Intelligent compact drives
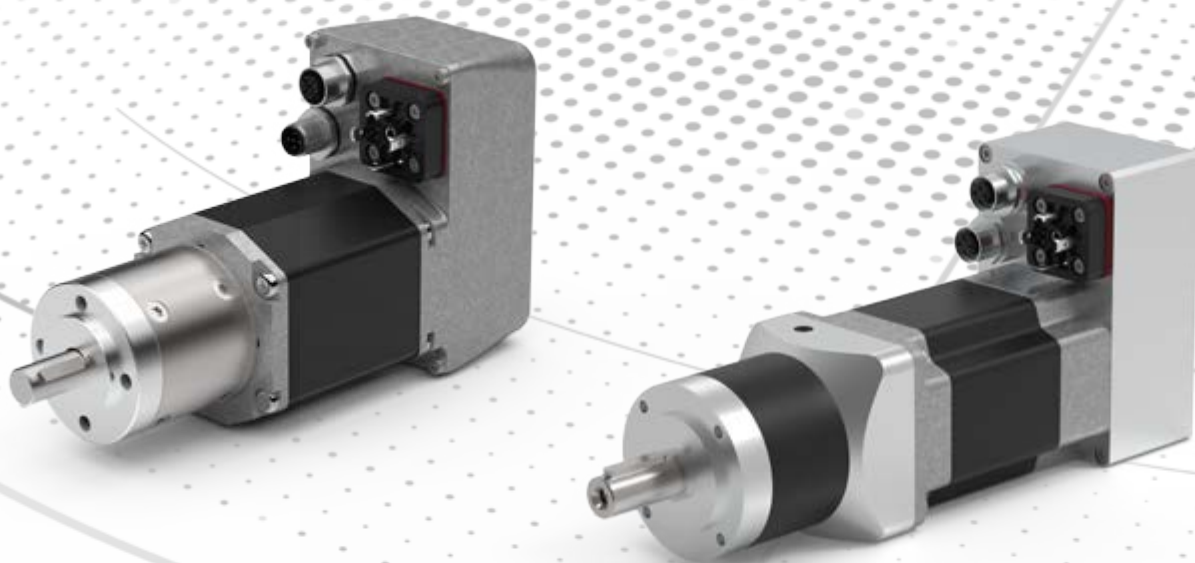
Voltage + fieldbus = positioning

PROFINET®   EtherCAT®   PROFIBUS®   CANopen

24-48 VDC

Absolute positioning
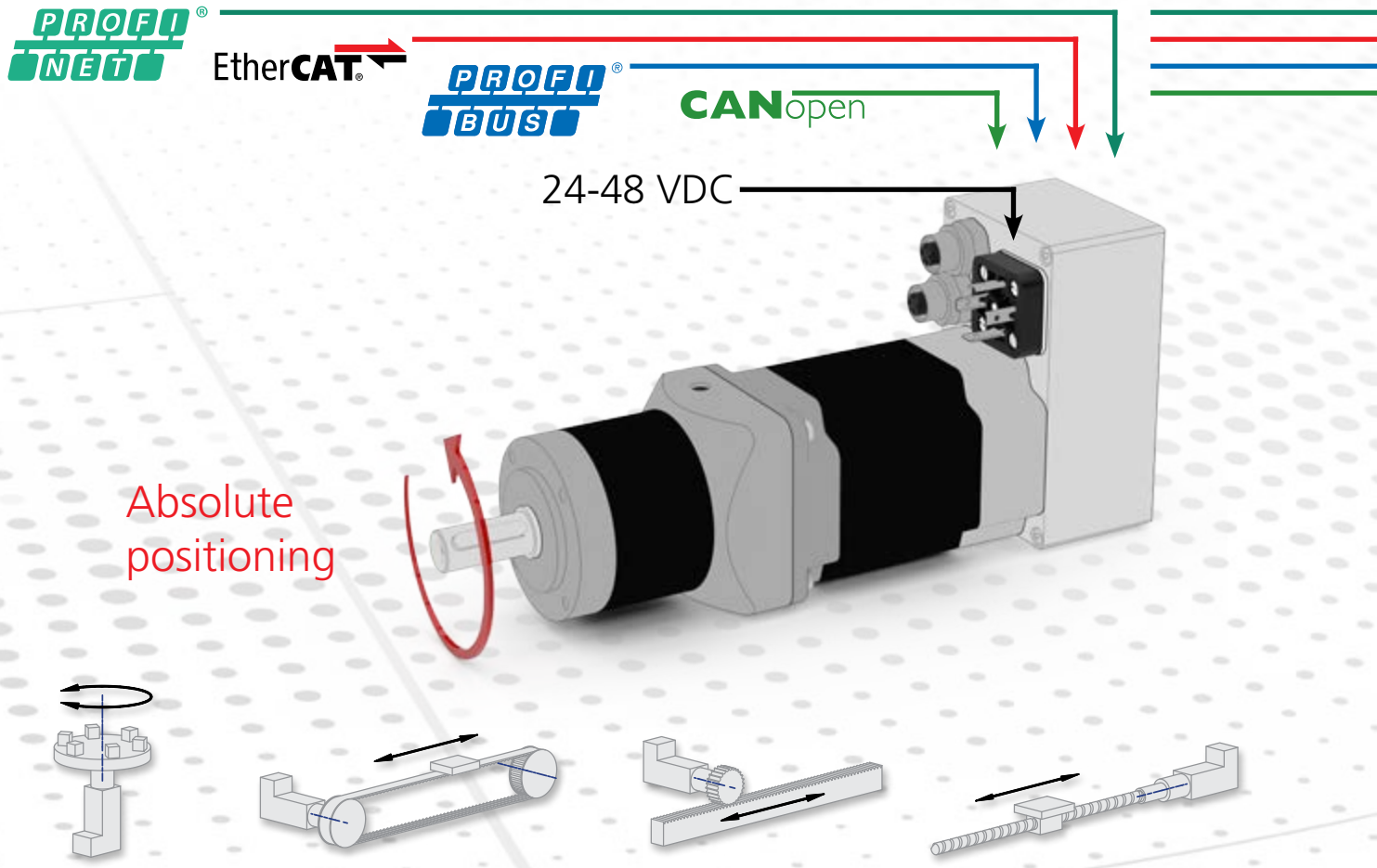
Power supply and fieldbus connection – this is all that's required to implement actuating and positioning tasks in your system with encoTRive compact drives. The concept of gear motor with integrated positioning controller offers numerous advantages:

