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Industrial Control and Systems:
Typical Proximity Switch Specifications

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Foreword

This Standards Publication was prepared by a technical committee of the NEMA Industrial Automation Control Products and Systems Section. It was approved in accordance with the bylaws of NEMA and supersedes the indicated NEMA Standards Publication. This Standards Publication is an addition part to ICS 5-2000: *Control-Circuit and Pilot Devices* and will be included into that standards publication when it is next revised. Annex B provides common dimensions and operating characteristics for a typical proximity switch.

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This standards publication was developed by the Industrial Automation Control Products and Systems Section. Section Approval of the standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Section was composed of the following members:

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Annex B
TYPICAL PROXIMITY SWITCH SPECIFICATIONS

(Normative)

Proximity switches may be classified according to their dimensions and operating characteristics. The following specifications represent common dimensions and operating characteristics.

Type designations in the following specifications are described in Annex A, *Classification of Proximity Switches*.

B.1 TYPE I–A, INDUCTIVE CYLINDRICAL PROXIMITY SWITCHES WITH THREADED BARREL

B.1.1 Dimensions of Type I–A

The dimensions and thread sizes of typical cylindrical proximity switches with threaded barrel, as shown in Figure B–1–1, are listed in Table B–1–1. Within the dimensional limits of d_1 and l_2, all rigid parts of the connecting leads shall be included. The diameter of unthreaded portion d_2 shall not exceed the minor diameter of the thread. For Type I–1, embeddable, the thread can be omitted and the diameter reduced to d_2 on a length not exceeding l_3 = 1 mm. For Type I–2, the thread can be omitted and the diameter reduced to d_2 on a length not exceeding $l_3 = 2\ s_n$.

Table B–1–1
TYPE I–A DIMENSIONS
INDUCTIVE CYLINDRICAL PROXIMITY SWITCHES WITH THREADED BARREL

Sensing means: Inductive (I)		Dimensions (mm)					
1 Embeddable	2 Non-embeddable	Body			Nuts		
Type		d_1 thread size	l_1 minimum	l_2 maximum	AF	m +0.15	d_3 max.
I1A08	I2A08	M8 x 1	40	60	13	4	15
I1A12	I2A12	M12 x 1	40	80	17	4	20
I1A18	I2A18	M18 x 1	50	100	24	4	28
I1A30	I2A30	M30 x 1.5	50	100	36	5	42

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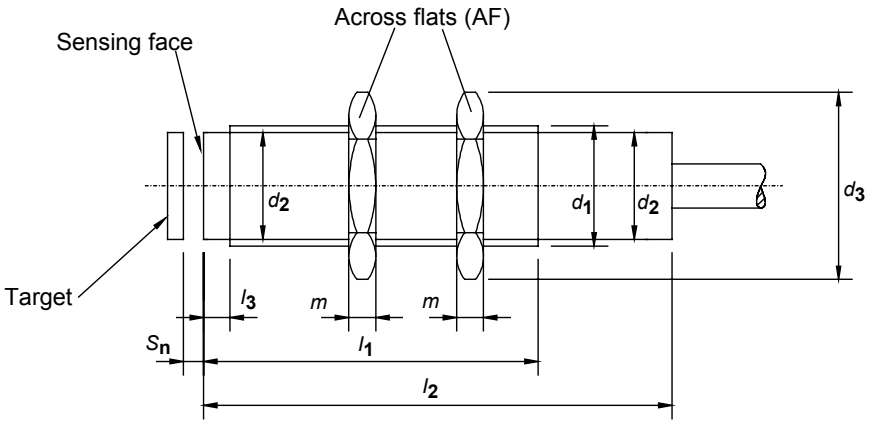


Figure B-1-1
DIMENSIONS OF TYPE I–A

B.1.2 Rated Operating Distances for Type I–A

The rated operating distance for embeddable and non-embeddable proximity switches shall be according to Table B-1-2. The rated operating distance is a conventional quantity; it does not take into account either manufacturing tolerances or variations due to external conditions such as voltage and temperature.

Extended Range Inductive Proximity Switch: A proximity switch that meets the minimum requirements given in Table B-1-2 under the stated standard test conditions.

B.1.3 Installation (Mounting) of Type I–A

Embeddable proximity switches, when installed in damping material, shall be according to Figure B-1-2 (a).

Non-embeddable proximity switches, when installed in damping material, shall be according to Figure B-1-2(c).

Semi-embeddable (unshielded) proximity switch is a variation of a non-embeddable proximity switch, when installed in damping material, shall be according to Figure B–1–2 (b).

