

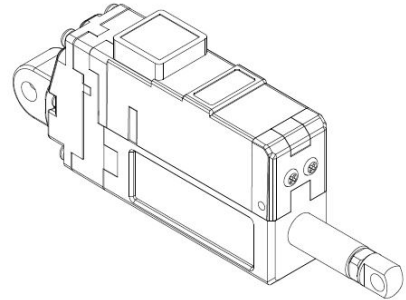
L12-12PT-3

L12-20PT-3 L12-40PT-3

L12-64PT-3 L12-100PT-3

Features / 주요 특징점

- Micro size / 마이크로 사이즈
- Precise position control/ 정밀위치제어
- Strong force comparing to the size / 체적대비 강한 힘
- Built-in Drive Circuitry / 드라이브 회로 내장
- TTL/PWM communication / TTL/PWM 통신 지원
- Parameter programmable on the Manager software / 매니저 소프트웨어를 통한 파라미터셋팅가능



Common Specifications / 공통 사양

- **Stroke / 스트로크** : 27mm (Extendable to 30mm on Manager software) (프로그램통해 30mm까지 확대 가능)
- **Force / 정격 힘** : 12N~100N according to gear ratio(See appendix.) / 기어비에 따라 12~100N(별첨 참조)
- **Micro controller** : 32 bit ARM Core, 4960 resolution (A/D converter)
- **Input Voltage / 입력전압** : 12.0V(Rated/정격), 7V~13V(Operating)
- **Motor Type / Watt**: coreless DC Motor / 26W
- **Recommended duty cycle / 권장 듀티사이클** : under 50% (50% 이하)
- **Current consumption / 소모전류** : 30mA(Idle), 380mA(Rated), 2.3A(Stall)
- **Position accuracy / 위치정밀도** : less than 0.05mm(50um)
- **Position sensor / 위치센서** : 10k Ω linearity potentiometer
- **Size / Weight / 크기, 무게** : 57.4(L)x29.9(W)x15(H)mm / 49~52g (to be varied according to gear ratio)
- **Communication/ 통신** : TTL/ PWM(Automatic signal recognition / 신호자동인식)
 - **TTL Level voltage** : 3.3~5.0V
 - **PWM Pulse range** : 900us(retracted/최대수축)~1500us(center)-2100us(extended/최대확장)
 - **TTL Communication range / TTL 통신 통달 거리** : Max. 4m
- **Operating Temperatures / 동작온도** : -10 $^{\circ}$ C ~ 60 $^{\circ}$ C
- **Ingress protection / 방수방진** : IP-54
- **Mechanical Backlash / 기구백래쉬** : 0.03mm(30um)
- **Audible Noise / 가청소음** : Approx. 50db at 1m
- **Gear ratio / 기어비** : 10:1(12PT,20PT,40PT) / 30:1(64PT) / 50:1(100PT)
- **Gear type / 기어타입**: Engineering plastic gears(12PT,20PT,40PT)
4metal & 2 Engineering plastic gears(64PT,100PT)
(Alluminum and stainless steel combination)
- **Rod type / Rod 타입** :Stainless steel rod / 스테인레스 스틸
- **Standard Accessory / 표준악세서리** : 1xHinge base, 1x Hinge, 1xHinge shaft, 1xRod end tip, 2x M3 NUT, 3 x M2.5x6 screws, 1x Molex wire harness (200mm)
- **Wire Harness** :Molex(50-37-5033) to Molex(50-37-5033)/ 200mm / 0.08x60(22AWG)

Data Sheet_L12-XXPT-3_R.1.2

Parameter	Symbol 심볼	Limit Values / 한계값			Unit 단위	Remarks 비고
		Min.	Typ.	Max.		

