



CP Automation  
Keeping industry  
in motion

HPV1000-App\_Note\_11

# Pre-Torque Setup Guide

Guide to setting up Pre-Torque on the HPV1000 Drive



**Please note:**

- 1) Pre-Torque should be a final adjustment. It is essential all adjustments in tuning the drive for smooth car ride should occur before thinking about tuning Pre-Torque – make sure you are 100% happy with acceleration, high speed running, levelling and stopping before turning on Pre-Torque.
- 2) Be aware the drive cannot affect the ferocity of the mechanical brake or overcome any bump caused by mechanical friction within the lift system therefore this should be overcome or taken into consideration prior to attempting any Pre-Torque adjustment.
- 3) This guide assumes your load weighing device has been correctly setup and calibrated according to the manufacturer's manual

The HPV1000 can be configured to use a pre-torque reference using an analogue voltage output from a load weighing device.

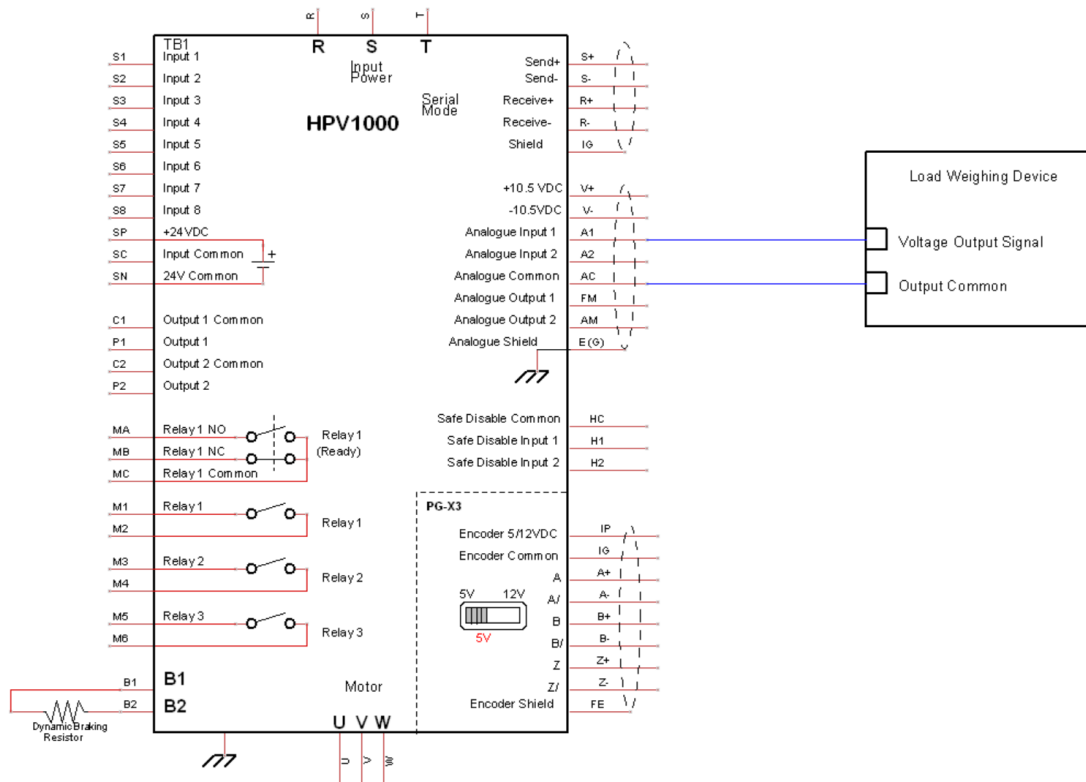
The maximum accepted voltage range for the analogue input is -10 to +10VDC.

The Torque Comp Source setting in the C1 menu (Trq Comp Src) should be set to Analogue.

The analogue load signal can be connected to either analogue input (A1 or A2) using the AC terminal as the common. The selected input should then be configured to "Pre-torque" in the C5 menu.

For example, if connected as pre the diagram below, Analogue A1 Select in the C5 menu should be set to "Pre-torque"

Configuring an analogue input to pretorque will disable the separate position lock feature, so the position lock parameters do not need to be adjusted.



