

MADE IN ITALY



## BORA

Oil injected rotary screw compressors  
with direct transmission, fixed or variable speed.

**90-250 kW**



## ROTARY SCREW COMPRESSORS FROM 90 TO 250 KW: A COMPLETE RANGE

The SHAMAL direct-driven screw compressors of the BORA range provide a very high performance solution for the most demanding applications. The BORA range offers a wide selection of models from 90 to 250 kW with operating pressure from 7.5 to 13 bar.

## HIGH ENERGY SAVINGS

The choice of high quality components combined with IE3 "Premium Efficiency" motors and high-performance air-ends, ensures low consumption, remarkable energy savings and exceptional efficiency performance. IE3 motors also reduce CO<sub>2</sub> emissions: an important contribution to protecting the environment.



### ★ High performance

The special design of the screw profile ensures high performance of compressed air production; a key point of the SHAMAL engineering project.

### ★ High reliability

Accurate quality control and the use of components of leading worldwide manufacturers ensure a long service life and long maintenance intervals.

All the energy of the motor is transferred to the compression process thanks to the simple direct drive arrangement, ensuring the most energy efficient operation and maximum reliability.

### ★ 2-year warranty

Air-ends, inverters and controllers are covered by a 2-year warranty.

### ★ Minimum maintenance

Low noise levels, reduced vibration, fewer components means less maintenance. The set-up of BORA models includes a pre-filtering panel for the separation of environmental particulate, to keep the inside of the machine clean.

Maintenance is facilitated by large hinged doors and panelling with safety closures. The radiators, the oil filters and the air filter are easy to reach and inspect.



Top view of models: 110kW - 132kW - 160kW

# BORA 90-250

from 90 to 250 kW

## STANDARDS... NOT OPTIONS

- Direct drive with elastic coupling element.
- Phase sequence relay.
- Air inlet pre-filtration.
- Two-stage air inlet filter.
- Condensate separator with automatic drain from 110 to 250 kW.
- IE3 Motors with enclosure IP55 - Class F.



### Advanced cooling system - 90kW model

The BORA 90kW model, unlike models with greater power, features a centrifugal fan, always driven by thermostatic control. The fan maintains the temperature of the entire compressor within a specific tolerance and at a constant level, avoiding peaks and major variations that can be harmful to correct machine operation. The action of the centrifugal fan installed starting from the 90kW model, combined with the efficiency of the oversized radiator, guarantees compressor operation even in critical climatic conditions, cooling not only the radiator but also the entire cabin. The acoustic level, thanks to the use of a "silent" fan and high quality soundproofing materials, is among the lowest in its range.



### Double oil filter (starting from 110 kW)

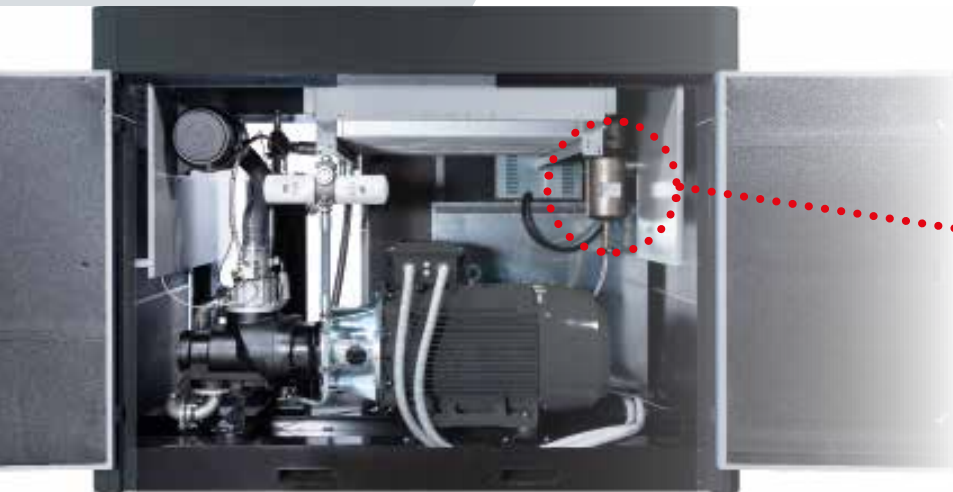
Filter support includes the thermostatic element. The working temperature of the compressor is controlled by both the throttling of the oil flow through the thermostatic element and the switching of the fans according to the air-end discharge temperature.



