

Control and signalling units Ø 22

Harmony® style 5
Pushbuttons, switches and pilot lights, with double
insulated bezel

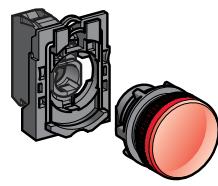
Description

The Ø 22, style 5 range of control and signalling units comprises:

Sub-assemblies for user assembly ZB5-A

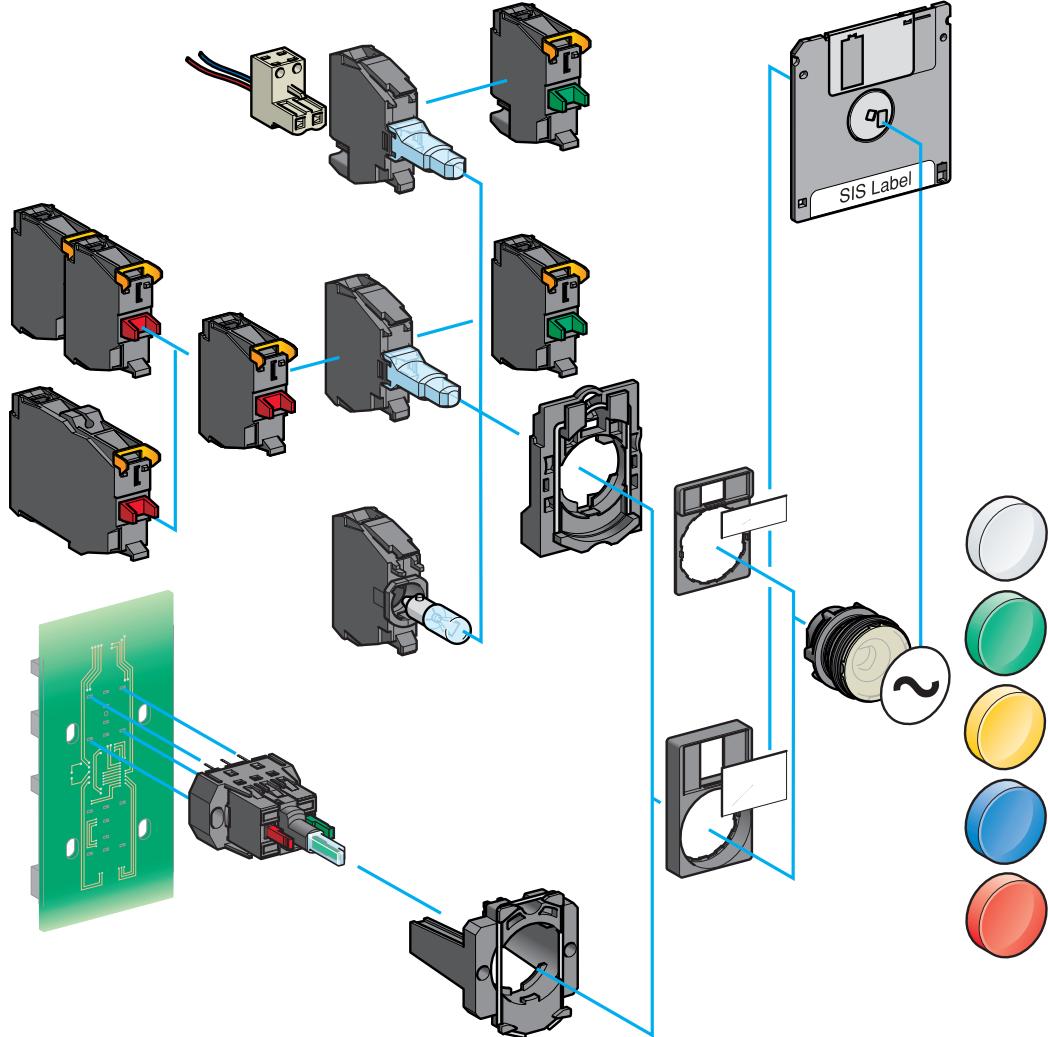


Pushbuttons and switches: Head and body sub-assemblies



Pilot lights: Head and body sub-assemblies

Component parts and accessories



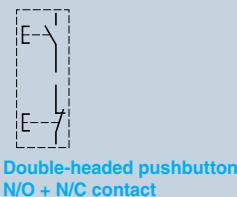
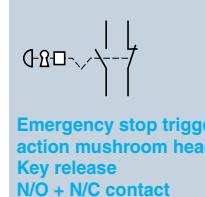
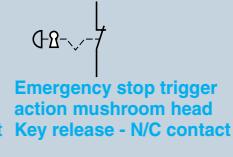
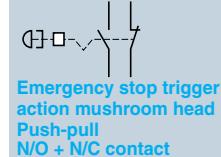
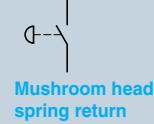
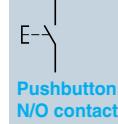
Characteristics: pages 2/6 to 2/9

References: pages 2/10 to 2/47

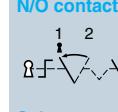
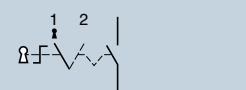
Dimensions: pages 2/48 to 2/55

Schematic library

