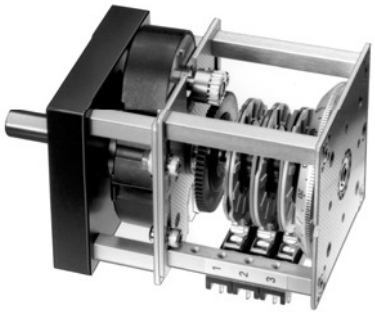
Geared limit switches
Getriebeendschalter

MICRONOR
automation components

Serie KW 60



• **Programmkanäle** (enistellbar) Program channel (free setting)	3...12
• **Mikroschalter** Snap action switches	4A 250V AC 1A 60V DC
• **Eingangsübersetzungen** Input ratios	1:1...2500 : 1

Bestelltext	How to order	Getriebeendschalter
Typ	**Type**	**KW60 L3 M750:1**

KW60 Lx xx:1

Bestellschlüssel	Order key				
Getriebeendschalter	Geared limit switches				
Baugrösse 60 x 60 mm	Size (2.36 x 2.36 inch)				
Programmkanäle	Program channel				
Anzahl Schalter (Masse)	Number of switches (Dimension)	**3**	**6**	**9**	**12**
Nutzkontakte (frei programierbar)	Program channels (free setting)	3	6	9	12 (NK4201)
Mass L (U1:1 + mehrstufig Mx:1)	Dimension L (U1:1 + more stage Mx:1)	44	68	92	116 mm
Mass L (einstufig Ux:1)	Dimension L (one stage Ux:1)	36	60	84	108 mm

Eingangsuntersetzung (Welle zu Schalter) — Input ratios (Shaft to switches)

Typ **U**	1 : 1	1,25	1,5	2	2,6	2,75	3,5	4	5	6,5
Typ **M**	12.5 : 1	20	25	37.5	40	52,5	75	100	200	
		300	420	600	750	1200	2250	2500		

U x:1 einstufig / one stage

M x:1 mehrstufig / more stages

Verstellbare Doppelnockenscheibe	Adjustable double cam	**NK4201**.180°
Programmiermöglichkeiten	Programming possibilities	
Anzahl Impulse pro Umdrehung	Number of pulses per revolution	1
mit Nockenvertiefung 4...180° ≅ 1...50 %	with cam profile valley 4...180° ≅ 1...50 %	COM (1) NC (2)
mit Nockenerhöhung 4...356° ≅ 1...99 %	with cam profile peak 4...356° ≅ 1...99 %	COM (1) NO (3)
Präzision Mikroschalter	Precision snap action switch	
Doppel- Löt- und Steckanschluss	Double solder and plug socket connection	2 x 2,8 x 0,5 mm
Gemeinsamer Kontakt	Common contact	COM (1)
Arbeitskontakt	Actuating contact normally open	NC (2)
Ruhekontakt	Rest contact, normally closed	NO (3)
Mikroschalter	Snap action switch	**KS25B4**
Schaltleistung	Switching power	4A 250V AC / 1A 60V DC
Kontaktmaterial	Contact material	Ag 999
Übergangswiderstand	Contact resistance	< 25mΩ
Drehknopfskala	Knob and scale	**SK360** (0...360°)
Anzeige für die Programmstellung	Indication of the existing program position	
Manuelle Vorwahl einer bestimmten Position	The manual preselection of a particular program position	
Option	Option	
Verstellbare Einfachnockenscheibe	Adjustable single cam	**NK4101**.20°
Programmiermöglichkeiten	Programming possibilities	
Anzahl Impulse pro Umdrehung	Number of pulses per revolution	1
mit Nockenvertiefung 20° (Anschluss)	with cam profile valley 20° (connection)	COM (1) NC (2)
mit Nockenerhöhung (Anschluss)	with cam profile peak (connection)	COM (1) NO (3)
Mikroschalter	Snap action switch	**KS26B4**
Kontaktmaterial	Contact material	Au 4...6 µm
Übergangswiderstand	Contact resistance	< 10mΩ
Anzeigeskala innen (vorne flach)	Indicator scale inside (flat frontside)	S360 (0...360°)

