Bedienungsanleitung
Operating Instructions
Mode d'emploi

broncolor opus
broncolor opus A

Operating Instructions

broncolor
OPUS 2 / 4 / A2 / A4 / A8

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Important: Read before startup

- Prior to replacing fuses, light bulbs or flash tubes, discharge the power pack and disconnect from power supply. Disconnect the lamp base from the power pack.

- Only those types of fuses indicated on the fuse label should be used. This is particularly important when using the halogen lamp in the lamp base which may explode if the wrong fuse is used.

- Only sand-filled fuses should be used. Sand-filled fuses can be identified by the opaque body of the fuse.

- These units are designed for use in dry conditions. Protect them from water and from excessive exposure to dust.

- The units are not suitable for use in an environment where there is a risk of explosion.

- The accessories mounted onto the lamp bases may heat up to high temperatures under specific conditions. Handle with care!

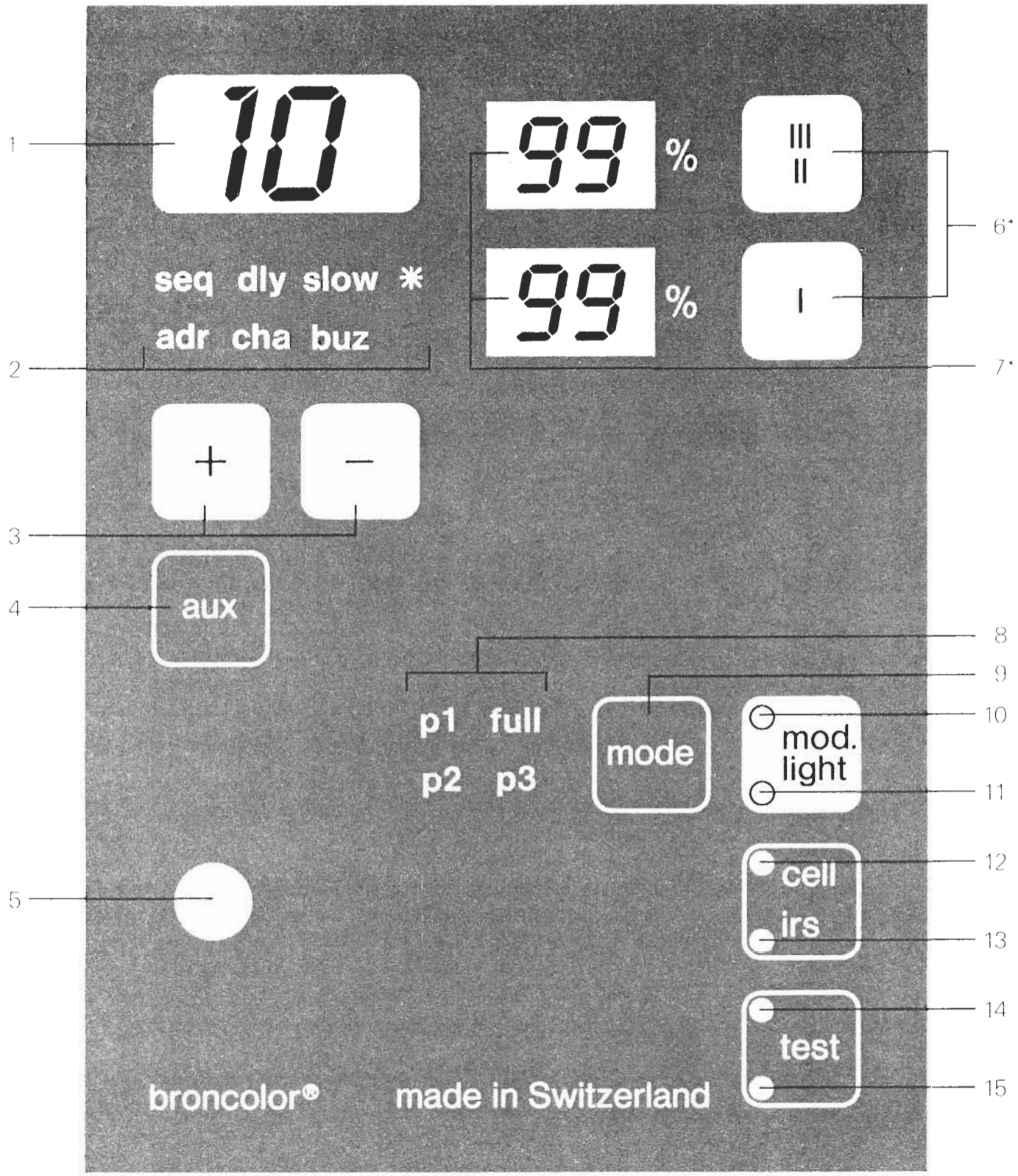
- With due allowance for heat radiation, lamp bases with more than 100 W modelling light may be directed against inflammable surfaces only at a minimum distance of 1 m.

