

Installation and Service Instructions for EX Series Explosion-proof Switches

ISSUE 4
50009662



⚠ 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.

GENERAL INFORMATION

The flame paths of Honeywell's EX explosion-proof switches cool exploding gases below the ignition temperature before they reach explosive gases surrounding the housing. The enclosed replaceable basic switch is accessible when the cover is removed. EX series products are NEMA 1 rated and therefore are not recommended for use in areas when they will be subjected to liquid splash.

EX series products are listed by Underwriters' Laboratories and CSA for use in hazardous locations NEMA 7, Class I, Groups C & D, and NEMA 9, Class II, Group E, F, and G. This includes vapors of ethyl ether, gasoline, petroleum, alcohol, acetone, lacquer solvent, natural gas, and atmospheres charged with grain dust, metal dust, carbon black, coal, or coke dust. EXHT series products have a temperature range of -40 °C to 204 °C (-40 °F to 400 °F) and meet the European Hazard Locations Designation: Exd IIB + H2 T2 category II 2 G. When used within the maximum voltage and current specified on the product, the products will have no heating problems. Select EX listings are also listed for Class I, Group B (hydrogen) atmospheres. CSA requires the following statement for Class I, Group B requirements.

⚠ DANGER

EMISSION OF HOT PARTICLES

- Joint surfaces must be thoroughly cleaned before closing.

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

IMPORTANT: All EX series products comply with UL Standard: UL 894 and UL 1203, CSA Standard: C22.2 no. 25-1966, C22.2 no. 30-M1986. EX series products also meet NEMA 1 enclosure requirements.

Select EX Series products also meet the European Hazardous Locations Designation: Exd IIB + H2 T6 category II 2 G, **KEMA 04ATEX2312X** and complies with the European Directive on Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres (94/9/EC) commonly referred to as the ATEX Directive. Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN50014:1997, EN50018:2000 and EN50281-1-1:1998. EX series products have a temperature range of -40 °C to 70 °C [-40 °F to 158 °F], and when used within the maximum voltage and current specified on the product will have no heating problems.

NOTICE

INSTALLATION INSTRUCTIONS

Cable connection

The cable entry device shall be certified in type of protection flameproof enclosure "d", suitable for the conditions of use and correctly installed.

For ambient temperatures above 60 °C [140 °F], cables and cable glands suitable for a temperature of at least 80 °C [176 °F] are required.

Conduit connection

A certified sealing device in type of protection flameproof enclosure "d", such as a conduit seal with setting compound shall be provided immediately to the entrance of the enclosure.

For ambient temperatures over 60 °C [140 °F], suitable heat resistant wiring and setting compound in conduit seal shall be used.

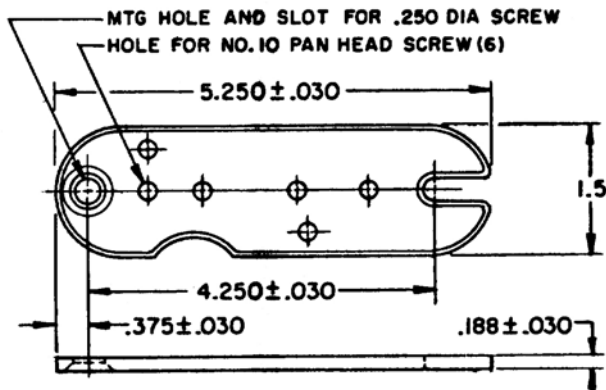
Blanking elements of unused apertures shall be certified in type of protection flameproof enclosure "d", suitable for the conditions of use and correctly installed

INSTALLING THE SWITCH

A mounting bracket (15PA85-EX) is furnished at no extra cost with most EX switches. This permits all rotary operated switches to be mounted from top, bottom, back or right end. Plunger switches may be mounted on back, bottom or right end with this standard bracket. For top mounting of plunger switches, bracket 15PA86-EX must be purchased separately. The double conduit switch also has an auxiliary bracket (included) which permits two-hole mounting from top, back or bottom. Direct mounting is by means of two 10-32 NF tapped holes on the top, back or bottom.

