

Rotary Cam Switch

9003K2

Catalog
9003CT1301R06/16
2016
Class 9003



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Product Overview

Features

The Class 9003K2 rotary cam switch is a versatile means of providing inexpensive logic control. The Type K2 cam switch is available with:

- Up to 12 switching positions
- Up to 20 contacts
- Attractive operator/handle appearance
- Standard or custom configured sequences
- Acceptance in countries worldwide

Components

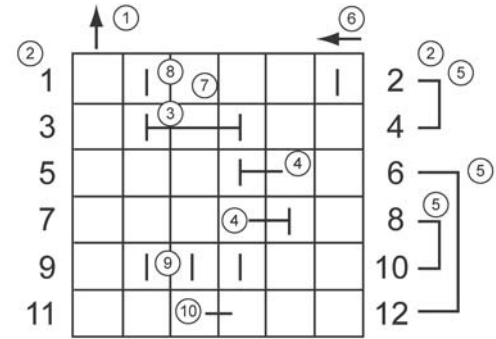
A complete rotary cam switch includes the following components.

- **Contact Block Assembly:** There are two ways of ordering a 9003K2 rotary cam switch contact block assembly.
 - If the desired contact sequence can be found on pages 3–5, order the catalog number of the device.
 - If the contact sequence cannot be found on pages 3–5, use the keysheet on page 9. Indicate the exact contact configuration desired. Devices will be assembled at the factory according to this keysheet.
- **Operator/handle:** See page 6. The operator/handle selection depends on the application and size of the rotary cam switch.
- **Legend Plate** (optional): Many operators/handles come standard with a blank legend plate. If not included—or, if additional legend plates are needed—see page 7.
- **Accessories** (optional): See page 7.

Contact Sequence/Wiring

Refer to the diagrams on pages 3–5, as necessary.

- ① The vertical arrow indicates contact status at the 0° (up) handle position.
- ② Terminal identification: terminals 1 and 2 are one contact.
- ③ Contact 3–4 is closed between positions 2 and 4. The  symbol indicates that the contact does not open while switching from one position to another.
- ④ Contacts 5–6 and 7–8 overlap between positions 4 and 5.
- ⑤ Jumpers are factory-installed between terminals 2 and 4; 6 and 12; and 8 and 10.
- ⑥ The horizontal arrow indicates spring-return-to-previous-position.
- ⑦ Contact 1–2 is open in position 3.
- ⑧ Contact 1–2 is closed in position 2.
- ⑨ A vertical bar (|) in adjacent boxes indicates that the contact might open when switching between adjacent positions.
- ⑩ Contact 11–12 closes momentarily when switching from position 3 to 4. This contact is not closed at position 3 or at position 4.



NOTE: This illustration is for the example only.

Contact Ratings

The following contact rating tables are to be used when properly sizing a 9003K2 rotary cam switch to a particular application. Table 1 reflects the ratings to UL specifications. The UL file is E164864. The 9003K2 is UL Listed in accordance with guide NLRV. Table 2 contains the contact ratings in accordance with German specification VDE 0660. The CSA file is LR 44087, Class 3211 05.

Table 1: UL Ratings

Contact Block Assembly	Maximum Voltage	General Purpose	Horsepower, 1 Phase—2 pole, 60 Hz					Horsepower, 3 Phase—3 pole, 60 Hz				
			110–120 V	200–208 V	220–240 V	440–480 V	550–600 V	110–120 V	200–208 V	220–240 V	440–480 V	550–600 V
K2	300 V	12 A	0.5 hp	1 hp	1 hp	—	—	1.5 hp	2 hp	3 hp	—	—



Table 2: Electrical Ratings (VDE 0660)

Contact Block	Shaft Dimensions	Rated Current as Load Break Switch (I _{lb})	Continuous Current (I _{th2})		Utilization Category AC1								Utilization Category AC2 and AC3								Utilization Category AC11			Operational Voltages				
					In Free Air (I _e)	Power Ratings						Rated Operational Current I _e				Power Ratings				Rated Operational Current I _e			Rated Insulation Voltage	Main Switch	Emergency Stop Switch	Emergency Main Switch		
						3 Phase 3 Pole				1 Phase 2 Pole		3 Phase 3 Pole				1 Phase 2 Pole		For Y-Delta Starters		1 Phase								
						220 V	415 V	500 V	660 V	240 V	415 V	220 V	415 V	500 V	660 V	240 V	415 V	220 V	415 V	500 V	660 V	240 V					415 V	500 V
	mm [1]	A	A	A	A	kW	kW	kW	kW	kW	kW	$\frac{kW}{A}$	$\frac{kW}{A}$	$\frac{kW}{A}$	$\frac{kW}{A}$	kW	kW	kW	kW	kW	kW	A	A	A	V	V	V	V
K2	6	20	20	16	16	6	10.5	14	14	4.5	7.5	$\frac{2.2}{8.5}$	$\frac{4}{8.5}$	$\frac{4}{6.5}$	$\frac{4}{5}$	1.3	2.2	2.5	4.5	4.5	4.5	4	3	2	660	500	660	500

