CROUZET
MOTORS

Industry

Railway

Renewable energy

dCmind
BRUSHLESS
MOTORS

Motion Control

www.crouzet.com

A brand of CST
CUSTOM SENSORS & TECHNOLOGIES

CROUZET MOTORS

Crouzet Motors, a brand of CST (Custom Sensors & Technologies), is specialized in the core technologies required to design and manufacture high performance DC Geared Motors for use in the most demanding applications.

With a long-term commitment to technological excellence, the engineering teams have mastered the following core technologies and know-how:

- Electromagnetism
- Electromechanical systems
- Thermal dynamics
- Electronic drives

Crouzet Motors's extensive ranges of DC Brush and Brushless Motors have been designed to perform in the most demanding conditions for applications where safety and reliability are key design objectives.

Covering the power range 1 to 400 watts (1/100 to 1/2 hp+) and available with spur, worm and planetary gearboxes plus adapted controllers, the Crouzet Motors' product offering is specifically designed for Medical Equipment, Railways, Aeronautics, Industry, Pumps and Valves.

Special products

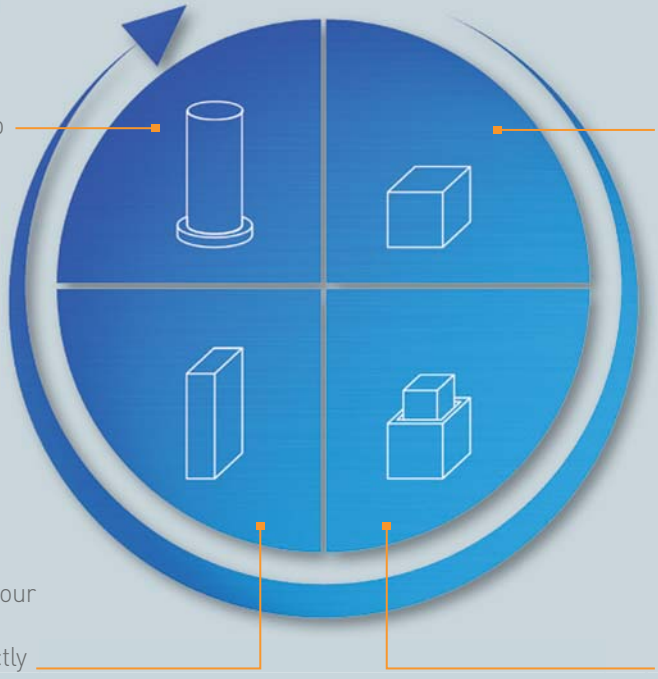
Engineers and teams
Dedicated project

From the very start of a project, Crouzet Motors experts work closely with your teams to develop the specification. All our design, industrialization and approval expertise goes into developing Motion Control solutions that are tailored to your requirements.

Standard products

Sales service

A full range of motors, geared motors and associated controllers. You can create your automation control applications as quickly as possible.



Adapted products

Customer Adaptation Center

Defined in coordination between your project teams and our specialists, these adapted products have exactly the right levels of performance and functionality you need for your applications.

Products with added value

Customer Adaptation Center

All our standard products can have additional factory-mounted auxiliaries or accessories: connectors, leads, special terminals, dedicated shafts, adaptor plates, etc.

Seamless integration in your equipment means you benefit from simpler logistics and optimum installation reliability.

CROUZET MOTORS

CST
CUSTOM SENSORS & TECHNOLOGIES

Custom Sensors & Technologies (CST) is a specialist in sensing, control and motion products.

Through its brands, BEI Kimco, BEI Sensors, BEI PSSC, Crouzet, Crydom, Kavlico, Newall and Systron Donner Inertial, CST offers customizable, reliable and efficient components for mission-critical systems in Aerospace & Defence, Transportation, Energy & Infrastructure, Medical, Food and Beverage and Building Equipment markets.

Focused on premium value offers and committed to excellence, CST, with 4400 employees worldwide and sales of $604M US in 2012, is the dependable and adaptable partner for the most demanding customers.

www.cstsensors.com

The Crouzet Motors team worldwide

- Production sites
- Sales subsidiaries

DCmind Brushless

Crouzet Motors, a specialist in customized motorization solutions, now launches the new generation of High Performance Brushless motors with integrated electronics TNi21 and SMi21.

A pioneer on the European market in 2002 with the Motomate, a Brushless motor with integrated electronics incorporating an intuitive visual programming interface, Crouzet Motors is blazing a new trail for compact standalone applications.

Crouzet Motors, a company continually evolving to meet customer needs, has upgraded its ranges with accessories, gearboxes, new part numbers and now, thanks to these new electronic devices, has enhanced the performance of its products with:

- more power
- more accuracy
- more functions
- simplicity of use and ease of integration.

TWO NEW ELECTRONIC PILOT CONTROL DEVICES

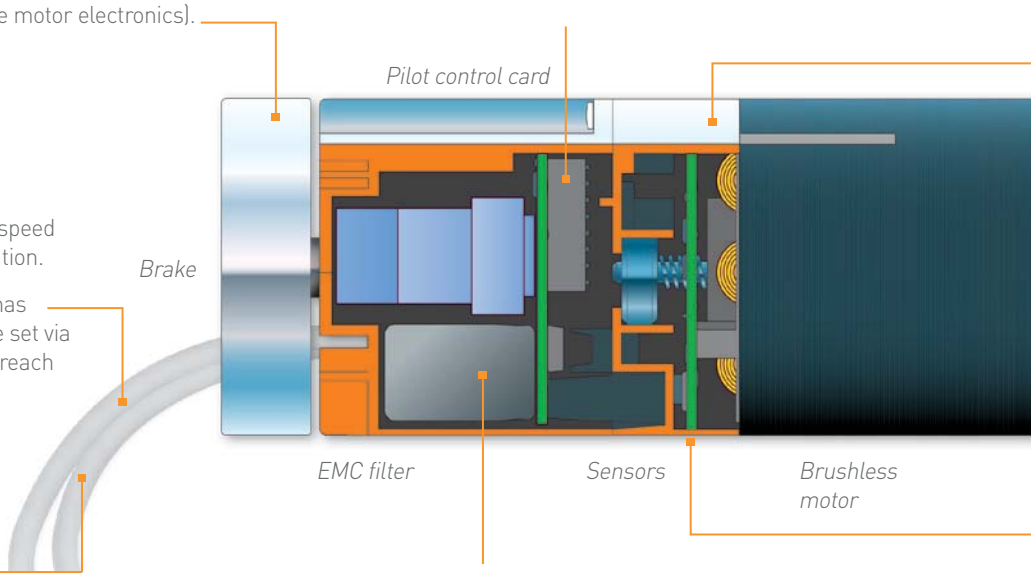
- The TNi21 for simpler applications, dedicated to speed and torque control.
- The SMi21, dedicated to motion control for applications that require accuracy. Thanks to a 4096-point encoder, it offers all the following control functions: position, torque, speed, direction, braking, etc.

Communicating

A micro-USB socket on the motor (SMi21) can be used to link this directly to a PC.

Braking and holding

With or without failsafe holding brake (active braking is performed by the motor electronics).



Control

- TNi21: 4 inputs and 3 outputs, torque and speed control on analog inputs with 10-bit resolution.
- SMi21: 6 inputs and 4 outputs, the motor has a wide selection of programs which can be set via a PC (position, speed and torque) and can reach as many as 64,000 positions.

Power supply

Single supply voltage needed across the whole voltage range:

- TNi21 (10 - 36 VDC)
- SMi21 (9 - 56 VDC)

Filtering and protecting

- Short-circuits, undervoltages
- EMC (received and transmitted)
- Temperature
- Mechanical (vibrations, shocks, etc.)

