F381A

GRAPHIC DISPLAY / TOUCH PANEL TYPE DIGITAL INDICATOR (SD CARD SLOT OPTION AVAILABLE)

CC-Link
DeviceNet
CE DIN 96 RoHS2
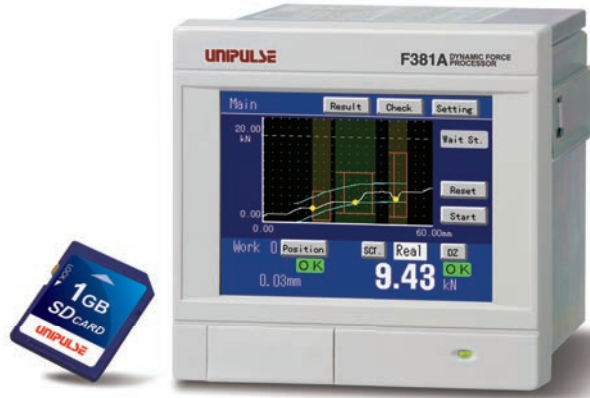
Comparison & Hold Function by Waveform Display

These functions are used to judge the acceptability of measurement waveforms.
Depending on type of applications, Waveform Comparison Function and Multi Hold Function can be jointly utilized for judgment.

Waveform Comparison Function

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

- Hi Limit Setting
- Measurement Waveform
- Lo Limit Setting

Y-axis: Pressure, Load or Torque etc.

Inflection Point Hold
Sample Hold
Bottom Hold

Multi Hold Function

Type of hold can be selected at segmented measuring area.

Hold Point

X-axis: Time or Displacement Input
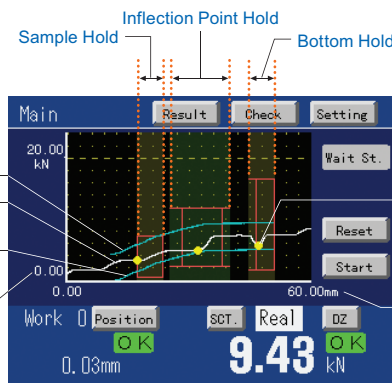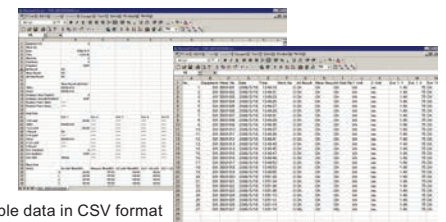
Saves Measurement Data in SD Card

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 Excel or its like.
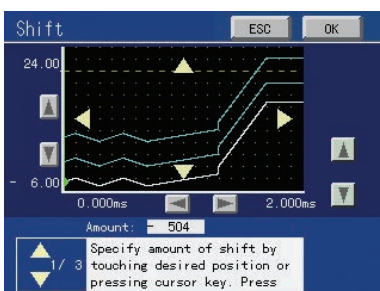
Example data in CSV format

- 4000 times/sec. high-speed processing
- Analog monitor output
  Voltage output is proportionate to the input signal making the recording on recorder convenient. Approx. 2 V per 1 mV/V strain gauge input
- 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
  F381A 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
  I/O Output: Sink type / Source type selectable.
  It can be connected to various types of external equipments such as PLCs.

Multi hold function

After the measuring range is segmented, judgment is carried out while the type of hold (sample, peak, bottom, P-P, Average, 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. Multipoint judgment is possible because the multi hold function is capable of using the peak hold to detect the inhibit timer immediately after the press-fit is started and then uses the inflection point hold to judge the load just before the ramming is commenced.

Displacement input as a standard equipment

It performs 2-dimensional waveform comparison & multi hold through its dual input from the displacement sensor and strain gauge sensor. On X-axis, voltage or pulse input can be connected while on Y-axis, strain gauge sensor can be connected.

This is highly effective for applications which are difficult to control only by time factor such as the control for pressing time of press machines and for the imposing time on works with individual differences.

* When nothing is connected with X-axis, Waveform Comparison & Multi Hold by the time series can be done.
* The voltage input is an option.

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)

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.

▲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.

【Result(List)】

【Result(Single)】

UNIPULSE

Sensor input

- Sensor input for load (strain gauge input)

Excitation voltage	DC 10 V, 2.5 V ±10% (Depending on setting) Output current: Within 30 mA
Signal input range	−3.0 to +3.0 mV/V
Accuracy	Non-linearity: Within 0.02% FS±1 digit (at 3.0 mV/V input)
	Zero drift: Within 0.5 μV/℃ RTI
	Gain drift: Within 0.01%/℃
Analog filter	Low-pass filter (-6 dB/oct.) Selectable from 10, 30, 100, 300 Hz
A/D converter	Speed: 4000 times/sec.
	Resolution: 24 bit (binary) Effective resolution: Approx. 1/30000 to 3.0 mV/V
Analog voltage output	Output level: Approx. 2 V per 1 mV/V input
	Load resistance 2 kΩ or more

- Sensor input for displacement (standard: pulse input open collector) Option: Pulse input (Line driver (LDI))

Max. input frequency	50 kHz
Internal count range	Approx. 1,000,000
Adaptable rotary encoder	Output: Incremental type 2-phase output (A/B-phase 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)
	Output stage circuit specification (LDI) Line driver (Based on RS-422)

- Sensor input for displacement (Option: Voltage input [VIN])

Signal input range	−5 to +5 V
Input impedance	Approx. 10 MΩ
Zero adjustment range	−5 to +5 V Automatic adjustment by digital processing
Equivalent input calibration range	−5 to −1 V, +1 to +5 V
Equivalent input calibration error	Within 0.1% FS
Actual calibration range	−5 to +5 V * In Approx. −0.01 to +0.01 V,
	a zero calibration point to calibration is impossible.
Accuracy	Non-linearity: Within 0.02% FS±1 digit (at 5 V input)
	Zero drift: Within 50 μV/℃ RTI
	Gain drift: Within 0.02%/℃
Analog filter	Low-pass filter (-6dB/oct.) Selectable from 10, 30, 100, 300 Hz
A/D converter	Speed: 4000 times/sec.
	Resolution: 24 bit (binary) Effective resolution: Approx. 1/30000 to 5 V

Display

Display	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 place: Selectable display position from 0.000, 0.00, 0.0, 0
Display frequency	Fixed at 3 times/sec

Measurement functions

	Multi-hold mode 16 ch (setting values can be stored)
	Measuring range can be segmented and changeover to any hold for judgment can be performed.
	Sample, Peak, Bottom, P-P, Relative Maximum, Relative Minimum, Inflection Point, Average, End Displacement
	Waveform comparison mode 16 ch (setting values can be stored) Compares the actually measured waveform against the preset Hi / Lo waveforms. The overall measured waveform will be compared against the preset Hi / Lo and if any of its points exceeds the preset waveform, then the measured waveform will be NG.

External signal

Output signal (16)	Output Type	Sink type/source type selectable. (Source Type is option: [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	30 V
	Rated current	30 mA
	Isolation	Photocoupler
Input signal (16)	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	Photocoupler

Interface

232:	RS-232C communication interface
ODN:	DeviceNet interface (option)
CCL:	CC-Link interface (option)
ETN:	Ethernet interface (option)
* Only one option can be installed)	

Option

LDI:	Pulse input (line driver)
VIN:	Voltage Input
ISC:	I/O Source Board
SDC:	SD Card Slot
	(1 GByte SD card is attached.)
	(1 MByte for storage capacity of up to 80 waveforms)

General specification

Power supply voltage	DC 24 V (±15%)
Power consumption	6 W typ.
Inrush current typ.	2 A, 10 msec (at room temperature, cold-start)
Operation condition	Temperature: Operation temperature range: -10 to +40℃
	Storage temperature range: -20 to +60℃
	Humidity: 85% RH or less (non-condensing)
External dimension	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
Operation Manual	1
Analogue I/O connector terminal block (Already mounted on the main unit)	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:	1 GByte card
SD2G:	2 GByte 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:	Round DIN 8p connector for RS-232C
CN71:	CC-Link connector
CN72:	Double row connector for CC-Link
CN81:	Analogue I/O connector terminal block (Same accessory as the attached one)
CND01:	DeviceNet connector
GMP96x96:	Rubber packing
TSU03:	DC Lightning surge unit

CE marking certification	EMC Directives EN61326-1

* 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.

DTC1: Case for F381A (with AC power supply)   Unit: mm

160 / 182 / 120 / 136 / 2 m
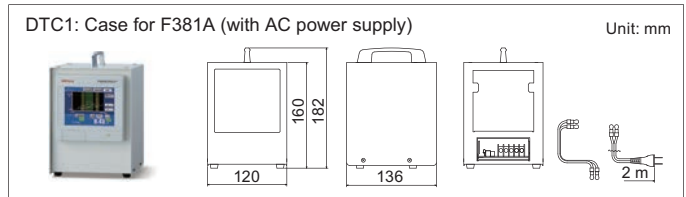
Structure of product code

F381A ☐ ☐ ☐ ☐
 ① ② ③ ④ ⑤
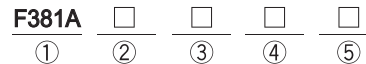
① Standard unit

② Displacement sensor input

Sign	Displacement sensor
Standard	Open collector
LDI	Line driver
VIN	Voltage

③ SD card slot

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

④ I/O output

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

⑤ Interface

Sign	Interface
Standard	RS-232C

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

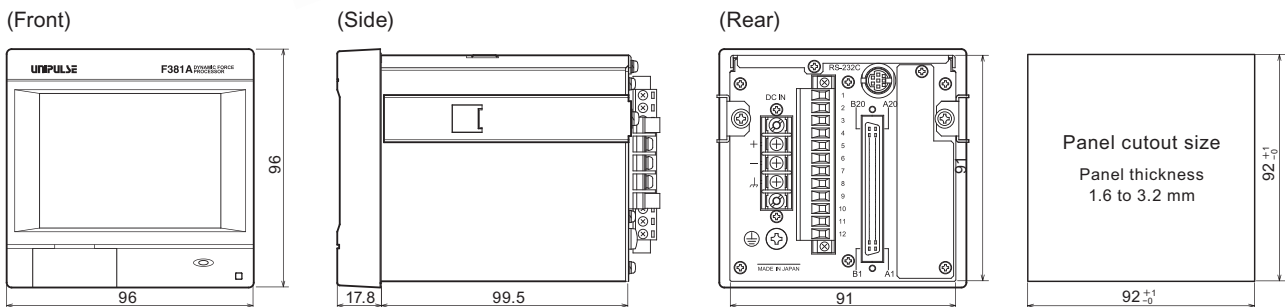| Sign	Interface
ODN	DeviceNet
CCL	CC-Link
ETN	Ethernet

Digital contact sensor ULE-50

A digital contact sensor designed for FS2000 and F381A-LDI. You can perform OK/NOK judgment with a Force vs Displacement curve.

* For specification & drawing of ULE-50, please refer to page 116 for more details.

Measuring range: 50 mm
Resolution: 2.5 μm

External dimension

(Front)

96 / 96

(Side)

17.8 / 99.5

(Rear)

91

Panel cutout size

Panel thickness 1.6 to 3.2 mm

92 +1 −0 / 92 +1 −0

Unit: mm