[1] All dimensions are in millimeters. To convert to inches, divide by 25.4.

Contact Block Assembly

A complete rotary cam switch consists of the following: a contact block assembly (see Table 3); an operator/handle (see Tables 6–9); a legend (see Table 12); and any required accessories (see Table 11).

Table 3: Contact Block Assembly: 2–4 Contacts

2 and 3 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type [1]
	45°	K2B001S
	45°	K2B001UA
	45°	K2B002A
	45°	K2B002GA
	45°	K2B002NA
	45°	K2B002QA
	45°	K2B003T
	45°	K2B004T
	45°	K2B006T
	45°	K2C002LA
	45°	K2C003A
	45°	K2C003GA
	45°	K2C003NA
	45°	K2C003QA
	45°	K2C007T

[1] When ordering, add prefix 9003 to the Type number.

4 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type [1]
	45°	K2D002S
	45°	K2D002UA
	45°	K2D003LA
	45°	K2D004A
	45°	K2D004GA
	45°	K2D004NA
	45°	K2D004QA
	30°	K2D005T
	30°	K2D012GA
	45°	K2D012NA
	45°	K2D012QA

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Contact Block Assembly: 5–7 Contacts

A complete rotary cam switch consists of the following: a contact block assembly (see Table 4); an operator/handle (see Tables 6–9); a legend (see Table 12); and any required accessories (see Table 11).

Table 4: Contact Block Assembly: 5–7 Contacts

5 and 6 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type ^[1]
	45°	K2E003WA
	45°	K2E005A
	45°	K2E005NA
	45°	K2E005QA
	45°	K2E005UA
	45°	K2F003SA
	45°	K2F006A
	45°	K2F003UA
	45°	K2F006NA
	45°	K2F006QA

^[1] When ordering, add prefix 9003 to the Type number.

6 and 7 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type ^[1]
	45°	K2F013GA
	45°	K2F013NA
	45°	K2F013QA
	60°	K2F013UA
	45°	K2F022GA
	45°	K2F022NA
	45°	K2F022QA
	45°	K2G007NA
	45°	K2G007QA
	45°	K2G007A

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Contact Block Assembly: 8–10 Contacts

A complete rotary cam switch consists of the following: a contact block assembly (see Table 5); an operator/handle (see Tables 6–9); a legend (see Table 12); and any required accessories (see Table 11).

Table 5: Contact Block Assembly: 8–10 Contacts

8 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type [1]
	45°	K2H004S
	45°	K2H004UA
	45°	K2H008NA
	30°	K2H008QA
	45°	K2H014GA
	45°	K2H014NA
	45°	K2H014QA
	45°	K2H032NA
	45°	K2H032QA

9 and 10 Contacts

Contact Sequence Wiring Diagram	Switching Angle	Panel Mounting Type [1]
	30°	K2I009NA
	30°	K2I009QA
	45°	K2I023GA
	45°	K2I023NA
	45°	K2I023QA
	45°	K2K005SA

[1] When ordering, add prefix 9003 to the Type number.

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Operators and Handles

Operators and Handles

Table 6: Selection of Operators and Handles

For single-hole mounting of the 9003K2 rotary cam switches in a 22 mm diameter hole. Protection category is IP65.

