

Proximity Sensors

972/973 Series

12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors
4-Wire DC, 2 or 4-Wire AC Types, Ferrous Only



FEATURES

- Perform in harsh environments (stainless steel housing and face)
- Designed to meet NEMA 4X, 6P, 13
- Two types of sensing:
 - ferrous metals only
 - ferrous/select non-ferrous metals
- Shielded sensing face for flush mounting
- 93-132 VAC and 10-30 VDC supply voltages
- N.O. only or N.O. & N.C. outputs
- 0 to 60°C (32 to 140°F) temperature range
- Connector or leadwire termination (oil resistant 16 gage STO cable)
- UL/CSA select listings
- LED indicators

ORDER GUIDE, FERROUS ONLY SENSING

Sensor Package Style	Sensing Range mm (in.)	Sensor Type	Sw. Freq.	Standard Target mm (in.)	Mtg. Dwg. No.	LED Ref. No.	Output Type	Termination	Catalog Listing
12 (.47)	2,0 (.08)	4-wire DC	20 Hz	12 (.47)	2	2	PNP, N.O./N.C.	Micro Connector	972AA2HI-D3P-LF
		2-wire AC	20 Hz	12 (.47)	1	3	N.O.	Micro Connector	973AA2JI-A5T-LF
18 (.71)	3,0 (.11)	4-wire DC	20 Hz	18 (.71)	13	1	PNP, N.O./N.C.	Mini Connector	972AA3II-D3P-LF
					4	1	PNP, N.O./N.C.	Preleaded (1)	972AA3WI-D3P-LF-S17
					4	1	PNP, N.O./N.C.	Preleaded (2)	972AA3WI-D3P-LF-S18
		2-wire AC	20 Hz	18 (.71)	3	3	N.O.	Mini Connector	973AH3II-A5T-LF
					5	3	N.O.	Preleaded (1)	973AH3WI-A5T-LF-037
		4-wire AC	20 Hz	18 (.71)	6	4	N.O./N.C.	Mini Connector	973AH3II-D5T-LF
					7	4	N.O./N.C.	Preleaded (1)	973AH3WI-D5T-LF-037
					8	5	N.O./N.C.	Mini Connector	973AA3II-C5T-LF1
					9	5	N.O./N.C.	Preleaded (1)	973AA3WI-C5T-LF1-037

ORDER GUIDE, FERROUS ONLY PLUS 304/316 STAINLESS STEEL SENSING

Sensor Package Style	Sensing Range mm (in.)	Sensor Type	Sw. Freq.	Standard Target mm (in.)	Mtg. Dwg. No.	LED Ref. No.	Output Type	Termination	Catalog Listing
18 (.71)	5,0 (.20)	4-wire DC	20 Hz	18 (.71)	13	1	NPN, N.O./N.C.	Mini Connector	972AA3II-D3N-LF-SO3
					13	1	PNP, N.O./N.C.	Mini Connector	972AA3II-D3P-LF-SO3
					4	1	PNP, N.O./N.C.	Preleaded (1)	972AA3WI-D3P-LF5-037
					4	1	PNP, N.O./N.C.	Preleaded (2)	972AA3WI-D3P-LF5-S18
		2-wire AC	20 Hz	18 (.71)	3	3	N.O.	Mini Connector	973AA3II-A5T-LF-S14
					5	3	N.O.	Preleaded (1)	973AA3WI-A5T-LF5-037
30 (1.18)	7 (.28)	4-wire DC	20 Hz	30 (1.18)	10	1	PNP, N.O./N.C.	Micro Connector	972AA4HI-D3P-LF-SO3
					11	1	PNP, N.O./N.C.	Preleaded (1)	972AA4WI-D3P-LF7-037
					11	1	PNP, N.O./N.C.	Preleaded (2)	972AA4WI-D3P-LF7-S18
		2-wire AC	20 Hz	30 (1.18)	12	3	N.O.	Mini Connector	973AA4II-A5T-LF-SO3
					14	3	N.O.	Preleaded (1)	973AA4WI-A5T-LF7-037

(1) STO cable

(2) Supertrex cable

Application Note: AC sensors, N.O./N.C. outputs: N.O. output must be powered in order for the N.C. output to function properly. *Based on inductive proximity principles, sensors may detect non-ferrous metals equal to or less than .012" thick.*

12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors 4-Wire DC, 2, 4-Wire AC Types