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Table B–1–2
TYPE I–A PROPOSED RATED MINIMUM OPERATING DISTANCES (MM)
INDUCTIVE CYLINDRICAL PROXIMITY SWITCHES WITH THREADED BARREL

Type I1–Embeddable			Type I2–Non-embeddable (and semi-embeddable)		
	Rated Operating Distance (mm)			Rated operating Distance (mm)	
Form and Size	Standard	Extended Range	Form and Size	Standard	Extended Range
A08	1	**2**	A08	2	**3**
A12	2	**4**	A12	4	**6**
A18	5	**8**	A18	8	**12**
A30	10	**15**	A30	15	**22**

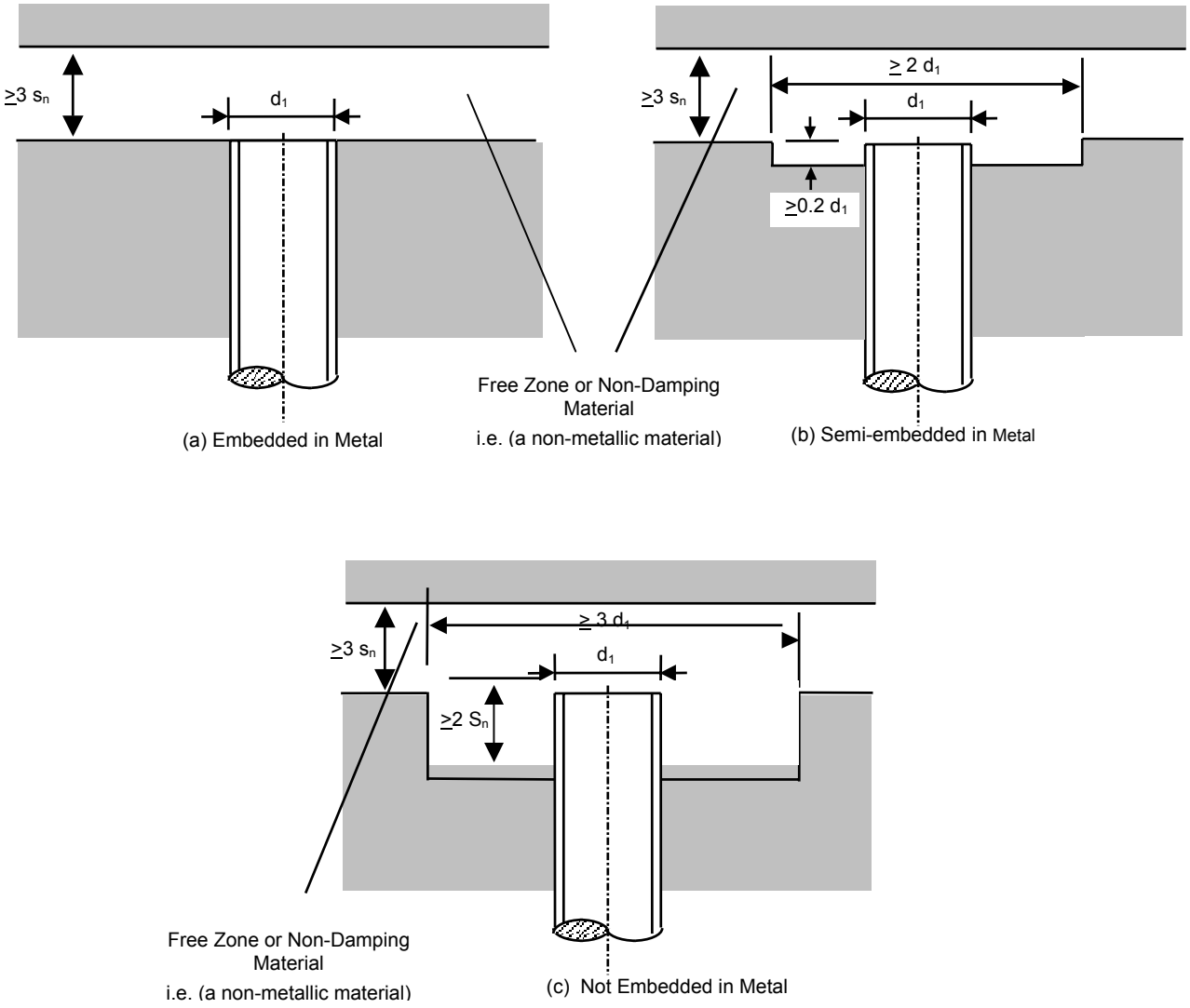


Figure B-1-2
INSTALLATION (MOUNTING) OF TYPE I–A

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B.1.4 Standard Frequency of Operation f, of Type I–A

The standard frequency of operation shall be according to Table B–1–3.

Table B–1–3
TYPE I–A STANDARD FREQUENCY OF OPERATION
INDUCTIVE CYLINDRICAL PROXIMITY SWITCHES WITH THREADED BARREL

Form and Size	Installation	Switching element function: A or B		
		Type of Output		
		P or N Hz	D Hz	F Hz
A08	1	500	300	
	2	300	200	
				5
A12	1	400	200	
	2	200	100	
A18	1	200	100	
	2	100	50	
A30	1	70	50	
	2	50	30	

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