

# IronHorse® Permanent-Magnet DC Motors (SCR Rated) Model Overview



**MTPM-P10-1JK43**



**MTPM-P25-1JK44**



**MTPM-P33-1L18**



**MTPM-P75-1L18**



**MTPM-1P5-1M18**

IronHorse motors are manufactured by leading motor suppliers with over 20 and 45 years experience delivering high-quality motors to the demanding U.S. market. Our suppliers test the motors during production and after final assembly. This is how we can stand behind our IronHorse motors with a **two-year warranty** (motors 1/3 hp and above only; motors 1/4 hp and less have a one-year warranty).

IronHorse DC motors are designed for use on unfiltered SCR (Thyristor) type and PWM (pulse width modulated) type DC adjustable speed drives, and on across-the-line DC controls.

The IronHorse line of DC motors features:

- Replacement brush sets
- Simple two-lead connection
- Class F insulation

## Features for Small-Frame Motors 1/4 hp and Under

- Available models accommodate 12VDC, 24VDC, 90VDC (110VAC DC drive), and 180VDC (230VAC DC drive)
- Rated for SCR drives
- TENV enclosure
- IP40 environmental rating
- Class F insulation
- High energy ceramic magnets
- Double shielded ball bearings
- Dynamically balanced armature
- Reversible design
- 18-inch leads, or junction boxes with 8-inch leads
- Externally replaceable brushes
- Can be mounted in any orientation
- Not intended for DC power generation
- UL recognized (E365956), CSA certified (259724), RoHS

## Features for Motors 1/3 hp and Above

- Input power of 115 or 230 volts rectified AC can be used with an appropriate SCR drive
- Linear speed/torque characteristics over entire speed range
- High starting torque for heavy load applications
- Capable of dynamic braking for faster stops
- Available in TENV or TEFC housings, depending on model
- NEMA 56C flange mount
- Rolled steel shell frame / cast aluminum end bell
- Removable base (0.33–2 hp)
- STABLE motor slide bases for adjustable mounting of NEMA motors from 56–449T
- Space-saving design
- Large replaceable brushes for longer brush life
- Easy access to DC motor brushes (DC motors ship with one set of brushes installed and one set of spare brushes in the box)
- Large easy-to-wire junction box with rubber gasket
- Heavy duty oversized ball bearings
- High tensile strength steel shaft
- Large easy to read nameplate
- Electrically reversible
- Not intended for DC power generation
- Service Factor: 1.0
- Two year warranty
- cCSA<sub>US</sub> certified (247070), CE, RoHS

## Applications

- Conveyors
- Turntables
- Where adjustable speed and constant torque are required
- When dynamic braking and reversing capabilities are needed

