



**FFT** *check*

# LEAK DETECTION PIG (LDP)

*„The solution for detecting leaks in pipelines“*

one step ahead in **INTELLIGENT** production systems



## **FFT***check* Leak Detection Pig

Detection of leakages by ultrasonic signals

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### **FFT***check* LDP - Overview

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### **FFT***check* LDP - Benefits

Precise measurement,  
Reliable detection of leakages

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### **FFT***check* LDP - Software & Accessories

PI2000 / PI2001

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### **FFT***check* LDP - References

Customers

# 1

## FFT *check* Leak Detection Pig Overview

How it works

one step ahead in **INTELLIGENT** production systems

# FFT*check* **LDP** - Overview

- Objective:
  - To detect creeping leaks in crude oil pipelines and determine their location
- Problem:
  - Creeping leaks may remain undetected for years because oil pipelines are underground and the leakage is minimal
- Solution by **FFT*check* Leak Detection Pig**:
  - Creeping leaks cause an ultrasonic signal, which is recorded by the FFT leak detection pig including the position

# FFT *check* LDP - Overview

## Mode of operation

- Placing the LDP into the pipeline
- LSD is driven by water pressure through the pipeline
- Data are recorded in electronic box  
→ Evaluate signals/Data analysis

## Recorded Data

- Ultrasonic signals
- Pressure
- Temperature
- Distance information



# 2

## FFT *check* Leak Detection Pig Technical information

Structure of LDP

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# FFT *check* LDP - Technical information

## Technical data:

<b>Sizes</b>	6" pipe diameters and larger
<b>Media</b>	Oil crude, oil products, water, etc.
<b>Pumping speed</b>	0.5 - 6 meters per second
<b>Runtime</b>	up to 6 weeks
<b>Length of pipeline</b>	up to 1000 km
<b>Leakage rates</b>	from 20 liters per hour
<b>Test pressure of the pressure vessel</b>	150 bar
<b>Pipe bends</b>	from 1,5 D

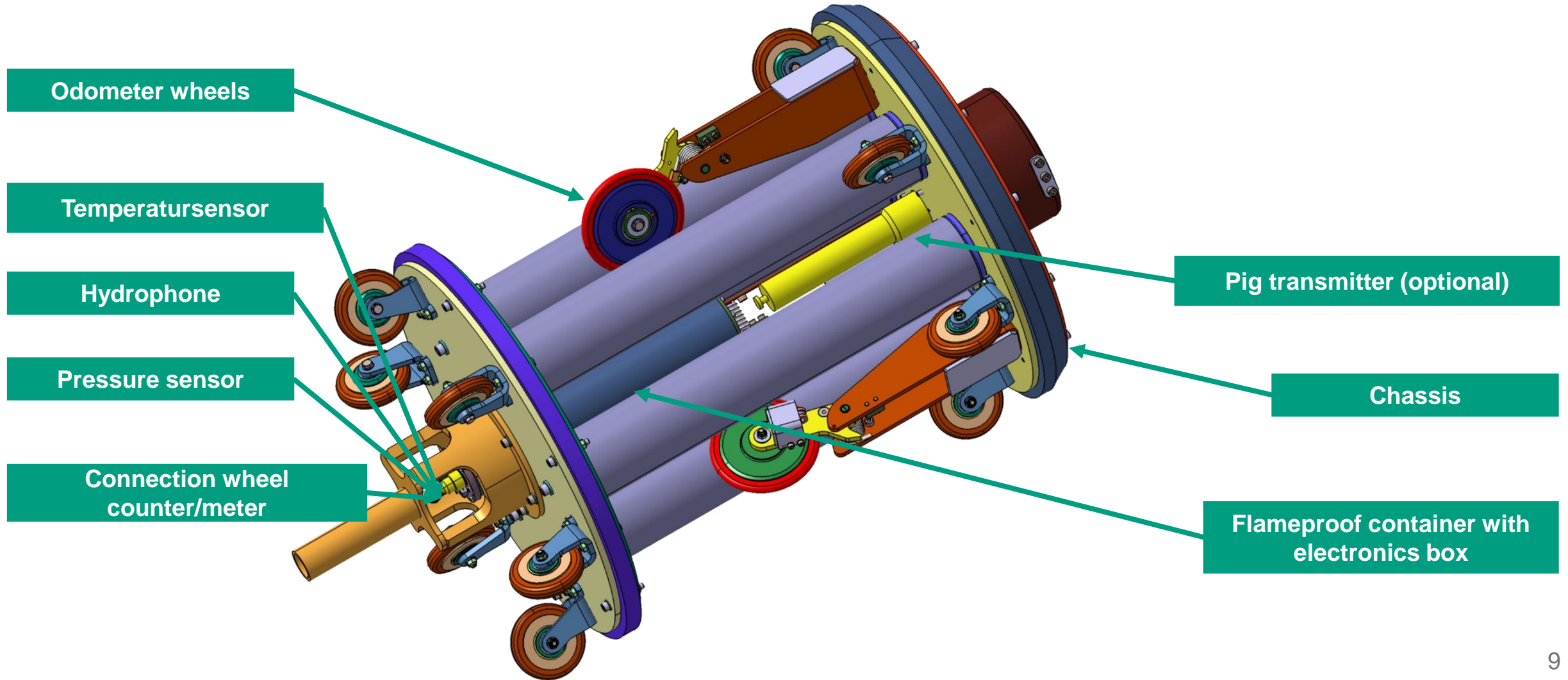
# FFT *check* LDP - Technical information

