

GINO-AKA

Industrial Automation



Compact Liquid Starter ARL

Product Data Catalogue

1 General Information

When a wound rotor induction motor (WRIM) is started the torque that is generated by the current must be higher than the load starting inertia to induce the rotation of the motor. The required load torque depends on each application and its specifications as the mass of the moving parts, inertia and friction values and materials within the application affecting the operation.

Without a starting resistor, the starting rotor current can reach up to 7 x rated current which would negatively influence the supply grids. Further, it is possible to generate a smoother starting curve which protects electrical as well as mechanical components drive and application and assures a smooth startup of the system. Therefore, liquid resistance starters LRS are commonly used to start up WRIM motors.

For liquid starters, the electrolyte solution of Na_2CO_3 or K_2CO_3 acts as a resistor, with the resistivity, in turn, depending on the soda concentration. For lower power WRIMs GINO-AKA provides the economical starter of the type ARL that varies the rotors resistance by switching resistive grid plates within the

electrolyte and utilizing the electrolytes resistance variation in dependency of its temperature.

The ARL system is predominantly used for motor powers up to 500kW. The robust design guarantees high operational reliability and long service life. In addition the simplicity guarantees best value per kW and fits even the tightest budget.

Advantages of the GINO-AKA compact starter ARL at a glance:

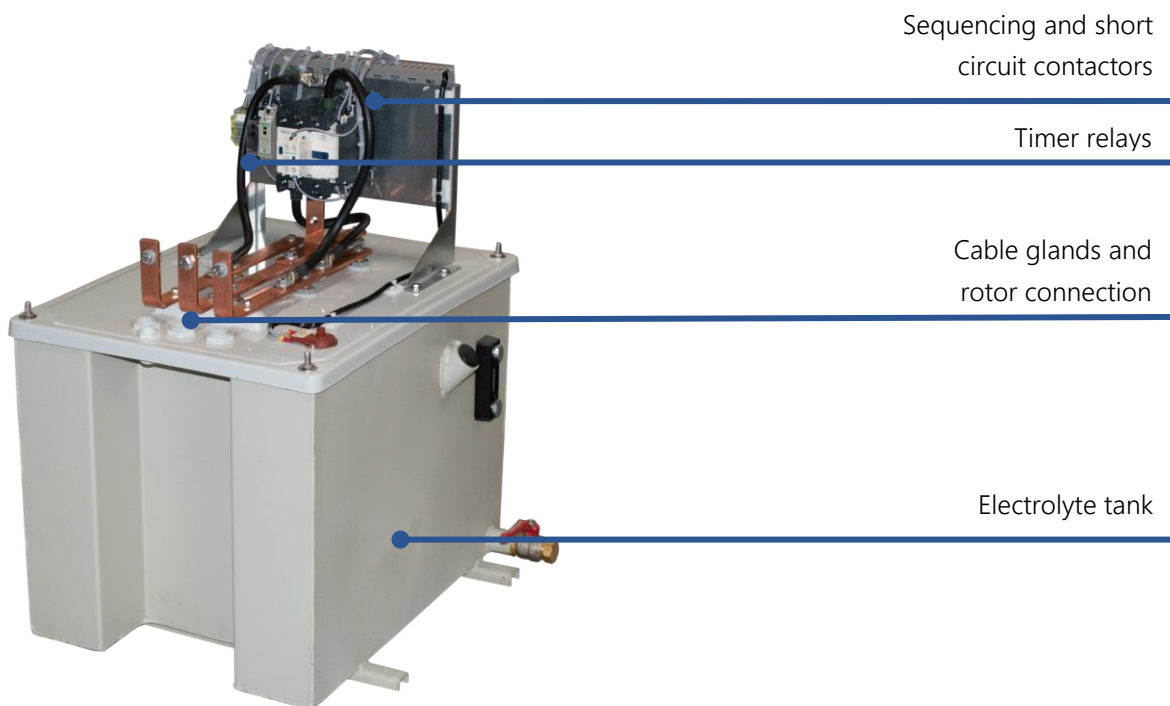
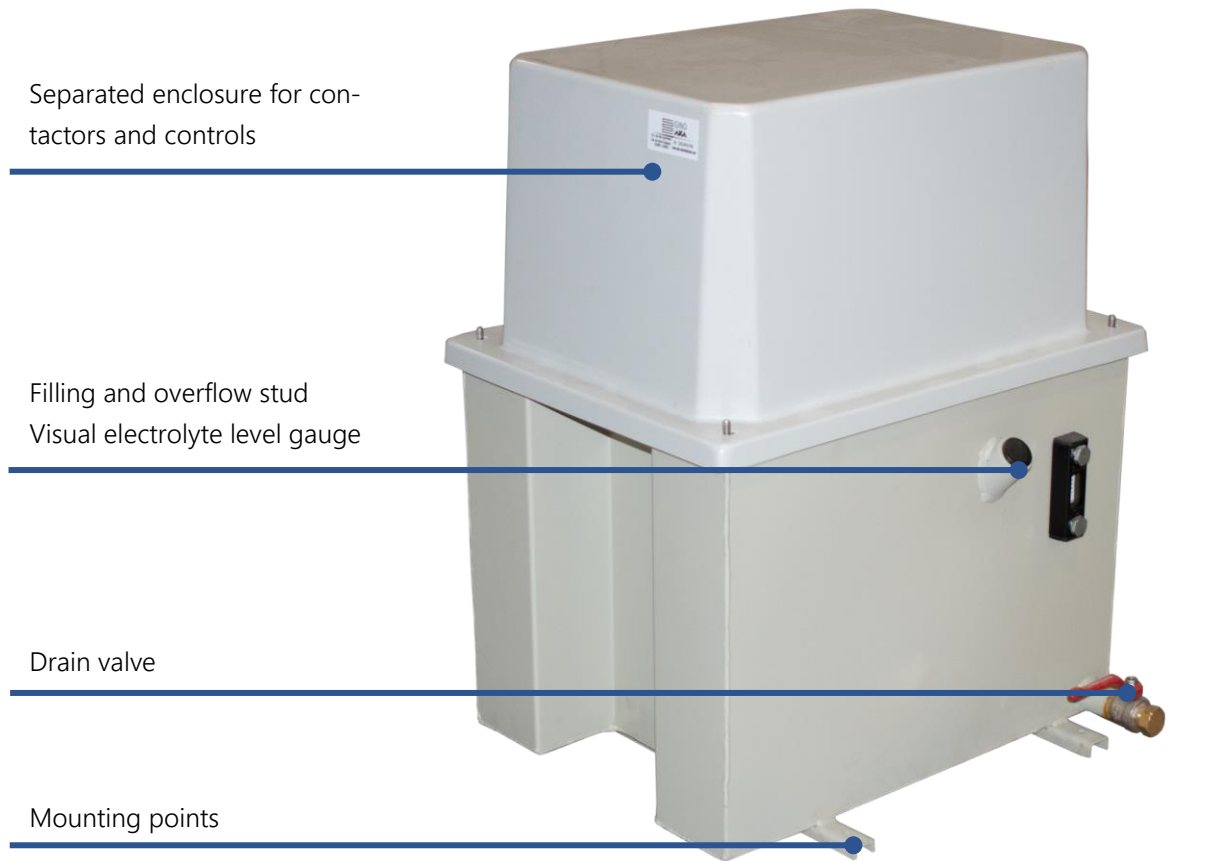
- High torque start-up of slip ring motors
- Adjustable starting times
- Protection class: IP 54
- Solid design without moving parts
- Maintenance free
- Global commissioning and service structure
- Adjustable to different motors
- Best cost/kW ratio on the market

Typical applications for ARL starters:

- Crushers
- Pumps
- Conveyors
- Ventilators



2 Design Overview



3 System Information

Standard Equipment	<ul style="list-style-type: none"> • Simple timer relay control • Schneider Electric short circuit and sequencing contactors • Visual level control • Temperature protection: tripping at 75°C • Resistive plates: Stainless steel 1.4016 • Drainage valve • Overflow valve • Auxiliary terminals for the customer's control • Painting RAL 7035 • Tank material: Steel 1.0037
Protection class	Starter: IP 54 (acc. to DIN 60529:2019-06)
Ambient temperature	0 °C to +40 °C, lower temperatures with antifreeze option
Installation altitude	Up to 1000 m above sea level, higher altitudes upon request
Electrolyte fill	<ul style="list-style-type: none"> • Electrolyte powder (Na₂CO₃ or K₂CO₃) • Each starter is delivered with quantity for first commissioning • Antifreeze solution (optional)
Site requirements	Water quality: Fresh water
Applied standards and regulations	<ul style="list-style-type: none"> • 2014/ 35/ EU (low voltage regulations) • IEC 60947-4-1

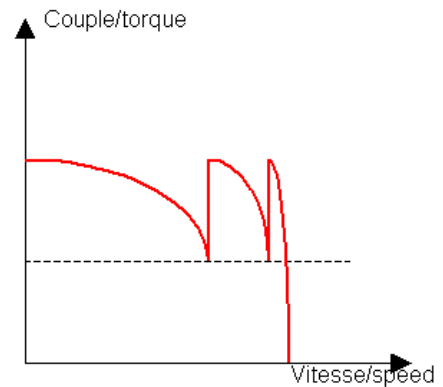
4 Technical Data

Model Size	Starting steps	Approx. Motor Power [kW]	Max. Rotor Current [A]	Max. Rotor Voltage [V]	Max. Starter Energy at 40°C [kJ]
ARL50	2	90	280	1200	8400
ARL1100	3	150	350	1200	16800
ARL1200	3	250	490	1200	33600
ARL1400	3	500	700	1200	67000
ARL1800	3	1200	700	1200	13400

5 Operating principle ARL

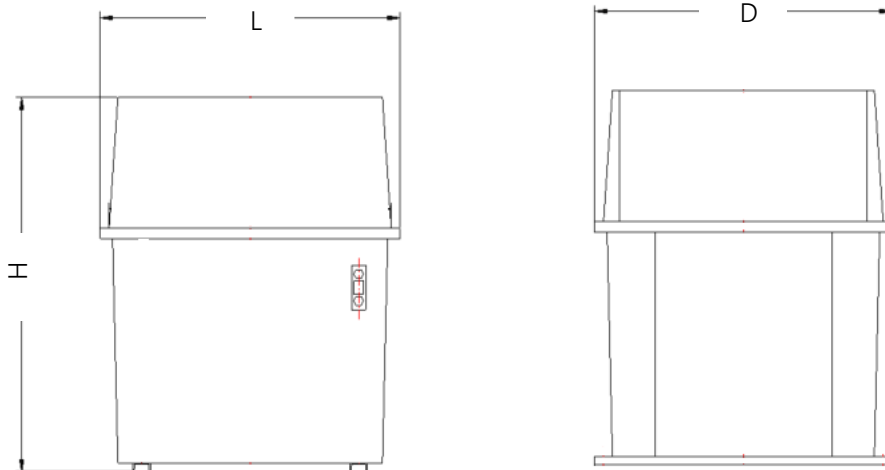
ARL starters utilize a liquid resistance medium in form of an electrolyte soda (Na_2CO_3 or K_2CO_3). As the current flows through the starter the heated electrolyte resistance decreases automatically through the temperature rise.

In accordance with the motor and the load characteristics two or three resistance step modifications are arranged by contactor switching in order to have a smooth start up procedure.



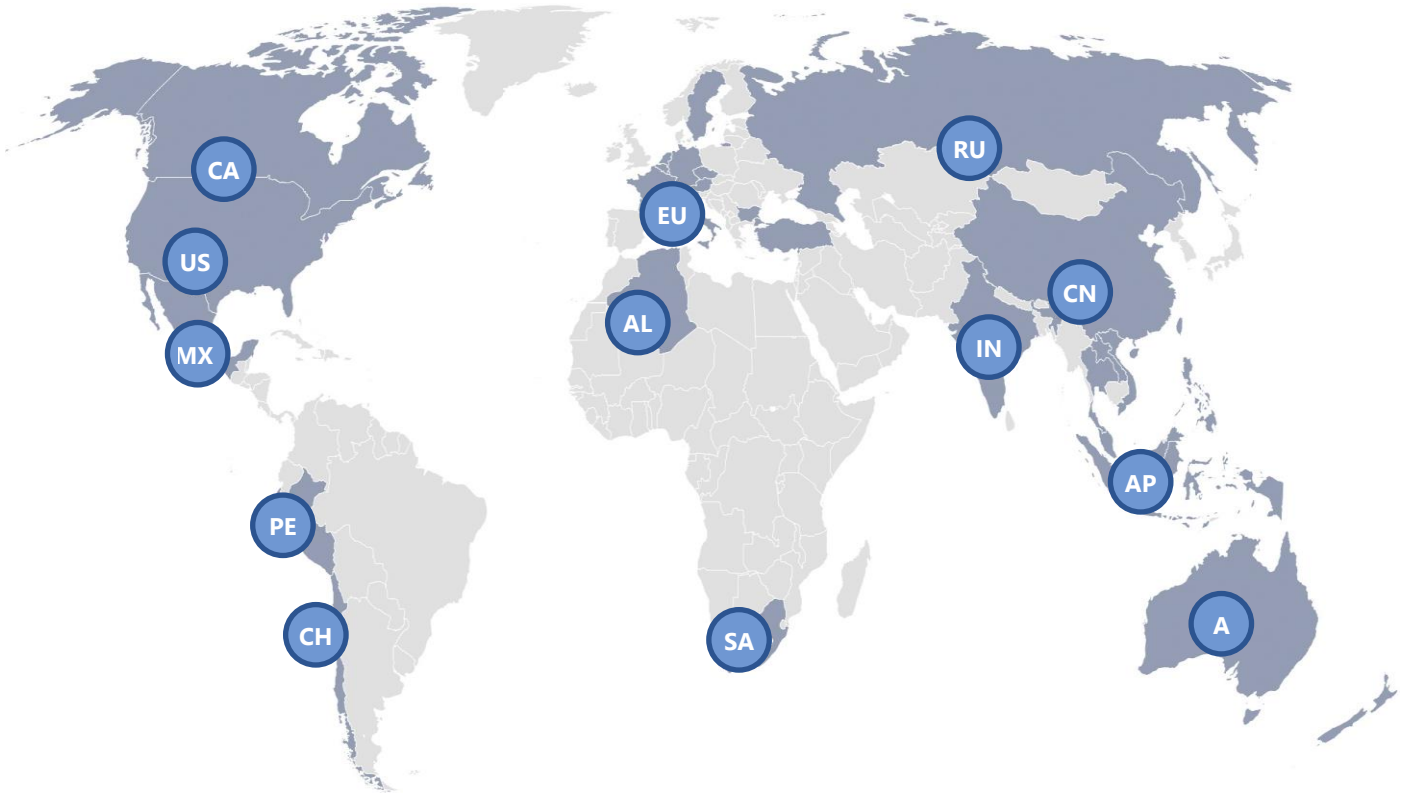
6 General arrangement































Dimension sheet ARL



Model Size	Electrolyte Volume [l]	Weight without Electrolyte [kg]	Length L [mm]	Width D [mm]	Height H [mm]
ARL50	50	35	580	440	665
ARL1100	100	55	850	440	660
ARL1200	200	75	850	440	1000
ARL1400	400	100	825	840	1060
ARL1800	800	180	1600	840	1160

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