DS2000XP
High Performance Servodrives

Customizable Integrated Axis Motion Control for Brushless Servomotors and Actuators in Closed-Loop Applications
OVERVIEW

HALF A CENTURY OF EXCELLENCE IN MOTION CONTROL

Moog has provided superior motion control solutions for the industrial marketplace for over 50 years. A leading designer and manufacturer of electric control products for over 20 years, Moog Electro-Mechanical Actuators, Servomotors, and Servodrives are known for reliability and accurate control. The Servodrive product line is a proven option for customers that need high dynamic performance and control accuracy. Moog Servodrives are user-friendly for easy installation and maintenance, and reliable for use in heavy-duty applications.

THE DS2000XP SERVODRIVE CONTROL SOLUTION

The DS2000XP Servodrive is a self-contained, fully digital stand-alone motion control drive with a highly customizable interface for control of brushless motors and actuators in high performance closed-loop applications. This servodrive has a high-performance 32-bit floating-point Motorola MPC555 RISC CPU on board to provide strong embedded real-time motion control capability.

The DS2000XP is ideal for applications requiring integrated axis motion control including simulation, power generation and all MaxForce actuator applications. This servodrive accepts a wide range of power supply. The DS2000XP can also operate a broad range of brushless servomotors and Electro-Mechanical Actuators with resolver or Sin/Cos encoder feedback devices.

This catalog is for users with technical knowledge. To ensure that all necessary characteristics for function and safety of the system are given, the user has to check the suitability of the products described herein. The products described herein are subject to change without notice. In case of doubt, please contact Moog.

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For the most current information, visit www.moog.com/servomotorsandservodrives
THE MOOG DS2000XP SERVODRIVE DESIGN

The DS2000XP has flexible motion control capabilities, very high performance, high resolution, absolute position feedback and built-in motion template for ease of use. It is highly customizable. This high performance servodrive is ideal on applications that require high bandwidth and very smooth motion. The DS2000XP features axis motion control, flexible control architecture, easy to use motion template for Electro-Mechanical Actuators and very high performance CAN-bus, FireWire and SERCOS interfaces.

• ADVANCED CONTROL DESIGN
  The DS2000XP Servodrive has a state-of-the-art control design. The typical three-loops basic control algorithm provides excellent torque, speed and position loop closure. In addition, Application Engineers can use the widely recognized industrial simulation and control software Simulink™/Stateflow™ (Mathworks Co.) to generate sophisticated application control model and motion sequences. These sequences are then developed, tested and debugged offline on a PC. The working model is then automatically converted to a real-time code and downloaded to the DS2000XP Servodrive. This allows for added convenience, more uptime and rapid prototyping of advanced control algorithms.

• FLEXIBLE CONTROL MODEL TEMPLATE
  Moog has developed model-based control templates to meet specific customer and market needs. Application parameters such as stroke length, homing method, motion limits and motion profile are used to customize a template to a specific application requirement. Some of the available template features are:
  - Closed-loop position and velocity control loops up to 5KHz sampling rate
  - Real-time trajectory control of position, velocity and acceleration limits
  - Home sequencing with stroke limit verification
  - Emergency stop sequencing
  - IT current motor torque limiting
  - Position following error detection
  - Digital I/O handling
  - Common units for application definition (ex: inches, mm, rpm, volts)
  - Application input error checking (range, polarity)
  - Special control functions

• GRAPHICAL USER INTERFACE (GUI)
  A Windows-based GUI is available to help customer access the DS2000XP Servodrive over the RS232 port. GUI functions include:
  - Control model downloading
  - System configuration parameters downloading and uploading
  - Application parameters downloading and uploading
  - System tuning and diagnostics
  - Servodrive status and fault status monitoring
  - Graphical display of data logged variables

• DIAGNOSTICS AND TUNING
  The local LCD display on the servodrive provides basic servodrive status and possible fault occurrence. It has the following functions:
  - Motor automatic phasing
  - Error detecting
  - Basic parameter access and monitoring

• FIELDBUS
  High-speed serial bus interfaces provide a fully digital link for receiving motion commands, providing feedback of status and initializing controller parameters.