### Easy access and maintenance

Wide front and rear access panels allow immediate access to the internal components, thus reducing inspection and maintenance times.

The two removable panels placed at the base of some compressors, preserve cleanliness and ensure more silent operation, when installed.



Condensate separator with automatic drain on models from 110 to 250 kW.

### ★ Advanced cooling system

Our oversized premium quality air-oil heat exchangers guarantee low operating temperatures even in severe working conditions.

The large coolers coupled with separate thermostatically controlled electro-fans and a thermostatic valve inside the oil cooling system ensure lower compressed air outlet temperatures, eliminating the risk of condensate from forming in the lubricant, providing the best protection against damage to internal components, ensuring a much longer service life to the entire compressor.



### ★ Reliable transmission

The direct drive arrangement eliminates power losses in the transmission and is virtually maintenance free.

The low operating speed and low operating temperature ensure very reliable operation and a long service life. The direct drive system also contributes to a higher output and therefore reduced power consumption.



### ★ High efficiency electric motor

Asynchronous IE3 High Efficiency electric motor fully protected with insulation class F and protection to IP 55. All the energy of the motor is transferred to the compression process thanks to the simple direct drive arrangement, ensuring the most energy efficient operation and maximum reliability.



### ★ Intake regulator

The electropneumatic system regulates compressor operation, ensures the minimum required pressure during no-load operation and maximum energy savings at start-up, thus optimising the energy cost / air generated ratio.

Model	Code	Power		Delivered air		Max. pressure		Sound level	Connection	Net weight		Net dimensions	Gross weight		Gross dimensions
		kW	HP	m <sup>3</sup> /min.	c.f.m.	bar	p.s.i.			kg	Lbs		L x W x H (cm)	kg	

#### BORA 90-250 kW - Fixed speed

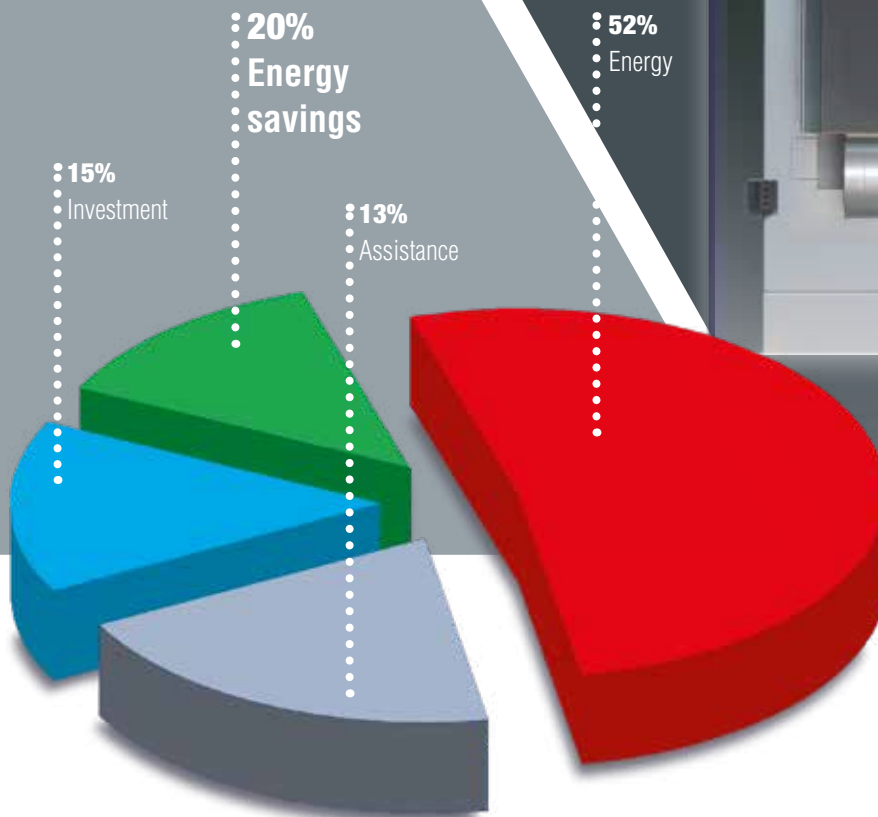
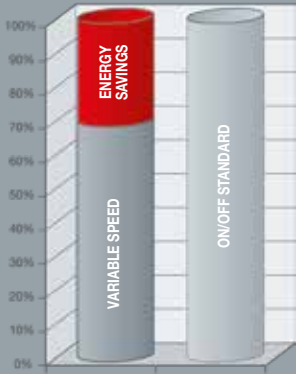
BORA 90-08	V60FH92SHA060	90	125	15.9	562	7.5	109	67	2"	2,927	6,453	230 x 146 x 196	3,107	6,850	256 x 166 x 223
BORA 90-10	V60FJ92SHA060	90	125	13.4	473	10	145	67	2"	2,927	6,453	230 x 146 x 196	3,107	6,850	256 x 166 x 223
BORA 110-08	V60MT92SHA180	110	150	18.7	660.4	8	116	75 ± 3	3"	3,240	7,143	290 x 155 x 216	3,410	7,502	306 x 171 x 234
BORA 110-10	V60MI92SHA180	110	150	16.3	575.6	10	145	75 ± 3	3"	3,240	7,143	290 x 155 x 216	3,410	7,502	306 x 171 x 234
BORA 110-13	ON DEMAND	110	150	13.9	490.9	13	189	75 ± 3	3"	3,240	7,143	290 x 155 x 216	3,410	7,502	306 x 171 x 234
BORA 132-08	V60MV92SHA180	132	180	23.4	826.4	8	116	76 ± 3	3"	3,300	7,275	290 x 155 x 216	3,470	7,634	306 x 171 x 234
BORA 132-10	V60MN92SHA180	132	180	19.9	702.8	10	145	76 ± 3	3"	3,300	7,275	290 x 155 x 216	3,470	7,634	306 x 171 x 234
BORA 132-13	V60MZ92SHA180	132	180	16.3	575.6	13	189	76 ± 3	3"	3,300	7,275	290 x 155 x 216	3,470	7,634	306 x 171 x 234
BORA 160-08	V60MX92SHA180	160	220	26.8	946.4	8	116	76 ± 3	3"	3,850	8,488	290 x 155 x 216	4,020	8,844	306 x 171 x 234
BORA 160-10	V60MQ92SHA180	160	220	23.4	826.4	10	145	76 ± 3	3"	3,850	8,488	290 x 155 x 216	4,020	8,844	306 x 171 x 234
BORA 160-13	ON DEMAND	160	220	19.9	702.8	13	189	76 ± 3	3"	3,850	8,488	290 x 155 x 216	4,020	8,844	306 x 171 x 234
BORA 200-08	V60MA92SHA180	200	270	34.8	1,229	8	116	76 ± 3	5"	4,550	10,031	330 x 210 x 216	4,728	10,402	346 x 226 x 234
BORA 200-10	V60MC92SHA180	200	270	28.8	1,017.10	10	145	76 ± 3	5"	4,550	10,031	330 x 210 x 216	4,728	10,402	346 x 226 x 234
BORA 200-13	ON DEMAND	200	270	24.4	861.7	13	189	76 ± 3	5"	4,550	10,031	330 x 210 x 216	4,728	10,402	346 x 226 x 234
BORA 250-08	V60ML92SHA180	250	340	40.5	1,430.20	8	116	76 ± 3	5"	4,700	10,362	330 x 210 x 216	4,878	10,732	346 x 226 x 234
BORA 250-10	V60MO92SHA180	250	340	36.8	1,299.60	10	145	76 ± 3	5"	4,700	10,362	330 x 210 x 216	4,878	10,732	346 x 226 x 234
BORA 250-13	ON DEMAND	250	340	28.8	1,017.10	13	189	76 ± 3	5"	4,700	10,362	330 x 210 x 216	4,878	10,732	346 x 226 x 234

Reference conditions: air intake temperature 20°C (68°F) – atmospheric pressure 1 bar (14.5 p.s.i.).

