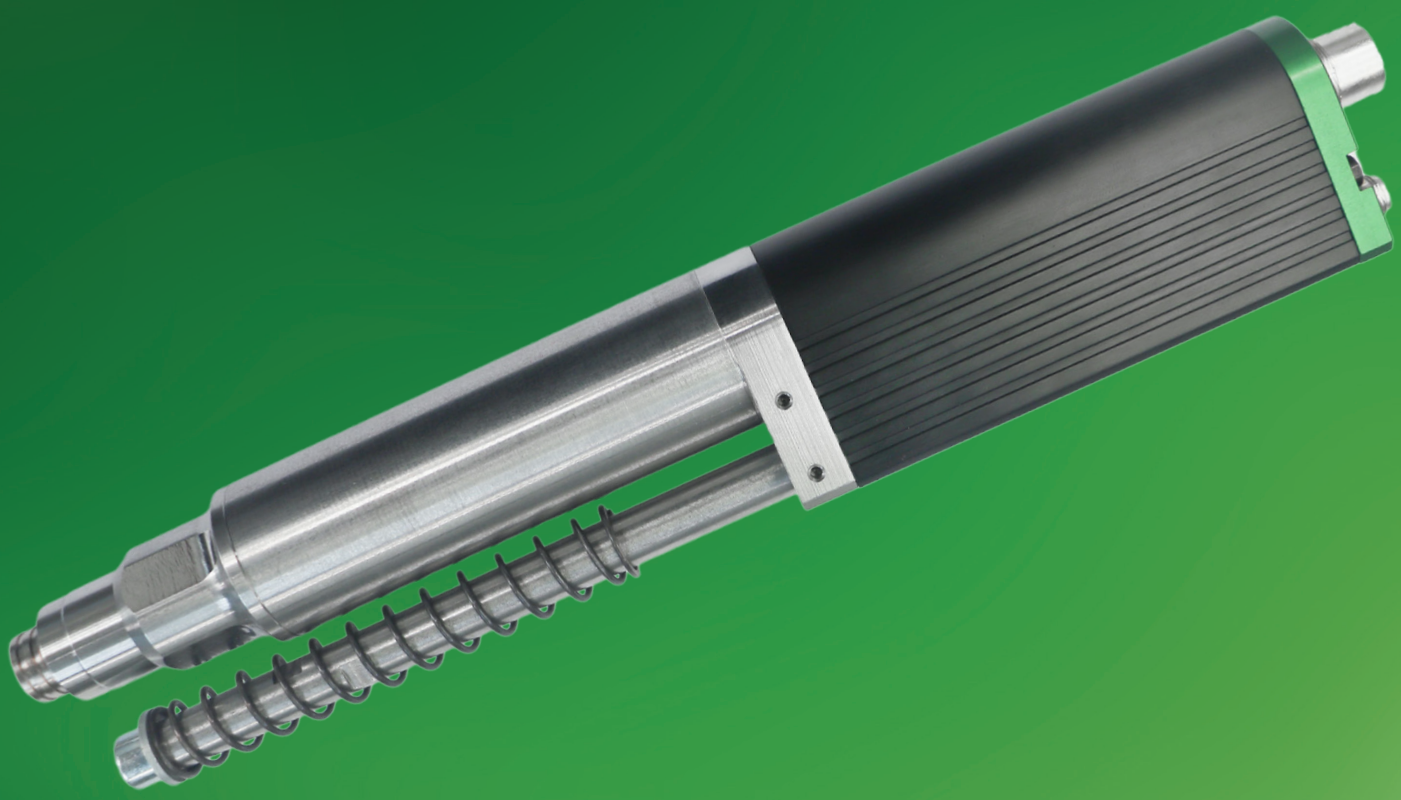
DEPRAG
machines unlimited

Screwdriver Spindles electric



MINIMAT-EDS Digital Electric Screwdriver

The screwdriving spindle with integrated screwdriving controller!

ADVANTAGES

New control concept

The control functionality of the screwdriving system is implemented by integrating intelligent power electronics into the screwdriver and incorporating screwdriving-specific software modules into the system control unit (PLC).

