

# GSD1 Series DC Drives

## GSD1 Introduction



**GSD1-48-10N4X**



**GSD1-48-xxC**

GSD1 Series DC Drives	
<b>12VDC @ 10A</b>	<b>1/50 – 1/8 hp motor</b>
<b>24VDC @ 10A</b>	<b>1/50 – 1/4 hp motor</b>
<b>36VDC @ 10A</b>	<b>1/50 – 3/8 hp motor</b>
<b>48VDC @ 10A</b>	<b>1/50 – 1/2 hp motor</b>
<b>12VDC @ 20A</b>	<b>1/50 – 1/4 hp motor</b>
<b>24VDC @ 20A</b>	<b>1/50 – 1/2 hp motor</b>
<b>36VDC @ 20A</b>	<b>1/50 – 3/4 hp motor</b>
<b>48VDC @ 20A</b>	<b>1/50 – 1 hp motor</b>

## Overview

IronHorse GSD1 series DC drives are high-performance Pulse-Width-Modulated (PWM) controllers for 12 to 48 volt equipment providing smooth control with high-efficiency operation.

The advanced design permits a substantial increase in equipment running time between charges over conventional techniques.

Features include adjustable maximum speed, minimum speed, current limit, I.R. compensation, and acceleration. The adjustable current-limit feature protects the control, battery, and motor from sustained overloads.

GSD1 series DC drives are available in open-frame and NEMA 4X enclosed styles, and all come standard with a speed pot, knob, and dial plate.

GSD1 series DC drives are available in 10A and 20A versions. A jumper on the drive selects 12, 24, 36 or 48V operating voltage.

## Features

- Provides smooth variable speed capability for mobile equipment
- Automatic compensation holds motor speed steady even if the load varies or battery voltage declines.
- Speed regulation is  $\pm 1\%$  of base speed
- Adjustable maximum speed
- Adjustable minimum speed
- Adjustable IR compensation
- Adjustable current limit
- Adjustable acceleration speed
- $5k\Omega$  speed pot with leads, knob and dial included
- Speed adjustment using  $5k\Omega$  speed pot or optional 0–10 VDC analog input signal
- Inhibit terminal permits optional start-stop without breaking battery / power line

## Accessories

- Replacement speed potentiometer kit
- Digital speed potentiometer

*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 lift
- 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 head