- For safety reasons, never operate the lamps/compact units without the protecting glass in place.

- Flash light contains, similar to sunlight, a specific portion of UV light. The undesirable side effects on skin and eyes are considerably reduced by using flash tubes and glass covers with a UV coating. Without these or other protective filters, use extreme care when shooting.

- Even when disconnected from the power supply, dangerous voltages may remain inside the unit. For this reason units should be opened by trained personnel only.

- **broncolor** power packs and lamp bases meet an extremely high safety standard. When connecting **broncolor** products to other manufacturers' products, integrated safety measures may become ineffective. Due to different design features and contact assignment of the lamp plugs of other makes, the user himself may even be at risk. We offer no guarantee or liability for damages which may be caused by this type of usage.


1
10
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99
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6*
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seq dly slow *
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aux
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8
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p1 full
p2 p3
mode
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light
10
11
5
cell
irs
12
13
14
test
15
broncolor®
made in Switzerland

* Opus A only

Controls and displays

1 Digital output level display / additional functions display

2 Display of selected additional function

3 +/- Output control

4 Additional functions on/off key

5 Infrared receiver cell

6 On/off keys for lamp base outlets (Opus A only)

7 Digital output distribution display per lamp (Opus A only)

8 Modelling light mode display

9 Modelling light mode key

10 Luminous spot red, modelling light on

11 Luminous spot yellow, modelling light off

12 Slave cell on/off key

13 Infrared on/off key

14 Test firing key, green ready light

15 Slave cell signal

1. Startup

1.1 Mains voltage

Information on mains voltage is listed on the rating place on the bottom of the unit.

1.2 Grounded network

Connect unit to power network always using grounded mains plug.

1.3 Startup

Power up unit using the power switch on the side of the unit. After completion of the charging action, the green "ready" signal (14) will light up and the energy display (1) changes from a flashing to a continuous display.

2. Energy control (asymmetrical for Opus A only)

2.1.1 Opus 2/A2/4/A4

Use the "+/-" keys (3) to control flash energy (flash intensity) in the range of 4 f-stops in symmetrical and 3 f-stops in asymmetrical operations. A value of 10 in the display indicates maximum intensity, 6 resp. 7* minimum. Whole numbers are full f-stop intervals, decimals indicate 1/10 f-stop steps. Brief pressure on the "+/-" keys (3) runs the power up (or down) by a 1/10 f-stop interval, prolonged pressure by a full f-stop. The display (1) then blinks until charging or discharging has stabilised the new level. The outlets I and II/III can be let down by 2 7/10 f-stops (Chapter 2.3) in asymmetrical use.

2.1.2 Opus A8

Use the "+/-" keys (3) to control flash energy (flash intensity) in the range of 3 f-stops. Whole numbers are full f-stop intervals, decimals indicate 1/10 f-stop steps. Brief pressure on the "+/-" keys (3) runs the power up (or down) by a 1/10 f-stop interval, prolonged pressure by a full f-stop. The display (1) then blinks until charging or discharging has stabilised the new level. The outlets I and II/III can be let down by 1 3/10 f-stops (Chapter 2.3).

2.2 1/10 or 1/3 f-stop increments control

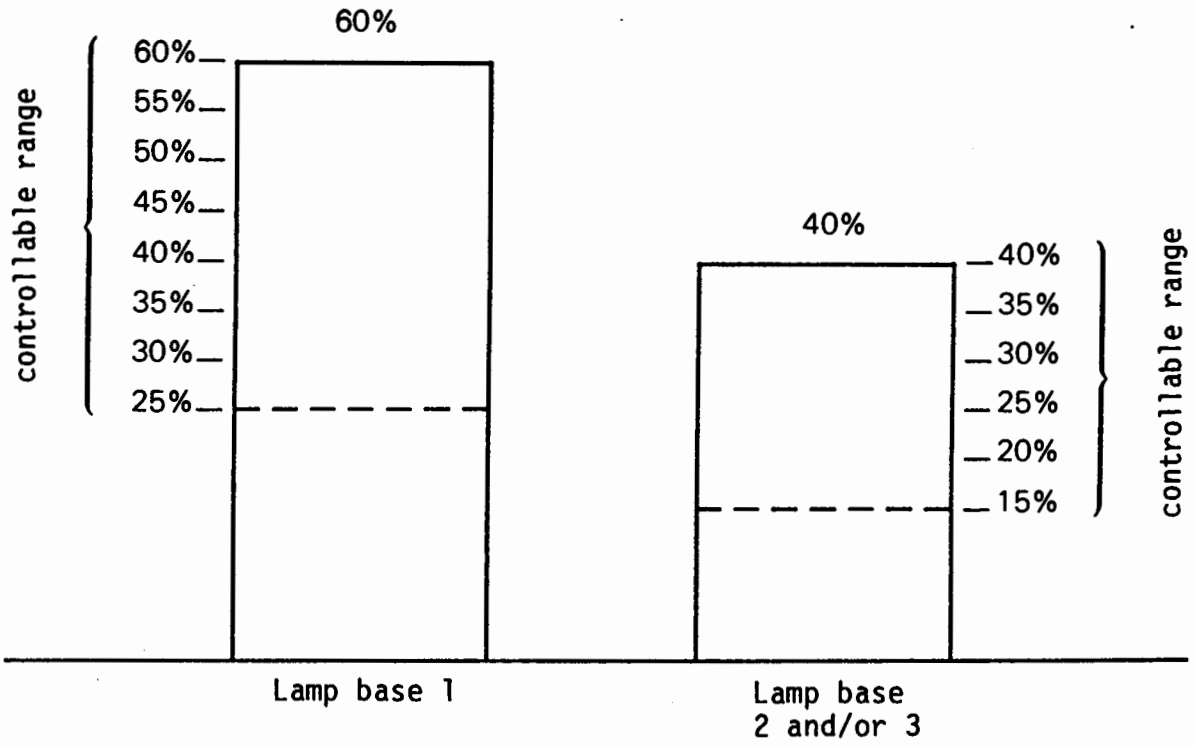
The fractional power level adjustment can be programmed for 1/10 or 1/3 f-stop intervals; the Pulso units are factory set to 1/10 steps. For reprogramming to 1/3 steps see Chapter 8.1 and 8.4.

