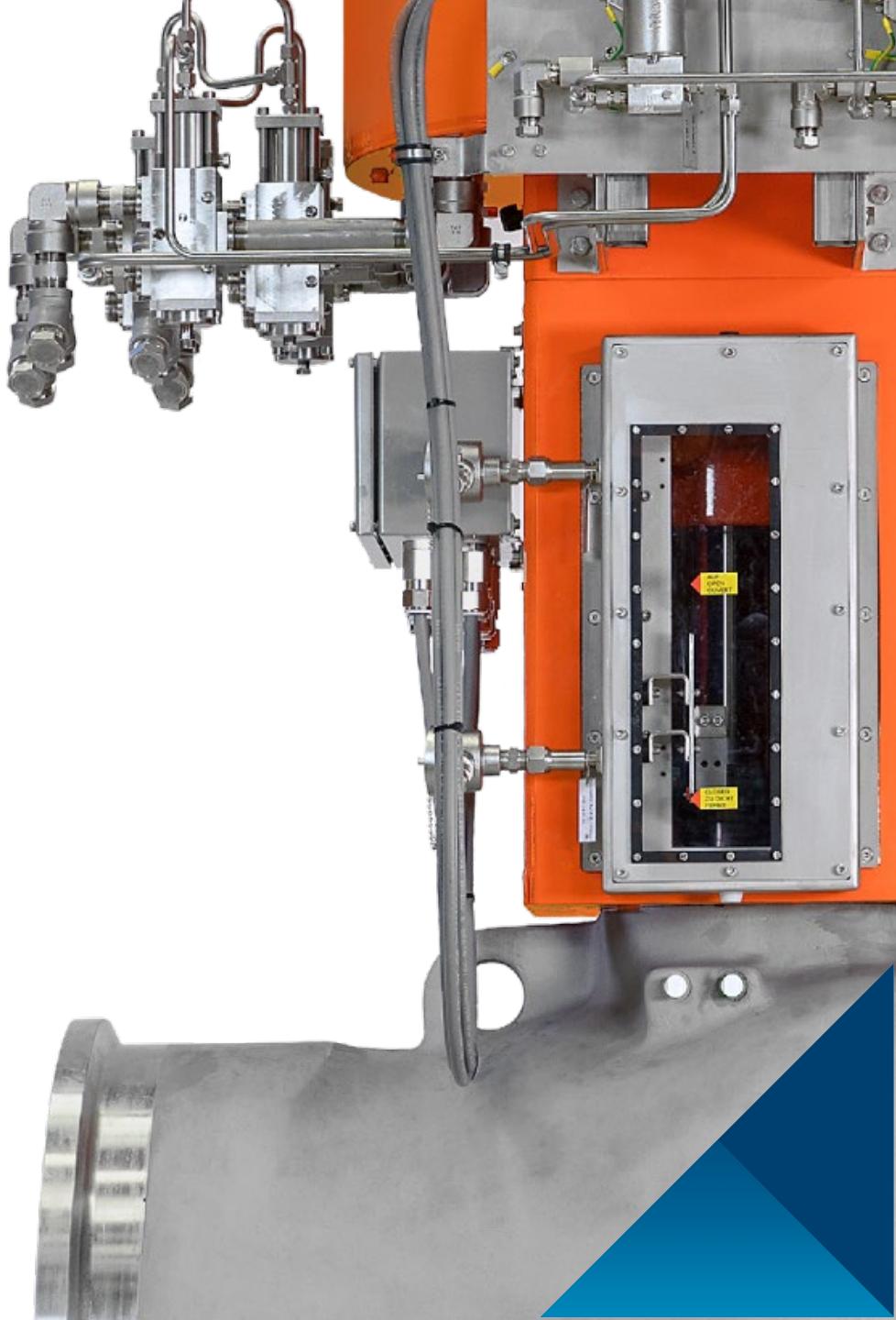


Hydrogreen

Douna - Leeuwarden, 17 November 2022

Zero emission (valve)