Pushbuttons and Emergency stop pushbuttons



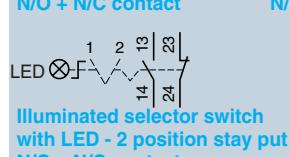
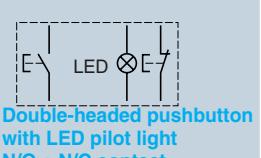
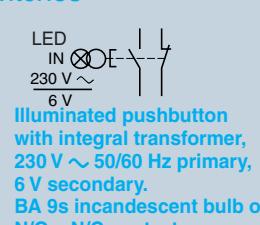
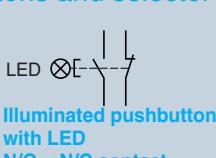
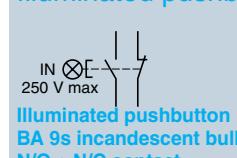
Selector switches



Pilot lights

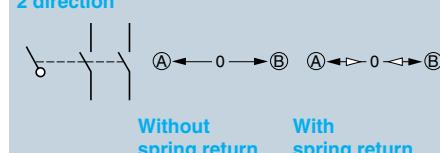


Illuminated pushbuttons and selector switches

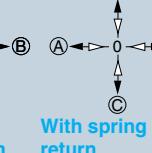
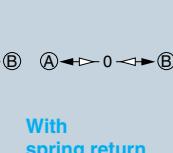
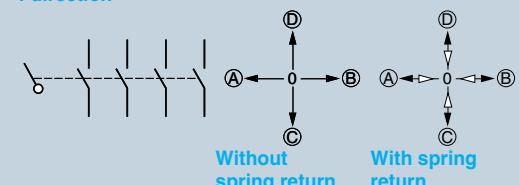


Joystick controllers

2 direction



4 direction



Non illuminated units
for user assemblyPushbuttons, spring return,
without marking

Contact functions

Body
sub-assembliesScrew clamp terminals
ZB5-AZ10/AZ141
see page 2/10Plug-in connector
ZB5-AZ10p4/AZ1414
see page 2/10Pushbuttons, spring return,
with marking

"Push-turn" pushbuttons

Double-headed pushbuttons,
spring return"Push-push to release"
pushbuttonsHead
sub-assemblies

