



Air Starters

DA-CA_en-a

Gali

The GALI air starters are intended for use on internal combustion engines and gas turbines.

For their size and weight, these starters are extremely powerful, and additionally feature high torque, high speed, low air consumption and reduced maintenance.

GALI starters can be operated at a pressure ranging from 3-4 MPa (30-40 bar) as the maximum and minimum working pressures depend on installation conditions.

The rapid response and the high speed of the GALI starters ensure that engines attain their ignition speed virtually instantly, thereby increasing the efficiency of the starting operation.

Since GALI starters require no external lubrication there is also no need for external pump lubricators which means a cleaner and more ecological installation area that is easier to maintain. They are additionally very resistant to humidity, saline atmosphere, and vibration, and they are unaffected by extreme temperatures.

GALI starters are successfully implemented in a widest range of applications including marine engines (propulsion and auxiliary) generator sets, conventional and nuclear power plants, military, locomotives, offshore, mining, etc.

“Two step engine starting sequence consisting on engagement and starting.”

“Very lightweight starters, left and right sense of rotation, high endurance.”

“Lubrication free.”

“The only starter on the market to operate directly at 30-40 bar and thus eliminate the need for problematic reduction valves.”



“Wide range of different models to start engines with up to 12.000 kW and more.”

GALI R&D

Our R&D department designs and develops all components of our air starters.

We apply our own technology to develop the main parts (rotors, crowns, shaft, main valve, servo-locker, etc) to assure the reliability and endurance of our starters.

We incorporate parts of high quality and resistance, avoiding any kind of material that might be affected by corrosion.

Main parts are distributed only by GALI.

“The reliability of an engine depends on the reliability of its starter.”

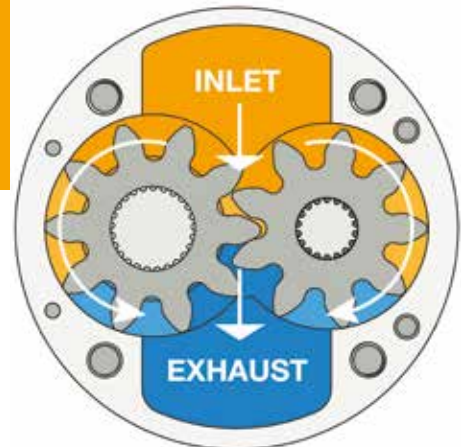


GALI starting system by rotors



“Long starter life and easy maintenance.”

The torque is produced as direct result of the pressure on the rotor side, obtaining the best results in initial compression and breakaway, which always ensures initial starting attempts even under adverse conditions.



GALI twins starters - to start engines with more than 12.000 kW



“Guarantee of first starting attempts.”

Only GALI engagement systems are able to ensure the perfectly harmonized and synchronized torque required to engage two starters simultaneously. Well known are the problems of broken gear rims occurring using other systems not manufactured by GALI.

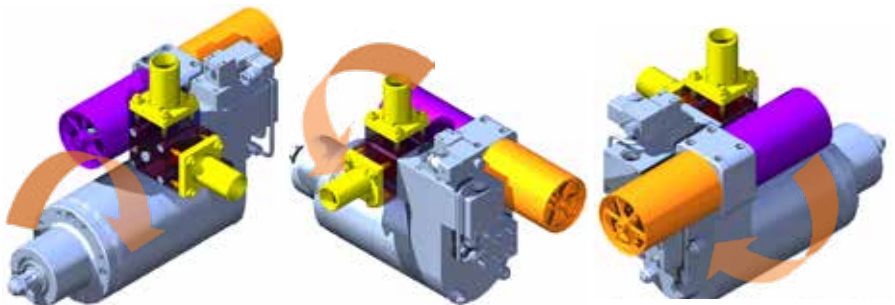


Simple and easy assembly

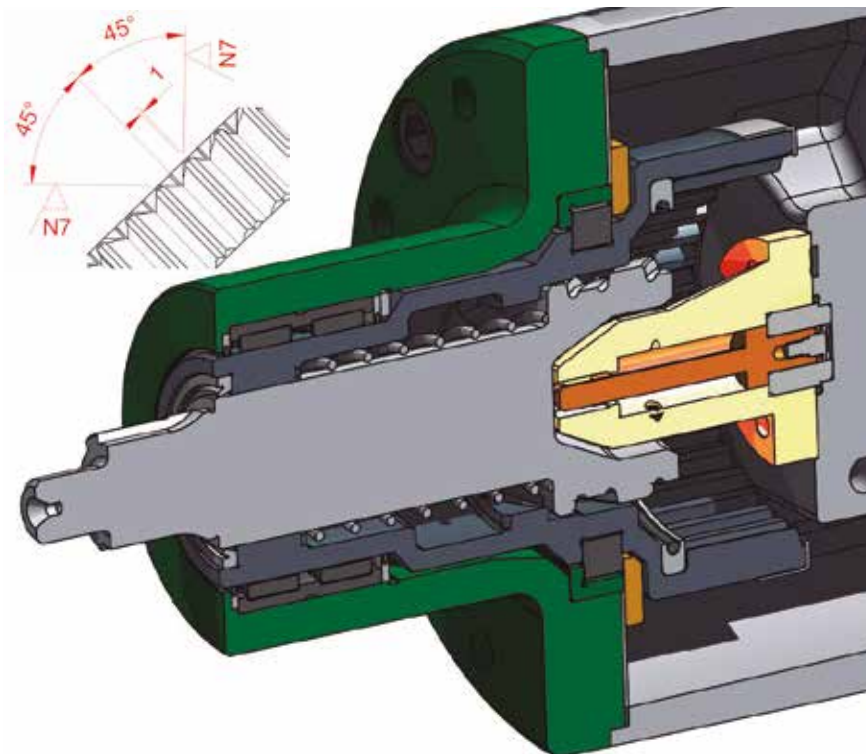
- **Fully Integrated**
The main and solenoid valves are incorporated in the starter body.
- **Versatile**
The inlet pipe and independent flange facilitate installation.
- **Lighter in weight**
Made of aluminum.
- **Easy to mount on existing engine brackets.**



“Save additional piping, relief valve, gauges & the problematic pressure reducing valve needed for other non GALI starters installations.”



Alternative soft engagement system by GALI



Enables the use of soft ring gears and eliminates the need for chamfering (same gear rim for CW and CCW rotation engines) thereby reducing costs for engine manufacturers.

Also completely avoids the problem of damaged crowns.

