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SERIES: ACZ11 | DESCRIPTION: MECHANICAL INCREMENTAL ENCODER

ELECTRICAL SPECIFICATIONS

parameter	conditions/description	min	typ	max	units
output waveform	square wave				
output signals	A, B phase				
current consumption	10 mA				
output phase difference	T1, T2, T3, T4 ≥ 3.5 ms @ 60 rpm (see output waveform)				
supply voltage	5 V dc max.				
output resolution	12, 15, 20, 30 ppr				
switch rating	12 V dc, 50 mA (ACZ11BRXE models only)				
insulation resistance	300 V dc, 100 MΩ				
withstand voltage	300 V ac				

MECHANICAL SPECIFICATIONS

parameter	conditions/description	min	typ	max	units
shaft load	axial			8	kgf
rotational torque	with detent click without detent click	60 30	140 80	220 100	gf•cm gf•cm
push switch operational force	(ACZ11BRXE models only)	300		900	gf•cm
push switch life	(ACZ11BRXE models only)			50,000	cycles
rotational life				30,000	cycles

ENVIRONMENTAL SPECIFICATIONS

parameter	conditions/description	min	typ	max	units
operating temperature		-10		65	°C
storage temperature		-40		75	°C
humidity		85			% RH
vibration	0.75 mm max. travel for 2 hours	10		55	Hz
hand soldering	for maximum 3 seconds			350	°C
wave soldering	for 5±1 seconds	255	260	265	°C

PART NUMBER KEY

ACZ11 X BR X E - XX XX X1 - XXX

Version:
"blank" = switch (momentary)
N = no switch

Bushing:
1 = M7 x 0.75 (H = 5)
2 = M7 x 0.75 (H = 7)
4 = smooth (H = 5)
5 = smooth (H = 7)

Shaft length:
15, 20, 25

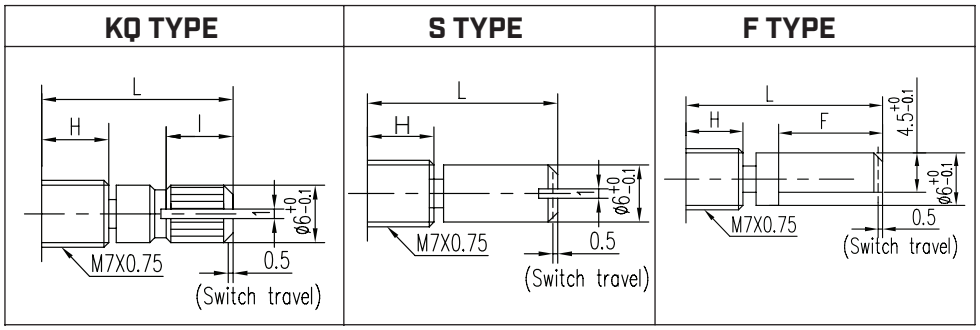
Shaft type:
KQ, S, F

Mounting orientation:
A = Horizontal
D = Vertical

Resolution (ppr):
12 = 12 ppr, no detent
12C = 12 ppr, 12 detent
15 = 15 ppr, no detent
30C15P = 15 ppr, 30 detent
20 = 20 ppr, no detent
20C = 20 ppr, 20 detent
30 = 30 ppr, no detent
30C = 30 ppr, 30 detent

Replacement Hardware:
M7x0.75 Nut: 071-0068R
Washer: 071-0069R

SHAFT OPTIONS (VERSIONS WITH SWITCH)



H=5

	15KQ	20KQ	25KQ
L	15	20	25
I	6	10	12

H=5

	15S	20S	25S
L	15	20	25

H=5

	15F	20F	25F
L	15	20	25
F	8	10	12

H=7

	15KQ	20KQ	25KQ
L	15	20	25
I	5	8.5	10

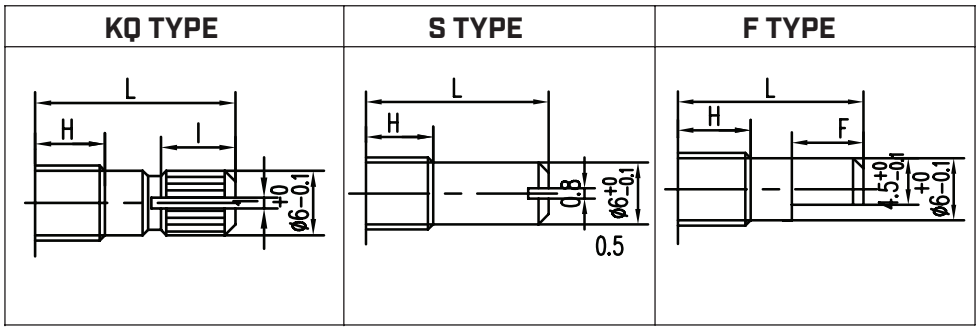
H=7

	15S	20S	25S
L	15	20	25

H=7

	15F	20F	25F
L	15	20	25
F	8	10	12

SHAFT OPTIONS (VERSIONS WITHOUT SWITCH)