LED INDICATOR GUIDE

LED Ref. No.	LED Indicator	Operation
1 (1 Dual LED)	Green On	N.O. output conducting
	Green Flashing	N.O. output shorted
	Red On	N.C. output conducting
	Red Flashing (2 LEDs)	N.C. output shorted
2 (2 LEDs)	Green On	N.O. output conducting
	Red On	N.C. output conducting
3 (1 LED)	Red On (1 LED)	Output conducting
4 (2 Dual LEDs)	N.O. Green On	N.O. output conducting
	N.O. Red On	N.O. output shorted
	N.C. Green On	N.C. output conducting
	N.C. Red On (2 [dual] LEDs)	N.C. output shorted
5 (1 LED)	Red On (1 LED)	N.O. output conducting (N.O. output has no indicator)

CONNECTOR ORDER GUIDE

Sensor Type	Connector Description	Cable Length	Catalog Listing	
			Straight	Right Angle
4-wire DC	Mini 4-pin standard key	6'	41108	—
		12'	41109	—
4-wire DC	Micro 4-pin standard key	6'	804000A09M020	804001A09M020
		12'	804000A09M050	804001A09M050
2-wire AC	Micro 3-pin dual slot (973AA2JI-A5T-LF only)	6'	703000D02F060	703001D02F060
		12'	703000D02F120	703001D02F120
2-wire AC	Mini 3-pin standard key	6'	40902	—
		12'	40903	—
4-wire AC	Mini 5-pin standard key	6'	41307	—
		12'	41308	—

*High temperature/thermal cycle wash-downs may cause loosening of cables to sensor, due to material incompatibility. Stainless steel or plastic cable nuts are suggested in these applications. Contact your local cable distributor for these devices.

Proximity

SPECIFICATIONS, AC AND DC SENSORS

Sensor Type	4-wire DC	2-wire AC	2-wire AC	2-wire AC	4-wire AC 973AA311-C5T-LF1 973AA3WI-C5T-LF1-037	4-wire AC 973AH311-D5T-LF 973AH3WI-D5T-LF-037
Sensor Diameter	12, 18, 30 mm	12 mm	18 mm	30 mm	18 mm	18 mm
Output Style	N.O. & N.C., NPN or PNP	N.O.	N.O.	N.O.	N.O. & N.C.	N.O. & N.C.
Supply Voltage	10-30 VDC	93-132 VAC	93-132 VAC	93-132 VAC	93-132 VAC	93-132 VAC
Load Current, min-max.	0-200 mA	5-100 mA	5-500 mA	5-500 mA	5-500 mA	5-500 mA
Leakage Current, max.	10 μ A	1.7 mA	1.7 mA	1.7 mA	1.7 mA	1.7 mA
Voltage Drop, max.	1.5 V	7.5 V	7.0 V	7.5 V	7.5 V	9.0 V (N.O.) 6.5 V (N.C.)
Inrush Current	—	500 mA	2.7 A	2.7 A	2.7 A	2.7 A
Short Circuit Protection	YES	NO	NO	NO	NO	YES

GENERAL SPECIFICATIONS

Repeatability	\pm 1%
Switching Frequency	20 Hz
Hysteresis	2 to 15% of sensing distance
Temperature Range	0° to 60°C (32° to 140°F)
Environmental Protection	NEMA 4X, 6P and 13
Preleaded Style	12 ft. 16 gage STO or Supertrex
Housing Material	303 stainless steel

SENSING DISTANCE

Standard sensing distance is based on the absence of any non-ferrous metals between sensor face and ferrous target. If a build-up of non-ferrous metals (chips, shavings, etc.) occurs, it may be necessary to move the ferrous target closer to the sensing face for proper operation. The degree of reduced sensing range depends on the size and level of build-up of the non-ferrous metals. Usually, minimal build-up causes no noticeable effect on sensor performance. Worst case conditions should be tested to determine actual maximum achievable sensing range before installation.

Proximity Sensors

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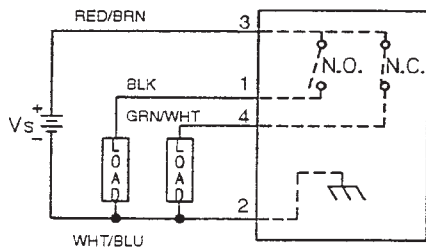
12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors

4-Wire DC, 2, 4-Wire AC Types

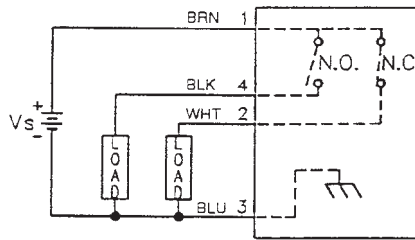
Wiring Diagrams

4-wire DC

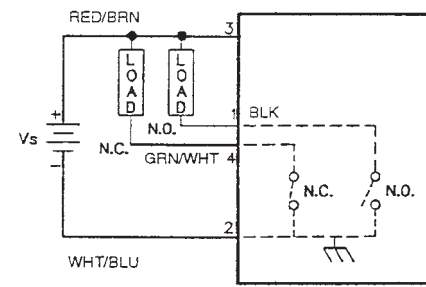
PNP (Sourcing) N.O./N.C.



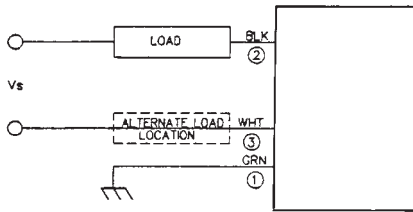
PNP (Sourcing) N.O./N.C. (Micro Connector only)



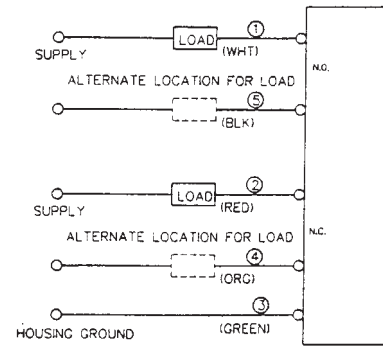
NPN (Sinking) N.O./N.C.



2-wire AC Single N.O. Output



4-wire AC Dual N.O. & N.C. Outputs



Note: N.O. output must be powered for N.C. output to work properly.

Proximity Sensors

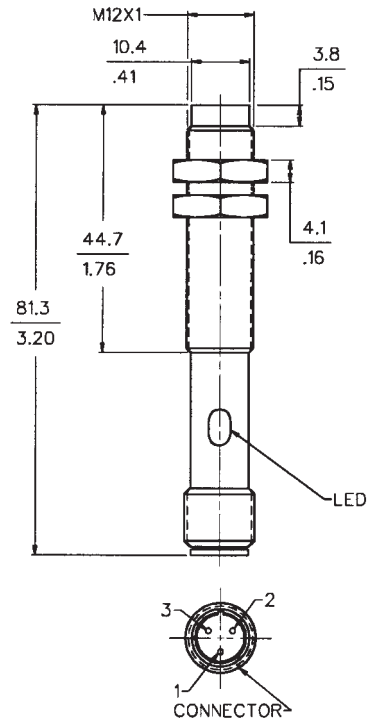
972/973 Series

12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors

4-Wire DC, 2 or 4-Wire AC Types

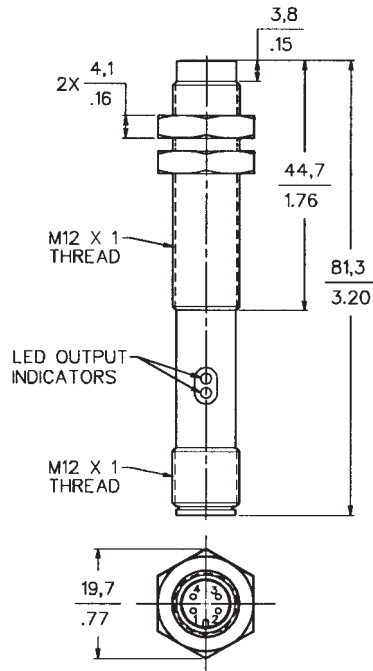
MOUNTING DIMENSIONS (For reference only)

