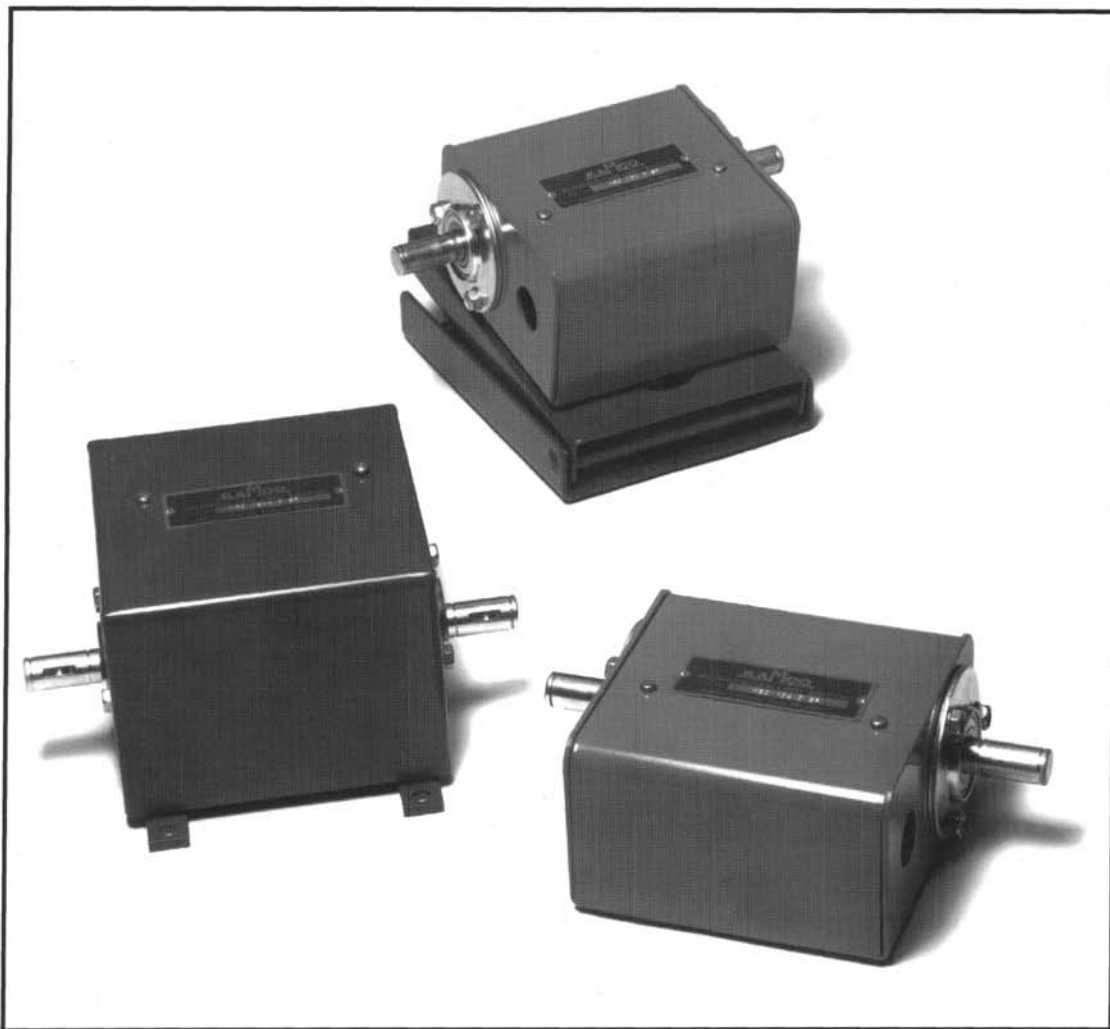




ROTATING CAM LIMIT SWITCHES

"The Cost Effective Solution for Simple, Reliable Control of Rotary Motion"



