

DCM and ADCM

332013G

EN

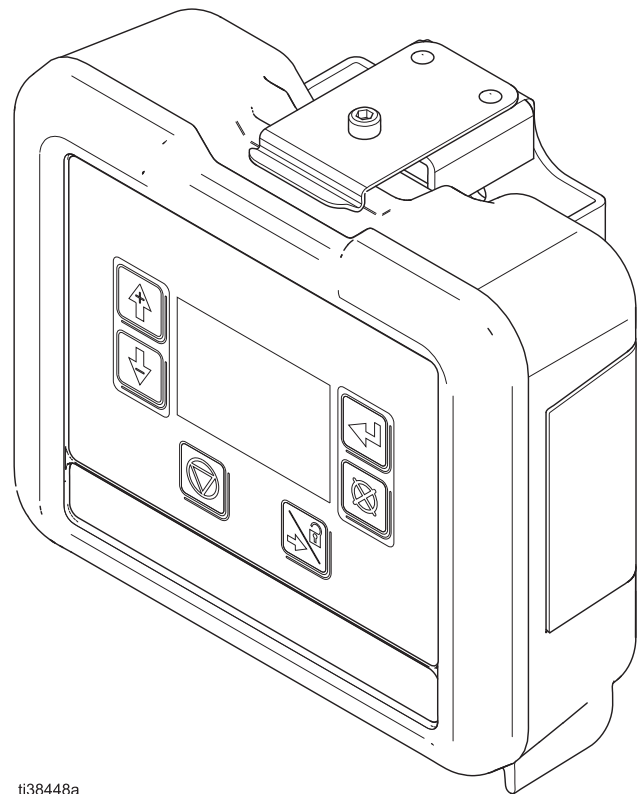
Display Control Module (DCM) and Advanced Display Control Module (ADCM), used to monitor and control flow rate and track material use. For professional use only.

See page 3 for kit information, including approvals.



Important Safety Instructions

Read all warnings and instructions in this manual before using the equipment. Be familiar with the proper control and usage of the equipment. Save these instructions.







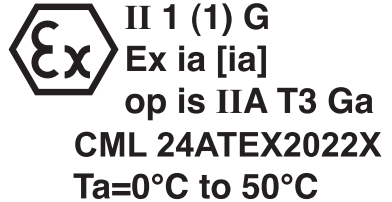
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Contents

Contents	2	Maintenance	11
Models	3	Update Software	11
Safety Symbols	4	Replace Battery	11
General Warning	5	Diagnostic Information	12
Installation	8	Parts	13
Intrinsically Safe	8	Appendix A - Control Drawing 16M169	14
Electrical Connections	8	Mounting Dimensions	20
Grounding	9	Technical Data	21
Connection Port	10	California Proposition 65	21
		Graco Standard Warranty	22
		Graco Information	22

Models

									
The DCM and ADCM are not approved for use in hazardous locations unless the module, all accessories, and all wiring meet local, state, and national codes.									





Approved for Hazardous Location Class I, Div 1, Group D, T3 (North America)☒ Class I, Zone 0, Group IIA, T3 (Europe)		
Model No.	Series	Description
24L096*	A	Display Control Module (DCM)
24L097*	A	Advanced Display Control Module (ADCM)
25B475*	A	Advanced Display Control Module (ADCM)
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;">  <p>9902471</p> <p>Class I, Div.1, Group D T3 Ex ia [ia] Ta=0°C to 50°C</p> <p>Intrinsically Safe Apparatus</p> <p>Part of Intrinsically Safe System.</p> <p>For use in Class I, Division 1, Group D T3 Hazardous Locations</p> <p>See Appendix A - Control Drawing 16M169, page 12 for entity parameters.</p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>Ex ia [ia] op is IIA T3 Ga IECEX CML 24.0021X Ta=0°C to 50°C</p> </div> </div>		

* **NOTE:** These models are not available for sale. They are the base models used in other Graco systems. See your system manual for kit and part information.

Safety Symbols

The following safety symbols appear throughout this manual and on warning labels. Read the table below to understand what each symbol means.

