IronHorse GSD Series DC Drives

GSD Series DC Drives Overview and Selection Guide

GSD DC Drives – Series Comparisons							
Series	***GSD1***	***GSD3***	***GSD4 & 4A***	***GSD5***	***GSD6***	***GSD7***	***GSD8***
Package Configurations Available	Open frame NEMA 4X	Open frame NEMA 4	Open frame NEMA 4X	Open frame NEMA 4/12	Open frame	Open frame	NEMA 4X
Power Quality Form Factor	1.05	1.4					1.36
Input Voltages	12/24/36/48 VDC	12/24 VAC 120/240 VAC	24/36 VAC 120/240 VAC	120/240 VAC	115/230 VAC	120VAC 240VAC	85-265 VAC
Output Voltages	0–12 VDC 0–24/36 VDC 0–12/24/36/48 VDC	0–12/24 VDC 0–90/180 VDC	0–24/36 VDC 0–90/180 VDC	0–90/180 VDC	0–90/180 VDC	0–90/180 VDC	0–90/180 VDC
Shunt Field Voltages (Currents)	–	10/20 VDC 100/200 VDC (0.75–1A)	20/30 VDC 100/200 VDC (0.5–1A)	100/200 VDC (1A)	100/200 VDC (1.5A)	100/200 VDC (1A)	–
Motor Ratings (hp)	1/50–1	1/50–2/3	1/50–2	1/8–2	1/8–3	1/50–2	1/2–2
Max Output Current (continuous)	10–20 A (DC)	0.15–3 A (DC)	1.2–10 A (DC)	0.15–10.8 A (DC)	15A (DC)	0.5–10 A (DC)	5–10 A
Current Overload Capacity	150% for 60s	200% for 60s	200% for 60s	150% for 60s	200% for 60s	200% for 60s	200% for 60s
Current Limit	Adjustable 0-200%	None	Adjustable 1–2.5A (DC) 1–15A (DC)	Adjustable 1–15A (DC)	Adjustable 2–30A (DC)	Adjustable 0.3–18A (DC)	None
Transient Protection	None	Metal Oxide Varistor (MOV)					MOV and X2 Cap.
I.R. Compensation	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	Adjustable	n/a
Speed Adjustment	5kΩ pot or 0–10 VDC input signal **	5kΩ pot	5kΩ pot or Optional 0–5/10/250 VDC or 4–20 mA input signal	5kΩ pot or 0–10 VDC input signal	5kΩ pot or Optional 4–20 mA input signal	5kΩ pot or 0–10 VDC input signal	Front panel / analog option
Speed Range	30:1	25:1	50:1	50:1	50:1	50:1	100:1
Speed Regulation	±1% of base speed						0.1%***
Maximum Speed	Adjustable 50–100%	Adjustable 40–120%	Adjustable 60–100%	Adjustable 66–110%	Adjustable 60–120%	Adjustable 60–110%	Non-adjustable 0–100%
Minimum Speed	Adjustable 0–30%						
Acceleration	Adjustable 0–10s	0.5s (fixed)	GSD4: 0.5s (fixed) GSD4A: Adjustable 0.5–8s	Adjustable 0.5–8s	Adjustable 0.3–12s	0.5s (fixed)	1-9999****
Deceleration	0.5s (fixed)	n/a (follows ramp of the reference)	Adjustable 0.5–8s	Adjustable 0.06–80s	Adjustable 0.6–12s	0.5s (fixed)	1-9999****
Plugging* / Dynamic Braking	No					Yes	No
Operating Temperature	-10–45 °C [14–113 °F]	-10–45 °C [14–113 °F] -10–40 °C [14–104 °F]	-10–45 °C [14–113 °F] -10–40 °C [14–104 °F]	-10–45 °C [14–113 °F]	-10–45 °C [14–113 °F]	-10–45 °C [14–113 °F]	-10–45 °C [14–113 °F]

** 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 to GSD1, please refer to "Operational Description – GSD1 – 0 to 10 VDC Analog Reference Signal" in the GSD1 section.*
**** Sensor PPR/application dependent*
***** Change per second in engineering units, dependent on mode.*

GSD1 Series DC Drives

GSD1 Introduction

GSD1-48-10N4X

GSD1-48-xxC

GSD1-24-15N4X-R

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

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 compared to systems using 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 ±1% of base speed
- Adjustable maximum speed
- Adjustable minimum speed
- Adjustable IR compensation
- Adjustable current limit
- Adjustable acceleration speed
- 5kΩ speed pot with leads, knob and dial included
- Speed adjustment using 5kΩ speed pot or optional 0–10VDC* analog input signal
- Inhibit terminal permits optional start-stop without breaking battery / power line

** For 0–10 VDC input signal to GSD1, please refer to "Operational Description – GSD1 – 0 to 10 VDC Analog Reference Signal" at the end of this GSD1 section.*

Accessories

- Replacement speed potentiometer kit
- Digital speed potentiometer (120-240 VAC only)

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

GSD1 Series DC Drives

GSD1 Selection and Specifications

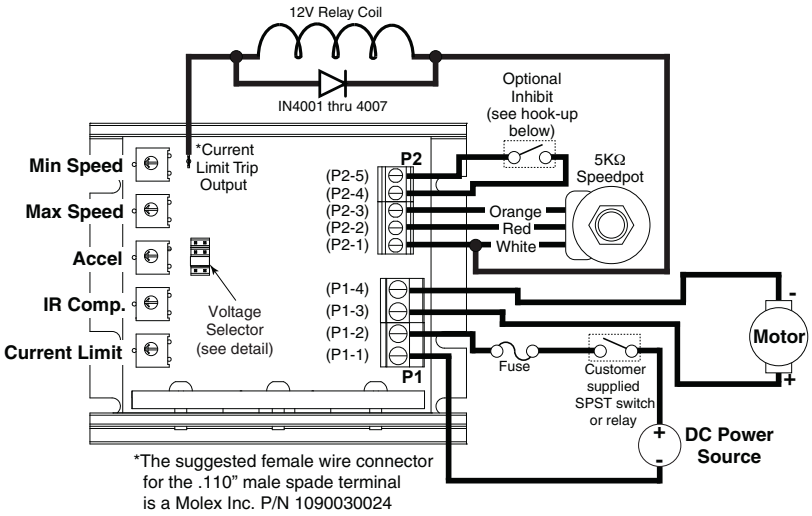
GSD1 Series DC Drives – Selection & Specifications				
Model	***GSD1-24-15N4X-R***	***GSD1-48-10C***	***GSD1-48-10N4X***	***GSD1-48-20C***
Price	$544.00	$217.00	$473.00	$251.00
Package Configuration	NEMA 4X	open frame	NEMA 4X	open frame
Power Quality Form Factor	1.05			
Input Voltage **	12–24 VDC ±15%	12/24/36/48 VDC ±15% (jumper selectable)		
Output Voltage	0–12/24 VDC	0–12/24/36/48 VDC		
Motor Rating (hp)	1/50–5/16	1/50–1/2		1/50–1
Output Current (continuous)	15A (DC)	10A (DC)		20A (DC)
Current Overload Capacity	200% for 10s; 150% for 60s			
Current Limit	Adjustable to 200% of motor Full Load Current, up to 200% of control current rating			
Speed Adjustment ***	5kΩ potentiometer or 0–10VDC*** input signal			
Speed Range	30:1			
Speed Regulation	1% of base speed via adjustable IR compensation trim pot			
Maximum Speed	Adjustable from 50% to 100% of base speed			
Minimum Speed	0–30% of adjustable maximum speed			
Acceleration	Adjustable from 0–10s			
Deceleration	0.5s (non-adjustable)			
Dynamic Braking	No			
Plugging Capability *****	No			
Internal Operating Frequency	18kHz			
Power Connections (P1)	Euro-style terminal block (10–14 AWG)	Euro-style terminal block (14–28 AWG)		Euro-style terminal block (10–14 AWG)
Signal Connections (P2)	Euro-style terminal block (14–28 AWG)			
External Fusing Required	DC-rated @ 150% motor Full Load Current (up to 150% Continuous Output Current rating of drive)			
Operating Temperature	-30 to 65°C [-22 to 140°F] for Chassis -15 to 60°C [5 to 140°F] for Enclosed			
Thermal Protection	None			
Mounting Orientation	Can be mounted in any orientation			
Corrosive Gases	NOT compatible with any corrosive gases			
Package Configuration	Black anodized aluminum extrusion			
Weight	40oz [1049g]	8oz [227g]	40oz [1049g]	8oz [227g]
Agency Approvals	RoHS			
Optional Accessories *				
Replacement Potentiometer	GSDA-5K			
Digital Potentiometer	GSDA-DP / GSDA-DP-D / GSDA-DP-S			
Manual Reverse Switch	GSDA-MREV	n/a		

** For accessories details, refer to the "GSD Series DC Drives Accessories" section.*
*** 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.
**** For 0–10 VDC input signal to GSD1, please refer to "Operational Description – GSD1 – 0 to 10 VDC Analog Reference Signal" at the end of this GSD1 section.*
***** Plugging is a method of rapidly changing motor direction by reversing motor armature polarity, while the motor is still running.*

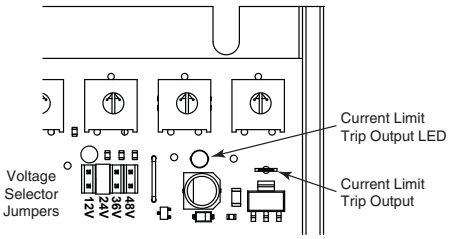
GSD1 Series DC Drives

GSD1 Wiring Diagrams

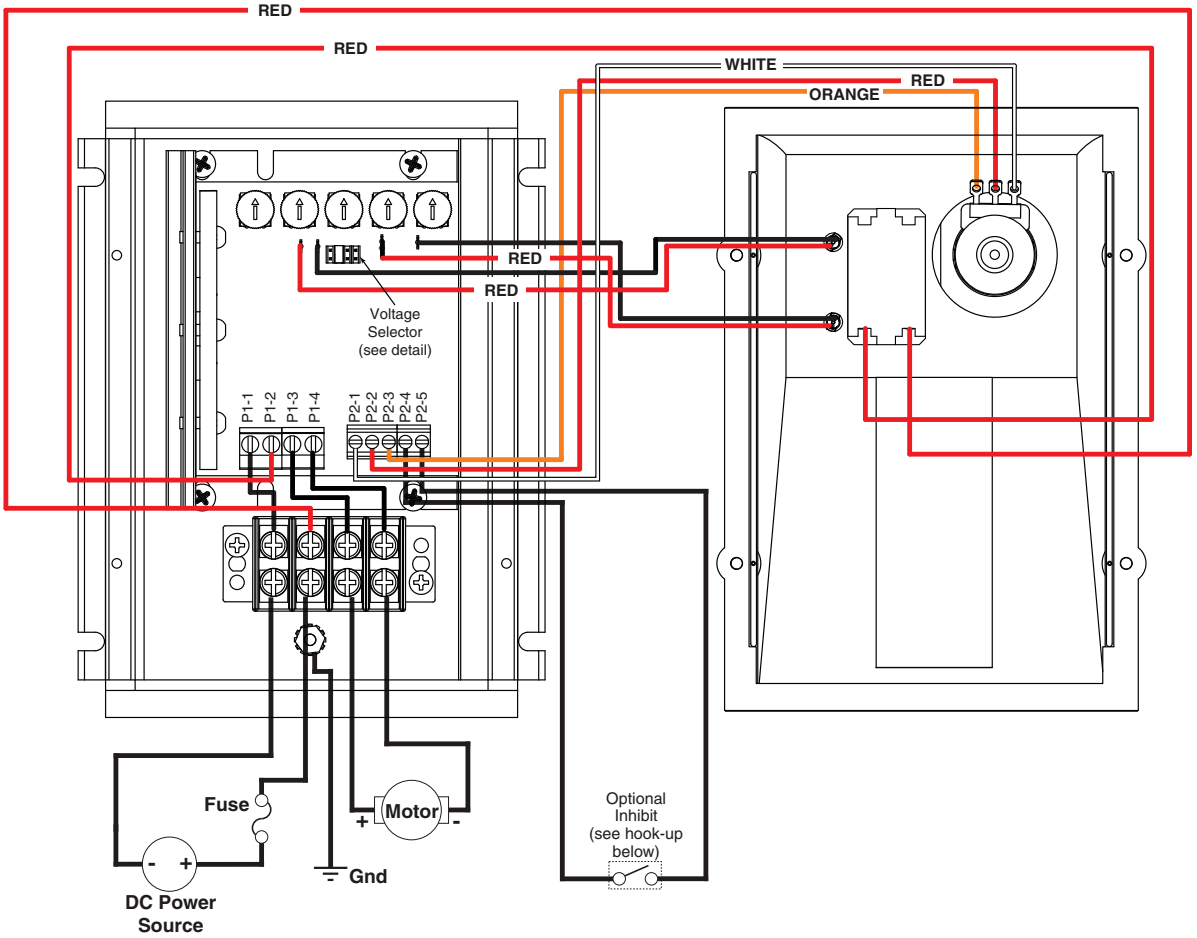
GSD1-48-xxC Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



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)



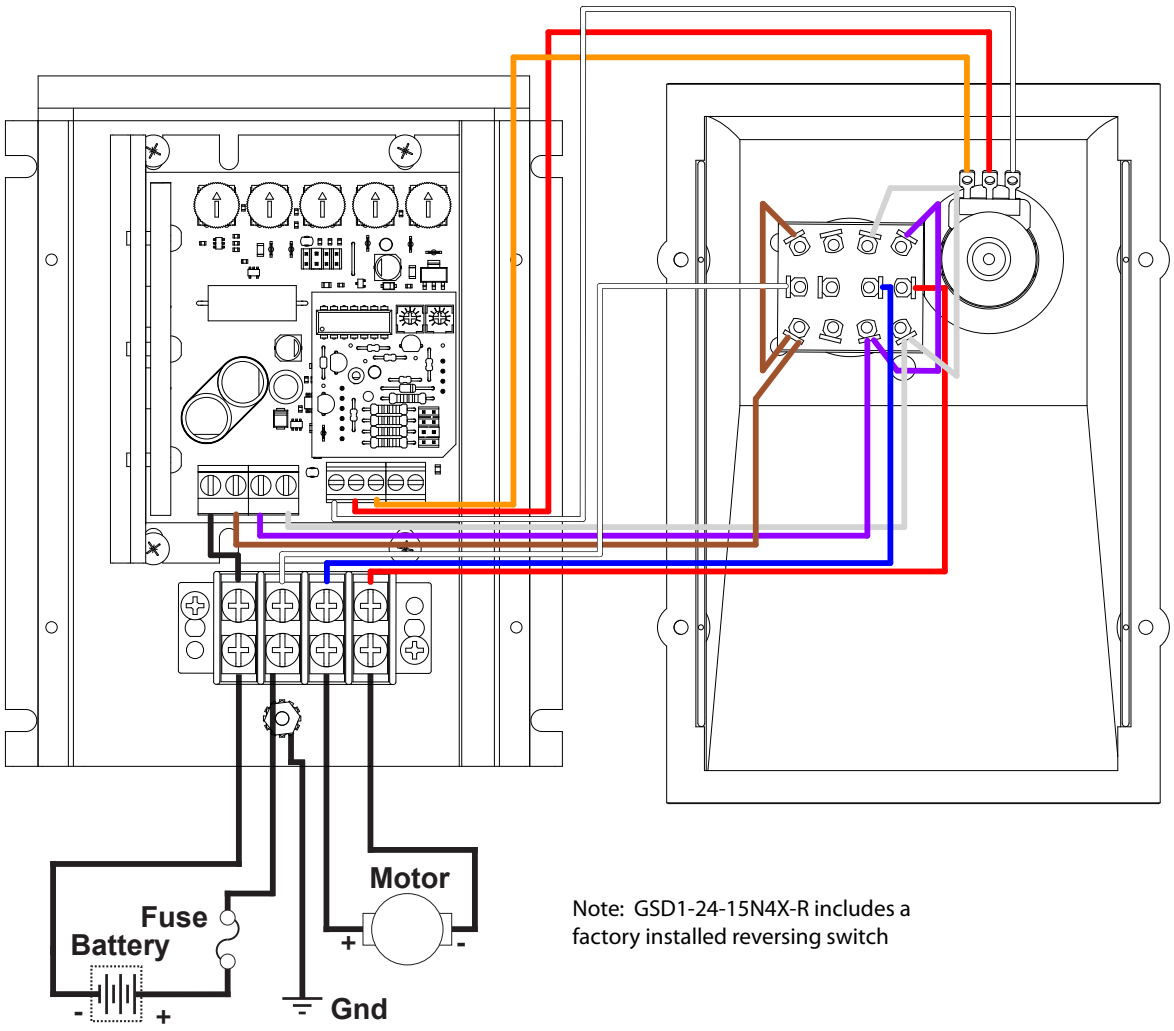
GSD1-48-10N4X Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



GSD1 Series DC Drives

GSD1 Wiring Diagrams

GSD1-24-15N4X-R Basic Wiring Diagram **–** *(refer to User Manual for more detailed wiring information)*

