ROJ

Technical Datasheet
Rugged brushless motor
with integrated drive and gear
P/N: 54T0xxxx

Features

- Designed for 24V agricultural equipment
- CANOpen communication (speed and position control)
- Integrated brushless motor drive
- Signalling LED
- GORE vent
- **ROJ protocol**

Applications

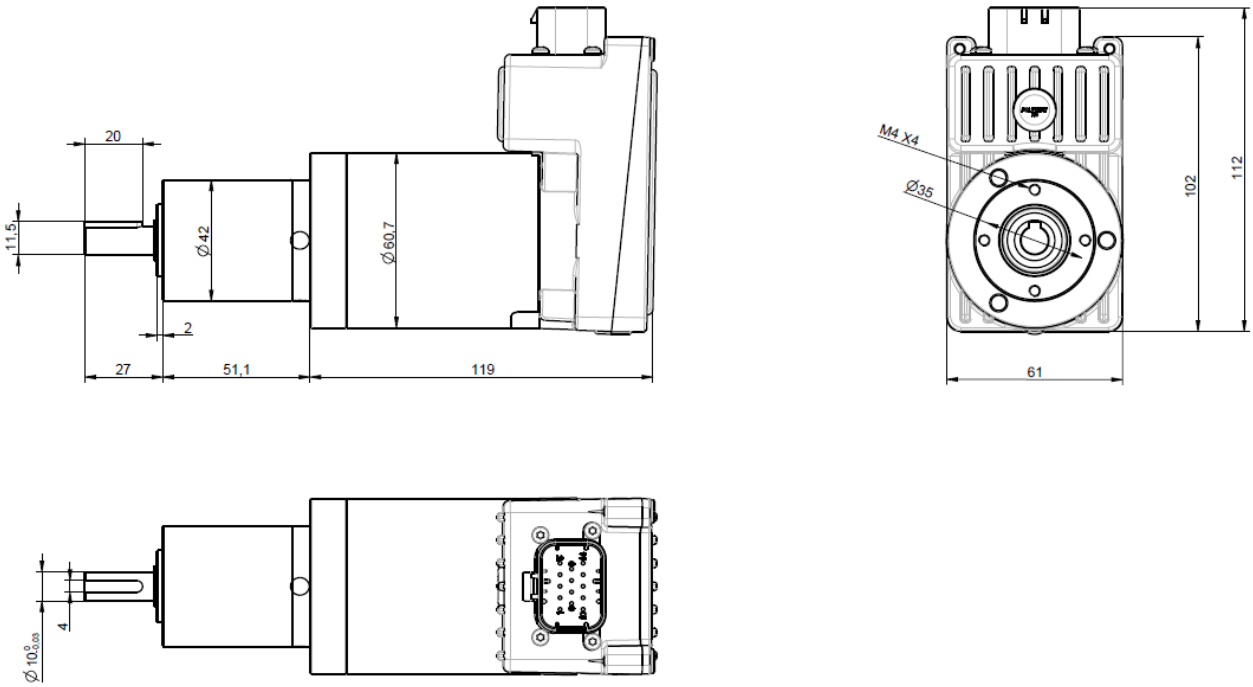
The DMD2-24V is an application specific brushless motor with integrated electronic drive. The motor can be used to replace mechanical or hydraulics transmissions in agricultural or other off-highway applications (e.g. variable rate applications).

Application example are:

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

Overall dimensions

Connector AMP AMPSEAL 1-776267



Dimensions in mm.

ROJ Srl, Via Vercellone, 11 - 13900 Biella - Italy
Tel. : +39 015 8480111 | Fax : +39 015 8480209
mechatronics@roj.com | www.roj.com

ROJ

Mechanical Specifications

Nominal Torque at output shaft	11 Nm	3 Nm
Peak Torque at output shaft	16 Nm (single pulse, duration 500ms)	6 Nm (Single pulse, duration 500ms)
Nominal Speed at output shaft	60 rpm	184 rpm
Gear ratio of integrated gear	1:48.82 axial planetary gear	15.45:1 axial planetary gear

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 600-68-2-6 Random vibration test: IEC 600-68-2-64 Temperature change test: IEC 60068-2-14 Shock test: IEC 600-68-2-27

Electrical Specifications

EMC	The unit fulfills EN ISO 14982: 2009 standard (Agricultural and forestry machinery). - Load dump (pulse 5b): 58V - All pins protected to short-to-battery, short-to-gnd. - Reverse polarity, jump start and reverse jump start protection. - Inrush current limitation
Supply voltage	- 22V-32V: full specs - 18V-22V: communication and diagnostic only - 11V-32V: CAN_SYNCHR_IN Note: Voltage is intended at MD connector input pins. Voltage drop due to cable harness shall be taken into account.
Supply current (at nominal Torque, nominal Speed and minimum supply voltage)	4,7A @22V
Supply current (sleep mode)	< 200uA

Input/output and communication

CAN	1 CAN bus line (compliant ISO SO 11898-2 and 5. Up to 1 Mbit/s) Wake-up over CAN to exit from sleep mode.
Sensor interface	None
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)

Output connector

Motor connector matches with AMP Ampseal 14 poles, with the following pinning. It matches with connector AMP Ampseal 776273-1.

Pin	Signal
1	POWER +24V
2	GND
3	
4	
5	
6	CAN_H
7	CAN_L

Pin	Signal
8	MOTOR_ENABLE_OUT(*)
9	
10	CAN_SYNCHR_OUT
11	CAN_SYNCHR_IN
12	MOTOR_ENABLE_IN
13	
14	

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 ⊖), 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: $B10_d >= 2 \cdot 10^6$

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, whether they are used for the seeding disc shaft or the fertilizer or micro-granular distributor shaft rotation, must be carried out in order to ensure a perfectly aligned coupling between the disk/distributor 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.

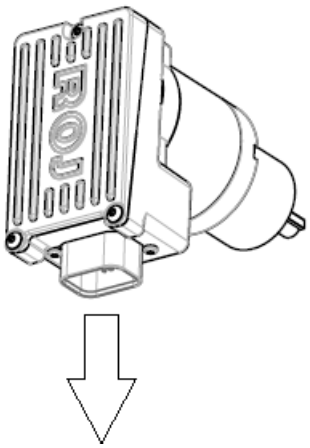
In order to relieve the bearing stress, an elastic coupling can be used. This one is not supplied with the motor kit and it must be chosen and dimensioned according to the application.

Output shaft axial/radial forces limitations

- Max. Axial load (output shaft center): 890N at n out=100rpm
- Max. Radial load (middle of the key): 305N at n out=100rpm

Orientation limits

It is preferable to mount the DMD2 motor so that the connector is facing downward to prevent stagnation of water over the sealing gaskets.



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 DMD2 Installation, Operation and Maintenance Manual