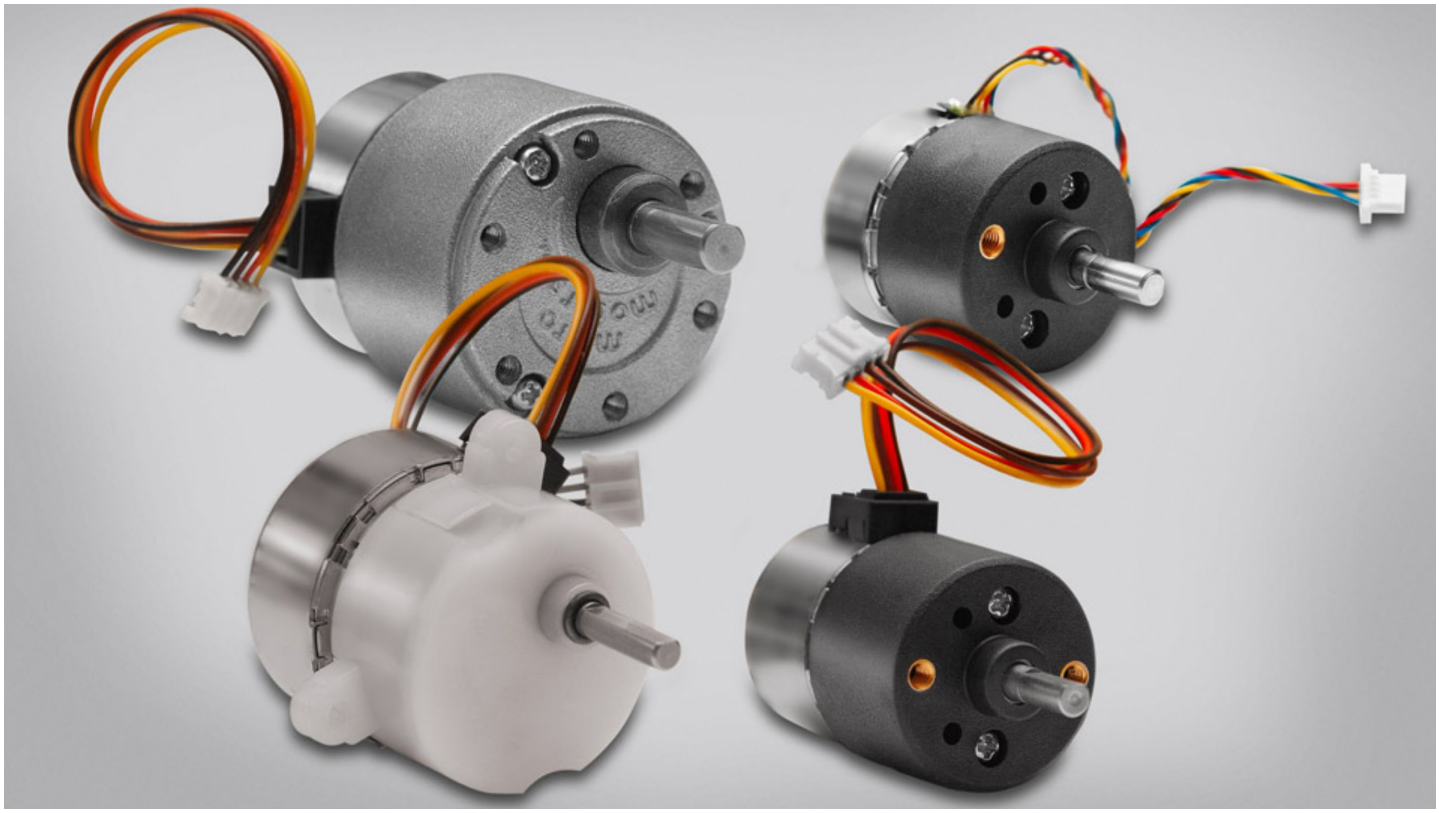
miniature stepper gearmotors and drives

micro motors s.r.l.



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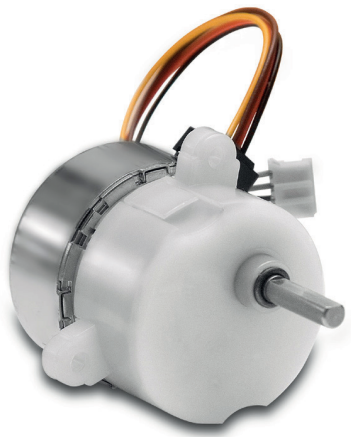
TECHNICAL DATA

series **SM138**

STEP MOTOR 35S48B07
with 138 gearbox



• High Torque • Low noise • Small size

TECHNICAL DATA

Motor Step Angle	7,5°	full step	Nominal voltage	12V
Number of Phase	2	bipolar	Voltage driver	3,75 - 36V
Insulation resistance	100 M Ω	500Vdc	Max axial/radial shaft load	5N/20N
Insulation class	E		Max allow torque	50 Ncm
Coil Resistance/Induction	7,5 Ω/10mH		Max current (continuous)	250 mA
Max temp. (motor housing)	60 °C		Max current (non-contin.)	500 mA
Racc. temp (motor housing)	35-45 °C		Operating temp.	-20 °C/+65 °C