Operator	Description	Style	Black Bezel / Black Knob	Chrome Bezel / Black Knob	Yellow Bezel / Red Knob
	Bezel—Small round similar to 9001D3 and D4 operators Does not include blank legend plate	Knob	KAA1H	KBA1H	—
		Key ^[1]	KAA1S	—	—
	Bezel—Large round Does not include blank legend plate	Knob	KAA2H	—	—
		Key ^[1]	—	—	—
	Chrome XB2B Style Standard Handle Requires KZ127 Adapter—Page 7	Knob	—	KAXZ1M12	—
	Chrome XB2B Style Extended Handle Requires KZ127 Adapter—Page 7	Knob	—	KAXZ1C12	—
	Chrome XB2B Style Key Handle (Ronis 455) Requires KZ127 Adapter—Page 7	30° Key	—	KAXZ1S131	—
		45° Key		KAXZ1S141	
		60° Key		KAXZ1S161	
		90° Key		KAXZ1S191	
	Bezel—45 x 45 mm	Knob	9003KAC1B	KBC1H	KCC1LZ
	Includes blank legend plate	Key ^[1]	KAC1S	KBC1S	—
	Bezel—60 x 60 mm	Knob	KAD1H	9003KBD1C699	KDD1PZ
	Includes blank legend plate	Key ^[1]	—	9003KBD1S	—

^[1] Add the key withdrawal code to the Type number. See Table 10.

Table 7: 9003K2 Rotary Cam Switches with 90° switching angle and only two positions

Operator	Description	Black Bezel / Black Knob	Yellow Bezel / Red Knob
	For Size K2 Bezel: 60 x 60 mm Mounting: 22 mm (7/8 in.) Uses standard marking 9-30 (see page 11) No other markings available	—	KCD1PZ

Table 8: 4-hole mounting of the 9003K2 rotary cam switch

Suitable for panel mounting or base mounting of contact block assemblies. Use with the KZ141 mounting plate (see Table on 11 page 7). Protection category is IP40. For gaskets, see Table on 11 page 7.

Operator	Description (includes blank bezel legend)	Black Legend / Black Knob	Chrome Legend / Black Knob	Yellow Legend / Red Knob
	For size K2 Bezel 45 x 45 mm	9003KAE1B	9003KBE1B	KCE1LZ
	For size K2 Bezel 60 x 60 mm	9003KAF1C	9003KBF1C	9003KCF1M

Table 9: 4-hole mounting of 9003K2 rotary cam switches with 90° switching angle and only two positions

Suitable for panel mounting or base mounting of contact block assemblies. Use with the KZ141 mounting plate (see Table on 11 page 7).

Operator	Description	Black Operator / Black Knob	Yellow Operator / Red Knob
	For size K2 Bezel 60 x 60 mm Uses standard marking 9-30 (see page 11) No other markings available.	KAF1PZ	KCF1PZ

Table 10: Key Withdrawal Codes

Angle	Code
30°	Not available
45°	16
60°	1
90°	6

When ordering a key operator for a contact block assembly, specify the switching angle of the contact block assembly. From Table 10, choose the appropriate suffix for the desired switching angle, and add this suffix to the end of the operator/handle's Type number.

Example: 45° switching for a KAC1S operator/handle is KAC1S16.

NOTE: The key is removable in all positions. The replacement key is ZBD8D1.

NOTE: All dimensions are in millimeters. To convert to inches, divide by 25.4.

Accessories, Legends, and Dimensions

Table 11: Accessories

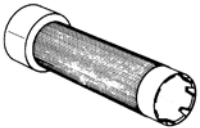
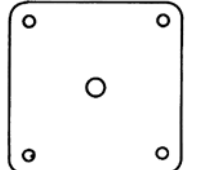
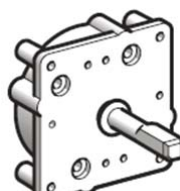
Operator	Description	Type
	Shroud 4 contacts	KZ35
	Ring Nut Wrench — for use with D1 and D2 operators/handles listed on page 6.	Z01
	Gasket for panel mounting contact block assemblies— used with the operators/handles listed on page 6 to provide IP65 protection.	45 x 45 mm KZ65
		60 x 60 mm KZ66
	Replacement ring nut for all K style operators/handles listed on page 6.	KZ30
	Mounting adapter for use with a chrome KAXZ style handle	KZ127
	Multi-mounting front mounting plate for use with the operators from Tables 8 and 9 on page 6.	KZ141

Figure 1: Panel Mount

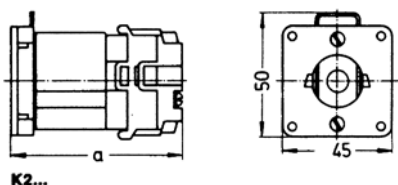


Table 12: Legends

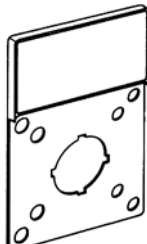
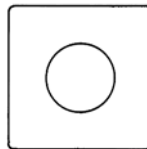
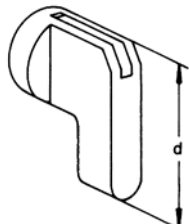
	Additional legend See page 6 to determine the size of the operator.		Type
	Holder with blank legend		KZ13
45 x 45 mm bezel	Blank legend only		KZ76
	Empty holder only		KZ14
	Holder with blank legend		KZ15
60 x 60 mm bezel	Blank legend only		KZ77
	Empty holder only		—
	Holder with blank legend		KZ15
	Bezel insert for blank legend plate		Type
	Size	Color	Type
	45 x 45 mm bezel	Silver	KZ18