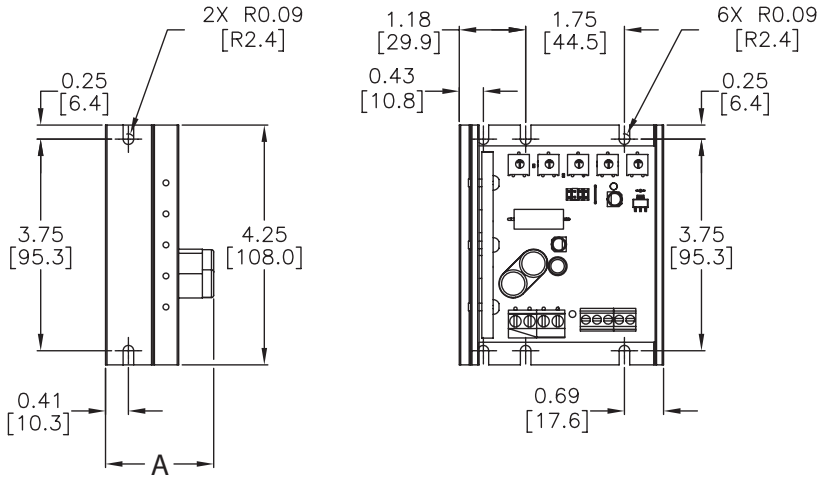


Note: GSD1-24-15N4X-R includes a factory installed reversing switch

GSD1 Series DC Drives

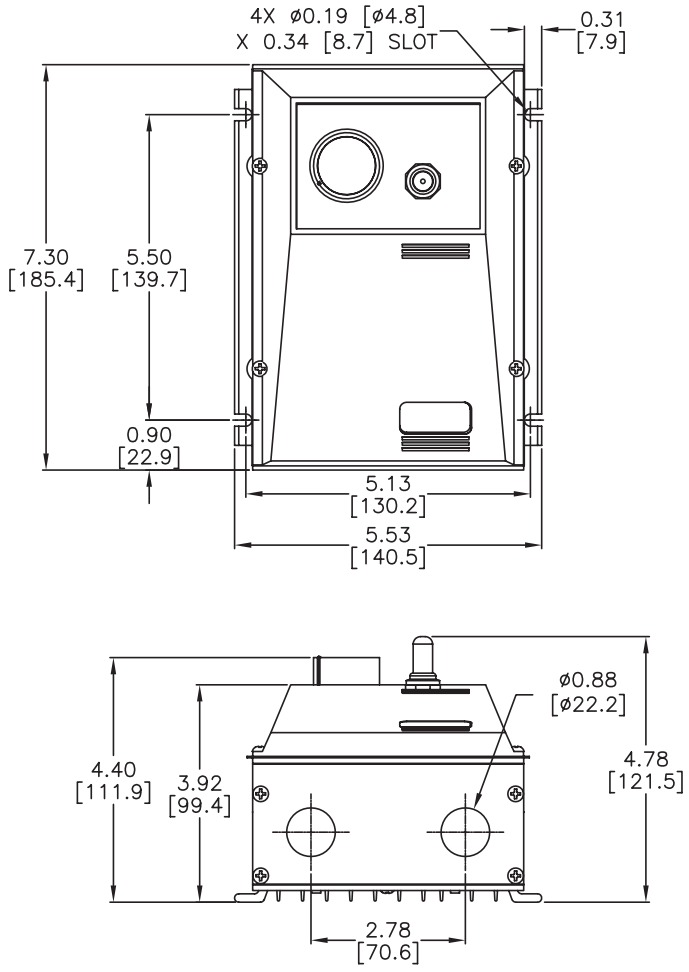
GSD1 Dimensions – *dimensions = in [mm]*

GSD1-48-xxC Dimensions



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

GSD1-48-10N4X and GSD1-24-15N4X Dimensions



GSD1 Series DC Drives

Operational Description – GSD1 – 0 to 10 VDC Analog Reference Signal

IronHorse GSD1 drives, though advertised to work with a 0 to 10 volt reference, exhibit an offset in output response when used in this manner. With 0 to 10 VDC connected to the GSD1 drive, output voltage is zero volts until the analog reference value reaches two volts, where the GSD1 drive output voltage will begin to rise. As the analog reference voltage rises, the GSD1 drive output voltage rises in proportion and linear to the reference. At 5 volts reference the GSD1 drive output is 50%, and at 10 volts reference the output is 100% of the expected voltage. Adjustments to min and max speed have no effect on the observed behavior.

The installation of a 4.7kΩ resistor across Pot Hi (P2-1) and Pot Lo (P2-3) helps with GSD1 drive output voltage, but is NOT a perfect solution. With the resistor installed, GSD1 drive output voltage is proportional to the lower reference voltage with a linear output response to midscale, where 1 to 5 volts reference equals 10% to 50% output. The problem is that linearity suffers as reference voltage increases. If the drive is linear from 1 to 5 volts then output voltage is low at the top, where 10 volts reference equals roughly 90% output. If adjustments are made to provide 100% output at the top, then the drive ignores the falling reference voltage and runs fast at midscale, where 5 volts reference equals 55% output.

All GSD1 drives have some dead band built into the speed pot circuit which, when a speed pot is used, can be tuned out using the MIN trim pot. The physical connection of a speed pot also provides a current path so that the MIN trim pot is active in the circuit. When using a reference signal connected +Signal to Wiper and -Signal to Pot Lo, the current path for the MIN trim pot is lost and therefore no longer in the circuit and a 4.7–5 kΩ resistor from Pot Hi to Pot Lo is needed.

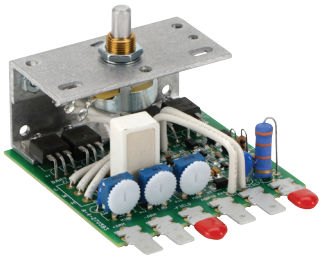
With a 0–10 VDC reference signal input, and with the MIN trim pot active, the MIN trim pot can be turned up to reduce or eliminate the dead band in the bottom end of the signal. However, this also has the effect of shifting the reference signal to effectively be a 2–12 VDC signal. The top of the reference (10–12 VDC) is ignored and the drive response becomes non-linear.

For most applications this is not an issue, as most do not operate in the bottom or top 20% of reference signal / speed range. However, for those applications that do, another fix is to scale the reference signal at the source to keep the effective reference signal always in the 0–10 VDC range. Changing from a 0–10 to a 0–8 VDC signal at the source, and turning up the MIN trim pot ~2V to offset dead band at the bottom, will operate the motor from 0–100% speed with a more linear response.

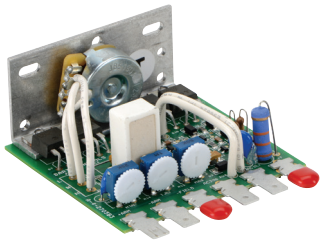
There is NO signal conditioning solution for the performance issue described in the GSD1 drive.

GSD3 Series DC Drives

GSD3 Introduction



GSD3-xxx-2CJ



GSD3-xxx-2CL

GSD3-24x-3N4

GSD3 Series DC Drives	
Motor Rating Range @ 12/24 VAC_{IN}	*1/50 – 1/12 hp*
Motor Rating Range @ 120/240 VAC_{IN}	*1/50 – 2/3 hp*

Overview

IronHorse GSD3 series DC drives are general-purpose, economical variable-speed controllers for small DC and universal motor applications.

Models are offered with dual input voltages of 12/24 VAC or 120/240 VAC with a DC output current rating of 2 Amps, adjustable trim pot settings, and quick-connect terminal pins.

GSD3 series DC drives are available in two compact panel-mount styles – open-frame and NEMA 4 enclosed.

Features

- Dual input voltage models of 12/24 VAC or 120/240 VAC
- Full-wave bridge power supply
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Fixed acceleration (0.5 seconds)
- 5kΩ speed potentiometer with leads, knob and dial included
- 25:1 speed range
- 1% speed regulation
- Shunt field supply provided (1 Amp max):
  - 10V for 12VAC; 20V for 24VAC input, 100V for 120VAC; 200V for 240VAC input
- Overload capacity of 200% for one minute
- Transient voltage protection
- Power on/off switch (enclosed models)
- AC line fuse (120–240 VAC NEMA 4 only)

Accessories

- Replacement speed potentiometer kit

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
- PLC-controlled reversing
- Printing and labeling machines
- Small shop machine tools
- Spray / print reciprocating head

GSD3 Series DC Drives

GSD3 Selection and Specifications

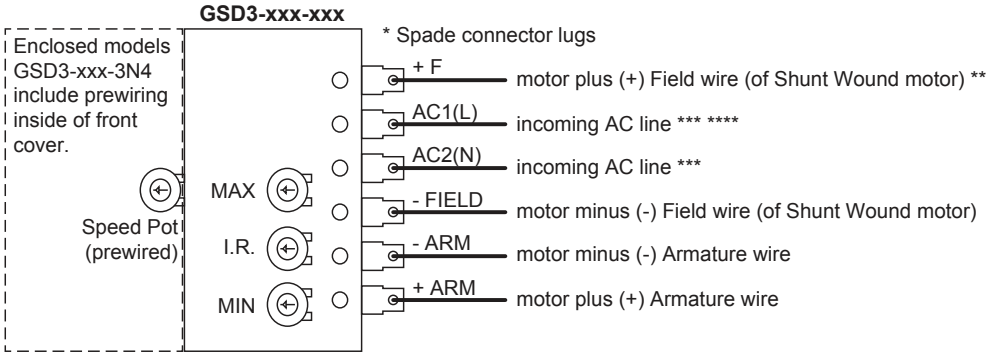
GSD3 Series DC Drives – Selection & Specifications						
Model	***GSD3-24A-2CJ***	***GSD3-24A-2CL***	***GSD3-24A-3N4***	***GSD3-240-2CJ***	***GSD3-240-2CL***	***GSD3-240-3N4***
Price	$100.00	$97.00	$185.00	$96.00	$94.00	$191.00
Package Configuration	Open frame		NEMA 4	Open frame		NEMA 4
Power Quality Form Factor	1.4					
Input Voltage	12/24 VAC ±10% @ 50/60 Hz			120/240 VAC ±10% @ 50/60 Hz		
Output Voltage	0–12 or 0–24 VDC			0–90 or 0–180 VDC		
Shunt Field Voltage & Current	10VDC @ 12 VAC 20VDC @ 24 VAC (1A max)		10VDC @ 12 VAC 20VDC @ 24 VAC (0.75A max)	100VDC @ 120 VAC 200VDC @ 240 VAC (1A max)		100VDC @ 120 VAC 200VDC @ 240 VAC (0.75A max)
Motor Rating (hp)	1/50–1/40 @ 11V 1/25–1/20 @ 22V		1/50–1/25 @ 11V 1/25–1/12 @ 22V	1/50–1/6 @ 90V 1/25–1/3 @ 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)
Current Overload Capacity	200% for 60s					
Current Limit	None					
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	n/a (follows the ramp of the reference)					
Dynamic Braking	No					
Plugging Capability **	No					
Electrical Connections	Spade-connector lugs					
External Fusing Required	Bussman ABC or Littlefuse 314 series ceramic fuses or equivalent GSD3-240-3N4 includes internal fusing adequate for 120 VAC line and neutral inputs Refer to wiring diagrams 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]
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			$_{C}$UL$_{US}$ listed (E333109), RoHS		
Optional Accessories *						
Replacement Potentiometer	GSDA-5K					
Manual Reverse Switch	GSDA-MREV***					

** 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.*
****To meet NEMA4 requirements, GSDA-MREV requires a user provided external exclosure.*

GSD3 Series DC Drives

GSD3 Wiring Diagrams

GSD3-24x-xxx Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



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

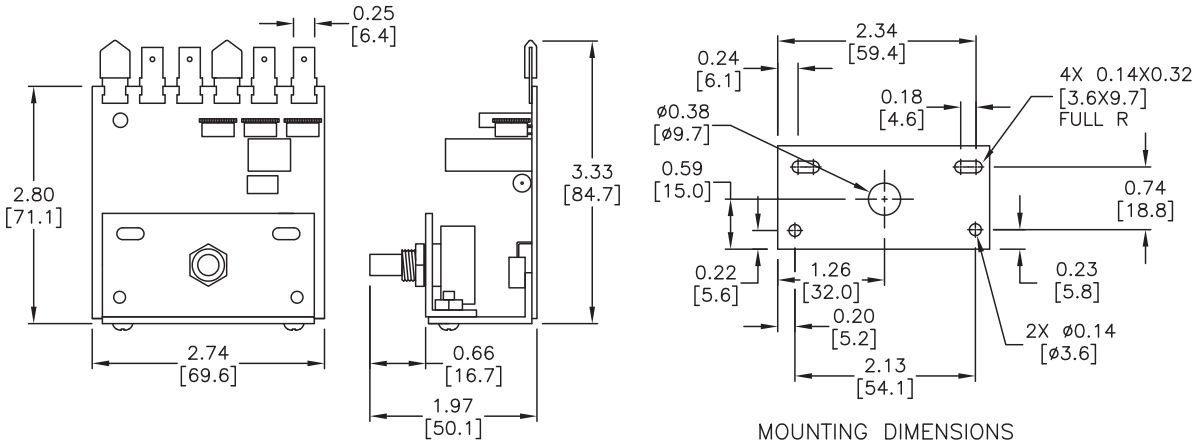
*** +F connection is only for Shunt Wound motor; NOT for Permanent Magnet motor. For motors with dual voltage field, i.e. 50/100V or 100/200V, connect the highest value.*

**** 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.*

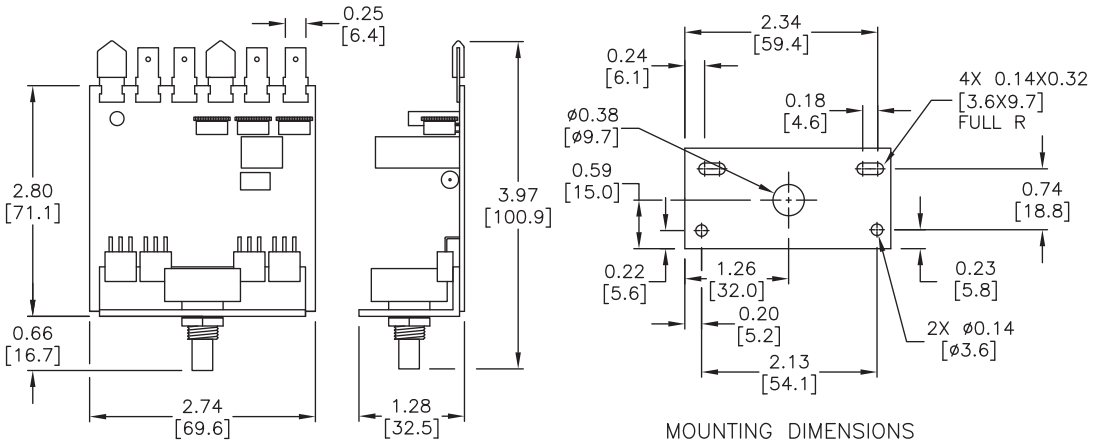
***** GSD3-240-3N4 drives include a replaceable built-in fuse wired in line with AC1. (Fuse is 250VAC, 6.3A Littlefuse 21606.30 or equivalent.)*

GSD3 Dimensions – *dimensions = in [mm]*

GSD3-24x-2CJ Dimensions



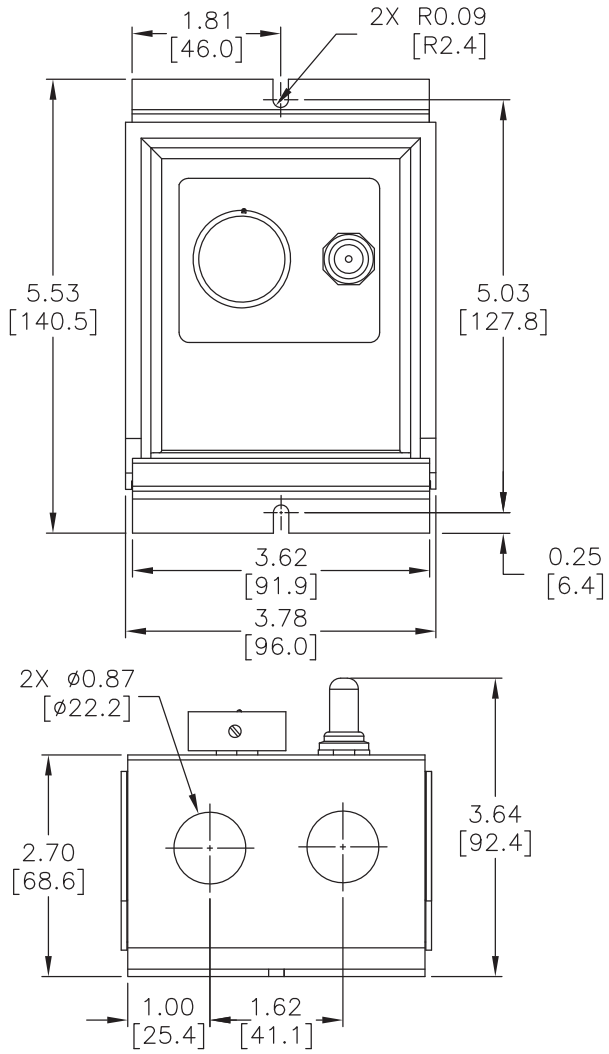
GSD3-24x-2CL Dimensions



GSD3 Series DC Drives

GSD3 Dimensions – *dimensions = in [mm]*

GSD3-24x-3N4 Dimensions



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 model only)
- 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		$141.00	$142.00	$157.00	$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		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

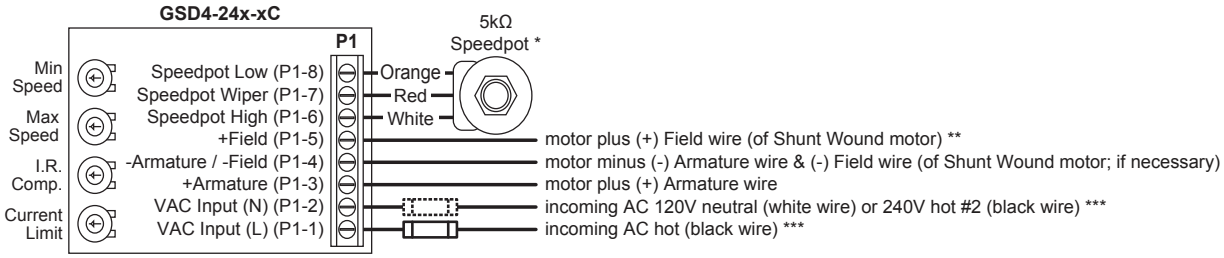
GSD4A Series DC Drives – Selection & Specifications			
Model		***GSD4A-240-2C***	***GSD4A-240-6C***
Price		$132.00	$144.00
Package Configuration		Open frame	
Power Quality Form Factor		1.4	
Input Voltage (@50/60Hz)		120/240VAC, jumper selectable (Note: 90VDC output voltage is available with both 120VAC 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) ***Motor Rating @ High V (hp)***		1/50 – 1/8 1/25 – 1/4	1/8 – 1/2 1/4 – 1
Output Current (continuous) **		2A (DC)	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)	
Modbus RTU Communications Module		GSDA-PU2E, GSDA-PU2R (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.

