Technical Information

Process Gas Chromatograph
GC8000
Installation Manual

TI 11B08A01-01E

Contents

25th Edition Sep. 2024(YK)

Introduction

This manual describes the installation of the GC8000 Process Gas Chromatograph.
Please read the following documents before installing and using the GC8000 system.

Documents Related to the GC8000 Process Gas Chromatograph

User's manuals

The product comes with the following user's manuals.
(The last "E" in the document number is the language code.)

- **User's manuals that do not depend upon the specifications of the product:**
  GC8000 Process Gas Chromatograph (IM 11B08A01-01E)
- **User's manuals that are attached depending on specifications of the product:**
  Process Gas Chromatograph GC8000 Installation Manual (TI 11B08A01-01E, this manual)
- **User's manuals for related products:**
  PCAS PC Analyzer Server Software (IM 11B06B01-01E)
  ASET Analyzer Server Engineering Terminal Software (IM 11B06C01-01E)
  ASGW Analyzer Server Gateway Software (IM 11B06E01-01E)
  ASIU Analyzer Server Interface Unit Software (IM 11B06F01-01E)
  GCVT Virtual Tech Software (IM 11B08C02-01E)
  ANABUS Ethernet System Redundancy Setting Manual (TI 11B03A03-14E)

Operation Data

Operation data is supplied with the operation manuals in the delivered package and contains the following application specific information required to use the GC8000 Process Gas Chromatograph.

- Process conditions and measurement range
- Instrument specifications and operating conditions
- Standard sample for calibration
- Column system and column
- Miscellaneous data
  Chromatogram, base line, repeatability, etc.
- Analyzer flow diagram and installation
- Parts composition table
- General connection diagram
- Sampling system diagram (when supplied by Yokogawa)

Notice

This Manual provides technical information for installing a GC8000 at site.

When installing or checking the installation of the GC8000, read the precautions carefully.

Regarding This Manual

- This Manual should be passed on to the end user.
- Read this manual carefully and fully understand how to operate this product before you start operation.
- All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- The contents of this manual are subject to change without prior notice.
- Great effort has been made to ensure that the descriptions in this Manual are correct. However, if you notice any error or inconsistency, please inform Yokogawa Electric Corporation.

Regarding Protection, Safety, and Prohibition Against Unauthorized Modification

- For the protection and safe use of the product and the system controlled by it, be sure to follow the safety instructions described in this manual. Safety is not guaranteed if you do not follow these instructions.
- The following safety symbol marks are used on the product concerned or in this Manual:

WARNING

A WARNING sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death of personnel.

CAUTION

A CAUTION sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

IMPORTANT

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

NOTE

Draws attention to information essential for understanding the operation and features.

TIP

Gives information that complements the present topic.

Protective ground terminal:

In order to provide protection against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

Function ground terminal:

In order to provide protection against noise. This symbol indicates that the terminal must be connected to ground prior to operation of equipment.

- If protection/safety circuits are to be used for the product or the system controlled by it, they should be installed outside of the product.
- When you replace parts or consumables of the product, use those specified by us.
- Do not modify the product.

Exemption from Responsibility

- Yokogawa Electric Corporation does not make any warranties regarding the product except for those mentioned in the WARRANTY that is provided separately.
- Yokogawa Electric Corporation assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

Trademark Acknowledgments

- Ethernet is a registered trademark of XEROX Corporation.
- All other company and product names mentioned in this user's manual are trademarks or registered trademarks of their respective companies.
- We do not use TM or ® mark to indicate those trademarks or registered trademarks in this user's manual.

ATEX Documentation

The procedure is only applicable to the countries in European Union.

GB

All instruction manuals for ATEX Ex related products are available in English, German and French. Should you require Ex related instructions in your local language, you are to contact your nearest Yokogawa office or representative.

DK

Alle brugervejledninger for produkter relateret til ATEX Ex er tilgængelige på engelsk, tysk og fransk. Skulle De ønske yderligere oplysninger om håndtering af Ex produkter på eget sprog, kan De rette henvendelse herom til den nærmeste Yokogawa afdeling eller forhandler.

I

Tutti i manuali operativi di prodotti ATEX contrassegnati con Ex sono disponibili in inglese, tedesco e francese. Se si desidera ricevere i manuali operativi di prodotti Ex in lingua locale, mettersi in contatto con l'ufficio Yokogawa più vicino o con un rappresentante.

E

Todos los manuales de instrucciones para los productos antiexplosivos de ATEX están disponibles en inglés, alemán y francés. Si desea solicitar las instrucciones de estos artículos antiexplosivos en su idioma local, deberá ponerse en contacto con la oficina o el representante de Yokogawa más cercano.

NL

Alle handleidingen voor producten die te maken hebben met ATEX explosiebeveiliging (Ex) zijn verkrijgbaar in het Engels, Duits en Frans. Neem, indien u aanwijzingen op het gebied van explosiebeveiliging nodig hebt in uw eigen taal, contact op met de dichtstbijzijnde vestiging van Yokogawa of met een vertegenwoordiger.

SF

Kaikkien ATEX Ex -tyyppisten tuotteiden käyttöhjeet ovat saatavilla englannin-, saksan- ja ranskankielisinä. Mikäli tarvitsette Ex -tyyppisten tuotteiden ohjeita omalla paikallisella kielellännne, ottakaa yhteyttä lähimpään Yokogawa-toimistoon tai -edustajaan.

P

Todos os manuais de instruções referentes aos produtos Ex da ATEX estão disponíveis em Inglês, Alemão e Francês. Se necessitar de instruções na sua língua relacionadas com produtos Ex, deverá entrar em contacto com a delegação mais próxima ou com um representante da Yokogawa.

F

Tous les manuels d'instruction des produits ATEX Ex sont disponibles en langue anglaise, allemande et française. Si vous nécessitez des instructions relatives aux produits Ex dans votre langue, veuillez bien contacter votre représentant Yokogawa le plus proche.

D

Alle Betriebsanleitungen für ATEX Ex bezogene Produkte stehen in den Sprachen Englisch, Deutsch und Französisch zur Verfügung. Sollten Sie die Betriebsanleitungen für Ex-Produkte in Ihrer Landessprache benötigen, setzen Sie sich bitte mit Ihrem örtlichen Yokogawa-Vertreter in Verbindung.

S

Alla instruktionsböcker för ATEX Ex (explosionssäkra) produkter är tillgängliga på engelska, tyska och franska. Om Ni behöver instruktioner för dessa explosionssäkra produkter på annat språk, skall Ni kontakta närmaste Yokogawakontor eller representant.

GR

Όλα τα εγχειρίδια λειτουργίας των προϊόντων με ATEX Ex διατίθενται στα Αγγλικά, Γερμανικά και Γαλλικά. Σε περίπτωση που χρειάζεστε οδηγίες σχετικά με Ex στην τοπική γλώσσα παρακαλούμε επικοινωνήστε με το πλησιέστερο γραφείο της Yokogawa ή αντιπρόσωπο της.

SK

Všetky návody na obsluhu pre prístroje s ATEX Ex sú k dispozícii v jazyku anglickom, nemeckom a francúzskom. V prípade potreby návodu pre Ex-prístroje vo Vašom národnom jazyku, skontaktujte prosím miestnu kanceláriu firmy Yokogawa.

CZ

Všechny uživatelské příručky pro výrobky, na něž se vztahuje nevýbušné schválení ATEX Ex, jsou dostupné v angličtině, němčině a francouzštině. Požadujete-li pokyny týkající se výrobků s nevýbušným schválením ve vašem lokálním jazyku, kontaktujte prosím vaši nejbližší reprezentační kancelář Yokogawa.

LT

Visos gaminiø ATEX Ex kategorijos Eksploatavimo instrukcijos teikiami anglø, vokieèiø ir prancûzø kalbomis. Norëdami gauti prietaisø Ex dokumentacijà kitomis kalbomis susisiekite su artimiausiu bendrovës “Yokogawa” biuru arba atstovu.

LV

Visas ATEX Ex kategorijas izstrâdâjumu Lietoðanas instrukcijas tiek piegâdâtas angïu, vâcu un franèu valodâs. Ja vçlaties saòemt Ex ierîèu dokumentâciju citâ valodâ, Jums ir jâsazinâs ar firmas Jokogava (Yokogawa) tuvâko ofisu vai pârstâvi.

EST

Kõik ATEX Ex toodete kasutamisjuhendid on esitatud inglise, saksa ja prantsuse keeles. Ex seadmete muukeelse dokumentatsiooni saamiseks pöörduge lähima Iokagava (Yokogawa) kontori või esindaja poole.

PL

Wszystkie instrukcje obsługi dla urządzeń w wykonaniu przeciwwybuchowym Ex, zgodnych z wymaganiami ATEX, dostępne są w języku angielskim, niemieckim i francuskim. Jeżeli wymagana jest instrukcja obsługi w Państwa lokalnym języku, prosimy o kontakt z najbliższym biurem Yokogawy.

SLO

Vsi predpisi in navodila za ATEX Ex sorodni pridelki so pri roki v angliščini, nemščini ter francoščini. Če so Ex sorodna navodila potrebna v vašem tukejnjem jeziku, kontaktirajte vaš najbliši Yokogawa office ili predstaunika.

H

Az ATEX Ex mûszerek gépkönyveit angol, német és francia nyelven adjuk ki. Amennyiben helyi nyelven kérik az Ex eszközök leírásait, kérjük keressék fel a legközelebbi Yokogawa irodát, vagy képviseletet.

BG

Всички упътвания за продукти от серията ATEX Ex се предлагат на английски, немски и френски език. Ако се нуждаете от упътвания за продукти от серията Ex на родния ви език, се свържете с най-близкия офис или представителство на фирма Yokogawa.

RO

Toate manualele de instructiuni pentru produsele ATEX Ex sunt in limba engleza, germana si franceza. In cazul in care doriti instructiunile in limba locala, trebuie sa contactati cel mai apropiat birou sau reprezentant Yokogawa.

M

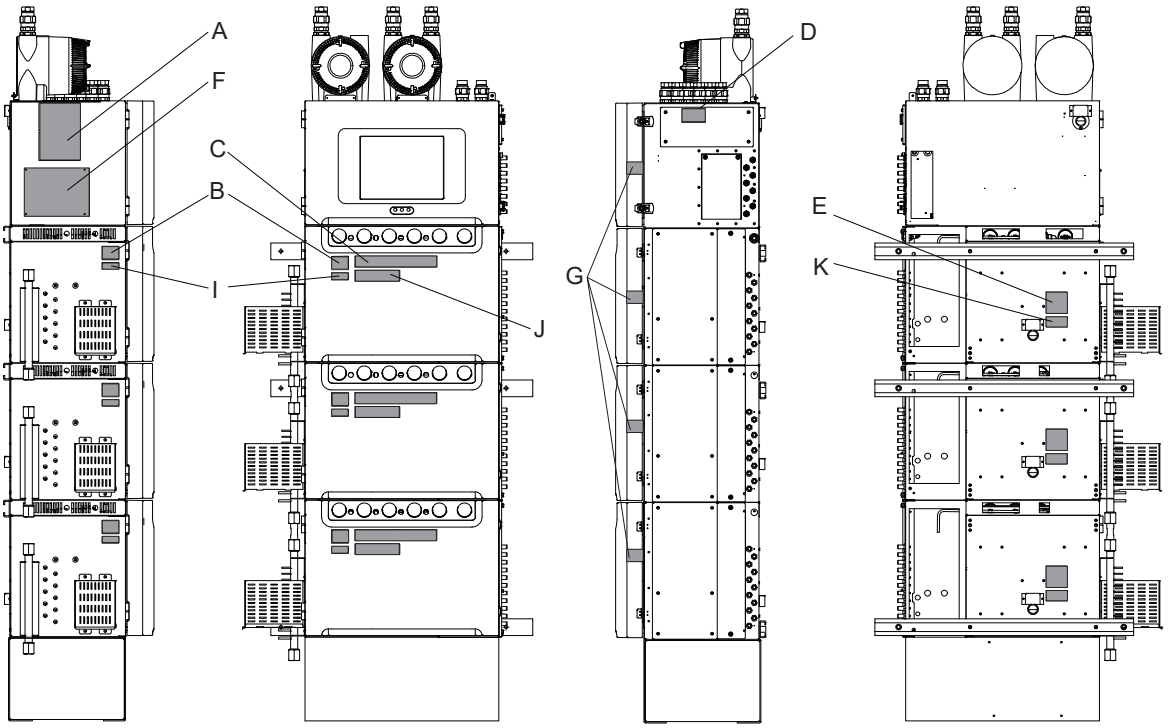
Il manwali kollha ta’ l istruzzjonijiet għal prodotti mmarbuta ma’ ATEX Ex huma disponibbli bl-Ingliż, bil-Ġermaniż u bil-Franċiż. Jekk tkun teħtieġ struzzjonijiet marbuta ma’ Ex fil-lingwa lokali tiegħek, għandek tikkuntattja lill-eqreb rappreżentan jew uffiċċju ta’ Yokogawa

Labeling

Labels are attached to the product for safety. Read each description.

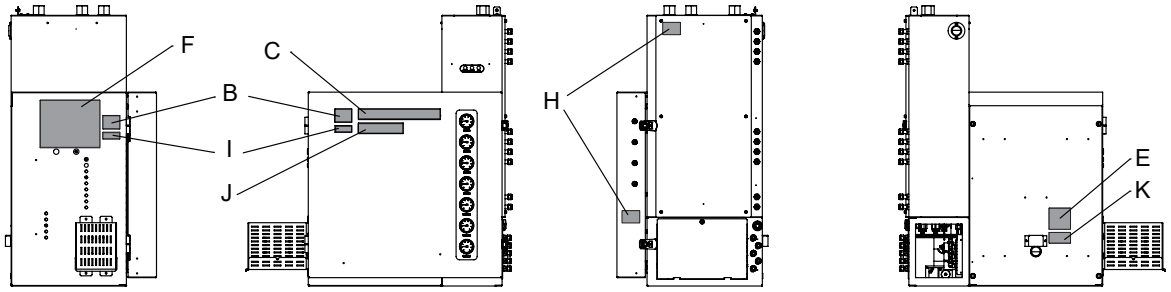
Label D is applicable only to TIIS explosion protection. Label G is for ATEX-X, IECEx-X and NEPSI-X. Label H is for ATEX-Y, IECEx-Y and NEPSI-Y. Label I, J, and K is for CSA.

Type 1 to 5



[Left side] [Front] [Right side] [Back]

Type 6



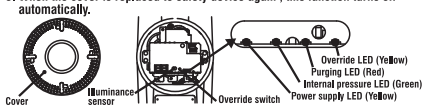
[Left side] [Front] [Right side] [Back]

A

Read the instruction manual thoroughly before use override function.

Override function manual

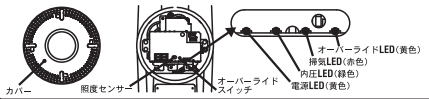
1. Ensure that the surrounding gas atmosphere is well below the lower explosive limit or comletely safe (the area is safe and non-hazard) by using gas detector, then remove the cover of flameproof enclosure.
2. When the illuminance sensor detects light and pressing the override switch, the power is supplied to electric circuit , isothermal oven and programmed temperature oven even if the internal pressure dropped below the specified minimum value.
3. When the cover is replaced to safety device again , this function turns off automatically.



オーバーライド機能を使用する場合は、
取扱説明書の注意事項を必ず読んでからお使いください。

オーバーライド機能の使用手順

1. 周囲の雰囲気が充分に爆発下限界以下になっていることを、ガス検知器などで確認しながら、耐圧容器のカバーを取り外してください。
2. 照度センサが光を感知してオーバーライドスイッチを押すと、規定の最小内圧が保たれない状態で、電気回路部、恒温槽、昇温槽に電源が供給されます。
3. 修理等が終了した後にカバーを取り付けると、自動的にオーバーライドスイッチ機能はオフになります。



B

(Except NEPSI)

⚠ WARNING
Hot surfaces

⚠ 警告
表面が高温です。
注意して下さい。

(NEPSI)

⚠ WARNING
Hot surfaces

⚠ 警告
表面高温，当心烫伤

C (Except NEPSI)

⚠ CAUTION HIGH TEMPERATURE

Do not touch the oven and parts inside oven
as temperature inside the oven is hot even after power off.
Allow one hour for cool down with purge air.

⚠ 高温注意

通電停止直後は，内部が高温になっています。通電を停止した後 1時間以上保護ガスの供給を保ち，内部および内部の部品に触れないでください。

(NEPSI)

⚠ CAUTION HIGH TEMPERATURE

Do not touch the oven and parts inside oven
as temperature inside the oven is hot even after power off.
Allow one hour for cool down with purge air.

⚠ 注意高温

电源关闭后，柱箱内部处于高温状态，请勿触摸柱箱内壁或内部部件，
并保持仪表空气持续吹扫1小时进行降温。

D (TIIS)

⚠ CAUTION
Use heat-resistant cables with maximum allowable temperature of 80˚C or above for pressurized enclosure.

⚠ 注意
内圧容器の外部導線は，最高許容温度が80℃以上のものを使用すること。

E

(Except NEPSI)

⚠ WARNING
High Temperature oven exhaust air. Keep hands, electrical cables, gas lines, chart paper and other items safely clear of exhaust stream.

⚠ 警告
排気エアーが高温です。注意して下さい。
手や電気のケーブル、ガスライン、
チャートペーパーなどを排気口に
近づけないで下さい。

(NEPSI)

⚠ WARNING
High Temperature oven exhaust air. Keep hands, electrical cables, gas lines, chart paper and other items safely clear of exhaust stream.

⚠ 警告
排气高温，当心烫伤。请确保您的手、
电缆、气体管线、图纸文件以及其他
物品远离高温柱箱排气口。

G

(ATEX-X, IECEx-X)

⚠ WARNING
After de-energizing,
delay 25 minutes
before opening

(NEPSI-X)

⚠ 警告
断电后,延迟
25分钟方可开盖

H

(ATEX-Y, IECEx-Y)

⚠ WARNING
After de-energizing,
delay 40 minutes
before opening

(NEPSI-Y)

⚠ 警告
断电后,延迟
40分钟方可开盖

I (CSA)

⚠ AVERTISSEMENT
Surfaces chaudes

J (CSA)

⚠ ATTENTION HAUTE TEMPERATURE

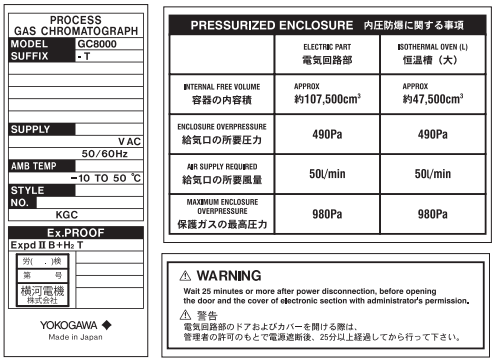
Ne touchez pas le four et les pièces à l'intérieur du four car la température à l'intérieur du four est chaude même après la mise hors tension.
Attendre une heure pour le refroidissement avec de l'air de purge.

K (CSA)

⚠ AVERTISSEMENT

Évacuation d'air du four à haute température.
Gardez les mains, les câbles électriques, les conduites de gaz, les papiers et autres objets à l'écart du flux d'échappement.

F TIIS



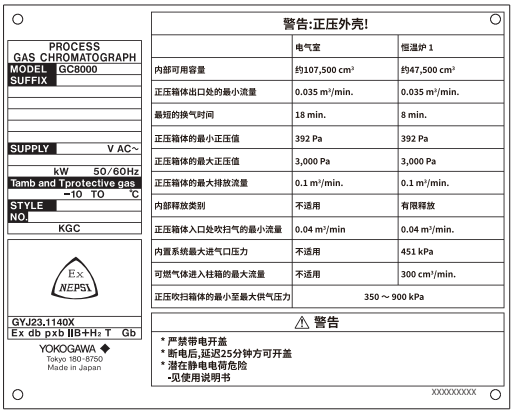
PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX - T
SUPPLY V AC
50/60Hz
AMB TEMP −10 TO 50 °C
STYLE
NO.
KGC
Ex.PROOF
Expd II B+H₂ T
別 . 検
第 号
横河電機株式会社
YOKOGAWA ◆
Made in Japan

PRESSURIZED ENCLOSURE 内圧防爆に関する事項

	ELECTRIC PART 電気回路部	ISOTHERMAL OVEN (L) 恒温槽（大）
INTERNAL FREE VOLUME 容器の内容積	APPROX 約107,500cm³	APPROX 約47,500cm³
ENCLOSURE OVERPRESSURE 給気口の所要圧力	490Pa	490Pa
AIR SUPPLY REQUIRED 給気口の所要風量	50l/min	50l/min
MAXIMUM ENCLOSURE OVERPRESSURE 保護ガスの最高圧力	980Pa	980Pa

⚠ WARNING
Wait 25 minutes or more after power disconnection, before opening the door and the cover of electronic section with administrator's permission.
⚠ 警告
電気回路部のドアおよびカバーを開ける際は、
管理者の許可のもとで電源遮断後、25分以上経過してから行って下さい。

NEPSI-X



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
Tamb and Tprotective gas
−10 TO °C
STYLE
NO.
KGC
Ex NEPSI
GYJ23.1140X
Ex db pxb IIB+H₂ T Gb
YOKOGAWA ◆
Tokyo 180-8750
Made in Japan

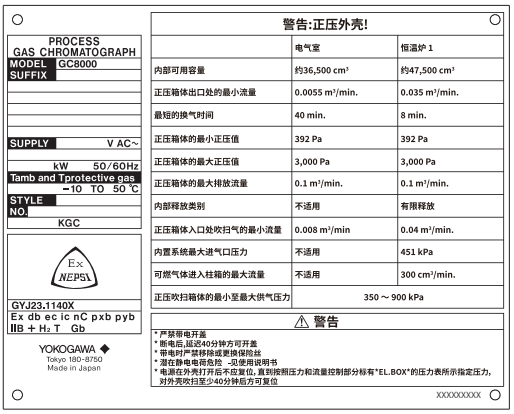
警告:正压外壳!

	电气室	恒温炉 1
内部可用容量	约107,500 cm³	约47,500 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa	

⚠ 警告
* 严禁带电开盖
* 断电后,延迟25分钟方可开盖
* 潜在静电电荷危险
-见使用说明书

XXXXXXXXX

NEPSI-Y



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
Tamb and Tprotective gas
−10 TO 50 °C
STYLE
NO.
KGC
Ex NEPSI
GYJ23.1140X
Ex db ec ic nC pxb pyb IIB + H₂ T Gb
YOKOGAWA ◆
Tokyo 180-8750
Made in Japan

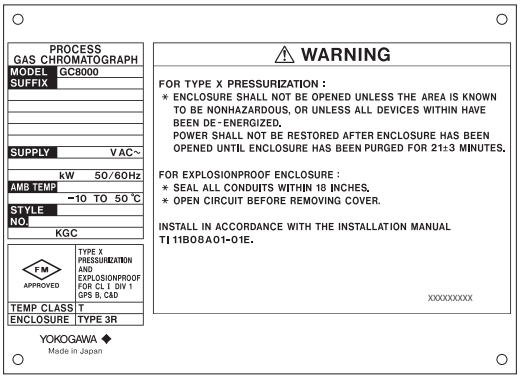
警告:正压外壳!

	电气室	恒温炉 1
内部可用容量	约36,500 cm³	约47,500 cm³
正压箱体出口处的最小流量	0.0055 m³/min.	0.035 m³/min.
最短的换气时间	40 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放
正压箱体入口处吹扫气的最小流量	0.008 m³/min	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa	

⚠ 警告
* 严禁带电开盖
* 断电后,延迟40分钟方可开盖
* 带电时严禁持续或更换保险丝
* 潜在静电电荷危险 -见使用说明书
* 电源在外壳打开后不应复位。直到控制压力和流量控制部分标有"EL.BOX"的压力表所示指定压力，对外壳吹扫至少40分钟后方可复位

XXXXXXXXX

FM-X



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
AMB TEMP −10 TO 50 °C
STYLE
NO.
KGC
FM APPROVED
TYPE X PRESSURIZATION AND EXPLOSIONPROOF FOR CL I DIV 1 GPS B, C&D
TEMP CLASS T
ENCLOSURE TYPE 3R
YOKOGAWA ◆
Made in Japan

⚠ WARNING

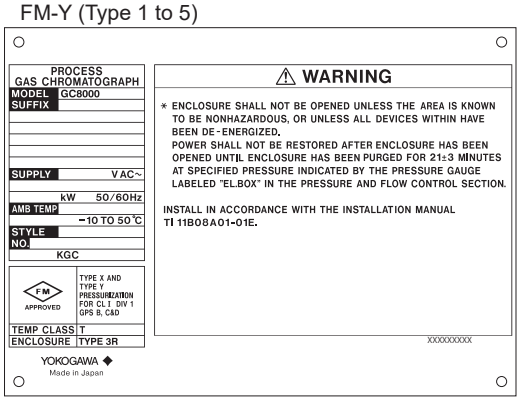
FOR TYPE X PRESSURIZATION :
* ENCLOSURE SHALL NOT BE OPENED UNLESS THE AREA IS KNOWN TO BE NONHAZARDOUS, OR UNLESS ALL DEVICES WITHIN HAVE BEEN DE-ENERGIZED.
POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 21±3 MINUTES.

FOR EXPLOSIONPROOF ENCLOSURE :
* SEAL ALL CONDUITS WITHIN 18 INCHES.
* OPEN CIRCUIT BEFORE REMOVING COVER.

INSTALL IN ACCORDANCE WITH THE INSTALLATION MANUAL TI 11B08A01-01E.

XXXXXXXXX

FM-Y (Type 1 to 5)



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
AMB TEMP −10 TO 50 °C
STYLE
NO.
KGC
FM APPROVED
TYPE X AND TYPE Y PRESSURIZATION FOR CL I DIV 1 GPS B, C&D
TEMP CLASS T
ENCLOSURE TYPE 3R
YOKOGAWA ◆
Made in Japan

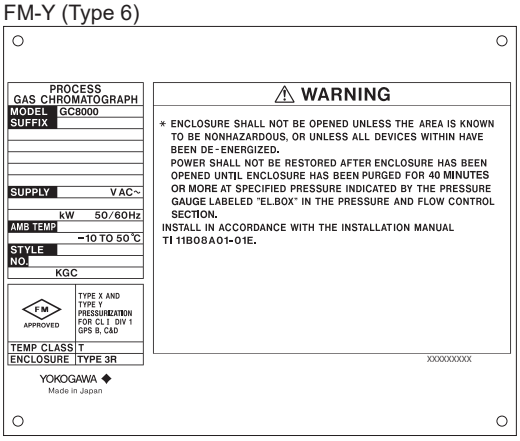
⚠ WARNING

* ENCLOSURE SHALL NOT BE OPENED UNLESS THE AREA IS KNOWN TO BE NONHAZARDOUS, OR UNLESS ALL DEVICES WITHIN HAVE BEEN DE-ENERGIZED.
POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 21±3 MINUTES AT SPECIFIED PRESSURE INDICATED BY THE PRESSURE GAUGE LABELED "EL.BOX" IN THE PRESSURE AND FLOW CONTROL SECTION.

INSTALL IN ACCORDANCE WITH THE INSTALLATION MANUAL TI 11B08A01-01E.

XXXXXXXXX

FM-Y (Type 6)



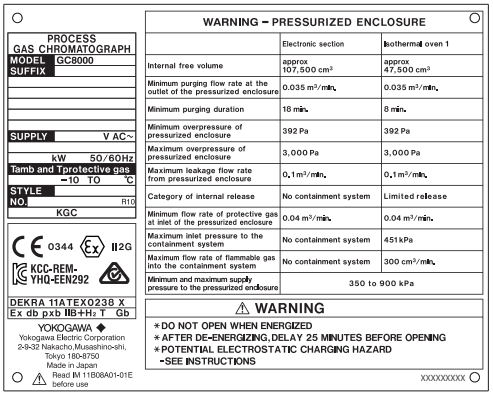
PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
AMB TEMP −10 TO 50 °C
STYLE
NO.
KGC
FM APPROVED
TYPE X AND TYPE Y PRESSURIZATION FOR CL I DIV 1 GPS B, C&D
TEMP CLASS T
ENCLOSURE TYPE 3R
YOKOGAWA ◆
Made in Japan

⚠ WARNING

* ENCLOSURE SHALL NOT BE OPENED UNLESS THE AREA IS KNOWN TO BE NONHAZARDOUS, OR UNLESS ALL DEVICES WITHIN HAVE BEEN DE-ENERGIZED.
POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 40 MINUTES OR MORE AT SPECIFIED PRESSURE INDICATED BY THE PRESSURE GAUGE LABELED "EL.BOX" IN THE PRESSURE AND FLOW CONTROL SECTION.
INSTALL IN ACCORDANCE WITH THE INSTALLATION MANUAL TI 11B08A01-01E.

XXXXXXXXX

ATEX-X



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
Tamb and Tprotective gas
−10 TO °C
STYLE
NO. R10
KGC
CE 0344 Ex II2G
KCC-REM-YHQ-EEN292
DEKRA 11ATEX0238 X
Ex db pxb IIB+H₂ T Gb
YOKOGAWA ◆
Yokogawa Electric Corporation
2-9-32 Nakacho,Musashino-shi,
Tokyo 180-8750
Made in Japan
Read IM 11B08A01-01E before use

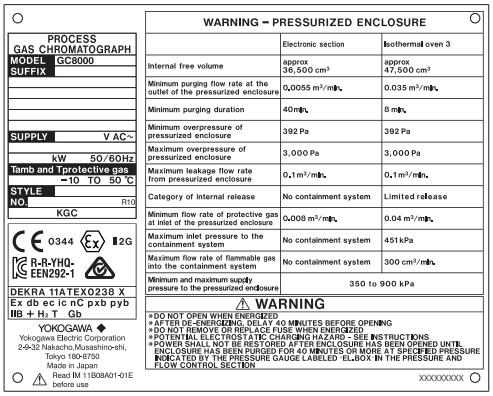
WARNING – PRESSURIZED ENCLOSURE

	Electronic section	Isothermal oven 1
Internal free volume	approx 107,500 cm³	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

⚠ WARNING
* DO NOT OPEN WHEN ENERGIZED
* AFTER DE-ENERGIZING, DELAY 25 MINUTES BEFORE OPENING
* POTENTIAL ELECTROSTATIC CHARGING HAZARD -SEE INSTRUCTIONS

XXXXXXXXX

ATEX-Y



PROCESS GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX
SUPPLY V AC~
kW 50/60Hz
Tamb and Tprotective gas
−10 TO 50 °C
STYLE
NO. R10
KGC
CE 0344 Ex II2G
R-R-YHQ-EEN292-1
DEKRA 11ATEX0238 X
Ex db ec ic nC pxb pyb IIB + H₂ T Gb
YOKOGAWA ◆
Yokogawa Electric Corporation
2-9-32 Nakacho,Musashino-shi,
Tokyo 180-8750
Made in Japan
Read IM 11B08A01-01E before use

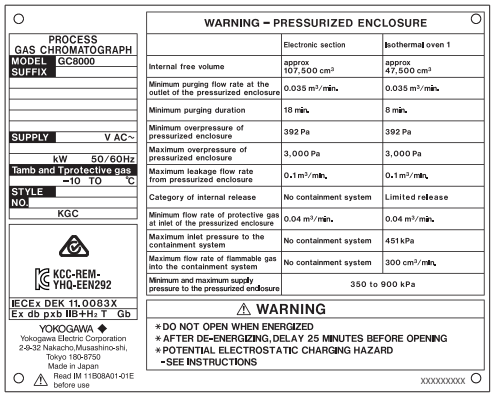
WARNING – PRESSURIZED ENCLOSURE

	Electronic section	Isothermal oven 3
Internal free volume	approx 36,500 cm³	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.0055 m³/min.	0.035 m³/min.
Minimum purging duration	40 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.008 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

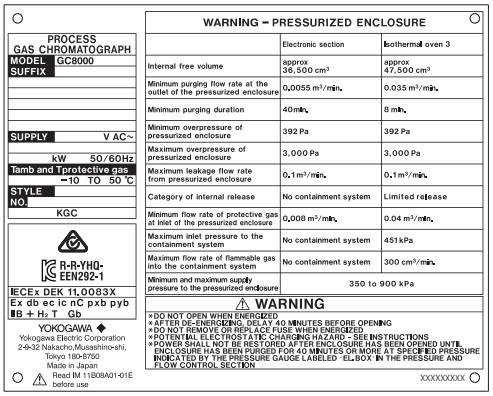
⚠ WARNING
* DO NOT OPEN WHEN ENERGIZED
* AFTER DE-ENERGIZING, DELAY 40 MINUTES BEFORE OPENING
* DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
* POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS
* POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 40 MINUTES OR MORE AT SPECIFIED PRESSURE INDICATED BY THE PRESSURE GAUGE LABELED "EL.BOX" IN THE PRESSURE AND FLOW CONTROL SECTION.

XXXXXXXXX

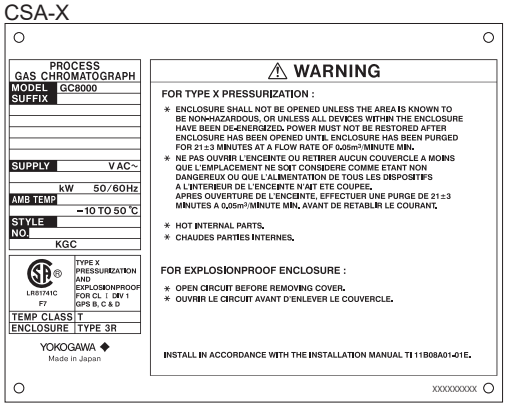
IECEx-X



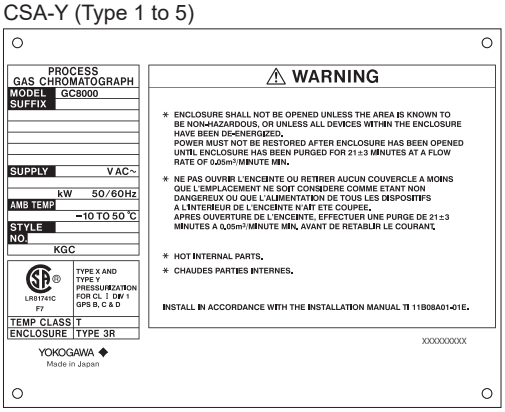
IECEx-Y



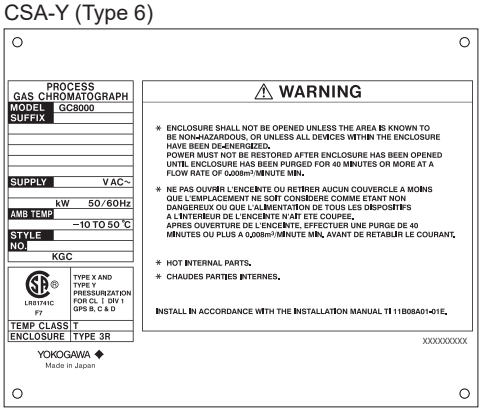
CSA-X



CSA-Y (Type 1 to 5)



CSA-Y (Type 6)



General Precautions

WARNING

In order to analyze gases, process gas chromatographs use various kinds of process gases and utility gases.

Since these gases are typically combustible, combustion-sustaining, toxic, odorous, resolvable, polymerizing, or corrosive, refer to the “Safety Information” in our approval drawings and others to ensure safety thoroughly before using them.

WARNING

- The GC8000 weighs about 85 to 220 kg. Unpack it near the installation site. Use a transportation machine to move it. Handle it carefully to prevent it from falling.
- Up to two protection system may be included, each of which weighs approximately 7 kg, are installed on top of the GC8000. Therefore, the center of gravity is higher than the center of the analyzer body.

CAUTION

For lifting and carrying the equipment, use those two (or three) fixture brackets which are fixed to the wooden (or other materials) crate for the equipment.

CAUTION

- Since the GC8000 is a precision instrument, take care when handling it to avoid impact.
- The GC8000 is designed for use under specified environment (over voltage category, pollution degree, ambient temperature, flowrate and pressure of sample and utility gas and specification of electric power). It is out of warranty against occurred result in case when exceed these specs.
- Use the GC8000 within the range of your purchase specifications.

  Yokogawa assumes no responsibility for problems resulting from use by the customer outside the purchase specifications.

  If the GC8000 needs to be modified or repaired, please contact your nearest Yokogawa representative. Yokogawa assumes no responsibility for results where the customer or any third party has attempted to modify or repair this product.
- For cleaning of analyzer, do not use any abrasives or organic solvent.

CAUTION

This instrument is a Class A product for EMC standard (Emission), and is designed for use in an industrial environment. Please use this instrument in an industrial environment only.

Complying with EMC Standard for ATEX, IECEx, and NEPSI:

- EN61326-1 Class A (Emission)
- EN61326-1, EN61326-2-3 (Immunity)
- Korea Electromagnetic Conformity Standard (except NEPSI)

IMPORTANT

- Read the attached instruction manual before operating the GC8000.
- The instruments must be installed and operated according to the installation manual, instruction manual, approval drawings, and operation data.

How to dispose the batteries:

This is an explanation about the EU Battery Directive. This directive is only valid in the EU.

Batteries are included on the Control CPU Card (Assy No. K9802AA, K9802AB, K9802AC and K9802AD) in this product. Batteries incorporated into this product cannot be removed by yourself. Dispose them together with this product.

When you dispose this product in the EU,contact your local Yokogawa Europe B.V.office. Do not dispose them as domestic household waste.

Battery type: Poly-carbon monofluoride Lithium battery

Notice: The symbol (see above) means they shall be sorted out and collected as ordained in the EU Battery Directive.

How to dispose GC8000 and Signal interrupters (K9806AA, K9806AE, K9806AJ and K9806AN):

Waste Electrical and Electronic Equipment (WEEE), Directive (This directive is only valid in the EU.)

GC8000, K9806AA, K9806AE, K9806AJ and K9806AN have been designed only for the purpose as part of a large industrial equipment at a pre-defined and dedicated location, hence the WEEE Directive is not applicable. Thus these products should be disposed in accordance with local and national legislation/regulations.

How to dispose the Desktop type Communication converter (K9806AT) or Signal interrupter (K9806AB):

Waste Electrical and Electronic Equipment (WEEE), Directive (This directive is only valid in the EU.)

This product complies with the WEEE Directive marking requirement.

The affixed product label (see below) indicates that you must not discard this electrical/ electronic product in domestic household waste.

Product Category

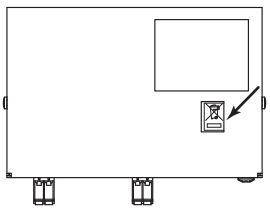
With reference to the equipment types in the WEEE directive, this product is classified as a “Monitoring and Control instruments.”

When disposing of products in the EU, contact your local Yokogawa Europe B.V. office.

Do not dispose of this products in domestic household waste.

- Labeling

  The following label is placed on the top side of the product.



Authorized Representative in the EEA * and the Importer into the EU/ EEA Market

The Authorized Representative for this product in the EEA and the importer for this product into the EU/EEA market via Yokogawa sale channel is:

Yokogawa Europe B.V.
Euroweg 2, 3825 HD Amersfoort, The Netherlands

*: Applicable only for GC8000-A (ATEX-X) and GC8000-B (ATEX-Y)

Precautions Against Electrostatic Damage

IMPORTANT

Electrostatic discharge may damage the operation panel. Handle them after discharging static electricity.

When handling cards with IC components mounted on them for maintenance or setting changes, take full precautions against electrostatic problems.

- When storing or carrying cards, enclose them in a conductive bag or antistatic bag. (Cards as shipped by Yokogawa are enclosed in a conductive bag or antistatic bag labeled with cautions against electrostatic problems.)
- When servicing cards, wear a wrist strap grounded via a 1 MΩ resistance. Connect the wrist strap to a ground terminal.
- When servicing cards on the bench, wear a wrist strap and place them on a conductive sheet grounded via a 1 MΩ resistance. Keep easily-chargeable plastic materials away from the bench.
- Never touch components mounted on the cards, the pattern side, connectors, pin components, etc. with bare hands, unless using a wrist strap and a conductive sheet.

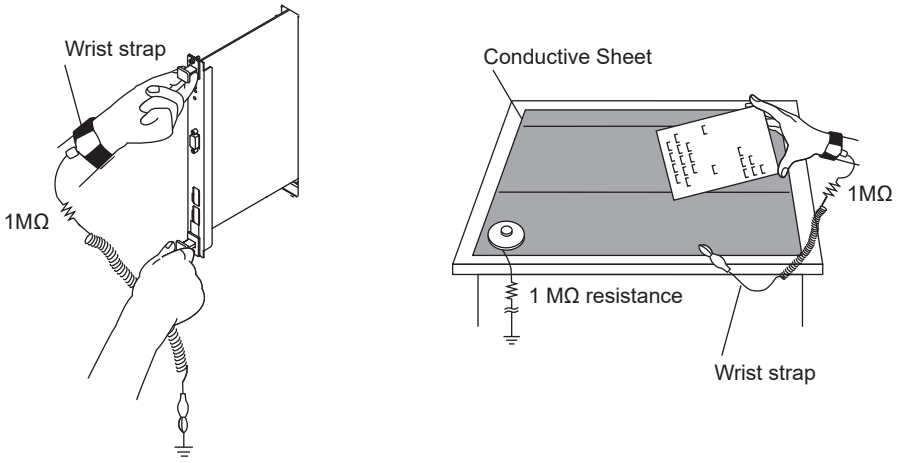


Figure 1 Example of wrist strap and conductive sheet

Replacing parts

Always use parts specified by Yokogawa when replacing parts. For replacement, see “6. Maintenance” in the User’s Manual (IM 11B08A01-01E).

Maintenance and Repair

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

CAUTIONS WHEN USING EXPLOSION-PROTECTED INSTRUMENTS

The GC8000 is designed to protect against explosion.

When the analyzer is used in a hazardous area, observe the following precautions.

Since the applicable standard differs depending on the specifications of the analyzer to be used, check the specifications of your analyzer.

Type of explosion protection

To assure explosion protection, the GC8000 has a pressurized and flameproof enclosure, meeting the following standards (flameproof enclosure of the protection system is not provided in FM-Y, CSA-Y, ATEX-Y, IECEx-Y, NEPSI-Y):

<GC8000-F (FM-X), GC8000-G (FM-Y)>

Type 1 to 5

Type X pressurization and Explosionproof for Class I, Division 1, Group B, C and D
(Described as FM-X hereafter)

Type X and Y pressurization for Class I, Division 1, Group B, C & D
(Described as FM-Y hereafter)

T1 (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)
T2 (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)
T3 (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)
T4 (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

Type 6

Type X and Y pressurization for Class I, Division 1, Group B, C & D
(Described as FM-Y hereafter)

T3 (isothermal oven 135°C max.)
T4 (isothermal oven 95°C max.)

<GC8000-C (CSA-X), GC8000-D (CSA-Y)>

Type 1 to 5

Type X pressurization and Explosionproof for Class I, Division 1, Group B, C and D
(Described as CSA-X hereafter)

Type X and Y pressurization for Class I, Division 1, Group B, C & D
(Described as CSA-Y hereafter)

T1 (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)
T2 (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)
T3 (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)
T4 (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

Type 6

Type X and Y pressurization for Class I, Division 1, Group B, C & D
(Described as CSA-Y hereafter)

T3 (isothermal oven 135°C max.)
T4 (isothermal oven 95°C max.)

<GC8000-A (ATEX-X), GC8000-B (ATEX-Y)>

ATEX: Group II Category 2G, DEKRA 11ATEX0238 X *

Type 1 to 5

Ex db pxb II B +H_2 T1 Gb (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)

Ex db pxb II B + H_2 T2 Gb (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)

Ex db pxb II B + H_2 T3 Gb (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)

Ex db pxb II B + H_2 T4 Gb (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

(Described as ATEX-X hereafter)

Type 6

Ex db ec ic nC pxb pyb II B+H_2 T3 Gb (isothermal oven 135°C max.)

Ex db ec ic nC pxb pyb II B+H_2 T4 Gb (isothermal oven 95°C max.)

(Described as ATEX-Y hereafter)

* : The symbol “X” used to denote specific conditions of use
The symbol “X” is used to provide a means of identifying that essential information for the installation, use, and maintenance of the equipment is contained within the certificate.

- Modification of the flameproof joints is not allowed.
- All externally powered input signals into the pressurized enclosure protected by the Ex pxb protection system shall be isolated by external relays controlled by the Ex pxb protection system (safety device).
- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the equipment shall be avoided.
- GC8000-B shall only be used in an area of at least pollution degree 2, as defined in EN IEC 60664-1.
- For GC8000-B , transient protection shall be provided that is set at a level not exceeding 119 V peak at the Input/Output terminals of the equipment.

Any special conditions of use including particulars of possible misuse are shown below.

- The threaded type and size of the flameproof enclosure is only uses “M25x1.5”.
  That is the reason why no indication on the flameproof enclosure.
  On the other hand, the threaded adapter has the indication of its own type and size.
- All wiring shall comply with EN 60079-14, and local electric codes and requirements.
- In a hazardous area, use appropriate certified cable entry devices for connecting cables.
- In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with appropriate torque. Care must be taken not to twist the conductor.
- The protective gas shall be instrumental air.
- Temperature of protective gas (instrumental air) at the inlet of pressurized enclosure shall be comply with the following temperature class range.
  GC8000-A
  T1 : -10 to +40°C
  T2 : -10 to +40°C
  T3 : -10 to +45°C
  T4 : -10 to +50°C
  GC8000-B
  T3 : -10 to +50°C
  T4 : -10 to +50°C
- Pressure of protective gas (instrumental air) at the inlet of analyzer shall be required 350 to 900 kPa.
- When using hydrogen gas as the carrier gas, the FID or FPD combustion gas, Supply hydrogen gas to this analyzer at 500 ±20 kPa.
- Only personnel authorized by Yokogawa Electric Corporation can repair the equipment in accordance with the relevant standards: EN 60079-19 (Equipment repair, overhaul and reclamation) and EN 60079-17 (Electrical installation inspection and maintenance).

<GC8000-E (IECEx-X), GC8000-M (IECEx-Y)>

IECEx certified: IECEx DEK 11.0083X *

Type 1 to 5

Ex db pxb II B +H_2 T1 Gb (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)

Ex db pxb II B + H_2 T2 Gb (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)

Ex db pxb II B + H_2 T3 Gb (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)

Ex db pxb II B + H_2 T4 Gb (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

(Described as IECEx-X hereafter)

Type 6

Ex db ec ic nC pxb pyb II B+H_2 T3 Gb (isothermal oven 135°C max.)

Ex db ec ic nC pxb pyb II B+H_2 T4 Gb (isothermal oven 95°C max.)

(Described as IECEx-Y hereafter)

* : The symbol “X” used to denote specific conditions of use
The symbol “X” is used to provide a means of identifying that essential information for the installation, use, and maintenance of the equipment is contained within the certificate.
- Modification of the flameproof joints is not allowed.
- All externally powered input signals into the pressurized enclosure protected by the Ex pxb protection system shall be isolated by external relays controlled by the Ex pxb protection system (safety device).
- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the equipment shall be avoided.
- GC8000-M shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1.
- For GC8000-M, transient protection shall be provided that is set at a level not exceeding 119 V peak at the Input/Output terminals of the equipment.

Any special conditions of use including particulars of possible misuse are shown below.
- The threaded type and size of the flameproof enclosure is only uses “M25x1.5”.
That is the reason why no indication on the flameproof enclosure.
On the other hand, the threaded adapter has the indication of its own type and size.
- All wiring shall comply with IEC 60079-14, and local electric codes and requirements.
- In a hazardous area, use appropriate certified cable entry devices for connecting cables.
- In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with appropriate torque. Care must be taken not to twist the conductor.
- The protective gas shall be instrumental air.
- Temperature of protective gas (instrumental air) at the inlet of pressurized enclosure shall be comply with the following temperature class range.
  GC8000-E
  T1 : -10 to +40°C
  T2 : -10 to +40°C
  T3 : -10 to +45°C
  T4 : -10 to +50°C
  GC8000-M
  T3 : -10 to +50°C
  T4 : -10 to +50°C
- Pressure of protective gas (instrumental air) at the inlet of analyzer shall be required 350 to 900 kPa.
- When using hydrogen gas as the carrier gas, the FID or FPD combustion gas, Supply hydrogen gas to this analyzer at 500 ±20 kPa.
- Only personnel authorized by Yokogawa Electric Corporation can repair the equipment in accordance with the relevant standards: IEC 60079-19 (Equipment repair, overhaul and reclamation) and IEC 60079-17 (Electrical installation inspection and maintenance).

<GC8000-P(NEPSI)>

NEPSI certified: GYJ23.1140X

Type 1 to 5

Ex db pxb II B +H_2 T1 Gb (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)

Ex db pxb II B + H_2 T2 Gb (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)

Ex db pxb II B + H_2 T3 Gb (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)

Ex db pxb II B + H_2 T4 Gb (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

(Described as NEPSI-X hereafter)

Type6

Ex db ec ic nC pxb pyb II B+H_2 T3 Gb (isothermal oven 135°C max.)

Ex db ec ic nC pxb pyb II B+H_2 T4 Gb (isothermal oven 95°C max.)

(Described as NEPSI-Y hereafter)

1. Special conditions for safe use (产 品安全使用特殊条件)

   The suffix “X” placed after the certificate number indicates that this product is subject to special conditions for safe use: (证书编号后缀 “X” 表明产品具有安全使用特殊条件)

- The values of the flamepaths are different from the standard values given in GB/T3836.2-2021. Repair of the equipment is only allowed when done by the manufacturer or authorized representative.

  (产品隔爆接合面参数与 GB/T 3836.2-2021标准中所规定的最小值或最大值不同。仅允许制造商或授权机构对产品进行维修。)
- When used in hazardous location, electrostatic discharge should be avoided.

  (产品在危险现场使用时严禁干擦以防静电积累危险。)
- All externally powered input signals into the pressurized enclosure shall be isolated by external relays controlled by the Ex pxb safety device (protection system).

  (外部供电信号必须经正压控制系统的继电器后，方可引入正压腔体内部。)
- For GC8000-Q400, it shall only be used in an area of at least pollution degree 2, as defined in GB/T 16935.1.

  (对于 GC8000-Q400，只能在 GB/T 16935.1规定的 2级以上污染区域使用。)
- For GC8000-Q400, transient protection shall be provided that is set at a level not exceeding 119 V peak at the Input/Output terminals of the equipment.

  (对于 GC8000-Q400 应提供瞬态保护该保护设置在设备输入/输出端子的峰值不超过119 V。)

2. Conditions for safe use (产品使用注意事项)

   2.1 The external earth connection facility shall be connected reliably.

   (色谱仪设有接地端子，用户在安装使用时应可靠接地。)

   2.2 The relationship among model designation, temperature class, ambient temperature range and maximum setting temperature of internal ovens/heaters are as following:

   (色谱仪的型号规格、温度组别、使用环境温度范围及内部烘箱/加热器最高设定温度的关系如下：)

Model designation (型号规格)	Temperature class (温度组别)	Ambient temperature range (使用环境温度范围)	Maximum setting temperature of internal ovens/heaters (内部烘箱/加热器最高设定温度)
GC8000-P□□□A	T1	-10°C ～ 40°C	320°C
GC8000-P□□□B	T2	-10°C ～ 40°C	225°C
GC8000-P□□□C	T3	-10°C ～ 45°C	145°C
GC8000-P□□□D	T4	-10°C ～ 50°C	95°C
GC8000-Q□□□C	T3	-10°C ～ 50°C	145°C
GC8000-Q□□□D	T4	-10°C ～ 50°C	95°C

2.3 Obey the warnings “DO NOT OPEN WHEN ENERGIZED” and “AFTER DE-ENERGIZING, DELAY 25 MINUTES BEFORE OPENING”.

(现场使用和维护色谱仪时，必须遵守“严禁带电开盖”及“断电后延迟25分钟方可开盖”的原则。)

2.4 3/4-14NPT or M25X1.5 cable entry, certified by notified body with type of protection Ex db II C Gb in accordance with GB/T3836.1-2021 and GB/T3836.2-2021, should be applied when installation in hazardous location. Blanking elements supplied by the manufacturer is also available.

(色谱仪的电缆引入口须配用经国家授权的检验机构认可、符合GB/T 3836.1-2021与GB/T3836.2-2021要求、防爆等级为Ex db II C Gb且螺纹规格为3/4-14NPT或M25X1.5的电缆引入装置。冗余电缆引入口须采用生产商提供的封堵件有效封堵。)

2.5 Forbid end user to change the configuration to ensure the equipment’s explosion protection performance.

(用户不得自行随意更换该产品的电气零部件，应会同产品制造商共同解决运行中出现的故障，以免影响防爆性能和损坏现象的发生。)

2.6 When installation, use and maintenance of Process Gas Chromatograph, observe following standards

GB/T3836.13-2021 “Explosive atmospheres - Part 13: Equipment repair, overhaul and reclamation”

GB/T3836.15-2017 “Explosive atmospheres - Part 15: Electrical installations design, selection and erection”

GB/T3836.16-2022 “Explosive atmospheres - Part 16: Electrical installations inspection and maintenance”

GB50257-2014 ”Code for construction and acceptance of electric equipment on fire and explosion hazard electrical equipment installation engineering”

(产品的安装、使用和维护应同时遵守产品使用说明书、GB/T 3836.13-2021“爆炸性环境第13部分：设备的修理、检修、修复和改造”、GB/T 3836.15-2017“爆炸性环境第15部分：电气装置的设计、选型和安装”、GB/T 3836.16-2022“爆炸性环境第16部分：电气装置的检查与维护”及GB 50257-2014“电气装置安装工程爆炸和火灾危险环境电气装置施工及验收规范”的有关规定。)

3. Installation and erection

3.1 In a hazardous area, use appropriate certified cable entry devices for connecting cables.

(在危险区域，应使用经过认证的合适的电缆格兰连接电缆。

3.2 In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with appropriate torque. Care must be taken not to twist the conductor.

(为了防止接地导线松脱，请务必以适当的扭矩拧紧螺钉，将导线固定在端子上。请务必小心，以免扭曲导线。

3.3 Field wiring for ethernet communication must be in accordance with IEEE 802.3 so as to avoid overvoltage of > 119V.*

(以太网通信的现场接线必须符合IEEE 802.3标准，以免过电压超出119 V。*)

3.4 Screws of the field wiring terminals must be tightened with specified torque values as follows:

- Terminal for power supply on Filter unit 1.2 N·m*

(请务必以规定的力矩值拧紧现场接线端子的螺钉，数值如下：

- 滤波器单元上的电源端子：1.2 N·m*)

3.5 For power supply line of the electrical circuit section, use cables with a conductor cross section of 3.5 mm^2 to 5.5 mm^2. *

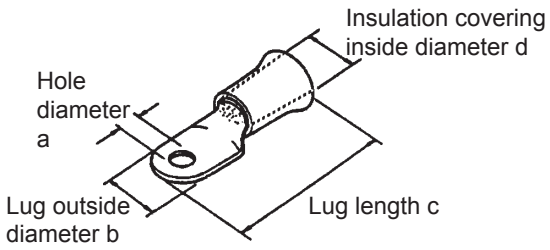
(对于电路部分的电源线请使用导体横截面为 3.5 mm^2～ 5.5 mm^2 的电缆。*)

3.6 In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with torque of approx. 1.2 N·m. *

(为了防止接地导线松脱，请务必以约1.2 N·m的扭矩拧紧螺钉，将导线固定在端子上。*)

3.7 Use crimp-on terminals for all power cables and grounding as follows. *

(对于所有电源线和接地线，均使用压接端子，如下所示。*)



3.8 Screws for cover of electronic section must be tightened with specified torque value: 1.4 N·m. *

(对于电气室保护盖的螺钉请务必以规定力矩值1.4 N·m拧紧。*)

3.9 Use FKC series terminals (manufactured by Phoenix Contact Ltd.) for the electric circuit except for the power or Ethernet line. For field wiring of this terminal, use cables with a conductor cross section of 0.5 mm^2 to 1.5 mm^2 and cable length of 1 km max. (Peel off length Approx. 10 mm.)

The tightening torque of the fixing screws for these terminals should be 0.3 N·m. *

(除电源或以太网线路外，电路请使用FKC系列端子 (菲尼克斯电气有限公司制造)。对于该端子的现场接线请使用导体横截面为0.5 mm^2 ～ 1.5 mm^2的电缆电缆长度最大为1 km (剥离长度约为10 mm)。

这些端子的固定螺钉的拧紧力矩应为0.3 N·m。*)

* : Only for GC8000-Q (仅适用于GC8000-Q)

4. Use and setting-up (使用和设置)

4.1 The protective gas shall be instrumental air.

(保护气体应为仪表气。)

4.2 Pressure of protective gas (instrumental air) at the inlet of analyzer shall be required 350 to 900 kPa.

(分析仪入口处的保护气体 (仪表气) 压力应为350 ～ 900 kPa。)

4.3 When using hydrogen gas as the carrier gas, the FID or FPD combustion gas, hydrogen gas is supplied to this analyzer at 500 ± 20 kPa.

(当使用氢气作为载气、FID或FPD燃烧气体时氢气以500 ± 20 kPa的压力供应给该分析仪。)

5. Maintenance and repair (维护和修理)

5.1 WARNING (警告)

5.2 A modification of the equipment would no longer comply with the construction described in the certificate documentation. (设备的改装将不再符合证书文档中描述的结构。)

5.3 Only personnel authorized by Yokogawa Electric Corporation can repair the equipment in accordance with the relevant standards.

(仅横河电机授权的人员才能按照相关标准维修设备。)

<GC8000-T (TIIS)>

TIIS (The Technology Institution of Industrial Safety)

Ex pd II B +H_2 T1 (programmed-temperature oven 320°C max., isothermal oven 225°C max., liquid-sample valve 250°C max.)

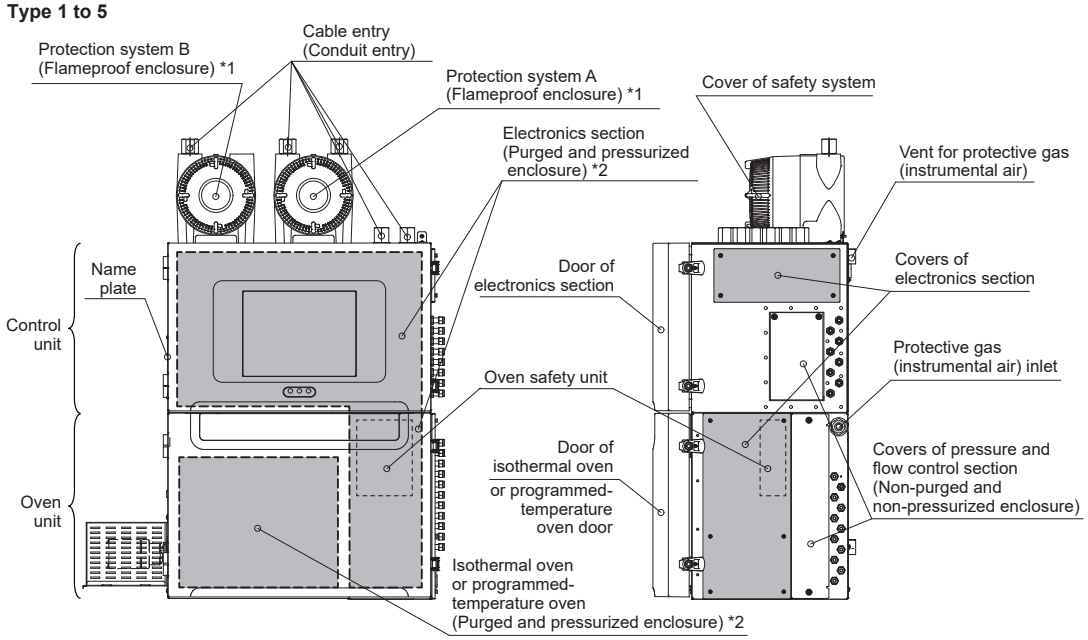
Ex pd II B +H_2 T2 (programmed-temperature oven 225°C max., isothermal oven 225°C max., liquid-sample valve 225°C max.)

Ex pd II B +H_2 T3 (programmed-temperature oven 145°C max., isothermal oven 145°C max., liquid-sample valve 145°C max.)

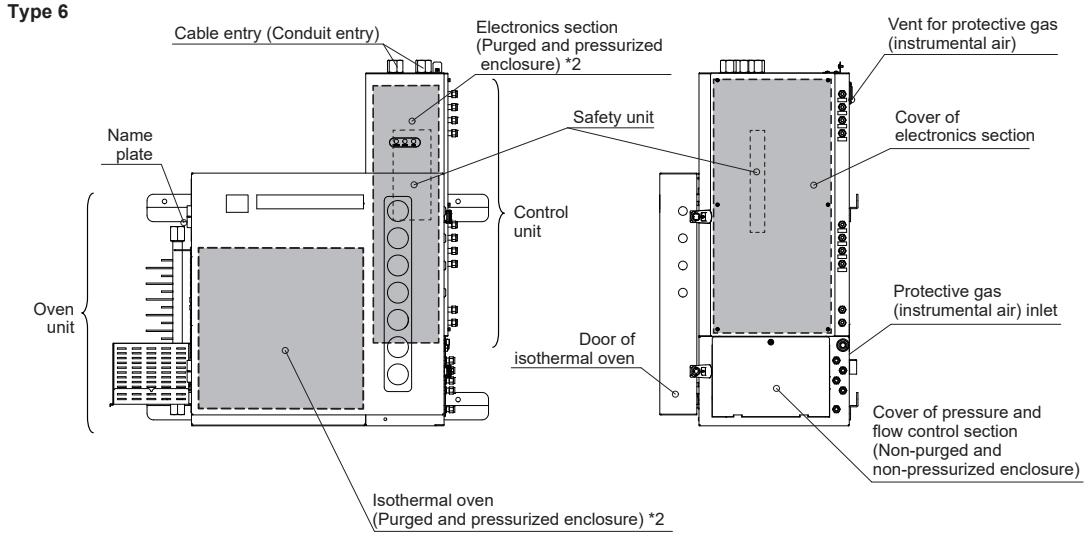
Ex pd II B +H_2 T4 (programmed-temperature oven 95°C max., isothermal oven 95°C max., liquid-sample valve 95°C max.)

Analyzer component names

Type 1 to 5



Type 6



Note: Replace the following term for FM, CSA explosionproof models.
*1: Protection system A or B (explosionproof enclosure)
*2: Type X pressurization enclosure or Type Y pressurization enclosure

Figure 2 Analyzer component names for explosionproof type

Opening/closing the door

The control unit, and the oven unit (large isothermal oven, standard isothermal oven, programmed temperature oven) have a door fastener with a lock.

Lock the door when operating these devices. The same key is used for all the door fasteners. Do not lose it.

Confirm that the lever cannot be lifted up after locking.

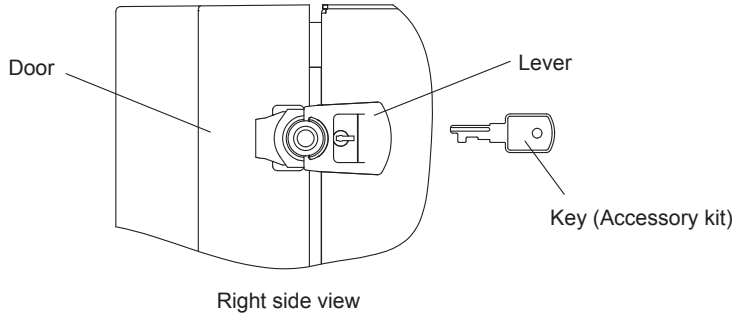


Figure 3 Door fastener

Electronics section

The electronics section of the control unit, and the oven unit (large isothermal oven, standard isothermal oven, programmed-temperature oven) is a pressurized enclosure.

Use a hex wrench (an accessory) to open/close the cover of the electronic chamber.

In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y) screws for cover of electronic section must be tightened with specified torque value: 1.4 N·m.

Precautions for protection system (The analyzer with FM-Y, CSA-Y, ATEX-Y, IECEx-Y, NEPSI-Y does not have the protection system.)

WARNING

When the cover of the protection system is uninstalled, use a gas detector to check that the concentration of explosive gases in the ambient atmosphere is less than the allowable limit.

The protection system is a flameproof enclosure.

When handling the screws on the cover of the protection system, note the following to avoid damaging the screws since they cannot be repaired.

- Use a hex wrench (option) to tighten/loosen the hexagon socketset screw.
- The cover should be placed in a clean plastic bag or on a clean space to prevent it from contamination.

  Before installing the cover, confirm that the body and screws are not contaminated. If they are, make sure to clean them.
- Since the screws are coated with MOLYKOTE, do not lubricate them.
- When installing the cover, tighten the screws by hand; never use tools.

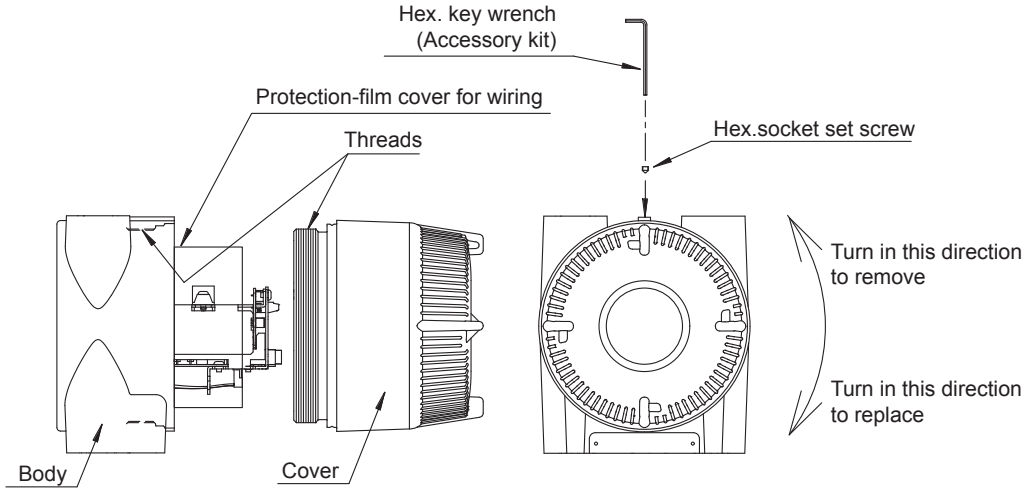


Figure 4 Opening/closing the cover of the protection system

Precautions for hydrogen gas

When using hydrogen gas as the carrier gas, the FID or FPD combustion gas, install the analyzer in a location equipped with a ventilator or where there is sufficient ventilation to ensure safety.

Check for leaks regularly to make sure there are no gas leaks from the pipe joints.

Supply hydrogen gas to this analyzer at 500 ±20 kPa to meet the explosionproof requirements.

Sample gas, carrier gas and other utility gas pipes

The sample gas inlet/outlet, carrier gas inlet and other utility gas inlets connect pipes with an outer diameter of 6 mm or 1/4 inch.

Refer to "Operational Data" for the user-specified pipe size.

Protection gas (instrumental air) pipe

This is the pipe for supplying air to the analyzer for purging pressurized enclosures.

An air pressure of 350 to 900 kPa (500 to 900 kPa for FPD or Programmed temperature oven with cooler) is required. Use general instrument air as the source and connect the piping to the analyzer PURGE AIR port. A pressure regulator should be installed in-between.

The protective gas inlet is Rc1/4, 1/4NPT, Rc1/2 or 1/2NPT. Refer to “Operational Data” for connection size specified by the user. Connect a pipe with an outer diameter of 1/2 inch or more.

Venting pipes

Sample vents are normally open to the atmosphere. In this case, pay sufficient attention to safety. If the sample vent is connected to a flare stack, consider the stack pressure and flow rate.

For vent pipes with vent headers, the piping is connected to the header.

For vent pipes without a vent header, the vent pipe is connected to the vent stack. Use a large pipe for venting to minimize pressure loss. Connect to an about a 2-inch header using 1/4 inch piping for FID/FPD and 1/8 inch piping for others.

Installation site and environment

The analyzer specifications allow it to be used in hazardous areas as defined by DIV1, GPS B, C & D, T1, T2, T3, T4 (FM, CSA) or Zone 1 IIB + H2T1, T2, T3, T4 (ATEX, IECEx, NEPSI, TIIS). However, never install the analyzer in an area where dense explosive gas exists for a long time.

The analyzer shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1 (EN IEC 60664-1).

For the class of hazardous areas:

For FM, refer to Article 500 of the National Electrical Code (NEC).

For CSA, refer to Section 18 of CSA C22.1, Canadian Electrical Code (CEC).

For ATEX or IECEx, see IEC/EN 60079-10-1.

For NEPSI, see GB 3836.14.

For TIIS explosion protection, refer to Article 1 (15) to (17) of the Constructional Requirements for Electrical Equipment for Explosive Atmospheres (Japanese only).

Wiring works

<FM>

WARNING

- All wiring shall comply with National Electric Code ANSI/NFPA 70 and Local Electric Codes.
- In a hazardous area, use conduits for wiring in the protection system or to electronics sections.

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to maintain pressure to the pressurized enclosure. Otherwise, power is not supplied to the electronics section.

<CSA>

WARNING

- All wiring shall comply with Canadian Electric Code CSA C22.1 and Local Electric Codes.
- In a hazardous area, use conduits for wiring in the protection system or to electronics sections.

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to maintain pressure to the pressurized enclosure. Otherwise, power is not supplied to the electronics section.

<ATEX, IECEx, NEPSI>

WARNING

- All externally powered input signals into the pressurized enclosure protected by the Ex pxb protection system shall be isolated by external relays controlled by the Ex pxb protection system (safety device).
- Electrostatic charges on the non-metallic parts (excluding glass parts) or coated parts of the equipment shall be avoided.
- The thread type of the cable entry is not indicated on the flameproof enclosure, since it is limited to “M25x1.5”.

  On the other hand, the threaded adapter has the indication of its own type and size.
- All wiring shall comply with IEC/EN 60079-14, Local Electric Codes and Requirements.
- In a hazardous area, use appropriate flameproof-certified parts for connecting cables.
- In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with appropriate torque. Care must be taken not to twist the conductor.
- In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), transient protection shall be provided that is set at a level not exceeding 119 V peak at the Input/Output terminals of the equipment.
- In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), the field wiring for Ethernet communication must be in accordance with IEEE 802.3 so as to avoid overvoltage of > 119 V.
- In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), screws of the field wiring terminals must be tightened with specified torque values as follows:

  - Terminal for power supply: 1.2 N·m

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to maintain pressure to the pressurized enclosure. Otherwise, power is not supplied to the electronics section.

<TIIS>

WARNING

- In case of TIIS-certified wiring, the attached cable packing adapters or sealing fitting must be used.

  Otherwise, it does not comply with TIIS regulation.
- Use the wiring to the pressurized enclosure, whose allowable temperature is more than 80°C.

IMPORTANT

Cables should be arranged in an orderly manner in the protection system.

Otherwise, they may damage other parts (e.g. relay).

Maintenance and inspection

Before opening the doors or the covers for maintenance and inspection, be sure to turn off the power and wait for at least 25 minutes (in the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), 40 minutes) with protective gas (instrument air) supplied. After completing inspections, close the door or cover tightly, check that the specified explosionproof performance is ensured, and then turn on the power. In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), the screws for cover of electronic section must be tightened with specified torque value: 1.4 N·m.

If any of the following damage occurs, contact a Yokogawa sales representative or the Yokogawa sales division.

- The screws securing the Protection System (explosionproof construction) are damaged
- The exterior of the enclosures is damaged
- Packings are cracked or deformed

<ATEX, IECEx, NEPSI>

WARNING

- Only personnel authorized by Yokogawa Electric Corporation can repair the equipment in accordance with the relevant standards: IEC/EN 60079-19 (Equipment repair, overhaul and reclamation) and IEC/EN 60079-17 (Electrical installation inspection and maintenance).
- Modification of the flameproof joints is not allowed.

Override function (The analyzer with FM-Y, CSA-Y, ATEX-Y, IECEx-Y, NEPSI-Y does not have this function.)

WARNING

When the override function is used, use a gas detector to check that the concentration of explosive gases in the ambient atmosphere is less than the allowable limit.

In this analyzer, if the pressure of the pressurized enclosure (electronics section) drops below a specified level while the power is on, the protection system is activated to stop power supply.

Therefore, if the door of the electronics section is inadvertently opened for maintenance while the power is on, the protection system is activated to cut off the power.

The override function forcibly disables this function.

This function allows operators to open the door or cover of the pressurized enclosure while the power is still on.

This function is activated by opening the cover of the protection system and pressing the override switch while the light sensor is detecting more than 100 (lx) of light.

The function becomes invalid automatically when the cover of the protection system is closed.

Checking the pressure in the pressurized enclosure

The LED (Green) of "POWER" is turned ON and the LED (Red) of "ALARM" is turned OFF when the pressure is in the normal condition. See Figure 5 or Figure 6.

The pressurized enclosure is divided into "Electronics section", "Isothermal oven", and "programmed temperature oven". How to check the pressure in each enclosure is as follows.

<Electronics section>

WARNING

When the cover of the protection system is uninstalled, use a gas detector to check that the concentration of explosive gases in the ambient atmosphere is less than the allowable limit.

The status of the protection system can be checked with the LEDs as shown in Figure 5.

The meaning of each LED is written on the status display.

POWER:	ON when power is supplied to the protection system
PRESSURE:	ON when the specified internal pressure is applied to the electronics section. This LED is ON in the normal condition. If the internal pressure becomes low, it turns off.
PURGING:	ON when purging the electronics section. After purging, it turns off. When power is supplied and “PRESSURE” LED is on, this LED turns ON and purging begins. After the electronics section is purged for 21 ±3 min, the LED turns off and power is supplied to the electronics section. The LED is OFF in the normal condition after purging. If purging ends incompletely, the status of purging is reset and purging begins again.
OVERRIDE:	ON when the override function is activated.

<Isothermal oven>, <programmed temperature oven>

If the internal pressure in the oven becomes low, the following alarms appear on the operation panel.

Top isothermal oven:	Alarm for low internal pressure No. 112 “OVEN1 PRESS DOWN”
Middle isothermal oven or programmed temperature oven:	Alarm for low internal pressure No. 113 “OVEN2 PRESS DOWN”
Bottom isothermal oven:	Alarm for low internal pressure No. 114 “OVEN3 PRESS DOWN”

Alarms are displayed on the “ASET” PC software for the specification without the operation panel on GC8000.

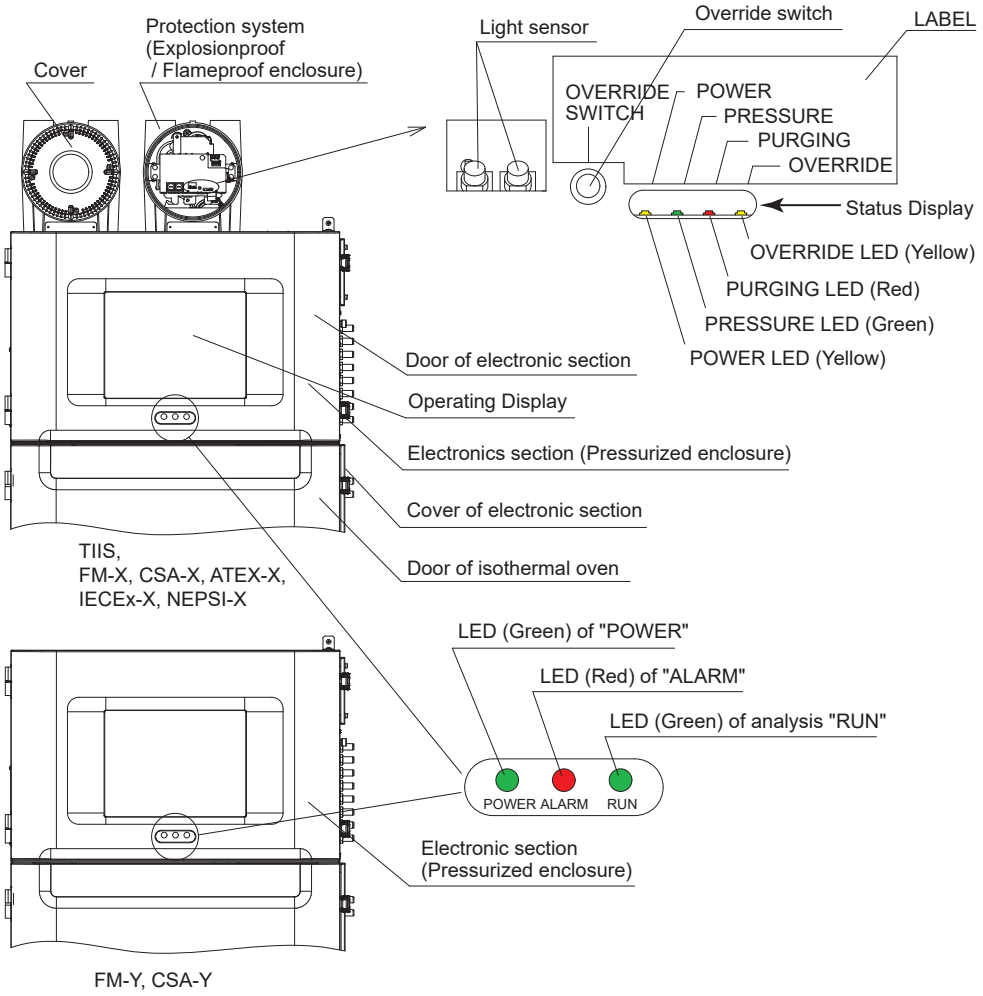


Figure 5 For Type 1 to 5

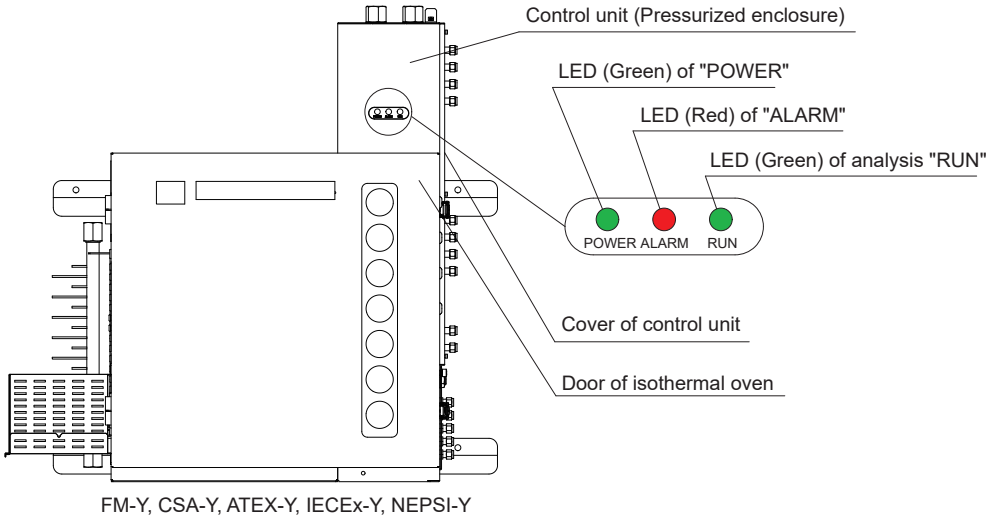


Figure 6 For Type 6

Operation

WARNING

- Do not open the doors and the covers. Refer servicing to properly trained personnel. High voltage and high temperature are presented on the inside parts. If contacted, produce electric shock and burns.
- To meet the specification of protection degree of enclosure, check that the control unit door, the oven unit door (large isothermal oven, standard isothermal oven, programmed-temperature oven) , the electronics section covers and the protection system covers are securely closed before the supplying power to this analyzer. In the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), the screws for cover of electronic section must be tightened with specified torque value: 1.4 N·m
- Before opening the doors and the covers, turn off the power under the permission of the administrator and wait for at least 25 minutes (in the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), 40 minutes) with the Protective gas (instrumental air) supplied.
- Electrostatic charge may cause an explosion hazard.
  Avoid any actions that cause the generation of electrostatic charge, such as rubbing with a dry cloth.
- Do not put anything on the surface of the Operating display (touch operation panel) such as clear protection film. This would be a violation for Ex-proof certification requirements.

CAUTION

- The oven is extremely hot after turning off the power immediately. Keep the protective gas (instrumental air) supplied for more than an hour after turning off the power. Keep hands away from the oven components.
- The protective gas shall be instrumental air.
- For ATEX, IECEx or NEPSI, the temperature of protective gas (instrumental air) at the inlet of pressurized enclosure shall be comply with the following temperature class range.
  ATEX-X, IECEx-X, NEPSI-X
  T1 : -10 to +40°C
  T2 : -10 to +40°C
  T3 : -10 to +45°C
  T4 : -10 to +50°C
  ATEX-Y, IECEx-Y, NEPSI-Y
  T3 : -10 to +50°C
  T4 : -10 to +50°C
- Pressure of protective gas (instrumental air) at the inlet of analyzer shall be required 350 to 900 kPa.
- When using hydrogen gas as the carrier gas, the FID or FPD combustion gas, supply hydrogen gas to this analyzer at 500±20 kPa.

FM-X, CSA-X, ATEX-X, IECEx-X, NEPSI-X, TIIS

<Power on>

(1) Power is supplied to the protection system (flameproof enclosure).
(2) Protective gas (instrumental air) is supplied to the protective gas (instrumental air) inlet.
(3) When the internal pressure in the electronics section, which is the control unit and oven unit 1 to 3, exceeds 392 (Pa), purging to each electronics section begins.
(4) After 21 ±3 minutes purging, power is applied to the electronics section of the control unit. On the other hand, it does not be applied to the electronics section of the oven unit 1 to 3, the heater and detector in the oven yet.
(5) When the internal pressure in the oven unit 1 to 3 exceeds 392 (Pa), purging to each oven unit begins independently.
(6) After the purging time as follows, power is applied to the electronics section of the oven unit. Then the hydrogen limiting unit, the heater and detector in the oven are ready for operation. The purging time depends on the flameproof certifications.

TIIS, FM, CSA: 9 ±2.5 minutes
ATEX, IECEx, NEPSI: 11 ±3 minutes

<Power off>

(1) The operation and supply of sample to be measured are stopped.
(2) The detector is turned off.
In case of FID, FID with methanizer and FPD, the detector should be “Frame out” with stopping the supply of make-up gas, combustion gas and combustion air. Then, wait for over 4 hours.
(3) Each heater of the isothermal oven (or programmed temperature oven), LSV and FPD is turned off.
(4) Wait until the oven temperature drops to near room temperature. Usually it takes over one hour.
(5) The supply of power to the protection system is stopped.
(6) After the oven temperature drops, the supply of the protective gas (instrumental air) is stopped.

IMPORTANT

In case of emergency, stop the supply of power immediately. In this case, it may damage to the analyzer.

<Low pressure in the pressurizedenclosure>

A. Electronics section (control unit, oven unit 1 to 3)

(1) When the internal pressure in the electronics section falls below 392 (Pa), the protection system immediately shuts off the power supply to the control unit and oven unit 1 to 3.
(2) When the internal pressure described above returns to normal, the procedure starts automatically from item (4) in <Power on>.

B. Each isothermal oven (or programmed temperature oven) in the oven unit 1 to 3

(1) When any of internal pressure in the oven falls below 392 (Pa), the control unit immediately shuts off the power supply to the electronics section of the relevant oven.

CAUTION

When the internal pressure in the oven falls, the status display is different from the actual status about the following items: detector, temperature controller, valve, atmospheric pressure balancing valve, hydrogen limiting units and EPC.

(2) When the internal pressure in the oven returns to normal, the procedure starts automatically at item (6) in <Power on>.

FM-Y, CSA-Y, ATEX-Y, IECEx-Y, NEPSI-Y

<Power on>

(1) Protective gas (instrumental air) is supplied to the protective gas (instrumental air) inlet.
(2) The pressure value is checked if it is indicated the specified one at the pressure gauge.
(3) Wait for 21 ±3 minutes (in case of Type 6, 40 minutes or more) to keep the protective gas (instrumental air) supplied.
(4) Start the supply of power to the electronics section of the control unit.
(5) Check if the “Elec. Press. Down” error is not outputted. When this alarm is outputted, stop the supply of power. In this case, the procedure starts automatically described in “A. Electronics section (control unit, oven unit 1 to 3)” in <Low pressure in the pressurized enclosure>.
(6) When the internal pressure in the oven unit 1 to 3 exceeds 392 (Pa), purging to the oven unit begins.
(7) After the purging time as follows, power is applied to the electronics section of the oven unit. Then the hydrogen limiting unit, the heater and detector in the oven are ready for operation. The purging time depends on the flameproof certifications.

FM, CSA:	9 ± 2.5 minutes
ATEX, IECEx, NEPSI:	11 ± 3 minutes

<Power off>

(1) The operation and the supply of sample to be measured are stopped.
(2) The detector is turned off.
In case of FID, FID with methanizer and FPD, the detector should be “Frame out” with stopping the supply of make-up gas, combustion gas and combustion air. Then, wait for over 4 hours.
(3) Each heater of the isothermal oven (or programmed temperature oven), LSV and FPD is turned off.
(4) Wait until the oven temperature drops to near room temperature. Usually it takes over one hour.
(5) The supply of power to the protection system is stopped.
(6) After the oven temperature drops, the supply of the protective gas (instrumental air) is stopped.

IMPORTANT

In case of emergency, stop the supply of power immediately. In this case, it may damage to the analyzer.

<Low pressure in the pressurizedenclosure>

A. Electronics section (control unit, oven unit 1 to 3)

When the internal pressure in the electronics section falls below 392 (Pa), the following function is activated.

The power supply is not shut off automatically. It should be done manually.

- The alarm is outputted from the contact output.
- The pressure low alarm is indicated on the operation panel.
- The “ALARM” LED is turned on.

B. Each isothermal oven (or programmed temperature oven) in the oven unit 1 to 3

When the internal pressure in any of the ovens falls below 392 (Pa), the control unit immediately shuts off the power supply to the heater and detector in the respective ovens.

The function as follows is also activated at the same time.

- The alarm is outputted from the contact output.
- The pressure low alarm is indicated on the operation panel.
- The “ALARM” LED is turned on.

When the internal pressure in the oven returns to normal, the procedure starts automatically from item (7) in <Power on>.

CAUTION

When the internal pressure in the oven falls, the status display is different from the actual status about the following items: detector, temperature controller, valve, atmospheric pressure balancing valve, hydrogen limiting units and EPC.

Adjustment and parameter setting

There is heater device, but it is set and adjusted by the manufacturer at the time of shipment.

Refer to “Operation data” for parameter setting values.

Taking out of service and dismantling

<ATEX, IECEx, NEPSI>

WARNING

- Except in case of emergency, stop the supply of power after stopping the system.
- When opening the door or cover, turn off the power and wait at least 25 minutes (in the case of GC8000-B (ATEX-Y), GC8000-M (IECEx-Y) and GC8000-Q (NEPSI-Y), 40 minutes) with protective gas (instrument air) supplied before opening the door and cover.
- The analyzers shall be installed and used in such a way that the risk from electrostatic discharge is avoided.
- All externally powered input signals into the pressurized enclosure protected by the Ex pxb protection system shall be isolated by external relays controlled by the Ex pxb protection system (safety device).

● Safety Instructions

This content described as follows is only for ATEX, IECEx and NEPSI.

● Specification of safety system

		Protection system	Oven safety unit
Power supply		Install in accordance with the specification of GC8000	
Ambient condition			
Threshold value	Pressure	392 Pa	
	Flow rate of protective gas (instrumental air)	35 L/min	
Time	Purging time	21 ±3 min	11 ±3 min
	Safety response time	< 2 sec	
Type of protection	Protection system itself	Ex db	Ex pxb
	Protection target	Ex pxb	

● Installation and wiring works

The safety system is built-in GC8000. Installation and wiring into GC8000 are completed before shipping.

- Do not use for other than GC8000.
- Do not change connection of cables and harnesses.

● Action in Emergency

Relays and SSRs in safety system will be in safe state (contact opens) when de-energized.

In emergency, stop supply of power to GC8000 immediately and contact your nearest Yokogawa representative.

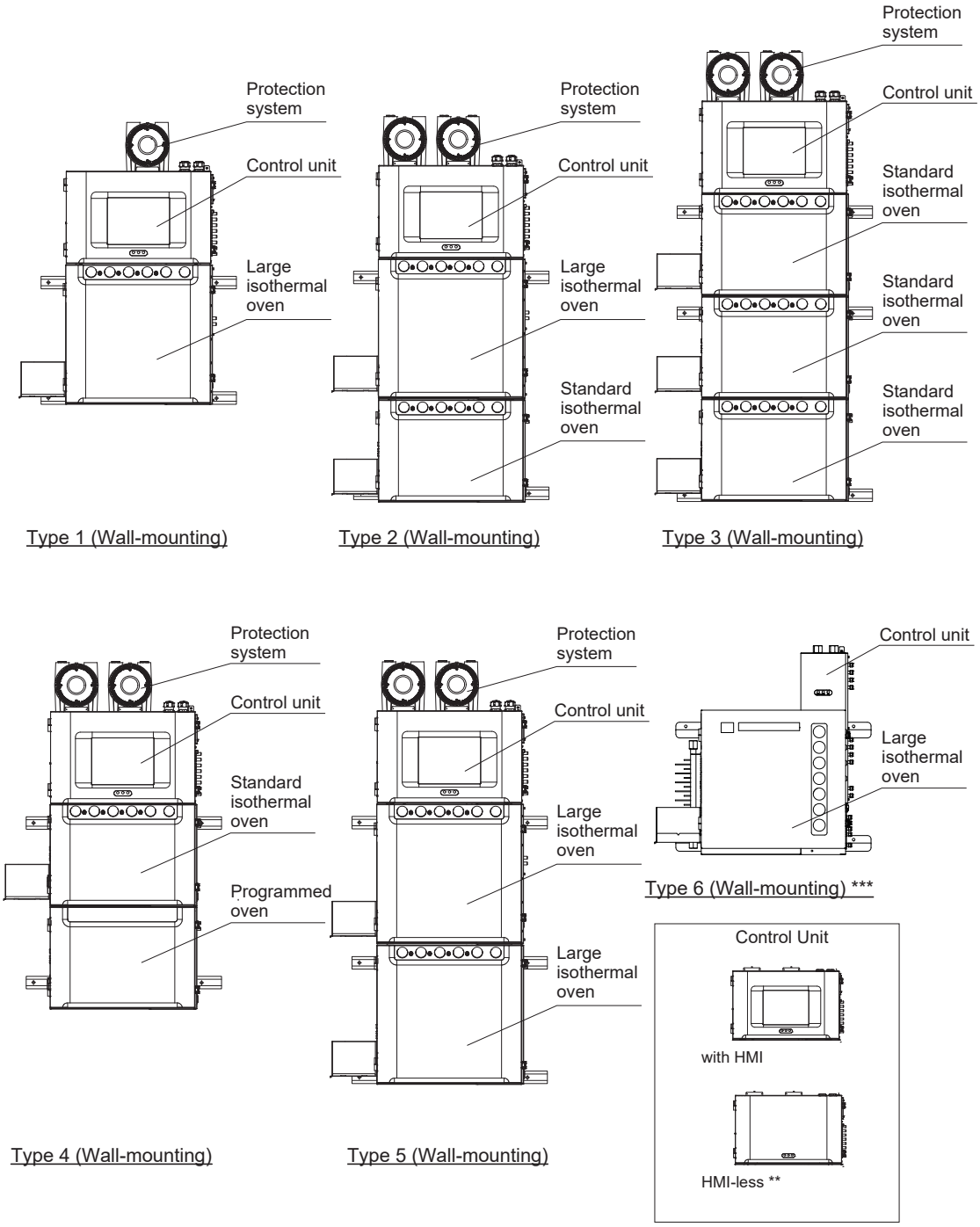
- In a normal situation, follow the procedure of "● Operation" for shutdown, or GC8000 may be damaged.

1. Overview

This document is an excerpted version of the GC8000 User's Manual for the customer's convenience.

See also Operation Data for installation work and operation.

Six types of GC8000 are available (Type 1 to 6). Type 1 to 5 have a wall-mounting version and a self-standing version (*). Type 6 has only a wall-mounting version.



*: Wall-mounting version and self-standing version are available excluding Type 6.
Analyzer base sampling unit (GCSMP) can be installed in the self-standing version (excluding Type 3, Type 5, and Type 6). Type 5 is not available for TIIS.

**: This option is available only for FM/CSA/ATEX/NEPSI/IECEx models. An "HMI-less" model is one that has no LCD or "Operation panel."

***: Type 6 is available for FM/CSA/ATEX/IECEx/NEPSI and only has the wall-mounting version and the HMI-less model.

Figure 1.1 GC8000 configuration example

System configuration

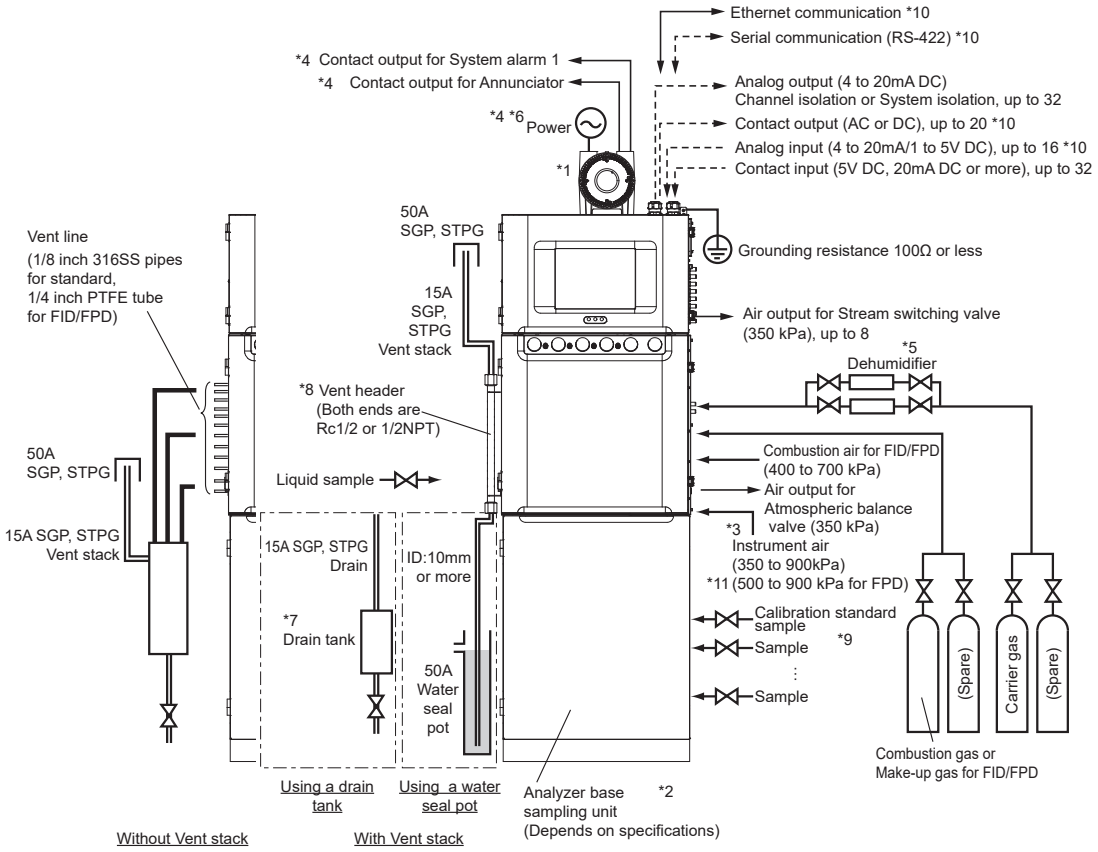
The following equipment is used to construct a process gas chromatograph system with the GC8000 analyzer:

- External sample conditioning equipment
- Personal computer
- Computer for upper system, Analog equipment
- Analyzer network system

The system configuration may differ according to the specifications.
See the General Specifications for details.

1.1 Wiring and Piping Diagram

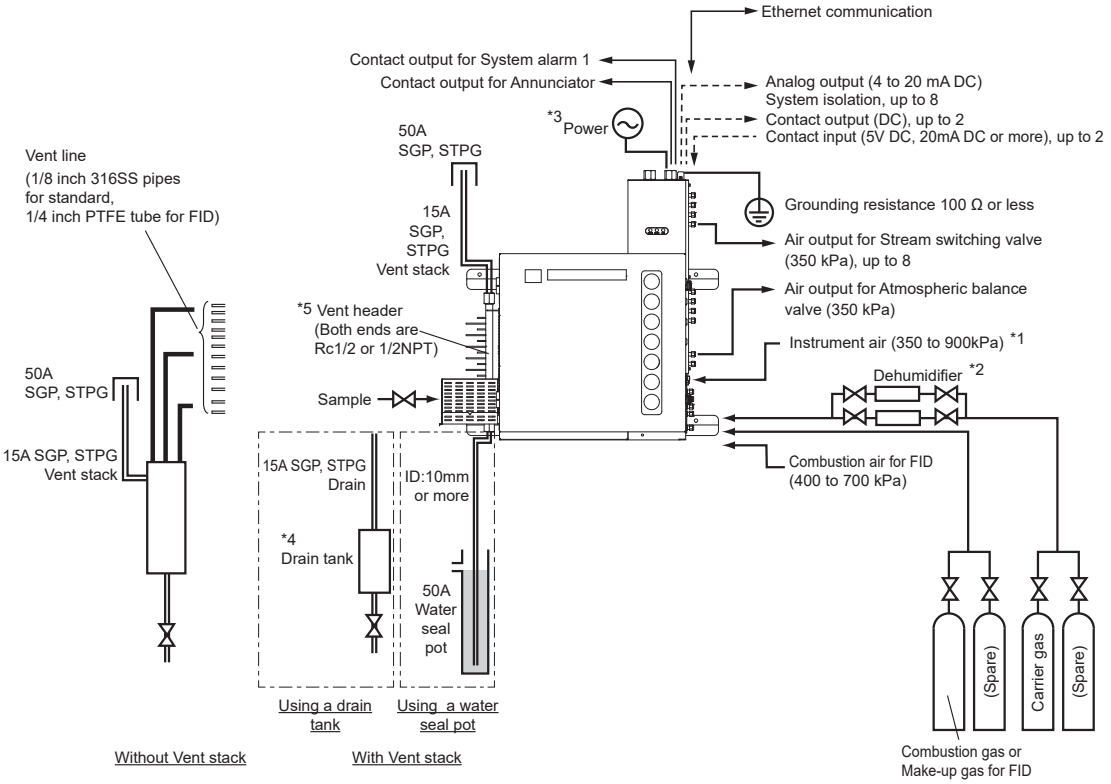
Type 1 to 5



*1: The specification determines the number of Explosion proof enclosures. No enclosures is needed for FM-Y, CSA-Y type.
*2: If an analyzer base sampling unit is provided, most applications require no external sampling equipment. In addition, optimum sampling systems are prepared depending on various conditions. (For details, consult Yokogawa. Optimal sampling systems will be offered.)
*3: For air purge piping, use stainless steel pipe of 1/2 inch or more.
*4: Power and contact output for system alarm 1 or annunciator are connected to control unit in case of FM-Y, CSA-Y type.
*5: Dehumidifier can be optionally provided by Yokogawa. Other wiring cables, piping and installation materials should be supplied by the user.
*6: Circuit breaker (30 AT or less) shall be suitable for the item of the power supply described in the specification, and located near the analyzer.
*7: Drain tank is needed only for GCs using FID/FPD. This is not used for GCs using TCD/MTCD.
*8: Fix venting pipes properly so that the load of the venting pipes does not apply to the assembling vents of this analyzer.

*9: The number of streams including one for calibration standard sample is as follows, in case of using GCSMP.
Type 1: Maximum of 7
Type 2, 4: Maximum of 4
*10: Signal interrupters (disconnecters) are required depending on the specification.
*11: Air pressure set value of the regulator is depended on the source air temperature and need to tune the setting value.
600 kPa is required when ambient or instrument-air temperature is higher than 46°C (1 FPD) or 40°C (2 FPDs).

Type 6

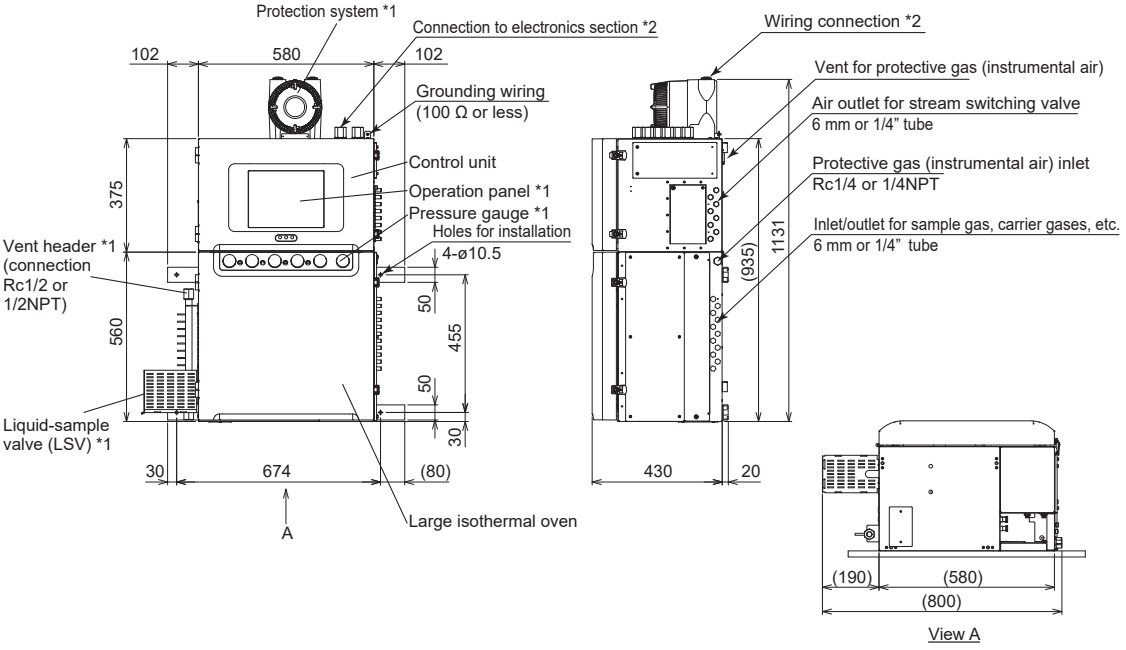


*1: For piping air purging, use stainless steel pipe of 1/2 inch or more.
*2: Dehumidifier can be optionally provided by Yokogawa. Other wiring cables, piping and installation materials should be supplied by the user.
*3: Circuit breaker (30 AT or less) shall be suitable for the item of the power supply described in the specification, and located near the analyzer.
*4: Drain tank is needed only for GCs using FID. This is not used for GCs using TCD/MTCD.
*5: Fix venting pipes properly so that the load of the venting pipes does not apply to the assembling vents of this analyzer.

1.2 External Dimensions

Type 1 (Wall-mounting)

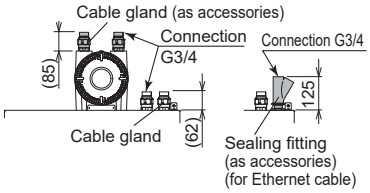
Unit: mm



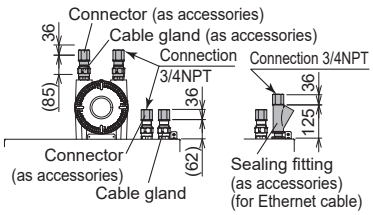
Weight: approx. 100 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

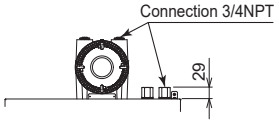
For TIIS (wiring connection: G3/4)



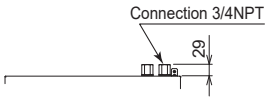
For TIIS (wiring connection: 3/4NPT)



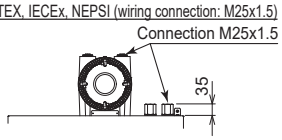
For FM-X, CSA-X (wiring connection: 3/4NPT)



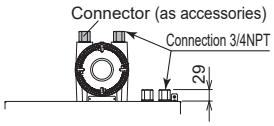
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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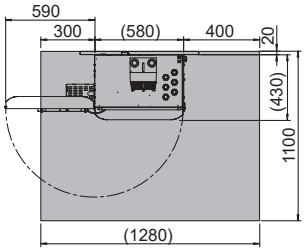
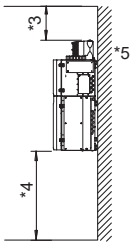
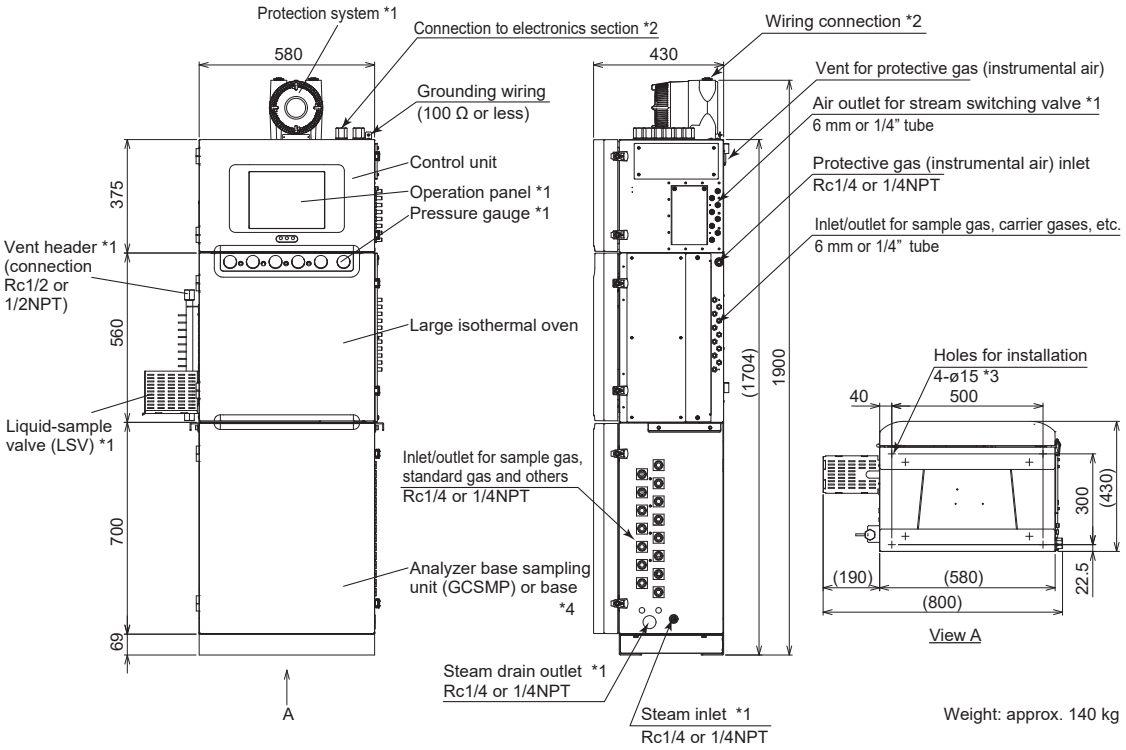




*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 1000 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

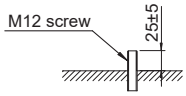
Type 1 (Self-standing)

Unit: mm



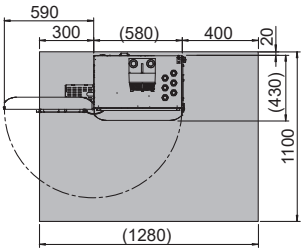
Weight: approx. 140 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.
*3: The four outer holes are used for installation.
The height of M12 screw (prepared by user) is 25 ±5 mm from the floor.

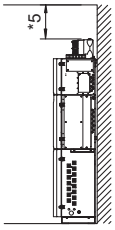


*4: The empty compartment (base) placed by Yokogawa to create a Self-standing GC8000-A, does not impair the compliance of the GC8000-A.

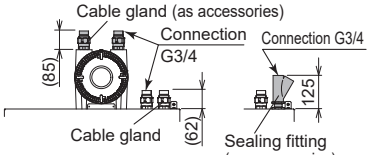
<Maintenance space>



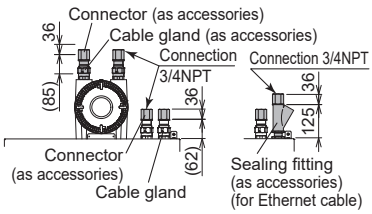
*5: Required clearance needed for wiring.



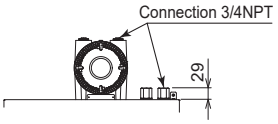
For TIIS (wiring connection: G3/4)



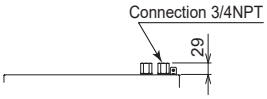
For TIIS (wiring connection: 3/4NPT)



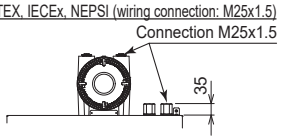
For FM-X, CSA-X (wiring connection: 3/4NPT)



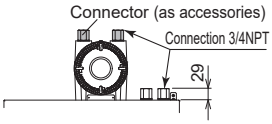
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)

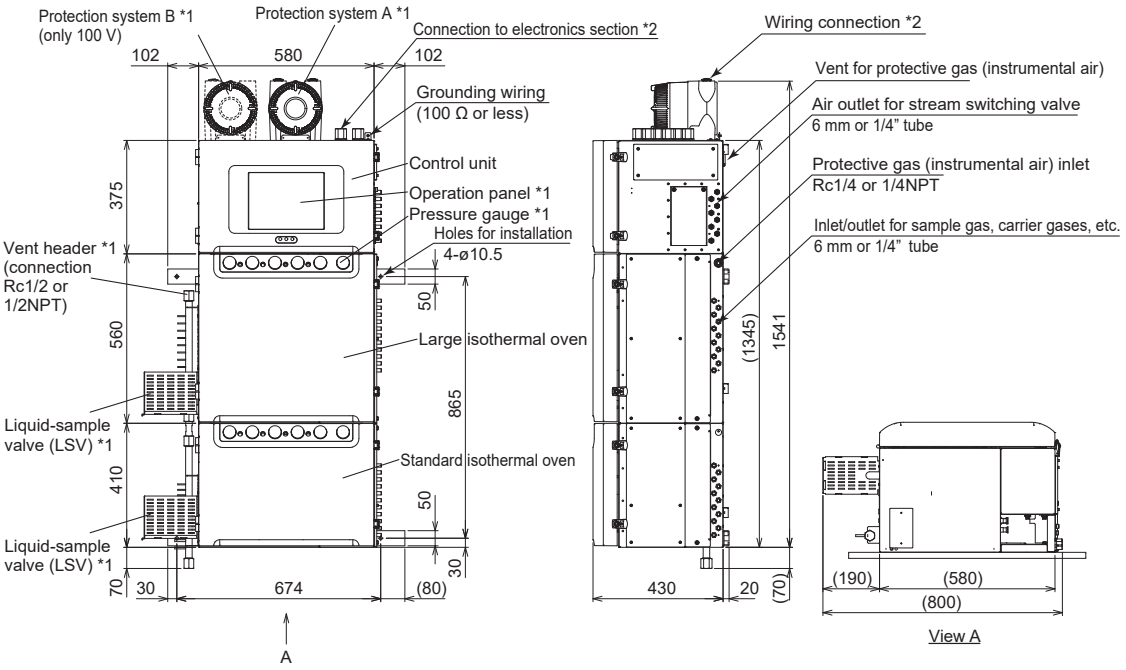


For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



Type 2 (Wall-mounting)

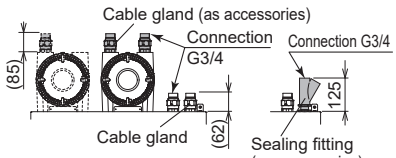
Unit: mm



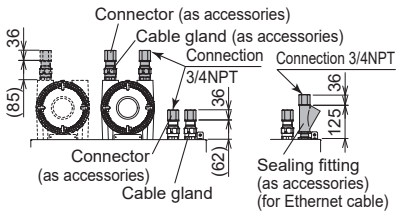
Weight: approx. 155 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

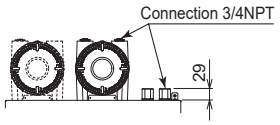
For TIIS (wiring connection: G3/4)



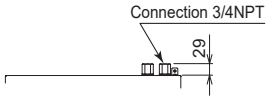
For TIIS (wiring connection: 3/4NPT)



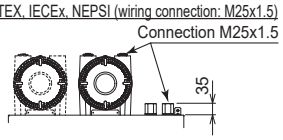
For FM-X, CSA-X (wiring connection: 3/4NPT)



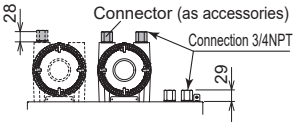
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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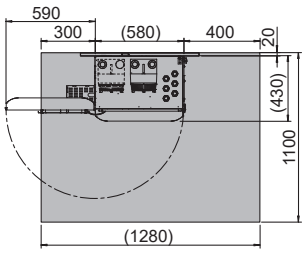
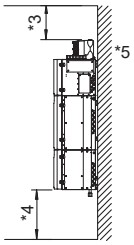
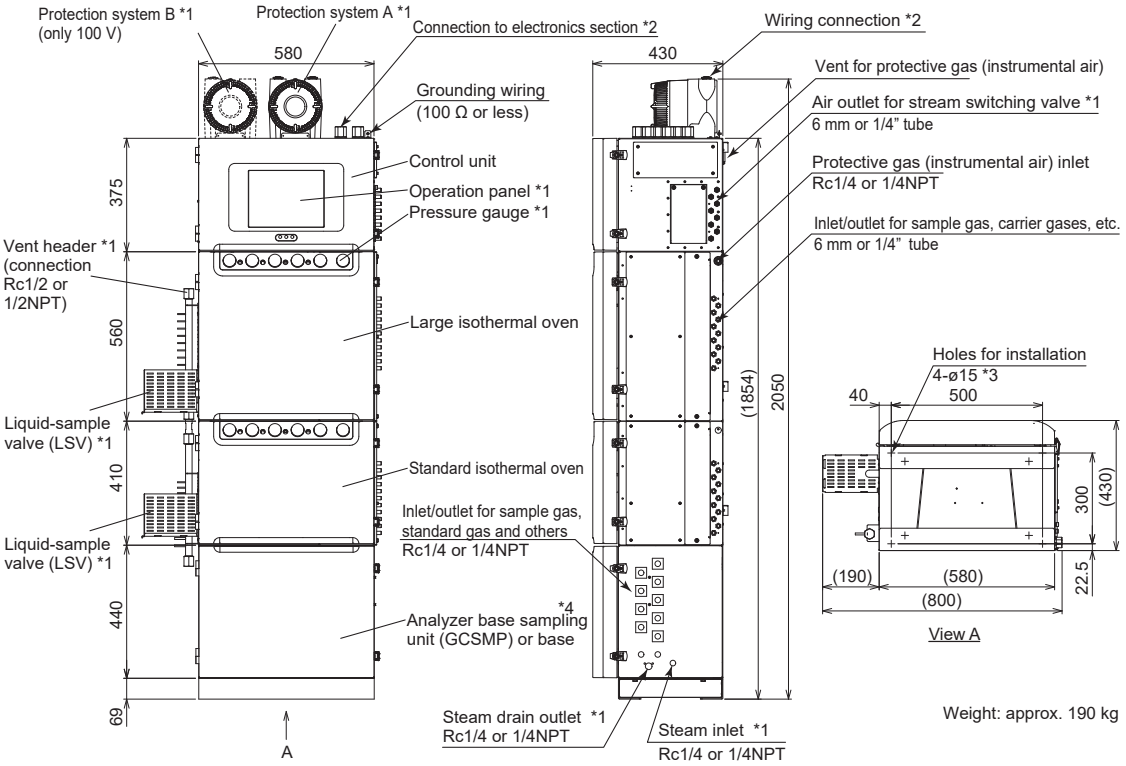




*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 500 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

Type 2 (Self-standing)

Unit: mm

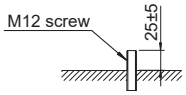


Weight: approx. 190 kg

*1: It depends on specifications.

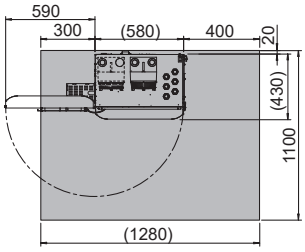
*2: Wiring connections are shown in right figures.

*3: The four outer holes are used for installation.
The height of M12 screw (prepared by user) is 25 ±5 mm from the floor.

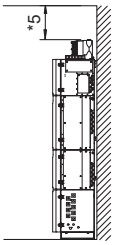


*4: The empty compartment (base) placed by Yokogawa to create a Self-standing GC8000-A, does not impair the compliance of the GC8000-A.

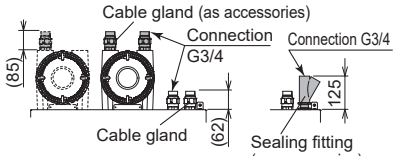
<Maintenance space>



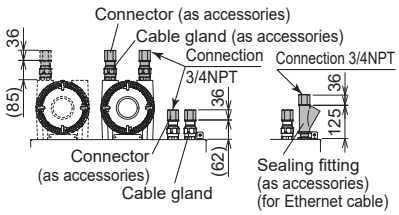
*5: Required clearance needed for wiring.



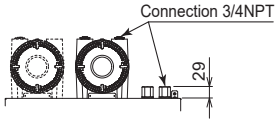
For TIIS (wiring connection: G3/4)



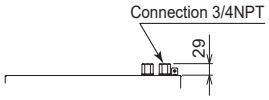
For TIIS (wiring connection: 3/4NPT)



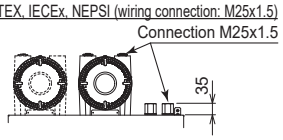
For FM-X, CSA-X (wiring connection: 3/4NPT)



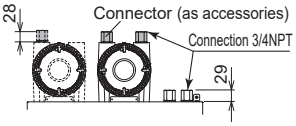
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)

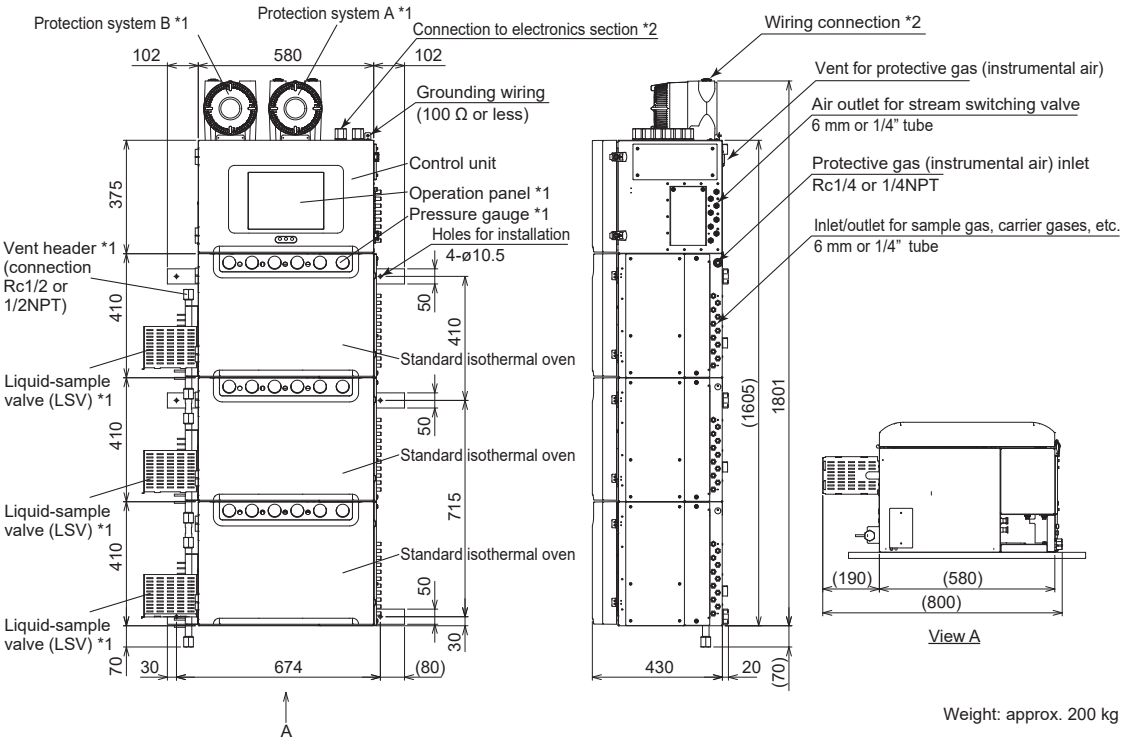


For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



Type 3 (Wall-mounting)

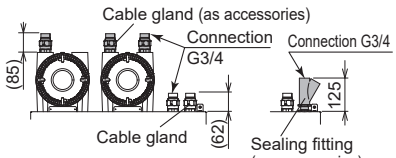
Unit: mm



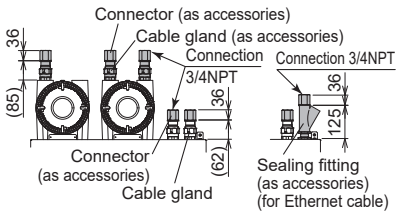
Weight: approx. 200 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

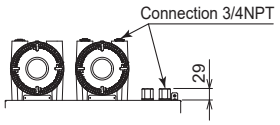
For TIIS (wiring connection: G3/4)



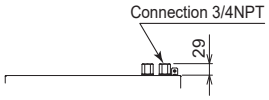
For TIIS (wiring connection: 3/4NPT)



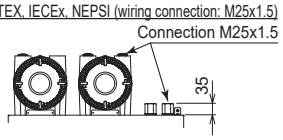
For FM-X, CSA-X (wiring connection: 3/4NPT)



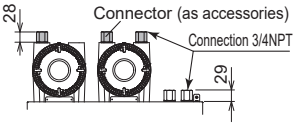
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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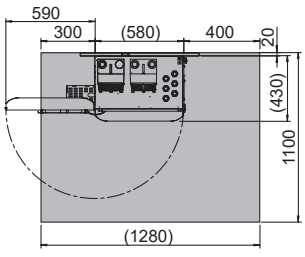
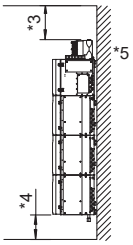
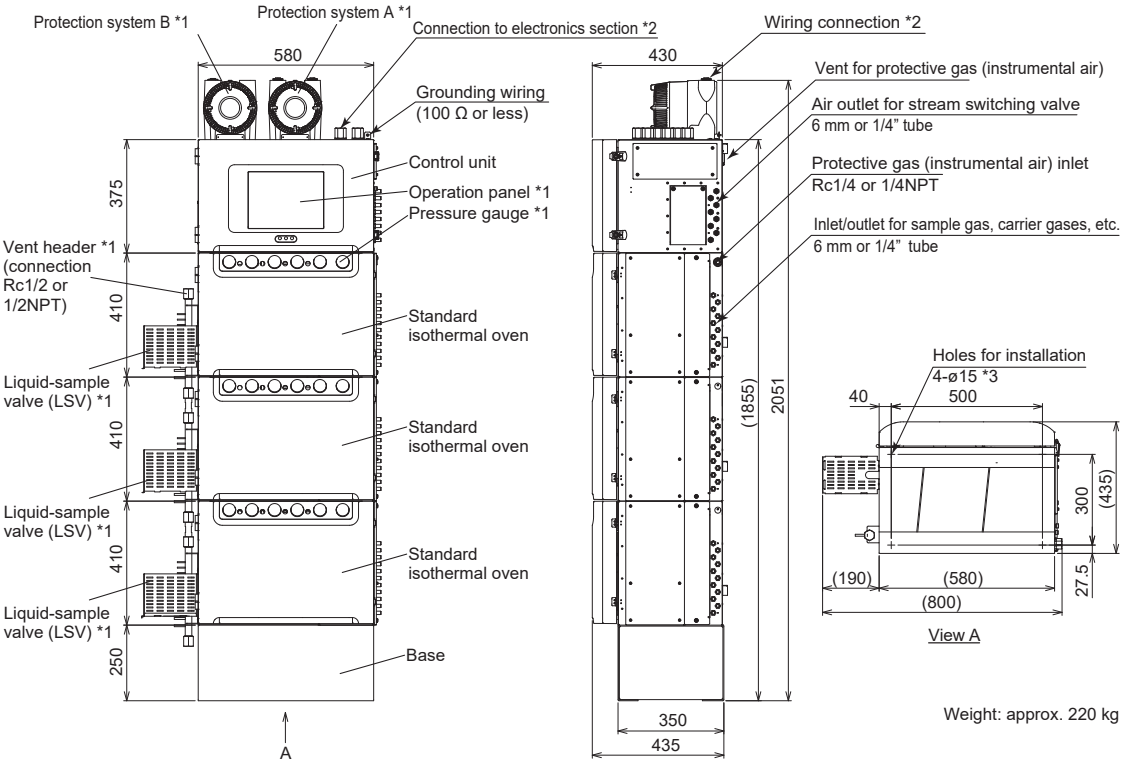




*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 250 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

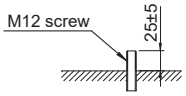
Type 3 (Self-standing)

Unit: mm



Weight: approx. 220 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.
*3: The four outer holes are used for installation.
The height of M12 screw (prepared by user) is 25 ±5 mm from the floor.



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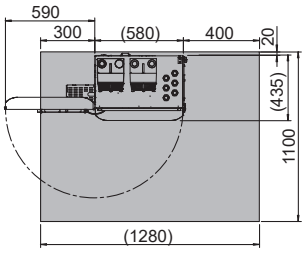
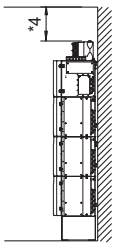
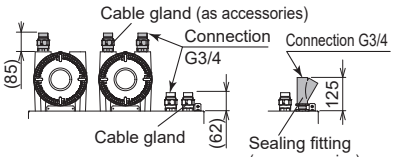


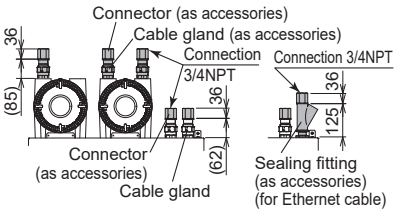
*4: Required clearance needed for wiring.



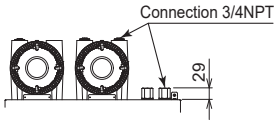
For TIIS (wiring connection: G3/4)



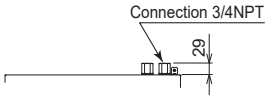
For TIIS (wiring connection: 3/4NPT)



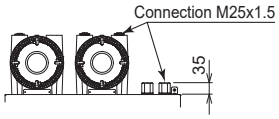
For FM-X, CSA-X (wiring connection: 3/4NPT)



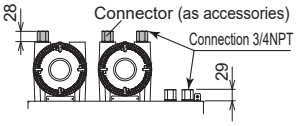
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)

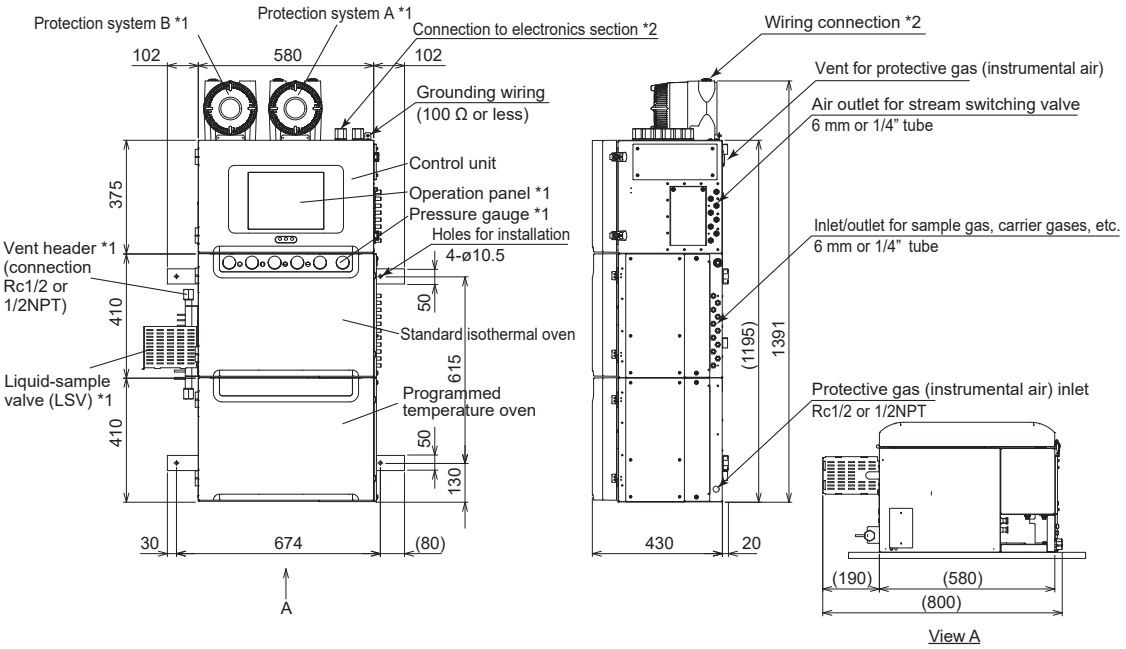


For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



Type 4 (Wall-mounting)

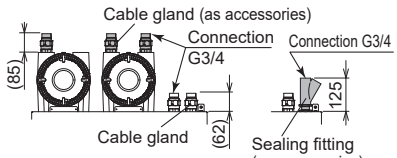
Unit: mm



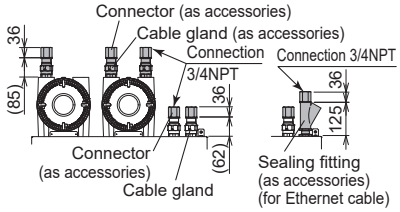
Weight: approx. 140 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

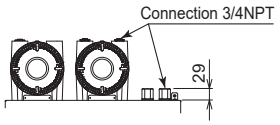
For TIIS (wiring connection: G3/4)



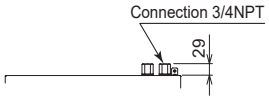
For TIIS (wiring connection: 3/4NPT)



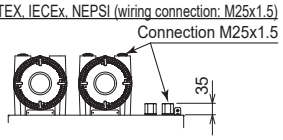
For FM-X, CSA-X (wiring connection: 3/4NPT)



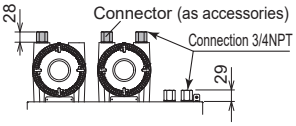
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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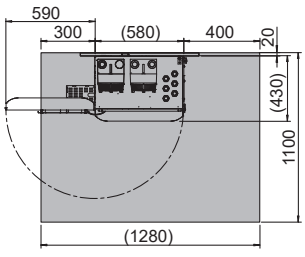
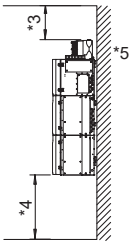
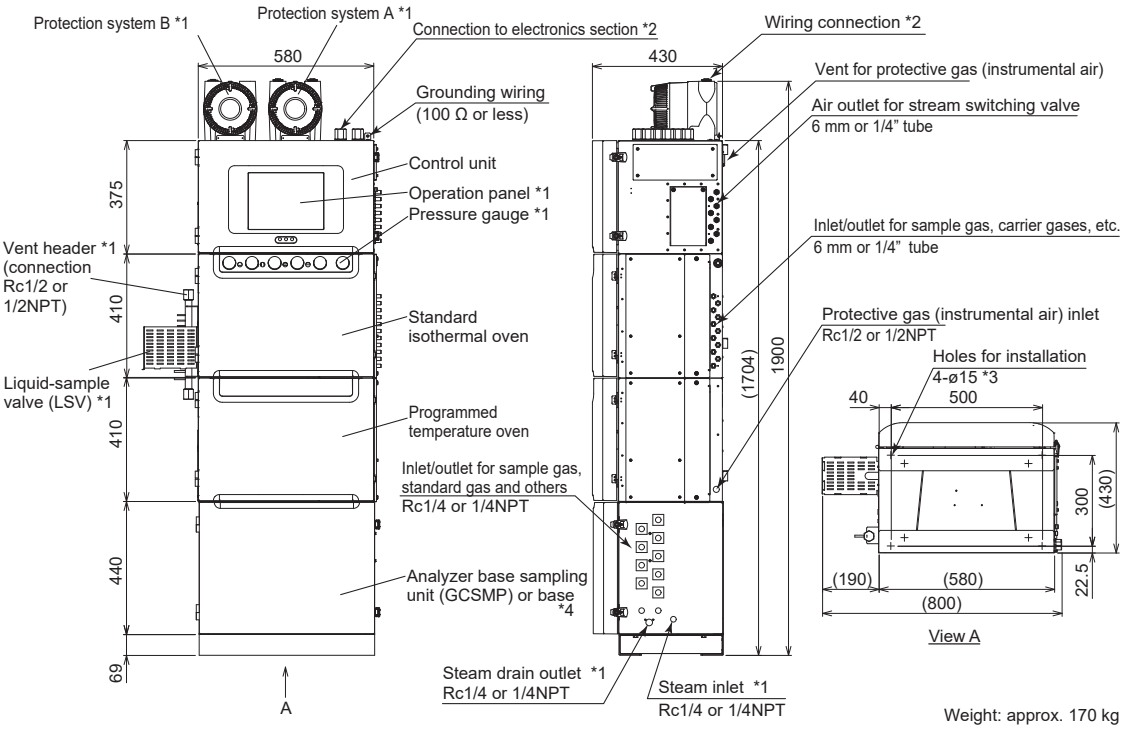




*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 500 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

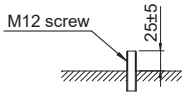
Type 4 (Self-standing)

Unit: mm



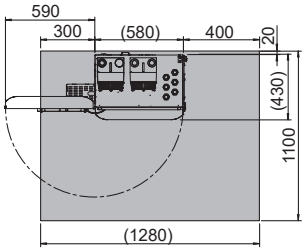
Weight: approx. 170 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.
*3: The four outer holes are used for installation.
The height of M12 screw (prepared by user) is 25 ±5 mm from the floor.

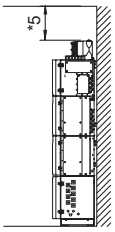


*4: The empty compartment (base) placed by Yokogawa to create a Self-standing GC8000-A, does not impair the compliance of the GC8000-A.

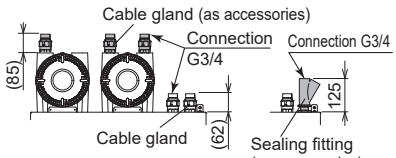
<Maintenance space>



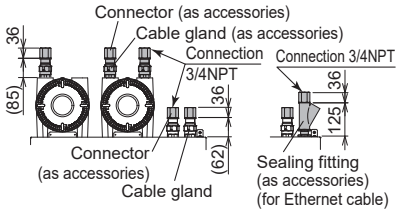
*5: Required clearance needed for wiring.



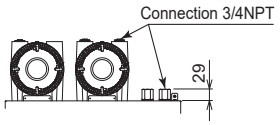
For TIIS (wiring connection: G3/4)



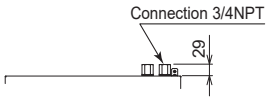
For TIIS (wiring connection: 3/4NPT)



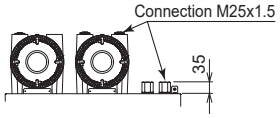
For FM-X, CSA-X (wiring connection: 3/4NPT)



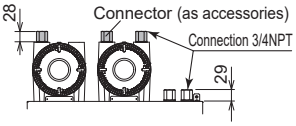
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)

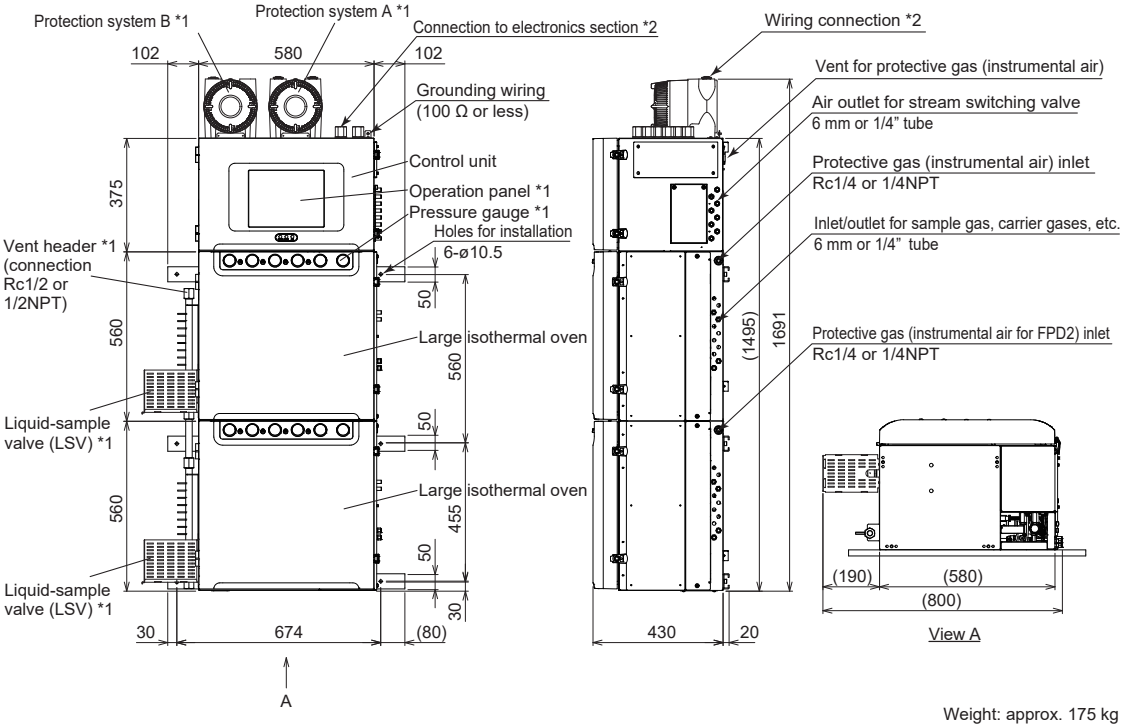


For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



Type 5 (Wall-mounting)

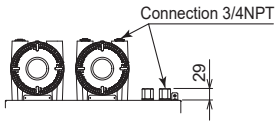
Unit: mm



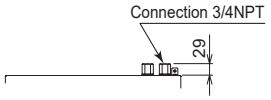
Weight: approx. 175 kg

*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

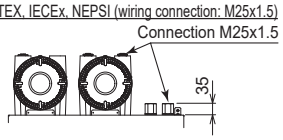
For FM-X, CSA-X (wiring connection: 3/4NPT)



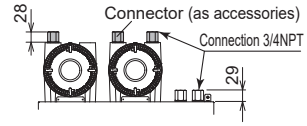
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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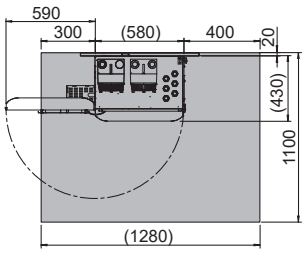
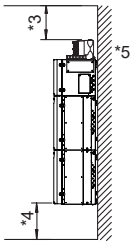
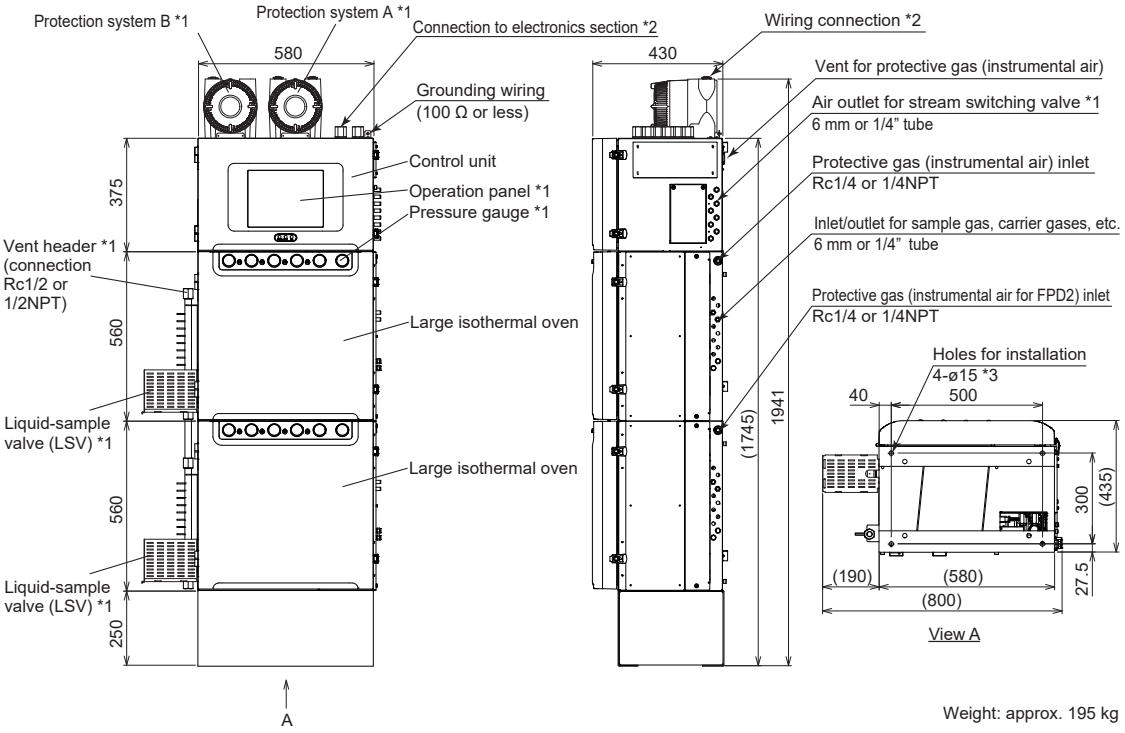




*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 250 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

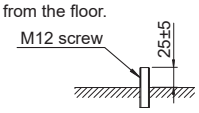
Type 5 (Self-standing)

Unit: mm

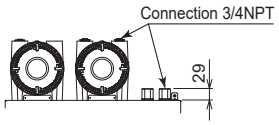


Weight: approx. 195 kg

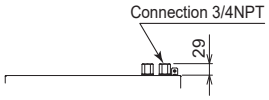
*1: It depends on specifications.
*2: Wiring connections are shown in right figures.
*3: The four outer holes are used for installation.
The height of M12 screw (prepared by user) is 25 ±5 mm from the floor.



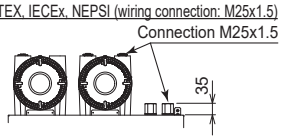
For FM-X, CSA-X (wiring connection: 3/4NPT)



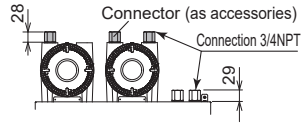
For FM-Y, CSA-Y (wiring connection: 3/4NPT)



For ATEX, IECEx, NEPSI (wiring connection: M25x1.5)



For ATEX, IECEx, NEPSI (wiring connection: 3/4NPT)



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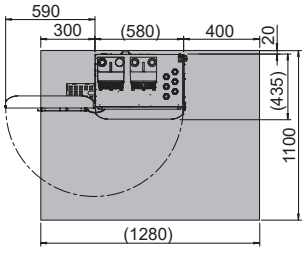
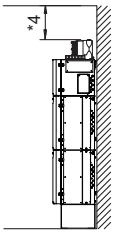
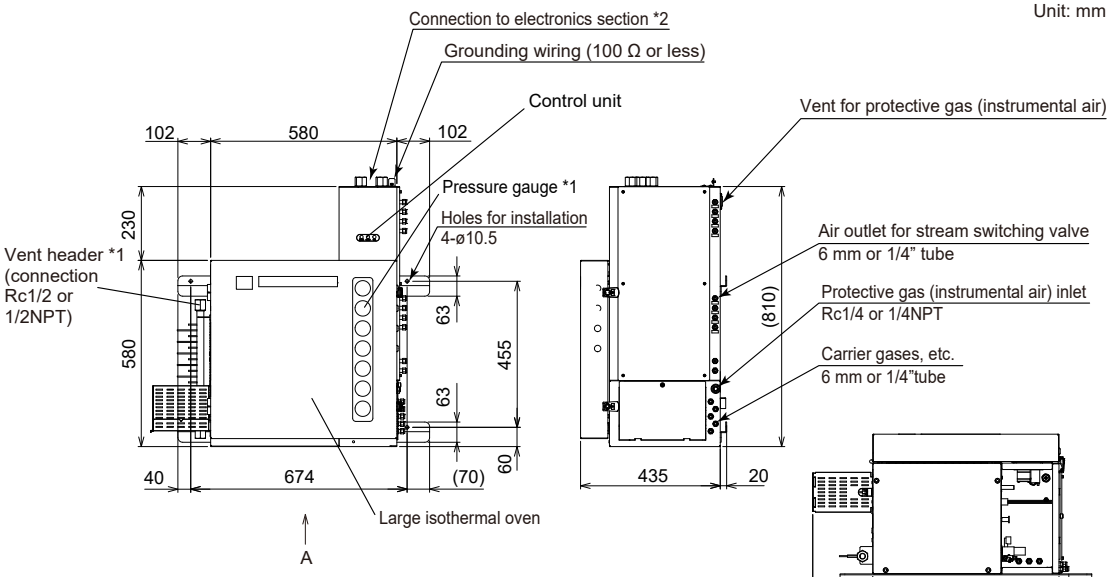


*4: Required clearance needed for wiring.



Type 6 (Wall-mounting)

Unit: mm

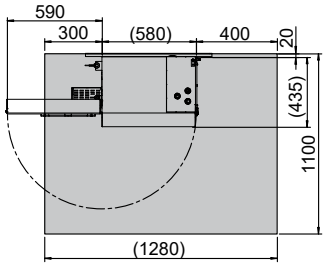


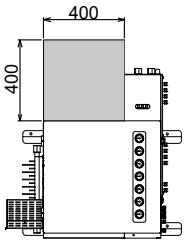
*1: It depends on specifications.
*2: Wiring connections are shown in right figures.

View A

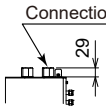
Weight: approx. 85 kg

<Maintenance space>

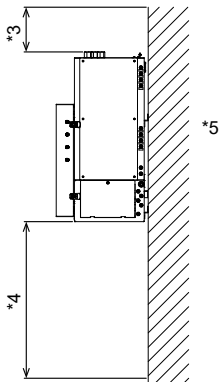




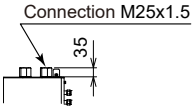
For FM-Y, CSA-Y, ATEX-Y, IECEx-Y, NEPSI-Y (wiring connection: 3/4NPT)



*3: Required clearance needed for wiring.
*4: It is recommended to mount at approx. 950 mm above the floor for easy operation or maintenance.
*5: The wall construction for mounting has to be designed to withstand 4 times the analyzer's own weight.

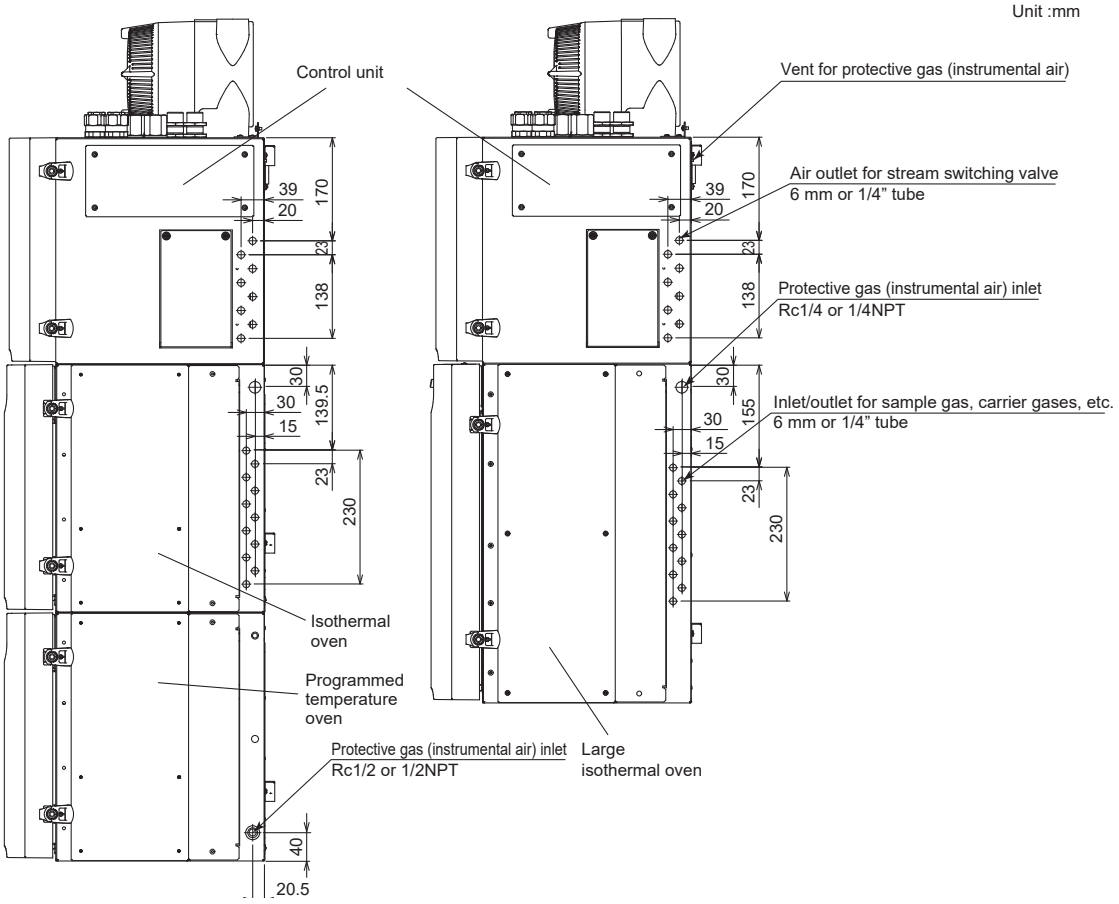


For ATEX-Y, IECEx-Y, NEPSI-Y (wiring connection: M25x1.5)

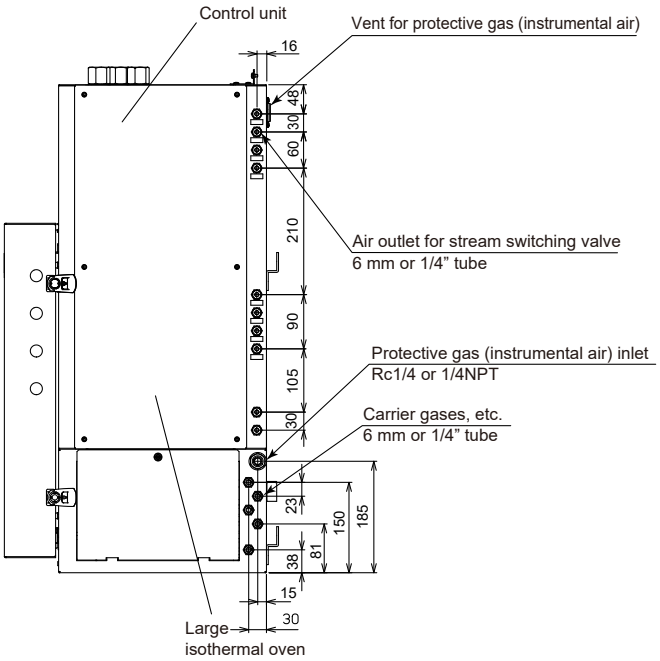


Piping connection of control unit, isothermal oven, large isothermal oven, and programmed temperature oven

Unit :mm

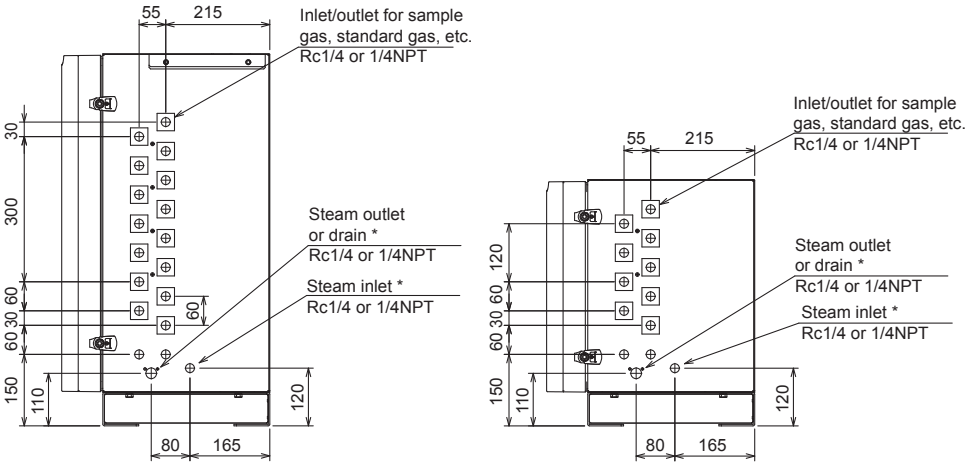


Unit :mm



Analyzer base sampling system (GCSMP)

Unit: mm



*: It depends on specifications.

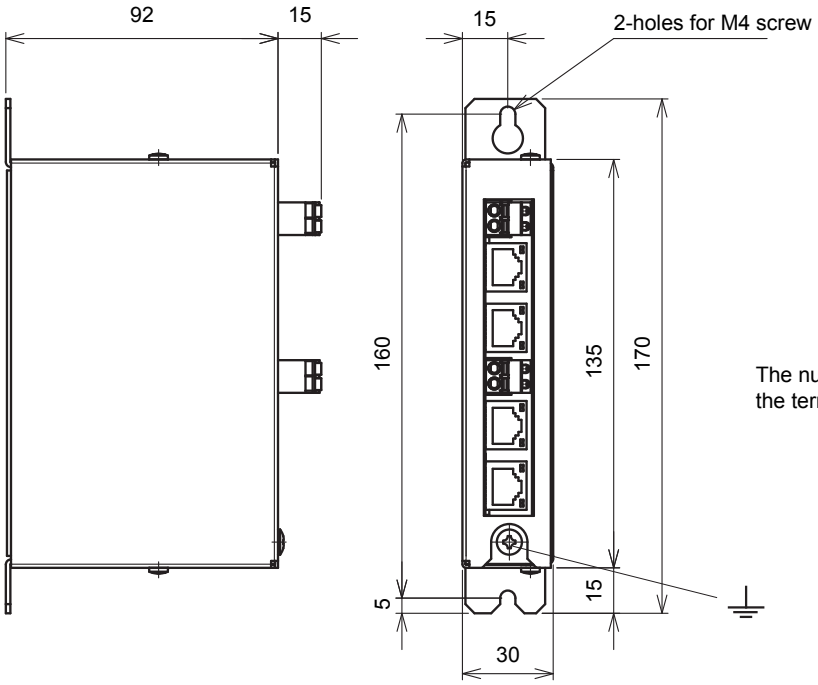
* Some specifications do not have these connections.

Communication converter/Signal interrupter (disconnecter)

Rack-mounted type

- **Converter for RS-422/RS-232C: K9806AS***
- **Signal interrupter for Ethernet twisted pair cable: K9806AA**
- **Signal interrupter for RS-422 output, analog input: K9806AE**

Unit: mm

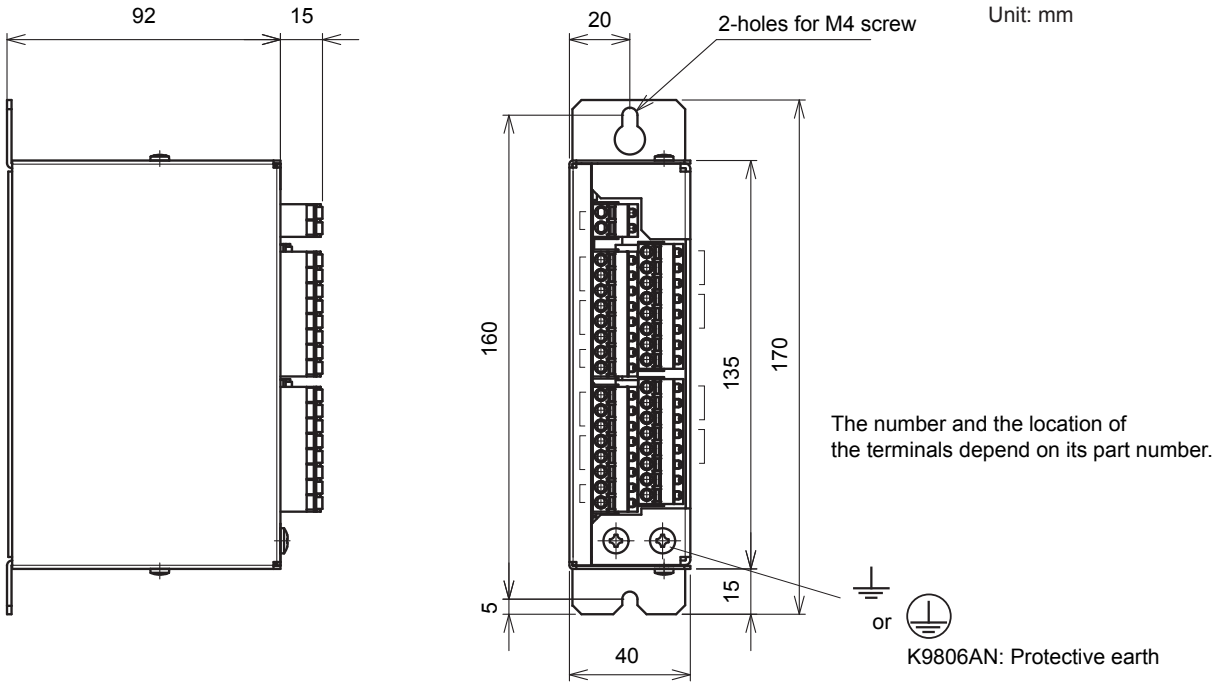


The number and the location of the terminals depend on its part number.

Weight: approx. 500 g

- **Signal interrupter for contact output (AC): K9806AN***
- **Signal interrupter for contact output (DC): K9806AJ***

Unit: mm



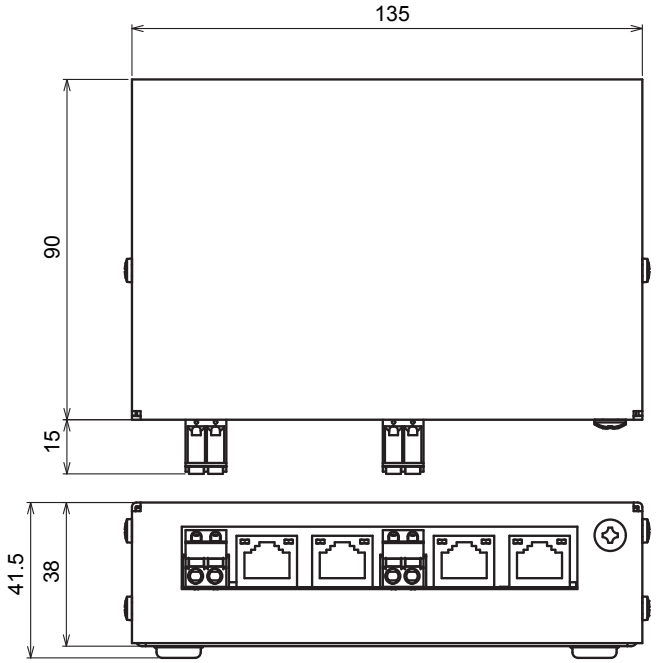
Weight: approx. 500 g

Note: Rack-mounted type should be installed vertically. The space between the converters/the signal interrupters with mark (*) should be kept more than 10 mm.
The wall construction for mounting has to be designed to withstand 4 times the product's own weight.

Desk-top type

- **Converter for RS-422/RS-232C: K9806AT**
- **Signal interrupter for Ethernet twisted pair cable: K9806AB**

Unit: mm



Weight: approx. 500 g

Note: Desk-top type should be installed horizontally.

1.3 Auxiliary Hardware

(1) Cylinders (carrier gas, standard gases, etc.)

These cylinders are filled with a carrier gas or standard gas.

The maximum filling pressure is limited to 15 MPa considering the strength of the cylinders.

(2) Regulator for cylinder

This valve reduces a cylinder pressure to a safe degree to facilitate handling. The valve is directly mounted to the cylinder.

(3) Stop valve

This valve shuts down the lines for the sample gas, instrument gas, and so on. It is operated manually.

(4) Dehumidifier

Any moisture in the carrier gas affects the columns. Therefore, if the carrier gas contains moisture over 10 ppm, it is recommended to use a desiccant, such as a molecular sieve, to prevent deterioration of the columns.

(5) Vent stacks

These are pipes to discharge sample bypass vent, sample vent, backflush vent, foreflush vent, detector vent, measurement gas vent, and others to the atmosphere collectively.

Direct the exhaust gas to an area where the gas sufficiently disperses and diffuses before discharging.

(6) Regulator for sample

This valve reduces the sample pressure to a specified degree.

To vaporize a liquid sample, use a regulator with a steam-heated vaporizer.

(7) Pipings

The pipes for the sample inlet, carrier gas inlet, standard gas inlet, air for valve driving, air for FID/FPD, FID/FPD hydrogen, steam, sampling bypass, and various vents are provided.

(8) Joints

The joints are used to connect pipes.

1.4 Gases Required for Operation

The following gases are required for the analyzer:

(1) Sample gas

The gas to be analyzed from the process line

(2) Carrier gas

Prepare a gas cylinder for the carrier gas. Keep spare cylinders at hand, too.

If two different carrier gases are used, two gas cylinders are needed.

The gas must satisfy the following conditions. (Gas with higher purity may be required depending on the specifications. See the delivery specifications for details.)

Purity: Measuring range from 0 to 50 ppm or more: 99.99% minimum
Moisture: 10 ppm or less; organic components: 5 ppm or less
Measuring range from 0 to less than 50 ppm: 99.999% minimum
Moisture: 5 ppm or less; organic components: 0.1 ppm or less

(3) Standard gas

This gas is used for calibration. Prepare a gas cylinder including measurement component.

Since up to three different standard gases can be used for automatic calibration, prepare gas cylinders suitable for calibration.

(4) FID/FPD combustion hydrogen gas

Hydrogen gas is necessary when either FID or FPD is used as a detector. Prepare pure hydrogen gas in a cylinder, and keep spare cylinders at hand.

The gas must satisfy the following conditions. (Gas with higher purity may be required depending on the specifications. See the delivery specifications for details.)

Purity: Measuring range from 0 to 50 ppm or more: 99.99% minimum
Moisture: 10 ppm or less; organic components: 5 ppm or less
Measuring range from 0 to less than 50 ppm: 99.999% minimum
Moisture: 5 ppm or less; organic components: 0.1 ppm or less

(5) Instrument air

This air is used for valve actuation and purging.

Pressure: 350 to 900 kPa
500* to 900 kPa (with FPD)
350 to 900 kPa (Programmed temperature oven without cooler)
500 to 900 kPa (Programmed temperature oven with cooler)

*: 600 kPa is required when ambient or instrument air temperature is higher than 46°C (1 FPD) or 40°C (2 FPDs).

Maximum flowrate:
Type 1: 140 L/min
Type 1 with FPD: 440 L/min
Type 2: 210 L/min
Type 2 with FPD: 510 L/min
Type 3: 280 L/min
Type 4: Depend on the specification
210 L/min or more (Without cooler and immediate cooling function)
600 L/min or more (Without cooler with immediate cooling function)
510 L/min or more (With cooler without immediate cooling function)
510 L/min or more (With cooler and immediate cooling function)
Type 5: Depend on the specification
210 L/min
510 L/min (For 1 FPD, air pressure 600 kPa)
870 L/min (For 2 FPDs, air pressure 600 kPa)
Type 6: 70 L/min typ. (85 L/min max)

Oil: 5 ppm or less

Cleanliness: Must be free from dust, corrosive elements, and toxic elements.

(6) FID/FPD combustion air

This air is used to burn hydrogen gas in an FID or FPD.

The air must satisfy the following conditions.

Purity: Measuring range from 0 to 50 ppm or more: moisture: 10 ppm or less; organic components: 5 ppm or less
Measuring range from 0 to less than 50 ppm: moisture: 5 ppm or less; organic components: 0.1 ppm or less

(7) Steam

Steam is required to steam-heat a sample. Prepare a steam source that can apply the pressure listed in “Operation Data.”

1.5 Conformance Standards

Safety Standard, EMC Standard and RoHS Standard are showed in the following list.

Regarding the scope of CE, check the details with EU-DoC at the end of this manual.

Ex Certification	MS code	Safety Standard	EMC standard	RoHS standard
TIIS	GC8000-T (TIIS)	-	-	-
ATEX *1	GC8000-A (ATEX-X) GC8000-B (ATEX-Y)	EN 61010-1 EN 61010-2-030	EN 61326-1 Class A, Table 2 EN 61326-2-3 RCM Mark Korea Electromagnetic Conformity Standard (except GC8000 -P, -Q)	EN IEC 63000 *4
IECEx *2	GC8000-E (IECEx-X) GC8000-M (IECEx-Y)			
NEPSI *3	GC8000-P (NEPSI-X) GC8000-Q (NEPSI-Y)	GB 30439.1		
FM	GC8000-F (FM-X) GC8000-G (FM-Y)	FM 3810 ANSI/UL 61010-1 ANSI/UL 61010-2-030	-	-
CSA	GC8000-C (CSA-X) GC8000-D (CSA-Y)	CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-C22.2 No. 61010-2-030	-	-

*1: Analyzer base sampling unit (GCSMP) or base placed under GC8000-A is not covered by the EU-DoC nor the EC Type-examination Certificate.
The empty compartment (base) placed by Yokogawa to create a Self-standing GC8000-A, does not impair the compliance of the GC8000-A. Analyzer base sampling unit (GCSMP) and base cannot be installed in GC8000-B. GC8000-B has not self-standing version.
*2: The design is based on the safety and EMC standard, though the mark of CE is not indicated.
*3: The design is based on the safety and EMC standard, though the mark of CE, KC and RCM are not indicated.
*4: Some parts of this product include the restricted substances of RoHS Directive, but their applications are under the exemption of the directive.

CAUTION

This instrument is a Class A product, and is designed for use in an industrial environment. Please use this instrument in an industrial environment only.

A list below shows the applicable standards for electrical equipment for explosive atmospheres.

This list does not include standards other than related to electrical equipment for explosive atmospheres.

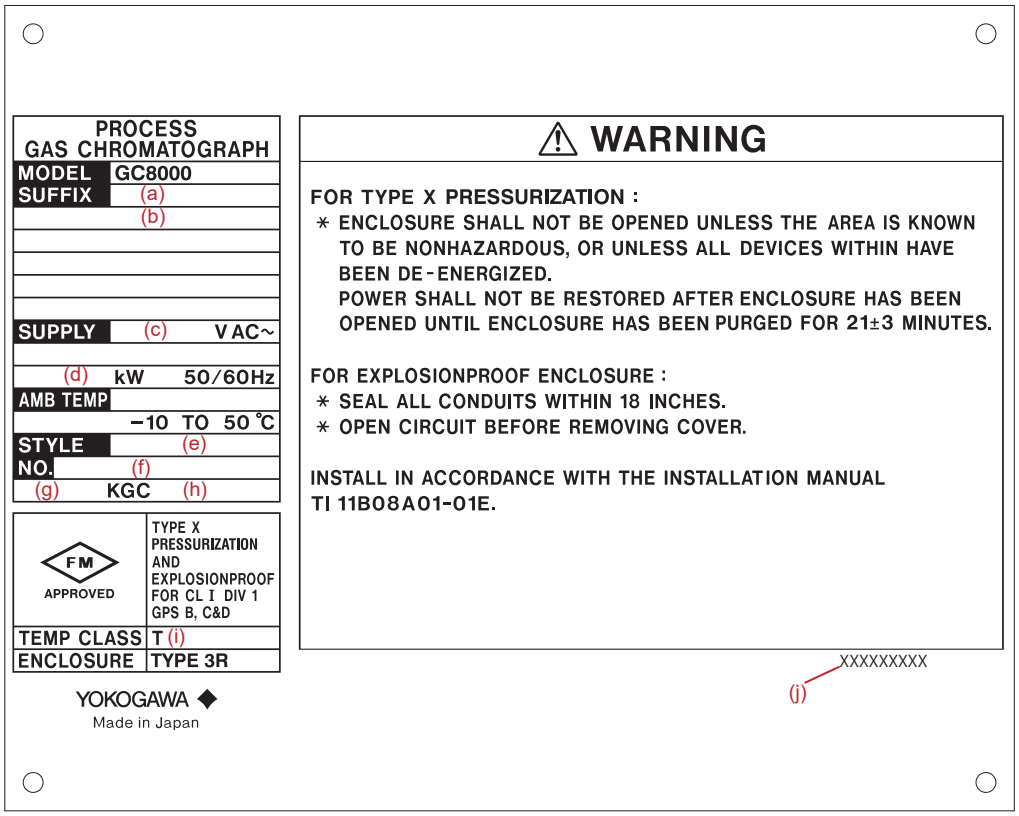
For more details, see each certificate. Please contact your nearest Yokogawa representative.

Ex Certification	Model	Standards for electrical equipment for explosive atmospheres		
TIIS	GC8000-T	Applicable standard: Constructional requirements for electrical equipment for explosive atmospheres Reference Guide : The Guidance of Test and Certification for Explosion-Protected Electrical Equipment (Technical Standards in Conformity with International Standards) November, 1996 Technology Institution of Industrial Safety (TIIS)		
ATEX	GC8000-A GC8000-B	EN IEC 60079-0:2018 EN IEC 60079-7:2015	EN 60079-1:2014 EN 60079-15:2010	EN 60079-2:2014 EN 60079-11:2012
IECEx	GC8000-E GC8000-M	IEC 60079-0:2017 IEC 60079-7:2017	IEC 60079-1:2014 IEC 60079-15:2010	IEC 60079-2:2014 IEC 60079-11:2011
NEPSI	GC8000-P GC8000-Q	GB/T 3836.1-2021 GB/T 3836.3-2021	GB/T 3836.2-2021 GB/T 3836.8-2021	GB/T 3836.5-2021 GB/T 3836.4-2021

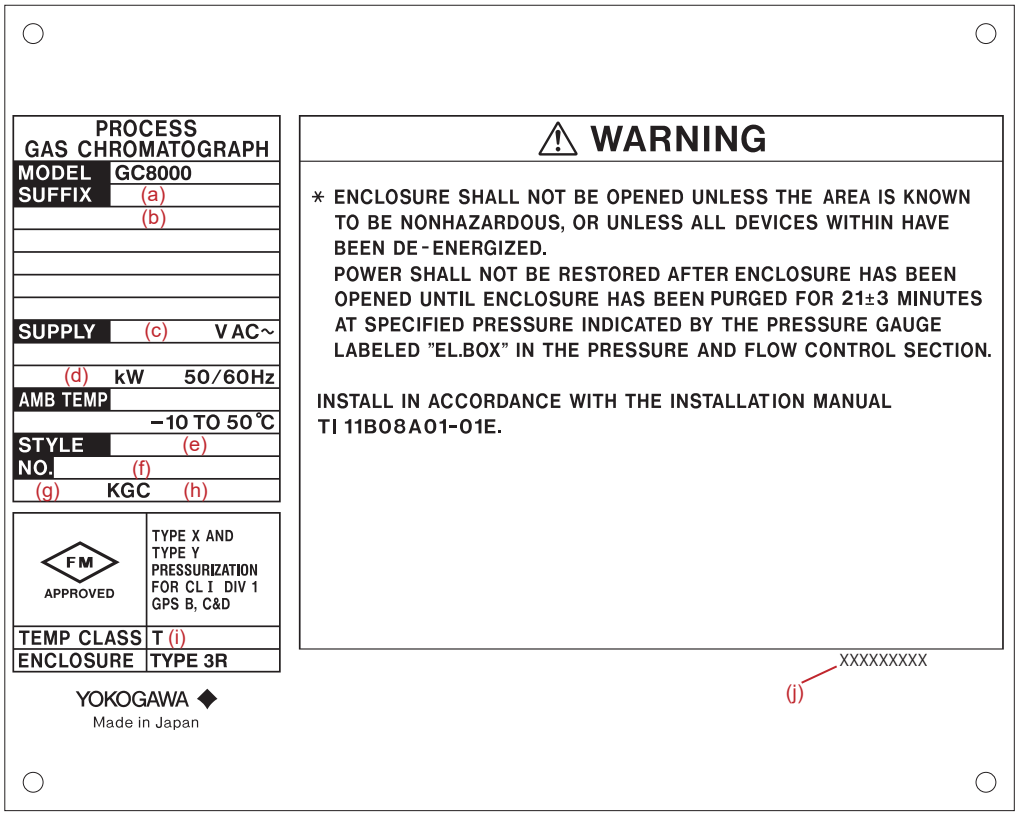
1.6 Data Plate

■ FM

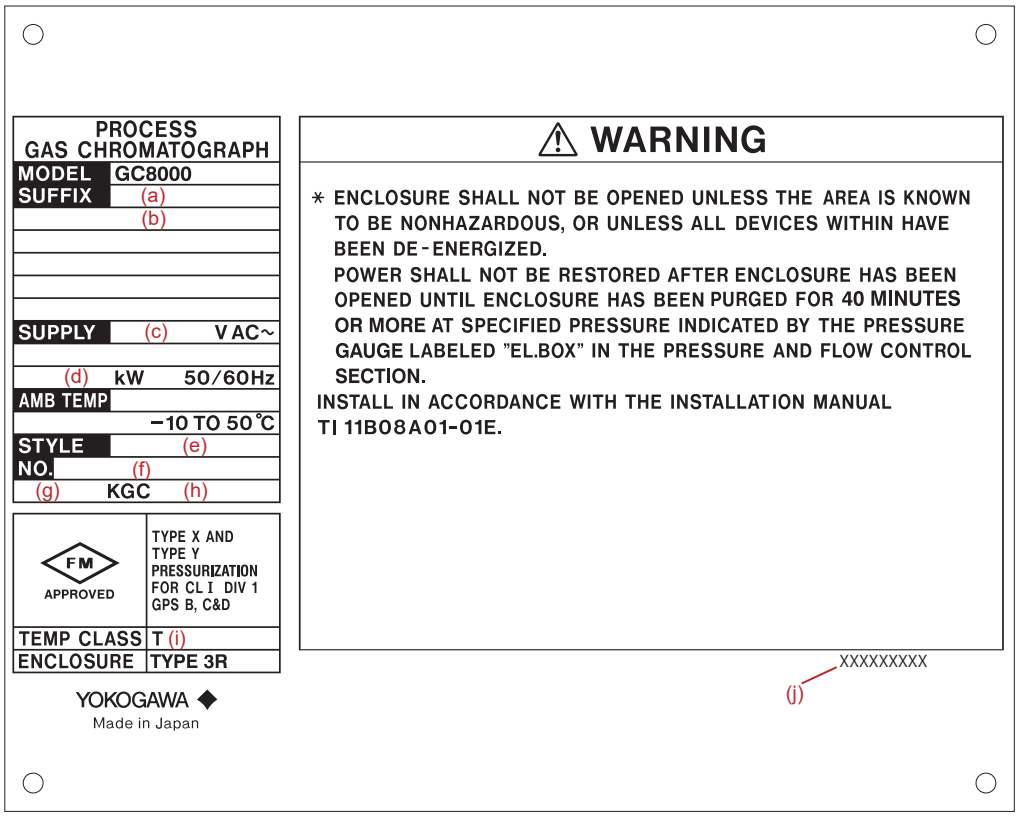
● FM-X



● FM-Y (Type 1 to 5)



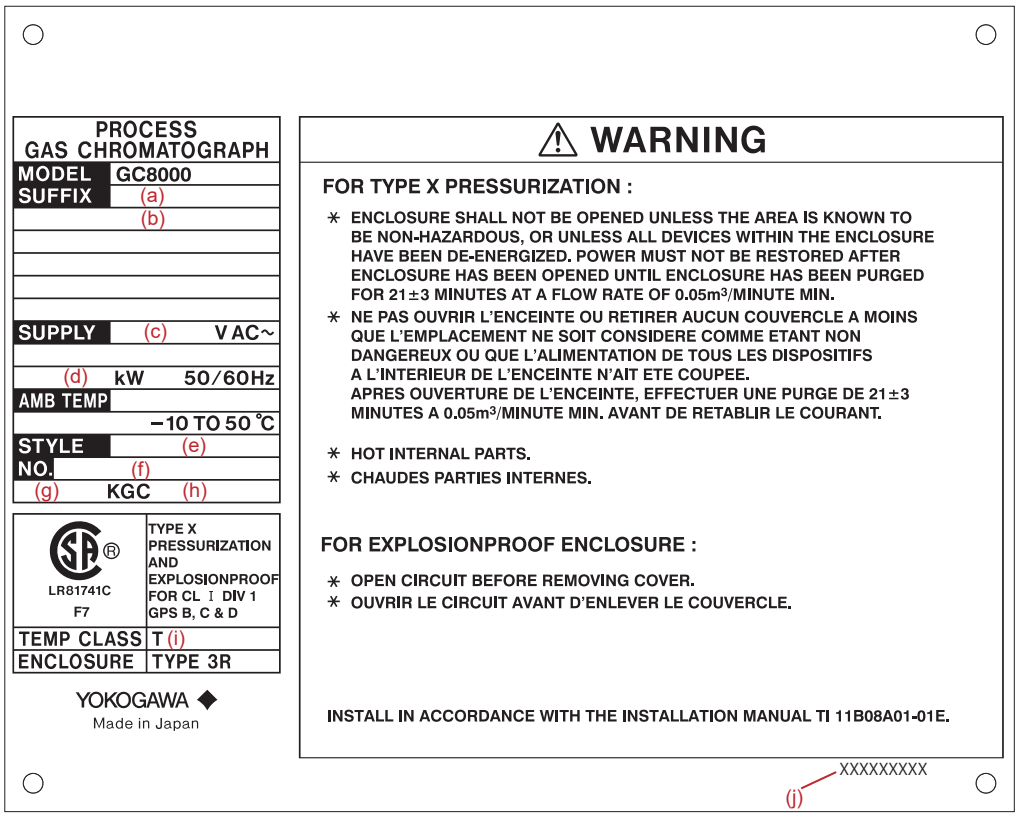
FM-Y (Type 6)



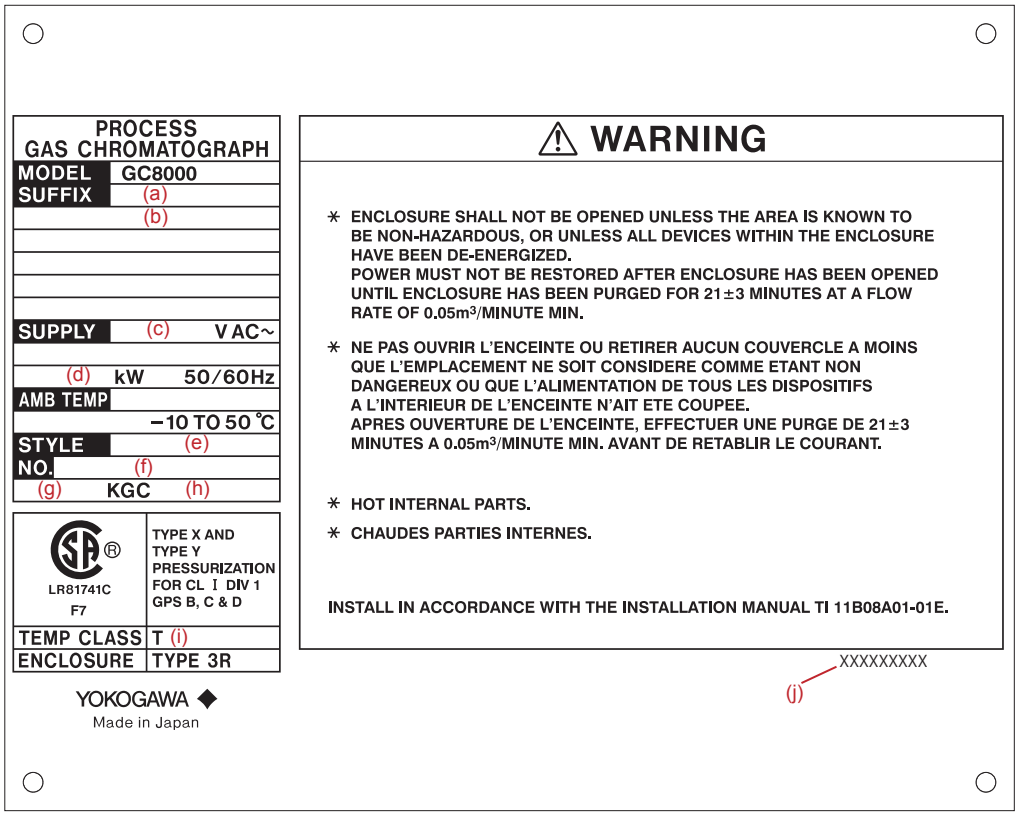
No.	Text	Remarks
(a)	-F, -G	FM-X, FM-Y
(b)	Model and suffix codes	With additional code
(c)	100, 110, 115, 120, 200, 220, 230, 240	Depends on power specifications (-A to -H)
(d)	Maximum rated power	
(e)	Latest style number	
(f)	Instrument number	
(g)	Year of production	In A.D. year
(h)	KGC number	
(i)	(T)1 to (T)4	Depends on temperature class specifications
(j)	Identification number of the data plate	

CSA

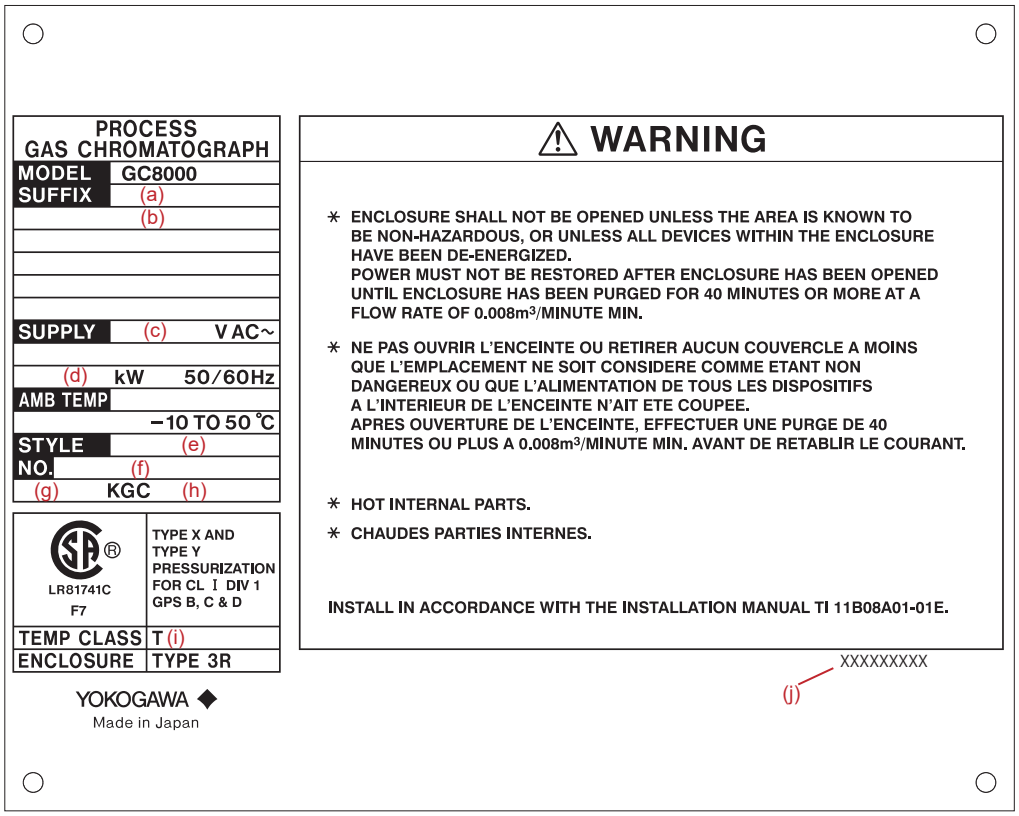
CSA-X



CSA-Y (for Type 1 to 5)



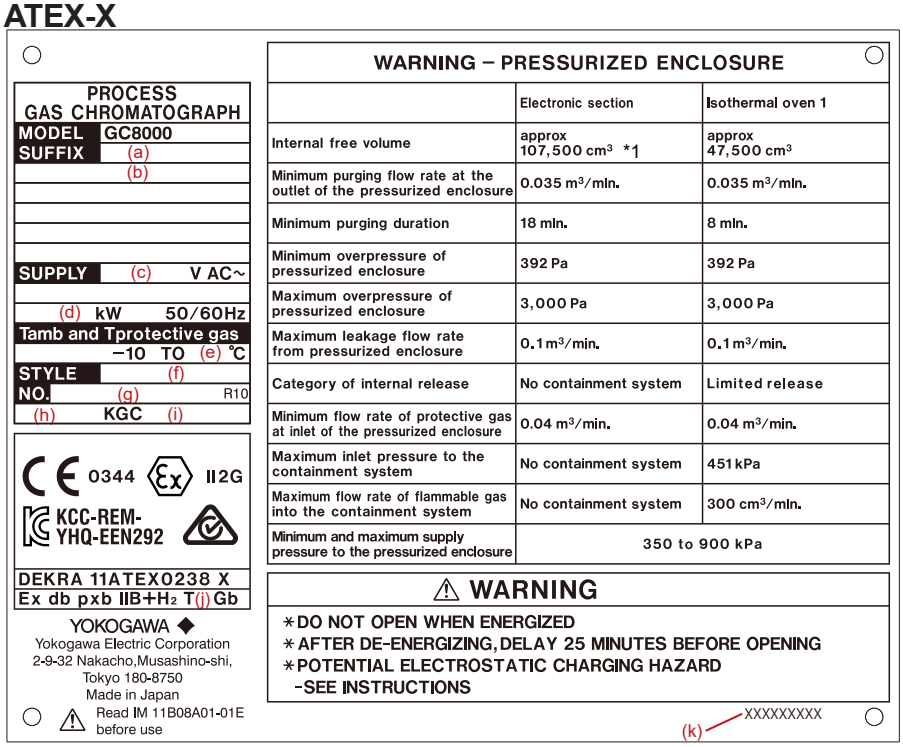
CSA-Y (for Type 6)



No.	Text	Remarks
(a)	-C, -D	CSA-X, CSA-Y
(b)	Model and suffix codes	With additional code
(c)	100, 110, 115, 120, 200, 220, 230, 240	Depends on power specifications (-A to -H)
(d)	Maximum rated power	
(e)	Latest style number	
(f)	Instrument number	
(g)	Year of production	In A.D. year
(h)	KGC number	
(i)	(T)1 to (T)4	Depends on temperature class specifications
(j)	Identification number of the data plate	

■ ATEX

● ATEX-X



In case of Type 1

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 1
Internal free volume	approx 107,500 cm³ *1	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

In case of Type 2

WARNING – PRESSURIZED ENCLOSURE			
	Electronic section	Isothermal oven 1 (large)	Isothermal oven 2 (standard)
Internal free volume	approx 124,000 cm³ *2	approx 47,500 cm³	approx 31,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa		

In case of Type 3

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 2 × 3 (each of them)
Internal free volume	approx 134,500 cm³ *3	approx 31,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

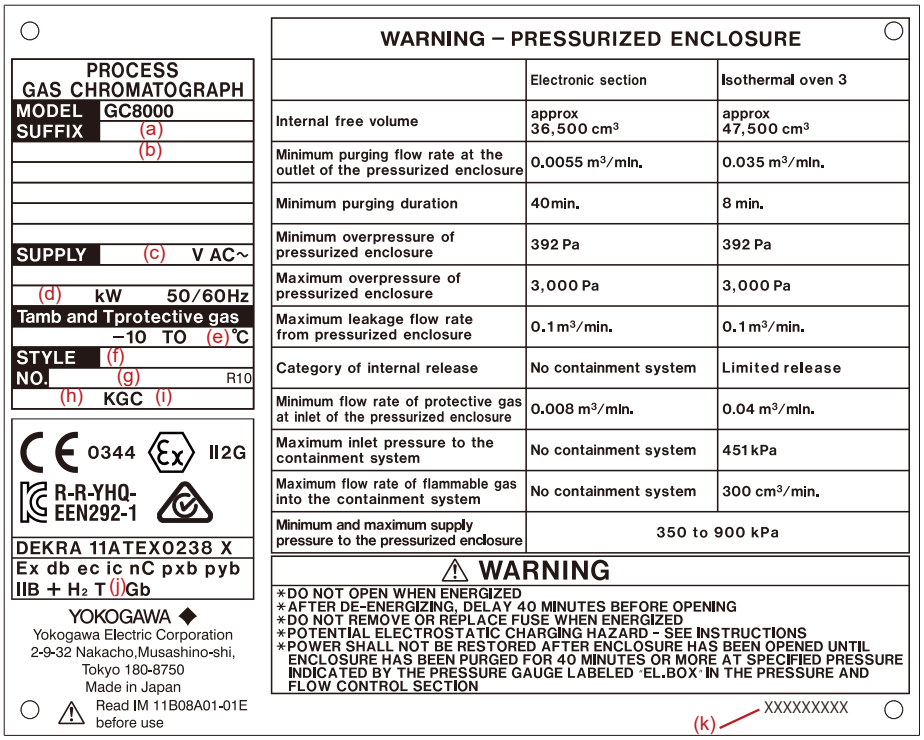
In case of Type 4

WARNING – PRESSURIZED ENCLOSURE			
	Electronic section	Isothermal oven 2	Programmed temperature oven
Internal free volume	approx 118,000 cm³ *4	approx 31,000 cm³	approx 11,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa	2,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa		

In case of Type 5

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 1 × 2 (each of them)
Internal free volume	approx 130,000 cm³ *5	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

ATEX-Y



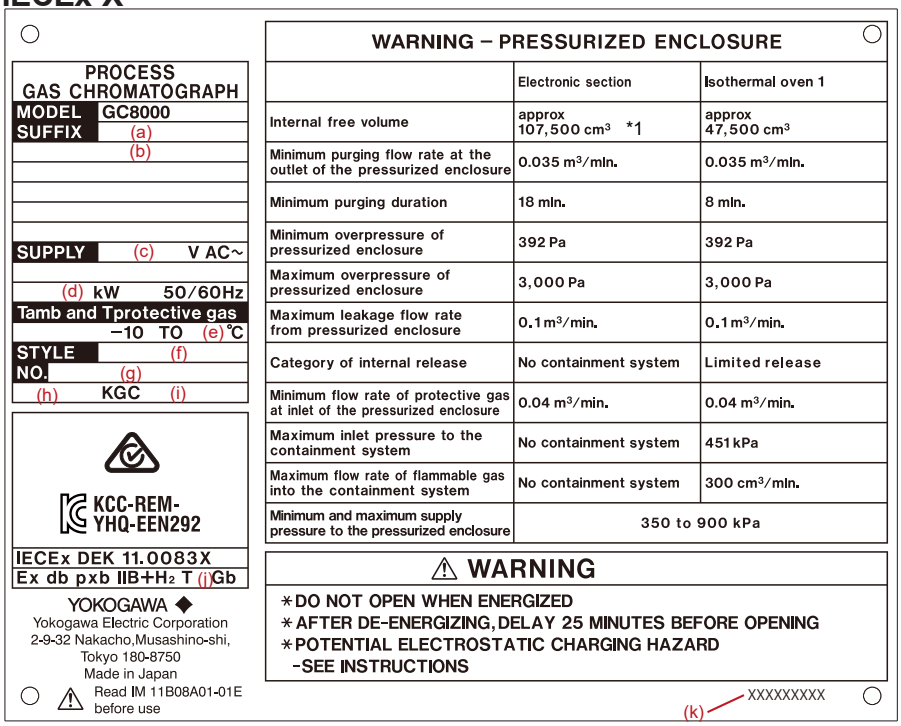
In case of Type 6

*1: Approx. 110,000 cm^3 with EPC
*2: Approx. 129,000 cm^3 with EPC
*3: Approx. 142,000 cm^3 with EPC
*4: Approx. 120,500 cm^3 with EPC
*5: Approx. 135,000 cm^3 with EPC

No.	Text	Remarks
(a)	-A, -B	ATEX-X, ATEX-Y
(b)	Model and suffix codes	With additional code
(c)	100, 110, 115, 120, 200, 220, 230, 240	Depends on power specifications (-A to -H)
(d)	Maximum rated power	
(e)	40, 45, 50	T1, T2: 40°C, T3: 45°C (Type 1 to 5), 50°C (Type 6), T4: 50°C
(f)	Latest style number	
(g)	Instrument number	
(h)	Year of production	In A.D. year
(i)	KGC number	
(j)	(T)1 to (T)4	Depends on temperature class specifications
(k)	Identification number of the data plate	

■ IECEx

● IECEx-X



In case of Type 1

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 1
Internal free volume	approx 107,500 cm³ *1	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

In case of Type 2

WARNING – PRESSURIZED ENCLOSURE			
	Electronic section	Isothermal oven 1 (large)	Isothermal oven 2 (standard)
Internal free volume	approx 124,000 cm³ *2	approx 47,500 cm³	approx 31,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa		

In case of Type 3

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 2 × 3 (each of them)
Internal free volume	approx 134,500 cm³ *3	approx 31,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

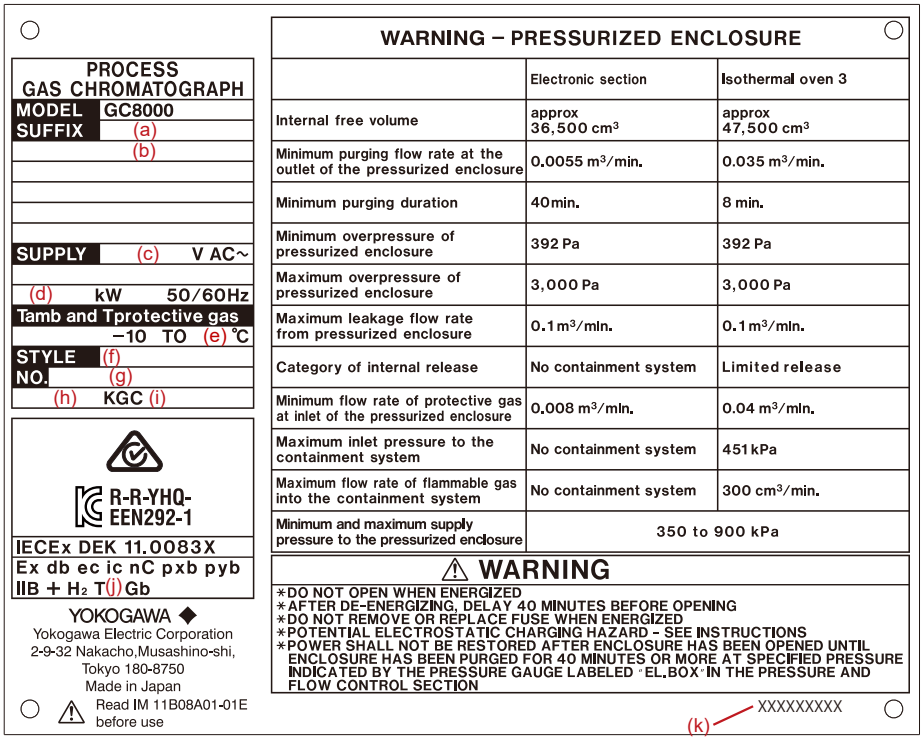
In case of Type 4

WARNING – PRESSURIZED ENCLOSURE			
	Electronic section	Isothermal oven 2	Programmed temperature oven
Internal free volume	approx 118,000 cm³ *4	approx 31,000 cm³	approx 11,000 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa	2,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa		

In case of Type 5

WARNING – PRESSURIZED ENCLOSURE		
	Electronic section	Isothermal oven 1 × 2 (each of them)
Internal free volume	approx 130,000 cm³ *5	approx 47,500 cm³
Minimum purging flow rate at the outlet of the pressurized enclosure	0.035 m³/min.	0.035 m³/min.
Minimum purging duration	18 min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m³/min.	0.1 m³/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.04 m³/min.	0.04 m³/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm³/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

IECEx-Y



In case of Type 6

PROCESS
GAS CHROMATOGRAPH
MODEL GC8000
SUFFIX (a)
(b)
SUPPLY (c) V AC~
(d) kW 50/60Hz
Tamb and Tprotective gas
−10 TO (e) °C
STYLE (f)
NO. (g)
(h) KGC (i)

R-R-YHQ-
EEN292-1
IECEx DEK 11.0083X
Ex db ec ic nC pxb pyb
IIB + H_2 T(j) Gb

YOKOGAWA ◆
Yokogawa Electric Corporation
2-9-32 Nakacho,Musashino-shi,
Tokyo 180-8750
Made in Japan
Read IM 11B08A01-01E
before use

WARNING – PRESSURIZED ENCLOSURE

	Electronic section	Isothermal oven 3
Internal free volume	approx 36,500 cm^3	approx 47,500 cm^3
Minimum purging flow rate at the outlet of the pressurized enclosure	0.0055 m^3/min.	0.035 m^3/min.
Minimum purging duration	40min.	8 min.
Minimum overpressure of pressurized enclosure	392 Pa	392 Pa
Maximum overpressure of pressurized enclosure	3,000 Pa	3,000 Pa
Maximum leakage flow rate from pressurized enclosure	0.1 m^3/min.	0.1 m^3/min.
Category of internal release	No containment system	Limited release
Minimum flow rate of protective gas at inlet of the pressurized enclosure	0.008 m^3/min.	0.04 m^3/min.
Maximum inlet pressure to the containment system	No containment system	451 kPa
Maximum flow rate of flammable gas into the containment system	No containment system	300 cm^3/min.
Minimum and maximum supply pressure to the pressurized enclosure	350 to 900 kPa	

⚠ WARNING
*DO NOT OPEN WHEN ENERGIZED
*AFTER DE-ENERGIZING, DELAY 40 MINUTES BEFORE OPENING
*DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
*POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
*POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 40 MINUTES OR MORE AT SPECIFIED PRESSURE INDICATED BY THE PRESSURE GAUGE LABELED "EL.BOX" IN THE PRESSURE AND FLOW CONTROL SECTION

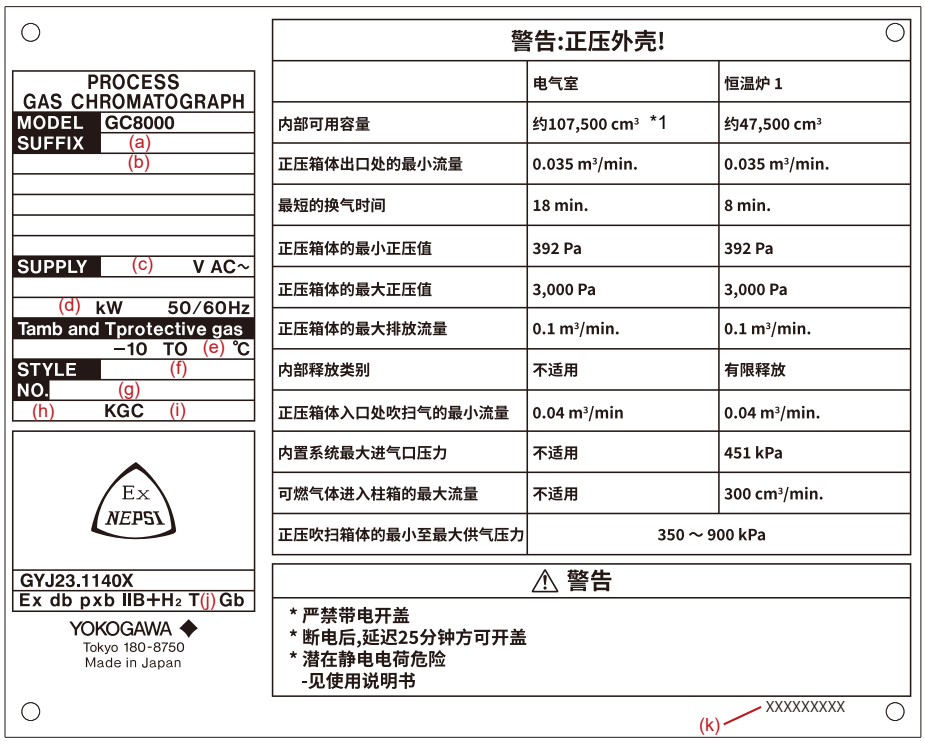
(k) XXXXXXXXX

*1: Approx. 110,000 cm^3 with EPC
*2: Approx. 129,000 cm^3 with EPC
*3: Approx. 142,000 cm^3 with EPC
*4: Approx. 120,500 cm^3 with EPC
*5: Approx. 135,000 cm^3 with EPC

No.	Text	Remarks
(a)	-E, -M	IECEx-X, IECEx-Y
(b)	Model and suffix codes	With additional code
(c)	100, 110, 115, 120, 200, 220, 230, 240	Depends on power specifications (-A to -H)
(d)	Maximum rated power	
(e)	40, 45, 50	T1, T2: 40°C, T3: 45°C (Type 1 to 5), 50°C (Type 6), T4: 50°C
(f)	Latest style number	
(g)	Instrument number	
(h)	Year of production	In A.D. year
(i)	KGC number	
(j)	(T)1 to (T)4	Depends on temperature class specifications
(k)	Identification number of the data plate	

■ NEPSI

● NEPSI-X



In case of Type 1

警告:正压外壳!		
	电气室	恒温炉 1
内部可用容量	约107,500 cm³ *1	约47,500 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa	

In case of Type 2

警告:正压外壳!			
	电气室	恒温炉 1 (大)	恒温炉2 (标准)
内部可用容量	约124,000 cm³ *2	约47,500 cm³	约31,000 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa		

In case of Type 3

警告:正压外壳!		
	电气室	恒温炉 2×3 (单个炉箱)
内部可用容量	约134,500 cm³ *3	约31,000 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa	

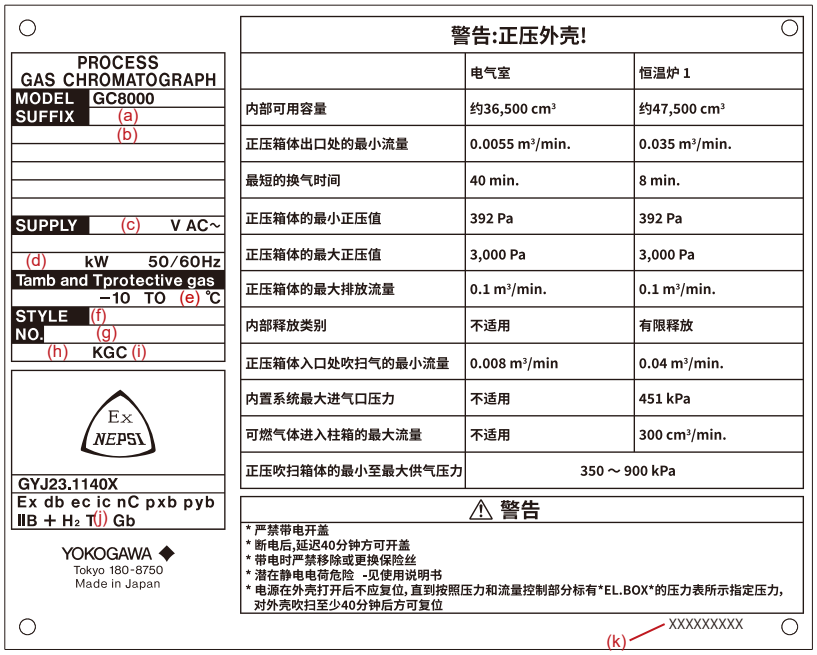
In case of Type 4

警告:正压外壳!			
	电气室	恒温炉 2	程序升温炉
内部可用容量	约118,000 cm³ *4	约31,000 cm³	约11,000 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa	2,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa		

In case of Type 5

警告:正压外壳!		
	电气室	恒温炉 1×2 (单个炉箱)
内部可用容量	约130,000 cm³ *5	约47,500 cm³
正压箱体出口处的最小流量	0.035 m³/min.	0.035 m³/min.
最短的换气时间	18 min.	8 min.
正压箱体的最小正压值	392 Pa	392 Pa
正压箱体的最大正压值	3,000 Pa	3,000 Pa
正压箱体的最大排放流量	0.1 m³/min.	0.1 m³/min.
内部释放类别	不适用	有限释放
正压箱体入口处吹扫气的最小流量	0.04 m³/min	0.04 m³/min.
内置系统最大进气口压力	不适用	451 kPa
可燃气体进入柱箱的最大流量	不适用	300 cm³/min.
正压吹扫箱体的最小至最大供气压力	350 ～ 900 kPa	

NEPSI-Y



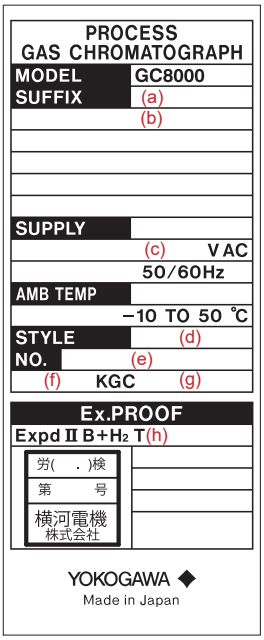
In case of Type 6

*1: Approx. 110,000 cm^3 with EPC
*2: Approx. 129,000 cm^3 with EPC
*3: Approx. 142,000 cm^3 with EPC
*4: Approx. 120,500 cm^3 with EPC
*5: Approx. 135,000 cm^3 with EPC

No.	Text	Remarks
(a)	-P, -Q	NEPSI-X, NEPSI-Y
(b)	Model and suffix codes	With additional code
(c)	100, 110, 115, 120, 200, 220, 230, 240	Depends on power specifications (-A to -H)
(d)	Maximum rated power	
(e)	40, 45, 50	T1, T2: 40°C, T3: 45°C (Type 1 to 5), 50°C (Type 6), T4: 50°C
(f)	Latest style number	
(g)	Instrument number	
(h)	Year of production	In A.D. year
(i)	KGC number	
(j)	(T)1 to (T)4	Depends on temperature class specifications
(k)	Identification number of the data plate	

■ TIIS

In case of Type 1



PRESSURIZED ENCLOSURE 内圧防爆に関する事項		
	ELECTRIC PART 電気回路部	ISOTHERMAL OVEN (L) 恒温槽（大）
INTERNAL FREE VOLUME 容器の内容積	APPROX 約107,500cm³ *1	APPROX 約47,500cm³
ENCLOSURE OVERPRESSURE 給気口の所要圧力	490Pa	490Pa
AIR SUPPLY REQUIRED 給気口の所要風量	50l/min	50l/min
MAXIMUM ENCLOSURE OVERPRESSURE 保護ガスの最高圧力	980Pa	980Pa

⚠ WARNING

Wait 25 minutes or more after power disconnection, before opening the door and the cover of electronic section with administrator's permission.

⚠ 警告

電気回路部のドアおよびカバーを開ける際は、
管理者の許可のもとで電源遮断後、25分以上経過してから行って下さい。

In case of Type 2

PRESSURIZED ENCLOSURE 内圧防爆に関する事項			
	ELECTRIC PART 電気回路部	ISOTHERMAL OVEN(L) 恒温槽（大）	ISOTHERMAL OVEN 恒温槽
INTERNAL FREE VOLUME 容器の内容積	APPROX 約124,000cm³ *2	APPROX 約47,500cm³	APPROX 約31,000cm³
ENCLOSURE OVERPRESSURE 給気口の所要圧力	490Pa	490Pa	490Pa
AIR SUPPLY REQUIRED 給気口の所要風量	50l/min	50l/min	50l/min
MAXIMUM ENCLOSURE OVERPRESSURE 保護ガスの最高圧力	980Pa	980Pa	980Pa

In case of Type 3

PRESSURIZED ENCLOSURE 内圧防爆に関する事項		
	ELECTRIC PART 電気回路部	ISOTHERMAL OVEN × 3 (EACH OF THEM) 恒温槽×3台（1台あたり）
INTERNAL FREE VOLUME 容器の内容積	APPROX 約134,500cm³ *3	APPROX 約31,000cm³
ENCLOSURE OVERPRESSURE 給気口の所要圧力	490Pa	490Pa
AIR SUPPLY REQUIRED 給気口の所要風量	50l/min	50l/min
MAXIMUM ENCLOSURE OVERPRESSURE 保護ガスの最高圧力	980Pa	980Pa

In case of Type 4

PRESSURIZED ENCLOSURE 内圧防爆に関する事項			
	ELECTRIC PART 電気回路部	ISOTHERMAL OVEN 恒温槽	PROGRAMMED TEMPERATURE OVEN 昇温槽
INTERNAL FREE VOLUME 容器の内容積	APPROX 約118,000cm³ *4	APPROX 約31,000cm³	APPROX 約11,000cm³
ENCLOSURE OVERPRESSURE 給気口の所要圧力	490Pa	490Pa	490Pa
AIR SUPPLY REQUIRED 給気口の所要風量	50l/min	50l/min	50l/min
MAXIMUM ENCLOSURE OVERPRESSURE 保護ガスの最高圧力	980Pa	980Pa	980Pa

*1: Approx. 110,000 cm^3 with EPC
*2: Approx. 129,000 cm^3 with EPC
*3: Approx. 142,000 cm^3 with EPC
*4: Approx. 120,500 cm^3 with EPC

No.	Text	Remarks
(a)	-T	TIIS
(b)	Model and suffix codes	With additional code
(c)	100 ±10%, 110 ±10%, 115 ±10%, 120 ±10%, 200 ±10%, 220 ±10%, 230 ±10%, 240 ±10%	Depends on power specifications (-A to -H)
(d)	Latest style number	
(e)	Instrument number	
(f)	Year of production	In A.D. year
(g)	KGC number	
(h)	(T)1 to (T)4	Depends on temperature class specifications

2. Installation, Piping, and Wiring

If the process gas chromatograph is installed in a hazardous area, do the wiring according to the applicable explosionproof requirements.

2.1 Installation

Refer to “1.1 Wiring and Piping Diagram”.

2.1.1 Installing the Analyzer

Two types of analyzer are available: self-standing and wall-mounted. Install the chromatograph according to the procedure for each type.

(1) Installation site

The following conditions must be met:

(a) Satisfying specified environmental conditions (atmospheric gases) even if it is a hazardous area.

(b) No vibration

(c) Not subject to rainfall or direct sunlight

(d) No corrosive gas and little dust

(e) Environmental temperature: –10 to 50°C, humidity: 95% RH or less

(f) Altitude of installation site: Max. 2000 m above sea level

(g) Installation category based on IEC 61010: II (See NOTE)

(h) Pollution degree based on IEC 61010 (IEC 60664-1 (EN IEC 60664-1)) : 2 (See NOTE)

NOTE

- The “Installation category” indicates the regulation for withstanding impulse voltage. It is also called the “Overvoltage category”. “II” applies to electrical equipment.
- “Pollution degree” describes the degree to which a solid, liquid or gas which degrades dielectric strength is adhering. “2” applies to a normal indoor atmosphere.

(2) Analyzer house

If the analyzer is installed outdoors, it should be constructed so as to protect it from rain and direct sunlight and to facilitate inspection and maintenance.

Figure 2.1 shows an example of an analyzer house.

The house should be designed to provide space for standard gas cylinders because the effects of the ambient temperature on standard gas can be better controlled indoors than outdoors.

It is also desirable for maintenance that the house accommodates an external sampling system if any, except when leakage of toxic or flammable standard gas is to be avoided indoors.

The floor area shown in Figure 2.1 is the minimum requirement for the house. Allow as much area as possible for the house taking into consideration the types of items to be accommodated and the space required for maintenance.

For the maintenance space, refer to “1.2 External Dimensions”.

Provide ventilation openings in the upper portion (near the ceiling) and lower portion (near the floor) of a side wall of the house.

Also provide a window and electric lights.

Carrier gas cylinders, should be protected from exposure to direct sunlight and rainfall by placing them under the eaves of the house.

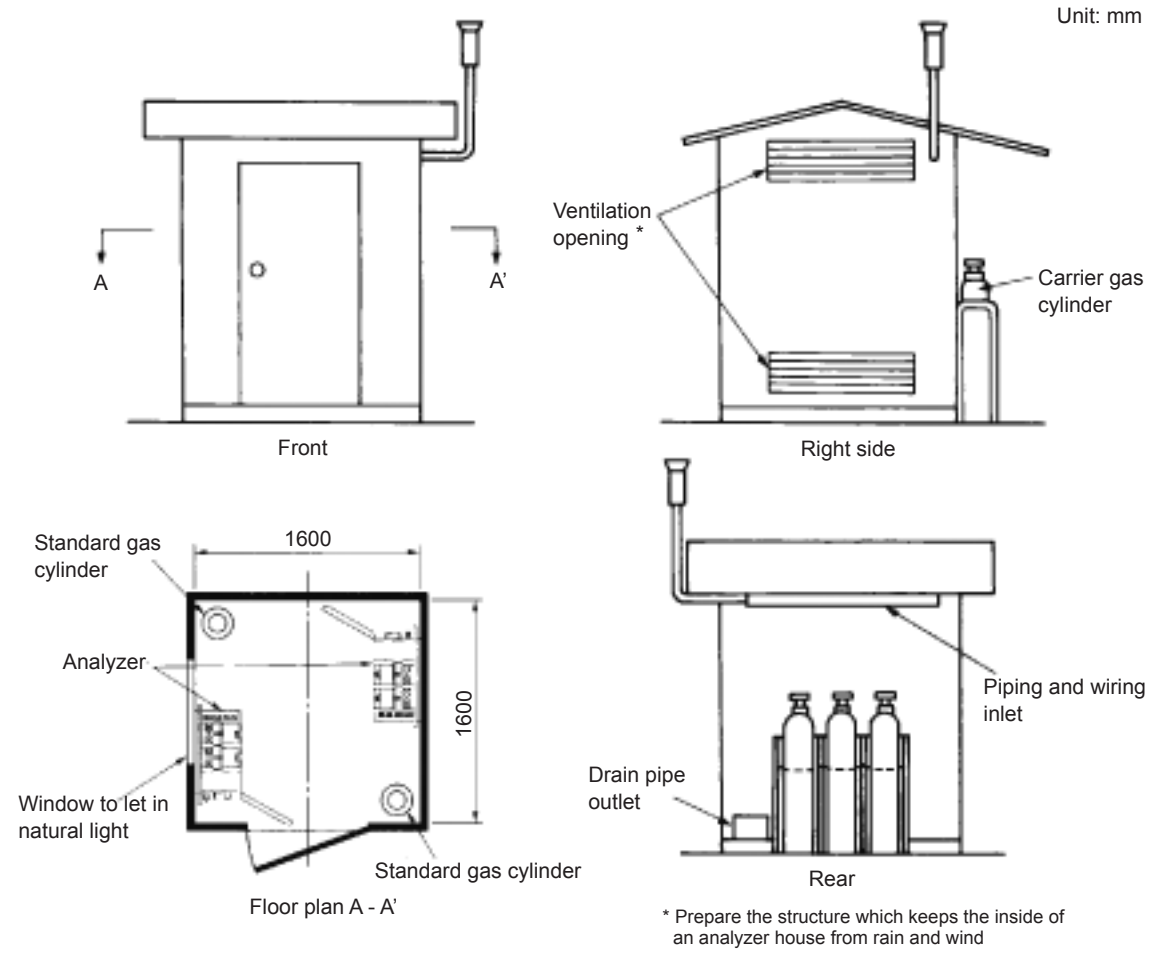


Figure 2.1 Example of analyzer house

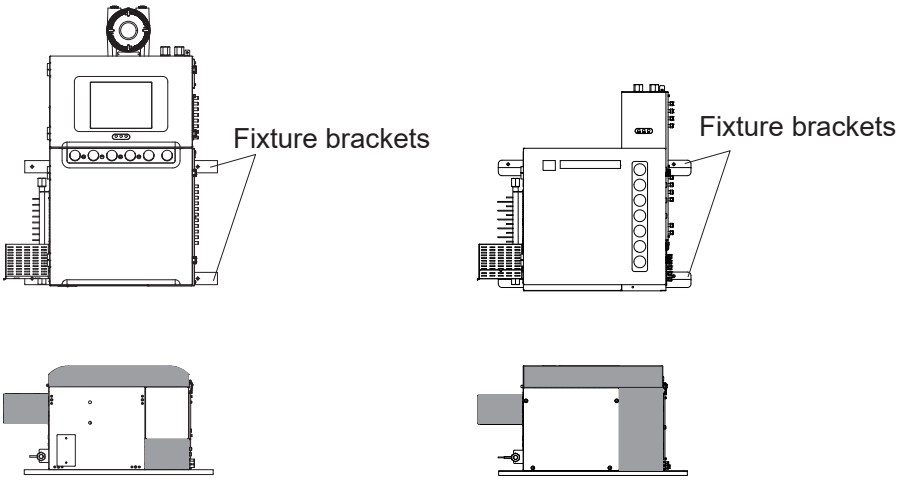
(3) Unpacking

WARNING

- The GC8000 weighs about 85 to 220 kg. Unpack it near the installation site. Use a transportation machine to move it. Handle it carefully to prevent it from falling.
- Up to two protection system may be included, each of which weighs approximately 7 kg. They are installed on top of GC8000. Therefore, the center of gravity is higher than the center of the analyzer body.

CAUTION

- For lifting and carrying the equipment, use those two (or three) fixture brackets which are fixed to the wooden (or other materials) crate for the equipment.
- For the Wall-mounted type, do not hold the highlighted part in the figure below.



GC8000 uses some fixture brackets for crating to secure the equipment to a crate during transportation.

Wall-mounted type : The fixture brackets for crating are meant to secure the equipment to a crate and to mount the equipment to a wall as well. However, don't use those screws applied to the brackets to mount the equipment to a wall. They are not designed for wall mounting.

Self-standing type: The fixture brackets for crating are exclusively for the purpose of shipping. Be sure to detach the brackets away from GC8000 after an installation of the equipment is completed. Don't use the brackets to mount the equipment to a wall. They are not designed for wall mounting.

(4) Checking equipment

Check that the equipment has not been damaged during transportation. Contact Yokogawa if any damage is found. Keep the packing such as crates.

Model and Suffix Codes

Check that the model and suffix codes on the data plate on the left side of the GC8000 match those on the order sheet. Refer to "1.6 Data Plate".

Accessories

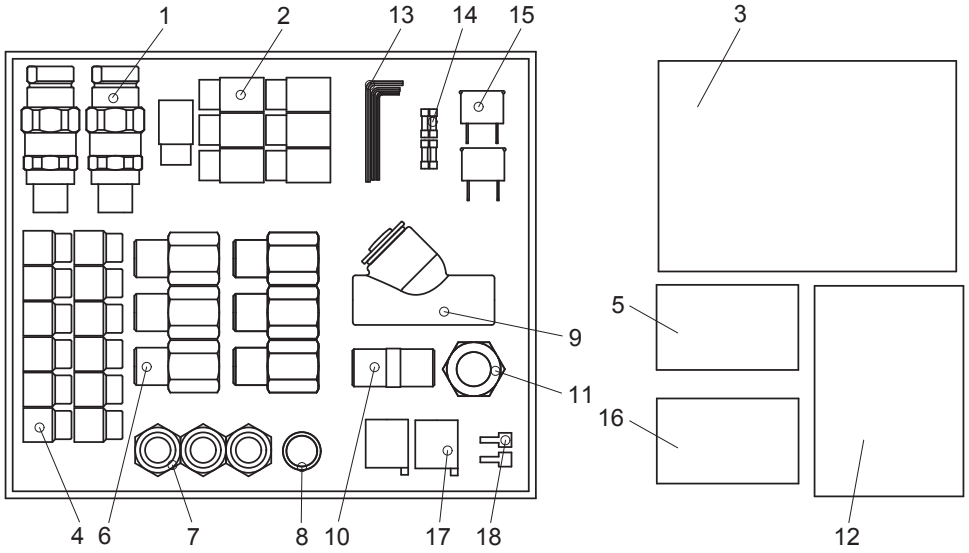
Check the part number of Accessory kit listed in Table 2.1 and the contents listed in Table 2.2. Check the others listed in Table 2.3 if necessary.

Table 2.1

<table>
<tr><th></th><th></th><th>G 3/4</th><th>3/4 NPT</th><th>M25x1.5</th></tr>
<tr><td rowspan="5">TIIS</td><td>Type 1</td><td rowspan="2">K9800EA</td><td rowspan="2">K9800EC</td><td>—</td></tr>
<tr><td>Type 2 (200V)</td><td>—</td></tr>
<tr><td>Type 2 (100V)</td><td rowspan="3">K9800EB</td><td rowspan="3">K9800ED</td><td>—</td></tr>
<tr><td>Type 3</td><td>—</td></tr>
<tr><td>Type 4</td><td>—</td></tr>
<tr><td rowspan="7">FM-X
CSA-X</td><td>Type 1</td><td colspan="3" rowspan="2">K9800EG</td></tr>
<tr><td>Type 2 (200V)</td></tr>
<tr><td>Type 2 (100V)</td><td colspan="3" rowspan="3">K9800EH</td></tr>
<tr><td>Type 3</td></tr>
<tr><td>Type 4</td></tr>
<tr><td>Type 5 (200V)</td><td colspan="3">K9800EG</td></tr>
<tr><td>Type 5 (100V)</td><td colspan="3">K9800EH</td></tr>
<tr><td rowspan="8">FM-Y
CSA-Y</td><td>Type 1</td><td colspan="3" rowspan="2">K9800EJ</td></tr>
<tr><td>Type 2 (200V)</td></tr>
<tr><td>Type 2 (100V)</td><td colspan="3" rowspan="3">K9800EK</td></tr>
<tr><td>Type 3</td></tr>
<tr><td>Type 4</td></tr>
<tr><td>Type 5 (200V)</td><td colspan="3">K9800EJ</td></tr>
<tr><td>Type 5 (100V)</td><td colspan="3">K9800EK</td></tr>
<tr><td>Type 6</td><td colspan="3">K9800EJ</td></tr>
<tr><td rowspan="7">ATEX-X
IECEx-X
NEPSI-X</td><td>Type 1</td><td>—</td><td rowspan="2">K9800HA</td><td rowspan="2">K9800EE</td></tr>
<tr><td>Type 2 (200V)</td><td>—</td></tr>
<tr><td>Type 2 (100V)</td><td>—</td><td rowspan="3">K9800HB</td><td rowspan="3">K9800EF</td></tr>
<tr><td>Type 3</td><td>—</td></tr>
<tr><td>Type 4</td><td>—</td></tr>
<tr><td>Type 5 (200V)</td><td>—</td><td>K9800HA</td><td>K9800EE</td></tr>
<tr><td>Type 5 (100V)</td><td>—</td><td>K9800HB</td><td>K9800EF</td></tr>
<tr><td>ATEX-Y
IECEx-Y
NEPSI-Y</td><td>Type 6</td><td>—</td><td colspan="2">K9800EM</td></tr>
</table>

Table 2.2

No.	Item	Parts No.	Accessory kit part number (K9800**) EA	EB	EC	ED	EG	EH	EJ	EK	EE	EF	EM	HA	HB	Remark
			Quantity													Remark
1	Cable packing adapter	B1010EN	2	3	2	3	—	—	—	—	—	—	—	—	—	
2	Packing	—	2	3	2	3	—	—	—	—	—	—	—	—	—	For B1010EN
3	Manual	K9800FG	1	1	1	1	—	—	—	—	—	—	—	—	—	For B1010EN
4	Packing	—	6	6	6	6	—	—	—	—	—	—	—	—	—	For B1009EN
5	Manual	K9800GE	1	1	1	1	—	—	—	—	—	—	—	—	—	For B1009EN
6	Connector	K9402PU	—	—	8	9	—	—	—	—	—	—	—	—	—	3/4NPT
7	Connector	K9800FX	—	—	—	—	—	—	—	—	—	—	—	2	3	3/4NPT
8	O-ring	B1042ER	—	—	—	—	—	—	—	—	—	—	—	2	3	Nominal size : P22
9	Sealing fitting	L9811GQ	1	1	1	1	—	—	—	—	—	—	—	—	—	For sealing fitting
10	Nipple	K9194ZS	1	1	1	1	—	—	—	—	—	—	—	—	—	
11	Nut	K9194ZU	2	2	2	2	—	—	—	—	—	—	—	—	—	
12	Manual	K9800GF	1	1	1	1	—	—	—	—	—	—	—	—	—	
13	Hex wrench	L9827AT	2	2	2	2	—	—	—	—	—	—	—	—	—	Nominal size : No.2
		L9827AC	2	2	2	2	2	2	—	—	2	2	—	2	2	Nominal size : No.2.5
		L9827AS	2	2	2	2	2	2	2	2	2	2	2	2	2	Nominal size : No.3
		K8012DW	—	—	—	—	—	—	2	—	—	—	2	—	—	Tool for Stem Lock
14	Fuse	A1423EF	2	2	2	2	2	2	—	—	2	2	-	2	2	
		A1463EF	2	2	2	2	2	2	2	2	2	2	2	2	2	
15	Fuse	A1598EF	2	4	2	4	2	4	2	4	2	4	2	2	4	UP300
16	Label	K9191NK	1	1	1	1	1	1	1	1	1	1	1	1	1	For pressure gauge
17	Ferrite core	A1179MN	—	—	—	—	—	—	—	—	4	5	2	4	5	
18	Key	B1018HL	4 or 6	6 or 8	4 or 6	6 or 8	4 or 6	6 or 8	2 or 4 or 6	6 or 8	4 or 6	6 or 8	2	4 or 6	6 or 8	



Accessory kit

Note: The picture is for illustrative purposes only. It is not be an exact representation of each part in the dimension ratio to the actual one or the number of pieces contained in a kit.

Table 2.3 Other Accessories

Item	Parts number	Quantity	Remark
User's manual	—	1	Booklet or CD-ROM (English or Japanese) is included according to the specification.
Protection of Environment	—	0 or 1	IM 11B08A01-85EN is included according to the specification. (Excluding TIIS, EAC and KOSHA)
Technical Information	—	0 or 1	TI 11B08A01-01E is included according to the specification. (only for FM and CSA)
Coil over wrench for LSV	—	number of LSV	
Seal kit for LSV	K9402VG	number of LSV	Rulon
Seal kit for LSV	K9402VH	number of LSV	PTFE
Nut (1/4 inch)/ Front sleeve/ Back sleeve	L9830AR /L9830AS /L9830AT	Depends on number of carrier gases and columns	For carrier line. Included according to the type of columns.
Nut (1/8 inch)/ Front sleeve/ Back sleeve	L9830AK /L9830AL /L9830AM	Depends on number of vents	For carrier line. Included according to the type of columns.
Nut (6mm)/ Front sleeve/ Back sleeve	L9830JA /L9830AX /L9830AY	Depends on number of carrier gases and columns	For carrier line. Included according to the type of columns.
Ferrule	J9218VU	Depends on columns	For capillary column
Ferrule	J9218VT	Depends on columns	For megabore column
Cutter	J9218VV	1	For megabore or capillary column
Operation data	—	1	
GCUD (CD)	—	1	For user programming option
Manual	—	1	For GCUD
Column	—	Refer to Operation data	
Tokutyu item	—		

(5) Installation

Use anchor bolts to secure the self-standing type analyzer on the floor. After the installation, remove the fixture brackets.

Use nuts and bolts to secure the wall-mounting type analyzer on the wall. The wall construction has to be designed to withstand four times the analyzer's own weight.

For the hole for installation, refer to "1.2 External Dimensions".

2.1.2 Installing Auxiliary Hardware

(1) Cylinders

The following conditions must be met:

(a) Located near the analyzer or the external sampling system.

(b) Not subject to rainfall or direct sunlight

(c) Ambient temperature: 0 to 40°C

(d) The place should be well-ventilated so that leaking gases, if any, do not accumulate.

Comply with regulations for high-pressure gases.

(2) Other items

(a) Dehumidifier

Provide a dehumidifier between the carrier gas cylinders and the analyzer (as near the analyzer as possible).

(b) Sample-gas pressure regulator

Provide sample-gas pressure regulators between the sampling point and the analyzer or the external sampling system (as near the sampling point as possible).

(c) Vent stack, Drain tank

Without Vent Stack

Provide a header with a diameter of about 5 cm near the analyzer to connect the venting lines. Extend the vent stack outside the house using a pipe with 1.5 cm diameter. Make provisions to prevent rain from getting in the top end of the vent stack. (See Figure 2.3.)

With Vent Stack

Connect the top end of the vent stack to the section for exhaust. Extend the vent stack outside the house using a pipe with 1.5 cm diameter. Make provisions to prevent rain from getting in the top end of the vent stack.

When using a TCD/MTCD detector, plug the lower end of the vent stack. When using a FID or FPD detector, provide a drain tank with a diameter of about 5 cm near the analyzer to the venting lines.

For the details, see Figure 2.4.

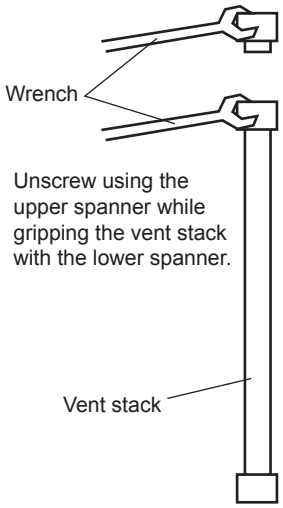


Figure 2.2 Unscrewing the vent stack

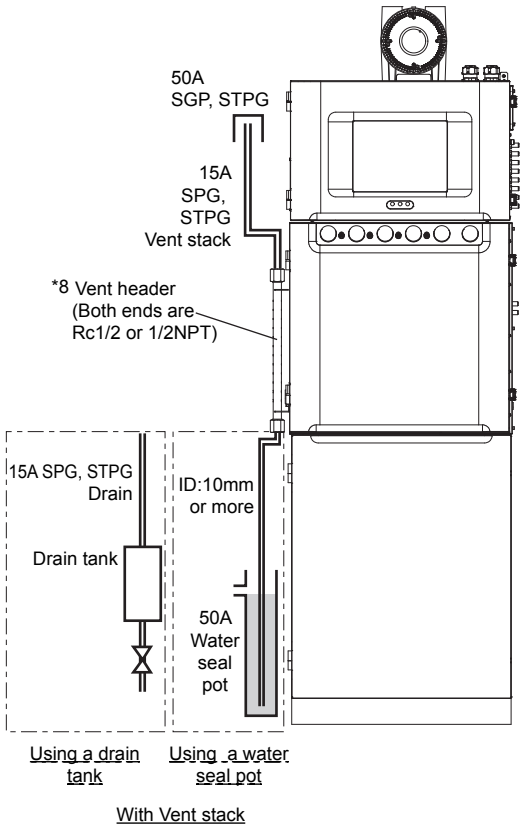
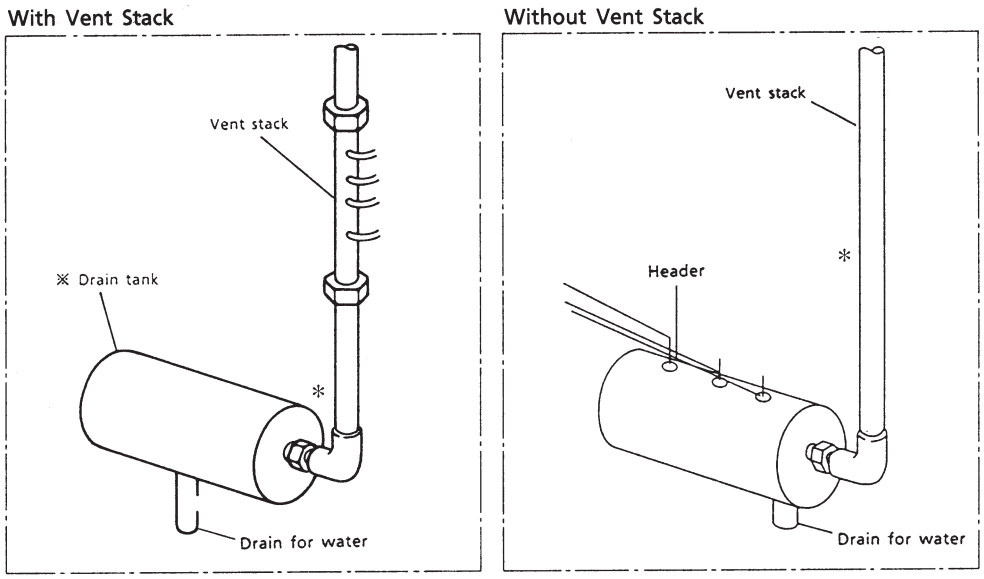


Figure 2.3 Example of vent stack installation



Note 1: The drain tank is used only for FID/FPD.
Note 2: For FID/FPD, incline the piping so that drain water will not accumulate in it.

Figure 2.4 Example of vent stack construction

2.2 Piping

IMPORTANT

- Do not remove the blind plugs at the analyzer piping connections until starting piping work to prevent deterioration of the columns. On the condition that carrier gas is not supplied even after the blind plugs are taken out or while the analyzer is out of operation, the column has the risk of deterioration. In these condition, fix the blind plugs at each vent with carrier gas enclosed.
- Use an anti-corrosion material for the pipes and pipe fittings.
- Never use pipes with too large a diameter for the sample inlet piping to reduce the dead time. However, use a little larger pipe for the exhaust line so as not to apply back pressure to the venting lines.
- Use pipes and pipe fittings free from interior contamination such as grease, oil or other substances. The contamination damage the analyzer. Before connecting the pipes, completely air-purge their interiors.
- Carefully connect the pipes so that there is no leakage from the pipe connections such as the joints.
- Use filters or other appropriate pipe fittings to prevent dust, moisture, or other foreign matter from getting into the analyzer.
- Without analyzer base sampling unit (GCSMP), use flow rate control needle valve between process lines and the inlet of sample gas, also or standard gas cylinders and the inlet of sample gas.

2.2.1 Types of Piping and Installation

The types of piping are shown below.

Note that the types of piping and quantities of individual pipes required vary with the specifications such as the analyzer type and detector type (TCD, MTCD, FID, or FPD).

See the flow sheets in the “Operation Data” for implementing piping.

Control unit

(A) Air output for stream valve 1 to 8 (AIR OUT 1 to AIR OUT 8)

Isothermal oven, large isothermal oven, programmed temperature oven

(B) Protective gas (instrumental air) inlet (PURGE AIR)

(C) Inlet/outlet of sample gas (SAMPLE 1 IN, SAMPLE 2 IN, SAMPLE 1 OUT, SAMPLE 2 OUT)

(D) Carrier gas (CARRIER 1, CARRIER 2)

(E) Hydrogen gas for combustion (H2)

(F) Make-up gas (MAKE UP)

(G) Air for combustion (BURNER AIR)

(H) Air output (ATM 1, ATM 2)

(J) FID vent (FID 1, FID 2)

(K) FPD vent (FPD 1)

(L) TCD vent (TCD1, REF.1, TCD2, REF.2)

(M) MTCD vent (Label example: MTCD1-1, MTCD1-2, MTCD1-3, REF1-1, REF1-2, MTCD2-1,MTCD2-2, MTCD2-3, REF2-1, REF2-2)

(N) Vent (VENT 1 to VENT 10)

Analyzer base sampling system (GCSMP)

(1) Sample inlet (STREAM #1 to STREAM #12)
(2) Standard-gas inlet (STANDARD #1 to STANDARD #3)
(3) Sample bypass vent (STREAM #1 B/P VENT to STREAM #12 B/P VENT)
(4) Sample vent (SAMPLE VENT 1 to SAMPLE VENT 3)
(5) Condensate drain (CONDENSATE OUT)
(6) Steam (STEAM IN)
(7) Steam drain (STEAM OUT)

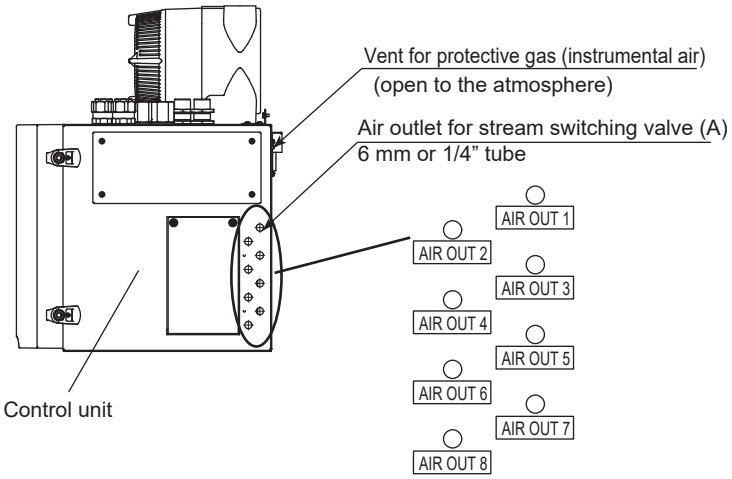


Figure 2.5 Right side of control unit for Type 1 to 5

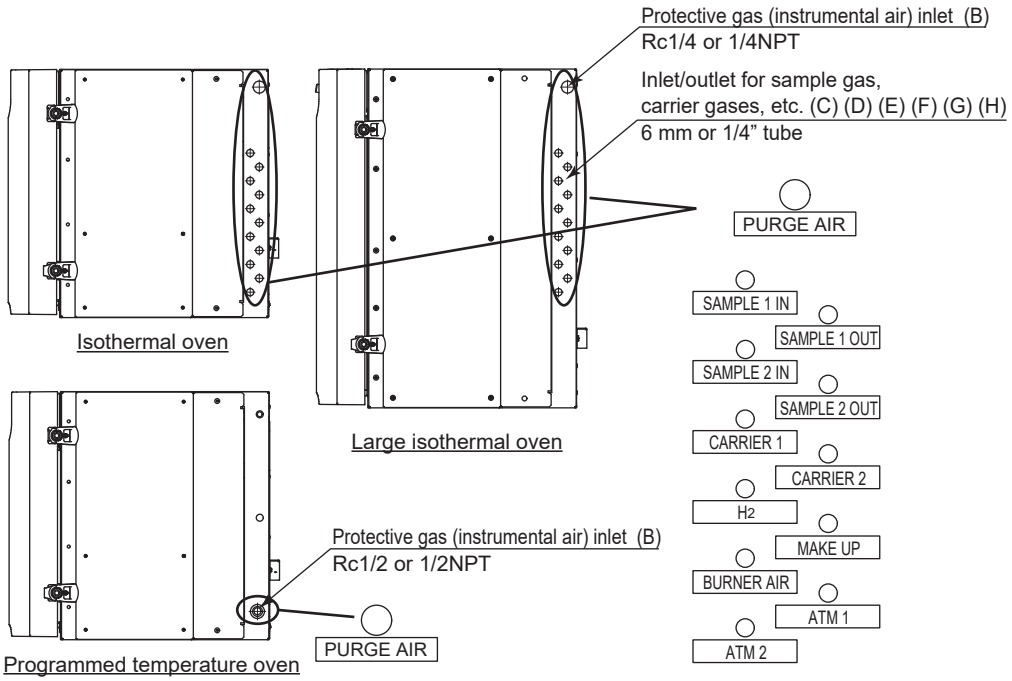


Figure 2.6 Right side of isothermal oven, large isothermal oven, and programmed temperature oven for Type 1 to 5

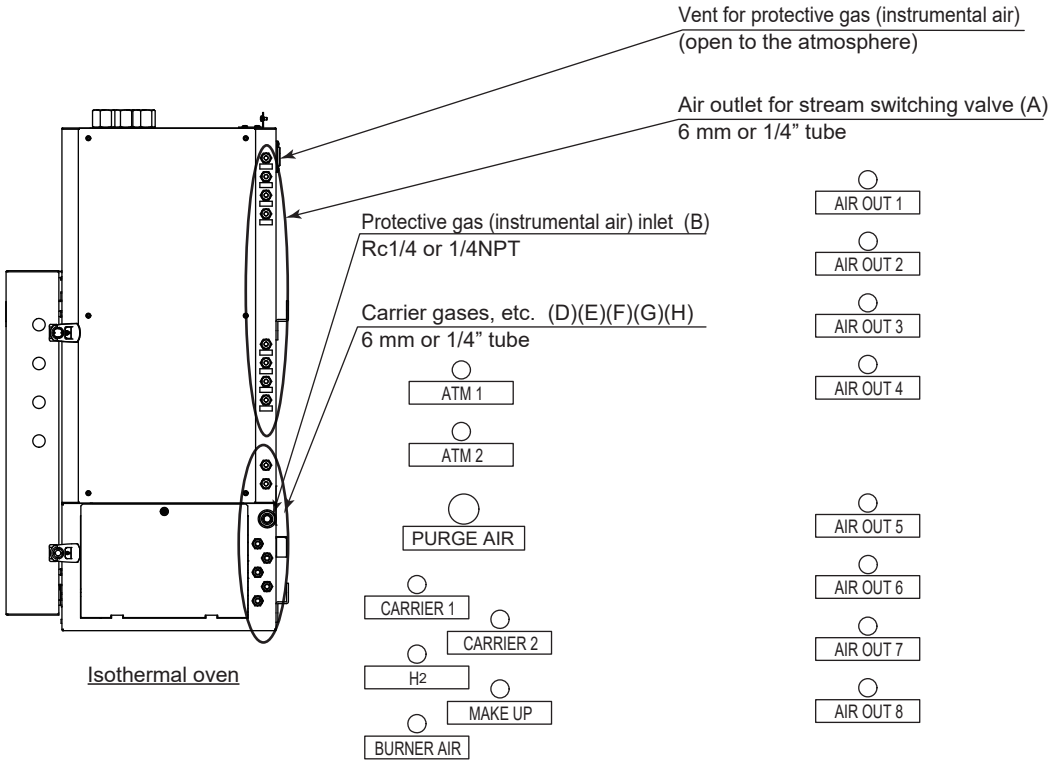


Figure 2.7 Right side of control unit for Type 6

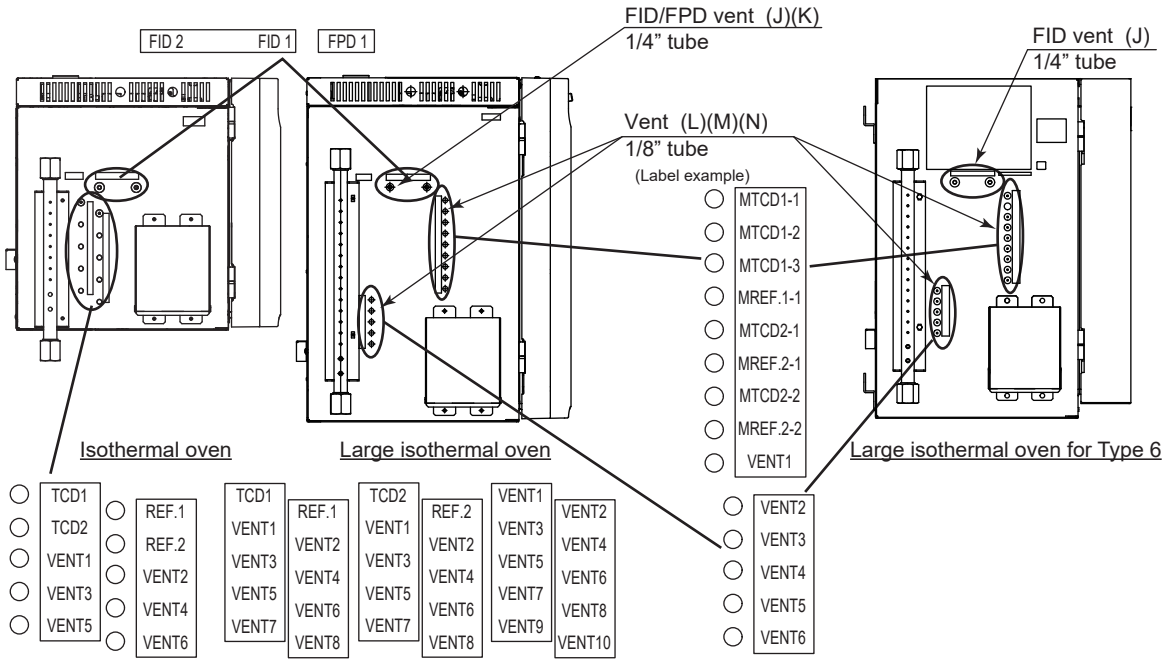


Figure 2.8 Left side of isothermal oven and large isothermal oven (Non-TIIS)

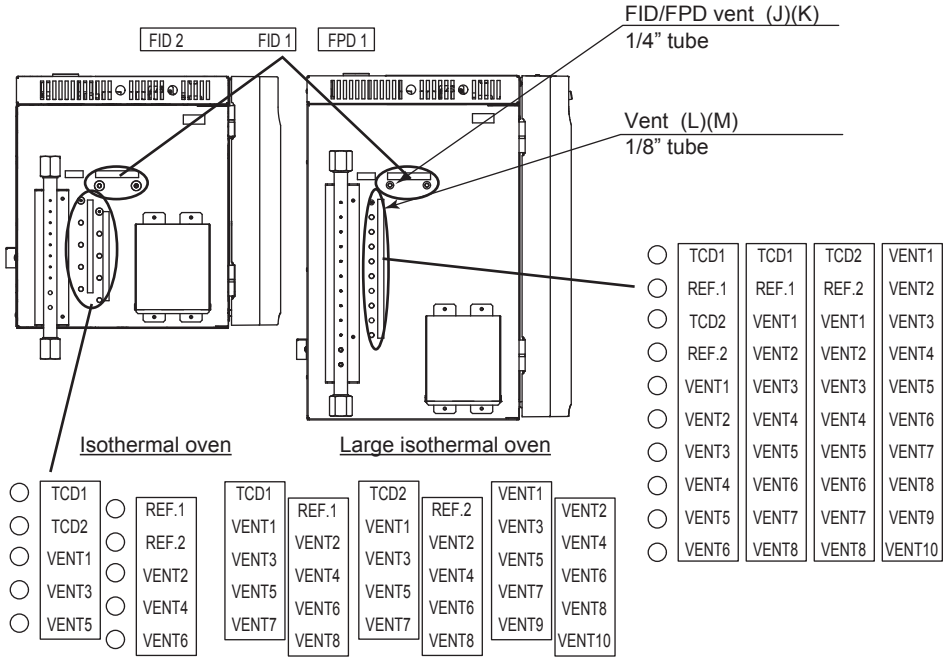


Figure 2.9 Left side of isothermal oven and large isothermal oven (TIIS)

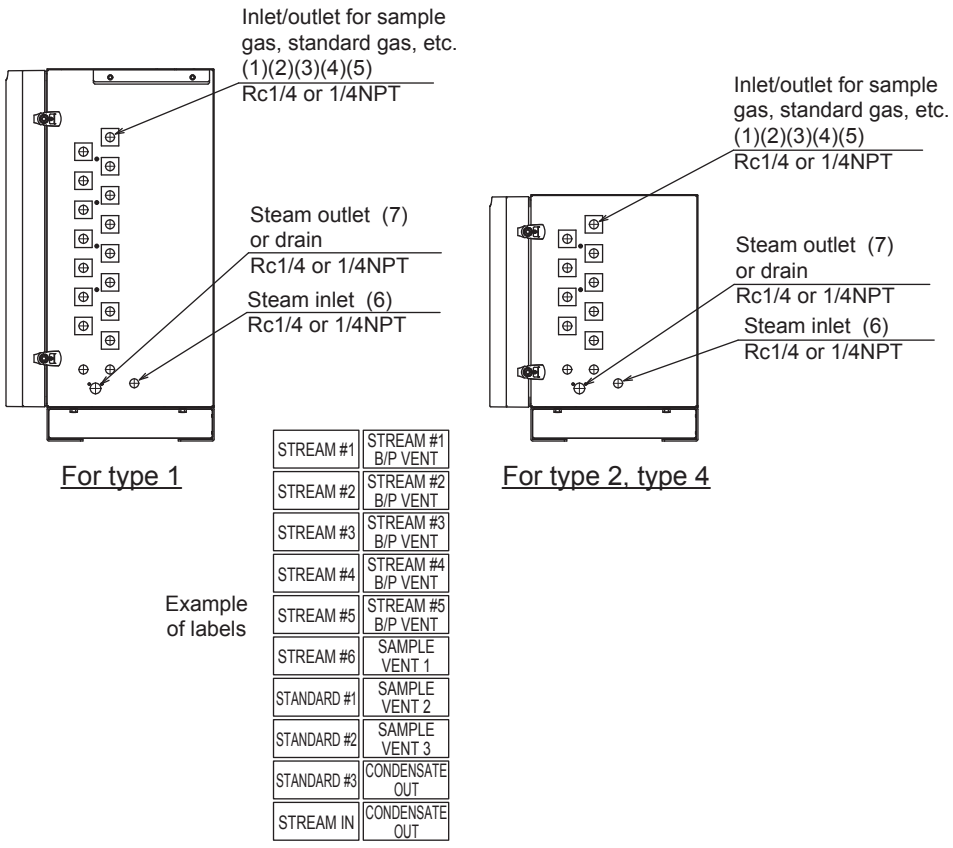


Figure 2.10 Analyzer base sampling unit (GCSMP)

2.2.2 Connecting Piping

For connection, refer to “1.2 External Dimensions”.

For the user-specific connection, refer to “Operation Data”.

(a) Sample inlet pipes

These are pipes to lead samples from process lines or an external sampling system into analyzer STREAMS #1 to #12 or the sample inlet of the pressure control section.

The analyzer can analyze up to 31 sample streams. For more than 31 sample streams, an external sampling system is employed, which has a stream switching function. In this case, one sample inlet pipe is used to lead multiple samples into the analyzer. When providing more than one pipe, see the “Operation Data” so that the specified sample can flow into the analyzer from the designated inlet port. STREAM and No. are marked at the piping port.

Use stainless steel of O.D. 6 mm or 1/4 inch with any oil cleaned off.

(b) Standard sample inlet pipes

These are pipes between the outlets of pressure regulators for standard gas cylinders and STANDARD #1 to #3 ports of the analyzer.

When different standard gases are used, provide separate pipes for each gas to lead them into the analyzer.

Use stainless steel of O.D. 6 mm or 1/4 inch with any oil cleaned off.

(c) Carrier gas inlet pipes

These are pipes to introduce the carrier gas to the analyzer between the outlets of carrier gas cylinder pressure regulators and CARRIER IN ports of the analyzer.

When two different carrier gases are used, provide separate pipes for each gas to lead them into the analyzer.

The following is recommended. By arranging the two gas cylinders in this way, there is no contamination of air.

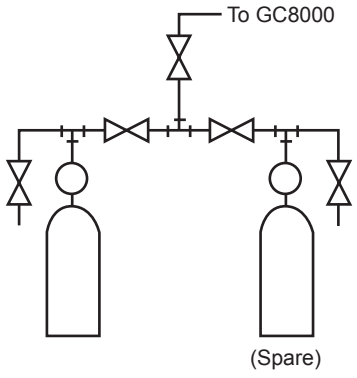


Figure 2.11

Confirm that the insides of the pipes and pipe fittings are not contaminated.

Confirm that the piping connections are done with no leakage.

CAUTION

The following explosionproof requirements must be satisfied for hydrogen gas.

- No leakage
- Supply hydrogen gas to the analyzer at 500 ±20 kPa.

If the carrier gas contains moisture with a dew point of –60°C or above, it is recommended that a desiccant, such as a molecular sieve, be used to remove moisture to prevent deterioration of the columns.

Use stainless steel of O.D. 6 mm or 1/4 inch with any oil cleaned off.

CAUTION

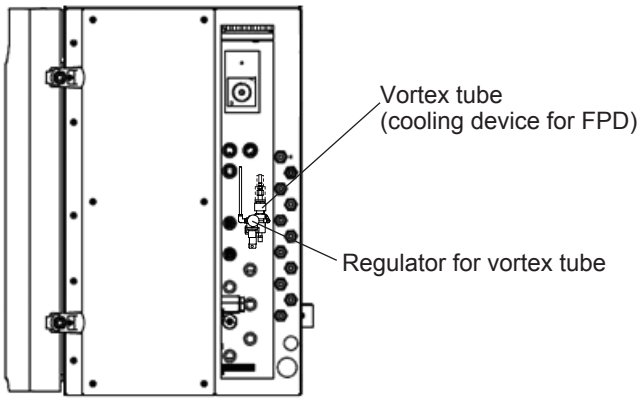
Do not use solvents containing impurities such as non-volatile components to clean the inside of the pipes. They will contaminate the inside of the pipes and prevent correct analysis. If it is necessary to use a solvent for cleaning, use highly pure acetone.

(d) Instrument air pipe

These are the pipes for supplying air to the analyzer for actuating sampling and backflush valves and for purging the inside of the electronics section and the ovens.

An air pressure of 350 to 900 kPa (500 to 900 kPa for FPD or Programmed temperature oven with cooler) is required. Use general instrument air as the source and do the piping to the analyzer PURGE AIR port. A pressure regulator should be installed in-between.

Use stainless steel pipe of O.D.1/2 inch or more with any oil cleaned off.



Pressure and flow control section of the large isothermal oven

Air pressure set value of the regulator is depended on the source air temperature and need to tune the setting value.

(e) Piping combustion air for FID/FPD

The FID/FPD air must not contain impurities that have an adverse effect on the analyzed results. Use an air supply meeting the above condition and do the piping between this supply and the analyzer BURNER AIR port.

Use stainless steel of O.D. 6 mm or 1/4 inch with any oil cleaned off.

(f) Piping combustion hydrogen gas for FID/FPD

Connect the piping between the outlet of the pressure regulator of a hydrogen gas cylinder and the analyzer BURNER FUEL port. Supply it at 500 ±20 kPa to meet the explosionproof requirements.

Use stainless steel of O.D. 6 mm or 1/4 inch with any oil cleaned off.

(g) Steam pipe

This is necessary for heating the sample with steam.

Connect the piping between a steam supply that can provide the required pressure (see Operation Data) and the analyzer STEAM IN port.

(h) Venting pipes

These are used for backflush venting, foreflush venting, detector venting, etc. With a vent header, the piping is provided. Without a vent stack, install piping to the vent stack.

Use large pipes for venting to minimize pressure losses.

Connect venting pipes of 1/4 inch for FID/FPD or 1/8 inch for others to about a 2-inch header.

When ejector suction is used in the sample outlet system, connect the venting pipes to the downstream of the vent header with a pipe of I.D. 10 mm or more.

CAUTION

Please keep safety in mind because the sample vent is usually open to the atmosphere.

When the sample vent is connected to the flare stack, please consider the pressure and the flow rate of the stack.

(i) Steam drain pipe

This is used to drain the condensate of the steam for heating the sample.

Connect the piping from the steam trap of the analyzer and also from the condensate drain piping port (CONDENSATE OUT), if provided, to the drain pit on the down-grade.

(j) Pipes for external valves

These are used for piping between the analyzer valve actuating pneumatic outlet and the external sampling system to actuate the stream valves and atmospheric balance valves provided in the external sampling system. Connect the piping properly according to the piping diagram.

Use stainless steel of O.D. 6 mm or 1/4 inch.

2.3 Wiring

See “1.1 Wiring and Piping Diagram” for wiring.

Note that the specifications determines the number of the protection system, which results in different wiring.

Table 2.4 Number of protection system

Explosionproof Specifications	Type 1 (100)	Type 2 (120)		Type 3 (222)	Type 4 (230)	Type 5 (110)		Type 6 (400)
		100 V (-A, B, C, D)	200 V (-E, F, G, H)			100 V (-A, B, C, D)	200 V (-E, F, G, H)	
TIIS (-T)	1	2	1	2	2	—	—	—
FM-X (-F), CSA-X (-C)	1	2	1	2	2	2	1	—
FM-Y (-G), CSA-Y (-D)	0							
ATEX-X (-A)	1	2	1	2	2	2	1	—
ATEX-Y (-B)	—							0
IECEx-X (-E)	1	2	1	2	2	2	1	—
IECEx-Y (-M)	—							0
NEPSI-X (-P)	1	2	1	2	2	2	1	—
NEPSI-Y (-Q)	—							

( ): Suffix codes

WARNING

In case of TIIS-certified wiring, the attached cable packing adapters or sealing fitting must be used. Otherwise, it does not comply with TIIS regulation.

CAUTION

- Lay the signal wiring and electrical wiring in separate conduit pipes or ducts.
- Use independent grounding with a grounding resistance of 100 ohms or less.

2.3.1 Types of Wiring and Locations

The following types of wiring are required for the GC8000.

The wiring required varies with the specifications.

(A) Electric circuit and heater power
(B) Heater power
(C) Contact output for system alarm 1
(D) Contact output for annunciator
(E) Analog input (4 to 20 mA)
(F) Contact input (Operation start/stop, mode-selection request, etc.)
(G) Contact output
(H) Communication wiring (RS-422 for Type 1 to 5 and analyzer bus)
(J) Analog output (4 to 20 mA), Analog hold output
(K) Grounding
(L) External I/O cutoff output (Power cutoff signal)
(M) Ethernet (twisted-pair cable)
(N) Ethernet (optic fiber cable)

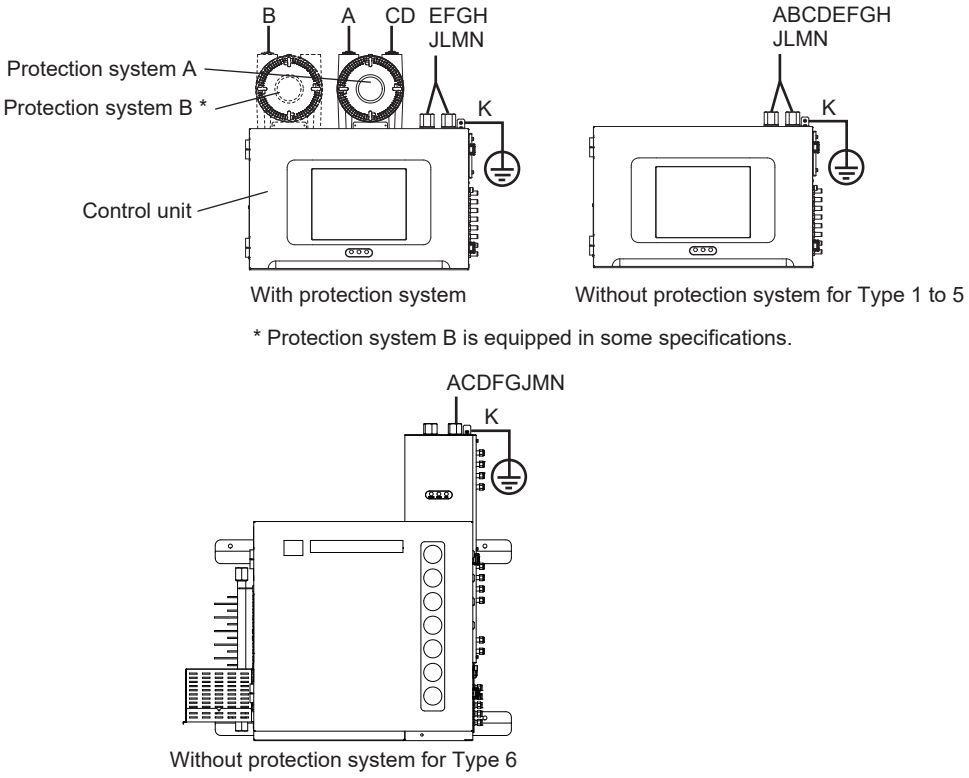


Figure 2.12 Cable connection locations

2.3.2 Recommended Cables

CAUTION

(C) to (L) cables:

Use heat-resistant cables with maximum allowable temperature of 80°C or higher.

(M) and (N) cables:

Required maximum allowable temperature of the cables depends on the temperature class of the instrument and the actual ambient temperature. Use cables with maximum allowable temperature shown in the table below.

Temperature Class	T1, T2	T3	T4	Maximum allowable temperature of cable
Ambient temp.	Up to 30°C	Up to 35°C	Up to 40°C	60°C
	31 to 36°C	36 to 40°C	41 to 45°C	65°C
	37 to 43°C	41 to 45°C	46 to 50°C	70°C
	44 to 50°C	46 to 50°C		75°C

Table 2.5

Wiring Connections	Cable Inlet	Cable O.D. (for TIIS)	Wiring	Cable Condition	Terminal	Cable Shield
Protection system	A (right): 2 B (left): 1	ø8.0 to 16.0 mm	Protection system A: (A) Electric circuit and heater power Protection system B: (B) Heater power	3.5 to 5.5 mm^2 max. 1.25 to 5.5 mm^2 max.	M4 screw crimp-on terminal	Not required
			(C) Contact output for system alarm 1 (D) Contact output for annunciator	0.75 to 1.5 mm^2 max. Cable length 1 km max.	For MKKDSN (Note 3)	Required
Electronics section	Type 1 to 5: 6 Type 6: 3 (Junction box as needed)	ø9.0 to 16.0 mm	Without protection system: (A) Electric circuit and heater power (B) Heater power	3.5 to 5.5 mm^2 max. 1.25 to 5.5 mm^2 max.	M4 screw crimp-on terminal	Not required
			Without protection system: (C) Contact output for system alarm 1 (D) Contact output for annunciator	0.75 to 1.5 mm^2 max. Cable length 1 km max.	For FKC (Note 3)	Required
			(E) Analog input (16 points max.)			
			(F) Contact input (32 points max.)			
			(G) Contact output (Note 1) (20 points max.)			
			(H) Serial communication (Note 2)			
			(J) Analog output (32 points max.)	0.5 to 1.5 mm^2 max. Cable length 1 km max.	For FKC (Note 3)	Required
			(K) Grounding	5.5 mm^2 or more Grounding resistance of 100 ohms max.	M4 screw crimp-on terminal	Not required
			(L) External I/O cutoff output (Power cutoff signal)	0.75 to 1.5 mm^2 max. Cable length 1 km max. Twisted-pair cable	For FKC (Note 3)	Required
		NA (use sealing fitting)	(M) Ethernet (shielded twisted-pair cable)	CAT.5/CAT.5E 50 m or less	RJ45	Required
			(N) Ethernet (fiber-optic cable)	For 1300 nm Outdoor type multi-mode of 50/125 µm or OM1. For 1310 nm Outdoor type single-mode of G.652	SC	

Note 1: Use double-isolation cables for the contact output line (AC).
Double-isolate either contact output line (AC) or (DC) if they are mixed.

Note 2: Twisted pair cable is recommended.

Note 3: Use MKKDSN series terminals (manufactured by Phoenix Contact Ltd.) for the protection system, and FKC series terminals (manufactured by Phoenix Contact Ltd.) for the electric circuit except for the power or Ethernet line. For these wiring connections, use AI series crimp-on terminals manufactured by the same company. Four types of crimp-on terminals are used according to the wire diameters (see Table 2.6).

Table 2.6 Crimp-on terminals

Terminal Series	Cable Core	Cable O.D.	Terminal Type	Peel off length
MKKDSN	0.75 mm^2	Less than ø2.8 mm	AI 0.75-6GY	Approx. 6 mm
	1 mm^2	Less than ø3.0 mm	AI 1-6RD	
	1.5 mm^2	Less than ø3.4 mm	AI 1.5-6BK	
FKC	0.5 mm^2	Less than ø2.5 mm	AI 0.5-10WH	Approx. 10 mm
	0.75 mm^2	Less than ø2.8 mm	AI 0.75-10GY	
	1 mm^2	Less than ø3.0 mm	AI 1-10RD	
	1.5 mm^2	Less than ø3.4 mm	AI 1.5-10BK	

Contact Phoenix Contact Ltd. for details.

2.3.3 Preparing Wiring Depending on Specifications

Perform wiring carefully because the connection of wiring varies depending on the GC8000 explosionproof specifications.

IMPORTANT

Cables should be arranged in an orderly manner in the protection system.

Otherwise, they may damage the parts (e.g. relay).

■ FM

WARNING

- All wiring shall comply with National Electric Code ANSI/NFP A 70 and Local Electric Codes.
- In a hazardous area, use conduits for wiring in the explosionproof enclosure or to electronics sections.

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to apply pressure to the pressurized enclosure. Otherwise, power does not supplied to the electronics section.

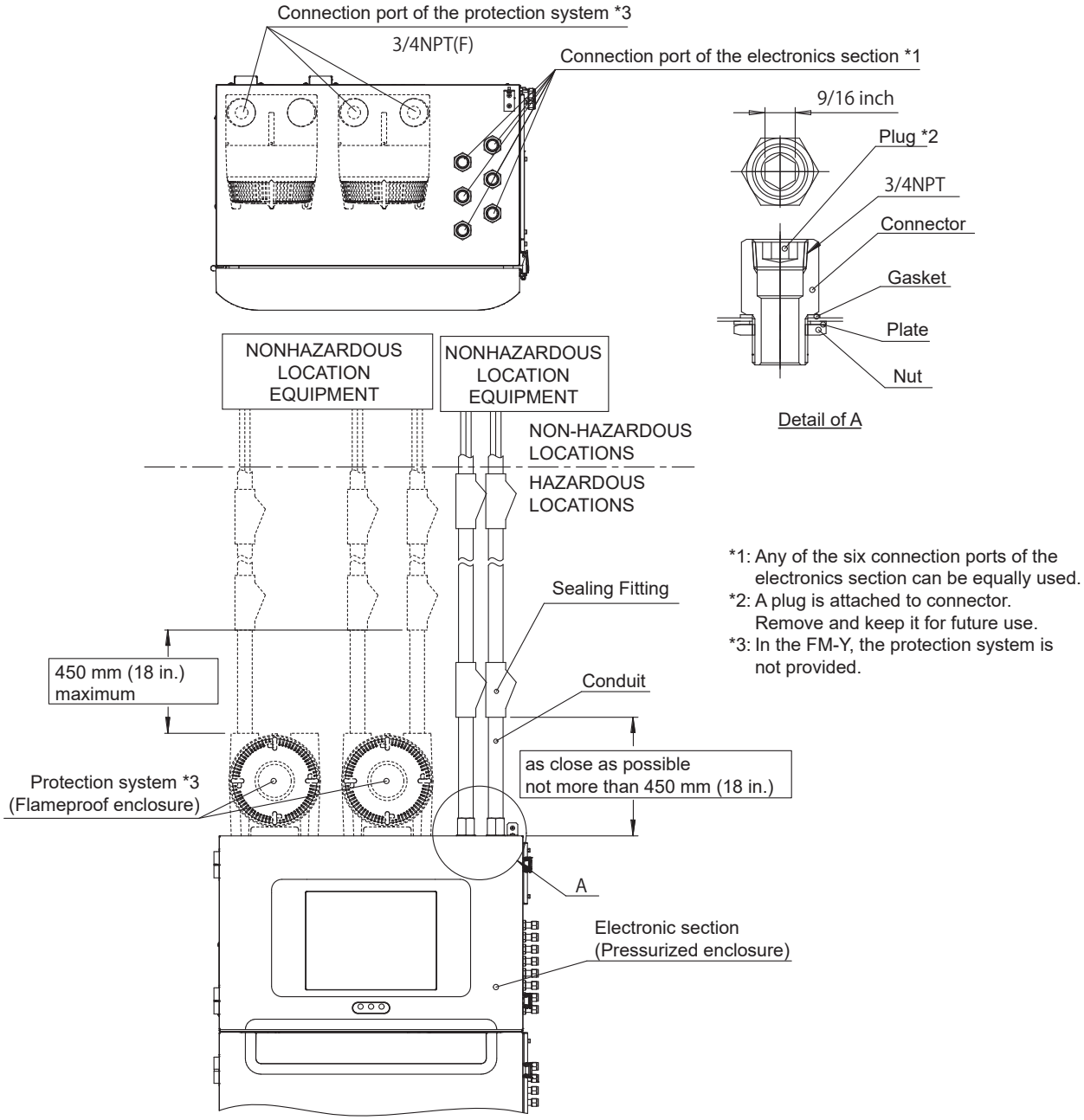
In the FM-Y, all wiring must be connected to the electronics section since the protection system is not provided.

Six connection ports are provided in the electronics section. Use convenient ones.

Remove the attached plug of the connector and perform wiring.

Three connection ports are provided in the electronics section, in case of Type 6.

Use convenient ones. Remove the attached plug of the connector and perform wiring.



*1: Any of the six connection ports of the electronics section can be equally used.
*2: A plug is attached to connector. Remove and keep it for future use.
*3: In the FM-Y, the protection system is not provided.

Figure 2.13 Wiring in FM specification for Type 1 to 5

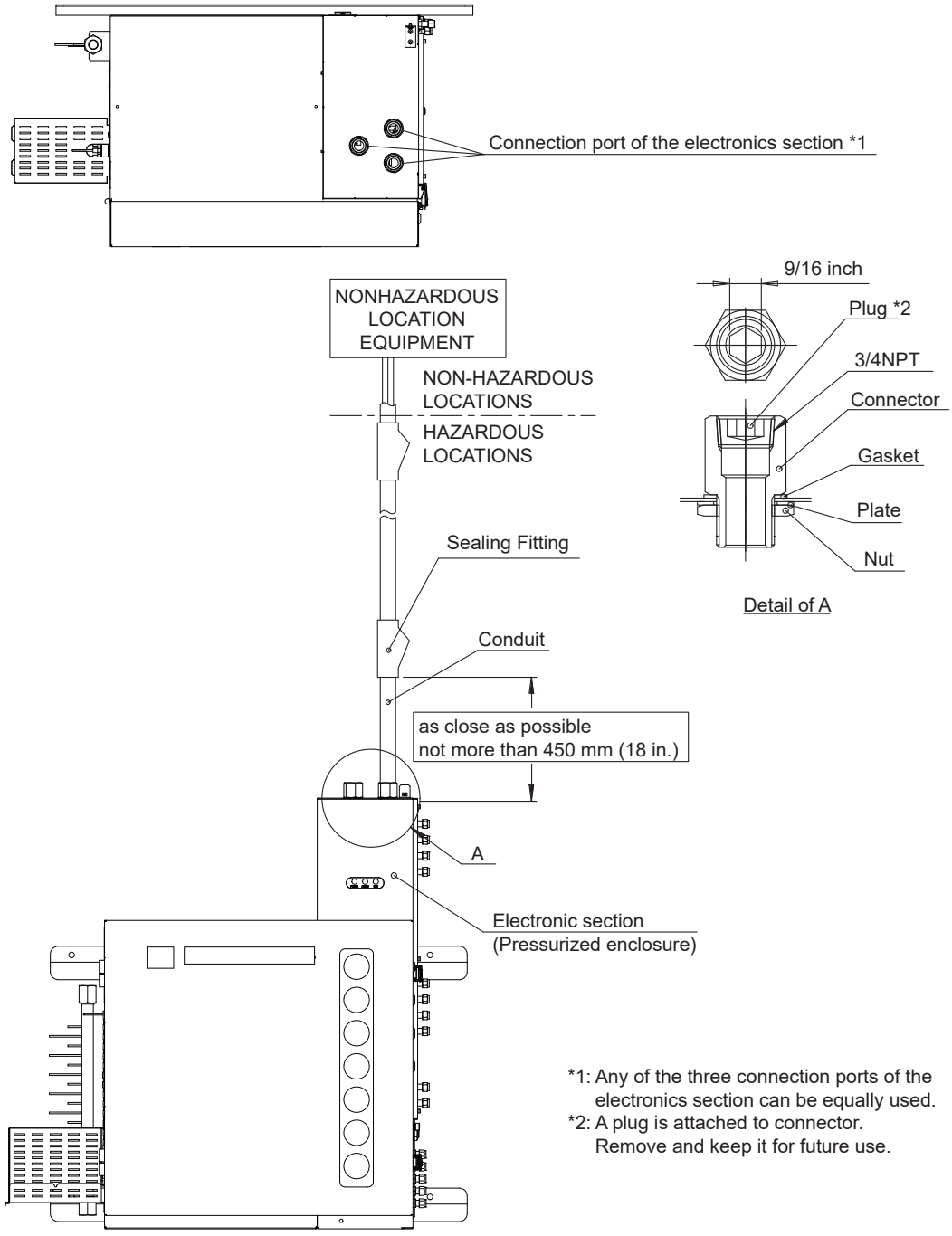


Figure 2.14 Wiring in FM specification for Type 6

CSA

WARNING

- All wiring shall comply with Canadian Electric Code C22.1 and Local Electric Codes.
- In a hazardous area, use conduits for wiring in the explosionproof enclosure or to electronics sections.

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to apply pressure to the pressurized enclosure. Otherwise, power does not supplied to the electronics section.

In the CSA-Y, all wiring must be connected to the electronics section since the protection system is not provided.

Six connection ports are provided in the electronics section. Use convenient ones.

Remove the attached plug of the connector and perform wiring.

Three connection ports are provided in the electronics section, in case of Type 6.

Use convenient ones. Remove the attached plug of the connector and perform wiring.

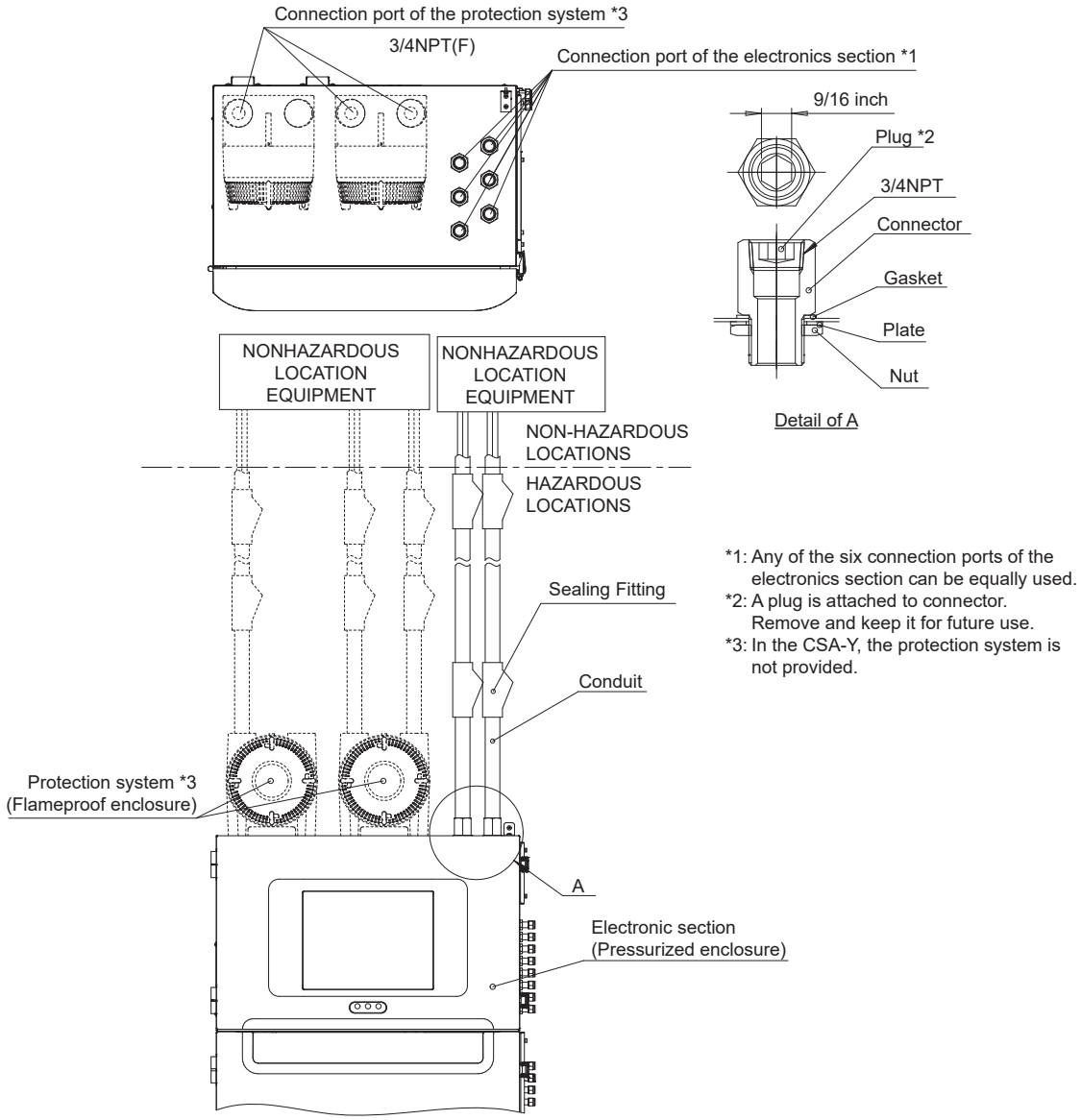


Figure 2.15 Wiring in CSA specification for Type 1 to 5

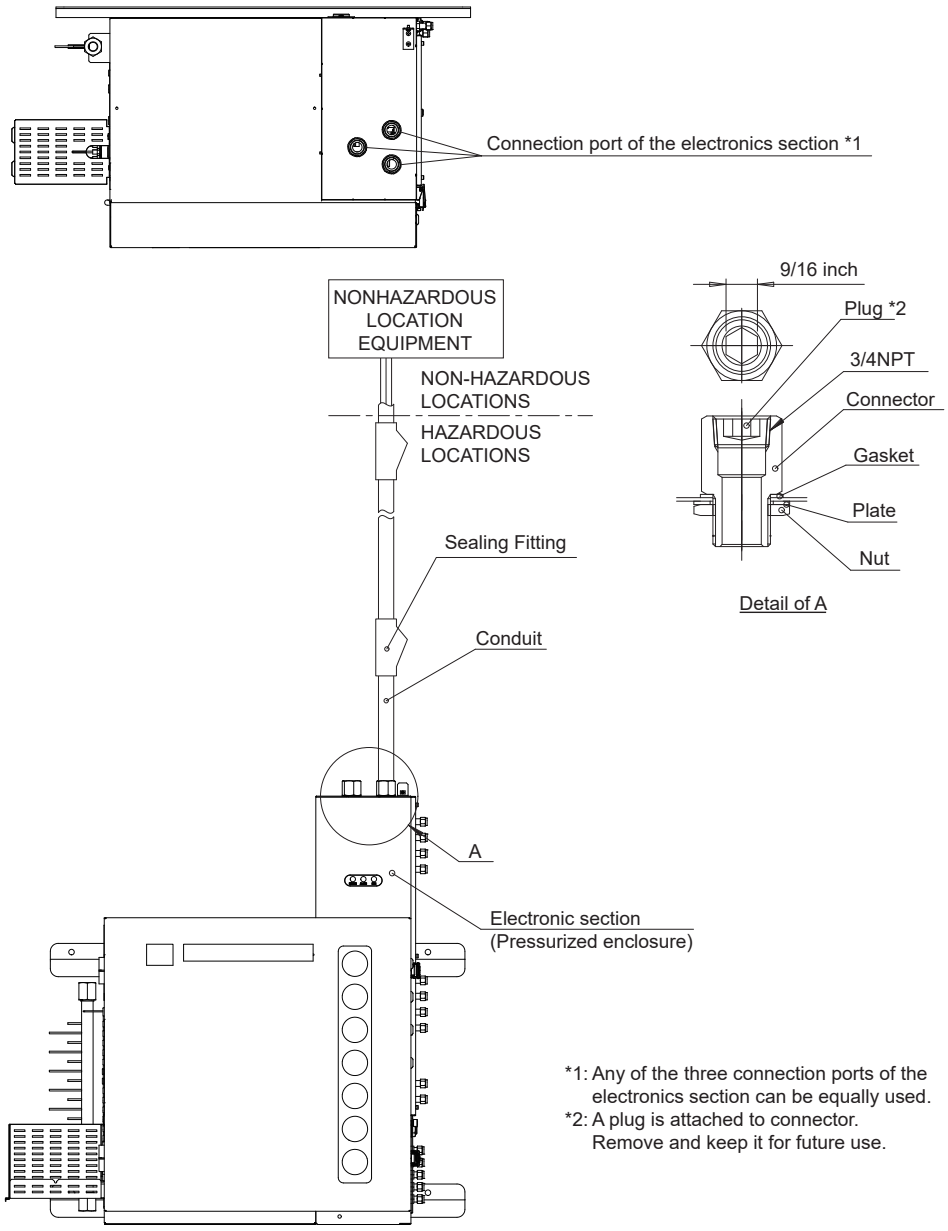


Figure 2.16 Wiring in CSA specification for Type 6

■ ATEX, IECEx, NEPSI

WARNING

- All wiring shall comply with IEC/EN 60079-14, Local Electric Codes and Requirements.
- In a hazardous area, use appropriate flameproof-certified parts for connecting cables.
- All externally powered input signals into the pressurized enclosure protected by the Ex pxb protection system shall be isolated by external relays controlled by the Ex pxb protection system (safety device).

CAUTION

- The unused electrical connection ports should be closed with an appropriate flameproof-certified plug.
- The blind plug shall not be used with an adapter.
- Analyzers have pressurized enclosures. The cable end should be sealed in order to apply pressure to the pressurized enclosure. Otherwise, power does not supplied to the electronics section.

In the ATEX-Y/IECEx-Y/NEPSI-Y, all wiring must be connected to the electronics section since the protection system is not provided.

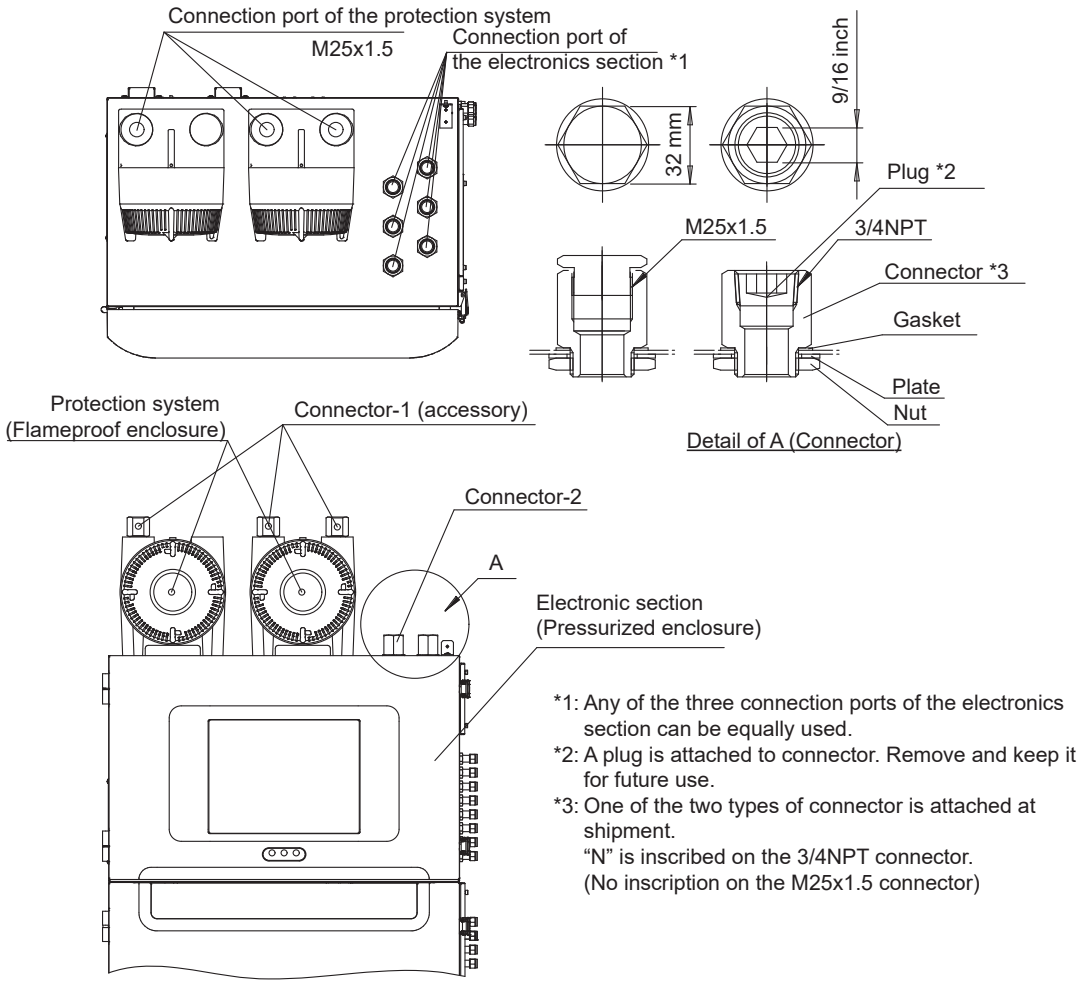


Figure 2.17 Wiring in ATEX, IECEx or NEPSI specification for Type 1 to 5

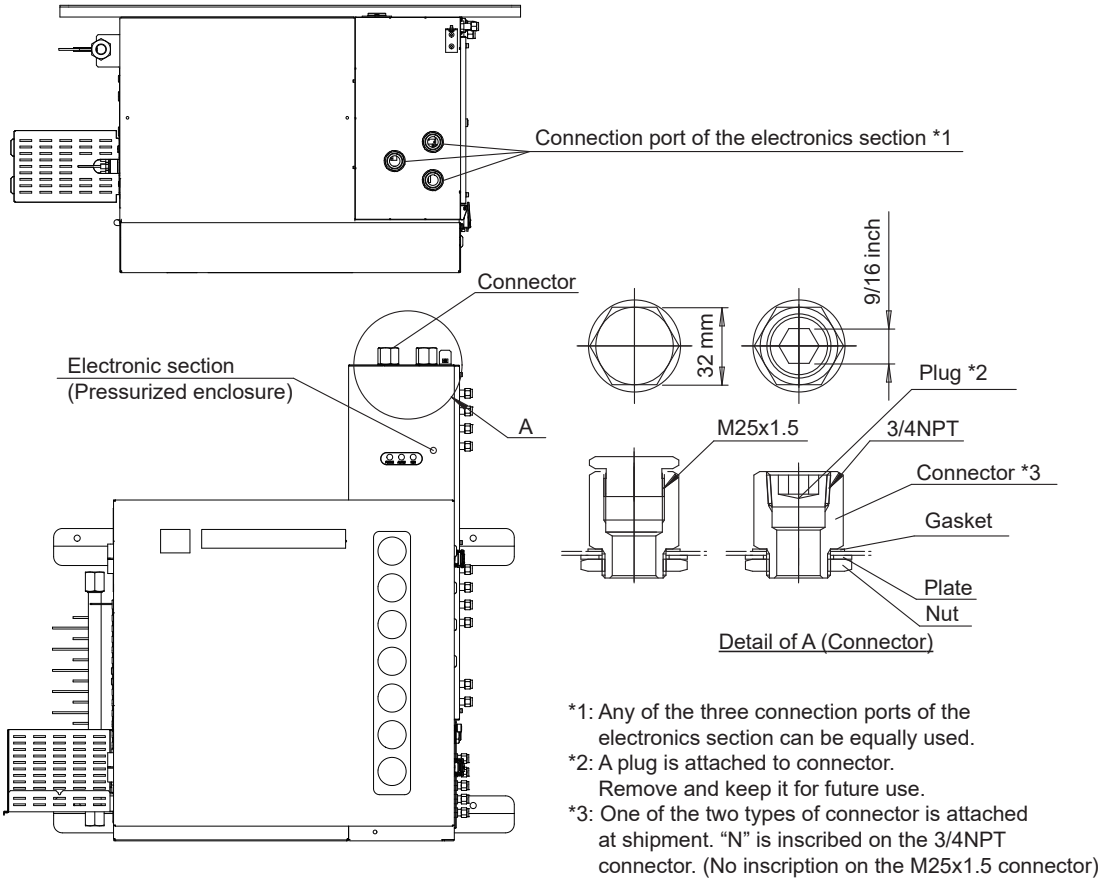


Figure 2.18 Wiring in ATEX, IECEx or NEPSI specification for Type 6

Connection port for the protection system

Remove the attached plug and perform wiring.

For the 3/4NPT connection port, use the connectors in the accessory kit.

Connection port for the electronics section

Six connection ports are provided in the electronics section. Use convenient ones.

Remove the attached plug of the connector and perform wiring.

Three connection ports are provided in the electronics section, in case of Type 6.

Use convenient ones. Remove the attached plug of the connector and perform wiring.

TIIS

For TIIS explosionproof wiring connections, use cable packing adapters or sealing fittings (for Ethernet cable).

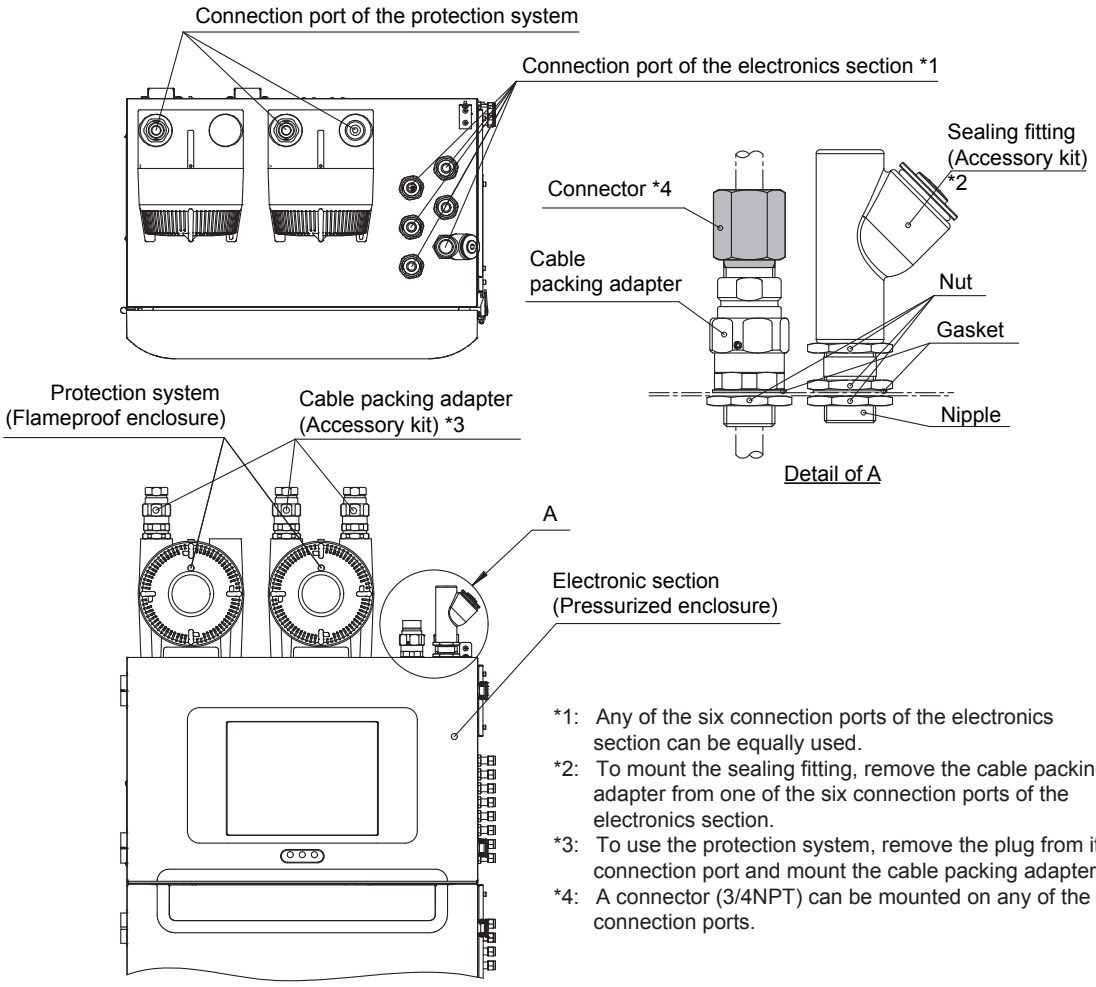


Figure 2.19 Wiring in TIIS specification

Connecting cables to the protection system

Remove the attached plug and mount the cable packing adapter (G3/4) in the accessory kit on the connection port. Use the connector in the accessory kit for the cable packing adapter (3/4NPT).

CAUTION

The minimum packing (for ø8.0 to ø9.0) is attached to the cable packing adapters at shipment. Change it to an appropriate packing for the cable O.D. (See Table 2.7.)

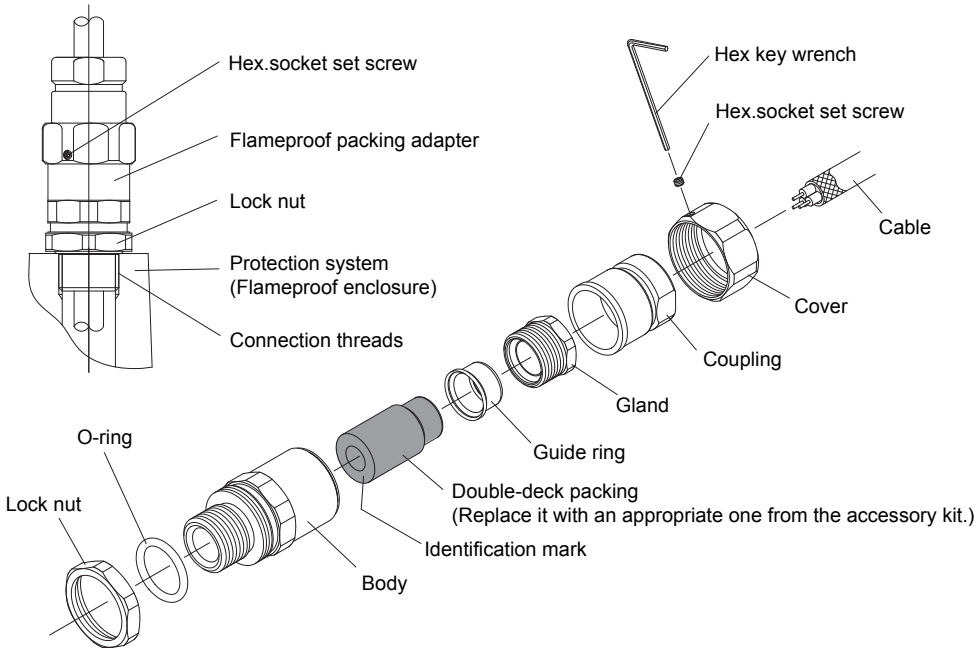


Figure 2.20 Procedure for mounting a cable packing adapter for a protection system

The cable packing adapters comply with the Technical Standard of the Ministry of Health, Labor and Welfare, Japan.

Table 2.7 Size of double-deck packing for the protection system

Connection port screw	Applicable cable O.D.	Identification mark	Recommended torque for the gland (N·m)
G3/4	ø8.0 to ø9.0	SFFP209 ø8.0 to ø9.0	17
	ø9.0 to ø10.0	SFFP2010 ø9.0 to ø10.0	25
	ø10.0 to ø11.0	SFFP2011 ø10.0 to ø11.0	20
	ø11.0 to ø12.0	SFFP2012 ø11.0 to ø12.0	20
	ø12.0 to ø13.0	SFFP2013 ø12.0 to ø13.0	20
	ø13.0 to ø14.0	SFFP2014 ø13.0 to ø14.0	25
	ø14.0 to ø15.0	SFFP2015 ø14.0 to ø15.0	20
	ø15.0 to ø16.0	SFFP2016 ø15.0 to ø16.0	20

*: When a cable O.D. falls under two categories, try both and choose the more suitable one.

Connecting cables to the electronics section

Six connection ports are provided in the electronics section. Use convenient ones.

The cable packing adapters (G3/4) and plates for sealing are mounted as standard. Remove the plate before using the port for wiring, and keep it for future use. (Do not remove the plate for the unused connection port.)

CAUTION

The minimum packing (for ø9.0 to ø10.0) is attached to the cable packing adapters at shipment. Change it to an appropriate packing for the cable O.D. (See Table 2.8.)

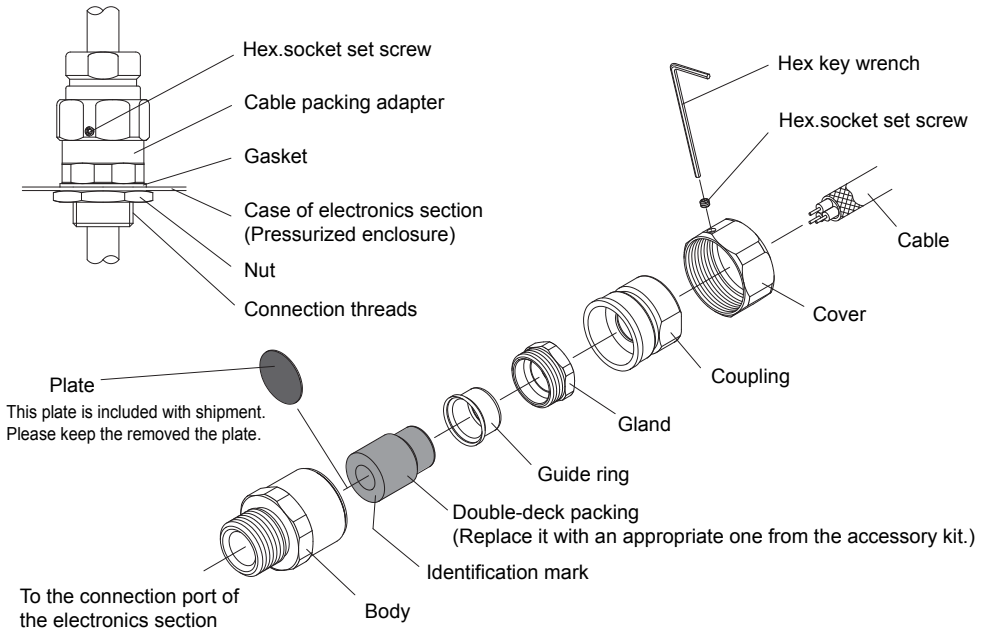


Figure 2.21 Procedure for mounting a cable packing adapter for the electronics section

The cable packing adapters comply with the Technical Standard of the Ministry of Health, Labor and Welfare, Japan.

Table 2.8 Double-deck packing size for electronics section

Connection port screw	Applicable cable O.D.	Identification mark	Recommended torque for the gland (N·m)
G3/4	ø9.0 to ø10.0	SCFP2010 ø9.0 to ø10.0	25
	ø10.0 to ø11.0	SCFP2011 ø10.0 to ø11.0	20
	ø11.0 to ø12.0	SCFP2012 ø11.0 to ø12.0	20
	ø12.0 to ø13.0	SCFP2013 ø12.0 to ø13.0	20
	ø13.0 to ø14.0	SCFP2014 ø13.0 to ø14.0	25
	ø14.0 to ø15.0	SCFP2015 ø14.0 to ø15.0	20
	ø15.0 to ø16.0	SCFP2016 ø15.0 to ø16.0	20

*: When a cable O.D. falls under two categories, try both and choose the more suitable one.

For Ethernet cable, use sealing fittings in the accessories kit for the connection port (see Figure 2.22). Remove the attached cable packing adapter and mount the sealing fitting back in place. Six connection ports are provided in the electronics section. Use convenient ones.

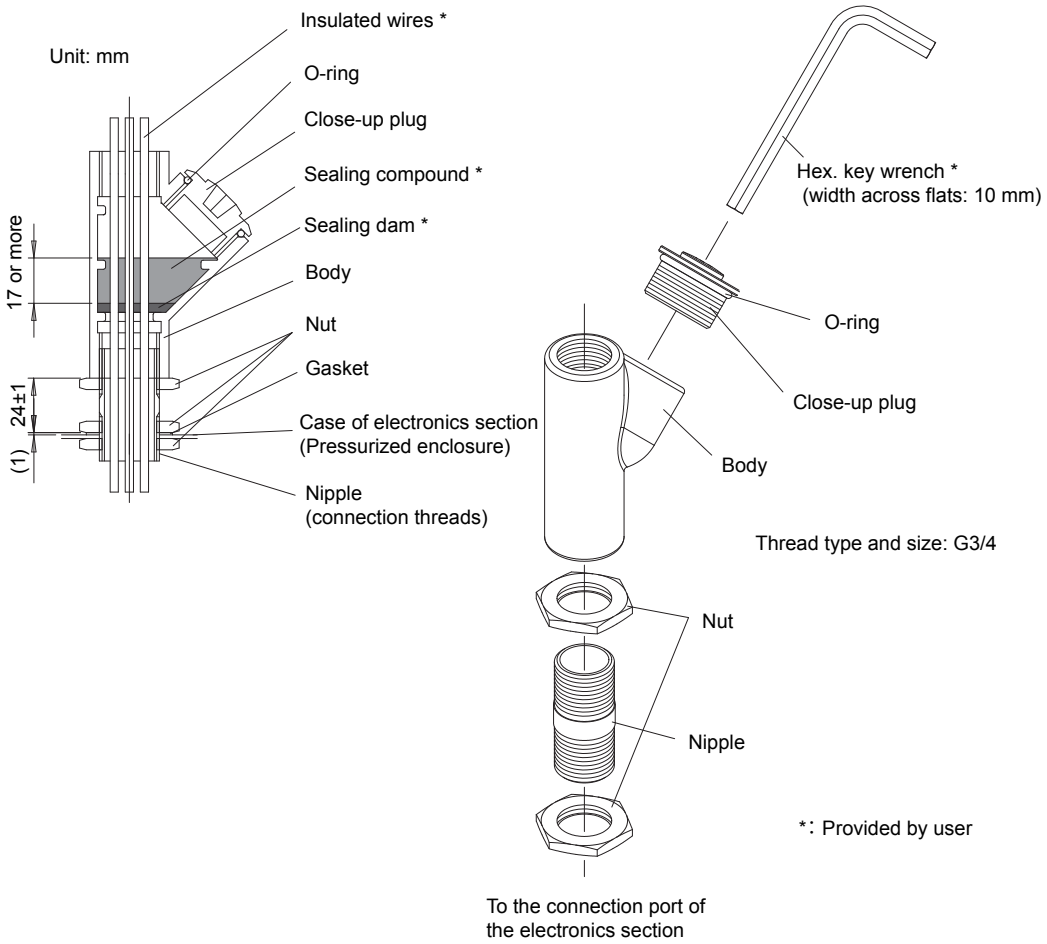


Figure 2.22 Mounting procedure for sealing fitting (accessory)

CAUTION

The cable end should be sealed in order to apply pressure to the electronics section. Otherwise, power does not be supplied to the electronics section.

For the 3/4NPT connection port, use the connectors in the accessory kit to all of the connections.

TIP

Refer to “USERS’ GUIDELINES for Electrical Installations for Explosive Gas Atmospheres in General Industry” for more details.

2.3.4 Connecting Power Cable and Grounding

CAUTION

- Wire the power supply cable keeping the distance of 1 cm or more from other signal wires.
- The power supply cable shall comply with UL or CSA.
- Do wiring after securing protective grounding.

Use crimp-on terminals for all power cables and grounding (see Figure 2.23).
Use crimp-on terminals suitable for the cable core (see Table 2.9).

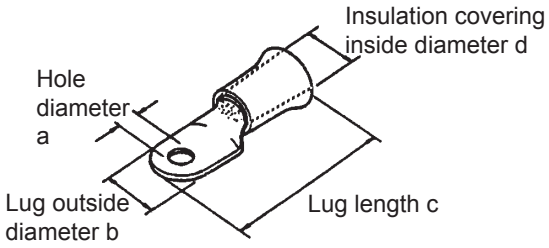


Figure 2.23 Crimp-on terminal

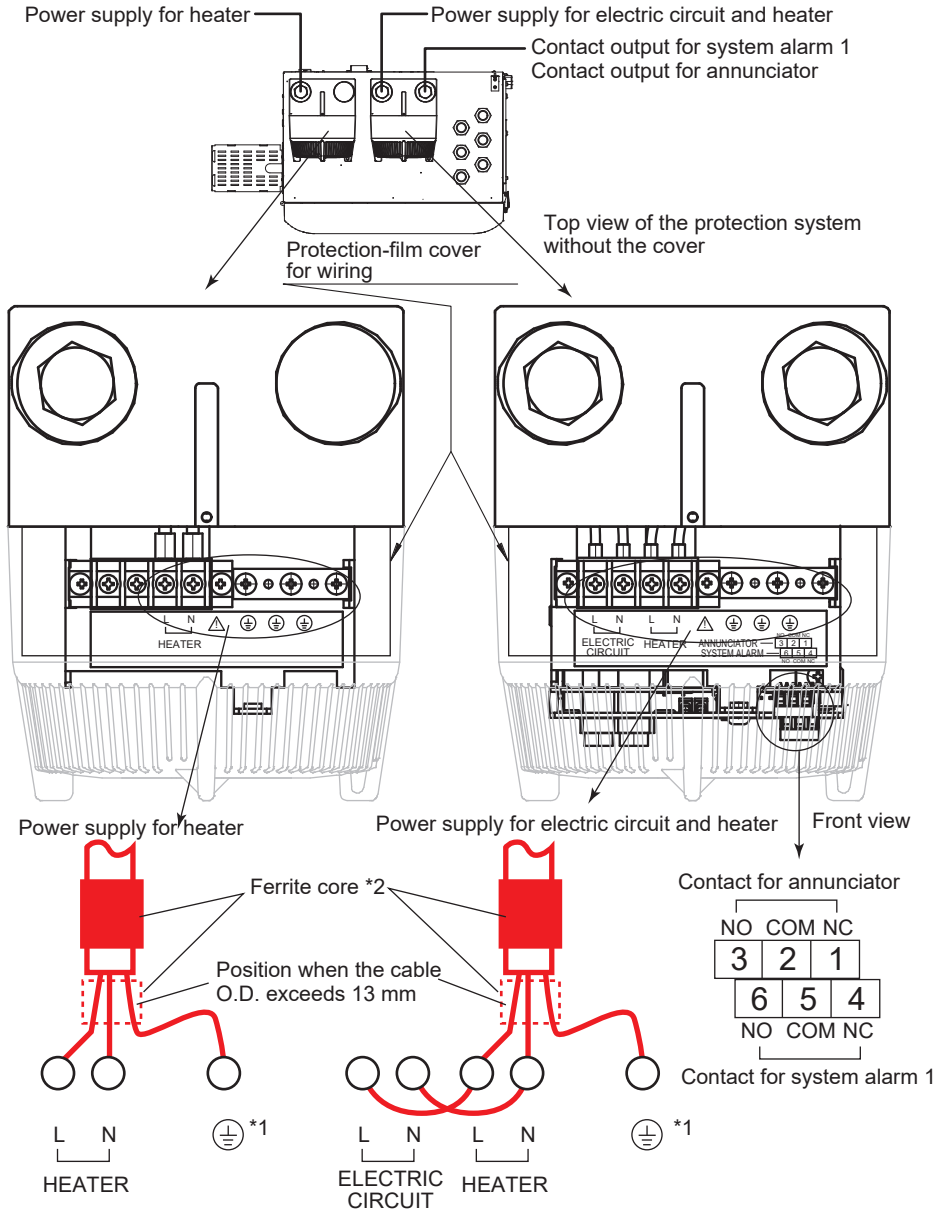
Table 2.9 Size of crimp-on terminal

Nominal cross sectional area	Screw (mm)	Hole diameter a (mm)	Outside diameter b (mm)	Length c (mm)	Insulation covering inside diameter d (mm)	Applicable terminal *
5.5 mm^2	4	4 to 5	9.8 or less	25 to 29	5.8 or less	AMP 170785-1 JST 5.5-4
2.0 mm^2	4	4.3 or more	8.7 or less	approx. 21	5.8 or less	AMP 170782-1 JST V2-4
1.25 mm^2	4	4.3 or more	8.7 or less	approx. 21	5.8 or less	AMP 170782-1 JST V1.25-4

*: AMP: Japan AMP Co., Ltd.
JST: JST Co., Ltd.

● Power supply line to the protection system (A) (B)

The power supply to protection system A is used for both heater power and electric circuit power.
The power supply or protection system B is used only for heater power.
Connect the attached ferrite core, in the case of GC8000-A (for ATEX-X), GC8000-E (for IECEx-X) or GC8000-P (for NEPSI-X).
Grounding must be wired.
Please do not forget to put protection-film cover, after wiring is finished.



*1: Grounding is possible from any one of the three terminals.
*2: Connect the attached ferrite core, in the case of GC8000-A (for ATEX-X), GC8000-E (for IECEx-X),or GC8000-P (for NEPSI-X).

Figure 2.24

CAUTION

Use heat-resistant cables with maximum allowable temperature of 80°C or above.

● Power supply line of the electronics section (A) (B) without the protection system

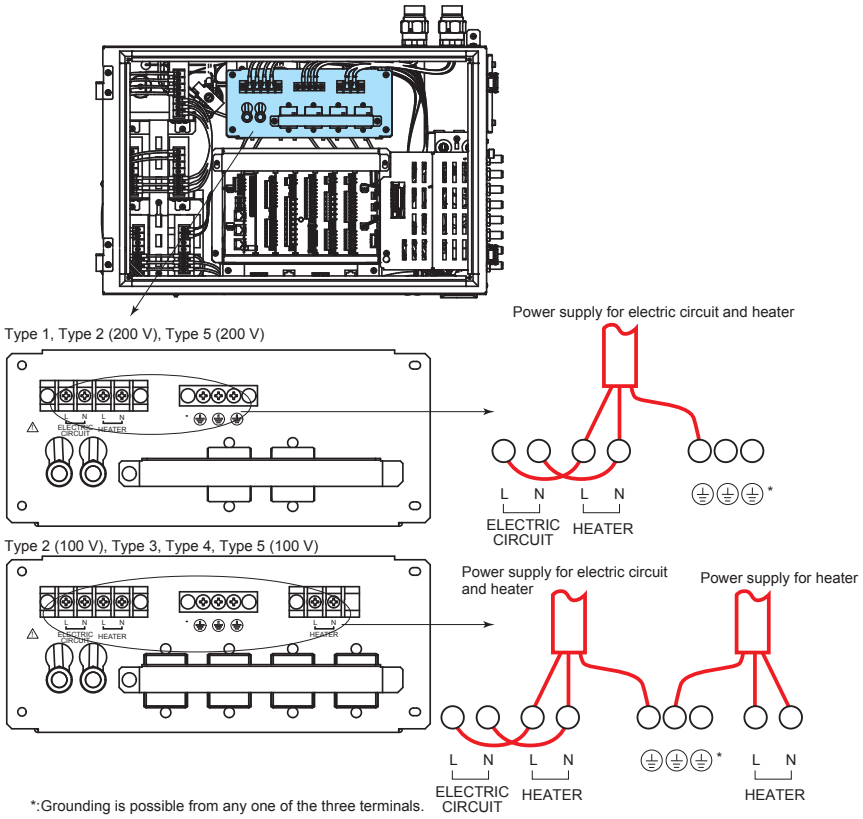


Figure 2.25 For Type 1 to 5

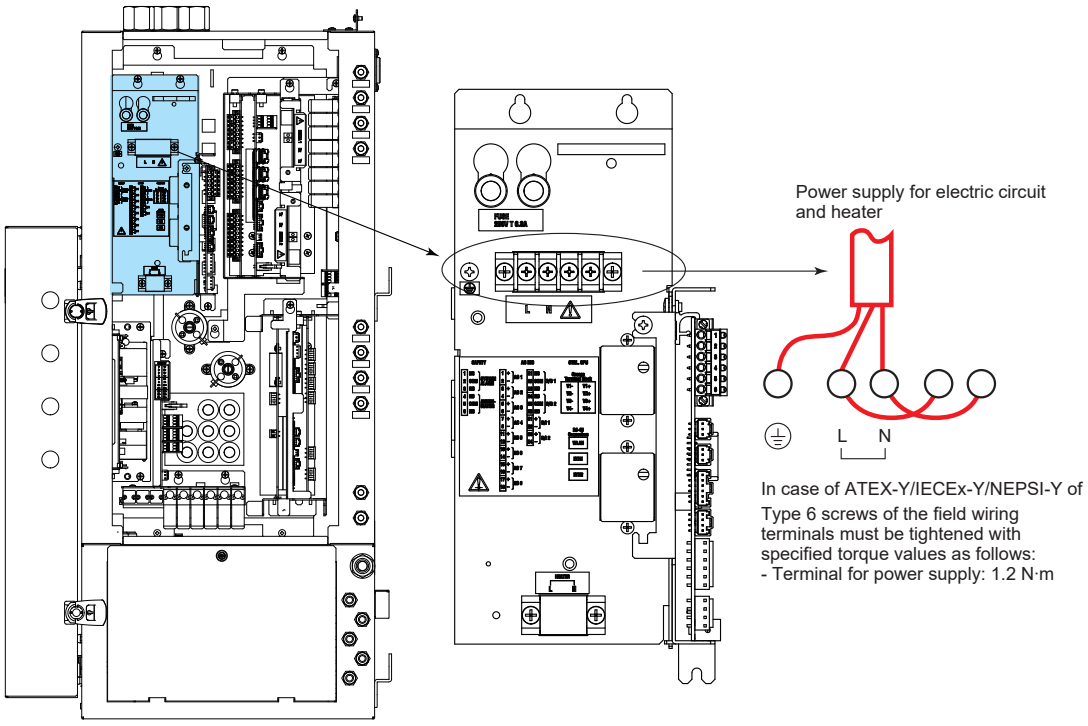


Figure 2.26 For Type 6

CAUTION

Use heat-resistant cables with maximum allowable temperature of 80°C or above.

Grounding (K)

CAUTION

Use independent grounding with a grounding resistance of 100 ohms or less.

Connect the earth terminal to the upper right of the control unit as shown in Figure 2.27 or Figure 2.28.

- In order to prevent the earthing conductor from loosening, the conductor must be secured to the terminal, tightening the screw with torque of approx. 1.2 N•m.
- Care must be taken not to twist the conductor.

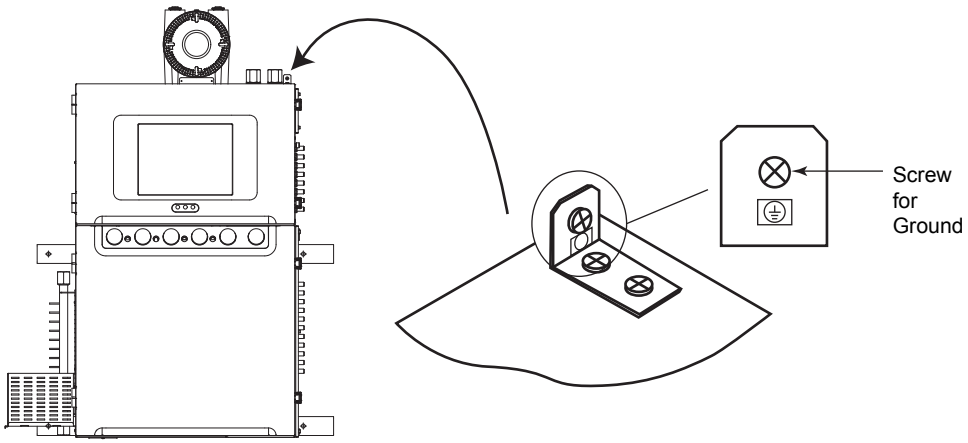


Figure 2.27 Earth terminal for Type 1 to 5

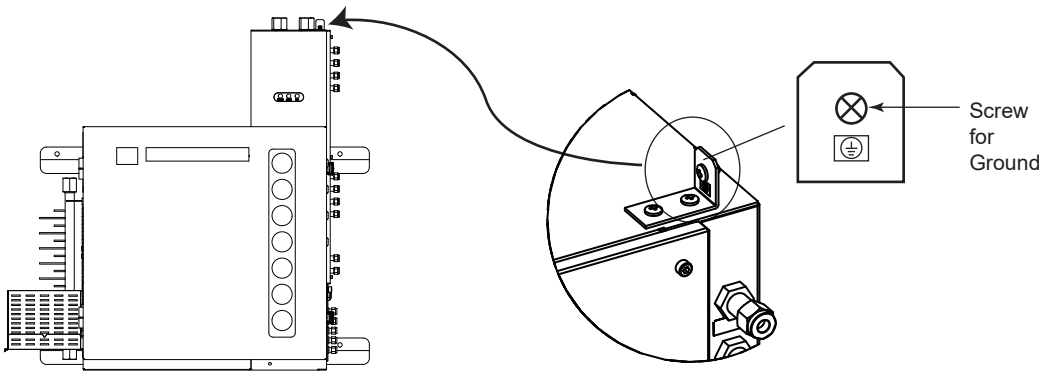


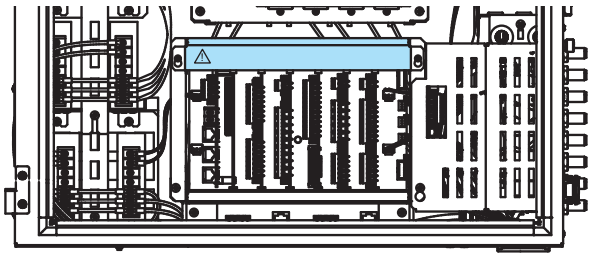
Figure 2.28 Earth terminal forType 6

2.3.5 Connecting Signal Cables

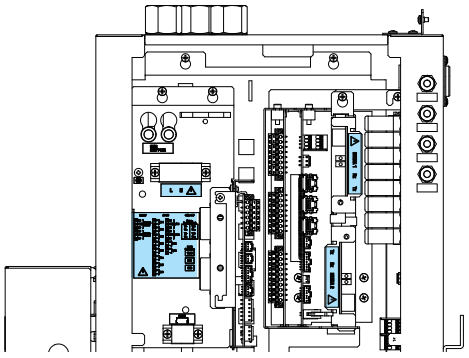
CAUTION

(C) to (L) cables:

Use heat-resistant cables with maximum allowable temperature of 80°C or higher.



For Type 1 to 5



For Type 6

(M) and (N) cables:

Required maximum allowable temperature of the cables depends on the temperature class of the instrument and the actual ambient temperature. Use cables with maximum allowable temperature shown in the table below.

Temperature Class	T1, T2	T3	T4	Maximum allowable temperature of cable
Ambient temp.	Up to 30°C	Up to 35°C	Up to 40°C	60°C
	31 to 36°C	36 to 40°C	41 to 45°C	65°C
	37 to 43°C	41 to 45°C	46 to 50°C	70°C
	44 to 50°C	46 to 50°C		75°C

CAUTION

Be sure to keep the power and signal cables apart. Avoid placing them in parallel.

NOTE

- For analog input, use twisted pair cables with a common shield (a twist pitch of 50 mm or less), to avoid induction noise.

  Use twisted pair cables for digital signals as well.
- Stranded cables are superior to single-conductor cables in the following respects:
- Stranded cables are more flexible and easy to lay in a curved pit or cramped space.
- Stranded cables provide better contact with crimp-on terminal, with less aging over time.
- Secure the cables so they do not weight on the terminals.
- Fasten the terminal screws securely.

Signal Cable Termination

CAUTION

- Use crimp-on terminal with insulated covering.
- Wire crimp-on terminal with the dedicated tool.
- The tool must be suitable for the size of wires.

Use crimp-on terminal for all signal cables.

The specifications of the crimp-on terminal are determined by the nominal cross sectional area of the power cable.

For the protection system, use MKKDSN series terminals from Phoenix Contact Ltd., and FKC series terminals from the same company for the contact output line (D) (G), analog input line (E), contact input line (F), serial communication line (H), analog output line (J), and explosionproof status line (L) of the electronics section.

For the Ethernet line (L) (M), use twisted-pair cables of CAT.5 or CAT.5E or multi-mode optical fiber of 50/125 µm or OM1, or Single-mode optical fiber of G.652.

For these wiring connections, use AI series crimp-on terminal from Phoenix Contact Ltd.

There are four types of crimp-on terminal for respective wire diameters (see Table 2.6).

Peel off the cover of wire by 6 mm for MKKDSN series terminals and 10 mm for FKC series terminals (maker-recommended values).

CAUTION

- Parts such as the signal line, relay terminal, relay, and power supply to be connected to the contact input/output shall comply with IEC 61010 or CSA 61010.
- Connect wiring after securing protective grounding.

External I/O cutoff output (power cutoff signal) (L)

Wiring for the cutoff signal must be performed in case the explosionproof requirements are not satisfied.

The shield is grounded at the earth bar (see Figure 2.29 or Figure 2.30). Remove the cover on the upper right of the electronics section and perform wiring.

Contact output for system alarm 1 (C) and contact output for annunciator (D)

The wiring locations differ depending on whether the protection system is provided or not.

Wiring to protection system A

Perform wiring to the terminals shown in Figure 2.24.

The MKKDSN series terminals from Phoenix Contact Ltd. are used.

For these wiring connections, use AI series crimp-on terminals from the same company. Check if the crimp-on terminals meet wire diameters in Table 2.6.

Wiring to the electronics section (without the protection system)

Perform wiring to the electronics section of the control unit (see Figure 2.29 or Figure 2.30).

FKC series terminals from Phoenix Contact Ltd. are used.

The tightening torque of the fixing screws for these terminals should be 0.3 N·m.

For these wiring connections, use AI series crimp-on terminals from the same company. Check if the crimp-on terminals meet wire diameters in Table 2.6.

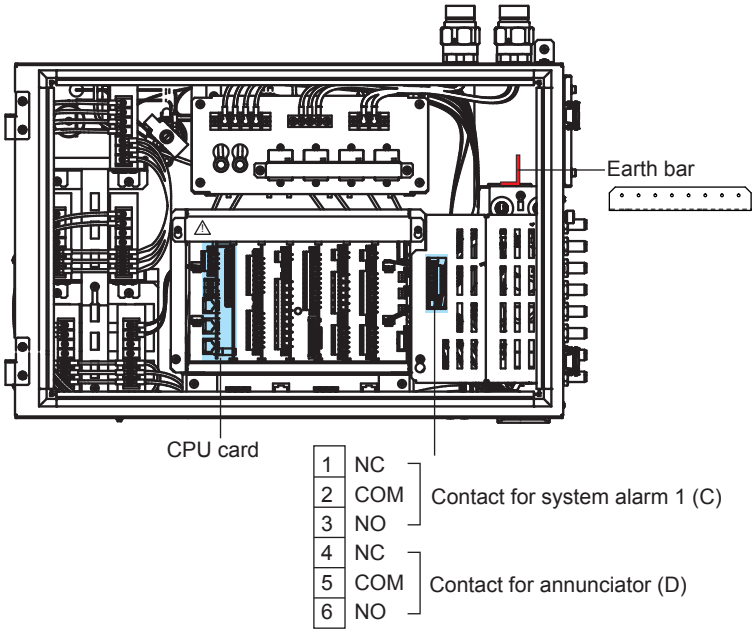
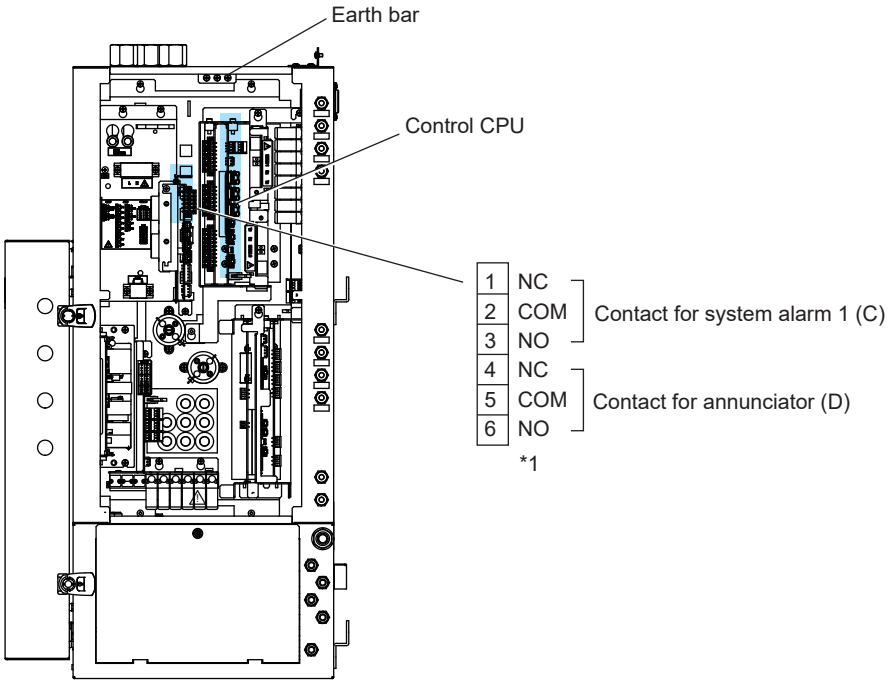


Figure 2.29 For Type 1 to 5



*1: Refer to Figure 2.46 for the wiring method.

Figure 2.30 For Type 6

Ethernet (twisted pair) (M) (L)

CAUTION

(M) cable:

Required maximum allowable temperature of the cables depends on the temperature class of the instrument and the actual ambient temperature. Use cables with maximum allowable temperature shown in the table below.

Temperature Class	T1, T2	T3	T4	Maximum allowable temperature of cable
Ambient temp.	Up to 30°C	Up to 35°C	Up to 40°C	60°C
	31 to 36°C	36 to 40°C	41 to 45°C	65°C
	37 to 43°C	41 to 45°C	46 to 50°C	70°C
	44 to 50°C	46 to 50°C		75°C

Connect the twisted pair cable of the RJ-45 connector to the CPU card.

The CPU card is labeled “CTRL.CPU”.

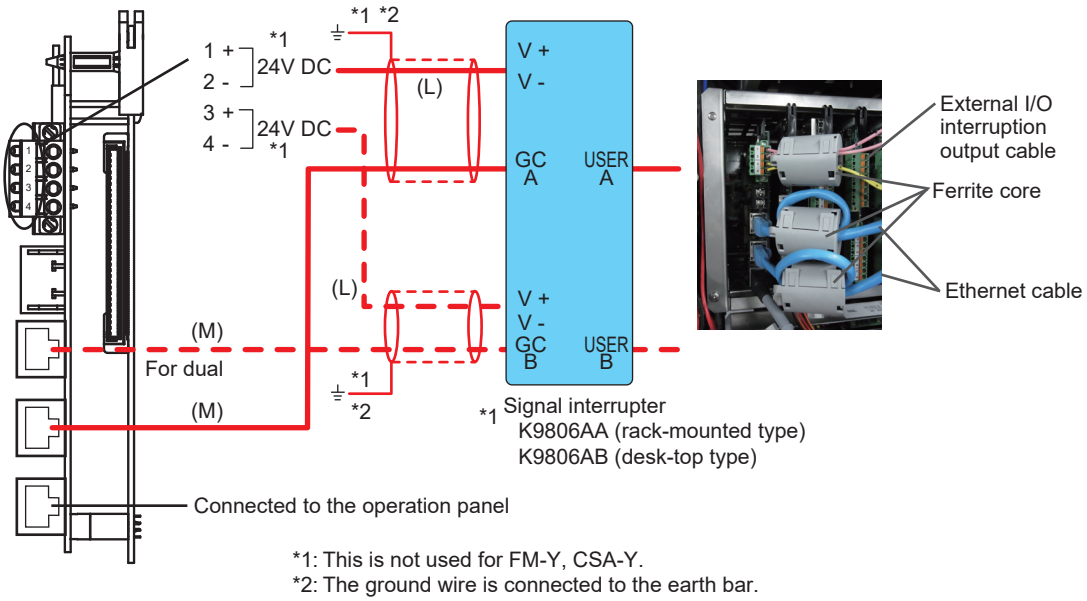


Figure 2.31 Ethernet (twisted pair cable) for Type 1 to 5

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar shown in Figure 2.29. Remove the cover on the upper right of the electronics section and perform wiring.

Connect the attached ferrite core to the external I/O cutoff output cable and Ethernet cable, in the case of GC8000-A (for ATEX-X), GC8000-E (for IECEx-X) or GC8000-P (for NEPSI-X).

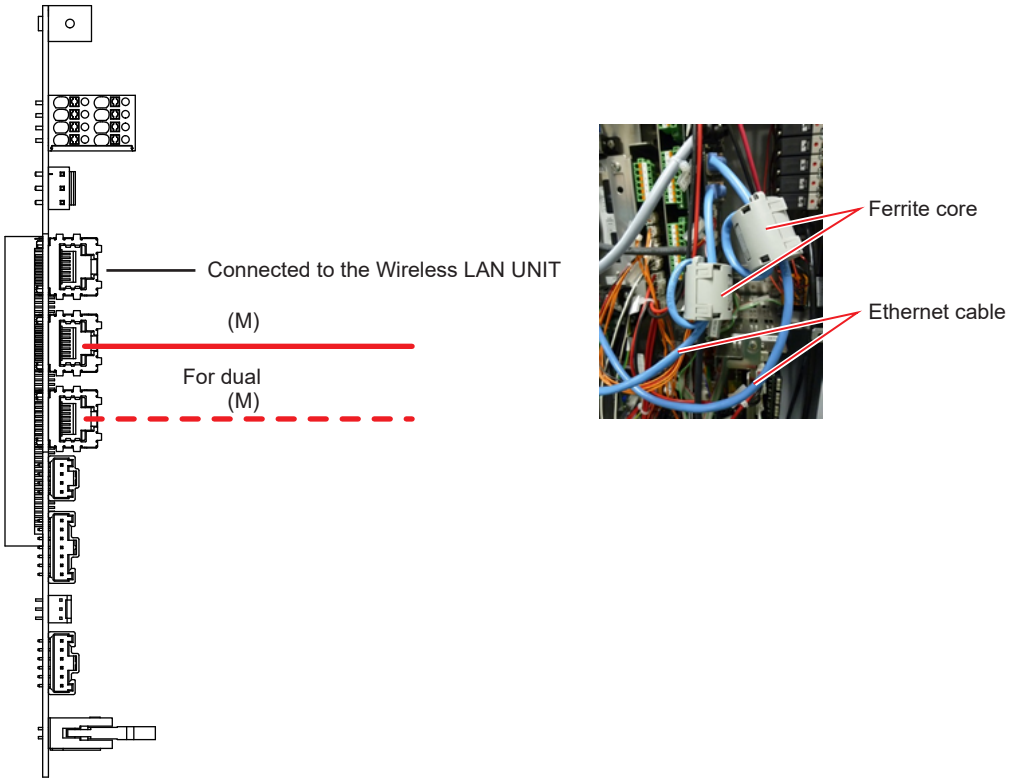


Figure 2.32 Ethernet (twisted pair cable) for Type 6

- Connect the attached ferrite core to the Ethernet cable (M), in the case of GC8000-B (for ATEX-Y), GC8000-M (for IECEx-Y) or GC8000-Q (for NEPSI-Y).
- In the case of GC8000-B (for ATEX-Y), GC8000-M (for IECEx-Y) or GC8000-Q (for NEPSI-Y), the field wiring for Ethernet communication must be in accordance with IEEE 802.3 so as to avoid overvoltage of > 119 V.

Ethernet (optical fiber) (N)

CAUTION

(N) cable:

Required maximum allowable temperature of the cables depends on the temperature class of the instrument and the actual ambient temperature. Use cables with maximum allowable temperature shown in the table below.

Temperature Class	T1, T2	T3	T4	Maximum allowable temperature of cable
Ambient temp.	Up to 30°C	Up to 35°C	Up to 40°C	60°C
	31 to 36°C	36 to 40°C	41 to 45°C	65°C
	37 to 43°C	41 to 45°C	46 to 50°C	70°C
	44 to 50°C	46 to 50°C		75°C

Connect an optical fiber to the media converter shown in Figure 2.33 or Figure 2.34.

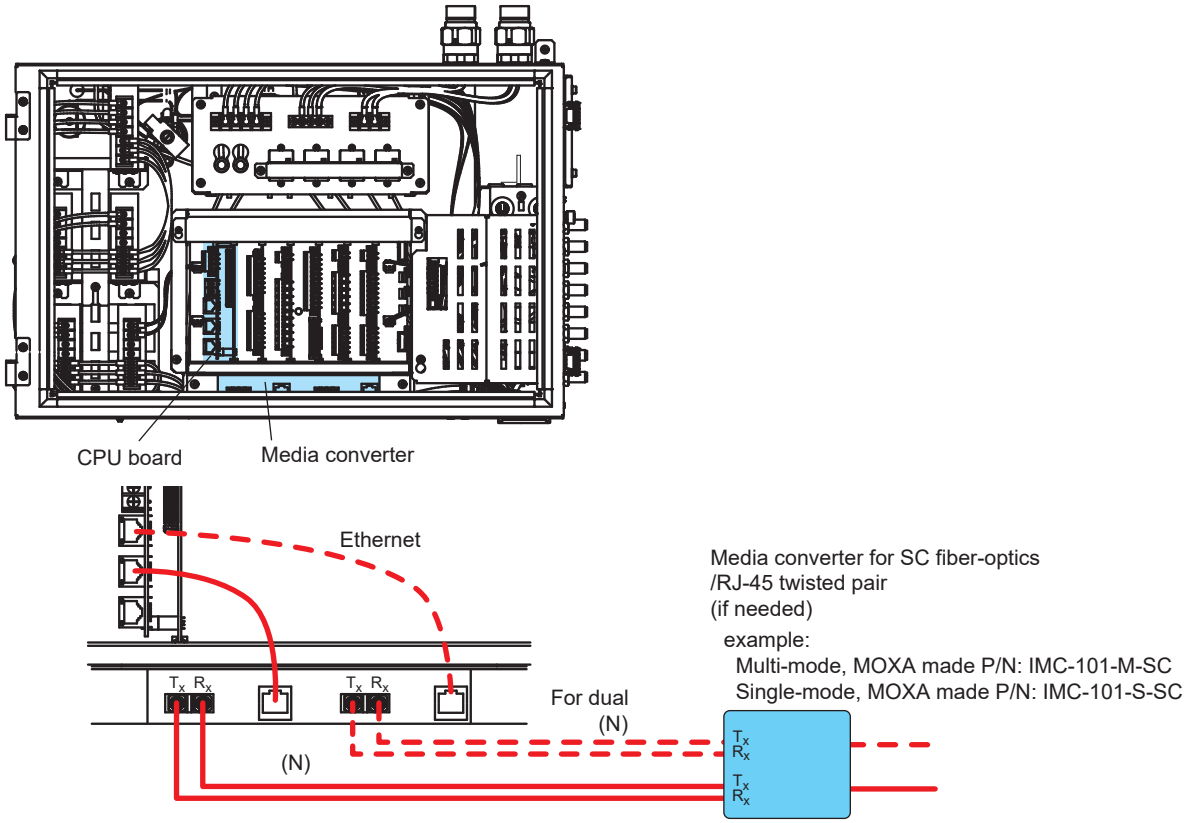


Figure 2.33 Ethernet (optical fiber) for Type 1 to 5

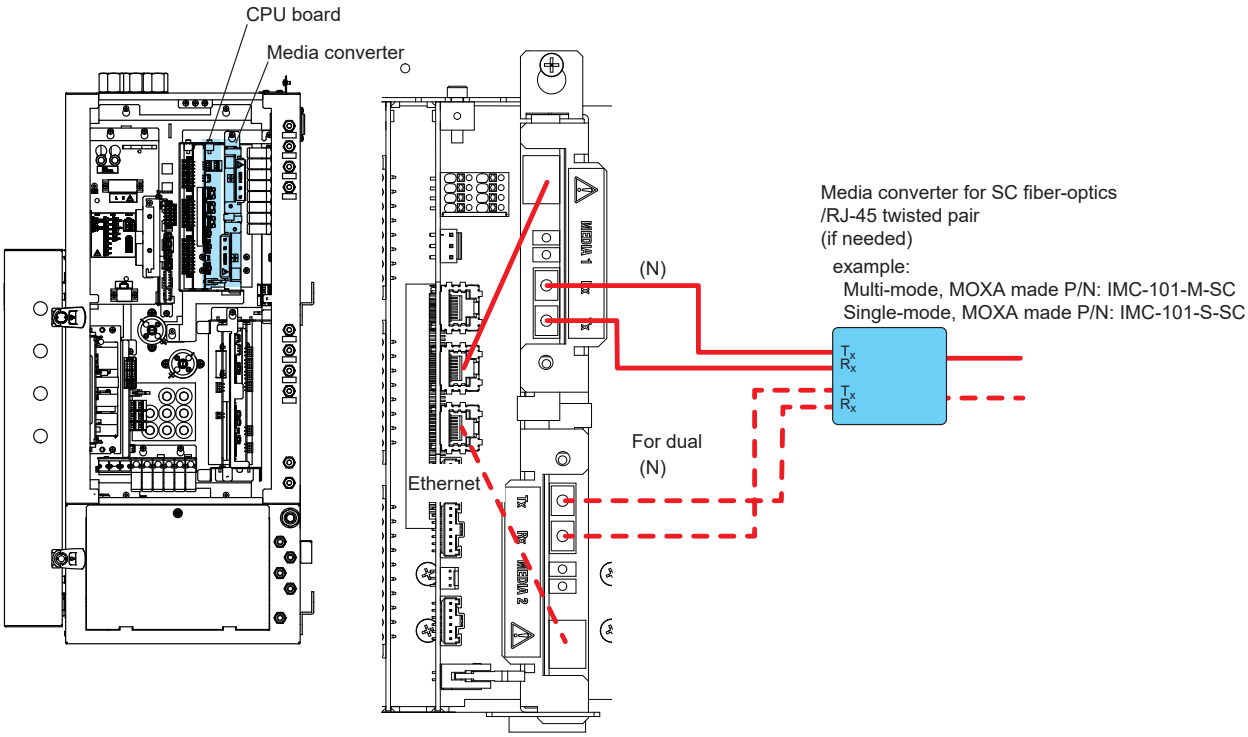


Figure 2.34 Ethernet (optical fiber) for Type 6

Wiring to slots 1 to 5

Perform wiring to slots 1 to 5 for each card.

CAUTION

After the card is removed, return it to its original position. There is a label on the card.

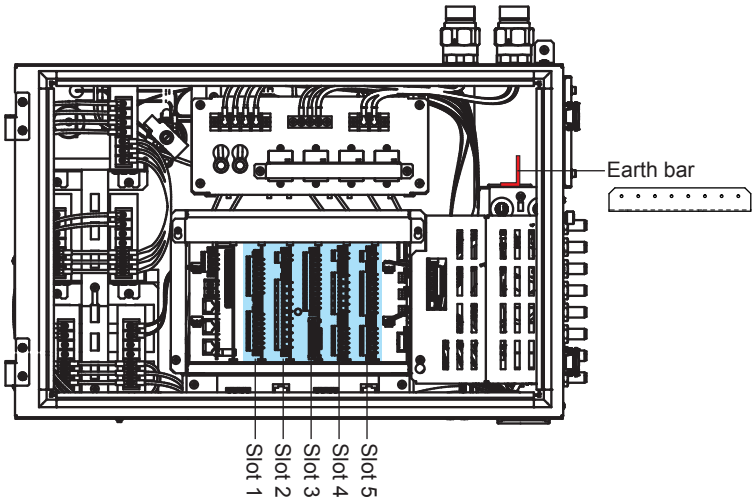


Figure 2.35 Location of I/O cards for Type 1 to 5

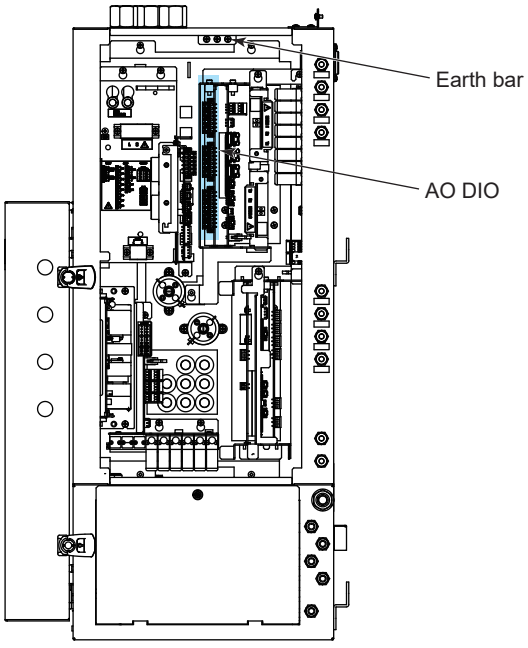
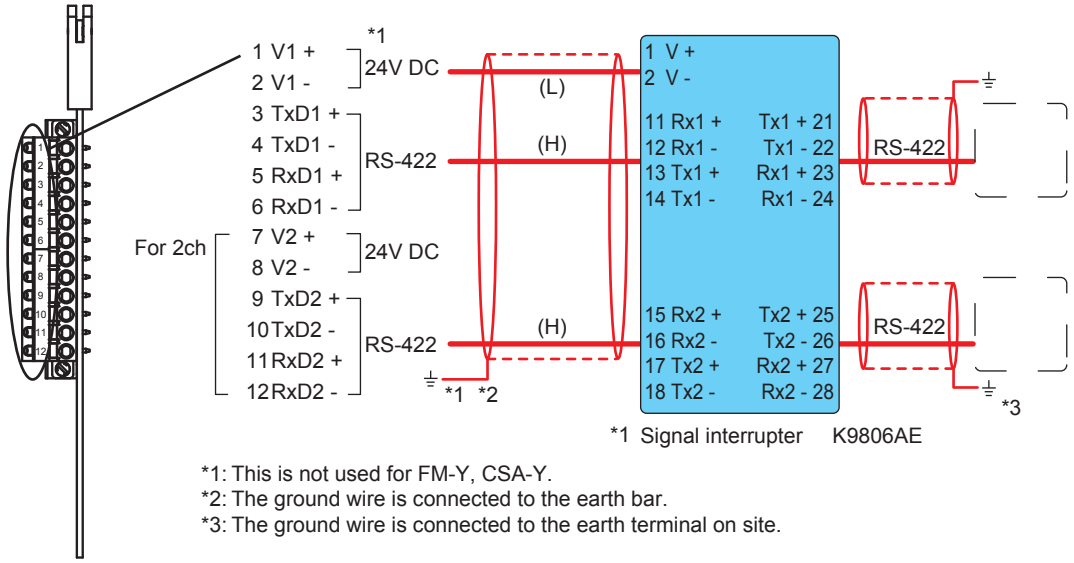


Figure 2.36 Location of I/O cards for Type 6

FKC series terminals from Phoenix Contact Ltd. are used.

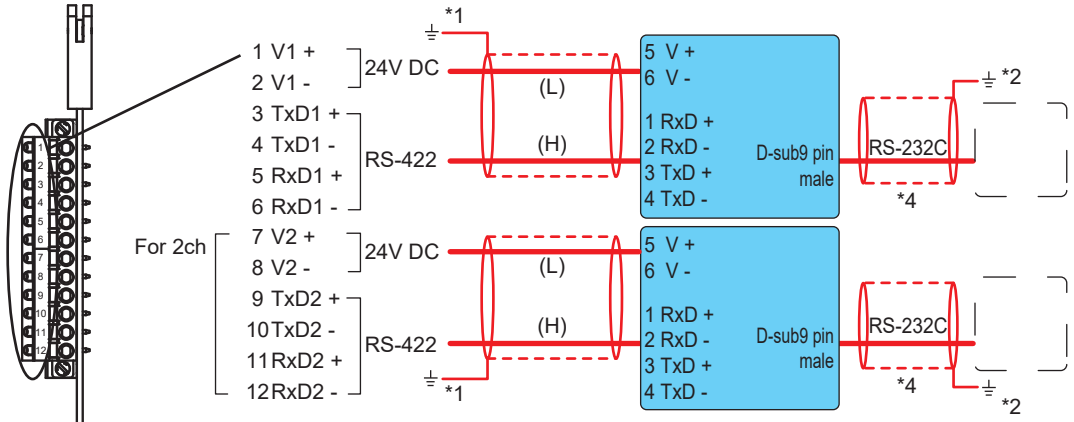
For these wiring connections, use AI series crimp-on terminals from the same company. Check if the crimp-on terminals meet wire diameters in Table 2.6.

Serial communication (1ch) (Code: C) and serial communication (2ch) (Code: D) (H) (L) (For Type 1 to 5)



*1: This is not used for FM-Y, CSA-Y.
*2: The ground wire is connected to the earth bar.
*3: The ground wire is connected to the earth terminal on site.

Figure 2.37 Wiring for serial communication cards



*1: The ground wire is connected to the earth bar.
*2: The ground wire is connected to the earth terminal on site.
*3: Two communication converters are required for 2ch.
*4: (a) shows cable connection of RS-232C communication.
Please refer to the following for flow control setting.
RS control: None, DR check: YES (Recommended), CD check: None
If the instrument to be connected accepts NULL modem-type connection, wiring (b) is also applicable.
Example: Regular personal computers, “FA-M3” (Yokogawa PLC).

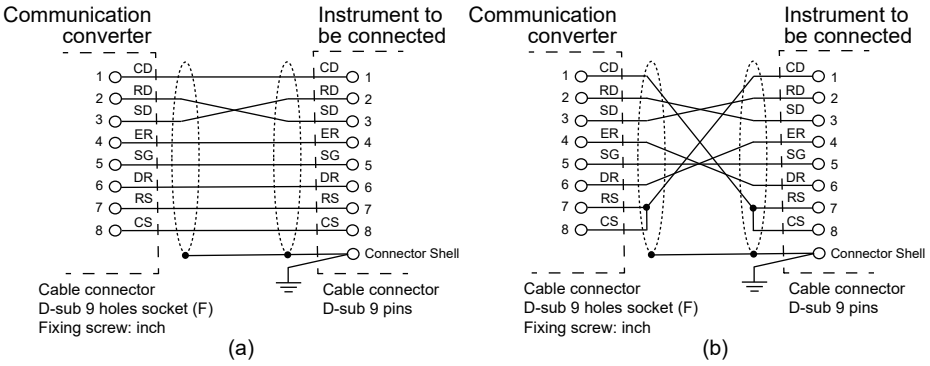


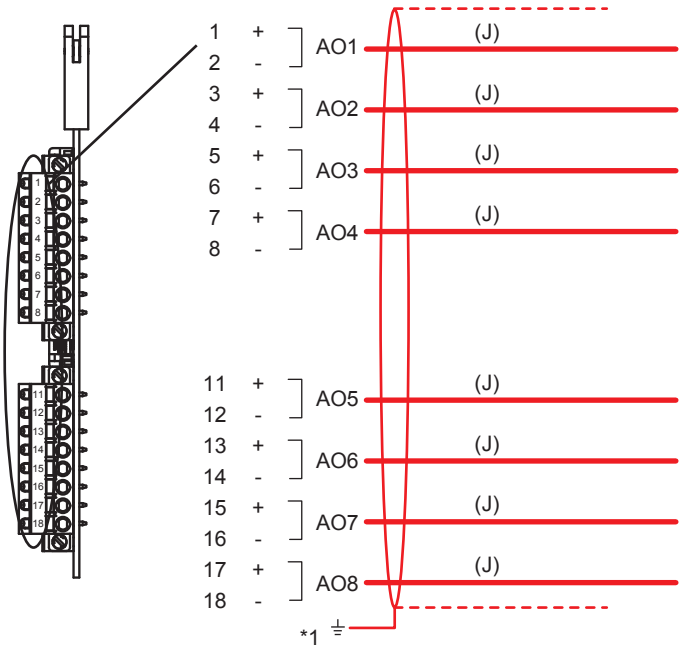
Figure 2.38 Wiring for serial communication cards

The serial communication card is labeled “COM”.

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

Analog output (system isolation) (Code: 1) and analog output (channel isolation) (Code: 2) (J) (For Type 1 to 5)

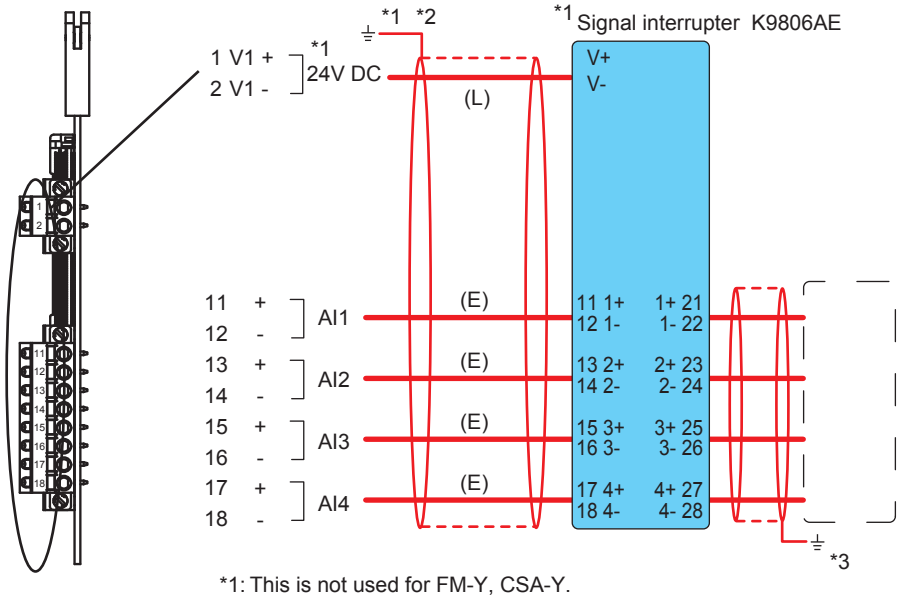


*1: The ground wire is connected to the earth bar.

Figure 2.39 Wiring for an analog output card

The analog output card is labeled “AO”.

Analog input (voltage) (Code: 3) and analog input (current) (Code: 4) (E) (L) (For Type 1 to 5)



*1: This is not used for FM-Y, CSA-Y.
*2: The ground wire is connected to the earth bar.
*3: The ground wire is connected to the earth terminal on site.

Figure 2.40 Wiring for an analog input card

The analog input card is labeled “AI”.

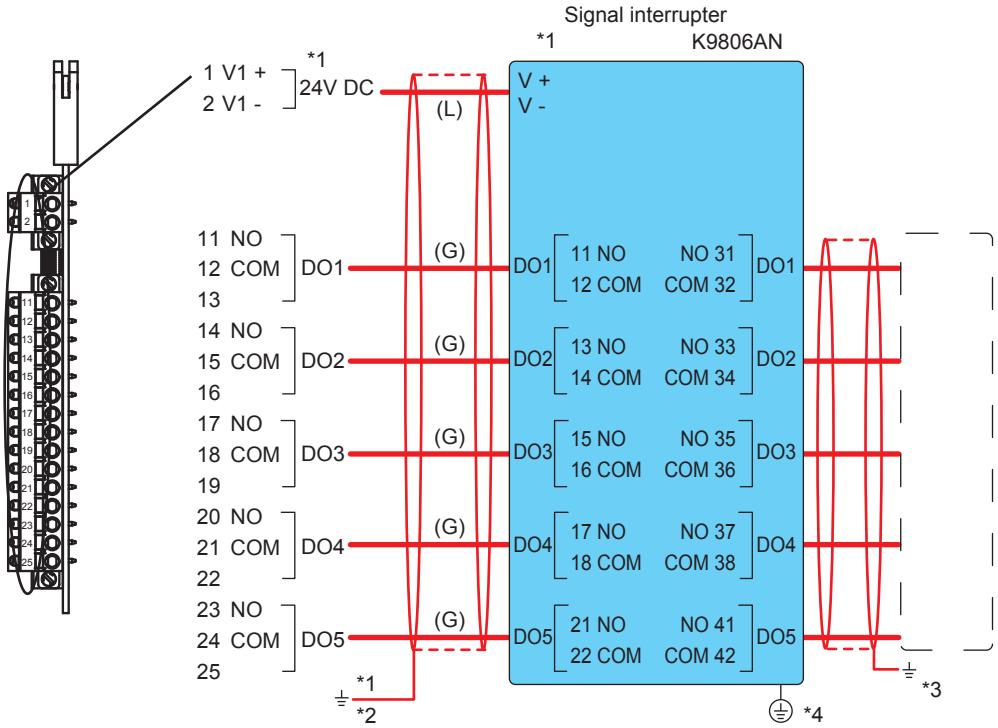
The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

WARNING

Do not use the analog input terminals for measurements on POWER SUPPLY CIRCUITS.

Contact output (AC) (Code: 8) (G) (L) (For Type 1 to 5)



*1: This is not used for FM-Y, CSA-Y.
*2: The ground wire is connected to the earth bar.
*3: The ground wire is connected to the earth terminal on site.
*4: The protection ground is connected to Class D ground (less than 100 Ω of grounding resistance), which is nearest to signal interrupter.

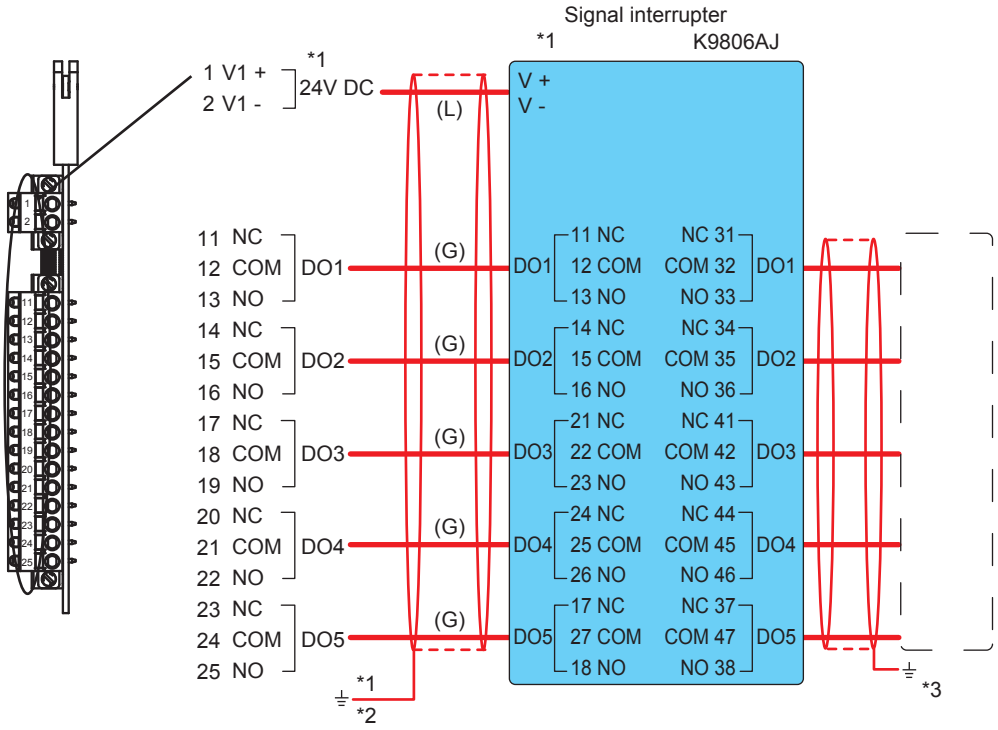
Figure 2.41 Wiring for a contact output card

The contact output card is labeled “DO”.

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

Contact output (DC) (Code: 7) (G) (L) (For Type 1 to 5)



*1: This is not used for FM-Y, CSA-Y.
*2: The ground wire is connected to the earth bar.
*3: The ground wire is connected to the earth terminal on site.

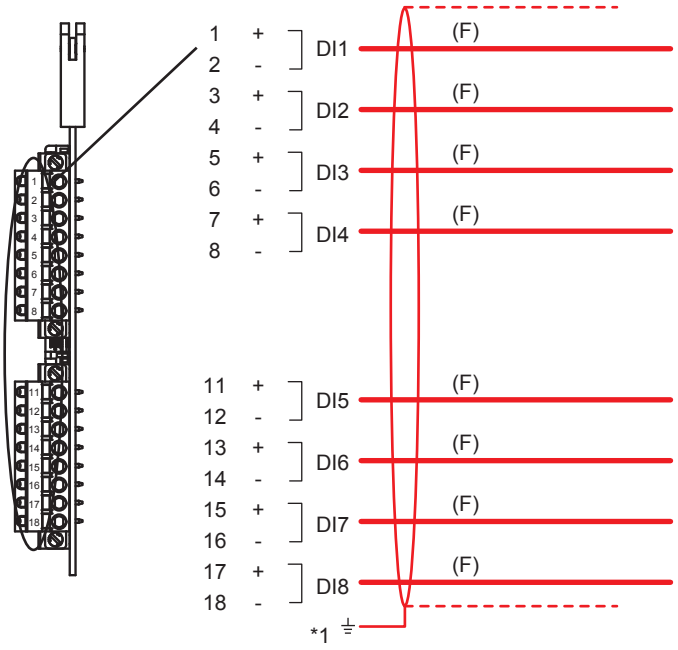
Figure 2.42 Wiring for a contact output card

The contact output card is labeled “DO”.

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

Contact input (Code: A) (F) (For Type 1 to 5)



*1: The ground wire is connected to the earth bar.

Figure 2.43 Wiring for a contact input card

The contact input card is labeled “DI”.

Contact input/output (AC) (Code: 6) (F) (G) (L) (For Type 1 to 5)

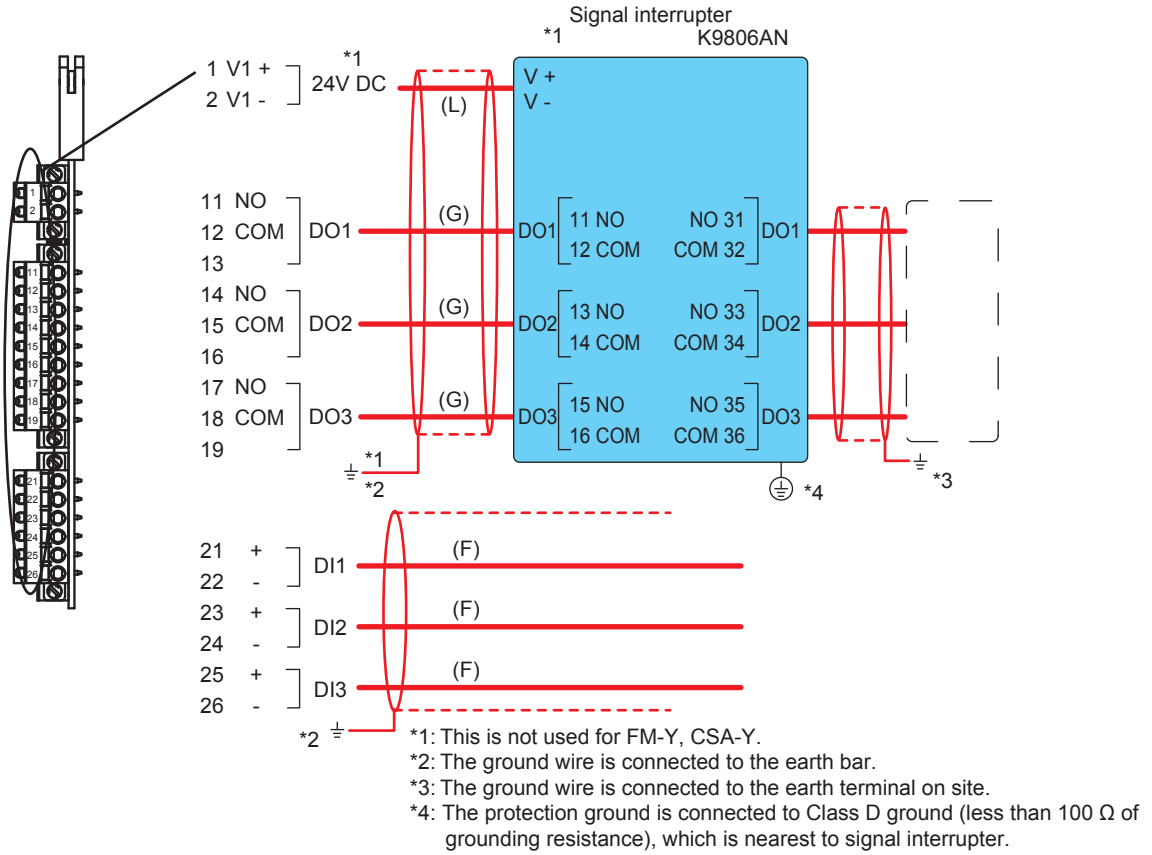


Figure 2.44 Wiring for a contact input/output card

The contact input/output card is labeled “DIO”.

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

Contact input/output (DC) (Code: 5) (F) (G) (L) (For Type 1 to 5)

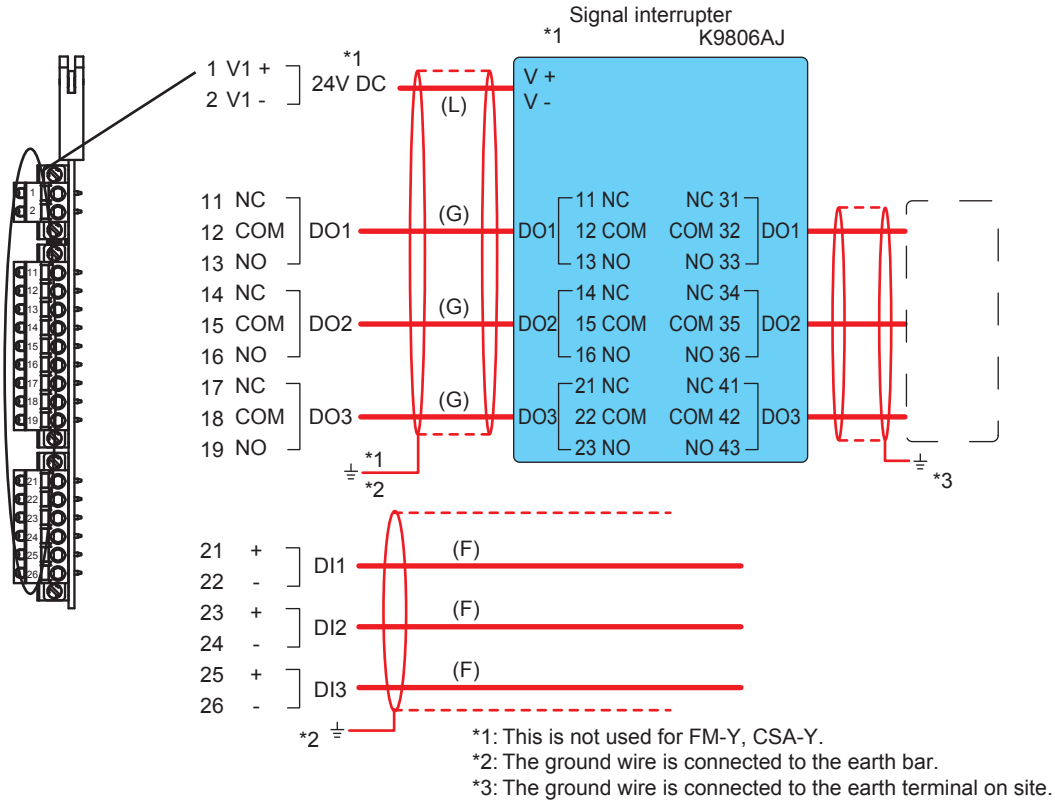


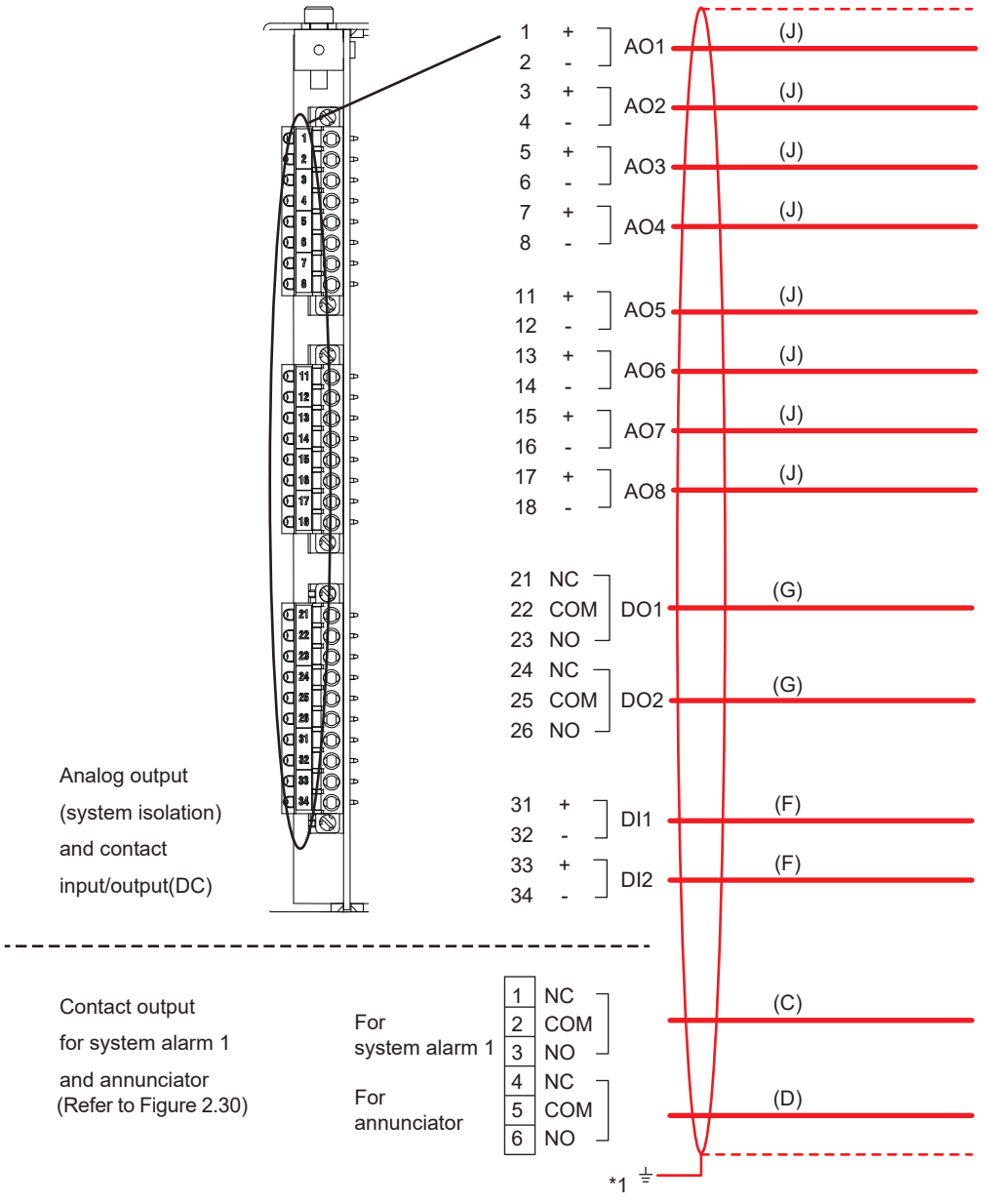
Figure 2.45 Wiring for a contact input/output card

The contact input/output card is labeled “DIO”.

The external I/O cutoff output (power cutoff signal) (L) is also wired.

The shield is grounded at the earth bar in Figure 2.35. Remove the cover on the upper right of the electronics section and perform wiring.

Analog output (system isolation) and contact input/output (DC) (Code: B) (C) (D) (F) (G) (J) (For Type 6)



*1: The ground wire is connected to the earth bar.

Figure 2.46 Wiring for a contact input/output card

The Analog output and Contact input/output card is labeled “AO DIO”

The shield is grounded at the earth bar in Figure 2.36

(C), (D), (F), (G), (J) must be bundled in a single sheath and all of these cables must have the same conductor cross-sectional area.

When using only (J), cables with a conductor cross section of 0.5 to 1.5 mm^2 can be used. However, when using (J) with any of (C), (D), (F), (G) use a cable with a conductor cross section of 0.75 to 1.5 mm^2.

Transient protection shall be provided that is set at a level not exceeding 119 V peak at the Input/Output terminals of the equipment.

Ethernet (Wireless LAN) (for Type 6)

For Type 6 only, the Wireless LAN units in the table below can be installed in the GC8000.

The following table shows Yokogawa part number and manufacturer's product name. The following Wireless LAN units are compliant with the standards under the manufacturer's product name applied by the manufacturer.

Part number	Destination	Manufacturer's product name	Manufacturer
K8015HA	China	SD-330AC-YD (*1)	Silex technology, Inc.
K8015HB	EU/EEA	SD-330AC-YD (EU) (*1)	Silex technology, Inc.
K8015HC	USA/Canada	SD-330AC-YD (US) (*1)	Silex technology, Inc.

(*1): This product is customized exclusively for GC8000. Please contact Yokogawa sales representatives for further information.

Parts included in K8015HA, K8015HB, or K8015HC

- Wireless LAN UNIT: SD-330AC-YD (*2) (1 pc)
- Bracket (1 pc)
- Screws (M3 size: 2 pcs, M4 size: 1 pc)
- Dedicated power cable (1 pc)
- Dedicated Ethernet Cable (1 pc)
- Setup Guide (A3 size printed manual)

(*2): Manufacturer's product name is “SD-330AC-YD” for China specifications, “SD-330AC-YD (EU)” for EU specifications and “SD-330AC-YD (US)” for US specifications.

Assembly Procedure for Wireless LAN UNIT

To comply with Radio Law, do not power on the product outside of the specified country.

SD-330AC-YD can be turned on only in China, SD-330AC-YD (EU) can be turned on only in EU/EEA, and SD-330AC-YD (US) can be turned on only in the USA/Canada.

Read the setup guide attached to K8015HA, K8015HB, or K8015HC carefully and fully understand how to setup this product before you start setup.

(1) Be sure to turn off the power to the GC8000 before opening the cover of the GC8000’s electrical compartment. Attach the product to the dedicated bracket according to Figure 2.47.

When installing the product, please pay attention to the mounting direction of the product and the direction of the antenna.

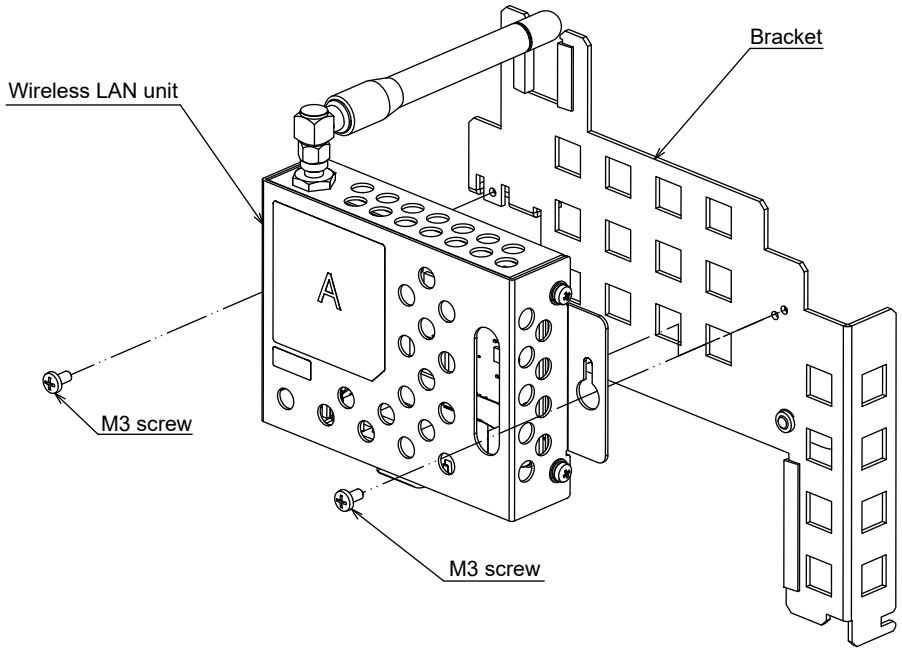
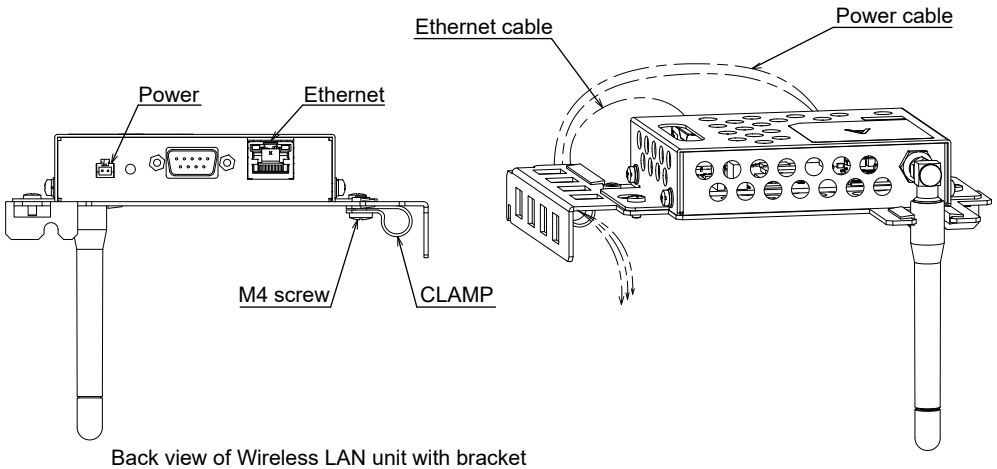


Figure 2.47

(2) Perform the wiring on the Wireless LAN UNIT side. Power cable and Ethernet cable should be wired to the product in advance before performing steps (3) (see Figure 2.50 for cable connection points on the product side).

Route the cable through the clamp as shown in Figure 2.48, forming it toward the front.

When clamping the cable, remove the clamp screws once, insert both the power cable and the Ethernet cable into the clamp, and then tighten the M4 screws again to secure the cable.



Back view of Wireless LAN unit with bracket

Figure 2.48

(3) With the cables wired to the product according to step (2) above, attach the product to the GC8000 main unit. Position the product as shown in Figure 2.49 and secure it using the hooks and M4 screws on the GC8000 side.

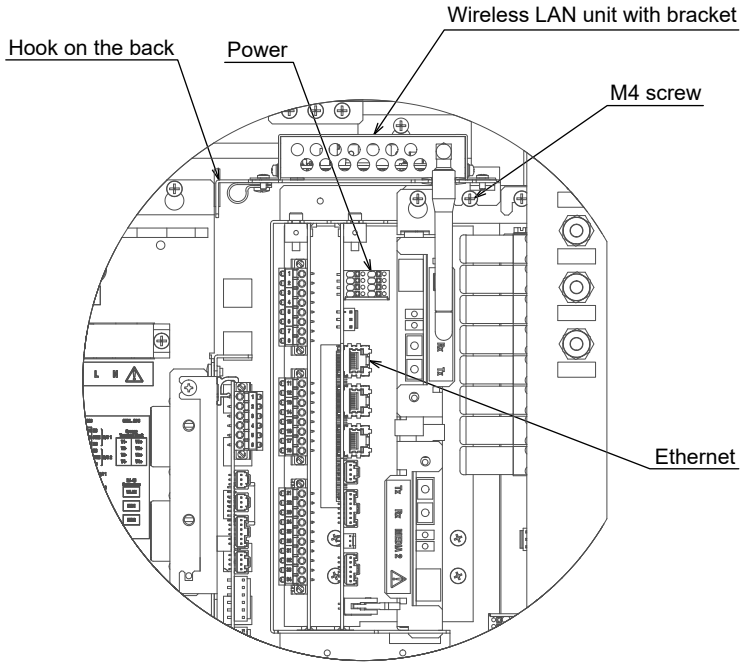


Figure 2.49

(4) Wire the GC8000 Control CPU Card (Part No. K8015AA or K8015AB) according to Figure 2.50. For the Power Cable, connect the red cable to terminal “V1+” and the black cable to terminal “V1-”. For the Ethernet Cable, wire to the Ethernet port (port name: WLAN).

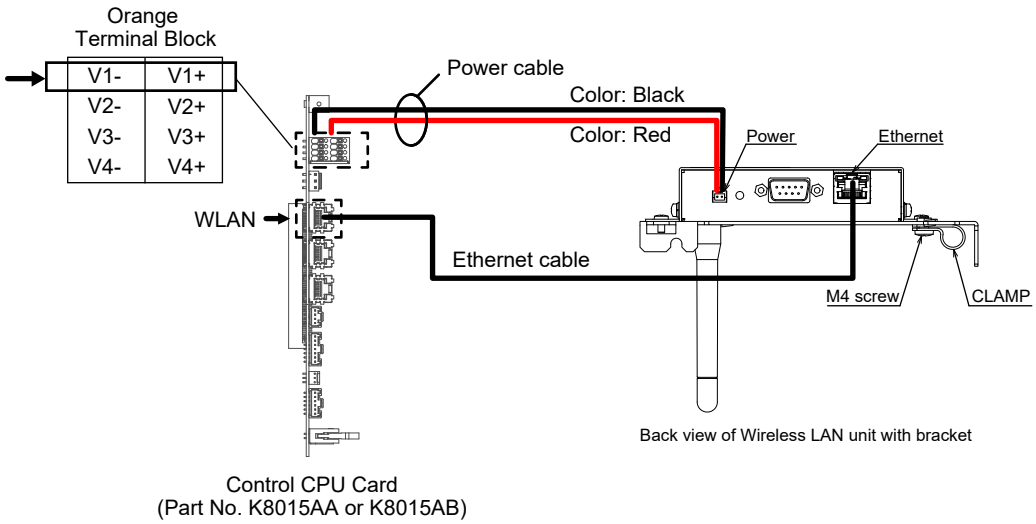


Figure 2.50

Revision Information

Title : Process Gas Chromatograph GC8000 Installation Manual
Manual number : TI 11B08A01-01E

Sep. 2024/25th Edition
Changed labels and explanation for NEPSI or CSA certification (pages 7 to10, 14, 17 to 19, 21, 24, 25, 27 to 33, 46, 52, 53, 56 to 63, 68, 80, 87 to 89, 94 to 96, 101, 102).
Added explanation (pages 37, 86).
Corrected (pages 109, 112)
Changed destination and explanation (page 114).
Dec. 2023/24th Edition
Changed explanation for NEPSI certification (pages 8 to10, 17, 30, 50, 59).
Deleted EAC and KOSHA (page 65, 91, 92, 98)
Aug. 2023/23rd Edition
Compliance to ATEX and IECEx standard (pages 8, 9, 12 to 15, 20 to 22, 26, 43, 64, 76, 85, 90, 91, 97, 98). Added destination (page 110) Corrections (pages 31, 32)
Changed nameplates (pages 9, 54 to 57). Added explanation (page 61, 109).
Mar. 2023/22nd Edition
Added K8012DW. (Page 65)
Oct. 2022/21st Edition
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Mar. 2022/20th Edition
Type 6 was added. (Pages 7 to 10, 17, 22, 24, 30 to 44, 48 to 51, 62, 64, 65, 71, 76 to 81, 90 to 92, 94, 96 to 98, 101, 104 to 110)
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Updated for CSA (Page 44)
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Jun. 2021/17th Edition
Updated for ATEX certification (Pages 8, 44, 48)
Nov. 2020/16th Edition
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Added IMPORTANT (Pages 63)
Dec. 2019/15th Edition
MTCD conformity to CSA explosionproof (Pages 8, 73)
FM conformance standard (Page 43)
Others (Page 26)
Sep. 2019/14th Edition
Corrections (Pages 59)
May 2019/13th Edition
Corrections (Pages 57 through 59)
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MTCD was added.(Pages 27, 59, 61, 63).
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Corrections (Pages 10, 11, 43, 57, 79, 83, 84, 86,)
Sep. 2017/11th Edition
Revised regulation on (60079-2 Ed.6) (Pages 8, 12, 13, 21, 23, 42 to 51).
Corrections (Pages 10, 11, 52, 56, 72, 78)
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RoHS is added. (Pages 8, 42, 46)
Corrections (Pages 2, 4, 8, 9, 10, 12, 13, 14, 23, 24, 35, 36, 46, 47, 48, 54, 55, 57)
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Corrections (Pages 25, 41, 45, 46)
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May 2014/6th Edition

Type 4 is added. (Pages 7, 14, 15, 19, 21, 22, 24, 25 to 30, 32, 33, 34, 38, 39, 43, 45, 47, 49, 52, 56, 57, 58, 63, 75, 76, 79, 80)

Dec. 2013/5th Edition

NEPSI certification is added. (Pages 6, 7, 9, 13, 16, 17, 20, 21, 23, 26 to 31, 37, 43, 47, 56, 62, 67, 68)
Protection-film cover for wiring is added. Correction of errors.
(Pages 9, 16, 18, 20, 25, 32, 33, 45, 49, 52, 55)

Sep. 2013/4th Edition

Add Cautions (Pages 9, 10, 20, 33, 43, 45, 67, 68, 69, 76, 79)
Description change of Safety Standard and EMC standard (Page 37)

Jun. 2013/3rd Edition

CSA certification is added. Correction of errors.
(Pages 7, 11, 13, 14, 15, 16, 17, 19, 20, 21, 24, 25 to 30, 33, 36, 38, 39, 40, 41, 43, 45, 54, 56, 58, 59, 66, 69, 70, 72, 73, 74, 75, 76, 77, 78)

Mar. 2012/2nd Edition

ATEX, IECEx certification is added. Correction of errors.
(Pages 6, 7, 8, 9, 11, 12, 13, 15, 18, 19, 21, 24 to 29, 32, 35 to 39, 42, 51, 55, 56, 61, 62)

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