Advantages for the switch cabinet
_No space consumption and no heat emission
  by the drive electronics

Simple wiring
_No EMC-critical motor cables need to
  be laid
_Thanks to the extra low voltage supply,
  all components and connections can be touched

Absolute position available at any time
_No reference runs required
_Reference initiators and associated wiring not necessary

Easy implementation of machine safety
_STO (**s**afe **t**orque **o**ff) optionally integrated

Tailored to your application
_Broad range of motor and gear variants
_Wide power range from 50 to 600 watts
_Assistance with selection and design by
  our drive specialists

Advantages for the application software
_Control of different types identical within a fieldbus
_Changeover or mixed operation between PROFIBUS
  and PROFINET possible with minimum effort
_Example PLC projects available

Problem-free use overseas
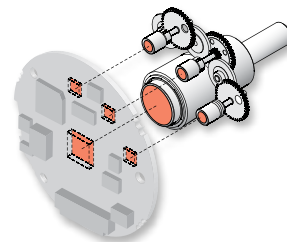_Optionally available as a UL-Recognized Component

Everything integrated

Interface

The encoTRive speaks many languages. It speaks the language of your control too.

Absolute encoder

Even if the drive is turned while de-energized, the absolute position is known as soon as the encoder is powered up again – battery-free, with a sturdy mechanical multiturn gear.
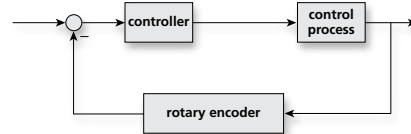
Positioning control

Simple to use:
Target and ramp parameters are preset using the fieldbus.
Reliable positioning is handled entirely in the drive.

Power electronics

The necessary power commutation to move the drive quickly and powerfully into position is generated from the extra-low voltage supply.

Motor

Numerous motor sizes and variants are available to suit the wide range of applications.
Whether brush motor or electronically commutated, with or without holding brake.

