General Specifications

Overview
The Gas Density Meter consists of gas density converter GD402 and gas density detector GD40. The Model GD402 gas density converter and Model GD40 detector not only provide continuous measurement of gas density, but also several other valuable parameters, including specific gravity and molecular weight. The GD40 detector is designed for intrinsically safe and explosion-proof, explosion protected applications. It is designed to be virtually maintenance free for all accepted applications. The Model GD402 is a rugged microprocessor-based converter designed in two versions to meet both general area and explosion-proof application requirements. In addition to the display of several key data items, the converter also provides the choice of three different means for calibration: automatic, semi-automatic and one-touch manual operation.

Features
• Proven design
Highly responsive and sensitive measurement of density. Specific gravity, molecular weight and gas concentration can also be displayed using Yokogawa’s gas density analyzing techniques.

• Detector features
1. Resistant to external vibrations.
2. Outstanding stability against sudden changes in gas temperature.
3. The multi-mode self-oscillation circuit minimizes drift caused by the sensor itself or by oil mist, dust, moisture, etc. sticking to the sensor.
4. Easy cleaning and regeneration of sensor. Should the sensor be contaminated with dust and/or mist, then it can be easily cleaned and returned to its original condition.
5. Only routine maintenance is required. (for example, once per 3 months depending on application.)

• Simple, user-friendly interface
Configuration can be performed locally via the front panel or remotely by using the (optional) “Brain” terminal.

• Low installation cost
Both explosion-proof and general purpose converters are designed for easy mounting on a pipe. Wiring between the detector and converter is based on a two-wire system, keeping installation cost to a minimum.

Only GD402G and GD40G conform to CE marking.
1. General Specification

1.1 System Components

(1) GD40G, T, V, R detector: Rainproof for outdoor use (equivalent to IP65/NEMA 4X)
(see note under “2.2 Ambient condition” on page 3.)
Ambient Temperature: -10 to 60°C
Ambient Humidity: 5 to 95%RH

GD40G: General purpose detector. (Non-Explosion-proof)
Electrical connection: 1/2 NPT female
Process connection: 1/4 NPT female

GD40T: FM Explosion-proof and Intrinsically safe Approval.
Explosion-proof for Class I, Division 1, Groups B, C and D;
Dust Ignition-proof for Class II, III, Division 1, Groups E, F and G with
Intrinsically Safe sensor for Class I, II, III, Division 1, Groups B, C, D, E, F and G.
Enclosure: NEMA Type 4X
Temperature Code: T5
Electrical connection: 1/2 NPT female
Process connection: 1/4 NPT female

GD40V: CSA Explosion-proof and Intrinsically safe Approval.
Explosion-proof for Class I, Division 1, Groups B, C and D;
Dust Ignition-proof for Class II, III, Division 1, Groups E, F and G with
Intrinsically Safe sensor for Class I, II, III, Division 1, Groups B, C, D, E, F and G.
Enclosure: Type 4X
Temperature Code: T5
Electrical connection: 1/2 NPT female
Process connection: 1/4 NPT female

GD40R-J: TIIS Explosion-proof and Intrinsically safe Approval.
Explosion-proof code: Exd [ia] IIB+H2T5
Temperature Code: T5
Electrical connection: G3/4 female
Process connection: Rc1/4

GD40R-K: KOSHA Explosion-proof and Intrinsically safe Approval.
Explosion-proof code: Exd [ia] IIB+H2T5
Temperature Code: T5
Electrical connection: G3/4 female
Process connection: Rc1/4

(2) GD402G, T, V, R Converter: Rainproof for outdoor use (equivalent to IP65 / NEMA 4X)
Ambient Temperature: -10 to 55°C
Ambient Humidity: 5 to 95%RH

GD402G: General purpose converter. (Non-Explosion-proof)
Electrical connection: 21mm (0.9inch) in diameter. Pg13.5 cable glands included

GD402T: FM Explosion-proof Approval.
Explosion-proof for Class I, Division 1, Groups B, C and D;
Dust Ignition-proof for Class II, III, Division 1, Groups E, F and G.
Enclosure: NEMA Type 4X
Temperature Code: T6
Electrical connection: 1/2 NPT female