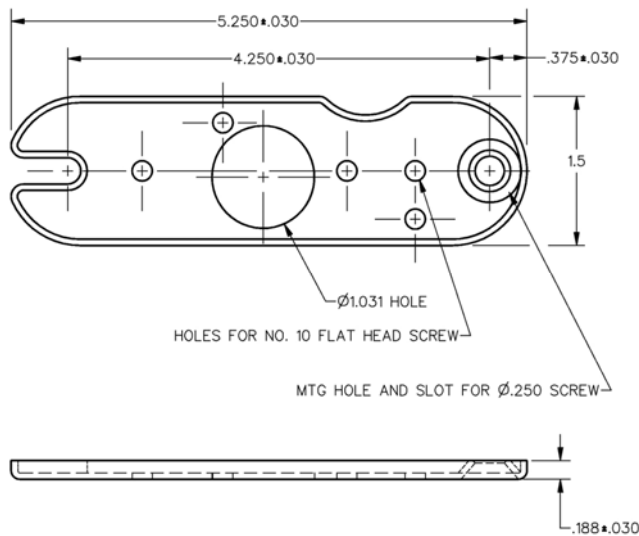
15PA85-EX

Fasten bracket to switch with screws furnished. Bracket may be secured to mounting surface with 0.250 inch machine screws.



15PA86-EX

Fasten bracket to top of switch with screws furnished. Bracket may be secured to mounting surface with 0.250 inch machine screws.



WIRING INSTRUCTION

Use up to size #14 AWG solid or stranded wires to connect to the pressure-type connector terminals. Use green wires for ground leads, red wires for NC leads, blue wires for NO leads, and black for common leads.

NOTICE

As ambient temperature approaches 60 °C [140 °F], cable entry can be 70 °C [158 °F] or higher and cable branching can be 80 °C [176 °F] or higher, making it important to select cable that meets these requirements.

ELECTRICAL RATINGS

Electrical ratings of EX switches depend on the type of basic switch enclosed in the housing. Ratings are shown on page 4 along with letter keys (A, B, C, D, E, F, G) shown in table of listings on page 5.

ADJUSTING ROLLER ARMS

The roller lever assembly is adjustable through 360° at any of 1,980 positive lock positions at intervals of approximately 0.2°.

To adjust the roller lever to the desired position, hold the hexagon washer with a wrench and loosen lock nut sufficiently to disengage the serrations. Hold shaft in position by means of the hexagon washer so that no torque will be applied to the internal parts of the unit when the lock nut is tightened or loosened. Failure to do so may result in damage to the enclosed switching mechanism.

Moving lever one serration forward or backward with respect to serrations on fluted washer changes the position of the lever approximately 8.2° (see sketch below).

Moving lever and fluted washer, as a unit, one serration forward or backward with respect to serrations on the hexagon washer changes position of the lever 8°.

Moving the lever one serration in one direction, and the lever and fluted washer, as a unit, one serration in the other direction, changes position of the arm approximately 0.2°.

After positioning lever arm, tighten lock nut sufficiently to prevent slippage of arm, but avoid over tightening.

NOTICE

Excessive tightening will also deform the hexagon serrated washer and cause lever assembly to bind.

NOTICE

For conduit sizes available, refer to installation drawing EX SERIES, CHART 1.

NOTICE

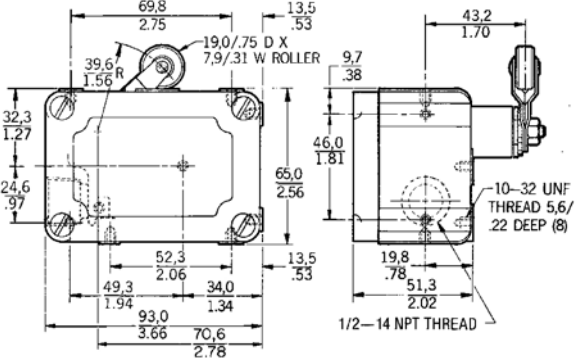
Separate conduit labels are available for each conduit type near the conduit hole. Use a proper mating threaded fitting that is identical with the conduit thread shown on the conduit label.

NOTICE

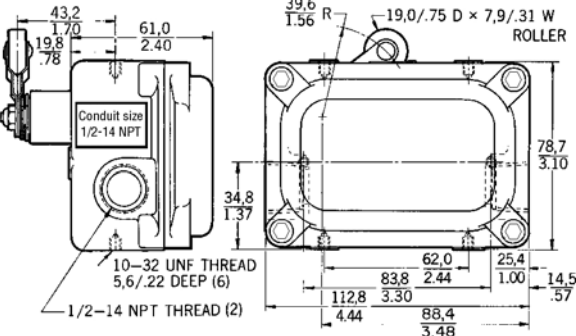
Refer to product nameplate for date code. DATE CODE is YYXX. YY is the last two digits of the year of manufacture, and XX is the week of manufacture of the product.