## Technical data:

<b>Recorded data</b>	Distance (resolution >0.5 m), time (real time 23 ppm) temperature (0-100° C), pressure (0-100 bar), noise (frequency band 23.5 kHz, 29 kHz & 35kHz)
<b>Supply voltage</b>	3,6 V (2 lithium batteries TYPE SAFT LS33600)
<b>Power consumption</b>	< 200 mA
<b>Fuse</b>	SMD fuse (gas-tight)
<b>Memory capacity</b>	128 MB (optional up to 1 GB)
<b>Marker detection</b>	35 kHz modulated with 72 Hz
<b>Displacement measurement</b>	3 independent odometer wheels



# FFT *check* LDP - Technical information



# FFT*check* LDP - Technical information

The procedure of a pipeline inspection



- Recording of the data (pressure, temperature, noise & distance) in the electronic box during the pig run
- After finishing the pigging run, the data is available on an SD card for further processing
- Evaluation of sensor data with the FFT software "PISTAR"
- The defined frequency ranges of the sound recording are selectively amplified to hide disturbing noises
- Markers are automatically identified

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## FFT*check* Leak Detection Pig Benefits

Accurate measurement, reliable detection of leaks

one step ahead in **INTELLIGENT** production systems

# FFT *check* LDP -BENEFITS



LDP available for pipeline diameters of 6 inches and larger



Accurate and precise location of the leakage



Long runs → up to 1000 km



Long running time → up to 6 weeks



Complete recording & storage of raw data



Very high stability & availability



Experience due to several projects with different customers

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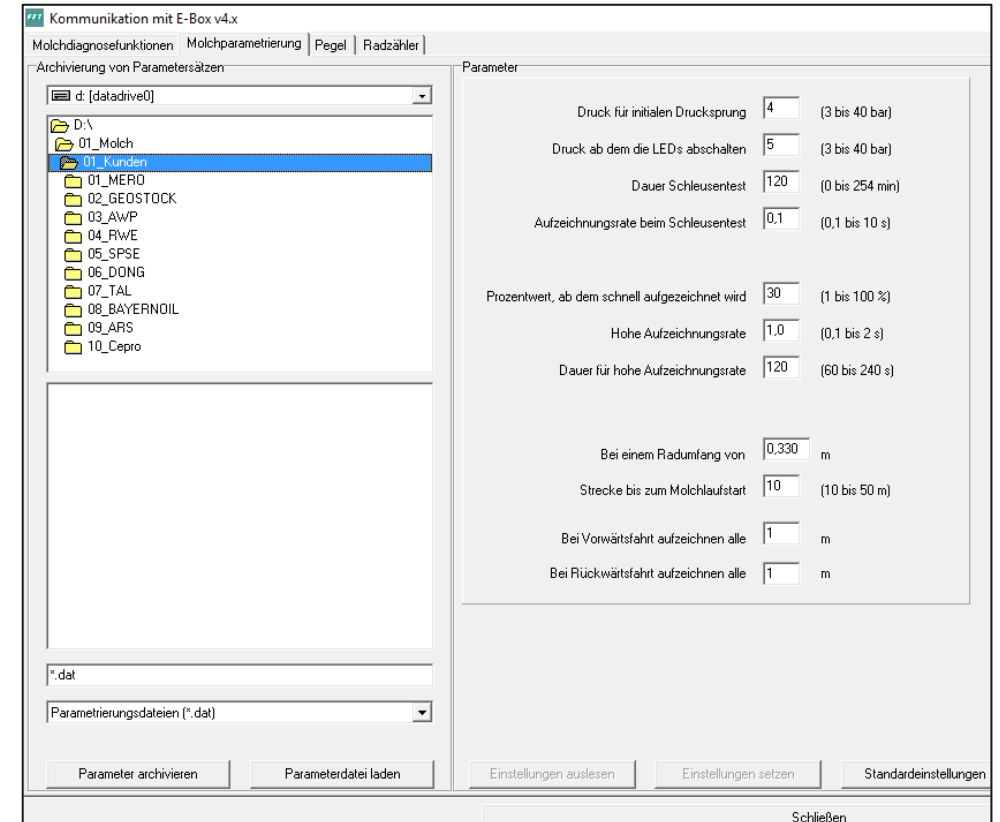
## FFT*check* Leak Detection Pig Software & Accessories

PI2000 / PI2001

one step ahead in **INTELLIGENT** production systems

# FFTcheck LDP - Software

- Main part of the operation is the software "PISTAR" developed by FFT. (Pipeline Inspection Set Trace Analyze Report)
- The software combines the main functions parameterization and evaluation  
→ easy operation & analysis with automatic report function
- User-friendly design of the parameterization, which can be set up based on preset parameters



# FFTcheck LDP - Software

Analysis and documentation

- Test report is automatically generated by the software.
- Creates a short report
  - for analysis
  - for an official report
  - for technical monitoring
  - Test reports für new types pf oil

**You can configure the software to your individual needs and use it without any previous knowledge!**

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**Auswertung**

**Pumppausen:**

Anzahl Pumppausen : 2  
 Mindestzeit : 60 min  
 Gesamtzeit : 3761 min

Nr.:	Start:	Ende:	Dauer [min]:
1	27.02.2021 21:23:41	02.03.2021 00:01:13	3037
2	02.03.2021 06:01:45	02.03.2021 18:06:20	724

**Marker:**

Anzahl Marker: 25

Name:	Soll bei [km]:	erkannt bei [km]:	Differenz [km]
LV1 MAR SIM	6,6960	6,7060	-0,0100
LV3 MAR	14,0440	13,9410	0,1030
LV4 MAR	20,0630	19,8725	0,1905
LV5 MAR	26,5000	26,2229	0,2771
L6a MAR	35,1600	34,9664	0,1936
LV8 MAR	42,1860	42,0004	0,1856
LV9 MAR	46,7430	46,5845	0,1585
L10 MAR	62,5740	62,2963	0,2777
L11 MAR	72,6240	72,2459	0,3781
L12 MAR	81,7010	81,3486	0,3524
L13 MAR	84,1140	83,8435	0,2705
L13a MAR	86,7270	86,5340	0,1930
L14 MAR	92,4660	92,3944	0,0716
L15 MAR	108,2280	108,1729	0,0551
L16 MAR	116,4170	116,5424	-0,1254
L17 MAR	125,2900	125,4821	-0,1921
L18 MAR	135,1150	135,4366	-0,3216
L19 MAR	140,4920	141,0026	-0,5106
L20 MAR	149,5710	150,0911	-0,5201
L22 MAR	165,0320	165,4556	-0,4236
L23 MAR	167,2760	167,7788	-0,5027
L24 MAR	174,4890	175,0557	-0,5667
L26 MAR	178,4980	179,1290	-0,6310
L28 MAR	186,7880	187,4610	-0,6730
L29 MAR SIM	195,5440	196,3714	-0,8274
END	210,0290	210,9932	-0,9642