Known range of functions without sequence controller

The familiar range of functions of DEPRAG EC screwdriving systems is available. However, no sequence controller is required to operate the MINIMAT-EDS screwdriver.

Hot plug

The screwdriver can be plugged in or unplugged without switching off the system (hot-plug, e.g. when using a tool changing system).

Use in screwdriving stations

The screwdrivers are designed for use in screwdriving stations with a central system control unit (PLC). They include intelligent power electronics with an electronic type plate and a communication interface for data exchange with the system controller via EtherCAT.

Intelligent software products

A PLC function block for the Beckhoff TwinCAT III development environment is available to integrate the screwdrivers into the system software. The creation of screwdriving programs is made possible by the DEPRAG Cockpit software. The TwinCAT Link software is provided to support the commissioning and integration of the screwdrivers.

Simple commissioning

Graphic data can be transferred to support commissioning and diagnostics.

Precise

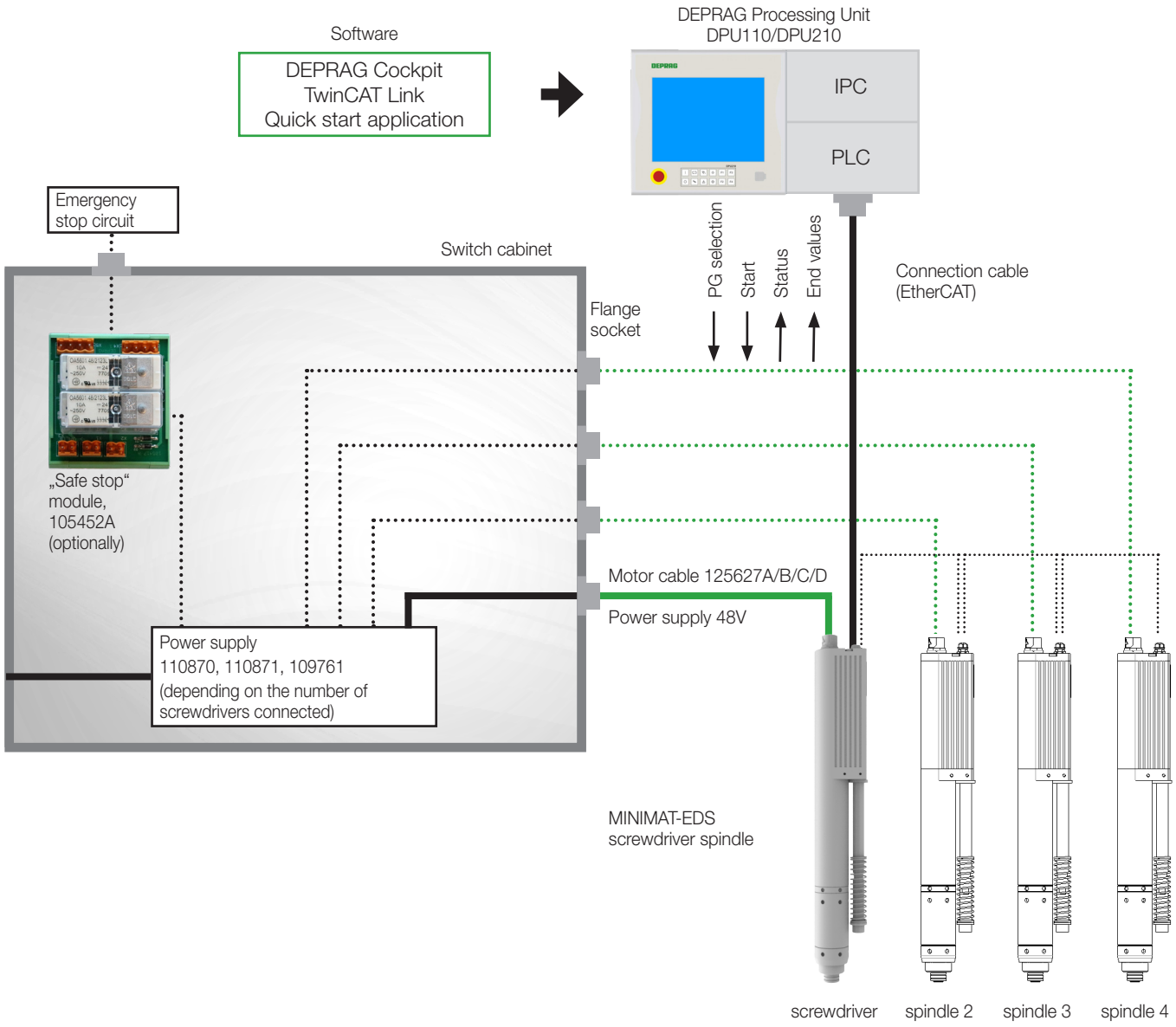
The screwdriver meets the requirements of screw category B.
Torque accuracies of < 2% standard deviation and thus Cmk values of ≥ 1.67 with a tolerance of ± 10% can be reached * with MINIMAT-EDS stationary screwdrivers. Statistically speaking, the error rate is less than 0.6 per one million screw assemblies.