# GSD1 Series DC Drives

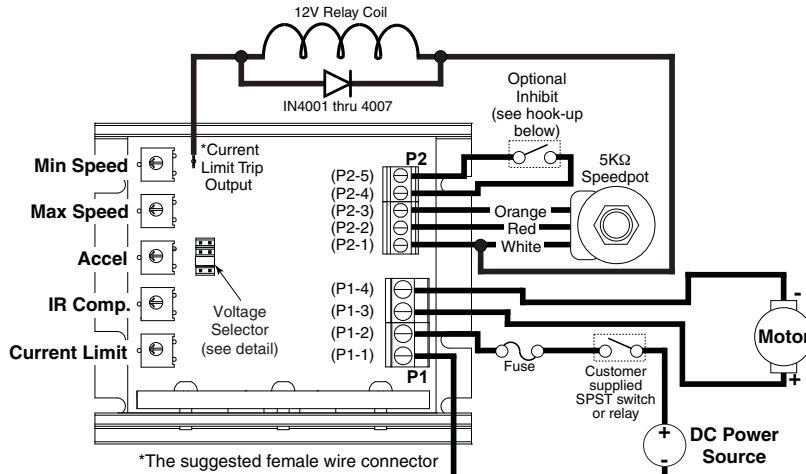
## GSD1 Selection and Specifications

<b>GSD1 Series DC Drives – Selection &amp; Specifications</b>			
<b>Model</b>	<b>GSD1-48-10C</b>	<b>GSD1-48-10N4X</b>	<b>GSD1-48-20C</b>
<b>Price</b>	\$133.00	\$244.00	\$186.00
<b>Package Configuration</b>	open frame	NEMA 4X	open frame
<b>Power Quality Form Factor</b>	1.05		
<b>Input Voltage **</b>	12/24/36/48 VDC ±15% (jumper selectable)		
<b>Output Voltage</b>	0–12/24/36/48 VDC		
<b>Motor Rating (hp)</b>	1/50 – 1/2		1/50 – 1
<b>Output Current (continuous)</b>	10A (DC)		20A (DC)
<b>Current Overload Capacity</b>	200% for 10s; 150% for 60s		
<b>Current Limit</b>	adjustable to 200% of motor Full Load Current, up to 200% of control current rating		
<b>Speed Adjustment</b>	5kΩ potentiometer or 0–10 VDC input signal		
<b>Speed Range</b>	30:1		
<b>Speed Regulation</b>	1% of base speed via adjustable IR compensation trim pot		
<b>Maximum Speed</b>	adjustable from 50% to 100% of base speed		
<b>Minimum Speed</b>	0–30% of adjustable maximum speed		
<b>Acceleration</b>	adjustable from 0–10s		
<b>Deceleration</b>	0.5s (non-adjustable)		
<b>Dynamic Braking</b>	no		
<b>Plugging Capability ***</b>	no		
<b>Internal Operating Frequency</b>	18kHz		
<b>Power Connections (P1)</b>	Euro-style terminal block (14–28 AWG)		Euro-style terminal block (10–14 AWG)
<b>Signal Connections (P2)</b>	Euro-style terminal block (14–28 AWG)		
<b>External Fusing Required</b>	DC-rated @ 150% motor Full Load Current (up to 150% Continuous Output Current rating of drive)		
<b>Operating Temperature</b>	-30 to 65°C [-22 to 140°F] for Chassis -15 to 60°C [5 to 140°F] for Enclosed		
<b>Thermal Protection</b>	none		
<b>Mounting Orientation</b>	Can be mounted in any orientation		
<b>Corrosive Gases</b>	NOT compatible with any corrosive gases		
<b>Package Configuration</b>	Black anodized aluminum extrusion		
<b>Weight</b>	8oz [227g]	40oz [1049g]	8oz [227g]
<b>Agency Approvals</b>	RoHS		
<b>Optional Accessories *</b>			
<b>Replacement Potentiometer</b>	GSDA-5K		
<b>Digital Potentiometer</b>	GSDA-DP		
<p>* For accessories details, refer to the "GSD Series DC Drives Accessories" section.</p> <p>** Input power supply must not exceed recommended voltage, or it may damage the GSD1 drive. Linear power supply can be sized per drive voltage and motor full load current. Switched power supply should be sized per drive voltage and double the motor full load current.</p> <p>*** Plugging is a method of rapidly changing motor direction by reversing motor armature polarity, while the motor is still running.</p>			

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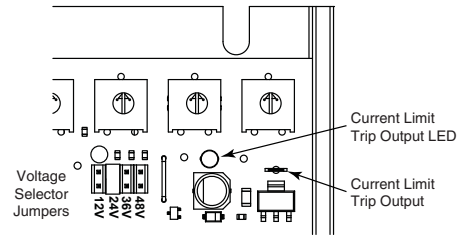
## GSD1 Wiring Diagrams

