

GSD4 Series DC Drives

GSD4 Introduction



GSD4-24x-xC



GSD4-240-10N4X



GSD4A-240-xC

GSD4 Series DC Drives

Motor Rating Range @ 24/36 VAC _{IN}	1/50 – 1/6 hp
Motor Rating Range @ 120/240 VAC _{IN}	1/50 – 2 hp

Overview

IronHorse GSD4 series DC drives provide cost efficient, reliable control for permanent magnet, shunt wound, and universal motors. The drives incorporate up-to-date design and engineering in a compact package.

Installation and field adjustments are facilitated using a barrier type terminal strip and large, easily adjustable trim pots to adjust horsepower ranges.

The GSD4-24A-5C model operates on a low input voltage of 24/36 VAC with an output of 1/50 – 1/6 hp.

Standard features include 1% speed regulation over a 50:1 speed range, plus an inhibit circuit for start-stop operation. Dual voltage 120/240 VAC or 24/36 VAC models are available.

Long life and quality are assured by 100% full load testing.

Features

- Dual input voltage 120/240 VAC or 24/36 VAC, 50/60Hz
- Adjustable horsepower settings
- Barrier terminal strip
- Full-wave bridge supply
- 1% speed regulation with armature voltage feedback ($\pm 1/2\%$ with tach feedback)
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable current limit
- Adjustable acceleration and deceleration (enclosed and GSD4A models)
- Line voltage compensation
- 5k Ω speed potentiometer with leads, dial and knob included
- 50:1 speed range
- Overload capacity: 200% for one minute
- Transient voltage protection
- Voltage following mode or DC tachometer follower by supplying ungrounded analog input signal
- DC tachometer feedback
- Inhibit circuit – permits start and stop without breaking AC lines
- Shunt field supply provided

Accessories

- Replacement speed potentiometer kit
- Digital potentiometer
- Manual reverse switch
- Accel/Decel adjustment card
- Analog current input card
- Analog voltage input card
- Heatsink

Detailed descriptions and specifications for GSD accessories are available in the "GSD Series DC Drives Accessories" section.

Typical Applications

- Auger feeders
- Automated door actuators
- Commercial cooking equipment
- Commercial lifts
- Food production
- Industrial pumping systems
- Measurement instruments
- Miniature lathes and mills
- Packaging / material-handling equipment
- Printing and labeling machines
- Small shop machine tools
- Spray / print reciprocating heads