Voltages / 전압

Supply voltage/ 공급전압	V	7.0	12.0	13.0	V	
Logic input voltage / 로직인가전압	V	2.0	3.3	5.5	V	TTL Level

Currents / 전류

Maximum peak Current / 최대 피크 전류	I	2.1	2.2	2.3	A	StallCurrent
No Load Current / 무부하전류	I	180	200	220	mA	No Load
Full LoadCurrent / 정격 부하 전류	I	420	450	480	mA	12N,20N,40N
	I	280	300	320	mA	64N,100N
Idle Current	I	25	30	35	mA	

Temperatures / 온도

StorageTemp. / 보관온도	T	-20	-	70	℃	
Operating Temp. / 동작온도	T	-10	-	60	℃	

Strokes / 스트로크

MIN Position / 최소수축위치	L	-	3.8	-	mm	
MAX Position / 최대확장위치	L	-	30.8	-	mm	
Stroke length/ 스트로크	L	-	27.0	-	mm	

PWM (27mm stroke)

MIN Pulse (0mm)	sec	-	900	-	us	Period is 4ms over / 4ms이상 주기
Neutral Pulse (13.5mm)	sec	-	1440	-	us	
MAX Pulse (27mm)	sec	-	1980	-	us	

PWM (30mm stroke)

MIN Pulse (0mm)	sec	-	900	-	us	Period is 4ms over / 4ms이상 주기
Neutral Pulse (15mm)	sec	-	1500	-	us	
MAX Pulse (30mm)	sec	-	2100	-	us	

*Stroke to be extendable to 30mm by manager software and IR-USB01 PC USB Interface.

*매니저 소프트웨어와 IR-USB01 PC USB interface를 통해 30mm로 확장 가능

No Load Speed / 무부하 속도

Maximum Speed at 12.0V 최대 속도 at 12.0V	S	119	120.0	121	mm/s	L12-12PT-3
	S	79.5	80.0	80.5	mm/s	L12-20PT-3
	S	27.5	28.0	28.5	mm/s	L12-40PT-3
	S	10.0	10.5	11.0	mm/s	L12-64PT-3
	S	7.3	7.7	8.1	mm/s	L12-100PT-3

Force / 힘

Parameter	Symbol 심볼	Limit Values / 한계값			Unit 단위	Remarks 비고
		Min.	Typ.	Max.		

Rated Force / 정격 힘

Rated Force at 12.0V 정격 힘 at 12.0V	F	11.5	12.0	12.5	N	L12-12PT-3
		2.58	2.69	2.81	lbf	
		1.17	1.22	1.27	kgf	
	F	19.0	20.0	21.0	N	L12-20PT-3
		4.27	4.49	4.72	lbf	
		1.93	2.04	2.14	kgf	
	F	38.0	40.0	42.0	N	L12-40PT-3
		8.54	8.99	9.44	lbf	
		3.87	4.07	4.28	kgf	
	F	61.0	64.0	67.0	N	L12-64PT-3
		13.71	14.38	15.06	lbf	
		6.22	6.52	6.83	kgf	
	F	95.0	100.0	105.0	N	L12-100PT-3
		21.35	22.48	23.60	lbf	
		9.68	10.19	10.70	kgf	

* 1 kgf = 9.8N , 1lbf = 4.45N

Self Lock Force / 셀프-락 포스

	Fl	-	N/A	-	N	L12-12PT-3
	Fl	-	7.0	-	N	L12-20PT-3
	Fl	-	40.0	-	N	L12-40PT-3
	Fl	-	64.0	-	N	L12-64PT-3
	Fl	-	100.0	-	N	L12-100PT-3

- Self-lock force :The force which actuator maintains its position by mechanical friction without motor power.
- 셀프-락포스 :액츄에이터가 전원을 통한 모터의 힘 없이, 기구마찰력만으로 위치를 고수할 수 있는 힘

Z Axis Force / Z축 포스

	Fz	-	N/A	-	N	L12-12PT-3
	Fz	-	7.0	-	N	L12-20PT-3
	Fz	-	30.0	-	N	L12-40PT-3
	Fz	-	48.0	-	N	L12-64PT-3
	Fz	-	75.0	-	N	L12-100PT-3

- Z axis force :Actuator force when it is installed vertically.
- Z축 포스 : 수직 중력방향 설치 시 액츄에이터의 힘

Figure 1.

