Solid State AC-Power supply for uv-lamps up to 7,500 W

BLP 75

BLP 75

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1 General

1.1 How does it work

The BLP 75 are full electronic, controllable AC power supplies for uv-lamps from about 5000 to 7500 watts nominal power and designed for standard industrial purposes (e.g. not for use in ships, due to the high vibrations there). It is tuned especially to operate with mercury discharge uv-lamps. The lamps are driven with square-wave current, through this the obscuring period during the zero-axis crossing of current, occurring at sinus-shaped supply (standard power supply), is dropped.

The BLP 75 is designed to be mounted in a cabinet or similar housing (it has IP 20).

Principle of function is a controllable constant current source. The lamp current may be in a large range between 1.8 and 18A. In practice an integrated interface unit controls **lamp power** to a constant value, depending to an extern DC 0...10V signal. Within a range of about 100 to 450V of nominal lamp voltages a power range of about 750 to 7500W is possible, but depending from the lamp data. Usually a power range for a specific lamp from 10 to 100% power is possible, but also depending from lamp type and lamp cooling.

So all lamps with electrical data's in the mentioned area could be connected to the same power supply!

The power supply ensures a good galvanic isolation between mains and control voltage levels, and gives interface to the electric control unit, e.g. a PLC. This interface is designed for controlling lamp power constantly. It is adjusted by an analogous voltage of DC 0....10V.

With the analogous input the lamp will be switched ON/OFF and adjusted for power.

Since switching is via semiconductors, there is no mechanical shut off as required by VDE or IEC, (necessary during servicing!) An additional mains contactor or mains switch is therefore recommended.

An analogues output (DC 0...10V) transmits the lamp voltage outwards for monitoring the lamp, and, together with one separate contact, for monitoring some special faults. To this output could be connected e.g. a voltmeter with colored scale (yellow, green, red = burn-in, good operation, fault) for optical control or the analogous input of a PLC for automatic monitoring the lamp.

Air cooling of this units is be ensured by 2 factory side equipped fans (max. 40°C ambient air temperature is recommended !).

1.2 Special advantages of this solid state power supply

step less controlling of lamp power
different lamps could be connected at the same power supply
very quick lamp power pulsing possible
automatic constant lamp power
3-phase symmetrical mains connection
easy to built in and less wiring
no ignitor needed
less heavy according to a standard 7,5 kW power supply
CE sign
designed in accordance with EN 50178 / VDE 0160, European and world wide standards

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2 Technical Data

2.1 General

Can operate mercury and metal halide lamps without any changes to the power supply.

Lamp power remote control

Lamp voltage monitor

Up-to-date FET technology

Air cooling

Efficiency	typical 92%
Ambient temperature range:	**+0 to +40° C**, see Derating Curve in 5.1, too
Storage temperature range:	-10 to +70° C
Protection degree	IP 20
Built-in position BLP 75	primarily upright with connectors down, or horizontal
Dimensions:	400 x 125 x 270 mm, incl. fan plus ≥ 35mm for undisturbed airflow
Weight:	~ 14 kg

2.2 Mains Input

Mains voltage and frequency:	
nominal:	3x 400 to 480V ±6% / 50 and 60Hz 3x 380V –10% = 342V min. is possible too, but with reduced lamp voltage to max. 430V !
short time:	3x 480V +10% for 1h within 24h operation
Mains connection:	3 phases plus Protective Earth (PE)

CAUTION: If connected to an IT-mains network (network with Neutral or Star Point NOT connected to PE) please contact your supplier. According to principle function of the missing phase protection, the BLP could be switched off by monitoring “missing phase” without a real missing phase.

Power factor	max. 0,75 at max. power
Fuse protection needed:	motor protection switch; setting current I_a could be calculated as follows: $I_a = 1{,}08 * P_{UV} / (U_{mains} * 0{,}75 * \sqrt{3})$ with P_{UV} = power of uv-lamp [W] U_{mains-} = actual mains voltage 3x 16A or 20A fuse link „gL“ could also be used
Typical inrush current when connected to mains:	typical 240A (0,01ms), 100A (0,3ms)
Remark:	This values are important for the right choice of a mains contactor, otherwise the contacts could be destroyed in the long run (contacts melt together).
Inrush current when starting the uv-lamp:	no inrush current
EMC	EN 55011, group I, class A (industrial areas)
Cooling fan	internally supplied

2.3 Output for UV lamps

Lamp current about (the lowest lamp current depends on the lamp and its cooling conditions, possibly a lamp switches off at approx. 3 or 4 A)	1.8 to 18A continuos
Frequency	about 255 Hz, rectangular
Suitable for nominal lamp voltage from	100 to 450 V to reach full max. power of BLP a higher than 100V operation voltage for the lamp will be recommended, due to the max. output lamp current of 18A, e.g. with 200V lamp voltage * 18A max. current a max power of 3600W is possible !

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Continuous power output	up to 7500 W; good air cooling is recommended.

It is possible to pulse lamp power between min. and max. values within very short times, e.g. 750 W and up to 7500W.

Pulse operation: (10-100%)	lamp current rise up time lamp current fall down time	≤ 2 ms ≤ 3 ms
Integrated ignition unit	Us = approx. 2x 2000V symmetric	

Power Supply is protected against short circuit on the output circuit

Power Supply is protected against ground fault on the output circuit

Power Supply is protected against open circuit (no lamp connected or cable disconnection)

Recommended maximum cable length (distance between power supply and uv-lamp):

for Hg lamps	max. 15 m
for doped lamps:	max. 10 m

(this values depends from cable capacitance and lamp igniting behavior)

Cable should be shielded, due to the EMC-Standards. Shield must be grounded only on 1 side !!

2.4 Controlling and Indications

Mains ON delay time	After applying mains to the BLP the unit needs a delay time of ≤ 5 sec. to be clear to operate. **Advice:** while this ON delay time, the fault monitoring contact may cause short and irregular switching!
analogous input for lamp power control:	DC 0...10V, $R_i \geq 5$ kΩ (input resistance) DC 0...0.5V = OFF DC 1...10V = ON and lamp power 10...100% within limits 1.8...18A DC 8…10V = ignition, apply min. 5sec.
Advice: for lamp starting (burn in) a high DC input voltage is recommended, such as DC 8...10V. After burn in reduce lamp power to the appropriate power of the lamp.	
limits	max. DC 10V, short time up to DC 15V (max. 5 sec.)
analogous output for lamp voltage monitoring:	DC 0...8V = AC 0...500V lamp voltage (= ratio 1:62,5) DC 8,0...8,5V = BLP ready, input OFF DC 8,0...10V = BLP ignites and/or lamp OFF DC 0...10V, 3mA, (short circuit protected)
in case of a fault (fault monitoring contact closed)	DC 0.2...1.5V = BLP overtemperature and/or fan faulty DC 2.0...4.0V = ground fault in lamp circuit DC 5.0...7.0V = missed phase on mains (t > 1 sec.)
digital output for fault monitoring	potential free contact, closes when any fault is monitored
contact data	voltage max. DC 48 V current max. DC 0,2 A insulation voltage against PE max. AC 60 V / DC 100 V

If a fault is monitored, lamp will be switched off automatically and the fault monitoring switch will be closed. Simultaneously the DC 0...10V output voltage runs up to ≥ 10V for 1 second, to allow programs, designed for the older ALP 50, to detect a fault as well.

Notice: in case of a fault do not switch off mains immediately, otherwise you get no monitoring from the BLP.

Reset: Overtemperature and Missing Phase faults will reset automatically if fault disappears. In case of Ground Fault mains have to be disconnected to the BLP for at least 20 seconds.

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2.5 Cooling

An efficient cooling of the BLP 75 is important for the maximum possible output power and especially for life time.
BLP 75 is equipped with two fans mounted in the middle on the rips of the cooling unit and on the side to cool the unit inside. Both fans are monitored by their turns per minute. If one fails, the BLP reacts with a “over temperature” monitoring.

