TECHNICAL DATA SHEET

Note: For safety, efficiency, and productivity, read and follow the owner’s manual and seek training for everyone who will use this equipment.

Purpose
The CMS-3 monitor detects carbon monoxide (CO) in the blast operator’s breathing-air supply and triggers audible, visual, and vibratory alarms when CO is detected in concentrations of at least 10 parts per million. The alarms alert the operator to an unsafe condition.

Requirements for Operation
• Battery installed in the CMS-3
• 25 ppm calibration gas, calibration cup and connector
• Grade D or ambient-air breathing-air supply for the abrasive blast operator
• Thorough familiarity with the CMS-3 instructions

Description of Operation
OSHA requires Grade D quality breathing air and NIOSH-approved Type CE continuous-flow supplied-air respirators for abrasive blast operators. OSHA regulations call for a maximum exposure limit to carbon monoxide of 10 parts per million (ppm). When the presence of carbon monoxide is detected at this level, the CMS-3 emits an audible alarm, a visible flash, and the unit vibrates. When an alarm occurs, the user should remove the respirator immediately when it is safe to do so. To prolong battery life, turn unit off when not in use; turn unit on and re-install at beginning of work shift.

CMS-3 Features
• Digital liquid crystal display (LCD)
• Audible, visual, and vibrating alarms
• Low battery alarm
• Sensor fail alarm
• Replaceable sensor and battery

Advantages
• Blast operator can work independently. No need to rely upon others to warn operator or take action when monitor alarms. No need for remote alarm; each user is individually protected for instant awareness of a hazardous condition.
• Unit is small, lightweight, and conveniently worn inside blast respirator. Requires no external connections or hoses.
• Unit can be calibrated in minutes, is easily installed, and easily removed.
• Long-life, economical easy-to-replace sensor with estimated sensor life of 2 years.
• Unit uses small commonly-available lithium easy-to-replace battery with estimated life of 3000 hours.
• Microprocessor controlled with digital read-out for accurate readings.

Specifications
OSHA rules dictate that maximum exposure limit to CO for abrasive blasters breathing Grade D air is 10 parts per million.
• Sampling by diffusion
• Operating temperature and humidity range: -4 to 104 degrees F (-20 to 40 degrees C); up to 85 percent relative humidity (non-condensing)
• Alarm points: Low and high alarms factory set at 10 ppm
• Accuracy rating: plus or minus 2 ppm
• Powered by 3-volt coin-type lithium battery (CR2450)
• Continuous operation: approximately 1 year of normal use (3000 hours)
• Unit net weight 1.6 ounces (0.1 lb)
• Dimensions: 2.5” w x 1.7” h x 0.9” d
• Unit calibrated with 25 ppm test gas; optional impurity-free gas available for fresh-air setting
• Over-range condition indicated by audible, vibratory, and visual alarms
• Low-battery warning given by visual flashing indicator
• Dead battery indicated by audible alarm
• System failure warning given by audible alarm
• Attachment to respirator: VELCRO®
• Warranty: 1 year material and workmanship

CMS Series Carbon Monoxide Monitor-Alarm
Model CMS-3 In-Helmet Monitor with Calibration Kit
Stock No. 24612

Actual Size

Model CMS-3 In-Helmet CO Monitor-Alarm
CMS-3 System and Accessories

CMS-3 CO Monitor Package
(-) CMS-3 CO Monitor Package
Includes items with asterisk (*). .................................................. 24612
1. CMS-3 CO Monitor only ......................................................... 24613
2. Calibration Connector Assembly ........................................... 24614
   Includes calibration connector, tubing and cup .................... 24614
3. Test gas, *25 ppm CO ......................................................... 25573
   Impurity free ........................................................................ 11132
4. Calibration cup ................................................................. 24615

Packaging: Monitor enclosed in plastic 3” diameter x 5” jar

Stock No. Carton Dimensions Shipping Wt.
24612 10”W x 12”L x 8-3/4” H 4 lb
24613 6-3/4”W x 11-1/4”L x 3-1/2” H 1 lb

Color: CMS-3: Red and black

Other Available Clemco CO Alarms

Description Stock No.
CMS-1 Wall-Mountable with Calibration Kit ......................... 23017
CMS-2 Field-Portable with Calibration Kit ......................... 22894

Related Clemco Literature

Description Stock No.
CMS-3 Owner's Manual ......................................................... 24658