Air flow was measured in the following operating pressures: 7 bar for models at 7.5 bar - 7.5 bar for models at 8 bar - 9.5 bar for models at 10 bar - 12.5 bar for models at 13 bar.

The data and results were measured in accordance with standard ISO 1217.

The sound level was measured in accordance with standard ISO 3744.



The graph shows the remarkable energy savings achieved with a variable speed compressor in a typical installation.

The 'Vector' type frequency inverters with exceptional power saving features, are characterized by the ability to provide a constant load torque curve over the motor's total operating speed range.

SHAMAL selects premium quality inverters, to guarantee the end user total reliability and first class service assistance worldwide.

BORA VS are particularly suitable for companies that use compressed air with frequently changing flow: the variable frequency drive allows the machine to adjust the flow rate to the actual demand.

The benefits of using the BORA VS with inverter are remarkable:

- continuous control of the compressed air generated by varying the speed of the electric motor from 40% up to 100% of the full speed;
- the compressed air generated is therefore constantly proportional to the requirements of the system;
- pressure control inside the system, in a range between 6 and 13 bar, depending on the chosen compressor model.

# BORA VS 90-250

from 90 to 250 kW

**VARIABLE SPEED COMPRESSORS:  
DESIGNED FOR INDUSTRIAL USE  
TO ACHIEVE THE HIGHEST ENERGY SAVINGS**

Reducing power consumption and protecting our valuable energy resources represents one of the greatest global environmental challenges of our times.

SHAMAL offers a wide range of Direct Driven Variable Speed screw compressors (VS versions) from 90 to 250 kW, providing high performance, robust and reliable solutions to suit all heavy duty industrial requirements.



Model	Code	Power		Delivered air (min. / max.)		Max. pressure		Sound level dB(A)	Conne- ction G	Net weight		Net dimensions L x W x H (cm)	Gross weight		Gross dimensions L x W x H (cm)
		kW	HP	m <sup>3</sup> /min.	c.f.m.	bar	p.s.i.			kg	Lbs		kg	Lbs	