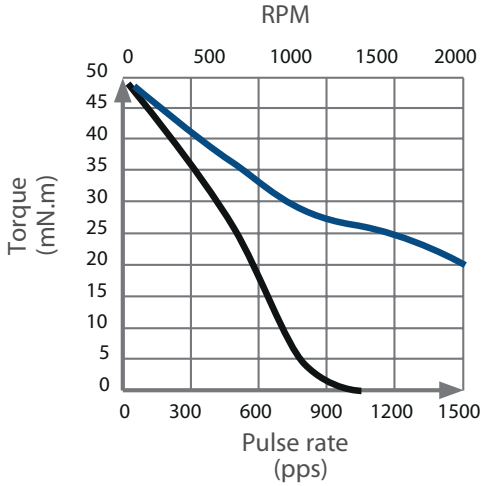
SM138

PART NUMBER	Ratio (x:1)	Length mm	Holding Torque mNm	Max Speed (ref.) RPM
SM138.35S.12	12,25	35	600	122
SM138.35S.21	21,14	35	800	71
SM138.35S.36	35,73	35	800	42
SM138.35S.72	71,54	35	800	21
SM138.35S.149	149,05	35	800	10
SM138.35S.208	208,66	35	800	7
SM138.35S.608	608,61	35	800	2,5
SM138.35S.1470	1470,82	35	800	1

Motor Dynamic Torque Curves 24V/0,5A

Conditions: Bi-polar Constant Current Driver
Driver: AMIS 30522
Mode: Full Step

Pull in torque — Pull out torque



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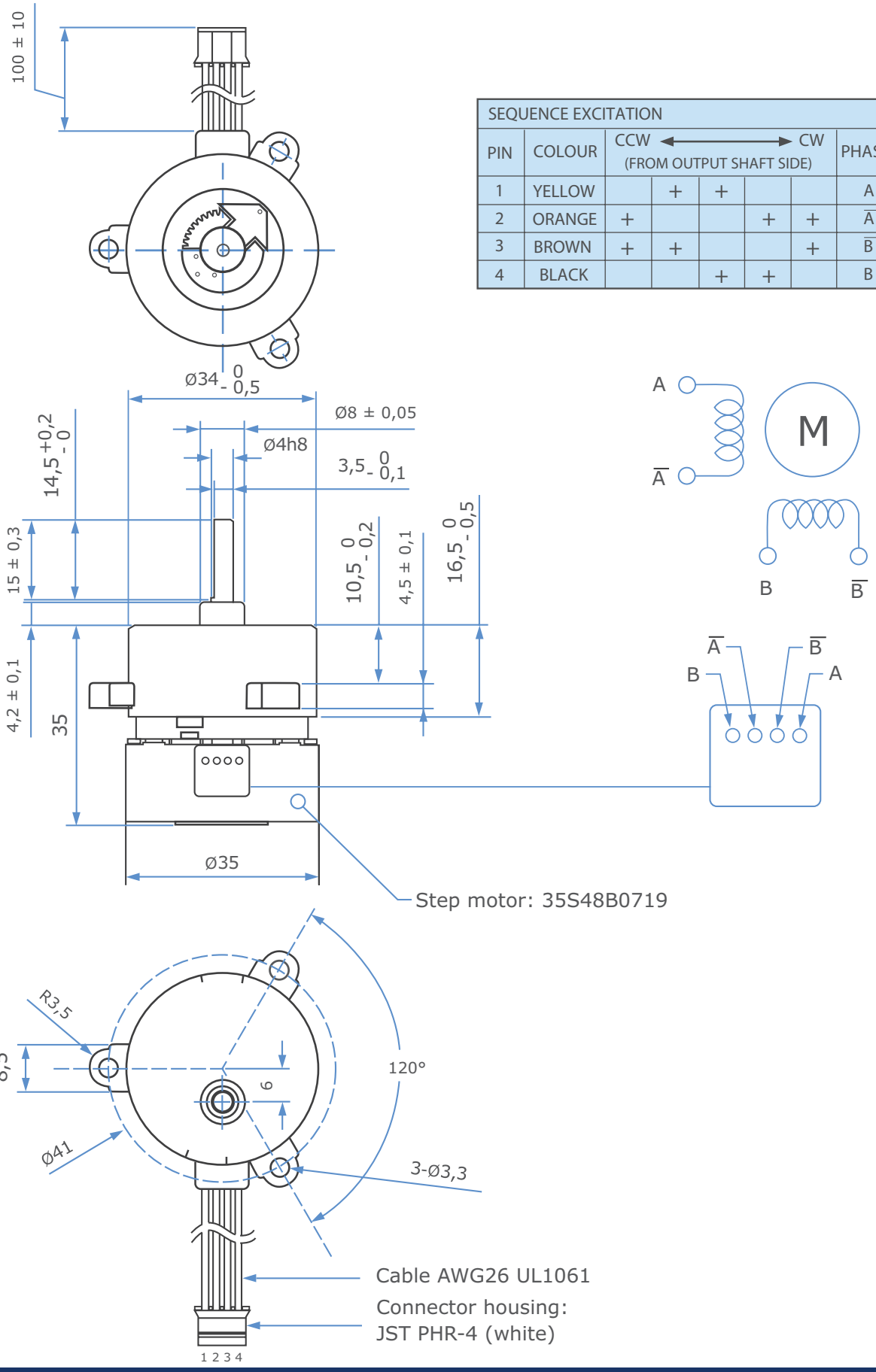
SM138 Mechanical dimensions