2.3 Asymmetrical distribution (Opus A only)

Opus A power packs incorporate a circuit for selectively splitting the power between the lamp base outlets. Outputs "I" and "II/III" are separated from each other. Each output is controlled independent of the others. To set the power distribution, keep the key of the lamp base in question (6) pressed and adjust the power with the "+/-" keys (3).

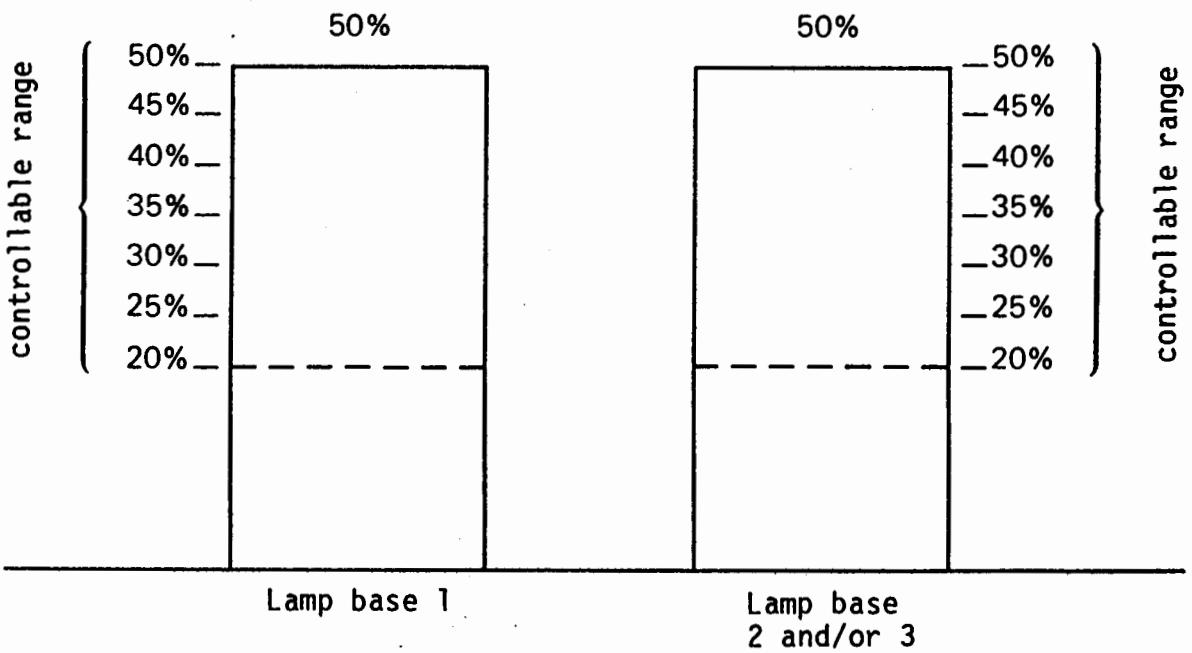
*Opus A only

Asymmetry control Opus A2/A4



Asymmetry control Opus A8

The asymmetry of Opus A8 differs from smaller units because outputs "I", "II/III" produce 50% of the total energy. Both outputs can be regulated separately as with Opus A2/A4, but cannot be switched to a single socket. The twin lamp, or any other lamp with 2 cables (Striplite, Cumulit etc.) can be used to receive the total energy via one single lamp.



3. Lamp base outlets

3.1 Lamp base connections of the Opus units are marked with the Roman numerals I to III. Opus A: The connections "I" and "II/III" may be switched individually. LED (7) indicates the percentage share of total energy for each separate lamp base. For newly connected lamp bases, the connection will be automatically activated.

4. Modelling light

4.1 The "mod.light" key (10) switches on the modelling lamps for all lamp bases plugged in. When switched on, the small red LED (Liquid Electronic Display) lights up; when switched off, the yellow LED lights up. Most lamp bases carry an additional modelling lamp switch. You may also operate the modelling light proportionally (Chapter 4.2) and adapt it to the various maximum outputs of **broncolor** power packs. To do so, use "mode" key (9) for selecting.

4.2 Proportionality

In field 8, you may select the various operating modes (modelling light proportionality) using the "mode" key. Stages p1, p2 and p3 are used to adapt the modelling light brightness of power packs with different output. The setting "modelling light proportional" duly allows for the output set, the number of lamp bases plus an asymmetrical energy distribution (opus A only).

The following operating modes are possible:

"p3" Proportional modelling light - brightest level with Opus 2/A2 and Pulso 2/A2.

"p2" Proportional modelling light - brightest level with Opus 4/A4/A8 and Pulso 4/A4.

"p1" This level allows matching of the Opus/Opus A units to the proportional control of the Pulso 8 power pack.

"full" All lamp bases with full modelling light, independent of flash output, type of power pack and output distribution.

Proportionality is guaranteed if the identical operating mode has been set for all power packs. The higher the digit, the brighter the modelling light. It is recommended to use the values on the table below for brightest viewing conditions.

Proportionality settings when combining packs of different output:

	Compuls 65	Compuls 95	Compuls 165	Opus Pulso 2/A2	Opus4/ A4/A8 Pulso 4/A4	Pulso 8
Compuls 65	4	4	3	3	2	--
Compuls 95	4	4	3	3	2	--
Compuls 165	3	3	3	3	2	1
Opus 2/A2, Pulso 2/A2	3	3	3	3	2	1
Opus 4/A4, A8, Pulso 4/A4	2	2	2	2	2	1
Pulso 8	--	--	1	1	1	1

Example 1: A power pack Opus A2 is operated together with a power pack Pulso 8. The modelling light is proportional when both are set to mode "p1".

Example 2: A power pack Opus 4 is operated together with a compact unit Compuls 95. The modelling light is proportional when both are set to mode "p2".

The power pack Opus 4/A4 (Opus A4 in symmetrical operation only) is provided with blockage for the position "p3". Cancelling this inhibition will allow a higher modelling light level if at least 2 lamp bases are connected. (To cancel the blockage, please refer to Chapter 8.1 and 8.3).

4.3 Reduced modelling light intensity (with low-power mains supplies)
To avoid overloading the mains supply, the 100-120 volt versions of the Opus power packs reduce the modelling light intensity during charging. You can clear this factory-installed program if the power rating of the mains supply is sufficient - see key combinations in section 8.1 and 8.7 of the programming additional functions. When working with limited-power on the mains supplies you can also slow down the charging rate with the additional functions "slow" - this reduces the risk of blowing the supply fuses.

4.4 Modelling light switch on lamp base
The switch on Pulso lamp bases permits selective lighting control with the modelling light. To avoid damage to the lamp filament, always switch off the modelling light before moving the lamp base.

5. Release and remote control

5.1 Slave cell (cell) and Infrared receiver (IRS)
The slave cell and IR receiver can be switched separately. The two small red LEDs (12) within the key area light up to show which function is on.

5.2 Infrared flash triggering channels (IRI, IRS, IRS-E)

You can fire Opus units from IRI, IRS-E, and IRS infrared transmitters. These use two different channels (IRI one channel only) for selective triggering of specific power packs or groups - e.g. on different sets in the same studio.

Select "adr" (2) by pressing the "aux" key (4) longer. Continue by a brief pressing of "aux" (4) to "cha" (2). In the left section of the LED display, "I" or "II" will start flashing. You are now in the program level for the Servor remote control channels (Chapter 5.6).

An additonal brief pressing of "aux" allows you access to the program level to select the IR flash release channel. The digits 1, 2 or 3 will be flashing. Set channel 1, 2 or 3 via the "+/-" keys.

Standard factory setting is 3, i.e. the unit will release in response to all release signals of all transmitters independent of the channel set on the transmitter. Operation with a transmitter without channel selection (IRI and older IR transmitters) is possible on this setting only. On this setting, the unit will also work together with other units fitted with IR release (404, Impact, Flashman, Compuls), in which case the slave cell must be activated at the same time.

If a selective release is to be triggered in one room on two work stations, please keep the following points in mind:

- In the same room, no other units except Opus, Opus A, Pulso and Pulso A may be operated.
- All power packs must be set either on IR channel 1 or IR channel 2 (i.e. selectively).
- The slave cell on all units must be shut off.
- Only 2-channel transmitters can be used.