DRAWING 1
973AA2JI-A5T-LF

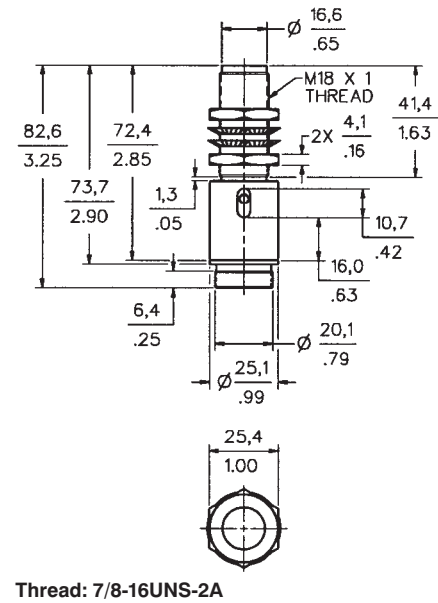


Thread: M12 x 1

DRAWING 2
972AA2HI-D3P-KF

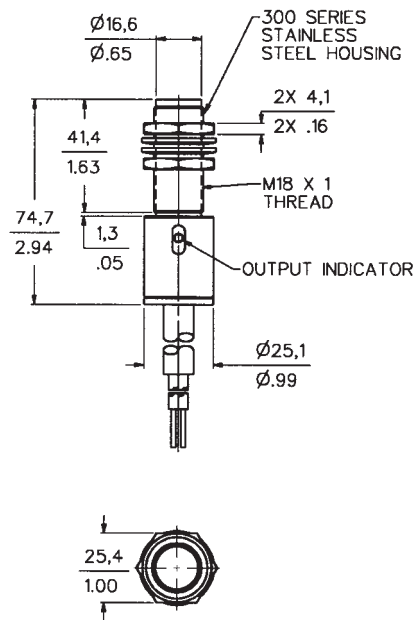


DRAWING 3
973AH3II-A5T-LF

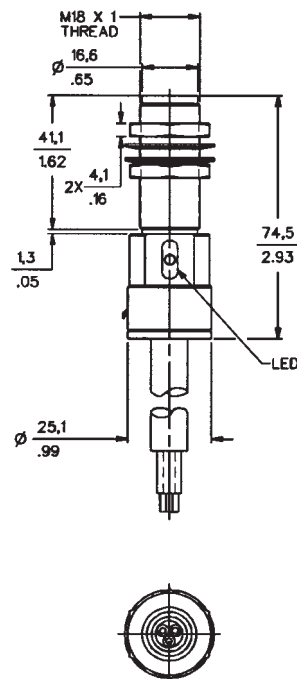


Thread: 7/8-16UNS-2A

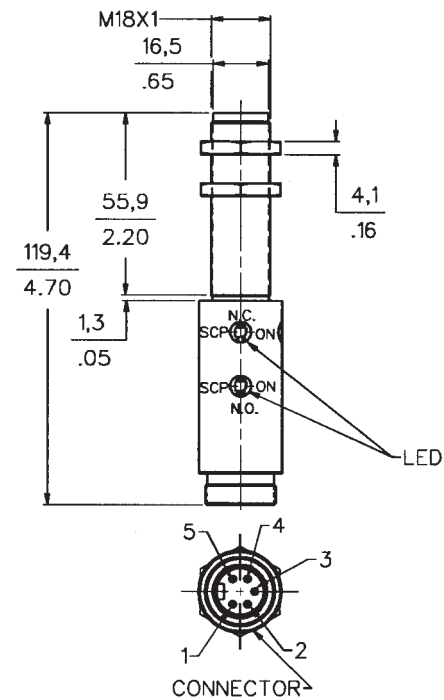
DRAWING 4
972AA3WI-D3P-LF-S17/S18
972AA3WI-D3P-LF5-037
972AA3WI-D3P-LF5-S18



DRAWING 5
973AH3WI-A5T-LF-037



DRAWING 6
973AH3II-D5T-LF



Thread: 7/8-16UNS-2A

Proximity

Proximity Sensors

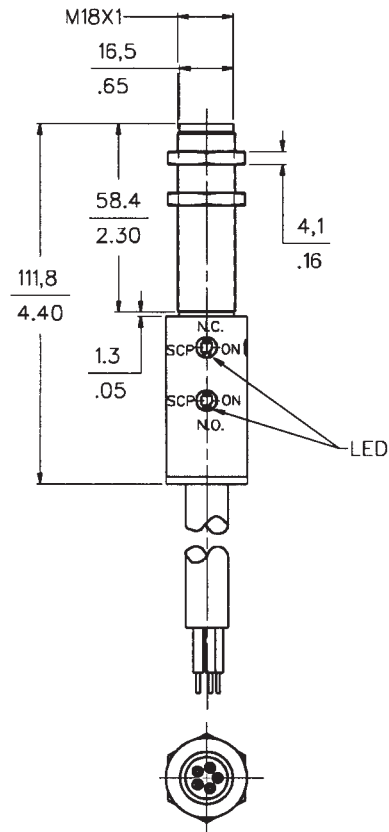
972/973 Series

12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors

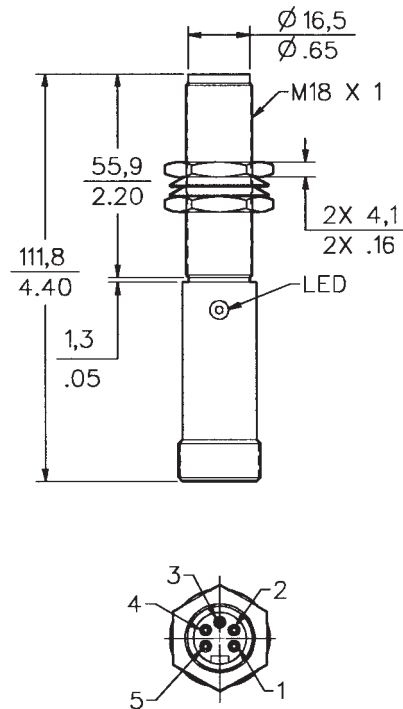
4-Wire DC, 2 or 4-Wire AC Types

MOUNTING DIMENSIONS (For reference only)

DRAWING 7
973AH3WI-D5T-LF-037

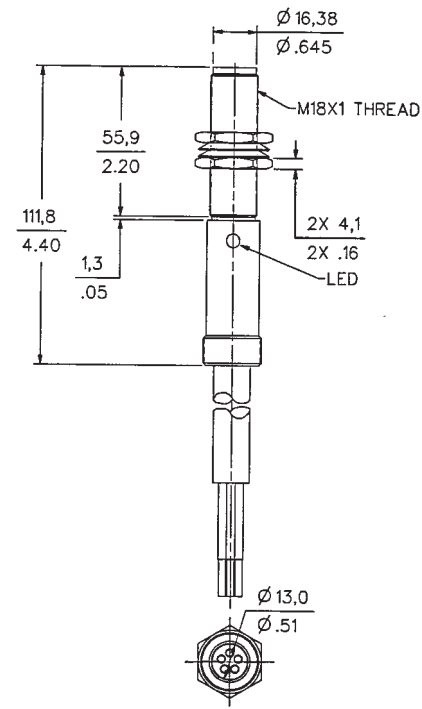


DRAWING 8
973AA3II-C5T-LF1

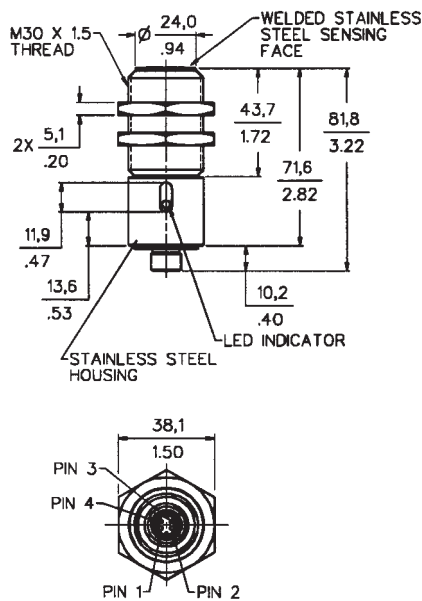


Thread: 7/8-16UNS-2A

DRAWING 9
973AA3WI-C5T-LF1-037

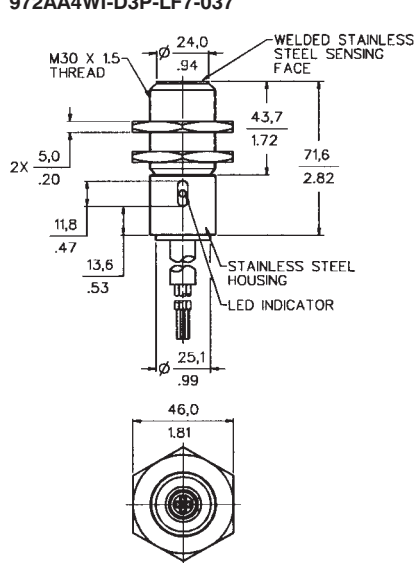


DRAWING 10
972AA4HI-D3P-LF-S03

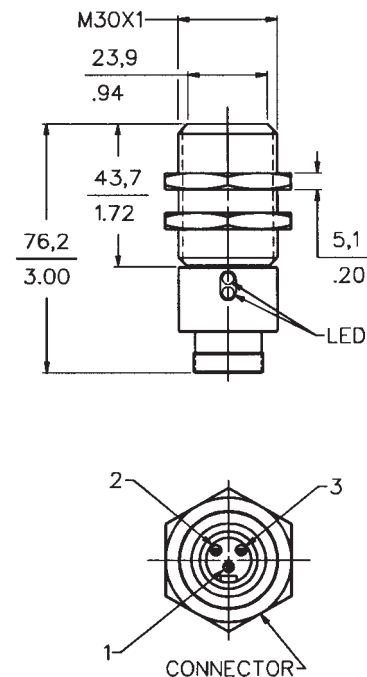


Thread: M12 x 1

DRAWING 11
972AA4WI-D3P-LF7-S18
972AA4WI-D3P-LF7-037



DRAWING 12
973AA4II-A5T-LF-S03



Thread: 7/8-16UNS-2A

Proximity Sensors

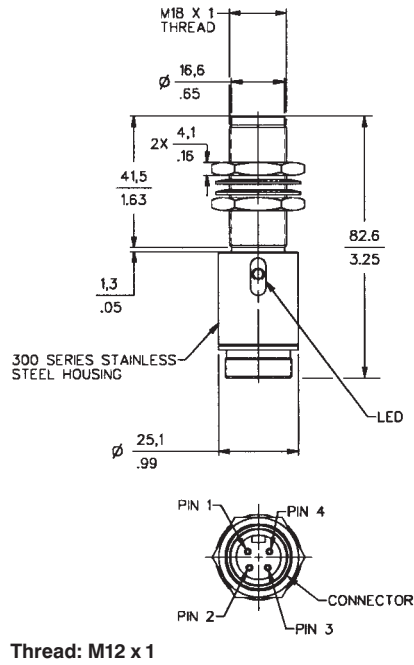
972/973 Series

12 to 30 mm Diameter Harsh Environment Stainless Steel Sensors

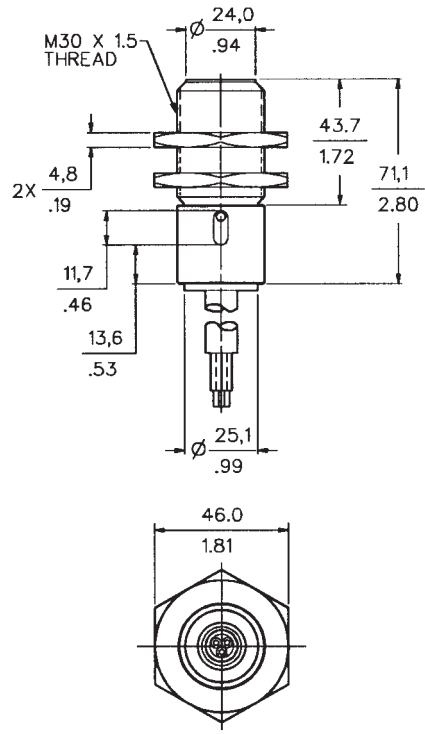
4-Wire DC, 2 or 4-Wire AC Types

MOUNTING DIMENSIONS (For reference only)

DRAWING 13
972AA3II-D3P-LF



DRAWING 14
973AA4WI-A5T-LF7-037



Proximity

Proximity Sensors

972/973 Series

12 to 30 mm Diameter Non-Ferrous Only Harsh Environment Stainless Steel Sensors 4-Wire DC, 2-Wire AC Types



FEATURES

- Perform in harsh environments (stainless steel housing and face)
- Designed to meet NEMA 4X, 6P, 13
- Shielded sensing face for flush mounting
- 93-132 VAC and 10-30 VDC supply voltages