GSD4 Series DC Drives

GSD4 Selection and Specifications

GSD4 Series DC Drives – Selection & Specifications				
Model	<u>GSD4-24A-5C</u>	<u>GSD4-240-1C</u>	<u>GSD4-240-5C</u>	<u>GSD4-240-10N4X</u>
Price	\$141.00	Retired	Retired	\$372.00
Package Configuration	Open frame			NEMA 4X
Power Quality Form Factor	1.4			
Input Voltage (@50/60Hz)	24/36 VAC ±10%	120/240 VAC ±10%		
Output Voltage	0–24/36 VDC	90VDC @ 120VAC input / 180 VDC @ 240VAC input		
Shunt Field Voltage	20VDC @ 24VAC in 30VDC @ 36VAC in (1A max)	100VDC @ 120VAC in 200VDC @ 240VAC in (1A max)	100VDC @ 120VAC in 200VDC @ 240VAC in (0.5A max)	
Motor Rating @ Low V (hp) Motor Rating @ High V (hp)	1/50 – 1/6	1/50 – 1/8 1/25 – 1/4	1/8 – 1/2 1/4 – 1	1/8 – 1 1/4 – 2
Output Current (continuous) **	5.5A (DC)	1.2A (DC)	5.5A (DC)	10A (DC)
Current Overload Capacity	200% for 60s			
Current Limit (adjustable)	1–15A (DC)	0.3–2.5A (DC)	1–15A (DC)	
Transient Protection	None	Metal Oxide Varistor (MOV)		
I.R. Compensation	Adjustable			
Speed Adjustment	Potentiometer	5kΩ potentiometer or 0-10 VDC**** isolated input signal		
	Current	4–20mA with opt acc GSDA-AI-A		n/a
	Voltage	n/a	0–5 VDC thru 0–250 VDC, 4–20 mA with optional accessory GSDA-AI-V4	
Speed Range	50:1			
Speed Regulation	±1% of base speed			
Maximum Speed	Adjustable from 60% to 110% of base speed			
Minimum Speed	0–30% of adjustable maximum speed			
Acceleration	0.5s (fixed)			adjustable from 0.5–8s
Deceleration				
Dynamic Braking	No			
Plugging Capability **	No			
Electrical Connections	8-position terminal strip; 22–14 AWG			
External Fusing Required	Bussman ABC or Littelfuse 314 series ceramic fuses or equivalent Refer to wiring diagrams for details			
Operating Temperature	-10 to 45 °C [14 to 113 °F]			-10 to 40 °C [14 to 104 °F]
Thermal Protection	Current limiting			
Mounting Orientation	Can be mounted in any orientation			
Corrosive Gases	NOT compatible with any corrosive gases			
Weight	8.0 oz [203g]	37 oz [1049g]	10.5 oz [297g]	59.5 oz [1687g]
Agency Approvals	RoHS, CE	cUL _{US} listed (E198015), RoHS, CE		cUL _{US} listed (E198015), RoHS
Optional Accessories*				
Replacement Potentiometer	<u>GSDA-5K</u>			
Digital Potentiometer	<u>GSDA-DP</u>			
Manual Reverse Switch	<u>GSDA-MREV****</u>			
Accel/Decel Adjustment Card	<u>GSDA-ACCDEC-4</u>			–
Analog Current Input Card	<u>GSDA-AI-A</u>			–
Analog Voltage Input Card	–	<u>GSDA-AI-V4</u>		–
Heatsink	<u>GSDA-HTSNK-4</u>			–
* For accessories details, refer to the "GSD Series DC Drives Accessories" section.				
** Plugging is a method of rapidly changing motor direction by reversing motor armature polarity, while the motor is still running.				
*** For 0-10 VDC input signal, please refer to "Operational Description: 0 to 10 VDC Analog Reference Signal to GSD4" in the users manual.				
**** To meet NEMA4 requirements, GSDA-MREV requires a user provided external enclosure.				

GSD4 Series DC Drives

GSD4A Selection and Specifications

GSD4A Series DC Drives – Selection & Specifications			
Model		GSD4A-240-2C	GSD4A-240-6C
Price		\$132.00	\$144.00
Package Configuration		Open frame	
Power Quality Form Factor		1.4	
Input Voltage (@50/60Hz)		120/240VAC, jumper selectable (Note: 90VDC output voltage is available with both 120VAC and 240VAC input voltage levels.)	
Output Voltage		0–90VDC @ 120 VAC input /180 VDC @ 240 VAC input	
Shunt Field Voltage		100VDC @ 120VAC in / 200VDC @ 240VAC in (7Adc Max shunt field amperage)	
Motor Rating	@ Low V (hp)	1/50–1/8 (without heatsink) 1/50–1/4 (with heatsink)	1/8–1/2 (without heatsink) 1/8–1 (with heatsink)
	@ High V (hp)	1/25–1/4 (without heatsink) 1/25–1/2 (with heatsink)	1/4–1 (without heatsink) 1/4–2 (with heatsink)
Output Current (continuous) **		2A (DC) / 6A (DC) with GSDA-HTSNK-4A	6A (DC) / 10A (DC) with GSDA-HTSNK-4A
Current Overload Capacity		200% for 60s	
Current Limit (adjustable)		0.3–2.5A (DC)	1–15A (DC)
Transient Protection		Metal Oxide Varistor (MOV)	
I.R. Compensation		Adjustable	
Speed Adjustment	Potentiometer	5kΩ potentiometer or 0–10 VDC**** isolated input signal	
	Current	4–20mA with option GSDA-AI-V4A	
	Voltage	0–5VDC thru 0–250VDC with option GSDA-AI-V4A	
Speed Range		50:1	
Speed Regulation		±1% of base speed	
Maximum Speed		Adjustable from 60% to 110% of base speed	
Minimum Speed		0–30% of adjustable maximum speed	
Acceleration		Adjustable from 0.5 to 8.0 seconds	
Deceleration		Adjustable from 0.5 to 6.0 seconds	
Dynamic Braking		no	
Plugging Capability **		no	
Electrical Connections		11-position terminal strip; 22–14 AWG	
External Fusing Required		Fuse Amperages are based on motor HP; see "Fusing"	
Operating Temperature		-10 to 45 °C [14 to 113 °F]	
Thermal Protection		Current limiting	
Mounting Orientation		Can be mounted in any orientation	
Corrosive Gases		NOT compatible with any corrosive gases	
Weight		7.12 oz [202g]	7.12 oz [202g]
Agency Approvals		cUL _{US} Listed (E198015), RoHS, CE	
Optional Accessories* (Some accessories are NOT compatible with GSD4 series drives)			
Replacement Potentiometer		GSDA-5K	
Digital Potentiometer		GSDA-DP	
Manual Reverse Switch		GSDA-MREV	
Signal Conditioner		GSDA-DP-S	
Closed loop digital potentiometer		GSDA-DP-D	
Isolated Current/Voltage Analog Input Module		GSDA-AI-V4A **** (for GSD4A drives only)	
Heatsink		GSDA-HTSNK-4A (for GSD4A drives only)	
* For accessories details, refer to the "GSD Series DC Drives Accessories" section.			
** Plugging is a method of rapidly changing motor direction by reversing motor armature polarity, while the motor is still running.			