**Kamco, Inc.
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K80 ROTATING CAM LIMIT SWITCHES

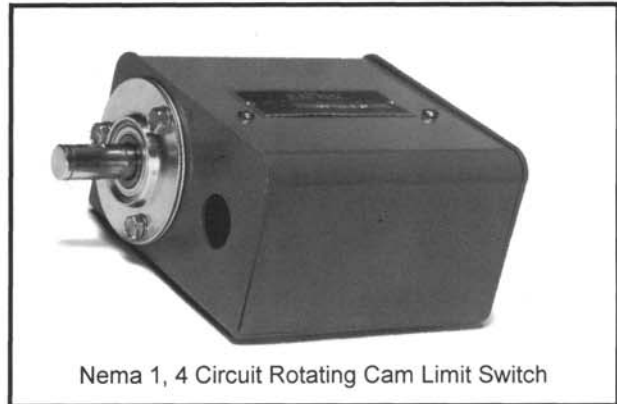
FEATURES

Precision Setting of Cam
Angle/Duration

Standard Cam Settings from 4 - 356
Degrees

Speeds to 500 RPM (SPM) in either
Direction

Rugged UL / CSA listed Snap
Switches



Nema 1, 4 Circuit Rotating Cam Limit Switch

OPTIONAL ITEMS

Combination Cam Switch / Resolver
Packages

Chain Break Bases

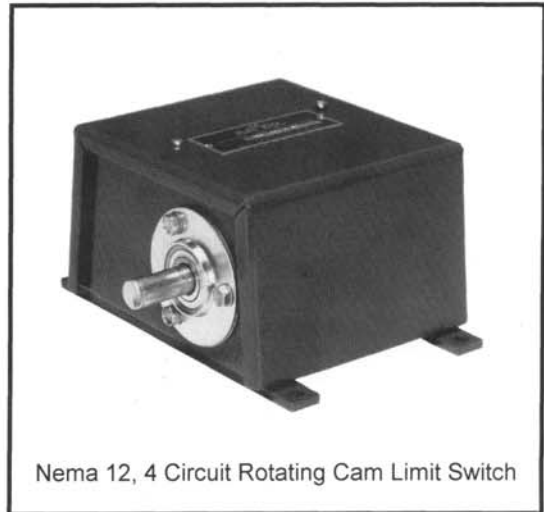
Right Angle Gear Reducers

Adjustable Couplings

Timing Drums

Custom Cut Cams

Integral Tachometers



Nema 12, 4 Circuit Rotating Cam Limit Switch

Mechanical Power Press Units

Chain Break Base- Detects loss of chain/belt tension and can be used to tension chain.

A switch interfacing the base is held active when tension is applied, a loss of tension will cause the switch to change state thus stopping further press operation.

Brake Monitor / Motion Detect- The **K80** Rotating Cam Limit Switch has provisions to adapt any brake monitor / motion detect sensor, or a resolver can be supplied internally, if required.

When properly applied, the Kamco **K80** units meet or exceed OSHA 1910.217(c) and ANSI B11.19-1990 safety standards as we know them.



K80 Unit with Chain Break Base

Mechanical Power Presses-

The **Kamco K80** style Rotating Cam Limit Switches are the accepted standard for controlling clutch and brake circuits on Mechanical Power Press controls. These highly accurate, repeatable devices offer simple set up and extreme reliability. By using multiple cams for each critical event and cross checking the contact operation in the press control, no single component failure can cause inadvertent operation of the press. The fact that the **Kamco K80** units are typically mounted on the press in an area that is not easily accessible to unauthorized personnel, lessens the chance of accidentally changing (adjusting) critical control settings.

The **K80 Chain Break Base** can be used in conjunction with the Rotating Cam Limit Switch to detect a broken / slack chain or belt. A switch, held active under normal conditions, allows the press to continue its cycle. If the chain loses tension or breaks, the switch changes state and stops the press from cycling.

Applications using solid state press controls can use the **Kamco K80-R Cam / Resolver Combination** unit. This device allows the mechanical cams to be used for critical clutch and brake controls while the resolver is used to control automation functions. This method is not only the best solution for safety reasons, it is also the most cost effective.

Note: The information provided above is for reference only. **Kamco K80** units when properly applied meet or exceed OSHA 1910.217(c) and ANSI B11.19-1990 standards. Consult your Press Control designer for specific installation and wiring details.

Index Tables-

The **K80 Rotating Cam Limit Switch** is ideal for use in controlling slow down and/or stop points over the table travel. The unit allows for dwells to be set, based on either direction of travel.

Packaging Machinery-

Applications requiring accurate, repetitive control of cyclical events such as **labelers, cartoners, case packers** and others are ideal for these units as they offer long life, easy set up and competitive pricing.

Automation Equipment-

Any project requiring feedback or control of rotary and/or rotary to linear motion can implement the **K80 Rotating Cam Limit Switches**. Devices such as **lifts, transfers, shuttles, hoists** and more can be accurately controlled using these devices. Connection to the machine must be in such a way that the Rotating Cam Limit Switch turns one revolution or less over the complete machine travel. This can be accomplished via chain and sprockets or with a gear reducer.

Steel Industry-

Applications such as **gates, valves, vessels, coil cars, lances** and more can be controlled via these industrial hardened units. The simple, rugged design allows these units to be set and forgotten in many steel Steel Mill applications.

K80 ROTATING CAM LIMIT SWITCHES

MOUNTING AND INSTALLATION

MOUNTING

The **K80 Rotating Cam Limit Switch** should be mounted to the machine's driving member or feedback shaft in such a way that the keyway of the **K80** unit is up (at the 0 degree position), and the machine to be coupled to at its home (starting) location. If directly coupling to the machine's shaft, a flexible coupling is recommended.

If using a **K80 Chain Break Base**, it should be set up such that the spring tension is applied in normal operating conditions. Example: If the **K80 Rotating Cam Limit Switch** is mounted above the machine's shaft, the springs should be mounted below the Chain Break Base such that as the chain is tightened, the springs compress. Conversely, if the machine's shaft is above the limit switch, the springs are mounted on the top of the chain break base.

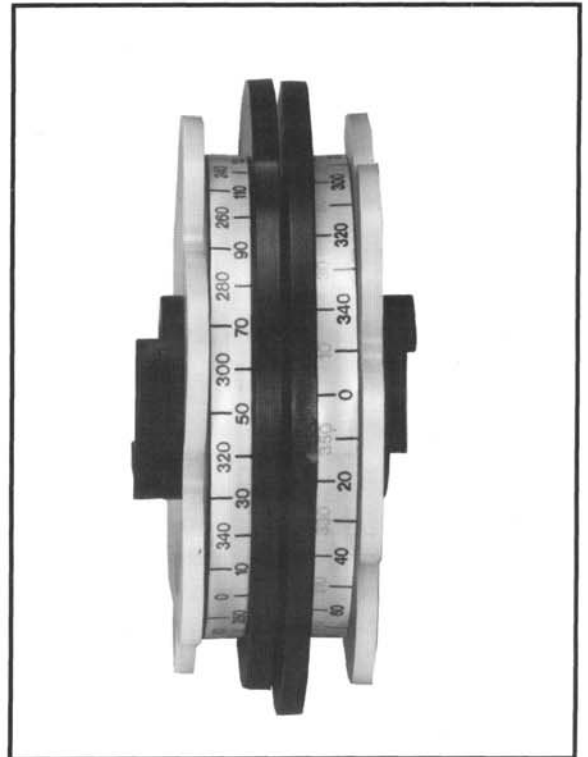
ADJUSTING CAMS

When adjusting cams on the **K80 Rotating Cam Limit Switch**, the following should be noted:

- 1) Cam shaft should be uppermost (above switches) when making adjustments.
- 2) Shaft rotation is established off of the right end of the unit even if the shaft coupling is to be on the left end.
- 3) For cam dwells less than 180 degrees, use the "A" contact (N.C.) and set the cam valley for your "active" portion. On dwells over 180 degrees, use the "B" contact and set the cam valley for the "inactive" portion. See more details below....

CAM SETTINGS

All cam settings are made with the shaft's keyway representing 0 degrees (T.D.C.). On clockwise applications with dwells less than 180 degrees, use the black marking to set your switch "make" (on) and the red markings to set the "break" (off). On dwells greater than 180 degrees, invert colors. For counterclockwise applications, set the "make" with the blue markings and the "break" with the yellow markings. Use the connection information supplied with the unit for wiring to your pilot device.



