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MICRO SWITCH Compact Limit Switches

NGC Series

002409 Issue 8

Datasheet



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.

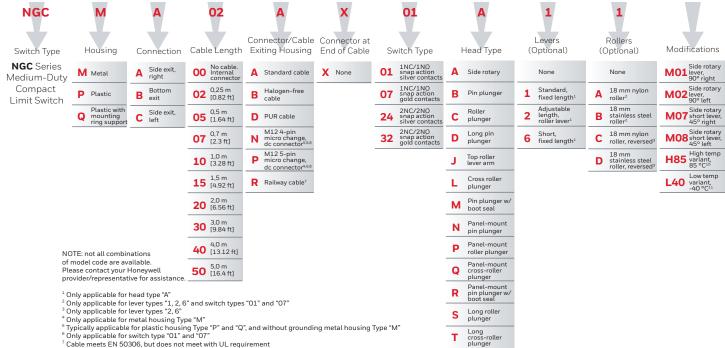
Table 1. Specifications

Characteristic	Parameter							
Description	compact, medium-duty limit switches							
Actuators	 Side Rotary Configurations Side rotary Side rotary (short) Side rotary with adjustable length roller lever Reversed side rotary (short) Reversed side rotary with adjustable length roller lever 	 Plunger Configurations Pin plunger (standard 4,8 mm [0.19 in] and long 7,4 mm [0.29 in]) Roller plunger (standard 15,3 mm [0.60 in] and long 17,85 mm [0.70 in]) Cross roller plunger (standard 15,3 mm [0.60 in] and long 17,85 mm [0.70 in]) Pin plunger with boot seal Panel-mount pin plunger Panel-mount roller 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: > SRI; welt rating: ST2; toxic gas rating: FED(TZUL=15min)< 1)							
Switching options	SPDT, DPDT; snap action contacts (1NC/1NO, 21	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 temperature options, see Table 3)							
Storage temperature	-40 °C to 85 °C [-40 °F to 185 °F]							
Mechanical endurance	1NC/1NO: 5 M cycles min. at 120 CPM 2NC/2NO: 5 M cycles min. at 60 CPM							
Electrical life	1 A, 110 Vdc, 500,000 cycles only for NC circuit 10 mA, 30 Vdc, 50,000 cycles only for gold-plate	d contacts						
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 1500 Vac between all terminals to enclsoure after							
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 ap							
Vibration	10 g as per IEC 60068-2-6, frequency range 10 F railway application per IEC 61373 Class I Car B ty							
Approvals	UL (UL508), cUL, CE (IEC 60947-5-1), CCC (GB1	14048.5-2008)						
Conforming to standards	IEC 60947-5-1, IEC 61373, EN45545-2 HL 3 (m	etal variants with M12 connectors only)						

Table 2. Electrical Ratings

Circuitry/contacts	Rating, Rated Voltage & Current				
1NC/1NO (silver-alloy contacts)	A300 AC15: 120 V 6 A; 240 V 3 A per IEC 60947-5-1 and UL508 Q300 DC13: 125 Vdc 0.55 A; 250 Vdc 0.27 A per IEC 60947-5-1 an UL508				
1NC/1NO (gold-plated contacts) low level current: 30 mVdc 10 mA resistive					
2NC/2NO (silver-alloy contacts)	C300 AC15: 0.75 A 240 Vac per IEC 60947-5-1 R300 DC13: 0.1 A 250 Vdc per IEC 60947-5-1				
2NC/2NO (gold-plated contacts)	low level current: 30 mVdc 10 mA resistive				

Figure 1. Product Nomenclature and Order Guide



¹ Cable meets EN 50306, but does not meet with UL requirement ⁹ Only applicable for "O0" cable length. Not applicable to switch types "24" and "32" ⁹ "00" cable length is not applicable for connector/cable exit type "A", "B", "D", and "R". Not applicable to switch types "24" and "32" ¹⁰ 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
¹¹ Modification code "L40" is a -40 °C variant. Only applicable to connector/cable types "B", "R", "N", and "P". See table 3

Table 3. Connector/Cable Type Temperature Options^{10, 11}

Connector/Cable type	Standard NG (with modific	C Series ation code, none)	High Temp N (with modifie	IGC Series cation 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		
Ρ	-25 °C	75 °C	-25 °C	85 °C	-40 °C	75 °C		

