



***industrial  
controls***






















# Control switches

## RM Series

**Control switches and indicating units 16, 22, 30mm  
Control stations 22, 30mm**


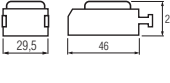

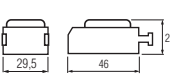



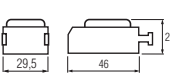

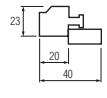


**Contact blocks**

	Function	Diagram	Code	
with screw terminals 	● 1NC		V40	
	● 1NO		V50	
	● 1NC late break		VR0	
	● 1NO early closure		VA0	
	(to connect eyelet terminals remove the coloured protection)			
with screw terminals 	● 1NC		G1769	
	● 1NO		G1770	
	● 1NC late break		G2545	
	● 1NO early closure		G2546	
	(base mounting type for PN control stations) IP20			
with faston terminals 	● 1NC		F40	
	● 1NO		F50	
	● 1NC late break		FR0	
	● 1NO early closure		FA0	
with faston terminals 	● 1NC+1NO		210	

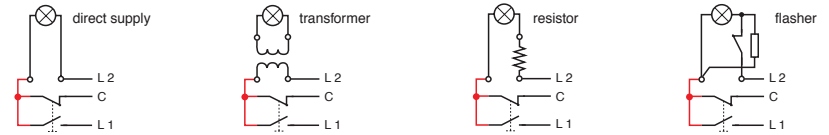
Writing connections should be in same polarity

**Power supplies**





	Voltages	Lamps	Code	
transformer 	110/6V	6.7.5V - 0.6.1.2W	T16	
	230/6V		T26	
	110/24V	24V - 1.2W	T12	
	230/24V		T22	
resistor 	110/48V	48V - 1.2W AC/DC	R14	
	230/130V	130V - 2W AC/DC	R21	
resistor with diode 	110/48V	48V - 1.2W AC	RD1	
	220/130V	130V - 2.6W AC	RD2	
flasher 	12..130V	2..12W AC/DC	L130	
full voltage module with lamp holder 	Base mounting for control station		G2134	
	Direct supply for modular illuminated control switches		G3820	

**Test pushbuttons**


Red marked connections are to be made in relation to the various types of power supplies



**Lamps**

	Voltages/Watt	Code	
BA 9s filament 	6V-1.2W	A14591/15	
	24V-2W	AP14591/6	
	36V-2W	A14591/18	
	48V-1.2W	AP14591/7	
	130V-2W	A14591/14	
BA 9s neon 	220V	A14591/13	
E10 filament 	24V-3W	AP11066/1	
E10 neon 	220V	AP11066/9	

**Led**

	Voltages/Watt	Code	
BA 9s Socket 	240 Vac-0.6W	Led 240 V	
		Led 240 R	
		Led 240 M	
		Led 240 A	
		Led 240 B	
	120 Vac-0.6W	Led 120 V	
		Led 120 R	
		Led 120 M	
		Led 120 A	
		Led 120 B	
	24 Vac/DC-0.5W	Led 24 V	
		Led 24 R	
	Led 24 M		
	Led 24 A		
	Led 24 B		

ALTERNATING CURRENT (IEC / EN 60947-5-1)

		Contact blocks									
		AGX001 (Ø 16 series)		V40-V50-V40-VRO-F40-F50-FA0-FR0 (Ø 22, 30 series)						210 (Ø 22, 30 series)	
Rated isolation voltage $U_i$	V	250 (60V Buzzer)		690						250	
Rated impulse voltage $U_{imp}$	kV	-		6						-	
Rated voltage $U_e$	V	100..125	200..220	24	48	110/120	240	400	500	600	250
<b>Rated current</b> $I_e$											
<b>AC-15</b> Electromagnetic loads >72VA	A	0,3	0,2	10	8,5	6,5	4,5	2,6	2,1	1,6	-
<b>AC-12</b> Resistive loads and solid state loads with insulation by opto couplers	A	1,5	1	-	-	-	-	-	-	-	-
<b>AC-13</b> Solid state loads with transformer insulation	A	1	0,7	-	-	-	-	-	-	-	-
<b>Minimum operating levels</b>		5V AC/DC - 2 mA			28V DC - 7 mA						
<b>Rated thermal current</b>											
open (IEC) $I_{th}$	A	5		12						10	
enclosed (IEC-UL/CSA) $I_{thE}$	A	-		10						10	
<b>Category / Protection class</b>		-		C Group (VDE01106) / Class II (CEI 23-11)						-	
<b>Wasted power</b> at thermal rated current $I_{thE}$	W	-		≤ 0,3						-	
<b>Short-circuit protection</b>		1 kA (fuse 1A)		1 kA (fuse NDZ 10A-500V gL/gG)						-	

		AGX001		V40, V50, F40, F50						
				VA0, VR0, FA0, FR0						
<b>RATED VOLTAGE</b> $U_e$	V	24	100..110	24	48	125	250	440	500	600
<b>DC-12</b> Resistive loads and solid state loads with insulation by opto couplers										
Rated current $I_e$	A	1	0,2	-	-	-	-	-	-	-
<b>DC-13</b> Control of electromagnets										
Rated current $I_e$	A	0,7	0,15	4	2	1,1	0,55	0,31	0,27	0,2
Electrical life in AC with $U_e, I_e$ (operations)		100.000		400.000 (AC-15)						
Electrical life in DC with $U_e, I_e$ (operations)		100.000		- (DC-13)						

UL / CSA		V40, V50, F40, F50		VA0, VR0, FA0, FR0		210		
<b>General use</b>		5A-250V AC 1A-24V DC 0,2A-125V DC		6A-600V AC / 6A-125V DC		6A-600V AC / 4A-125V DC		10A-300V AC
Heavy Pilot Duty (HD)	code designation			A600(HD)		A600(HD)		-
Standard Duty (SD)	code designation			P600 (SD)		P150 (SD)		B300(SD) P150(SD)

POWER SUPPLIES (Ø 22, 30 series)

		Direct supply		Transformer		Resistor		Flasher	
<b>Rated isolation voltage</b> $U_i$	V	250		-		250		250	
<b>Maximum rated voltage</b> $U_{e max}$	V	250		-		250		24 130	
Rated voltage primary circuit	V	-		110/220	110/220/380	110/220	220	-	
Rated voltage secondary circuit	V	-		6	24	48	130	-	
Frequency	Hz	-		50/60	50/60	-	-	50/60	50/60
Flash frequency at rated voltage (per min.)		-		-	-	-	-	70 ± 10	70 ± 5
Flash begins at minute - at rated voltage		-		-	-	-	-	< 20 sec	immediate
Power supply		AC-DC		AC		AC-DC		AC	AC
Rated power	W	2		0,6..1	2..3	1,2	2..2,6	2..12	1..12
Short-circuit resistant of the secondary circuit for building									
<b>Max. wire gauges</b>		A3		A2		A1		A3	
Terminal sizes according to IEC / EN 60947-5-1		1 x 0,5..3,3 o 2 x 2,5		1 x 1,2..5 o 2 x 2,5		1 x 0,75..1,5 o 2 x 1,5		1 x 0,5..3,3 o 2 x 2,5	
Rigid and stranded	N. x mm <sup>2</sup> N. x AWG	1 x 20..12 o 2 x 14		1 x 14..12 o 2 x 14		1 x 18..16 o 2 x 16		1 x 20..12 o 2 x 14	
<b>Terminals</b>	Type	screw		screw		screw		screw	
	Thread	M3,5		M3,5		M3,5		M3,5	
	Screwdriver size	3/2		3/2		2		3/2	

PILOT LIGHTS

		Ø 16 series		Ø 22, 30 series		Monolithic		Jumbo light	
						Ø 16		Ø 30	
Connection lamp holder		Midget Groove T1 3/4		BA 9s		BA 9s/E10		E14/BA 15d	
Rated voltage	W	1,2		2		3		6	
Rated isolation voltage $U_i$	V	250		250		250		250	
Maximum rated voltage $U_{e max}$	V	250		250		250		250	
Rated impulse voltage $U_{imp}$	kV	4		4		4		4	
Max. wire gauges				A3		B1		A1	
Terminal sizes according to IEC/EN 60947-1						2 x 0,75..1,5		2 x 0,75..1,5	
Stranded/Solid wire	N° x mm <sup>2</sup> N° x AWG	2 x 0,8 2 x 20		2 x 0,5..1,5 2 x 20..16		2 x 18..16		2 x 18..16	
<b>Terminals</b>	Recommended torque Nm			0,8		0,5		0,8	
	Type	soldering		screw		screw		screw	
	Thread			M3		M3		M3	
	Screwdriver size			2/-		2/-		2/-	

ENVIRONMENTAL DATA

		(Ø 16 series)		(Ø 22, 30 series - Monolithic signal - Jumbo light)	
<b>Ambient temperature:</b>	Operation:	-5°C ... +70°C		-25°C ... +60°C	
	Storage:	-25°C ... +80°C		-40°C ... +80°C	

		AGX001 (Ø 16 series)		V40-V50-VA0-VRO-F40-F50-FA0-FR0 (Ø 22, 30 series- Monolithic signal - Jumbo light)	
<b>MECHANICAL DATA</b>					
<b>Protection class</b> according to IEC / EN 60529		IP 40 (IP 65 selector switches)		IP65	
Front		IP00		IP20	
Base					
<b>Mechanical life</b> (Mio. operations)					
Illuminated / non-illuminated momentary pushbuttons		1		6	
Illuminated / non-illuminated maintained pushbuttons		1		1	
Non-illuminated selector switches		0,25		1	
Illuminated selector switches				0,2	
Emergency mushroom pushbutton				0,2	
Maintained mushroom pushbuttons				0,2	
Maintained push-on / push off pushbuttons				1	
Joy stick operators				1	
Control stations with momentary operators				6	
<b>Vibration withstand</b> (base mounting)					
Frequency	Hz			2..13,2 - 10..100Hz	
Amplitude/displacement width	mm			±1	
Acceleration amplitude	g			0,7	
<b>Max. wire gauges</b>				A3	
Terminal sizes according to IEC / EN 60947-5-1				1 x 0,5..3,3 o 2 x 2,5	
Rigid and stranded wire	N. x mm <sup>2</sup> N. x AWG	2 x 0,8 2 x 20		1 x 20..12 o 2 x 14	
<b>Terminals</b>	Type	soldering		screw	
	Thread			M3,5	
	Screwdriver size			3/2	
	Type	Clutch 1x2,8mm		Clutch 1x6,3mm or 2x2,8mm	
<b>Max. No. of contacts on operators</b>					
non-illuminated / illuminated with direct supply		4N0+4NC		4 (on 2 levels)	
non-illuminated selector switches		3N0+3NC		4 (on 2 levels)	
illuminated with transformer or resistor				2 (on 2 levels)	
illuminated / non-illuminated push-on / push-off				2 (on 1 level)	

APPROVALS

CE-Confimal  
CSA (Canada)  
R.I.Na. Italian Naval Register - Italy (Ø16 series not included)  
UR (USA)

## Specifications



### Colours according to IEC / EN 60204-1

Colours used for starting pushbuttons are white, grey or black, preferably white. Also green is permitted. Red is not to be used. Red must be used for emergency stop pushbuttons. Colours for stop pushbuttons are black, grey or white preferably black. Also red is permitted. Green is not to be used. White, grey and black are recommended colours for start/stop pushbuttons. Not to be

used colours are red, yellow or green. White, grey and black are recommended colours for maintained pushbuttons. Red, yellow or green are not to be used. Green is the colour reserved to those functions indicating standard or safety conditions. Yellow is the colour reserved to those functions indicating dangerous or non-standard conditions. Blue is the colour reserved to all compulsory functions. Reset pushbuttons must be blue, white, grey

or black. When used as stop/switch off pushbuttons, colours recommended are white, grey or black with a strong preference for black. Green is not to be used.

