

Smooth pole-change unit WPU for pole changing motors

Installation and Operating Instructions

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SEW EURODRIVE

Smooth pole-change units WPU optimize the operational performance of pole-changing motors for applications where smooth changing from high to low speed is required.

The regenerative brake torque when switching from high to low speed can – depending on the design and frame size of the motor – for a short time reach three to nine times the rated torque of the low-speed winding.

The smooth pole-change unit WPU reduces this regenerative change-back torque to approx. one third of the above mentioned values.

When the change-back braking process is initiated, the integrated electronic circuit, using a wear-free switching element (Triac), opens one phase of the motor power supply.

The breakaway and rated torques of the motor are not effected by this at all.

Smooth pole-change units WPU 1001/1003 and 1010 are designed as modular units for top-hat rail mounting with screw terminals.

Units WPU 1001 and 1003 come without heatsink; WPU 1010 is provided with a heatsink, mounted on the side of the housing.

WPU 2030 is designed for switch cabinet installation. This unit has a heatsink integrated in the rear of the housing.

Characteristics:

- precise, automatic reconnection of the third phase after change-back – current-and speed-optimized in the synchronous point – completely load-independent
- no loss of energy, high efficiency
- wear-free
- full starting torque
- unlimited starting frequency
- minimal wiring requirements
- suitable for use with any pole-changing motor

The unit is to be installed by qualified electrical personnel only, in strict compliance with the applicable regulations for the prevention of accidents and the installation and operating instructions!



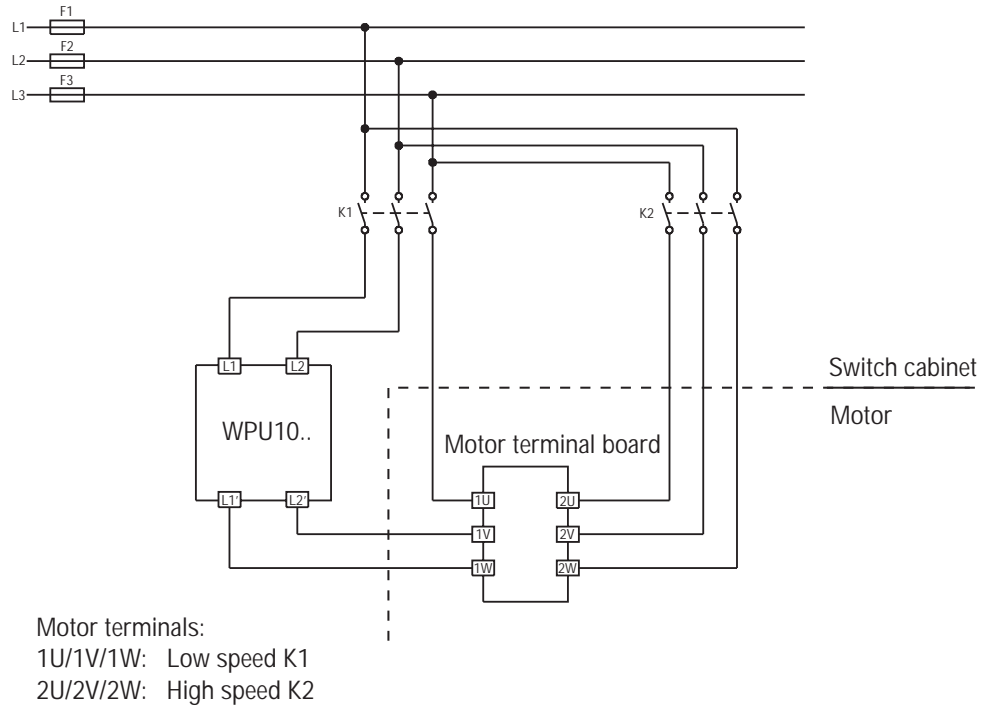
When installing the unit, please observe the following mechanical and electrical requirements:

- **Important:** Ensure that the unit is sufficiently cooled!

