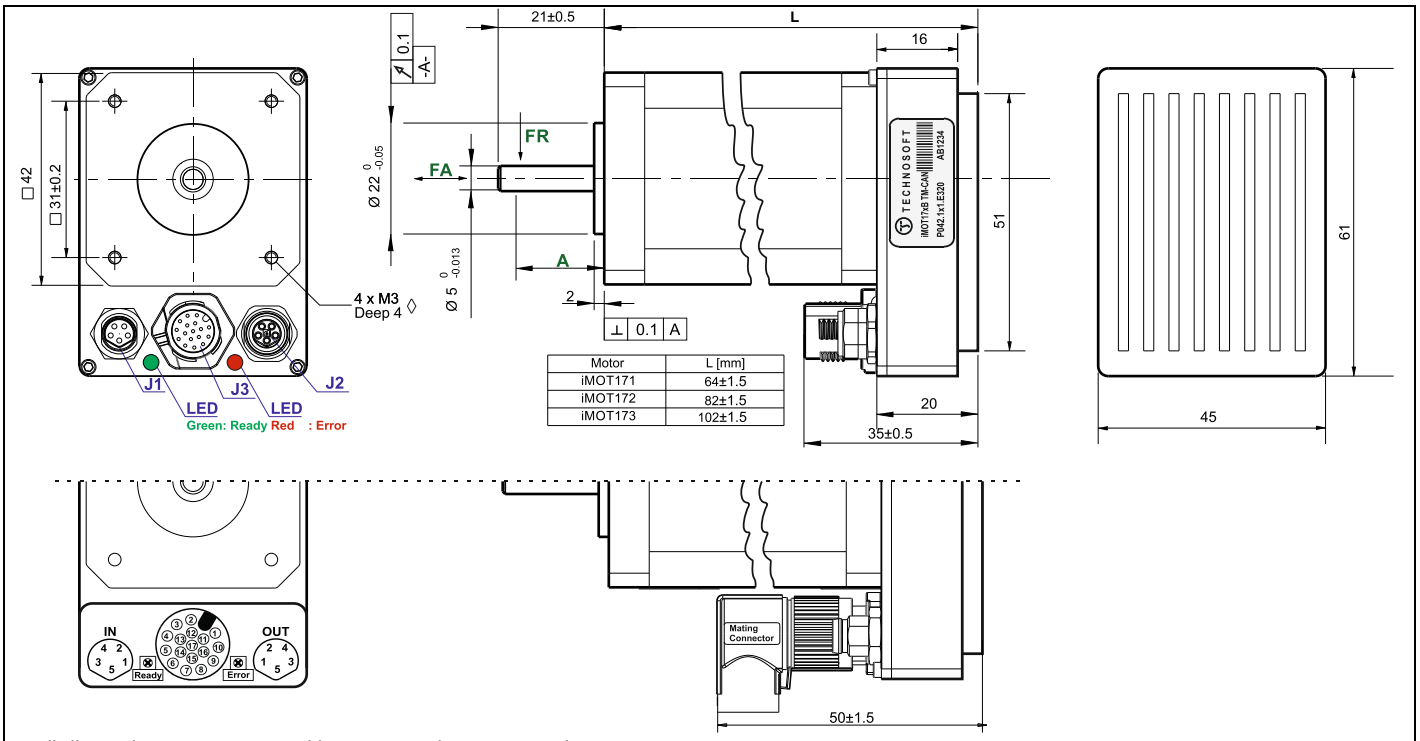
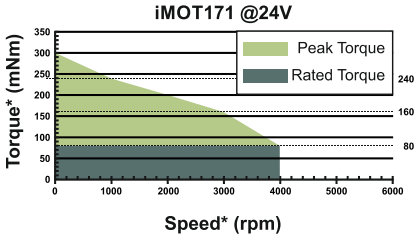


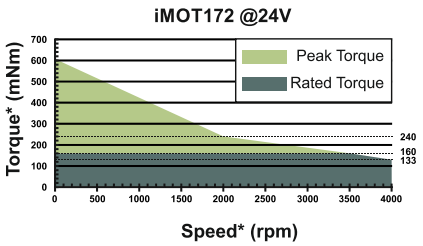
All dimensions are expressed in mm; Drawing not to scale.
◊ Use the front plate (with 4x M3x4 threaded holes) for earth connection.
Represented mating connector corresponds with J3 from the Mating cables section.

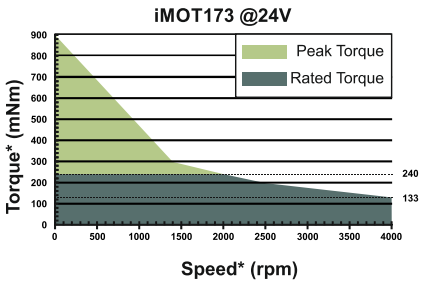
Features

- Fully digital intelligent brushless servo motor with embedded motion controller, drive and absolute position sensor
- Available in 3 motor lengths, offering 80, 160 and 240 mNm of continuous torque
- Motor supply: 12-48V; Logic supply 12-36V
- Cost effective positioning system, due to compactness and elimination of motor wiring
- Advanced motion control capabilities (PVT, S-curve, electronic cam)
- Motion programming via TML (Technosoft Motion Language) or motion libraries for Visual C / VB / LabVIEW / Linux and PLC
- Standalone operation with stored motion sequences
- Communication:
  - RS-232 serial communication for drive commissioning
  - TMLCAN and CANopen (CiA 301 v4.2 and CiA 402 v3.0) protocols selectable by hardware pin
- Digital and analogue I/Os:
  - 4 digital programmable inputs, 5-24V, PNP/NPN
  - 2 digital outputs, 24V/TTL, NPN/0.5A
  - 1 analogue input: 12 bits resolution, 0-5V
- Feedback device:
  - Absolute single-turn position sensor offering a resolution of 4096 counts / revolution
- Protections:
  - Over-current, over-temperature, short circuit
  - Over and undervoltage, i2t, control error
- 16 h/w addresses selectable by hex switch
- 2.5K × 16 SRAM for data acquisition
- 4K × 16 E^{2}ROM for TML motion programs and data storage

Torque – Speed characteristic



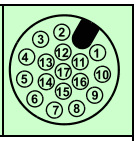




*All values are ±10%

Mating Cables				
Connector	**Producer**	**Part No.**	**Description**	**Image**
J1	**MOLEX**	130029-0005	Motor to wire (male) cable, 90º angled, 5 pins	
	Phoenix Contact	1575903		
J2	**MOLEX**	30029-0002	Motor to wire (female) cable, 90º angled, 5 pins	
	Phoenix Contact	1575916		
J3	**Phoenix Contact**	SAC-17P- 1,5-35T/FR SH SCO - 1430323	Motor to wire (female) cable, 90º angled, 17 pins	
J1 to J2	**MOLEX**	130030-0070	Motor to Motor (male to female) shielded cable, 90º angled, 5 pins	
	Phoenix Contact	1575945		

Connector J1&J2 Description			IN J1	OUT J2
Pin	**Name**	**Type**	**Description**	
1	**GND**	-	Return ground for CAN-Bus, Internally connected to all GND pins.	
2	**CANopen**	**I**	Connect to GND to enable CANopen protocol; Leave unconnected for TMLCAN protocol	
3	**Can-Hi**	**I/O**	CAN-Bus positive line (dominant high)	
4	**GND**	-	Return ground for CAN-Bus. Internally connected to all GND pins.	
5	**Can-Lo**	**I/O**	CAN-Bus negative line (dominant low)	

Connector J3 Description			
Pin	**Name**	**Type**	**Description**
1	**GND**	-	Return ground. Internally connected to all GND pins.
2	**+V_{MOT}**	**I**	Positive terminal of the motor supply: 12 to 48V_{DC}. Internally connected to all +V_{MOT} pins.
3	**+V_{MOT}**	**I**	Positive terminal of the motor supply: 12 to 48V_{DC}. Internally connected to all +V_{MOT} pins.
4	**OUT0**	**O**	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
5	**OUT1**	-	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
6	**IN3/LSN**	**I**	5-36V digital PNP/NPN input. Negative limit switch input
7	**IN2/LSP**	**I**	5-36V digital PNP/NPN input. Positive limit switch input
8	**Enable**	**I**	5-36V digital PNP/NPN input. Enable input
9	**+V_{LOG}**	**I**	Positive terminal of the motor supply: 12 to 36V_{DC}.
10	**GND**	-	Return ground. Internally connected to all GND pins.
11	**GND**	-	Return ground. Internally connected to all GND pins.
12	**+V_{MOT}**	**I**	Positive terminal of the motor supply: 12 to 48V_{DC}. Internally connected to all +V_{MOT} pins.
13	**232TX**	O	RS-232 Data Transmission
14	**232RX**	I	RS-232 Data Reception
15	**IN0**	**I**	5-36V general-purpose digital PNP/NPN input
16	**ANLG**	**I**	Analogue input, 12-bit, 0-5V. Used to read an analogue position/speed reference or feedback , or used as general purpose analogue input
17	**GND**	-	Return ground. Internally connected to all GND pins.