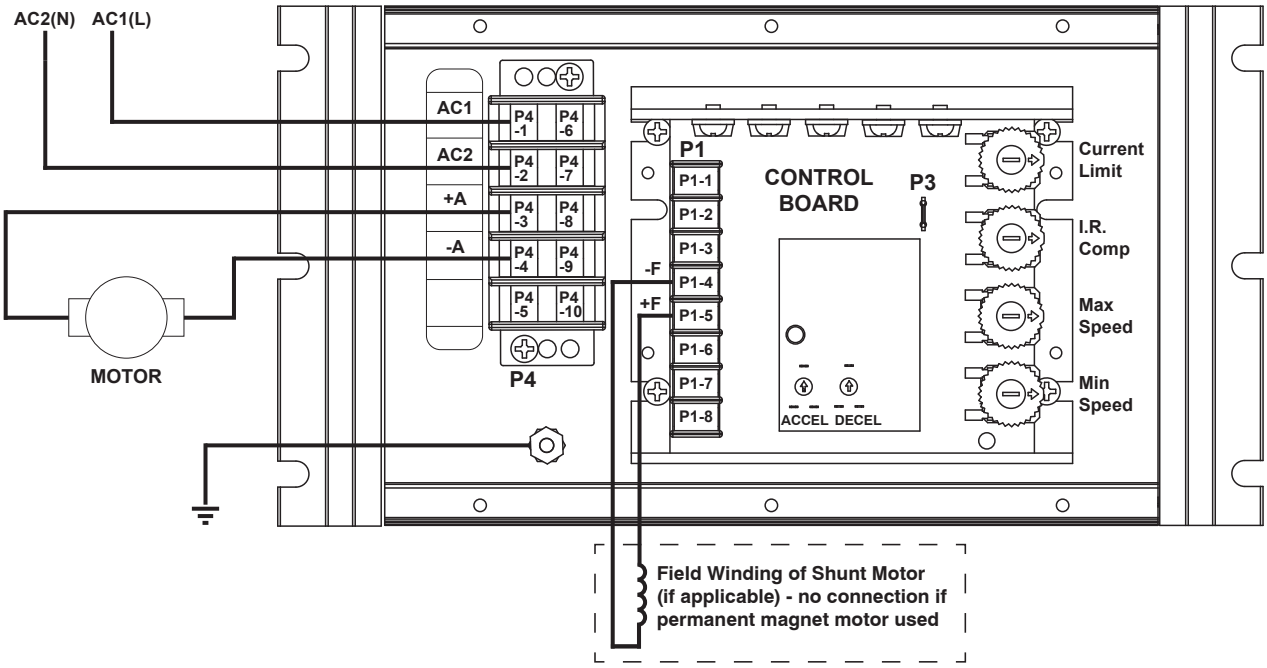
** P1-7 connects to Speedpot Wiper (red wire). THIS INPUT MUST NOT BE GROUNDED!*
For Voltage-Follower applications, THIS INPUT MUST NOT BE GREATER THAN +12V MAXIMUM!

** 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.

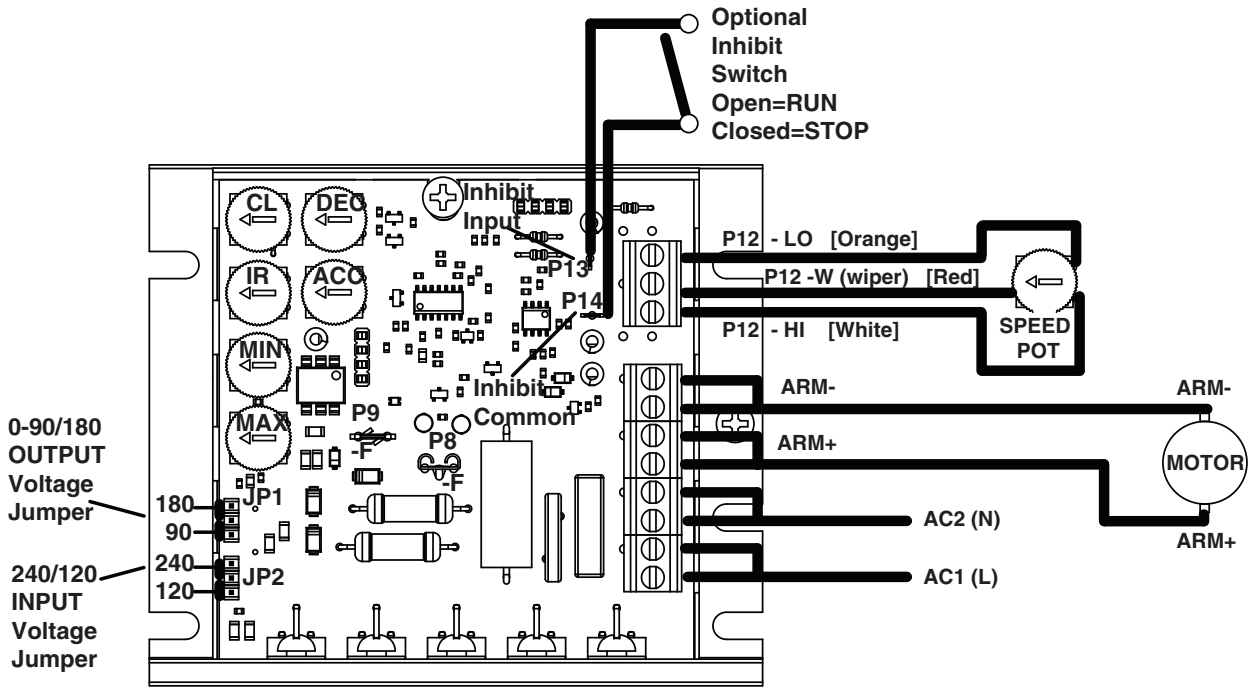
GSD4-240-10N4X Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



GSD4 Series DC Drives

GSD4A Wiring Diagrams

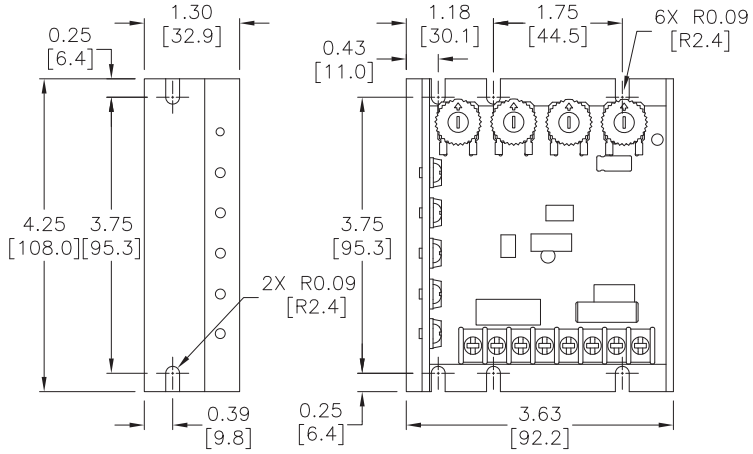
GSD4A-240-xC Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



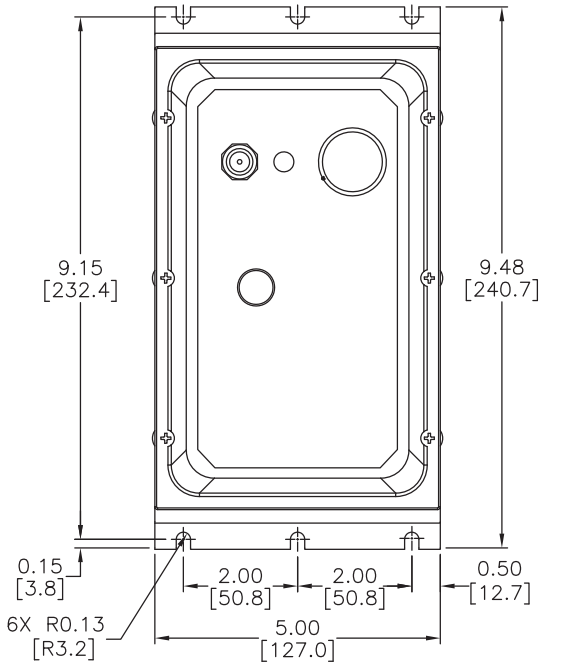
GSD4 Series DC Drives

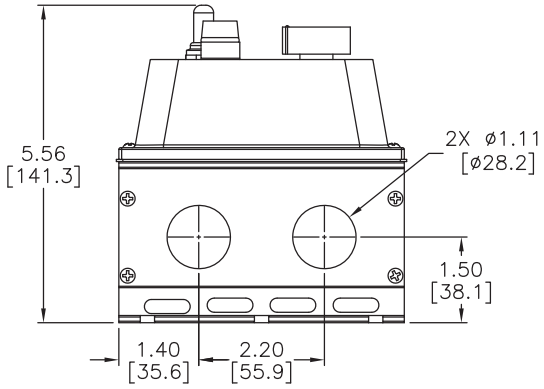
GSD4 Dimensions – *dimensions = in [mm]*

GSD4-24x-xC Dimensions

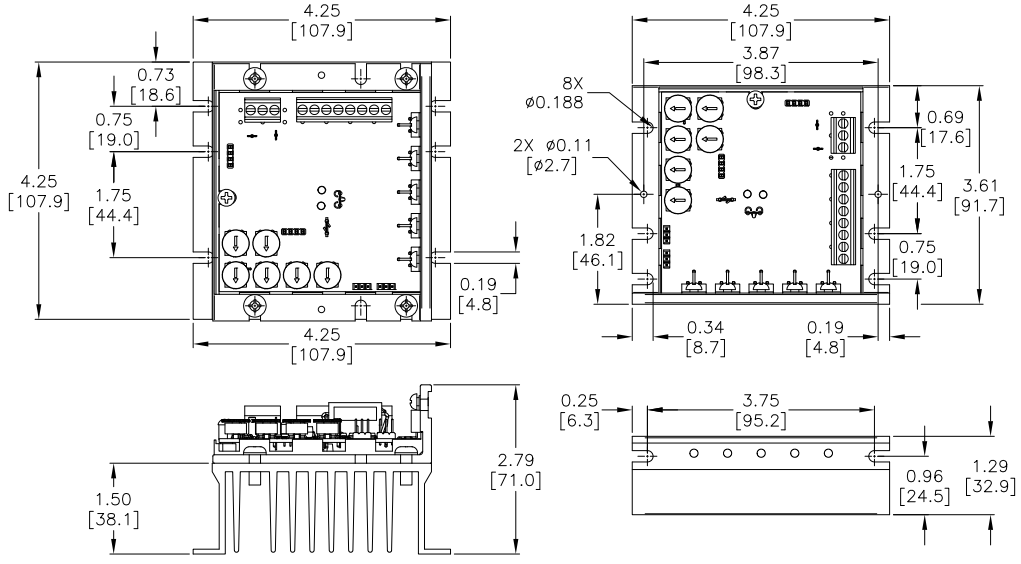


GSD4-240-10N4X Dimensions





GSD4A-240-xC Dimensions



GSD5 Series DC Drives

GSD5 Introduction

GSD5-240-10C

GSD5-240-10N4-x

GSD5 Series DC Drives	
Motor Rating Range @ 120/240 VAC_{IN}	*1/8 – 2 hp*

Overview

IronHorse GSD5 series DC drives offer superb flexibility, reliability, and value. A general purpose, economical line of drives rated to 2 horsepower, it provides the ultimate in standard features and versatility, offered in open-frame and NEMA 4/12 enclosed models.

A logical, easily-accessible layout simplifies installation and adjustment. Clean design, quality components and careful assembly are trademarks of IronHorse GSD DC drives.

Features

- Dual input voltage – 120/240 VAC, 50/60Hz
- Adjustable horsepower settings
- Barrier terminal strip
- Packaged bridge supply (full wave)
- 1% speed regulation with armature voltage feedback (±1/2% with tach feedback)
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable linear acceleration
- Adjustable current limit
- Line voltage compensation
- 5kΩ speed potentiometer with leads, knob, and dial included
- Power on/off switch (enclosed models)
- 50:1 speed range
- Overload capacity: 150% 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
- Remote start/stop via pot circuit or inhibit circuit
- Shunt field supply provided
- AC line fuse
- Enclosed models rated NEMA 4/12 with threaded conduit holes

Accessories

- Replacement speed potentiometer kit
- Digital potentiometer
- Manual reverse switch
- Analog current input card
- Analog voltage input card

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

GSD5 Series DC Drives

GSD5 Selection and Specifications

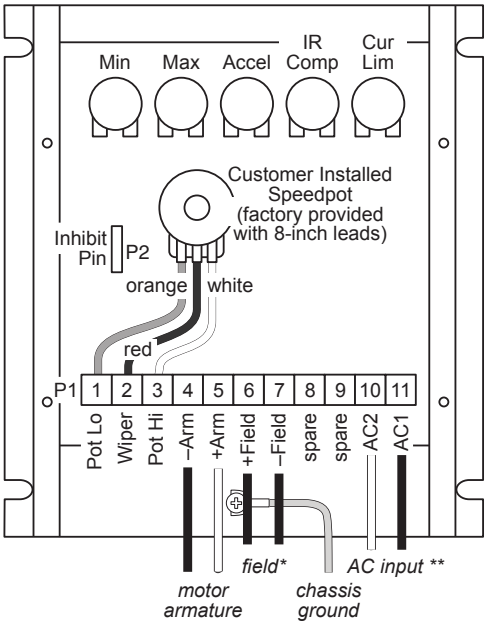
GSD5 Series DC Drives – Selection & Specifications						
Model		***GSD5-240-10C***	***GSD5-240-10N4***	***GSD5-240-10N4-A***	***GSD5-240-10N4-R***	***GSD5-240-10N4-V***
Price		$183.00	$329.00	$382.00	$412.00	$458.00
Package Configuration		open frame	NEMA 4/12			
Power Quality Form Factor		1.4				
Special Features		None		Current follower	Manual reversing	Voltage follower
Input Voltage (@50/60Hz)		120/240 VAC ±10%				
Output Voltage		0–90/180 VDC				
Shunt Field Voltage		100VDC @ 120VAC input; 200VDC @ 240VAC input; (1A max)				
Motor Rating (hp)		1/8 – 1 hp @ 90VDC ; 1/4 – 2 hp @ 180VDC				
Output Current (continuous)		150mA – 10.8A (DC)				
Current Overload Capacity		150% for 60s				
Current Limit (adjustable)		1–15A (DC)				
Transient Protection		Metal Oxide Varistor (MOV)				
I.R. Compensation		Adjustable				
Speed Adjustment	***Potentiometer***	5kΩ 2W potentiometer or 0–10VDC isolated input signal				
	Current	4–20mA with option GSDA-AI-A or -V5	n/a	4–20mA	n/a	4–20mA
	Voltage	0-5VDC, 0-250VDC with option GSDA-AI-V5	n/a	n/a	n/a	0-5VDC, 0-250VDC
Speed Range		50:1				
Speed Regulation		±1% of base speed (0.5% with tachometer feedback)				
Maximum Speed		Adjustable from 66% to 110% of base speed				
Minimum Speed		Linear ramp 0–30% of adjustable maximum speed				
Acceleration		Linear ramp adjustable 0.5–8s				
Deceleration		Follows acceleration setting				
Dynamic Braking		No				
Plugging Capability **		No				
Electrical Connections		Barrier-type terminal strip; 26–12 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]				
Thermal Protection		Current limiting				
Mounting Orientation		Can be mounted in any orientation				
Corrosive Gases		NOT compatible with any corrosive gases				
Weight		16.25 oz [413g]	25.50 oz [723g]			
Agency Approvals		$_{C}UL_{US}$ listed (E333109), RoHS				RoHS
Optional Accessories *						
Replacement Potentiometer		GSDA-5K				
Digital Potentiometer		GSDA-DP				
Manual Reverse Switch		GSDA-MREV***			Included	GSDA-MREV***
Analog Current Input Card		GSDA-AI-A	–	Included	–	–
Analog Voltage Input Card		GSDA-AI-V5	–	–	–	Included

** 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.*
****To meet NEMA4 requirements, GSDA-MREV requires a user provided external exclosure.*

GSD5 Series DC Drives

GSD5 Wiring Diagrams

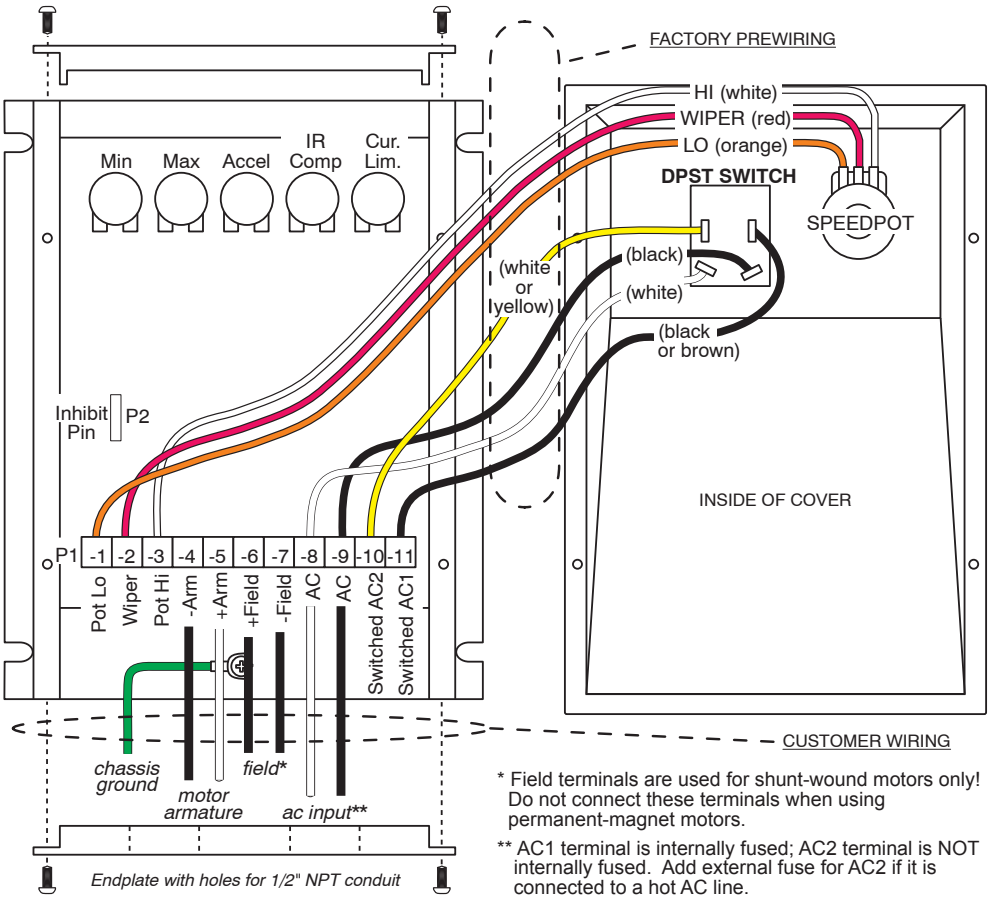
GSD5-240-10C Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



* Field terminals are used for shunt-wound motors only!
Do not connect these terminals when using permanent-magnet motors.