Type	Maximum permissible ambient temperature	Necessary cooling clearance	
		at the sides	top and bottom
WPU 1001	+ 45 °C	–	70 mm
WPU 1003		35 mm	
WPU 1010		–	
WPU 2030		–	100 mm

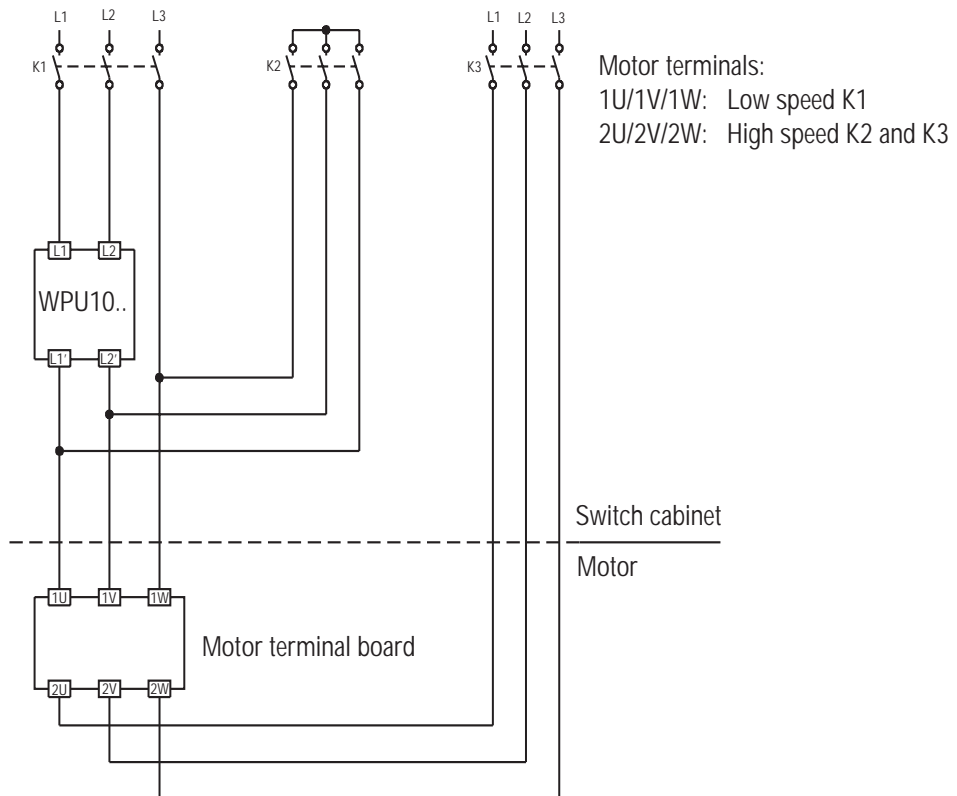
- Ensure protective earthing of WPU 1010 and WPU 2030.
- The lead cross-sections are to be dimensioned depending on the motor connected.
Maximum lead cross-section: WPU 1001/WPU 1003/WPU 1010: max. 2.5 mm²
WPU 2030: max. 16 mm²
- The fuses are to be chosen in accordance with the lead cross-section and the connected motor. As overload protection for the WPU, a motor circuit-breaker with instantaneous magnetic tripping may be used. It is to be interconnected in the lead of the low-speed winding and to be adjusted to the rated current of this winding (please refer to page “Technical Data”)