Symbol	Meaning
	Electric Shock Hazard
	Equipment Misuse Hazard
	Fire and Explosion Hazard
	Pressurized Equipment Hazard
	Splash Hazard

Symbol	Meaning
	Ground Equipment
	Follow Pressure Relief Procedure
	Ventilate Work Area
	Eliminate Ignition Sources











Safety Alert Symbol

This symbol indicates: Attention! Become Alert! Look for this symbol throughout the manual to indicate important safety messages.

General Warning

The following warnings apply throughout this manual. Read, understand, and follow the warnings before using this equipment. Failure to follow these warnings can result in serious injury.

 <h2 style="margin: 0;">WARNING</h2>	
   	<p>FIRE AND EXPLOSION HAZARD</p> <p>Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding, page 9 instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are antistatic or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
  	<p>SPECIFIC CONDITIONS OF USE</p> <p>The DCM and ADCM do not provide 500 VAC isolation through the coupling nuts on the enclosure. The associated apparatus and the field apparatus cable shields must not be connected to the DCM or ADCM coupling nuts. To help prevent fire, explosion, or electric shock, equipment must comply with the following conditions.</p> <ul style="list-style-type: none"> • Follow all isolation and grounding instructions. See Grounding, page 9. <p>Static charge may build up on plastic parts during cleaning and could discharge and ignite flammable vapors. To help prevent fire and explosion:</p> <ul style="list-style-type: none"> • Clean plastic parts only in a well ventilated area. • Do not clean with a dry cloth.
 	<p>ELECTRIC SHOCK HAZARD</p> <p>This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock.</p> <ul style="list-style-type: none"> • Turn off and disconnect power at main switch before disconnecting any cables and before servicing or installing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations. • Do not expose to rain. Store indoors



WARNING



INTRINSIC SAFETY







Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements.



- Installation should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electrical Code® (ANSI/NFPA 70).
- Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
- For ATEX, install per EN 60079-14 and applicable local and national codes.
- Equipment that comes in contact with intrinsically safe terminals must meet the entity parameter requirements specified in Control Drawing 16M169. See Appendix A in Manual 332013. This includes safety barriers, DC voltage meters, ohmmeters, cables, and connections. Remove the unit from the hazardous area when servicing.
- If a printer, computer, or other electrical component is connected, it must be used in conjunction with a safety barrier.
- Without the safety barrier, the equipment is no longer intrinsically safe and must not be operated in hazardous locations, as defined in article 500 of the National Electrical Code (USA) or your local electrical code.
- Do not install equipment approved only for non-hazardous location in a hazardous area. See the ID label for the intrinsic safety rating for your model.
- Do not use intrinsically safe equipment with a power supply that has no barrier. Intrinsic safety may be compromised.
- Ground the power supply. A voltage limiting safety barrier must be properly grounded to be effective. For proper grounding, use a 12 gauge minimum ground wire. The barrier’s ground must be within 1 ohm of true earth ground.
- Do not remove any cover until power has been removed.
- Do not substitute system components as this may impair intrinsic safety.



WARNING

  	<p>PRESSURIZED EQUIPMENT HAZARD</p> <p>Fluid from the equipment, leaks, or ruptured components can splash in the eyes or on skin and cause serious injury.</p> <ul style="list-style-type: none"> • Follow the Pressure Relief Procedure when you stop spraying/dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses, tubes, and couplings daily. Replace worn or damaged parts immediately.
 	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer.

Installation

Intrinsically Safe



Do not substitute or modify system components as this may impair intrinsic safety. For installation, maintenance, or operation instructions, read instruction manuals. Do not install equipment approved only for non-hazardous location in a hazardous location. See the identification label for the intrinsic safety rating for your model.

The DCM and ADCM are designed for use with Graco Control Architecture based

systems that have a compatible design. See **Appendix A - Control Drawing 16M169**, page 14, for installation requirements and entity parameters.

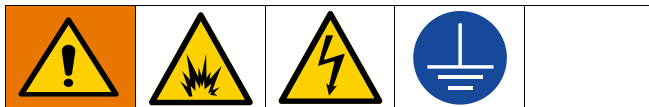
Follow all installation instructions in your system manual.

- Intrinsically safe (IS) equipment should not be used with a power supply that has no barrier.
- Do not move units from a non-intrinsically safe (non-IS) installation to an IS installation.
- IS equipment that has been used with a non-IS power supply must not be returned to a hazardous location.
- Always use an IS power supply with IS equipment.

