

Insertion Flow Meter Series 454FTB-WGF

The Kurz WGF single-point insertion flow meter for **wet gas environments** includes the qualities and features found in all Kurz constant temperature thermal flow meters that make them outperform all other currently available thermal mass flow meters, including:

- The first thermal mass flow meter offering accurate and reliable wet gas flow measurements (patent pending)
- The highest repeatability, accuracy, and reliability available
- The fastest response to temperature and velocity changes in the industry
- Constant temperature thermal technology
- Interchangeable sensor and electronics (single circuit board) — no matched sets
- Built-in dry gas flow calculation on all flow units for saturated processes
- Continuous self-monitoring electronics that verify the integrity of sensor wiring and measurements
- Sensor does not overheat at zero flow using a unique constant temperature control method and power limiting design
- Zero velocity as a valid data point
- Insensitive to left or right horizontal installations
- Completely field configurable using the flow meter user interface or via a computer connection
- User-programmable correction factors to compensate for velocity profiles
- Velocity-temperature mapping for wide ranging velocity and temperature
- Sensor Blockage Correction Factor (SBCF)
- Patented digital sensor control circuit (US 7,418,878)

Kurz Instruments is dedicated to manufacturing and marketing the best thermal mass flow meters available and to support our customers in their efforts to improve their businesses.

Applications

- Biogas
- Wastewater facilities
- Landfill sites
- Fogging in stacks
- Fan inlets
- EPA greenhouse gas emissions



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SPECIFICATIONS

- **Velocity range**
0 to 4,000 SFPM (18.6 NMPS) (Air)
0 to 2,000 SFPM (9.3 NMPS) (Biogas)
- **Velocity accuracy**
Dry \pm (1% of reading +20 SPFM)
Wet \pm (5% of reading +20 SPFM)
@ 0.008% LWMF*
- **0.25% reading repeatability**
- **Velocity time constant**
1.5 second for velocity changes at 4,000 SFPM (constant temp)
- **Process temperature time constant**
10 seconds for temp changes at 1,000 SFPM (constant velocity)
- **Velocity-dependent correction factors for flow rate**
- **Electronics operating temperature**
(integral display)
-13°F to 149°F (-25°C to 65°C)
(remote display)
-40°F to 149°F (-40°C to 65°C)

PROCESS CONDITIONS

- **Process pressure rating**
Up to 150 PSIG (10 BARg)
- **Process temperature rating**
-40°F to 248°F (-40°C to 120°C)

APPROVALS

- **EPA mandatory GHG certification**
CFR 98.34(c)(1)
- **Alarm output conformity**
NAMUR NE43
- **European Union CE compliance**
EMC, LVD, PED, WEEE, and ROHS
- **CSA, ATEX & IECEx approvals pending for Nonincendive, Flameproof, and Explosion-proof**
EN IEC 60079-0, EN IEC 60079-1
EN IEC 60079-15, EN IEC 61241-1,
Class 1, Div 1 and 2
(Select models are CSA pre-approved)

TRANSMITTER FEATURES

- **Aluminum (Type 4, IP66) dual chamber polyester powder-coated enclosure**
- **Two optically-isolated loop powered 4-20mA outputs**
12-bit resolution and accuracy
Maximum loop resistance is 300Ω at 18 VDC, 550Ω at 24 VDC, 1400Ω at 36 VDC
- **One 4-20mA non-isolated analog input** (optional)
- **Input power**
AC (85-265V 47/63 Hz, 24 watts max) or DC (24V \pm 10%)
- **Integral or remote user interface**
- **Easy-to-use interface**
Backlit display / keypad
2-lines of 16-characters each
- **User-configurable flow display (scrolling or static)**
- **User-configurable English or metric units for mass flow rate, mass velocity, and process temperature**
°C, °F, KGH, KGM, NCMH, NLPMM, NMPS, PPH, PPM, SCFH, SCFM, SCMh, SFPM, SLPM, SMPS
- **Flow valve PID controller and configurable control application**
Permits controlling set point velocity or flow rate through available control valve, damper, or 4-20mA interface (optional)
- **Built-in zero-mid-span drift check**
- **Built-in flow totalizers and elapsed time**
- **User-configurable digital filtering from 0 to 600 seconds**
- **Configuration/data access**
USB or RS-485 Modbus
- **Meter memory**
200 recent events, top 20 min/max, and 56 hours (10 second samples of trends)
- **3-year warranty**

SUPPORT & ELEMENT COMPONENTS

- **Sensor material**
C-276 alloy all-welded sensor construction (standard)
- **Sensor support**
316L stainless steel (standard)
C-276 alloy (optional)
- **Sensor support diameter**
3/4" and 1" (19 mm and 25mm)
- **Sensor support length**
6" to 60" (152 mm to 1524 mm)
- **3-year warranty**

OPTIONS

- **Adjustable display/keypad orientation**
- **HART communication**
Process control industry standard allows remote configuration, diagnostic monitoring, and online testing with handheld configurators
- **Two optically isolated solid-state relays / alarms**
Configurable as alarm outputs, pulsed totalizer output, or air purge cleaning
- **Two digital inputs dedicated to purge and zero-mid-span drift check**
- **Pulsed output as a remote flow totalizer**
- **Hardware accessories**
Available hardware includes flanges, ball valves, restraints, retractors, cable glands, conduit seals, cable, compression fittings, packing glands, and branch fittings



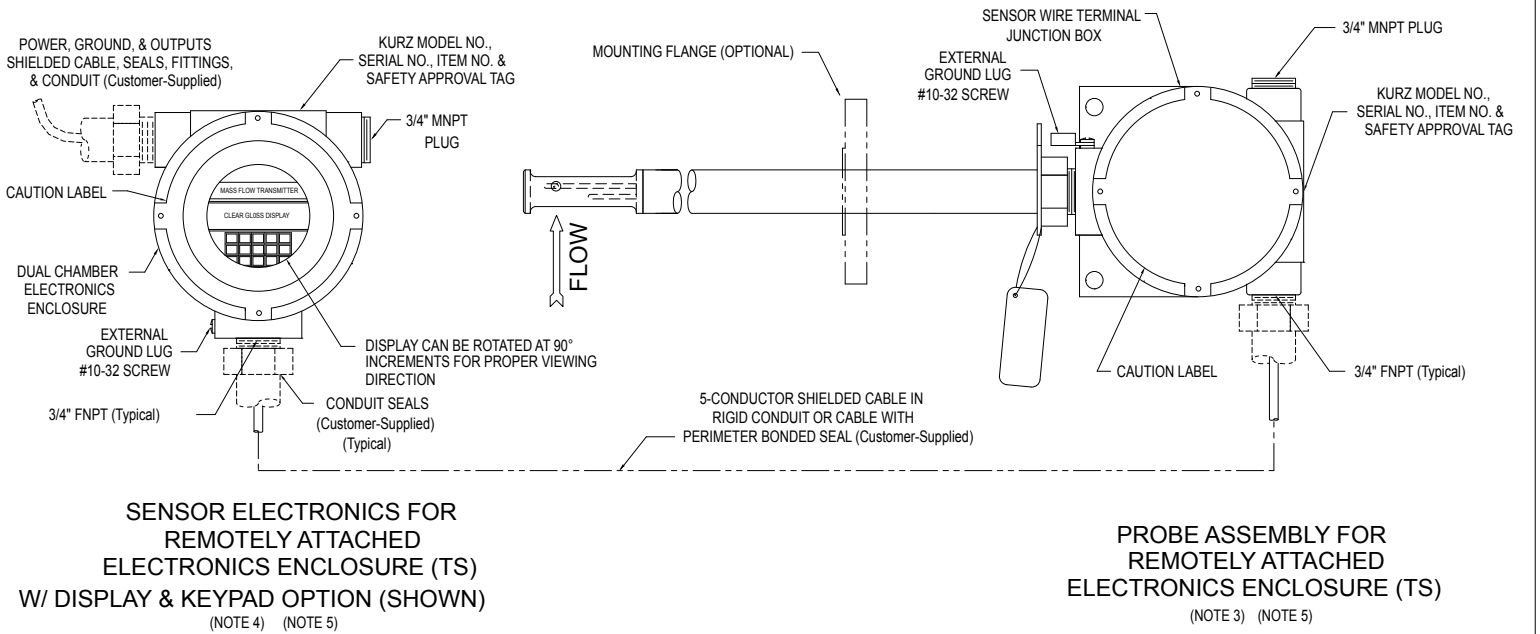
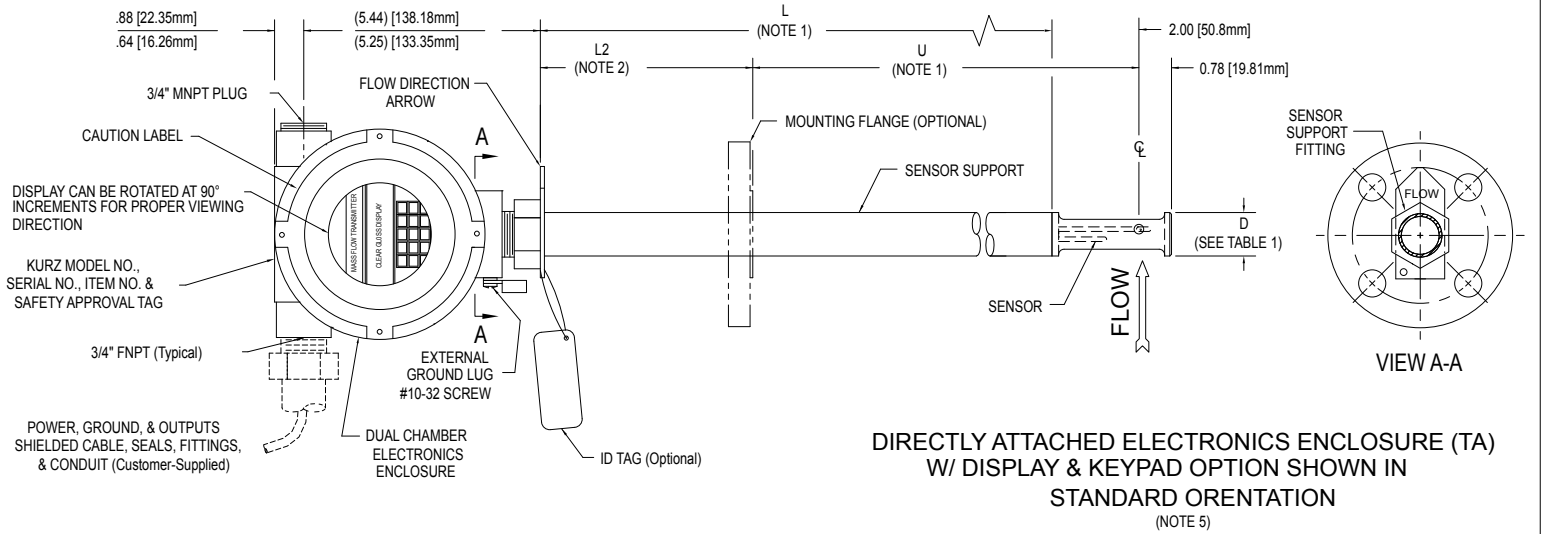
* LIQUID WATER MASS FRACTION: $LWMF = W_w / (W_w + W_g)$,

WHERE W_w IS THE MASS OF LIQUID WATER AND W_g IS THE MASS OF GAS VAPOR.

WET GAS FLOW INCLUDES THE MASS OF WATER VAPOR. DRY GAS FLOW REMOVES THE WATER VAPOR.

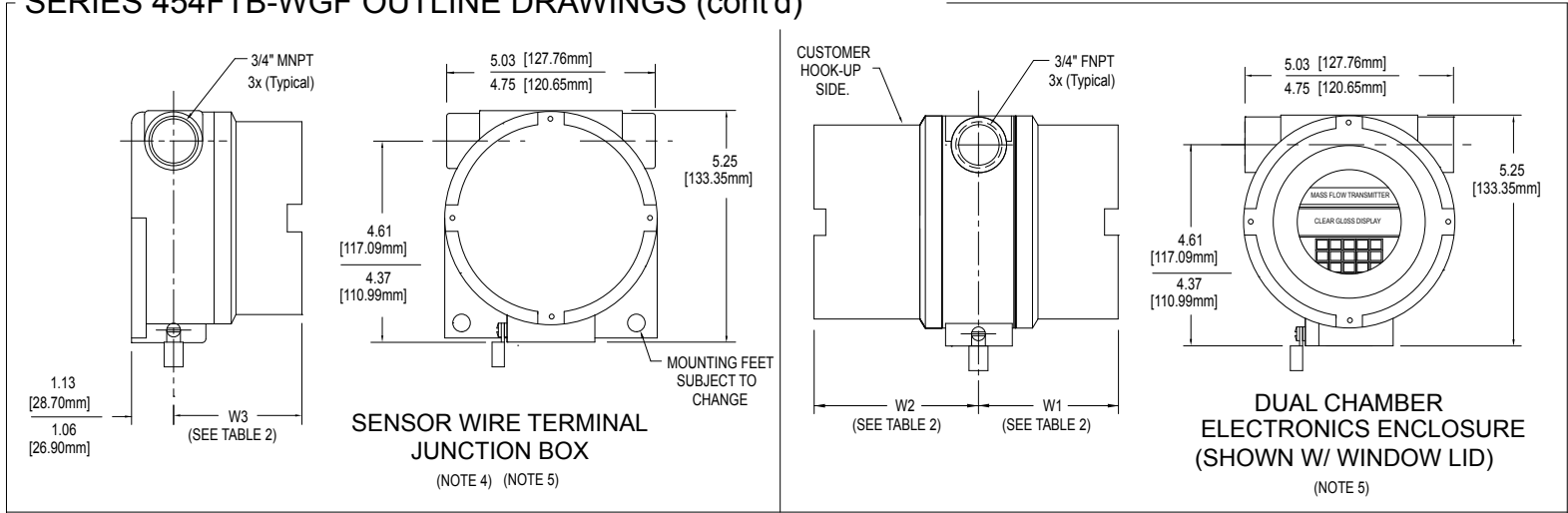


SERIES 454FTB-WGF OUTLINE DRAWINGS





SERIES 454FTB-WGF OUTLINE DRAWINGS (cont'd)



NOTES:

- 1) FOR FLANGED OPTION: $L = (U + L2 - 2.00 [50.8mm])$, $U (MIN.) = 4.00 [101.6mm]$.
- 2) $L2 (MIN.)$ TO BE 5.00 [127mm].
- 3) THIS PROBE CONFIGURATION ALSO USED FOR DIRECTLY ATTACHED, DC POWERED, WITH NO DISPLAY.
- 4) SENSOR WIRE TERMINAL JUNCTION BOX USED FOR SENSOR ELECTRONICS FOR DC POWERED, WITH NO DISPLAY. ENCLOSURE ALSO USED FOR REMOTE TERMINAL OPTION.
- 5) ENCLOSURE STYLES AND DIMENSIONS ARE SUBJECT TO CHANGE.
- 6) THIS CONFIGURATIONS ALLOWS FOR PROBE ASSY TO BE MOUNTED IN ZONE 1 AREA AND FOR REMOTE ELECTRONICS TO BE MOUNTED IN ZONE 2 AREA.

FEATURE 1	PROBE DIAMETER (D)
B	0.75 [19.5mm]
C	1.00 [25.4mm]

INPUT POWER	DISPLAY / KEYPAD	W1 (MAX.) (MIN.)	W2 (MAX.) (MIN.)	W3 (MAX.) (MIN.)
AC	YES	3.63 [92.20mm]	5.01 [127.25mm]	N/A
		3.41 [86.61mm]	4.69 [119.13mm]	
AC	NO	3.16 [80.26mm]	5.01 [127.25mm]	N/A
		2.81 [71.37mm]	4.69 [119.13mm]	
24VDC	YES	3.63 [92.20mm]	5.01 [127.25mm]	N/A
		3.41 [86.61mm]	4.69 [119.13mm]	
24VDC	NO (NOTE 4)	N/A	N/A	5.01 [127.25mm]
				4.88 [123.95mm]
SENSOR WIRE TERMINAL J-BOX (FOR REMOTE OPT.)		N/A	N/A	3.16 [80.26mm]
				2.81 [71.37mm]



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756 4 1 0
Parent number

F1

F2

F3

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F12

F13

Parent Number	Model
756410	454FTB-WGF

F1	Option	Probe Support Diameter
	B	0.75" (19 mm) (6" – 36" probe length)
	C	1" (25 mm) (6" – 60" probe length)

F2	Option	Probe Support & Flange Material
	2	316L stainless steel
	3	C-276 alloy

F3	Option	Probe Support Length
	B	6" (152 mm) (0.75" or 1" probe)
	C	9" (229 mm) (0.75" or 1" probe)
	D	12" (305 mm) (0.75" or 1" probe)
	F	18" (457 mm) (0.75" or 1" probe)
	H	24" (610 mm) (0.75" or 1" probe)
	J	30" (762 mm) (0.75" or 1" probe)
	K	36" (914 mm) (0.75" or 1" probe)
	M	48" (1219 mm) (1" probe)
	P	60" (1524 mm) (1" probe)

F4	Compression Fittings or Flanges
	Choose one only - None, Compression Fitting, or Flange

Option	Compression Fittings
1A	None
2B	0.75" MNPT (0.75" probe only), stainless steel front and back ferrules
2D	0.75" MNPT (0.75" probe only), PTFE-compound front and back ferrules
2G	1" MNPT (0.75" or 1" probe), stainless steel front and back ferrules
2J	1" MNPT (0.75" or 1" probe), PTFE-compound front and back ferrules

Option 1 Class 150 lbs.	Option 2 Class 300 lbs.	ANSI 16.5 Flange	0.75" and 1" probe diameter
1A	1A	None	
3D	4E	0.75" (19 mm)	1" probe diameter
3F	4G	1" (25 mm)	
3J	4K	1.5" (38 mm)	
3L	4M	2" (51 mm)	
3N	4P	2.5" (64 mm)	
3S	4T	3" (76 mm)	
3U	4V	4" (102 mm)	

F5	Option	Flange U Dimension
	----	Enter 000 for no flange connection. Enter U-dimension to nearest 10th of an inch without a decimal point. For example, 7.7" is 077 and 23.6" is 236. Note: Convert metric units to English units.

F6	Option	Electronics Configuration (Approvals Pending, select models CSA Certified Explosion Proof)
	A	Integral - Standard Display viewing Aluminum Type 4, IP66 enclosure Explosion-Proof / Flame-Proof, CSA, ATEX, and IECEx Ex d IIB + H2 Gb, T6, T4, T1 110°C or T1 30°C (electronics enclosure) Ex d IIB + H2 Gb, T4 or T3 (sensing element)
	E	Integral - Display rotated 180° for viewing Aluminum Type 4, IP66 enclosure Explosion-Proof / Flame-Proof, CSA, ATEX, and IECEx Ex d IIB + H2 Gb, T6, T4, T1 110°C or T1 30°C (electronics enclosure) Ex d IIB + H2 Gb, T4 or T3 (sensing element)
	J	Remote - Transmitter and sensing element separate Aluminum Type 4, IP66 enclosures Explosion-Proof / Flame-Proof, CSA, ATEX, and IECEx Ex d IIB + H2 Gb, T6, T4, T1 110°C or T1 30°C (electronics enclosure) Ex d IIB + H2 Gb, T4 or T3 (sensing element)

F7	Option	Display / Keypad
	1	Display / Keypad
	2	Blind

F8	Option	Power
	A	AC (85-265V 47/63 Hz, 24 watts max)
	D	DC (24V ±10%)

F9	Option	Analog and Digital Inputs/Output
	2	Standard Two 4-20mA isolated outputs
	3	Full Two 4-20mA isolated outputs, two relays, two digital inputs, one non-isolated 4-20mA input
	5	HART One 4-20mA isolated outputs, two relays, two digital inputs, one non-isolated 4-20mA input

F10	Option	Gas Type
	A	Air (laboratory calibration only)
	D	Biogas (methane and carbon dioxide mix)
	Y	Customer specified

F11	Option	Percent of Methane
	--	Enter two digits for percent of methane. Enter two zeros (00) for Air only. Enter YY for all other gases.

F12	Option	Velocity Calibration Range
	B	300 SFPM (1.4 NMPS)
	C	600 SFPM (2.8 NMPS)
	E	1,000 SFPM (4.7 NMPS)
	G	2,000 SFPM (9.3 NMPS)
	K	4,000 SFPM (18.6 NMPS) (Air only)

F13	Option	Calibration Type
	1	Correlation
	2	Laboratory