Simple, Reliable Control of Rotary Motion

TECHNICAL DATA

Temperature- All **K80 Rotating Cam Limit Switches** are rated for -50 to +185 degrees F operation.

Input Shaft Loading- All standard units are rated for 50 lbs. end thrust and 500 lbs. radial load. Units incorporate lifetime sealed ball bearings that allow for mounting in any position.

Operating Force- Each cam requires .6 lb.-in. force to activate the switch. To calculate total force required, multiply the number of cams by .6.

Cam Dwell Adjustment- Standard cams are adjustable for dwells from a minimum of 4 degrees to 180 degrees. For circuits requiring dwells greater than 180 degrees, use the "B" side contact (N.O.) and set the cams using an inverted dwell.

Ex: A dwell of 200 degrees is required from 90 to 290 degrees. Set a dwell from 290 to 90 (valley). Using the "B" side contact will give a contact closure from 90 to 290 degrees.

Cam Repeatability- Cams are repeatable to +/- 1/4 degree.

Snap Switch Life- Under normal loading and usage conditions, recommended snap switch replacement is 15,000,000 cycles. Conditions which can affect snap switch life include excessive electrical loads causing contact welding, as well as high cycle speeds which can cause arcing across contacts.

SNAP SWITCH DATA

The **K80 Snap Switches** are rugged UL/CSA listed industrial duty switches offering reliable, trouble free operation for millions of cycles. SPDT and DPDT versions are available in any combination. Each switch is individually mounted for ease of wiring and comes with a **K80-RF Roller Follower** assembly for added snap switch life.