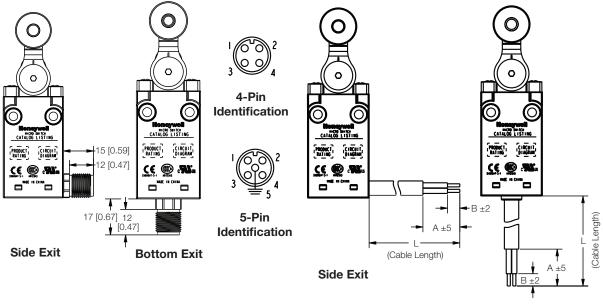


Figure 2. Connector Dimensions and Pin-Out Identification

Bottom Exit

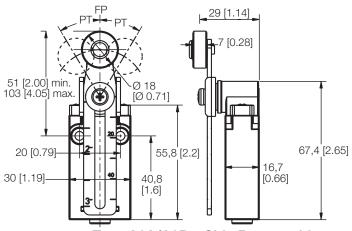
Table 4. Cable Descriptions

	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	nal connector)					
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]		0 x 0,1 0 11111		0 x 0,0 mm
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]				

65,5 [2.58] 0 18 (0 0.71] 0 16,7 [0.66] 0 7,4 [2.65] 0 1.19 0 1.19 0 7,4 [2.65] 0 1.19 0 7,4 [2.65] 0 1.19 0 7,4 [2.65]

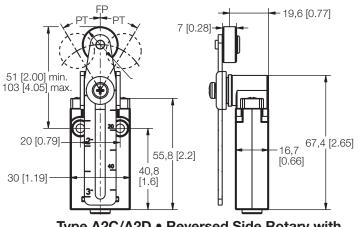
Figure 3. Side Rotary A1A/A1B Dimensions

Figure 5. Side Rotary A2A/A2B Dimensions



Type A2A/A2B • Side Rotary with Adjustable Length Roller Lever

Figure 7. Side Rotary A2C/A2D Dimensions



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

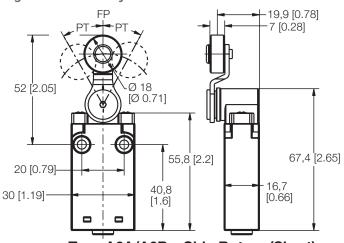
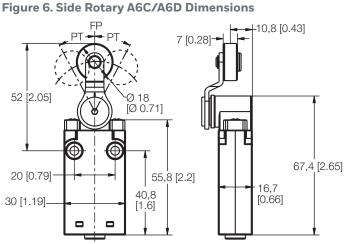


Figure 4. Side Rotary A6A/A6B Dimensions

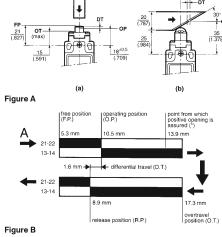
Type A6A/A6B • Side Rotary (Short)



Type A6C/A6D • Reversed Side Rotary (Short)

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 Brown				
	NGCP****X01A**	D		13 — 14				
	NGCP****X07A**	А		Black/ Zb Black				
	NGCP****X07A**	В	07	White	00 050 450 050			
	NGCP****X07A**	D			0° 25° 45° 65° 21-22			
	NGCP****X01A**	N	01	10^{-0} 2^{-1} 13^{-1} 14^{-14} 21^{-1} 22^{-1}				
	NGCP****X07A**	N	07	3 4 + 21 + 22 = 22			10.11	2,5 Ncm
	NGCM****X01A**	А			21-22	15°	18 Ncm [1.59 in-lb]	[0.22
	NGCM****X01A**	В	01	Blue				in-lb]
	NGCM****X01A**	D			Contact Closed			
	NGCM****X07A**	А		i21 22 Black Zb Black	Positive Opening			
	NGCM****X07A**	В	07	Green/Yellow				
Ciala	NGCM****X07A**	D						
Side Rotary	NGCM****X01A**	Р	01					
	NGCM****X07A**	Р	07	$3 \textcircled{24}_{5} \textcircled{21}_{2b} \textcircled{22}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \textcircled{21}_{2b} \textcircled{21}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \textcircled{21}_{2b} \textcircled{21}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \textcircled{21}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \textcircled{21}_{2b} \hline{21}_{2b} \hline{21}_{2$				
	NGCP****X24A**	А						
	NGCP****X24A**	В	24	Ŷ	0° 26.5° 45° 65°			
	NGCP****X24A**	D	-	Orange Blue Brown Red	White-Violet			
	NGCP****X32A**	А		Gray-Black White-Violet	Brown-Red			
	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		,	Gray-Black Brown-Red Orange-Blue	16.5°	[1.5 in-lb]	[0.19 in-lb]
	NGCM****X24A**	В	24	Orange Blue	Contact Closed			-
	NGCM****X24A**	D	1	Brown – Red Gray – Black	Contact Open			
	NGCM****X32A**	А		White 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 mm from the vertical center line of the unit. At this stage there is a circuit between the terminals 21-22 but no circuit between terminals 13-14. The unit can be actuated until it reaches the operating position which is 10,5 mm from the center line – a travel distance of 10,5 – 5,3 = 5,2 mm from the free position. At this point the circuit arrangement changes – no circuit between 21-22 but making a circuit between 13-14. If, however, the contacts of terminals 21-22 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 mm. As the switch returns it reaches the release position at 8,9 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 mm. The asterisk (*) indicates the point from which the positive opening is assured.

Figure 8. Pin Plunger B & D Dimensions

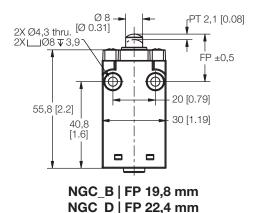
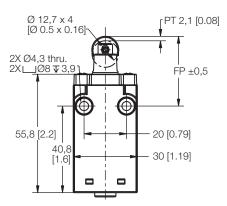


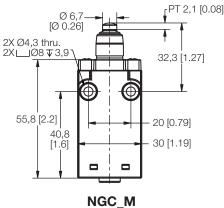
Figure 9. Roller Plunger C & S Dimensions



NGC_C | FP 30,3 mm NGC_S | FP 32,85 mm Roller Plunger

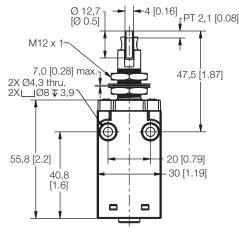
Figure 11. Pin Plunger with Boot Seal M Dimensions

Pin Plunger

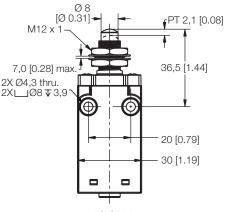


Pin Plunger with Boot Seal

Figure 14. Panel-Mount Cross Roller Plunger Q Dimensions



NGC_Q Panel-Mount Cross Roller Plunger Figure 12. Panel-Mount PIn Plunger N Dimensions



NGC_N Panel-Mount Pin Plunger

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

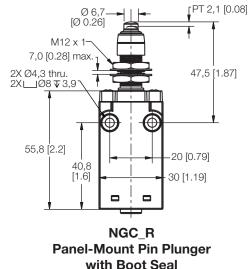
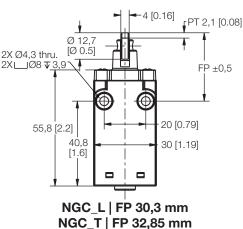
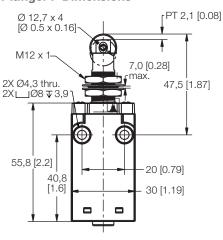


