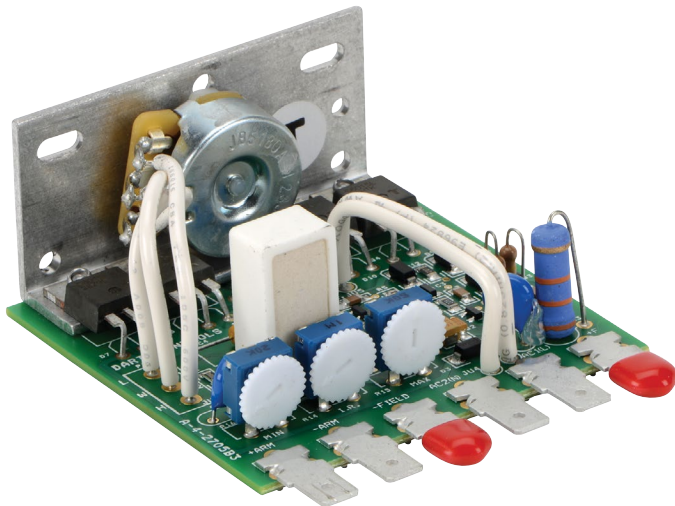
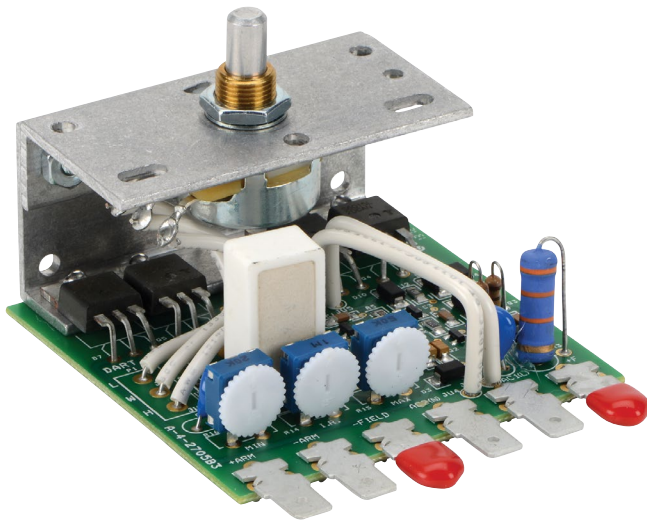


IRONHORSE™

GSD3 SERIES DC DRIVES USER MANUAL

USER MANUAL NUMBER: IH-GSD3-USER-M



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GSD3 DC DRIVES USER MANUAL OVERVIEW

OVERVIEW OF THIS PUBLICATION

The IronHorse GSD3 Series DC Drives User Manual describes the installation, configuration, and methods of operation of the GSD3 Series DC Drives.

All information contained in this manual is intended to be correct. However, information and data in this manual are subject to change without notice. AutomationDirect (ADC) makes no warranty of any kind with regard to this information or data. Further, ADC is not responsible for any omissions or errors or consequential damage caused by the user of the product. ADC reserves the right to make manufacturing changes which may not be included in this manual.

WHO SHOULD READ THIS USER MANUAL

This manual contains important information for those who will install, maintain, and/or operate any of the GSD3 Series DC Drives.

TECHNICAL SUPPORT

By Telephone: 770-844-4200 (Mon.–Fri., 9:00 a.m.–6:00 p.m. ET)

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Our technical support group is glad to work with you in answering your questions. If you cannot find the solution to your particular application, or, if for any reason you need additional technical assistance, please call Technical Support at 770-844-4200. We are available weekdays from 9:00 a.m. to 6:00 p.m. Eastern Time.

We also encourage you to visit our web site where you can find technical and non-technical information about our products and our company. Visit us at www.automationdirect.com.

SPECIAL SYMBOLS



WHEN YOU SEE THE “NOTEPAD” ICON IN THE LEFT-HAND MARGIN, THE PARAGRAPH TO ITS IMMEDIATE RIGHT WILL BE A SPECIAL NOTE.