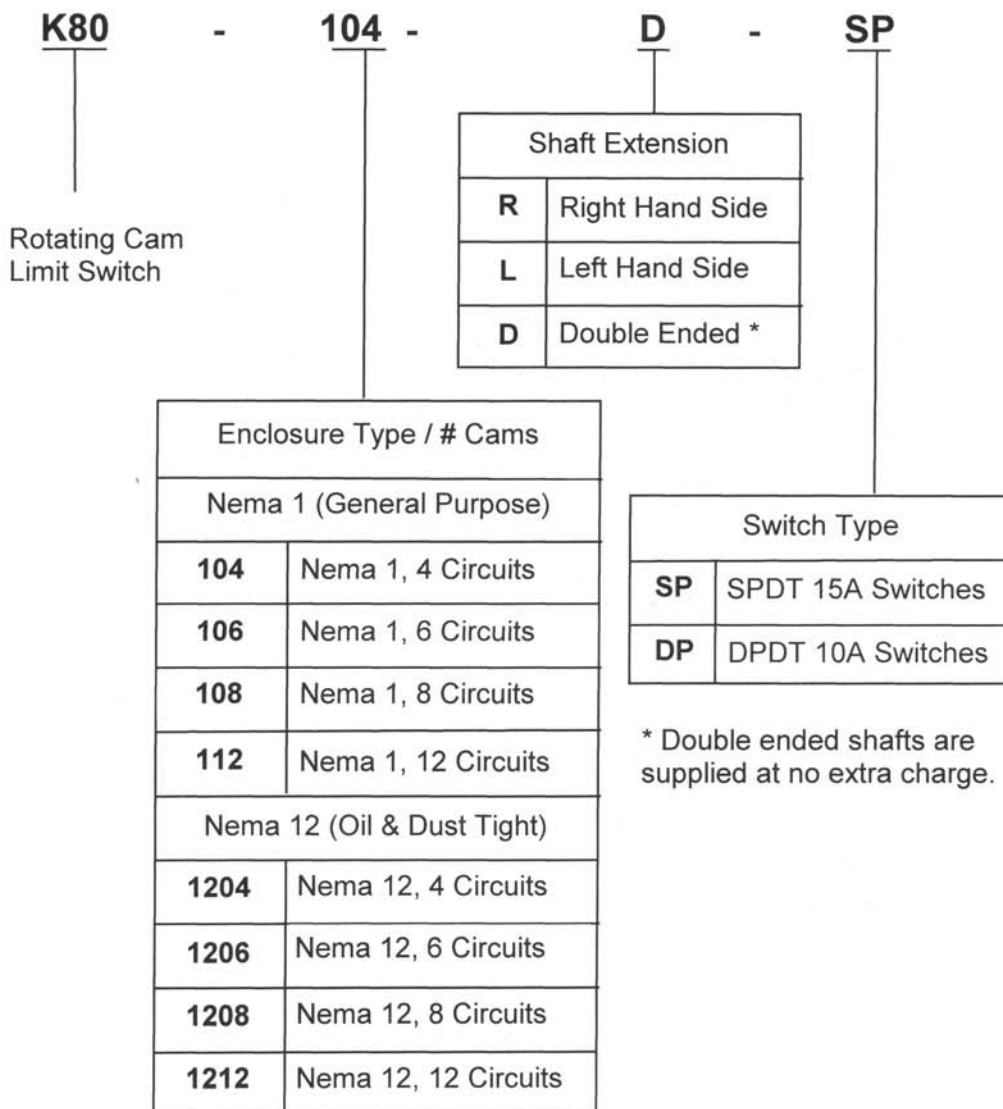
ELECTRICAL CONTACT RATINGS

Switch Type	AC - 50 or 60 Hz						DC			AC or DC
	Volts	Inductive 35% Power Factor				Resistive 75% Power Factor	Volts	Inductive and Resistive			Continuous Carrying Amperes
		Make		Break		Make and Break Amperes		Make and Break Amperes		
		Amps	VA	Amps	VA			Single Throw	Double Throw	
SPDT Form Z	120	40	4800	15	1800	15	125	2.0	0.5	15
SPST●	240	20	4800	10	2400	10	250	0.5	0.2	15
Form X or Y	480	10	4800	6	2880	6	600	0.1	0.02	15
	600	8	4800	5	3000	5	....	....	....	15
DPDT	120	30	3600	3	360	3	125	1.0	0.2	10
Form ZZ	240	15	3600	1.5	360	1.5	250	0.3	0.1	10
DPST	480	7.5	3600	0.75	360	0.75	600	0.1	....	10
Form AA or BB	600	6	3600	0.6	360	0.6	....	....	....	10

K80 ROTATING CAM LIMIT SWITCHES

CATALOG NUMBERING SYSTEM
(Standard Units)

Page 6



* Double ended shafts are supplied at no extra charge.

Note: Styles shown are the standard versions only. Details on other units such as 2,3,5,7,9,10,11 circuits and above, geared units, special shaft extensions or sizes, special cut cams or any other feature not shown, are available upon request. Consult **Kamco** or your local representative for more details.

Simple, Reliable Control of Rotary Motion

CATALOG NUMBERING SYSTEM (R.C.L.S. with Integral Resolver)

K80 - Rotating Cam Limit Switch with Integral Resolver
R1 -
104 -
R -
SP

Resolver Type	
R1	Unit compatible with Gemco*, Auto-Tech*, & C&A* Products
R2	Compatible with AMCI*

Consult the factory for brands not shown above.

Shaft Extension	
R	Right Hand Side
L	Left Hand Side

Note: Double Ended Shaft is not available on Cam / Resolver combination units.

Enclosure Type / # Circuits	
Nema 1 (General Purpose)	
104	Nema 1, 4 Circuits
106	Nema 1, 6 Circuits
108	Nema 1, 8 Circuits
112	Nema 1, 12 Circuits
Nema 12 (Oil and Dust Tight)	
1204	Nema 12, 4 Circuits
1206	Nema 12, 6 Circuits
1208	Nema 12, 8 Circuits
1212	Nema 12, 12 Circuits

Switch Type	
SP	SPDT 15A Switches
DP	DPDT 10A Switches

Note: Styles shown are the standard versions only. Details on other units such as 2, 3, 5, 7, 9, 10, 11 circuits and above, geared units, special shaft extensions or sizes, special cut cams or any other feature not shown, are available upon request. Consult the factory or your local **Kamco** representative for details.

* Gemco is a registered trademark of Patriot Sensors and Controls, AutoTech is a registered trademark of AVG Automation, C&A Products is a registered trademark of Namco Controls and AMCI is a registered trademark of Advanced Micro Controls, Inc.

K80 ROTATING CAM LIMIT SWITCHES

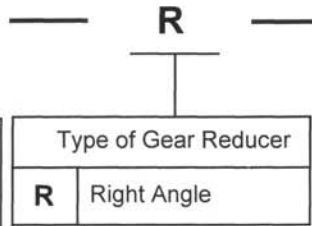
CATALOG NUMBERING SYSTEM (Right Angle Gear Reducer)

K80-104-D-SP

Specify Rotating Cam Limit Switch to be used with Gear Reducer from pages 6 & 7 of catalog. Ex: K80-104-D-SP gear box designator is added to this number. K80-104-D-SP-R-5-R1

Note: Rotating Cam Limits with single ended shafts must use same shaft location designator as gear box. Ex: K80-106-L-SP must use L1-L8 shaft designator.

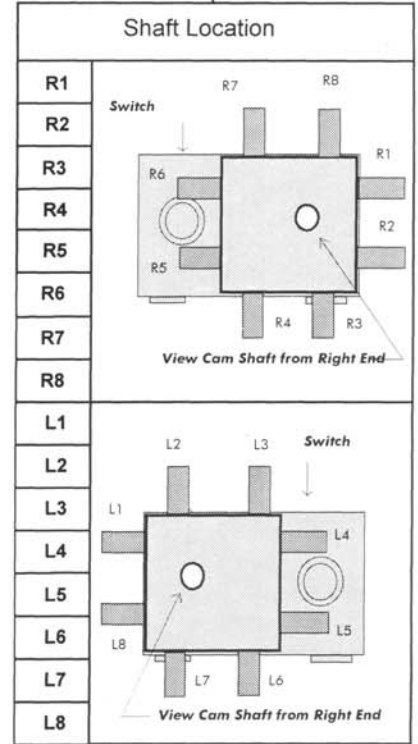
Other gear ratios are available. Consult the factory with any request not shown within this section.



Note: Consult factory for straight drive or multiplier units.

Gear Ratio	
No.	Ratio
1	1:1
1.3	1.3:1
1.5	1.5:1
1.6	1.6:1
2	2:1
3	3:1
4	4:1
5	5:1
6	6:1
7	7:1
7.5	7.5:1
8	8:1
9.3	9.3:1
10	10:1
12.5	12.5:1
15	15:1
16	16:1
18	18:1
20	20:1
25	25:1
30	30:1
36	36:1
40	40:1
50	50:1
60	60:1
80	80:1
96	96:1
100	100:1
120	120:1

5 — **R1**



Simple, Reliable Control of Rotary Motion

CATALOG NUMBERING SYSTEM (Ancillary Equipment)

Page 9

Adjustable Coupling

K80-ADC

Complete adjustable coupling kit. Includes adjustable coupling, snap rings and mounting hardware for a customer supplied sprocket.

Timing Drum

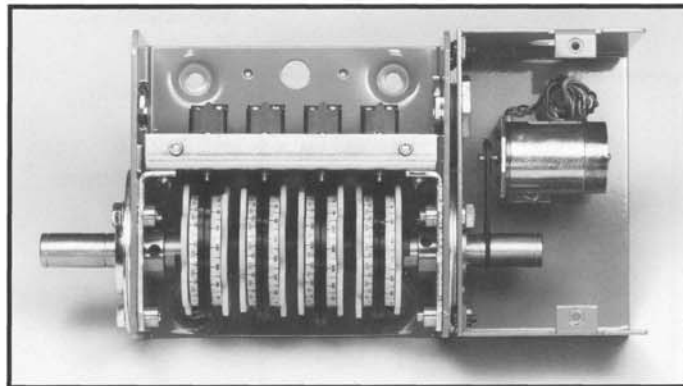
K80-TD1

TD1	Clockwise operation devices
TD2	Counter Clockwise operation devices

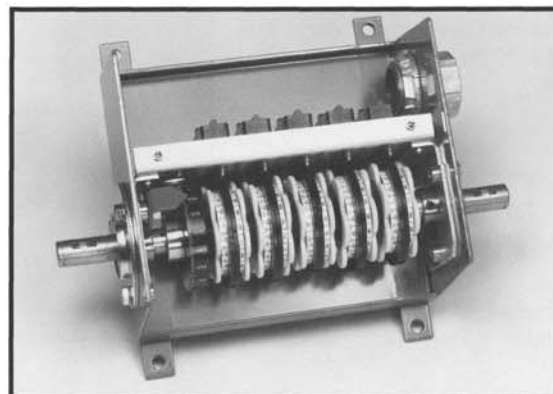
Add on Tachometer

Kamco offers an add on enclosure with an integral Tachometer. These options are available for use with many different style control packages. Consult Kamco or your local representative for more details.

Note: Timing drums called out as separate items are for use externally on the right hand shaft of the cam switch. If you desire the timing drum internally mounted, call out the timing drum designation at the end of the cam switch part number. Ex: K80-104-D-SP-TD1. The timing drum takes up one circuit space in the enclosure. For example, the above unit would be in a 6 circuit enclosure.



Nema 1 unit with Add On Tachometer



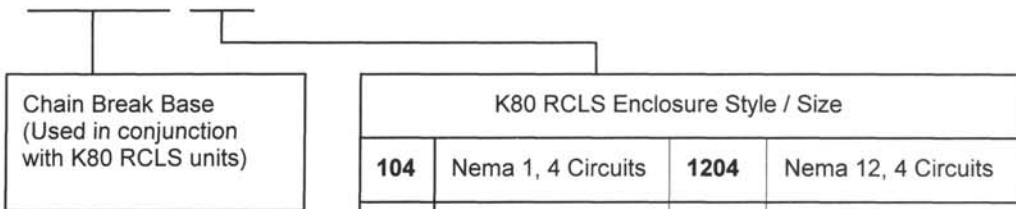
Nema 12 unit with integral Timing Drum

K80 ROTATING CAM LIMIT SWITCHES

CATALOG NUMBERING SYSTEM (Chain Break Base / Spare Parts)

Chain Break Base

K80-CB-104



Chain Break Base
(Used in conjunction
with K80 RCLS units)

K80 RCLS Enclosure Style / Size			
104	Nema 1, 4 Circuits	1204	Nema 12, 4 Circuits
106	Nema 1, 6 Circuits	1206	Nema 12, 6 Circuits
108	Nema 1, 8 Circuits	1208	Nema 12, 8 Circuits
112	Nema 1, 12 Circuits	1212	Nema 12, 12 Circuits

Note: For systems with K80-R Cam Resolver Combinations add 4 circuit spaces to the K80-CB number. Ex: A K80-R2-104-R-SP would require a K80-CB-108. In applications where a non-standard cam switch is supplied (i.e. cam switch with integral encoder, potentiometer or tachometer, consult factory for proper K80-CB size.

Spare Parts

K80-SW-SP1
SPDT 15A

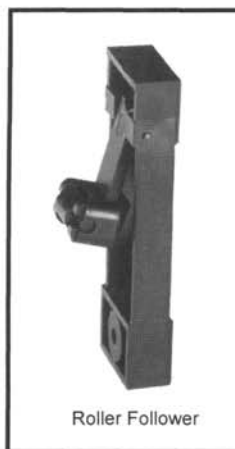
K80-SW-DP1
DPDT 10A



Standard Style K80 Snap Switches

K80-RF1
Standard Roller
Follower.

K80-RF2
Roller follower
for use as
replacement in
Gemco* style
1980 units.



Roller Follower

Note: K80-SW Switches can be used as replacements in Gemco and Gleason RCLS units. On Gemco style units a K80-RF1 must also be used with the K80-SW. *

Replacement Cams

K80-CAM1
Standard cam with (2) 178 degree lobes.
Consult factory for other styles.



Standard Cam Assembly

* Gemco is a registered trademark of Patriot Sensors and Controls. Gleason is a registered trademark of Gleason Reel.