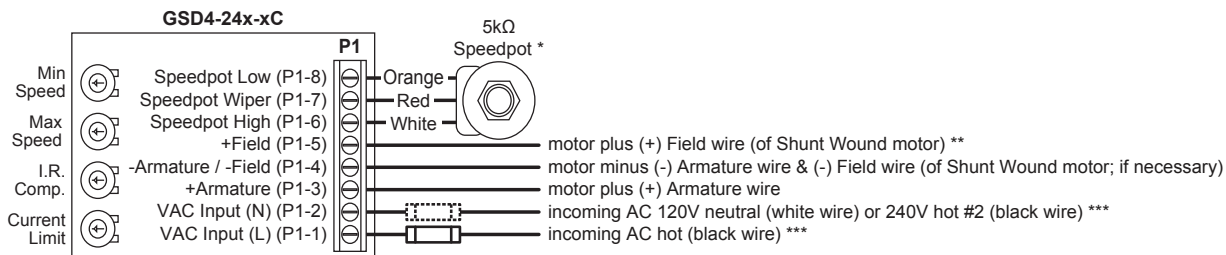
* For accessories details, refer to the “GSD Series DC Drives Accessories” section.

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GSD4 Series DC Drives

GSD4 Wiring Diagrams

GSD4-24x-xC Basic Wiring Diagram – (refer to User Manual for more detailed wiring information)



* P1-6 has internal +12V, and connects to Speedpot High (white wire). **THIS INPUT MUST NOT BE GROUNDED!**

For start-stop applications, the connection between P1-6 and Speedpot High can be opened and closed by a SPST switch.

* P1-7 connects to Speedpot Wiper (red wire). **THIS INPUT MUST NOT BE GROUNDED!**

For Voltage-Follower applications, **THIS INPUT MUST NOT BE GREATER THAN +12V MAXIMUM!**

* P1-8 connects to Speedpot Low, and is raised and lowered by the Min Speed trimpot. **THIS INPUT MUST NOT BE GROUNDED!**