*WHEN YOU SEE THE “EXCLAMATION MARK” ICON IN THE LEFT-HAND MARGIN, THE PARAGRAPH TO ITS IMMEDIATE RIGHT WILL BE A **WARNING**. THIS INFORMATION COULD PREVENT INJURY, LOSS OF PROPERTY, OR EVEN DEATH (IN EXTREME CASES).*

IRONHORSE GSD3 SERIES DC DRIVES GENERAL INFORMATION



CAREFULLY CHECK THE DC DRIVE FOR SHIPPING DAMAGE. REPORT ANY DAMAGE TO THE CARRIER IMMEDIATELY. DO NOT ATTEMPT TO OPERATE THE DRIVE IF VISIBLE DAMAGE IS EVIDENT TO EITHER THE CIRCUIT OR TO THE ELECTRONIC COMPONENTS.

STANDARD FEATURES

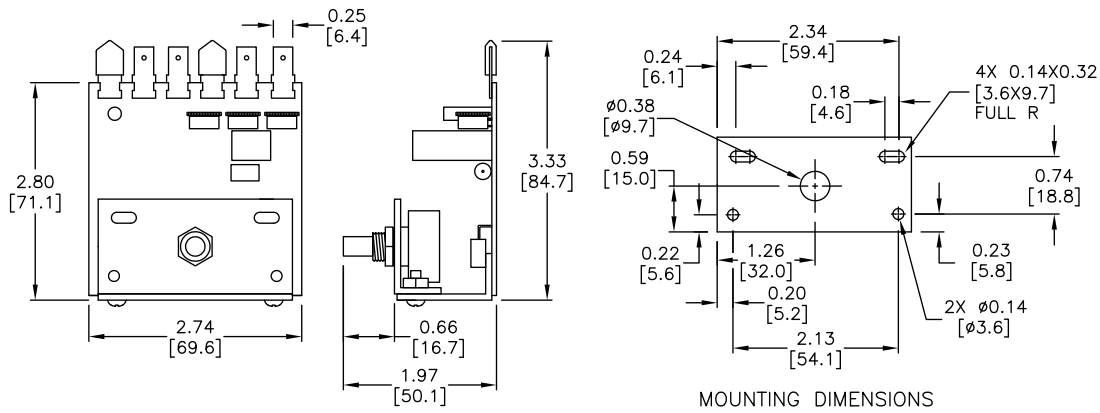
- Dual voltage models of 12/24 VAC or 120/240 VAC input.
- Full wave bridge power supply.
- Adjustable minimum and maximum speeds.
- Adjustable IR Compensation.
- Fixed Acceleration (0.5 seconds).
- 5k Ω speed potentiometer with leads, knob & dial included.
- 25:1 speed range; 1% speed regulation.
- Shunt field supply provided.
- Overload capacity of 200% for 1 minute.
- Transient voltage protection.
- Power on/off switch (enclosed models only).
- AC line fuse (120/240 VAC enclosed model GSD3-240-3N4 only)
- Enclosed models (GSD3-xxx-3N4) are rated NEMA 4.

