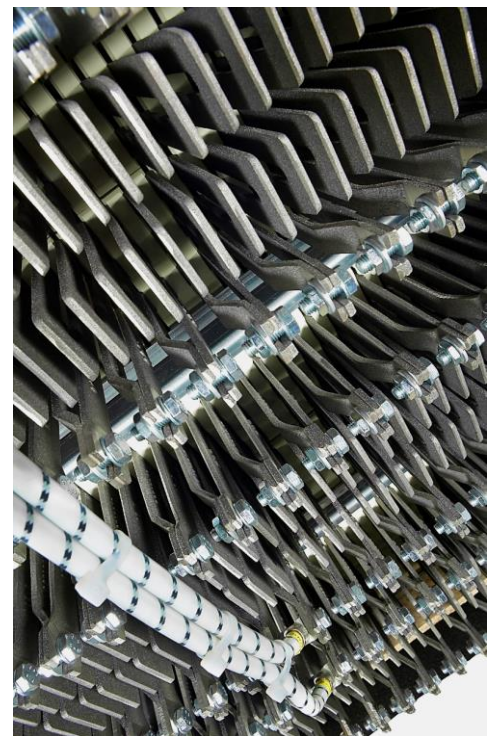


# GINO AG

Elektrotechnische Fabrik



Oil-cooled Starters  
Product data catalogue



## 1 General Information

3PA3 starters are stepped resistance starters with 3PR3 cast iron resistors in a tank filled with mineral based insulating oil. GINO AG acquired the 3PR3 series from Siemens in the year of 2000.

The oil-cooled starters store the heat dissipated during the starting process and slowly release it to the atmosphere via the tank surface. Therefore, they are suitable for large drives in applications with low starting frequency.

The change of resistance in the wound rotor induction motor (WRIM) rotor circuit is accomplished by successively switching out resistance steps with power contactors. The resistance is defined by the cast elements and the transformer oil acts as an energy storage and insulation medium.

The design combines the advantages of a resistor starter with those of a more economical heat carrier (oil) and a high protection class for applications in

harsh environments. Robust power contactors guarantee high operational reliability and a long service life combined with low maintenance requirements.

Advantages of the GINO AG 3PA3 starters at a glance:

- Compact design with small footprint
- High protection class: IP 54
- Global commissioning and service structure
- Use of cast iron resistor material
- Suitable for heavy duty environment
- Low maintenance
- High operational safety

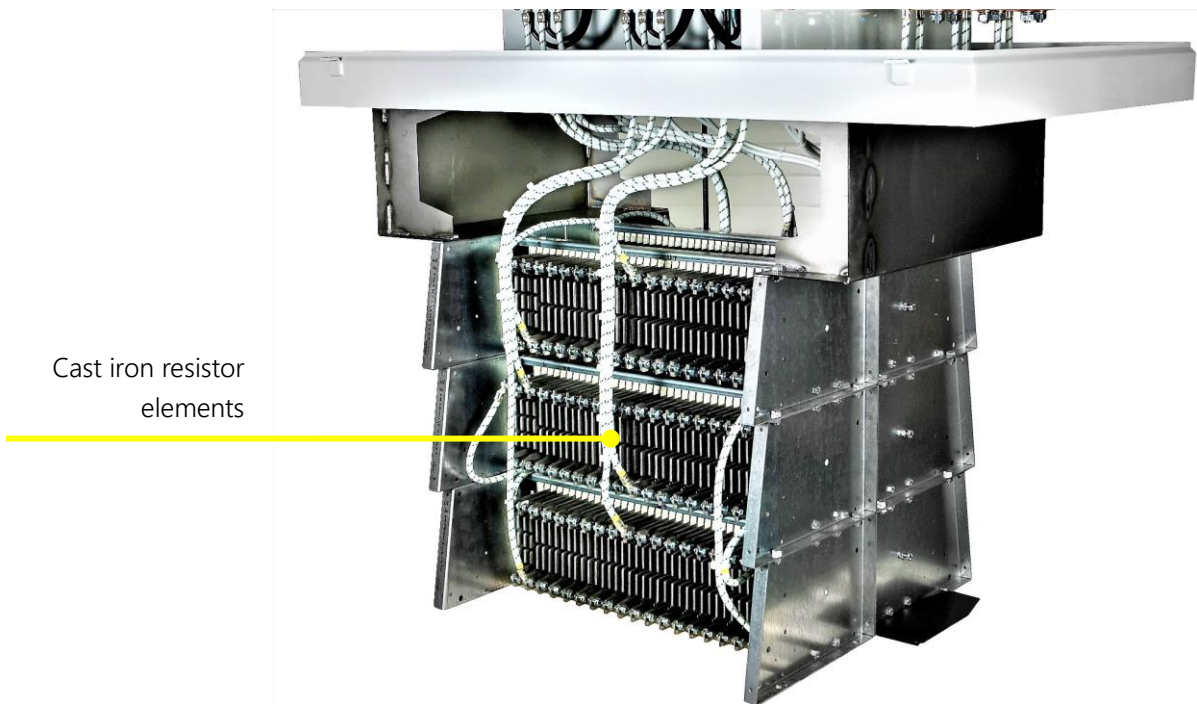
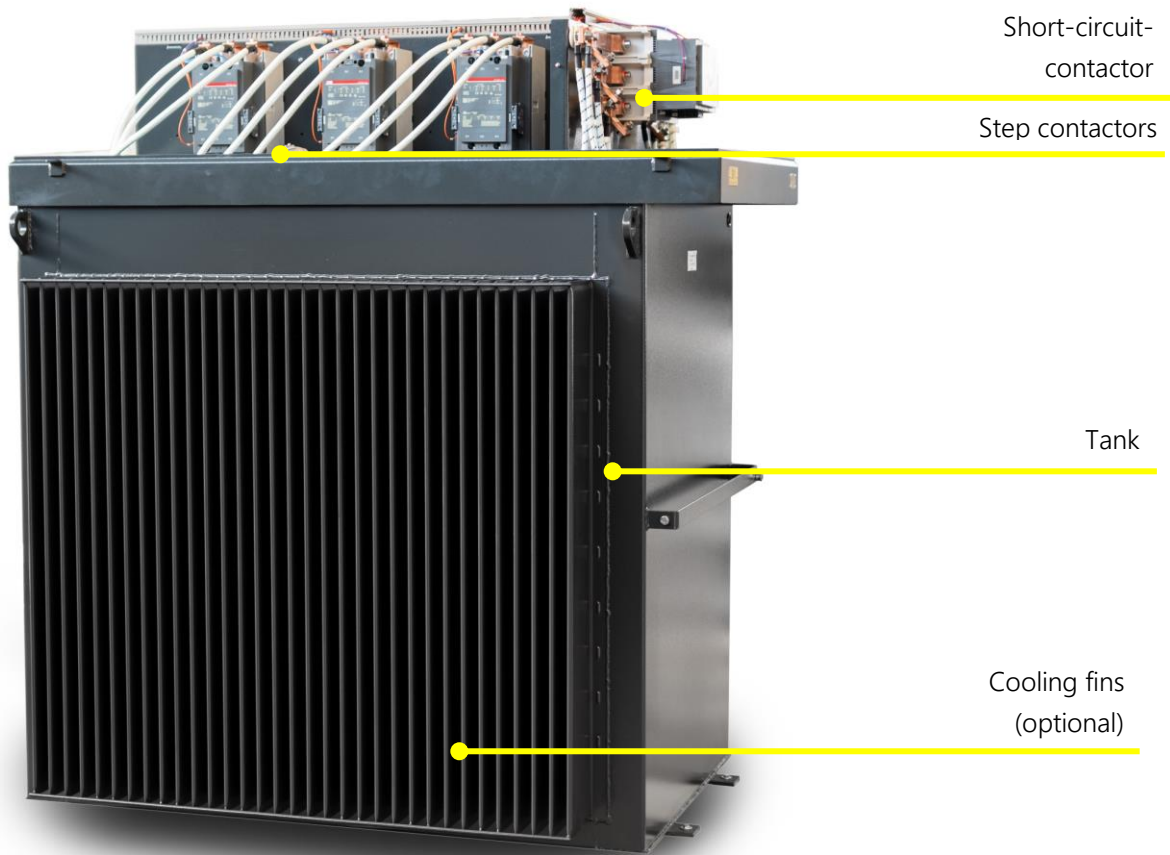
Applications of the 3PA3 starters are the following:

- Conveyors
- Mill Fan
- Ball Mill
- Cement Mill
- Pumping Station





2 Design Overview



## 3 System Information

Standard Equipment	<ul style="list-style-type: none"> <li>Eaton easyE4 PLC controller with Ethernet communication protocol (Modbus TCP)</li> <li>Cast iron resistor elements type 3PR3</li> <li>ABB / Siemens contactor configuration</li> <li>Visual level control</li> <li>Auxiliary terminals for the customer's control</li> <li>Temperature protection: warning at 100°C, tripping at 130°C</li> <li>Painting RAL 7016</li> <li>Tank material: steel 1.0037 (optional: 1.4301)</li> </ul>
Protection class	IP 54 acc. to DIN EN 60529:2019-06
Ambient temperature	0 °C to +40 °C, deviating temperature range upon request
Installation height	Up to 1000 m above sea level, higher altitudes upon request
Oil fill	<ul style="list-style-type: none"> <li>Use acid-free insulating oil acc. to DIN EN 60422:2013-11, VDE 0370-2:2013-11, IEC 60422 (2013)</li> <li>Oil not included in delivery scope (transportation without oil fill)</li> </ul>
Applied standards and regulations	<ul style="list-style-type: none"> <li>DIN/ VDE 0101/ 0111</li> <li>DIN EN 60529</li> <li>2014/ 35/ EU (low voltage regulations)</li> <li>IEC 60947-4-1</li> </ul>

## 4 Technical Data

Model Size	Approx. Motor Power				Rotor Current		Max. Rotor Voltage [V]	Max. Starter Energy [kJ]
	Half load	Fan	Full load	Heavy load	Type			
	f=0,7 <sup>(1)</sup> [kW]	f=1,0 [kW]	f=1,4 [kW]	f=2,0 [kW]	1 [A]	2 [A]		
01 <sup>(2)</sup>	200	140	100	70	150	250	2200	9500
02	450	315	225	155	250	450	2200	23000
03 <sup>(2)</sup>	640	450	320	225	250	450	2200	29000
04	900	630	450	315	450	630	2200	32500
05	1260	880	630	440	450	630	2200	55500
06	1800	1250	900	625	630	1100	2200	79000
07	2500	1750	1250	875	630	1100	2200	120000
08	3600	2500	1800	1250	1100	1600	2200	170000
09	5000	3500	2500	1750	1100	1600	2200	250000
10	6400	4500	3200	2250	1100	1600	2200	324000

(1) Starter load factor (for more information please see chapter 6)

(2) Available only as spare parts and no longer produced for new applications

## 5 Extras

### Local control

The local control gives an intuitive interface for the control of the starting steps.

### Brush lifting device control

Brush lifting device of slip ring motors can be integrated in the starter control system on request.

### Timer relay control

The timer relay control system can be factory-built into 3PA3 starters on request.

### Cabinet heating

Cabinet heating with thermostat incl. hygrostat for proper operation in cold environments.

### Electrical blocking control

The electrical blocking control detects jamming of a motor or the application and automatically trips the starting procedure to protect the equipment.

### Deviating supply voltage

Specific supply voltage on request.

### Electrical level monitoring

The electrical sensor monitors the oil level and transmits trip signal to customer control system.

### Continuous temperature monitoring

The oil temperature is monitored by a PT 100 and transmitted to customer control system.

### Cooling fins

Starters can be equipped with additional cooling fins to increase starting frequency of applications.

### Heat exchanger

GINO AG calculates and designs a fitting cooling circuit (Oil/Water or Oil/Air cooling).

### Cable cover

Cable cover to protect starter feeder cables against mechanical damage and increase the degree of protection to IP55.

### Customized paint finish

Specific paint finish and thickness on request.



## 6 Required Technical Data

### Power (P, kW)

The largest driving factor for the size of the starter is the motor power.

### Rotor voltage ( $U_2$ , V)

As specified on the Motor data sheet. (This data is needed for the layout of the switchgear and bus bars)

### Number of consecutive starts (z)

The value z determines the number of consecutive starts from cold condition. These are usually between 2 and 5 and describe the possible number of starts with starting time  $t_a$  and interval time  $2 \times t_a$  until reaching the maximum temperature (130°C).

### Starting time ( $t_a$ , s)

The starting time is the value for the duration of the start sequence in seconds and must be specified by the customer. If not GINO AG will use empirically determined standard times according to motor size and drive application.

### Rotor current ( $I_2$ , A)

As specified on the Motor data sheet. (This data is needed for the layout of the switchgear and bus bars)

### Starter load factor (f)

The starter load factor depends on the application and must be provided by the customer.

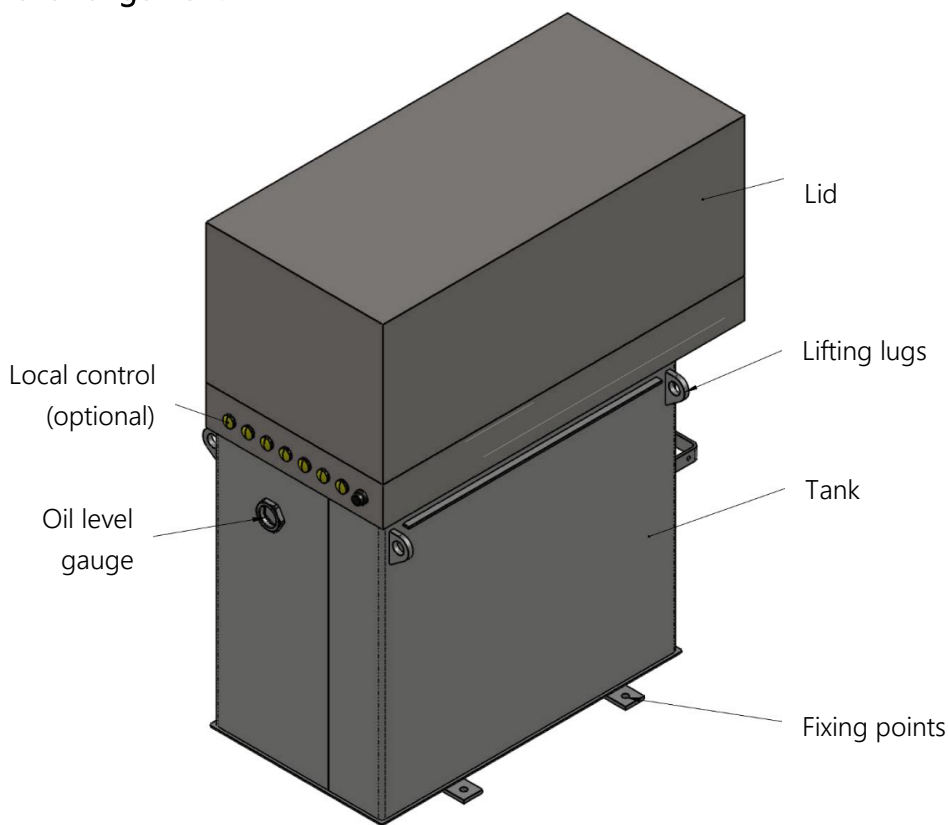
### Starting frequency per hour (h)

After having z starting operations and reaching the operating temperature the value h shows how many starts per hour are possible. This value must be determined by the customer as it will affect the surface needed for heat dissipation.

### Environmental data

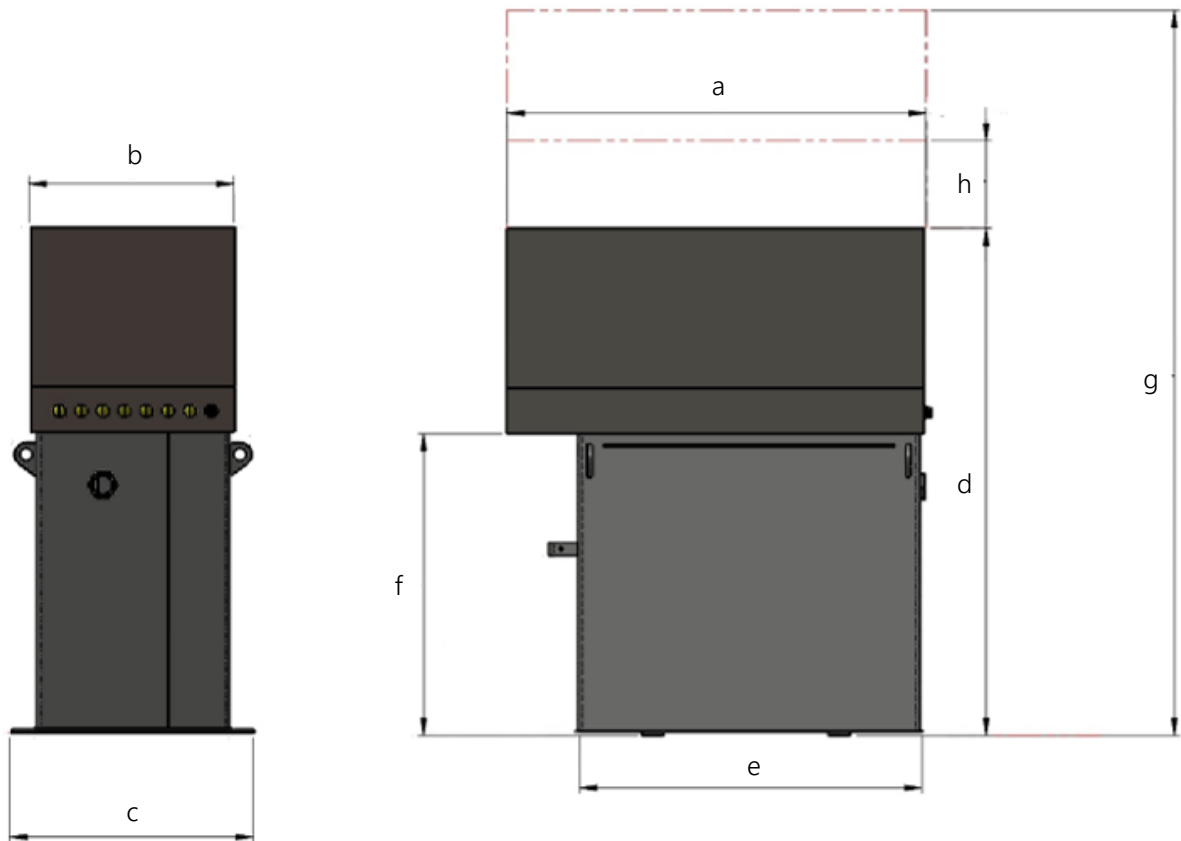
For exact calculations and in extreme circumstances we must take environmental data (extreme temperature, extreme height) into account. Please ask customer of details on the environmental circumstances of the installation site

