



Dynamic Motor Motion
Technology Corporation

DYN232M[™]
DYN AC SERVO SYSTEM - RS232 MOTION



DYN2 AC Servo System
General Product Catalog
TYPE A - GENERAL-PURPOSE PULSE/ANALOG/DYN232M
REV. A3412 11/15

adaptive TUNING II



Low Voltage AC Servo
Technique for the FUTURE

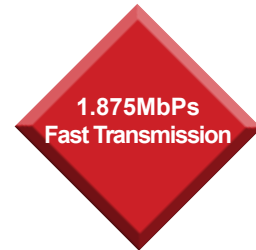
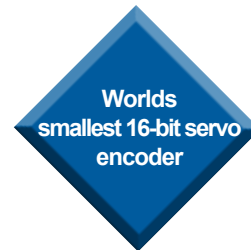
The capabilities of Industrial Automation determines the future. The improvement of servo technology allows higher precision, faster speeds, improved efficiency and safer operation. Combining these characteristics with an easy to use and more versatile package, the DYN2 AC Servo System leads the industry to a more harmonized tomorrow.



High Resolution 16-bit Absolute Encoder

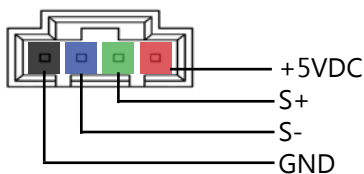
A new 16-bit absolute encoder with 65,536 pulses per revolution is standard on all servo motors. High resolution feedback increase motor smoothness, motion accuracy and maintain better dynamic performance under all speed/load characteristics. High speed 4-wire serial bus transmission with data redundancy check allows fast and reliable positioning.

- Robust and reliable magnetic sensor - Patented
- Over 18 years ABS encoder application heritage
- 8 sensor interpolation to achieve highest accuracy
- Rigid structure. Resistant to heat, vibration, shock



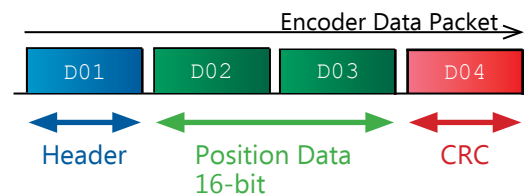
4-Wire Interface

Encoder feedback is achieved with only 4 wires - two for power and two for data. Wiring is easy and reliable.



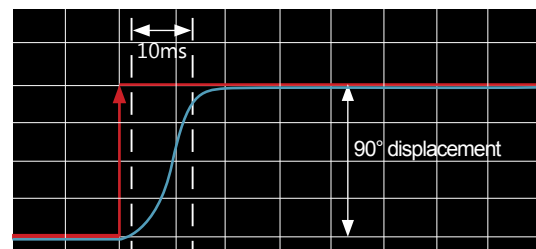
Transmission Speed and Reliability

1.875Mbps speed with 8-bit CRC per data packet. Reliable, high speed feedback.



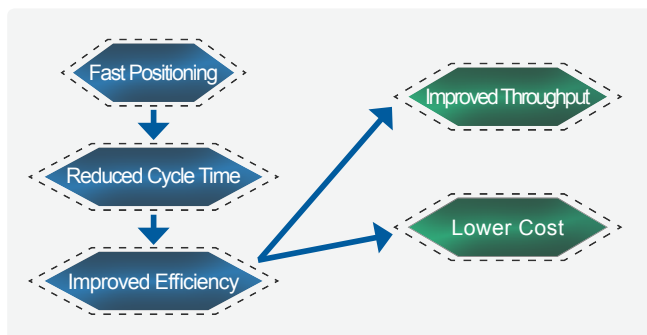
Fast Positioning Response

High frequency response is key to achieving accurate and fast positioning. During development, the new DYN2 servo drive was tested under harsh instantaneous acceleration/deceleration profiles. The servo drive achieved outstanding 10ms position response. The fast servo loop allows the new DYN2 servo drive to perform even in the most demanding applications.



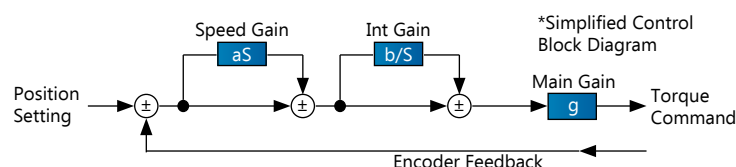
— Command Reference
— Motor Position

Typical response of 200W servo motor given 90° (16,384point) instantaneous step command. Servo drive in position servo mode.



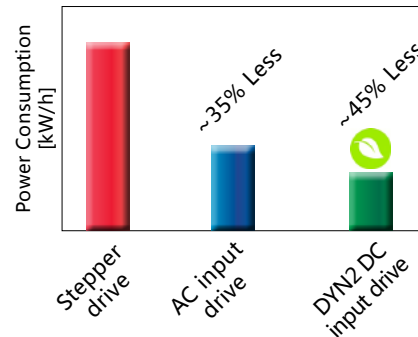
DYN *adaptive* TUNING II

The DYN servo drives adaptive tuning has been improved for better stability and wider range of inertia load. The control algorithm uses only 3 parameters to adjust gain and internally optimizes position accuracy and torque ripple during real time operation. **The only** tuning method of this kind in the industry. Combines perfect simplicity and flexibility.



Low Voltage DC Input

Low voltage initiative with max. +75VDC input allows easy application into new or existing designs with DC power supply or battery. Low voltage is also safer for both user and machine. DC input consumes less power and increases system efficiency by utilizing Common DC Bus voltage to minimize overall consumption.



* Tested for 3 Axis X/Y/Z 400W, 1.27Nm continuous output motor under the same load condition. Draw measured for 1 hour period.

Small Modular Size

The new DYN2 servo drive sets an unprecedented package size for it's class, measuring just 32mm wide, 85mm tall and 75mm deep. Instead of being *designed* into the system, the new DYN2 servo drive can simply be *placed* into the system.

World's smallest servo drive relative to 20A peak output capacity!



Simple and Effective I/O

To maximize usability and application range, new I/O signals have been added. Simplified down to key selections, with available custom selections for fast and easy integration. Standard outputs include Servo On Position, Zero Point Index, Servo Alarm and +5VDC supply. Standard inputs include command pulse/analog, Servo Enable, and Drive Reset. No matter the application, the new DYN2 servo drive has the relevant communication to meet requirements.

Industry Standard Control Input

Standard pulse formats with photo-isolated interface. High pulse frequency capability and electronically scalable travel. Differential line receiver reduce transmission noise. Analog speed/ torque reference with ±10VDC voltage range.

Pulse Reference

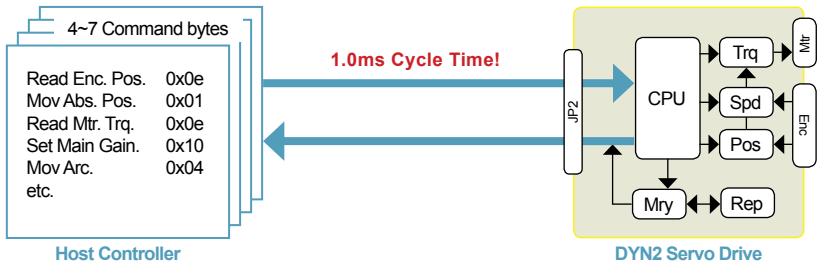
- ◆ PULSE + DIRECTION ◆ CW + CCW
- ◆ A + B PHASE QUADRATURE

Analog Command

- ◆ -10VDC~+10VDC analog reference input for Speed and Torque servo control mode.

DYN232M Integrated Control

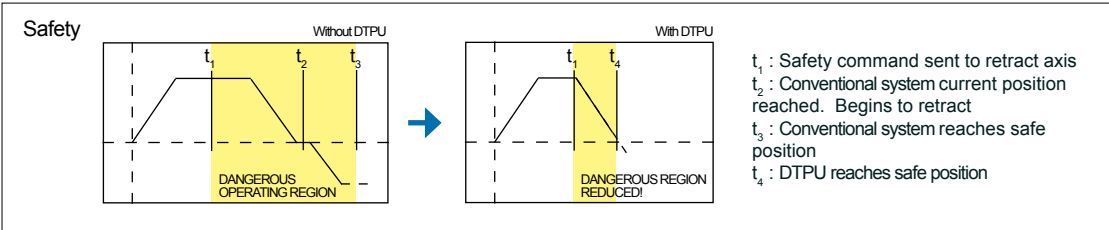
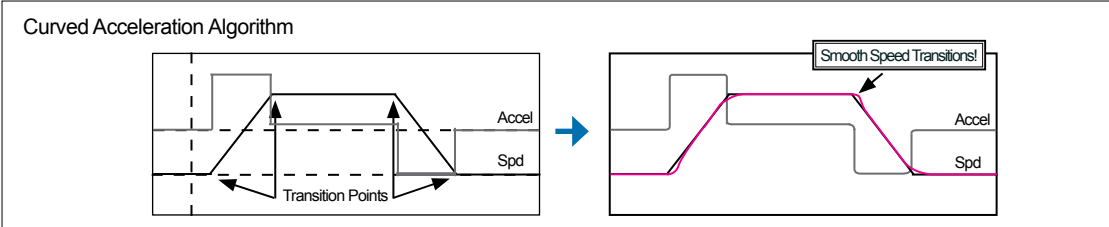
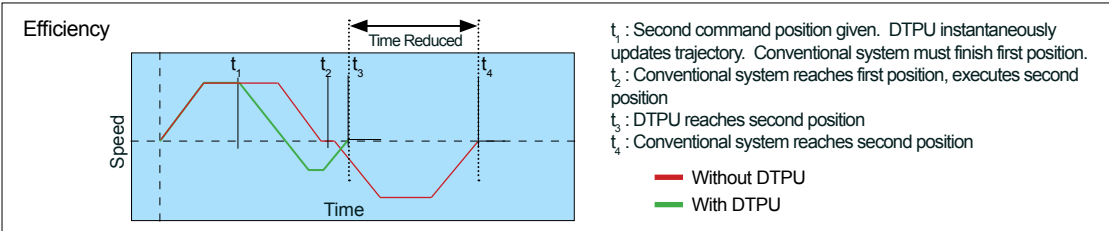
Through DYN232M serial communication, the host controller has direct access to all servo drive parameters and status including absolute encoder position and motor torque. All drives feature integrated point to point S-Curve, linear and circular multi-axis interpolated positioning. Can communicate with any device with serial port.



Dynamic Target Position Update (DTPU) technology allows instantaneous position target update regardless of whether the current command position has been completed or not.



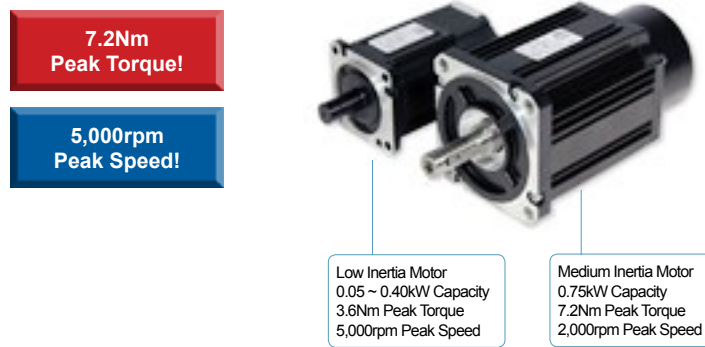
World's only drive integrated positioning of this kind!



Features

High Motor Capacity

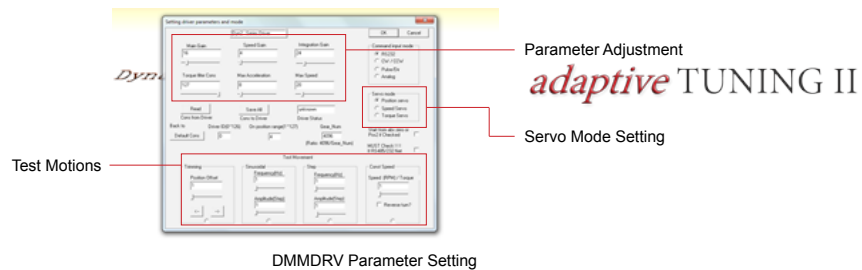
The new DYN2 servo drive's highly efficient and reliable control technology allows for highest motor capacity pair than any other servo drive in its class. The motor capacity selection reflect industry requirements including low inertia or medium inertia. With 5,000rpm peak speed (within 0.4kW) and 7.2Nm (1,020Oz-in) peak torque (0.75kW).



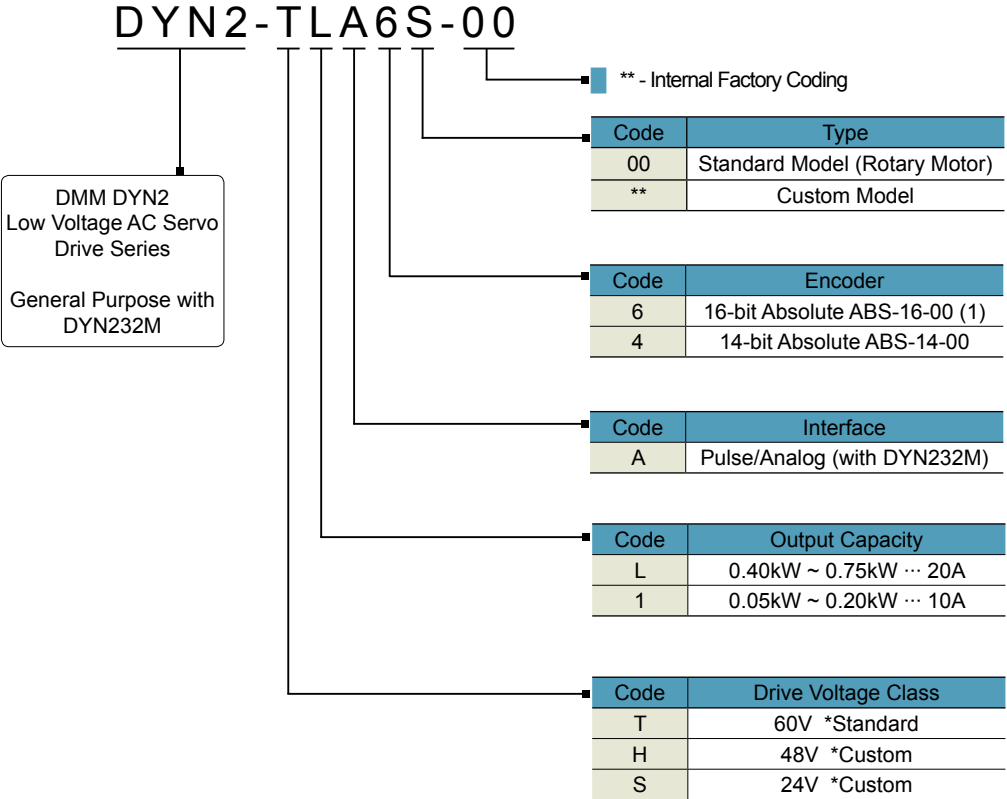
Easy Set Up and Communication

Servo drive testing and tuning is all done through simple RS232 or USB connection with PC using DMMDRV graphic interface. Using just a few parameters, the user has full control over communication and behaviour. Each application calls for a different dynamic - the new DYN2 servo drive gives the user maximum control over the machine.

Easy to use PC Interface



■ Servo Drive Designation



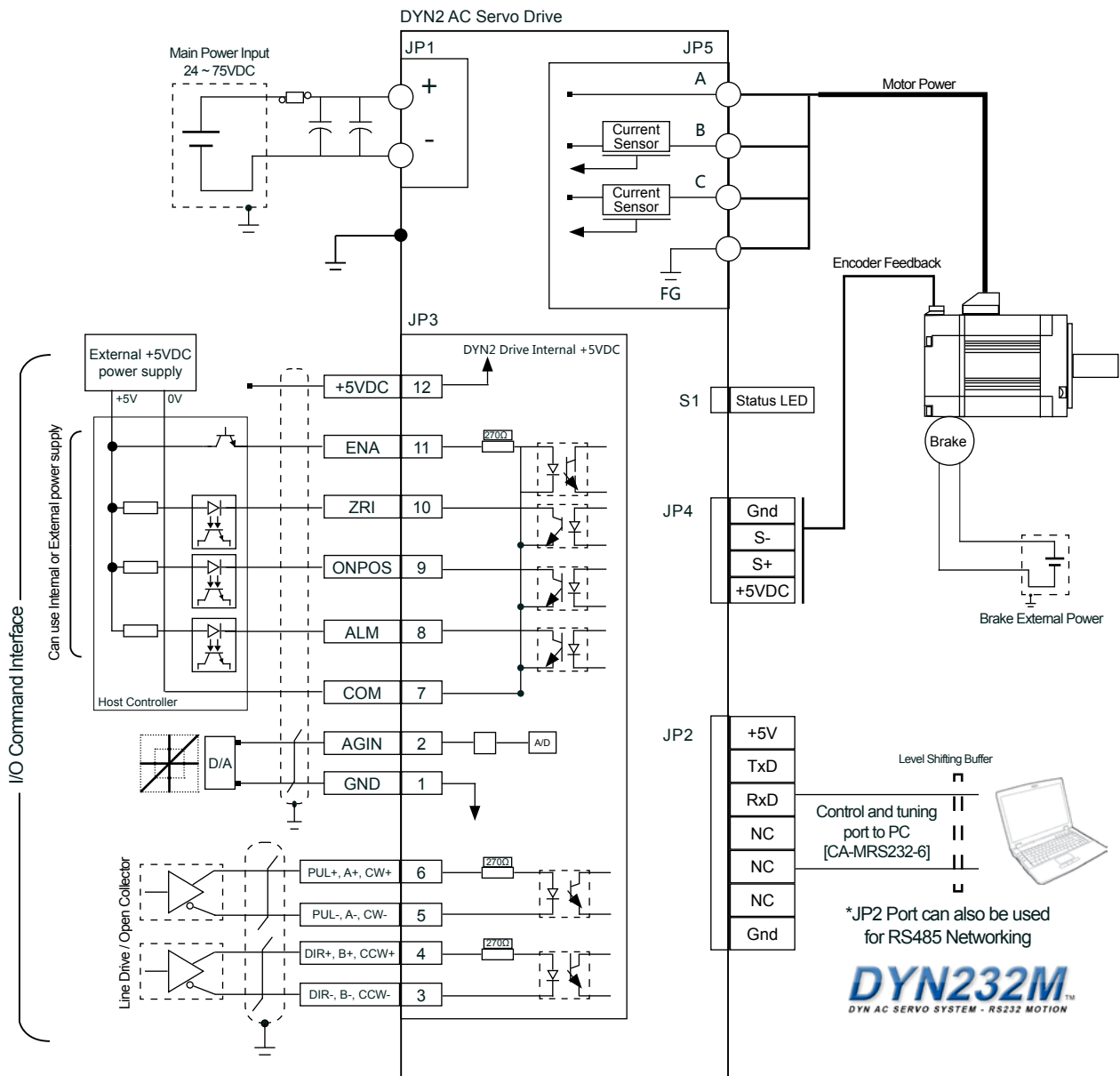
Servo Drive Specification

DYN2 AC Servo Drive		DYN2-TLA6S	DYN2-T1A6S
Input	Rated Voltage	60VDC±10%	
	Permissible Input Voltage	24~75VDC ^{*1}	
	Rated Current	16A	
Output	Rated Voltage	Peak +75VAC between any two motor phase	
	Current	20A Peak	10A Peak
	Motor Capacity	0.40kW ~ 0.75kW	0.05kW ~ 0.20kW
Drive Interface Power Supply (JP2 Pin. 12)	Voltage	5VDC±5%	
	Max Current Draw	50mA	
Control Method	3-Phase SVPWM Amplifier		
Dynamic Brake	Integrated non-adjustable		
Encoder Feedback	14-bit Absolute [16,384ppr] - Serial - Magnetic Sensor 16-bit Absolute [65,536ppr] - Serial - Magnetic Sensor		
Protection Functions	Over Current, Over/Under Voltage, Over Temperature, Over Power, Position Lost Follow, CRC Error, Parameter Error		
Position Servo	Pulse Format ^{*2}	Pulse+Sign, A/B Phase Quadrature 90° Phase Differential, CW+CCW ^{*2}	
	Max. Input Frequency	500kHz	
	Input Voltage	5VDC ± %5 (Higher voltage available as option) Over drive photo-coupler diode	
	Positioning Feedback	Z Index pulse output	
Speed Servo	Speed Control Range	0:5000	
	Input Reference Voltage	±10VDC ± 5% 3,000min ⁻¹ reference at ± 5VDC	
	Max Input Voltage	±12VDC	
Torque Servo	Input Reference Voltage	±10VDC ± 5% 50% peak current output at ± 5VDC	
	Max Input Voltage	±12VDC	
DYN232M Serial	Port	RS232 Serial [UART/SPI]	
	Position Commands	Point to Point, S-Curve, Linear & Circular Coordinated	
Environment	Protection	IP10	
	Operation Temperature	0°C~55°C	
	Storage Temperature	-20°~65°C	
	Max. Operation Humidity	95RH% (No Condensation)	
	Max. Storage Humidity	95RH% (No Condensation)	
Mass	0.2kg ± 10%		

Note. 1) Over-voltage alarm triggered at 80VDC input. Drive circuit protection up to 100VDC.

Note. 2) CW+CCW command format available as option.

Standard Wiring Diagram Example



Connector	Type	Housing	Plug	Pin Contact	Mfg.
JP1	Main power supply input	MSTBA 2,5/ 2-G	MSTB 2,5/ 2-ST	-	Phoenix
JP2	RS232 port to PC or controller	70553-0041	50-57-9407	70058	Molex
JP3	I/O to controller	MC 1,5/ 12-G-3,5	MC 1,5/ 12-ST-3,5	-	Phoenix
JP4	Encoder feedback	70553-0038	50-57-9404	70058	Molex
JP5	Servomotor power	MSTBA 2,5/ 3-G	MSTB 2,5/ 3-ST	-	Phoenix

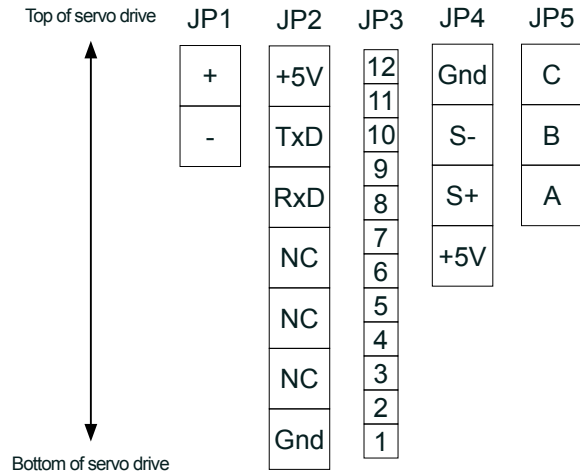
Drive Specification

Servo Drive Interface

Applicable Model: All DYN2 models

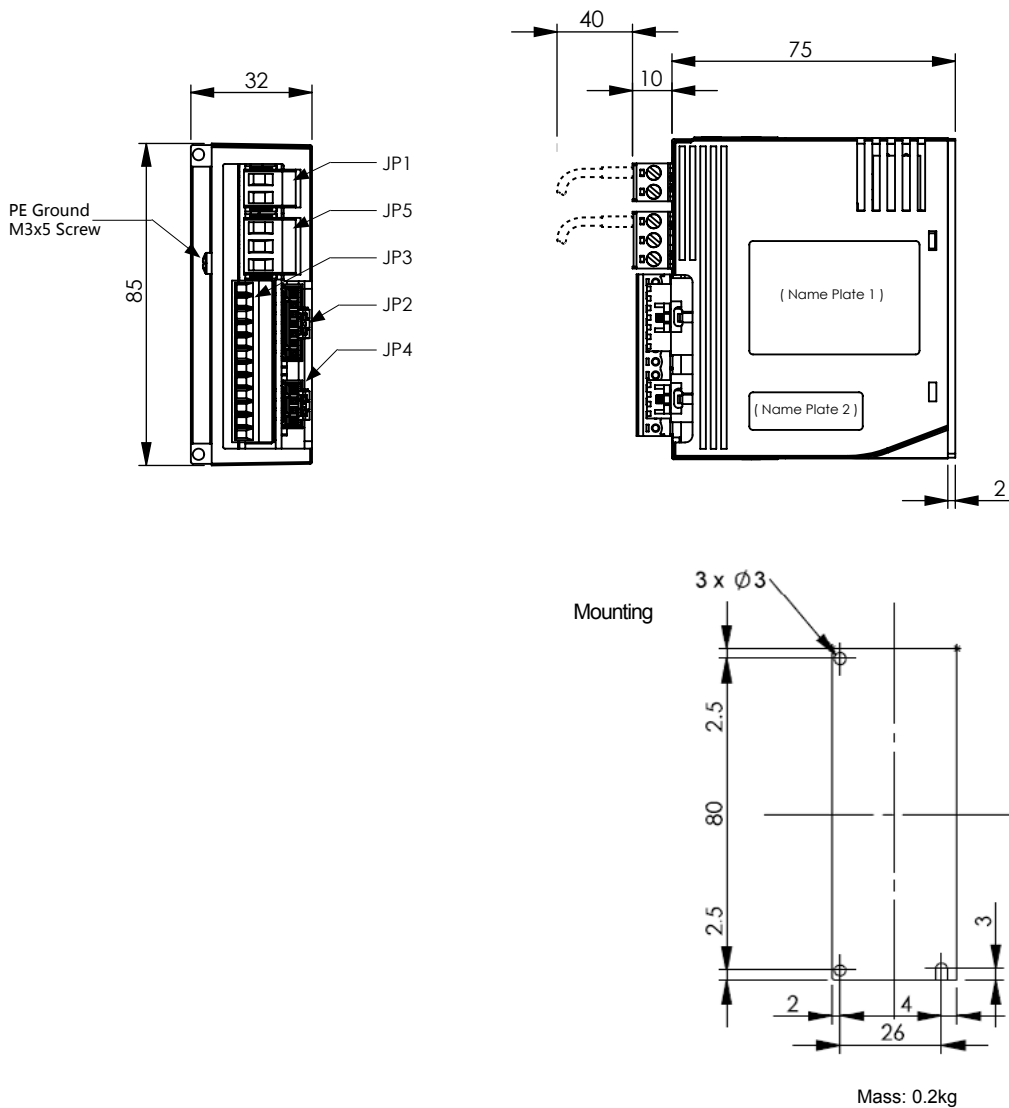
Terminal Layout

Connector	Type
JP1	Main power supply input
JP2	RS232 port to PC or controller
JP3	I/O to controller
JP4	Encoder feedback
JP5	Servomotor power



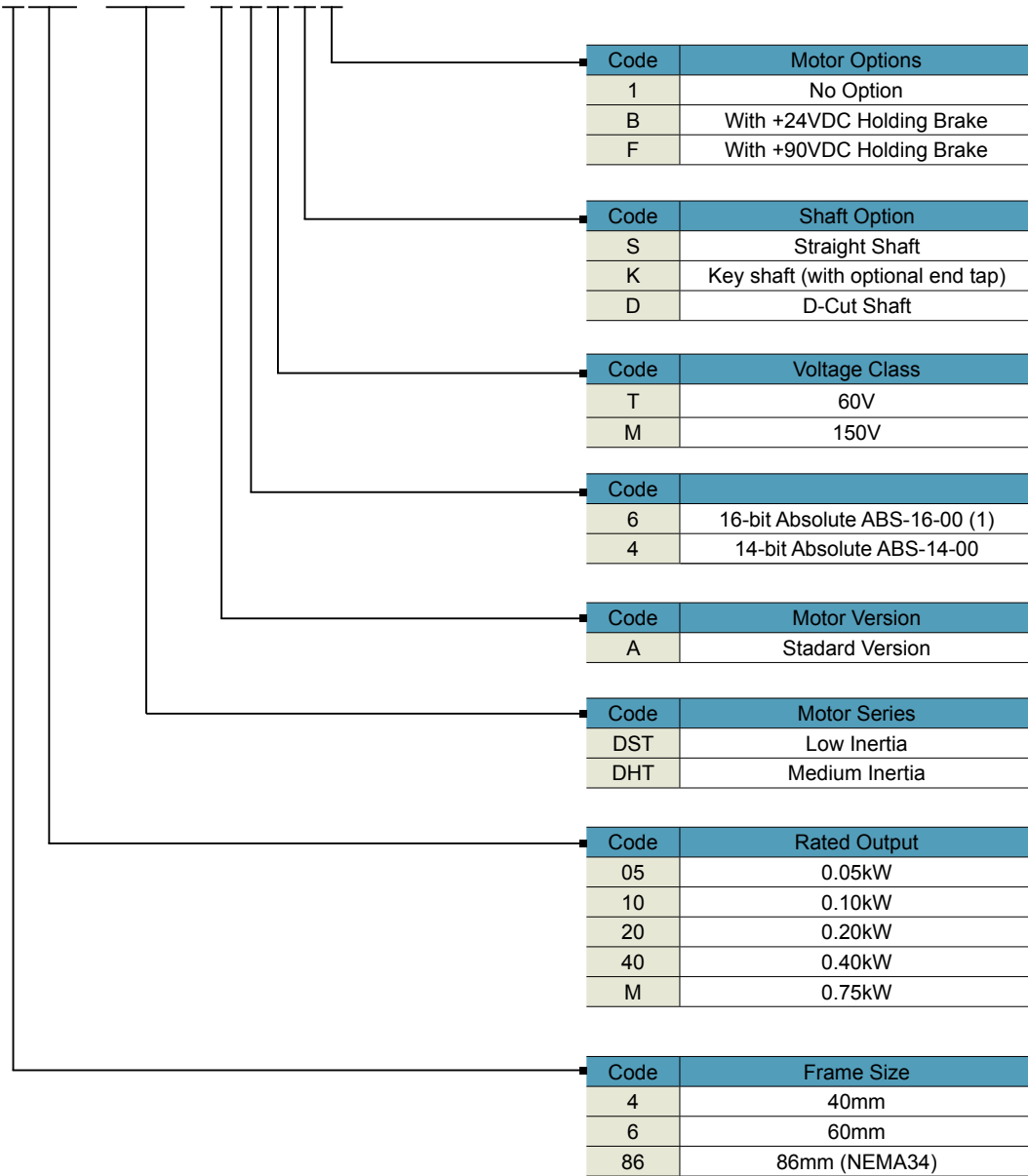
Dimension

Units: Millimeter [mm]



Servo Motor Designation

640-DST-A6TS1



Motor Specification

☐☐☐ Servo Motor Specification

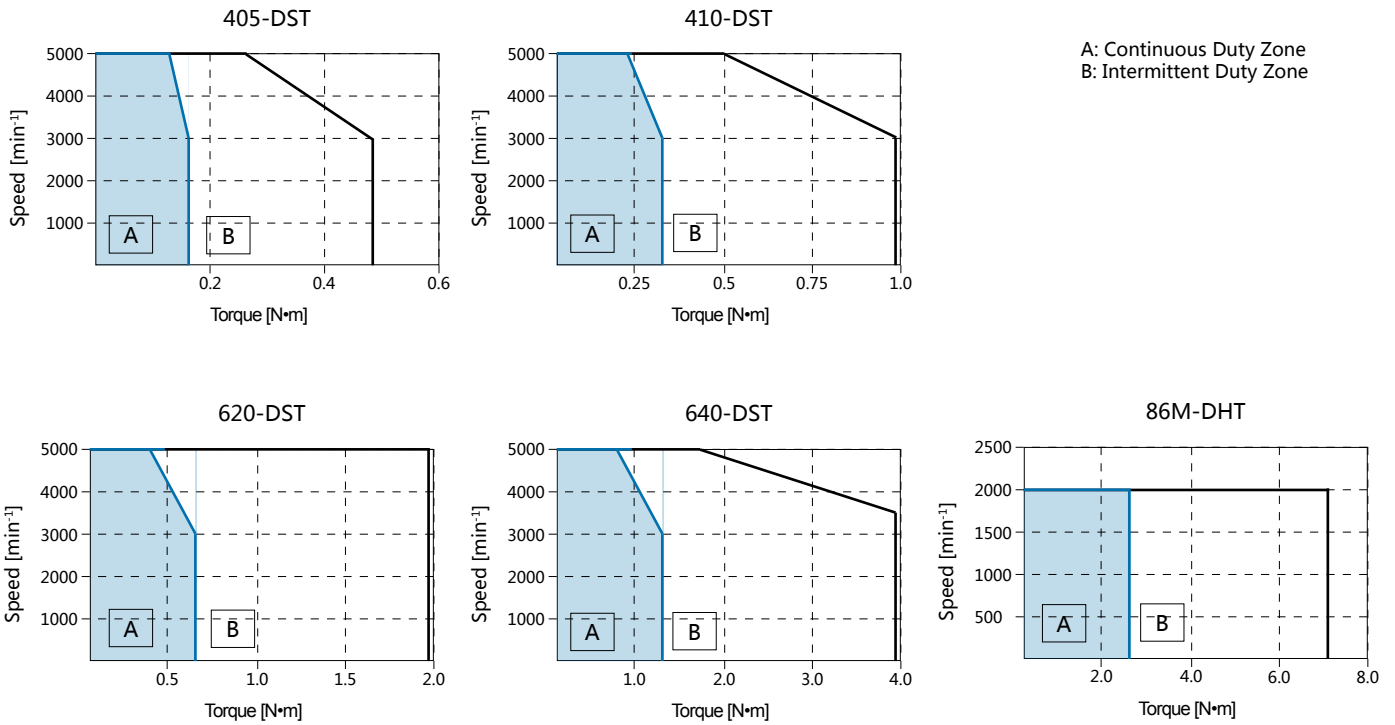
Motor Model	☐☐☐-DST/DHT	405	410	620	640	86M
Inertia Class		Low				Medium
Frame Size	mm	40		60		86
Rated Voltage	V	60				150
Rated Output	kW	0.05	0.1	0.2	0.4	0.75
Encoder		16-bit Absolute [ABS-16-00 (01)] 14-bit Absolute [ABS-14-00]				
Rated Torque	N•m	0.159	0.318	0.637	1.27	2.4
Rated Current	A	2	3	4.5	8.4	7.2
Instantaneous Peak Torque	N•m	0.447	0.955	1.9	3.8	7.16
Peak Current	A	6	9	11.3	21	19
Rated Speed	min ⁻¹	3000				2000
Max Speed	min ⁻¹	5000				N/A
Line Resistance	Ω			0.63	0.28	0.7
Voltage Gradient	V/1,000min ⁻¹	6.5	7	9.41	9.72	22
Torque Coefficient	N•m/A	0.107	0.115	0.156	0.161	0.33
Rotor Inertia	kg-cm ²			0.232	0.426	2.45
Insulation Class		F				
Dielectric Strength		1500VAC - Withstand 60 seconds				
Insulation Resistance		DC 500V - 20MΩ or higher				
Enclosure		IP65 (Excluding shaft)				
Ambient Temperature		0 ~ 40°C (Operating) -20 ~ 40°C (Storage)				
Storage Temperature		-20 ~ 80%RH (No Condensation)				
Forward Rotation		CW as viewed from shaft side				
Servo Drive		DYN2-T1A6S		DYN2-TLA6S		

