

Weld Select Series

Targeted Products and Programs for Welding



Weld Select Series

Weld Select is an industry proven group of Balluff products designed for use in the most inhospitable welding environments.

Poor sensor selection costs welders in every industry increased downtime, unnecessary maintenance, delayed delivery, and lost profits. Now Balluff presents a complete package of welding solutions that extends sensor life and increases productivity in the harshest welding environments.

This guide contains two sections. The front section is designed to help all plant levels identify existing issues and offer Balluff-developed solutions to address them. The second section offers an extensive list of products developed by Balluff welding experts from valuable customer input. These products have been tested in the harshest welding environments and provide significant process and part quality improvement.



Pre-Engineered Automation System: Fanuc ArcMate Robot with Lincoln Electric Welding Package, featuring the Balluff zone limit system.

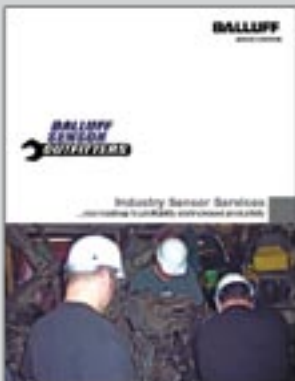
Stop Wasting Sensors *and destroying connectors*

Change the Paradigm *of accepted high volume sensor usage*

Reduce Downtime *due to sensor failure*

Slash Consumption *of sensors and connectors*

Boost Profitability *throughout the plant*



Balluff's Holistic Approach to Weld Cell Process Improvement

- Expert analysis of all problematic sensor "hotspots" on your plant floor
- Timely and tailored recommendations for weld cell process improvements
- Provide your company with a "roadmap" towards significantly reducing unplanned downtime, greatly reducing material consumption, and increasing profitability
- Train and educate people to make premature sensor failures in welding a thing of the past



www.balluff.com/welding

- New Product News
- Welding Application Reports
- Industry Articles
- Sensor Information
- Case Studies

Non-contact inductive proximity sensors must perform a wide variety of clamping and nesting indication, and Poke-Yoke functions in harsh welding environments. Hot weld slag accumulation, elevated ambient temperatures, and strong electromagnetic fields emitted by weld guns can cause false triggering and degrade sensor performance.

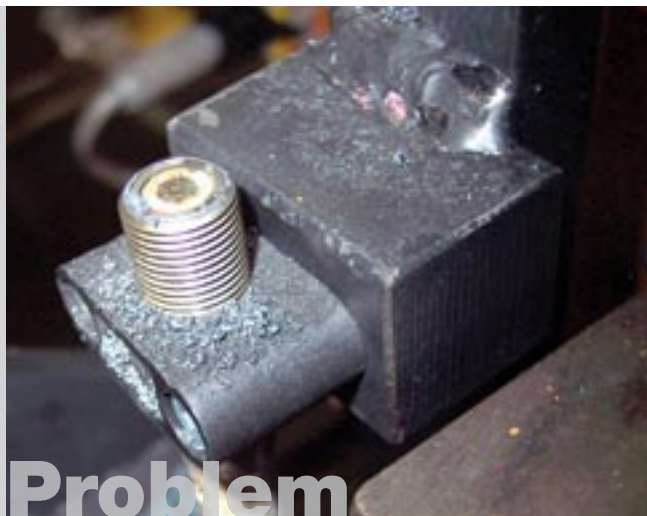


Welding Environment



SlagMaster

**Weld Field Immune
Factor 1**



Problem

Electromagnetic Weld Fields

Strong electromagnetic fields cause conventional sensors to false trigger or “chatter.”

Solution

Balluff inductive proximity and magnetic field sensors with weld field immunity (WFI) resist electromagnetic fields emitted by weld guns up to 100 ka/meter.

See pages 14-17



Problem

Weld Slag

Hot welding slag (a.k.a. weld debris, weld spatter, weld berries) sticks to sensor faces and bodies and causes premature failure to sensors in weld cells.

Solution

Balluff SlagMaster® coating on sensor faces resists weld debris and provides a thermal barrier, significantly enhancing sensor longevity, and reducing false triggering. PTFE coated sensor bodies resist weld debris accumulation and promote slag removal during regular scheduled maintenance periods.

See pages 12-17

Incidental sensor damage caused by incorrect parts loading either by human or robotic action can significantly degrade sensor performance, shorten sensor life, or even destroy a sensor. Balluff SteelFace® inductive proximity sensors can withstand multiple heavy impacts and abrasion, and often have the sensing range to be placed out of harm's way.



Loading Impact



Problem

Damage from Loading Impact

Severe loading impact and continuous operational impact damages plastic and/or PTFE sensor faces as well as sensor bodies.



Problem

Sensor Faces Damaged by Impact

Tubular sensors fail a majority of the time from damage to the sensor face caused by slag and impact. Over time, the smallest amounts of damage to the face can cause sensor failure.

Solution

Every precaution should be taken to prevent electronics such as sensors from being hit, but in many cases, loading impact cannot always be avoided. By encapsulating a Balluff SteelFace® inductive proximity sensor into a rugged Prox Mount or Bunker Block™, the likelihood of premature failure becomes lessened, even with repeated impact over time.

See pages 18-19, 24-25

Solution

Balluff SteelFace® inductive proximity sensors with extended range and solid stainless steel faces and enclosures, resist impact, providing long life in weld cell impact zones. Balluff Bunker Blocks™ and Prox Mounts provide sensors an extraordinary degree of physical protection, preventing contact damage to the sensor body and face as well as rapid sensor removal and replacement without need for recalibration.

See pages 18-19, 24-25

Parts welded in a robotic weld cell must be nested and held in place by pneumatically or hydraulically actuated clamps which are often equipped with sensors located in the clamp jaws to indicate “clamped” or “unclamped” position. Clamp position can also be determined by magnetic field sensors located on the outer wall of an aluminum or composite pneumatic cylinder. To determine clamping position, a Balluff BMF magnetoresistive sensor tracks the magnetic field emitted by a magnet attached to the cylinder’s piston. In high-pressure hydraulic cylinders, Balluff StrokeMaster® end-of-stroke sensors detect the “spud” or cushion of a piston shaft to sense clamp position.



Cylinder & Clamp Position



**BMF
Gripper Sensors**



Cylinders & Clamps Need Stroke Detection

High-pressure hydraulic welding clamps need the right sensors to accurately sense piston extend/retract position and may require electronic weld field immune sensors.

Solution

Balluff StrokeMaster® high pressure rated end-of-stroke sensors accommodate pressures up to 3,000 PSI and fit virtually all common cylinder brands and bore sizes. StrokeMaster heads swivel to direct connector wiring away from weld hostility.

See pages 20-21



Premature Reed Switch Failure

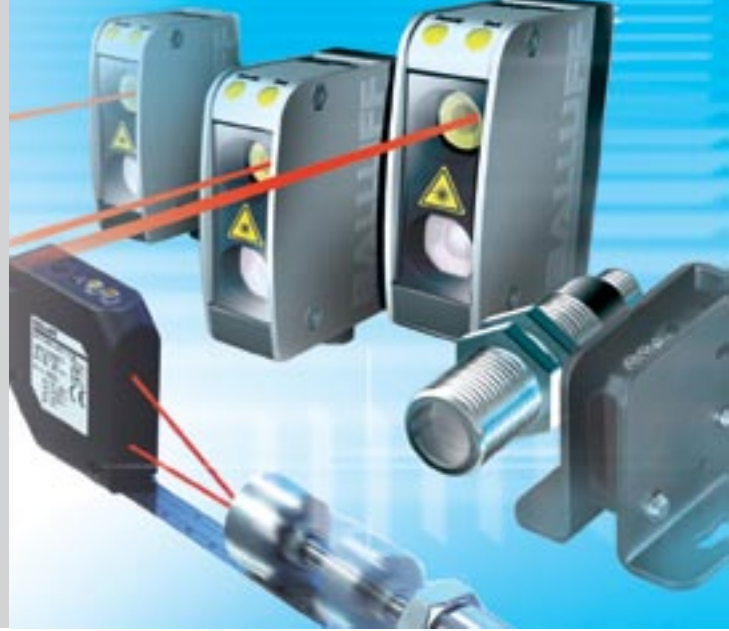
When installed on pneumatic clamping cylinders, contamination-prone reed switches and drift-prone Hall Effect sensors deteriorate, often providing inaccurate switch points before failing completely.

Solution

Balluff BMF magnetoresistive sensors come with a lifetime warranty and fit virtually all cylinder housing styles and brands. They provide precise switch points and withstand the rigors of the weld process.

See pages 20-21

Photoelectric and fiber optic sensors require special protection and mounting expertise when integrated into welding cells. Balluff has a wide range of photoelectrics with application-specific infrared, red, or laser capability that can reliably sense through smoke, oil and dirt. In addition, Balluff provides a range of accessories that protect photo-electric optics from heat, slag, and lens occlusion in the hostile weld cell environment.



Photoelectric Sensors



Lasers
Bunker Block™
Tubular Metal Body
SHARPSHOOTER™



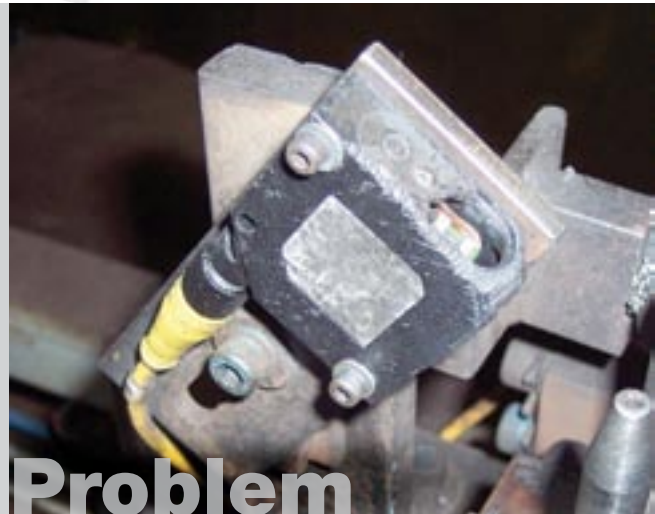
Fiber Optic Limitations

Fiber optics can become occluded in the weld cell and stop functioning. They can become broken when weld fixtures are removed, causing fibers to vibrate loose. Cables with excess length break when tied back and get damaged by slag.

Solution

Typically, fiber optic solutions are not the best choice in weld cells. Metal body laser sensors or inductive proximity sensors are almost always a better choice.

See pages 22-23



Damage by Loading Impact

Impact-prone photoelectric sensors can easily become physically damaged in welding environments.

Solution

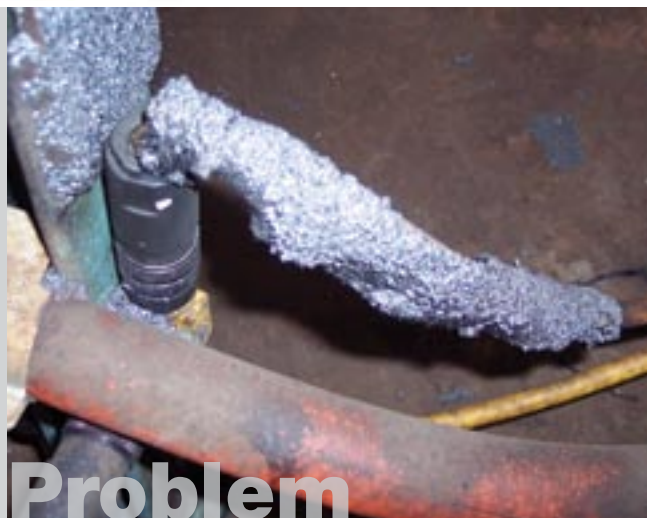
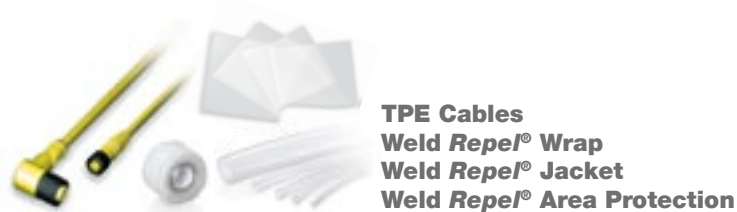
The advantages of mounting tubular inductive proximity sensors in Balluff Bunker Blocks™ and Prox Mounts hold true for tubular-style photoelectric sensors. They provide a thermal barrier, protect against weld slag and impact, and provide rapid sensor change out. Bunker Blocks™, available in several sizes and styles, protect block style photoelectric sensors in the weld environment.

