WOODWARD

Product Manual 35205
(Revision -, 5/2022)
Original Instructions

GS40 Mass Flow Metering Leg

Installation and Operation Manual

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26311*, *Revision Status & Distribution Restrictions of Woodward Technical Publications*, on the publications page of the Woodward website:

www.woodward.com

The latest version of most publications is available on the publications page. If your publication is not there, please contact your customer service representative to receive the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside of its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty, thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Contents

Illustrations and Tables

Warnings and Notices

Important Definitions

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control:

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible, as these do not store static electric charges as much as synthetics.

2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:

- Do not touch any part of the PCB except the edges.
- Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
- When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. After removing the old PCB from the control cabinet, immediately place it in the antistatic protective bag.

IMPORTANT

External wiring connections for reverse-acting controls are identical to those for direct-acting controls.

Tampering Notice

NOTICE

Under no circumstances should the fasteners shown in the picture below be loosened or removed by anyone other than an authorized Woodward service provider. Loosening or removing the screws will result in the loss of position calibration, potentially resulting in unsafe operation of the valve. Warranty of the product may be voided if these screws are tampered with.

Regulatory Compliance

European Compliance for CE Marking:
These listings are limited only to those units bearing the CE Marking.

EMC Directive: Declared to Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (EMC).

Pressure Equipment Directive: Directive 2014/68/EU on the harmonisation of the laws of Member States relating to the making pressure equipment available on the market.
PED Category II
PED Module H - Full Quality Assurance
CE-0062-PED-H-WDI 001-20-USA-rev-A, Bureau Veritas SAS (0062)

ATEX Directive: Directive 2014/34/EU on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
Conduit (without flying leads) Versions:
Zone 1: II 2 G Ex db IIB T3 Gb, CSANe 20ATEX1196X
All Versions:
Zone 2: II 3 G Ex ec IIC T3 Gc
Note:
ATEX EU-Type Certificate is limited to Category 2 (Zone 1) and only for conduit entry versions.
See Declaration of Conformity for clarification.

Other European Compliance:
Compliance with the following European Directives or standards does not qualify this product for application of the CE Marking:

ATEX: Exempt from the non-electrical portion of the ATEX Directive 2014/34/EU due to no potential ignition sources per EN ISO 80079-36:2016 for Zone 1 installation.

Machinery Directive: Compliant as partly completed machinery with Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006 on machinery.

RoHS Directive: Restriction of Hazardous Substances 2011/65/EU:
Woodward Turbomachinery Systems products are intended exclusively for sale and use only as a part of Large Scale Fixed Installations per the meaning of Art.2.4(e) of directive 2011/65/EU. This fulfills the requirements stated in Art.2.4(c) and as such the product is excluded from the scope of RoHS2.

Other International Compliance:
These certifications are limited only to those units bearing the appropriate marking.

IECEx: Certified for use in explosive atmospheres per certificate:
IECEx CSA 19.0038X.
Zone 1: Ex db IIB T3 Gb (applies to conduit entry versions)
Zone 2: Ex ec IIC T3 Gc (applies only to conduit entry and flying lead versions)

North American Compliance:
These listings are limited only to units bearing the CSA identification.

CSA: (actuator and driver only)	**All Versions:** Class I, Div 2, Groups A, B, C & D T3 for North America Ex ec IIC T3 Gc for Canada Class I, Zone 2, AEx ec IIC T3 Gc for United States Certificate 70218547 **Special-order Conduit Versions:** Class I, Div 1, Groups C, D T3 for North America Class I, Div 2, Groups A, B, C & D T3 for North America Ex ec IIC T3 Gc for Canada Class I, Zone 2, AEx ec IIC T3 Gc for United States Certificate 70218547

NOTICE

Conduit versions certified for Class I, Div 1 have tighter tolerance flamepath joints than the standard version which is ATEX and IECEx Zone 1 certified. Consult Woodward for the appropriate part number when ordering.