THE MOTOR'S INTEGRATED ELECTRONICS ALLOW YOU TO:

PRODUCT ADVANTAGES

- **Easy and accurate control** thanks to an optimized control loop
- Improved **safety** with internal thermal protection
- **Safe, reliable operation** as a result of its excellent EMC characteristics, due to the shortest possible wiring and shielding with a metal cover

USER ADVANTAGES

- **Save time** and **improve reliability** due to less wiring and fewer connections.
- **Control the logistic problem** better with fewer part numbers to manage
- **Save space** thanks to a more compact solution

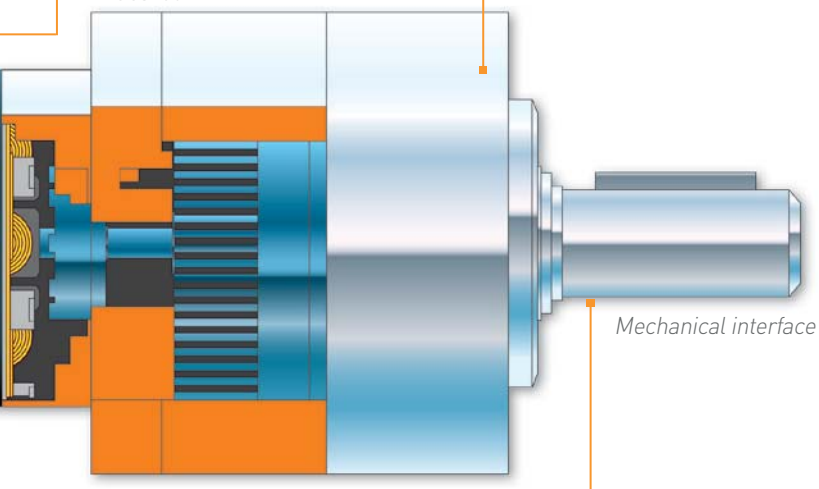
Pilot control

Motor pilot control card for operation in 4 quadrants, sine operation (SMi21) or trapezoidal operation (TNi21).

Gearboxe

Using Crouzet Motors gearboxes, the motor speed and torque can be adapted to your applications from 0.01 to 4000 rpm and 0.1 to 120 Nm (0.9 to 1062 in-lbs).

Gearbox



Mechanical interface

Integration

Crouzet Motors adapts the mechanical interfaces of its solutions for perfect integration in your equipment: fixing plate, transmission shafts, special pinions.

Sensing

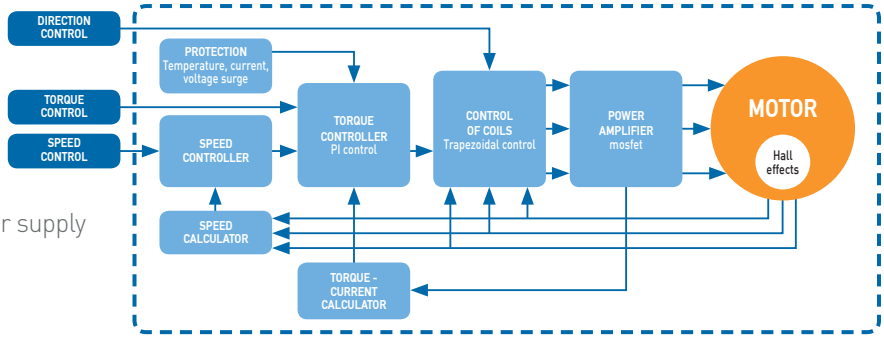
3 Hall effects for identifying the rotor position.

SMi21: plus 1 encoder (4096 pulses per motor revolution) for precision of regulation and sinusoidal power supply to the coils.

Integrated ELECTRONICS

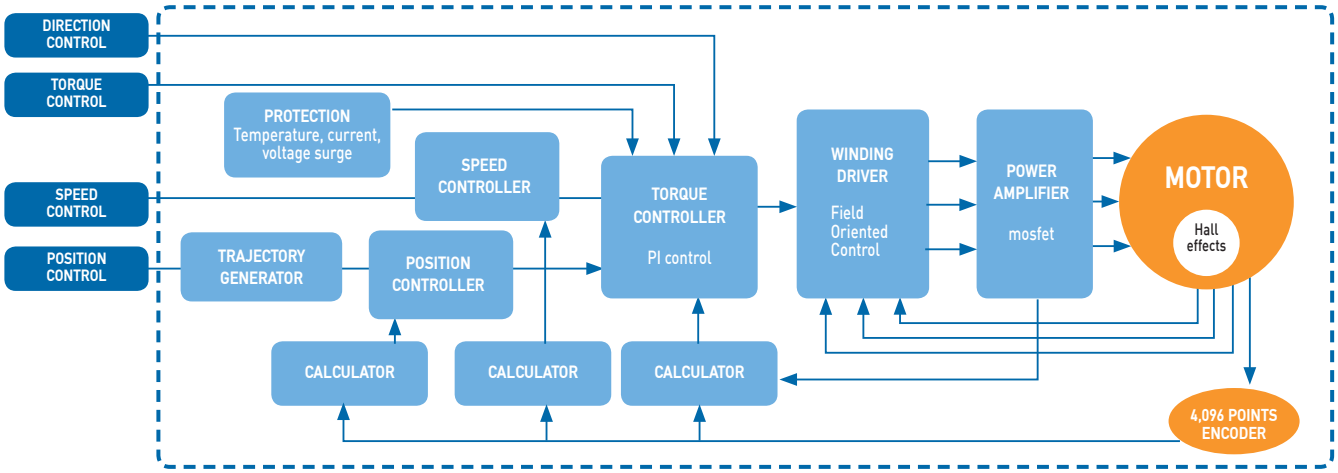
TNi21 SPEED AND TORQUE CONTROL:

- 4 inputs, 3 outputs.
- 2 x 10-bit analog inputs for fine-tuned speed and torque and speed control.
- 4 rejective quadrants.
- Use on its own or in combination with other motors or controlled by a PLC.
- Can be used in production immediately (without setup stage).
- Also suitable for a 12 V or 24 V battery power supply (voltage range between 10 and 36 volts).



SMI21 POSITION, SPEED AND TORQUE CONTROL:

- 6 inputs and 4 outputs, 2 of which are 10-bit analog inputs.
- Intuitive, easy-to-use setup software - with application mode for quick start-up.
- Very flexible thanks to the various programs on offer. All the parameters are adjustable and can be used to optimise application operation.
- Also suitable for a 12 V, 24 V or 48 V battery power supply (voltage range between 9 and 56 volts).
- Low power consumption when idling (1 W).
- Rotor position controlled with 4096-point encoder and use of sinusoidal vector control.
- Reprogramming and re-use of motors as required by changing the application program or by modifying the configuration.
- Firmware updating made easier with the "bootloader" function.
- Use on its own, in combination with other motors or controlled by a PLC.



The new RANGE

MOTOR TYPE		Nominal usable power at 24 VDC	Max. usable power	TYPE OF GEARBOX P52 25 Nm max.	P62 50 Nm max.	P81 120 Nm max.	RAD10 10 Nm max.
80 140 	TNi21	77 W	150 W	80 149 5 TNi21 	80 149 6 TNi21 	-	80 141 0 TNi21 
	SMi21	92 W	184 W	80 149 5 SMi21 	80 149 6 SMi21 	-	80 141 0 SMi21 
80 180 	TNi21	100 W	211 W	-	80 189 6 TNi21 	80 189 7 TNi21 	80 181 0 TNi21 
	SMi21	105 W	314 W	-	80 189 6 SMi21 	80 189 7 SMi21 	80 181 0 SMi21 
80 280 	TNi21	133 W	251 W	-	-	80 289 7 TNi21 	80 281 0 TNi21 
	SMi21	170 W	419 W	-	-	80 289 7 SMi21 	80 281 0 SMi21 

Nominal power ratings may vary according to the supply voltage.