** AC1 terminal is internally fused; AC2 terminal is NOT internally fused.
Add external fuse for AC2 if it is connected to a hot AC line.

GSD5-240-10N4 Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



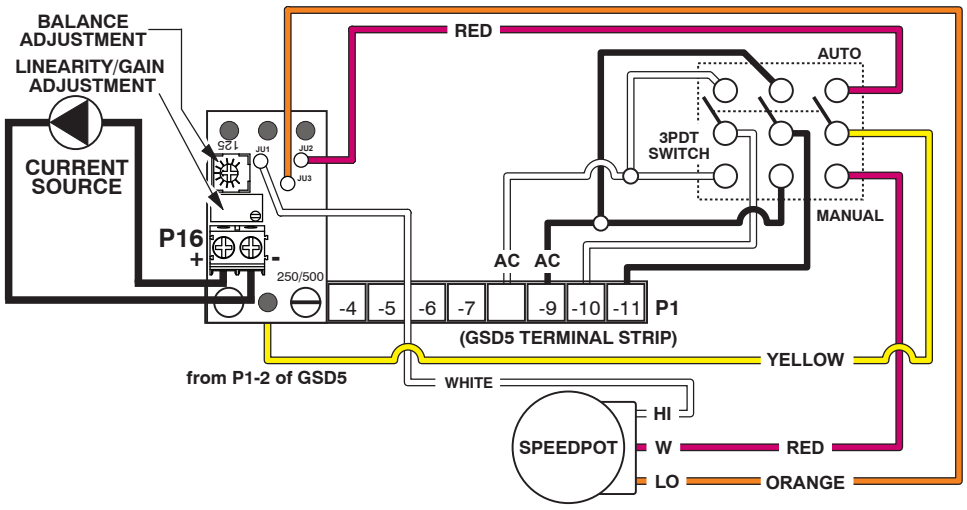
* Field terminals are used for shunt-wound motors only!
Do not connect these terminals when using permanent-magnet motors.

** AC1 terminal is internally fused; AC2 terminal is NOT internally fused. Add external fuse for AC2 if it is connected to a hot AC line.

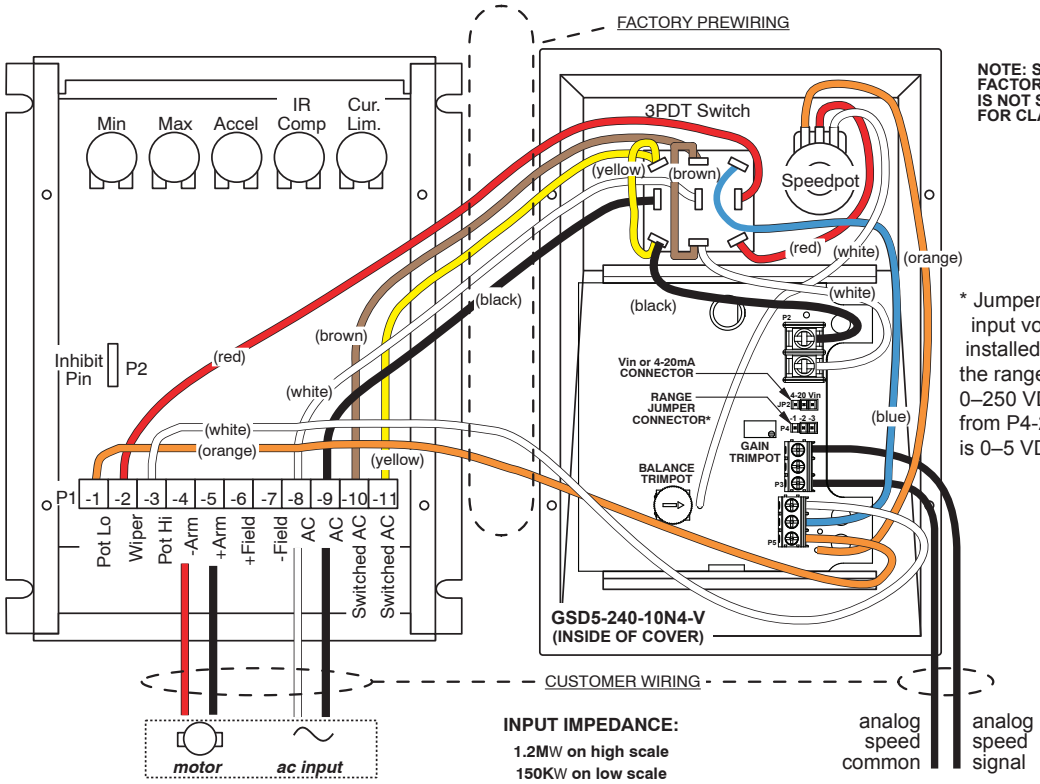
GSD5 Series DC Drives

GSD5 Wiring Diagrams

GSD5-240-10N4-A Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



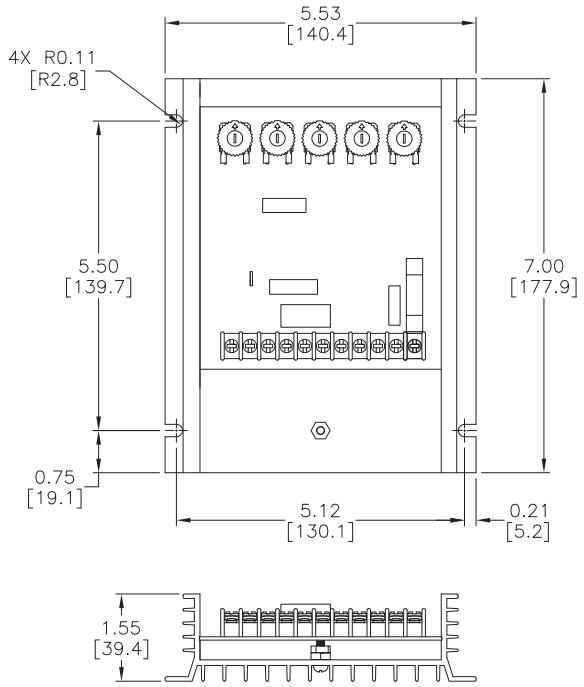
GSD5-240-10N4-V Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



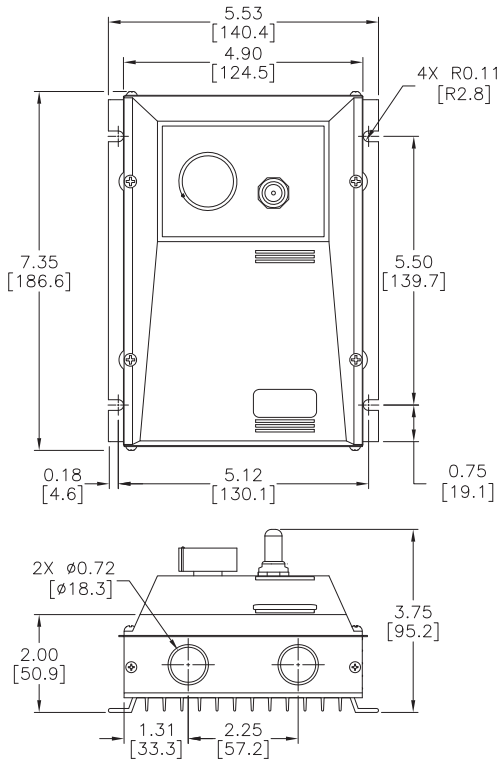
GSD5 Series DC Drives

GSD5 Dimensions – *dimensions = in [mm]*

GSD5-240-10C Dimensions



GSD5-240-10N4-x Dimensions



GSD6 Series DC Drives

GSD6 Introduction

GSD6-240-15C

GSD6 Series DC Drives	
Motor Rating Range @ 115/230 VAC_{IN}	*1/8 – 3 hp*

Overview

The reliable, versatile, and economical GSD6 DC drive is the most fully-featured IronHorse analog DC drive.

It provides many standard features typically offered as options by other DC drives.

By combining advanced engineering design, quality component selection, and rigorous quality control, the GSD6 DC drive offers an excellent off-the-shelf SCR control device. Its dependable, time-proven circuitry offers performance characteristics previously available only in more costly drives.

Features

- Dual input voltage 115/230 VAC, 50/60 Hz via slide selector switch
- Adjustable horsepower settings
- Barrier terminal strip
- Packaged bridge supply (full wave)
- 1% speed regulation with armature voltage feedback (±1/2% with tach feedback)
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable linear acceleration
- Adjustable linear deceleration
- Adjustable current limit
- 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 (jumper selectable)
- Inhibit circuit – permits start and stop without breaking AC lines
- Shunt field supply provided
- AC line fuses
- +12 VDC, 12mA power supply, user accessible

Accessories

- Replacement speed potentiometer kit
- Digital potentiometer
- Analog current input card

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

GSD6 Series DC Drives

GSD6 Selection and Specifications

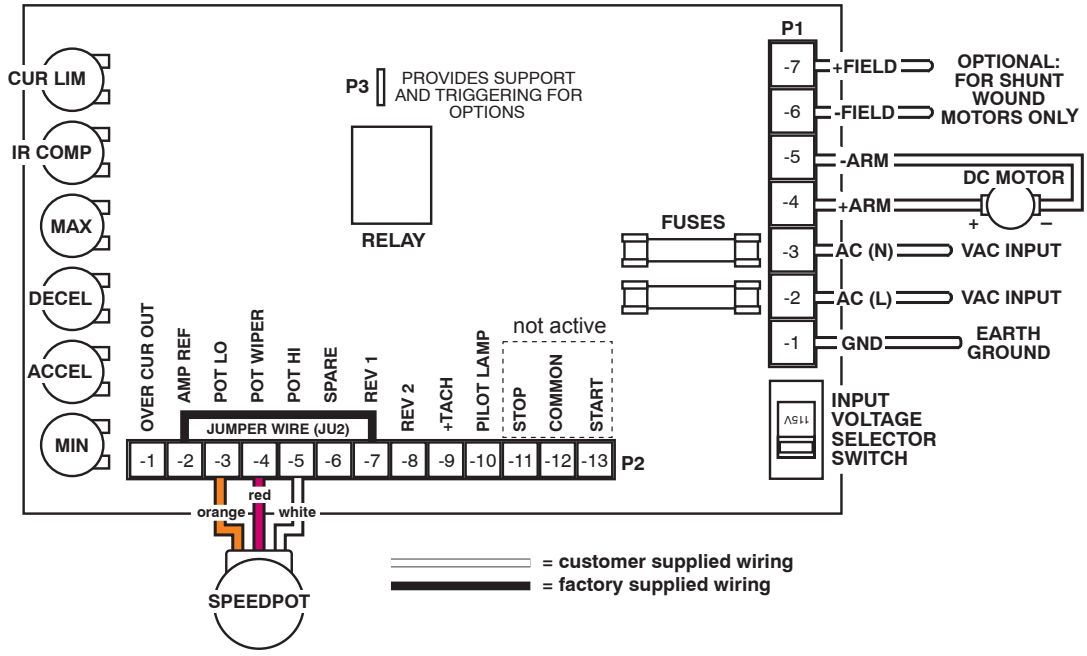
GSD6 Series DC Drives – Selection & Specifications		
Model		***GSD6-240-15C***
Price		$424.00
Package Configuration		Open frame
Power Quality Form Factor		1.4
Input Voltage (@50/60Hz)		115/230 VAC ±10%
Output Voltage		0–90 @ 115 VAC INPUT / 0 -180 VDC @ 230 VAC input
Shunt Field Voltage		100VDC @ 115VAC input ; 200VDC @ 230VAC input ; (1.5A max)
Motor Rating (hp)		1/8 – 1.5 hp @ 90VDC ; 1/4 – 3 hp @ 180VDC
Output Current (continuous)		15A (DC)
Current Overload Capacity		200% for 60s
Current Limit (adjustable)		2–30A (DC)
Transient Protection		Metal Oxide Varistor (MOV)
I.R. Compensation		Adjustable
Speed Adjustment	***Potentiometer***	5kΩ 2W potentiometer
	Current	4–20mA with option GSDA-AI-A
	Voltage	n/a
Speed Range		50:1
Speed Regulation		±1% of base speed
Maximum Speed		Adjustable from 60% to 120% of base speed
Minimum Speed		Linear ramp 0–30% of adjustable maximum speed
Acceleration		Linear ramp adjustable 0.3–12s
Deceleration		Adjustable 0.6–12s
Dynamic Braking		No
Plugging Capability **		No
Electrical Connections		Barrier-type terminal strip; 26–12 AWG
Fusing		(2) 20A fuses included (Bussman ABC-20 or Littlefuse 314020 ceramic fuses or equivalent)
Operating Temperature		-10 to 45 °C [14 to 113 °F]
Thermal Protection		Not available
Mounting Orientation		Can be mounted in any orientation
Corrosive Gases		NOT compatible with any corrosive gases
Weight		40 oz [1134g]
Agency Approvals		RoHS
Optional Accessories*		
Replacement Potentiometer		GSDA-5K
Digital Potentiometer		GSDA-DP
Analog Current Input Card		GSDA-AI-A

** 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.*

GSD6 Series DC Drives

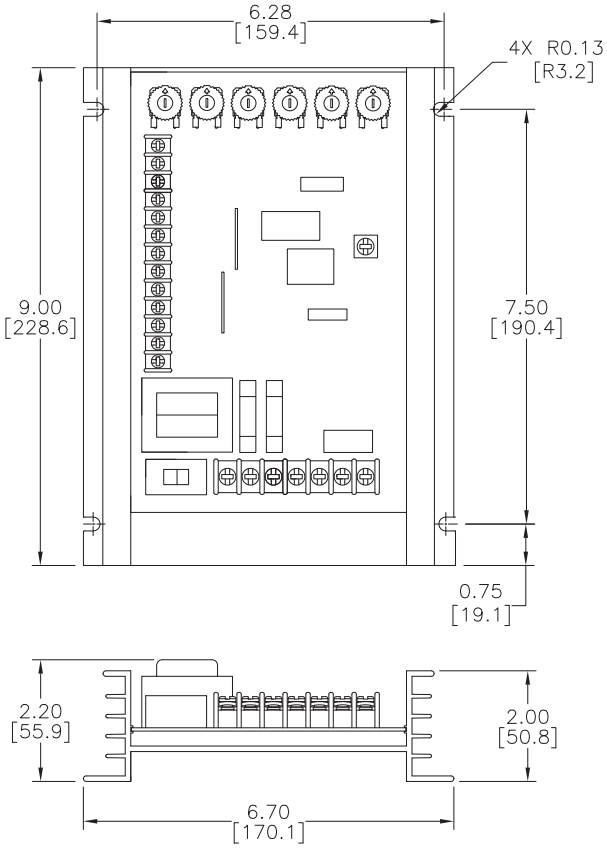
GSD6 Wiring Diagrams

GSD6-240-15C Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



GSD6 Dimensions – *dimensions = in [mm]*

GSD6-240-15C Dimensions



GSD7 Series DC Drives

GSD7 Introduction

GSD7-xxx-xCR3

GSD7-xxx-xCR30

GSD7 Series DC Drives	
Motor Rating Range @ 120 VAC_{IN}	*1/50 – 1 hp*
Motor Rating Range @ 240 VAC_{IN}	*1/25 – 2 hp*

Overview

Instant reversing, quick stopping, rapid cycling… The IronHorse GSD7 series DC drives outperform other dynamic braking and reversing drives by utilizing unique zero-speed detect and dynamic braking circuits.

These circuits eliminate the contact arcing and failed braking problems associated with other reversing and dynamic braking drives. The GSD7 zero-speed detect circuit also eliminates motor plug reversing problems.

In the event of a power loss or emergency stop condition, the GSD7 Series DC drives will drop into a dynamic brake condition to safely and quickly bring the motor to a stop.

Features

- Adjustable horsepower settings
- Barrier terminal blocks
- Full-wave bridge supply
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable current limit
- Fixed acceleration (0.5 sec)
- Line voltage compensation
- 5kΩ pot with leads, dial, and knob included
- 50:1 speed range
- Overload capacity: 200% for one minute
- Transient voltage protection
- Shunt field supply provided
- Onboard dynamic brake resistor
- Automatic dynamic braking on power loss
- 1% speed regulation with armature voltage feedback

Accessories

- Replacement speed potentiometer kit
- Digital 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
- PLC-controlled reversing
- Printing and labeling machines
- Small shop machine tools
- Spray / print reciprocating head