See pages 22-23

Weld cells demand the toughest connectivity solutions. Hot debris, cable flex, and high ambient heat can damage peripheral devices. PVC jacketed sensor connectors, fine for clean and dry applications, are generally unsuitable for welding environments. Today, PUR (polyurethane) connector jacketing is being replaced with superior high-flex, chemical resistant TPE (thermoplastic elastomer) jacket materials that can better withstand well cell punishment. Now, TPE connectivity components teamed with Balluff Weld Repel® products can result in reduced weld cell material costs and downtime plus increased system longevity and overall profitability.



Protecting Connectivity



Sensor Cable Burn-Through

Weld slag burns through and destroys conventional cabling. It's weight often pulls the cable away from the connector, exposing it to even more damage.

Solution

Balluff TPE cables provide the utmost in flex characteristics. In conjunction with Balluff Weld Repel® silicone jacketing, typical problems with connector burn through disappear. When self-bonding Weld Repel wrap is used to attach Weld Repel silicone jacketing to the sensor connector, all gaps allowing debris are eliminated - and it's transparent for viewing LEDs. Use area protection sheets to protect large areas from debris.

See pages 24-25



Plastic Multiport Interface Blocks

Sensor connections often terminate into plastic multiport interface blocks (MIB's) which can be easily damaged in welding cells.

Solution

Balluff metal MIB's offer a much greater degree of strength and durability on robust applications like robotic or automated welding cells. All DeviceNet blocks provide strength in the harshest environments. They also have the brightest LEDs in the industry for easier viewing and troubleshooting.

See page 27

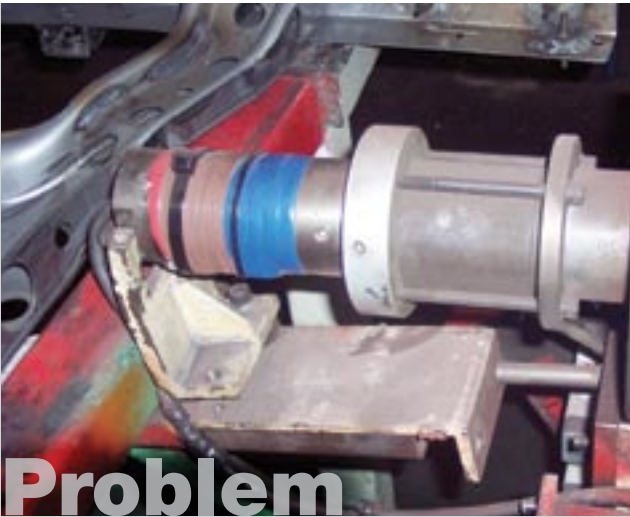
Interchangeable weld fixtures and rotating weld tables often require the use of troublesome, expensive, and high maintenance contact-based rotating assemblies such as slip rings or commutator ring and brush solutions. In many cases wires inevitably fray and break. In contrast, Balluff's unique Power Remote system provides non-contact, wear free wireless connectivity, powering sensors and sending and receiving control information across an air gap. Different systems are available to transmit different levels of power and up to 64 sensors and up to 2 amps.



Wireless Connectivity



Power Remotes
Hi-Power Power Remotes

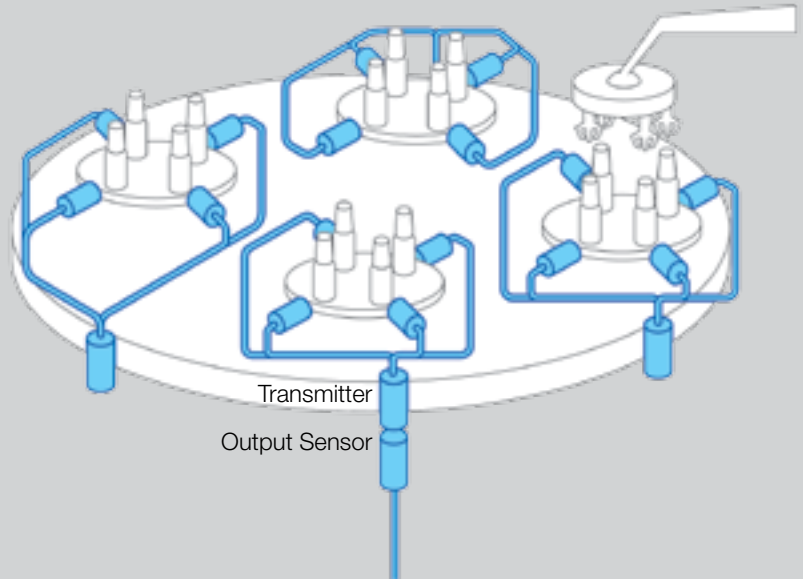


Broken or Worn Out Commutator Rings

Rotational weld cells, or cells that use interchangeable fixtures, often incur high maintenance and frequent stoppages due to damaged slip rings, tangled, over-flexed, or twisted wiring.

Solution

Remote sensor systems provide wireless connectivity allowing communication between two or more separated weld cell components through an air gap to energize and communicate between clamping and nesting sensors. Because there is no hard wiring connection, weld fixtures can be inserted into a weld cell frame without the need for mechanical sensor connections, facilitating rapid change out, and improved operator safety.



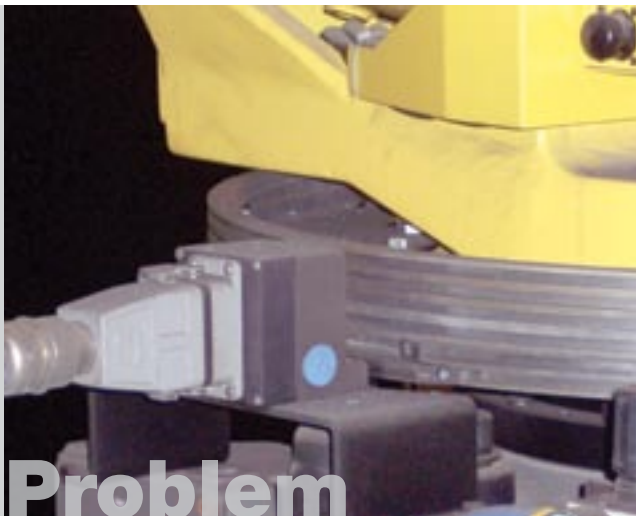
For more information, visit:
www.balluff.com/remotes

Save time, money, and effort with robot zone limit kits from Balluff. Whether you need 1, 2, or 3-axis rotary, or linear top loaders and RTUs, Balluff's pre-engineered, fully functional kits are the fastest solution. Our kits are ready to install on popular robot models manufactured by Fanuc, Motoman, and Nachi, and are ready to interface with your safety monitoring circuitry for an easy DLD light curtain muting solution. Mechanical limit switch and inductive non-contact versions are available for both new robotic builds and as a retrofit upgrade for existing robots.



Pre-Engineered Automation System: Fanuc ArcMate Robot with Lincoln Electric Welding Package, featuring the Balluff zone limit system.

Robot Zone Limit Systems

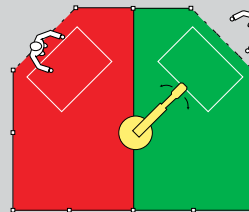


Increased Safety within Robotic Weld Cells

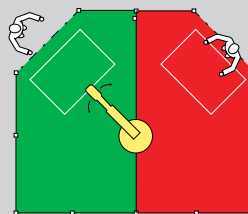
Operators working in robot welding installations need to be continuously protected from the equipment during loading and unloading sequences.

Solution

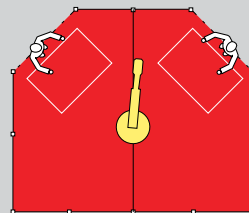
Balluff robot zone limit safety systems are rated for multi-axis movement. They can be set up to work with or without a light curtain, and provide freedom of movement within designated zones. This prevents the robot from entering the zone or stopping the robot if the operator enters the robot's zone of operation.



In Figure 1, the robot is free to work only in the right hand zone because the operator is standing outside of that zone. The robot is prevented from operating in the left zone because the operator on the left is working in that zone.



In Figure 2, the operator on the right has entered the zone, while the operator on the left has withdrawn. Now the robot is free to operate solely in the left hand zone and can not enter the right hand zone.



In Figure 3, both operators are working in their zones, automatically immobilizing the robot.

www.balluff.com

For more information, visit:

www.balluff.com/robotzonelimit

Achieve Maximum Performance in Your Welding Process with Balluff Industry Sensor Services

Balluff Industry Sensor Services can go a long way in analysis of your own weld cell productivity, where dramatic decreases in unplanned machine down time can be realized with short ROI payback time intervals. All of this is accomplished through audit training first, then through physical upgrade of your weld cell sensor systems. You say you're understaffed to do the job right? Balluff Outfitters can upgrade your sensor system point by point to ensure long sensor performance and increase productivity and profitability.

Weld Cell Audit Service

- Expert analysis of all problematic sensor "hotspots" on your plant floor
- Timely and tailored recommendations for weld cell process improvements
- Provide your company with a "roadmap" towards significantly reducing unplanned downtime, greatly reducing material consumption, and increasing profitability



Weld Cell Training Services

- Integrate the welding industry's Best Practices
- Proactively maintain nesting, clamping, and error proofing sensing devices in the weld cell
- Bunker and protect all sensing system components to ensure the longest possible life of these systems

Balluff Sensor Outfitters

- Does understaffing prevent your company from upgrading your welding cells?
- Team of "hands on" experts come and install the industry's Best Practices sensor system (sensors, heavy duty bunkers, connectivity, protective jacketing)
- Get your weld cells running with dramatically reduced unplanned machine down time

Examples of common weld cell problems that we've solved:

Unprotected and non-bunkered sensors, sensors in damage-prone areas, and/or lightweight brackets.



Damage to unprotected sensor faces and cables caused by impact and contact.



Slag accumulation and unprotected pigtail sensors cause large amounts of downtime.



Bunker Blocks™ and SlagMaster® coating allow full protection against harsh impact.



Weld Repel® Wrap, clear silicone jacketing, and TPE cables provide flexibility and resistance to weld slag, lubricants, and connector burn-through.



PTFE coated Prox-Mounts and Weld Repel® covered sacrificial cables improve sensor life and productivity.

SlagMaster®

SlagMaster® coating significantly prolongs sensor life by providing a thermal barrier to protect against heat, retarding build up of weld slag spatter and spray, and easing removal of surrounding deposits of weld debris during scheduled maintenance periods.

The parts listed below are non-weld field immune sensors and do not offer PTFE coating. For PTFE coated weld field immune sensors, see pages 14-17.

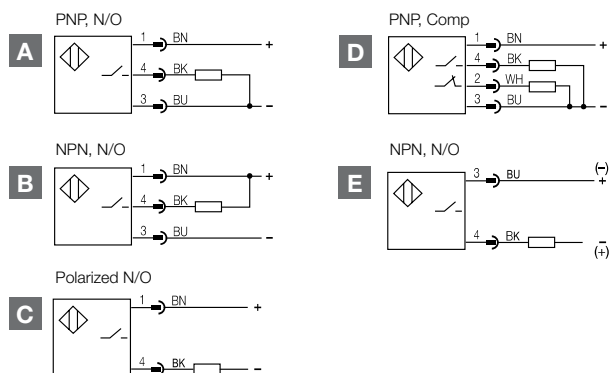
For the most up to date parts list, visit: www.balluff.com/slagmaster.