Wiring diagram WPU for motors with separate windings



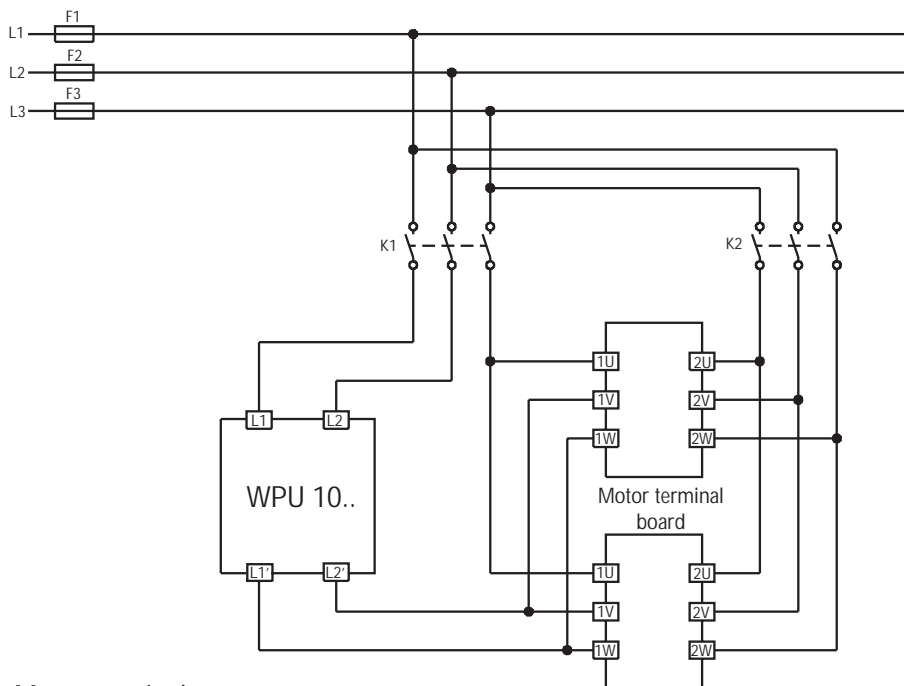
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Wiring diagram WPU for tapped wound motors



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Wiring diagram WPU for motors connected in parallel



Motor terminals:
 1U/1V/1W: Low speed K1
 2U/2V/2W: High speed K2

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CAUTION: The sum of the individual currents may not exceed the maximum permissible current!

Wiring diagrams for WPU 2030

The wiring diagrams for WPU 2030 are identical to those for WPU 10.. with one exception: see the following assignments for terminal designations.

WPU	10..	2030
Terminal	L1 L2 L1' L2'	2 1 4 3



The unit is to be installed by qualified electrical personnel only, in strict compliance with the applicable regulations for the prevention of accidents and the installation and operating instructions!

It is recommended to carry out the commissioning with the motor in the cold state.

1. Switch the motor off.
Take appropriate measures to prevent unintentional switch-on of the motor!
2. For hoists and brake motors:
Ensure that the brake is disconnected electrically, i. e. that the brake is applied.
For this purpose, remove the lead at terminal 2 and/or terminal 3 of the brake rectifier.
3. Turn the potentiometer 20 turns in counterclockwise direction (I_{\min}).
Note: The 20-turn potentiometer is provided with a slipping clutch, so no stop can be felt.
4. Connect the motor at low speed.
→ The red LED lights up.
The motor does not rotate.
5. Turn the potentiometer in clockwise direction
→ The red LED goes off.
Motors without brake: The motor starts rotating.
Brake motors: The motor wants to start rotating, however, is blocked by the brake and therefore needs to be switched off as soon as possible.
Leave potentiometer setting at this point.
6. Switch the motor off again.
7. For brake motors with disconnected brake:
Reconnect brake.
8. Carry out trial run.

The setting is correct if

- the motor starts rotating immediately when connected (at low speed), the red LED does not shine.
- and the red LED lights up when changing from high to low speed. The LED remains lit during the deceleration process thus indicating its duration.