Electrical Connections

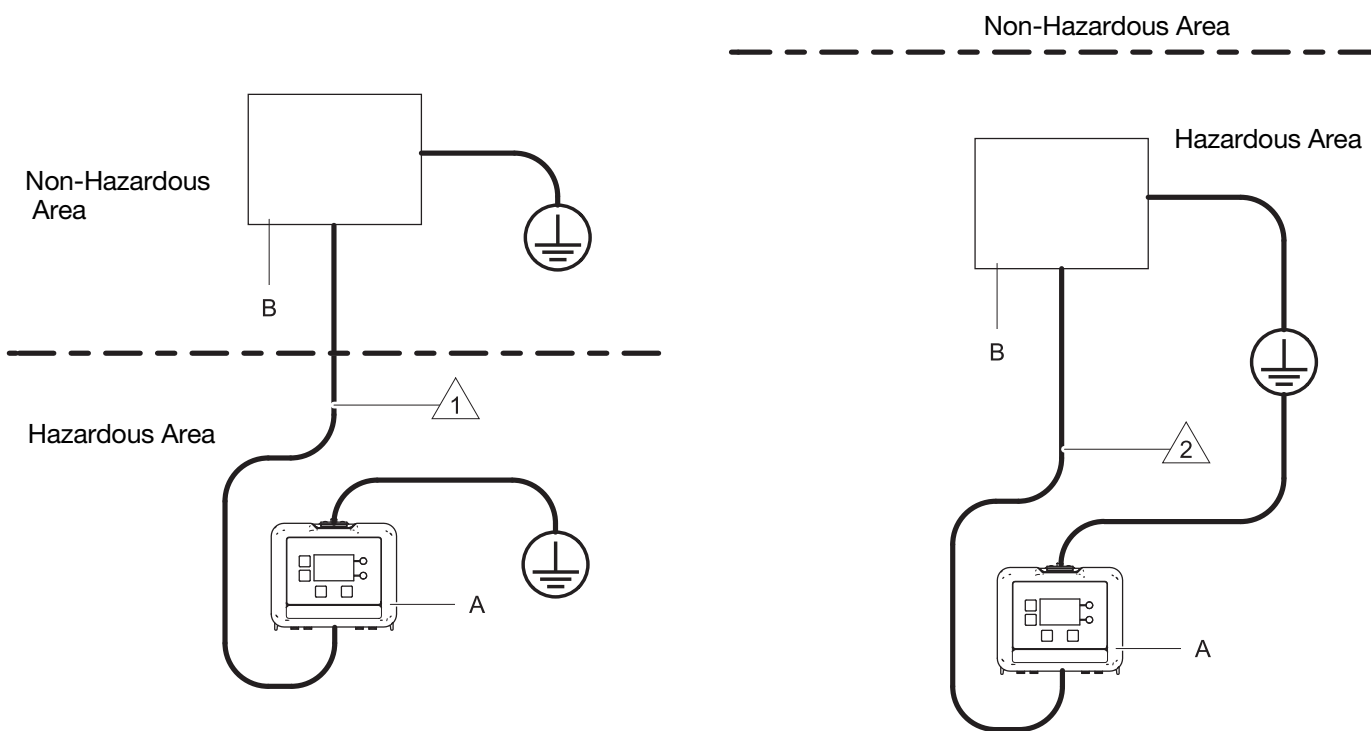
Install per the control drawing in Appendix A.

Grounding



The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

The DCM and ADCM are used in a variety of systems, with varying grounding requirements. Follow all instructions in your system manual.



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Power Supply Located in Non-Hazardous Area

Power Supply Located in Hazardous Area

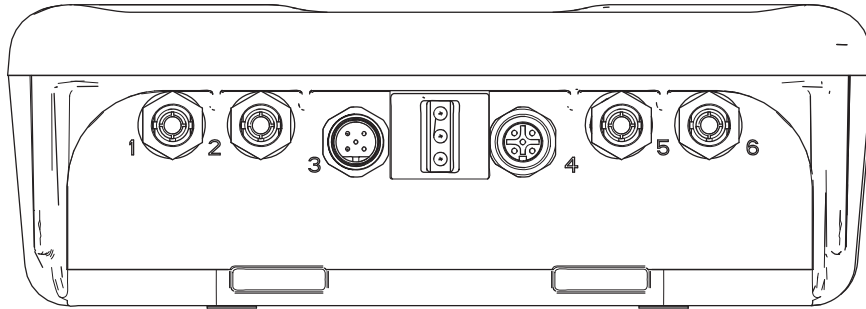
FIG. 1

KEY

- A DCM or ADCM
- B Power Supply and Barrier

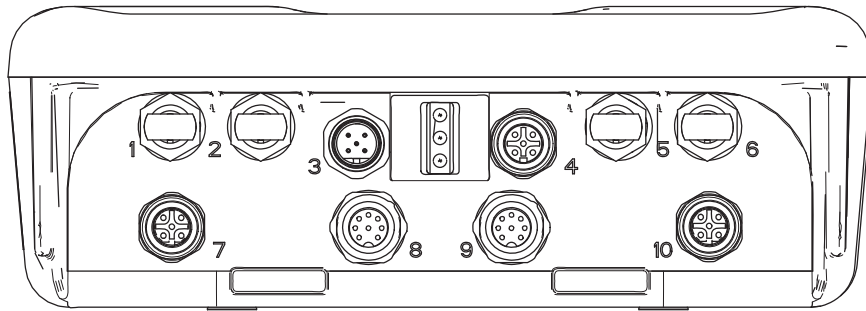
- 1 Power cable CANNOT have cable shield tied to coupling nut. 500 VAC isolation is required. The power cable and circuit board are isolated from the DCM/ADCM enclosure. They have conductive paths to **SEPARATE grounds**.
- 2 Power cable CAN have cable shield tied to coupling nut. Power cable coupling nut and DCM/ADCM have conductive path to **COMMON ground**.

Connection Port



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Fig. 2: Display Control Module (DCM)



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Fig. 3: Advanced Display Control Module (ADCM)

Port	Description
1	Fiber Optic Receiver
2	Fiber Optic Transmitter
3	Power In/CAN Data
4	Digital Input/Output
5	Fiber Optic Receiver
6	Fiber Optic Transmitter
7	Analog Input
8	Analog Output
9	Analog Output
10	Analog Input



Maintenance

Update Software

Manual 3A1244 will accompany any necessary software updates. Follow all instructions and warnings in Manual 3A1244 to update your DCM or ADCM software.

Replace Battery

Replace the battery only if the clock stops functioning after disconnecting power or a power failure.

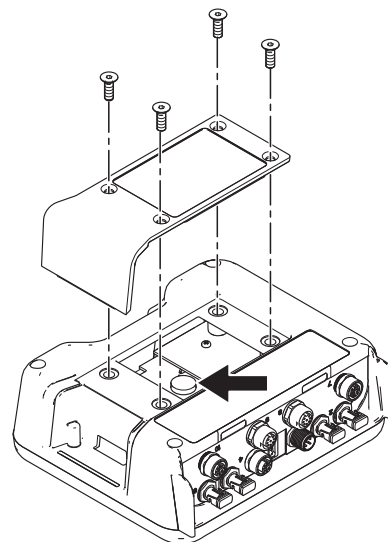
				
<p>Sparking can occur when changing the battery. Replace the battery only in a non-hazardous location, away from flammable fluids or fumes.</p>				

NOTICE

To avoid damaging the circuit board, wear a grounding strap.

1. Disconnect power.
2. Remove the module from the bracket.
3. Attach grounding strap.

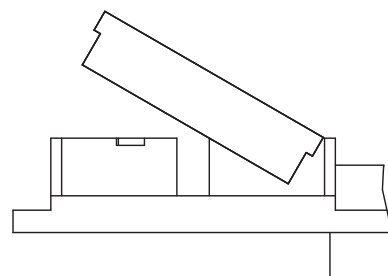
4. Remove 4 screws, and then remove the access cover.



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FIG. 4

5. Use a flathead screwdriver to pry out the old battery.



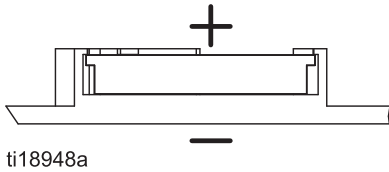
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FIG. 5

NOTE: Dispose of battery properly in an approved container and according to applicable local guidelines.