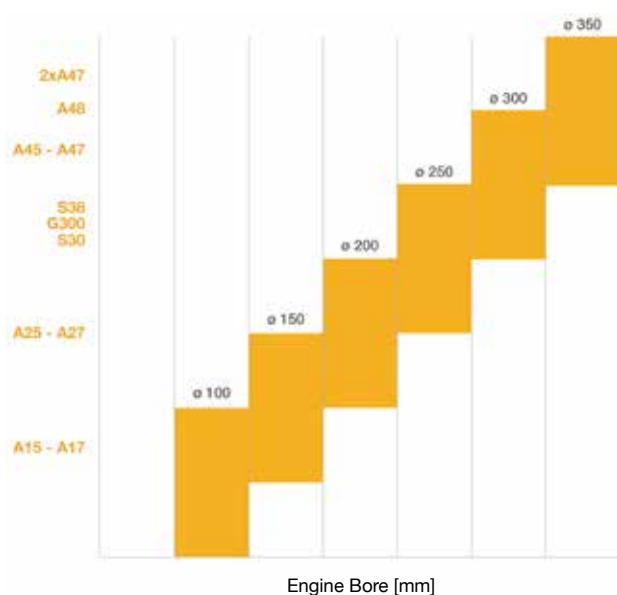
No chamfer machining necessary.

“Ultimate solution to the problem of expensive ring gear damage.”

Range of GALI Starters

Model	Max. Working Pressure	Max. Torque	Speed Range	Speed at Max. Power	Max. Power	Net Weight
A17	40 bar	88 Nm	0 - 4.000 rpm	4.000 rpm	16.5 kW	6.6 kg
A27	40 bar	188 Nm	0 - 4.000 rpm	2.800 rpm	30 kW	13 kg
A47	30 bar	540 Nm	0 - 3.500 rpm	2.300 rpm	66 kW	26 kg
A48	30 bar	640 Nm	0 - 3.500 rpm	2.200 rpm	77 kW	34 kg
S30	30 bar	305 Nm	0 - 3.500 rpm	2.500 rpm	41.5 kW	21 kg
S38	30 bar	360 Nm	0 - 3.500 rpm	2.500 rpm	42 kW	21.5 kg
G300	40 bar	380 Nm	0 - 3.500 rpm	2.500 rpm	46 kW	21 kg

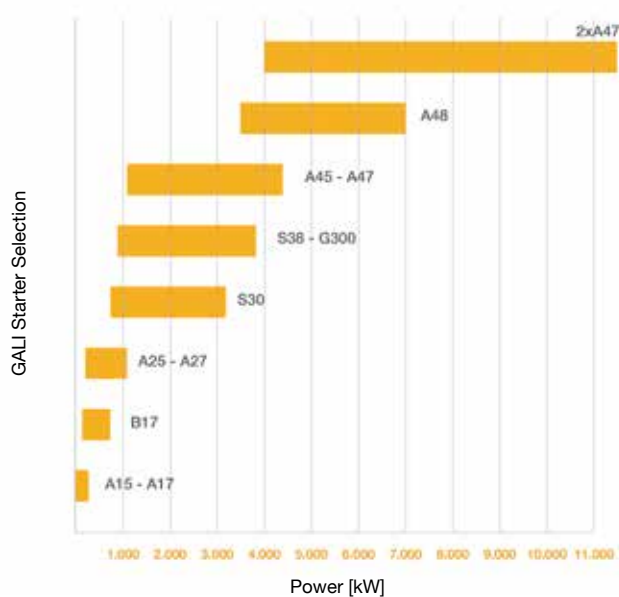
Starter selection chart by engine power & engine bore



The power and pressure required to start an engine depends exactly on the engine's technical characteristics such as the bore and stroke of the pistons, the number of crown teeth, the compression ratio, and the engine torque resistance in addition to the working temperature conditions and the specific characteristics of each installation.

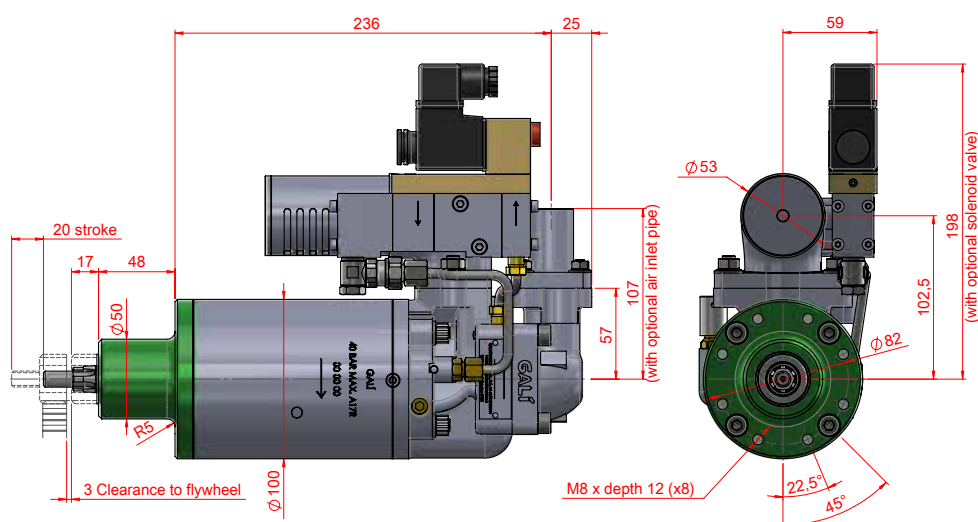
This is only a basic reference selection chart.

Before choosing a GALI starter for any application, contact your local dealer or our nearest representative.