CMS-3 System and Accessories

CMS-3 CO Monitor Package

Stock No. 24612

Calibration Connector Assembly

Packaging: Monitor enclosed in plastic 3” diameter x 5” jar

Stock No. Carton Dimensions Shipping Wt.
24612 10”W x 12”L x 8-3/4” H 4 lb
24613 6-3/4”W x 11-1/4”L x 3-1/2” H 1 lb

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CMS-3 Owner's Manual ......................................................... 24658

Authorized Distributor:

VELCRO® refers to VELCRO® brand hook and loop fastener.
VELCRO® is a registered trademark of VELCRO Industries B.V.
**TECHNICAL DATA SHEET**

*Note: For safe, efficient blasting, read and follow the owner's manual and seek training for everyone who will use this equipment.*

**Purpose**

The CMS monitor detects carbon monoxide and hydrocarbons in a compressed air supply and triggers visual and audible alarms when CO is detected in concentrations of 10 parts per million. CMS-1 is wall-mountable; CMS-2 is field-portable with integral rugged carrying case. NOTE: CMS monitors do not remove CO or convert CO to CO₂.

**Requirements for Operation**

- Compressed-air source (55 to 145 psi) of Grade D breathing air as defined by the Compressed Gas Association commodity specification: G-7.1 ([www.cganet.net](http://www.cganet.net)).
- Air flow of 0.5 to 0.8 scfh at 55 psi or more to operate and maintain adequate sampling
- Power – 120 volt AC or 12 volt DC. Line cord provided for 120 volt AC; may be conduit wired.

**Description of Operation**

Connect the CMS to the air supply and to an electric power source. The system warms up and stabilizes in about five minutes.

Once stabilized, the unit is operational and continuously monitors the incoming air. The indicator light glows green to indicate adequate air pressure and flow, and that the CO concentration is below 10 ppm. The alarm light glows yellow, and a loud, intermittent alarms sounds if air flow or pressure drops.

The air-quality light turns red and the CMS sounds a loud, constant alarm if CO reaches 10 ppm. To prevent CO poisoning, the operators must immediately remove their respirators and exit the blast environment.

Once the source of CO has been located, and corrected, the CMS will continue to monitor the air and will glow green automatically when the CO has passed out of the air supply.

**Advantages**

- One monitor can serve multiple respirators
- Microprocessor circuit and digital readout provide accurate readings
- Simple, rugged construction for in-plant or field use
- Manual calibration accomplished in minutes
- Long-lasting replaceable sensor
- May be used with 120 volt AC or 12 volt DC power source
- Accommodates optional remote alarm kit

**Approvals and Certifications**

- Meets OSHA requirement for CO monitoring

**Specifications**

- Shielded to reject radio frequency interference
- Includes 10 feet of 1/8-inch tubing and connector fittings
- Electrochemical sensor responds instantly to CO
- CMS-1 has polycarbonate case with impact-resistant clear plastic cover meets NEMA-4 specifications
- CMS-2 has polyethylene case with dual hinges, dual latches, and dust-tight, weather-resistant rubber seal
- Nominal noise rating of 98 dB at distance of one foot for the standard alarm; and 100 dB at distance of 3.1 feet for the optional remote alarm.

**Options and Accessories**

- Humidifier ..........Stock No. 03600
- Remote alarm kit includes: remote alarm, stand, wiring connector, and 50-ft. cord..........Stock No. 22909
- Remote alarm extension cord ..................Stock No. 22910
Related Clemco Literature

<table>
<thead>
<tr>
<th>Description</th>
<th>Stock No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator Safety Equipment</td>
<td>07764</td>
</tr>
<tr>
<td>CMS-1 Owners Manual</td>
<td>23301</td>
</tr>
<tr>
<td>CMS-2 Owners Manual</td>
<td>22925</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Stock No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-)</td>
<td>CMS-1 CO monitor package, includes: monitor, calibration connector, and 10 PPM test gas</td>
<td>23017</td>
</tr>
<tr>
<td>1.</td>
<td>CMS-1 CO monitor includes: monitor and items 3 to 9</td>
<td>23012</td>
</tr>
<tr>
<td>2.</td>
<td>Calibration connector assembly</td>
<td>23011</td>
</tr>
<tr>
<td>3.</td>
<td>Test gas 10 PPM</td>
<td>22865</td>
</tr>
<tr>
<td>4.</td>
<td>Test gas, impurity free</td>
<td>11132</td>
</tr>
<tr>
<td>5.</td>
<td>Regulator /Filter</td>
<td>23013</td>
</tr>
<tr>
<td>6.</td>
<td>Flowmeter</td>
<td>21376</td>
</tr>
<tr>
<td>7.</td>
<td>Horn w/ wire, 12 Volt DC</td>
<td>22922</td>
</tr>
<tr>
<td>8.</td>
<td>Adapter, straight, 1/8&quot; NPT x 1/8&quot; barb</td>
<td>11732</td>
</tr>
<tr>
<td>9.</td>
<td>Adaptor, elbow, 1/8&quot; NPT x 1/8&quot; barb</td>
<td>11733</td>
</tr>
<tr>
<td>10.</td>
<td>Reducer, 1/4&quot; x 1/8&quot;</td>
<td>02026</td>
</tr>
<tr>
<td>(-)</td>
<td>Sensor (not shown)</td>
<td>23015</td>
</tr>
<tr>
<td>(-)</td>
<td>Filter element (not shown)</td>
<td>23014</td>
</tr>
</tbody>
</table>