Gear

To consistently ensure the correct operating point, a wide range of gears with finely graduated reductions is available. Planetary gears - axial or with an angled stage - and worm gears are typical.
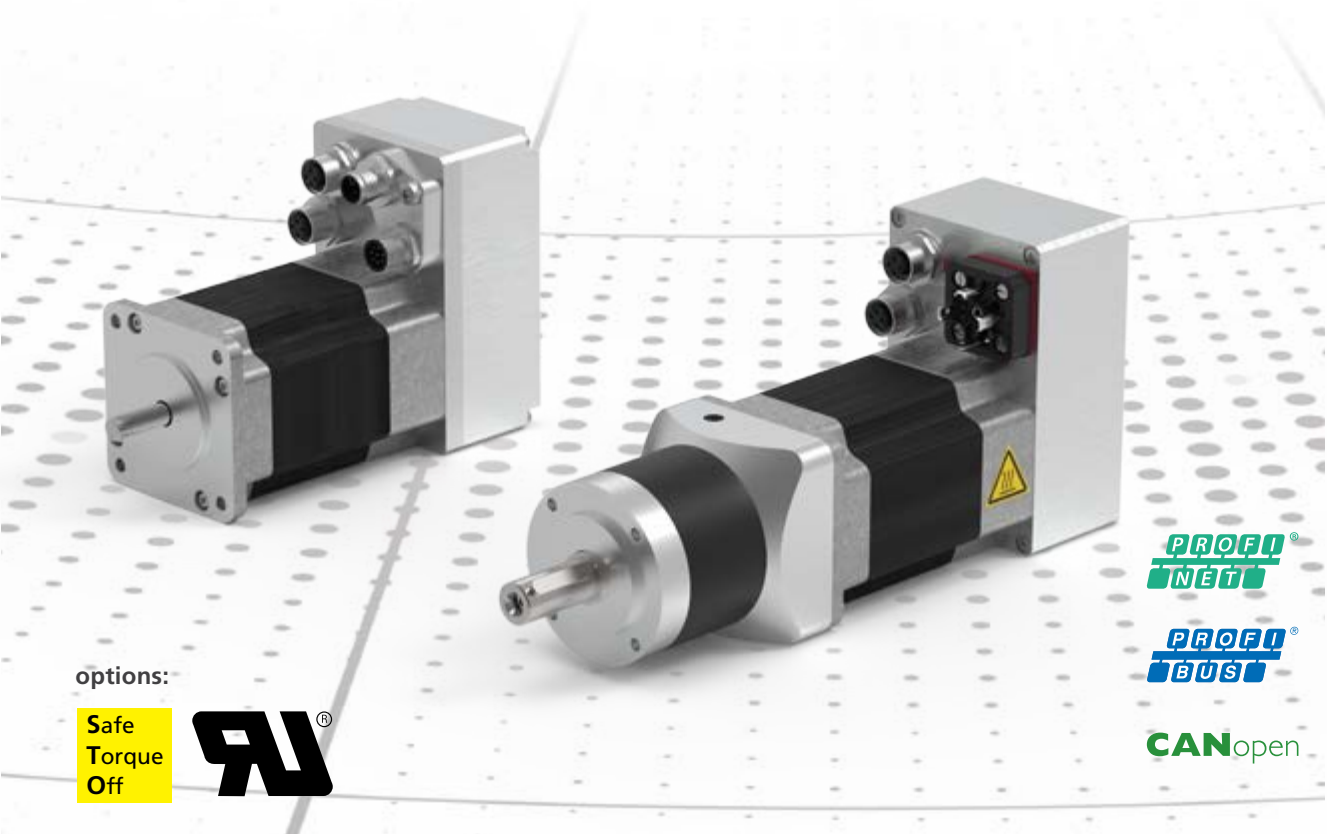
Safety

The safety functions **STO** (**s**afe **t**orque **o**ff) or **SS1** (**s**afe **s**top **1**) are optionally integrated.

Safe **T**orque **O**ff

Positioning drive MP 200

options:

Safe
Torque
Off

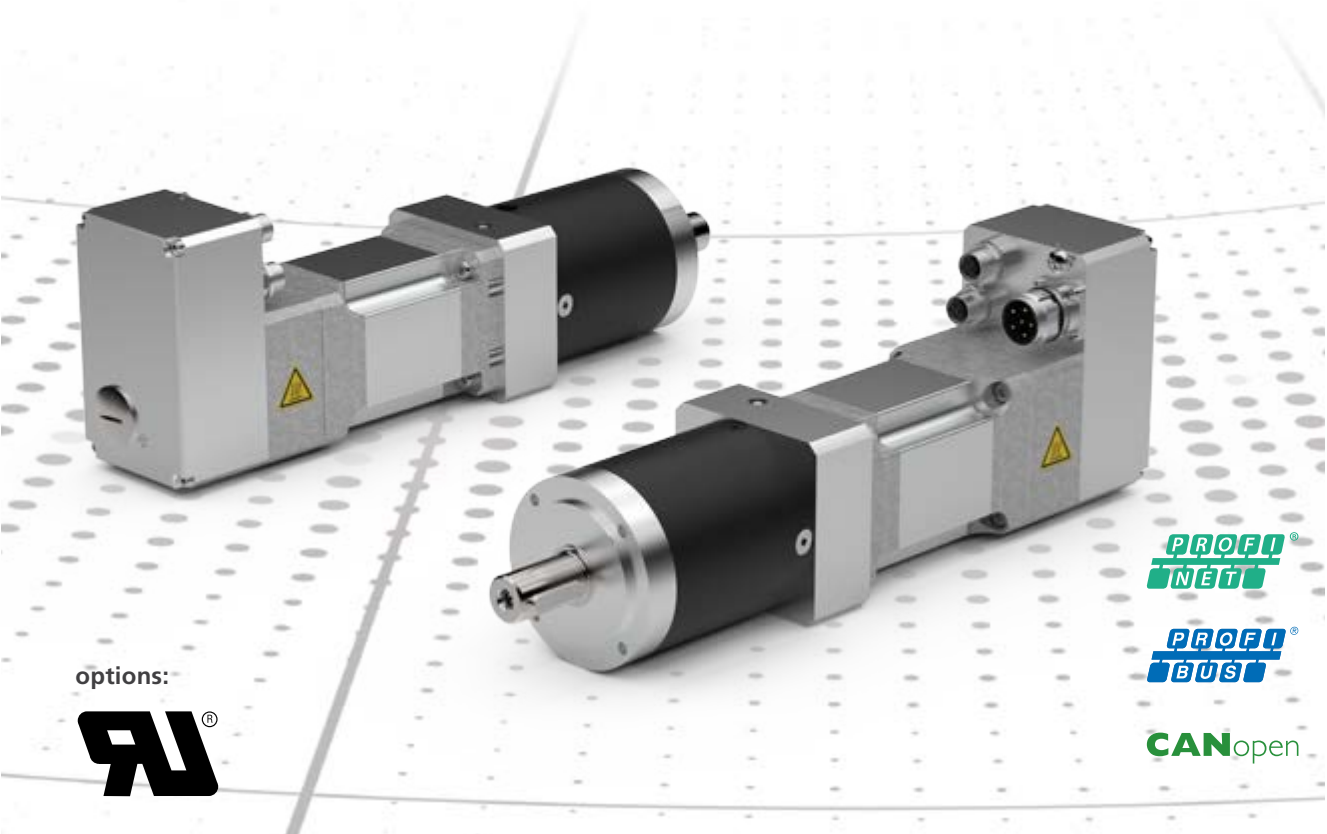| Technical data		MP 200	
Nominal voltage	VDC	24	48
Nominal torque S1 (S3)	Nm	0.40 (1.10)	0.40 (1.10)
Nominal power S1 (S3)	W	91 (178)	182 (357)
Nominal speed S1 (S3)	min^{-1}	2,175 (1,550)	4,350 (3,100)
Nominal current S1 (S3)	A	5.2	4.8
Inertia torque	gcm^2	512 (612 with holding brake)	
Electric motor _ Technology _ Protection class		EC, electronically commutated motor IP 54, motor shaft IP 41	
Encoder _ Technology _ Positioning resolution _ Positioning range _ Positioning accuracy		Absolute encoder, multi turn 0.088° / 4,096 steps per revolution 65,536 revolutions ±0.7° / ±8 steps	
Options		Holding brake, **S**afe **T**orque **O**ff ,	

