



ANGA

USZCZELNIENIA MECHANICZNE
MECHANICAL SEALS
GLEITRINGDICHTUNGEN
ТОРЦОВЫЕ УПЛОТНЕНИЯ

Scope of application of compressor seals type GK

The GK seals are used on fluid-flow compressors (various types), which require eliminating of traditional oil, labyrinth, or segmented seals that work in explosive hazard or environmental polluting zones. Area of applications includes industries: chemical, refinery, petrochemical, chemistry of coke, handling of technical or natural gases (petroleum gas), etc. Sealed agents may be gases and vapors of explosive and aggressive liquids as: ammonia, methane, ethylene, toluene, acetone, hydrogen chloride, hydrogen sulfide, carbon oxide, etc.

Many old type compressors work in domestic industry, these may be successfully modernized and equipped with dynamical gas seals GK.

Advantages of compressor seals type GK

- contact-less operation while maintaining a containment seal of area sealed with gas (most often with nitrogen);
- lower energy consumption (frictionless operation),
- modular design allowing for installation in single and dual arrangements,
- manufactured as a "compact" seal convenient to direct assembling and disassembling;
- leak tightness of the system in a standstill condition,
- standard power supply and seal operation monitoring system adopted for installation area,
- continuous or periodical monitoring of the seal operation by means of control and measuring blocks, extending of operating period and lowering of repair costs

Operating parameters of GK compressor seals

temperature	$t = -40 \text{ до } 180 \text{ }^\circ\text{C}$
pressure	$p_{\text{max}} = 4 \text{ MPa}$
limit speed	$V_g = 100 \text{ m/s}$
range of diameter	$d = 30 + 150 \text{ mm}$

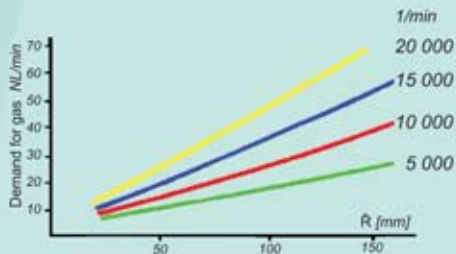
NOTE: individual fabrication allows to improve above parameters.

Principle of operation of GK seals



Seal operation is created with gas compression effect in micro-cavities of one of rotating seal ring. It relies on keeping stable gas film flowing continuously through the gap between primary faces of the seal. The barrier gas flow supplying the seal in a compressor, depends on a diameter and rotational speed of a shaft and also on process and barrier gas pressure.

GKF seal on ammonia compressor



Barrier gas installations

Every installation arrangement of dynamical gas seals for compressors requires a suitable barrier gas supply installation. These systems are specially designed for this group of seals and have the following tasks:

- barrier gas pressure control with enhance possibility of it
- barrier gas filtering
- seal operation monitoring and alarm condition signaling
- independent emergency supply, maintaining the seal operation in case of a main supply failure

Rough demand for barrier gas on GK seals
for $p=3,5 \text{ MPa}$

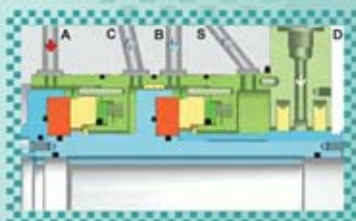
GKT

Double series arrangement installation tandem

Two seals arranged in series, and in a case of failure, the second seal takes over a function of the first one, which operates like in single arrangement (process gas is delivered from a selected compressor stage). During normal (failure-free) operating, the second seal is supplied from the main installation and presents a buffer blocking process gas flow, which flows out from the first seal in small quantities (from the process side).

Application:

The most popular in a case of explosive and toxic process gases



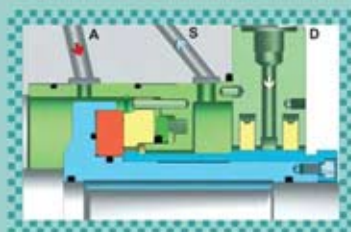
GKP

Single arrangement installation

GKP single seal operates in process gas and it is supplied from an appropriate compressor stage. Its small quantity is compressed by seal rings and gets outside, where it is carried away to a central flare system.

Application:

On low risk compressors for environment friendly gases at low operating parameters.



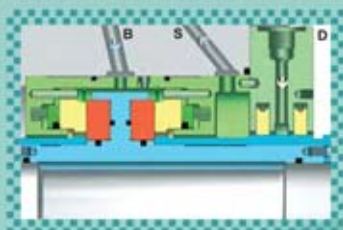
GKF

Dual face arrangement installation - "face-to-face"

Two seals in face arrangement having a common rotating part. The seal supply is connected directly from main installation through a special filtering and stabilizing block of the barrier pressure. A small part of the barrier gas (normally nitrogen) gets into process gas.

Application:

For especially, chemically aggressive gases, but at low process pressure and relatively short installation length.



Diagrams of supply and monitoring installations

- A ■ process-gas connection before dynamical gas seal
- B ■ barrier/buffer gas connection to the dynamical gas seal
- C ■ carrying away of gas to a flare
- D ■ blocking gas connection to a radial seal
- S ■ carrying away of gas to a flare system

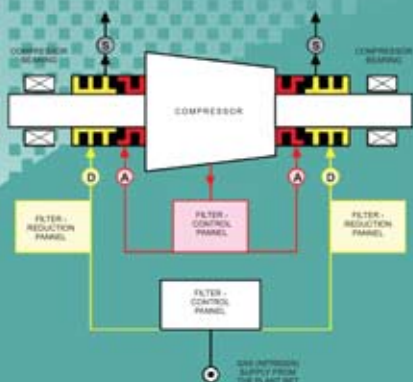


Diagram of supply and monitoring system for GKP seals in single arrangement

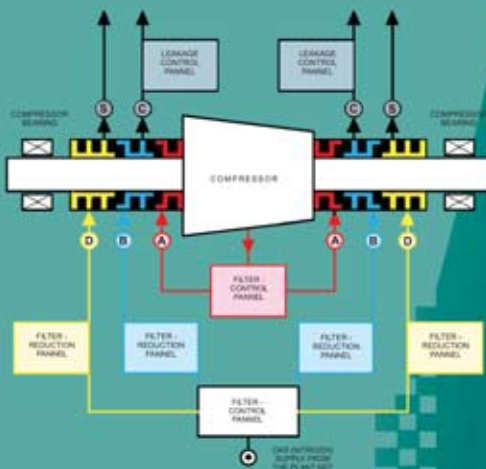


Diagram of supply and monitoring system for GKT seals in double series arrangement (tandem) and with buffer gas

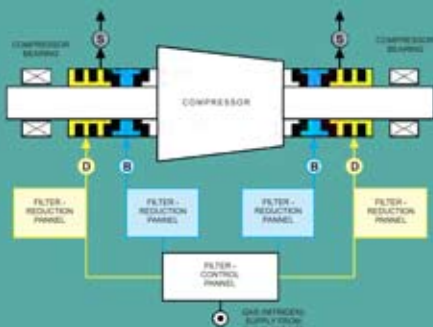


Diagram of supply and monitoring system for GKF seals in double face arrangement ("face-to-face")



Supply and monitoring block

"ANGA"

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