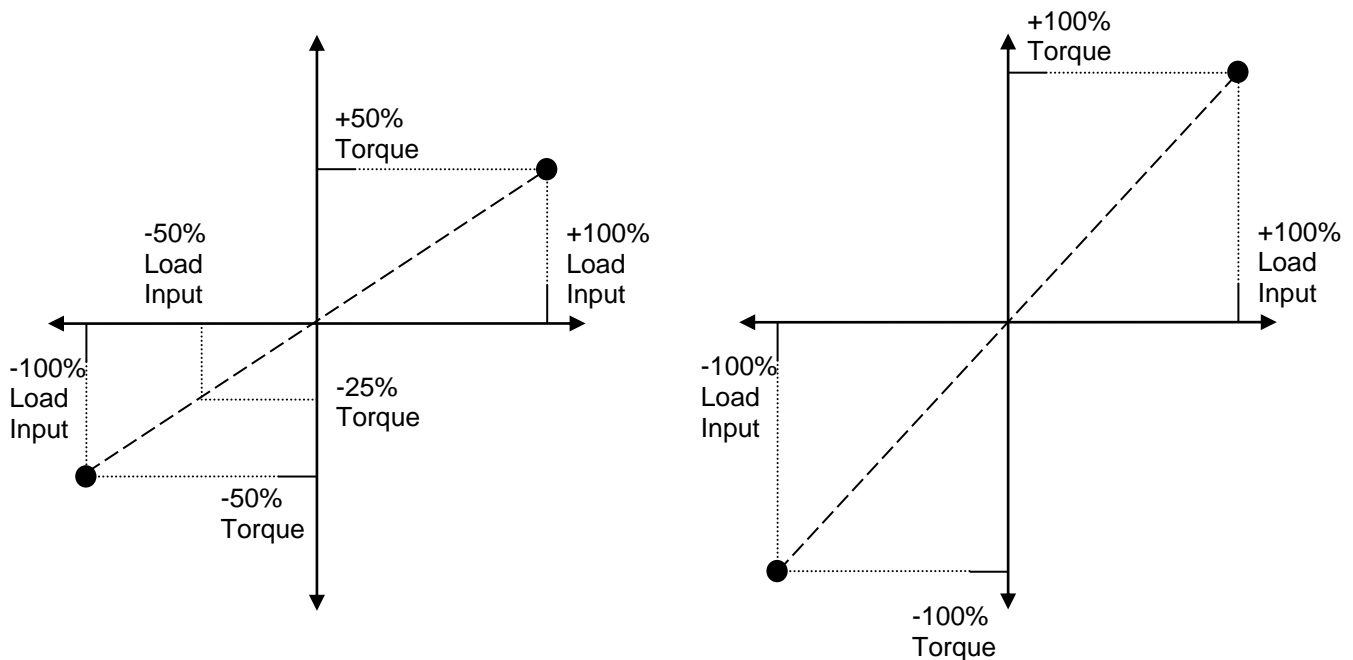
Pre-Torque on the HPV1000 drive uses four parameters which define two set points to work correctly over a range.

For example, the drive can be told that with an empty car, the analogue input from the load weigh device will be -100%, and at full load it will be +100%. Then the drive can be told that at empty car, the drive should use -50% torque to hold the car, and at full load, it should use +50% to hold the car:

The drive will then scale the Pre-torque so at -50% analogue input for torque to hold the car, as per diagram 1.

**Diagram 2** Torque % between these two values, example, the drive will use -25%

If the AnaRef Empty Car and AnaRef Full Car parameters were instead set to -100% and 100%, the pre-torque would scale as per diagram 2:



**Pre Torque Parameters:**

Parameter Name	Initial Start Value	General Working Range	Function
C1 - Trq Comp Cmd Src	Disabled	Analogue	Sets the signal source for pretorque to the analogue input
C5 - Analogue A1 Select or Analogue A2 Select	Not Used	Pretorque	Selects which analogue input is used for the pretorque signal
C5 - TrqRef Empty Car	-100%	-100% to 100%	Torque % at Empty car
C5 - AnaRef Empty Car	100%	-100% to 100%	Analogue Input % at Empty Car
C5 - TrqRef Full Car	-100%	-100% to 100%	Torque % at Full Load
C5 - AnaRef Full Car	100%	-100% to 100%	Analogue Input % at Full Load

### **Procedure to set Pre Torque Parameters:**

Procedure for Empty Car Load Condition (C5 - TrqRef Empty Car, AnaRef Empty Car)

1. Make sure the load weigher signal is connected as per the drawing above, and settings match those in the table.
2. Set the speed reference to 0%.
3. Ensure there is no weight inside the elevator car.
4. Move to the Elevator Data D1 menu, and note the value of the analog input level for the input that the load signal input is connected to ("Analog A1 Level" for terminal A1, "Analog A2 Level" for terminal A2).
5. Provide an elevator Up or Down command, using Inspection Operation or normal operation mode. The car should be held in place when the brake releases.
6. In the Power Data D2 menu, note the drives internal torque reference displayed in "Torque Reference".
7. Stop the drive.
8. Set the value noted in step 4 to parameter AnaRef Empty Car. Set the value noted in step 6 to parameter TrqRef Empty Car.

Procedure for Full Car Load Condition (C5 - TrqRef Full Car, AnaRef Full Car)

1. Set the speed reference to 0%.
2. Apply as much load to the car as possible (at least 50% of the maximum weight, but full load if possible).
3. Move to the Elevator Data D1 menu, and note the value of the analog input level for the input that the load signal input is connected to ("Analog A1 Level" for terminal A1, "Analog A2 Level" for terminal A2).
4. Provide an elevator Up or Down command, using Inspection Operation or normal operation mode. The car should be held in place when the brake releases.
5. In the Power Data D2 menu, note the drives internal torque reference displayed in "Torque Reference".
6. Stop the drive.
7. Set the value noted in step 3 to parameter AnaRef Full Car. Set the value noted in step 5 to parameter TrqRef Full Car.