

# DURAPULSE GS4 AC Drives – Optional GS4-Specific Internal Accessories List

## Accessories Available for GS4 AC Drives Only

| GS4 AC Drives Software and Accessories Internal or Attached to GS4 Drive |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
|--------------------------------------------------------------------------|------------|-----------------------------|-----------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------------|--------------------------------|-----------------------------|-----------------------------------------------------------|-----------------------------------------------------------|-----------------------------|
| Model Number                                                             | Frame Size | GS4 Drive Software          | GS4 PLC Software                                          | Drive Keypad*               | Keypad Mounting Bezel       | I/O Modules                       | Communication Modules          | Conduit Boxes               | Cooling Fans*                                             | Flange Mount Kits                                         |                             |
|                                                                          |            | <a href="#">pg.tGSX-103</a> | <a href="#">pg.tGSX-104</a>                               | <a href="#">pg.tGSX-105</a> | <a href="#">pg.tGSX-105</a> | <a href="#">pg.tGSX-101</a>       | <a href="#">pg.tGSX-102</a>    | <a href="#">pg.tGSX-108</a> | 230Vpg.tGSX-106<br>460Vpg.tGSX-107                        | <a href="#">pg.tGSX-109</a>                               |                             |
| <a href="#">GS4-21P0</a>                                                 | A          | GSOFT2                      | GSLOGIC                                                   | GS4-KPD                     | GS4-BZL                     | GS4-06CDD<br>GS4-06NA<br>GS4-06TR | GS4-CM-ENETIP<br>GS4-CM-MODTCP | n/a                         | n/a                                                       | <a href="#">GS4-FMKIT-A</a>                               |                             |
| <a href="#">GS4-22P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           | <a href="#">GS4-FMKIT-1</a>                               |                             |
| <a href="#">GS4-23P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             | <a href="#">GS4-FAN-AM</a>                                | <a href="#">GS4-FMKIT-A</a>                               |                             |
| <a href="#">GS4-25P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           | <a href="#">GS4-FMKIT-A</a>                               |                             |
| <a href="#">GS4-27P5</a>                                                 | B          |                             |                                                           |                             |                             |                                   |                                | n/a                         | <a href="#">GS4-FAN-BM1</a><br><a href="#">GS4-FAN-BB</a> | <a href="#">GS4-FMKIT-B</a>                               |                             |
| <a href="#">GS4-2010</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             | <a href="#">GS4-FAN-BM2</a><br><a href="#">GS4-FAN-BB</a> |                                                           |                             |
| <a href="#">GS4-2015</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-2020</a>                                                 | C          |                             |                                                           |                             |                             |                                   |                                |                             | n/a                                                       | <a href="#">GS4-FAN-CM</a><br><a href="#">GS4-FAN-CB1</a> | <a href="#">GS4-FMKIT-C</a> |
| <a href="#">GS4-2025</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-2030</a>                                                 | D**        |                             |                                                           |                             |                             |                                   |                                | <a href="#">GS4-CBX-D</a>   | <a href="#">GS4-FAN-DM</a><br><a href="#">GS4-FAN-DB</a>  | n/a                                                       |                             |
| <a href="#">GS4-2040</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-2050</a>                                                 | E**        |                             |                                                           |                             |                             |                                   |                                | <a href="#">GS4-CBX-E</a>   | <a href="#">GS4-FAN-EM1</a><br><a href="#">GS4-FAN-EB</a> | n/a                                                       |                             |
| <a href="#">GS4-2075</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             | <a href="#">GS4-FAN-EM2</a><br><a href="#">GS4-FAN-EB</a> |                                                           |                             |
| <a href="#">GS4-2100</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-41P0</a>                                                 | A          |                             |                                                           |                             |                             |                                   |                                | n/a                         | n/a                                                       | <a href="#">GS4-FMKIT-A</a>                               |                             |
| <a href="#">GS4-42P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           | <a href="#">GS4-FMKIT-1</a> |
| <a href="#">GS4-43P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             | <a href="#">GS4-FAN-AM</a>                                |                                                           | <a href="#">GS4-FMKIT-A</a> |
| <a href="#">GS4-45P0</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-47P5</a>                                                 | B          |                             |                                                           |                             |                             |                                   |                                | n/a                         | <a href="#">GS4-FAN-BM1</a><br><a href="#">GS4-FAN-BB</a> | <a href="#">GS4-FMKIT-B</a>                               |                             |
| <a href="#">GS4-4010</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             | <a href="#">GS4-FAN-BM2</a><br><a href="#">GS4-FAN-BB</a> |                                                           |                             |
| <a href="#">GS4-4015</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4020</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4025</a>                                                 | C          | n/a                         | <a href="#">GS4-FAN-CM</a><br><a href="#">GS4-FAN-CB2</a> | <a href="#">GS4-FMKIT-C</a> |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4030</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4040</a>                                                 | D0**       | <a href="#">GS4-CBX-D0</a>  | <a href="#">GS4-FAN-D0M</a><br><a href="#">GS4-FAN-DB</a> | n/a                         |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4050</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4060</a>                                                 | D**        | <a href="#">GS4-CBX-D</a>   | <a href="#">GS4-FAN-DM</a><br><a href="#">GS4-FAN-DB</a>  | n/a                         |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4075</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4100</a>                                                 | E**        | <a href="#">GS4-CBX-E</a>   | <a href="#">GS4-FAN-EM2</a><br><a href="#">GS4-FAN-DB</a> | n/a                         |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4125</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4150</a>                                                 | F**        | <a href="#">GS4-CBX-F</a>   | <a href="#">GS4-FAN-FM</a><br><a href="#">GS4-FAN-FB</a>  | n/a                         |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4175</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4200</a>                                                 | G          | <a href="#">GS4-CBX-G</a>   | <a href="#">GS4-FAN-FM</a><br><a href="#">GS4-FAN-FB</a>  | n/a                         |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4250</a>                                                 |            |                             |                                                           |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |
| <a href="#">GS4-4300</a>                                                 |            |                             | <a href="#">GS4-FAN-FM</a><br><a href="#">GS4-FAN-FB</a>  |                             |                             |                                   |                                |                             |                                                           |                                                           |                             |



\* Keypads and Cooling Fans are pre-installed and included with the GS4 Drives.  
They are field-replaceable and available for purchase separately as spare or replacement parts.

\*\* GS4 drives in D0, D, E and F frames can be flanged mounted and do not require a flange mount kit.

Note: Refer to the page numbers shown above for more complete information about the accessory products.

# GS4-Specific Optional Accessories – Input/Output Expansion Cards

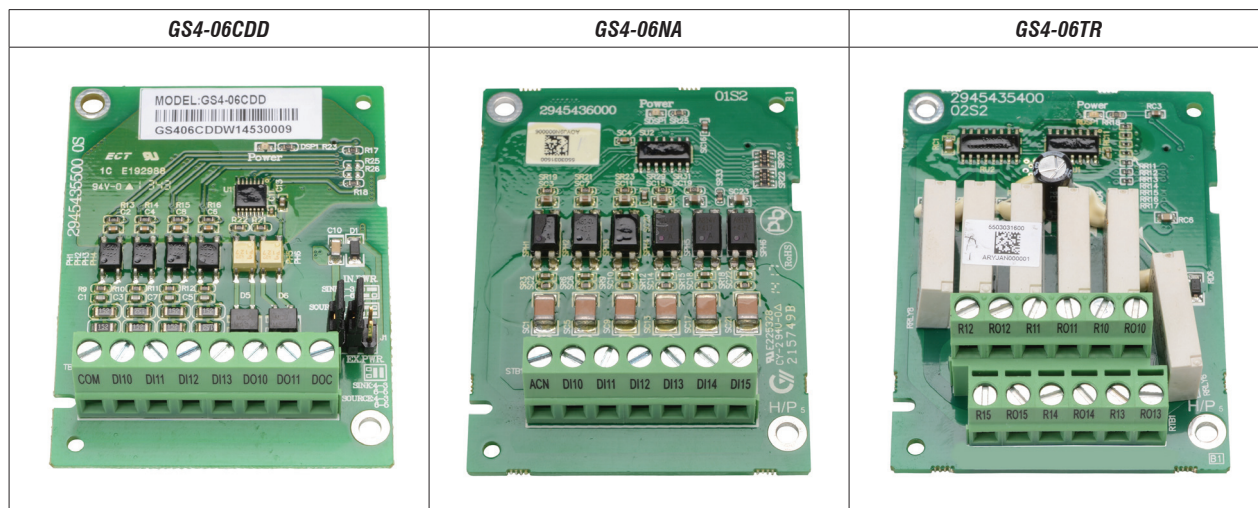
## Accessories Applicable Only to GS4 AC Drives

Please refer to the "GS/DURApulse AC Drives – Accessories" section for accessories applicable to multiple families of GS/DURApulse AC Drives, including GS4.

## Input/Output Expansion Cards

Optional I/O cards allow additional inputs and outputs to be added to the GS4 internal I/O. (Only one I/O card can be installed at a time.)

| GS4 DURApULSE Drives Input/Output Expansion Cards                                                                                                                                                 |         |                                                                                                                                                                                                           |           |                                                                                                                                                                                                                    |           |            |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|-----------|
| Part Number                                                                                                                                                                                       | Price   | Description                                                                                                                                                                                               | Terminals | Specifications                                                                                                                                                                                                     | Wire Size | Placement* | GS Drive  |
| <u>GS4-06CDD*</u>                                                                                                                                                                                 | \$33.50 | DURApULSE combination discrete I/O module, selectable sinking or sourcing 24VDC input, 24VDC output, 4-point input, 2-point output, 1 input common(s), 1 output common(s), 50mA resistive output current. | COM       | (1) Common for Input Terminals                                                                                                                                                                                     | 20–24 AWG | slot #3    | GS4 – all |
|                                                                                                                                                                                                   |         |                                                                                                                                                                                                           | DI10–DI13 | (4) Discrete Inputs; selectable sinking or sourcing<br>Internal power available: 24VDC ±5% 200mA, 5W<br>External power: 24VDC (30V max, 19V min), 30W<br>ON: activation 6.5mA @ ≥ 9VDC<br>OFF: leakage 10µA ≤ 3VDC |           |            |           |
|                                                                                                                                                                                                   |         |                                                                                                                                                                                                           | DO10–DO11 | (2) Discrete Outputs (photocoupler)<br>Duty-cycle: 50%<br>Max. output frequency: 100Hz<br>Max. current: 50mA resistive<br>Max. voltage: 48VDC                                                                      |           |            |           |
|                                                                                                                                                                                                   |         |                                                                                                                                                                                                           | DOC       | (1) Common for Output Terminals                                                                                                                                                                                    |           |            |           |
| <u>GS4-06NA*</u>                                                                                                                                                                                  | \$36.00 | DURApULSE discrete input module, sinking 120VAC input, 6-point input, 1 input common(s).                                                                                                                  | ACN       | (1) AC power common for Input Terminal (Neutral)                                                                                                                                                                   | 20–24 AWG | slot #3    | GS4 – all |
|                                                                                                                                                                                                   |         |                                                                                                                                                                                                           | DI10–DI15 | (6) Discrete Inputs; sinking<br>Input voltage: 100–130 VAC<br>Input frequency: 47–63 Hz<br>Input impedance: 27kΩ<br>Terminal response time: ON: 10ms<br>OFF: 20ms                                                  |           |            |           |
| <u>GS4-06TR*</u>                                                                                                                                                                                  | \$55.00 | DURApULSE relay output module, Form A (SPST-NO) relays, 6-point output, 6 output common(s), 3 Amps resistive output current, 1.2 Amps inductive output current, 250VAC/30VDC input.                       | R10–R15   | (6) separate commons for each relay                                                                                                                                                                                | 20–26 AWG | slot #3    | GS4 – all |
|                                                                                                                                                                                                   |         |                                                                                                                                                                                                           | RO10–RO15 | (6) normally open relay output<br>Resistive load: 5A(NO) / 250VAC<br>5A(NO) / 30VDC<br>Inductive load (COSØ 0.4)<br>2A(NO) / 250VAC                                                                                |           |            |           |
| * GS4 AC drives have three option card slots; each slot will hold only one option card designed for that particular slot. I/O cards are designed for slot #3, and will not fit in any other slot. |         |                                                                                                                                                                                                           |           |                                                                                                                                                                                                                    |           |            |           |



# GS4-Specific Optional Accessories – Communication Interface Cards

## Accessories Applicable Only to GS4 AC Drives

Please refer to the "GS/DURApulse AC Drives – Accessories" section for accessories applicable to multiple families of GS/DURApulse AC Drives, including GS4.

## Communication Cards

Communication interface cards provide EtherNet/IP™ or ModbusTCP communication capability. Only one communication card can be installed at a time.

| GS4 DURAPULSE Drives Communication Interface Cards                                                                                                                                                                    |          |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|
| Part Number                                                                                                                                                                                                           | Price    | Description                               | Specifications                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Placement* | GS Drive  |
| <b><u>GS4-CM-ENETIP*</u></b>                                                                                                                                                                                          | \$110.00 | DURAPULSE communication card, EtherNet/IP | Interface: EtherNet/IP RJ45 with MDI/MDIX auto-detect<br>Number of ports: 1 (16 connections max)<br>Transmission method: IEEE 802.3, IEEE 802.3u<br>Transmission cable: Category 5e shielding 100MHz<br>Transmission speed: 10/100 Mbps Auto-Detect<br>Network protocol: ICMP, IP, TCP, UDP, DHCP, Modbus TCP, EtherNet/IP<br>Power supply voltage: 5VDC (supplied by the GS4 AC drive)<br>Insulation voltage: 500VDC<br>Power consumption: 0.8W<br>Weight: 25g<br>Noise immunity<br>ESD (IEC 61800-5-1, IEC 61000-4-2)<br>EFT (IEC 61800-5-1, IEC 61000-4-4)<br>Surge Test (IEC 61800-5-1, IEC 61000-4-5)<br>Conducted Susceptibility Test (IEC 61800-5-1, IEC 61000-4-6)<br>Operation: -10°C to +50°C [14°F to 122°F] (temperature), 90% (humidity)<br>Storage: -25°C to +70°C [-13°F to +158°F] (temperature), 95% (humidity)<br>Vibration / Shock immunity:<br>IEC 61800-5-1, IEC 60068-2-6/IEC 61800-5-1, IEC 60068-2-27<br>Ethernet timeout functionality for EtherNet/IP connections<br>GS4-CM-ENETIP supports 4 EtherNet/IP connections and also supports 4 ModTCP connections. These ModTCP connections cannot start/stop or change command frequency in the drive, but can be used to monitor the drive and change Parameters.<br>Ethernet timeout functionality <u>for ModTCP connections</u> is <u>not</u> supported on the EtherNet/IP card. | slot #1    | GS4 – all |
| <b><u>GS4-CM-MODTCP*</u></b>                                                                                                                                                                                          | \$97.00  | DURAPULSE communication card, ModbusTCP   | Interface: Ethernet RJ45 with MDI/MDX auto-detect<br>Number of ports: 1 (4 connections max)<br>Transmission method: IEEE 802.3, IEEE 802.3u<br>Transmission cable: Category 5e shielding 100MHz<br>Transmission speed: 10/100 Mbps Auto-Detect<br>Network protocol: ICMP, IP, TCP, UDP, DHCP, Modbus TCP<br>Power supply voltage: 5VDC (supplied by the GS4 AC drive)<br>Insulation voltage: 500VDC<br>Power consumption: 0.8W<br>Weight: 25g<br>Noise immunity<br>ESD (IEC 61800-5-1, IEC 61000-4-2)<br>EFT (IEC 61800-5-1, IEC 61000-4-4)<br>Surge Test (IEC 61800-5-1, IEC 61000-4-5)<br>Conducted Susceptibility Test (IEC 61800-5-1, IEC 61000-4-6)<br>Operation: -10°C to +50°C [14°F to 122°F] (temperature), 90% (humidity)<br>Storage: -25°C to +70°C [-13°F to +158°F] (temperature), 95% (humidity)<br>Vibration / Shock immunity:<br>IEC 61800-5-1, IEC 60068-2-6/IEC 61800-5-1, IEC 60068-2-27<br>Ethernet Timeout functionality for ModTCP connections                                                                                                                                                                                                                                                                                                                                                                                      | slot #1    | GS4 – all |
| * GS4 AC drives have three option card slots; each slot will hold only one option card designed for that particular slot. Communication interface cards are designed for slot #1, and will not fit in any other slot. |          |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |           |

**GS4-CM-ENETIP**



**GS4-CM-MODTCP**



# DuraPulse Accessories – Software

## GSoft2 Drive Configuration Software

### GSoft2 Drive Configuration Software

Available for *FREE* Download

| <b>DURAPULSE Drives GSOFT2 Drive Configuration Software</b>                                                   |               |                                                                                                                                                                                           |                                                              |
|---------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <b>Part Number</b>                                                                                            | <b>Price*</b> | <b>Description</b>                                                                                                                                                                        | <b>For GS Drive</b>                                          |
| <b>GSOFT2</b>                                                                                                 | \$10.50       | GSOFT2 Windows configuration software, USB or free download. For use with DURApulse GS4, GS10, GS20, GS20X and GS30 series AC drives. Requires PC serial port or USB-485M serial adapter. | GS4 – all<br>GS10 – all<br>GS20(X) – all<br>GS30 – all       |
| <b>USB-485M</b>                                                                                               | \$60.00       | PC adapter, USB A to RS-485 (RJ45/RJ12).                                                                                                                                                  | GS4/GS10                                                     |
| <b>USB-CBL-AB3</b>                                                                                            | \$12.00       | Programming cable, USB A to USB B, 3ft cable length.                                                                                                                                      | GS4 – all (for Drive FW only)<br>GS20(X) – all<br>GS30 – all |
| * GSOFT2 can be downloaded for <u>free</u> or purchased on USB from AutomationDirect.com (search for GSOFT2). |               |                                                                                                                                                                                           |                                                              |

### GSOFT2 Drive Configuration Software

GSoft2 is the configuration software for the Automation DuraPulse family of drives. It is designed to allow you to connect a personal computer to the drive, and perform a variety of functions.

GSoft2 includes an integral help file with software instructions. GSoft2 can be downloaded for free or purchased on USB from AutomationDirect.com (search for GSoft2).

### Functions

- Create new drive configurations
- Upload/download drive configurations
- Edit drive configurations
- Archive/store multiple drive configurations on your PC
- Trend drive operation parameters (not available with GS10)
- Tune the drive PID loop
- View real time key operating parameters
- Real-time trending
- Start/Stop drive and switch directions, provided drive is set up for remote operation
- View drive faults

### Computer System Requirements

GSoft2 will run on Windows PCs that meet the following requirements:

- Windows OS: **8**: 32 & 64 bit, **8.1**: 32 & 64 bit, **10**: 64 bit, 11
- Edge or Chrome (for HTML help support)
- 32 Mb of available memory
- 10 Mb hard drive space
- Available USB port
- USB to RS485 adapter needed for GS4 and GS10 models



# GS4/GS20(X)/GS30 Accessories – Software

## GSLogic PLC Programming Software

Optional Accessory Software Applicable Only to AC Drive Series:

- GS4
- GS20(X)
- GS30

### GSLOGIC Drive Configuration Software

Available for **FREE** Download

| GS4/GS20(X)/GS30 DURAPULSE Drives GSLogic PLC Programming Software                                              |         |                                                                                                                                                                              |                                          |
|-----------------------------------------------------------------------------------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Part Number                                                                                                     | Price*  | Description                                                                                                                                                                  | For GS Drive                             |
| <b>GSLOGIC</b>                                                                                                  | \$10.50 | GSLOGIC Windows logic software, USB or free download. For use with DURApulse GS4, GS20, GS20X and GS30 series AC drives. Requires PC serial port or USB-485M serial adapter. | GS4 - all<br>GS20(X) - all<br>GS30 - all |
| <b>USB-485M</b>                                                                                                 | \$60.00 | PC adapter, USB A to RS-485 (RJ45/RJ12).                                                                                                                                     | GS4 - all                                |
| <b>USB-CBL-AB3</b>                                                                                              | \$12.00 | Programming cable, USB A to USB B, 3ft cable length.                                                                                                                         | GS20(X) - all<br>GS30 - all              |
| * GSLOGIC can be downloaded for <b>free</b> or purchased on USB from AutomationDirect.com (search for GSLOGIC). |         |                                                                                                                                                                              |                                          |

### PLC Summary

The GS4, GS20(X), and GS30 drives include a built-in PLC. Programmed in ladder logic, the PLC provides a comprehensive set of instructions and 2,000 (GS20(X)), 5,000 (GS30), or 10,000 (GS4) steps of programming capacity. GSLogic PLC software includes a Help File which contains the detailed information needed to use the PLC.

The PLC functionality is included with every GS4, GS20(X), and GS30 drive, and can be accessed over communications by external PLCs (via serial Modbus), or by the drive itself (using built-in PLC instructions). The PLC is perfectly suited for applications where digital and analog I/O requirements are small. For applications with complex PLC programming or large I/O requirements, please consider Click, Productivity, or Do-More/BRX. All of these PLCs can be easily integrated with the GS drive family or PLC. The GS4-KPD keypad is capable of storing multiple PLC programs.

There are two methods for communicating from the PLC to the drive. The first method is to use the WPR and RPR instructions available in the PLC's library. These two instructions can read from or write to any AC drive parameter in the same physical drive. The second method is to use Modbus RTU. The PLC is a Serial Modbus slave only. A Modbus RTU master can communicate with the PLC via serial only; optional communication cards cannot address the PLC. If communication cards (EtherNet/IP or Modbus TCP) are the desired method of communication, the drive includes PLC Buffers parameters that can be used. Simply write the needed information from the PLC into the drive's PLC buffer parameters using the WPR instruction. The Modbus TCP or EtherNet/IP cards can then read the VFD parameters.

### GSLogic Introduction

GSLogic is the drive PLC programming software for the AutomationDirect GS4, GS20(X), and GS30 family of drives. It is designed to enable you to perform a variety of drive PLC programming functions. Windows editing functions like cut, copy, paste, multiple windows, etc., are supported. GSLogic also provides for register editing, settings, file reading, saving, online monitoring settings, and other convenience functions, such as:

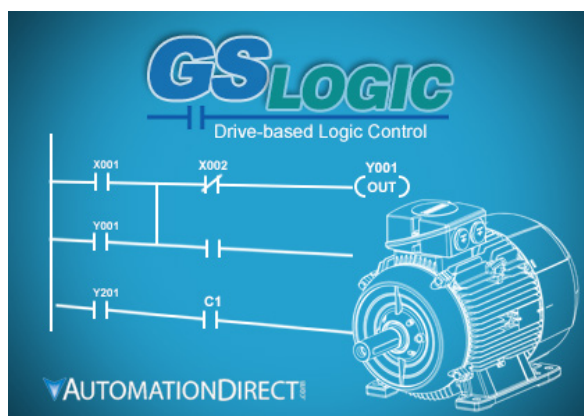
- Upload/download drive PLC program files to the onboard PLC
- Create new drive PLC programs
- Edit drive PLC programs
- Archive/store multiple drive PLC programs on your PC or the GS4-KPD drive keypad
- Control drive PID loops (FPID instructions)
- View in real time all drive PLC registers
- Print drive PLC program files

GSLogic includes an integral help file that includes software instructions, how to use GSLogic, and how to use the GS drive PLC.

### GSLogic System Requirements

GSLogic is a Windows-based programming software environment. Please check the following requirements when choosing your PC configuration:

- Windows OS: **8**: 32 & 64 bit, **8.1**: 32 & 64 bit, **10**: 64 bit, **11**
- 300MB free hard-disk space
- USB Port required for project transfer to drive
- USB-485M serial adapter required for GS4 models



# DuraPulse Optional Accessories – Advanced LCD Keypad

## Advanced Keypad

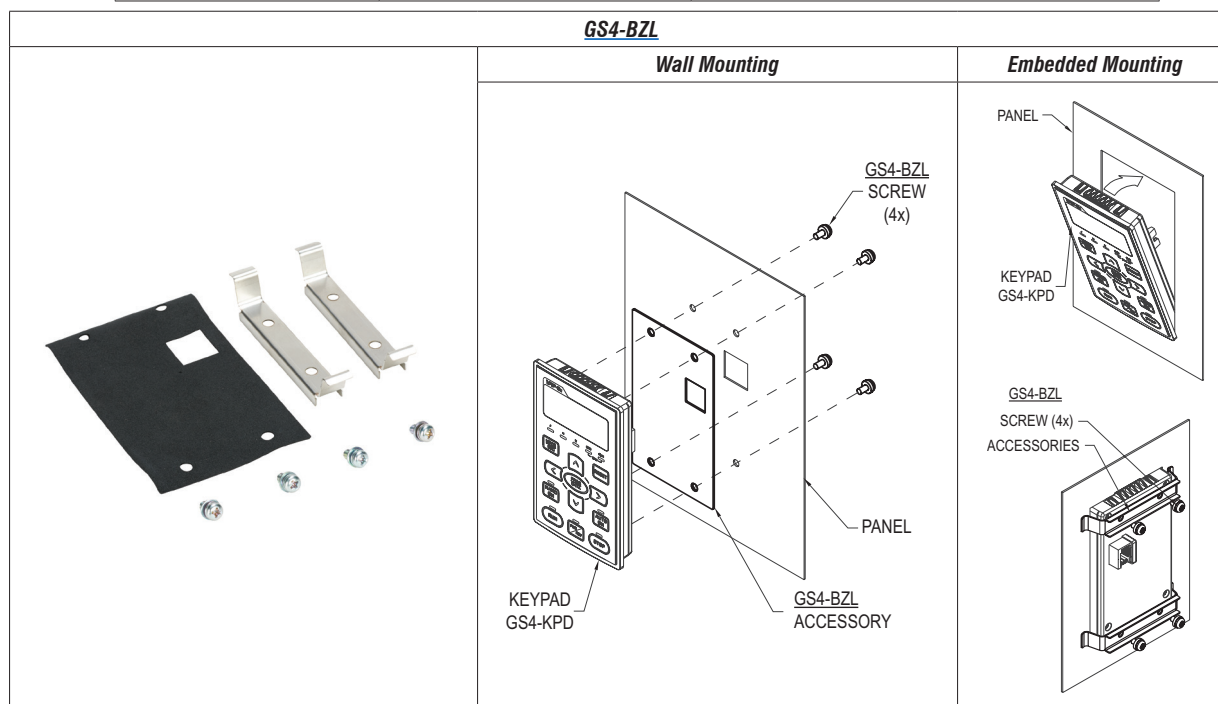
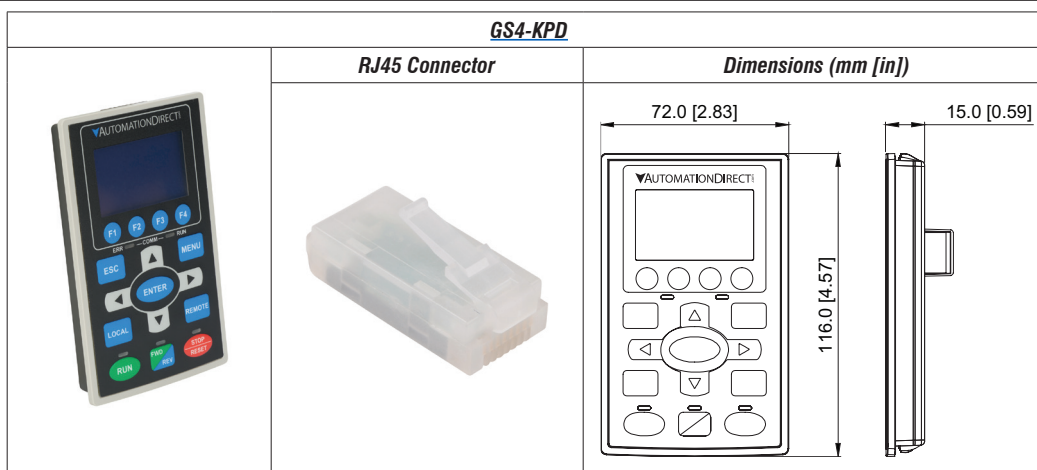
NOTE: The keypad described below is included with the GS4 AC Drive, and is also available for purchase separately as a spare/replacement component for GS4, or an optional upgrade for GS10/GS20(X)/GS30.

## Keypad Panel-Mounting Kit

NOTE: The keypad panel-mounting kit described below is an optional accessory that is NOT included with the GS10/GS20(X)/GS30 AC drive.

| GSx Series <i>DURAPULSE</i> Drives Keypad and Keypad Panel-Mounting Kit |          |                                                                                                                                                                                                                                                                                        |                                                        |
|-------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Part Number                                                             | Price    | Description                                                                                                                                                                                                                                                                            | For GS Drive                                           |
| <b>GS4-KPD*</b>                                                         | \$107.00 | Spare or replacement keypad for GS4 AC drives; optional advanced keypad for GS20(X) drives; includes RJ45 connector; great for maintenance or back-up programs.                                                                                                                        | GS4 – all<br>GS10 – all<br>GS20(X) – all<br>GS30 – all |
| <b>GS4-BZL**</b>                                                        | \$29.50  | Keypad Panel-Mounting Kit for remote surface mounting or embedded mounting of the AC drive removable keypad; hardware included. Use a standard Cat5e RJ45 patch cable (not included) to connect a remote-mounted keypad to the drive. Max cable length for remote-mounted keypad = 5m. | GS4 – all<br>GS10 – all<br>GS20(X) – all<br>GS30 – all |

\* A keypad is included with each GS4 AC Drive; additional keypads are available for spare/replacement components.  
 \*\* The keypad mounting kit is an optional accessory that is NOT included with the GS4 AC drive; for mounting the keypad remotely from the drive.  
 Note: Keypad firmware can only be upgraded when connected to a GS4 drive.



# GS4-Specific Optional Accessories – Spare/Replacement Cooling Fans

## Accessories Applicable Only to GS4 AC Drives

Please refer to the "GS/DURApulse AC Drives – Accessories" section for accessories applicable to multiple families of GS/DURApulse AC Drives, including GS4.

### Cooling Fans for 230V GS4 Drives (Spare/Replacement)

NOTE: The fans described below are included with the applicable GS4 AC Drive, and are also available for purchase separately as spare/replacement components.

| GS4 230V Models – (GS4-2xxx) – Fan Selection Table |                                    |          |                                                                                     |                     |                        |         |                      |            |
|----------------------------------------------------|------------------------------------|----------|-------------------------------------------------------------------------------------|---------------------|------------------------|---------|----------------------|------------|
| Drive Model                                        | Fan Model *                        |          |                                                                                     | Description         | Size                   | Voltage | Amps / Fan           | Fans / Kit |
|                                                    | Part #                             | Price    | Photo                                                                               |                     |                        |         |                      |            |
| GS4-22P0<br>GS4-23P0<br>GS4-25P0                   | <a href="#"><u>GS4-FAN-AM</u></a>  | \$28.00  |    | Frame A main        | 40mm                   | 24      | 0.15                 | 1          |
| GS4-27P5                                           | <a href="#"><u>GS4-FAN-BM1</u></a> | \$34.50  |    | Frame B main        | 80mm                   | 24      | 0.33                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-BB</u></a>  | \$27.00  |    | Frame B board level | 40mm                   | 24      | 0.18                 | 1          |
| GS4-2010<br>GS4-2015                               | <a href="#"><u>GS4-FAN-BM2</u></a> | \$52.00  |    | Frame B main        | 80mm                   | 24      | 0.51                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-BB</u></a>  | \$27.00  |   | Frame B board level | 40mm                   | 24      | 0.18                 | 1          |
| GS4-2020<br>GS4-2025<br>GS4-2030                   | <a href="#"><u>GS4-FAN-CM</u></a>  | \$49.00  |  | Frame C main        | 92mm                   | 24      | 0.75                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-CB1</u></a> | \$28.00  |  | Frame C board level | 40mm                   | 24      | 0.18                 | 1          |
| GS4-2040<br>GS4-2050                               | <a href="#"><u>GS4-FAN-DM</u></a>  | \$174.00 |  | Frame D main        | 92mm                   | 24      | 0.75                 | 2          |
|                                                    | <a href="#"><u>GS4-FAN-DB</u></a>  | \$58.00  |  | Frame D board level | 70mm                   | 24      | 0.33                 | 1          |
| GS4-2060<br>GS4-2075                               | <a href="#"><u>GS4-FAN-EM1</u></a> | \$239.00 |  | Frame E main        | 120mm                  | 24      | 1.08                 | 2          |
|                                                    | <a href="#"><u>GS4-FAN-EB</u></a>  | \$119.00 |  | Frame E board level | 120mm                  | 24      | 0.76                 | 1          |
| GS4-2100                                           | <a href="#"><u>GS4-FAN-EM2</u></a> | \$303.00 |  | Frame E main        | 92mm<br>120mm<br>120mm | 24      | 0.75<br>1.08<br>1.08 | 3          |
|                                                    | <a href="#"><u>GS4-FAN-EB</u></a>  | \$119.00 |  | Frame E board level | 120mm                  | 24      | 0.76                 | 1          |

\* These fans are included with the GS4 drive, and also available separately as spare or replacement components. Electrical connectors are included.

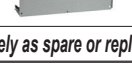
# GS4-Specific Optional Accessories – Spare/Replacement Cooling Fans

## Accessories Applicable Only to GS4 AC Drives

Please refer to the "GS/DURApulse AC Drives – Accessories" section for accessories applicable to multiple families of GS/DURApulse AC Drives, including GS4.

## Cooling Fans for 460V GS4 Drives (Spare/Replacement)

NOTE: The fans described below are included with the applicable GS4 AC Drive, and are also available for purchase separately as spare/replacement components.

| GS4 460V Models – (GS4-4xxx) – Fan Selection Table |                                    |          |                                                                                     |                     |                        |         |                      |            |
|----------------------------------------------------|------------------------------------|----------|-------------------------------------------------------------------------------------|---------------------|------------------------|---------|----------------------|------------|
| Drive Model                                        | Fan Model *                        |          |                                                                                     | Description         | Size                   | Voltage | Amps / Fan           | Fans / Kit |
|                                                    | Part #                             | Price    | Photo                                                                               |                     |                        |         |                      |            |
| GS4-43P0<br>GS4-45P0<br>GS4-47P5                   | <a href="#"><u>GS4-FAN-AM</u></a>  | \$28.00  |    | Frame A main        | 40mm                   | 24      | 0.15                 | 1          |
| GS4-4010                                           | <a href="#"><u>GS4-FAN-BM1</u></a> | \$34.50  |    | Frame B main        | 80mm                   | 24      | 0.33                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-BB</u></a>  | \$27.00  |    | Frame B board level | 40mm                   | 24      | 0.18                 | 1          |
| GS4-4015<br>GS4-4020                               | <a href="#"><u>GS4-FAN-BM2</u></a> | \$52.00  |    | Frame B main        | 80mm                   | 24      | 0.51                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-BB</u></a>  | \$27.00  |    | Frame B board level | 40mm                   | 24      | 0.18                 | 1          |
| GS4-4025<br>GS4-4030<br>GS4-4040                   | <a href="#"><u>GS4-FAN-CM</u></a>  | \$49.00  |   | Frame C main        | 92mm                   | 24      | 0.75                 | 1          |
|                                                    | <a href="#"><u>GS4-FAN-CB2</u></a> | \$34.50  |  | Frame C board level | 40mm                   | 12      | 0.60                 | 1          |
| GS4-4050<br>GS4-4060                               | <a href="#"><u>GS4-FAN-D0M</u></a> | \$98.00  |  | Frame D0 main       | 80mm                   | 24      | 0.75                 | 2          |
|                                                    | <a href="#"><u>GS4-FAN-DB</u></a>  | \$58.00  |  | Frame D board level | 70mm                   | 24      | 0.33                 | 1          |
| GS4-4075<br>GS4-4100                               | <a href="#"><u>GS4-FAN-DM</u></a>  | \$174.00 |  | Frame D main        | 92mm                   | 24      | 0.75                 | 2          |
|                                                    | <a href="#"><u>GS4-FAN-DB</u></a>  | \$58.00  |  | Frame D board level | 70mm                   | 24      | 0.33                 | 1          |
| GS4-4125<br>GS4-4150                               | <a href="#"><u>GS4-FAN-EM2</u></a> | \$303.00 |  | Frame E main        | 92mm<br>120mm<br>120mm | 24      | 0.75<br>1.08<br>1.08 | 3          |
|                                                    | <a href="#"><u>GS4-FAN-EB</u></a>  | \$119.00 |  | Frame E board level | 120mm                  | 24      | 0.76                 | 1          |
| GS4-4175<br>GS4-4200                               | <a href="#"><u>GS4-FAN-FM</u></a>  | \$431.00 |  | Frame F main        | 92mm                   | 24      | 0.76                 | 4          |
|                                                    | <a href="#"><u>GS4-FAN-FB</u></a>  | \$126.00 |  | Frame F board level | 120mm                  | 24      | 1.08                 | 1          |
| GS4-4250<br>GS4-4300                               | <a href="#"><u>GS4-FAN-GM</u></a>  | \$902.00 |  | Frame G main        | 250mm                  | 48      | 2.2                  | 2          |

\* These fans are included with the GS4 drive, and also available separately as spare or replacement components. Electrical connectors are included.

# GS4-Specific Optional Accessories – Conduit Boxes

## Accessories Applicable Only to GS4 AC Drives

Please refer to the "GS/DURApulse AC Drives – Accessories" section for accessories applicable to multiple families of GS/DURApulse AC Drives, including GS4.

## Conduit Boxes

Optional Conduit Box Kits can be ordered separately. These kits bolt onto the bottom of the applicable GS4 drive to provide a convenient connection point for conduit entry, allowing the GS4 to maintain a IP20/NEMA 1 environmental protection rating; especially useful for GS4 drives mounted outside of an electrical control panel.

**Note:** GS4 Frames A through C have integral conduit box space built into the drive. No separate conduit boxes are necessary or available.

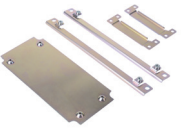
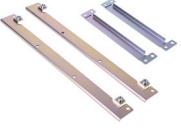
| GS4 Frame Sizes D0–G – Conduit Box Selection Table                                                                                                                                                                                                                                                                                                 |        |                                   |          |                                                                                     |                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------------------|----------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Drive                                                                                                                                                                                                                                                                                                                                              |        | Conduit Box **                    |          |                                                                                     | Description                                                                                |
| Model                                                                                                                                                                                                                                                                                                                                              | Frame* | Part #                            | Price    | Photo                                                                               |                                                                                            |
| GS4-4060,<br>GS4-4050                                                                                                                                                                                                                                                                                                                              | D0     | <a href="#"><u>GS4-CBX-D0</u></a> | \$163.00 |    | NEMA 1 conduit box kit for use with GS4 frame size D0 AC drive; mounting hardware included |
| GS4-2040,<br>GS4-2050;<br>GS4-4075,<br>GS4-4100                                                                                                                                                                                                                                                                                                    | D      | <a href="#"><u>GS4-CBX-D</u></a>  | \$163.00 |    | NEMA 1 conduit box kit for use with GS4 frame size D AC drive; mounting hardware included  |
| GS4-2060,<br>GS4-2075,<br>GS4-2100;<br>GS4-4125,<br>GS4-4150                                                                                                                                                                                                                                                                                       | E      | <a href="#"><u>GS4-CBX-E</u></a>  | \$188.00 |   | NEMA 1 conduit box kit for use with GS4 frame size E AC drive; mounting hardware included  |
| GS4-4150,<br>GS4-4200                                                                                                                                                                                                                                                                                                                              | F      | <a href="#"><u>GS4-CBX-F</u></a>  | \$271.00 |  | NEMA 1 conduit box kit for use with GS4 frame size F AC drive; mounting hardware included  |
| GS4-4250,<br>GS4-4300                                                                                                                                                                                                                                                                                                                              | G      | <a href="#"><u>GS4-CBX-G</u></a>  | \$513.00 |  | NEMA 1 conduit box kit for use with GS4 frame size G AC drive; mounting hardware included  |
| <p>* GS4 Frame Sizes A through C have integral conduit box space built into the drive; separate conduit boxes are not necessary nor available.</p> <p>** Conduit Box Kits include mounting hardware; box base, box cover, bushings, and screws.</p> <p>Conduit box dimensions are shown with the AC drive dimensions, as mounted on the drive.</p> |        |                                   |          |                                                                                     |                                                                                            |

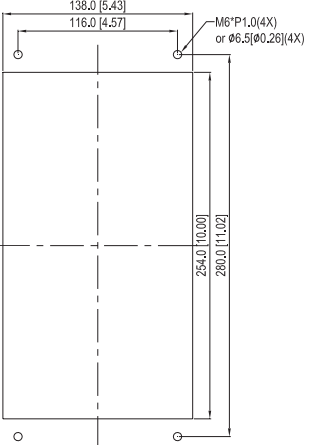
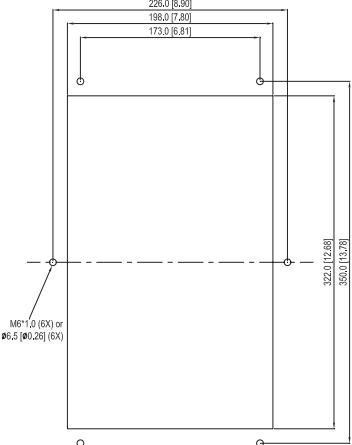
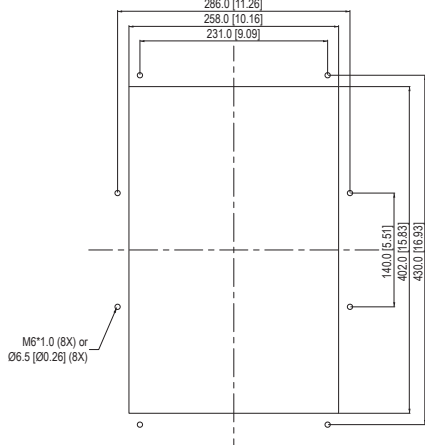
# GS4-Specific Optional Accessories – Flange Mounting Kits

## Flange Mounting Kits

Optional GS4 drive flange mounting kits allow the heat sinks on the back of select GS4 drives to be positioned through the back of the control enclosure. Since a majority of the heat generated by the GS4 drive will be outside the enclosure, heat load will be reduced and a smaller enclosure may possibly be used. These flange mounting kits are applicable to GS4 drive frame sizes A through C.

**NOTE:** GS4 Frames D0, D, E, and F have integral flange mounting hardware; additional Flange Mounting Kit not required (see cutout dimensions below).  
Frame size G cannot be flange-mounted.

| GS4 Frame Sizes A–C – Flange Mounting Kit Selection Table                                                                                                                                                                                                                                                                           |        |                           |         |                                                                                     |                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------|---------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Drive                                                                                                                                                                                                                                                                                                                               |        | Flange Mounting Kit **    |         |                                                                                     | Description                                                                                                                    |
| Model                                                                                                                                                                                                                                                                                                                               | Frame* | Part #                    | Price   | Photo                                                                               |                                                                                                                                |
| GS4-22P0<br>GS4-23P0<br>GS4-43P0                                                                                                                                                                                                                                                                                                    | A      | <b><u>GS4-FMKIT-1</u></b> | \$74.00 |    | GS4 series Flange Mounting Kit, NEMA 1; for use with multiple GS4 Frame A drives; adapter plate and mounting hardware included |
| GS4-21P0<br>GS4-25P0<br>GS4-41P0<br>GS4-42P0<br>GS4-45P0<br>GS4-47P5                                                                                                                                                                                                                                                                | A      | <b><u>GS4-FMKIT-A</u></b> | \$62.00 |    | GS4 series Flange Mounting Kit, NEMA 1; for use with multiple GS4 Frame A drives; mounting hardware included                   |
| GS4-27P5<br>GS4-2010<br>GS4-2015<br>GS4-4010<br>GS4-4015<br>GS4-4020                                                                                                                                                                                                                                                                | B      | <b><u>GS4-FMKIT-B</u></b> | \$70.00 |   | GS4 series Flange Mounting Kit, NEMA 1; for use with GS4 Frame B drives; mounting hardware included                            |
| GS4-2020<br>GS4-2025<br>GS4-2030<br>GS4-4025<br>GS4-4030<br>GS4-4040                                                                                                                                                                                                                                                                | C      | <b><u>GS4-FMKIT-C</u></b> | \$79.00 |  | GS4 series Flange Mounting Kit, NEMA 1; for use with GS4 Frame C drives; mounting hardware included                            |
| <p>* See panel cutout dimensions below for GS4 Frames A, B, C.</p> <p>* GS4 Frames D0, D, E, and F have integral flange mounting hardware; additional Flange Mounting Kit not required. See Appendix A of the GS4 User Manual for panel cut-out dimensions for frames D0, E, F.</p> <p>* Frame size G cannot be flange-mounted.</p> |        |                           |         |                                                                                     |                                                                                                                                |

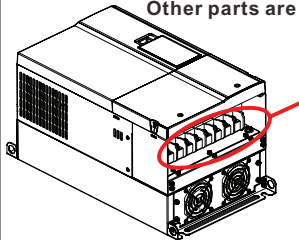
| GS4 Flange Mounting Kit Cutout Dimensions ( mm [in] )                               |                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Frame A                                                                             | Frame B                                                                             | Frame C                                                                              |
|  |  |  |

# DURAPULSE GS4 AC Drives Specifications – Installation

Understanding the installation requirements for your *DURAPULSE* AC drive will help to ensure that it operates within its environmental and electrical limits.

**Note:** Never use only this catalog for installation instructions or operation of equipment; refer to the User Manual, GS4\_UMW.

| Environmental Conditions for GS4 AC Drives |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      |                      |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------|
| Condition                                  | Operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Storage                                              | Transportation       |
| Installation Location                      | IEC60364-1/IEC60664-1 Pollution degree 2, Indoor use only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | n/a                                                  | n/a                  |
| Ambient Temperature                        | see separate Operating Temperature table below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      | -25°C to +70°C       |
| Relative Humidity                          | Max 90%, non-condensing, non-frozen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Max 95%, non-condensing, non-frozen                  |                      |
| Air Pressure                               | 86 to 106 kPa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                      | 70 to 106 kPa        |
| Pollution Level                            | IEC721-3-3, no concentrate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                      |                      |
|                                            | Class 3C2; Class 3S2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Class 2C2; Class 2S2                                 | Class 1C2; Class 1S2 |
| Altitude                                   | 0–1000m<br>(see separate derating section for altitudes of 1000–3000m)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | n/a                                                  | n/a                  |
| Package Drop                               | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ISTA procedure 1A(according to weight) IEC60068-2-31 |                      |
| Vibration                                  | 1.0mm, peak to peak value range from 2Hz to 13.2Hz; 0.7G–1.0G range from 13.2Hz to 55Hz; 1.0G range from 55Hz to 512Hz. Comply with IEC 60068-2-6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                      |
| Impact                                     | IEC/EN 60068-2-27                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                      |
| Installation Orientation                   | <div><div>10°→</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div></div> |                                                      |                      |

| Operating Temperature and Protection Level |                                    |                         |                           |                                                                                                                                                                                 |                       |
|--------------------------------------------|------------------------------------|-------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Frame Size                                 |                                    | Top cover               | Conduit Box               | Protection Level                                                                                                                                                                | Operating Temperature |
| A–C                                        | 230V: 1.0–30 hp<br>460V: 1.0–40 hp | With top cover removed  | Standard<br>conduit plate | IP20 / UL Open Type                                                                                                                                                             | -10–50°C [14–122°F]   |
|                                            |                                    | With top cover in place |                           | IP20 / UL Type1 / NEMA 1                                                                                                                                                        | -10–40°C [14–104°F]   |
| D0–G                                       | 230V: >30hp<br>460V: >40hp         | N/A                     | With conduit box          | IP20 / UL Type1 / NEMA 1                                                                                                                                                        | -10–40°C [14–104°F]   |
|                                            | 230V: >30hp<br>460V: >40hp         | N/A                     | Without conduit box       | IP00 / IP20 / UL Open Type *<br>Only the circled area is IP00.<br>Other parts are IP20.<br> | -10–50°C [14–122°F]   |

\* Only the exposed terminal blocks are IP00; the other components are IP20

\* Only the exposed terminal blocks are IP00; the other components are IP20



**WARNING:** AC DRIVES GENERATE A LARGE AMOUNT OF HEAT WHICH MAY DAMAGE THE AC DRIVE. AUXILIARY COOLING METHODS MAY BE REQUIRED TO AVOID EXCEEDING MAXIMUM OPERATING TEMPERATURE. WHEN POSSIBLE, CONSIDER FLANGE MOUNTING TO LOWER ENCLOSURE TEMPERATURES.



**WARNING:** MAXIMUM AMBIENT TEMPERATURES MUST NOT EXCEED 50°C (122°F), OR 40°C (104°F), FOR ALL GS4 MODELS.

# DURAPULSE GS4 AC Drives Specifications – Air Flow and Power (Heat) Dissipation

| GS4 AC Drives Air Flow and Power (Heat) Dissipation |                                        |          |       |                                              |          |       |                                        |          |       |
|-----------------------------------------------------|----------------------------------------|----------|-------|----------------------------------------------|----------|-------|----------------------------------------|----------|-------|
| Model Number                                        | Airflow Rate <sup>1)</sup> for Cooling |          |       |                                              |          |       | Power (Heat) Dissipation <sup>2)</sup> |          |       |
|                                                     | Flow Rate <sup>1)</sup> (cfm)          |          |       | Flow Rate <sup>1)</sup> (m <sup>3</sup> /hr) |          |       | Power Dissipation <sup>2)</sup> (Watt) |          |       |
|                                                     | External                               | Internal | Total | External                                     | Internal | Total | External (Heat sink)                   | Internal | Total |
| <a href="#">GS4-21P0</a>                            | –                                      | –        | –     | –                                            | –        | –     | 33                                     | 27       | 60    |
| <a href="#">GS4-22P0</a>                            | 14                                     | –        | 14    | 24                                           | –        | 24    | 56                                     | 31       | 87    |
| <a href="#">GS4-23P0</a>                            | 14                                     | –        | 14    | 24                                           | –        | 24    | 79                                     | 36       | 115   |
| <a href="#">GS4-25P0</a>                            | 10                                     | –        | 10    | 17                                           | –        | 17    | 113                                    | 46       | 159   |
| <a href="#">GS4-27P5</a>                            | 40                                     | 14       | 54    | 68                                           | 24       | 92    | 197                                    | 67       | 264   |
| <a href="#">GS4-2010</a>                            | 66                                     | 14       | 80    | 112                                          | 24       | 136   | 249                                    | 86       | 335   |
| <a href="#">GS4-2015</a>                            | 58                                     | 14       | 73    | 99                                           | 24       | 123   | 409                                    | 121      | 530   |
| <a href="#">GS4-2020</a>                            | 166                                    | 12       | 178   | 282                                          | 20       | 302   | 455                                    | 161      | 616   |
| <a href="#">GS4-2025</a>                            | 166                                    | 12       | 178   | 282                                          | 20       | 302   | 549                                    | 184      | 733   |
| <a href="#">GS4-2030</a>                            | 166                                    | 12       | 178   | 282                                          | 20       | 302   | 649                                    | 216      | 865   |
| <a href="#">GS4-2040</a>                            | 179                                    | 30       | 209   | 304                                          | 51       | 355   | 913                                    | 186      | 1099  |
| <a href="#">GS4-2050</a>                            | 179                                    | 30       | 209   | 304                                          | 51       | 355   | 1091                                   | 220      | 1311  |
| <a href="#">GS4-2060</a>                            | 228                                    | 73       | 301   | 387                                          | 124      | 511   | 1251                                   | 267      | 1518  |
| <a href="#">GS4-2075</a>                            | 228                                    | 73       | 301   | 387                                          | 124      | 511   | 1401                                   | 308      | 1709  |
| <a href="#">GS4-2100</a>                            | 246                                    | 73       | 319   | 418                                          | 124      | 542   | 1770                                   | 369      | 2139  |
| <a href="#">GS4-41P0</a>                            | –                                      | –        | –     | –                                            | –        | –     | 33                                     | 25       | 58    |
| <a href="#">GS4-42P0</a>                            | –                                      | –        | –     | –                                            | –        | –     | 45                                     | 29       | 74    |
| <a href="#">GS4-43P0</a>                            | 14                                     | –        | 14    | 24                                           | –        | 24    | 71                                     | 33       | 104   |
| <a href="#">GS4-45P0</a>                            | 10                                     | –        | 10    | 17                                           | –        | 17    | 103                                    | 38       | 141   |
| <a href="#">GS4-47P5</a>                            | 10                                     | –        | 10    | 17                                           | –        | 17    | 134                                    | 46       | 180   |
| <a href="#">GS4-4010</a>                            | 40                                     | 14       | 54    | 68                                           | 24       | 92    | 216                                    | 76       | 292   |
| <a href="#">GS4-4015</a>                            | 66                                     | 14       | 80    | 112                                          | 24       | 136   | 287                                    | 93       | 380   |
| <a href="#">GS4-4020</a>                            | 58                                     | 14       | 73    | 99                                           | 24       | 123   | 396                                    | 122      | 518   |
| <a href="#">GS4-4025</a>                            | 99                                     | 21       | 120   | 168                                          | 36       | 204   | 369                                    | 138      | 507   |
| <a href="#">GS4-4030</a>                            | 99                                     | 21       | 120   | 168                                          | 36       | 204   | 476                                    | 158      | 634   |
| <a href="#">GS4-4040</a>                            | 126                                    | 21       | 147   | 214                                          | 36       | 250   | 655                                    | 211      | 866   |
| <a href="#">GS4-4050</a>                            | 179                                    | 30       | 209   | 304                                          | 51       | 355   | 809                                    | 184      | 993   |
| <a href="#">GS4-4060</a>                            | 179                                    | 30       | 209   | 304                                          | 51       | 355   | 929                                    | 218      | 1147  |
| <a href="#">GS4-4075</a>                            | 179                                    | 30       | 209   | 304                                          | 51       | 355   | 1156                                   | 257      | 1413  |
| <a href="#">GS4-4100</a>                            | 186                                    | 30       | 216   | 316                                          | 51       | 367   | 1408                                   | 334      | 1742  |
| <a href="#">GS4-4125</a>                            | 257                                    | 73       | 330   | 437                                          | 124      | 561   | 1693                                   | 399      | 2092  |
| <a href="#">GS4-4150</a>                            | 223                                    | 73       | 296   | 379                                          | 124      | 503   | 2107                                   | 491      | 2598  |
| <a href="#">GS4-4175</a>                            | 224                                    | 112      | 336   | 381                                          | 190      | 571   | 2502                                   | 579      | 3081  |
| <a href="#">GS4-4200</a>                            | 289                                    | 112      | 401   | 491                                          | 190      | 681   | 3096                                   | 687      | 3783  |
| <a href="#">GS4-4250</a>                            | –                                      |          | 454   | –                                            |          | 771   | –                                      |          | 4589  |
| <a href="#">GS4-4300</a>                            |                                        |          | 454   |                                              |          | 771   |                                        |          | 5772  |

The required airflow shown in chart is for installing a single GS4 drive in a confined space.

When installing multiple GS4 drives, the required air volume would be the cumulative air volume for all drives in the enclosure.

Heat dissipation shown in the chart is for installing a single GS4 drive in a confined space.

When installing multiple drives, the volume of heat dissipation should be the cumulative heat dissipation of all drives in the enclosure.

Heat dissipation for each model is calculated by rated voltage, current and default carrier frequency.

1) External flow rate is across the heat sink. Internal flow rate is through the chassis.

Published flow rates are the result of active cooling using fans; factory-installed in the drive.

Unpublished flow rates (-) are the result of passive cooling in drives without factory-installed fans.

2) When calculating power dissipation (Watt Loss) use the total value if the drive is foot mounted, or the internal value if the drive is flange mounted. Where only a total value is published, these models cannot be flange mounted.

## Dimensions for Minimum Clearance \* ( mm / in )

| Frame Size | Above & Below | Side to Non-Heat Source | Side to Heat Source | Front |
|------------|---------------|-------------------------|---------------------|-------|
| A–C        | 60 / 2.4      | 30 / 1.2                | 10 / 0.4            | 0 / 0 |
| D(0)–F     | 100 / 4.0     | 50 / 2.0                | n/a                 | 0 / 0 |
| G          | 200 / 7.9     | 100 / 4.0               | 2 x B               | 0 / 0 |

\* The minimum mounting clearances stated in this table applies to GS4 drives frames A to G. Failure to follow the minimum mounting clearances may cause the fan to malfunction and cause a heat dissipation problem.