**Simulatoren:**

Anzahl Simulatoren: 2

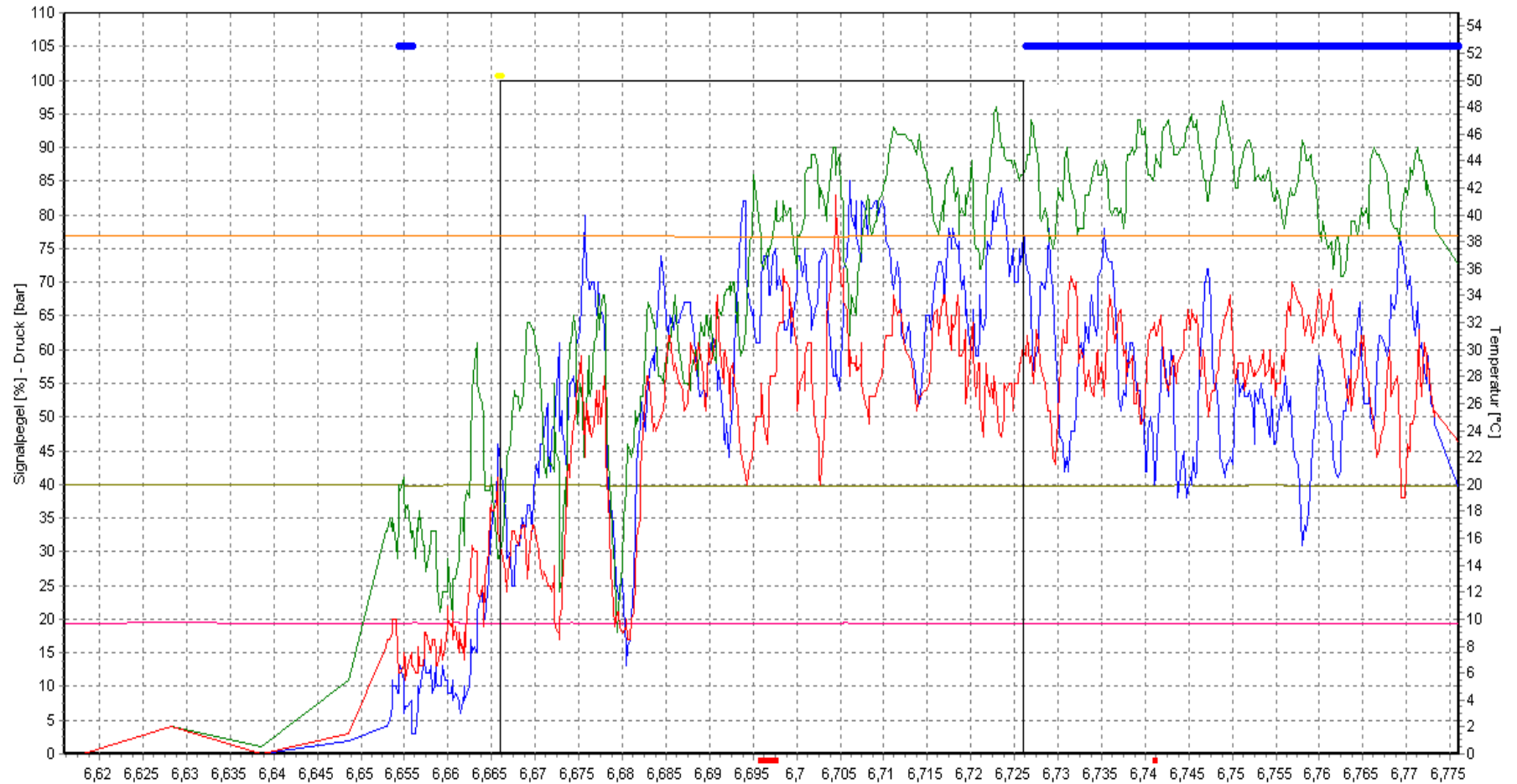
Name:	Start [km]:	Ende [km]:	Funktion:
LV1 MAR SIM	6,6660	6,7260	IO
L29 MAR SIM	195,5140	195,5740	IO

