

Oxygen/Combustibles Transmitter

- Both oxygen and combustibles measurements in a single instrument
- Unique architecture – electronics mounted with sensor housing
- Simplified installation
 - no electronics box, probe cable or conduit
 - universal power supply provides automatic line voltage selection
 - adaptable to any O₂/combustibles installation
- Robust, highly integrated electronics
 - surface-mount technology improves reliability and vibration resistance
- Optional explosion-proof rating
- Digital HART® communications
 - AMS/PlantWeb® compatible
- Fully field-repairable



The combustibles analog output is 4-20 mAdc and the combustibles detector range is 0-1000 PPM to 0-5% combustibles. Individual analog signals (4-20 mAdc or 20-4 mAdc, selectable) are provided for oxygen and combustibles. With the option of internally mounted safe barriers on the analog output, the output is intrinsically safe. The OCX offers optional ATEX Hazardous Area certifications.

HART communication is available. The HART protocol is accessible through a Model 375 handheld communicator or through a PC utilizing Asset Management Solutions (AMS) software. The HART protocol provides a link into Emerson Process Management's Plantweb field-based architecture. Instrument technicians can interface with the O₂/combustibles transmitter from the control room or any location where the analyzer's signal wires terminate. Service diagnostics and calibrations can be performed remotely as well. As an option, a Local Operator Interface (LOI) located on the analyzer electronics allows local communications to the electronics. The OCX offers a single alarm output. Optionally, relay outputs for low oxygen level alarm, high combustibles level alarm and unit fail can be provided by a separate HART device.

The arrangement for the measurements is close coupled to the process flue gas and requires no sample conditioning. A sample is drawn from the process stream by an air-operated aspirator. The sample is drawn past the sensors. Dilution air is drawn in and mixes with the flue gas before passing the combustibles sensor.

The OCX offers the unique ability to measure combustibles even with no oxygen left in the flue gas – a key advantage in detecting major combustion upsets such as:

- Burner fouling
- Process tube leaks
- Major variations in fuel BTU values
- Loss of flame events

THE LATEST BREAKTHROUGH FOR COMBUSTION FLUE GAS ANALYSIS

Emerson Process Management Rosemount Analytical is the leader in oxygen flue gas analyzer technology. Our in situ, zirconium oxide oxygen analyzers have long been established as industry standards. Now we've combined the reliability of the zirconium oxide oxygen measurement with the added benefit of a combustibles measurement.

The OCX Oxygen/Combustibles Transmitter is a rugged, industrial analytical instrument designed to detect oxygen and combustibles concentrations in flue gas temperatures up to 2600°F (1427°C). Typical applications include:

- Refinery process heaters
- Petrochemical reactor furnaces
- Small package hot water and steam boilers
- Inert process atmospheres
- Gas and oil boilers

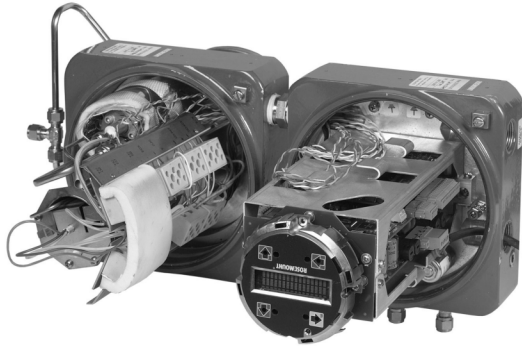
ROSEMOUNT®
Analytical

Visit our website at www.processanalytic.com
On-line ordering available.


EMERSON™
Process Management

THE OCX TRANSMITTER IS COMPLETELY FIELD-REPAIRABLE

The OCX is fully field-repairable. The probe's design provides convenient access to internal probe components and electronics so technicians can service the unit in house. The sensing cell and heater/thermocouple are fully field-replaceable. We offer sample probes in different materials and lengths up to 9 foot for flue gas temperatures up to 2600°F (1427°C).