Special Conditions for Safe Use:

Special Conditions for Safe Use (ATEX, IECEx, and CSA):
Wiring must be in accordance with North American Class/Division, or European or other international Zone wiring methods as applicable, and in accordance with the authority having jurisdiction.

Compliance with the Machinery Directive 2006/42/EC noise measurement and mitigation requirements is the responsibility of the manufacturer of the machinery into which this product is incorporated.

Conduit barriers are not required for Zone 2 or Class I, Division 2 installation. A conduit seal must be installed within 457 mm (18 inches) of the conduit entry when the valve is used in Zone 1 or Class I, Division 1 hazardous locations.

Conduit when installed, must retain the IP66 rating by way of use of a suitably rated conduit adapter.

Conduit plugs when installed, must retain the IP66 rating.

Unused entries must be blanked in accordance with special condition to retain the IP66 rating.
Internal field wiring is to be installed in accordance with instructions detailed in this user manual.

Field wiring for the GS Series valves must be suitable for at least 105C for installations using ATEX or IECEx. 115C required for installations using North American (CSA) certification.

Interface temperature between the actuator and valve must not exceed 112C. Equipment is to be used in accordance with instructions in this user manual pertaining to process fluid temperature. This has been satisfied by Woodward when selecting the mating valve and process fluid temperature ratings.

Upon installation, equipment ground terminal is to be connected to earth and continuity confirmed.

For ATEX and IECEx Zone 1 marked units:

- The maximum constructional gap ic of flamepath D, E, F as specified in the manufacturer's drawings are less than the maximum required gap per IEC 60079-1-2014-ED7, Table 2. Flameproof joints are not intended to be repaired.

- GS40 Driver cover captive screws:
  - Class 12.9, M8x1.25x30 mm socket head shall be used on cover to carrier.
  - Class 12.9, M8x1.25x35 mm socket head shall be used on cover to driver.
  - Class 12.9, M8x1.25x100 mm socket head shall be used on housing to carrier.

Note: Refer to the installation chapter of GS40 manual 35136 for required torque values.

⚠WARNING

EXPLOSION HAZARD - Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

AVERTISSEMENT - Risque d'explosion— Ne pas enlever les couvercles, ni raccorder / débrancher les prises électriques, sans vous en assurez auparavant que le système a bien été mis hors tension; ou que vous situez bien dans une zone non explosive.

General EMC Compliance – Special Conditions for Use

To meet EMC regulatory compliance, shielded twisted cable shall be used as specified by the user manual. Shields at both sides shall be connected to earth ground. An AC coupling (shield connected to earth ground via R||C components) shall be ensured on at least at one side (at GS Series valves or opposite cable end). Connect the ground terminal of the GS Series valve to earth ground.

⚠WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 2 or Zone 2 applications.

⚠AVERTISSEMENT

RISQUE D'EXPLOSION—Ne pas enlever les couvercles, ni raccorder / débrancher les prises électriques, sans vous en assurez auparavant que le système a bien été mis hors tension; ou que vous situez bien dans une zone non explosive.

La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, applications Division 2 ou Zone 2.

Chapter 1.
General Information

The Woodward GS40 Mass Flow Metering Leg is an integrated valve, driver, and pressure-sensing unit with the ability to meter gas fuel accurately for low-emissions turbines. To achieve accurate gas fuel metering, a digital position demand signal from the supervisory control must be used. The GS40 valve is capable of CANopen digital communications protocols. The GS40 valve flow characteristics are kept within the valve driver onboard the unit. The position demand from the supervisory control is generated by a calculation based on the pressures, temperature, and other properties of the gas fuel. The pressures are received from the Woodward Smart Pressure Transducer manifold affixed to the flow leg. The pressure transmitter sends the pressure data digitally via an RS-422 protocol to the supervisory control.

Refer to manual 35136 for complete wiring, installation, operation, and maintenance instructions for the GS40 valve.

Refer to manual 26080 for complete wiring, installation, operation, and maintenance instructions for the Smart Pressure Transducer.