Cooling depends from the amount of airflow through the rips of the cooling unit and the temperature of air as well as the ambient temperature. **Care have been taken to insure max. 40°C cooling air temperature in any case!**

It is recommended, that no heat producing parts radiate its IR to the BLP! In case apply a shielding by e.g. metal sheets.

Nevertheless, it is very important to run the units as cool as ever possible to have a long time and reliable operation. Imagine as a general rule for electronics: 10 K less results in double life time! 10 K more results in half life time!

2.6 Repair of BLP 75

Practice has shown, that the BLP 75 is a high reliable electronic power supply. Equipped with ground fault protection there should be nearly no extern fault, which could destroy the unit. But if it happens, it could be repaired by the manufacturer, because of its modular inner design.

If the BLP is opened from customer side (broken label), the warranty is void !

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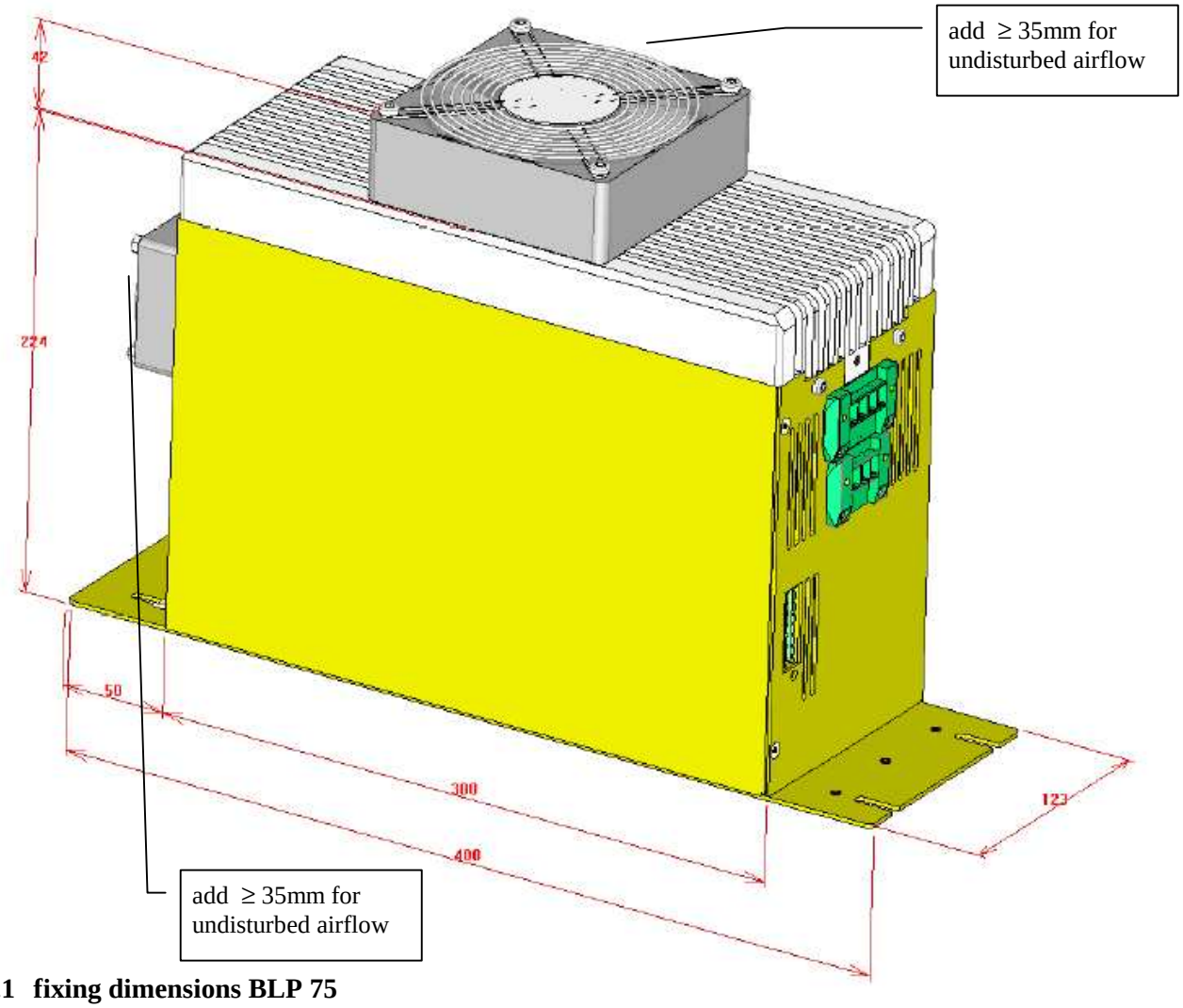
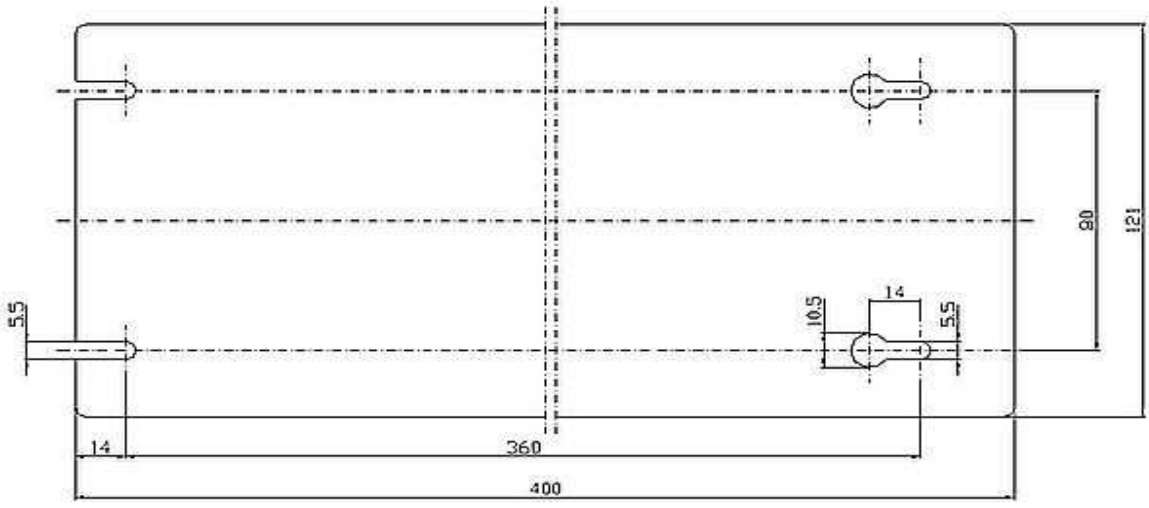
2.7 Dimensions BLP 75



2.7.1 fixing dimensions BLP 75



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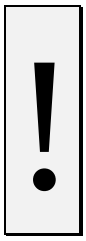
3 Safety Requirements:



To minimize the risk of electric shock while e.g. make service at the uv-lamp connected to the output of the power supply, it is important to switch off mains with a main switch or mains contactor in accordance with the national standards, before working at the parts connected to the power supply.

Reason: The uv-lamp is switched off by semiconductors, which have a high but not infinite resistance. So electric shock may occur, if mains is not disconnected.

3.1 Instructions for Instrument Safety concerning Protective Earth Conductor Connection

3.1.1 General:

For noise elimination, there are installed three-phase current line filters in the electronic power supplies. For these line filters, which are necessary in these power categories, it is impossible to manage with discharge currents, which are smaller than 3.5 mA. Therefore, in accordance to the current Standards, appropriate precautionary measures have to be carried out.
We start the following contemplations from the assumption that our instruments operate in plants, which are solid connected with mains.
In accordance to EN 50176 (VDE0160) April 1998 Section 5.3.2.1 "Discharge Current via the Protective Earth Conductor" one of the following measures has to be taken:

a) Cross section of the protective earth conductor has to be at least 10 mm^2 Cu.
   NOTE: This minimum cross section was established out of consideration for its mechanical strength.
b) Monitoring of protective earth conductor by a facility, which leads to independent switching-off of the electronic equipment in case of failure.
c) Wiring of a second conductor, electrical parallel to the protective earth conductor, via separate terminals. This conductor by itself has to comply with the demands for the protective conductor.