GD402V: CSA Explosion-proof Approval.
Explosion-proof for Class I, Division 1, Groups B, C and D;
Dust Ignition-proof for Class II, III, Division 1, Groups E, F and G.
Enclosure: Type 4X
Temperature Code: T6
Electrical connection: 1/2 NPT female

Explosion-proof code: Exd IIB+H2T6
Temperature Code: T6
Electrical connection: G3/4 female

GD402R-K: KOSHA Explosion-proof Approval.
Explosion-proof code: Exd IIB+H2T6
Temperature Code: T6
Electrical connection: G3/4 female

(3) EJX310A Absolute press transmitter (optional)
See GS 01C25D01-01EN for EJX310A.
1.2 Characteristics

GD402 specification list

<table>
<thead>
<tr>
<th>Item</th>
<th>Density kg/m³</th>
<th>Density lb/ft³</th>
<th>Specific Gravity</th>
<th>Molecular Weight</th>
<th>Concentration vol%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0 - 6 (compensated) 0 - 60 (physical)</td>
<td>0 - 0.4 (compensated) 0 - 4 (physical)</td>
<td>0 - 5</td>
<td>0 - 140</td>
<td>0 - 100</td>
</tr>
<tr>
<td>Minimum Range</td>
<td>0.1</td>
<td>0.01</td>
<td>0.1</td>
<td>4</td>
<td>Concentration equivalent to 0.100 kg/m³</td>
</tr>
<tr>
<td>Response Time 90%</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
</tr>
<tr>
<td>Linearity</td>
<td>+/-1%FS</td>
<td>+/-1%FS</td>
<td>+/-1%FS</td>
<td>+/-1%FS</td>
<td>+/-1%FS</td>
</tr>
<tr>
<td>Repeatability</td>
<td>+/-0.001 or +/-0.5%FS *1</td>
<td>+/-0.001 or +/-0.5%FS *1</td>
<td>+/-0.001 or +/-0.5%FS *1</td>
<td>+/-0.001 or +/-0.5%FS *1</td>
<td>+/-0.001 or +/-0.5%FS *1</td>
</tr>
<tr>
<td>Long term stability</td>
<td>+/-0.003/month</td>
<td>+/-0.002/month</td>
<td>+/-0.003/month</td>
<td>+/-0.07/month</td>
<td>Concentration equivalent to +/-0.003 kg/m³/month</td>
</tr>
</tbody>
</table>

*1: Whichever is greater

Density is the basic measurement, the other representations are derived from the Density data.

<table>
<thead>
<tr>
<th>Item</th>
<th>Hz in Air vol%</th>
<th>Hz in CO₂ vol%</th>
<th>Air in CO₂ vol%</th>
<th>Caloric value MJ/m³</th>
<th>British Thermal Unit KBTU/ft³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>85 - 100</td>
<td>0 - 100</td>
<td>0 - 100</td>
<td>Caloric value equivalent to 0.100 kg/m³</td>
<td>Caloric value equivalent to 0.100 kg/m³</td>
</tr>
<tr>
<td>Minimum Range</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
</tr>
<tr>
<td>Response Time 90%</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
<td>approx. 5 sec</td>
<td>+/-1%FS</td>
<td>+/-1%FS</td>
</tr>
<tr>
<td>Linearity</td>
<td>+/-1</td>
<td>+/-1</td>
<td>+/-1</td>
<td>+/-0.5%FS</td>
<td>+/-0.5%FS</td>
</tr>
<tr>
<td>Repeatability</td>
<td>+/-0.5</td>
<td>+/-0.5</td>
<td>+/-0.5</td>
<td>+/-0.5%FS or Caloric value equivalent to 0.001 kg/m³ *1</td>
<td>+/-0.5%FS or Caloric value equivalent to 0.001 kg/m³ *1</td>
</tr>
<tr>
<td>Drift</td>
<td>+/-0.5/month</td>
<td>+/-0.5/month</td>
<td>+/-0.5/month</td>
<td>Caloric value equivalent to +/-0.003 kg/m³/month</td>
<td>Caloric value equivalent to +/-0.0025/month</td>
</tr>
</tbody>
</table>

*1: Whichever is greater

Caloric Value and BTU are possible representations of the Density. GD402 does not contain table information, only a single mathematical equation.

1.3 Output Signals

Output 1: 4-20 mA DC
Isolated from inputs; load resistance: 600 Ω maximum
(Load resistance of 250-550 Ω required when in the BRAIN communication mode)

Output 2: 4-20 mA DC
Isolated from inputs; load resistance: 600 Ω maximum

1.4 Power Supply

Rated voltage range: 100 to 240 V AC, 24 V DC
Allowable voltage range: 85 to 264 V AC, 21.6 to 26.4 V DC

Rated frequency: 50 or 60 Hz
Allowable frequency range: 47 to 63 Hz

1.5 Power Consumption

Approximately 12 W.

1.6 Sample gas conditions

Sample gas: All gases except for corrosive gas and acetylene gas

Temperature: -10 to 50°C (non-condensing)
Pressure: 50 kPa to 588.4 kPa (abs)
Gas flow: 0.1 to 1 L/min

1.7 Safety, EMC, and RoHS conformity standards

Installation Altitude: 2000 m or less
Category based on IEC 61010: II (Note)
Pollution degree based on IEC 61010: 2 (Note)

Note: Installation category, called over-voltage category, specifies impulse withstand voltage.
Category II is for electrical equipment.
Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions
which may reduce dielectric strength. Degree 2 is the normal indoor environment.

Safety Standards:
EN 61010-1, EN 61010-2-030
Applied only when GD402G converter is used with
GD40G detector.

EMC Standards:
EN 61326-1 - Class A, Table 2
EN 61326-2-3, EN 61000-3-2, EN 61000-3-3

EMC Regulatory Arrangement in Australia and New Zealand (RCM) EN61326-1 Class A

Korea Electromagnetic Conformity Standard*
*: Applied only when GD402G converter is used with
GD40G detector.
*: Applied only when GD402R converter is used with
GD40R detector.

RoHS: EN 50581

Information of the WEEE Directive
This product is purposely designed to be used in a large scale fixed installations only and,
therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply. The WEEE
Directive is only valid in the EU.

CAUTION

This instrument is a Class A product, and it is designed for use in the industrial environment.
Please use this instrument in the industrial environment only.
2. GD40G,T,V,R Detector

2.1 Material exposed to gas
SUS316 stainless steel, Acrylonitrile Butadiene Rubber and Fluorine-contained Rubber (o-ring)

2.2 Ambient conditions
Temperature: -10 to 60°C (14 to 140°F)
Humidity: 5 to 95%RH
Installation: Pipe-mounted or on panel
Construction: Intrinsically safe, Explosion-proof

Though the detector construction makes it relatively insensitive to sudden changes in the gas temperature, extra precision can be achieved by keeping ambient temperature conditions as constant as possible. In measurements where optimum precision is required it is therefore not recommended to install the detector in an outdoors environment, especially not if such installation is prone to direct sunlight.

2.3 Finish
Cover: equivalent to Munsell 0.6GY3.1/2.0
Case: equivalent to Munsell 2.5Y8.4/1.2

2.4 Weight
Approx. 7 kg (with Pipe-mounting Bracket)

2.5 Detector unit
When the system is ordered to be used as a hydrogen purity analyzer, an optional pressure analyzer is required for pressure compensation.

- If /EJAJ1Ω /EJAF2Ω/EJAF3Ω or EJAF4Ω are ordered, the detector unit and the pressure transmitter and the tubing in between will all be integrated on a single mounting plate. This allows the space where the pressure transmitter is normally mounted to be used effectively for other purposes.

3. GD402G,T,V,R Converter

3.1 Display
Reading: Digital(6 digits maximum)
Data items shown:
- Measured value: Always on display.
- Alarm indications: Abnormal concentration, abnormal pressure range of input and abnormal values of calibration.

Parameters for calibration:
- Time of calibration, settling time, starting time of calibration and calibration cycle
- Self-diagnostic indications:
  - Sensor oscillation shutdown, abnormal oscillation frequency of sensor, failure in sensor temperature detection, failure in A/D conversion stage and memory failure
- Alarm settings: The contact state can be set to either “normally open (NO)” or “normally closed (NC)” depending on the needs of the application.
- Temperature: Temperature of gas being measured

3.2 Contact Outputs/Input
Contact output:
- Signals for Maintenance, Fail, Hi/Lo alarms
- Contact capacity: 250 V AC at 3 A or 30 V DC at 3 A

Contact input:
- Signal for switching between the Hydrogen Purity meter and the Replacement meter

3.3 Calibration
Manual (one touch), Semi automatic, Automatic calibration

3.4 Communication
Protocol: BRAIN communication
Data items that can be transmitted by the hand-held terminal are numerical data, such as concentration, temperature and pressure, alarm set-point and self-diagnostic parameters.

3.5 Ambient Conditions
Temperature: -10 to 55°C (14 to 131°F)
Humidity: 5-95%RH

3.6 Installation
- Non-Explosion-proof models:
  - Pipe-, panel- or wall-mounted
- Explosion-proof models:
  - Pipe-mounted

3.7 Finish
Model GD402G (general purpose):
- Front cover: equivalent to Munsell 0.6GY3.1/2.0
- Case: equivalent to Munsell 2.5Y8.4/1.2

Model GD402R, T, V (explosion-proof):
- equivalent to Munsell 0.6GY3.1/2.0

3.8 Weight
Model GD402G (general purpose): approx. 3 kg (6.6 pounds)
Model GD402T, V, R (explosion-proof): approx. 15 kg (33.1 pounds)
## MODEL and SUFFIX CODES

### 1. Gas Density Converter

**Model** | **Suffix code** | **Option code** | **Description**
--- | --- | --- | ---
GD402G | - - - - - - - - - - - - - - - - - - - - - - - - - | General purpose model, 6 cable glands included.
GD402T | - - - - - - - - - - - - - - - - - - - - - - - - - | FM certified explosion proof model. Gland threads 1/2 NPT. No cable glands included.
GD402V | - - - - - - - - - - - - - - - - - - - - - - - - - | CSA certified explosion proof model. Gland threads 1/2 NPT. No cable glands included.
GD402R | - - - - - - - - - - - - - - - - - - - - - - - - - | TIIS certified explosion proof model. Gland threads G3/4. No cable glands included.

**Power supply**
- **-D** | 24 V DC
- **-A** | 100-240 V AC

**Label and approval**
- **-E** | English label
- **-J** | TIIS approval, English label (only GD402R)
- **-K** | KOSHA approval, English label (only GD402R)

**Instruction Manual**
- **-E** | English
- **-J** | Korean

**Options (only GD402G)**
- **/PA** | Panel mounting
- **/U** | Universal (Pipe and Wall) Mounting
- **/H** | Hood

---

**Note1:** Explosion-proof models, GD402T, V, R have only pipe mounting hardware as standard.

**Note2:** In the case of GD402R, where cables enter into the converter, cable glands specified in cl.3 shall be used.

### GD402 Standard Accessory List

**Model** | **Item** | **Qty** | **Part Number**
--- | --- | --- | ---
GD402G | Fuse | 1 | A1109EF (Power Supply: 100-240 V AC)
|  |  |  | A1111EF (Power Supply: 24 V DC)
| Universal Mount Set | 1 | K9171SS
| Panel Mount Set | 1 | K9171ST
GD402R | Fuse | 1 | A1109EF (Power Supply: 100-240 V AC)
|  |  |  | A1111EF (Power Supply: 24 V DC)
| Bracket | 1 | K9214HD
| Bracket | 1 | K9214HE
| U-Bolt Assy | 2 | D0117XL-A
| Bolt | 1 | Y9835NU
| Bolt | 2 | Y9820NU

### 2-1. Gas Density Detector

**Model** | **Suffix code** | **Option code** | **Description**
--- | --- | --- | ---
GD40G | - - - - - - - - - - - - - - - - - - - - - - - - - | General purpose detector. 1/4 NPT gas threads and 1/2 NPT gland threads. No cable gland included. Mounting hardware included.
GD40R | - - - - - - - - - - - - - - - - - - - - - - - - - | TIIS certified explosion proof detector. Rc1/4 gas threads and G1/2 gland threads. No cable gland included. Mounting hardware included.

