

Linear PM Motor Attributes

These are the motor configuration attributes that apply specifically to linear PM motor types.

PM Motor Rated Force

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional	Set/GSV	REAL	0 DB	0	∞	N

The PM Motor Rated Force attribute is a floating point value that specifies the nameplate continuous force rating of a linear permanent magnet motor in Newtons (N).

PM Motor Force Constant

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional	Set/SSV*	REAL	0 DB	0	∞	N/Amp (RMS)

* Indicates the attribute cannot be set while the drive power structure is enabled (Power Structure Enable bit in CIP Axis Status is true).

The PM Motor Force Constant attribute is a floating point value that specifies the force constant of a linear permanent magnet motor in Newtons per RMS Amp.

PM Motor Linear Voltage Constant

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Required	Set/SSV*	REAL	0 DB	0	∞	Volts (RMS) / (m/s)

* Indicates the attribute cannot be set while the drive power structure is enabled (Power Structure Enable bit in CIP Axis Status is true).

The PM Motor Linear Voltage Constant attribute is a floating point value that specifies the voltage, or back-EMF, constant of a linear permanent magnet motor in phase-to-phase RMS Volts per meter/sec.

If the optional PM Motor Force Constant, Kf, is not explicitly supported in the implementation, the value may be computed from the PM Motor Linear Voltage Constant, Ke, according to this equation: $Kf (N/A_{rms}) = 1.732 * Ke (V_{rms}/(m/s))$

PM Motor Linear Bus Overvoltage Speed

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - PVT (PM Only)	Set/GSV	REAL	0 FD	0	∞	m/s

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The PM Motor Linear Bus Overvoltage Speed attribute value corresponds to the linear motor speed at which the back-EMF of the motor equals the maximum operational bus voltage of the drive. When the extended speed range of a PM motor is not permitted (PM Motor Extended Speed Permissive is False), this value can be used to limit motor speed to protect the drive from damage due to bus overvoltage conditions that can occur when disabling a PM motor at high speed.

When configured for Position Loop or Velocity Loop operation, this bus overvoltage protection includes limiting the magnitude of the velocity reference value allowed into the velocity summing junction to the Bus Overvoltage Speed Limit value using the velocity limiter function. If the signal entering the velocity limiter exceeds this velocity limit value, and the PM Motor Extended Speed Permissive is False, the velocity limiter clamps the velocity reference to this value and sets the Velocity Limit status bit. If the PM Motor Extended Speed Permissive is True, or the value of this attribute is 0, this limit is not applied.

When the extended speed range of a PM motor is not permitted, overvoltage protection is also provided through motor overspeed detection based on the Motor Overspeed Factory Limit and Motor Overspeed User Limit. Exceeding these limits results in a Motor Overspeed FL or UL Axis Exception. Overspeed detection is the only source of protection when the axis is configured for Torque Loop operation.

PM Motor Linear Max Extended Speed

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - PVT (PM Only)	Set/SSV	REAL	0 FD	0	∞ or Linear Motor Max Speed	m/s

When the extended speed range of a PM motor is permitted (PM Motor Extended Speed Permissive is True) the PM Motor Linear Max Extended Speed attribute value can be used to limit the speed of a linear motor to protect the motor or load from damage due to an overspeed condition.

When configured for Position Loop or Velocity Loop operation, this overspeed protection includes limiting the magnitude of the velocity reference value allowed into the velocity summing junction using the velocity limiter function. If the signal entering the velocity limiter exceeds this velocity limit value, the velocity limiter clamps the velocity reference to this value and sets the Velocity Limit status bit. If the value of this attribute is 0, this limit is not applied.

When the extended speed range of a PM motor is permitted, overspeed protection is also provided through motor overspeed detection based on the Motor Overspeed Factory Limit and Motor Overspeed User Limit. Exceeding these limits results in a Motor Overspeed FL or UL Axis Exception. Overspeed detection is the only source of protection when the axis is configured for Torque Loop operation.

If the related optional attribute, Rotary or Linear Motor Max Speed, is supported, software will apply this maximum speed value as the Max Value for this attribute.

See also

[General Permanent Magnet Motor Attributes](#)

[General Rotary Motor Attributes](#)

[General Linear Motor Attributes](#)

[Induction Motor Attributes](#)

[Velocity Loop Signal Attributes](#)

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