OCX Housing

The electronics can be mounted on the probe or separate to provide electronics and operator indication at grade level. We have built the oxygen/combustibles measurement around the time-proven Oxymitter oxygen cell and added a combustibles measurement with dilution air. This means the combustibles measurement is valid with or without oxygen in the flue gas stream and is extremely useful in reducing conditions. This situation is ideal for optimization of your fuel/air ratio or indication of your combustion process from a safety standpoint.

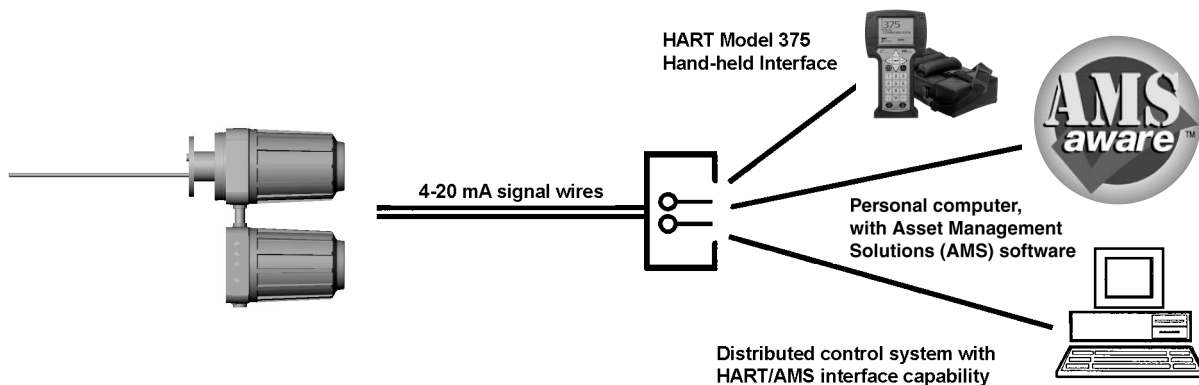


Electronics Housing with Local Operator Interface

OCX OXYGEN/COMBUSTIBLES TRANSMITTER FEATURES AND BENEFITS

Features	Benefits
HART communications	All information from analyzer is updated constantly and provided to the operator or technician. Low cost to maintain
Rapid, accurate, and reliable measurement of excess oxygen and combustibles	Provides inputs for significant fuel savings which normally pay for the analyzer in less than one year
Integrated sensors and electronics simplifies installation	Eliminates costs of mounting separate electronics. Eliminates cabling and conduit between sensors and electronics
Temperature-controlled combustible sensor	Minimize drift and better sensitivity
Field-replaceable cell and heater/thermocouple assembly and plug-in electronics module	Ease of maintenance
Suitable for process temperatures up to 2600°F (1427°C)	Suitable for use in most combustion applications
Probe material of construction 316 LSS, inconel 600 and ceramic	High resistance to corrosion and higher temperatures
Oxygen cell sensitivity increases logarithmically when oxygen decreases	Very useful for low oxygen levels. Ideal for low excess air burners
Automatic line voltage selections	Automatically selects from 90 to 240 VAC and 50/60 Hz. without configuration or setup

Communicate with the OCX almost anywhere via the HART Protocol



SPECIFICATIONS ¹

OCX OXYGEN/COMB TRANSMITTER

Net O₂ Range: 0-1% to 0-40% O₂
Fully field-selectable via HART

Combustibles: 0-1000 ppm to 0-5%
Fully field-selectable via HART

Accuracy:
Oxygen: ± .75% of reading or .05% O₂,
which ever is greater

Combustibles: ± 2% F.S.

