

SpeedBox

PERFORMANCE BOOSTER

24 V controller for electromagnetic clutches and brakes

Mönninghoff

INTELLIGENT CONTROL SOLUTION FOR ELECTROMAGNETIC CLUTCHES

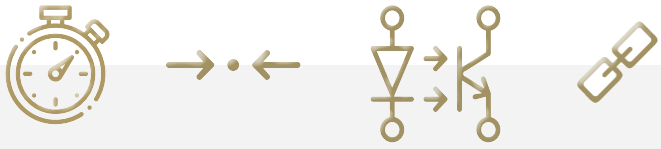
Technology that meets the highest standards.

The SpeedBox is a compact electronic controller designed to control suitable electromagnetic clutches and brakes with a 24 V DC coil. The full MOSFET bridge handles the switching of the inductive load. An integrated protection circuit ensures the controlled management of switch-off energy and voltage spikes.

SpeedBox Core provides the basic functions for switching and protection. SpeedBox Pro adds targeted reverse polarisation of the load during de-energisation. This allows the residual magnetic field to be dissipated more quickly and shortens the de-energisation or venting process.

The compact DIN-rail housing is designed for a compact and well-organised installation in the control cabinet. A galvanically isolated control input facilitates integration into PLCs and machine control systems.

The SpeedBox uses a full MOSFET bridge to electronically control suitable 24 V DC inductive loads. The Pro version can reverse the polarity of the load for a defined period of time during switch-off. Firmware updates can be carried out quickly and securely via the USB-C interface to install updated software versions and add features released in future.



FEATURES

- **24 V DC controller** f for suitable electromagnetic clutches and brakes
- **electronic MOSFET full-bridge circuit**
- **wear-free switching** with no mechanical contacts in the controller
- **integrated protection circuitry** for inductive loads
- **galvanically isolated control input**
- **SpeedBox Core** for basic functionality
- **SpeedBox Pro** with targeted reverse polarity for demagnetization
- **Monitoring of supply voltage, output, current and temperature** within the hardware/firmware design
- **Local diagnostic and service options via the SpeedBox Control Center,** depending on the released software version; Firmware updates via the USB-C interface for customized software versions and features to be released in the futur
- **Easy to integrate** thanks to a convenient DIN-rail enclosure including connectors
- **Separate factory and customer data** in the software design

TECHNICAL OPERATING PRINCIPLE

The SpeedBox accepts a 24-V DC power supply and processes an external control signal. The microcontroller controls the MOSFET full bridge, thereby switching the connected electromagnetic clutch or brake. Firmware updates can be performed quickly and securely via the USB-C interface. This allows for the installation of updated software versions and the addition of features released in the future.

In the Core version, the load is switched in the approved normal output direction. The Pro version can reverse the polarity for a defined period of time during deactivation. The reverse polarity generates a counter-magnetic field, thereby supporting the faster dissipation of residual magnetization.
When switching, the approved “break-before-make” switching sequence must be followed. The specific time and load limits depend on the approved production status.

OVERVIEW OF VARIANTS

Feature	SpeedBox Core	SpeedBox Pro
Electronic MOSFET full bridge	✓	✓
Integrated protection circuitry	✓	✓
Galvanically isolated control input	✓	✓
Normal switching of suitable 24-V DC loads	✓	✓
Reverse polarity during turn-off	Not supported	Intended
Accelerated magnetic field decay	Above normal Shutdown profile	Supported by defined reverse polarity
Primary Application	Compact base integration	Applications with increased requirements for the turn-off or venting time

Safety Notice

The SpeedBox is not an emergency stop, a safety shutdown, or a standalone safety control system. The host machine must have its own safe shutdown and protective functions independent of the SpeedBox.

Initial testing may only be performed on a suitable, mechanically secured load and in accordance with the approved installation and service specifications.