H=5

	15KQ	20KQ	25KQ
L	15	20	25
I	6	10	12

H=5

	15S	20S	25S
L	15	20	25

H=5

	15F	20F	25F
L	15	20	25
F	8	10	12

H=7

	15KQ	20KQ	25KQ
L	15	20	25
I	5	8.5	10

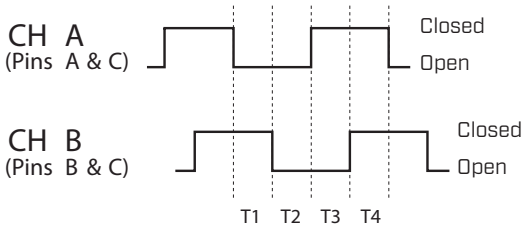
H=7

	15S	20S	25S
L	15	20	25

H=7

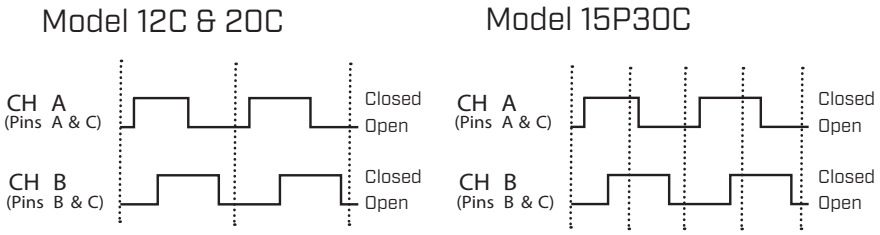
	15F	20F	25F
L	15	20	25
F	8	10	12

OUTPUT WAVEFORM



CW direction (@ 60 rpm)

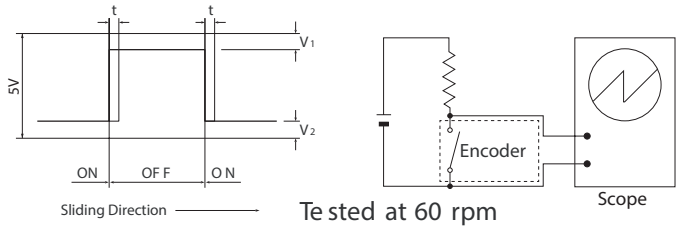
DETENT POSITIONS



CW direction ⟶ CW direction ⟶

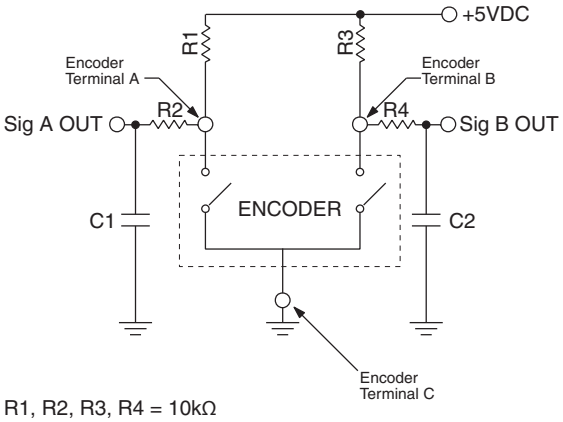
SLIDING NOISE

t = Masking time to avoid chatter (5mS) $V_1 = V_2 = 1V$ max.



Tested at 60 rpm

SUGGESTED FILTER

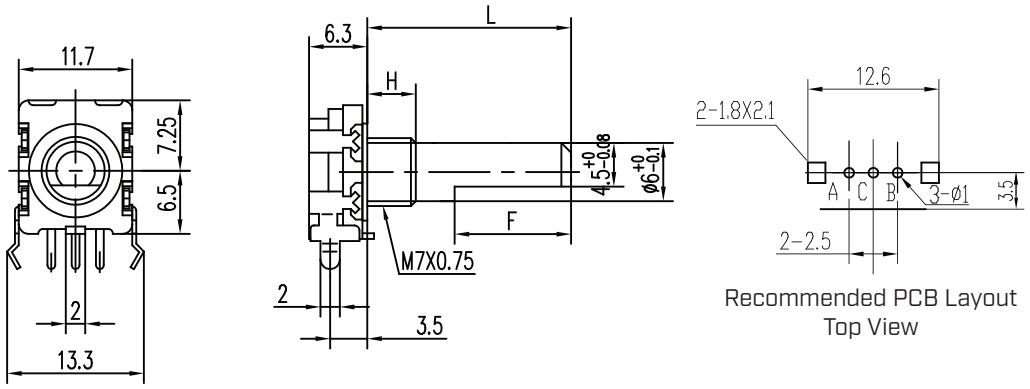


R1, R2, R3, R4 = 10kΩ
C1, C2 = 0.01µF

MECHANICAL DRAWING (HORIZONTAL)