Maximum power ratings are given for the maximum permissible motor voltage.

Example: the 80 280 SMi21 motor develops peak mechanical power of 419 W at 48 VDC.

OPTIONS AND ACCESSORIES

TNi21

- Motors available with or without mechanical brake for holding at breaking current.
- Supplied with 1 control cable and a power supply cable or with a M16 12-pin connector output including all the connections (motors 80140 and 80180).
- Accessory, shielded cable and 12-pin M16 connector.

SMi21

- Motors available with or without mechanical brake for holding at breaking current.
- Requires a standard commercially-available USB/micro-USB cable and the setup software. This can be downloaded free of charge from the Crouzet website or ordered in the form of a "starter kit".

SMi21: DCmind-Soft

Simplified programming

www.crouzet.com

Simple and intuitive software

Available in several languages, with multiple possible uses, at any level of performance.

2 programming modes

- Application approach: Select an application template, then set only those parameters that relate directly to your application. These programs use preset expert programs. You can fine-tune these settings by calling up the corresponding expert program.
- Expert approach: for automation system programs and settings covering a wide range of parameters.

DCmind-Soft

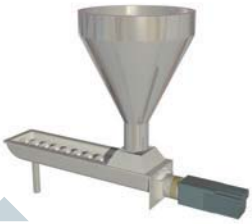
Available on our website **www.crouzet.com**, or can be supplied on a USB stick in the "starter kit".

Applications

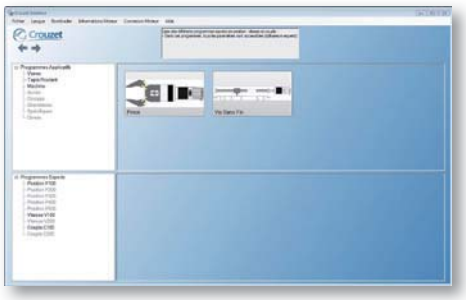
Varied applications where position control, repeated movement and accuracy are key factors.

Stepper operation, detection of thrust and proportional adjustment of forces.

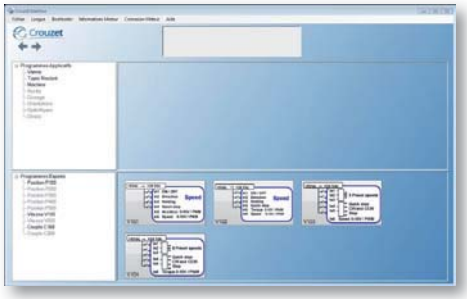
Performing cyclical operation, adjustment of speed and forces. Set to safety mode in the event of a fault.



Several motors combined, operation without a PLC, ease of assembly.



"Application" menu



"Expert" menu

"Parameter definition" mode

CHARACTERISTICS

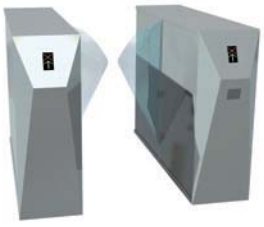
2 languages: English, French, other languages to come (German, Spanish).
Operating system: XP Family, XP Pro, Vista, Windows 7.
Application programs: valve, conveyor belt, clamp, format adjustment, etc.
Expert programs: position, speed, torque with digital and analog inputs.

- Numerous programs are available, offering:
  - 64,000 proportional positions which can be selected by two 0/10V inputs
  - 30 independent positions which can be selected by digital encoding
  - A variety of outputs which can be selected to suit your requirements
  - The option of setting inverted inputs, selecting 0/10V or PWM operation on the analog inputs, and even setting their operating limit stops
  - The option of modifying the control loop PID parameters for difficult applications
  - Automatic detection of the reference position for position control ("homing" function)
- Special programs created on request, firmware updating made easier with the "Bootloader" function
- Loading programs simplified with a USB connection
- Other programs to come, please visit our website

Some examples of applications

Format adjustment, automatic feed, synchronization, flow control, accurate dosage.

Operation on 12 V battery, low consumption.



S curve pilot control and operation on 12 V backup battery.

Speed pilot control

➜ Motors 38 to 145 W nominal output power range TNi21

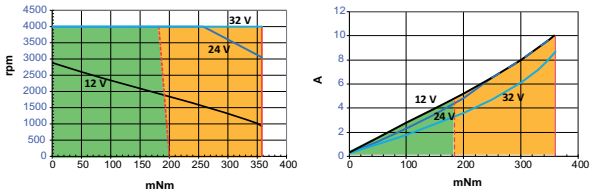
- **For control, speed and torque applications**
- **Very high power density**
- **4 inputs (where 2 of them analog) / 3 outputs integrated electronic controls**
- **Holding torque function**
- **Battery supply compatible 12 V and 24 V**

Part numbers

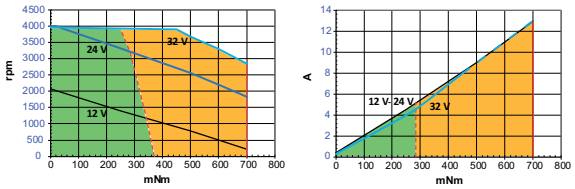
	38 to 75 W			45 to 102 W			72 to 145 W		
Type	80140 TNi21			80180 TNi21			80280 TNi21		
Part numbers									
PWM speed mode, cable output	**80140059**			**80180056**			**80280013**		
0-10 V speed mode, cable output	**80140051**			**80180050**			**80280007**		
PWM speed mode, connector M16 - 12 pins	**80140079**			**80180072**					
0-10 V speed mode, connector M16 - 12 pins	**80140071**			**80180066**					
Nominal power supply range (V⎓)	12 - 32			12 - 32			12 - 32		
Min. max. power supply (V⎓)	10 - 36			10 - 36			10 - 36		
No-load characteristics	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**
Speed of rotation (rpm)	2900	4000	4000	2100	4000	3950	2000	3950	3950
Absorbed current (A)	0.34	0.29	0.27	0.35	0.39	0.34	0.5	0.7	0.6
Nominal characteristics	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**
Speed (rpm)	1900	4000	4000	1250	3350	3900	1400	3250	3900
Absorbed current (A)	5.2	4.4	3.2	6.7	5.4	4	8.5	6.9	6
Torque (mNm)	193	184	178	340	285	250	490	390	355
Output power (W)	38	77	75	45	100	102	72	133	145
Maximal characteristics	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**	**12 V⎓**	**24 V⎓**	**32 V⎓**
Speed (rpm)	1600	3050	4000	1040	2160	3100	800	1900	2400
Absorbed current (A)	6.5	10	10	7.2	11	12	15	15	12.5
Torque (mNm)	250	358	358	400	600	650	1000	1000	1000
Output power (W)	42	114	150	44	136	211	84	199	251
General characteristics									
Regulation (quadrants)	4			4			4		
Conformity to EMC Directive in accordance with (EN 55022)	Class B			Class B			Class B		
Insulation conforming to IEC60085	Class E			Class E			Class B		
Thermal time constant (mn)	20			30			30		
Noise level (dBA)	40			40			50		
Inertia (g.cm^2)	75			115			120		
Number of rotor poles	4			4			8		
Ambient operating temperature (°C)	-30 → +70			-30 → +70			-30 → +70		
Service life (h)	20000			20000			20000		
Ball bearing	✓			✓			✓		
Weight (kg)	0.95			1.34			1.44		
0-10 V or PWM Speed input characteristics									
Input impedance (kΩ)	69			69			69		
Speed control (rpm)	120 → 4000			120 → 4000			120 → 4000		
Level 0 input voltage (V)	0 → 2			0 → 2			0 → 2		
Level 1 input voltage (V)	7.5 → 39			7.5 → 39			7.5 → 39		
Frequency range (Hz)	100 → 2000			100 → 2000			100 → 2000		
0-10 V or PWM Torque input characteristics									
Input impedance (kΩ)	69			69			69		
Torque limit (mNm)	360 → 35			700 → 30			1000 → 40		
Holding limit (mNm)	150 → 35			230 → 30			310 → 40		
Level 0 input voltage (V)	0 → 2			0 → 2			0 → 2		
Level 1 input voltage (V)	7.5 → 39			7.5 → 39			7.5 → 39		
Frequency range (Hz)	100 → 2000			100 → 2000			100 → 2000		
On/Off and Direction digital input characteristics									
Input impedance (kΩ)	57			57			57		
Level 0 input voltage (V⎓)	0 → 2			0 → 2			0 → 2		
Level 1 input voltage (V⎓)	4 → 39			4 → 39			4 → 39		
Torque alarm, Encoder and Direction output characteristics									
Type of output-Maximum admissible current (mA)	PNP			PNP			PNP		
Maximum admissible current (mA)	50			50			50		
IP65 over the whole motor apart from the shaft output. Versions with brake are IP20									
Accessory									
2 metre shielded cable with 12-pin female M16 connector							**15275008**		

Curves

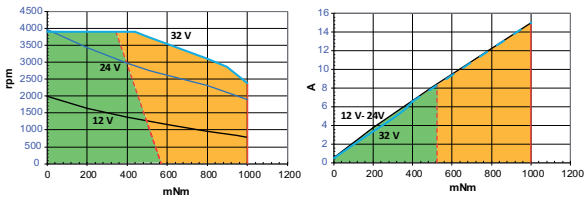
Speed / Torque 80140 TNi21 - Current / Torque 80140 TNi21



Speed / Torque 80180 TNi21 - Current / Torque 80180 TNi21



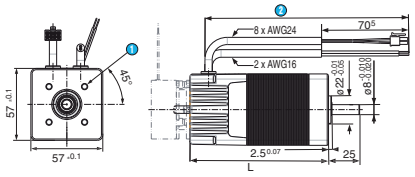
Speed / Torque 80280 TNi21 - Current / Torque 80280 TNi21



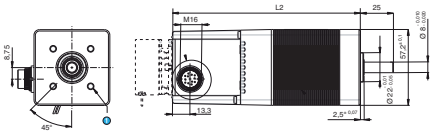
- Continuous running area
- Cycling running area
- Maximum continuous torque
- Maximum peack torque

Dimensions (mm)

Cable output versions



M16 connector version - 12 pins



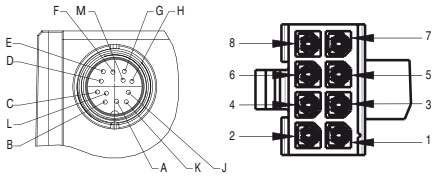
L: 80140: 92 max
L: 80180 / 80280: 112 max

L2: 80140: 123 max
L2: 80180 / 80280: 143 max

More information: see page 16

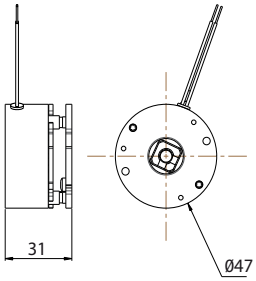
Connections

	Connector M16	Cable color
Power ground	G+M	AWG16 Blue
Power supply 24 V	E+F	AWG16 Brown
Logic ground	H	AWG24 Black (5)
Input 1: On/Off	C	AWG24 Green (1)
Input 2: Direction	B	AWG24 Yellow (2)
Input 3: Speed	J	AWG24 Orange (4)
Output 1: Tachometer	A	AWG24 Brown (6)
Output 2: Real direction	L	AWG24 Red (8)
Input 4: Torque	D	AWG24 Blue (3)
Output 3: Torque at max.	K	AWG24 Purple (7)

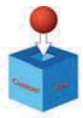


Options

Holding brake 0.5 Nm - 24 V⎓



Product adaptations



- **Shaft, pinion, pulley dimensions**
- **Cable wire length**
- **Powerful controlled brake (directed)**
- **Programs evolution**

User information

Notice available on website, please read it before use.

DCmind: Brushless motors

➜ Motors 34 to 192 W nominal output power range SMi21

- **Servomotor for position, speed and torque control applications**
- **Very high power density**
- **Built-in electronics with 6 inputs (2 of which are analog) and 4 outputs**
- **Built-in 4096-pulse encoder**
- **With application programs already debugged and saved in the motor**
- **Expert programs can be used to adapt to the requirements of difficult applications**
- **Parameters set on the PC via USB connection**
- **Integrated bootloader for embedding special customer firmware**

Parts number

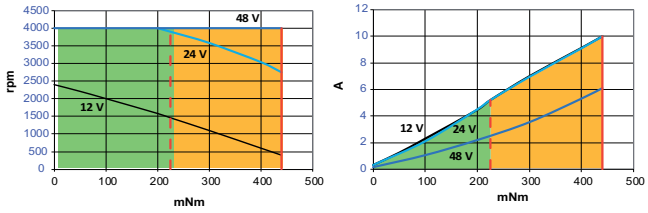
	34 to 94 W			40 to 145 W			82 to 192 W		
Type	80140 SMi21			80180 SMi21			80280 SMi21		
Part numbers									
IP65 option	**80140043**			**80180044**			**80280001**		
Holding torque brake 0.5 Nm option	**80140044**			**80180045**			**80280002**		
Nominal operating range (V⎓)	12 - 48			12 - 48			12 - 48		
Min. max. operating range (V⎓)	9 - 56			9 - 56			9 - 56		
No-load characteristics	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**
Speed of rotation (rpm)	2400	4000	4000	1700	3500	4000	1500	3050	4000
Absorbed current (A)	0.3	0.3	0.2	0.3	0.33	0.2	0.38	0.44	0.35
Nominal characteristics	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**
Speed (rpm)	1460	3900	4000	1100	2900	4000	1100	2863	4000
Torque (mNm)	225	225	225	350	350	350	685	565	460
Absorbed current (A)	5.2	5.2	2.6	5.65	5.40	3.65	10	8	5
Output power (W)	34	92	94	40	105	145	82	170	192
Maximal characteristics	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**	**12 V⎓**	**24 V⎓**	**48 V⎓**
Speed of rotation (rpm)	1100	3000	4000	1000	2400	4000	740	2250	4000
Torque (mNm)	300	400	440	400	600	750	1000	1000	1000
Absorbed current (A)	7	9.5	6.1	6.4	10	10.1	14	14	11.5
Output power (W)	34	125	184	42	151	314	77	235	419
General characteristics									
Rotor inertia (gcm²)	75			115			120		
Number of rotor poles	4			4			8		
Ambient operating temperature (°C)	-30 → +70			-30 → 70			-30 → +70		
Service life (h)	20000			20000			20000		
Ball bearing	✓			✓			✓		
Weight (kg)	1.17			1.52			1.62		
Integrated software									
Applications software	✓			✓			✓		
Positioning mode	✓			✓			✓		
Speed mode	✓			✓			✓		
Torque mode	✓			✓			✓		
Inputs / Outputs									
Analog inputs (PWM and 0-10 V)	2			2			2		
Digital inputs	4			4			4		
(PWM) output	2			2			2		
Digital output	2			2			2		
IP65 over the whole motor apart from the shaft output. Versions with brake are IP20									
Accessory									
Starter kit, DCmind soft program and USB cable							**79298008**		

Product adaptations

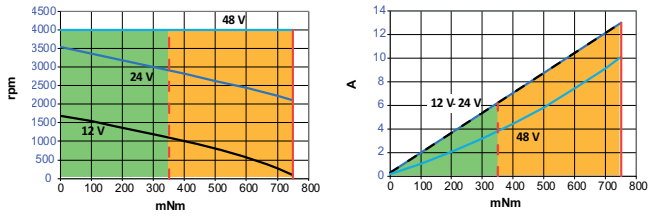
- **Other specific applications software**
- **Specific PC interface**
- **Special cable lenght**
- **Special shaft**
- **Other connectors**