## BORA VS 90-250 kW - Variable speed

BORA 90-08 VS	V60FH97SHA060	90	125	5.70 / 15.90	201 / 562	7,5	109	68	2"	2,981	6,572	230 x 146 x 196	3,161	6,969	256 x 166 x 223
BORA 90-10 VS	V60FJ97SHA060	90	125	4.80 / 13.40	170 / 473	10	145	70	2"	2,981	6,572	230 x 146 x 196	3,161	6,969	256 x 166 x 223
BORA 110-08 VS	V60MT97SHA180	110	150	3.90 / 18.50	137.7 / 653.3	8	116	75 ± 3	3"	3,315	7,293	290 x 155 x 216	3,485	7,667	306 x 171 x 234
BORA 110-10 VS	V60MI97SHA180	110	150	4.50 / 15.90	158.9 / 561.5	10	145	75 ± 3	3"	3,315	7,293	290 x 155 x 216	3,485	7,667	306 x 171 x 234
BORA 110-13 VS	ON DEMAND	110	150	4.40 / 13.50	155.4 / 476.7	13	189	75 ± 3	3"	3,315	7,293	290 x 155 x 216	3,485	7,667	306 x 171 x 234
BORA 132-08 VS	V60MV97SHA180	132	180	3.55 / 22.20	125.4 / 784	8	116	75 ± 3	3"	3,380	7,436	290 x 155 x 216	3,550	7,810	306 x 171 x 234
BORA 132-10 VS	V60MN97SHA180	132	180	5.40 / 19.00	190.7 / 671	10	145	75 ± 3	3"	3,380	7,436	290 x 155 x 216	3,550	7,810	306 x 171 x 234
BORA 132-13 VS	ON DEMAND	132	180	6.22 / 16.10	219.7 / 568.6	13	189	75 ± 3	3"	3,380	7,436	290 x 155 x 216	3,550	7,810	306 x 171 x 234
BORA 160-08 VS	V60MX97SHA180	160	220	5.00 / 25.60	176.6 / 904.1	8	116	74 ± 3	3"	3,950	8,690	290 x 155 x 216	4,120	9,064	306 x 171 x 234
BORA 160-10 VS	V60MQ97SHA180	160	220	5.12 / 22.90	180.8 / 808.7	10	145	74 ± 3	3"	3,950	8,690	290 x 155 x 216	4,120	9,064	306 x 171 x 234
BORA 160-13 VS	ON DEMAND	160	220	6.00 / 19.40	211.9 / 685.1	13	189	74 ± 3	3"	3,950	8,690	290 x 155 x 216	4,120	9,064	306 x 171 x 234
BORA 200-08 VS	V60MA97SHA180	200	270	9.45 / 33.50	333.7 / 1,183	8	116	76 ± 3	5"	4,660	10,252	330 x 210 x 216	4,838	10,644	346 x 226 x 234
BORA 200-10 VS	V60MC97SHA180	200	270	9.90 / 28.50	349.6 / 1,006.5	10	145	76 ± 3	5"	4,660	10,252	330 x 210 x 216	4,838	10,644	346 x 226 x 234
BORA 200-13 VS	ON DEMAND	200	270	9.20 / 24.60	324.9 / 868.7	13	189	76 ± 3	5"	4,660	10,252	330 x 210 x 216	4,838	10,644	346 x 226 x 234
BORA 250-08 VS	V60ML97SHA180	250	340	9.90 / 42.10	349.6 / 1,486.7	8	116	76 ± 3	5"	4,855	10,681	330 x 210 x 216	5,033	11,073	346 x 226 x 234
BORA 250-10 VS	V60M097SHA180	250	340	9.60 / 35.70	339 / 1,260.7	10	145	76 ± 3	5"	4,855	10,681	330 x 210 x 216	5,033	11,073	346 x 226 x 234
BORA 250-13 VS	ON DEMAND	250	340	9.70 / 30.60	342.6 / 1,080.6	13	189	76 ± 3	5"	4,855	10,681	330 x 210 x 216	5,033	11,073	346 x 226 x 234

Reference conditions: air intake temperature 20°C (68°F) – atmospheric pressure 1 bar (14.5 p.s.i.).

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# DNAir2

## ADVANCED ELECTRONIC CONTROLLER

The advanced controller DNAir2 featured in the entire BORA Series has been specifically developed to guarantee optimum monitoring and regulation of compressors operation, allowing flexibility and full programming of the complete compressed air station for maximum efficiency and safety.



### DNAir2

The DNAir2 controller features a large backlit LCD display with clear and simple icons, offering 19 languages and RS485 communication port.

The main screen displays:

- Operating pressure
- Oil temperature
- Compressor status (stand-by, idle, load)
- Fan status (off/on)
- Date and time
- Remaining hours to maintenance
- Drive speed percentage (for units with inverter)

### COMPRESSOR ROTATION MANAGEMENT

The extremely user-friendly serial interface allows maximum connectivity to up to 4 screw compressors (all models at fixed speed or all models at variable speed), equipped with the DNAir2 controller. The controller software provides the ability to balance each machine's operating hours and at the same time the pre-set pressure values are rotated along with the machine sequence.



# How to achieve maximum energy saving?

Based upon decades of experience in the industrial sector, SHAMAL provides a professional auditing service to its clients. Our skilled technicians, using advanced measurement and analysis equipment (EATool and EASoftware) can carry out a full audit of any system. This allows us to fully understand your system demands, existing energy consumption and wastage. Our advanced simulation software then allows us to propose various technical options that are aimed at providing considerable economic and energy consumption savings.

## EASoftware

Using accurate data on the actual consumption or generation of compressed air in the system along with existing energy usage. Providing a complete and precise Energy Audit of the system (generated air, system load, pattern of use, pressure etc.).

Provides options for an alternative system that might include one or more compressors and controls as a possible alternative to the existing installation, to provide maximum energy savings and a reduction in wasted energy.

## EATool

Designed to measure compressed air systems where up to 3 compressors operate. Measurements are downloaded to a USB drive or USB/PC. Supplied: up to 3 x 400 A ampere clamps (optional up to 1000A) and a pressure sensor. Capable of analysing over a long time period (usually eight days or more is ideal).



## SMS DEVICE Service Management System

SMS is the innovative device for remote control and perform predictive maintenance on screw compressors equipped with DNAir2 controller.

The device automatically sends an e-mail (up to 3 addresses to be defined during set-up) in case of an alarm and according to pre-set thresholds (every hour, every day, every week): this feature allows you to schedule routine maintenance and timely intervention in case of special maintenance on the compressor it is connected to.

Furthermore, you can have full remote control from any device (tablet, smartphone, PC, notebook, etc.), via a web page, as long as it is connected to the same Internet network as the SMS device.

### Predictive and targeted maintenance:

- automated e-mails in case of alarms,
- automated e-mails every hour / day / week.

### Compressor remote control:

- access to the various menu levels (user, service),
- compressor online status check,
- on / off control,
- no software to be installed.



# ORIGINAL SPARE PARTS

Extend the life and efficiency of your screw compressor

**FSN** is the brand of the original spare parts for SHAMAL compressors and identifies after-sales services. It guarantees that the components are original and that they were carefully selected, checked and tested by skilled technicians. Using FSN certified original spare parts reduces management costs and guarantees the efficiency, reliability and longevity of the compressor.



## MINERAL BASE RotarECOFLUID OIL

Formulated with high quality selected **mineral base** oils enhanced with advanced anti-oxidants, anti-wear (zinc free), rust preventers and anti-foaming agents, the FSN **RotarECOFLUID** oil offers optimal control of oxidation and residue deposits as well as an excellent level of thermal stability and oxidation to ensure the longevity of equipment and long life performance.

#600000020	RotarECOFLUID oil 46 cSt - 1 x 3.8 L (3.3 kg) tank
#600000021	RotarECOFLUID oil 46 cSt - 1 x 20 L (17.36 kg) tank
#600000022	RotarECOFLUID oil 46 cSt - 1 x 200 L (174 kg) drum



## SYNTHETIC BASE ROTENERGY OIL

Our **synthetic base** lubricants - FSN RotEnergy - have been specifically designed for use on our screw compressors, supplied by leading world manufacturers. They are available in cans, drums or multiple packages. **RotEnergyPlus**: ensures quick water separation, lower friction and energy consumption, extends maintenance intervals and ensures excellent lubrication of the bearings while offering excellent protection. **RotEnergyFood**: is a high quality lubricant for rotary compressors, suitable for use in the food industry, where specific quality standards are required.

#600000018A	RotEnergyPlus oil 46 cSt - 1 x 3.8 L (3.25 kg) tank
#600000009A	RotEnergyPlus oil 46 cSt - 4 tanks x 3.8 L (3.25 kg) each
#600000007A	RotEnergyPlus oil 46 cSt - 1 x 19 L (16 kg) tank
#600000012A	RotEnergyPlus oil 46 cSt - 1 x 208 L (181 kg) drum
#600000014A	RotEnergyFood oil 46 cSt - 4 tanks x 3.9 L (3.25 kg) each
#600000016A	RotEnergyFood oil 46 cSt - 1 x 19 L (18.5 kg) tank
#600000017A	RotEnergyFood oil 46 cSt - 1 x 208 L (175 kg) drum



*We recommend changing the oil according to the interval reported in the use and maintenance manual of the compressor or once a year. We suggest using our RotarECOFLUID or RotEnergy oil.*



## SCREW COMPRESSORS

### catalogue

Oil injected, belt-transmission, power from 2.2 to 75 kW



## LONG LIFE KIT

### catalogue

Spare parts kit for scheduled maintenance of rotary screw compressors.



## PISTON AIR COMPRESSORS

### catalogue

Piston compressors for professional use from 0.75 to 20 HP.

