

Features

- DMD40 Planetary: 12 Nm @100 rpm
- Designed for 12V agricultural equipment:
- Custom versions upon request.
- CANOpen communication
- Speed and position control mode
- Integrated brushless motor drive
- Signalling LEDs
- 6x External Digital 2KHz NPN inputs (e.g. seed sensor or hopper level sensor)
- GORE vent
- **ROJ protocol (54T01168)**



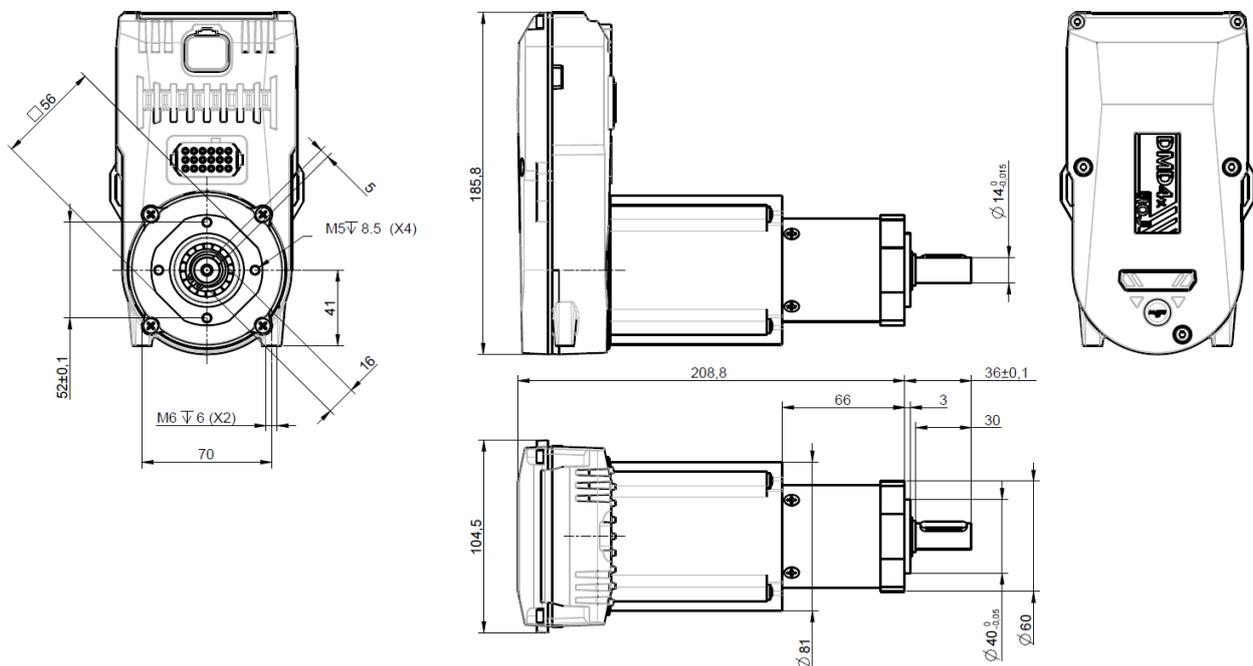
Applications

The DMD4x is an application specific brushless motor with integrated planetary gearbox and electronic drive. The motor can be used to replace mechanical or hydraulics transmissions in agricultural or other off-highway applications (e.g. variable rate applications).

Application example are:

- Actuation of seeding element in pneumatic precision planting machines
- Actuation of seed distributor in air-drills or grain planters
- Actuation of fertilizer in agricultural machines
- Salt, fertilizer, grain spreaders

Overall dimensions



Dimensions in mm.

Mechanical Specifications

Nominal Torque at output shaft	12 Nm
Peak Torque at output shaft	18 Nm
Nominal Speed at output shaft	100 rpm
Gear ratio of integrated gear	1:25,71 axial planetary gear
Gear fix	4x M5
Output shaft	ø 14mm

Environmental Specifications

Operational Temperature:	-10°C...+55°C (full specs) -10°C...+70°C (derated)
Storage Temperature:	-40°C...+80°C
IP grade	IP65 excluding the front flange/output shaft. Note: the system integrator shall provide means of protecting those surfaces when integrating the motor into the machine
Vibrations	Sinusoidal vibration test: IEC 60068-2-6 Random vibration test: IEC 60068-2-64 Temperature change test: IEC 60068-2-14 Shock test: IEC 60068-2-27

Electrical Specifications

EMC	The unit fulfills EN ISO 14982: 2009 standard (Agricultural and forestry machinery)
Supply voltage	11-16V Note: Voltage is intended at MD connector input pins. Voltage drop due to cable harness shall be taken into account.
Supply current	19 A (at nominal Torque, nominal Speed and minimum supply voltage)
Number of electric poles	8

Input/output and communication

CAN	1 CAN bus line (compliant ISO SO 11898-2 and 5. Up to 1 Mbit/s)
Sensor interface	4 x NPN input 2 kHz 2 x NPN input 200 k Hz
Safety switch input	Contact switch input to remove supply to power stage.
Daisy Chain CAN addressing line	Input and output signal for automatic CAN node assignment (CAN_SYNCHR_OUT and CAN_SYNCHR_IN)

Connector pin-out

Motor connector (18 poles) matches with AMPHENOL AT16-18SD, with the following pinning:

1	POWER SENSOR (+8V)	7	CAN_L	13	CAN_H
2	GND SENSOR	8	BAT -	14	BAT -
3	IN_1	9		15	BAT +
4	IN_5	10	IN_6	16	GND SENSOR
5	IN_2	11	IN_4	17	MOTOR_ENABLE_IN
6	IN_3	12	BAT +	18	MOTOR_ENABLE_OUT

Safety switch

A safety switch shall be connected to signals MOTOR_ENABLE_IN/ MOTOR_ENABLE_OUT. If the contact is open, the DMD cannot rotate. The safety switch must be implemented using:

- an electro-mechanical switch with “positive opening” NC contact (condition indicated by the symbol \ominus), or
- an electromagnetic sensor with high reliability (e.g. SICK RE11-SA03 or equivalent)
- In order to ensure the requested safety level (Performance Level = c according to EN ISO 13849-1), it is necessary to provide a safety contact with the following characteristics: $B10_d \geq 2 \cdot 10^6$

Note: $B10_d$ is the reliability parameter declared by the device Manufacturer that corresponds to the number of switching operations guaranteed without errors.

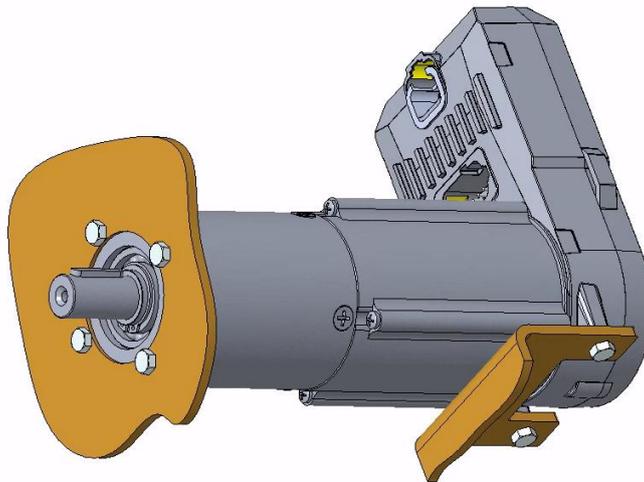
Installation

The fastening of motors to the machine, must be carried out in order to ensure a perfectly aligned coupling between the application's shaft and the gear output shaft.



In the absence of a perfect alignment, radial forces may occur on the bearings, causing an increase of the necessary torques and a reduction of the device life.

In order to relieve the bearing stress, an elastic coupling can be used. This one is not supplied with the motor kit and it must be chosen and dimensioned according to the application.



The motor must be fixed both on the gearbox and at the bottom of the electronics housing.

- tightening torque on the gearbox 4 x M5 5 Nm
- tightening torque on electronics housing 2 x M6 9 Nm

Output shaft axial/radial forces limitations

- Max. Radial load (middle of the key) 540 N at n out=100rpm
- Max. Axial load (output shaft center) 1630 N at n out=100rpm

Water ingress protection

Motor has a **IP65** rating, excluding the front flange/output shaft.

Disclaimer

The present specifications are intended to be preliminary. Parameters and values indicated in the document might be subjected to changes. For further information, please contact: mechatronics@roj.com

For more details, please refer to DMD4x Installation, Operation and Maintenance Manual