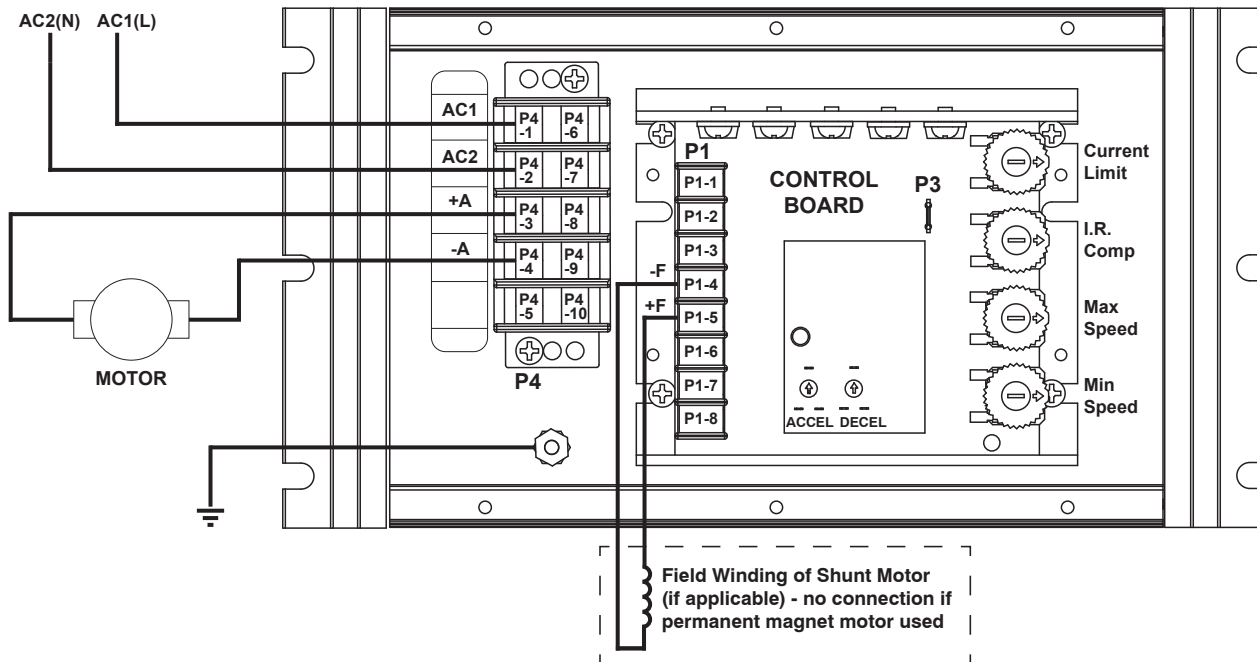
Electronic speed input (voltage follower) may be referenced to this input if the Min Speed trimpot adjustments are to be active. Otherwise, inputs may be referenced to -Armature, which will bypass the Min Speed trimpot.

** +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.

*** Fuse hot AC inputs only; refer to Fusing section for size and type. Fuse both AC lines for 240 VAC input. Do NOT fuse AC(N) on 120V systems. Connect incoming AC ground (green wire) to GSD4 chassis.

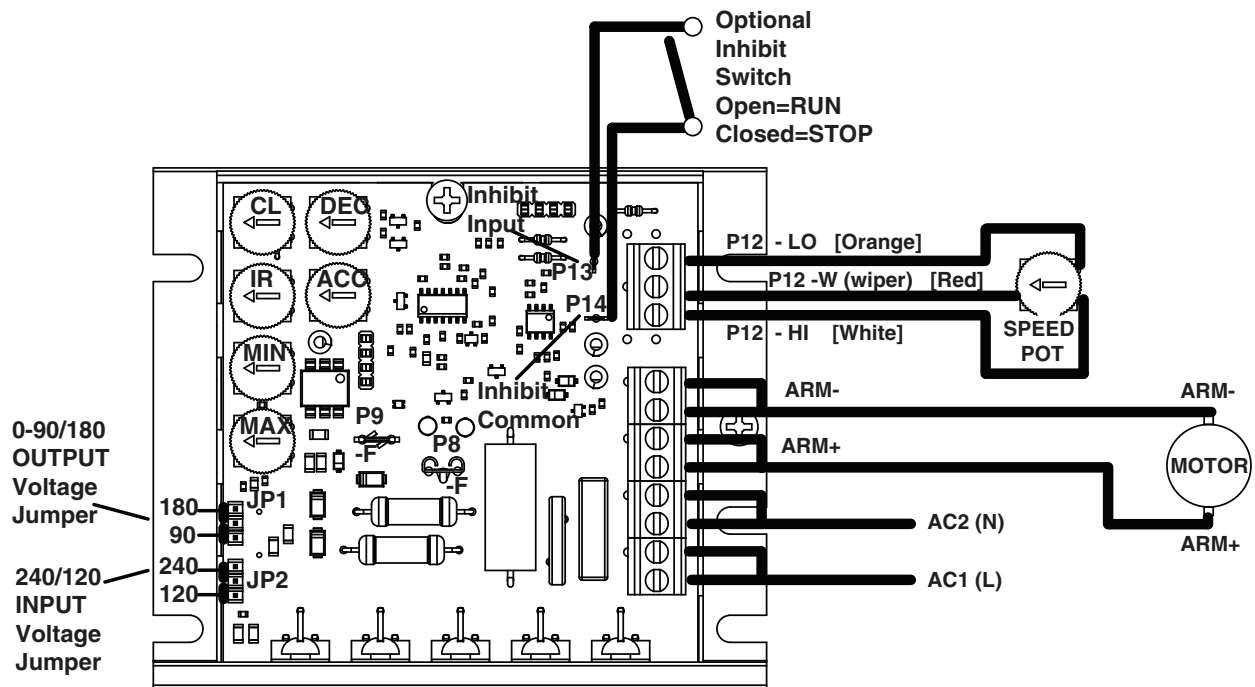
GSD4-240-10N4X Basic Wiring Diagram – (refer to User Manual for more detailed wiring information)



