

# **Sensors for Automation**

## **Catalog Section Inductive Proximity Switches and Accessories**

ALSEN TK 1 + 12.1 Edition 9.13



## **Contents**

0	Introduction	12	Accessories for Sensors
0.0.3 0.0.4 0.0.5 0.0.6 0.0.7 0.0.8 0.0.9 0.0.10 0.0.11 0.0.12	Inductive Proximity Switches by ref. no. Inductive Proximity Switches by type Accessories by ref. no. Accessories by type Basic information Type code Connecting variables Connection diagrams DC 3- and 4-pole Connection diagrams DC and AC 2-pole Connection diagrams DC 3-pole push-pull Materials and leads	12.1 12.1.0.1 12.1.1.1 12.1.2.1 12.1.2.3 12.1.3.1	Connectors, adaptors Overview Cordsets (socket-lead, ready-for-use Field attachable sockets Field attachable plugs Cordsets (socket-lead-plug, adaptors  Agencies and distributors
4	Industive Provincity Switches		
1 1.0.1 1.0.2 1.0.3 1.0.4	Inductive Proximity Switches  Tasks, mode of operation, requirement profiles Switching behaviour Switching frequency, external influences Mounting instructions		
1.1 1.1.0.1 1.1.1.1 1.1.2.1 1.1.3.1 1.1.4.1 1.1.5.1	All Metal Standard, DC 3- and 4-pole Characteristics, overview Series IAD/AHM-8eg Series IAD/AHM-12mg Series IAD/AHM-18mg Series IAD/AHM-30mg Series IAD/AHM-40aq, -80aq		
<b>1.2</b> 1.2.0.1 1.2.1.1 1.2.2.1	All Metal Automotive, DC 3- and 4-pole Characteristics, overview Series IAD/AHMS-8eg, -12mg, -18mg, -30mg Series IAD/AHMS-40aq, -80aq		
1.3 1.3.0.1 1.3.1.1 1.3.2.3 1.3.3.1 1.3.3.3 1.3.3.5 1.3.3.7 1.3.4.1 1.3.4.3 1.3.4.5 1.3.4.7 1.3.5.1 1.3.5.3 1.3.5.3 1.3.5.1 1.3.5.3	Ferro DC 3- and 4-pole Characteristics, overview Series IAD-4er, -6,5mr Series IAD-8mg Series IAD-8mg Series IAD-12eg, -12fg, -12mg Series IAD-12mg Series IAD-12mg Series IAD-12mg Series IAD-18mg Series IAD-18mg Series IAD-18mg Series IAD-18mg Series IAD-18mg Series IAD-30fg, -30mg Series IAD-30mg, -30sg Series IAD-34aq Series IAD-80fr		
1.10 1.10.0.1 1.10.1.1 1.10.1.3	Non-ferrous Metal Characteristics, overview Series IBD-30mg, -34fq Series IBD-40fv		
1.13 1.13.0.1 1.13.1.1 1.13.1.3 1.13.1.5	Distance and Displacement Sensors, Inductive Characteristics, overview Series IGA-12mg Series IGA-18mg Series IGA-30mg		



You will find a further selection from our extensive product range of sensors in the following catalogs:

Catalog Section Pulse Sensors and Accessories TK 2 + 12.1

Catalog Section Safety Elements and Accessories TK 5 + 12.2

Catalog Section Ultrasonic Sensors TK 8

Catalog Section Capacitive Sensors TK 9

## Articles sorted by ref. no.

Ref. no.	Type designation	Page	Ref. no.	Type designation	Page
11.03-94-050	IAD-80fr70n50-1NT1A	1.3.8.2	11.35-92	IAD-8mg50b2-1Wc1A	1.3.2.2
11.16-50-020	IAD-30fg80b10-12NK1A	1.3.5.1	11.35-93	IAD-8mg50n3-1Wc1A	1.3.2.2
11.17-12-020	IAD-18fg80b5-1NK1A	1.3.4.1	11.35-94	IAD-8zq60b2-1Wc1A	1.3.2.3
11.18-32-020	IAD-18mg85b5-12NK1A	1.3.4.6	11.35-95	IAD-8mg58n3-1Sd1A	1.3.2.2
11.18-71-020	IAD-30mg80b10-12NT1A	1.3.5.4	11.35-96	IAD-8mg58b2-1Sd1A	1.3.2.2
11.20-01-020	IAD-12mg60b2-1NT1A	1.3.3.6	11.36-03	IAD/AHMS-12mg50b3,5-1Sd1A	1.2.1.2
11.20-02-020	IAD-18mg85b5-1NT1A	1.3.4.6	11.36-04	IAD/AHMS-18mg50b6-1Sd1A	1.2.1.2
11.20-03-020	IAD-30mg80b10-1NT1A	1.3.5.2	11.36-07	IAD/AHMS-30mg50b10-12Sd1A	1.2.1.2
11.20-15-020	IAD-12mg60n5-1NK1A	1.3.3.8	11.36-16	IAD/AHMS-40aq40b15-12Sd1B	1.2.2.1
11.20-30-020	IAD-18mg35b5-1NK1A	1.3.4.2	11.36-18	IAD/AHMS-80aq40b40-12Sd1B	1.2.2.1
11.20-67-030	IAD-12mg40b2-1NK1A	1.3.3.4	11.36-22	IAD/AHMS-8eg60b1,5-1Wc1A	1.2.1.1
11.20-73	IAD-12mg50b2-1S1A	1.3.3.5	11.36-23	IAD/AHMS-8eg60b1,5-1Sd1A	1.2.1.1
11.20-75-020	IAD-18mg85n10-1NT1A	1.3.4.7	11.37-03	IAD/AHM-12mg50b3,5-1Sd1A	1.1.2.1
11.20-95-020	IAD-18fg80n10-1NK1A	1.3.4.1	11.37-04	IAD/AHM-18mg50b6-1Sd1A	1.1.3.1
11.22-03	IAD-18mg60b5-12S1A	1.3.4.4	11.37-06	IAD/AHM-18mg50b6-12Sd1A	1.1.3.1
11.22-04	IAD-30sg80b10-12S1A	1.3.5.3	11.37-07	IAD/AHM-30mg50b10-12Sd1A	1.1.4.1
11.22-05	IAD-30mg80n20-12S1A	1.3.5.2	11.37-10	IAD/AHM-12mg50b3,5-2Sd1A	1.1.2.1
11.22-06	IAD-18mg50b5-1S1A	1.3.4.3	11.37-16	IAD/AHM-40aq40b15-12Sd1B	1.1.5.1
11.22-11-020	IAD-12mg60b2-12NK1A	1.3.3.6	11.37-18	IAD/AHM-80aq40b40-12Sd1B	1.1.5.1
11.22-12	IAD-12mg60b2-12S1A	1.3.3.6	11.37-22	IAD/AHM-8eg60b1,5-1Wc1A	1.1.1.1
11.22-16	IAD-18mg50n10-1S1A	1.3.4.4	11.37-23	IAD/AHM-8eg60b1,5-1Sd1A	1.1.1.2
11.22-19	IAD-30mg50b10-1S1A	1.3.5.1	11.37-24	IAD/AHM-8eg60b1,5-2Wc1A	1.1.1.1
11.22-23	IAD-12mg60n5-12S1A	1.3.3.8	11.37-25	IAD/AHM-8eg60b1,5-2Sd1A	1.1.1.2
11.22-42-020	IAD-12mg50b2-1PK1A	1.3.3.5	11.37-26-020	IAD/AHM-8eg45b1,5-1NDc1A	1.1.1.2
11.22-85	IAD-18mg80b5-1S1A	1.3.4.6	11.37-27-020	IAD/AHM-8eg45b1,5-2NDc1A	1.1.1.2
11.22-86	IAD-30mg95b10-1S1A	1.3.5.3	11.37-28-020	IAD/AHM-12mg50b3,5-1NDc1A	1.1.2.1
11.22-91	IAD-18mg80n10-1S1A	1.3.4.6	11.37-29-020	IAD/AHM-12mg50b3,5-2NDc1A	1.1.2.1
11.24-09-030	IAD-12mg60m4-1NT1A	1.3.3.7	11.37-30-020	IAD/AHM-18mg50b6-1NDc1A	1.1.3.1
11.24-89	IAD-12eg60b2-12S2A	1.3.3.1	11.37-32-020	IAD/AHM-18mg50b6-12NDd1A	1.1.3.1
11.25-03	IAD-12mg60m4-1S1A	1.3.3.8	11.37-33-020	IAD/AHM-30mg50b10-12NDd1A	1.1.4.1
11.25-04	IAD-12mg60n5-1S1A	1.3.3.8	11.37-35-050	IAD/AHM-80aq40b40-12NKd1B	1.1.5.2
11.25-52	IAD-40fv114b15-12L1B	1.3.7.1	11.37-52	IAD/AHM-12mg60n6-1Sd1A	1.1.2.2
11.25-53	IAD-40fv114n25-12L1B	1.3.7.1	11.37-53	IAD/AHM-12mg60n6-2Sd1A	1.1.2.2
11.25-66	IAD-40fv114b15-12S1B	1.3.7.2	11.37-54	IAD/AHM-18mg60n10-1Sd1A	1.1.3.2
11.25-81-020	IAD-12mg60m4-1PD1A	1.3.3.7	11.37-55	IAD/AHM-18mg60n10-12Sd1A	1.1.3.2
11.25-82-030	IAD-18mg70m8-1PD1A	1.3.4.4	11.37-57	IAD/AHM-8eg60n3-1Wc1A	1.1.1.1
11.25-85	IAD-12mg60b2-1S2A	1.3.3.6	11.37-58	IAD/AHM-8eg60n3-1Sd1A	1.1.1.2
11.25-86	IAD-18mg70b5-1S1A	1.3.4.4	11.37-59	IAD/AHM-8eg60n3-2Wc1A	1.1.1.1
11.25-88	IAD-30mg70b10-1S1A	1.3.5.2	11.37-60	IAD/AHM-8eg60n3-2Sd1A	1.1.1.2
11.25-90	IAD-34aq65b12-1S1A	1.3.6.1	11.37-61-020	IAD/AHM-8eg45n3-1NDc1A	1.1.1.2
11.25-92	IAD-80fr70n50-1S1A	1.3.8.2	11.37-62-020	IAD/AHM-8eg45n3-2NDc1A	1.1.1.2
11.25-97	IAD-18mg70m8-1S1A	1.3.4.5	11.37-63-020	IAD/AHM-12mg60n6-1NDc1A	1.1.2.2
11.32-17-020	IAD-12mg45b2-1NK1A	1.3.3.4	11.37-64-020	IAD/AHM-12mg60n6-2NDc1A	1.1.2.2
11.32-19-050	IAD-12mg45b2-7NK1A	1.3.3.4	11.37-67-020	IAD/AHM-18mg60n10-1NDc1A	1.1.3.2
11.32-36	IAD-30mg65n20-1S1A	1.3.5.2	11.37-69-020	IAD/AHM-18mg60n10-12NDd1A	1.1.3.2
11.32-61-020	IAD-12fg50b2-1NK1A	1.3.3.2	11.37-70	IAD/AHM-30mg85n20-12Sd1A	1.1.4.2
11.32-62-030	IAD-12fg50n5-1NK1A	1.3.3.2	11.37-71-020	IAD/AHM-30mg65n20-12NDd1A	1.1.4.2
11.32-85	IAD-12eg60b2-12S3A	1.3.3.1	11.43-08	IAD-80fr70e80-1Sd1A	1.3.8.1
11.32-91	IAD-18mg70n10-12V1A	1.3.4.5	13.02-11	IGA-18mg61n1/8-1Sd1	1.13.1.4
11.32-98	IAD-40fv114n25-12S1B	1.3.7.2	13.02-12	IGA-30mg50b1/9-1Sd1	1.13.1.5
11.33-05-020	IAD-12mg35m4-1PD1A	1.3.3.2	13.02-13-020	IGA-30mg40b1/9-1ND1	1.13.1.6
11.33-10-020	IAD-12mg35m4-6ND1A	1.3.3.4	13.02-14-020	IGA-12mg50b0,25/3-1ND1	1.13.1.1
11.33-11-020	IAD-18mg40m8-6ND1A	1.3.4.2	13.02-15	IGA-12mg60b0,25/3-1Sd1	1.13.1.2
11.33-18	IAD-18mg50m8-1S1A	1.3.4.3	13.02-16-020	IGA-18mg50n1/8-1ND1	1.13.1.3
11.35-01-030	IAD-12mg35m4-1ND2A	1.3.3.3	13.02-17	IGA-30mg50n3/15-1Sd1	1.13.1.6
11.35-02-020	IAD-12mg35m4-2ND1A	1.3.3.3	13.17-04	IBD-30mg95b8-1T1A	1.10.1.1
11.35-03-020	IAD-18mg40m8-1ND2A	1.3.4.2	13.17-08	IBD-34fq65b10-1T1A	1.10.1.2
11.35-04-020	IAD-18mg45m8-2ND1A	1.3.4.2	13.17-09	IBD-30mg80b8-1S1A	1.10.1.1
11.35-22	IAD-80fr70n35-12S1A	1.3.8.1	13.22-02	IBD-40fv114b20-12T1B	1.10.1.3
11.35-87-020	IAD-4er27b0,8-1PD1A	1.3.1.1	13.22-05	IBD-40fv114b20-12K2B	1.10.1.4
11.35-88-020	IAD-6,5mr30b2-1ND1A	1.3.1.1	13.22-06	IBD-40fv114b20-12S1B	1.10.1.4
11.35-89-020	IAD-8mg33b2-1ND1A	1.3.2.1	13.27-02	IGA-18mg80b5-1S1	1.13.1.4
11.35-90-020	IAD-8mg33n3-1ND1A	1.3.2.1			
11.35-91-020	IAD-8zq40b2-1ND1A	1.3.2.3			
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## **Articles sorted by type**



Town deal made	Defere	Barrie	<b>T</b>	Define	Deve
Type designation	Ref. no.	Page	Type designation	Ref. no.	Page
IAD-4er27b0,8-1PD1A	11.35-87-020	1.3.1.1	IAD-40fv114n25-12L1B	11.25-53	1.3.7.1
IAD-6,5mr30b2-1ND1A	11.35-88-020	1.3.1.1	IAD-40fv114n25-12S1B	11.32-98	1.3.7.2
IAD-8mg33b2-1ND1A	11.35-89-020	1.3.2.1	IAD-80fr70e80-1Sd1A	11.43-08	1.3.8.1
IAD-8mg33n3-1ND1A	11.35-90-020	1.3.2.1	IAD-80fr70n35-12S1A	11.35-22	1.3.8.1
IAD-8mg50b2-1Wc1A	11.35-92	1.3.2.2	IAD-80fr70n50-1NT1A	11.03-94-050	1.3.8.2
IAD-8mg50n3-1Wc1A	11.35-93	1.3.2.2	IAD-80fr70n50-1S1A	11.25-92	1.3.8.2
IAD-8mg58b2-1Sd1A	11.35-96 11.35-95	1.3.2.2 1.3.2.2	IAD/AHM 80g45b1,5-1NDc1A	11.37-26-020	1.1.1.2 1.1.1.2
IAD-8mg58n3-1Sd1A IAD-8zq40b2-1ND1A	11.35-91-020	1.3.2.3	IAD/AHM-8eg45b1,5-2NDc1A IAD/AHM-8eg45n3-1NDc1A	11.37-27-020 11.37-61-020	1.1.1.2
IAD-8zq60b2-1Wc1A	11.35-94	1.3.2.3	IAD/AHM-8eg45n3-2NDc1A	11.37-62-020	1.1.1.2
IAD-12eg60b2-12S2A	11.24-89	1.3.3.1	IAD/AHM-8eg60b1,5-1Sd1A	11.37-23	1.1.1.2
IAD-12eg60b2-12S3A	11.32-85	1.3.3.1	IAD/AHM-8eg60b1,5-1Wc1A	11.37-22	1.1.1.1
IAD-12fg50b2-1NK1A	11.32-61-020	1.3.3.2	IAD/AHM-8eg60b1,5-2Sd1A	11.37-25	1.1.1.2
IAD-12fg50n5-1NK1A	11.32-62-030	1.3.3.2	IAD/AHM-8eg60b1,5-2Wc1A	11.37-24	1.1.1.1
IAD-12mg35m4-1ND2A	11.35-01-030	1.3.3.3	IAD/AHM-8eg60n3-1Sd1A	11.37-58	1.1.1.2
IAD-12mg35m4-1PD1A	11.33-05-020	1.3.3.2	IAD/AHM-8eg60n3-1Wc1A	11.37-57	1.1.1.1
IAD-12mg35m4-2ND1A	11.35-02-020	1.3.3.3	IAD/AHM-8eg60n3-2Sd1A	11.37-60	1.1.1.2
IAD-12mg35m4-6ND1A	11.33-10-020	1.3.3.4	IAD/AHM-8eg60n3-2Wc1A	11.37-59	1.1.1.1
IAD-12mg40b2-1NK1A	11.20-67-030	1.3.3.4	IAD/AHM-12mg50b3,5-1NDc1A	11.37-28-020	1.1.2.1
IAD-12mg45b2-1NK1A	11.32-17-020	1.3.3.4	IAD/AHM-12mg50b3,5-1Sd1A	11.37-03	1.1.2.1
IAD-12mg45b2-7NK1A	11.32-19-050	1.3.3.4	IAD/AHM-12mg50b3,5-2NDc1A	11.37-29-020	1.1.2.1
IAD-12mg50b2-1PK1A	11.22-42-020	1.3.3.5	IAD/AHM-12mg50b3,5-2Sd1A	11.37-10	1.1.2.1
IAD-12mg50b2-1S1A	11.20-73	1.3.3.5	IAD/AHM-12mg60n6-1NDc1A	11.37-63-020	1.1.2.2
IAD-12mg60b2-12NK1A	11.22-11-020	1.3.3.6	IAD/AHM-12mg60n6-1Sd1A	11.37-52	1.1.2.2
IAD-12mg60b2-12S1A	11.22-12	1.3.3.6	IAD/AHM-12mg60n6-2NDc1A	11.37-64-020	1.1.2.2
IAD-12mg60b2-1NT1A	11.20-01-020	1.3.3.6	IAD/AHM-12mg60n6-2Sd1A	11.37-53	1.1.2.2
IAD-12mg60b2-1S2A	11.25-85	1.3.3.6	IAD/AHM-18mg50b6-12NDd1A	11.37-32-020	1.1.3.1
IAD-12mg60m4-1NT1A	11.24-09-030	1.3.3.7	IAD/AHM-18mg50b6-12Sd1A	11.37-06	1.1.3.1
IAD-12mg60m4-1PD1A	11.25-81-020	1.3.3.7	IAD/AHM-18mg50b6-1NDc1A	11.37-30-020	1.1.3.1
IAD-12mg60m4-1S1A	11.25-03	1.3.3.8	IAD/AHM-18mg50b6-1Sd1A	11.37-04	1.1.3.1
IAD-12mg60n5-12S1A	11.22-23	1.3.3.8	IAD/AHM-18mg60n10-12NDd1A	11.37-69-020	1.1.3.2
IAD-12mg60n5-1NK1A	11.20-15-020	1.3.3.8	IAD/AHM-18mg60n10-12Sd1A	11.37-55	1.1.3.2
IAD-12mg60n5-1S1A	11.25-04	1.3.3.8	IAD/AHM-18mg60n10-1NDc1A	11.37-67-020	1.1.3.2
IAD-18fg80b5-1NK1A	11.17-12-020	1.3.4.1	IAD/AHM-18mg60n10-1Sd1A	11.37-54	1.1.3.2
IAD-18fg80n10-1NK1A	11.20-95-020	1.3.4.1	IAD/AHM-30mg50b10-12NDd1A	11.37-33-020	1.1.4.1
IAD-18mg35b5-1NK1A	11.20-30-020	1.3.4.2	IAD/AHM-30mg50b10-12Sd1A	11.37-07	1.1.4.1
IAD-18mg40m8-1ND2A	11.35-03-020	1.3.4.2 1.3.4.2	IAD/AHM-30mg65n20-12NDd1A	11.37-71-020 11.37-70	1.1.4.2 1.1.4.2
IAD-18mg40m8-6ND1A IAD-18mg45m8-2ND1A	11.33-11-020 11.35-04-020	1.3.4.2	IAD/AHM-30mg85n20-12Sd1A IAD/AHM-40aq40b15-12Sd1B	11.37-16	1.1.4.2
IAD-18mg50b5-1S1A	11.22-06	1.3.4.3	IAD/AHM-80aq40b40-12NKd1B	11.37-10	1.1.5.1
IAD-18mg50m8-1S1A	11.33-18	1.3.4.3	IAD/AHM-80aq40b40-12Sd1B	11.37-18	1.1.5.2
IAD-18mg50n10-1S1A	11.22-16	1.3.4.4	IAD/AHMS-8eg60b1,5-1Sd1A	11.36-23	1.2.1.1
IAD-18mg60b5-12S1A	11.22-03	1.3.4.4	IAD/AHMS-8ea60b1,5-1Wc1A	11.36-22	1.2.1.1
IAD-18mg70b5-1S1A	11.25-86	1.3.4.4	IAD/AHMS-12mg50b3,5-1Sd1A	11.36-03	1.2.1.2
IAD-18mg70m8-1PD1A	11.25-82-030	1.3.4.4	IAD/AHMS-18mg50b6-1Sd1A	11.36-04	1.2.1.2
IAD-18mg70m8-1S1A	11.25-97	1.3.4.5	IAD/AHMS-30mg50b10-12Sd1A	11.36-07	1.2.1.2
IAD-18mg70n10-12V1A	11.32-91	1.3.4.5	IAD/AHMS-40aq40b15-12Sd1B	11.36-16	1.2.2.1
IAD-18mg80b5-1S1A	11.22-85	1.3.4.6	IAD/AHMS-80aq40b40-12Sd1B	11.36-18	1.2.2.1
IAD-18mg80n10-1S1A	11.22-91	1.3.4.6	IBD-30mg80b8-1S1A	13.17-09	1.10.1.1
IAD-18mg85b5-12NK1A	11.18-32-020	1.3.4.6	IBD-30mg95b8-1T1A	13.17-04	1.10.1.1
IAD-18mg85b5-1NT1A	11.20-02-020	1.3.4.6	IBD-34fq65b10-1T1A	13.17-08	1.10.1.2
IAD-18mg85n10-1NT1A	11.20-75-020	1.3.4.7	IBD-40fv114b20-12K2B	13.22-05	1.10.1.4
IAD-30fg80b10-12NK1A	11.16-50-020	1.3.5.1	IBD-40fv114b20-12S1B	13.22-06	1.10.1.4
IAD-30mg50b10-1S1A	11.22-19	1.3.5.1	IBD-40fv114b20-12T1B	13.22-02	1.10.1.3
IAD-30mg65n20-1S1A	11.32-36	1.3.5.2	IGA-12mg50b0,25/3-1ND1	13.02-14-020	1.13.1.1
IAD-30mg70b10-1S1A	11.25-88	1.3.5.2	IGA-12mg60b0,25/3-1Sd1	13.02-15	1.13.1.2
IAD-30mg80b10-1NT1A	11.20-03-020	1.3.5.2	IGA-18mg50n1/8-1ND1	13.02-16-020	1.13.1.3
IAD-30mg80n20-12S1A	11.22-05	1.3.5.2	IGA-18mg61n1/8-1Sd1	13.02-11	1.13.1.4
IAD-30mg95b10-1S1A	11.22-86	1.3.5.3	IGA-18mg80b5-1S1	13.27-02	1.13.1.4
IAD-30mg80b10-12NT1A	11.18-71-020	1.3.5.4	IGA-30mg40b1/9-1ND1	13.02-13-020	1.13.1.6
IAD-30sg80b10-12S1A	11.22-04	1.3.5.3	IGA-30mg50b1/9-1Sd1	13.02-12	1.13.1.5
IAD-34aq65b12-1S1A	11.25-90	1.3.6.1	IGA-30mg50n3/15-1Sd1	13.02-17	1.13.1.6
IAD-40fv114b15-12L1B	11.25-52	1.3.7.1			
IAD-40fv114b15-12S1B	11.25-66	1.3.7.2			

## **Accessories**

## Articles sorted by ref. no.

Ref. no.	Type designation	Page	Ref. no.	Type designation	Page
13.97-01-020	JSM8U3/LN3x0,34u5,0OG	12.1.1.1	13.98-01	JSM8U3	12.1.2.1
13.97-01-050	JSM8U3/LN3x0,34u5,0OG	12.1.1.1	13.98-02	JSM8U4	12.1.2.1
13.97-01-100	JSM8U3/LN3x0,34u5,0OG	12.1.1.1	13.98-03	JSM8V3	12.1.2.1
13.97-03-020	JSM8U4/LN4x0,25u5,0OG	12.1.1.1	13.98-04	JSM8V4	12.1.2.1
13.97-03-050	JSM8U4/LN4x0,25u5,0OG	12.1.1.1	13.98-06	JSM12U4	12.1.2.1
13.97-03-100	JSM8U4/LN4x0,25u5,0OG	12.1.1.1	13.98-08	JSM12V4	12.1.2.1
13.97-05-020	JSM8V3/LN3x0,34u5,0OG	12.1.1.1	13.98-09	JSM12U5	12.1.2.2
13.97-05-050	JSM8V3/LN3x0,34u5,0OG	12.1.1.1	13.98-10	JSM12U8	12.1.2.2
13.97-05-100	JSM8V3/LN3x0,34u5,0OG	12.1.1.1	13.98-11	JSM12V5	12.1.2.2
13.97-07-020	JSM8V4/LN4x0,25u5,0OG	12.1.1.1	13.98-12	JJSM12V8	12.1.2.2
		12.1.1.1			
13.97-07-050	JSM8V4/LN4x0,25u5,0OG		13.98-13	JSM18U4	12.1.2.2
13.97-07-100	JSM8V4/LN4x0,25u5,0OG	12.1.1.1	13.98-14	JSM18V4	12.1.2.2 12.1.2.2
13.97-09-020	JSM8V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-19	JSV28V5	
13.97-09-050	JSM8V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-30	JSM8S3	12.1.2.3
13.97-09-100	JSM8V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-31	JSM8S4	12.1.2.3
13.97-11-020	JSM12U3/LN3x0,34u5,0OG	12.1.1.2	13.98-32	JSM8T3	12.1.2.3
13.97-11-050	JSM12U3/LN3x0,34u5,0OG	12.1.1.2	13.98-33	JSM8T4	12.1.2.3
13.97-11-100	JSM12U3/LN3x0,34u5,0OG	12.1.1.2	13.98-34	JSM12S3	12.1.2.3
13.97-13-020	JSM12U4/LN4x0,25u5,0OG	12.1.1.2	13.98-35	JSM12S4	12.1.2.3
13.97-13-050	JSM12U4/LN4x0,25u5,0OG	12.1.1.2	13.98-36	JSM12T3	12.1.2.3
13.97-13-100	JSM12U4/LN4x0,25u5,0OG	12.1.1.2	13.98-37	JSM12T4	12.1.2.3
13.97-17-020	JSM12V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-38	JSM12S5	12.1.2.4
13.97-17-050	JSM12V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-39	JSM12S8	12.1.2.4
13.97-17-100	JSM12V3gy/LN3x0,34u5,0OG	12.1.1.2	13.98-40	JSM12T5	12.1.2.4
13.97-19-020	JSM12V4gyy/LN4x0,25u5,0OG	12.1.1.2	13.98-41	JSM12T8	12.1.2.4
13.97-19-050	JSM12V4gyy/LN4x0,25u5,0OG	12.1.1.2			
13.97-19-100	JSM12V4gyy/LN4x0,25u5,0OG	12.1.1.2			
13.97-21-020	JSM12V4/LN4x0,25u5,0OG	12.1.1.2			
13.97-21-050	JSM12V4/LN4x0,25u5,0OG	12.1.1.2			
13.97-21-100	JSM12V4/LN4x0,25u5,0OG	12.1.1.2			
13.97-24-020	JSM12V3/LN3x0,34u5,0OG	12.1.1.2			
13.97-24-050	JSM12V3/LN3x0,34u5,0OG	12.1.1.2			
13.97-24-100	JSM12V3/LN3x0,34u5,0OG	12.1.1.2			
13.97-50-006	JSM8U3/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-50-010	JSM8U3/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-50-020	JSM8U3/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-51-006	JSM8V3gy/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-51-010	JSM8V3gy/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-51-020	JSM8V3gy/LP3x0,34u4,3BK/SM8S3	12.1.3.1			
13.97-52-006	JSM8U3/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-52-010	JSM8U3/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-52-020	JSM8U3/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-53-006	JSM8V3qy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-53-010	JSM8V3gy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-53-020	JSM8V3gy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-54-006	JSM12U3/LP3x0,34/SM12S3	12.1.3.2			
	JSM12U3/LP3x0,34/SM12S3				
13.97-54-010 13.97-54-020	,	12.1.3.2 12.1.3.2			
	JSM12U3/LP3x0,34/SM12S3				
13.97-55-006	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-55-010	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-55-020	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	12.1.3.2			
13.97-56-006	JSM12U4/LP4x0,34/SM12S4	12.1.3.2			
13.97-56-010	JSM12U4/LP4x0,34/SM12S4	12.1.3.2			
13.97-56-020	JSM12U4/LP4x0,34/SM12S4	12.1.3.2			
13.97-57-006	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	12.1.3.2			
13.97-57-010	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	12.1.3.2			
13.97-57-020	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	12.1.3.2			

## **Accessories**

JSM12U4/LN4x0,25u5,0OG JSM12U4/LN4x0,25u5,0OG

JSM12U4/LN4x0,25u5,0OG

JSM12U4/LP4x0,34/SM12S4

JSM12U4/LP4x0,34/SM12S4

JSM12U4/LP4x0,34/SM12S4

## Articles sorted by ref. no.



Type designation	Ref. no.	Page	Type designation	Ref. no.	Page
JSM8S3	13.98-30	12.1.2.3	JSM12U5	13.98-09	12.1.2.
JSM8S4	13.98-31	12.1.2.3	JSM12U8	13.98-10	12.1.2.
JSM8T3	13.98-32	12.1.2.3	JSM12V3/LN3x0,34u5,0OG	13.97-24-020	12.1.1.
JSM8T4	13.98-33	12.1.2.3	JSM12V3/LN3x0,34u5,0OG	13.97-24-050	12.1.1.
JSM8U3	13.98-01	12.1.2.1	JSM12V3/LN3x0,34u5,0OG	13.97-24-100	12.1.1.
JSM8U3/LN3x0,34u5,0OG	13.97-01-020	12.1.1.1	JSM12V3gy/LN3x0,34u5,0OG	13.97-17-020	12.1.1.
JSM8U3/LN3x0,34u5,0OG	13.97-01-050	12.1.1.1	JSM12V3gy/LN3x0,34u5,0OG	13.97-17-050	12.1.1.
JSM8U3/LN3x0,34u5,0OG	13.97-01-100	12.1.1.1	JSM12V3gy/LN3x0,34u5,0OG	13.97-17-100	12.1.1.
JSM8U3/LP3x0,34u4,3BK/SM12S3	13.97-52-006	12.1.3.2	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	13.97-55-006	12.1.3.
JSM8U3/LP3x0,34u4,3BK/SM12S3	13.97-52-010	12.1.3.2	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	13.97-55-010	12.1.3.
JSM8U3/LP3x0,34u4,3BK/SM12S3	13.97-52-020	12.1.3.2	JSM12V3gy/LP3x0,34u4,3BK/SM12S3	13.97-55-020	12.1.3.
JSM8U3/LP3x0,34u4,3BK/SM8S3	13.97-50-006	12.1.3.1	JSM12V4	13.98-08	12.1.2.
JSM8U3/LP3x0,34u4,3BK/SM8S3	13.97-50-010	12.1.3.1	JSM12V4/LN4x0,25u5,0OG	13.97-21-020	12.1.1.2
JSM8U3/LP3x0,34u4,3BK/SM8S3	13.97-50-020	12.1.3.1	JSM12V4/LN4x0,25u5,0OG	13.97-21-050	12.1.1.
JSM8U4	13.98-02	12.1.2.1	JSM12V4/LN4x0,25u5,0OG	13.97-21-100	12.1.1.
JSM8U4/LN4x0,25u5,0OG	13.97-03-020	12.1.1.1	JSM12V4gyy/LN4x0,25u5,0OG	13.97-19-020	12.1.1.
JSM8U4/LN4x0,25u5,0OG	13.97-03-050	12.1.1.1	JSM12V4gyy/LN4x0,25u5,0OG	13.97-19-050	12.1.1.
JSM8U4/LN4x0,25u5,0OG	13.97-03-100	12.1.1.1	JSM12V4gyy/LN4x0,25u5,0OG	13.97-19-100	12.1.1.
JSM8V3	13.98-03	12.1.2.1	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	13.97-57-006	12.1.3.
JSM8V3/LN3x0,34u5,0OG	13.97-05-020	12.1.1.1	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	13.97-57-010	12.1.3.2
JSM8V3/LN3x0,34u5,0OG	13.97-05-050	12.1.1.1	JSM12V4gy/LP4x0,34u4,7BK/SM12S4	13.97-57-020	12.1.3.
JSM8V3/LN3x0,34u5,0OG	13.97-05-100	12.1.1.1	JSM12V5	13.98-11	12.1.2.
JSM8V3gy/LN3x0,34u5,0OG	13.97-09-020	12.1.1.2	JSM12V8	13.98-12	12.1.2.
JSM8V3gy/LN3x0,34u5,0OG	13.97-09-050	12.1.1.2	JSM18U4	13.98-13	12.1.2.
JSM8V3gy/LN3x0,34u5,0OG	13.97-09-100	12.1.1.2	JSM18V4	13.98-14	12.1.2.
JSM8V3gy/LP3x0,34u4,3BK/SM12S3	13.97-53-006	12.1.3.2	JSV28V5	13.98-19	12.1.2.
JSM8V3gy/LP3x0,34u4,3BK/SM12S3	13.97-53-010	12.1.3.2			
JSM8V3gy/LP3x0,34u4,3BK/SM12S3	13.97-53-020	12.1.3.2			
JSM8V3gy/LP3x0,34u4,3BK/SM8S3	13.97-51-006	12.1.3.1			
JSM8V3gy/LP3x0,34u4,3BK/SM8S3	13.97-51-010	12.1.3.1			
JSM8V3gy/LP3x0,34u4,3BK/SM8S3	13.97-51-020	12.1.3.1			
JSM8V4	13.98-04	12.1.2.1			
JSM8V4/LN4x0,25u5,0OG	13.97-07-020	12.1.1.1			
JSM8V4/LN4x0,25u5,0OG	13.97-07-050	12.1.1.1			
JSM8V4/LN4x0,25u5,0OG	13.97-07-100	12.1.1.1			
JSM12S3	13.98-34	12.1.2.3			
JSM12S4	13.98-35	12.1.2.3			
JSM12S5	13.98-38	12.1.2.4			
JSM12S8	13.98-39	12.1.2.4			
JSM12T3	13.98-36	12.1.2.3			
JSM12T4	13.98-37	12.1.2.3			
JSM12T5	13.98-40	12.1.2.4			
JSM12T8	13.98-41	12.1.2.4			
JSM12U3/LN3x0,34u5,0OG	13.97-11-020	12.1.1.2			
JSM12U3/LN3x0,34u5,0OG	13.97-11-050	12.1.1.2			
JSM12U3/LN3x0,34u5,0OG	13.97-11-100	12.1.1.2			
JSM12U3/LP3x0,34/SM12S3	13.97-54-006	12.1.3.2			
JSM12U3/LP3x0,34/SM12S3	13.97-54-010	12.1.3.2			
JSM12U3/LP3x0,34/SM12S3	13.97-54-020	12.1.3.2			
JSM12U4	13.98-06	12.1.2.1			

12.1.1.2

12.1.3.2

13.97-13-020 12.1.1.2

13.97-13-050 12.1.1.2

13.97-56-010 12.1.3.2

13.97-56-020 12.1.3.2

13.97-13-100

13.97-56-006

#### Sensors

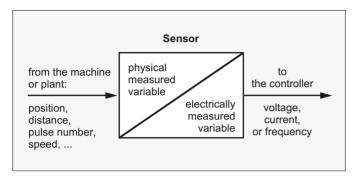
#### **Basic information**



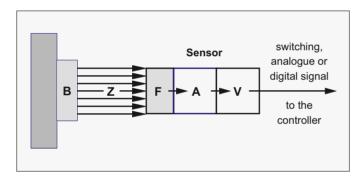
#### Principle and function

Sensors are physical-electrical converters, whose task is to acquire measured variables such as distance, pressure and temperature, speed and acceleration and to convert these into an electrical variable. In combination with conrols, these serve for detection of the actual value.

Sensors in machines and plants are usually **position**, **distance or motion sensors**. Their task is to take up the current values of the physical measured variables and to convert these into electrically measured variables for the controller.



The principal internal configuration of a sensor has the following features:



- an actuating element B influences the sensor element F when entering the sensitive zone Z of the sensor,
- the sensor element F generates or alters an electrical signal (current, voltage, frequency or phase) as a function of the physical measured variable.
- a coupling element A transforms the usually weak electrical measuring signal into the desired signal form, e. g. in a switching-, analogue or digital signal,
- a switching- or output amplifier generates a high performance signal which is suitable to bridge large distances between sensor and controller without of information.

Our sensors are based on the most modern circuit concepts and technologies and show the following characteristics:

- contactless, feedback-free detection,
- high resolution and sensitivity.
- short transformation time,
- large ambient temperature range,
- free of wear and therefore long operating life
- fully encapsulated and poured,
- to a large extent insensitive against chemicals and other environmental influences,
- contactless electronic output,
- high resistance to ageing,
- small design,
- low failure rate.

#### Characteristics and types

Proximity sensors are position sensors that work non-contacting and contactless. They are to a large extent insensitive against environmental influences and do not contain any parts which are subject to wear. We distinguish between switches and analogue sensors

They are employed in those areas where the customer has high requirements with regard to operating life, reliability, switching point accuracy, response time and speed.

The physical operating mode can be distinguished as follows:

- Acoustic proximity sensors, suitable for medium to large distances, with medium operating times,
- Inductive proximity sensors for the detection of ferrous and nonferrous metals; the special designs are pressure-; magnetic fieldresistant, surface switches and non-ferrous metal switches,
- Capacitive proximty sensors for the detection of metals and
- Optical proximity sensors for large distances according to the barrier and reflection principle,
- Magnetic field proximity sensors for a high geometrical resolution and high operating frequencies.

The following designs are available:

- Cylindrical designs with or without thread,
- Rectangular designs.
- Surface-, barrier-type or slot designs.

The following versions are available:

- DC-voltage versions according to NAMUR, with 2, 3, 4 or 5 terminals.
- AC-voltage versions with 2 terminals,
- All voltage versions with 2 terminals.

The DC voltage versions of the proximity sensors are mainly used for the connection to programmable controllers such as the SECONIX. The AC- and all-voltage versions can only be employed with conventional applications in connection with relays or magnetic switches.

## **Sensors**

## Type code



1	Type Series: Principle A acoustic O optical B rotation speed dependent R rotary H hall T temperature-dependent I inductive Y safety-oriented K capacitive SIDENT safety sensor M magneto-resistive WIDENT tool recognition	1
2	Type Series: Properties  A proximity switch B non-ferrous metal switch C code reader D speed and frequency E foil detection F surface switch G distance sensor H thickness measurement J sensor  N seam detection P pressure-resistant Q fork-shaped ring-shaped S safety switch T temperature-resistant V valve position detection X detector III, IV safety category	
3	Type of the Output and Supply Voltage A analogue voltage output, 10 30 V DC B two-pole, 8 / 10 30 / 60 V DC C analogue current output 0 20 mA, 10 30 V DC D three-pole, four-pole, 8 / 10 30 / 60 V DC E three-pole, four-pole, 5 V DC stabilized F frequency output (safety sensor) N NAMUR sensor G push-pull output GS three-pole, four-pole, 8 / 10 30 / 60 V DC H analogue current output 4 20 mA, 10 30 V DC P passive output (sensor) U two-pole, 20 320 V DC and 20 265 V AC V two-pole, 20 70 V AC W two-pole, 20 / 90 250 / 265 / 280 V AC	
4	Number of Sensors per Unit (optional entry) 2 double sensor n multiple sensor, n whole number ≥ 3	
5	Special Characteristics (optional entries, several entries are possible) Co, Pb, Is, Se with field bus interface CANopen, Profibus, Interbus, serial A all metal sensor D rotationally symmetrical coil W magnetic field-resistant N radiation-proof F ferrous sensor, with red. factor r S weld-proof S weld-proof	
6	Cylinder: housing Ø in mm Rectangular: edge length in mm	_
7	Housing Material a aluminium e stainless steel f moulded plastic g mica k ceramic m brass s steel w special material z pressure-moulded zinc	1
8	Housing Design f flat g cylindrical with thread q rectangular r cylindrical, smooth s special design v rectangular, turnable surface	
9	Total Length, without socket or sleeve	
10	Mounting Type b flush t partly flush n non-flush e non-flush, increased switching distance m flush, maximized switching distance	
11	Operating Distance or Distance Range in mm	

5	-	6   7   8   9   10   11   -   12   13	14	15	16				
16	Le	ngth of the Connecting Lead in r	n (o	ptiona	l entry)				
15	1	without LED display  F with 2 6 LED displays		A	with 1 l	LED dis	splay		
14	Consecutive Version Number, starting with 1								
13	Connection via Connector or Terminal Identification with one capital letter = type and size and one lower-case letter = pole number								
	Type and Size  F flat connector (AMP or other manufacturer)  K, L, M, N clamp terminal 3-, 4-, 5-, 6-pole  S connector M12  U connector Ø 30 mm  V connector M18  W connector M8  X connector M6  Y, Z special connector see brief description KB  Manufacturers: Amphenol-Tuchel, Binder, Hirschmann, Lumberg, Torson.								
					Lea	d mate	rial		
		Connection via outgoing lead Identification with 2 capital letters		PVC normal	PVC very flexible	PUR very flexible	Silicone rubber	Teflon or special	
		directly via kink protection via hose bush via PG-thread		ND NK NT NV	HD HK HT HV	PD PK PT PV	GD GK GT GV	TD TK TT TV	
	Po a d g j	le Number (optional entry)         1-pole       b       2-pole         4-pole       e       5-pole         7-pole       h       8-pole         10-pole       k       11-pole	ole ole			f 6-p i 9-p	oole oole oole		
12	Output Plus-Switching  1 NO short-circuit-protected 2 NC short-circuit-protected 3 NO not short-circuit-protected 4 NC not short -circuit-protected Output Minus-Switching 6 NO short-circuit-protected 7 NC short-circuit-protected 8 NO short-circuit-protected 9 NC not short-circuit-protected Push-Pull Output 5 NO plus-switching, NC minus-switching 0 NO minus-switching, NC plus-switching Combinations (Examples) 12 NO and NC 102 NO or NC								
	Ou 1 4 7	tput Analogue or Digital voltage 2 curr passive 5 digit		) a erial			rent a . ital para		

digital contactless

## **Connecting variables**



#### Power supplies and frequencies

Sensors are preferably operated at **DC-voltage 24 V**. They are, however, designed in such a way that they can be operated within a large **connecting voltage range**, ranging from 10 V DC to 30 V DC, e.g. at 12, 18 or at 24 V DC.

Thus the **remaining ripple**  $\sigma$ , which is the content of a possibly superimposed alternating voltage, is measured peak to peak and may not exceed 15% of the measured effective value Uv of the supply voltage (according to DIN 41 755).

The design of the **power supply unit** for the voltage supply of the sensors must be stable enough to retain the **voltage fluctuations us** of the effective value of the supply network within a threshold of  $\pm$  15%. These fluctuations develop due to a fluctuation of the supply network and when operating the sensors.

When selecting the power supply units it also has to be considered that **transients** from the power system (low- and high-frequency pulses of a high voltage) are reliably **suppressed**. This can be accomplished best with suitable filters and HF-capacitors as well as via peak voltage limiters at the output of the power supply unit.

Sensors are used less frequently for AC- and/or DC-voltage (AC/DC). If used as so-called all-voltage sensors, they can be operated in a large range from 20 to 250 V with an alternating voltage from 50 to 60 Hz or with DC-voltage. In case of operation with alternating voltage the operating frequency (maximum operating frequency) is limited, however, to the frequency of the supply voltage. The time delay before availability is then augmented to over 20 ms

When all-voltage sensors are operated with DC-voltage the above applies with regard to ripple voltage and voltage fluctuations..

#### Currents

The current consumption of a sensor has two portions: The idleor no-load current IR flows as long as no load resistance is connected. Its task is the supply of the sensor electronics. When connecting the load resistance / the load resistances, an operating current additionally develops during operation of the output / the outputs. The sum of idle current and operating current results in the total current consumption.

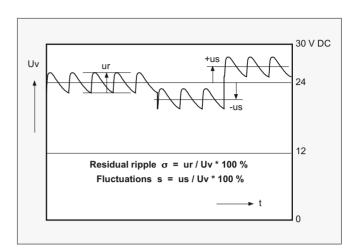
Each exit is protected against overloading by a clocking **short-circuit-protection**, which becomes effective from a **maximum load current l**<sub>Lmax</sub>. For the verification of the short-circuit-resistance the standard EN 60947-5-2 requires for the type examination a power supply unit, which is capable to quickly supply a current > 100 A.

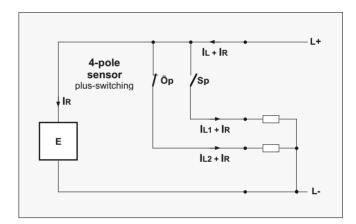
A **voltage drop** over the current-carrying output, whose extent depends to a certain degree on the magnitude of the load current, develops due to the short-circuit protection, pole protection, and a residual voltage.

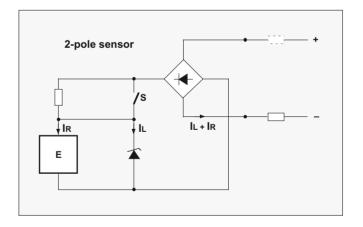
In the case of **3- and 4-pole sensors** a very small **residual current** of a few  $\mu$ A develops due to the load arising when the output is closed. In the Technical Data the residual current is usually not indicated because the voltage drop at the load resistance caused by it is negligibly small. The idle current of 2-pole sensors flows over the load and generates a voltage drop, which is to be considered when connecting the sensor.

#### **Switching capacity**

The switching capacity is divided into utilization categories according to the standard EN 60947-5-2.







Supply	Category	Typical applications
AC- voltage	AC -12	Control of resistive loads and semiconductor loads with isolation via opto-coupler
	AC-140	Control of small electromagnetic loads with holding current ≤ 0.2 A; e.g. auxiliary contact
DC- voltage	DC-12	Control of resistive loads and semiconductor loads with isolation via opto-coupler
	DC-13	Control of electromagnets

#### **Sensors**

## Connection diagrams DC 3- and 4-pole



#### DC 3 and 4-pole plus-switching (p)

#### Connector

#### **Outgoing lead**



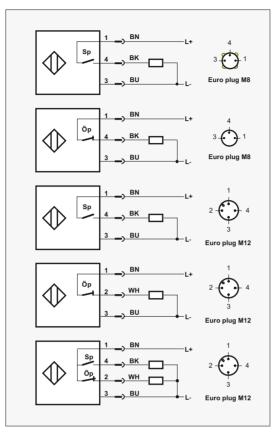


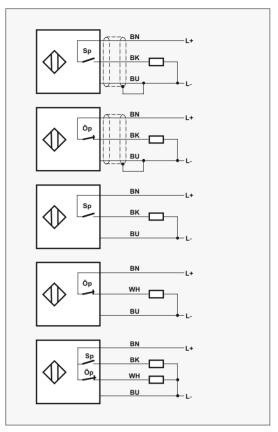
NC plus-switching

NO plus-switching

NC plus-switching NCp

> NO and NC plus-switching NOp + NCp





#### DC 3 and 4-pole minus-switching (n)

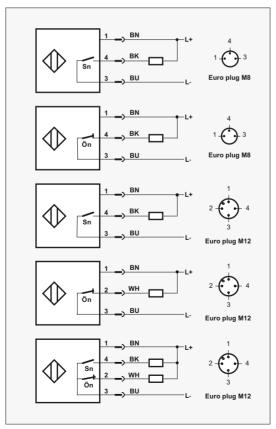
NO minus-switching NOn

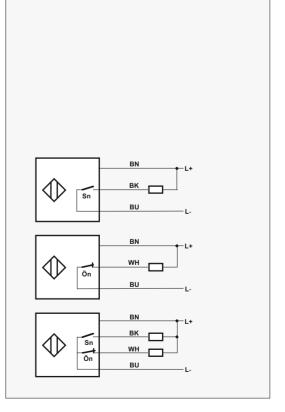
NC minus-switching NCn

NO minus-switching NOn

NC minus-switching NCn

> NO and NC minus-switching NOn + NCn





#### **Sensors**

#### Materials and leads

#### Metal

#### employed as material for housings and mounting parts

#### Al Aluminium wrought alloy

Material for housings and mounting. Suitable for metal-cutting forming. Transformable and cold-flow pressable. Small specific weight. Colour anodization. It shall be considered that the anodized coat has an insulating effect.

#### Al-DG Aluminium alloyage for die casting

Aluminium die cast alloy. Material with low specific weight. Anodizable. The anodized coat has an insulating coat.

#### CuZn Brass

Housing material for cut round housings with and without thread. The surface is usually nickel-plated.

#### X... Stainless high-grade steel

A magnetic, high-grade steel with a medium or high cutting property, and with a medium coefficient of thermal expansion of ca. 16 ppm/K, mainly used for cut round housings, but also for formed rectangular or cuboid housings.

**X5CrNi 18-10** For application in automotive, chemical, petrochemical and food industry. Transformable, compressable, forgeable, polishingable.

**X5CrNiMo 17-12-2** For application in oil and food industry. Transformable, forgeable, polishingable.

**X2CrNiMo 17-12-2** For application in chemical, oil, food, medical and pharamceutic industry. Transformable, forgeable and compressable, polishable.

**X6CrNiMoTi 17-12-2** For application in apparatus engineering and piping construction, in chemical and food industry, in medical and pharmaceutic industry as well as in ship building.

#### Zn-DG Die-cast zinc

Alloy of zinc, aluminium and copper. High dimensional accuracy. Usually with surface refinement, solderable.

#### **Technical Ceramics**

#### employed as material for housings and substrates

#### Al2O3 Aluminiumoxide

Material for substrates, protective pipes, insulating parts. High stability and hardness, further application termperature range, low coefficient of thermal expansion with 6 ppm/K in the range 20 to 1000 °C, corrosion-resistant

#### Plastic material

employed as material for housings and mounting parts; cast resin lead sheath

#### ABS Acrylonitrile-butadiene-styrene-copolymere

Housing material, heat-resistant up to 80 °C, limited chemical resistance, hard, scratch- and impact proof.

#### EP Epoxy resin

Liquid, then hard-setting for pouring, heat-resistant up to 110 °C, coefficient of thermal expansion with filling material 75 ppm/K, with inorganic filling material content 60% 40 ppm/K, dielectricity constant 4.

#### LCP Liquid crystalline copolyeter

High quality material for housings and mounting parts, with fibre optic or mineral filling material, application temperature range -200 to +220 °C

#### PA Polyamide

Materials for housings and mounting parts.

**PA 6** Application termperature range -40 to +90 °C, for injection moulding or metal-cutting transformation.

**PA 12** Application temperature range -70 to +110 °C, for injection moulding or metal-cutting transformation, suitable for food industry.

**PA 66** Application temperature range -40 to +100 °C, for injection moulding or metal-cutting transformation.

#### PBT Polybutylenenterephtalate

Material for housings and mounting parts. Application temperature range -50 to +120 °C, for injection moulding, good resistance against oil and chemicals.

#### PC Polycarbonate

Material for housings and mounting parts with high resistance. Application temperature range -100 to +125  $^{\circ}$ C, for injection moulding, Thermal forming or metal-cutting transformation, sensitive against chemicals and stress cracking.

#### PEEK Polyetheretherketone

High-quality and high-strength, but very expensive material for housings and mounting parts. For injection moulding or metal-cutting transformation, application temperature range -65 to +250 °C, good resistance against chemicals.

#### POM Polyoxymethylene

Universal material for housings and mounting parts. Application temperature range -50 to +80 °C, for injection moulding. Good resistance against oil and chemicals, especially against solvents. Resistance agianst stress cracking.

#### PTFE Polytetrafluorethylene

Material with the highest resistance against chemicals. For injection moulding or transformation. Application temperature range -200 to +260 °C, low mechanical quality level.

#### PUR, TPU Polyurethane

Material for lead sheath and seals. Application temperature range -40 to +120 °C. High impact resistance and form stability, good resistance against oil and chemicals.

#### PVC Polyvinylchloride

Material for lead sheath. Good mechanical stability and resistance against chemicals, application temperature range -30 to +60 °C.



Leads for sensors and as sensor accessories with plug

Number x lead cross section in mm^2 2x0.14	Outer diameter of the leads in mm 3,0	Number x lead cross section	Outer diameter	Number x lead cross	Outer
in mm^2			of the leads	section	diameter of the leads
2v0 1/	3.0	in mm^2	in mm	in mm^2	in mm
270.14	0.0				
2x0.19	3.5				
2x0.25	4.5				
2x0.34	3.6 shielded	2x0.34	5.2	2x0.34	3.6
2x0.50	4.6	2x0.50	4.3		
2x0.75	6.0 shielded				
3x0.09	2.3				
3x0.14	3.5	3x0.14	3.5		
3x0.14	4.0 shielded				
3x0.25	4.0	3x0.25	4.0		
3x0.25	4.5 shielded				
3x0.34	4.8	3x0.34	4.9		
3x0.34	4.8 shielded				
3x0.50	5.8	3x0.50	5.2		
3x0.50	6.5 shielded				
3x0.75	6.4			3x0.75	6.8
3x0.75	7.0 shielded				
4x0.14	3.5				
4x0.25	4.5 shielded	4x0.25	4.8		
4x0.34	5.4	4x0.34	5.4		
4x0.34	shielded				
4x0.50	6.3				
4x0.50	shielded			4x0.50	7.0
4x0.75	8.0 shielded				
4x0.75	7.4				
5x0.75	7.6				
6x0.14	4.4				
6x0.25	5.0				
6x0.75	8.5 shielded				
7x0.34	6.3				
7x0.75	7.8				

## Tasks, mode of operation, requirement profiles



#### Mode of operation of Inductive Proximity Switches

An inductive proximity switch consists of an oscillator with a resonant circuit, rectifier and an output amplifier.

The coil of the oscillating circuit determines the size and shape of the "sensing face" of the proximity switch. The oscillator generates a high frequency oscillation, whose alternating field emanates on the open side of the coil and/or the ferrite core. If a metal piece is inserted into this field, energy is absorbed from the oscillating circuit by eddy current and losses of the alternating magnetization. Thus the oscillator amplitude is being reduced by sufficient approximation of the metal object; the switch is said to be "damped". As a result, the threshold of the rectifier falls short and the switching amplifier alters the switching condition of the output. An internal feedback leads to a sweeping behaviour and hysteresis of the switch-over procedure.

The dimensions of the alternating field depend on the dimensions of the switch and determine the radius of the alternating field, and thus the switching distance of the sensor.

#### Inductive Proximity Switches for machinery and plant

are position sensors which require no mechanical contact. They are not subject to mechanical wear. They are mainly used as final position switches. Due to their ruggedness (completely encapsulated) and the highly reliable operating frequency they can be employed for many other tasks, such as pulse sensors for the detection of rotation speed.

Inductive proximity switches are normally used in applications demanding a high operating frequency and actuation speed, switching point accuracy and reliability as well as an operation under harsh conditions (e.g. under water), and a long operational life expectancy.

The company "Industrieelektronik Dr. Klaschka", predecessor to the Klaschka GmbH & Co. KG, launched the first inductive proximity switch in 1964. Today the product range of sensors comprises several hundred types. This "Sensor" Catalogue presents the most important types which are usually available directly from stock.

In addition to the selection in this catalogue, we carry a large number of standard- and customer-specific versions, for which we can send you the Technical Data on request.

#### Requirement profiles and executions of Inductive Proximity Switches

#### A. For the application at PLCs and Field Bus Interface connections

- Supply voltage range 8 ... 30 V DC
- Outputs are protected against polarity reversal and short-circuit-proof, with LED display, 2-poles with 1 NO with 5 ... 60 mA or
  - 3-poles with 1 NOp ≤ 200 mA or
  - 4-poles with 1 NOp + 1 NCp ≤ 200 mA
- · Switching frequencies up to 100 kHz
- Normal switching distances for flush mounting according to standard or increased for non-flush mounting according to standard, or maximized for flush mounting

#### B. For contactor- or relay-optimized applications

- Supply voltage range 18 ... 230 V AC
- Outputs protected against polarity reversal and short-circuit-proof, with LED display, 2-poles 1 NO with 10 ... 240 mA
- Switching frequencies up to 10 Hz
- Normal switching frequencies for flush mounting according to standard
- in housings from 18 mm Ø and/or from 34 mm edge length

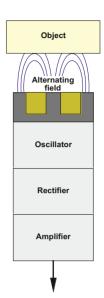
#### C. For NAMUR and DIN 60947-5-6 applications

- Voltage range 7.7 ... 30 VsDC
- · Output 2-conductor-current loop with subsequent ZSN-auxiliary device
- Switching frequencies up to 5 kHz (4 mm Ø)
- Switching distances as described under A.

#### D. For special applications

adapted to the special requirements of the automotive industry such as

- All metal switches.
- Non-ferrous metal switches,
- · Double switches,
- · Magnetic field- and weld-proof executions,
- · Pressure-resistant executions up to 300 bar,
- Extended surface switches up to 200 cm edge length and with switching distances up to 50 cm,
- Supply voltage ranges 8 ... 65 V DC, 20 ... 320 V DC,
- Totally insulated executions etc.









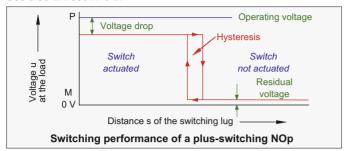




## Switching performance



#### See also EN 60947-5-2.



The switching distance s is the distance at which an actuating element (object) approaching the sensing face causes a signal change. The switching distance depends on the size of the sensing face as well as on the size, the shape, and the material of the actuating element. The VDE standard 660 part 208 defines in addition to the application switching distance s the rated operating distance s, the real switching distance s, and the operating distance s, measured with a standard reference plate.

The high frequency magnetic field emanates from the **sensing face**. It depends on the size of the measuring coil and/or the ferrite core, and can be compared with the diameter and/or the edge length of the cap (blue marked).

According to ISO 630 the **standard reference plate a\*a\*1** is a square actuating element made of Fe 360 with a thickness of 1 mm which permits comparing measurements with the switching distance s. The surface of the measuring plate shall always be moved parallel to the sensing face. The side length a corresponds to the diameter r of the written circle of the sensing face or the triple rated operating distance, if this value is larger.

The **reduction factor R** refers to the switching distance and indicates the factor of the so-called **ferrous** proximity switches, by which the switching distance of metallic actuating elements, which aren't made of iron or steel, is reduced. The switching distance of **all metal** proximity switches is not being reduced. All metals always have the reduction factor R = 1.

**Reproducibility** is the repetition accuracy of at least two measurements of the switching distance within a time interval of 8 hours with a housing temperature between +15 °C and +30 °C and a voltage between 95 % and 105 % of the nominal voltage. Switches with Ø of up to 12 mm may measure the difference between two measurements by maximally  $\leq$  10 %. Larger ones may have a difference of maximally  $\leq$  5 %.

The **characteristic response curves** are determined by the size and type of the coil of the resonant circuit and the ferrite core material. In case of cylindrical coils, the field is rotationally symmetric and can be illustrated two-dimensionally by a cross sectional diagram through the axis s.

w = path axis, s = distance axis, s<sub>n</sub> = switching distance, r = switching radius,  $A_W$ ,  $A_S$  = switching-on points,  $B_W$ ,  $B_S$ , C = switching-off points,  $K_a$ ,  $K_b$  = characteristic response curves,

H<sub>w</sub>, H<sub>s</sub> = switching hysteresis in w-direction and s-direction,

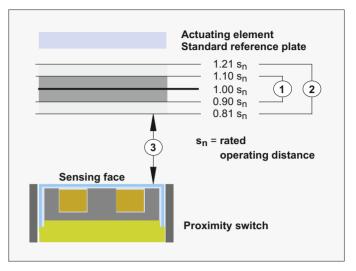
 $\emptyset$  = diameter of the proximity switch and the reference plate.

From the **starting direction** of the reference plate you can distinguish between

- s-direction the distance switching points  $A_s$  and  $B_s$  when entering und leaving the sensor field, and
- w-direction the path-switching-points A<sub>w</sub> and B<sub>w</sub> (actuation by front edge) and A<sub>w</sub> and C<sub>w</sub> (actuation by front edge when entering and by back edge when leaving the sensor field).

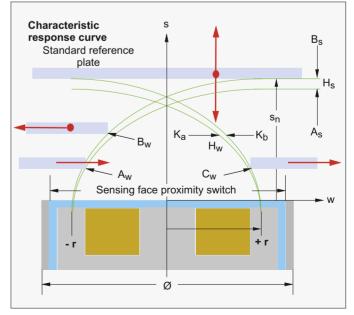
The differences between the switching-on- and switching-off points with an approaching and a receding reference plate are called **the switching hysteresis H<sub>s</sub>**, **H<sub>w</sub>**. For all proximity switches applies: 0.03  $s_n \leq H_s \leq 0.2 \ s_n$ .

The switching radius  $\bf r$  is the distance of the switching point from the central axis of the sensing face, when a reference plate approaches radially and with the axial distance of s=0.



- 1 The **real switching distance**  $s_r$  is measured at a nominal voltage and ambient temperature:  $0.9 s_n \le s_r \le 1.1 s_n$ . Its tolerance zone considers the permissible manufacturer's tolerance.
- 2 The application switching distance s considers external influences of supply voltage, termperature and mounting:  $0.81 \text{ s}_{D} \le s \le 1.21 \text{ s}_{D}$ .
- The **operating distance**  $s_a = 0 \dots 0.81 s_n$  corresponds to the safe operating range.

Reduction Factor R	Fe Switch	All Metal Switch
Iron	1.00	1.00
Aluminium	0.33 0.42	1.00
Brass	0.33 0.45	1.00
Stainless steel	0.56 1.00	1.00
Copper	0.30 0.45	1.00
Cast iron	0.88 1.00	1.00



## Switching frequency, external influences



#### Switching frequencies and response times

In the Technical Data of the inductive proximity switches the **switching frequency f** is defined as the maximum possible number of switching operations per second. The diagram shows the system for measuring the switching frequency according to IEC 60947-5-2.

Standard reference plates are mounted on a non-conductive rotary reference wheel. The distance between two reference plates must be twice as large as the edge length A of the square reference plate. The dimension A of the standard reference plate depends on the sensing face of the proximity switch used (see standard reference plate).

The quoted standard specifies that the calculation value of switching frequency is reached, if either the switching-on signal or the switching-off signal at the output of the proximity switch amounts to periodically 50 µs. This regulation supposes that the possible switching frequency of a proximity switch is limited to values under 20 kHz.

Indeed switching frequencies over 5 kHz can hardly be realized with the current proximity switches.

Klaschka surpassed this margin clearly with all types of its **All Metal Series** IAD/AHM. Therefore the internal company standard KWN "switching frequency inductive proximity sensors" sets the value quoted on 10 for the **nominal switching frequency fb** indicated in the Technical Data.

Altering the conditions indicated in the diagram, e. g. with reference to the damping surfaces, the spacing between the sensing faces, stability of the adjusted switching distance etc. will result in lower values than indicated in the catalogue.

The limit of the maximum switching frequency on a maximum value mainly lies in the time required for the building-up of the measuring oscillator as well as in the time required for the remaining circuit.

The diagram shows the principal course of the switching frequency f over the switching distance s. The curve a was taken up with the configuration shown above according to the IEC standard. The curve b was determined with an individual actuator (actuating cam).

The **minimum damping time** is measured in the same configuration as the switching frequency. It corresponds to half the period of the switching frequency.

The **time delay before availability** is the time required from the provision of the supply voltage at the sensor until its availability. It may amount to maximally 300 ms. In this period incorrect signals of maximally 2 ms duration may arise.

#### External influences on the switching behaviour

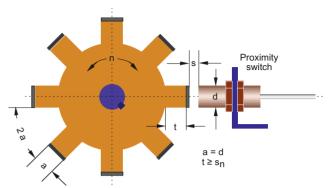
Disturbing **magnetic fields** are mainly produced in industrial plants by electrical welding and electrical drives. If an inductive proximity switch is within the magnetic interference field, fault signals may arise. Also see EN 60947-5-2 (1998) appendix E.

**Magnetic-field-resistant proximity switches,** as e.g. our All Metal Standard and All Metal Automotive Sensors, comply with this standard due to their special construction of sensor coil and circuit.

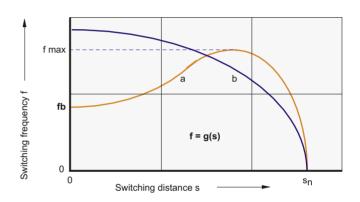
The ambient temperature also influences the switching behaviour.

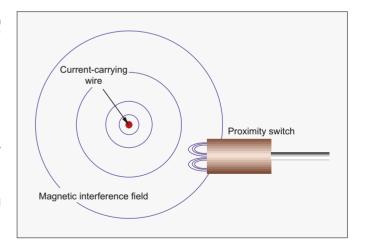
The **temperature dependency** of the switching distance s in the indicated ambient temperature range is described by a function s = f(T) which is to be determined empirically.

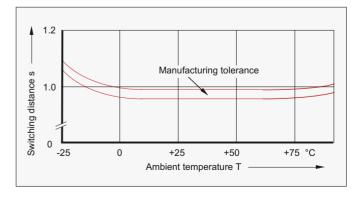
According to EN 60947-5-2 the permissible alternation or **drift of the switching distance** in the indicated ambient temperature range may not exceed a value of 10%.



Measurement according to EN 60947-5-2: The measuring wheel is a non-conducting disc with an applied squared standard measuring plate







## **Mounting instructions**



#### Mounting instructions for cylindrical sensors

**Flush mounting (b):** A cylindrical inductive sensor is flush mountable if an arbitrary damping material can be attached around the sensing face, without affecting the characteristics.

The flush mountable sensor with the diameter d and the rated operating distance  $s_n$  can be mounted with the sensing face AF flush in metal. The following mounting instructions apply:

- Distance between the centre of two sensors when these are arranged in row ≥ 2d
- Distance to an opposite metal face  $\geq 3 s_n$
- Distance to a side face ≥ d

**Non-flush mounting (n):** A cylindrical inductive sensor is non-flush mountable if a certain free zone around its sensing face is required in order to maintain its characteristics.

The non-flush mountable sensor with the diameter d and the rated operating distance  $s_n$  has to stick out of the metal surface by at least 2  $s_n$ . The following mounting instructions apply:

- Distance between the centre of two sensors when these are arranged in a row  $\geq 3$  d
- Distance of the sensing face to an opposite metal face ≥ 3 s<sub>n</sub>
- Distance to a side face ≥ d

#### Mounting instructions for rectangular sensors

**Flush mounting (b):** A rectangular inductive sensor allows flush mounting if it can be mounted up to the sensing face **on** an arbitrary damping material without affecting the characteristics.

The flush mountable sensor with the width b and the rated operating distance  $s_n$  can be mounted with the sensing face AF flush in metal. The following mounting instructions apply:

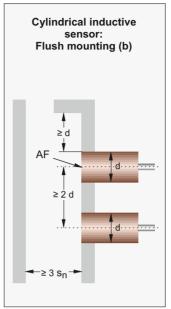
- Distance between the centre of two sensors when these are arranged in a row  $\geq 2 \text{ b}$
- Distance to an opposite metal face ≥ 3 s<sub>n</sub>
- Distance to a side face ≥ b

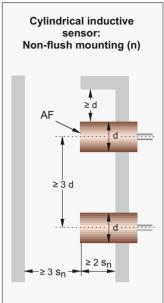
In case of L- or U-shaped mounting into a metallic environment (see diagram below) the value  $e \ge s$  is to be kept.