Introductie

- Opgericht in 1922 in Gouda
 - Actief in het maken van afsluiters sinds 1955
 - Partner van Douna sinds 1985
 - 375 vakkundige medewerkers wereldwijd
-
- Afsluiter maten : 2" - 84" (DN 50 - DN 1800)
 - Drukklasse : ASME 150 - API 15 000 (PN 10 - PN 1035)
-
- Gemiddelde afmeting en drukklasse is 16" ASME 900 (axial valves)
 - Op jaarbasis gemiddeld 2.500 op maat gemaakte afsluitersystemen



Hoofdkantoor en fabriek in Gouda: 18.000 m²



Angle choke fabriek in Maleisië



Wereldwijd netwerk

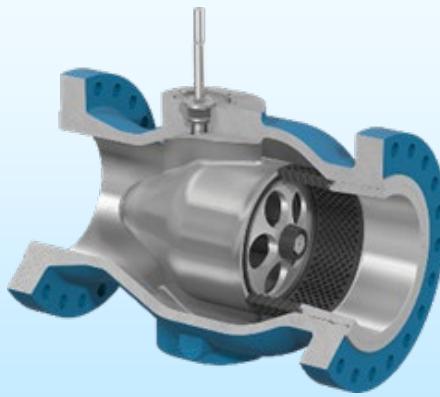
1. Mokveld Valves BV
2. Mokveld USA Inc
3. Mokveld UK Ltd
4. Mokveld Norge AS
5. Mokveld Central Europe GmbH
6. Mokveld Valves BV, Middle East
7. Mokveld Malaysia Sdn. Bhd., Malaysia
8. Mokveld Valves BV, Asia Pacific
9. Mokveld Valves BV, China
10. Mokveld Valves BV, Algeria
11. Mokveld Valves BV, Brasil