- Replace with new battery. Ensure battery fits under connector tabs before snapping other end in place.

NOTE: Use only Panasonic CR2032 batteries for replacement.



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- Reassemble access cover and screws.
- Snap the module back into the bracket.

FIG. 6

Diagnostic Information

The LEDs on the bottom of the DCM or the ADCM give important information about system function.

LED Signals

Signal	Description
Green On	DCM or ADCM is powered up.
Yellow	Internal communication in progress.
Red solid	DCM or ADCM failure. See Troubleshooting in your system manual.
Red flashing	Software is updating.
Red flashing slowly	Token error. Remove token and upload software token again.

Appendix A - Control Drawing 16M169



Intertek

9902471

Class I, Div.1,

Group D T3

Ex ia [ia]

Ta=0°C to 50°C



II 1 (1) G

Ex ia [ia]

op is IIA T3 Ga

CML 24ATEX2022X

Ta=0°C to 50°C

Ex ia [ia] op is IIA T3 Ga

IECEX CML 24.0021X

Ta=0°C to 50°C



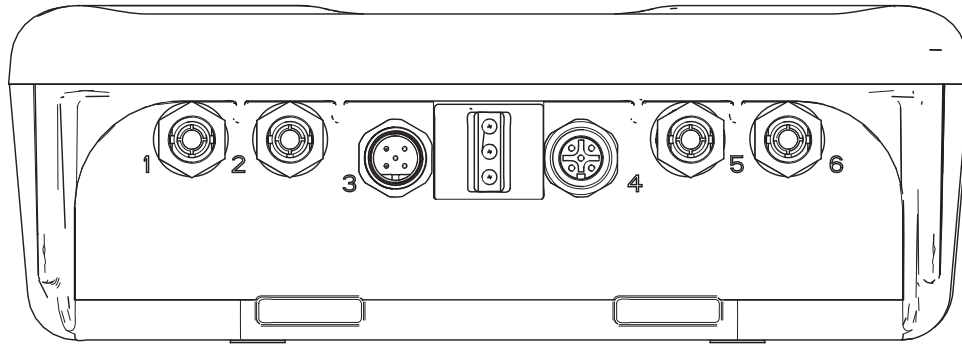
GRACO INC
P.O. Box 1441
Minneapolis, MN 55440
U.S.A.

NOTES:

1. The non-intrinsically safe terminals (power rail) must not be connected to any device which uses or generates more than $U_m=250$ Vrms or DC unless it has been determined that the voltage has been adequately isolated.
2. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70)
3. Installation in Canada should be in accordance with the Canadian Electrical Code, CSA C22.1, Part 1, Appendix F.
4. For ATEX, install per EN 60079-14 and applicable local and national codes,
5. Multiple earthing of components is allowed only if a high integrity equipotential system is realized between the points of bonding.
6. Do not remove any cover until power has been removed.
7. Lithium clock cell: Manufacturer: Panasonic; Part Number: CR2032; No orientation restrictions.
8. For installation, maintenance or operation instructions, see instruction manual.

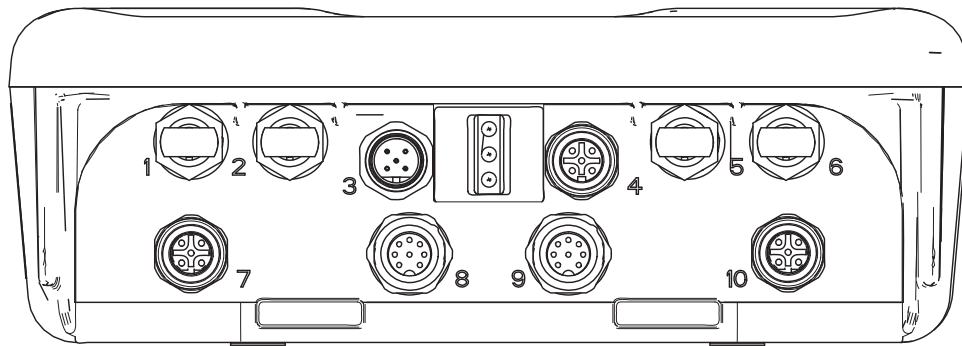
Warning: Substitution of components may impair intrinsic safety.