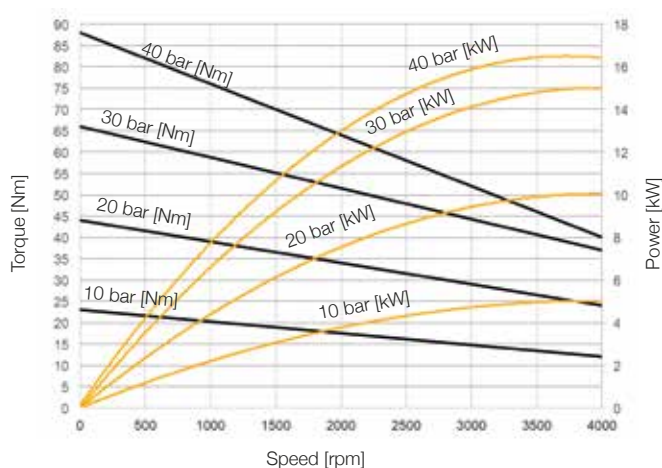


A17

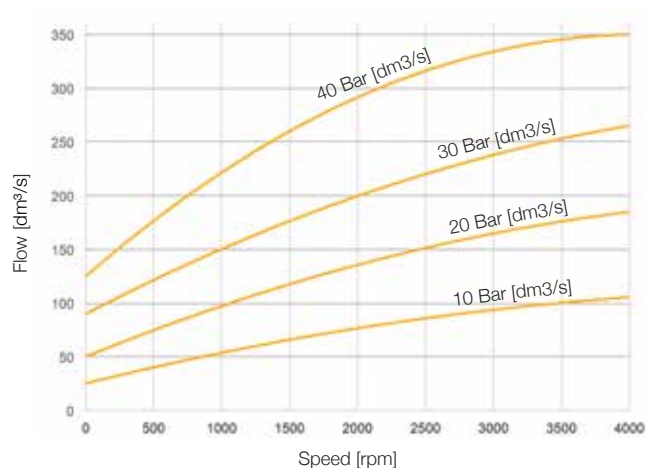
The type A17 air starter is generally used for starting internal combustion engines of an approximate rating of up to 300 kW (400 HP), although the suitability depends, in practice, on the engine capacity, number of cylinders and the ratio of the driving pinion to the fly-wheel ring gear.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM

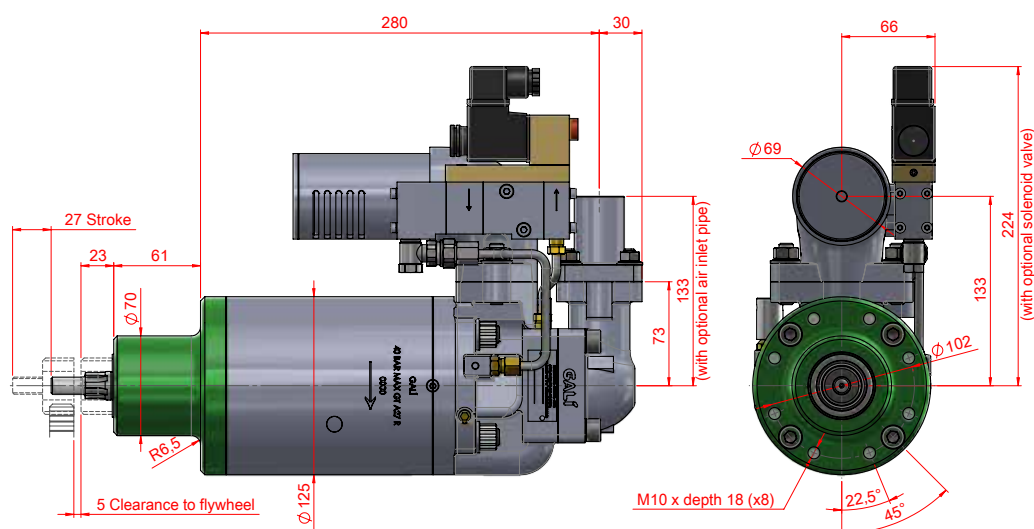
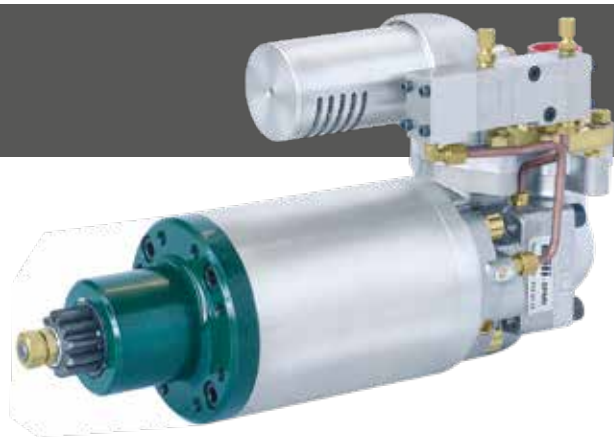


Technical Data

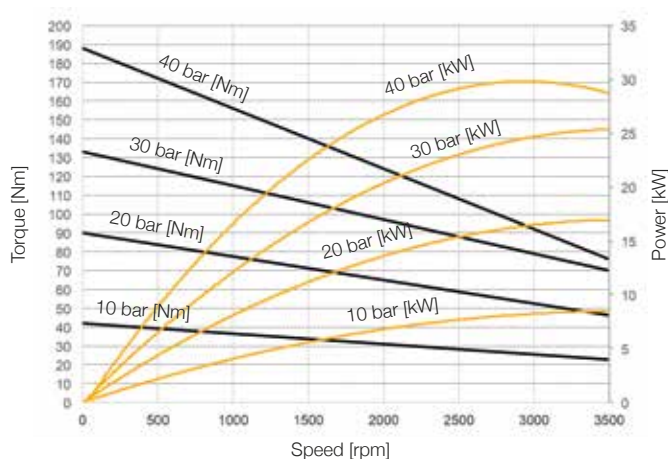
Max. Working Pressure	4 MPa (40 bar)
Max. Power	16.5 kW
Speed at max. Power	4000 min ⁻¹
Max. Torque	88 Nm
F.A.D.	125-350 dm ³ /s
Minimum inner diameter of feed air pipe	25 mm (1 in)
Net weight	6.6 kg / 15 lb

A27

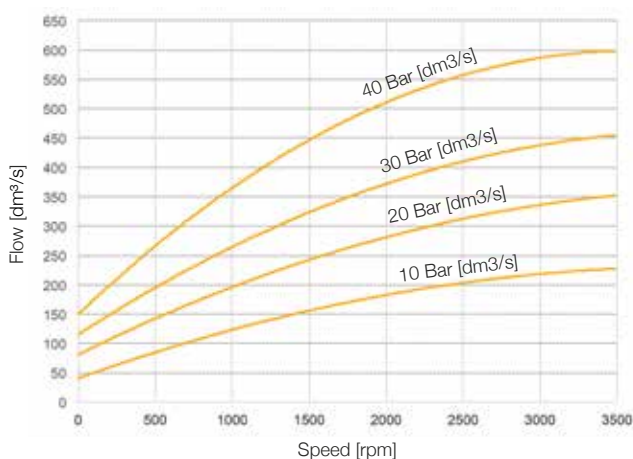
The type A27 air starter is generally used for starting internal combustion of an approximate range of ratings of 220-1.100 kW (300-1.500 HP), although the suitability depends, in practice, on the engine capacity, number of cylinders and the ratio of the pinion to the flywheel ring gear.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM

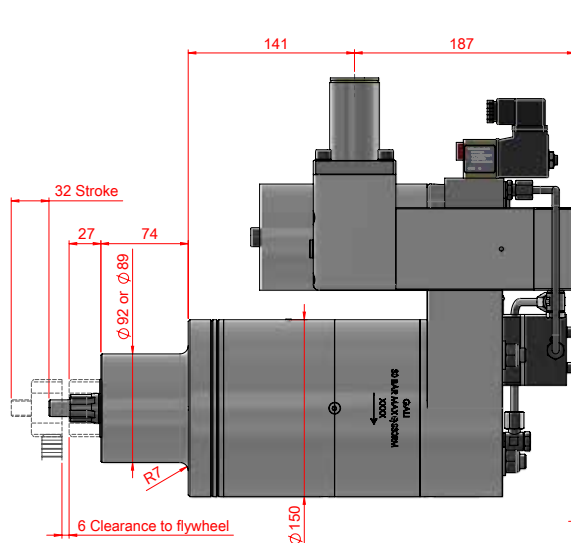


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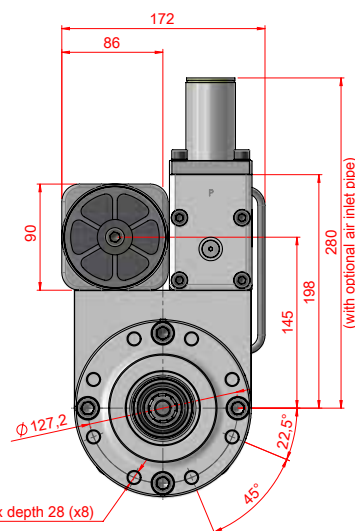
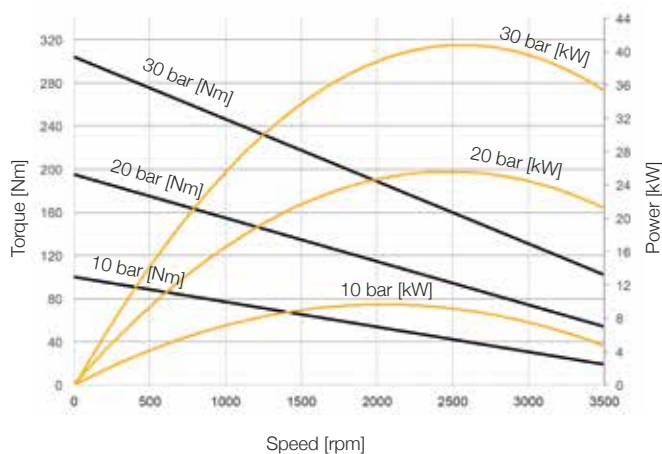
Max. Working Pressure	4 MPa (40 bar)
Max. Power	30 kW
Speed at max. Power	2800 min ⁻¹
Max. Torque	188 Nm
F.A.D.	300-600 dm³/s
Minimum inner diameter of feed air pipe	30 mm (1-3/16 in)
Net weight	13 kg / 28.7 lb

S30

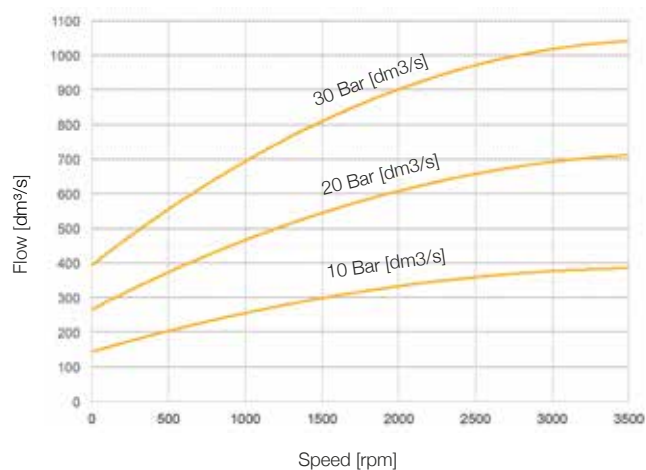
The type S30 air starter has been developed to start internal combustion engines of a power range from 750 to 3.200 kW (1.020 to 4.350 HP), although the suitability depends, in practice, on the engine capacity, number of cylinders and the ratio of the driving pinion to the flywheel ring gear.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM

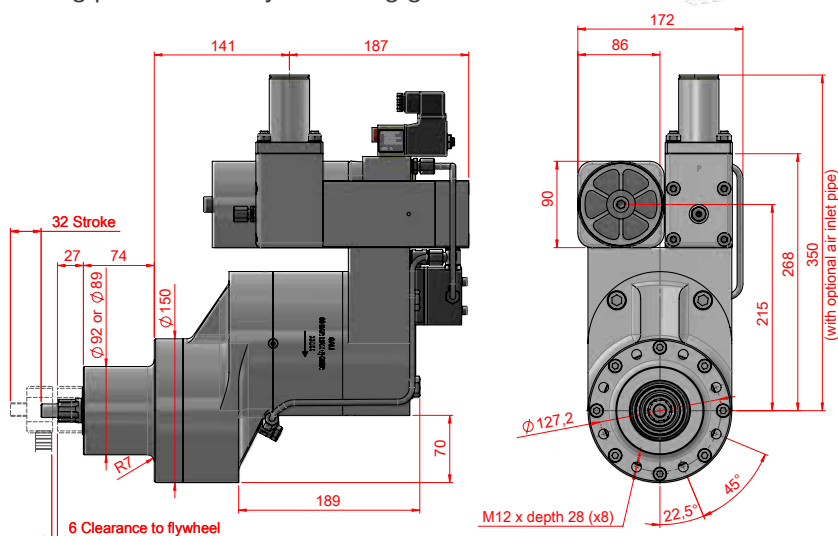


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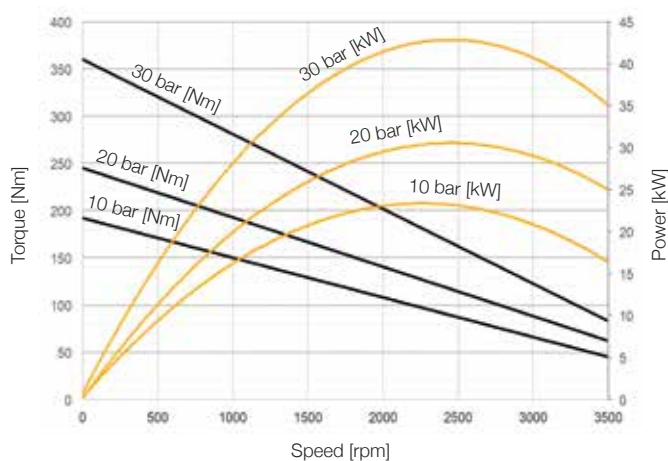
Max. Working Pressure	3 MPa (30 bar)
Max. Power	41.5 kW
Speed at max. Power	2500 min ⁻¹
Max. Torque	305 Nm
F.A.D.	400-1050 dm ³ /s
Minimum inner diameter of feed air pipe	36 mm (1-3/8 in)
Net weight	21 kg / 46.3 lb