Color: CMS-2: black case w/ white graphic front
       CMS-1: gray metal enclosure w/ white graphic front
       Optional Remote Alarm: gray metal

Item Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Stock No.</th>
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<tbody>
<tr>
<td>(-) CMS-2 CO monitor/alarm package, includes: monitor, calibration connector, and 10 PPM test gas</td>
<td></td>
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<tr>
<td>120 V AC</td>
<td>22894</td>
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<tr>
<td>12 V DC</td>
<td>25024</td>
</tr>
<tr>
<td>1. CMS-2 CO monitor/alarm (instrument only)</td>
<td>22892</td>
</tr>
<tr>
<td>120 V AC</td>
<td>22892</td>
</tr>
<tr>
<td>12 V DC</td>
<td>25072</td>
</tr>
<tr>
<td>220 V AC</td>
<td>25532</td>
</tr>
<tr>
<td>2. Calibration connector assembly</td>
<td>22939</td>
</tr>
<tr>
<td>3. Test gas 10 PPM</td>
<td>22865</td>
</tr>
<tr>
<td>Test gas, impurity free</td>
<td>11132</td>
</tr>
<tr>
<td>4. Flowmeter</td>
<td>21376</td>
</tr>
<tr>
<td>5. Horn w/ wire, 12 Volt DC</td>
<td>22922</td>
</tr>
<tr>
<td>6. Alarm light, exterior w/ wire</td>
<td>22923</td>
</tr>
<tr>
<td>7. Fitting, 1/4&quot; OD, quick fit</td>
<td>22924</td>
</tr>
<tr>
<td>8. Tubing, urethane, per foot</td>
<td>12475</td>
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<tr>
<td>(-) Sensor (not shown)</td>
<td>22919</td>
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<tr>
<td>(-) Regulator/filter (not shown)</td>
<td>22920</td>
</tr>
<tr>
<td>(-) Filter element (not shown)</td>
<td>22921</td>
</tr>
<tr>
<td>(-) Air-line humidifier</td>
<td>03600</td>
</tr>
</tbody>
</table>

Optional Remote Alarm

<table>
<thead>
<tr>
<th>Description</th>
<th>Stock No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(-) Remote Alarm: includes; alarm, stand, wiring connector and 50 ft. cord</td>
<td>22909</td>
</tr>
<tr>
<td>1. Cable, remote alarm extension 50 feet</td>
<td>22910</td>
</tr>
<tr>
<td>2. Strobe light</td>
<td>22984</td>
</tr>
<tr>
<td>3. Horn</td>
<td>22985</td>
</tr>
<tr>
<td>4. Wiring adaptor</td>
<td>22986</td>
</tr>
<tr>
<td>5. Stand assembly with internal wiring</td>
<td>22987</td>
</tr>
</tbody>
</table>

Packing: Ships in one carton with owner’s manual.

<table>
<thead>
<tr>
<th>Stock No.</th>
<th>Dimensions</th>
<th>Shipping Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>23017</td>
<td>7-1/2&quot; H x 7 1/2&quot; W x 5-1/2&quot; D</td>
<td>8 lb</td>
</tr>
<tr>
<td>23012</td>
<td>7-1/2&quot; H x 7 1/2&quot; W x 5-1/2&quot; D</td>
<td>6 lb</td>
</tr>
<tr>
<td>22894</td>
<td>9-1/4&quot; H x 10 3/8&quot; W x 5&quot; D</td>
<td>9 lb</td>
</tr>
<tr>
<td>22892</td>
<td>9-1/4&quot; H x 10 3/8&quot; W x 5&quot; D</td>
<td>7 lb</td>
</tr>
</tbody>
</table>

Authorized Distributor: