

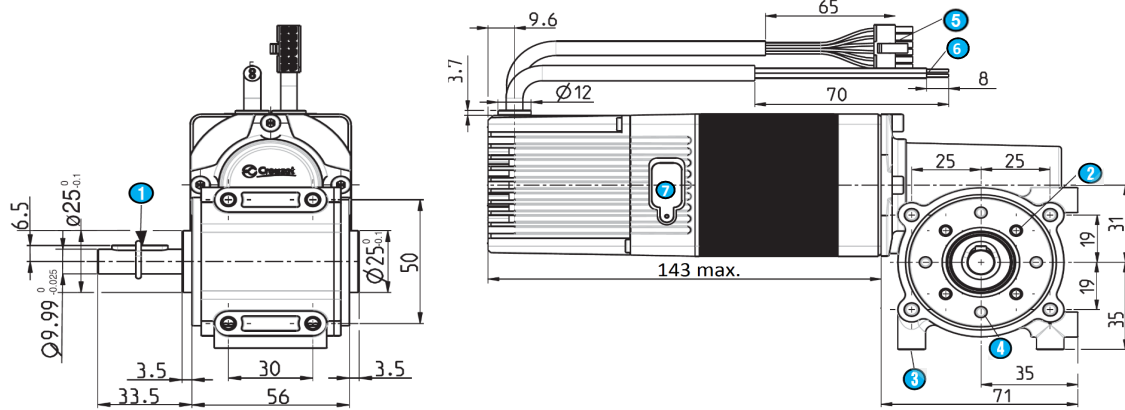
# DCmind Brushless gearmotor

## Data sheet

**80 281 017**  
ratio 10

Series

**80 281 0 SMI21**



- 1 Parallel key 4 x 4 x 20 DIN6885A
- 2 4 x M4, depth 8 over diameter 36 mm
- 3 8 x M5, depth 8
- 4 4 x holes D. 3,8 mm, depth 10 over diameter 40 mm
- 5 Input - Output cable / 500 mm + 20
- 6 Power supply cable / 500 mm + 20
- 7 Micro-USB B connector

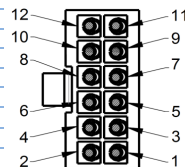
## General characteristics

Power supply		
Direct current voltage supply		✓
Nominal voltage range (6)	Vdc	12 -> 72
Max. current	A	14

Gearmotor type		80 281 0 SMI21
Motor type		80 280 001
Gearbox type		81 041 0
Gear ratio		10
Shaft output		Left
Max. allowed torque	Nm	10
Max. gear play	°	0,50

Motor characteristics (1)	12 Vdc	24 Vdc	48 Vdc	
<b>At no load</b>				
Max. output speed	rpm	150	300	400
Current at the max output speed (7)	A	0,39	0,43	0,36
Standby current	A	0,1	0,05	0,025
<b>At nominal</b>				
Speed	rpm	118	238	391
Torque (4)	Nm	3,1	2,7	2,2
Output power	W	38	67	90
Current	A	8,90	8,00	4,80
Efficiency	%	36	35	39
<b>At max. output power</b>				
Speed	rpm	97	190	363
Torque (4)	Nm	4,8	4,8	4,8
Output power	W	49	95	182
Current	A	13,80	14,00	10,20
Efficiency	%	29	28	37
<b>At peak torque</b>				
Speed	rpm	97	190	363
Torque (4)	Nm	4,8	4,8	4,8
Output power	W	49	95	182
Current	A	13,80	14,00	10,20
<b>Others</b>				
Weight	kg	2,32		
Noise level	dBA	50		

Connecting	
<b>Input - Output cable</b>	With Molex connector ref: 43025-1200
Output cable, UL style 2464 80°C 300V - 12 wires AWG26	
Input 1 (digital)	1 - Green
Input 2 (digital)	2 - Yellow
Input 3 (digital)	3 - White
Input 4 (digital)	4 - White/brown
Input 5 (analogic)	5 - Blue
Input 6 (analogic)	6 - Orange
0V	7 - Black
0V	8 - White/black
Output 1 (digital - PWM)	9 - Brown
Output 2 (digital - PWM)	10 - Purple
Output 3 (digital)	11 - Red
Output 4 (digital)	12 - Gray
<b>Power supply cable</b>	
Cable UL style 2517 105°C 300V - 2 wires AWG16	
+ 12Vcc -> + 75 Vcc (6)	Brown
0V	Blue
<b>Connector for settings</b>	
Connector type	Micro-USB B