GSD7 Series DC Drives

GSD7 Selection and Specifications

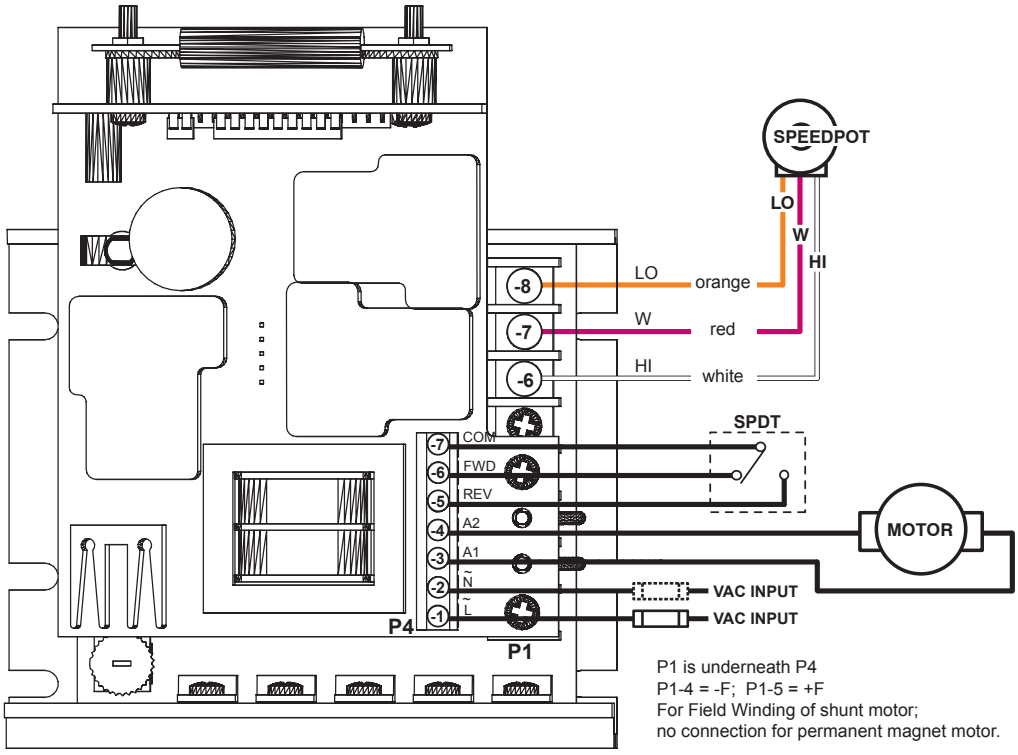
GSD7 Series DC Drives – Selection & Specifications							
Model	***GSD7-120-1CR3***	***GSD7-120-1CR30***	***GSD7-120-5CR3***	***GSD7-120-10CR30***	***GSD7-240-1CR3***	***GSD7-240-5CR3***	***GSD7-240-10CR30***
Price	$264.00	$318.00	$264.00	$320.00	$$288.00	$287.00	$323.00
Package Configuration	Open frame						
Power Quality Form Factor	1.4						
Input Voltage (@50/60Hz)	120 VAC ±10%				240 VAC ±10%		
Output Voltage	0–90 VDC				0–180 VDC		
Shunt Field Voltage	100 VDC (1A max)				200 VDC (1A max)		
Motor Rating (hp)	1/15 – 1/8		1/8 – 1/2	1/8 – 1	1/25 – 1/4	1/4 – 1	1/4 – 2
Output Current (continuous)	500mA–1.2A (DC)		500mA–5.5A (DC)	500mA–10A (DC)	500mA–1.2A (DC)	500mA–5.5A (DC)	500mA–10A (DC)
Current Overload Capacity	200% for 60s						
Current Limit (adjustable)	0.3–3A (DC)		1–18A (DC)		0.3–3A (DC)	1–18A (DC)	
Cycling Rate (cycles/min)	3	30	3	30	3	3	30
Transient Protection	Metal Oxide Varistor (MOV)						
I.R. Compensation	Adjustable						
Speed Adjustment	5kΩ 0.5W potentiometer or 0–10VDC isolated input signal						
Speed Range	50:1						
Speed Regulation	±1% of base speed						
Maximum Speed	Adjustable from 60% to 110% of base speed						
Minimum Speed	Linear ramp 0–30% of adjustable maximum speed						
Acceleration	0.5s fixed						
Deceleration	0.5s fixed						
Dynamic Braking	Yes						
Plugging Capability **	Yes						
Electrical Connections	Barrier-type terminal blocks; 22–14 AWG						
External Fusing Required	Bussman ABC or Littlefuse 314 series ceramic fuses or equivalent Refer to "Installation and Wiring" section of user manual for details						
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	1.1 lb [490g]	3.3 lb [1497g]	1.1 lb [490g]	3.3 lb [1497g]	1.1 lb [490g]	1.1 lb [490g]	3.3 lb [1497g]
Agency Approvals	$_{C}UL_{US}$ (E333109), RoHS						
Optional Accessories*							
Replacement Potentiometer	GSDA-5K						
Digital Potentiometer	GSDA-DP						

** 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.*

GSD7 Series DC Drives

GSD7 Wiring Diagrams

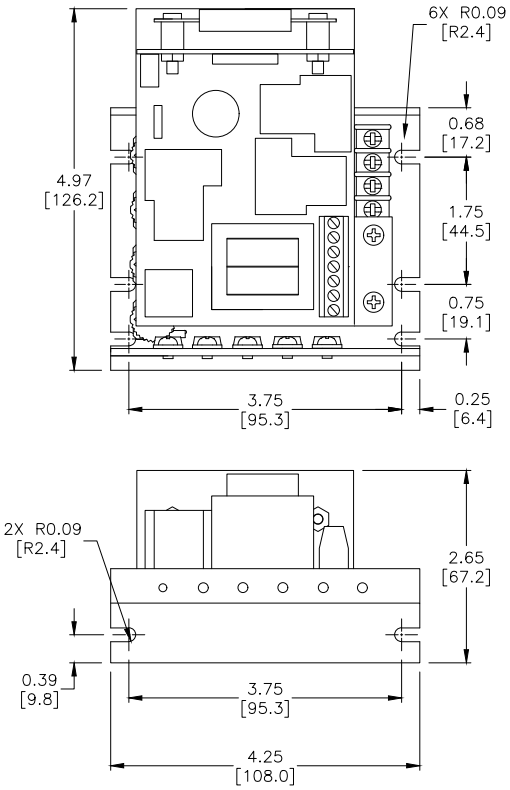
GSD7-xxx-xxxxx Basic Wiring Diagram – *(refer to User Manual for more detailed wiring information)*



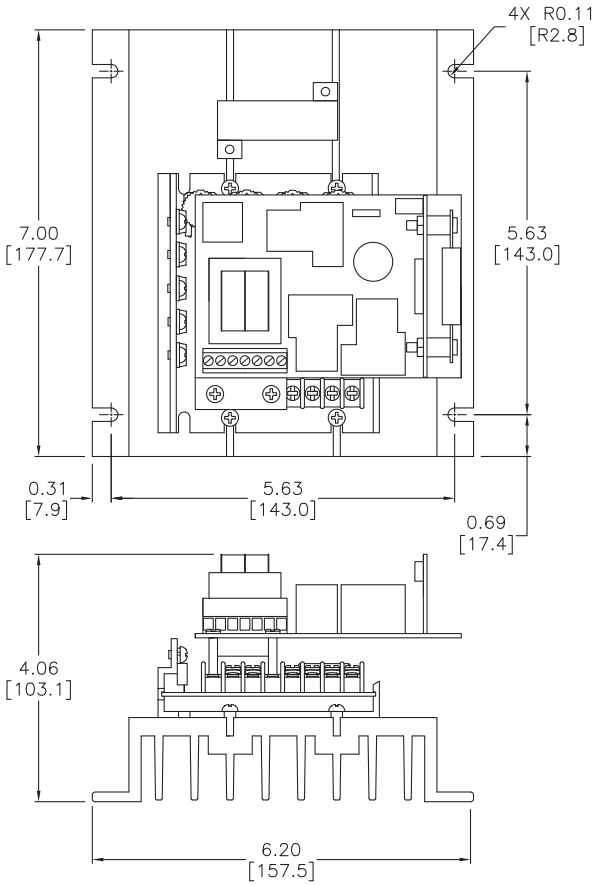
GSD7 Series DC Drives

GSD7 Dimensions – *dimensions = in [mm]*

GSD7-xxx-xCR3 Dimensions



GSD7-xxx-xCR30 Dimensions



GSD8 Series DC Drives

GSD8 Introduction

GSD8-240-5C

GSD8-240-10N4X-xx

GSD8-240-10C-D

GSD8-240-5C-D

GSD8 Series DC Drives	
Motor Rating Range @ 120 VAC_{IN}	*1/2 – 1 hp*
Motor Rating Range @ 240 VAC_{IN}	*1 – 2 hp*

Overview

The GSD8 series DC drives are compact, microprocessor-based motor controllers capable of factory or field configurations for a variety of industrial applications. GSD8 DC drives make use of either a pulse accumulation algorithm (GDS8-240-5C) or a velocity PID algorithm (all other GSD8 drives) that can be easily configured for operation as a speed controller, time-based process controller, or follower drive in a master-slave application. Using modular design techniques, the GSD8 drives are perfect for applications that require specialized I/O.

Features

- Microprocessor-based design
- Digital closed-loop algorithm
- Non-volatile memory storage
- Factory or field programmable
- Adjustable parameters
- Programmable alarm output
- Universal power supply accepts 85-265 VAC at 50-60 Hz without switches or jumpers
- Self-contained 5V power supply for external sensor
- Large 4-digit 1/2 inch LED display
- European terminal block
- Standard 1/8 or 1/4 DIN panel mounting
- Meets NEMA 4X standards when used with NEMA 4X enclosures

Accessories

- Hall-effect pickup, single-channel
- Input/Output option card
- Serial communications option card

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

Typical Applications

- Water and wastewater treament systems
- Conveyor oven controllers
- Synchronized conveyer lines

GSD8 Series DC Drives

GSD8 Selection and Specifications

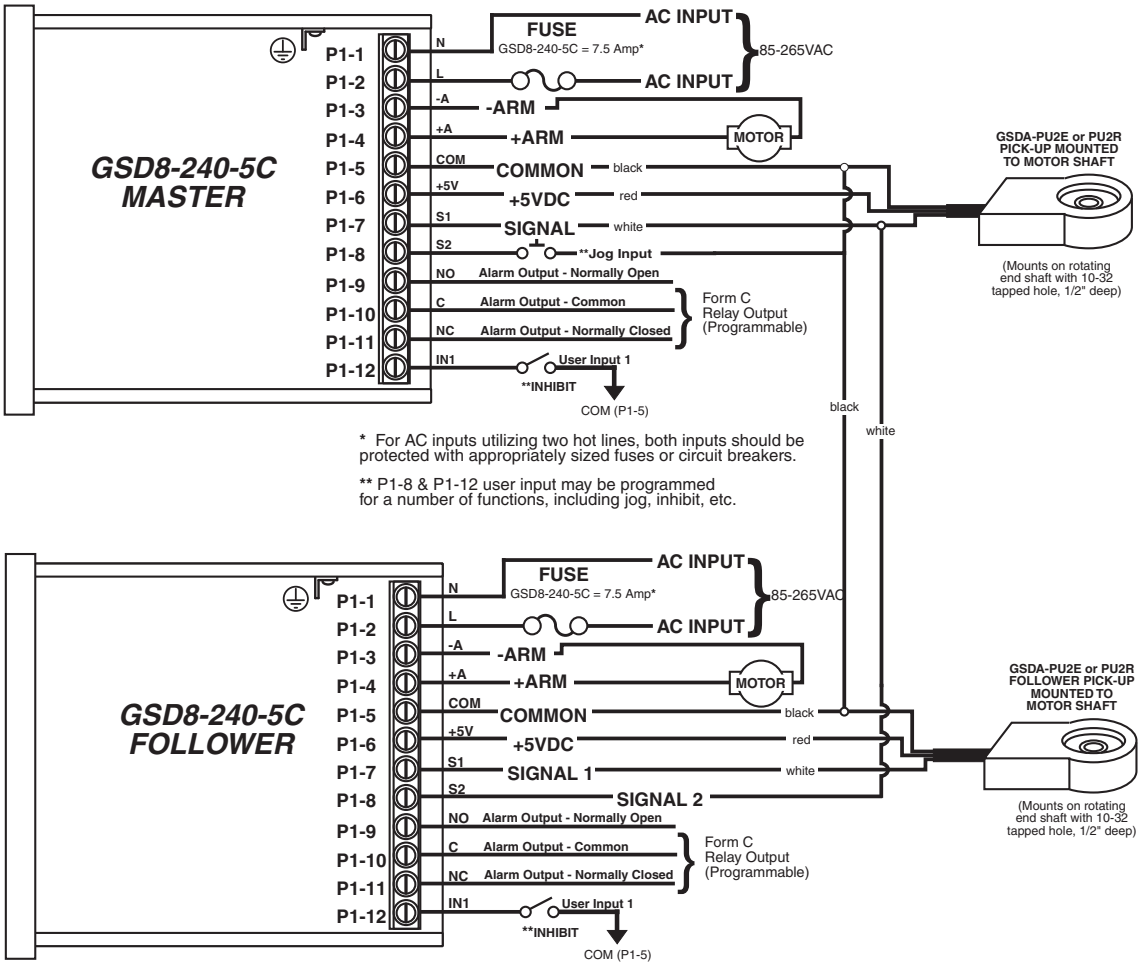
GSD8 Series DC Drives – Selection & Specifications							
Model		***GSD8-240-5C***	***GSD8-240-5C-D***	***GSD8-240-10C-D***	***GSD8-240-10N4X***	***GSD8-240-10N4X-A***	***GSD8-240-10N4X-U***
Price		$457.00	$470.00	$562.00	$651.00	$973.00	$835.00
Package Configuration		NEMA 4X					
Power Quality Form Factor		1.36					
Input Voltage (@50/60Hz)		85–265 VAC					
Input Frequency		48–62 Hz					
Output Voltage @120VAC (@240VAC)		90VDC (180VDC)					
Max Output hp @120VAC (@240VAC)		½ (1)		1 (2)			
Max Continuous Output Current		5A		10A			
Transient Protection		Metal Oxide Varistor (MOV) and X2 Cap.					
Pickup or Encoder Required		Yes					
Speed Adjustment	***Default Mode***	Front panel display					
	Current	n/a	4–20 mA with opptional accessory GSDA-AI-A8 or -CM8			4–20 mA	
	Voltage	n/a	0–5 VDC with optional accessory GSDA-CM-8				0–5 VDC
	Potentiometer	n/a	500W to 5kW Pot type, with optional accessory GSDA-CM-8				500W to 5kW
	Remote Comm	n/a	ASCII with optional accessory GSDA-CM-8				ASCII
Signal Input Voltage Range		0–5 VDC to 0–24 VDC square wave					
Signal Input Frequency Range		0–50,000 pulses/ minute***	0–600,000 pulses/minute @5V square wave				
Speed Regulation		0.1% (sensor PPR/application dependent)					
Maximum Speed		0–100% (max and min speeds are NOT individually adjustable)					
Minimum Speed							
Acceleration		1–9999 (change per second in engineering units, dependent on mode)					
Deceleration		1–9999 (change per second in engineering units, dependent on mode)					
Display Range		0.001–9,999					
Units of Operation		User programmable, any unit					
Sensor/Pickup Power Supply		5V @ 50mA					
Isolated Alarm Relay Output Ratings		250VAC @ 5A					
Average Armature Output Voltage		5A		10A			
Design Overload Capacity		200% for 1 minute					
Display Type		LED, red, 4 digit, 1/2" height					
Connector Style		12-position 5mm European style					
Terminal Block Torque Setting		4.4 in·lb maximum (0.5 N·m)					
Operating Temperature Range		-10°C to 45°C (15°F to 115°F)					
Operating Humidity Range		95%, non-condensing					
Faceplate Material		Polycarbonate with Lexan overlay					
Housing Material		Aluminum					
Weight		13.48 oz (382.14 g)	14.94 oz (423.43 g)	25.78 oz (730.85 g)	27.85 oz (789.53 g)		
Agency Approvals		UL Listed #E333109, RoHS					
Recommended Accessories							
Incremental Encoder***		GSDA-PU2E or GSDA-PU2R					
Analog Module		n/a	GSDA-AI-A8			Included	GSDA-AI-A8
ASCII Communications Module		n/a	GSDA-CM-8				Included
Manual Reverse Switch		GSDA-MREV****					

** 500 pulses/minute minimum required for proper operation. Higher frequency possible with internal frequency divisor/prescaler.*
***250 pulses/minute minimum required for proper operation.*
****Hall-Effect pickup, single channel encoder. 1/10/20 PPR*
*****To meet NEMA4 requirements, GSDA-MREV requires a user provided external exclosure.*

GSD8 Series DC Drives

GSD8 Wiring Diagrams

GSD8-240-5C Wiring Diagram



* For AC inputs utilizing two hot lines, both inputs should be protected with appropriately sized fuses or circuit breakers.

** P1-8 & P1-12 user input may be programmed for a number of functions, including jog, inhibit, etc.

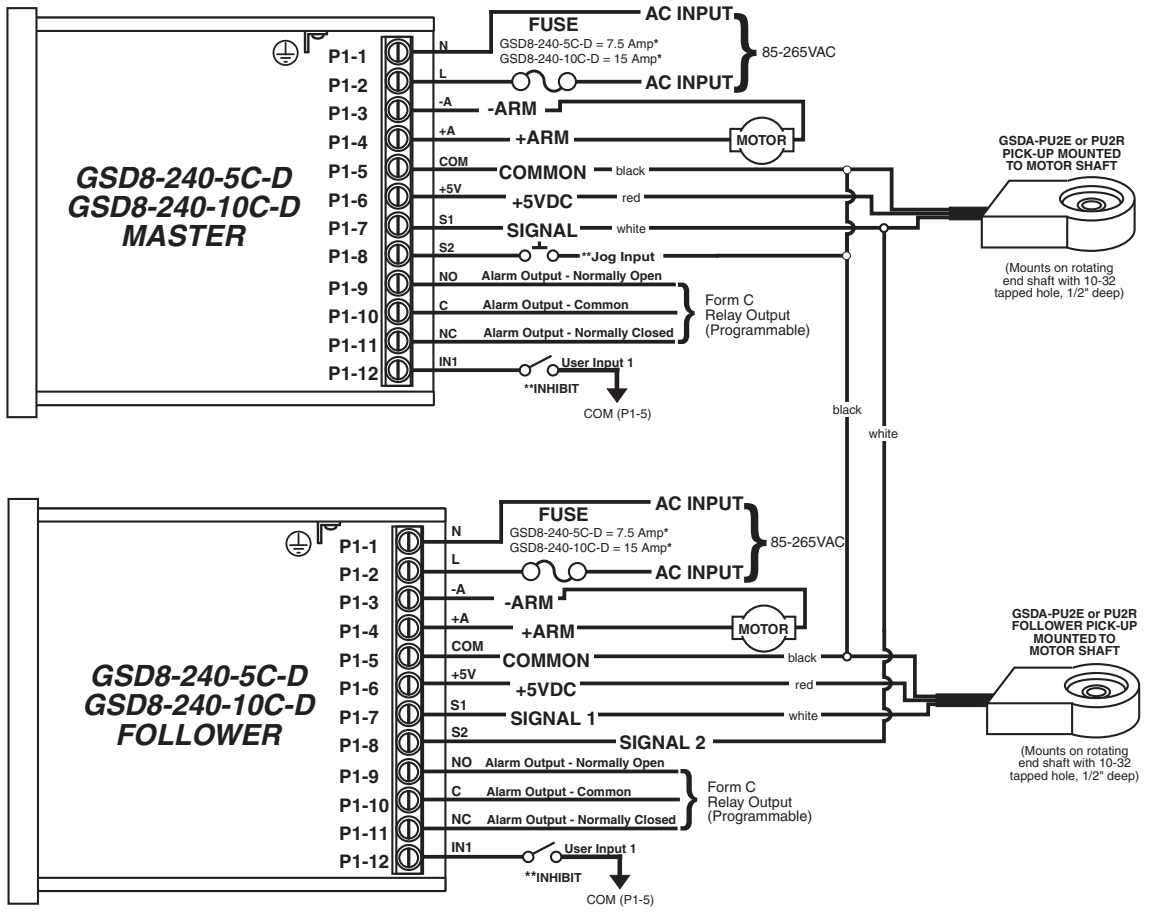
* For AC inputs utilizing two hot lines, both inputs should be protected with appropriately sized fuses or circuit breakers.

