

# VONK - H2 PACE

Power supplies for large scale electrolysis

*H2 PACE*

2-3 December 2021



**vonk**<sup>®</sup>

Energizing Ambitions

# VONK: more than 80 years of experience



**HOLEC** 



**vonk**®

1937

VONK established by Mr. Arjen Vonk



1999

VONK acquires Holec's Power Electronics division

2002

Imtech acquires VONK

2015

VONK continues as part of Industry International Group

2020

VONK & Ampulz merge into VONK to strengthen position in energy transition

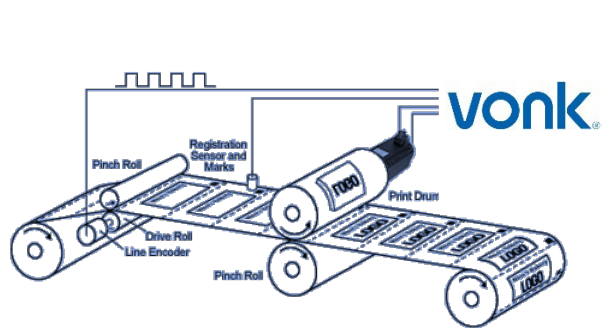
**Ampulz** **vonk**®





# Technical Capabilities: Specialized power conversion solutions

VONK offers unique power conversion solutions for high reliability & accuracy requirements



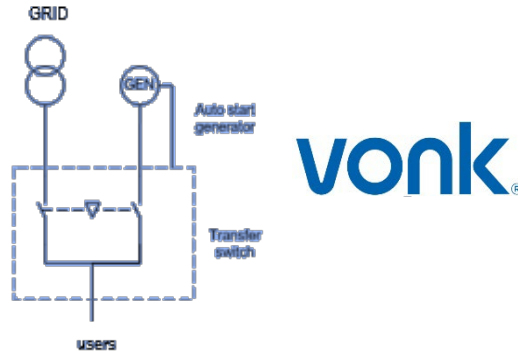
## Drive solutions

Customized drive solutions engineered to meet complex applications

- ❖ Medium frequency drives
- ❖ High voltage / Low voltage drives
- ❖ Direct current (DC) drives

## Key differentiator

Very fast reaction time and outstanding stability of controlling power components, using our proprietary Control Platform



## Industrial grid connections

Active and stable connections for high quality grid connections between different energy sources, users and grids.

- ❖ Power quality improvement
- ❖ Proprietary Active Front End technology
- ❖ High voltage / Low voltage components & distribution

Proprietary developed configurable technology, hard- and software engineering capabilities to deliver high quality stable grid connections



