

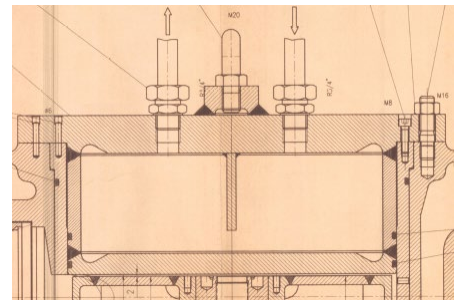
CASE STUDY

A producer of technical gases in Germany required a cost-effective capacity control system to eliminate the energy losses associated with the existing bypass control.

Reduced energy costs with excellent ROI through upgraded capacity control

Compressor manufacturer: LMF

Type	T162-236 N 2.4	Gas	H ₂ /CO mix
Power	120 kW (163 hp)	Suction pressure	4.5 bar (65 psi)
Speed	590 rpm	Discharge pressure	24 bar (348 psi)
Lubrication	no		



Original cylinder head

Facts in Brief

- T162-236 N 2.4 compressor handles a H₂/CO mixture
- Capacity was controlled at 80% by a bypass system

Customer requirements

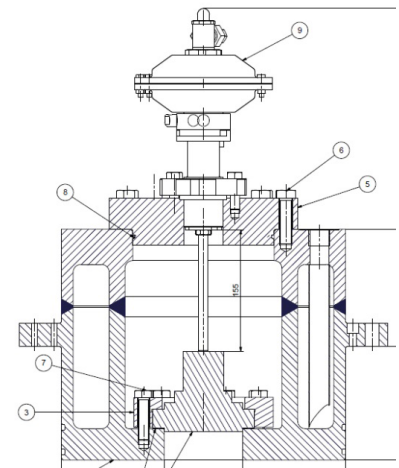
- Reduce energy costs by avoiding bypass control
- Implement cost-efficient and reliable capacity control
- Payback within 2 years

Solution applied

- Calculate the clearance pocket volume required for the first-stage cylinder to achieve 80% capacity
- Design a new cylinder head incorporating the clearance pocket and a cooling water jacket
- Specify layout of the clearance valve and actuator
- Stress analysis (FEA) of the complete cylinder head
- Manufacture and inspect all components
- Hydraulic pressure and leak test
- Project management and documentation, including functional description and certification

Results

- The modified compressor met the customer's requirements and can be controlled at 80% of full capacity
- Energy costs were reduced by eliminating bypass control



New cylinder head including valve and actuator



New control system in place on the cylinder