Curves

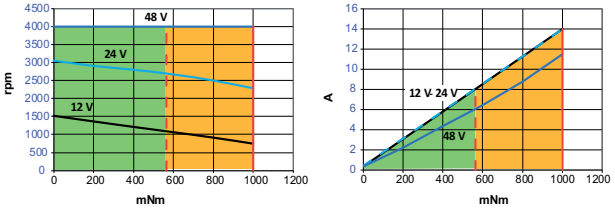
Speed / Torque 80140 SMi21- Current / Torque 80140 SMi21



Speed / Torque 80180 SMi21 - Current / Torque 80180 SMi21



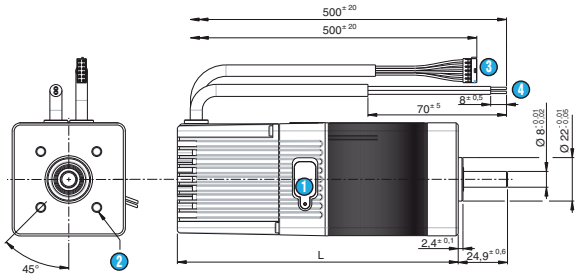
Speed / Torque 80280 SMi21- Current / Torque 80280 SMi21



- Continuous running area
- Cycling running area
- Maximum continuous torque
- Maximum peack torque

Dimensions (mm)

80140 - 80180 - 80280 SMi21



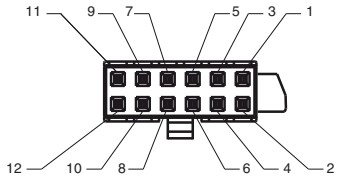
1. USB connection type A or B
2. 4 x M5 over Ø 40 depth 4.5
3. Command cable 12 x AWG26
4. Power cable 2 x AWG16

L: 80140: 123 max
L: 80180 / 80280: 143 max

More information: see page 16

Connection

Connector (Molex 0430251200)



Pin	Logic cable	
	Description	Wires color
1	Input 1 - logic	Green
2	Input 2 - logic	Yellow
3	Input 3 - logic	White
4	Input 4 - logic	White-brown
5	Input 5 - analog	Blue
6	Input 6 - analog	Orange
7	0 V⎓	Black
8	0 V⎓	White-black
9	Output 1 - PWM	Brown
10	Output 2 - PWM	Purple
11	Output 3 - logic	Reed
12	Output 4 - logic	Grey

Power cable	
Description	Wires color
+12 V⎓ ➡ 48 V⎓	Brown
0 V⎓	Blue

User information

Notice available on website, please read it before use.

Gearboxes for DCmind Brushless range

➜4 to 120 Nm

- **Planetary and worm gearboxes**
- **Shafts on ball bearings**
- **Long service life**
- **IP65**




Part numbers

Gearboxes	Planetary Ø 52			Planetary Ø 62			Planetary Ø 81			Worm
Type	810495			810496			810497			810410
Associated motors	**Part number**			**Part number**			**Part number**			**Part number**
80140 TNi21	801495 TNi21			801496 TNi21						801410 TNi21
80180 TNi21				801896 TNi21			801897 TNi21			801810 TNi21
80280 TNi21							802897 TNi21			802810 TNi21
80140 SMi21	801495 SMi21			801496 SMi21						801410 SMi21
80180 SMi21				801896 SMi21			801897 SMi21			801810 SMi21
80280 SMi21							802897 SMi21			802810 SMi21
Gearbox characteristics										
Number of stages	1	2	3	1	2	3	1	2	3	1
Maximum permitted torque (Nm)	4	12	25	8	25	50	20	60	120	10
Efficiency	0.8	0.75	0.7	0.9	0.8	0.7	0.9	0.8	0.7	0.6 ➞ 0.3
Axial dynamic load (daN)	6	10	15	7	10	15	8	12	20	10
Radial dynamic load (daN)	20	32	45	24	36	52	40	60	100	15
Operating temperature	-20 ➞ +70°C			-20 ➞ +70°C			-20 ➞ +70°C			-20 ➞ +70°C
Weight (kg)	0.7	0.8	1.1	0.8	1.2	1.6	1.8	2.5	3.2	0.7
Standard reduction ratios	6.75	25 46	93 169 308	5.16 6.75	19 27 46	100 139 236 308	5	19 27	100 139 236	5 - 10 - 20 - 30 - 50
Other ratios possible										15 - 100
Comments										

Ø 52 planetary gearbox: Metal gears on all stages. IP65 apart from the output shaft.

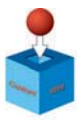
Ø 62 planetary gearbox: On the first stage, the planet gears are made of composite materials which improve efficiency and service life. On the other stages, the metal gears turn on needle bearings. IP65 apart from the output shaft.

Ø 81 planetary gearbox: All gears are metal and turn on needle bearings, resulting in excellent robustness and a very long service life. IP65 apart from the output shaft.

Worm gearbox: This gearbox combines a tempered steel worm and a hard bronze helical gear wheel, thus ensuring a long service life. The wheel is coated with grease, ensuring an excellent slip coefficient and good heat dissipation. O-rings and lipseals are used in combination with a compression spring to create a tight seal at the gearbox output shaft and the motor input shaft. IP65 gearbox.

The casing is made of aluminium to maximise heat exchanges with its supporting surface on the machine.
However, due to the high power that can be transmitted by this gearbox and the low efficiency inherent in large worm gearbox reduction ratios, make sure that the gearbox casing temperature does not exceed 75°C during operation.
The output shaft can be placed on the right or left, or can be a double shaft (shaft output on both sides).

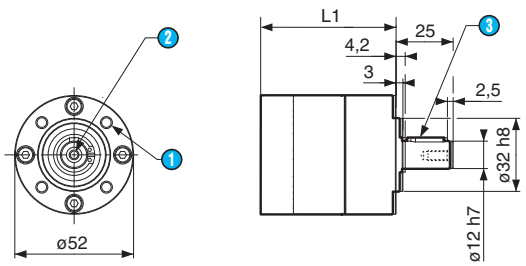
Made to order products, available on request



- **Special shafts**
- **Other reduction ratios**
- **Other fixing holes**
- **Special mounting flange**

Dimensions (mm)

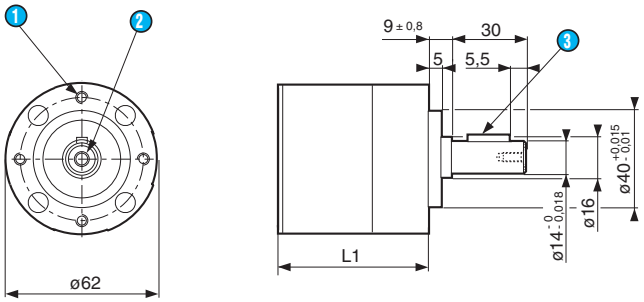
Planetary gearbox Ø 52 (810495)



1. 4 x M5 at 90°, depth 10 over Ø 40
2. M4 x 10
3. Parallel key 4 x 4 x 16 DIN 6885 A

L1 1 stage: 55.3 ± 0.5
L1 2 stages: 69.5 ± 0.5
L1 3 stages: 83.7 ± 0.5

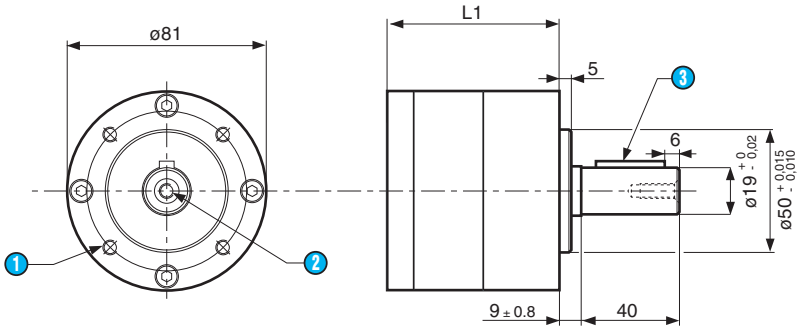
Planetary gearbox Ø 62 (810496)