S38

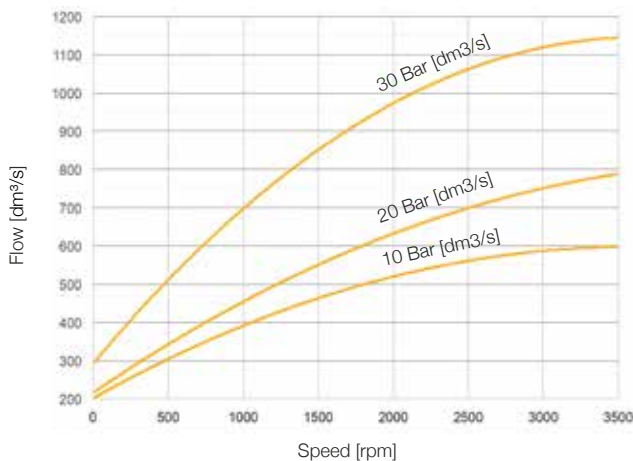
The type S38 air starter belongs to the new generation of GALI Starters, to cover all the range of engine powers. The S38 is intended to start internal combustion engines of a power range from 900 to 3.800 kW (1.210 to 5.100 HP), although the suitability depends, in practice, on the engine capacity, number of cylinders and the ratio of the driving pinion to the flywheel ring gear.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM

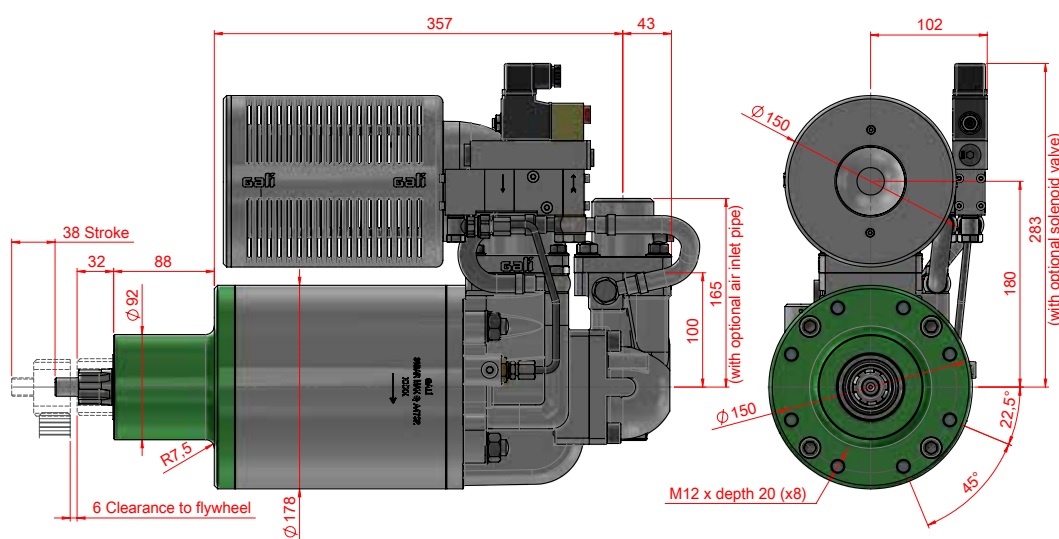


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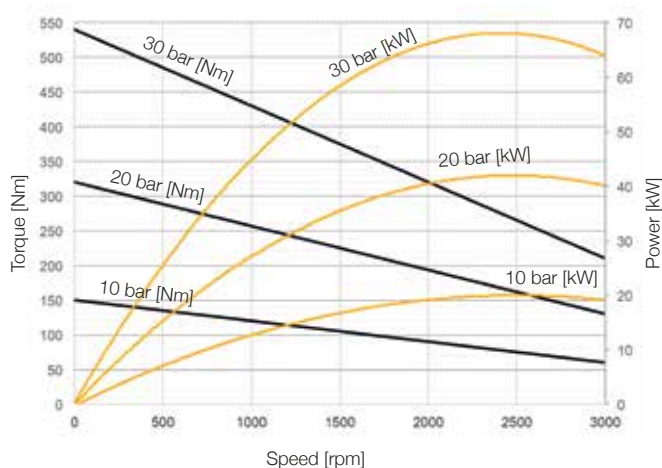
Max. Working Pressure	3 MPa (30 bar)
Max. Power	42 kW
Speed at max. Power	2500 min ⁻¹
Max. Torque	360 Nm
F.A.D.	300-1100 dm³/s
Minimum inner diameter of feed air pipe	36 mm (1-3/8 in)
Net weight	21.5 kg / 47.4 lb

A47

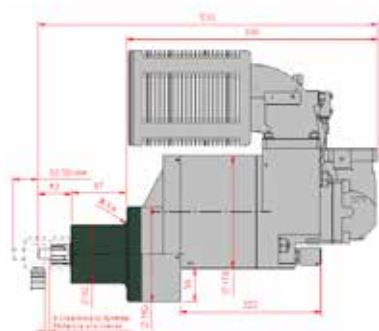
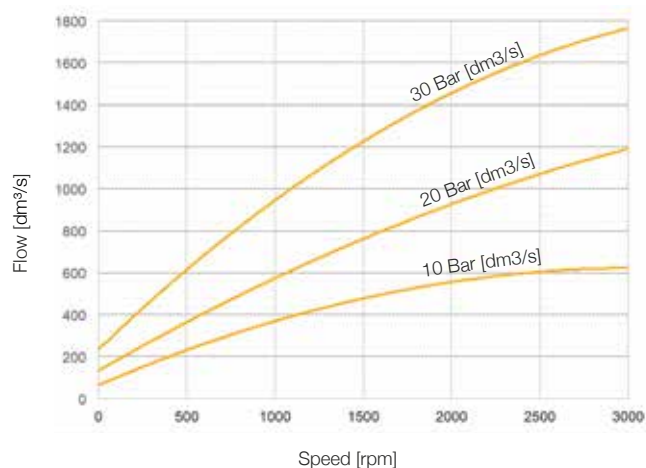
The type A47 air starter is generally used for starting internal combustion engines of an approximate range of ratings of 1.100-4.400 kW (1.500-6.000 HP), although the suitability depends, in practice, on the engine capacity, number of cylinders and the ratio of the driving pinion to the flywheel ring gear.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM



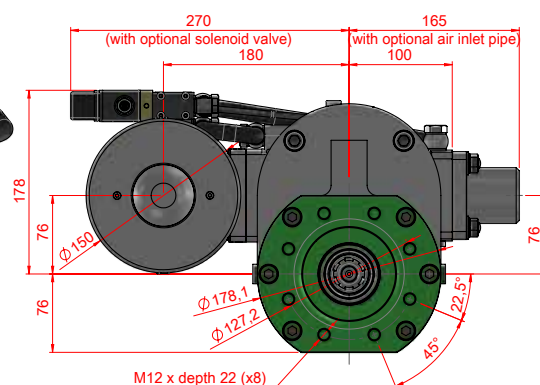
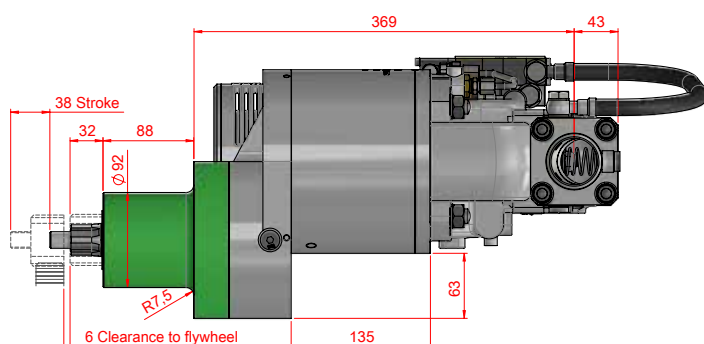
“Also available our A47 in 'Z' version to fit in reduced spaces.”

Technical Data

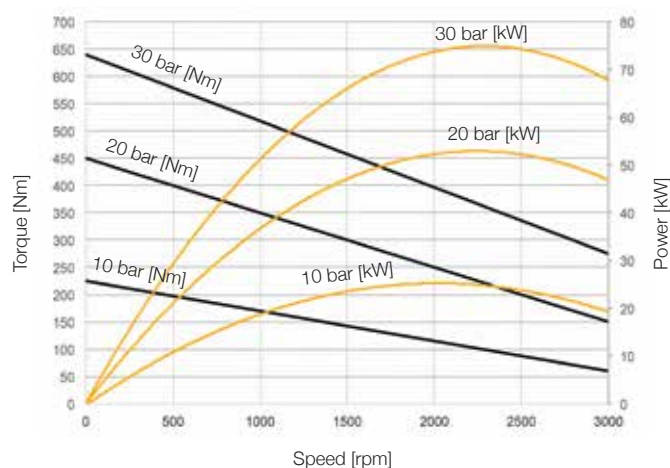
Max. Working Pressure	3 MPa (30 bar)
Max. Power	66 kW
Speed at max. Power	2300 min ⁻¹
Max. Torque	540 Nm
F.A.D.	250-1750 dm ³ /s
Minimum inner diameter of feed air pipe	45 mm (1-3/4 in)
Net weight	26 kg / 57.3 lb

A48

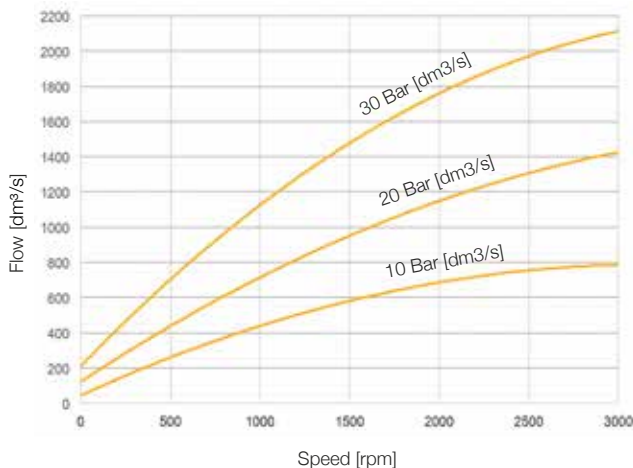
The type A48 air starter, with their 640 Nm torque, is generally used for starting internal combustion engines -Diesel or Gas- of power ratings from 3.500 to 7.000 kW (4.750-9.520 HP). Its 'Z' shape allows the incorporation of this starter on engines with complex and reduced spaces.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM



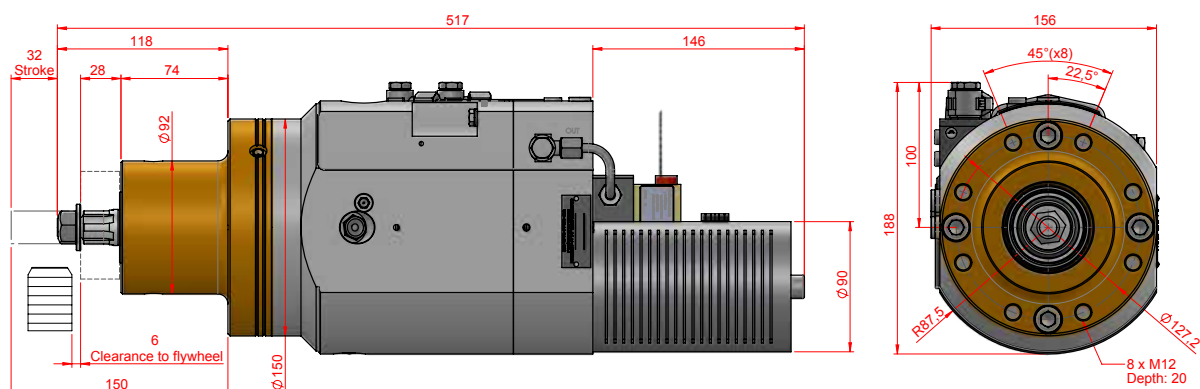
Technical Data

Max. Working Pressure	3 MPa (30 bar)
Max. Power	77 kW
Speed at max. Power	2200 min ⁻¹
Max. Torque	640 Nm
F.A.D.	210-2100 dm ³ /s
Minimum inner diameter of feed air pipe	45 mm (1-3/4 in)
Net weight	34 kg / 75 lb

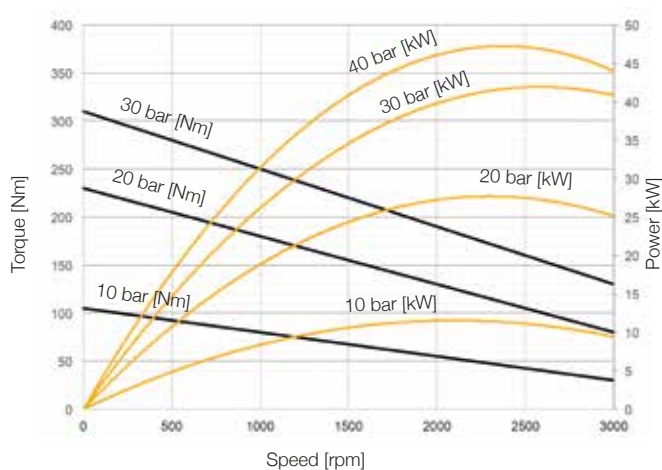
G300

This range of starter is designed to start internal combustion engines from 750 up to 3.200 kW (1.020 to 4.350 CV) with a compact design to allow maximum clearance for engine components.

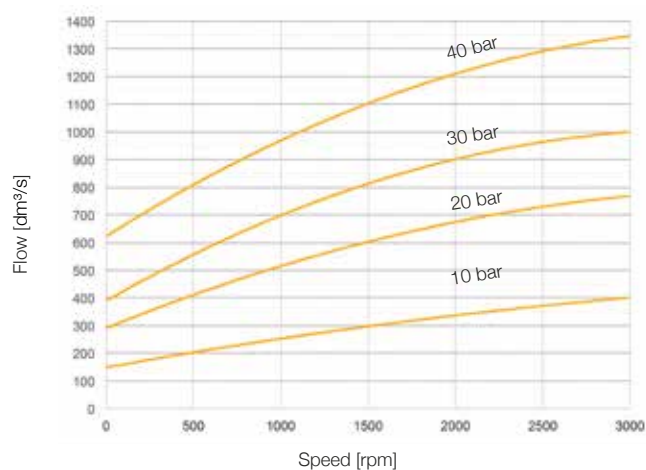
This new air starter is an evolution of actual S30 type improved to reduce maintenance operations and increase lifetime.



TORQUE / SPEED / POWER DIAGRAM



AIR FLOW DIAGRAM

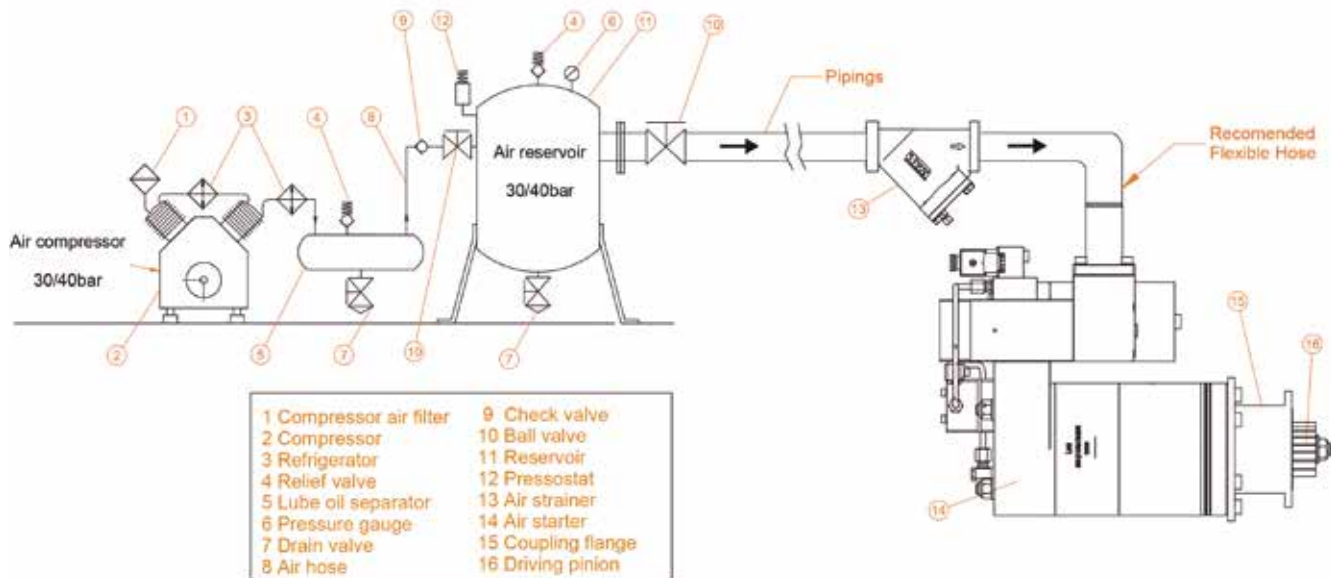


“The Air Starter G300 has been designed to achieve the actual demand of compact starters on the market.”

Technical Data

Max. Working Pressure	4 MPa (40 bar)
Max. Power	46 kW
Speed at max. Power	2300 min ⁻¹
Max. Torque	380 Nm
F.A.D.	500-1200 dm ³ /s
Minimum inner diameter of feed air pipe	36 mm (1-3/8 in)
Net weight	21 kg / 46.3 lb

Full installation sketch



Certificates

Our starters are homologated by Bureau Veritas, Lloyd's Register, Germanischer Lloyds & American Bureau of Shipping.

On request, we will be glad to provide other certificates such as **Korean Register, Rinna, etc.**

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CERTIFICADO DEL SISTEMA DE GESTIÓN

Número de certificado: 001010-0100-000-000	Fecha de emisión: 20/06/2018	Vigencia: 01/06/2018 - 01/06/2020
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Se certifica que el sistema de gestión de:

GALI INTERNACIONAL, S.A.

