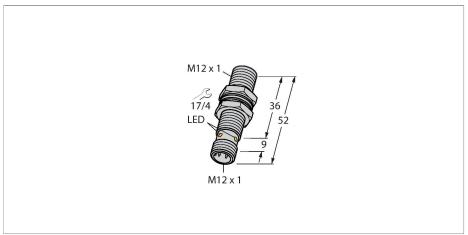


# BI4U-MT12-AP6X-H1141/S1589 Inductive Sensor - With WeldGuard™ coating





### Technical data

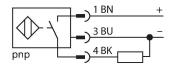
ID 1634997  Special version S1589 Corresponds to:With Weld-Guard Coating  General data  Rated switching distance 4 mm  Mounting conditions Flush  Secured operating distance ≤ (0.81 × Sn) mm  Repeat accuracy ≤ 2 % of full scale  Temperature drift ≤ ±10 %  ≤ ± 15 %, ≤ -25 °C ∨ ≥ +70 °C  Hysteresis 315 %  Electrical data  Operating voltage U <sub>8</sub> 1030 VDC  Ripple U <sub>8</sub> ≤ 10 % U <sub>8max</sub> DC rated operating current I <sub>8</sub> ≤ 200 mA  No-load current ≤ 25 mA  Residual current ≤ 0.1 mA  Isolation test voltage 0.5 kV  Short-circuit protection yes/Cyclic  Voltage drop at I <sub>8</sub> ≤ 1.8 V  Wire break/reverse polarity protection yes/Complete  Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mT  Switching frequency 3 kHz	Type	BI4U-MT12-AP6X-H1141/S1589
Guard™ Coating  General data  Rated switching distance 4 mm  Mounting conditions Flush  Secured operating distance ≤ (0.81 × Sn) mm  Repeat accuracy ≤ 2 % of full scale  Temperature drift ≤ ±10 %  ≤ ± 15 %, ≤ -25 °C v ≥ +70 °C  Hysteresis 315 %  Electrical data  Operating voltage U <sub>B</sub> 1030 VDC  Ripple U <sub>ss</sub> ≤ 10 % U <sub>Bmax</sub> DC rated operating current I <sub>B</sub> ≤ 200 mA  No-load current ≤ 25 mA  Residual current ≤ 0.1 mA  Isolation test voltage 0.5 kV  Short-circuit protection yes/Cyclic  Voltage drop at I <sub>B</sub> ≤ 1.8 V  Wire break/reverse polarity protection yes/Complete  Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mT <sub>ss</sub>	ID	1634997
Rated switching distance       4 mm         Mounting conditions       Flush         Secured operating distance       ≤ (0.81 × Sn) mm         Repeat accuracy       ≤ 2 % of full scale         Temperature drift       ≤ ±10 %         ≤ ± 15 %, ≤ -25 °C v ≥ +70 °C         Hysteresis       315 %         Electrical data         Operating voltage U <sub>B</sub> 1030 VDC         Ripple U <sub>25</sub> ≤ 10 % U <sub>Bmax</sub> DC rated operating current I <sub>6</sub> ≤ 200 mA         No-load current       ≤ 25 mA         Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at I <sub>6</sub> ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mT	Special version	
Mounting conditions       Flush         Secured operating distance       ≤ (0.81 × Sn) mm         Repeat accuracy       ≤ 2 % of full scale         Temperature drift       ≤ ±10 %         ≤±15 %, ≤ -25 °C v ≥ +70 °C         Hysteresis       315 %         Electrical data         Operating voltage U <sub>s</sub> 1030 VDC         Ripple U <sub>s</sub> ≤ 10 % U <sub>smax</sub> DC rated operating current I <sub>s</sub> ≤ 200 mA         No-load current       ≤ 25 mA         Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at I <sub>s</sub> ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mT	General data	
Secured operating distance $\leq (0.81 \times Sn) \text{ mm}$ Repeat accuracy $\leq 2 \% \text{ of full scale}$ Temperature drift $\leq \pm 10 \%$ $\leq \pm 15 \%, \leq -25 \text{ °C v} \geq +70 \text{ °C}$ Hysteresis $315 \%$ Electrical data  Operating voltage U <sub>B</sub> $1030 \text{ VDC}$ Ripple U <sub>SS</sub> $\leq 10 \% \text{ U}_{Bmax}$ DC rated operating current I <sub>B</sub> $\leq 200 \text{ mA}$ No-load current $\leq 25 \text{ mA}$ Residual current $\leq 0.1 \text{ mA}$ Isolation test voltage $0.5 \text{ kV}$ Short-circuit protection $0.5 \text{ kV}$ Wire break/reverse polarity protection $0.5 \text{ kV}$ Wire break/reverse polarity protection $0.5 \text{ kV}$ Output function $0.5 \text{ kV}$ DC field stability $0.5 \text{ kV}$ AC field stability $0.5 \text{ kV}$	Rated switching distance	4 mm
Repeat accuracy $\leq 2\%$ of full scale  Temperature drift $\leq \pm 10\%$ $\leq \pm 15\%, \leq -25 ^{\circ}\text{C V} \geq +70 ^{\circ}\text{C}$ Hysteresis $315\%$ Electrical data  Operating voltage U <sub>B</sub> $1030 ^{\circ}\text{VDC}$ Ripple U <sub>ss</sub> $\leq 10\% ^{\circ}\text{U}_{\text{Brmax}}$ DC rated operating current I <sub>e</sub> $\leq 200 ^{\circ}\text{mA}$ No-load current $\leq 25 ^{\circ}\text{mA}$ Residual current $\leq 0.1 ^{\circ}\text{mA}$ Isolation test voltage $0.5 ^{\circ}\text{kV}$ Short-circuit protection $0.5 ^{\circ}\text{kV}$ Wire break/reverse polarity protection $0.5 ^{\circ}\text{kV}$ Wire break/reverse polarity protection $0.5 ^{\circ}\text{kV}$ DC field stability $0.5 ^{\circ}\text{kV}$ AC field stability $0.5 ^{\circ}\text{kV}$	Mounting conditions	Flush
Temperature drift $\leq \pm 10 \%$ $\leq \pm 15 \%, \leq -25 \degree \text{C v} \geq +70 \degree \text{C}$ Hysteresis $315 \%$ Electrical data  Operating voltage $U_B$ $1030 \text{ VDC}$ Ripple $U_{ss}$ $\leq 10 \% U_{Bmax}$ DC rated operating current $I_e$ $\leq 200 \text{ mA}$ No-load current $\leq 25 \text{ mA}$ Residual current $\leq 0.1 \text{ mA}$ Isolation test voltage $0.5 \text{ kV}$ Short-circuit protection $0.5 \text{ kV}$ Wire break/reverse polarity protection $0.5 \text{ kV}$ Wire break/reverse polarity protection $0.5 \text{ kV}$ DC field stability $0.5 \text{ kV}$ AC field stability $0.5 \text{ mT}_{ss}$	Secured operating distance	≤ (0.81 × Sn) mm
$\leq \pm 15 \ \%, \leq -25 \ ^{\circ}\text{C v} \geq +70 \ ^{\circ}\text{C}$ Hysteresis 315 %  Electrical data  Operating voltage $U_B$ 1030 VDC  Ripple $U_{ss}$ $\leq 10 \ \% \ U_{Bmax}$ DC rated operating current $I_c$ $\leq 200 \ \text{mA}$ No-load current $\leq 25 \ \text{mA}$ Residual current $\leq 0.1 \ \text{mA}$ Isolation test voltage 0.5 kV  Short-circuit protection yes/Cyclic  Voltage drop at $I_c$ $\leq 1.8 \ \text{V}$ Wire break/reverse polarity protection yes/Complete  Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mT	Repeat accuracy	≤ 2 % of full scale
Hysteresis $315\%$ Electrical data         Operating voltage $U_B$ $1030 \text{ VDC}$ Ripple $U_{ss}$ $\leq 10\% U_{Bmax}$ DC rated operating current $I_e$ $\leq 200 \text{ mA}$ No-load current $\leq 25 \text{ mA}$ Residual current $\leq 0.1 \text{ mA}$ Isolation test voltage $0.5 \text{ kV}$ Short-circuit protection       yes/Cyclic         Voltage drop at $I_e$ $\leq 1.8 \text{ V}$ Wire break/reverse polarity protection       yes/Complete         Output function $3$ -wire, NO contact, PNP         DC field stability $300 \text{ mT}$ AC field stability $300 \text{ mT}$	Temperature drift	≤ ±10 %
Electrical data  Operating voltage U <sub>B</sub> 1030 VDC  Ripple U <sub>ss</sub> ≤ 10 % U <sub>Bmax</sub> DC rated operating current I <sub>e</sub> ≤ 200 mA  No-load current  ≤ 25 mA  Residual current  ≤ 0.1 mA  Isolation test voltage  0.5 kV  Short-circuit protection  yes/Cyclic  Voltage drop at I <sub>e</sub> Wire break/reverse polarity protection  yes/Complete  Output function  3-wire, NO contact, PNP  DC field stability  300 mT  AC field stability  300 mT <sub>ss</sub>		≤ ± 15 %, ≤ -25 °C v ≥ +70 °C
Operating voltage $U_s$ 1030 VDC         Ripple $U_{ss}$ ≤ 10 % $U_{Bmax}$ DC rated operating current $I_e$ ≤ 200 mA         No-load current       ≤ 25 mA         Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at $I_e$ ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	Hysteresis	315 %
Ripple Uss       ≤ 10 % Usmax         DC rated operating current Io       ≤ 200 mA         No-load current       ≤ 25 mA         Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at Io       ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mT	Electrical data	
DC rated operating current I₀ ≤ 200 mA  No-load current ≤ 25 mA  Residual current ≤ 0.1 mA  Isolation test voltage 0.5 kV  Short-circuit protection yes/Cyclic  Voltage drop at I₀ ≤ 1.8 V  Wire break/reverse polarity protection yes/Complete  Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mTss	Operating voltage U <sub>B</sub>	1030 VDC
No-load current       ≤ 25 mA         Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at I₀       ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	Ripple U <sub>ss</sub>	≤ 10 % U <sub>Bmax</sub>
Residual current       ≤ 0.1 mA         Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at $I_e$ ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	DC rated operating current I <sub>e</sub>	≤ 200 mA
Isolation test voltage       0.5 kV         Short-circuit protection       yes/Cyclic         Voltage drop at I₀       ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	No-load current	≤ 25 mA
Short-circuit protection       yes/Cyclic         Voltage drop at $I_e$ ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	Residual current	≤ 0.1 mA
Voltage drop at $I_e$ ≤ 1.8 V         Wire break/reverse polarity protection       yes/Complete         Output function       3-wire, NO contact, PNP         DC field stability       300 mT         AC field stability       300 mTss	Isolation test voltage	0.5 kV
Wire break/reverse polarity protection yes/Complete  Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mTss	Short-circuit protection	yes/Cyclic
Output function 3-wire, NO contact, PNP  DC field stability 300 mT  AC field stability 300 mT <sub>ss</sub>	Voltage drop at I <sub>e</sub>	≤ 1.8 V
DC field stability 300 mT  AC field stability 300 mT <sub>ss</sub>	Wire break/reverse polarity protection	yes/Complete
AC field stability 300 mT <sub>ss</sub>	Output function	3-wire, NO contact, PNP
	DC field stability	300 mT
Switching frequency 3 kHz	AC field stability	300 mT <sub>ss</sub>
	Switching frequency	3 kHz