Definitions

S1
Continuous operation

S3
Intermittent operation
25 %, 4 min
Make time 1 min
Cycle time 4 min
Max. torque 1.10 Nm

True absolute encoder
Fail-safe position information
through electromechanical
principle of measurement

Positioning drive MP 220 / 280

options:

Technical data		MP 220	MP 280
Nominal voltage	VDC	48	48
Nominal torque S1 (S2)	Nm	0,40 (1,4)	0,40 (2,0)
Nominal power S1 (S2)	W	167 (586)	167 (837)
Nominal speed S1 (S2)	min^{-1}	4.000 (4.000)	4.000 (4.000)
Nominal current S1 (S2)	A	4,5 (16)	4,5 (20)
Inertia torque	gcm^2	360	700
Electric motor _ Technology _ Protection class		EC, electronically commutated motor IP 54, motor shaft IP 41	
Encoder _ Technology _ Positioning resolution _ Positioning range _ Positioning accuracy		Absolute encoder, multi turn 0.088° / 4,096 steps per revolution 65,536 revolutions ±0.7° / ±8 steps	
Options		Holding brake,	

definition
S1
Continuous operation

S2
short-time operation
2 min

True absolute encoder
Fail-safe position
information through
electromechanical principle
of measurement

Positioning drive MD 300

Definitions
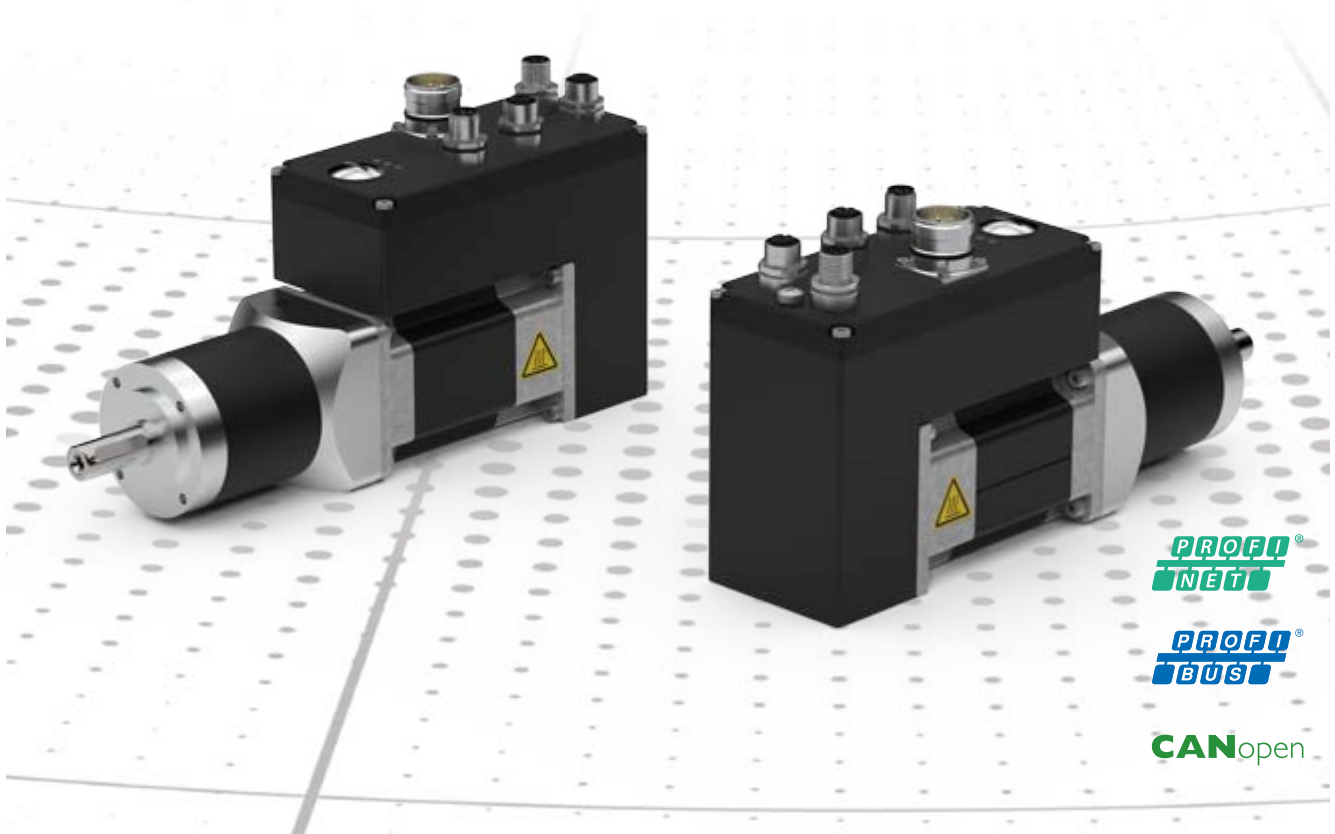
Technical data		MD 300	
Nominal voltage	VDC	24	48
Nominal torque S1 (S3)	Nm	0.60 (1.10)	0.60 (1.10)
Nominal power S1 (S3)	W	136 (178)	273 (357)
Nominal speed S1 (S3)	min^{-1}	2,175 (1,550)	4,350 (3,100)
Nominal current S1 (S3)	A	8.0	7.6
Inertia torque	gcm^2	512 (612 with holding brake)	
Electric motor _ Technology _ Protection class		EC, electronically commutated motor IP 54, motor shaft IP 41	
Encoder _ Technology _ Positioning resolution _ Positioning range _ Positioning accuracy		Absolute encoder, multi turn 0.35˚ / 1,024 steps per revolution 65,536 revolutions ±0.7˚ / ±2 steps	
Options		Holding brake, hand-held operator panel	
Brake chopper		Power 50 W, pulse energy 35 Ws	