** P1-8 & P1-12 user input may be programmed for a number of functions, including jog, inhibit, etc.

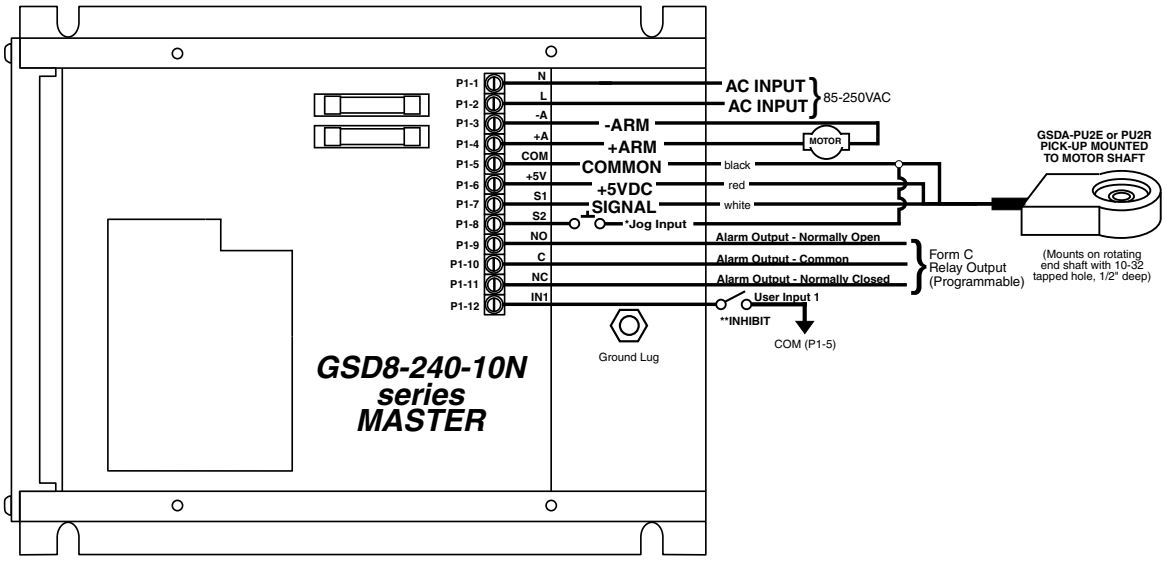
GSD8 Series DC Drives

GSD8 Wiring Diagrams

GSD8-240-5C-D, GSD8-240-10C-D Wiring Diagram



GSD8-240-10N4X, 10N4X-A, 10N4X-U Wiring Diagram



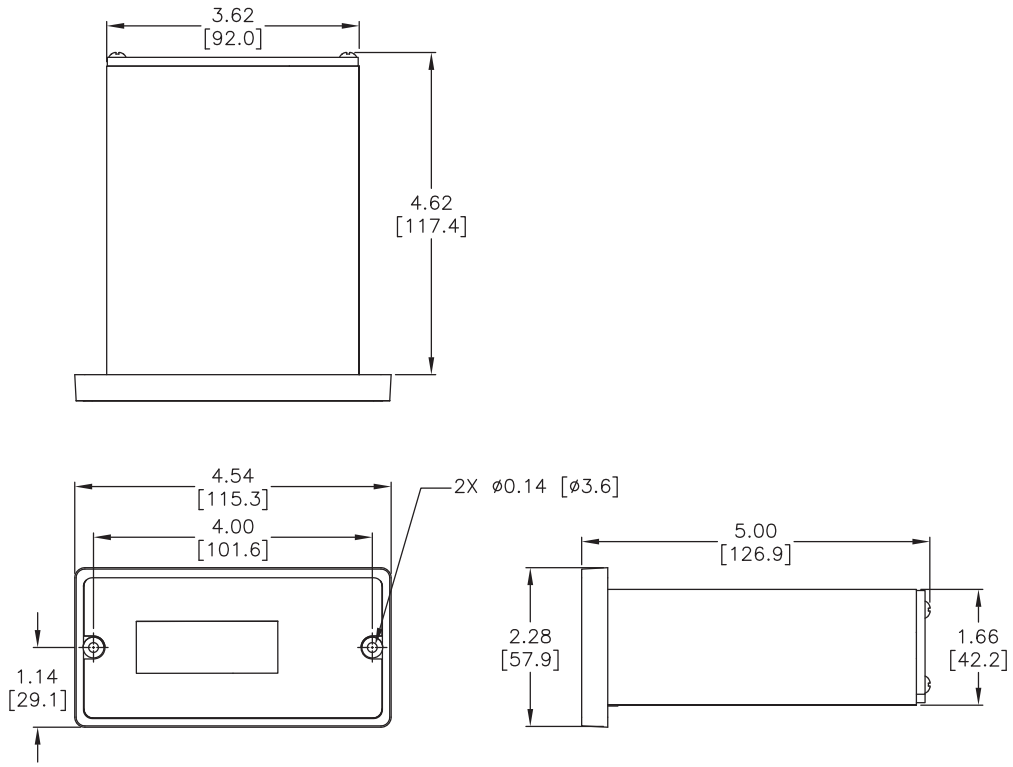
* For AC inputs utilizing two hot lines, both inputs should be protected with appropriately sized fuses or circuit breakers.

** P1-8(Master) & P1-12 user input may be programmed for a number of functions, including jog, inhibit, etc.

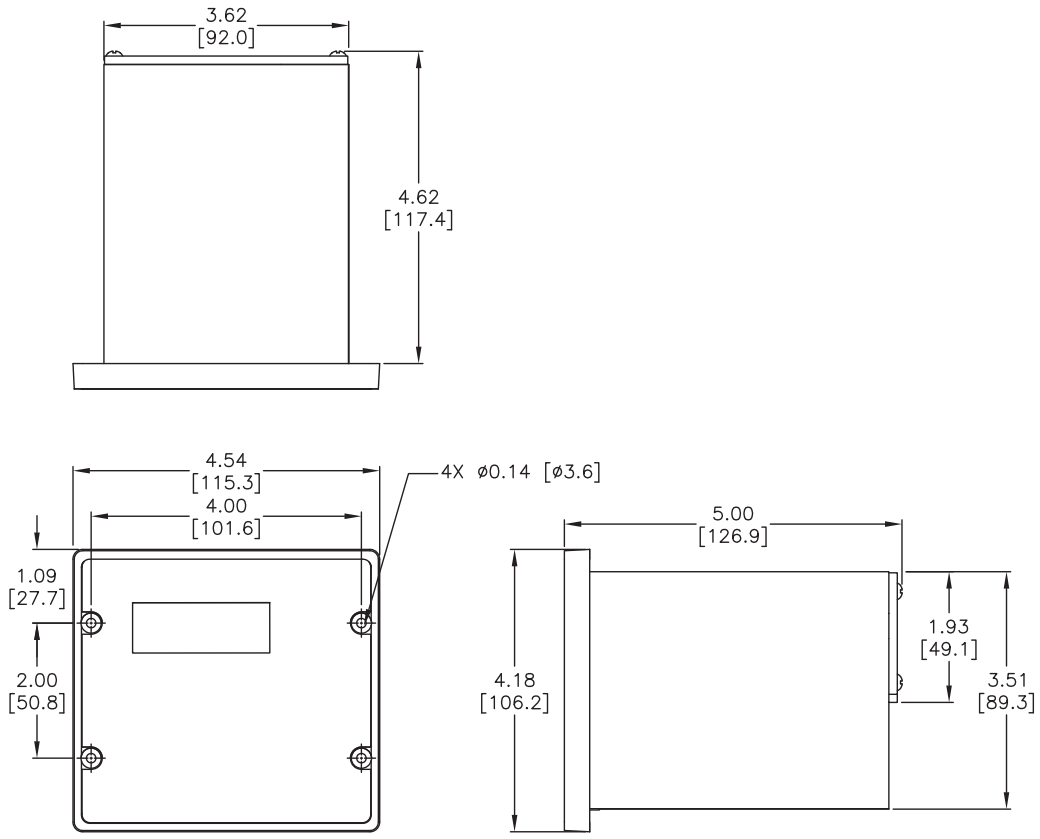
GSD8 Series DC Drives

GSD8 Dimensions – *dimensions = in [mm]*

GSD8-240-5C(-D) Dimensions



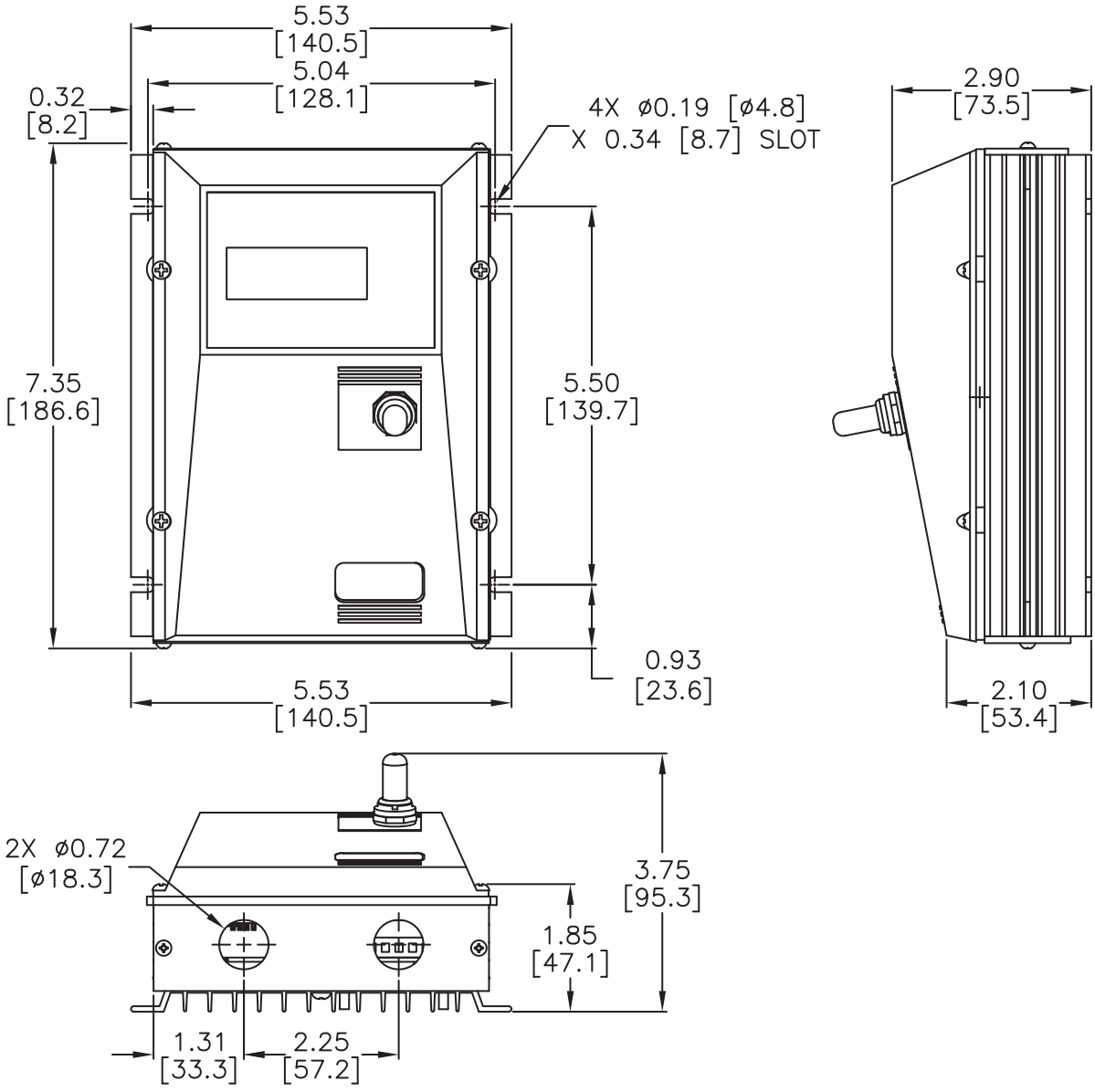
GSD8-240-10C-D Dimensions



GSD8 Series DC Drives

GSD8 Dimensions – *dimensions = in [mm]*

GSD8-240-10N4X-x Dimensions



GSD Series DC Drives Accessories

GSDA Accessories for GSD Series DC Drives – Selection & Specifications

GSDA Accessories for GSD Series DC Drives			
Model	***Price***	***Description***	***For Use With***
GSDA-5K	$21.00	IronHorse GSD series speed potentiometer kit, replacement, output up to input voltage, 5k ohm, 0.5W. For use with all GSD series DC drives. Includes potentiometer, knob, 0-100% dial and mounting hardware.	GSD - all
GSDA-ACCDEC-4	$27.00	IronHorse GSD4 series acceleration/deceleration module, for use with GSD4 series DC drives.	GSD4-xxx-xC
GSDA-AI-A	$64.00	IronHorse GSD series analog input module, 1-channel, current, isolated, input current signal range(s) of 4-20 mA.	GSD4-24x-xC (open-frame) GSD5-240-10C (open-frame) GSD6 (open-frame)
GSDA-AI-A8	$195.00	IronHorse GSD8 series relay/analog combo module, Analog Input: 1-channel, current, Analog Output: 1-channel, current, Discrete Output: 1-point, relay, (1) Form C (SPDT) relay. For use with multiple GSD8 series DC drives.	All GSD8 drives except GSD8-240-5C
GSDA-AI-V4	$106.00	IronHorse GSD4 series analog input module, 1-channel, current/voltage, isolated, input current signal range(s) of 4-20 mA, input voltage signal range(s) of 0-5 VDC, 0-250 VDC.	GSD4-240-xC (240V open-frame)
GSDA-AI-V4A	$103.00	IronHorse GSD4A series analog input module, 1-channel, current/voltage, isolated, input current signal range(s) of 4-20 mA, input voltage signal range(s) of 0-5 VDC, 0-250 VDC.	All GSD4A drives
GSDA-AI-V5	$101.00	IronHorse GSD5 series analog input module, 1-channel, current/voltage, isolated, input current signal range(s) of 4-20 mA, input voltage signal range(s) of 0-5 VDC, 0-250 VDC.	GSD5-240-10C (open-frame)
GSDA-CM-8	$142.00	IronHorse GSD8 series communication module, ASCII, 1 port, (1) RS-232/RS-485 (RJ45) port(s). For use with IronHorse GSD8-240-5C-D and GSD8-240-10C-D DC drives.	All GSD8 drives except GSD8-240-5C
GSDA-DP	$412.00	IronHorse GSD series digital potentiometer, 120/240 VAC input, bipolar/unipolar, NEMA 4X, aluminum housing. For use with multiple AC and DC drives.	GSD1, GSD4(A), GSD5, GSD6, GSD7
GSDA-DP-D	$464.00	IronHorse GSD series PID digital potentiometer, 120/240 VAC input, voltage, NEMA 4X, IP67, aluminum housing. For use with multiple AC and DC drives.	GSD1 - all, GSD3-24A-xxx (12–24V), GSD4 - all, GSD5 - all, GSD6 - all, GSD7 - all
GSDA-DP-S	$391.00	IronHorse signal conditioner, isolated, current, voltage or PWM input, current, voltage or PWM output, 120/240 VAC operating voltage, IP67, 1/8 DIN mount, screw terminals.	GSD1 - all, GSD3-24A-xxx (12–24V), GSD4 - all, GSD5 - all, GSD6 - all, GSD7 - all
GSDA-MREV	$118.00	IronHorse GSD series manual reverse switch, 10A, field installable, screw terminals. For use with all GSD series DC drives.	GSD3 - all GSD4/4A - all GSD5 - all GSD8 - all
GSDA-HTSNK-4	$42.00	IronHorse GSD series heatsink, for use with GSD4 series DC drives.	GSD4-24x-xC (open-frame)
GSDA-HTSNK-4A	$24.00	IronHorse GSD4A series heatsink, for use with IronHorse GSD4A-240-2C and GSD4A-240-6C DC drives.	All GSD4A drives
GSDA-PU2E	$84.00	IronHorse encoder, 5-24 VDC, NPN open collector output, 1/10/20 ppr, 61mm diameter body, NEMA 12, IP52, 6ft cable length, pigtail. For use with GSD8 series DC drives. Mounting hardware and (3) magnets included.	All GSD8 drives and GSDA-DP-D
GSDA-PU2R	$172.00	IronHorse encoder, 5-24 VDC, NPN open collector output, 1/10/20 ppr, 61mm diameter body, NEMA 3R, IP14, 6ft cable length, pigtail. For use with GSD8 series DC drives. Mounting hardware and (3) magnets included.	All GSD8 drives and GSDA-DP-D
NOTE: All GSDA Accessories are RoHS compliant.			

GSD Series DC Drives Accessories

GSDA-5K

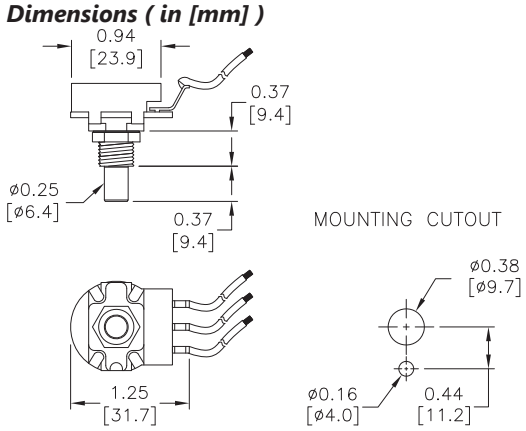
For use with all GSD series DC drives

The GSDA-5K is a replacement potentiometer kit that can be used with IronHorse GSD series DC drives to control the speed of a DC motor.
(All GSD series DC drives include a speed potentiometer.)

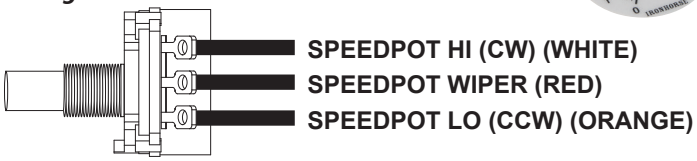
The kit includes the following:

- (1) 5kΩ potentiometer
- (3) pigtail wiring leads (8-1/2 in; 20 AWG)
- (1) adjustment knob
- (1) 0–100% dial
- (1) mounting nut and lock washer

Dimensions (in [mm])



Wiring Connections



GSDA-ACCDEC-4

For use with all GSD4 DC drives

The GSDA-ACCDEC-4 option card overrides the fixed accel ramp built into the GSD4 drive, providing independently adjustable linear acceleration and deceleration from 0.5–8.0 seconds. Adjustments are made via two separate trim pots.

This option card plugs into the expansion connector on the GSD4 main circuit board.

