BALLUFF

PRODUCTS FOR EFFICIENT AUTOMATION

Products and Services

innovating automation

Safety, Industrial Networking,
Power Supplies

4

Innovative solutions

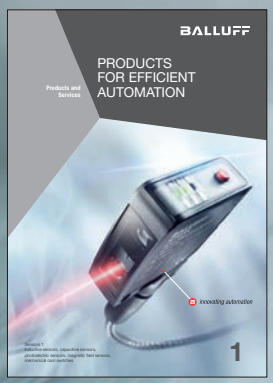
TO MEET YOUR AUTOMATION NEEDS

Plastics, Rubber and Tires
Mobility
Packaging, Foods and Beverages
Energy Generation

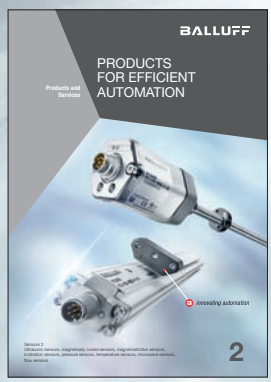
INNOVATIVE SOLUTIONS FOR ANY REQUIREMENT

To give you an overview of our range of offerings we have condensed our product portfolio into five volumes. This overview provides a list of topics contained in each volume.

1 2



Sensors 1
- Inductive Sensors
- Capacitive Sensors
- Photoelectric Sensors
- Magnetic Sensors
- Mechanical Cam Switches



Sensors 2
- Ultrasonic Sensors
- Magnetically Coded Sensors
- Magnetostrictive Sensors
- Inclination Sensors
- Pressure Sensors
- Temperature Sensors
- Microwave Sensors
- Flow Sensors

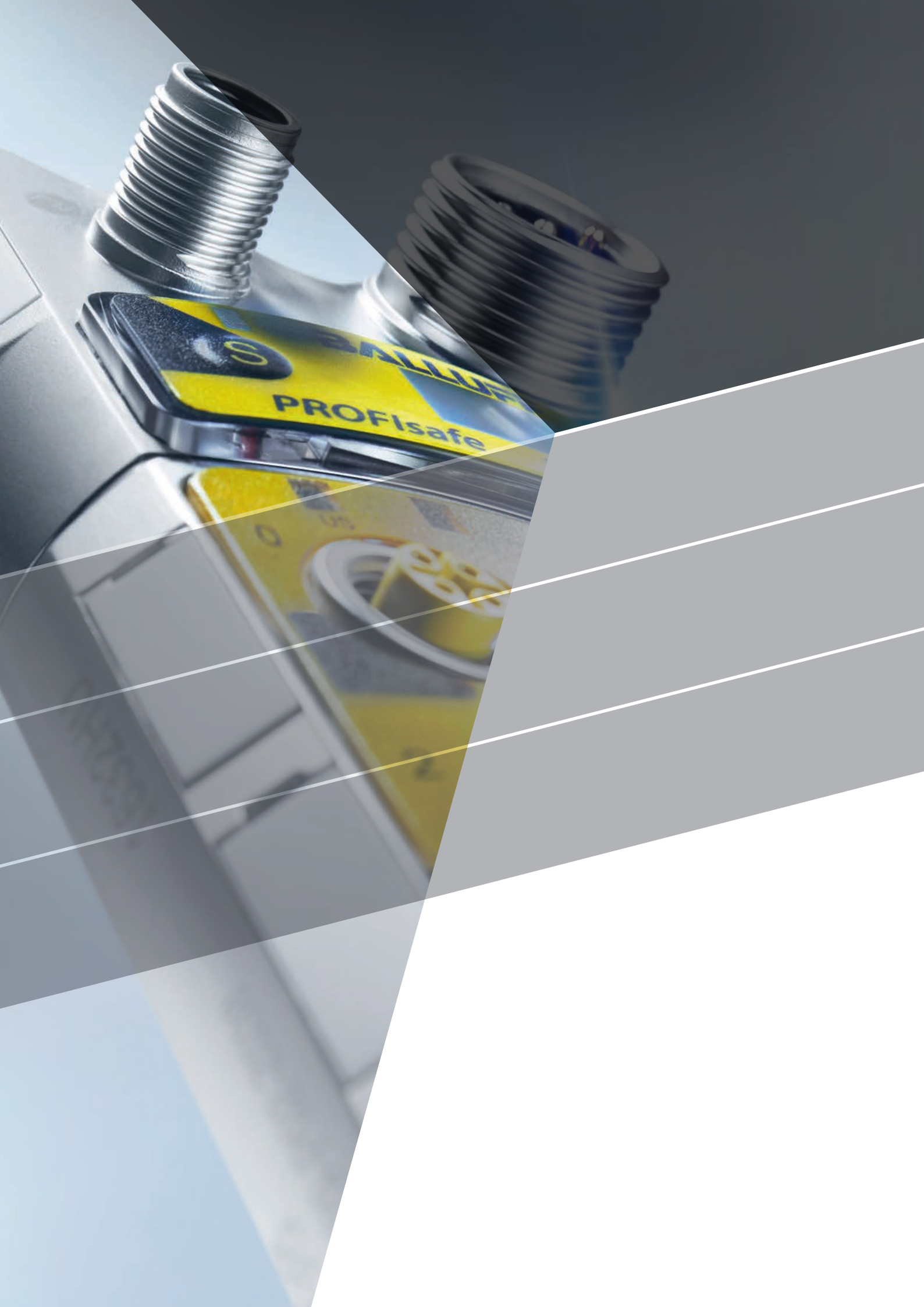
3 **4** 5

- RFID
- Machine Vision and Optical Identification
- Human Machine Interfaces
- Systems

- Safety
- Industrial Networking
- Power Supplies

- Connectivity
- Accessories

Do you need more details? Our Product Finder at www.balluff.com provides you with product-specific information, including technical drawings, data sheets, user guides and more for each individual product. All items are available for download.


PROFIsafe

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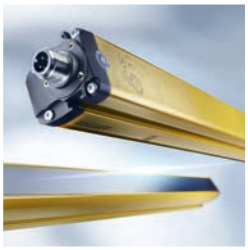

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40 Opto-Electronic Protective Devices
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76 Safety Command Devices

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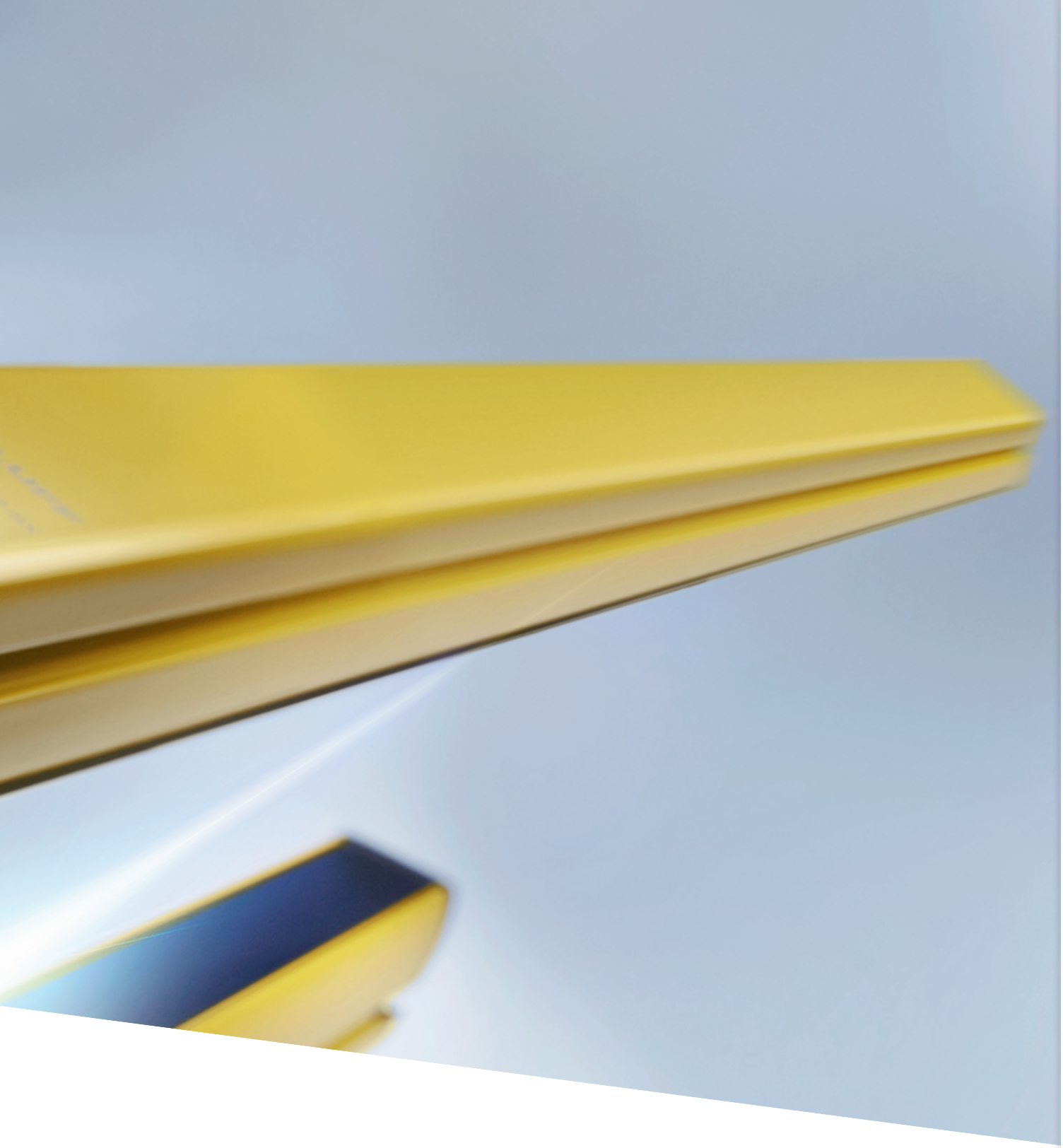
Machine safety with Balluff quality

SAFETY

innovating automation



Automation requires safety. And safety is based on reliability. Balluff quality guarantees great reliability with a variety of solutions that make machines and equipment dependable and safe. Our safety sensors together with safe controller technology enable innovative concepts for your machine safety – all while maintaining consistent quality that lasts for years. The Balluff safety concept for automation includes a continually increasing number or products and components that contribute to minimizing the risk to man and machine while safely processing the information. These components can easily be integrated into the machine controllers.

Your Balluff solutions

- Safe I/O modules
- Safety switches and safety sensors
- Opto-electronic protective devices
- Safety interlocks
- Safety command devices

SAFETY

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78 Emergency stop device

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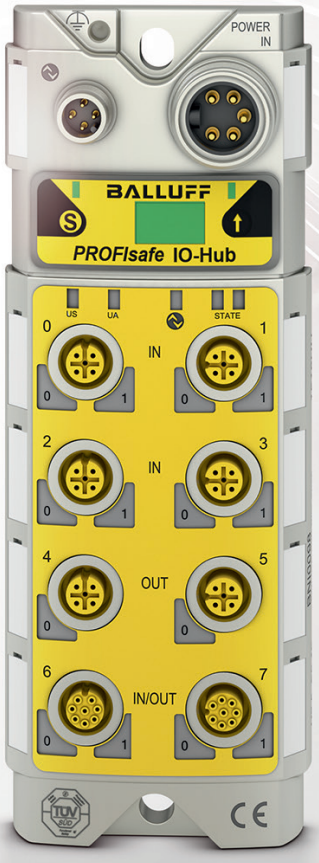


Safely transport signals

SAFE I/O MODULES

The safe I/O modules from Balluff combine safety and automation technology using IO-Link. They provide both sensor and actuator signals as well as safety-relevant information. The best part: all you need for the safety concept in your plant is an infrastructure for implementing industrial safety in your automation processes. The universal IO-Link interface makes integrating industrial safety technology easier than ever.

At Balluff the core of Safety over IO-Link is the Safety Hub with Profisafe for Profinet. Safety switches and sensors, opto-electronic protective devices or safety command devices are quick and easy to incorporate. All you need is standard M12 cables for connecting virtually any safe field device.

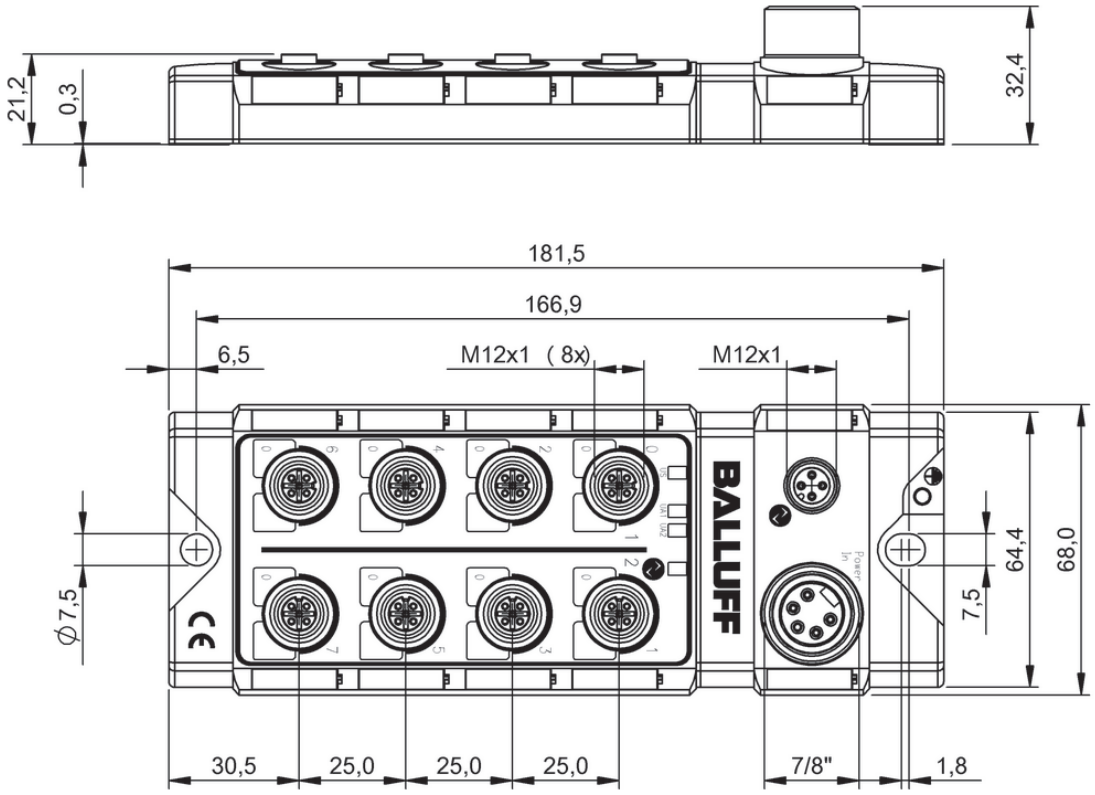
Safe communication with the controller level is via Profisafe for Profinet. Together with our safety components the result is an all-round safe system on which you can rely.

The most important benefits

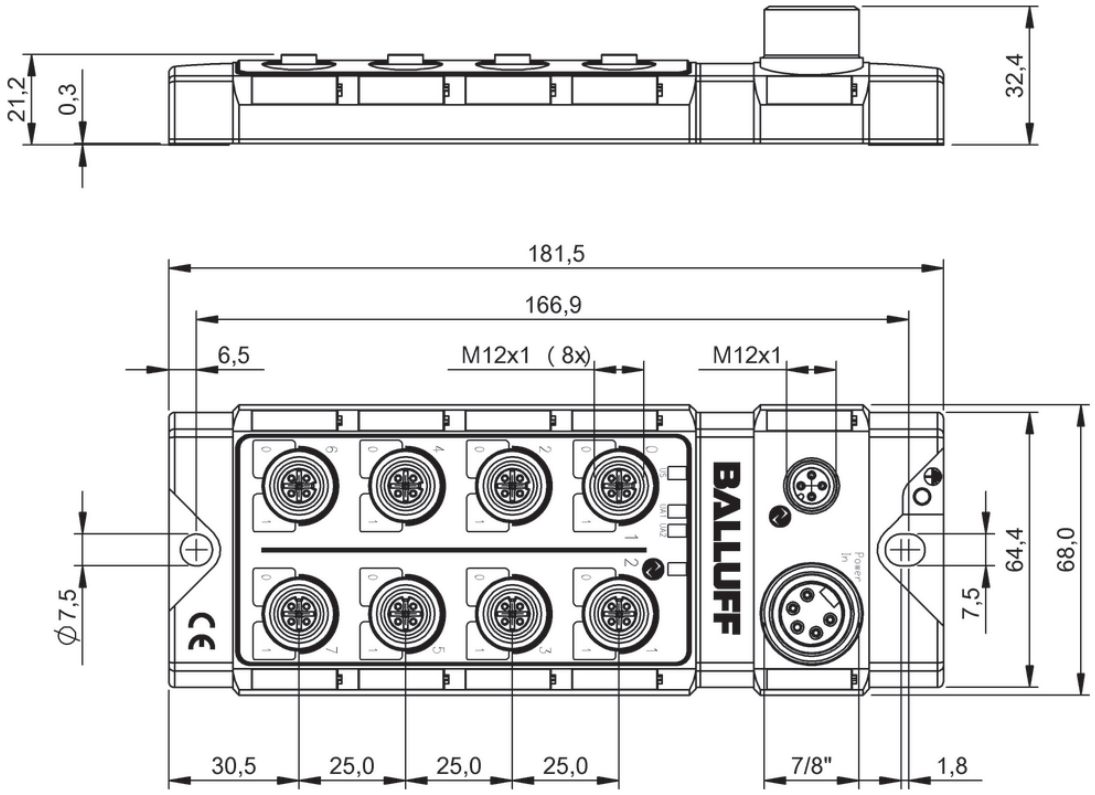
- For safety applications up to PLe/SIL3
- Reduce IP addresses
- Standardized wiring concept with M12 cables, safe interlocking devices can be directly connected
- Simple device replacement
- Nearly any safety device can be connected

	BNI0033 BNI IOL-252-000-Z013	BNI003W BNI IOL-252-S01-Z013	
Performance Level	—	—	
Safety category (EN ISO 13849-1)	—	—	
SIL (IEC 61508)	—	—	
SIL CL (EN 62061)	—	—	
Response time max.	—	—	
Approval/Conformity	CE	CE	
Current sum US, sensor	—	—	
Current sum UA, actuator	9.0 A	9.0 A	
Digital inputs	—	—	
Digital outputs	8x PNP	8x PNP	
Interface	IO-Link 1.0	IO-Link 1.0	
Connection slots	—	—	
Dimension	68 x 32.4 x 181.5 mm	68 x 32.4 x 181.5 mm	
Ambient temperature	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	
Housing material	Zinc, die-cast	Zinc, die-cast	
Productview	Page 16	Page 16	

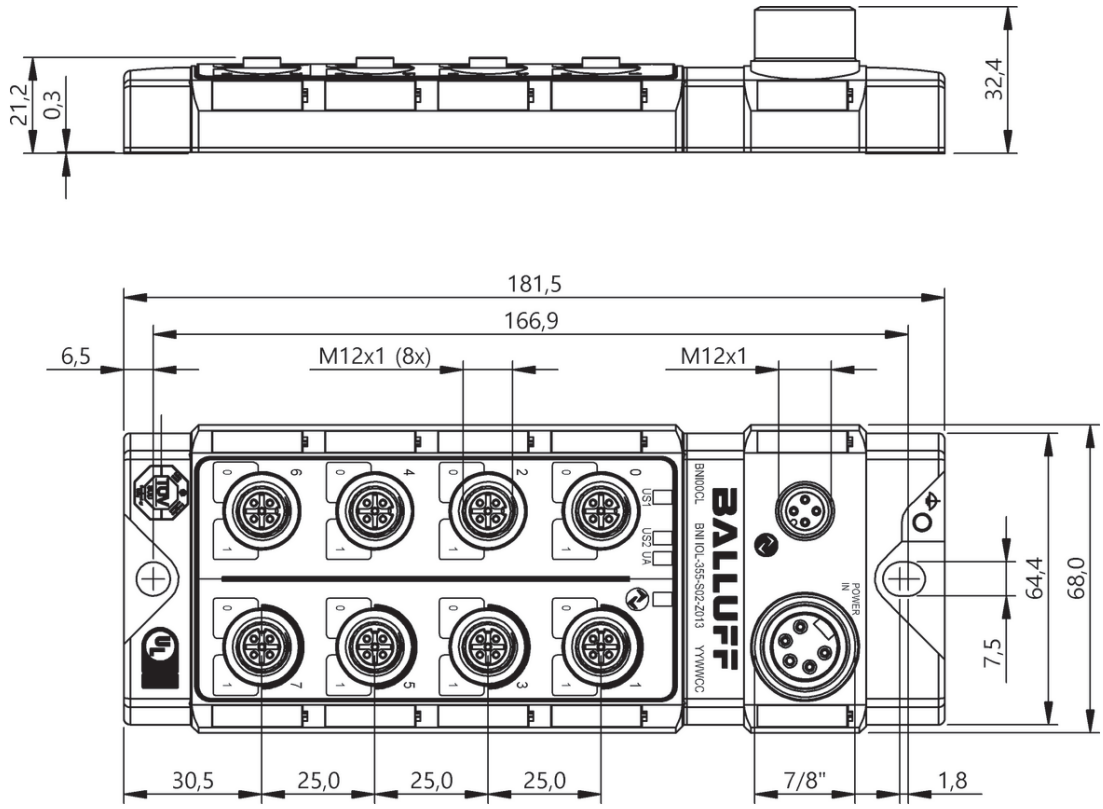
	BNI0034 BNI IOL-256-000-Z013	**BNI003Y** BNI IOL-256-S01-Z013	**BNI00CL** BNI IOL-355-S02-Z013	
	—	—	d	
	—	—	3	
	—	—	2	
	—	—	2	
	—	—	1 ms	
	CE	CE	CE, TÜV, IO-Link, cULus, UL-File E319845, VOL.1 SEC.1	
	—	—	9 A	
	9.0 A	9.0 A	9 A	
	—	—	8x PNP, Type3	
	16x PNP	16x PNP	8x yes	
	IO-Link 1.0	IO-Link 1.0	IO-Link 1.1	
	—	—	8x M12x1-Female, 5-pole, A-coded	
	68 x 32.4 x 181.5 mm	68 x 32.4 x 181.5 mm	68 x 32.4 x 181.5 mm	
	-5...70 °C	-5...70 °C	-5...55 °C	
	IP67	IP67	IP67	
	Zinc, die-cast	Zinc, die-cast	Die-cast zinc	
	Page 16	Page 16	Page 17	



BNI0033, BNI003W



BNI0034, BNI003Y


21,2
0,3
32,4
181,5
166,9
6,5
M12x1 (8x)
M12x1
BALLUFF
BNI00CL
BNI IOL-355-S02-Z013
YYWWCC
POWER IN
64,4
68,0
7,5
30,5
25,0
25,0
25,0
7/8"
1,8

BNI00CL

Performance Level	
Safety category (EN ISO 13849-1)	
SIL (IEC 61508)	
SIL CL (EN 62061)	
Response time max.	
Approval/Conformity	
Number of safe inputs	
Number of safe inputs	
Current sum US, sensor	
Current sum UA, actuator	
Digital inputs	
Interface	
Connection slots	
Dimension	
Ambient temperature	
Protection degree	
Housing material	
Productview	

BNI0098 BNI IOF-329-P02-Z038
e
4
3
3
20 ms
CE, TÜV, cULus, UL-File E319845, VOL.1 SEC.1
12
2
4.8 A
8 A
12x PNP, Type 3
PROFIsafe over IO-Link
2x M12x1-Female, 8-pole, A-coded 6x M12x1-Female, 5-pole, A-coded
68 x 32.4 x 181.5 mm
-5...55 °C
IP67
Die-cast zinc
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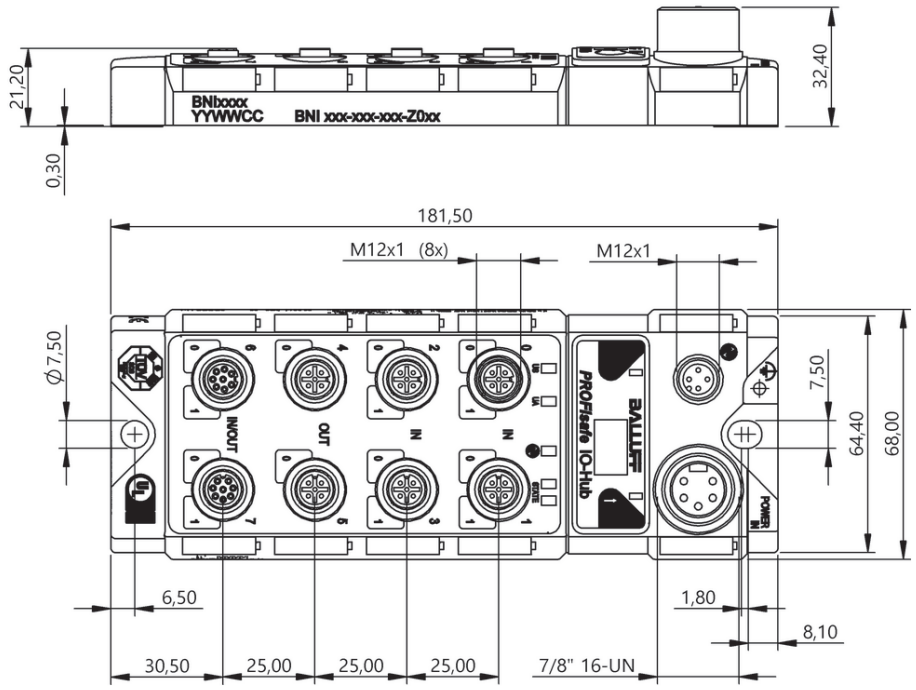

21,20
0,30
32,40
BNIxxxx
YYWWCC
BNI xxx-xxx-xxx-Z0xx
181,50
M12x1 (8x)
M12x1
Ø7,50
7,50
64,40
68,00
6,50
1,80
8,10
30,50
25,00
25,00
25,00
7/8" 16-UN
IN/OUT
OUT
IN
IN
PROFIsafe IO-Hub
BALLUFF
POWER IN

BNI0098

For high plant safety

SAFETY SWITCHES AND SAFETY SENSORS

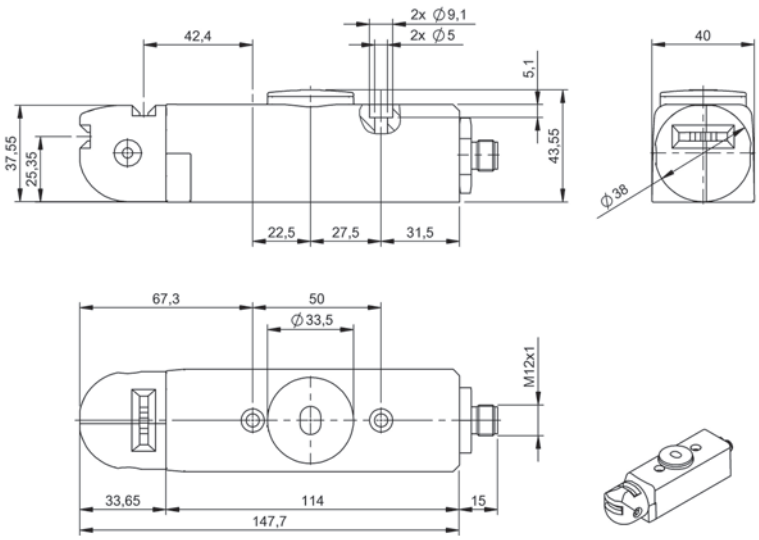
Balluff safety switches and safety sensors are designed for many different application situations. Our safe switches and sensors protect both man and machine alike. The safety switches and sensors offer you a variety of operating principles:
Inductive for non-contact safe detection of position and end-of-travel of metallic objects, electromechanical such as REED or RFID-based for access or position security for both personal and machine protection.

You save time and money thanks to universal M12 standard cables. You also avoid wiring errors, gain a clear overview and ensure reliable monitoring.

The most important benefits

- Safety switches and sensors for a variety of applications
- Rugged housing versions with LED function indicator
- Suitable for safety applications up to PLe/SIL3
- Savings of time and money plus prevention of errors thanks to standardized M12 connection technology
- Reduced installation expense and space requirements
- Also suitable for heavy protective equipment
- Manipulation-resistant
- Insensitive to vibration and imprecise door guides

	BID0005 BID F101-2M100-M20ZZ0-S92
B10d (EN ISO 13849-1)	5 million Switching operations
Coding level (EN ISO 14119)	low
Approval/Conformity	TÜV NRTL, CE, RoHS, TÜV
Operating principle	mechanical - force, contact
No of contacts	2x positive opening
Utilization category	AC-15, DC -13
Approach direction	laterally + above
Life expectancy mechanical	1 million Switching operations
Connection	M12x1-Male, 5-pole, A-coded
Dimension	40 x 147.7 x 43.5 mm
Ambient temperature	0...40 °C
Protection degree	IP65
Housing material	Aluminum
Productview	Page 25


2x Ø9,1
2x Ø5
42,4
40
5,1
37,55
25,35
43,55
Ø38
22,5
27,5
31,5
67,3
50
Ø33,5
M12x1
33,65
114
15
147,7

BID0005



	BES0577 BES M30EP-PFC12F-S04G-D12	**BES057A** BES Q40ZU-PFC15B-S04G-D12	**BES057C** BES Q40ZU-PFC20F-S04G-D12	
Performance Level	e	e	e	
Safety category (EN ISO 13849-1)	3	3	3	
SIL (IEC 61508)	3	3	3	
SIL CL (EN 62061)	3	3	3	
Response time max.	200 ms	200 ms	200 ms	
Approval/Conformity	CE, TÜV, cULus	CE, TÜV, cULus	CE, TÜV, cULus	
Operating principle	non-contact (inductive)	non-contact (inductive)	non-contact (inductive)	
Approach direction	any to sensing surface	any to sensing surface	any to sensing surface	
Assured switch on distance Sao	12 mm	15 mm	20 mm	
Assured switch off distance Sar	30 mm	30 mm	45 mm	
Connection	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Switching output	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	
Installation	non-flush	Shielded on one side	non-flush	
Dimension	Ø 30 x 80 mm	40 × 66 mm	40 × 66 mm	
Ambient temperature	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...60 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	
Protection degree	IP68, IP69K	IP67	IP67	
Housing material	Stainless steel (1.4404)	Die-cast zinc	Die-cast zinc	
Productview	Page 28	Page 28	Page 28	





	BES0574 BES M12EN-PFC40F-S04G-D11	**BES0575** BES M18EN-PFC80F-S04G-D11	**BES0576** BES M18MN-PFC50B-S04G-D11	**BES0578** BES M30EN-PFC15F-S04G-D11	**BES0579** BES M30MN-PFC10B-S04G-D11
	d	d	d	d	d
	2	2	2	2	2
	2	2	2	2	2
	2	2	2	2	2
	1 ms	1 ms	1 ms	1 ms	1 ms
	CE, TÜV, cULus	CE, TÜV, cULus	CE, TÜV, cULus	CE, TÜV, cULus	CE, TÜV, cULus
	non-contact (inductive)	non-contact (inductive)	non-contact (inductive)	non-contact (inductive)	non-contact (inductive)
	any to sensing surface	any to sensing surface	any to sensing surface	any to sensing surface	any to sensing surface
	4 mm	8 mm	5 mm	15 mm	10 mm
	6 mm	12 mm	7 mm	22 mm	15 mm
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	PNP OSSD, PNP normally closed (NC)	PNP OSSD, PNP normally closed (NC)	PNP OSSD, PNP normally closed (NC)	PNP OSSD, PNP normally closed (NC)	PNP OSSD, PNP normally closed (NC)
	non-flush	non-flush	for flush mounting	non-flush	for flush mounting
	Ø 12 x 70 mm	Ø 18 x 70.5 mm	Ø 18 x 70.5 mm	Ø 30 x 70 mm	Ø 30 x 70 mm
	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years	-25...70 °C, for service life ≤ 10 years 10…40 °C, for service life ≤ 20 years
	IP67	IP67	IP67	IP67	IP67
	Stainless steel (1.4404)	Stainless steel (1.4571)	Brass	Stainless steel (1.4571)	Brass
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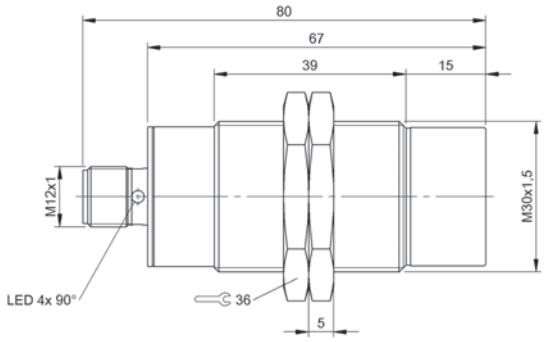
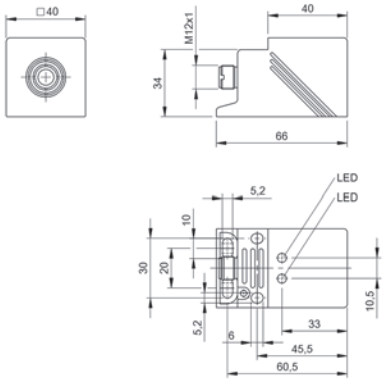
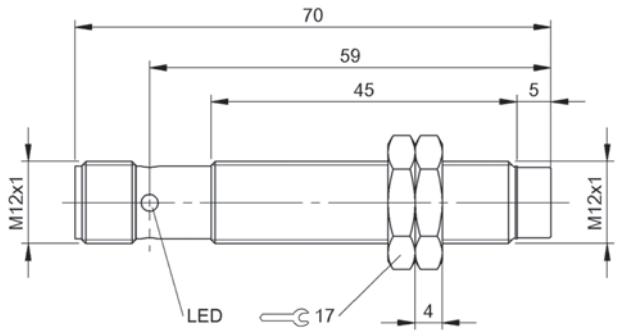


BES0577



1) Sensing surface

BES057A, BES057C



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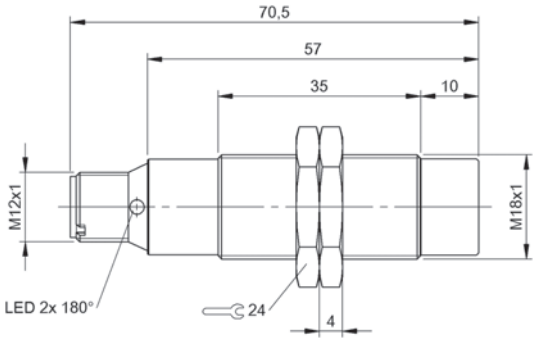
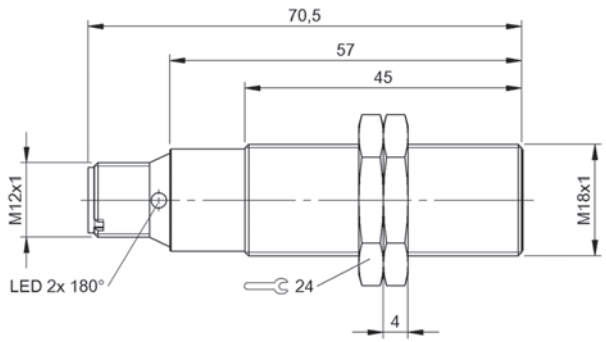
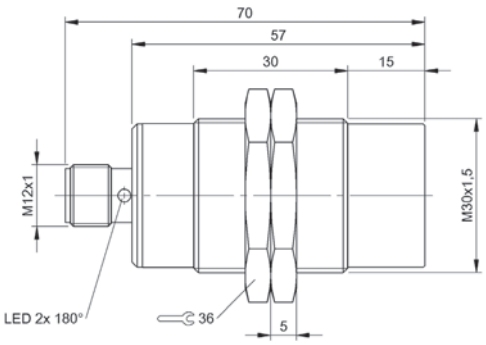


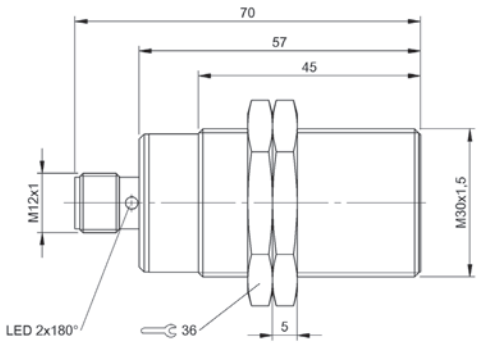
BES0575



BES0576



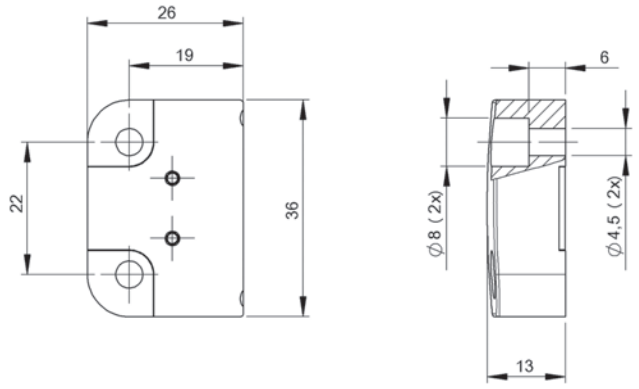
BES0578



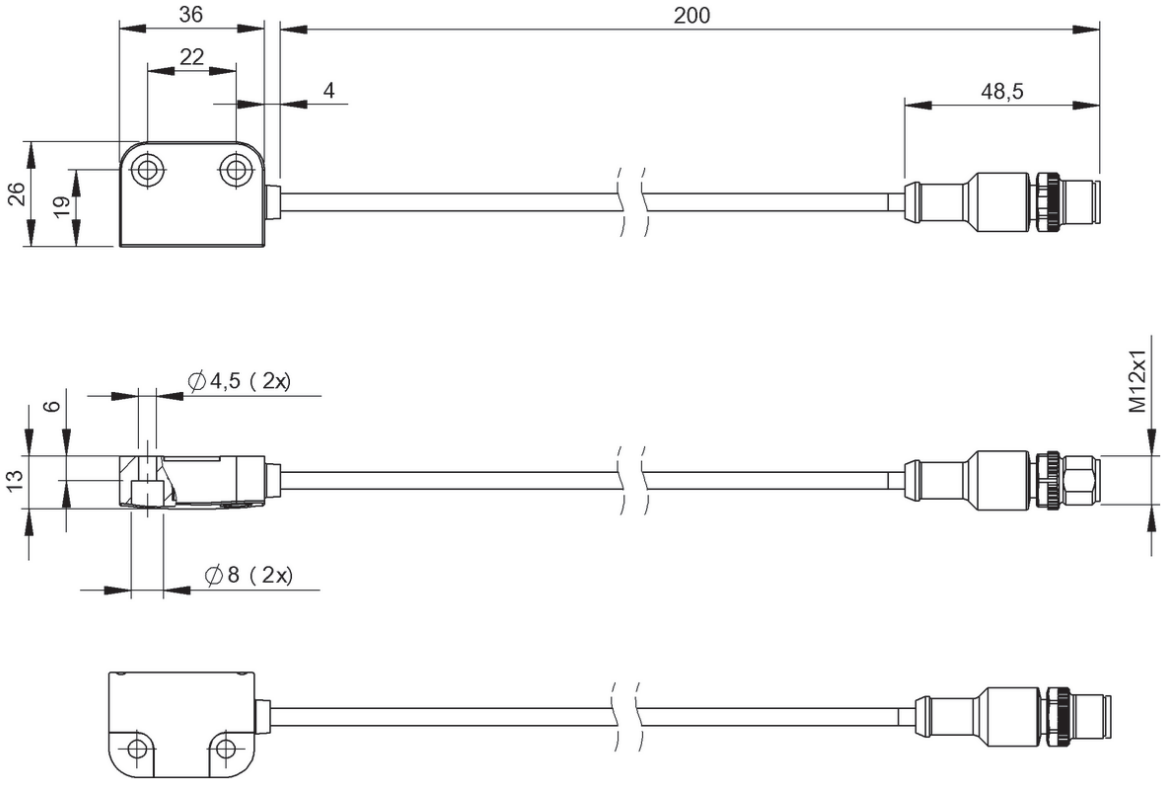
BES0579

	BID000T BID R01K-4M100	
B10d (EN ISO 13849-1)	—	
Coding level (EN ISO 14119)	low	
Approval/Conformity	CE, cULus	
Operating principle	non-contact (magnetic)	
No of contacts	—	
Approach direction	—	
Life expectancy mechanical	—	
Assured switch on distance Sao	5 mm	
Assured switch off distance Sar	—	
Connection	—	
Dimension	26 x 36 x 13 mm	
Ambient temperature	-25...70 °C	
Protection degree	—	
Housing material	Thermoplastic, glass-fibre reinforced	
Productview	Page 32	

BID0007 BID R01K-4M100-M20ZZ0-EP00,2-S92	
NC at 20% contact load 25 mil. Switching operations	
—	
CE, cULus	
non-contact (magnetic)	
2x NC	
vertrical to the active surface	
100 million Switching operations	
5 mm	
15 mm	
Cable with connector, M12x1, 5-pin, 20 cm, PUR	
26 x 36 x 13 mm	
-25...70 °C	
IP67	
Thermoplastic, glass-fibre reinforced	
Page 32	



BID000T



BID0007

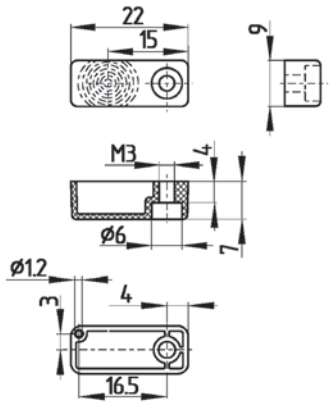
	BID000W BID Q02K-4R300	BID000U BID R02K-4R300	
Performance Level	—	—	
Safety category (EN ISO 13849-1)	—	—	
SIL (IEC 61508)	—	—	
SIL CL (EN 62061)	—	—	
Coding level (EN ISO 14119)	—	—	
Response time max.	—	—	
Approval/Conformity	TÜV, cULus, CE	TÜV, cULus, CE	
Operating principle	—	—	
Approach direction	—	—	
Actuator retention force	—	—	
Assured switch on distance Sao	—	—	
Assured switch off distance Sar	—	—	
Connection	—	—	
Switching output	—	—	
Installation	any	any	
Dimension	22 x 7 x 9 mm	39.2 x 18 x 29.5 mm	
Ambient temperature	-25...65 °C	-25...65 °C	
IP rating	—	—	
Housing material	Thermoplast	Thermoplast	
Productview	Page 38	Page 38	



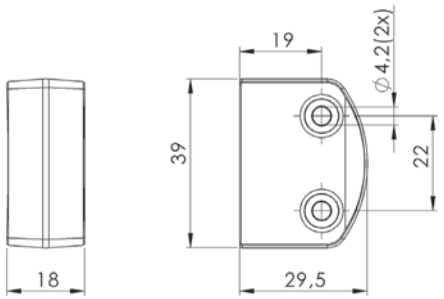

	BID0008 BID R02K-4R100-020ZZ0-EP00,2-S92	BID0009 BID R02K-4R300-020ZZ0-EP00,2-S92	BID000Y BID R03K-4R300	BID000C BID R03K-4R100-020ZZ0-S92
	e	e	—	e
	4	4	—	4
	3	3	—	3
	3	3	—	3
	low	high	—	low
	100 ms	100 ms	—	100 ms
	TÜV, cULus, CE	TÜV, cULus, CE	CE, cULus, TÜV, Ecolab	CE, cULus, TÜV, Ecolab
	non-contact (RFID)	non-contact (RFID)	non-contact (RFID)	non-contact (RFID)
	any to the active surface or laterally	any to the active surface or laterally	—	any to sensing surface
	—	—	0 N	0 N
	4 mm 8 mm	4 mm 8 mm	—	10 mm
	18 mm	18 mm	—	20 mm
	Cable with connector, M12x1, 5-pin, 25 cm, PUR	Cable with connector, M12x1, 5-pin, 25 cm, PUR	—	Connector, M12x1, 5-pin
	2x PNP OSSD	2x PNP OSSD	—	2x PNP OSSD
	for flush mounting	for flush mounting	any	for flush mounting
	39.2 x 18 x 29.5 mm	39.2 x 18 x 29.5 mm	91 x 25 x 22 mm	106 x 25 x 22 mm
	-25...65 °C	-25...65 °C	-25...70 °C	-25...70 °C
	IP65, IP67	IP65, IP67	—	IP65, IP67, IP69
	Thermoplast	Thermoplast	Thermoplastic, glass-fibre reinforced	Thermoplastic, glass-fibre reinforced
	Page 38	Page 38	Page 39	Page 39

	BID000F BID R03K-4R300-O20ZZ0-S92	BID000Z BID R03K-4R3S0	
Performance Level	e	—	
Safety category (EN ISO 13849-1)	4	—	
SIL (IEC 61508)	3	—	
SIL CL (EN 62061)	3	—	
Coding level (EN ISO 14119)	high	—	
Response time max.	100 ms	—	
Approval/Conformity	CE, cULus, TÜV, Ecolab	CE, cULus, TÜV, Ecolab	
Operating principle	non-contact (RFID)	non-contact (RFID)	
Approach direction	any to sensing surface	—	
Actuator retention force	0 N	18 N	
Assured switch on distance Sao	10 mm	—	
Assured switch off distance Sar	20 mm	—	
Connection	Connector, M12x1, 5-pin	—	
Switching output	2x PNP OSSD	—	
Installation	for flush mounting	any	
Dimension	106 x 25 x 22 mm	91 x 25 x 22 mm	
Ambient temperature	-25...70 °C	-25...70 °C	
Protection degree	IP65, IP67, IP69	—	
Housing material	Thermoplastic, glass-fibre reinforced	Thermoplastic, glass-fibre reinforced	
Productview	Page 39	Page 39	

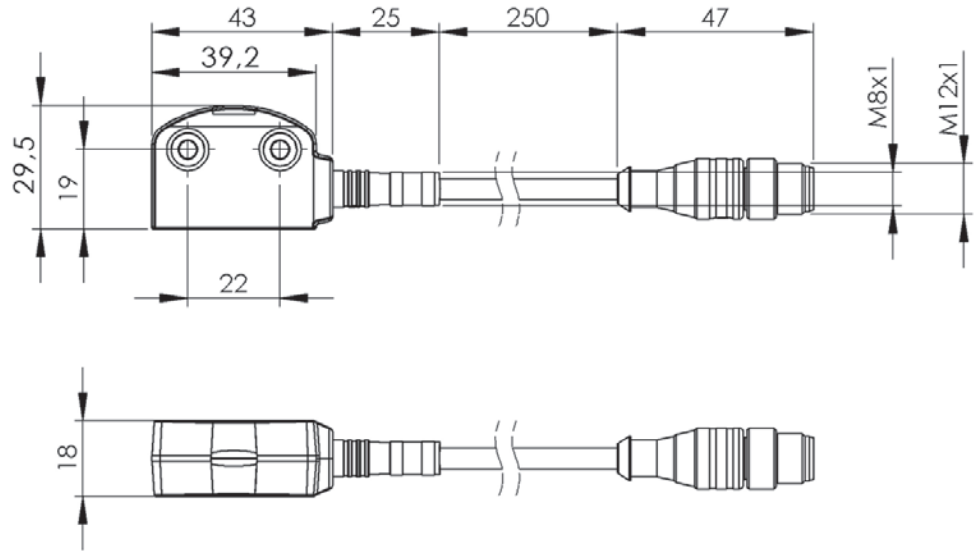
	BID000E BID R03K-4R1S0-020ZZ0-S92	BID000H BID R03K-4R3S0-020ZZ0-S92		
	e	e		
	4	4		
	3	3		
	3	3		
	low	high		
	100 ms	100 ms		
	CE, cULus, TÜV, Ecolab	CE, cULus, TÜV, Ecolab		
	non-contact (RFID)	non-contact (RFID)		
	any to sensing surface	any to sensing surface		
	18 N	18 N		
	10 mm	10 mm		
	20 mm	20 mm		
	Connector, M12x1, 5-pin	Connector, M12x1, 5-pin		
	2x PNP OSSD	2x PNP OSSD		
	for flush mounting	for flush mounting		
	106 x 25 x 22 mm	106 x 25 x 22 mm		
	-25...70 °C	-25...70 °C		
	IP65, IP67, IP69	IP65, IP67, IP69		
	Thermoplastic, glass-fibre reinforced	Thermoplastic, glass-fibre reinforced		
	Page 39	Page 39		



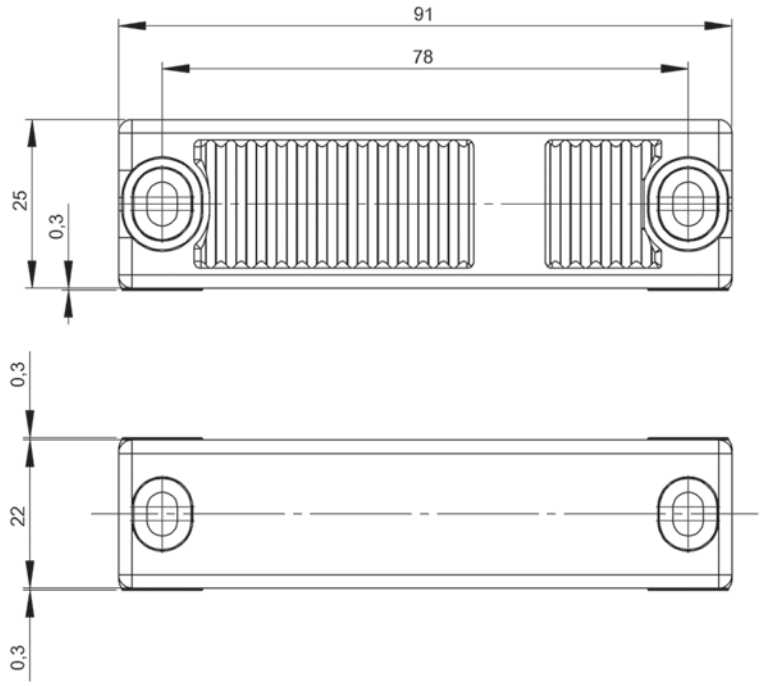
BID000W



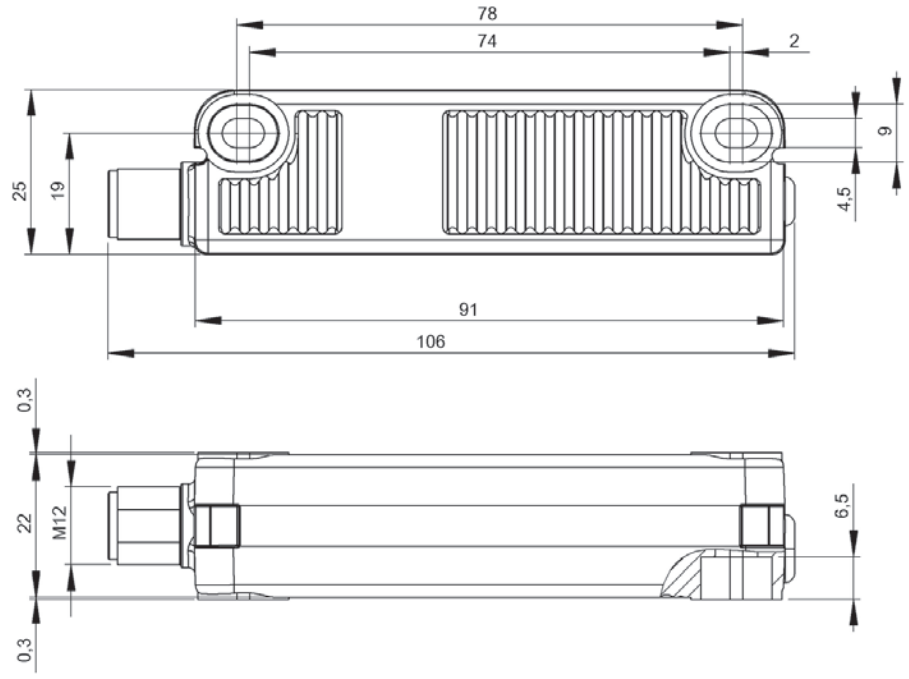
BID000U



BID0008, BID0009



BID000Y, BID000Z



BID000C, BID000F, BID000E, BID000H

Safe personal protection for interaction between man and machine

OPTO-ELECTRONIC PROTECTIVE DEVICES

Flexible production places high demands on safety when man and machine work so closely together.
This interplay must not ever compromise the safety of employees. Opto-electronic protective devices such as light curtains from Balluff provide safe solutions that also enable great flexibility. Another benefit to you: by using light curtains that consist of multiple parallel light beams, you save space since they can replace cumbersome guard fence constructions or assemblies of multiple through-beam sensors.

The most important benefits

- Finger, hand and body detection for convenient and fast interaction between man and machine
- Defined protected area with infrared protection field – suitable for safety applications up to PLe SIL3
- Safe machine stoppage in safety-critical applications
- Better space utilization by eliminating the need for protective fence structures
- High level of manipulation protection



	BLG000A BLG 4A-015-600-014-001-SX	**BLG000C** BLG 4A-030-600-014-001-SX	**BLG000E** BLG 4A-045-600-014-001-SX	
Performance Level	e	e	e	
Safety category (EN ISO 13849-1)	4	4	4	
SIL (IEC 61508)	3	3	3	
SIL CL (EN 62061)	3	3	3	
Response time max.	11 ms	15 ms	18 ms	
Approval/Conformity	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	
Operating principle	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	
Detection capability	14 mm	14 mm	14 mm	
Protective field height (Hp)	150 mm	300 mm	450 mm	
Range	6 m	6 m	6 m	
Connection 1	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	
Connection 2	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	
Switching output	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	
Dimension	32.3 x 233.3 x 37 mm	32.3 x 383.2 x 37 mm	32.3 x 533.2 x 37 mm	
Ambient temperature	0...55 °C	0...55 °C	0...55 °C	
Protection degree	IP65	IP65	IP65	
Housing material	Aluminum	Aluminum	Aluminum	
Productview	Page 46	Page 46	Page 47	



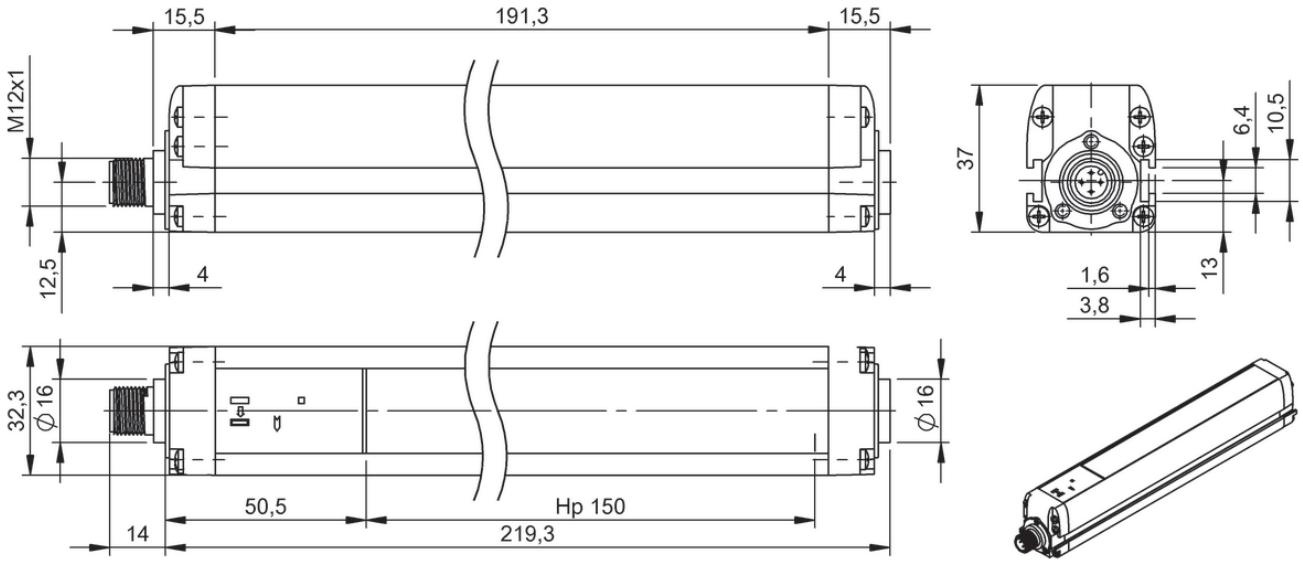


	BLG000F BLG 4A-060-600-014-001-SX	BLG000H BLG 4A-075-600-014-001-SX	BLG000J BLG 4A-090-600-014-001-SX	BLG000K BLG 4A-105-600-014-001-SX	BLG000L BLG 4A-120-600-014-001-SX
	e	e	e	e	e
	4	4	4	4	4
	3	3	3	3	3
	3	3	3	3	3
	22 ms	25 ms	29 ms	33 ms	36 ms
	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE
	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)
	14 mm	14 mm	14 mm	14 mm	14 mm
	600 mm	750 mm	900 mm	1050 mm	1200 mm
	6 m	6 m	6 m	6 m	6 m
	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded
	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male	Receiver: M12x1-Male
	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD
	32.3 x 683.2 x 37 mm	32.3 x 833.2 x 37 mm	32.3 x 983.2 x 37 mm	32.3 x 1133.2 x 37 mm	32.3 x 1283.3 x 37 mm
	0...55 °C	0...55 °C	0...55 °C	0...55 °C	0...55 °C
	IP65	IP65	IP65	IP65	IP65
	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
	Page 47	Page 48	Page 48	Page 49	Page 49

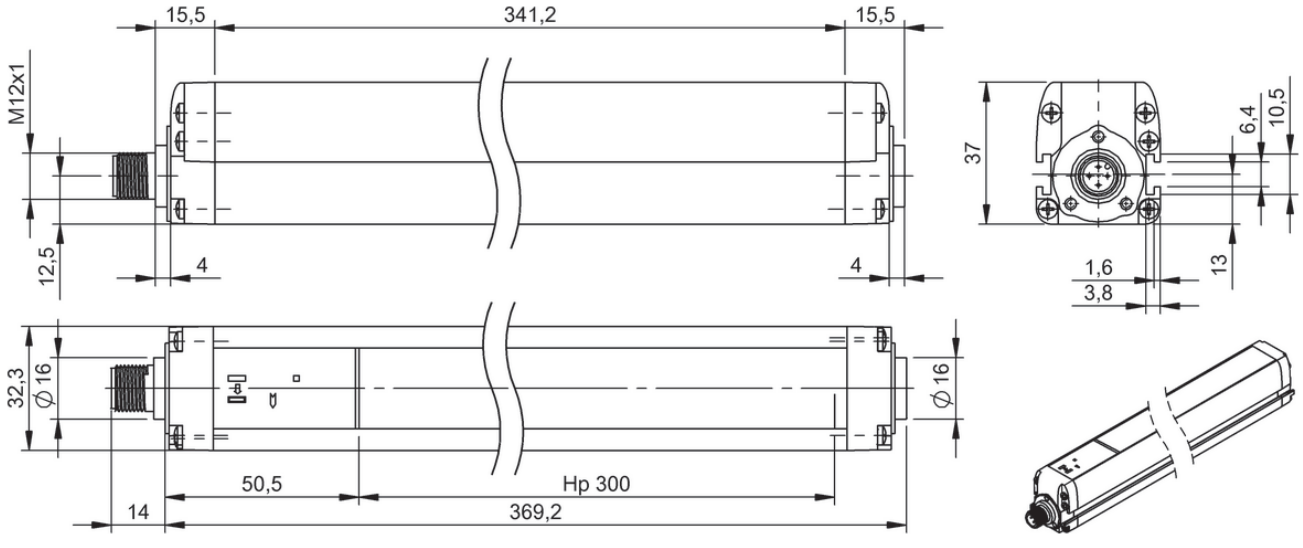


	BLG000R BLG 4A-135-600-014-001-SX	**BLG000M** BLG 4A-150-600-014-001-SX	**BLG000N** BLG 4A-165-600-014-001-SX	
Performance Level	e	e	e	
Safety category (EN ISO 13849-1)	4	4	4	
SIL (IEC 61508)	3	3	3	
SIL CL (EN 62061)	3	3	3	
Response time max.	40 ms	43 ms	47 ms	
Approval/Conformity	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	
Operating principle	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	
Detection capability	14 mm	14 mm	14 mm	
Protective field height (Hp)	1350 mm	1500 mm	1650 mm	
Range	6 m	6 m	6 m	
Connection 1	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	
Connection 2	Receiver: M12x1-Male	Receiver: M12x1-Male	Receiver: M12x1-Male	
Switching output	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	
Dimension	32.3 x 1433.2 x 37 mm	32.3 x 1583.3 x 37 mm	32.3 x 1733.3 x 37 mm	
Ambient temperature	0...55 °C	0...55 °C	0...55 °C	
Protection degree	IP65	IP65	IP65	
Housing material	Aluminum	Aluminum	Aluminum	
Productview	Page 50	Page 50	Page 51	

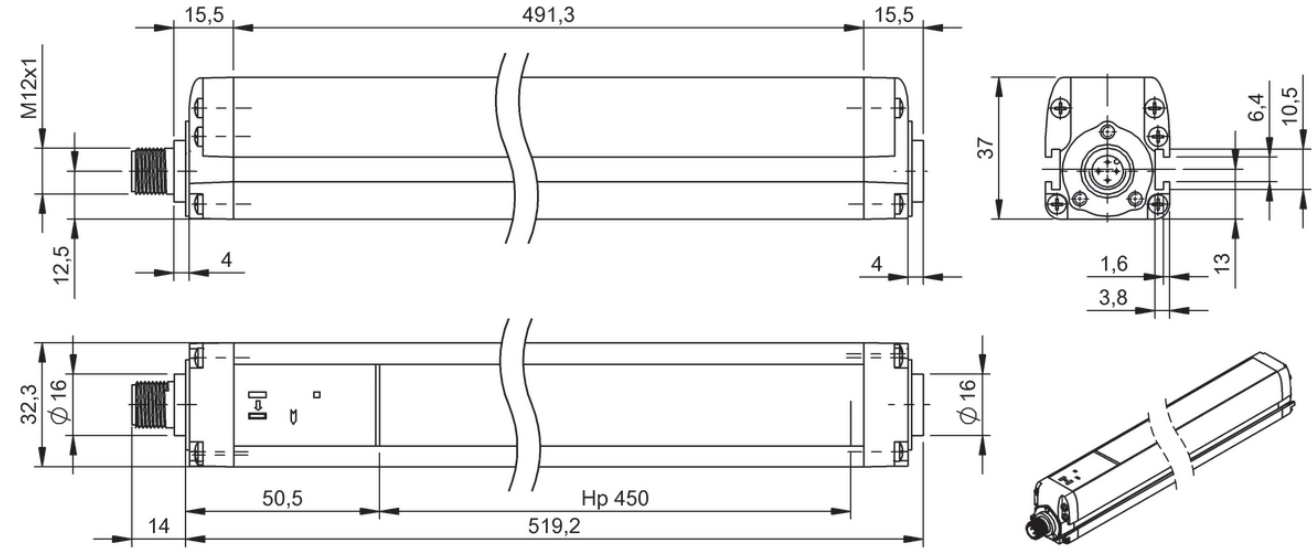
	BLG000P BLG 4A-180-600-014-001-SX				
	e				
	4				
	3				
	3				
	50 ms				
	TÜV, cULus, CE				
	non-contact (photoelectric)				
	14 mm				
	1800 mm				
	6 m				
	Emitter: M12x1-Male, A-coded				
	Receiver: M12x1-Male				
	2x PNP OSSD				
	32.3 x 1883.3 x 37 mm				
	0...55 °C				
	IP65				
	Aluminum				
	Page 51				



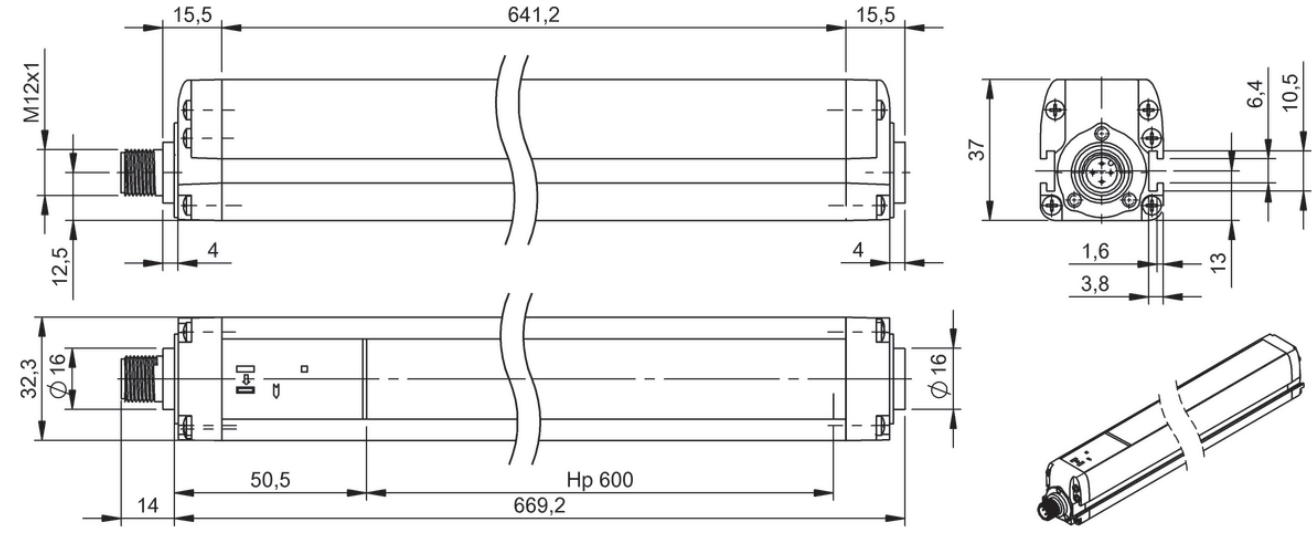
BLG000A



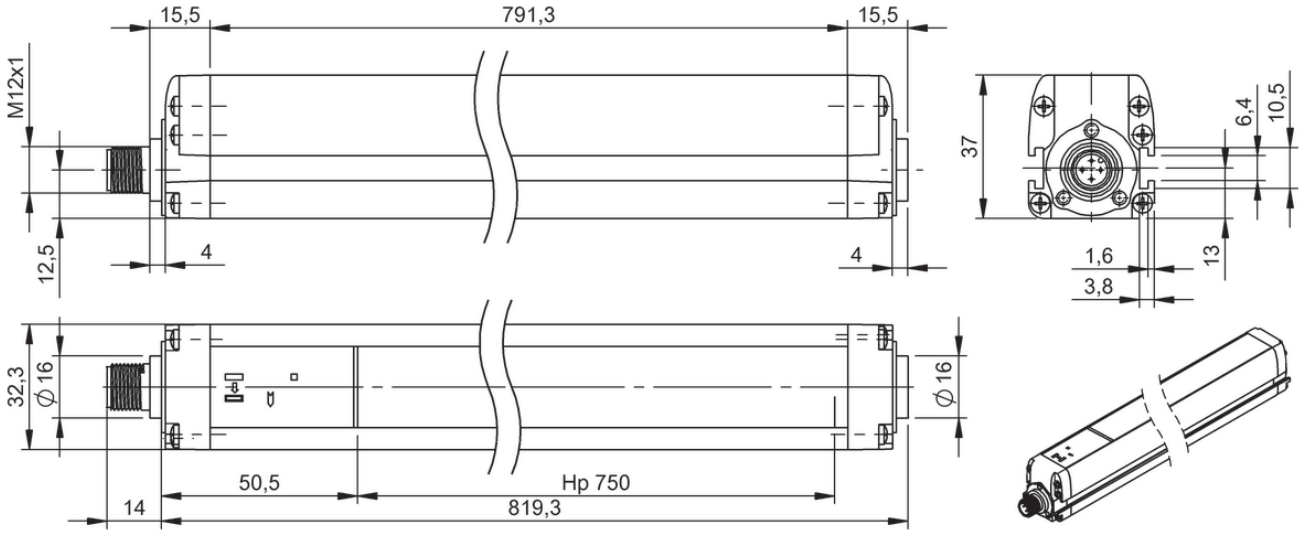
BLG000C



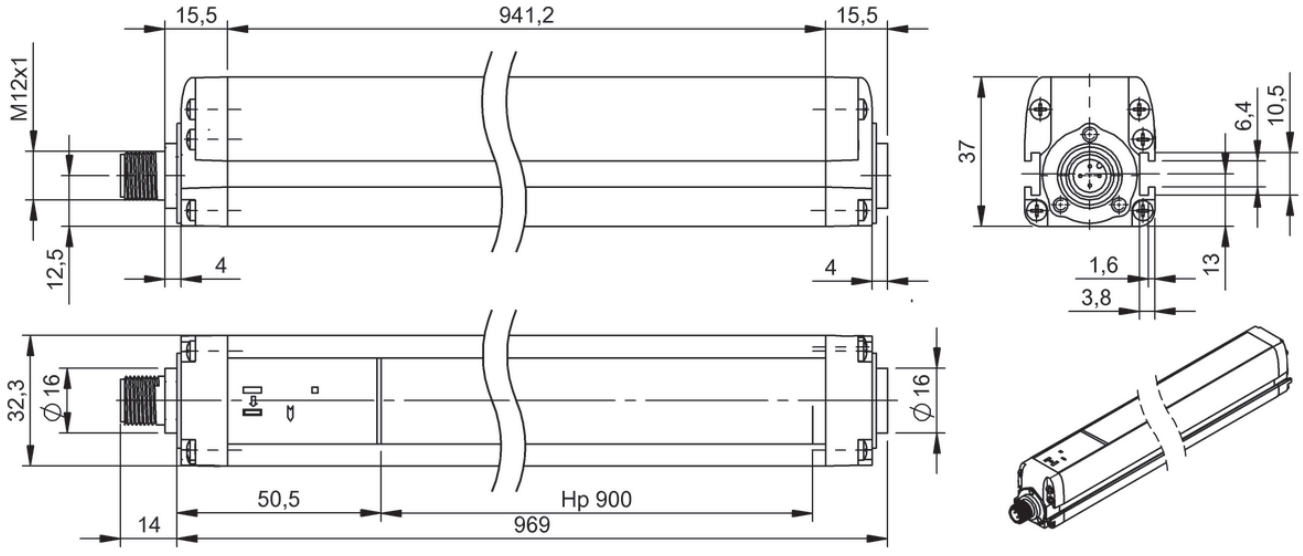
BLG000E



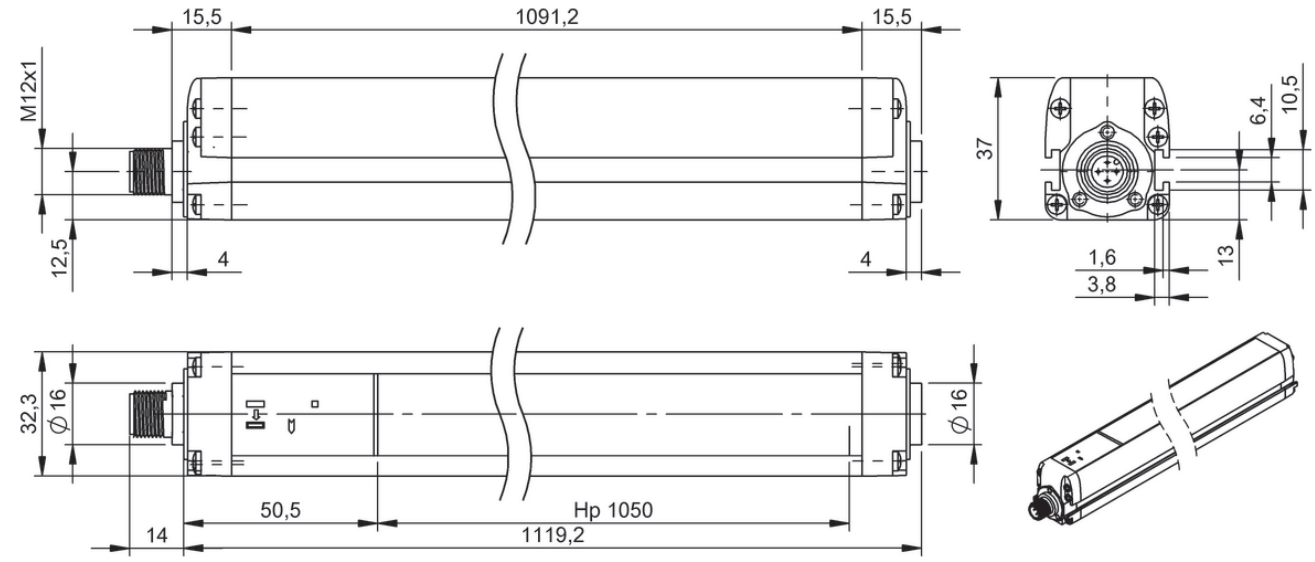
BLG000F



BLG000H



BLG000J



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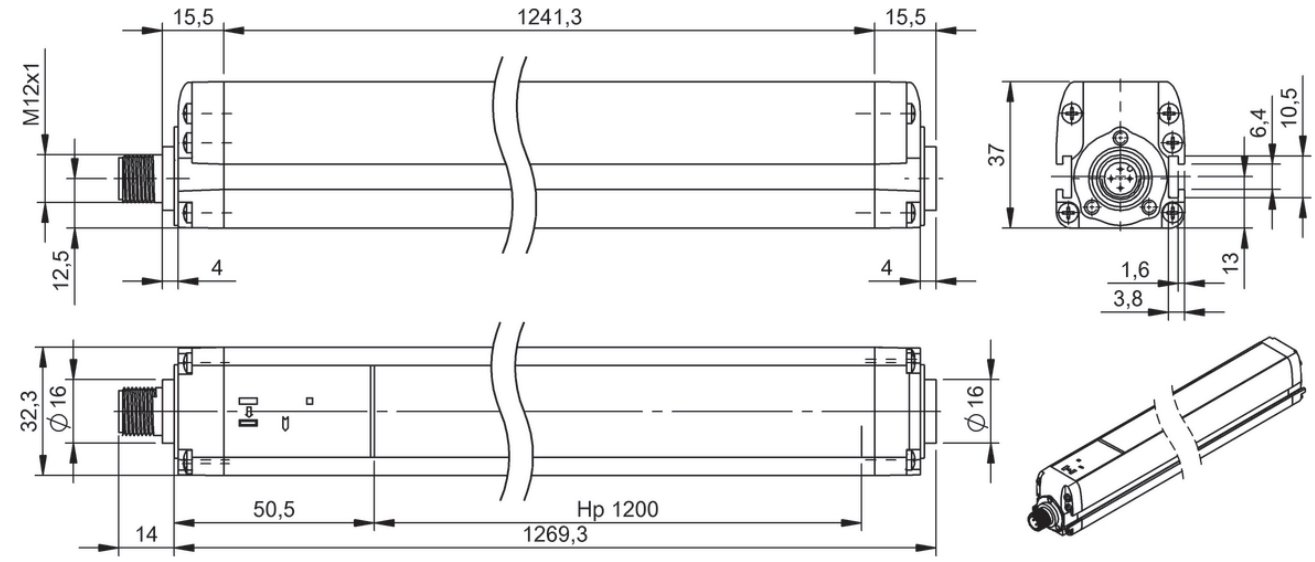

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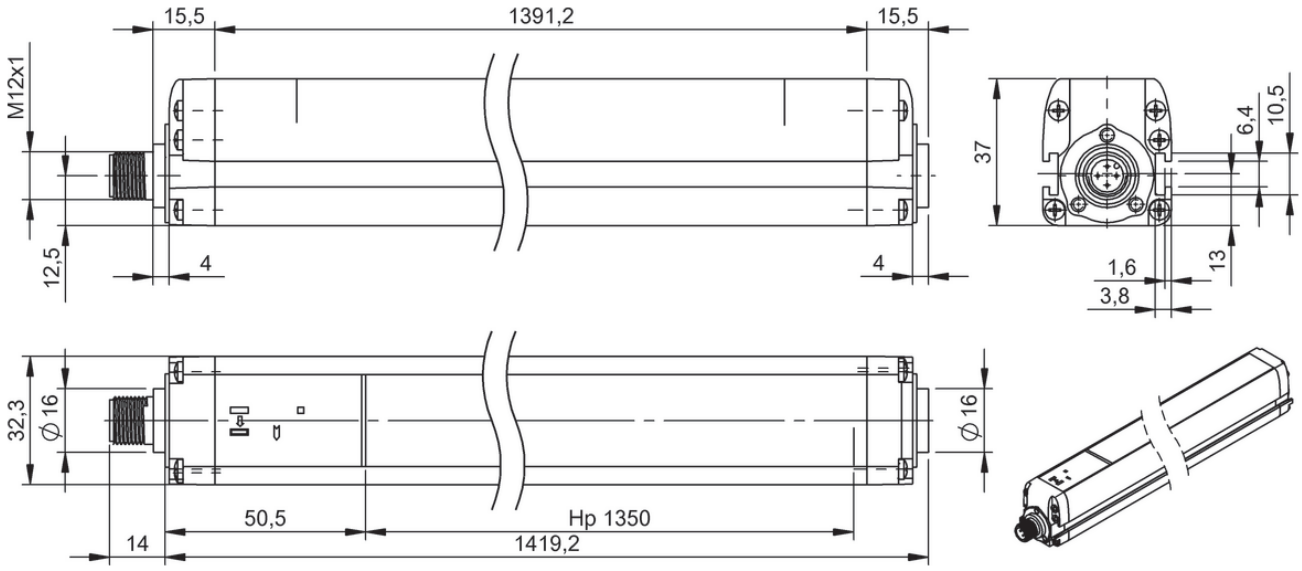

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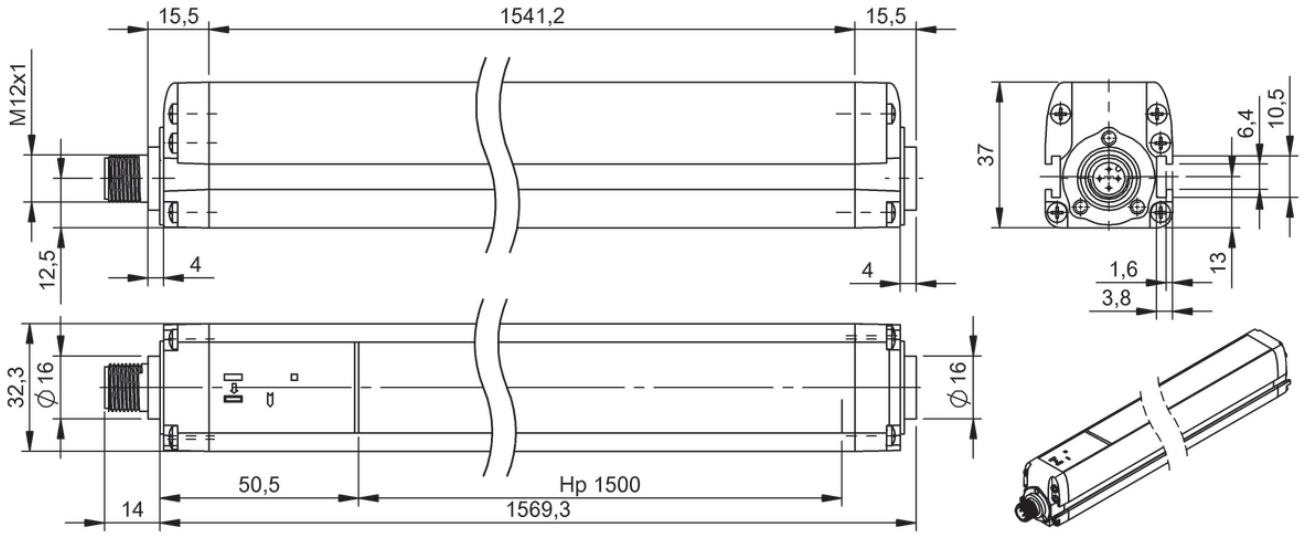
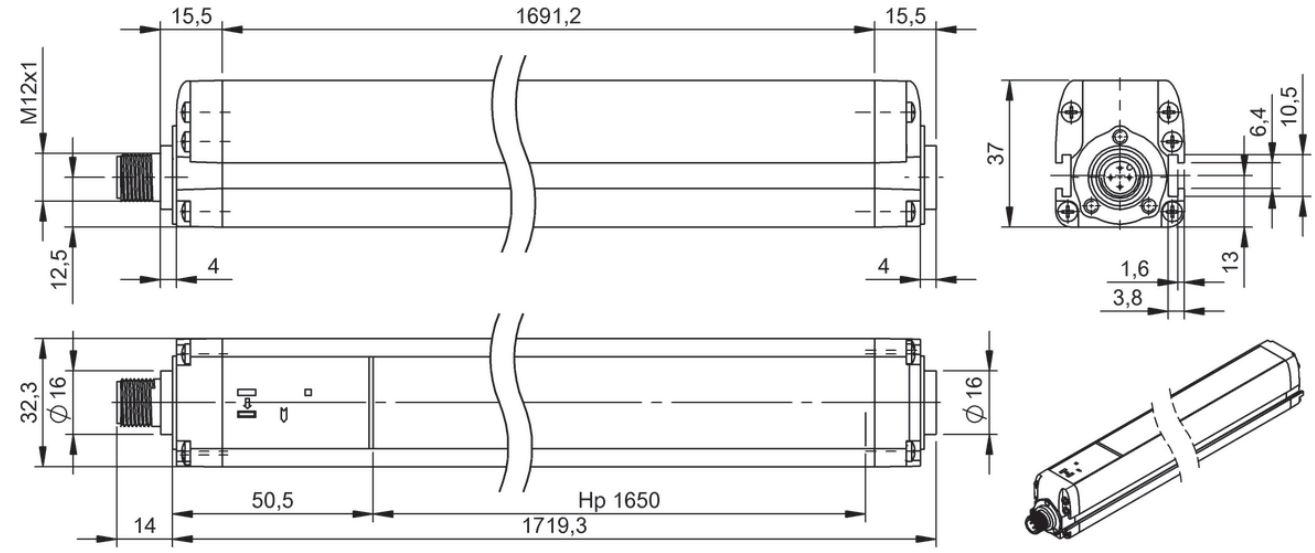
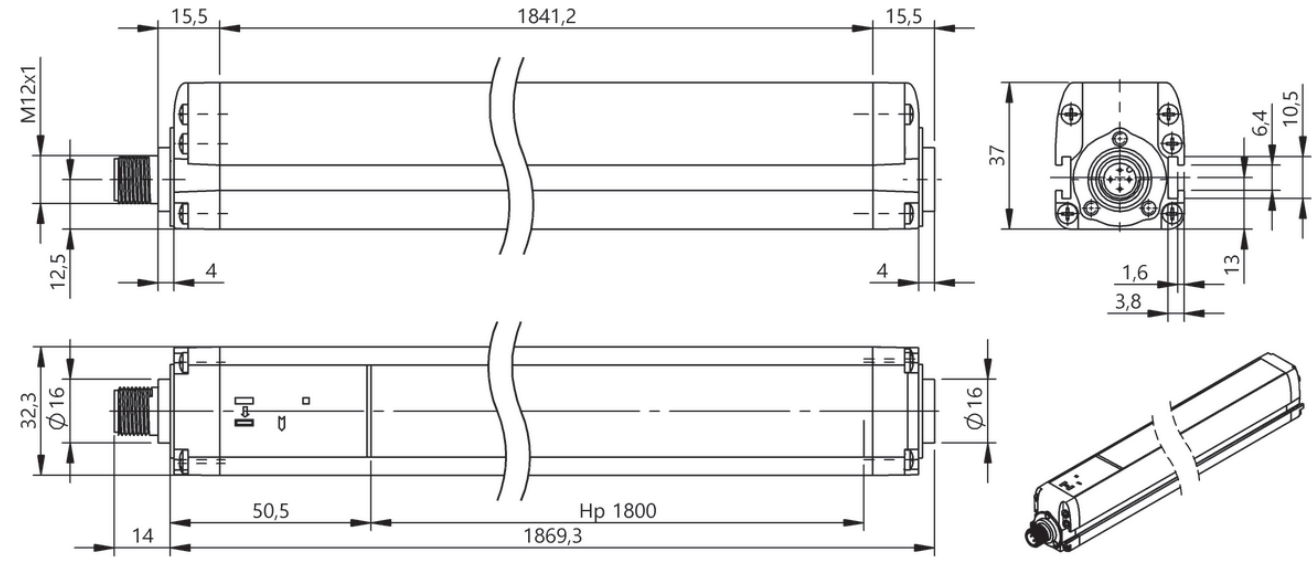


BLG000M



BLG000N



BLG000P



	BLG000T BLG 4A-015-19X-030-001-SX	**BLG000U** BLG 4A-030-19X-030-001-SX	**BLG000W** BLG 4A-045-19X-030-001-SX	
Performance Level	e	e	e	
Safety category (EN ISO 13849-1)	4	4	4	
SIL (IEC 61508)	3	3	3	
SIL CL (EN 62061)	3	3	3	
Response time max.	9 ms	11 ms	13 ms	
Approval/Conformity	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	
Operating principle	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	
Detection capability	30 mm	30 mm	30 mm	
Protective field height (Hp)	150 mm	300 mm	450 mm	
Range	19 m	19 m	19 m	
Connection 1	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	
Connection 2	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	
Switching output	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	
Dimension	32.3 x 233.3 x 37 mm	32.3 x 383.2 x 37 mm	32.3 x 533.2 x 37 mm	
Ambient temperature	0...55 °C	0...55 °C	0...55 °C	
Protection degree	IP65	IP65	IP65	
Housing material	Aluminum	Aluminum	Aluminum	
Productview	Page 56	Page 56	Page 57	