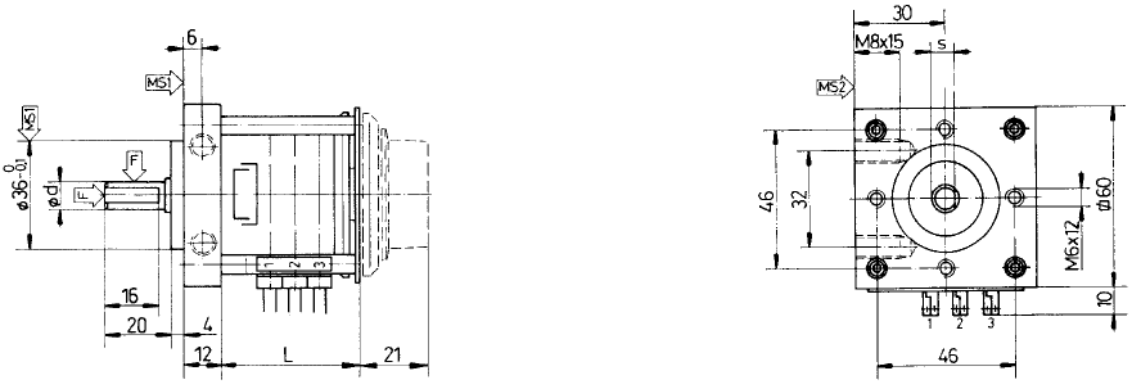
Serie KW 60

Massbild
Outline drawing

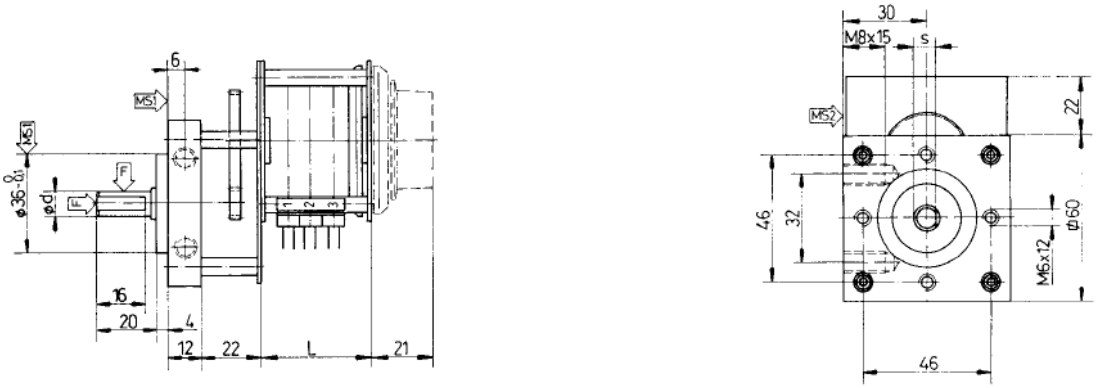
- **L = siehe Anzahl Schalter**
  L = Please see number of switches

Welle zu Endschalter / Shaft to switches **U** 1:1

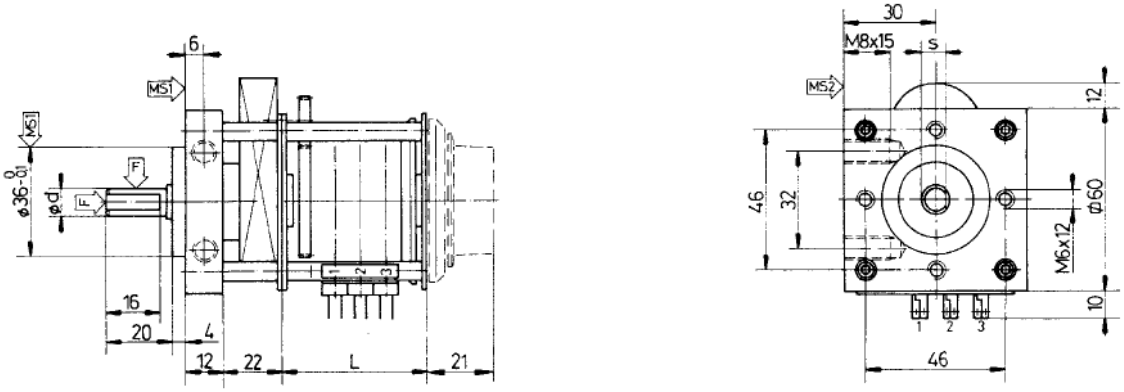
ød = 9-h8 s = 8,5 F⇨ = 40 N ⇩ = 80 N MS = Montagefläche / Mounting surface