Chapter 2.
Installation

Introduction

WARNING

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the Woodward GS40 Mass Flow Metering Leg.

WARNING

The surface of this product can become hot or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

WARNING

External fire protection is not provided in the scope of this product. It is the user's responsibility to satisfy any applicable requirements for their system.

WARNING

The engine, turbine, or other type of prime mover should be equipped with an overspeed, misfire, and detonation detection shutdown device(s), that operate completely independent of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the system fail.

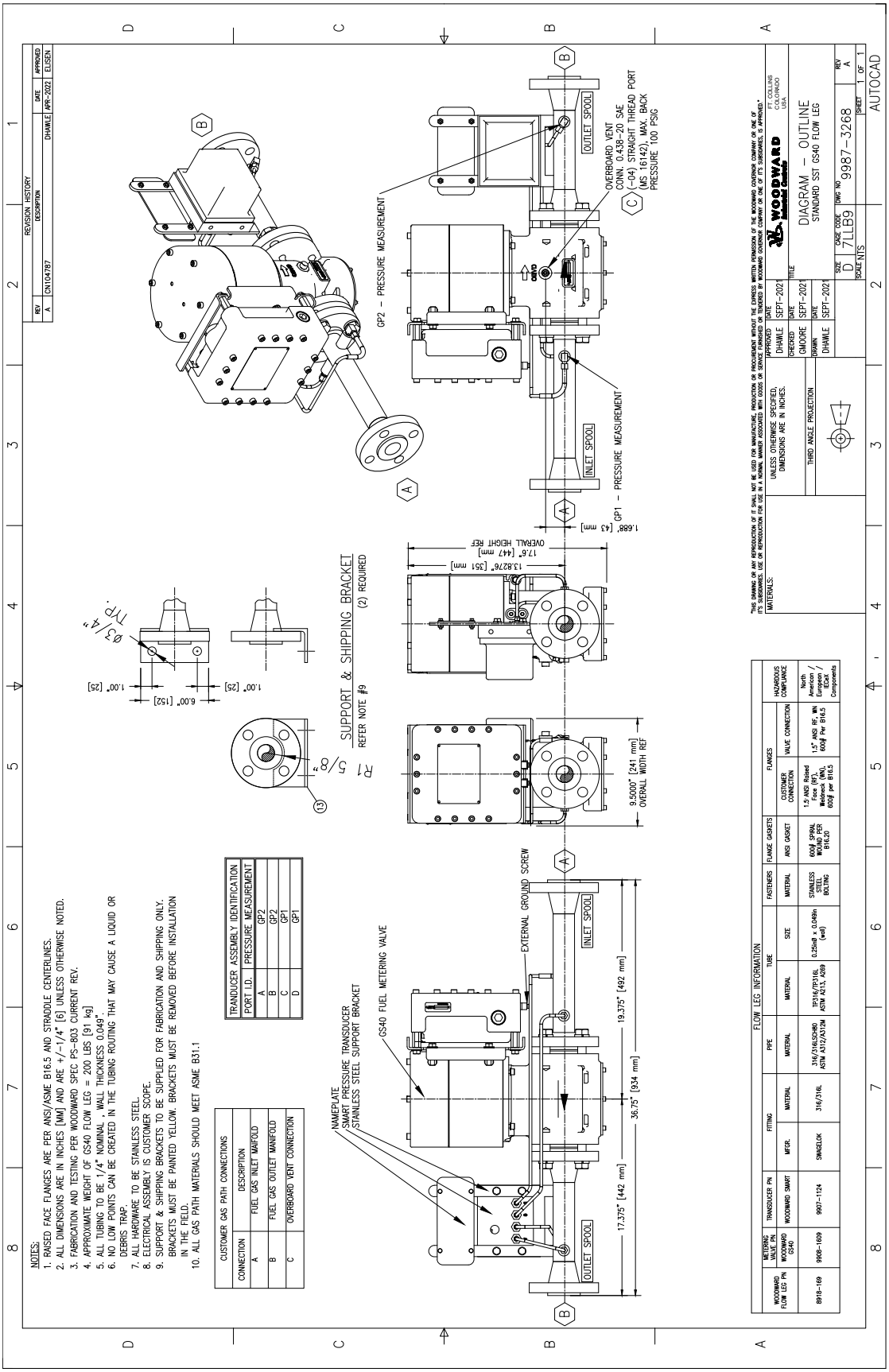

Figure 2-1. Installation Drawing of Standard GS40 Flow Leg

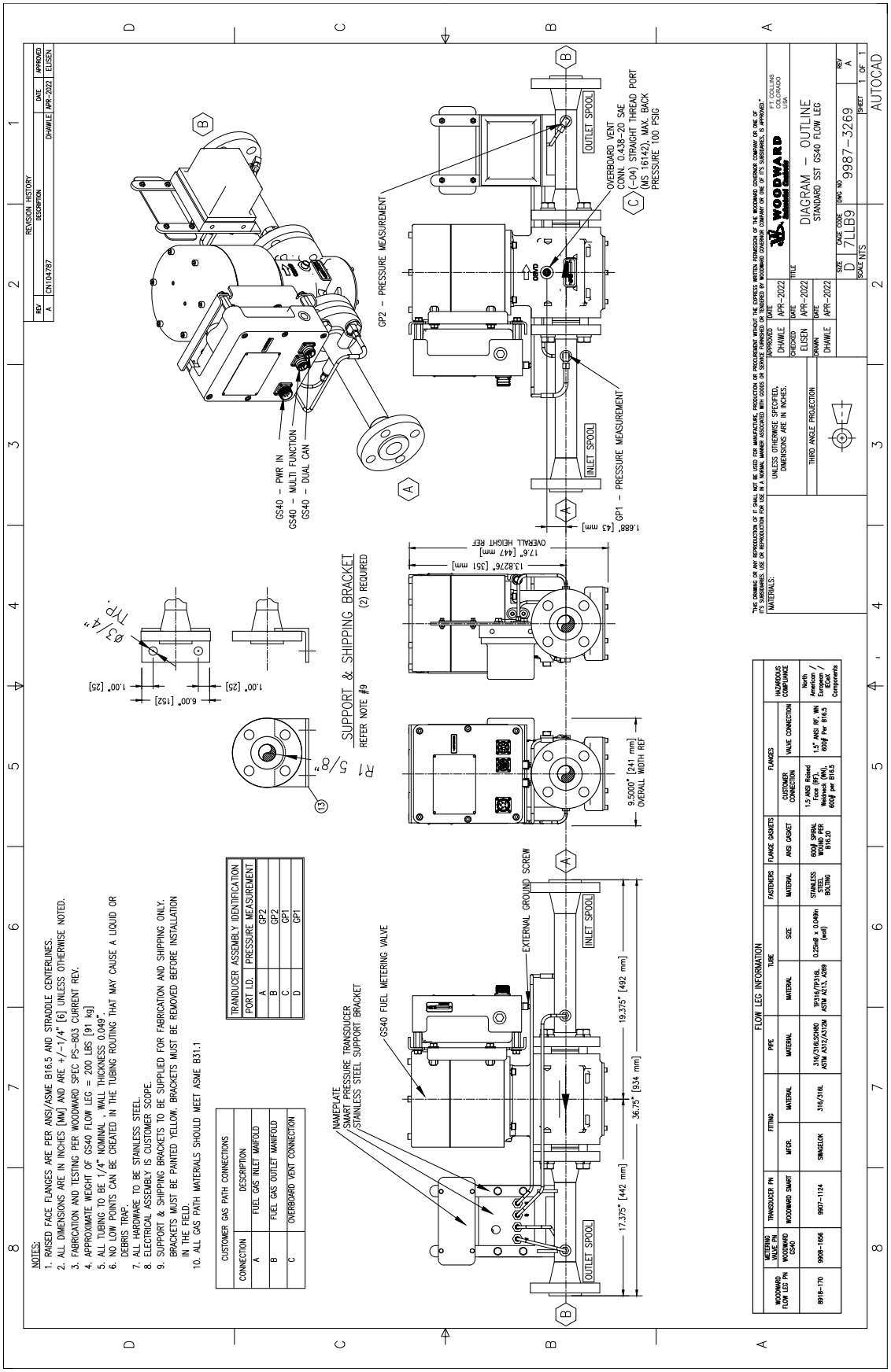

Figure 2-2. Installation Drawing of Standard GS40 Valve with Connectors

Mechanical Installation

Take precautions when unpacking the flow leg. Check the assembly for signs of damage, such as bent or dented covers, scratches, and loose or broken parts. Notify the shipper and Woodward if damage is found.

The Woodward GS40 Mass Flow Metering Leg can be supplied with support and shipping brackets. These brackets are indicated on the appropriate outline drawing and are typically painted a different color (usually yellow). These brackets must be removed from the flow leg prior to installation into the piping.

The Woodward GS40 Mass Flow Metering Leg ships with covers on the pipe flanges and OBVD vent port (GS40 valve). These shipping covers must be removed before installation into the piping system. This will prevent debris from entering the flow leg before final assembly into the fuel system.