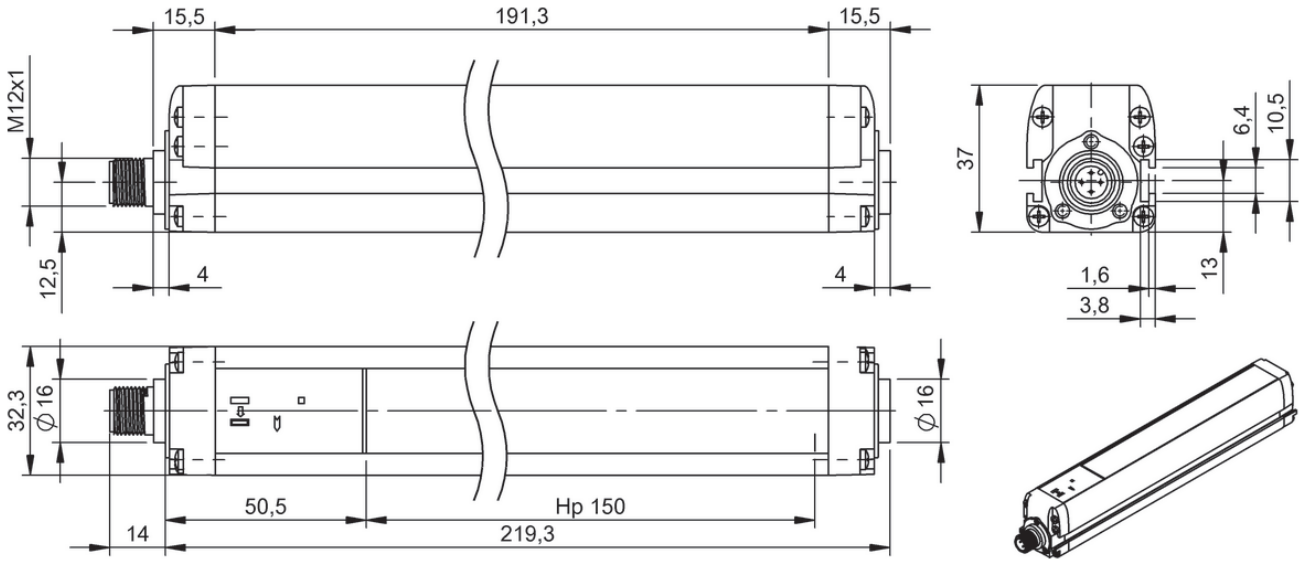


	BLG000Y BLG 4A-060-19X-030-001-SX	BLG000Z BLG 4A-075-19X-030-001-SX	BLG0010 BLG 4A-090-19X-030-001-SX	BLG0011 BLG 4A-105-19X-030-001-SX	BLG0012 BLG 4A-120-19X-030-001-SX
	e	e	e	e	e
	4	4	4	4	4
	3	3	3	3	3
	3	3	3	3	3
	14 ms	16 ms	18 ms	19 ms	21 ms
	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE
	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)
	30 mm	30 mm	30 mm	30 mm	30 mm
	600 mm	750 mm	900 mm	1050 mm	1200 mm
	19 m	19 m	19 m	19 m	19 m
	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded
	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male
	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD
	32.3 x 683.2 x 37 mm	32.3 x 833.2 x 37 mm	32.3 x 983.2 x 37 mm	32.3 x 1133.2 x 37 mm	32.3 x 1283.3 x 37 mm
	0...55 °C	0...55 °C	0...55 °C	0...55 °C	0...55 °C
	IP65	IP65	IP65	IP65	IP65
	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
	Page 57	Page 58	Page 58	Page 59	Page 59

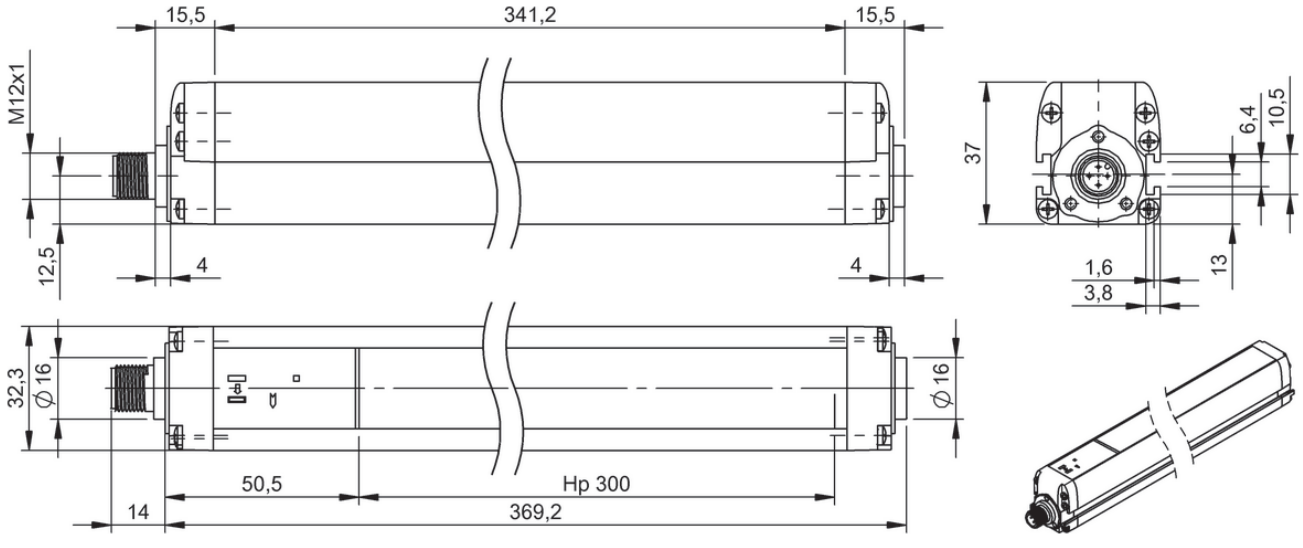


	BLG0013 BLG 4A-135-19X-030-001-SX	BLG0014 BLG 4A-150-19X-030-001-SX	BLG0015 BLG 4A-165-19X-030-001-SX	
Performance Level	e	e	e	
Safety category (EN ISO 13849-1)	4	4	4	
SIL (IEC 61508)	3	3	3	
SIL CL (EN 62061)	3	3	3	
Response time max.	23 ms	25 ms	26 ms	
Approval/Conformity	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	
Operating principle	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)	
Detection capability	30 mm	30 mm	30 mm	
Protective field height (Hp)	1350 mm	1500 mm	1650 mm	
Range	19 m	19 m	19 m	
Connection 1	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	
Connection 2	Receiver: M12x1-Male	Receiver: M12x1-Male	Receiver: M12x1-Male	
Switching output	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD	
Dimension	32.3 x 1433.2 x 37 mm	32.3 x 1583.3 x 37 mm	32.3 x 1733.3 x 37 mm	
Ambient temperature	0...55 °C	0...55 °C	0...55 °C	
Protection degree	IP65	IP65	IP65	
Housing material	Aluminum	Aluminum	Aluminum	
Productview	Page 60	Page 60	Page 61	

	BLG0016 BLG 4A-180-19X-030-001-SX				
	e				
	4				
	3				
	3				
	28 ms				
	TÜV, CE, cULus				
	non-contact (photoelectric)				
	30 mm				
	1800 mm				
	19 m				
	Emitter: M12x1-Male, A-coded				
	Receiver: M12x1-Male				
	2x PNP OSSD				
	32.3 x 1883.3 x 37 mm				
	0...55 °C				
	IP65				
	Aluminum				
	Page 61				



BLG000T



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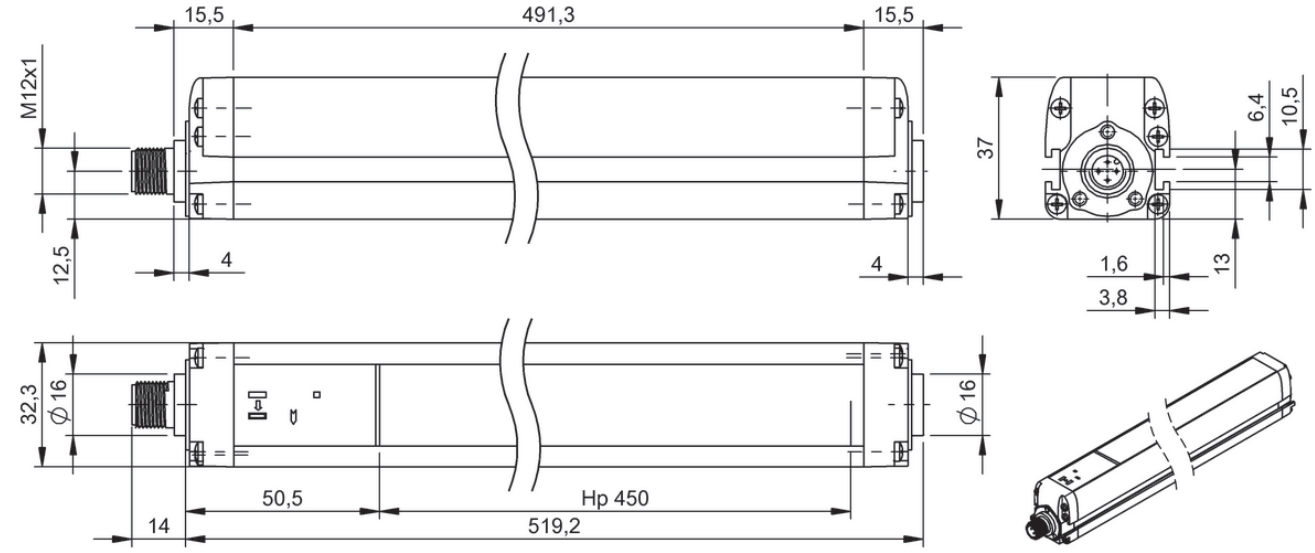

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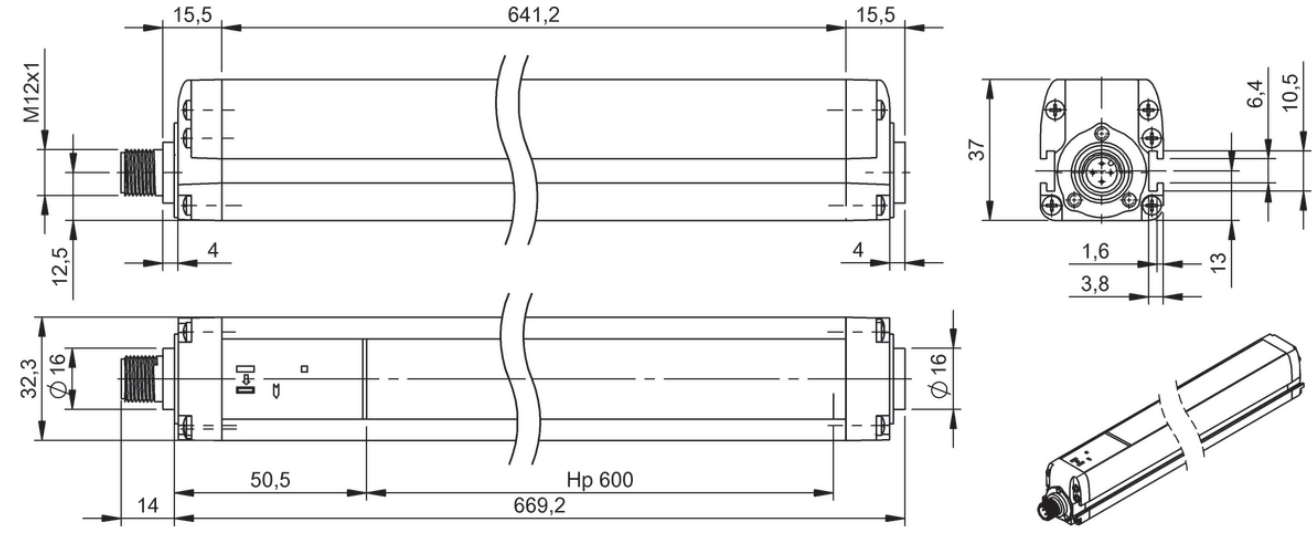
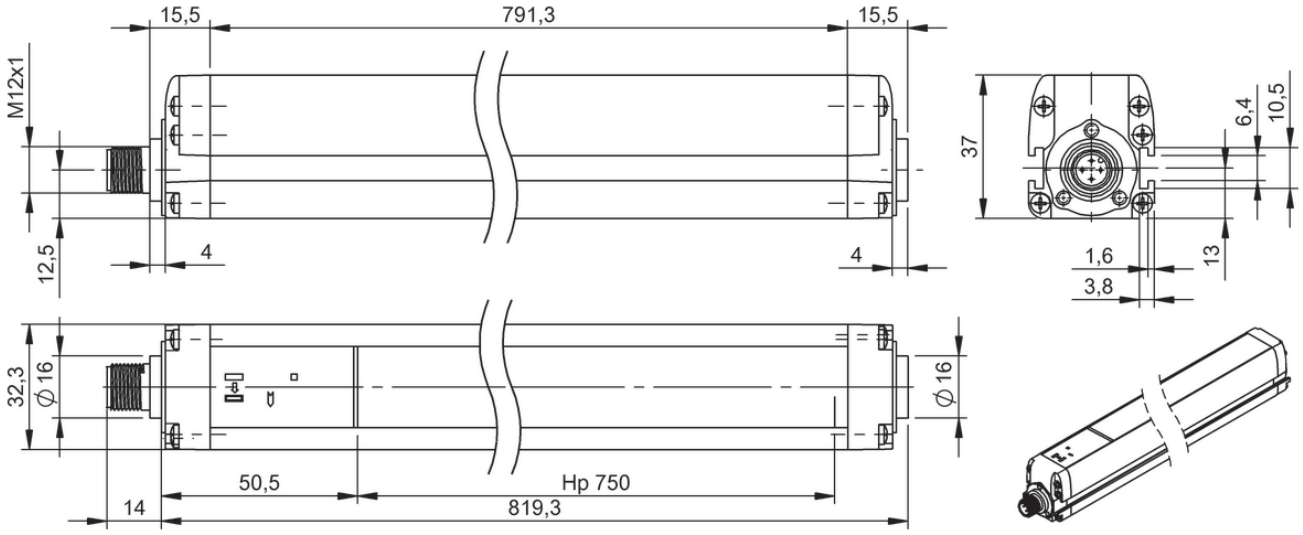
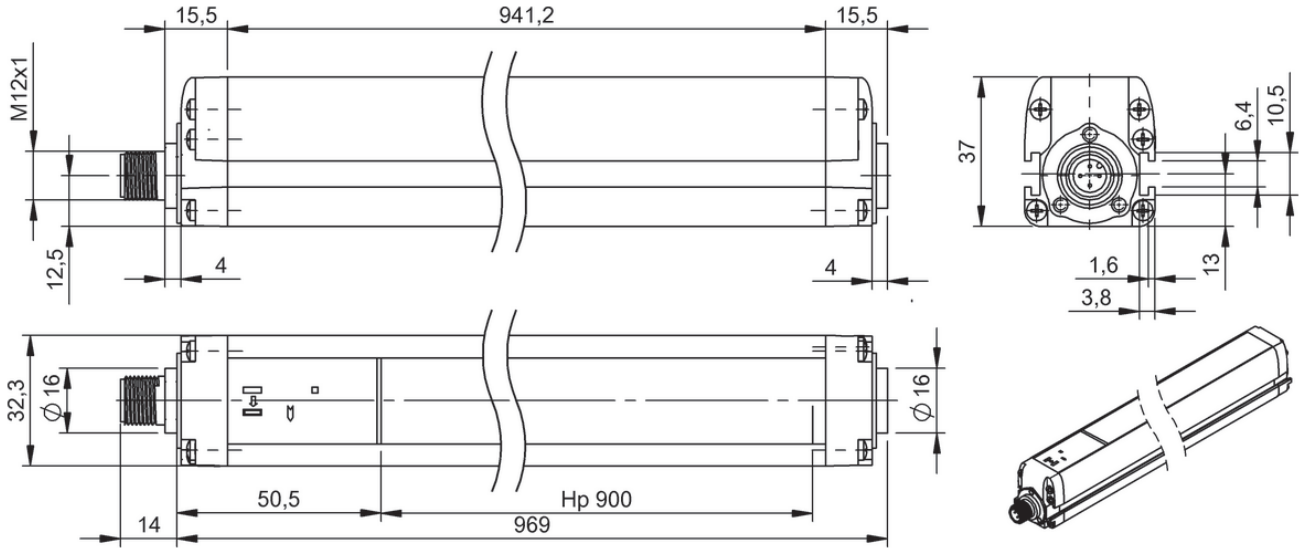


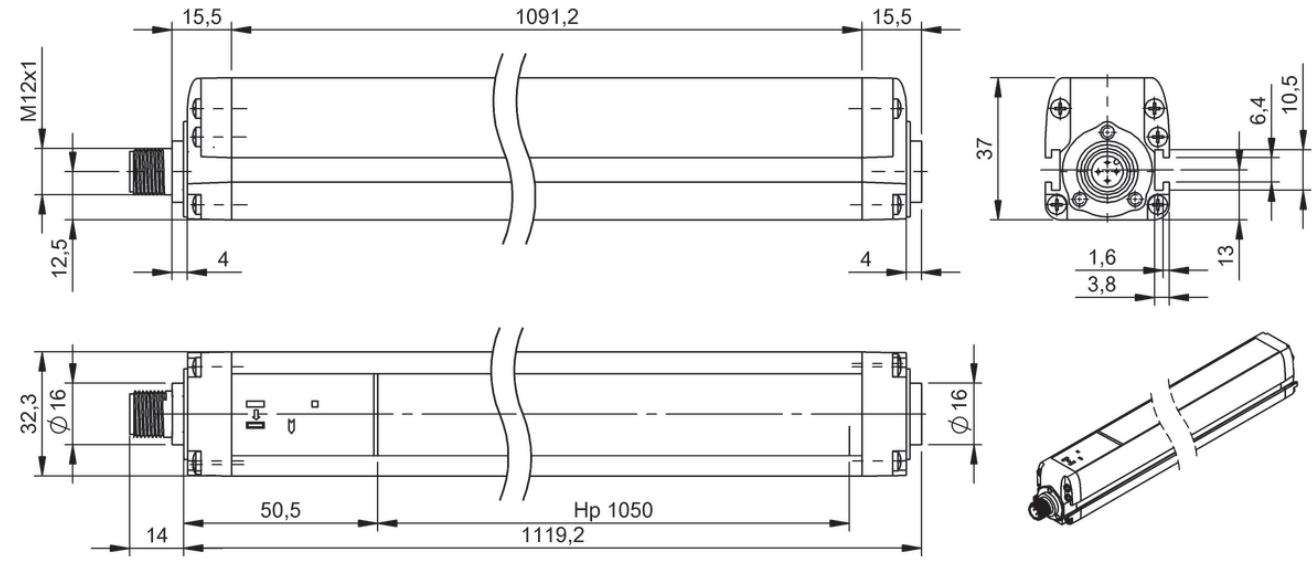
BLG000Y



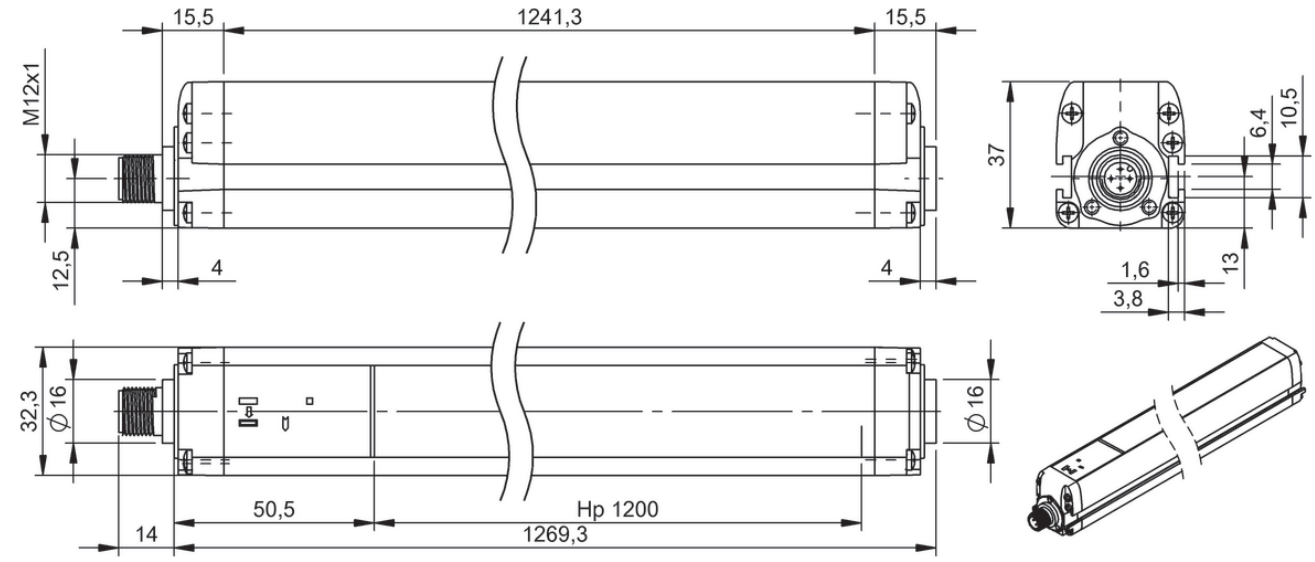
BLG000Z



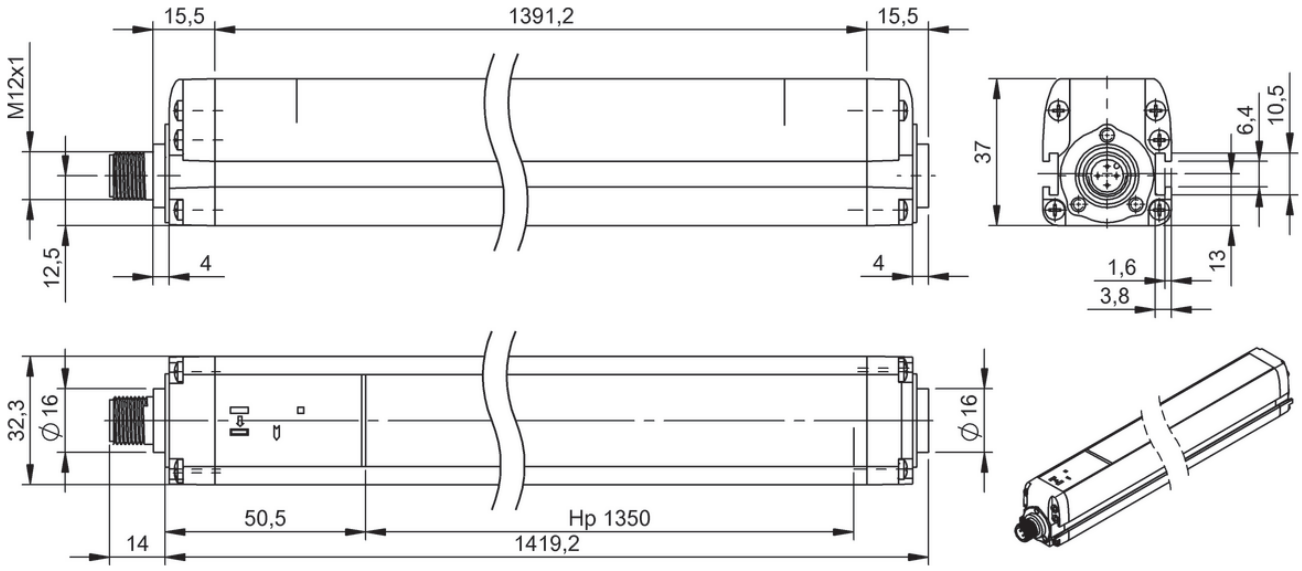
BLG0010



BLG0011



BLG0012



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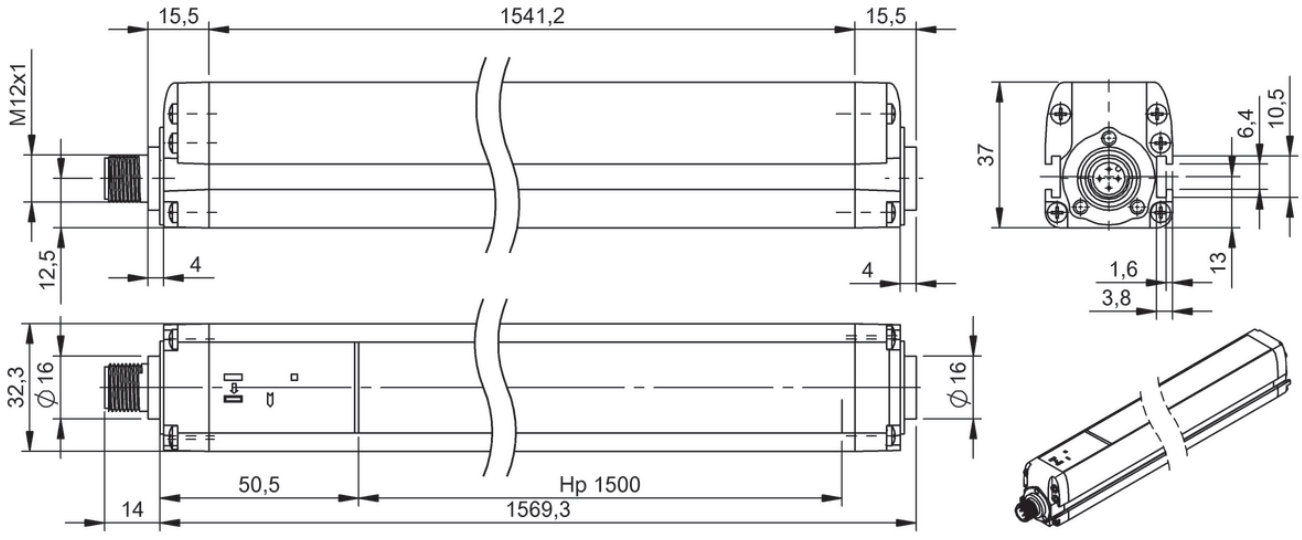
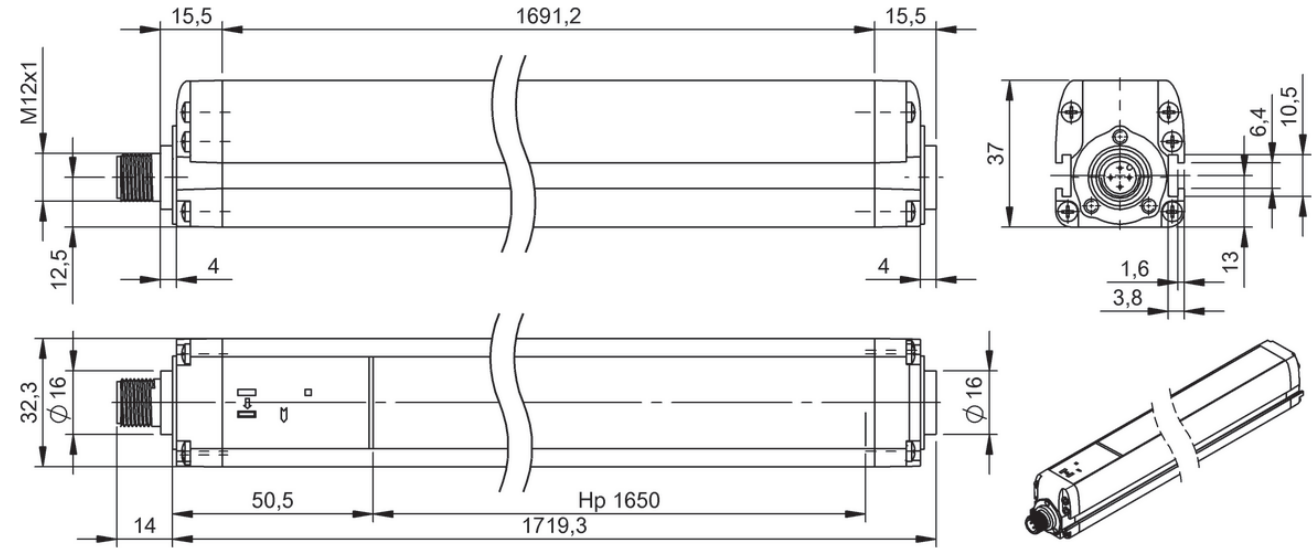
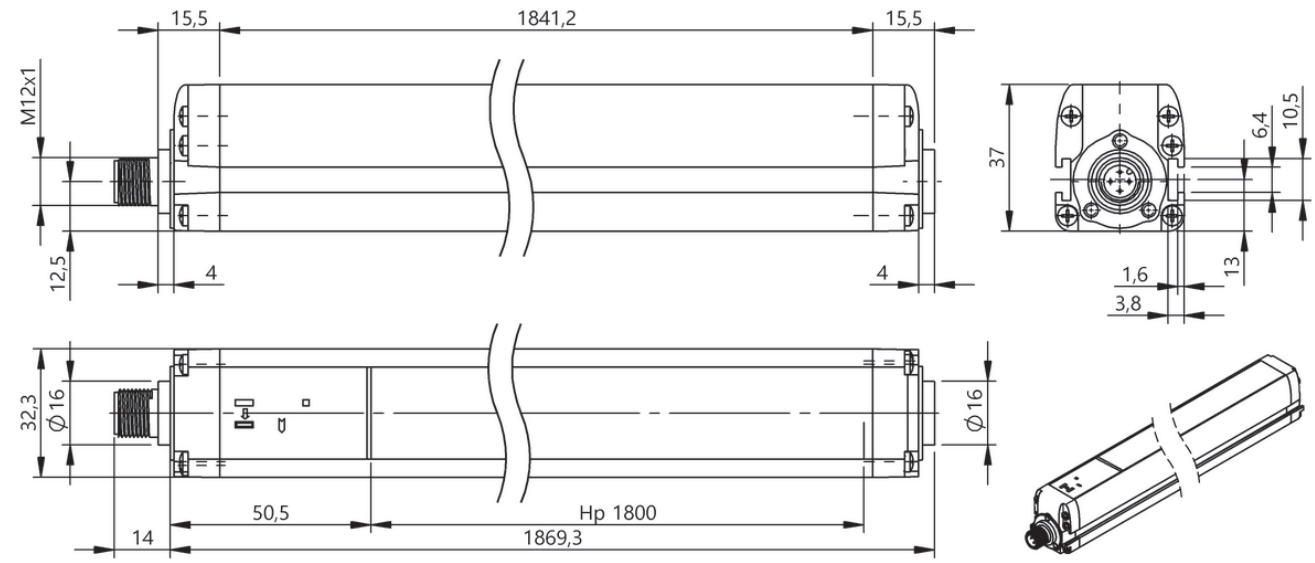


BLG0014



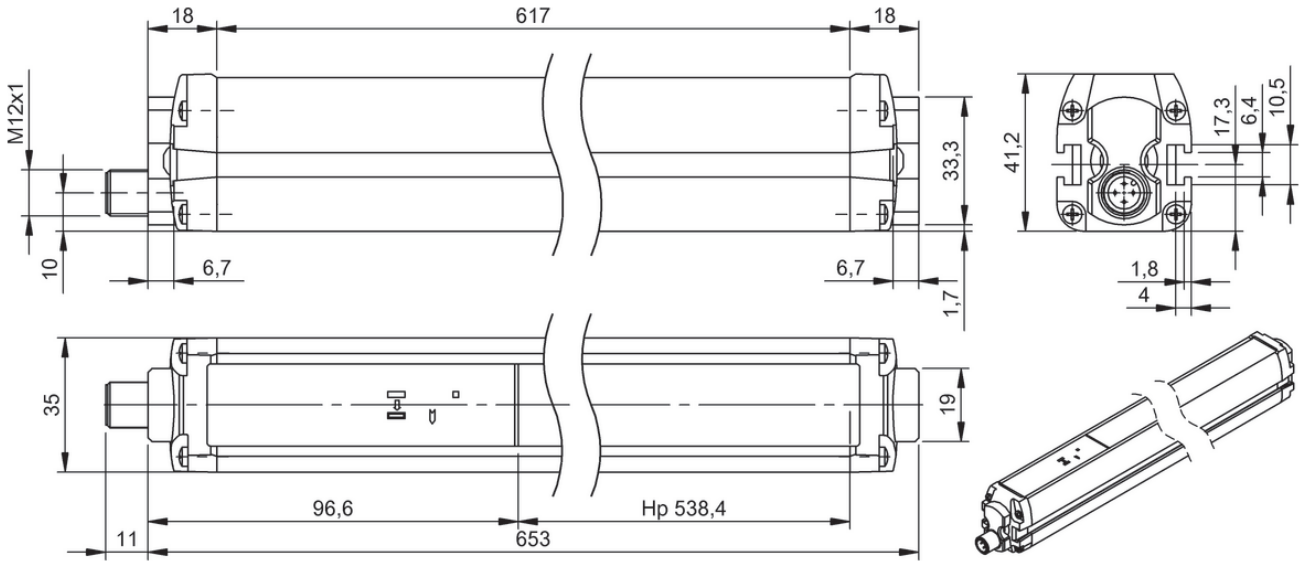
BLG0015



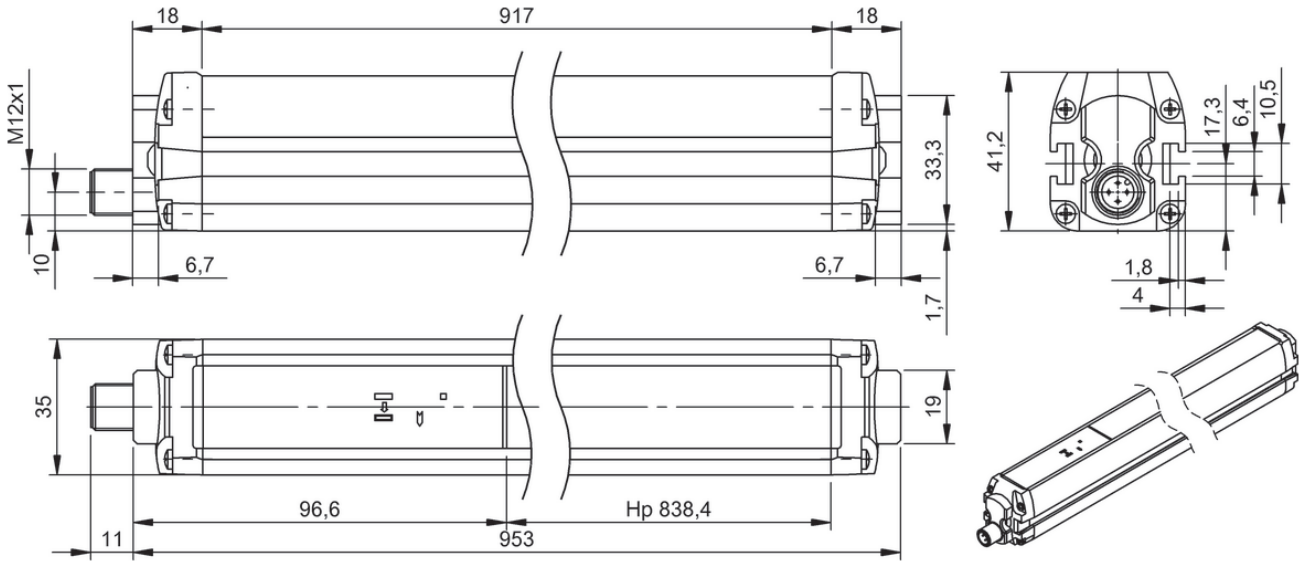
BLG0016

	BLG0006 BLG 4A-050-50X-B02-001-SX	
Performance Level	e	
Safety category (EN ISO 13849-1)	4	
SIL (IEC 61508)	3	
SIL CL (EN 62061)	3	
Response time max.	14 ms	
Approval/Conformity	TÜV, cULus, CE	
Operating principle	non-contact (photoelectric)	
Light beams, number	2	
Protective field height (Hp)	515 mm	
Range	50 m	
Connection 1	Emitter: M12x1-Male, A-coded	
Connection 2	Receiver: M12x1-Male, A-coded	
Switching output	2x PNP OSSD	
Dimension	35 x 664 x 41.2 mm	
Ambient temperature	-10...55 °C	
Protection degree	IP65	
Housing material	Aluminum	
Productview	Page 64	

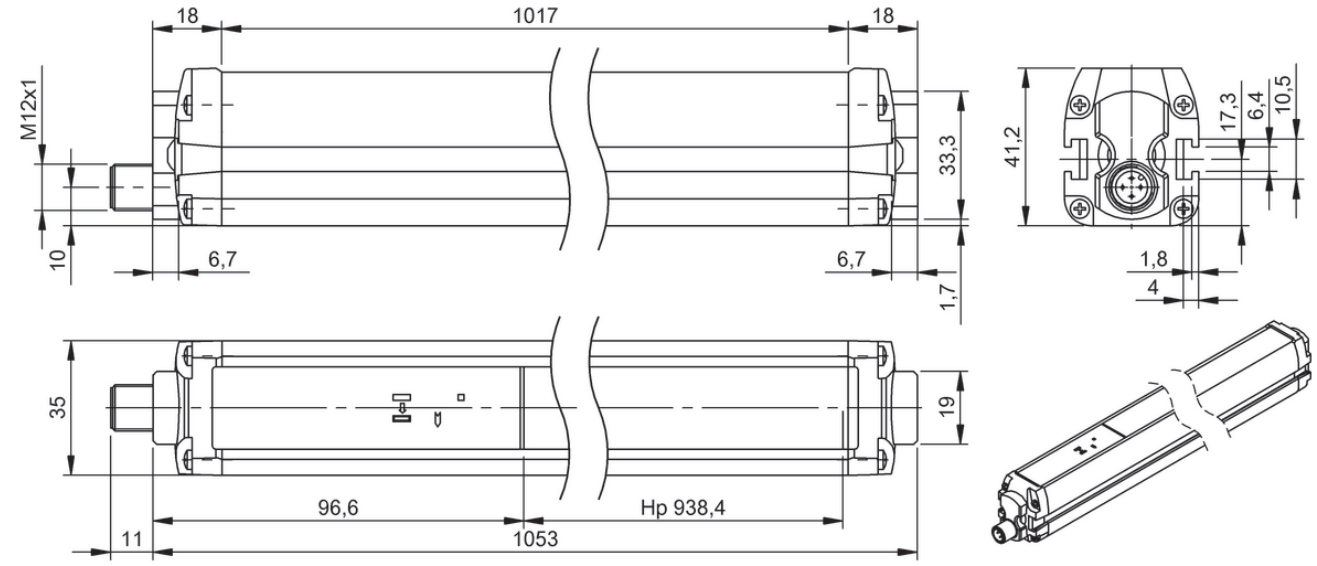
	BLG0007 BLG 4A-080-50X-B03-001-SX	BLG0008 BLG 4A-090-50X-B04-001-SX	BLG0009 BLG 4A-120-50X-B04-001-SX
	e	e	e
	4	4	4
	3	3	3
	3	3	3
	14 ms	16 ms	16 ms
	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE
	non-contact (photoelectric)	non-contact (photoelectric)	non-contact (photoelectric)
	3	4	4
	815 mm	915 mm	1215 mm
	50 m	50 m	50 m
	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded	Emitter: M12x1-Male, A-coded
	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male, A-coded	Receiver: M12x1-Male
	2x PNP OSSD	2x PNP OSSD	2x PNP OSSD
	35 x 964 x 41.2 mm	35 x 1064 x 41.2 mm	35 x 1364 x 41.2 mm
	-10...55 °C	-10...55 °C	-10...55 °C
	IP65	IP65	IP65
	Aluminum	Aluminum	Aluminum
	Page 64	Page 65	Page 65



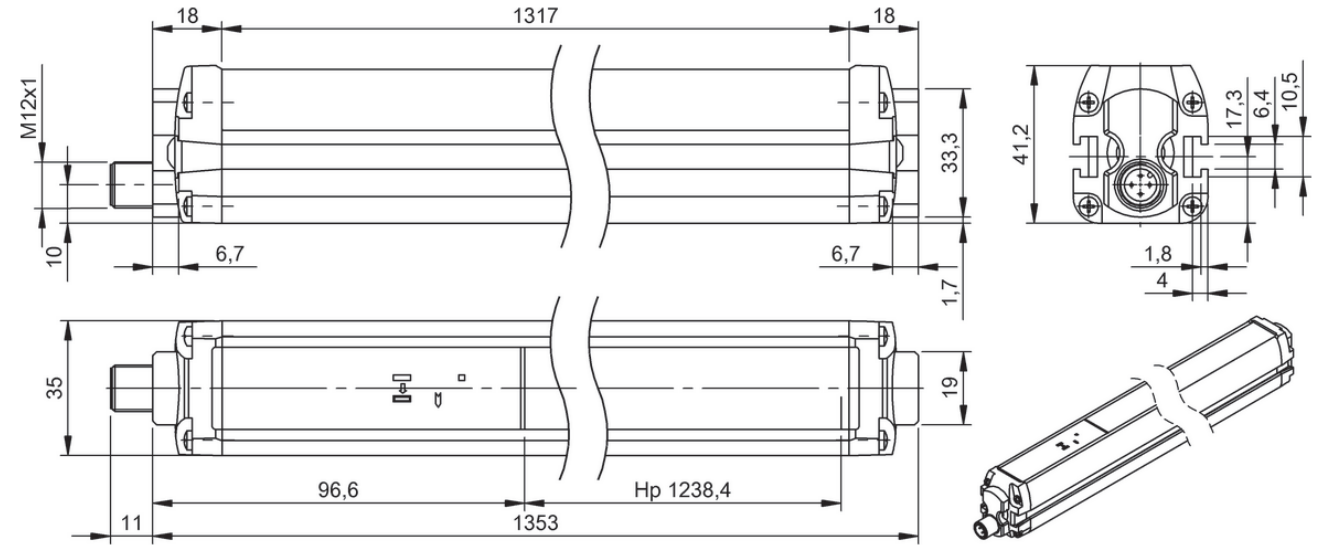
BLG0006



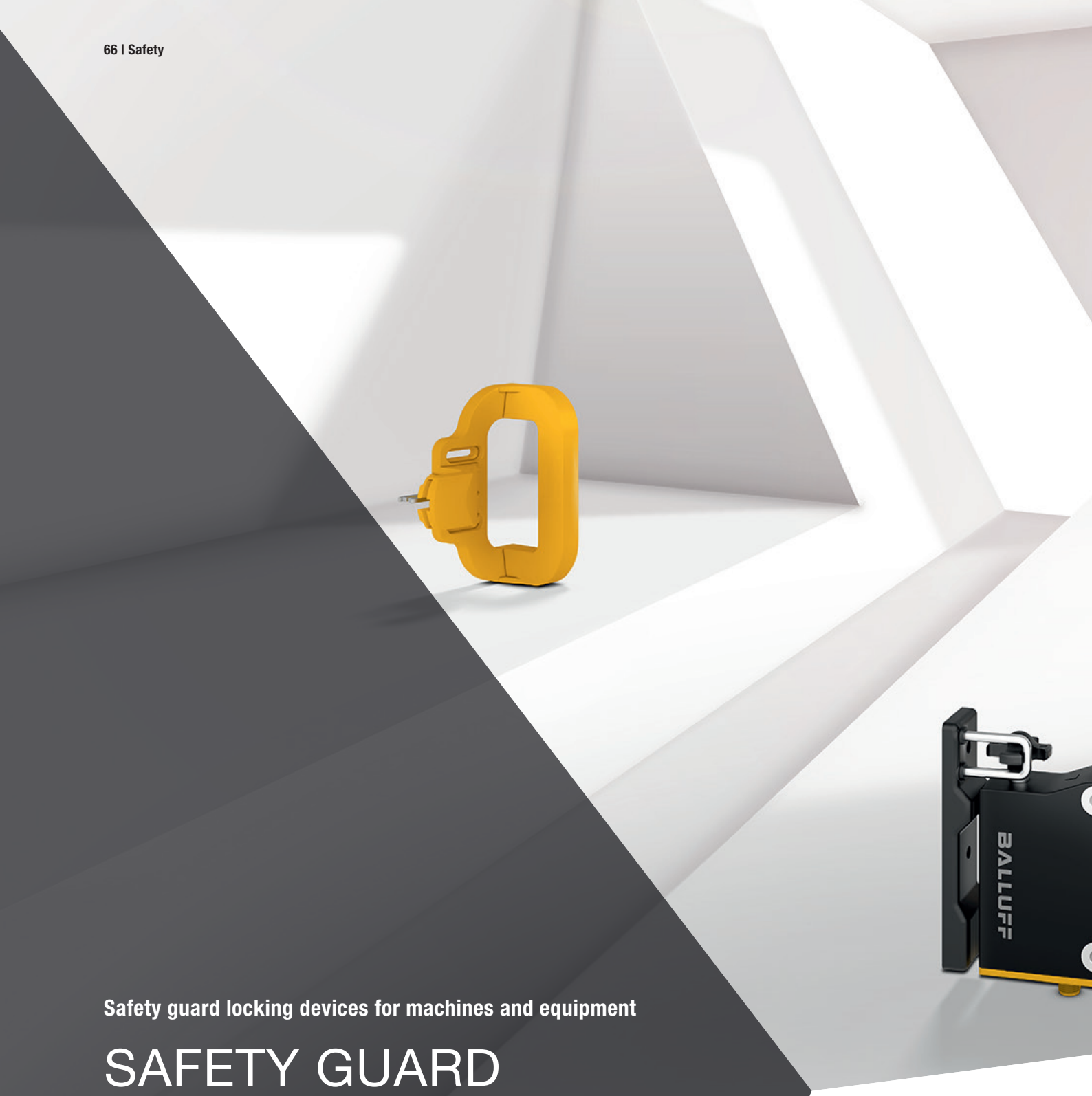
BLG0007



BLG0008



BLG0009



Safety guard locking devices for machines and equipment

SAFETY GUARD LOCKING DEVICES

Interlocking and guard devices from Balluff offer high holding forces of 1000 to 2500 newtons and ensure personal and machine protection. They are suitable for safety applications up to PLe/SIL3 and are an intelligent solution for preventing uncontrolled access to hazardous areas. Our safe interlocking devices feature a high coding level with great anti-tamper protection.

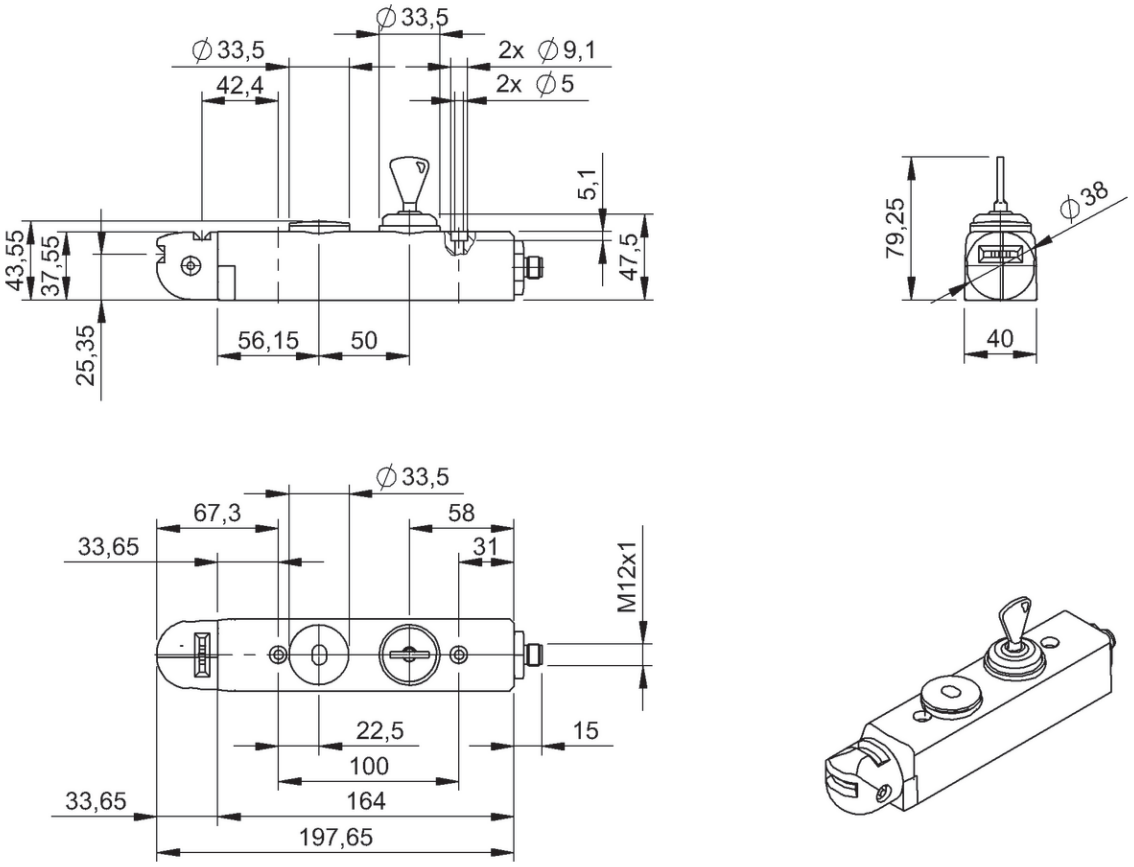
With the different operating principles available from Balluff you can enjoy a wide range of application possibilities. Choose from electromechanical or transponder-coded interlocking devices. It's also good to know that the rugged housings with LED indicator will stand up to harsh environments. This makes selecting the right solution easy.

The most important benefits

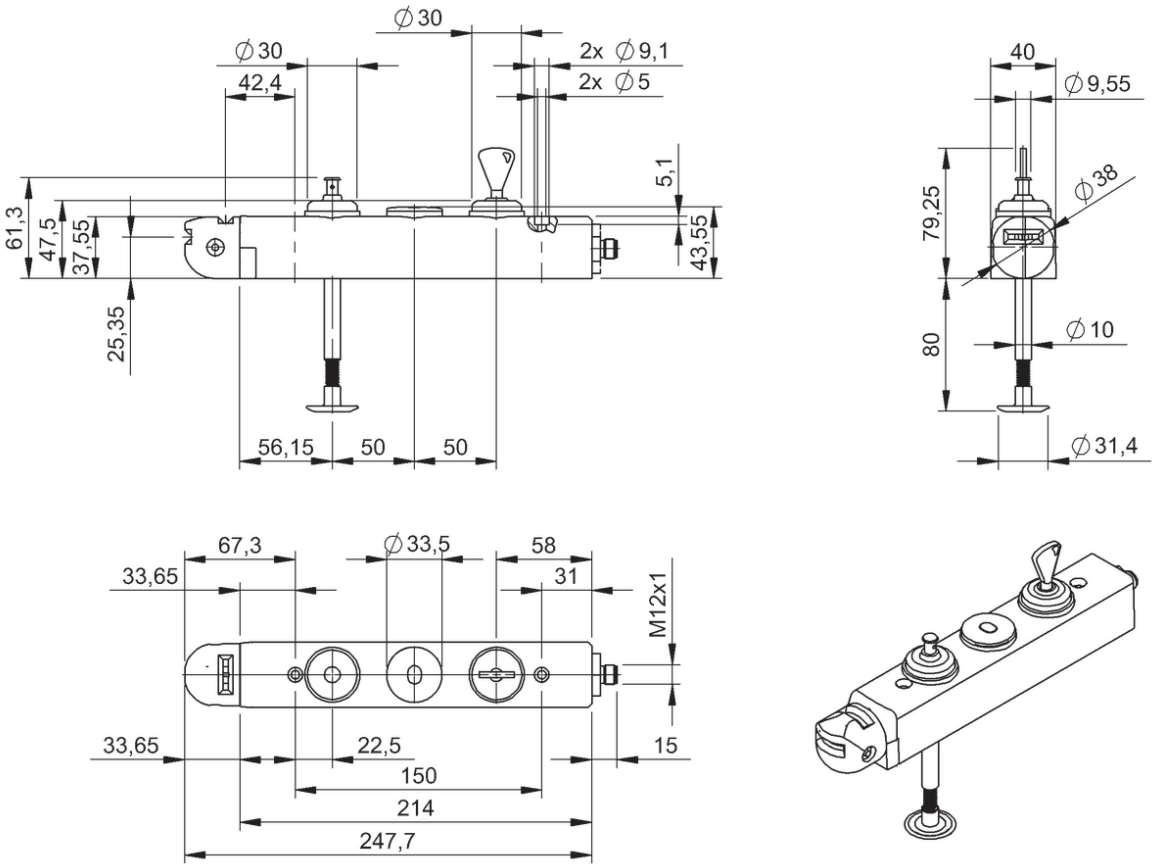
- Suitable for safety applications up to PLe/SIL3
- Insensitive to vibration and mechanical play
- Save installation and assembly time and money
- Also suitable for heavy protective equipment
- Manipulation-resistant
- Simple connections using standardized M12 connectivity

	BID0004 BID F101-2M1M3-M02AZ0-S115	
B10d (EN ISO 13849-1)	5 million Switching operations	
Coding level (EN ISO 14119)	low	
Approval/Conformity	CE, TÜV NRTL, TÜV, RoHS	
Operating principle	mechanical - force, contact	
No of contacts	2x positive opening	
Utilization category	AC-15, DC -13	
Approach direction	laterally + above	
Guard locking, principle	yes, spring force (power to unlock)	
Holding force FZH	2500 N	
Auxillary release	key	
Escape release	no	
Life expectancy mechanical	1 mil. switching operations	
Connection	Connector, M12x1 connector, 8-pin	
Dimension	40 x 197.7 x 47.5 mm	
Ambient temperature	0...40 °C	
Protection degree	IP65	
Housing material	Aluminum	
Productview	Page 70	

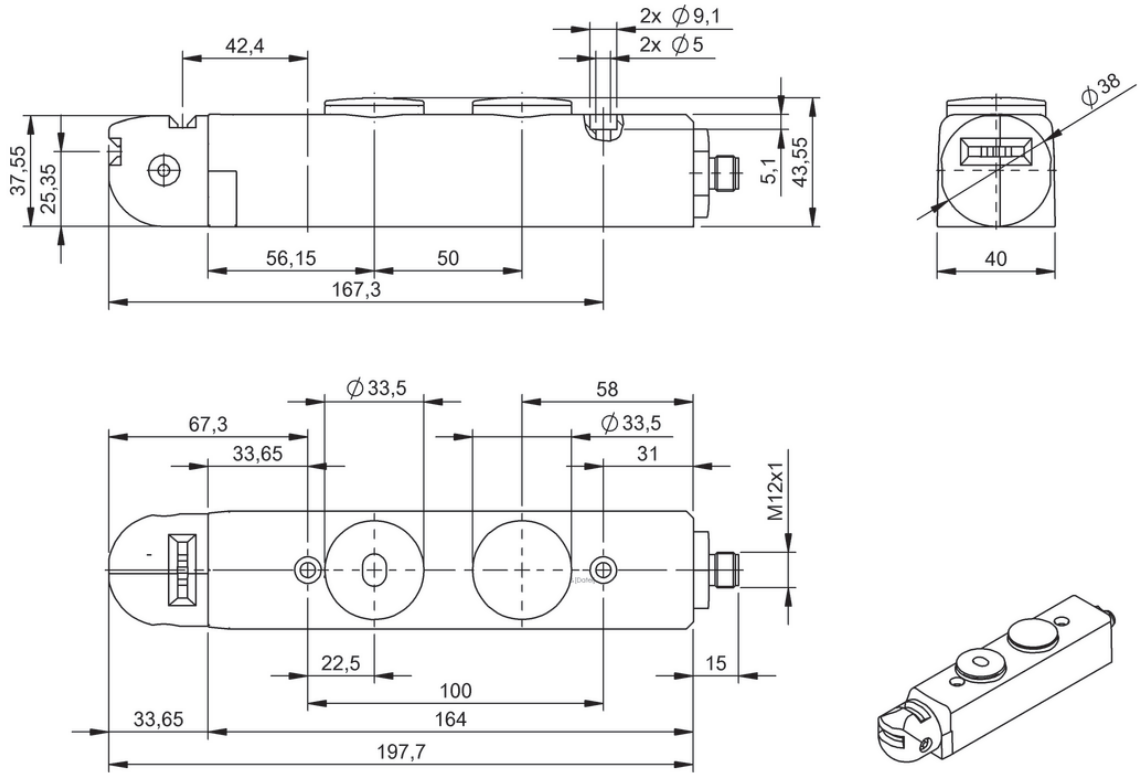
	BID0002 BID F101-2M1M3R-M02AZ0-S115	**BID0003** BID F101-2M1E3-M02AZ0-S115	**BID0001** BID F101-2M1E3R-M02AZ0-S115
	5 million Switching operations	5 million Switching operations	5 million Switching operations
	low	low	low
	CE, TÜV NRTL, TÜV, RoHS	CE, TÜV NRTL, TÜV, RoHS	TÜV NRTL, TÜV, CE, RoHS
	mechanical - force, contact	mechanical - force, contact	mechanical - force, contact
	2x positive opening	2x positive opening	2x positive opening
	AC-15, DC -13	AC-15, DC -13	AC-15, DC -13
	laterally + above	laterally + above	laterally + above
	yes, spring force (power to unlock)	yes, magnetic force (power to lock)	yes, magnetic force (power to lock)
	2500 N	2500 N	2500 N
	key	no	no
	yes	no	yes
	1 mil. switching operations	1 mil. switching operations	1 mil. switching operations
	Connector, M12x1 connector, 8-pin	Connector, M12x1 connector, 8-pin	Connector, M12x1 connector, 8-pin
	40 x 247.7 x 61.3 mm	40 x 197.7 x 44 mm	40 x 247.7 x 61.3 mm
	0...40 °C	0...40 °C	0...40 °C
	IP65	IP65	IP65
	Aluminum	Aluminum	Aluminum
	Page 70	Page 71	Page 71



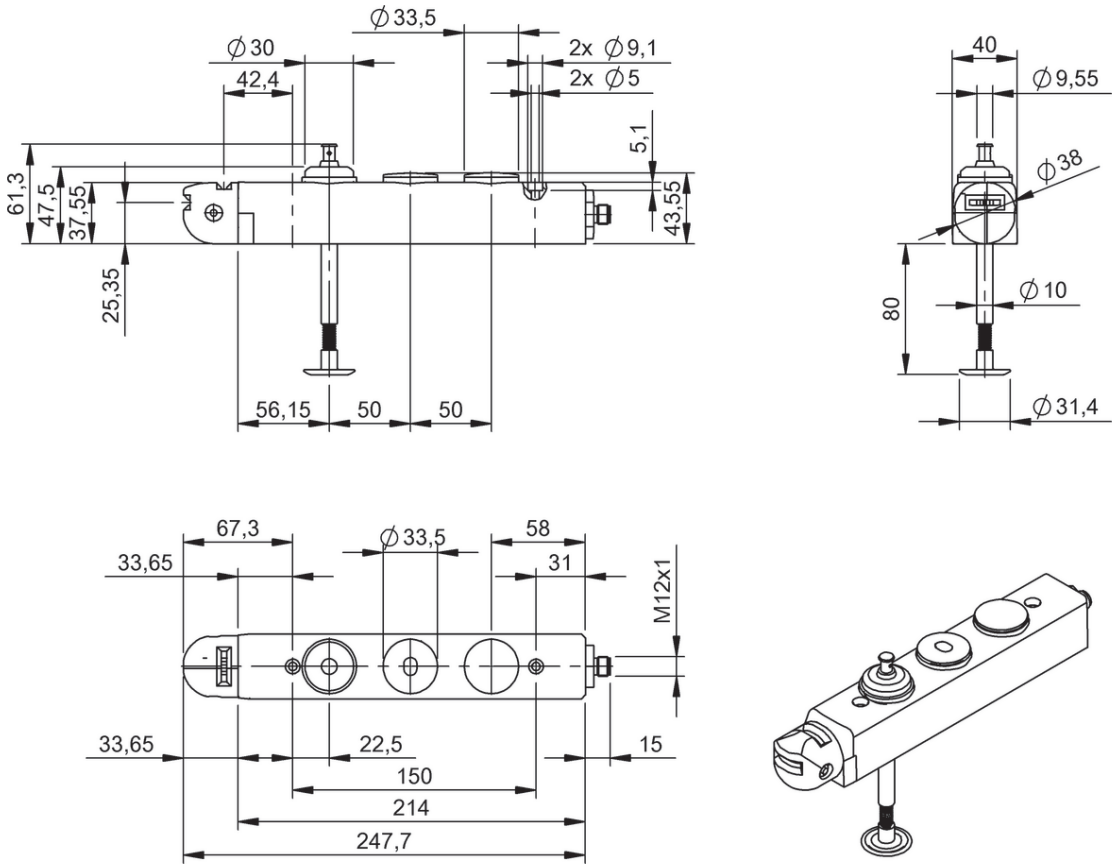
BID0004



BID0002



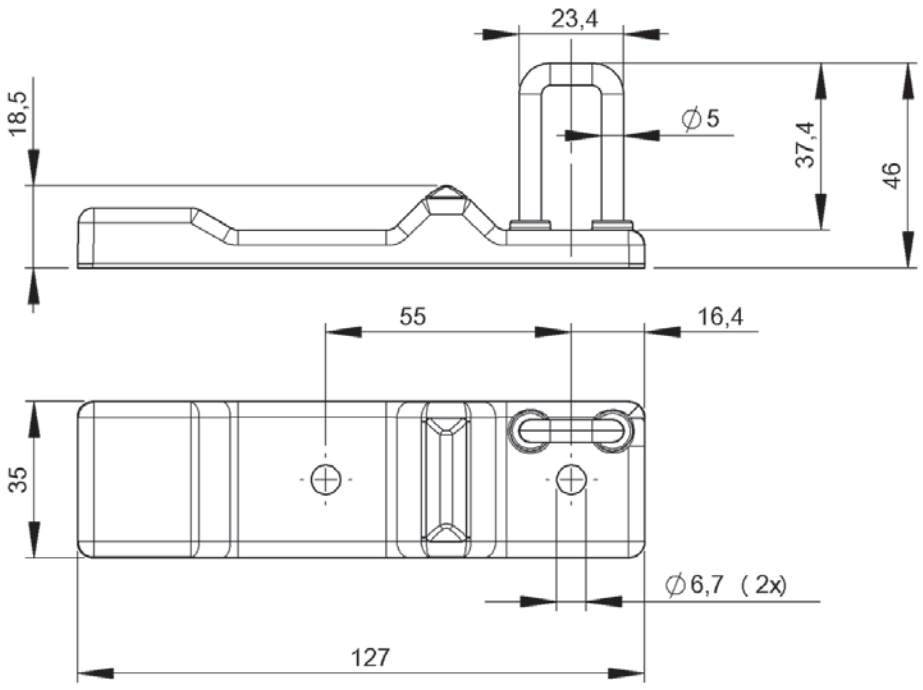
BID0003



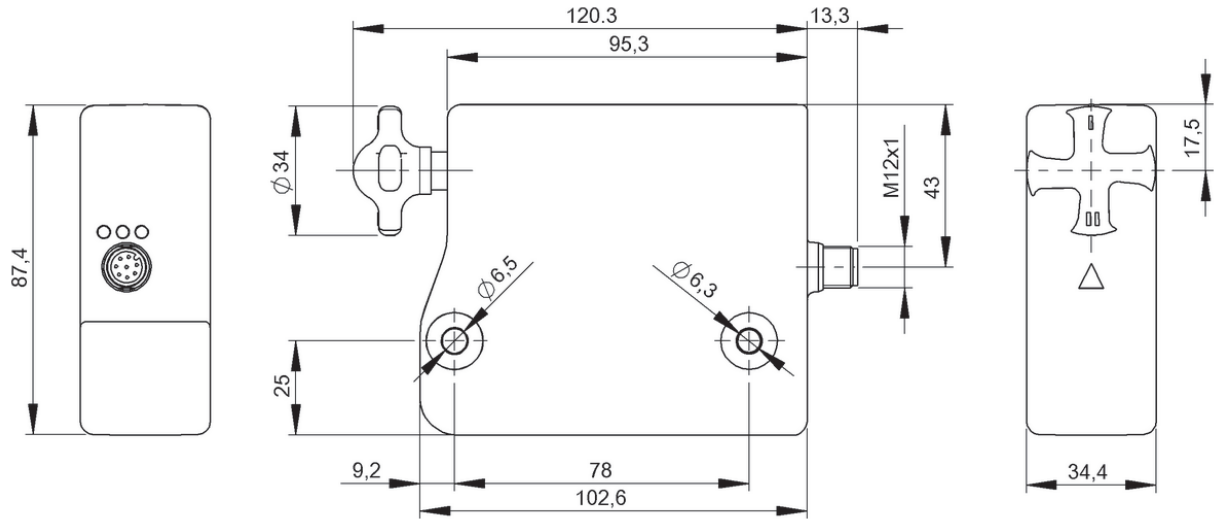
BID0001

	BID0010 BID Z01K-4R3M0	
Performance Level	—	
Safety category (EN ISO 13849-1)	—	
SIL (IEC 61508)	—	
SIL CL (EN 62061)	—	
Coding level (EN ISO 14119)	—	
Response time max.	—	
Approval/Conformity	Ecolab	
Operating principle	non-contact (RFID)	
Utilization category	—	
Approach direction	—	
Guard locking, principle	—	
Holding force FZH	—	
Auxillary release	—	
Escape release	—	
Life expectancy mechanical	—	
Connection	—	
Switching output	—	
Dimension	46 x 127 x 35 mm	
Ambient temperature	0...60 °C	
Protection degree	—	
Housing material	Thermoplastic, glass-fibre reinforced	
Productview	Page 74	

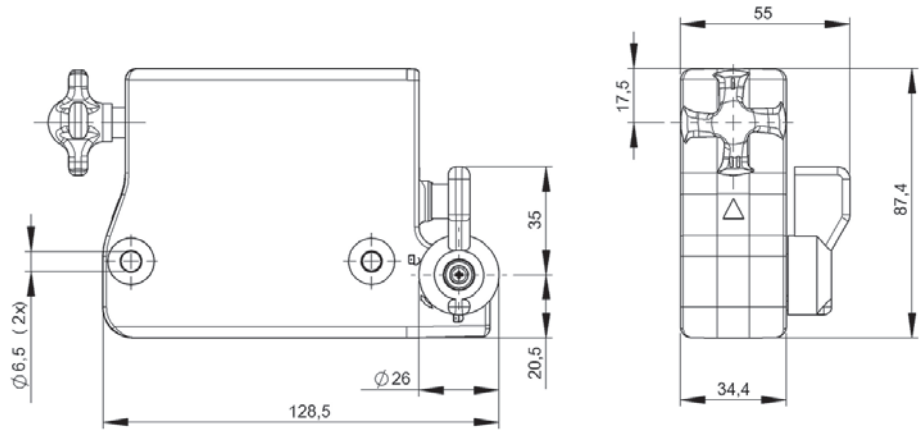
	BID0011 BID Z01K-4R3M3-002KZ0-S115	BID0013 BID Z01K-4R3M3R-002KZ0-S115	BID0012 BID Z01K-4R3E3-002KZ0-S115
	e (for locking function), d (for retention function)	e (for locking function), d (for retention function)	d (for retention function), e (for locking function)
	4 (for locking function), 2 (for retention function)	4 (for locking function), 2 (for retention function)	4 (for locking function), 2 (for retention function)
	3 (for locking function), 2 (for retention function)	3 (for locking function), 2 (for retention function)	3 (for locking function), 2 (for retention function)
	3 (for locking function), 2 (for retention function)	3 (for locking function), 2 (for retention function)	3 (for locking function), 2 (for retention function)
	high	high	high
	100 ms	100 ms	100 ms
	CE, cULus, TÜV, Ecolab	CE, cULus, TÜV, Ecolab	CE, cULus, TÜV, Ecolab
	non-contact (RFID)	non-contact (RFID)	non-contact (RFID)
	DC-12: 24 V/0.25 A, DC-13: 24 V/0.25 A	DC-12: 24 V/0.25 A, DC-13: 24 V/0.25 A	DC-12: 24 V/0.25 A, DC-13: 24 V/0.25 A
	lateral	lateral	lateral
	yes, spring force (power to unlock)	yes, spring force (power to unlock)	yes, magnetic force (power to lock)
	1000 N	1000 N	1000 N
	Screwdriver	Triangular Key	Screwdriver
	no	yes	no
	1 mil. switching operations	1 mil. switching operations	1 mil. switching operations
	Connector, M12x1, 8-pin	Connector, M12x1, 8-pin	Connector, M12x1, 8-pin
	2x PNP OSSD, PNP NC	2x PNP OSSD, PNP NC	2x PNP OSSD, PNP NC
	87.5 x 120 x 35 mm	87.5 x 129 x 35 mm	87.5 x 120 x 35 mm
	0...60 °C	0...60 °C	0...60 °C
	IP69, IP67, IP66	IP69, IP67, IP66	IP69, IP67, IP66
	Thermoplastic, glass-fibre reinforced	Thermoplastic, glass-fibre reinforced	Thermoplastic, glass-fibre reinforced
	Page 74	Page 75	Page 74



BID0010



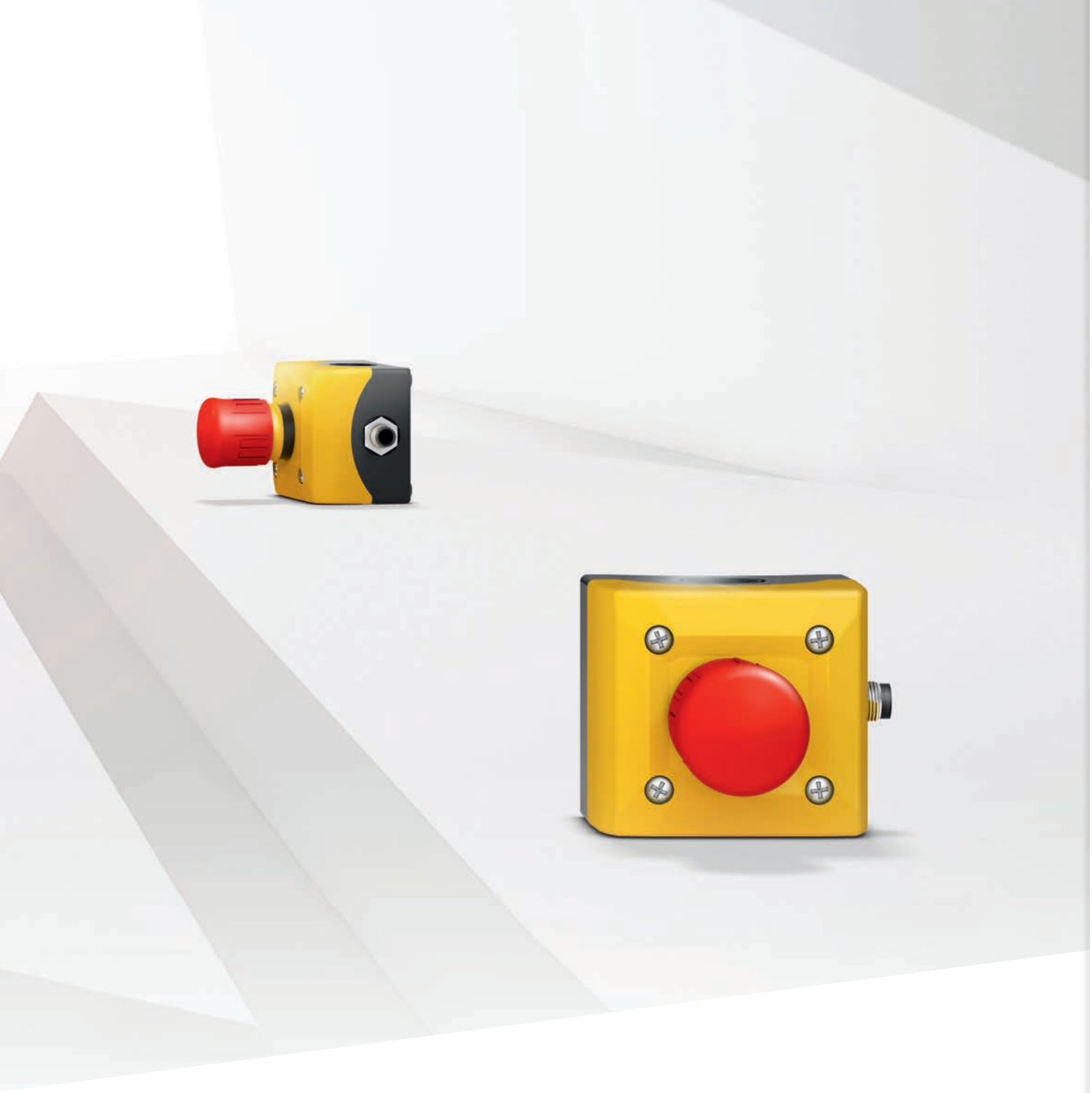
BID0011, BID0012



BID0013

Quickly stop machines at critical times

SAFETY COMMAND DEVICES



Safe operation of automatic machines and equipment falls under a company's due diligence responsibility. To be sure that in emergency situations machine hazards can be prevented or reduced, safety command devices such as E-Stop or E-Off units must be used. As a supplementary protective measure equipment must always include an E-Stop device – whether during installation, operation or maintenance. And regardless of whether this function is implemented as an E-Off (shuts off power) or an E-Stop (hazardous process or movement is stopped).

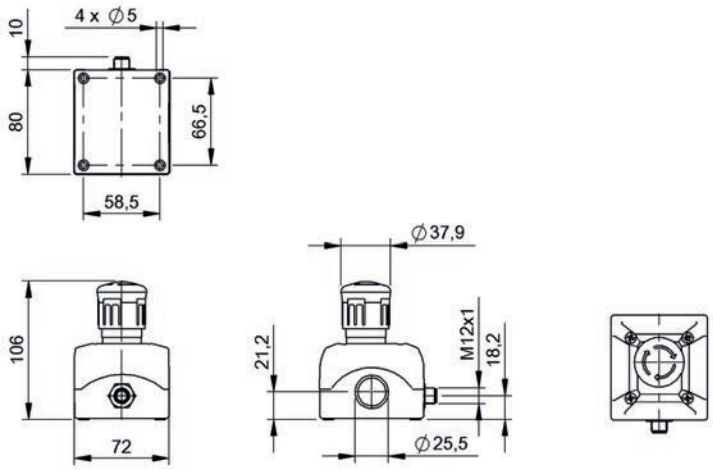
The safety command devices must be easy to reach, always available and functional, and should bring the machine to a safe condition immediately. Our highly visible command devices carry out an immediate E-Stop function when there is a malfunction. This makes them ideal for protecting both persons and machines.

The safety command devices from Balluff feature a compact housing, so that you can install them on various machines, even where space is at a premium. They are also quite easy to install.

The most important benefits

- Reliable disconnection of the power supply
- Positive opening operation compliant with IEC 60947-5-1, Addendum K
- Pluggable connection with M12 (5-pin)
- Turn-to-release mushroom pushbutton
- High degree of protection against dust and water
- Compact housing, easy installation

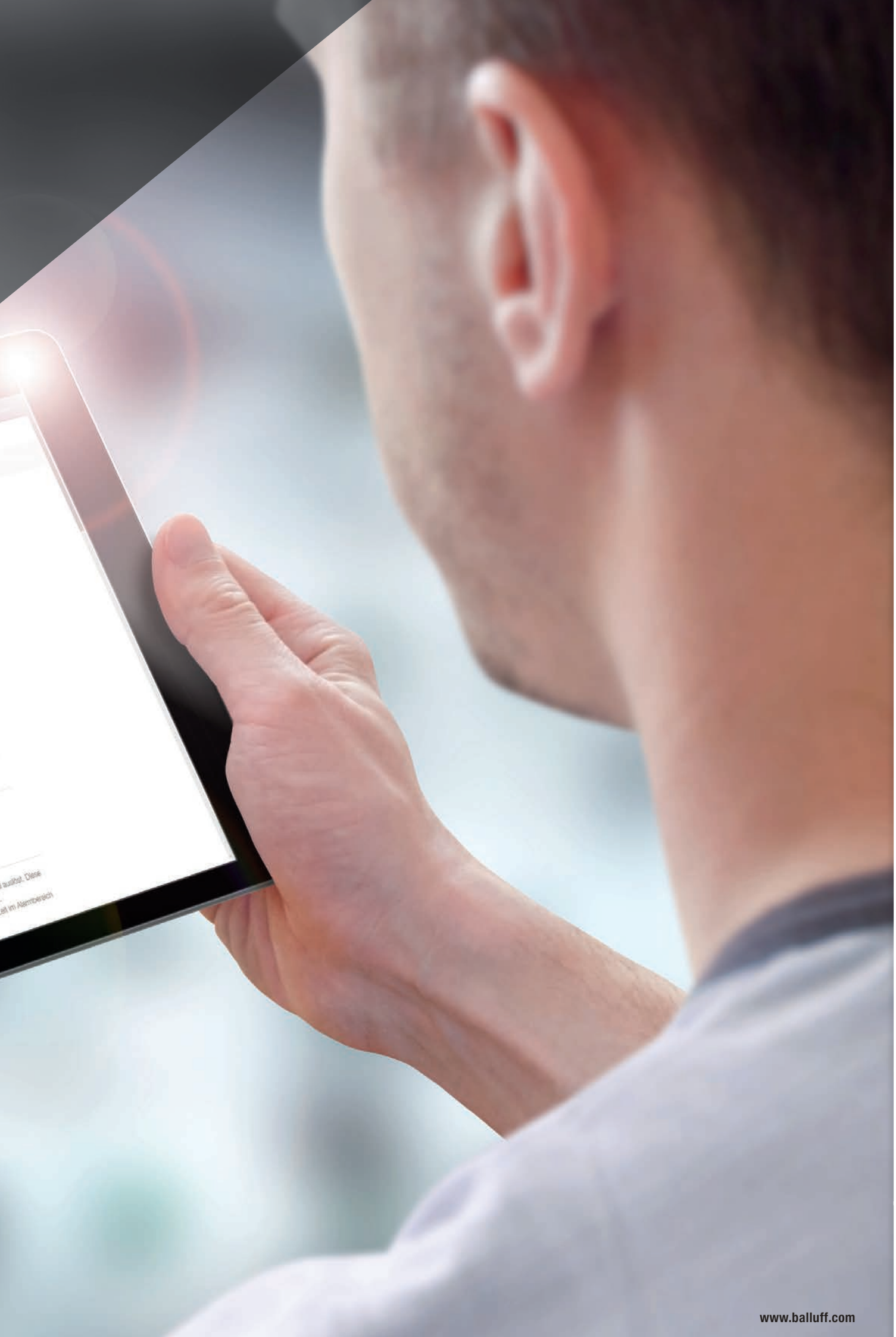
	BAM02HA BAM ES-XA-01D-01-R01-201-S92
B10d (EN ISO 13849-1)	0.1 million Switching operations
Approval/Conformity	UL CERTIFIED, CE, TÜV
Operating principle	PIM-Export ERROR: Attribute failed
No of contacts	2x positive opening
Utilization category	AC-15, DC -13
Type of release	Turning
Life expectancy mechanical	0.06 million Switching operations
Connection	M12x1-Male, 5-pole, A-coded
Dimension	80 x 106 x 72 mm
Ambient temperature	-25...70 °C
Protection degree	IP65
Housing material	Plastic
Productview	Page 79



BAM02HA

Safety

BASICS AND GLOSSARY



AOPD	Active opto-electronic protective devices (e.g. light curtains)	DIN EN ISO 13849-1, EN ISO 12 100
AOPDDR	Active opto-electronic protective device responsive to diffuse reflection (e.g. laser scanners)	DIN EN ISO 13849-1, EN ISO 12 100
Open-circuit principle	Using the example of an interlock: when the actuator is plugged in, the current circuit of the safety contacts is closed when the solenoid is energized, causing the device to lock. If the voltage is eliminated from the solenoid, the safety contacts are opened and the locking mechanism is released. See also "Closed-circuit principle"	
Failure	The inability of a unit to fulfill a required function	DIN EN ISO 13849-1, EN ISO 12 100
β	Is the common cause failure factor for undetectable dangerous faults λ_{DU}	IEC 62061
B_{10d}	Number of cycles until 10 % of the components fail dangerously	DIN EN ISO 13849-1
Construction types (of interlocks)	**Type 1:** Interlock with mechanically actuated position switch with non-coded actuator (e.g. interlock with hinge) **Type 2:** Interlock with mechanically actuated position switch with coded actuator (e.g. tongue actuated position switches) **Type 3:** Interlock with non-contract actuated position switch with non-coded actuator (e.g. proximity switches) **Type 4:** Interlock with non-contract actuated position switch with coded actuator (e.g. RFID transponder actuated position switches)	DIN EN ISO 14119
User information (illustrative safety)	All of the information required for safe and proper use of the machine. It informs the user of the residual risk and warn him of it.	EN 12100

ESPE	Electro-sensitive protective equipment	EN 61496
CCF	Common cause failure, a specific type of dependent failure where several failures result from a single shared cause.	DIN EN ISO 13849-1
CE marking	Indication from the manufacturer, distributor or EU-Representative that declares a product in compliance with EU regulation 765/2008, meaning the product meets the prevailing requirements as specified in the harmonization legislation of the Union regarding its affixing.	EU regulation 765/2008, EU regulation 765/2008
Coding	Connectors are designed to be reverse polarity protected.	DIN EN ISO 13849-1, IEC 62061, IEC 61508-2:2000
Coding levels (of interlocks)	The coding of actuators/tags is intended to prevent the interlocking device to be defeated using easily available means. Low coding = 1 to 9 different codes Medium coding = 10 to 1000 different codes High coding = > 1000 different codes	EN ISO 14119
CRC	Cyclic redundancy check, procedure for determining a check value for data in order to detect errors in transmission or saving.	
DC	Diagnostic coverage indicator of the probability that the errors will be revealed by means of a test. Safety systems must be tested so that one knows whether they still function. The diagnostic coverage depends on the quality of the test. Poor tests cover only a few, whereas good tests cover many or even all errors. DC = $\sum\lambda dd/\lambda dtotal$	DIN EN ISO 13855
DCavg	Average diagnostic coverage DC: Measure of the effectiveness of the diagnostics, which can be determined as the ratio of the failure rate of the detected hazardous fault and the fault rate of the total dangerous failures.	DIN EN ISO 13849-1
Diversity	Having multiple means for performing a required function. Diversity-redundant systems can increase reliability.	DIN EN 61508-4, VDE 0803-4

E/E/PES	Functional safety of electrical/electronic/programmable electronic safety-related systems	DIN EN 61508
EDM	Monitoring of controlled actuators, feedback circuit	
Supplementary protective measures (indirect safety) (indirect safety measures)	Standards that must be taken to protect persons from hazards which cannot be sufficiently prevented or where the risks cannot be sufficiently limited.	EN 12100
Broken spring	A failure in a mechanical switching element that can result in a malfunction.	
Error	Condition of a unit characterized by its inability to perform a required function. Not to be confused with "tampering"	DIN EN ISO 13849-1, EN ISO 12100
FIT	Failure in time: A singular failure per 10^9 hours, or one failure per 114,000 years.	DIN EN ISO 13849-1
Escape release	Ability for manual unlocking of the interlocking device without aid from inside the protected area in order to exit this area.	DIN EN ISO 14119
FMEA	Failure mode effects analysis	DIN EN ISO 13849-1, EN ISO 12100
Functional safety	The part of overall safety which depends on the correct function of the E/E/PE safety related system for risk reduction	DIN EN 61508-4 VDE 0803-4
Hazard/risk	Potential source of damage	DIN EN ISO 13849-1
Hazardous area (risk area)	Any area in a machine and/or around a machine in which a person can be subjected to a hazard.	EN ISO 12100
Strict liability	The liability for damages resulting from a permissible risk (e.g. operation of a hazardous device, keeping of a house pet). Strict liability does not depend on the illegality of the action or on the fault of the injuring party.	§§ 1, 10 ProdHaftG – Manufacturer of a (defective) product

Device types	Devices which are evaluated as a system first by the design process of the user are Device Type 2 or 3. Type 1 or Type 4 have been developed directly for use in a safety function. **Device Type 1:** Devices are ready to use safety devices with integrated diagnostics. These are already classified as SIL or PL. Examples: Safety light curtain, safety light grid, components for safety controllers, safe drives/drive functions, safety switching devices **Device Type 2:** Devices where the user must himself evaluate the device in terms of its safety. This requires additional application data (circuit structure, DC, CCF). Examples: Non-safe electronics, e.g. operational amplifier, proximity switch, pressure sensor, hydraulic valve **Device Type 3:** Devices are subject to wear. The user must provide additional application data for evaluating the safety function (switching frequency, actuation frequency, circuit structure, DC, CCF). Examples: Wear-prone electro-mechanical components, including power contactors, switches, pneumatic valves, interlocking devices, command devices **Device Type 4:** A special case of Device Type 1. For Device Type 4 the probability of a dangerous failure per hour PFHD = 0. The fault is either precluded or the fault always results in a safe state.	EN 62061, VDMA 66413 standard sheet
GSD file	General station description, a file which describes the features of a device type uniquely and fully in an exactly specified format. The GSD is generated individually for each device type by the manufacturer and provided to the user as a file for designing Profinet systems.	
GSDML	GSD Markup Language is a language for describing Profinet IO field devices. See also "GSD file"	
HFT	Hardware fault tolerance: Ability to still perform a required function in the presence of errors or failures	DIN EN 62061, VDE0113-50
Auxiliary Release	The manual unlocking of the interlocking device using a tool or key from outside the protected area in case of a malfunction. An interlocking device with auxiliary release is not suitable for emergency release or escape release of the interlocking device.	DIN EN ISO 14119

Inherent safety	Direct intrinsic safety: A design that prevents hazards or reduces risks through suitable selection of design features of the machine itself.	EN 12100
Placing on the market	Includes the responsibility if a distributed product does not comply with the relevant regulations.	MaschRL 2006/42/EG Article 5
IODD Checker	A tool that tool checks not only the schema conformity, but also all the rules of the IODD specification which cannot be checked using an XML schema.	EN 12100
IODD	IO device description concerning sensors and actuators in an IO-Link network. It contains information for identification, device parameters, process and diagnostics data, communication properties and the structure of the user interface in engineering tools.	ISO 15745
IO-Link	IO-Link is the standardized IO technology for communicating with sensors and actuators. IO-Link is not a fieldbus, but rather a point-to-point communication based on the long-familiar 3-conductor sensor and actuator connection.	IEC 61131-9
Iterative process	A process of repetition of the same or similar actions for approaching a solution or particular goal.	DIN EN ISO 13849-1
Category [Cat.]	Categorization of the safety-related parts of a controller with respect to their resistance to errors and their behavior following an error. Categories are based on the structure of the arrangement of the parts, the error detection and/or their reliability.	IEC 61131-9
Conformity	Declaration by the manufacturer that the distributed machine complies with all the relevant safety and health requirements.	MaschRL 2006/42/EG Article 7/12

λ (lambda)	Failure rate in [FIT] = 10^{-9} 1/h	IEC 62061
λ_d	Failure rate in the unsafe (hazardous) direction	IEC 62061
λ_{dd}	Failure rate in the unsafe (hazardous) direction; the failure is however detected through diagnostic means before it can have a hazardous effect.	IEC 62061
λ_{du}	Failure rate in the unsafe (hazardous) direction; the failure is not detected	IEC 62061
Λ_s (also: λsafe)	Failure rate in the safe direction	IEC 62061
Tampering	Intentional defeating or by-passing of protective devices and their components	Addendum 1 No. 2.8 BetrSichV
MTTFd	Mean time to failure: Expected value of the average time until a dangerous failure	DIN EN ISO 13849-1
MTTR	Mean time to repair	
Muting	Temporary automatic suppression of one or more safety functions by the SRP/CS	DIN EN ISO 13849-1
NC	Normally closed contact	
NO	Normally open contact	
Emergency unlocking	Ability for manual unlocking of the interlocking device in emergency cases without aids from outside the protected area. An interlocking device with emergency unlocking can for example be required for freeing enclosed persons or for fire fighting.	

OSSD	Output Signal switching device	EN 61496-1
PDDB (formerly PDF)	Proximity switch with defined behavior under fault conditions	DIN EN 60947-5-3:2014-12, VDE 0660-214:2014-12
PL	Performance level: Discrete level which specifies the capability of safety-relevant parts of a controller for performing a safety function under predictable conditions	DIN EN ISO 13849-1
Personal protection	Use of an interlocking device for protecting a person from a hazard. (See also "Process protection")	
PFD	Probability of failure on demand	EN IEC 61 508-1/-7:2001
PFD(T)	Probability of a hazardous failure on demand at time T. (T generally refers to the proof test interval)	
PFDav	Average probability of failure on demand	
PFH	Probability of (dangerous) failure per hour	
PFHd	Probability of a dangerous failure per hour of a safety system or sub-system	DIN EN 62061, VDE 0113-50
PIPD	Passive infrared protective device	
Product liability	Liability for damages compensation on the part of the manufacturer for damages to the end user resulting from a defective product	§4 Par. 1 Sentence 1 ProduktHaftG
Profisafe	How safety devices (E-Stop buttons, light grids, overfill prevention systems etc.) safely communicate with safety controllers over Profibus.	

Process protection	Use of an interlocking device for protection against interruption of the work process. See also "Personal protection"	DIN EN 62061, VDE 0113-50
PTE	Probability of transmission error: Probability of a hazardous transmission error	EN 61508, EN 62061
RDF	Ratio of dangerous failures (= λD/λ)	VDMA 66413 standard sheet
Response time (for devices)	Time between action and reaction Example for safe I/O module: – Time between detection of a (state) change on the input port and the availability of this information on the communication interface (IO-Link) – Time between detection of new information on the communication interface (IO-Link) and its implementation on the output port	EN 61508, EN 62061
Redundancy	Reproducing critical components or functions of a system in order to increase reliability	IEC 61784-3
Residual risk	Risk remaining after protective measures have been taken	DIN EN ISO 13849-1, ISO 12100
Risk analysis	Combination of determining the limits of the machine, identifying the risk, and risk assessment	DIN EN ISO 13849-1, EN ISO 12100
Risk assessment	Totality of the process which includes a risk analysis and risk assessment	DIN EN ISO 13849-1, EN ISO 12100
	Assessment based on the risk analysis as to whether the goals for risk reduction were achieved	DIN EN ISO 13849-1, EN ISO 12100
Risk estimation	Determination of the probable extent of damage and probability of its occurrence	EN ISO 12100-1, DIN EN 1050

Risk graph	Means for classifying risk. Determines which PL or SIL results from a given case. Factors include severity of the injury, frequency and/or duration of exposure to the hazard, and possibilities for preventing the hazard	DIN EN ISO 13849-1, DIN EN 62061
Closed-circuit principle	Using the example of an interlock: when the actuator is plugged in the current circuit of the safety contacts is closed when the solenoid is energized, so that the device locks. The principle of circuit design where a normally energized electric circuit which, on being interrupted or deenergized, will cause the controlled function to assume its most restrictive condition. See also "Open-circuit principle"	
Safe stop 1 SS1	Corresponds to Stop Category 1 pursuant to IEC 60204. See also "Stop category"	IEC 60204-1
Safe stop 2 SS2	Corresponds to Stop Category 2 pursuant to IEC 60204. See also "Stop category"	IEC 60204-1
Safe torque OFF STO	Corresponds to Stop Category 0 pursuant to IEC 60204. See also "Stop category"	IEC 60204-1
Damage	Physical injury and/or damage too health or objects	DIN EN ISO 13849-1, DIN EN 61508-4, VDE 0803-4
Protection devices	Protective device or guard for protecting persons from possible dangers of a machine.	EN ISO 12100
Protection field	Area in which a specified test body is detected by the protective device	DIN EN ISO 13855
Protective measure	Measure which provides for risk reduction	DIN EN 62061, VDE 0113-50
SFF	Safe failure fraction: Fraction of the total failure rate of a sub-system which results in a non-dangerous failure	DIN EN 61508-4, VDE 0803-4, DIN EN 62061, VDE 0113-50

Safety function	Function of a machine whereby a failure of the function can result in an increased risk (or risks)	DIN EN ISO 13849-1, EN ISO 12100
SIL	Safety integrity level discrete level for specifying the safety integrity of the safety functions, whereby SIL 4 represents the highest level and SIL 1 the lowest level.	EN 61508
SIL CL	SIL claim limit (of a sub-system)	EN 62061
Simatic	Product family name of the Siemens company. It is used for products in automation technology, control technology and the manufacturing execution level.	
SRCF	Safety-relevant control function	EN 62061
SRECS	Safety-relevant electrical control system	EN 62061
SRP/CS	Safety-relevant part of a controller which responds to safety-relevant input signals and generates safety-relevant output signals	DIN EN ISO 13849-1
SRS	Safety requirements specification	
Stop category	**Stop category 0:** Bringing to a stop by immediately interrupting power to the machine drive elements (i.e. an uncontrolled stop) **Stop category 1:** Controlled stopping, where the power to the machine drive elements is retained in order to cause stopping. The power is only interrupted when stop is achieved. **Stop category 1b:** Controlled stopping, where the power to the machine drive elements is maintained in order to cause stopping. Continuity of the stop condition is monitored, and when a failure is detected power is interrupted without generating a hazardous situation. **Stop category 2:** Controlled stopping, where power to the machine drive elements is maintained	IEC 60204-1

TCI	Tool calling interface: Software for enabling communication over Profibus DP or Profinet IO	
TD	Diagnostic test interval: Time between online tests for uncovering errors in a safety-relevant system with a specified diagnostic coverage degree.	DIN EN 61508-4
TIA	Totally integrated automation: Software framework for the entire automation software. The TIA portal is the successor to the traditional STEP 7	
TM	Mission time: Time which covers the specified use of the SRP/CS	DIN EN ISO 13849-1
TS	Sub-system	DIN EN 62061
TSE	Sub-system element	DIN EN 62062
By-passing	An action by means of which the interlocking device can be disabled or by passed such that a machine can no longer be used as intended by the designer or only without the required safety measured.	DGUV
Validation	German Social Accident Insurance, ensures that a product provides the required results. See also "Verification"	DIN EN 61508-4, VDE 0803-4 PMBOK
Verification	Confirmation that a product meets the requirements. See also "Validation"	DIN EN 61508-4, VDE 0803-4 PMBOK
Interlock(ing device)	Mechanical, electrical, or other type of device meant to prevent dangerous machine functions under defined conditions (in general as long as the isolating protection device is not closed). See also "Construction types [of interlocking devices]"	DIN EN ISO 14119

Fault-based liability	The obligation for damages replacement based on legal liability provisions under private law which presume a culpable, i.e. not only objective illegal, but rather personally attributable behavior which is intentional or negligent.	§§ 823 ff BGB
Guard locking device	Device whose purpose is to keep a separating protective device in the closed position and which is connected to the controller.	DIN EN ISO 14119
Reliability	The ability of an object to perform a particular function under particular conditions over a specified time interval	IEC 60050
Positive opening contacts	Contacts in a relay/contactor which are mechanically connected to each other such that normally open and normally closed can never be in the same position at the same time.	IEC EN 60947-5-1, Addendum L
Positive opening	Assurance of contact separation as a direct result of a specified movement of the operating component of the switch over non-sprung parts.	DIN EN 60947-5-1, Addendum K

Reliable information exchange across all levels

INDUSTRIAL NETWORKING.

innovating automation

The demands on industrial networking continually increase. The rising quantities of data and ever more complex communication require high-performance components that can reliably transport the information across all levels. This is especially true if high protection types, robustness, use at high temperatures or special interfaces and connections for maximum security are needed.

With the intelligent combination of high-performance industrial networking technology and the IO-Link communication standard, Balluff makes flexible and smooth communication in the most varied application scenarios possible.

Your Balluff solutions

- Network modules
- I/O modules
- Switches
- Memory modules
- Inductive couplers

INDUSTRIAL NETWORKING

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NETWORK BLOCKS

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INDUCTIVE COUPLERS

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BASICS AND GLOSSARY

Extraordinary parameter settings and diagnostics capabilities

NETWORK BLOCKS

Balluff has developed a new generation of network modules for perfect linking of sensors and actuators. The system features highly versatile parameter settings and diagnostics possibilities that can be carried out via display, LEDs and an integrated Web server.

The status LEDs on the modules are large, bright and easy to read and interpret. This saves you time in setup, maintenance or troubleshooting. With an output current of up to 2 A, the Balluff network modules are capable of driving almost any load. Each output also offers overload protection with LED indicator and a memory feature for easy troubleshooting. The rugged, full-jacket enclosure also withstands high mechanical loads.

Features

- High performance in all networks
- Faster, simpler connection
- Reliable even in harsh environments, shock and vibration resistant
- IP67 design and rugged full-jacket enclosure
- Integrated Web server
- Line topology construction



	BNI007M BNI PNT-509-105-Z033	BNI005H BNI PNT-508-105-Z015	BNI00AZ BNI PNT-538-105-Z063	
Principle of operation	Active splitter	Active splitter	Active splitter	
Interface	Profinet I/O	Profinet I/O	Profinet I/O	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (COM 2)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	M12x1-Male, 4-pole, T-coded	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	7/8“-Female, 5-pole	M12x1-Female, 4-pole, T-coded	
Connection slots	16x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	32x PNP, Type 3	16x PNP, Type3	12x PNP, Type 3	
Digital outputs	32x PNP	16x PNP	12x PNP	
Configurable inputs/outputs	yes	yes	yes	
Output current max.	2 A	2 A	2 A	
Current sum US, sensor	9.0 A	9.0 A	12.0 A	
Current sum UA, actuator	9.0 A	9.0 A	12.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 334 mm	68 x 37.9 x 224 mm	68 x 31.7 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	IP67	
Auxiliary interfaces	16x IO-Link	8x IO-Link	8x IO-Link	
IO-Link version	1.1	1.1	1.1	
Port-class	Type A	Type A	Type A (4x) + Type B (4x)	
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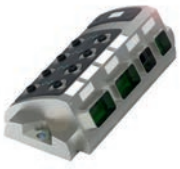



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	Active splitter	Active splitter	Active splitter	Active splitter	Active splitter
	Profinet I/O	Profinet I/O	Profinet I/O	Profinet I/O	Profinet I/O
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	Push-Pull RJ45, 8-pole	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded
	Push-Pull RJ45, 8-pole	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded
	Push/Pull, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole
	Push/Pull, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole	—	—
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	4x M12x1-Female, 5-pole, A-coded	4x M12x1-Female, 5-pole, A-coded
	16x PNP, Type 2	16x PNP, Type3	16x PNP, Type3	8x PNP, Type3	4x PNP, Type 3
	16x PNP	16x PNP	16x PNP	8x PNP	—
	yes	yes	yes	yes	no
	2 A	2 A	2 A	2 A	—
	16.0 A	9.0 A	9.0 A	9.0 A	9.0 A
	16.0 A	9.0 A	9.0 A	9.0 A	9.0 A
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	84.4 x 47 x 185.4 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	37 x 32.6 x 224 mm	37 x 32.6 x 224 mm
	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C
	IP67	IP67	IP67	IP67	IP67
	8x IO-Link	4x IO-Link	4x IO-Link	4x IO-Link	4x IO-Link
	1.1	1.1	1.1	1.1	1.1
	Type A	Type A	Type A	Type A	Type B
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	BNI0052 BNI PNT-302-105-Z015	BNI0053 BNI PNT-104-105-Z015	BNI005K BNI PNT-305-105-Z015	
Principle of operation	Active splitter	Active splitter	Active splitter	
Interface	Profinet I/O	Profinet I/O	Profinet I/O	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (COM 2)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	8x PNP, Type2	
Digital outputs	16x PNP	—	8x PNP	
Configurable inputs/outputs	yes	no	no	
Output current max.	2 A	—	2 A	
Current sum US, sensor	9.0 A	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	—	9.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	IP67	
Auxiliary interfaces	—	—	—	
IO-Link version	—	—	—	
Port-class	—	—	—	
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	BNI005F BNI PNT-202-105-Z015	BNI009M BNI PNT-508-005-E002	BNI009N BNI PNT-302-005-E002		
	Active splitter	Active splitter	Active splitter		
	Profinet I/O	Profinet I/O	Profinet I/O		
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC		
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded		
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded		
	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole		
	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole		
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded		
	—	16x PNP, Type3	16x PNP, Type3		
	8x PNP	16x PNP	16x PNP		
	no	yes	yes		
	2 A	2 A	2 A		
	9.0 A	9.0 A	9.0 A		
	9.0 A	9.0 A	9.0 A		
	Zinc, die-cast	Stainless steel (1.4571)	Stainless steel (1.4571)		
	68 x 37.9 x 224 mm	70 x 44.1 x 228 mm	70 x 44.1 x 228 mm		
	-5...70 °C	-5...70 °C	-5...70 °C		
	IP67	IP69	IP69		
	—	8x IO-Link	—		
	—	1.1	—		
	—	Type A	—		
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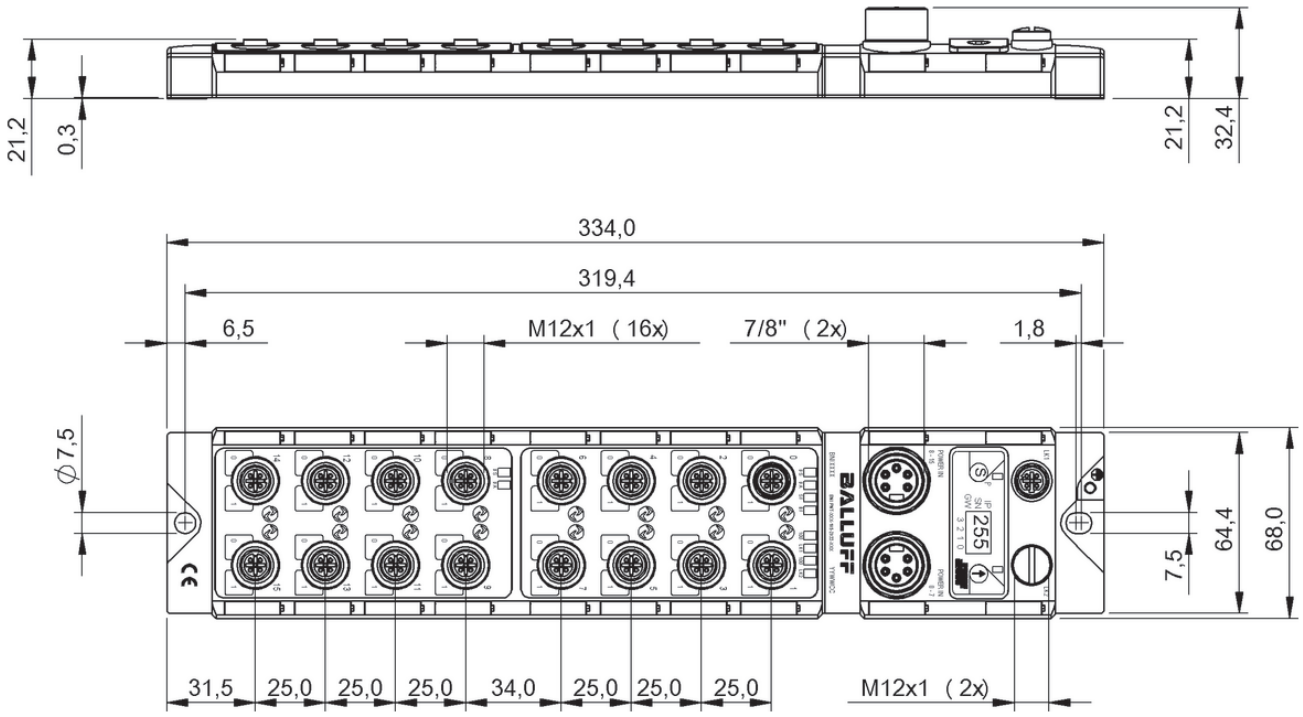

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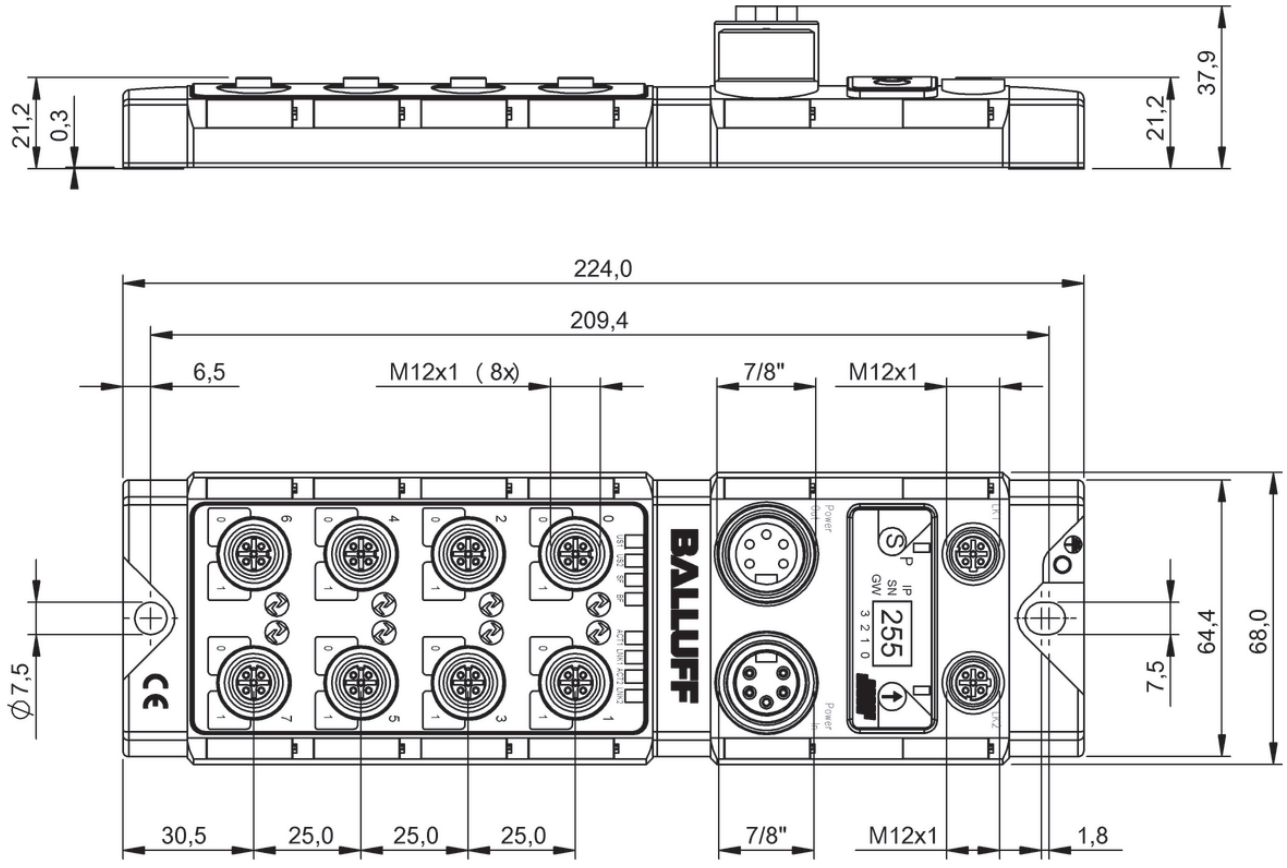

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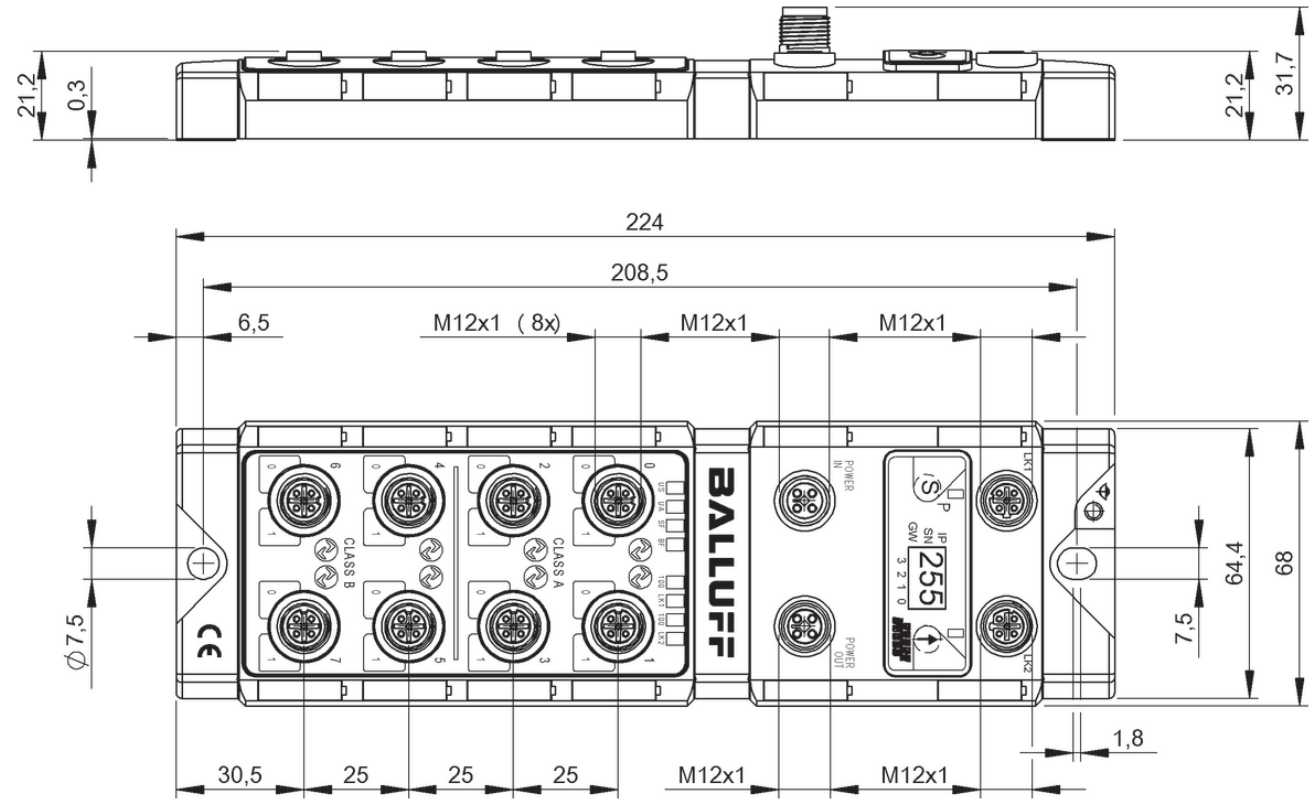

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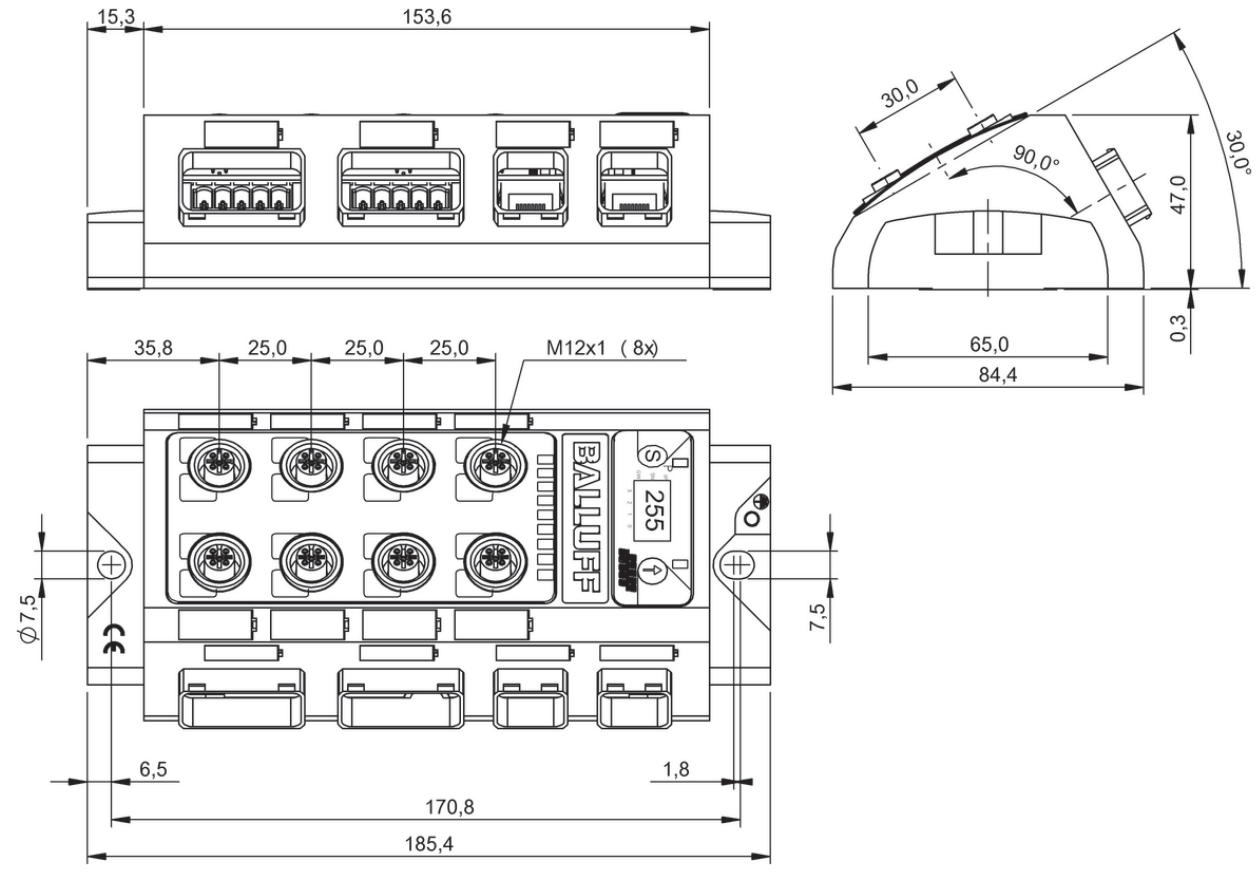

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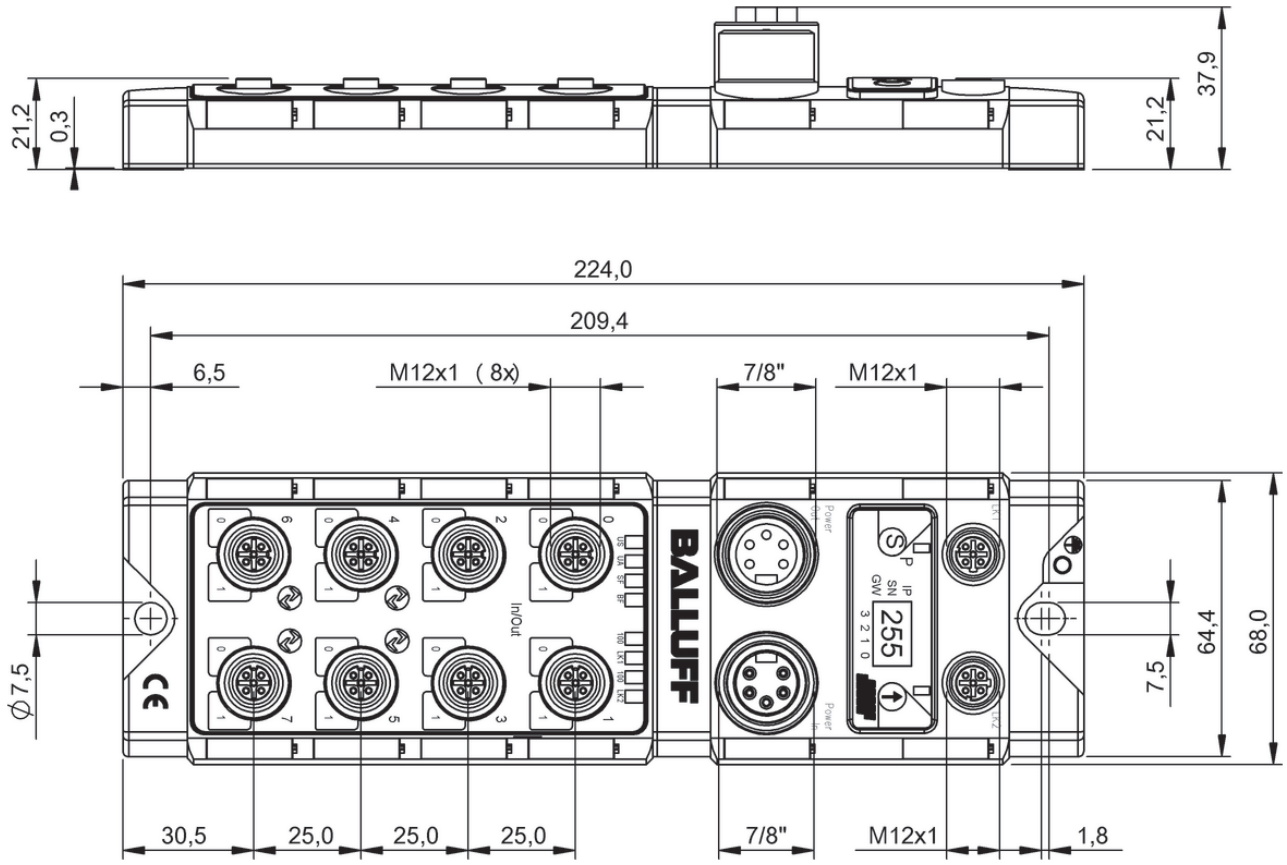

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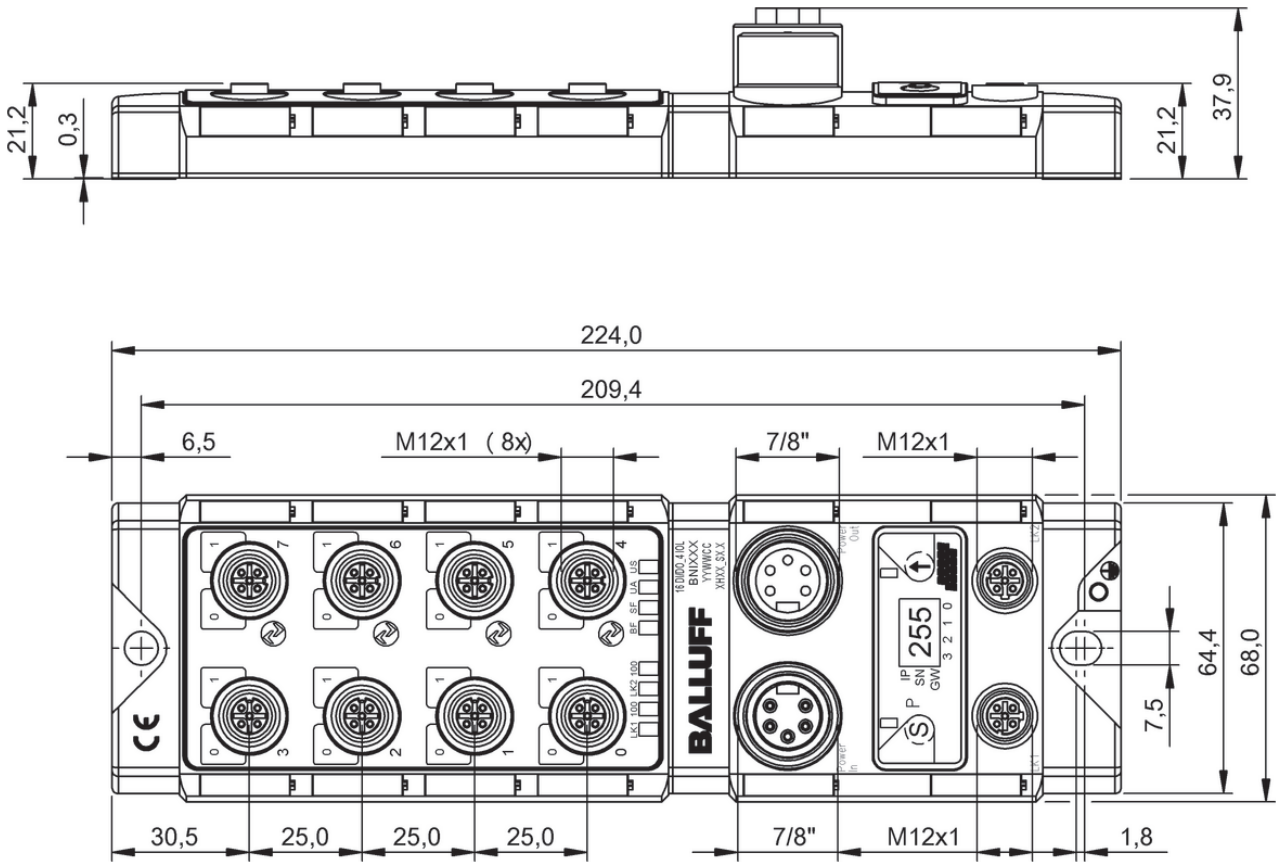

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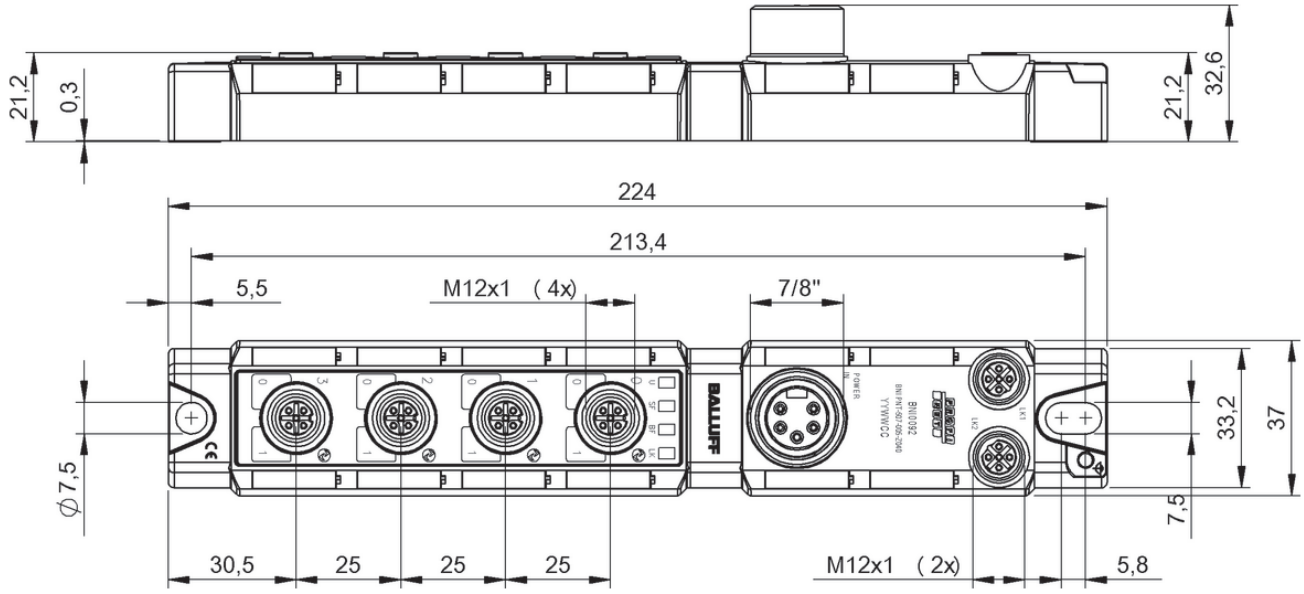

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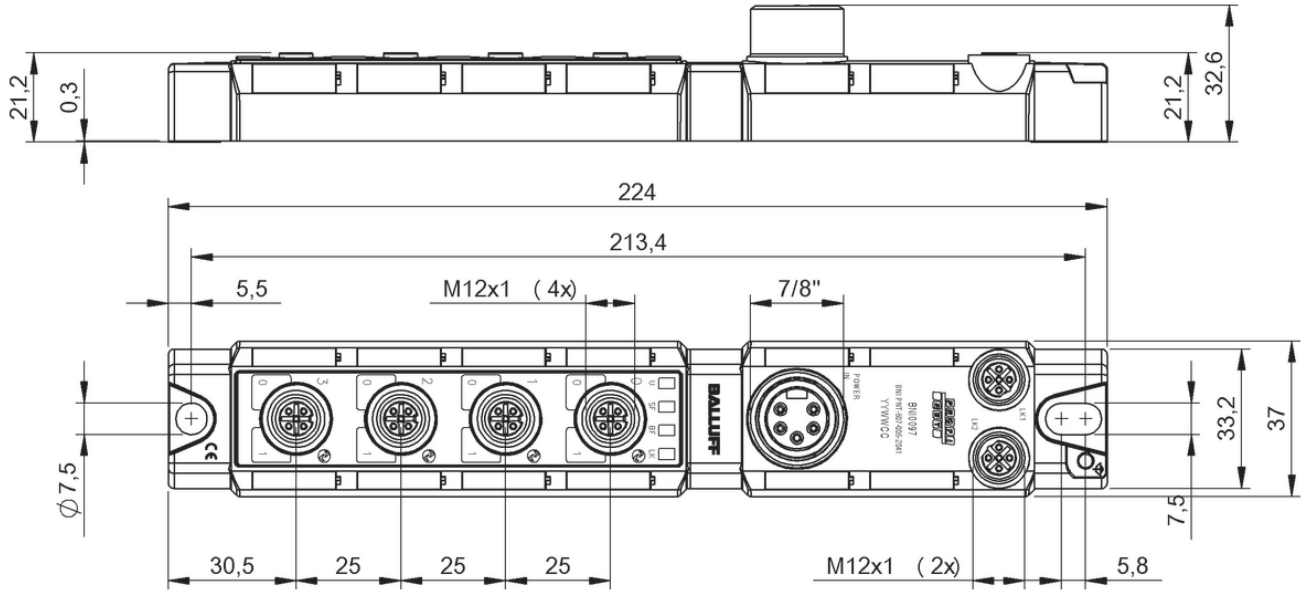

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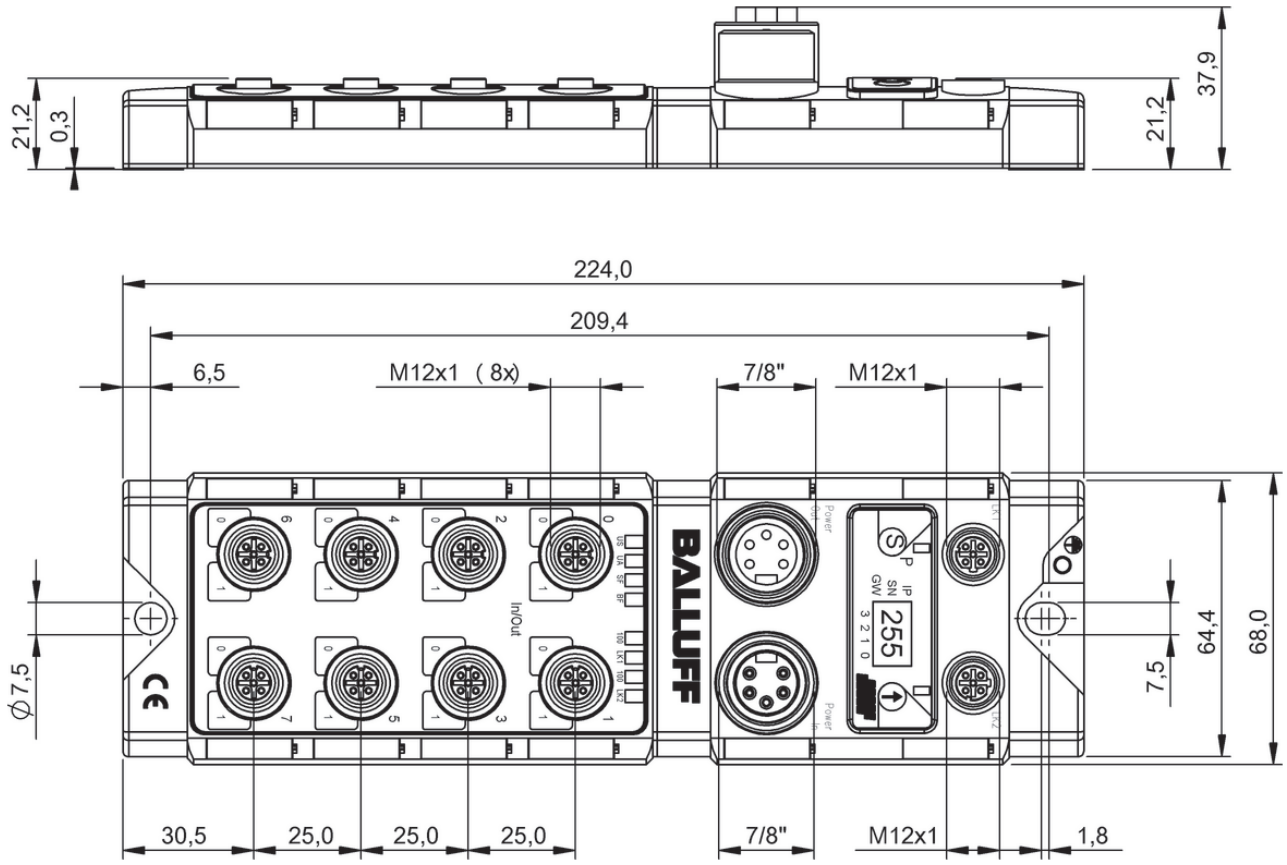

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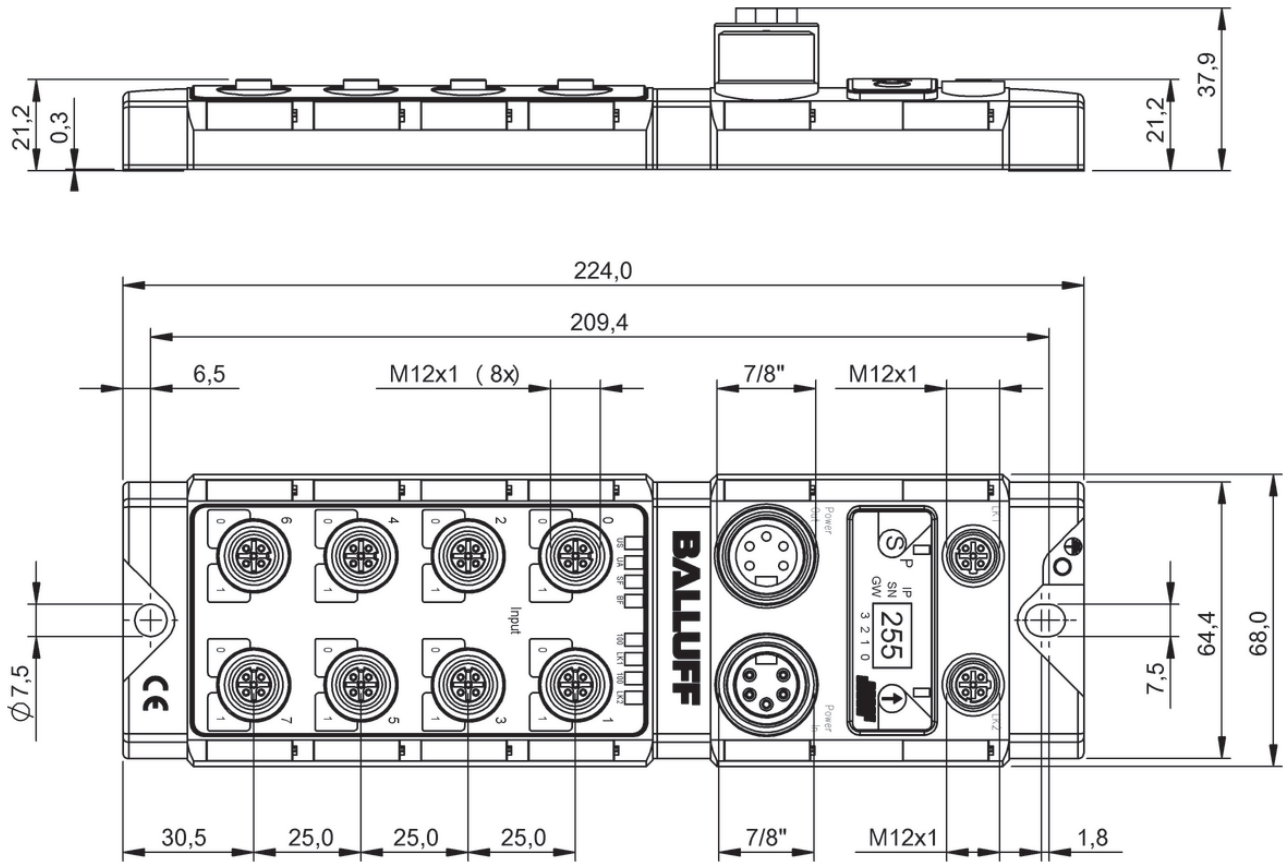

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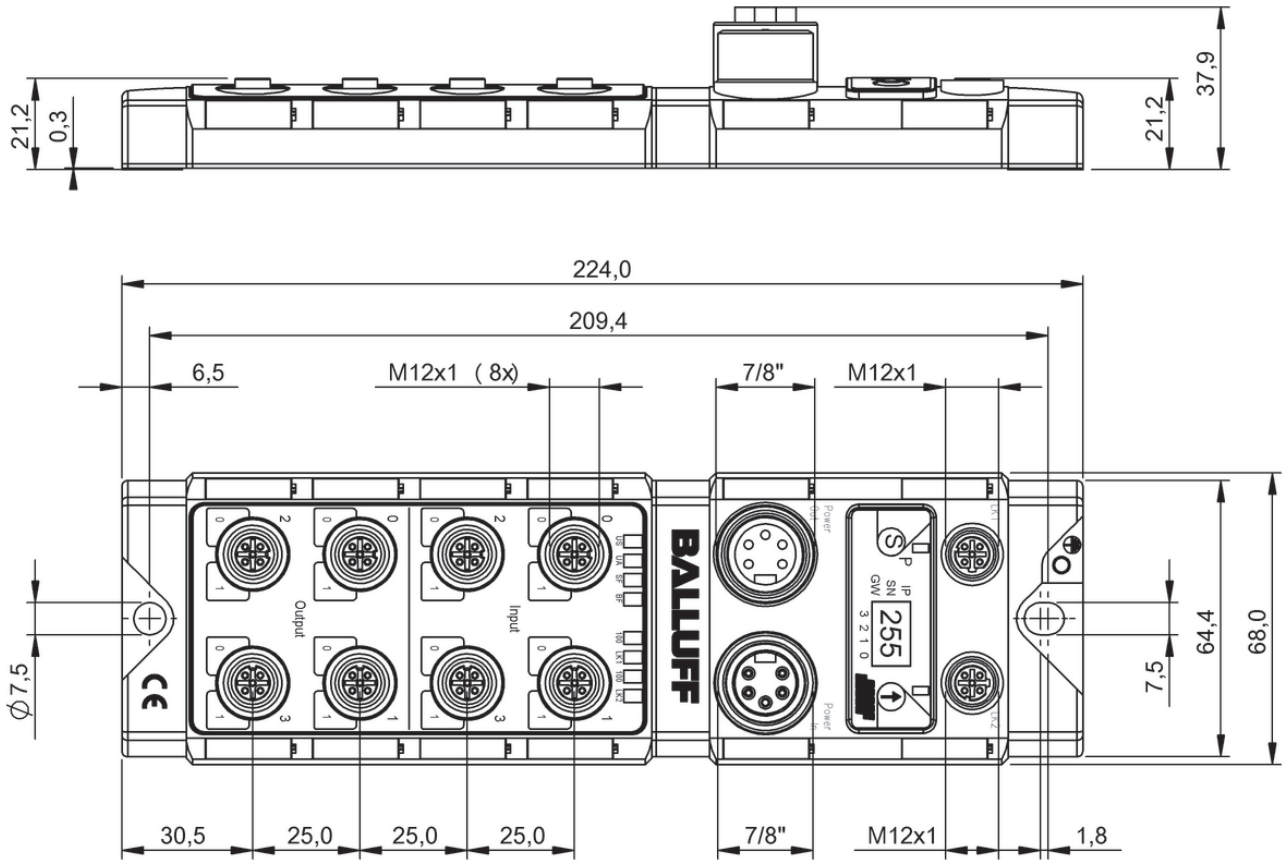

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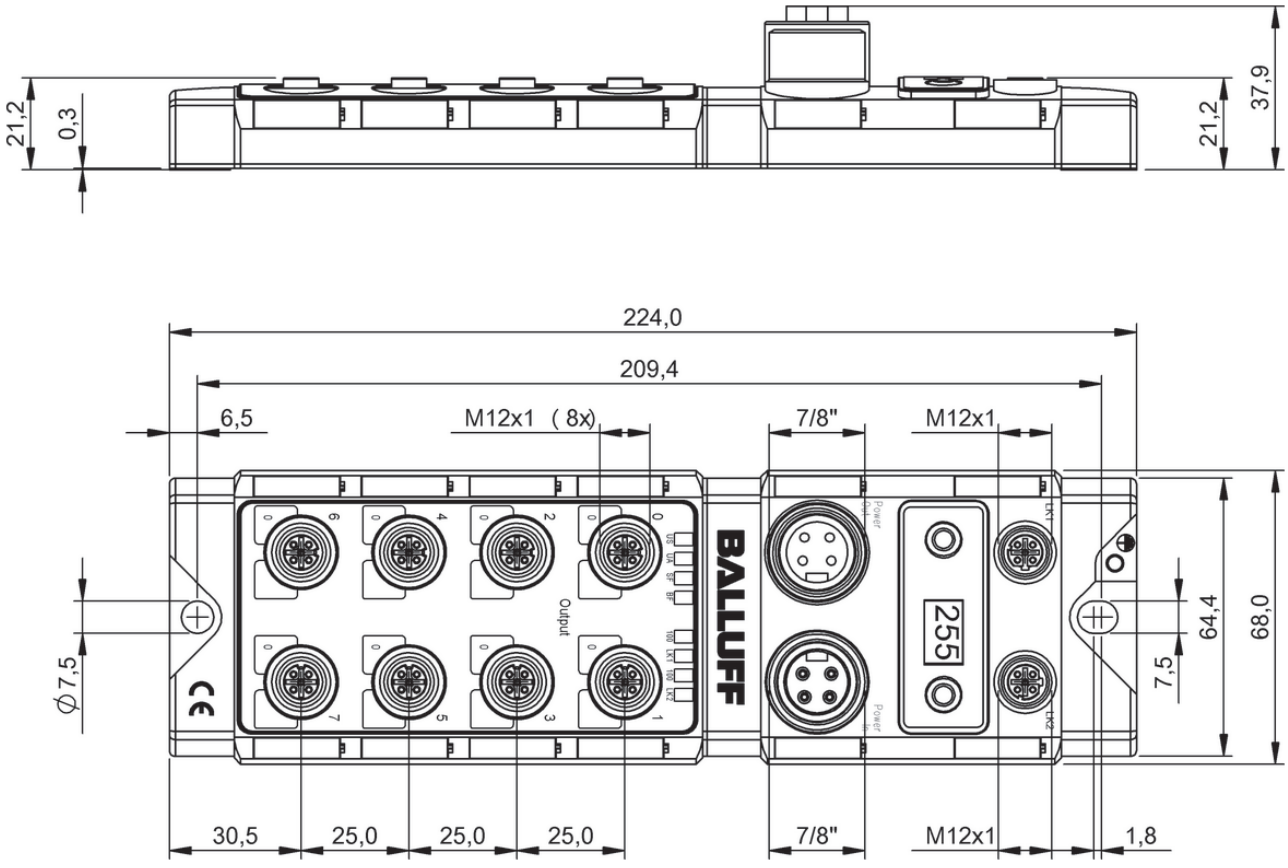
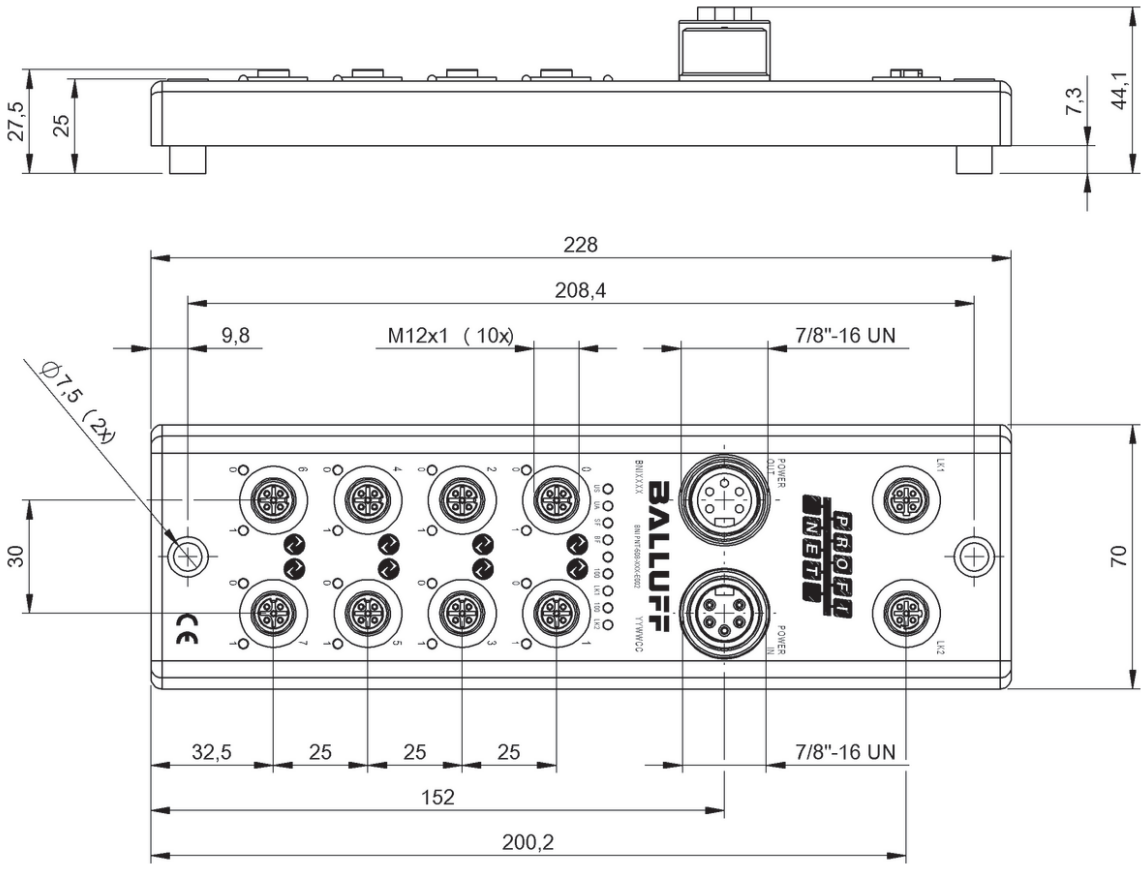
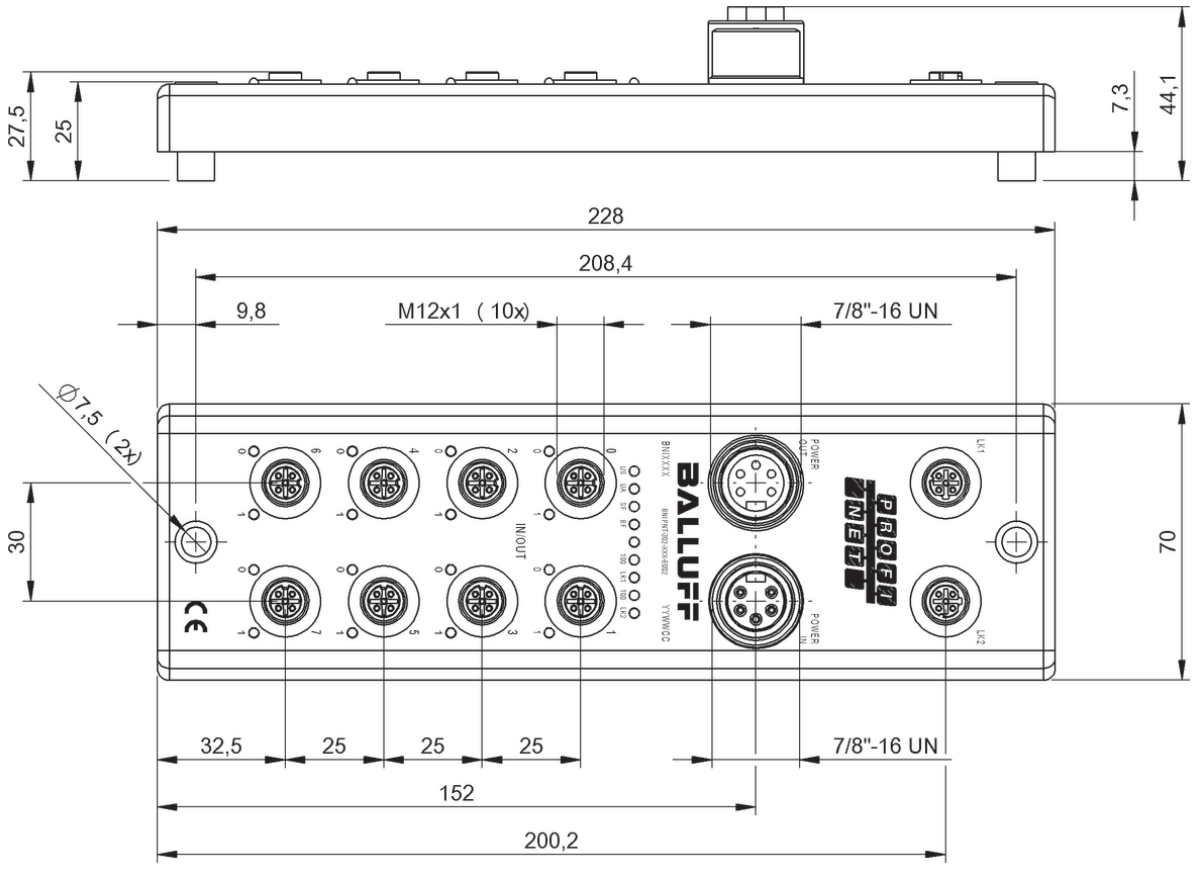


BNI005F



BNI009M



BNI009N

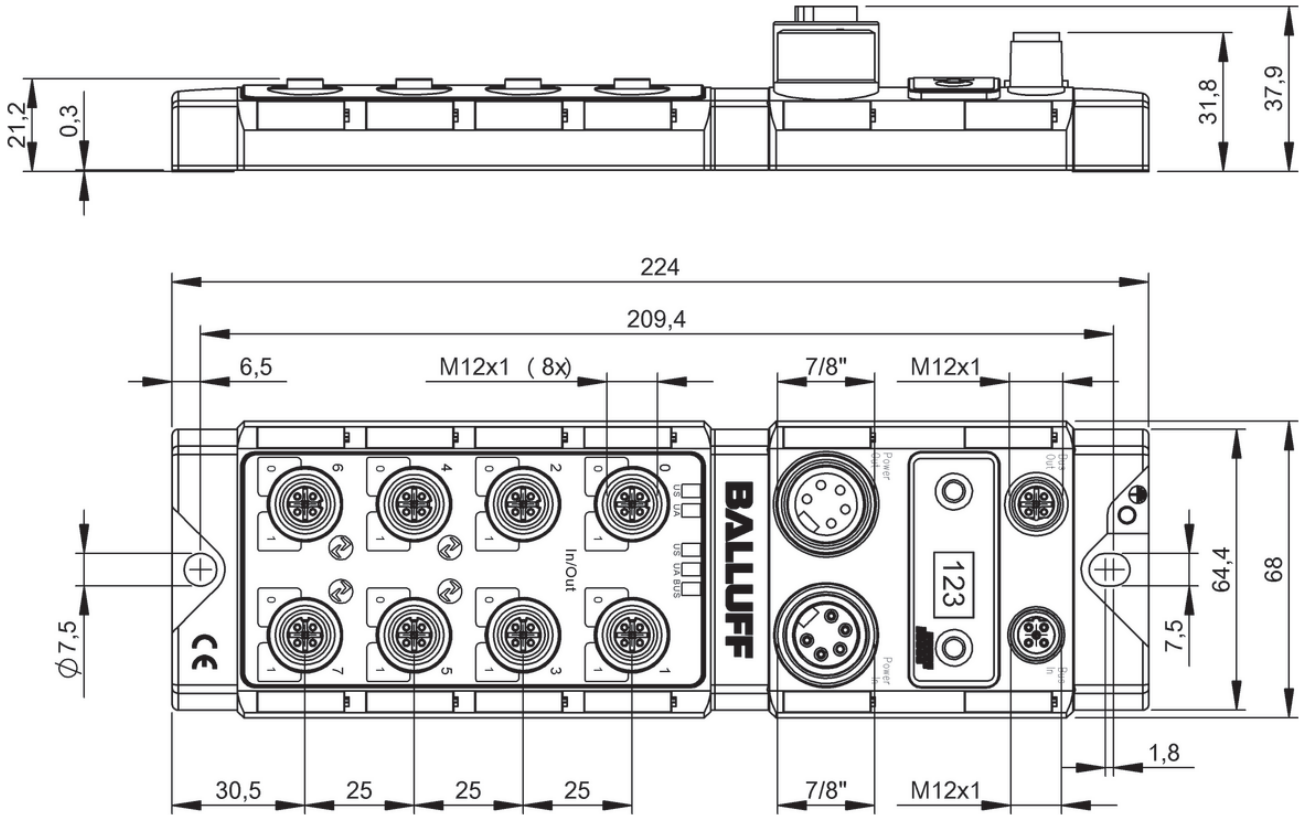
	BNI005R BNI PBS-502-101-Z001	BNI004N BNI PBS-507-002-Z011	
Principle of operation	Active splitter	Active splitter	
Interface	Profibus DP EN 50170	Profibus DP EN 50170	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	Bus in: M12x1-Male, 5-pole, B-coded	Bus in: M12x1-Male, 5-pole, B-coded	
Connection (COM 2)	Bus out: M12x1-Female, 5-pole, B-coded	Bus out: M12x1-Female, 5-pole, B-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	—	
Connection slots	8x M12x1-Female, 5-pole, A-coded	4x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	8x PNP, Type2	
Digital outputs	16x PNP	8x PNP	
Analog inputs	—	—	
Configurable inputs/outputs	yes	yes	
Output current max.	2 A	2 A	
Current sum US, sensor	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	9.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	37 x 32.4 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	
Auxiliary interfaces	4x IO-Link	4x IO-Link	
IO-Link version	1.1	1.1	
Port-class	Type A	Type A	
Productview	Page 116	Page 116	



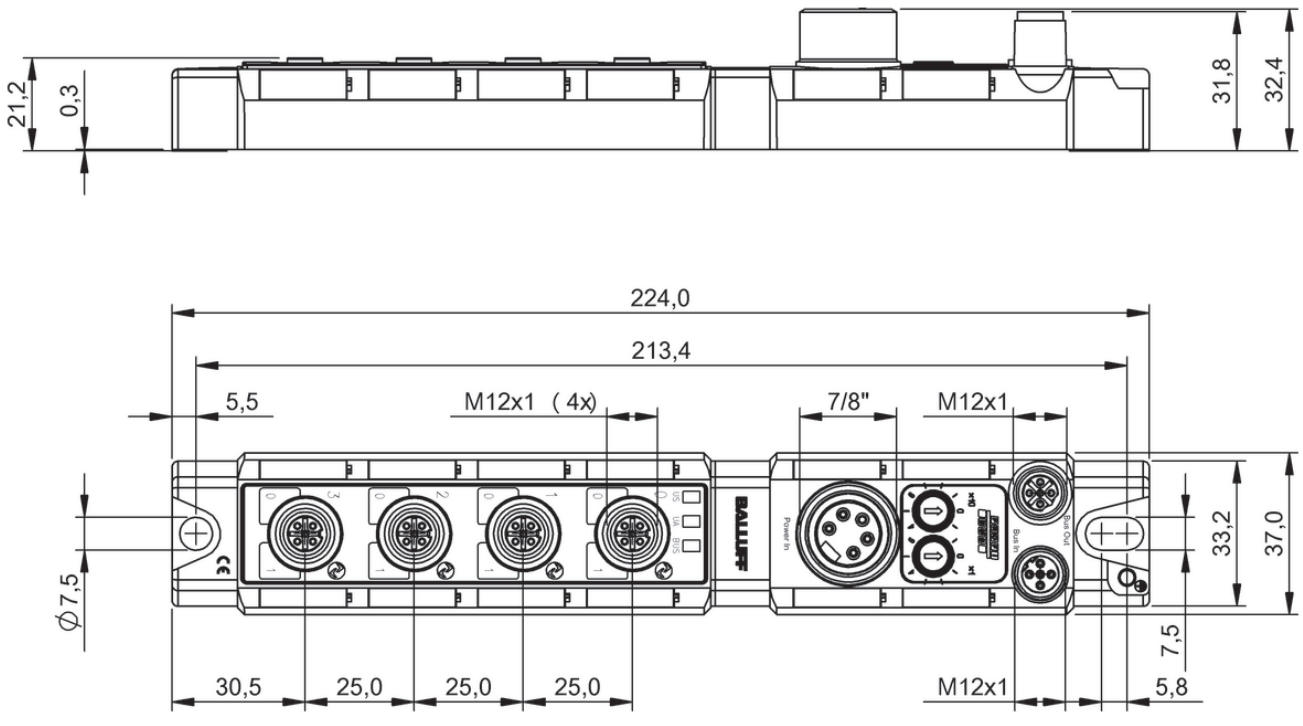

	BNI0064 BNI PBS-551-001-Z001	BNI0065 BNI PBS-552-001-Z001	BNI0054 BNI PBS-302-103-Z001	BNI003Z BNI PBS-302-102-Z001
	Active splitter	Active splitter	Active splitter	Active splitter
	Profibus DP EN 50170	Profibus DP EN 50170	Profibus DP EN 50170	Profibus DP EN 50170
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	Bus in: M12x1-Male, 5-pole, B-coded	Bus in: M12x1-Male, 5-pole, B-coded	Bus in: M12x1-Male, 5-pole, B-coded	Bus in: M12x1-Male, 5-pole, B-coded
	Bus out: M12x1-Female, 5-pole, B-coded	Bus out: M12x1-Female, 5-pole, B-coded	Bus out: M12x1-Female, 5-pole, B-coded	Bus out: M12x1-Female, 5-pole, B-coded
	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole
	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole
	4x M12x1-Female, 5-pole, A-coded 4x M12x1-Female, 8-pole, A-coded	4x M12x1-Female, 5-pole, A-coded 4x M12x1-Female, 8-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	8x PNP, Type2	—	16x PNP, Type 2	16x PNP, Type 2
	—	—	16x PNP	16x PNP
	—	4x Analog, voltage/Analog, current	—	—
	no	no	yes	yes
	—	—	2 A	2 A
	9.0 A	9.0 A	9.0 A	9.0 A
	—	—	9.0 A	9.0 A
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm
	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C
	IP67	IP67	IP67	IP67
	4x BTL P-111	4x BTL P-111	—	—
	—	—	—	—
	—	—	—	—
	Page 117	Page 117	Page 118	Page 118

	BNI0047 BNI PBS-302-101-Z001	BNI005C BNI PBS-104-101-Z001	
Principle of operation	Active splitter	Active splitter	
Interface	Profibus DP EN 50170	Profibus DP EN 50170	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	Bus in: M12x1-Male, 5-pole, B-coded	Bus in: M12x1-Male, 5-pole, B-coded	
Connection (COM 2)	Bus out: M12x1-Female, 5-pole, B-coded	Bus out: M12x1-Female, 5-pole, B-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	7/8“-Female, 5-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	16x PNP	—	
Analog inputs	—	—	
Configurable inputs/outputs	yes	no	
Output current max.	2 A	—	
Current sum US, sensor	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	—	
Housing material	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	
Auxiliary interfaces	—	—	
IO-Link version	—	—	
Port-class	—	—	
Productview	Page 119	Page 119	

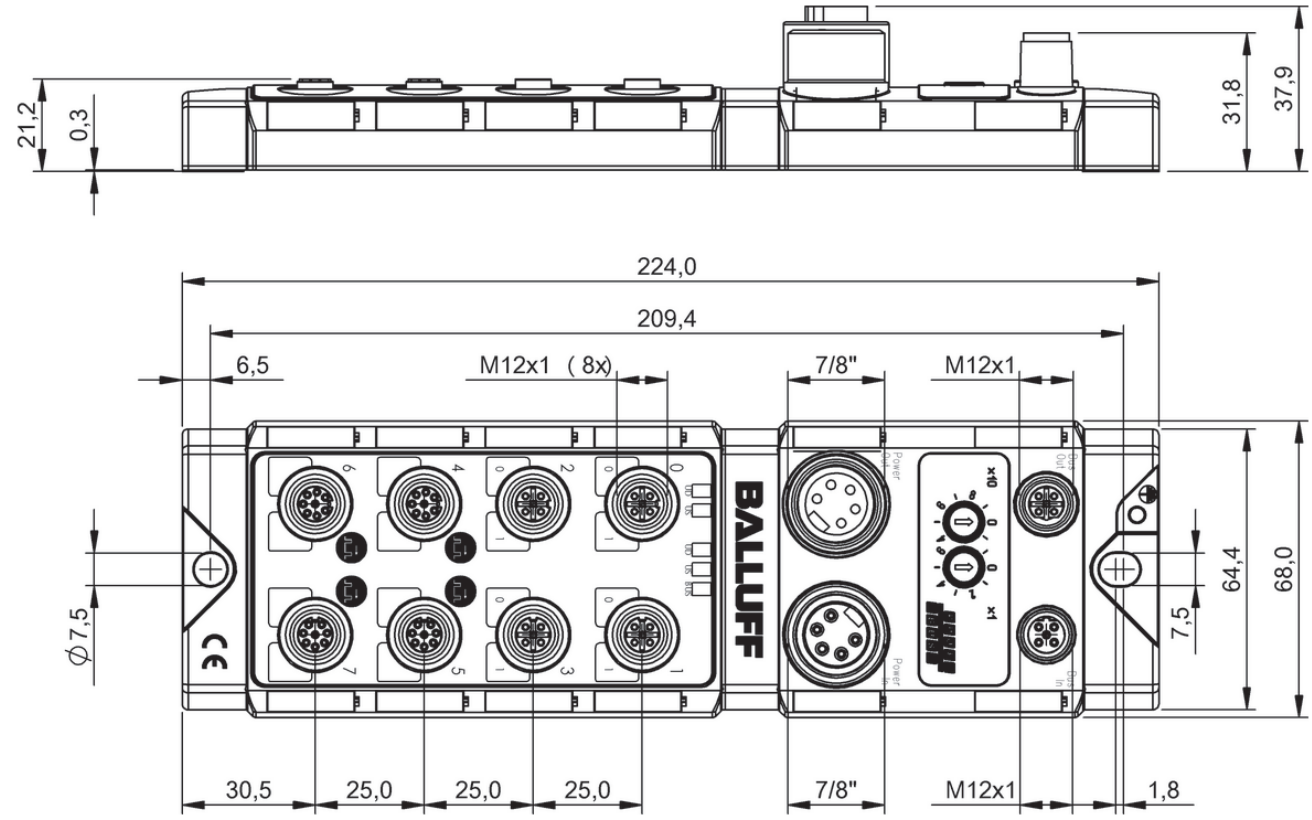
	BNI004P BNI PBS-504-002-K008			
	Active splitter			
	Profibus DP EN 50170			
	18...30.2 VDC			
	D-Sub-Female, 9-pole			
	—			
	Spring terminal			
	—			
	4x M12x1-Female, 5-pole, A-coded			
	4x PNP, Type2			
	4x PNP			
	—			
	yes			
	2 A			
	9.0 A			
	9.0 A			
	ABS			
	75.8 x 10 x 150.8 mm			
	-5...55 °C			
	IP54			
	4x IO-Link			
	1.1			
	Type A			
	Page 119			



BNI005R



BNI004N



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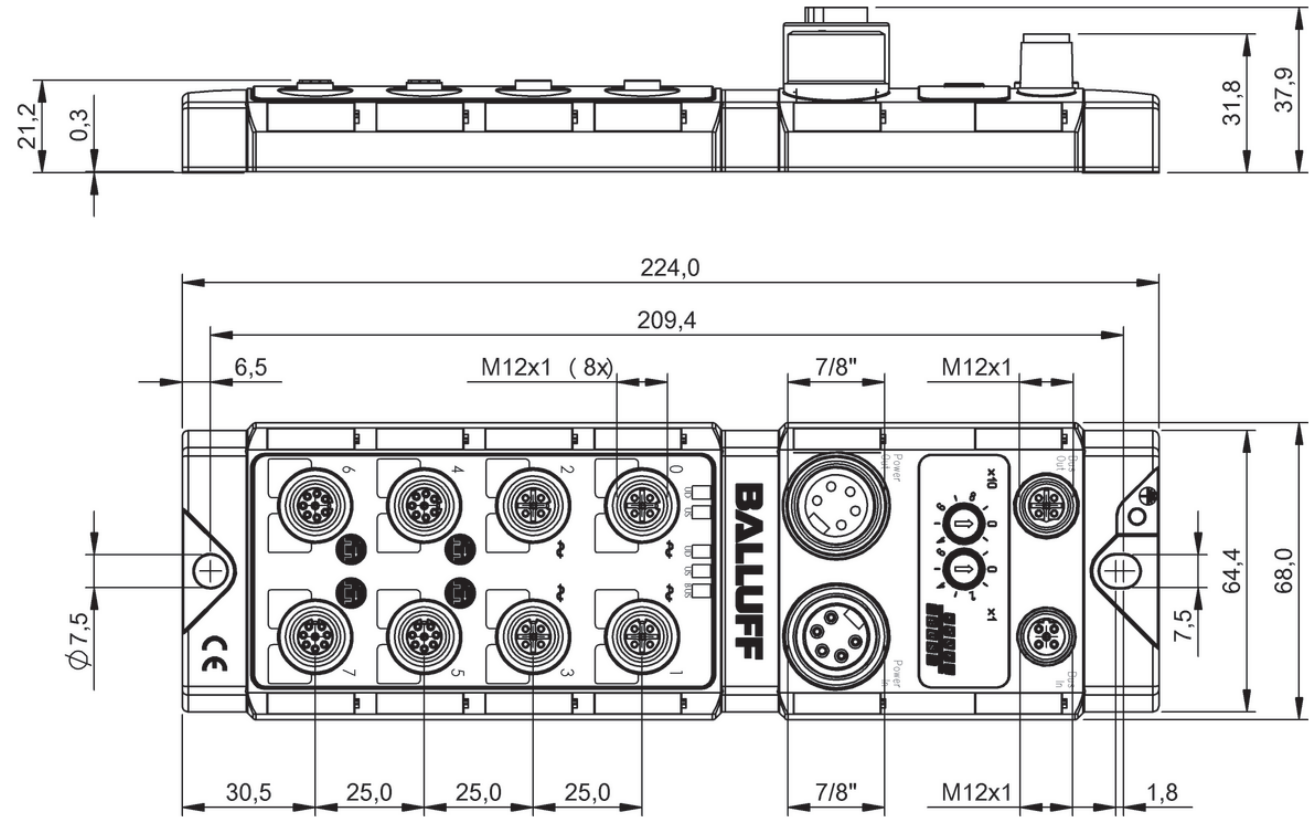
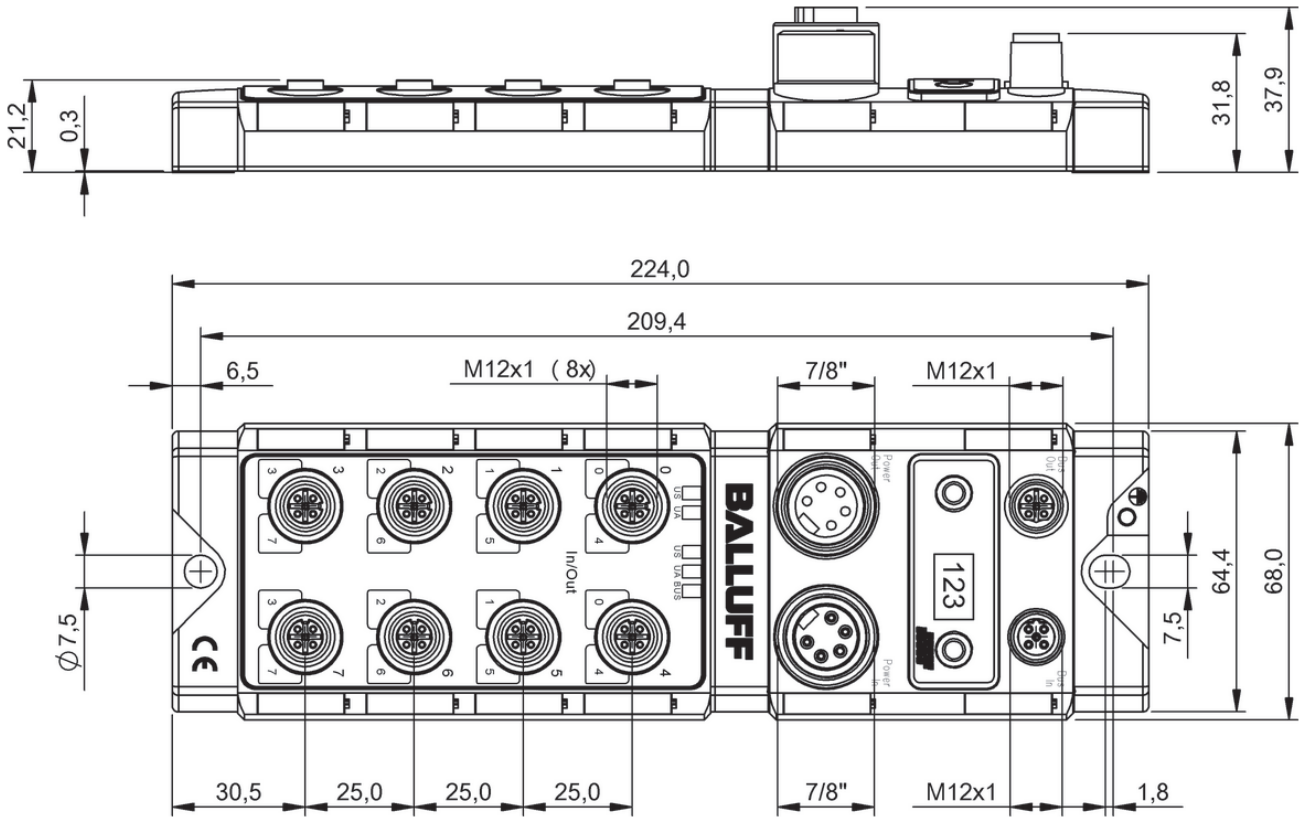
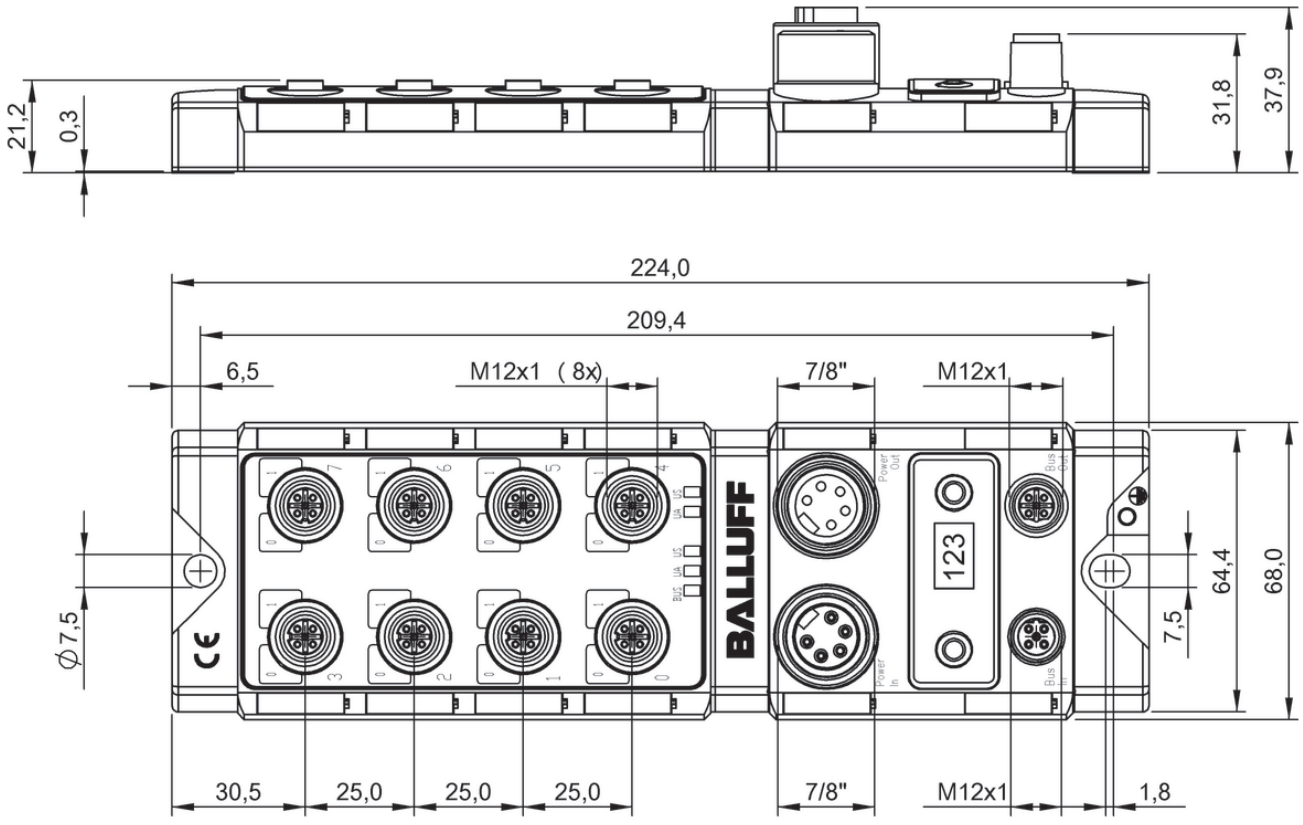


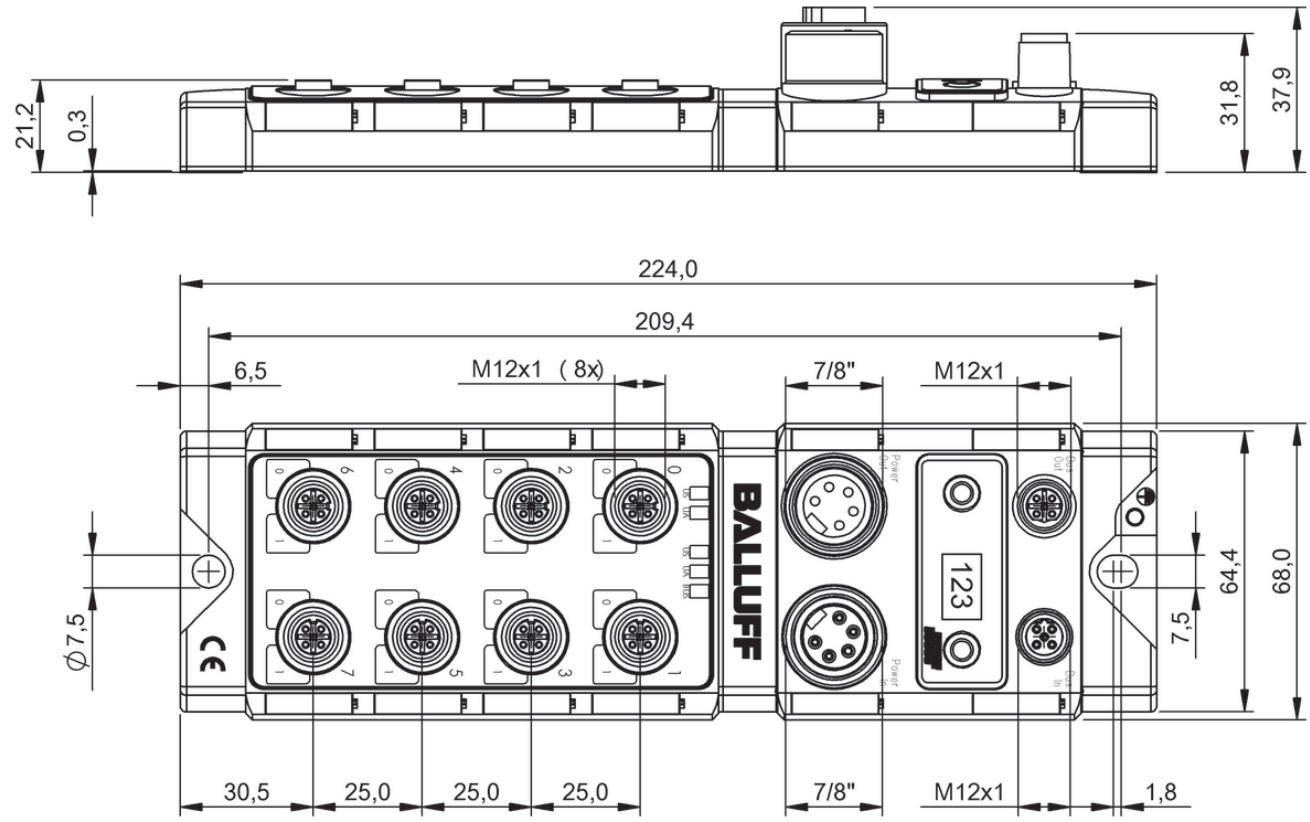
BNI0065



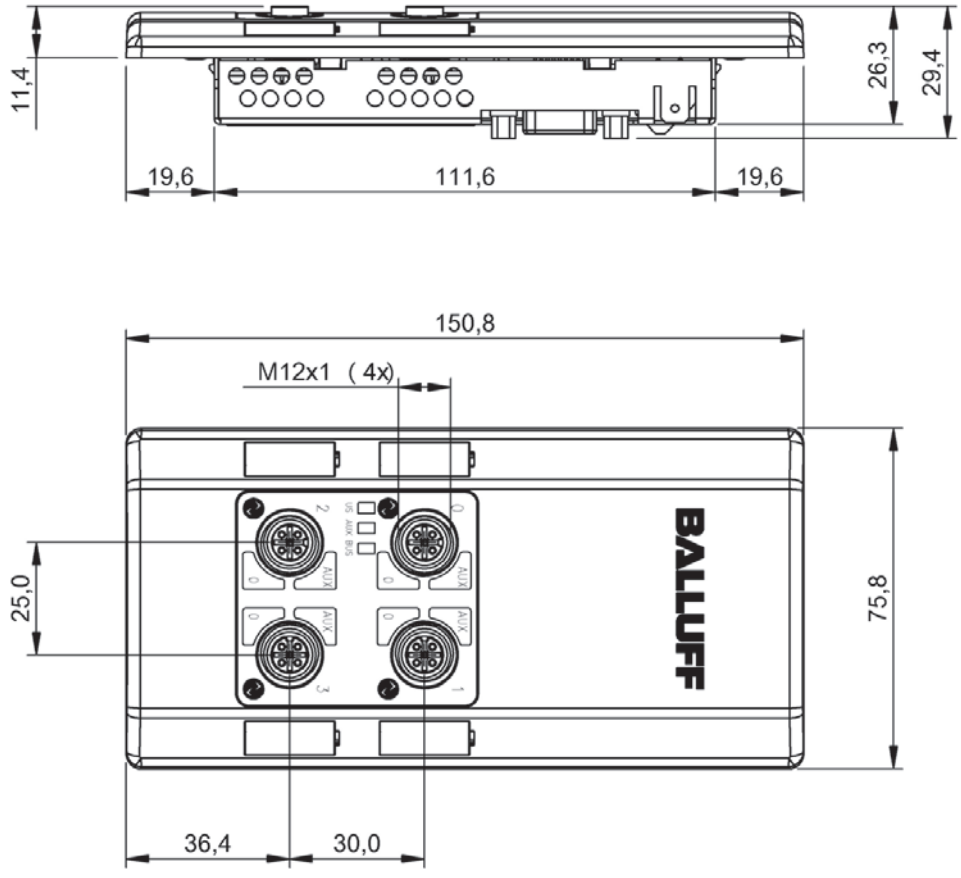
BNI0054



BNI003Z



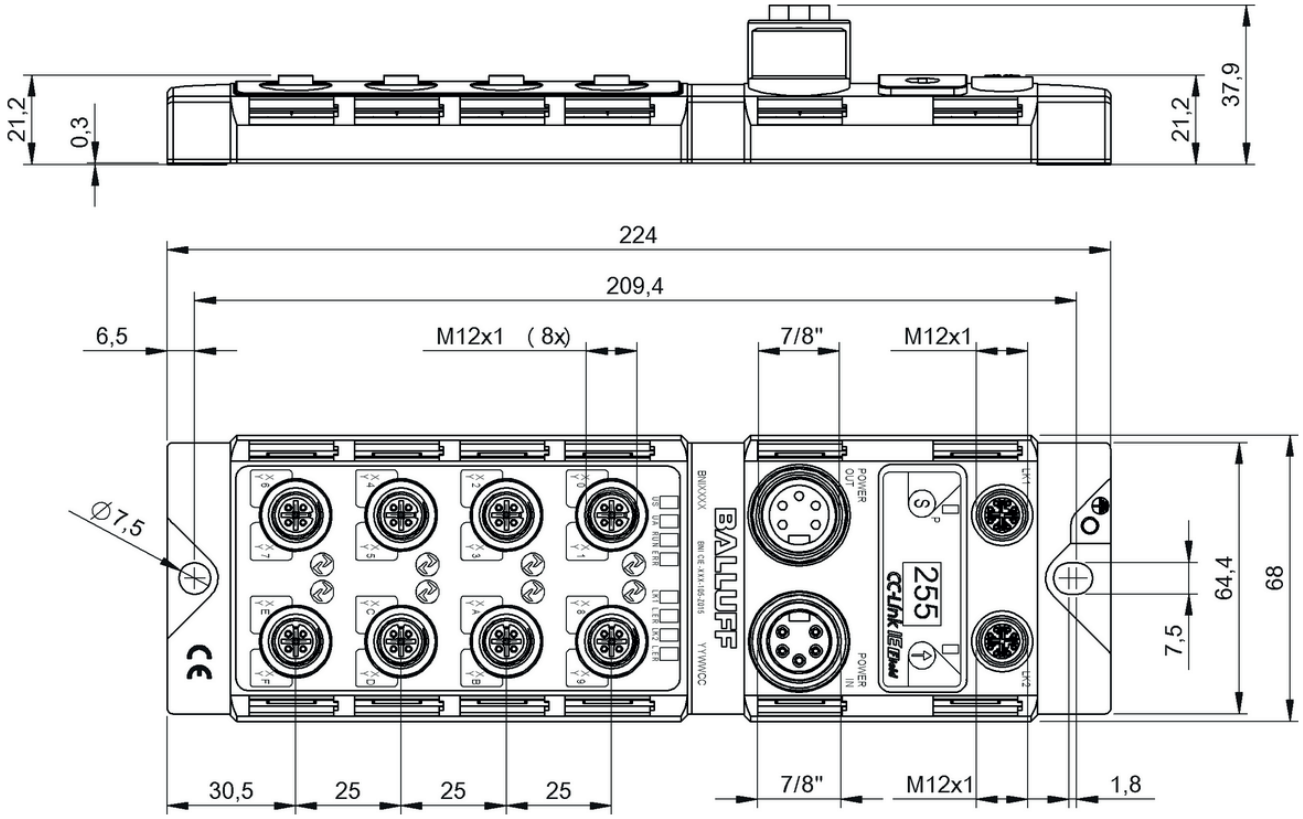
BNI0047, BNI005C



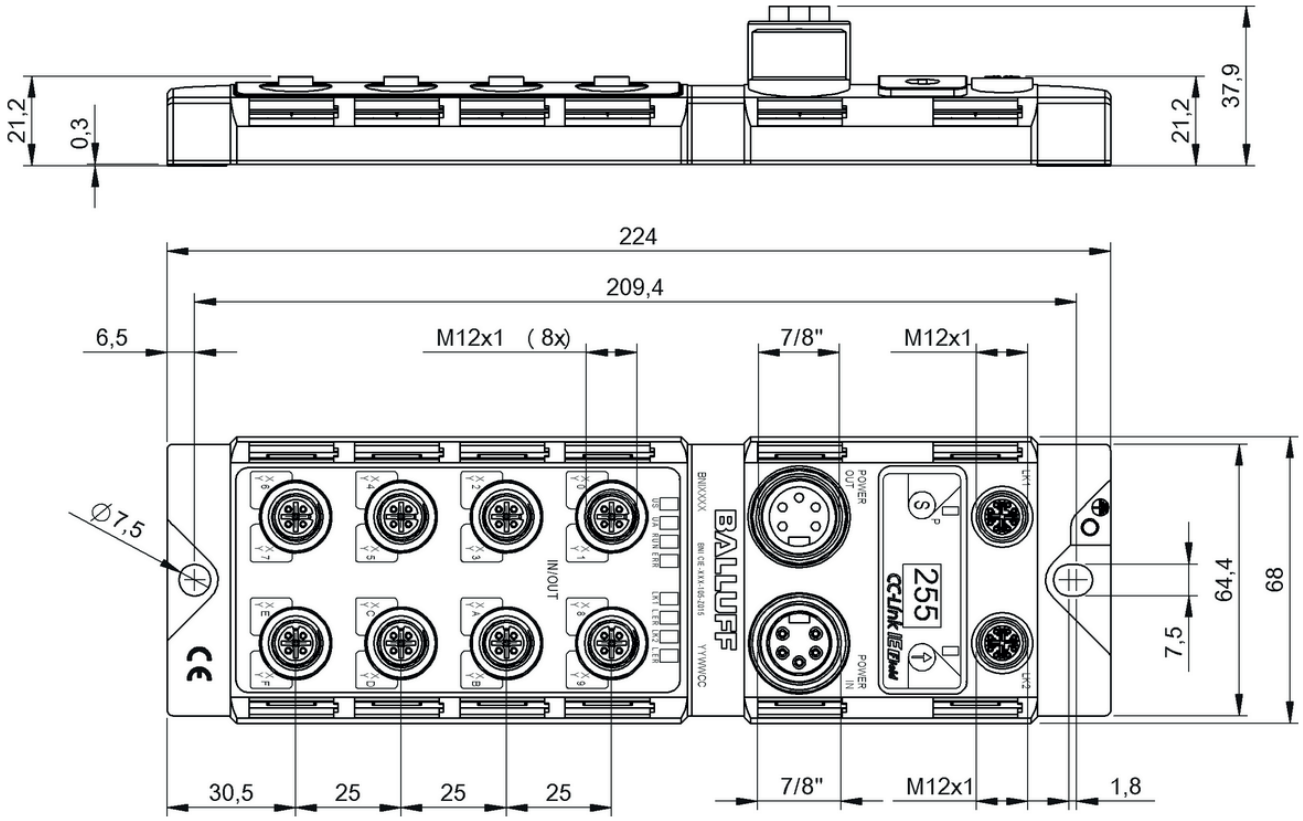
BNI004P

	BNI008C BNI CIE-508-105-Z015	
Principle of operation	Active splitter	
Interface	CC-Link IE Field V0	
Operating voltage Ub	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 8-pole, X-coded	
Connection (COM 2)	M12x1-Female, 8-pole, X-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type3	
Digital outputs	16x PNP	
Configurable inputs/outputs	yes	
Output current max.	2 A	
Current sum US, sensor	9.0 A	
Current sum UA, actuator	9.0 A	
Housing material	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	
Protection degree	IP67	
Auxiliary interfaces	8x IO-Link	
IO-Link version	1.1	
Port-class	Type A	
Productview	Page 122	

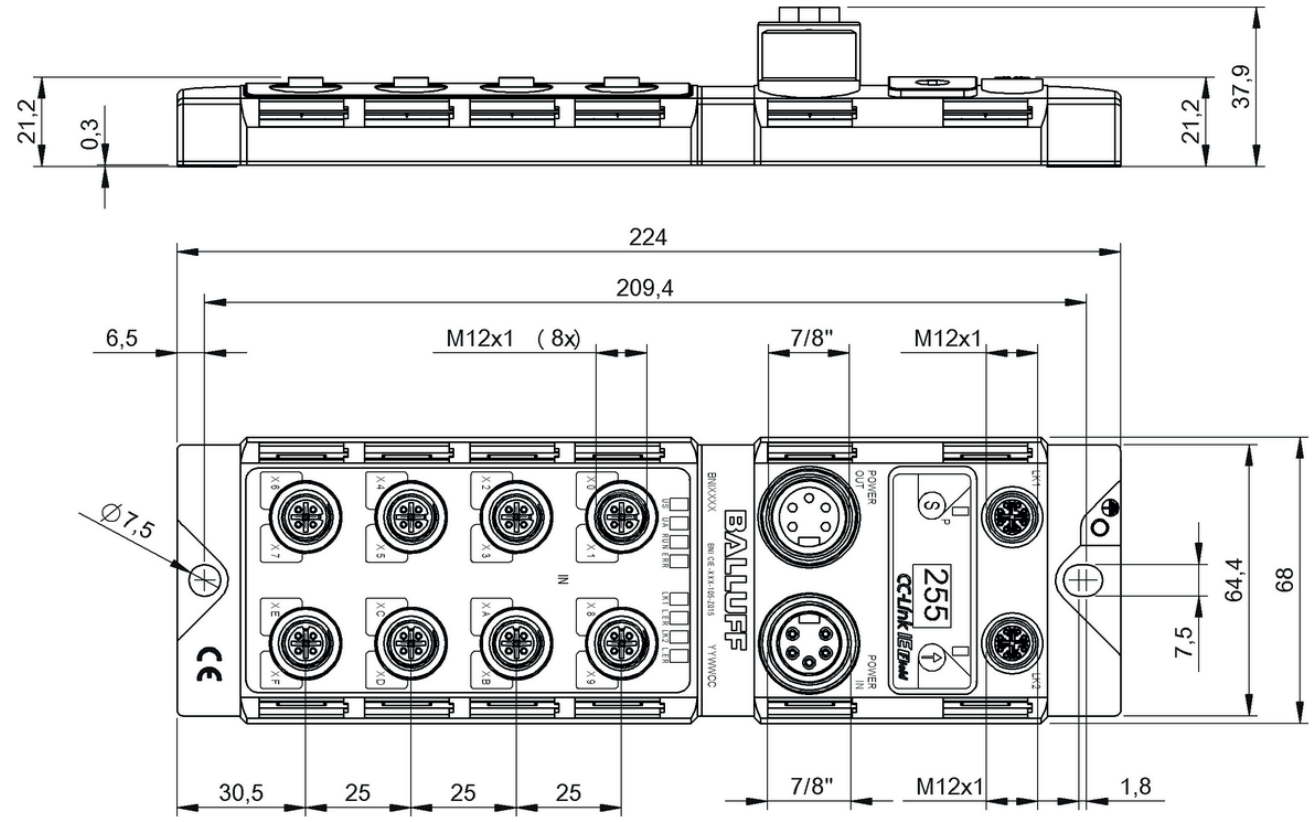
	BNI0095 BNI CIE-302-105-Z015	BNI0094 BNI CIE-104-105-Z015	BNI008T BNI CIE-106-105-Z015
	Active splitter	Active splitter	Active splitter
	CC-Link IE Field V0	CC-Link IE Field V0	CC-Link IE Field V0
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Female, 8-pole, X-coded	M12x1-Female, 8-pole, X-coded	M12x1-Female, 8-pole, X-coded
	M12x1-Female, 8-pole, X-coded	M12x1-Female, 8-pole, X-coded	M12x1-Female, 8-pole, X-coded
	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole
	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type3	16x PNP, Type3	16x NPN, Type3
	16x PNP	—	—
	yes	no	no
	2 A	—	—
	9.0 A	9.0 A	9.0 A
	9.0 A	—	—
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm
	-5...70 °C	-5...70 °C	-5...70 °C
	IP67	IP67	IP67
	—	—	—
	—	—	—
	—	—	—
	Page 122	Page 123	Page 123



BNI008C



BNI0095



BNI0094, BNI008T

	BNI0040 BNI CCL-502-100-Z001	BNI002A BNI CCL-302-100-Z001	
Principle of operation	Active splitter	Active splitter	
Interface	CC-Link V1.1	CC-Link V1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (COM 2)	M12x1-Female, 4-pole, A-coded	M12x1-Female, 4-pole, A-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	
Connection (supply voltage OUT)	7/8“-Female, 5-pole	7/8“-Female, 5-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	16x PNP	16x PNP	
Configurable inputs/outputs	yes	yes	
Output current max.	2 A	2 A	
Current sum US, sensor	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	9.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP67	IP67	
Auxiliary interfaces	4x IO-Link	—	
IO-Link version	1.1	—	
Port-class	Type A	—	
Productview	Page 126	Page 126	




	BNI002F BNI CCL-104-100-Z001	BNI0049 BNI CCL-106-100-Z001	BNI002C BNI CCL-305-100-Z001	BNI002E BNI CCL-202-100-Z001
	Active splitter	Active splitter	Active splitter	Active splitter
	CC-Link V1.1	CC-Link V1.1	CC-Link V1.1	CC-Link V1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	M12x1-Female, 4-pole, A-coded	M12x1-Female, 4-pole, A-coded	M12x1-Female, 4-pole, A-coded	M12x1-Female, 4-pole, A-coded
	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole
	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type 2	16x NPN, Type2	8x PNP, Type2	—
	—	—	8x PNP	8x PNP
	no	no	no	no
	—	—	2 A	2 A
	9.0 A	9.0 A	9.0 A	—
	—	—	9.0 A	9.0 A
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm
	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C
	IP67	IP67	IP67	IP67
	—	—	—	—
	—	—	—	—
	—	—	—	—
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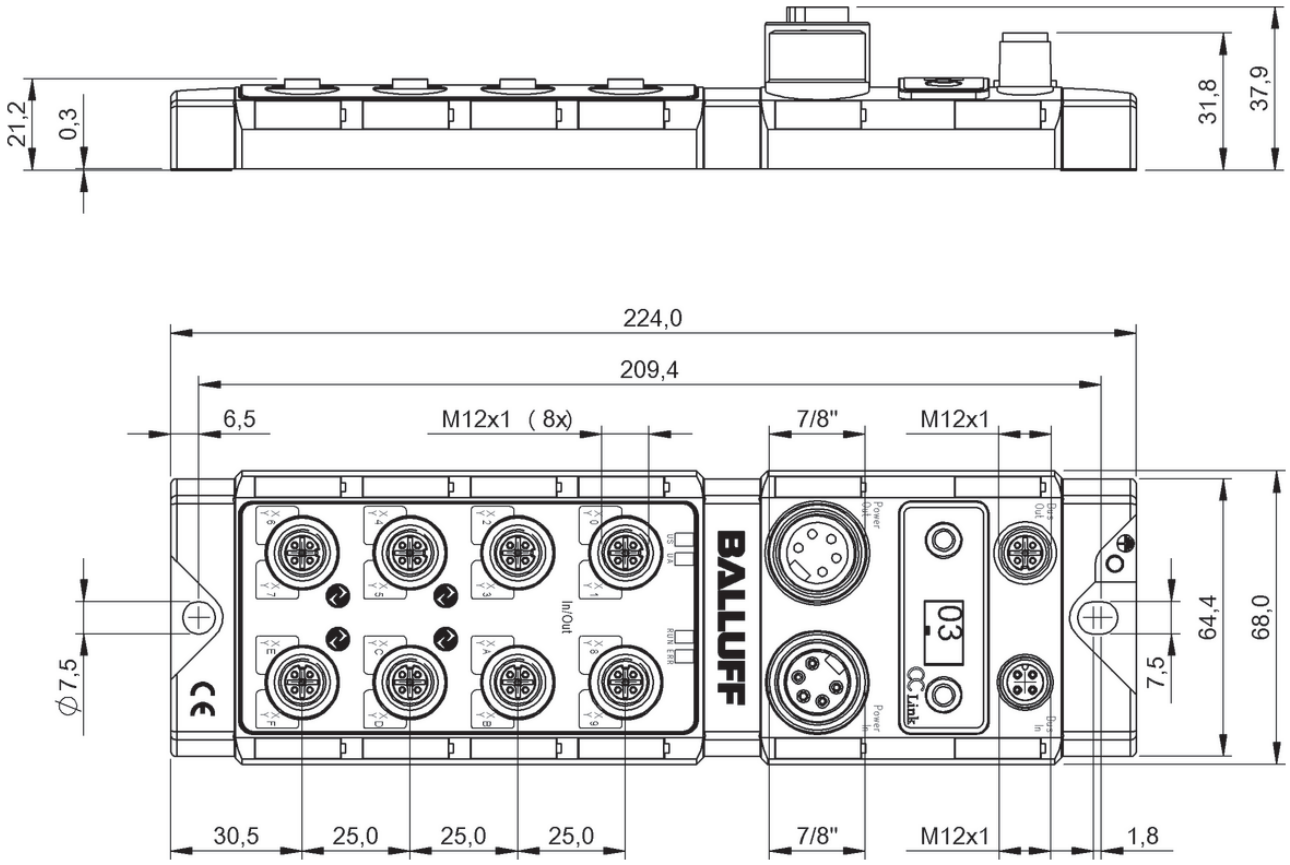
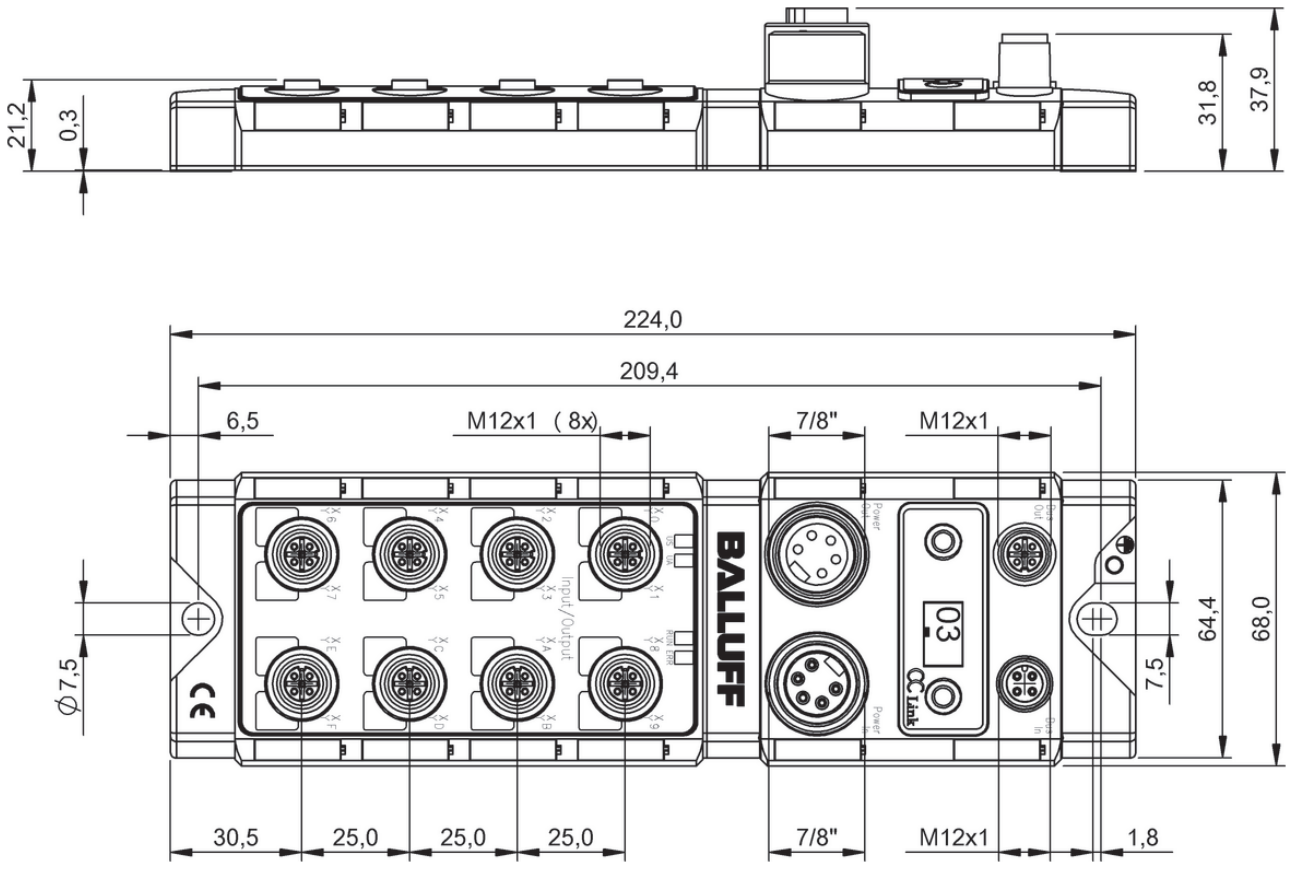
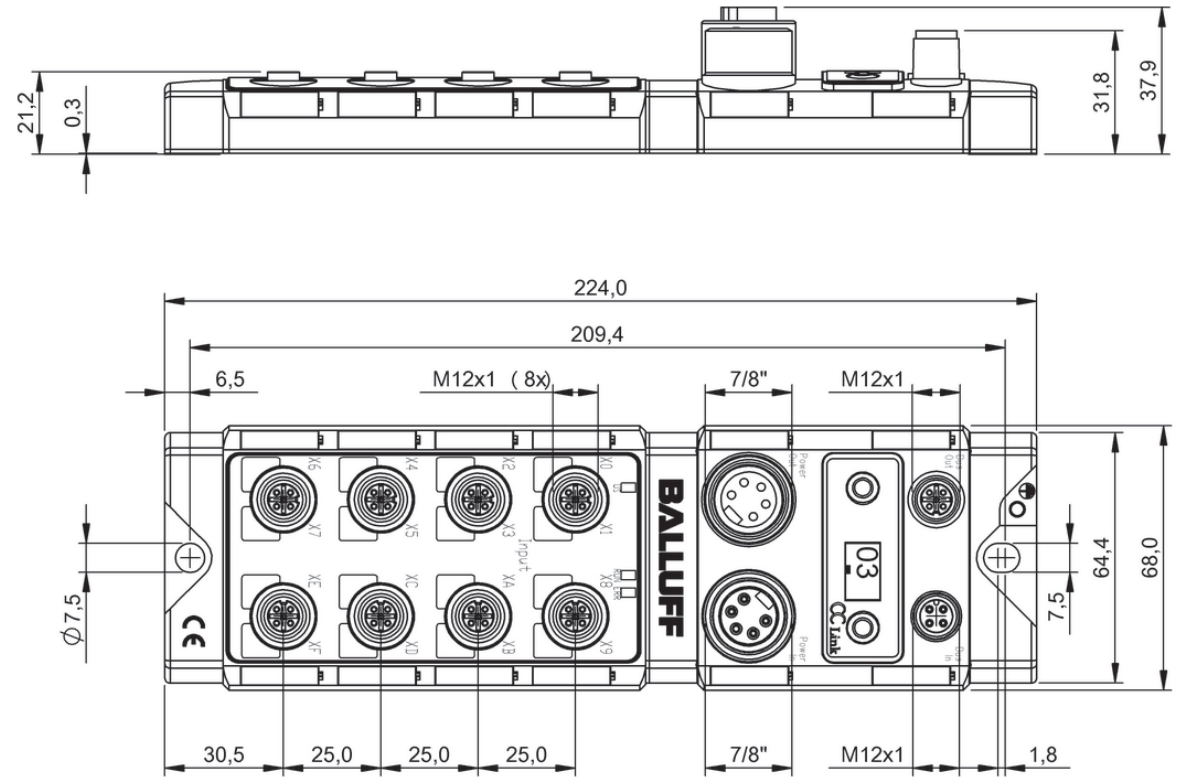


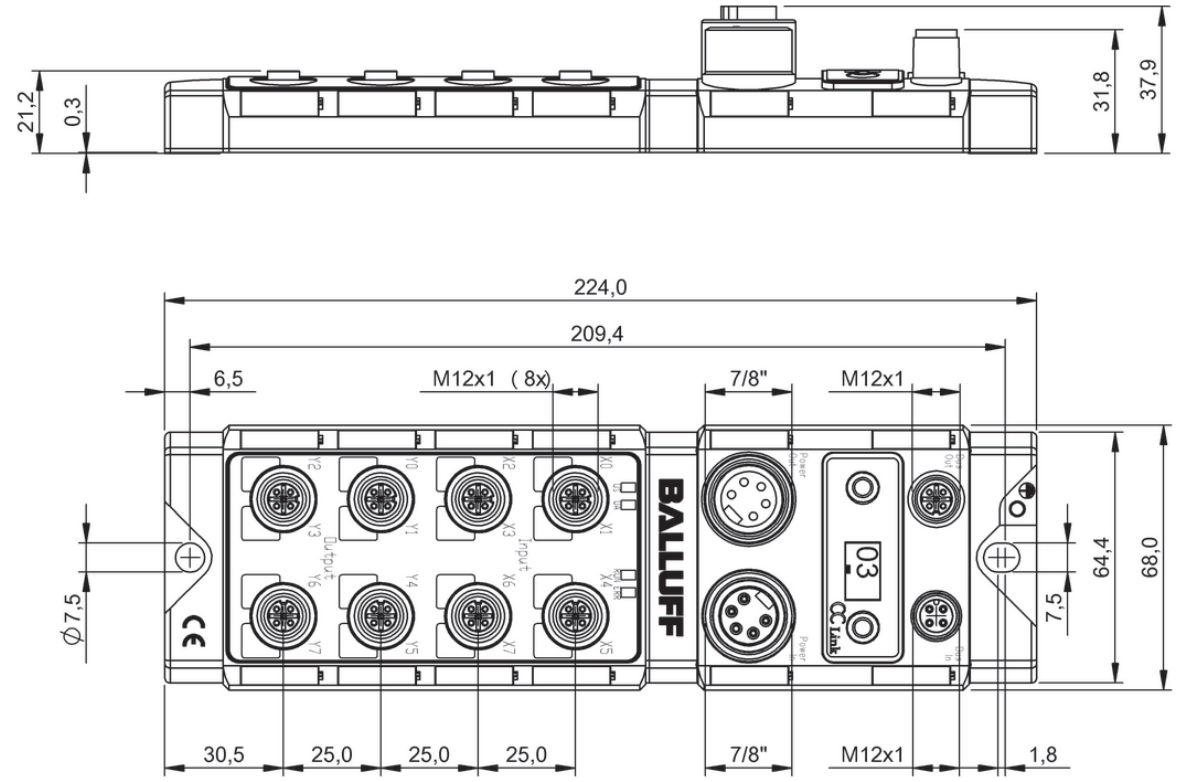
BNI0040



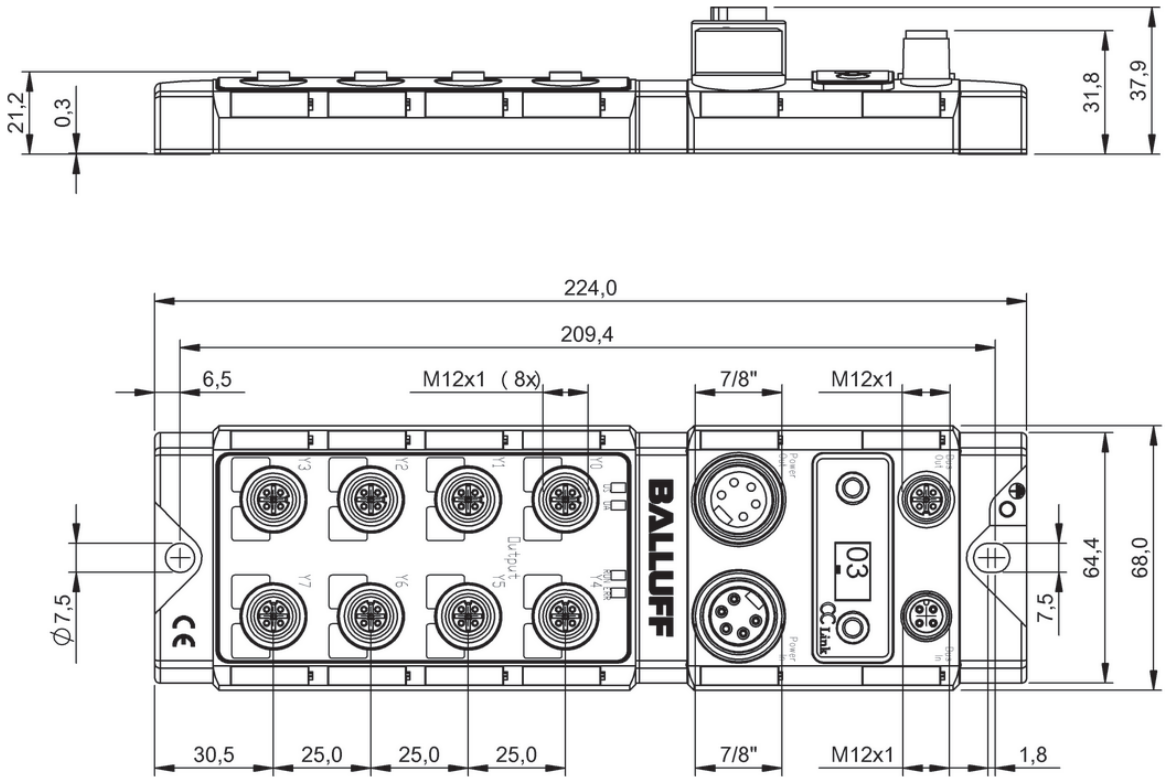
BNI002A



BNI002F, BNI0049



BNI002C


21,2
0,3
31,8
37,9
224,0
209,4
6,5
M12x1 (8x)
7/8"
M12x1
BALLUFF
03
64,4
68,0
7,5
ϕ7,5
30,5
25,0
25,0
25,0
7/8"
M12x1
1,8

BNI002E



	BNI006A BNI EIP-508-105-Z015	BNI007C BNI EIP-508-105-Z015-C06	BNI004A BNI EIP-502-105-Z015	
Principle of operation	Active splitter	Active splitter	Active splitter	
Interface	Ethernet/IP	Ethernet/IP	Ethernet/IP	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (COM 2)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (supply voltage IN)	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole	
Connection (supply voltage OUT)	7/8“-Female, 4-pole	7/8“-Female, 4-pole	7/8“-Female, 4-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type3	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	16x PNP	16x PNP	16x PNP	
Configurable inputs/outputs	yes	yes	yes	
Output current max.	2 A	2 A	2 A	
Current sum US, sensor	9.0 A	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	9.0 A	9.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	IP67	
Auxiliary interfaces	8x IO-Link	8x IO-Link	4x IO-Link	
IO-Link version	1.1	1.1	1.1	
Port-class	Type A	Type A	Type A	
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	BNI009T BNI EIP-507-005-Z040	BNI00AA BNI EIP-527-005-Z040	BNI004F BNI EIP-302-105-Z015	BNI004M BNI EIP-104-105-Z015	BNI0096 BNI EIP-508-005-E002
	Active splitter	Active splitter	Active splitter	Active splitter	Active splitter
	Ethernet/IP	Ethernet/IP	Ethernet/IP	Ethernet/IP	Ethernet/IP
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded
	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole
	—	—	7/8“-Female, 4-pole	7/8“-Female, 4-pole	7/8“-Female, 4-pole
	4x M12x1-Female, 5-pole, A-coded	4x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	8x PNP, Type3	4x PNP, Type 3	16x PNP, Type 2	16x PNP, Type 2	16x PNP, Type3
	8x PNP	—	16x PNP	—	16x PNP
	yes	no	yes	no	yes
	2 A	—	2 A	—	2 A
	9.0 A	9.0 A	9.0 A	9.0 A	9.0 A
	9.0 A	9.0 A	9.0 A	—	—
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Stainless steel (1.4571)
	37 x 32.6 x 224 mm	37 x 32.6 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	70 x 44.1 x 228 mm
	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C
	IP67	IP67	IP67	IP67	IP69
	4x IO-Link	4x IO-Link	—	—	8x IO-Link
	1.1	1.1	—	—	1.1
	Type A	Type B	—	—	Type A
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	BNI009K BNI EIP-302-005-E002	BNI009L BNI EIP-104-005-E002	BNI008M BNI EIP-508-105-R015	
Principle of operation	Active splitter	Active splitter	Active splitter	
Interface	Ethernet/IP	Ethernet/IP	Ethernet/IP	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (COM 2)	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	
Connection (supply voltage IN)	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole	
Connection (supply voltage OUT)	7/8“-Female, 4-pole	7/8“-Female, 4-pole	7/8“-Female, 4-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3	
Digital outputs	16x PNP	—	16x PNP	
Configurable inputs/outputs	yes	no	yes	
Output current max.	2 A	—	2 A	
Current sum US, sensor	9.0 A	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	—	9.0 A	
Housing material	Stainless steel (1.4571)	Stainless steel (1.4571)	PPS	
Dimension	70 x 44.1 x 228 mm	70 x 44.1 x 228 mm	68 x 42.9 x 226 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP69	IP69	IP67	
Auxiliary interfaces	—	—	8x IO-Link	
IO-Link version	—	—	1.1	
Port-class	—	—	Type A	
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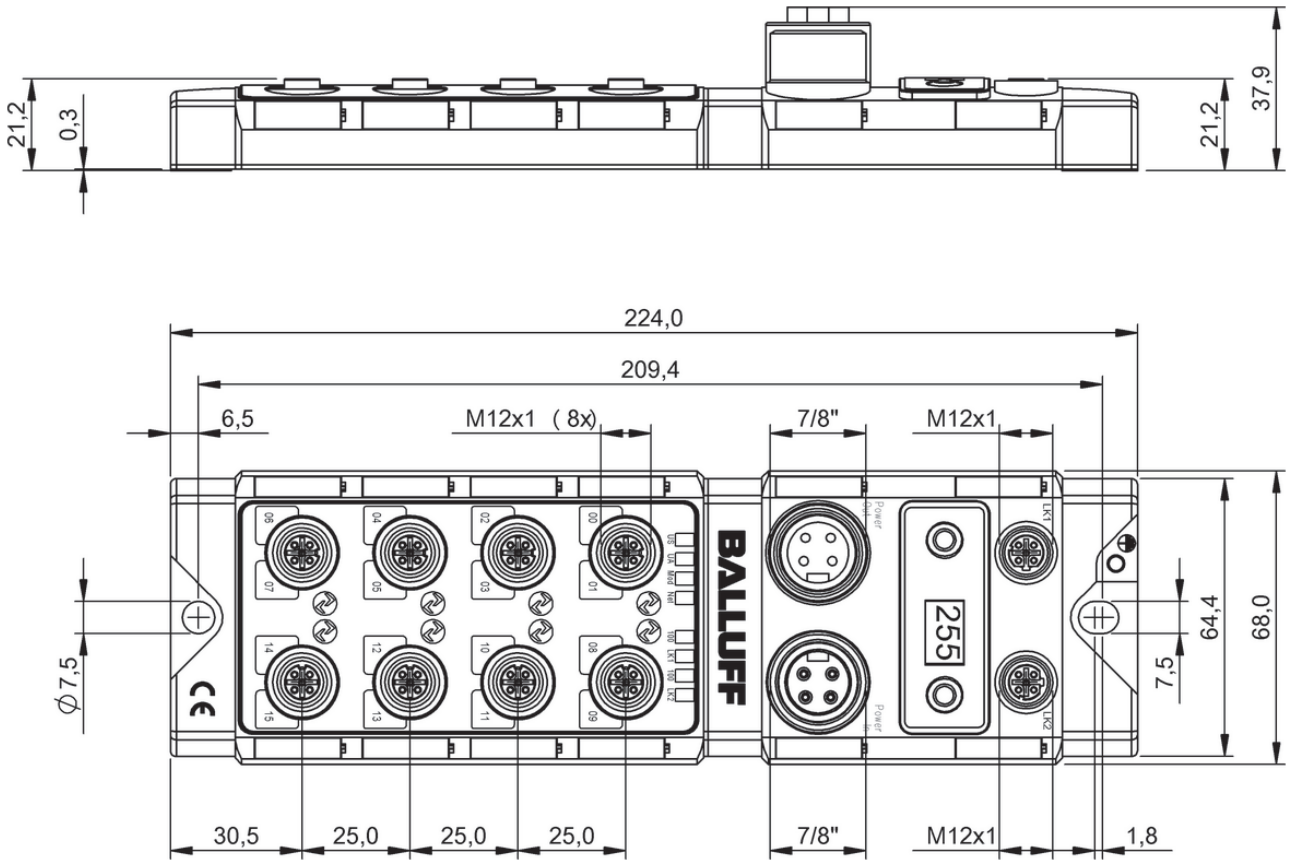
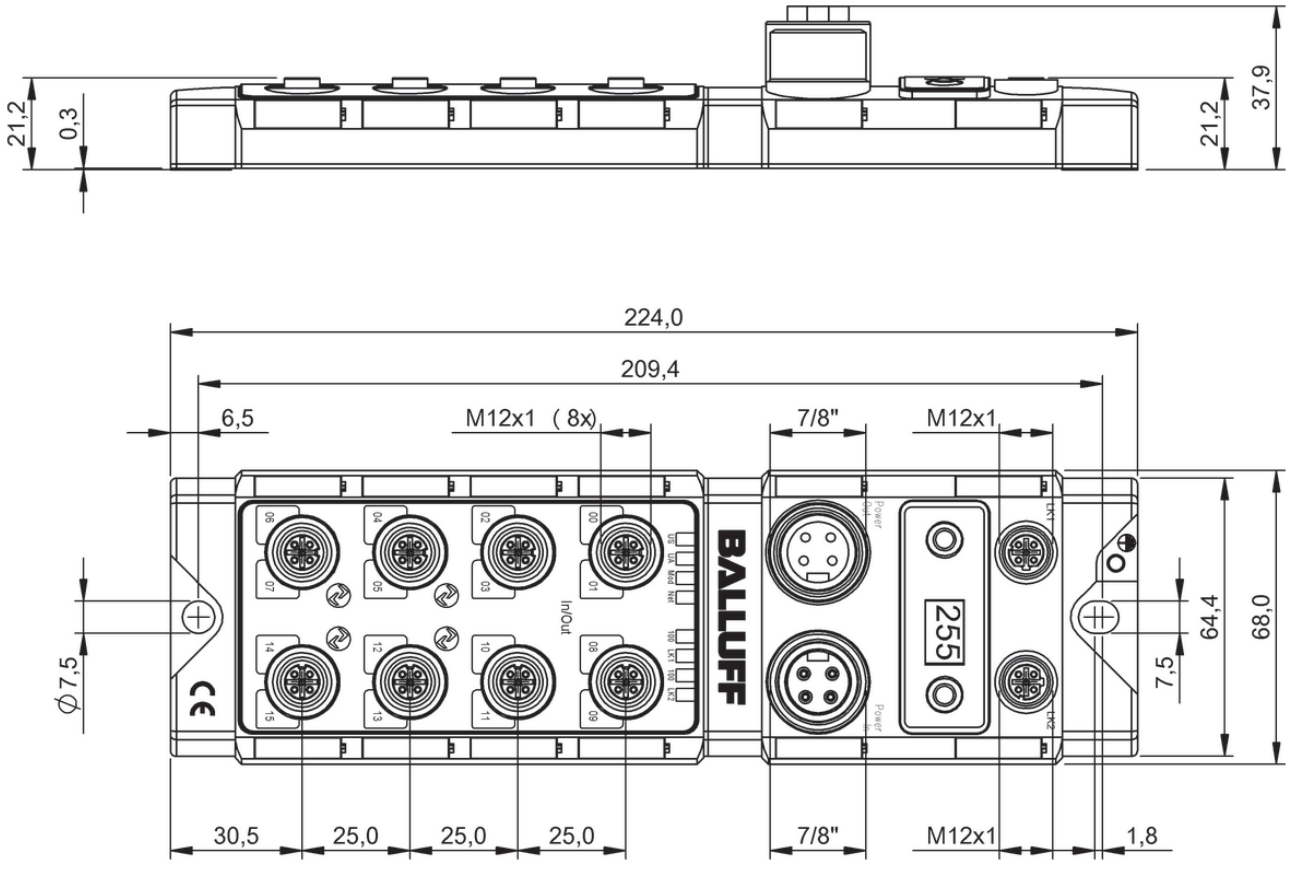
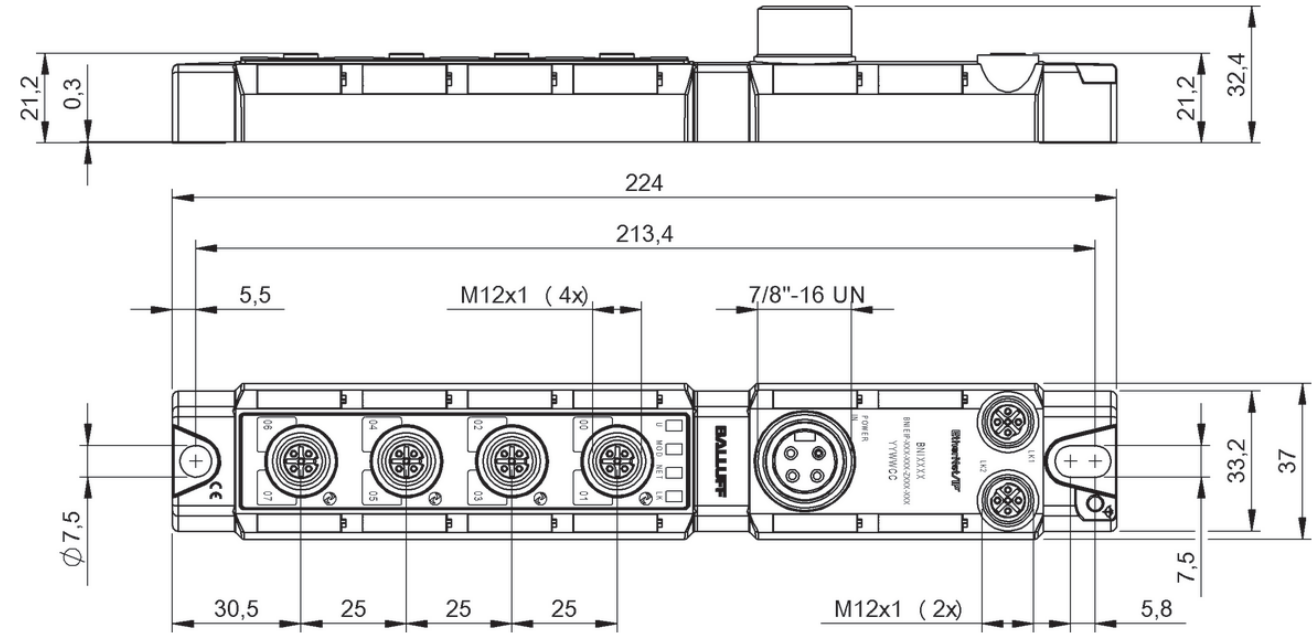
	BNI008Z BNI EIP-502-105-R015	BNI008P BNI EIP-302-105-R015	BNI008Y BNI EIP-104-105-R015		
	Active splitter	Active splitter	Active splitter		
	Ethernet/IP	Ethernet/IP	Ethernet/IP		
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC		
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded		
	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded	M12x1-Female, 4-pole, D-coded		
	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole		
	7/8“-Female, 4-pole	7/8“-Female, 4-pole	7/8“-Female, 4-pole		
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded		
	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3		
	16x PNP	16x PNP	—		
	yes	yes	no		
	2 A	2 A	—		
	9.0 A	9.0 A	9.0 A		
	9.0 A	9.0 A	—		
	PPS	PPS	PPS		
	68 x 42.9 x 226 mm	68 x 42.9 x 226 mm	68 x 42.9 x 226 mm		
	-5...70 °C	-5...70 °C	-5...70 °C		
	IP67	IP67	IP67		
	4x IO-Link	—	—		
	1.1	—	—		
	Type A	—	—		
	Page 138	Page 139	Page 139		



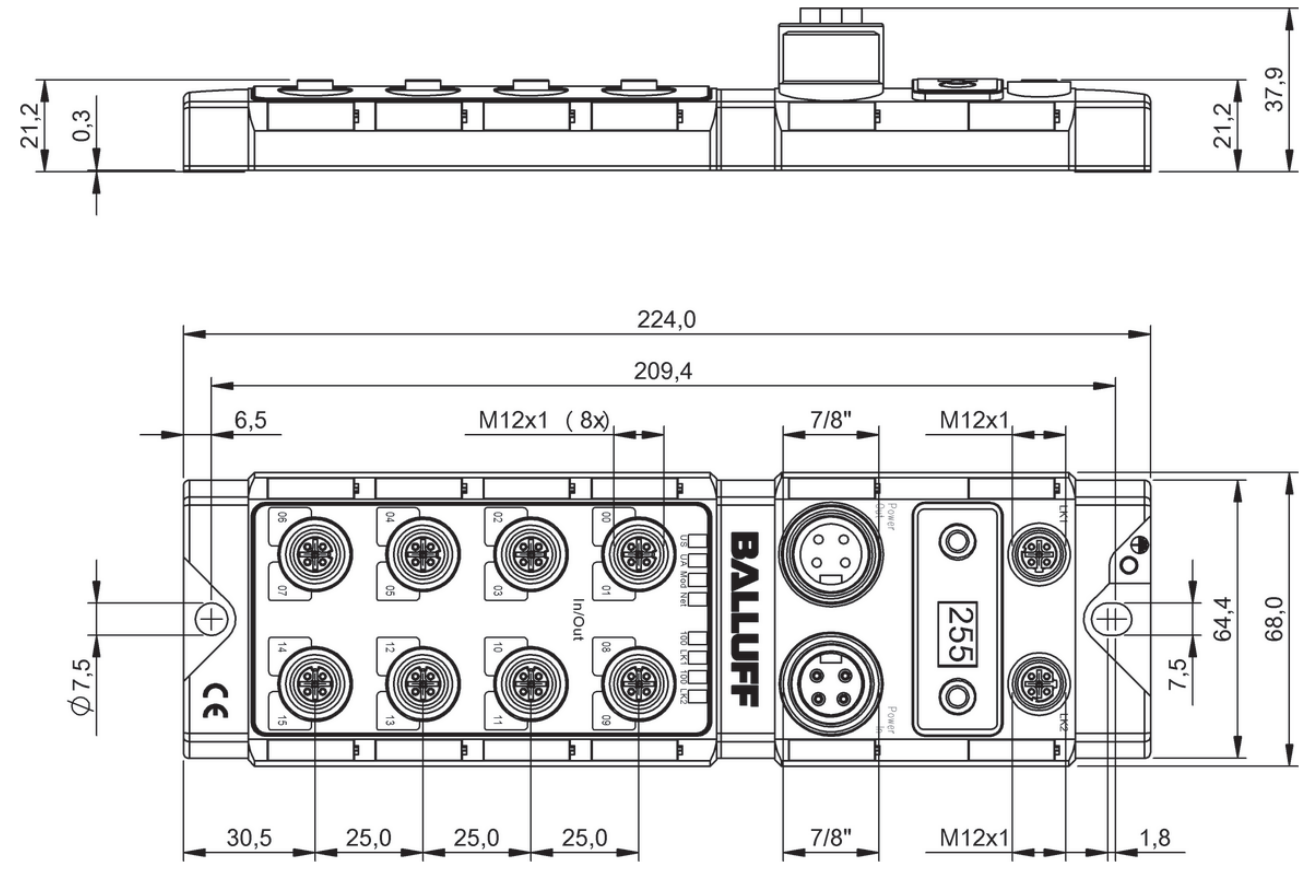
BNI006A, BNI007C



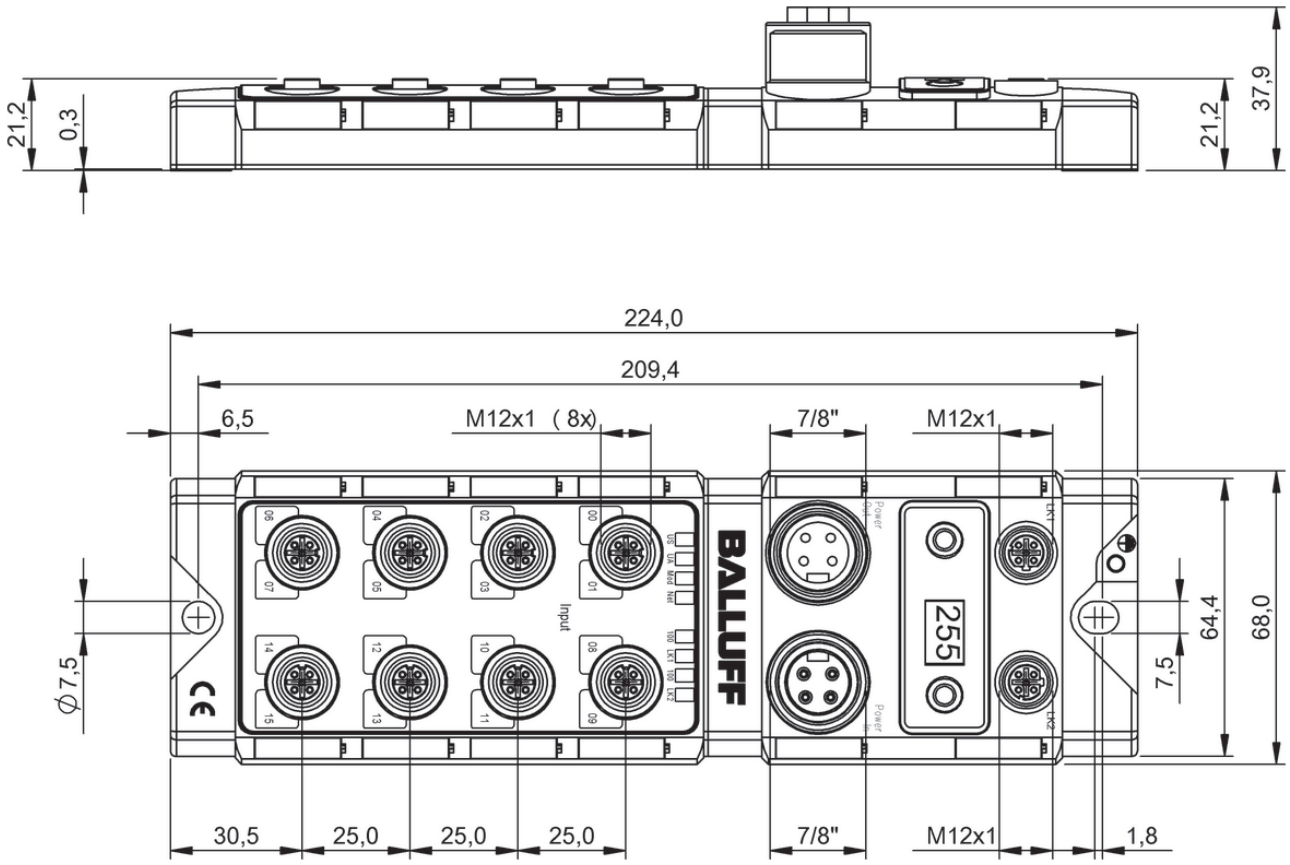
BNI004A



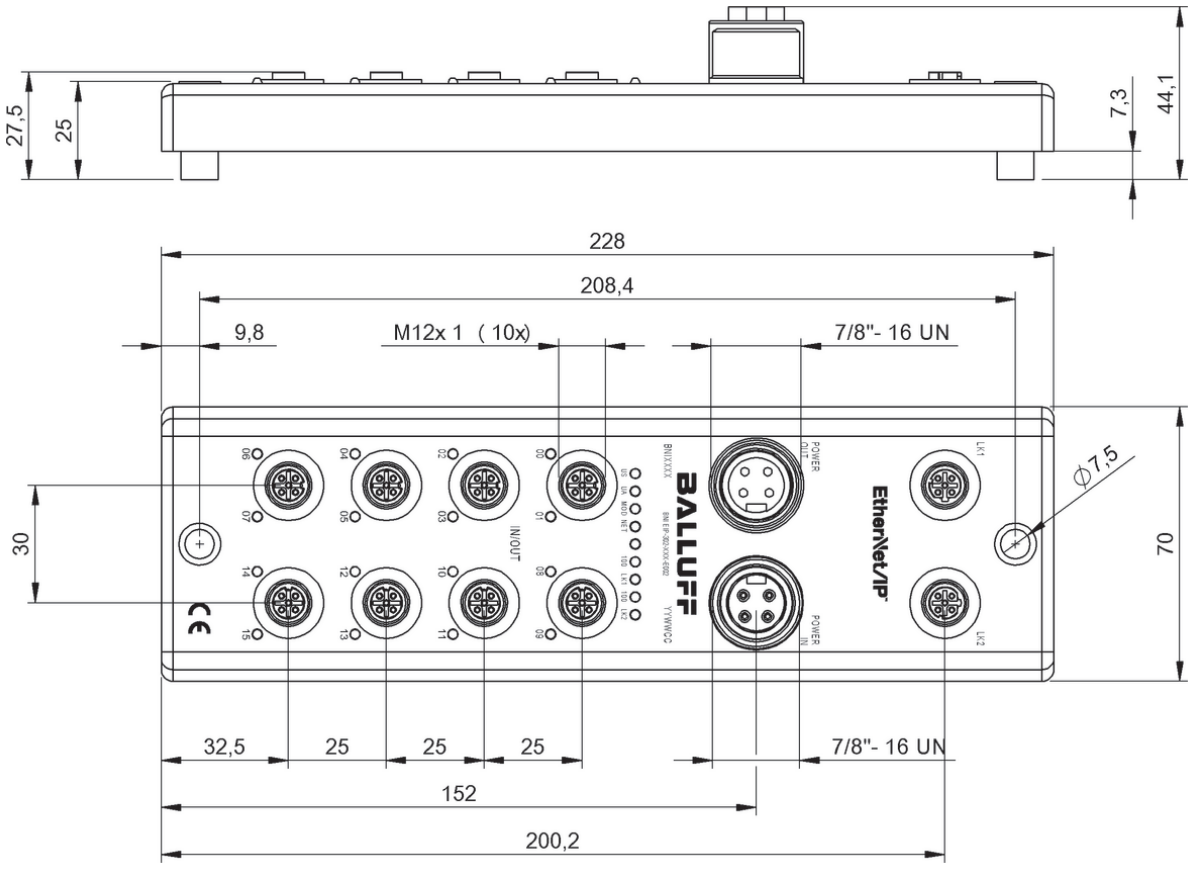
BNI009T, BNI00AA



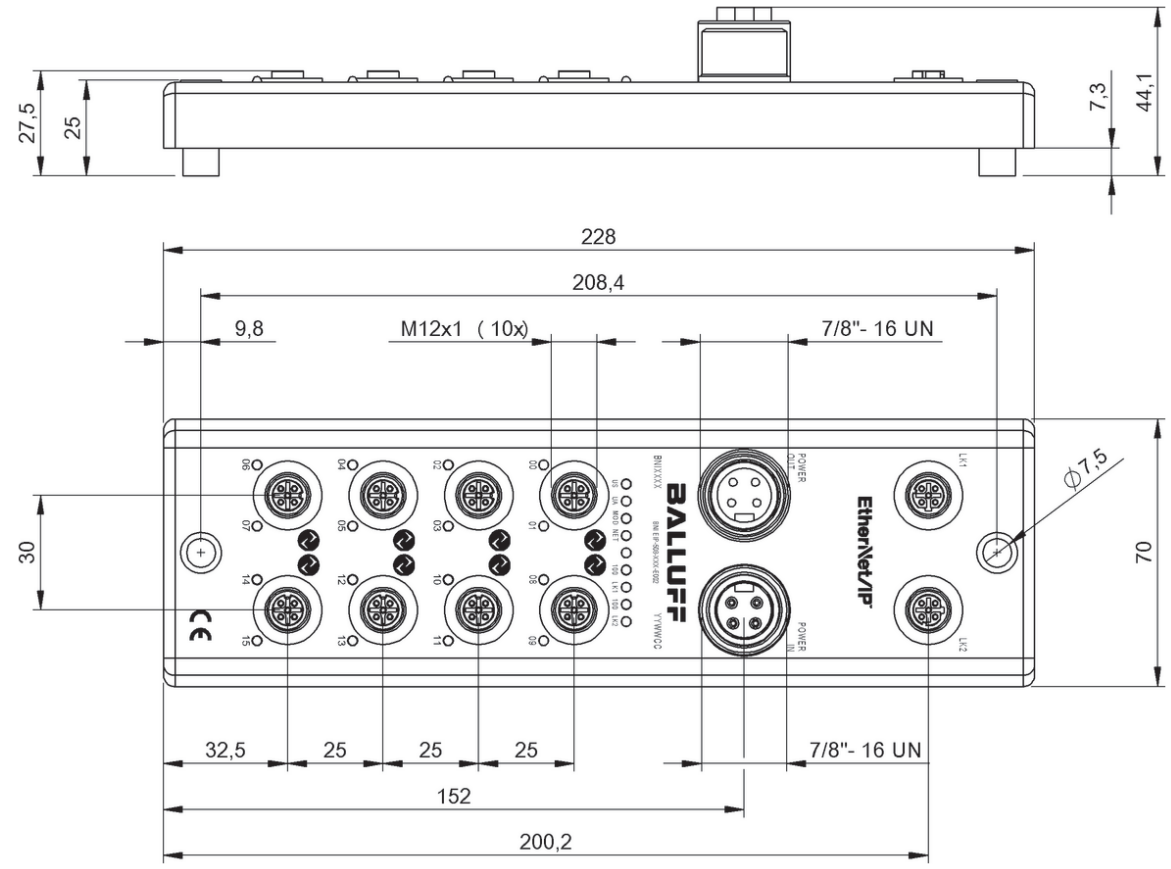
BNI004F



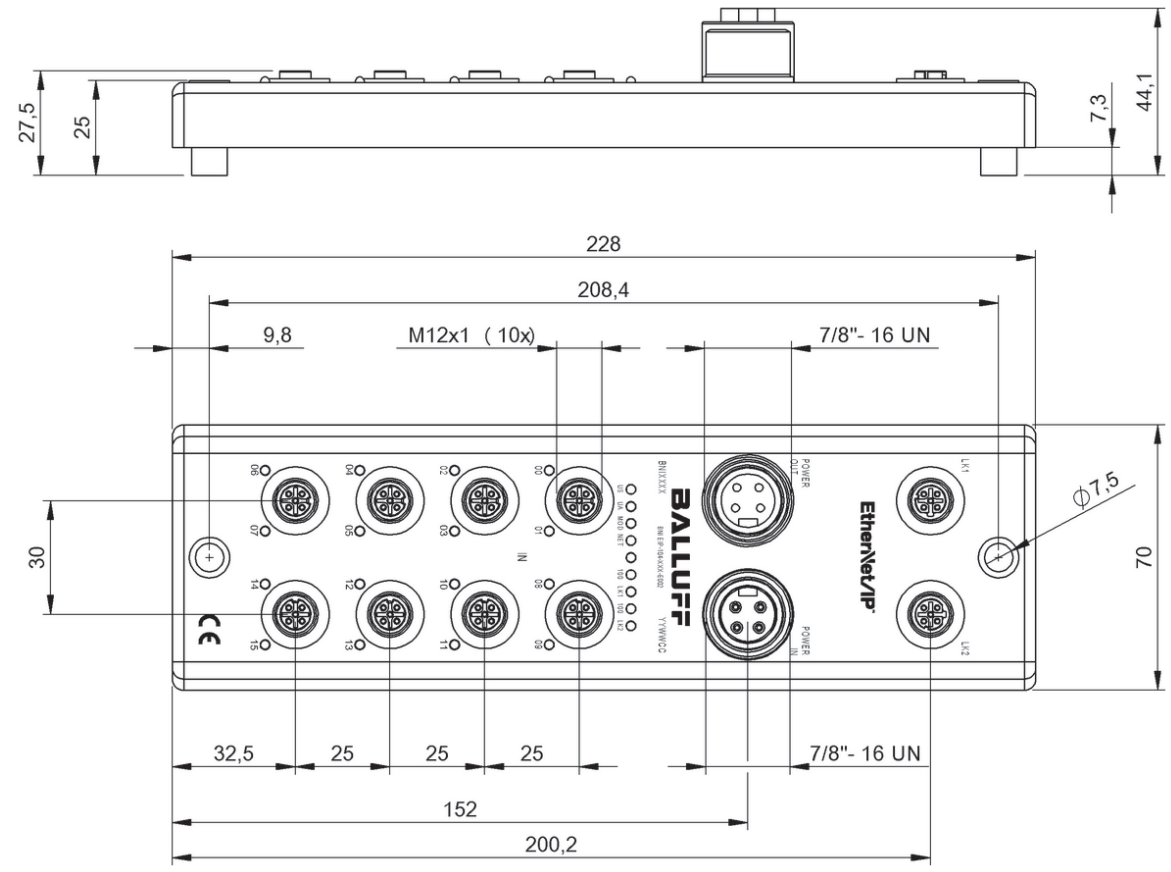
BNI004M



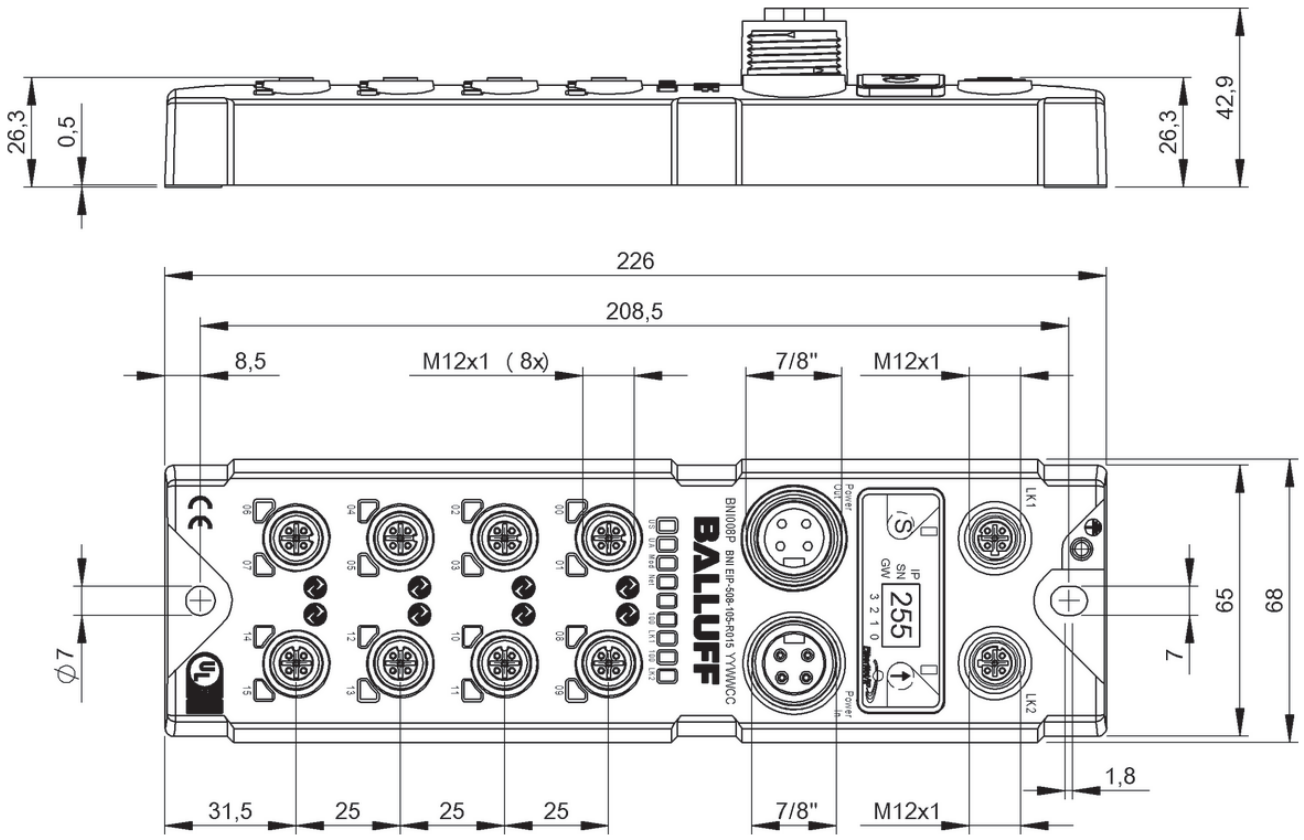
BNI009K



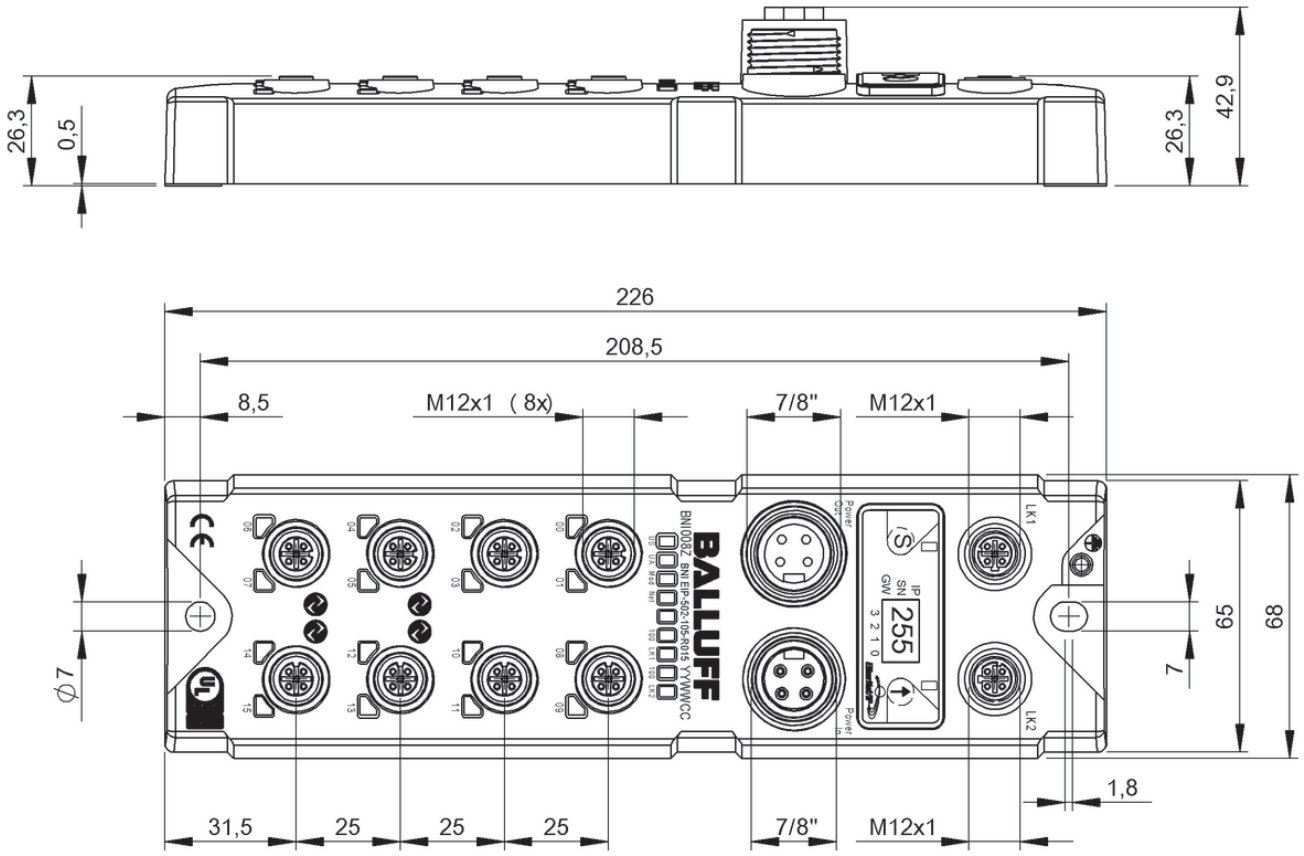
BNI0096



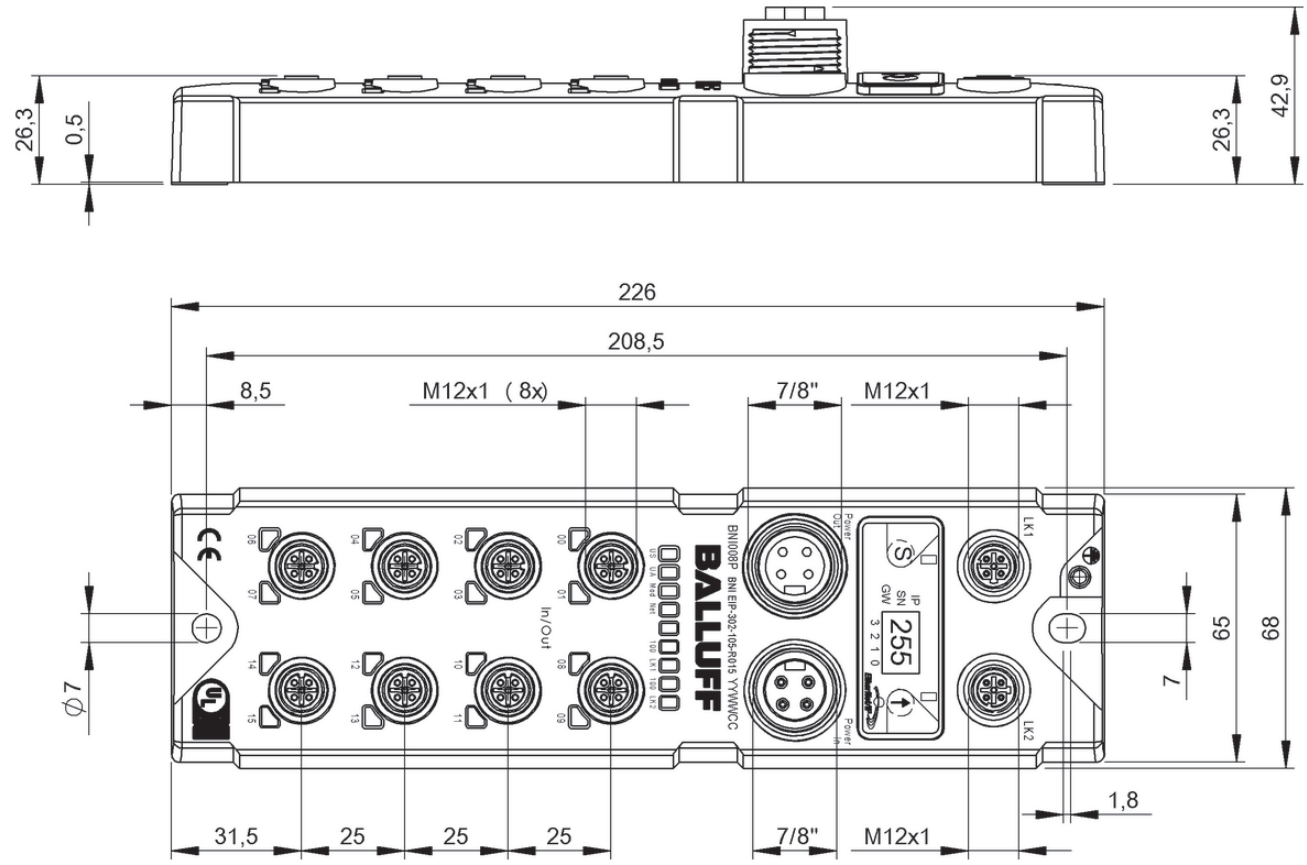
BNI009L



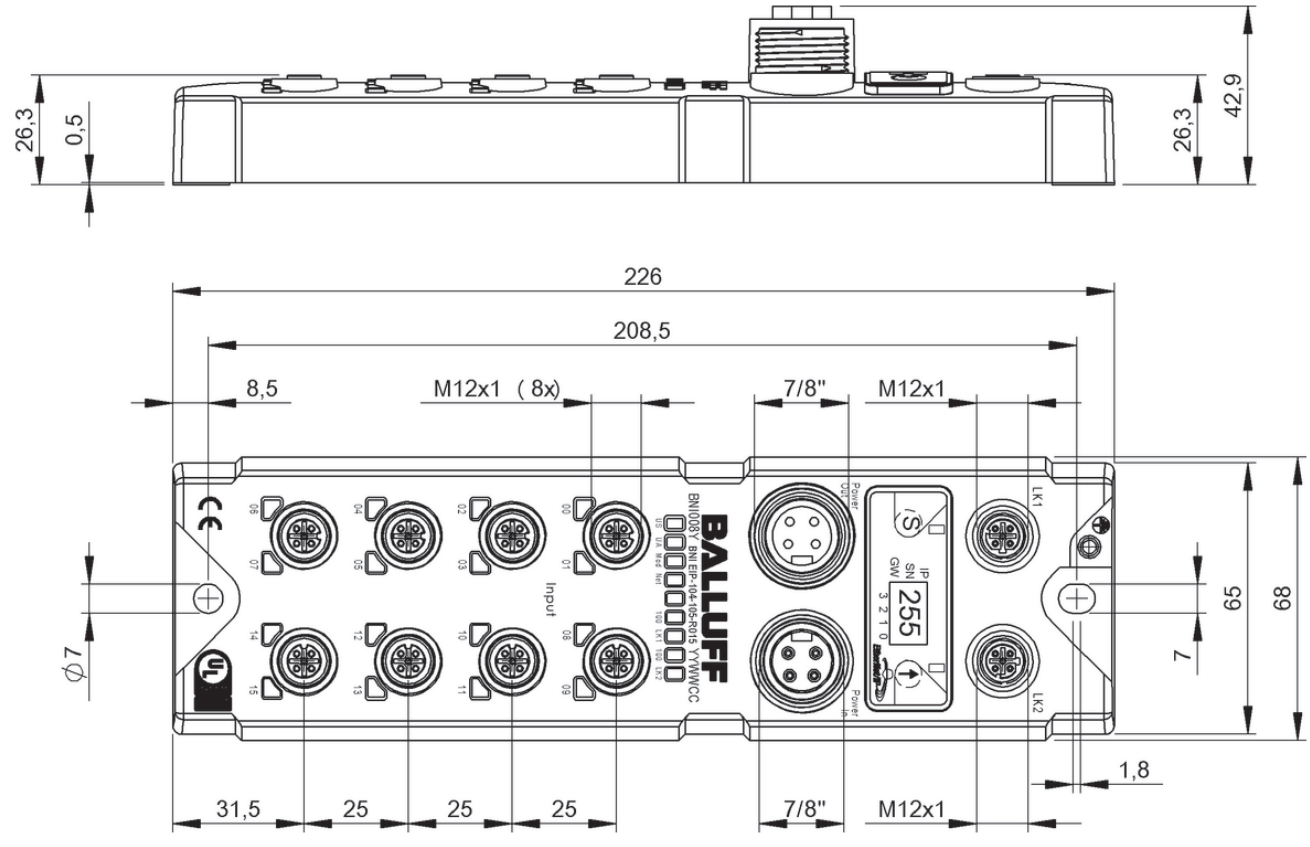
BNI008M



BNI008Z



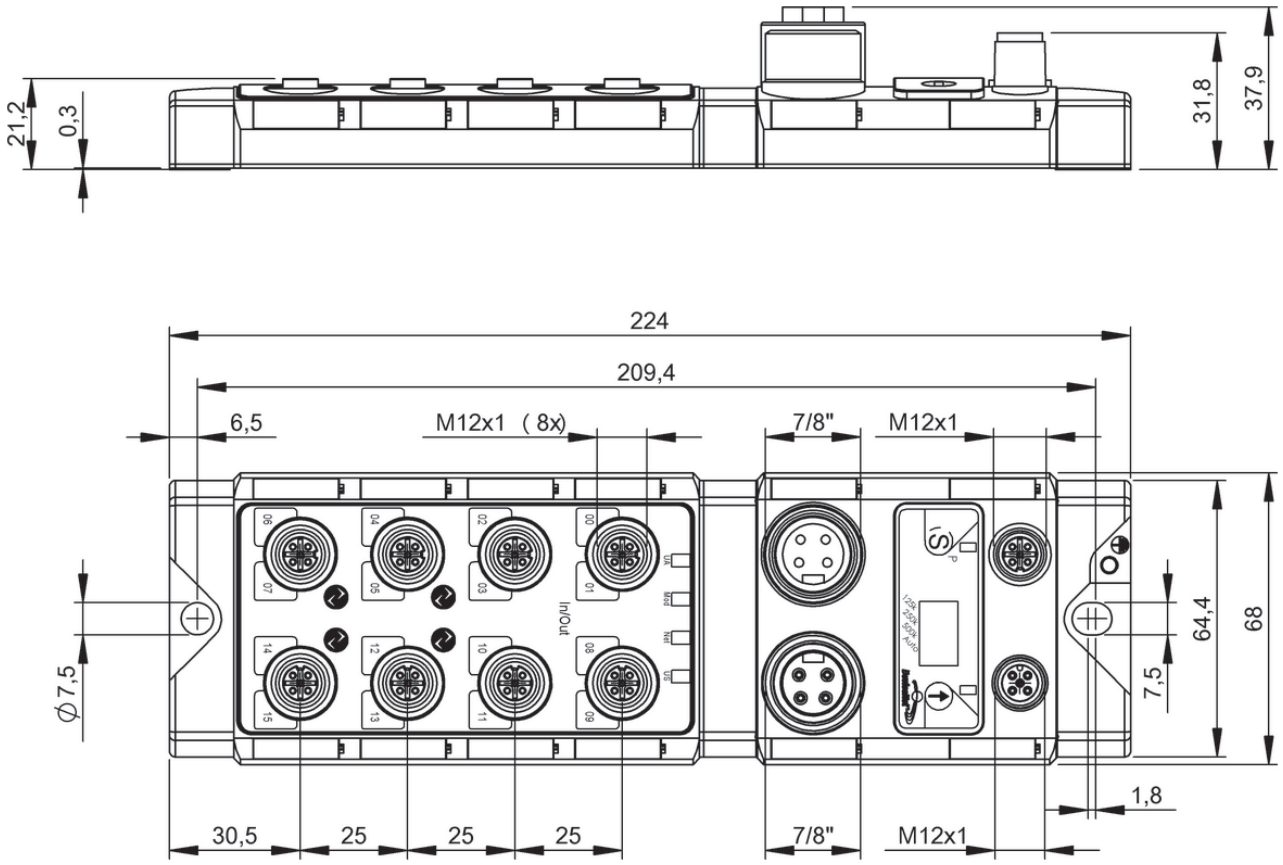
BNI008P



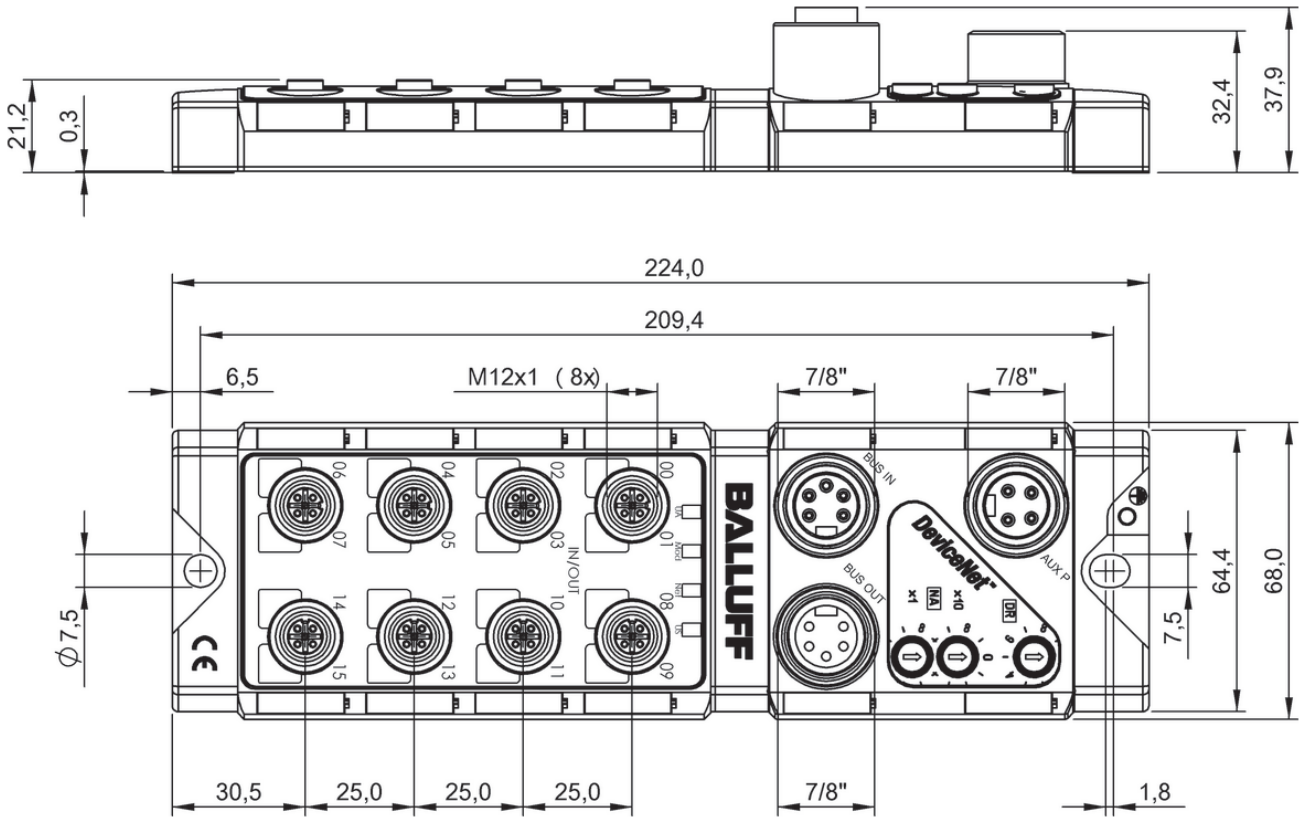
BNI008Y

	BNI005A BNI DNT-502-100-Z001	BNI0003 BNI DNT-302-000-Z005	
Principle of operation	Active splitter	Active splitter	
Interface	DeviceNet	DeviceNet	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 5-pole, A-coded	7/8“-Male, 5-pole	
Connection (COM 2)	M12x1-Female, 5-pole, A-coded	7/8“-Female, 5-pole	
Connection (supply voltage IN)	7/8“-Male, 4-pole	7/8“-Male, 4-pole	
Connection (supply voltage OUT)	7/8“-Female, 4-pole	—	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	16x PNP	16x PNP	
Configurable inputs/outputs	yes	yes	
Output current max.	2 A	2 A	
Current sum US, sensor	9.0 A	9.0 A	
Current sum UA, actuator	9.0 A	9.0 A	
Housing material	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	-5...70 °C	
Protection degree	IP67	IP67	
Auxiliary interfaces	4x IO-Link	—	
IO-Link version	1.1	—	
Port-class	Type A	—	
Productview	Page 142	Page 142	

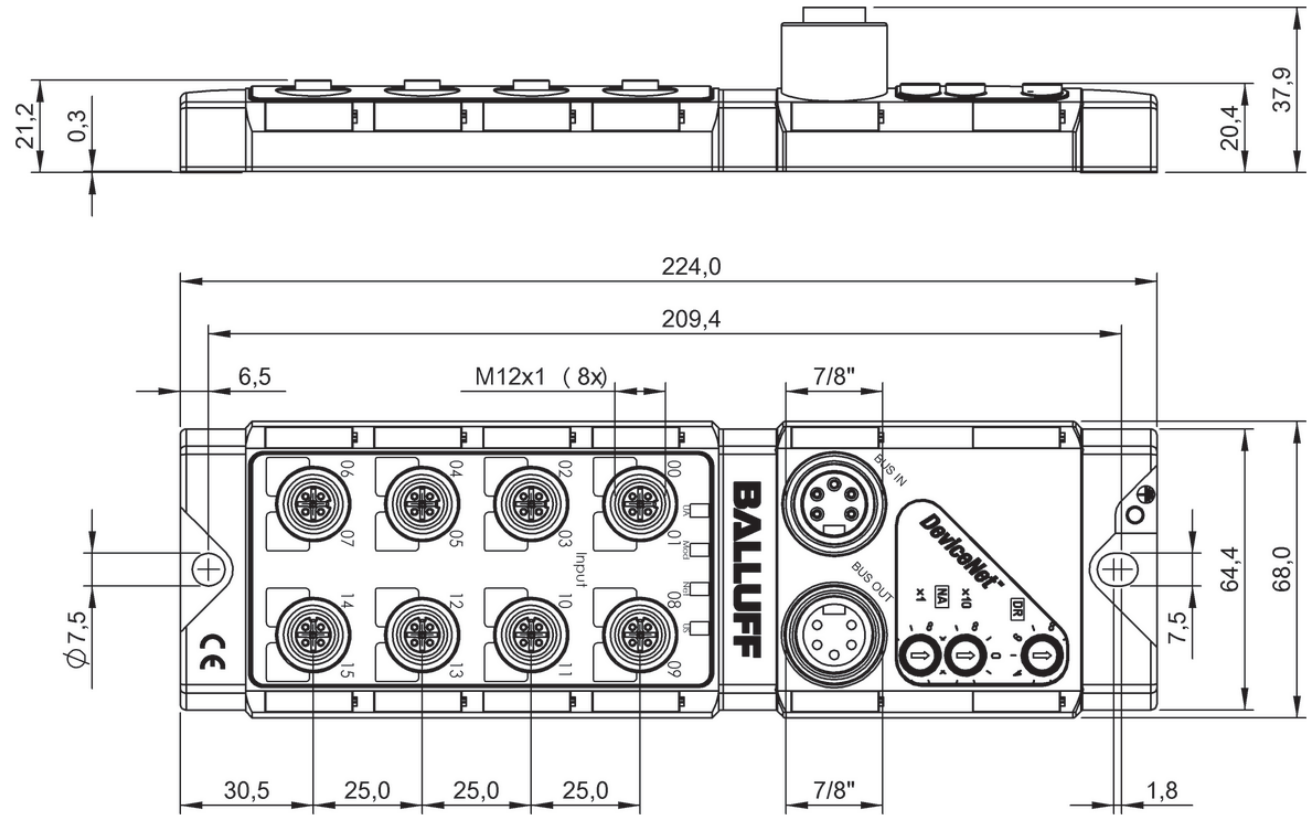
	BNI0001 BNI DNT-104-000-Z004	BNI0004 BNI DNT-305-000-Z005	BNI0002 BNI DNT-202-000-Z005	
	Active splitter	Active splitter	Active splitter	
	DeviceNet	DeviceNet	DeviceNet	
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 5-pole	
	7/8“-Female, 5-pole	7/8“-Female, 5-pole	7/8“-Female, 5-pole	
	7/8“-Male, 4-pole	7/8“-Male, 4-pole	7/8“-Male, 4-pole	
	—	—	—	
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
	16x PNP, Type 2	8x PNP, Type2	—	
	—	8x PNP	8x PNP	
	no	no	no	
	—	2 A	2 A	
	9.0 A	9.0 A	—	
	—	9.0 A	9.0 A	
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	68 x 37.9 x 224 mm	
	-5...70 °C	-5...70 °C	-5...70 °C	
	IP67	IP67	IP67	
	—	—	—	
	—	—	—	
	—	—	—	
	Page 143	Page 143	Page 144	



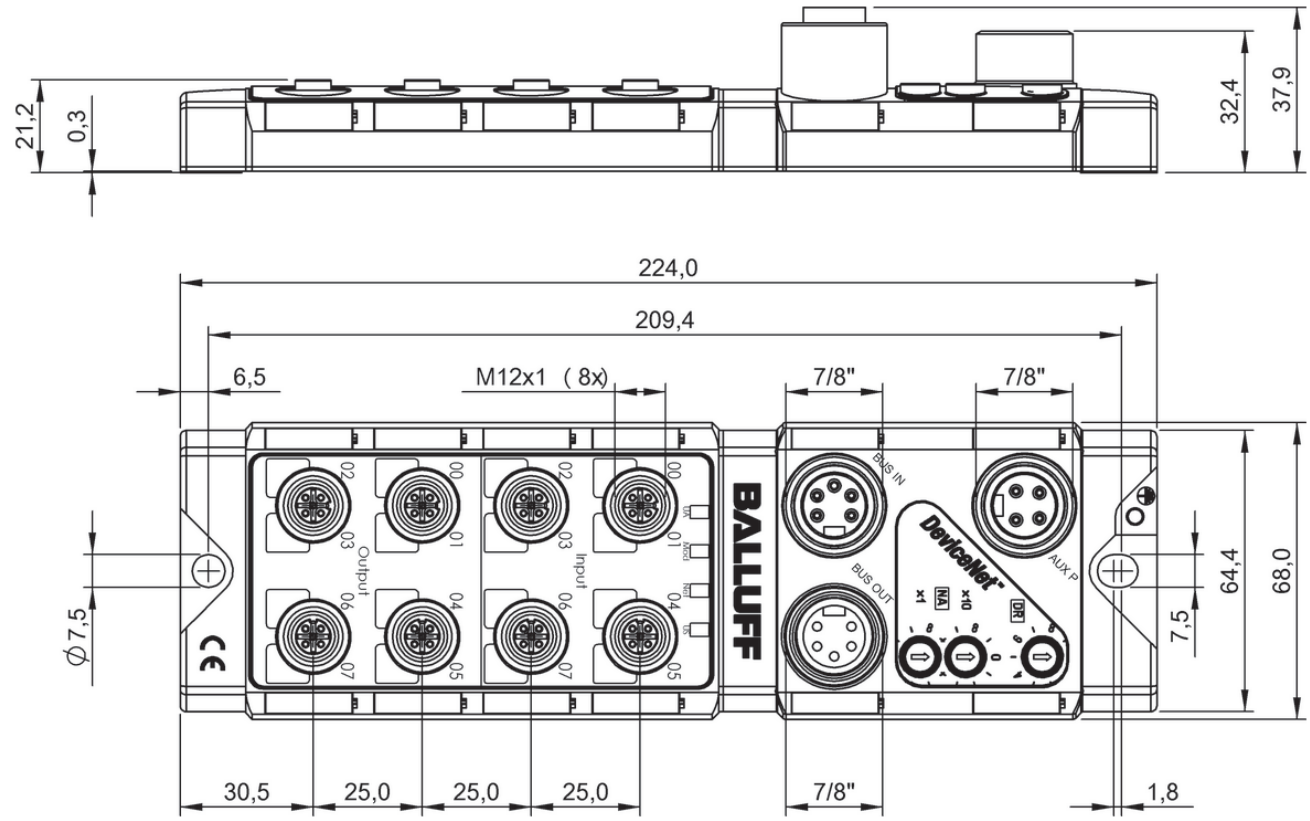
BNI005A



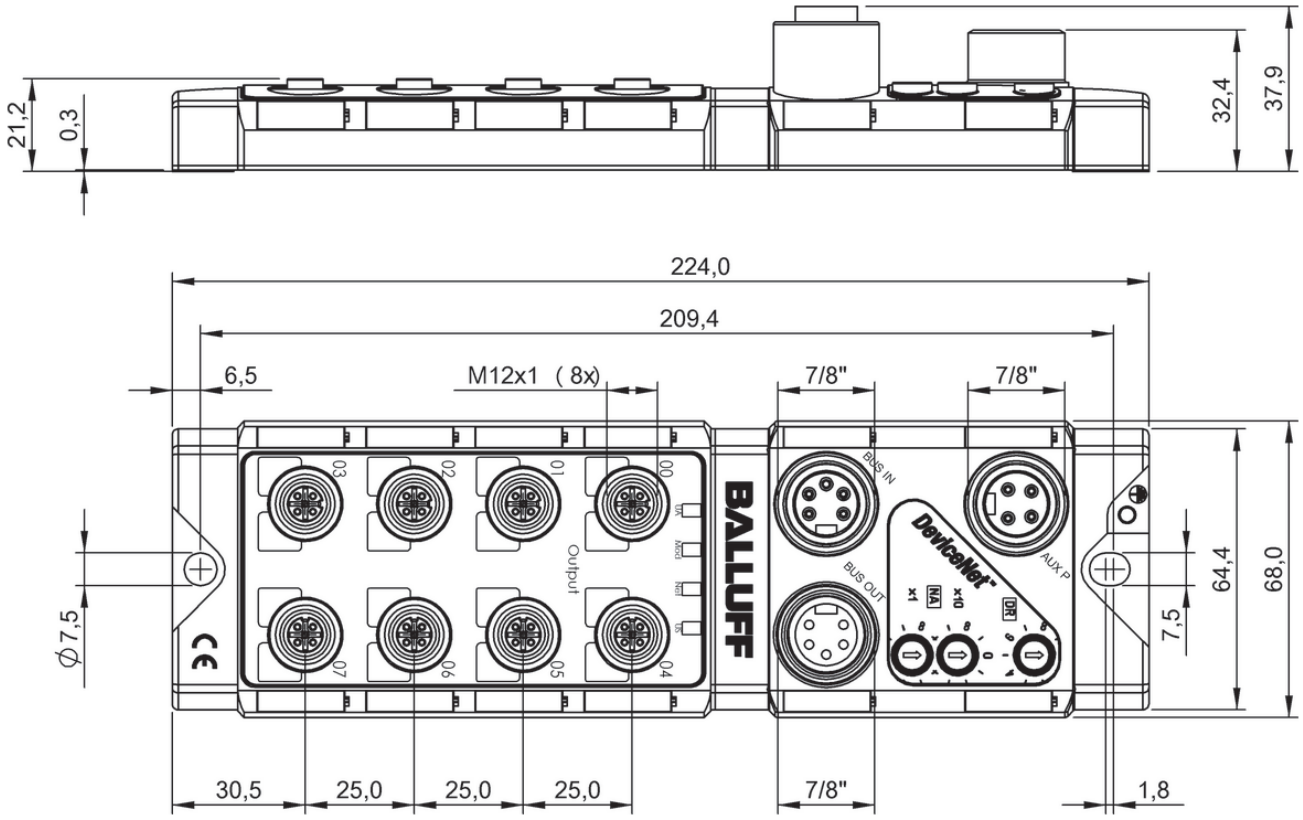
BNI0003



BNI0001



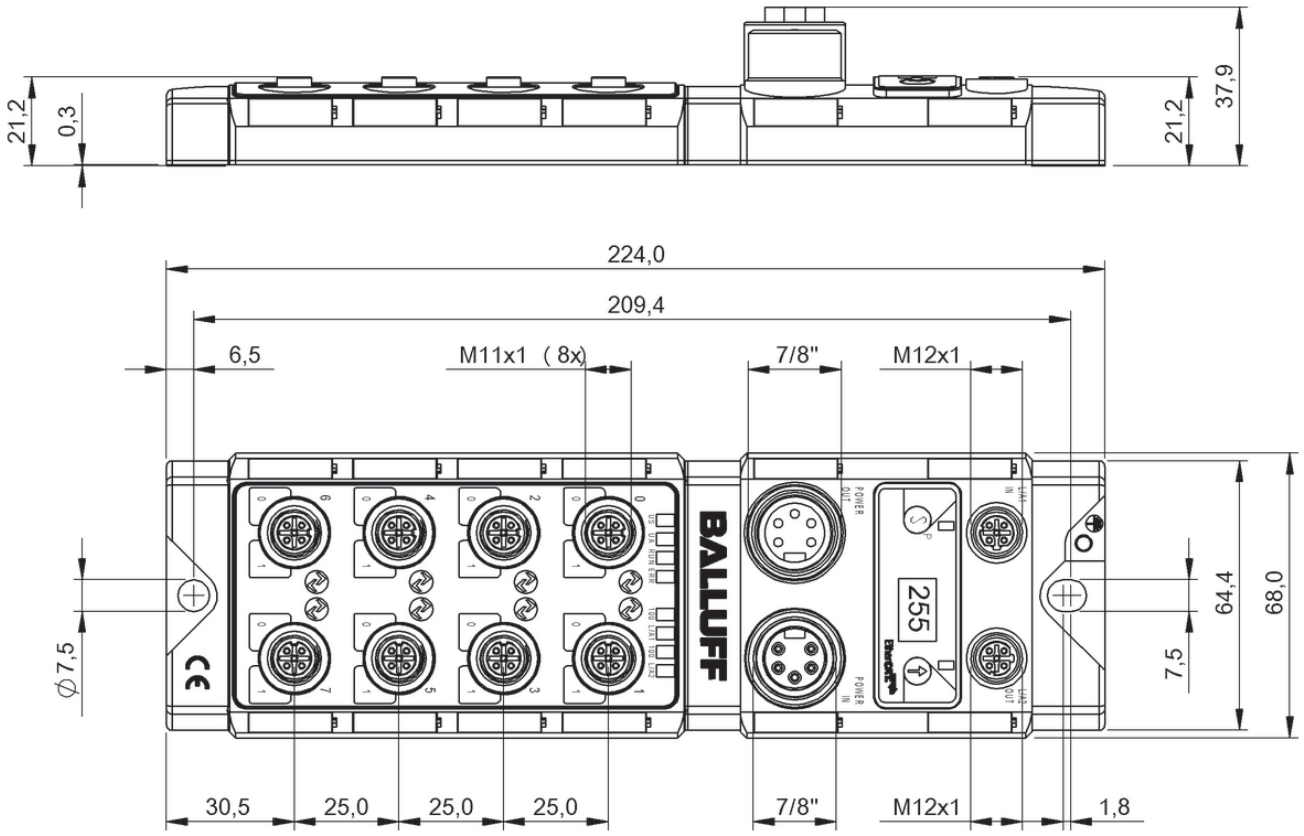
BNI0004


21,2
0,3
32,4
37,9
224,0
209,4
6,5
M12x1 (8x)
7/8"
7/8"
BUS IN
BUS OUT
AUX P
DeviceNet
Output
BALLUFF
03
02
01
00
07
06
05
04
64,4
68,0
7,5
ϕ7,5
30,5
25,0
25,0
25,0
7/8"
1,8

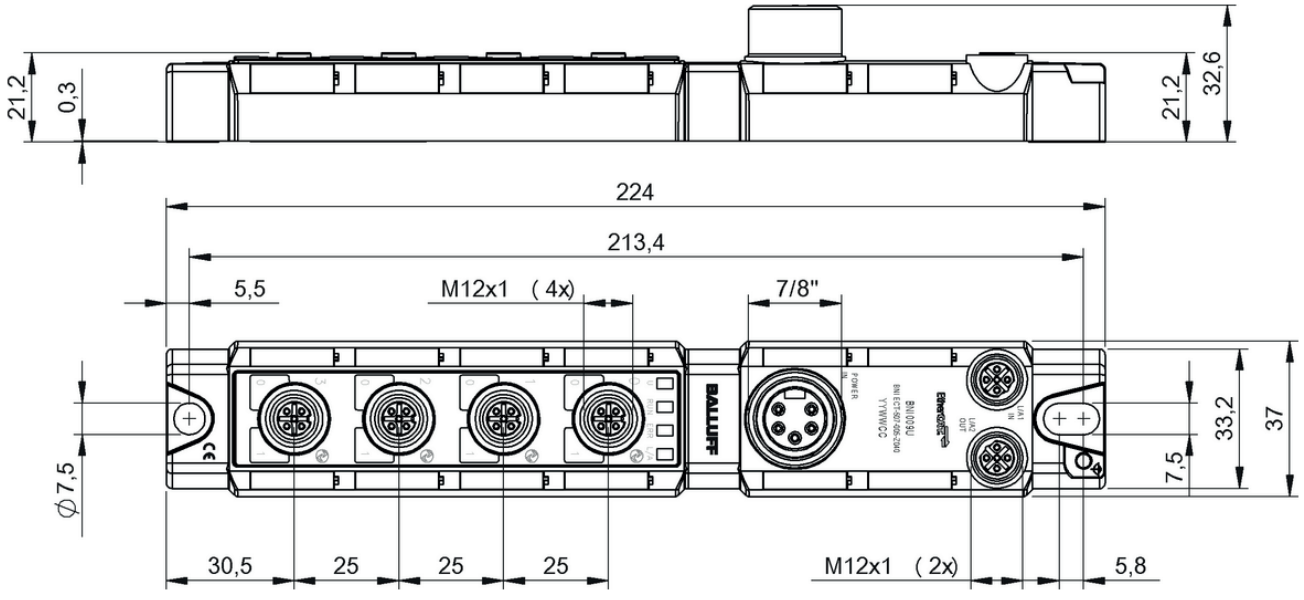
BNI0002

	BNI0077 BNI ECT-508-105-Z015	
Principle of operation	Active splitter	
Interface	EtherCAT	
Operating voltage Ub	18...30.2 VDC	
Connection (COM 1)	M12x1-Female, 5-pole, D-coded	
Connection (COM 2)	M12x1-Female, 5-pole, D-coded	
Connection (supply voltage IN)	7/8“-Male, 4-pole	
Connection (supply voltage OUT)	7/8“-Female, 4-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	
Digital outputs	16x PNP	
Configurable inputs/outputs	yes	
Output current max.	2 A	
Current sum US, sensor	9.0 A	
Current sum UA, actuator	9.0 A	
Housing material	Zinc, die-cast	
Dimension	68 x 37.9 x 224 mm	
Ambient temperature	-5...70 °C	
Protection degree	IP67	
Auxiliary interfaces	8x IO-Link	
IO-Link version	1.1	
Port-class	Type A	
Productview	Page 148	

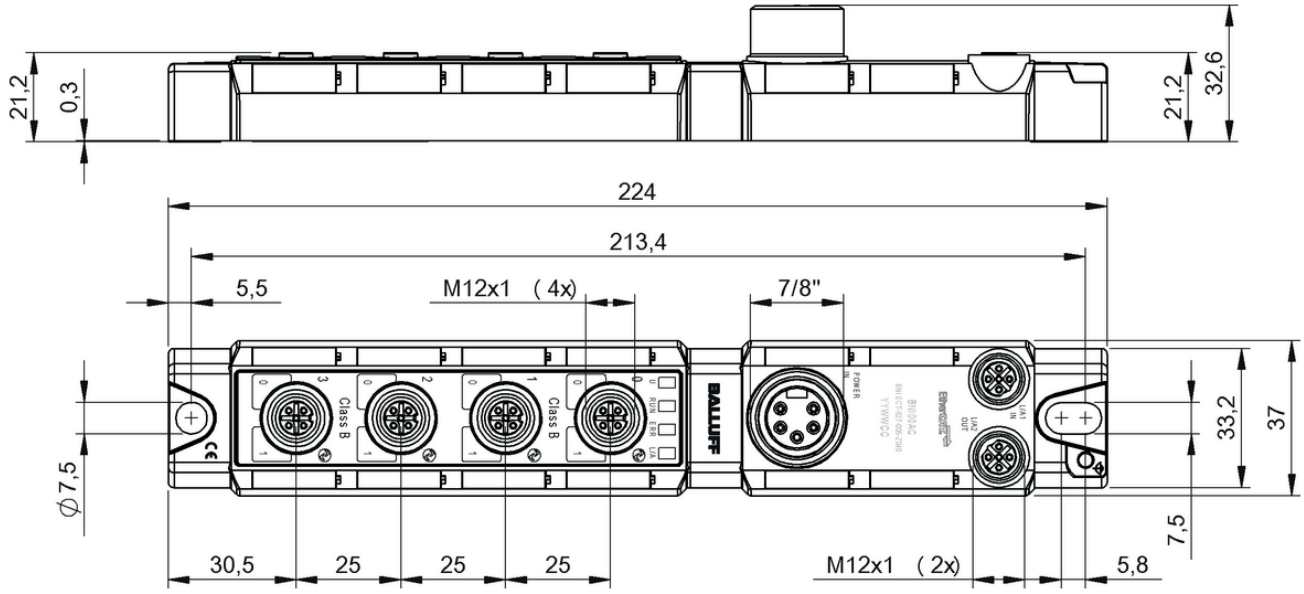
BNI009U BNI ECT-507-005-Z040	BNI00AC BNI ECT-527-005-Z040
Active splitter	Active splitter
EtherCAT	EtherCAT
18...30.2 VDC	18...30.2 VDC
M12x1-Female, 5-pole, D-coded	M12x1-Female, 5-pole, D-coded
M12x1-Female, 5-pole, D-coded	M12x1-Female, 5-pole, D-coded
7/8“-Male, 4-pole	7/8“-Male, 4-pole
—	—
4x M12x1-Female, 5-pole, A-coded	4x M12x1-Female, 5-pole, A-coded
8x PNP, Type3	4x PNP, Type 3
8x PNP	—
yes	no
2 A	—
9.0 A	9.0 A
9.0 A	—
Zinc, die-cast	Zinc, die-cast
37 x 32.6 x 224 mm	37 x 32.6 x 224 mm
-5...70 °C	-5...70 °C
IP67	IP67
4x IO-Link	4x IO-Link
1.1	1.1
Type A	Type B
Page 148	Page 149



BNI0077



BNI009U


21,2
0,3
21,2
32,6
224
213,4
5,5
M12x1 (4x)
7/8"
Class B
Class B
BALLUFF
POWER
33,2
37
7,5
ϕ7,5
30,5
25
25
25
M12x1 (2x)
5,8

BNI00AC

System solutions for efficient network design

SWITCHES

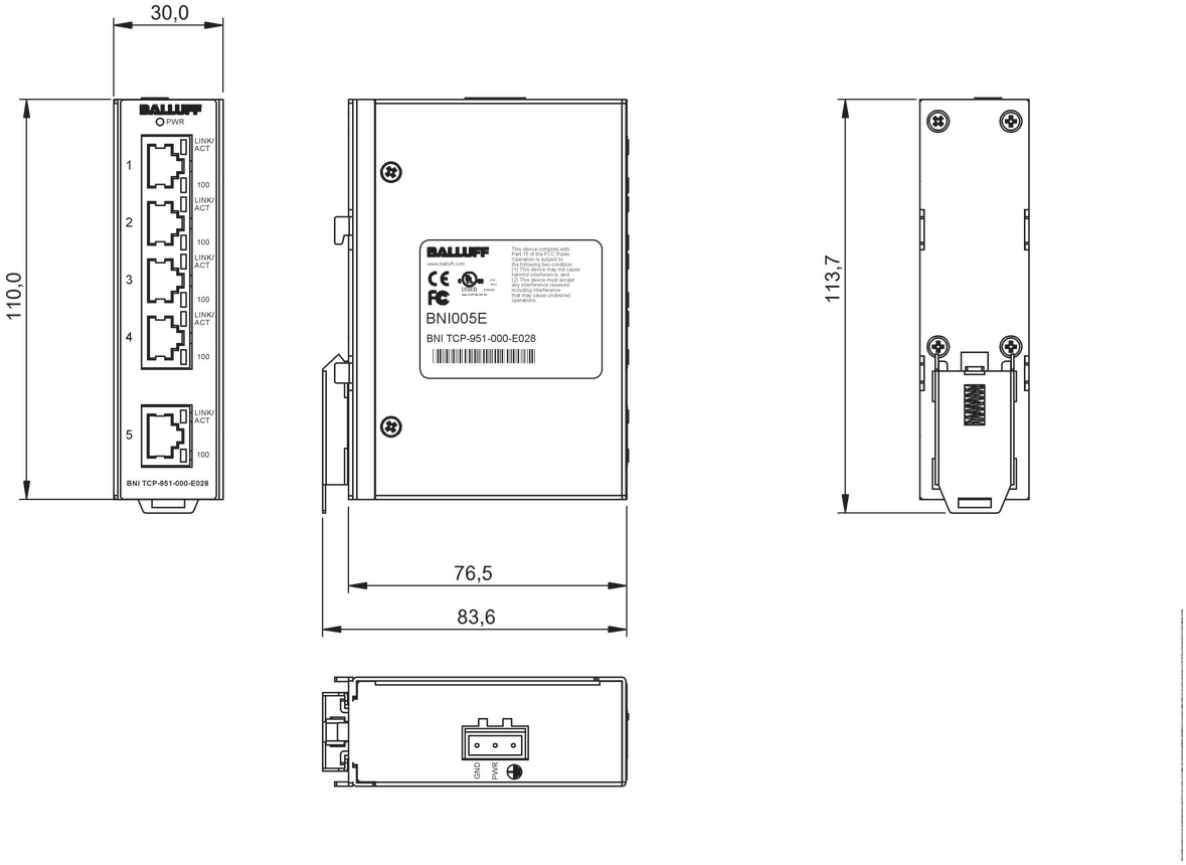
Ethernet-based network systems are increasingly gaining significance in industrial automation. To enable you to easily link all Ethernet system components with Ethernet, Balluff provides you with a complete system. We offer you a multiplicity of Ethernet-based systems and network components for machine and system outfitting, including Profinet and Ethernet/IP. This means optimum infrastructure for complex networks.

Features

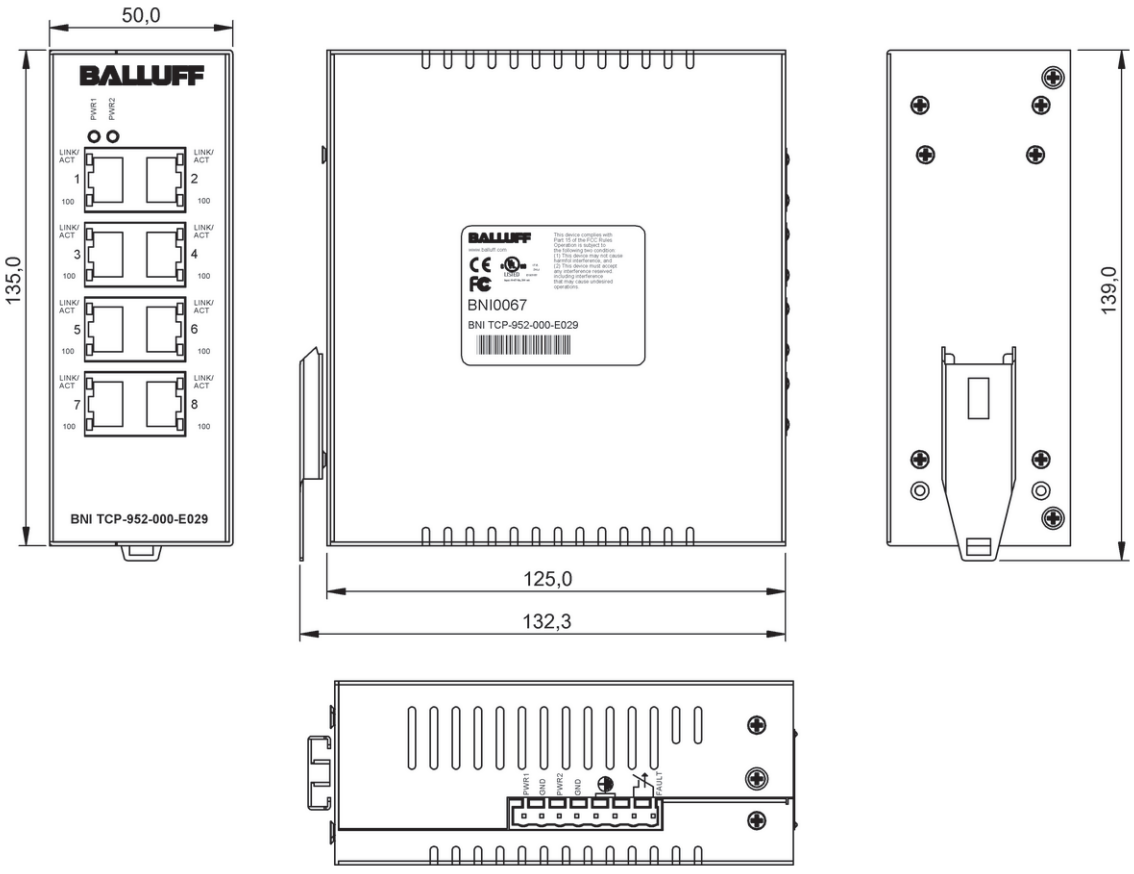
- Variety of Ethernet-based systems and network components
- Complete system for linking Ethernet system components with Ethernet

	BNI005E BNI TCP-951-000-E028	
Principle of operation	Active splitter	
Dimension	30 x 76.5 x 110 mm	
Mounting	DIN rail mount	
Housing material	Steel, coated	
Interface	Ethernet TCP/IP 10Base-T/100Base-TX	
Operating voltage Ub	12...48 VDC	
Connection slots	5x RJ45-Female, 8-pole	
Ambient temperature	-10...60 °C	
Protection degree	IP30	
Productview	Page 154	

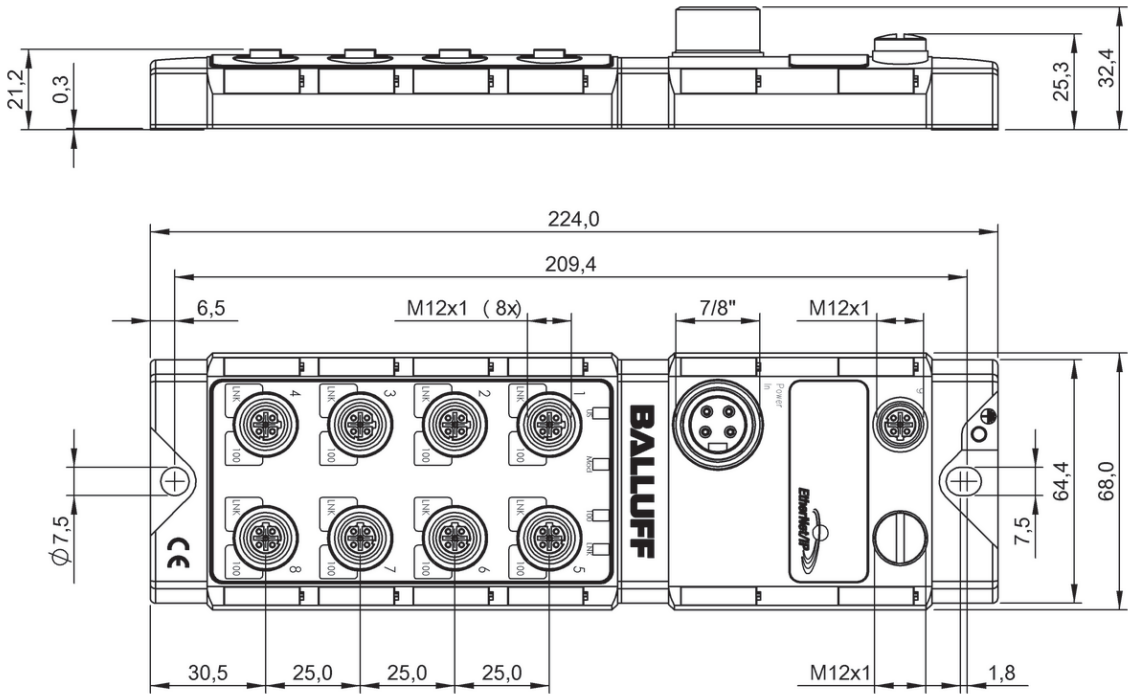
BNI0067 BNI TCP-952-000-E029	BNI000F BNI EIP-950-000-Z009
Active splitter	Active splitter
50 x 76.5 x 135 mm	68 x 32.4 x 224 mm
DIN rail mount	2-hole screw mount
Steel, coated	Zinc, die-cast
Ethernet TCP/IP 10Base-T/100Base-TX	Ethernet TCP/IP 10Base-T/100Base-TX
12...48 VDC	18...30.2 VDC
8x RJ45-Female, 8-pole	8x M12x1-Female, 4-pole, D-coded
-20...60 °C	-5...55 °C
IP30	IP67
Page 154	Page 155



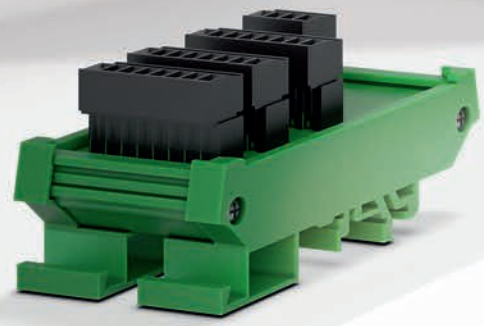
BNI005E



BNI0067


21,2
0,3
25,3
32,4
224,0
209,4
6,5
M12x1 (8x)
7/8"
M12x1
⌀7,5
64,4
68,0
7,5
30,5
25,0
25,0
25,0
M12x1
1,8
BALLUFF

BNI000F



**Reliable signal transmission,
even under extreme conditions**

I/O MODULES

I/O modules from Balluff connect binary and analog sensors and actuators to the control level via a bus. By using our modules you can significantly reduce the number of cables required. The Balluff I/O modules also offer additional functions for signal preprocessing and expanded diagnostic options. Various form factors and connection technologies provide solutions for a wide range of requirements – even under extreme ambient conditions.

Features

- Simple to install
- Efficient configuration
- Continuous diagnostics
- Individual solutions through a variety of designs and connection techniques
- Suitable for use under extreme conditions



	BNI0093 BNI IOL-309-002-Z019	BNI0099 BNI IOL-102-002-Z019	BNI00AU BNI IOL-302-002-Z046	
Interface	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	—	—	—	
Connection slots	8x M8x1-Female, 3-pole	8x M8x1-Female, 3-pole	16x M8x1-Female, 3-pole	
Digital inputs	8x PNP, Type3	8x PNP, Type3	16x PNP, Type3	
Digital outputs	8x PNP	—	16x PNP	
Analog inputs	—	—	—	
Configurable inputs/outputs	yes	no	yes	
Additional function	Extension port	Extension port	Extension port	
Output current max.	300 mA	—	300 mA	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	30 x 32.5 x 132 mm	30 x 32.5 x 132 mm	30 x 32.8 x 220 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.5 ms	3.2 ms	4.0 ms	
Process data in	1 bytes	1 bytes	2 bytes	
Process data out	1 bytes	—	2 bytes	
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	BNI00AY BNI IOL-104-002-Z046	BNI000R BNI IOL-102-000-K019	BNI001Y BNI IOL-102-S01-K019	BNI0021 BNI IOL-104-000-K021	BNI0022 BNI IOL-104-S01-K021
	IO-Link 1.1	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	—	—	—	—	—
	16x M8x1-Female, 3-pole	8x M8x1-Female, 3-pole	8x M8x1-Female, 3-pole	8x M8x1-Female, 4-pole	8x M8x1-Female, 4-pole
	16x PNP, Type3	8x PNP, Type2	8x PNP, Type2	16x PNP, Type 2	16x PNP, Type 2
	—	—	—	—	—
	—	—	—	—	—
	no	no	no	no	no
	Extension port	—	Single-channel monitoring	—	Single-channel monitoring
	—	—	—	—	—
	Zinc, die-cast	PBT, GF	PBT, GF	PBT, GF	PBT, GF
	30 x 32.8 x 220 mm	30 x 24 x 129.5 mm	30 x 24 x 129.5 mm	30 x 24 x 129.5 mm	30 x 24 x 129.5 mm
	-5...70 °C	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C
	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	3.5 ms	2.5 ms	2.5 ms	2.5 ms	10 ms
	2 bytes	1 bytes	2 bytes	2 bytes	3 bytes
	—	—	—	—	—
	Page 173	Page 174	Page 174	Page 174	Page 174

	BNI000P BNI IOL-101-000-K018	BNI001W BNI IOL-101-S01-K018	BNI00CN BNI IOL-302-S02-Z012	
Interface	IO-Link 1.0	IO-Link 1.0	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	—	—	—	
Connection slots	4x M8x1-Female, 3-pole	4x M8x1-Female, 3-pole	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	4x PNP, Type2	4x PNP, Type2	16x PNP, Type3	
Digital outputs	—	—	16x PNP	
Analog inputs	—	—	—	
Configurable inputs/outputs	no	no	yes	
Additional function	—	Single-channel monitoring	Extension port, Single-channel monitoring	
Output current max.	—	—	500 mA	
Housing material	PBT, GF	PBT, GF	Zinc, die-cast	
Dimension	30 x 24 x 85.5 mm	30 x 24 x 85.5 mm	68 x 31.8 x 181.5 mm	
Ambient temperature	-5...55 °C	-5...55 °C	-5...55 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	2.5 ms	2.5 ms	6.2 ms	
Process data in	1 bytes	2 bytes	8 bytes	
Process data out	—	—	2 bytes	
Productview	Page 175	Page 175	Page 175	





	BNI00CR BNI IOL-104-S02-Z012	BNI0063 BNI IOL-106-000-Z012	BNI0062 BNI IOL-106-S01-Z012	BNI0061 BNI IOL-106-S01-Z012-C01	BNI00AJ BNI IOL-719-002-Z012
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	—	—	—	—	—
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type3	16x NPN, Type2	16x NPN, Type2	16x NPN, Type2	—
	—	—	—	—	—
	—	—	—	—	8x Analog, voltage/ ANalog, current/ana-log, temperature (0…10 V/-10…10 V/0…5 V/-5…5 V/5...10 V/4…20 mA/0…20 mA/Pt100/ Pt1000/Thermocouple Type J/Thermocouple Type K)
	no	no	no	no	no
	Extension port, Sing-le-channel monitoring	—	Single-channel monitoring	Single-channel monitoring, Identification 2 bytes	—
	—	—	—	—	—
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm
	-5...55 °C	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C
	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	4.4 ms	3.0 ms	3.5 ms	4.0 ms	55 ms
	4 bytes	2 bytes	4 bytes	6 bytes	22 bytes
	—	—	—	—	1 bytes
	Page 175	Page 176	Page 176	Page 176	Page 176



	BNI003U BNI IOL-302-000-Z012	BNI0032 BNI IOL-104-000-Z012	BNI003T BNI IOL-104-S01-Z012-C01	
Interface	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	—	—	—	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	16x PNP	—	—	
Analog inputs	—	—	—	
Configurable inputs/outputs	yes	no	no	
Additional function	—	—	Single-channel monitoring, Identification 2 bytes	
Output current max.	500 mA	—	—	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...70 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	12 ms	3.0 ms	18 ms	
Process data in	2 bytes	2 bytes	6 bytes	
Process data out	2 bytes	—	—	
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	BNI005P BNI IOL-104-S01-Z012-C02	BNI0031 BNI IOL-102-000-Z012	BNI0043 BNI IOL-205-000-Z012	BNI00CM BNI IOL-302-002-Z042	BNI0046 BNI IOL-302-S02-Z013
	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	—	—	—	—	7/8“-Male, 5-pole
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type 2	8x PNP, Type2	—	16x PNP, Type3	16x PNP, Type3
	—	—	16x PNP	16x PNP	16x PNP
	—	—	—	—	—
	no	no	no	yes	yes
	Single-channel monitoring, Identification 4 bytes	—	—	Extension port	Extension port, Sing-le-channel monitoring
	—	—	500 mA	2 A	2 A
	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast
	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 31.8 x 181.5 mm	68 x 32.4 x 181.5 mm
	-5...70 °C	-5...70 °C	-5...70 °C	-5...55 °C	-5...55 °C
	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	24 ms	3.0 ms	3.0 ms	4.4 ms	6.2 ms
	8 bytes	1 bytes	—	2 bytes	8 bytes
	—	—	2 bytes	2 bytes	2 bytes
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Do you need more details? Our Product Finder at www.balluff.com provides you with product-specific information, including technical drawings, data sheets, user guides and more for each individual product. All items are available for download.



	BNI0035 BNI IOL-302-000-Z013	BNI0048 BNI IOL-302-S01-Z013-C01	BNI00CP BNI IOL-302-S02-Z026	
Interface	IO-Link 1.0	IO-Link 1.0	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	7/8“-Male, 5-pole	7/8“-Male, 5-pole	7/8“-Male, 4-pole	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type 2	16x PNP, Type 2	16x PNP, Type3	
Digital outputs	16x PNP	16x PNP	16x PNP	
Analog inputs	—	—	—	
Configurable inputs/outputs	yes	yes	yes	
Additional function	—	Single-channel monitoring, Identification 2 bytes	Extension port, Sing-le-channel monitoring	
Output current max.	2 A	2 A	2 A	
Housing material	Zinc, die-cast	Zinc, die-cast	Zinc, die-cast	
Dimension	68 x 32.4 x 181.5 mm	68 x 32.4 x 181.5 mm	68 x 32.4 x 181.5 mm	
Ambient temperature	-5...70 °C	-5...70 °C	-5...55 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	12 ms	30 ms	5.6 ms	
Process data in	2 bytes	10 bytes	6 bytes	
Process data out	2 bytes	2 bytes	2 bytes	
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	BNI0050 BNI IOL-302-000-Z026	BNI00AR BNI IOL-302-002-E012	BNI00AP BNI IOL-104-002-E012	BNI00AT BNI IOL-302-002-E013	BNI0090 BNI IOL-104-S02-R012
	IO-Link 1.0	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	7/8“-Male, 4-pole	—	—	7/8“-Male, 5-pole	—
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type 2	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3
	16x PNP	16x PNP	—	16x PNP	—
	—	—	—	—	—
	yes	yes	no	yes	no
	—	Extension port	Extension port	Extension port	Extension port, Sing-le-channel monitoring
	2 A	2 A	—	2 A	—
	Zinc, die-cast	Stainless steel (1.4571)	Stainless steel (1.4571)	Stainless steel (1.4571)	PPS
	68 x 32.4 x 181.5 mm	70 x 37.9 x 185.6 mm	70 x 37.9 x 185.6 mm	70 x 38.5 x 185.6 mm	68 x 36.8 x 183.5 mm
	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C	-5...70 °C
	IP67 when threaded in	IP69 when threaded in	IP69 when threaded in	IP69 when threaded in	IP67 when threaded in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	12 ms	4.0 ms	3.5 ms	4.0 ms	4.5 ms
	2 bytes	2 bytes	2 bytes	2 bytes	4 bytes
	2 bytes	2 bytes	—	2 bytes	—
	Page 180	Page 180	Page 180	Page 181	Page 181

	BNI0091 BNI IOL-302-S02-R026	BNI005L BNI IOL-302-000-K006	BNI005U BNI IOL-302-000-K006-C01	
Interface	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	7/8“-Male, 4-pole	—	—	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3	
Digital outputs	16x PNP	16x PNP	16x PNP	
Analog inputs	—	—	—	
Configurable inputs/outputs	yes	yes	yes	
Additional function	Extension port, Sing-le-channel monitoring	—	Identification 2 bytes	
Output current max.	2 A	350 mA	350 mA	
Housing material	PPS	PA, Transparent	PA, Transparent	
Dimension	68 x 37.6 x 183.5 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	
Ambient temperature	-5...70 °C	-5...55 °C	-5...55 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	6.0 ms	3.5 ms	4.0 ms	
Process data in	6 bytes	2 bytes	4 bytes	
Process data out	2 bytes	2 bytes	2 bytes	
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	BNI007Z BNI IOL-302-002-K006	BNI005T BNI IOL-302-S01-K006	BNI005W BNI IOL-302-S01-K006-C01	BNI00AF BNI IOL-311-002-K006	BNI00AW BNI IOL-311-S02-K006-C01
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded
	—	—	—	—	—
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded
	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3	16x NPN, Type3	16x NPN, Type3
	16x PNP	16x PNP	16x PNP	16x NPN	16x NPN
	—	—	—	—	—
	yes	yes	yes	yes	yes
	Extension port	Single-channel monitoring	Single-channel monitoring, Identification 2 bytes	Extension port	Extension port, Single-channel monitoring, Identification 2 bytes
	300 mA	350 mA	350 mA	350 mA	350 mA
	PA, Transparent	PA, Transparent	PA, Transparent	PA, Transparent	PA, Transparent
	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm
	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C
	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	3.5 ms	5.0 ms	5.5 ms	3.5 ms	6.0 ms
	2 bytes	8 bytes	10 bytes	2 bytes	10 bytes
	2 bytes	2 bytes	2 bytes	2 bytes	2 bytes
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	BNI0074 BNI IOL-106-000-K006	BNI0075 BNI IOL-106-S01-K006	BNI0076 BNI IOL-106-S01-K006-C01	
Interface	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection (supply voltage IN)	—	—	—	
Connection slots	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	
Digital inputs	16x NPN, Type2	16x NPN, Type2	16x NPN, Type2	
Digital outputs	—	—	—	
Analog inputs	—	—	—	
Configurable inputs/outputs	no	no	no	
Additional function	—	Single-channel monitoring	Single-channel monitoring, Identification 2 bytes	
Output current max.	—	—	—	
Housing material	PA, Transparent	PA, Transparent	PA, Transparent	
Dimension	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	
Ambient temperature	-5...55 °C	-5...55 °C	-5...55 °C	
Protection degree	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.0 ms	3.5 ms	4.0 ms	
Process data in	2 bytes	4 bytes	6 bytes	
Process data out	—	—	—	
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	BNI0006 BNI IOL-104-000-K006	BNI0005 BNI IOL-102-000-K006	BNI0007 BNI IOL-709-000-K006	BNI0008 BNI IOL-710-000-K006	BNI007P BNI IOL-309-000-K024-001
	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	Pluggable without terminals
	—	—	—	—	Pluggable without terminals
	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	8x M12x1-Female, 5-pole, A-coded	Pluggable without terminals
	16x PNP, Type 2	8x PNP, Type2	8x PNP, Type2	8x PNP, Type2	8x PNP, Type2
	—	—	—	—	8x PNP
	—	—	4x Analog, current (4…20 mA)	4x Analog, voltage (0…10 V)	—
	no	no	no	no	yes
	—	—	—	—	—
	—	—	—	—	350 mA
	PA, Transparent	PA, Transparent	PA, Transparent	PA, Transparent	PA 6.6, UL94V-0
	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	50 x 30.8 x 115 mm	48.6 x 33.6 x 84 mm
	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C	-5...50 °C
	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP67 when threaded in	IP20
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	3.0 ms	3.0 ms	30 ms	30 ms	3.0 ms
	2 bytes	1 bytes	10 bytes	10 bytes	1 bytes
	—	—	—	—	1 bytes
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	BNI004K BNI IOL-309-000-K024	BNI007R BNI IOL-310-000-K025-001	BNI004L BNI IOL-310-000-K025	
Interface	IO-Link 1.0	IO-Link 1.0	IO-Link 1.0	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	Screw/plug-in terminals	Pluggable without terminals	Screw/plug-in terminals	
Connection (supply voltage IN)	Screw/plug-in terminals	Pluggable without terminals	Screw/plug-in terminals	
Connection slots	Screw/plug-in terminals	Pluggable without terminals	Screw/plug-in terminals	
Digital inputs	8x PNP, Type2	16x PNP, Type 2	16x PNP, Type 2	
Digital outputs	8x PNP	16x PNP	16x PNP	
Analog inputs	—	—	—	
Configurable inputs/outputs	yes	yes	yes	
Additional function	—	—	—	
Output current max.	350 mA	350 mA	350 mA	
Housing material	PA 6.6, UL94V-0	PA 6.6, UL94V-0	PA 6.6, UL94V-0	
Dimension	48.6 x 42.6 x 84 mm	79 x 33.6 x 84 mm	79 x 42.6 x 84 mm	
Ambient temperature	-5...50 °C	-5...50 °C	-5...50 °C	
Protection degree	IP20	IP20	IP20	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.0 ms	12.0 ms	12.0 ms	
Process data in	1 bytes	2 bytes	2 bytes	
Process data out	1 bytes	2 bytes	2 bytes	
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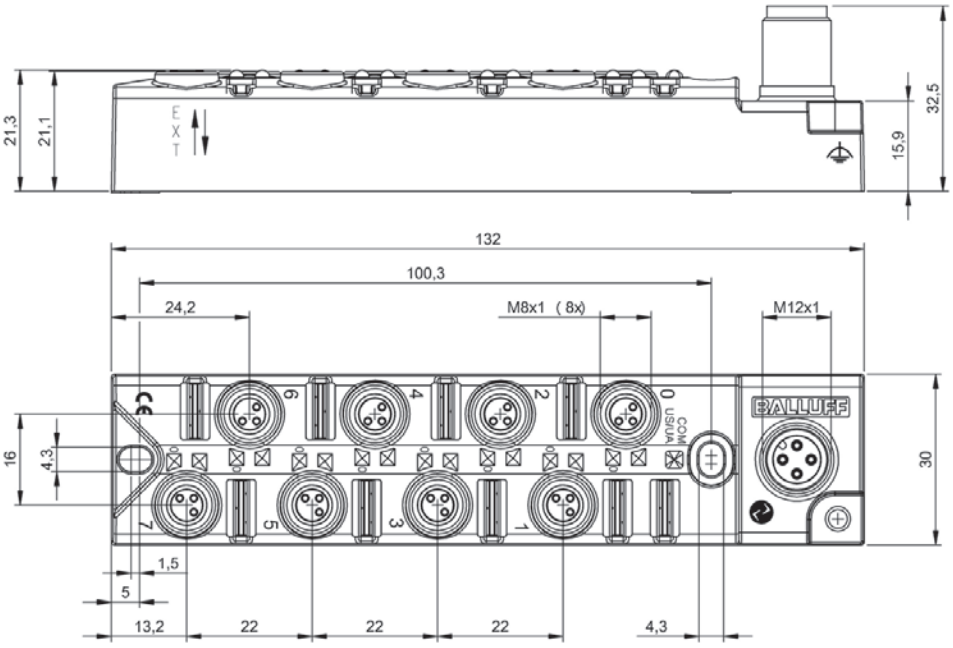
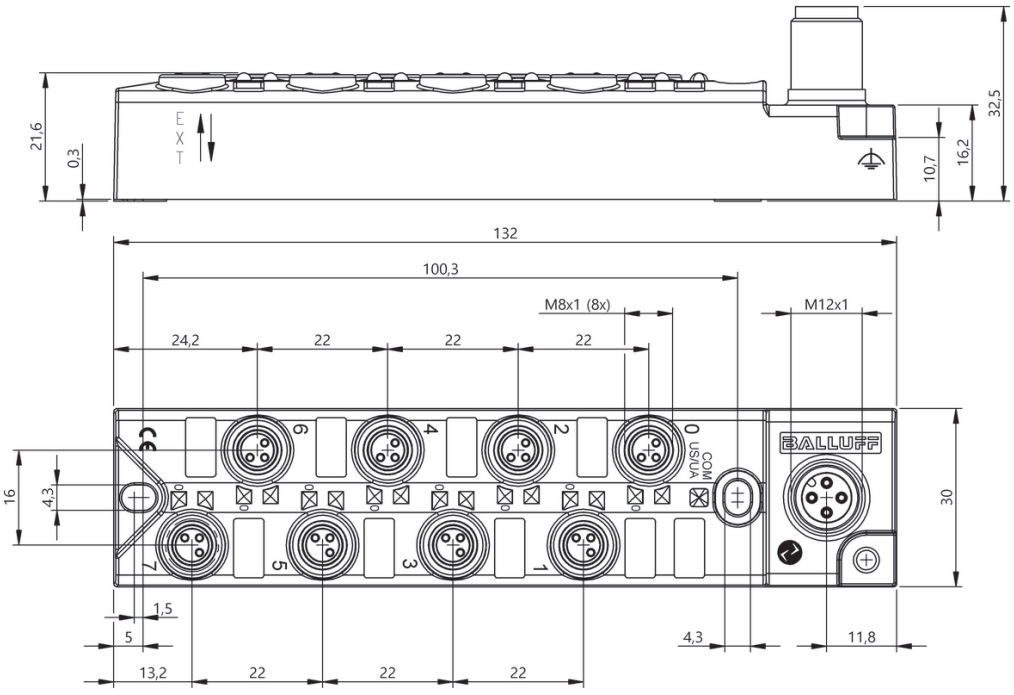


BNI0093



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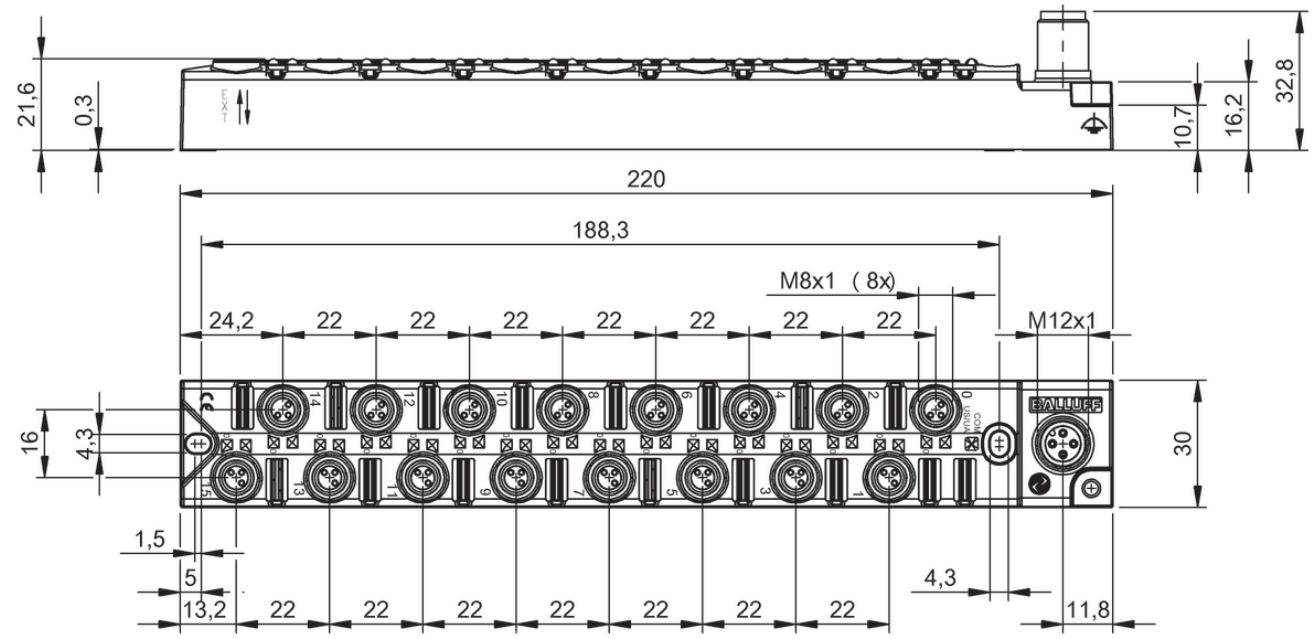

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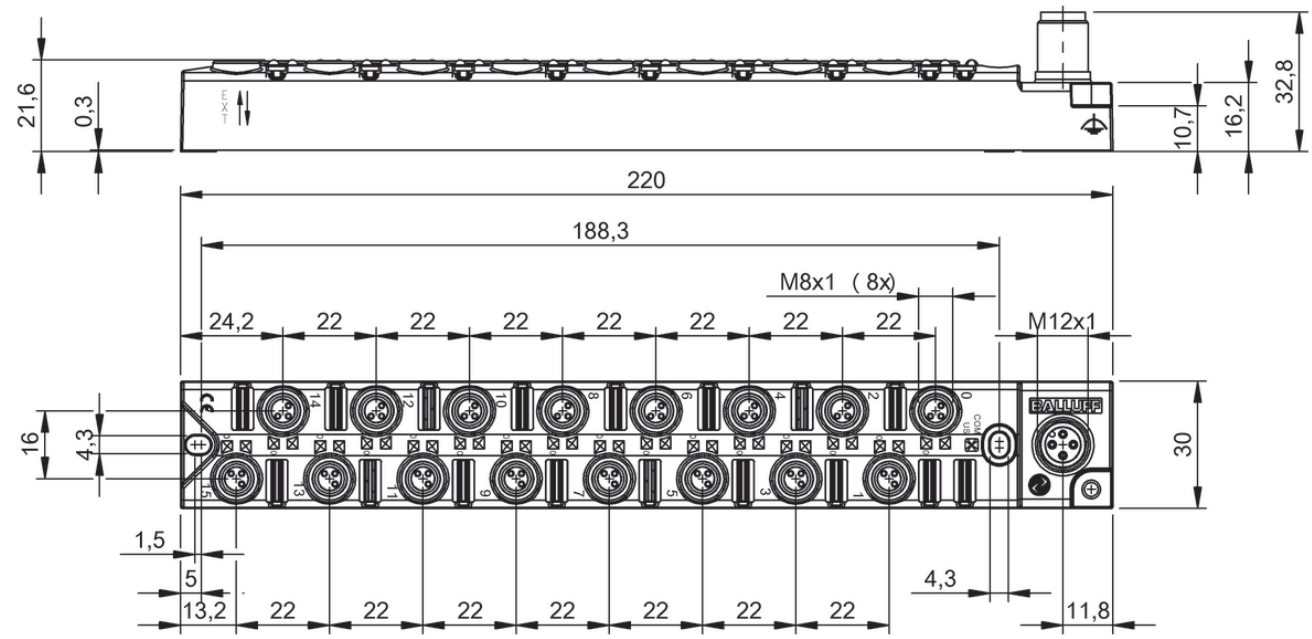
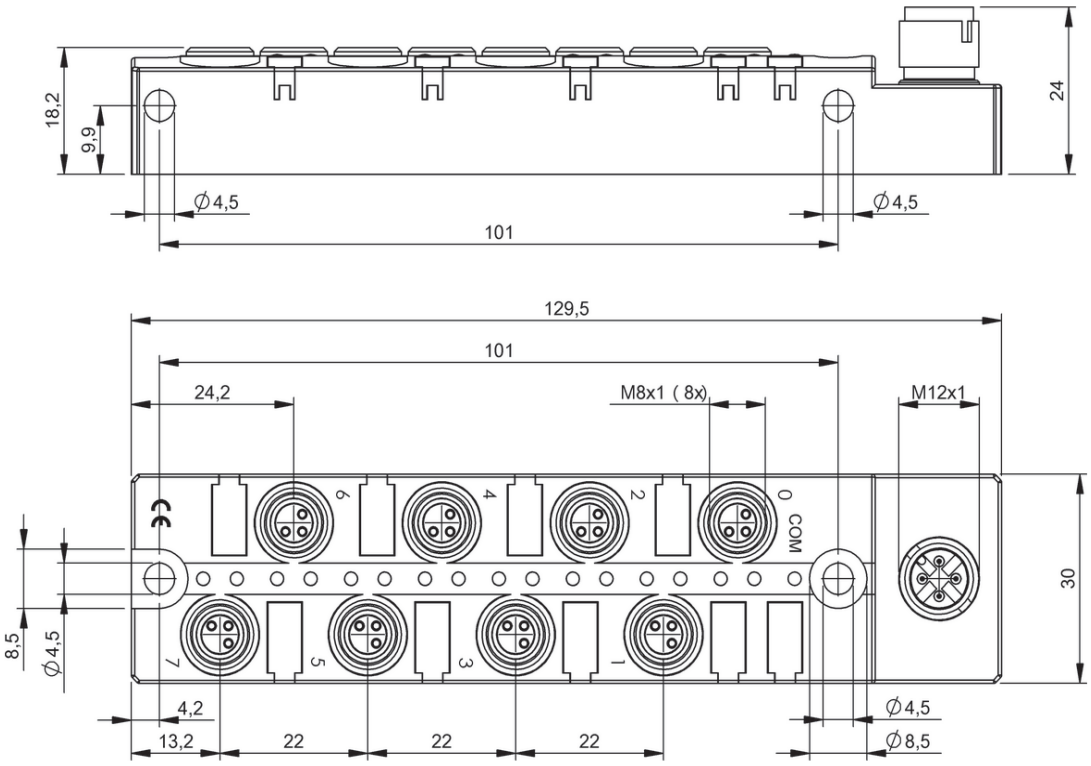
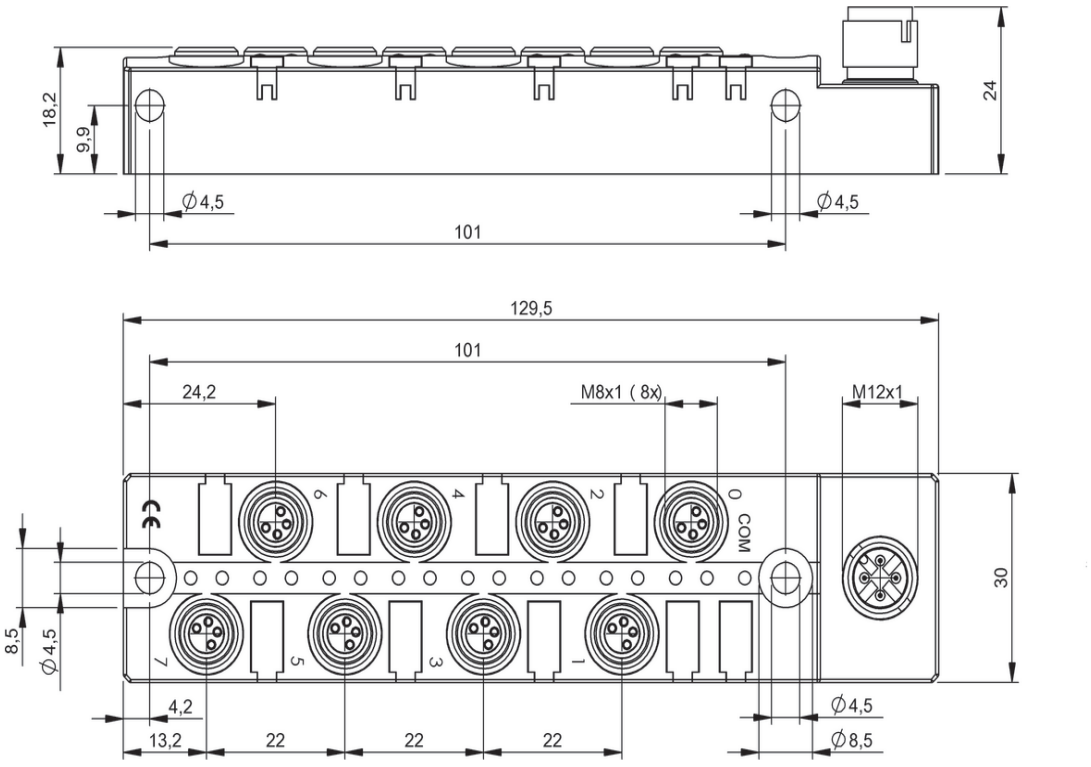


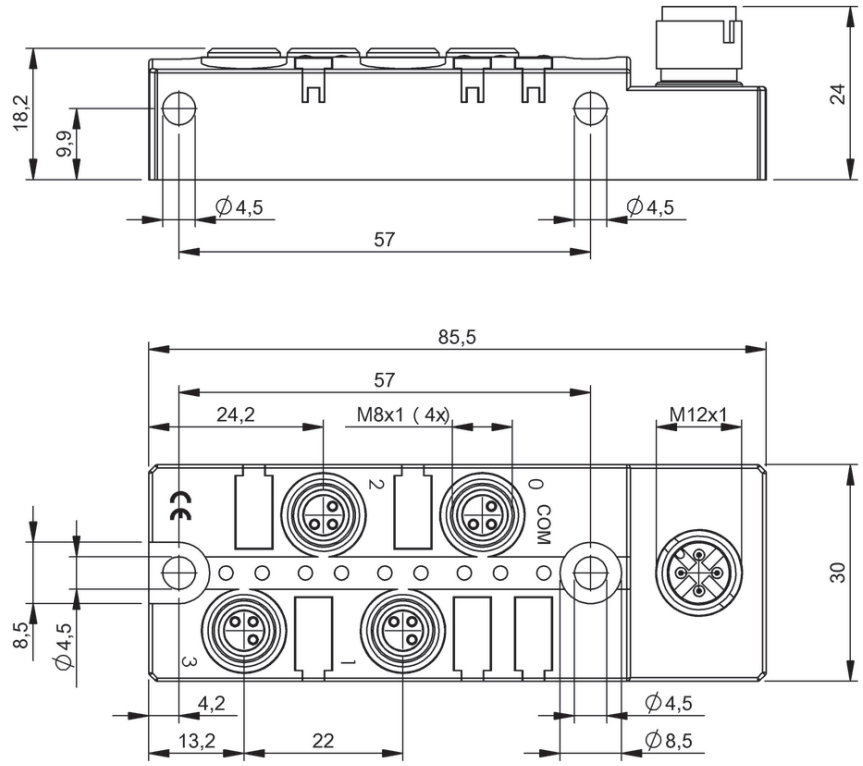
BNI00AY



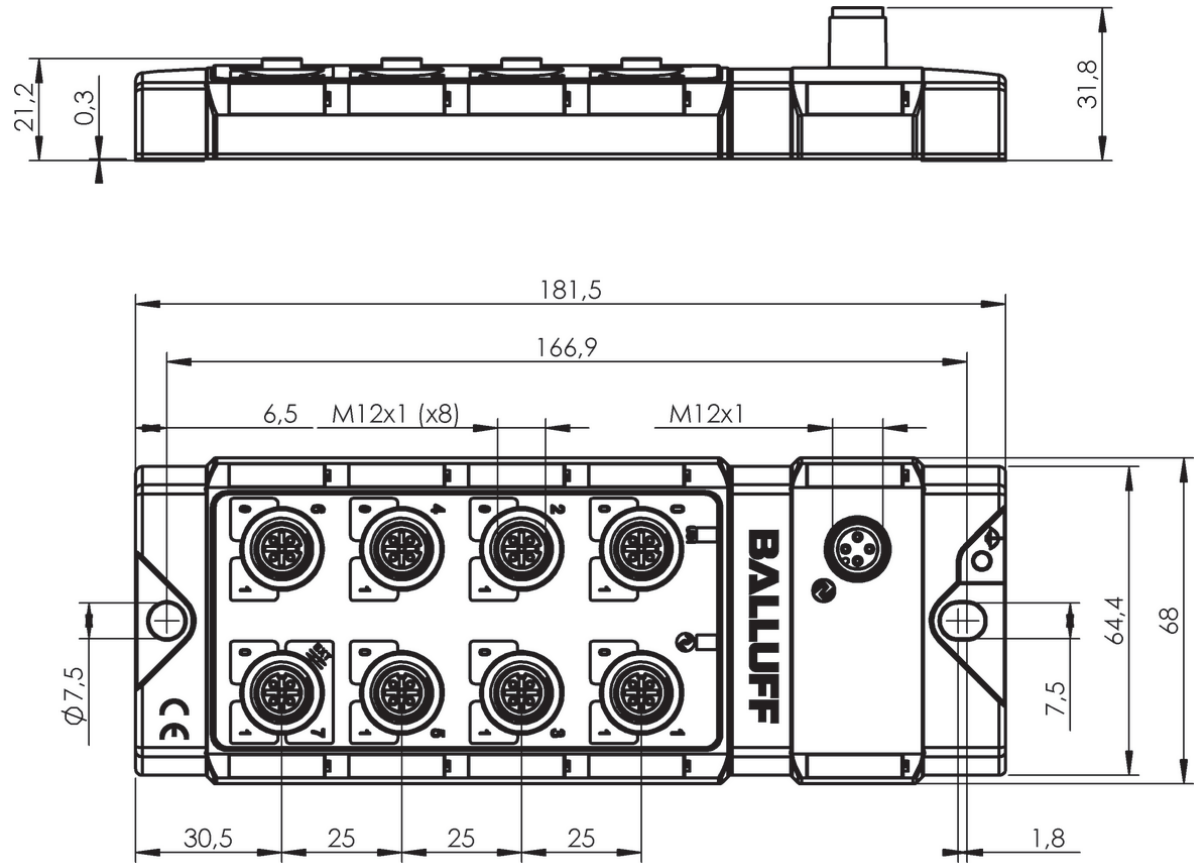
BNI000R, BNI001Y



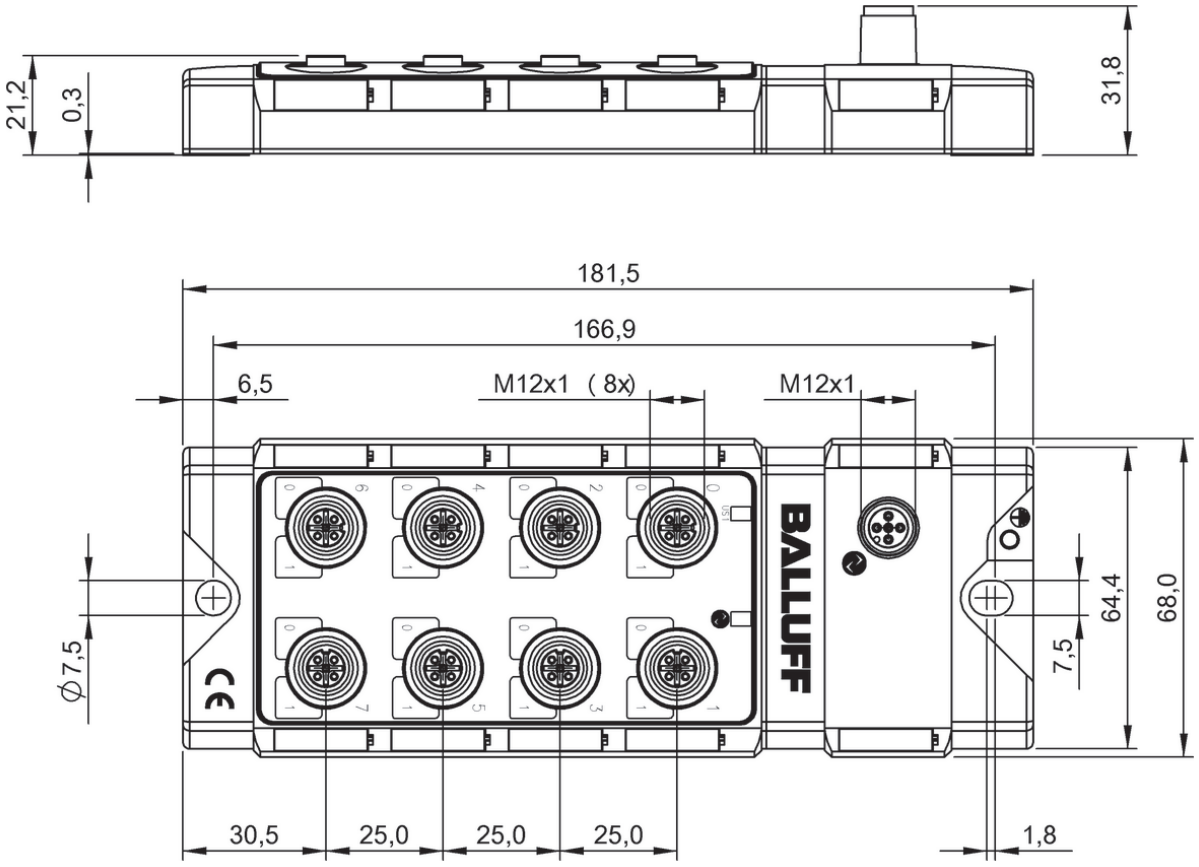
BNI0021, BNI0022



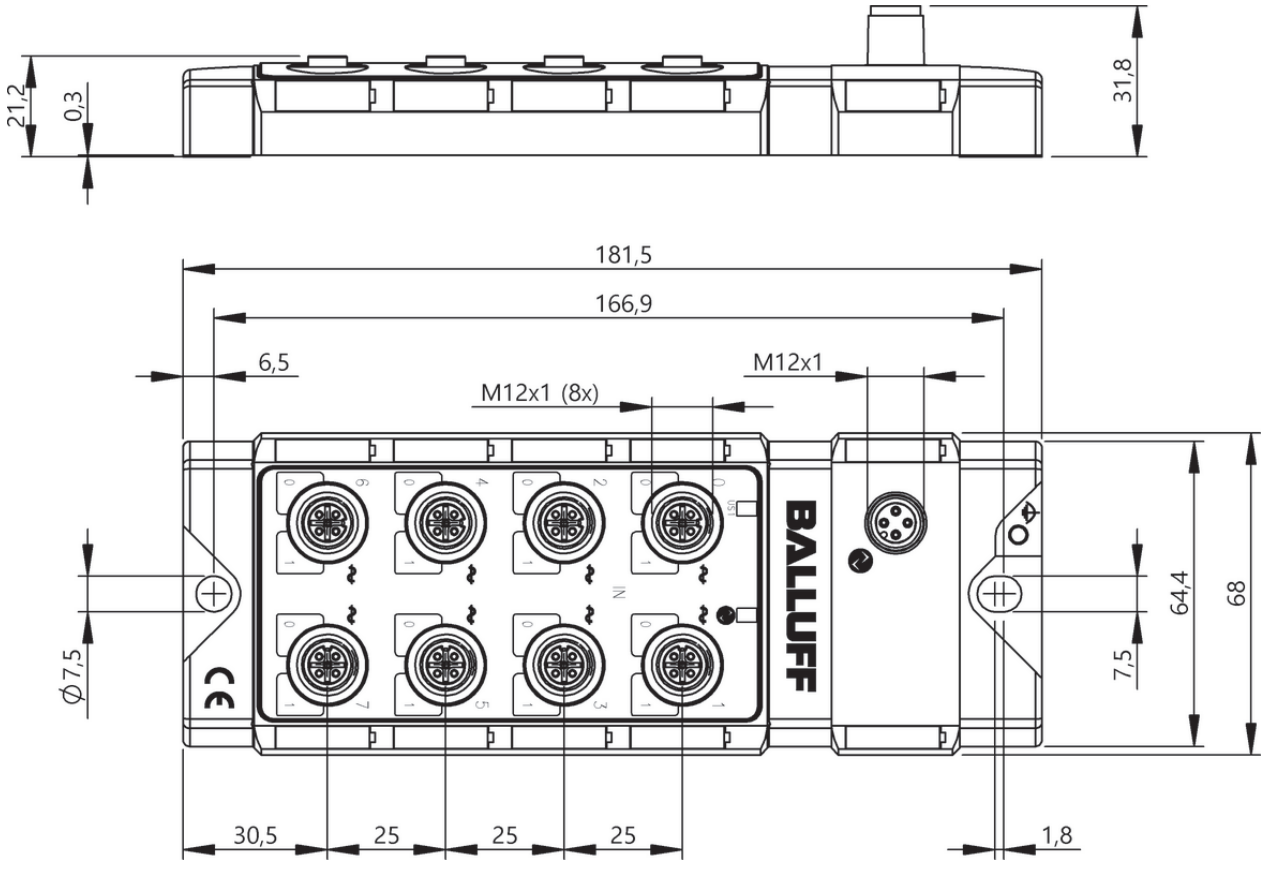
BNI000P, BNI001W



BNI00CN, BNI00CR, BNI00CM



BNI0063, BNI0062, BNI0061



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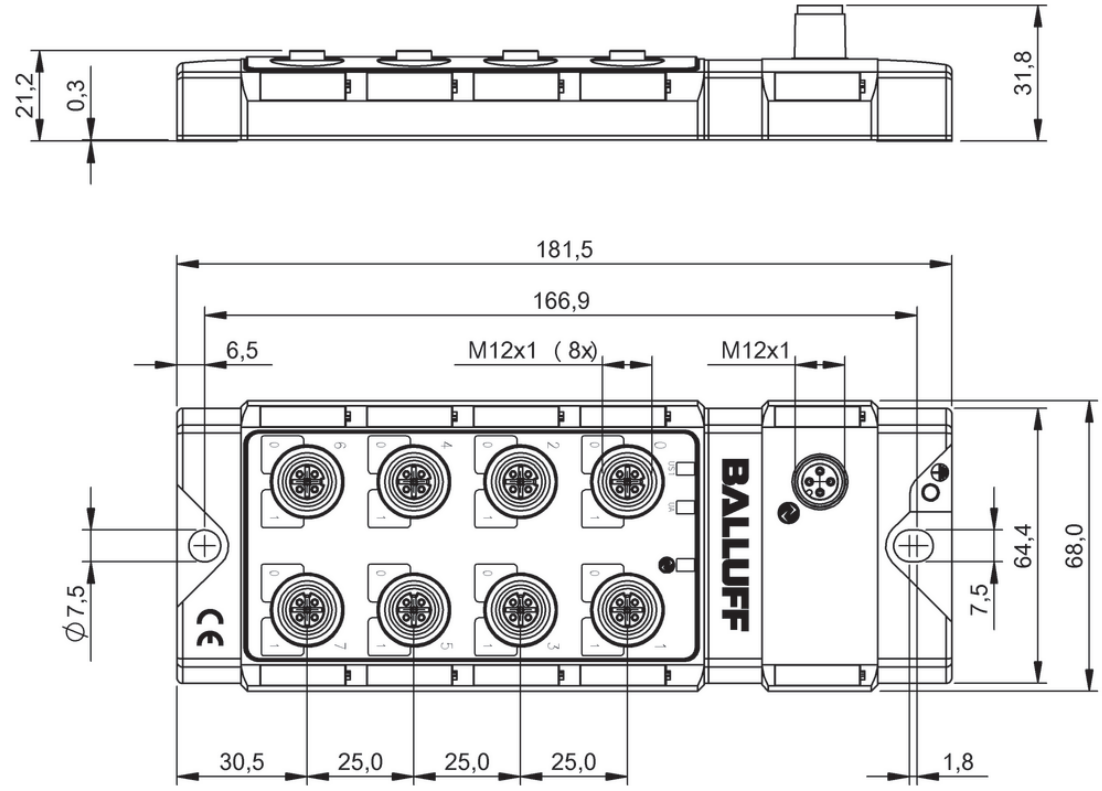
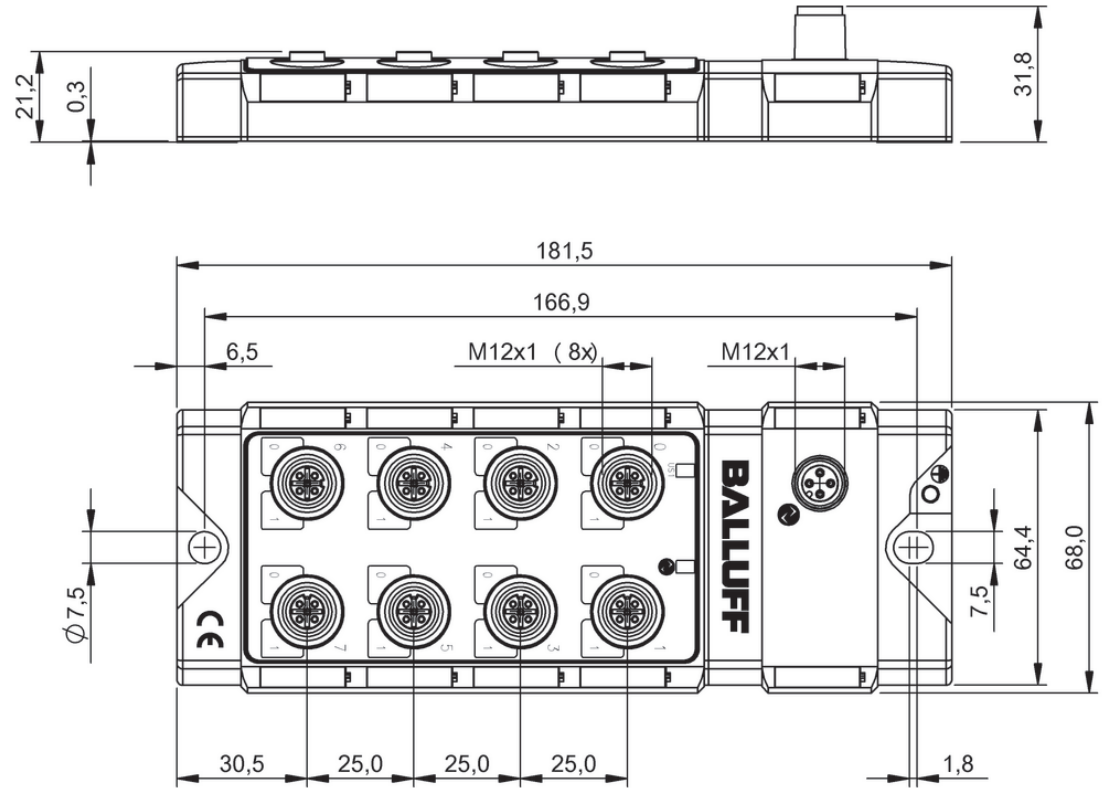
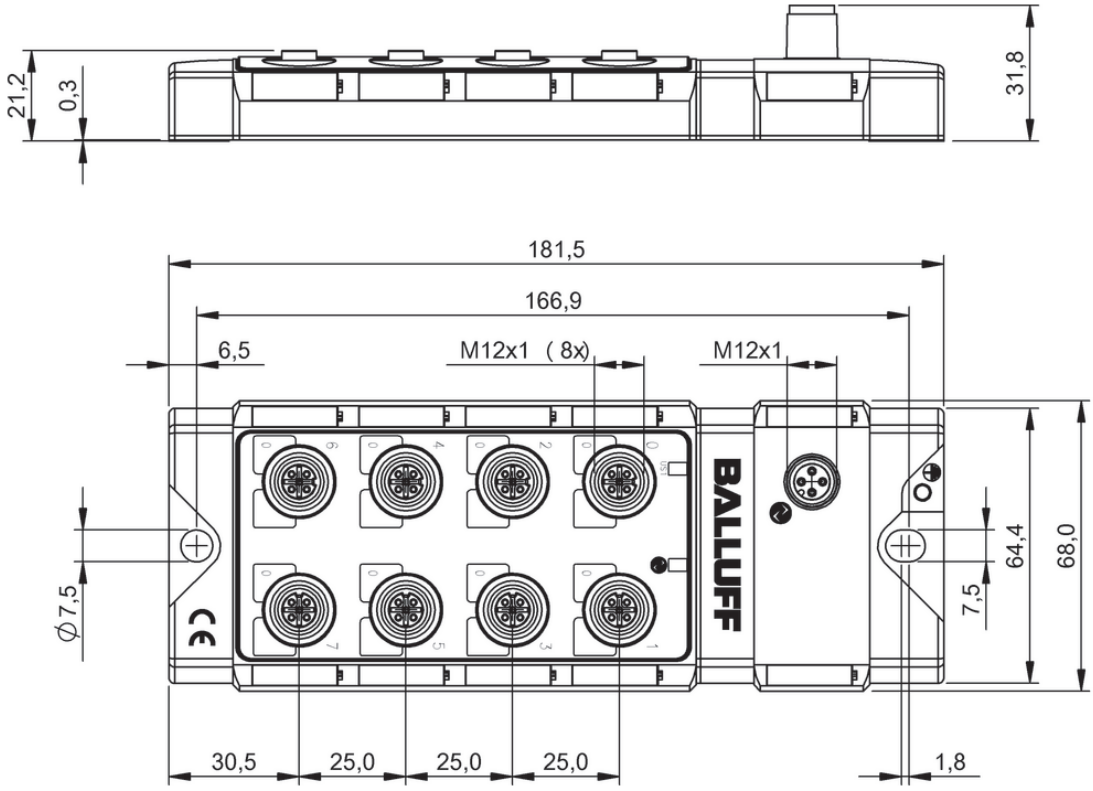


