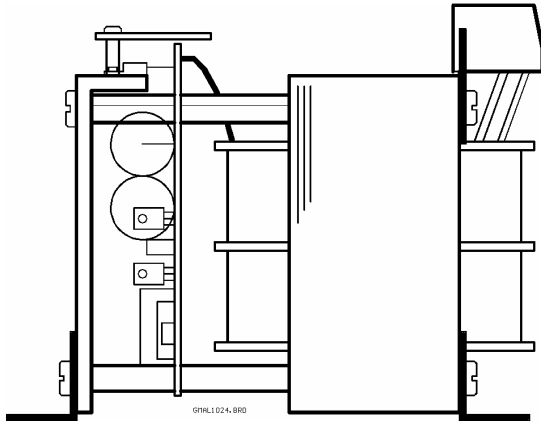


## Stabilized Battery Charging Unit AL... Ranges: 12V, 24V

5A, 10A, 15A, 20A, 35A



- Power supply: 231 or 400V mains
- High efficiency ( 80 - 90% )
- Resistant to sustained short-circuit
- Soft start of power circuit
- Heavy charging up to 33V
- Overheating protection
- Characteristics acc. to DIN 41773
- Mains transformer acc. to VDE 0551

### Application

The battery charging unit AL. is used for charging high-quality lead, lead-gel or nickel-cadmium batteries and for the DC supply of standing loads in switch cabinets. The charging unit is suitable for emergency power supplies and diesel engine batteries whose starter and control batteries must be loaded according to the DIN characteristic curve. Special attention was given to the operating safety and long-term stability of the charging unit, the components having been selected and dimensioned accordingly. The charging unit can be used with normal mains (0-231V) and three-wire mains supplies (0-400V) and at increased environmental temperatures of up to 55°C.

The output of the battery charging unit is connected directly to the battery or DC supply via protective equipment and mounted to the angles provided for it on the assembly plate of the switch cabinet.

### Charging

**Normal Charging:** The empty battery is first charged at the constant current set. Before the preset final charging voltage is reached, the current gradually decreases. The gassing of the battery is limited and the continually reduced current causes the voltage to rise slowly until it reaches the final charging voltage. This characteristic curve ensures the gradual charging of the battery.

**Heavy Charging:** At intervals specified by the manufacturer, nickel-cadmium batteries are subjected to heavy charging at an increased charging voltage. For this purpose the heavy charging terminal **ST** is short-circuited, it being necessary to ensure that the charging process is terminated via automatic opening of the contact on completion of heavy charging. The equipment connected must not be impaired by the voltage used for heavy charging. The height of the final charging voltage used for heavy charging is set via the potentiometer ST (in no-load operation).

### Power Supply Operation

The battery charging unit AL can also be used for power supply operation or mixed applications. Here please note that in case of mixed application a continuous dc current load should not be higher than 30% of maximum load. If the remaining current for charging is too low the next bigger charging unit should be used.

**Remark:** In case of continuous dc current consumption the charger unit will be warm up after a time. By additionally applying of charging the charge capacity will be lower than 100% in case of this additionally heating of unit the maximum temperature will be reached earlier so that the unit keeps in full function but with reduced current and longer charging time. Even with higher environmental temperatures enough reserve should be calculated for not too long charging times ( i.E. by a total discharged battery ).

### Settings

The AL charging unit is set to a battery voltage of 26.6V (13.5V) in no-load operation and the charging current is set to  $I_{max}$  before the unit leaves the factory. The controls for this are located under the removable aluminium data plate. The final charging voltage is adjusted in no-load operation via the adjuster **U** with aid of a 1-class meter. A suitable load resistance (or empty battery) should be used to set the current (Adjuster **I**). Remark: For compensation charging acc. to DIN57510 following values are recommended for lead batteries 2,23V (+/-1%) / cell and for nickel-cadmium batteries 1,38 – 1,40V / cell.

### Series / Parallel Connection

The output current or output voltage can be increased by connecting any desired number of AL charging units to the outputs in parallel or in series. In order to ensure that the units are subjected to the same load in parallel operation, the final charging voltage in each case must be set to the same value before the units are connected.