Drive	
<b>Type</b>	<b>SMI21</b>
Built-in drive	✓
Internal encoder	4096 pulses/turn
Setting software on PC	DCmind Soft
<b>Control</b>	
Position - speed - torque	✓
4 quadrants with regenerative energy	✓
Type "Field Oriented Control"	✓
Pulse counter range	+ - 31 bits
<b>Security</b>	
Output cut-short	✓
Input inverted	✓
Low voltage	Vdc < 8
Short high voltage (6)	Vdc > 100
Internal drive temperature protection (2)	°C 110
Drive temperature allowing to restart	°C 90

Generic parameters	
Motor for direct current supply	✓
Output shaft with ball bearings	✓
Max. Radial force (12mm from front face)	N 150
Max. axial force (5)	N 100
Temperature range	CEI60068-2-1/2 °C -30 -> +70
Storage temperature	°C -40 -> +80
Dielectric (1s/2mA/50Hz)	CEI60335 Vac 1 000
Motor insulation	CEI60085 class E
Salt spray	CEI60068-2-52 level 2
Degree of protection (output shaft not included)	CEI60529 IP 65
<b>EMC</b>	
Electrostatic Discharge	CEI61000-4-2 level 3
Radiated radio frequency	CEI61000-4-3 level 3
Electrical fast transient / burst test	CEI61000-4-4 level 3
Surge test	CEI61000-4-5 level 1
Conducted disturbances	CEI61000-4-6 level 3
Radiated emission	EN55022 class A
<b>Approvals</b>	
ROHS	2011/65/UE ✓
EC	2014/30/UE ✓

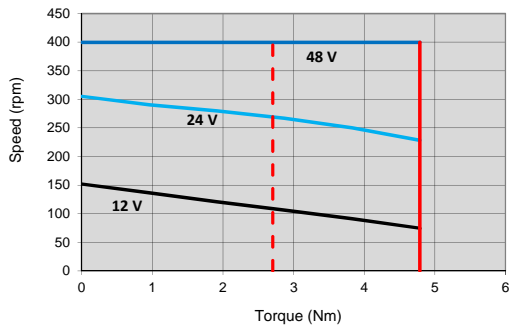
Notes	
Values without tolerance, are average production values.	
Added informations are in "SMI21 manual and security". Available on <a href="http://www.crouzet-motors.com">www.crouzet-motors.com</a> and in the "Discovery kit"	
Motor not protected in case of reversed power voltage	
(1) Cold motor, 20 °C ambient temperature, full speed	
(2) With max.torque (limit tab ) lower than peack torque	
(4) Max torque for continuous operation at 20 ° C, decrease this value for higher ambient temperature	
(5) Pinion or pulley fitting are done at the Crouzet factory, before final assembly.	
(6) Value upgraded in September 2015. The value was different before to this date.	
(7) Value without gearbox. With gearbox, the value increases and varies depending on grease temperature.	

## Drive electrical datas

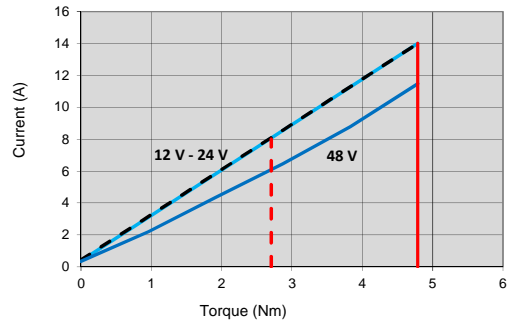
Absolute maximum ratings			
<b>Parameters</b>			
Max. voltage supply "Vcc max" (6)	Vdc		100
Max. current "Icc max"	A		14
Max. voltage on inputs "Vin max"	Vdc		50 / 75
Max. voltage on outputs "Vout max" (6)	Vdc		100
Max. output current "Iout max"	mA		50
Running datas			
<b>Parameters</b>			
Voltage supply "Vcc" (6)	Vdc	Min.	Typical
Current "Icc"	A		Max.
Standby power "Wo"	W		
Speed setting (6)	rpm		
Torque setting	Nm		

Input datas				
<b>Parameters</b>				
Impedance - Input 1, 2, 3, 4	$\Omega$	Min.	Typical	Max.
Impedance - Input 5, 6	$\Omega$			
Low level - Input 1, 2, 3, 4	Vdc			
High level - Input 1, 2, 3, 4	Vdc			
Low level - Input 5, 6	Vdc			
High level - Input 5, 6	Vdc			
Output datas				
<b>Parameters</b>				
Low level Output 1, 2, 3, 4	Vdc	Min.	Typical	Max.
with "pull down resistor" = 4,7K $\Omega$ and Vcc = 24 V				
High level Output 1, 2, 3, 4	Vdc			
with "pull down resistor" = 4,7K $\Omega$ and Vcc = 24 V				
= voltage supply added from eventual rejective voltage				
Notes				
Outputs can be destroyed if they are connected to zero ground or to a capacitive load				

## Speed-torque and current-torque curves

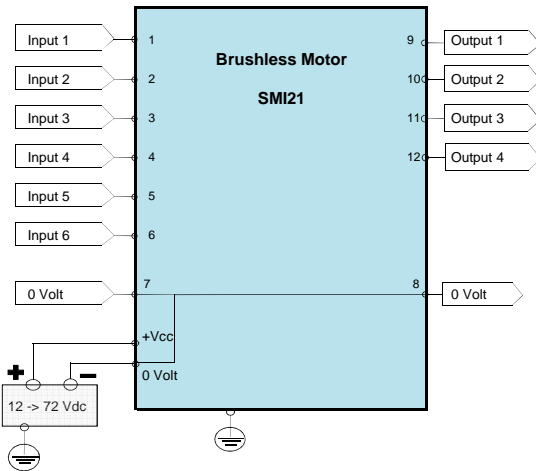


..... Nominal torque



— Peak torque

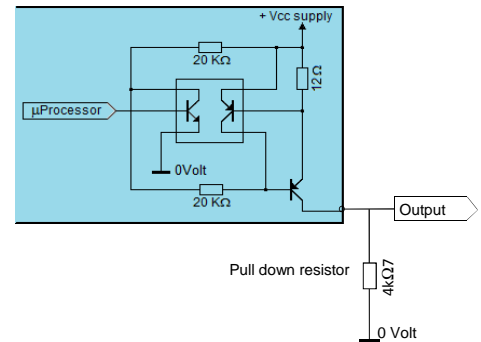
## Wiring



## Output equivalent circuit

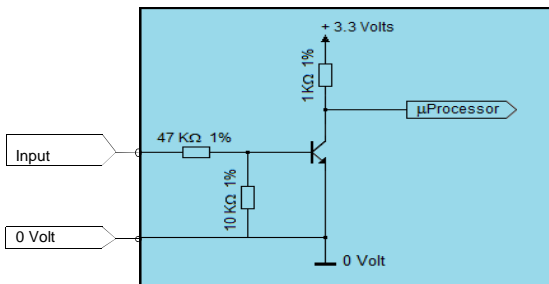
### Output 1,2,3,4

Add a pull down resistor

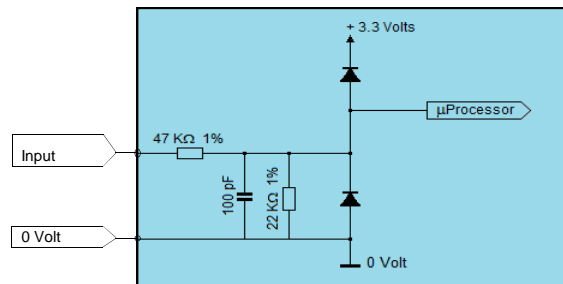


## Input equivalent circuit

### Inputs 1, 2, 3, 4



### Inputs 5, 6



## Accessory

Discovery kit	
Part number	79 298 008
Includes: a MicroUSB - USB cable and a memory stick with DCmind Soft program	