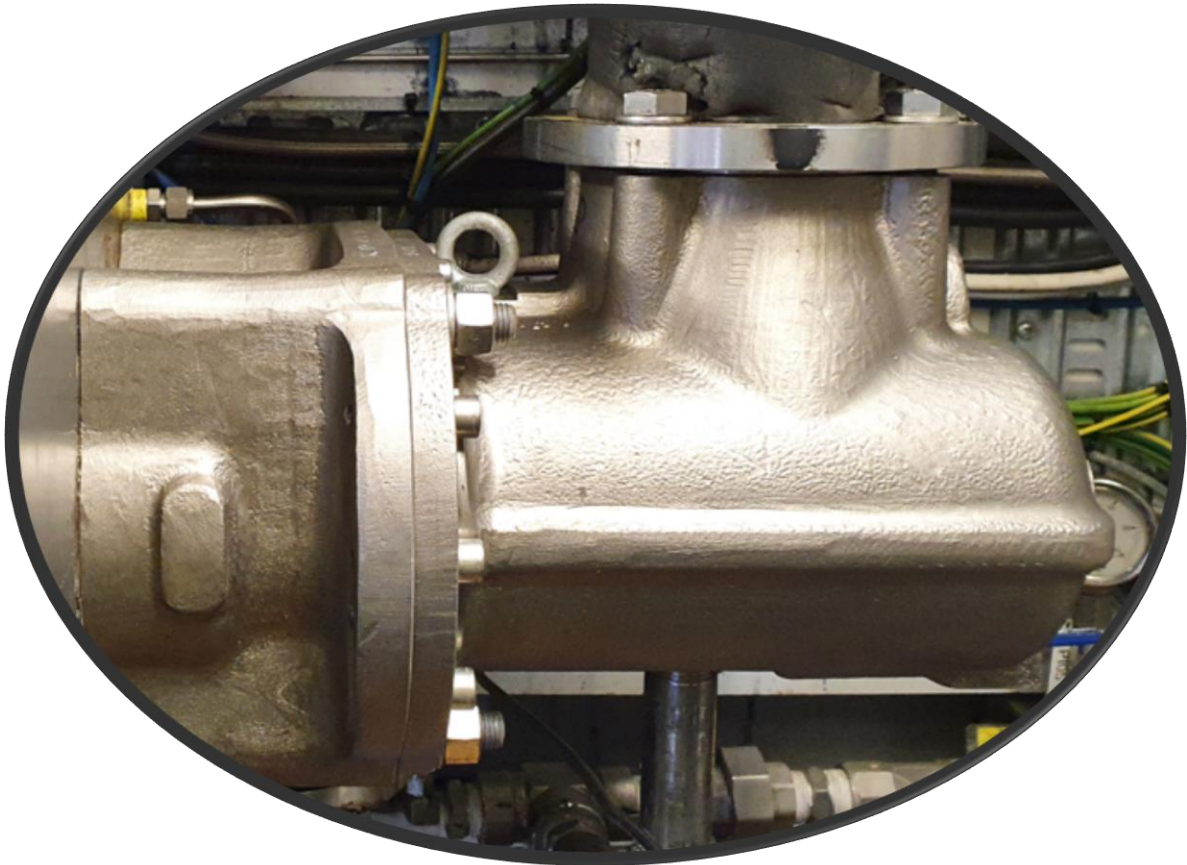




WB 300 / K419

Water Lubricated Biogas

Compressor



General Information

1 General information

The WB300/ K-419 compressor is a water-lubricated and water injected twin screw compressor designed to compress biogas and similar gases, containing hydrocarbons, CO₂ and large amount H₂S.

The screw compressor is a positive displacement compressor with low gas pulsations compared to other displacement compressors. The principle of the compression cycle can be divided into three steps as shown in figure below.



The cycle starts with a suction phase where air is taken into the chamber between the screws and the housing. Further rotation of screws causes reduction of the enclosed chamber volume, In the second stage the gas is compressed inside the screw shaped compression chamber. When this chamber meets the discharge port in the casing, the gas is discharged to the outlet port of the compressor. This implies that the screw compressor has internal compression of the gas, which reduces power consumption and pressure pulsations in relation to other positive displacement compressors.

The compressor is absolutely oil-less as no oil or grease is introduced into the compressor. Key features of the compressor are the hydrodynamic bearing arrangement, plastic/ceramic rotors and water injection. Hydrodynamic bearings have been used to avoid oil or grease in the compressor.

At the moment SRM has supplied around 100 of such compressors for various raw biogas upgrade plants around the globe.

1.1 Basic data and limits of operation

Compressor data:

Over all dimensions:	561 x 308 x 246
Weight:	100 kg
Material in housing:	Stainless steel
Material in rotors:	Plastic/ceramic on stainless steel shaft
Shaft seal_	Mechanical shaft seal SRM part no: K419312

Air flow at inlet conditions:	1.5 – 6.2 m ³ /min
Operating ambient temperature	0 – 50 °C
Suction flange pressure:	0.9 – 1.5 bar(a)
Operating pressure range (P _d):	4 – 21 bar(a)
Hydraulic test pressure:	32 bar a
Shaft speed range:	1500 – 6300 rpm

Speed range at P _d ≤ 7 bar(a):	1500 – 6300 rpm
Speed range at P _d ≤ 8 bar(a):	2000 – 6300 rpm
Speed range at 8 bar(a) < P _d ≤ 10 bar(a):	2500 – 6300 rpm
Speed range at 10 bar(a) < P _d ≤ 14 bar(a):	3000 – 6300 rpm
Speed range at 14 bar(a) < P _d ≤ 18 bar(a):	4000 – 6300 rpm
Speed range at 18 bar(a) < P _d ≤ 21 bar(a):	5000 – 6300 rpm

Inlet flange dimension:	DN80 PN6 Non standard
Outlet flange dimension:	DN40 PN16

Water injection

Water is injected in the compressor for following reasons:

- 1 Increase the efficiency by sealing the internal gas leakage
- 2 Lubricate rotors and bearings
- 3 Cool the gas during compression
- 4 Lubricate and cool the shaft seal
- 5 In biogas water scrubber systems, the injected water will also absorb CO₂ gas more effectively to the small size droplets which are created in the compressor after water injection.
- 6 In biogas membrane systems the absence of oil will extend the life of membrane efficiency.

2 Installation

2.1 Dimensions and port locations