## Technical Data

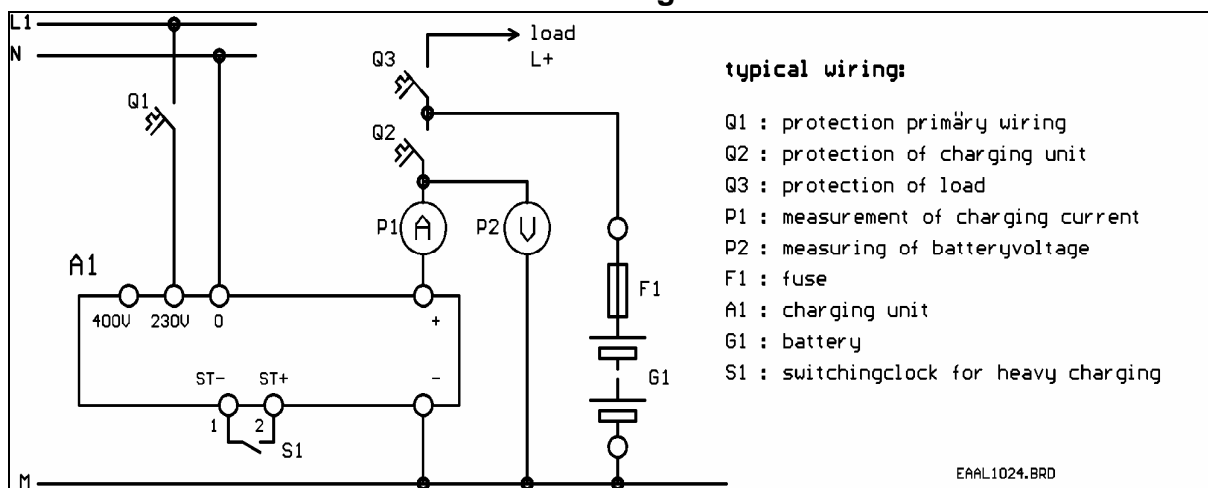
Type	Final Charging max.	Consumption		Fusing		Weight	Dimensions ( mm , B x H x T)	
		Current (max)	P (max)	Prim. (Q1)	Sec. (Q2)			
<b>AL0512</b>	12 - 16V	5A	100W	an 231V 400V 4AC	4AB	10AB	3,8kg	120x125x135
<b>AL0524</b>	12 - 33V	5A	200W	6AC	4AC	10AB	5,5kg	120x125x155
<b>AL1012</b>	12 - 16V	10A	200W	6AC	4AC	16AB	3,8kg	120x125x135
<b>AL1024</b>	12 - 33V	10A	400W	8AC	6AC	16AB	5,5kg	120x125x155
<b>AL1524</b>	12 - 33V	15A	600W	10AC	8AC	20AB	7,3kg	120x125x180
<b>AL2024</b>	12 - 28V	20A	600W	16AC	8AC	25AB	7,3kg	120x125x180
<b>AL2033</b>	12 - 33V	20A	850W	16AC	8AC	25AB	10,2kg	150x155x185
<b>AL3524</b>	12 - 33V	35A	1400W	20AC	16AC	50AB/C	18,1kg	180x185x250

In case of fuse falling under unfavorable conditions (e.g. inrushcurrent of transformer or on-switching of starter during discharged battery) a bigger rated fusing could be choosen without getting safety problems.

Supply voltage	231V 50/60Hz und 400VAC (-10 +15%), Other voltages available on request
Charging parameters	IU (Wa)-param. Acc. to DIN 41773 (< +/- 1% tolerance) and DIN 57510 Wa = dropping characteristic in U-range (appr. 2% drop) with off setting
MTBF (lifetime)	Continuous operation, MTBF according to power consumption and environmental temperature 30.000 to more than 100.000 h.
Efficiency	80 - 90%
Softstart	Aprx.0,5 sec. after switching on the load current will be switched on
Correction time	Load dependent, aprx. 100 to 500 msec.
Output hum	with ohmic load (half rated load) aprx. 2VAC (battery not connected)
Overload	Automatic power limitation, short circuit proof, charger switches on again after overload condition is cleared (fold back) without output overvoltage swing Automatical switch on after overload with < 50% ohmic load in other case 100%
Temperature overload	In case of overheating the load current will be limited, after the overheating has been cleared the fully output current is available again
Polarity protection	Aprx. 6A oder 50A (100ms) [battery feedback current]
Final charging voltage	Tolerance 0,1% / 10°C
Ambient temperatures	-20 °C bis +55°C, up to 70°C with full operation but output current falls to low values
Storing temperatures	-40°C bis + 85°C
Relative air humidity	95%
Kind of protection	IP00
Maintenance	Maintenancefree
Mains isolating	EN 60 742 (Savety transformers)
General regulations	EN 50 178 (Units in power current installation)
Radio interference	EN 55 022 / Class B
EMV	EN 61000 und EN V 50 140

**Mounting:** The charging unit can be mounted in any desired position. In order to ensure a maximum service life, it is recommended to mount the unit in such a way that the aluminium cooling plate is perpendicular ( to the earth's ) surface. Because on the open metal parts of charging unit the temperature rise to 70°C in case of maximum power consumption the customer should look to precautions i.E. against application of plastic materials in the near environment.

### Circuit Diagram



### Safety Remarks

Before installation of battery charger the user should look to the preset final charging voltage and the maximal charging current whether it fits with the choosen type of battery. Otherwise higher gassing or overheating of battery could be occurred with risk of detonate or fire. Fire could also develop from spark discharge i.e. by disconnections of the wiring to the battery or the current from battery flows without any protection ( fuse F1 be missing) into the battery charger i.e. by wrong terminal connection or short circuit inside the secondary section of charger.