### GSD1-48-xxC Basic Wiring Diagram – (refer to User Manual for more detailed wiring information)

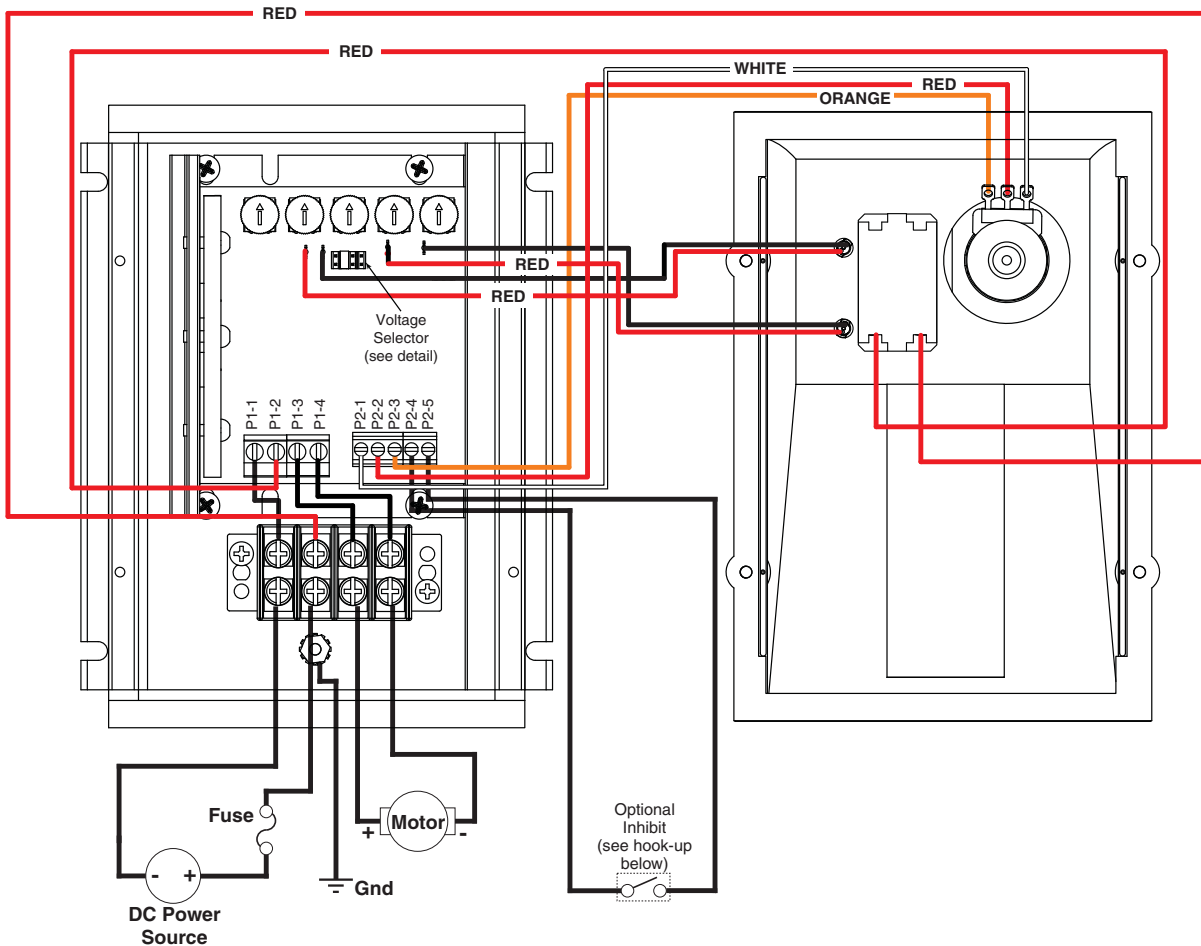


\*The suggested female wire connector for the .110" male spade terminal is a Molex Inc. P/N 1090030024

GSD1 Series Terminals		
Terminal Number	Description	Terminal Marking
P1-1	- Battery	(-B)
P1-2	+ Battery	(+B)
P1-3	+ Armature	(+A)
P1-4	- Armature	(-A)
P2-1	Potentiometer High	(HI)
P2-2	Potentiometer Wiper	(WP)
P2-3	Potentiometer Low	(LO)
P2-4	Common	(COM)
P2-5	Inhibit	(INH)



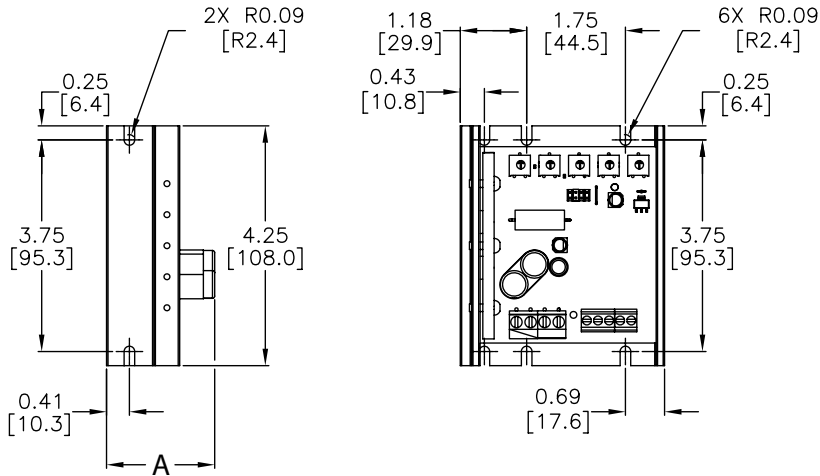
### GSD1-48-10N4X Basic Wiring Diagram – (refer to User Manual for more detailed wiring information)



# GSD1 Series DC Drives

## GSD1 Dimensions – dimensions = in [mm]

### GSD1-48-xxC Dimensions



Model	A
GSD1-48-10C	1.70 [43.1]
GSD1-48-20C	1.92 [48.7]

### GSD1-48-10N4X Dimensions

