NGC SERIES

MICRO SWITCH Compact Limit Switches



DESCRIPTION

Honeywell's MICRO SWITCH Compact Limit Switches, NGC Series, are a configurable platform of medium-duty switches that allow the customer to choose SPDT (single pole, double throw) or DPDT (double pole, double throw) circuitry while maintaining the same housing and mounting footprint throughout the NGC Series. MICRO SWITCH NGC Series can be configured more than 380,000 ways, carries global approvals, and are sealed to IP67 for potential use in indoor and outdoor applications.

VALUE TO CUSTOMERS

- Cost-effective: Provides a single source for a compact SPDT and DPDT limit switch, which can help minimize the Original Equipment Manufacturer's sourcing expenses by simplifying their supply chain
- **Versatile:** Durable packaging allows for use in many harsh indoor or outdoor applications, providing performance confidence
- **Configurable:** Allows design engineers to standardize on a single footprint while meeting a variety of electrical requirements
- **Application support:** Customers with a global footprint can count on Honeywell for regional support for new applications and troubleshooting

FEATURES

- SPDT or DPDT configurable circuitry
- Snap-action, positive-break contacts
- Silver alloy and gold-plated contact options
- UL, CE, cUL, and CCC approvals
- Conforms to IEC 60947-5-1, IEC 61373, EN45545-2 (metal variants with M12 connectors only)
- NEMA 1, 4, 12, 13; IP67 sealing
- Metal and plastic housing options
- Low and high temperature variants
- Cable and connector terminations
- Variety of heads and actuator levers

POTENTIAL INDUSTRIAL APPLICATIONS

- · Boom position detection
- Elevators and escalators
- Machine tools
- Mobile light towers
- · Packaging equipment
- Rail doors
- Scissor lifts

DIFFERENTIATION

- With two times the vibration (10 g) and shock (50 g) ratings of comparable competitive devices, the NGC Series can be implemented in the harshest of environmental conditions, providing enhanced reliability and repeatability
- Broader current capacity (10 A) than comparable devices allows for potential use in a wider set of applications, making platform standardization an easier task

PORTFOLIO

The NGC Series joins the 14CE, 914CE, LS, and E6/V6 Series of Medium-Duty Limit Switches. Honeywell also offers a portfolio of MICRO SWITCH Heavy-Duty Limit Switches and Global Limit Switches.