EDAG PISTAR Version 6.5 Release 23-03-2015 LE

# FFTcheck LDP - Software

Analysis and documentation

**Simulation of leakage**  
 → Abrupt increase of all 3 frequencies

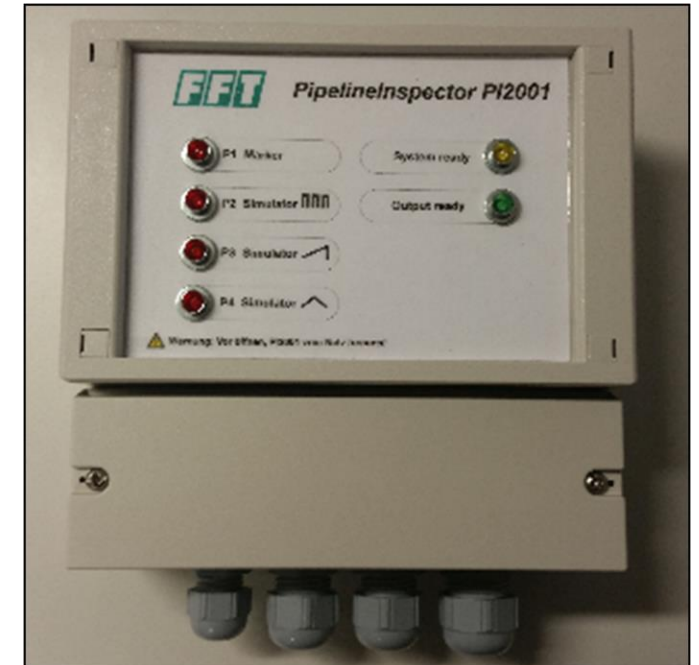




# FFT *check* LDP - Accessories

PI2000 / PI2001

- The FFT - **PipelineInspector PI2000** is used to monitor the proper function and to correct the odometry of the leak detection pig, as well as the detection of a passing pig.
- The FFT - **PipelineInspector PI2001** monitors the correct function and is used to correct the odometry of the leak detection pig.
- The PI2001 is also available in a mobile version for the field  
→ No need for complex 24 V cabling