Characteristics

All parameters were measured under the following conditions (unless otherwise specified):

- Tamb = 25°C, logic supply (VLOG) = 24VDC, motor supply (VMOT) =48VDC ;
- Supplies start-up / shutdown sequence: -any- ;

Motor and feedback sensor parameters		**Value**		**Units**
Rated torque	iMOT171B	80		mNm
	iMOT172B	160		
	iMOT173B	240		
Rated current	iMOT171B	2.9		A
	iMOT172B	3.1		
	iMOT173B	3.6		
Peak current	iMOT171B	8.7		A
	iMOT172B	9.3		
	iMOT173B	13.6		
Absolute single-turn position feedback		4096		Bits/ rot
Rotor inertia	iMOT171B	29		gcm^2
	iMOT172B	59		
	iMOT173B	89		
Axial – Force **FA**		10		N
Distance **A**		20		mm
Radial-Force **FR**		28		N
		Axial	Radial	
Shaft play		0.08	0.02	mm
At load		4.5	4.5	N

Environmental Characteristics			**Min.**	**Typ.**	**Max.**	**Units**
Size (Length x Width x Height)		iMOT171B		64 x 61 x 45		mm
				~2.52 x 2.4 x 1.78		inch
		iMOT172B		82 x 61 x 45		mm
				~3.23 x 2.4 x 1.78		inch
		iMOT173B		98 x 61 x 45		mm
				~3.86 x 2.4 x 1.78		inch
Weight	Without mating connectors	iMOT171B		395		g
		iMOT172B		515		
		iMOT173B		720		
Cleaning agents				Only dry cleaning is recommended		
Protection degree	According to IEC60529, UL508			IP40		-

Operating Conditions		**Min.**	**Typ.**	**Max.**	**Units**
Ambient temperature[1]		0		+40	ºC
Ambient humidity	Non-condensing	0		90	%Rh
Altitude / pressure[2]	Altitude (vs. sea level)	-0.1	0 ÷ 2.5	[2]	km
	Ambient Pressure	0 [2]	0.75 ÷ 1	10.0	atm
Magnetic field				20	mT

Storage Conditions		**Min.**	**Typ.**	**Max.**	**Units**
Ambient temperature		-40		+105	ºC
Ambient humidity	Non-condensing	0		100	%Rh
Ambient Pressure		0		10.0	atm

EARTH Connection		**Min.**	**Typ.**	**Max.**	**Units**
EARTH to GND	Galvanic isolation	-100		+100	V_{DC}
	Capacitive coupling		200		nF
	Discharge resistor		300		kΩ
EARTH connection	Location	Front plate of motor, using 4x M3x4 threaded holes			
	Connection	Required for EMC compliance and thermal dissipation			

[1] Operating temperature can be extended up to **TBD ºC** with reduced current and power ratings.

[2] iMOT17xB TM-CAN can be operated in vacuum (no altitude restriction), but at altitudes over 2,500m, current and power rating are reduced due to thermal dissipation efficiency.

Logic Supply Input (+V_{LOG})			Min.	Typ.	Max.	Units
Supply voltage	Nominal values		12.5	24	36	V_{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters		5.3		39	V_{DC}
	Absolute maximum values, continuous		0		42	V_{DC}
	Absolute maximum values, surge (duration ≤ 10ms)†		0		+45	V
Supply current	No Load on Digital Outputs	+V_{LOG} = 12.5V		80	200	mA
		+V_{LOG} = 24V		47	120	
		+V_{LOG} = 36V		36	100	

