Heinrichs
KOBOLD Group

Products (mechanical)

Level

Variable Area

Flap - Flow

Density

Products (electronic)

New

Coriolis

Vortex

Magnetic Inductive

Heating jackets

- Internal winding tubes
- Double wall containment housing
- Multiple heating: Flange to flange and heating tubes
- Heating plates for retrofitting
- for steam and liquid

Short overview




	TME Economy	**TMU** Standard	**TM** Universal	**TMR** PD-Replacer
Materials (wetted parts)	Stainless steel	Stainless steel, Hastelloy	Stainless steel, Hastelloy, Tantalum, Nickel, Titanium, ...	Stainless steel
Process-connections	DIN, ANSI	DIN, ANSI, JIS, BS, NPT, ...	DIN, ANSI, JIS, BS, NPT, ...	DIN, ANSI, ….
Size	DN10 (½“) to DN80 (3“)	DN10 (½“) to DN400 (16“)	DN10 (½“) to DN80 (3“)	DN10 (½“) to DN100 (4“)
Containment	Cast iron	Stainless steel, steel	Stainless steel, steel	Stainless steel, steel
Flow range	20 to 60.000 kg/h	20 to 2.200.000 kg/h	0,8 to 40.000 kg/h	0,8 to 120.000 kg/h
Accuracy	0,15% of actual flow	0,1% of actual flow	0,1% (0,05%) of actual flow	0,15% (0,05%) of actual flow

TMR-series replacement of Oval Wheel Meter
UFC-85 / Formalin

Installation:	Kuwait
Wetted parts:	1.4571
Range:	0-20.000 kg/h (44000 lb/h)
Process connection:	DN50 PN40
Pressure:	25 bar (363 psi)
Process temperature:	+196°C (+385°F)
Ambient temperature:	+100°C (+212°F) (hazard. Area)
Date of installation:	2007

TMR-series replacement of Oval Wheel Meter UFC-85 / Formalin

Ambient temperature:	+80°C (+176°F) (hazard. area)
Date of installation:	2010

Glue Monitoring
UFC-85 / Formalin

Customer:	Bayernoil
Wetted parts:	1.4571
Flow range:	0-114.000 kg/h
Process connection:	DN150 PN16
Pressure rating:	10 bar (145 psi)
Process temperature:	+180°C (+356°F)
Design:	Double heating jacket, High temperature design up to +180°C
Date of installation:	2011

Calibration Certificate 12“ Mass Flow Meter

CZECH METROLOGY INSTITUTE
Regional Inspectorate Brno, Okružní 31, 638 00 Brno
Czech Republic

CALIBRATION CERTIFICATE

No. **6031-KL-P205-04**

Date of issue: October 5, 2004

Ing. Radovan Wiecek
Director OI Brno

ČESKÝ METROLOGICKÝ INSTITUT Oblastní inspektorát BRNO 60

Customer: Badger Meter Czech Republic s.r.o.

Identification: **Mass flowmeter**
Range: **DN 300**
Marked as: **Heinrichs**
Serial no.: **236316**

Calibration Certificate 12“ Mass Flow Meter

Calibration Certificate No. 6031-KL-P205-04 **Page 2 of 2**

Place of calibration: Badger Meter Czech Republic s.r.o.

Conditions of Measurement:

The average ambient conditions during the measurement were as follows:
air temperature: (20,4 ± 0,1) °C
relative humidity: (50.0 ± 5) %

Measurement results:

	100%	75%	60%	50%	40%	25%
Watter temperature (°C)	17,1	17,1	17,1	17,1	17,1	17,1
Temperature in test (°C)	18,2	18,2	18,2	18,2	18,2	18,2
Flow (m^3/h)	1400	1050	840	700	560	350
True flow (m^3/h)	1320,24	1050,24	1281,24	692,70	554,10	336,12
Mass – weight (kg)	22004	21880	21354	23090	18470	11204
Puls count – flowmeter	22031	21885	21350	23060	18466	11216
Test time (s)	60	75	90	120	120	120
Error (%)	0,12	0,02	-0,02	-0,13	-0,02	0,11

Uncertainty of measurement:
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the cover = 2, which for a normal distribution correspondeds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EAL Publication EAL-R2 (EA 4/02).

Dates of calibration: October 11, 2004
Calibrated by: Petr Bláha

Gas Calibration Certificate

pigsar ™

National Standard of Germany for volume of high-pressure natural gas

Certificate Number: 3165/2004
Order: 0
Date: 2004–09–02

Applicant
Name Customer Organization
Heinrichs Messtechnik GmbH

Meter under Test

Type	Coriolis Meter TM–UMC–2B
Manufacturer	Heinrichs Messtechni
Serial number	236313
Nominal Size	8"
Year of manufacture	2004

Testing Conditions

p (absolute) =	26,72 bar	T =	15,1 °C
ρ (average) =	21,690 kg/m³	η =	11,64 x 10^{-6} Pa s

Testing medium
Natural gas (analysis)

H_i =	0,00 Vol.%	CO_2 =	1,6 Vol.%
H_s =	10,322 kWh/m³	K–ratio =	0,9493

ρ_n = 0,8239 kg/m3 at normal reference conditions (273,15 K; 101,325 kPa)

Results

Q / Q_{max}	Q (kg/h)	Reynoldsnumber	Deviation (%)	U_{tot} (%)
0,10	5023,94	0,76 *10^6	–0,01	0,32
0,20	10118,93	1,54 *10^6	–0,42	0,24
0,40	19752,77	3,00 *10^6	–0,59	0,28
0,63	31463,84	4,78 *10^6	0,03	0,25
0,84	42044,89	6,39 *10^6	0,91	0,40
0,98	48924,64	7,44 *10^6	4,68	2,43

The *deviation* is defined as:

$$\text{Deviation} = \frac{(\text{Indicated Volume} - \text{Reference Volume})}{(\text{Reference Volume})} \cdot 100\%$$

where the reference volume refers to the conditions at the meter under test. The reported values of this deviation are the arithmetical meansof *n* single measurements at each flow–rate.

The reported *total uncertainty* is defined as:

$$U_{tot} = \sqrt{U^2_{harmonized} + U^2_{density} + (k \cdot u_{meter})^2}\ ; (k = 2)$$

where $U_{harmonized}$ is the expanded uncertainty of 0.15% of the harmonized reference volume, stated as the standard uncertainty of measurement multiplied by the coverage factor *k*=2, and u_{meter} is the standard uncertainty of the meter under test determined on the base of n single measurements of the meter under test at each flow–rate.

The *deviation according to OIML/R32, determined as a weighed mean average* amounts to 0,9 %.

Remarks
Security marks are applied
The results have been measured with C = 60230 kg/h/10µs.

The uncertainty of the mass flow is 0.24%.

Tested in Dorsten at *pigsar*, on 2004–09–02 Aldenhoff

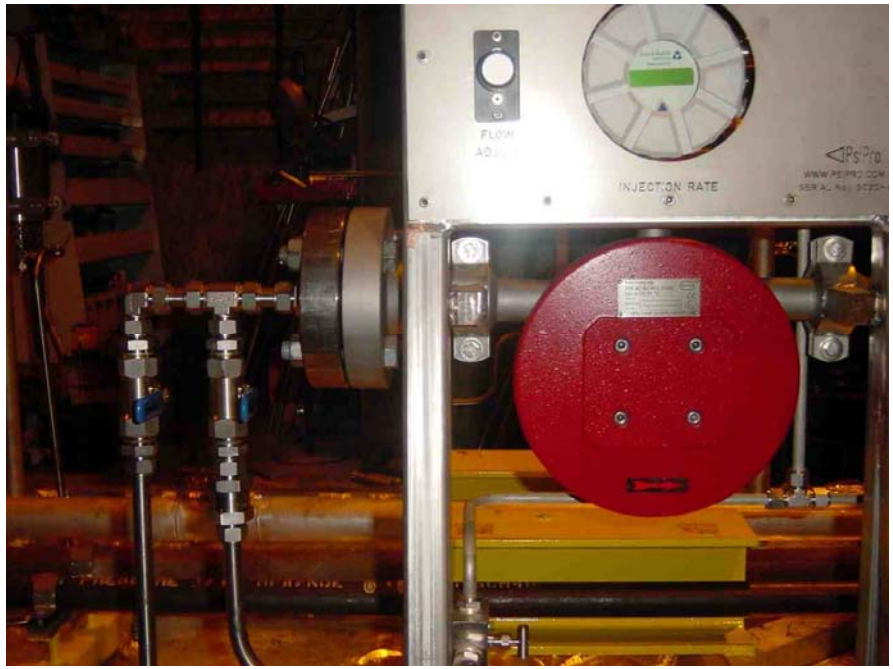
Test Certificates without signature and seal are not valid. This Test Certificate may not be reproduced otherwise than completely except with written permission of the signing authority.

Diesel Fuel Depot

Customer:	Romanian Railway Company CFR
Wetted parts:	1.4571
Flow range:	0-40.000 kg/h
Process connection:	DN80 PN40
Pressure rating:	16 bar (232 psi)
Process temperature:	+40°C (+104°F)
Design:	Custody Transfer
Date of installation:	2002

Hydrogen Dispensing Station

Customer:	Norsk Hydro, Norway
Installation:	Island
Wetted parts:	1.4571
Flow range:	0-1.800 kg/h (4000 lb/h)
Process connection:	M16x1,5 (LH Hofer-Standard)
Pressure rating:	440 bar (6381 psi)
Process temperature:	-40°C up to +40°C (-40°F up to +104°F)
Design:	High Pressure
Date of installation:	2002



Hydrogen Dispensing Station

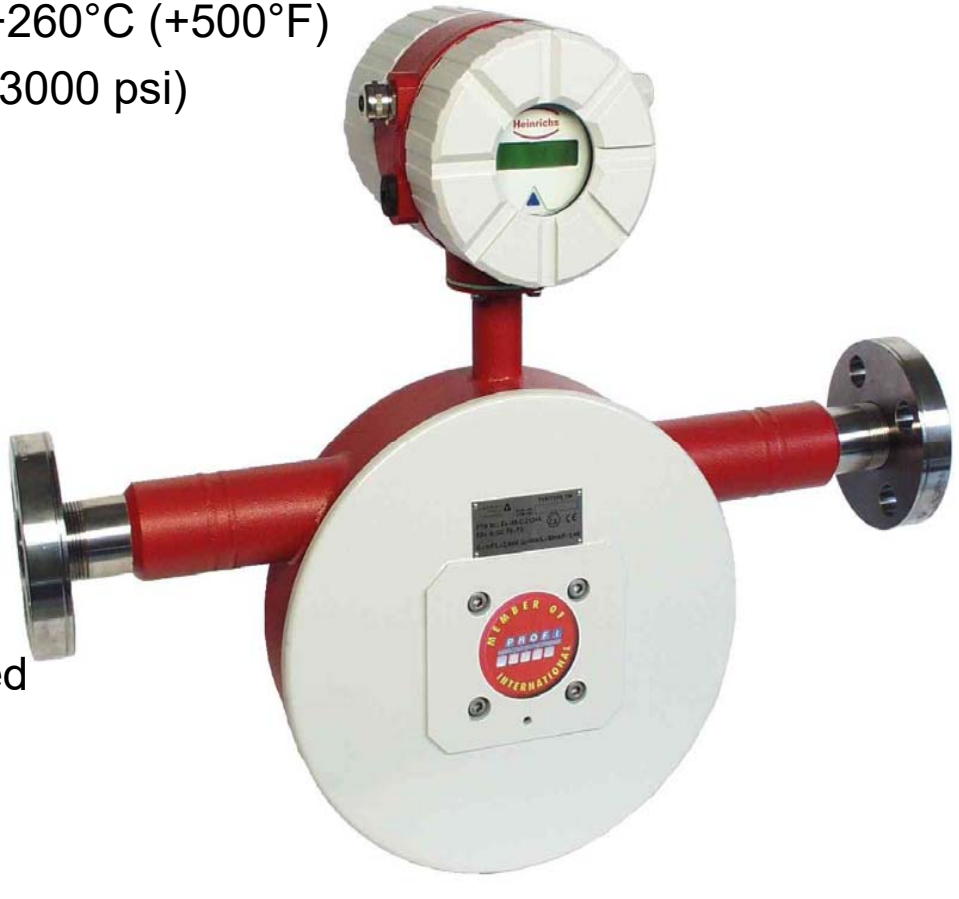
Customer:	Norsk Hydro, Norway
Installation:	Porsgrunn, Norway
Wetted parts:	1.4571
Flow range:	0-180 kg/h (400 lb/h)
Process connection:	M16x1,5 LH Hofer-Standard
Pressure rating:	500 bar (7250 psi)
Process temperature:	-40°C up to +40°C (-40°F up to +104°F)
Design:	High Pressure
Date of installation:	2007

Phosgene Gas Monitoring

Customer:	Bayer AG Germany
Wetted parts:	1.4571
Flow range:	0-20.000 kg/h
Process connection:	DN50 PN40
Pressure rating:	8 bar (116 psi)
Process temperature:	max. +120°C (+248°F)
Design:	Pressure resistant secondary encasement, connection for Gas-detection sensor
Date of installation:	2002

Sensor features

- Flow ranges from 0,06 kg/min (0.13 lb/h) up to 2.200.000 kg/h
- Process temperature from -60°C (-76°F) up to +260°C (+500°F)
- Ultra high pressure capabilities up to 900 bar (13000 psi)
- Almost every process connection possible
- Special materials for nearly every application
- Special heating optional (flange to flange)
- Drain connection optional
- Pressure resistant secondary encasement as option
- Secondary encasement in stainless steel
- Robust against external stresses
- No independent pressure compensation required

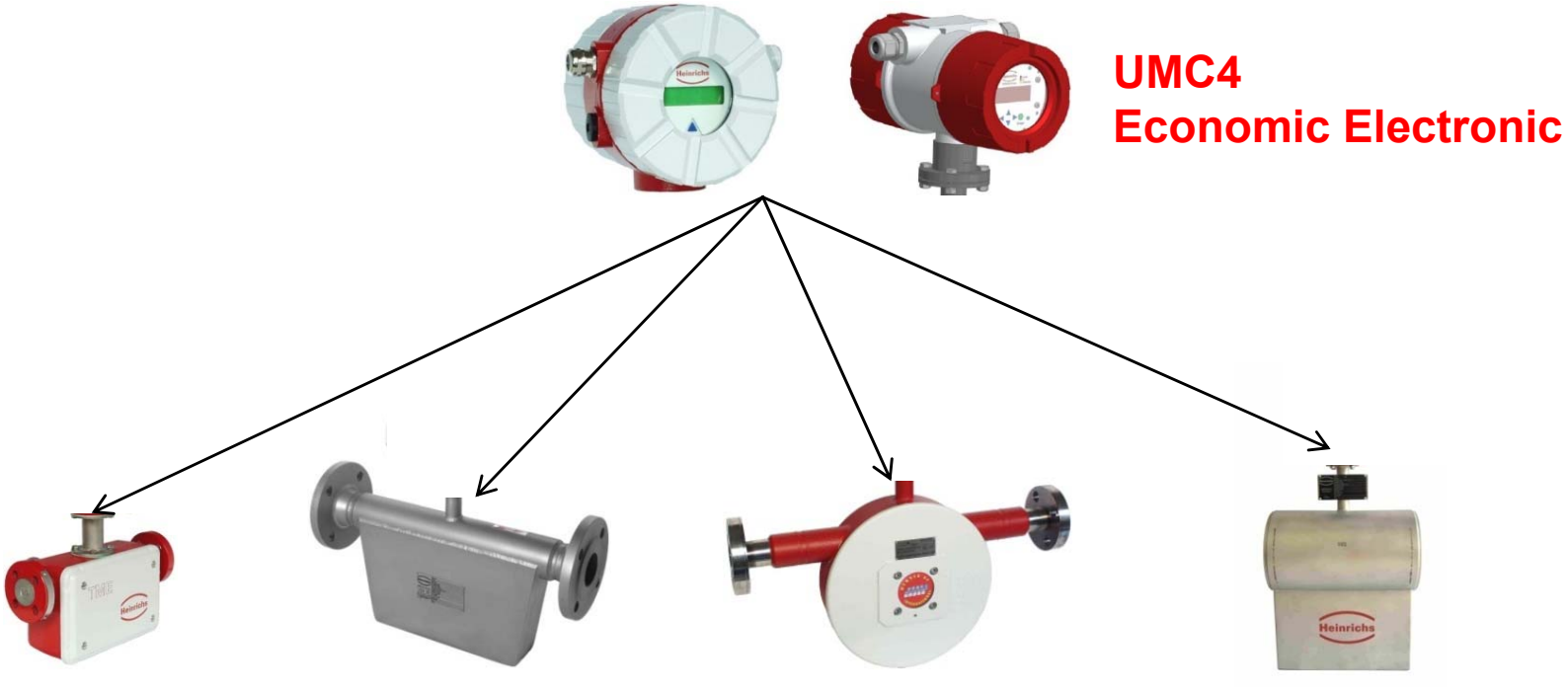


Transmitter UMC3 / UMC4

For series

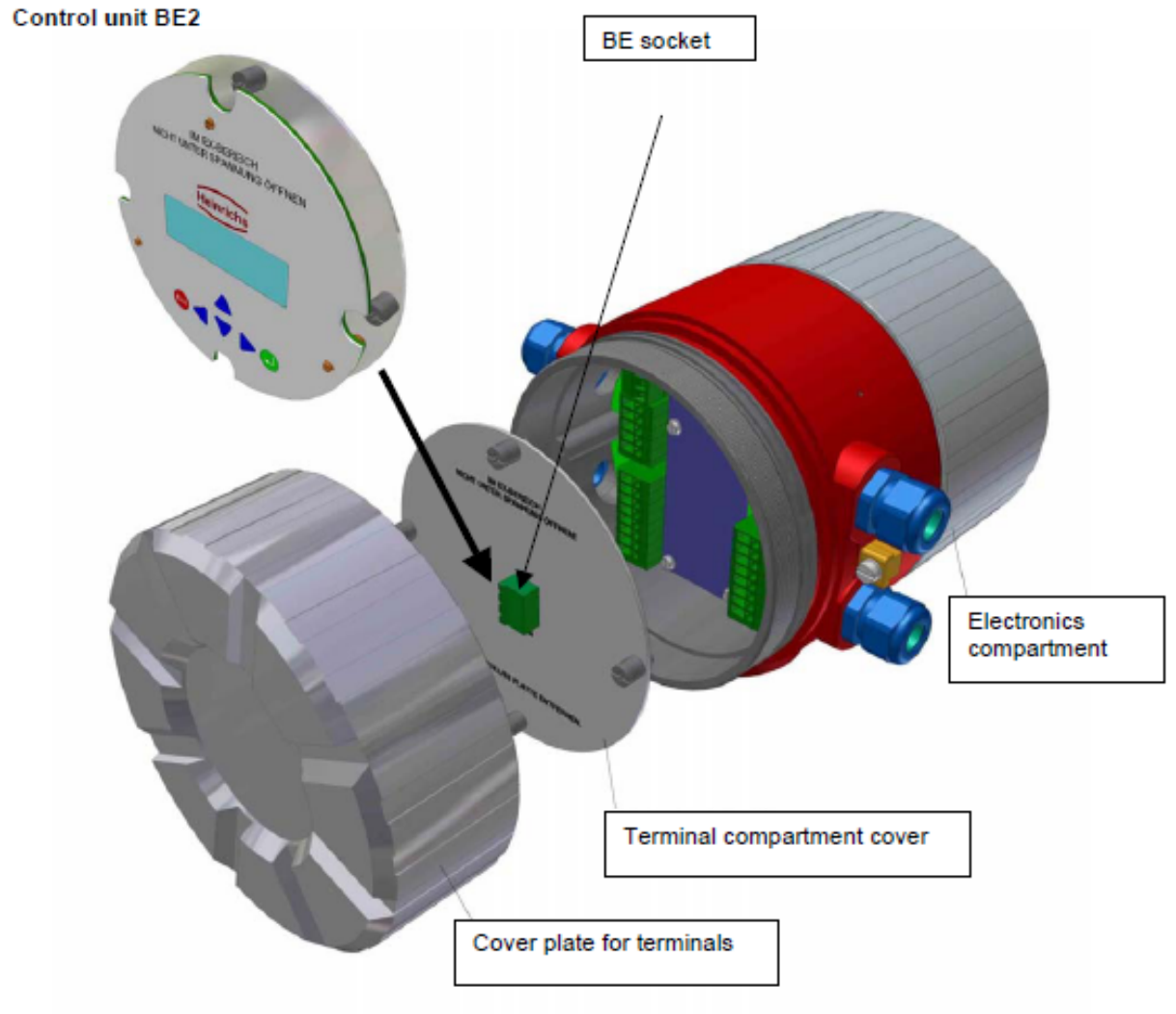
- TME
- TMU
- TM
- TMR

Microcontroller based transmitter
Dual compartment housing with IS interface access
Flameproof by design
LCD-Display usable as configuration board

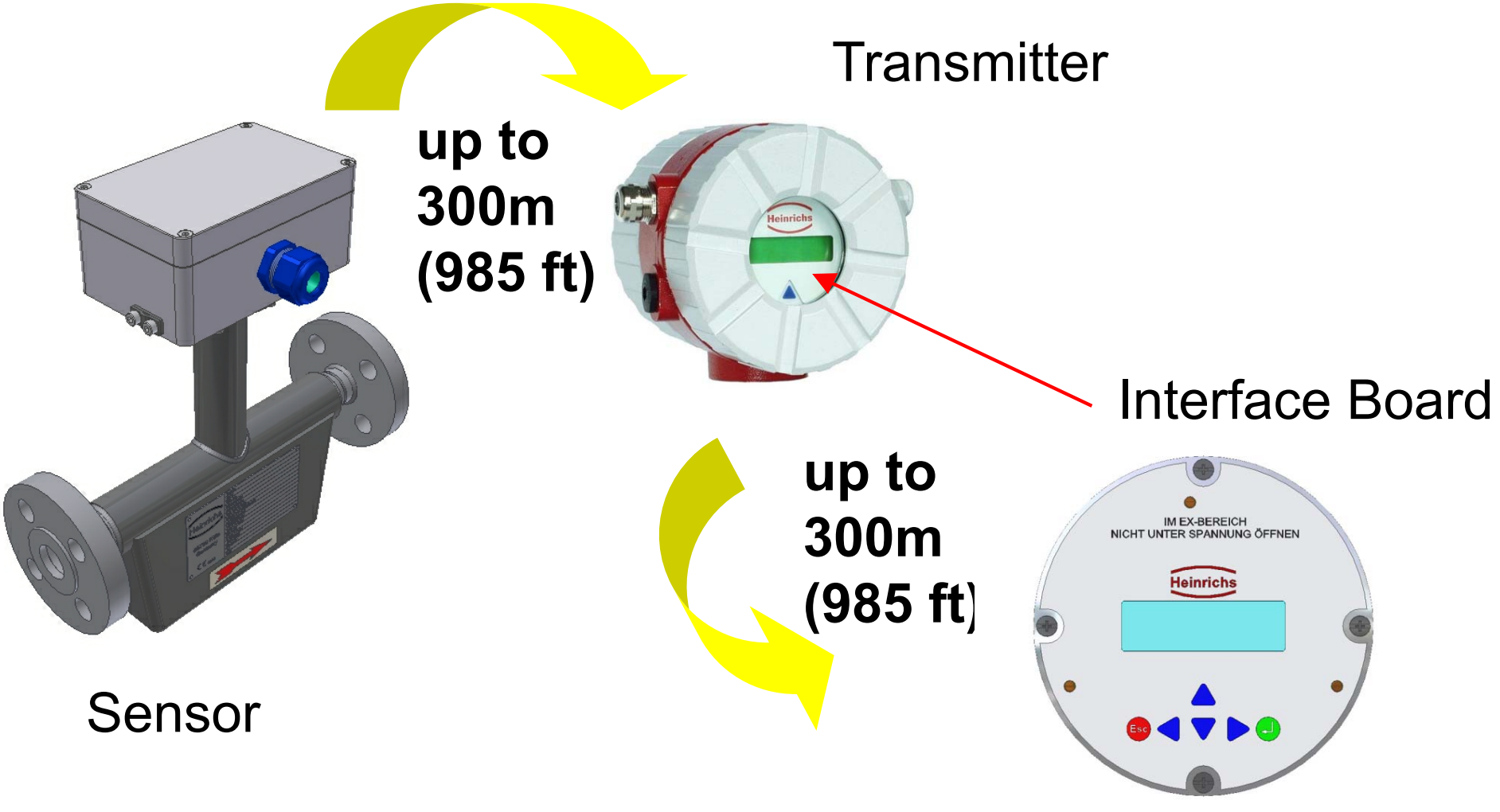


UMC4
Economic Electronic

Transmitter UMC3



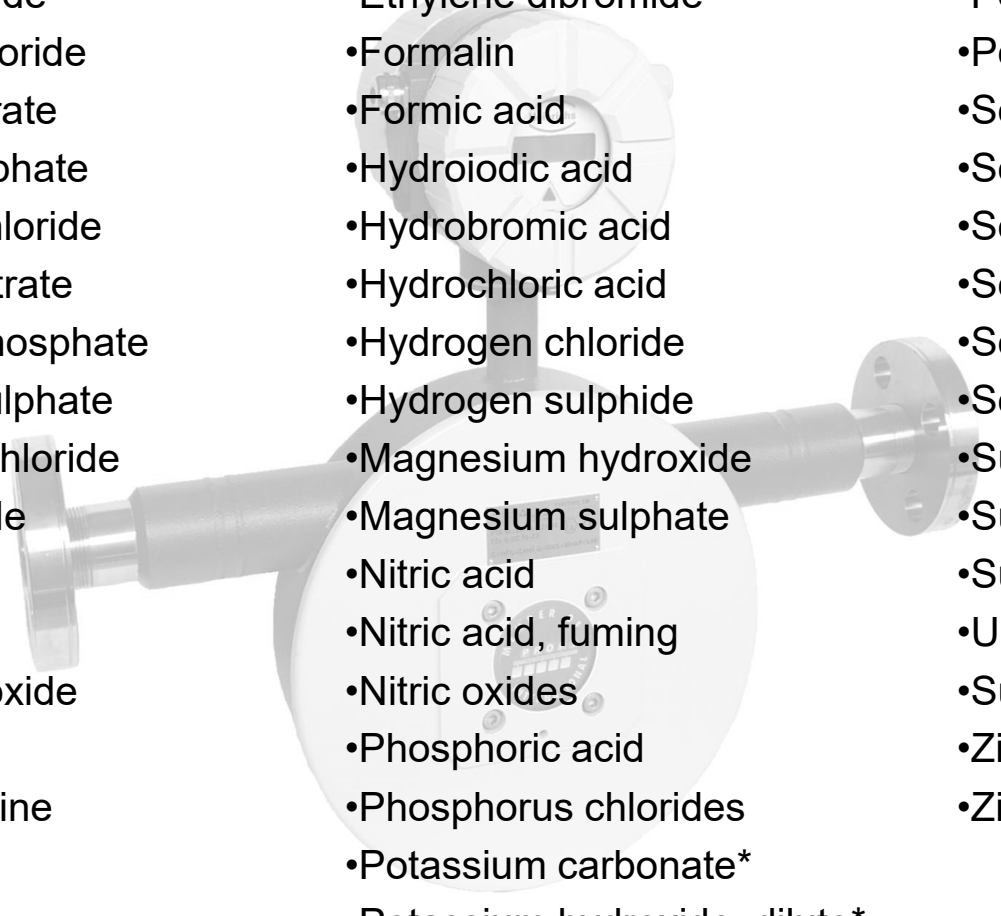
Transmitter UMC3



Application target (highly aggressive/corrosive media)

Tantalum:

- Acetic Acid
- Acetic Anhydride
- Aluminium chloride
- Aluminium nitrate
- Aluminum sulphate
- Ammonium chloride
- Ammonium nitrate
- Ammonium phosphate
- Ammonium sulphate
- Aniline hydrochloride
- Barium chloride
- Benzoic acid
- Bromine
- Calcium hydroxide
- Chloric acid
- Chlorinated brine
- Chlorine
- Citric acid
- Dichloroecetic
- Ethylene dibromide
- Formalin
- Formic acid
- Hydroiodic acid
- Hydrobromic acid
- Hydrochloric acid
- Hydrogen chloride
- Hydrogen sulphide
- Magnesium hydroxide
- Magnesium sulphate
- Nitric acid
- Nitric acid, fuming
- Nitric oxides
- Phosphoric acid
- Phosphorus chlorides
- Potassium carbonate*
- Potassium hydroxide, dilute*
- Potassium nitrate
- Potassium sulphate
- Potassium thiosulphate
- Sodium bisulphate, solution
- Sodium carbonate*
- Sodium chlorate
- Sodium hydroxide, dilute*
- Sodium nitrate
- Sodium phosphate
- Sulphur chlorides
- Sulphur dioxide
- Sulphuric acid
- UFC-85
- Sulphurous acid
- Zinc chloride
- Zinc sulphate



* depending of concentration and temperature

Application target (Chemical Industry)

Hastelloy:
- Sulfuric Acid
- Acetic Acid
- Nitric Acid
- Ferric Chloride

Nickel:
- Hydrofluoric Acid
- Organic Acid
- Alkaline and saline solution
- Sea water

Monel:
- Sulfuric Acid
- Hydrofluoric Acid
- Phosphoric Acid
- Organic Acid
- Alkaline and saline solution
- Sea water

Application target (Loading, Custody Transfer)

Loading:

- Truck
- Rail-car
- Ship
- Storage tanks

Custody Transfer:

- Pipelines
- Metering Skids

Key customer

Heinrichs
KOBOLD Group

Thanks for your attention