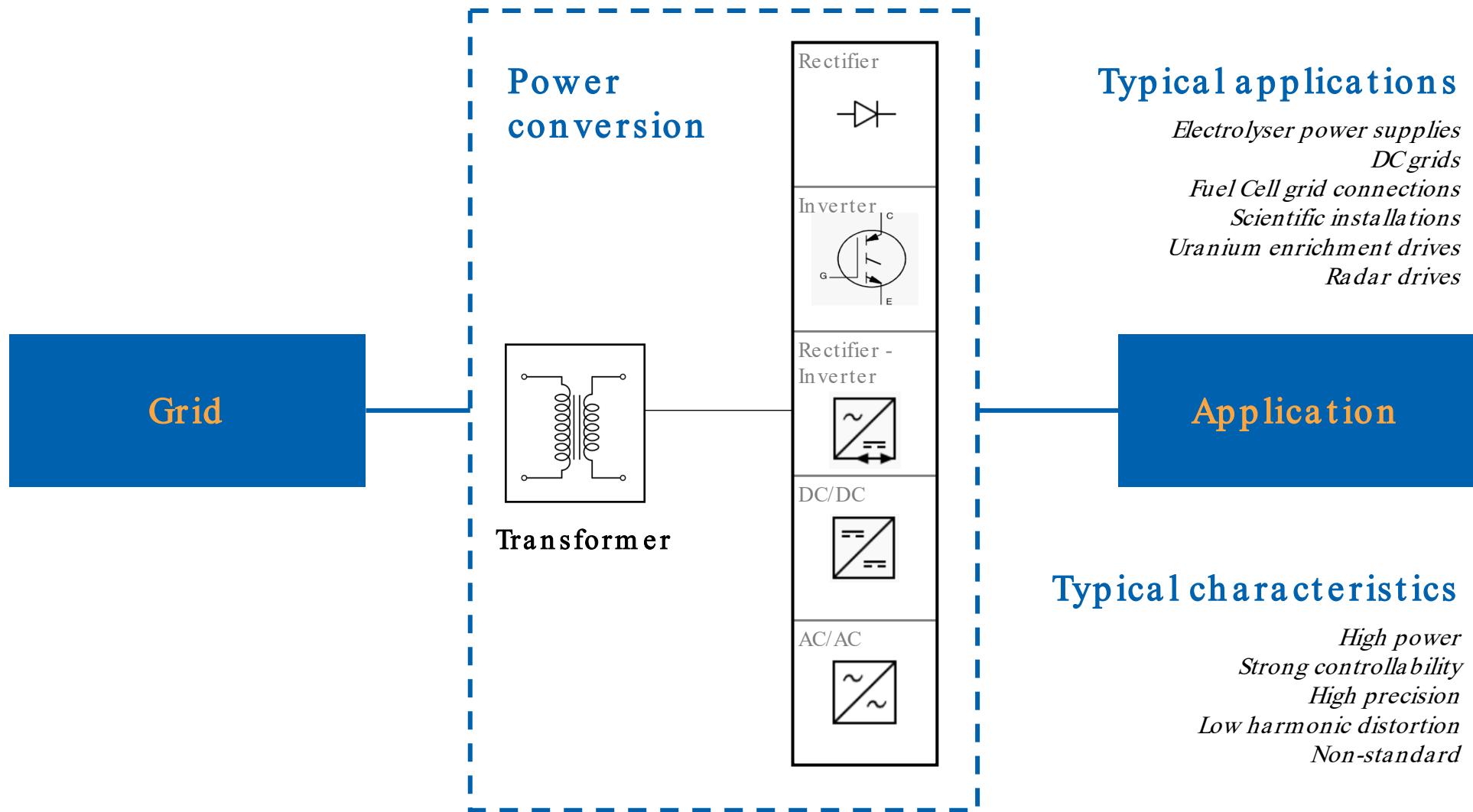
## Special power converters

Solutions enabling complex magnetic and power system management for specialized scientific and industrial applications.

- ❖ Pulse modulators
- ❖ Rectifier systems
- ❖ DC/DC converters

Qualified to deliver power converters for nuclear fusion, particle acceleration and high magnetic fields

# Specialized Power Conversion solutions



# Customer-optimized solutions

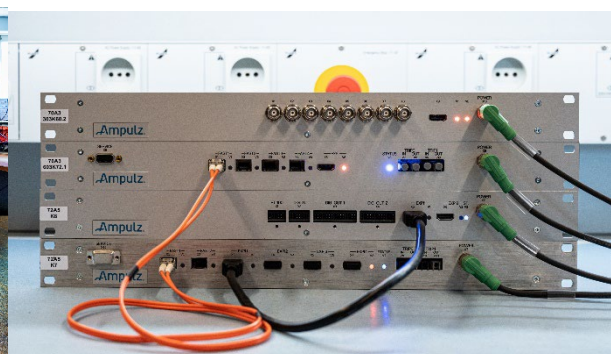
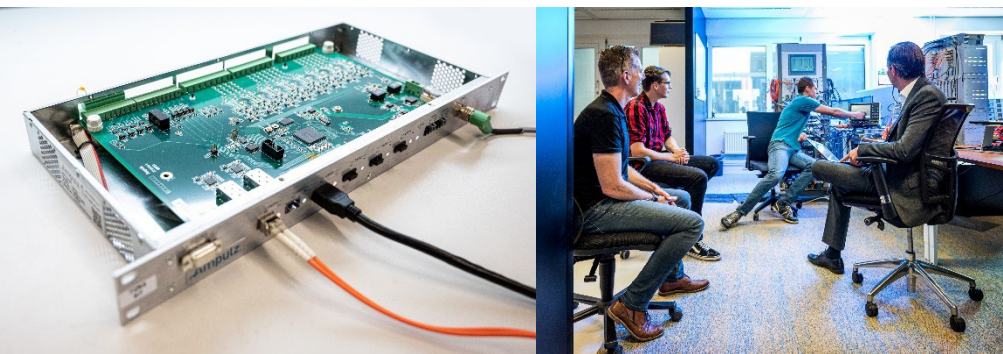
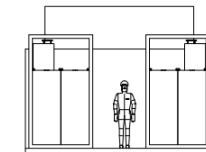
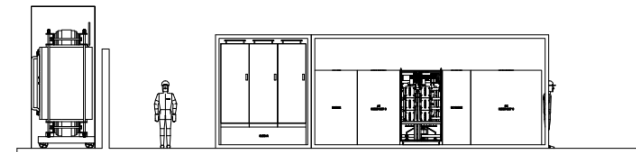
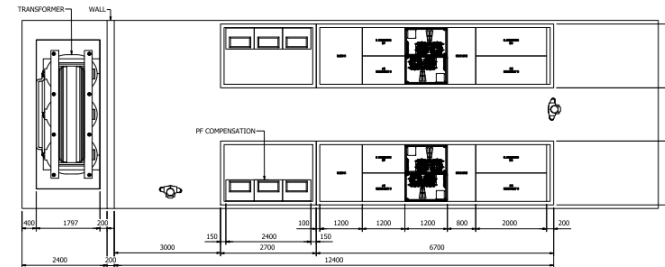
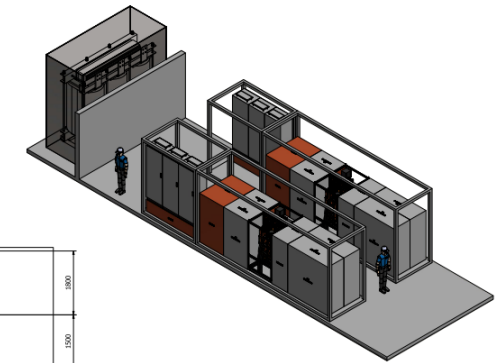
## ▶ Standardizing...

- ❖ Rectifier setup
- ❖ Skid-design
- ❖ Control electronics

## ▶ ...and Optimizing

- ❖ Power components
- ❖ Customer-specific integration

*>98% system efficiency*  
*Strong THDi & PF performance*





# Recent Hydrogen project

## HydroHub facility

- ❖ Hydrogen test lab in Groningen
- ❖ Main Dutch hydrogen research lab
- ❖ Consortium with a.o. Shell, Nouryon and Yara



## Low Voltage with high Current

- ❖ Output Voltage: 0---40 V
- ❖ Output Current: 0---10kA

## 2 converters

- ❖ For Alkaline electrolyser
- ❖ For PEM electrolyser

## Strong harmonics requirements

- ❖ Research purposes
- ❖ Other operations on-side

# References: large scale project

## Max Planck Institute for Plasma Physics

- ❖ Fusion research centre in Munich (DE)
- ❖ Largest fusion reactor in the world



## Power Supply 140 MW

- ❖ Maximum Voltage: 1300V
- ❖ Maximum Current: 45kA

## Flexible setup

- ❖ Consists of 4 identical converters
- ❖ Multiple operation modes

## Total solution

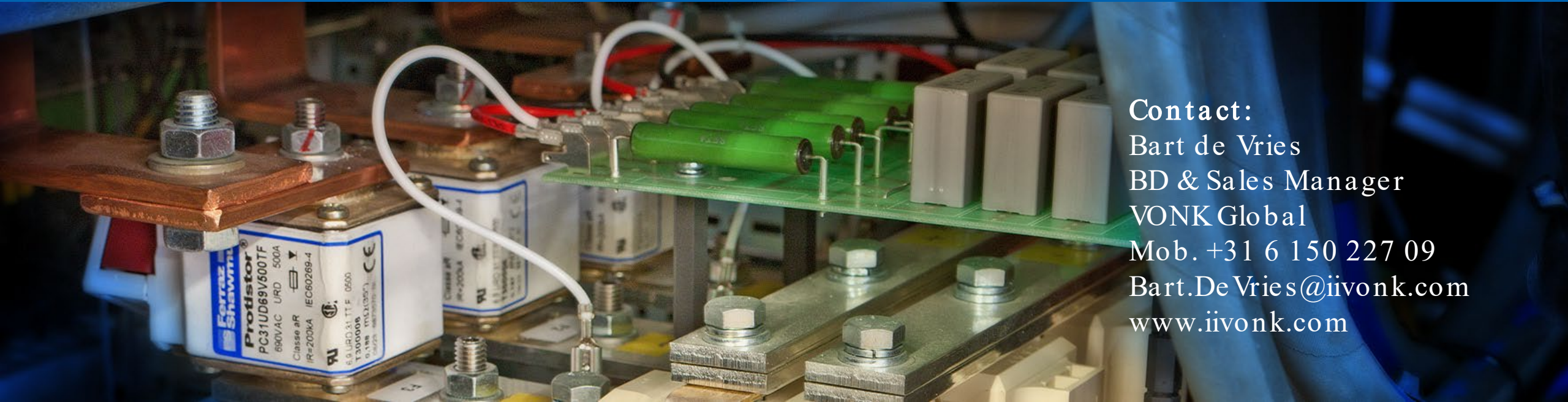
- ❖ Scope includes transformer, rectifier, switchgear, cooling, busducts



Questions?

**vonk**®

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