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753/754

Documenting Process Calibrator

Users Manual

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Introduction

The 753 and 754 Documenting Process Calibrators (the Product) are battery-powered, hand-held instruments that measure and source electrical and physical parameters. In addition, the 754 supplies basic HART® communicator functions when used with HART-capable transmitters. See the *754 HART Mode Users Guide* for instructions on how to use the HART communication feature.

The Product helps troubleshoot, calibrate, verify, and document work performed on process instruments.

Note

All figures in this manual show the 754.

How to Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit <http://register.fluke.com>.

To view, print, or download the latest manual supplement, visit <http://us.fluke.com/usen/support/manuals>.

The latest software trial version of *DPCTrack2* can be downloaded at www.fluke.com/DPCTrack. For more information see "Communication with a PC".

753/754 Accessories can be found at www.fluke.com/process_acc.

Safety Information

A **Warning** identifies conditions and actions that pose hazards to the user; a **Caution** identifies conditions and actions that may damage the Product or the equipment under test.

Warning

To prevent personal injury, use the Product only as specified, or the protection supplied by the Product can be compromised.

To prevent possible electrical shock, fire, or personal injury:

- Read all safety Information before you use the Product.
- Carefully read all instructions.
- Use only correct measurement category (CAT), voltage, and amperage rated probes, test leads, and adapters for the measurement.
- The battery must be locked in place before you operate the Product.
- Recharge the battery when the low battery indicator shows to prevent incorrect measurements.
- Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.
- Limit operation to the specified measurement category, voltage, or amperage ratings.
- Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.
- Measure a known voltage first to make sure that the Product operates correctly.
- Do not touch voltages > 30 V ac rms, 42 V ac peak, or 60 V dc.
- Do not use the Product around explosive gas, vapor, or in damp or wet environments.
- Do not use and disable the Product if it is damaged.
- Do not use the Product if it operates incorrectly.
- Keep fingers behind the finger guards on the probes.
- Remove all probes, test leads, and accessories that are not necessary for the measurement.
- Only use probes, test leads, and accessories that have the same measurement category, voltage, and amperage ratings as the Product.

- **Connect the common test lead before the live test lead and remove the live test lead before the common test lead.**
- **Use only current probes, test leads, and adapters supplied with the Product.**
- **Do not touch the probes to a voltage source when the test leads are connected to the current terminals.**
- **Use only cables with correct voltage ratings.**
- **Do not use test leads if they are damaged. Examine the test leads for damaged insulation, exposed metal, or if the wear indicator shows. Check test lead continuity.**
- **Examine the case before you use the Product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.**
- **Always put the stackable end of the test lead into a terminal of the Product.**

Symbols used on the Product and in this manual are explained in Table 1.

Table 1. Symbols















Symbol	Meaning	Symbol	Meaning
	Earth ground		Common (LO) Input equipotentiality
	AC- alternating current		Conforms to relevant North American Safety Standards.
	DC- direct current		Conforms to European Union directives.
	Risk of danger. Important information. See manual.		Pressure
	Hazardous voltage. Risk of electrical shock.		This product complies with the WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information.

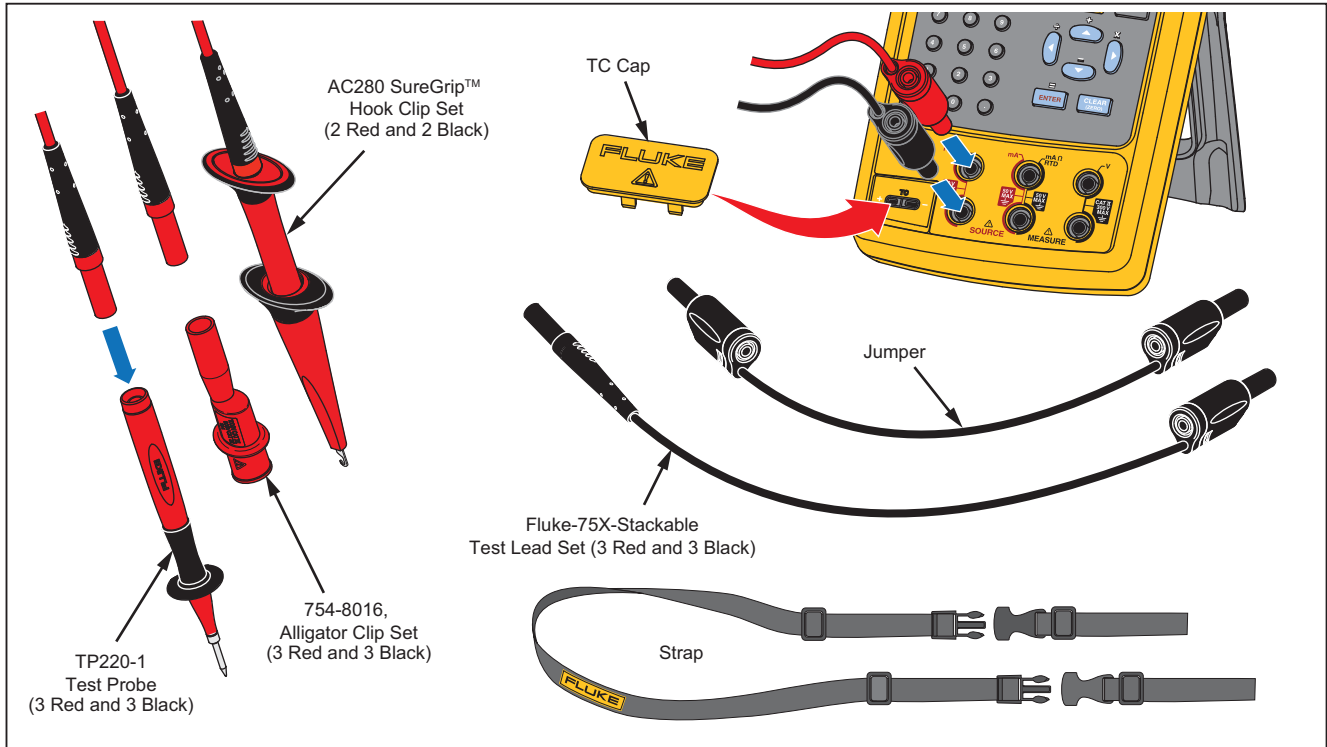
Table 1. Symbols (cont.)

Symbol	Meaning	Symbol	Meaning
	Application around and removal from HAZARDOUS LIVE conductors is permitted.	 N10140	Conforms to relevant Australian standards.
	Double insulated		German certifying body.
CAT II	CAT II equipment is designed to protect against transients from energy-consuming equipment supplied from the fixed installation, such as TVs, PCs, portable tools, and other household appliances.		

Standard Equipment

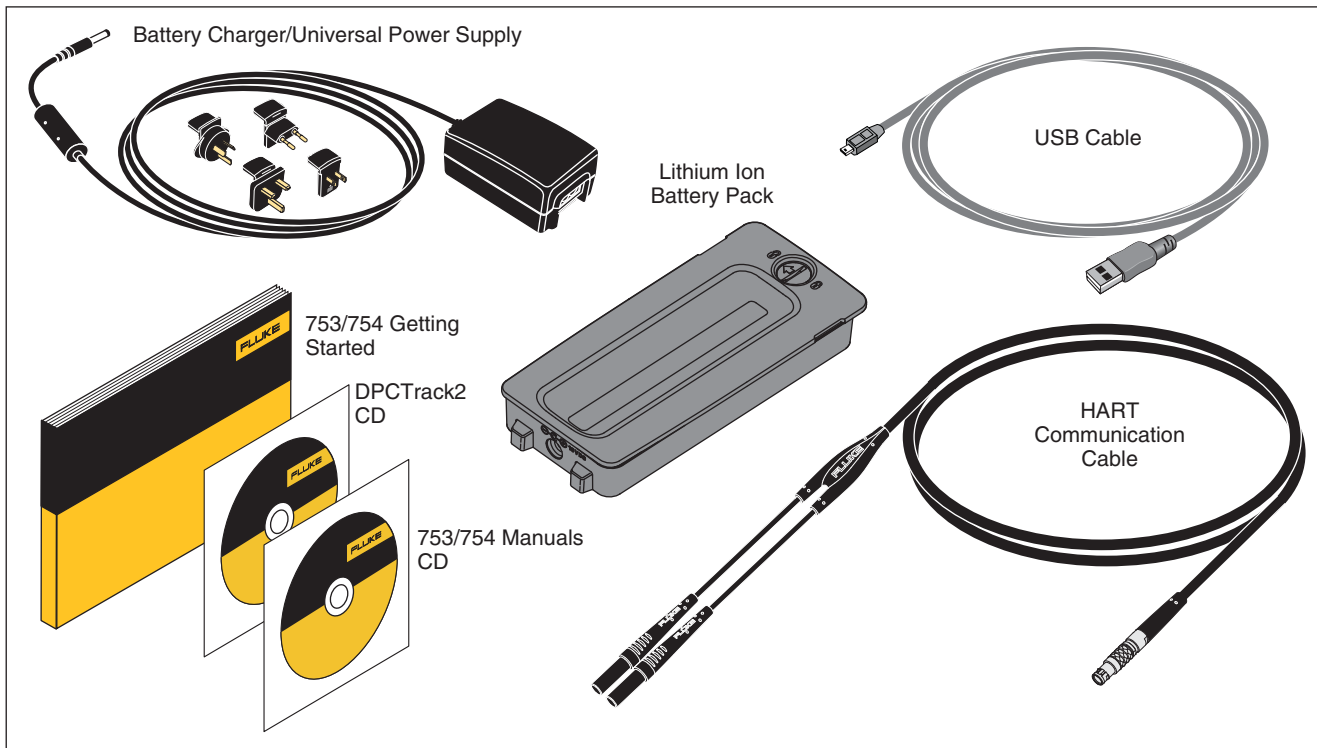
Items included with the Product are listed below and shown in Figure 1. If the Product is damaged or something is missing, contact the place of purchase immediately.

- Battery with integrated charger/power supply and international adapters
- Printed multilingual *753/754 Getting Started Manual*
- *753/754 Manual CD* containing multilingual Users Manuals
- Three sets of TP220-1 test probes
- Three sets of 75X industrial test leads with stackable ends
- Three pairs of 754 Alligator Clip Set (extended tooth)
- Two sets of AC280 Suregrip Hook Clips (red and black)
- Adjustable quick-release strap
- Jumper for three-wire RTD measurement connections
- USB Cable: 6 ft. type A to type mini-B
- HART communications cable (754)
- Calibration Manual (available from Fluke's website)
- Sample *DPCTrack2* application software
- NIST-traceable Certificate of Calibration
- TC Input Cap



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Figure 1. Standard Equipment



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Figure 1. Standard Equipment (cont)











Functions

A summary of functions supplied by the Product is shown in Table 2. More features include:

- Analog display for easy to read measurements when inputs are unstable.
- Localized display (5 languages). See “Display Languages”.
- Thermocouple (TC) input/output jack and internal isothermal block with automatic reference-junction temperature compensation. Or manually record an external temperature reference.
- Test results storage.
- Data logging. Automatically log up to 8,000 data points.
- A USB computer interface to upload or download tasks, lists, and results.
- Automatic calibration procedures for transmitters and limit switches when you use split screen MEASURE/SOURCE mode.
- Transmitter mode in which the Product can be configured to emulate the functions of a process instrument.
- Calculator feature with square-root function, and accessible registers that contain measure and source values.
- Damp feature (smoothes the last several readings), with display indicator of damped status.
- Display of measurements in engineering units, percent of scale, square-law inputs, or custom units.
- Min/Max feature captures and shows minimum and maximum measured levels.
- Set source values to engineering units, percent of scale, square-law outputs, or custom units.
- Manual and automatic stepping and an output ramp feature for testing limit switches. Trip detect is either a 1 V change or a continuity status change (Open or Short) from one ramp increment to the next.

For performance testing and calibration instructions, download the *753/754 Calibration Manual* from Fluke’s website.

Table 2. Summary of Source and Measure Functions

Function	Measure	Source
 Volts dc	0 V to ± 300 V	0 V to ± 15 V (10 mA max)
 Volts ac	0.27 V to 300 V rms, 40 Hz to 500 Hz	No sourcing
 Frequency	1 Hz to 50 kHz	0.1 V to 30 V p-p sine wave, or 15 V peak square wave, 0.1 Hz to 50 kHz sine wave, 0.01 Hz square wave
 Resistance	0 Ω to 10 k Ω	0 Ω to 10 k Ω
 dc Current	0 mA to 100 mA	0 to 22 mA sourcing or sinking
 Continuity	Beep and the word Short indicates continuity	No sourcing
 Thermocouple	Types E, N, J, K, T, B, R, S, C, L,U, BP, or XK	
 RTD (2-W, 3-W, 4-W)	100 Ω Platinum (3926) 100 Ω Platinum (385) 120 Ω Nickel (672) 200 Ω Platinum (385) 500 Ω Platinum (385) 1000 Ω Platinum (385) 10 Ω Copper (427) 100 Ω Platinum (3916)	
 Pressure	^[1] 29 modules ranging from 0 to 1 inch H ₂ O (250 Pa) to 0 to 10,000 psi (69,000 kPa)	
 Loop Power	26 V	
^[1] Use an external hand pump or other pressure source as a pressure stimulus for the source pressure function.		






Get Started

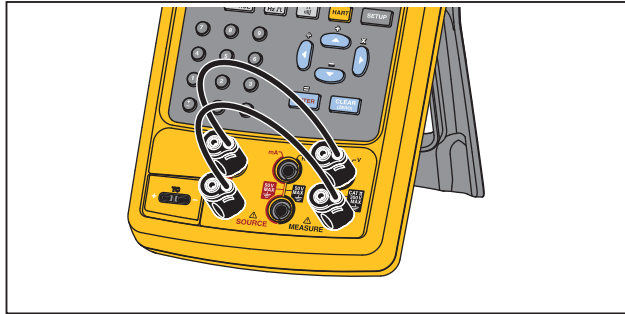
⚠⚠ Warning

To prevent possible electrical shock, fire, or personal injury:

- **Remove circuit power before you connect the Product in the circuit when you measure current. Connect the Product in series with the circuit.**
- **Do not touch exposed metal on banana plugs, they can have voltages that could cause death.**
- **Disconnect power and discharge all high-voltage capacitors before you measure resistance or continuity.**

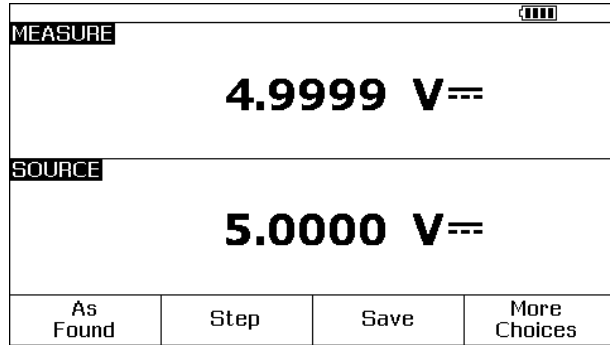
A brief getting started exercise follows:

1. After you unpack the Product, charge the battery for 8 hours (if the battery is outside of the Product, charge for 5 hours). For more information, see “The Battery”. The Battery will only charge if the Product is off.
2. Connect voltage output to the voltage input. To do this connect the left pair of jacks (V Ω RTD SOURCE) to the right pair of jacks (V MEASURE). See Figure 2.
3. Push  to turn on the Product. If necessary, adjust the display brightness. See “Display Brightness”. The Product powers up in the dc voltage measurement function, and is reading on the V MEASURE pair of input jacks.
4. Push  to show the SOURCE screen. The Product still measures dc voltage and the active measurement is at the top of the display.
5. Push  to select dc voltage sourcing. Push 5 on the keypad and  to begin sourcing 5.0000 V dc.
6. Push  to go to the split-screen, simultaneous MEASURE/SOURCE mode. The Product simultaneously sources dc volts and measures dc volts. The measurement readings are shown on the top display, and the active source value on the bottom display as shown in Figure 3.



gks03f.eps

Figure 2. Jumper Connections



gks04s.bmp

Figure 3. Measure/Source Example

Operation Features

Input and Output Jacks

Figure 4 shows the input and output jacks and connectors.

Table 3 explains their use.

Table 3. Input/Output Jacks and Connectors

No.	Name	Description
①	HART jack (754 only)	Connects the Product to HART devices.
②	Pressure module connector	Connects the Product to a pressure module.
③	TC input/output	Jack to measure or simulate thermocouples. This jack accepts a miniature polarized thermocouple plug with flat, in-line blades spaced 7.9 mm (0.312 in) center to center.
④,⑤	⚠ MEASURE V jacks	Input jacks to measure voltage, frequency, or three- or four-wire RTDs (Resistance Temperature Detectors).
⑥,⑦	⚠ SOURCE mA, MEASURE mA Ω RTD jacks	Jacks to source or measure current, measure resistance and RTDs, and supply loop power.
⑧,⑨	⚠ SOURCE V Ω RTD jacks	Output jacks to source voltage, resistance, frequency, and to simulate RTDs.
⑩	Battery Charger jack	Jack for the battery charger/universal power supply (referred to as the battery charger throughout this manual). Use the battery charger for bench-top applications where ac line power is available.
⑪	USB port (Type 2)	Connects the Product to a USB port on a PC.