Table 1. Specifications

Characteristic	Parameter					
Description	compact, medium-duty limit switches					
Actuators	Side Rotary Configurations Side rotary Side rotary Side rotary (short) Side rotary with adjustable length roller lever Reversed side rotary with adjustable length roller lever Plunger Configurations Pin plunger (standard 4,8 mm [0.19 in long 7,4 mm [0.29 in]) Roller plunger (standard 15,3 mm [0.70 in]) Cross roller plunger (standard 15,3 mm [0.70 in]) Pin plunger with boot seal Panel-mount pin plunger Panel-mount cross roller plunger Panel-mount pin plunger with boot seal Top roller lever arm					
Terminations (SPDT)	Normal cable (refer to table 4) PUR cable (refer to table 4) Special application cable (refer to table 4) Railway cable (refer to table 4) Connector, 4-pin male, M12 thread Connector, 5-pin male, M12 thread					
Terminations (DPDT)	Normal cable (refer to table 4) PUR cable (refer to table 4) Special application cable (refer to table 4) Railway cable (refer to table 4)					
Material approval standard	(only applicable for product with non-halogen cable) DIN5510-2-2009 (flammability rating: S3; smoke rating: > S toxic gas rating: FED(TZUL=15min)< 1)	RI; welt rating: ST2;				
Switching options	SPDT, DPDT; snap action contacts (1NC/1NO, 2NC/2NO)					
Sealing	NEMA 1, 4, 12, 13; IP67 per IEC 60529 suitable for outdoor applications					
Contacts	snap action, positive break standard: silver alloy; gold: gold-plated					
Operating temperature	-25 °C to 75 °C [-13 °F to 167 °F] (for extended operating to	emperature options, see Table 3)				
Storage temperature	-40 °C to 85 °C [-40 °F to 185 °F]					
Mechanical endurance	1NC/1NO: 5,000,000 cycles min. at 120 CPM 2NC/2NO: 5,000,000 cycles min. at 60 CPM – for AgNi cont For wedge actuation: 500,000 cycles min. at 60 CPM for bot Applicable only for Head type C, L, P, Q, S, and T					
Electrical life	see table 3					
Contact bounce limit	50 msec max., use proper signal filter accordingly					
Thermal current	1NC/1NO: 10 A; 2NC/2NO: 5 A					
Rated insulation voltage (Ui)	1NC/1NO: 400 V as per IEC 60947-5-1 2NC/2NO: 250 V as per IEC 60947-5-1					
Dielectric strength	1890 Vac for metal housing; 2890 Vac for plastic housing 1500 Vac between all terminals to enclsoure after durability	test				
Impulse voltage	1NC/1NO: 2500 Vdc as per IEC 60947-5-1 2NC/2NO: 1500 Vac as per IEC 60947-5-1					
Pollution degree	3 (III)					
Humidity	95 %RH max.					
Operating speed	0,3 mm/s to 2 m/s					
Switching frequency	1NC/1NO: 120 CPM max. 2NC/2NO: 60 CPM max.					
Shock	50 g for 11 μs as per IEC 60068-2-27; railway application, p	er IEC 61373 Class I Car B type				
Vibration	10 g as per IEC 60068-2-6, frequency range 10 Hz to 500 H railway application per IEC 61373 Class I Car B type	Z;				
Approvals	UL (UL508), cUL, CE (IEC 60947-5-1), CCC (GB14048.5-20	008)				
Conforming to standards	IEC 60947-5-1, IEC 61373, EN45545-2 HL 3 (metal variant	s with M12 connectors only)				

Table 2. Electrical Rating and Utilization Category

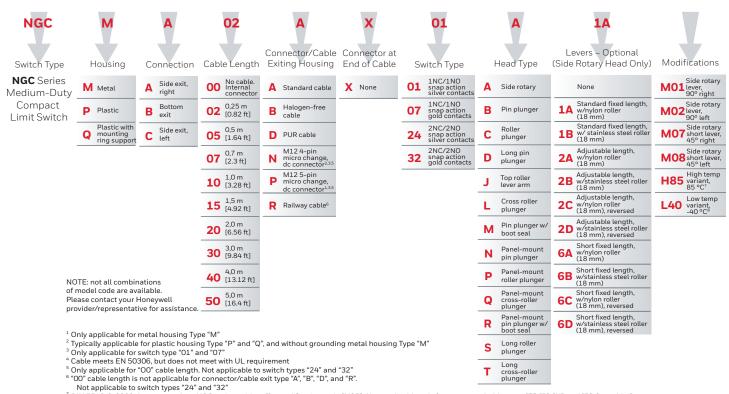
	SPDT 1	NO/1NC			DPDT 2	SPDT and DPDT				
ac		ac d		а	С	C	lc	gold-plated contacts		
A300 Ue (volts)	AC15 le (amps)	Q300 Ue (volts)	DC13 le (amps)	C300 Ue (volts)	AC15 le (amps)	R300 Ue (volts	DC13 le (amps)			
120	6	125	0.55	240	0.75	250	0.1	30 mVdc		
240	3	250	0.27					10 mA resistive		
Per IEC 6094	Per IEC 60947-5-1 and UL 508									

Table 3. Electgrical Life Expectancy at Illustrated Load

Switch Type	Voltage	Current	Life
SPDT (01) silver contact ¹	110 Vdc	1A	500,000
DPDT (24) silver contact ¹	110 Vdc	1 A	500,000
DPDT (24) silver contact ²	24 Vdc	15 mA	1,500,000
DPDT (32) gold-plated contact ²	30 mVdc	10 mA	50,000
SPDT (07) gold-plated contact ²	30 mVdc	10 mA	50,000

¹ 15 cycles/minute max. Applicable to NC circuit only. All loads resistive. Life mentioned are min. life.