1. 4 x M5 at 90°, depth 10 over Ø 52
2. M5, depth 12.5
3. Parallel key 5 x 5 x 18 DIN 6885 A

L1 1 stage: 52.1 ± 0.7
L1 2 stages: 67.9 ± 0.7
L1 3 stages: 83.8 ± 0.7

Planetary gearbox Ø 81 (810497)

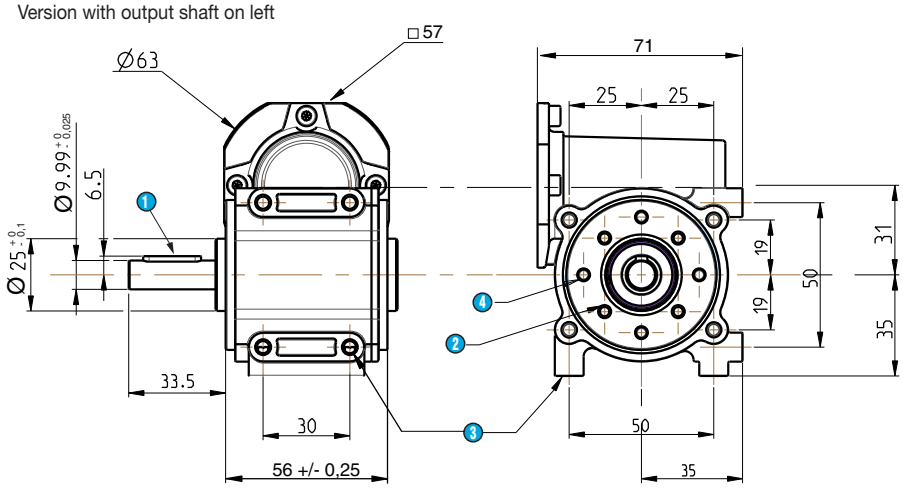


1. 4 x M6, depth 12 over Ø 65
2. M6 x 16
3. Parallel key 6 x 6 x 28 DIN 6885 A

L1 1 stage: 70.5 ± 0.6
L1 2 stages: 92.2 ± 0.6
L1 3 stages: 113.8 ± 0.6

Worm gearbox RAD10

Version with output shaft on left

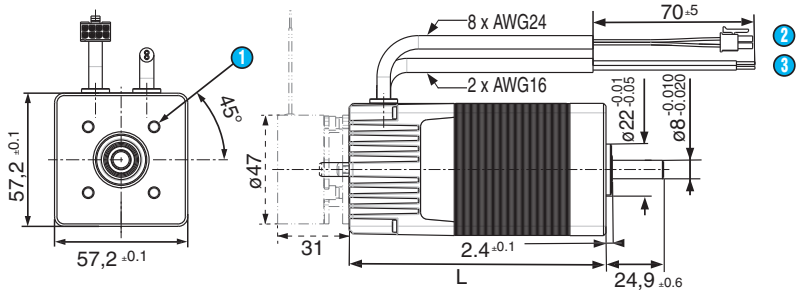


1. Parallel key 4 x 4 x 20 DIN6885
2. 4 x M4, depth 8 over Ø 36
3. 8 x M5, depth 8
4. 4 x Ø 3.8 depth 10 over Ø 40

The left-hand and right-hand sides of the gearbox are identical.

Dimensions (mm)

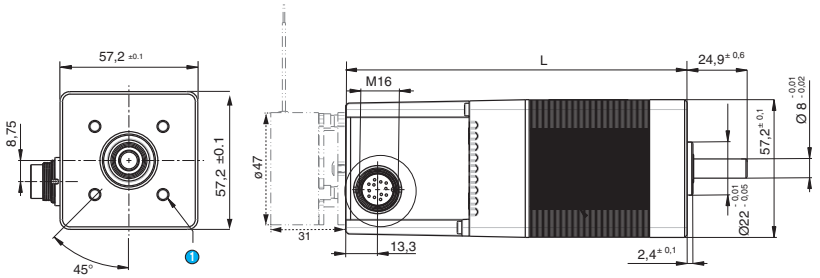
80140 - 80180 - 80280 - TNi21 version output cable with or without brake



L 80140: 92 max.
L 80180: 112 max.
L 80280: 112 max.

1. 4 x M5 at 90°, depth 6 over Ø 40
2. Command cable 8 x AWG24 / 500 mm
3. Power cable 2 x AWG16 / 500 mm

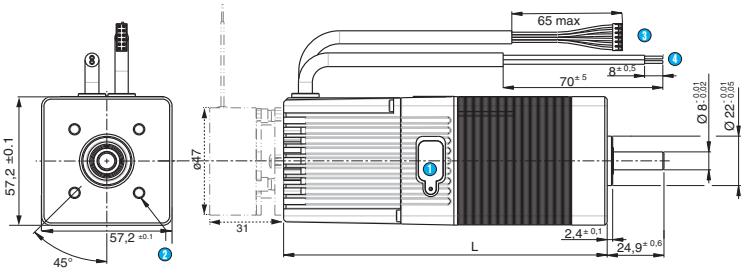
80140 - 80180 - TNi21 version connector M16 - 12 pins with or without brake



L 80140: 123 max.
L 80180: 143 max.

1. 4 x M5 at 90°, depth 6 over Ø 40

80140 - 80180 - 80280 - SMi21 with or without brake

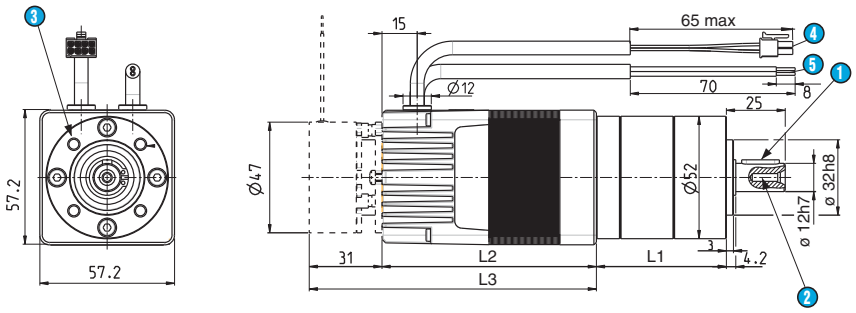


L 80140: 123 max.
L 80180: 143 max.
L 80280: 143 max.

1. USB connection type A or B
2. 4 x M5 at 90°, depth 6 over Ø 40
3. Command cable 10 x AWG24 / 500 mm
4. Power cable 2 x AWG16 / 500 mm

Dimensions (mm)

801495 - TNi21 + P52 with or without brake



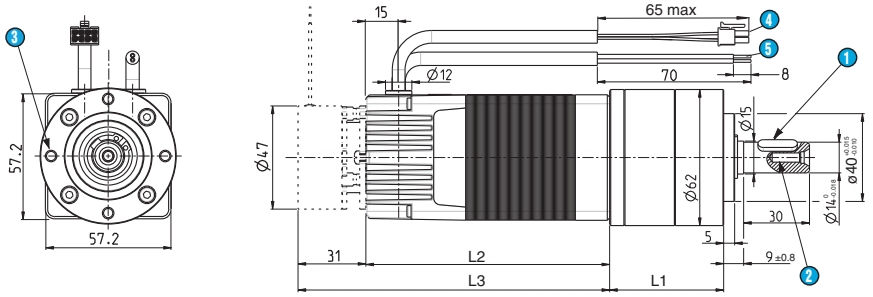
L1 1 stage: 55.3 ±0.5
L1 2 stages: 69.5 ±0.5
L1 3 stages: 83.7 ±0.5

L2 80140: 92 max.

L3 80140: 123 max.

1. Parallel key 4 x 4 x 16 DIN 6885 A
2. M4 x 10
3. 4 x M5 at 90°, depth 10 over Ø 40
4. Command cable 8 x AWG24 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801496 - 801896 - TNi21 + P62 with or without brake



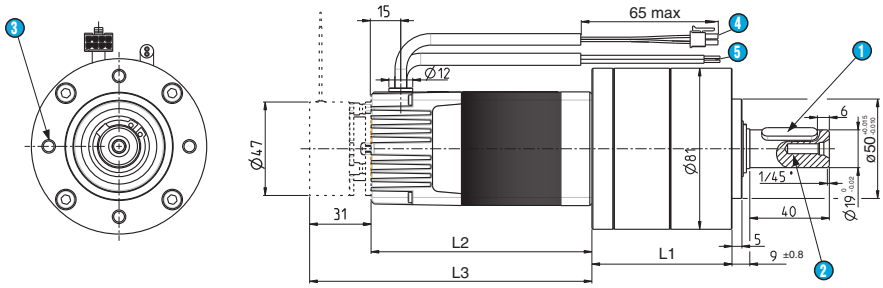
L1 1 stage: 52.1 ±0.7
L1 2 stages: 67.9 ±0.7
L1 3 stages: 83.8 ±0.7

L2 80140: 92 max.
L2 80180: 112 max.

L3 80140: 123 max.
L3 80180: 143 max.

1. Parallel key 5 x 5 x 18 DIN 6885 A
2. M5 x 12
3. 4 x M5 at 90°, depth 10 over Ø 52
4. Command cable 8 x AWG24 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801897 - 802897 - TNi21 + P81 with or without brake



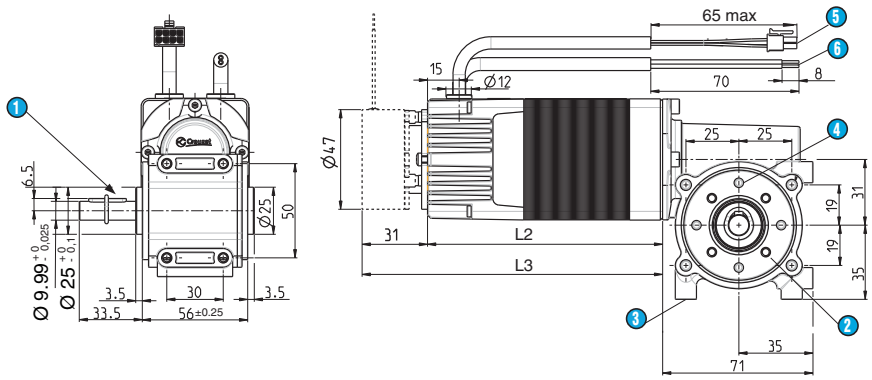
L1 1 stage: 70.5 ±0.6
L1 2 stages: 92.2 ±0.6
L1 3 stages: 113.8 ±0.6

L2 80180-80280: 112 max.

L3 80180-80280: 143 max.

1. Parallel key 6 x 6 x 28 DIN 6885 A
2. M6 x 16
3. 4 x M6 at 90°, depth 12 over Ø 65
4. Command cable 8 x AWG24 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801410 - 801810 - 802810 - TNi21 + RAD10 with or without brake



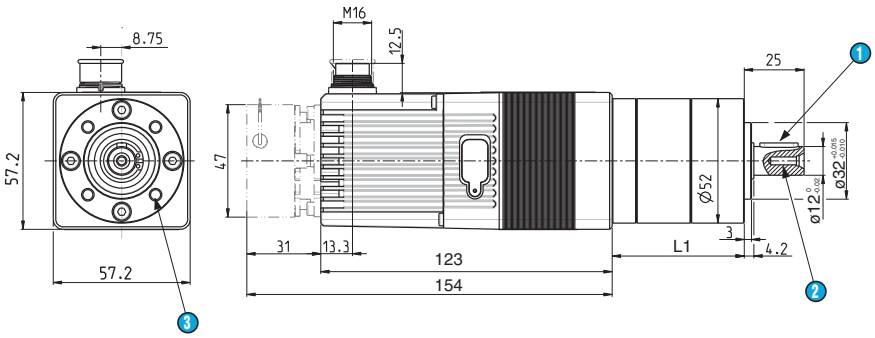
L2 80140: 92 max.
L2 80180-80280: 112 max.

L3 80140: 123 max.
L3 80180-80280: 143 max.

1. Parallele key 4 x 4 x 20 DIN 6885 A
2. 4 x M4, depth 8 over Ø 36
3. 8 x M5 depth 8
4. 4 x Ø 3,8, depth 10 over Ø 40
5. Command cable 8 x AWG24 / 500 mm
6. Power cable 2 x AWG16 / 500 mm

Dimensions (mm)

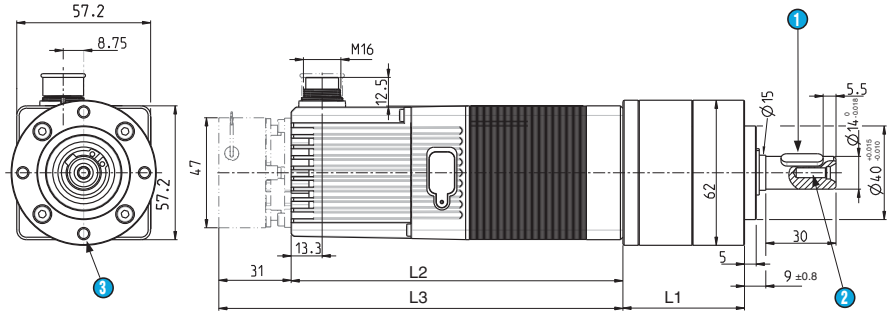
801495 - TNi21 + P52 M16 connector with or without brake



L1 1 stage: 55.3 ±0.5
L1 2 stages: 69.5 ±0.5
L1 3 stages: 83.7 ±0.5

1. Parallel key 4 x 4 x 16 DIN 6885 A
2. M4 x 10
3. 4 x M5 at 90°, depth 10 over Ø 40

801496 - 801896 - TNi21 + P62 M16 connector with or without brake



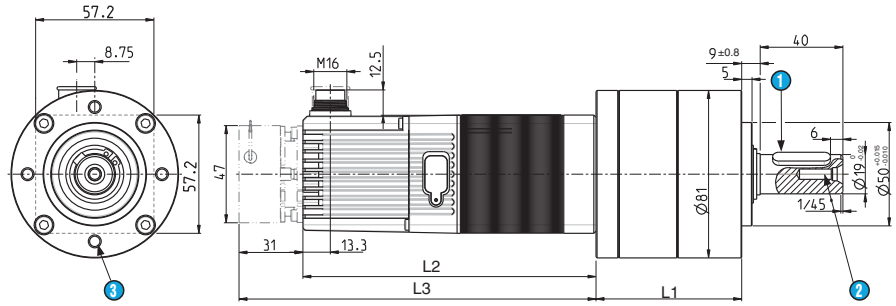
L1 1 stage: 52.1 ±0.7
L1 2 stages: 67.9 ±0.7
L1 3 stages: 83.8 ±0.7

L2 80140: 123 max.
L2 80180: 143 max.

L3 80140: 154 max.
L3 80180: 174 max.