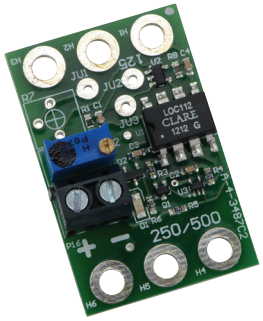
GSDA-ACCDEC-4 installation and wiring information is included in the GSD4 DC Drives User Manual.

GSDA-AI-A

For use with DC drives: GSD4-24x-xC, GSD5-240-10C, GSD6-all (open-frame)

This option card is a 4–20 mA isolated analog current signal card that can replace the speed pot as a speed input signal to certain GSD series drives. The 4–20 mA signal input can be either grounded or ungrounded. The board sits on spacers screwed to the potentiometer HI, Wiper, and LO terminals on the main GSD drive board using screws (included).

GSDA-AI-A installation and wiring information is included in the GSDA-AI-A DC Drives Accessory Data Sheet.



GSDA-AI-A8

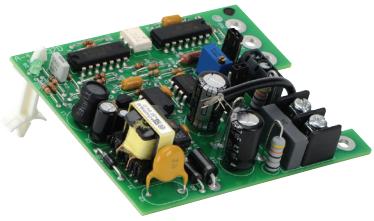
For use with DC drives: All GSD8 series drives except GSD8-240-5C

This option card features an Optically-Isolated 4-20 mA Current Loop Input and an Optically-Isolated 4-20 mA Current Loop Output. In addition, a non-isolated SPST switch input is provided. That switch is used to determine where the GSD8 Drive gets its "Target Speed" setting. In "Manual" mode, the GSD8 Drive uses its normal Front Panel display and Up/Down buttons to set the Target Speed (or Time). In "Auto" mode, the GSD8 Drive follows the GSDA-AI-A8's 4-20 mA Current Loop signal. In either mode, the GSDA-AI-A8's Current Loop Output provides a real-time updating 4-20 mA signal that represents the GSD8 Drive motor's Actual (Tach) Speed.

GSDA-AI-A8 installation and wiring information is included in the GSDA-AI-A8 User Manual.

GSD Series DC Drives Accessories

GSDA-AI-V4



For use with GSD4-240-xC (120–240V open-frame) DC drives

This option card allows for the use of either a grounded or non-grounded remote DC signal such as 0–5 VDC through 0–250 VDC, 4–20mA current, or a remote speed pot. The DC input signal type can be selected for voltage (Vin) or current (4–20mA), and there is a GAIN trim pot to set full linear output in reference to the input signal range. The output of this remote signal isolation board is a linear signal that is proportional to the remote input signal being supplied.

GSDA-AI-V4 installation and wiring information is included in the GSD4 DC Drives User Manual.

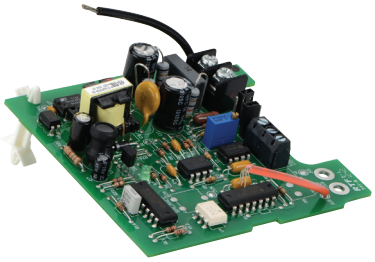
GSDA-AI-V4A

For use with GSD4A-240-2C, GSD4A-240-6C DC drives

This option card allows for the use of either a grounded or non-grounded remote DC signal such as 0–5 VDC through 0–250 VDC, 4–20mA current, or a remote speed pot. The DC input signal type can be selected for voltage (V) or current (4–20mA) via the JP2 jumper. The GAIN trimpot is used to set full linear output in reference to the input signal range. The output of this remote signal isolation board is a linear signal that is proportional to the remote input signal being supplied.

GSDA-AI-V4A installation and wiring information is included in the GSDA-AI-V4A DC Drives Accessory Data Sheet.

GSDA-AI-V5



For use with GSD5-240-10C (open-frame) DC drives

This option card allows for the use of either a grounded or non-grounded remote DC signal such as 0–5 VDC through 0–250 VDC, 4–20mA, or a remote speed potentiometer. The DC input signal type can be selected for voltage (Vin) or current (4–20mA), and there is a Hi/Lo range selection to select the voltage ranges. The GAIN trim pot is used to set full linear output in reference to the input signal range. The output of this remote signal isolation board is a linear signal that is proportional to the remote input signal being supplied.

GSDA-AI-V5 installation and wiring information is included in the GSD5 DC Drives User Manual.

GSDA-CM-8

For use with all GSD8 drives except GSD8-240-5c

This is an ASCII option card with RS-232 or RS-485 serial communications and additional features. Baud rate is configurable from 300 to 57600. In addition, the GSDA-CM-8 can output a square wave frequency from 4 pulses per minute to 9999 ppm. The analog input of the GSDA-CM-8 has been designed to use three types of analog signal sources: Potentiometer, 0 to +5VDC, or 4 to 20mA current source. Additionally, the GSDA-CM-8 can drive the "Auto/Manual" LED indicator to display whether the source of the Target setting comes from the analog input or from the "Front Panel" ("Manual").

GSDA-CM-8 installation and wiring information is included in the GSDA-CM-8 User Manual.

GSD Series DC Drives Accessories

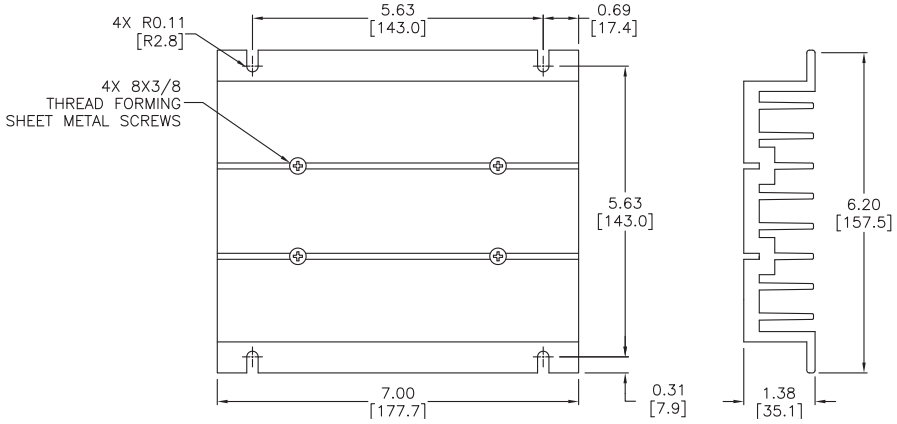
GSDA-HTSNK-4

For use with GSD4-xxx-xC (open-frame) DC drives

Optional heatsink for open-frame GSD4-xxx-1C and GSD4-xxx-5C DC drives only.

Increases the output current capability of GSD4-240-5C drives to 10A (non-UL applications only).

Dimensions (in [mm])



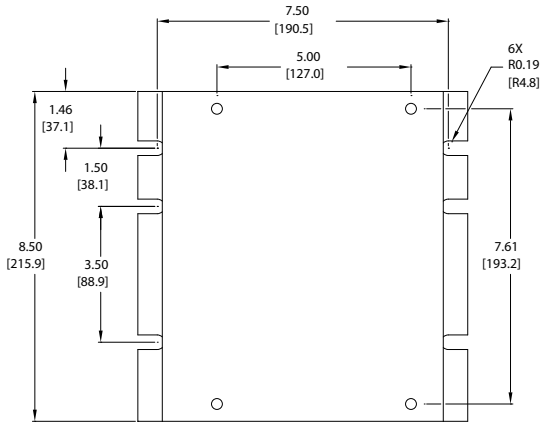
GSDA-HTSNK-4A

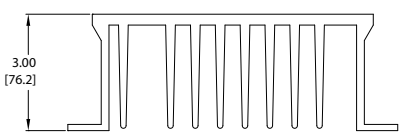
For use with GSD4A DC drives

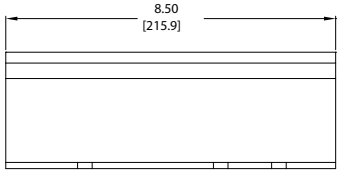
Optional heatsink for open-frame GSD4A-240-2C and GSDA-240-6C drives only.

Increases the output current capability.

Dimensions (in [mm])





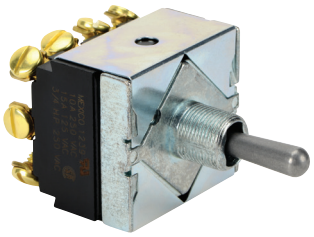


GSD Series DC Drives Accessories

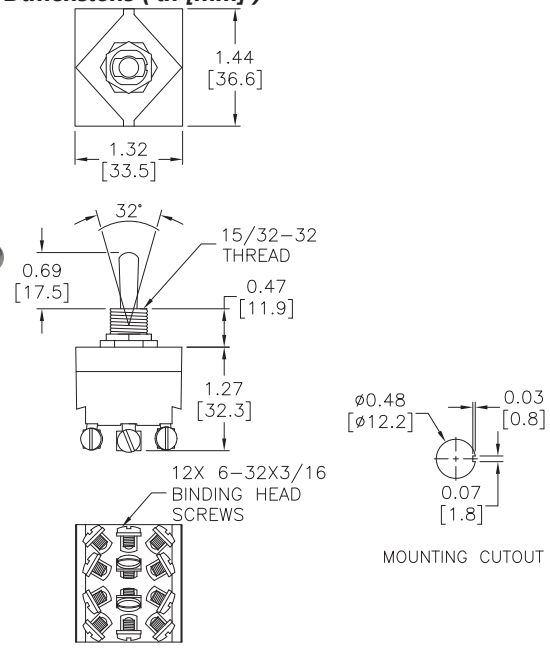
GSDA-MREV

For use with DC drives: GSD3 (all), GSD4/4a (all), GSD5 (all), GSD8 (all)

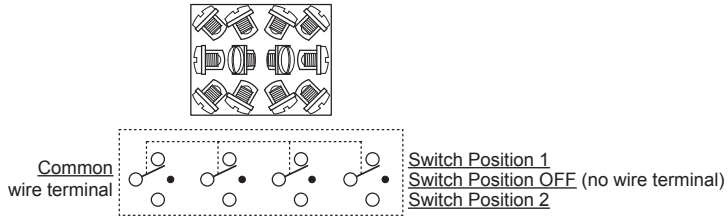
The GSDA-MREV Manual Reversing Switch is a 4PDT 10A-rated center-blocked manual switch that can be used with IronHorse GSD series DC drives to manually reverse the direction of a DC motor. When switched between the Forward and Reverse positions, the blocked center position causes a delay which protects the DC drive from any voltage that may be on the motor armature terminals. The center position is OFF/NEUTRAL and is not connected to a wiring terminal. If GSDA-MREV is used in conjunction with a NEMA4x model drive, a user supplied enclosure separate from the drive must be used.



Dimensions (in [mm])



Use the GSDA-MREV switch to manually reverse a DC motor without damaging the drive.



GSDA-PU2E/GSDA-PU2R

For use with all GSD8 drives, and GSDA-DP-D

The PU2E and PU2R pickups are an economical way to monitor motor speed. The PU2E is designed for indoor use, while the PU2R is for wash down or outdoor use. Both provide one pulse per revolution. They operate from a +5V power supply, producing a 5V square wave whose frequency is proportional to speed. This signal is fed into the device speed control as a speed or position reference for the microprocessor.

GSDA-PU2E/PU2R installation and wiring information is included in the GSDA-PU2E/PU2R Accessory Data Sheet.

GSD Series DC Drives Accessories

GSDA-DP

For use with DC drives: GSD1 (all), GSD3-24A-xxx (12–24V), GSD4 (all), GSD5 (all), GSD6 (all), GSD7 (all)

The GSDA-DP digital potentiometer is a compact, microprocessor-based unit capable of being either field or factory configured for a number of industrial user interface / control signal needs. The GSDA-DP allows the user to adjust the displayed value via the front-panel push buttons. As the displayed value is raised or lowered, the output signal from the GSDA-DP follows proportionally according to the unit's configuration. These units support both unipolar and bipolar output and are capable of automatically inverting, scaling, and offsetting the output as needed. The GSDA-DP series is ideal for volume OEM applications requiring specialized inputs and outputs.

The GSDA-DP's durable 1/8 DIN aluminum housings can be easily mounted in a panel or control cabinet.

Standard Features

- Microprocessor-based design combines the ultimate in responsiveness and accuracy in one package
- Non-volatile memory stores adjustable parameters even when power has been removed
- Adjustable parameters include display range, output range, output polarity, alarm options, etc.
- Internal program-enable jumper selectively prevents tampering with unit's configuration
- Optional keyswitch mode prevents unauthorized changes (purchase GCX1420, etc. separately)
- Universal power supply accepts line voltages inputs from 85–265 VAC @ 50–60Hz without switches or jumpers. The unit automatically adjusts as needed
- Transient voltage protection prolongs unit's life in harsh industrial environments
- Self-contained power supply for external sensor, limited to 5V @ 50mA
- 1/8 DIN durable aluminum housing for panel mounting
- Large 4-digit, 1/2 inch LED display
- Lexan membrane and gasket (which are included) meet NEMA 4X standards when used with NEMA 4X enclosures
- Wide operating ambient temperature range of -10 °C to 45 °C (14 °F to 113 °F)
- Multiple operating modes including:
  – Rate Mode* – Displays in rate and non-rate units such as rpm, gallons per second, and percent
  – Time Mode* – Displays in time units such as HH:MM, MM:SS, SS:TT, or other units
  – Rate and Time Modes operate inversely from each other

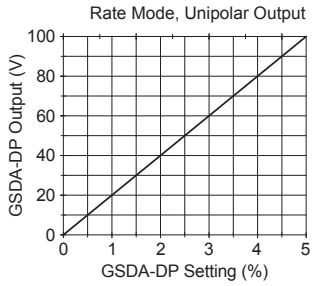
GSDA-DP – Specifications		
Electrical	*Line Input Voltage*	85–265 VAC
	Line Input Frequency	48–62 Hz
	Display Range	0.001–9999
	Units of Operation	User programmable, any Unit
	Onboard Power Supply (externally accessible)	5V @ 50mA
	Pot Lo/Hi Supply VDC Range (external supply)	0–2 VDC through 0–24 VDC
	Pot Wiper VDC Range	Pot Lo +50mV through Pot Hi -50mV
	Pot Circuit Current Draw	2mA @ 12V
	Pot Circuit Isolation	>500 MΩ
	Isolated Alarm Relay Output Ratings	250VAC @ 5A; Form C
	Resolution of D-A Converter	10 bits
	Analog Output	Any unipolar or bipolar voltage range (based on input voltage) up to 24VDC
Mechanical	*Display Type*	LED, red, 4-Digit, 1/2 inch height
	Housing Type (with supplied gasket in NEMA 4X panel)	1/8 DIN NEMA 4X
	Connector Style	12-position 5mm European style
	Terminal Block Torque Setting	4.4 lb·in max [0.5 N·m]
	Faceplate Material	Polycarbonate with Lexan overlay
	Housing Material	Aluminum
	Weight	14.4 oz [408.22g]
Environmental	*Operating Temperature Range*	-10°C to 45°C [14°F to 113°F]
	Operating Humidity Range	95% non-condensing
Regulatory	*Agency Approvals*	RoHS

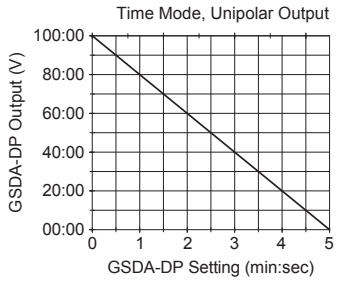
GSD Series DC Drives Accessories

GSDA-DP

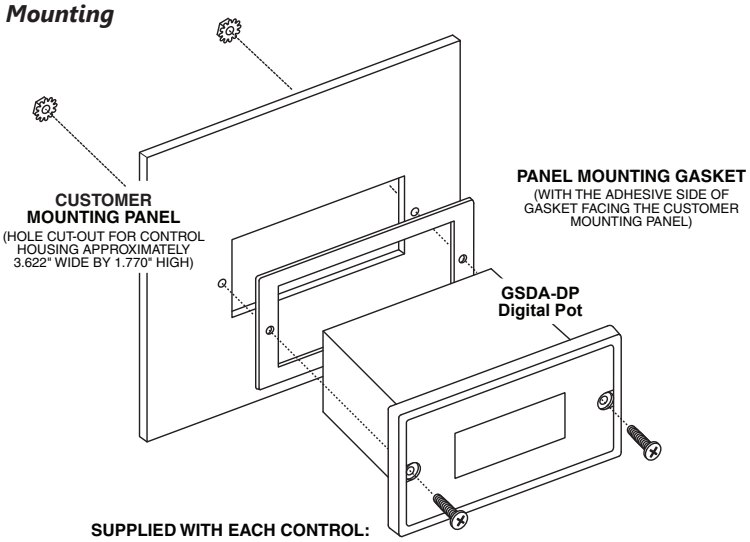
GSDA-DP Operation Modes

Rate and Time mode cycle times operate inversely from each other.