# IronHorse® DC Motors

## MTPM Small-Frame Permanent Magnet DC Motors – 1/31 hp – 1/4 hp



**MTPM-P10-1JK43**  
with flying leads



**MTPM-P25-1JK44**  
with junction box

### Selection and Specifications

Motor Specifications – MTPM Series Small-Frame Permanent Magnet DC Motors												
Part Number	Price	Voltage (VDC)	HP	Speed (rpm)	F/L Torque (oz-in)	F/L Current (A)	Shaft Dia (in)	Pilot Shaft (in)	Overhung Load (lb)	Axial/Thrust Load (lb)	Wiring Type	Weight (lb)
<b>MTPM-P10-1JK43</b>	\$71.00	12 24	1/20 1/10	1746 4252	28	4.83	0.3125	1.00	85	70	flying leads	2.75
<b>MTPM-P13-1JK42</b>	\$77.00	12 24	1/17 1/8	1825 4224	32	5.39	0.3125					3.25
<b>MTPM-P17-1JK43</b>	\$104.00	12 24	1/13 1/6	1841 4290	42	7.54	0.50	2.02	130	150	junction box	5.3
<b>MTPM-P25-1JK40</b>	\$127.00	12 24	1/6 1/4	1732 3996	96 80	14.3 12.2	0.50					7.8
<b>MTPM-P25-1JK44</b>	\$127.00	12 24	1/5 1/4	1854 4375	113 70	18.1 11.9	0.50					9
<b>MTPM-P03-1L18</b>	\$75.00	90	1/31	1797	18	0.39	0.3125	1.00	85	70	flying leads	2.75
<b>MTPM-P04-1L17</b>	\$79.00		1/26	1749	22	0.46	0.3125					3.25
<b>MTPM-P05-1L19</b>	\$104.00		1/19	1917	28	0.68	0.50	2.02	130	150	junction box	5.3
<b>MTPM-P13-1L19</b>	\$121.00		1/8	1917	73	1.4	0.50					7.8
<b>MTPM-P14-1L19</b>	\$133.00		1/7	1740	86	1.61	0.50					9
<b>MTPM-P07-1M24</b>	\$109.00	180	1/15	2440	28	0.42	0.50	2.02	130	150	junction box	5.3
<b>MTPM-P13-1M19</b>	\$133.00		1/8	1865	73	0.73	0.50					7.8
<b>MTPM-P14-1M18</b>	\$133.00		1/7	1828	84	0.83	0.50					9



**MTPM-BRUSH-x**



**MTGA-KIT-1**

### Replacement Parts

Replacement Parts for MTPM Series Small-Frame Permanent Magnet DC Motors *			
Part Number	Price	Description	For Motors MTPM-
<b>MTPM-BRUSH-4</b>	\$28.00	DC motor brushes, replacement, for 1/4 hp 24VDC MTPM series permanent magnet DC motors. Package includes one set of 2 brushes and 2 brush caps.	P25-1JK40, P25-1JK44
<b>MTPM-BRUSH-5</b>	\$21.00	DC motor brushes, replacement, for 24VDC MTPM series permanent magnet DC motors 1/6 hp and smaller. Package includes one set of 2 brushes and 2 brush caps.	P10-1JK43, P13-1JK42, P17-1JK43
<b>MTPM-BRUSH-6</b>	\$24.00	DC motor brushes, replacement, for 1/7 or 1/8 hp 90VDC or 180VDC MTPM series permanent magnet DC motors. Package includes one set of 2 brushes and 2 brush caps.	P13-1L19, P14-1L19, P13-1M19, P14-1M18
<b>MTPM-BRUSH-7</b>	\$19.00	DC motor brushes, replacement, for 90VDC or 180VDC MTPM series permanent magnet DC motors 1/10 hp and smaller. Package includes one set of 2 brushes and 2 brush caps.	P03-1L18, P04-1L17, P05-1L19, P07-1M24
<b>MTGA-KIT-1</b>	\$36.00	DC motor spare parts kit, for certain MTPM series permanent magnet DC motors as listed. Includes: two metal brush cap covers, one terminal box, one 1/8 (0.125 inch) shaft key and one 3/16 (0.187 inch) shaft key.	P05-1L19, P13-1L19, P14-1L19, P17-1JK43, P25-1JK40, P25-1JK44, Pxx-1Mxx

\* These replacement parts also fit many AutomationDirect DC gearmotors. Refer to the Gearmotors section for gearmotor application information.

# IronHorse® DC Motors

## 56C Frame TEFC/TENV Motors – DC – 0.33 to 2 hp



Motor Specifications – DC 56C Frame Motors – 1800 RPM									
Part Number	Price	HP	Base RPM	Armature Voltage	Housing	NEMA Frame	Service Factor	F.L. Amps	Weight (lb)
MTPM-P33-1L18	\$134.00	1/3	1800	90 VDC	TENV	56C flange mount	1.0	3.5	17.70
MTPM-P50-1L18	\$171.00	1/2						5.2	20.74
MTPM-P75-1L18	\$194.00	3/4						7.8	25.30
MTPM-001-1L18	\$217.00	1			TEFC			10.4	28.36
MTPM-1P5-1L18	\$234.00	1-1/2						15.4	34.97
MTPM-P33-1M18	\$133.00	1/3						180 VDC	TENV
MTPM-P50-1M18	\$170.00	1/2		2.6	20.74				
MTPM-P75-1M18	\$194.00	3/4		3.9	25.58				
MTPM-001-1M18	\$217.00	1		TEFC	5.2				28.32
MTPM-1P5-1M18	\$234.00	1-1/2			7.7				35.70
MTPM-002-1M18	\$372.00	2			9.8				61.95