Table 13: Replacement Knobs

For K2 Operators	Handle Code ^[1]	Color	Length (d)	Type
	A	Black	29 mm	KZ26
	B	Black	34 mm	KZ27
	C	Black	42 mm	KZ28
	D	Black	57 mm	KZ29

^[1] The Handle Code is the last letter of the operator/handle Type number.

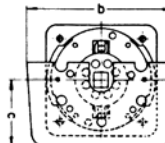
Table 14: Contact Block Assembly Depth

Number of Contacts	K2 Length Dimension a ^[1] (mm)	Number of Contacts	K2 Length Dimension a ^[1] (mm)
1–2	52.5	11–12	102.5
3–4	62.5	13–14	112.5
5–6	72.5	15–16	122.5
7–8	82.5	17–18	132.5
9–10	92.5	19–20	142.5

^[1] Dimension a for the 9003K2 is for 4-hole mounting operator/handles.
Add 18 mm to dimension a when using single-hole mounting operator/handles.

Figure 2: With Shrouds

mm	K2
b	48
c	26



Rotary Cam Switch, 9003K2

Key Sheet / Order Form

Key Sheet / Order Form

Using the Key Sheet

If the desired contact sequence cannot be found on pages 3–5, fill out the key sheet on page 9 by following the instructions below. An example of a completed key sheet is on page 10.

1. Check the box for K2 (20 A).
 2. Fill out the product quantity in the box provided.
 3. Verify front mounting by checking the box labeled Front Mounting.
 4. If ordering a base/contact block only, check the box for 22 mm plastic or 22 mm metal mounting. Then fill out the following (see Steps 8–9):
 - ③ Switching angle (positions)
 - ④ Contact scheme and jumpers (pre-wired)
 5. If ordering a complete switch (base/contact block, head, legend), check the box labeled Complete Switch. Then fill out the following (see Steps 6–9):
 - ① Operating head reference
 - ② Legend reference
 - ③ Switching angle (positions)
 - ④ Contact scheme and jumpers (pre-wired)
 6. Operating head reference ①: specify the catalog number of the operating head
 7. Legend reference ②: specify the catalog number of the legend
 8. Switching angle (positions) ③ and special legend marking:
 - a. Choose the switching angle increments:
 - 30° or 60°
 - 45° or 90°
 - b. Fill in the legend markings desired at the positions indicated. Zero degrees is always straight up.
- NOTE:** The rotation of the operator will stop clockwise at the top (0° position), unless you check the box labeled Full Rotation through 360°.
9. Contact scheme and jumpers (pre-wired) ④ :
 - a. For pre-wired jumpers, draw a horizontal line between the terminals to be jumpered, as shown in the example on page 10.
 - b. Refer to the Legend at the bottom of page 9 for contact sequences (for example, X indicates contact closure). See page 10 for examples of how to fill in this portion of the key sheet.

Rotary Cam Switch, 9003K2

Key Sheet / Order Form

Figure 3: 9003K2 Cam Switch Order Form

[illegible]