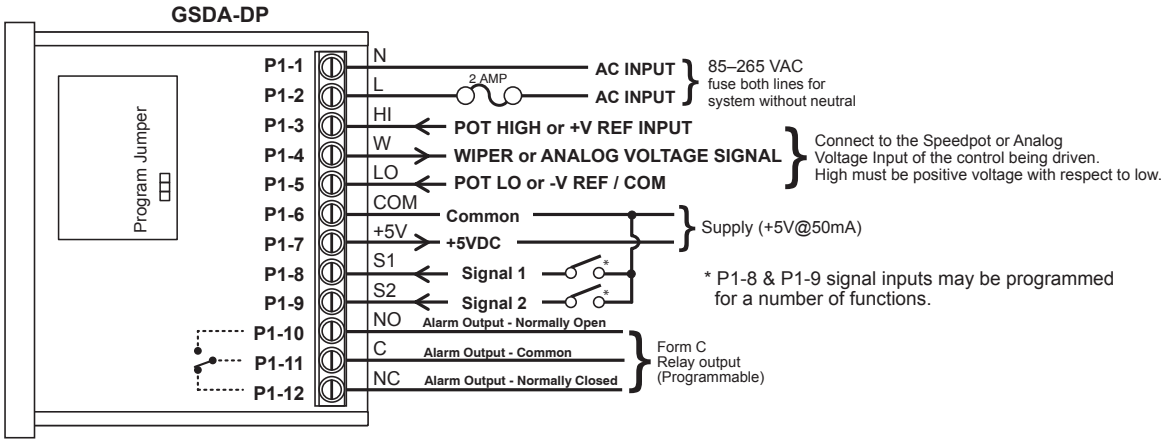
GSDA-DP Mounting



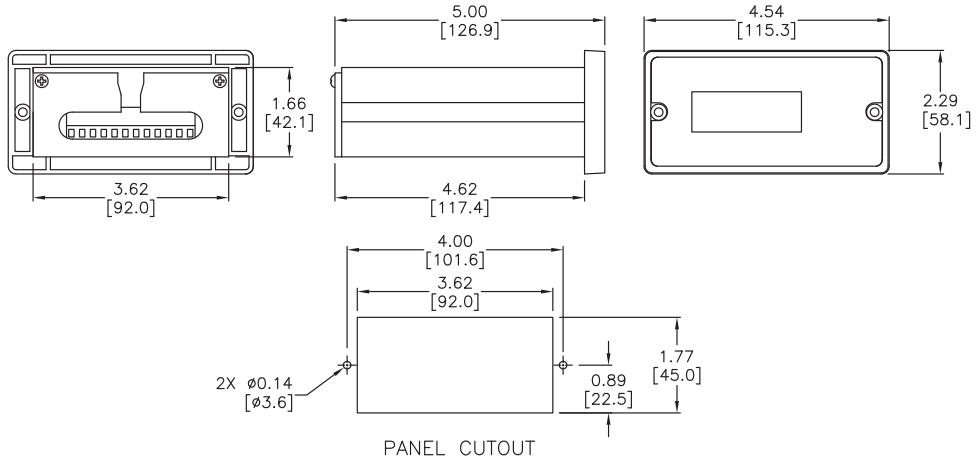
SUPPLIED WITH EACH CONTROL:

1) GASKET
2) (2) 6-32 X 3/4 PANHEAD BLACK OXIDE STAINLESS SCREWS
3) (2) #6 NUT WITH LOCKWASHER

GSDA-DP Wiring



GSDA-DP Dimensions (in [mm])



GSD Series DC Drives Accessories

GSDA-DP-D

For use with GSD1 (all), GSD3-24A-xxx (12–24V), GSD4 (all), GSD5 (all), GSD6 (all), GSD7 (all)

The GSDA-DP-D motor speed control is a compact, microprocessor-based unit capable of being either field or factory configured for a number of motion control needs. The control is designed around a velocity form PID algorithm and provides a DC speedpot signal to an external drive. A flexible open-loop mode is also available for applications where using a speed pickup is not practical or desired. The GSDA-DP-D is easily configured to operate as a digital speed controller, time-based process controller, or as a ratiometric follower controller in master-slave systems. Featuring a Modbus expansion slot architecture, it is ideal for volume OEM adjustable speed control applications requiring specialized inputs and outputs.

Standard Features

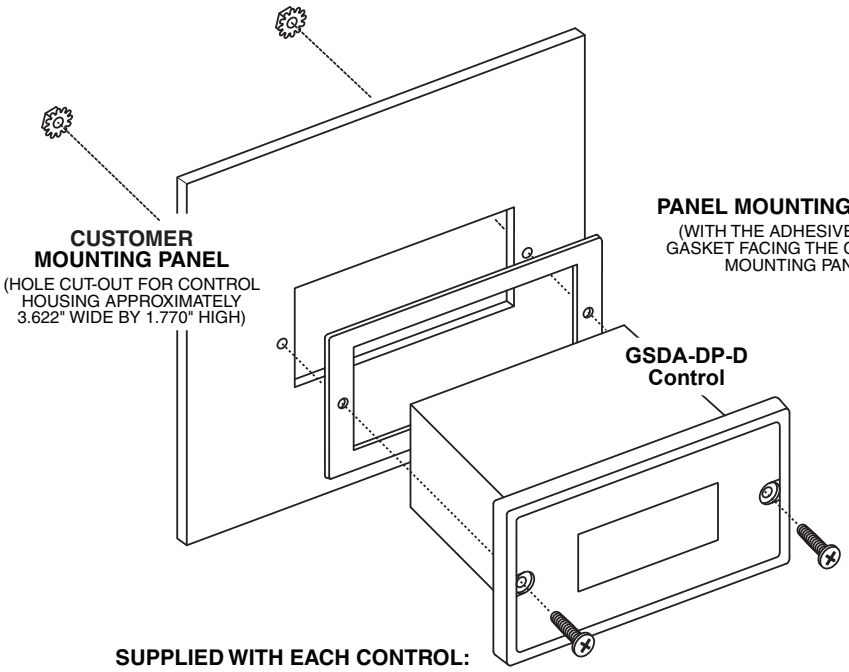
- Microprocessor-based design allows for incredible flexibility
- Modbus expansion to accommodate a wide variety of I/O
- Digital closed-loop algorithm ensures accuracy of plus or minus 1/2 RPM of set speed or equivalent
- Digital open-loop operation available
- Non-volatile memory stores settings without batteries
- Factory or field programmable via front-panel keypad
- Universal power supply accepts line voltages inputs from 85-265VAC @ 50-60Hz without switches or jumpers. The unit automatically adjusts as needed
- Transient voltage protection
- Flexible user inputs support Inhibit, Emergency-Stop, and Jog functionality
- Speed pickup input compatible with a variety of signal input types
- Self-contained power supply for external devices (5V @ 50mA)
- Two separate programmable alarm outputs with Form C contacts
- 1/8 DIN durable aluminum housing for panel mounting
- Large 4-digit, 1/2 inch LED display, with user-settable decimal point (colon displayed in Time mode)
- Polycarbonate membrane and gasket (included) meet NEMA 4X standards when used with NEMA 4X enclosures

GSDA-DP-D – Specifications		
Electrical	*Line Input Voltage*	85–265 VAC
	Line Input Frequency	48–62 Hz
	Signal Input Voltage Range	5VDC to 24VDC (square wave, referenced to P1-6 COMMON)
	Speed Pickup Input Frequencey Range (S1 and S2 Inputs)	0–600,000 pulses per minute @ 5V square wave
	Display Range	0.001–9,999
	Units of Operation	User programmable, any unit
	Sensor/Pickup Power Supply	5V @ 50mA
	Isolated Alarm Relay Output Rating	250VAC @ 5A
	Voltage Difference between PotLo and PotHit Inputs	2VDC to 24VDC
	Pot Wiper Output Voltage Range	PotLo +50mVDC to PotHi -50mVDC
Mechanical	*Display Type*	LED, red, 4-Digit, 1/2 inch height
	Housing Type (with supplied gasket in NEMA 4X panel)	1/8 DIN NEMA 4X
	Connector Style	12-position 5mm European style
	Terminal Block Torque Setting	4.4 lb·in [0.5 N·m] max
	Faceplate Material	Polycarbonate with polycarbonate overlay
	Housing Material	Aluminum
	Weight	15.30 oz [433.86 g]
Environmental	*Operating Temperature Range*	-10°C to 45°C [14°F to 113°F]
	Operating Humidity Range	95% non-condensing
Regulatory	*Agency Approvals*	RoHS
Accessories	*GSDA-PU2E/PU2R*	Hall-effect pickup, single channel
	GSDA-AI-A8	Input/Output option card
	GSDA-CM-8	Serial communications option card

GSD Series DC Drives Accessories

GSDA-DP-D

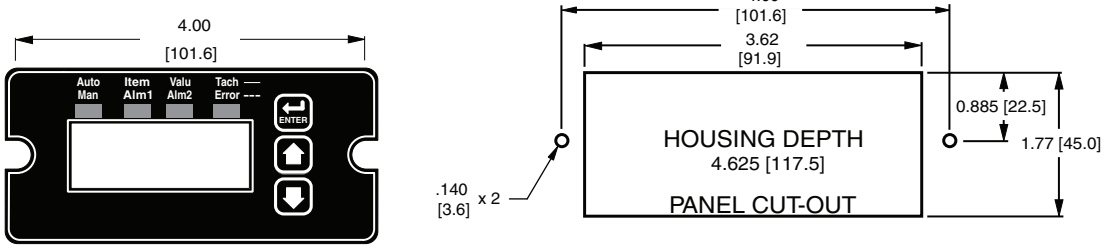
GSDA-DP-D Mounting



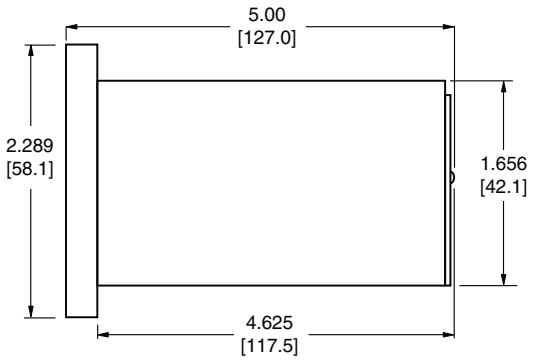
SUPPLIED WITH EACH CONTROL:

1) GASKET
2) (2) 6-32 X 3/4 PANHEAD BLACK OXIDE STAINLESS SCREWS
3) (2) #6 NUT WITH LOCKWASHER

GSDA-DP-D Dimensions (in [mm])



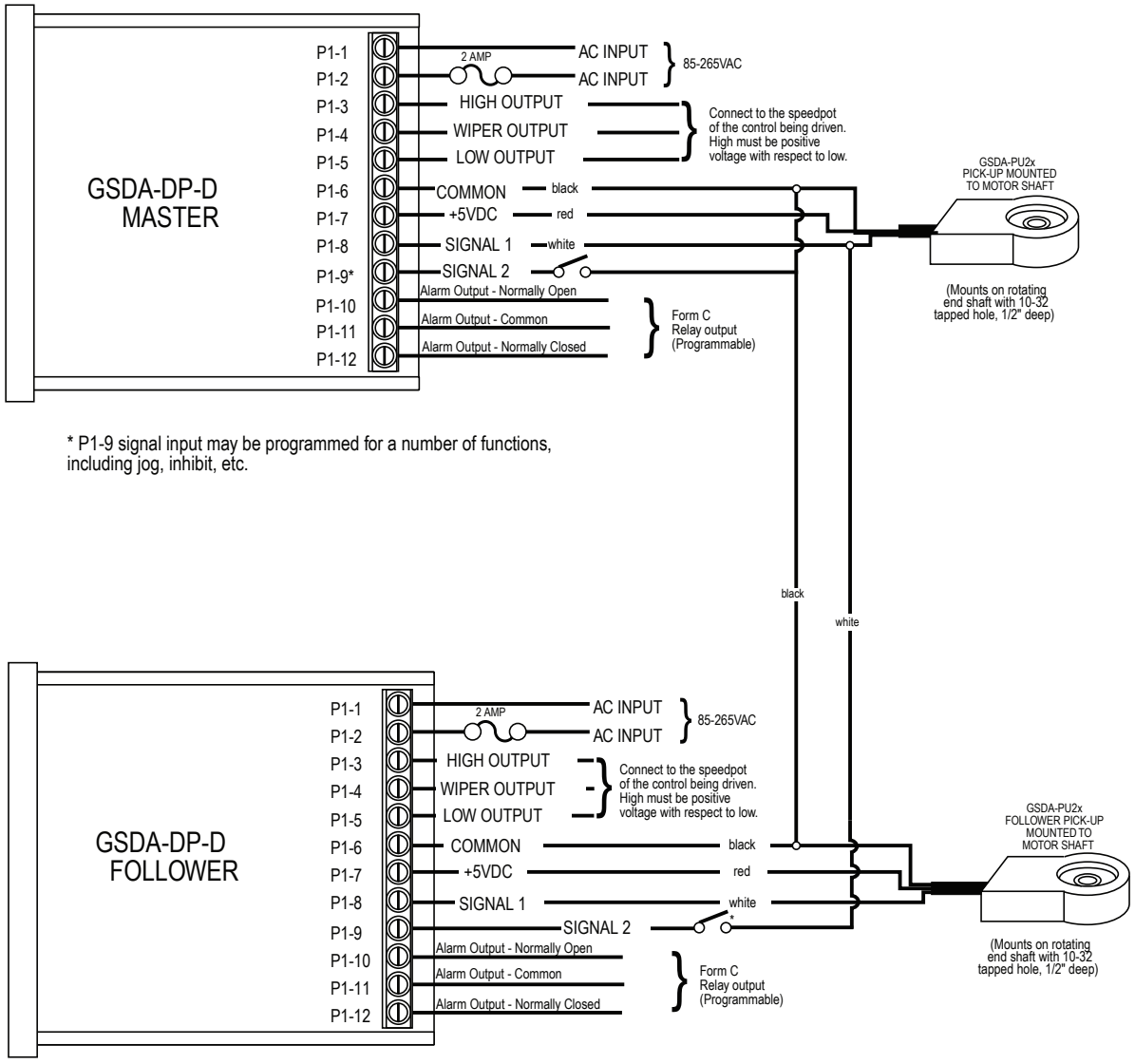
GSDA-DP-D Dimensions



GSD Series DC Drives Accessories

GSDA-DP-D

GSDA-DP-D Wiring



* P1-9 signal input may be programmed for a number of functions, including jog, inhibit, etc.

* Optional Inhibit Switch

NOTE: Speed pickups shown above are not required for open-loop operation.

GSD Series DC Drives Accessories

GSDA-DP-S

For use with GSD1 (all), GSD3-24A-xxx (12–24V), GSD4 (all), GSD5 (all), GSD6 (all), GSD7 (all)

The GSDA-DP-S is a panel mounted, multi-purpose signal conditioner that allows the operator easy access to make adjustments to system operations. The GSDA-DP-S may be used in OEM equipment designs, plant operation or laboratory applications. Most other signal conditioners are DIN rail mounted inside a panel and designed to be set up once but many applications require frequent adjustments to meet application needs. The unique front-panel design of the GSDA-DP-S addresses this by making output adjustment easily accessible via convenient up and down pushbuttons and a large, easy to read LED display.

Standard Features

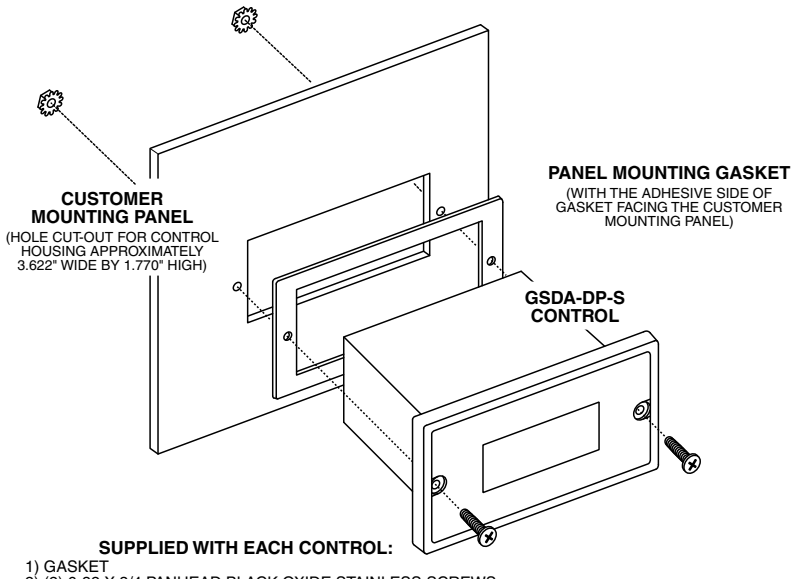
- Microprocessor design digital accuracy and repeatability
- Digital design offers long-term stability in a variety of environments
- Dual-Mode operation: Signal Scaling or Signal Generation
- Works in either voltage or current output modes
- Universal power supply accepts voltages of 85-265VAC@50-60Hz without switches or jumper settings
- Transient voltage protection protects device in harsh industrial environments
- 1/8 DIN panel mount is rated up to NEMA 4X in similarly rated panel
- Large 4 digit, 1/2 inch LED display is easy to read in indoor or outdoor applications
- Euro style terminal strip standard
- Wide operating temperature -10°C to +45°C (14°F to 113°F)
- Jumper selectable signal type - Voltage or Current (mA) signal
- Configurable input to lock out operator changes once set

GSDA-DP-S – Specifications			
Electrical	*Line Input Voltage*		85–265 VAC
	Line Input Frequency		48–62 Hz
	Voltage Signal Input		0–10 VDC
	Voltage Signal Output	*Minimum*	0.1–5 VDC
		Maximum	0.1–20 VDC, 10mA
	mA Signal Input		4–20 mA
	mA Signal Output		4–20 mA
	Display Range	*Default*	0–100.0%
		Maximum	-9999–9999
	Units of Operation		Programmable
	Onboard Power Supply (Externally Accessible)		5V @ 500mA
	Voltage Regulated Supply Output Range		24VDC ± 5%, 200mA
Mechanical	*Display Type*		LED, red, 4 digit, 1/2 inch height
	Housing Type (with supplied gasket in NEMA 4X panel)		1/8" DIN NEMA 4X
	Connector Style		3.5mm and 5mm European style
	Terminal Block Torque Setting		4.4 in·lb [0.5 N·m] maximum
	Faceplate Material		Polycarbonate with Lexan overlay
	Housing Material		Aluminum
	Weight		14.4 oz [408.22g]
Environmental	*Operating Temperature Range*		-10°C to 45°C [14°F to 113°F]
	Operating Humidity Range		95%, non-condensing
Regulatory	*Agency Approvals*		RoHS

GSD Series DC Drives Accessories

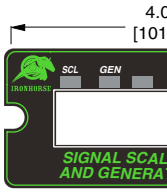
GSDA-DP-S

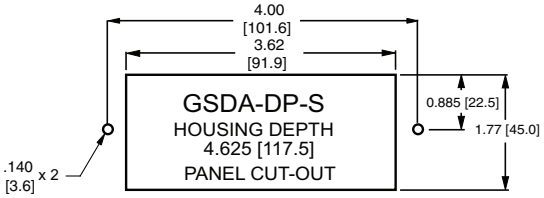
GSDA-DP-S Mounting

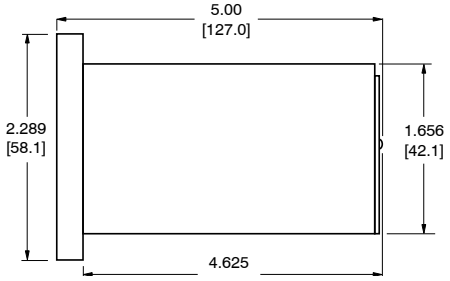


SUPPLIED WITH EACH CONTROL:
1) GASKET
2) (2) 6-32 X 3/4 PANHEAD BLACK OXIDE STAINLESS SCREWS
3) (2) #6 NUT WITH LOCKWASHER

GSDA-DP-S Dimensions (in [mm])







GSDA-DP-S Wiring