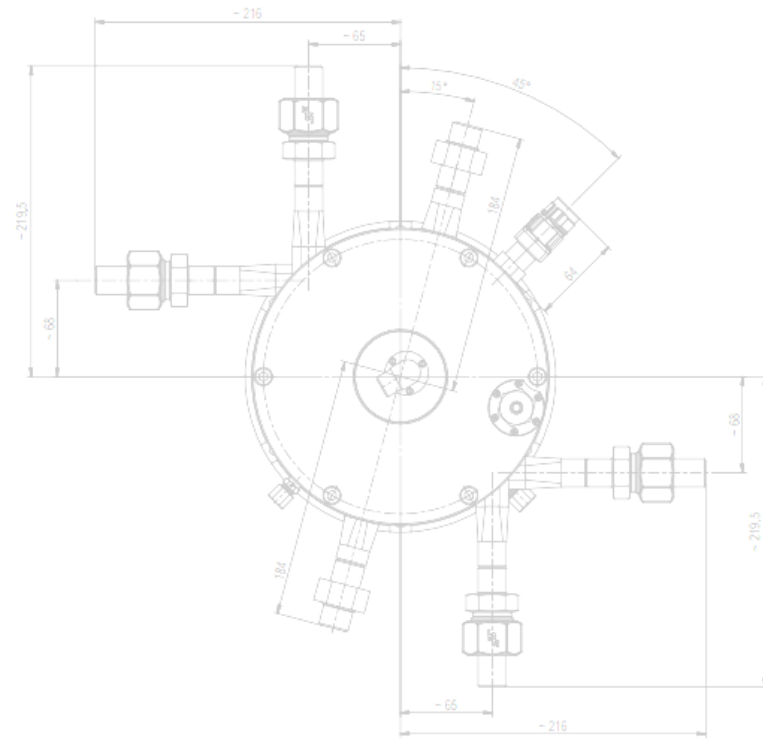


# ATEKO a.s.

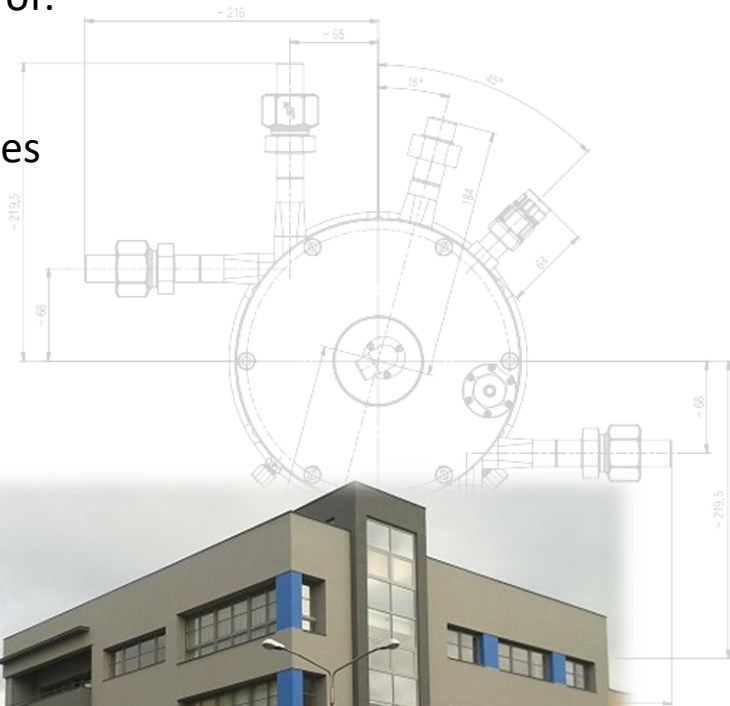
1949 – 2019

*A Company Introduction  
Cryogenics & Low Temperatures Equipment*



# ATEKO a.s.

- **ATEKO a.s.** is an engineering, manufacturing and supply company, offers turn-key deliveries of complete investment plants in the field of:
  - Chemical, gas & oil, energy and food industry
  - Low temperatures, power production technologies
  - Environmental protection technologies.
- Czech company
- Founded in 1949 as a research institute
- Since 1994 ATEKO a.s. (a joint-stock company)
- Company headquarters: Hradec Kralove
- Number of employees: approx. 50
- Share of exports: 30-45 %
- Member of MEDIS Group
- EN ISO 9001:2015
- EN ISO 14001:2015



# ATEKO a.s. Business Profile

ATEKO a.s. is an engineering company and specialized supplier that offers deliveries of turnkey industrial plants, technology equipment and numerous services for the chemical, gas & oil, energy, engineering and manufacturing industry.

## *Portfolio of products and services*

- » **Design and engineering services**
  - Civil engineering and design
  - Design of processes and technological plants
  - Design and construction of technological apparatuses, machinery and equipment
  - Designer's and technical supervision
  - Investment consultancy
- » **Technological supplies**
  - Equipment – exchangers, separators, columns, filters, tanks, vessels etc.
  - Machinery – compressors, turboexpanders and expanders
  - Compact technological systems – skids
  - Prototypes and experimental equipment
- » **Construction and civil engineering**
  - Industrial plants
  - Technology plants

## *Market segments*

- **Chemical and petrochemical industry**
- **Gas & oil industry**
- **Automotive and machinery industry**
- **Research centers**
- **Energy sector**

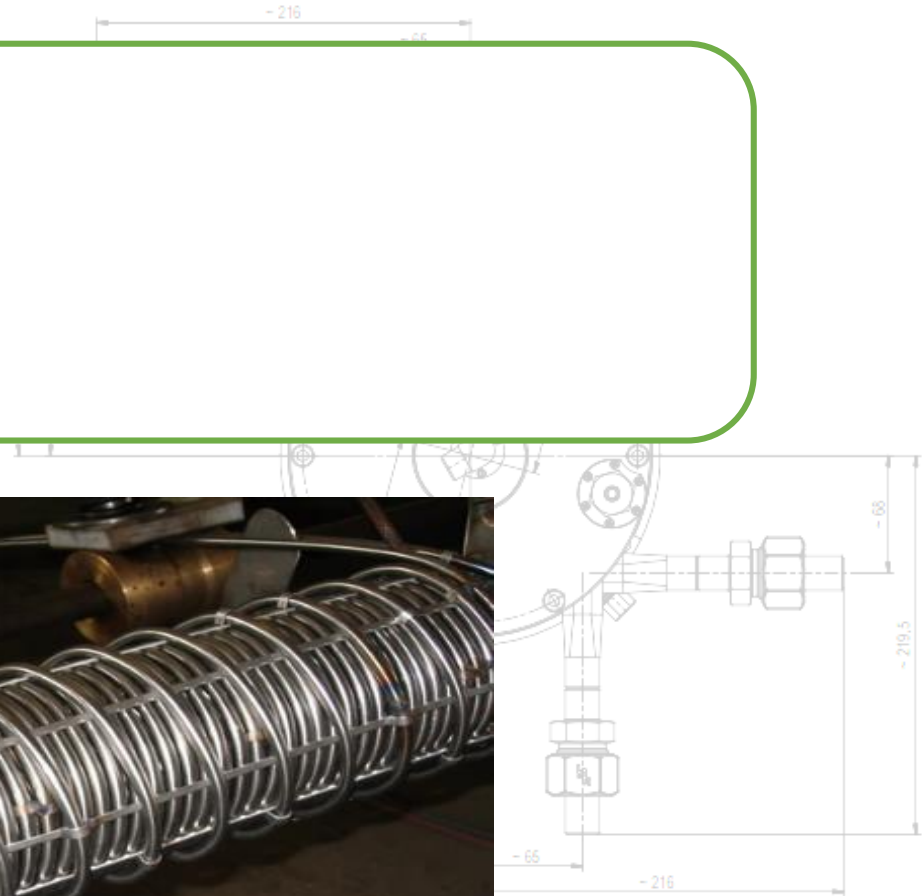
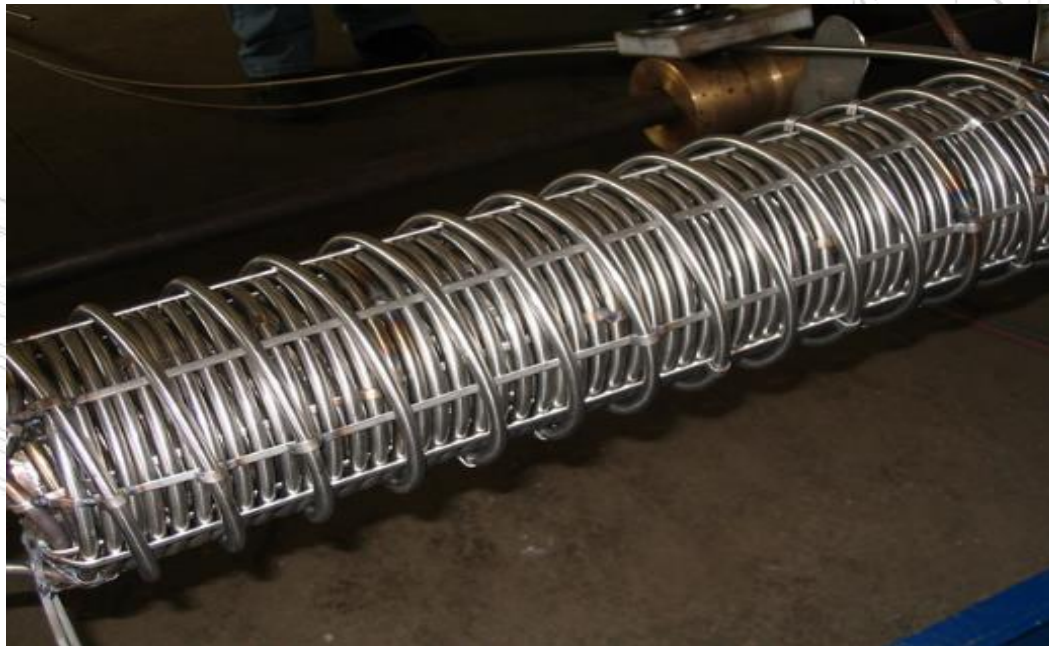
## *Internal organization*

- Business Unit „Advanced Technology & Equipment“**
- Business Unit „Plant Design & Construction“**

# Cryogenics & Low Temperatures Technology Survey 1

## Low Temperature Heat Exchangers

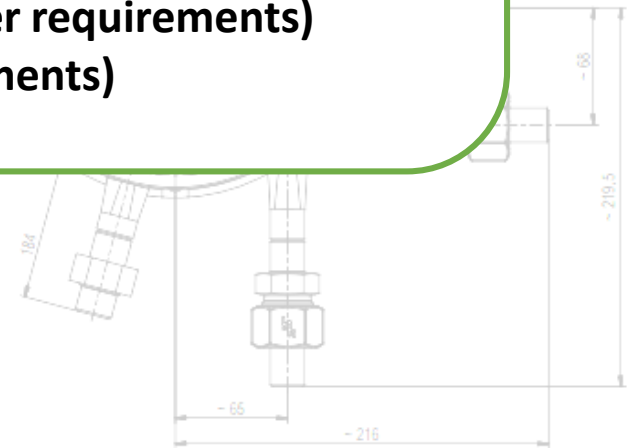
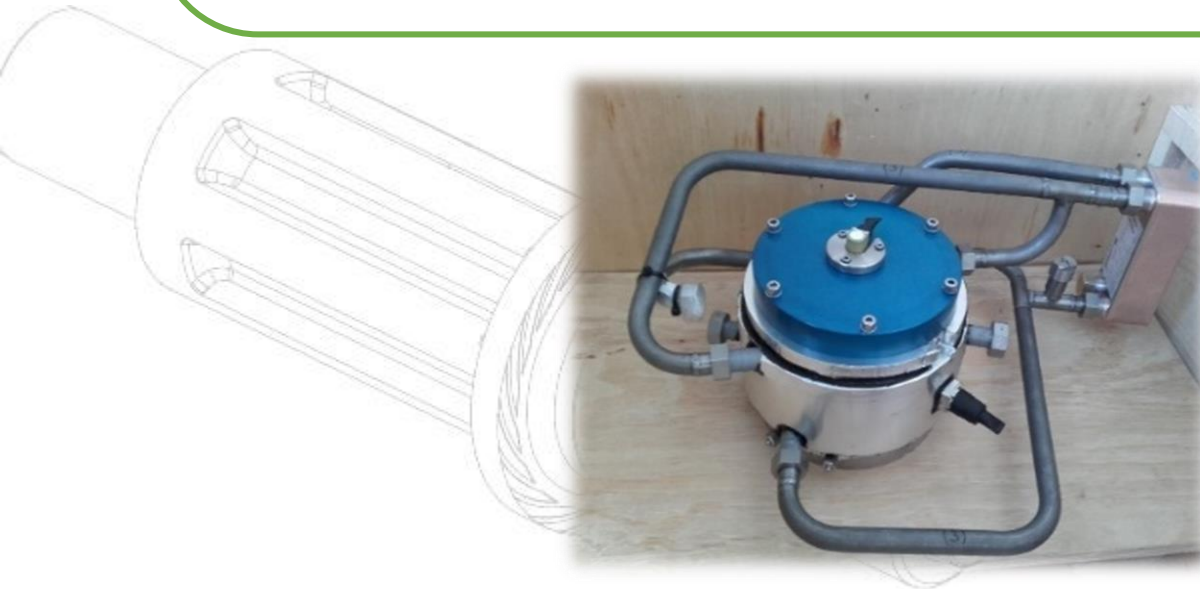
- **Spiral wound design**
- **Temperature:** up to 77 K
- **Pressure:** up to 1.6 MPa,g



# Cryogenics & Low Temperatures Technology Survey 2

## Helium Expansion Turbines (HET)

- A single shaft high-speed cryogenic machine braked by eddy current brake
- Designed as a one stage expansion of He or other gases ( $N_2$ , Ar,  $CO_2$ ,  $CH_4$  etc.)
- Up to 300 000 rpm
- HET 2 – 10 kW, HEXT 0.1 – 2 kW
- Inlet temperature: from approx. 5 K (or by customer requirements)
- Pressure: up to 2.5 MPa,a (or by customer requirements)

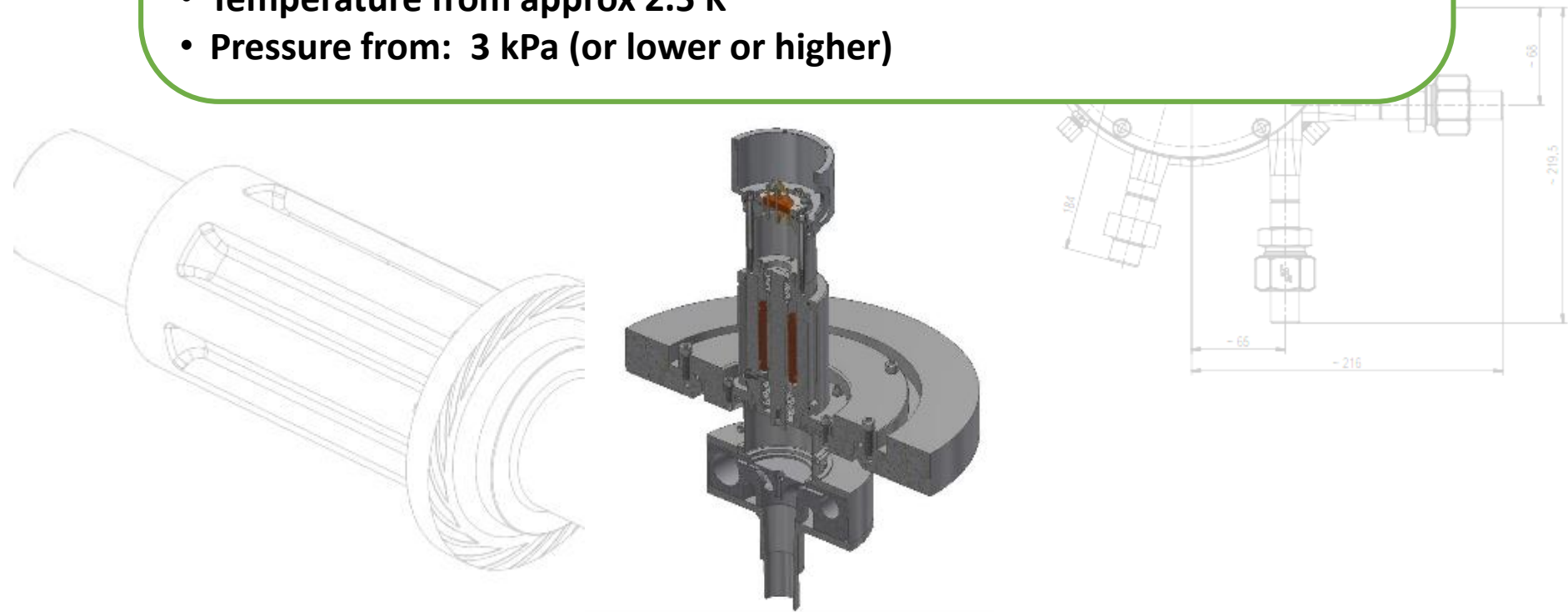




# Cryogenics & Low Temperatures Technology Survey 3

## Cold Compressors (CC)

- A single shaft high-speed machine
- Designed as a one stage compression of cryogenic Helium
- Up to 54 000 rpm (or higher according operating param. and customer requirements)
- 0.1 - 10 kW
- Temperature from approx 2.5 K
- Pressure from: 3 kPa (or lower or higher)



# Cryogenics & Low Temperatures Technology Survey 4

## Turbo-Expander Circulator (TEC) – Cryogenic Cooling System Brayton (CSB)

- A cryogenic cooling system Brayton
- 250 000 rpm
- Cooling power: 0.1 - 20 kW
- Temperature: 170 - 5 K
- Pressure: 2.5 Mpa,a (or higher according to customer requirements)



# Cryogenics & Low Temperatures Technology Survey 5

## International Underground Laboratories - Radon Removal Systems

### Laboratories:

- Modane, France, 2004,
- Gran Sasso, Italy, 2011-12,
- Y2L, Korea, 2015
- LSC, Spain, 2015
- SURF, USA, 2017

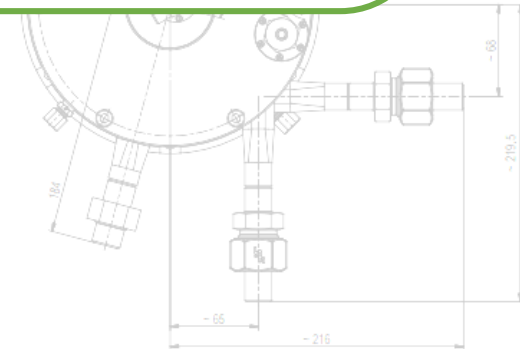
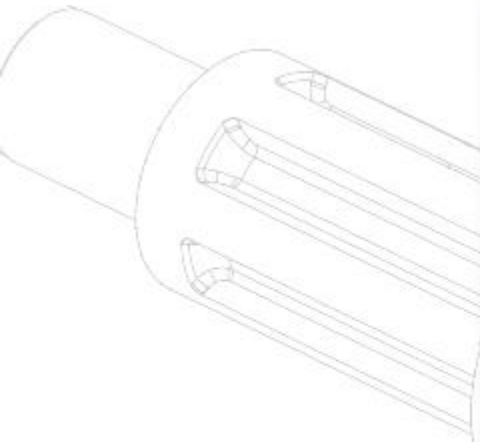
### *Technical data:*

*Air flow 120 – 300 m<sup>3</sup>/h*

*Input radon concentration 20 - 100 bq/m<sup>3</sup>*

*Reduction of radon concentration 1000*

*Output air humidity -70°C*

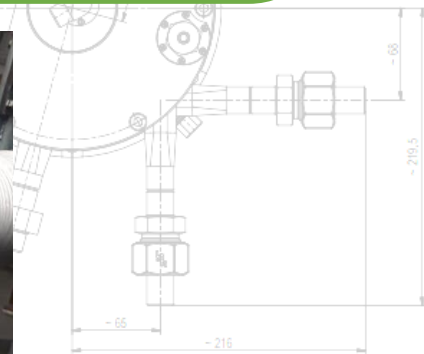
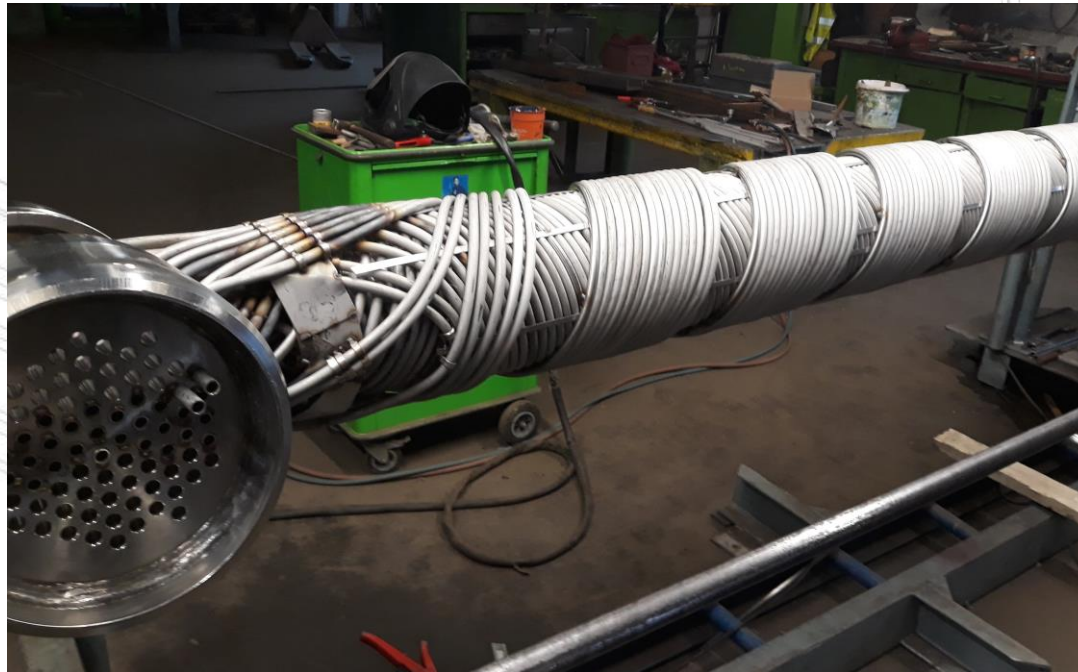




# Cryogenics & Low Temperatures Survey Main Projects 2018

## Wound Exchanger, customer in Russia via Germany

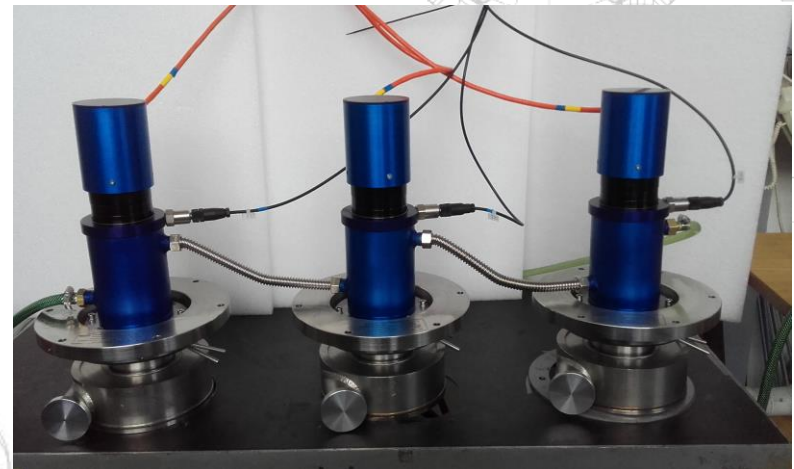
- Total heat area of heat exchanger is approx. 42,6 m<sup>2</sup>.
- Design pressure (for all spaces) 5 MPa,g
- Design temperature (for all spaces) -90°C - +50°C
- Working medium - mixture of: Hydrogen, Ethane, Ethylene, Propane, Propylene, Nitrogen
- ASME Sect. VIII, Div.1 without U-stamp, EAC (TR TS 032/2013, TR TS 010/201)



# Cryogenics & Low Temperatures Survey Main Projects 2018

## TIPC, China

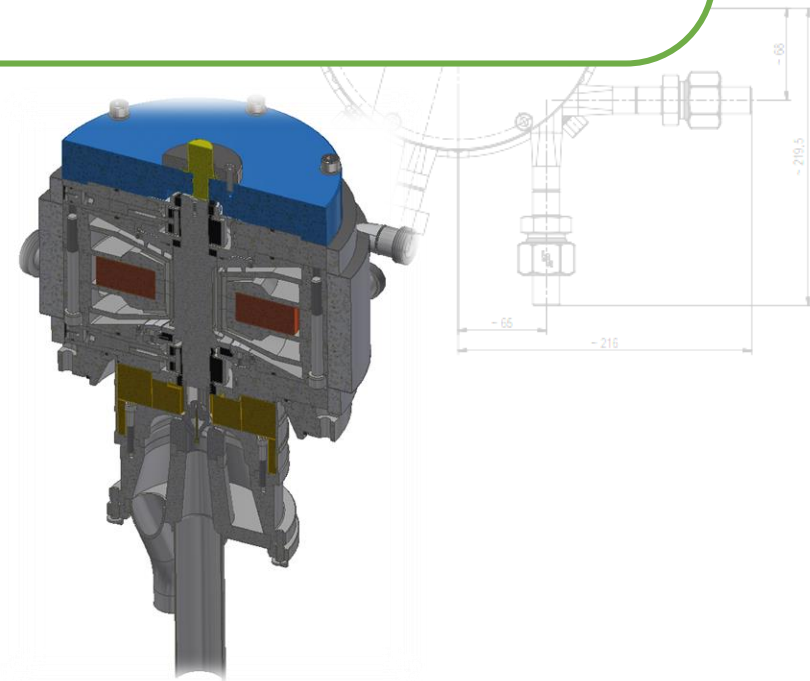
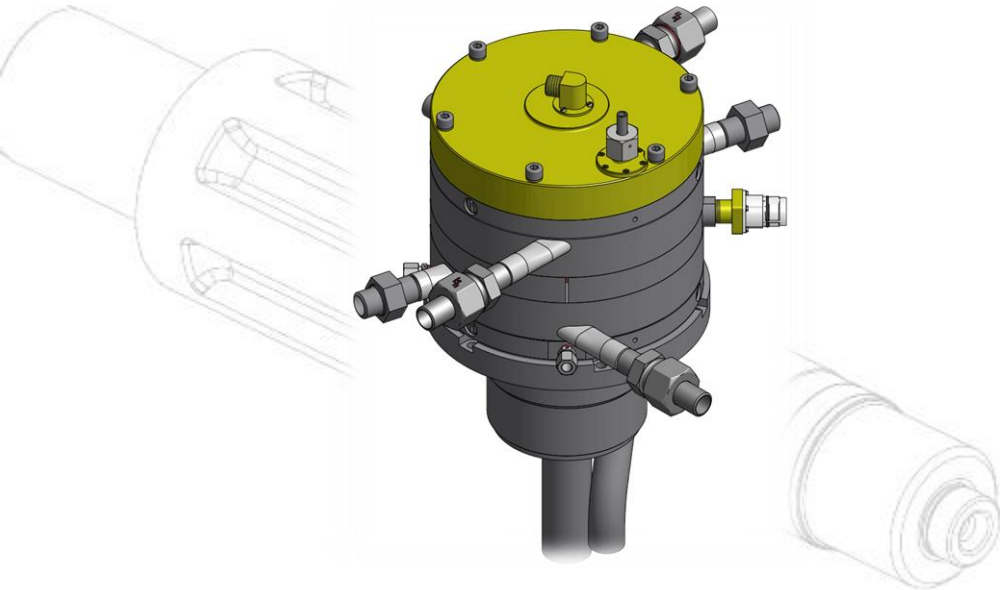
- 3 pcs.
- Cold compressors
- Including control system
- Delivered and on-site tested
- Inlet pressure 3 – 25 kPa,a
- Max. 43 000 rpm



# Cryogenics & Low Temperatures Survey Main Projects 2016

## ASIPP, China

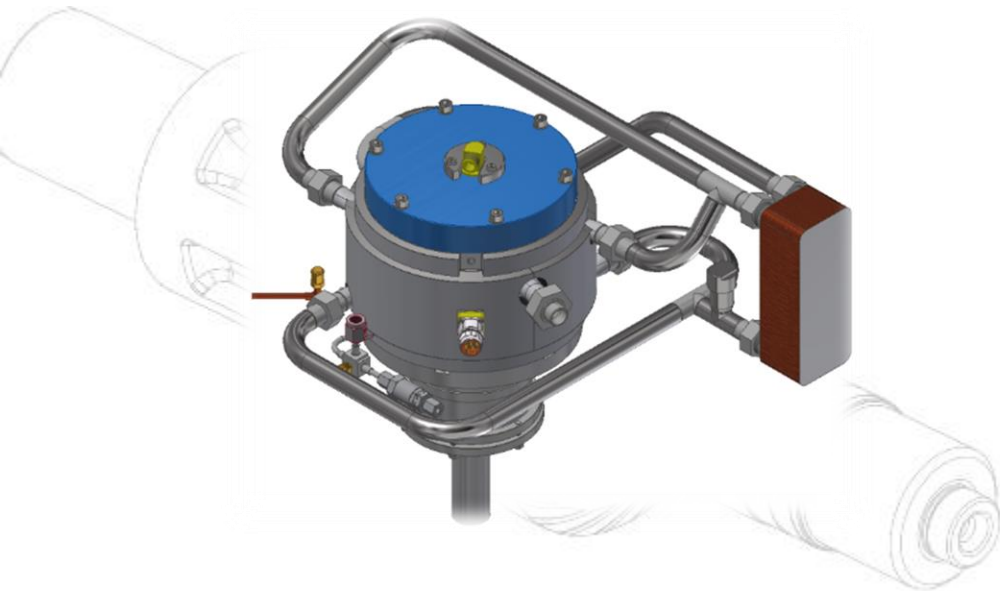
- Helium turbo-expanders
- Cooling power: 500 - 10 000 W
- Inlet temperature 14 K – 80 K
- Inlet pressure 0.5 – 2.0 MPa,a
- Max. 250 000 rpm
- 2 types (HET and HEXT)
- 9 pieces – 5x HET, 4x HEXT



# Cryogenics & Low Temperatures Survey Main Projects 2015

## TIPC, China

- Helium turbo-expanders
- Cooling power: 500 - 10 000 W
- Inlet temperature 14 K – 45 K
- Inlet pressure 0.5 – 1.8 MPa,a
- max. 250 000 rpm
- 5 pieces – 1x HET, 4x HEXT





# Cryogenics & Low Temperatures Survey Main Projects 2015

## ELI Beamlines

- AV CR, 2014 - 2015, Czech Republic
- Cooling System Brayton
- 1x Helium turbo-expander-circulator, 1x Turbo-circulator
- Cooling power: 300 W
- Cooling temperature 150 K
- Design pressure 1.2 MPa,a
- 120 000 rpm





# Cryogenics & Low Temperatures Survey Main Projects 2015

## Low temperature spiral wound heat exchanger, Lukoil Stavrolen, Russia

- 1 pc., Hydrogen and Hydrocarbons
- ASME VIII Div. 1



*Thank you for your attention*

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