

# FH8400

OIML R117-1 / MID  
Class 0.3

## The Ultrasonic Custody Transfer Flowmeter for Light & Medium Viscosity Products

*The Solution to Protect your Revenues*



### Main Applications

- Refined Products Transfer
- Pipeline Measurement
- Tank Farm Management
- Tanker Loading / Unloading



**FAURE HERMAN**  
*Mastering the Flow*

**IDEX**  
LIQUID CONTROLS GROUP



# FH8400

The FAURE HERMAN FH8400 Ultrasonic Flowmeter is dedicated to the custody transfer measurement of low and medium viscosity products.

## FH8000 Product Line



**FH8500**

- Custody transfer applications
  - 18 beams
  - Multi products
  - Low to high viscosities
  - Severe flow conditions : vortices, asymmetric profiles



**FH8400**

- Custody transfer applications
  - 3 beams
  - Multi products
- Low and medium viscosities



**FH8300**

- Process applications
  - 1 or 2 or 3 beams
  - Single product
- Low and medium viscosities



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## High Performances for Custody Transfer Applications

### Key Technological Features

- High accuracy
- High measurement reproducibility
- Curve linearization
- Multi viscosities measurement
- Bi-directional measurement
- No pressure drop
- Removable transducers under pressure and flowing conditions
- Fully integrated electronics
- Infrared remote control
- Predictive maintenance software
- Modbus & Hart communication

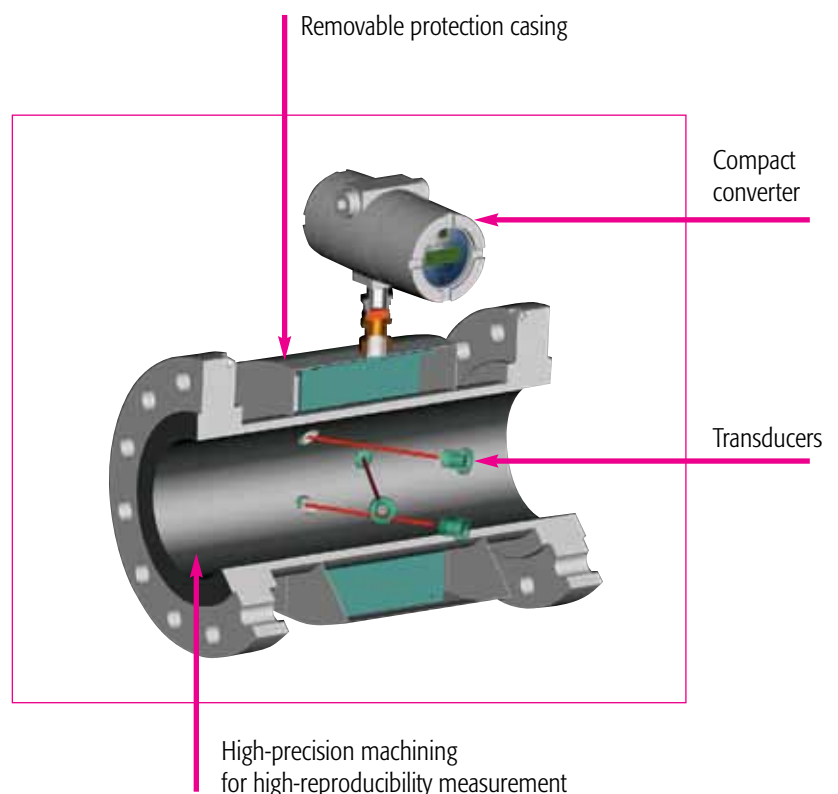


### Key Customer Advantages

- Suitable for custody transfer applications in compliance with API and OIML recommendations
- Multi products measurement
- Bi directional flow measurement
- Interface detection
- Long term stability
- Fully integrated metering solution
- Energy savings
- Low and easy maintenance
- Low cost of ownership
- Easily integrated
- Process integrity
- Easily flushed

## FH8400 Design

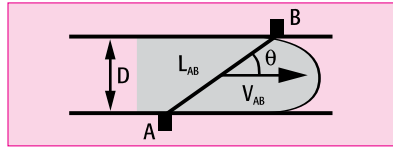
- 3 beams
- +/- 0.15% accuracy
- flow profile compensation for multi products measurement



# Measurement Principle and Operating Range



$$V_{AB} = \frac{L_{AB}}{2 \cdot \cos\theta} \times \frac{T_{BA} - T_{AB}}{T_{BA} + T_{AB}}$$



## Ultrasonic Transit Time Method

The FH8400 measurement is based on the Ultrasonic Transit Time Method.

Basically, this method measures the difference in propagation time between ultrasonic pulses transmitted along and against the flow between A and B,  $T_{AB}$  and  $T_{BA}$  respectively. The average flow velocity  $V_{AB}$  along AB is proportional to  $(T_{BA} - T_{AB})$ .

### Meter size in mm/(inch)

	80/(3)	100/(4)	150/(6)	200/(8)	250/(10)	300/(12)	350/(14)	400/(16)	450/(18)	500/(20)	600/(24)
Maximum viscosity (cSt)	Turndown ratio of 10:1*										
	8	10	15	20	25	30	35	40	45	50	60
	Turndown ratio of 5:1*										
	15	20	30	40	50	60	70	80	90	100	120
	Turndown ratio of 3:1*										
	22	30	45	60	75	90	105	120	135	150	180

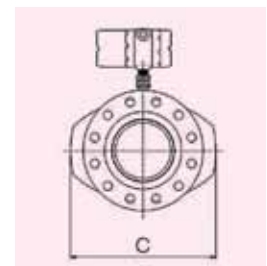
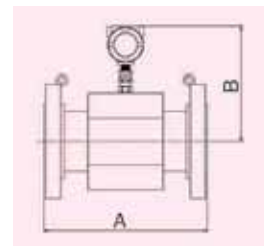
\* For any other application or other size, please call your FAURE HERMAN representative.

## Meter Selection

### Standard Dimensions : ANSI 150 to ANSI 900 RF WN flanges

Sizes		A : Lenght*				B		C		Approx. Weights (ANSI 150)		Minimum Flowrates (1 m/s)		Maximum Flowrates (10 m/s)*		Maximum Design Flowrates (13 m/s)	
		(ANSI 150/300)		(ANSI 600/900)													
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	kg	lbs	m³/h	Bbl/h	m³/h	Bbl/h	m³/h	Bbl/h
3	80	17.7	450	19.7	500	13.1	332	14.2	361	36	79	16	100	160	1010	210	1320
4	100	20.5	520	23.2	590	14.4	366	15.3	390	38	84	27	170	270	1700	350	2200
6	150	18.9	480	22.8	580	15.6	397	17.7	450	57	126	60	377	600	3770	780	4910
8	200	21.3	540	25.6	650	16.7	424	20	506	92	203	110	692	1100	6920	1430	8990
10	250	22.8	580	28.7	730	17.8	452	22.2	565	123	271	170	1069	1700	10690	2210	13900
12	300	25.6	650	31.5	800	18.8	478	24.4	620	190	419	240	1510	2400	15100	3120	19620
14	350	26.8	680	33.5	850	19.5	495	25.8	656	221	487	290	1824	2900	18240	3770	23710
16	400	28.3	720	34.6	880	20.5	521	28	711	288	635	380	2390	3800	23900	4940	31070
18	450	30.3	770	37.0	940	21.5	546	30.2	767	355	783	480	3019	4800	30190	6240	39250
20	500	31.5	800	39.6	1005	22.5	572	32.2	817	442	974	600	3774	6000	37740	7800	49060
24	600	35.4	900	45.5	1155	24.5	623	36.8	936	652	1437	850	5346	8500	53460	11050	69500

\* Extended flowrange : upon request



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## The FHview Software

*FHview is the PC software for the configuration and operation of the FAURE HERMAN FH8400 ultrasonic product line. The communication between FHview and the FH8400 is via MODBUS protocol over RS485 serial link.*



# Specifications

<b>Environment</b>	
Ambient temperature range	-40 to +60°C (-40 to +140°F)
Process temperature range	-40 to +120°C (-40 to +248°F)
Storage temperature	-40 to +60°C (-40 to +140°F)
Climatic protection	IP 66 / NEMA 4X
<b>Safety : ATEX II 2 G (compatible with installation in zone 1, division 1, groups C &amp; D)</b>	
Transducer classification	Ex d IIB T6 to T3 / LCIE 04 ATEX 6047 X
Enclosure classification	Ex d IIB T6 / LCIE 04 ATEX 6071 X
Remote control	Ex ia IIC T4 / LCIE 03 ATEX 6240 X
<b>Mechanical</b>	
Flange rating	ANSI 150 / 300 / 600 / 900
Meter body materials	Carbon steel ASTM A105 / A106 Low temperature steel ASTM A350 LF2 / A333 Gr 6 Austenitic stainless steel ASTM A182 F316 / A312 TP 316 Duplex (upon request)
<b>Performances</b>	
Accuracy	± 0.15 % (10:1) : refer to paragraph «Measurement Principle and Operating Range» page 3
Repeatability	In compliance with API recommendations
Standard fluid velocity range	1 m/s to 10 m/s (3.28 fts to 32.8 fts)
Viscosity range	Refer to paragraph «Measurement Principle and Operating Range» page 3
Density range	400 to 1,500 kg/m <sup>3</sup>
Reynolds number range	≥ 10 000
<b>Electronics</b>	
Power supply	18 to 36 Vdc 8W – 110 to 220 Vac ± 15 %
Inputs	2 off 4-20 mA (temperature, pressure) 1 off dry contact
Outputs	2 off 4-20 mA (Flowrate and/or VOS) 2 off pulses with galvanic separation 2 dry contacts (Alarms)
Communication / serial link	1 RS 485 (Modbus) (other upon request)
Software	Configuration and analysis PC software FHview
<b>Installation conditions</b>	
Standard	10D & flow conditioner upstream, 5D downstream
<b>Options</b>	
LCD Local display	4 alphanumeric lines
Data & Event logger	Flowrates, VOS, Gain, ...
Remote converter	Distance < 5m
Calibration	Multi-product
Interface detection	Through 4-20 mA and/or Modbus
<b>Approvals</b>	
Custody transfer	OIML R117-1 / MID (Class 0.3)
ATEX	94/09/EC compliant
PED	97/23/EC & ASME compliant
EMC	2004/108/EC compliant



**FAURE HERMAN**  
www.faureherman.com

**FAURE HERMAN** - Route de Bonnétale - BP 20154 - 72406 La Ferté-Bernard Cedex - France  
Tel. : + 33 (0)2 43 60 28 60 - Fax : + 33 (0)2 43 60 28 70

E-mail : fhprojects@idexcorp.com

**FAURE HERMAN METER** - 4702 North Sam Houston Parkway West - Suite 100 - Houston, TX 77086 (U.S.A)  
Phone : +1 713 623 0808 – Fax : +1 713 623 2332 – E-mail : FHH-Sales@idexcorp.com

www.liquidcontrolsgroup.com