C/ Isaac Tola, nº 15, Polígono Industrial de Haza d'Ena, 36181, Santarcom, Barro, Lugo, España

se conforme a la Norma del Sistema de Gestión de Calidad:

ISO 9001:2008

Este certificado es válido para el siguiente campo de aplicación:

DISEÑO, FABRICACIÓN Y/O COMERCIALIZACIÓN DE COMPONENTES PARA MOTORES DIESEL Y GAS, GRUPOS COMBUSTORES Y CENTRALES HIDROELÉCTRICAS, PRODUCTOS ANTIDEPÓSITANTES ANTIS-SECC, MAQUINARIA TEXTIL DE ESTAMPACIÓN Y OTROS PRODUCTOS RELACIONADOS

Localidad: Barro,
 Fecha: 20/06/2018



ENAC
 CERTIFICACIÓN
 N.º 001010-0100-000-000

Oficina de certificación:
 001010 - Barro, Galicia (España)
 Oficina de contacto: 001010 - Barro, Lugo, España
 E-mail: 001010@dnv-gl.com


Enric Gualandri *Enric*
 Responsable de la Oficina

El presente certificado es válido únicamente para el sistema de gestión de calidad en el campo de aplicación:

www.dnv-gl.com

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Accessories

Coupling flanges

Designed for mounting air starters to internal combustion engines.



Centrifugal filter

Centrifugal force filters designed to drain all moisture and remove all particles from the air. Ideal for installations where engines are exposed to high humidity and rough working conditions (boats).



Filters

Strainer-principle separator and static filters designed to ensure minimum pressure loss.



Pinions

GALI starters can be equipped with pinions with any number of teeth, pressure angles, diameter pitches as required for the engine flywheel gear.



Solenoid Valves

Many types are available upon request to be used for automatic control of air starter.



GALI benefits against low pressures starters

Low pressure starters need many additional components to start engines



“GALI high pressure starters are plug and play: only one component needed to start engines”



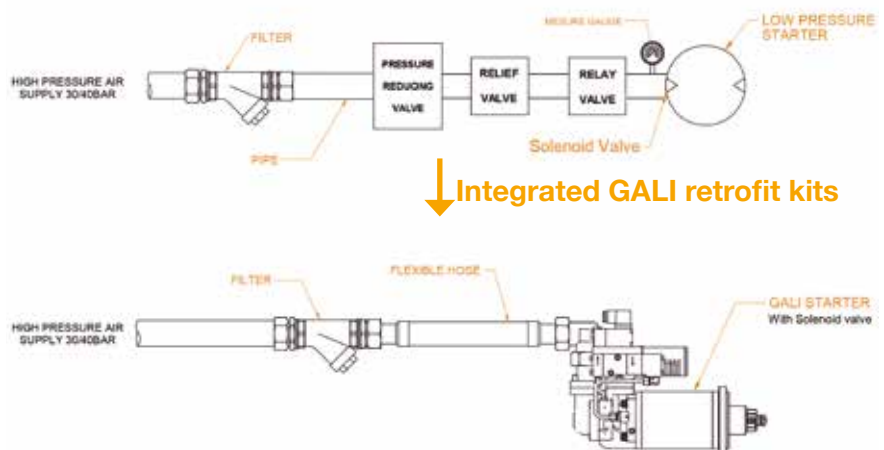
- Soft starting sequence avoiding collision with the flywheel.
- Work directly from 30 to 12 bars, thus avoiding additional problematic elements (pressure reduction valve, relay valve, relief valve, extra piping, etc.).

Retrofitting GALI Kits

“Fewer components -easier installation- only one supplier.”

GALI provides complete retrofit kits for replacing other air starters on the market where 30 bars of air pressure is available. Our starters are connected directly to the main air supply pipe after removing problematic reduction valves and other elements.

Please contact GALI for information on the correct retrofit kit.



GALI starters are successfully installed in

- Generator sets
- Motor pump sets
- Locomotives
- Forklift truck engines
- Industrial vehicles
- Offshore sea platforms
- Conventional and nuclear power plants
- Marine propulsion and auxiliary engines
- Mines

Our customers

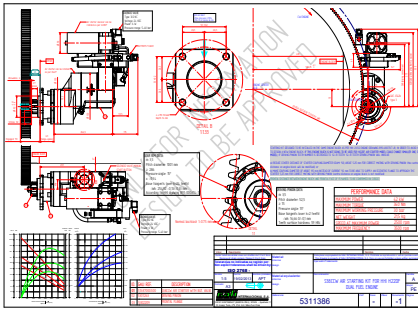
GUANGZHOU DIESEL	CATERPILLAR	DEUTZ	VOLVO PENTA
MAN	ROLLS-ROYCE	SMDER-711	CSR YUCHAI
MTU	ISOTTA FRASCHINI	HYUNDAI	S.E.M.T. PIELSTICK
GENERAL MOTORS	WÄRTSILÄ	MITSUBISHI	NIIGATA
HENAN DIESEL	GE JENBACHER	SHAANXI DIESEL ENGINE	FAIRBANKS MORSE ENGINE
KIRLOSKAR OIL ENGINES	MOTEURS BAUDOUIN	KAWASAKI	CUMMINS
MWM	GUASCOR	ZHENJIANG MARINE	HATZ DIESEL
PERKINS	STX	DIESEL ABC	FTP
SCANIA	DOOSAN	DAIHATSU	NANNI DIESEL
			JOHN DEERE

RIGAS DIESEL, AKSA, PROCO, ELECTRAMOLINS, INTERGEN, GRUPO ATURIA, MARGEN GRUPPI ELETTRICI, ÇUKUROVA, LINDENBERG, FINANZAUTO, EUROGEN, SDMO, MPS, FGWILSON, MILAN TRACTOR, TELYME, FINBETA, CTM, ROLF JANSSEN ELEKTROTECHNISCHE WERKE, FPT POWERTRAIN, ENERIA, ENERCAL, BES, FLOWSERVE, AFRIQUE ENERGIE, DALKIA FRANCE, SEGUIN FOLLET, ADV ALTARES, TOTAL, SULZER POMPES, FAUCHE ENERGIE, ALSTOM HYDRO FRANCE, MUTHEC, DCNS

Customer support

We provide full support during all processes involved selecting the best starter solution.

We provide complete technical information (drawings, calculations, etc) and free cooperation in running trial tests on engines to ensure the optimal performance of our starters.



GALI service team

Carrying out maintenance on GALI starters is a very easy and simple task. We provide our customers support by supplying free digital materials which enable them to deal with maintenance issues confidently. If necessary, our experienced service team is also available to visit your installation site for testing or service.

Maintenance tools



“In addition to air starters, we also supply hydraulic starters, shutoff valves, hydraulic and compressor sets, ATEX-compliant engine starters, and more.”

Contact GALI for information on the right starter system for your diesel or gas engines.

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Gali
Technical Solutions since 1951