*) under suitable process conditions

Space-saving

Extremely space-saving when used in multi-spindle screwdriving systems, as no screwdriving controller is required.

SYSTEM SET UP AND COMPONENTS



SYSTEM COMPONENTS

MINIMAT-EDS Screwdriver spindle straight handle design	Type Part no.	330EDS36-0012 460000A	330EDS36-0018 460000B	330EDS36-0032 460000C	330EDS36-0048 460000D
Torque min.	Nm/in.lbs	0.24/2.1	0.36/3.2	0.64/5.66	1/8.85
Torque max.	Nm/in.lbs	1.2/10.6	1.8/15.9	3.2/28.3	4.8/42.5
Speed min.	rpm	150	150	80	90
Speed max.	rpm	1500	1500	1200	900
Diameter	mm/in.	36/1.4	36/1.4	36/1.4	36/1.4
Length	mm/in.	319/12.44	319/12.44	319/12.44	319/12.44
Weight	kg/lbs	1.2/2.6	1.2/2.6	1.2/2.6	1.2/2.6
Line voltage (DC)	V	48	48	48	48
Internal hex drive DIN ISO 1173		F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")
Suitable inserting tools and connection parts with inserting end DIN ISO 1173		E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")

MINIMAT-EDS Screwdriver spindle straight handle design	Type Part no.	330EDS36-0075 460000F	330EDS36-0110 460000G	330EDS36-0140 460000H	330EDS36-0180 460000I
Torque min.	Nm/in.lbs	1.5/13.3	2.2/19.5	2.8/24.8	3.6/31.9
Torque max.	Nm/in.lbs	7.5/66.4	11/97.4	14/123.9	18/159.3
Speed min.	rpm	50	40	25	20
Speed max.	rpm	560	390	290	220
Diameter	mm/in.	36/1.4	36/1.4	36/1.4	36/1.4
Length	mm/in.	361/14.1	361/14.1	361/14.1	361/14.1
Weight	kg/lbs	1.5/3.3	1.5/3.3	1.5/3.3	1.5/3.3
Line voltage (DC)	V	48	48	48	48
Internal hex drive DIN ISO 1173		F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")	F6.3 (1/4")
Suitable inserting tools and connection parts with inserting end DIN ISO 1173		E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")	E6.3 (1/4")

Optional accessories for the screwdriver spindles		
Spring sleeve cpl.	Part no.	364672A
Spring sleeve cpl., with vacuum connection (in connection with finder, see catalogue: Inserting tools D3320E)	Part no.	364672C
Screwdriver adapter	Part no.	9082435A

Optional component for the installation into a switch cabinet

„Safe stop“ module
part no. 105452A

The “safe stop” module disconnects the power supply to the screwdriver. The power supply is retained. Disconnection is carried out on two channels with monitoring contacts, so that Performance Level e in accordance with EN ISO 13849-1 is fulfilled (functional safety).
Each “safe stop” module can be used to protect up to three screwdrivers. After triggering the safety-cut off around 10s is needed for the screwdriver to return to operational readiness.