3.1.2 Fault-Current Circuit Breaker

Above mentioned “b)” is complied with this. Additionally the following should be taken into consideration:
Our electronic equipment can carry a DC leakage in case of failure. Therefore a special fault-current circuit breaker has to be used, which releases at DC fault.
Also attention has to be paid to a peculiarity of the three-phase line filter:
In normal case, when all three phases are applied to, the discharge current is typically under 30 mA. In case of missing phase or phases or in the moment of switching on or off, there can occur asymmetries, in consequence of which the current values can be up to 180 mA.
If several power supplies are installed in the machine, it is impossible to use a fault-current circuit breaker. The Standard speaks here about incompatibility of protective measures.

Therefore one of the following measures has to be applied:

3.1.3 Connection of Protective Earth Conductor with at least 10 mm^2 Cu

Our units BLP 75 have a separate M5-screw at their case for connection of protective earth conductor. Via this screw the demanded 10 mm^2 Cu-wire has to be contacted safely with the unit and has to be routed to the electric distribution.

With the above mentioned notes we want to give support to the user. In the end the user himself is responsible for the compliance with the relevant Standards and their realization.

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4 Trouble shooting BLP 75

fault	measuring/ indication	reason	elimination
BLP 75 or lamp could not be switched on auto turn off while running	fault monitoring contact not closed and DC-output voltage about ≥ 8.0 V	DC input voltage < 8,0V reignition after switch off will not run because of still too hot uv-lamp uv-lamp switched off itself, is destroyed or a too long mains short cut occurred lamp too cold and shut off when running in stand by a longer time	apply DC input ≥ 8V for ignition wait for cooling down lamp check uv-lamp check terminations and wiring to the lamp Check cooling of lamp
same	fault monitoring contact closed and DC-output voltage 5.0...7.0 V	missed phase in main (t > 1 sec.) or isolated/asymmetrical grounded mains supply system (e.g. one phase grounded (Japan) or IT-network = Neutral not grounded)	check mains fuses etc. check terminations and mains contactor (1 contact burned out ?) automatic RESET when all 3 phases are reconnected In case of an asymmetrical or IT-network system the Missing Phase detection must be deactivated (ask your supplier)
same	fault monitoring contact closed and DC-output voltage 2.0...4.0 V	ground fault in lamp circuit	check terminations and wiring to the lamp RESET by switching OFF-ON mains for at least 20 sec. OFF
same	fault monitoring contact closed and DC-output voltage 0.2...1.5 V	thermal switch off, BLP too hot because of overload, or bad cooling or too high ambient and/or cooling air temperature or blocked or defective fans	air stream impeded ? air filters in cabinet polluted ? fans blocked or defective ? Measuring: at the right or left side at middle height of cooling unit near housing of BLP 75 : ≤ 50°C recommended, 60°C max automatic RESET after cooling down BLP 75
same	fault monitoring contact not closed and DC-output voltage ≤ 0,2V	Mains fault short circuit in lamp circuit BLP 75 defective.	check mains voltages check terminations and wiring to the lamp replace BLP 75
asymmetrical mains phase currents	current L1, L2, L3 is different	A difference of about 1A is normal. Asymmetrical mains voltage failure of 1 phase of mains	Nothing to do. check mains and fuses check mains fuses

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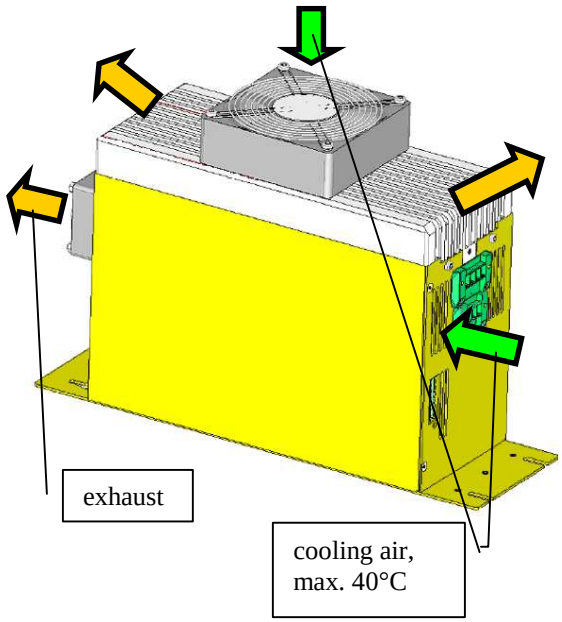
5 Installation

5.1 Mounting and Cooling

An efficient cooling of the BLP 75 is important for the output power (otherwise possible shut OFF) and especially for life time. BLP 75 is equipped with two fans mounted in the middle on the rips of the cooling unit and on the side to cool the unit inside. Both fans of BLP 75 are supplied internal and supervised of their function. If defective or blocked, BLP 75 monitors “overtemperature”.

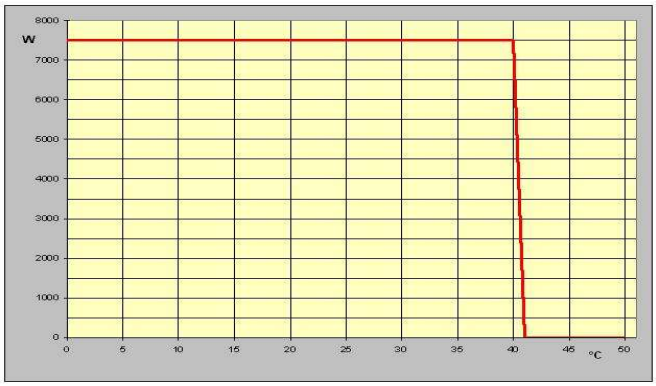
Cooling depends mainly from the amount of airflow through the rips of the cooling unit and the temperature of air as well as the ambient temperature. To ensure good air flow, a minimum distance of 50mm from air in- and outlet is recommended.

IMPORTANT: The cooling air temperature and the ambient temperature must not exceed 40°C !



If the unit is installed inside a cabinet or a other housing, care have to be taken to avoid high temperatures inside this housing by flowing it by air. The amount of air depends from ambient temperature and power loss of the BLP 75 . Power loss is about 8% of the real maximum lamp power. Distance to any air flow blocking parts and BLP 75 / fan should be minimum 50mm. A general rule for power electronics says: as cooler the ambient air is, the longer and better are reliability and life time of the unit. Half temperature will double life time.

Derating curve BLP 75



The derating curve shows the maximum allowed lamp power over cooling air /ambient temperature

As an example: with 7,5kW lamp power, 40° C inside cabinet temperature, 35°C max. outside cabinet temperature an air flow of 396 m³/h throughout the cabinet is recommended. The BLP 75 should be positioned near the cold air entry.

Rough calculation for needed air flow throughout a housing/cabinet:

$$V = 3{,}3 * \frac{P_{LOSS}}{40°C - T_{AMBIENT,\,max}}$$

with

V	=	air volume in [m³/h]
P_{LOSS}	=	loss power of BLP in [W] (P_{LOSS} = 8% of max. lamp power)
$T_{AMBIENT,\,max}$	=	max. possible air temperature outside the cabinet/housing, e.g. in summer.