BNI003U, BNI0043



BNI0032, BNI003T, BNI005P



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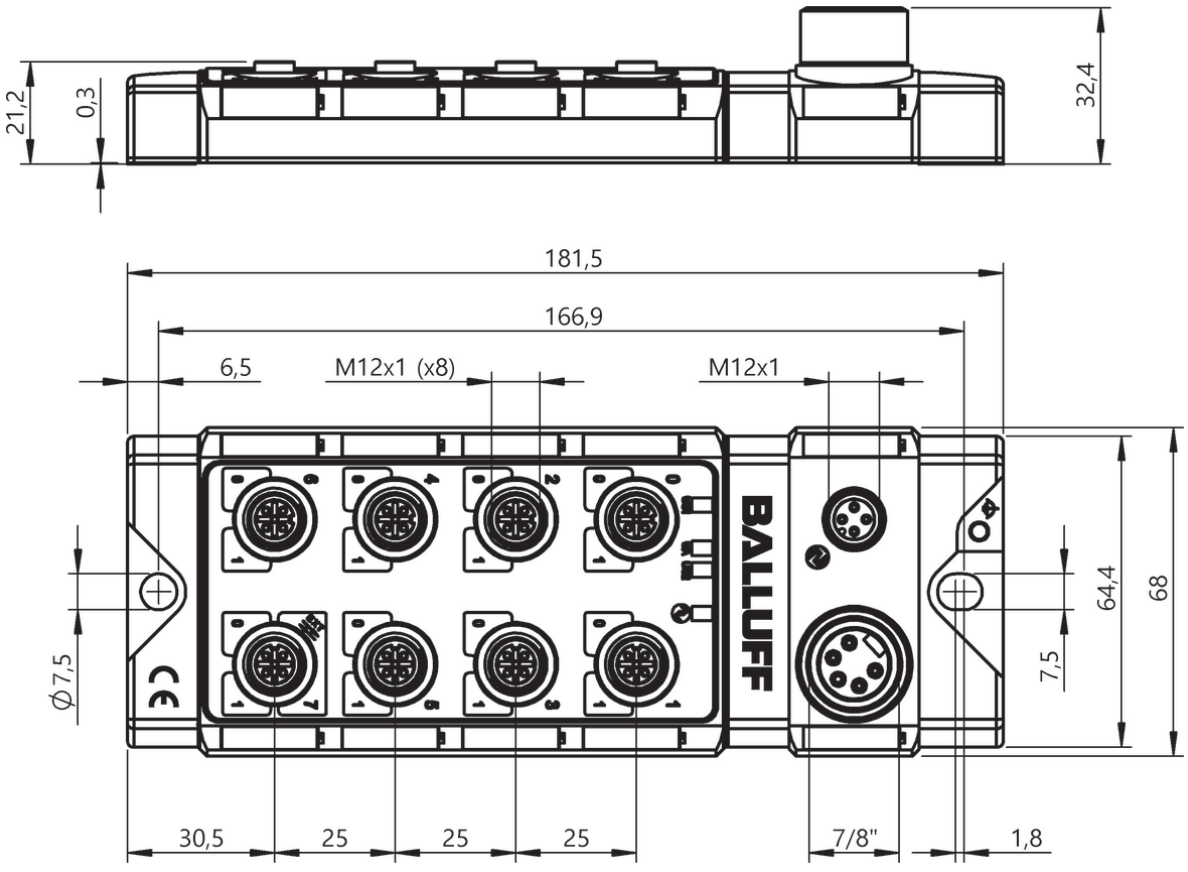

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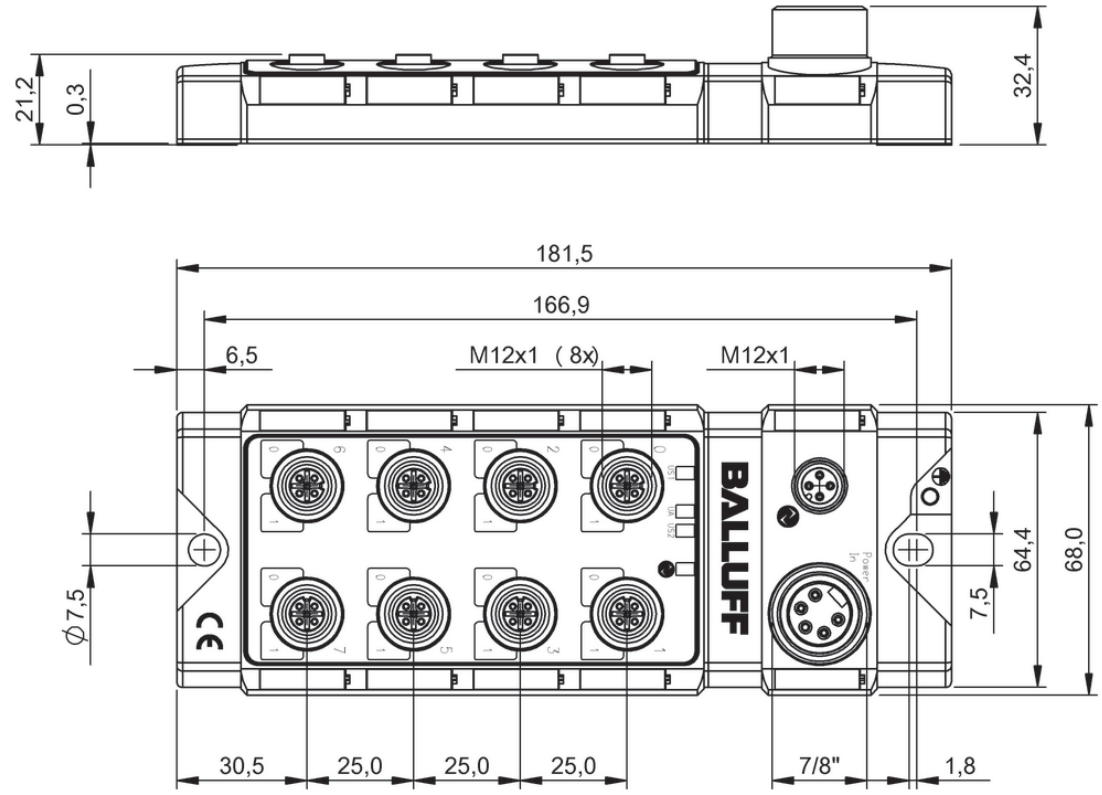
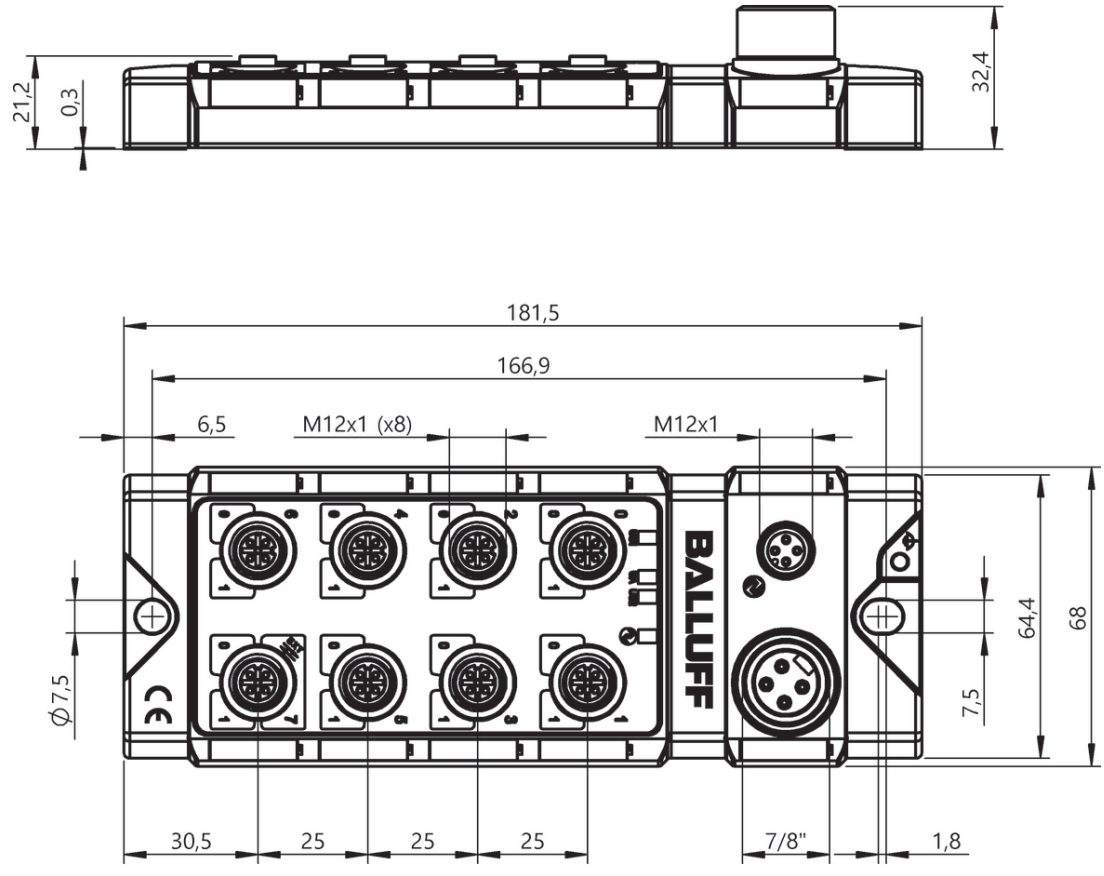


BNI0035, BNI0048



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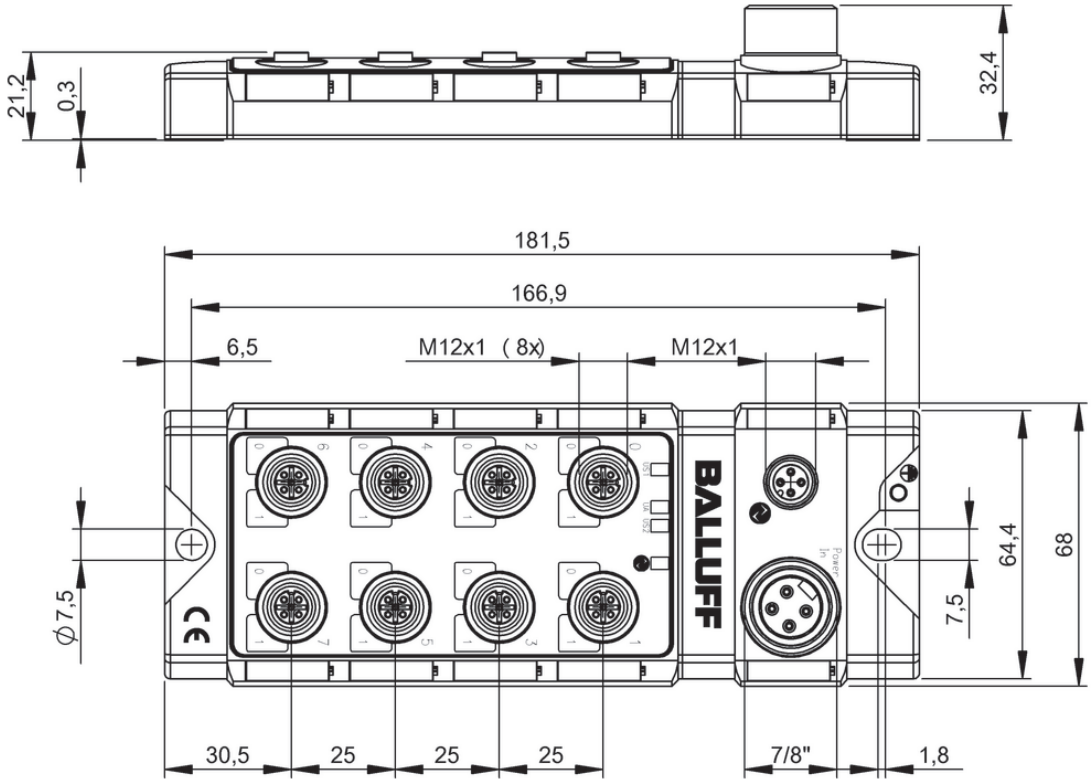
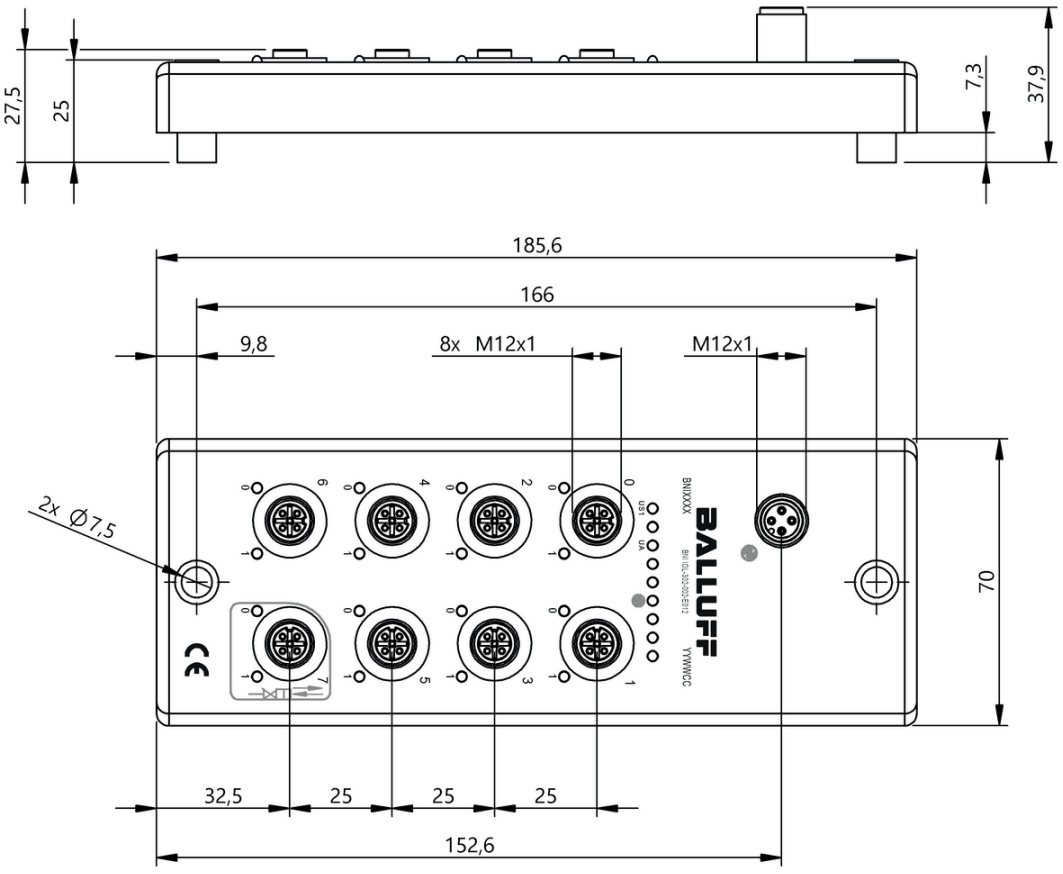


BNI0050



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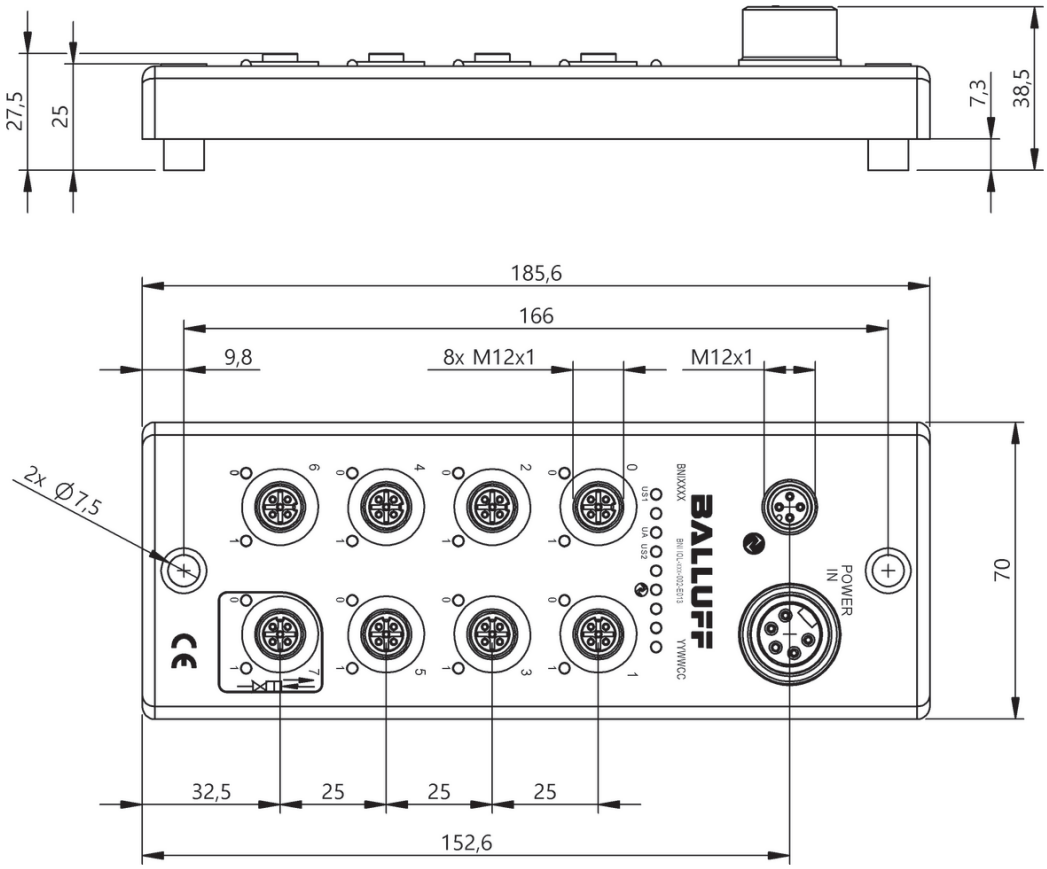

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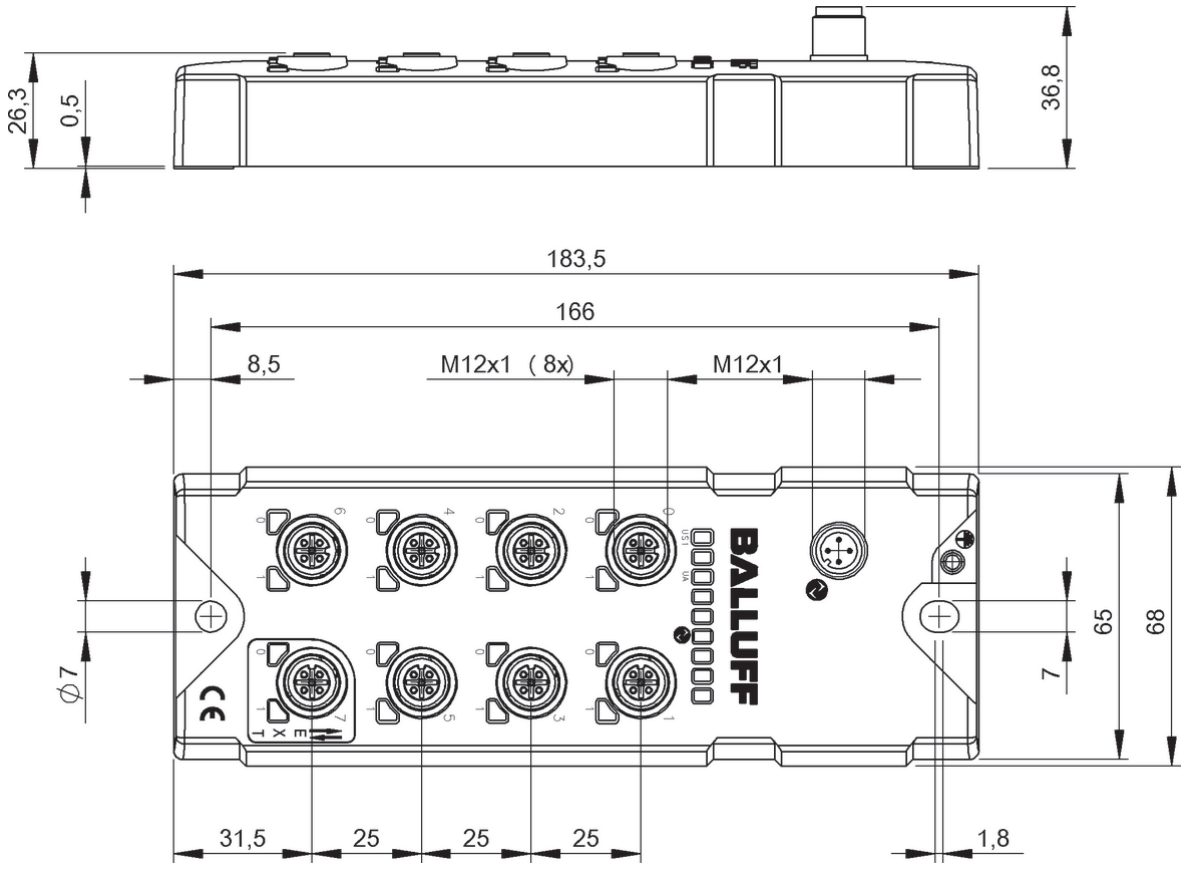

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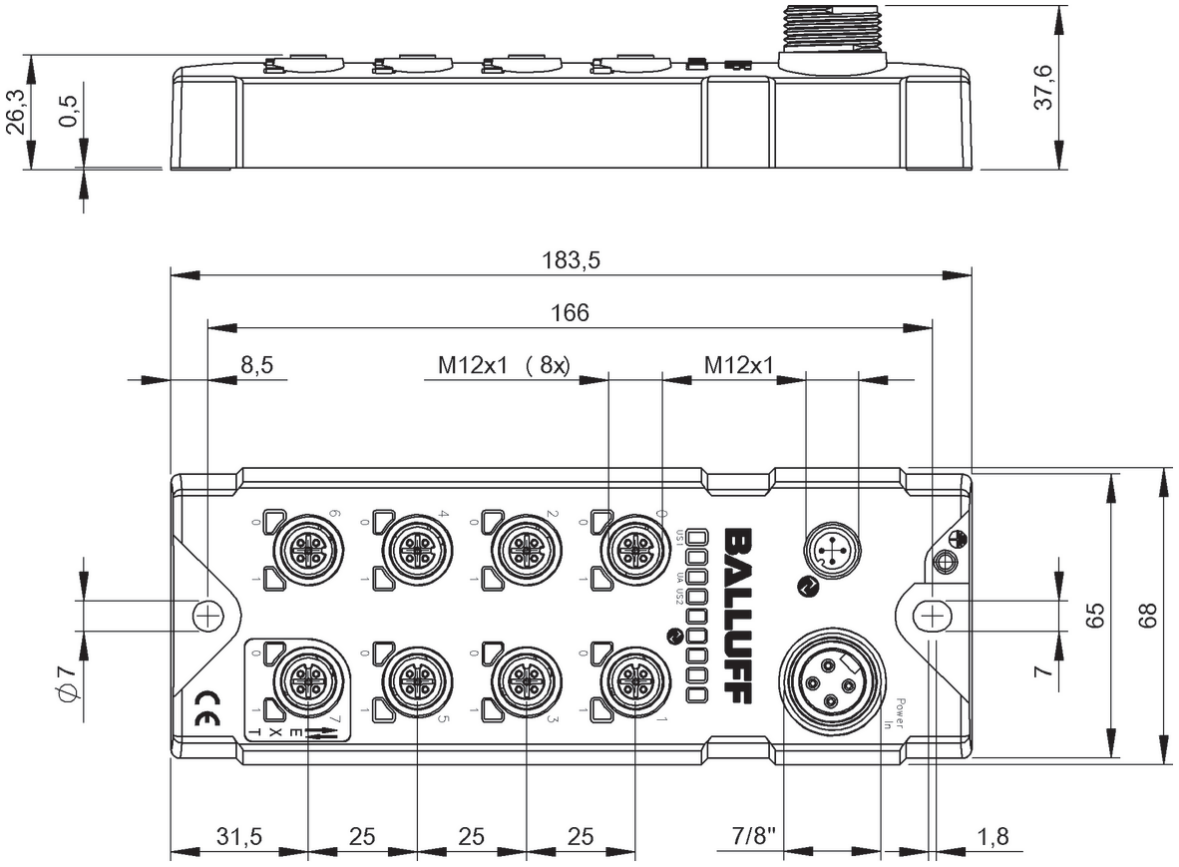

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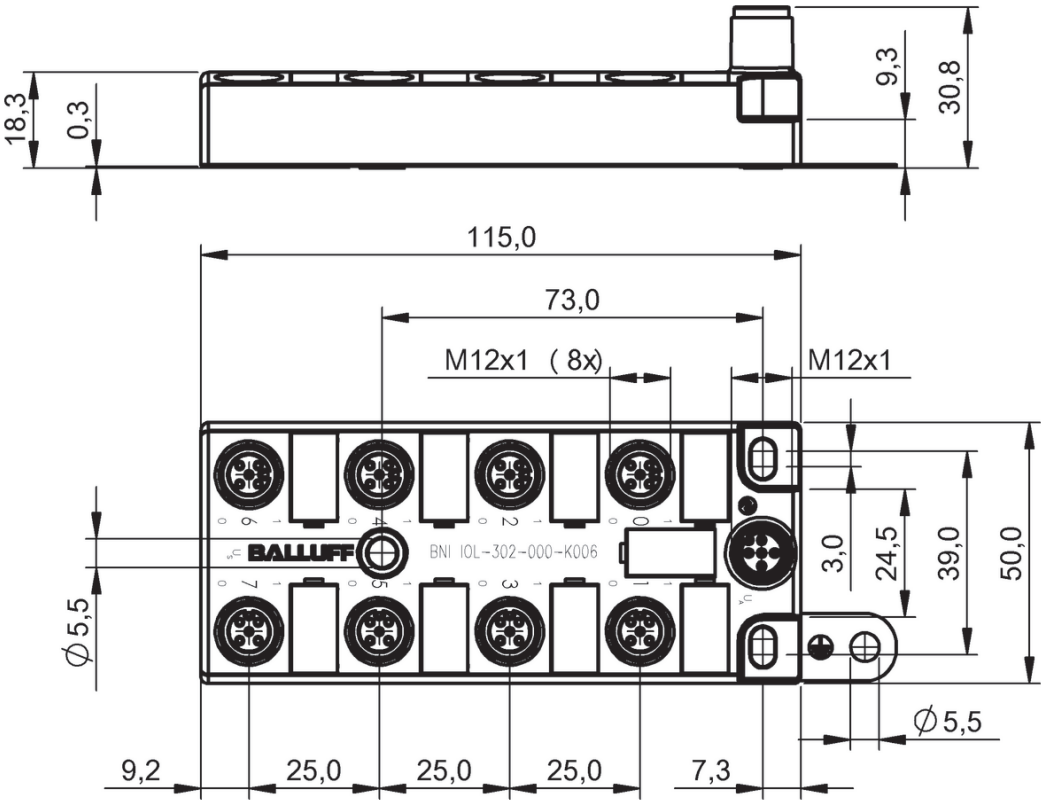

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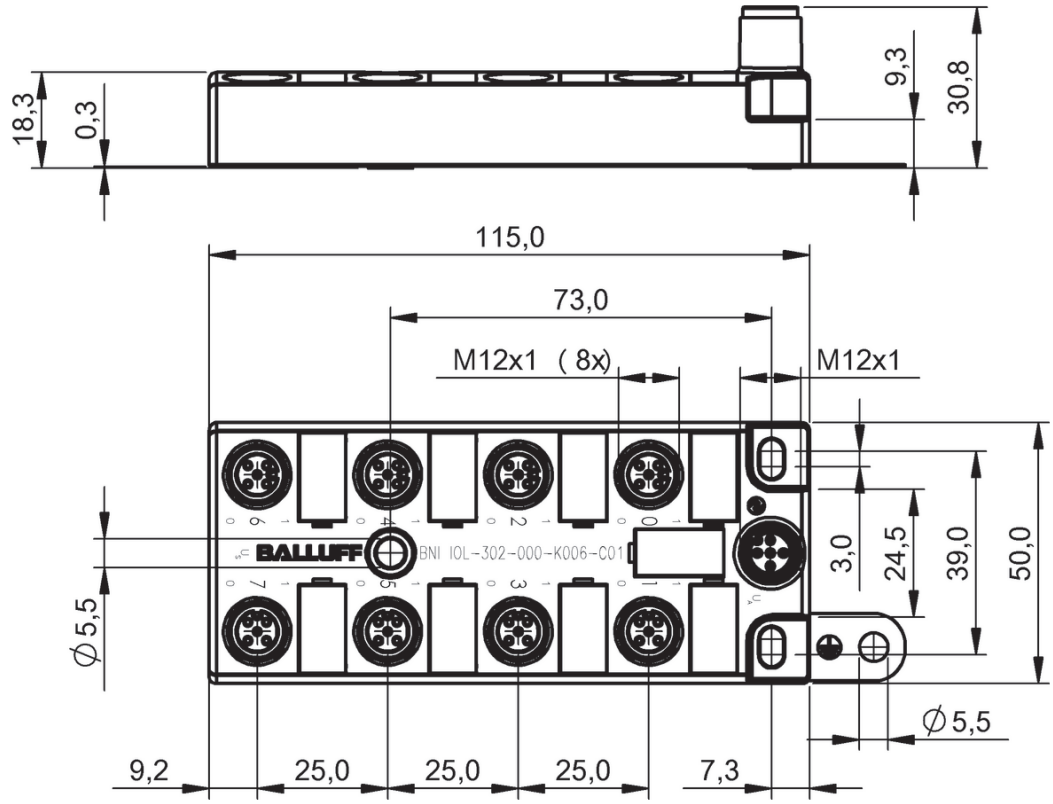

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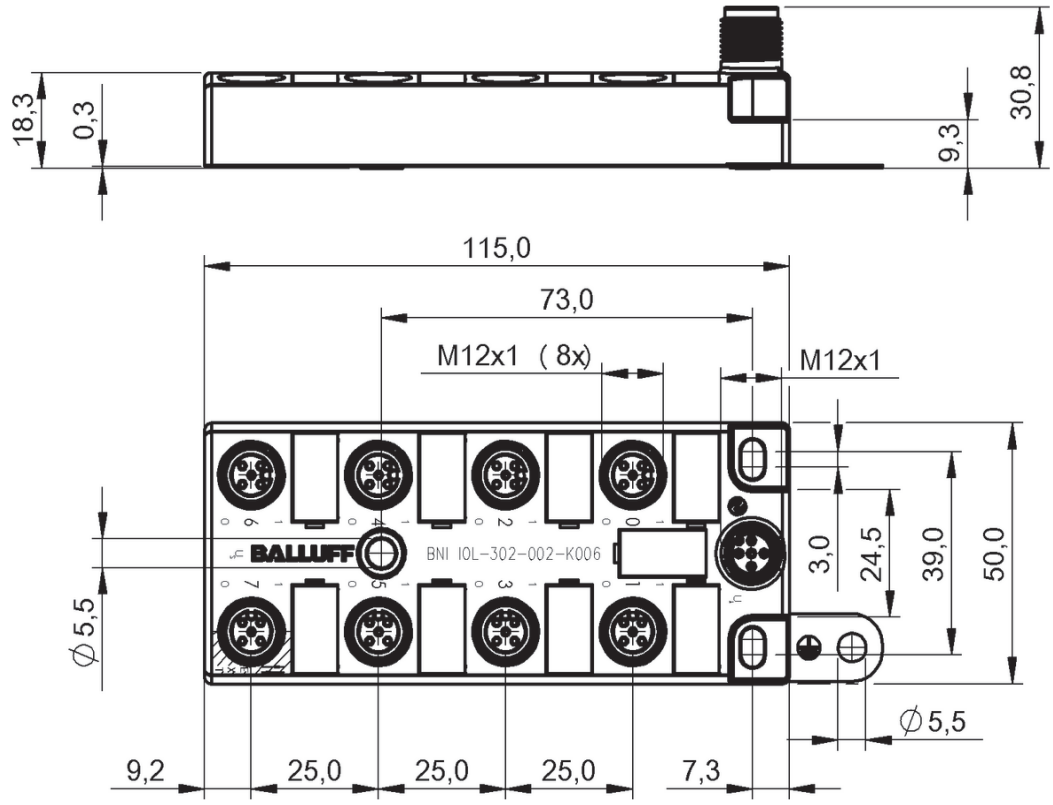

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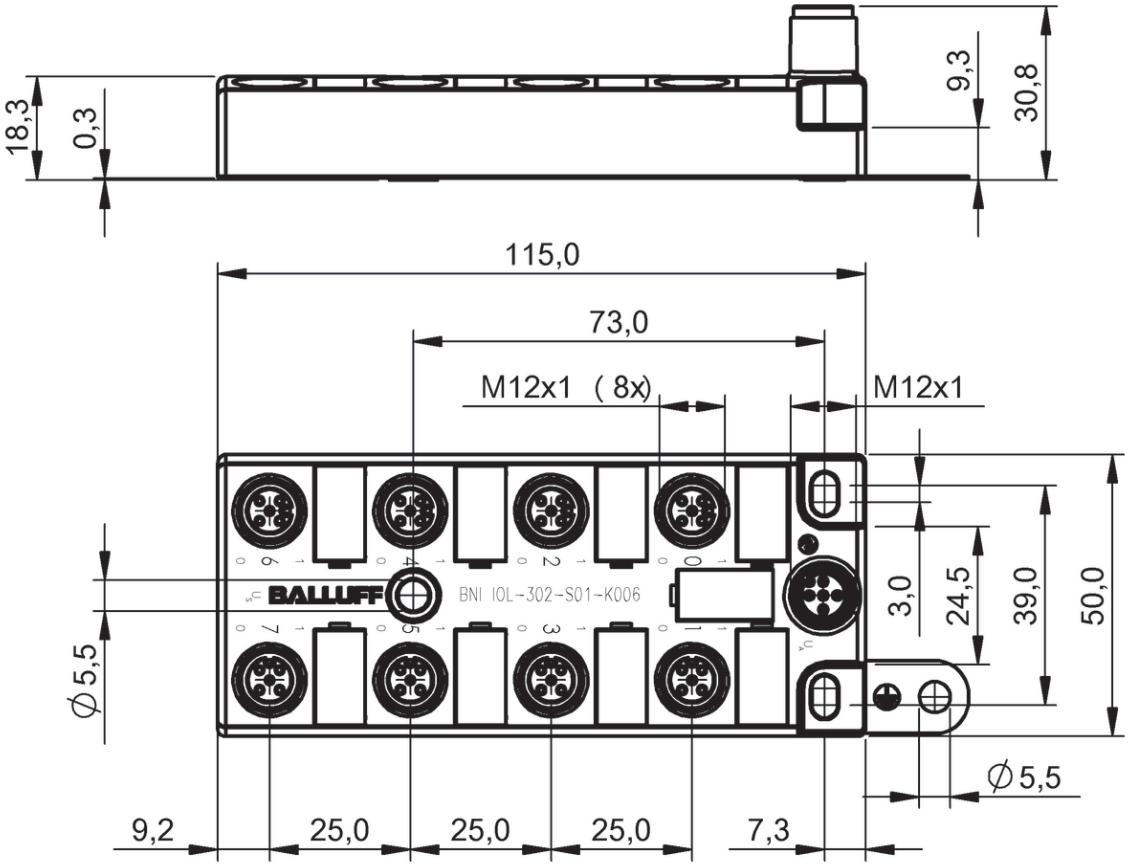

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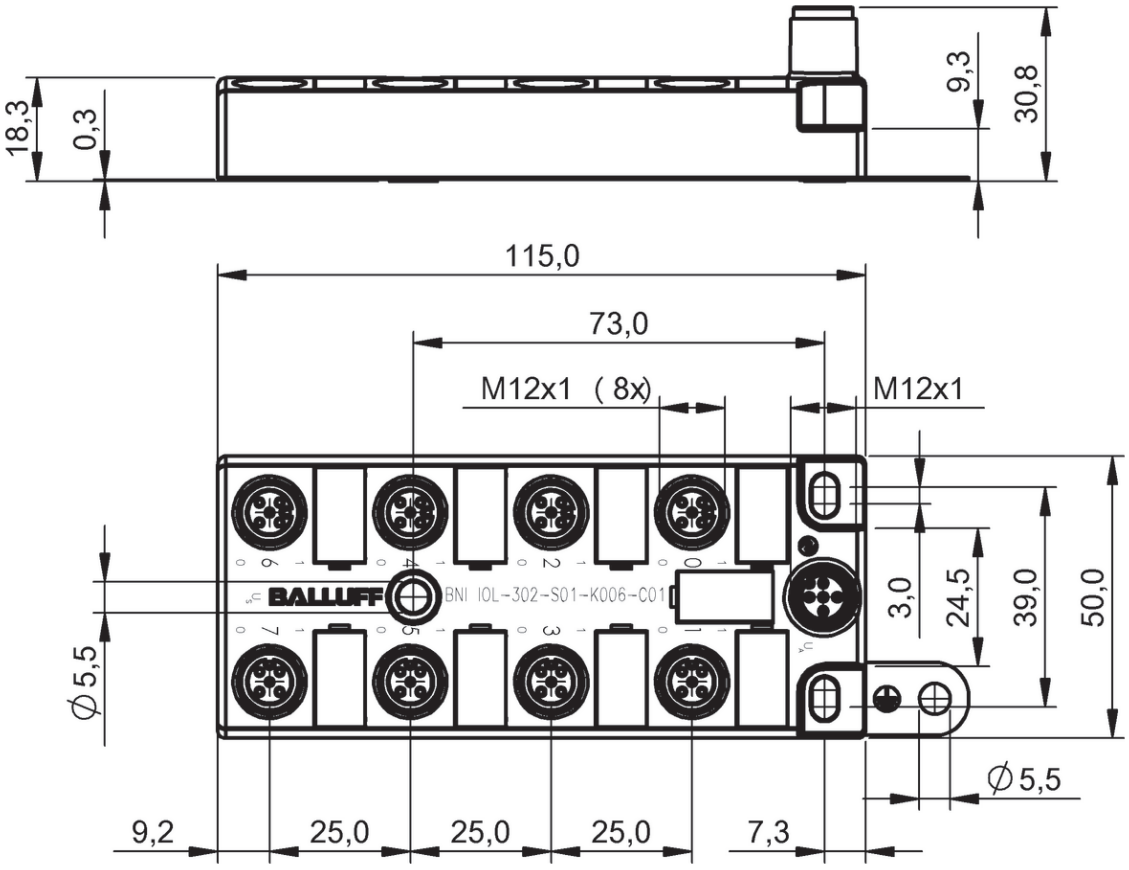

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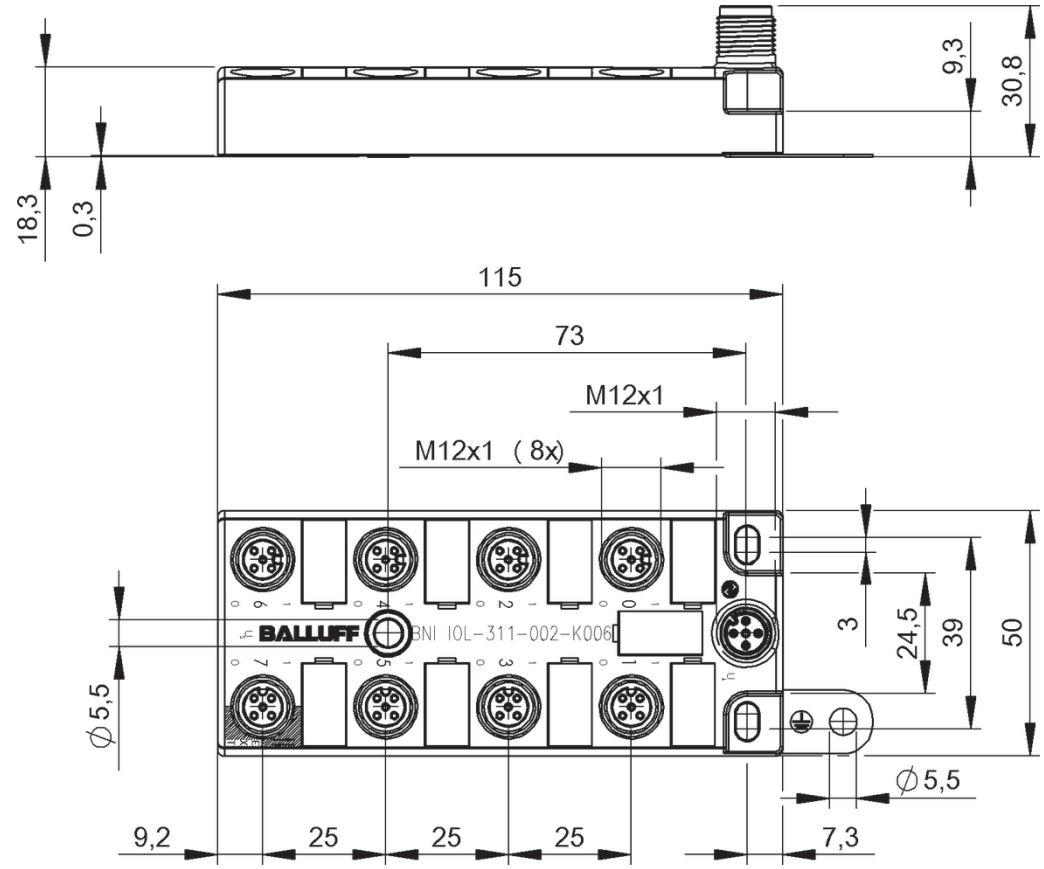

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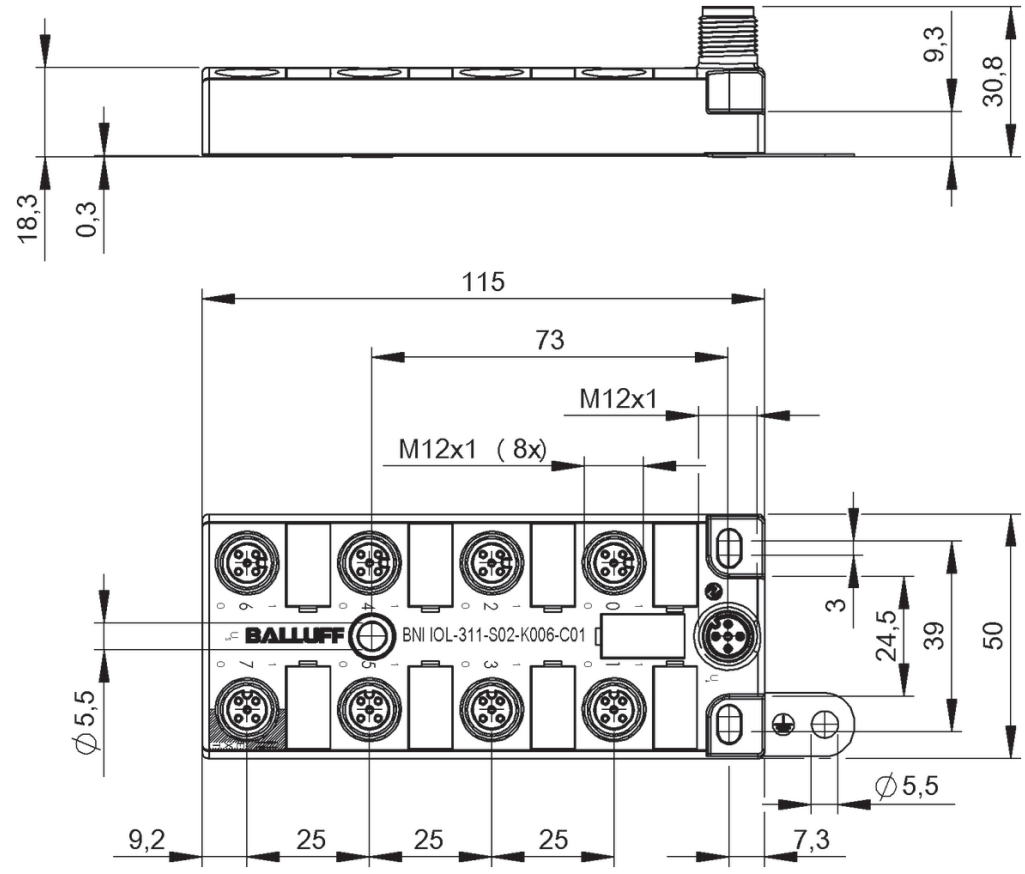

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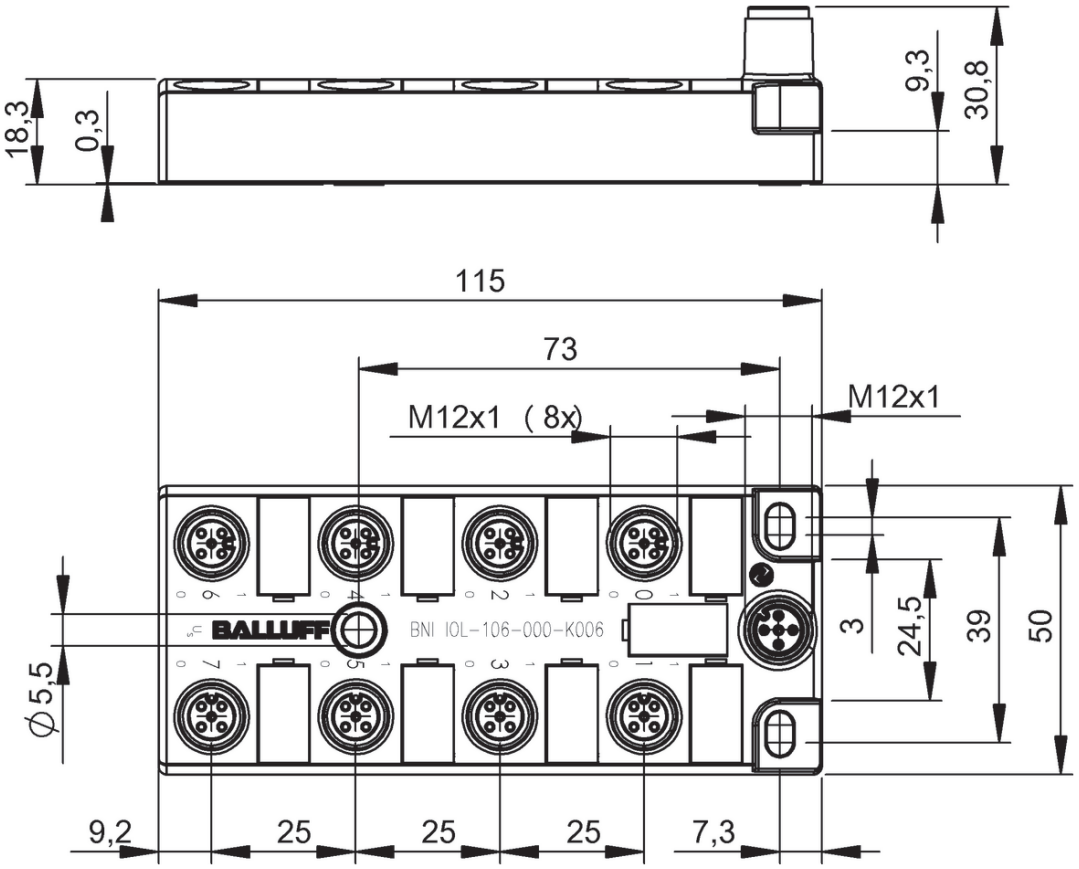

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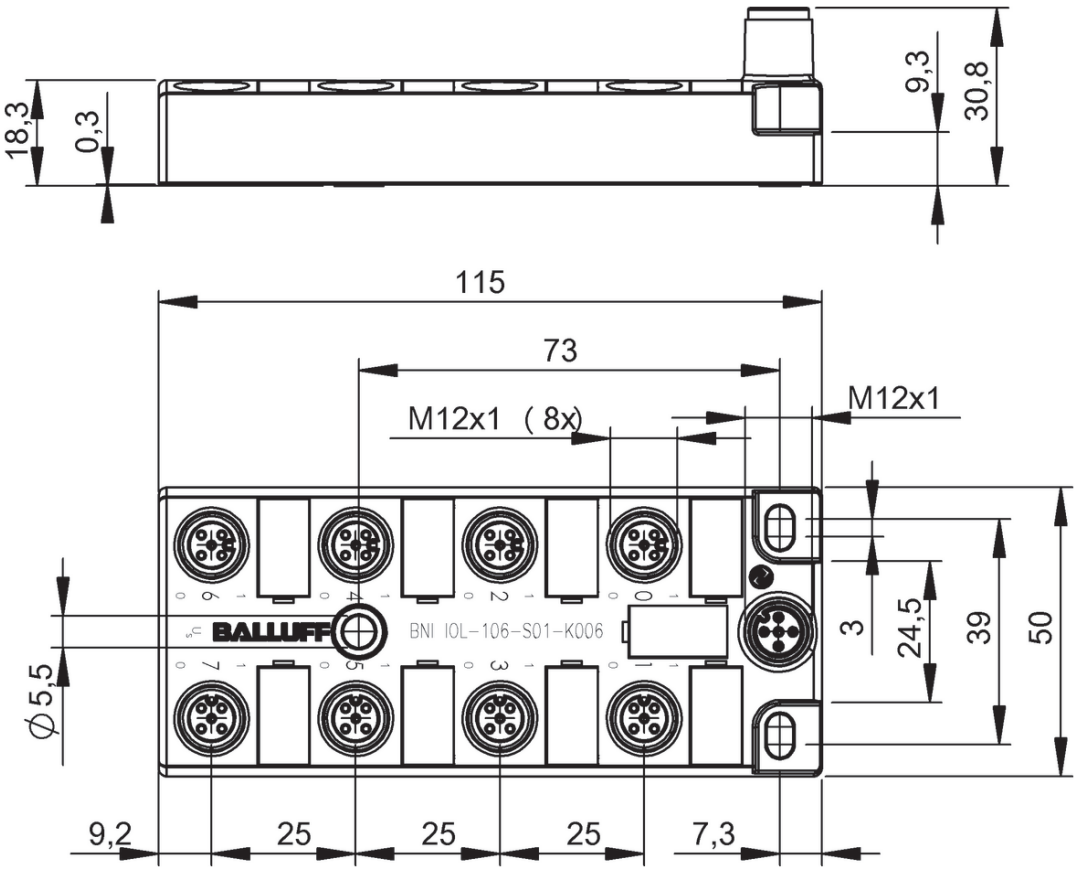

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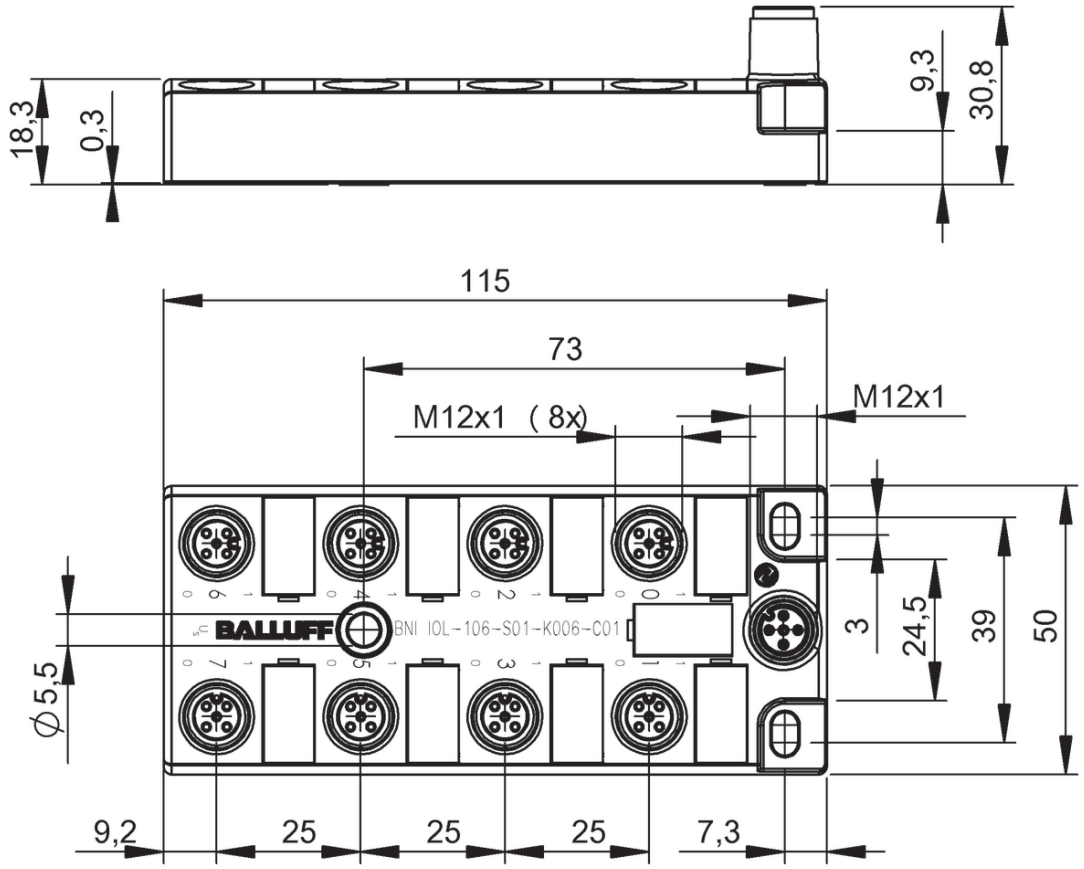

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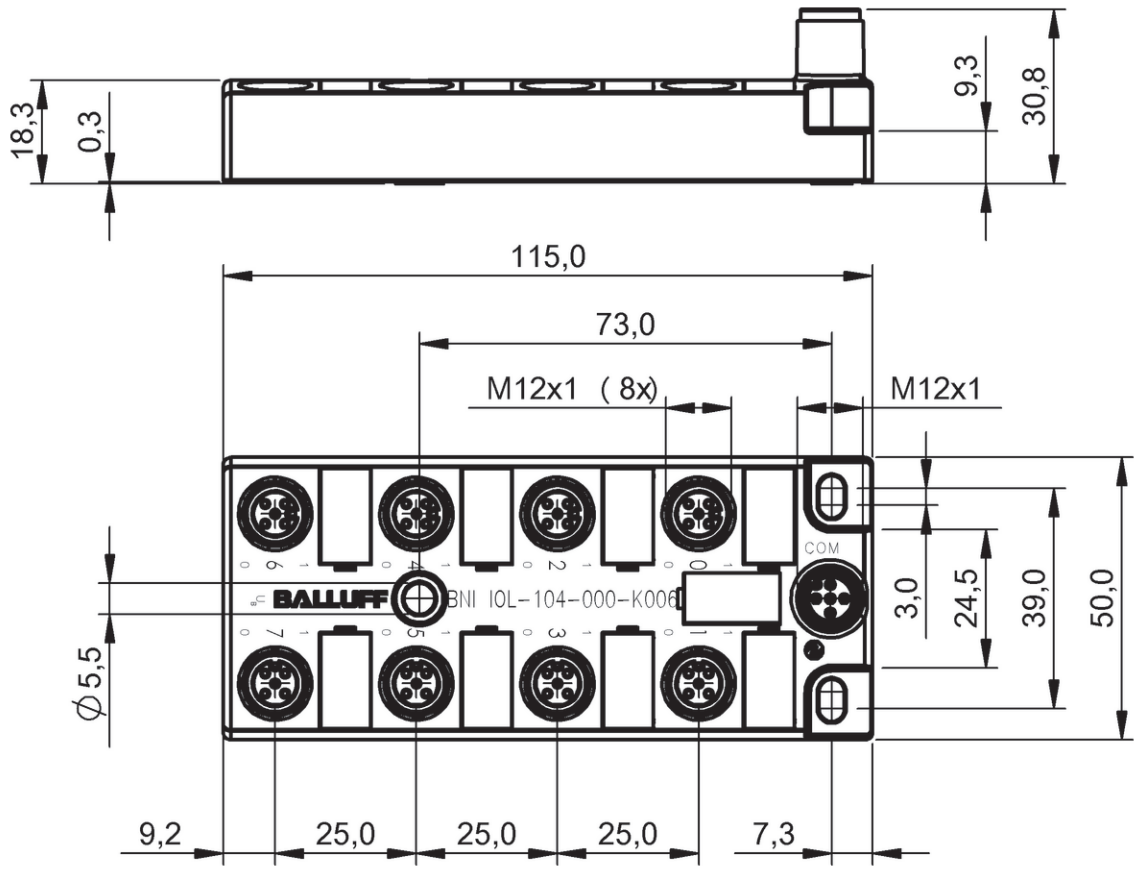

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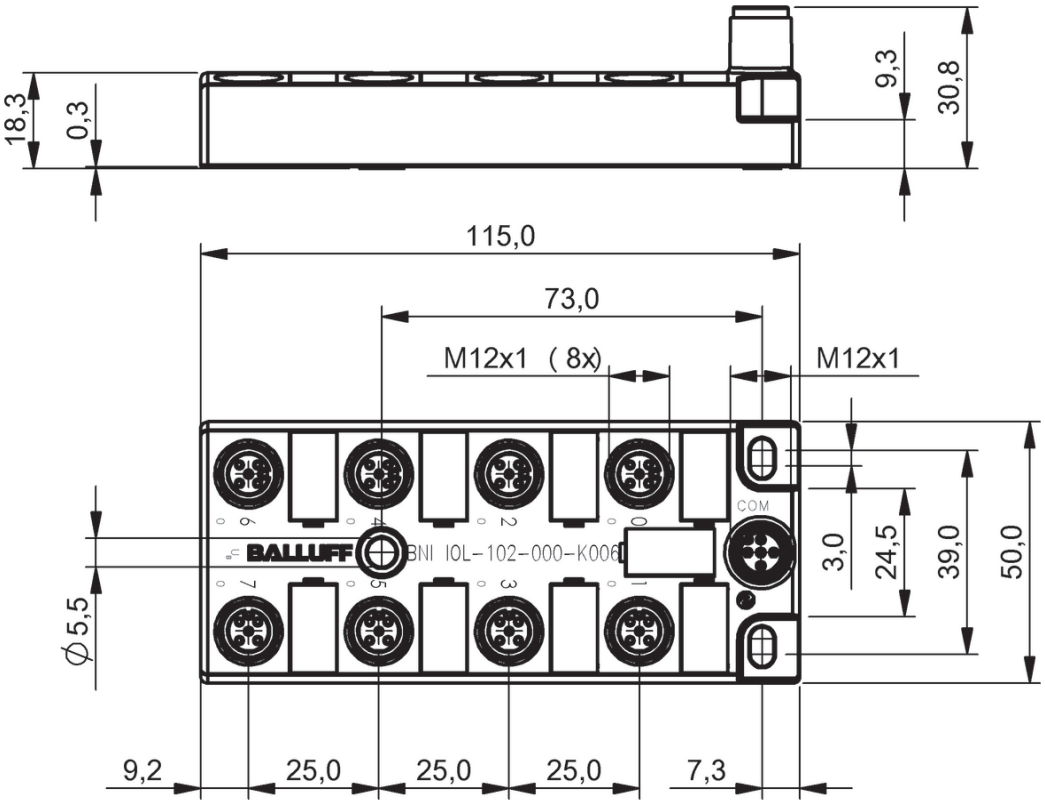

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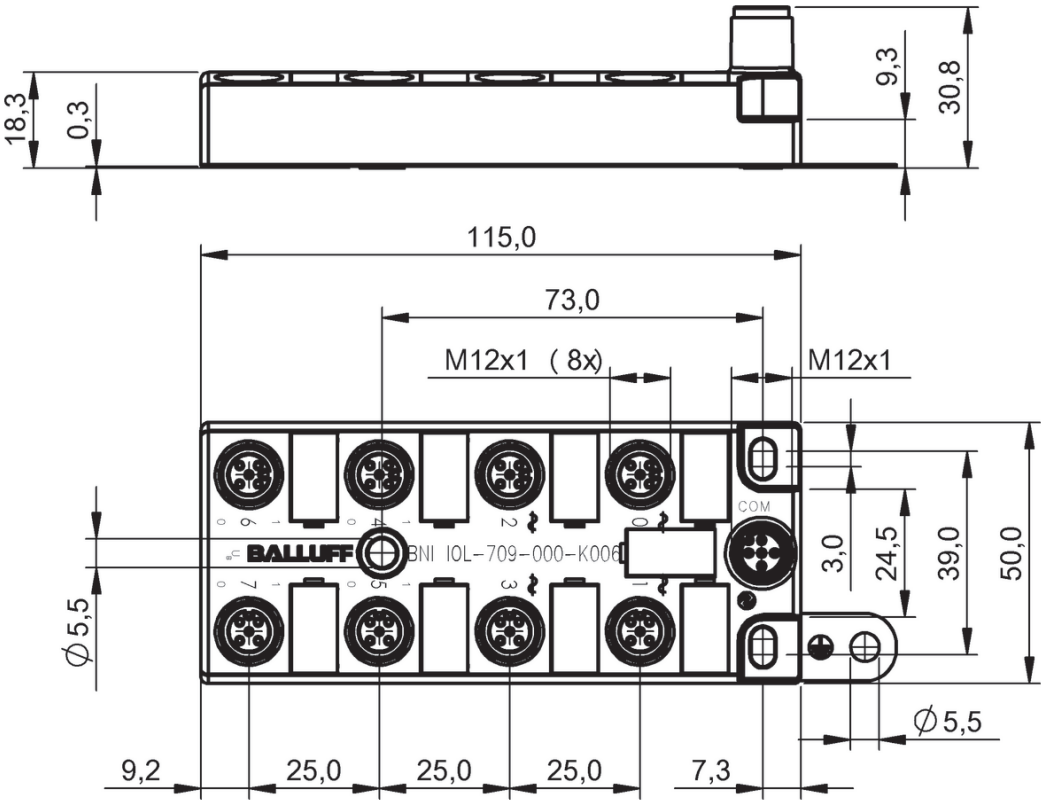

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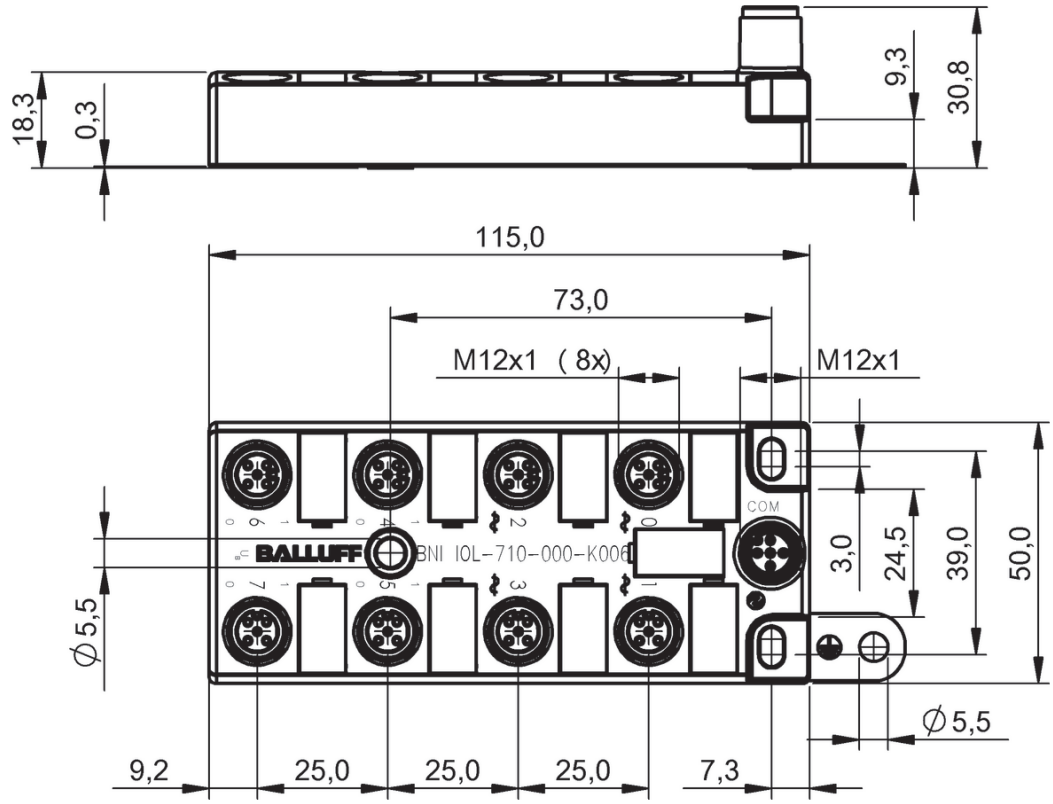

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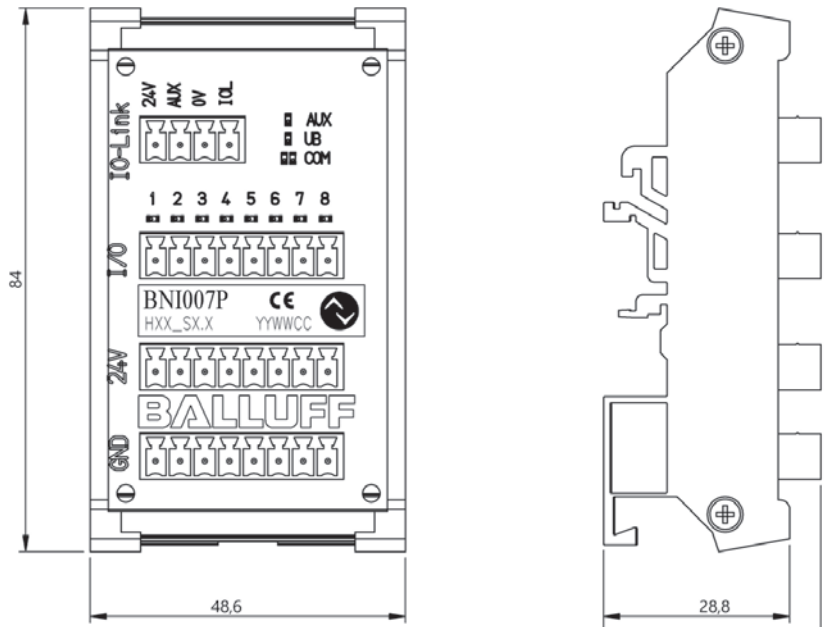

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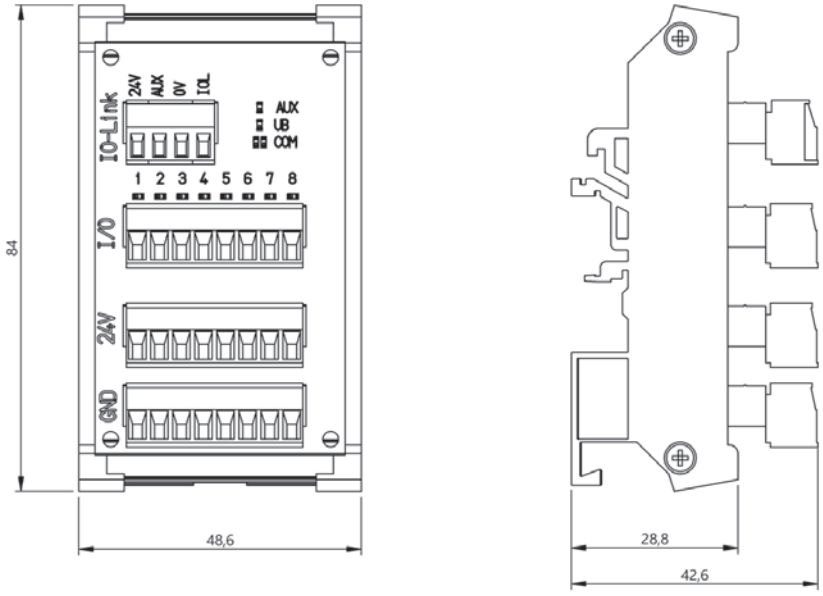

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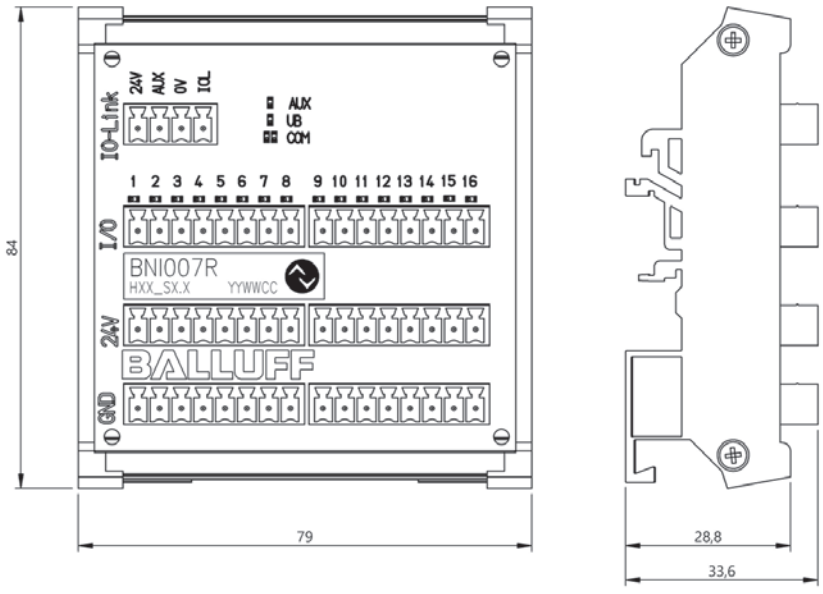

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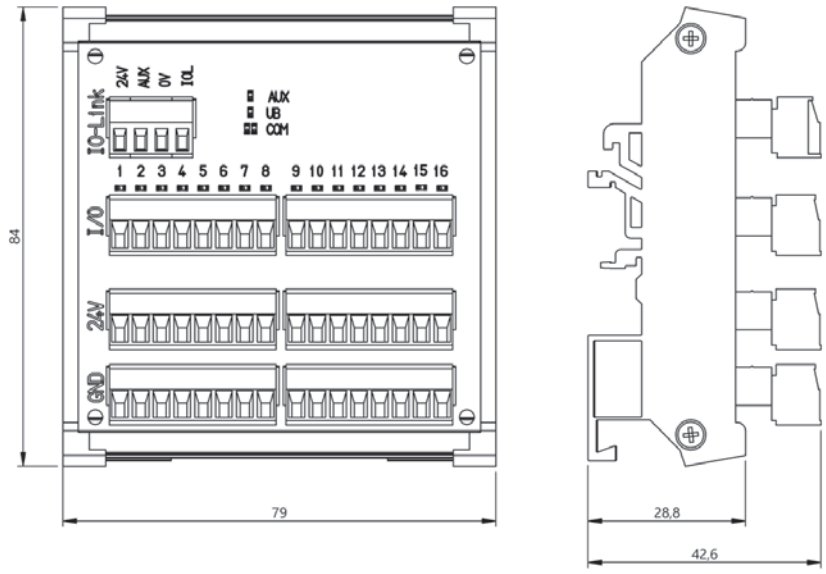
24V
AUX
0V
IOL
IO-Link
AUX
UB
COM
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
I/O
24V
GND
84
79
28,8
42,6

BNI004L

	BNI006J BNI IOL-750-V08-K007	BNI006E BNI IOL-750-V09-K007	
Version	Valve interface	Valve interface	
Application	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04, Bürkert Typ 8640	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04	
Interface	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	
Valve terminal connection	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	
Cable length L	0.6 m	0.6 m	
Outputs, number	24	16	
Output current max. UA, actuator	400 mA	400 mA	
Current sum UA, actuator	1.2 A	1.2 A	
Function	3-pin connection, Actuator supply on Pin 1	3-pin connection, Actuator supply on Pin 1	
Housing material	PA	PA	
Dimension	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP40 plugged in	IP40 plugged in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.5 ms	3.0 ms	
Process data in	—	—	
Process data out	4 bytes	2 bytes	
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	BNI006K BNI IOL-750-V10-K007	BNI006H BNI IOL-750-V11-K007	BNI006L BNI IOL-750-V13-K007	BNI006N BNI IOL-751-V08-K007
	Valve interface	Valve interface	Valve interface	Power Aux valve terminal connector
	SMC VQC 1000/2000/4000	SMC VQC 1000/2000/4000	Numatics	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04, Bürkert Typ 8640
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded
	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole
	0.6 m	0.6 m	0.6 m	0.6 m
	24	16	22	24
	400 mA	400 mA	400 mA	400 mA
	1.2 A	1.2 A	1.2 A	1.2 A
	3-pin connection, Actuator supply on Pin 1	3-pin connection, Actuator supply on Pin 1	3-pin connection, Actuator supply on Pin 1	4-pin connection, Power Aux on Pin 2
	PA	PA	PA	PA
	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm
	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C
	IP40 plugged in	IP40 plugged in	IP40 plugged in	IP40 plugged in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	3.5 ms	3.0 ms	3.5 ms	3.5 ms
	—	—	—	—
	4 bytes	2 bytes	4 bytes	4 bytes
	Page 198	Page 198	Page 198	Page 198

	BNI006M BNI IOL-751-V09-K007	BNI006P BNI IOL-751-V10-K007	
Version	Power Aux valve terminal connector	Power Aux valve terminal connector	
Application	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04	SMC VQC 1000/2000/4000	
Interface	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	
Valve terminal connection	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	
Cable length L	0.6 m	0.6 m	
Outputs, number	16	24	
Output current max. UA, actuator	400 mA	400 mA	
Current sum UA, actuator	1.2 A	1.2 A	
Function	4-pin connection, Power Aux on Pin 2	4-pin connection, Power Aux on Pin 2	
Housing material	PA	PA	
Dimension	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP40 plugged in	IP40 plugged in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.0 ms	3.5 ms	
Process data in	—	—	
Process data out	2 bytes	4 bytes	
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	BNI006T BNI IOL-751-V11-K007	BNI006R BNI IOL-751-V13-K007	BNI006Y BNI IOL-752-V08-K007	BNI006U BNI IOL-752-V09-K007
	Power Aux valve terminal connector	Power Aux valve terminal connector	Power Aux valve terminal connector	Power Aux valve terminal connector
	SMC VQC 1000/2000/4000	Numatics	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04, Bürkert Typ 8640	Festo with D-Sub female, 25-pin, GND in Pin 25, Bosch Rexroth LS04
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC
	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded
	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole
	0.6 m	0.6 m	0.6 m	0.6 m
	16	22	24	16
	400 mA	400 mA	400 mA	400 mA
	1.2 A	1.2 A	1.2 A	1.2 A
	4-pin connection, Power Aux on Pin 2	4-pin connection, Power Aux on Pin 2	5-pin connection, Power Aux on Pin 2, also 0V on Pin 5	5-pin connection, Power Aux on Pin 2, also 0V on Pin 5
	PA	PA	PA	PA
	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm
	-5...55 °C	-5...55 °C	-5...55 °C	-5...55 °C
	IP40 plugged in	IP40 plugged in	IP40 plugged in	IP40 plugged in
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	3.0 ms	3.5 ms	3.5 ms	3.0 ms
	—	—	—	—
	2 bytes	4 bytes	4 bytes	2 bytes
	Page 198	Page 198	Page 198	Page 198

	BNI006Z BNI IOL-752-V10-K007	BNI006W BNI IOL-752-V11-K007	
Version	Power Aux valve terminal connector	Power Aux valve terminal connector	
Application	SMC VQC 1000/2000/4000	SMC VQC 1000/2000/4000	
Interface	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	
Valve terminal connection	D-Sub-Female, 25-pole	D-Sub-Female, 25-pole	
Cable length L	0.6 m	0.6 m	
Outputs, number	24	16	
Output current max. UA, actuator	400 mA	400 mA	
Current sum UA, actuator	1.2 A	1.2 A	
Function	5-pin connection, Power Aux on Pin 2, also 0V on Pin 5	5-pin connection, Power Aux on Pin 2, also 0V on Pin 5	
Housing material	PA	PA	
Dimension	53 x 61 x 12.5 mm	53 x 61 x 12.5 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP40 plugged in	IP40 plugged in	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	3.5 ms	3.0 ms	
Process data in	—	—	
Process data out	4 bytes	2 bytes	
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	BNI006F BNI IOL-752-V13-K007	BNI007E BNI IOL-770-000-A027	BNI004W BNI IOL-770-V06-A027	
	Power Aux valve terminal connector	Power Aux valve terminal connector	Power Aux valve terminal connector	
	Numatics	open cable end	SMC VQC 1000/2000/4000	
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	M12x1-Male, 5-pole, A-coded	
	D-Sub-Female, 25-pole	—	M27-Female, 26-pole, A-coded	
	0.6 m	0.5 m	0.5 m	
	22	24	24	
	400 mA	400 mA	400 mA	
	1.2 A	1.2 A	1.2 A	
	5-pin connection, Power Aux on Pin 2, also 0V on Pin 5	4-pin connection, Power Aux on Pin 2, Diagnostics	4-pin connection, Power Aux on Pin 2, Diagnostics	
	PA	Aluminum	Aluminum	
	53 x 61 x 12.5 mm	31.8 x 31.8 x 185 mm	31.8 x 31.8 x 185 mm	
	-5...55 °C	-5...70 °C	-5...70 °C	
	IP40 plugged in	IP67 plugged in	IP67 plugged in	
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
	3.5 ms	5.5 ms	5.5 ms	
	—	9 bytes	9 bytes	
	4 bytes	4 bytes	4 bytes	
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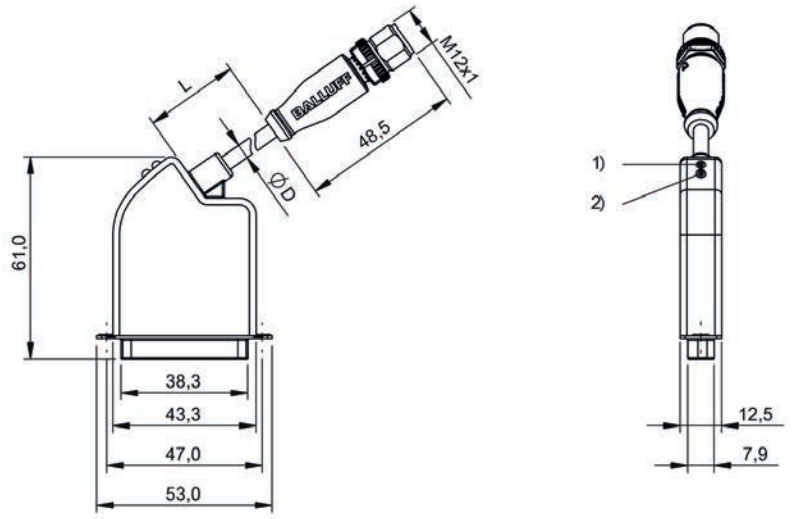

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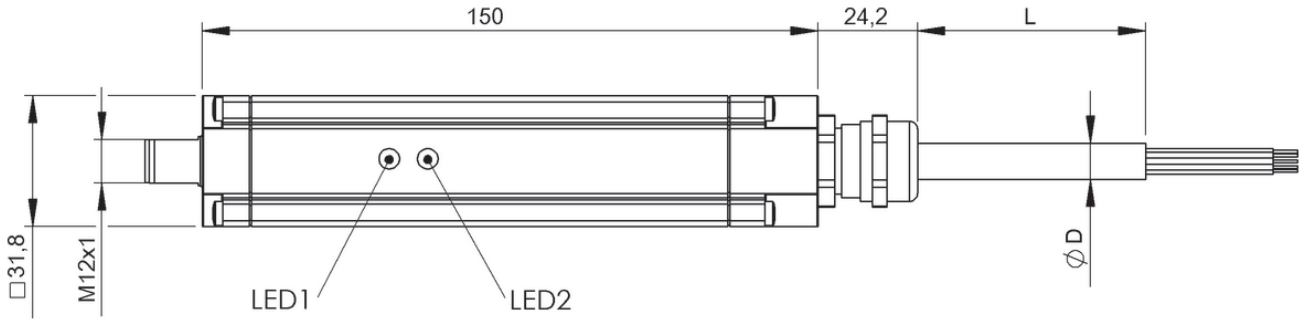

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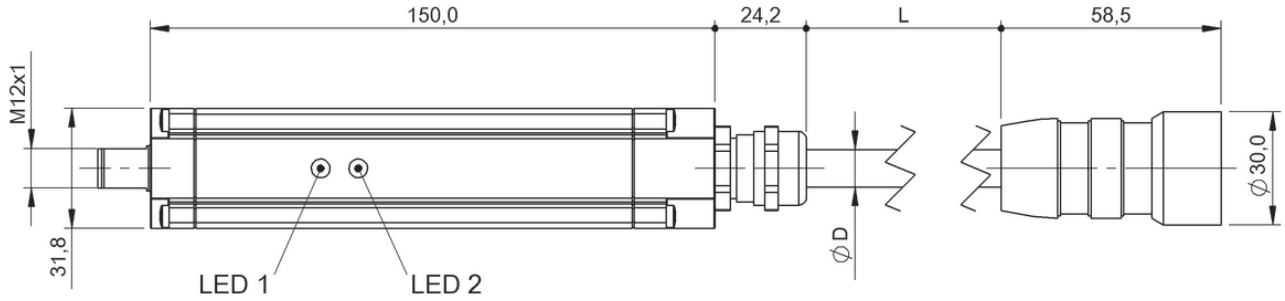

BNI004W



	BNI005Z BNI IOL-771-000-A027	BNI005M BNI IOL-771-000-K027	BNI00CA BNI IOL-771-002-K027-003	
Version	Universal cable I/O interface	Universal cable I/O interface	Universal cable I/O interface	
Interface	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
Operating voltage Ub	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
Connection (COM 1)	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
Connection for sensor	Leads	Leads	Leads	
Cable length L	0.5 m	0.5 m	3 m	
Digital inputs	16x PNP, Type3	16x PNP, Type3	16x PNP, Type3	
Digital outputs	16x PNP	16x PNP	16x PNP	
Configurable inputs/outputs	yes	yes	yes	
Output current max.	400 mA	400 mA	400 mA	
Additional function	Diagnostics (under-current, coil wire break), Output voltage on Pin 2	—	—	
Housing material	Aluminum	PA	PA	
Dimension	31.8 x 31.8 x 193.2 mm	43.3 x 16.3 x 88.3 mm	43.3 x 16.3 x 88.3 mm	
Ambient temperature	-5...55 °C	-5...55 °C	-5...55 °C	
Protection degree	IP67 when threaded in	IP54 up to open cable end	IP54 up to open cable end	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Process data cycle min.	4 ms	4 ms	4 ms	
Process data in	2 bytes	2 bytes	2 bytes	
Process data out	2 bytes	2 bytes	2 bytes	
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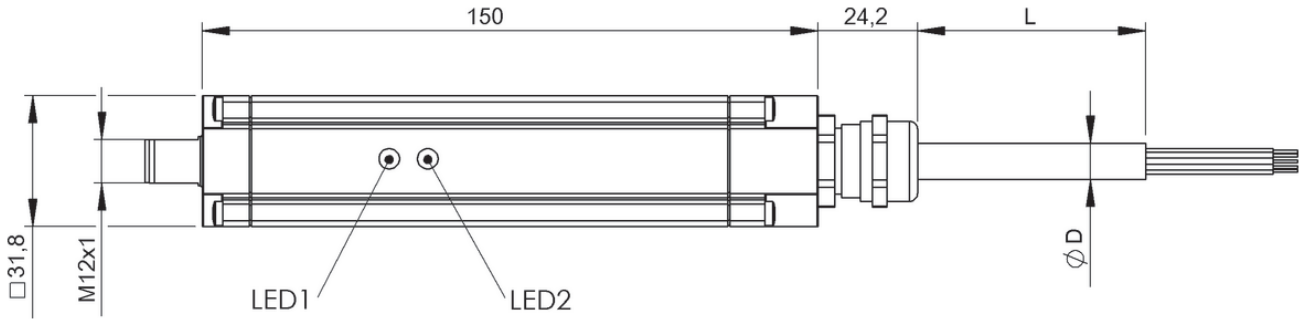
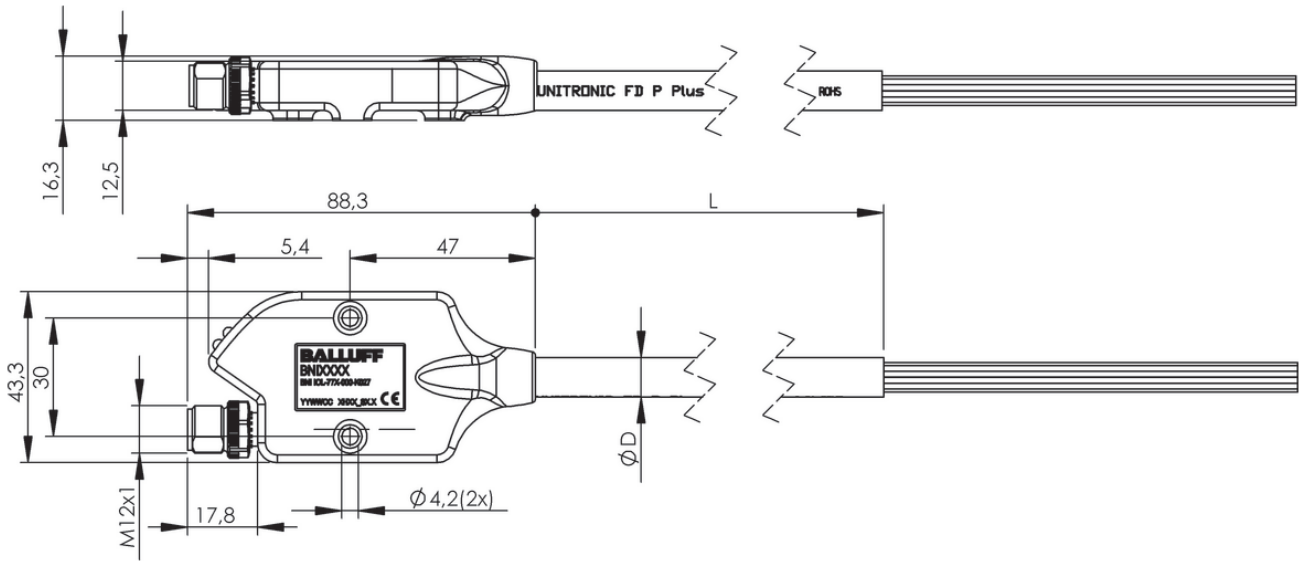
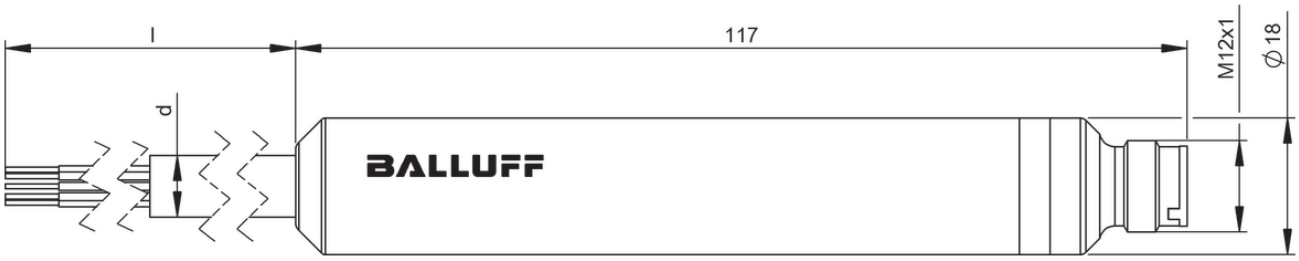
	BNI005Y BNI IOL-772-000-A027	BNI005N BNI IOL-772-000-K027	BNI00CC BNI IOL-772-002-K027-003	BNI00AE BNI IOL-772-002-E032	
	Universal cable I/O interface	Universal cable I/O interface	Universal cable I/O interface	Universal cable I/O interface	
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	
	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	18...30.2 VDC	
	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	M12x1-Male, 4-pole, A-coded	
	Leads	Leads	Leads	Leads	
	0.5 m	0.5 m	3 m	1.3 m	
	8x PNP, Type3	8x PNP, Type3	8x PNP, Type3	8x PNP, Type3	
	8x PNP	8x PNP	8x PNP	8x PNP	
	yes	yes	yes	yes	
	400 mA	400 mA	400 mA	400 mA	
	Diagnostics (under-current, coil wire break), Output voltage on Pin 2	—	—	—	
	Aluminum	PA	PA	Stainless steel (1.4305)	
	31.8 x 31.8 x 193.2 mm	43.3 x 16.3 x 88.3 mm	43.3 x 16.3 x 88.3 mm	Ø 18 x 117 mm	
	-5...55 °C	-5...55 °C	-5...55 °C	-5...60 °C	
	IP67 when threaded in	IP54 up to open cable end	IP54 up to open cable end	IP69K, IP68	
	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
	3 ms	3.2 ms	3.2 ms	8.5 ms	
	1 bytes	1 bytes	1 bytes	1 bytes	
	1 bytes	1 bytes	1 bytes	1 bytes	
	Page 202	Page 202	Page 202	Page 203	



BNI005Z, BNI005Y



BNI005M, BNI00CA, BNI005N, BNI00CC



BNI00AE

Important parameters for optimized processes

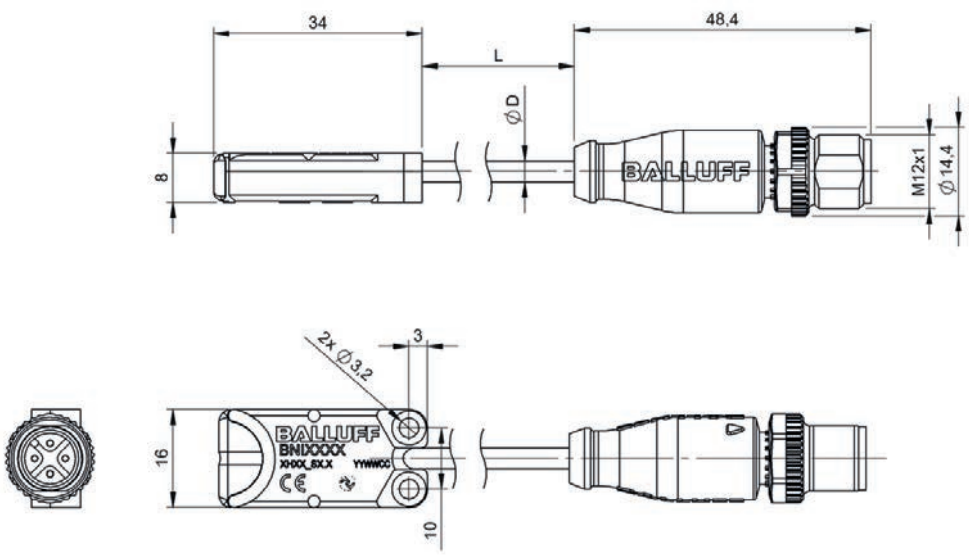
MEMORY MODULES

Our memory modules have a built-in data storage memory and thereby fulfill the function of a removable data carrier. Many parameters can be logged and saved on the IO-Link memory module: from the operating data of a tool through the histogram of the temperature level during operation and the required power level to the number of tool cycles and error messages in the tool.