SELECTION AND SPECIFICATIONS

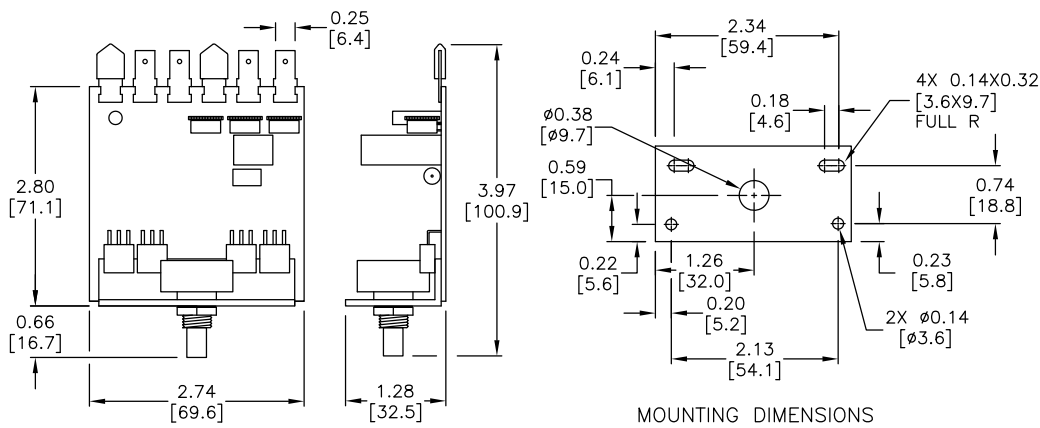
GSD3 Series DC Drives – Selection & Specifications						
Model	GSD3-24A-2CJ	GSD3-24A-2CL	GSD3-24A-3N4	GSD3-240-2CJ	GSD3-240-2CL	GSD3-240-3N4
Package Configuration	open frame		NEMA 4	open frame		NEMA 4
Power Quality Form Factor	1.4					
Input Voltage (@ 50/60 Hz)	12 or 24 VAC ±10%			120 or 240 VAC ±10%		
Output Voltage	0–12 or 0–24 VDC			0–90 or 0–180 VDC		
Shunt Field Voltage & Current	10 VDC @ 12 VAC 20 VDC @ 24 VAC (1A max)	10 VDC @ 12 VAC 20 VDC @ 24 VAC (0.75A max)	100 VDC @ 120 VAC 200 VDC @ 240 VAC (1A max)	100 VDC @ 120 VAC 200 VDC @ 240 VAC (0.75A max)		100 VDC @ 120 VAC 200 VDC @ 240 VAC (0.75A max)
Output Rating (hp)	1/50 – 1/40 @ 12V 1/25 – 1/20 @ 24V	1/50 – 1/25 @ 12V 1/25 – 1/12 @ 24V	1/50 – 1/6 @ 90V 1/25 – 1/3 @ 180V	1/50 – 1/3 @ 90V 1/25 – 2/3 @ 180V		1/50 – 1/3 @ 90V 1/25 – 2/3 @ 180V
Output Current (continuous)	150 mA to 2A (DC)	150 mA to 3A (DC)	150 mA to 2A (DC)	150 mA to 3A (DC)		150 mA to 3A (DC)
Current Overload Capacity	200% for 60s					
Current Limit	n/a					
Transient Protection	Metal Oxide Varistor (MOV)					
I.R. Compensation	adjustable – full range					
Speed Adjustment	5kΩ potentiometer					
Speed Range	25:1					
Speed Regulation	±1% of base speed					
Maximum Speed	adjustable from 40% to 120% of base speed					
Minimum Speed	adjustable from 0% to 30% of maximum speed					
Acceleration	0.5s (fixed)					
Deceleration	0.5s (fixed)					
Dynamic Braking	no					
Plugging Capability **	no					
Electrical Connections	spade connector lugs					
External Fusing Required	Internal fusing is included which is adequate for GSD3-240-3N4 120 VAC line and neutral inputs. Refer to “Fusing” (page 7) and “Wiring Diagrams” (page 7) for external fusing requirements for other wiring configurations.					
Operating Temperature	-10 to 45 °C [14 to 113 °F]	-10 to 40 °C [14 to 104 °F]	-10 to 45 °C [14 to 113 °F]	-10 to 40 °C [14 to 104 °F]		-10 to 40 °C [14 to 104 °F]
Thermal Protection	none					
Mounting Orientation	can be mounted in any orientation					
Corrosive Gases	NOT compatible with any corrosive gases					
Weight	2.9 oz [83g]	2.6 oz [75g]	20.3 oz [575g]	2.9 oz [83g]	2.6 oz [75g]	20.3 oz [575g]
Agency Approvals	RoHS			cUL _{US} Listed (E333109), RoHS		
Optional Accessories *						
Replacement Potentiometer	GSDA-5K					
Manual Reverse Switch	GSDA-MREV***					
* For accessories details, please visit www.AutomationDirect.com .						
** Plugging is a method of rapidly changing motor direction by reversing motor armature polarity, while the motor is still running.						
*** To meet NEMA4 requirements, GSDA-MREV requires a user provided external enclosure.						