Avertissement: La substitution de composants peut compromettre la securite intrinseque.



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FIG. 8: DCM View



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FIG. 9: ADCM View

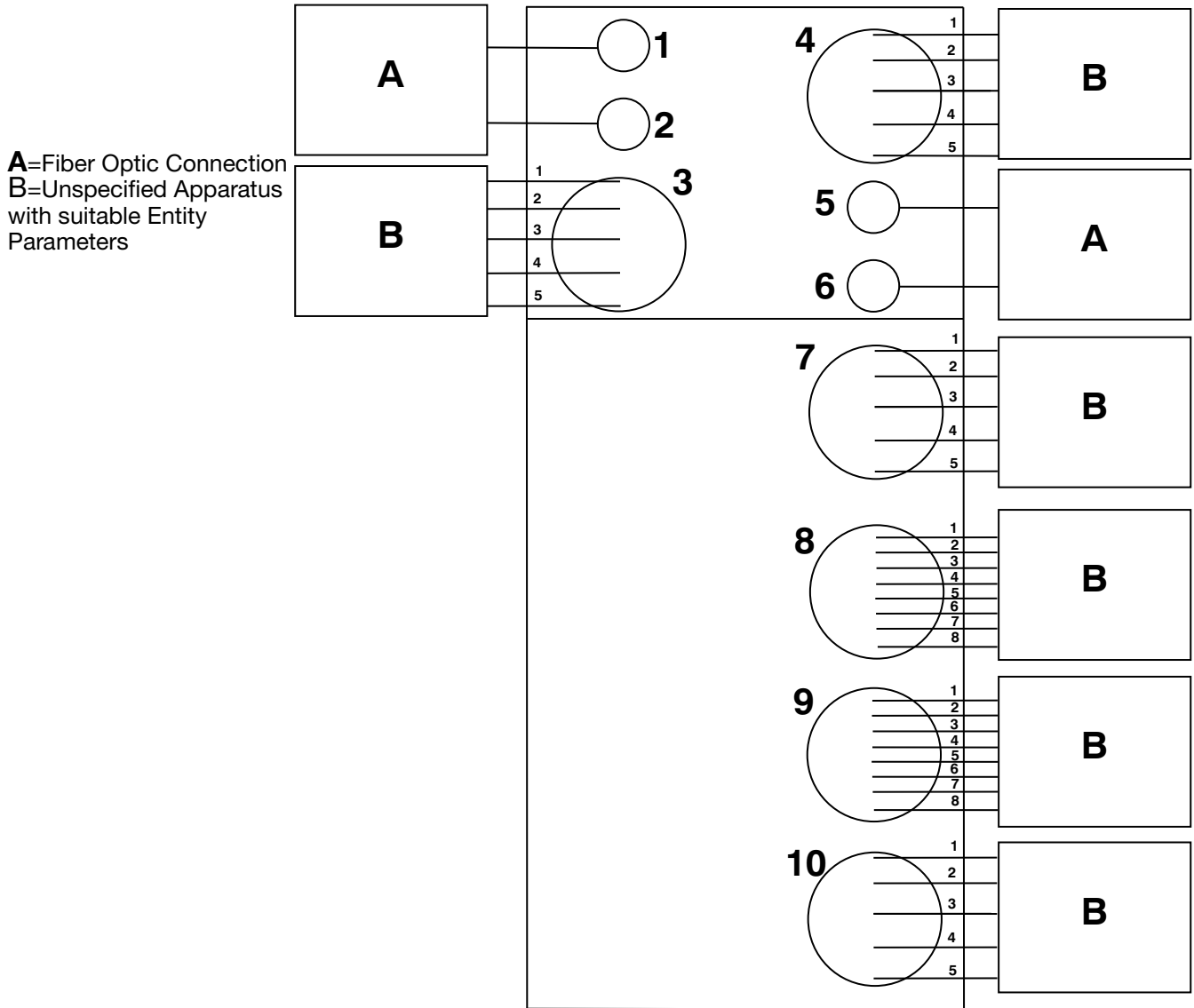
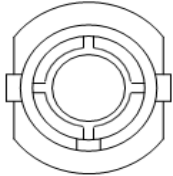