Lifting

⚠WARNING

The Woodward GS40 Mass Flow Metering Leg weighs 97 kg (214 lbs.) In order to prevent injury, use a lifting eye that is appropriately rated for the weight of the flow leg assembly for lifting assistance. Alternatively, use a lifting strap when handling the flow leg. Do not lift or handle the unit by conduit, cable, or tubing.

There are two, M8 x 1.25 threaded holes located on the top of all GS Series valves to be used with lifting eyes. Ensure that the lifting eyes used are rated for the full weight of the flow leg assembly.

If lifting straps are used, ensure that the straps do not pinch or bind any pressure tubing, cables, or conduit.

Overboard Drain

The GS40 overboard (OBVD) drain port is a vent between dual redundant shaft seals. It must be connected by means of rigid steel piping to a fuel connection, purge, vent, or flare-off system so as not to be exposed to danger of obstruction, physical damage, or back pressure in excess of 689 kPa (100 psig).

Mounting

The strength of the flow leg mounting structure must be sufficient to support the total weight (up to ~105 kg/ 232 lbs.) of the flow leg.

The GS40 valve is a straight-through type valve. Verify the directional arrow cast into the GS40 valve body points in the desired direction of flow. Verify that the process piping centerline-to-flange-face dimensions meet the requirements of the outline drawings within standard piping tolerances. The valve should mount between the piping interfaces such that the flange bolts can be installed with only manual pressure applied to align the flanges. Mechanical devices such as hydraulic or mechanical jacks, pulleys, chain-falls, or similar should never be used to force the piping system to align with the valve flanges. Follow ASME B16.5 for piping fastener requirements.

Pipe Installation

Flange gasket materials should conform to ASME B16.20. The user should select a gasket material which will withstand the expected bolt loading without injurious crushing, and which is suitable for the service conditions. When installing the valve into the process piping, it is important to properly torque the studs/bolts in the appropriate sequence in order to keep the flanges of the mating hardware parallel to each other. A two-step torque method is recommended. Once the studs/bolts are hand tightened, torque the fasteners in a crossing pattern to half the required torque value. Once all studs/bolts have been torqued to half the appropriate value, repeat the pattern until the rated torque value is obtained. Torque values must be determined from appropriate standards, gasket material, and stud/bolt information.

⚠WARNING

Check all gaseous fuel connections for leaks. Leaking gaseous fuel can cause explosion hazards, property damage, or loss of life.

Orientation

Woodward recommends that the GS40 Mass Flow Metering Leg be installed with the GS40 valve in the upright position and the piping in the horizontal position. The fuel metering leg can be mounted in other orientations as well. Take special care to ensure that tubing low points are minimized. These low points can accumulate condensation, oil and/or debris, which can cause erroneous pressure transducer readings on that channel.