Eingangsuntersetzung (**einstufig**) / Input ratio (one stage) **U** x:1



Eingangsuntersetzung (**mehrstufig**) / Input ratio (more stages) **M** x:1



Serie KW 60

Order key

KW60	3	U1	1

Dimension: 2.36 x 2.36 inch

Size (mm) / Number of switches:

		44 mm (U 1:1 + more stage Mx:1) --> Size
		36 mm (more stage Ux:1) --> Size
3	=	3 Switches (KS25B4 or KS26B4)
		3 Program channels free setting (NK4201) or Single cam (NV4101)
		Knob and scale SK360 (0° ... 360°)
		68 mm (U 1:1 + more stage Mx:1) --> Size
		60 mm (more stage Ux:1) --> Size
6	=	6 Switches (KS25B4 or KS26B4)
		6 Program channels free setting (NK4201) or Single cam (NV4101)
		Knob and scale SK360 (0° ... 360°)
		92 mm (U 1:1 + more stage Mx:1) --> Size
		84 mm (more stage Ux:1) --> Size
9	=	9 Switches (KS25B4 or KS26B4)
		9 Program channels free setting (NK4201) or Single cam (NV4101)
		Knob and scale SK360 (0° ... 360°)
		116 mm (U 1:1 + more stage Mx:1) --> Size
		108 mm (more stage Ux:1) --> Size
12	=	12 Switches (KS25B4 or KS26B4)
		12 Program channels free setting (NK4201) or Single cam (NV4101)
		Knob and scale SK360 (0° ... 360°)

Input ratios (Shaft to switches): --> U = one stage; M = more stage

U1	=	1:1	**M1**	=	12,5:1
U2	=	1,25:1	**M2**	=	20:1
U3	=	1,5:1	**M3**	=	25:1
U4	=	2:1	**M4**	=	37,5:1
U5	=	2,6:1	**M5**	=	40:1
U6	=	2,75:1	**M6**	=	52,5:1
U7	=	3,5:1	**M7**	=	75:1
U8	=	4:1	**M8**	=	100:1
U9	=	5:1	**M9**	=	200:1
U10	=	6,5:1	**M10**	=	300:1
			M11	=	420:1
			M12	=	600:1
			M13	=	750:1
			M14	=	1200:1
			M15	=	2250:1
			M16	=	2500:1

Interface:

1 = MR 265

GENERIC Wiring and Cam Programming Table (to be filled in by user)

Wiring Block Contact No.	CAM PROGRAM (in Degrees)		SWITCH CONTACT DESIGNATION			Customer Circuit ID	SWITCHING DIAGRAM 0° 360°
	ON	OFF	COM	NC	NO		■ Denotes Closed Contact
1							
2							
3							
4							
5							
6							
7							
8							

EXAMPLE:

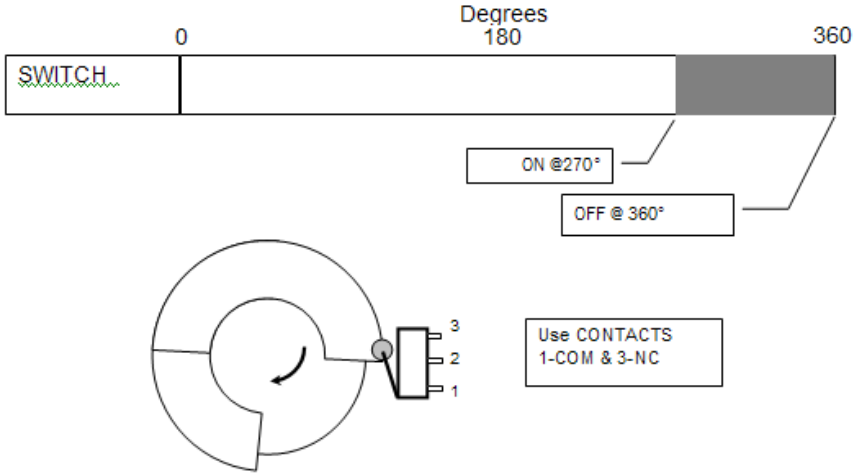
Wiring Block Contact No.	CAM PROGRAM (in Degrees)		SWITCH CONTACT DESIGNATION			Customer Circuit ID	SWITCHING DIAGRAM 0° 360°
	ON	OFF	COM	NC	NO		■ Denotes Closed Contact
1	10	90	X			SW1	
2				X		SW1	
3	45	225	X			SW2	
4					X	SW2	

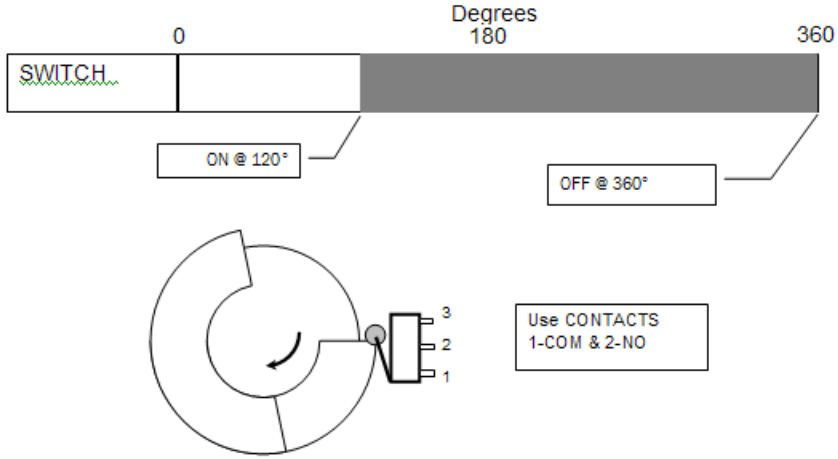
Cam Programming (General Guidance)

Single cams can produce only a fixed single pulse (20° wide) if switch channel uses standard NV4101.20 single cams.

Double cams (NK4201.180) can be programmed for a switching profile of 4° to 356°. Due to the design of the cam, switches cannot be disengaged for more than 180°.

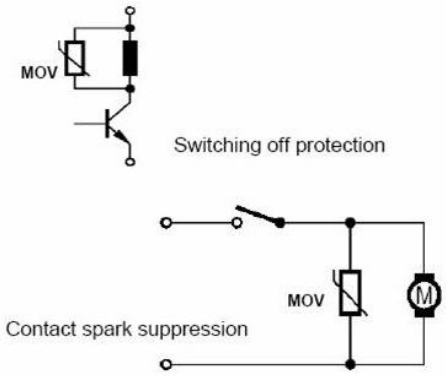
If the system requires that the switch does not make contact for more than 180°, the normally closed (NC) contact must be wired. For programs greater than 180°, the NO contact is used. The right-hand illustrations depict these two cam programming cases. It is always helpful to diagram the desired switch settings before wiring and programming the cams.