- N.O. only or N.O. & N.C. outputs
- 0 to 60°C (32 to 140°F) temperature range
- Connector or leadwire termination (oil resistant 16 gage STO cable)
- UL/CSA select listings
- LED indicators

ORDER GUIDE, NON-FERROUS ONLY SENSING

Sensor Package Style	Sensing Range mm (in.)	Sensor Type	Sw. Freq.	Standard Target mm (in.)	Dwg. No.	LED Ref. No.	Output Type	Termination	Catalog Listing
12 (.47)	2,0 (.08)	4-wire DC	20 Hz	12 (.47)	2	2	PNP, N.O.	Micro Connector	972AA2HI-D3P-LNF
		2-wire AC	20 Hz	12 (.47)	1	3	N.O.	Micro Connector	973AA2JI-A5T-LNF
18 (.71)	3,0 (.11)	4-wire DC	20 Hz	18 (.71)	3	1	PNP, N.O./N.C.	Micro Connector	972AA3HI-D3P-LNF
		2-wire AC	20 Hz	18 (.71)	7	3	N.O.	Preleaded (1)	973AA3WI-A5T-LNF-037
30 (1.18)	7 (.28)	4-wire DC	20 Hz	30 (1.18)	6	1	PNP, N.O./N.C.	Mini Connector	972AA4II-D3P-LNF
					5	1	PNP, N.O./N.C.	Micro Connector	972AA4HI-D3P-LNF
		2-wire AC	20 Hz	30 (1.18)	4	3	N.O.	Mini Connector	973AA4II-A5T-LNF

(1) STO cable

Application Note: AC sensors, N.O./N.C. outputs: N.O. output **must** be powered in order for the N.C. output to function properly.