Flush push

ZB5-AA0/AA9
see page 2/11

Projecting push

ZB5-AL●
see page 2/11

Flush push

ZB5-AA●3●/AA●4●
see page 2/12Lockable
ZB5-AFD
see page 2/12Knurled knob (1)
ZB5-AF
see page 2/12Flush pushes (IP 40/IP 66)
Without/with markingsZB5-AA81/AA82
see page 2/13Flush push
ZB5-AH0/CH0
see page 2/13Flush push for
insertion of legendZB5-AA●8
see page 2/11

Recessed push

ZB5-AA●4
see page 2/11

Booted flush push

ZB5-AP●/AP●8
see page 2/11

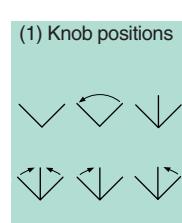
Projecting push

ZB5-CL●
see page 2/11

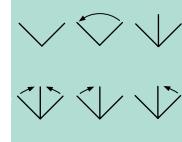
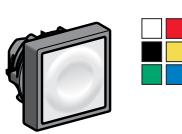
Flush push

ZB5-CA●8
see page 2/11

Flush push

ZB5-CA●3/CA●9
see page 2/12

(1) Knob positions

Flush push + Projecting push (IP 40/IP 66)
Without/with markingsZB5-AL83/AL84
see page 2/13Flush push
ZB5-CH●
see page 2/13

Flush push

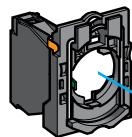
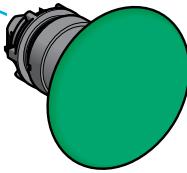
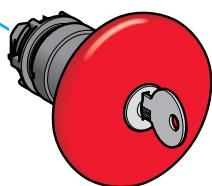
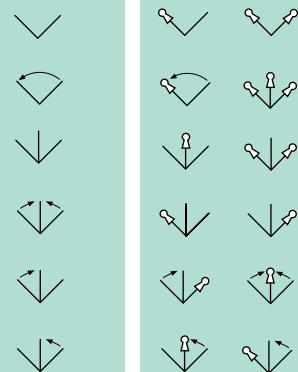
ZB5-CA●●
see page 2/11

Flush push

ZB5-CL●
see page 2/11

Non illuminated units
for user assembly
(continued)Mushroom head pushbuttons,
spring return

Contact functions (continued)

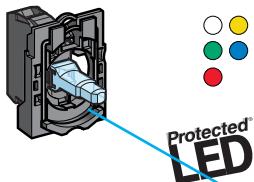
Body
sub-assembliesScrew clamp terminals
ZB5-AZ10●/AZ141
see page 2/10Head
sub-assemblies● ○ ■
Ø 30
Ø 40
Ø 60Spring return
ZB5-AC/AR
see page 2/14Mushroom head pushbuttons,
latchingPlug-in connector
ZB5-AZ10●4/AZ1414
see page 2/10Ø 30
Ø 40
Ø 60Push-pull
ZB5-AT84/AT●/AX●
see page 2/15●
Ø 30
Ø 40
Ø 60Key release
ZB5-AS9●4/AS7●/AS1●/AS2●
see page 2/15● ○ ■
Ø 30
Ø 40
Ø 60Turn to release
ZB5-AS8●4/AS4●/AS5●/AS6●
see page 2/15Selector switches
and key switchesStandard handle (1)
ZB5-AD●
see page 2/16Long blk. handle (1)
ZB5-AJ●
see page 2/17(1) Switch handle
and knob(2) Key withdrawal
positions for key
switches
Key withdrawal
positionsKnurled blk. knob (1)
ZB5-AD●9
see page 2/18Key switches (2)
ZB5-AG●/AG0●
see page 2/19