System Response to Test Gas:

O₂: 10 sec T90

Combustibles: 25 sec T90

Temperature Limits:

Process: 32° to 2600°F (0° to 1427°C)

Sensors Housing: -4° to 222°F (-20° to 100°C)

Electronics Housing: -4° to 149°F (-20° to 65°C)²

Probe Lengths, Nominal and Approximate Shipping Weights:

18 in (457 mm) package: 54 pounds (24.5 kg)

3 foot (0.91 m) package: 55 pounds (24.5 kg)

6 foot (1.83 m) package: 57 pounds (26 kg)

9 foot (2.74 m) package: 59 pounds (26.8 kg)

Mounting and Mounting Position:

Sensors: Flange

Electronics: Wall/Pipe

Materials:

Probes: 316L stainless steel – 1300°F (704°C)
Inconel 600 – 1832°F (1000°C)
Ceramic – 2600°F (1427°C)

Enclosures: Low-copper aluminum

Calibration: Semi-automatic or automatic

Calibration Gas mixtures recommended:

0.4% O₂, balance N₂
8% O₂, balance N₂
1000 ppm CO, balance N₂
(3 bottles test gas kit 1A99119G04)

Calibration Gas

Flow: 5 scfh (2.5 l/m)

Reference Air: 2 scfh (1 l/m), clean, dry, instrument-quality air (20.95% O₂), regulated to 35 psi (238 kPa)

Eductor Air: 5 scfh (2.5 l/m), clean, dry, instrument-quality air (20.95% O₂), regulated to 35 psi (238 kPa)

Dilution Air: .1 scfh (0.5 l/m), clean, dry, instrument-quality air (20.95% O₂), regulated to 35 psi (238 kPa)

Blowback Air: (Optional) Clean, dry, instrument quality air (20.95% O₂) regulated to 55 psi (374 kPa)

Sensors Housing: NEMA 4X, IP55
Two 3/4" – 14 NPT conduit ports

Electronics Housing: NEMA 4X, IP55
Two 3/4" – 14 NPT conduit ports

Electrical Noise: Meets EN 50082-2 Electromagnetic Compatibility Generic Immunity Std., Part II
Includes ENG 1000 4-R for electrostatic discharge 4 Kv contact, 8 Kv in air
Includes ENG 1000 4-R "Namur-increased" 8 Kv contact, 16 Kv in air
Includes IEC 801-4 fast transients-2 Kv on power supply and control lines

Optional Hazardous

Area Certifications: Without IS Barriers ATEX II 2 G EEx d IIB + H₂ T6 (electronics housing)/T₃(sensor housing)
With IS Barriers ATEX II 2 G EEx d ia IIB + H₂ T6 (electronics housing)/T₃(sensor housing)
The OCX complies with the European Union PED 97/23/EC Directive by virtue of SEP.

Line Voltage: Universal 90 to 240 VAC, 48 to 62 Hz. No switches or jumpers required 3/4" – 14 NPT conduit port


Isolated Output: O₂, 4-20mAdc, 950 ohm maximum with HART capability
COMB, 4-20mAdc, 950 ohm maximum

Logic Signals: (optional) SPA HART ALARM module
Low O₂ alarm
High Comb alarm
Calibration status
Unit failure
Alarm output relay – dry contact, 30mA and 30 VDC capacity

Power Consumption Limits:

Power Consumption of Heaters: 650 W nominal maximum

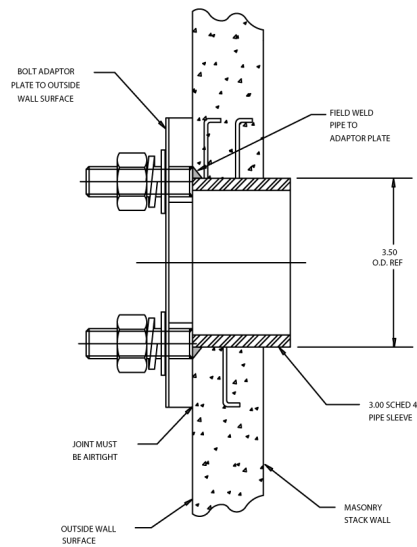
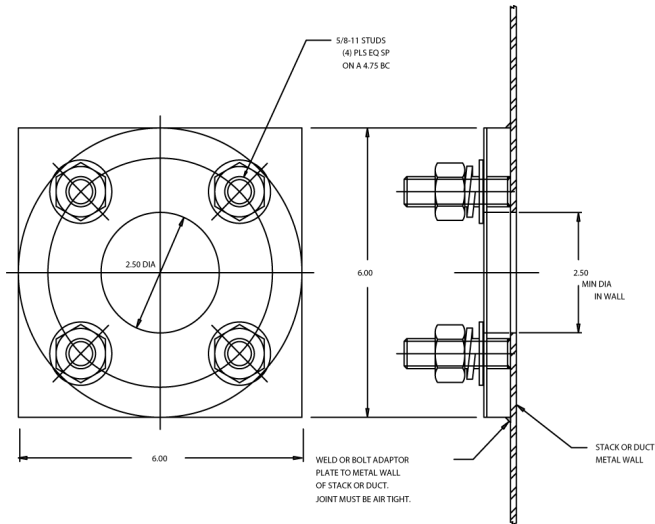
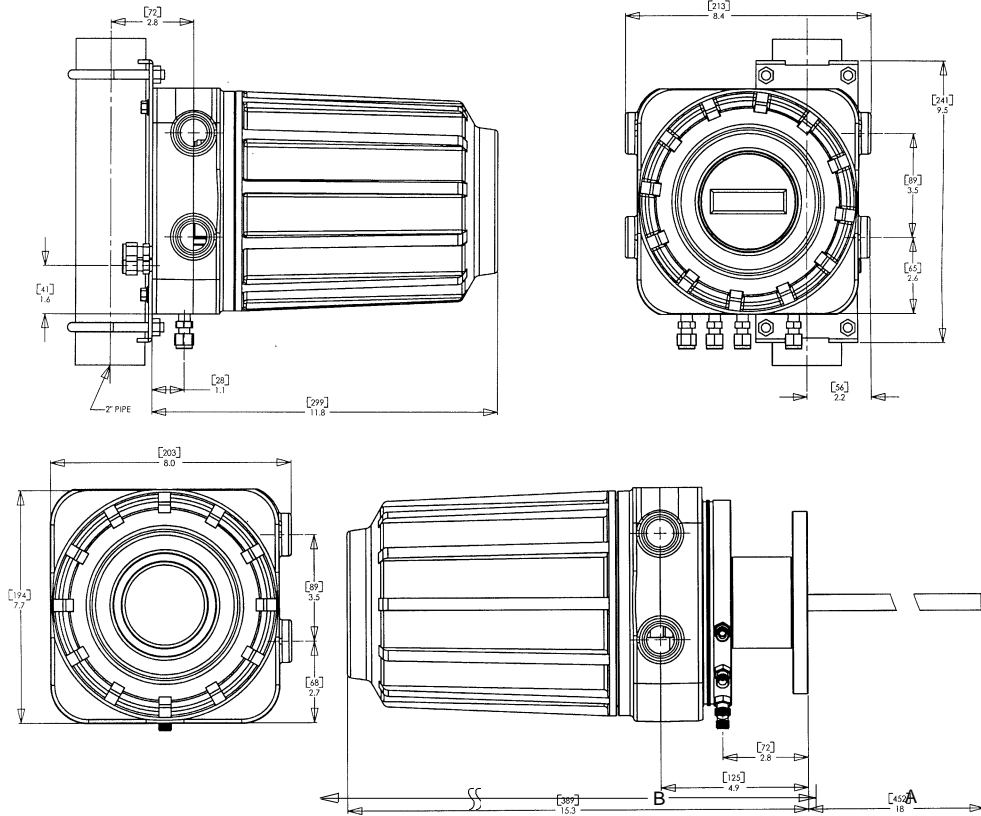
Power Consumption of Electronics: 50 W nominal maximum

 Emerson Process Management has satisfied all obligations coming from the European Legislation to harmonize the product requirements in Europe.