Regel afsluiters



Axial Control Valve

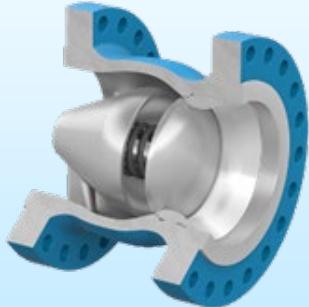


Axial Choke Valve



Angle Choke Valve

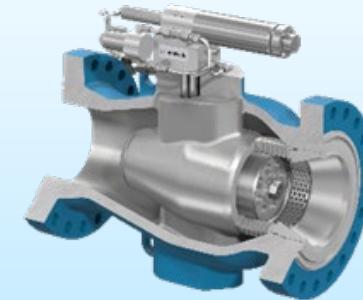
Veiligheidsafsluiters



Axial Check Valve

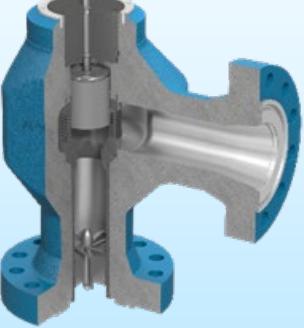


Axial On-off Valve

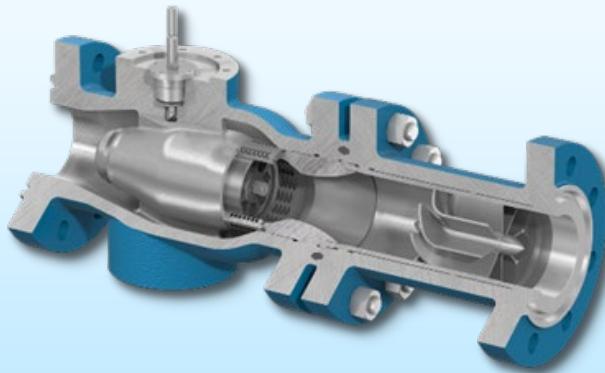


Axial Surge Relief Valve

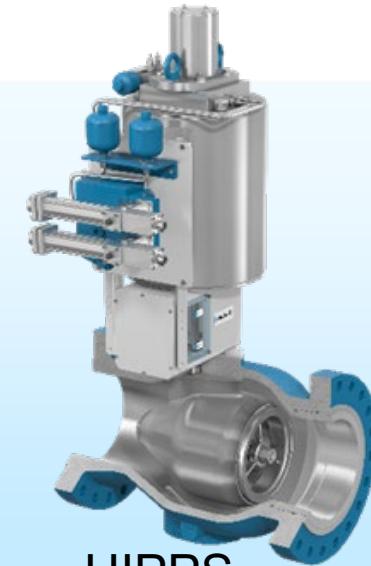
Systemen



Angle Typhoon Valve System



Axial Typhoon Valve System

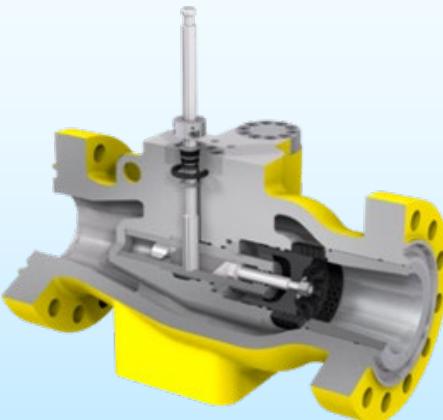


HIPPS

Subsea afsluiters



Axial Check Valve



Axial Control / Choke Valve

Mokveld axial valve



Hydrogen field experience

≈100 in operation, oldest >30 years

Mokveld
valves are
H₂
ready



Axial Control Valve



Axial Check Valve



Axial On-off Valve

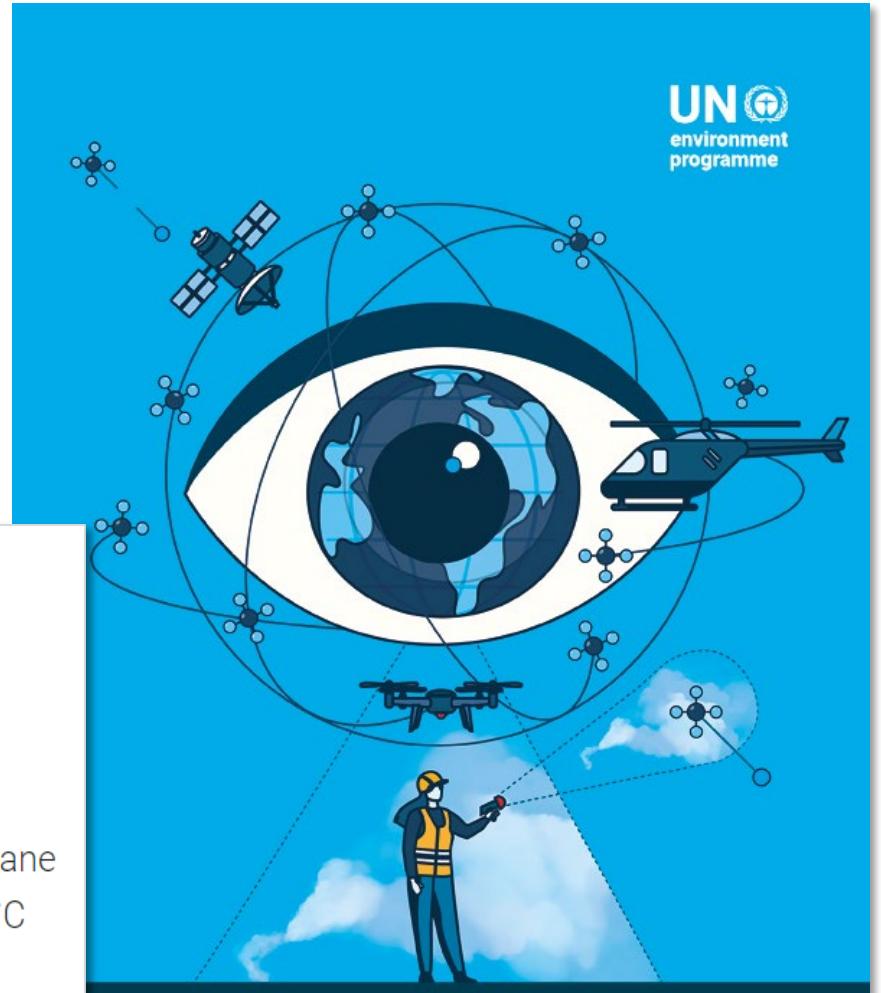
Impact of emissions

- CH₄ remains present approx. 12 years
- Global Warming Potential (GWP) 20 years of CH₄ = 80 - 85
- H₂ rapidly reacts with other gasses, shortly present
- Global Warming Potential (GWP) 20 years of H₂ = 20 - 40