5.3 Synchro jack

Synchronous cables art. no. 34.111.00 or 34.112.00 may be plugged into the jack to release flashes via cable.

5.4 "Test" key

This key (14) allows manual release of the powerpack as soon as 70% of the set energy is available.

5.5 Remote Control

The remote control of the power packs Opus/ Opus A is operated by the Remote Control unit Servor 3, whereby the following has to be considered:

- It is not possible to use remote control for the alternation of symmetry/asymmetry or for the variation of asymmetry.
- When addressing the Opus with the Servor remote control, operation corresponds to the one of Pulso A.
- When Pulso A is coupled with the remote control Servor 3, the system functions differently from Opus in several ways: (e.g. 4 lamp connections, functions aid t.01, focus light modus low, power reduction down until to 4.0). The use of corresponding keys on the Opus has no effect.

5.6 Servor power pack addresses

Addresses will be assigned to the individual power packs for individual control. On the power pack, select "adr" (2) by a prolonged pressure on the "aux" key (4). Following this, set the intended address 1 to 8 using the "+/-" keys (3).

5.7 Servor remote control channels

Remote control may be performed via 2 separate channels (studio work stations). Each channel contains 8 adresses. Select "adr" (2) by a prolonged pressure on the "aux" (4) key. Continue by briefly pressing "aux" for "cha". The selected display (I or II) will flash. Now set the channel I or II by pressing the "+/-" keys (3).
In doing so, observe the Roman numerals only. The number of the IR flash release channel (Chapter 5.2).

6. Flash ready signals

6.1 The **visual signal** is the green LED within the "test" key (14). It lights up only when the unit is fully charged. After a test flash this LED goes out and lights up again when the unit is fully charged once more.

6.2 The **audible signal** "buz" sounds when the power capacitors are 100% charged up. It may be switched on ("on") or off ("-") with the "+/-" keys following to pressing "aux" once long and three times briefly.

6.3 Audible fault signal (Opus A only)

When the flash discharge fails, a warning signal of some 3 sec. duration will be set and the display of the relevant lamp base will flash.

7. Additional functions

The **broncolor** power packs Opus/Opus A are equipped with additional functions, e.g. flash series or release delays can be programmed.

7.1 Setting additional functions

A brief pressing of the "aux" key (4) generates a switching of the lighted numerical field to additional functions or to the next additional function and at the end to leaving the program level.

"seq"	=	Flash sequences (Chapter 7.1.1)
"dly"	=	Release delay (Chapter 7.1.2)
"slow"	=	Slow charging (Chapter 7.1.3)
"*"	=	Selectable definable additional functions (Chapter 7.1.4)
	-	Alternating release (ping-pong release) (prog. no. 15, Chapter 7.1.4.1)
	-	Sequence shift (1st. delay) (prog. no. 16, Chapter 7.1.4.2.)

The function displays "seq", "dly", "slow", "*" may display three operating modes:

Blinking display:	= Entry of a value with "+/-" keys. Clear with "+/-" keys till the digital display shows "-".
Steady display:	= Shows that an input was stored.
Flickering display:	= A desired effect cannot be achieved because of an incorrect combination of two or more functions. Select relevant display by "aux" and change the setting by "+/-" until the display stops flickering.

Saving the functions

The input values are saved on loss of mains supply power (for whatever reason) - with the exception of the "seq", "dly", "slow" and "*" functions. Power failure or switching off clears these functions and so avoids operating errors after a prolonged idle interval. (Chapter 8.1 and 8.6)

A run of the flash sequences or the release delay may be interrupted by the "aux", "+" or "-" key.

7.1.1 Flash sequences "seq"

In "seq" mode you can select a number of flashes to be triggered in succession. Brief pressure on the "+/-" (3) keys adjust the number of flashes in single units, while a prolonged pressure changes it in multiples of ten - up to a maximum of 51 flashes in series.
Triggering via a cable, the IRS or by hand starts the flash sequence. The digital display counts down the number of flashes.

If the flash sequence is released via the photocell, the illuminated dot "cell" will flash, indicating that an additional attempt to release via the photocell is blocked in order to prevent any unintentional flashing of a new series. Press the "cell" key to cancel the inhibition. The remaining types of releases are not affected by this blocking. When several series are repeated, the integrated thermal monitor may respond. In order to protect the unit against overheating, the flash series will be interrupted. The display shows th = thermo. The unit will not operate until cooled down.

7.1.2 Release delay "dly"

In "dly" mode you can delay triggering the flash by 0.1 to 9.9 sec. Brief pressure on the "+/-" keys (3) runs up 0.1 sec intervals, prolonged pressure full seconds.

When using several power packs set to different delay times this mode can generate stroboscopic multiple exposure effects.

The slave cell is locked out after firing in "dly" mode (Chapter 7.1.1). Clear with the "cell" key (12).

7.1.3 Slow charging "slow"

In case of weak mains power supply lines, charging time may be extended using the "slow" (2) mode. By briefly pressing the "+/-" keys, this function may be switched on and off. If "dly" and "seq" are set at the same time, the function slow charging is not possible.