DIMENSIONS

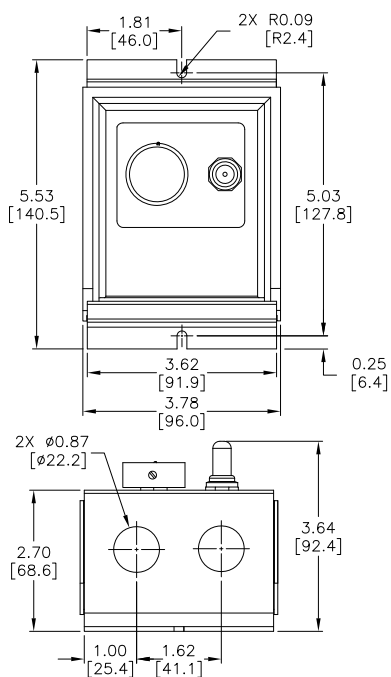
GSD3-24x-2CJ (dimensions = in [mm])



GSD3-24x-2CL (dimensions = in [mm])



GSD3-24x-3N4 (dimensions = in [mm])



INSTALLATION AND WIRING



INSTALL OPEN-FRAME DRIVES IN AN ENCLOSURE WITH A VOLUME AT LEAST THREE TIMES THE VOLUME OF THE OPEN-FRAME DRIVE.



DO NOT MOUNT GSD3-24x-2Cx DC DRIVE WHERE AMBIENT TEMPERATURE IS OUTSIDE THE RANGE OF -10 TO 45 °C (14 TO 113 °F).

DO NOT MOUNT GSD3-24x-3N4 DC DRIVE WHERE AMBIENT TEMPERATURE IS OUTSIDE THE RANGE OF -10 TO 40 °C (14 TO 104 °F).



IMPROPER INSTALLATION OR OPERATION OF THIS DC DRIVE MAY CAUSE INJURY TO PERSONNEL OR DRIVE FAILURE. THE DRIVE MUST BE INSTALLED IN ACCORDANCE WITH LOCAL, STATE, AND NATIONAL SAFETY CODES. MAKE CERTAIN THAT THE POWER SUPPLY IS DISCONNECTED BEFORE ATTEMPTING TO SERVICE OR REMOVE ANY COMPONENTS!!! IF THE POWER DISCONNECT POINT IS OUT OF SIGHT, LOCK IT IN DISCONNECTED POSITION AND TAG IT TO PREVENT UNEXPECTED APPLICATION OF POWER. ONLY A QUALIFIED ELECTRICIAN OR SERVICE PERSONNEL SHOULD PERFORM ANY ELECTRICAL TROUBLESHOOTING OR MAINTENANCE. AT NO TIME SHOULD CIRCUIT CONTINUITY BE CHECKED BY SHORTING TERMINALS WITH A SCREWDRIVER OR OTHER METAL DEVICE.



BEFORE ATTEMPTING TO WIRE THE DC DRIVE, MAKE SURE ALL POWER IS DISCONNECTED. RECHECK CODE DESIGNATION TO ASSURE PROPER VOLTAGE IS PRESENT FOR THE DC DRIVE. CAREFULLY SELECT PROPER WIRE SIZE FOR CURRENT AND VOLTAGE DROP. LIMIT THE VOLTAGE DROP THROUGH THE WIRING TO 5% OF THE LINE VOLTAGE AT FULL LOAD.