TECHNISCHE DATEN

Hardware

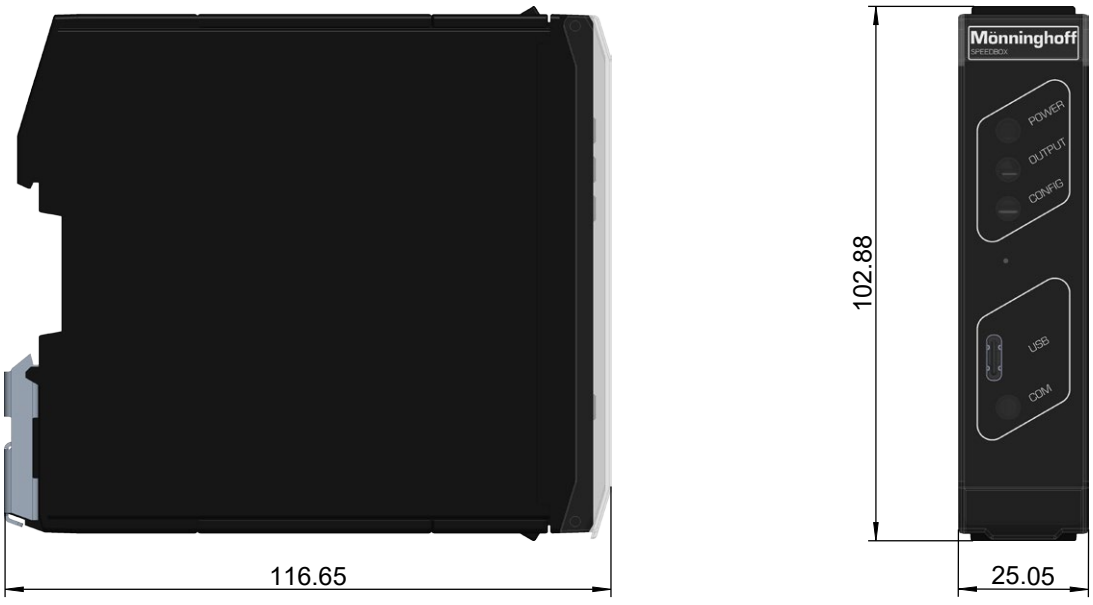
Product Name	Speedbox Pro/Core
Revision	V1.0F
Date	August 6, 2026
Manufacturer	Maschinenfabrik Mönninghoff GmbH & Co. KG
Product Type	Electronic 24 V DC Controller
Supply Rated Voltage	24 V DC
Permissible Supply Voltage Range	+10% / -10%
Max. Output Voltage	26,4 V DC
Max. Continuous Output Current	15 A (without heat sink)
Max. Peak Current	19 A (max 0,5 S)
Max. Power	360 watts
Permissible Load Type	Inductive DC load (clutch/brake)
Operating Environment	Control cabinet / industrial environment / indoor use
Ambient Temperature	0 ... +55 °C
Ambient Temperature (Storage/Transport)	−20 ... +70 °C
Protection Class / Housing	IP20
Max. Power Supply Cable Length	max. 3m
Max. Output Cable Length	max. 3m
Max. Control Input Cable Length	max. 30m
Power Supply Cable Cross-Section	0.2...2.5 mm², 2.5 mm² recommended for high loads
Output Cable Cross-Section	0.2...2.5 mm², 2.5 mm² recommended for high loads
Fuse Protection	Internal 20 A fuse
Intended Use	Control of suitable DC clutches and DC brakes within the specified limits.
Non-Intended Use	No safety control; do not use outside specified electrical/ thermal limits.
Target Audience for Installation	Qualified electrical personnel
EMC Environment	Industrial / residential and commercial areas in accordance with 61000-6-2 / 61000-6-3 / 61000-6-4
Pollution Degree	2 in accordance with IEC 61010-1

Software

Software Name	SpeedBoxManager
Revision	V1.4.2
Date	November 19, 2026
Manufacturer	Maschinenfabrik Mönninghoff GmbH & Co. KG
Product Type	32-bit MCC Harmony Project
Development Environment	MPLAB X IDE v6.35
Compiler	XC32 5.10
RTOS-Version	FreeRTOS 10.4.1
Licenses	Microchip Software License / MIT