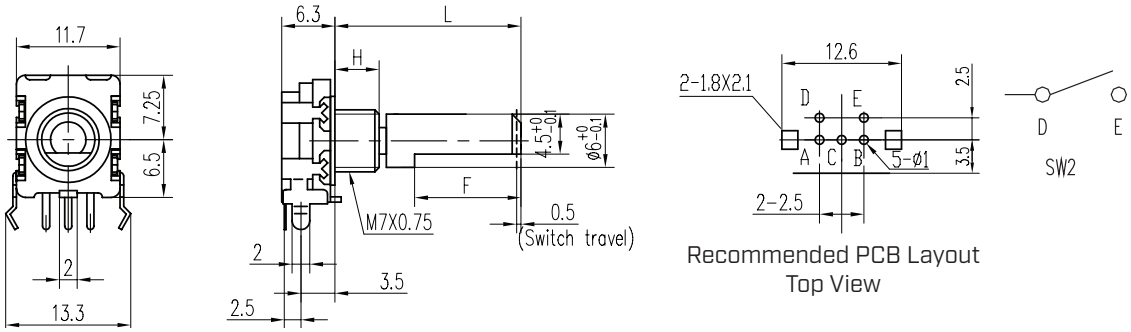
units: mm
tolerance:
X≤10: ±0.3 mm
10<X≤30: ±0.5 mm
Unless otherwise noted

ACZ11NBRXE



Recommended PCB Layout
Top View

ACZ11BRXE

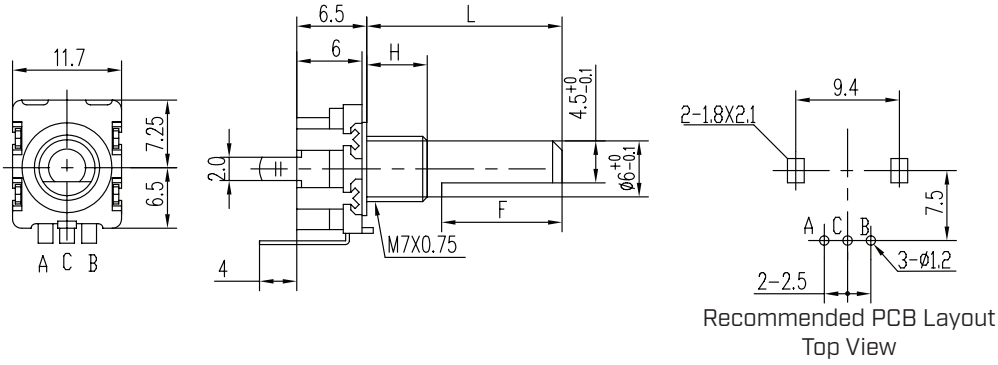


Recommended PCB Layout
Top View

MECHANICAL DRAWING (VERTICAL)

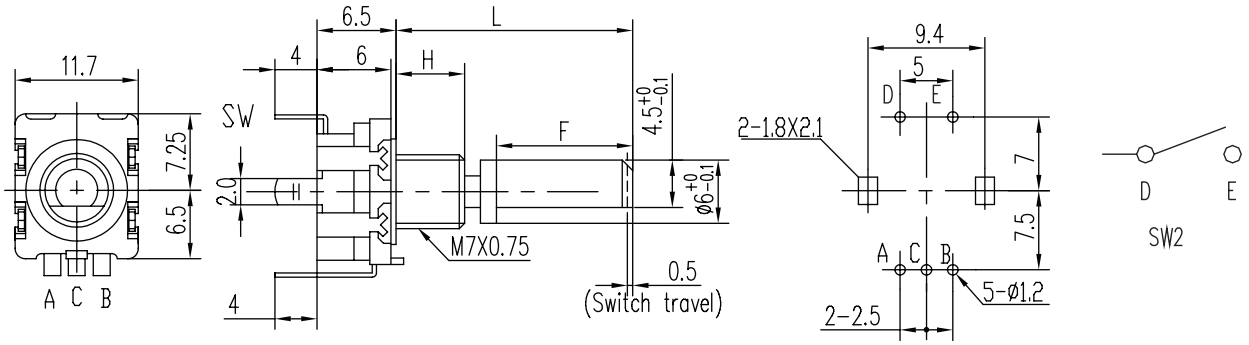
units: mm
tolerance:
X≤10: ±0.3 mm
10<X≤30: ±0.5 mm
Unless otherwise noted

ACZ11NBRXE



Recommended PCB Layout
Top View

ACZ11BRXE



Recommended PCB Layout
Top View

REVISION HISTORY

rev.	description	date
1.0	initial release	10/30/2009
1.01	brand update	10/04/2019
1.02	updated datasheet	06/15/2020
1.03	updated drawings; logo, datasheet style update	09/08/2022
1.04	CUI Devices rebranded to Same Sky	09/12/2024
1.05	added soldering details	04/04/2025
1.06	updated shaft option table	05/08/2025
1.07	updated shaft tolerance details	03/23/2026

The revision history provided is for informational purposes only and is believed to be accurate.

Same Sky offers a one (1) year limited warranty. Complete warranty information is listed on our website.

Same Sky reserves the right to make changes to the product at any time without notice. Information provided by Same Sky is believed to be accurate and reliable. However, no responsibility is assumed by Same Sky for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

Same Sky products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.