CAUTION!! TURN POWER OFF WHILE MAKING WIRING CONNECTIONS.



CAUTION!! DO NOT ATTEMPT TO PERFORM A HI-POT TEST ACROSS THE AC LINES WITH THE DC DRIVE IN THE CIRCUIT. THIS WILL RESULT IN IMMEDIATE OR LONG-TERM DAMAGE TO THE DRIVE.

FUSING

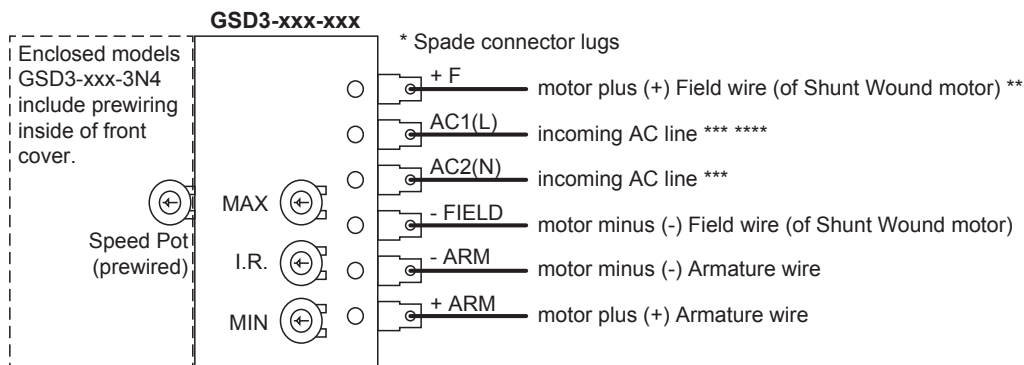
Refer to the wiring diagram for fusing information.

TERMINALS

GSD3 Wiring Terminals			
GSD Model	Type	Wire Range	Tightening Torque
GSD3-xxx-xxx	Spade connector lugs	n/a	n/a

WIRING DIAGRAM

GSD3-xxx-xxx WIRING DIAGRAM



* For wiring connections, use customer-supplied Sta-Kon 0.25 in x 0.25 in spade connectors or similar.

** +F connection is only for Shunt Wound motor; NOT for Permanent Magnet motor. For motors with dual voltage field, i.e. 50/100V or 100/200V, connect the highest value.

*** Use normal-blow fuses in series with all ungrounded (hot) AC inputs, rated to 125% of motor current. NOTE: Fuse both AC input lines for 240 VAC input, where both lines are hot. For line-to-neutral circuits, fuse the hot input line and connect it to AC1.

**** GSD3-240-3N4 drives include a replaceable built-in fuse wired in line with AC1. (Fuse is 250VAC, 6.3A Littlefuse 21606.30 or equivalent.)

TRIM POT ADJUSTMENTS

Before the power is applied, the speed potentiometer and trim pots should be preset as follows:

TRIM POT PRESET

- 1) Preset trim pots in the counter-clockwise position (CCW).
- 2) Apply power and set GSD3-24x-3N4 power ON/OFF switches to the ON position.
- 3) Turn the Speed pot fully CW.
- 4) Adjust the MAX trim pot in the CW direction until the maximum desired speed is obtained.
- 5) Turn the Speed pot fully CCW.
- 6) Adjust the MIN trim pot in the CW direction until deadband or the desired speed is obtained.

TRIM POT ADJUSTMENT

The IR COMP trim pot is used as a regulation adjustment. If better motor regulation is needed between minimum and maximum loads, then adjust the IR COMP trim pot as follows:

- 1) Turn the Speed pot CW to the 50% position.
- 2) Turn the IR COMP trim pot CW as needed to increase regulation.
- 3) Recheck and readjust the trim pots if necessary. Trim pot interaction with each other will be minimal.

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Literature Number: LT134

Drawing Number: A-5-3901C