GSD4 Series DC Drives

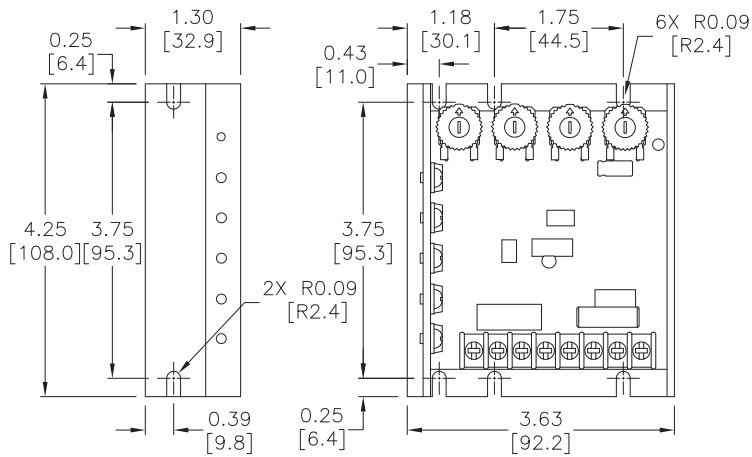
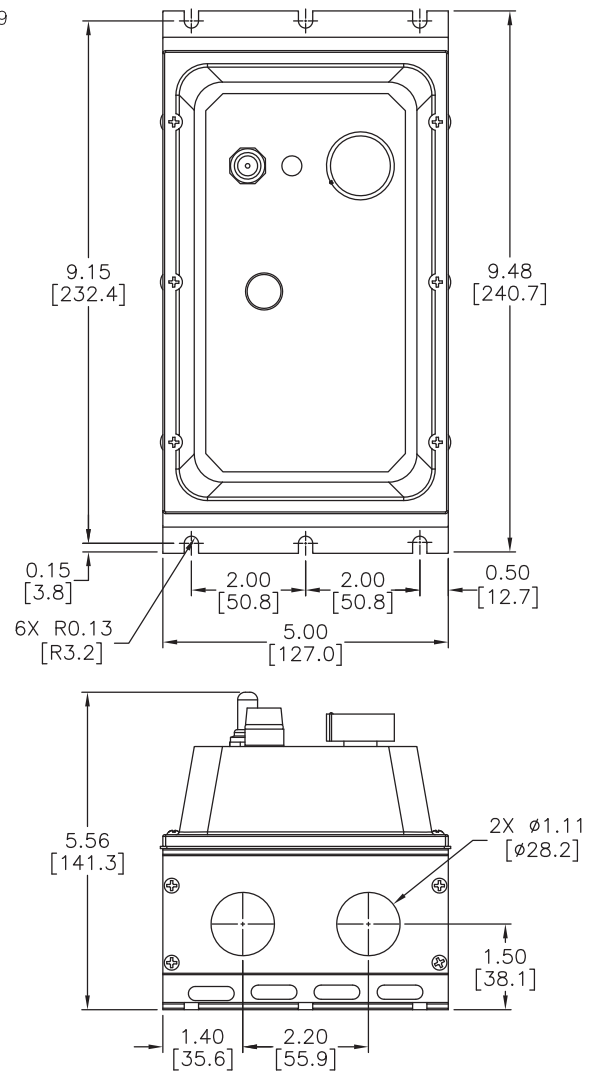
GSD4A Wiring Diagrams

GSD4A-240-xC Basic Wiring Diagram – (refer to User Manual for more detailed wiring information)



GSD4 Series DC Drives

GSD4 Dimensions — dimensions = in [mm]

GSD4-24x-xC Dimensions

GSD4-240-10N4X Dimensions

GSD4A-240-xC Dimensions