SPECIFICATIONS, AC AND DC SENSORS

Sensor Type	4-wire DC	2-wire AC	2-wire AC
Sensor Diameter	12, 18, 30 mm	12 mm	18, 30 mm
Output Style	N.O. & N.C., NPN or PNP	N.O.	N.O.
Supply Voltage	10-30 VDC	93-132 VAC	93-132 VAC
Load Current, min.-max.	0-200 mA	5-100 mA	5-500 mA
Leakage Current, max.	10 µA	1.7 mA	1.7 mA
Voltage Drop, max.	1.5 V	7.5 V	7.5 V
Inrush Current	—	500 mA	2.7 A
Short Circuit Protection	YES	NO	NO

GENERAL SPECIFICATIONS

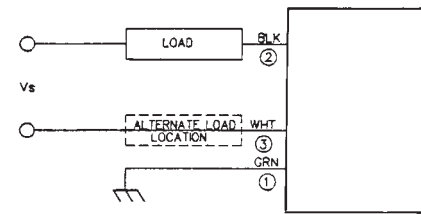
Repeatability	±1%
Switching Frequency	20 Hz
Hysteresis	2 to 15% of sensing distance
Temperature Range	0° to 60°C (32° to 140°F)
Environmental Protection	NEMA 4X, 6P and 13
Preleaded Style	12 ft. 16 gage STO
Housing Material	303 stainless steel

LED REFERENCE GUIDE

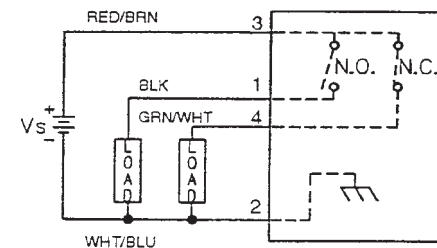
LED Ref. No.	LED Indicator	Operation
1 (1 Dual LED)	Green ON	N.O. output conducting
	Green Flashing	N.O. output shorted
	Red On	N.C. output conducting
	Red Flashing	N.C. output shorted
		Output conducting
2 (2 LEDs)	Green On	N.O. output conducting
	Red On	N.C. output conducting
3 (1 LED)	Red On	Output conducting

WIRING DIAGRAMS

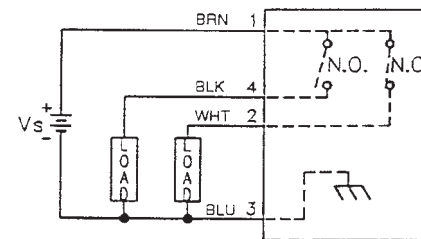
2-wire AC Single N.O. Output



4-wire DC PNP (Sourcing) Mini Connector



4-wire DC PNP (Sourcing) Micro Connector



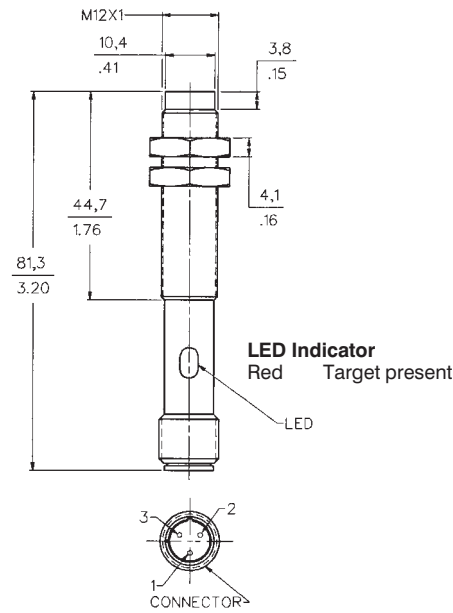
Proximity Sensors

972/973 Series

12 to 30 mm Diameter Non-Ferrous Only Harsh Environment Stainless Steel Sensors:
4-Wire DC, 2-Wire AC Types

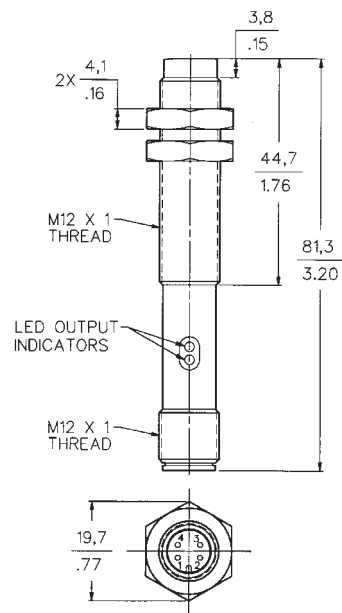
MOUNTING DIMENSIONS (For reference only)