*Note: Please review the AutomationDirect Terms & Conditions for warranty and service on this product.*

Performance Data – DC 56C Frame Motors – 1800 RPM																	
Part Number	HP	Armature Voltage	Torque (lb-ft)	Form Factor *	Ambient Temp.	Insulation Class	Ball Bearings		Mounting	Wire / Housing	Shaft	Constant Torque Speed Range	Overall Speed Range	Base / Type	Paint Color	Rotor Inertia (kg/m <sup>2</sup> )	Efficiency (%)
			Full Load				DE Bearing	ODE Bearing									
MTPM-P33-1L18	1/3	90 VDC	0.97	1.35	40°C (104°F)	F	6203	6203	Top Mounted	Junction Box	Keyed	90-1800 RPM	0-2000 RPM	Rigid Removable	Gray	0.01956	79
MTPM-P50-1L18	1/2		1.46													0.02365	
MTPM-P75-1L18	3/4		2.19													0.02795	
MTPM-001-1L18	1		2.92													0.03225	
MTPM-1P5-1L18	1-1/2		4.38													0.04945	81
MTPM-P33-1M18	1/3	180 VDC	0.97	1.35	40°C (104°F)	F	6203	6203	Top Mounted	Junction Box	Keyed	90-1800 RPM	0-2000 RPM	Rigid Removable	Gray	0.01956	79
MTPM-P50-1M18	1/2		1.46													0.02365	
MTPM-P75-1M18	3/4		2.19													0.02795	
MTPM-001-1M18	1		2.92													0.03225	
MTPM-1P5-1M18	1-1/2		4.38													0.04945	81
MTPM-002-1M18	2		5.84													0.09675	85

\* See additional information in Form Factor Table.

### Form Factor

The voltage used to power a permanent magnet (PM) DC motor is not pure DC; it is derived by rectifying a supplied AC voltage. The resulting DC voltage has a ripple that is related to the frequency of the AC input.

Form factor is the ratio of  $I_{rms}$  to  $I_{dc}$ , and it indicates how close the driving voltage is to pure DC. The form factor for a DC battery is 1.0. The higher the form factor is above 1.0, the more it deviates from pure DC. The Form Factor Table shows examples of commonly used voltages.

Form factor should not exceed 1.40 for continuous operation. Half wave rectification is not recommended, as it drastically increases form factor.

Operating Ironhorse PMDC motors with DC voltages with form factors higher than 1.40 can result in premature brush failure and excessive motor heating.

Form Factor Table	
Form Factor	DC Voltage Source
1.0	Battery (pure DC)
1.05 *	Pulse width modulation (PWM)
1.40 **	Full wave rectification (single phase)
1.9 ***	Half wave rectification (single phase) **

**\* All DC-input IronHorse GSD series DC drives are 1.05. IronHorse AC-input GSD5 DC drive is 1.05.**

**\*\* Single phase full wave rectification is the most common form of DC drive in 0.33-2 hp range. All IronHorse GSD series DC drives are 1.40 or better.**