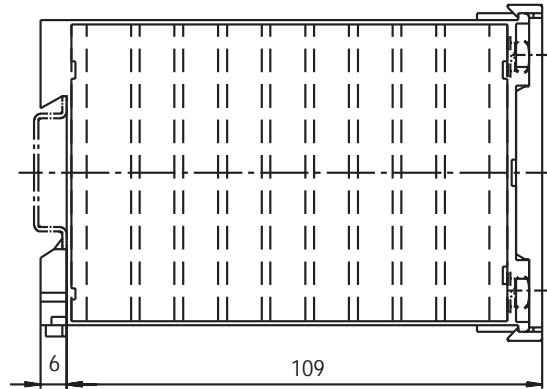
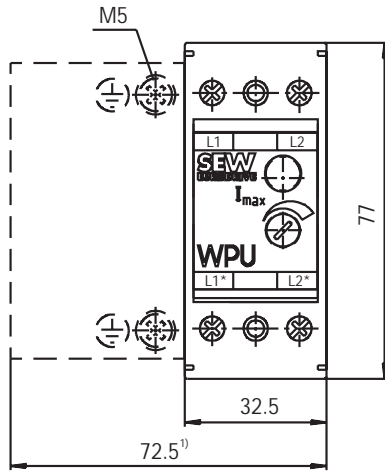
The setting is incorrect if

- the motor does not start rotating immediately when connected (at low speed), the red LED shines.
→ Turn potentiometer in clockwise direction.
- the red LED does not light up when changing from high to low speed.
→ Turn potentiometer in counterclockwise direction.

Type	WPU 1001	WPU 1003	WPU 1010	WPU 2030
Part no.	825 742 6	825 743 4	825 744 2	825 745 0
Rated supply voltage V_{mains}	2 x 150...500 V _{AC}			
Mains frequency f_{mains}	50/60 Hz			
Rated current I_N (continuous operation S1)	1 A _{AC}	3 A _{AC}	10 A _{AC}	30 A _{AC}
For pole-changing motors with rated current at low speed I_N (continuous operation S1)	0.2...1 A _{AC}	1...3 A _{AC}	3...10 A _{AC}	10...30 A _{AC}
For pole-changing motors with rated current at low speed I_N (intermittent operation S3 – cyclic duration factor 40/60 %) *)	0.2...1 A _{AC}	1...5 A _{AC}	3...15 A _{AC}	10...50 A _{AC}
Ambient temperature T_a	-15...+45 °C			
Enclosure type	IP 20			
Weight	0.3 kg	0.3 kg	0.6 kg	1.5 kg
Dimensions W x H x D	32.5x77x114 mm		72.5x77x114mm	143x200x80 mm
Mechanical design	Top-hat rail mounting with screw terminals			Mounted to switch cabinet wall

*) with a starting current of $\frac{I_a}{I_N} > 3$ the WPU must only be selected for S1 continuous operation.

WPU 1001/1003 and WPU 1010

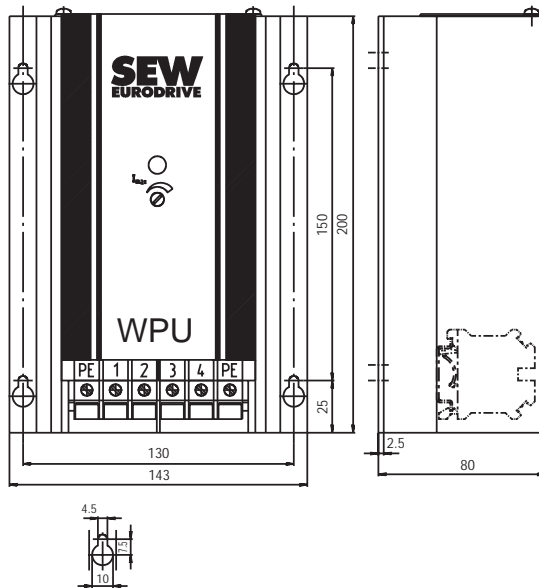


Mounted on top-hat rail EN 55022 - 32 x 7.5

1) Heat sink only on WPU 1010

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WPU 2030



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