

NPC-D-5200 Series

Digital Controllers

A standalone single axis closed loop piezo actuator controller designed to cover the most challenging applications requiring the best dynamic performance.

The controller is updated with the position of the stage 120,000 times per second which, combined with a high continuous power rating, allows stages to be driven at higher maximum speeds for faster step-settle times. This can be particularly important for longer range stages or stages designed for high load bearing.

Queensgate stage designs incorporate capacitive sensors which give precise positional feedback in closed-loop mode delivering high resolution, low noise and high linearity of movement. The stable system delivers repeatability of movement with improved precision and accuracy for static and dynamic motion applications.

There is no compromise: the NPC-D-5200 delivers precision, accuracy and speed.





Key Features

- Precision capacitive sensor measurement circuit for closed loop operation.
- Update rate of 8.3 micro seconds (120KHz).
- Low electronic noise the low noise design allows stage position noise as low as a few tens of picometres.
- High power rating, -30 to +150V drive with 160mA continuous current as standard.

Interfacing

- Analog command and position output +/-10 V
- Digital commands over USB or optional RS232C.
- Easy to interface with OEM software using supplied DLL (Dynamic Link Library). In position digital outputs can be used to interface with external devices. Expansion slot to allow custom board for OEM integration.
- Examples of software in C/C++, Python and LabVIEW[®] provided.
- User programmable Function Playback of custom programmed waveforms such as constant velocity profiles.
- TTL input/output triggers for external control.
 Programmable when "Function playback" feature used.
- TTL In-Position output to indicate when NanoMechanism reaches the desired/set position (user selectable position accuracy).



Technical specification

Size (Widh'x Depth x Height Height Includes feet Not Including proponents at front and rear of controller Sage Mass 1.8 kg Vents on rear and base	Parameter	Value	Units	Comments
Height Neight Including profunding components at front and rear of controller and rearrangement and rear of contro	Mechanical			
Cooling Fan forced air Vents on rear and base Electrical Fower input 96 to 265 Vrms Using external supply, Only use approved power supply Power input 47 to 63 Hz provides protective earth connection. DC power input 4 24 ± 0.75g5A V Only use Queensgate approved power supply DC power input connector 4 pin DIN Plus protective parts connection Rear panel Connectivity For connectivity For channel - front panel Analog input command BNC Per channel - front panel Analog Position Monitor BNC Per channel - front panel vulput 25 pin D-type socket Per channel - front panel village of supply of the parts of the part	Height) Height includes feet Not including protruding components at	268 x 194 x 70	mm	
Power input	Stage Mass	1.8	kg	
Power input 47 to 63	Cooling	Fan forced air		Vents on rear and base
A7 to 63	Electrical			
DC power input 24 ± 0.75@5A V Only use Queensgate approved power supply	Power input	96 to 265	Vrms	Using external supply. Only use approved power supply
DC power input connector earth connection earth connection earth connection earth connection Connectivity USB		47 to 63	Hz	provides protective earth connection.
DC power input connector depin DIN Plus protective earth connection depin DIN Plus Plus Protective earth connection depin DIN Plus Protective earth connection depin DIN Plus Protective earth connection depin DIN Plus Protective depin DIN Protective depin DIN Protective depin DIN Plus Protective depin DIN	DC power input	± 24 ± 0.75@5A	V	
Connectivity USB 2.0 compliant USB type B connector. Note: power not taken from USB port. Analog input command BNC Per channel - front panel Analog Position Monitor output BNC Per channel - front panel "TRIG" input, "TRIG" output and Quadrature Interface 25 pin D-type socket Image: panel pan		4 pin DIN Plus protective		
Connectivity USB 2.0 compliant USB type B connector. Note: power not taken from USB port. Analog input command BNC Per channel - front panel Analog Position Monitor output BNC Per channel - front panel "TRIG" input, "TRIG" output and Quadrature Interface 25 pin D-type socket Image: panel pan		earth connection		
USB 2.0 compliant USB type B connector. Note: power not taken from USB port. Analog input command BNC Per channel - front panel Analog Position Monitor output BNC Per channel - front panel "TRIG" input, "TRIG" output and Quadrature Interface 25 pin D-type socket Image: panel pan	Connectivity			
Analog input command BNC Per channel - front panel Analog Position Monitor output BNC Per channel - front panel "TRIG" input, "TRIG" output, "IN-POS" output and Quadrature Interface 25 pin D-type socket signals Rear panel Controller Synchronizing signals 9 pin D-type socket signals Rear panel Environmental - Operational *** PC Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping *** PC Temperature -20 to 70 *** Non-condensing Relative Humidity 0 to 95 %RH Non-condensing General *** *** ** Warm up time 40 (typ) Min ** "ANA I/P" analog input channel -10 to +10 V Connector BNC - Single ended MAXIMUM input: ±15V "POS MON" analog output position monitor per channel -10 to +10 Connector BNC - Single ended MAXIMUM input: ±15.5V	-	2.0 compliant		USB type B connector. Note: power not taken from USB port.
Analog Position Monitor output "TRIG" input, "TRIG" output and Quadrature Interface Controller Synchronizing signals Environmental - Operational Temperature 10 to 40 8c Rear panel Selative Humidity 5 to 80 8c RH Non-condensing Environmental - Storage and Shipping Temperature 20 to 70 8c Relative Humidity 0 to 95 8c RH Non-condensing Seneral Warm up time 40 (typ) 40 to +10	Analog input command			
output 25 pin D-type socket Image: Controller Synchronizing Signals 25 pin D-type socket Image: Controller Synchronizing Signals 9 pin D-type socket Image: Controller Synchronizing Signals 9 pin D-type socket Image: Controller Synchronizing Signals 9 pin D-type socket Image: Controller Synchronizing Synchronizing Signals 9 pin D-type socket Rear panel Environmental - Operational Temperature 10 to 40 9C Section Controller Synchronizing Synchronizing Environmental - Storage and Stripping Temperature 20 to 70 9C Section Controller Synchronizing Synchronizing General Warm up time 40 (typ) Min Min "ANA I/P" analog input option command per channel 10 to +10 V Connector BNC – Single ended MAXIMUM input: ±15V "ANA I/P" analog input impedance (per channel) -50k Ohms Connector BNC – Single ended MAXIMUM input: ±15.5V "POS MON" analog output position monitor per channel -10 to +10 Connector BNC – Single ended MAXIMUM input: ±15.5V		BNC		Per channel - front panel
"TRIG" input, "TRIG" output and Quadrature Interface Controller Synchronizing signals Environmental - Operational Temperature 10 to 40 °C Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping Emerature 20 to 70 °C Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min Min Connector BNC – Single ended MAXIMUM input: ±15V position nomitor per channel "ANA I/P" analog input impedance (per channel) "POS MON" analog output position monitor per channel				·
Quadrature Interface Rear panel Controller Synchronizing signals 9 pin D-type socket Rear panel Environmental - Operational *** ***	"TRIG" input, "TRIG"	25 pin D-type socket		
Controller Synchronizing signals Environmental - Operational Temperature 10 to 40 °C Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping Temperature -20 to 70 °C Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min "ANA I/P" analog input position command per channel "POS MON" analog output position monitor per channel "POS MON" analog output position monitor per channel	"IN-POS" output and			
signals Invironmental - Operational Temperature 10 to 40 9C Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping Temperature -20 to 70 9C Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min Min "ANA I/P" analog input channel -10 to +10 V Connector BNC - Single ended MAXIMUM input: ±15V "ANA I/P" analog input impedance (per channel) > 50k Ohms "POS MON" analog output position monitor per channel -10 to +10 Connector BNC - Single ended MAXIMUM input: ±15.5V	Quadrature Interface			
Temperature 10 to 40 °C Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping Temperature -20 to 70 °C Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min Connector BNC – Single ended MAXIMUM input: ±15V position command per channel "ANA I/P" analog input impedance (per channel) -50k Ohms "POS MON" analog output position monitor per channel "Connector BNC – Single ended MAXIMUM input: ±15.5V position monitor per channel "Connector BNC – Single ended MAXIMUM input: ±15.5V		9 pin D-type socket		Rear panel
Relative Humidity 5 to 80 %RH Non-condensing Environmental - Storage and Shipping Temperature -20 to 70 °C Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min Connector BNC – Single ended MAXIMUM input: ±15V position command per channel "ANA I/P" analog input impedance (per channel) > 50k "POS MON" analog output position monitor per channel "Connector BNC – Single ended MAXIMUM input: ±15.5V	Environmental - Operational			
Environmental - Storage and Shipping Temperature	Temperature	10 to 40	ōС	
Temperature	Relative Humidity	5 to 80	%RH	Non-condensing
Relative Humidity 0 to 95 %RH Non-condensing General Warm up time 40 (typ) Min "ANA I/P" analog input position command per channel "ANA I/P" analog input impedance (per channel) "POS MON" analog output position monitor per channel "ANA IMD Non-condensing Min Connector BNC – Single ended MAXIMUM input: ±15V Ohms Connector BNC – Single ended MAXIMUM input: ±15.5V Connector BNC – Single ended MAXIMUM input: ±15.5V	Environmental - Storage and	Shipping		
Warm up time 40 (typ) Min "ANA I/P" analog input -10 to +10 V Connector BNC – Single ended MAXIMUM input: ±15V position command per channel >50k "ANA I/P" analog input impedance (per channel) > 50k "POS MON" analog output position monitor per channel	Temperature	-20 to 70	ōС	
Warm up time 40 (typ) Min "ANA I/P" analog input -10 to +10 "ANA I/P" analog input position command per channel ANA I/P" analog input impedance (per channel) "POS MON" analog output position monitor per channel "ANA I/P" analog output position monitor per channel	Relative Humidity	0 to 95	%RH	Non-condensing
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position command per channel "ANA I/P" analog input impedance (per channel) "POS MON" analog output position monitor per channel "Other impedance (per channel) "Connector BNC – Single ended MAXIMUM input: ±15.5V Connector BNC – Single ended MAXIMUM input: ±15.5V				
channel "ANA I/P" analog input impedance (per channel) "POS MON" analog output position monitor per channel "Connector BNC – Single ended MAXIMUM input: ±15.5V Connector BNC – Single ended MAXIMUM input: ±15.5V	"ANA I/P" analog input	-10 to +10	V	Connector BNC — Single ended MAXIMUM input: ±15V
impedance (per channel) "POS MON" analog output position monitor per channel "POS MON" analog output position monitor per channel	1.			
position monitor per channel	_ :	> 50k	Ohms	
"IN- POSITION" Logic "0" < 0.8 V 15 pin D-Type on rear panel.	position monitor per	-10 to +10		Connector BNC — Single ended MAXIMUM input: ±15.5V
	"IN- POSITION"	Logic "0" < 0.8	V	15 pin D-Type on rear panel.
Output Logic "1" 2.4 to 5 V For OUTPUTS Load impedance: > 1k ohms. MAXIMUM	Output	Logic "1" 2.4 to 5	V	For OUTPUTS Load impedance: > 1k ohms. MAXIMUM
"TRIG" Logic "0" < 0.8 V output: 5.5V For INPUTS Input impedance: 50 ohms.			V	output: 5.5V For INPUTS Input impedance: 50 ohms.
Logic "1" 2.4 to 5 V MAXIMUM input: 5.5V		Logic "1" 2.4 to 5	V	MAXIMUM input: 5.5V



Technical specification

Parameter	Value	Units	Comments
NanoMechanism interfacing	- controller - per channel	·	
Connector	17W2 D type		Mixed signal connector
HV output swing	-30 to +150	V	Factory set (default)
	-20 to +120		Factory set (optional)
HV drive current	160	mA	Factory set (default)
HV amplifier bandwidth	>50	kHz	
HV amplifier intrinsic noise	0.3	mV	
"ANA I/P" analog output	-5 to +5	V	Connector BNC
position command			Differential input - core +ve
"POS MON" analog output	-5 to +5	V	Connector BNC
position monitor			Single ended
"READY" output	Logic "0" < 0.8	V	Connector BNC
signal	Logic "1" 2.4 to 5	V	
"TRIG I/P" input	Logic "0" <0.8	V	
signal			

Ordering information

Product Ref	Description	
QGNPC-D-5200	NPC-D-5200 Single axis high performance digital controller.	

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