

IronHorse GSD Series DC Drives

GSD Series DC Drives Overview and Selection Guide



GSD DC Drives – Series Comparisons						
Series	GSD1	GSD3	GSD4	GSD5	GSD6	GSD7
Package Configurations Available	open frame NEMA 4X	open frame NEMA 4	open frame NEMA 4X	open frame NEMA 4/12	open frame	open frame
Power Quality Form Factor	1.05			1.4		
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	120 VAC 240 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
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 hp	1/50 – 2/3 hp	1/50 – 2 hp	1/8 – 2 hp	1/8 – 3 hp	1/50 – 2 hp
Max Output Current (continuous)	10–20A (DC)	0.15–3A (DC)	1.2–10A (DC)	0.15–10.8A (DC)	15A (DC)	0.5–10A (DC)
Current Overload Capacity	150% for 60s	200% for 60s	200% for 60s	150% 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)
Transient Protection	none	Metal Oxide Varistor (MOV)				
I.R. Compensation	adjustable	adjustable	adjustable	adjustable	adjustable	adjustable
Speed Adjustment	5k Ω pot or 0–10VDC input signal	5k Ω pot	5k Ω pot or 0–5/10/250 VDC or 4–20mA input signal	5k Ω pot or 0–10 VDC input signal	5k Ω pot	5k Ω pot or 0–10 VDC input signal
Speed Range	30:1	25:1	50:1	50:1	50:1	50:1
Speed Regulation	±1% of base speed					
Maximum Speed	adjustable 50–100%	adjustable 40–120%	adjustable 60–100%	adjustable 66–110%	adjustable 60–120%	adjustable 60–110%
Minimum Speed	adjustable 0–30%					
Acceleration	adjustable 0–10s	0.5s (fixed)	0.5s (fixed)	adjustable 0.5–8s	adjustable 0.3–12s	0.5s (fixed)
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)
Plugging* / Dynamic Braking	no					yes
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]

* 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 Introduction



GSD1-48-10N4X



GSD1-48-xxC

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 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

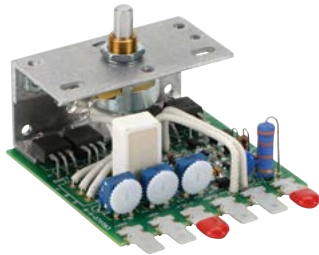
GSD1 Series DC Drives

GSD1 Selection and Specifications

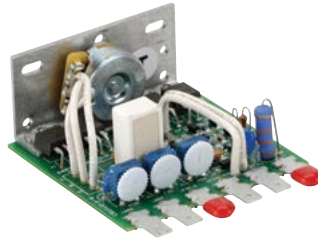
GSD1 Series DC Drives – Selection & Specifications			
Model	GSD1-48-10C	GSD1-48-10N4X	GSD1-48-20C
Price	\$133.00	\$244.00	\$186.00
Package Configuration	open frame	NEMA 4X	open frame
Power Quality Form Factor	1.05		
Input Voltage **	12/24/36/48 VDC ±15% (jumper selectable)		
Output Voltage	0–12/24/36/48 VDC		
Motor Rating (hp)	1/50 – 1/2		1/50 – 1
Output Current (continuous)	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 0–10 VDC 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 (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	8oz [227g]	40oz [1049g]	8oz [227g]
Agency Approvals	RoHS		
Optional Accessories *			
Replacement Potentiometer	GSDA-5K		
Digital Potentiometer	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>			

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)
- 5k Ω 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	\$62.00	\$62.00	\$244.00	\$61.00	\$61.00	\$116.00
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	10 VDC @ 12 VAC 20 VDC @ 24 VAC (1A max)		10 VDC @ 12 VAC 20 VDC @ 24 VAC (0.75A max)	100 VDC @ 120 VAC 200 VDC @ 240 VAC (1A max)		100 VDC @ 120 VAC 200 VDC @ 240 VAC (0.75A max)
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 Littelfuse 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			cUL _{US} listed (E333109), RoHS		
Optional Accessories *						
Replacement Potentiometer	GSDA-5K					

* 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 Introduction



GSD4-24x-xC



GSD4-240-10N4X

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

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

Features

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

Accessories

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

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

Typical Applications

- Auger feeders
- Automated door actuators
- Commercial cooking equipment
- Commercial 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

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	\$77.00	\$66.00	\$71.00	\$250.00
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	0–90/180 VDC		
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	5kΩ potentiometer or 0–10VDC isolated input signal			
		4–20mA	n/a	
	–	0–5VDC thru 0–250VDC		
Speed Range	50:1			
Speed Regulation	±1% of base speed			
Maximum Speed	adjustable from 60% to 110% of base speed			
Minimum Speed	0–30% of adjustable maximum speed			
Acceleration	0.5s (fixed)			adjustable from 0.5–8s
Deceleration				
Dynamic Braking	no			
Plugging Capability **	no			
Electrical Connections	8-position terminal strip; 22–14 AWG			
External Fusing Required	Bussman ABC or Littelfuse 314 series ceramic fuses or equivalent Refer to wiring diagrams for details			
Operating Temperature	-10 to 45 °C [14 to 113 °F]			-10 to 40 °C [14 to 104 °F]
Thermal Protection	current limiting			
Mounting Orientation	can be mounted in any orientation			
Corrosive Gases	NOT compatible with any corrosive gases			
Weight	8.0 oz [203g]	37 oz [1049g]	10.5 oz [297g]	59.5 oz [1687g]
Agency Approvals	RoHS, CE	cUL _{US} listed (E198015), RoHS, CE		cUL _{US} listed (E198015), RoHS
Optional Accessories *				
Replacement Potentiometer	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.				

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 ($\pm 1/2\%$ with tach feedback)
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable linear acceleration
- Adjustable current limit
- Line voltage compensation
- 5k Ω 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	\$136.00	\$179.00	\$248.00	\$268.00	\$271.00
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	5kΩ 2W potentiometer or 0–10VDC isolated input signal				
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	adjustable 0.06–80s (dependent on acceleration time 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	cUL _{US} listed (E333109), RoHS				RoHS
Optional Accessories *					
Replacement Potentiometer	GSDA-5K				
Digital Potentiometer	GSDA-DP				
Manual Reverse Switch	GSDA-MREV	–	–	included	–
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.					

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 ($\pm 1/2\%$ with tach feedback)
- Adjustable minimum speed
- Adjustable maximum speed
- Adjustable IR compensation
- Adjustable linear acceleration
- Adjustable linear deceleration
- Adjustable current limit
- Line voltage compensation
- 5k Ω speed potentiometer with leads, dial, and knob included
- 50:1 speed range
- Overload capacity: 200% for one minute
- Transient voltage protection
- Voltage following mode or DC tachometer follower by supplying ungrounded analog input signal
- DC tachometer feedback (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	\$339.00
Package Configuration	open frame
Power Quality Form Factor	1.4
Input Voltage (@50/60Hz)	115/230 VAC ±10%
Output Voltage	0–90/180 VDC
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	5k Ω 2W potentiometer
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 Littelfuse 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.	

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	\$165.00	\$197.00	\$165.00	\$197.00	\$172.00	\$172.00	\$202.00
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	5k Ω 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 Littelfuse 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	cUL _{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.							

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	\$15.00	Speed Potentiometer Kit. 5k Ω accessory/replacement. Includes adjustment knob and 0-100% speed dial.	GSD - all
GSDA-ACCDEC-4	\$12.00	Independent Accel/Decel Adjustment Card. Field installable.	GSD4-xxx-xC
GSDA-AI-A	\$39.00	Isolated Analog Current Signal Input Card. Range: 4–20mA. Field installable for open-frame drives as shown.	GSD4-24x-xC (open-frame) GSD5-240-10C (open-frame) GSD6 (open-frame)
GSDA-AI-V4	\$81.00	Isolated Analog Voltage Signal Input Card. Range: 0–10V or 0–250V. Field installable for open-frame drives as shown.	GSD4-240-xC (240V open-frame)
GSDA-AI-V5	\$81.00	Isolated Analog Voltage Signal Input Card. Range: 0–10V or 0–250V. Field installable for open-frame drives as shown.	GSD5-240-10C (open-frame)
GSDA-DP	\$229.00	Digital Potentiometer. 120–240 VAC input. Programmable. Outputs any unipolar or bipolar voltage range (based on input voltage) up to 24VDC ($\pm 12V$, $\pm 10V$, 0–5V, 0–24V, etc.). NEMA 4X enclosure fits 1/8 DIN cutout. Replaces analog potentiometers where vibration, repeatability, or precision is a concern.	GSD1 - all GSD4 - all GSD5 - all GSD6 - all GSD7 - all
GSDA-MREV	\$80.00	Manual Reverse Switch. 4PDT rated at 10A. Allows reversing by switching DC motor armature leads. Center-blocking prevents motor leads from reversing when motor is still turning in the previous direction.	GSD4 - all GSD5-240-10C (open-frame)
GSDA-HTSNK-4	\$27.00	Heatsink. Increases the drive's output current rating.	GSD4-24x-xC (open-frame)

NOTE: All GSDA Accessories are RoHS compliant.

GSDA-5K

For use with all GSD series DC drives

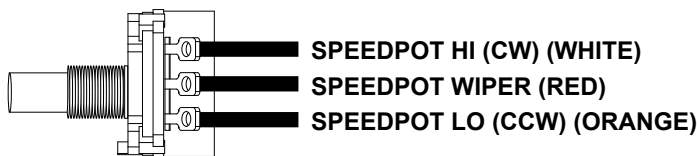
The GSDA-5K is a replacement potentiometer kit that can be used with IronHorse GSD series DC drives to control the speed of a DC motor.

(All GSD series DC drives include a speed potentiometer.)

The kit includes:

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

Wiring Connections



Dimensions (in [mm])