Figure 10. Cross Roller Plunger L & T Dimensions



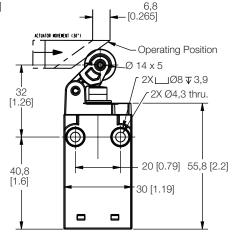
Cross Roller Plunger





NGC_P Panel-Mount Roller Plunger

Figure 16. Top Roller Lever Arm J Dimensions



NGC_J Top Roller Lever Arm Sensing and Internet of Things 7

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					11 N [2.47 lb]	
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	В	01	Blue Brown 13 - 14				
	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		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 37 37			
	NGCP****X01 B/C/D/L/M/N/P/Q/R/S/T	Ν	01	160^2 30^4 $13-4^4$ 14	²¹⁻²² ²¹⁻²² ¹³⁻¹⁴			3 N [0.67 lb]
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	Ν	07	$3 \bigcirc 4 \bigoplus 21 \bigcirc 22 \bigcirc 22 \bigcirc 22 \bigcirc 22 \bigcirc 22 \bigcirc 22 \bigcirc 22$	2,1	1,2 mm [0.047		
	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	А			4,0			
	NGCM****X01 B/C/D/L/M/N/P/Q/R/S/T	В	01	Blue Brown 13 - 14 21 - 22 Black Zb Black White Zb Black		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	Ρ	01 .	$3 \bigoplus_{j=1}^{2} 4 \bigoplus_{j=1}^{j=1} 4 \bigoplus_{j=1}^{j=1} 22 \bigoplus_{j=1}^{2} \frac{1}{Zb} 2^{j}$				
	NGCP****X07 B/C/D/L/M/N/P/Q/R/S/T	Р						
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	А						2,2 N
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	В	24					
	NGCP****X24 B/C/D/L/M/N/P/Q/R/S/T	D		Orange Blue Brown Red	Red			
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	А		Gray Black White Violet	0 Gray-Black Gray-Black Brown-Red Orange-Blu Brown-Red Gray-Black Gray-Black			
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	В	32	2 P ⁻ 2 Zb				
	NGCP****X32 B/C/D/L/M/N/P/Q/R/S/T	D			2,1	1,4 mm	9,5 N	
	NGCM****X24 B/C/D/L/M/N/P/Q/R/S/T	А		(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	24	Orange Blue				
	NGCM****X24 B/C/D/L/M/N/P/Q/R/S/T	D		Brown – Red Gray – Black	Contact Closed Contact Open Positive Opening			
	NGCM****X32 B/C/D/L/M/N/P/Q/R/S/T	А		White Violet				
	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 Brown				
	NGCP****X01 J	D		13 - 14				
	NGCP****X07 J	А		Black/Zb Black				
	NGCP****X07 J	В	07	White				
	NGCP****X07 J	D			125 45			
	NGCP****X01 J	N	01	100^2 30^4 414			5,5 N [1.24 lb]	1,2 N [0.27 lb]
	NGCP****X07 J	N	07	$3 \bigcirc 4 \bigoplus 21 \bigcirc 22 \bigcirc 2b \bigcirc 21 \bigcirc 2b \bigcirc 22 \bigcirc 2b \bigcirc 2b \bigcirc$	6,8	4 mm [0.157 in]		
	NGCM****X01 J	А			12,5 15,2 Contact Closed Contact Open • Positive Opening			
	NGCM****X01 J	В	01	Blue				
	NGCM****X01 J	D						
	NGCM****X07 J	А						
	NGCM****X07 J	В	07					
Тор	NGCM****X07 J	D						
Roller Arm	NGCM****X01 J	Р	01					
	NGCP****X07 J	P	07	$3 \bigoplus_{j=1}^{4} \bigoplus_{j=1}^{21} \bigoplus_{j=1}^{22i} \bigoplus$				
	NGCP****X24 J	A			0 Mhite-Violet Gray-Black Gray-Black Orange-Blue Mhite-Violet Gray-Black Gray-Black Gray-Black			
	NGCP****X24 J	В	24	φ				1,2 N [0.27 lb]
	NGCP****X24 J	D		Orange Blue Brown Red				
	NGCP****X32 J	А		Gray Black White Violet				
	NGCP****X32 J	В	32	2 Zb				
	NGCP****X32 J	D			6,8	4,3 mm	4,5 N	
	NGCM****X24 J	А		,	12,5	[0.169 in]	[1.01 lb]	
	NGCM****X24 J	В	24	Orange Blue	Blue FRed Black Violet Black Bla			
	NGCM****X24 J	D						
	NGCM****X32 J	А		White Violet				
	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

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Honeywell Sensing and Internet of Things

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A WARNING PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

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

▲ WARNING MISUSE 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.

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 acknowledgement 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.

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