MOUNTING DIMENSIONS

Roller Arm – Single Conduit

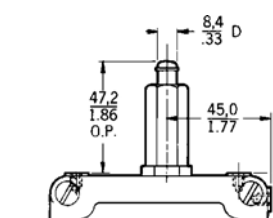


Roller Arm – Double Conduit

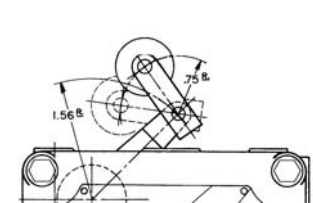


NOTE: The yield stress of bolts to fasten the enclosure together is according to drawing, EX SERIES CHART 1.

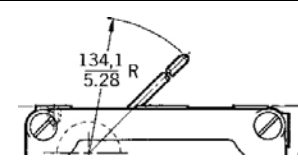
Straight Plunger



One-way Roller Arm

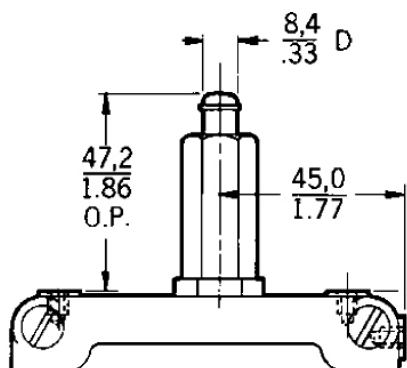


Low Force Rod



STRAIGHT PLUNGER ACTUATION

Do not actuate by cams or slides or by any other device which will impart side thrust to the plunger. Use straight "push" action in the direction of the plunger motion. **Do not oil** this plunger mechanism. Sufficient grease of the proper type is assembled in the plunger during manufacture to last the lifetime of the switch. Additional grease, oil, water or fine abrasive may cause jamming or electrical failure.

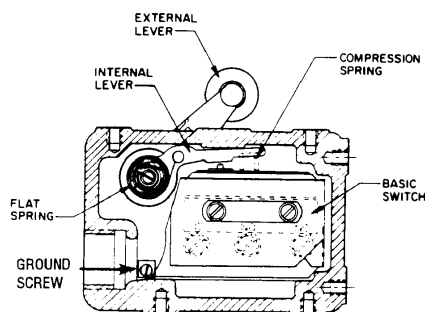
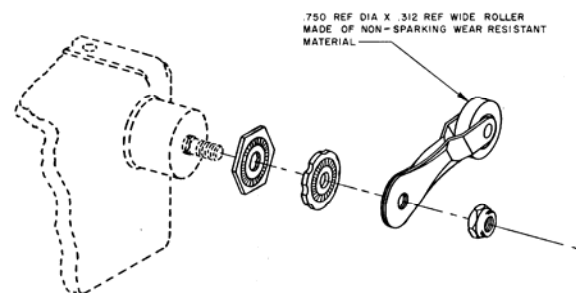
**REPLACING BASIC SWITCH**

1. Observe this notice:

NOTICE

Disconnect power supply circuit before opening switch.

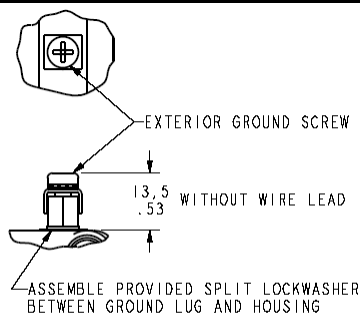
2. Remove cover of housing, disconnect the lead-in wires, loosen screws holding the basic switch, then remove the basic switch.
3. Place replacement switch in the insulator, insert the screws, and place basic switch in the housing.
4. Tighten the screws and connect the lead-in wires.
5. Be sure small compression spring is returned to its position between the top of the basic switch and the internal lever (or above internal lever in the case of the CCW actuated switches).