Electrical Installation

WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 2 or Zone 2 applications.

WARNING

Take care not to damage the threads when removing or replacing the covers. Damage to threads or flat surfaces may result in moisture ingress, fire, or explosion. Clean the surface with rubbing alcohol if necessary. Inspect the threads to ensure that they are not damaged or contaminated.

WARNING

For Division 1/Zone 1 products: Proper torque is very important to ensure that the unit is sealed properly.

WARNING

A conduit seal must be installed within 50 mm (2 inches) of the conduit entry of the Smart Pressure Transducer when used in any ATEX classified explosive atmosphere. This is a Category 2, type 'd' flameproof product and type 'd' wiring methods must be maintained in any ATEX explosive atmosphere (Zone 1 or Zone 2).

The GS40 valve requires a conduit seal when used in a Zone 1 or Class I, Division 1 hazardous location. This seal must be installed within 457 mm (18 inches) of the conduit entry.

WARNING

Detailed specifications, requirements, and warnings are included in each component's respective manual.

Refer to manual 35136 for complete wiring, operation, installation, and maintenance instructions for the GS40 valve.

Refer to manual 26080 for complete wiring, operation, installation, and maintenance instructions for the Smart Pressure Transducer.

GS40 Valve Setup/Configuration

Refer to manual 35136 for complete Service Tool setup instructions.

Chapter 3.
Service Options

Product Service Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

- Consult the troubleshooting guide in the manual.
- Contact the manufacturer or packager of your system.
- Contact the Woodward Full Service Distributor serving your area.
- Contact Woodward technical assistance (see “How to Contact Woodward” later in this chapter) and discuss your problem. In many cases, your problem can be resolved over the phone. If not, you can select which course of action to pursue based on the available services listed in this chapter.

OEM and Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Engine Retrofitter (RER)** is an independent company that does retrofits and upgrades on reciprocating gas engines and dual-fuel conversions, and can provide the full line of Woodward systems and components for the retrofits and overhauls, emission compliance upgrades, long term service contracts, emergency repairs, etc.
- A **Recognized Turbine Retrofitter (RTR)** is an independent company that does both steam and gas turbine control retrofits and upgrades globally, and can provide the full line of Woodward systems and components for the retrofits and overhauls, long term service contracts, emergency repairs, etc.

You can locate your nearest Woodward distributor, AISF, RER, or RTR on our website at:
www.woodward.com/directory

Woodward Factory Servicing Options

The following factory options for servicing Woodward products are available through your local Full-Service Distributor or the OEM or Packager of the equipment system, based on the standard Woodward Product and Service Warranty (5-01-1205) that is in effect at the time the product is originally shipped from Woodward or a service is performed:

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime. This is a flat-rate program and includes the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205).

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Charges for the Replacement/Exchange service are based on a flat rate plus shipping expenses. You are invoiced the flat rate replacement/exchange charge plus a core charge at the time the replacement unit is shipped. If the core (field unit) is returned within 60 days, a credit for the core charge will be issued.

Flat Rate Repair: Flat Rate Repair is available for the majority of standard products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be. All repair work carries the standard Woodward service warranty (Woodward Product and Service Warranty 5-01-1205) on replaced parts and labor.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option with the exception that the unit will be returned to you in “like-new” condition and carry with it the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205). This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:

- Return authorization number
- Name and location where the control is installed
- Name and phone number of contact person
- Complete Woodward part number(s) and serial number(s)
- Description of the problem
- Instructions describing the desired type of repair

Packing a Control

Use the following materials when returning a complete control:

- Protective caps on any connectors
- Antistatic protective bags on all electronic modules
- Packing materials that will not damage the surface of the unit
- At least 100 mm (4 inches) of tightly packed, industry-approved packing material
- A packing carton with double walls
- A strong tape around the outside of the carton for increased strength

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Replacement Parts

When ordering replacement parts for controls, include the following information:

- The part number(s) (XXXX-XXXX) that is on the enclosure nameplate
- The unit serial number, which is also on the nameplate

Engineering Services

Woodward offers various Engineering Services for our products. For these services, you can contact us by telephone, by email, or through the Woodward website.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact. Emergency assistance is also available during non-business hours by phoning Woodward and stating the urgency of your problem.