# **Features**

- ■Threaded barrel, M12 x 1
- ■Brass, PTFE-coated
- Front cap with special coating, very resistant to thermal and mechanical load
- Factor 1 for all metals
- Protection class IP68
- Resistant to magnetic fields
- ■Extended temperature range
- High switching frequency
- ■DC 3-wire, 10...30 VDC
- ■NO contact, PNP output
- ■M12 x 1 male connector

# Wiring diagram





# Functional principle

Inductive sensors are designed for wear-free and contactless detection of metal objects. uprox Factor 1 sensors have significant advantages due to their patented ferritecoreless 3-coil system. They detect all metals at the same large switching distance and are resistant to magnetic fields.

Turck WeldGuard sensors for use in welding systems are equipped with a thin coating made of thermosetting plastic. This high-tech

# BI4U-MT12-AP6X-H1141/S1589| 21-02-2025 15-14 | Technical modifications reserved

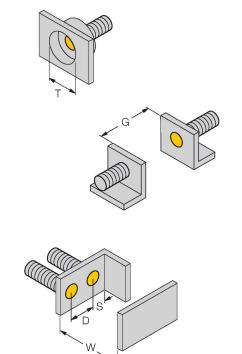
# Technical data

Mechanical data Design Threaded barrel, M12 x 1 **Dimensions** 52 mm Housing material Metal, CuZn, PTFE-coated Plastic, LCP + WeldGuard™, grey Active area material Max. tightening torque of housing nut 7 Nm Electrical connection Connector, M12 × 1 Environmental conditions Ambient temperature -30...+85 °C Vibration resistance 55 Hz (1 mm) Shock resistance 30 g (11 ms) Protection class IP68 **MTTF** 874 years acc. to SN 29500 (Ed. 99) 40 LED, Yellow Switching state

coating is resistant to abrasion and withstands mechanical stress.

# Mounting instructions

# Mounting instructions/Description



Distance D	2 x B
Distance W	3 x Sn
Distance T	3 x B
Distance S	1.5 x B
Distance G	6 x Sn
Diameter active area B	Ø 12 mm

QMT-12 6945106

M5 28 40 18

Mounting clamp for threaded barrel sensors, with dead-stop; material: PA6

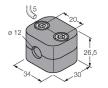


Quick-mount bracket with dead-stop; material: brass, PTFE-coated; Male thread M16 × 1. Note: The switching distance of the proximity switches may change when using quick-mount brackets.

BSS-12

6901321

Mounting clamp for smooth and threaded barrel sensors; material: Polypropylene



# Accessories

Dimension drawing	Туре	ID
	RKC4T-2/TXL1001	6630249



Connection cable, M12 female connector, straight, 3-pin, cable length: 2 m, protective jacket material: aramid fibers, yellow; temperature peak: 200 °C