Figure 1. Product Nomenclature and Order Guide



DIN 5510-2-2009 does not apply to NGC variant with suffix modification code "H85". Also applicable only for connector/cable types "B", "R", "N", and "P". See table 3 Modification code "L40" is a -40 °C variant. Only applicable to connector/cable types "B", "R", "N", and "P". See table 3

² 30 cycles/minute max. All loads resistive. Life mentioned are min. life.

Table 4. Connector/Cable Type Temperature Options^{10,11}

Connector/Cable type	Standard NGC (with modificat	Series tion code, none)	High Temp N (with modific	GC Series ation code, H85)	•	Low Temp NGC Series (with modification code, L40)		
	Tmin	Tmax	Tmin	Tmax	Tmin	Tmax		
Α	-25 °C	75 °C	_	-	_	-		
В	-25 °C	75 °C	-25 °C	85 °C	-40 °C	75 °C		
D	-25 °C	75 °C	_	_	_	_		
R	-25 °C	75 °C	-25 °C	85 °C	-40 °C	75 °C		
N	-25 °C	75 °C	-25 °C	85 °C	-40 °C	75 °C		
P	-25 °C	75 °C	-25 °C	85 °C	-40 °C	75 °C		

Figure 2. Connector Dimensions and Pin-Out Identification

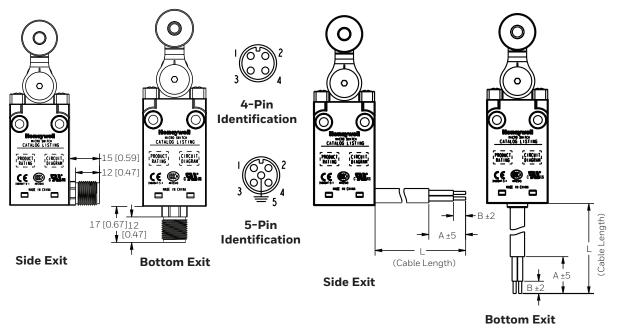


Table 5. Cable Descriptions

	Cable Descrip	tion	,		,	,	
Listing	Length (L) min.	Jacket strip length (A)	Insulation strip length (B)	NGCP*01* NGCP*07* (01 or 07 switch type)	NGCM*01* NGCM*07* (01 or 07 switch type)	NGCP*24* NGCP*32* (24 or 32 switch type)	NGCM*24* NGCM*32* (24 or 32 switch type)
NGC*00*	no cable (inter						
NGC*02*	0,25 m [9.8 in]	23 mm [0.91 in]	5 mm [0.20 in]				
NGC*05*	0,5 m [19,7]	32 mm [1.26]	17 mm [0.67 in]				
NGC*07*	0,7 m [27.6 in]	32 mm [1.26]	17 mm [0.67 in]				
NGC*10*	1 m [39.37 in]	23 mm [0.91 in]	5 mm [0.20 in]				
NGC*15*	1,5 m [59 in]	23 mm [0.91 in]	5 mm [0.20 in]	18 AWG or 4 x 0,75 mm ²	18 AWG or 5 x 0,75 mm ²	20 AWG or 8 x 0,5 mm ²	20 AWG or 9 x 0,5 mm ²
NGC*20*	2 m [78.74 in]	23 mm [0.91 in]	5 mm [0.20 in]	7 7 0,7 3 11111	3 x 0,7 3 111111	0 x 0,5 111111	3 x 0,3 11111
NGC*30*	3 m [9.84 ft]	23 mm [0.91 in]	5 mm [0.20 in]				
NGC*40*	4 m [13.12 ft]	23 mm [0.91 in]	5 mm [0.20 in]				
NGC*50*	5 m [16.4 ft]	23 mm [0.91 in]	5 mm [0.20 in]				

Figure 3. Side Rotary A1A/A1B Dimensions

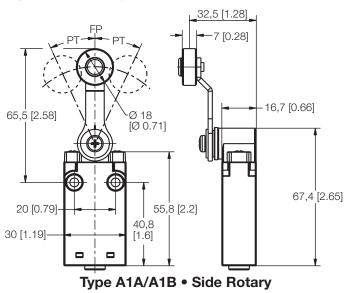
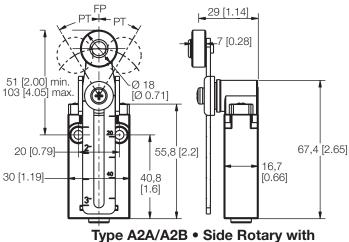


Figure 5. Side Rotary A2A/A2B Dimensions



Adjustable Length Roller Lever

Figure 4. Side Rotary A6A/A6B Dimensions

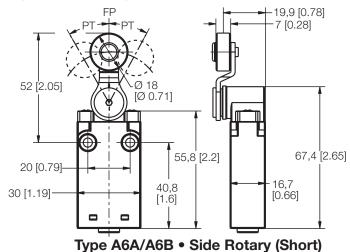
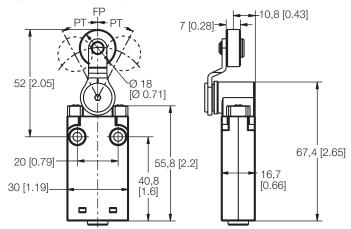
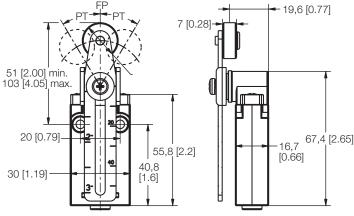


Figure 6. Side Rotary A6C/A6D Dimensions



Type A6C/A6D • Reversed Side Rotary (Short)

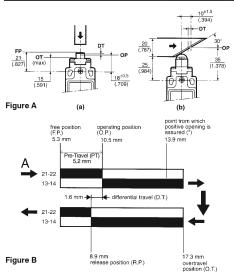
Figure 7. Side Rotary A2C/A2D Dimensions



Type A2C/A2D • Reversed Side Rotary with **Adjustable Length Roller Lever**

Table 5. Side Rotary Operating Characteristics

Actua- tion	Catalog Listing	Connec- tor/ Cable Exit	Switch Type	Circuit Diagram	Bar Charts	Differen- tial Travel max.	Operating Force/ Torque max.	Release Force/ Torque max.
	NGCP****X01A**	А						
	NGCP****X01A**	В	01	Blue P Brown				
	NGCP****X01A**	D		13 — 14				
	NGCP****X07A**	А		21 22 Black Zb Black				
	NGCP****X07A**	В	07	White	00 050 450 050			
	NGCP****X07A**	D			21-22 25° 45° 65°			
	NGCP****X01A**	N	01	1602 3 4	13-14			
	NGCP****X07A**	N	07	3 4 21 Zb 22 Zb 2	DT-			2,5 Ncm [0.22
	NGCM****X01A**	А			21-22	15°	18 Ncm [1.59 in-lb]	
	NGCM****X01A**	В	01	Blue Brown 13 14 21 22 Black Zb Black White Zb Black			[2.00	in-lb]
	NGCM****X01A**	D			Contact Closed Contact Open			
	NGCM****X07A**	А			Positive Opening			
	NGCM****X07A**	В	07	Green/Yellow				
C: -I -	NGCM****X07A**	D						
Side Rotary	NGCM****X01A**	Р	01	10002 3 0 4 13 14				
	NGCM****X07A**	Р	07	3 Green/Yellow				
	NGCP****X24A**	А						
	NGCP****X24A**	В	24	9	0° 26.5° 45° 65° White-Violet Gray-Black →			
	NGCP****X24A**	D		Orange——Blue Brown——Red				
	NGCP****X32A**	А		Gray Black White Violet	Brown-Red Orange-Blue			
	NGCP****X32A**	В	32	∠ P _{2 Zb}	DT-			
	NGCP****X32A**	D			White-Violet Gray-Black	10.50	17 Ncm	2,1 Ncm
	NGCM****X24A**	А		,	Brown-Red	16.5°	[1.5 in-lb]	[0.19 in-lb]
	NGCM****X24A**	В	24	Orange Blue	Orange-Blue Contact Closed			
	NGCM****X24A**	D		Brown——Red Gray——Black	Contact Open			
	NGCM****X32A**	А		White Violet 2 Zb	Positive Opening			
	NGCM****X32A**	В	32	Green/Yellow				
	NGCM****X32A**	D						

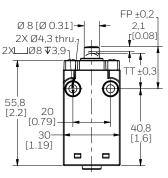


How to read and understand the bar chart information

The following example relates to a unit which has a snap action basic and which has a roller pin plunger actuator. Follow the black arrows and the black strip on the chart. The black strip indicates that there is a circuit between the terminals whose numbers are shown on the left and when white there is no circuit.

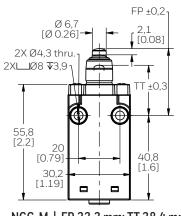
Look at Figures A and B as examples. Actuator type used for test is the linear Cam travel type (b) shown left. The start point is at the arrow marked "A" (See fig. B). This shows the free position to be $5.3 \, \text{mm}$ from the vertical center line of the unit. At this stage there is a circuit between the terminals 21- $22 \, \text{but}$ no circuit between terminals 13-14. The unit can be actuated until it reaches the operating position which is $10.5 \, \text{mm}$ from the center line – a travel distance of $10.5 \, -5.3 \, = 5.2 \, \text{mm}$ from the free position. At this point the circuit arrangement changes – no circuit between 21- $22 \, \text{but}$ making a circuit between 13-14. If, however, the contacts of terminals 21- $22 \, \text{weld}$ together and will not separate, a mechanical safety feature will take effect if the switch is travelled past the point from which positive opening is assured, $13.9 \, \text{mm}$. As the switch returns it reaches the release position at $8.9 \, \text{mm}$ from the center line. The circuit will change back to the original state and the difference between the operating position and the release position gives what is known as the differential travel i.e. $10.5 - 8.9 = 1.6 \, \text{mm}$. The asterisk (*) indicates the point from which the positive opening is assured.

Figure 8. Pin Plunger B & D **Dimensions**



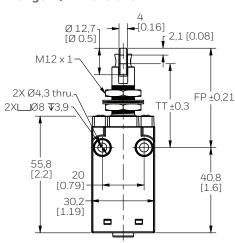
NGC_B | FP 19,8 mm; TT 15,9 mm NGC_D | FP 22,4 mm; TT 18,5 mm Pin Plunger

Figure 11. Pin Plunger with Boot Seal **M Dimensions**



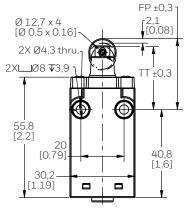
NGC_M | FP 32,3 mm; TT 28,4 mm Pin Plunger with Boot Seal

Figure 14. Panel-Mount Cross Roller **Plunger Q Dimensions**



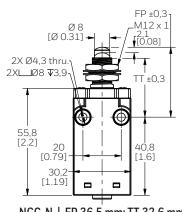
NGC_Q | FP 47,5 mm; TT 43,6 mm Panel-Mount Cross Roller Plunger

Figure 9. Roller Plunger C & S **Dimensions**



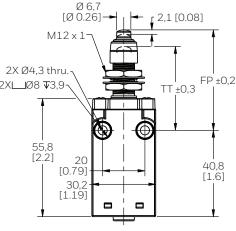
NGC_C | FP 30,3 mm; TT 26,4 mm NGC_S | FP 32,85 mm; TT 28,95 mm Roller Plunger

