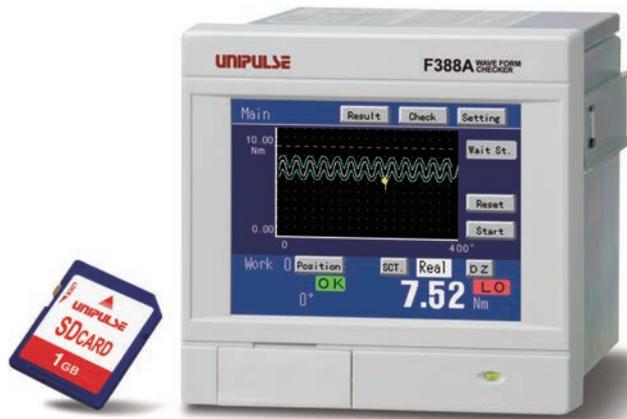


F388A

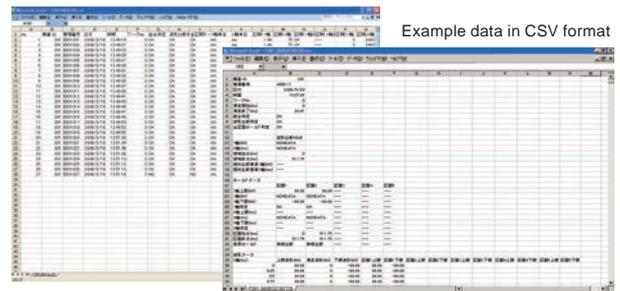
WAVEFORM MONITOR FOR SENSORS WITH ANALOGUE (VOLTAGE/CURRENT) OUTPUT



- RoHS-compliant product
- 4000 times/sec high-speed processing
- Analog monitor output
Voltage output is proportionate to the input signal making the recording on recorder convenient.
At voltage input: Approx. 0.6V per 1V
At current input: Approx. 0.15V per 1mA
- Variety of interfaces
RS-232C / DeviceNet / CC-Link / Ethernet
- 3.5-inch color LCD module & touch panel
Operation can be effortlessly performed by a direct touch on the touch panel.
- Excellent operability
F388A is right-down demanding on straightforwardness and is therefore made able to automatically mask non-required setting items and also to display setting in the required sequence when that particular set item has specific setting sequence.
- I/O Input: Plus common / Minus common shared
It can be connected to various types of external equipments such as PLCs.

Saves Measurement Data in SD Card

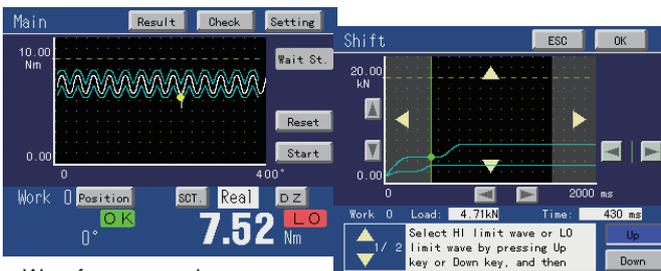
Measurement data and set values can be logged (recorded) in the SD Card where it can be retained as a 100% recorded quality data or be used when setting up equipments or when performing cause analysis or improvement of problems. The data can be easily converted to CSV format and is therefore easily edited in Microsoft Excel or its like.



Example data in CSV format

Waveform comparison function

This function compares the actual measurement waveform against the setup High/Low limit waveforms and will give out an NG judgment when any of the point exceeded the preset High/Low limit waveforms. As it compares the overall measurement waveform, accurate judgment can be made even applications that are unable to narrow down its judgment points.



Waveform comparison screen
Hi and Lo limit comparison of overall measurement waveform can be performed.

Setup Waveform Creation Screen
The High/Low limit waveforms can be easily created on the actual measurement waveform or on the setup waveform creation screen.

Multi hold function

After the measuring range is segmented, judgment is carried out while the type of hold (sample, peak, bottom, P-P, max, min, inflection point, End Displacement) is interchanged as set. The multi hold function can specify the Hi/Lo limit value and type of hold at each of the segmented range.

Pulse input as a standard equipment

It performs 2-dimensional waveform comparison & multi hold through its pulse input. On X-axis, pulse input can be connected while on Y-axis, voltage · current output sensor can be connected.

※When nothing is connected with X-axis, Waveform Comparison & Multi Hold by the time series can be done.

Judgment results display

The comparison results of Waveform Comparison Function and Multi Hold Function can be verified on the display. [Result(List)] (An individual display) and [Result(Single)] (a list display) to selection is possible. (Latest 40 data)

No.	Time	All	Y (Nm)	X (°)
01	20:58:42	OK	0.329	267.2
02	20:55:51	OK	0.330	267.2
03	20:46:12	OK	0.332	267.2
04	19:52:33	OK	0.331	267.2
05	19:46:29	OK	0.335	269.6
06	19:41:17	L	0.335	269.6
07	19:34:53	L	0.335	269.6
08	19:33:40	H/L	0.335	269.6

【Result(List)】

SCT.	Y (Nm)	X (°)
SCT. 1	0.717	0.0
SCT. 2	0.329	267.2
SCT. 3	0.390	479.6
SCT. 4	0.434	654.8
SCT. 5	1.200	800.0
Wave	-----	-----

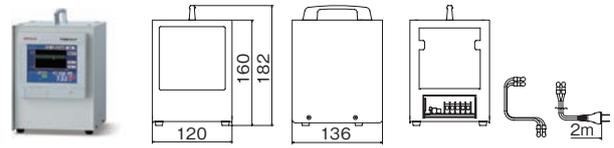
【Result(Single)】

Specifications

SENSOR INPUT	Voltage-Current input	
	Signal input range	-10V to +10V or -20mA to +20mA Voltage input: Input Impedance 1M or more Current input: Input resistance Approx. 250
	Zero-Gain Adjustable range	Automatic adjustment by digital operation
	Equivalent input calibration range	-10V to +10V or -20mA to +20mA (0 is excluded.)
	Equivalent input calibration error	Within 0.1% F.S.
	Actual calibration range	-10V to +10V or -20mA to +20mA ※In Approx. -0.02V to +0.02V or Approx. -0.03mA to +0.03mA, a zero calibration point to calibration is impossible.
	Accuracy	Nonlinearity: Within 0.02%/FS±1digit (at 10V or 20mA input) Zero drift: Within 0.2mV/°C RTI or Within 0.4µA/°CRTI Gain drift: Within 0.01%/°C
	Analog filter	Low-pass filter (-6dB/oct) Selectable from 10, 30, 100, 300Hz
	A/D converter	Rate: 4000 times/sec. Resolution: 24bit (binary) Effective resolution: Approx. 1/30000 to 10V or 20mA
	Analog voltage output	Output level Approx. 0.6V per 1V input or Approx. 0.15V per 1mA input Load resistance 2k or more
	Pulse input (open collector)	
	Maximum input frequency	50kHz
	Internal counting range	Approx. 1000000
	Adaptable sensor	Output: Incremental type 2-phase output (A/B signal output) Also capable of single-phase output (A-phase input used). All pulses are counted as in the plus direction.) Output stage circuit specification: open collector (NPN type, V _{ceo} =30V or more, I _c =30mA or more)
	DISPLAY	Display
Indicated value		Load -9999 to +9999 Displacement -9999 to +32000
Decimal point		The decimal place is to be input together with a value at the time of calibration. 0.000, 0.00, 0.0, 0
Number of display times		Fixed at 3 times/sec.
MEASUREMENT FUNCTION	Multi Hold Mode 16ch (Settings can be saved)	The measurement section is divided, and Hold is switched arbitrarily and judged. Sample, Peak, Bottom, P-P, Relative Maximum, Relative Minimum, Inflection Point, Average, End Displacement
	Waveform Comparison Mode 16ch (Settings can be saved)	The setting waveform of an upper and lower limit is compared with actual measurement waveform. If the whole measurement waveform serves as a candidate for upper and lower limit comparison and at least one and exceeds a setting waveform, it will be judged NG.
EXTERNAL SIGNAL	Output signals (16 points)	
	Hold Result (Load/DPM) /Overload/Complete/Wave Result/Load OK/DPM OK/Run/SD OK	Output type sink type/source type selectable. (Source type is optional [ISC].) Output transistor ON at signal ON. To connect an input unit like a PLC, connect plus common for sink type, and minus common for source type.
	Rated voltage 30V	
	Rated current 30mA	
	Isolation photocoupler	
	Input signals (16 points)	Load Digital Zero/DPM Positioning/Start/Stop/Hold/Reset/Prohibit Touch Panel/Backlight On /Work Input type Plus common/minus common shared. To connect a transistor, connect NPN output type (sink type) for plus common and PNP output type (source type) for minus common. ON voltage 12V or more OFF voltage 3V or less At 24V load approx. 5mA Isolation photocouplers

INTERFACE	232 RS-232C Communication interface
	ODN DeviceNet interface (Options) CCL CC-Link interface (Options) ETN Ethernet interface (Options) (Only one option can be installed)
OPTION	ISC: I/O Source board SDC: SD Card slot (An SD card of 1GB is attached.) (Approx. 80 waveforms can be memorize by 1MB.)
GENERAL SPECIFICATIONS	Power supply voltage DC24V (±15%)
	Power consumption 5W typ
	Inrush current (Typ) 2A, 10msec (at ordinary temperature, cold-start)
	Operating conditions Temperature: Operating temperature range -10°C to +40°C Storage temperature range -20°C to +60°C Humidity: 85%RH or less (non-condensing)
	Outside dimensions 96W×96H×117.3D [mm] (not including projections) Weight Approx. 1.0kg
ATTACHMENTS	FCN series I/O connector (with cover)×1, Jumper wire ×1, Operation manual×1, DeviceNet connector (when DeviceNet option is selected)×1, CC-Link connector (when CC-Link option is selected)×1
OPTIONAL ACCESSORIES	DTC1 Special case
	SD1G 1GByte SC card
	SD2G 2GByte SC card
	SD-ADP SD card adapter (ATA TYPEII)
	CA81-232X miniDIN-D-Sub9p cross cable 1.5m
	CN52 I/O connector (with cover)
	CN57 FCN series I/O connector (with diagonal cover)
	CN60 Circular DIN 8p connector for RS-232C
	CN71 CC-Link connector
	CN81 Analog I/O connector terminal
	CND01 DeviceNet connector
	GMP96x96 Rubber packing
	TSU03 DC lighting surge unit

DTC1 : Special case



Structure of product code

F388A □ □ □
① ② ③ ④

① Standard unit

② SD card slot

Sign	Card slot
Standard	W/O
SDC	SD card slot (1GB attached)

③ I/O output

Sign	Output type
Standard	Sink type (NPN output)
ISC	Source type (PNP output)

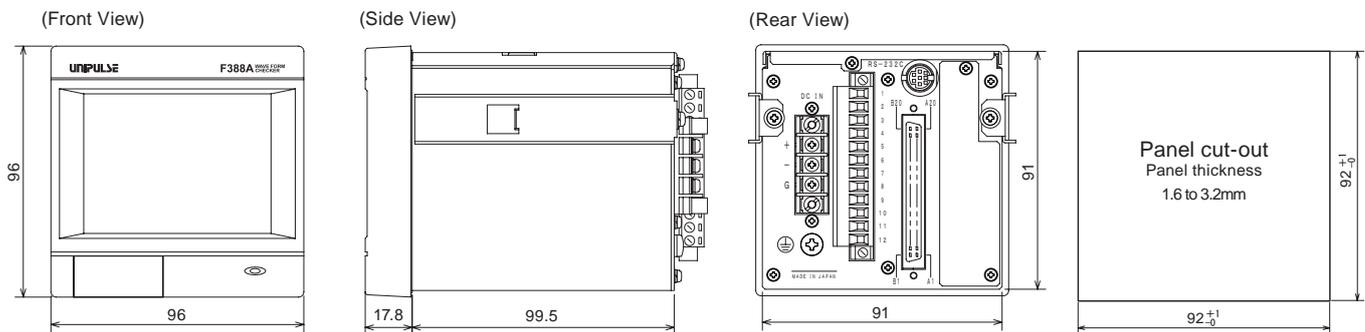
④ Interface

Sign	Interface
Standard	RS-232C

One optional interface can be added in addition the standard interface.

ODN	DeviceNet
CCL	CC-Link
ETN	Ethernet

External dimension



Unit : mm