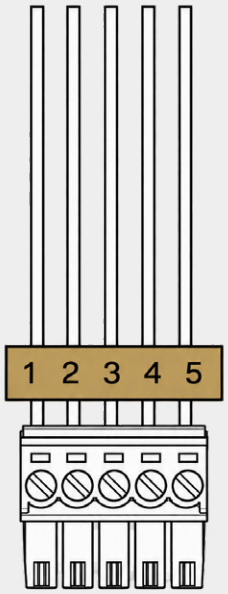
DIMENSIONS

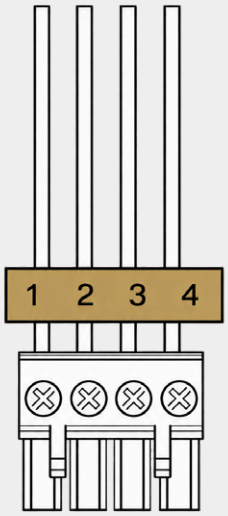
Phoenix Contact ICS25-B100X98-V-9005



PIN ASSIGNMENT

5-pin and 4-pin

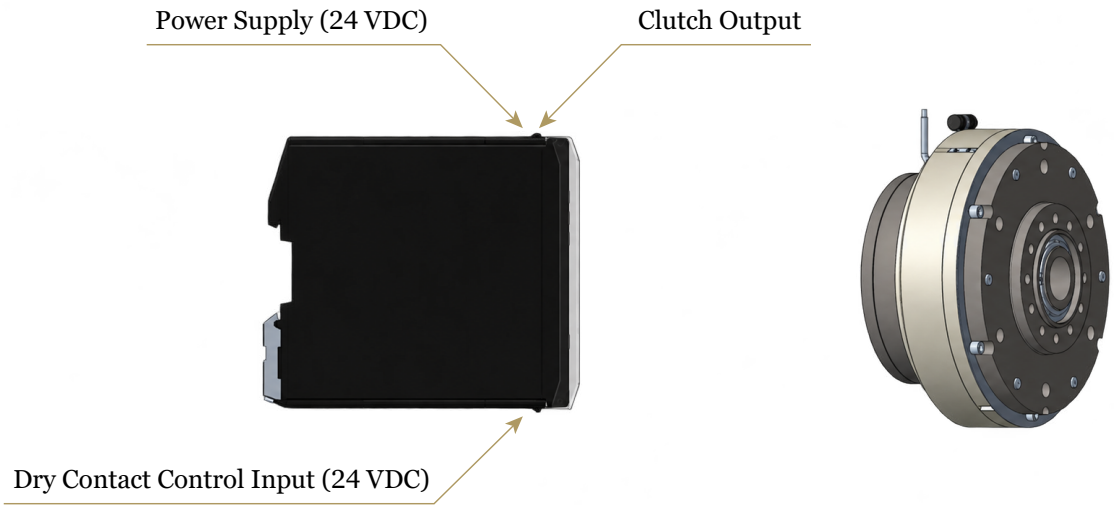




Control Signal Input	
1	Din+
2	Din-
3	n.c.
4	n.c.
5	n.c.