Figure1-1 . CURRENT VS FORCE (12 VDC)

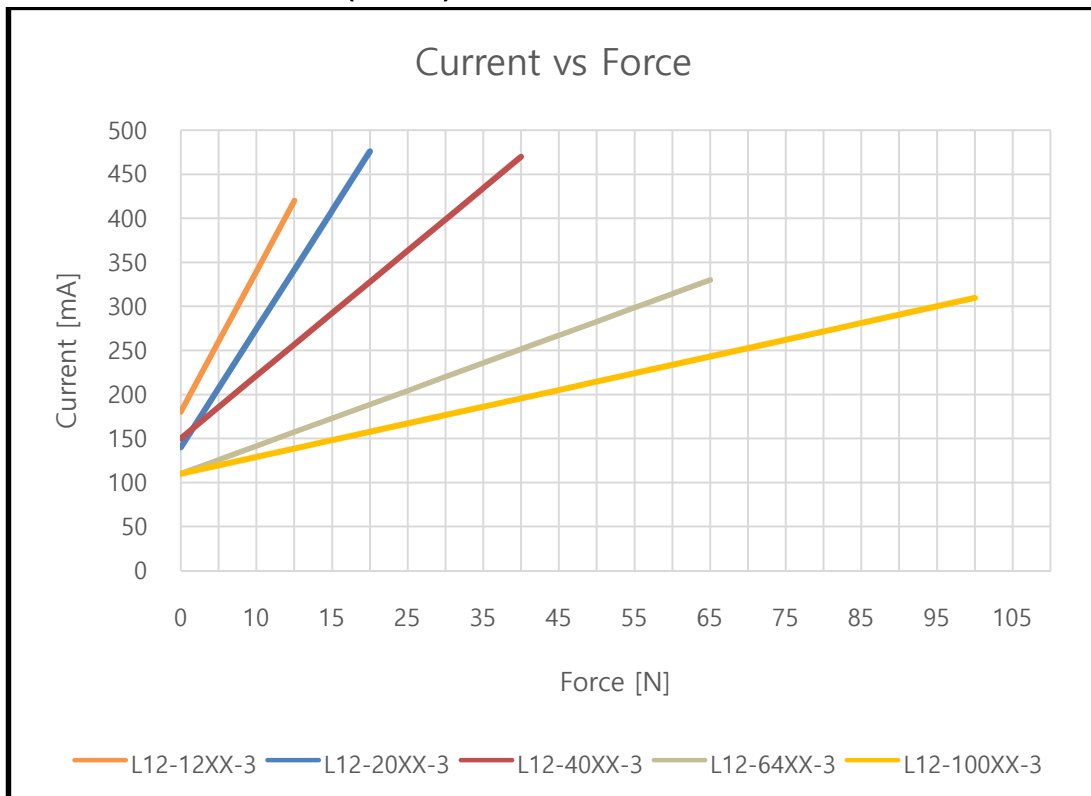


Figure1-2 . SPEED VS LOAD (12 VDC)

