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 (±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
- 5kΩ 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		***GSD4-24A-5C***	***GSD4-240-1C***	***GSD4-240-5C***	***GSD4-240-10N4X***
Price		<--->	<--->	<--->	<--->
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		n/a
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 Littlefuse 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	$_{C}UL_{US}$ listed (E198015), RoHS, CE		$_{C}UL_{US}$ listed (E198015), RoHS
Optional Accessories*					
Replacement Potentiometer		GSDA-5K			
Digital Potentiometer		GSDA-DP			
Manual Reverse Switch		GSDA-MREV****			
Accel/Decel Adjustment Card		GSDA-ACCDEC-4			–
Analog Current Input Card		GSDA-AI-A			–
Analog Voltage Input Card		–	GSDA-AI-V4		–
Heatsink		GSDA-HTSNK-4			–

** 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 exclosure.*

GSD4 Series DC Drives

GSD4A Selection and Specifications

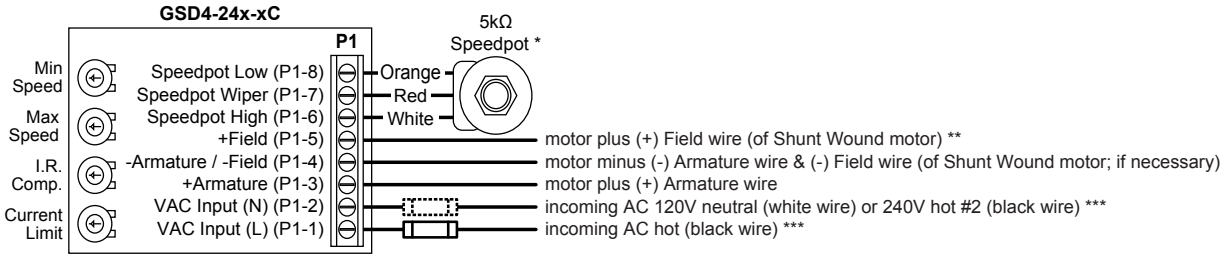
GSD4A Series DC Drives – Selection & Specifications			
Model		***GSD4A-240-2C***	***GSD4A-240-6C***
Price		<--->	$<--->
Package Configuration		Open frame	
Power Quality Form Factor		1.4	
Input Voltage (@50/60Hz)		120/240VAC, jumper selectable (Note: 90VDC output voltage is available with both 120VAC 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		$_{c}$UL$_{US}$ 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.*

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.

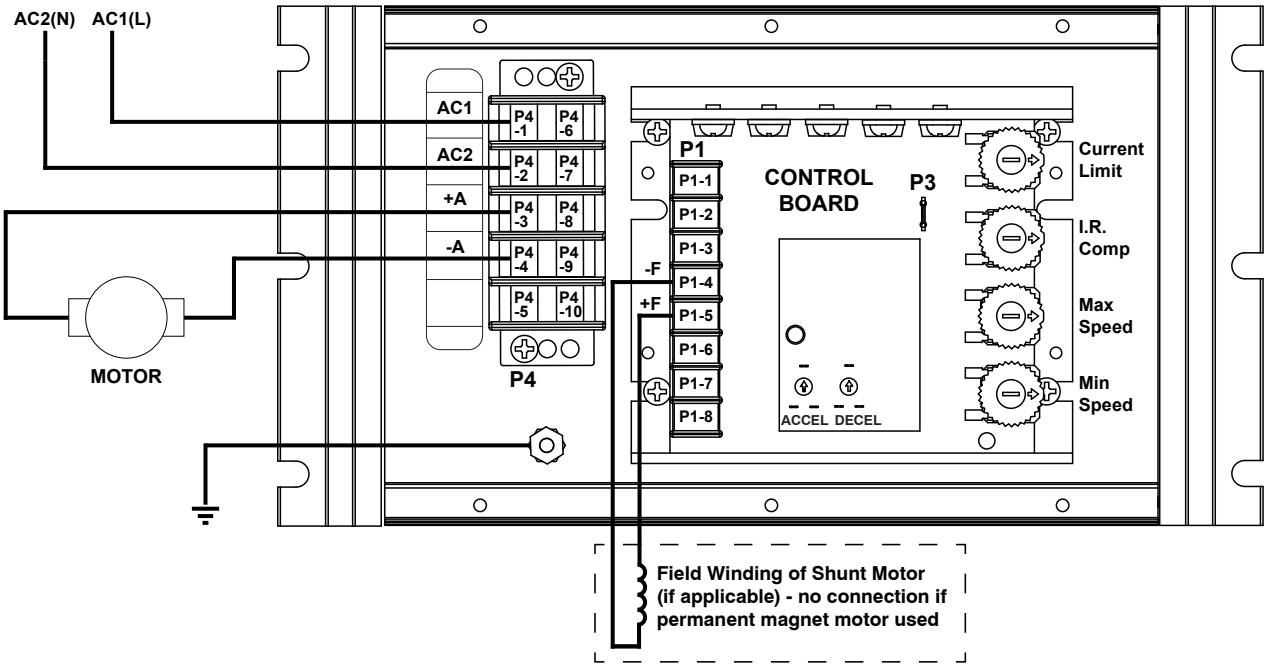
* *P1-7 connects to Speedpot Wiper (red wire). THIS INPUT MUST NOT BE GROUNDED!*
For Voltage-Follower applications, THIS INPUT MUST NOT BE GREATER THAN +12V MAXIMUM!

* *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.

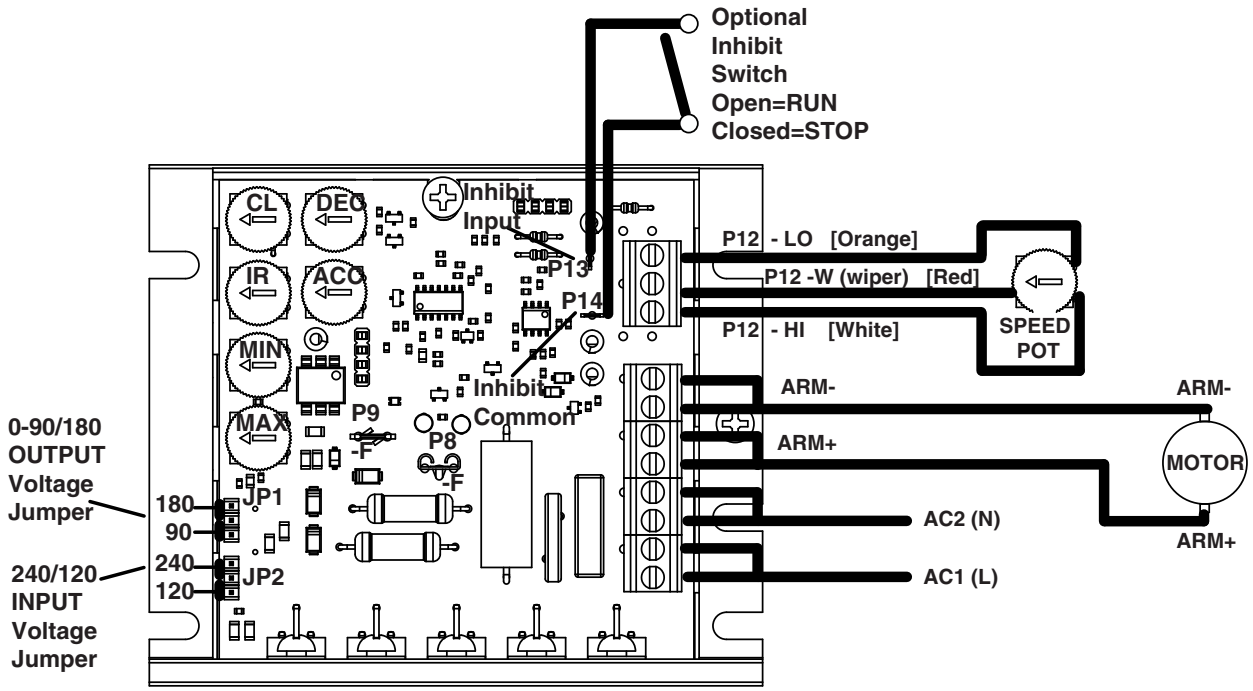
GSD4-240-10N4X Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



GSD4 Series DC Drives

GSD4A Wiring Diagrams

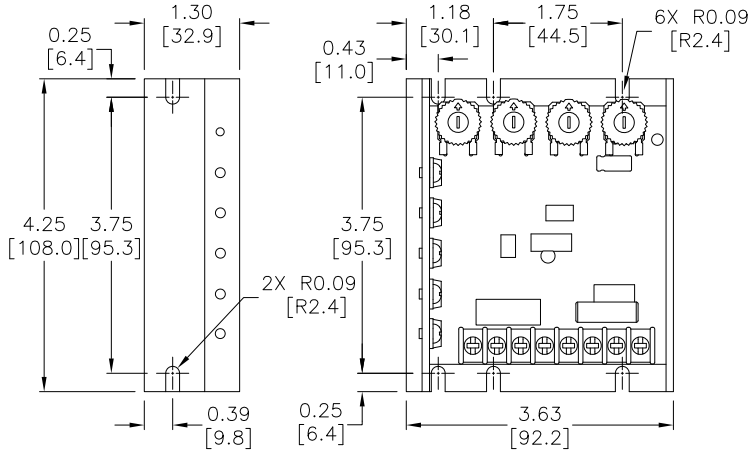
GSD4A-240-xC Basic Wiring Diagram **–** *(refer to User Manual for more detailed wiring information)*



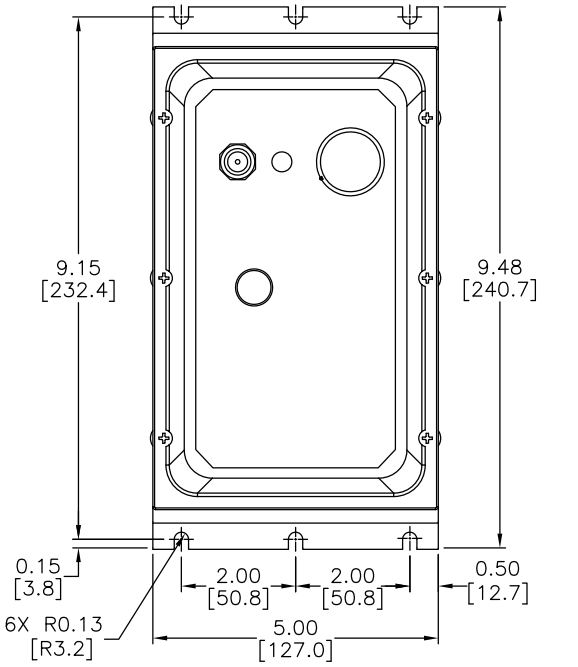
GSD4 Series DC Drives

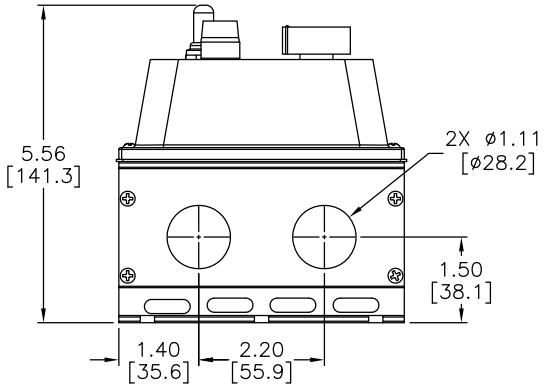
GSD4 Dimensions – *dimensions = in [mm]*

GSD4-24x-xC Dimensions



GSD4-240-10N4X Dimensions





GSD4A-240-xC Dimensions