Motor Supply Input (+V_{MOT})		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12	24	48	V_{DC}
	Absolute maximum values, continuous	-0.5		50	V_{DC}
	Absolute maximum values, surge (duration ≤ 10ms)†	-1		50	V
Supply current	Idle		1	5	mA
	Operating	-13.6	±3	+13.6	A

Digital Inputs (IN0, IN2/LSP, IN3/LSN, Enable)		Min.	Typ.	Max.	Units
Input voltage	Logic "LOW"		2.2	1.2	V
	Logic "HIGH"	4.8	3.8		
	Histerezis	0.8	1.6	2.8	
	Absolute maximum, continuous	-36		+36	
	Absolute maximum, surge (duration ≤ 1s)†	-50		50	
	Floating voltage, NPN (not connected)		0		
	Floating voltage, PNP (not connected)		+V_{LOG}		
Input frequency		0		400	kHz
Minimum pulse		-15	1.2	0.9	ms
ESD protection	Human body model	±15			kV
Mode compliance	Internal 3.9 kΩ resistor to GND	PNP			
Default state	Input floating (wiring disconnected)	Logic LOW			
Input current	Logic "LOW";			0	mA
	Logic "HIGH"; pulled to +24V		6	8	
	Hysteresis		0.5		
Mode compliance	Internal 3.9 kΩ resistor to +V_{LOG}	NPN/ TTL / CMOS / Open-collector			
Default state	Input floating (wiring disconnected)	Logic LOW			
Input current	Logic "HIGH"			0	mA
	Logic "LOW"; pulled to GND		6	8	
	Hysteresis		0.5		

Analog Input (ANLG)		Min.	Typ.	Max.	Units
Input voltage	Operational range	0		5	V
	Absolute maximum values, continuous	-8		+12	
	Absolute maximum, surge (duration ≤ 1s)†			±24	
Input impedance	To 0.23V		33		kΩ
Resolution			12		bits
Integral linearity				±2	bits
Offset error			±2	±10	bits
Gain error			±1%	±3%	% FS[1]
Bandwidth (-3dB)	Software selectable	0		250	Hz
ESD protection	Human body model	±5			kV

RS-232		Min.	Typ.	Max.	Units
Compliance		TIA/EIA-232-C			
Bit rate	Software selectable	9600		115200	Baud
Short-circuit	232TX short to GND	Guaranteed			
ESD protection	Human body model	±15			kV

CAN-Bus		Min.	Typ.	Max.	Units
Compliance		ISO11898, CiA-301v4.2, CiA 402v3.0			
Bit rate	Software selectable	125		1000	Kbps
Bus length	1Mbps			25	m
	500Kbps			100	
	≤ 250Kbps			250	
Resistor	Between CAN-Hi, CAN-Lo	none on-board			
Node addressing	Software	1 ÷ 127 (CANopen); 1- 255 (TMLCAN)			
ESD protection	Human body model	±15			kV

Digital Outputs (OUT0, OUT1)			Min.	Typ.	Max.	Units
Mode compliance			TTL / CMOS / Open-collector / NPN 24V			
Default state	Not supplied (+V_{LOG} floating or to GND)		High-Z (floating)			
	Normal operation	OUT0	Logic "HIGH"			
Output voltage	Logic "LOW"; output current = 0.5A			0.2	0.8	V
	Logic "HIGH"; output current = 0, no load		2.8	3	3.3	
	Logic "HIGH", external load to +V_{LOG}			V_{LOG}		
	Absolute maximum, continuous		-0.5		V_{LOG}+0.5	
	Absolute maximum, surge (duration ≤ 1s)†		-1		V_{LOG}+1	
Output current	Logic "LOW", sink current, continuous				0.5	A
	Logic "LOW", sink current, pulse ≤ 5 s				1	A
	Logic "HIGH", source current; external load to GND; V_{OUT} >= 2.0V				1	mA
	Logic "HIGH", leakage current; external load to +V_{LOG}; V_{OUT} = V_{LOG} max = 36V			0.1	0.2	mA
Minimum pulse width			2			µs
ESD protection	Human body model		±15			kV

Conformity		Min.	Typ.	Max.	Units
EU Declaration		2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU (RoHS), 1907/2006/EC (REACH), 93/68/EEC (CE Marking Directive), EC 428/2009 (non dual-use item, output frequency limited to 590Hz)			

† Stresses beyond values listed under "absolute maximum ratings" may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

[1] "FS" stands for "Full Scale"