¹ All static performance characteristics are with operating variables constant. Specifications subject to change without notice.

² Operating temperature of electronics inside of electronics housing, as measured by a HART Communicator, or Emerson Process Management Asset Management Solutions software or local operator interface.

OUTLINE DIMENSIONS FOR OCX OXYGEN/COMB TRANSMITTER



	Dimensions Dia. In. (mm)		
	ANSI	DIN	JIS
Flange (x)	6.00 (153)	7.5 (190)	6.5 (165)
StudSize	5/8" – 11	M12 X 1.75	M16 x 2
4 Studs Eq. Sp. on B.C.	4.75 BC	5.12 BC	5.71 BC

	Dim "A" Insertion Depth	Dim "B" Removal Envelope
18 in. (457 mm) Probes	18.00 (457)	34.00 (864)
3 ft. (0.91 m) Probes	36.00 (914)	52.00 (1321)
6ft. (1.83m) Probes	72.00 (1829)	88.00 (2235)
9ft. (2.74 m) Probes	108.00 (2743)	124.00 (3150)

ORDERING INFORMATION FOR GENERAL PURPOSE

Model	Description
OCX44A	Oxygen/Combustibles Transmitter (OCX 4400)

Level 1	Probe Length and Material	
	11	18" (457mm) 316 SS, up to 1300°F (704°C)
	12	3' (0.91m) 316 SS, up to 1300°F (704°C)
	13	6' (1.83m) 316 SS, up to 1300°F (704°C)
	14	9' (2.74m) 316 SS, up to 1300°F (704°C)
	21	18" (457mm) Inconel 600, up to 1832°F (1000°C)
	22	3' (0.91m) Inconel 600, up to 1832°F (1000°C)
	23	6' (1.83m) Inconel 600, up to 1832°F (1000°C)
	31	18" (457mm) Ceramic, up to 2600°F (1426°C)
	32	3' (0.91m) Ceramic, up to 2600°F (1426°C)

Level 2	Probe Mounting Assembly	
	10	ANSI (North American Standard)
	20	DIN (European Standard)
	30	JIS (Japanese Standard)

Level 3	Mounting Hardware (stack side)	
	0	No mounting hardware ("0" must be chosen under Mounting hardware – probe side)
	1	New installation – square weld plate with studs
	2	Mounting to Model 218/240 mounting plate (with Model 218/240 shield removed)
	3	Mounting to existing Model 218/240 support shield
	4	Mounting to other mounting
	5	Mounting to Model 132 adapter plate
	6	Mounting to Ametek WDG-IVC
	7	Mounting to Servomex Xendos 2700
	8	Mounting to Elsag Bailey SMA-90

Level 4	Mounting Hardware (probe side)	
	0	No mounting hardware
	1	Probe only (ANSI)
	4	Probe only (DIN)
	7	Probe only (JIS)

Level 5	Electronic Housing – NEMA 4X, IP66 HART® Communications – Standard	
	01	Basic unit
	02	Local operator interface
	03	Calibration solenoids
	04	IS barrier
	05	Local operator interface and calibration solenoids
	06	Local operator interface and IS barrier
	07	Calibration solenoids and IS barrier
	08	Local operator interface and calibration solenoids and IS barrier

Level 6	Electronic Mounting	
	01	Integral to sensor housing electronics
	02	Split electronics and no cable
	03	Split electronics and 6m (20') cable
	04	Split electronics and 12m (40') cable
	05	Split electronics and 18m (60') cable
	06	Split electronics and 24m (80') cable
	07	Split electronics and 30m (100') cable
	08	Split electronics and 45m (150') cable

Level 7	Flow and Calibration Hardware	
	00	No hardware
	01	Cal-gas rotometer, flow rotometers and reference gas set
	11	Blow-back option and cal-gas rotometer, flow rotometer and reference gas set