7.1.4 Random definable additional functions "*"

7.1.4.1 Alternating release (ping-pong)

This provides the option of determining the release sequence of a maximum of 8 power packs, i.e., only one power pack triggers per IR signal, while the others are at rest.

Example: 3 Opus A power packs

1st IR signal triggers the 1st power pack
2nd IR signal triggers the 2nd power pack
3rd IR signal triggers the 3rd power pack
4th IR signal triggers the 1st power pack
5th IR signal triggers the 2nd power pack
etc.

This function allows the shooting of very fast photographic sequences with a motor-driven camera (Chapter 8.1 and 8.15)

7.1.4.2 Sequence shift (1st delay)

The sequence shift may be used only in conjunction with the release delay "dly" and flash series "seq".

With a normal "dly", the time delay between the trigger command, the initial flash and a possibly following sequence is identical. Using this "sequence shift", it is now possible to set the delay between the trigger command and the initial flash differently from the time interval within the following sequence. First set the desired number of flashes on each power pack. Then set "dly" to the desired value (note: minimum recharging delay of the power pack depends on the power setting). Subsequently divide the delay value time "dly" by the number of power packs used and enter this in the "*" function.

7.2 Secondary additional functions "adr", "cha", "buz"

These functions are set by prolonged pressure on the "aux" key (4).

"adr" = Power pack addresses for remote control (Chapter 5.5)
"cha" = Remote control channel (Chapter 5.6, Roman numerals)
"cha" = IRS triggering channel (Chapter 6.2, Arab numerals)
"buz" = Audible signal (Chapter 6.2)

8. Programming additional functions

8.1 With the unit switched on, press the keys "aux" (4) and "mode" (9) simultaneously for approx. 3 sec. (now, "*", "p1" and the number of the program version will be displayed.) After an additional brief pressing of the "aux" key, the program address number will be displayed together with the abbreviation "adr". You may now select the intended program address using the "+/-" keys. After another brief pressing of the "aux" key ("adr" changes to "*"), you may now either change the program function using "+/-" or read it (e.g. flash counter).

In order to return to the main menu, press the "aux" key for a number of seconds.

	Program address = display and "adr"	Display and "*"	Switch by	Function
8.2	0	0.00	-	<u>Program version display</u> Cannot be changed.
8.3	1	on/-	+/-	<u>Modelling light proportionality lock</u> Opus 4/A4 power packs are factory-programmed to lock out the "p3" proportionality setting. Cancel by selecting "-" with the "+/-" keys. (Do this only when using 2 or more lamp bases.)
8.4	2	10-6/.3	+/-	<u>f-stop display mode</u> 1/10 f-stop intervals The Opus units can display flash output in 1/10 f-stop intervals over a range of 4 f-stop (in symmetrical operations). All Opus power packs are factory-set to show values from 10 to 6, with 10 indicating the maximum and 6 the minimum output level. You can shift this 4 f-stop display range downwards to match up Opus power packs of different power (Opus 2/A2-Opus 4/A4), so that the same value indicates the same flash intensity on each. E.g. Opus 2 value 8 = 1600 J Opus 4 value 9 = 3200 J Pulso 8 value 10 = 6400 J

	Display and "adr"	Display and "*"	Switch by	Function
	2	10-6/.3	+/-	1/10 f-stops 10 9 8 7 6 10 9 9 8 8 8 7 7 7 7 6 6 6 6 6 5 5 5 5 4 4 4 3 3 2 1/3 f-stops .3 +9 8 7 6 5 4 -3 Use the "+/-" keys to shift the display range by selecting 10, 9, 8, 7 or 6 at maximum display. With the remote control Servor 3, we recommend retaining the standard setting (maximum energy 10) since complications in the display in the command mode "all" may arise otherwise. For 1/3 f-stop intervals use the "+/-" keys to set the display to .3. This then shows power levels from +9 (highest) to -3 (lowest).
8.5	3	on/-	+/-	<u>Auxiliary ignition for "Varipuls"</u> When using Opus power packs with Varipuls switch off the auxiliary ignition. **Attention:** By switched off auxiliary ignition directly connected lamp bases may not flash perfectly in all situations.
8.6	4	on/-	+/-	<u>Saving additional functions</u> Opus power packs are factory-set to clear all programming function adjustments on loss of mains supply power. This avoids operating errors on subsequent startup. If you select "on" with the "+/-" keys the data remain stored even during a mains power failure.

	Display and "adr"	Display and "*"	Switch by	Function
8.7	6	on/-	+/-	<u>Reduced modelling light intensity during charging</u> The modelling light intensity can be reduced during charging, also on a weak power supply (lighting circuits). Switch on this reduction by selecting "on" with the "+/-" keys.
8.8	7	20 = 200V 22 = 220V or 10 = 100V 11 = 117V	+/-	<u>Voltage adaptor for modelling light</u> Use "+/-" to switch from 220 V to 200 V or from 117 V to 100 V.
8.9	8		mode	<u>Flash counter</u> A 6-digit counter counts every flash discharge. The number of flashes fired appears in: p1 = 0 - 99 p2 = 1XX - 9'9XX p3 = 1X'XXX - 99X'XXX The flash counter is not set to zero when delivered to the customer since a quality check is made at the factory prior to delivery.
8.10	10	on/-	-	<u>Servor</u> (broncolor remote control) The receiver for the Servor signals can only be shut off by the service department.
8.11	11	-	-	<u>Power pack versions</u> for servicing information.
8.12	12	00.00	mode	<u>Delivery date to customer</u> p1: month 00 p2: year 00
8.13	13	00.00	mode	<u>Last servicing date</u> p1: month 00 p2: year 00
8.14	14	00	-	<u>Country code</u> for sales and queries.

	Display and "adr"	Display and "*"	Switch by	Function
8.15	15	on/-	+/-	"*" Alternating release (ping-pong) 1st number (to the left of the dot) = number of power packs. The number of power packs may be raised to a maximum of 8 by a prolonged pressing of the "+/-" keys for approx. 2 sec. (in the program level seq, dly, slow and *). 2nd number (to the right of the dot) = position within the flash sequence. By a brief pressing of the "+/-" keys (in the program level seq, dly, slow and *), the position within the flash sequence may be set. This function may not be activated if "seq" and "dly" are set.
8.16	16	on/-	+/-	"*" Sequence shift (1st delay) Sequence shift may be activated only if "seq" and "dly" are set. By a short pressure on the "+/-" keys (in the program level seq, dly, slow and *), the tenth values, by prolonged pressure unit values will be set.
8.17	17	- b -b	+/-	Display type of asymmetrical energy distribution With this function, the energy distribution of the Opus A units may be displayed in various fashions. By briefly pressing the "+/-" keys, the display may be switched from % to f-stop difference or decimal value (similar to output display): - means % b means decimal value -b means f-stop difference as compared to the main display (negative).

9. Protective facilities / Fault indication

9.1 Cooling

Fan will be powered up after a number of flashes for a specific time.

9.2 th-display

To protect against overheating after extended series of flashes, the unit will power down for a number of minutes. During this process, the display will show "th" for "thermo". In this condition, the power pack should remain ON so that temperature can be monitored electronically.

9.3 Al

In case of an afterglow of an older flash tube, the display will show the alarm message "Al".

10. Lamp bases

Lamp bases and accessories of broncolor Pulso system may be used without restriction.

10.1 Replace flash tubes

Prior to any changing of the flash tube, make sure that the lamp base is disconnected from the power pack.

Pulso lamp bases use plug-in flash tubes. A protective glass cover fits over the flash tube and modelling lamp and is held in place by three springs. This glass cover is available in three versions with and without UV-absorbing coatings: clear 5900 K, UVE 5500 K and UV 5100 K.

On Pulso 4 lamp bases, the UV coating is on the glass dome; the flash tube for thermal reasons is clear.
On Pulso 2 lamp bases, the UV coating is normally applied directly to the tube. Any glass cover used must be clear. Upon request, the Pulso 2 lamp base may also be supplied with a clear tube and a coated glass cover.

To change the flash tube, carefully pull off the glass cover. Pull straight, without tilting. Push back the reflector section to grip the flash tube by its base and pull out of the fitting. Again be sure to pull straight along the lamp base axis. When inserting the same tube check the ceramic base is fully pushed back in.

Get an authorized servicing agency to change flash tubes in lamp units with fixed tubes (Boxlite).

10.2 Changing the tungsten-halogen lamp

Depending on the voltage version, Pulso lamp bases use either plug-in or screw-in tungsten-halogen lamps. The 200-240 volt models use 650 watt pin-based lamps, the 100-120 volt models use 250 watt lamps with a screw cap.

Only sand-filled fuses of the type indicated on the rating plate may be used; otherwise, the halogen lamp may explode.

10.3 Cooling fan

A cooling fan in the lamp base cools the flash tube and modelling lamp. It also runs when the modelling lamp is switched off.

10.4 Thermal protection

The lamp bases have been fitted with an automatic thermal protection. Should the lamp base overheat (e.g. by impending the flow of cooling air), the modelling light is shut off. Nevertheless, you may continue producing flashes.

10.5 Lamp base plugs

The lamp base plugs and sockets carry mechanical interlocks to prevent inadvertent disconnection. To plug in, insert the plug with its protruding spur in the socket and then push down. To unplug, push down the locking spring below the cable guide and lift out the plug.

10.6 Reflectors

Pulso lamp bases have a bayonet fitting to take reflektors. A lock prevents accidental disengagement and allows reflector rotation through 360°. The sliding catch on the lamp base releases the reflector.

11. Technical data

	Opus 2/A2	Opus 4/A4	Opus A8	
Flash energy	1600 J	3200 J	2 x 3200 J	
f-stop at a distance of 2 m (6 1/2 ft) 100 ISO, reflector P 70	64 1/10	90 1/10	Twin lamp base/Reflector P 65 128 1/10	
Flash duration t 0.1 (t 0.5)			Socket 1	Socket 2/3
1 lamp base	1/230 (1/700)	1/120 (1/350)	1/120 (1/350)	1/120 (1/350)
2 lamp bases	1(390 (1/1200)	1/230 (1/700)	-	1/230 (1/700)
3 lamp bases	1/530 (1/1700)	1/270 (1/850)	-	-
	Flash duration may be halved by using a Pulso Twin lamp base			
Charging time (for 100%of selected energy)	2: 0,5 - 1,8 s A2: 0,2 - 1,8 s switchable to slow recharge	4: 1,0 - 3,5 s A4: 0,4 - 3,5 s	0,8 - 6,9 s	
Ready display	optical, buzz (may be shut off)			
Lamp base connections	3	3	3	
Power output distribution	2/4: symmetrical A2/A4: symmetrical or asymmetrical		symmetrical or asymmetrical	
Control	Dust and scratch-resistand foil keyboard, important functions are remote controllable			
Control range	2/4: 4 f-stops in symmetrical operating A2/A4: 5 7/10 f-stops in asymmetrical operating mode switchable in 1/10 or 1/3 stop increments		4 3/10 f-stops (5 3/10 with Pulso modeTwin 4)	
Modelling light	Halogen max. 3 x 650 W at 200 - 240 V Halogen max. 3 x 300 W at 100 - 120 V Proportional to flash energy plus full light. Proportionality adaptable to all Pulso/A and Compuls units.			
Additional functions	Flash sequences "seq", Release delay "dly", Slow charging "slow", Alternating release Sequence shift			
Flash release	IRS 2-channel transmitter, wireless, photocell, sync cable, manual release button, FM, FCM, FCC			
Stabilized flash voltage	+/- 1%			
Interference suppressor	SEV, VDE N degree			
Power requirements	200 - 240 V 10 A / 100 - 120 V 15 A			
Dimensions mm	180 x 288 x 275,5	180 x 288 367,5	180 x 288 x 459,5	
Weight kg	7,3 / 7,45	10,3 / 10,45	15,55	

Subject to change in the interest of technical development.

12. Brief Operating Instructions

(The numbers in brackets correspond to the directions and reading elements on page 4.)

Energy
Chapter 2

Symmetric with "+/-" (3) keys from display 10 to 6.0
Asymmetric with "+/-" (3) keys from display 10 to 7.0
in 1/3 or 1/30 f-stop increments.

Modelling light
Chapter 4

On/Off with "mod.light" key (10)
red LED (Liquid Electronic Display) = modelling light on
yellow LED (Liquid Electr. Display) = modelling light off
May be switched with "mode" key (9) on "prop 1 to 3" and "full"

Asymmetry

Chapter 2.3

May be switched with rotary button.

outlet I Opus A2/A4: 60% - 25% OpusA8 50% - 20%
outlets II/III 40% - 15% 50% - 20%
Keep I or II/III pressed down and set value by using keys "+/-" value.

IRS (infrared)
Chapter 5.1

On/Off with "cell/irs" key (12)

Cell
Chapter 5.1

On/Off with "cell/irs" key (12)

Aux

Chapter 7

The additional functions can be recalled as follows:

Short pressing of **"aux"** key allows access to "seq" (flash sequences), "dly" (release delay), "slow" (slow charging) and "*" (programmable additional functions). Set intended value using "+/-".
Prolonged pressing of **"aux"** key allows access to "adr" (power pack addresses), "cha" (studio channel, "IR" channel), "buz" (acoustic signal). Set intended value using "+/-". Recommended standard setting: cha = I.3.

Test

The "test" key (14) allows the release of a flash. The green LED (Liquid Electronic Display) shows the power pack is ready.

Programming
Chapter 8

With the unit switched on, press the keys "aux" (4) and "mode" (9) simultaneously for approx. 3 sec. (Now, "*", "p1" and the number of the program version will be displayed.) After an additional brief pressing of the "aux" (4) key, the program address number will be displayed together with the abbreviation "adr". You may now select the intended program address using the "+/-" keys.

adr 2 - f-stop display mode (1/10, 1/3, scaling)
adr 4 - Saving additional functions in case of power failure
adr 6 - Reduced modelling light intensity during charging
adr 15 - Ping-pong release
adr 16 - Sequence shift (with "seq", "dly" only)
adr 17 - Display type of asymmetrical energy distribution (Opus A only)

After another brief pressing of the "aux" key ("adr" changes to "*"), you may now either change the program function using "+/-" or read it (e.g. flash counter).

In order to return to the main menu, press the "aux" (4) key for a second.