Product Training is available as standard classes at many of our worldwide locations. We also offer customized classes, which can be tailored to your needs and can be held at one of our locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from many of our worldwide locations or from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact us via telephone, email us, or use our website: **www.woodward.com**.

How to Contact Woodward

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory at www.woodward.com, which also contains the most current product support and contact information.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used in Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 8818 5515
Germany:	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (32) 422-5551
Poland	+48 (12) 295 13 00
United States	+1 (970) 482-5811

Products Used in Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 8818 5515
Germany	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+ 82 (32) 422-5551
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used in Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 8818 5515
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+ 82 (32) 422-5551
The Netherlands	+31 (23) 5661111
Poland	+48 (12) 295 13 00
United States	+1 (970) 482-5811

You can also locate your nearest Woodward distributor or service facility on our website at:
www.woodward.com/directory

Technical Assistance

If you need to telephone for technical assistance, you will need to provide the following information. Please write it down here before phoning:

Your Name	
Site Location	
Phone Number	
Fax Number	
Engine/Turbine Model Number	
Manufacturer	
Number of Cylinders (if applicable)	
Type of Fuel (gas, gaseous, steam,	
Rating	
Application	
Control/Governor #1	
Woodward Part Number & Rev. Letter	
Control Description or Governor Type	
Serial Number	
Control/Governor #2	
Woodward Part Number & Rev. Letter	
Control Description or Governor Type	
Serial Number	
Control/Governor #3	
Woodward Part Number & Rev. Letter	
Control Description or Governor Type	
Serial Number	

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

Chapter 4.
Asset Management and Refurbishment Scheduling Period

This product is designed for continuous operation in a typical industrial environment and does not include any components that require periodic service. However, to take advantage of related product software and hardware improvements, we recommend that your product be sent back to Woodward or to a Woodward authorized service facility after every five to ten years of continuous service for inspection and component upgrades. Please refer to the above service programs when returning products.

⚠WARNING

EXPLOSION HAZARD—Remove inputs. To prevent possible serious personal injury or damage to the equipment, be sure that all electric power, hydraulic pressure, and gas pressure have been removed from the GS40 Mass Flow Metering Leg before beginning any maintenance or repairs.

⚠WARNING

EXPLOSION HAZARD—Do not remove covers or connect/disconnect electrical connectors unless power has been switched off or the area is known to be non-hazardous.

Substitution of components may impair suitability for Class I, Division 2 or Zone 2 applications.

⚠WARNING

Due to typical noise levels in turbine environments, hearing protection should be worn when working on or around the GS40 Flow Leg.

⚠WARNING

The surface of this product can become hot or cold enough to be a hazard. Use protective gear for product handling in these circumstances. Temperature ratings are included in the specification section of this manual.

Refer to manual 35136 for complete troubleshooting and maintenance instructions for the GS40 valve.

Refer to manual 26080 for complete field servicing and maintenance instructions for the Smart Pressure Transducer.

Control Specifications

Woodward Part Number	8918-169 8918-170
Electrical Characteristics	
GS40 Electrical Information	Refer to GS40 manual 35136
Smart Pressure Transducer Electrical Information	Refer to Smart Pressure Transducer manual 26080
Mechanical Characteristics	
Weight	105 kg (232 lb)
Mounting	See installation drawings.
Fuel Connections	See installation drawings.
Temperature	
Ambient Operating Temperature	-35C to +93C (–31 to 200 °F)
Fuel Temperature	-35C to +125C (–31 to 257 °F)
Pressure	
Maximum Fuel Pressure	69.0 bar
Pipe Flanges	
ASME Designation	1.5 inch, Class 600, RFWN per ASME B16.5 (inlet and outlet)

Revision History

Revision -

- New manual

Released

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 35205.

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