## 7 General arrangement



# Oil-cooled Starters

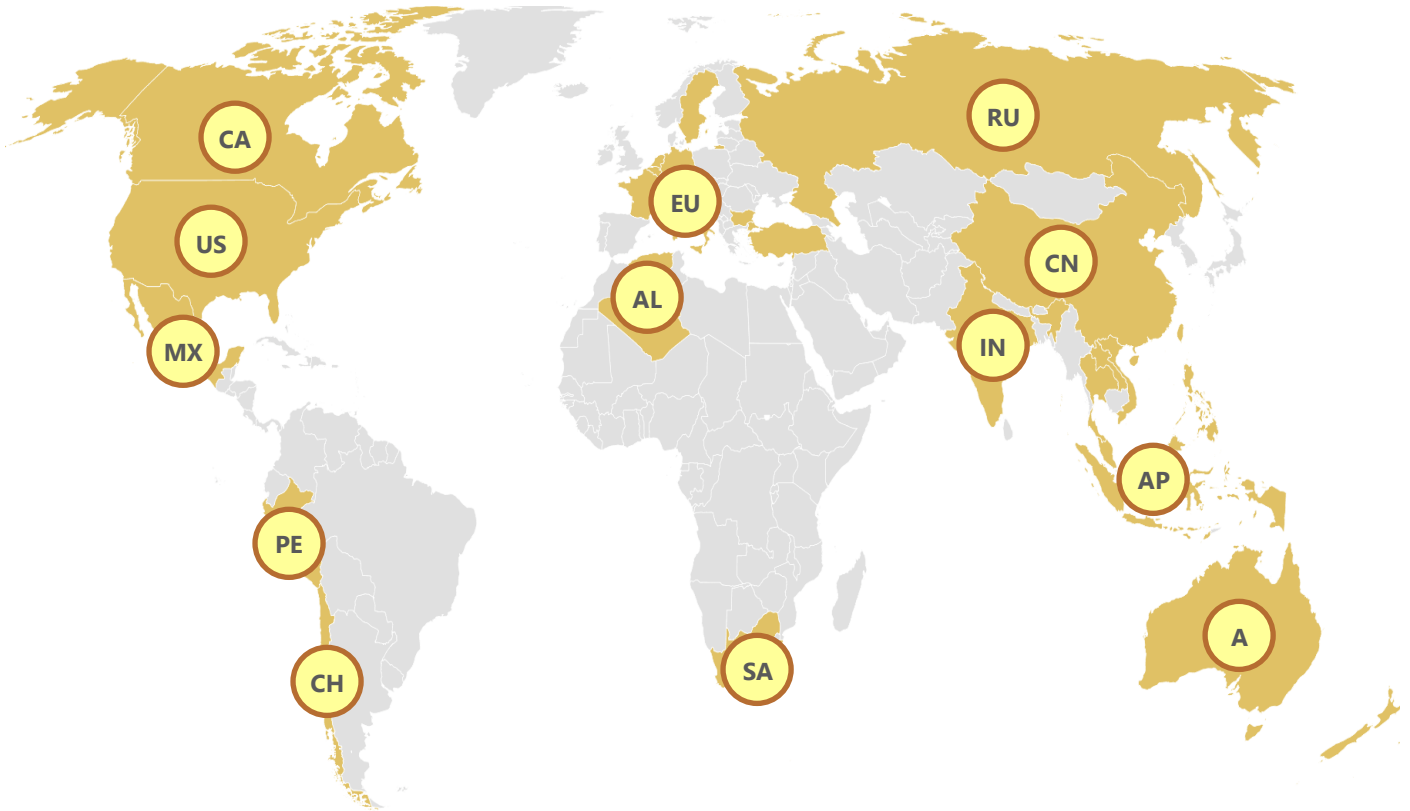
## Dimension sheet 3PA



Model size	Oil volume [l]	a [mm]	b [mm]	c [mm]	d [mm]	e [mm]	f [mm]	g [mm]	h [mm]
01 <sup>(1)</sup>	60	766	322	380	900	524	474	1239	330
02	110	1101	471	560	870	833	439	1320	330
03 <sup>(1)</sup>	185	962	471	560	1155	786	684	1850	370
04	205	962	471	560	1255	786	784	2050	370
05	350	1169	732	836	1257	926	766	2030	390
06	500	1221	847	951	1327	1026	836	2430	390
07	765	1221	942	1048	1600	1043	1109	2700	390
08	1075	1641	942	1048	1630	1463	1139	2760	390
09	1585	1706	1012	1118	1940	1528	1449	3380	390
10	2040	2136	1012	1118	2000	1958	1509	3500	390

(1) Available only as spare part and no longer produced for new applications

# GINO Representatives



Australia		Austria		Belgium		Bulgaria		Canada	
Chile		China		Czech Republic		England		France	
Hong Kong		India		Indonesia		Italy		Laos	
Luxembourg		Malaysia		Netherlands		New Zealand		Peru	
Philippines		Russia		South Africa		Sweden		Switzerland	
Taiwan		Thailand		Turkey		United States		Vietnam	
	Algeria					Mexico			



certified acc. to ISO 9001, IRIS

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