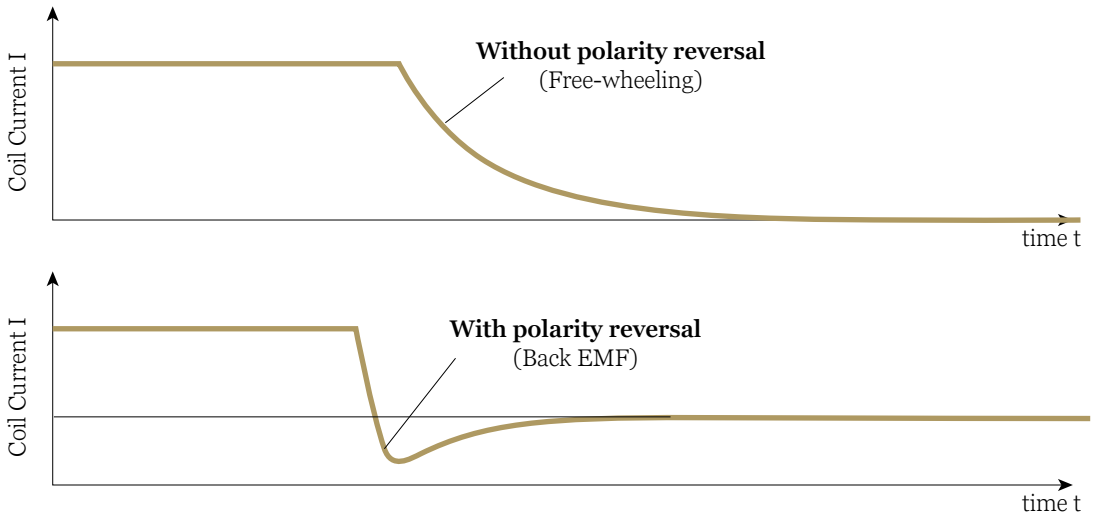
Input/Output	
1	GND
2	+24VDC
3	Out A
4	OUT B

POWER AND SIGNALS



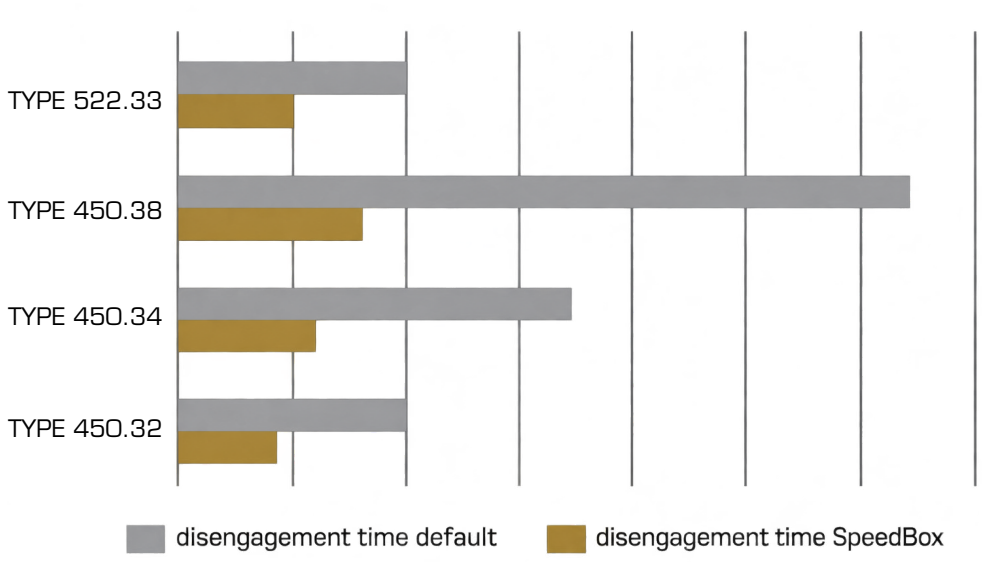
COIL CURRENT

Free-Wheeling and Reverse Polarity



REDUCTION IN DISENGAGEMENT

for common clutch sizes



REQUEST A QUOTE

Would you like to select the right SpeedBox for your clutch or brake?

Please send us the details of your application.

- **Mönninghoff clutch or brake type**
- **Rated voltage and coil specifications**
- **Switching or polarity reversal frequency**
- **Supply voltage and tolerances**
- **Ambient temperature**
- **Installation configuration and wiring layout**
- **Required Core or Pro function**

Based on the information you provide, we'll determine whether the SpeedBox Core or the SpeedBox Pro is the optimal solution for your requirements.

Für more Informationen

YOUR CONTACT AT MÖNNINGHOFF

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+49 2327 3033-0 | info@moenninghoff.com

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