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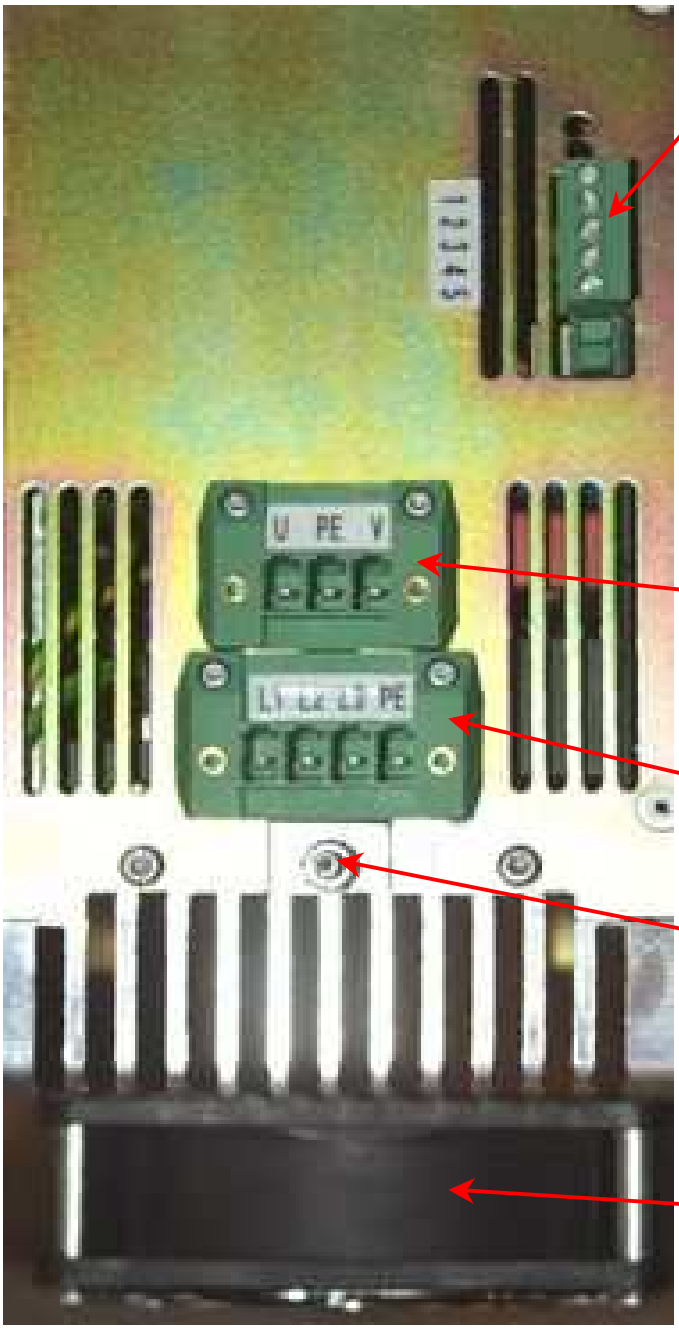
5.2 Electrical connections BLP 75



control connections:

1	GND
2	+ DC 0...10V input (power controlling)
3	+ DC 0...10V output (lamp voltage)
4	fault monitoring contact
5	fault monitoring contact
6	(blocked, do not connect!)
7	(blocked, do not connect!)

lamp connections:

U	uv-lamp
PE	ground (not used)
V	uv-lamp

mains connections

L1 L2 L3 PE

Additional M5 bolt PE-connection
see paragraph § 3.1

cooling fan (internal supplied)

Connectors for cable side (included):

- lamp connector:	PC4HV/3-STF-7,62	Phoenix 1882382
- mains connector	PC4HV/4-STF-7,62	Phoenix 1882395
- control connector	MVSTBR 2,5/5-ST-5,08	Phoenix 1792278

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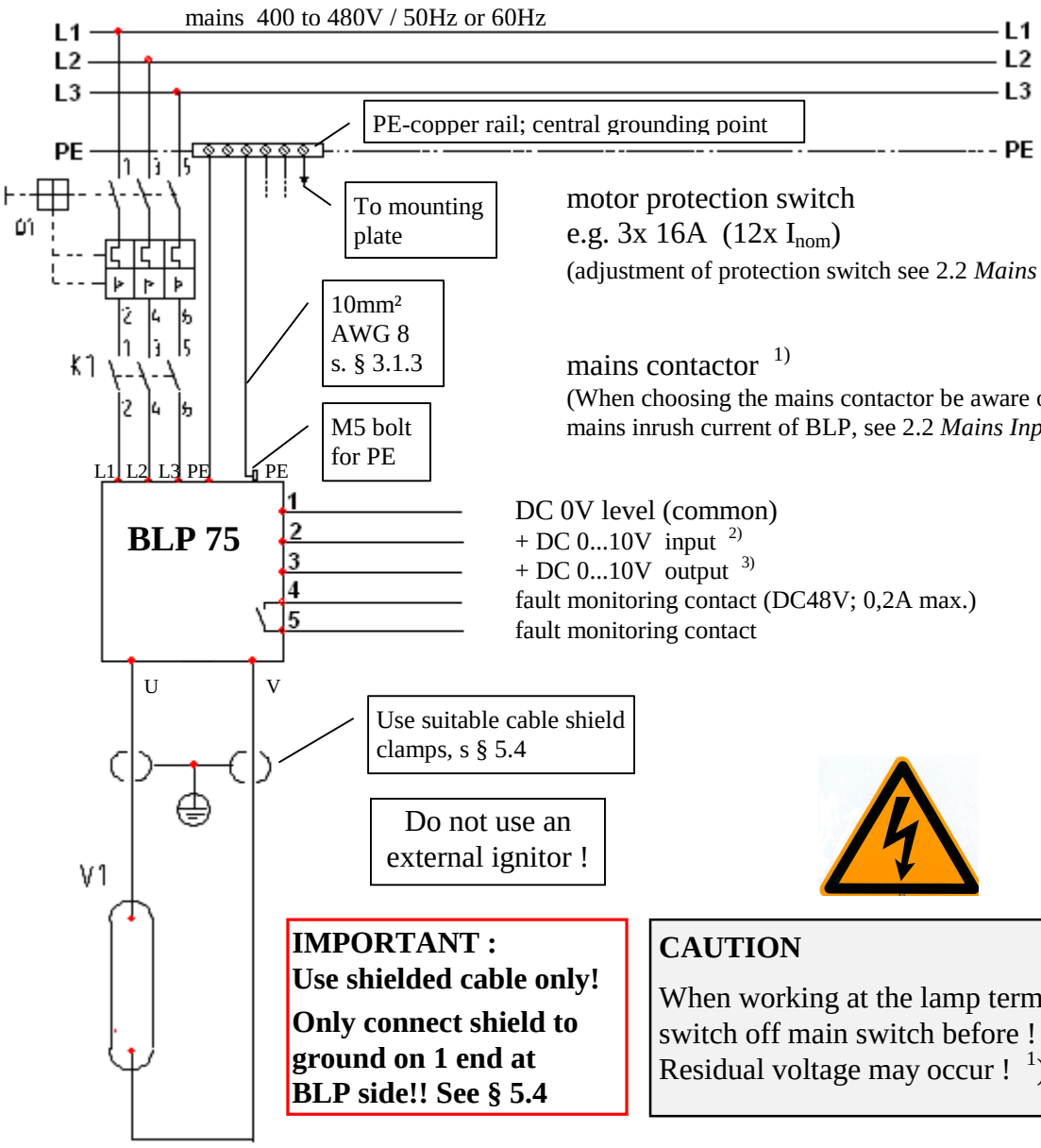
5.3 Electrical wiring diagram BLP 75



1) Main contactor recommended to have reliable switch OFF and no residual voltages at the output t the lamp.
Otherwise electric shock may occur while working at the uv-lamp etc. e.g. for service !

2) ON/OFF and power control

3) lamp voltage monitor and, in case of fault, fault monitor

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5.4 Installation according to EMC rules

5.4.1 Protection against voltage strikes on mains (lightning strike protection)

Experience has shown that electrical installations all over the world are often not sufficiently protected against mains disturbances (for example from the result of lightning strikes etc..) . This sometimes leads to flash-overs and the following destruction of components inside the power supplies. This is because these strikes are much more energy intensive than the standard energy “spikes” that the units are designed to cope with.
The problem is less to do with strikes between phases, but more with strikes between phases and earth (PE). These strikes mostly overload the EMC filter and the main current components in the BLP.
With further development and upgrading of the BLP, the EMC-filters have been changed to reach lower currents to earth in regard to use GFI (ground fault interrupter) with lower setting currents.
Therefore impedance between PE and phases is higher. This is an advantage for using GFI, but at same time a disadvantage against strikes.
The purpose of the so called Y-capacitors inside the EMC filter, which incidentally influence the effect of protection, is not to protect against lightning strikes, but to fulfill RFI rules.

