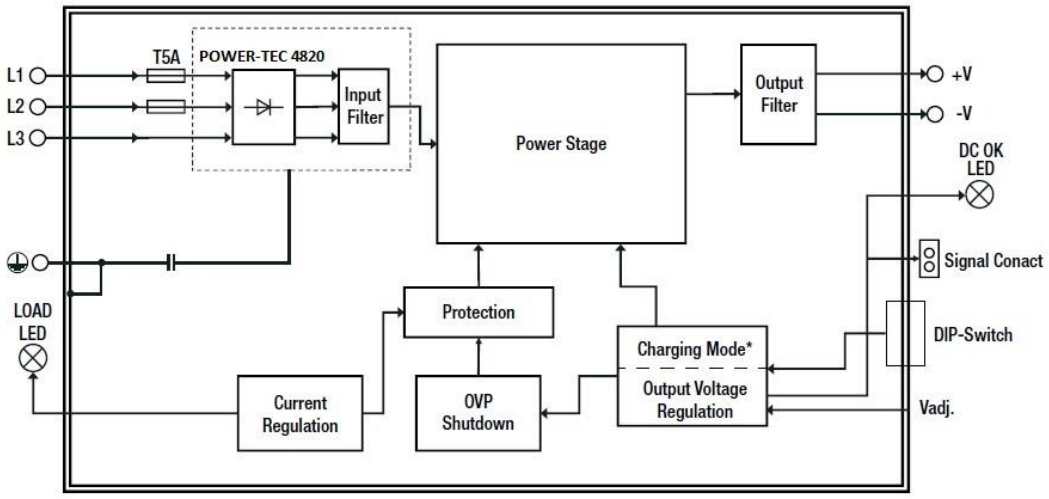


Phase redundancy

If one phase fails, operation is still guaranteed. (2-phase operation)



Block Diagram



Packaging Information		
Packaging Dimension (LxWxH)	cardboard box	180 x 175 x 96 mm
Packaging Quantity		1 pc
Storage Temperature Range		-40 °C to +85 °C
Storage Humidity	non-condensing	85 % RH max.