



FLEXIM

Technical specification

FLUXUS H831



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## Transmitter

### Technical data

		FLUXUS H831 (831-AB*, 831-SB*)	FLUXUS H831 (831-ANN, 831-SNN)	FLUXUS H831**-F1N		
						
design		<b>831-AB*</b> (aluminum housing): explosion-proof field device or <b>831-SB*</b> (stainless steel housing): explosion-proof offshore device zone 1 (intrinsic safety: outputs, inputs, process interfaces)	<b>831-ANN</b> (aluminum housing): explosion-proof field device or <b>831-SNN</b> (stainless steel housing): explosion-proof offshore device zone 1	aluminum housing: explosion-proof field device FM		
<b>measurement</b>						
<ul style="list-style-type: none"> <li>• <b>HPI</b></li> </ul>						
standard volumetric flow rate	%	$\pm 1$ (crude oil, refined products, liquefied gases, heavy oils) $VCF = CTL \cdot CPL = \rho/\rho_N$ VCF - volume correction factor CTL - correction for the effect of temperature on liquid CPL - correction for the effect of pressure on liquid $\rho$ - operating density $\rho_N$ - normalized density				
operating density, normalized density	%	$\pm 1$ (with field calibration of sound speed)				
<b>flow</b>						
measurement principle		transit time difference correlation principle, automatic NoiseTrek selection for measurements with high gaseous or solid content				
flow direction		bidirectional				
flow velocity	ft/s	0.03 to 82				
repeatability		0.15 % MV $\pm 0.02$ ft/s				
fluid		all acoustically conductive liquids with < 10 % gaseous or solid content in volume (transit time difference principle)				
temperature compensation		corresponding to the recommendations in ANSI/ASME MFC-5.1-2011				
<b>measurement uncertainty (volumetric flow rate)</b>						
measurement uncertainty of the measuring system <sup>1</sup>		$\pm 0.3\% MV \pm 0.02$ ft/s includes calibration certificate traceable to NIST				
measurement uncertainty at the measuring point <sup>2</sup>		$\pm 1\% MV \pm 0.02$ ft/s (see also graphical representation)				
<b>transmitter</b>						
power supply		20 to 32 V DC, $U_m = 120$ V	<ul style="list-style-type: none"> <li>• 100 to 230 V/50 to 60 Hz or</li> <li>• 20 to 32 V DC</li> </ul>			
power consumption	W	< 4	< 8			
number of measuring channels		1, optional: 2				
damping	s	0 to 100 (adjustable)				
measuring cycle	Hz	100 to 1000 (1 channel)				
response time	s	1 (1 channel), option: 0.02				
housing material		aluminum housing: cast aluminum EN AC 44200 mod, special heavy-duty coating (C5 according to EN ISO 12944) stainless steel housing: stainless steel 316/316L		cast aluminum EN AC 44200 mod, special heavy-duty coating (C5 according to EN ISO 12944)		
degree of protection		IP66				
dimensions	inch	see dimensional drawing				
mounting position		<b>831-A*F</b> (Profibus PA, FF H1), <b>831-S**:</b> nameplate faces upwards				
weight	lb	aluminum housing: 14.3, stainless steel housing: 34.4				
fixation		wall mounting, 2" pipe mounting				
ambient temperature	°F	aluminum housing: <ul style="list-style-type: none"> <li>• -40 to +140</li> <li>• <b>831-A*F</b> (Profibus PA, FF H1): -40 to +122 (&lt; -4 without operation of the display)</li> </ul> stainless steel housing: <ul style="list-style-type: none"> <li>• -4 to +140</li> <li>• <b>831-S**F</b> (Profibus PA, FF H1): -4 to +122</li> </ul>	aluminum housing: <ul style="list-style-type: none"> <li>-40 to +140 (&lt; -4 without operation of the display)</li> </ul> stainless steel housing: <ul style="list-style-type: none"> <li>-4 to +140</li> </ul>	-40 to +140 (< -4 without operation of the display)		
display		128 x 64 pixels, backlight				
menu language		English, German, French, Spanish, Dutch, Russian, Polish, Turkish, Italian, Chinese				

<sup>1</sup> with aperture calibration of the transducers

<sup>2</sup> for transit time difference principle and reference conditions

<sup>3</sup> outside the explosive atmosphere (housing cover open)

	FLUXUS H831 (831-AB*, 831-SB*)	FLUXUS H831 (831-ANN, 831-SNN)	FLUXUS H831**-F1N
<b>explosion protection</b>			
• ATEX/IECEx			
marking	<b>CE</b> 0637  II(1)2G II(1)2D Ex db eb ia [ia Ga] IIC T6 Gb Ex tb ia [ia Da] IIIC T100 °C Db <b>831-ABN:</b> T <sub>a</sub> -40...+60 °C <b>831-SBN:</b> T <sub>a</sub> -20...+60 °C <b>831-ABF:</b> T <sub>a</sub> -40...+50 °C <b>831-SBF:</b> T <sub>a</sub> -20...+50 °C	<b>CE</b> 0637  II2G II2D Ex db eb IIC T6 Gb Ex tb IIIC T100 °C Db <b>831-ANN:</b> T <sub>a</sub> -40...+60 °C <b>831-SNN:</b> T <sub>a</sub> -20...+60 °C	-
certification	IBExU20ATEX1103 X, IECEx IBE 20.0015X	IBExU20ATEX1103 X, IECEx IBE 20.0015X	-
• FM			
			 Cl. I, II, III, Div. 2, GP A, B, C, D, F, G / T4A Cl. I Div. 1, GP. A, B, C, D / T6 For Group A, conduit seal of connection compartment is required within 18 inches. Cl. II, Div. 1, GP. E, F, G / T6 Cl. III, Div. 1 / T6 T <sub>a</sub> = -40°C to +60°C   Cl. I, II, III, Div. 2, GP A, B, C, D, F, G / T4A Cl. I Div. 1, GP. B, C, D / T6 Cl. II, Div. 1, GP. E, F, G / T6 Cl. III, Div. 1 / T6 T <sub>a</sub> = -40°C to +60°C
<b>measuring functions</b>			
physical quantities	<ul style="list-style-type: none"> <li>operating volumetric flow rate, standard volumetric flow rate according to ASTM 1250/TP25/4311, flow velocity, mass flow rate</li> <li><b>additional output quantities</b> <ul style="list-style-type: none"> <li>HPI: API gravity, density, normalized density</li> <li>interface detection: slope of the HPI physical quantities</li> <li>fluid detection: according to fluid table</li> </ul> </li> </ul>		
totalizer	volume, mass		
calculation functions	average, difference, sum (2 measuring channels necessary)		
diagnostic functions	sound speed, signal amplitude, SNR, SCNR, standard deviation of amplitudes and transit times		
<b>communication interfaces</b>			
service interfaces	measured value transmission, parametrization of the transmitter: USB <sup>3</sup>		
process interfaces	intrinsic safety, max. 1 option: <ul style="list-style-type: none"> <li>HART</li> <li>Profibus PA</li> <li>FF H1</li> </ul>		
	max. 1 option: <ul style="list-style-type: none"> <li>Modbus RTU/RS485</li> <li>HART</li> <li>Profibus PA</li> <li>FF H1</li> <li>BACnet MS/TP</li> </ul>		
intrinsic safety parameters	Profibus PA, FF H1: U <sub>i</sub> = 24 V I <sub>i</sub> = 174 mA P <sub>i</sub> = 1044 mW L <sub>i</sub> = 10 µH C <sub>i</sub> negligible		
<b>accessories</b>			
data transmission kit	USB cable		
software	<ul style="list-style-type: none"> <li>FluxDiagReader: reading of measured values and parameters, graphical representation</li> <li>FluxDiag (optional): reading of measurement data, graphical representation, report generation, parametrization of the transmitter</li> </ul>		
<b>data logger</b>			
loggable values	all physical quantities, totalized physical quantities and diagnostic values		
capacity	max. 800 000 measured values		

1 with aperture calibration of the transducers

2 for transit time difference principle and reference conditions

3 outside the explosive atmosphere (housing cover open)

		FLUXUS H831 (831-AB*, 831-SB*)	FLUXUS H831 (831-ANN, 831-SNN)	FLUXUS H831**-F1N
<b>outputs</b>				
The outputs are galvanically isolated from the transmitter.				
<b>• switchable current output</b>				
number			configurable according to NAMUR NE43	
range	mA	-	All switchable current outputs are jointly switched to active or passive. max. 3	
Unsicherheit		-	4 to 20 (alarm current: 3.2 to 3.99, 20.01 to 24, hardware fault current: 3.2)	
active output		-	0.04 % v. AW ±3 µA	
passive output		-	$R_{ext} = 250$ to 530 Ω, $U_{opencircuit} = 28$ V DC	
current output in HART mode		-	$U_{ext} = 9$ to 30 V DC, depending on $R_{ext}$ ( $R_{ext} < 458$ Ω at 20 V) option	
• range	mA	-	4 to 20 (alarm current: 3.5 to 3.99, 20.01 to 22, hardware fault current: 3.2)	
• active output		-	$R_{ext} = 250$ to 530 Ω, $U_{opencircuit} = 28$ V DC	
• passive output		-	$U_{ext} = 9$ to 30 V DC, depending on $R_{ext}$ ( $R_{ext} = 250$ to 458 Ω at 20 V)	
<b>• current output</b>				
range	mA	configurable according to NAMUR NE43		
		4 to 20 (alarm current: 3.2 to 3.99, 20.01 to 24, hardware fault current: 3.2)	-	
Unsicherheit		0.04 % v. AW ±3 µA	-	
passive output		$U_{ext} \leq 29$ V DC, depending on $R_{ext}$ ( $R_{ext} < 458$ Ω at 20 V)	-	
current output in HART mode		option		
• range	mA	4 to 20 (alarm current: 3.5 to 3.99, 20.01 to 22, hardware fault current: 3.2)	-	
• passive output		$U_{ext} = 9$ to 29 V DC, depending on $R_{ext}$ ( $R_{ext} = 250$ to 458 Ω at 20 V)	-	
intrinsic safety parameters		$U_i = 29$ V $I_i = 100$ mA $P_i = 0.725$ W $C_i = 1$ nF $L_i = 50$ nH	-	
<b>• digital output</b>				
functions		• frequency output • binary output • pulse output	• frequency output • binary output • pulse output	
type		open collector (passive)	open collector (passive)	
operating parameters		8.2 V/30 mA (NAMUR)	8.2 V/30 mA (NAMUR)	
max. values		8 mA at 29 V DC	8 mA at 29 V DC	
<b>frequency output</b>				
• range	kHz	2 to 10	2 to 10	
• damping	s	0 to 999.9	0 to 999.9	
• pulse-to-pause ratio		1:1	1:1	
<b>binary output</b>				
• binary output as alarm output		limit, change of flow direction or error	limit, change of flow direction or error	
<b>pulse output</b>				
• pulse value	units	0.01 to 1000	0.01 to 1000	
• pulse width	ms	0.05 to 1000	0.05 to 1000	
• pulse rate		max. 10 000 pulses	max. 10 000 pulses	
intrinsic safety parameters		$U_i = 29$ V $I_i = 100$ mA $P_i = 0.725$ W $C_i = 1$ nF $L_i = 50$ nH	-	

<sup>1</sup> with aperture calibration of the transducers<sup>2</sup> for transit time difference principle and reference conditions<sup>3</sup> outside the explosive atmosphere (housing cover open)

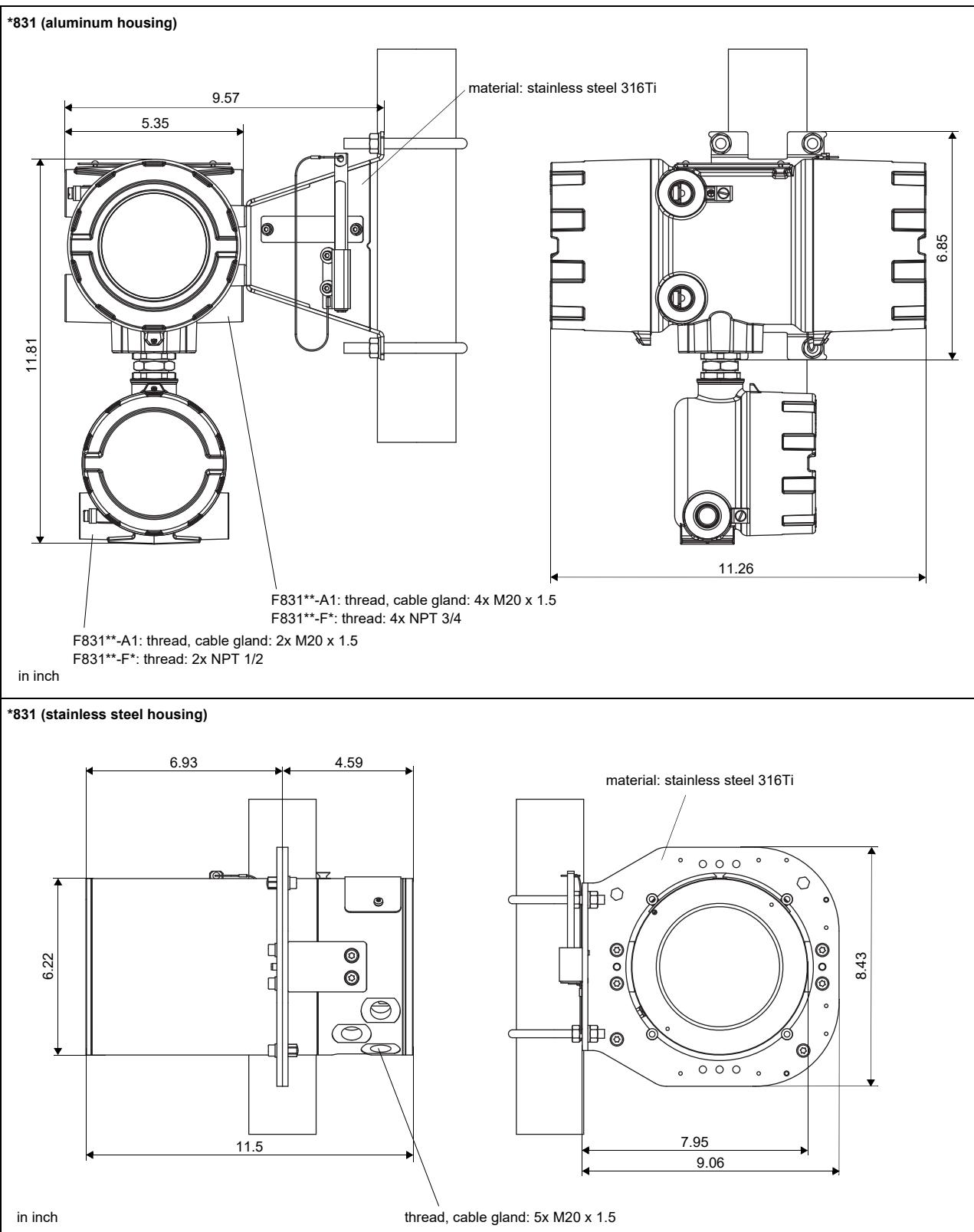
	<b>FLUXUS H831 (831-AB*, 831-SB*)</b>	<b>FLUXUS H831 (831-ANN, 831-SNN)</b>	<b>FLUXUS H831**-F1N</b>
<b>inputs</b>			
	not short-circuit proof The inputs are not galvanically isolated from the transmitter.	The inputs are galvanically isolated from the transmitter.	
<b>• temperature input</b>			
number	max. 1	max. 1	
type	Pt100/Pt1000	Pt100/Pt1000	
connection	4-wire	4-wire	
range	°F -238 to +1040	-238 to +1040	
resolution	K 0.01	0.01	
accuracy	±0.01 % MV ±0.03 K at 64 to 82 °F ±0.01 % MV ±0.03 K ±0.0005 %/K at <64 °F/>82 °F	±0.01 % MV ±0.03 K at 64 to 82 °F ±0.01 % MV ±0.03 K ±0.0005 %/K at <64 °F/>82 °F	
Kabelwiderstand	Ω max. 1000	max. 1000	
intrinsic safety parameters		U <sub>o</sub> = 9.2 V I <sub>o</sub> = 25 mA P <sub>o</sub> = 0.057 W C <sub>o</sub> = 4283 nF L <sub>o</sub> = 57 mH	-
<b>• switchable current input</b>			
	All switchable current inputs are jointly switched to active or passive.		
number	-	max. 2	
accuracy	-	±0.1 % MV ±0.01 mA at 64 to 82 °F ±0.1 % MV ±0.01 mA ±0.005 %/K at <64 °F/>82 °F	
resolution	μA 0.1	0.1	
active input	-	R <sub>int</sub> = 75 Ω, I <sub>max</sub> ≤ 30 mA U <sub>opencircuit</sub> = 28 V (Leerlauf) U <sub>min</sub> = 21.4 V at 20 mA 0 to 20	
• range	mA -		
passive input	-	U <sub>ext</sub> = 24 V, R <sub>int</sub> = 35 Ω, I <sub>max</sub> ≤ 24 mA	
• range	mA -	0 to 20	
<b>• current input</b>			
number	max. 1	-	
accuracy	±0.1 % MV ±0.01 mA at 64 to 82 °F ±0.1 % MV ±0.01 mA ±0.005 %/K at <64 °F/>82 °F	-	
resolution	μA 0.1	-	
active input	-	R <sub>int</sub> < 20 V, R <sub>int</sub> ≤ 385 Ω, I <sub>max</sub> ≤ 40 mA U <sub>min</sub> = 19.6 V - R <sub>int</sub> · I 0 to 20	
• range	mA -	-	
intrinsic safety parameters		U <sub>o</sub> = 29.2 V I <sub>o</sub> = 88 mA P <sub>o</sub> = 0.64 W C <sub>o</sub> = 73 nF L <sub>o</sub> = 4.1 mH	-

<sup>1</sup> with aperture calibration of the transducers

<sup>2</sup> for transit time difference principle and reference conditions

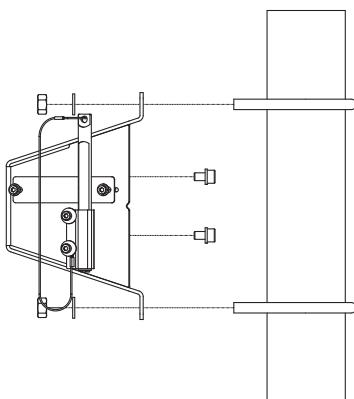
<sup>3</sup> outside the explosive atmosphere (housing cover open)

## Dimensions

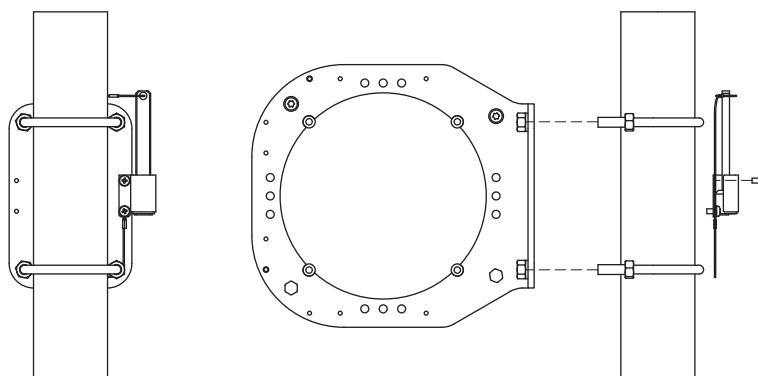


## Wall and 2" pipe mounting kit

\*831 (aluminum housing)



\*831 (stainless steel housing)



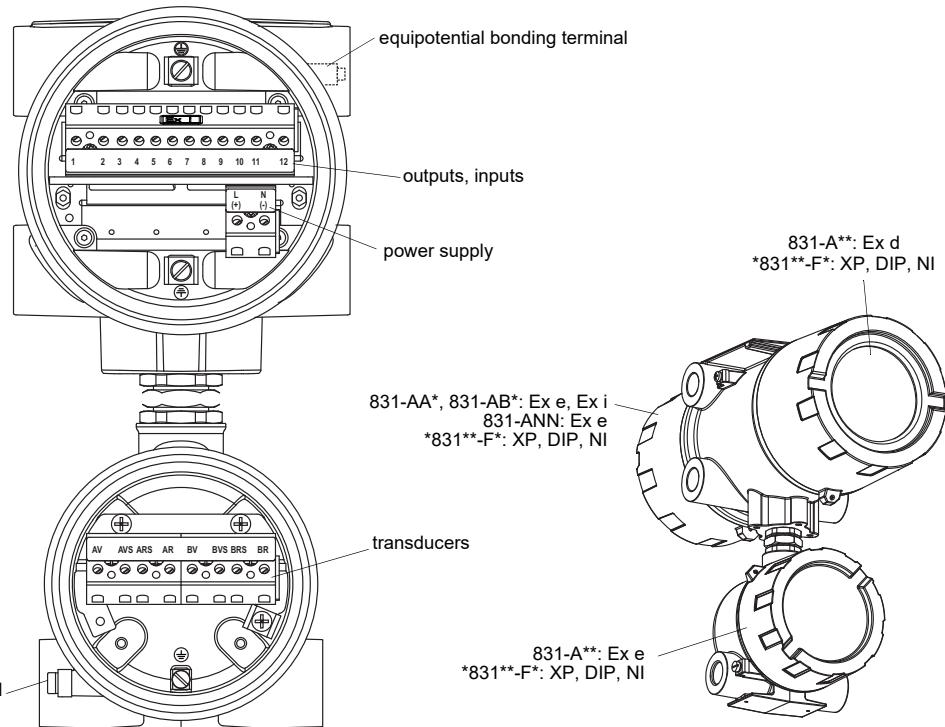
### Storage

- do not store outdoors
- store within the original package
- store in a dry and dust-free place
- protect against sunlight
- keep all openings closed
- storing temperature:
  - aluminum housing: -40...+140 °F
  - stainless steel housing: -4...+140 °F

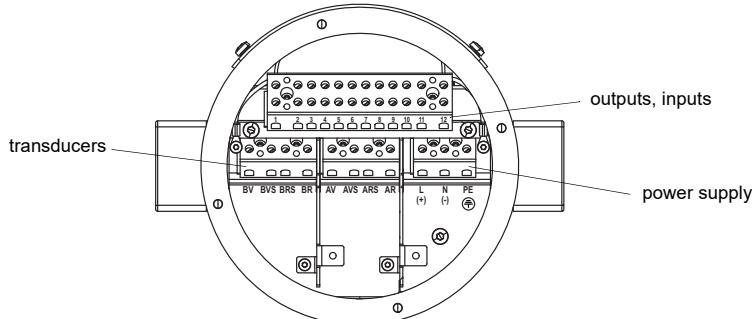
## Terminal assignment

### \*831 (aluminum housing)

upper housing,  
back view  
831-AA\*: Ex e, Ex i  
831-ANN: Ex e  
\*831\*\*-F\*: XP, DIP, NI



### \*831 (stainless steel housing)



### power supply<sup>1</sup>

AC		DC	
terminal	connection	terminal	connection
L	outer conductor	(+)	+
N	neutral conductor	(-)	-
	protective conductor		protective conductor

<sup>1</sup> cable (by customer): e.g., flexible wires, with insulated wire ferrules, wire cross-section: AWG14 to 24

### transducers, extension cable

measuring channel A		measuring channel B		transducer
terminal	connection	terminal	connection	
AV	signal	BV	signal	
AVS	internal shield	BVS	internal shield	
ARS	internal shield	BRS	internal shield	
AR	signal	BR	signal	
cable gland	external shield	cable gland	external shield	

<b>outputs, inputs<sup>1, 2</sup></b>		
<b>terminal</b>	<b>connection</b>	
depending on configuration	current output, digital output, current input	
3, 4, 5, 6	temperature input	
11+, 12-	passive current output/HART	
11-, 12+	active current output/HART	
11, 12	Modbus RTU, FF H1, Profibus PA, BACnet MS/TP	
<b>temperature probe</b>		
<b>terminal</b>	<b>direct connection</b>	<b>connection with extension cable</b>
3	red	red
4	white	black
5	red	green
6	white	white
USB	type C Hi-Speed USB 2.0 Device	service (FluxDiag/FluxDiagReader)

<sup>1</sup> cable (by customer): e.g., flexible wires, with insulated wire ferrules, wire cross-section: AWG14 to 24

<sup>2</sup> The number, type and terminal assignment are customized.

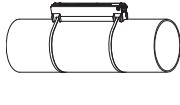
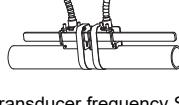
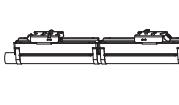
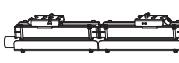
## Transducers

### Overview

#### Shear wave transducers

	technical type					
	G	K	M	P	Q	S
zone 1 normal temperature range	CDG1N81 CLG1N81	CDK1N81 CLK1N81	CDM2N81 CLM2N81	CDP2N81 CLP2N81	CDQ2N81 CLQ2N81	
zone 1 IP68	CDG1LI1	CDK1LI1	CDM2LI1	CDP2LI1		
zone 1 extended temperature range	CDG1E83 CLG1E83	CDK1E83 CLK1E83	CDM2E85 CLM2E85	CDP2E85 CLP2E85	CDQ2E85 CLQ2E85	
FM Class I Div. 1 normal temperature range	CDG1N62 CLG1N62	CDK1N62 CLK1N62	CDM1N62 CLM1N62	CDP1N62 CLP1N62	CDQ1N62 CLQ1N62	
FM Class I Div. 2 normal temperature range	CDG1N52 CLG1N52	CDK1N52 CLK1N52	CDM2N52 CLM2N52	CDP2N52 CLP2N52	CDQ2N52 CLQ2N52	CDS2N52
FM Class I Div. 2 extended temperature range			CDM2E52 CLM2E52	CDP2E52 CLP2E52	CDQ2E52 CLQ2E52	
<b>inner pipe diameter d</b>						
min. extended	inch	15.7	3.9	2	0.98	0.39
min. recommended	inch	19.7	7.9	3.9	2	0.98
max. recommended	inch	157.5	78.7	39.4	15.7	5.9
max. extended	inch	255.9	94.5	47.2	18.9	9.4
<b>pipe wall thickness</b>						
min.	inch	0.43	0.2	0.1	0.05	0.02
for further data see Technical specification TS_F8xx-transducersVx-xXX_Lus						

### Transducer mounting fixture

PermaRail	PermaFix	transducer box WI for WavelInjector with chains
		
transducer frequency S		
PermaFix with bolt mounting plates	transducer box WI for WavelInjector with threaded rods	outer pipe diameter: 1.4 to 15 inch
		

for further data see Technical specification TS\_F8xx-transducersVx-xXX\_Lus

### Coupling materials for transducers

	normal temperature range	extended temperature range	WavelInjector	
< 212 °F	< 338 °F	< 302 °F	< 392 °F	392 to 464 °F
< 24 h	coupling compound type N or coupling pad type VT	coupling compound type E or coupling pad type VT	coupling compound type E or H or coupling pad type VT	coupling pad type TF
long time measurement	coupling pad type VT	coupling pad type VT	coupling pad type VT	coupling pad type A and coupling pad type VT

for further data see Technical specification TS\_F8xx-transducersVx-xXX\_Lus

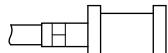
## Connection systems

connection system T1		
connection with extension cable	direct connection	transducers technical type
<p>JB01</p>	<p>transmitter</p>	*****8*
<p>JB01</p>	<p>transmitter</p>	*****L1*
<p>terminal board for junction box (junction box by customer)</p>	<p>transmitter</p>	*****62
connection system TS		
connection with extension cable	direct connection	transducers technical type
<p>JB04</p>	<p>transmitter</p>	*****52

for further data see Technical specification TS\_F8xx-transducersVx-xXX\_Lus

## Temperature probes

PT12N (item number: 770415-6)	PT12N (item number: 770415-7)
<ul style="list-style-type: none"><li>• Pt100</li><li>• clamp-on</li><li>• -49 to +446 °F</li><li>• ATEX zone 0/1 (intrinsic safety)</li><li>• for 831-*B*</li></ul>	<ul style="list-style-type: none"><li>• Pt100</li><li>• clamp-on</li><li>• -49 to +482 °F</li><li>• ATEX zone 1</li><li>• for 831-*NN</li></ul>



see Technical specification TS\_PTVx-xXX