**Label approval**
- **-E** | English label, no approval (only GD40G)
- **-J** | TIIS approval, English label (only GD40R)
- **-K** | KOSHA approval, English label (only GD40R)

**Options**
- **/EJAJ1** | TIIS certified EJX mounted with detector on mounting plate. Rc1/4 gas threads and G1/2 gland thread. Cable gland included. (only GD40R)
- **/EJXF5** | KOSHA certified EJX mounted with detector on mounting plate. Rc1/4 gas threads and 1/2 NPT gland thread. No cable gland included. (only GD40G)
- **/EJAJ1T** | TIIS certified EJX mounted with detector on mounting plate. Rc1/4 gas threads and G1/2 gland thread. EJX with TAG (only GD40R)
- **/EJXF5T** | KOSHA certified EJX mounted with detector on mounting plate. Rc1/4 gas threads and 1/2 NPT gland thread. EJX with TAG (only GD40R)
- **/EJAF2** | EJX mounted with detector on mounting plate. 1/4 NPT gas threads and 1/2 NPT gland threads. No cable gland included. (only GD40G)
- **/EJAF2T** | EJX mounted with detector on mounting plate. 1/4 NPT gas threads and 1/2 NPT gland threads. EJX with TAG (only GD40G)
2-2. Gas Density Detector

Style: S1

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GD40T</td>
<td>-</td>
<td>-</td>
<td>FM certified explosion proof detector. 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. Mounting hardware included.</td>
</tr>
<tr>
<td>GD40V</td>
<td>-</td>
<td>-</td>
<td>CSA certified explosion proof detector. 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. Mounting hardware included.</td>
</tr>
</tbody>
</table>

Options

<table>
<thead>
<tr>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/EJAF3</td>
<td>FM certified EJX mounted with detector on mounting plate, 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. (only GD40T)</td>
</tr>
<tr>
<td>/EJAF3T</td>
<td>FM certified EJX mounted with detector on mounting plate, 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. EJX with TAG (only GD40T)</td>
</tr>
<tr>
<td>/EJAF4</td>
<td>CSA certified EJX mounted with detector on mounting plate. 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. (only GD40V)</td>
</tr>
<tr>
<td>/EJAF4T</td>
<td>CSA certified EJX mounted with detector on mounting plate. 1/4 NPT gas threads and 1/2 NPT gland thread. No cable gland included. EJX with TAG (only GD40V)</td>
</tr>
</tbody>
</table>

**GD40□ Standard Accessory**

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-Bolt Assy *1</td>
<td>4</td>
<td>D0117XL-A</td>
</tr>
<tr>
<td>Bracket *1</td>
<td>1</td>
<td>K9214HD</td>
</tr>
<tr>
<td>Bracket *1</td>
<td>1</td>
<td>K9214HE</td>
</tr>
<tr>
<td>Gland *2</td>
<td>1</td>
<td>G9601AM</td>
</tr>
</tbody>
</table>

*1: Not supplied when option code "/EJAF1□", "/EJAF2□", "/EJAF3□" or "/EJAF4□" is specified.

*2: Supplied only for GD40R.

3. Hardware for Connection with External Cables (For Explosion-Proof use)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L9811LL</td>
<td>G3/4 explosion proof cable gland. Cable’s outside diameter 8 to 16 mm. Used for the GD402R converter.</td>
</tr>
</tbody>
</table>

Note: Specify the number of cable glands for converter in hazardous area.

4. Two-Core, Double-Shielded Cable

Normally two conductor shielded cable can be used, but when failure arises from noises disturbance, this cable is recommended for connection between the GD402 converter and GD40 detector.

<table>
<thead>
<tr>
<th>Model</th>
<th>Basic code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDW</td>
<td>-</td>
<td>Two core, double shielded cable, both ends finished with cable pins.</td>
</tr>
<tr>
<td>Length</td>
<td>-</td>
<td>Length in meters, 500 meter maximum.</td>
</tr>
</tbody>
</table>

5. Brain Terminal (Optional)

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT200</td>
<td>-</td>
<td>-</td>
<td>Brain terminal *1</td>
</tr>
<tr>
<td>Printer</td>
<td>-N</td>
<td>-P</td>
<td>Standard type (without printer) With printer</td>
</tr>
<tr>
<td></td>
<td>00</td>
<td>-</td>
<td>Always 00</td>
</tr>
</tbody>
</table>

Options /\□

*1: BT200 has following accessories, two communication cables, one with IC clips and another with alligator clips, handy carrying case and five AA 1.5 V dry batteries.

**OPTIONS FOR BT200**

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
<th>Option codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>/C1</td>
<td>Communication cable *1 With a 5-pin connector(for the signal conditioner)</td>
<td></td>
</tr>
<tr>
<td>/CS1</td>
<td>Intrinsically safe type *1 *2 CSA Intrinsically safe approval Class I, Groups A, B, C and D Temp. Code: T4</td>
<td></td>
</tr>
</tbody>
</table>

*1: Optional code /C1 can not be combined with/CS1.

*2: Applicable only for Model BT200-N00.

See GS 1C0A11-E for “BT200” brain terminal in detail.

6. Pressure transmitter (optional)

/EJAJ1□ means TIIIS certified EJX310A.
/EJAF2□ means general purpose model EJX310A.
/EJAF3□ means FM certified EJX310A.
/EJAF4□ means CSA certified EJX310A.
/EJXF5□ means KOSHA certified EJX310A.

See GS 01C25D01-01EN for “EJX310A” pressure transmitter in detail if a different selection from pre-selected options seems necessary.
**System Configuration**

(for wiring, see Instruction Manual IM11T3E1-01E.)

*1: P1 (Inlet pressure) ≤ Max. 0.5 MPa (71 psi)

*2: P1 (Inlet pressure) - P2 (Outlet pressure) ≥ 0.5 kPa (0.071 psi) (depending on the size and length of the pipe)

*3: Flowrate = 0.1 to 1 L/min

*4: The cylinder pressure must be reduced to P1 (Inlet pressure).

---

**1) Example of Gas density and calorie meters**

*1: P1 (Inlet pressure) ≤ Max. 0.5885 MPa (abs.)

*2: Flowrate = 0.1 to 1 L/min

*3: P1 (Input pressure) - P2 (Output pressure) ≥ 0.5 kPa

*4: The cylinder pressure must be reduced to P1 (Inlet pressure).

---

**2) Example of Hydrogen purity meter**
EXTERNAL VIEWS AND DIMENSIONS

1. GD402G Converter (Non-Explosion-Proof):

   Unit: mm (in.)

   Four holes, 6 mm (0.24) in dia., 8 mm deep M6

   Grounding terminal (4 mm screws)

   Cable inlet (21 mm in dia.)
   Compatible with a PG13.5 cable gland

   Cable gland Connection
   
   A, B • Pressure transmitter
   • Analog output • Contact Input
   C • Detector
   D, E • Contact Output
   F • Power Supply

   Weight: Approx. 3 kg (6.6 pounds)
   (including mounting hardware)
2. Pipe and Wall-Mounting Hardware (Optional)

• Hardware for Pipe Mounting (Option code /U)

Mounting pipe of JIS 50A (60.5 mm in outer dia.)

- 4 - M6 screws
- Weight: Approx. 3 kg

Dimensions of panel cutout

• Hardware for Wall Mounting (Option code /U)

• Hardware for Panel Mounting (Option code /PA)

Optional hardware

Unit: mm (in.)

Weight: Approx. 3 kg

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GS 11T3E1-01E  9th Edition  2019.02.13-00
3. GD402T, V, R Converter (Explosion-proof)

Unit: mm (in.)
Weight: approximately 15 kg
(33.1 pounds)

Approx. 212 (8.3) in dia

Side view from arrow A direction

4-M8, depth 20 mm

Cable glands not included

Approx. 200 (7.9)

Pipe-mounting hardware

Approx. 182 (7.2)

Mounting pipe
of JIS 50 A nominal size
(60.5 mm (2.4) in outer dia.)

(300) (11.8)

Approx. 209 (8.2)

Approx. 173 (6.8)

15 (0.6)

36 (1.4)

Approx. 242 (9.5)

Approx. 212 (8.3) in dia

Grounding terminal
(5 mm (0.2) screw)

65 (2.6)

24 (0.9)

Six wiring holes, G3/4 threaded

Approx. 200 (7.9)

Approx. 182 (7.2)

Approx. 200 (7.9)

Approx. 140 (5.5)

Approx. 15 (0.6)

36 (1.4)

Approx. 242 (9.5)

54 39 24 (0.9)

Cable gland

Connection

A  •  Power Supply
B, C  •  Contact Output
D  •  Detector
E, F  •  Pressure from Transmitter,
•  Analog Output  •  Contact Input

4-M8, depth 16 mm,
one on each side

(Used to fix the
pipe-mounting hardware)

Approx. 242 (9.5)

2-M8, depth 16 mm,
one on each side

(Used to fix the pipe-mounting hardware)

The screw hole for panel installation
on the converter and 20mm deoth.
The bolts attached to the product are
M8 screw and 20mm in length.
4. Detector Unit with mounting plate

- Model: GD40□(-E) /EJAF□(T)
  GD40R-J /EJAJ1(T)

- Detector wiring port:
  - See Table
- EJX wiring port:
  - See Table

- Cable gland is included only in EJAJ1(T)

- Weight: approx. 15 kg (27.8 pounds)

- Unit: mm (in.)

- Option codes:
  - GD40 wiring: G1/2
  - EJX wiring: G1/2
  - Gas out/in:
    - /EJAJ1(T): G1/2, 1/2NPT, 1/4NPT
    - /EJAF2(T): 1/2NPT, 1/2NPT, 1/4NPT
    - /EJAF3(T): 1/2NPT, 1/2NPT, 1/4NPT
    - /EJAF4(T): 1/2NPT, 1/2NPT, 1/4NPT
    - /EJAF5(T): G1/2, 1/2NPT, Rc1/4

5. GD40□ Detector

- Hardware for Pipe Mounting: GD40□

- Grounding terminal:
  - (3 mm (0.11) screw)

- Wiring hole:
  - GD40R: G1/2
  - GD40V: 1/2NPT
  - GD40T: 1/2NPT
  - GD40G: 1/2NPT

- Sample gas inlet:
  - GD40R: Rc1/4
  - GD40V: 1/4NPT
  - GD40T: 1/4NPT
  - GD40G: 1/4NPT

- Sample gas outlet:
  - GD40R: Rc1/4
  - GD40V: 1/4NPT
  - GD40T: 1/4NPT
  - GD40G: 1/4NPT

- Note: Cable gland is included only in GD40R.
WIRING DIAGRAM

(See Instruction Manual IM11T3E1-01E for details on cable installation.)

GD402□ Converter

MAINTENANCE Contact output
14 MAINT
15
16
ALARM Contact output
17 ALM
18
19
FAIL Contact output
20 FAIL
21
22
FUNCTION Contact output
23 SPAN/FUNC
24
25
SELECT GAS Contact output
26 ZERO/SEL GAS
27
28
Power supply 100 to 240 V AC or 24 V DC
29
30
Contact input
31 CONT INP
32 +
33 -
34
35
ANLG OUT1
36 +
37 -
38
39
ANLG OUT2
40 +
41 -
42
43
Isolated 4-20 mA Output with BRAIN Communication
44
45
Isolated 4-20 mA Output
46
47
Pressure Transmitter
48
49
Case grounding terminal
50
51
Intrinsic safety Grounding *1
52
53
Case grounding terminal (grounding resistance 10 Ω or less) *2
54
55
56
Terminal Indication Shield Requirement Requirement

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Indication</th>
<th>Shield</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINTENANCE Contact</td>
<td>MAINT</td>
<td>Unshielded</td>
</tr>
<tr>
<td>ALARM</td>
<td>ALM</td>
<td>Unshielded</td>
</tr>
<tr>
<td>FAIL</td>
<td>FAIL</td>
<td>Unshielded</td>
</tr>
<tr>
<td>FUNCTION Contact</td>
<td>SPAN</td>
<td>Unshielded</td>
</tr>
<tr>
<td>SELECT GAS Contact</td>
<td>ZERO</td>
<td>Unshielded</td>
</tr>
<tr>
<td>Contact input</td>
<td>CONT INP</td>
<td>Unshielded</td>
</tr>
<tr>
<td>Analog output1</td>
<td>ANLG OUT1</td>
<td>Shielded</td>
</tr>
<tr>
<td>Analog output2</td>
<td>ANLG OUT2</td>
<td>Shielded</td>
</tr>
<tr>
<td>Pressure transmitter</td>
<td>SNSR PWR</td>
<td>Shielded</td>
</tr>
<tr>
<td>Detector input</td>
<td>DET INP</td>
<td>Shielded</td>
</tr>
<tr>
<td>Supply</td>
<td>L, N, G</td>
<td>Unshielded</td>
</tr>
</tbody>
</table>

*1 Intrinsic safety grounding
GD402V, GD40V: All wiring should comply with Canadian Electrical Code and Local Electrical Codes.
GD402T, GD40T: All wiring should comply with National Electrical Code and ANSI/NFPA 70 and Local Electrical Codes.

*2 When select GD402T/V/R.

*3 Terminal 26 is connected to the case-grounding terminal.

Cable List

GD402V, GD40V: All wiring should comply with Canadian Electrical Code and Local Electrical Codes.
GD402T, GD40T: All wiring should comply with National Electrical Code and ANSI/NFPA 70 and Local Electrical Codes.

Total resistance should not exceed 50 Ω.
Shield should be grounded at one end only.
Maximum load resistance including wire resistance is 600Ω. When BRAIN communication is used, it is 250 to 550 Ω.
Contact Input Function of the Hydrogen Purity Meter

For hydrogen purity meter, the contact input is used for range selection.

Open: Concentration measurement for air in carbon dioxide
Close: Concentration measurement for hydrogen in carbon dioxide

Contact Output Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Contact Type:</th>
<th>Contact rating:</th>
<th>Contact arrangement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAINT</td>
<td>Voltage free, dry contact</td>
<td>250 V AC 3A or 30 V DC 3A</td>
<td>NO/NC, selectable</td>
</tr>
<tr>
<td>ALM</td>
<td>(mechanical relay contact output)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAIL</td>
<td>Voltage free, dry contact</td>
<td>250 V AC 3A or 30 V DC 3A</td>
<td>NC, fixed</td>
</tr>
<tr>
<td></td>
<td>(mechanical relay contact output)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPAN/FUNC</td>
<td>Function contact; use</td>
<td></td>
<td>NO/NC, selectable</td>
</tr>
<tr>
<td></td>
<td>distinguish between the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrogen purity meter and the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Replacement meter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZERO/SEL GAS</td>
<td>Select gas contact; use</td>
<td>250 V AC 3A or 30 V DC 3A</td>
<td>NO/NC, selectable</td>
</tr>
<tr>
<td></td>
<td>distinguish measuring ranges</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>in the Replacement meter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Contact Type:</td>
<td>Voltage free, dry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contact (mechanical relay</td>
<td>contact output)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>contact output)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GD402 Gas Density Meter Inquiry Form

1. General
   Customer: ___________________________
   Tag No.: ___________________________
   Plant name: ___________________________
   Measuring point: ___________________________
   Purpose of use:
     □ Monitoring □ Control □ Alarm
     □ Transaction □ Other
   Quantity to be measured:
     □ Density, □ Specific gravity,
     □ Molecular weight, □ Caloric value
     □ BTU, □ H₂ in Air, □ Air in CO₂
     □ H₂ in CO₂, □ Concentration
   Measuring range: ___________________________
   Document: □ English

2. Utilities and Installation Conditions
   Power supply: □ V AC □ Hz □ %
   □ 24 V DC
   Instrument air: Pressure ________ □ psi, □ Pa
   Steam supply: Pressure ________ □ psi, □ Pa
   Cooling water: Pressure ________ □ psi, □ Pa
   Distance between gas sampling point and analyzer: ________ m

   Notes:
   ___________________________
   ___________________________
   ___________________________

3. Process Conditions
   Gas component(s): Refer to blew list.
   Pressure at gas sampling point: ________ □ psi, □ kPa
   Temperature at gas sampling point: ________ °C, □ °F
   Quantity of dust: ________ g/m³
   Moisture: □ ________ vol% □ °C, □ °Fsaturated
   Corrosiveness: □ ________ No □ ________ Yes

4. Installation Conditions
   Temperature: ________ °C Maximum, ________ °F Minimum,
   Corrosive gas: □ No □ Yes ________
   Vibration: □ No □ Yes ________
   Location: □ Indoors □ Outdoors

5. Other Specific Items
   ___________________________
   ___________________________
   ___________________________

6. Scope of Estimation
   □ Converter ________ units
   □ Non-explosion-proof
   □ Explosion-proof
   □ Detector ________ units
   □ Gas sampling system (special order) ________ sets
   □ Others ________ sets

<table>
<thead>
<tr>
<th>Gas component(s)</th>
<th>Concentration (vol%)</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nor.</td>
<td>Max.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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Notes:
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