Rotary Cam Switch, 9003K2

Key Sheet / Order Form

Figure 4: Example—9003K2 Cam Switch Order Form

Order No. _____ Date : _____ Agency: _____ Branch: _____ Customer: _____ Address: _____ Delivery instructions: _____ Product reference: Type : K	9003K2 (20 A): ☒ <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Product quantity: 1</td> <td style="width: 50%;">Front mounting ☒</td> </tr> </table> Base/contact block only (no operating head): $\varnothing$ 22 plastic: ☐ $\varnothing$ 22 metal: ☐ Complete: 3 4	Product quantity: 1	Front mounting ☒																																																																																																																																																																																																
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Switching angle (positions) 30° or 60° 45° or 90° Full rotation through 360°: ☐	Complete switch (base/contact block, head, legend) ☒ Complete: 1 2 3 4 For 22 mm plastic mounting: ① Operating head reference: 9003KAC1B ② Legend reference: 9003KZ18 or for mounting with metal base: ① Operating head reference: KAX Z ② Legend reference: XBCY Special legend marking: As per diagram on left: As per form: Accessories / comments: KZ 36																																																																																																																																																																																																		
④ Contact scheme and jumpers (pre-wired): <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td colspan="2"></td> <td colspan="2">1</td> <td colspan="2">3</td> <td colspan="2">5</td> <td colspan="2">7</td> <td colspan="2">9</td> <td colspan="2">11</td> <td colspan="2">13</td> <td colspan="2">15</td> <td colspan="2">17</td> <td colspan="2">19</td> <td colspan="2">21</td> <td colspan="2">23</td> <td colspan="2">25</td> <td colspan="2">27</td> <td colspan="2">29</td> <td colspan="2">31</td> <td colspan="2">33</td> <td colspan="2">35</td> <td colspan="2">37</td> <td colspan="2">39</td> </tr> <tr> <td colspan="2"></td> <td colspan="2">2</td> <td colspan="2">4</td> <td colspan="2">6</td> <td colspan="2">8</td> <td colspan="2">10</td> <td colspan="2">12</td> <td colspan="2">14</td> <td colspan="2">16</td> <td colspan="2">18</td> <td colspan="2">20</td> <td colspan="2">22</td> <td colspan="2">24</td> <td colspan="2">26</td> <td colspan="2">28</td> <td colspan="2">30</td> <td colspan="2">32</td> <td colspan="2">34</td> <td colspan="2">36</td> <td colspan="2">38</td> <td colspan="2">40</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>* x</th> <th></th> <th>1</th><th>3</th><th>5</th><th>7</th><th>9</th><th>11</th><th>13</th><th>15</th><th>17</th><th>19</th><th>21</th><th>23</th><th>25</th><th>27</th><th>29</th><th>31</th><th>33</th><th>35</th><th>37</th><th>39</th> </tr> <tr> <th>A</th> <td></td> <td></td><td>x</td><td></td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <th>0</th> <td>0°</td> <td></td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <th>1</th> <td>30°</td> <td></td><td></td><td></td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <th>2</th> <td>60°</td> <td>x</td><td></td><td></td><td>x</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>				1		3		5		7		9		11		13		15		17		19		21		23		25		27		29		31		33		35		37		39				2		4		6		8		10		12		14		16		18		20		22		24		26		28		30		32		34		36		38		40		* x		1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	A			x		x																	0	0°		x																			1	30°				x																	2	60°	x			x																
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(x) Key withdrawal position for key operators; by default, withdrawal in all positions. Conditions for provision of spring return function: R, Spring return to 30° from 0° position or to last position after a 90° angle (for maximum of 3 contacts simultaneously) <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15%;"> ☒ Contact closed in 1 position. </td> <td style="width: 15%;"> ☒ Contact closed with break maintained between the 2 positions (for angle $\geq 45^\circ$) </td> <td style="width: 15%;"> ☒ Contact closed and maintained between several successive positions </td> <td style="width: 15%;"> ☒ Contact closed and maintained between two positions </td> <td style="width: 15%;"> ☒ Overlap of two contacts between two positions </td> <td style="width: 15%;"> ☒ Contact overlapping on previous and next positions </td> </tr> </table>		☒ Contact closed in 1 position.	☒ Contact closed with break maintained between the 2 positions (for angle $\geq 45^\circ$)	☒ Contact closed and maintained between several successive positions	☒ Contact closed and maintained between two positions	☒ Overlap of two contacts between two positions	☒ Contact overlapping on previous and next positions																																																																																																																																																																																												
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Legends—Standard and Special Markings

Standard Markings

The legend markings in Table 17 are standard for the 45 x 45 mm and 60 x 60 mm bezel operators. To order one of these size bezel operators with a standard marking, add the code of the desired marking from Table 17 as a suffix to the operator type number. Example: KBC1H4-3.

Special Markings

All other legend engraving is considered special. To order, clearly indicate the position of the desired marking. See Tables 15 and 16 for the maximum characters allowed on a specially engraved legend.

Table 15: Rectangular Legends

Type	Legend Size	For Operator Size	Maximum Characters Per Position
KZ13 KZ76	42 x 13 mm	45 x 45 mm	12
KZ15 KZ77	57 x 27 mm	60 x 60 mm	17

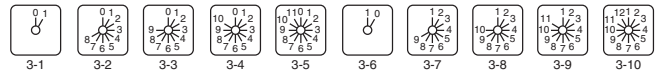
Table 16: Square Legends

Type			Size (mm)		Maximum Characters Per Position
Black	Silver	Yellow	Bezel	Legend	
9003KZ17 9003KAC1B 9003KAE1B KAC1S	9003KZ18 KBC1H 9003KBE1B	KBC1S KCC1LZ KCE1LZ	45 x 45	42 x 42	3
9003KZ20 KAD1H 9003KAF1C	9003KZ21 9003KBD1C699 9003KBF1C	9003KBD1S KDD1PZ 9003KCF1M	60 x 60	57 x 57	5
KZ23	—	—	90 x 90	87 x 87	6

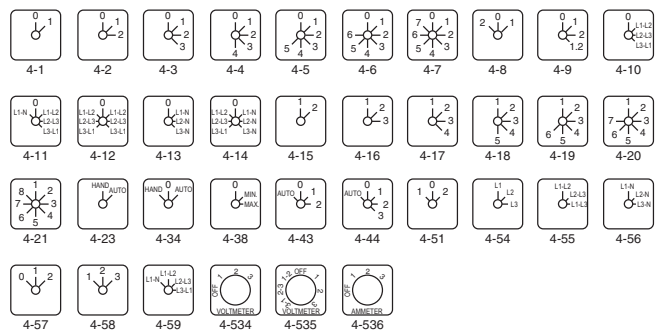
NOTE: Dimensions are in mm. To convert to inches, divide by 25.4.

Table 17: Standard Markings

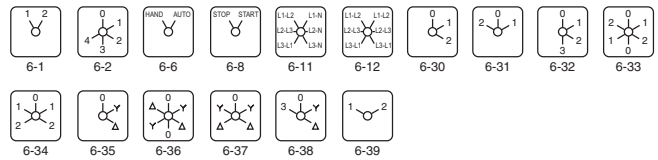
30° Marking



45° Marking



60° Marking



90° Marking

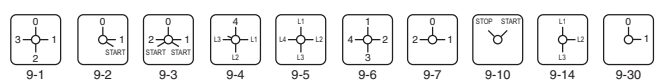
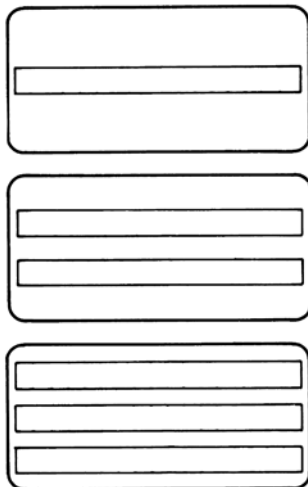
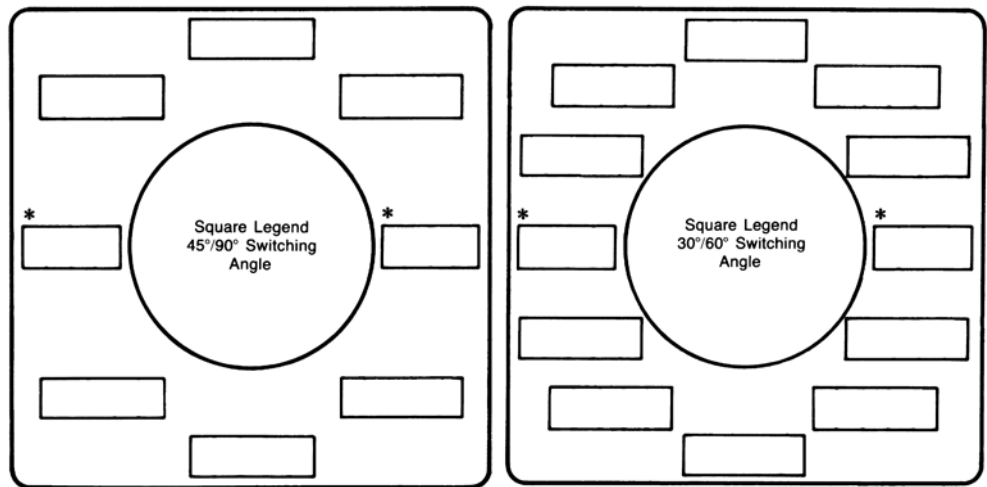


Figure 5: Positions of engravable locations on blank legends

Rectangular Legends



Square Legends



* Maximum number of characters for these positions is one less than the listed maximum in Tables 15 and 16.

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