S1
Continuous operation

S3
Intermittent operation
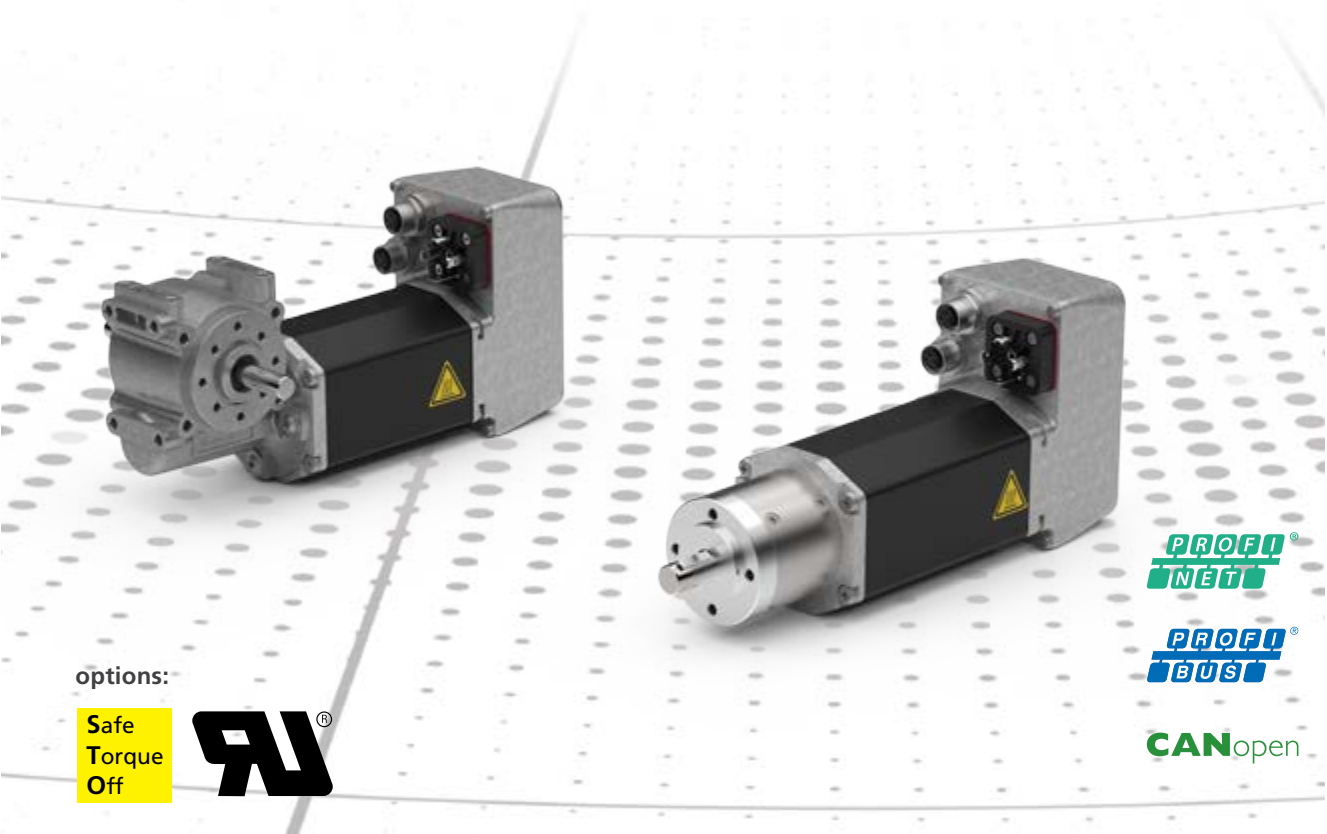25 %, 10 min
Make time 2.5 min
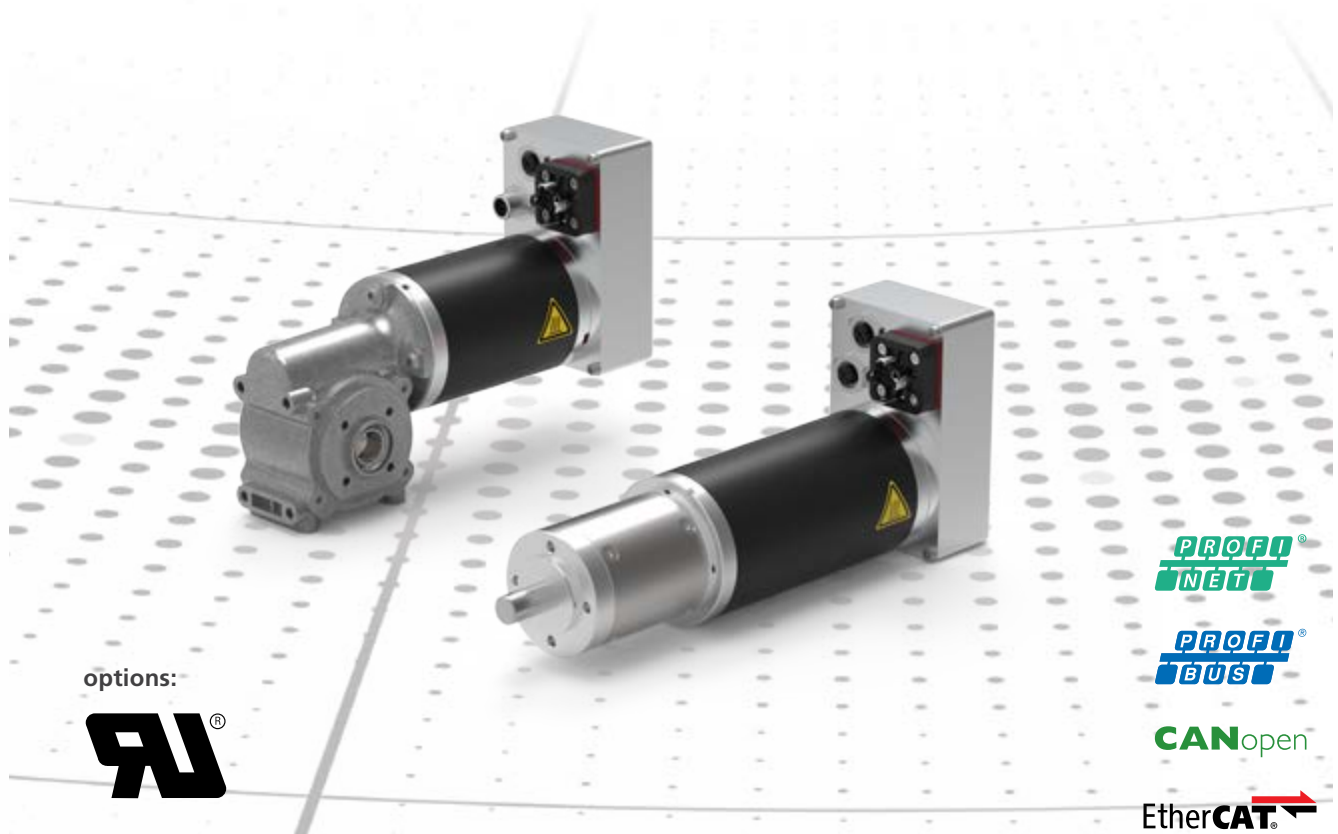Cycle time 10 min
Max. torque 1.10 Nm

True absolute encoder
Fail-safe position information
through electromechanical
principle of measurement

Positioning drive MP 060 … 180

options:

Technical data		MP 060	MP 100	MP 140	MP 180
Nominal voltage	VDC	24	24	42	24
Nominal torque S1	Nm	0.17	0.26	0.40	0.49
Nominal power S1	W	55	84	120	166
Nominal speed S1	min^{-1}	3,080	3,090	2,860	3,240
Nominal current S1	A	4.0	5.6	4.5	9.5
Inertia torque	gcm^2	72	128	172	129
Electric motor _ Technology _ Protection class		EC, electronically commutated motor with neodynium magnet IP 50			
Encoder _ Technology _ Positioning resolution _ Positioning range _ Positioning accuracy		Absolute encoder, multi turn 0.088˚ / 4,096 steps per revolution 65.536 revolutions ±0.7˚ / ±8 steps			
Options		Special voltages for large production series,			

Actuating drive MA 055 … 130

options:

| Technical data		MA 055	MA 100	MA 130
Nominal voltage	VDC	24	24	48
Nominal torque S1	Nm	0.14	0.27	0.32
Nominal power S1	W	44	86	107
Nominal speed S1	min^{-1}	3,000	3,050	3,750
Nominal current S1	A	2.7	4.9	4.5
Inertia torque	gcm^2	400	750	750
Electric motor _ Technology _ Protection class		DC, brushed motor IP 50		
Encoder _ Technology _ Positioning resolution _ Positioning range _ Positioning accuracy		Absolute encoder, multi turn 0.088˚ / 4,096 steps per revolution 65,536 revolutions ±0.7˚ / ±8 steps		
Options		Special voltages for large production series,		

Precision gear for MP 200 … 280 and MD 300

Planetary gear PLE 60

The PLE 60 is ideal for applications that require high torques and low backlash combined with high efficiency.

_ High torque up to 44 Nm (S1) and 70 Nm (S3)
_ Low backlash: 10 … 15 arcmin
_ High efficiency: 98 … 88 %
_ High permissible shaft forces: axial 600 N / radial 500 N
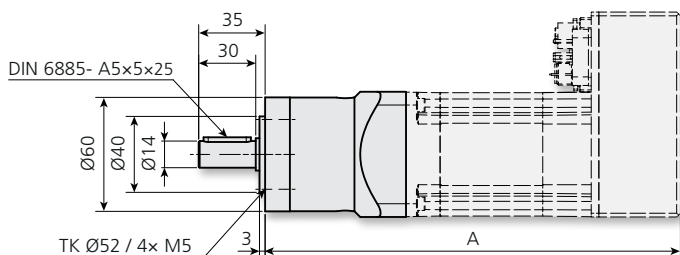
Dimensions [mm]

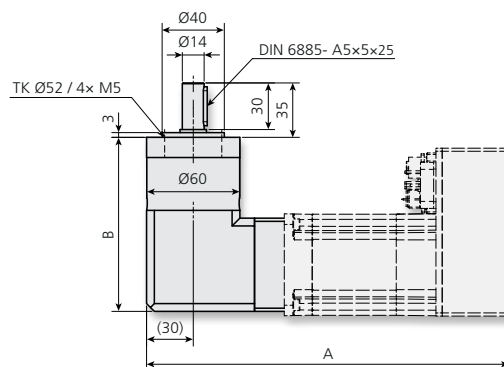| Gear		Dimension A [mm]: Drive variant (with brake)			
Stages	Reduction	MP 200	MP 220	MP 280	MD 300
1	3, 4, 5, 7, 8, 10	218.8 (253.2)	198.7 (231.7)	230.2 (263.2)	219.8 (254.2)
2	12, 15, 16, 20, 25, 32, 40	231.3 (265.7)	211.2 (244.2)	242.7 (275.7)	232.3 (266.7)
3	60, 80, 100, 120	243.8 (278.2)	223.7 (256.7)	255.2 (288.2)	244.8 (279.2)

Angular planetary gear WPLE 60

The WPLE 60 is ideal for applications that require high torques and low backlash combined with high efficiency, with an orthogonal output shaft.
Four different outlet directions are available.

_ High torque up to 44 Nm (S1) and 70 Nm (S3)
_ Low backlash: 16 … 21 arcmin
_ High efficiency: 95 … 80 %
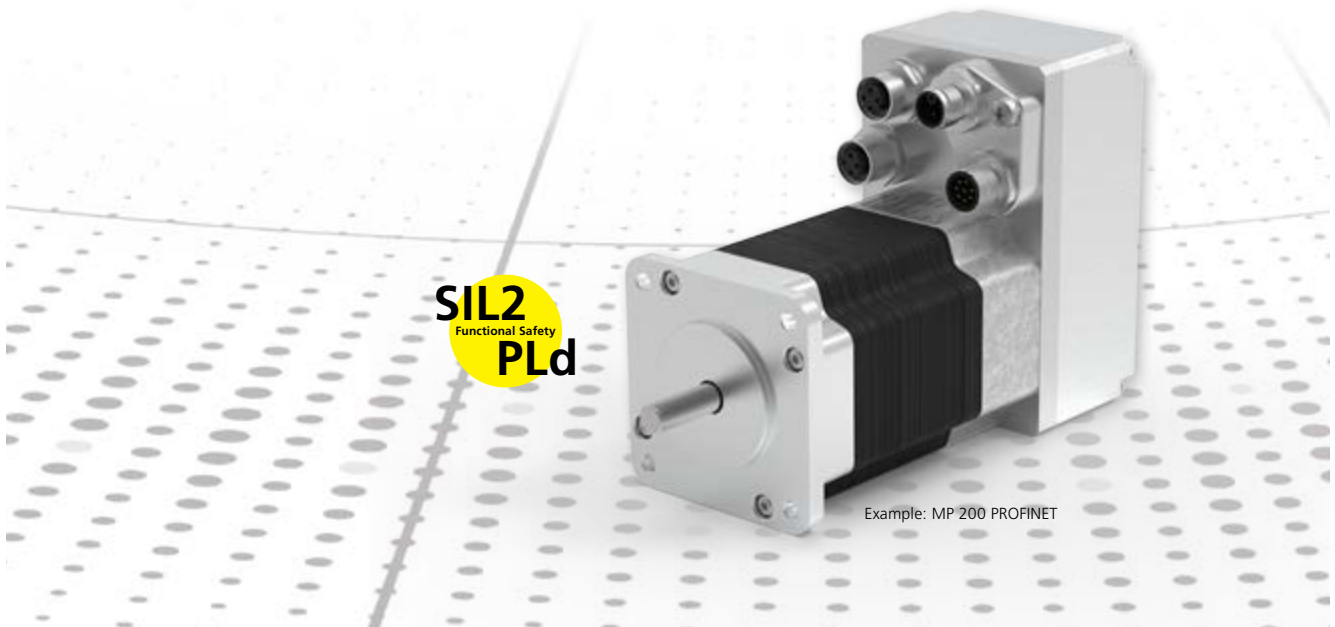_ High permissible shaft forces: axial 600 N / radial 500 N

Dimensions [mm]

Gear		Dimension B [mm]
Stages	Reduction	
1	3, 4, 5, 7, 8, 10	112
2	12, 15, 16, 20, 25, 32, 40	124.5
3	60, 80, 100, 120	137

Dimension A [mm]: Drive variant (with brake)			
MP 200	MP 220	MP 280	MD 300
233.2 (267.6)	213.1 (246.1)	244.6 (277.6)	234.2 (268.6)

Integrated safety technology

SIL2
Functional Safety
PLd

Example: MP 200 PROFINET

Drives MP 060 … 200 PN are also optionally available with integrated safety technology. All drive functions continue to be controlled via the PROFINET interface. In addition, the **STO** (**s**afe **t**orque **o**ff) or **SS1** (**s**afe **s**top **1**) function can be triggered via a safe digital input.

STO (safe torque off)

In response to a specific trigger or a safety-relevant error, the drive is disconnected from the power, so that no further torque is generated and the motor coasts to a stop if necessary.

Safe digital input

Two channels are used, in order to also ensure safe control of the safety function. The correct signals must be present in order for the drive to turn: e.g. two 24 volt signals, depending on the configuration. If one of the two signals fails, this is immediately recognized as a safety-relevant error.
A second possibility is to define the signals non-equivalently: one 24 volt signal and one 0 volt signal. This has the advantage that a possible short-circuit between the signals is also recognized as a safety-relevant error.
Two digital signals are available for confirmation. These indicate whether a safety-relevant error is present and whether the drive is in a safe (powerless) state.

SS1 (safe stop 1)

In response to a specific trigger or a safety-relevant error, a safety timer starts. When this has run down the drive is disconnected from the power, so that no further torque is generated and the motor coasts down if necessary. While the safety timer is running down, the drive can be controlled normally and can e.g. be braked in a controlled manner.

Configuration

The different configuration options are defined according to the customer's requirements and set in the factory. This guarantees that the safety function is correctly configured in the system and saves the user the need for onerous setting procedures and separate configuration programs.

Different selection options include:
_ **STO** or **SS1**
_ The desired **SS1** time
_ With or without short-circuit monitoring