

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)

WEIGHT	2 pounds (900 grams)
DIMENSIONS	4.6 x 6.6 x 2.9 inches (118 x 167 x 73 mm)
TYPICAL GASES	<p>COMBUSTIBLES (%LEL and/or % Volume)</p> <p>OXYGEN</p> <p>CARBON MONOXIDE</p> <p>HYDROGEN SULFIDE</p> <p>SULFUR DIOXIDE</p> <p>CHLORINE</p> <p>NITROGEN DIOXIDE</p> <p>NITRIC OXIDE</p> <p>AMMONIA</p> <p>HYDROGEN</p> <p>HYDROGEN CHLORIDE</p> <p>HYDROGEN CYANIDE</p> <p>HYDROGEN FLUORIDE</p> <p>PHOSPHINE</p> <p>FLUORINE</p> <p>ETHYLENE OXIDE</p> <p>CHLORINE DIOXIDE</p> <p>VOLATILE ORGANICS</p> <p>CARBON DIOXIDE – Infrared</p> <p>METHANE - Infrared (%LEL and % Volume)</p> <p>PROPANE - Infrared (%LEL and % Volume)</p> <p>BUTANE - Infrared (%LEL and % Volume)</p> <p>ETHYLENE- Infrared (%LEL and % Volume)</p> <p>ACETYLENE- Infrared (%LEL and % Volume)</p> <p><i>PLEASE CONTACT CEA INSTRUMENTS REGARDING SENSORS FOR ANY OTHER GAS(ES)</i></p>
TYPICAL RESPONSE	Combustibles 20 seconds; Oxygen 10 seconds; Toxic Gas 20 seconds
SENSOR LIFE	Combustibles 5 years; Oxygen 2 years; Typical Toxic Gas 3 years
ALARMS	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.
DISPLAY	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.
DATALOGGING	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.)



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TRIPLE PLUS + SPECIFICATIONS (Part 2)

BATTERY	Sealed lead acid 1.2 Ah, interchangeable battery pack lasts over 12 hours between charges for standard (non-pumped) instruments and 8 to 10 hours for pumped instrument.
BATTERY CHARGERS	Dual rate 'drop in' stand up charger for instrument or dual rate charger / PC interface 'flat bed' for instrument and battery pack.
ELECTRIC PUMP	Optional built-in internal pump with on/off button.
TEMPERATURE	-4°F to 122°F (-20°C to 50°C).
HUMIDITY	0 to 95% RH non condensing.
APPROVALS	UL and CSA (Class 1, Div. 1, Groups A, B, C, D) and other worldwide intrinsic safety approvals.
INGRESS PROTECTION	NEMA 4X (tested to IP65) - highly water resistant and dust proof. Unit will float if accidentally dropped in water!
RF PROTECTION	RF radiation tested to EN55022 class B and meets EN50081-2. RF immunity tested to IEC801-3 and meets EN50082-2.
PC INTERFACE	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.
AUTOCALIBRATOR	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

	Pump	Battery Type	Part No	Price
Triple Plus+ (no sensors)	No	Rechargeable	TPP-0141	\$1040.00
Triple Plus+ (no sensors)	Internal	Rechargeable	TPP-0142	\$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.

Part No.	Description	Code	Price
S011375	0-100% LEL Combustibles (formerly S01238)	A	\$ 276.00
S011371	0-25% Oxygen - Two Year Sensor	B	\$ 184.00
S01241	0-500 ppm Carbon Monoxide	C	\$ 310.00
S01240	0-50 ppm Hydrogen Sulfide	D	\$ 304.00
S01242	0-10 ppm Sulfur Dioxide	E	\$ 366.00
S01244	0-10 ppm Nitrogen Dioxide *	F	\$ 468.00
S01829	0-5 ppm Chlorine (Sensoric) *	G	\$ 456.00
S01725	0-25 ppm Hydrogen Cyanide (Sensoric)	H	\$ 680.00
S01252	0-2 ppm Phosphine *	I	\$ 680.00
S01726	0-100 ppm Ammonia (Sensoric)	J	\$ 680.00
S011848	0-1000 ppm Ammonia (Sensoric)	hi J	\$ 680.00
S01871	0-1 ppm Chlorine Dioxide *	L	\$ 530.00
S011363	0-100 ppm Nitric Oxide (formerly S01245)	M ***	\$ 564.00
S011369	0-10 ppm Hydrogen Chloride (Sensoric) * (formerly S01724)	N ***	\$ 680.00
S011367	0-100 ppm Volatile Organics (formerly S01253)	P ***	\$ 530.00
S011366	0-10 ppm Ethylene Oxide (formerly S01254)	Q ***	\$ 680.00
S01832	0-10 ppm Hydrogen Fluoride (Sensoric) *	R	\$ 770.00
S01423	0-100% Volume Methane w/ TC Block	S	\$ 328.00
S011407	0-100% LEL Jet Fuel Vapors	U	\$ 510.00
S011368	0-500 ppm Carbon Monoxide (H2 immune) ***	V	\$ 546.00
S011219	0-10 ppm Sulfur Dioxide (H2S immune)	Z	\$ 366.00
S01250	0-2000 ppm Hydrogen	T	\$ 564.00
S011752	0-10,000 ppm Hydrogen	hi T	\$ 564.00
S011966	0-10 ppm Fluorine	W	\$ 470.00
S011957	0-100% LEL Methane (use for dual range units)	Y	\$ 328.00
S011389	0-2% Volume Carbon Dioxide	IRCO2	\$ 990.00
S011320	0-100% LEL Butane IR	IRB	\$ 880.00
S011321	Dual range 0-100% LEL and 0-100% Volume Butane IR	IRBD **	\$1020.00
S011322	0-100% LEL Ethylene IR	IRE	\$ 880.00
S011323	Dual range 0-100% LEL and 0-100% Volume Ethylene IR	IRED **	\$1020.00
S011316	0-100% LEL Methane IR	IRM	\$ 880.00
S011317	Dual range 0-100% LEL and 0-100% Volume Methane IR	IRMD **	\$1020.00
S011318	0-100% LEL Propane IR	IRP	\$ 880.00
S011319	Dual range 0-100% LEL and 0-100% Volume Propane IR	IRPD **	\$1020.00
S011790	0-100% LEL Acetylene	IRA	\$1470.00
S011792	Dual range 0-100% LEL and 0-100% Volume Acetylene	IRAD **	\$1570.00

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

** A maximum of three (3) sensors is allowed when ordering a Dual Range Infrared (IR) sensor.

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



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Special Triple Plus + Kit Package

Add \$350 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 FL/O₂/CO/H₂S sensors KIT would be part number **TPP-0142/ABCD/K** with a price of **\$2,844** (\$1420 + \$276 + \$184 + \$310 + \$304 + \$350)*

Triple Plus + Battery Chargers & Software

Part Number	Description	Price
C01546	Charger (no power supply), two rate charging of complete instrument	\$ 139.00
C01547	Charger with 230V power pack for UK only	\$ 183.00
C01548	Charger with 230V power pack for Europe only	\$ 183.00
C01549	Charger with 110V power pack for USA only	\$ 183.00
C01550	Charger with 230V power pack without plug	\$ 183.00
C01551	Charger with 110V power pack without plug	\$ 183.00
C01439	Charger/Interface II - for Australia only	\$ 270.00
C01438	Charger/Interface II - for Europe only	\$ 270.00
C01626	Charger/Interface II - for South Africa only	\$ 270.00
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
C01686	Comms pack, Windows software & computer lead –Windows 3.1/3.11/95/98/NT	\$ 160.00
C01715	Crowcomms 2000 / SetPortable / ACE - Windows 3.1/3.11/95/98/NT	\$ 65.00
C01327	Computer lead assembly 9 way - 9 way	\$ 45.00
C01296	Charging lead for vehicle lighter socket	\$ 36.00
E01537	Power supply for drop in charger	\$ 60.00

Triple Plus + Accessories

Part Number	Description	Price
C01685	Aspirator and pouch	\$ 88.00
C01297	Carrying case and belt	\$ 100.00
C01451	Waist belt	\$ 30.00
C01323	Shoulder strap	\$ 20.00
C01325	Baffle plate to protect sensor apertures	\$ 41.00
M05364	Top label protective film	\$ 2.00
C01097	Aspirator probe – Three (3) Feet	\$ 107.00
C01757	Telescopic Aspirator Probe – Extends up to Five (5) Feet	\$ 121.00
M04032B	Aspirator hose, Neoprene, per Yard (3 Feet)	\$ 9.00
M04032C	Aspirator hose, Tygon, per Foot	\$ 13.00
C01245	Water trap	\$ 275.00
C03141	Six yard drop line	\$ 41.00



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Triple Plus + Spare Parts

Part Number	Description	Price
APP002	Plastic aspirator probe assembly	\$ 85.00
APP003	Replacement filter kit for plastic aspirator probe (Includes 3 hydrophobic filters/10 particulate filters)	\$ 51.00
APP004	Replacement filters for plastic aspirator probe (25 hydrophobic only)	\$ 283.00
C01009	Allen key, 2.5 mm (for TP+ battery compartment)	\$ 3.50
C01012	Allen key, 3 mm	\$ 1.20
C01094	Aspirator pouch	\$ 60.00
C01097	Aspirator probe, 3 feet long (stainless steel)	\$ 107.00
C01253	Battery pack 6V 1.2Ah	\$ 77.00
C01280	Flowhead assembly	\$ 60.00
C01295	Computer lead 9-25 pin	\$ 37.00
C01297	Carrying case and belt	\$ 100.00
C01298	Aspirator c/w flow adaptor, tubing & bulb	\$ 107.00
C01323	Carrying strap	\$ 20.00
C01325	Baffle plate (to protect sensor apertures)	\$ 41.00
C01327	Computer lead (9 pin to 9 pin)	\$ 45.00
C01686	Communications software and computer lead	\$ 160.00
C01730	Metal flowhead assembly	\$ 108.00
C01755	Dilution metal flowhead assembly (50% dilution)	\$ 155.00
C01757	Aspirator probe, telescopic to 5 feet (stainless steel)	\$ 121.00
C01832	Portables PC software	\$ 55.00
C03141	Drop line 18 feet (for lowering instrument into a pit)	\$ 41.00
CASE	Lockable polyethylene case with foam inserts	\$ 99.00
CIF001	500mA fuse (Charger/Interface)	\$ 3.40
E01066	62mA fuse	\$ 9.00
E01122	Encapsulated fuse	\$ 10.00
E01330	Membrane switch Triple Plus	\$ 66.00
E01331	LCD display	\$ 115.00
E01332	Nicad back-up battery	\$ 30.00
E01535	Power supply for charger - 230V for UK only	\$ 55.00
E01536	Power supply for charger - 230V for Europe only	\$ 55.00
E01537	Power supply for charger - 110V for US only	\$ 66.00
E01552	Power supply for charger - 230V no plug	\$ 66.00
E01553	Power supply for charger - 110V no plug	\$ 66.00
E01693	Membrane switch Triple Plus + (single battery screw - old moldings)	\$ 63.00
E01753	Membrane switch Triple Plus + (two battery screws - new moldings)	\$ 63.00
E01823	Membrane switch Triple Plus + IR version	\$ 50.00
E07155	Flexible circuit/connector	\$ 50.00
ILF001	In line hydrophobic aspirator filter	\$ 29.00
ILF005	In line hydrophobic aspirator filters (pack of 5)	\$ 114.00
M01337	Battery cover screw, M3	\$ 2.30
M02095	PTFE filter membrane disc used on oxygen and flammable sensors	\$ 6.00
M02118	In-line membrane filter pumped version only (Internal)	\$ 11.55
M03216	Oxygen/flammable sensor fixing screw, M3 x 25 (minimum order 5)	\$ 1.00
M03226	Toxic sensor/sounder fixing screw, M3 x 15 (minimum order 5)	\$ 1.00
M03227	PCB top lid/sounder fixing screws, long M3 x 10 (minimum order 5)	\$ 1.00
M03314	Circuit board to top molding screws M3x5 (minimum order 5)	\$ 0.75
M03445	Flat nylon washer M3 (minimum order 5)	\$ 0.75



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Triple Plus + Spare Parts

Part Number	Description	Price
M03572	Socket cap screw for top fixing, M4x12 (2 required) (minimum order 6)	\$ 1.10
M03583	Socket cap screw for case fixing, M4 x 25 (minimum order 5)	\$ 1.50
M03584	Case fixing nut, M4 (minimum order 5)	\$ 1.00
M03605	M4 square nut zinc/clear (2 required) (minimum order 6)	\$ 0.75
M04001	Aspirator bulb	\$ 26.40
M04028	4" Tube from flowhead to pump inlet nozzle (minimum order 5)	\$ 1.10
M04032B	Aspirator hose, Neoprene, per Yard (3 Feet)	\$ 9.00
M04032C	Aspirator hose, Tygon, per Foot	\$ 13.00
M04128	Sealing washer for flammable sensor (also needs M02095) or speaker seal (1993-) (minimum order 5)	\$ 2.00
M04170	Front molding assembly, c/w inserts	\$ 38.00
M04170/P	Front molding assembly, c/w inserts (pumped)	\$ 38.00
M04177	Sensor seal used on oxygen sensor (also needs M02095) or toxic sensor	\$ 2.00
M04182	Flowhead gasket	\$ 1.10
M04218	'D' ring for strap	\$ 4.40
M04382	Male luer taper pipe fitting	\$ 4.60
M05236	Caution label	\$ 12.65
M05248	Calibration label	\$ 8.25
M05316	I.S. Caution label - CSA	\$ 8.25
M05318	I.S. Approval label - CSA	\$ 5.25
M05341	I.S. Approval label - UL	\$ 5.25
M05364	Top label protective film	\$ 2.00
M07058	Service manual	\$ 15.00
M07098	Instruction card	\$ 8.00
M07190	Instruction manual - Triple Plus +	\$ 15.00
M07198	Instruction card (shoulder strap mounted)	\$ 13.00
M07629	Instruction manual - Triple Plus + IR	\$ 15.00
S011146	Triple Plus + Complete molding set (pumped) *	\$ 203.00
S011148	Triple Plus + Complete molding set (non-pumped) *	\$ 181.00
S011149	Front molding assembly (2-screw battery cover)	\$ 38.00
S011152	Top molding assembly (2-screw battery cover)	\$ 115.00
S011153	Battery cover assembly, 2 screws version & label	\$ 20.00
S011154	Rear molding assembly (2-screw battery cover)	\$ 45.00
S011184	Pump 6V	\$ 248.00
S011298/2	Main PCB with data logging also with display, Triple Plus + (formerly S01884)	\$ 659.00
S011300	Sounder assembly (1993 models onwards) (formerly S01261)	\$ 84.00
S011301	Safety PCB assembly (formerly S01994)	\$ 70.00
S011474	Sensor fixing kit	\$ 14.00
S01231	Pump upgrade kit	\$ 335.00
S01263	Sounder seal/gauze assembly pre 1993 models	\$ 5.50
S01266	Blanking plug kit	\$ 5.50
S01268	Battery cover assembly, c/w screw (single) & label	\$ 20.00
S01269	Rear molding assembly, c/w gaskets & labels	\$ 45.00
S01358	Sounder loom	\$ 10.00
S01359	Main loom	\$ 14.00
S01458	Charger/Interface circuit board	\$ 170.00
S01885	Triple Plus to Triple Plus + upgrade kit	\$ 850.00
S01976	Top molding assembly c/w membrane switch	\$ 115.00