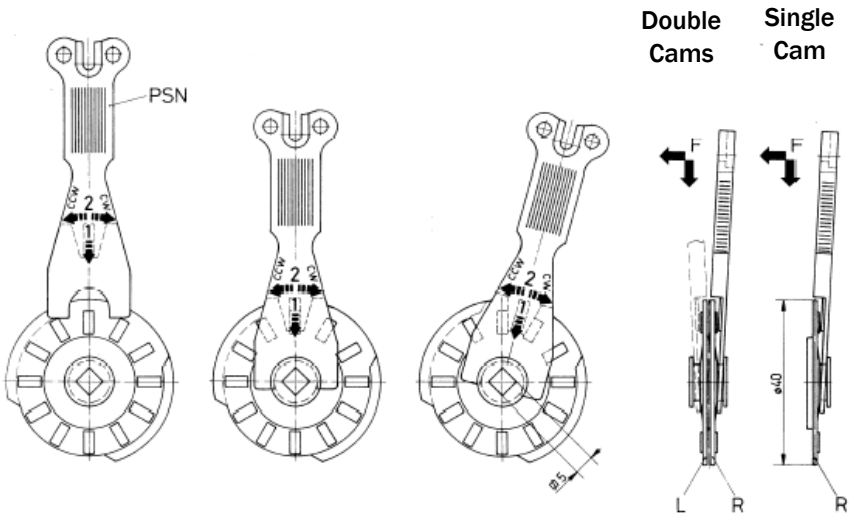
Contact Arcing Protection With Relay (Inductive) Loads

Consult www.littlefuse.com for MOV (varistor) product information and application notes.



Cam Programming (NK Series with PSN Black key)

Programming the switching profile is done with the PSN (black) cam programming tool. The general technique is shown in the diagram to the right.

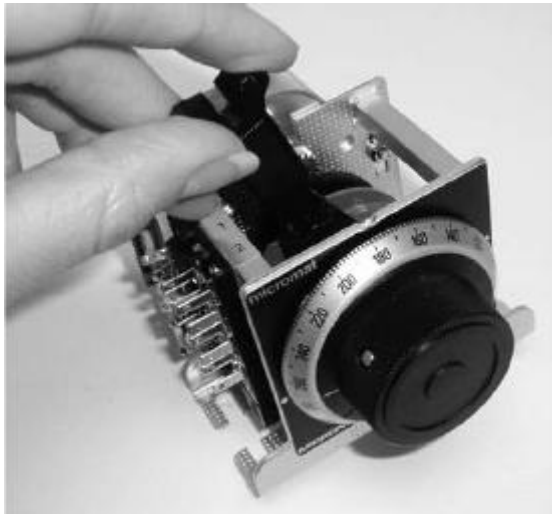


Step 1 Insert PSN key into unit, as shown in right hand figure, with the numbered side away from the cam and the notched side towards the cam.

Step 2 While gently applying pressure against the cam with the key, rotate the cam to the desired position.

Step 3 For double cams (NK4201), adjust the other side of the cam by flipping over the key and repeating steps 1 and 2 on the other side of the cam.

Step 4 Test the unit to confirm that the switch engages and disengages at the selected positions.



Single Cam (20º)

Double Cam (1 side Shown, 180º)

Cam Programming (NK Series with Orange QS Key)

Cam timers with double cams can be conveniently preprogrammed with the QA (orange) Cam Programming Key. The procedure described here is for cam timers/motor pots with switches mounted on the left side as shown in the photos.

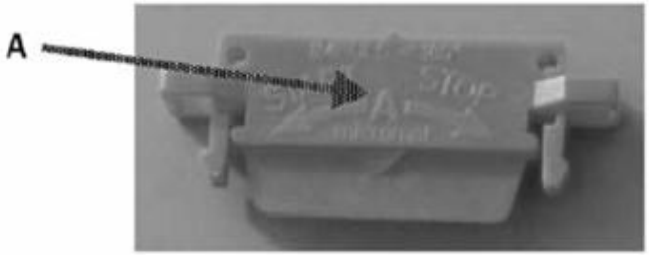
Step 1 Insert blade of the orange **QS key** between the two discs of the NK4201 double cam. Snap the key firmly into place with **A side** facing you (for programming impulses less than 180°).

Step 2 Turn the knob in the direction of the START arrow. Make one complete turn and continue until the **Triangular Indicator** on the right side is even with the chosen value of the start of the impulse.

Step 3 Turn the knob in the direction of the STOP arrow. Make one complete turn and continue turning until the **Triangular Indicator** at the right side is even with the chosen value for the end of the impulse.

Step 4 Test the unit to confirm that the switch engages and disengages at the selected positions. In operation, use the top **V-notch** as your position indicator

- For impulses less than 180°, have side A of the key face the knob.



- For impulses greater than 180°, have side B of the key face the knob.