11 NOV 2022 | PRESS RELEASE | CLIMATE ACTION

Methane is a powerful greenhouse gas, contributing at least a quarter of today's climate warming. According to the Intergovernmental Panel on Climate Change, we must cut methane emissions at least 30% by 2030 – the goal of the Global Methane Pledge – to keep the 1.5°C temperature limit within reach.



An Eye on Methane
International Methane Emissions Observatory
2022 Report

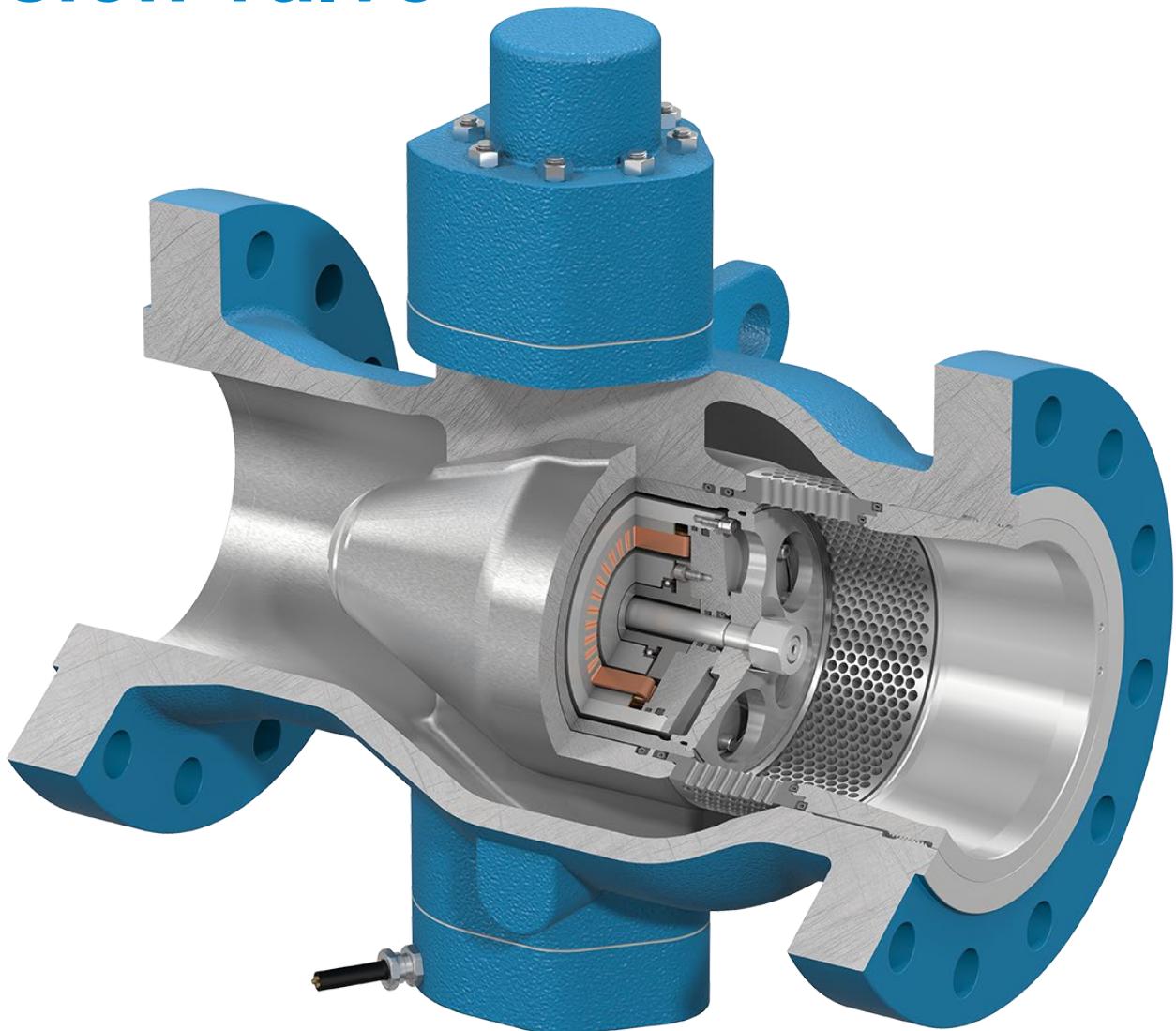
Emissions of Hydrogen to be avoided

- Hydrogen is also a Green House Gas
 $GWP_{100} = 11$ ($CH_4 = 27$)
 $GWP_{20} = 33$ ($CH_4 = 85$)
- Leakage of H_2 higher than with CH_4
 H_2 comparable to He
- Wide ignition range & invisible flame

CEN working group 19
**Hydrogen and
Industrial valves**

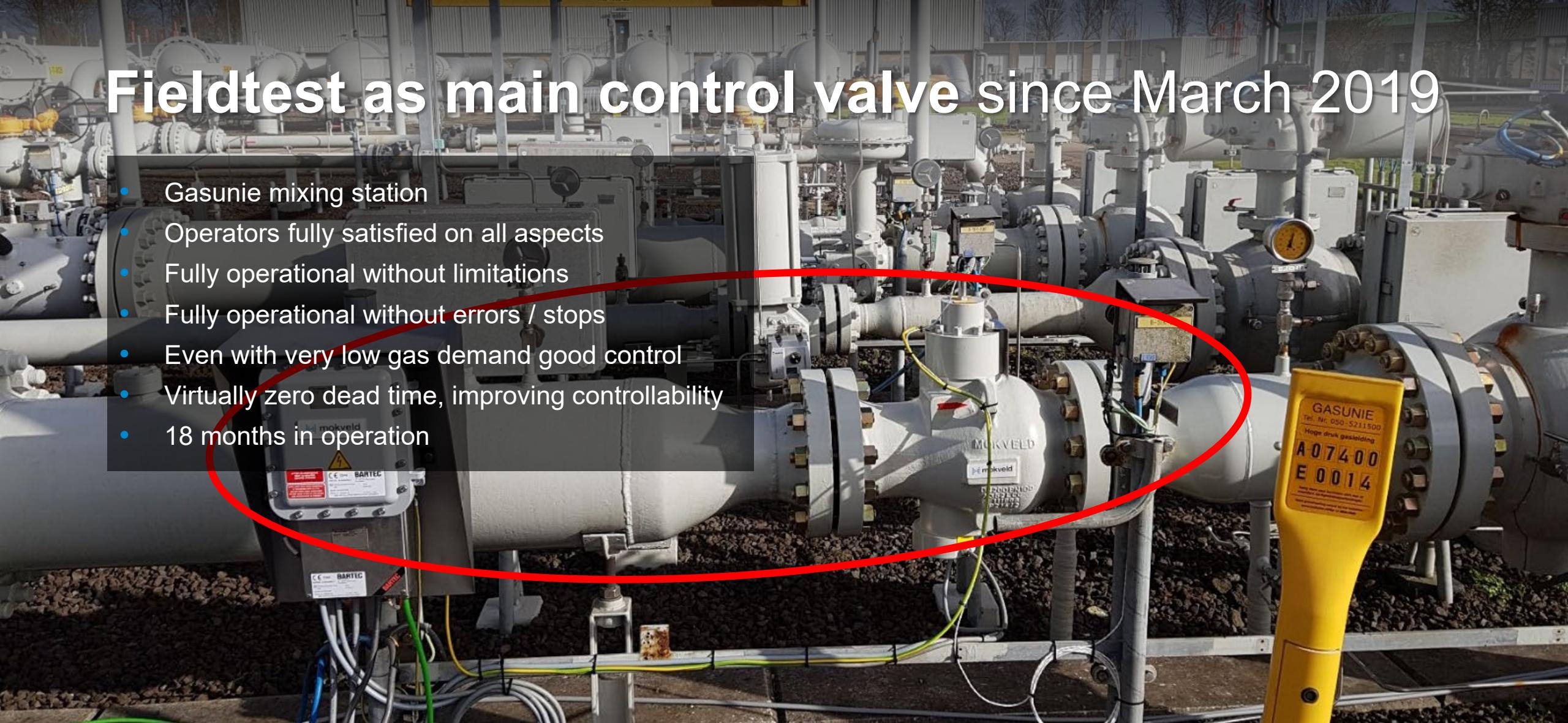
Mokveld ZERO emission valve

ZEV-R-RQX

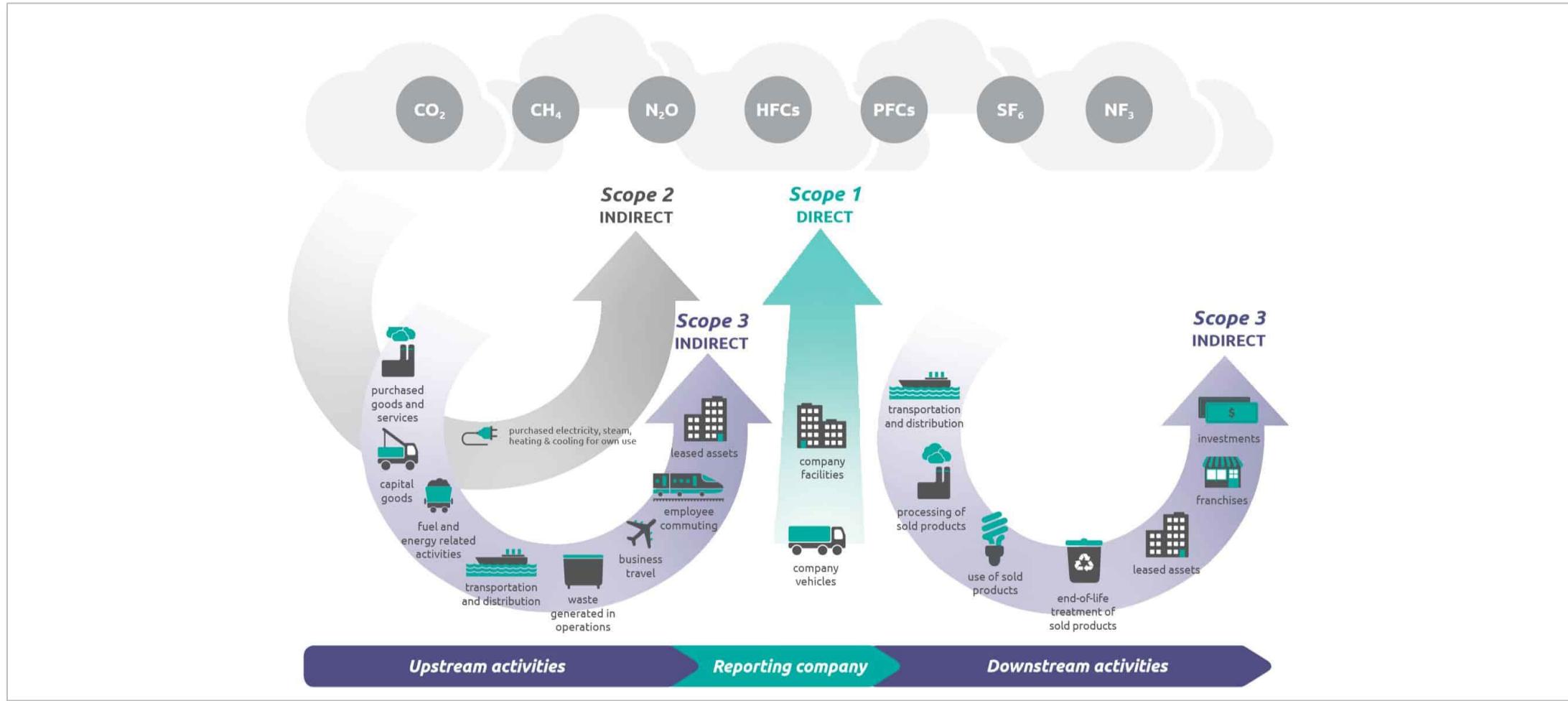


Fieldtest as main control valve since March 2019

- Gasunie mixing station
- Operators fully satisfied on all aspects
- Fully operational without limitations
- Fully operational without errors / stops
- Even with very low gas demand good control
- Virtually zero dead time, improving controllability
- 18 months in operation



ZEV reduces Scope 1 and 2 and 3 GHG Protocol

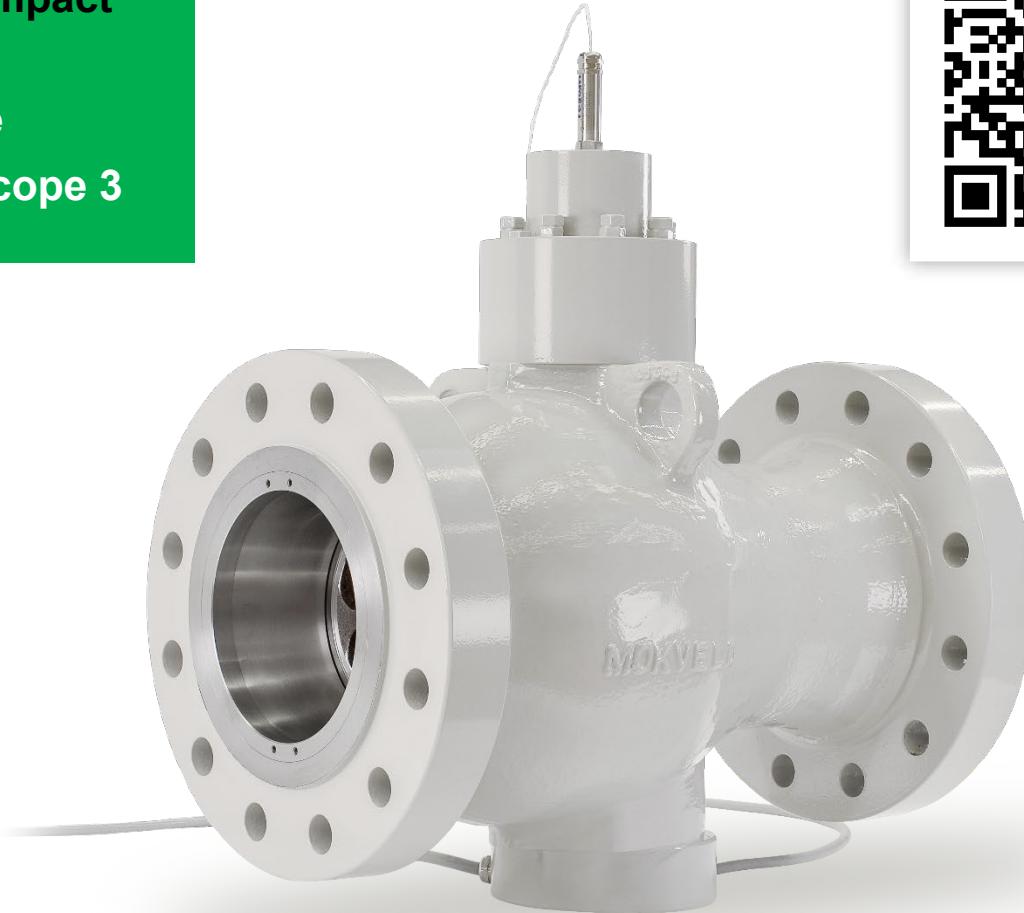


ZEV reduces Scope 1 and 2 and 3 GHG Protocol

ZERO emission
over the full
lifetime
Reduce
GHG Scope 1

Extremely low
power
consumption
Reduce
GHG Scope 2

Low weight
and compact
design
Reduce
GHG Scope 3



Thank you.

Achieve
net-zero with
Mokveld's ZERO
emission
valve.