Features

- Built-in data carrier
- Logs and saves many different parameters
- More efficient maintenance/repair, since supplementary information is available

	BNI00AM BNI IOL-910-002-K060
Principle of operation	Memory module
Interface	IO-Link 1.1
Operating voltage Ub	18...30.2 VDC
Connection	M12x1-Male, 4-pole, A-coded
Cable length L	0.3 m
Data storage	14*64 Bytes
IO-Link function	Remote memory module for operating data
Housing material	PP
Dimension	16 x 8 x 34 mm
Ambient temperature	-25...70 °C
Protection degree	IP67 when threaded in
Transfer rate	COM2 (38.4 kBaud)
Cycle time min.	2.0 ms
Productview	Page 207


34
L
48,4
ØD
8
BALLUFF
M12x1
Ø14,4
2x Ø3,2
3
16
10
BALLUFF
BNI0000
XXXX_6XX
YYWWCC

BNI00AM

Efficient communication without wear

INDUCTIVE COUPLERS

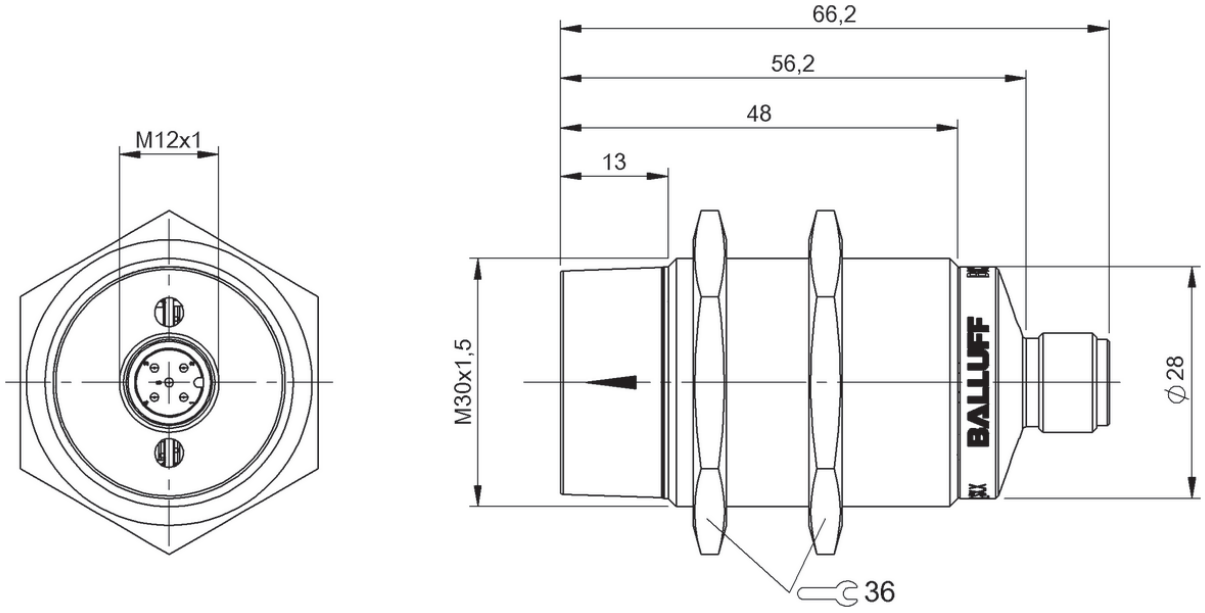
Fixed wiring of sensors and actuators comes with drawbacks: cable and contacts are often severely loaded in automation, and cables can fatigue and break. In the worst case scenario this can result in a machine failure. Our BIC inductive couplers transmit data and power contactlessly across an air gap. Thus, no mechanical wear is produced. The system availability is higher, the cycle times are shorter and the sequences are more flexible. The units can quickly be disconnected, are easy to handle and are maintenance-free. This enables you to meet new demands quickly.

Features

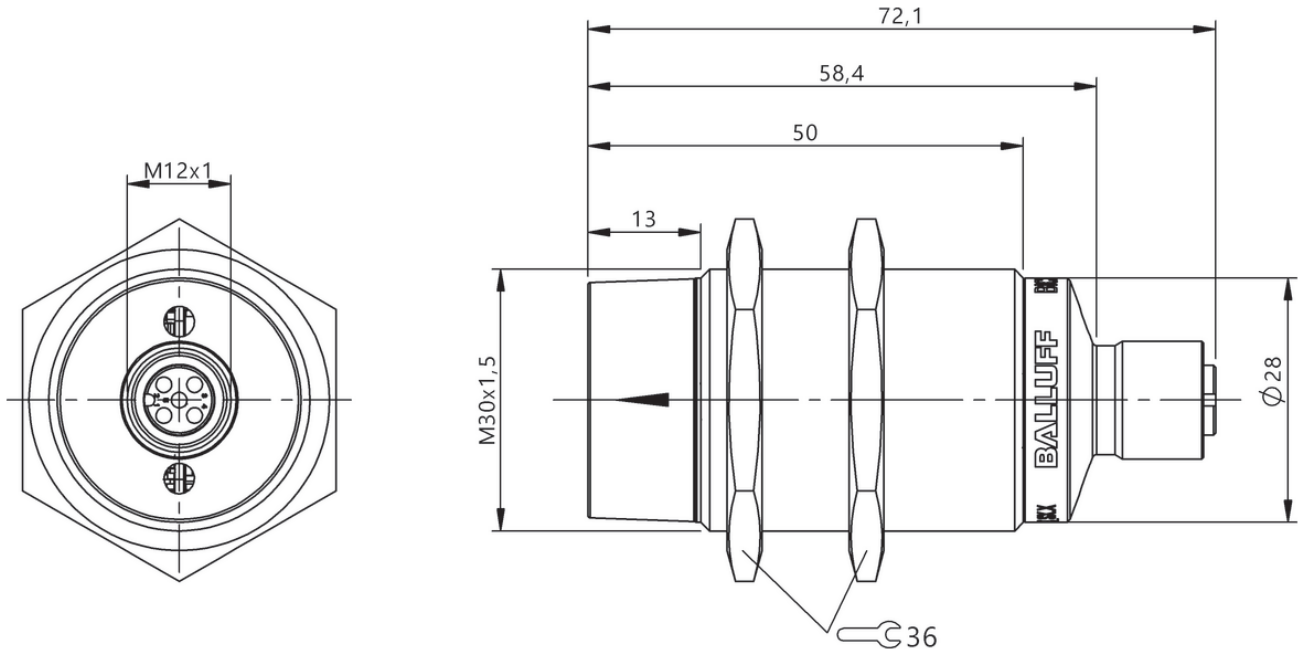
- No mechanical wear
- Higher system availability, shorter cycle times, more flexible sequences
- Quickly disconnectable, easy to handle, maintenance free

	BIC007L BIC 1B0-ITA50-M30MF1-SM4A5A	BIC007E BIC 2B0-ITA50-M30MF1-SM4A5A	
Function	IO-Link signal transmission	IO-Link signal transmission	
Signal type	bi-directional	bi-directional	
Transmission distance	0...10 mm	0...10 mm	
Component	Base	Remote	
Interface	IO-Link 1.1	IO-Link 1.1	
Connection	Connector, M12x1 connector, 5-pin	Connector, M12x1 connector, 5-pin	
Rated operating voltage Ue	24 VDC	—	
Output voltage	—	24 VDC	
Rated output current	—	650 mA	
Output current max.	—	5 A / 0.12 ms	
Housing material	Brass	Brass	
Dimension	Ø 30 x 66.2 mm	Ø 30 x 72.1 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP67	IP67	
Transfer rate	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)	
Additive cycle time	Device + 2.0 ms	Device + 2.0 ms	
Process data in	0…32 bytes	0…32 bytes	
Process data out	0…32 bytes	0…32 bytes	
SIO mode	yes	yes	
Productview	Page 212	Page 212	

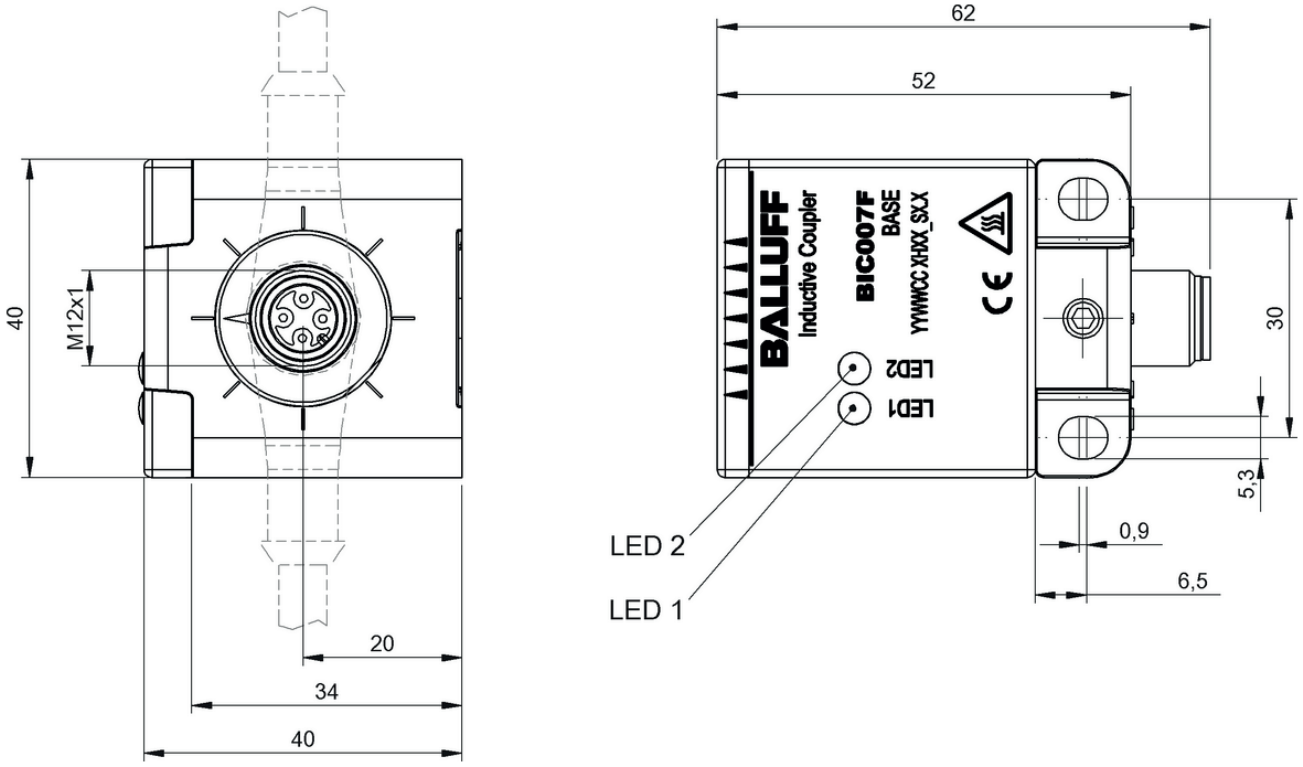
	BIC007F BIC 1B0-IT1A7-Q40KFU-SM4A4A	BIC007H BIC 2B0-IT1A7-Q40KFU-SM4A5A	BIC0070 BIC 1B0-ITA50-Q40KFU-SM4A4A	BIC0071 BIC 2B0-ITA50-Q40KFU-SM4A5A
	IO-Link signal transmission	IO-Link signal transmission	IO-Link signal transmission	IO-Link signal transmission
	bi-directional	bi-directional	bi-directional	bi-directional
	0...5 mm	0...5 mm	0...5 mm	0...5 mm
	Base	Remote	Base	Remote
	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1	IO-Link 1.1
	Connector, M12x1 connector, 4-pin	Connector, M12x1 connector, 5-pin	Connector, M12x1 connector, 4-pin	Connector, M12x1 connector, 5-pin
	24 VDC	—	24 VDC	—
	—	24 VDC	—	24 VDC
	—	1.7 A	—	500 mA
	—	5 A / 1 ms	—	5 A / 0.05 ms
	PBTP	PBTP	PBTP	PBTP
	40 x 40 x 62 mm	40 x 40 x 60.8 mm	40 x 40 x 62 mm	40 x 40 x 63 mm
	-5...55 °C	-5...55 °C	-5...65 °C	-5...65 °C
	IP67	IP67	IP67	IP67
	COM2 (38.4 kBaud), COM3 (230.4 kBaud)	COM2 (38.4 kBaud), COM3 (230.4 kBaud)	COM2 (38.4 kBaud)	COM2 (38.4 kBaud)
	Device + 2.8 ms	Device + 2.8 ms	Device + 2.0 ms	Device + 2.0 ms
	0…32 bytes	0…32 bytes	0…32 bytes	0…32 bytes
	0…32 bytes	0…32 bytes	0…32 bytes	0…32 bytes
	no	no	yes	yes
	Page 213	Page 213	Page 214	Page 214



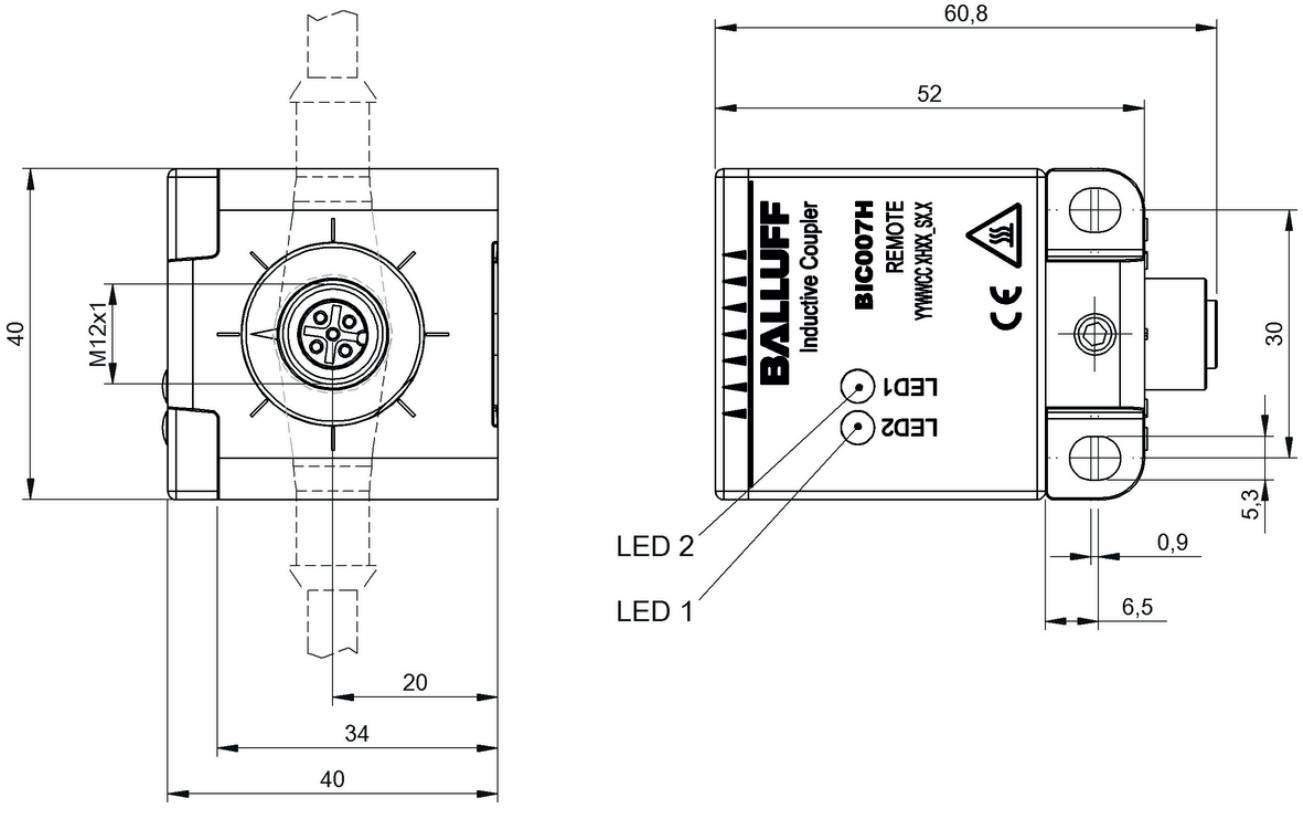
BIC007L



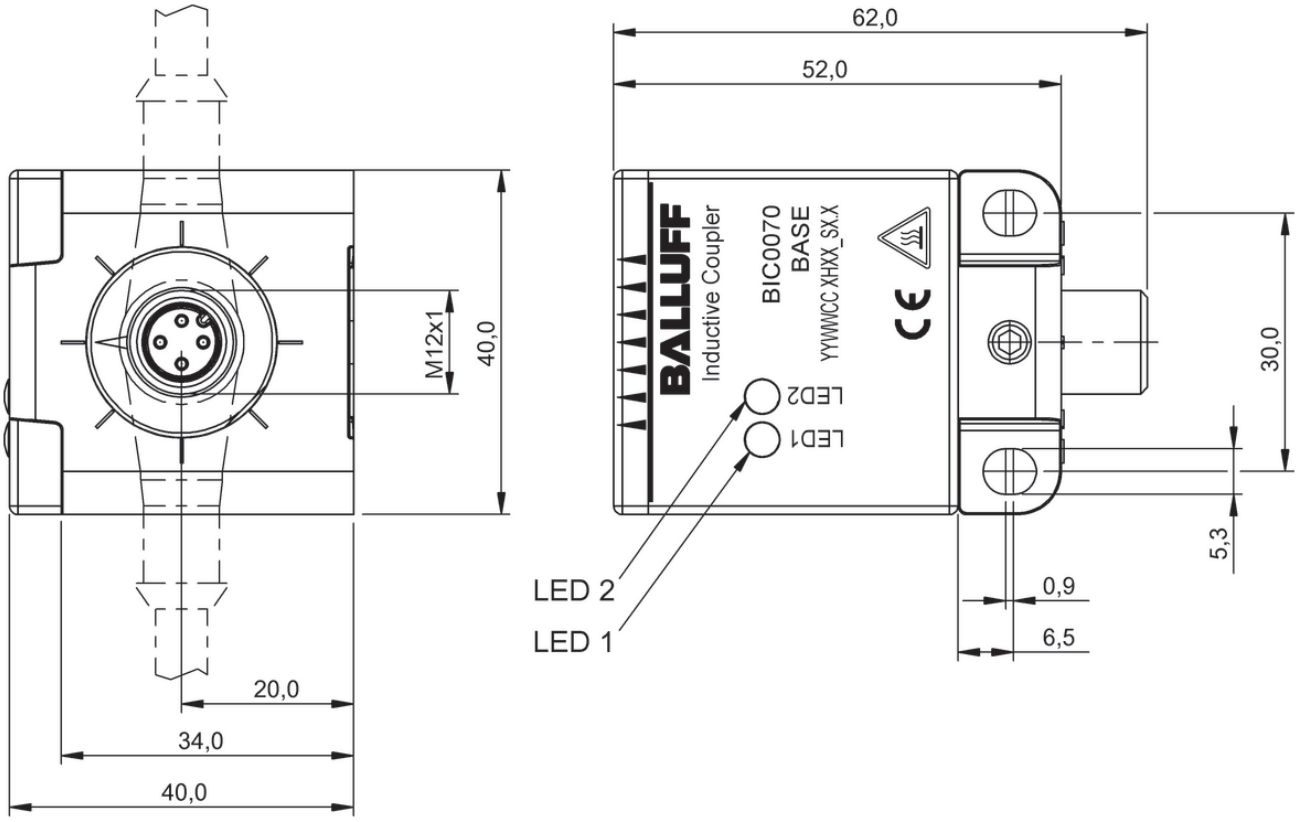
BIC007E



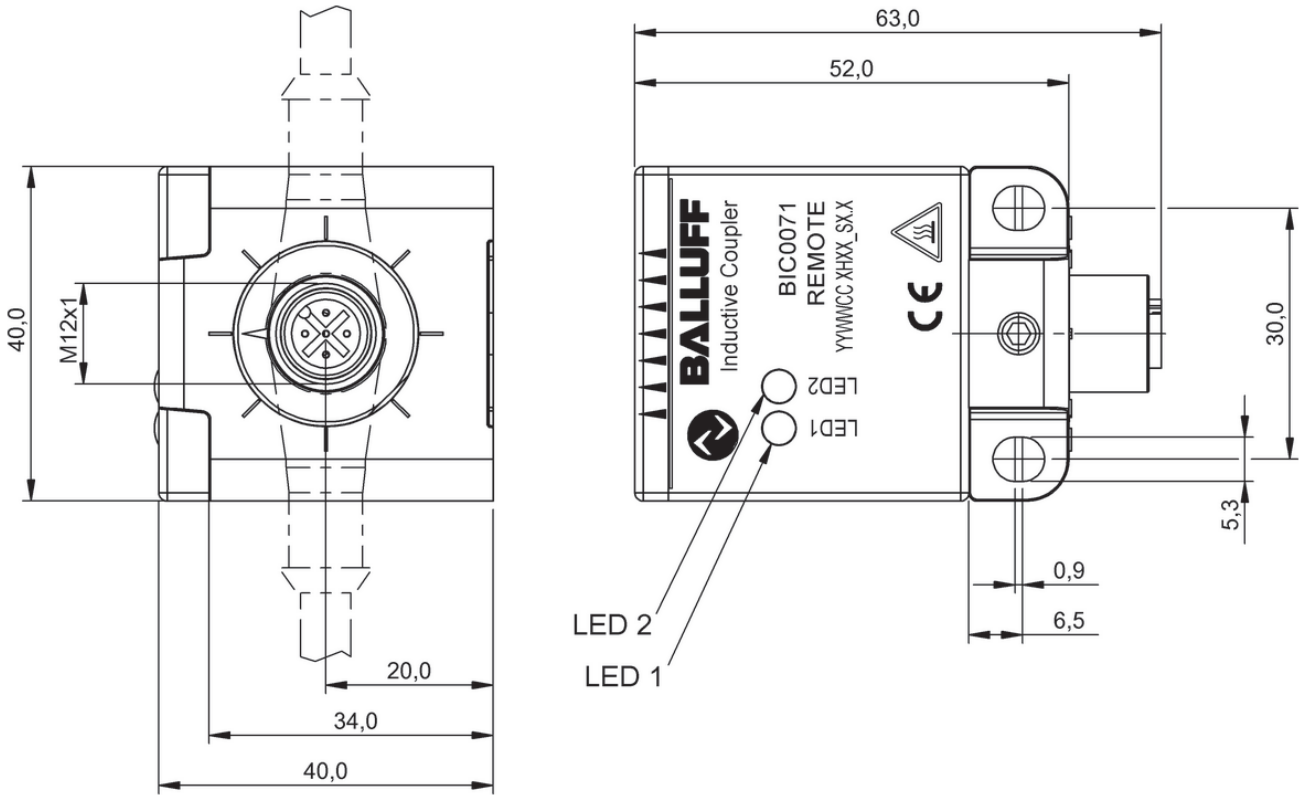
BIC007F



BIC007H



BIC0070



BIC0071

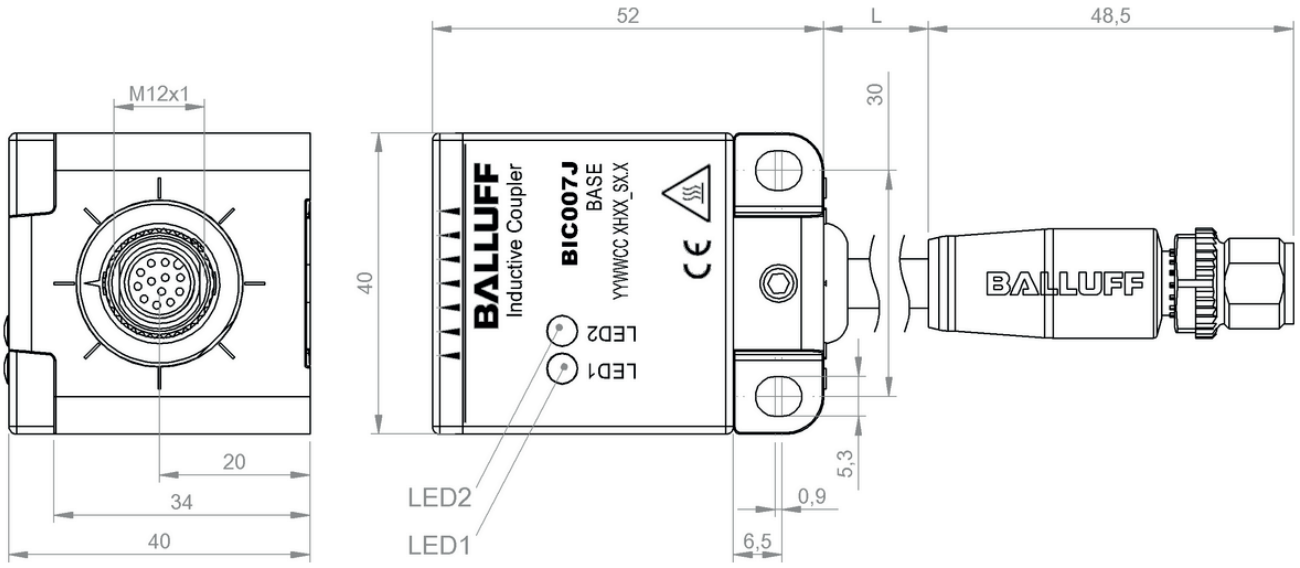
	BIC007J BIC 1I3-P2A50-Q40KFU-EPX0-002-M4CA	BIC007K BIC 2I3-P2A50-Q40KFU-EPX0-002-M4CA	
Function	Signal transmission	Signal transmission	
Signal type	unidirectional	unidirectional	
Digital inputs	—	8x PNP	
Digital outputs	8x PNP	—	
Transmission distance	0...5 mm	0...5 mm	
Component	Base	Remote	
Connection	Connector, M12x1, 12-pin, 0.20 m, PUR	Connector, M12x1, 12-pin, 0.20 m, PUR	
Rated operating voltage Ue	24 VDC	—	
Output voltage	—	24 VDC	
Rated output current	—	500 mA	
Housing material	PBTP	PBTP	
Dimension	40 x 40 x 52 mm	40 x 40 x 52 mm	
Ambient temperature	-5...65 °C	-5...65 °C	
Protection degree	IP67	IP67	
Productview	Page 220	Page 220	



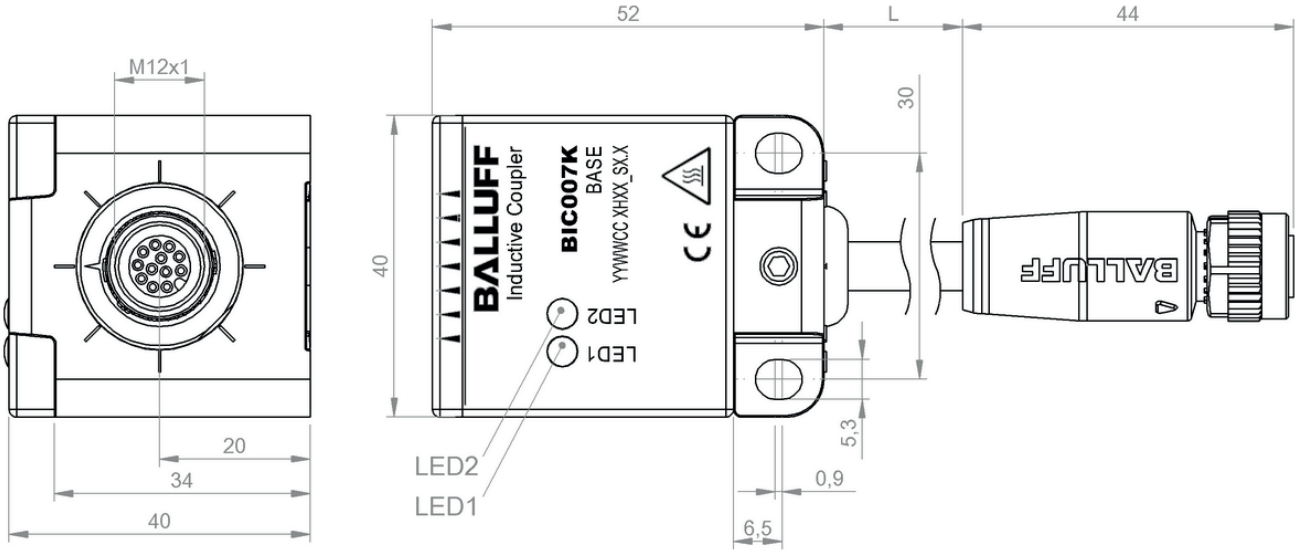

	BIC0077 BIC 1I1-P2A05-M12MM-BPX0-003-M45A	BIC0078 BIC 2I1-P2A05-M12MF-BPX0-003-M44A	BIC007T BIC 1I22-P2A02-M18MN2-EPX07-050	BIC007U BIC 2I22-P2A02-M18MF2-EPX07-050
	Signal transmission	Signal transmission	Signal transmission	Signal transmission
	unidirectional	unidirectional	unidirectional	unidirectional
	—	2x PNP	—	4x PNP
	2x PNP	—	4x PNP	—
	0...2.5 mm	0...2.5 mm	1...3 mm	1...3 mm
	Base	Remote	Base	Remote
	Connector, M12x1, 5-pin, 0.30 m, PUR	Connector, M12x1, 5-pin, 0.30 m, PUR	Cable, 5.00 m, PUR	Cable, 5.00 m, PUR
	24 VDC	—	24 VDC	12 VDC
	—	24 VDC	—	24 VDC
	—	50 mA	—	100 mA
	Brass	Brass	Brass	Brass
	Ø 12 x 65 mm	Ø 12 x 41 mm	Ø 18 x 94 mm	Ø 18 x 61 mm
	-10...50 °C	-10...50 °C	0...50 °C	0...50 °C
	IP67	IP67	IP67	IP67
	Page 221	Page 221	Page 222	Page 222

	BIC0009 BIC 1I3-P2A50-M30MI3-SM4ACA	BIC005J BIC 2I3-P2A50-M30MI3-BPX0C-002-M4CA	
Function	Signal transmission	Signal transmission	
Signal type	unidirectional	unidirectional	
Digital inputs	—	8x PNP	
Digital outputs	8x PNP	—	
Transmission distance	0...5 mm	0...5 mm	
Component	Base	Remote	
Connection	Connector, M12x1, 12-pole	Connector, M12x1, 12-pin, 0.20 m, PUR	
Rated operating voltage Ue	24 VDC	—	
Output voltage	—	24 VDC	
Rated output current	—	500 mA	
Housing material	Brass	Brass	
Dimension	Ø 30 x 107 mm	Ø 30 x 85.5 mm	
Ambient temperature	0...55 °C	0...55 °C	
Protection degree	IP67	IP67	
Productview	Page 223	Page 223	

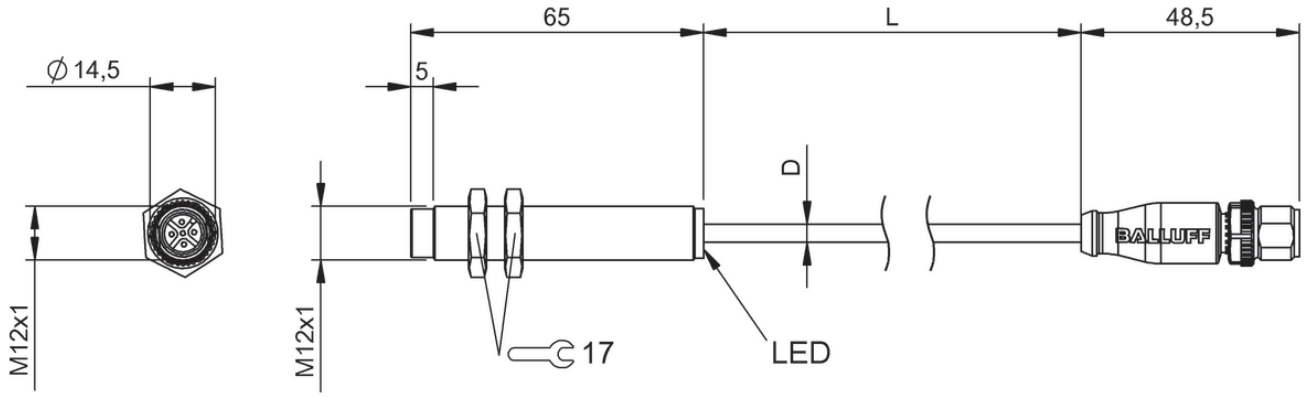
	BIC000A BIC 2I3-P2A50-M30MI3-SM4ACA			
	Signal transmission			
	unidirectional			
	8x PNP			
	–			
	0...5 mm			
	Remote			
	Connector, M12x1, 12-pole			
	–			
	24 VDC			
	500 mA			
	Brass			
	Ø 30 x 106 mm			
	0...55 °C			
	IP67			
	Page 224			



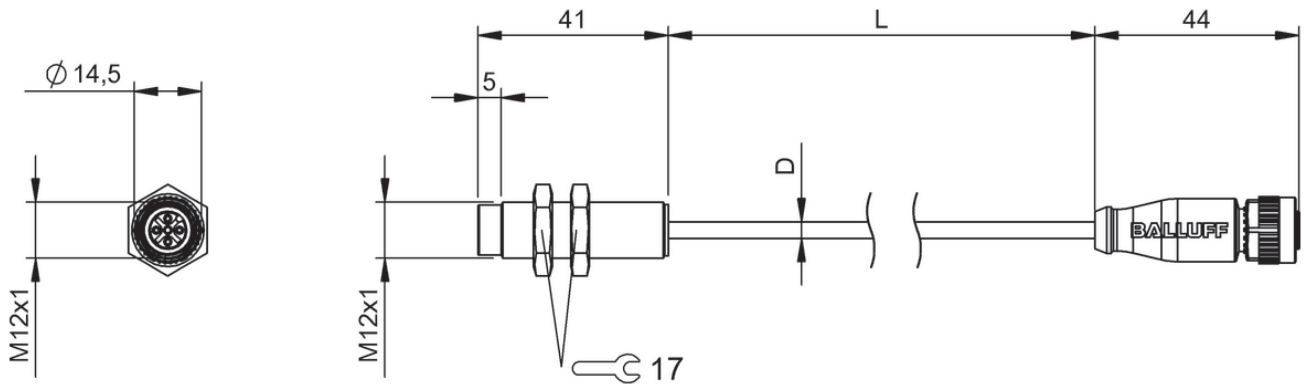
BIC007J



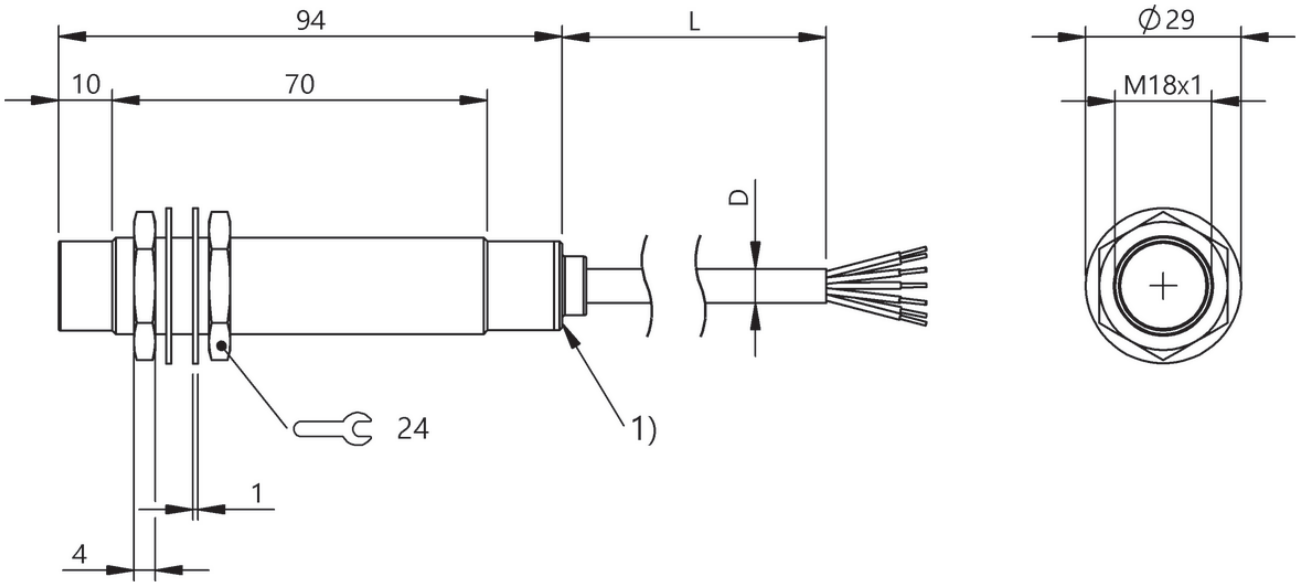
BIC007K



BIC0077

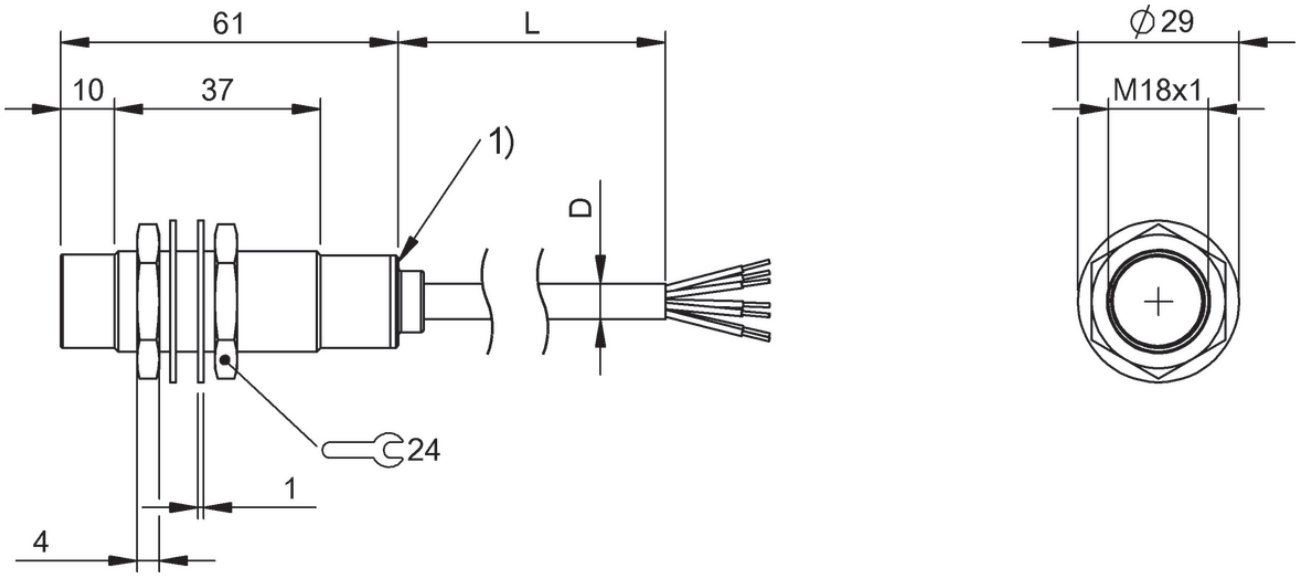


BIC0078



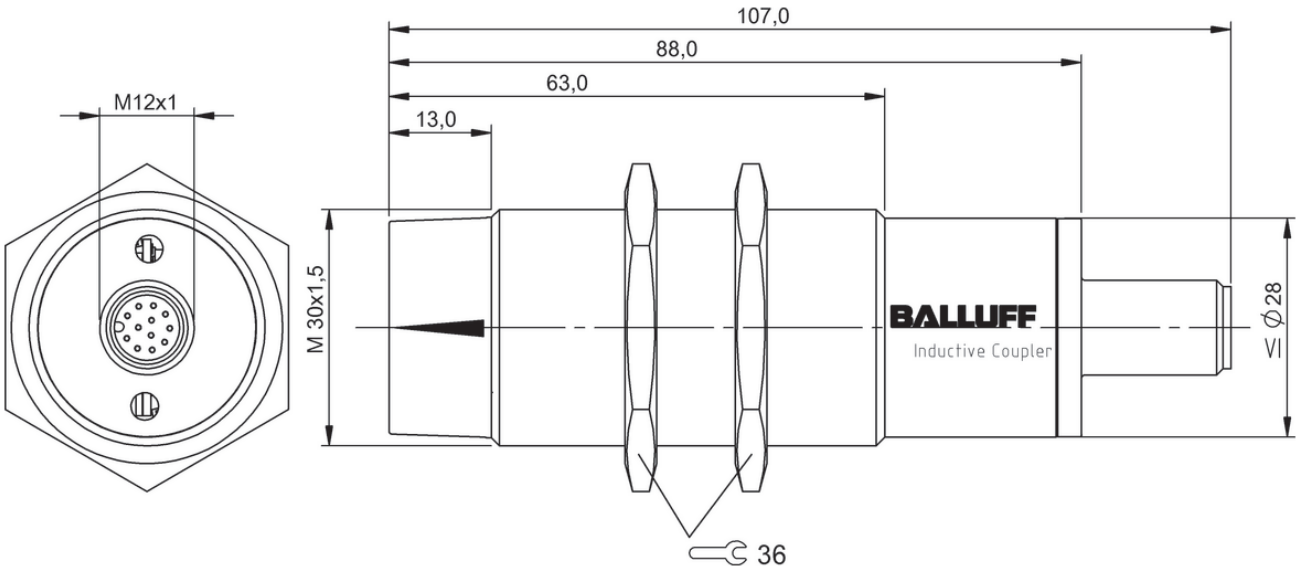
1) LED function indicator

BIC007T

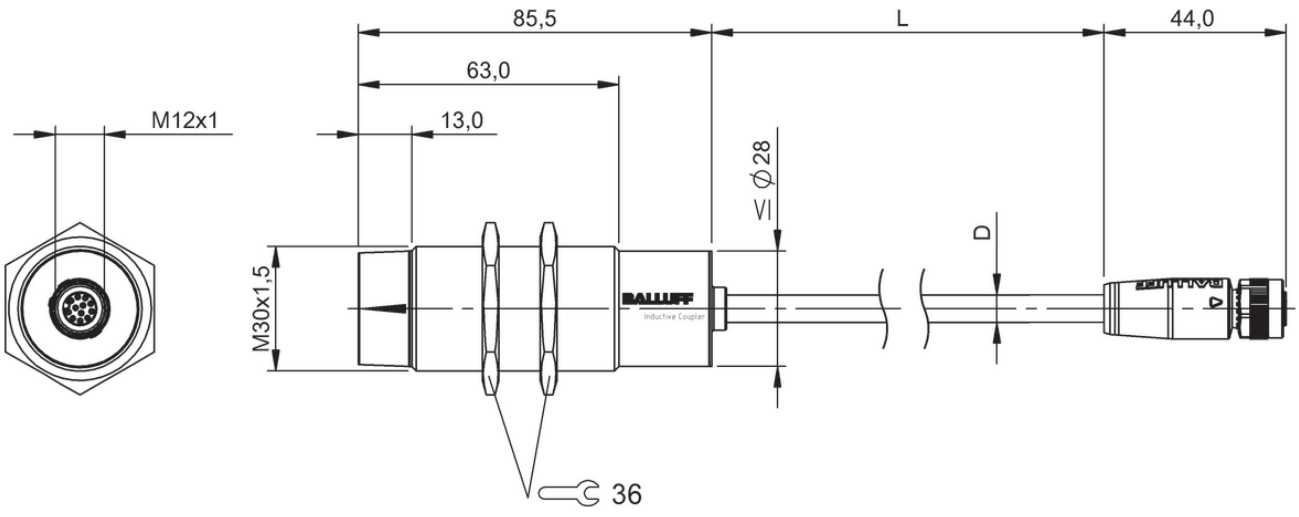


1) LED function indicator

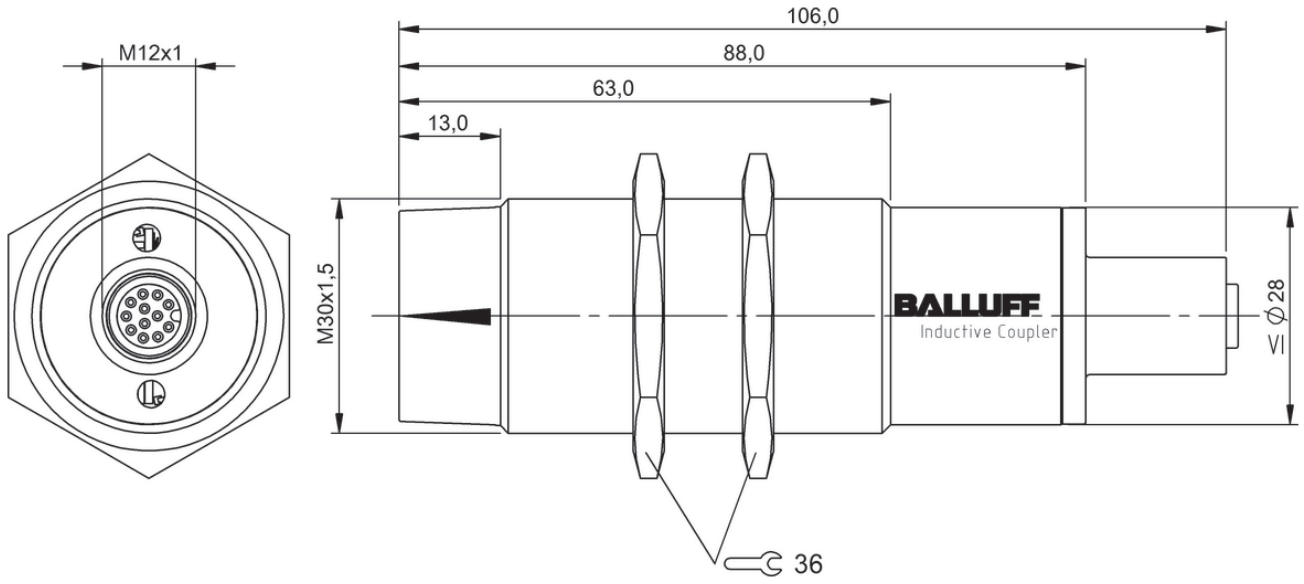
BIC007U



BIC0009



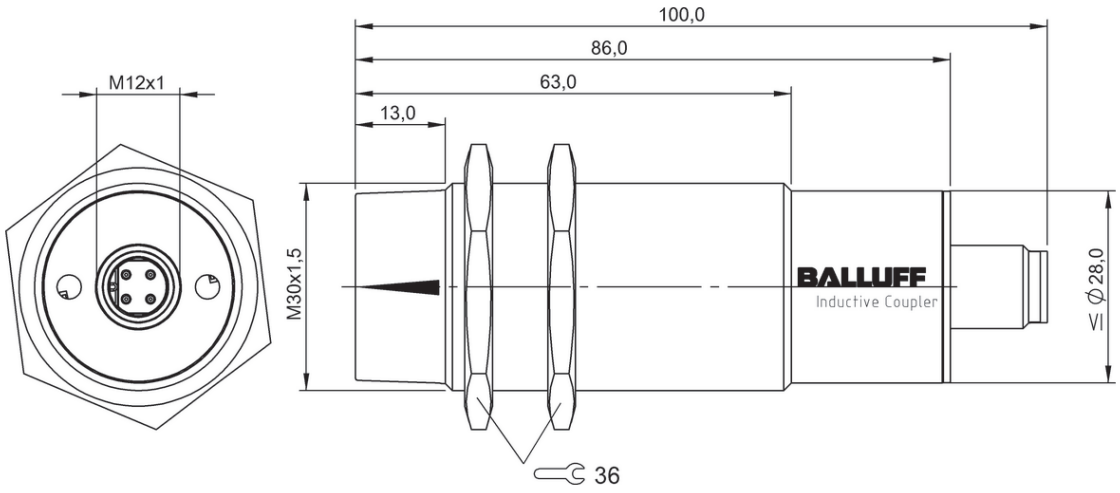
BIC005J


106,0
88,0
63,0
13,0
M12x1
M30x1,5
BALLUFF
Inductive Coupler
⌀28
36

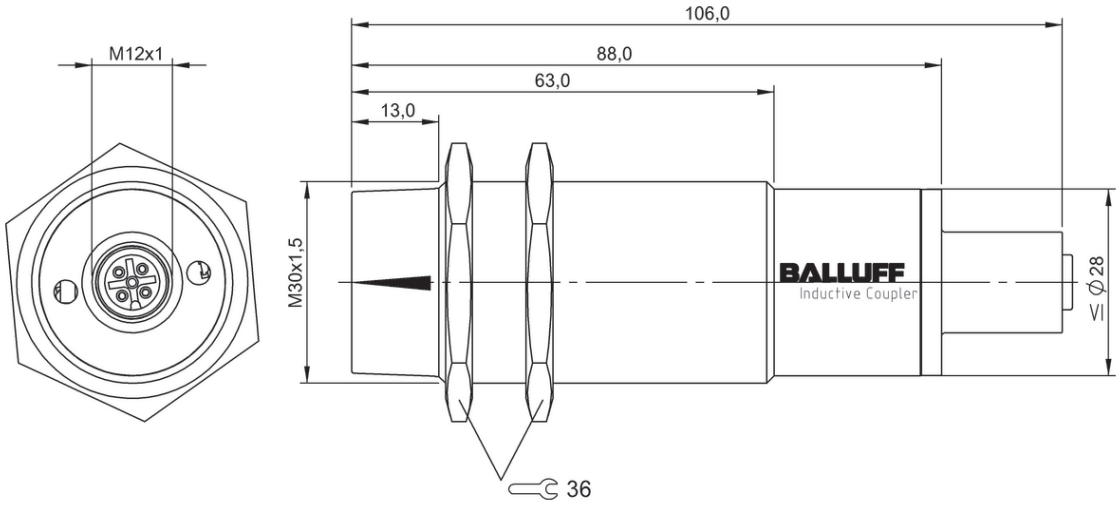
BIC000A

	BIC0007 BIC 1P0-P2A50-M30MI3-SM4A4A	BIC0008 BIC 2P0-P2A50-M30MI3-SM4A5A	
Function	Power only	Power only	
Transmission distance	0...5 mm	0...5 mm	
Component	Base	Remote	
Connection	Connector, M12x1, 4-pin	Connector, M12x1, 5-pin	
Rated operating voltage Ue	24 VDC	—	
Output voltage	—	24 VDC	
Rated output current	—	500 mA	
Housing material	Brass	Brass	
Dimension	Ø 30 x 100 mm	Ø 30 x 107.5 mm	
Ambient temperature	-5...55 °C	-5...55 °C	
Protection degree	IP67	IP67	
Productview	Page 228	Page 228	

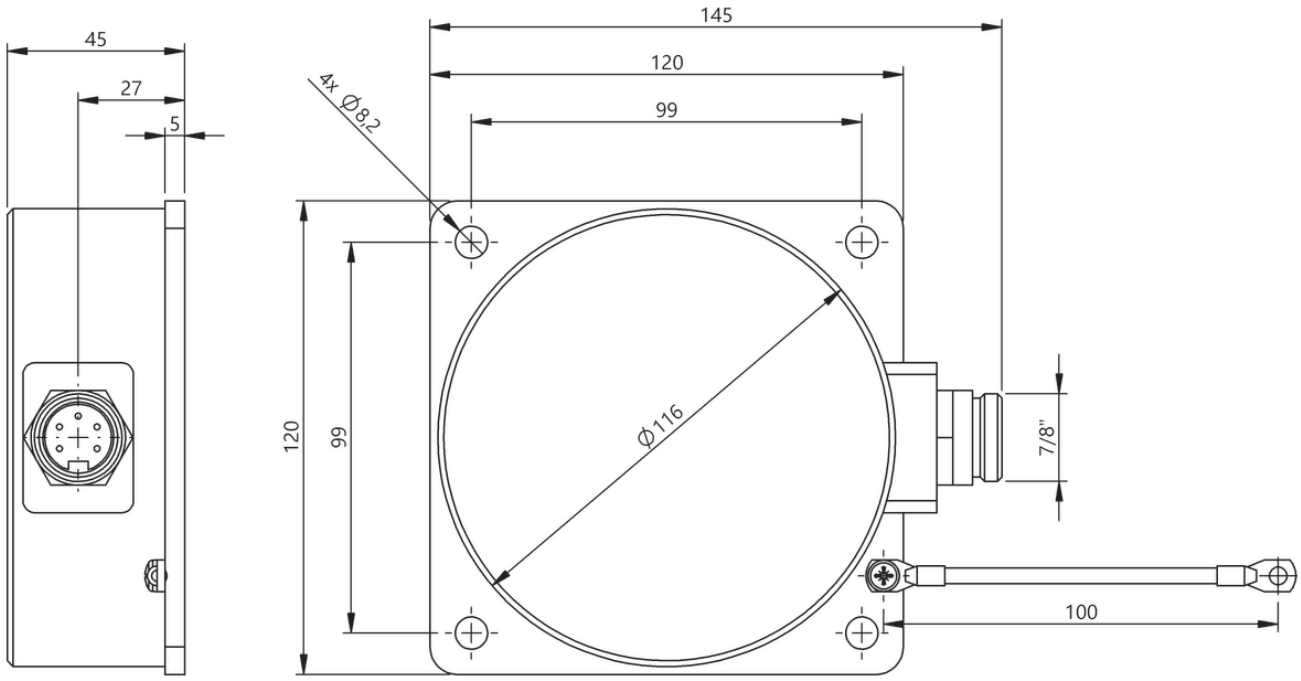
	BIC0075 BIC 1P0-P25A0-Q120AE-SA3A40	BIC0076 BIC 2P0-P25A0-Q120AE-SA3A40	BIC0073 BIC 1P0-P25A0-Q120AE-SA3A50	BIC0074 BIC 2P0-P25A0-Q120AE-SA3A50
	Power only	Power only	Power only	Power only
	0...4 mm	0...4 mm	0...4 mm	0...4 mm
	Base	Remote	Base	Remote
	Connector, 7/8“, 4-pole	Connector, 7/8“, 4-pole	Connector, 7/8“, 5-pole	Connector, 7/8“, 5-pole
	24 VDC	—	24 VDC	—
	—	24 VDC	—	24 VDC
	—	5 A	—	5 A
	Aluminum, black anodized	Aluminum, black anodized	Aluminum, black anodized	Aluminum, black anodized
	120 x 45 x 120 mm	120 x 45 x 120 mm	120 x 45 x 120 mm	120 x 45 x 120 mm
	-10...50 °C	-10...50 °C	-10...50 °C	-10...50 °C
	IP67	IP67	IP67	IP67
	Page 229	Page 229	Page 229	Page 229



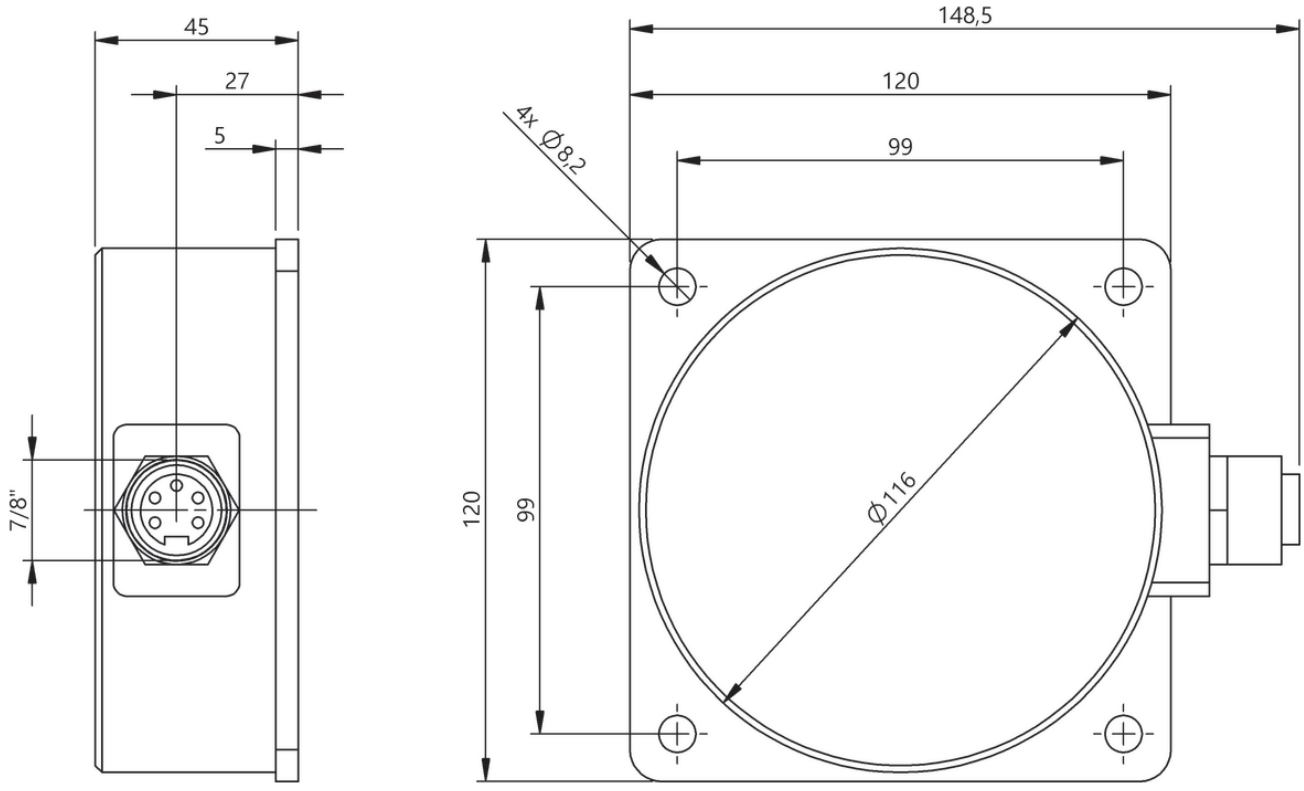
BIC0007



BIC0008



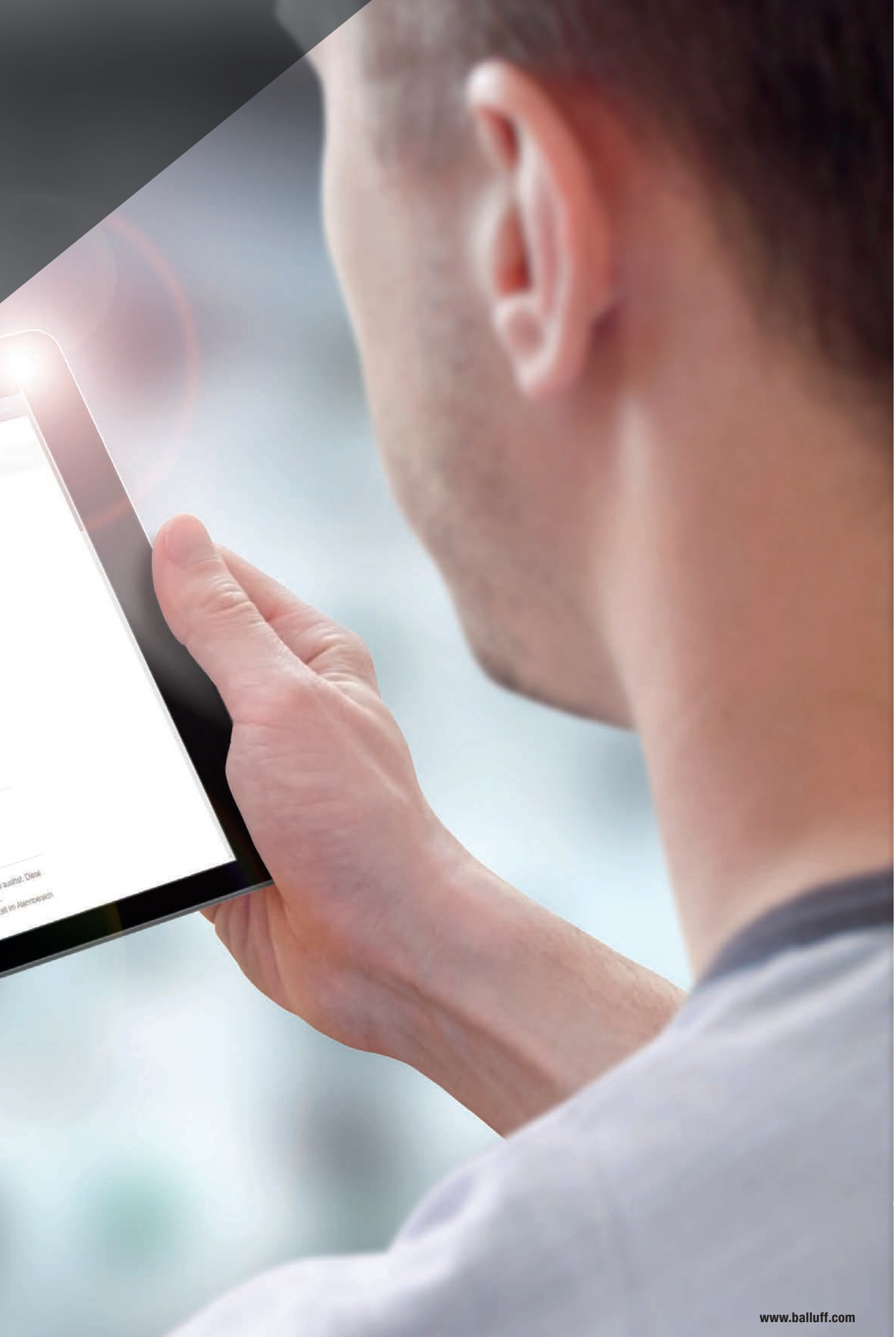
BIC0075, BIC0073



BIC0076, BIC0074

Industrial Networking

BASICS AND GLOSSARY



CC-Link

A standardized fieldbus designed to integrate the most diverse automation components of a wide range of providers. The fieldbus offers high transmission speed and deterministic communication. The open network is used mainly in Asia. CC-Link is supported by the worldwide represented CC-Link Partner Association CLPA. More than 1000 companies belong to this association .

CC-Link IE/Field

Gigabit per second transmission and real time protocol which enables controlling of decentralized I/O field devices with virtually no transmission delay. Its transmission rate is at least 10 x faster than the current available industrial Ethernet-based networks. CC-Link IE/Field is the first industrial Gigabit Ethernet network which can be brought down to the field level. A key difference between CC-Link IE/Field and other industrial Ethernet solutions is that the former implements deterministic communication without additional Ethernet switches. This reduces the hardware costs and implementation effort for such components.

Devicenet

An open fieldbus standard developed by Rockwell Automation and the ODVA (Open Devicenet Vendor Association), which is based on the CAN protocol. Devicenet is standardized in EN 50325. Specification and maintaining of the standard is the responsibility of the ODVA.

I/O module

Modules with IO-Link interface which connect the binary and analog sensors and actuators to the control level through a bus. Use of these modules substantially reduces the number of lines needed. They also offer additional functions for signal pre-processing and expanded diagnostics capabilities. Different designs and connection techniques enable solutions for a wide variety of applications, even under the most extreme environmental conditions.

EtherCAT

Open fieldbus system based on Ethernet and which due to its speed enables data transmission in real time. The technology for industrial networks in automation technology was standardized in the international standards IEC 61158 and IEC 61784 as well as in ISO 15745-4.

Ethernet/IP

Industrial Ethernet standard for industrial networks in automation technology, which is used especially in the North American market and in combination with Rockwell controllers. Standardization is through the international series IEC 61158. Based on CIP protocol (Common Industrial Protocol) and is used for transmitting cyclical I/O data as well as acyclic parameter data.

Inductive couplers

Non-contact transmission of data and energy over an air gap which eliminates mechanical wear.
The units are easy to use and require no maintenance.
They can be easily disconnected, so that new situations can be quickly responded to. The disadvantages of fixed wiring such as cable wear and break are eliminated while positive outcomes are gained: Elimination of unplanned machine stoppages, high system availability, shorter cycle times and more flexible sequences.

IO-Link

Worldwide standardized IO technology (IEC 61131-9) for communicating from the controller to the lowest level of automation. The interface can be used universally and is a fieldbus-neutral, point-to-point connection that operates using an unshielded industrial cable. Advantages of this digital communication standard include simple installation, need-based maintenance, efficient operation and the highest machine availability.

IO-Link device manager

Software for configuring IO-Link devices. Direct access to all IO-Link devices in the network via UDP (User Datagram Protocol) enables parallel configuration of different devices in the same network. The multi-window function of the software allows different devices to be configured and diagnosed at the same time. The ability to perform an IO test using software and make parameter settings without the PLC means significantly faster system startup. Along with PLC communication, process-, parameter- and diagnostics data can be transported without affecting the process cycle. This communication takes place continuously with all IO-Link devices in the network. The IO-Link device manager can be used with all Profinet and Ethernet/IP master modules from Balluff.

Memory module

A network technology with built-in data storage. In machines and equipment it can, for example, assume the function of an interchangeable data carrier. It logs and stores many parameters: including the operating data of the tool, the histogram of the temperature level in operation, the required power level up to the number of tool cycles, and the error messages in the tool.
This means operating data as well as supplemental information is always available during maintenance or repair in the factory.

Network module

Interface between fieldbus/industrial Ethernet and the IO-Link communication standard. Ever faster, more efficient and variable production demands seamless communication from the sensor to the Internet. The result is a growing amount of data within the production processes. This demands components which can make this information available. At the same time an infrastructure is required which transports the data across all levels. Network modules are required for these purposes. They usually serve as an interface between fieldbus/industrial Ethernet and the IO-Link communication standard.

Profibus

Universal standard for fieldbus communication in automation technology. This fieldbus is standardized in IEC 61158.
The basis of the protocol architecture is the OSI layer model. Profibus (Process Field Bus) is especially suited for complex applications and is today one of the most used fieldbuses in automation technology.

Profinet

Official industrial Ethernet standard of the Profibus User Organization. Based on TCP/IP, the protocol connects drives and safety technology directly to the network world.
Profinet (Process Field Network) is real time Ethernet capable and ensures significantly faster communication than Profibus. Both standards can be easily combined with each other. Profinet can be integrated consistently from the control level to the drive. Profinet is a communication solution which has been used in many applications for many years worldwide.

Signal converter

A module which stores an incoming signal in a particular format and outputs it in a different format.
Frequently, such modules are used in the conversion of analog signals into digital signals or vice versa. Likewise, you can convert different communication protocols using signal converters.

Switch, managed

Device which receives, processes and passes data packets to other devices in the network. It thereby connects individual network segments to each other. Can be configured so that it is matched to the network requirements (in contrast to an unmanaged switch) and has for example functions which ensure high system availability and high safety requirements.

Switch, unmanaged

Device which receives, processes and passes data packets to other devices in the network. It thereby connects individual network segments to each other. Cannot be configured and is integrated into a network using plug-and-play with no pre-settings.

UL

Independent, globally recognized organization with headquarters in the USA. Tests and certifies products, product groups and materials for safety. UL (Underwriters Laboratories) is not a product approval body, rather it tests whether products meet the specific safety requirements for certain applications. The UL logo, which can be attached on a product which has been certified, is recognized as a quality indicator especially in North America.

Wide range of voltages and power levels

POWER SUPPLIES.

innovating automation

With our power supplies you can power any of your applications. Whether single-phase, three-phase, for parallel or series wiring, whether for the control cabinet, in compact form for automated machines or for harsh conditions directly in the field. At Balluff you will find a wide selection of voltages and power levels for reliable and efficient power supply. Our devices are approved according to CE/TÜV, UL or CCC.

Your Balluff solutions

- Switching Power Supplies

Reliable and efficient power supply

SWITCHING POWER SUPPLIES

Balluff offers high-performance power supplies to ensure that your systems run efficiently and without interference. Our power supplies for the control cabinet withstand overload and have especially long service life: up to 800,000 hours (91 years) to ensure the availability of your machines and equipment.

Our power supplies with the Heartbeat® function provide continuous function information about the internal device condition and indicate the current load situation and demand on the internal components. And the Lifetime display gives you warning for preventive maintenance. The diagnostics function can be applied anywhere in the system via IO-Link.

All the devices are available in several versions and output voltages. Heartbeat® versions for use directly in harsh environments are also available in IP67.

The most important benefits

- Complete line – everything from a single source
- Safety in case of short circuits and overloads in industrial environments
- Long service life for reliable operation
- High system availability of all equipment
- Comprehensive approval packages for global use

Heartbeat® Power Supply Units	240
Heartbeat® Power Supplies with IO-Link Interface	244
Power Supplies for the Control Cabinet	250
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	BAE00EP BAE PS-XA-1W-24-038-602	
Dimension	85.4 x 57 x 139 mm	
Version	IP67	
Mounting	Flange mounting	
Housing material	Aluminum	
Connection (supply voltage IN)	7/8“-Male	
Connection (supply voltage OUT)	7/8“-Female	
Input voltage	100…240 V AC, Single phase	
Rated output voltage DC	24 V	
Rated output current	3.8 A	
Output capacity max.	91.2 W	
Output current max.	6 A for max. 4s	
Protection degree	IP67 with connector	
Approval/Conformity	CE, cURus	
Ambient temperature	-25...70 °C	
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	BAE00FW BAE PS-XA-1W-24-038-607	BAE00FL BAE PS-XA-1W-24-080-605	BAE00FY BAE PS-XA-1W-24-080-606
	85.4 x 57 x 139 mm	116 x 70 x 150 mm	116 x 70 x 150 mm
	IP67	IP67	IP67
	Flange mounting	Flange mounting	Flange mounting
	Aluminum	Aluminum	Aluminum
	7/8“-Male	7/8“-Male	7/8“-Male
	7/8“-Female	7/8“-Female	7/8“-Female
	100…240 V AC, Single phase	100…240 V AC, Single phase	100…240 V AC, Single phase
	24 V	24 V	24 V
	3.8 A	8 A	8 A
	91.2 W	192 W	192 W
	6 A for max. 4s	12 A for max. 4s	12 A for max. 4s
	IP67 with connector	IP67 with connector	IP67 with connector
	CE, cURus	CE, cURus	CE, cURus
	-25...70 °C	-25...70 °C	-25...70 °C
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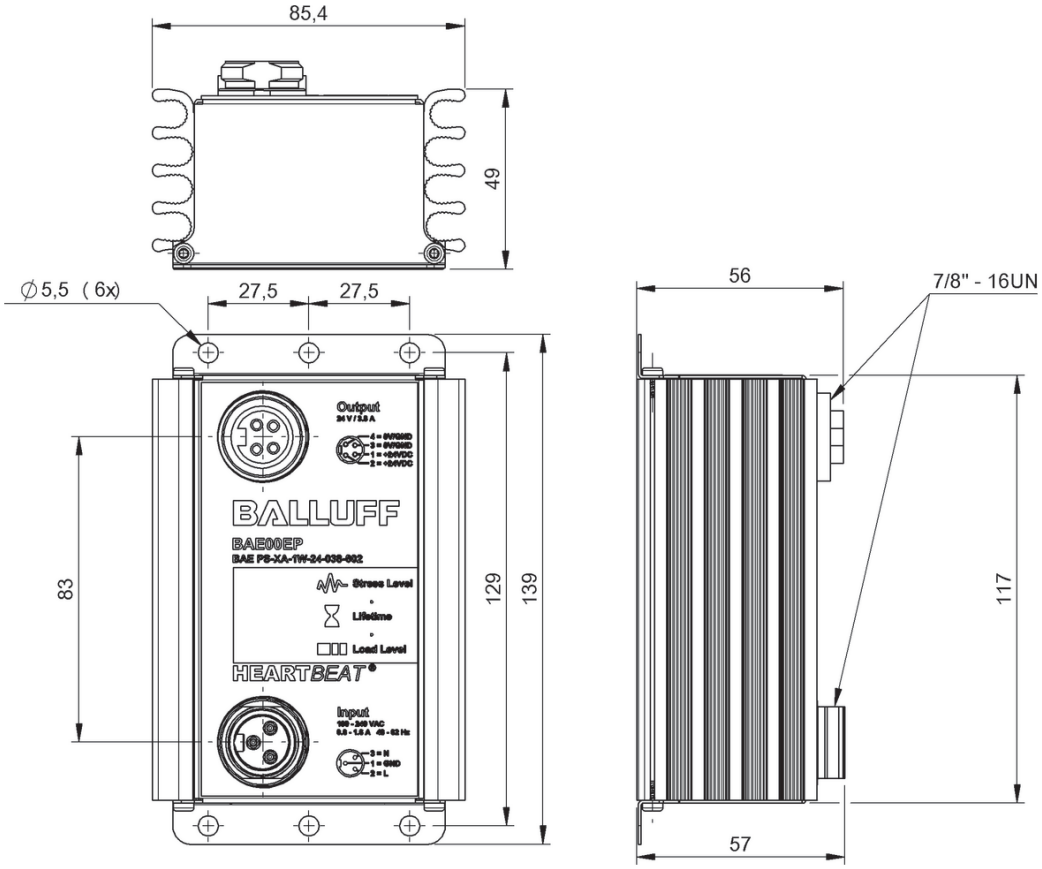

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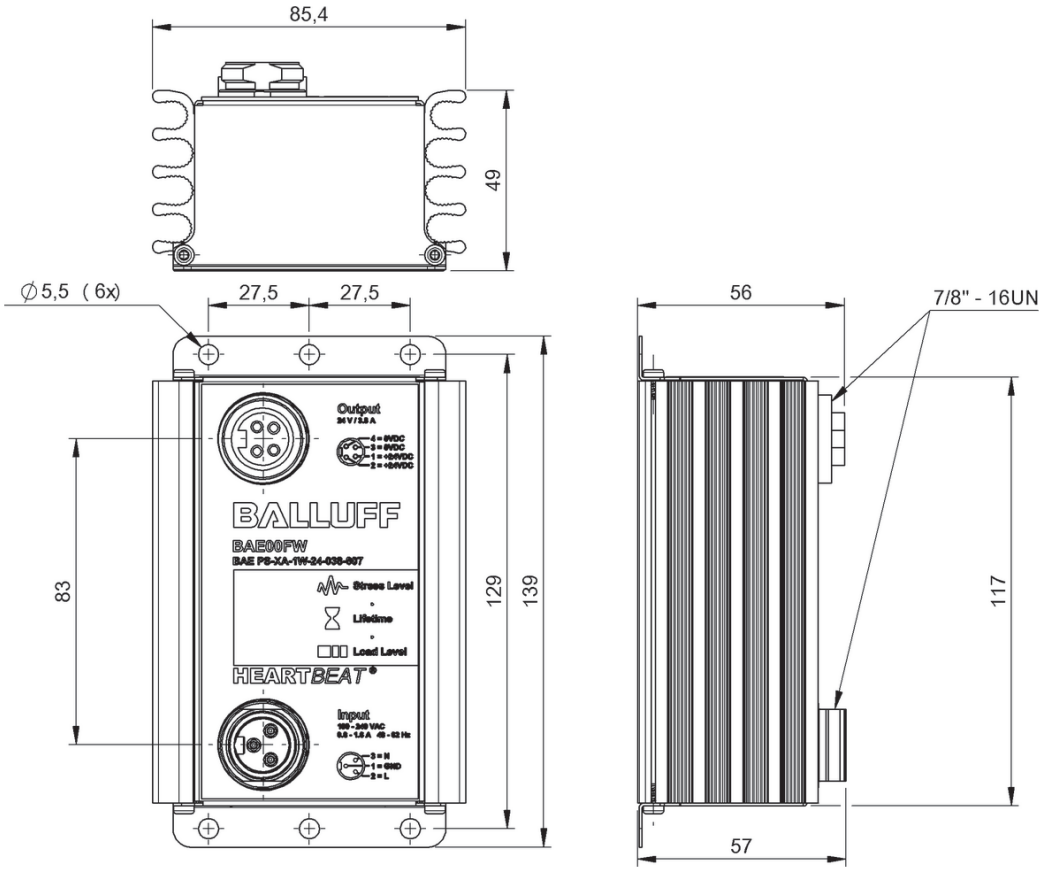

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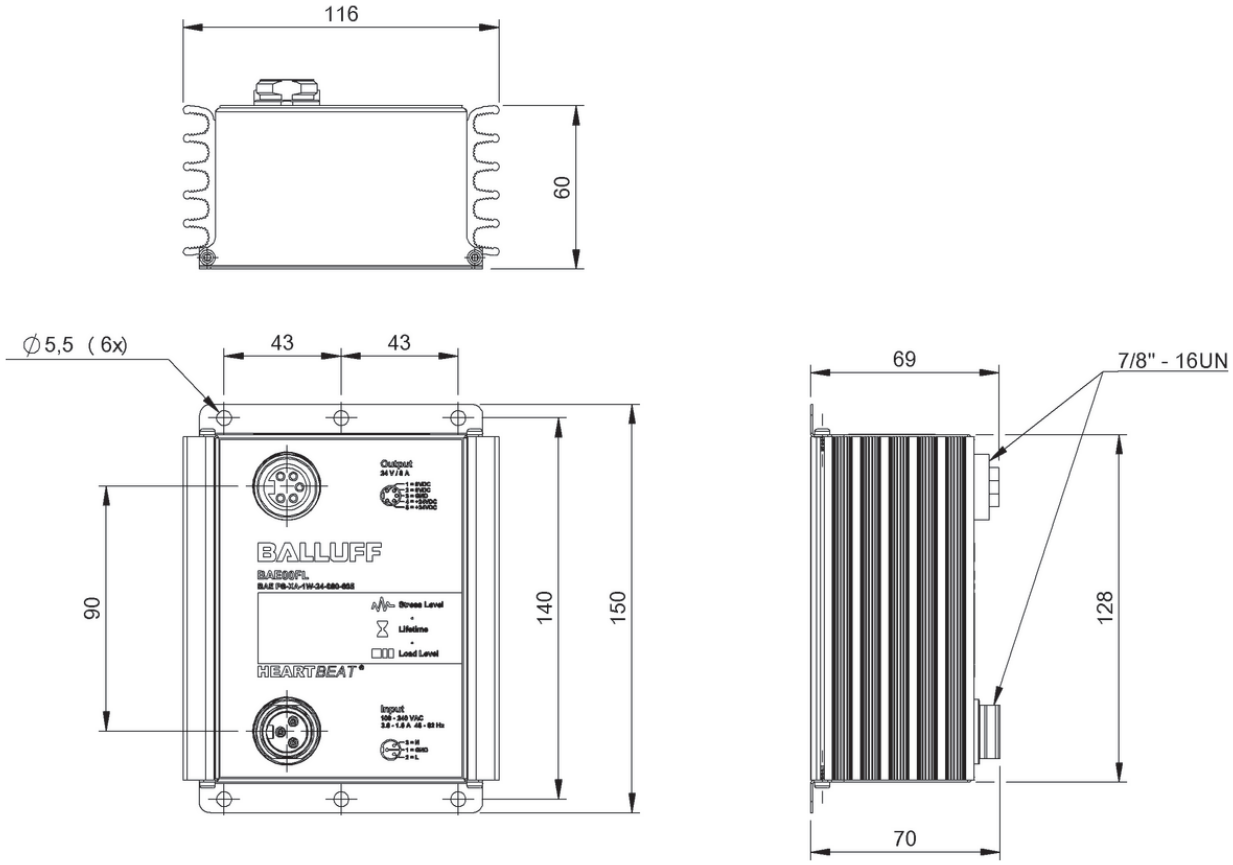

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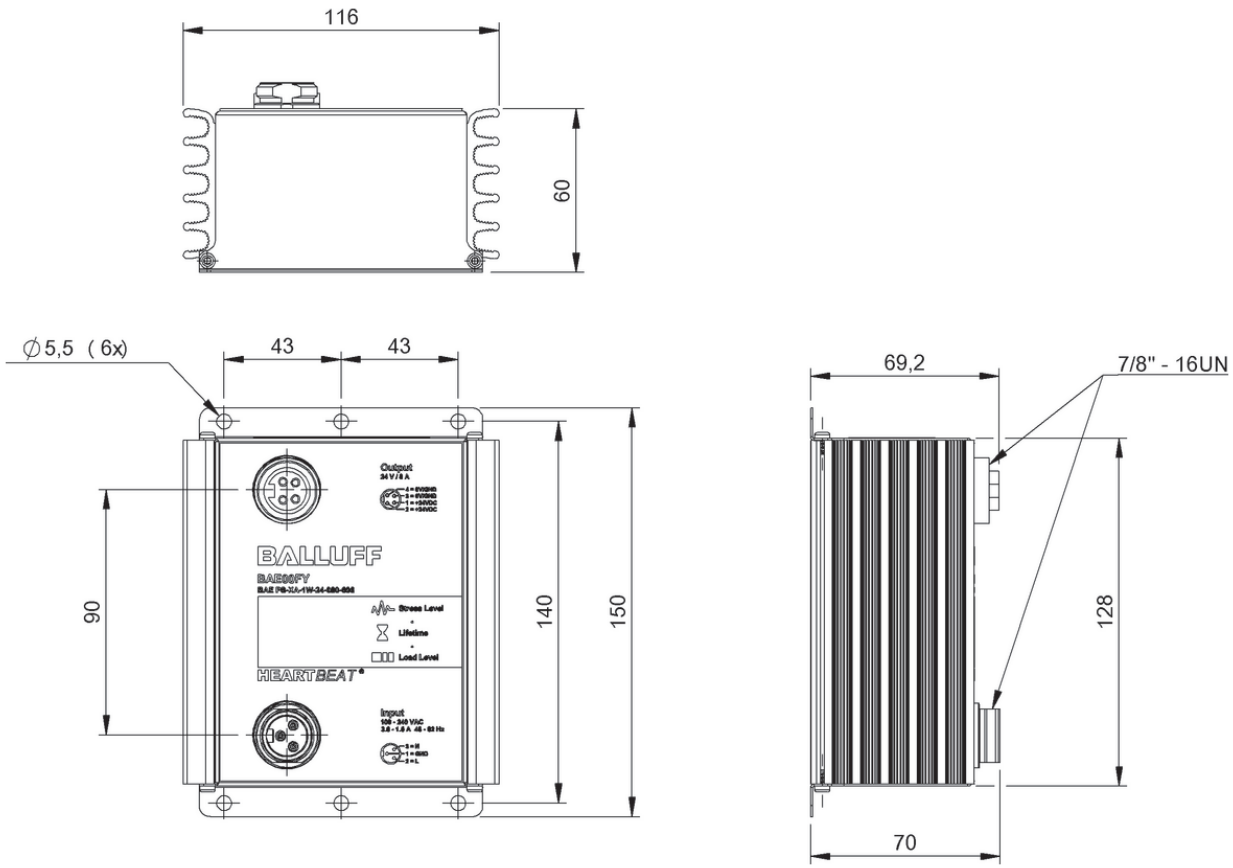

BAE00FY



	BAE00T4 BAE PS-XA-1S-24-050-102	BAE00LJ BAE PS-XA-1S-24-100-103	BAE00M3 BAE PS-XA-1S-24-200-104	
Dimension	38 x 127 x 120 mm	60 x 127 x 127 mm	79 x 127 x 139 mm	
Version	DIN rail	DIN rail	DIN rail	
Mounting	DIN rail mount	DIN rail mount	DIN rail mount	
Housing material	Aluminum	Aluminum	Aluminum	
Connection (supply voltage IN)	Terminal strip	Terminal strip	Terminal strip	
Connection (supply voltage OUT)	Terminal strip	Terminal strip	Terminal strip	
Input voltage	115/230 V AC automatic selection, Single phase	115/230 V AC automatic selection, Single phase	115/230 V AC automatic selection, Single phase	
Rated output voltage DC	24 V	24 V	24 V	
Rated output current	5 A	10 A	20 A	
Output capacity max.	180 W	360 W	720 W	
Output current max.	7.5 A for max. 4s 1x/min.	15 A for max. 4s 1x/min.	30 A for max. 4s 1x/min.	
Protection degree	IP20	IP20	IP20	
Approval/Conformity	CE, CB, cURus, cULus	CE, CB, cURus, cULus	CE	
Ambient temperature	-25...70 °C	-25...70 °C	-25...60 °C	
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	BAE00TR BAE PS-XA-1W-24-025-101	BAE00TJ BAE PS-XA-1W-24-038-602-I	BAE00TK BAE PS-XA-1W-24-038-603-I	BAE00TL BAE PS-XA-1W-24-080-604-I	BAE00TM BAE PS-XA-1W-24-080-605-I
	24 x 127 x 92 mm	85.4 x 72.6 x 139 mm	85.4 x 72.6 x 139 mm	116 x 85 x 150 mm	116 x 85 x 150 mm
	DIN rail	IP67	IP67	IP67	IP67
	DIN rail mount	Flange mounting	Flange mounting	Flange mounting	Flange mounting
	Aluminum	Aluminum PC	Aluminum PC	Aluminum PC	Aluminum PC
	Terminal strip	7/8“-Male	7/8“-Male	7/8“-Male	7/8“-Male
	Terminal strip	7/8“-Female	7/8“-Female	7/8“-Female	7/8“-Female
	100…240 V AC, Single phase	100…240 V AC, Single phase	100…240 V AC, Single phase	100…240 V AC, Single phase	100…240 V AC, Single phase
	24 V	24 V	24 V	24 V	24 V
	2.5 A	3.8 A	3.8 A	8 A	8 A
	90 W	91.2 W	91.2 W	192 W	192 W
	3.75 A for max. 4s 1x/min.	6 A for max. 4s	6 A for max. 4s	12 A for max. 4s	12 A for max. 4s
	IP20	IP67 with connector	IP67 with connector	IP67 with connector	IP67 with connector
	CE, CB, cURus, cULus	CE, cURus, IO-Link	CE, cURus, IO-Link	CE, cURus, IO-Link	CE, cURus, IO-Link
	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C	-25...70 °C
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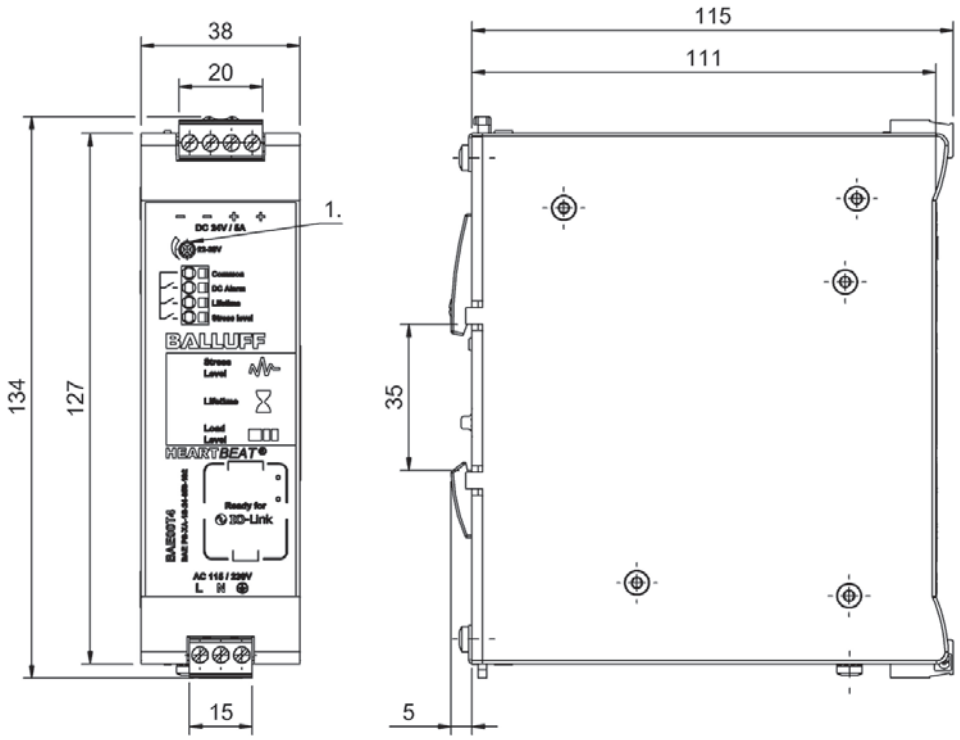
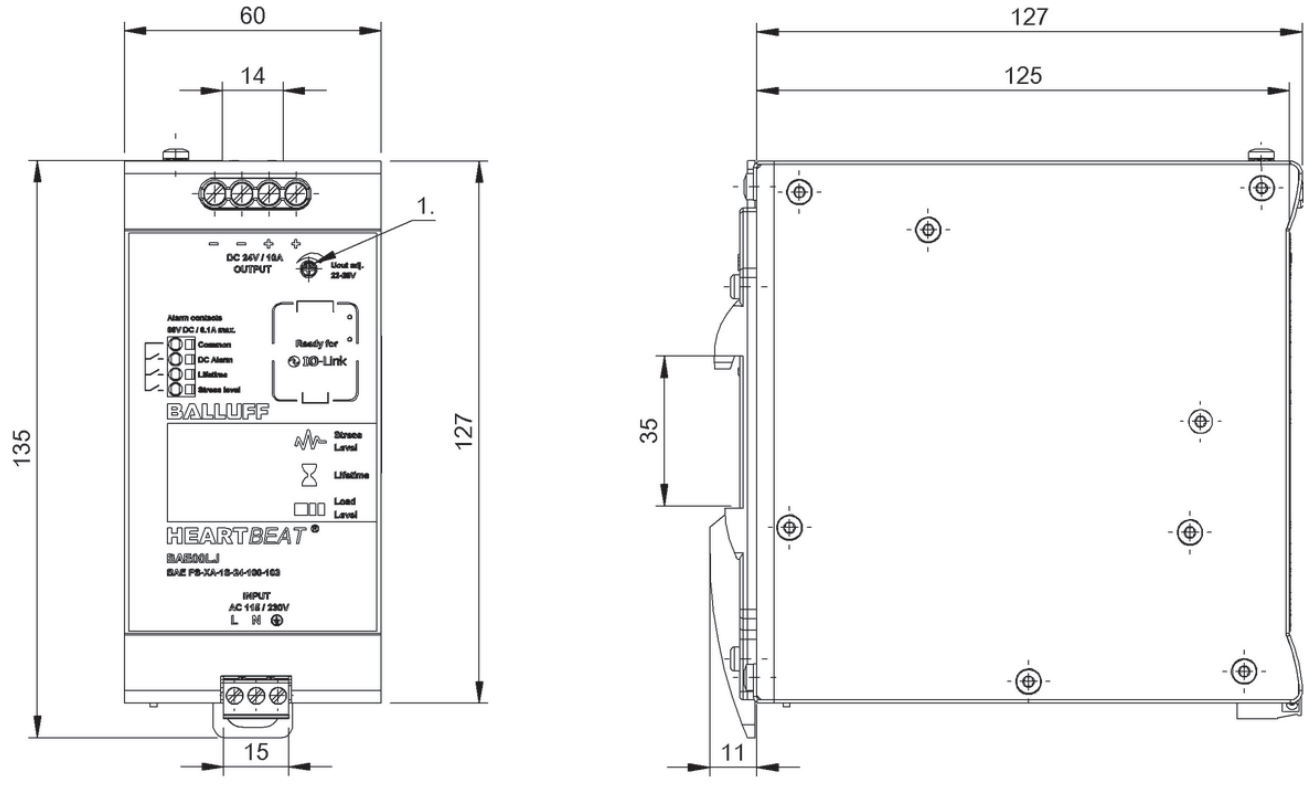


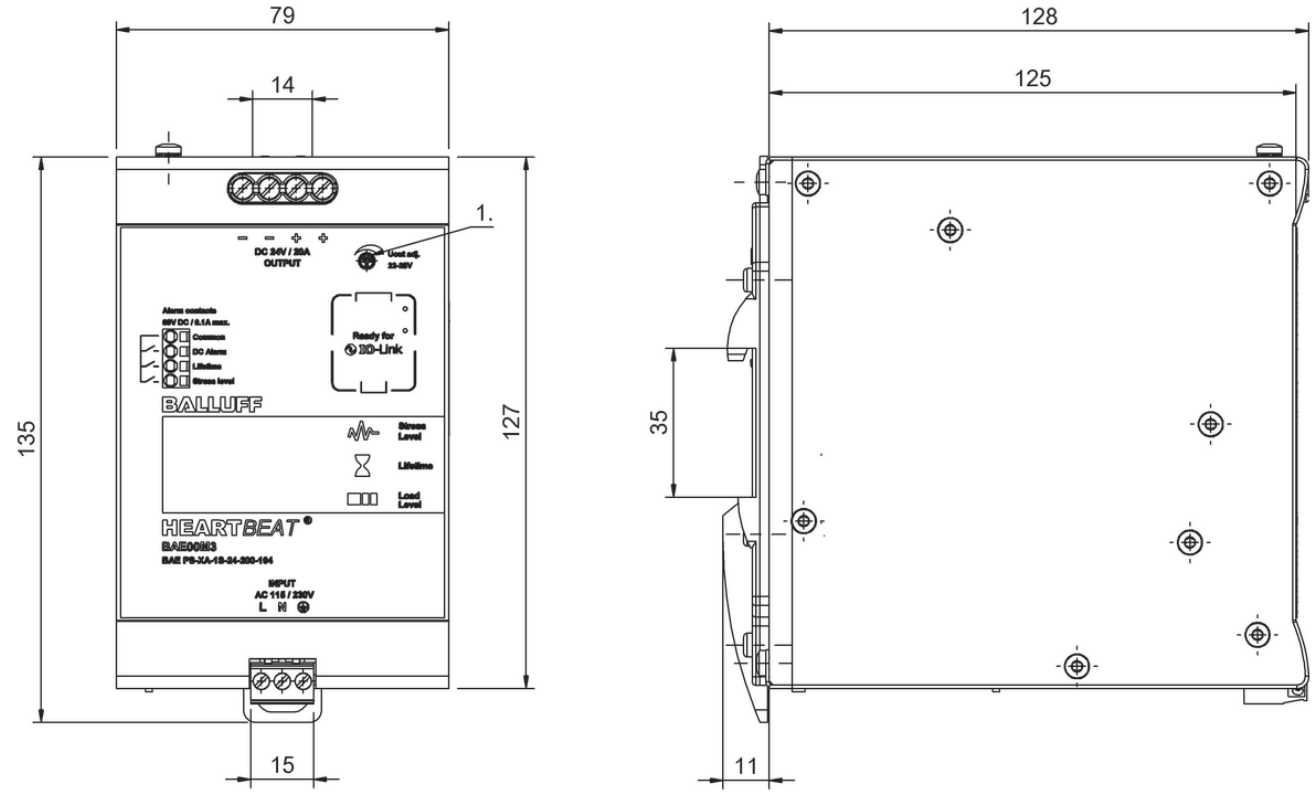
1) Potentiometer

BAE00T4



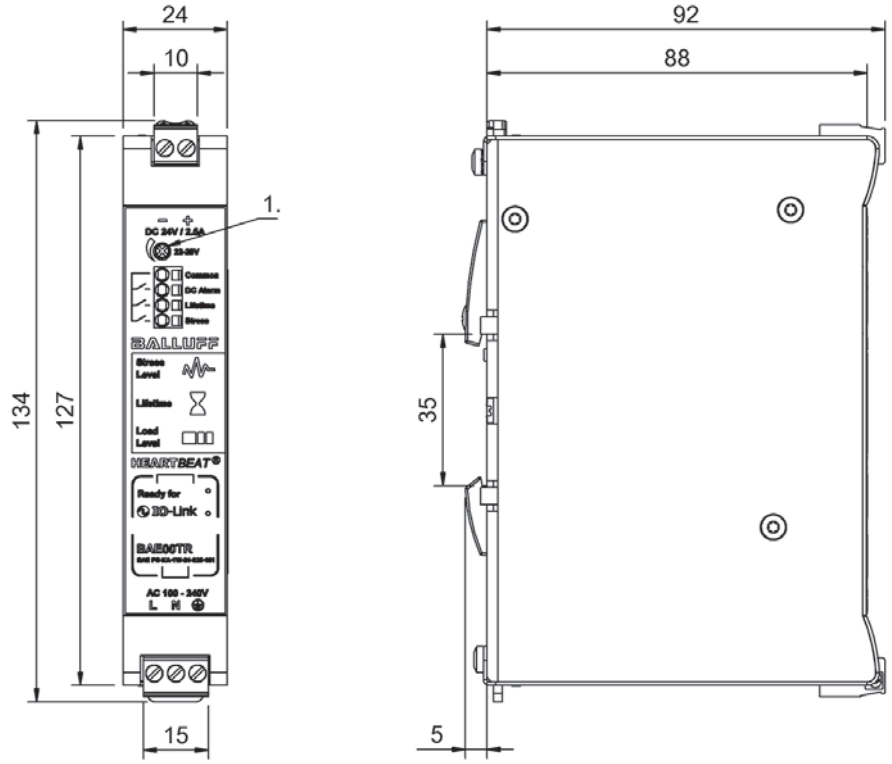
1) Potentiometer

BAE00LJ



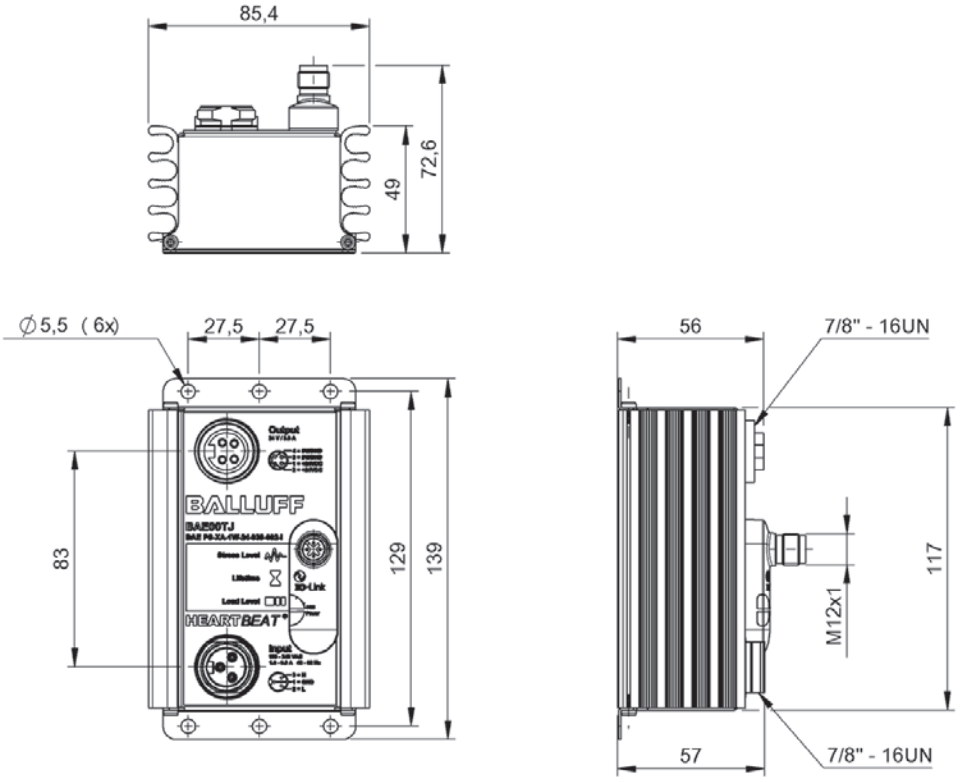
1) Potentiometer

BAE00M3



1) Potentiometer

BAE00TR



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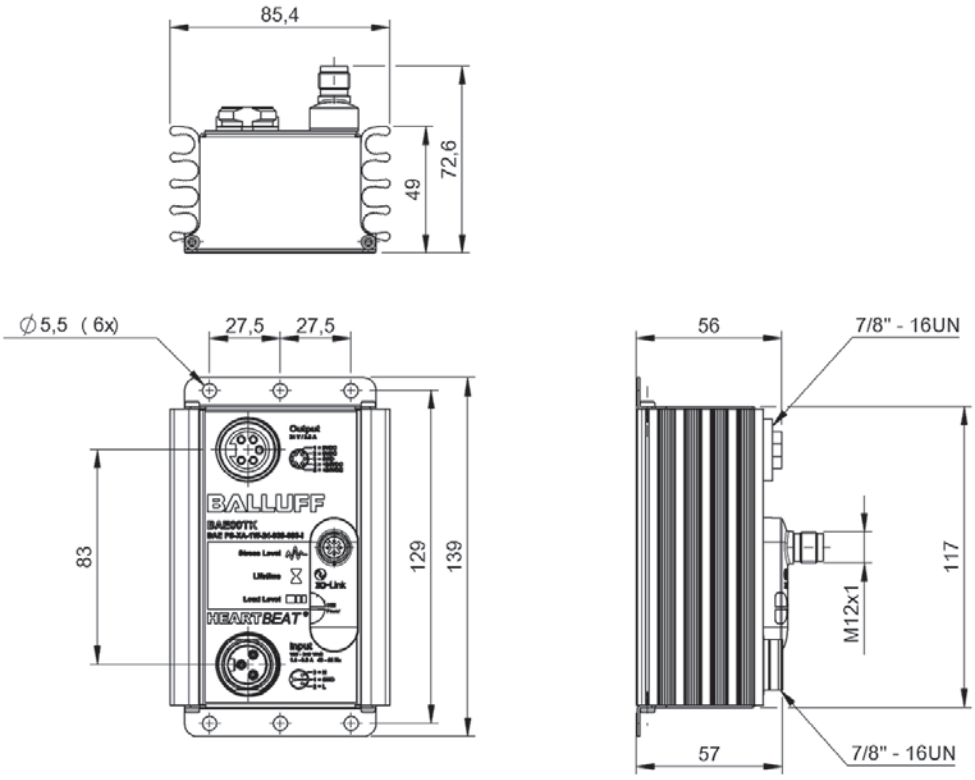

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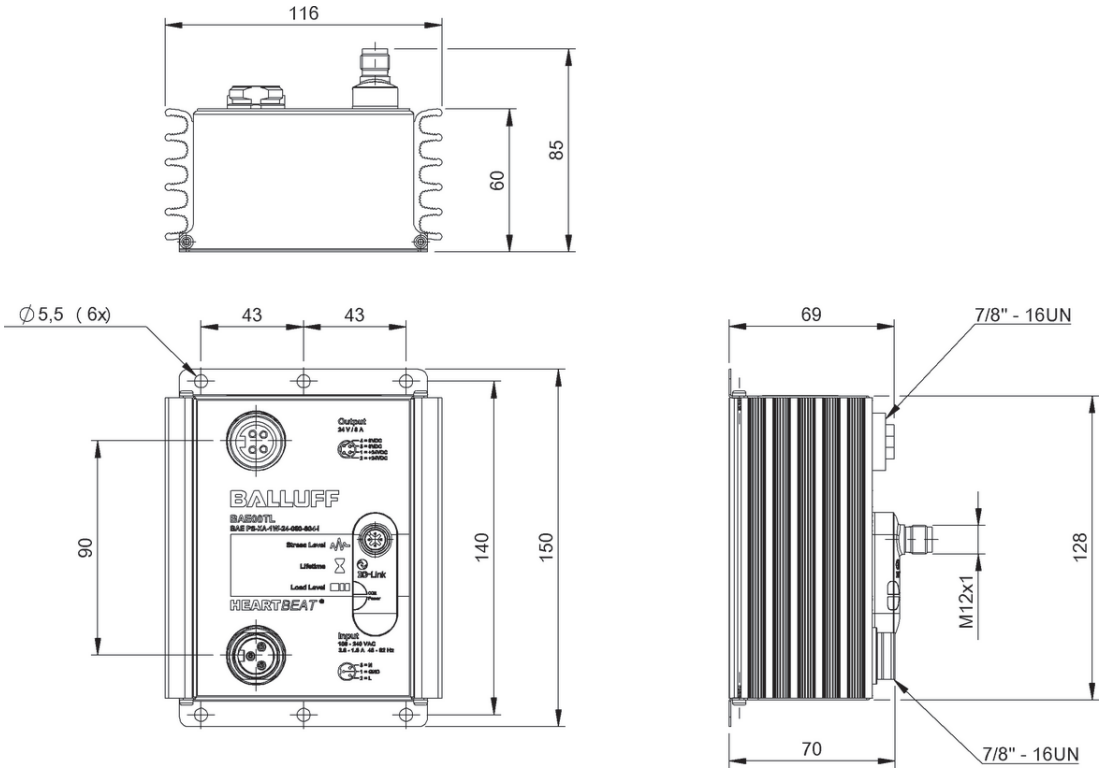

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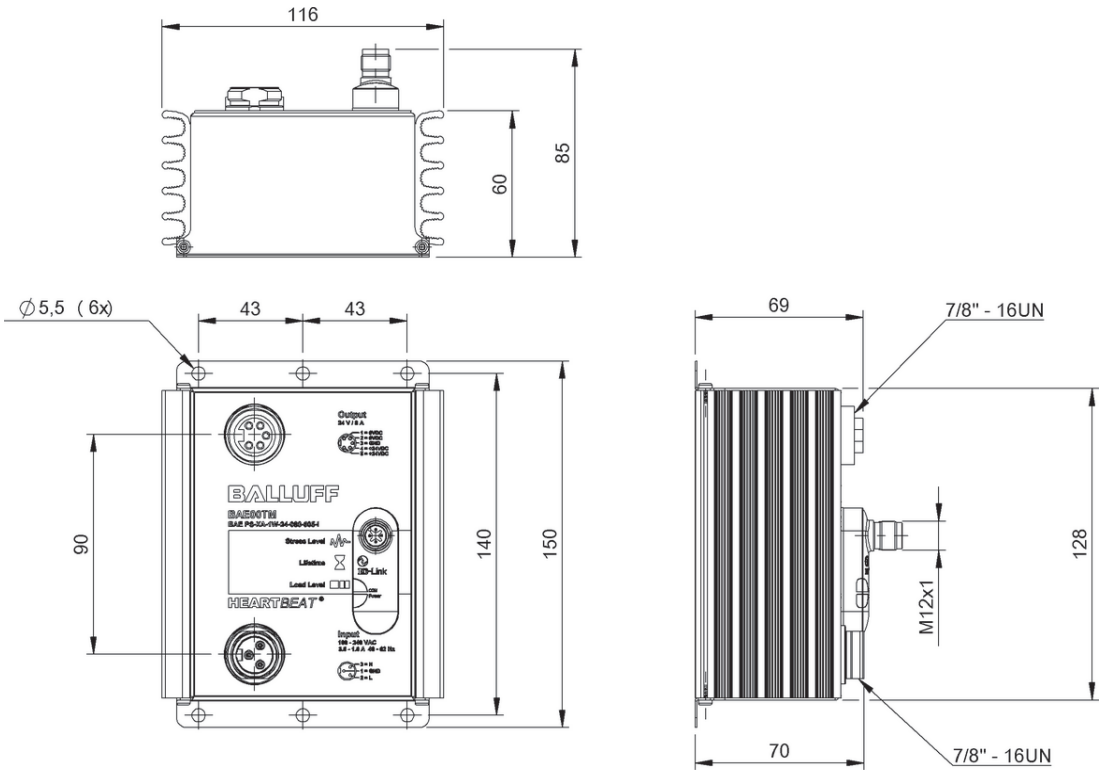

BAE00TM



	BAE0005 BAE PS-XA-1W-24-025-002	BAE0006 BAE PS-XA-1W-24-050-003	BAE0002 BAE PS-XA-1W-24-100-004	
Dimension	40.5 x 90 x 114 mm	64 x 124.5 x 116.6 mm	83.5 x 124.5 x 116.6 mm	
Version	DIN rail	DIN rail	DIN rail	
Mounting	DIN rail mount	DIN rail mount	DIN rail mount	
Housing material	Plastic	Metal	Metal	
Connection	Clamp, 0.25 mm²...2.5 mm²	Clamp, 0.25 mm²...4 mm²	Clamp, 0.25 mm²...4 mm²	
Input voltage	100…240 V AC, Single phase	115/230 V AC automatic selection, Single phase	115/230 V AC automatic selection, Single phase	
Rated output voltage DC	24 V	24 V	24 V	
Rated output current	2.5 A	5 A	10 A	
Protection degree	IP20	IP20	IP20	
Approval/Conformity	CE, CCC, cULus	CE, CCC, cULus	CE, CCC, cULus	
Ambient temperature	-40...70 °C	-35...70 °C	-40...70 °C	
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	BAE0003 BAE PS-XA-1W-24-200-005	BAE0007 BAE PS-XA-3Y-24-050-009	BAE0008 BAE PS-XA-3Y-24-100-006	BAE0009 BAE PS-XA-3Y-24-200-007	BAE003R BAE PS-XA-3Y-24-400-010
	175.5 x 124.5 x 116.6 mm	74.3 x 124 x 111.9 mm	89 x 124 x 111.9 mm	150 x 124 x 111.9 mm	275.8 x 126.2 x 111.9 mm
	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail
	DIN rail mount	DIN rail mount	DIN rail mount	DIN rail mount	DIN rail mount
	Metal	Metal	Metal	Metal	Metal
	Clamp, 0.25 mm²...4 mm²	Clamp, 0.25 mm²...4 mm²	Clamp, 0.25 mm²...4 mm²	Clamp, 0.25 mm²...4 mm²	Clamp, 0.25 mm²...4 mm², 0.5 mm²...10 mm²
	100…240 V AC, Single phase	400…500 V AC, Three-phase	400…500 V AC, Three-phase	400…500 V AC, Three-phase	400…500 V AC, Three-phase
	24 V	24 V	24 V	24 V	24 V
	20 A	5 A	10 A	20 A	40 A
	IP20	IP20	IP20	IP20	IP20
	CE, CCC, cULus	CE, CCC, cULus	CE, CCC, cULus	CE, CCC, cULus	CE, CCC, cULus
	-40...70 °C	-40...70 °C	-40...70 °C	-30...70 °C	-40...70 °C
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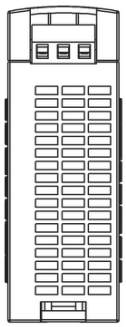

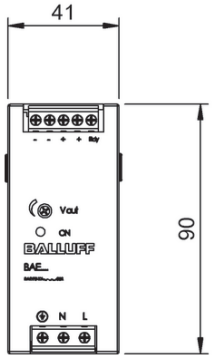

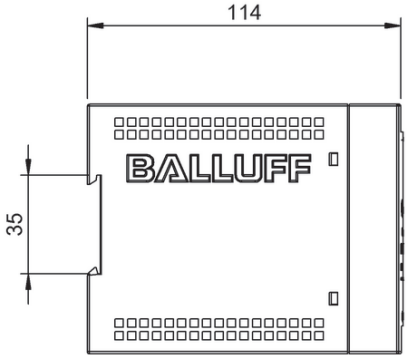

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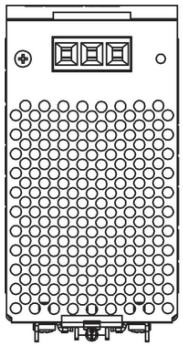

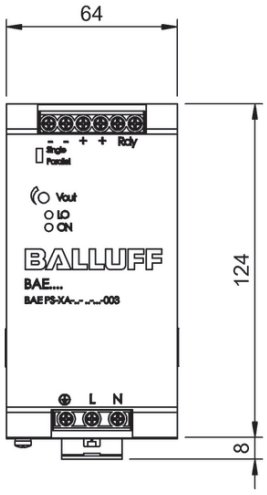

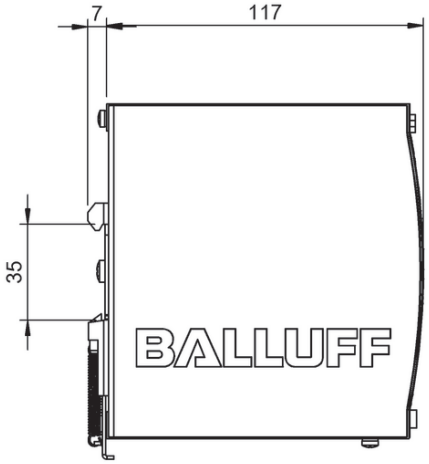

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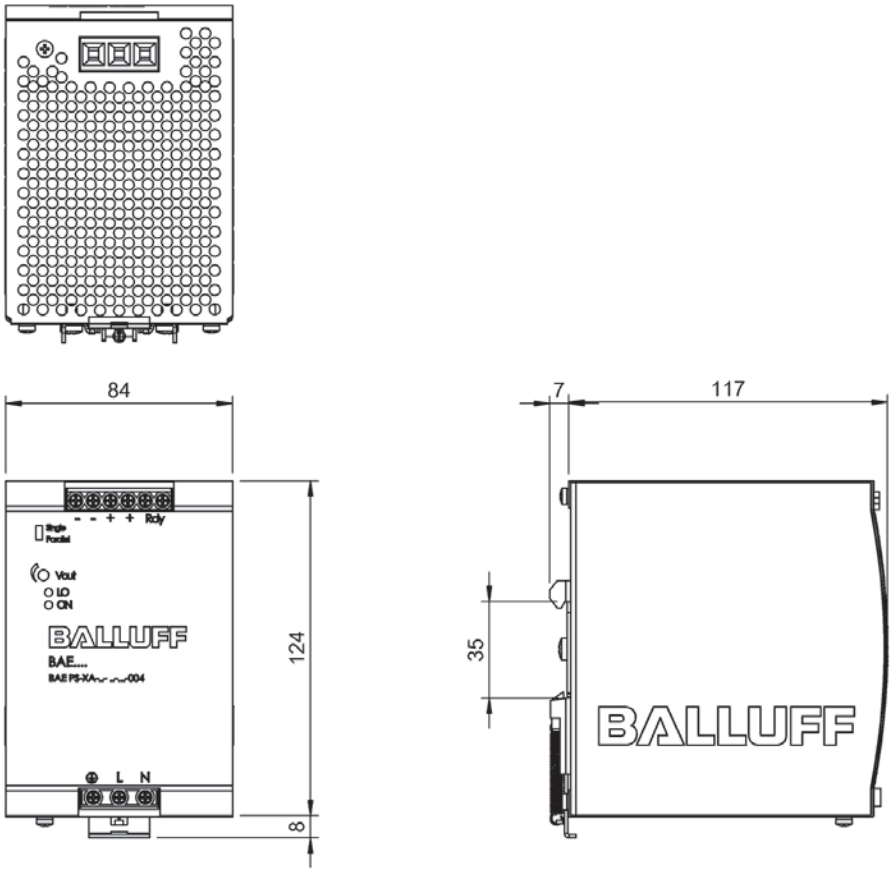

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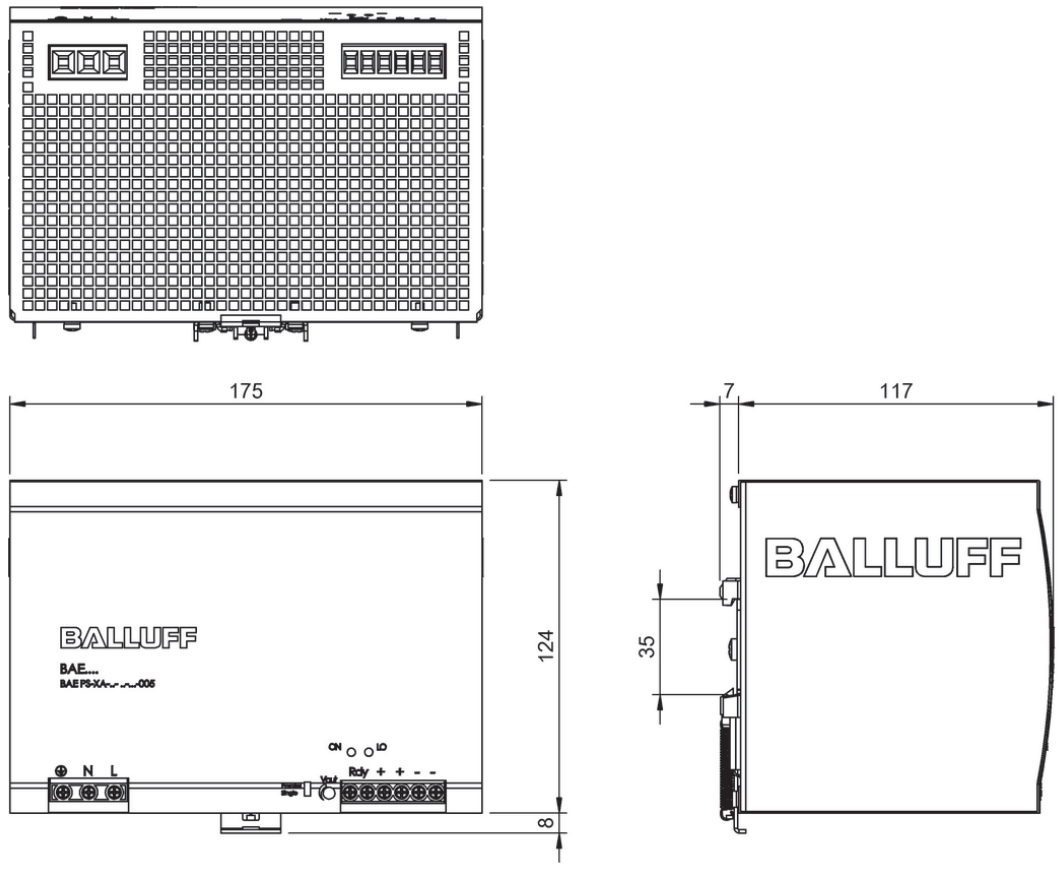

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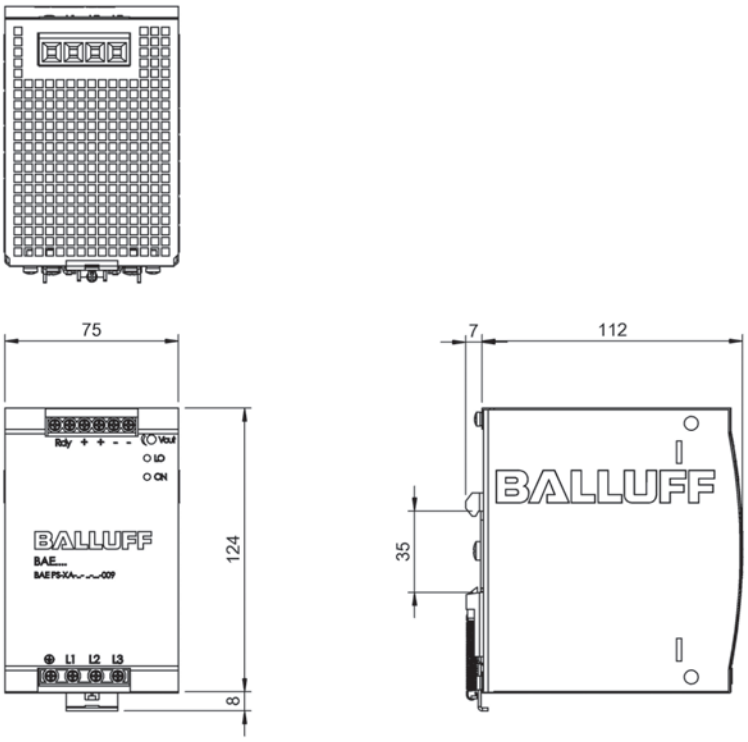

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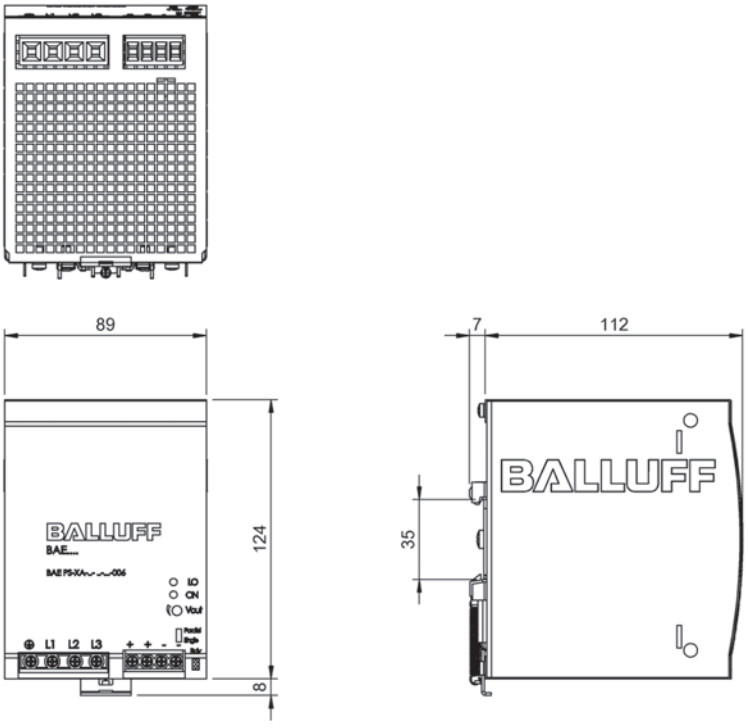

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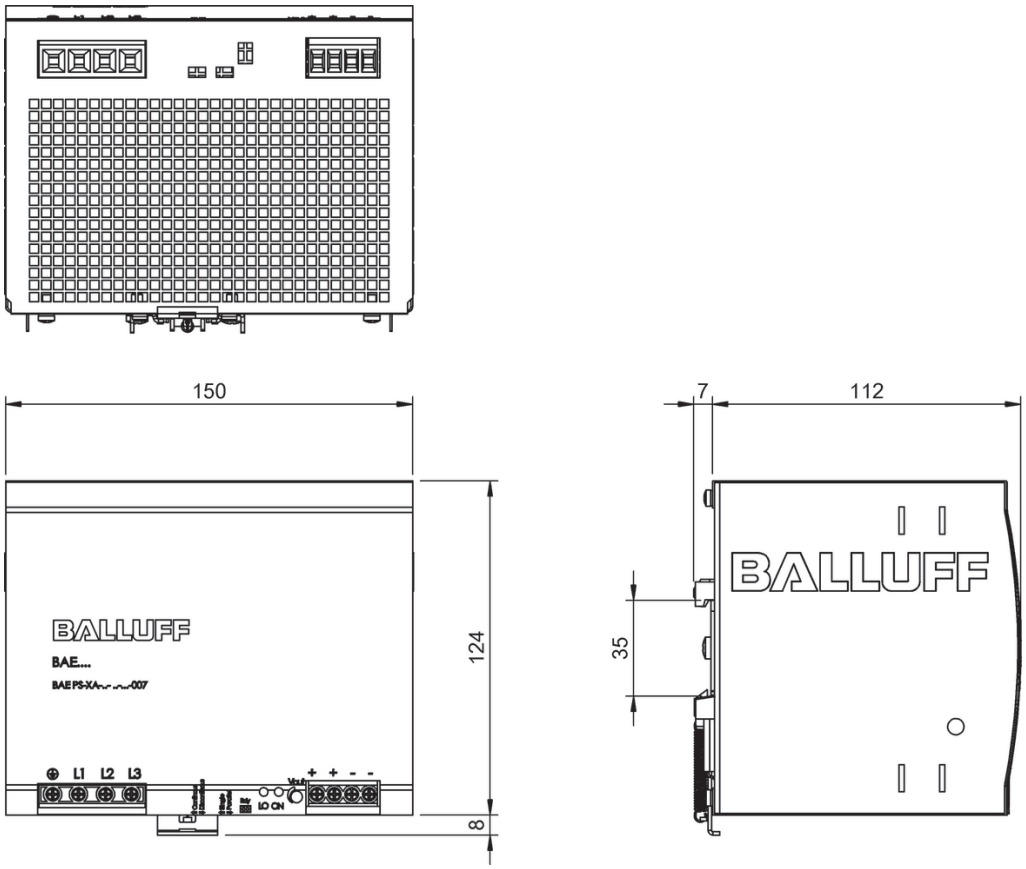

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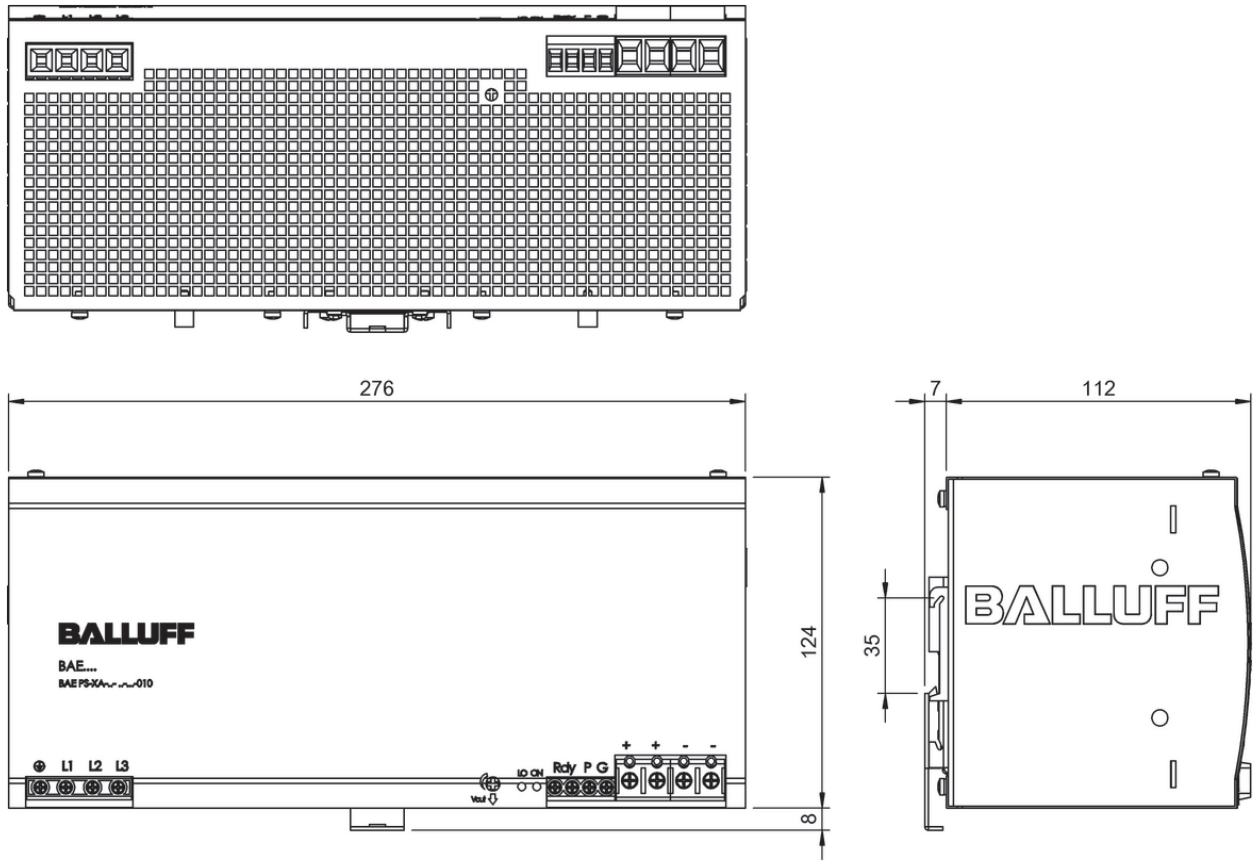
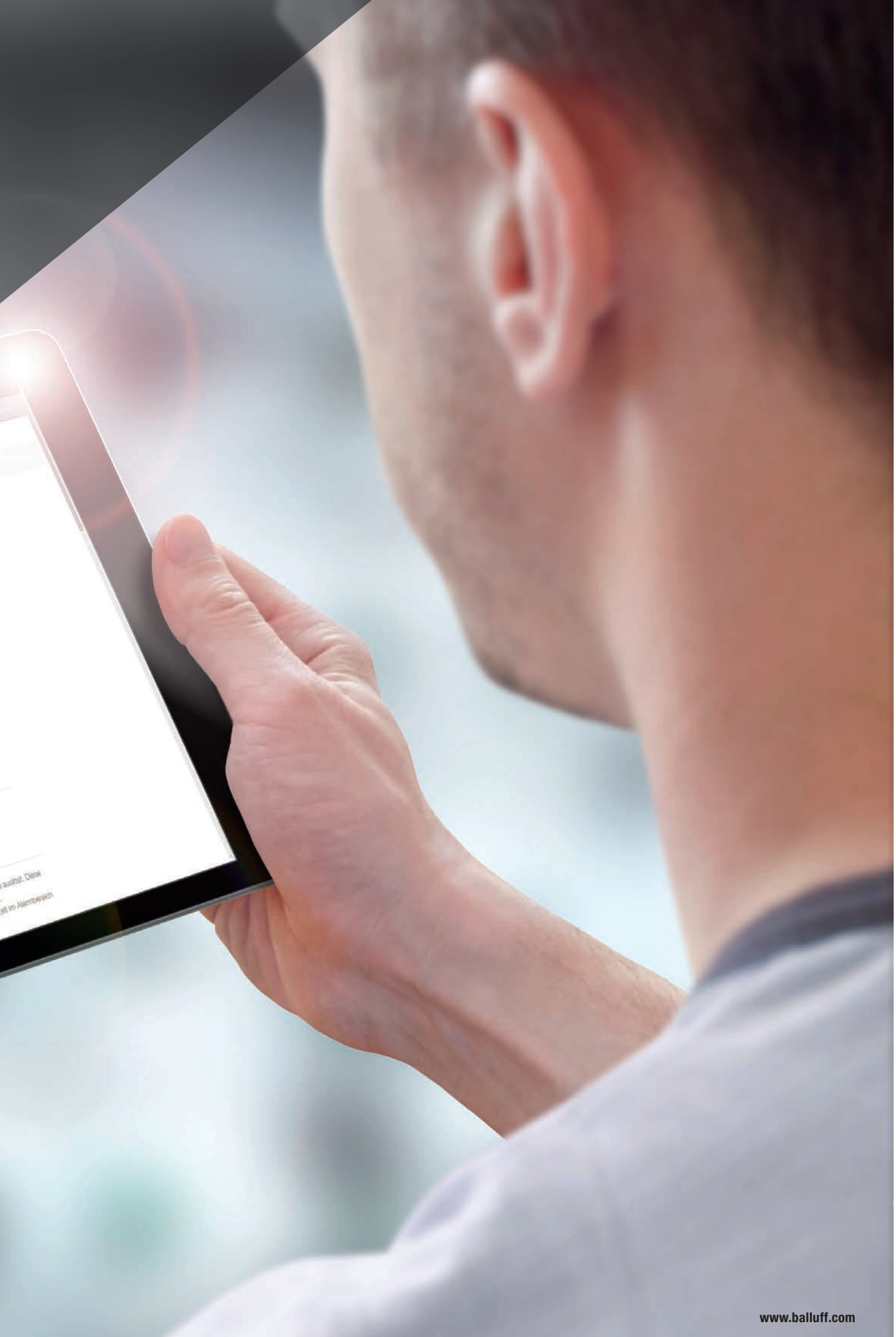


BAE003R

Power Supplies

BASICS AND GLOSSARY



Wear indicator

Lifetime: Irreversible over a long period of time
Lifetime shows the remaining service life of the device, based on the total of all loads.

Load level

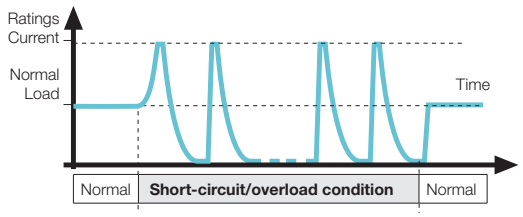
Load level: Short term reversible
Load level indicates the current load on the device.
The display indicates the load without any delay.

Heartbeat

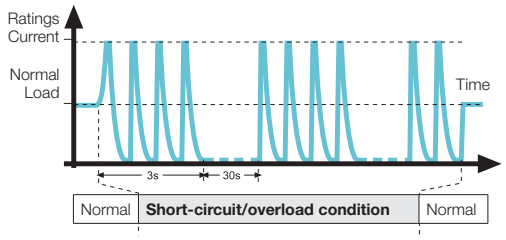
Stress level: Medium term reversible
Stress level indicates the physical and thermal loads.
Changing the load has an effect on device wear.

Short circuit protection (output)

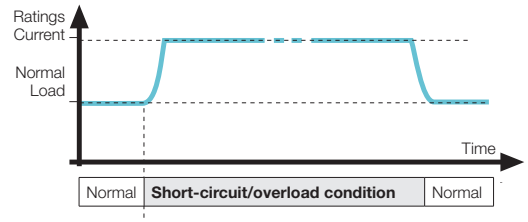
Hiccup mode overload protection*



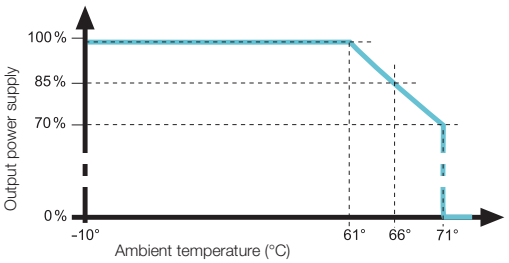
Hiccup mode with turn-off overload protection*



Current limiter and forward characteristic*



Temperature under-load



LED definition

DC ON	DC LO	Possible situation
○ off	○ off	AC power supply off, internal fuse burned out, short circuit
● on	○ off	Normal operation
○ off	● on	Output voltage < 19.2 V
● on	● on	Power supply failure

*Note: Diagrams are for illustration only.
They do not reflect the actual waveforms.

Power supply

Provision of a defined voltage to the electrical consumer.

Overload protection

Protection for a sensor against overloading which occurs when turning on alternating-current devices (contactors/relays).

Alphanumeric Index

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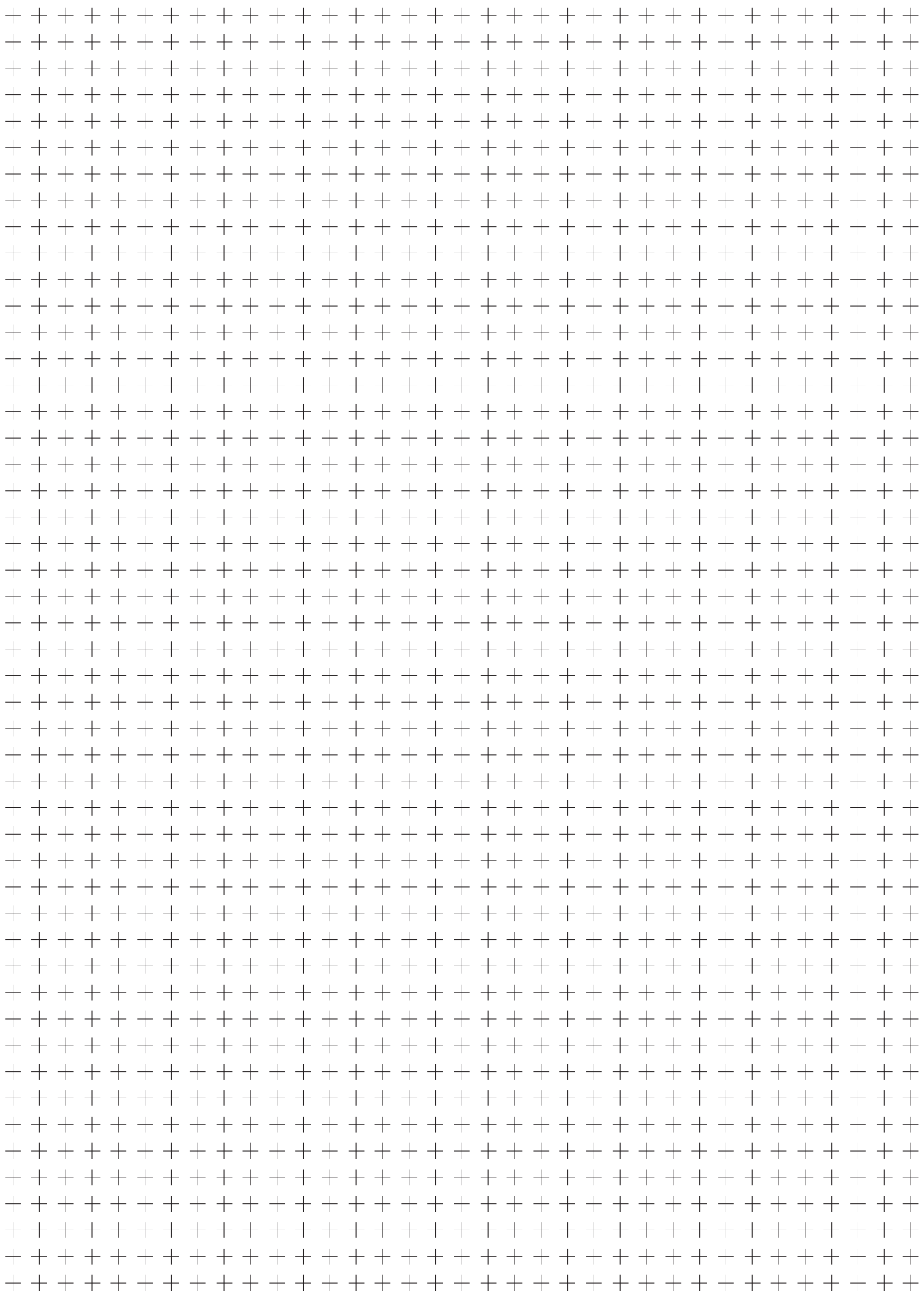

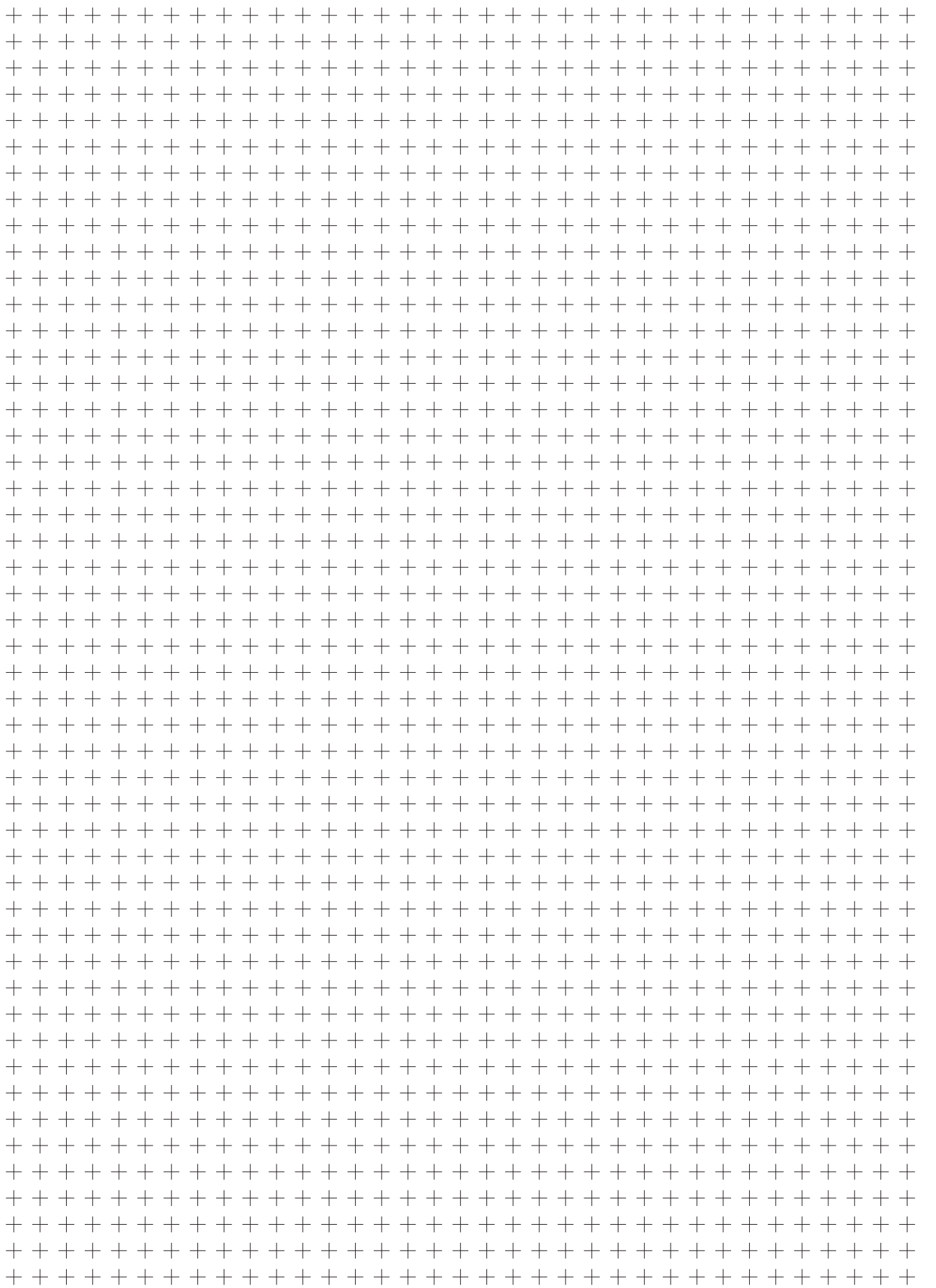

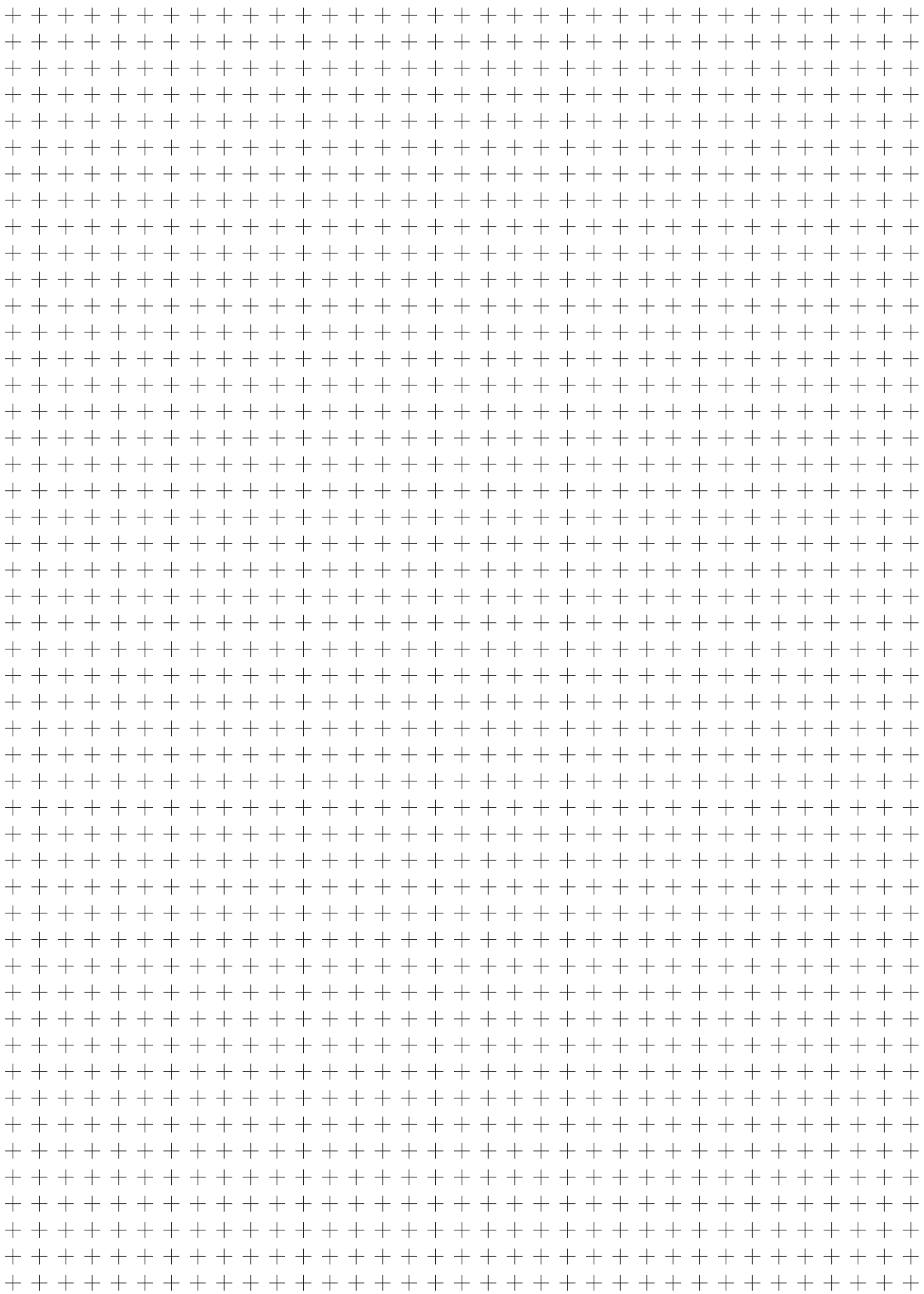

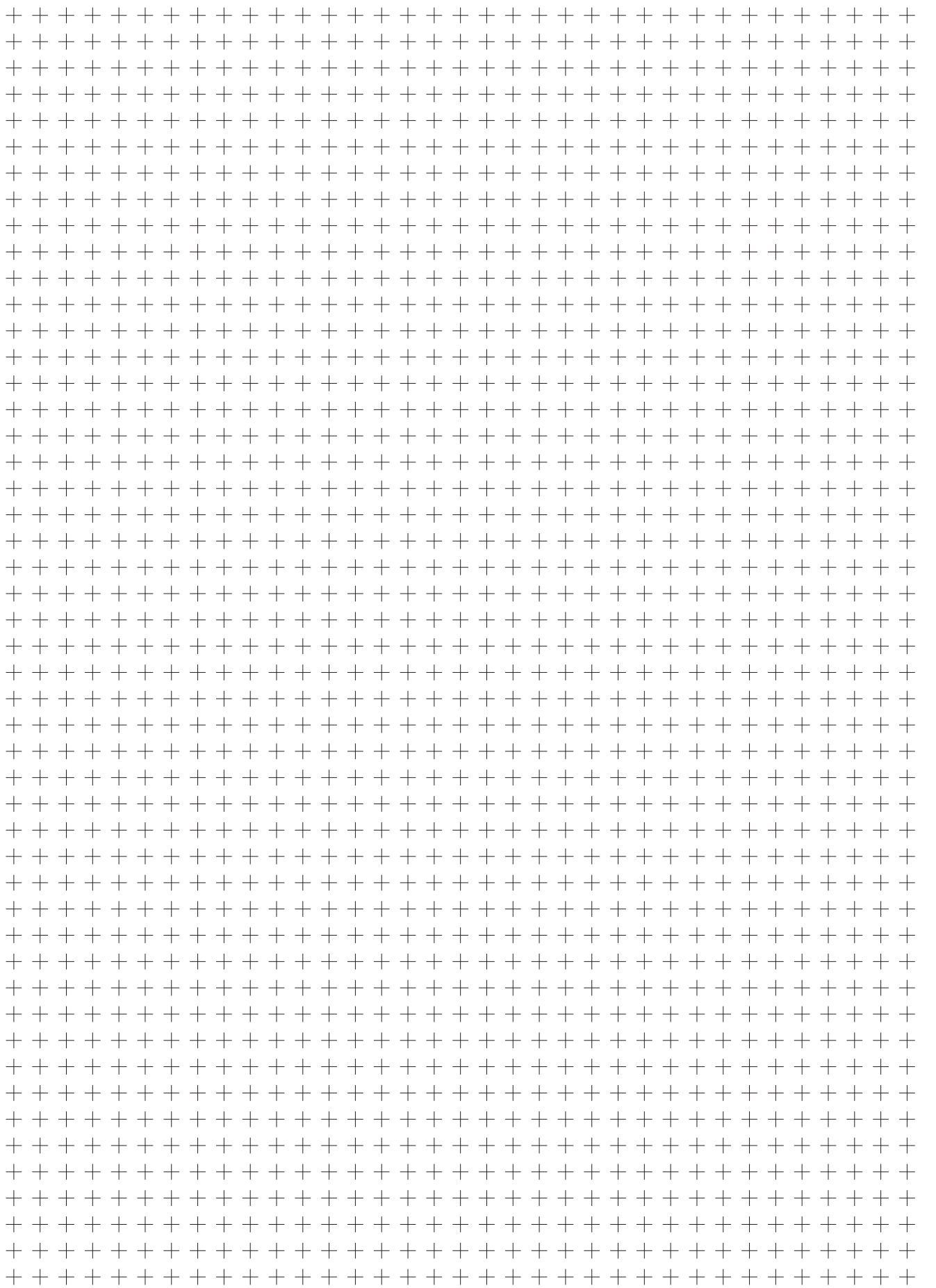

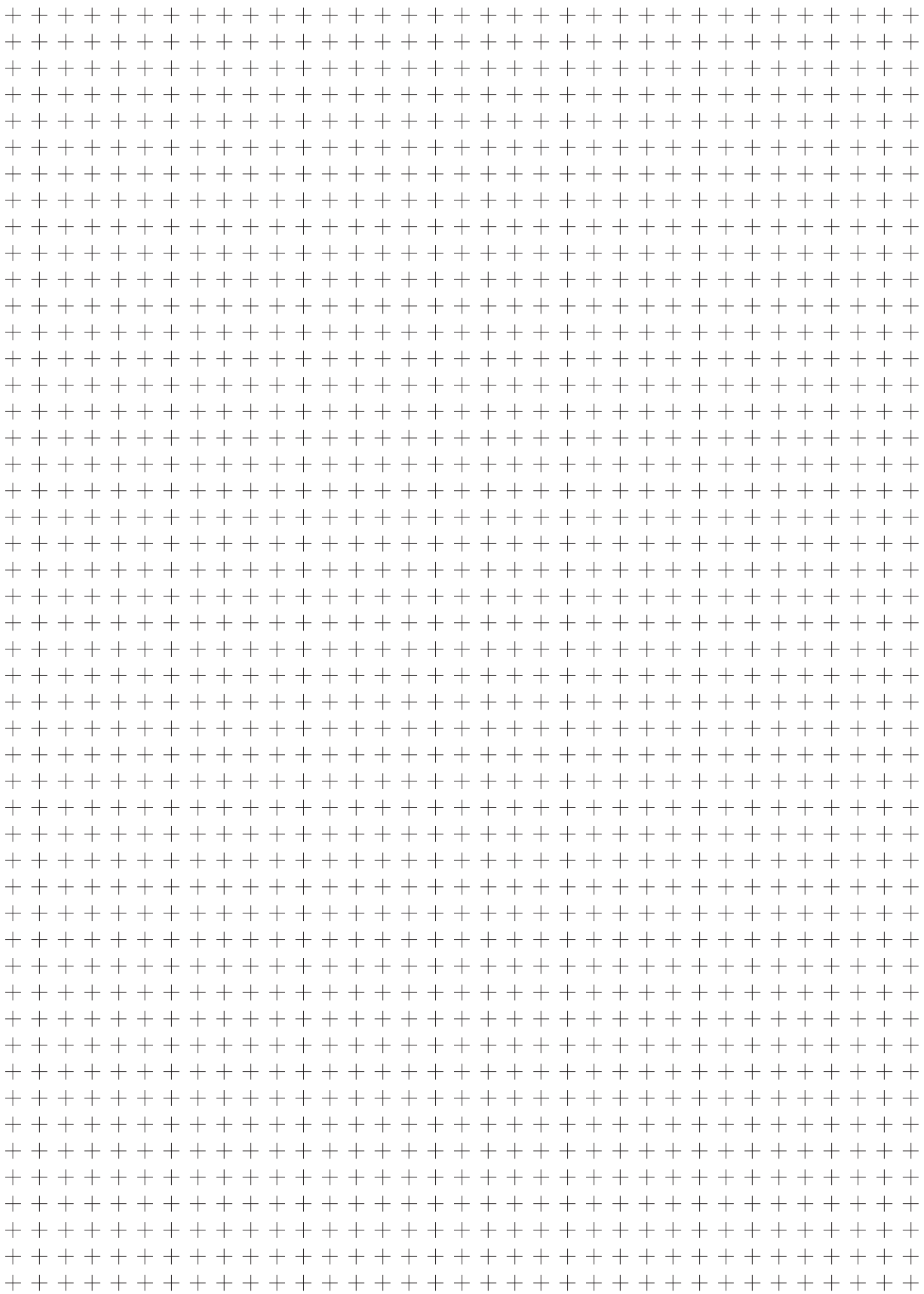

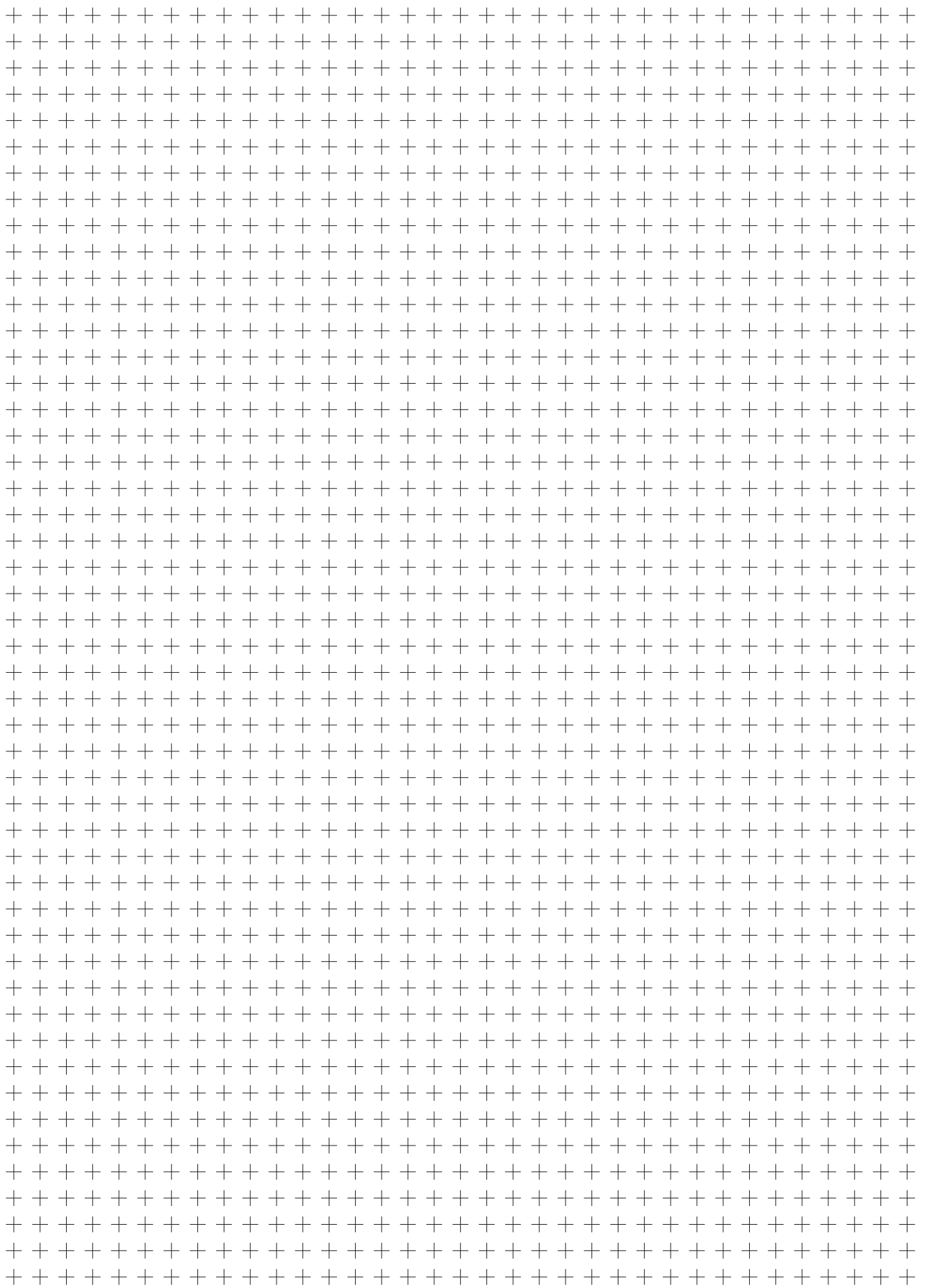

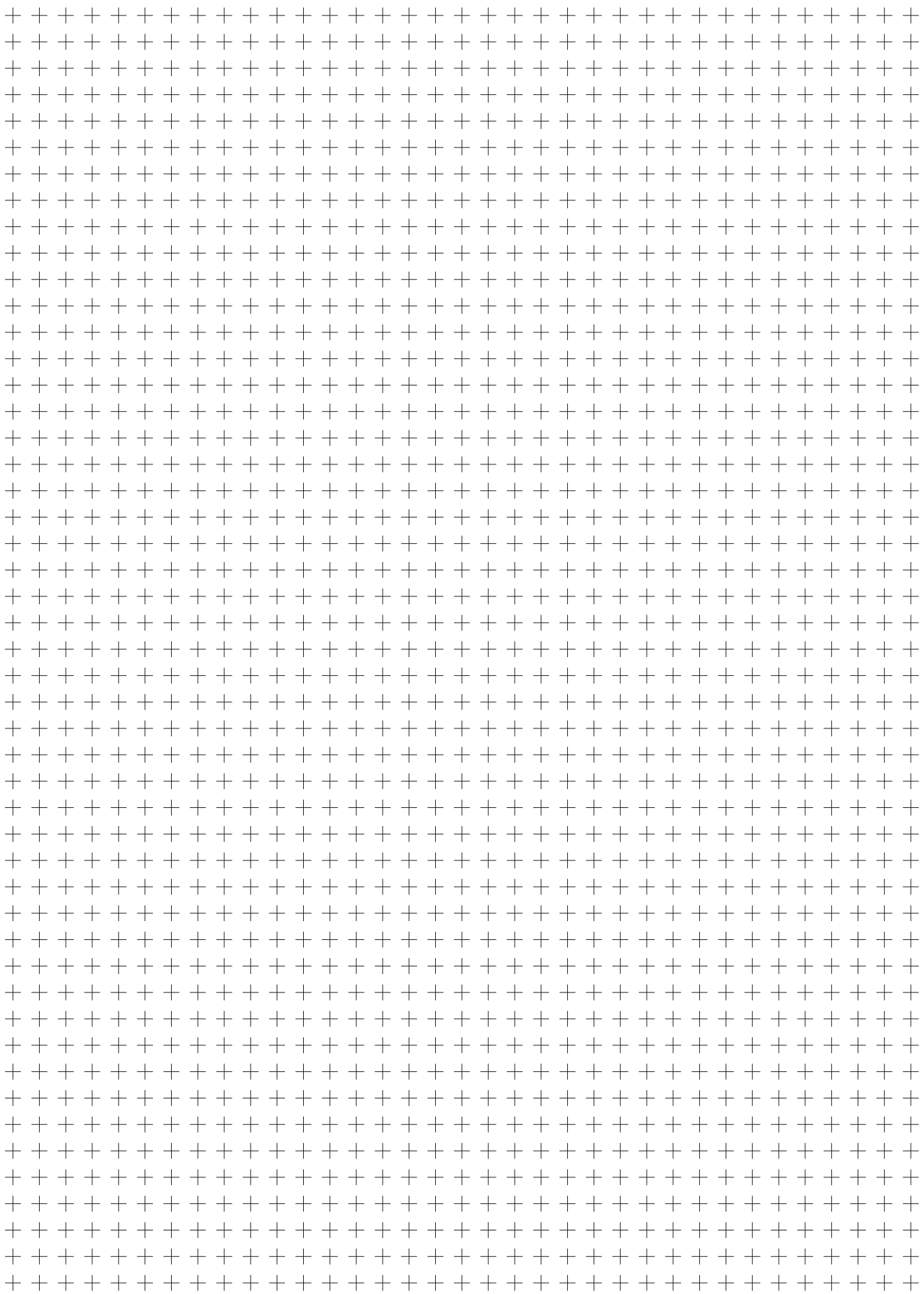

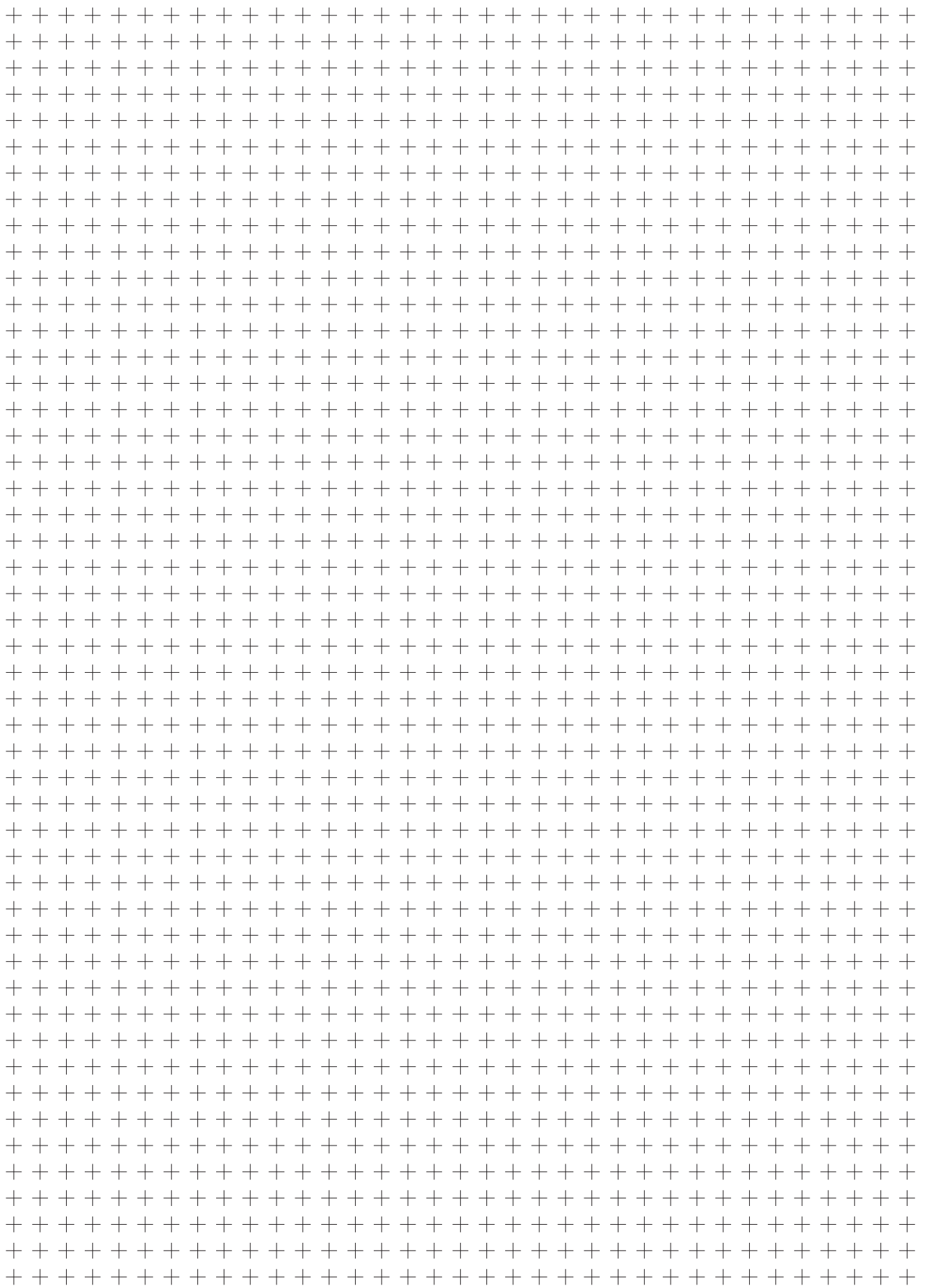

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