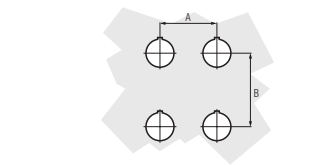
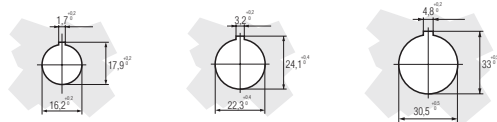
PUSHBUTTONS (NON-ILLUMINATED)	PILOT LIGHTS
<p><b>RED</b> <i>Emergency</i> (push in case of danger or emergency).</p>	<p><b>RED</b> <i>Emergency</i> (dangerous conditions). Immediate action to solve one dangerous situation (es. moving the emergency stop).</p>
<p><b>YELLOW</b> <i>Non-standard</i> (push in case of non-standard condition). To stop one non-standard condition or re-start one interrupted automatic cycle.</p>	<p><b>YELLOW</b> <i>Non-standard</i> (non-standard or difficult situation). Control or intervention (es. re-establishing the desired function).</p>
<p><b>GREEN</b> <i>Safety</i> (push in case of safety condition or to prepare one standard condition).</p>	<p><b>GREEN</b> <i>Standard</i> (standard condition). Authorization to proceed.</p>
<p><b>BLUE</b> <i>Compulsory</i> (push when a condition requires one compulsory action). Reset function.</p>	<p><b>BLUE</b> <i>Compulsory</i> (indicates that an operator intervention is needed). Obligation.</p>
<p><b>WHITE</b> <i>No particular meaning</i> For general start of functions excepted emergency stop ①. Start (optional) or stop.</p>	<p><b>WHITE</b> <i>Neutral</i> (control and general information). It can be used in any case of doubt as an alternative to red, yellow, green and blue.</p>
<p><b>GREY</b> <i>No particular meaning</i> For general start of functions excepted emergency stop ①. Start or stop.</p>	
<p><b>BLACK</b> <i>No particular meaning</i> or general start of functions excepted emergency stop ①. Stop (optional) or start.</p>	

① In case of use of an additional coding (for example body, shape, position) to identify pushbuttons actuators, the same colour white, grey or black can be employed for different functions (for example white for starting or stop actuators).

### Illuminated pushbuttons

Illuminated pushbuttons actuators must be coloured according to "Pushbuttons and pilot lights" colour code. When a suitable colour is difficult to be determined, it is necessary to use white.

### Mounting holes



	Ø16	Ø22	Ø30
<b>A</b>	25	30	50
<b>B</b>	25	50	65



BRETER has been established in the fifties as a manufacturer of switches for industrial applications and achieved a key specialist role in the market of electromechanical low-voltage industrial controls, especially due to its expertise on custom-designed products.

Product quality has been Breter distinctive and prestigious way to be successful through the years.

Thanks to its development and constructive policies, today Breter's strength is a unit of 20.000 square meters, a specialists equipe, the leading position into the major international markets besides Italy and a worldwide distribution network.

The Company works in Quality Warranty to ensure top quality levels, also confirmed by products conformity to UL/CSA and IEC/EN national and international regulation and a number of approvals.

Breter faces the future with technological innovations applied to design systems, workshop, production and Quality Warranty structures.

High innovative production organizations are based on automatic assembly lines and automatic injection plastic materials presses as well as advanced gears for quality control carried out on 100% of finished products.

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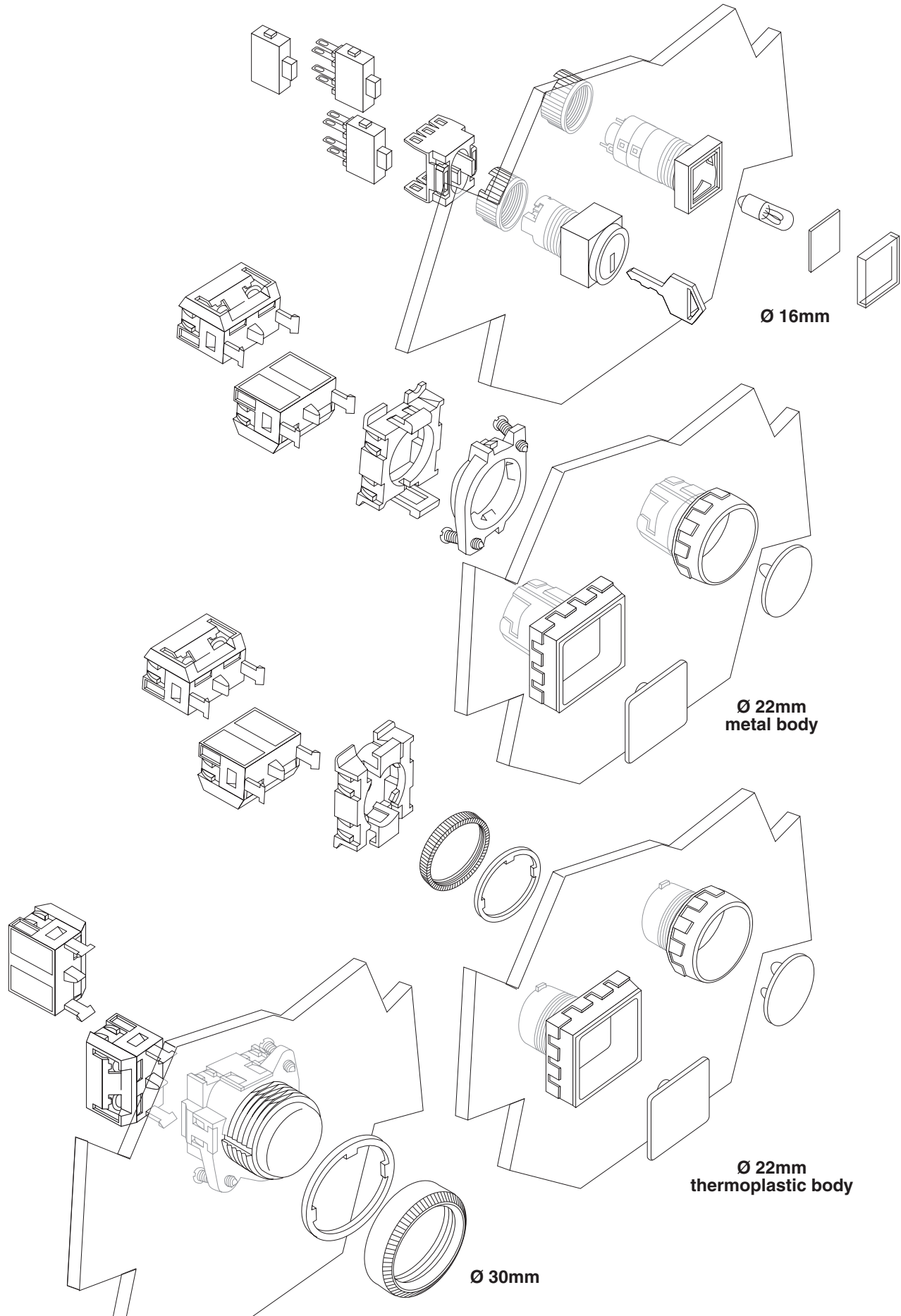
The Company Test Laboratory is equipped with gears and instruments suitable for electrical, mechanical and climatic high reliable tests both on prototypes and finished products.

Breter complete range of standard and special versions for all power and control functions in electrical and electronic applications is typically used by OEM, panel builders and installers in the following fields: tools and industrial machines, automation, transports, off-shore, lifting equipment, energy production and distribution.

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***industrial  
controls***



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**Control Switches RM 2004/E**