STB Self-Checking Optical Touch Buttons†

Self-Checking Ergonomic Actuating Devices

Features

- Diverse-redundant microcontroller-based photoelectric touch buttons

- Continuous internal self-checking operation

- Ergonomically designed to eliminate hand, wrist and arm stresses associated with repeated switch operation; require no physical pressure to operate

- Immune to ambient light, EMI and RFI interference

- High excess gain cuts through heavy contamination

- Yellow field cover included

- LED power, output and fault indicators

†U.S. Patent(s) issued or pending

Models

Model	Cable*	Upper Housing	Supply Voltage	Output Type	DUO-TOUCH® SG Compatibility
STBVP6 STBVP6Q STBVP6Q5	4-wire 2 m (6.5') integral cable 4-Pin Mini-style QD 4-Pin Euro-style QD	Polysulfone	10 to 30V dc	Complementary PNP	AT-FM-10K Two-hand control module
STBVR81 STBVR81Q STBVR81Q6	5-wire 2 m (6.5') integral cable 5-Pin Mini-style QD 5-Pin Euro-style QD		20 to 30V ac/dc	Two Individual Complementary Relays (see Figure 4)	
STBVP6L STBVP6LQ STBVP6LQ5	4-wire 2 m (6.5') integral cable 4-Pin Mini-style QD 4-Pin Euro-style QD	Polycarbonate	10 to 30V dc	Complementary PNP	
STBVR81L STBVR81LQ STBVR81LQ6	5-wire 2 m (6.5') integral cable 5-Pin Mini-style QD 5-Pin Euro-style QD		20 to 30V ac/dc	Two Individual Complementary Relays (see Figure 4)	

* 9 m cables are available by adding suffix "**W/30**" to the model number of any cabled STB (e.g., **STBVP6 W/30**).
  A model with a QD connector requires a mating cordset; see page 10.

⚠ **WARNING . . . Not a Stand-Alone Safety Device**

STB Series Touch Buttons are self-checking ergonomic actuating devices, but are not, by themselves, safety devices. To be used in a safety application, two STBs must be interfaced with a type IIIC two-hand-control module, such as the Banner AT-FM-10K, in order to meet all relevant safety requirements of the appropriate standards.
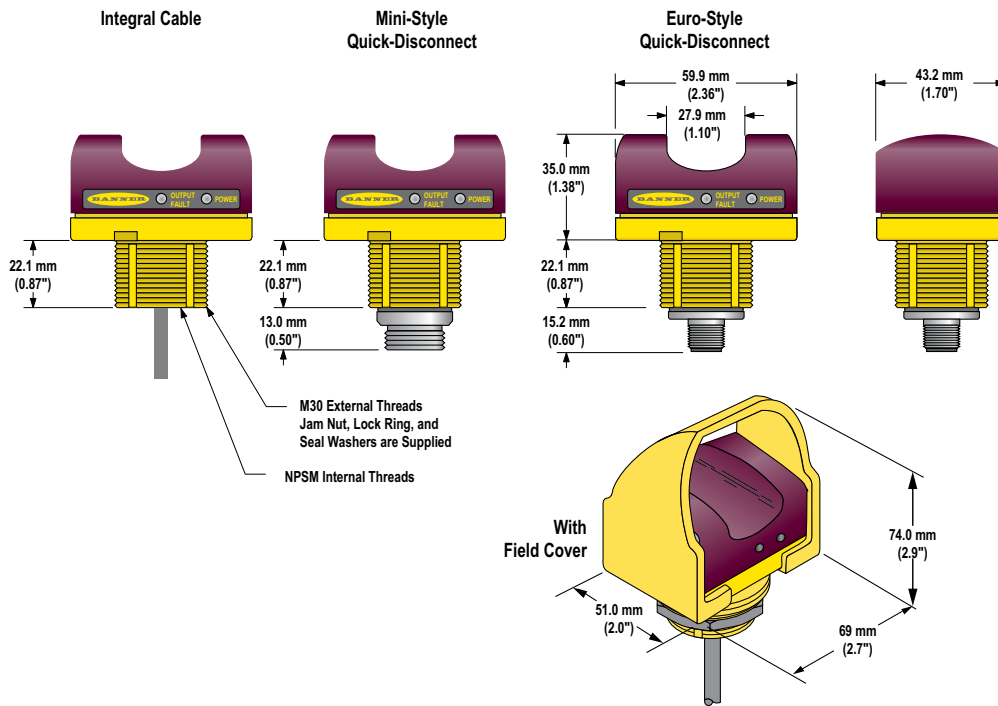
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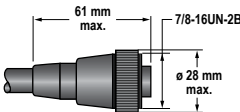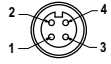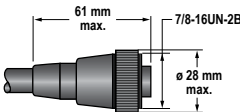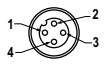| Specifications	
Supply Voltage and Current	**STBVP6 Models:** 10 to 30V dc **STBVR81 Models:** 20 to 30V ac/dc
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Output Configuration	**STBVP6 Models:** Complementary PNP (sourcing) open-collector transistors **STBVR81 Models:** Complementary electromechanical relays