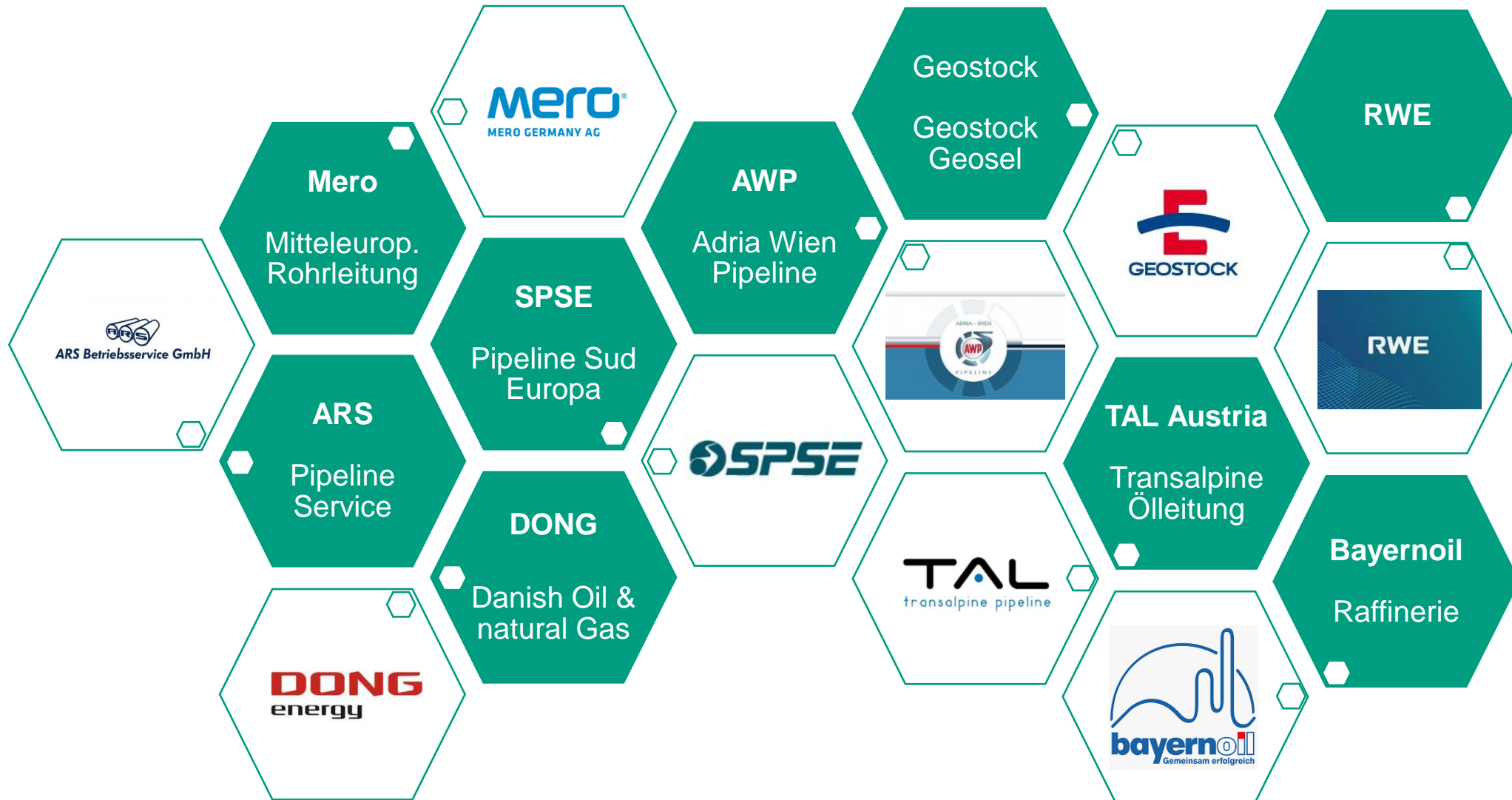
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## FFT*check* Leak Detection Pig References

customers

one step ahead in **INTELLIGENT** production systems

# FFTcheck LDP - References



# SERVICE OPTIONS

We support your project from the idea to the realization and gladly beyond.



We take into account quality and deadline requirements and we assume the responsibility for the project until turnkey handover.



## Consulting

Use our experience for your tasks



## Project Management

Support from the idea to the start of production



## Risk Analysis

Identification of risks in the process



## Custom design

Creation of individual solutions



## Manufacturing

Successful manufacturing with modern technologies



## Documentation

Clear and logical




## Conformity

Compliance with standards and regulations



## After Sales

Competent service through FFT



We support our customers in efficiently implementing their production systems according to their specifications.

“

DO YOU NEED AN  
**INDIVIDUAL SOLUTION**  
FOR YOUR TASK?



# CONTACT

## Your personal contact person

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# THANK YOU

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