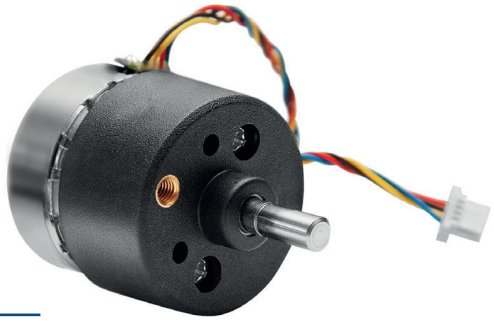


SEQUENCE EXCITATION							
PIN	COLOUR	CCW ⟷ CW (FROM OUTPUT SHAFT SIDE)					PHASE
1	YELLOW		+	+			A
2	ORANGE	+			+	+	Ā
3	BROWN	+	+			+	B̄
4	BLACK			+	+		B

TECHNICAL DATA

series **SM149**

STEP MOTOR 25T48B23
with 149 gearbox



• High Torque • Low noise • Small size

TECHNICAL DATA

Motor Step Angle	7,5°	full step	Nominal voltage	12V
Number of Phase	2	bipolar	Voltage driver	9,2 - 36V
Insulation resistance	100 M Ω	500Vdc	Max axial/radial shaft load	5N/10N
Insulation class	E		Max allow torque	20 Ncm
Coil Resistance/Induction	23 Ω/9mH		Max current (continuous)	150 mA
Max temp. (motor housing)	60 °C		Max current (non-contin.)	400 mA
Racc. temp (motor housing)	35-45 °C		Operating temp.	-20 °C/+65 °C

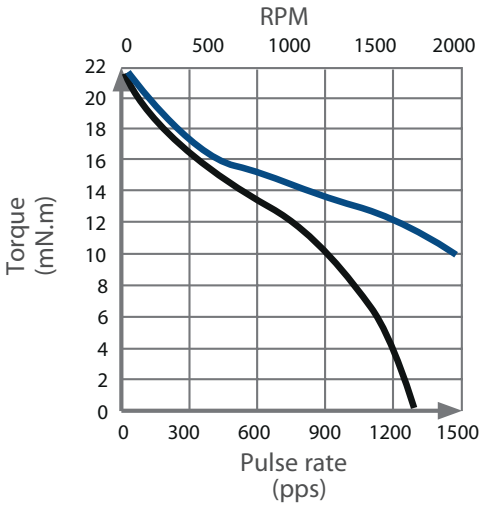
PART NUMBER	Ratio (x:1)	Length mm	Holding Torque mNm	Max Speed (ref.) RPM
SM149.25T.10	10	26	220	150
SM149.25T.21	20,8	26	400	72
SM149.25T.43	43,3	31	400	35
SM149.25T.90	90,3	31	400	17
SM149.25T.188	188	36	400	8
SM149.25T.392	391,8	36	400	4

SM149

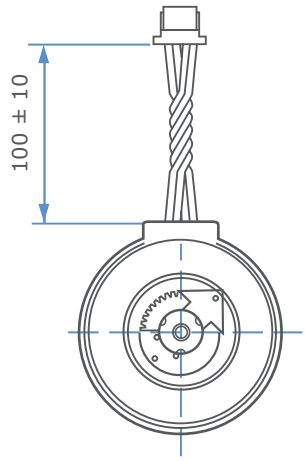
Motor Dynamic Torque Curves 24V/0,4A

Conditions: Bi-polar Constant Current Driver
Driver: AMIS 30522
Mode: Full Step

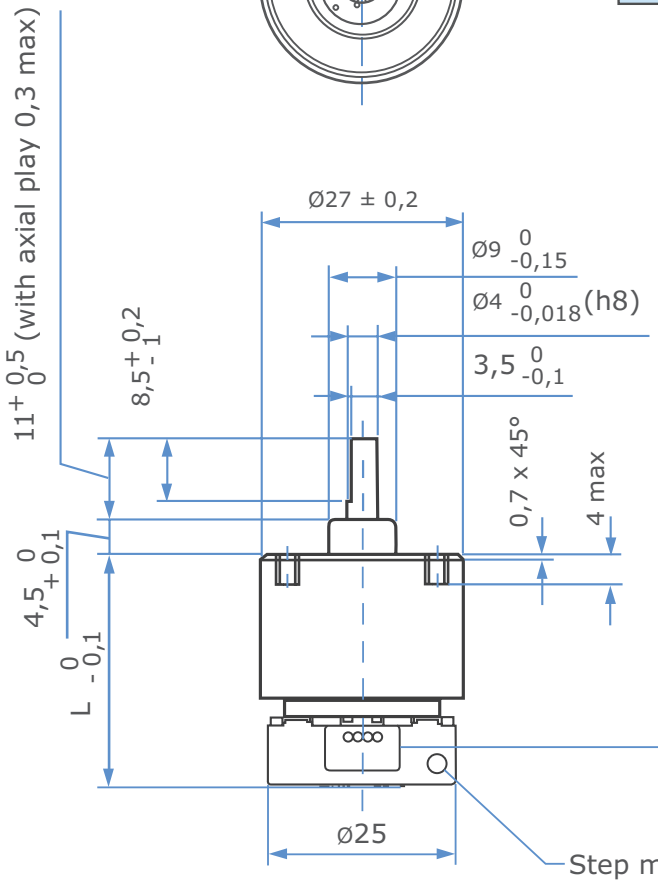
Pull in torque — Pull out torque

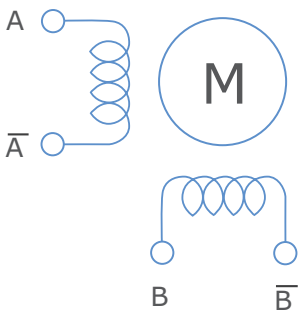


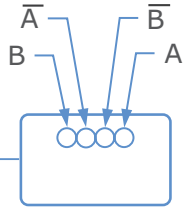
SM149 Mechanical dimensions



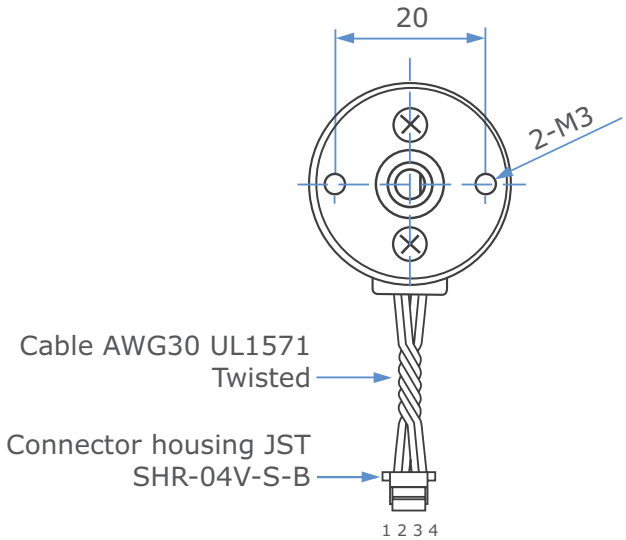
SEQUENCE EXCITATION							
PIN	COLOUR	CCW ⟷ CW (FROM OUTPUT SHAFT SIDE)					PHASE
1	RED	+			+	+	$\overline{A}$
2	BLACK		+	+			A
3	YELLOW	+	+			+	$\overline{B}$
4	BLUE			+	+		B







Step motor: 25T48B2301



Ratio		L (mm)
10:1	(9,9826:1)	26
20,8:1	(20,7672:1)	26
43,3:1	(43,3274:1)	31
90,3:1	(90,2655:1)	31
188:1	(188,0531:1)	36
391,8:1	(391,7773:1)	36

TECHNICAL DATA

series **SM155**

STEP MOTOR 25L48B09
with 155 gearbox

• High Torque • Low noise • Small size

TECHNICAL DATA

Motor Step Angle	7,5°	full step	Nominal voltage	12V
Number of Phase	2	bipolar	Voltage driver	3,6 - 36V
Insulation resistance	100 M Ω	500Vdc	Max axial/radial shaft load	5N/10N
Insulation class	E		Max allow torque	25 Ncm
Coil Resistance/Inductance	9Ω/10mH		Max current (continuous)	250 mA
Max temp. (motor housing)	60 °C		Max current (non-contin.)	500 mA
Racc. temp (motor housing)	35 - 45 °C		Operating temp.	-25 °C/+65 °C

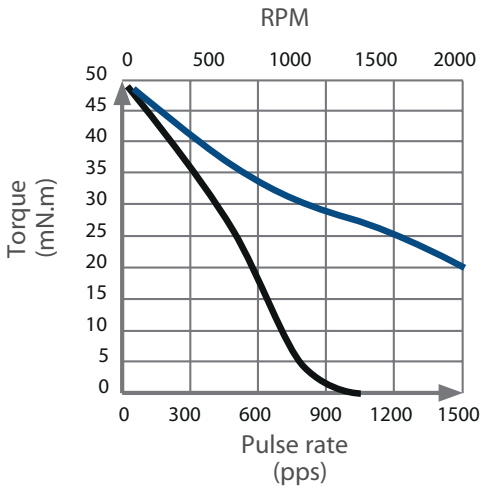
SM155

PART NUMBER	Ratio (x:1)	Length mm	Holding Torque mNm	Max Speed (ref.) RPM
SM155.25L.10	10	39,5	400	150
SM155.25L.21	20,8	39,5	400	72
SM155.25L.43	43,3	44,5	400	35
SM155.25L.90	90,3	44,5	400	17

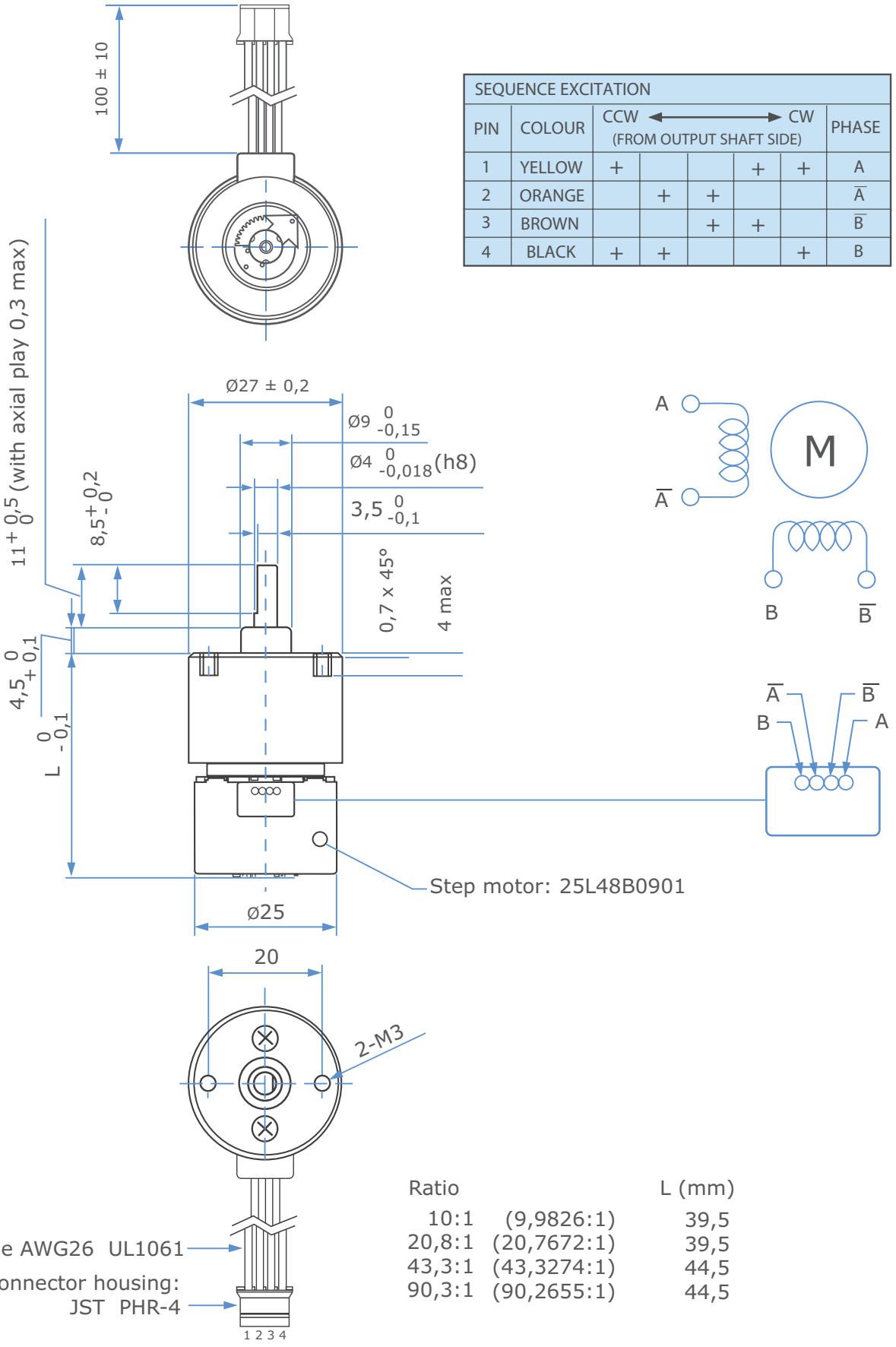
Motor Dynamic Torque Curves 24V/0,5A

Conditions: Bi-polar Constant Current Driver
Driver: AMIS 30522
Mode: Full Step

Pull in torque — Pull out torque



SM155 Mechanical dimensions



SEQUENCE EXCITATION							
PIN	COLOUR	CCW ⟷ CW (FROM OUTPUT SHAFT SIDE)					PHASE
1	YELLOW	+			+	+	A
2	ORANGE		+	+			Ā
3	BROWN			+	+		B̄
4	BLACK	+	+			+	B

Ratio		L (mm)
10:1	(9,9826:1)	39,5
20,8:1	(20,7672:1)	39,5
43,3:1	(43,3274:1)	44,5
90,3:1	(90,2655:1)	44,5

TECHNICAL DATA

series **SM158**

STEP MOTOR 35S48B07
with 158 gearbox

• High Torque • Low noise • Small size

TECHNICAL DATA

Motor Step Angle	7,5°	full step	Nominal voltage	12V
Number of Phase	2	bipolar	Voltage driver	3,75 - 36V
Insulation resistance	100 M Ω	500Vdc	Max axial/radial shaft load	10N/50N
Insulation class	E		Max allow torque	100 Ncm
Coil Resistance/Induction	7,5 Ω/10mH		Max current (continuous)	250 mA
Max temp. (motor housing)	60 °C		Max current (non-contin.)	500 mA
Racc. temp (motor housing)	35-45 °C		Operating temp.	-20 °C/+65 °C

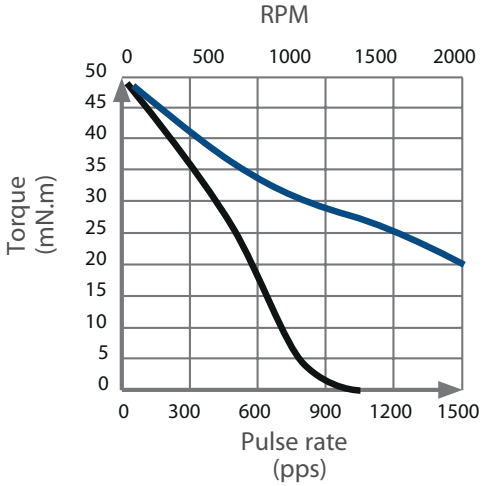
PART NUMBER	Ratio (x:1)	Length mm	Holding Torque mNm	Max Speed (ref.) RPM
SM158.35S.15	14,14	43,3	700	105
SM158.35S.30	29,75	43,3	1500	50
SM158.35S.75	76,84	45,8	1500	20
SM158.35S.100	94,37	45,8	1500	16
SM158.35S.200	198,5	48,3	1500	7
SM158.35S.250	243,8	48,3	1500	6
SM158.35S.510	512,85	51,3	1500	3
SM158.35S.630	629,82	51,3	1500	2

SM158

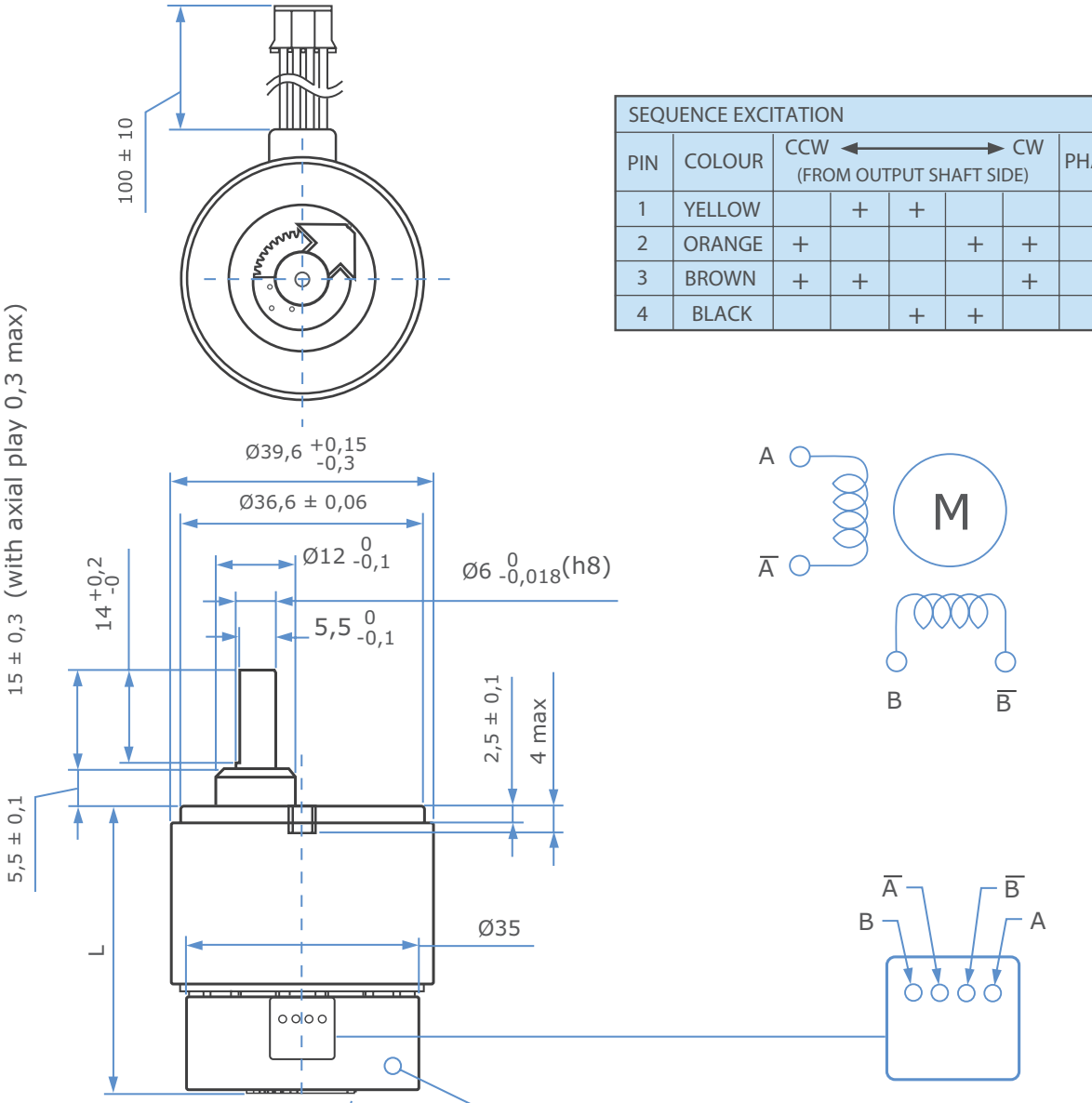
Motor Dynamic Torque Curves 24V/0,5A

Conditions: Bi-polar Constant Current Driver
Driver: AMIS 30522
Mode: Full Step

Pull in torque — Pull out torque



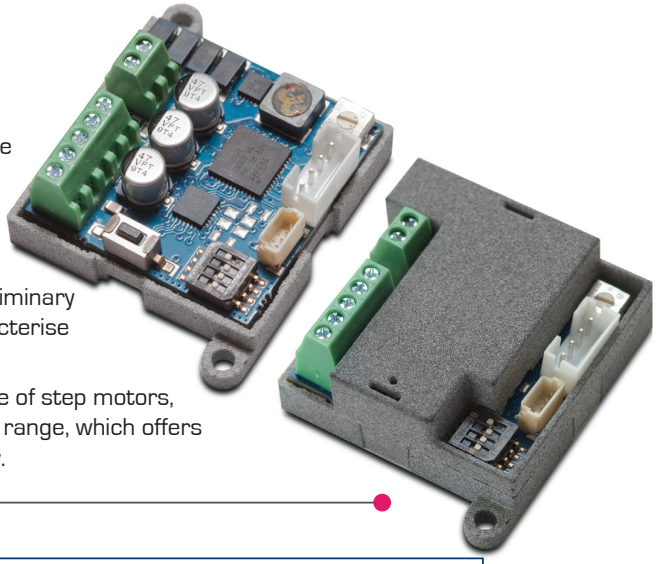
SM158 Mechanical dimensions



SEQUENCE EXCITATION							
PIN	COLOUR	CCW ⟷ CW (FROM OUTPUT SHAFT SIDE)					PHASE
1	YELLOW		+	+			A
2	ORANGE	+			+	+	$\overline{A}$
3	BROWN	+	+			+	$\overline{B}$
4	BLACK			+	+		B

Ratio		L (mm)
15:1	(14,14:1)	43,3
30:1	(29,75:1)	43,3
75:1	(76,85:1)	45,8
100:1	(94,37:1)	45,8
200:1	(198,52:1)	48,3
250:1	(243,80:1)	48,3
510:1	(512,85:1)	51,3
630:1	(629,82:1)	51,3

STEPPER GEARMOTOR DRIVER MM003AT/21-22



The step-motor is a synchronous electric motor with pulsed direct current and brushless electronic control which can divide its rotation into a large number of steps. Unlike brush DC motors, the position of the motor can be accurately controlled without an encoder (feedback). It is extremely important to choose the correct size and type of motor to suit the application. The use of a step-motor requires a careful preliminary analysis of the operating conditions in order to correctly characterise the system.

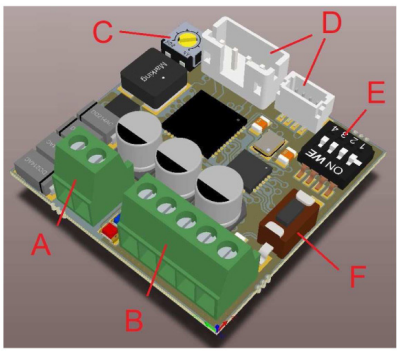
Since control electronics are required to ensure an optimal use of step motors, Micro Motors has developed a dedicated driver for its product range, which offers the possibility of using the motors in a simple and versatile way.

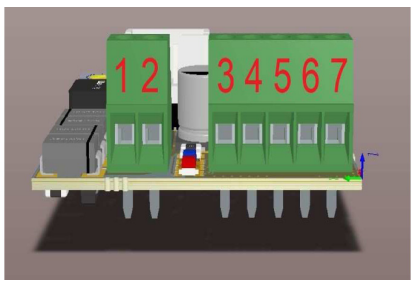
TECHNICAL FEATURES:

Power supply: from 12 to 30Vdc - from 12 to 24Vac
Setting current: 160mA or 330mA
Operating mode: as a step-motor (STEP/DIR) or as a brush motor simulation
Dimensions: 33 x 33 x 14 mm
Weight: approx. 10g

OVERVIEW:

A = Power input terminal
B = Control signal input terminal
C = Speed/acceleration trimmer
D = Motor connection
E = DIP switch program configuration
F = Service button





CONNECTIONS:

1-2 = Power input +/-, for more details see "programs" section
3 = Step pulse input (5-30V, ref. program 3)
4 = Input for CW/CCW rotation (connect to GND to change the rotation direction, ref. Programs 3,4,5 and 6)
5 = Speed control by voltage input (1-5V or 2-10V program ref. 4 and 5)
6 = Speed control by current input (4-20mA ref. Program 6)
7 = GND reference point of the signals described above

SELECTABLE PROGRAMS

PROG. 1	BRUSH MOTOR SIMULATION WITH DC DRIVER INPUT, CW/CCW ROTATION ACCORDING TO POWER SUPPLY POLARITY.
PROG. 2	BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT AND FIXED CW/CCW ROTATION.
PROG. 3	STEPPER WITH AC/DC DRIVER INPUT AND STEP/DIR CONTROL.
PROG. 4	BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (5V) AND ACCELERATION/DECELERATION CONTROL.
PROG. 5	BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (10V) AND ACCELERATION/DECELERATION CONTROL.
PROG. 6	BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (4-20mA) AND ACCELERATION/DECELERATION CONTROL.
PROG. 7	MAXIMUM CURRENT SETTING 160 or 330mA.