1. Parallel key 5 x 5 x 18 DIN 6885 A
2. M5 x 12
3. 4 x M5 at 90°, depth 10 over Ø 52

801897 - TNi21 + P81 M16 connector with or without brake

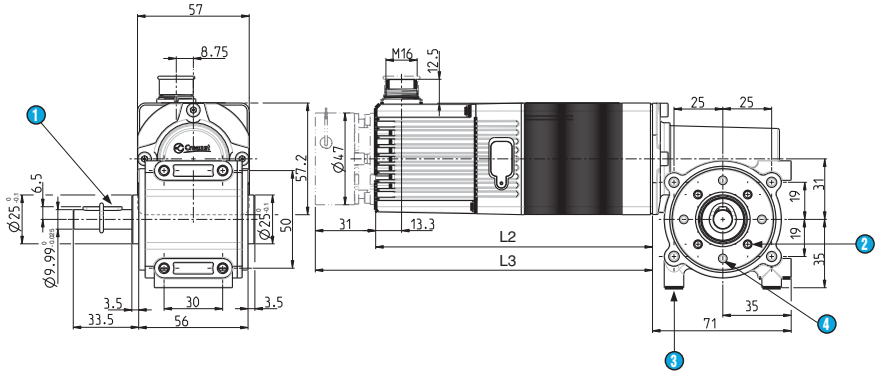


L1 1 stage: 70.5 ±0.6
L1 2 stages: 92.2 ±0.6
L1 3 stages: 113.8 ±0.6

L2 80140: 143 max.
L3 80140: 174 max.

1. Parallel key 6 x 6 x 28 DIN 6885 A
2. M6 x 16
3. 4 x M6, depth 12 over Ø 65

801410 - 801810 - 802810 - TNi21 + RAD10 M16 connector with or without brake



L2 80140: 123 max.
L2 80180-80280: 143 max.

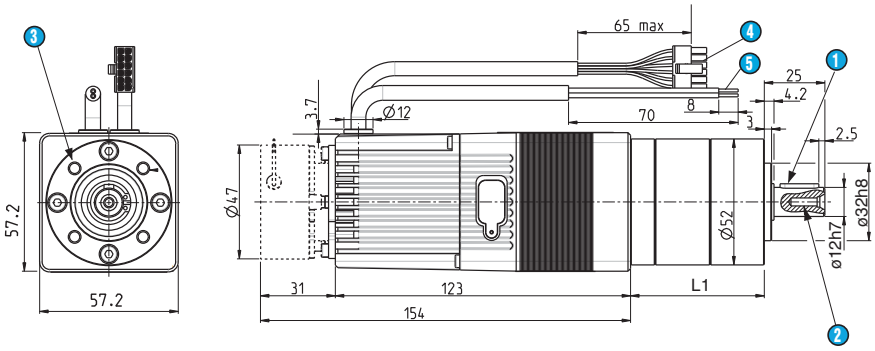
L3 80140: 154 max.
L3 80180-80280: 174 max.

1. Parallel key 4 x 4 x 20 DIN 6885 A
2. 4 x M4, depth 8 over Ø 36
3. 8 x M5, depth 8
4. 4 x 3.8, depth 10 over Ø 40

DC geared DCmind Brushless SMi21

Dimensions (mm)

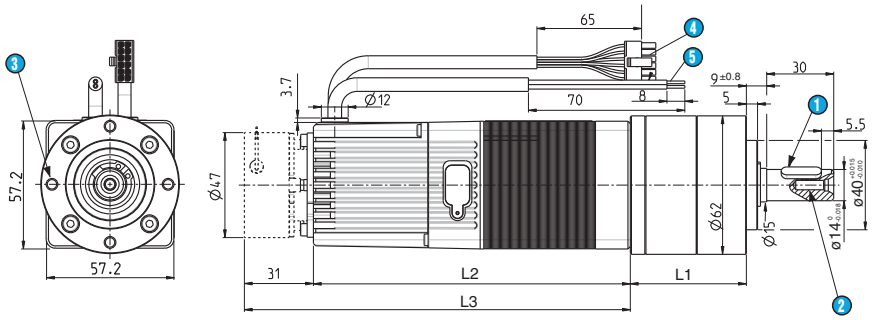
801495 - SMi21 + P52 with or without brake



L1 1 stage: 55.3 ±0.5
L1 2 stages: 69.5 ±0.5
L1 3 stages: 83.7 ±0.5

1. Parallel key 4 x 4 x 16 DIN 6885 A
2. M4 x 10
3. 4 x M5 at 90°, depth 10 over Ø 40
4. Command cable 12 x AWG26 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801496 - 801896 - SMi21 + P62 with or without brake



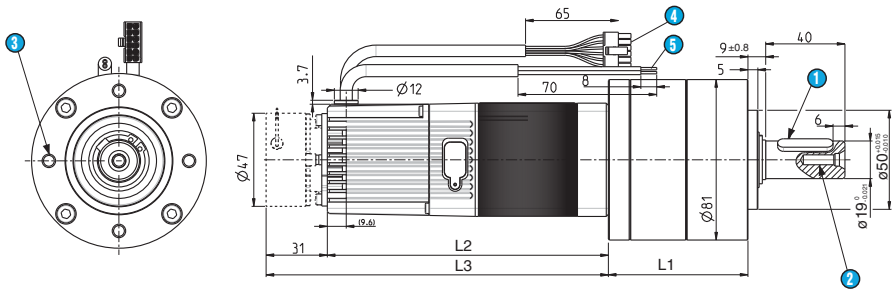
L1 1 stage: 52.1 ±0.7
L1 2 stages: 67.9 ±0.7
L1 3 stages: 83.8 ±0.7

L2 80140: 123 max.
L2 80180: 143 max.

L3 80140: 154 max.
L3 80180: 174 max.

1. Parallel key 5 x 5 x 18 DIN 6885 A
2. M5 x 12
3. 4 x M5 at 90°, depth 10 over Ø 52
4. Command cable 12 x AWG26 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801897 - 802897 - SMi21 + P81 with or without brake

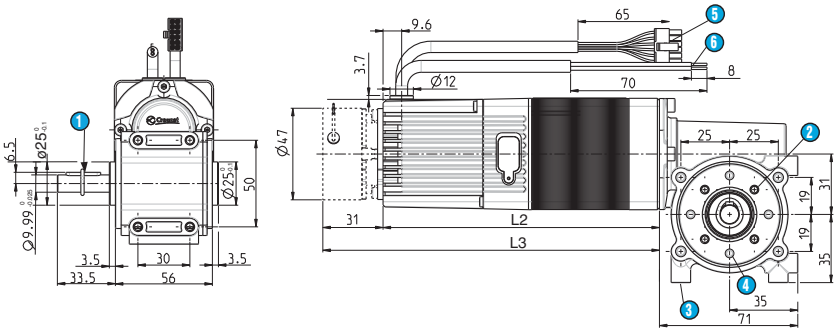


L1 1 stage: 70.5 ±0.6
L1 2 stages: 92.2 ±0.6
L1 3 stages: 113.8 ±0.6

L2 80180 - 80280: 143 max.
L3 80180 - 80280: 174 max.

1. Parallel key 6 x 6 x 28 DIN 6885 A
2. M6 x 16
3. 4 x M6 at 90°, depth 12 over Ø 65
4. Command cable 12 x AWG26 / 500 mm
5. Power cable 2 x AWG16 / 500 mm

801410 - 801810 - 802810 - SMi21 + RAD10 with or without brake



L2 80140: 123 max.
L2 80180 - 80280: 143 max.

L3 80140: 154 max.
L3 80180 - 80280: 174 max.

1. Parallel key 4 x 4 x 20 DIN 6885 A
2. 4 x M4, depth 8 over Ø 36
3. 8 x M5, depth 8
4. 4 x Ø 3.8, depth 10 over Ø 40
5. Command cable 12 x AWG26 / 500 mm
6. Power cable 2 x AWG16 / 500 mm

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