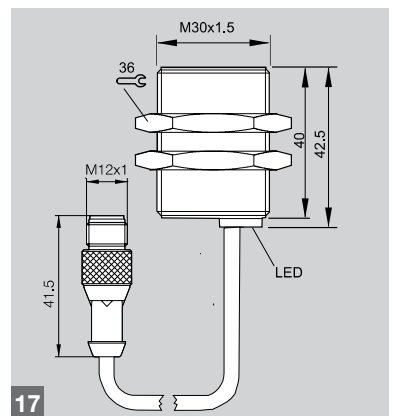
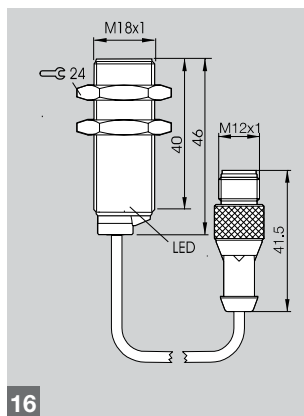
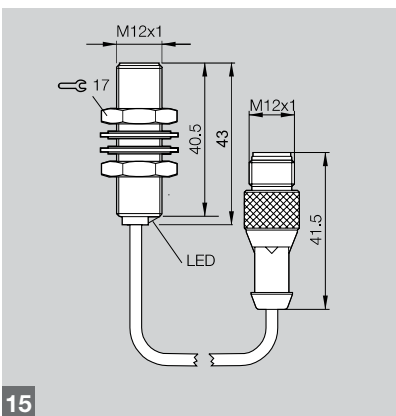
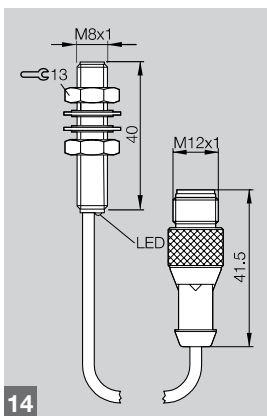
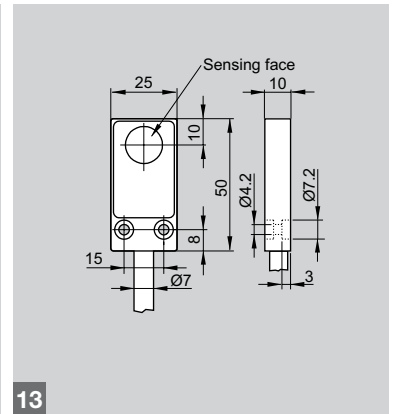
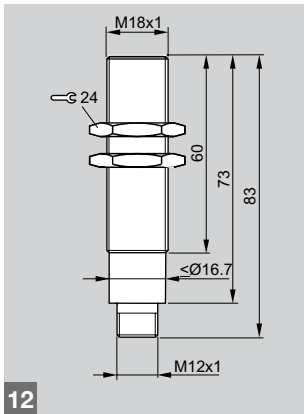
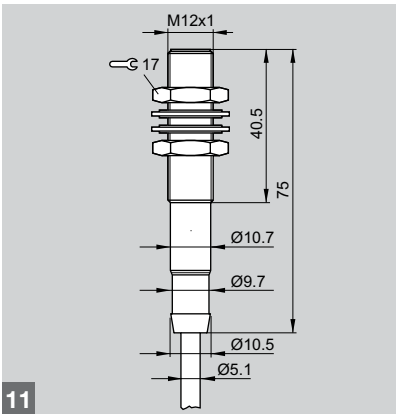
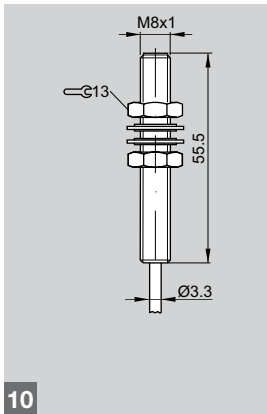
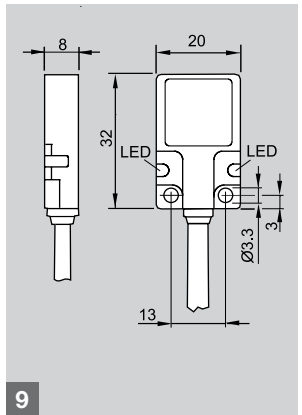
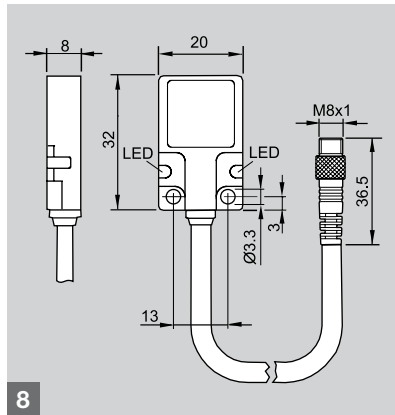
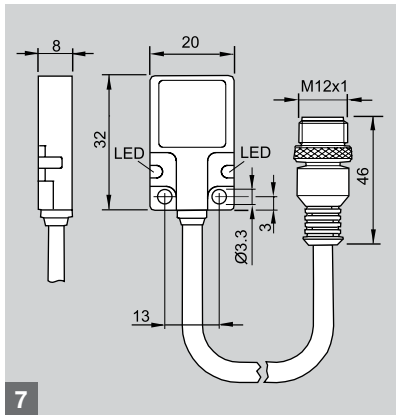
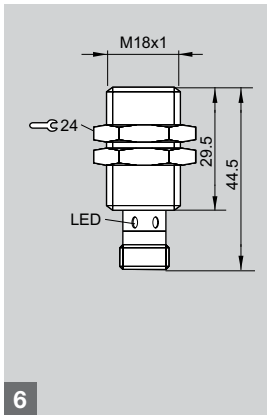
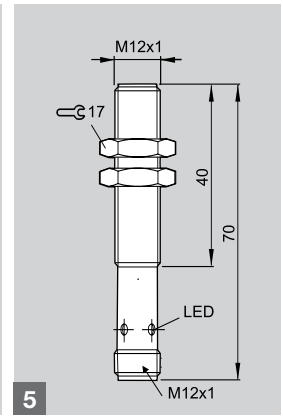
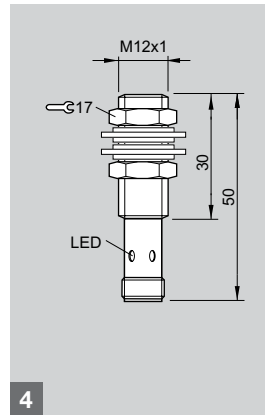
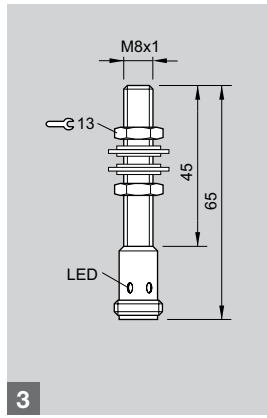
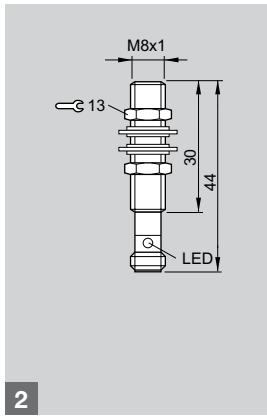
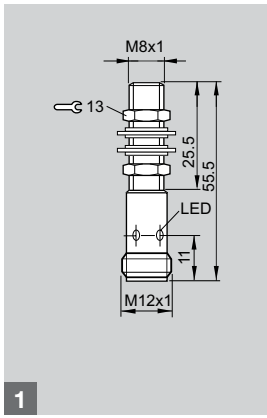


Balluff Part Number	Housing Diameter	Sensing Distance (mm)	Mounting	Output Logic	Housing Material	Drawing	Wiring Diagram
10...30VDC, Non-Weld Field Immune							
BES 516-324-SA96-G-E5-C-S 4	M8	2	F	PNP, N/O	Nickel plated brass	1	A
BES 516-324-SA96-G-E5-C-S49	M8	2	F	PNP, N/O	Nickel plated brass	2	A
BES 516-343-SA96-G-E5-C-S49	M8	2	F	NPN, N/O	Nickel plated brass	2	B
BES M08MH1-NSC20B-S04G-101	M8	2	F	NPN, N/O	Nickel plated brass	3	B
BES 516-325-SA96-G-E5-Y-S 4	M12	4	F	PNP, N/O	Nickel plated brass	4	A
BES 516-325-SA96-G-S4-C	M12	4	F	PNP, N/O	Nickel plated brass	4	A
BES 516-329-SA96-G-E5-Y-S 4	M12	4	F	NPN, N/O	Nickel plated brass	5	B
BES 516-326-SA96-G-E5-Y-S 4	M18	8	F	PNP, N/O	Nickel plated brass	6	A
BES 516-355-SA96-G-E5-Y-S 4	M18	8	F	NPN, N/O	Nickel plated brass	6	B
BES R01ZC-PSC70B-BX00.2-GS04-101	20x32	7	F	PNP, N/O	GD-Zn	7	A
BES R01ZC-PSC70B-BX00.2-GS49-101	20x32	7	F	PNP, N/O	GD-Zn	8	A
BES R01ZC-PSC70B-BX05-101	20x32	7	F	PNP, N/O	GD-Zn	9	A
High Temperature 120°C, Non-Weld Field Immune							
BES 516-324-SA55-03	M8	2	F	PNP, N/O	Stainless steel	10	A
BES 516-325-SA68-03	M12	2	F	PNP, N/O	Nickel plated brass	11	A
BES 516-105-SA9-S4	M18	5	F	PNP/Comp	Nickel plated brass	12	D
BES 516-347-SA13-03	25x50x10	5	F	PNP, N/O	GOAlSi12	13	A
2-Wire DC, 10...30VDC, Polarized, Normally Open, Non-Weld Field Immune							
BES M08MG-GSC20B-BP00.3-GS04-101	M8	2	F	2-wire	Nickel plated brass	14	C
BES M12MG-GSC30B-BP00.3-GS04-101	M12	3	F	2-wire	Nickel plated brass	15	C
BES M18MG-GSC70B-BP00.3-GS04-101	M18	7	F	2-wire	Nickel plated brass	16	C
BES M30MF-GSC15B-BP00.3-GS04-101	M30	15	F	2-wire	Nickel plated brass	17	C
BES R01ZC-USC50B-BP00.2-G-S04-101	20x23	5	F	2-wire	GD-Zn	7	E

F = Flush, NF = Non-flush, QF = Quasi-flush

Pigtail sensors available with preinstalled Weld Repel® tubing. Contact factory for availability.



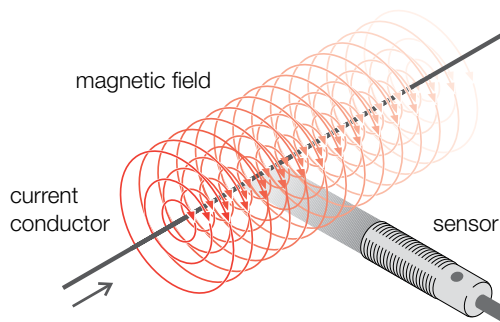


Weld Field Immune

Magnetic field immune (weld-immune) inductive sensors are used for work-piece positioning in welding areas where strong magnetic fields influence ordinary sensors' oscillator/coil systems. This leads to false switching when no target is present.

Balluff magnetic field immune inductive sensors can be mounted in the direct vicinity of welding tongs or electrodes, since welding currents of up to 25 kA do not affect the switching function of the sensor.

These parts are available with SlagMaster® coating.