DRAWING 1
973AA2JI-A5T-LNF

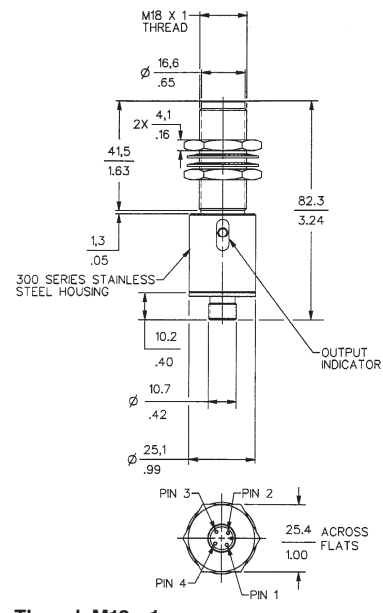


Thread: M12 x 1

DRAWING 2
972AA2HI-D3P-LNF

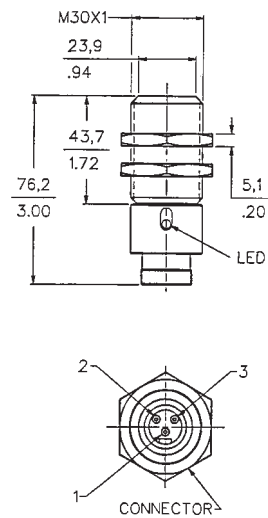


DRAWING 3
972AA3HI-D3P-LNF



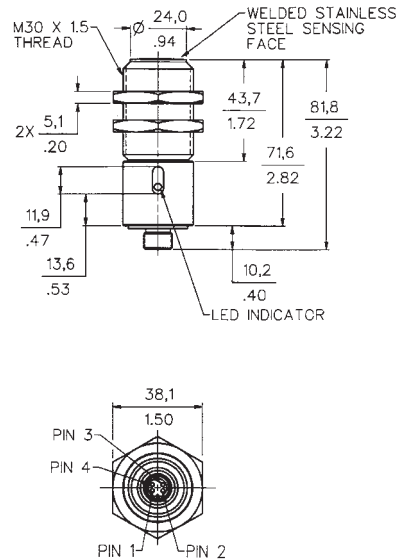
Thread: M12 x 1

DRAWING 4
973AA4II-A5T-LNF



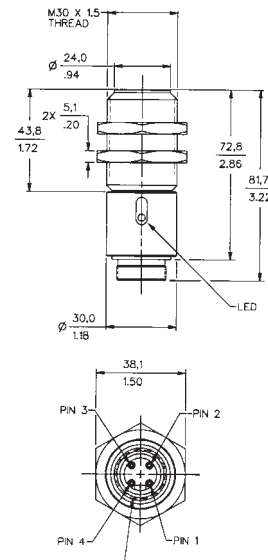
Thread: 7/8-16UNS-2A

DRAWING 5
972AA4HI-D3P-LNF



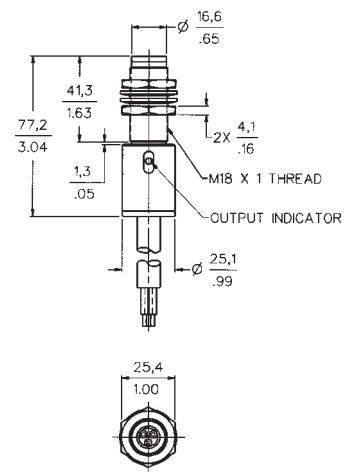
Thread: M12 x 1

DRAWING 6
972AA4II-D3P-LNF



Thread: 7/8-16UNS-2A

DRAWING 7
973AA3WI-AST-LNF-037



CONNECTOR ORDER GUIDE

Sensor Type	Connector Description	Cable Length	Catalog Listing*	
			Straight	Right Angle
4-wire DC	Mini 4-pin standard key	6'	41108	—
		12'	41109	—
4-wire DC	Micro 4-pin standard key	6'	804000A09M020	804001A09M020
		12'	804000A09M050	804001A09M050
2-wire AC	Micro 3-pin dual slot (973AA2JI-A5T-LF/-LNF only)	6'	703000D02F060	703001D02F060
		12'	703000D02F120	703001D02F120
2-wire AC	Mini 3-pin standard key	6'	40902	—
		12'	40903	—
4-wire AC	Mini 5-pin standard key	6'	41307	—
		12'	41308	—

Proximity