Figure 12. Panel-Mount PIn Plunger **N Dimensions**



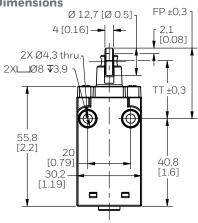
NGC_N | FP 36,5 mm; TT 32,6 mm Panel Mount Pin Plunger

Figure 15. Panel-Mount PIn Plunger With Boot Seal R Dimensions



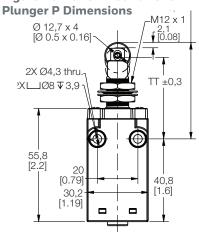
NGC_R | FP 47,5 mm; TT 43,6 mm Panel-Mount Pin Plunger with Boot Seal

Figure 10. Cross Roller Plunger L & T **Dimensions**



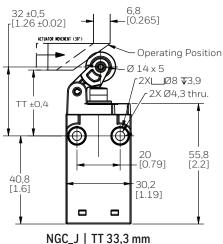
NGC_L | FP 30,3 mm; TT 26,4 mm NGC_T | FP 32,85 mm; TT 28,95 mm Cross Roller Plunger

Figure 13. Panel-Mount Roller



NGC_P | FP 47,5 mm; TT 43,6 mm Panel-Mount Roller Plunger

Figure 16. Top Roller Lever Arm **J Dimensions**



Top Roller Lever Arm

Figure 17. Wedge Actuation

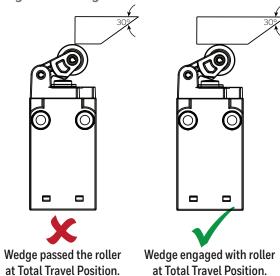
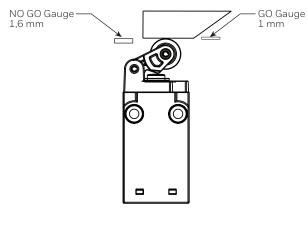


Figure 18. Final Installation Check at TTP



NOTE: Strictly adhere to installation instruction mentioned in Figures 1 to 18. Failure to comply with these could result in a functional issue.

Table 6. Plunger Operating Characteristics

Actu- ation	Catalog Listing	Connector/ Cable Exit	Switch Type	Circuit Diagram	Bar Charts	Differ- ential Travel max.	Oper- ating Force/ Torque max.	Re- lease Force/ Torque max.
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	А						
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	В	01	Blue Brown				
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	D						
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	А		21 22 Black/ Zb Black				
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	В	07	White				
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	D				1,2 mm		
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	N	01	1602 3 4	21-22 13-14 13-14 13-14			
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	N	07	3 4 21 22 Zb 2	2,1		11 N [2.47 lb]	3 N [0.67 lb]
	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	А		Blue Brown 13 — 14 21 — 22 Black Zb Black White Zb Black	4,0	[0.047		
	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	В	01		4.9	in]		
	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	D			Contact Closed			
	NGCM****X07 B/C/D/L/M/N/P/Q/R/S/T	А	07		Contact Open Positive Opening			
	NGCM****X07 B/C/D/L/M/N/P/Q/R/S/T	В						
Plung-	NGCM****X07 B/C/D/L/M/N/P/Q/R/S/T	D						
er Head	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	Р	01	16002 3 0 4				
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	Р	07	3 4 21 22 1 25 2 1				
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	А						
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	В	24	9 3				
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	D		Orange——Blue Brown——Red	olet ck ted Blue olet ck ted Blue			
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	А		Gray Black White Violet	White-Vi Gray-Bla Brown-R Brown-R Orange-I Gray-Bla Gray-Bla Brown-R			
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	В	32	∠ ⊬ _{2 Zb}				
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	D			2,1	1,4 mm	9,5 N	2,2 N
	NGCM****X24 B/C/D/L/M/N/P/Q/R/S/T	А	24	,	4,0	[0.051 lb]	[2.14 lb]	[0.49 lb]
	NGCM****X24 B/C/D/L/M/N/P/Q/R/S/T	В		Orange — Blue	4,9 LL			
	NGCM****X24 B/C/D/L/M/N/P/Q/R/S/T	D		Brown——Red Gray — Black	Contact Closed Contact Open			
	NGCM****X32 B/C/D/L/M/N/P/Q/R/S/T	А		White 2 Zb	Positive Opening			
	NGCM****X32 B/C/D/L/M/N/P/Q/R/S/T	В	32	Green/Yellow				
	NGCM****X32 B/C/D/L/M/N/P/Q/R/S/T	D						

Table 7. Top Roller Arm Operating Characteristics, Head Type J

Actu- ation	Catalog Listing	Connec- tor/ Cable Exit	Switch Type	Circuit Diagram	Bar Charts	Differ- ential Travel max.	Oper- ating Force/ Torque max.	Release Force/ Torque max.
	NGCP****X01 J	А						
	NGCP****X01 J	В	01	Blue P Brown				
	NGCP****X01 J	D		13 — 14				
	NGCP****X07 J	А		21 22 Black Zb Black				
	NGCP****X07 J	В	07	White				
	NGCP****X07 J	D			√ 24 24 ↑			
	NGCP****X01 J	N	01	1602 3 4	0 13-14 13-14 13-14			
	NGCP****X07 J	N	07	3 2 4 21 7 22 Zb 2	6,8 V 12,5 O	4 mm [0.157 in]	5,5 N [1.24 lb]	1,2 N [0.27 lb]
	NGCM****X01 J	А		Blue Brown 13 — 14 21 — 22 Black Black White Zb Green/Yellow				
	NGCM****X01 J	В	01		15,2 L			
	NGCM****X01 J	D			Contact Closed			
	NGCM****X07 J	А	07		Contact Open Positive Opening			
	NGCM****X07 J	В						
Тор	NGCM****X07 J	D						
Roller Arm	NGCM****X01 J	Р	01	3 0 4 13 14				
	NGCP****X07 J	Р	07	3 Green/Yellow				
	NGCP****X24 J	А			Mthe-Volet Gray-Black Brown-Red Gray-Black Gray-Black Gray-Black Gray-Black Gray-Black Gray-Black Brown-Red Gray-Black Gr			
	NGCP****X24 J	В	24	ρ.				
	NGCP****X24 J	D		Orange Blue				
	NGCP****X32 J	А		Gray Black White Violet				
	NGCP****X32 J	В	32	Willie 1 2 Zb				
	NGCP****X32 J	D			6,8	4,3 mm	4,5 N	1,2 N
	NGCM****X24 J	А		f=	12,5	[0.169 in]	[1.01 lb]	[0.27 lb]
	NGCM****X24 J	В	24	Orange Blue	15,2 LDT			
	NGCM****X24 J	D		Brown——Red Gray——Black	Contact Closed Contact Open			
	NGCM****X32 J	А		White Violet 2 Zb	Positive Opening			
	NGCM****X32 J	В	32	Green/Yellow				
	NGCM****X32 J	D						

ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at sensing.honeywell.com:

- Product line guide
- Product part listing/ nomenclature tree
- Product range guide
- Application note

FOR MORE INFORMATION

Honeywell Sensing and Internet of Things services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sensing.honeywell.com or call:

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WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

△ WARNINGIMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNINGMISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only.
 Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

Honeywell Sensing and Internet of Things

830 East Arapaho Road Richardson, TX 75081



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NGCPB10AX01B NGCPB10AX01R NGCMB10AX07C NGCPB10AX24A1A NGCMB10AX01L NGCMB10AX07A1A

NGCPB10AX01C NGCMB10AX01C NGCPB10AX01N NGCPB10AX01Q NGCMB10AX24A1A NGCPB10AX01M

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