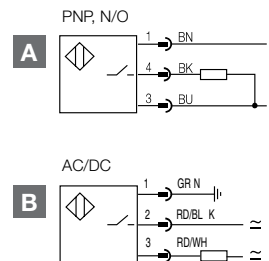
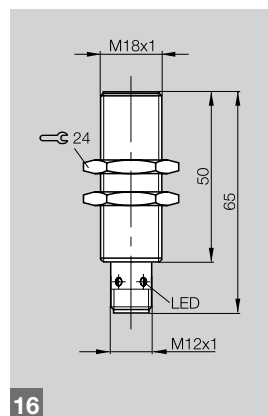
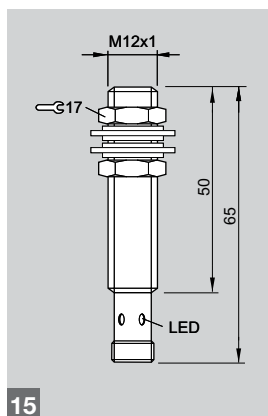
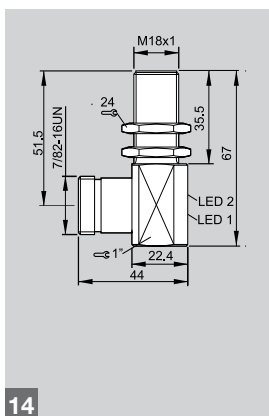
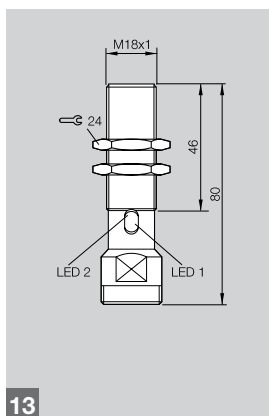
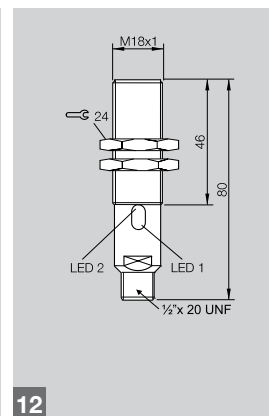
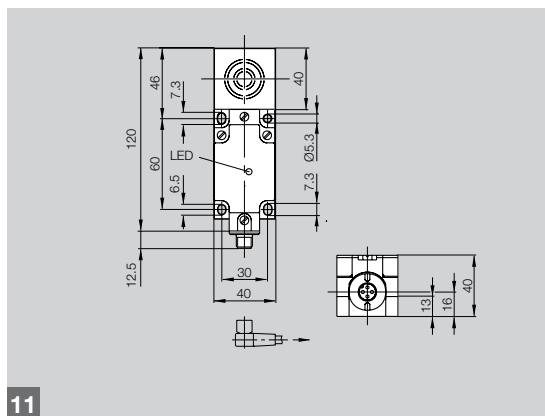
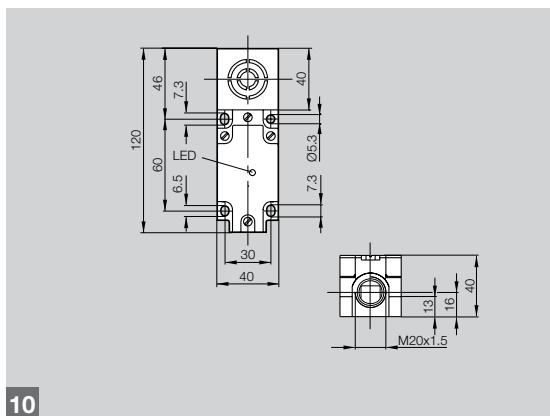
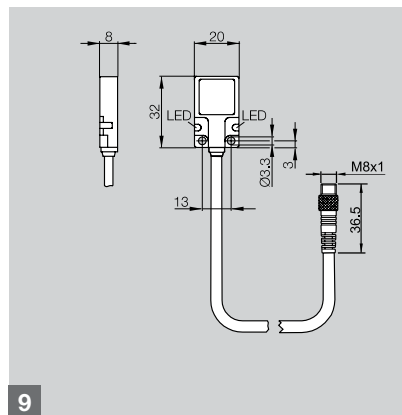
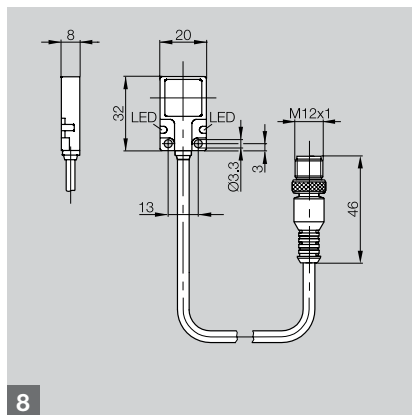
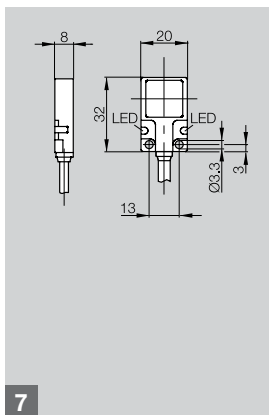
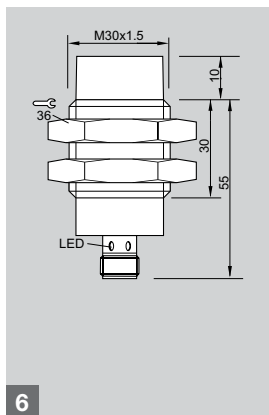
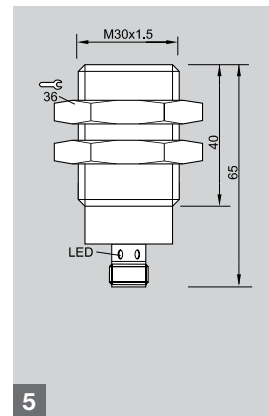
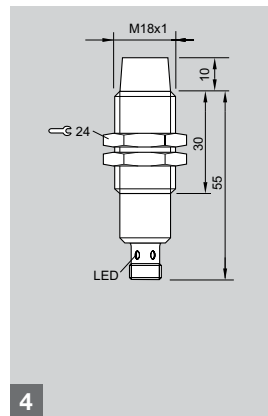
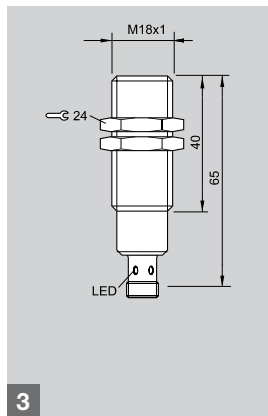
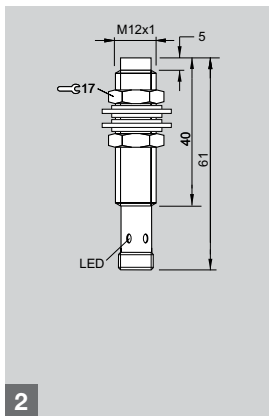
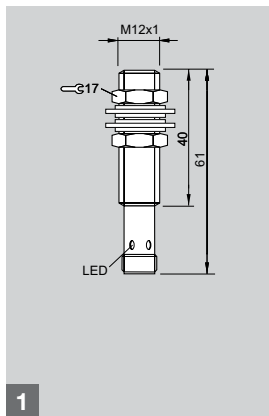
Balluff Part Number	Housing Diameter	Sensing Distance (mm)	Mounting	Housing Material	SlagMaster® Coated Face	Drawing	Wiring Diagram
10...30 Vdc, PNP, Normally Open							
BES 516-325-S4-W	M12	2	F	PTFE Coated Brass		1	A
BES 516-325-SA96-S4-W	M12	2	F	PTFE Coated Brass	■	1	A
BES 516-356-S4-W	M12	4	NF	PTFE Coated Brass		2	A
BES 516-326-S4-W	M18	5	F	PTFE Coated Brass		3	A
BES 516-326-SA96-S4-W	M18	5	F	PTFE Coated Brass	■	3	A
BES 516-360-S4-W	M18	8	NF	PTFE Coated Brass		4	A
BES 516-327-S4-W	M30	10	F	PTFE Coated Brass		5	A
BES 516-327-SA96-S4-W	M30	10	F	PTFE Coated Brass	■	5	A
BES 516-362-S4-W	M30	15	NF	PTFE Coated Brass		6	A
BES R01ZC-PSC50B-BX03-V	20x32	5	F	GD-Zn		7	A
BES R01ZC-PSC50B-BX05-W01	20x32	5	F	GD-Zn	■	7	A
BES R01ZC-PSC50B-BX____-GS04-V*	20x32	5	F	GD-Zn		8	A
BES R01ZC-PSC50B-BX00.2-GS04-W01	20x32	5	F	GD-Zn	■	8	A
BES R01ZC-PSC50B-BX00.2-GS04-W11	20x32	5	F	GD-Zn w/Al backplate	■	8	A
BES R01ZC-PSC50B-BX____-GS49-V*	20x32	5	F	GD-Zn		9	A
BES 517-385-M3-CW-S	40x40	15	F	PBT		10	A
BES 517-385-M3-CW-S-S4	40x40	15	F	PBT		11	A
20...250V AC/DC, Normally Open							
BES 516-211-S21-EL-W	M18	5	F	PTFE Coated Brass		12	B
BES 516-211-SA96-S21-EL-W	M18	5	F	PTFE Coated Brass	■	12	B
BES 516-211-S5-EL-W	M18	5	F	PTFE Coated Brass		13	B
BES 516-211-SA96-S5-EL-W	M18	5	F	PTFE Coated Brass	■	13	B
BES 516-211-S5-EL-W-SA1	M18	5	F	PTFE Coated Brass		14	B
10...30 Vdc, PNP, Normally Open, 2x							
BES M12MI-PSC30B-S04G-W	M12	3	F	PTFE Coated Brass		15	A
BES M12MI-PSC30B-S04G-W01	M12	3	F	PTFE Coated Brass	■	15	A
BES M18MI-PSC70B-S04G-W	M18	7	F	PTFE Coated Brass		16	A
BES M18MI-PSC70B-S04G-W01	M18	7	F	PTFE Coated Brass	■	16	A

F = Flush, NF = Non-flush, QF = Quasi-flush

Pigtail sensors available with preinstalled Weld Repel® tubing. Contact factory for availability.

*Please specify the cable length for sensors with cable and connector.
00.2, 00.5 = Irradiated PUR, length 0.2 m or 0.5 M



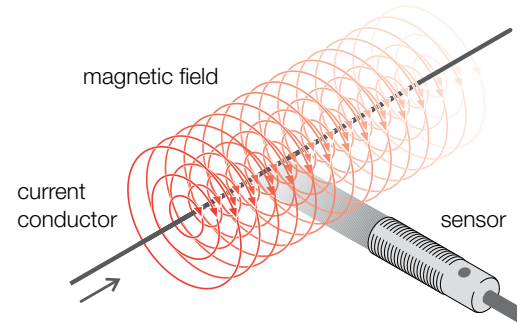


Factor 1

Balluff Factor 1 sensors have special dual coil electronic circuitry whose function is unaffected by strong magnetic fields found in processes such as induction hardening and welding environments. They also come equipped with PTFE coated housings resistant to weld splatter.

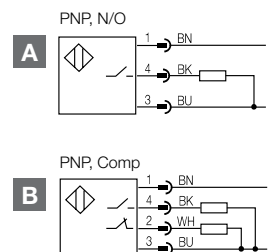
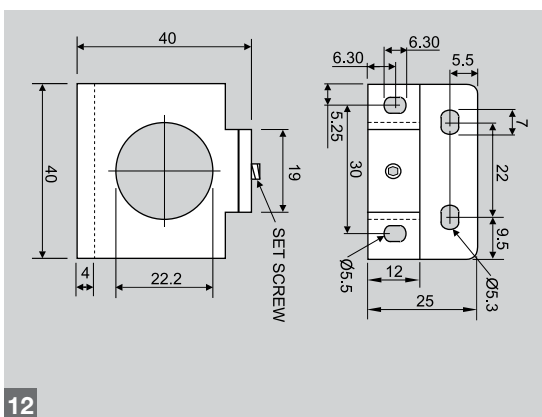
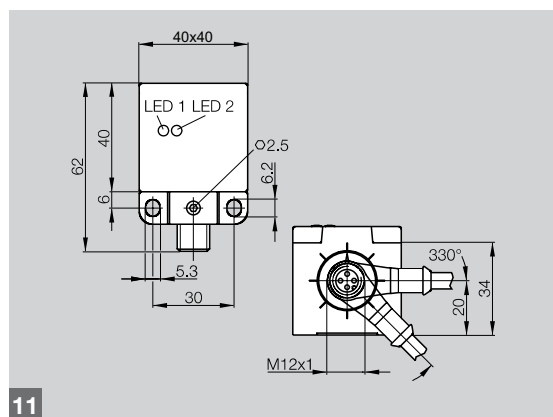
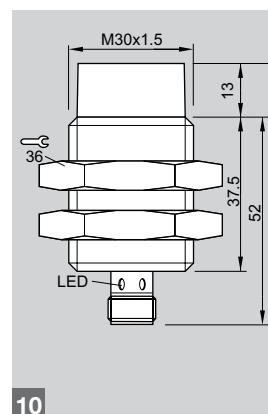
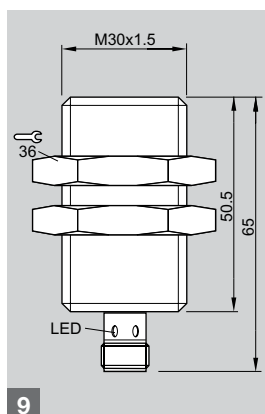
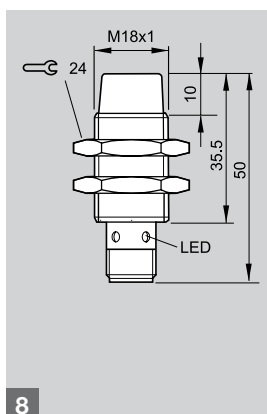
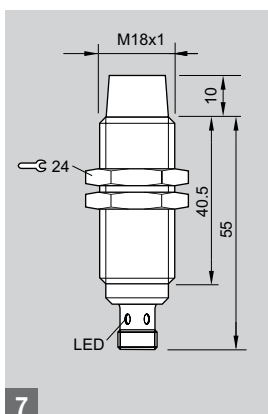
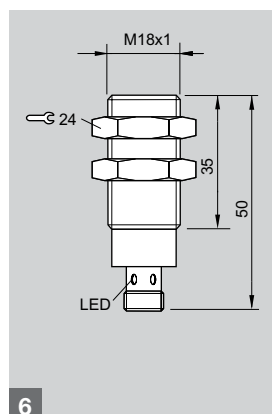
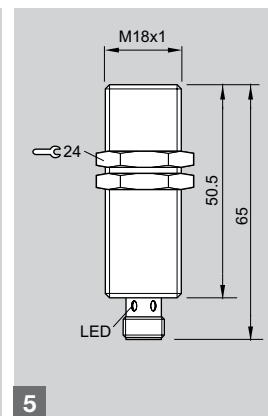
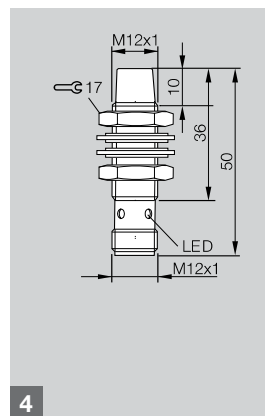
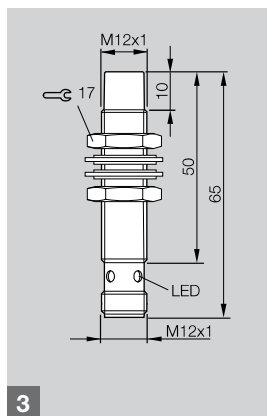
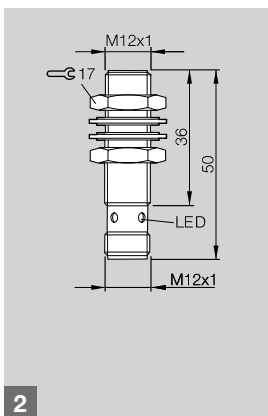
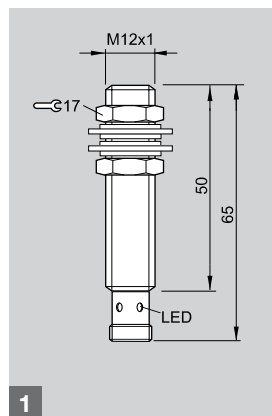
Factor 1 sensors sense all metals at the same distance. There is no need to derate the sensing distance based on target material.

These parts are available with SlagMaster® coating.



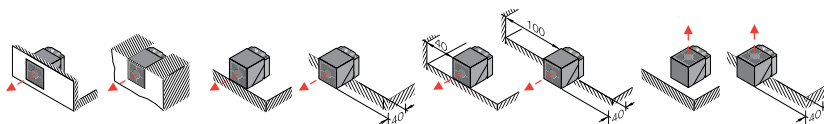
Balluff Part Number	Housing Diameter	Sensing Distance (mm)	Mounting	Output Logic	Housing Material	SlagMaster® Coated Face	Drawing	Wiring Diagram
BES M12MF1-PSC30A-S04G-W	M12	3	F	PNP, N/O	PTFE Coated Brass		2	A
BES M12MF1-PSC30A-S04G-W01	M12	3	F	PNP, N/O	PTFE Coated Brass	■	2	A
BES M12ML-PSC30A-S04G-W	M12	3	F	PNP, N/O	PTFE Coated Brass		1	A
BES M12ML-PSC30A-S04G-W01	M12	3	F	PNP, N/O	PTFE Coated Brass	■	1	A
BES M12ML-PSC80E-S04G-W	M12	8	N	PNP, N/O	PTFE Coated Brass		3	A
BES M12ML-PSC80E-S04G-W01	M12	8	N	PNP, N/O	PTFE Coated Brass	■	3	A
BES M12MD1-PSC80E-S04G-W	M12	8	N	PNP, N/O	PTFE Coated Brass		4	A
BES M12MD1-PSC80E-S04G-W01	M12	8	N	PNP, N/O	PTFE Coated Brass	■	4	A
BES M18ML-PSC50A-S04G-W	M18	5	F	PNP, N/O	PTFE Coated Brass		5	A
BES M18ML-PSC50A-S04G-W01	M18	5	F	PNP, N/O	PTFE Coated Brass	■	5	A
BES M18MF1-PSC50A-S04G-W	M18	5	F	PNP, N/O	PTFE Coated Brass		6	A
BES M18MF1-PSC50A-S04G-W01	M18	5	F	PNP, N/O	PTFE Coated Brass	■	6	A
BES M18ML-PSC12E-S04G-W	M18	12	N	PNP, N/O	PTFE Coated Brass		7	A
BES M18ML-PSC12E-S04G-W01	M18	12	N	PNP, N/O	PTFE Coated Brass	■	7	A
BES M18MD-PSC12E-S04G-W	M18	12	N	PNP, N/O	PTFE Coated Brass		8	A
BES M18MD-PSC12E-S04G-W01	M18	12	N	PNP, N/O	PTFE Coated Brass	■	8	A
BES M30ML-PSC10A-S04G-W	M30	10	F	PNP, N/O	PTFE Coated Brass		9	A
BES M30ML-PSC10A-S04G-W01	M30	10	F	PNP, N/O	PTFE Coated Brass	■	9	A
BES M30ML-PSC20E-S04G-W	M30	20	N	PNP, N/O	PTFE Coated Brass		10	A
BES M30ML-PSC20E-S04G-W01	M30	20	N	PNP, N/O	PTFE Coated Brass	■	10	A
BES Q40KFU-PAC15A-S04G	40X40	15	F	PNP, Comp	PBT		11	B
BES Q40KFU-PAC15A-S04G-W01	40X40	15	F	PNP, Comp	PBT	■	11	B
BES Q40KFU-PSC15A-S04G	40X40	15	F	PNP, N/O	PBT		11	A
BES Q40KFU-PSC15A-S04G-W01	40X40	15	F	PNP, N/O	PBT	■	11	A
BES Q40KFU-PAC20A-S04G	40X40	20	F	PNP, Comp	PBT		11	B
BES Q40KFU-PSC20A-S04G	40X40	20	F	PNP, N/O	PBT		11	A
BES Q40KFU-PAC35E-S04G	40X40	35	N	PNP, Comp	PBT		11	B
BES Q40KFU-PAC35E-S04G-W01	40X40	35	N	PNP, Comp	PBT	■	11	B
BES Q40KFU-PSC35E-S04G	40X40	35	N	PNP, N/O	PBT		11	A
BES Q40KFU-PSC35E-S04G-W01	40X40	35	N	PNP, N/O	PBT	■	11	A
BES Q40KFU-PAC40E-S04G	40X40	40	N	PNP, Comp	PBT		11	A





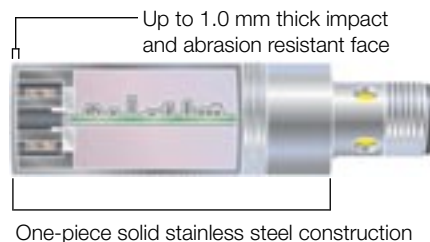
Q40 Mounting Guidelines

Sensing Distance Sn	Sensor with...								
15 mm	Original bracket (plastic)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Optional BES Q40-HW-2 (metal)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20 mm	Original bracket (plastic)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Optional BES Q40-HW-2 (metal)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35 mm	Original bracket (plastic)	No	No	No	Yes	No	Yes	Yes	Yes
	Optional BES Q40-HW-2 (metal)	No	No	No	Yes	No	Yes	No	No
35 mm BES...35Z...011	Original bracket (plastic)	No	No	Yes	Yes	Yes	Yes	Yes	Yes
	Optional BES Q40-HW-2 (metal)	No	No	No	Yes	No	Yes	No	Yes
40 mm	Original bracket (plastic)	No	No	No	Yes	No	Yes	No	Yes
	Optional BES Q40-HW-2 (metal)	No	No	No	Yes	No	Yes	No	No



SteelFace®

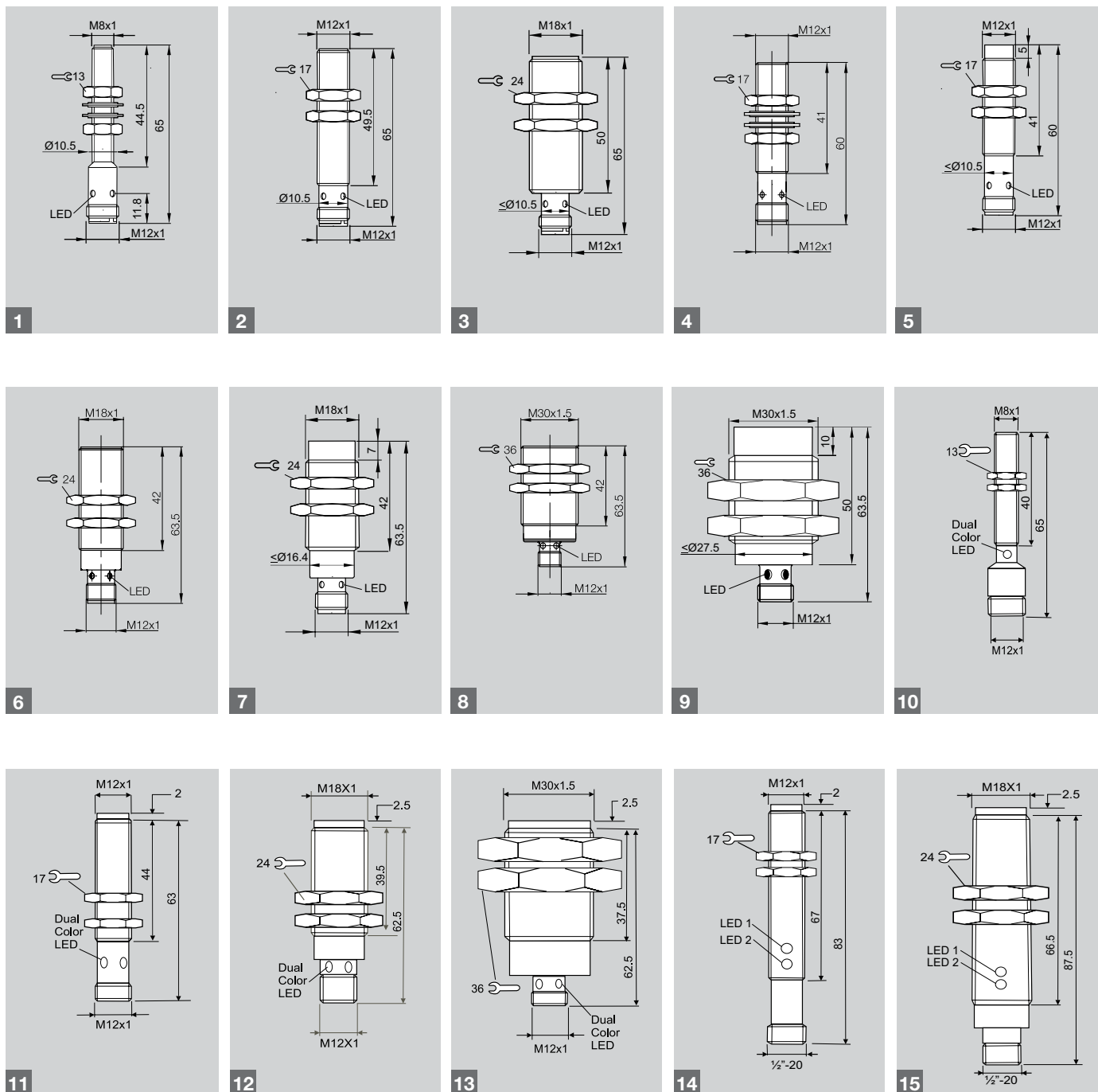
Balluff SteelFace® sensors are the go-to sensors for harsh sensing environments. Their one piece gun drilled stainless steel housings stand up to major incidental impacts, their long range characteristics combined with PTFE coatings give them long term survivability in tough weld cell applications, and their price/performance ratio is the best in the market.



Balluff Part Number	Housing Diameter	Sensing Distance (mm)	Mounting	Output Logic	PTFE Coated	Housing Material	Drawing	Wiring Diagram
2X Extended Range Product Family (All units 10-30Vdc) (Non-PTFE coated available, remove 01 suffix)*								
BES M08EH1-PSC20B-S04G-S01	M8	2	F	PNP, N/O	■	SS 316	1	A
BES M08EH1-NSC20B-S04G-S01	M8	2	F	NPN, N/O	■	SS 316	1	B
BES M12EI-PSC40B-S04G-S01	M12	4	F	PNP, N/O	■	SS 316	2	A
BES M12EI-NSC40B-S04G-S01	M12	4	F	NPN, N/O	■	SS 316	2	B
BES M18EI-PSC72B-S04G-S01	M18	7.2	F	PNP, N/O	■	SS 316	3	A
BES M18EI-NSC72B-S04G-S01	M18	7.2	F	NPN, N/O	■	SS 316	3	B
3X Extended Range Product Family (All units 10-30Vdc)								
BES M12EG1-PSC60Z-S04G-S11	M12	6	QF	PNP, N/O		SS 316	4	A
BES M12EG1-NSC60Z-S04G-S11	M12	6	QF	NPN, N/O		SS 316	4	B
BES M12EF1-PSC10F-S04G-S	M12	10	NF	PNP, N/O		SS 316	5	A
BES M12EF1-NSC10F-S04G-S	M12	10	NF	NPN, N/O		SS 316	5	B
BES M18EG1-PSC10Z-S04G-S11	M18	10	QF	PNP, N/O		SS 316	6	A
BES M18EG1-NSC10Z-S04G-S11	M18	10	QF	NPN, N/O		SS 316	6	B
BES M18EF1-PSC20F-S04G-S	M18	20	NF	PNP, N/O		SS 316	7	A
BES M18EF1-NSC20F-S04G-S	M18	20	NF	NPN, N/O		SS 316	7	B
BES M30EG1-PSC20Z-S04G-S11	M30	20	QF	PNP, N/O		SS 316	8	A
BES M30EG1-NSC20Z-S04G-S11	M30	20	QF	NPN, N/O		SS 316	8	B
BES M30EE1-PSC40F-S04G-S	M30	40	NF	PNP, N/O		SS 316	9	A
BES M30EE1-NSC40F-S04G-S	M30	40	NF	NPN, N/O		SS 316	9	B
Ferrous-only Sensing SteelFace® Product Family (10-30Vdc) (Non-ferrous available)								
BES M08EG1-PSC15S-S04G-S	M8	1.5	F	PNP, N/O		SS 303	10	A
BES M08EG1-NSC15S-S04G-S	M8	1.5	F	NPN, N/O		SS 303	10	B
BES M12EG1-PSC20S-S04G-S	M12	2	F	PNP, N/O		SS 303	11	A
BES M12EG1-POC20S-S04G-S	M12	2	F	PNP, N/C		SS 303	11	C
BES M12EG1-NSC20S-S04G-S	M12	2	F	NPN, N/O		SS 303	11	B
BES M18EG1-PSC50S-S04G-S	M18	5	F	PNP, N/O		SS 303	12	A
BES M18EG1-POC50S-S04G-S	M18	5	F	PNP, N/C		SS 303	12	C
BES M18EG1-NSC50S-S04G-S	M18	5	F	NPN, N/O		SS 303	12	B
BES M30EG1-PSC80S-S04G-S	M30	8	F	PNP, N/O		SS 303	13	A
BES M30EG1-NSC80S-S04G-S	M30	8	F	NPN, N/O		SS 303	13	B
Ferrous-only Sensing SteelFace® Product Family (20-250Vac/300Vdc) (Non-ferrous available)								
BES M12EN1-USU20S-S21G-S	M12	2	F	AC/DC, N/O		SS 303	14	D
BES M18EP1-USU50S-S21G-S	M18	5	F	AC/DC, N/O		SS 303	15	D

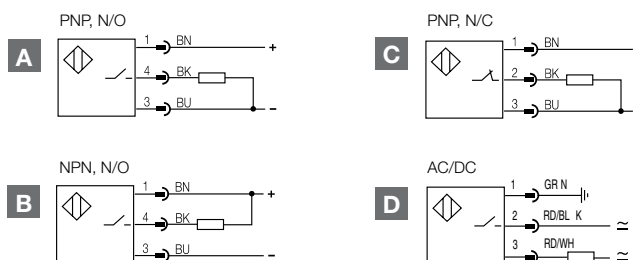
F = Flush, NF = Non-flush, QF = Quasi-flush

*Use steel Prox Mounts when Prox Mounts are selected, see page 24



Mounting Guidelines

Each SteelFace® family of sensors has unique mounting requirements. Please contact the factory for additional mounting information.



Magnetoresistive Sensors

Ineffective Reed or Hall Effect switches, often provide inaccurate clamped or unclamped position information for pneumatic cylinders used in weld cells. An upgrade to Balluff BMF magnetoresistive sensors will provide more accurate position information over time. BMF sensors are available for virtually every cylinder configuration. They increase machine up-time, lower stocking requirements, and are guaranteed for life.



Balluff Part Number	Specialty Mode	Output Logic	Connector Type	Drawing	Wiring Diagram
BMF 305M-PS-C-2-S4*	Metal Body Only	PNP, N/O	M12	1	A
BMF 305M-PS-C-2-S49*	Metal Body Only	PNP, N/O	M8	2	A
BMF 305M-PS-C-2-SA4-S49*	Extended Temperature	PNP, N/O	M8	2	A
BMF 305M-PS-W-2-S4*	WFI	PNP, N/O	M12	1	A
BMF 315M-PS-W-2-S04-00.3	WFI	PNP, N/O	Pigtail M12	4	A
BMF 315M-PS-W-2-S49-00.3	WFI	PNP, N/O	Pigtail M8	5	A
BMF 315M-PS-W-2-PU-05	WFI	PNP, N/O	5 m Cable	6	A
BMF 315M-PS-D-2-SA3-S49-00.3	Extended Temperature	PNP, N/O	Pigtail M8	5	A
BMF 315M-PS-D-2-SA3-PU-05	Extended Temperature	PNP, N/O	5 m Cable	6	A
BMF 32M-PS-W-2-S4*	WFI	PNP, N/O	M12	3	A
BMF 32M-NS-W-2-S4*	WFI	NPN, N/O	M12	3	B

Know your cylinder?
Find your sensor.
For more information, visit:
www.balluff.com/bmf.

* Requires additional bracketry, visit www.balluff.com/bmf

Pigtail sensors available with preinstalled Weld Repel® tubing. Contact factory for availability.

StrokeMaster®

Balluff high-pressure cylinder sensors are designed to sense the “spud” or cushion of a high pressure pneumatic or hydraulic cylinder’s piston to indicate clamped or unclamped cylinder gripping jaw positions. Rated to 3000 psi, these embedded inductive, WFI sensors are commonly found in heavy duty welding applications such as automotive and Tier supplier welding environments. StrokeMaster® sensors are available to accommodate many cylinder bore diameters in both AC/DC and in DC formats to meet many welding electrical requirements.



Balluff Part Number*,**	Input Voltage	Output Logic	Connector Type	Drawing	Wiring Diagram
BES 516-300-S 295/0.912"...4.560"-S4	10...30 Vdc	PNP, N/O	M12	7	A
BES 516-200-S 2/0.912"...4.560"-S21	20...250 Vac/Vdc	AC/DC, N/O	1/2" UNF-20-2A	7	C
BES 516-300-S 2/0.912"...4.560"-S5	20...250 Vac/Vdc	AC/DC, N/O	7/8"-16 UN	7	C

*Lengths available:
0.912, 1.025, 1.13, 1.25, 1.35, 1.5, 1.75, 1.875, 2.062, 2.375, 2.775, 2.875, 3.775, 4.56

**150+ other lengths available with the use of spacer kits. (Consult chart below for sizes.)

Z/Spacers (inches)

	0.18	0.188	0.225	0.307	0.372	0.375	0.5	0.544	0.562	0.6	0.684	0.712	0.81	0.937
0.912	0.732	0.724	0.687	0.605	0.540	0.537	0.412	0.368	0.350	0.312	0.228	0.200	0.102	--
1.025	0.845	0.837	0.800	0.718	0.653	0.650	0.525	0.481	0.463	0.425	0.341	0.313	0.215	0.088
1.25	1.070	1.062	1.025	0.943	0.878	0.875	0.750	0.706	0.688	0.650	0.566	0.538	0.440	0.313
1.35	1.170	1.162	1.125	1.043	0.978	0.975	0.850	0.806	0.788	0.750	0.666	0.638	0.540	0.413
1.5	1.320	1.312	1.275	1.193	1.128	1.125	1.000	0.956	0.938	0.900	0.816	0.788	0.690	0.563
1.75	1.570	1.562	1.525	1.443	1.378	1.375	1.250	1.206	1.188	1.150	1.066	1.038	0.940	0.813
1.875	1.695	1.687	1.650	1.568	1.503	1.500	1.375	1.331	1.313	1.275	1.191	1.163	1.065	0.938
2.062	1.882	1.874	1.837	1.755	1.690	1.687	1.562	1.518	1.500	1.462	1.378	1.350	1.252	1.125
2.375	2.195	2.187	2.150	2.068	2.003	2.000	1.875	1.831	1.813	1.775	1.691	1.663	1.565	1.438
2.775	2.595	2.587	2.550	2.468	2.403	2.400	2.275	2.231	2.213	2.175	2.091	2.063	1.965	1.838
2.875	2.695	2.687	2.650	2.568	2.503	2.500	2.375	2.331	2.313	2.275	2.191	2.163	2.065	1.938
3.775	3.595	3.587	3.550	3.468	3.403	3.400	3.275	3.231	3.213	3.175	3.091	3.063	2.965	2.838
4.56	4.380	4.372	4.335	4.253	4.188	4.185	4.060	4.016	3.998	3.960	3.876	3.848	3.750	3.623

Example: Need probe length of 1.125" combine sensor BES-516-200-S2-1.35-S21 with a 0.225" spacer (1.35" tube length - 0.225" spacer = 1.125" adjusted length).

Note: A difference of 0.005" will still have to be carefully considered when sizing a spacer and sensor to the cylinder.

- Spacer kits include a spacer, "O" ring, and appropriate mounting screws.
- Other spacer kits may be available; consult factory.

To order a spacer kit:
Use part number BESA-516-20-KIT-* (X.XXX) measured in inches. (For both DC and AD/DC devices, there is no difference in flange dimensions.)

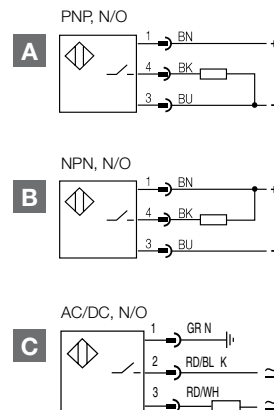
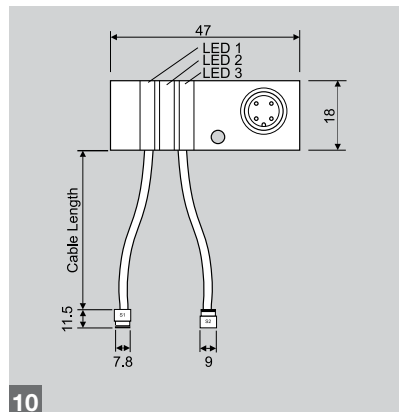
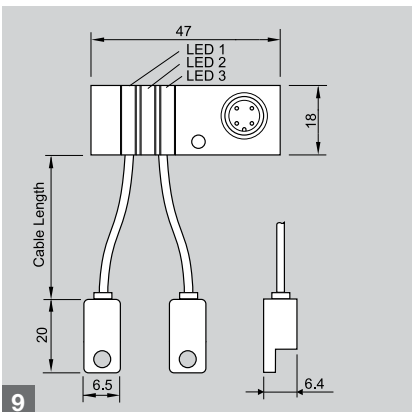
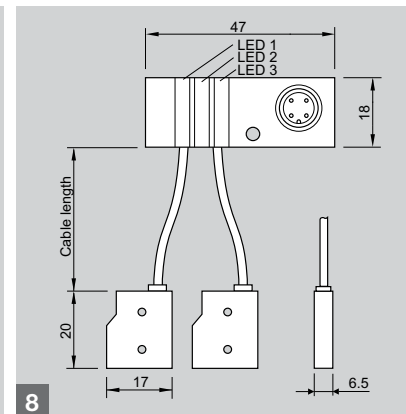
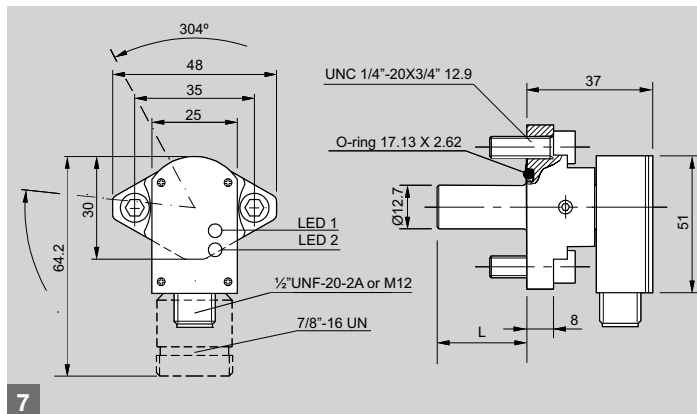
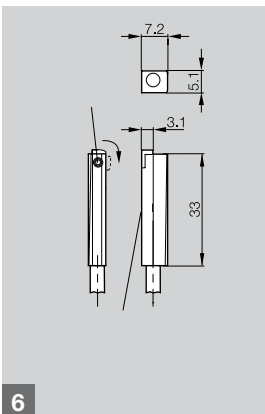
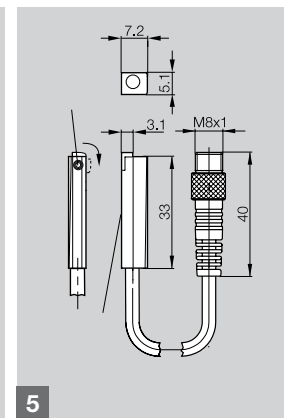
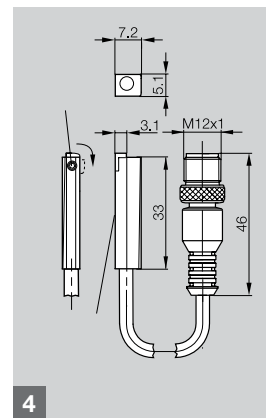
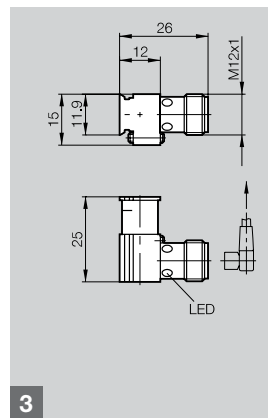
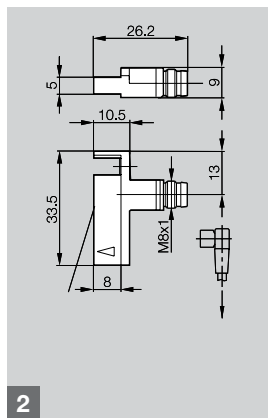
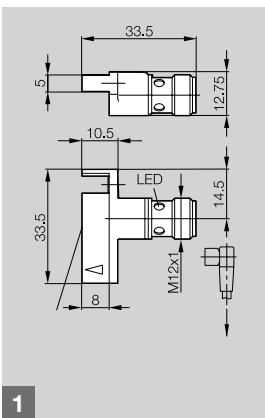
Power Clamp & Gripper Sensing

Many newer generation power clamp mechanisms integrate a dual inductive proximity sensor “chicklet” configuration joined to a common mounting housing with one common DC micro electrical outlet into their clamp indication system. These inductive proximity sensors sense the passing of steel components passing by the inductive fields to indicate clamped or unclamped jaw position. Balluff power clamp sensors are available to accommodate a wide range of power clamp mechanical configurations and electrical requirements.



Input Voltage	Output Logic	Connector Type	Drawing
BES Z02KR2-PSC20F-P*-S04-V	PNP, N/O	M12	8
BES Z02KR1-PSC20F-P*-S04-V	PNP, N/O	M12	9
BES Z02KR3-PSC20F-P*-S04-V	PNP, N/O	M12	10

*Lengths Available: P100 = 100 mm, P165 = 165 mm, P200 = 200 mm



Photoelectric

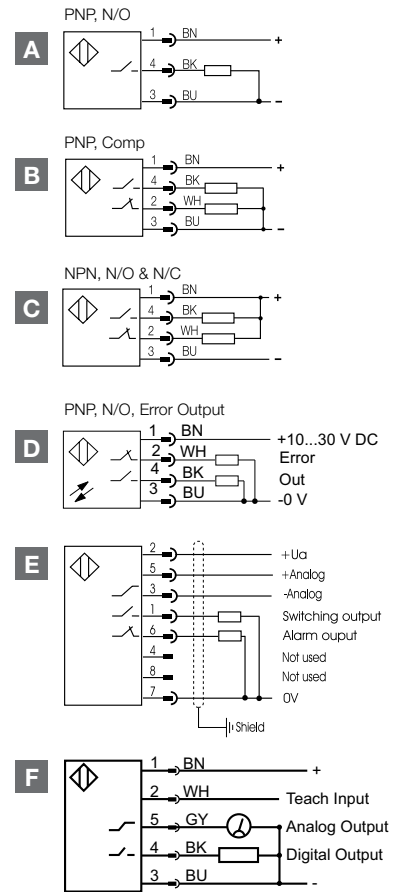
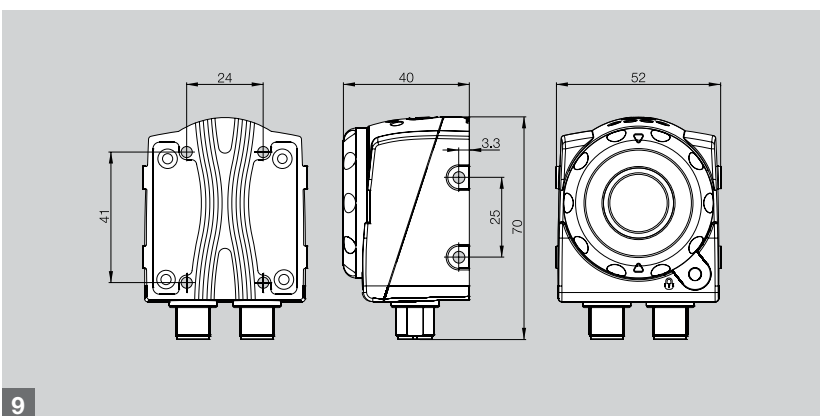
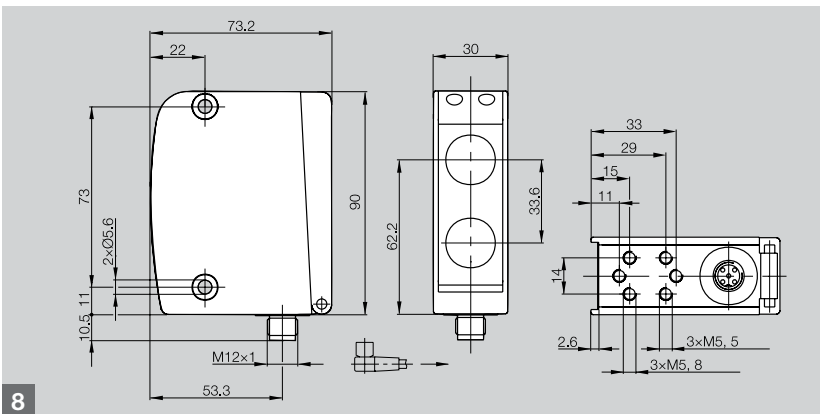
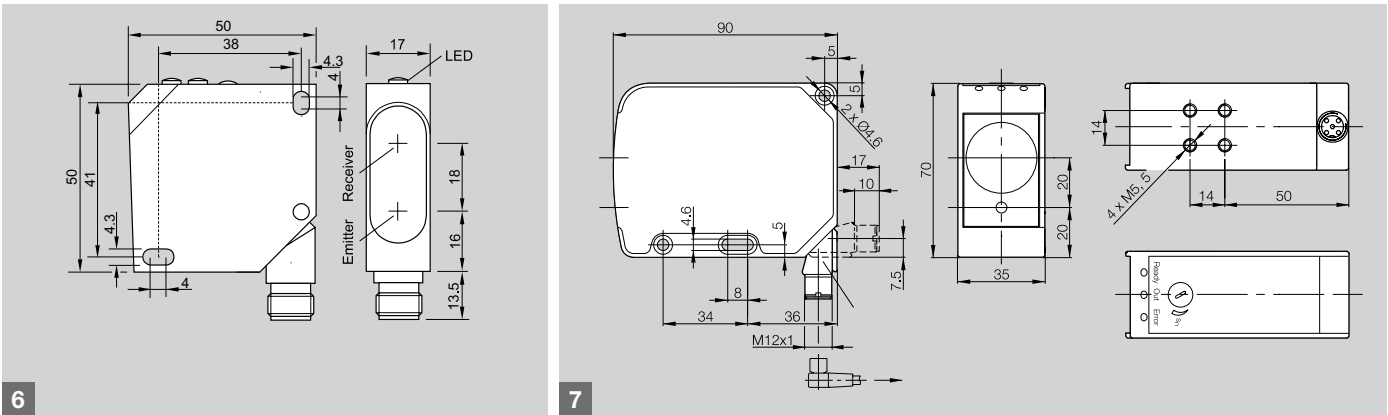
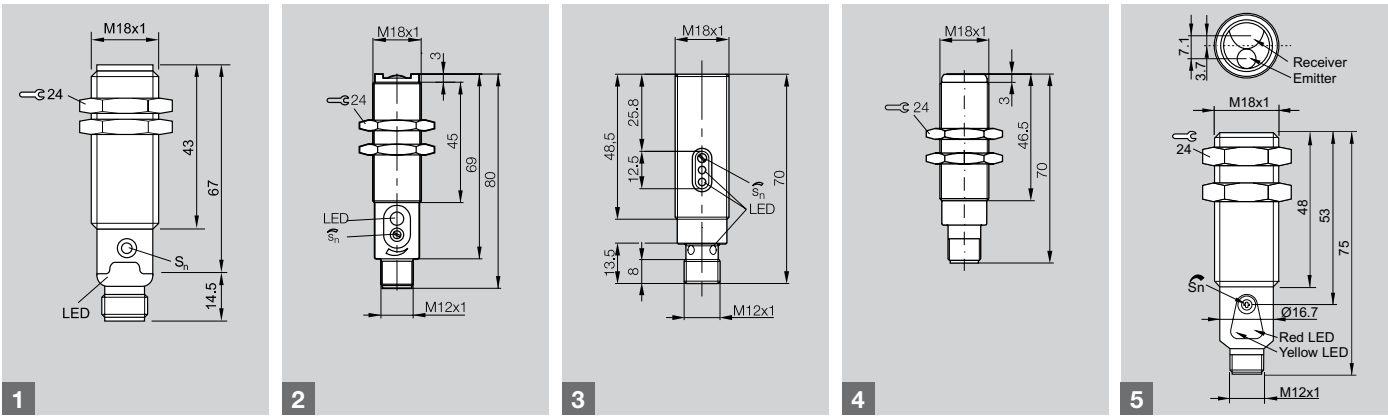
When a photoelectric sensor has to be used in a weld cell, it must be protected to survive in this extreme sensing environment. This requires a degree of application expertise. Mechanical protection and bunkering must be applied to achieve acceptable sensor survivability. In addition, ambient weld smoke, weld debris, oil, and mist, as well as sensing distance, excess gain requirements, and precision parameters must be taken into account in the choice of a photoelectric sensor. However, with the appropriate sensor choice, mounting hardware, and connectivity, it is possible to apply a photoelectric in the weld cell environment. Sharpshooter vision sensors offer accurate cost-effective capability in a small package for intra-weld and post weld parts feature validation.



Part Number	Sensing Distance	Output	Light Source	Housing Size	Housing/ Lens Material	Bunker Block Available	Drawing	Wiring Diagram
Metal Body Diffuse and Background Suppression (BGS) 18 mm Tubular Sensors (Light-on)								
BOS 18M-PA-LD10-S4	350 mm Diffuse	PNP, Comp	Class 1 Laser	M18	NiPB/PMMA	■	1	B
BOS 18M-NA-LD10-S4	350 mm Diffuse	NPN, Comp	Class 1 Laser	M18	NiPB/PMMA	■	1	C
BOS 18M-PSV-LH22-S4	150 mm BGS	PNP, N/O	Class 1 Laser	M18	NiPB/PMMA	■	5	D
BOS 18M-PA-1HA-S4-C	40...120 mm BGS	PNP, Comp	Visible Red	M18	NiPB/PMMA	■	2	B
BOS 18M-PS-1HA-E5-C-S4	10...120 mm BGS	PNP, N/O	Visible Red	M18	NiPB/PMMA	■	3	A
Extreme IP69K Diffuse 18 m Tubular Sensors (Light-on)								
BOS 18E-PS-1YA-E5-D-S4	100 mm Diffuse	PNP, N/O	Visible Red	M18	Stainless Steel/Glass	■	4	A
BOS 18E-PS-1YB-E5-D-S4	200 mm Diffuse	PNP, N/O	Visible Red	M18	Stainless Steel/Glass	■	4	A
BOS 18E-PS-1YD-E5-D-S4	400 mm Diffuse	PNP, N/O	Visible Red	M18	Stainless Steel/Glass	■	4	A
Background Suppression Block Style Sensors (Light-on)								
BOS 26K-PA-1LHC-S4-C	50...300 mm BGS	PNP, Comp	Class II Laser	50X17X50	ABS/PMMA	■	6	B
BOS 26K-NA-1LHC-S4-C	50...300 mm BGS	NPN, Comp	Class II Laser	50X17X50	ABS/PMMA	■	6	C
BOS 26K-PA-1LHB-S4-C	30...150 mm BGS	PNP, Comp	Class II Laser	50X17X50	ABS/PMMA	■	6	B
BOS 26K-NA-1LHB-S4-C	30...150 mm BGS	NPN, Comp	Class II Laser	50X17X50	ABS/PMMA	■	6	C
Analog Block Style Sensors with BGS Switching (Light-on)								
BOD 63M-LA01-S115*	500...6000 mm BGS	0-10 V, PNP	Class II Laser	70X35X90	Anodized AL/Glass		7	E
BOD 63M-LB01-S115*	500...6000 mm BGS	4-20 mA, PNP	Class II Laser	70X35X90	Anodized AL/Glass		7	E
BOD 66M-RA01-S92-C**	100...600 mm BGS	0-10 V, PNP	Visible Red/ Class II Laser	100.5X30X73.2	GD-Zn/Glass	■	8	F
BOD 66M-RB01-S92-C**	100...600 mm BGS	4-20 mA, PNP	Visible Red/ Class II Laser	100.5X30X73.2	GD-Zn/Glass	■	8	F
BOD 66M-LA04-S92-C**	200...2000 mm BGS	0-10 V, PNP	Visible Red/ Class II Laser	100.5X30X73.2	GD-Zn/Glass	■	8	F
BOD 66M-LB04-S92-C**	200...2000 mm BGS	4-20 mA, PNP	Visible Red/ Class II Laser	100.5X30X73.2	GD-Zn/Glass	■	8	F
Sharpshooter® Machine Vision Sensors								
BVS OI-3-001-E	460X380 mm	3x, PNP	Front Illumination Red LED	40x52x70	Painted Al/PMMA		9	G
BVS OI-3-002-E	460X380 mm	3x, NPN		40x52x70	Painted Al/PMMA		9	G
BVS OI-3-003-E	320X210 mm	3x, PNP		40x52x70	Painted Al/PMMA		9	G
BVS OI-3-004-E	320X210 mm	3x, NPN		40x52x70	Painted Al/PMMA		9	G
Accessories								
BOS 26-HW-7		Bunker Block™		26K Block Style			Aluminum	
BES 24-KB-9L & BES 18.0-KH-2L/W		Bunker Block™		18M Tubular Style			Aluminum	
BES 18.0-KB-10/W		Bunker Block™ II		18M Tubular Style			Copper Plated Steel	
BOD 66-SH-4		Lens		PTFE lens cover for BOD 63 & 66M			Aluminum/PTFE	
BOD 66-SH-5		Lens		PTFE slotted lens cover for BOD 63 & 66M			Aluminum/PTFE	

* Use cable C04 ANT-00-PB-050MS

** Use cable C04 ANQ-00-VB-050MS



Accessories

Balluff's Weld Repel® sensor protection solution provides total protection not only for the sensor, but for the connector and cable as well. This complete protection package will yield the weld cell a significant increase in productivity because the sensor and its associated connectivity will last far longer than a similar unprotected or poorly protected sensor and cable. The same excellent protection is found in area protection sheets for draping large surfaces. Protecting valve banks, large collections of cables, air lines, weld pedestals, and robots becomes easy with silicone area protection sheets.

