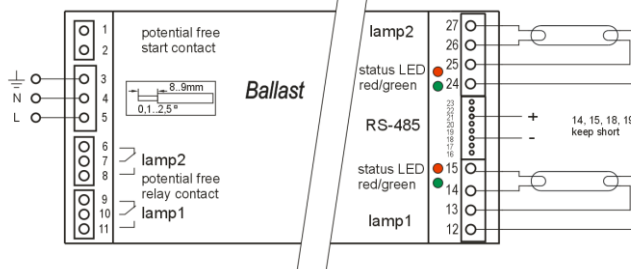


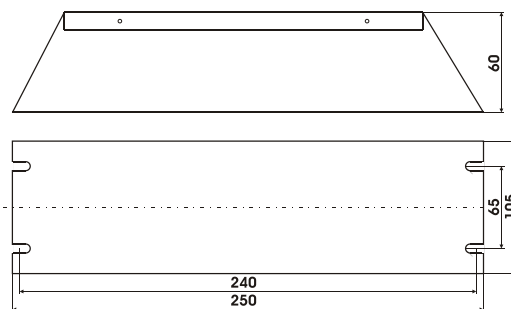
Electronic Ballast for UVC-Lamps with adjustable Lamp Current



Wiring



Dimensions



Features

- Controller based design (Cut-Off preheat start)
- Lamp current adjustable in steps
- Remote control via RS-485 interface
- 2 separate working lamp channels
- External/internal start alternatively
- Inrush current limiter
- 2 potential free relay contacts

Technical Data

| | |
|---|--|
| Type | LT-UVC 2x (100..200) W 1,2 A .. 2,1 A |
| Supply | 208/230 V AC ± 10 % 50/60 Hz |
| Input power min. / max. | 220 W .. 450 W |
| Output power two lamp application | 2x 100 W .. 2x 200 W |
| Adjustable range of lamp current | (1,2 A / 1,5 A / 1,8 A / 2,0 A / 2,1 A) ± 10 % |
| Powerfactor | > 0,95 |
| Efficiency | > 0,9 |
| Operating frequency | approx. 26..50 kHz |
| Inrush current | $\hat{I} < 40 \text{ A to } 30 \mu\text{s} / \hat{I} < 30 \text{ A to } 300 \mu\text{s}$ |
| Relay Contact | 1 changeover contact |
| Relay Contact – Maximum switching voltage | 5 A 250 V AC / 5 A 24 V DC (resistive load) |
| Relay Contact – Recommended range | ≥ 12 V / 10 mA |
| External start input | 10..230 V AC / DC (potential free) |
| Internal / external start | Adjustable by rotating switch. |
| Independent | 1 channel fails, other channel keeps in operation |
| Standby power dissipation | approx. 2 W |
| CE-conformity | yes |

Type coding

| | |
|---|--|
| C | Preheat start ballast (Cut-Off Technology) |
| M | Potential free relay contact |
| E | External start input |
| I | – selection lamp current – RS-485 interface |

Adjustment of lamp current

| | | |
|---|---|---|
| Adjustment by rotary switch on top of the ballast | | Pos. 0..4: internal start (local start) – ballast starts automatically after mains turn on Pos. 5..9: external start (remote start) – ballast starts by external start signal at the start input No warranty for damages caused by incompatible lamps or wrong adjustments! |
| Lamp typ | On request | |
| Adjustment of lamp current parameters | Must be carried out before voltage application, switching during operation will not be detected | |

Adjustment of lamp current

| Switch | Lamp current | preheat current maximal |
|--------|--------------|-------------------------|
| 0/5 | 1,2 A | 1,6 A |
| 1/6 | 1,5 A | 1,6 A |
| 2/7 | 1,8 A | 2,9 A |
| 3/8 | 2,0 A | 2,1 A |
| 4/9 | 2,1 A | 2,9 A |

Monitoring

| | |
|------------------------------------|---|
| Mains Control | Switch off at permanent under – or over voltage |
| Temperature | Switch off at permanent over temperature |
| Lamp presence | No start if no lamp is connected |
| Deactivated lamp, rectifier effect | Switch off |
| Shortage on the lamp line | Switch off |
| End of life lamp | Switch off |

General indications

| | |
|----------------------------|--|
| Operation | LED green – trouble free operation |
| Failure | LED red – failure, no operation |
| Potential free contact PFK | Relay on – trouble free operation Relay off – failure or ballast does not start (Standby) |

State indications operation/failure

| Ballast status | PFK | LED green | LED red | Description | Cause |
|----------------------------------|-----|-----------------|-----------------|--|---|
| No start condition | Off | Permanent blink | Permanent blink | Ballast waits for start | - Under- or over voltage mains - Over temperature - no lamp connected - No HI level at the external start input |
| Ballast start/ procedure | Off | On | On | Lamp starts | |
| Ballast works trouble free | On | On | Off | Electronic ballast / lamp – normal mode | |
| Failure Temperature | Off | Off | 1x blinking | Cut off at over temperature Ambient temperature too high Temperature at tc to high | - Wrong installation - No heat dissipation , surface of housing too small |
| Under voltage mains | Off | Off | 2x blinking | Switch off at wrong mains | - Mains voltage under limit |
| Over voltage mains | Off | Off | 3x blinking | Switch off at wrong mains | - Mains voltage over limit |
| Failure lamp voltage | Off | Off | 4x blinking | Switch off Lamp voltage out of tolerance | - Wrong lamp type in use - End of lamp life - Deactivated lamp under operation - Rectifier effect of lamp - Start with deactivated lamp |
| Failure over current half bridge | Off | Off | 5x blinking | Switch off by over current half bridge (abnormal operation) | - Wrong lamp wiring - Shortage on lamp lines - Start without lamps |

Mounting instructions

| | |
|--------------------------|--|
| Designed for | Installations in switch cabinet |
| International protection | IP20 |
| Dimension of case | 250 x 105 x 60 mm |
| Installation position | Vertical, mains terminal below |
| Ambient temperature | ta = 0..40 °C |
| Temperature at tc-point | tc = 50 °C max. maximum case temperature |

Cabling

| | |
|---------------------------------|------------|
| Max. length of lamp cables | < 5 m |
| Max. capacitance of lamp cables | < 150 pF/m |
| Screened lamp cables permitted | yes |

Terminal blocks

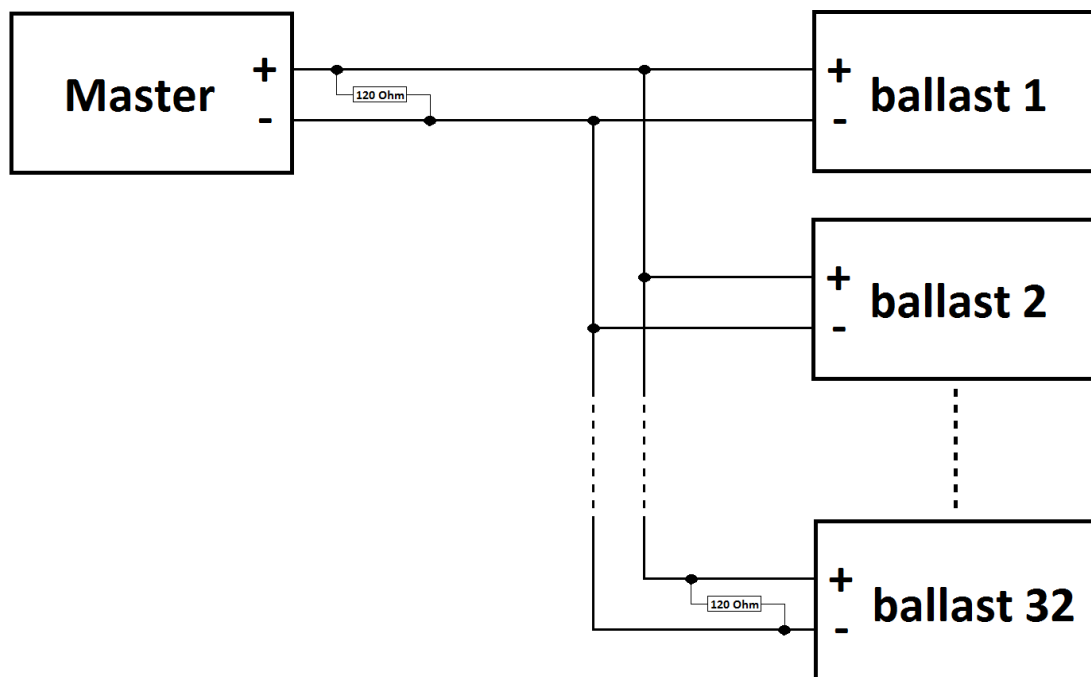
| | |
|--|---|
| Mains Wago 231-303 3 pole Spacing 5,08 mm | Cross section: 0,75–2,5 mm ² (solid) Cross section: 0,75–1,5 mm ² (fine-stranded with ferrule) |
| Lamp Wago 231-304 4 pole Spacing 5,08 mm | Cross section: 0,75–2,5 mm ² (solid) Cross section: 0,75–1,5 mm ² (fine-stranded with ferrule) |
| potential free relay contacts Wago 734-203 3 pole Spacing 3,81 mm | Cross section: 0,2–1,5 mm ² (solid) Cross section: 0,25–1,0 mm ² (fine-stranded with ferrule) |
| external start input Wago 734-202 2 pole Spacing 3,81 mm | Cross section: 0,2–1,5 mm ² (solid) Cross section: 0,25–1,0 mm ² (fine-stranded with ferrule) |

Communication parameters

| | |
|-----------|------|
| Baud rate | 9600 |
| Date bit | 8 |
| Stop bit | 1 |
| Parity | none |

Wiring RS-485 interface

| | |
|--------------------------|--|
| Maximum number of slaves | 32 |
| Bus termination | 120 Ohm resistor at both ends of the network |



Addressing

| Ballast-address | DIP-switch | | | | |
|-----------------|------------|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 1 | 0 | 0 | 0 | 0 | 0 |
| 2 | 1 | 0 | 0 | 0 | 0 |
| 3 | 0 | 1 | 0 | 0 | 0 |
| 4 | 1 | 1 | 0 | 0 | 0 |
| 5 | 0 | 0 | 1 | 0 | 0 |
| 6 | 1 | 0 | 1 | 0 | 0 |
| 7 | 0 | 1 | 1 | 0 | 0 |
| 8 | 1 | 1 | 1 | 0 | 0 |
| 9 | 0 | 0 | 0 | 1 | 0 |
| 10 | 1 | 0 | 0 | 1 | 0 |
| 11 | 0 | 1 | 0 | 1 | 0 |
| 12 | 1 | 1 | 0 | 1 | 0 |
| 13 | 0 | 0 | 1 | 1 | 0 |
| 14 | 1 | 0 | 1 | 1 | 0 |
| 15 | 0 | 1 | 1 | 1 | 0 |
| 16 | 1 | 1 | 1 | 1 | 0 |
| 17 | 0 | 0 | 0 | 0 | 1 |
| 18 | 1 | 0 | 0 | 0 | 1 |
| 19 | 0 | 1 | 0 | 0 | 1 |
| 20 | 1 | 1 | 0 | 0 | 1 |
| 21 | 0 | 0 | 1 | 0 | 1 |
| 22 | 1 | 0 | 1 | 0 | 1 |
| 23 | 0 | 1 | 1 | 0 | 1 |
| 24 | 1 | 1 | 1 | 0 | 1 |
| 25 | 0 | 0 | 0 | 1 | 1 |
| 26 | 1 | 0 | 0 | 1 | 1 |
| 27 | 0 | 1 | 0 | 1 | 1 |
| 28 | 1 | 1 | 0 | 1 | 1 |
| 29 | 0 | 0 | 1 | 1 | 1 |
| 30 | 1 | 0 | 1 | 1 | 1 |
| 31 | 0 | 1 | 1 | 1 | 1 |
| 32 | 1 | 1 | 1 | 1 | 1 |

Function code

| Function code | MODBUS function | Register |
|---------------|------------------------------|-------------|
| 01 | Read Boolean variables | 1 - 3 |
| 03 | Read Numeric variables | 4001 - 4017 |
| 05 | Set Single Boolean variables | 1 - 3 |

Data

| Register | Address | Name | Description | Data type |
|----------|---------|--|---|-----------|
| 1 | 0x00 | Power | 0 = ON (ballast works) 1 = OFF (ballast in standby) | Boolean |
| 2 | 0x01 | RESET lamp 1 Operating time counter/Start counter | 0 = Operating 1 = Set counter to 0 | Boolean |
| 3 | 0x02 | RESET lamp 2 Operating time counter/Start counter | 0 = Operating 1 = Set counter to 0 | Boolean |
| 4001 | 0x00 | Ballast address | Displays the set ballast address (1 - 32) | Word |
| 4002 | 0x01 | Ballast type | 1 = LT-UVC2x(30..80)W-R/M/E/I 0,35..0,8 A 2 = LT-UVC2x(30..80)W-R/M/E/I 0,8..1,5 A 3 = LT-UVC2x(60..100)W-R/M/E/I 0,35..0,65 A 4 = LT-UVC2x(80..125)W-R/M/E/I 0,8..1,5 A 5 = LT-UVC2x(100..200)W-C/M/E/I 1,2..2,1 A | Word |
| 4003 | 0x02 | Switch position | Displays the adjustment of lamp current (0 - 9) | Word |

| | | | | |
|------|------|---|---|------|
| 4004 | 0x03 | State lamp 1 | 1 = Ballast start 2 = Lamp preheating 3 = Ballast works 4 = Ballast waits for start 5 = Reserved 6 = Failure – Temperature 7 = Failure – Under voltage mains 8 = Failure – Over voltage mains 9 = Failure – Lamp voltage 10 = Failure – Over current 11 = Failure – Over current Preheating | Word |
| 4005 | 0x04 | State lamp 2 | 1 = Ballast start 2 = Lamp preheating 3 = Ballast works 4 = Ballast waits for start 5 = Reserved 6 = Failure – Temperature 7 = Failure – Under voltage mains 8 = Failure – Over voltage mains 9 = Failure – Lamp voltage 10 = Failure – Over current 11 = Failure – Over current Preheating | Word |
| 4006 | 0x05 | Operating time counter lamp 1 - Minute | Displays the operating time in minutes (0 - 60 min.) - counter only works in state 3 - | Word |
| 4007 | 0x06 | Operating time counter lamp 1 - Hour | Displays the operating time in hours (0 - 65535 h) - counter only works in state 3 - | Word |
| 4008 | 0x07 | Operating time counter lamp 2 - Minute | Displays the operating time in minutes (0 - 60 min.) - counter only works in state 3 - | Word |
| 4009 | 0x08 | Operating time counter lamp 2 - Hour | Displays the operating time in hours (0 - 65535 h) - counter only works in state 3 - | Word |
| 4010 | 0x09 | Start counter lamp1 | Displays the number of lamp starts (0 - 65535) | Word |
| 4011 | 0x0A | Start counter lamp2 | Displays the number of lamp starts (0 - 65535) | Word |
| 4012 | 0x0B | Ballast temperature | Displays the temperature of the ballast in °C (ballast switch off at approx. 80 °C) - does not reflect the temperature at the case($t_{c-point}$) - | Word |
| 4013 | 0x0C | Main voltage | 1 = Mains voltage under limit ($U_{Netz} < 187 V$) 2 = Typical tolerance ($187 V < U_{Netz} < 253 V$) 3 = Mains voltage over limit ($U_{Netz} > 253 V$) | Word |
| 4014 | 0x0D | Lamp voltage lamp 1 | Displays the lamp voltage in V ($\pm 10\%$) | Word |
| 4014 | 0x0D | Lamp voltage lamp 2 | Displays the lamp voltage in V ($\pm 10\%$) | Word |
| 4014 | 0x0D | Lamp current lamp 1 | Displays the lamp current in mA ($\pm 10\%$) | Word |
| 4014 | 0x0D | Lamp current lamp 2 | Displays the lamp current in mA ($\pm 10\%$) | Word |

Checksum

| | |
|-----------------------|--------|
| Calculation algorithm | CRC 16 |
| Generator polynomial | 0x8005 |
| CRC-start value | 0xFFFF |

Error control

| Error code | Description |
|------------|------------------------------------|
| 0x01 | Using an unsupported function code |
| 0x02 | Using an invalid memory address |