**\*\*\* Not Recommended.**

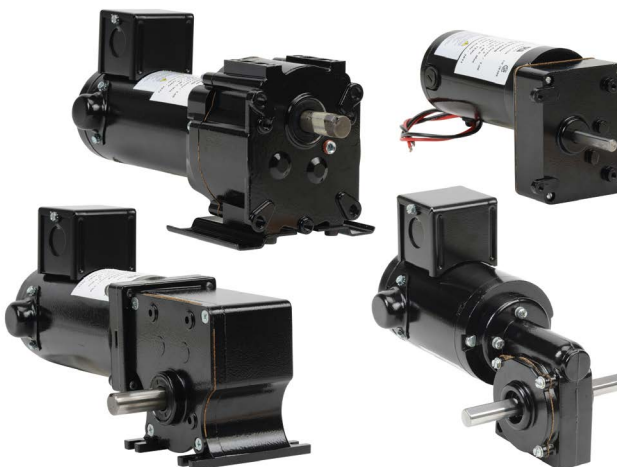
# IronHorse® DC Gearmotors

## Series MTG Gearmotors – 1/19 hp – 1/5 hp

### Model Overview

IronHorse DC gearmotors are manufactured in the U.S.A. by a leading motor supplier with over 65 years experience delivering high-quality motors and gearmotors to the demanding U.S. market. Our supplier does 100% dynamic testing of the gearmotors before shipment.

IronHorse DC gearmotors are designed for use on unfiltered SCR (Thyristor) type rectified AC input. They may also be used with PWM (pulse width modulated) type DC adjustable speed drives, and in across-the-line applications.



### Applications

- Conveyors
- Turntables
- Pick and place
- Indexers
- Small machinery
- Where reduced speed and/or increased torque are required

### General Features

- Available in 12, 24, and 90 VDC
- Available from 1/19 to 1/5 hp
- Available with parallel or right-angle gear shafts

### Gearmotor Features

- TENV enclosure
- IP40 environmental rating
- Class F insulation
- SCR rated
- Externally replaceable brushes
- Double-shielded bearings
- Dynamically balanced armature
- Reversible design
- 18-inch leads, or junction box with 8-inch Leads
- Replacement components are available
- Can be mounted in any orientation
- Not intended for DC power generation
- UL recognized (E365956), CSA certified (259724), RoHS

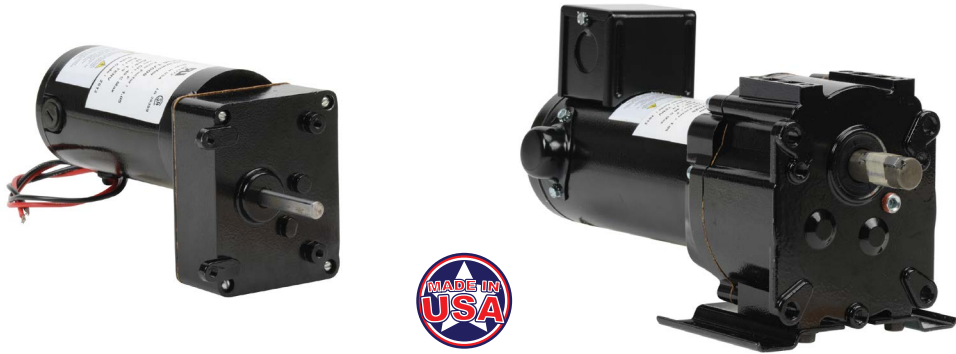
## Replacement Parts for MTGP and MTGR DC Gearmotors

