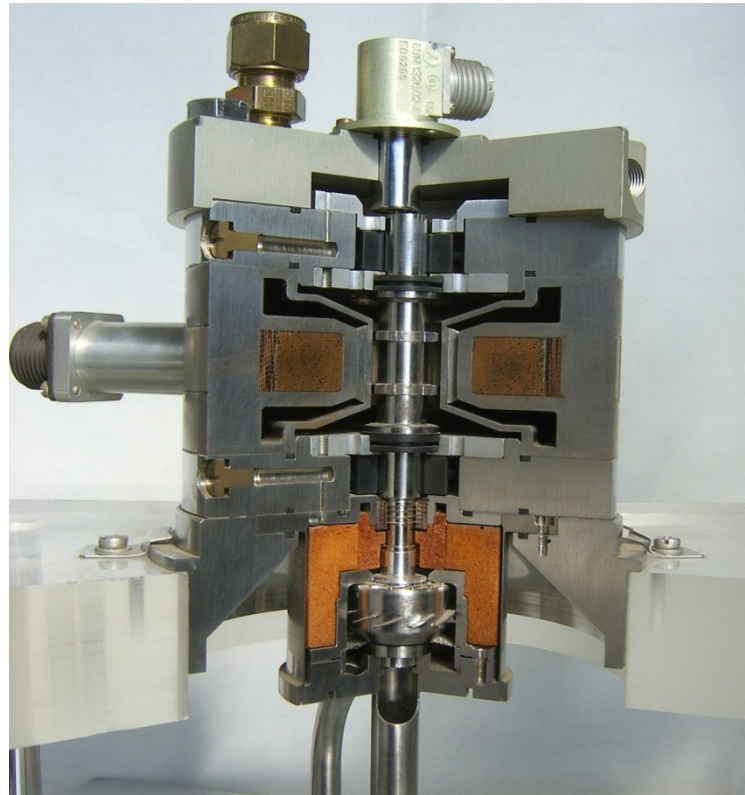




Apparatus, Technologies & Constructions
www.ateko.cz

History of CERN / ATEKO collaboration Deliveries of ATEKO Turbomachines into LHC technology

1995 - ATEKO
presented at
CERN gas
bearing
Turbomachines
developed for
Linde He
liquefiers



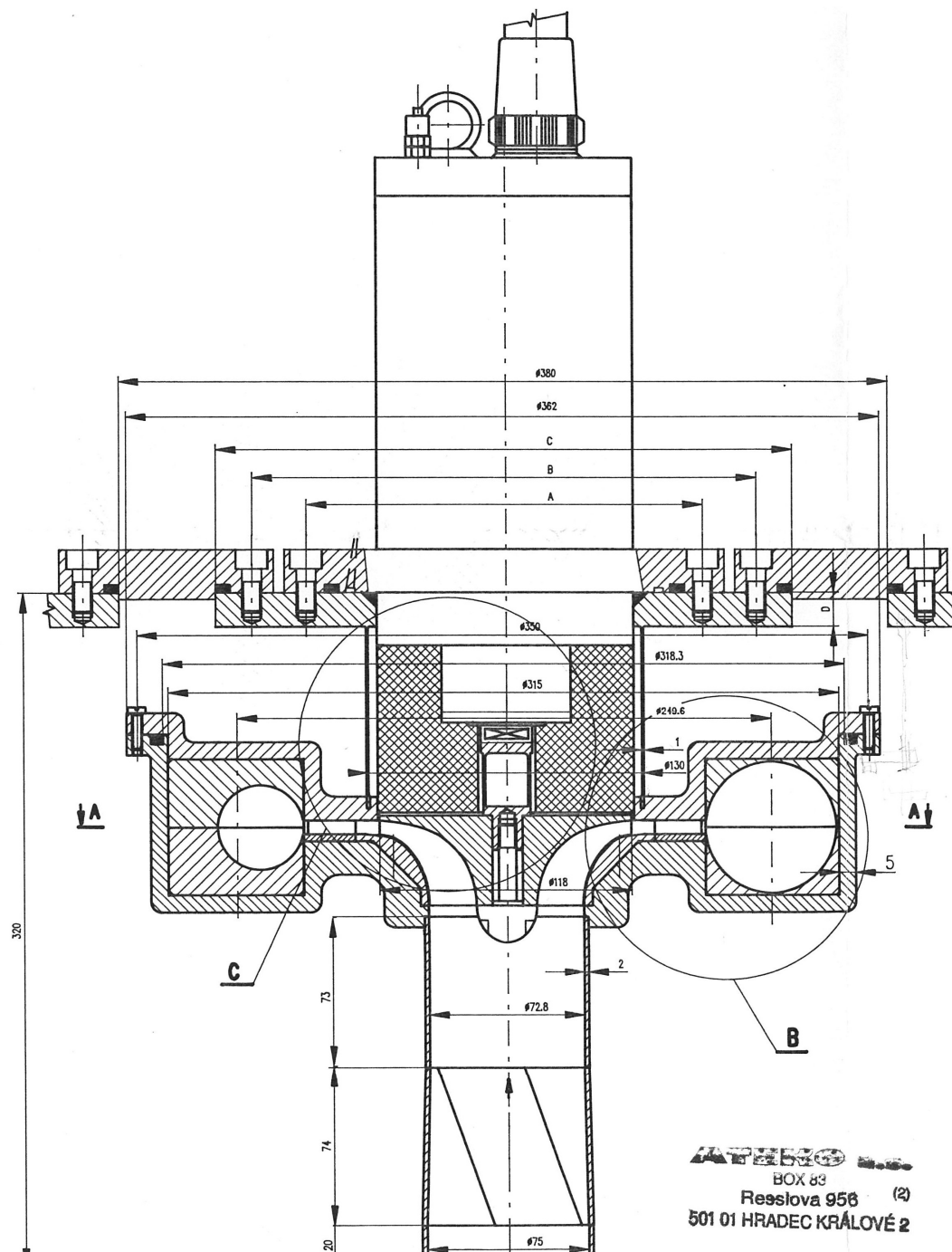
1996 - ATEKO +
Linde delivered &
tested prototype of
one stage Low
Temperature
TurboCompressor
(LTTC)
($m = 65 \text{ kg/h}$, $CR = 3$, $P_{in} = 10 \text{ mbara}$,
 $T_{in} = 3\text{K}$, $n = 24\,000 \text{ rpm}$)



2000 - On the base of this ATEKO LTTC Compressor design were designed:

By ATEKO / Air Liquide / PBS real size LTTC machines (with wheel diameters app 250 mm). Working stages were manufactured by PBS.

By IHI Japan machines LTTC machine



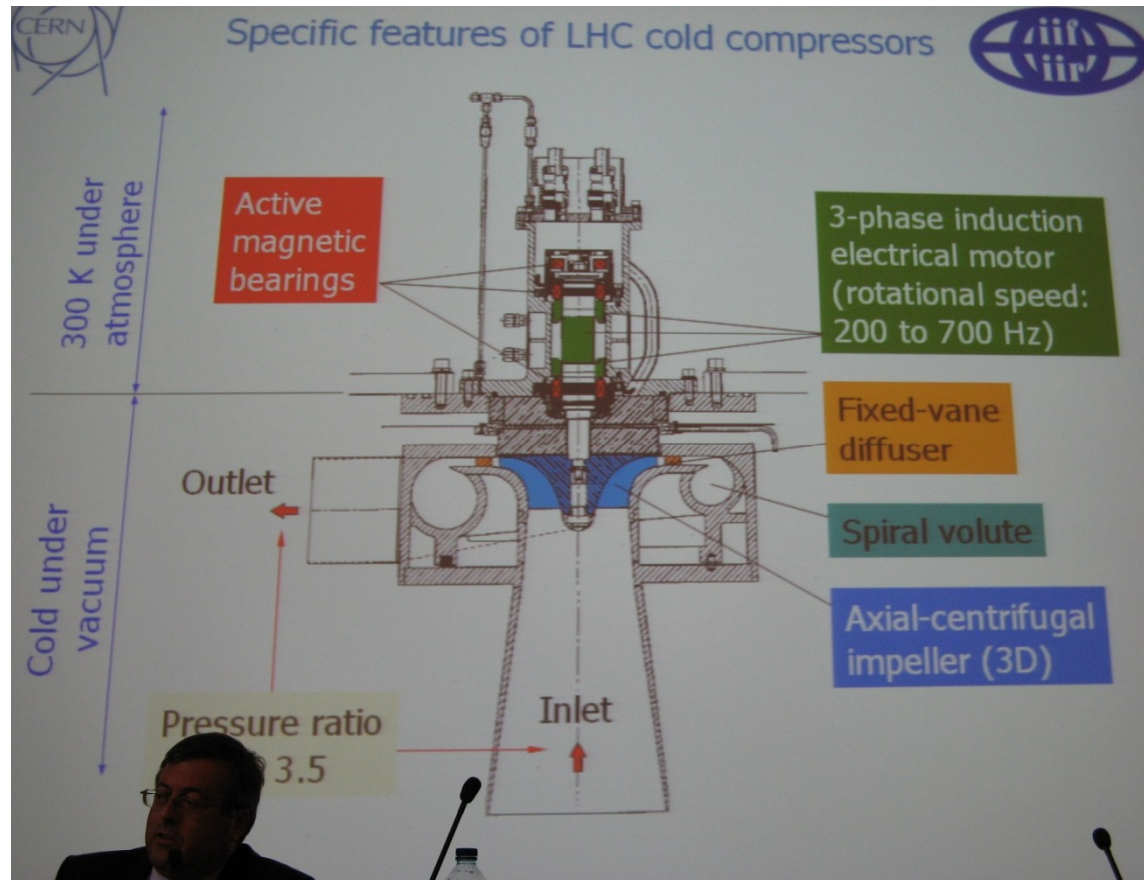


**LTTC (AirLiquide / PBS /
ATEKO)
Assembly in CERN**





LTTC presentation by
P.Lebrun



$$(n = 77\,000 \text{ } ^1/\text{min}, P_{in}=3 \text{ bar (a)}, T_{in} = 20 \text{ } ^\circ\text{C}, \pi = \frac{P_{out}}{P_{in}} = 1,5, Q = 200 \text{ Nm}^3/\text{h})$$



2005 – 2009

**Argon turbocirculator
real sizes for Muon Detector**

CERN - ArC 6.3 kWe



2001

**– Argon turbocirculator
– prototype**



$$(n = 65\,000 \text{ } ^1/\text{min}, P_{in}=3 \text{ bar (a)}, T_{in} = 20 \text{ } ^\circ\text{C}, \pi = \frac{P_{out}}{P_{in}} = 1,5, Q = 350 \text{ Nm}^3/\text{h}, N = 6.3 \text{ kW})$$



Similar ATEKO Turbo-machines

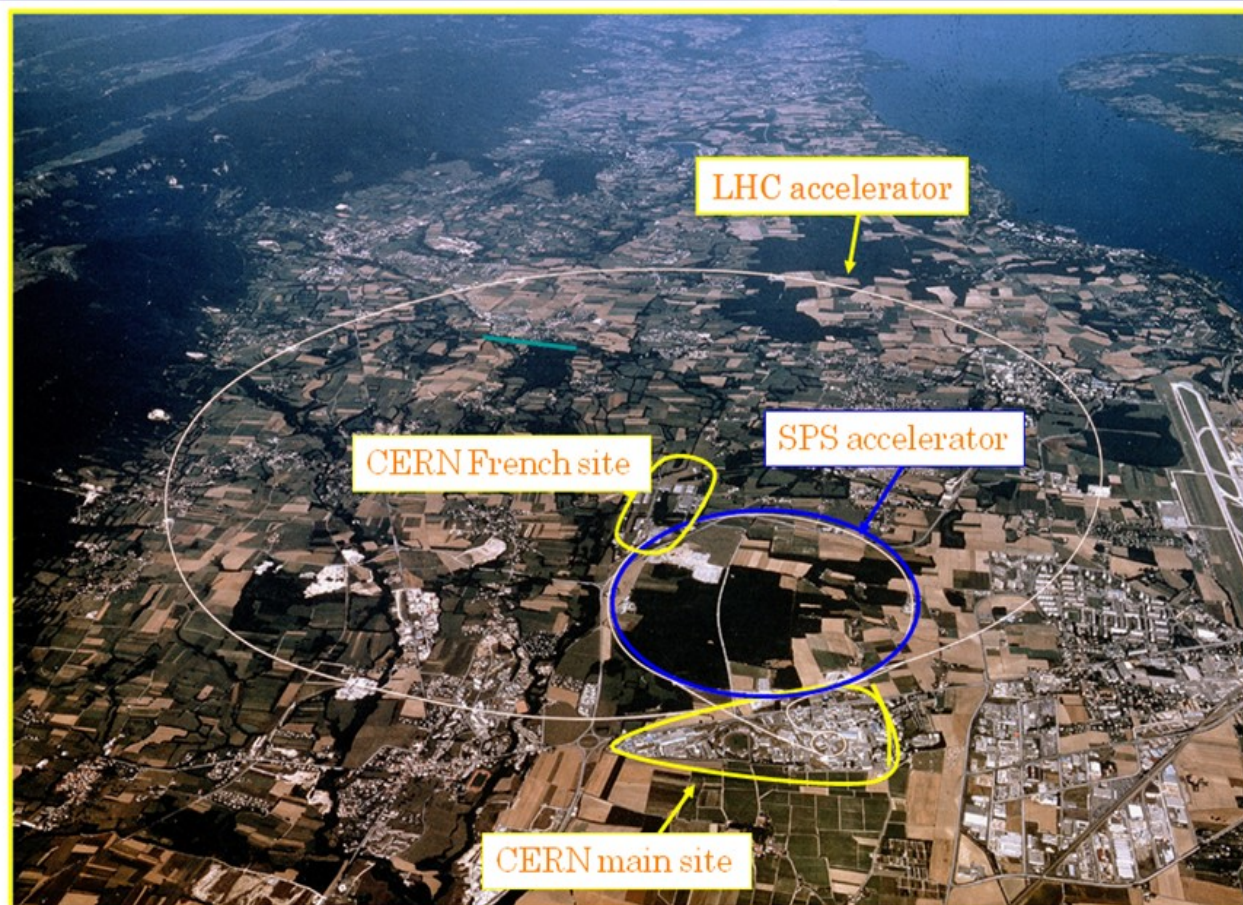


**TC CEA – 9 kWe, 85 000 rpm (He, 75 000 rpm,
Pin/out 80/95 bar, N= 11 kWe)**



CERN - ArC 6.3 kWe TC machine

$$\text{COP} = \frac{35}{48} = 0.73$$



Thank you for attention

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