• MOTOR FEEDBACK
  In addition to the standard motor resolver feedback, the DS2000XP Servodrive interfaces to high resolution Sin/Cos encoders. Position resolution is greatly increased with a corresponding increase in velocity dynamic range. This translates to improved low speed performance.
PERFORMANCE SPECIFICATIONS

**ELECTRICAL CHARACTERISTICS**
- **Power Supply**: 3-phase, 65 Vac to 510 Vac; 1-phase, 103 Vac to 243 Vac
- **Auxiliary Power Supply**: 24 Vdc
- **PWM Frequency**: 10 kHz
- **Continuous Peak Output Current**: 3A/9A to 100A/240A (see chart below)

**ENVIRONMENTAL DATA**
- **Operating Ambient Temperature**: 0 to 40°C
- **Storage Temperature**: -25 to +55°C
- **Thermal Protection**: 70°C to de-rating the drive

**I/O INTERFACES**
- 2 analog input, 0-20 mA or 10 V, 14 bit DAC
- 2 analog output, 0-20 mA or 10 V, 14 bit DAC
- 2 basic monitoring output (1 velocity, 1 programmable)
- 5 digital input, isolated 24 Vdc
- 3 digital output, isolated 24 Vdc
- 1 relay output (COM, NO, NC)
- 1 simulation encoder output

**FIELDBUS**
- CANopen; SERCOS; FireWire; RS485 - Modbus

**MOTOR FEEDBACK**
- Stegmann Hiperface incremental and multi-revolution absolute encoders;
  EnDat format Sin/Cos encoders; Resolution up to 2^24 encoder counts per revolution

**MOTOR POLE RANGE**
- 2 to 24 poles

**SINUSOIDAL ENCODER RANGE**
- up to 24-bit resolution

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Note: Please refer to ordering code on page 11 for complete order numbers.
DS2000XP Size A - CONNECTORS AND DESCRIPTION

- J1: RS232 Communication
- J2: Servodrive Enable and monitoring
- J4: Motor Encoder feedback
- J5: Motor Resolver feedback
- J6: Digital Input
- J7: Digital Output
- J9: Sin/Cos Encoder feedback (optional)
- J10: CAN in (or SERCOS/FireWire)
- J11: CAN out (or SERCOS/FireWire)

**POWER**
- AC or DC power supply and motor connection

**DIMENSIONS**

![Dimensions Diagram]
TECHNICAL DATA

DS2000XP Size B - CONNECTORS AND DESCRIPTION

- J1: RS232 Communication
- J2: Servodrive Enable and monitoring
- J4: Motor Encoder feedback
- J5: Motor Resolver feedback
- J6: Digital Input
- J7: Digital Output
- J9: Sin/Cos Encoder feedback (optional)
- J10: CAN in (or SERCOS/FireWire)
- J11: CAN out (or SERCOS/FireWire)

POWER: AC or DC power supply and motor connection

DIMENSIONS:

- POWER CONNECTOR: Type: 14/42
- Dimensions in inches:
  - 12.579 [319.50]
  - 12.992 [330.00]
  - 2.632 [66.00]
  - 2.953 [75.00]
  - 4.724 [120.00]
  - 8.811 [224.30]
TECHNICAL DATA

DS2000XP Size C - CONNECTORS AND DESCRIPTION

J1 RS232 Communication
J2 Servodrive Enable and monitoring
J4 Motor Encoder feedback
J5 Motor Resolver feedback
J6 Digital Input
J7 Digital Output
J9 Sin/Cos Encoder feedback (optional)
J10 CAN in (or SERCOS/FireWire)
J11 CAN out (or SERCOS/FireWire)

POWER AC or DC power supply and motor connection

DIMENSIONS

8.66 [22.50] 4.724 [120.00] 8.66 [22.50]

6.496 [165.00]
TECHNICAL DATA

DS2000XP Size D - CONNECTORS AND DESCRIPTION

J1 RS232 Communication
J2 Servodrive Enable and monitoring
J4 Motor Encoder feedback
J5 Motor Resolver feedback
J6 Digital Input
J7 Digital Output
J9 Sin/Cos Encoder feedback (optional)
J10 CAN in (or SERCOS/FireWire)
J11 CAN out (or SERCOS/FireWire)

POWER AC or DC power supply and motor connection

DIMENSIONS

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DS2000XP Size E - CONNECTORS AND DESCRIPTION

- J1 RS232 Communication
- J2 Servodrive Enable and monitoring
- J4 Motor Encoder feedback
- J5 Motor Resolver feedback
- J6 Digital Input
- J7 Digital Output
- J9 Sin/Cos Encoder feedback (optional)
- J10 CAN in (or SERCOS/FireWire)
- J11 CAN out (or SERCOS/FireWire)

POWER
- AC or DC power supply and motor connection

Type: 100/240

DIMENSIONS
# ORDERING INFORMATION

## Model Series Designator

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## Current Hardware Revision

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