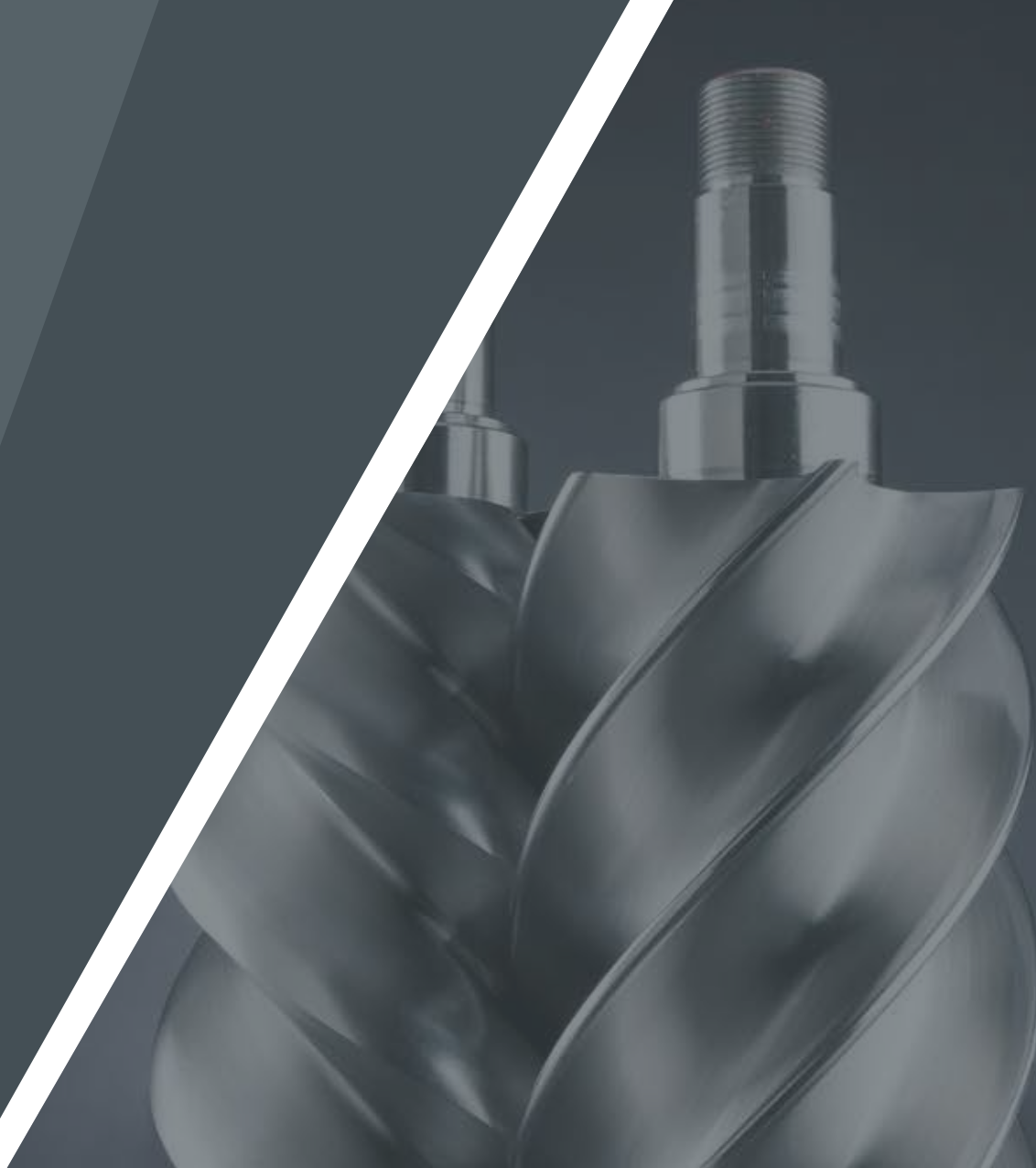


## MPK

### catalogue

Spare parts kit for piston compressor maintenance





The models and characteristics described in this catalogue may be subject to change without notice. The images shown may vary from the actual products. 9990207 - 12/2019



**FNA S.p.A.**

Via Einaudi, 6 - 10070 Robassomero (TO) - Italy

Tel. +39 011 9233000 - Fax +39 011 9241138

[www.SHAMALcompressors.com](http://www.SHAMALcompressors.com)

[info@fnacompressors.com](mailto:info@fnacompressors.com)



Authorized distributor: