HUNCH AUTOMATION — FCU5400 SERIES

STEAM FLOW COMPUTER

FCU5400 · MULTI VARIABLE DP ORIFICE METERING

The most accurate, affordable and compact DP-based flow computer available — measuring steam, gas, air and water with built-in temperature & pressure compensation. Recommended for billing accuracy.

⚡ Get Quotation

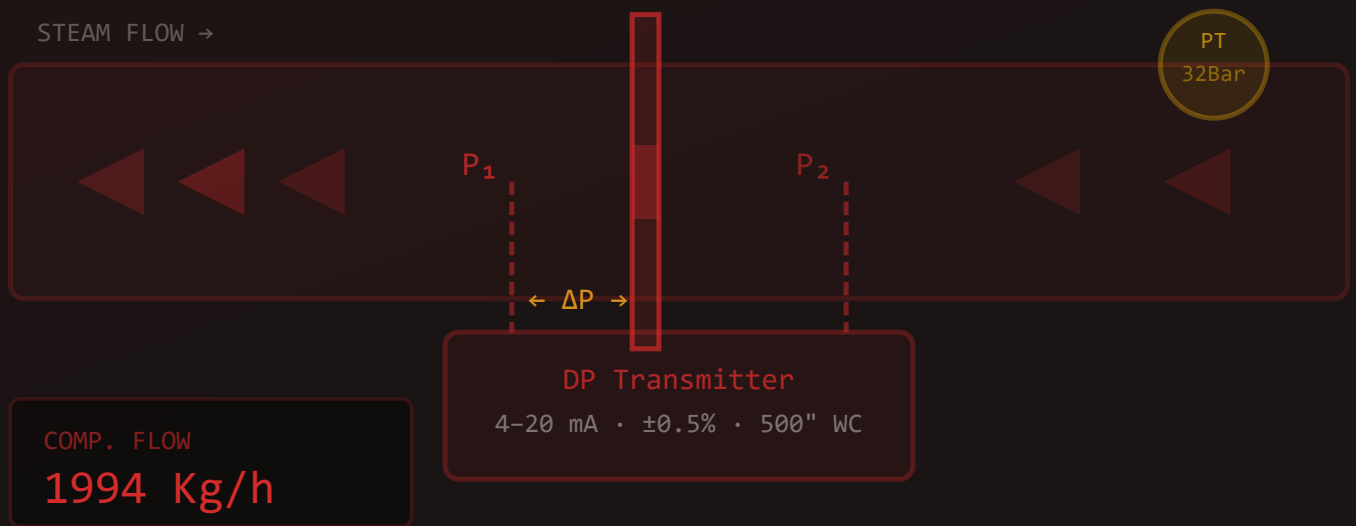
↓ Specifications

WHY FCU5400

The Compact Revolution in DP Flow

Exclusive housing design eliminates the traditional complexity of DP flow systems — no external impulse pipes, no condensate pots, no purging. All instruments are integral parts of the flange housing.

◈ DP ORIFICE FLOW PRINCIPLE — FCU5400



RANGE	TEMP MAX	PRESSURE
0.5–70 TPH	300 °C	32 Bar

01

Zero External Pipework — Exclusive Design

The FCU5400's revolutionary flange-integrated design eliminates all impulse pipes, condensate pots and purge valves. Every instrument is housed within the flanged body — dramatically reducing installation time, leak points and maintenance.

02

ASME Standard DP Calculations — Billing Grade

Full Bernoulli DP flow equation with discharge coefficient, beta-ratio, gas expansion factor and Reynolds number correction — all computed in real-time. FCU5400 is specifically recommended for utility billing applications.

03

Triple Compensation — Density Auto-Calculated

Simultaneous DP, temperature and pressure inputs allow real-time density correction and mass flow compensation. Works excellently at low pressure, low flow, and peak demand conditions — no loss of accuracy across the full range.

04

Highly Accurate & Remarkably Affordable

FCU5400 delivers ±1% reading accuracy comparable to premium international brands — at a fraction of the price. Local engineering, development and support means faster delivery, local calibration and no import delays.

70 TPH

MAXIMUM STEAM FLOW CAPACITY

From 0.5 TPH sub-metering to 70 TPH main steam supply — FCU5400 covers the complete range of industrial steam applications with 100:1 turndown.

— TECHNICAL SPECIFICATIONS

Engineered for Steam Environments

Every component selected for high-temperature, high-pressure industrial process environments — SS304/316L orifice plate, IP67 protection, 32 Bar pressure rating, and 300°C temperature capability.

🌡 FLOW PERFORMANCE

Flow Range (Steam)	0.5 ~ 70 TPH
Accuracy	±1% of reading
Turndown Ratio	100 : 1
Response Time	90 ms (Auto)
Compensation	T + P + Density
Standard	ASME / Bernoulli
Pipe Size Range	DN 25 ~ DN 300

📊 DP TRANSMITTER

Range	Programmable 500" WC
Accuracy	±0.5% of reading

Turndown	100 : 1
Output	4 ~ 20 mA
Fitting	Pre Manifold
Calibration	HART Protocol
Display	Digital Onboard

PRESSURE & TEMPERATURE

Pressure Range	Up to 32 Bar
Pressure Accuracy	±1% reading
Pressure Output	4 ~ 20 mA
Temp. Sensor	PT-100
Temp. Range	0 ~ 300 °C
Temp. Accuracy	±1% reading
PT Fitting	½" NPT

MECHANICAL & HOUSING

Housing	Zinc-coated Sched. 40
Orifice Plate	SS 304 / 316L
Syphons (DP)	2 Nos. Isolating
Syphons (PT)	1 No. Isolating
IP Protection	IP 67
Fitting Type	Counter Flanges
Pipe Connection	½" NPT

COMMUNICATION & I/O

Wi-Fi	Web Browser (Any)

Industrial Comms	Modbus RS485
Network	TCP/IP
Analog Output	4 ~ 20 mA Loop
Digital Output	NPN 2 Nos. 20mA
Alarm Output	Yes — Configurable
OTA Firmware	Over-The-Air

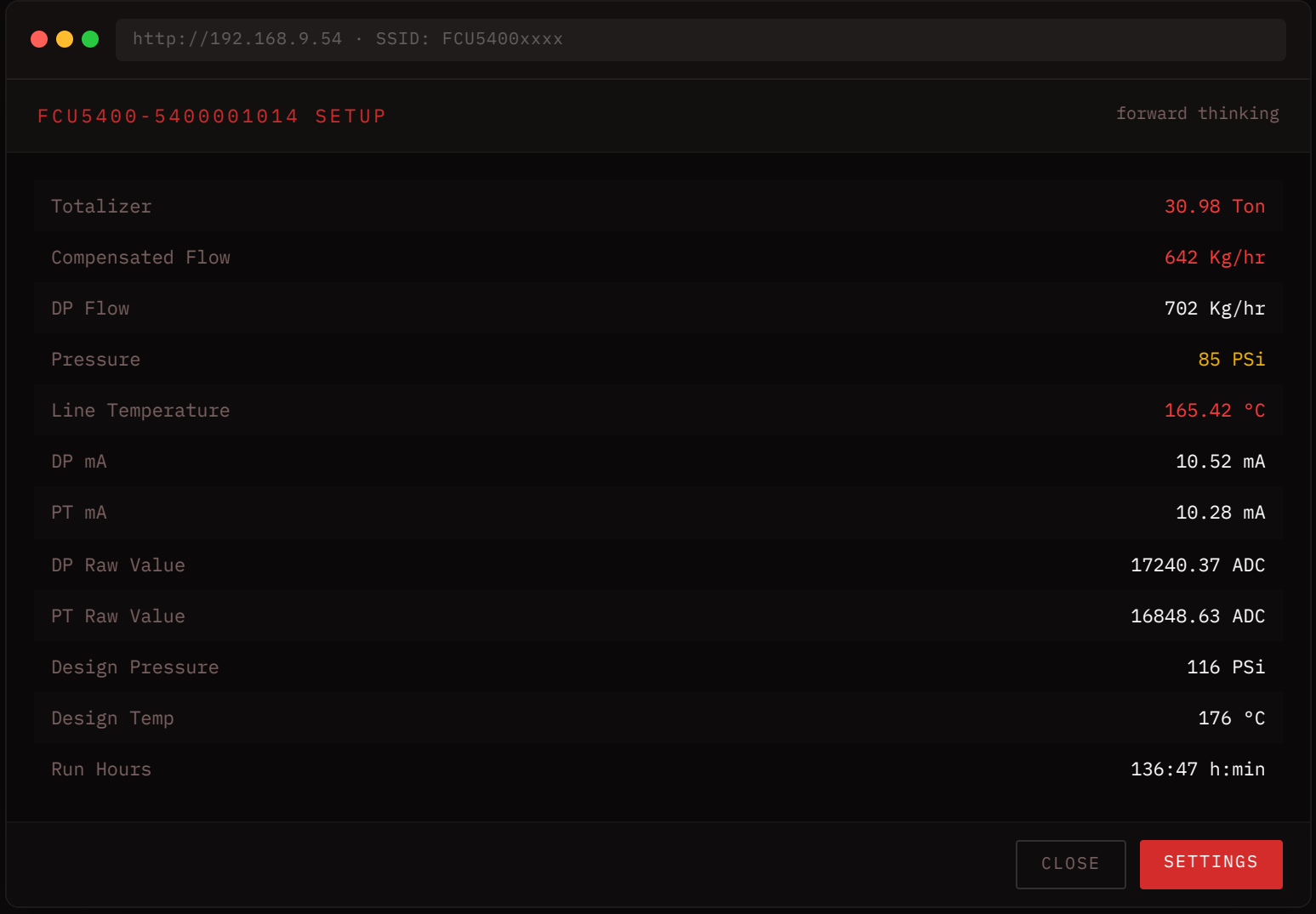
💻 ELECTRONICS & DISPLAY

Processor	Dual Core RISC-V RTOS
Display	4.3" TFT Touch Screen
ADC Resolution	15 Bit × 4 Channels
ADC Response	32 ms (Auto)
Data Storage	SD Card · 50,000 rec.
Clock	Real Time Clock
Power Supply	100-250V AC / 24V DC

WEB INTERFACE

Configure from Any Browser

No app downloads. No proprietary software. No USB cables. The FCU5400 hosts its own web interface — access full configuration and live data from any smartphone, tablet or laptop via Wi-Fi.



Platform Independent — Any Browser

Chrome, Safari, Firefox — any browser on any device. No software installation. No proprietary configurator. Simply connect to the FCU5400 Wi-Fi hotspot and open a browser.

Complete Live Parameter Dashboard

All process values visible in real-time: compensated flow, DP flow, pressure, temperature, density, raw mA signals, ADC values, run hours and totalizer — all in one screen.

Full Settings & Calibration Page

Configure square root, compensation, DP zero/span, PT ranges, K-factors, Modbus ID, baud rate, SSID, log interval and more — all from any browser, with Upload/Download configuration backup.

Cloud & Local Server Data Logging

Slave-mode Wi-Fi streams all tags to any local or internet server via HTTP/MQTT. Real-time online monitoring and reporting up and running within minutes of installation.

OTA Firmware Updates Over Wi-Fi

Firmware update page available directly in the browser. Upload the latest firmware file over the air — no site visits, no downtime, no specialist engineer required.

— EXCLUSIVE FEATURES

Nothing Like It at This Price

Three exclusive innovations that make FCU5400 the most practical, cost-effective DP flow computer in industrial applications today.

No Pipes. No Pots. No Purging.

The FCU5400's integral flange housing eliminates the most failure-prone, maintenance-intensive elements of conventional DP flow systems. Impulse lines that freeze, condensate pots that fill, purge valves that clog — all eliminated by design.

EXCLUSIVE DESIGN

Billing Grade — ASME Certified Calculations

Full ASME standard DP flow equations with discharge coefficient (Cd = 0.607), beta-ratio correction, gas expansion factor (Y_1 = 0.990) and Reynolds number compensation computed in real-time. Trusted for utility billing and energy accounting.

BILLING ACCURATE

Any Browser Interface — No App Required

Unlike every competitor in its class, the FCU5400 needs zero proprietary software or mobile apps. Any internet browser on any device — smartphone, tablet or laptop — gives you complete access. Maximum usability, zero friction.

ZERO SOFTWARE

— FLUIDS & INDUSTRIES

Steam. Gas. Water. All Measured.

The FCU5400 is a true multi-variable flow computer — not just for steam. Measure natural gas, compressed air, feed water and specialty chemicals with the same hardware, the same accuracy.

SATURATED STEAM

Primary application — boiler output metering, distribution, billing

≤ 300°C

SUPER-HEATED STEAM

Turbine inlet, power generation, process heating systems

≤ 300°C

NATURAL GAS (MEDIUM P)

Plant fuel gas supply, burner management, consumption monitoring

High P

COMPRESSED AIR

Factory air supply, sub-metering, leak detection baseline

Up to 32 Bar

BOILER FEED WATER

BFW pump monitoring, make-up water accounting

Pressurized

OXYGEN / NITROGEN

Industrial gas processes, chemical reactor control

Up to 32 Bar

NON-ACIDIC CHEMICALS

Process plant fluid monitoring, utility tracking

Custom

INDUSTRIES SERVED

TEXTILES | PHARMACEUTICALS | CHEMICAL PROCESSING | FOOD & BEVERAGE | POWER PLANTS | COMPRESSOR STATIONS | HOTELS | SUB METERING | PROCESS ENGINEERING

Wi-Fi — Web Browser

Built-in Wi-Fi with full web stack. Configure from any browser. No app, no cable, no proprietary software — ever.

HTTP / ANY BROWSER

TCP/IP Ethernet

Ethernet connectivity for fixed network integration. Connect directly to plant LAN for centralized monitoring without Wi-Fi dependency.

TCP/IP

Modbus RS485

Industrial Modbus with Master/Slave auto-switching. Compensated flow, totalizer, temperature and pressure tags available — standard holding registers.

PLC / SCADA / DCS

4–20 mA Analog Output

Loop-powered analog output transmits compensated flow signal to any controller, recorder or DCS with 4-20mA input. Standard process signal.

LOOP POWERED

Digital Pulse + Alarm Output

Two NPN digital outputs (20mA) — one isolated pulse for totalizer, one configurable alarm output. Immediate notification on setpoint breach.

NPN · 72MS PULSE

Cloud / Local Server Logging

Slave-mode Wi-Fi streams all process tags to local or remote server via HTTP/MQTT. Real-time dashboards and daily reports available from anywhere.

MQTT / HTTP

— MODBUS REGISTER MAP

Direct PLC/SCADA Integration

Standard Modbus RS485 registers — connect to any PLC, DCS, SCADA or OPC server. No custom drivers, no special configuration.

PARAMETER	DATA TYPE	ADDRESS
Compensated Flow	Swapped Long	0X02
Totalizer	Swapped Long	0X04
Device ID	Swapped Long	0X06
Line Temperature	Swapped Long	0X08
Line Pressure	Swapped Long	0X0A

Function Code: 03 or 04

Register Type: Holding Register

Default Baud Rate: 9600 (configurable)

Master/Slave: Auto Switching

ANALOG INPUTS

Channels	4 Nos. 15-Bit
DP Signal	4~20 mA
PT Signal	4~20 mA
ADC Response	32 ms Auto

ANALOG OUTPUTS

Type	Loop Powered
Range	4 ~ 20 mA
Signal	Comp. Flow
Ext. Voltage	2~10 V DC

DIGITAL OUTPUTS

Type	NPN Sink
Channels	2 Nos.
Current	20 mA
Pulse Width	72 ms Isolated

POWER SUPPLY

AC Input	100~250 V AC
DC Input	24 V DC ±5%
Current	2.5 A
Type	SMPS

— ENGINEERING INSIDE

ASME Standard Calculations

Every reading backed by proven ASME Bernoulli differential pressure equations — with full Reynolds correction, gas expansion factor and density compensation computed at 32ms intervals.

ASME STANDARD

◈ DP FLOW EQUATION CHAIN — ASME

Bernoulli: $P_1/\rho + \frac{1}{2}V_1^2 = P_2/\rho + \frac{1}{2}V_2^2$

Volume Flow: $Qv = \pi/4 \cdot d^2 \cdot \sqrt{(2\Delta P/\rho(1-d^4/D^4))}$

Discharge Coeff: $Cd = 0.607$ ASME verified

Beta Ratio: $\beta = d/D$

Mass Flow: $Qm = \pi/4 \cdot Cd \cdot E \cdot d^2 \cdot \sqrt{(2\Delta P\rho)}$

Gas Expansion: $Y_1 = 0.990$

Final Eq: $Qm = \pi/4 \cdot CdY_1d^2 \cdot \sqrt{(2\Delta P\rho/(1-d^4/D^4))}$

Density Comp: $\rho c = \rho b \times Pb \times Pa / (Ta + Tb)$

Reynolds Corr: $Rd = 4QV\rho / \vartheta\pi D$

Reference: Nm^3 @ 0°C · 1.01325 bar A

📐 Real-Time Density Compensation

Temperature and pressure are continuously measured and fed into the density correction equation. Flow is compensated in real-time — you always get true mass flow, not just approximated volume flow, regardless of process conditions.

🎯 Low-Flow & Peak-Load Performance

Unlike Vortex or turbine meters that struggle at low flow rates, the FCU5400's DP principle with square-root extraction and 15-bit ADC maintains excellent accuracy from 0.5 TPH all the way to full-scale — at any pressure and temperature condition.

⚖️ Billing & Energy Accounting Grade

ASME compliant calculations with ±1% accuracy make the FCU5400 suitable for inter-department billing, energy cost allocation, and utility metering. Totalizer values with timestamps are stored on SD card and cloud — fully auditable.

🔧 Field-Configurable Range Changes

The correction feature allows range changes without affecting accuracy — reducing the need for stock variants. A single FCU5400 unit can be reconfigured in the field for different pipe sizes and flow ranges via the browser interface.

READY TO MEASURE YOUR STEAM?

Know Exactly *What* You're Using.

Every kilogram of unmetered steam is money you cannot account for. The FCU5400 pays for itself within weeks through energy visibility alone. Contact HUNCH Automation today.

Request Quotation

Speak to an Engineer

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