**ELECTRICAL RATINGS**

A	UL and CSA listed: L96 15 amps, 125, 250 or 480 Vac; 1/8 Hp, 125 Vac; 1/4 Hp, 250 Vac; 1/2 amp, 125 Vdc; 1/4 amp, 250 Vdc
B	UL and CSA listed: L23 20 amps, 125, 250 or 480 Vac; 10 amps, 125 Vac "L"; 1 Hp, 125 VAC, 2 Hp, 250 VAC; 1/2 amp, 125 VDC; 1/4 amp, 250 Vdc
C	UL and CSA listed: L59 10 amps, 125 or 250 VAC; 0.3 amp, 125 Vdc; 0.15 amp, 250 Vdc
D	UL and CSA listed: L9 10 amps, 125, 250 or 480 Vac; 1/2 amp, 125 Vdc; 1/4 amp, 250 Vdc
E	UL listed: L22 1 amp, 125 Vac
F	UL and CSA listed: L110 3 amps, 125 or 250 VAC 1/10 HP, 125 Vac; 1/16 HP, 250 Vac
G	UL and CSA listed: L35 5 amps, 125, 250 or 480 Vac; 1/2 amp, 125 Vdc; 1/4 amp 250 Vdc

TEMPERATURE RATINGS

T2	-40 °C to 204 °C [-40 °F to 400 °F]	EXHT Series
T6	-40 °C to 70 °C [-40 °F to 158 °F]	EX Series



A ground screw is provided for convenient grounding.

EXTERIOR GROUND SCREW CAN BE ASSEMBLED TO ANY UNUSED MOUNTING SCREW HOLE

REPLACEMENT PARTS Packets illustrated on page 6. Installation instructions are included with each packet

1	2	3	4	5	6	7	8
Catalog Listing	Description	Elec. Rtg.	Basic Switch Unit	External Actuator	Internal Lever	Springs	Mounting Bracket
EX-AR	Roller arm, CW actuation, SPDT, 15 amp capacity	A	BZ-2R-P4	6PA5-EX*	33PA1-EX	33PA7-EX	15PA85-EX
EX-AR800	Roller arm, CW actuation, SPDT, 15 amp capacity; UL Class I, Group B (hydrogen) atmosphere	A	BZ-2R-P4	6PA5-EX*	33PA1-EX	33PA7-EX	15PA85-EX
EXA-AR	Roller arm, CW actuation, SPDT, 20 amp capacity	B	BA-2R-P4	6PA5-EX*	33PA1-EX	33PA6-EX	15PA85-EX
EXD-AR-3	Roller arm, CW actuation, DPDT, 10 amp capacity; UL Class I, Group B (hydrogen) atmosphere	C	DT-2R4-A7	6PA5-EX*	33PA1-EX	33PA6-EX	15PA85-EX
EXH-AR3	Roller arm, CCW actuation, SPDT, hermetically sealed basic switch, UL Class I, Group B, 125 in. leadwires	E	4HS202	6PA5-EX*	33PA1-EX	33PA7-EX	15PA85-EX
EX-AR20	No external actuator furnished, CW actuation, 15 amp capacity, SPDT	A	BZ-2R-P4	Note 1	33PA1-EX	33PA7-EX	15PA85-EX
EXH-AR33	Roller arm, CCW actuation, SPDT, hermetically sealed basic switch, UL Class I, Group B, 126 in. leadwires	E	4HS203	6PA5-EX*		33PA5-EX	15PA85-EX
EX-AR16	Roller arm, CW or CCW actuation, low force SPDT, 15 amp capacity, no lever return spring, no mounting bracket	A	BZ-2RW88-P5	P26PA5K-EX*			
EX-CR	One-way roller arm, CW actuation, SPDT, 15 amp capacity	A	BZ-2R-P4	6PA131-EX	33PA1-EX	33PA7-EX	15PA85-EX
EX-AR128	One-way roller arm, CW actuation, SPDT, 15 amp capacity	A	BZ-2R-P4	6PA130-EX*	33PA1-EX	33PA7-EX	15PA85-EX
EX-AR1613	Low force rod, CW actuation, SPDT, 15 amp capacity, No mounting bracket	A	BZ-2RW88-P5	6PA136-EX			
EX-Q	Overtravel plunger, SPDT, 15 amp capacity	A	BZ-2R-P4	8PA15-EX			Note 2
EX-Q800	Overtravel plunger, SPDT, 15 amp capacity, UL Class I Group B (Hydrogen) atmospheres	A	BZ-2R-P4	8PA15-EX			Note 2
EXA-Q	Overtravel plunger, SPDT, 20 amp capacity	B	BA-2R-P4	8PA15-EX			Note 2
EXD-Q-3	Overtravel plunger, DPDT, 10 amp capacity, UL Class I Group B (Hydrogen) atmospheres	C	DT-2R-A7				Note 2
EX-N15	Overtravel plunger, SPDT, 10 amp capacity Elastomer plunger boot	D	BZ-2R15-P4	8PA12-EX			Note 2
EX-AR50	Manual actuator paddle, SPDT, 15 amp capacity	A	BZ-2R-P4	6PA134-OP		33PA7-EX	15PA85-EX
1EX1	Roller arm, CW actuation, SPDT, 15 amp capacity 1/2 inch conduit openings in both ends	A	BZ-2R-P49	6PA5-EX*	33PA1-EX	33PA7-EX	
2EX1	Roller arm, CW actuation, SPDT, 20 amp capacity 1/2 inch conduit openings in both ends	B	BA-2R-P4	6PA5-EX*	33PA1-EX	33PA6-EX	
4EX1-3	Roller arm, CW actuation, DPDT, 10 amp capacity 3/4 inch conduit openings in both ends	C	DT-2R4-A7	6PA5-EX*	33PA1-EX	33PA6-EX	