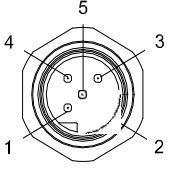
FIG. 10

Calculation Procedures	
Divisions	Zones
$V_{oc} \leq V_{max}$	$U_o \leq U_i$
$I_{sc} \leq I_{max}$	$I_o \leq I_i$
$P_o \leq P_i$	$P_o \leq P_i$
$C_a \geq C_i + C_{cable}$	$C_o \geq C_i + C_{cable}$
$L_a \geq L_i + L_{cable}$	$L_o \geq L_i + L_{cable}$
$L_a/R_a \geq L_i/R_i$	$L_o/R_o \geq L_i/R_i$

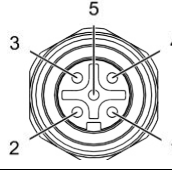
1, 2, 5, and 6: Fiber Optics

	Fiber Optic Receiver A (1) and B (5) Fiber Optic Transmitter A (2) and B (6)
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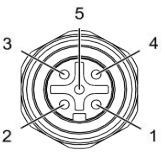
3: CAN Data/Power In Entity Parameters

	IEC (Zones)	CAN Data/Power Input Loads					CAN Data Output Barriers					
		Ui	Ii	Pi	Li	Ci	Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Vmax	Imax	Pi	Li	Ci	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μH	μF	V	mA	mW	μH	μF	μH/Ω
1	CAN Data Low	6.0	780	1170	70	80	5.0	65	35	50000	700	3540
2	VIN	17.9	725	2900	50	2.3	—	—	—	—	—	—
3	VIN Ground	—	—	—	—	—	—	—	—	—	—	—
4	CAN Data High	6.0	780	1170	70	80	5.0	65	35	50000	700	3540
5	Ground	—	—	—	—	—	—	—	—	—	—	—
1±4	CAN Data	6.0	780	1170	70	80	5.0	65	35	50000	700	3540

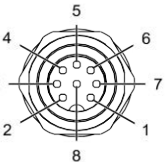
4: Digital I/O A Output Barriers

	IEC (Zones)	Digital I/O A Output Barriers					
		Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μH	μF	μH/Ω
1	DIO_4_1: Power	17.9	100	441	20000	4.8	635
2	DIO_4_2: In	17.9	1	1	20000	4.8	875000
3	DIO_4_3: Out	17.9	101	442	20000	4.8	634
4	DIO_4_4: Out	17.9	101	442	20000	4.8	634
5	DIO_4_5: Ground	—	—	—	—	—	—
1±2	DIO_4: Meter outputs	17.9	101	442	20000	4.8	634
2±4	DIO_4: Regulator outputs	17.9	101	442	20000	4.8	634
1±2±4	DIO_4: Meter and solenoid	17.9	168	731	5000	4.8	378
1±2±3±4	DIO_4: All outputs	17.9	217	937	5000	4.8	292

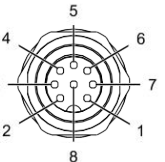
7: Differential Analog Input

	IEC (Zones)	Differential I/O A Output Barriers					
		Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μH	μF	μH/Ω
1	mV_7_1: Power	5.88	60	88	50000	700	3250
2	mV_7_2: Neg	5.88	1	1	50000	700	325000
3	mV_7_3: Ground	—	—	—	—	—	—
4	mV_7_4: Pos	5.88	1	1	50000	700	325000
5	mV_7_5: Shield	—	—	—	—	—	—
1±2±4	mV_7: All outputs	5.88	61	90	50000	700	3190

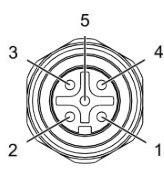
8: 4–20 mA Output A

	IEC (Zones)	4–20 mA Output A					
		Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μH	μF	μH/Ω
1	FC_8_1: Ground	—	—	—	—	—	—
2	FC_8_2: Ground	—	—	—	—	—	—
3	FC_8_3: Ground	—	—	—	—	—	—
4	FC_8_4: Ground	—	—	—	—	—	—
5	FC_8_5: FCA	17.9	124	540	15000	2	516
6	FC_8_6: Ground	—	—	—	—	—	—
7	FC_8_7: Ground	—	—	—	—	—	—
8	FC_8_8: Ground	—	—	—	—	—	—

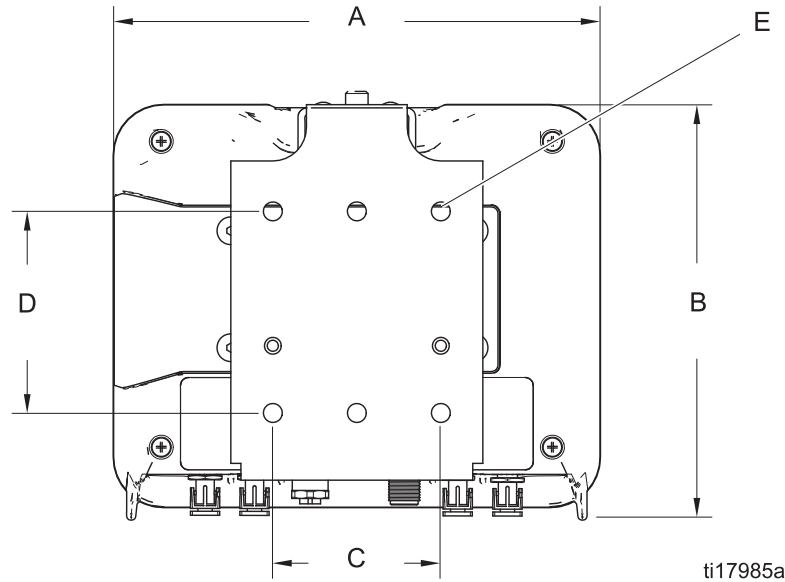
9: 4–20 mA Output B

	IEC (Zones)	4–20 mA Output B					
		Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μH	μF	μH/Ω
1	FC_9_1: Ground	—	—	—	—	—	—
2	FC_9_2: Ground	—	—	—	—	—	—
3	FC_9_3: Ground	—	—	—	—	—	—
4	FC_9_4: Ground	—	—	—	—	—	—
5	FC_9_5: FCB	17.9	124	540	15000	2	516
6	FC_9_6: Ground	—	—	—	—	—	—
7	FC_9_7: Ground	—	—	—	—	—	—
8	FC_9_8: Ground	—	—	—	—	—	—

10: Differential Analog Input B

	IEC (Zones)	Differential I/O B Output Barriers					
		Uo	Io	Po	Lo	Co	Lo/Ro
	ISA (Divisions)	Voc	Isc	Pt	La	Ca	La/Ra
PIN	Units	V	mA	mW	μ H	μ F	μ H/ Ω
1	mV_7_1: Power	5.88	60	88	50000	700	3250
2	mV_7_2: Neg	5.88	1	1	50000	700	325000
3	mV_7_3: Ground	—	—	—	—	—	—
4	mV_7_4: Pos	5.88	1	1	50000	700	325000
5	mV_7_5: Shield	—	—	—	—	—	—
1±2±4	mV_7: All outputs	5.88	61	90	50000	700	3190

Mounting Dimensions



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FIG. 11

A Overall Width in. (mm)	B Overall Height in. (mm)	Overall Depth in. (mm)	Mounting Dimensions Width (C) x Height (D) in. (mm)	E Mounting Hole Size in. (mm)
7.2 (183)	6.0 (152)	2.8 (71)	2.5 x 3.0 (64 x 76)	0.28 (7)

Technical Data

DCM and ADCM	US	Metric
Operating Temperature	32° to 122°F	0° to 50°C
Storage Temperature	-22° to 140°F	-30° to 60°C
Non-Hazardous Location Power Supply Requirements	15 VDC, 500 mA Minimum	
NOTE: Use recommended power supply PN 16V680		
Weight		
DCM	1 lb	0.45 kg
ADCM	1.5 lb	0.68 kg
Mounting Bracket	1 lb	0.45 kg
Mounting Bracket Material	Painted and zinc-plated carbon steel. Contains less than 10% by mass of aluminum+magnesium+titanium+zirconium, AND Contains less than 7.5% by mass of magnesium+titanium+zirconium	
Humidity	0 to 95 percent, non-condensing	
Display housing is solvent resistant.		

California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The Parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés, à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

To place an order, contact your Graco Distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

All written and visual data contained in this document reflects the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice.

Original instructions. This manual contains English. MM 332013

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