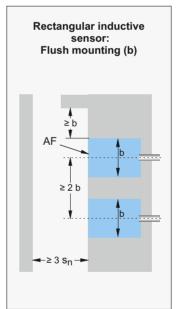
**Non-flush mounting (n):** A rectangular inductive sensor is non-flush mountable if a certain free zone around its sensing face is necessary in order to maintain its characteristics.

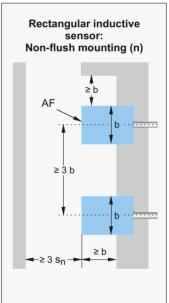
The non-flush mountable sensor with the width b and the rated operating distance  $s_n$  has to stick out of the metal at least by b. The following mounting instructions apply:

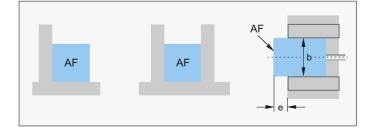
- Distance between the centre of two sensors when these are arranged in a row ≥ 3 b
- Distance of the sensing face to an opposite metal face  $\geq$  3 s<sub>n</sub>
- Distance to a side face ≥ b



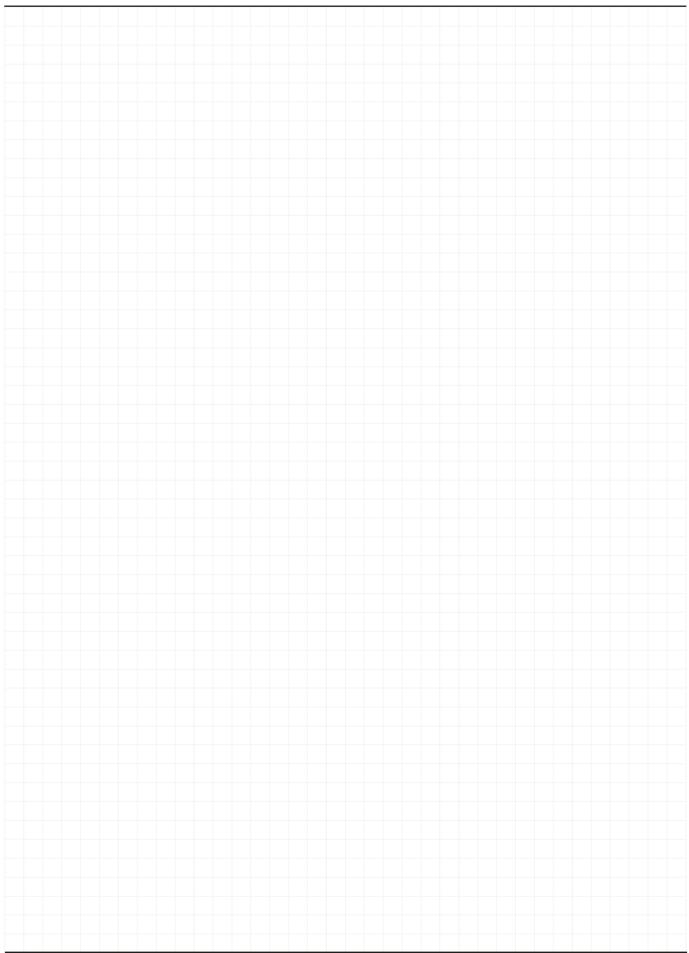








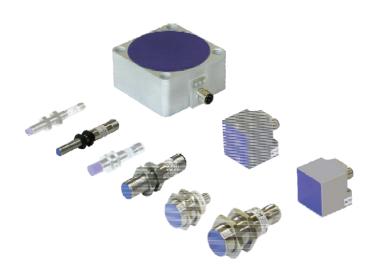
## **Notes**



## Type All Metal Standard



#### **Characteristics**



The Inductive Proximity Switches of the Type All Metal Standard IAD / AHM have an ironless coil in connection with an ironless housing. Therefore this type has the

- reduction factor 1 for all metals (A) magnetic field-resistance to over 150 mT (M)

and properties, which exceed the requirements stipulated by  $\,$  DIN EN 60 947-5-2 by far such as

- increased switching distance with the flush mounting version
- increased ambient temperature range 25 ... + 85 °C
- increased switching frequency of over 10 kHz (H)

The increased maximum switching frequencies (maximum operating frequencies) of over 10 kHz have to be considered in particular. Unlike these, conventional proximity switches with maximum operating frequencies of 200 Hz to 2 kHz are comparably

Apart from the high maximum possible operating frequencies these sensors also offer **very short operating times**  $\leq$  50  $\mu$ s (instead of 0.2 to 5 ms with conventional proximity switches).

The LED displays of the Q40 and Q80 versions in the metal housing lead into **bright lightened printed-circuit boards**, which can be well seen by the operator.

#### Type All Metal Standard

		Switching distance
Туре	Ref. No.	in mm
		Mounting *)
IAD/AHM-8eg60b1,5-1Wc1A	11.37-22	1,5 b
IAD/AHM-8eg60b1,5-2Wc1A	11.37-24	1,5 b
IAD/AHM-8eg60b1,5-1Sd1A	11.37-23	1,5 b
IAD/AHM-8eg60b1,5-2Sd1A	11.37-25	1,5 b
IAD/AHM-8eg45b1,5-1NDc1A	11.37-26-020	1,5 b
IAD/AHM-8eg45b1,5-2NDc1A	11.37-27-020	1,5 b
IAD/AHM-8eg60n3-1Wc1A	11.37-57	3,0 n
IAD/AHM-8eg60n3-1Sd1A	11.37-58	3,0 n
IAD/AHM-8eg60n3-2Wc1A	11.37-59	3,0 n
IAD/AHM-8eg60n3-2Sd1A	11.37-60	3,0 n
IAD/AHM-8eg45n3-1NDc1A	11.37-61-020	3,0 n
IAD/AHM-8eg45n3-2NDc1A	11.37-62-020	3,0 n
IAD/AHM-12mg50b3,5-1Sd1A	11.37-03	3,5 b
IAD/AHM-12mg50b3,5-2Sd1A	11.37-10	3,5 b
IAD/AHM-12mg50b3,5-1NDc1A	11.37-28-020	3,5 b
IAD/AHM-12mg50b3,5-2NDc1A	11.37-29-020	3,5 b
IAD/AHM-12mg60n6-1Sd1A	11.37-52	6,0 n
IAD/AHM-12mg60n6-2Sd1A	11.37-53	6,0 n
IAD/AHM-12mg60n6-1NDc1A	11.37-63-020	6,0 n
IAD/AHM-12mg60n6-2NDc1A	11.37-64-020	6,0 n

		Switching distance
Туре	Ref. No.	in mm
		Mounting *)
IAD/AHM-18mg50b6-1Sd1A	11.37-04	6,0 b
IAD/AHM-18mg50b6-12Sd1A	11.37-06	6,0 b
IAD/AHM-18mg50b6-1NDc1A	11.37-30-020	6,0 b
IAD/AHM-18mg50b6-12NDd1A	11.37-32-020	6,0 b
IAD/AHM-18mg60n10-1Sd1A	11.37-54	10,0 n
IAD/AHM-18mg60n10-12Sd1A	11.37-55	10,0 n
IAD/AHM-18mg60n10-1NDc1A	11.37-67-020	10,0 n
IAD/AHM-18mg60n10-12NDd1A	11.37-69-020	10,0 n
IAD/AHM-30mg50b10-12Sd1A	11.37-07	10,0 b
IAD/AHM-30mg50b10-12NDd1A	11.37-33-020	10,0 b
IAD/AHM-30mg85n20-12Sd1A	11.37-70	20,0 n
IAD/AHM-30mg65n20-12NDd1A	11.37-71-020	20,0 n
IAD/AHM-40aq40b15-12Sd1B	11.37-16	15,0 b
IAD/AHM-80aq40b40-12NKd1B	11.37-35-050	40,0 b
IAD/AHM-80aq40b40-12Sd1B	11.37-18	40,0 b

<sup>\*)</sup> b = flush mounting, n = non-flush mounting

## Series IAD/AHM-8eg

Design; length  Material of the sensing face / of the housing		O M8 x 1; 60 mm	O M8 x 1; 60 mm	
		PBT / stainless steel	PBT / stainless steel	
	Rated operating distance, mounting (see page 1.0.4)	1.5 mm, flush	3 mm, non-flush	
	Range assured operating distance	0 1.22 mm	0 2.43 mm	
	NO plus-switching NOp		(1) IAD/AHM-8eg60n3-1Wc1A, 11.37-57 (1)	
Tune designation	NC plus-switching NCp	IAD/AHM-8eg60b1.5-2Wc1A, 11.37-24	(2) IAD/AHM-8eg60n3-2Wc1A, 11.37-59 (2)	
Type designation, Ref. no.	NO and NC plus-switching NOp + NCp			
(Wiring)	NO plus-, NC minus-switching NOp + NCn			
(*******9)	NO minus-switching NOn			
	NC minus-switching NCn			
N	Maximum switching frequency / Minimum damping period	20 kHz / 25 μs	20 kHz / 25 μs	
	Wiring (connector or lead; number of wires)	connector M8; 3 wires	connector M8; 3 wires	
Repetition a - w	Common Technical Data  Reduction factor  ysteresis of the switching point s accuracy of the switching point s ith permanent operating voltage and ambient temperature  Magnetic field-resistance  Permissible ripple voltage  Short-circuit-proof? Reverse polarity protection?  I for all metals  3 10 %  ≥ 10 %  ≥ 10 %  ≥ 15 %  yes, clocking  yes	sensing face	sensing face w	
Vo	tage drop over a closed contact   ≤ 2.5 V DC     Ambient temperature range   -25 + 85 °C     Specific Technical Data	LED visible from 4 sides — M8x1  Dimensions subject to change!	LED visible from 4 sides M8x1  Dimensions subject to change!	
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
	Current consumption load	≤ 20 mA	≤ 20 mA	
	Load current	≤ 200 mA	≤ 200 mA	
	Nominal insulation voltage	75 V DC	75 V DC	
	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF	
	Ø Sensing face	6.4 mm	6.4 mm	
Switching radi	us r (at operating distance of the target s = 0; see page 1.0.2)	1.0 mm	3.0 mm	
	Function indication?	yes, YE	yes, YE	
	Maximum lead length	500 m	500 m	
Lead type	/ standard lead length / number of wires x lead cross section	-		
	-			
	Utilization category according to IEC 60947-5-2	DC 13	DC 13	
	Protection rating according to IEC 60529	IP 67	IP 67	
	Protection class			
	Permissible torque without / with toothed disc	8 Nm / 20 Nm	8 Nm / 20 Nm	
	Weight	10 g	10 g	
	<u>-</u>			
	Recommended accessories			

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

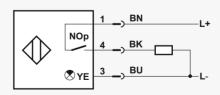


#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 3-pole, plug

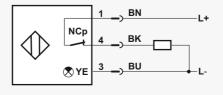


#### Euro Plug M8

with LED display YE visible from 4 sides



#### Wiring (2) DC 3-pole, plug



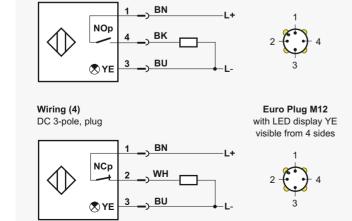
#### Euro Plug M8

with LED display YE visible from 4 sides



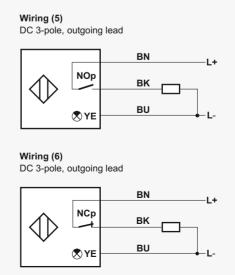


O M8 x 1; 60 mm	O M8 x 1; 60 mm	O M8 x 1; 45 mm	O M8 x 1; 45 mm	
PBT / stainless steel	PBT / stainless steel	PBT / stainless steel	PBT / stainless steel 3 mm, non-flush	
1.5 mm, flush	3 mm, non-flush	1.5 mm, flush		
0 1.22 mm	0 2.43 mm	0 1.22 mm	0 2.43 mm	
IAD/AHM-8eg60b1.5-1Sd1A, 11.37-23 (3)		IAD/AHM-8eg45b1.5-1NDc1A, 11.37-26-020 (5)	AD/AHM-8eg45n3-1NDc1A, 11.37-61-020 (5)	
IAD/AHM-8eg60b1.5-2Sd1A, 11.37-25 (4)		IAD/AHM-8eg45b1.5-2NDc1A, 11.37-27-020 (6)	IAD/AHM-8eq45n3-2NDc1A, 11.37-62-020 (6)	
11.57 time cogoda 1.5 25 time, 11.57 25 (1)	WENT THE CONTROL LOCALITY, THE CO. (1)	1/12/7/4 HW 0094001.0 21400174, 11.07 27 020 (0)	1/12/74 IN 009-010 21420 IV, 11.07 02 020 (0)	
20 kHz / 25 μs	20 kHz / 25 μs	20 kHz / 25 μs	20 kHz / 25 μs	
connector M12; 3 wires	connector M8; 3 wires	lead; 3 wires	lead; 3 wires	
sensing face  M8x1  V  OF  N13  LED visible from 4 sides  M12x1	sensing face	sensing face  LED  standard lead length 2.0 m	sensing face $\infty$ LED standard lead length 2.0 m	
10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
75 V DC ≤ 1.0 μF	75 V DC ≤ 1.0 μF	75 V DC ≤ 1.0 μF	75 V DC ≤ 1.0 μF	
6.4 mm	6.4 mm	6.4 mm	6.4 mm	
1.0 mm	3.0 mm	1.0 mm	3.0 mm	
	3.5 11111			
yes, YE	yes, YE	yes, YE	yes, YE	
500 m	500 m	500 m	500 m	
		ND / 2.0 m / 3 x 0.14 mm^2	ND / 2.0 m / 3 x 0.14 mm^2	
DC 13	DC 13	DC 13	DC 13	
IP 67	IP 67	IP 67	IP 67	
II, 🗆	II, 🗆	II, 🖂	,	
8 Nm / 20 Nm	8 Nm / 20 Nm	8 Nm / 20 Nm	8 Nm / 20 Nm	
12 g	12 g	12 g + weight of the lead	12 g + weight of the lead	



Wiring (3)

DC 3-pole, plug



Euro Plug M12

with LED display YE

visible from 4 sides

## Series IAD/AHM-12mg

	Design; length	O M12 x 1; 50 mm	O M12 x 1; 50 mm	
Material of the sensing face / of the housing		PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	
	Rated operating distance, mounting (see page 1.0.4)	3,5 mm, flush	3.5 mm, flush	
	Range assured operating distance	0 2.83 mm	0 2.83 mm	
	NO plus-switching NOp	IAD/AHM-12mg50b3.5-1Sd1A, 11.37-03 (1	) IAD/AHM-12mg50b3.5-1NDc1A, 11.37-28-020 (3	
Type designation,	NC plus-switching NCp	IAD/AHM-12mg50b3.5-2Sd1A, 11.37-10 (2	(1) IAD/AHM-12mg50b3.5-2NDc1A, 11.37-29-020 (4)	
	NO and NC plus-switching NOp + NCp		,	
Ref. no. (Wiring)	NO plus-, NC minus-switching NOp + NCn			
(wiring)	NO minus-switching NOn			
-	NC minus-switching NCn			
N	laximum switching frequency / Minimum damping period	20 kHz / 25 μs	20 kHz / 25 μs	
	Wiring (connector or lead); number of wires	connector M12; 3 wires	lead; 3 wires	
Repetition 2 - w	Common Technical Data  Reduction factor //steresis of the switching point s accuracy of the switching point s ith permanent operating voltage and ambient temperature Magnetic field-resistant Permissible ripple voltage Short-circuit-proof? Reverse polarity protection? Reverse polarity protection? Ambient temperature range  Common Technical Data  1 for all metals 3 10 %  ≤ 10 %  ≤ 150 mT  ≤ 15 % yes, clocking yes  ≥ 2.5 ∨ DC  - 25 + 85 °C	sensing face  17  LED visible from 4 sides  M12x1    M12x1	sensing face  17  Sensing face  17  Standard lead length 2.0 m	
	Specific Technical Data Permissible operating voltage range	10 24 30 V DC	10 <u>24</u> 30 V DC	
	Current consumption without load	≤ 20 mA	≤ 20 mA	
	Load current	≤ 200 mA	≤ 200 mA	
	Nominal insulation voltage	75 V DC	75 V DC	
		≤ 1.0 µF	≤ 1.0 µF	
	Permissible capacity at output	·	<u>'</u>	
Switching radio	Ø Sensing face	10.5 mm	10.5 mm	
Switching radio		·	<u>'</u>	
Switching radio	Ø Sensing face	10.5 mm	10.5 mm	
Switching radii	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?	10.5 mm 4.5 mm yes, YE	10.5 mm 4.5 mm yes, YE	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length	10.5 mm 4.5 mm	10.5 mm 4.5 mm yes, YE	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?	10.5 mm 4.5 mm yes, YE	10.5 mm 4.5 mm yes, YE	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length / standard lead length / number of wires x lead cross section	10.5 mm 4.5 mm yes, YE	10.5 mm 4.5 mm  yes, YE  500 m  ND / 2.0 m / 3 x 0.34 mm^2	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2	10.5 mm 4.5 mm  yes, YE  500 m	10.5 mm 4.5 mm  yes, YE  500 m  ND / 2.0 m / 3 x 0.34 mm^2	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length  I standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529	10.5 mm 4.5 mm  yes, YE  500 m  DC 13 IP 67	10.5 mm 4.5 mm  yes, YE  500 m  ND / 2.0 m / 3 x 0.34 mm^2  DC 13  IP 67	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length  I standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class	10.5 mm 4.5 mm  yes, YE  500 m  DC 13 IP 67 II,	10.5 mm 4.5 mm  yes, YE  500 m  ND / 2.0 m / 3 x 0.34 mm^2  DC 13  IP 67  II,	
	Ø Sensing face us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length  I standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529	10.5 mm 4.5 mm  yes, YE  500 m  DC 13 IP 67	10.5 mm 4.5 mm  yes, YE  500 m  ND / 2.0 m / 3 x 0.34 mm^2  DC 13  IP 67	

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

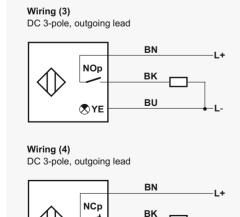
Subject to technical changes!

## Wiring (1) Euro Plug M12 DC 3-pole, plug with LED display YE visible from 4 sides BN NOp BK Wiring (2) DC 3-pole, plug BN NCp

BU



O M12 x 1; 60 mm	O M12 x 1; 60 mm	 
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	
6 mm, non-flush	6 mm, non-flush	 
0 4.86 mm	0 4.86 mm	 
IAD/AHM-12mg60n6-1Sd1A, 11.37-52 (1)	IAD/AHM-12mg60n6-1NDc1A, 11.37-63-020 (3)	
IAD/AHM-12mg60n6-2Sd1A, 11.37-53 (2)	IAD/AHM-12mg60n6-2NDc1A, 11.37-64-020 (4)	
20 kHz / 25 μs	20 kHz / 25 μs	
connector M12; 3 wires	lead; 3 wires	
	M12x1	
M12x1	<del>-</del>	
<b>→</b>	sensing face	
sensing face	face	
face	<b>A</b>	
ļ <del>.                                      </del>		
<u> </u>		
S₁7	\$17 Find 8 1	
	/>= " " " " " " " " " " " " " " " " " " "	
<u> </u>		
LED visible		
from 4 sides — o d	LED + V	
M12x1—► ∞ ▼		
	standard	
	lead length 2.0 m	
	2.0 111	
10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
≤ 20 mA	≤ 20 mA	
≤ 200 mA	≤ 200 mA	
75 V DC	75 V DC	
≤ 1.0 µF	≤ 1.0 μF	
10.5 mm	10.5 mm	
4.5 mm	4.5 mm	
yes, YE	yes, YE	
500 m	500 m	
	ND / 2.0 m / 3 x 0.34 mm^2	
DC 13	DC 13	
IP 67	IP 67	
	II, □	
9 Nm / 30 Nm	9 Nm / 30 Nm	
14 g	14 g + weight of the lead	 
<u> </u>		



**♥YE** 

BU

## Series IAD/AHM-18mg

	Design; length	O M18 x 1; 50 mm	O M18 x 1; 50 mm	
Material of the sensing face / of the housing		PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	
	Rated operating distance, mounting (see page 1.0.4)	6 mm, flush	6 mm, flush	
	Range assured operating distance	0 4.86 mm	0 4.86 mm	
	NO plus-switching NOp	IAD/AHM-18mg50b6-1Sd1A, 11.37-04 (1)	IAD/AHM-18mg50b6-1NDc1A, 11.37-30-020 (3	
[	NC plus-switching NCp	, , , , , , , , , , , , , , , , , , , ,	,	
Type designation, - Ref. no.	NO and NC plus-switching NOp + NCp	IAD/AHM-18mg50b6-12Sd1A, 11.37-06 (2)	IAD/AHM-18mg50b6-12NDd1A, 11.37-32-020 (	
(Wiring)	NO plus-, NC minus-switching NOp + NCn	, , , , , , , , , , , , , , , , , , , ,		
(vviiiig)	NO minus-switching NOn			
	NC minus-switching NCn			
, N	Maximum switching frequency / Minimim damping period	20 kHz / 25 μs	20 kHz / 25 μs	
	Wiring (connector or lead); number of wires	connector M12; 3 / 4 wires	lead; 3 / 4 wires	
Repition a - wi	Common Technical Data  Reduction factor ysteresis of the switching point s accuracy of the switching point s ith permanent operating voltage and ambient temperature Magnetic field-resistance Permissible ripple voltage Short-circuit-proof? Reverse polarity protection?  Reverse polarity protection?  State 1 for all metals 3 10 % 5 10 % 5 10 % 5 15 0 mT 5 2 15 0 mT 7 2 yes, clocking 7 yes, clocking 8 yes 5 2 5 V DC	sensing face  \$\int 24  \	sensing face  M18x1  Sensing face  LED  standard lead length 2.0 m	
	Specific Technical Data			
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
	Current consumption without load	≤ 20 mA	≤ 20 mA	
	Load current	≤ 200 mA	≤ 200 mA	
	Nominal insulation voltage	75 V DC	75 V DC	
	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF	
Curitobina no di	Ø Sensing face	16.5 mm	16.5 mm	
Switching radit	us r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?	6.0 mm	6.0 mm yes, YE	
	Function indication ?	yes, YE	yes, re	
	Maximum lead length	500 m	500 m	
Load tuno	e / standard lead length / number of wires x lead cross section		ND / 2.0 m / 3 x 0.34 mm^2	
ьеай туре		- 25 + 85 °C	- 25 + 85 °C	
	Ambient temperature range	- 20 + 00 C	- 20 + 00 C	
	Utilization category according to IEC 60947-5-2	DC 13	DC 13	
	Protection rating according to IEC 60547-5-2	IP 67	IP 67	
	Protection rating according to IEC 60529  Protection class	II, 🗆	II, 🗆	
	Permissible torque without / with toothed disc	34 Nm / 70 Nm	34 Nm / 70 Nm	
	•	28 g	28 g + weight of the lead	
	veignt	20 y	Zo g + weight of the lead	
	Weight  Recommended accessories	28 ;	<u>g</u>	

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

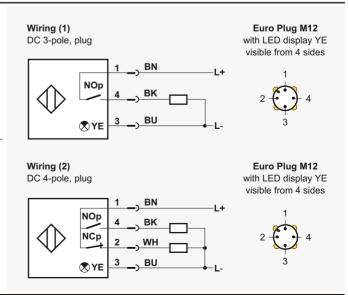
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

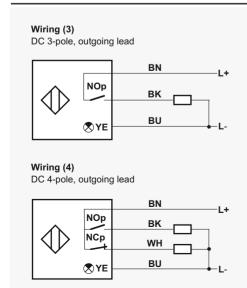
Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!





O M18 x 1; 60 mm	O M18 x 1; 60 mm	
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	
10 mm, non-flush	10 mm, non-flush	
0 8.1 mm	0 8.1 mm	 
IAD/AHM-18mg60n10-1Sd1A, 11.37-54 (1)	IAD/AHM-18mg60n10-1NDc1A, 11.37-67-020 (3)	
IAD/AHM-18mg60n10-12Sd1A, 11.37-55 (2)	IAD/AHM-18mg60n10-12NDd1A,11.37-69-020(4)	
20 kHz / 25 μs	20 kHz / 25 μs	
connector M12; 3 wires	lead; 3 / 4 wires	
sensing face	sensing face 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
≤ 20 mA	≤ 20 mA	
≤ 200 mA	≤ 200 mA	 
75 V DC	75 V DC	 
≤ 1.0 µF	≤ 1.0 µF	 
16.5 mm	16.5 mm	 
7.0 mm	7.0 mm	
yes, YE	yes, YE	 
500 m	500 m	 
	ND / 2.0 m / 3 x 0.34 mm^2	 
- 25 + 85 °C	- 25 + 85 °C	 
DC 42	DC 42	 
DC 13	DC 13 IP 67	 
IP 67		 
	II, 🗆	
34 Nm / 70 Nm	34 Nm / 70 Nm	 
28 g	28 g + weight of the lead	 



## Series IAD/AHM-30mg

	Design; length	O M30 x 1.5; 50 mm	O M30 x 1.5; 50 mm	
Material of the sensing face / of the housing  Rated operating distance, mounting (see page 1.0.4)		PBT / CuZn nickel-plated	PBT / CuZn nickel-plated 10 mm, flush	
		10 mm, flush		
	Range assured operating distance	0 8.1 mm	0 8.1 mm	
	NO plus-switching NOp			
Type designation,	NC plus-switching NCp			
Ref. no.	NO and NC plus-switching NOp + NCp	IAD/AHM-30mg50b10-12Sd1A, 11.37-07 (1)	IAD/AHM-30mg50b10-12NDd1A,11.37-33-020 (	
(Wiring)	NO plus-, NC minus-switching NOp + NCn			
. 3/	NO minus-switching NOn			
	NC minus-switching NCn			
N	laximum switching frequency / Minimum damping period	15 kHz / 33 μs	15 kHz / 33 μs	
	Wiring (connector or lead); number of wires	connector M12; 4 wires	lead; 4 wires	
Repetition 2 - w	Common Technical Data  Reduction factor //steresis of the switching point s accuracy of the switching point s ith permanent operating voltage and ambient temperature Magnetic field-resistance Permissible ripple voltage Short-circuit-proof? Reverse polarity protection? Reverse polarity protection? Ambient temperature range  Common Technical Data  1 for all metals 3 10 %  ≤ 10 %  ≤ 15 0 mT  yes, clocking yes  ≥ 2.5 V DC  - 25 + 85 °C	sensing face  M30x1.5  Sensing face  C36  LED visible from 4 sides  M12x1  M30x1.5	sensing face  M30x1.5  Sensing face  Standard lead length 2.0 m	
	Specific Technical Data	40.04.004.00	40.04.00470	
	Permissible operating voltage range	10 <u>24</u> 30 V DC ≤ 25 mA	10 <u>24</u> 30 V DC ≤ 25 mA	
	Current consumption without load			
	Load current	≤ 200 mA 75 V DC	≤ 200 mA	
	Nominal insulation voltage	≤ 1.0 μF	75 V DC ≤ 1.0 μF	
	Permissible capacity at output  Ø Sensing face	27.4 mm	27.4 mm	
Switching radio	us r (at operating distance of the target s = 0; see page 1.0.2)	11.0 mm	11.0 mm	
Owntoning raun	us i (at operating distance of the target's – 0, see page 1.0.2)	11.0 11111	11.0 11111	
	Function indication ?	yes, YE	yes, YE	
	Maximum lead length	500 m	500 m	
Lead type	e / standard lead length / number of wires x lead cross section		ND / 2.0 m / 4 x 0.34 mm^2	
	Utilization category according to IEC 60947-5-2	DC 13	DC 13	
	Protection rating according to IEC 60529	IP 67	IP 67	
	Protection class	II, 🗆	II, 🗆	
	Permissible torque without / with toothed disc	150 Nm / < 200 Nm	150 Nm / < 200 Nm	
	Weight	75 g	75 g + weight of the lead	
	Recommended accessories			

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 4-pole, plug

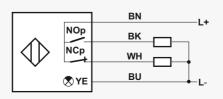
# 1 BN L+ NOp 4 BK NCp 2 WH YE 3 BU L-

## Euro Plug M12

with LED display YE visible from 4 sides



## Wiring (2) DC 4-pole, outgoing lead





O M30 x 1.5; 85 mm	O M30 x 1.5; 65 mm	 
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	 
20 mm, non-flush	20 mm, non-flush	
0 16.2 mm	0 16.2 mm	
IAD/AHM-30mg85n20-12Sd1A, 11.37-70 (1)	IAD/AHM-30mg65n20-12NDd1A,11.37-71-020 (2)	
15 kHz / 33 μs	15 kHz / 33 μs	 
connector M12; 4 wires	lead; 4 wires	
sensing face	sensing face	
LED visible from 4 sides M12x1 $\infty$	S 36 LED standard lead length 2.0 m	
10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
 ≤ 25 mA	<u> </u>	
≤ 200 mA	≤ 200 mA	-
75 V DC	75 V DC	
≤ 1.0 µF	≤ 1.0 µF	
27.4 mm	27.4 mm	
13.5 mm	13.5 mm	
yes, YE	yes, YE	
500 m	500 m	 
	ND / 2.0 m / 4 x 0.34 mm^2	 
DC 13	DC 13	 
IP 67	IP 67	 
II, 🗆	II, 🗆	 
150 Nm / < 200 Nm	150 Nm / < 200 Nm	 
130 g	100 g + weight of the lead	 

## Series IAD/AHM-40aq, -80aq

	Design; height; length	<b>□ 40 mm</b> ; 40 mm; 40 mm	<b>□ 80 mm</b> ; 40 mm; 80 mm
	Material of the sensing face / of the housing	PBT / AI	PBT / Al
	Rated operating distance, mounting (see page 1.0.4)	15 mm, flush	40 mm, flush
	Range assured operating distance	0 12.2 mm	0 32.4 mm
	NO plus-switching NOp		
Type designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp	IAD/AHM-40aq40b15-12Sd1B, 11.37-16 (1)	IAD/AHM-80aq40b40-12Sd1B, 11.37-18 (
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(**************************************	NO minus-switching NOn		
	NC minus-switching NCn		
M	laximum switching frequency / Minimum damping period	15 kHz / 33 μs	15 kHz / 33 μs
	Wiring (connector or lead); number of wires	connector M12; 4 wires	connector M12; 4 wires
Repitition a	Common Technical Data  Reduction factor  Insteresis of the switching point solution of the sw	sensing Ø 5.4 face  -35.5 -	96 96 98 99 Sensing face 19 90 10
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
	Current consumption without load	≤ 30 mA	≤ 30 mA
	Load current	≤ 200 mA	≤ 200 mA
	Nominal insulation voltage	75 V DC	75 V DC
<u> </u>	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF
	Ø Sensing face	38 x 38 mm	78 mm
Switching radio	us r (at operating distance of the target s = 0; see page 1.0.2)	17.0 mm	32.0 mm
	Function indication ?	GN for operation, YE for actuated	GN for operation, YE for actuated
	Maximum lead length	500 m	500 m
Lead type	/ standard lead length / number of wires x lead cross section		
	11688	DC 13	
	Utilization category according to IEC 60947-5-2		DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class	II, 🗆	II, 🗅
	Permissible torque without / with toothed disc	110 ~	450 ~
	Weight	110 g	450 g
	Recommended accessories		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

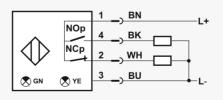


#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

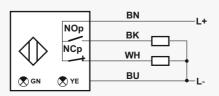
#### Wiring (1) DC 4-pole, plug



#### Euro Plug M12



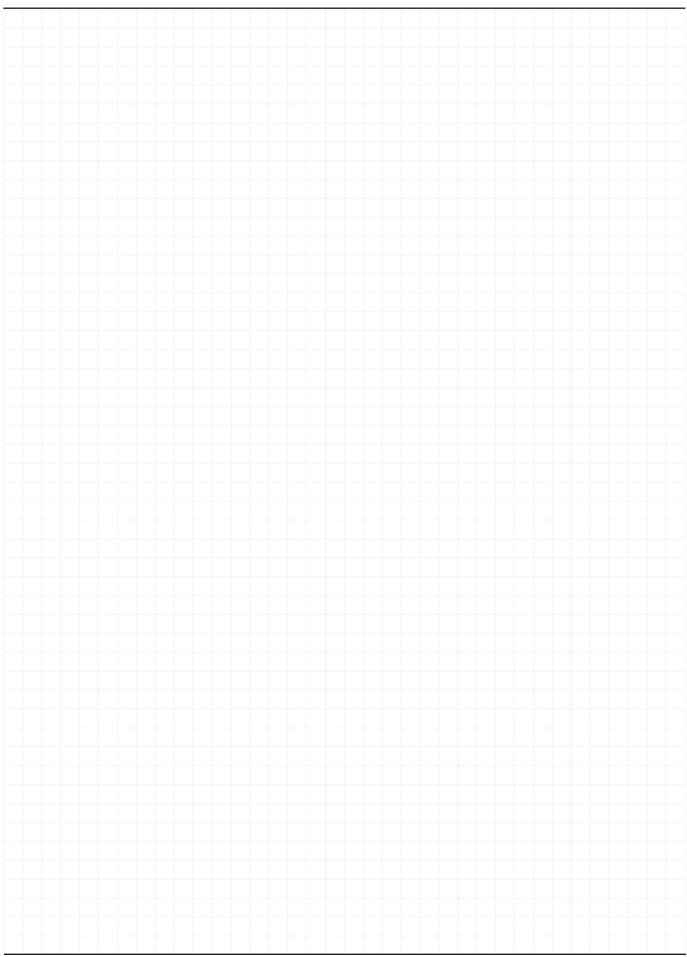
#### Wiring (2) DC 4-pole, outgoing lead





□ 80 mm; 40 mm; 80 mm		
PBT / Al		
40 mm, flush		
0 32.4 mm		
IAD/AHM-80aq40b40-12NKd1B, 11.37-35-050 (2)		
15 kHz / 33 μs		
lead; 4 wires		
96		
sensing of the sensin		
10 <u>24</u> 30 V DC		 
≤ 30 mA		
≤ 200 mA		
75 V DC		
≤ 1.0 µF		 
78 mm		
32.0 mm		
GN for operation, YE for actuated	-	 
· · · · · · · · · · · · · · · · · · ·		 
500 m		
NK / 2.0 m / 4 x 0.34 mm^2		
DC 13		
IP 67		
II, 🛛		
450 g		

## Notes



#### **Series All Metal Automotive**



#### Characteristics



The Series All Metal Automotive IAD / AHMS consists of Inductive Proximity Switches, which were particularly developed for the production lines in the Automotive Industry. They durably withstand the extreme environmental conditions occurring there.

Some of the **special requirements** Inductive Proximity Switches have to fulfill are

- 1. the detection of targets of different metals such as iron and aluminium, copper and brass, V2A- and other steels has to be possible without causing a change of the switching distance.
- 2. the reliable operation in strong electromagnetic fields has to be guaranteed.
- 3. welding splashes, which can't be avoided in body shops, may not impair the characteristics of the switch.

The **proximity switches of the Series All Metal Automative** made by KLASCHKA have an ironless coil in connection with an ironless housing. The housings are Teflon-coated, the sensing faces are ceramic-coated. Thus these sensors offer

- the reduction factor 1 for all metals (A), a high switching frequency and short operating time (H), a magnetic field-resistance of more than 150 mT (M),
- a weld-resistance (S).

The proximity switches of the series All Metal Automotive offer features, which go far beyond the requirements of DIN EN 60 947-5-2

- an increased switching distance with flush mounting an increased ambient temperature range 25 ... + 85  $^{\circ}\text{C}$  an increased switching frequency of more than 10 kHz

The **switching frequencies** (maximally possible operating frequencies) **of more than 10 kHz** have to be considered in particular. Unlike these, conventional proximity switches with switching frequencies from 200 Hz to 2 kHz are relatively slow.

Apart from the high maximally possible operating frequencies these sensors offer very short operating times ≤ 50 µs (instead of 0.2 to 5 ms of conventional proximity switches).

All versions can be mounted **flush** into a metal environment and have the **connectors M12**, **O M8** also has the **connector M8**.

The LED displays of the 40aq and 80aq lead into bright lightened printed-circuit-boards, which can be well seen by the operator.

Tuma		Switching distance	
Туре	Ref. No.	in mm	
		Mounting *)	
IAD/AHMS-8eg60b1,5-1Wc1A	11.36-22	1,5 b	
IAD/AHMS-8eg60b1,5-1Sd1A	11.36-23	1,5 b	
IAD/AHMS-12mg50b3,5-1Sd1A	11.36-03	3,5 b	
IAD/AHMS-18mg50b6-1Sd1A	11.36-04	6,0 b	
IAD/AHMS-30mg50b10-12Sd1A	11.36-07	10,0 b	
IAD/AHMS-40aq40b15-12Sd1B	11.36-16	15,0 b	
IAD/AHMS-80ag40b40-12Sd1B	11.36-18	40,0 b	

\*) b = flush mounting

## **Inductive Proximity Switches, All Metal Automotive**

## Series IAD/AHMS-8eg, -12mg, -18mg, -30 mg

			Design; length	O M8 x 1; 60 mm	O M8 x 1; 60 mm
	Material of the	sensing face /	of the housing	PBT rad. cross-linked/V2A Teflcoated	PBT rad. cross-linked/V2A Teflcoated
	Rated operating distance	, mounting (se	ee page 1.0.4)	1.5 mm, flush	1.5 mm, flush
	Range	assured oper	ating distance	0 1.22 mm	0 1.22 mm
	NO p	olus-switching	NOp	IAD/AHMS-8eg60b1.5-1Wc1A, 11.36-22 (1	AD/AHMS-8eg60b1.5-1Sd1A, 11.36-23 (2)
Type designation,	NC p	olus-switching	NCp		
Ref. no.	NO and NC p	olus-switching	NOp + NCp		
(Wiring)	NO plus-, NC mi	nus-switching	NOp + NCn		
(**************************************	NO mi	nus-switching	NOn		
	NC mi	nus-switching	NCn		
M	laximum switching frequency	Minimum da	mping period	20 kHz / 25 μs	20 kHz / 25 μs
	Wiring (connec	tor or lead); nu	ımber of wires	connector M8; 3 wires	connector M12; 3 wires
	Common Technical Data				
	Reduction factor	1 for all meta	als	M8x1	M8x1
Hys	steresis of the switching point s	3 10 %		-	-
		≤ 10 %		sensing	sensing —
	ith permanent operating voltage			face	face A
	and ambient temperature	≤ 2 %			
	Magnetic field-resistance				
	Permissible ripple voltage	≤ 15 %		S 13 4 9	\$ 13 P
	Short-circuit-proof?	yes, clocking			
	Reverse polarity protection ?	yes		LED	LED visible
Vol	tage drop over a closed contact	≤ 2.5 V DC		visible V	from 4
	Ambient temperature range	-25 + 85 °C	С	from 4 sides o o	sides 📥 🗴 d
				M8x1	M12x1
		Specific Te	echnical Data	Dimensions subject to change!	Dimensions subject to change!
	Permiss	sible operating	voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
		ent consumptio		≤ 20 mA	≤ 20 mA
			Load current	≤ 200 mA	≤ 200 mA
		Nominal insu	ulation voltage	75 V DC	75 V DC
	Р	ermissible cap	acity at output	≤ 1.0 µF	≤ 1.0 µF
		Ø	Sensing face	6.4 mm	6.4 mm
Switching radio	us r (at operating distance of the	target s = 0; se	ee page 1.0.2)	3.0 mm	3.0 mm
		Function	on indication ?	yes, YE	yes, YE
		Maximi	ım lead length	500 m	
Lead type	/ standard lead length / number				
	Utilization category	according to I	FC 60947-5-2	DC 13	DC 13
		ting according		IP 67	
	1 10.000001110		otection class		
	Permissible torqu			8 Nm / 20 Nm	8 Nm / 20 Nm
			Weight	10 g	12 g
		December	d 0000001		
		Recommende	u accessories		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

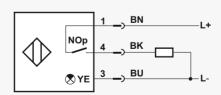


#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 3-pole, plug

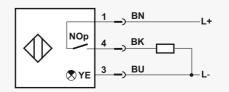


#### Euro Plug M8

with LED display YE visible from 4 sides



#### Wiring (2) DC 3-pole, plug



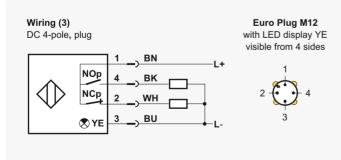
#### Euro Plug M12

with LED display YE visible from 4 sides





O M12 x 1; 50 mm	O M18 x 1; 50 mm	O M30 x 1.5; 50 mm	
PBT rad. cross-linked/V2A Teflcoated	PBT rad. cross-linked/V2A Teflcoated		
3.5 mm, flush	6 mm, flush	10 mm, flush	
0 2.83 mm	0 4.86 mm	0 8.1 mm	
IAD/AHMS-12mg50b3.5-1Sd1A, 11.36-03 (2)		IAD/AHMS-30mg50b10-12Sd1A, 11.36-07 (3)	
(-)	——————————————————————————————————————	was a moon good to recently those of the	
20 kHz / 25 μs	20 kHz / 25 μs	15 kHz / 33 μs	
connector M12; 3 wires	connector M12; 3 wires	connector M12; 4 wires	
Connector W12, 3 wires	Connector W12, 3 wires	Connector W12, 4 wires	
sensing face  VIT NOTE OF THE PROPERTY OF THE	sensing face  C 24  LED visible from 4 sides  M12x1   M18x1   OE EE  OG  M12x1   M18x1	M30x1.5  sensing face  36  LED visible from 4 sides  M12x1   M30x1.5	
10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
≤ 20 mA	≤ 20 mA	≤ 25 mA	
≤ 200 mA	≤ 200 mA	≤ 200 mA	
75 V DC	75 V DC	75 V DC	
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	
12 mm	16.5 mm	27.4 mm	
4.5 mm	6.0 mm	11.0 mm	
yes, YE	yes, YE	yes, YE	
500 m	500 m	500 m	
	· <del></del>	· · · · · · · · · · · · · · · · · · ·	
DC 13	DC 13	DC 13	
IP 67	IP 67	IP 67	
II, 🗆	II, 🗆	II, 🗆	
9 Nm / 30 Nm	34 Nm / 70 Nm	150 Nm / < 200 Nm	
14 g	28 g	75 g	



## **Inductive Proximity Switches, All Metal Automotive**

## Series IAD/AHMS-40aq, -80aq

Rated operating distance, mounting (see page 1.0.4) Rated operating distance, mounting (see page 1.0.4) Range assured operating distance NO plus-switching NOp NO Pus-witching NOp NO plus-witching NOp NO plus-witching NOp NO plus-witching NOp + NCp NO plus-witching NOp + NCp NO plus-witching NOp + NCp NO plus-witching NOn NO minus-switching NO		Design; height; length	<b>□ 40 mm</b> ; 40 mm; 40 mm	<b>□ 80 mm</b> ; 40 mm; 80 mm
Rated operating distances, mounting (see page 1.0.4)  Range assured operating distance of NO plus-switching NOp NOp NO plus-switching NOp NOp NO plus-switching NOp NOp NO plus-switching NOp				
Type designation, Ref no. (Wiring)  NO plus-switching NOp NOp NO plus-switching NOp NOp NO not not plus-switching NOp NOp NO not not plus-switching NOp		<u> </u>		
No plus-switching NOp   NC plus-switching NOp   NC   NC plus-switching NOp   NC   NC plus-switching NOp   NC   NC plus-switching NOp   NC   NO plus   NC minus-switching NOp   NC   NC minus-switching NOp   NC m				-
Type designation, Ref. no.   NO and NC plus-switching NOp + NCp   NO phose   NOp + NCp   NOp		, ,		
NO and NC plus-witching   NOp + NCp				
No plus, NC minus-switching NOp NOn NO			IAD/AHMS-40ag40b15-12Sd1B. 11.36-16 (1)	IAD/AHMS-80aq40b40-12Sd1B. 11.36-18 (1)
NO minus-switching NCn NC minus-switching NCn Wirely (connector or lead); number of wires  Common Technical Data Reduction factor Hysteresis of the switching point s 3 10 % Replittion accuracy of the switching point s 4 10 % - with permanent operating voltage and ambient temperature s 2 % Magnetic field-resistance s 150 mT Permissible ripple voltage s 15 % Short-circult-proof? yes, clocking Reverse polarity protection? P yes Voltage drop over a closed contact s 2.5 V DC Ambient temperature range - 25 + 85 °C  Specific Technical Data Permissible operating woltage and Load current Normal insulation voltage Permissible capacity at output s 200 mA \$ 200 mA Sommal insulation voltage Permissible capacity at output s 200 mA \$ 200 mA Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Function indication?  GN for operation, YE for actuated  Weight 110 g 360 g			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
NC minus-switching requency / Minimum damping period Wiring (connector or lead); number of wires  Common Technical Data Reduction factor 1 for all metals Hysteresis of the switching point s ≤ 10 % -with permanent operating voltage and ambient temperature ≤ 2 % Magnetic field-resistance ≤ 150 mT Permissible ripple voltage ≤ 15 % Short-circuit-proof? Reverse polarity protection? Voltage drop over a closed contact ≤ 2.5 V DC Ambient temperature range  Current consumption without load Load current Norinal insulation voltage To Voltage to prover a closed contact ≤ 2.5 V DC Ambient temperature range  Current consumption without load Load current Norinal insulation voltage Permissible capacity at output Ø Sensing face Switching radius r (at operating distance of the target s = 0, see page 1.0.2)  Function indication?  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Velight  Permissible torque without / with toothed disc Weight  110 g  15 kHz / 33 µs connector M12; 4 wires  connec	(vviring)			
Maximum switching frequency / Minimum damping period  Wiring (connector of lead), number of wires  Common Technical Data  Reduction factor 1 for all metals  Hysteresis of the switching point s ≤ 10 %  Repitition accuracy of the switching point s ≤ 10 %  - with permanent operating youtdage  - with permanen				
Common Technical Data  Reduction factor 1 for all metals Hysteresis of the switching points 3 10 %  Repitition accuracy of the switching points 5 10 %  -with permanent operating voltage and ambient temperature 2 2 %  Magnetic field-resistance 5 150 mT  Permissible ripple voltage 5 15 mT  Reverse polarity protection? yes Voltage drop over a closed contact 5 2 2 V DC  Ambient temperature range  Current consumption without load  Current consumption without load  Load current 5 200 mA 5 200 mA  Specific Technical Data  Permissible operating voltage range Current consumption without load Load current 5 200 mA 5 200 mA  Sound 5 30 mA 5 200 mA 5 200 mA  Sound 75 V DC 75 V DC 75 V DC 75 V DC  Permissible capacity at output 5 1.0 µF 78 mm  Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 609529 IP 67 IP 67  Protection class II. ©  Permissible torque without / with toothed disc Weight  110 g 360 g		· ·	15 kHz / 33 µs	15 kHz / 33 µs
Common Technical Data   Reduction factor   Hysteresis of the switching point s   310 %   Septition accuracy of the switching point s   510 %   with permanent operating voltage   and ambient temperature   52 %   Magnetic field-resistance   515 mT   Permissible ripple voltage   515 %   Short-circuit-proof ? yes, clocking   Reverse polarity protection ? yes   Voltage drop over a closed contact   \$2.5 V DC   Ambient temperature range   -25 + 85 °C   Specific Technical Data   Specific Technical Data   Permissible operating voltage range   10 24 30 V DC   S 30 mA   S 30		<u> </u>		
Permissible operating voltage range Current consumption without load Load current Some Management Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Permissible torque without / with toothed disc Weight  Permissible to a maximum lead length Mominal insulation voltage Some Management Maximum lead length  Permissible capacity at output ≤ 1.0 μF  Some Maximum Some Maximum Some Maximum Some Maximum Some Maximum lead length Some Maximum Some Maximum lead length Some Maximum Some Maxi	Repitition :	Reduction factor ysteresis of the switching point s accuracy of the switching point s accuracy of the switching point s with permanent operating voltage and ambient temperature ≤ 2 % Magnetic field-resistance ≤ 150 mT Permissible ripple voltage Short-circuit-proof? Reverse polarity protection? Reverse polarity protection? Ambient temperature range  1 for all metals 3 10 % 4 10 %  yes 2 5 4 50 mT  yes, clocking yes 4 2 2.5 V DC  Ambient temperature range - 25 + 85 °C	sensing Ø 5.4 face	96 Sensing Garage Sen
Current consumption without load Load current Load current Solution voltage Load current Solution voltage T5 V DC Permissible capacity at output Solution radius r (at operating distance of the target s = 0; see page 1.0.2)  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Weight Solution radius r (at operation category according to IEC 60947-5-2 Permissible torque without / with toothed disc Weight  Nominal insulation voltage T5 V DC T5 V DC T5 V DC T6 V DC T75 V DC			10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
Nominal insulation voltage Permissible capacity at output Sensing face Sensing face Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  GN for operation, YE for actuated  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2 Protection rating according to IEC 60529 Permissible torque without / with toothed disc Weight  Nominal insulation voltage 75 V DC 76 V DC				
Permissible capacity at output  Ø Sensing face Ø S		Load current	≤ 200 mA	≤ 200 mA
Permissible capacity at output  Ø Sensing face Ø S	Nominal insulation voltage		75 V DC	75 V DC
Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  GN for operation, YE for actuated  Maximum lead length  Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class  Permissible torque without / with toothed disc  Weight  110 g  32.0 mm  32.0 mm  32.0 mm  500 m  500 m  500 m  DC 13  DC 13  II, □  III, □  III, □  Sermissible torque without / with toothed disc  Weight			≤ 1.0 μF	≤ 1.0 μF
Function indication? GN for operation, YE for actuated  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  DC 13  Protection rating according to IEC 60529 IP 67 IP 67 Protection class II, □  Permissible torque without / with toothed disc Weight  Maximum lead length 500 m  500 m  DC 13  DC 13  IP 67  IP 67  II, □  II, □  360 g			38 x 38 mm	78 mm
Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class Permissible torque without / with toothed disc Weight  DC 13  DC 13  IP 67  IP 67  II, □  Weight  110 g  360 g	Switching radius r (at operating distance of the target s = 0; see page 1.0.2)		17.0 mm	32.0 mm
Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class  Permissible torque without / with toothed disc  Weight  DC 13  DC 13  IP 67  IP 67  II, □  Weight  110 g  360 g	Function indication ?		GN for operation, YE for actuated	GN for operation, YE for actuated
Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class  Permissible torque without / with toothed disc  Weight  DC 13  DC 13  IP 67  IP 67  II, □  Weight  110 g  360 g	Maximum lead length		500 m	500 m
Protection rating according to IEC 60529 IP 67 IP 67  Protection class II, □ II, □  Permissible torque without / with toothed disc  Weight 110 g 360 g	Lead type	· · · · · · · · · · · · · · · · · · ·		
Protection rating according to IEC 60529 IP 67 IP 67  Protection class II, □ II, □  Permissible torque without / with toothed disc  Weight 110 g 360 g				
Protection rating according to IEC 60529 IP 67 IP 67 Protection class II, □ II, □ Permissible torque without / with toothed disc Weight 110 g 360 g	Utilization category according to IEC 60947-5-2		DC 13	DC 13
Protection class II,  Permissible torque without / with toothed disc  Weight 110 g 360 g			IP 67	IP 67
Permissible torque without / with toothed disc Weight 110 g 360 g				
Weight         110 g         360 g				-
Pocommended accessories	·		110 g	360 g
Pacammandad accessarias				
Neconinenced accessories		Recommended accessories		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

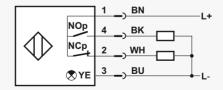


#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 4-pole, plug



#### Euro Plug M12






## Type Ferrous DC 3- and 4-pole

#### **Characteristics**

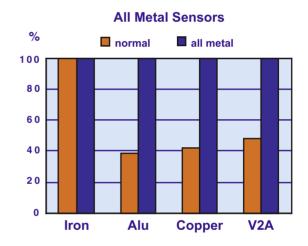


The **series ferrous 3- and 4-pole** comprises the "orthodox" Inductive Proximity Switches, which have been developed in the last decades under consideration of the special requirements of our customers. This series is standardized according to EN 60947-5-2.

On behalf of our clients we developed numerous different types whose dimensions deviate from the dimensions indicated in the standard.

When applying these types of the ferrous series it has to be considered that only ferrous metals have the indicated switching distance. When other metals are involved, a reduction factor has to be taken into consideration (see table and diagram).

Reduction Factor R	Fe-Switch	All Metal Switch
Iron	1.00	1.00
Aluminium	0.33 0.42	1.00
Brass	0.33 0.45	1.00
Stainless steel	0.56 1.00	1.00
Copper	0.30 0.45	1.00
Cast-iron	0.88 1.00	1.00





#### Type Ferrous DC 3- and 4-pole

		Switching dis-				Switching dis-	
Туре	Ref. No.	Mounting *)	Page	Туре	Ref. No.	Mounting *)	Page
cylindrical smooth Ø 4 x L				cylindrical M18 x L			
IAD-4er27b0,8-1PD1A	11.35-87-020	0,8 b	1.3.1.1	IAD-18mg85b5-1NT1A	11.20-02-020	5 b	1.3.4.6
IAD-46127 b0,0-1F b 1A	11.55-07-020		1.0.1.1	IAD-18mg85b5-12NK1A	11.18-32-020	5 b	1.3.4.6
cylindrical smooth Ø 6,5 x L	-			IAD-18mg85n10-1NT1A	11.20-75-020	10 n	1.3.4.7
IAD-6,5mr30b2-1ND1A	11.35-88-020	2 b	1.3.1.1	IAD-16IIIg65II10-IIV1 IA			1.5.4.7
IAD-0,3IIII30BZ-1ND1A	11.00-00-020			cylindrical M30 x L			
cylindrical M8 x L	-			IAD-30fg80b10-12NK1A	11.16-50-020	10 b	1.3.5.1
IAD-8mg33b2-1ND1A	11.35-89-020	2 b	1.3.2.1	IAD-301g00010-1210R1A	11.22-19	10 b	1.3.5.1
IAD-8mg33n3-1ND1A	11.35-90-020	3 n	1.3.2.1	IAD-30mg65n20-1S1A	11.32-36	20 n	1.3.5.2
IAD-8mg50b2-1Wc1A	11.35-92	2 b	1.3.2.2		11.25-88	10 b	1.3.5.2
IAD-8mg50n3-1Wc1A	11.35-92	3 n	1.3.2.2	IAD-30mg70b10-1S1A	11.20-03-020	10 b	1.3.5.2
-	11.35-95	2 b		IAD-30mg80b10-1NT1A			
IAD-8mg58b2-1Sd1A			1.3.2.2	IAD-30mg80n20-12S1A	11.22-05	20 n	1.3.5.2
IAD-8mg58n3-1Sd1A	11.35-95	3 n	1.3.2.2	IAD-30mg95b10-1S1A	11.22-86	10 b	1.3.5.3
IAD-8zq40b2-1ND1A	11.35-91-020	2 b	1.3.2.3	IAD-30sg80b10-12S1A	11.22-04	10 b	1.3.5.3
IAD-8zq60b2-1Wc1A	11.35-94	2 b	1.3.2.3	IAD-30sg80b10-12NT1A	_ 11.18-71-020	10 b	1.3.5.4
cylindrical M12 x L		-		rectangular 34 x 50 x 65		-	
IAD-12eg60b2-12S2A	11.24-89	2 b	1.3.3.1	IAD-34aq65b12-1S1A	11.25-90	12 b	1.3.6.1
IAD-12eg60b2-12S3A	11.32-85	2 b	1.3.3.1				
IAD-12fg50b2-1NK1A	11.32-61-020	2 b	1.3.3.2	rectangular 40 x 40 x L			
IAD-12fg50n5-1NK1A	11.32-62-030	5 n	1.3.3.2	IAD-40fv114b15-12L1B	11.25-52	15 b	1.3.7.1
IAD-12mg35m4-1PD1A	11.33-05-030	4 m	1.3.3.2	IAD-40fv114n25-12L1B	11.25-53	25 n	1.3.7.1
IAD-12mg35m4-1ND2A	11.35-01-030	4 m	1.3.3.3	IAD-40fv114b15-12S1B	11.25-66	15 b	1.3.7.2
IAD-12mg35m4-2ND1A	11.35-02-020	4 m	1.3.3.3	IAD-40fv114n25-12S1B	11.32-98	25 n	1.3.7.2
IAD-12mg35m4-6ND1A	11.33-10-020	4 m	1.3.3.4		_		
IAD-12mg40b2-1NK1A	11.20-67-030	2 b	1.3.3.4	cylindrical 80 x L			
IAD-12mg45b2-1NK1A	11.32-17-020	2 b	1.3.3.4	IAD-80fr70e80-1Sd1A	11.43-08	80 n	1.3.8.1
IAD-12mg45b2-7NK1A	11.32-19-050	2 b	1.3.3.4	IAD-80fr70n35-12S1A	11.35-22	35 n	1.3.8.1
IAD-12mg50b2-1PK1A	11.22-42-020	2 b	1.3.3.5	IAD-80fr70n50-1S1A	11.25-92	50 n	1.3.8.2
IAD-12mg50b2-1S1A	11.20-73	2 b	1.3.3.5	IAD-80fr70n50-1NT1A	11.03-94-050	50 n	1.3.8.2
IAD-12mg60b2-12NK1A	11.22-11-020	2 b	1.3.3.6				
IAD-12mg60b2-12S1A	11.22-12	2 b	1.3.3.6				
IAD-12mg60b2-1NT1A	11.20-01-020	2 b	1.3.3.6				
IAD-12mg60b2-1S2A	11.25-85	2 b	1.3.3.6		_	-	
IAD-12mg60m4-1NT1A	11.24-09-030	4 m	1.3.3.7				
IAD-12mg60m4-1PD1A	11.25-81-030	4 m	1.3.3.7				
IAD-12mg60m4-1S1A	11.25-03	4 m	1.3.3.8				
IAD-12mg60n5-12S1A	11.22-23	5 n	1.3.3.8		_	-	-
IAD-12mg60n5-1NK1A	11.20-15-020	5 n	1.3.3.8				
IAD-12mg60n5-1S1A	11.25-04	5 n	1.3.3.8				
cylindrical M18 x L					_		
IAD-18fg80b5-1NK1A	11.17-12-020	5 b	1.3.4.1		_		
IAD-18fg80n10-1NK1A	11.20-95-020	10 n	1.3.4.1		_		
IAD-18mg35b5-1NK1A	11.20-30-020	5 b	1.3.4.2		_		
IAD-18mg40m8-1ND2A	11.35-03-020	8 m	1.3.4.2				
IAD-18mg40m8-6ND1A	11.33-11-020	8 m	1.3.4.2				
IAD-18mg45m8-2ND1A	11.35-04-020	8 m	1.3.4.2		_		
IAD-18mg50b5-1S1A	11.22-06	5 b	1.3.4.3				
IAD-18mg50m8-1S1A	11.33-18	8 m	1.3.4.3		_		
IAD-18mg50n10-1S1A	11.22-16	10 n	1.3.4.4		_		
IAD-18mg60b5-12S1A	11.22-03	5 b	1.3.4.4		_		-
IAD-18mg70b5-1S1A	11.25-86	5 b	1.3.4.4		_		
					_		
IAD-18mg70m8-1PD1A	11.25-82-030	8 m	1.3.4.4		_		
IAD-18mg70m8-1S1A	11.25-97	8 m	1.3.4.5		_		
IAD-18mg70n10-12V1A	11.32-91	10 n	1.3.4.5		_		
IAD-18mg80b5-1S1A	11.22-85	5 b	1.3.4.6		_		
IAD-18mg80n10-1S1A	11.22-91	10 n	1.3.4.6				

<sup>\*)</sup> b = flush mounting, n = non-flush mounting, m = maximized; flush mounting

#### Series IAD-4er, -6.5mr

	Design; length	Ø 4; 27 mm	Ø 6.5; 30 mm
	Material of the sensing face / of the housing	PA 6.6 / stainless	PA 6.6 / brass
	Rated operating distance, mounting (see page 1.0.4)	0.8 mm, flush	2 mm, flush
	Range assured operating distance	0 0.65 mm	0 1.62 mm
	NO plus-switching NOp	IAD-4er27b0,8-1PD1A, 11.35-87-020 (1)	IAD-6,5mr30b2-1ND1A, 11.35-88-020 (1
Type designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(**************************************	NO minus-switching NOn		
	NC minus-switching NCn		
M	laximum switching frequency / Minimum damping period	3 kHz / ≥ 0.17 ms	3 kHz / ≥ 0.17 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	lead; 3 wires
	Common Technical Data		
	Reduction factor Fe / AI / V2A 1 / 0.4 / 0.5		
	steresis of the switching point s ≤ 15 %	Ø 4	Ø 6.5
	accuracy of the switching point s ≤ 11 %		-
- wi	ith permanent operating voltage	sensing ————————————————————————————————————	sensing
	and ambient temperature ≤ 1 %	lace	face
	Permissible ripple voltage ≤ 10 %	27 - 1	
	Short-circuit-proof? yes, clocking		
	Reverse polarity protection ? yes	<u>!</u>	
Vol	tage drop over a closed contact ≤ 2.4 V DC	LED	<u> </u>
	Ambient temperature range25 + 70 °C	standard	standard LED
		lead length 2.0 m	lead length 2.0 m
		¥	2.0 m <b>Q</b>
	Specific Technical Data		
	Permissible operating voltage range	10 24 30 V DC	10 24 30 V DC
	Current consumption without load	≤ 13 mA	≤ 15 mA
	Load current	≤ 200 mA	≤ 200 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output		
	Ø Sensing face		-
Switching radio	us r (at operating distance of the target s = 0; see page 1.0.2)		
Owntorning radiit	as I (at operating distance of the target's - 0, see page 1.0.2)		
	Function indication ?	yes, YE	yes, YE
	i andion indication :		, , , , , , , , , , , , , , , , , , ,
	Maximum lead length		150 m
Lead type	/ standard lead length / number of wires x lead cross section	PD / 2.0 m / 3 x 0.08 mm^2	ND / 2.0 m / 3 x 0.14 mm^2
Load type			
	EMV-class	EN 60947-5-2	EN 60947-5-2
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class	-	-
	Permissible torque without / with toothed disc		
	Weight	2 g + weight of the lead	4 g + weight of the lead
	Recommended accessories	chapter 12	chapter 12
	. 1000		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



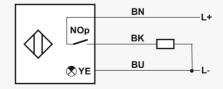
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1)

DC 3-pole, outgoing lead





 	 <del>·</del>

#### **Series IAD-8mg**

	Design; length	O M8 x 1; 33 mm	O M8 x 1; 33 mm
	Material of the sensing face / of the housing	PCP / brass nickel-plated	PCP / brass nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	2 mm, flush	3 mm, non-flush
	Range assured operating distance	0 1.62 mm	0 2.43 mm
	NO plus-switching NOp	IAD-8mg33b2-1ND1A, 11.35-89-020 (1)	IAD-8mg33n3-1ND1A, 11.35-90-020 (1)
Type designation	NC plus-switching NCp		
Type designation, – Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(**************************************	NO minus-switching NOn		
	NC minus-switching NCn		
М	aximum switching frequency / Minimum damping period	3 kHz / ≥ 0.17 ms	2.5 kHz / ≥ 0.2 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	lead; 3 wires
	Common Technical Data		
	Reduction factor Fe / AI / V2A 1 / 0.4 / 0.5	NO 4	N/O /
	steresis of the switching point s ≤ 15 %	M8x1	M8x1
	ccuracy of the switching point s ≤ 15 %		
- wi	th permanent operating voltage	sensing face	sensing face
	and ambient temperature ≤ 5 %	lace	lace 1
	Permissible ripple voltage ≤ 10 %		
	Short-circuit-proof? yes, clocking	<i>S</i> 13 ₩ ₩	S 13 H 8 €
	Reverse polarity protection ? yes		
Volt	tage drop over a closed contact ≤ 2.4 V DC	<u> </u>	[
	Ambient temperature range25 + 70 °C	standard	standard
		lead length   360° LED	lead length   360° LED
		لياء 2.0 m	2.0 m
	Specific Technical Data		
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 24 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 200 mA	≤ 200 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	-	-
	Ø Sensing face		
Switching radiu	us r (at operating distance of the target s = 0; see page 1.0.2)		
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	150 m	150 m
Lead type	/ standard lead length / number of wires x lead cross section	ND / 2.0 m / 3 x 0.14 mm^2	ND / 2.0 m / 3 x 0.14 mm^2
	EMV-class	EN 60947-5-2	EN 60947-5-2
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		
	Permissible torque without / with toothed disc	8 Nm / 20 Nm	8 Nm / 20 Nm
	Weight	5 g + weight of the lead	5 g + weight of the lead
	Recommended accessories	chapter 12	chapter 12
	. 1835511204 40000001100	0.16pto. 12	5.16pto. 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



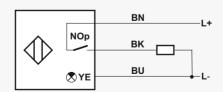
#### Safety Regulations

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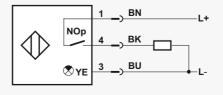
Subject to technical changes!

#### Wiring (1)

DC 3-pole, outgoing lead



#### Wiring (2) DC 3-pole, plug



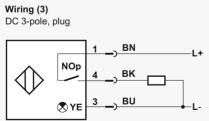
#### Euro Plug M8

with LED display YE visible from 4 sides





O M8 x 1; 50 mm	O M8 x 1; 50 mm	O M8 x 1 mm; 58 mm	O M8 x 1 mm; 58 mm	
PCP / brass nickel-plated	PCP / brass nickel-plated	PCP / brass nickel-plated	PA 6.6 / brass nickel-plated	
2 mm, flush	3 mm, non-flush	2 mm, flush	3 mm, non-flush	
0 1.62 mm	0 2.43 mm	0 1.62 mm	0 2.43 mm	
IAD-8mg50b2-1Wc1A, 11.35-92 (2				
	, (,		(,	
3 kHz / ≥ 0.17 ms	2.5 kHz / ≥ 0.2 ms	3 kHz / ≥ 0.17 ms	2 kHz / ≥ 0.25 ms	
connector M8; 3 wires	connector M8; 3 wires	connector M12; 3 wires	connector M12; 3 wires	
Sensing face  C13  LED visible from 4 sides  M8x1  P  O9  M8x1	Sensing face WS 13 04 05 05 05 05 05 05 05 05 05 05 05 05 05	sensing face  Sample of the sensing face  Sample of the sensing face  M8x1  Sample of the sensing face  M12x1  M8x1	sensing face SN N N N N N N N N N N N N N N N N N N	
10 24 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
≤ 10 mA	≤ 10 mA	≤ 10 mA	≤ 13 mA	
≤ 200 mA	≤ 200 mA	≤ 200 mA	≤ 200 mA	
75 V DC	75 V DC	75 V DC	75 V DC	
yes, YE	yes, YE	yes, YE	yes, YE	
150 m	150 m	150 m	150 m	
EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
DC 13	DC 13	DC 13	DC 13	
IP 67	IP 67	IP 67	IP 67	
8 Nm / 20 Nm	8 Nm / 20 Nm			
12 g	12 g	19 g	18 g	
chapter 12	chapter 12	chapter 12	chapter 12	





#### Series IAD-8zq

	Design; length	■ 8 x 8 mm; 40 mm	□ 8 x 8 mm; 60 mm
	Material of the sensing face / of the housing	PBT / die-cast zinc	PA 6.6 / die-cast zinc
	Rated operating distance, mounting (see page 1.0.4)	2 mm, flush	2 mm, flush
	Range assured operating distance	0 1.62 mm	0 1.62 mm
	NO plus-switching NOp	IAD-8zq40b2-1ND1A, 11.35-91-020 (1)	IAD-8zq60b2-1Wc1A 11.35-94 (
ype designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
. 0,	NO minus-switching NOn		
	NC minus-switching NCn		
	Maximum switching frequency / Minimum damping period	2 kHz / ≥ 0.25 ms	1 kHz / ≥ 0.5 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	connector M8; 3 wires
	Common Technical Data	aanaina	anning
	Reduction factor Fe / Al / V2A 1/0.4/0.5	sensing face	sensing face
	ysteresis of the switching point s ≤ 15 %	\	3.3
· · · · · · · · · · · · · · · · · · ·	accuracy of the switching point s ≤ 15 %	3 - 3	5.5
- W	vith permanent operating voltage	9	4 4
	and ambient temperature ≤ 5 %  Permissible ripple voltage ≤ 10 %	1 1 10 10 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Short-circuit-proof? yes, clocking	30-	3x0.5
	Reverse polarity protection ? yes	——————————————————————————————————————	1:1 %   5   1:1
Vc	oltage drop over a closed contact ≤ 2.4 V DC		9 2 2
	Ambient temperature range - 25 + 70 °C	/	LED
	7 timbioni temperatare range	T T	│ │ │ │ │ │ │ Visible
		LED	pod pod sides
			M8x1
		7	, IVIOX I
	Specific Technical Data		
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
	Current consumption without load	≤ 13 mA	≤ 20 mA
	Load current	≤ 200 mA	≤ 200 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output		
	Ø Sensing face		
Switching radi	ius r (at operating distance of the target s = 0; see page 1.0.2)		
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	150 m	150 m
I ead type	e / standard lead length / number of wires x lead cross section	ND / 2.0 m / 3 x 0.14 mm^2	130 111
Leau type	o , standard load longer / humber of wifes A lead 61055 Section	115 / 2.0 III / 3 X 0.14 IIIII 2	
	EMV-class	EN 60947-5-2	EN 60947-5-2
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		
	Permissible torque without / with toothed disc		
	Weight	12 g + weight of the lead	7 g
	Recommended accessories	chapter 12	chapter 12
or proximity switch	es with connector: Please choose the connector and lead	Wiring (1)	
	ter 12, "Accessories". The connector with its lead must be	DC 3-pole, outgoing lead	
	,		

ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.  $\,$ 

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

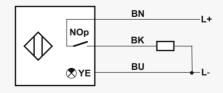
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



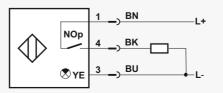
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!



#### Wiring (2) DC 3-pole, plug








#### **Series IAD-12eg, -12fg, -12mg**

Rated operating distance, mounting (see page 1.0.4)   2 mm, flush   2		Design; length	O M12 x 1; 60 mm	O M12 x 1; 60 mm
Rated operating distance, mounting (see page 1.0.4)   2 mm, flush   0 1.62 mm   0 1.		<u> </u>		<u> </u>
Range assured operating distance  NO plus-switching NCp NO minus-switching NCp		<u> </u>		
NO plus-switching   NOp   NC plus-switching   NCp				
Type designation, Ref. no.   NO and NC plus-switching   NOp + NCp		3 1 0	2.11.1132.11111	3 III 1132 IIIIII
No and NC plus-switching   NOp + NCp	ŀ	1 0 1		
NO plus, NC minus-switching NOp + NCn			IAD-12eg60b2-12S2A. 11.24-89 (1)	IAD-12eg60b2-12S3A, 11.32-85 (1)
NO minus-switching   NOn   NC minus-switching   NOn   NC minus-switching   NOn   NC minus-switching   NOn   NC minus-switching   NC more   NC minus-switching   NC more   NC minus-switching   NC more   NC minus-switching   NC more   NC				11.02 cc (1)
NC minus-switching NCn	(vviring)	1 7 0 1		
Maximum switching frequency / Minimum damping period Wiring (connector or lead); number of wires  Common Technical Data Reduction factor Fe / Al / V2A 1/0.4/0.5 Hysteresis of the switching point s 3 20 % Replittion accuracy of the switching point s ≤ 10 %  - with permanent operating voltage such and ambient temperature ≤ 2 % Permissible ripple voltage ≤ 15 % Short-circuit-proof? yes, clocking Reverse polarity protection? yes Voltage drop over a closed contact ≤ 2.5 V DC  11.24-89: ≤ 1.5 V DC  11.24-89: ≤ 1.5 V DC  11.24-89: ≤ 1.5 V DC  Ambient temperature range - 25 + 75 °C  Specific Technical Data Permissible operating voltage range Current consumption without load Load current Nominal insulation voltage Permissible capacity at output Ø Sensing face 10 24 30 V DC 10 25 30 V DC 10 26 30 V DC 10 27 30 V DC 10 27 30 V DC 10 28 30 V	-	<u>~</u>		
Wiring (connector or lead); number of wires  Common Technical Data  Reduction factor Fe / M / V2A 1 / 0.4 / 0.5 Hysteresis of the switching point s 3 20 %  Repitition accuracy of the switching point s ≤ 10 % -with permanent operating voltage and ambient temperature ≤ 2 %  Permissible ripple voltage ≤ 15 %  Short-torout-proof? 9 yes, clocking Reverse polarity protection ? yes  Voltage drop over a closed contact ≤ 2.5 V DC  11.32-85: ≤ 1.5 V DC  11.32-85: ≤ 1.5 V DC  11.32-85: ≤ 1.5 V DC  25 + 75 °C   Specific Technical Data  Permissible operating voltage range Current consumption without load Load current ≤ 200 mA  Nominal insulation voltage Permissible capacity at output  Ø Sensing face  10 24 30 V DC  11.0 µF  ≤ 10 mA  ≤ 10 mA  ≤ 200 mA  5 200 mA  5 200 mA  5 200 mA  5 200 mA  Sensing face  10 24 30 V DC  10 24 3	N	6	3 kHz / ≥ 0.1 ms	3 kHz / > 0.1 ms
Common Technical Data  Reduction factor Fe / Al / V2A Hysteresis of the switching point s 3 20 %  Repitition accuracy of the switching point s 4 20 %  Repitition accuracy of the switching point s 4 20 %  Permissible ripple voltage 515 % Short-circuit-proof? yes, clocking Reverse polarity protection ? yes Voltage drop over a closed contact 52.5 V DC 11.24-89: \$1.5 V DC 11.32-85: \$1.5 V DC 11.		<u> </u>		
Permissible operating voltage range Current consumption without load  Load current Load current South Permissible capacity at output  Ø Sensing face Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Permissible torque without / with toothed disc Permissible torque without with toothed disc Weight  10 24 30 V DC  10 24 30 V DC  11 24 30 V DC  11 24 30 V DC  12 30 V DC  13 24 30 V DC  14 30 V DC  15 30 V DC  15 30 V DC  15 30 V DC  16 30 V DC  17	Hy Repitition æ - w	Reduction factor Fe / Al / V2A  ysteresis of the switching points accuracy of the switching points accuracy of the switching points  ith permanent operating voltage and ambient temperature  Permissible ripple voltage  Short-circuit-proof?  Reverse polarity protection?  Reverse polarity protection?  Itage drop over a closed contact  11.24-89: ≤ 1.5 ∨ DC  11.32-85: ≤ 1.5 ∨ DC	sensing face	sensing face 04 09 LED 09
Current consumption without load Load current Load current Load current Load current Load current South Decrease Seep age 1.0.2  Load current Load current Load current South Decrease Seep age 1.0.2  Permissible capacity at output South Sensing face South S		•	10 01 00 / 00	40.04.00
Load current Nominal insulation voltage Permissible capacity at output Ø Sensing face Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Punction indication?  Wes, YE  Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2 Protection rating according to IEC 60529 Protection class Permissible torque without / with toothed disc Weight  Sensing face 10.5 mm 10.5				
Nominal insulation voltage       75 V DC       75 V DC         Permissible capacity at output       ≤ 1.0 μF       ≤ 1.0 μF         Ø Sensing face       10.5 mm       10.5 mm         Switching radius r (at operating distance of the target s = 0; see page 1.0.2)       1.85 mm       1.85 mm         Function indication?       yes, YE       yes, YE         Maximum lead length       300 m       300 m         Lead type / standard lead length / number of wires x lead cross section       DC 13       DC 13         Utilization category according to IEC 60947-5-2       DC 13       DC 13         Protection rating according to IEC 60529       IP 67       IP 67         Protection class       II, □         Permissible torque without / with toothed disc       12 Nm / 45 Nm       12 Nm / 45 Nm         Weight       30 g       30 g		•		
Permissible capacity at output Ø Sensing face Ø Sensing face 10.5 mm 10.5 mm 1 10.5 mm 1 1.85 mm  Function indication?  Weight				
Ø Sensing face Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  Function indication?  Yes, YE  Maximum lead length Jutilization category according to IEC 60947-5-2 Protection rating according to IEC 60529 Protection class Permissible torque without / with toothed disc Weight  Weight  10.5 mm 1		<u>~</u> _		
Switching radius r (at operating distance of the target s = 0; see page 1.0.2)  1.85 mm  1.80 mm  300 m  1.80 mm  300 m  1.80 mm  1.85 mm  1.80 mm  1.85 mm			<u> </u>	
Function indication?    Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication?   Second Permissible torque without / with toothed disc National Protection indication indication   Second Permissible torque without / with toothed disc National Protection indication   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed disc National Protection   Second Permissible torque without / with toothed without / with toothed disc National Protection   Second Per	Switching radio			
Maximum lead length Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  DC 13  Protection rating according to IEC 60529 Protection class Protection class Permissible torque without / with toothed disc Weight  Maximum lead length 300 m  300 m  DC 13  DC 13  IP 67  IP 67  IP 67  II, □  Permissible torque without / with toothed disc 30 g 30 g	Owitoring radio	us i (at operating distance of the target 5 – 0, see page 1.0.2)	1.00 111111	1.03 11111
Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  DC 13  Protection rating according to IEC 60529  Protection class  Protection class  Permissible torque without / with toothed disc  Weight  DC 13  DC 13  IP 67  IP 67  II, □  Permissible torque without / with toothed disc  30 g  30 g		Function indication ?	yes, YE	yes, YE
Lead type / standard lead length / number of wires x lead cross section  Utilization category according to IEC 60947-5-2  Protection rating according to IEC 60529  Protection class  Permissible torque without / with toothed disc  Weight  DC 13  DC 13  IP 67  IP 67  II, □  Permissible torque without / with toothed disc  Weight  30 g  30 g		Maximum lead length	300 m	300 m
Utilization category according to IEC 60947-5-2 DC 13 DC 13  Protection rating according to IEC 60529 IP 67 IP 67  Protection class Permissible torque without / with toothed disc Weight  DC 13  DC 13  IP 67  IP 67  II, □  Permissible torque without / with toothed disc 30 g 30 g	I ead type	<u> </u>		
Protection rating according to IEC 60529 IP 67 IP 67  Protection class Permissible torque without / with toothed disc Weight  Protection class 12 Nm / 45 Nm 12 Nm / 45 Nm Weight 30 g 30 g	2000 1900			
Protection rating according to IEC 60529 IP 67 IP 67  Protection class Permissible torque without / with toothed disc Weight  Protection class 12 Nm / 45 Nm 12 Nm / 45 Nm Weight 30 g 30 g		Utilization category according to IFC 60947-5-2	DC 13	DC 13
Protection class Permissible torque without / with toothed disc Weight  12 Nm / 45 Nm 12 Nm / 45 Nm 12 Nm / 45 Nm 30 g 30 g		ÿ , ÿ		
Permissible torque without / with toothed disc 12 Nm / 45 Nm 12 Nm / 45 Nm Weight 30 g 30 g		· · · · · · · · · · · · · · · · · · ·		. <u> </u>
Weight         30 g         30 g			12 Nm / 45 Nm	-
		·		
		· · · · · · · · · · · · · · · · · · ·		
Recommended accessories chapter 12 chapter 12		Recommended accessories	chapter 12	chapter 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

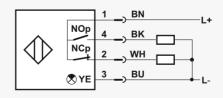


#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

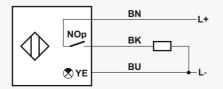
#### Wiring (1) DC 4-pole, plug



#### Eurostecker M12



# Wiring (2) DC 3-pole, outgoing lead





O M12 x1; 50 mm PBT / PBT PBT PBT 2 mm, flush 0 1.62 mm 0 3.24				
2 mm, flush 0162 mm         5 mm, non-flush 0405 mm         4 mm, flush, maximized 0324 mm           IAD-1265002-1NK1A         113245000         (2)         AD-12655062-1NK1A         113245030         (2)         AD-127655062-1NK1A         113245030         (2)           2 kHz / ≥ 0.2 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           3 17         1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           4 mm, flush, maximized AD-12765062-1NK1A         1132450300         (2)           5 kHz / ≥ 0.2 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           5 lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           5 loop         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           1 kHz / ≥ 0.3 ms lead; 3 wires         1 kHz / ≥ 0.3 ms lead; 3 wires           5 loop         2 loop         2 loop         2 loop	O M12 x 1; 50 mm	O M12 x 1; 50 mm	O M12 x 1; 35 mm	
0162 mm 0405 mm 0324 mm 0325 mm 0335 mm 0325 mm 0330 mm 0305 mm				
AD-12/g5002-1MK1A		- <u>·</u>		
2 kHz /≥ 0.2 ms lead; 3 wires				
lead; 3 wires   lead; 3 wire	IAD-12fg50b2-1NK1A, 11.32-61-020 (2)	IAD-12fg50n5-1NK1A, 11.32-62-030 (2)	IAD-12mg35m4-1PD1A, 11.33-05-030 (2)	
lead; 3 wires   lead; 3 wire				
lead; 3 wires   lead; 3 wire				
lead; 3 wires   lead; 3 wire				
lead; 3 wires   lead; 3 wire				
lead; 3 wires   lead; 3 wire			1111 /5 22	
82430 V DC  \$10 mA \$400 mA \$400 mA \$5 V DC \$1.0 μF \$1.0 5 mm \$1.85 mm \$1.85 mm  \$3.5 mm  \$3.5 mm  \$3.6 mm  NK / 2.0 m / 3 x 0.34 mm²2  DC13  P67  P67  P67  P67  P67  P67  P67  P6				
82430 V DC  \$ 10 mA  \$ 10 mA  \$ 400 mA  \$ 400 mA  \$ 510 mF  \$ 51.0 µF  \$ 10.0 µF	lead; 3 wires	lead; 3 wires	lead; 3 wires	
≤ 10 mA       ≤ 10 mA       ≤ 10 mA         ≤ 400 mA       ≤ 400 mA       ≤ 400 mA         75 V DC       75 V DC       75 V DC         ≤ 1.0 μF       ≤ 0.47 μF       ≤ 1.0 μF         10.5 mm       10.7 mm       10.5 mm         1.85 mm       3.5 mm       3.6 mm         yes, YE       yes, YE       yes, YE         300 m       300 m       300 m         NK / 2.0 m / 3 x 0.34 mm²2       NK / 3.0 m / 3 x 0.34 mm²2       PD / 3.0 m / 3 x 0.34 mm²2         DC13       DC13       DC 13         IP 67       IP 67       IP 67         II, □       1.5 Nm / 2 Nm       9 Nm / 30 Nm         30 g + weight of the lead       20 g + weight of the lead       20 g + weight of the lead	sensing face	sensing face	sensing face	
≤ 10 mA       ≤ 10 mA       ≤ 10 mA         ≤ 400 mA       ≤ 400 mA       ≤ 400 mA         75 V DC       75 V DC       75 V DC         ≤ 1.0 μF       ≤ 0.47 μF       ≤ 1.0 μF         10.5 mm       10.7 mm       10.5 mm         1.85 mm       3.5 mm       3.6 mm         yes, YE       yes, YE       yes, YE         300 m       300 m       300 m         NK / 2.0 m / 3 x 0.34 mm²2       NK / 3.0 m / 3 x 0.34 mm²2       PD / 3.0 m / 3 x 0.34 mm²2         DC13       DC13       DC 13         IP 67       IP 67       IP 67         II, □       1.5 Nm / 2 Nm       9 Nm / 30 Nm         30 g + weight of the lead       20 g + weight of the lead       20 g + weight of the lead	8 24 30 V DC	8 24 30 V DC	10 24 30 V DC	
≤ 400 mA       ≤ 400 mA       ≤ 400 mA         75 V DC       75 V DC       75 V DC         ≤ 1.0 μF       ≤ 0.47 μF       ≤ 1.0 μF         10.5 mm       10.5 mm       10.5 mm         1.85 mm       3.5 mm       3.6 mm         yes, YE         300 m       300 m       300 m         NK / 2.0 m / 3 x 0.34 mm²2       NK / 3.0 m / 3 x 0.34 mm²2       PD / 3.0 m / 3 x 0.34 mm²2         DC13       DC 13       DC 13         IP 67       IP 67       IP 67         II, □       1.5 Nm / 2 Nm       9 Nm / 30 Nm         30 g + weight of the lead       30 g + weight of the lead       20 g + weight of the lead				
75 V DC  ≤ 1.0 μF  ≤ 0.47 μF  10.5 mm  10.7 mm  1.85 mm  3.5 mm  3.6 mm   yes, YE  yes, YE  yes, YE  yes, YE  yes, YE   300 m  NK / 2.0 m / 3 x 0.34 mm <sup>2</sup> DC13  IP 67  IP 67  II, □  1.5 Nm / 2 Nm  30 g + weight of the lead  75 V DC  75 V DC  51.0 μF  ≤ 1.0 μF  ≤ 1.0 μF  γes, YE  yes, YE  10.5 mm  300 m  NK / 3.0 m / 3 x 0.34 mm <sup>2</sup> 2  PD / 3.0 m / 3 x 0.34 mm <sup>2</sup> 2  II, □  9 Nm / 30 Nm  20 g + weight of the lead  20 g + weight of the lead				
10.5 mm 1.85 mm 1.85 mm 3.5 mm 3.6 mm  yes, YE  yes, YE  yes, YE  yes, YE  300 m  NK / 2.0 m / 3 x 0.34 mm^2  DC13  DC13  IP 67  IP 67  II, □  1.5 Nm / 2 Nm  1.5 Nm / 2 Nm  30 g + weight of the lead  10.5 mm 10.5 m	75 V DC	75 V DC	75 V DC	
1.85 mm       3.5 mm         yes, YE       yes, YE         300 m       300 m         NK / 2.0 m / 3 x 0.34 mm^2       NK / 3.0 m / 3 x 0.34 mm^2         DC13       DC 13         IP 67       IP 67         II, □         1.5 Nm / 2 Nm       1.5 Nm / 2 Nm         30 g + weight of the lead       30 g + weight of the lead	≤ 1.0 µF	≤ 0.47 µF	≤ 1.0 µF	
yes, YE       yes, YE       yes, YE         300 m       300 m       300 m         NK / 2.0 m / 3 x 0.34 mm²2       NK / 3.0 m / 3 x 0.34 mm²2       PD / 3.0 m / 3 x 0.34 mm²2         DC13       DC 13       DC 13         IP 67       IP 67       IP 67         II, □       1.5 Nm / 2 Nm       9 Nm / 30 Nm         30 g + weight of the lead       30 g + weight of the lead       20 g + weight of the lead	10.5 mm		10.5 mm	
300 m  NK / 2.0 m / 3 x 0.34 mm^2  NK / 3.0 m / 3 x 0.34 mm^2  DC13  DC13  IP 67  IP 67  II, □  1.5 Nm / 2 Nm  1.5 Nm / 2 Nm  30 g + weight of the lead  30 g + weight of the lead  30 g + weight of the lead  30 m  300 m  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  II, □  9 Nm / 30 Nm  20 g + weight of the lead	1.85 mm	3.5 mm	3.6 mm	
300 m  NK / 2.0 m / 3 x 0.34 mm^2  NK / 3.0 m / 3 x 0.34 mm^2  DC13  DC13  IP 67  IP 67  II, □  1.5 Nm / 2 Nm  1.5 Nm / 2 Nm  30 g + weight of the lead  30 g + weight of the lead  30 g + weight of the lead  30 m  300 m  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  PD / 3.0 m / 3 x 0.34 mm^2  II, □  9 Nm / 30 Nm  20 g + weight of the lead				
NK / 2.0 m / 3 x 0.34 mm^2       NK / 3.0 m / 3 x 0.34 mm^2       PD / 3.0 m / 3 x 0.34 mm^2         DC13       DC 13         IP 67       IP 67         II, □         1.5 Nm / 2 Nm       1.5 Nm / 2 Nm         30 g + weight of the lead       30 g + weight of the lead    PD / 3.0 m / 3 x 0.34 mm^2 IP 67 II, □ 9 Nm / 30 Nm 20 g + weight of the lead	yes, YE	yes, YE	yes, YE	
NK / 2.0 m / 3 x 0.34 mm^2       NK / 3.0 m / 3 x 0.34 mm^2       PD / 3.0 m / 3 x 0.34 mm^2         DC13       DC 13         IP 67       IP 67         II, □         1.5 Nm / 2 Nm       1.5 Nm / 2 Nm         30 g + weight of the lead       30 g + weight of the lead    PD / 3.0 m / 3 x 0.34 mm^2 IP 67 II, □ 9 Nm / 30 Nm 20 g + weight of the lead				
DC13       DC 13         IP 67       IP 67         II, □         1.5 Nm / 2 Nm       1.5 Nm / 2 Nm         30 g + weight of the lead       30 g + weight of the lead    DC 13 II, □ 9 Nm / 30 Nm 20 g + weight of the lead 20 g + weight of the lead			-	
IP 67     IP 67       II, □       1.5 Nm / 2 Nm     1.5 Nm / 2 Nm       30 g + weight of the lead     30 g + weight of the lead       20 g + weight of the lead	NK / 2.0 m / 3 x 0.34 mm^2	NK / 3.0 m / 3 x 0.34 mm^2	PD / 3.0 m / 3 x 0.34 mm^2	
IP 67     IP 67       II, □       1.5 Nm / 2 Nm     1.5 Nm / 2 Nm       30 g + weight of the lead     30 g + weight of the lead       20 g + weight of the lead	DC12			
II, □       1.5 Nm / 2 Nm     1.5 Nm / 2 Nm     9 Nm / 30 Nm       30 g + weight of the lead     30 g + weight of the lead     20 g + weight of the lead				
1.5 Nm / 2 Nm       1.5 Nm / 2 Nm       9 Nm / 30 Nm         30 g + weight of the lead       30 g + weight of the lead       20 g + weight of the lead	IF 6/	IP 6/		
30 g + weight of the lead 30 g + weight of the lead 20 g + weight of the lead	1.5 Nm / 2 Nm	1.5 Nm / 2 Nm	<u> </u>	
chapter 12 chapter 12 chapter 12	50 g + weight of the lead	30 g + weight of the lead	20 g + weight of the lead	
Chapter 12 Chapter 12 Chapter 12	chanter 12	chapter 12	obonto- 40	
	Chapter 12	спарсет 12	спартег 12	

#### **Series IAD-12mg**

	Design; length	O M12 x 1; 35 mm	O M12 x 1; 35 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	4 mm, flush, maximized	4 mm, flush, maximized
	Range assured operating distance	0 3.24 mm	0 3.24 mm
	NO plus-switching NOp	IAD-12mg35m4-1ND2A, 11.35-01-030 (1)	
	NC plus-switching NCp		IAD-12mg35m4-2ND1A, 11.35-02-020 (2
Type designation, - Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(vviiiig)	NO minus-switching NOn		
	NC minus-switching NCn		
V	Maximum switching frequency / Minimum damping period	≤ 1.5 kHz / ≥ 0.3 ms	≤ 1.5 kHz / ≥ 0.3 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	lead; 3 wires
	g (	,.	
	Gemeommon Technical Data		
	Reduction factor Fe / Al / V2A 1 / 0.4 / 0.5	M12x1	M12x1
	ysteresis of the switching point s 3 20 %	<b>→</b>	<b>→</b>
	accuracy of the switching point s ≤ 10 %	sensing —	sensing —
· · · · · · · · · · · · · · · · · · ·	ith permanent operating voltage	face	face
***	and ambient temperature ≤ 2 %		
	11.35-01, -02: ≤ 0.5 %	\$17 F 19	∑17 →
	Permissible ripple voltage ≤ 15 %	/~ "	
	11.35-01, -02: ≤ 10 %	LED ─ <del> </del> <del>-</del> •	LED <del>-</del>
	Short-circuit-proof? yes, clocking	<u> </u>	<u> </u>
	Reverse polarity protection? yes	i	į.
Vol	tage drop over a closed contact ≤ 2.5 V DC,		
VOI	Ambient temperature range - 25 + 75 °C		
	7 Inibioni tomporatare range		
	Specific Technical Data		
	Permissible operating voltage range	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 400 mA	≤ 200 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF
	Ø Sensing face	10.5 mm	10.5 mm
Switching radio	us r (at operating distance of the target s = 0; see page 1.0.2)	3.6 mm	3.6 mm
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	300 m	300 m
Lead type	e / standard lead length / number of wires x lead cross section	ND / 3.0 m / 3 x 0.34 mm <sup>2</sup>	ND / 2.0 m / 3 x 0.34 mm <sup>2</sup>
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		
	Permissible torque without / with toothed disc	9 Nm / 30 Nm	9 Nm / 30 Nm
	Majaht	90 g + weight of the lead	90 g + weight of the lead
	Weight	30 g · Weight of the lead	og weight of the four
	Note	no internal load resistance	no internal load resistance

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



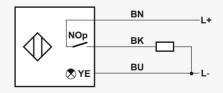
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

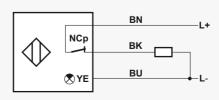
#### Wiring (1)

DC 3-pole, outgoing lead



#### Wiring (2)

DC 3-pole, outgoing lead





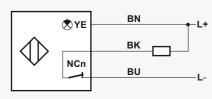
O M12 x 1; 35 mm	O M12 x 1; 40 mm	O M12 x 1; 45 mm	O M12 x 1; 45 mm
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
4 mm, flush, maximized	2 mm, flush	2 mm, flush	2 mm, flush
0 3.24 mm	0 1.62 mm	0 1.62 mm	0 1.62 mm
	IAD-12mg40b2-1NK1A, 11.20-67-030 (1)	IAD-12mg45b2-1NK1A, 11.32-17-020 (1)	
	(1)	g	
IAD-12mg35m4-6ND1A, 11.33-10-020 (3)			
11.00 10 020 (0)			IAD-12mg45b2-7NK1A, 11.32-19-050 (4)
1.5 kHz / ≥ 0.3 ms	2 kHz / ≥ 0.2 ms	3 kHz / ≥ 0.1 ms	3 kHz / ≥ 0.1 ms
lead; 3 wires	lead; 3 wires	lead; 3 wires	lead; 3 wires
1000, 0 111100	ioda, o wildo	1000, 0 W1100	load, o whoo
sensing face 17 LED	sensing face  M12x1  Sensing face  LED  OF  SG  SG  SG  SG  SG  SG  SG  SG  SG  S	sensing face Schnorr locking washer	sensing face  Schnorr locking washer  LED  M12x1  Schnorr locking washer
10 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC ≤ 10 mA	8 <u>24</u> 30 V DC ≤ 10 mA
≤ 10 mA ≤ 400 mA	≤ 10 mA ≤ 400 mA	≤ 400 mA	≤ 10 mA
≤ 400 mA 75 V DC	- <u>≤ 400 mA</u> 75 V DC	75 V DC	75 V DC
	≤ 1.0 μF	≤ 1.0 μF	≤ 1.0 μF
≤ 1.0 μF 10.5 mm	10.5 mm	10.5 mm	10.5 mm
	1.85 mm	1.85 mm	1.85 mm
3.6 mm	1.03 111111	1.00 111111	1.03 111111
yes, YE	yes, YE	yes, YE	yes, YE
300 m	300 m	300 m	300 m
ND / 2.0 m / 3 x 0.34 mm^2	NK / 3.0 m / 3 x 0.34 mm^2	NK / 2.0 m / 3 x 0.34 mm^2	NK / 5.0 m / 3 x 0.34 mm^2
DC 13	DC 13	DC 13	DC 13
IP 67	. IP 67	IP 67	IP 67
II, 🗆	- II, 🖂	II, 🗆	II, 🗆
9 Nm / 30 Nm	9 Nm / 30 Nm	9 Nm / 30 Nm	9 Nm / 30 Nm
20 g + weight of the lead	25 g + weight of the lead	40 g + weight of the lead	40 g + weight of the lead
ZU g + weight of the lead	25 g + weight of the lead		
chapter 12	chapter 12	chapter 12	chapter 12
Chapter 12	chapter 12	Glapter 12	σιαριοί 12



Wiring (3)
DC 3-pole, outgoing lead



Wiring (4)
DC 3-pole, outgoing lead



#### **Series IAD-12mg**

	Design; length	O M12 x 1; 50 mm	O M12 x 1; 50 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	2 mm, flush	2 mm, flush
	Range assured operating distance	0 1.62 mm	0 1.62 mm
	NO plus-switching NOp	IAD-12mg50b2-1PK1A, 11.22-42-020 (1)	IAD-12mg50b2-1S1A, 11.20-73 (2
Tune designation	NC plus-switching NCp		
Type designation, Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(**************************************	NO minus-switching NOn		
	NC minus-switching NCn		
N	Maximum switching frequency / Minimum damping period	2 kHz / ≥ 0.2 ms	2 kHz / ≥ 0.2 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	connector M12; 3 wires
	Common Technical Data	M12x1	
	Reduction factor Fe / Al / V2A 1/0.4/0.5	-	M12x1
	ysteresis of the switching point s 3 20 %	sensing	- <b>-</b>
<u> </u>	accuracy of the switching point s ≤ 10 %	face	sensing —
- W	vith permanent operating voltage		face
	and ambient temperature ≤2 %	<i>S</i> 17	_ <del>     </del>
	Permissible ripple voltage ≤ 15 %		S₁7
	Short-circuit-proof? yes, clocking	65	
	Reverse polarity protection ? yes	<u> </u>	- 20
Vo	Itage drop over a closed contact ≤ 1.5 V DC	LED +	LED — P
	11.25-85: ≤ 2.5 V DC	<del>                                      </del>	<u> </u>
	Ambient temperature range 25 + 75 °C		M12x1 → ∞ ▼
			' <b>↑</b>
	Specific Technical Data	The state of the s	
	Permissible operating voltage range	8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF
Curitahina	Ø Sensing face	10.5 mm	10.5 mm
Switching radi	us r (at operating distance of the target s = 0; see page 1.0.2)	1.85 mm	1.85 mm
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	300 m	300 m
Lead type	e / standard lead length / number of wires x lead cross section	PK / 2.0 m / 3 x 0.34 mm^2	
			·
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class	II, 🗆	II, 🗆
	Permissible torque without / with toothed disc	9 Nm / 30 Nm	9 Nm / 30 Nm
	Weight	45 g + weight of the lead	30 g
	Recommended accessories	chapter 12	chapter 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

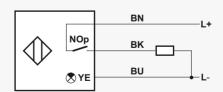


#### Safety Regulations

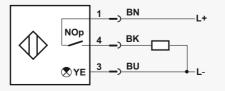
Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 3-pole, outgoing lead

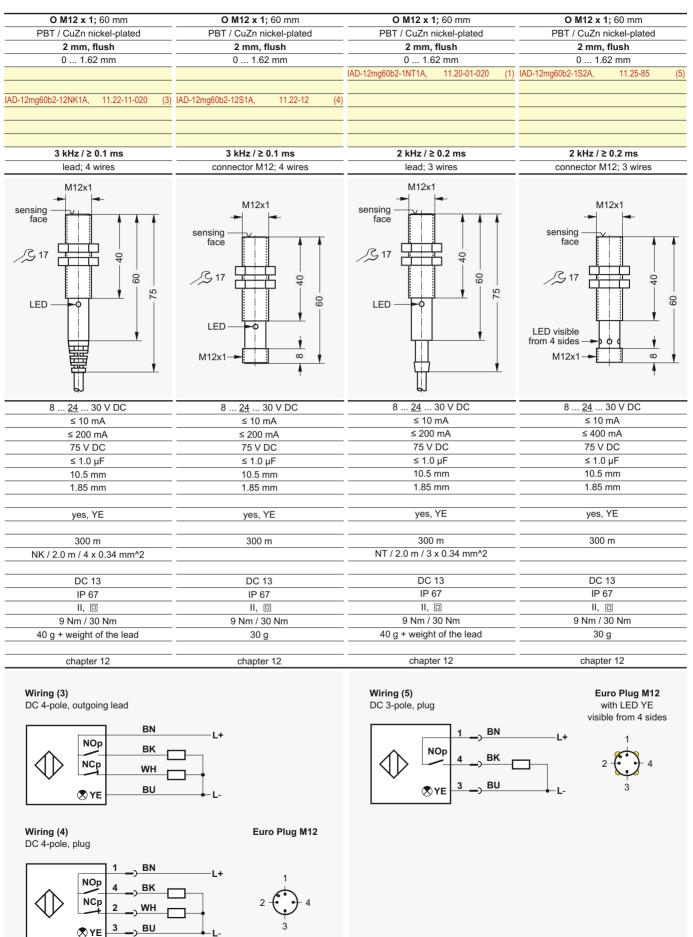


#### Wiring (2) DC 3-pole, plug









#### **Series IAD-12mg**

	Design; length	O M12 x 1; 60 mm	O M12 x 1; 60 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	4 mm, flush, maximized	4 mm, flush, maximized
	Range assured operating distance	0 3.24 mm	0 3.24 mm
	NO plus-switching NOp	IAD-12mg60m4-1NT1A, 11.24-09-030 (1)	IAD-12mg60m4-1PD1A, 11.25-81-020
	NC plus-switching NCp		
ype designation, Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(viiiig)	NO minus-switching NOn		
	NC minus-switching NCn		
ı	Maximum switching frequency / Minimum damping period	1 kHz / ≥ 0.3 ms	1 kHz / ≥ 0.1 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	lead; 3 wires
		M12x1	M40v4
	Common Technical Data	WIIZXI	M12x1
	Reduction factor Fe / Al / V2A 1 / 0.4 / 0.5	sensing	sensing — V
Н	ysteresis of the switching point s 3 20 %	face	face A A
Repitition	accuracy of the switching point s ≤ 10 %		
- v	vith permanent operating voltage	C 17	C 17
	and ambient temperature ≤ 2 %	<i>S</i> 17	S₁7
	Permissible ripple voltage ≤ 15 %	- 09	- 09
	Short-circuit-proof? yes, clocking	75 –	l l l l l l l
	Reverse polarity protection ? yes	LED FOI	<u> </u>
Vo	oltage drop over a closed contact ≤ 2.5 V DC		
	<b>11.22-23</b> : ≤ 1.5 V DC		lil l
	Ambient temperature range 25 + 75 °C	<del>                                      </del>	LED -
			ii
		<u> </u>	lil.
		<u>L</u> il	Lj l
	Specific Technical Data		
	Permissible operating voltage range	10 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 μF	≤ 1.0 µF
	Ø Sensing face	10.5 mm	10.5 mm
Switching rad	ius r (at operating distance of the target s = 0; see page 1.0.2)	3.6 mm	3.6 mm
	Function indication ?	yes, YE	yes, YE
		200	200
nod t	Maximum lead length	300 m NT / 3.0 m / 3 x 0.34 mm^2	300 m PD / 2.0 m / 3 x 0.34 mm^2
Lead type	e / standard lead length / number of wires x lead cross section	1N1 / 3.0 III / 3 X U.34 IIIIII'2	
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60547-3-2	IP 67	IP 67
	Protection rating according to IEC 60329  Protection class	II, 🗆	II, 🗆
	Permissible torque without / with toothed disc	9 Nm / 30 Nm	9 Nm / 30 Nm
	Weight	40 g + weight of the lead	40 g + weight of the lead
	weignt	To g . Weight of the lead	To g . Weight of the lead
	Recommended accessories	chapter 12	chapter 12
	Neconinenced accessories	σταρίοι 12	Giapter 12
	nes with connector: Please choose the connector and lead	Wiring (1)	
u require in Chap	ter 12, "Accessories". The connector with its lead must be	DC 3-pole, outgoing lead	

ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

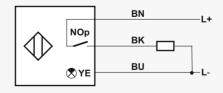
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!



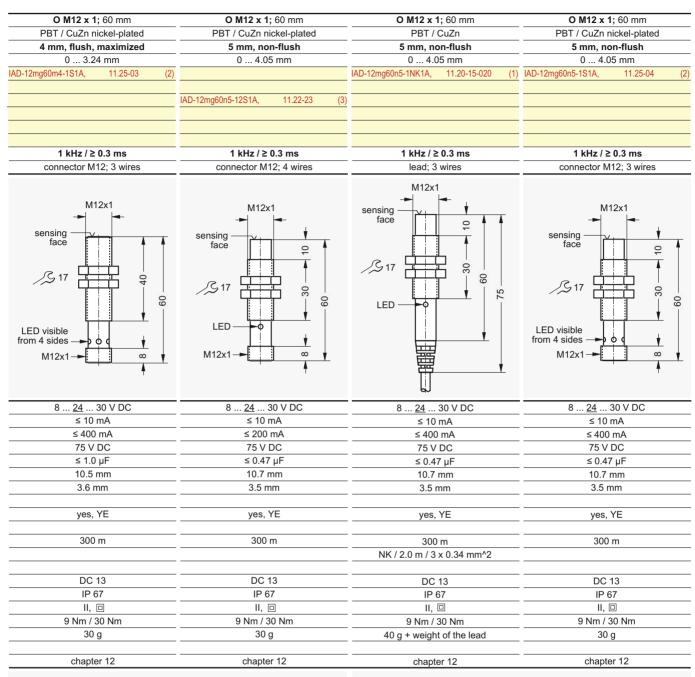
#### Wiring (2) DC 3-pole, plug BN NOp

BU

#### Euro Plug M12 with LED YE visible from 4 sides









) WH

NCp

**♥YE** 



# Series IAD-18fg, -18mg

Type designation,	Material of the sensing face / of the housing Rated operating distance, mounting (see page 1.0.4)	PBT / PBT	PBT / PBT
		E manus fluoris	
		5 mm, flush	10 mm, non-flush
	Range assured operating distance	0 4.05 mm	0 8.1 mm
	NO plus-switching NOp	IAD-18fg80b5-1NK1A, 11.17-12-020 (1)	IAD-18fg80n10-1NK1A, 11.20-95-020
	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
, ,	NO minus-switching NOn		
	NC minus-switching NCn		
N	Maximum switching frequency / Minimum damping period	1 kHz / ≥ 0.3ms	800 Hz / ≥ 1 ms
	Wiring (connector or lead); number of wires	lead; 3 wires	lead; 3 wires
		-► M18x1 -	-► M18x1   <del>-</del>
	Common Technical Data	sensing —	sensing —
	Reduction factor Fe / AI / V2A 1 / 0.4 / 0.5	face	face A A
	ysteresis of the switching point s 3 20 %		
•	accuracy of the switching point s ≤ 10 %		i
- W	ith permanent operating voltage	S 24 24 00 00 00 00 00 00 00 00 00 00 00 00 00	S 24 1 8
	and ambient temperature ≤ 2 %		
	11.35-03: ≤ 0.5 %	80	
	11.33-11: ≤ 0.5 %	95	
	Permissible ripple voltage ≤ 15 %		
	11.35-03: ≤ 10 %		
	<u>11.33-11: ≤ 10 %</u>		
	? / Reverse polarity protection ? yes, clocking / yes	LED -	LED *
Vo	Itage drop over a closed contact ≤ 2.5 V DC		
	Ambient temperature range - 25 + 75 °C	# · · · · · · · · · · · · · · · · · · ·	<u></u>
	Specific Technical Data	Ü	Ü
	Specific Technical Data Permissible operating voltage range	8 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
	Current consumption without load	<u> </u>	≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 μF	≤ 1.0 µF
	Ø Sensing face	16.5 mm	16.5 mm
Switching radi	us r (at operating distance of the target s = 0; see page 1.0.2)	4.8 mm	6.0 mm
	(		
	Function indication ?	yes, YE	yes, YE
		•	
	Maximum lead length	300 m	300 m
Lead type	e / standard lead length / number of wires x lead cross section	NK / 2.0 m / 3 x 0.34 mm^2	NK / 2.0 m / 3 x 0.34 mm^2
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		
	Permissible torque without / with toothed disc	2.5 Nm / 3.5 Nm	2.5 Nm / 3.5 Nm
	Weight	80 g + weight of the lead	80 g + weight of the lead
	Note		
	Recommended accessories	chapter 12	chapter 12

ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

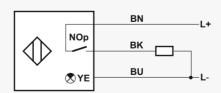
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

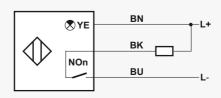
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#### Wiring (2)

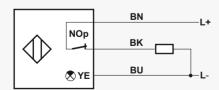
DC 3-pole, outgoing lead





O M18 x 1; 35 mm	O M18 x 1; 40 mm	O M18 x 1; 40 mm	O M18 x 1; 45 mm
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
5 mm, flush	8 mm, flush, maximized	8 mm, flush, maximized	8 mm, flush, maximized
0 4.05 mm	0 6.48 mm	0 6.48 mm	0 6.48 mm
IAD-18mg35b5-1NK1A, 11.20-30-020 (1)		IAD-18mg40m8-1ND2A, 11.35-03 (1)	
			IAD-18mg45m8-2ND1A, 11.35-04 (3
			and resignation and any
	IAD-18mg40m8-6ND1A, 11.33-11-020 (2)		
	, , , , , , , , , , , , , , , , , , , ,		
1 kHz / ≥ 0.3 ms	1 kHz / ≥ 1 ms	≤ 1 kHz / ≥ 1 ms	≤ 1 kHz / ≥ 1 ms
lead; 3 wires	lead; 3 wires	lead; 3 wires	lead; 3 wires
			,
sensing face  M18x1  Sensing face  ED  EG  EG	sensing face  M18x1  Sensing face  LED	sensing face  M18x1  Selection of the se	sensing face  M18x1  LED
8 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC
≤ 10 mA	≤ 10 mA	≤ 10 mA	≤ 10 mA
≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA
75 V DC	75 V DC	75 V DC	75 V DC
≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF	≤ 1.0 µF
16.5 mm	16.5 mm	16.5 mm	16.5 mm
4.8 mm	6.0 mm	4.8 mm	6.0 mm
yes, YE	yes, YE	yes, YE	yes, YE
300 m	300 m	300 m	300 m
NK / 2.0 m / 3 x 0.34 mm^2	ND / 2.0 m / 3 x 0.34 mm^2	ND / 2.0 m / 3 x 0.34 mm^2	ND / 2.0 m / 3 x 0.34 mm^2
DC 13	DC 13	DC 13	DC 13
IP 67	IP 67	IP 67	IP 67
II, 🖸			II, 🖸
34 Nm / 70 Nm	34 Nm / 70 Nm	34 Nm / 70 Nm	34 Nm / 70 Nm
35 g + weight of the lead	40 g + weight of the lead	40 g + weight of the lead	40 g + weight of the lead
		no internal load resistance	no internal load resistance
chapter 12	chapter 12	chapter 12	chapter 12

# Wiring (3) DC 3-pole, outgoing lead



# Inductive Proximity Switches, Ferrous DC 3- and 4-pole Series IAD-18mg

	Design; length	O M18 x 1; 50 mm	O M18 x 1; 50 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	5 mm, flush	8 mm, flush, maximized
	Range assured operating distance	0 4.05 mm	0 6.48 mm
	NO plus-switching NOp	IAD-18mg50b5-1S1A, 11.22-06 (**	I) IAD-18mg50m8-1S1A, 11.33-18
Γγρe designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
, ,,	NO minus-switching NOn		
	NC minus-switching NCn		
IV	laximum switching frequency / Minimum damping period	1 kHz / ≥ 0.3 ms	1 kHz / ≥ 1 ms
	Wiring (connector or lead); number of wires	connector M12; 3 wires	connector M12; 3 wires
Hy Repitition a - w	Common Technical Data  Reduction factor Fe / AI / V2A /steresis of the switching point s accuracy of the switching point s ith permanent operating voltage and ambient temperature Permissible ripple voltage Short-circuit-proof? Reverse polarity protection? tage drop over a closed contact Ambient temperature range  Common Technical Data  1 / 0.4 / 0.5  2 10 %  ≤ 10 %  ≤ 15 % yes, clocking yes  ≤ 2.5 ∨ DC  - 25 + 75 °C	sensing face  Sensing face  Sensing face  M18x1  Sensing face  Se	sensing face  M18x1  Sensing face  M12x1  M12x1  M12x1
	Specific Technical Data	9 24 20 V DC	10 24 20 V DC
	Permissible operating voltage range  Current consumption without load	8 <u>24</u> 30 V DC ≤ 10 mA	10 <u>24</u> 30 V DC ≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 µF	≤ 1.0 µF
	Ø Sensing face	16.5 mm	16.5 mm
Switching radio	us r (at operating distance of the target s = 0; see page 1.0.2)	4.8 mm	6.0 mm
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	300 m	300 m
Lead type	/ standard lead length / number of wires x lead cross section		_
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		II, 🛛
	Permissible torque without / with toothed disc	34 Nm / 70 Nm	34 Nm / 70 Nm
	Weight	50 g	50 g
	Recommended accessories	chapter 12	chapter 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

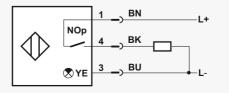
# DC 3-pole, plug 1 BN NOp 4 BK SYE 3 BU

#### Euro Plug M12 with LED YE visible from 4 sides



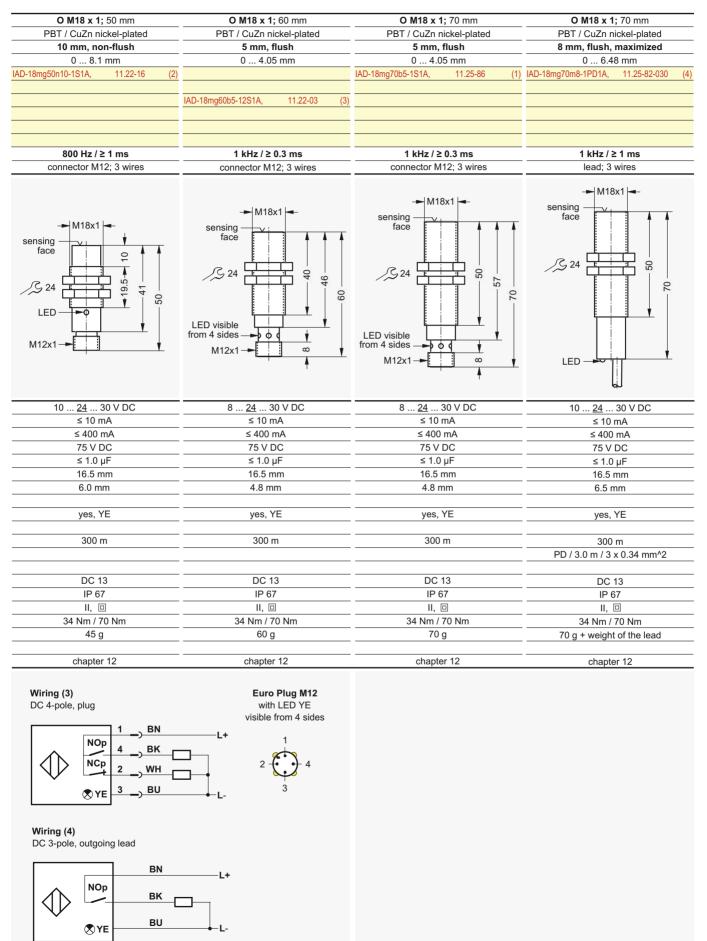
#### Wiring (2) DC 3-pole, plug

Wiring (1)









#### **Series IAD-18mg**

	Design; length	O M18 x 1; 70 mm	O M18 x 1; 67 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	8 mm, flush, maximized	10 mm, non-flush
	Range assured operating distance	0 6.48 mm	0 8.1 mm
	NO plus-switching NOp	IAD-18mg70m8-1S1A, 11.25-97 (1)	
Tune decimation	NC plus-switching NCp		
Type designation, - Ref. no.	NO and NC plus-switching NOp + NCp		IAD-18mg70n10-12V1A, 11.32-91 (2
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(**************************************	NO minus-switching NOn		
	NC minus-switching NCn		
M	aximum switching frequency / Minimum damping period	1 kHz / ≥ 1 ms	200 Hz / ≥ 1 ms
	Wiring (connector or lead); number of wires	connector M12; 3 wires	connector M18; 4 wires
Hy Repitition a - wi	Common Technical Data  Reduction factor Fe / Al / V2A  Insteresis of the switching point solution for the switching point solution	sensing face  M18x1  Sensing face  LED visible from 4 sides M12x1  M12x1	sensing face 01 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	Specific Technical Data Permissible operating voltage range	10 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 1.0 μF	≤ 1.0 µF
	Ø Sensing face	16.5 mm	16.5 mm
Switching radiu	us r (at operating distance of the target s = 0; see page 1.0.2)	6.5 mm	6.0 mm
	Function indication ?	yes, YE	yes, YE
	Maximum lead length	300 m	300 m
Lead type	/ standard lead length / number of wires x lead cross section		
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class	II, 🗆	II, 🗆
	Permissible torque without / with toothed disc	34 Nm / 70 Nm	34 Nm / 70 Nm
	Weight	70 g	60 g

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

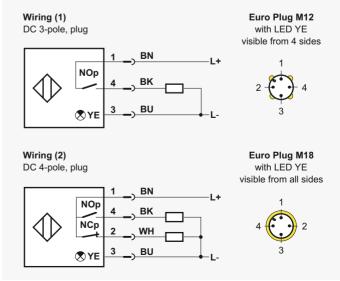
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



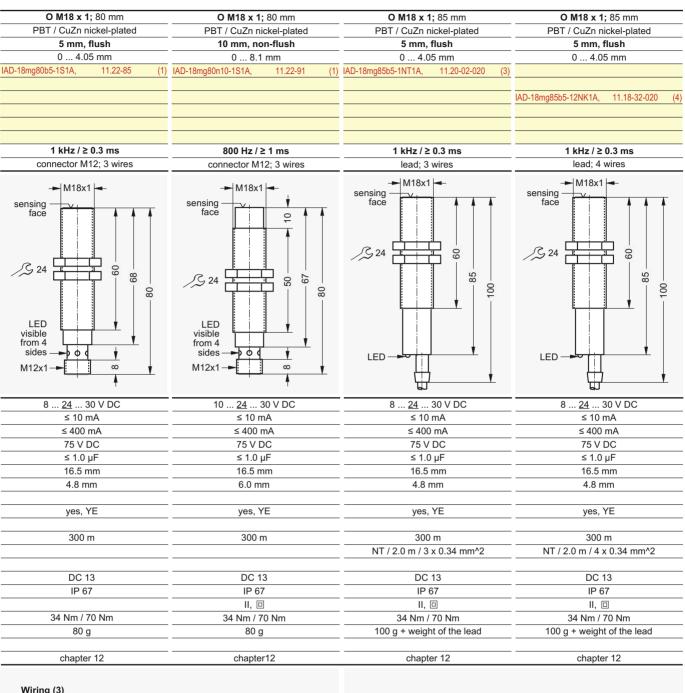
#### Safety Regulations

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Subject to technical changes!

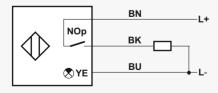






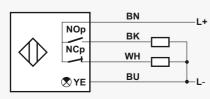


DC 3-pole, outgoing lead



#### Wiring (4)

DC 4-pole, outgoing lead



# Inductive Proximidy Switches, Ferrous DC 3- and 4-pole Series IAD-18mg

	Design; length	O M18 x 1; 85 mm	
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	
	Rated operating distance, mounting (see page 1.0.4)	10 mm, non-flush	
	Range assured operating distance	0 8.1 mm	
	NO plus-switching NOp	IAD-18mg85n10-1NT1A, 11.20-75-020 (1)	
	NC plus-switching NCp		
Type designation,	NO and NC plus-switching NOp + NCp		
Ref. no.	NO plus-, NC minus-switching NOp + NCn		
(Wiring)	NO minus-switching NOn		
	NC minus-switching NCn		
	Maximum switching frequency / Minimum damping period	800 Hz / ≥ 1 ms	
<u>'</u>	Wiring (connector or lead); number of wires	lead; 3 wires	
	willing (conflector or lead), humber of wires		
	Common Technical Data	→ M18x1 →	
	Reduction factor Fe / Al / V2A 1 / 0.4 / 0.5	sensing face	
ш	Hysteresis of the switching point s 3 20 %	face 9	
	accuracy of the switching point s ≤ 10 % with permanent operating voltage		
- v	and ambient temperature ≤2 %		
	Permissible ripple voltage ≤ 15 %	S 24 B B	
	Short-circuit-proof? yes, clocking	8	
		100	
Va	Reverse polarity protection ? yes  oltage drop over a closed contact ≤ 2.5 V DC	<u> </u>	
٧٥			
	Ambient temperature range - 25 + 75 °C		
		LED	
	Curatific Technical Date	<del>\</del>	
	Specific Technical Data  Permissible operating voltage range	10 <u>24</u> 30 V DC	
	Current consumption without load	≤ 10 mA	
	Load current	≤ 400 mA	
	Nominal insulation voltage	75 V DC	
		≤ 1.0 µF	
	Permissible capacity at output	16.5 mm	
Cuitabina nad	Ø Sensing face	6.0 mm	
Switching rad	ius r (at operating distance of the target s = 0; see page 1.0.2)	0.0 111111	
	Franchisco in discretion 0	Voc VE	
	Function indication ?	yes, YE	
	Maximum land landth	300 m	
Load to	Maximum lead length e / standard lead length / number of wires x lead cross section	NT / 2.0 m / 3 x 0.34 mm^2	
Lead type	e / standard lead length / number of wires x lead cross section	N1 / 2.0 III / 3 X 0.34 IIIII 2	
	Litilization extensive according to IEC 60047.5.2	DC 13	
	Utilization category according to IEC 60947-5-2	IP 67	
	Protection rating according to IEC 60529  Protection class		
		34 Nm / 70 Nm	
	Permissible torque without / with toothed disc		
	Weight	90 g + weight of the lead	
		chapter 12	
	Recommended accessories		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



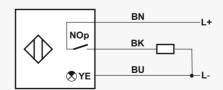
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1)

DC 3-pole, outgoing lead






#### Series IAD-30fg, -30mg

	Design; length	O M30 x 1.5; 80 mm	O M30 x 1.5; 50 mm
	Material of the sensing face / of the housing	PBT / PBT	PBT / CuZn nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	10 mm, flush	10 mm, flush
	Range assured operating distance	0 8.1 mm	0 8.1 mm
	NO plus-switching NOp		IAD-30mg50b10-1S1A, 11.22-19 (2
Type designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp	IAD-30fg80b10-12NK1A, 11.16-50-020 (1)	
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
( 3/	NO minus-switching NOn		
	NC minus-switching NCn		
N	laximum switching frequency / Minimum damping period	300 Hz / ≥ 1 ms	300 Hz / ≥ 1 ms
	Wiring (connector or lead); number of wires	lead; 4 wires	connector M12; 3 wires
	Common Technical Data		
	Reduction factor Fe / Al / V2A 1 / 0.4 / 0.5	► M30x1.5	
	/steresis of the switching point s 3 20 %	sensing	
	accuracy of the switching points $\leq 10\%$	face A A	- 18400 4.5.1
· · · · · · · · · · · · · · · · · · ·			M30x1.5
- vv	ith permanent operating voltage		sensing face
	and ambient temperature ≤ 2 %	€ 36	
	Permissible ripple voltage ≤ 15 %		)\$36 \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	Short-circuit-proof? yes, clocking	95	200
\/a	Reverse polarity protection? yes	<u> </u>	LED visible
VO	Itage drop over a closed contact ≤ 2.5 V DC		from 4 sides 🔻 🔻
	Ambient temperature range 25 + 75 °C	, <u> </u>	M12x1 ──
		LED	•
	Specific Technical Data		
	Permissible operating voltage range	8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	 ≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 0.47 µF	≤ 0.47 µF
	Ø Sensing face	27.4 mm	27.4 mm
Switching radi	us r (at operating distance of the target s = 0; see page 1.0.2)	9.4 mm	9.4 mm
	Function indication ?	yes, YE	yes, YE
	***	200	000
1 11	Maximum lead length	300 m	300 m
Lead type	e / standard lead length / number of wires x lead cross section	NK / 2.0 m / 4 x 0.34 mm^2	
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class		
	Permissible torque without / with toothed disc	8 Nm / 10 Nm	150 Nm / < 200 Nm
	Weight	90 g + weight of the lead	100 g
	Recommended accessories	chapter 12	chapter 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

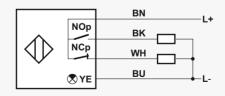


#### Safety Regulations

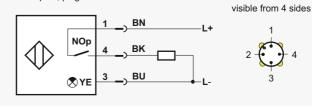
Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

#### Wiring (1) DC 4-pole, outgoing lead



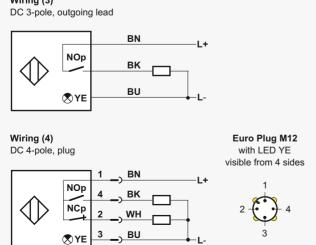
#### Wiring (2) DC 3-pole, plug



#### Euro Plug M12 with LED YE



O M30 x 1.5; 65 mm	O M30 x 1.5; 70 mm	O M30 x 1.5; 80 mm	O M30 x 1.5; 80 mm
PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated	PBT / CuZn nickel-plated
20 mm, non-flush	10 mm, flush	10 mm, flush	20 mm, non-flush
0 16.2 mm	0 8.1 mm	0 8.1 mm	0 16.2 mm
AD-30mg65n20-1S1A, 11.32-36 (2)	IAD-30mg70b10-1S1A, 11.25-88 (2)	IAD-30mg80b10-1NT1A, 11.20-03-020 (3)	
			IAD-30mg80n20-12S1A, 11.22-05 (4
150 Hz / ≥ 2 ms	300 Hz / ≥ 1 ms	300 Hz / ≥ 1 ms	150 Hz / ≥ 2 ms
connector M12; 3 wires	connector M12; 3 wires	lead; 3 wires	connector M12; 4 wires
sensing M30x1.5  Sensing face M30x1.5  LED visible from 4 sides M12x1	sensing face M30x1.5  Sensing face M30x1.5  LED visible from 4 sides M12x1	sensing M30x1.5 sensing M30x1.5 hose nozzle	sensing M30x1.5  face Sensing M30x1.5  LED visible from 4 sides M12x1
8 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
≤ 10 mA	≤ 10 mA	≤ 10 mA	≤ 10 mA
≤ 400 mA	≤ 400 mA	≤ 400 mA	≤ 400 mA
75 V DC	75 V DC	75 V DC	75 V DC
≤ 1.0 µF	≤ 0.47 μF	≤ 0.47 μF	≤ 1.0 μF
27.4 mm	27.4 mm	27.4 mm	27.4 mm
12.2 mm	9.4 mm	9.4 mm	12.2 mm
yes, YE	yes, YE	yes, YE	yes, YE
300 m	300 m	300 m NT / 2.0 m / 3 x 0.34 mm^2	300 m
DC 13	DC 13	DC 13	DC 13
IP 67	IP 67	IP 67	IP 67
II, 🗆		- II, 🗈	II, 🗆
150 Nm / < 200 Nm	150 Nm / < 200 Nm	150 Nm / < 200 Nm	150 Nm / < 200 Nm
100 g	150 g	190 g + weight of the lead	100 g
chapter 12	chapter 12	chapter 12	chapter 12



# Inductive Proximity Switches, Ferrous DC 3- and 4-pole Series IAD-30mg, -30sg

	Design; length	O M30 x 1.5; 95 mm	O M30 x 1.5; 82 mm
	Material of the sensing face / of the housing	PBT / CuZn nickel-plated	PBT / stainless nickel-plated
	Rated operating distance, mounting (see page 1.0.4)	10 mm, flush	10 mm, flush
	Range assured operating distance	0 8.1 mm	0 8.1 mm
	NO plus-switching NOp	IAD-30mg95b10-1S1A, 11.22-86 (1)	
Type designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		IAD-30sg80b10-12S1A, 11.22-04 (2)
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(viiiig)	NO minus-switching NOn		
	NC minus-switching NCn		
М	laximum switching frequency / Minimum damping period	300 Hz / ≥ 1 ms	300 Hz / ≥ 1 ms
	Wiring (connector or lead); number of wires	connector M12; 3 wires	connector M12; 4 wires
	Common Technical Data		
	Reduction factor Fe / AI / V2A 1 / 0.4 / 0.5	sensing M30x1.5	► M30x1.5 ►
	steresis of the switching point s 3 20 %	face	sensing
<del></del>	accuracy of the switching point s ≤ 10 %		face
- wi	ith permanent operating voltage		<u> </u>
	and ambient temperature ≤2 %	36 8	36 9 9
	Permissible ripple voltage ≤ 15 %		
	Short-circuit-proof? yes, clocking	8   -   8   95	85-
	Reverse polarity protection ? yes		<u> </u>
Volt	tage drop over a closed contact ≤ 2.5 V DC	LED	LED
	Ambient temperature range - 25 + 75 °C	visible from 4	from 4
		sides → o ( V	sides • o d •
		M12x1 <u>∞ ▼</u>	M12x1 ──
	·	+	*
	Specific Technical Data		
	Permissible operating voltage range	8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC
	Current consumption without load	≤ 10 mA	≤ 10 mA
	Load current	≤ 400 mA	≤ 400 mA
	Nominal insulation voltage	75 V DC	75 V DC
	Permissible capacity at output	≤ 0.47 µF	≤ 0.47 µF
	Ø Sensing face	27.4 mm	27.4 mm
Switching radiu	us r (at operating distance of the target s = 0; see page 1.0.2)	9.4 mm	9.4 mm
	Function indication ?	yes, YE	yes, YE
	r drough indication :	,, ·-	,
	Maximum lead length	300 m	300 m
Lead type	/ standard lead length / number of wires x lead cross section		
	Utilization category according to IEC 60947-5-2	DC 13	DC 13
	Protection rating according to IEC 60529	IP 67	IP 67
	Protection class	II, 🗆	
	Permissible torque without / with toothed disc	150 Nm / < 200 Nm	170 Nm / < 200 Nm
	Weight	180 g	175 g
	Recommended accessories	chapter 12	chapter 12

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

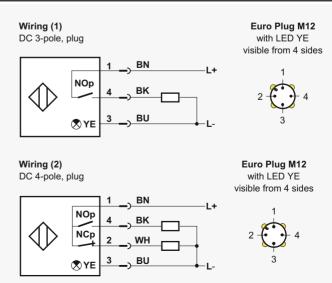
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



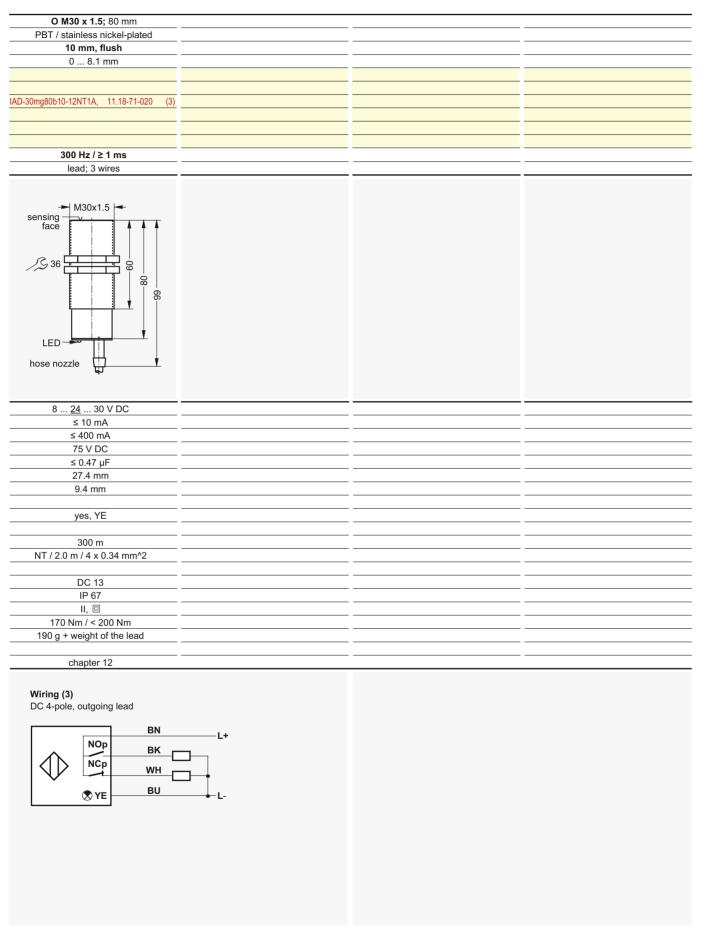
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!







#### Series IAD-34aq

	Design; length	<b>□ 50 x 34 mm</b> ; 65 mm	
	Material of the sensing face / of the housing	PBT / AI	
	Rated operating distance, mounting (see page 1.0.4)	12 mm, flush	
	Range assured operating distance	0 9.72 mm	
	NO plus-switching NOp	IAD-34aq65b12-1S1A, 11.25-90 (1)	
F	NC plus-switching NCp		
Γype designation, Ref. no.	NO and NC plus-switching NOp + NCp		
(Wiring)	NO plus-, NC minus-switching NOp + NCn		
(vviiiig)	NO minus-switching NOn		
	NC minus-switching NCn		
N	Maximum switching frequency / Minimum damping period	300 Hz / ≥ 1 ms	
	Wiring (connector or lead); number of wires	connector M12; 4 wires	
	3(11.11.11.11)		
	Common Technical Data	sensing face	
	Reduction factor Fe / Al / V2A 1 / 0.4 / 0.5	Ø 6.6	
H	ysteresis of the switching point s 3 20 %		
	accuracy of the switching point s ≤ 10 %	LED \$ 58	
	vith permanent operating voltage		
***	and ambient temperature ≤ 2 %		
	Permissible ripple voltage ≤ 15 %		
	Short-circuit-proof? yes, clocking	screw	
	Reverse polarity protection ? yes	thread M6	
Vo	oltage drop over a closed contact ≤ 2.5 V DC		
V O	Ambient temperature range - 25 + 75 °C		
	Ambient temperature range -25 + 75 C	£	
	<del></del>	<b>₹</b> [!;!	
		₹ 50 →	
		X  <b>→</b> 50 <b>→</b>	
	Specific Technical Data	2	
	Permissible operating voltage range	10 <u>24</u> 30 V DC	
	Current consumption without load	≤ 10 mA	
	Load current	≤ 400 mA	
	Nominal insulation voltage	75 V DC	
	Permissible capacity at output	≤ 0.47 µF	
	Ø Sensing face	48 mm x 32 mm	
Switching radi	ius r (at operating distance of the target s = 0; see page 1.0.2)	11.8 mm	
Switching radi	ius i (at operating distance of the target's – 0, see page 1.0.2)	11.0 11111	
	Function indication ?	yes, YE	
	Function indication ?	yeə, 1L	
	Maximum load longth	300 m	
Load type	Maximum lead length	300 111	
Lead type	e / standard lead length / number of wires x lead cross section		
	Utilization category according to IEC 60947-5-2	DC 13	
	Protection rating according to IEC 60547-5-2	IP 67	
		IF 0/	
	Protection class		
	Permissible torque without / with toothed disc	200 ~	
	Weight	300 g	
	Recommended accessories	chapter 12	
	Recommended accessories	спарсет 12	
	es with connector: Please choose the connector and lead	Wiring (1)	Euro Plug M12
ou require in Chap	ter 12, "Accessories". The connector with its lead must be	DC 5-pole, plug	
rdered separately.			

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.  $\,$ 

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

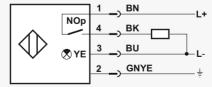
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

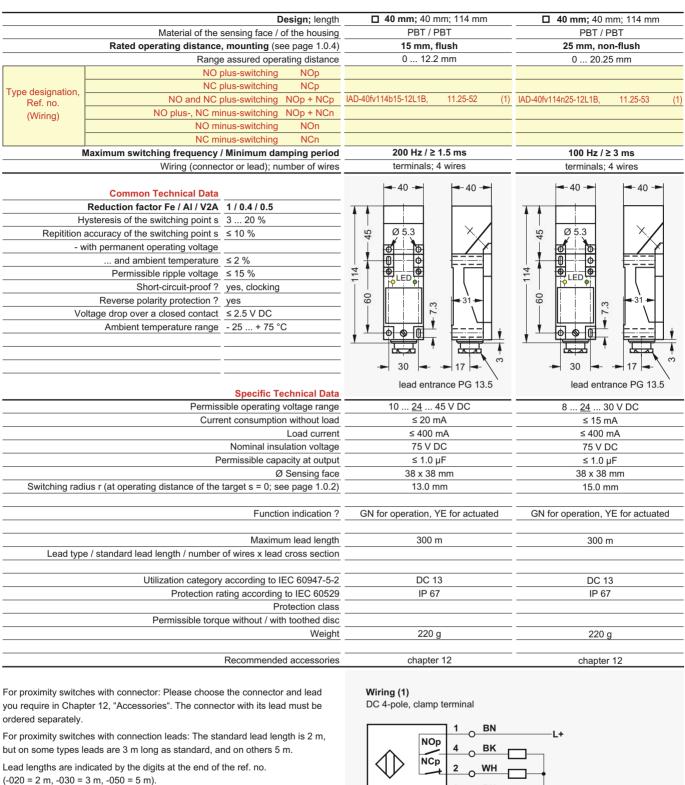
Subject to technical changes!








#### Inductive Proximity Switches, Ferrous DC 3- and 4-pole Series IAD-40fv



#### Certifications

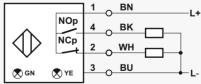
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



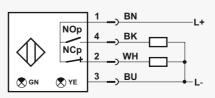
#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!



#### Wiring (2) DC 4-pole, plug







□ 40 mm; 40 mm; 114 mm	□ 40 mm; 40 mm; 114 mm	 
PBT / PBT	PBT / PBT	
15 mm, flush	25 mm, non-flush	
0 12.2 mm	0 20.25 mm	
IAD-40fv114b15-12S1B, 11.25-66 (2)	IAD-40fv114n25-12S1B, 11.32-98 (2)	
200 Hz / ≥ 1.5 ms	100 Hz / ≥ 3 ms	
connector M12; 4 wires	connector M12; 4 wires	
·	,	
40 — 40 — 40 — 40 — 40 — 40 — 40 — 40 —	40 — 40 — 40 — 40 — 40 — 40 — 40 — 40 —	
10 <u>24</u> 45 V DC	8 <u>24</u> 30 V DC	
 ≤ 20 mA	 ≤ 15 mA	
≤ 400 mA	≤ 400 mA	
75 V DC	75 V DC	
≤ 1.0 µF	≤ 1.0 μF	
38 x 38 mm	38 x 38 mm	
13.0 mm	15.0 mm	
GN for operation, YE for actuated	GN for operation, YE for actuated	
300 m	300 m	
DC 13	DC 13	
IP 67	IP 67	
230 g	230 g	
chapter 12	chapter 12	

# Inductive Proximity Switches, Ferrous DC 3- and 4-pole Series IAD-80fr

	Design; length	Ø 80 mm; 70 mm	Ø 80 mm; 70 mm	
	Material of the sensing face / of the housing	PBT / PBT	PBT / PBT	
Rated operating distance, mounting (see page 1.0.4)		80 mm, non-flush, adjustable	35 mm, non-flush	
	Range assured operating distance	0 64.8 mm	0 28.35 mm	
	NO plus-switching NOp	IAD-80fr70e80-1Sd1A, 11.43-08 (1)		
Type designation,	NC plus-switching NCp			
Ref. no.	NO and NC plus-switching NOp + NCp		IAD-80fr70n35-12S1A, 11.35-22 (2	
(Wiring)	NO plus-, NC minus-switching NOp + NCn			
( 3,	NO minus-switching NOn			
	NC minus-switching NCn			
M	aximum switching frequency / Minimum damping period	100 Hz / ≥ 4 ms	100 Hz / ≥ 4 ms	
	Wiring (connector or lead); number of wires	connector ø 28; 3 wires	connector ø 28; 4 wires	
		<b>←</b> Ø 80 <b>→</b>	<b>←</b> —Ø 80 <b>→</b>	
	Common Technical Data	2000	Ø 80 <b></b>	
	Reduction factor Fe / Al / V2A 1/0.4/0.5	i 1 † †	1 1	
	esteresis of the switching point s 3 20 %	02 7	02	
	ccuracy of the switching point s ≤ 10 %	102 7	102	
- WI	ith permanent operating voltage	7	~ <del>\</del>	
	and ambient temperature ≤ 2 %	III ↓	li l	
	Permissible ripple voltage ≤ 15 %	M8 →	M8	
	Short-circuit-proof? yes, clocking	ï	IVIO	
Val	Reverse polarity protection ? yes	setting potentiometer		
VOI	tage drop over a closed contact ≤ 2.5 V DC	1	1	
	Ambient temperature range 25 + 75 °C	LED	LED	
		8 (	86 (	
		6	6	
		₩12x1	M12x1	
	Specific Technical Data	T		
	Permissible operating voltage range	8 <u>24</u> 30 V DC	10 <u>24</u> 30 V DC	
	Current consumption without load	≤ 10 mA	 ≤ 10 mA	
	Load current	≤ 400 mA	≤ 400 mA	
Nominal insulation voltage		75 V DC	75 V DC	
	Permissible capacity at output	≤ 1.0 μF	≤ 1.0 μF	
Ø Sensing face		80 mm	80 mm	
Switching radius r (at operating distance of the target s = 0; see page 1.0.2)		48.0 mm	25.3 mm	
	European in P. C. C.	yes, YE		
	Function indication ?	yes, fE	yes, YE	
Maximum lead length		300 m	300 m	
Lead type	/ standard lead length / number of wires x lead cross section			
Utilization category according to IEC 60947-5-2		DC 13	DC 13	
	Protection rating according to IEC 60529	IP 04	IP 65	
	Protection class			
	Permissible torque without / with toothed disc	600 ~	600 ~	
	Weight	600 g	600 g	
	Recommended accessories	chapter 12	chapter 12	

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

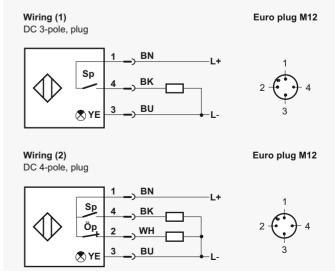
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

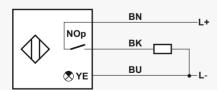
Subject to technical changes!





	<b>6.00</b> 70	
Ø 80 mm; 70 mm	Ø 80 mm; 70 mm	 
PBT / PBT PBT PBT / PBT		 
50 mm, non-flush	50 mm, non-flush	 
0 40.5 mm	0 40.5 mm	
IAD-80fr70n50-1S1A, 11.25-92 (1	IAD-80fr70n50-1NT1A, 11.03-94-050 (3)	
100 Hz / ≥ 3 ms	100 Hz / ≥ 4 ms	
connector M12; 3 wires	lead; 3 wires	 
Connector W12, 6 Wires	- Icad, o wiles	
0 80 — 0 20 D D D D D D D D D D D D D D D D D	M8 — LED hose nozzle	
8 <u>24</u> 30 V DC	8 <u>24</u> 30 V DC	
6 <u>24</u> 30 V DC ≤ 10 mA	<u>6 <u>24</u> 30 V DC ≤ 10 mA</u>	
≤ 400 mA	≤ 400 mA	
75 V DC	75 V DC	 
≤ 1.0 µF	≤ 1.0 μF	 
80 mm	80 mm	 
31.0 mm	31.0 mm	
·	- · · · · · · · · · · · · · · · · · · ·	 
yes, YE	yes, YE	
300 m	300 m	
	NT / 5.0 m / 3 x 0.75 mm^2	
DC 13	DC 13	
IP 67	IP 67	
II, 🗆		
600 g	600 g + weight of the lead	
chapter 12	chapter 12	

# Wiring (3) DC 3-pole, outgoing lead



#### **Inductive Proximity Switches**

#### **Type Non-ferrous Metal**

#### Characteristics



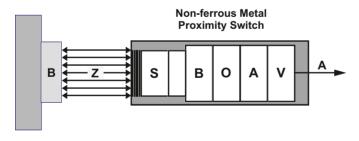
#### Task

Non-ferrous Metal Switches detect only non-ferrous metals such as aluminium and brass. They attain the same switching distances as Inductive Proximity Switches of the same size.

Non-ferrous Metal Switches cannot detect materials that contain iron, which makes this type of proximity switch especially suitable for distinguishing between ferrous and non-ferrous metals.

#### Mode of operation

A frequency and amplitude stabilised oscillator O supplies an AC bridge circuit B. The oscillating circuit S, consisting of a coil contained in a channel-shaped ferritic core and a capacitor, forms one branch of the bridge. The output stage A amplifies the voltage of the bridge and a comparator converts it into a switching signal. This low resistance switching signal is available at the output of the amplifier stage V.



When non-ferrous metal approaches, an Inductive Non-ferrous Metal Proximity Switch operates in a very different way to a standard, Inductive Proximity Switch.

When a **piece** of **ferrous metal** enters the alternating magnetic field of the oscillating circuit coil, the magnetic properties of the iron lead to a high proportion of magnetization losses and only a low proportion of eddy current losses. As with Standard Proximity Switches, these high losses lead to damping of the oscillating circuit. In addition, the permeability of the iron lowers the frequency of the oscillating circuit.

Under the same conditions with a **non-ferrous metal**, the behaviour is completely different. As a result of the sensor's specific arrangement, only eddy currents are generated and they attenuate the damping and increase the frequency of the oscillating circuit.

#### **Application examples**

- Detection of non-ferrous metals without reduction of the switching distance.
- Separation of ferrrous and non-ferrous metals, e. g. aluminium tubes on steel mandrels.
- Simple guidance system for conveying vehicles (e. g. tool change carriage).

#### **Application notes**

- Ferrous metals behind a non-ferrous metal target have no influence, as long as the dimensions of the target are larger or equal to those of a standard target.
- The switching distance is reduced when the target is segmented.
- Thin-walled ferrous rings and holes (Ø 25 ... 60 mm) in metals can damp the switch when the distance of the target is less than approx.
   10 % of the switching distance and centred on the sensing face. This is caused by eddy-current effects.
- Within the hysteresis field ferrous metals between sensing face and non-ferrous metal target can activate the output .
- Distinction between workpieces.
- Simple encoding tasks.

#### Mounting

Non-ferrous Metal Switches can be mounted so that they are flush with ferrous metals. Three faces of the rectangular version of the housing with pivoting head can be flush-mounted.

For non-ferrous metals the minimum distance must be the same than the single nominal switching distance.

#### Note

The product described here is for use in machinery or plant only. Connection, commissioning or maintenance must only be carried out by suitably-qualified specialists. Commissioning is only permissible after it has been established that the installation or plant complies with current EU directives.



#### **Type Non-ferrous Metal**

		Switching distance			Switching distance
Туре	Ref. No.	in mm	Туре	Ref. No.	in mm
		Mounting *)			Mounting *)
cylindrical M30 x L					
IBD-30mg95b8-1T1A	13.17-04	8,0 b			
IBD-30mg80b8-1S1A	13.17-09	8,0 b			
rectangular 34 x 50 x 65					_
IBD-34fq65b10-1T1A	13.17-08	10,0 b			
rectangular 40 x 40 x L					
IBD-40fv114b20-12T1B	13.22-02	20,0 b			
IBD-40fv114b20-12K2B	13.22-05	20,0 b			
IBD-40fv114b20-12S1B	13.22-06	20,0 b			
	_				_
	_				
	_				

<sup>\*)</sup> b = flush mounting, n = non-flush mounting

#### **Inductive Proximity Switches, Non-ferrous Metal**

#### Series IBD-30mg, 34fq

	Design; length	O M30 x 1.5; 95 mm	O M30 x 1.5; 80 mm
Material of the sensing face / of the housing  Rated operating distance, mounting (see page 1.0.4)		PBT / CuZn	PBT / CuZn
		8 mm, flush	8 mm, flush
	Range assured operating distance	0 6.48 mm	0 6.48 mm
	NO plus-switching NOp	IBD-30mg95b8-1T1A, 13.17-04 (1)	IBD-30mg80b8-1S1A, 13.17-09 (2
Type designation,	NC plus-switching NCp		
Ref. no.	NO and NC plus-switching NOp + NCp		
(Wring)	NO plus-, NC minus-switching NOp + NCn		
( ),	NO minus-switching NOn		
	NC minus-switching NCn		
N	laximum switching frequency / Minimum damping period	≤ 300 Hz / ≥ 1 ms	≤ 300 Hz / ≥ 1 ms
	Wiring (connector or lead); number of wires	connector ø 28; 3 wires	connector M12; 3 wires
	Common Technical Data		
	ctor for all Non-ferrous Metals 1.0	sensing M30x1.5	→ M30x1.5 →
	/steresis of the switching point s 3 20 %	face A	sensing face
· · · · · · · · · · · · · · · · · · ·	accuracy of the switching point s ≤ 10 %		
- W	ith permanent operating voltage		
	and ambient temperature ≤ 0.5 %	\$36	\$36 \frac{1}{1} \frac{1}{12} \f
	Permissible ripple voltage ≤ 10 %		
	Short-circuit-proof? yes, clocking	96	8
\/a	Reverse polarity protection? yes	<u> </u>	<u> </u>
VO	tage drop over a closed contact ≤ 2.5 V DC	LED	
	Ambient temperature range 25 + 75 °C	<b>-</b> Ø 28 <b>-</b>	LED visible
		<u> </u>	from 4 sides
		<u> </u>	M12x1 ─► □ □ □ □ □
	Specific Technical Data		
	Permissible operating voltage range	12 <u>24</u> 30 V DC	12 <u>24</u> 30 V DC
	Current consumption without load	 ≤ 20 mA	 ≤ 20 mA
Load current		≤ 400 mA	≤ 400 mA
	Ø Sensing face		-
Function indication ?		yes, YE	yes, YE
Maximum lead length Lead type / standard lead length / number of wires x lead cross section		300 m	300 m
ьеай іўре	- / standard lead length / number of wires x lead cross section		
Utilization category according to IEC 60947-5-2		DC 13	DC 13
Protection rating according to IEC 60529		IP 65	IP 65
	Protection class		
Permissible torque without / with toothed disc		150 Nm / 200 Nm 150 Nm / < 200 I	
	Weight	200 g	175 g
			-
	Recommended accessories	chapter 12.1	chapter 12.1

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is  $2\ m$ , but on some types leads are  $3\ m$  long as standard, and on others  $5\ m$ .

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001

#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

# Wiring (2) DC 3-pole, plug BN BN BN BW Wiring (2) DC 3-pole, plug Wiring (2) DC 3-pole, plug BN BU BU Euro Plug M12 with LED display YE visible from 4 sides



<b>34 x 50 mm</b> ; 65 mm		
PBT / plastic		
10 mm, flush		
0 8.1 mm		
IBD-34fq65b10-1T1A, 13.17-08 (1)		
≤ 150 Hz / ≥ 2 ms		
connector ø 28; 3 wires	 	
sensing face  Ø 6.6  LED  Screw thread M6  36		
rotary plug insert		
12 <u>24</u> 30 V DC		
 ≤ 20 mA		
≤ 400 mA	 	
\$ 400 IIIA	 	
yes, YE	 	
300 m		
DC 13	 	
IP 65	 	
140 g	 	
chapter 12.1	 	
Chapter 12.1		

#### **Inductive Proximity Switches, Non-ferrous Metal**

#### Series IBD-40fv

Design; length		□ 40 x 40 mm; 114 mm
Material of the sensing face / of the housing		PBT glass fibre reinforced / PBT glass fibre reinforced
Rated operating distance, mounting (see page 1.0.4)		20 mm, flush
Range assured operating distance		0 16.2 mm
	NO plus-switching NOp	IBD-40fv114b20-12T1B, 13.22-02 (1)
Type designation,	NC plus-switching NCp	
Ref. no.	NO and NC plus-switching NOp + NCp	
(Wiring)	NO plus-, NC minus-switching NOp + NCn	
(**************************************	NO minus-switching NOn	
	NC minus-switching NCn	
Maximum switching frequency / Minimum damping period		≥ 150 Hz / ≤ 2 ms
Wiring (connector or lead); number of wires		connector ø 28; 4 wires

Common Technical Data	
Reduction factor for all non-ferrous metals	1.0
Hysteresis of the switching point s	≤ 20 %
Repitition accuracy of the switching point s	≤ 10 %
- with permanent operating voltage	
and ambient temperature	≤ 1 %
Permissible ripple voltage	≤ 30 %
Short-circuit-proof?	yes, clocking
Reverse polarity protection ?	yes
Voltage drop over a closed contact	≤ 2.5 V DC
Ambient temperature range	- 25 + 75 °C

#### Attainable switching distances (see table)

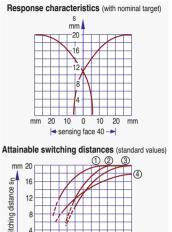
To ①: egde length of a solid rod with square cross-section.

To ②: width of a rail, 1 mm thick.

To (3): egde length of a square, 1 mm thick.

To (4): diameter of a solid rod with cylindrical cross-section.

# \*) sensing face 90 Amphenol-Tuchel plu



	Amphenoi-Tuchei piug	
Specific Technical Data	Dimensions of the target	
Permissible operating voltage range	12 <u>24</u> 30 V DC	
Current consumption without load	≤ 20 mA	
Load current	≤ 400 mA	
Ø sensing face	38 x 38 mm	
Function indication ?	GN for operation, YE for actuated	
Maximum lead length	300 m	
Lead type / standard lead length / number of wires x lead cross section		
Utilization category according to IEC 60947-5-2	DC 13	
Protection rating according to IEC 60529	IP 65	
Protection class		
Permissible torque without / with toothed disc		
Weight	210 g	

chapter 12.1

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

Recommended accessories

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

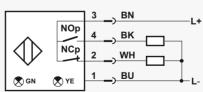
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208).

We are certified according to DIN EN ISO 9001

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

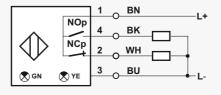




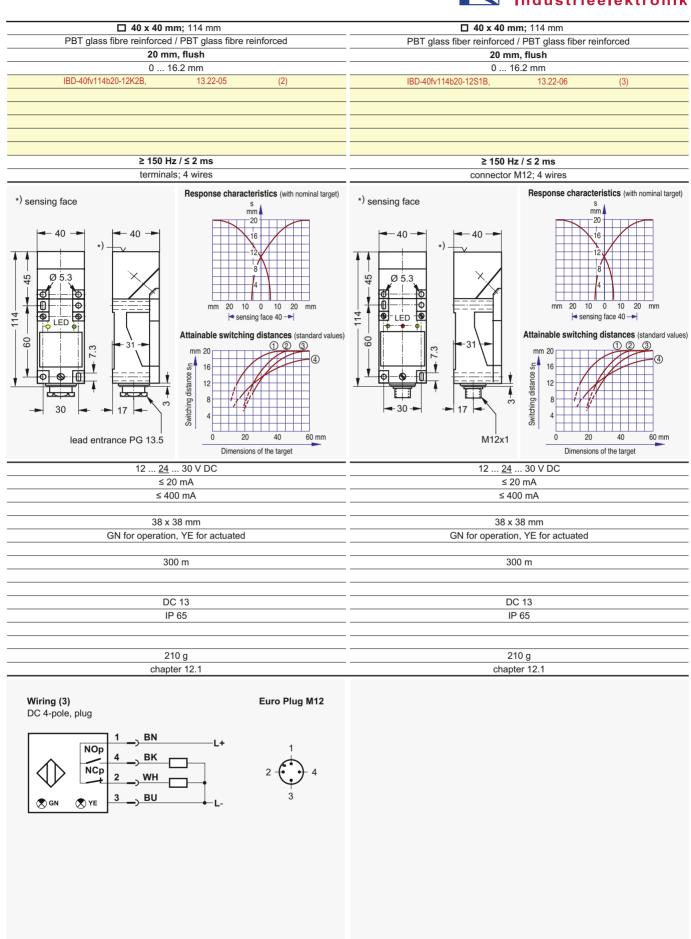
#### Plug Amphenol, 5-pole



#### Wiring (2) DC 4-pole, clamp terminal









#### Task

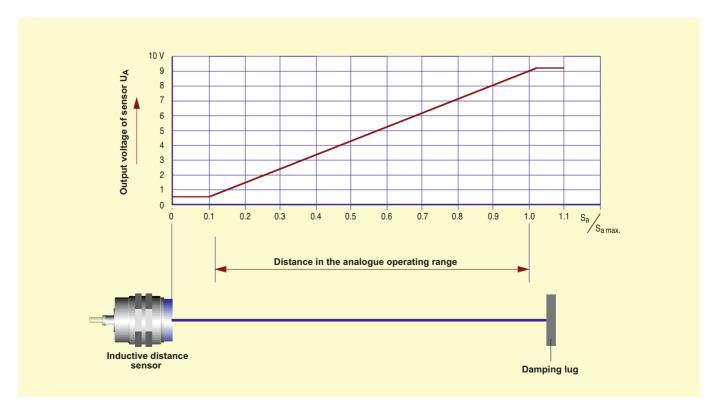
The task of a distance sensor is to convert the distance between its active surface and the damping lug into an analogue voltage or current. This signal voltage or current is available to the user at the output of the sensor.

Depending on the physical principle used, distances in the millimeter range (inductive sensors) and in the meter range (acoustic sensors) can be measured.

#### **Application examples**

#### **Inductive Distance Sensors**

- Measuring of the ripple of belt-shaped materials
- Classifying of objects of different sizes
- Routing transmitters for driverless transport systems
- Sheet metal thickness measurement or double sheet monitoring
- Measuring of belt center and belt width
- Position control and positioning of motions
- Orientation of tools, e.g. of robot grippers
- Hole radius measurement





#### **Inductive Distance Sensor IGA**

#### Tips for use:

- With non-ferrous metals material corretion factors have to be considered.
- Proximate distance sensors influence themselves reciprocally.
   The sensor distance should be ≥ 5 x maximum range.

#### Material correction factors for inductive distance sensors IGA

The actuation characteristic curve of the distance sensor IGA has been measured with the standard actuating element made of St 37 steel sheet. Often, however, other materials must be used. The following table lists correction factors of the upper limit of the actuating range for non-ferrous metals. These factors are approximate only, because they are also depending on the thickness of these materials and the osillation frequency. Use of foils of these materials results in values higher than those given in the table.

Material	Correction factor
St 37 iron	1.00
Aluminium foil	0.90 0.95
Chrom - nickel - steel	0.82 0.90
magnetizable brass	0.50 0.61
Aluminium	0.45
Copper	0.42
Stainless steel, non-magnetizable	0.40

#### **Inductive Distance Sensors IGA**

		Range	
Туре	Ref.no.	in mm	Page
		mounting *)	
cylindrical M12 x L	-		
IGA-12mg50b0,25/3-1ND1	13.02-14	0.25 3.0 b	1.13.1.1
IGA-12mg60b0,25/3-1Sd1	13.02-15	0.25 3.0 b	1.13.1.2
cylindrical M18 x L	-		
IGA-18mg50n1/8-1ND1	13.02-16	1.0 8.0 n	1.13.1.3
IGA-18mg61n1/8-1Sd1	13.02-11	1.0 9.0 n	1.13.1.4
IGA-18mg80b5-1S1	13.27-02	2.0 5.0 b	1.13.1.4

		Range	
Туре	Ref.no.	in mm	Page
		mounting *)	
cylindrical M30 x L			
IGA-30mg50b1/9-1Sd1	13.02-12	1.0 9.0 b	1.13.1.5
IGA-30mg40b1/9-1ND1	13.02-13	1.0 9.0 b	1.13.1.6
IGA-30mg50n3/15-1Sd1	13.02-17	3.0 15.0 n	1.13.1.6
			-

<sup>\*)</sup> b = flush mounting, n = non-flush mounting

You will find ultrasonic distance sensors with cylindrical housings (18mm) for operating distances ranging from 30 to 2000 mm in the catalogue section "Ultrasonic sensors".

#### **Inductive Distance Sensors**

#### **Series IGA-12mg**

		Design; length	O M12 x 1; 50 mm	
Material of the sensing face / of the housing			PCP / CuZn	
Operating ra	nge (maximum operating range		0.25 3 mm, flush	
	Max	kimum switching frequency	500 Hz	
ype designation,	Analog	gue output 4 20 mA		
Ref.no.	Analog	gue output 1 9 V	IGA-12mg50b0,25/3-1ND1, 13.02-14 (1)	
(wiring)	Ana	logue output 1 10 V		
, 0,		Maximum actuation rate		
		ctor or lead); number of wires	lead; 3 wires	
	willing (confidence	ctor or lead), flumber or wires	icau, o wiica	
	Common Technical Data			
		40/02/07		
	Reduction factor Fe / Al / V2A		V	
	Permissible ripple voltage		M12x1 10	
	Reverse polarity protection ?	yes	Canaia a	
			Sensing face	
			S <sub>17</sub> → 6	
			6 <b>age</b> 5	
			Output voltage UA (V) 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
			3 3	
			<b>1 1 2 1 2</b>	
			T	
			<u> </u>	
			0 1 2 3	4
			Distance in mm →	-
			Operating range	
		Specific Technical Data		
Permissible operating voltage range			11 <u>24</u> 35 V DC	
Current consumption without load		ent consumption without load	≤ 5 mA	
		Output current		
Short-circuit-proof?		Short-circuit-proof?	yes	
Protection against interferences ?		ction against interferences ?		
		Linearity	≤ 5 %	
		Linearity Reproducibility	≤ 5 % ≤ 1 %	
		Reproducibility		
		Reproducibility Ambient temperature range	≤ 1 % - 25 + 70 °C	
	Oneration (	Reproducibility  Ambient temperature range  Drift of temperature	≤ 1 % - 25 + 70 °C ± 5 %	
	·	Reproducibility Ambient temperature range Drift of temperature range / max. operating range	≤ 1 % - 25 + 70 °C	
	·	Reproducibility  Ambient temperature range  Drift of temperature	≤ 1 % - 25 + 70 °C ± 5 %	
	·	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error	≤1 % -25 + 70 °C ± 5 % 0.25 3 mm	
Londition	Linea	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length	≤1 % -25 + 70 °C ± 5 % 0.25 3 mm	
	Linea	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2	
	Lines e / standard lead length / number category acc. to IEC 60947-5-2 /	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67	
	Lines e / standard lead length / number category acc. to IEC 60947-5-2 /	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 ue without / with toothed disc	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm	
	Lines e / standard lead length / number category acc. to IEC 60947-5-2 /	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67	
	Lines e / standard lead length / number category acc. to IEC 60947-5-2 /	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 ue without / with toothed disc	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm	
Utiliz. of Utiliz. of proximity switch ou require in Chapt	Lines e / standard lead length / number category acc. to IEC 60947-5-2 /	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 ue without / with toothed disc Weight Recommended accessories	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead	
Utiliz. of Utiliz. of proximity switch ou require in Chapterdered separately.	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torque es with connector: Please choose er 12, "Accessories". The connector	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 ue without / with toothed disc Weight Recommended accessories  e the connector and lead ctor with its lead must be	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead  chapter 12.1  Wiring (1)  DC 3-pole, outgoing lead	
Utiliz. of Utiliz. of proximity switch ou require in Chapterdered separately.	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torque es with connector: Please choose	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 ue without / with toothed disc Weight Recommended accessories  e the connector and lead ctor with its lead must be	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm  100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead  chapter 12.1  Wiring (1)	
Or proximity switch ou require in Chapt rdered separately.	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torque es with connector: Please choose er 12, "Accessories". The connector	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section prot. rating acc.to IEC 60529 use without / with toothed disc Weight Recommended accessories  ethe connector and lead ctor with its lead must be	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm   100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead  chapter 12.1  Wiring (1)  DC 3-pole, outgoing lead  BN  L+	
Otiliz. of Utiliz. of or proximity switch ou require in Chapter of separately. For proximity switch out on some types le	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torqu  es with connector: Please choose er 12, "Accessories". The connectors es with connection leads: The stated are 3 m long as standard, a	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section orot. rating acc.to IEC 60529 the without / with toothed disc Weight Recommended accessories  The the connector and lead stor with its lead must be andard lead length is 2 m, and on others 5 m.	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm   100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead chapter 12.1  Wiring (1) DC 3-pole, outgoing lead	
Or proximity switch ou require in Chapt rdered separately. or proximity switch ut on some types to ead lengths are income.	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torqu  es with connector: Please choose er 12, "Accessories". The connect es with connection leads: The state adds are 3 m long as standard, a licated by the digits at the end of	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section orot. rating acc.to IEC 60529 the without / with toothed disc Weight Recommended accessories  The the connector and lead stor with its lead must be andard lead length is 2 m, and on others 5 m.	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm   100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead  chapter 12.1  Wiring (1)  DC 3-pole, outgoing lead  BN  L+	
Utiliz. of	Lines e / standard lead length / number category acc. to IEC 60947-5-2 / Permissible torqu  es with connector: Please choose er 12, "Accessories". The connect es with connection leads: The state adds are 3 m long as standard, a licated by the digits at the end of	Reproducibility Ambient temperature range Drift of temperature range / max. operating range ar range / max. linearity error  Maximum lead length of wires x lead cross section orot. rating acc.to IEC 60529 the without / with toothed disc Weight Recommended accessories  The the connector and lead stor with its lead must be andard lead length is 2 m, and on others 5 m.	≤ 1 %  - 25 + 70 °C  ± 5 %  0.25 3 mm   100 m  ND / 2.0 m / 3 x 0.14 mm^2  DC 13 / IP 67  9 Nm / 30 Nm  30 g + weight of the lead  chapter 12.1  Wiring (1)  DC 3-pole, outgoing lead  BN  L+	

#### Certifications

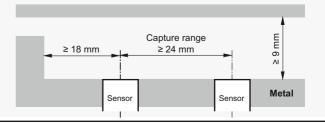
Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001.



Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

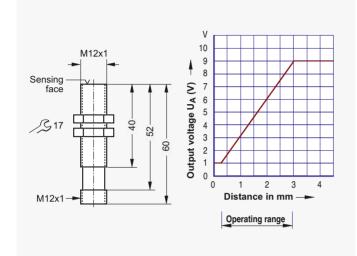
For installation instructions (flush), see also page 1.0.4





<b>O M12 x 1</b> ; 60 mm PCP / CuZn		
		0.25 3 mm, flush
500 Hz		
IGA-12mg60b0,25/3-1Sd1, 13.02-15	(2)	

#### connector M12, 3 wires



14 <u>24</u> 35 V DC
≤ 5 mA

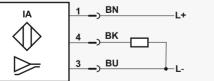
yes

≤ 5 % ≤ 1 % - 25 ... + 70 °C ± 5 % 0.25 ... 3 mm

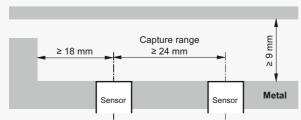
100 m

DC 13 / IP 67 9 Nm / 30 Nm 30 g chapter 12.1

## Wiring (2) Euro Plug M12 DC 3-pole, plug 1 BN



#### For installation instructions (flush), see also page 1.0.4



#### **Inductive Distance Sensors**

#### **Series IGA-18mg**

<b>O M18 x 1</b> ; 50 mm PCP / CuZn	Design; length  Material of the sensing face / of the housing			
1 8 mm, non-flush	Operating range, mounting (see page1.0.4)			
400 Hz	mum switching frequency	Max		
	ue output 4 20 mA	Analog	ype designation,	
IGA-18mg50n1/8-1ND1, 13.02-16 (1)	ue output 1 9 V		Ref.no.	
	ogue output 1 10 V	Anal	(wiring)	
	Maximum actuation rate			
lead; 3 wires	or or lead); number of wires	Wiring (connec		
	10/00/07	Common Technical Data		
V		Reduction factor Fe / Al / V2A		
→ M18x1 → 10		Permissible ripple voltage		
ensing face 9 8 8 7	yes	Reverse polarity protection?		
(A) 7 6 5 9 00 00 00 00 00 00 00 00 00 00 00 00 0				
wo to				
0 1 2 3 4 5 6 7 8 9  Distance in mm				
Operating range				
	Specific Technical Data			
11 <u>24</u> 35 V DC	Permissible operating voltage range			
≤ 5 mA	Current consumption without load			
	Output current			
yes	Short circuit proof 2			
yes	Short-circuit-proof? Protection against interferences?			
		11000		
± 0.1 mm	Maximum distance tolerance			
< 1 mm	Blind zone			
< 1 111111	Linearity			
≤ 5 %	Linearity	Reproducibility		
			Ambient temperature range	
≤ 5 %	Reproducibility			
≤ 5 % ≤ 1 %	Reproducibility			
≤ 5 % ≤ 1 % - 25 + 70 °C ± 5 %	Reproducibility  Ambient temperature range  Drift of temperature			
≤ 5 % ≤ 1 % - 25 + 70 °C ± 5 %	Reproducibility Ambient temperature range Drift of temperature  Maximum lead length	ne / standard lead length / number	Lead type	
≤ 5 % ≤ 1 % - 25 + 70 °C ± 5 % 100 m ND / 2.0 m / 3 x 0.34 mm^2	Reproducibility Ambient temperature range Drift of temperature  Maximum lead length of wires x lead cross section	pe / standard lead length / number		
≤ 5 % ≤ 1 % - 25 + 70 °C ± 5 % 100 m ND / 2.0 m / 3 x 0.34 mm^2 DC 13 / IP 67	Reproducibility  Ambient temperature range Drift of temperature  Maximum lead length of wires x lead cross section rot. rating acc. to IEC 60529	category acc. to IEC 60947-5-2 / p		
≤ 5 % ≤ 1 % - 25 + 70 °C ± 5 % 100 m ND / 2.0 m / 3 x 0.34 mm^2	Reproducibility Ambient temperature range Drift of temperature  Maximum lead length of wires x lead cross section	category acc. to IEC 60947-5-2 / p		

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is  $2\ m$ , but on some types leads are  $3\ m$  long as standard, and on others  $5\ m$ .

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001



#### Safety Regulations

Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

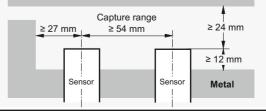
Subject to technical changes!