Note 1: Actuators, Catalog Listings 6PA5-EX, 6PA127-EX, 6PA130-EX(CW), 6PA131-EX, 6PA136-EX and 6PA138-EX may be ordered for use with the EX-AR20 listing.

Note 2: For mounting plunger actuator switches from the bottom, back or end, order packet 15PA65-EX. For top mounting, order packet 15PA86-EX.

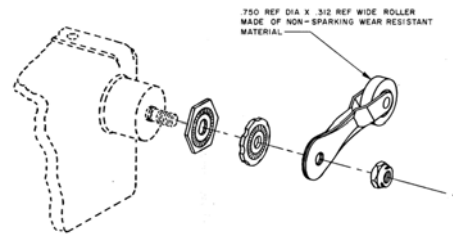
*Packet 19PA4-EX, containing only the hexagon washer, fluted washer and lock nut for this actuator, is available.

REPLACEMENT PACKETS (Order from columns 5, 6 and 7, page 5)

External Actuators - Rotary

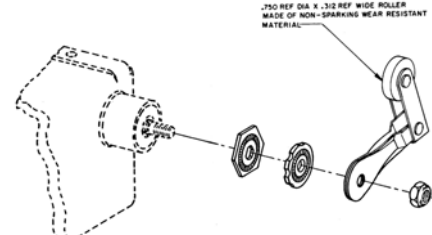
6PA5-EX (Non-sparking roller)

6PA127-EX (High strength nylon roller)

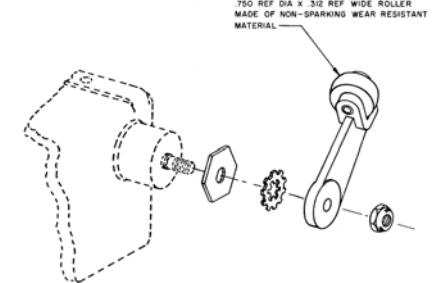


6PA130-EX (One-way roller arm) CW

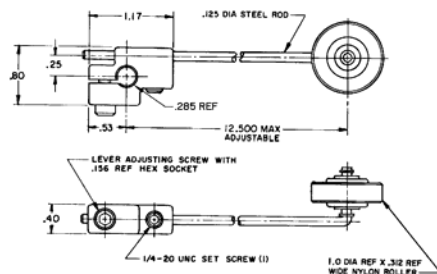
6PA142-EX (One-way roller arm) CCW



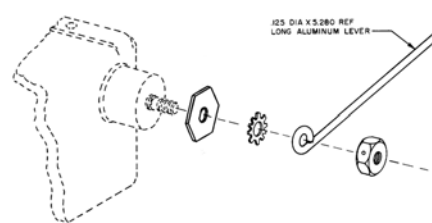
6PA131-EX (Cross-roller arm)



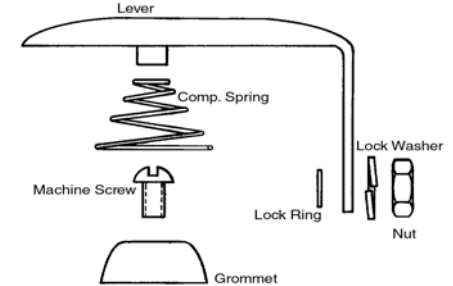
6PA126-EX (Adjustable length rod)



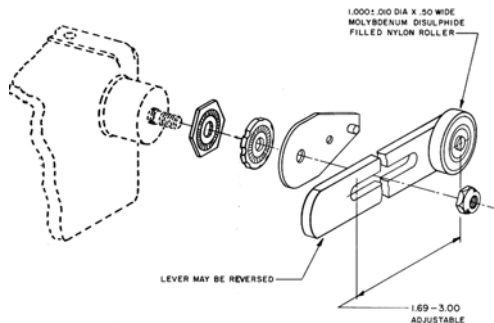
6PA136-EX (Aluminum rod)



6PA134-OP (Manual paddle)



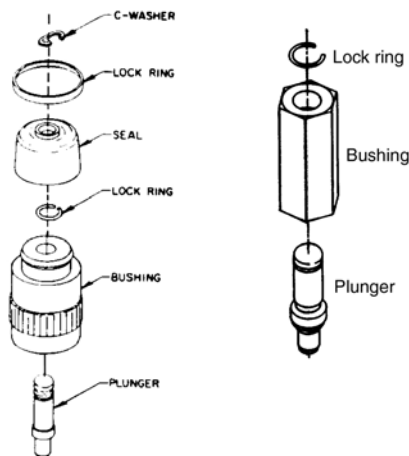
6PA138-EX



EXTERNAL ACTUATORS - Plunger

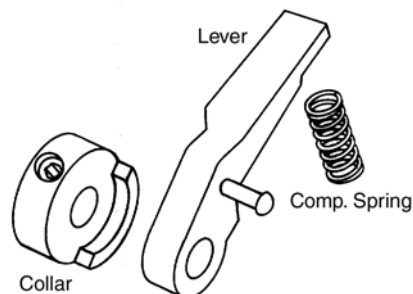
8PA12-EX

8PA15-EX

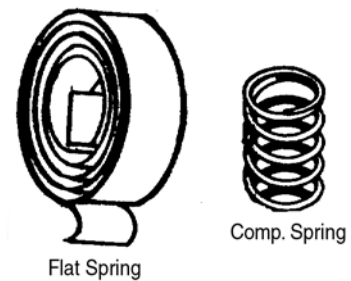


INTERNAL LEVERS - Rotary

33PA1-EX



33PA5-EX, 33PA6-EX, 33PA7-EX



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Registered No 217808 (England)

EC Declaration of Conformity

Honeywell Control Systems Ltd. hereby declare that the products identified below conform to the essential requirements of the EC Directive(s) listed below and that the products supplied are in conformity with the type described in any EC Type Examination Certificate (EC TEC) identified below.

Manufacturer: GALENA

Product: Llimit Switch EX
EX enclosed basic switch see sheet 2

Directive (Amendments)

Conformity Details

94/9/EC

Standards applied:

BS EN 60079-0 :2006
BS EN 60079-1; 2007

EC TEC No:

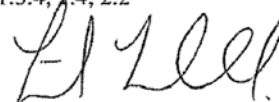
KEMA 04ATEX2312 X

KEMA Registered Quality B.V., Utrechtsweg
310, 6812 AR Arnhem, Nederland.

Provisions fulfilled:

1.0, 1.1, 1.2.1, 1.2.5, 1.2.7, 1.2.9, 1.3.1, 1.3.2,
1.3.4, 1.4, 2.2

Signed on behalf of Honeywell Control Systems Ltd. :



Frank Turnbull, S&C Chief Engineer

DoC No: A401

DoC Issue: 2

DoC Date: 12/03/2009

Page 1 of 2

MICRO SWITCH™ EX Series Nomenclature

1	EX	A	Y	Q	XXX
Conduit code	Switch type	Basic switch code (optional)	Special basic switch circuitry (optional)	Actuator code	Additional features (optional)
*One 1/2 in conduit opening. 15 A SPDT	Explosion-proof series	BZ style switch	Y Split contact basic switch	Q Top plunger	Up to three characters designating optional features
1 Two 1/2 conduit openings. 15 A SPDT		A BA style switch		AR Side rotary	
2 Three 1/2 conduit openings. 20 A DPDT		D DT style switch		CR Side rotary with cross roller	
4 Two 3/4 conduit openings. 10 A DPDT		H HS style switch		N Elastomer sealed plunger	
		HT HT style switch			

* Unless otherwise specified

NOTES

(1) Not all possible combinations are available; these are only guidelines.

WARNING

OPENING PRODUCTS HAZARD

DO NOT OPEN these products when energized or in a flammable gas atmosphere.

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

WARNING

IMPROPER CONDUIT THREAD USE

DO NOT USE any other conduit thread than the one identified on the product. Verify that the mating threaded fitting is identical with the conduit thread shown on the product nameplate

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. 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 it 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 we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer 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 printing. However, we assume no responsibility for its use.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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