Toggle switches

2 positions
ZB5-AD●8
see page 2/19

Pilot lights
for user assembly

Signalling functions

Body sub-assemblies
Integral LED

Head sub-assemblies

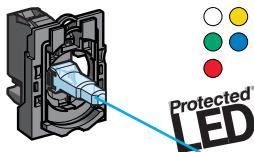


With lens mounted
ZB5-AV0●3
see page 2/21

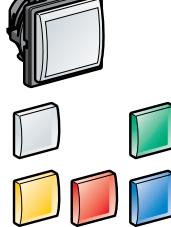


ZB5-CV0●3
see page 2/21

Screw clamp terminals
ZB5-AVB/AVG/AVM
see page 2/20

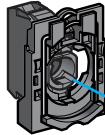


With 5 separate lenses
ZB5-AV003
see page 2/21



ZB5-CV003
see page 2/21

Plug-in connector
ZB5-AVB●4/AVG●4/AVM●4
see page 2/20

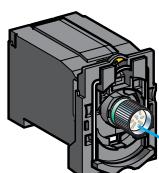
Body sub-assemblies
for BA 9s bulb

Head sub-assemblies



With lens mounted
ZB5-AV0●
see page 2/21

Direct supply
Screw clamp terminals
ZB5-AV6
see page 2/21



Via integral transformer
Screw clamp terminals
ZB5-AV●/AV3D●(1)/AV5D●(1)
see page 2/21

Control and signalling units Ø 22

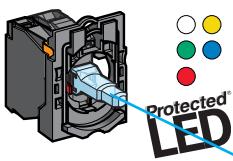
Harmony® style 5

Pushbuttons, switches and pilot lights, with double insulated bezel
Sub-assemblies, ZB5-A

Illuminated pushbuttons and selector switches for user assembly

Illuminated pushbuttons, spring return

Combined contact and signalling functions

Body sub-assemblies
Integral LED

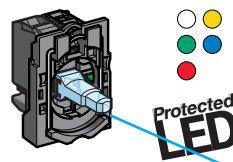
Head sub-assemblies



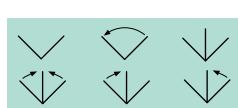
Flush push with cap mounted or not

ZB5-AW3●3/AW9●3
see page 2/29

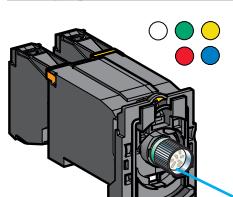
Flush push for insertion of legend

ZB5-AW5●3
see page 2/29Screw clamp terminals
ZB5-AW0B/AW0G/AW0M
see page 2/24

Projecting push

ZB5-AW1●3/AL●8
see page 2/29ZB5-CW3●3/CW1●3
see page 2/29Flush pushes
Without/with markingsZB5-AW81●●3,
see page 2/30Flush push + projecting push
Without/with markingsZB5-AW83●●3,
see page 2/30ZB5-AW84●●3
see page 2/30Flush or projecting
"push-push to release"
ZB5-AH0i3/AH●3
see page 2/30Selector switches with
standard handle
ZB5-AK1●i3
see page 2/31Body sub-assemblies
For BA 9s bulb

Head sub-assemblies

Flush push
ZB5-AW3●
see page 2/29Direct supply
Screw clamp terminals
ZB5-AW06●
see page 2/28Projecting push
ZB5-AW1●
see page 2/29Via integral transformer
Screw clamp terminals
ZB5-AW03/4/5/3D/5D
see page 2/28

Environment

Protective treatment standard version			"TH"
Ambient air temperature around the device	Storage	°C	- 40...+ 70
	Operation	°C	- 25...+ 70 unless otherwise stated
Electric shock protection	Conforming to IEC 536		Class II
Degree of protection	Conforming to IEC 529		IP 65, unless otherwise stated IP 66, for booted pushbutton heads
	Conforming to NEMA		NEMA type 4X and 13, unless otherwise stated
High pressure cleaning resistance		Pa	70 x 10 ⁵ (70 bar); distance: 0.1 m Temperature: 55°C
Mechanical shock protection	Conforming to EN 50102		Non illuminated heads: IK 03 Illuminated heads: IK 05
			IEC/EN 60947-1, IEC/EN 60947-5-1, IEC/EN 60947-5-4, JIS C 4520, UL 508, CSA C22-2 n° 14
Product certifications	UL Listed, CSA		Standard single contacts with screw clamp terminals: A600; Q600 Double contacts with screw clamp terminals: A600; Q600 Light blocks with screw clamp terminals Joystick controllers XD5-PA/ZD5-PA: A600; R300
	UL Recognized, CSA		Standard single contacts for plug-in connector: A300; R300 Standard single contacts for printed circuit board: B300; R300
	BV, RINA, LROS, DNV, GL (pending)		Standard single contacts and double contacts with screw clamp terminals
Terminal identification	Conforming to EN 50005 & EN 50013		