Holding Brake Timing

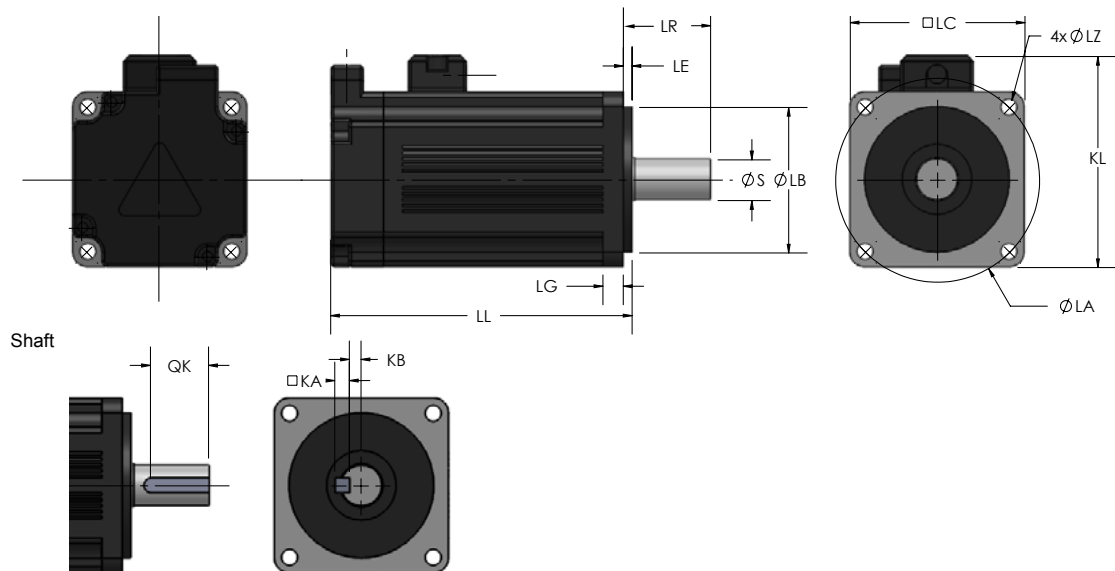
Rated Voltage		24VDC ± 5%, 90VDC ± 5%
Torque Release Time (reduced to 10%)	ms	<50
Torque Rise Time (90% applied)	ms	<70
After power loss, torque applied delay	ms	3

Torque - Speed Curve

Measured at +60VDC Input
*Torque above 5,000rpm not rated



Dimension



Motor Model	LL	LG	KL	LA	LB	LE	LC	LZ	LR	S	QK	KA	KB
405 -DST-□□□1	75.5	5	55	46	30h7	2.5	42	4.5	25	8h6	14	3	2.2
410 -DST-□□□1	93.5	5	55	46	30h7	2.5	42	4.5	25	8h6	14	3	2.2
620 -DST-□□□1	91	6	73	70	50h7	3	60	5.5	30	14h6	20	5	4
640 -DST-□□□1	115	6	73	70	50h7	3	60	5.5	30	14h6	20	5	4
86M -DHT-□□□1	149	8	77	100	80h7	3	86	8	45	14h6	30	5	4

Note. 1) All dimensions for servomotor without holding brake. Contact DMM Representative for dimension with holding brake.

Cable Selection

Cable Specification

• Servomotor End Connector

Encoder

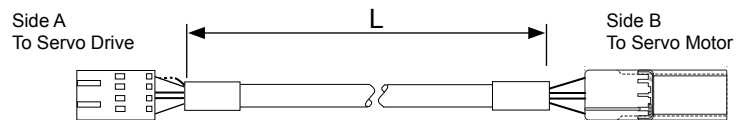
Assembly: HILP-04V-1-S
Pin Contact: SHIF-01T-P0.5
Mfg: J.S.T.

Motor Power

Assembly: VLP-04V (Retainer: VLS-02V x2)
Pin Contact: SVF-61T-P2.0
Mfg: J.S.T.

• Encoder Cable

Model	Length [L]
CAEN-LH3-SP0	3m
CAEN-LH5-SP0	5m
CAEN-LH10-SP0	10m
CAEN-LH15-SP0	15m



1. Cable shield connected on servo drive receiving end
2. All cable ends terminated with heat shrink tube

Specification:

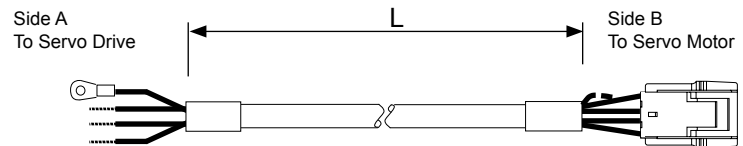
A side to servo drive	
Connector Assembly	50-57-9404 or equivalent
Pin Contact	16-02-0069 or equivalent
Mfg.	Molex.

Cable	
Rating	30V, 105°C UL20789
Conductor	0.63mm dia. AWG24
Insulator	PVC
Outer Diameter	5.6mm

B side to servomotor	
Connector Assembly	HILR-04VF-1-S
Pin Contact	SHIM-01T-P0.5
Mfg.	J.S.T.

• Motor Power Cable

Model	Length [L]
CAMP-LH3-SP0	3m
CAMP-LH5-SP0	5m
CAMP-LH10-SP0	10m
CAMP-LH15-SP0	15m



1. Cable shield connected on servomotor receiving end
2. All cable ends terminated with heat shrink tube

Specification:

A side to servo drive	
Connection	4 Flying Lead

Cable	
Rating	600V, 121°C UL1581
Conductor	1.5mm dia. AWG16
Insulator	PVC
Outer Diameter	9mm

B side to servomotor	
Connector Assembly	VLR-04V
Pin Contact	SVM-61T-P2.0
Mfg.	J.S.T.



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DYN2 SERIES
AC SERVO DRIVE
TYPE A - GENERAL-PURPOSE PULSE/ANALOG/DYN232M
REV. A3412 11/15

DMM Technology Corp. constantly strive to improve it's products performance and reliability. The contents of this manual outlines the latest features and specifications of the DYN2 AC Servo Drive and may be changed at any time to reflect corrections, improvements or changes to the product or information in this document.

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