Replacement Parts for MTGP and MTGR Series DC Gearmotors *			
Part Number	Price	Description	For Gearmotors
<b>MTPM-BRUSH-4</b>	\$28.00	DC motor brushes, replacement, for 1/5 hp 12VDC or 24VDC MTGR and MTGP series DC gearmotors. Package includes one set of 2 brushes and 2 brush caps.	MTGx-P20-1Jxxx, MTGx-P20-1Kxxx
<b>MTPM-BRUSH-5</b>	\$21.00	DC motor brushes, replacement, for 12VDC or 24VDC MTGR and MTGP series DC gearmotors 1/7 hp and smaller. Package includes one set of 2 brushes and 2 brush caps.	MTGx-P06-1Jxxx, MTGx-P07-1Jxxx
<b>MTPM-BRUSH-6</b>	\$24.00	DC motor brushes, replacement, for 1/7 hp 90VDC or 180VDC MTGR and MTGP series DC gearmotors. Package includes one set of 2 brushes and 2 brush caps.	MTGx-P14-1Lxxx
<b>MTPM-BRUSH-7</b>	\$19.00	DC motor brushes, replacement, for 90VDC or 180VDC MTGR and MTGP series DC gearmotors 1/15 hp and smaller. Package includes one set of 2 brushes and 2 brush caps.	MTGx-P06-1Lxxx, MTGx-P05-1Lxxx
<b>MTGA-KIT-1</b>	\$36.00	DC motor spare parts kit, for certain MTGP and all MTGR series DC gearmotors as shown in dimension drawings P-B, R-A, & R-B. Includes: two metal brush cap covers, one terminal box, one 1/8 (0.125) inch shaft key and one 3/16 (0.187) inch shaft key.	MTGP-P14-1xxxx, MTGP-P20-1xxxx, MTGR-Pxx-1xxxx

\* These replacement parts also fit many AutomationDirect small-frame DC motors. Refer to the DC Motors section for small-frame motor application information.

# IronHorse® DC Gearmotors

## MTGP Parallel Shaft Gearmotors – 1/17 hp – 1/5 hp



### Selection and Specifications

Gearmotor Specifications – MTGP Series Parallel Shaft Gearmotors													
Part Number	Price	Voltage (VDC)	Motor HP	Speed (rpm)	Gear Ratio	F/L Torque (in.-lb)	F/L Current (A) *	Shaft Dia (in)	Overhung Load (lb)	Axial/Thrust Load (lb)	Weight (lb)	Gearbox Features	Dimension Drawing #
MTGP-P06-1J008	\$162.00	12	1/16	7.9	386:1	50	1.39	0.3125	50	None (not suitable for applications with axial/thrust loading)	4.0	Grease lubrication ** Sleeve bearings 18-inch wiring leads Face mounted	P-A
MTGP-P06-1J024	\$179.00			24	120:1	50	2.41						
MTGP-P06-1J034	\$182.00			34	83:1	45	2.86						
MTGP-P06-1J050	\$162.00			50	55:1	45	3.88						
MTGP-P06-1J097	\$162.00			97	26:1	36	5.68						
MTGP-P06-1L008	\$173.00	90	1/17	8.4	386:1	50	0.19	0.625	150	200	11.4	Oil lubrication ** Needle bearings Junction box with 8-inch wiring leads Face mounted or foot mounted Designed to AGMA standards	P-B
MTGP-P06-1L012	\$179.00			12	269:1	50	0.23						
MTGP-P06-1L037	\$179.00			37	83:1	45	0.40						
MTGP-P06-1L055	\$162.00			55	55:1	45	0.54						
MTGP-P06-1L114	\$162.00			114	26:1	26	0.61						
MTGP-P14-1L026	\$289.00	90	1/7	26	69:1	280	1.58	0.625	150	200	11.4	Oil lubrication ** Needle bearings Junction box with 8-inch wiring leads Face mounted or foot mounted Designed to AGMA standards	P-B
MTGP-P14-1L039	\$289.00			39	46:1	189	1.59						
MTGP-P14-1L061	\$281.00			61	30:1	130	1.59						
MTGP-P14-1L091	\$281.00			91	20:1	86	1.58						
MTGP-P14-1L165	\$281.00			165	11:1	47	1.57						
MTGP-P20-1J026	\$297.00	12	1/5	26	69:1	280	12.60	0.625	150	200	11.4	Oil lubrication ** Needle bearings Junction box with 8-inch wiring leads Face mounted or foot mounted Designed to AGMA standards	P-B
MTGP-P20-1J037	\$297.00			37	46:1	245	15.80						
MTGP-P20-1J056	\$291.00			56	30:1	168	15.70						
MTGP-P20-1J084	\$291.00			84	20:1	112	15.70						
MTGP-P20-1J154	\$279.00			154	11:1	61	15.60						
MTGP-P20-1K018	\$291.00	24	1/5	18	110:1	280	4.41	0.625	150	200	11.4	Oil lubrication ** Needle bearings Junction box with 8-inch wiring leads Face mounted or foot mounted Designed to AGMA standards	P-B
MTGP-P20-1K036	\$291.00			36	46:1	245	7.89						
MTGP-P20-1K084	\$287.00			84	20:1	112	7.87						
MTGP-P20-1K153	\$287.00			153	11:1	61	7.81						

\* Current must be limited so that it does not exceed 125% of the gearmotor rated current.  
 \*\* Permanently lubricated.

Replacement parts are available, as shown in "Replacement Parts for MTGP and MTGR DC Gearmotors" subsection.

# IronHorse® DC Gearmotors

## MTGR Right Angle Gearmotors – 1/19 hp – 1/5 hp



### Selection and Specifications

Gearmotor Specifications – MTGR Series Right-Angle Shaft Gearmotors													
Part Number	Price	Voltage (VDC)	Motor HP	Speed (rpm)	Gear Ratio	F/L Torque (in-lb)	F/L Current (A) *	Shaft	Overhung Load (lb)	Axial/Thrust Load (lb)	Weight (lb)	Gearbox Features	Dimension Drawing #
<b>MTGR-P05-1L038</b>	\$277.00	90	1/19	38	50:1	42	0.68	dual shaft 0.5 in diameter	200	150	8.3	Grease lubrication **  Ball bearings  Junction box with 8-inch wiring leads	R-A
<b>MTGR-P05-1L053</b>	\$277.00			53	36:1	33	0.68						
<b>MTGR-P05-1L093</b>	\$277.00			93	20.5:1	23	0.68						
<b>MTGR-P05-1L132</b>	\$277.00			132	14.5:1	17	0.67						
<b>MTGR-P05-1L197</b>	\$277.00			197	9.75:1	12	0.68						
<b>MTGR-P07-1J036</b>	\$221.00	12	1/15	36	50:1	50	5.69	dual shaft 0.5 in diameter	200	150	8.3	Foot mounted  Single worm	R-A
<b>MTGR-P07-1J084</b>	\$221.00			84	20.5:1	34	6.78						
<b>MTGR-P07-1J177</b>	\$221.00			177	9.75:1	18	6.78						
<b>MTGR-P14-1L022</b>	\$287.00	90	1/7	22	82:1	280	1.41	single shaft 0.625 in diameter	150	200	14.4	Double shielded ball bearings  Junction box with 8-inch wiring leads  Foot mounted  Bevel gears  80 – 90% efficient  Can be backdriven ***	R-B
<b>MTGR-P14-1L040</b>	\$289.00			40	44:1	185	1.64						
<b>MTGR-P14-1L064</b>	\$309.00			64	28:1	116	1.65						
<b>MTGR-P14-1L077</b>	\$287.00			77	23:1	97	1.65						
<b>MTGR-P14-1L178</b>	\$287.00			178	10:1	44	1.64						
<b>MTGR-P20-1K023</b>	\$295.00	24	1/5	23	82:1	280	5.64	single shaft 0.625 in diameter	150	200	14.4	Double shielded ball bearings  Junction box with 8-inch wiring leads  Foot mounted  Bevel gears  80 – 90% efficient  Can be backdriven ***	R-B
<b>MTGR-P20-1K039</b>	\$291.00			39	44:1	263	8.74						
<b>MTGR-P20-1K075</b>	\$295.00			75	23:1	137	8.72						
<b>MTGR-P20-1K174</b>	\$295.00			174	10:1	63	8.75						

\* Current must be limited so that it does not exceed 125% of the gearmotor rated current.  
 \*\* Permanently lubricated.  
 \*\*\* Not intended for DC power generation.

Replacement parts are available, as shown in "Replacement Parts for MTGP and MTGR DC Gearmotors" subsection.