Characteristics of contact blocks

Mechanical characteristics

Contact operation	N/C or N/O		Slow break
Positive operation	Conforming to IEC/EN 60947-5-1 Appendix K		All functions incorporating a N/C contact are positive opening operation
Operating travel (to change electrical state)	Pushbutton	mm mm mm	Changing N/C state: 1.5 Changing N/O state: 2.6 Total travel: 4.3
Operating force	Pushbutton	N N	Changing N/C state: 3.5 Changing N/O state: 3.8
	Additional contact (extra to change state)	N N	Single N/C contact: 2 Single N/O contact: 2.3
		N N N	Double contact N/C: 3.4 Double contact N/O: 5 Double contact N/C + N/O: 4.6
	Emergency stop with N/C + N/O	N N	Standard push-pull: 45 Trigger action push-pull: 50
		N N	Standard turn to release and key release: 40 Trigger action turn to release and key release: 44

Characteristics of contact blocks (continued)

Mechanical characteristics (continued)

Operating torque (to change electrical state)	Selector switches	N.m	N/O contact: 0.14
	Additional contact (extra)	N.m	N/O contact: 0.05
Mechanical durability (in millions of operating cycles)	Pushbuttons	Spring return	5
		Double-headed	1
		Push-push to release	0.5
	Selector switches	Non illuminated	3
		Illuminated	1
	Toggle switches		0.5
	Emergency stop pushbuttons		0.3
	Joystick controllers		1
	Standard contact blocks		5
	Low power switching contact blocks		0.5
Vibration resistance	Conforming to IEC 68-2-6	gn	Frequency: 2 to 500 Hz: 5
Shock resistance	Conforming to IEC 68-2-27	gn	All functions except mushroom head pushbuttons
		gn	half sine wave acceleration 11 ms: 50
		gn	half sine wave acceleration 18 ms: 30
		gn	Mushroom head pushbuttons (half sine wave acceleration 11 ms: 10)

Electrical characteristics

Cabling capacity	Conforming to IEC/EN 60947-1	mm² mm²	Screw clamp terminals Min.: 1 x 0.22 without cable end Max.: 2 x 1.5 with cable end Cross headed screw (Pozidrive or Philips type 1), slotted for flat 4 and 5.5 mm screwdriver. Tightening torque: 0.8 N.m (max. 1.2 N.m)
Contact material	Silver alloy (Ag / Ni)		Standard single and double blocks with screw clamp terminals Blocks for plug-in connector Standard blocks for printed circuit board connection
	Gold flashed (Ag / Ni / Au)		Low power switching contact blocks with screw clamp terminals Low power switching contact blocks for printed circuit board connection
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A A A	Standard single and double blocks with screw clamp terminals: 10 (gG cartridge fuse conforming to IEC 269-1) Blocks for plug-in connector: 4 (gG cartridge fuse conforming to IEC 269-1) Standard blocks for printed circuit board connection: 4 (gG cartridge fuse conforming to IEC 269-1)
Nominal thermal current	Conforming to IEC/EN 60947-5-1	A A A	Standard single and double blocks with screw clamp terminals: 10 Blocks for plug-in connector: 10 Standard blocks for printed circuit board connection: 6
Rated insulation voltage	Conforming to IEC/EN 60947-1	V V V	Standard single and double blocks with screw clamp terminals: Ui = 600 degree of pollution 3 Blocks for plug-in connector or Faston connectors: Ui = 250 degree of pollution 3 Standard blocks for printed circuit board connection: Ui = 250 degree of pollution 3
Rated impulse withstand voltage	Conforming to IEC/EN 60947-1	kV kV kV	Standard single and double blocks with screw clamp terminals: Uimp = 6 Blocks for plug-in connector: Uimp = 4 Standard blocks for printed circuit board connection: Uimp = 4

Characteristics of contact blocks (continued)

Electrical characteristics (continued)

Characteristics

Control and signalling units Ø 22

Harmony® style 5

Pushbuttons, switches and pilot lights, with double insulated bezel

2

Characteristics of illuminated units (pilot lights, illuminated pushbuttons and illuminated switches)

Mechanical characteristics

Vibration resistance	Conforming to IEC 68-2-6	gn	Frequency: 12 to 500 Hz: 5
Shock resistance	Conforming to IEC 68-2-27	gn gn	Half sine wave acceleration 11 ms: 50 Half sine wave acceleration 18 ms: 30

Electrical characteristics

Cabling capacity	Conforming to IEC/EN 60947-1	mm ² mm ²	Screw clamp terminals Min.: 1 x 0.22 without cable end (1 x 0.34 for linking) Max.: 2 x 1.5 with cable end
Rated insulation voltage	Conforming to IEC/EN 60947-1	V V V	Direct supply pilot light blocks (BA 9s bulb): Ui = 250 degree of pollution 3 Pilot light blocks with integral LED: Ui = 250 degree of pollution 3 Pilot light blocks with transformer: Ui = 600 degree of pollution 3
Rated impulse withstand voltage	Conforming to IEC/EN 60947-1	kV kV kV	Direct supply pilot light blocks (BA 9s bulb): Uimp = 4 Pilot light blocks with integral LED: Uimp = 4 Pilot light blocks with transformer: Uimp = 6

Specific characteristics of light modules only, with integral LED

Voltage limits	Nominal voltage	V	12 V: 10 to 15 $\frac{V}{V}$; 10.2 to 13.8 \sim 24 V: 19.2 to 30 $\frac{V}{V}$; 21.6 to 26.4 \sim 24 to 120 V: 20 to 132 $\frac{V}{V}$ 48 to 120 V: 40 to 132 \sim 240 V: 195 to 264 \sim
Current consumption	Applicable to all colours	mA mA mA mA	\sim 12 V supply blocks: 18 \sim 24 V supply blocks: 18 \sim 120 V supply blocks: 14 \sim 240 V supply blocks: 14
Service life	At nominal voltage and at an ambient temperature of 25 °C	H	100,000
Surge withstand	Conforming to IEC 61000-4-5	kV	1
Resistance to fast transients	Conforming to IEC 61000-4-4	kV	2
Resistance to electromagnetic fields	Conforming to IEC 61000-4-3	V/m	10
Resistance to electrostatic discharges	Conforming to IEC 61000-4-2	kV	8/6
Direct parallel connection across inductive load E.g.: contactor coil or solenoid	Maximum power of load	VA	For applications involving high powers (\geq 30 VA), a ZBZ-V• LED suppressor must be connected across the light block terminals (see page 2/33)
Electromagnetic emission	Conforming to EN 55011		Class B

Specific characteristics

Body/fixing collar			
Tightening torque of fixing screw		N.m	0.8 (1.2 max.)
Hour counters and annunciations			
Voltage limits	Hour counter and annunciator	V	\pm 10% of the nominal voltage
Current consumption	Hour counter	mA	XB5-DSB (\sim 12 to 24 V): 7 to 15 XB5-DSG (\sim 120 V): 8 XB5-DSM (\sim 230 to 240 V): 8
	Annunciator	mA	5