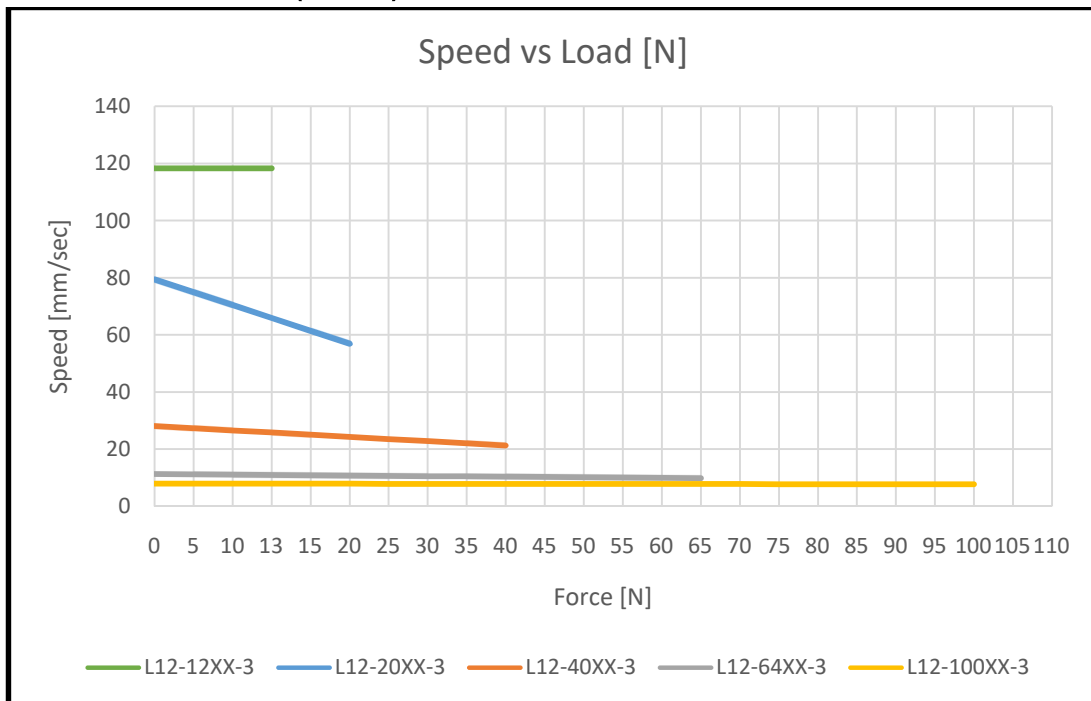


Figure 2.

Figure2-1 . Voltage /Speed[m/s] (12V / 27mm Products)

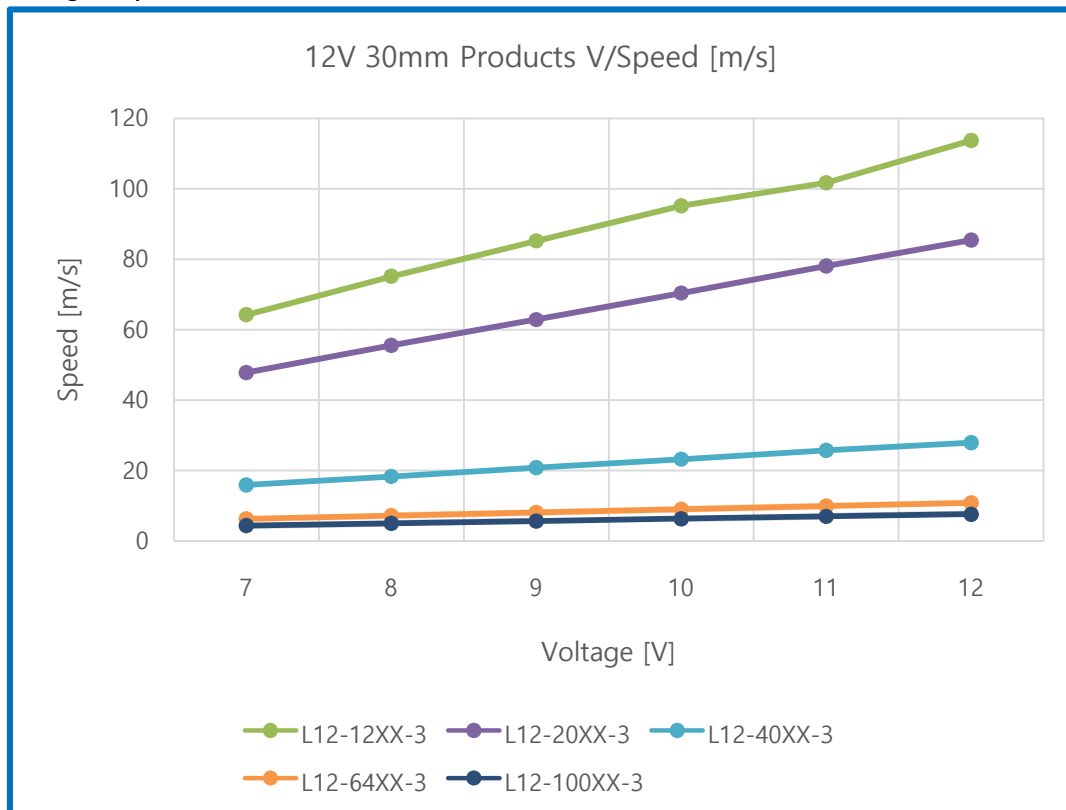
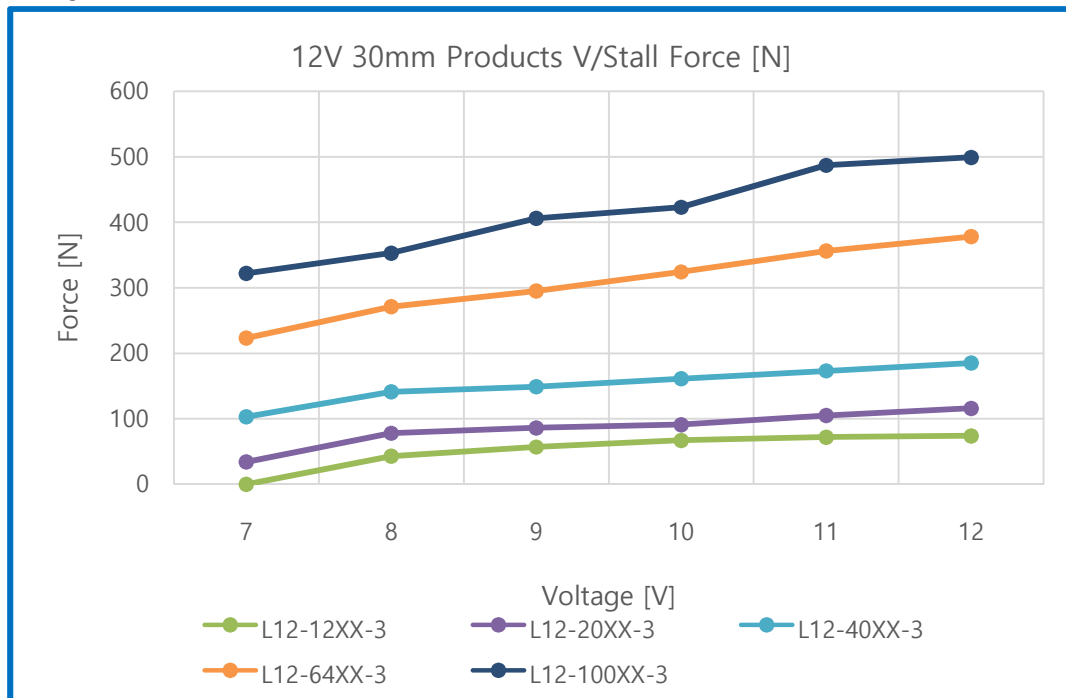


Figure2-2 . Voltage /Stall Force[N] (12V / 27mmProducts)

**CAUTION (주의)**

- Stall force는 참고용으로, 제품의 파손을 방지하기 위해 실제 application에서의 사용시에는 Rated force(Fig.2-3)에 맞추어 사용하여 주십시오.
- Stall force is for reference only. In order to prevent damage of the product, please use it according to the Rated force(Fig.2-3) when using in actual application.

Figure2-3 . Voltage /Rated Force [m/s] (12V 27mmProducts)

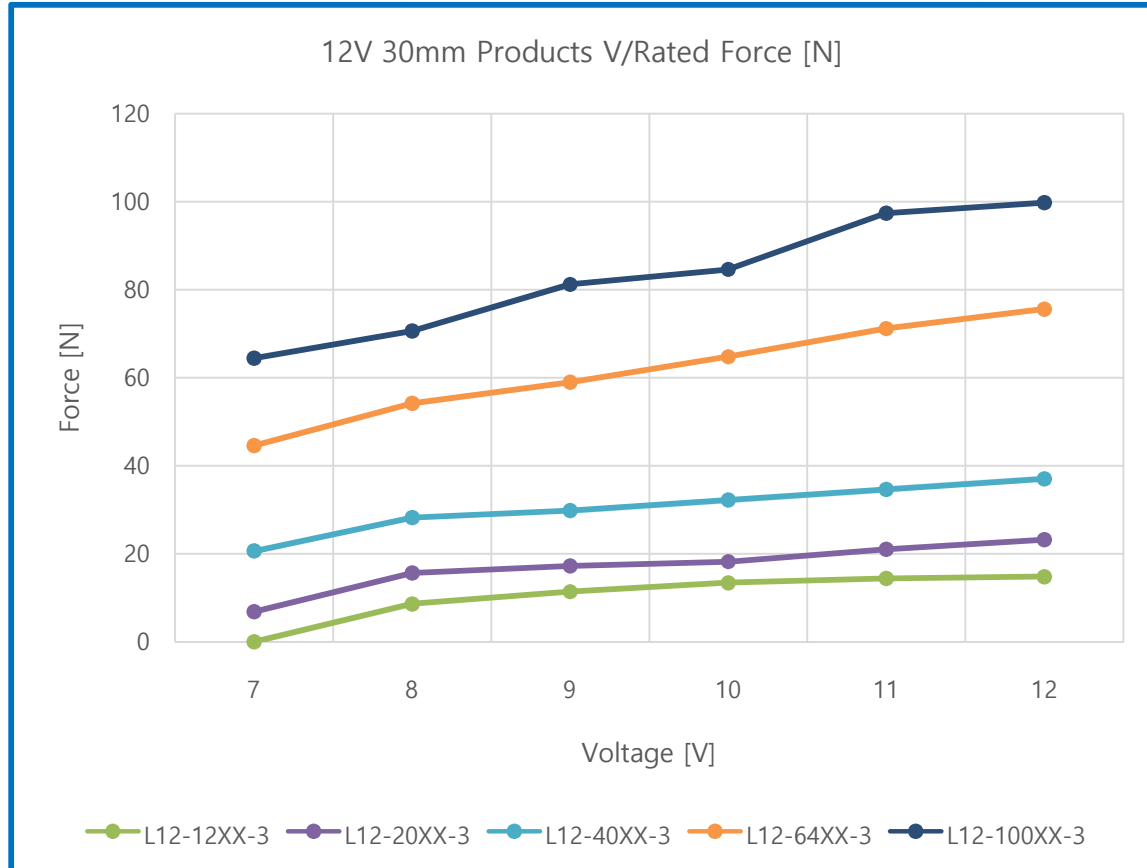


Figure 3.PIN Map

PIN NUMBER(COLOR)	PIN NAME	FUNCTION
1(WHITE)	DATA	통신
2(RED)	VCC	전원 +
3(BLACK)	GND	전원 -

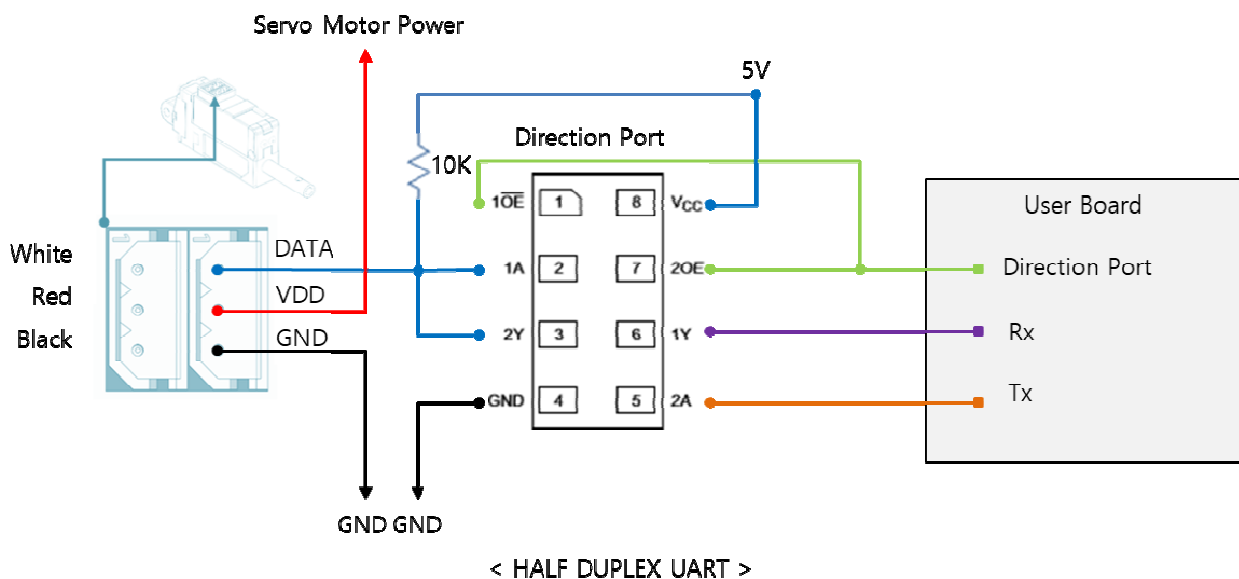
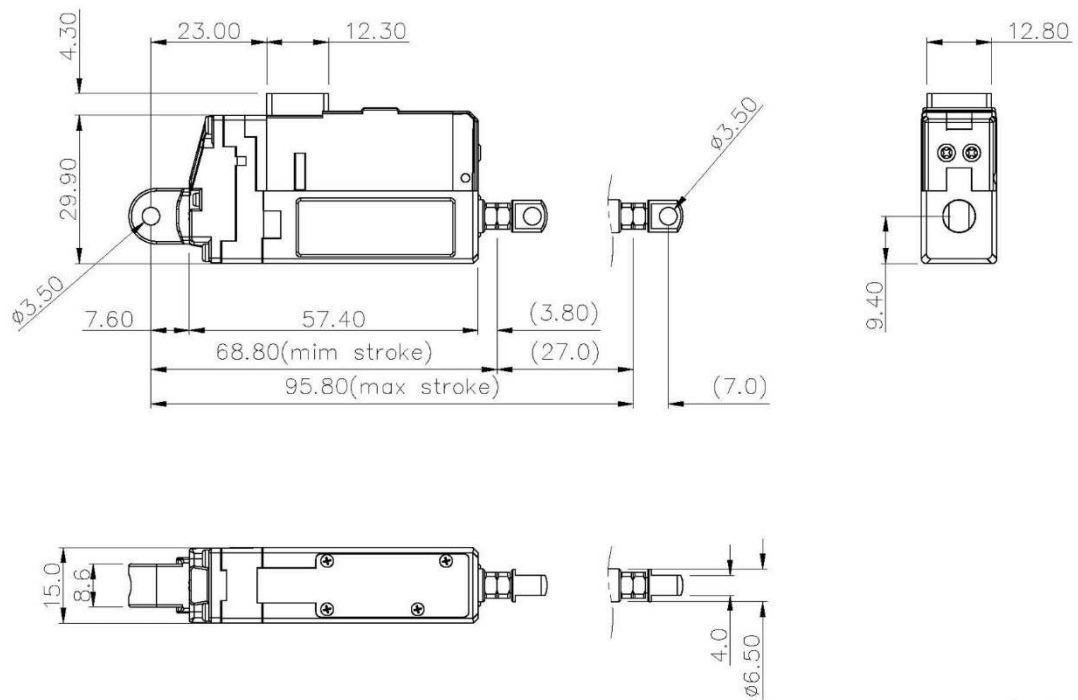
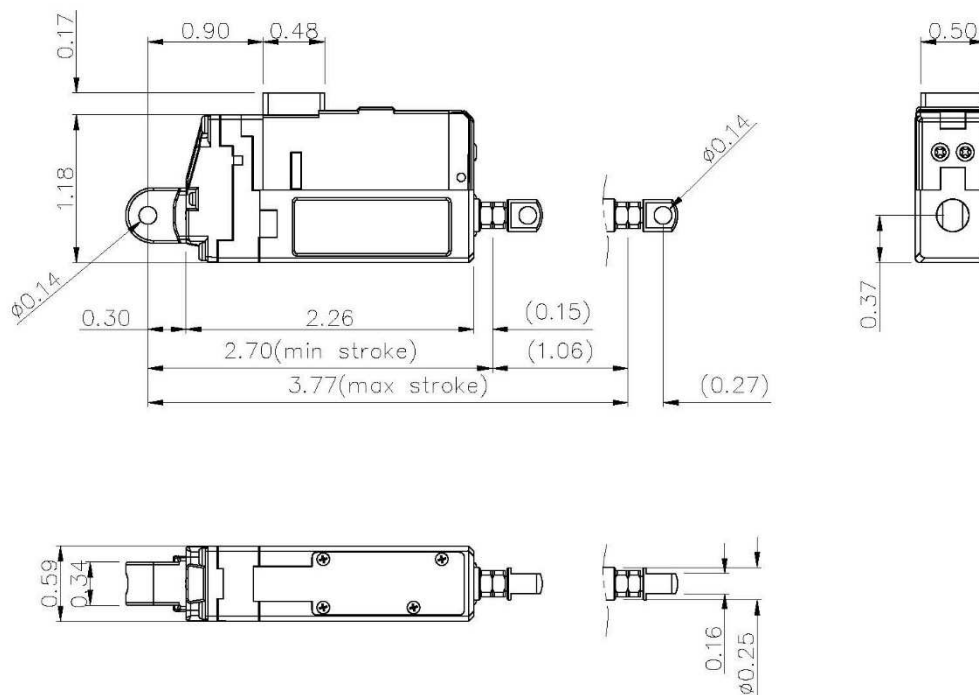


Figure 4. Dimension



unit : mm



unit : inch