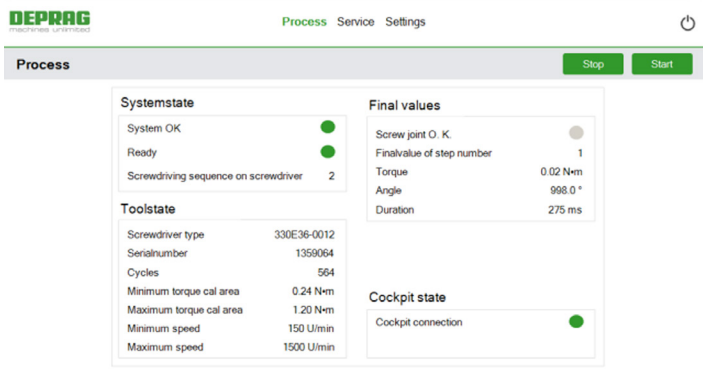
SYSTEM COMPONENTS

Required components for the installation into a switch cabinet			
Motor cable length 2 m alternative: Motor cable length 5 m Motor cable length 7.5 m Motor cable length 10 m	Type Part no. Type Part no. Type Part no. Type Part no.	KMO-330EDS-2M 125627A KMO-330EDS-5M 125627B KMO-330EDS-7.5M 125627C KMO-330EDS-10M 125627D	To connect the screwdriver with the power supply.
Power supply single 240W-48V 2-fold 480W-48V 4-fold 960W-48V	 Part no. Part no. Part no.	 110870 110871 109761	Selection depends on the number of screwdrivers used. The different power supply options can be combined with one another.
Flange socket	Part no.	128635A	Interface for switch cabinet
Connection cable length 2m	Part no.	164078	Connection cable between PLC and MINIMAT-EDS
Connection cable length 5m	Part no.	164079	
Connection cable length 7.5m	Part no.	164429	
Connection cable length 10m	Part no.	164430	
Connection cable length 0.1m	Part no.	813895	Connection cable between MINIMAT-EDS and MINIMAT-EDS (for multi-spindle applications)
Connection cable length 0.2m	Part no.	816576	
Connection cable length 0.5m	Part no.	813896	

SYSTEM COMPONENTS

Additional software			
Required software: The TwinCAT Link software and the necessary number of DEPRAG Cockpits must be ordered for each system.			
TwinCAT Link (activation key)	Part no.	140996	PLC block, Quick start - for easy integration into the Beckhoff TwinCAT III development environment.
DEPRAG Cockpit On Premise 1	Part no.	19930	License for 1 screwdriving system
DEPRAG Cockpit On Premise 5	Part no.	19932	License for 5 screwdriving systems
DEPRAG Cockpit On Premise 10	Part no.	19933	License for 10 screwdriving systems
DEPRAG Cockpit On Premise 20	Part no.	19934	License for 20 screwdriving systems
DEPRAG Cockpit On Premise 50	Part no.	19935	License for 50 screwdriving systems
Optionally available:			
DEPRAG Friction Value Process (activation key)	Part no.	201820	License for 1 screwdriving system

DEPRAG Cockpit is also available in a cloud version. Use the advantages of DEPRAG Cockpit Cloud now exclusively via myDEPRAG.
Please find details of our software products in our product catalogue D3900E.



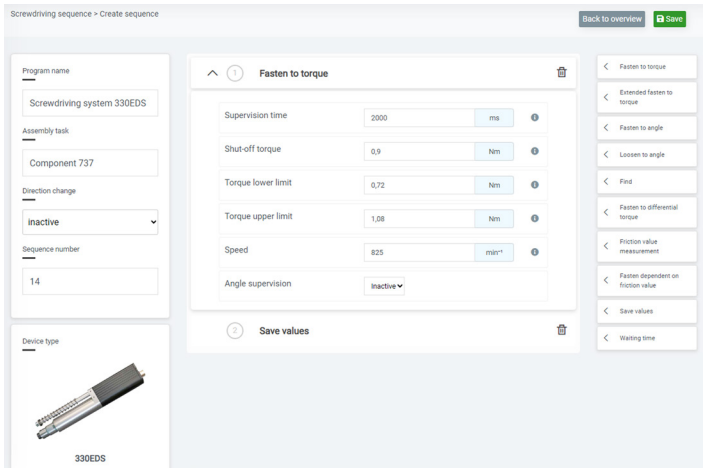
TwinCAT Link

The Quick start application enables commissioning and testing the screwdriving system quickly and easily.
By accessing the Application Programming Interface (API) of the PLC module, selected functions can be used without programming knowledge.
This supports initial commissioning, diagnostics during servicing and product presentations.

Commissioning the system

The following steps are required to commission the system (details can be found in the operating instructions):

- Installing the 330EDS software components via TwinCAT Link
- Create screwdriving tools with serial number
- Creating screwdriving programs with the DEPRAG Cockpit



DEPRAG Cockpit On Premise / DEPRAG Cockpit Cloud

The 330EDS screwdriving system integrates seamlessly into the DEPRAG Cockpit. The DEPRAG Cockpit analyzes and manages any number of different screwdriving technology controls and their parameters.

In conjunction with the 330EDS screwdriving system, the DEPRAG Cockpit offers the following options:

- Creation and transfer of screwdriving sequences
- Audit-proof storage of screwdriving programs
- Persistence of final values
- Linking screwdriving results with serial numbers
- Linking used screwdriving program with the performed screw fastening

Screwdriving sequences for the 330EDS screwdriving system are created in the DEPRAG Cockpit and transferred to the system controller. This constellation enables an unlimited number of screwdriving programs.
The decentralized storage of the screwdriving program on the system controller ensures a high cycle time and a resilient connection. This means that if the connection between the system controller and the DEPRAG Cockpit is lost (e.g. maintenance work), the screwdriving programs can still be executed. Any screwdriving results are stored decentrally on the system controller and transferred when the connection is restored.

COMPARISON OF SCREWDRIVING SYSTEMS – MINIMAT-ED vs. MINIMAT-EDS

			NEW
	MINIMAT-ED **the electronic screwdriving system with no external screwdriving sequence controller**		**MINIMAT-EDS** **the electronic screwdriving system with integrated screwdriving sequence controller** → Control functionality of the screwdriving system through the intelligent power electronics in the screwdriver
	The DEPRAG DPU series controllers can be used to control the MINIMAT-ED screwdriver in combination with the Interface 330E for signal and data exchange between the system controller (PLC) and the control electronics of the screwdriver. In combination with a DPU, single and multi-channel EC screwdriving solutions can be integrated into the controller concept of complete systems at low cost.		All components and functions of the sequence controller required for other systems (AST, ComCenterED, Interface 330E) are integrated in the screwdriver or transferred to the system control. The screwdrivers are designed for use in screwdriving stations with a central system control unit (DPU). They contain intelligent power electronics and a communication interface for data exchange with the system controller via EtherCAT. For integrating the screwdrivers into the system software the TwinCAT Link software is available. The creation of screwdriving programs is made possible by the DEPRAG Cockpit software. The Quickstart application software is provided to support the commissioning and integration of the screwdrivers.
Characteristics	**in combination with Interface 330E and standard software 330 OS BASIC**	**in combination with Interface 330E and software 330 OS ADVANCED**	
Tightening and shut-off via torque	☑	☑	☑
Tightening and shut-off via torque with angle control	☒	☑	☑
Tightening and shut-off via angle	☑	☑	☑
Tightening and shut-off via angle with torque control	☒	☑	☑
Loosening and shut-off via angle	☑	☑	☑
Extended screwdriving strategies, e.g., friction dependent screw assembly	☒	☑	☑
Parameter adjustment of screwdriving sequences	☑	☑	☑
Creation of screwdriving sequences	☒	☑	☑
Graphic recording	☒	☒	☑ *)
Communication interfaces	☑	☑	☑
Storage / documentation / analysis	☑	☑	☑

*) For commissioning and analysis purposes only. Not for automatic process data documentation in series operation.

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