

# PERSONAL MULTI-GAS CONFINED SPACE ENTRY MONITORS

## TRIPLE PLUS +

### FEATURES

- SIMULTANEOUSLY MONITORS, DISPLAYS, AND ALARMS FOR ONE TO FOUR GASES USING FIELD INTERCHANGEABLE SMART SENSORS IDEAL FOR MANY APPLICATIONS
- BUILT-IN ELECTRIC AIR PUMP OPTION OR DIFFUSION STYLE
- EXTREMELY RUGGED DESIGN, VIRTUALLY UNBREAKABLE
- INTERNAL DATALOGGER WITH MEMORY BACK UP BATTERY
- WATER RESISTANT, DUST PROOF, AND HIGHLY RF SHIELDED
- MANY FEATURES YET COMPACT, LIGHTWEIGHT, AND FLOATS!
- UL, CSA AND MANY OTHER INTRINSIC SAFETY APPROVALS
- LARGE, HIGH CONTRAST DISPLAY WITH BRIGHT BACKLIGHT
- MANY SPECIAL OPTIONS AVAILABLE



Over 40,000 units of the Triple Plus + design are presently in use worldwide. Our customers have come to depend on its robust and reliable performance. The extremely durable Triax™ case and internal construction means it won't break when you drop it and floats when you need it to.



**CEA Instruments, Inc.**

*"EXPERTS IN TOXIC GAS DETECTION"*

## TRIPLE PLUS + SPECIFICATIONS (Part 1)

<b>WEIGHT</b>	1.9 pounds (880 grams)
<b>DIMENSIONS</b>	4.6 x 6.6 x 2.9 inches (118 x 167 x 73 mm)
<b>TYPICAL GASES</b>	<p>                     COMBUSTIBLES (%LEL and/or % Volume)                      OXYGEN                      CARBON MONOXIDE                      HYDROGEN SULFIDE                      SULFUR DIOXIDE                      CHLORINE                      NITROGEN DIOXIDE                      NITRIC OXIDE                      AMMONIA                      HYDROGEN                      HYDROGEN CHLORIDE                      HYDROGEN CYANIDE                      HYDROGEN FLUORIDE                      PHOSPHINE                      ARSINE                      FLUORINE                      ETHYLENE OXIDE                      CHLORINE DIOXIDE                      VOLATILE ORGANICS                      CARBON DIOXIDE – Infrared                      METHANE - Infrared (%LEL and % Volume)                      PROPANE - Infrared (%LEL and % Volume)                      BUTANE - Infrared (%LEL and % Volume)                      ETHYLENE- Infrared (%LEL and % Volume)                 </p> <p style="text-align: center;"><i>PLEASE CONTACT CEA INSTRUMENTS REGARDING SENSORS FOR ANY OTHER GAS(ES)</i></p>
<b>TYPICAL RESPONSE</b>	Combustibles 20 seconds; Oxygen 10 seconds; Toxic Gas 20 seconds
<b>SENSOR LIFE</b>	Combustibles 5 years; Oxygen 2 years; Typical Toxic Gas 3 years
<b>ALARMS</b>	Adjustable alarms set to current U.S. OSHA limits ( <i>unless specified otherwise</i> ). Piercing rapid intermittent, piezo-electric tone, 92 dBA at 1 foot with ultra bright flashing red LED in gas hazard. Selectable confidence blip with slow flashing green LED indicates instrument is working. Distinctive double blip and double flash of green LED indicates low battery.
<b>DISPLAY</b>	2 lines of 24 characters, dot matrix high contrast LCD with back light. Values and units for up to 4 gases displayed simultaneously at current, TWA, STEL, or peak levels. Low battery, pump failure, real time and elapsed time, calibration and configuration data also displayed.
<b>DATALOGGING</b>	Adjustable sample rate, 100 hours @ 1 minute sample rate (maximum 6000 data points per channel), logging of events, user, and site.

(Specifications subject to change without notice.)



### CEA Instruments, Inc.

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## TRIPLE PLUS + SPECIFICATIONS (Part 2)

<b>BATTERY</b>	LIBRA Lithium-Ion rechargeable battery pack lasts over 12 hours between charges for standard (non-pumped) instruments and over 10 hours for pumped instrument.
<b>BATTERY CHARGERS</b>	Dual rate 'drop in' stand up charger for instrument or dual rate charger / PC interface 'flat bed' for instrument and battery pack.
<b>ELECTRIC PUMP</b>	Optional built-in internal pump with on/off button.
<b>TEMPERATURE</b>	-4°F to 122°F (-20°C to 50°C).
<b>HUMIDITY</b>	0 to 95% RH non condensing.
<b>APPROVALS</b>	UL and CSA (Class 1, Div. 1, Groups A, B, C, D) and other worldwide intrinsic safety approvals.
<b>INGRESS PROTECTION</b>	NEMA 4X (tested to IP65) - highly water resistant and dust proof. Unit will float if accidentally dropped in water!
<b>RF PROTECTION</b>	RF radiation tested to EN55022 class B and meets EN50081-2. RF immunity tested to IEC801-3 and meets EN50082-2.
<b>PC INTERFACE</b>	PC access is achieved through an RS232 serial link by locating the instrument in the charger/PC interface. The Windows™ compatible software Portables PC is then used to adjust or set: all alarms, levels of alarm (3 for all channels, Oxygen has 2 low and 1 high), clock, password, combustible gas correction factors, time zones, user, site, and more.  Log Manager controls datalogging, giving the user a choice of direct graphical output or a datafile compatible with all leading spreadsheets.
<b>AUTOCALIBRATOR</b>	Triple Plus can be routinely calibrated quickly and simply using Autocalibrator. The internal pump of Autocalibrator handles up to five different gases. A PC interface provides easy access with optional datalogging for proof of calibration.



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## TRIPLE PLUS + PRICE LIST

Triple Plus + units are the ultimate multi-gas personal monitors that offer the detection of up to four gases simultaneously with numerous microprocessor features. It combines simplicity with the durability required for the harshest of environments. Combustible gas channels are normally calibrated to Methane if not specified. Complete with shoulder strap, instruction manual, and internal datalogging as standard.

### Choose one of the below two Triple Plus + versions

	<b>Pump</b>	<b>Battery Type</b>	<b>Part No</b>	<b>Price</b>
Triple Plus+ (no sensors)	No	Rechargeable	<b>TPP-0141</b>	\$1040.00
Triple Plus+ (no sensors)	Internal	Rechargeable	<b>TPP-0142</b>	\$1420.00

Choose up to four of the below gas sensors by adding each letter Code to the end of the above part number. Add the price of each selected sensor to the base price of the Triple Plus + version selected.

<b>Part No.</b>	<b>Description</b>	<b>Price</b>	<b>Code</b>
S011375	0-100% LEL Methane** <i>(as standard unless another gas is specified)</i>	\$ 276.00	A
S011371	0-25% vol. Oxygen	\$ 184.00	B
S01241	0-500 ppm Carbon Monoxide	\$ 310.00	C
S01240	0-50 ppm Hydrogen Sulfide	\$ 304.00	D
S011368	0-500 ppm Carbon Monoxide (Hydrogen compensated)	\$ 587.00	V***
S011045	0-1000 ppm Hydrogen Sulfide	\$ 376.00	Hi D
S011219	0-10 ppm Sulfur Dioxide (Hydrogen Sulfide immune)	\$ 421.00	Z
S01250	0-2000 ppm Hydrogen	\$ 581.00	T
S011363	0-100 ppm Nitric Oxide	\$ 640.00	M
S01244	0-10 ppm Nitrogen Dioxide*	\$ 496.00	F
S01829	0-5 ppm Chlorine*	\$ 456.00	G
S011369	0-10 ppm Hydrogen Chloride*	\$ 680.00	N***
S01725	0-25 ppm Hydrogen Cyanide	\$ 680.00	H
S01726	0-50 ppm Ammonia	\$ 680.00	J
S011848	0-1000 ppm Ammonia	\$ 691.00	Hi J
S01871	0-1 ppm Chlorine Dioxide*	\$ 616.00	L
S01252	0-2 ppm Phosphine*	\$ 698.00	I
S011992	0-1 ppm Arsine	\$ 784.00	4
S011367	0-100 ppm Volatile Organics	\$ 750.00	P***
S011366	0-10 ppm Ethylene Oxide	\$ 715.00	Q***
S01832	0-10 ppm Hydrogen Fluoride*	\$ 770.00	R
S011966	0-10 ppm Fluorine*	\$ 482.00	W
S011957	0-100% LEL Methane for dual range %LEL / %VOL units (w/ S01423)	\$ 328.00	Y
S01423	0-100% vol. Methane for dual range %LEL / %VOL units (w/ TC Block)	\$ 397.00	S
S011971	0-4% Hydrogen (Electrochemical as 0-100% LEL)	\$ 784.00	Hi T

\* Readily absorbed gases that will not be properly detected if an internal pump, aspirator, or hose are used.

\*\* LEL sensors are calibrated to Methane unless Propane, Pentane, Butane, Ethylene, Hydrogen, or another gas is specified.

\*\*\* Only one biased sensor can be installed in a single instrument.

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Part No.	Description	Price	Code
S011316/U	0-100% LEL Methane IR (UL)	\$ 882.00	IRM
S012997	0-100% LEL Pentane IR	\$ 882.00	IRPEN
S011317/U	Dual range 0-100% LEL and 0-100% vol. Methane IR (UL)	\$1018.00	IRMD
S011318	0-100% LEL Propane IR	\$ 882.00	IRP
S011319	Dual range 0-100% LEL and 0-100% vol. Propane IR	\$1018.00	IRPD
S011320	0-100% LEL Butane IR	\$ 882.00	IRB
S011321	Dual range 0-100% LEL and 0-100% vol. Butane IR	\$1018.00	IRBD
S011322	0-100% LEL Ethylene IR	\$ 882.00	IRE
S011790	0-100% LEL Acetylene IR	\$1459.00	IRA
S011792	Dual range 0-100% LEL and 0-100% vol. Acetylene IR	\$1566.00	IRAD
S011323	Dual range 0-100% LEL and 0-100% vol. Ethylene IR	\$1018.00	IREC
S011389	0-5% vol. Carbon Dioxide IR	\$ 989.00	IRCO2

If adding a sensor from the above list, screw fixing kit (S011474) is needed.

S011474	Screw fixing kit	\$ 18.00	
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## Special Triple Plus + Kit Package

**Add \$525.00** and /K to the end of each unit part number to receive the recommended **Triple Plus + KIT**.

Each KIT includes the unit, battery charger / interface II (110 VAC), shoulder strap, waist belt, communication software, computer lead (9 pin to 9 pin) and instruction manual, all packaged in a carrying (brief) case with foam inserts. An aspirator kit and inline filter is also supplied with pumped unit kits.

*Example: Triple Plus + (no sensors), internal pump version with LEL/O2/CO/SO2 sensors KIT would be part number **TPP-0142/ABCZ/K** with a price of **\$3,128** (\$1420 + \$276 + \$184 + \$310 + \$413 + \$525)*

## Triple Plus + Battery Chargers & Software

Part Number	Description	Price
C01546	Charger (no power supply), two rate charging of instrument	\$ 140.00
C01550	Charger with 230V power pack without plug	\$ 183.00
C01551	Charger with 110V power pack without plug	\$ 183.00
C011321	Charger w/ multi-region power supply (includes UK, EU, US, AU plug adapters)	\$ 183.00
C03580	Multi-region power supply (includes UK, EU, US and AU plug adapters)	\$ 46.00
E01083	Ferrite for non-interface chargers (must be used when charging LIBRA in a drop in chargers listed)	\$ 28.00
C01436	Charger/Interface II for UK only	\$ 270.00
C01437	Charger/Interface II for USA only	\$ 270.00
C01440	Charger/Interface II international without plug	\$ 270.00
C01832	Portables PC software CD	\$ 85.00
C01327	Computer lead assembly 9 way to 9 way	\$ 61.00
C01296	Vehicle charging lead	\$ 140.00



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## Triple Plus + Accessories

Part Number	Description	Price
C01685	Aspirator and pouch	\$ 88.00
C01297	Carrying case and belt	\$ 107.00
C01451	Waist belt	\$ 36.00
C01323	Shoulder strap	\$ 23.00
C01325	Baffle plate to protect sensor apertures	\$ 48.00
M05809	Top label protective film (minimum order quantity 4)	\$ 10.00
C01097	1m sample Probe	\$ 132.00
C01757	Telescopic aspirator Probe	\$ 164.00
M04032 B	Aspirator hose - Neoprene per yard	\$ 12.00
M04032 C	Aspirator hose - Tygon per foot	\$ 13.00
FIL29001	in-line water trap/particulate filter including filter element	\$ 59.00
FIL99008	Filter element, price per element (minimum order	\$ 8.00
C03141	Six meter drop line	\$ 41.00
C01985	Single sensor calibration adaptor	\$ 94.00

## Triple Plus + Spare Parts

Part Number	Description	Price
C01006	LIBRA lithium ion battery pack for TRP+/IR (initially fitted w/lead acid batteries ATEX/IECEX variants)	\$ 197.00
C01013	LIBRA lithium ion battery pack for TRP+/IR (initially fitted w/ lead acid batteries UL variant)	\$ 197.00
C011202	Spare LIBRA lithium ion battery pack for TRP+/IRATEX/IECEX variants	\$ 197.00
C011198	Spare LIBRA lithium ion battery pack for TRP+/IRUL variant	\$ 197.00
C01094	Aspirator pouch (pouch only)	\$ 62.00
<i>C01298</i>	<i>Aspirator bulb w/ flow adaptor/without pouch</i>	<i>\$ 107.00</i>
C01280	Flow plate assembly	\$ 62.00
M04182	Flow plate gasket	\$ 6.00
S011148	Triple Plus+ complete molding set, non-pumped	\$ 235.00
S011146	Triple Plus+ complete molding set, pumped	\$ 339.00
S011152	Display molding assembly	\$ 141.00
M04652	Battery cover gasket	\$ 6.00
E01753	Membrane switch Triple Plus+ (two battery screws -new moldings)	\$ 80.00
E01823	Membrane switch Triple Plus+ IR version	\$ 80.00
M04218	'D' ring for strap	\$ 8.00
M03584	Case fixing nut, M4 (minimum order quantity 10)	\$ 5.00
M01337	Battery cover screw, M3 (minimum order quantity	\$ 6.00



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## Triple Plus + Spare Parts

Part Number	Description	Price
M03572	Socket cap screw for lid fixing, M4 x 12 (minimum order quantity 10)	\$ 2.00
M03583	Socket cap screw for case fixing, M4 x 25 (minimum order quantity 10)	\$ 6.00
M03314	PCB top lid fixing screws, short, M3 x 5 (minimum order quantity 10)	\$ 5.00
M03227	PCB top lid/sounder fixing screws, long M3 x 10	\$ 6.00
E01331	LCD module	\$ 74.00
E01332	Memory back up battery (on main PCB)	\$ 38.00
M03226	Toxic sensor/sounder fixing screw, M3 x 15	\$ 5.00
M03216	Oxygen/flammable sensor fixing screw M3 x 25	\$ 5.00
M03445	M3 flat washer, nylon (minimum order quantity 10)	\$ 5.00
S01266	Blanking plug kit	\$ 11.00
M02118	In-line membrane filter pumped version only	\$ 16.00
<i>S011184</i>	<i>Pump assembly (formerly S012105)</i>	<i>\$ 248.00</i>
<i>S011151</i>	<i>Pump upgrade kit (TRP+ non-pumped to pumped)</i>	<i>\$ 340.00</i>
M04128	Sealing washer flammable sensor (min. order qty 10). Sealing washer used on flammable sensor also needs M02095 speaker seal for 1993 models onwards	\$ 10.00
M04177	Sensor seal oxygen and toxic (minimum order quantity 10). Sensor seal used on oxygen sensor also needs M02095 used alone on toxic sensor	\$ 6.00
M02095	PTFE filter membrane disc used on oxygen and flammable sensors	\$ 10.00
M01505	Exhaust adapter (pumped TRP+)	\$ 10.00
M03633	M6 nut (inlet/outlet) - (minimum order quantity 10)	\$ 5.00
M03442	M6 shakeproof washer (inlet/outlet) (minimum order quantity 10)	\$ 5.00
M04388	M6 O-ring (inlet/outlet) - (minimum order quantity 10)	\$ 5.00
S01263	Sounder seal/gauze assembly pre-1993 models	\$ 10.00
M05248	Calibration label	\$ 11.00
M05236	Caution label	\$ 16.00
M07198	Instruction card	\$ 11.00
M07701	Instruction manual - Triple Plus+ /Triple Plus+ IR	\$ 18.00
S01358/2	Sounder loom	\$ 13.00
S01359/2	Main loom	\$ 18.00
<i>S011298/E</i>	<i>Main PCB assembly, Triple Plus+ (formerly S01884) English</i>	<i>\$ 659.00</i>
S011301/3	Safety PCB assembly (formerly S01994)	\$ 91.00
E07155	Flexible circuit/connector	\$ 51.00
S011300	Sounder assembly (1993 models onwards formerly S01261)	\$ 90.00
E01066	Fuse 62MA I.S. encapsulated (trained service	\$ 21.00
DE0104	Fuse 100MA encapsulated (trained service centers	\$ 16.00