The Balluff Bunker Block™ with a quick-change Prox Mount protects the sensor body and face from abusive physical damage. Since the Bunker Block™ is made of machined aluminum and the Prox Mount is PTFE-coated, the entire system repels weld slag buildup. The copper clad, all steel Bunker Block® II offers excellent loading impact and compliments Balluff 2X SteelFace sensors in the toughest welding applications. The SlagMaster® coating on the face of the proximity sensor can also repel weld slag accumulation and protect the sensor face from damage even in severe welding environments. To connect the sensor, start with a TPE cable which has high durability, and then cover the cable with the Weld Repel® system. This system uses a medical grade silicone jacket to protect the cable and a silicone wrap to secure the jacket in its proper location while sealing remaining connectivity components against harsh, hot weld spray. Pre-installed Weld Repel® jacketing over select TPE cables are available. Please consult factory for additional information.



The Weld Select Series from Balluff is the ultimate solution for increasing productivity and decreasing sensor failure.

TPE Cables

C04 AEL-00-TY-050M	M12 Straight female, 4-wire, 5 m
C04 BEL-00-TY-050M	M12 Right angle female, 4-wire, 5 m
C04 AEH-00-TY-050M	M12 Straight female, 3-wire, PNP LED, 5 m
C04 BEH-00-TY-050M	M12 Right angle female, 3-wire, PNP LED, 5 m
C49 ANE-00-TY-050M-2	M8 Straight female, 3-wire, 5 m
C49 BNE-00-TY-050M-2	M8 Right angle female, 3-wire, 5 m
C21 AE3-00-TY-150F	1/2" X 20 UNF Straight female, 3-pin dual keyway, 15 ft
C21 BE3-00-TY-150F	1/2" X 20 UNF Right angle female, 3-pin dual keyway, 15 ft

Other cables available, consult factory for more information.



Prox Mounts

PTFE (White) Coated Brass Short Proxes (≥30mm)	PTFE (White) Coated Brass Long Proxes (≥40mm)	PTFE (Black) Coated Steel Proxes (≥30mm)	Outer Diameter	Inner Diameter
BES 08.0-KH-2S/W	BES 08.0-KH-2L/W	BES 08.0-KH-11S/W	M12x1	8 mm
BES 12.0-KH-2S/W	BES 12.0-KH-2L/W	BES 12.0-KH-11S/W	M16x1	12 mm
BES 12.0-KH-2S/W-M18		BES 12.0-KH-11S/W-M18	M18x1	12 mm
BES 18.0-KH-2S/W	BES 18.0-KH-2L/W	BES 18.0-KH-11S/W	M24x1.5	18 mm
BES 30.0-KH-2S/W	BES 30.0-KH-2L/W		M36x1.5	30 mm

**Weld Repel® Wrap**

BKS PW-26/20-SI-TR-03,5	1" wide x 12 ft Clear silicone wrap
BKS PW-51/30-SI-TR-11	2" wide x 36 ft Clear silicone wrap

**Weld Repel® Area Protection**

BKS S-PS-914/16-SI	3 ft x custom length in ft
BKS S-PS-914/16-SI-00,91	3 ft x 3 ft sheet

**Weld Repel® Jacket**

BKS-PT-7/16-SI-15	Clear silicone tubing, 1/4" dia. x 50 ft (15 m)
BKS-PT-10/16-SI-15	Clear silicone tubing, 3/8" dia. x 50 ft (15 m) [†]
BKS-PT-13/16-SI-15	Clear silicone tubing, 1/2" dia. x 50 ft (15 m) ^{††, *}
BKS-PT-16/16-SI-15	Clear silicone tubing, 5/8" dia. x 50 ft (15 m) ^{**}
BKS-PT-19/16-SI-15	Clear silicone tubing, 3/4" dia. x 50 ft (15 m)
BKS-PT-38/16-SI-07.5	Clear silicone tubing, 1/5" dia. x 25 ft (15 m)
BKS-PT-50/16-SI-07.5	Clear silicone tubing, 2" dia. x 25 ft (15 m)

* Recommended for use with M12 (micro) single ended cables

** Recommended for use with M12 (micro) double ended cables

[†] Recommended for use with M8 (nano) single ended cables

^{††} Recommended for use with M8 (nano) single ended cables

SlagMaster® recommended.
See pages 12-17.

**Bunker Block®**

Machined AL	Prox Mount Required	Description
BES 12.0-KB-9L	BES 08,0-KH-2L/W	M8 sensors (40 mm+)
BES 16.0-KB-9L	BES 12,0-KH-2L/W	M12 sensors (40 mm+)
BES 24.0-KB-9L	BES 18,0-KH-2L/W	M18 sensors (40 mm+)
BES 36.0-KB-9L	BES 30,0-KH-2L/W	M30 sensors (40 mm+)
BES 12.0-KB-9S	BES 08,0-KH-2S/W	M8 sensors (short)
BES 16.0-KB-9S	BES 12,0-KH-2S/W	M12 sensors (short)
BES 24.0-KB-9S	BES 18,0-KH-2S/W	M18 sensors (short)
BES 36.0-KB-9S	BES 30,0-KH-2S/W	M30 sensors (short)

Bunker Block® II without positive stop

Copper Plated Steel	Description
BES 08.0-KB-10/W	M8 sensors
BES 12.0-KB-10/W	M12 sensors
BES 18.0-KB-10/W	M18 sensors
BES 30.0-KB-10/W	M30 sensors



Additional Accessories

Balluff offers many accessories designed to survive in the welding environment. These offerings are very effective at protecting and increasing sensor and connectivity life. Covers, caps, plungers, and clamps are all designed to help protect the sensor from damage. Metal connectivity accessories allow for heavy duty applications in the harshest environments, while Weld Jacket is another option in the fight to protect cables from damage. All of the products listed below will help reduce sensor failure and increase sensor life expectancy.



Aluminum Clamp with Positive Stop

BES 08,0-KB-4-F	AL clamp for M8 sensors
BES 12,0-KB-4-F	AL clamp for M12 sensors
BES 18,0-KB-4-F	AL clamp for M18 sensors
BES 30,0-KB-4-F	AL clamp for M30 sensors



Q40 & 26K Sensor Accessories

BES Q40-HW-2	Metal mounting bracket
BES Q40-SH-1	AL protection cover
BES Q40-SH-2	PA6 protection cover
BOS 26-HW-7	BOS 26K Bunker Block®



Air Blow-off Accessories & Air Knife

BOS 12-LT-1	Air blow-off for M12 sensors
BOS 18-LT-1	Air blow-off for M18 sensors
BMS CZ M-D-18-1001	Air knife



R01 Flatpack Sensor Accessories

BES R01-SH-4-A	Over-the-top, retro-fit bunker block
BES R01-SH-4-B	Socket style bunker block (for new installations)
BES R01ZC-TC	PTFE protective cover



Protective Caps

BES 12-CERAMIC-CAP-1	Ceramic for M12 sensors
BES 18-CERAMIC-CAP-1	Ceramic for M18 sensors
BES 30-CERAMIC-CAP-1	Ceramic for M30 sensors
BES _ _ -SM-4	PTFE caps for Prox Mounts (12, 16, 24, 36)



Heavy Duty Prox Actuator Plunger

BES JPH-0.625-12-1.50	Prox plunger for M12 sensors
-----------------------	------------------------------



WELD Jacket

WELD-JACKET-1/2"	Silicone & fiberglass 1/2" diameter (by the foot)
WELD-JACKET-3/4"	Silicone & fiberglass 3/4" diameter (by the foot)

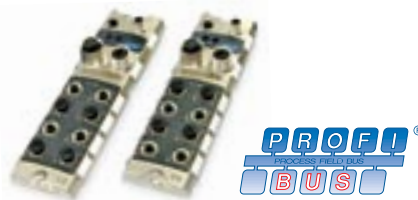
Networking and Passive Connectivity

The Balluff line of welding products now includes a family of passive and active multiple interface blocks and modules, which allows the end-user to consolidate multiple I/O points to one location. Typically, these products are plastic and non-potted, but Balluff's blocks and modules are IP67, fully potted and metal housed, allowing them to survive in the toughest environments. The active modules communicate on DeviceNet and Profibus and for ease of troubleshooting they contain the largest and most visible LEDs in the industry and provide all the needed diagnostic data demanded in today's industries. Balluff's Networking and Passive connectivity products complete the total welding solution from the sensor to the controls cabinet.



DeviceNet Modules

BNI DNT-104-00-Z004	16 input only
BNI DNT-202-00-Z005	8 output only
BNI DNT-302-00-Z005	16 configurable
BNI DNT-305-00-Z005	8 in/8 out



Profibus Modules

BNI PBS-104-000-Z004	16 input only
BNI PBS-302-000-Z001	16 configurable



Metal Multiple Interface Blocks (with PNP LEDs)

BSB-04-F01P/4-M02M-KP-*	4 port MIB, cable out
BSB-04-F01P/4-M01M-2319	4 port MIB, QD homerun cable
BSB-04-F01P/8-M02M-KP-*	8 port MIB, cable out
BSB-04-F01P/8-M01M-2319	8 port MIB, QD homerun cable
CM 23_1 N8-00-PB-100M	QD homerun cable, 10 m

* 05 (5 m cable) or 10 (10 m cable)

¹ = A (straight) or B (90°)



A full line of networking and auxiliary power cables are available. Visit www.balluff.com or consult factory for more details.



Stop Wasting Sensors and select your sensor based on application

Change the Paradigm and use sensor and cable protection systems

Reduce Downtime by installing SlagMaster® and SteelFace® sensors

Slash Consumption by protecting with Weld Repel® Jacket and Wrap

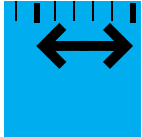
Boost Profitability through extending sensor life

BALLUFF

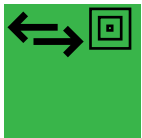
sensors worldwide



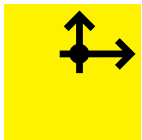
Object Detection



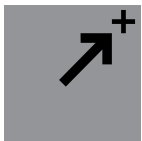
Linear Position and Measurement



Industrial Identification



Networking and Connectivity



Accessories



■ www.balluff.com/welding

USA

Balluff Inc.
8125 Holton Drive
Florence, KY 41042
Phone: (859) 727-2200
Toll-free: 1-800-543-8390
Fax: (859) 727-4823
E-Mail: balluff@balluff.com

Canada

Balluff Canada, Inc.
2840 Argentia Road, Unit #2
Mississauga, Ontario L5N 8G4
Phone: (905) 816-1494
Toll-free: 1-800-927-9654
Fax: (905) 816-1411
E-Mail: balluff.canada@balluff.ca

Mexico

Balluff de Mexico S.A. de C.V.
Prol. Av. Luis M. Vega #109
Col. Ampliacion Cimataro
Queretaro, QRO 76030
Phone: (++52 442) 212-4882, 224-3583, 224-3171
Fax: (++52 442) 214-0536
E-Mail: balluff.mexico@balluff.com