ORDERING INFORMATION (Continued)

Option Notes	
General Notes:	<p>Oxygen / Combustibles Transmitter</p> <p>High Sulfur Service.</p> <p>High sulfur cell can be selected for any probe; add a line item note to your purchase order requesting the high sulfur ZrO₂ cell in place of the standard ZrO₂ cell. Add 4232 UOM to the system matrix UOM total.</p> <p>Example: Note: Delete – standard cell P/N 4847B63G01 Add – high sulfur cell P/N 4847B63G02</p> <p>Cell replacement kits for high sulfur service are also available. Consult P/N 4849B94XX in the Combustion Solutions Center Spare Parts list.</p>
Level 1:	<p>Option: 12, 22, 32</p> <p>0.5 / 1 kg/lb. shipping weight</p>
Level 1:	<p>Option: 13, 23</p> <p>1.4 / 3 kg/lb. shipping weight</p>
Level 1:	<p>Option: 14</p> <p>2.3 / 5 kg/lb. shipping weight</p>
Level 2:	<p>Option: 10, 20, 30</p> <p>24.6 / 54 kg/lb. shipping weight</p>
Level 3:	<p>Option: 4</p> <p>Where possible, specify SPS number; otherwise provide details of the existing mounting plate as follows:</p> <p>Plate with studs: Bolt circle diameter, number and arrangement of studs, stud thread, stud height above mounting plate.</p> <p>Plate without studs: Bolt circle diameter, number and arrangement of holes, thread, depth of stud mounting plate with accessories.</p>
Level 5:	<p>Option: 01, 02, 03, 04, 05, 06, 07, 08</p> <p>If the Local Operator Interface (LOI) is not implemented remote access and functionality are available via the HART Model 375 Hand-held Communicator with O₂/Combustibles device descriptor (DD) required.</p>
Level 5:	<p>Option: 04, 06, 07, 08</p> <p>Only the O₂ analog output is available when using the IS Barrier. If the combustible analog output is needed, part number 1A99292H01 must also be ordered and configured.</p>
Level 6:	<p>Option: 05</p> <p>13.5 / 30 kg/lb. shipping weight</p>
Level 6:	<p>Option: 06</p> <p>18 / 40 kg/lb. shipping weight</p>
Level 6:	<p>Option: 07</p> <p>22.5 / 50 kg/lb. shipping weight</p>
Level 6:	<p>Option: 08</p> <p>34 / 75 kg/lb. shipping weight</p>
Level 6:	<p>Option: 03</p> <p>4.5 / 10 kg/lb. shipping weight</p>
Level 6:	<p>Option: 04</p> <p>9 / 20 kg/lb. shipping weight</p>

ORDERING INFORMATION FOR HAZARDOUS AREA

Model	Description
OCX44C	Oxygen/Combustibles Transmitter – Explo-Proof (OCX 4400)

Level 1	Probe Length and Material	
	11	18" (457mm) 316 SS, up to 1300°F (704°C)
	12	3' (0.91m) 316 SS, up to 1300°F (704°C)
	13	6' (1.83m) 316 SS, up to 1300°F (704°C)
	14	9' (2.74m) 316 SS, up to 1300°F (704°C)
	21	18" (457mm) Inconel 600, up to 1832°F (1000°C)
	22	3' (0.91m) Inconel 600, up to 1832°F (1000°C)
	23	6' (1.83m) Inconel 600, up to 1832°F (1000°C)
	31	18" (457mm) Ceramic, up to 2600°F (1426°C)
	32	3' (0.91m) Ceramic, up to 2600°F (1426°C)

Level 2	Probe Mounting Assembly	
	10	ANSI (North American Standard)
	20	DIN (European Standard)
	30	JIS (Japanese Standard)

