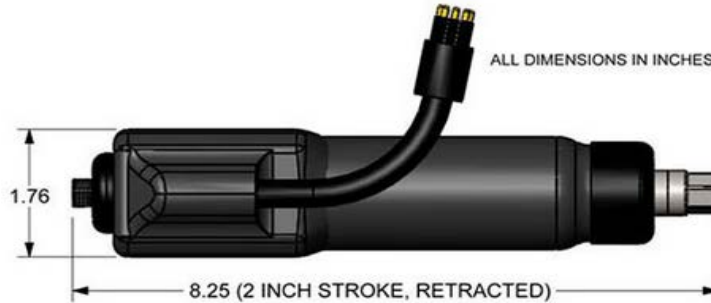


Ultra Motion Series U1 Linear Actuator

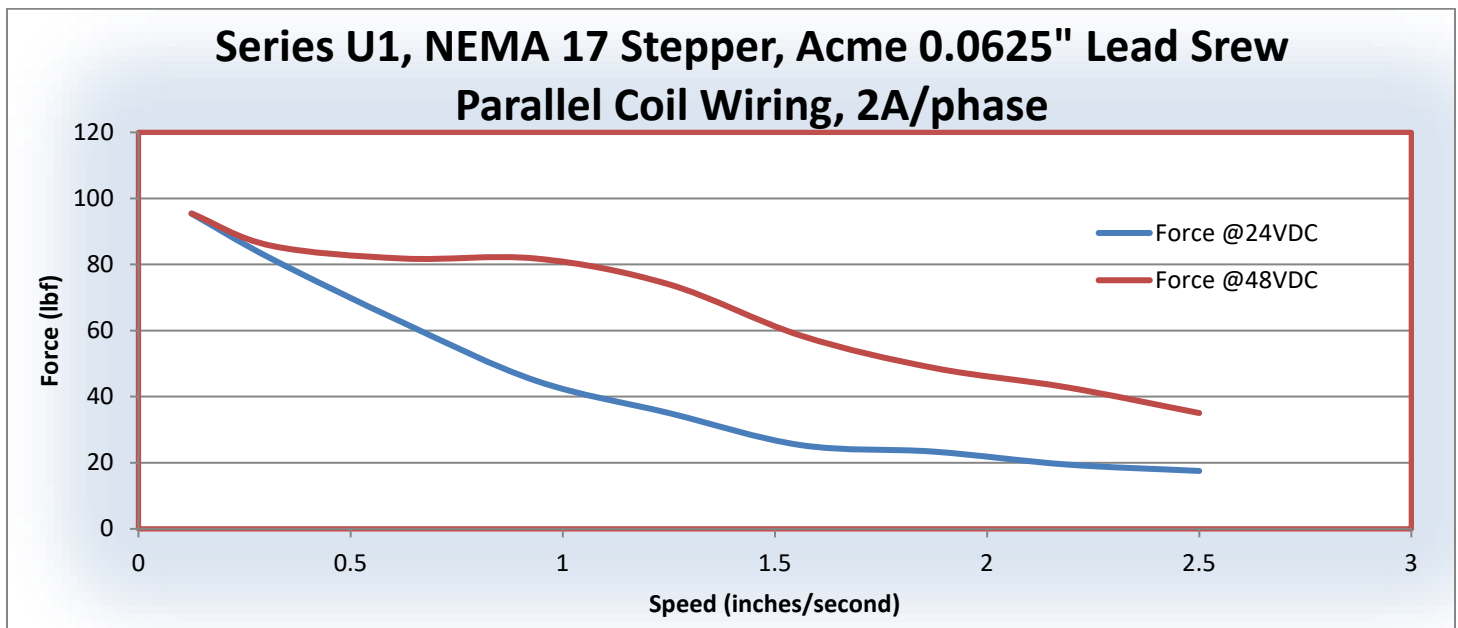
Product Features:

- Inline mounted motor
- NEMA 17 frame
- Standard high torque NEMA 17 stepper motor
- Standard with linear potentiometer feedback
- Brushless DC motors available
- Standard stroke lengths: 2", 4" & 8"
- Custom stroke lengths to 16"
- Standard with 2-foot SubConn underwater cable with 8-pin male connector & female locking sleeve



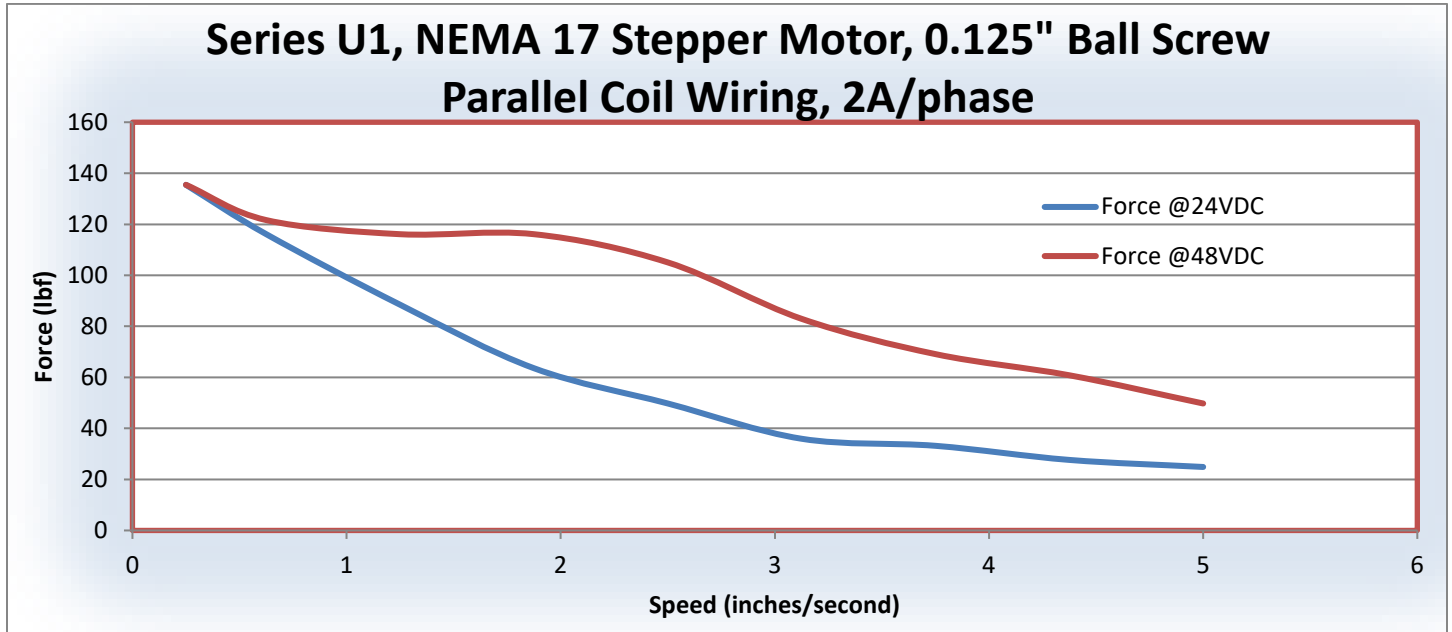
Speed/force graphs (with standard high torque NEMA 17 stepper motor):

With self-locking Acme 0.063 pitch high resolution lead screw:

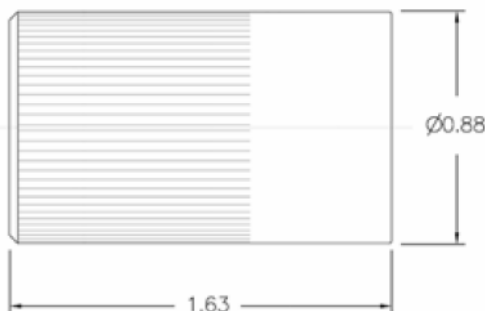
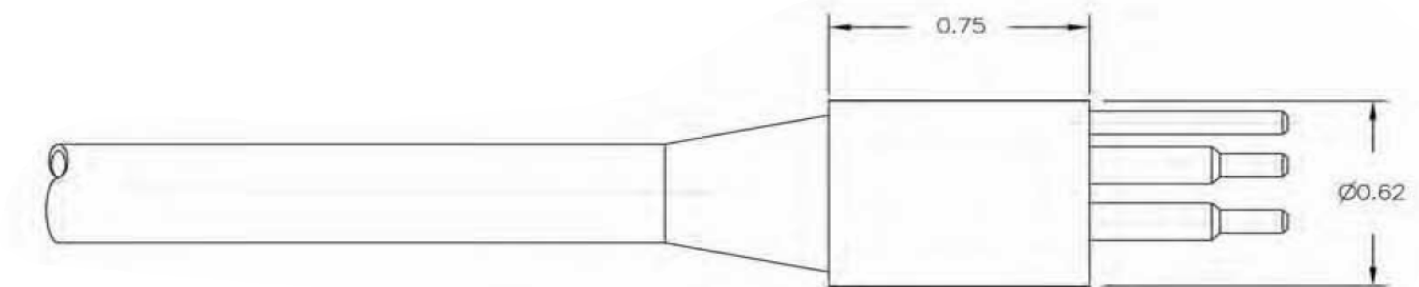


Ultra Motion Series U1 Linear Actuator

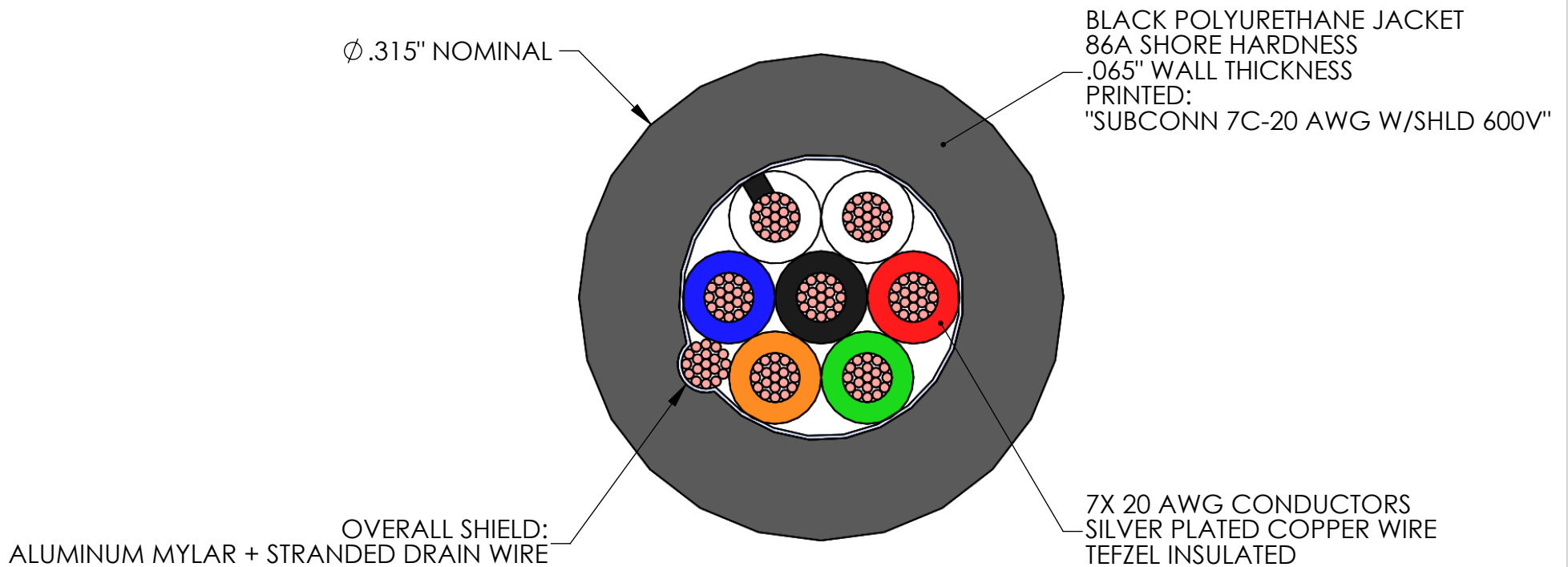
With high efficiency 0.125" pitch ball screw option:



Connector/Locking Sleeve:



Contact Current Rating:	5A/contact (max 20A/connector)
Insulation resistance:	> 200 Mohm
Contact resistance:	< 0.01 ohm
Cable Jacket & Overmold Material:	Black Polyurethane
Locking Sleeve Material:	Black Delrin
Locking Sleeve Snap Ring Material:	AISI 302 Stainless Steel



COLOR CODE:

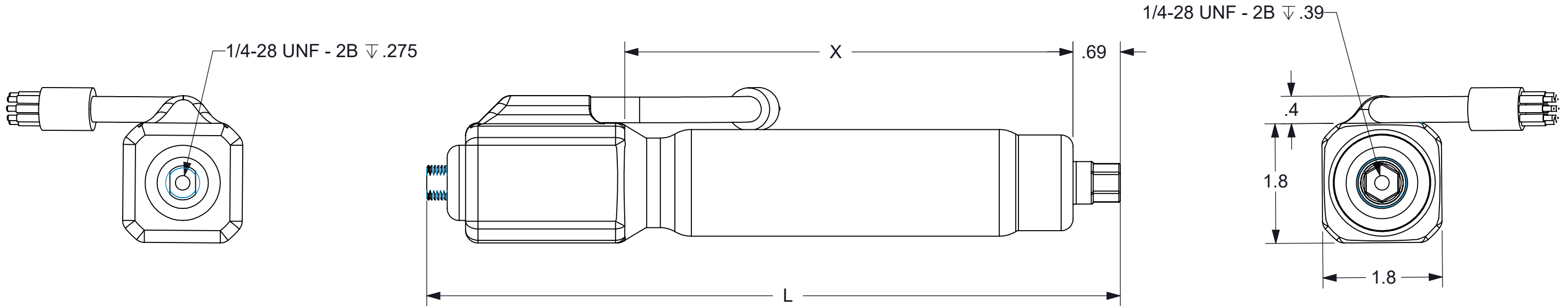
1. BLACK (CENTER)
2. WHITE
3. RED
4. GREEN
5. ORANGE
6. BLUE
7. WHITE/BLACK
8. DRAIN WIRE

UNLESS OTHERWISE SPECIFIED:		NAME	DATE				
DIMENSIONS ARE IN INCHES TOLERANCES:		DRAWN	CL	6/6/13	TITLE: P7C20# OS		
RADIUS: MACH ± .002		CHECKED	RD	7/2/13			
TWO PLACE DECIMAL ± .01		ENG APPR.					
THREE PLACE DECIMAL ± .005		MFG APPR.	BOWER	7/3/13			
ANGULARITY ±0.5		Q.A.					
THIRD ANGLE PROJECTION 		PROPRIETARY AND CONFIDENTIAL			SIZE DWG. NO. REV A PUR #4 IR		
MATERIAL AS NOTED		THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SUBCONN INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SUBCONN INC. IS PROHIBITED.					
FINISH							
					SCALE: NTS	WEIGHT: N/A	SHEET 1 OF 1

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The information subject to this restriction is contained in every page of this document.

REVISIONS				
REV.	CHANGE DESCRIPTION	DATE	ECO#	APPROVED BY

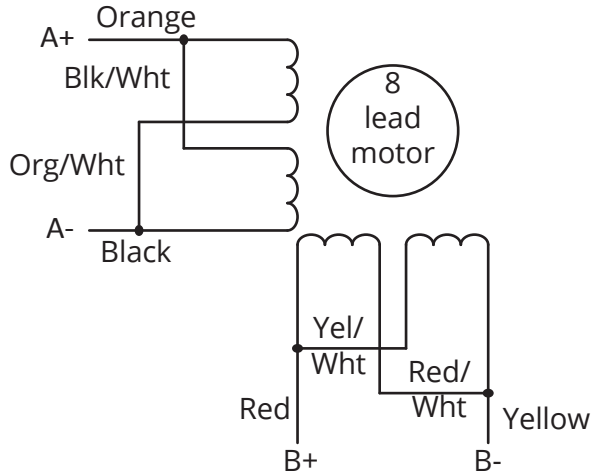


STROKE LENGTH		RETRACTED LENGTH "L"		"X"	
INCHES	MM	INCHES	MM	INCHES	MM
2	50.8	8.16	207.26	4.47	113.54
4	101.6	10.16	258.06	6.47	164.34
6	152.4	12.16	308.86	8.47	215.14
8	203.2	14.16	359.66	10.47	265.94
10	254	18.16	461.26	14.47	367.54
12	304.8	20.16	512.06	16.47	418.34
14	355.6	24.16	613.66	20.47	519.94

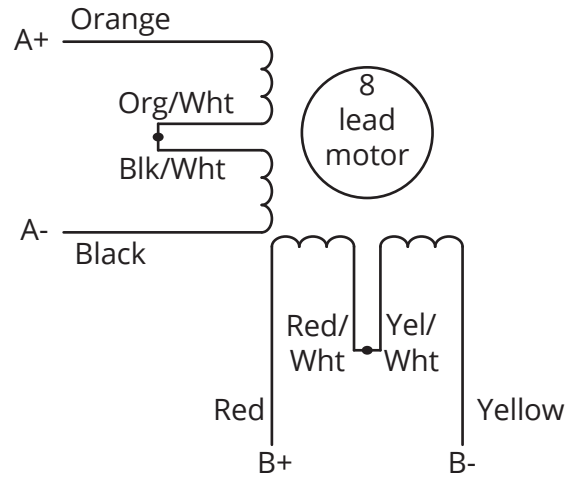
 22355 COUNTY RD 48 UNIT 21 CUTCHOGUE NY 11935	NAME: T.QUARTARARO		DATE: 1/8/2015	
	TITLE: U1, STEPPER			
UNLESS OTHERWISE SPECIFIED: · INTERPRET DWG IAW ANSI Y14.5M · DIMENSIONS ARE IN INCHES · BREAK ALL SHARP EDGES · DRAWING TOLERANCES ARE: ANGLES : 1° 0.XX : 0.01" 0.XXX : 0.005"	DOC TYP: ASSEMBLY SPECIFICATION			
	DOCUMENT NUMBER: UM711028			
	MATERIAL: NA		FINISH: SEE NOTES	
	WEIGHT (lbs)		SHEET SIZE: B	SHEET 1 OF 1

Stepper Motor

Parallel Wire Configuration



Series Wire Configuration



$$\text{Steps Per Inch} = \frac{\text{Steps per Rev}}{\text{Lead}} \times \text{Belt Ratio}$$

$$\text{Encoder Cycles Per Inch} = \frac{\text{Steps per Rev}}{\text{Lead}} \times 500$$

$$\text{Quadrature Counts Per Inch} = \frac{\text{Steps per Rev}}{\text{Lead}} \times 2000$$

Maximum Current: B2, D1, U1	Series	0.85A _{RMS}
	Parallel	1.70A _{RMS}

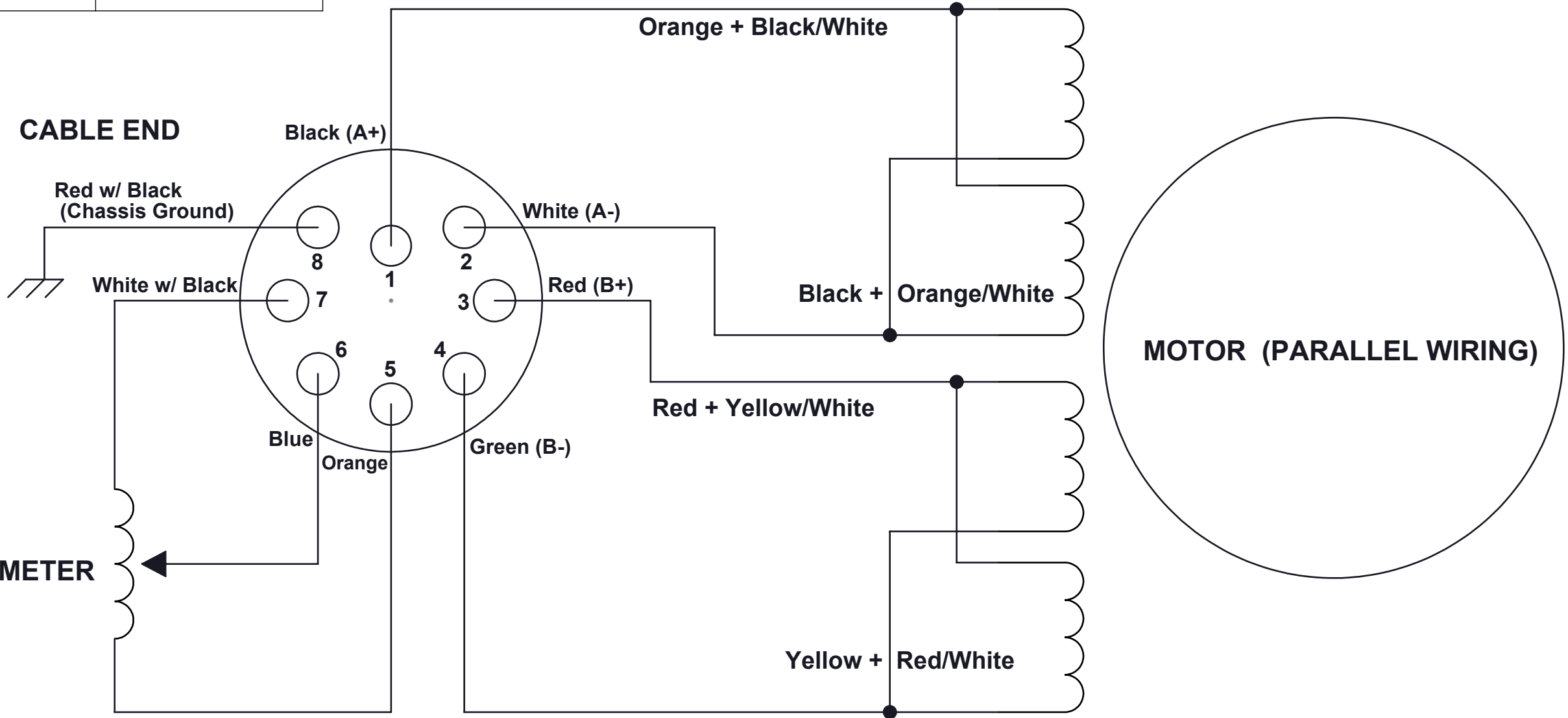
Maximum Current: B3, D2, U2	Series	2.12A _{RMS}
	Parallel	4.24A _{RMS}

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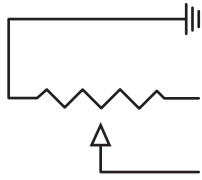
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	-	INITIAL RELEASE	11/10/2009	R. KOCH
	A.01		10/20/2014	T.QUARTARARO

MOTOR SIZE	RESISTANCE - PHASE TO PHASE
NEMA17	~ 2.0 Ohm
NEMA23	~ 0.8 Ohm



NAME R. KOCH		DATE 11/10/2009		ULTRA MOTION 22355 COUNTY RD 48 UNIT 21 CUTCHOGUE NY 11935 Phone: 631 298 9179 Fax: 631 298 6593 WWW.ULTRAMOTION.COM INFO@ULTRAMOTION.COM A					
FABRICATION INSTRUCTIONS UNLESS OTHERWISE SPECIFIED:							TITLE 8-PIN PARALLEL WIRING		
· INTERPRET DWG IAW ANSI Y14.5M · DIMENSIONS ARE IN INCHES · BREAK ALL SHARP EDGES · DRAWING TOLERANCES ARE: THIRD ANGLE PROJECTION									
* ANGLES : 1° * 0.XX : 0.01 * 0.XXX : 0.005									
MATERIAL -		SIZE B		DWG No. 8PINPARALLEL		REV A.01			
WEIGHT (lbs) -		DO NOT SCALE DRAWING, WORK FROM DIMENSIONS		SCALE: 1:1		SHEET 1 OF 1			

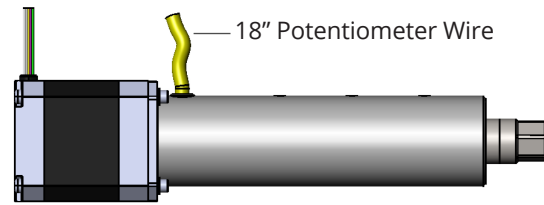
Internal Potentiometer



Black (Ground)

Brown (V+)

Blue (Reference)



Potentiometer wire on D1 actuator for reference

General	The linear potentiometer on your actuator is intended to be used as a voltage divider. A voltage is to be applied across the brown and black wires and a reference voltage is to be read from the blue wire. The recommended and maximum voltage values to be applied depend upon the maximum resistance of the potentiometer but as a guideline, we suggest:
Voltage	2 inch stroke: Less than 39 volts recommended, 50 volts max. 4 inch stroke: Less than 50 volts recommended, 63 volts max. 8 inch stroke: Less than 70 volts recommended, 90 volts max.
Resistance	Max: 2 inch stroke: 3k Ohms 4 inch stroke: 5k Ohms 8 inch stroke: 10k Ohms Min: 90 to 900 Ohms Tolerance: ±20%
Linearity	±2%
Repeatability	No hysteresis
Power Rating	Depending on size, varies with length and temperature: 1 Watt max. @ 25°C, ≤0.5 Watt recommended
Resolution	Analog output is theoretically infinite and will depend on the resolution of your ADC
Dielectric Value	No affect @ 500VAC for 1 minute