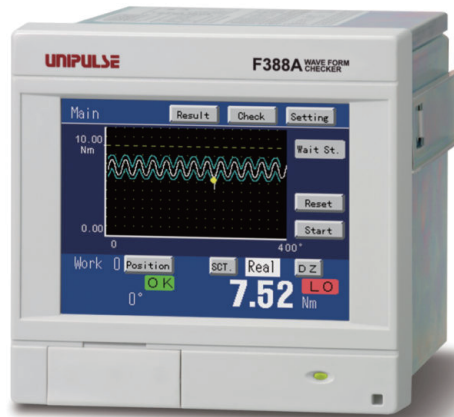# F388A

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

CC-Link
DIN 96 RoHS2

- 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. 0.6 V per 1 V
  At current input: Approx. 0.15 V per 1 mA
- Variety of interfaces
  RS-232C ／ 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.
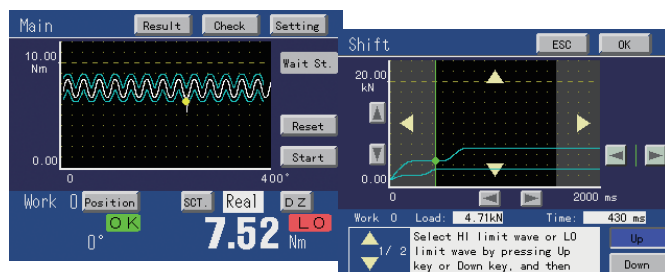
▲Waveform comparison screen
Hi and Lo limit comparison of overall measurement waveform can be performed.

▲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)

【Result(List)】

【Result(Single)】

UNIPULSE

SENSOR INPUT	Voltage・Current input		
	Signal input range	-10 to +10 V or -20 to +20 mA	
		Voltage input: Input impedance 1 M or more	
		Current input: Input resistance Approx. 250Ω	
	Zero・Gain Adjustable range	Automatic adjustment by digital operation	
	Equivalent input calibration range	−10 to +10 V or -20 to +20 mA (0 is excluded.)	
	Equivalent input calibration error	Within 0.1% FS	
	Actual calibration range	-10 to +10 V or -20 to +20 mA	
		* In Approx. -0.02 to +0.02 V or Approx. -0.03 to +0.03 mA, a zero calibration point to calibration is impossible.	
	Accuracy	Nonlinearity: Within 0.02% FS±1 digit (at 10 V or 20 mA input) Zero drift: Within 0.2 mV/℃ RTI or Within 0.4 A/℃ RTI Gain drift: Within 0.01%/℃	
	Analog filter	Low-pass filter (-6 dB/oct.) Selectable from10, 30, 100, 300 Hz	
	A/Dconverter	Rate: 4000 times/sec. Resolution: 24 bit (binary) Effective resolution: Approx. 1/30000 to 10 V or 20 mA	
	Analog voltage output	Output level Approx. 0.6 V per 1 V input or Approx. 0.15 V per 1 mA input Load resistance 2 kΩ or more	
	Pulse input (open collector)		
	Maximum input frequency	50 kHz	
	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, Vceo = 30 V or more, Ic = 30 mA or more)	
DISPLAY	Display	3.5-inch TFT color LCD module	
		Display area	71(W) × 53(H) mm
		Dot configuration	320×240 dot
	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 16 ch (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 16 ch (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 sinktype, and minus common for source type. Rated voltage 30 V Rated current 30 mA 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	12 V or more	
	OFF voltage	3 V or less	
	At 24 V load approx. 5 mA		
	Isolation photocouplers		

INTERFACE	232	RS-232C Communication interface
	CCL	CC-Link interface (Options)
	ETN	Ethernet interface (Options)
	(Only one option can be installed)	
OPTION	ISC	I/O Source board
GENERAL SPECIFICATIONS	Power supply voltage	DC 24 V (±15%)
	Power consumption	5 W typ.
	Inrush current typ.	2 A, 10 msec (at ordinary temperature, cold-start)
	Operating conditions	Operating temperature range: -10 to +40℃ Storage temperature range: -20 to +60℃ Humidity: 85% RH or less (non-condensing)
	Outside dimensions	96(W) × 96(H) × 117.3(D) mm (not including projections)
	Weight	Approx. 1.0 kg
ATTACHMENTS	FCN series I/O connector (with cover) ×1, Jumper wire ×1, Operation manual ×1, 1 GByte SD card ×1, Analog I/O connector terminal block (Already mounted on the main unit) ×1, CC-Link connector (when CC-Link option is selected) ×1	
ACCESSORIES	DTC1	Special case
	SD1G	1 GByte SD card
	SD2G	2 GByte SD card
	CA81-232X	miniDIN-D-Sub9p cross cable 1.5 m
	CN52	FCN series 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
	CN72	Double row connector for CC-Link
	CN81	Analog I/O connector terminal block (Same accessory as the attached one)
	GMP96×96	Rubber packing

* Please note that there are possibilities of individual differences in a color tone on display devices such as LEDs, fluorescent display tubes and LCDs due to manufacturing process or production lots.

Structure of product code

F388A-SDC ① □② □③

①Standard unit
②I/O output

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

③Interface

Sign	Interface
Standard	RS-232C

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

CCL	CC-Link
ETN	Ethernet

External dimension

(Front View)

96

96

(Side View)

17.8   99.5

(Rear View)

91

91

Panel cut-out
Panel thickness
1.6 to 3.2 mm

92^{+1}_{-0}

92^{+1}_{-0}
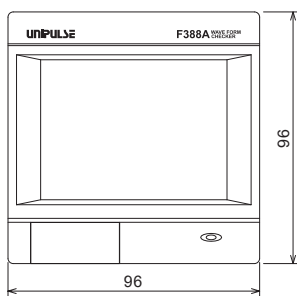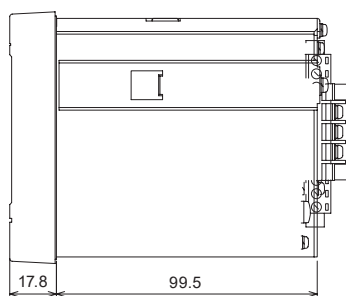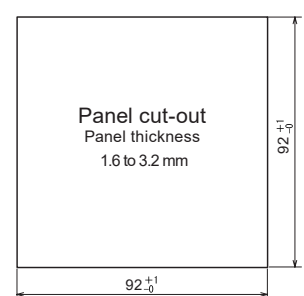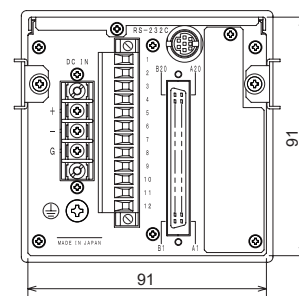
Unit : mm

DTC1: Special case

160
182

120   136   2 m