We therefore recommend, if the protection standard at the customers installation is unknown or bad, to add to the BLP installation (e.g. inside the electrical cabinet) extra components for strike suppression.

Useful and professional components may be found e.g. at PHOENIX CONTACT (www.phoenixcontact.com). Their brochure "TRABTECH" includes a lot of technical hints, as well as data for the necessary components.

5.4.2 Shielding of lamp cables

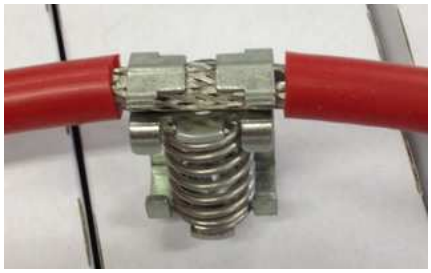
Example photo see appendix A

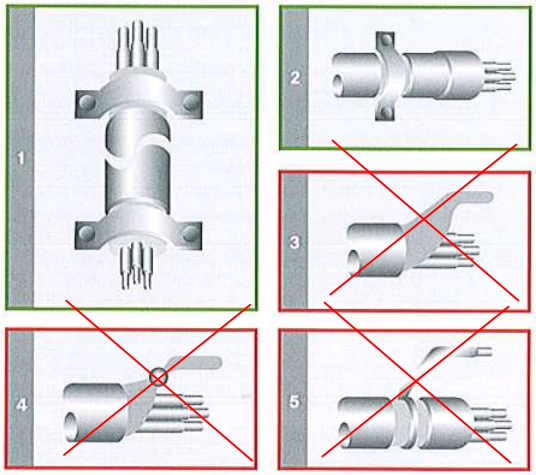
Due to the rectangular current, the lamps are driven (approx. 255Hz), harmonics occur. According to EMC rules, these cables have to be shielded between the BLP 75 and lamp housing.

IMPORTANT: connection of shielding to ground:

1. Cable shielding generally has to be grounded to the central grounding point (PE) of the cabinet. Shielding should protect against the high frequency harmonics. Grounding of a shield has to be made with as large as possible surface area:

   Best solution is to use a shield clamp:





2. It is important that the shield clamps or clamps as shown in the picture 1 and 2 above (green) have an excellent connection to the grounded mounting plate or a separate, properly earthed copper rail !
   If painted surface mounting plates are used, please completely remove the isolating coating from the connection point!

3. **<u>Shielding must be grounded only on one end of lamp cable, preferably near to the BLP !!</u>**
   Otherwise the Ground Fault Protection of BLP 75 detects a fault.
   The shield MUST NOT BE connected at the other end (shield should be cut back and protected by a heat shrink sleeve) and
   UNDER NO CIRCUMSTANCES must the shield be used as PE for grounding the lamp housing.

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4. Regarding the connectors between the BLP and the lamp e.g. the connector on the lamp housing or near the cabinet, the shield of the first part of the cable (= between BLP and the connector) has to be grounded near to the BLP, and to the central PE point in the cabinet, or to the properly grounded mounting plate according to 1. above. Do NOT connect the shield on the other end cable to PE, just cut the end of the shielding back and isolate it by e.g. a heat shrink tube.
5. The second cable section (from connector to the lamp) also has to be grounded only on 1 end, usually at the connector end if the connectors metal housing is properly grounded to PE. The connectors PE should not only be grounded to the surrounding metal sheets it is mounted on, but additionally connected by a 10 mm² lead (AWG 8) to the central PE point in the cabinet!
   For safety grounding of the actual lamp housing (PE) a separate 2,5 mm² lead from connectors PE to the lamp head is ok.
6. If using terminals (e.g. ceramic post terminals) at the exit of the cabinet for the connection of lamp heads, it is good practice to ground the shield of both cables (one to BLP, one to lamp) together in one place near the terminal with 2 special shield connection clamps (e.g. clamping on a common copper rail). Do NOT ground the shield on the other end of the both cables.
   It is important, that this copper rail AND the BLP (bolt near the mains connector) is additionally grounded by a 10 mm² lead to the central PE point of the cabinet.

5.4.3 Laying cables

As normal with laying cables according to EMC rules, the lamp and the mains cables should not be laid in parallel to cables for analogue or other low level signals, to avoid disturbances to these signals.
If not possible to avoid parallel laying, all concerned cables should to be shielded carefully. Additionally an intensive test of all functions of these low level and analogous signals should be made in varied conditions, the lamp running, e.g. during ignition (disturbance from the ignition pulses), during running at full power, etc.

Best cable to be used for lamp connection from power supply is a 2 core cable (2x 2.5mm² or bigger), both cores shielded together (each single shielded is good either). If using single core cables, it is important, to lay the 2 according cables as near together as ever possible, in order to reduce any difference in inductivity and capacity as most as possible.

Cut the cable cabinet to lamp to the right length and connect it accordingly at the cabinet and lamp end. NEVER roll to a ring a too long cable, as it is often seen after installation on site at the bottom or in the sockets of cabinets !!

For connect Protective Earth (PE) see more in paragraph § 3.1.

5.5 Measuring devices e.g. for service

To measure with separate devices, e.g. for service with a clamp ampere meter or a multi meter, lamp voltage or currents use **TrueRMS** devices with a **frequency range of up to 10kHz** as minimum. Other devices may show serious deviations from the true values or show hardly differing values.

CAUTION: if measuring lamp voltage, do NOT connect the volt meter while a lamp is not operated (open circuit). If there is no lamp current, the ignitor impulses are applied to the output and may destroy your measuring device!

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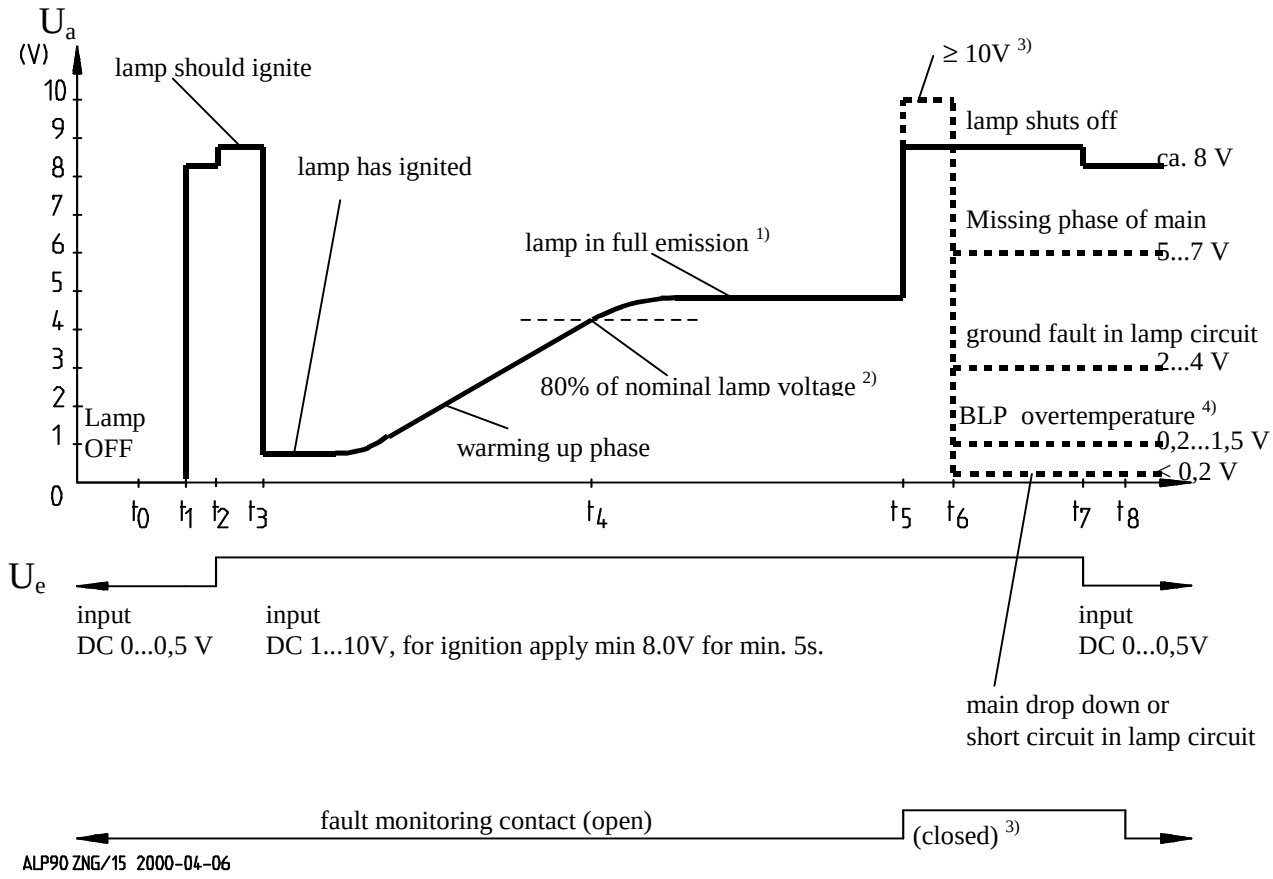
5.6 Help for programming PLC

Behavior of lamp voltage when BLP 75 is switched on and when a fault occurs



Legend:

U_a DC output voltage, shows lamp voltage or, in case of faults, monitors the fault (see *2.4*).
U_e DC input voltage, ON/OFF of BLP and adjusting lamp power (see *2.4*).
t_0 switch mains ON
t_1 = t_0 + 5 sec (inner switch on delay of BLP)
t_2 BLP ON + ignite (max. 10 sec. if lamp does not ignite, controlled by extern switch OFF by DC voltage U_e), apply ≥ DC 8.0V for ≥ 10 sec.
t_3 lamp ignites (U_e should have 10V in order to shorten warm up phase)
t_4 lamp has warmed up (U_a ≥ 80% of nominal lamp voltage); now is the first moment power adjustment should be used by U_e = DC 1...10V
t_5 a fault occur
t_6 = t_5 + 1 sec
t_7 = t_5 + 5...10 sec; switch OFF BLP by U_e ≤ 0,5 V
t_8 mains OFF for at least 20 sec for a Reset (necessary only when Ground Fault has occur)

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1) voltage U_a depend of nominal lamp voltage (operating voltage)
2) lamp cooling have to be active over 80% lamp voltage, reduce cooling when lower than 80%.
3) only in case of fault monitoring: Missed Phase, Ground Fault and BLP Overtemperature
4) automatically Reset when fault is eliminated

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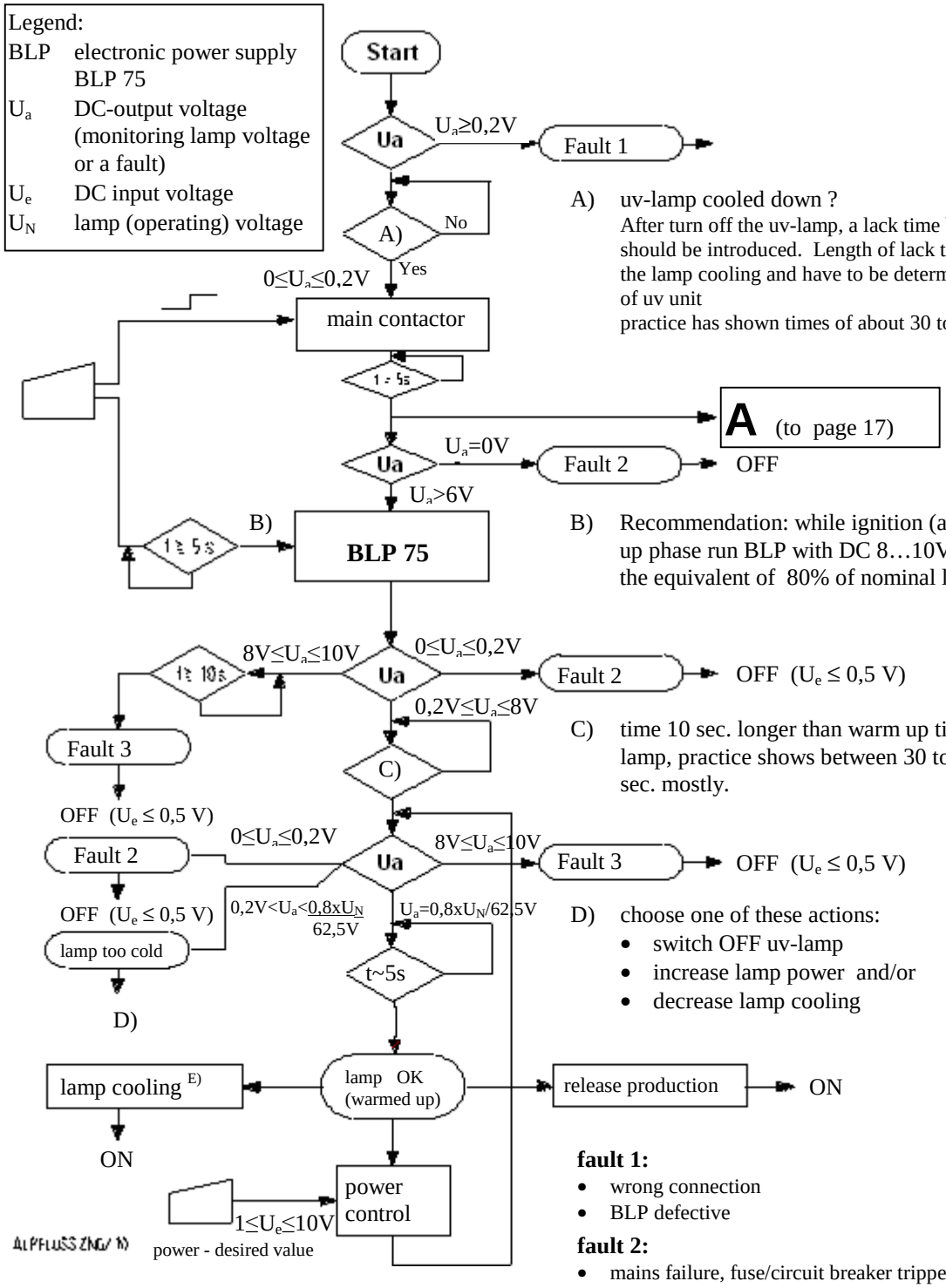
Help for programming PLC (continued)

Flow diagram for controlling BLP 75 together with UV-lamp



A) uv-lamp cooled down ?
After turn off the uv-lamp, a lack time before turning on again should be introduced. Length of lack time depends mostly of the lamp cooling and have to be determined for each type of uv unit
practice has shown times of about 30 to 600 sec.

B) Recommendation: while ignition (as a demand) and warm up phase run BLP with DC 8…10V, until U_a has reached the equivalent of 80% of nominal lamp voltage.

C) time 10 sec. longer than warm up time of lamp, practice shows between 30 to 120 sec. mostly.

D) choose one of these actions:
- switch OFF uv-lamp
- increase lamp power and/or
- decrease lamp cooling

E) switch ON lamp cooling, when lamp voltage has reached 80% of nominal lamp voltage.

fault 1:
- wrong connection
- BLP defective

fault 2:
- mains failure, fuse/circuit breaker tripped
- short circuit in lamp circuit
- BLP defective

fault 3:
- uv-lamp shut OFF / do not ignite
- disconnection to the lamp

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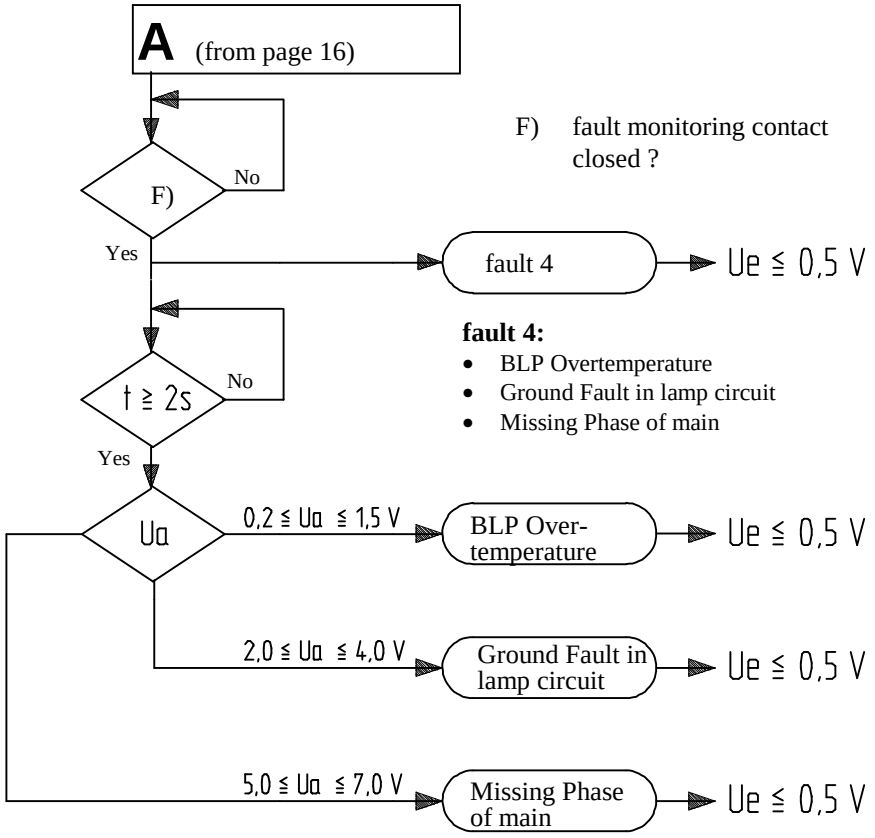
Help for programming PLC (continued)

Flow diagram for controlling BLP 75 together with UV-lamp (continued)



In case of Ground Fault:
switch OFF mains
(= Reset, approx. 20 sec)

Reset after fault 4:

- BLP Overtemperature and Missing Phase of mains are reseted automatically when fault is eliminated.
- Ground Fault in lamp circuit: mains have to be switched OFF for at least 30 sec.

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6 EC-Conformity Declaration

We uv-technik meyer gmbh
Glauburgstr. 34, D-63683 Ortenberg-Bleichenbach

Declare under our sole responsibility, that the product

power supply for uv-lamps
type: **BLP 75**

to which this declaration relates is in conformity with the following European standards:

Harmonized Standards	2004/108/EC	Electromagnetic Compatibility Directive
	2006/95/EC	Low Voltage Directive
National, harmonized Standards	DIN EN 50178 (VDE 0160)	
	DIN 31000 (VDE 1000)	
	DIN EN 55011 (VDE 0875 part 11)	

These products therefore has the qualification to be signed with the CE-sign.
Signing: 2012

This declaration is valid as long as in the above mentioned standards or in the product no substantial changes will be done.

date 2012-04-23

Michael Miseré
- uv-technik meyer gmbh -

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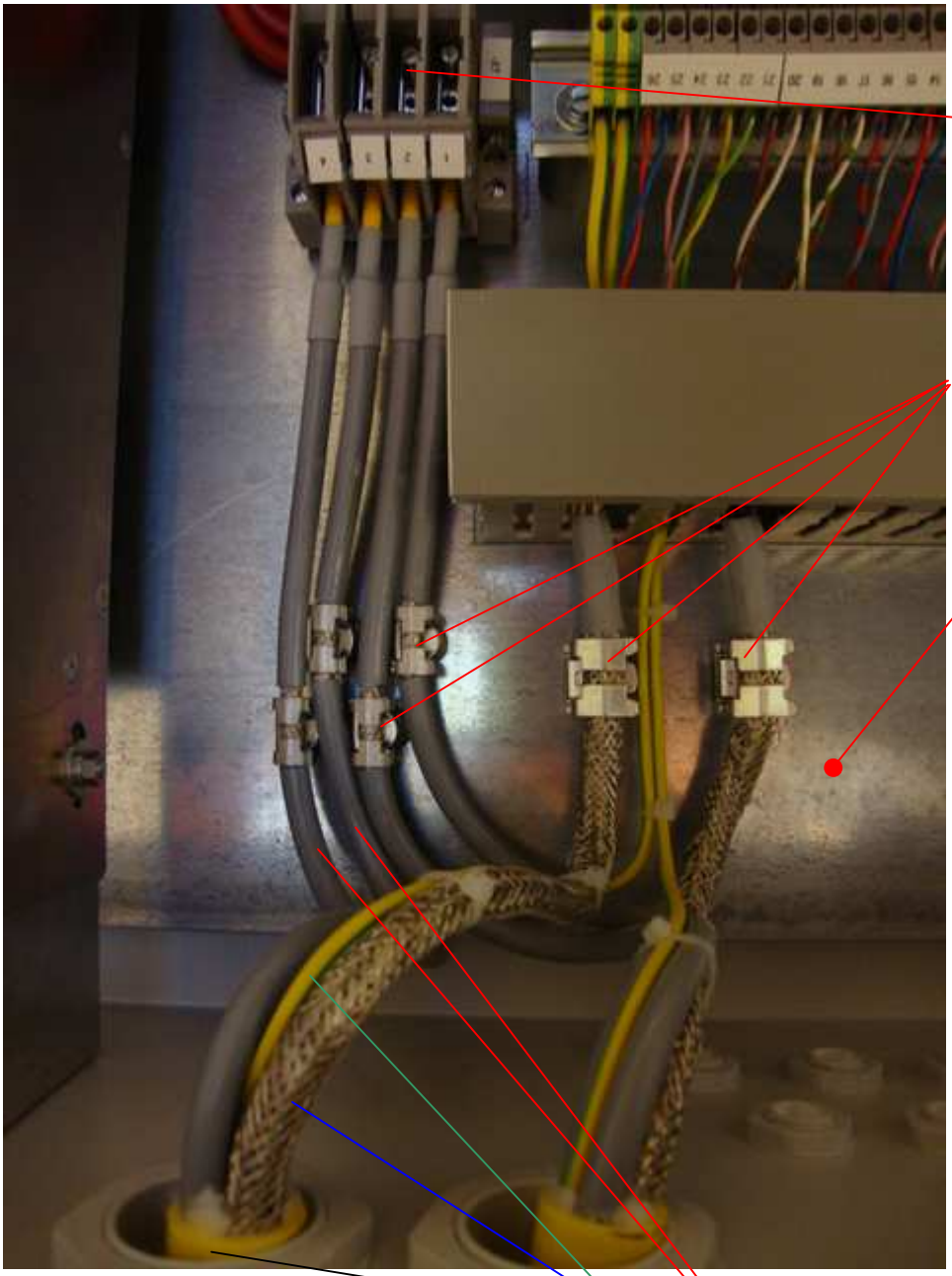
7 Appendix A (example for cabling / shield grounding)

Example photo for connecting and grounding cable from lamp housing running into a cabinet:



Terminal clamps in cabinet, other side goes to the BLP (here 2 units)

Typical shield clamps

Mounting plate with electrical conducting surface, galvanized, NOT painted.

Cable to lamp housing, containing
- 2 lamp cables (single shielded)
- control wires (here 12x 0,34mm²) separate shielded;
- PE (here 2.5mm²) for security grounding of the lamp house.