Output Rating	**STBVP6 Models (solid-state outputs):**
	    Maximum load: 150 mA
	    On-state saturation voltage: ≤ 15V @ full load
	    Off-state leakage current: < 1 µA
	
	STBVR81 Models (electromechanical relays):
	    Maximum switching voltage: 125V dc/150V ac
	    Maximum switching current: 1A
	    Maximum resistive power: 30W dc/60VA ac
	    Mechanical life of relays: 10^9 cycles
	    Electrical life of relays: 1.5×10^5 cycles at 1 amp, 24V resistive

Output Protection Circuitry	All models protected against false pulse on power-up. Models with solid-state outputs have overload and short-circuit protection.
Output Response Time	20 milliseconds ON/OFF

Indicators	**2 green LED indicators:**
	Power: ON – power applied
	Output/fault: ON – button is activated
	            OFF – button is deactivated
	            Flashing – internal fault or blocked button on power-up detected

Construction	Totally encapsulated, non-metallic enclosure. Black polysulfone or red polycarbonate upper housing (see Application Notes below); fiber-reinforced PBT polyester base. Electronics fully epoxy-encapsulated. Supplied with polypropylene (TP) field cover.
Environmental Rating	Meets NEMA standards 1, 3, 4, 4X, 12 and 13; IEC IP66
Connections	PVC-jacketed 2 m (6.5') cables or QD fitting, depending on model. Accessory QD cables required for QD models; see Accessories, page 9. **STBVP6 Models:** 4-wire (4-pin Mini-style or Euro-style QD) **STBVR81 Models:** 5-wire (5-pin Mini-style or Euro-style QD) Integral 9 m (30') cables are also available; see model selection chart, page 1.
Ambient Light Immunity	Up to 100,000 lux
EMI/RF Immunity	Immune to EMI and RFI noise sources, per IEC 947-5-2.
Operating Conditions	**Temperature:** 0º to +50º C (+32º to +122º F) **Maximum relative humidity:** 90% @ +50º C (non-condensing)

Application Notes	**Environmental considerations for models with polysulfone upper housings:**
	  The polysulfone upper housing will become brittle with prolonged exposure to outdoor sunlight. Window glass effectively filters longer wavelength ultraviolet light and provides excellent protection from sunlight. Avoid contact with strong alkalis. Clean periodically using mild soap solution and a soft cloth.
	
	Environmental considerations for models with polycarbonate upper housings:
	  Avoid prolonged exposure to hot water and moist high-temperature environments above 66º C (150º F). Avoid contact with aromatic hydrocarbons (such as xylene and toluene), halogenated hydrocarbons and strong alkalis. Clean perodically using mild soap solution and a soft cloth.
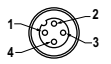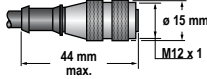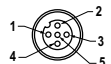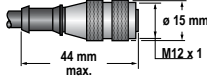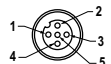
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Dimensions

Integral Cable

Mini-Style Quick-Disconnect

Euro-Style Quick-Disconnect

22.1 mm (0.87")

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13.0 mm (0.50")

59.9 mm (2.36")

27.9 mm (1.10")

35.0 mm (1.38")

22.1 mm (0.87")

15.2 mm (0.60")

43.2 mm (1.70")

M30 External Threads
Jam Nut, Lock Ring, and
Seal Washers are Supplied

NPSM Internal Threads

With Field Cover

74.0 mm (2.9")

51.0 mm (2.0")

69 mm (2.7")

Accessories

Quick-Disconnect (QD) Cordsets

Style	Model	Length	Used With	Dimensions	Pinout	
4-Pin Mini Female Straight	**MBCC-406** **MBCC-412** **MBCC-430**	2 m (6.5') 4 m (12') 9 m (30')	STB Mini-Style QD models with PNP outputs	61 mm max. 7/8-16UN-2B ø 28 mm max.		1 = Brown 2 = White 3 = Blue 4 = Black
5-Pin Mini Female Straight	**MBCC-506** **MBCC-512** **MBCC-530**	2 m (6.5') 4 m (12') 9 m (30')	STB Mini-Style QD models with electromechanical relay outputs			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Yellow
4-Pin Euro Female Straight	**MQDC-406** **MQDC-415** **MQDC-430**	2 m (6.5') 5 m (15') 9 m (30')	STB Euro-Style QD models with PNP outputs	ø 15 mm 44 mm max. M12 x 1		1 = Brown 2 = White 3 = Blue 4 = Black
5-Pin Euro Female Straight	**MQDC1-506** **MQDC1-515** **MQDC1-530**	2 m (6.5') 5 m (15') 9 m (30')	STB Euro-Style QD models with electromechanical relay outputs			1 = Brown 2 = White 3 = Blue 4 = Black 5 = Gray