PROGRAM SELECTION (DIP switch "E")

PROG. 1

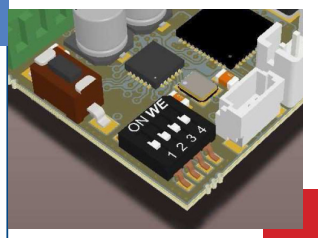
BRUSH MOTOR SIMULATION WITH DC DRIVER INPUT, CW/CCW ROTATION ACCORDING TO POWER SUPPLY POLARITY

DIP switch: 1 = OFF 2 = OFF 3 = OFF 4 = (see program 7)

In this configuration the motor acts like a brush motor whose CW/CCW rotation depends on the power supply polarity applied to terminals 1 and 2.

Trimmer "C" sets the speed.

Motor torque varies according to supply voltage and speed.



PROG. 2

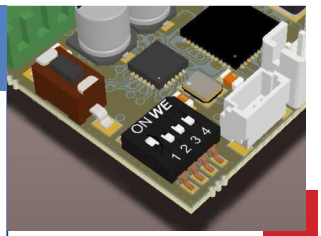
BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT AND FIXED CW/CCW ROTATION

DIP switch: 1 = ON 2 = OFF 3 = OFF 4 = (see program 7)

In this configuration the motor acts like a brush motor whose CW/CCW rotation is not determined by the power supply polarity, but by the position of the dipswitches 1 and 2.

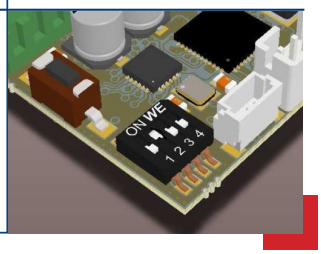
Trimmer "C" sets the speed.

The driver can be powered in either AC or DC mode (terminals 1 and 2).



DIP switch: 1 = OFF 2 = ON 3 = OFF 4 = (see program 7)

As the previous configuration but with the opposite direction of rotation.



PROG. 3

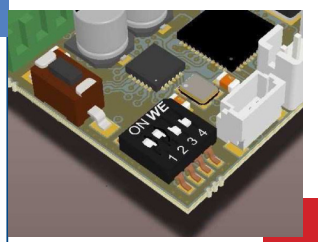
STEPPER WITH AC/DC DRIVER INPUT AND STEP/DIR CONTROL

DIP switch: 1 = ON 2 = ON 3 = OFF 4 = (see program 7)

In this configuration the motor acts like a step-motor.

The driver can be powered either in AC or DC mode (terminals 1 and 2).

A square wave signal must be applied to terminal 3 which determines the speed of the motor (from 5 to 30V), while terminal 4 determines the CW/CCW rotation (connect or disconnect to GND to reverse rotation).



PROGRAM SELECTION (DIP switch "E")

PROG. 4

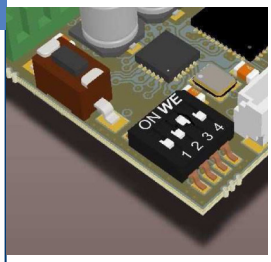
BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (5V) AND ACCELERATION/DECELERATION CONTROL

DIP switch: 1 = OFF 2 = OFF 3 = ON 4 = (see program 7)

In this configuration the motor acts like a brush motor whose speed is determined by the voltage supplied on terminal 5 (from 1 to 5V), while terminal 4 determines the CW/CCW rotation (connect or disconnect to GND to reverse direction).

The drive can be powered either in AC or DC mode (terminals 1 and 2).

Trimmer "C" sets the acceleration and deceleration.



PROG. 5

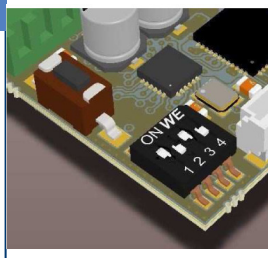
BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (10V) AND ACCELERATION/DECELERATION CONTROL

DIP switch: 1 = ON 2 = OFF 3 = ON 4 = (see program 7)

In this configuration the motor acts like a brush motor whose speed is determined by the voltage supplied on terminal 5 (from 2 to 10V), while terminal 4 determines the CW/CCW rotation (connect or disconnect to GND to reverse direction).

The driver can be powered either in AC or DC mode (terminals 1 and 2).

Trimmer "C" sets the acceleration and deceleration.



PROG. 6

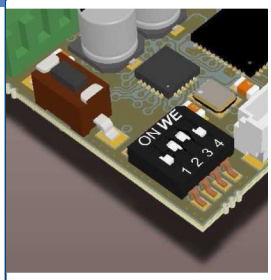
BRUSH MOTOR SIMULATION WITH AC/DC DRIVER INPUT WITH SPEED (4-20mA) AND ACCELERATION/DECELERATION CONTROL

DIP switch: 1 = OFF 2 = ON 3 = ON 4 = (see program 7)

In this configuration the motor acts like a brush motor whose speed is determined by the current supplid on terminal 6 (from 4 to 20mA), while terminal 4 determines the CW/CCW rotation (connect or disconnect to GND to reverse direction).

The driver can be powered either in AC or DC mode (terminals 1 and 2).

Trimmer "C" sets the acceleration and deceleration.



PROG. 7

MAXIMUM CURRENT SETTING 160 or 330mA

The maximum motor current is set with dip switch 4.

DIP switch: 1 = (x) 2 = (x) 3 = (x) 4 = OFF

The maximum motor current is set at 330mA.

DIP switch: 1 = (x) 2 = (x) 3 = (x) 4 = ON

The maximum motor current is set at 160mA.