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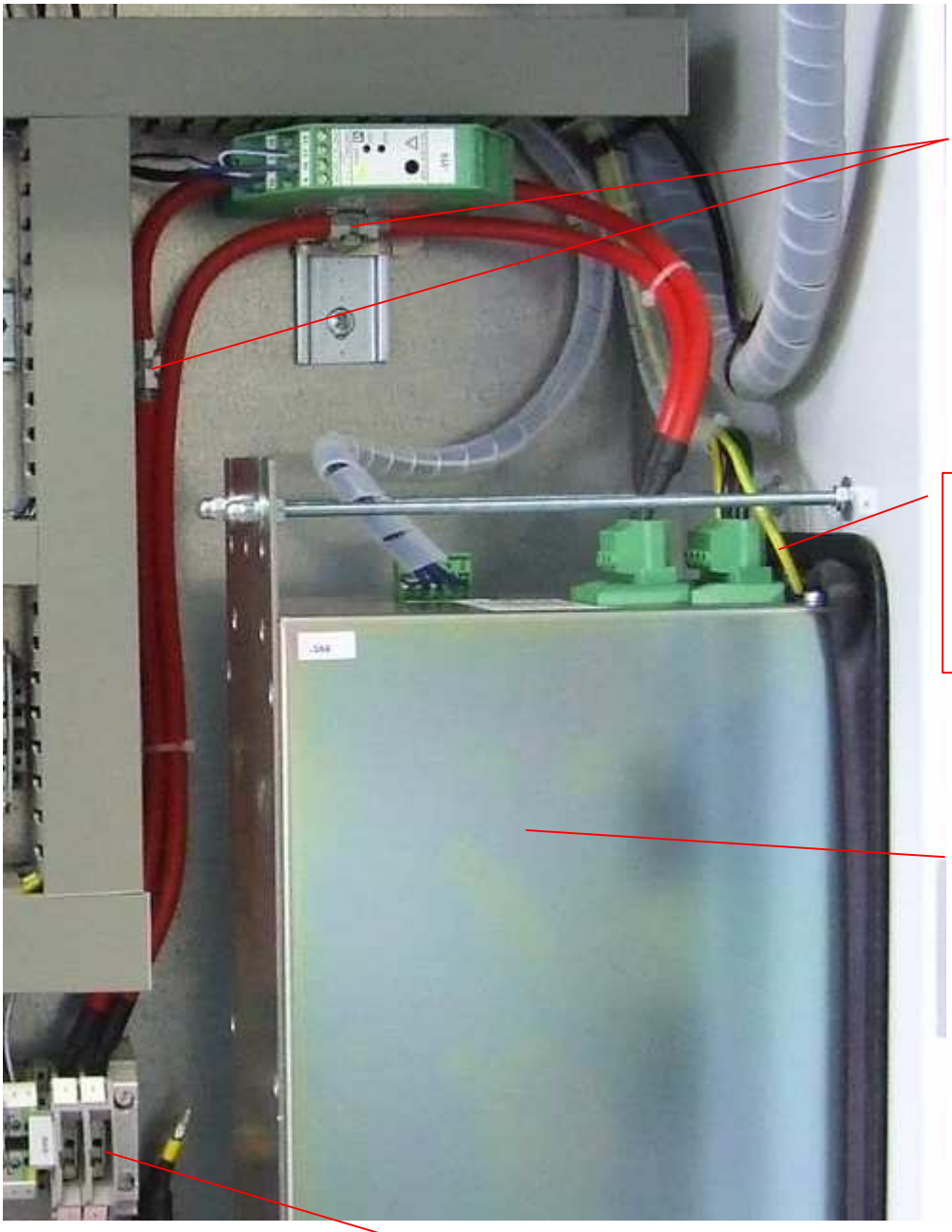
Example photo of the grounding of lamp cable inside a cabinet between BLP and terminals:



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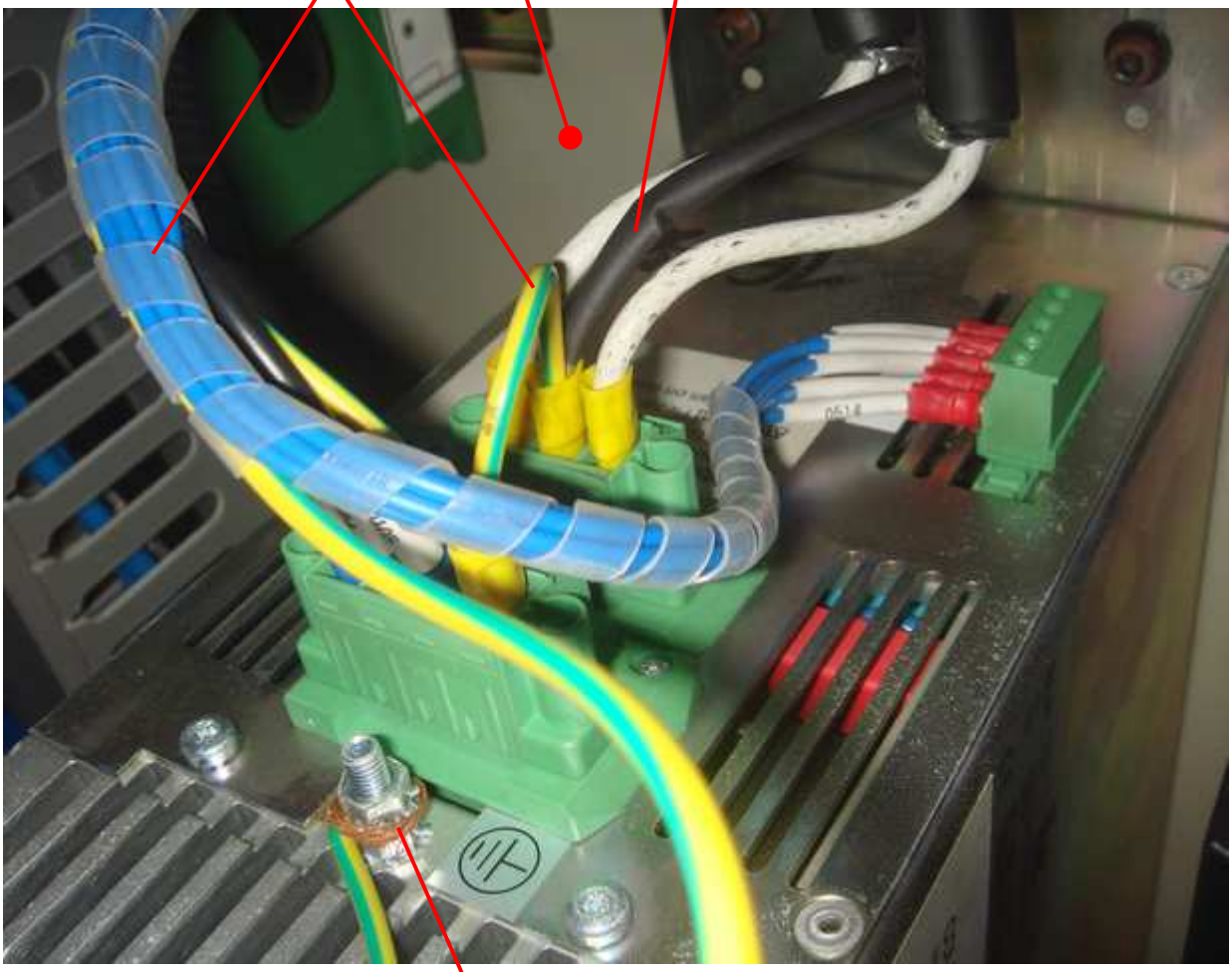
Example photo, of how cabling should **NOT** to be done:

Painted surface of mounting plate isolates the shield clamps and other groundings.

WRONG :
Analogue control cables should NOT run in parallel with mains (or lamp) cables, but separated. If not avoidable, use shielded control cable and ground the shield carefully like the lamp cable shields. [1])

This PE cable is not necessary.

WRONG:
Lamp cable shields are wound together to make a wire and connected to the PE via the connector (using shield clamps would be the correct way)



WRONG:
Cable cross section is too small, 10mm² (AWG8) would be correct.
Just wrapping loose wires around the bolt offers nearly no connection in EMC terms !!! (high HF resistance)
(using a crimping connection would be correct)

---

1) running control cable parallel to mains or lamp cable could result in strange behavior, like wrong power setting, fault monitoring where no fault is etc. Typically very hard to find and to detect between real faults and EMC caused faults. Strongly recommended to avoid cabling like in the photo !!!

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