Level 3	Mounting Hardware (stack side)	
	0	No mounting hardware ("0" must be chosen under Mounting hardware – probe side)
	1	New installation – square weld plate with studs
	2	Mounting to Model 218/240 mounting plate (with Model 218/240 shield removed)
	3	Mounting to existing Model 218/240 support shield
	4	Mounting to other mounting
	5	Mounting to Model 132 adapter plate
	6	Mounting to Ametek WDG-IVC
	7	Mounting to Servomex Xendos 2700
	8	Mounting to Elsag Bailey SMA-90

Level 4	Mounting Hardware (probe side)	
	0	No mounting hardware
	1	Probe only (ANSI)
	4	Probe only (DIN)
	7	Probe only (JIS)

Level 5	Electronic Housing – NEMA 4X, IP66 HART® Communications – Standard	
	01	Basic unit
	02	Local operator interface
	03	Calibration solenoids
	04	IS barrier
	05	Local operator interface and calibration solenoids
	06	Local operator interface and IS barrier
	07	Calibration solenoids and IS barrier
	08	Local operator interface and calibration solenoids and IS barrier

Level 6	Electronic Mounting	
	01	Integral to sensor housing electronics
	02	Split electronics and no cable
	03	Split electronics and 6m (20') cable
	04	Split electronics and 12m (40') cable
	05	Split electronics and 18m (60') cable
	06	Split electronics and 24m (80') cable
	07	Split electronics and 30m (100') cable
	08	Split electronics and 45m (150') cable

Level 7	Flow and Calibration Hardware	
	00	No hardware
	01	Cal-gas rotometer, flow rotometers and reference gas set
	11	Blow-back option and cal-gas rotometer, flow rotometer and reference gas set

ORDERING INFORMATION (Continued)

Option Notes	
General Notes:	<p>Oxygen / Combustibles Transmitter – Explo-Proof High Sulfur Service.</p> <p>High sulfur cell can be selected for any probe; add a line item note to your purchase order requesting the high sulfur ZrO₂ cell in place of the standard ZrO₂ cell. Add 4232 UOM to the system matrix UOM total.</p> <p>Example: Note: Delete – standard cell P/N 4847B63G01 Add – high sulfur cell P/N 4847B63G02</p> <p>Cell replacement kits for high sulfur service are also available. Consult P/N 4849B94XX in the Combustion Solutions Center Spare Parts list.</p>
Level 1:	Option: 12, 22, 32 0.5 / 1 kg/lb. shipping weight
Level 1:	Option: 13, 23 1.4 / 3 kg/lb. shipping weight
Level 1:	Option: 14 2.3 / 5 kg/lb. shipping weight
Level 3:	<p>Option: 4 Where possible, specify SPS number; otherwise provide details of the existing mounting plate as follows:</p> <p>Plate with studs: Bolt circle diameter, number and arrangement of studs, stud thread, stud height above mounting plate.</p> <p>Plate without studs: Bolt circle diameter, number and arrangement of holes, thread, depth of stud mounting plate with accessories.</p>
Level 5:	<p>Option: 01, 02, 03, 04, 05, 06, 07, 08</p> <p>If the Local Operator Interface (LOI) is not implemented remote access and functionality are available via the HART Model 375 Hand-held Communicator with O₂/Combustibles device descriptor (DD) required.</p>
Level 5:	<p>Option: 04, 06, 07, 08</p> <p>Only the O₂ analog output is available when using the IS Barrier. If the combustible analog output is needed, part number 1A99292H01 must also be ordered and configured.</p>
Level 6:	Option: 05 13.5 / 30 kg/lb. shipping weight
Level 6:	Option: 06 18 / 40 kg/lb. shipping weight
Level 6:	Option: 07 22.5 / 50 kg/lb. shipping weight
Level 6:	Option: 08 34 / 75 kg/lb. shipping weight
Level 6:	Option: 03 4.5 / 10 kg/lb. shipping weight
Level 6:	Option: 04 9 / 20 kg/lb. shipping weight

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