#### Wiring (1)

DC 3-pole, outgoing lead



For installation instructions (non-flush), see also page 1.0.4





O M18 x 1; 61 mm	O M18 x 1; 80 mm	
PCP / CuZn	CuZn / PBT	
1 8 mm, non-flush	2 5 mm, flush	
400 Hz	100 Hz	
IGA-18mg61n1/8-1Sd1, 13.02-11 (2)	IGA-18mg80b5-1S1, 13.27-02 (3)	
connector M12, 3 wires	connector M12, 3 wires	
Sensing face	Sensing face    M18x1	
11 <u>24</u> 35 V DC	14 <u>24</u> 30 V DC	
≤ 5 mA	≤ 10 mA	
15 mA	15 mA	
yes	yes	
± 0.1 mm	± 0.1 mm	
< 1 mm	< 2 mm	
≤ 5 %		
≤ 1 %		
- 25 + 70 °C	0 + 60 °C	
± 5 %		
100 m	300 m	
DC 13 / IP 67	DC 13 / IP 67	
34 Nm / 70 Nm	34 Nm / 70 Nm	
50 g	150 g	
chapter 12.1	chapter 12.1	
Wiring (2) DC 3-pole, plug  IA  1  BN  4  BK  3  BU  4  3	Wiring (3) DC 3-pole, plug  IA  JBN L+  JBK JBU	
For installation instructions (non-flush), see also page 1.0.4  Capture range  2 24 mm  2 8 mm  Sensor  Metal  Sensor	For installation instructions (flush), see also page 1.0.4  Capture range ≥ 27 mm ≥ 36 mm ≥ 15 mm  Sensor  Sensor  Metal	

#### **Inductive Distance Sensors**

#### Series IGA-30mg

		Design; length	O M30 x 1.	<b>5</b> ; 50 mm
Material of the sensing face / of the housing		PCP / CuZn		
Operating range, mounting (see page1.0.4)		1 9 mm, flush		
Maximum switching frequency		400	Hz	
Type designation,	Analogue output 4 20 mA			
Ref.no.		gue output 1 9 V	IGA-30mg50b1/9-1Sd1,	13.02-12 (1)
(wiring)	Anal	ogue output 1 10 V		
		Maximum actuation rate		
	Wiring (connec	ctor or lead); number of wires	connector M	12, 3 wires
	Common Technical Data			
	Reduction factor Fe / Al / V2A			V
-	Permissible ripple voltage			10
	Reverse polarity protection ?	yes	→ M30x1.5 →	9
				Output voltage UA(V) 8 4 9 9 4 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9
			Sensing face : A A A	5 7 <del>                                    </del>
				<b>9</b> 6
			36	<b>a</b> 5
				\$ 4
			3	<b>p</b> 3
			<u> </u>	<b>8</b> 2
			<u> </u>	1 /
			M12x1 → ∞	0 2 4 6 8 10 12 14
-			IVI IZXI	Distance in mm —
			,	Operating range
		Specific Technical Data		
	Permiss	sible operating voltage range	11 <u>24</u>	35 V DC
	Curre	ent consumption without load	≤ 5 r	mA
		Output current	≤ 15	mA
	<u> </u>			
		Short-circuit-proof?	yes	
	Prote	ection against interferences ?		
		Maximum distance tolerance		0/.
		Blind zone	± 5 % < 1 mm	
		Linearity	≤5 %	
	Reproducibility		≤ 5 % ≤ 1 %	
Ambient temperature range		- 25 + 70 °C		
Drift of temperature		± 5		
		Maximum lead length	100	m
	e / standard lead length / number			
Utiliz. c	category acc. to IEC 60947-5-2 / p	-	DC 13 /	
	Permissible torqu	ue without / with toothed disc	150 Nm / <	
	Weight		84 g	
		Recommended accessories	chapter	r 12.1

For proximity switches with connector: Please choose the connector and lead you require in Chapter 12, "Accessories". The connector with its lead must be ordered separately.

For proximity switches with connection leads: The standard lead length is 2 m, but on some types leads are 3 m long as standard, and on others 5 m.

Lead lengths are indicated by the digits at the end of the ref. no. (-020 = 2 m, -030 = 3 m, -050 = 5 m).

#### Certifications

Proximity switches according to standard: DIN EN 60 947-5-2 (VDE 0660 Part 208). We are certified according to DIN EN ISO 9001.



#### Safety Regulations

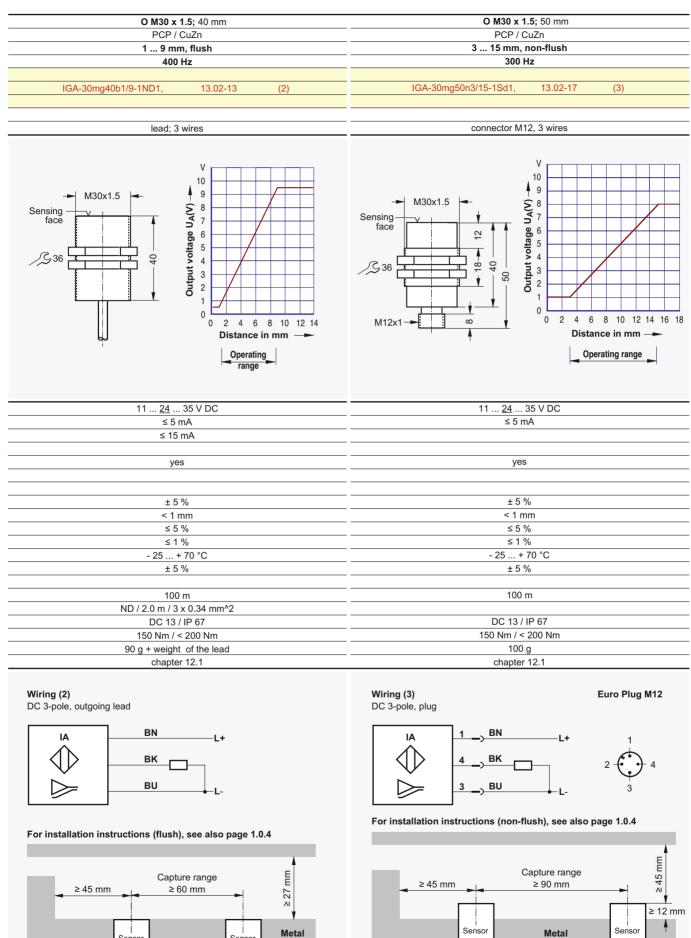
Connection, commissioning and maintenance may only be accomplished by specialists or instructed staff.

Subject to technical changes!

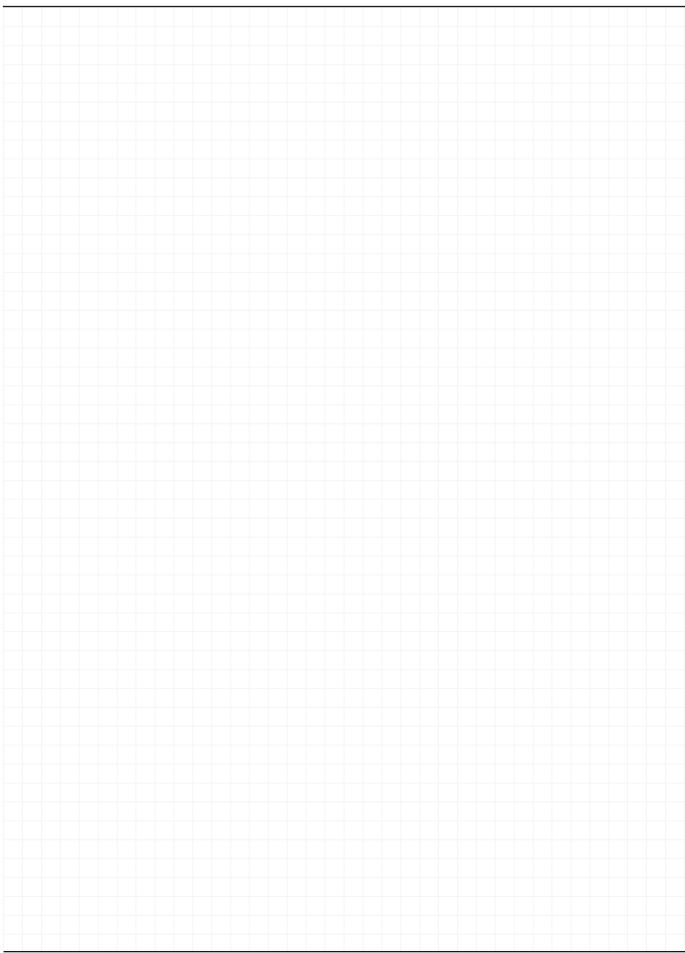
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1.13.1.6



#### **Notes**





#### Cordsets with sockets















Field attachable connectors













#### Cordset with socket and plug





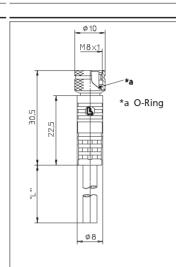


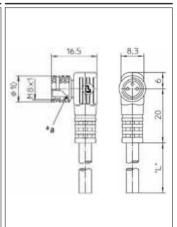


#### Cordsets with M8 and M12 connectors, ready-for-use

Connector	lead M8	lead socket M8
Version; pole number;	straight; 3- and 4-pole	angled; 3- and 4-pole
Material: Housing / insulating body / contact carrier	TPU; self-extinguishing	TPU; self-extinguishing
Flange	CuZn nickel-plated	CuZn nickel-plated
Contact material and surface	CuZn gold-plated	CuZn gold-plated
Connection type	lead firmly assembled, moulded	lead firmly assembled, moulded
Manufacture	Lumberg RKMV	Lumberg RKMWV







#### 3-polig 3 poles



braun / brown blau / blue schwarz / black

## 4-polig 4 poles



braun / brown 2 = 3 = 4 = weiß / white blau / blue schwarz / black

IP 67; unshielded

- 25 ... + 80 °C

3-polig 3 poles



braun / brown blau / blue schwarz / black

## 4-polig 4 poles



1 = 2 = 3 = braun / brown

weiß / white blau / blue schwarz / black

IP 67; unshielded

- 25 ... + 80 °C

JSM8U3 / LN3x0,34u5,0OG	JSM8V3 / LN3x0,34u5,0OG
13.97-01-020; -050; -100; -xxx *)	13.97-05-020; -050; -100; -xxx
60 V; 4 A; ≤ 5 mΩ	60 V; 4 A; ≤ 5 mΩ
PVC; OG	PVC; OG
5.0 mm; 3 x 0.34 mm^2	5.0 mm; 3 x 0.34 mm^2

Type designation *)	JSM8U4 / LN4x0,25u5,0OG	JSM8V4 / LN4x0,25u5,0OG
Ref. no. for lead length 2 m; 5 m; 10 m; on request *)	13.97-03-020; -050; -100; -xxx *)	13.97-07-020; -050; -100; -xxx *)
Nominal voltage at 40 °C; contact resistance	30 V; 4 A; ≤ 5 mΩ	30 V; 4 A; ≤ 5 mΩ
Material of lead jacket; lead colour	PVC; OG	PVC; OG
Lead diameter; number of single cores x cross section	5.0 mm; 4 x 0.25 mm <sup>2</sup>	5.0 mm; 4 x 0.25 mm <sup>2</sup>
Number of LEDs and colour	0	0
Protection rating acc. to IEC 60529 (screw locked); shield	IP 67; unshielded	IP 67; unshielded
Ambient temperature range	- 25 + 80 °C	- 25 + 80 °C

Nominal voltage at 40 °C; contact resistance

Lead diameter; number of single cores x cross section

Protection rating acc. to IEC 60529 (screw locked); shield

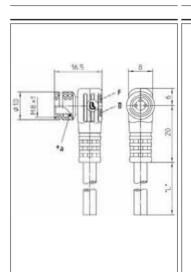
Material of lead jacket; lead colour

Number of LEDs and colour

Ambient temperature range



lead socket M8 with indicator	lead socket M12	lead socket M12	lead socket M12 with indicator
angled; 3-pole	straight; 3- and 4-pole	angled; 3- and 4-pole	angled; 3- and 4-pole
TPU; self-extinguishing	TPU; self-extinguishing	TPU; self-extinguishing	TPU; self-extinguishing
CuZn nickel-plated	CuZn nickel-plated	CuZn nickel-plated	CuZn nickel-plated
CuZn gold-plated	CuSn gold-plated	CuSn nickel sublayer a. 0,3 µm gold-plat.	CuSn gold-plated
lead firmly assembled, moulded	lead firmly assembled, moulded	lead firmly assembled, moulded	lead firmly assembled, moulded
Lumberg RKMWV/LED	Binder, Lumberg RKT	Lumberg RKWT	Binder, Lumberg RKWT/LED



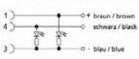
- \*a O-Ring O-ring
- Betriebsanzeige grün operation indicator green
- Funktionsanzeige gelb function indicator yellow

#### 3-polig 3 poles



braun / brown blau / blue schwarz / black 1 = 3 = 4 =

pnp-Schließer / pnp Normally open = gelb-grün / yellow-green



## 39,7 Ø 8,8 ø 10,3

3-polig 3 poles

1 = 2 = 3 = 4 = schwarz / black

4-polig 4 poles

,00

,00

1 = 2 = 3 =

braun / brown n.c. blau / blue



12. 14.5 3333 φ8,8 ø 10,5

24.5

- \*a O-Ring
- \*b Schutzschlauchmontage protective hose mounting

## 3-polig 3 poles

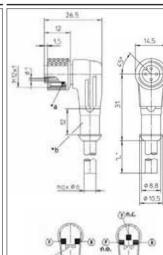


1 = 2 = 3 = braun / brown n.c. blau / blue schwarz / black

## 4-polig 4 poles



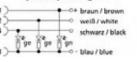
- 1 = 2 = 3 = braun / brown weiß / white blau / blue
- schwarz / black



- LED A. \*a O-Ring
- \*b Schutzschlauchmontage
- Betriebsanzeige grün
- Funktionsanzeige gelb

pnp-Öffner/-Schließer / pnp-Normally closed/open = gelb-gelb-grün (Antivalent) / yellow-yellow-green

LED P



pnp-Schließer / pnp Normally open = gelb-grün / yellow-green schwarz / black

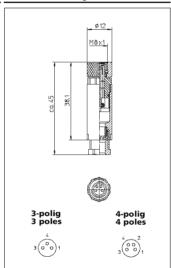
JSM8V3gy / LN3x0,34u5,0OG	JSM12U3 / LN3x0,34u5,0OG	JSM12V3 / LN3x0,34u5,0OG	JSM12V3gy / LN3x0,34u5,0OG
13.97-09-020; -050; -100; -xxx *)	13.97-11-020; -050; -100; -xxx *)	13.97-24-020; -050; -100; -xxx *)	13.97-17-020; -050; -100; -xxx *)
10 30 V DC; 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ	10 30 V DC; 4 A; ≤ 5 mΩ
PVC; OG	PVC; OG	PVC; OG	PVC; OG
5.0 mm; 3 x 0.34 mm <sup>2</sup>	5.0 mm; 3 x 0.34 mm <sup>2</sup>	5.0 mm; 3 x 0.34 mm^2	5.0 mm; 3 x 0.34 mm <sup>2</sup>
1 LED GN + 1 LED YE	0	0	1 LED GN + 1 LED YE
IP 67; unshielded	IP 67; unshielded	IP 67; unshielded	IP 67; unshielded
- 25 + 80 °C			

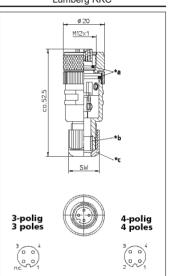
JSM12U4 / LN4x0,25u5,0OG	JSM12V4 / LN4x0,25u5,0OG	JSM12V4gyy / LN4x0,25u5,0OG
13.97-13-020; -050; -100; -xxx *)	13.97-21-020; -050; -100; -xxx *)	13.97-19-020; -050; -100; -xxx *)
240 V; 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ	10 30 V DC; 4 A; ≤ 5 mΩ
PVC; OG	PVC; OG	PVC; OG
5.0 mm; 4 x 0.25 mm <sup>2</sup>	5.0 mm; 4 x 0.25 mm <sup>2</sup>	5.0 mm; 4 x 0.25 mm^2
0	0	1 LED GN + 2 LED YE
IP 67; unshielded	IP 67; unshielded	IP 67; unshielded
- 25 + 80 °C	- 25 + 80 °C	- 25 + 80 °C

#### Field attachable sockets

Connector; type of lead connection	lead socket M8; screwable	lead socket M12; screwable
Version	straight	straight
Pole number: Type designation; ref. no.	3-pole: JSM8U3; 13.98-01	4-pole: JSM12U4; 13.98-06
Pole number: Type designation; ref. no.	4-pole: JSM8U4; 13.98-02	
Material: Housing / insulating body / contact carrier	PA / PA / TPU; self-extinguishing	PA / PA / PA
Flange	CuZn nickel-plated	CuZn nickel-plated
Contact material and surface	CuZn gold-plated	CuZn gold-plated
Nominal voltage; nominal current at 40 °C; contact resistance	60 V (4-pol. 30 V); 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ
Number of LED's and colour	0	0
Lead diameter	3.5 5.0 mm	3,0 6.5 mm
Recommended: Number of single cores x cross section	3 / 4 x 0.34 mm^2	3 / 4 x 0.34 mm^2
Protection rating acc. to IEC 60529 (screw locked)	IP 67	IP 67
Ambient temperature range	- 40 + 85 °C	- 25 + 90 °C
Manufacture	Lumberg RKMCK	Lumberg RKC

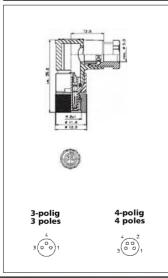


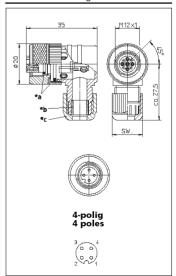




Connector; type of lead connection	socket M8; screwable	socket M12; screwable
Version	angled	angled
Pole number: Type designation; ref. no.	3-pole: JSM8V3; 13.98-03	4-pole: JSM12V4; 13.98-08
Pole number: Type designation; ref. no.	4-pole: JSM8V4; 13.98-04	
Material: Housing / insulating body / contact carrier	PBT / PBT / PA	PA / PA / PA
Flange	CuZn	CuZn nickel-plated
Contact material and surface	CuSn gold-plated	CuZn gold-plated
Nominal voltage; nominal current at 40 °C; contact resistance	60 V (4-pol. 30 V); 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ
Number of LED's and colour	0	0
Lead diameter / PG-thread	3.5 5.0 mm	3.0 6.5 mm
Recommended: Number of single cores x cross section	3 / 4 x 0.34 mm^2	3 / 4 x 0.34 mm^2
Protection rating acc. to IEC 60529 (screw locked)	IP 67	IP 67
Ambient temperature range	- 40 + 85 °C	- 25 + 90 °C
Manufacture	Lumberg RKMCW	Lumberg RKCW

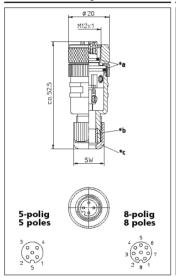


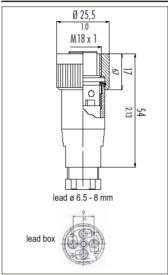


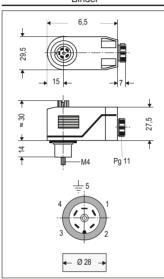




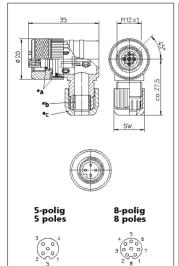
lead socket M12; screwable	lead socket M18; srewable	socket V28; screwable	
straight	straight	angled	
5-pole: JSM12U5; 13.98-09	4-pole: JSM18U4; 13.98-13	5-pole: JSV28V5; 13.98-19	
8-pole: JSM12U8; 13.98-10			
PA / PA / PA	PA / PA / PA		
CuZn nickel-plated	CuZn		
CuZn gold-plated	CuZn		
60 V (8-pol. 30 V); 4 A (8-pol. 2 A); ≤ 5 mΩ	250 V; 5 A; ≤ 8 mΩ		
0	0		
3.0 6.5 mm	3.0 6.5 mm		
5 / 8 x 0.34 mm^2	4 x 0.34 mm^2		
IP 67	IP 65		
- 25 + 90 °C	- 40 + 85 °C		= -
Lumberg RKC	Binder series 714	Binder	

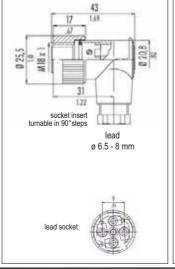


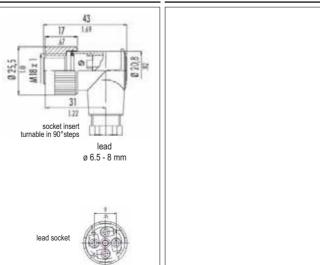




socket M12; screwable	socket M18; screwable	
angled	angled	
5-pole: JSM12V5; 13.98-11	4-pole: JSM18V4; 13.98-14	
8-pole: JSM12V8; 13.98-12		
PA	PBT / PA / PA	
CuZn nickel-plated	CuZn	
CuSn gold-plated	CuZn	
60 V (8-pol. 30 V); 4 A (8-pol. 2 A); ≤ 5 m $\Omega$	250 V; 5 A; ≤ 8 mΩ	
0	0	
3.0 6.5 mm (8-pol. 4.0 8.0 mm)	3.0 6.5 mm	
5 / 8 x 0.34 mm^2	4 x 0.34 mm^2	
IP 67	IP 65	
- 25 + 90 °C	- 40 + 85 °C	
Lumberg RKCW	Binder series 714	



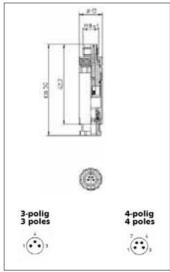


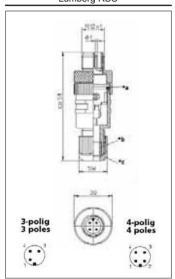


#### Field attachable plugs

Connector; type of lead connection	plug M8, screwable	plug M12, screwable
Version	straight	straight
Pole number: Type designation; ref. no.	3-pole: JSM8S3; 13.98-30	3-pole: JSM12S3; 13.98-34
Pole number: Type designation; ref. no.	4-pole: JSM8S4; 13.98-31	4-pole JSM12S4; 13.98-35
Material: Housing / insulating body / contact carrier	PA / PA / TPU, self-quenching	PA / PA / PA
Flange	CuZn nickel-plated	CuZn nickel-plated
Contact material and surface	CuZn gold-plated	CuZn gold-plated
Nominal voltage; nominal current at 40 °C; contact resistance	60 V (4-pol. 30 V); 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ
Number of LED's and colour	0	0
Lead diameter	3.5 5.0 mm	3.0 6.5 mm
Recommended: Number of single cores x cross section	3 / 4 x 0.34 mm^2	3 / 4 x 0.34 mm^2
Protection rating according to IEC 60529 (screw locked)	IP 67	IP 67
Ambient temperature range	- 40 + 85 °C	- 25 + 90 °C
Manufacture	Lumberg RSMCK	Lumberg RSC

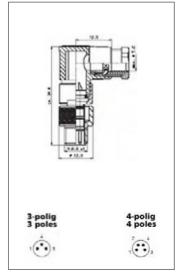


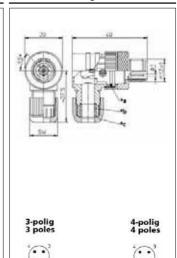




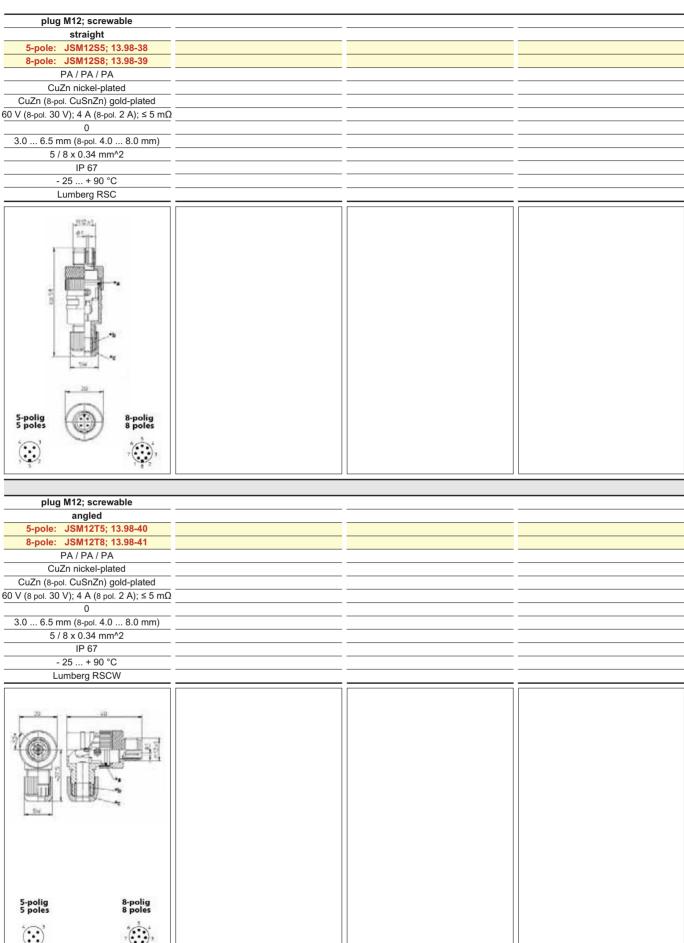
Connector; type of lead connection	plug M8; screwable	plug M12; screwable
Version	angled	angled
Pole number: Type designation; ref. no.	3-pole: JSM8T3; 13.98-32	3-pole: JSM12T3; 13.98-36
Pole number: Type designation; ref. no.	4-pole: JSM8T4; 13.98-33	4-pole: JSM12T4; 13.98-37
Material: Housing / insulating body / contact carrier	PBT / PBT / PA	PA / PA / PA
Flange	CuZn	CuZn nickel-plated
Contact material and surface	CuZn gold-plated	CuSn gold-plated
Nominal voltage; nominal current at 40 °C; contact resistance	60 V (4 pol. 30 V); 4 A; ≤ 5 mΩ	240 V; 4 A; ≤ 5 mΩ
Number of LED's and colour	0	0
Lead diameter	3.5 5.0 mm	3.0 6.5 mm
Recommended: Number of single cores x cross section	3 / 4 x 0.34 mm^2	3 / 4 x 0.34 mm^2
Protection rating according to IEC 60529 (screw locked)	IP 67	IP 67
Ambient temperature range	- 40 + 85 °C	- 25 + 90 °C
Manufacture	Lumberg RSMCW	Lumberg RSCW











#### Cordsets with M8 or M12 connectors (adaptors)

	Socket version; plug version	M8 straight; M8 straight	M8 angled; M8 straight
	Connection type (screws or snap-ins)	both sockets and plugs: screws	both sockets and plugs: screws
	Material: Housing / insulating body / contact carrier	TPU	TPU
-	Flange and surface / contact material and surface  Nominal voltage	CuZn nickel-plated / CuZn gold-plated 60 V	CuZn nickel-plated / CuZn gold-plated
	Nominal current at 40 °C	4 A	10-30 V DC 4 A
	LED indicator in the angled plug	0	1 x GN, 1 x YE
	Lead jacket / colours	PUR / BK	PUR / BK
	Protection rating according to IEC 60529 (screw locked)	IP 67	IP 67
	Ambient temperature range	- 25 + 80 °C	- 25 + 80 °C
	Manufacture	Lumberg RSMV-RKMV	Lumberg RSMV-RKMWV/LED
Pole	no. socket / no. of cores x cross section / pole no. plug	3 / 3 x 0.34 mm^2 / 3	3 / 3 x 0.34 mm^2 / 3
	Type designation	JSM8U3 / LP3x0.34u4.3BK / SM8S3	JSM8V3gy / LP3x0.34u4.3BK / SM8S3
	Ref. no.	13.97-50-xxx	13.97-51-xxx
Pol	e no. socket/ no. of cores x cross section / pole no. plug		
	Type designation		
	Ref. no.		
D 1	and cooket inc of course we are as the first include		
Pole	e no. socket / no. of cores x cross section / pole no. plug  Type designation		
	Ref. no.		
Pole	no. socket / no. of cores x cross section / pole no. plug		
	Type designation		
	Ref. no.		
D-1-	no cocket ino of cores v erose eastion include a situation		
Pole	e no. socket / no. of cores x cross section / pole no. plug  Type designation		
	Ref. no.		
	3-polig A pnp-Schließer / 3-poles pole policy polic		
Socket M8 straight;	gelb-orun / vellow-oreen	<b>₽</b>	
Plug M8 straight	1 = braun / brown 3 = blau / blue		
Socket M8 angled;	4 = schwarz / black 1) 0 brant / brant		
Plug M8 straight	1(00) 1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7	
	3-polig A pnp-5chließer / 3 poles pnp Normally open =		
Socket M8 straight;	gelb-grün / vellgw-green		
Plug M12 traight	1 = braun / brown 3 = blau / blue 4 = schwarz / black 1) • 0 • braun / brown		
Socket M8 angled;	4 a schwarz / hlack 1) 0 to beaut / black 4 to 0 to beaut / black		
Plug M12straight	1 (0°0) 1 (1 - htm//htm		No.
	NAME OF TAXABLE PARTY.		
	3-polig 4-polig		
	3 poles 4 poles		
	1 = braun / brown 2 = n.c. 1 = braun / brown 2 = wei8 / white		
	3 = blau / blue 3 = blau / blue 4 = schwarz / black		
	(0)	_ ø 10	, Ø 10 ,
		<u></u> . <u>M8×1,</u>	M8×1,
	5-polig 6-polig 5 poles 6 poles		I I I I I I I I I I I I I I I I I I I
	1 = hraun / hrown 1 = weiß / white	<del>     </del>	
Socket M12 straight	2 = weilB /white , , , , 2 = grūn / green 3 = blau / blue , , , , 3 = gelb / yellow 4 = gruy / green		
Plug M12 straight	S = grun/gelb / S = braun / brown		
	green/yellow 6 = n.c. 7 = blau/blue 8 = n.c.		37
	,		
	8-polig 8 poles		
	6 1 weiß / white		
	4 1 = weiß / white 2 = braun / brown 3 = grūn / green 1 2 4 = gelb / yellow		
	5 5 = grau /grey 6 6 = rosa / pink		
	7 7 = blau/blue 2 4 8 = Schirm/shield		
	A pnp-Schließer / pnp-Offfner/-Schließer / pnp-Normally open = R	30.5	
Socket M12 angled;	gelb-grün / gelb-gelb-grün (Antivalent) / yellow-green yellow-yellow-green		
Plug M12 straight	1) • O+ brauntrown 1) • O+ brauntrown 4) • O whenty 2) • O well/while		99,7
	ge ge that 4) to the should	( <del>1</del>	
	3) 0 Marthae 3) 00 00 00 Marthae	ø 9.7_	16,6



M8 straight; M12 straight both sockets and plugs: screws TPU CuZn nickel-plated / CuZn gold-plated 60 V 4 A 0 PUR / BK IP 67 - 25 + 80 °C	M8 angled; M12 straight both sockets and plugs: screws TPU CuZn nickel-plated / CuZn gold-plated 10-30 V DC	M12 straight; M12 straight both sockets and plugs: screws TPU CuZn nickel-plated / CuSn gold-plated	M12 angled; M12 straight both sockets and plugs: screws TPU CuZn nickel-plated / CuSn gold-plated
TPU CuZn nickel-plated / CuZn gold-plated 60 V 4 A 0 PUR / BK IP 67	TPU CuZn nickel-plated / CuZn gold-plated	TPU	TPU
CuZn nickel-plated / CuZn gold-plated 60 V 4 A 0 PUR / BK IP 67	CuZn nickel-plated / CuZn gold-plated		
60 V 4 A 0 PUR / BK IP 67		Cuzn nickei-biated / Cusn dold-biated	
4 A 0 PUR / BK IP 67		3-4 pol. 240 V, 5 pol. 60 V, 6-8 pol. 30 V	10-30 V DC
0 PUR / BK IP 67	4 A	3-5 pol. 4 A, 6-8 pol. 2 A	4 A
PUR / BK	1 x GN, 1 x YE	0	1 x GN, 1 x YE
IP 67	PUR / BK	PUR / BK	PUR / BK
	IP 67	IP 67	IP 67
- 2J + OU U	- 25 + 80 °C	- 25 + 80 °C	- 25 + 80 °C
Lumberg RST-RKMV	Lumberg RST-RKMWV/LED	Lumberg RST-RKT	Lumberg RST-RKWT/LED
3 / 3 x 0.34 mm^2 / 3	3 / 3 x 0.34 mm^2 / 3	3 / 3 x 0.34 mm^2 / 3	3 / 3 x 0.34 mm^2 / 3
JSM8U3 / LP3x0.34u4.3BK / SM12S3	JSM8V3gy / LP3x0.34u4.3BK / SM12S3	JSM12U3 / LP3x0.34u4.3BK / SM12S3	JSM12V3gy/LP3x0.34u4.3BK/SM12S
13.97-52-xxx	13.97-53-xxx	13.97-54-xxx	13.97-55-xxx
		4 / 4 x 0.34 mm^2 / 4	4 / 4 x 0.34 mm^2 / 4
		JSM12U4 / LP4x0.34u4.7BK / SM12S4	
		13.97-56-xxx	13.97-57-xxx
<i>→</i>		<b>A</b>	<b>A</b>
			912
		9	7
			/
			/
		1	1
			A.
_ Ø14,5		Ø 14.5	
		_M12×1_,	
M12 ×1	<del>- Ø 14.5 -</del>		
	_M12 x1_		Ø14,5
			M12×1_
		46	
46.75		46.75	
Li Li	46		
	6,75		46,75
			Uni
		42.9	
2 io E			12 W
V21\ 1 (000			
	1 1/0 100 PTT - 11 HTM177 - 1		
M8×1	9.9.7 XX	M12×1	M 12 X 1
M8×1 99.7	92 8	M12×1	26.5