

DURAPULSE GS20(X) AC Drives – Introduction



| DURAPULSE GS20(X) AC Drives | | | | | | | | | | | | | |
|-----------------------------|----|-----|-----|------|-----|-----|-----|-----|-----|----|----|------|----|
| Motor Rating | HP | 1/4 | 1/2 | 1 | 2 | 3 | 5 | 7.5 | 10 | 15 | 20 | 25 | 30 |
| | kW | 0.2 | 0.4 | 0.75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 | 11 | 15 | 18.5 | 22 |
| 120V Single-phase | | ✓ | ✓ | ✓ | | | | | | | | | |
| 230V Single-phase | | ✓ | ★ | ★ | ★ | ★ | | | | | | | |
| 230V Three-phase | | ✓ | ★ | ★ | ★ | ★ | ★ | ★ | ✓ | ✓ | ✓ | | |
| 460V Three-phase | | | ★ | ★ | ★ | ★ | ★ | ★ | ✓ | ✓ | ✓ | ✓ | ✓ |
| 575V Three phase | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |

✓ = GS20 model available ★ = GS20 and GS20X models available

Overview

The DuraPulse GS20(X) new generation high performance vector control drives provide many standard and advanced functions—all in a compact unit that has been reduced 40% in size. A NEMA 4X version provides service in the harshest of environments.

The drives include many of the same standard features as our GS family of drives including dynamic braking, PID, removable keypad, and RS-485 Modbus communication.

The GS20(X) drive expands the *DURAPULSE* family by adding single-phase input capability (ALL 230VAC drives can be supplied single-phase), a built-in PLC, and optional EtherNet/IP and ModbusTCP communication card. The drive supports up to four (4) independent IM motor parameter sets or supports control of a single AC PM motor.

DURAPULSE GS20(X) AC drives offer several different speed control modes: standard V/Hz with pulse input feedback, sensorless vector (SVC) for Induction Motors (IM) and Permanent Motors (PM), and ultra precise Field Oriented Vector control (FOC) for maximum open loop speed regulation control.

DURAPULSE GS20(X) offers two analog inputs, one analog output, one frequency output, seven digital inputs (including one pulse train input up to 33kHz), two digital outputs, one SPDT relay output, and two STO inputs. All of the analog and digital I/O can be configured for a wide variety of input or output functions. One option card slot is available for either the backup control power option card or Ethernet/IP and Modbus TCP communication option card.

Features

- Broad offering from 1/4 to 30 hp
- NEMA 4X available up to 10hp
- Single-phase 120VAC up to 1hp
- Single-phase/three-Phase 230VAC up to 20HP
- Three-phase 460VAC and 575VAC
- Single-phase UL Ratings – 230VAC input for 1 to 20 hp models (see selection tables for derated output)
- Dual rating design – CT/VT Ratings (Light & Heavy Duty)
- “Zero Stack” side-by-side zero gap installation
- Compact Design
- Spring clamp terminal blocks
- Speed control potentiometer built in
- Flexible carrier frequency to 15khz and output frequency to 600Hz
- STO – Safe Torque Off (TUV Certified)
- Built-in PLC to support up to 2K steps
- Built-in USB port for fast & easy programming
- Free downloadable software for drive configuration and PLC programming
- Field-upgradable firmware (drive & communication option card)
- Optional LCD text-based advanced keypad (IP66/NEMA 1) can be remotely mounted
- Local/Remote control mode selection or digital/comm input with Hand/Off/Auto control
- Display custom values on keypad
- Momentary power loss restarts
- 100kA Short Circuit Current Rating
- DC Bus Connection Terminals (except 120VAC models)
- Conduit Box(s) for NEMA 1
- Analog I/O – configurable 2 Inputs and 1 Output
- Multi-Motor Control (4 total)
- Built-in Dynamic Braking – optional resistors
- PID Controller – including sleep and wake
- Password protection
- RTD and/or PTC input motor protection
- GS2 mode duplicates exact parameter configuration of GS2
- Modularized design eases maintenance and expansion, including quick replacement of cooling fan
- High speed communication interfaces

with MODBUS RTU built in, with optional EtherNet/IP and ModbusTCP Communication Card

- Circuit boards have conformal coating for improved environmental tolerance
- Excellent heat-sink design; able to operate at 50°C ambient temperature
- Fire Mode – Run fire mode during emergencies to have uninterrupted smoke removal and system pressure
- Two-year warranty
- CE, TUV, UL, cUL

Accessories

- AC line reactors
- dV/dT output filters
- EMI filters
- RF filter
- Braking resistors
- Fuses
- Conduit boxes
- Mounting Kits
- Replacement cooling fans
- Replacement keypad
- Extension cable for remote keypad placement
- Optional advanced LCD keypad (and remote-mount bezel kit)
- EtherNet/IP and ModbusTCP comm card
- Four and eight-port RS-485 multi-drop termination boards
- GSoft2 drive configuration software
- GSLogic PLC programming software
- Type A to B USB cable
- Detailed descriptions and specifications for GS accessories are available in the “GS/ DURAPulse Accessories” section.

Typical Applications

- Conveyors
- Compressors
- Material handling
- Extruding
- Grinding
- Shop tools
- Fans
- Pumps
- HVAC
- Mixing

DURAPULSE GS20(X) AC Drives – Selection

Selecting the Proper Drive Rating

| Selecting the Proper Drive Rating | | | | | | | | | | | |
|--|--|--------------|-------------------------|---|-----|------|-----|------|----|------|----|
| Determine Motor Voltage and Full-Load Amperage (FLA) | | | | | | | | | | | |
| | Motor voltage and FLA are located on the nameplate of the motor. NOTE: FLA of motors that have been rewound may be higher than stated. | | | | | | | | | | |
| Determine Motor Overload Requirements | | | | | | | | | | | |
| | Many applications experience temporary overload conditions due to starting requirements or impact loading. Most AC drives are designed to operate at 150% overload for 60 seconds. If the application requires an overload greater than 150% or longer than 60 seconds, the AC drive must be oversized. NOTE: Applications that require replacement of existing motor starters with AC drives may require up to 600% overload. | | | | | | | | | | |
| Determine Application Type: Constant Torque or Variable Torque | | | | | | | | | | | |
| | This torque requirement has a direct effect on which drive to select. Variable Torque applications are generally easier to start; typically fans and pumps. Most other applications outside fans and pumps fall into the Constant Torque category (machine control, conveyors, etc.). If you are unsure of the application, assume Constant Torque. The specification, derating, and selection tables are generally segregated by Constant Torque and Variable Torque. | | | | | | | | | | |
| Installation Altitude | | | | | | | | | | | |
| | AC drives rely on air flow for cooling. As the altitude increases, the air becomes less dense, and this drop in air density decreases the cooling properties of the air. Therefore, the AC drive must be oversized to compensate for the decrease in cooling. GS20(X) drives are designed to operate at 100% capacity at altitudes up to 1000 meters. NOTE: For use above 1000m, the AC drive must be derated as described below. | | | | | | | | | | |
| Derate Output Current Based on Altitude Above 1000 Meters | | | | | | | | | | | |
| | <ul style="list-style-type: none"> If the AC drive is installed at an altitude of 0–1000m, follow normal operation restrictions. If installed at an altitude of 1000–2000m, decrease 1% of the rated current or lower 0.5°C of temperature for every 100m increase in altitude. Maximum altitude for Corner Grounded is 2000m. If installation at an altitude higher than 2000m is required, please contact AutomationDirect. | | | | | | | | | | |
| <p style="text-align: center;">Derating for Altitude</p> <table border="1"> <caption>Derating for Altitude Data</caption> <thead> <tr> <th>Altitude (m)</th> <th>Current Rated Ratio (%)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>100</td> </tr> <tr> <td>1000</td> <td>100</td> </tr> <tr> <td>2000</td> <td>90</td> </tr> <tr> <td>2500</td> <td>70</td> </tr> </tbody> </table> | | Altitude (m) | Current Rated Ratio (%) | 0 | 100 | 1000 | 100 | 2000 | 90 | 2500 | 70 |
| Altitude (m) | Current Rated Ratio (%) | | | | | | | | | | |
| 0 | 100 | | | | | | | | | | |
| 1000 | 100 | | | | | | | | | | |
| 2000 | 90 | | | | | | | | | | |
| 2500 | 70 | | | | | | | | | | |

DURAPULSE GS20(X) AC Drives – Selection

Selecting the Proper Drive Rating, continued

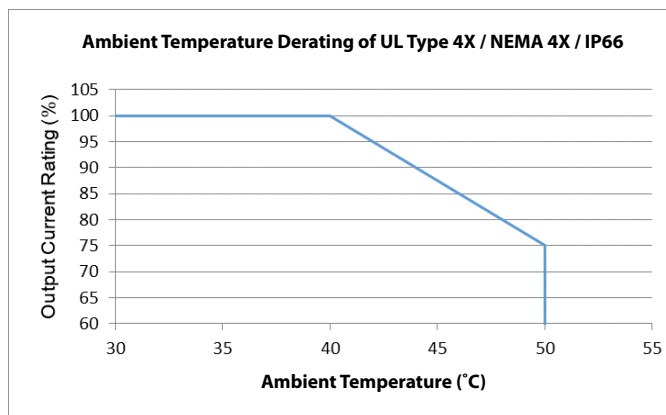
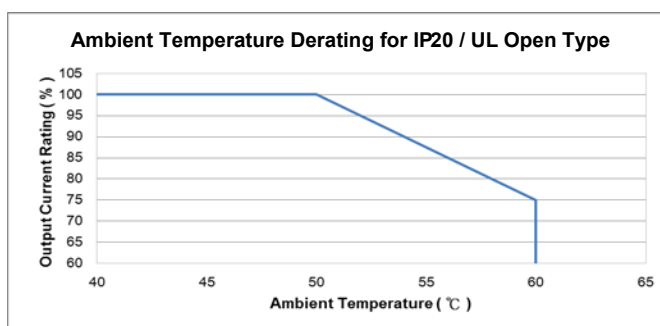
Determine Maximum Enclosure Internal Temperature

AC drives generate a significant amount of heat and can cause the internal temperature of an enclosure to exceed the rating of the GS20(X) drive, even when the ambient temperature is less than 104°F (40°C). Enclosure ventilation and/or cooling may be required to reduce maximum internal temperature to 104°F (40°C) or less. Ambient temperature measurements/calculations should be made for the maximum expected temperature.

NOTE: For use above 104°F (40°C), the AC drive must be derated as described below.

Derate Output Current Based on Temperature Above 104°F (40°C) or 122°F (50°C)

| Drive Derating by Temperature and Protection Level | |
|--|---|
| Protection Level | Derating |
| UL Open Type / IP20* | When the GS20(X) drive is operating at rated current, the ambient temperature has to be between -10°C and +50°C. When ambient temperature exceeds 50°C, decrease the rated current by 2.5% for every 1°C temperature increase. Maximum allowable temperature is 60°C. |
| UL Type 4X / NEMA 4X / IP66* | When the GS20(X) drive is operating at rated current, the ambient temperature has to be between -10°C and +40°C. When ambient temperature exceeds 40°C, decrease the rated current by 2.5% for every 1°C temperature increase. Maximum allowable temperature is 50°C. |
| * For more information about environmental ratings, refer to "Environmental Conditions for GS20 AC Drives" on page tGSX-30 and "Environmental Conditions for GS20X AC Drives" on page tGSX-30. | |



DURAPULSE GS20(X) AC Drives – Selection

Selecting the Proper Drive Rating, continued

Derate Output Current Based on Carrier Frequency (if necessary)

Carrier Frequency Effects

AC Drives rectify the incoming 50 or 60Hz line power resulting in DC power at 0Hz. The resulting DC power is then pulse-width modulated and supplied to the motor by the drive's power electronics. IGBTs invert the DC power, simulating a sine wave at the desired frequency (that's what allows variable speed in AC induction motors). The speed at which the IGBTs are turned ON and OFF is called Carrier Frequency. In GS20(X) drives, the Carrier Frequency can range from 2kHz to 15kHz. Though Carrier Frequency can be adjusted, there are trade-offs between high Carrier Frequencies and low Carrier Frequencies.

Benefits of Higher Carrier Frequencies:

- Better efficiency (lower harmonic losses) in the motor
- Lower audible noise

Benefits of Lower Carrier Frequencies:

- Better efficiency in the drive
- Lower EMI (electrical noise)
- Reduced reflective wave peak voltage

As a general rule, the Carrier Frequency should be set as low as possible without creating unacceptable audible noise in the motor. Smaller systems can have higher Carrier Frequencies, but larger drives (>20 or 30hp) should not have Carrier Frequencies set higher than 6kHz. Heavy duty applications typically run around 2–4 kHz.

Derating Tables

The tables below show the derating curves for both GS20 and GS20X drives running in two different modes under variable torque and constant torque conditions.

Line 1: Ta = 50°C / Load = 100%

Line 2: Ta = 50°C / Load = 75% or Ta = 40°C / Load = 100%

Line 3: Ta = 50°C / Load = 50% or Ta = 35°C / Load = 100%

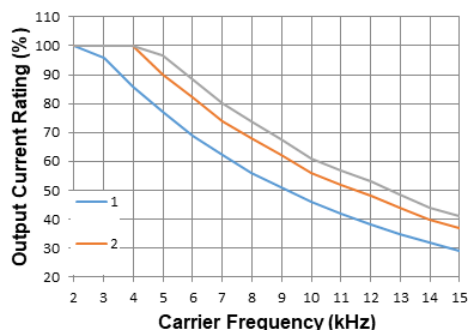
Set PWM mode via P11.41.

SVPWM = Space Vector Pulse Width Modulation mode

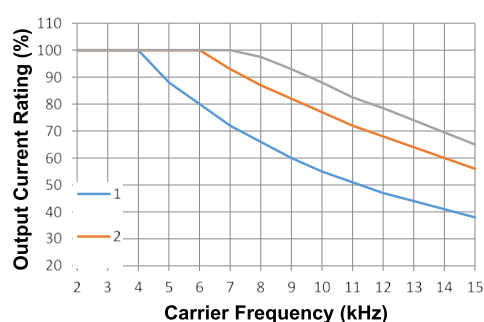
DPWM = Two Phase Pulse Width Modulation mode

Variable Torque Carrier Frequency Derating

SVPWM Mode

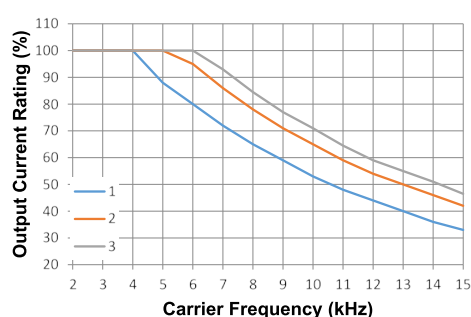


DPWM Mode

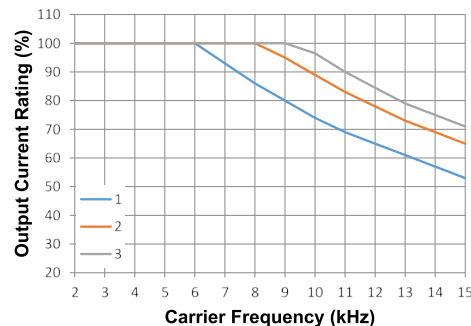


Constant Torque Carrier Frequency Derating

SVPWM Mode



DPWM Mode



DURApULSE GS20X AC Drives – Selection Specifications

GS20X Drive Model Selection Tables

| GS20X 230V ¹ 1-Phase Specifications – Frame Sizes A, B | | | | | | | |
|--|-------------------------------|--------------------------------|--|---------------------|---------------------|---------------------|------|
| Model Name | | | GS21X-20P5 | GS21X-21P0 | GS21X-22P0 | GS21X-23P0 | |
| Price | | | \$242.00 | \$270.00 | \$326.00 | \$405.00 | |
| Frame Size | | | A | A | A | B | |
| Drawing | | | PDF | PDF | PDF | PDF | |
| Output Rating | Max Motor Output | hp | 1/2 | 1 | 2 | 3 | |
| | | kW | 0.4 | 0.75 | 1.5 | 2.2 | |
| | CT | Rated Output Capacity | kVA | 1.1 | 1.7 | 2.9 | 4.2 |
| | | Rated Output Current | A | 2.8 | 4.8 | 7.5 | 11 |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | |
| | VT | Rated Output Capacity | kVA | 1.2 | 1.9 | 3.2 | 4.8 |
| | | Rated Output Current | A | 3.2 | 5 | 8.5 | 12.5 |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | |
| Input Rating ² | CT | Rated Input Current | A | 7.3 | 10.8 | 16.5 | 24.2 |
| | VT | Rated Input Current | A | 8.3 | 11.3 | 18.5 | 27.5 |
| | Rated Voltage/Frequency | | One-phase 200–240 VAC (-15% to +10%), 50/60 Hz | | | | |
| | Operating Voltage Range (VAC) | | 170–264 | | | | |
| | Frequency Tolerance (Hz) | | 47–63 | | | | |
| IE2 Efficiency - Relative Power Loss | | | 3.4% | 2.9% | 2.6% | 2.4% | |
| Weight (kg [lb]) | | | 2.25 [4.96] | 2.6 [5.73] | 3.1 [6.83] | 3.5 [7.72] | |
| Cooling Method | | | Convective | | | Fan | |
| IP Rating | | | IP66 / NEMA 4X | | | | |
| 1 - For Use With Three-Phase Motors Only. | | | | | | | |
| 2- If 3-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” in the GS20(X) AC Drives User Manual, Chapter 2. | | | | | | | |
| Please refer to “GS20(X) DURApulse Accessories – Fusing” (pg.tGSX-76) for input fusing information. | | | | | | | |
| 3 - The carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency”. | | | | | | | |

DURApULSE GS20X AC Drives – Selection Specifications

GS20X Drive Model Selection Tables, continued

| GS20X 230V ¹ 3-Phase Specifications – Frame Sizes A, B, C | | | | | | | | | |
|--|--|---|---|---------------------|---------------------|---------------------|---------------------|---------------------|------------|
| Model Name | | | GS23X-20P5 | GS23X-21P0 | GS23X-22P0 | GS23X-23P0 | GS23X-25P0 | GS23X-27P5 | |
| Price | | | \$259.00 | \$274.00 | \$342.00 | \$398.00 | \$440.00 | \$670.00 | |
| Frame Size | | | A | A | A | B | B | C | |
| Drawing | | | PDF | PDF | PDF | PDF | PDF | PDF | |
| Output Rating | Max Motor Output (3-phase [1-phase]) ⁴ | | hp | 0.5 [0.25] | 1 [0.5] | 2 [1] | 3 [1.5] | 5 [2.5] | 7.5 [3.5] |
| | | | kW | 0.4 [0.2] | 0.75 [0.375] | 1.5 [0.75] | 2.2 [1.1] | 3.7 [1.85] | 5.5 [2.75] |
| | CT | Rated Output Capacity 3-phase [1-phase]) | kVA | 1.1 [0.55] | 1.8 [0.9] | 2.9 [1.5] | 4.2 [2.1] | 6.5 [3.25] | 9.5 [4.75] |
| | | Rated Output Current 3-phase [1-phase]) | A | 2.8 [1.4] | 4.8 [2.4] | 7.5 [3.75] | 11 [5.5] | 17 [8.5] | 25 [12.5] |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | | | |
| | VT | Rated Output Capacity | kVA | 1.2 | 1.9 | 3 | 4.8 | 7.4 | 10.3 |
| | | Rated Output Current | A | 3.2 | 5 | 8 | 12.5 | 19.5 | 27 |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | | | |
| Input Rating ² | CT | Rated Input Current | A | 3.4 | 5.8 | 9 | 13.2 | 20.4 | 30 |
| | VT | Rated Input Current | A | 3.8 | 6 | 9.6 | 15 | 23.4 | 32.4 |
| | Rated Voltage/Frequency | | 3-phase or 1-phase 200–240 VAC (-15% to +10%), 50/60 Hz | | | | | | |
| | Operating Voltage Range (VAC) | | 170–264 | | | | | | |
| | Frequency Tolerance (Hz) | | 47–63 | | | | | | |
| IE2 Efficiency - Relative Power Loss | | | 3.4% | 2.9% | 2.5% | 2.5% | 2.2% | 2.3% | |
| Weight (kg [lb]) | | | 2.3 [5.07] | 2.45 [5.40] | 2.75 [6.06] | 3.4 [7.50] | 3.5 [7.72] | 4.25 [9.37] | |
| Cooling Method | | | Convective | | | | Fan | | |
| IP Rating | | | IP66 / NEMA 4X | | | | | | |
| <div>1 - For Use With Three-Phase Motors Only.</div> <div>2- If 3-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” in the GS20(X) AC Drives User Manual, Chapter 2.</div> <div>Please refer to “GS20(X) DURApulse Accessories – Fusing” (pg.tGSX-76) for input fusing information.</div> <div>3 - The carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency”.</div> <div>4 - Three phase models can be powered with 1-phase or 3-phase input power. If using 1-phase input power, GS21 models up to 3HP provide higher output power than equivalent GS23 models with 1-phase.</div> | | | | | | | | | |

DURApULSE GS20(X) AC Drives – Selection Specifications

GS20X Drive Model Selection Tables, continued

| GS20X 460V ¹ 3-Phase Specifications – Frame Sizes A, B, C | | | | | | | | | | |
|---|-------------------------------|--------------------------------|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|------|
| Model Name | | | GS23X-40P5 | GS23X-41P0 | GS23X-42P0 | GS23X-43P0 | GS23X-45P0 | GS23X-47P5 | GS23X-4010 | |
| Price | | | \$309.00 | \$318.00 | \$366.00 | \$407.00 | \$495.00 | \$680.00 | \$768.00 | |
| Frame Size | | | A | A | A | A | B | C | C | |
| Drawing | | | PDF | PDF | PDF | PDF | PDF | PDF | PDF | |
| Output Rating | Max Motor Output | | hp | 1/2 | 1 | 2 | 3 | 5 | 7 1/2 | 10 |
| | | | kW | 0.4 | 0.75 | 1.5 | 2.2 | 3.7 | 5.5 | 7.5 |
| | CT | Rated Output Capacity | kVA | 1.1 | 2.1 | 3.2 | 4.2 | 6.9 | 9.9 | 13 |
| | | Rated Output Current | A | 1.5 | 2.7 | 4.2 | 5.5 | 9 | 13 | 17 |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | | | | |
| | VT | Rated Output Capacity | kVA | 1.4 | 2.3 | 3.5 | 5 | 8 | 12 | 15.6 |
| | | Rated Output Current | A | 1.8 | 3 | 5.6 | 6.5 | 10.5 | 15.7 | 20.5 |
| | | Carrier Frequency ³ | kHz | 2–15 (default 4) | | | | | | |
| Input Rating ² | CT | Rated Input Current | A | 2.1 | 3.7 | 5.8 | 6.2 | 9.9 | 14.3 | 18.7 |
| | VT | Rated Input Current | A | 2.5 | 4.2 | 6.4 | 7.2 | 11.6 | 17.3 | 22.6 |
| | Rated Voltage/Frequency | | Three-phase 380–480 VAC (-15% to +10%), 50/60 Hz | | | | | | | |
| | Operating Voltage Range (VAC) | | 323–528 | | | | | | | |
| | Frequency Tolerance (Hz) | | 47–63 | | | | | | | |
| IE2 Efficiency - Relative Power Loss | | | 4.0% | 2.6% | 2.3% | 2.3% | 2.0% | 2.0% | 1.9% | |
| Weight (kg [lb]) | | | 2.35 [5.18] | 2.6 [5.73] | 2.8 [6.17] | 3.6 [7.94] | 3.45 [7.61] | 4.25 [9.37] | 4.25 [9.37] | |
| Cooling Method | | | Convective | | | | Fan | | | |
| IP Rating | | | IP66 / NEMA 4X | | | | | | | |
| 1 - For Use With Three-Phase Motors Only. | | | | | | | | | | |
| 2- If 3-phase power source is non-symmetrical, refer to “Circuit Connections – RFI Jumper” in the GS20(X) AC Drives User Manual, Chapter 2. Please refer to “GS20(X) DURApulse Accessories – Fusing” (pg.tGSX-76) for input fusing information. | | | | | | | | | | |
| 3 - The carrier frequency is a factory default. Decrease the current value if you need to increase the carrier frequency. Refer to “Derate Output Current Based on Carrier Frequency”. | | | | | | | | | | |

DURAPULSE GS20(X) AC Drives – General Specifications

GS20(X) Drive Model Selection Tables, continued

| GS20(X) General Specifications (Applicable to All Models) | | | | |
|---|----------------------------------|---|---|--|
| Control Characteristics | Control Method | | V/F, Sensorless Vector (SVC), Field Oriented Control (FOC) Sensorless, Volt/Frequency with Pulse Generator input (VFP), Torque (TQC Sensorless) | |
| | Applicable Motor | | 3-phase AC Induction Motor, 3-phase Permanent Magnet AC motor | |
| | Starting Torque ¹ | | 150% / 3Hz 100% / (motor rated frequency/20) 200% / 0.5 Hz | (V/F, SVC control for IM, CT, rated) (SVC control for PM, CT, rated) (FOC control for IM, CT, rated) |
| | Torque Accuracy | | ± 15% TQC Sensorless | |
| | Torque Limits | 120/230/460V | VT: 160% of output current, max CT: 180% of output current, max | |
| | | 575V | 200% of output current, max | |
| | Speed Control Range ¹ | | 1: 50 (V/F, SVC control for IM, CT, rated) 1: 20 (SVC control for PM, CT, rated) 1: 100 (FOC control for IM, CT, rated) | |
| | Max. Output Frequency | | 0.00–599.00 Hz | |
| | Overload Capacity | | VT: rated output current of 120% 60 sec, 150% 3 sec. CT: rated output current of 150% 60 sec, 200% 3 sec. | |
| | Frequency Setting Signal | | 0–10 V / -10–10 V 4–20 mA / 0–10 V 1 channel pulse input (33kHz), 1 channel pulse output (33kHz) | |
| | Digital Inputs | | Seven (7) - 24VDC NPN or PNP, includes 1 pulse train frequency input 33kHz | |
| | Digital Outputs | | Three (3) - (2)-48VDC, (1) Relay-250VAC/30VDC | |
| | Analog Inputs | | Two (2) - (1) voltage, (1) selectable Voltage or Current | |
| | Analog Outputs | | One (1) - selectable voltage or current | |
| | Frequency Output | | One (1) - 30VDC, 33kHz | |
| | Safe Torque Off | | STO1 and STO2 inputs- 24VDC | |
| | Main Functions | | Multiple motor switching (a maximum of four independent motor parameter settings), Fast start-up, Deceleration Energy Back (DEB) function, Wobble frequency function, Fast deceleration function, Master and Auxiliary frequency source selectable, Restart after momentary power loss, Speed tracking, Over-torque detection, 16-step speed (including the master speed), Accel./decel. time switch, S-curve accel./decel., three-wire operation control, JOG frequency, Frequency upper/lower limit settings, DC brake at start-up and stop, PID control, Built-in PLC (2000 steps), and Simple positioning function. | |
| Application Macro | | Built-in application parameter groups (selected by industry) and user-defined application parameter groups. | | |
| Protection Characteristics | Motor Protection | | Over-current, over-voltage, over-heating, phase loss. | |
| | Stall Prevention | | Stall prevention during acceleration, deceleration, and running (independent settings). | |
| Accessory | Communication Card | | GS20A-CM-ENETIP (EtherNet/IP and Modbus TCP) | |
| | External DC Power Supply | | GS20A-BPS (24V power backup supply card) | |
| Agency Approvals | | | UL, CE ² , TUV (SIL 2), RoHS, REACH | |
| 1: Control accuracy may vary depending on the environment, application conditions, or different motors. For more information, contact AutomationDirect. | | | | |
| 2: See CE declaration here: https://support.automationdirect.com/docs/GS20A-GS20AX-CE.pdf | | | | |

DURAPULSE GS20(X) AC Drives – Environmental Specifications

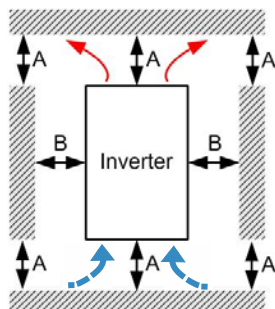
GS20(X) Environmental Specifications

| Environmental Conditions for GS20 AC Drives | | | |
|---|--|--|---|
| Condition | Operation | Storage | Transportation |
| Installation Location | IEC 60364-1/ IEC 60664-1 Pollution degree 2, Indoor use only. | | n/a |
| Ambient Temperature | IP20/UL Open Type: -20–50°C (-20–60°C w/derating) | -40–85°C | -20–70°C |
| | Non-condensing, non-freezing | | |
| Relative Humidity | 90%, no water condensation | | 95%, no water condensation |
| Air Pressure | 86–106 kPa | | 70–106 kPa |
| Pollution Level | IEC 60721-3, concentrate prohibited | | |
| | Class 3C2; Class 3S2 | Class 2C2; Class 2S2 | Class 1C2; Class 1S2 |
| Environmental Air | No corrosive/inflammable gases permitted | | |
| Altitude | <1000 m (For altitudes > 1000 m, derate to use it.) | | |
| Package Drop | n/a | ISTA procedure 1A (according to weight) IEC 60068-2-31 | |
| Vibration | 1.0 mm, peak to peak value range from 2–13.2 Hz; 0.7–2.0 G range from 13.2–55 Hz; 2.0 G range from 55–512 Hz. Compliance with IEC 60068-2-6 | | 2.5 G peak, 5 Hz–2 kHz 0.015" maximum displacement |
| Impact | 15G, 11ms Compliance with IEC/EN60068-2-27 | | 30G |
| DO NOT expose the GS20 AC Drive to harsh environments such as dust, direct sunlight, corrosive/flammable gases, humidity, liquid, or vibrations. The salts in the air must be less than 0.01 mg/cm ² every year. | | | |

| Environmental Conditions for GS20X AC Drives | | | |
|---|---|--|----------------------|
| Condition | Operation | Storage | Transportation |
| Installation Location | PCB design is compliant with IEC 60364-1 / IEC 60664-1 Pollution Degree 2. The outer case meets IP66 standard for indoor use. If the drive is for outdoor application, avoid direct sunlight. | n/a | n/a |
| Ambient Temperature | IP66 / NEMA 4X / UL Type 4X: -20-40°C (-20-50°C w/derating) | -40-85°C | -20-70°C |
| | Non-condensing, non-freezing | | |
| Relative Humidity | 0-100%, no water condensation | 95%, no water condensation | |
| Air Pressure | 86-106 kPa | 70-106 kPa | |
| Pollution Level | IEC 60721-3, concentrate prohibited | | |
| | Class 3C2; Class 3S2 | Class 2C2; Class 2S2 | Class 1C2; Class 1S2 |
| Altitude | <1000m (For altitudes > 1000m, derate to use it.) | | |
| Package Drop | n/a | ISTA procedure 1A (according to weight) IEC 60068-2-31 | |
| Vibration | 1.0 mm, peak to peak value range from 2-13.2 Hz; 0.7-2.0 G range from 13.2-55 Hz; 2.0 G range from 55-512 Hz; complies with IEC 60068-2-6. | 2.5 G peak, 5 Hz-2 kHz 0.015" maximum displacement | |
| Impact | 15G, 11ms Compliance with IEC/EN60068-2-27 | 30G | |
| DO NOT expose the GS20X AC Drive to harsh environments such as direct contact with chemical substance and solvent, and exposure to direct sunlight. | | | |

DURAPULSE GS20(X) AC Drives Specifications – Air Flow and Power (Heat) Dissipation

Minimum Clearances and Air Flow for GS20X Series Drives



Single Drive Installation

| GS20X Minimum Mounting Clearances* | | | | |
|------------------------------------|--------|--------|-----------------------|----------------|
| Installation Method | A (mm) | B (mm) | Operation Temperature | |
| | | | Max (w/out derating) | Max (Derating) |
| Single drive installation | 50 | 30 | 40 | 50 |

* The minimum mounting clearances stated in this table apply to GS20X drives frames A to C. Failure to follow the minimum mounting clearances may cause a heat dissipation problem.

| GS20X Airflow and Power Dissipation | | | | | | |
|-------------------------------------|------------|--------------------------|--------------------------------|---------------------------|----------|-------|
| Model Number | Frame Size | Airflow Rate for Cooling | | Power Dissipation (Watts) | | |
| | | Flow Rate (cfm) | Flow Rate (m ³ /hr) | Loss External (Heat sink) | Internal | Total |
| GS21X-20P5 | A | 0.0 | 0.0 | 16.3 | 14.5 | 30.8 |
| GS21X-21P0 | | | | 29.1 | 20.1 | 49.2 |
| GS23X-20P5 | | | | 16.5 | 12.6 | 29.1 |
| GS23X-21P0 | | | | 29.1 | 20.1 | 49.2 |
| GS23X-40P5 | | | | 17.6 | 11.1 | 28.7 |
| GS23X-41P0 | | | | 30.5 | 17.8 | 48.3 |
| GS21X-22P0 | | | | 46.5 | 31 | 77.5 |
| GS23X-22P0 | | | | 50.1 | 24.2 | 74.3 |
| GS23X-42P0 | | | | 45.9 | 21.7 | 67.6 |
| GS23X-43P0 | | | | 60.6 | 22.8 | 83.4 |
| GS21X-23P0 | B | 27.3 | 46.4 | 70.0 | 35.0 | 105.0 |
| GS23X-23P0 | | | | 76.0 | 30.7 | 106.7 |
| GS23X-25P0 | | | | 108.2 | 40.1 | 148.3 |
| GS23X-45P0 | | | | 93.1 | 42.0 | 135.1 |
| GS23X-27P5 | C | 33.5 | 56.6 | 192.8 | 53.3 | 246.1 |
| GS23X-47P5 | | | | 132.8 | 39.5 | 172.3 |
| GS23X-4010 | | | | 164.7 | 53.3 | 246.1 |

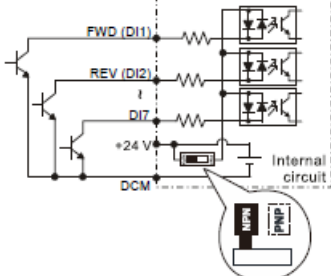
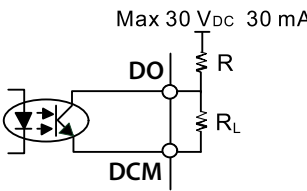
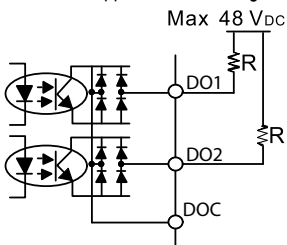
- Published flow rates are the result of active cooling using fans, factory installed in the drive.
- Unpublished flow rates (-) are the result of passive cooling in drives without factory installed fans.
- The required airflow shown in the chart is for installing a single GS20X drive in a confined space.

- When calculating power dissipation (Watt Loss), use the Total value. Heat dissipation shown in the chart is for installing a single GS20X drive in a confined space.
- Heat dissipation for each model is calculated by rated voltage, current and default carrier frequency.

DURAPULSE GS20(X) AC Drives Specifications

– Terminals

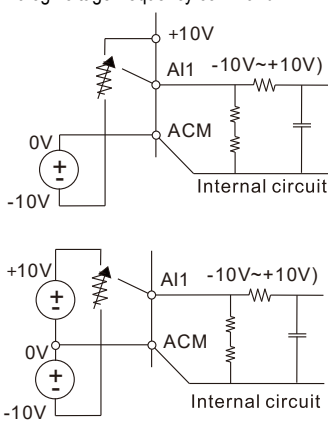
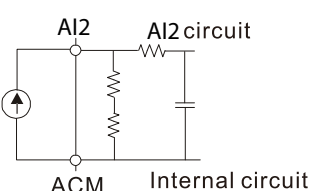
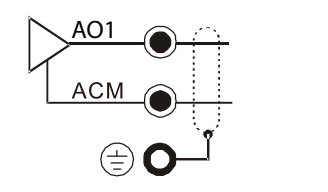
Control Circuit Terminal Names and Definitions

| Control Circuit Terminals | | |
|--|--|--|
| Terminal Symbol | Terminal Function | Description |
| +24V | Digital control signal common (Source) | +24V \pm 10% 100mA |
| FWD (DI1) REV (DI2) DI3 - DI7 | Digital input 1-7 ① Sink Mode with internal power (+24 V _{DC})  See pg.tGSX-35 for sinking/sourcing wiring examples. | <p>Source Mode: ON: activation current 3.3 mA \geq 11VDC OFF: cut-off voltage \leq 5VDC</p> <p>Sink Mode: ON: activation current 3.3 mA \leq 13VDC OFF: cut-off voltage \geq 19VDC</p> <p>DI7: Single pulse input, maximum input frequency=33kHz.</p> <p>Digital inputs can be configured by the user for many different functions. Refer to P02.01-02.07 to program the digital inputs FWD (DI1), REV (DI2), DI3-DI7. When P02.00=0, FWD (DI1) and REV (DI2) can be programmed.</p> <ul style="list-style-type: none"> When P02.00\neq0, the functions of FWD (DI1) and REV (DI2) act according to P02.00 setting. When P02.07=0, DI7 is pulse input terminal. DI7 uses pulse input can be used as frequency command source or connect it to the encoder for motor closed-loop control. DI7 motor closed-loop control only supports VFGP control mode. |
| DO | Digital frequency signal output  Max 30 V _{DC} 30 mA | DO uses pulse voltage as an output monitoring signal; Duty-cycle: 50% Min. load impedance RL: 1k Ω / 100pF Max. current endurance: 30 mA Max. voltage: 30VDC \pm 1% (when 30VDC / 30mA / RL=100pF) Max. output frequency: 33kHz Current-limiting resistor R: \geq 1K Ω Output load impedance RL Capacitive load \leq 100pF |
| DCM | Digital control / Frequency signal common (Sink) | Resistive load \geq 1k Ω , resistance determines the output voltage value. DO-DCM voltage = external voltage * (RL / (RL+R)) |
| DO1 | Digital Output 1 (photo coupler) | The AC motor drive outputs various monitoring signals, such as drive in operation, frequency reached, and overload indication through a transistor (open collector). Outputs can be wired as sinking or sourcing. See User manual Appendix D for wiring examples.  Max 48 V _{DC} 50 mA |
| DO2 | Digital Output 2 (photo coupler) | |
| DOC | Digital Output Common (photo coupler) | |
| R10 | Relay Output 1 (N.O.) | <p>Resistive Load</p> <ul style="list-style-type: none"> 3.0 A (NO), 3.0 A (NC) @250VAC 5.0 A (NO), 3.0 A (NC) @30VDC <p>Inductive Load (COS 0.4)</p> <ul style="list-style-type: none"> 1.2 A (NO), 1.2 A (NC) @250VAC 2.0 A (NO), 1.2 A (NC) @30VDC <p>To output different kinds of monitoring signals such as motor drive in operation, frequency reached, and overload indication.</p> |
| R1C | Relay Output 1 (N.C.) | |
| R1 | Relay Output 1 Common | |
| +10V | Potentiometer power supply | Power supply for analog frequency setting: +10.5 \pm 0.5 VDC / 20mA |

DURAPULSE GS20(X) AC Drives Specifications

– Terminals

Control Circuit Terminal Names and Definitions

| Control Circuit Terminals (continued) | | |
|---------------------------------------|--|---|
| Terminal Symbol | Terminal Function | Description |
| AI1 | <p>Analog voltage frequency command</p>  | <p>Impedance: 20kΩ Range: 0–10 V / -10–10 V = 0–Maximum Operation Frequency (P01.00) Mode switching by setting P03.00, P03.28 AI1 resolution=10 bits</p> |
| AI2 | <p>Analog current frequency command</p>  | <p>Impedance: Current mode=250 Ω, Voltage mode=20kΩ Range: 0–20 mA / 4–20 mA / 0–10 V = 0–Maximum Operation Frequency (P01.00) Mode switching by setting P03.01, P03.29 Switch: The AI2 default is 0–20 mA / 4–20 mA (current mode) AI2 resolution = 12 bits</p> |
| AO1 | <p>Multi-function analog voltage output</p>  | <p>Switch: The AO1 default is 0–10 V (voltage mode). To switch to the current mode, two steps are required: 1. A dip switch must be configured (follow the instructions on the inner side of the front cover). 2. Change P03.31 to 1 or 2 (see Chapter 4 of the GS20(X) User Manual). Voltage mode Range: 0–10 V (P03.31=0) corresponds to the maximum operating range of the control target Max. output current: 2mA Max. Load: 5kΩ Current mode Range: 0–20 mA (P03.31=1) / 4–20 mA (P03.31=2) corresponds to the maximum operating range of the control target, maximum load 500Ω AO1 resolution=10 bits</p> |
| ACM | Analog Signal Common | Analog signal common terminal |
| +24V (red) | STO 24V power terminal | |
| STO1, STO2 (red) | <p>Default: STO1 / STO2 short-circuited to +24V Rated voltage: 24VDC ± 10 %; maximum voltage: 30VDC ± 10 % Rated current: 6.67 mA ± 10 % STO activation mode Input voltage level: 0VDC < STO1-SCM or STO2-SCM < 5VDC STO response time ≤ 20ms (STO1 / STO2 operates until the AC motor drive stops outputting current) STO cut-off mode Input voltage level: 11VDC < STO1-SCM and STO2-SCM < 30VDC Power removal safety function per EN 954-1 and IEC / EN 61508 Note: Refer to Chapter 17 SAFE TORQUE OFF FUNCTION for details.</p> | |
| SCM (red) | STO Common - Signal Terminal | |
| SG+ | Modbus RS-485 | |
| SG- | Note: Refer to GS20(X) User Manual Chapter 4 Descriptions of Parameter Settings, Parameter Group 09: Communication Parameters for details. | |
| SGND | | |
| RJ45 | <p>PIN 1, 2, 6: Reserved PIN 3, 7: SGND PIN 4: SG- PIN 5: SG+ PIN 8: +10V supply GS4-KPD (provides optional power supply)</p> | The RJ45 port provides a serial communications connection. Max Baud Rate = 115.2 kbps |

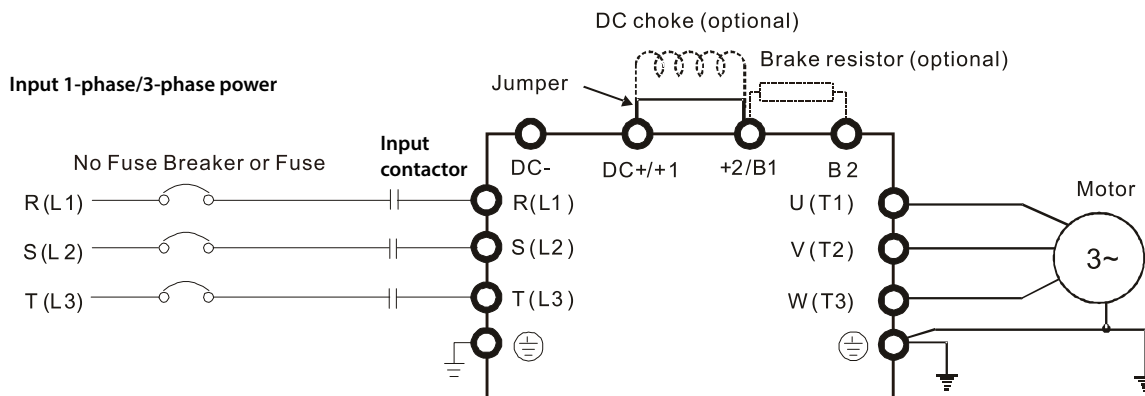
DURAPULSE GS20(X) AC Drives – Basic Wiring Diagram

Main Circuit Wiring Diagram: GS20(X) All Models

Note: Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to GS20(X) User Manual for additional specific wiring information.)

Note: DC reactors (chokes) are specified but not stocked by AutomationDirect.

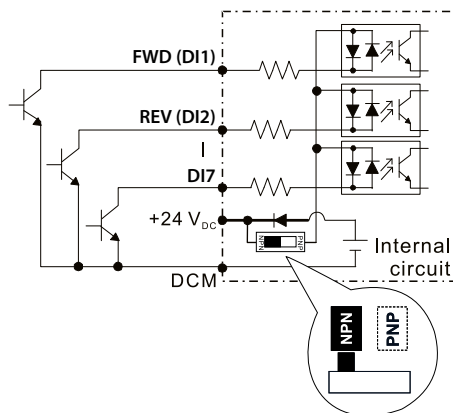
Note: DC- and DC+/+1 terminals are not available on 120V series drives.



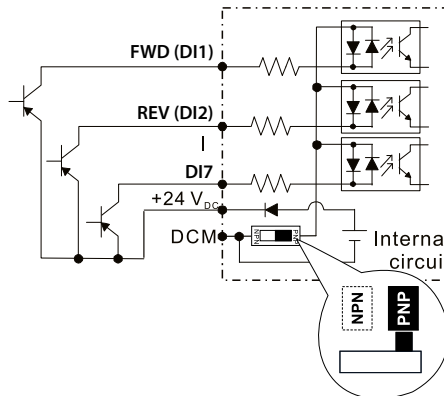
Control Circuit Wiring Diagram: Digital Inputs - Internal Power

Note: Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to GS20(X) User Manual for additional specific wiring information.)

- ① Sink Mode with internal power (+24 V_{DC})



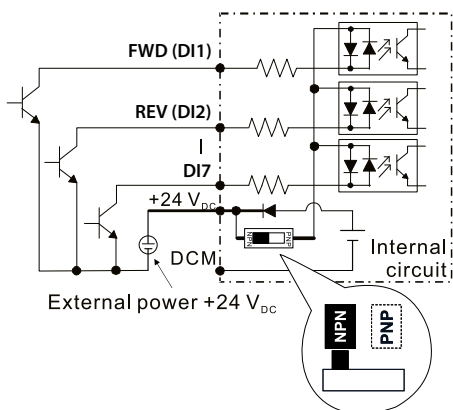
- ② Source Mode with internal power (+24 V_{DC})



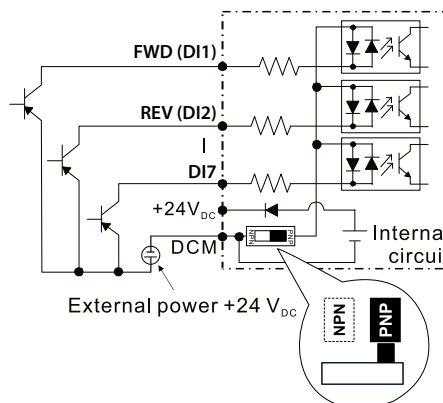
Control Circuit Wiring Diagram: Digital Inputs - External Power

Note: Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to GS20(X) User Manual for additional specific wiring information.)

- ③ Sink Mode with external power



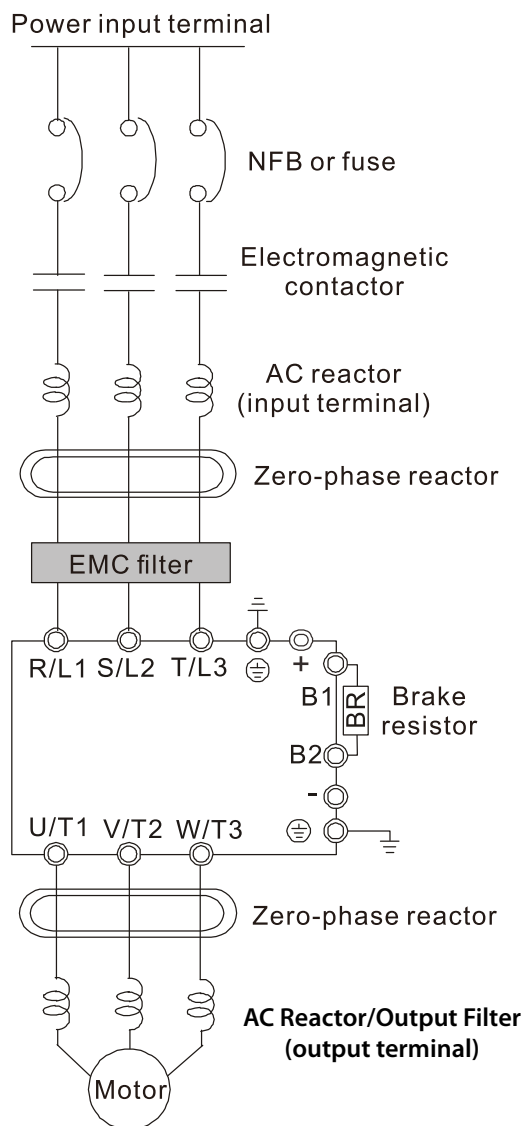
- ④ Source Mode with external power



DURAPULSE GS20(X) AC Drives – Basic Wiring Diagram

System Wiring Diagram:

Note: Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to user GS20(X) User Manual for additional specific wiring information.)

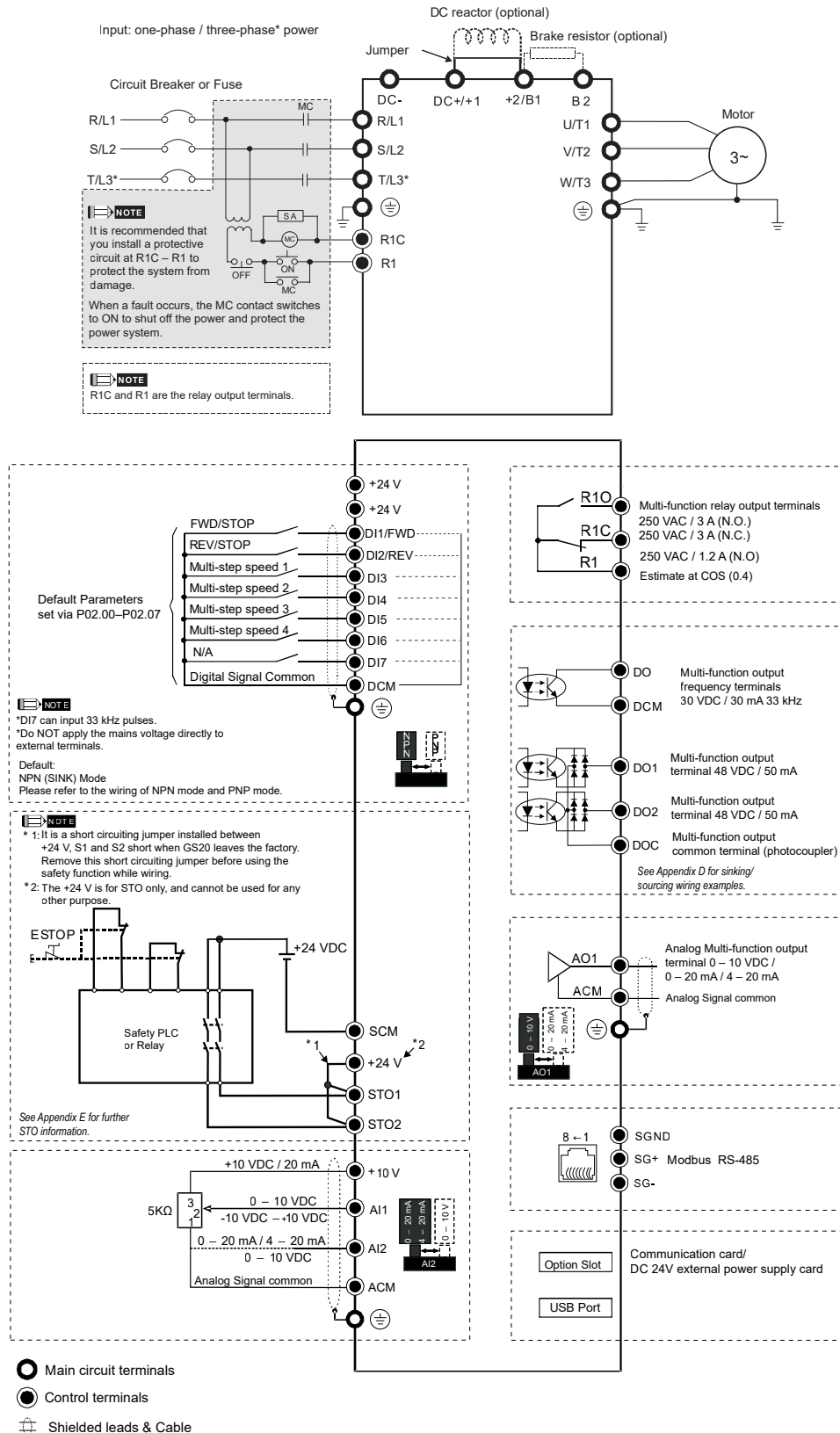


| System Wiring Components | |
|--|---|
| Component | Function |
| Power input terminal | Supply power according to the rated power specifications indicated in the manual |
| NFB or fuse | There may be a large inrush current during power on. Select a suitable NFB or Fuse. |
| Electromagnetic contactor | Switching the power ON/OFF on the primary side of the electromagnetic contactor can turn the drive ON/OFF, but frequent switching can cause drive failure. Do not switch ON/OFF more than once an hour. Do not use the electromagnetic contactor as the power switch for the drive; doing so shortens the life of the drive. |
| AC reactor (input terminal) | When the main power supply capacity is greater than 500kVA, or when it switches into the phase capacitor, the instantaneous peak voltage and current generated may destroy the internal circuit of the drive. It is recommended that you install an input side AC reactor in the drive. This also improves the power factor and reduces power harmonics. The wiring distance should be within 10 m. |
| Zero phase reactor | Used to reduce radiated interference, especially in environments with audio devices, and reduce input and output side interference. The effective range is AM band to 10MHz. |
| EMC filter | Can be used to reduce electromagnetic interference. |
| Brake module and Brake resistor (BR) | Used to shorten the deceleration time of the motor. |
| AC Reactor/Output Filter (output terminal) | The motor cable length affects the size of the reflected wave on the motor end. For motor distances greater than 100feet, the VTF series dV/dT filter is recommended. |

DURAPULSE GS20(X) AC Drives – Basic Wiring Diagram

Control Wiring Diagram: Full I/O

Note: Users **MUST** connect wiring according to the circuit diagram shown below. (Refer to user manual GS20-UMW for additional specific wiring information.)



DURApULSE GS20(X) AC Drives – Optional Accessories

Accessories Available for GS20(X) AC Drives

The table below lists types of accessories available for your GS20 or GS20X series drive. To see if your specific model can use a particular accessory, please click the reference link to go to the accessory page.

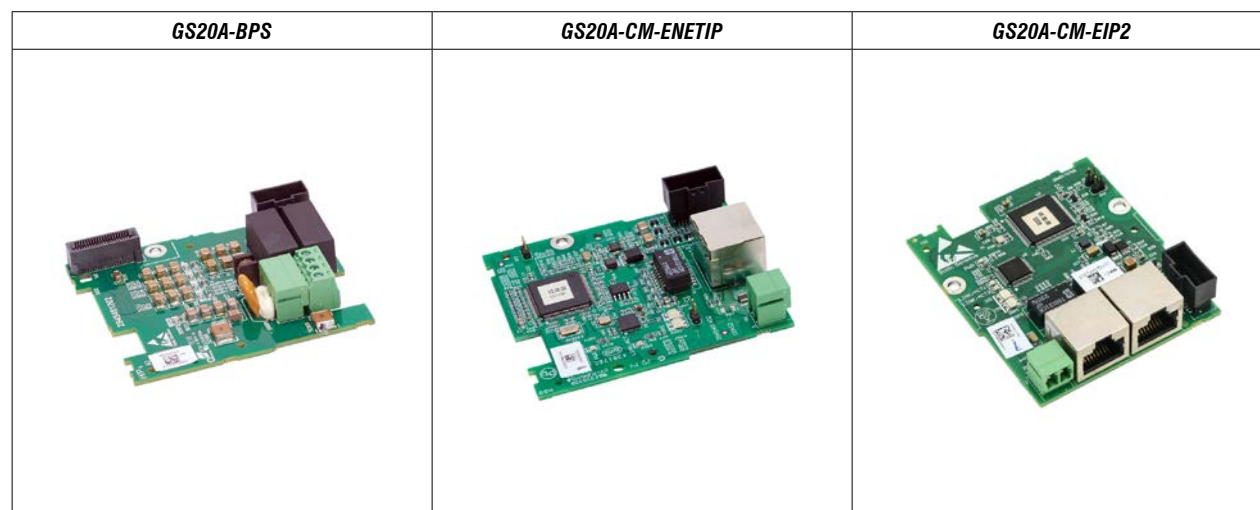
| GS20(X) AC Drives Available Software and Accessories | | | |
|--|--------------------|---------------------|---|
| Accessory | GS20 Series Drives | GS20X Series Drives | Reference |
| GSoft 2 Drive Software | ✓ | ✓ | "GSoft2 Drive Configuration Software" on page tGSX-103 |
| GSLogic PLC Software | ✓ | ✓ | "GSLOGIC Drive Configuration Software" on page tGSX-104 |
| Backup Power Supply | ✓ | ✓ | "GS20A-BPS" on page tGSX-59 |
| Braking Resistors | ✓ | ✓ | "GS10/GS20 Braking Resistors" on page tGSX-64 |
| Capacitive Filter | ✓ | ✓ | "Capacitive Filter" on page tGSX-79 |
| Communication Module | ✓ | ✓ | "GS20A-CM-ENETIP" on page tGSX-59 |
| Conduit Boxes | ✓ | | "GS20 Conduit Boxes" on page tGSX-67 |
| DIN Rail Mounting (A–C frame only) | ✓ | | "DIN Rail Mounting" on page tGSX-85 |
| Disconnect Switch | | ✓ | "GS20(X) Disconnect Switch" on page tGSX-78 |
| Earthing Plates | | ✓ | "GS20X Earthing Plate" on page tGSX-78 |
| EMC Filter | ✓ | ✓ | "GS10/GS20 High Performance EMI Input Filters" on page tGSX-73 |
| EMC Shield Plates | ✓ | | "EMC Shield Plate" on page tGSX-79 |
| EMI Filters | ✓ | ✓ | "GS10/GS20 High Performance EMI Input Filters" on page tGSX-73 |
| Fuses/Circuit Breakers | ✓ | ✓ | "GS20X Fuses/Circuit Breakers" on page tGSX-76 |
| Keypad Extension Cables | ✓ | | "GS20 Keypad Extension Cables" on page tGSX-80 |
| Line/Load Reactor/Voltage Time Filter | ✓ | ✓ | "GS20(X) Line Reactors/Voltage Time Filters" on page tGSX-83 |
| Mounting Adapter Plate (A–C frame only) | ✓ | | "Mounting Adapter Plate" on page tGSX-86 |
| Optional Advanced Keypad | ✓ | ✓ | "Advanced Keypad" on page tGSX-105 |
| Replacement Fan Kit | ✓ | ✓ | "Cooling Fans for GSxx Series Drives (Spare/Replacement)" on page tGSX-87 |
| Replacement Keypad | ✓ | | "GS20(X) Replacement Keypad" on page tGSX-80 |
| RF Filter | ✓ | ✓ | "RF Filter" on page tGSX-88 |

GS20(X) Optional Accessories – Expansion Cards

GS20(X) Optional Modules

The GS20A-BPS is a backup power supply option card that can be used to maintain functionality to your GS20 or GS20X drive when external power is unavailable. The GS20A-CM-ENETIP is a communication module that can be used to enable Modbus TCP and EtherNet/IP communication. Note that only one option module can be installed at a time. Please see the GS20(X) User Manual for additional information and installation instructions.

| GS20(X) DURApULSE Drives I/O and Communication Cards | | | | | |
|--|----------|---|---|------------|---------------|
| Part Number | Price | Description | Features/Specifications | Placement* | GS Drive |
| <u>GS20A-BPS</u> | \$150.00 | DURApULSE GS20(X) series Backup Power Supply Module | Provides external power supply and supports 24VDC input. Supports parameter read/write and drive status monitoring. When providing backup power, the following functions work normally: <ul style="list-style-type: none"> • Parameter reading and writing • Keypad display • Keys on the keyboard panel (except the RUN key) • Analog input with +10V terminal supply power • Multi-function inputs with +24V terminal or external power supply • Relay output • Pulse sequence frequency command • Testing RS485 communications | Slot 1 | GS20(X) – all |
| <u>GS20A-CM-ENETIP</u> | \$92.00 | DURApULSE GS20(X) series communication module, EtherNet/IP and Modbus TCP | Features: <ul style="list-style-type: none"> • Supports Modbus TCP and EtherNet/IP protocol • 32/32 words read/write parameters correspondence • User-defined corresponding parameters • MDI/MDI-X auto-detect • IP filter simple firewall function Specifications: <ul style="list-style-type: none"> • RJ45 with Auto MDI/MDIX interface • 1 port (ENETIP) or 2 ports (EIP2) • IEEE 802.3, IEEE 802.3u transmission method with Cat 5e shielding 100MHz cable at 10/100 Mbps Auto-detect transmission speed • Network protocol: ICMP, IP, TCP, UDP, DHCP, HTTP, SMTP, Modbus over TCP/IP, EtherNet/IP, BOOTP • Requires 15VDC provided by AC drive • 500VDC insulation voltage • 0.8 W power consumption • 25g (ENETIP) or 30g (EIP2) weight | Slot 1 | GS20(X) – all |
| <u>GS20A-CM-EIP2</u> | \$99.00 | DURApulse GS20 series communication module, EtherNet/IP and Modbus TCP, 2 ports, (2) Ethernet (RJ45) port(s). | | Slot 1 | GS20(X) – all |



GS20(X) Series Optional Accessories - Braking

GS20(X) Braking Resistors

Use the table below to find the appropriate braking resistor model for your GS20(X) series AC drive. For more information and installation instructions, please see the GS20 User Manual. All listed resistors are available for purchase at www.automationdirect.com.

| GS20(X) AC Drive Braking Component Selection | | | | | | | | | | | | |
|---|--------------|------------------|-----------------------------------|-----------------------------|---------------------------------------|---------------|---------------------|-------------------------|-------------------------------------|---------------|-------------------------|------|
| Drive Voltage | Drive Model | Motor Power (hp) | Drive Brake Capacity - Max Torque | | 125% Braking Torque @ 10% Duty Cycle* | | | | | | | |
| | | | Min Resistor Value (Ω) | Max Total Brake Current (A) | Open Type Braking Resistor | | | | NEMA1 Resistors with Thermal Switch | | | |
| | | | | | Part # | Qty. | Brake Torque (kg·m) | Total Brake Current (A) | Part # | Qty. | Total Brake Current (A) | |
| 120V | GS21-10P2 | 1/4 | 190.0 | 2 | GS-BR-080W750 | 1 | 0.1 | 0.5 | BR-N1-240W200 | 1 | 2.0 | |
| | GS21-10P5 | 1/2 | 95.0 | 4 | GS-BR-080W200 | 1 | 0.3 | 1.9 | BR-N1-240W150 | 1 | 2.6 | |
| | GS21-11P0 | 1 | 63.3 | 6 | | 1 | 0.5 | | 1 | | | |
| 230V | GS21-20P2 | 1/4 | 190.0 | 2 | GS-BR-080W750 | 1 | 0.1 | 0.5 | BR-N1-240W200 | 1 | 2.0 | |
| | GS21-20P5 | 1/2 | 95.0 | 4 | GS-BR-080W200 | 1 | 0.3 | 1.9 | BR-N1-240W150 | 1 | 2.6 | |
| | GS21-21P0 | 1 | 63.3 | 6 | | 1 | 0.5 | | 1 | | | |
| | GS21-22P0 | 2 | 47.5 | 8 | GS-BR-200W091 | 1 | 1 | 4.2 | BR-N1-280W50 | 1 | 7.8 | |
| | GS21-23P0 | 3 | 38.0 | 10 | GS-BR-300W070 | 1 | 1.5 | 5.4 | | 1 | | |
| | GS23-20P2 | 1/4 | 190.0 | 2 | GS-BR-080W750 | 1 | 0.1 | 0.5 | BR-N1-240W200 | 1 | 2.0 | |
| | GS23-20P5 | 1/2 | 95.0 | 4 | GS-BR-080W200 | 1 | 0.3 | 1.9 | BR-N1-240W150 | 1 | 2.6 | |
| | GS23-21P0 | 1 | 63.3 | 6 | | 1 | 0.5 | | 1 | | | |
| | GS23-22P0 | 2 | 47.5 | 8 | GS-BR-200W091 | 1 | 1 | 4.2 | BR-N1-280W50 | 1 | 7.8 | |
| | GS23-23P0 | 3 | 38.0 | 10 | GS-BR-300W070 | 1 | 1.5 | 5.4 | | 1 | | |
| | GS23-25P0 | 5 | 19.0 | 20 | GS-BR-400W040 | 1 | 2.5 | 9.5 | BR-N1-800W25 | 1 | 15.6 | |
| | GS23-27P5 | 7 1/2 | 16.5 | 23 | GS-BR-1K0W020 | 1 | 3.7 | 19 | BR-N1-800W18P0 | 1 | 21.7 | |
| | GS23-2010 | 10 | 14.6 | 26 | | 1 | 5.1 | | BR-N1-1K1W15P0 | 1 | 26.0 | |
| | GS23-2015 | 15 | 12.6 | 29 | GS-BR-1K5W013 | 1 | 7.4 | 29 | BR-N1-1K5W14P0 | 1 | 27.9 | |
| | GS23-2020 | 20 | 8.3 | 46 | GS-BR-1K0W4P3 (x2 series) | 2 | 10.2 | 44 | BR-N1-2K2W08P6 | 1 | 45.3 | |
| | 460V | GS23-40P5 | 1/2 | 380.0 | 2 | GS-BR-080W750 | 1 | 0.3 | 1 | BR-N1-250W400 | 1 | 2.0 |
| | | GS23-41P0 | 1 | 190.0 | 4 | | 1 | 0.5 | | BR-N1-240W200 | 1 | 3.9 |
| | | GS23-42P0 | 2 | 126.7 | 6 | GS-BR-200W360 | 1 | 1 | 2.1 | BR-N1-240W150 | 1 | 5.2 |
| | | GS23-43P0 | 3 | 108.6 | 7 | GS-BR-300W250 | 1 | 1.5 | 3 | BR-N1-500W200 | 1 | 3.9 |
| | | GS23-45P0 | 5 | 84.4 | 9 | GS-BR-400W150 | 1 | 2.5 | 5.1 | BR-N1-500W130 | 1 | 6.0 |
| GS23-47P5 | | 7 1/2 | 50.7 | 15 | GS-BR-1K0W075 | 1 | 3.7 | 10.2 | BR-N1-720W85 | 1 | 9.2 | |
| GS23-4010 | | 10 | 40.0 | 19 | | 1 | 5.1 | | BR-N1-1K2W50 | 1 | 15.6 | |
| GS23-4015 | | 15 | 33.0 | 23 | GS-BR-1K5W043 | 1 | 7.4 | 17.6 | BR-N1-1K5W40 | 1 | 19.5 | |
| GS23-4020 | | 20 | 26.2 | 29 | GS-BR-1K0W016(x2 series) | 2 | 10.2 | 24 | BR-N1-1K7W30 | 1 | 26.0 | |
| GS23-4025 | | 25 | 26.2 | 29 | GS-BR-1K0W016 (x2 series) | 2 | 12.2 | | BR-N1-2K3W26 | 1 | 30.0 | |
| 575V | GS23-4030 | 30 | 23.0 | 33 | GS-BR-1K5W013 (x2 series) | 2 | 14.9 | 29 | BR-N1-2K8W25 | 1 | 31.2 | |
| | GS23-51P0 | 1 | 280.0 | 4 | GS-BR-080W750 | 1 | 0.5 | 1.2 | BR-N1-250W400 | 1 | 2.8 | |
| | GS23-52P0 | 2 | 186.7 | 6 | GS-BR-200W360 | 1 | 1 | 2.6 | BR-N1-240W200 | 1 | 5.6 | |
| | GS23-53P0 | 3 | 160.0 | 7 | GS-BR-300W400 | 1 | 1.5 | 2.3 | BR-N1-500W200 | 1 | | |
| | GS23-55P0 | 5 | 93.3 | 12 | GS-BR-500W100 | 1 | 2.5 | 9.2 | BR-N1-500W130 | 1 | 8.6 | |
| | GS23-57P5 | 7 1/2 | 80.0 | 14 | GS-BR-750W140 | 1 | 3.7 | 6.6 | BR-N1-720W85 | 1 | 13.2 | |
| GS20X - 230V | GS23-5010 | 10 | 70.0 | 16 | GS-BR-1K0W075 | 1 | 5.1 | 12.3 | BR-N1-1K2W75 | 1 | 14.9 | |
| | GS21X-20P5 | 1/2 | 95.0 | 4 | GS-BR-080W200 | 1 | 0.3 | 1.9 | BR-N1-240W150 | 1 | 2.6 | |
| | GS21X-21P0 | 1 | 63.3 | 6 | | 1 | 0.5 | | | 1 | | |
| | GS21X-22P0 | 2 | 47.5 | 8 | GS-BR-200W091 | 1 | 1 | 4.2 | BR-N1-280W50 | 1 | 7.8 | |
| | GS21X-23P0 | 3 | 38.0 | 10 | GS-BR-300W070 | 1 | 1.5 | 5.4 | | 1 | | |
| | GS23X-20P5 | 1/2 | 190.0 | 2 | GS-BR-080W200 | 1 | 0.1 | 0.5 | BR-N1-240W200 | 1 | 2.0 | |
| | GS23X-21P0 | 1 | 95.0 | 4 | | 1 | 0.3 | | | 1 | | |
| | GS23X-22P0 | 2 | 63.3 | 6 | GS-BR-200W091 | 1 | 0.5 | 1.9 | BR-N1-240W150 | 1 | 2.6 | |
| | GS23X-23P0 | 3 | 47.5 | 8 | GS-BR-300W070 | 1 | 1 | 4.2 | | 1 | | |
| | GS23X-25P0 | 5 | 38.0 | 10 | GS-BR-400W040 | 1 | 1.5 | 5.4 | BR-N1-280W50 | 1 | 7.8 | |
| | GS23X-27P5 | 7 1/2 | 19.0 | 20 | GS-BR-1K0W020 | 1 | 2.5 | 9.5 | | 1 | | |
| | GS20X - 460V | GS23X-40P5 | 1/2 | 380.0 | 2 | GS-BR-080W750 | 1 | 0.3 | 1 | BR-N1-800W25 | 1 | 15.6 |
| GS23X-41P0 | | 1 | 190.0 | 4 | 1 | | 0.5 | BR-N1-800W18P0 | | 1 | 21.7 | |
| GS23X-42P0 | | 2 | 126.7 | 6 | GS-BR-200W360 | 1 | 1 | 2.1 | BR-N1-240W200 | 1 | 3.9 | |
| GS23X-43P0 | | 3 | 108.6 | 7 | GS-BR-300W250 | 1 | 1.5 | 3 | BR-N1-240W150 | 1 | 5.2 | |
| GS23X-45P0 | | 5 | 84.4 | 9 | GS-BR-400W150 | 1 | 2.5 | 5.1 | BR-N1-500W200 | 1 | 3.9 | |
| GS23X-47P5 | | 7 1/2 | 50.7 | 15 | GS-BR-1K0W075 | 1 | 3.7 | 10.2 | BR-N1-500W130 | 1 | 6.0 | |
| GS23X-4010 | | 10 | 40.0 | 19 | | 1 | 5.1 | | BR-N1-720W85 | 1 | 9.2 | |
| | | | | | | | | | BR-N1-1K2W50 | 1 | 15.6 | |
| * 10% Duty Cycle with maximum ON (braking) time for 10 seconds. | | | | | | | | | | | | |

* 10% Duty Cycle with maximum ON (braking) time for 10 seconds.

GS20(X) Optional Accessories – EMC Filter & Zero Phase Reactor

GS20(X) Standard Footprint EMC Filter and Zero Phase Reactor

If electromagnetic noise is harmful to your manufacturing environment, we recommend that you select an EMC filter as shown below. For some motor drive models, you need to work with zero phase reactors to be compliant with EMC regulations. Refer to the table and figure below for the recommended model, setting method, and maximum motor cable length of the EMC filter and zero phase reactor. The footprint filter allows mounting of the drive on top of the recommended filter, saving panel space and wiring. For more information and installation instructions, please see the GS20(X) User Manual.

| GS20(X) EMC Filter and Zero Phase Reactor | | | | | | | | | | | | |
|---|-------------|-------------------|--------------------------|----------|--------------------------------|--|---|----------------------------|-----------------------------|-------------------|---|---|
| Frame | Drive Model | Input Current (A) | Footprint Filter Model # | Price | Recommended Zero Phase Reactor | Conducted Emission | | | | Radiated Emission | | |
| | | | | | | C1-motor cable length-30m | | C2-motor cable length-100m | C2-motor cable length- 100m | | | |
| | | | | | | Position to Install a Zero Phase Reactor | | | | | | |
| 1 | 2 | 3 | n/a | 1 | 2 | 3 | | | | | | |
| A | GS21-10P2 | 6.8 | EMF11AM21A | \$58.00 | RF008X00A | | | | N/A | | | |
| | GS21-20P2 | 3.8 | EMF11AM21A | \$58.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS21-20P5 | 6.7 | EMF11AM21A | \$58.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-20P2 | 2.2 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-20P5 | 3.8 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-21P0 | 6 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-40P5 | 2.5 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| | GS23-41P0 | 4.2 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| | GS23-51P0 | 2.4 | EMF6A0M63B | \$167.00 | | | | | N/A* | | | |
| | GS21-10P5 | 10.1 | EMF11AM21A | \$58.00 | | | | | N/A | | | |
| GS20X A | GS21X-20P5 | 8.3 | EMF11AM21A | \$58.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS21X-21P0 | 11.3 | EMF11AM21A | \$58.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS21X-22P0 | 18.5 | EMF27AM21B | \$102.00 | | | | ✓ | N/A | | | ✓ |
| | GS23X-20P5 | 3.8 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23X-21P0 | 6 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23X-22P0 | 9.6 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23X-40P5 | 2.5 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| | GS23X-41P0 | 4.2 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| | GS23X-42P0 | 6.4 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| | GS23X-43P0 | 7.2 | EMF12AM43B | \$128.00 | | | | | N/A | | | |
| B | GS21-21P0 | 10.5 | EMF11AM21A | \$58.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-22P0 | 9.6 | EMF10AM23A | \$80.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-52P0 | 4.2 | EMF6A0M63B | \$167.00 | | | | | N/A* | | | |
| | GS23-42P0 | 6.4 | EMF6A0M43A | \$73.00 | | | | ✓ | N/A | | | ✓ |
| GS20X B | GS21X-23P0 | 27.5 | EMF27AM21B | \$102.00 | | | | ✓ | N/A | | | ✓ |
| | GS23X-23P0 | 15 | EMF24AM23B | \$125.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23X-25P0 | 23.4 | EMF24AM23B | \$125.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23X-45P0 | 11.6 | EMF12AM43B | \$128.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| C | GS21-11P0 | 20.6 | EMF27AM21B | \$102.00 | | | | | N/A | | | |
| | GS21-22P0 | 17.9 | EMF27AM21B | \$102.00 | | | | ✓ | N/A | | | ✓ |
| | GS21-23P0 | 26.3 | EMF27AM21B | \$102.00 | | | | ✓ | N/A | | | ✓ |
| | GS23-23P0 | 15 | EMF24AM23B | \$125.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-25P0 | 23.4 | EMF24AM23B | \$125.00 | | | ✓ | ✓ | N/A | | ✓ | ✓ |
| | GS23-43P0 | 7.2 | EMF12AM43B | \$128.00 | | | | | N/A | | | |
| | GS23-53P0 | 5.8 | EMF16AM63B | \$171.00 | | | | | N/A* | | | |
| | GS23-55P0 | 9.3 | EMF16AM63B | \$171.00 | | | | | N/A | | | |
| | GS23-45P0 | 11.6 | EMF12AM43B | \$128.00 | | | | ✓ | N/A | | ✓ | ✓ |
| | GS23X-27P5 | 32.4 | EMF33AM23B | \$182.00 | | ✓ | ✓ | | N/A | ✓ | ✓ | |
| GS20X C | GS23X-47P5 | 17.3 | EMF23AM43B | \$175.00 | | ✓ | ✓ | ✓ | N/A | ✓ | ✓ | ✓ |
| | GS23X-4010 | 22.6 | EMF23AM43B | \$175.00 | | ✓ | ✓ | ✓ | N/A | ✓ | ✓ | ✓ |
| Continued on next page | | | | | | | | | | | | |

Continued on next page

GS20(X) Optional Accessories – EMC Filter & Zero Phase Reactor

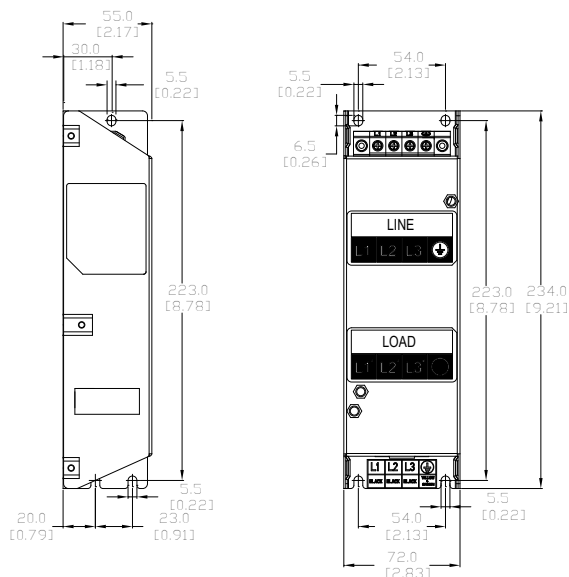
GS20(X) Standard Footprint EMC Filter and Zero Phase Reactor, continued

| GS20(X) EMC Filter and Zero Phase Reactor (continued) | | | | | | | | | | | | | | |
|---|---------------------------|-------------------|----------------------------|----------|--------------------------------|--|---|---|----------------------------|-----------------------------|---|---|---|--|
| Frame | Drive Model | Input Current (A) | Footprint Filter Model # | Price | Recommended Zero Phase Reactor | Conducted Emission | | | | Radiated Emission | | | | |
| | | | | | | C1-motor cable length-30m | | | C2-motor cable length-100m | C2-motor cable length- 100m | | | | |
| | | | | | | Position to Install a Zero Phase Reactor | | | | | | | | |
| | | | | | | 1 | 2 | 3 | n/a | 1 | 2 | 3 | | |
| D | GS23-27P5 | 32.4 | EMF33AM23B | \$182.00 | RF008X00A | ✓ | ✓ | | N/A | ✓ | ✓ | | | |
| | GS23-47P5 | 17.3 | EMF23AM43B | \$175.00 | | ✓ | ✓ | ✓ | N/A | ✓ | ✓ | ✓ | | |
| | GS23-57P5 | 13.4 | EMF16AM63B | \$171.00 | | | | | N/A | | | | | |
| | GS23-5010 | 17.5 | EMF16AM63B | \$171.00 | | | | | N/A | | | | | |
| | GS23-4010 | 22.6 | EMF23AM43B | \$175.00 | | ✓ | ✓ | ✓ | N/A | ✓ | ✓ | ✓ | | |
| E | GS23-2010 | 43.2 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |
| | GS23-2015 | 61.2 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |
| | GS23-4015 | 30.8 | n/a | – | | | | | | N/A | | | | |
| | GS23-4020 | 39.6 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |
| | GS23-2020 | 82.8 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |
| F | GS23-4025 | 45.7 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |
| | GS23-4030 | 53.9 | n/a | – | | | | ✓ | ✓ | N/A | | ✓ | ✓ | |

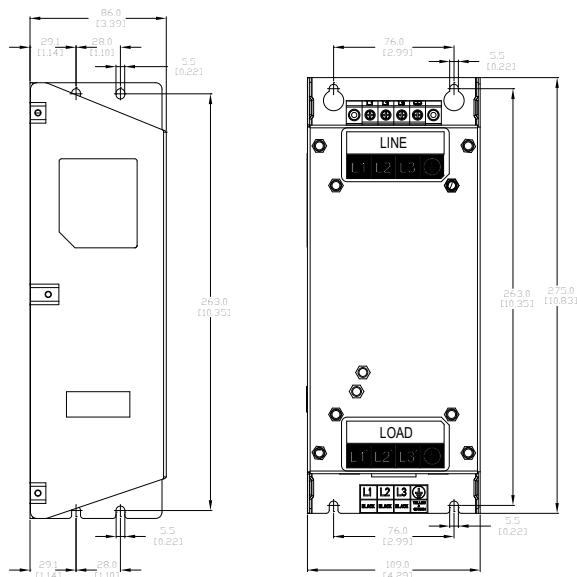
Note: It is not necessary to add a zero phase reactor for passing the C2 conducted emission test.
* The maximum motor cable length of the conducted emission C2 class for GS23-51P0, GS23-52P0, and GS23-53P0 is 75 meters. All others are 100 meters.
** See diagram below for installation positions.

EMF Series Filter Dimensions

(Units = mm [in])



EMF11AM21A
EMF10AM23A
EMF6A0M43A



EMF27AM21B; EMF24AM23B
EMF33AM23B; EMF12AM43B
EMF23AM43B; EMF6A0M63B;
EMF16AM63B

GS10/GS20 Series Optional Accessories – EMI Input Filters

GS10/GS20 High Performance EMI Input Filters

High performance EMI filters may improve drive performance for certain applications. Use the table below to select the correct filter for your drive. For additional information and installation instructions, please see your GSx series User Manual.

| EMI Filters Selection | | | | |
|----------------------------|----------------------------|------------------|------------------------------|---------------------------|
| Model | | Description | EMI Filter* | |
| GS10 Drives | GS20(X) Drives | | Roxburgh Filters Chassis 1ph | Roxburgh Filters C2 Rated |
| GS11N-10P2 | GS21-10P2 | 120V 1ph 0.25 hp | RES90F10 | MIF10 |
| GS11N-10P5 | GS21-10P5 | 120V 1ph 0.5 hp | RES90F16 | MIF16 |
| GS11N-11P0 | GS21-11P0 | 120V 1ph 1.0 hp | RES90S30 | MIF23 |
| GS11N-20P2 | GS21-20P2 | 230V 1ph 0.25 hp | RES90F06 | MIF06 |
| GS11N-20P5 | GS21-20P5 | 230V 1ph 0.5 hp | RES90F10 | MIF10 |
| GS11N-21P0 | GS21-21P0 | 230V 1ph 1.0 hp | RES90F16 | MIF16 |
| GS11N-22P0 | GS21-22P0 | 230V 1ph 2.0 hp | RES90S20 | MIF23 |
| GS11N-23P0 | GS21-23P0 | 230V 1ph 3.0 hp | RES90S30 | MIF330B |
| GS13N-20P2 | GS23-20P2 | 230V 3ph 0.25 hp | - | KMF306A |
| GS13N-20P5 | GS23-20P5 | 230V 3ph 0.5 hp | - | KMF306A |
| GS13N-21P0 | GS23-21P0 | 230V 3ph 1.0 hp | - | KMF306A |
| GS13N-22P0 | GS23-22P0 | 230V 3ph 2.0 hp | - | KMF318A |
| GS13N-23P0 | GS23-23P0 | 230V 3ph 3.0 hp | - | KMF318A |
| GS13N-25P0 | GS23-25P0 | 230V 3ph 5.0 hp | - | KMF325A |
| GS13N-27P5 | GS23-27P5 | 230V 3ph 7.5 hp | - | KMF336A |
| n/a | GS23-2010 | 230V 3ph 10hp | - | KMF350A |
| | GS23-2015 | 230V 3ph 15hp | - | KMF370A |
| | GS23-2020 | 230V 3ph 20hp | - | KMF3100A |
| GS13N-40P5 | GS23-40P5 | 460V 3ph 0.5 hp | - | KMF306A |
| GS13N-41P0 | GS23-41P0 | 460V 3ph 1.0 hp | - | KMF306A |
| GS13N-42P0 | GS23-42P0 | 460V 3ph 2.0 hp | - | KMF306A |
| GS13N-43P0 | GS23-43P0 | 460V 3ph 3.0 hp | - | KMF310A |
| GS13N-45P0 | GS23-45P0 | 460V 3ph 5.0 hp | - | KMF318A |
| GS13N-47P5 | GS23-47P5 | 460V 3ph 7.5 hp | - | KMF318A |
| GS13N-4010 | GS23-4010 | 460V 3ph 10hp | - | KMF325A |
| n/a | GS23-4015 | 460V 3ph 15hp | - | KMF336A |
| | GS23-4020 | 460V 3ph 20hp | - | KMF350A |
| | GS23-4025 | 460V 3ph 25hp | - | KMF350A |
| | GS23-4030 | 460V 3ph 30hp | - | KMF370A |
| | GS23-51P0 | 575V 3ph 1.0 hp | - | KMF306V |
| | GS23-52P0 | 575V 3ph 2.0 hp | - | KMF306V |
| | GS23-53P0 | 575V 3ph 3.0 hp | - | KMF306V |
| | GS23-55P0 | 575V 3ph 5.0 hp | - | KMF310V |
| | GS23-57P5 | 575V 3ph 7.5 hp | - | KMF318V |
| | GS23-5010 | 575V 3ph 10hp | - | KMF318V |
| | GS21X-20P5 | 230V 1ph 0.5 hp | RES90F10 | MIF10 |
| | GS21X-21P0 | 230V 1ph 1.0 hp | RES90F16 | MIF16 |
| | GS21X-22P0 | 230V 1ph 2.0 hp | RES90S20 | MIF23 |
| | GS21X-23P0 | 230V 1ph 3.0 hp | RES90S30 | MIF330B |
| | GS23X-20P5 | 230V 3ph 0.5 hp | - | KMF306A |
| | GS23X-21P0 | 230V 3ph 1.0 hp | - | KMF306A |
| | GS23X-22P0 | 230V 3ph 2.0 hp | - | KMF310A |
| | GS23X-23P0 | 230V 3ph 3.0 hp | - | KMF318A |
| | GS23X-25P0 | 230V 3ph 5.0 hp | - | KMF325A |
| | GS23X-27P5 | 230V 3ph 7.5 hp | - | KMF336A |
| | GS23X-40P5 | 460V 3ph 0.5 hp | - | KMF306A |
| | GS23X-41P0 | 460V 3ph 1.0 hp | - | KMF306A |
| | GS23X-42P0 | 460V 3ph 2.0 hp | - | KMF306A |
| | GS23X-43P0 | 460V 3ph 3.0 hp | - | KMF310A |
| | GS23X-45P0 | 460V 3ph 5.0 hp | - | KMF318A |
| | GS23X-47P5 | 460V 3ph 7.5 hp | - | KMF318A |
| | GS23X-4010 | 460V 3ph 10hp | - | KMF325A |

* All specs for the EMI filters can be found at www.automationdirect.com or by clicking the following links: [-KMF Series Filters](#), [-MIF Series Filters](#), [-RES90 Series Filters](#)

GS20(X) Optional Accessories – Fuses/Circuit Breakers

GS20X Fuses/Circuit Breakers

Protection devices are essential to prevent damage to your GS20(X) drive and application equipment. Please use the fuse specification chart below to select fuses that are applicable to your GS20(X) drive. Only use UL-certified fuses which comply with your local regulations.

| Fuse Specification Chart GS20(X) DURAPULSE Drives | | | | | | | | | |
|---|-------|-------------|-------|--------------------|------------|---------------------|-----------------|-----------------|-------------------|
| Drive Model | HP | Input Power | | | Input Fuse | | | Circuit Breaker | |
| | | Ø | Volts | GS20(X) Input Amps | Fuse Amps | Fast Acting Class T | Edison Class J* | Size | Molded Case CB |
| GS21-10P2 | 1/4 | 1 | 120 | 6.8 | 10 | TJN10 | JHL10 | 20 | G3P-020 |
| GS21-10P5 | 1/2 | 1 | 120 | 10.1 | 10 | TJN10 | JHL10 | 25 | G3P-025 |
| GS21-11P0 | 1 | 1 | 120 | 20.6 | 25 | TJN25 | JHL25 | 50 | G3P-050 |
| GS21-20P2 | 1/4 | 1 | 230 | 5.8 | 10 | TJN10 | JHL10 | 15 | G3P-015 |
| GS21-20P5 | 1/2 | 1 | 230 | 8.3 | 15 | TJN15 | JHL15 | 20 | G3P-020 |
| GS21-21P0 | 1 | 1 | 230 | 11.3 | 20 | TJN20 | JHL20 | 30 | G3P-030 |
| GS21-22P0 | 2 | 1 | 230 | 18.5 | 35 | TJN35 | JHL35 | 45 | G3P-040 |
| GS21-23P0 | 3 | 1 | 230 | 27.5 | 50 | TJN50 | JHL50 | 70 | G3P-070 |
| GS23-20P2 | 1/4 | 3 | 230 | 2.2 | 10 | TJN10 | JHL10 | 15 | G3P-015 |
| GS23-20P5 | 1/2 | 3 | 230 | 3.8 | 15 | TJN15 | JHL15 | 15 | G3P-015 |
| GS23-21P0 | 1 | 3 | 230 | 6 | 20 | TJN20 | JHL20 | 15 | G3P-015 |
| GS23-22P0 | 2 | 3 | 230 | 9.6 | 35 | TJN35 | JHL35 | 25 | G3P-025 |
| GS23-23P0 | 3 | 3 | 230 | 15 | 50 | TJN50 | JHL50 | 40 | G3P-040 |
| GS23-25P0 | 5 | 3 | 230 | 23.4 | 80 | TJN80 | JHL80 | 60 | G3P-060 |
| GS23-27P5 | 7 1/2 | 3 | 230 | 32.4 | 60 | TJN60 | JHL60 | 63 | G3P-060 |
| GS23-2010 | 10 | 3 | 230 | 43.2 | 80 | TJN80 | JHL80 | 90 | G3P-090 |
| GS23-2015 | 15 | 3 | 230 | 61.2 | 110 | TJN110 | JHL110 | 125 | F3P-125 |
| GS23-2020 | 20 | 3 | 230 | 82.8 | 150 | TJN150 | JHL150 | 160 | BW250JAGU-3P160SB |
| GS23-40P5 | 1/2 | 3 | 460 | 2 | 10 | TJS10 | JHL10 | 15 | G3P-015 |
| GS23-41P0 | 1 | 3 | 460 | 3.3 | 15 | TJS15 | JHL15 | 15 | G3P-015 |
| GS23-42P0 | 2 | 3 | 460 | 5.1 | 20 | TJS20 | JHL20 | 15 | G3P-015 |
| GS23-43P0 | 3 | 3 | 460 | 7.2 | 25 | TJS25 | JHL25 | 20 | G3P-020 |
| GS23-45P0 | 5 | 3 | 460 | 11.6 | 45 | TJS45 | JHL45 | 30 | G3P-030 |
| GS23-47P5 | 7 1/2 | 3 | 460 | 17.3 | 35 | TJS35 | JHL35 | 32 | G3P-030 |
| GS23-4010 | 10 | 3 | 460 | 22.6 | 45 | TJS45 | JHL45 | 45 | G3P-040 |
| GS23-4015 | 15 | 3 | 460 | 30.8 | 60 | TJS60 | JHL60 | 60 | G3P-060 |
| GS23-4020 | 20 | 3 | 460 | 39.6 | 80 | TJS80 | JHL80 | 80 | G3P-080 |
| GS23-4025 | 25 | 3 | 460 | 45.7 | 90 | TJS90 | JHL90 | 90 | G3P-090 |
| GS23-4030 | 30 | 3 | 460 | 53.9 | 110 | TJS110 | JHL110 | 100 | G3P-100 |
| GS23-51P0 | 1 | 3 | 575 | 2.4 | 6 | TJS6 | JHL6 | 6 | n/a |
| GS23-52P0 | 2 | 3 | 575 | 4.2 | 10 | TJS10 | JHL10 | 10 | n/a |
| GS23-53P0 | 3 | 3 | 575 | 5.8 | 10 | TJS10 | JHL10 | 15 | BW125JAGU-3P015SB |
| GS23-55P0 | 5 | 3 | 575 | 9.3 | 20 | TJS20 | JHL20 | 30 | BW125JAGU-3P030SB |
| GS23-57P5 | 7 1/2 | 3 | 575 | 13.4 | 25 | TJS25 | JHL25 | 30 | BW125JAGU-3P030SB |
| GS23-5010 | 10 | 3 | 575 | 17.5 | 30 | TJS30 | JHL30 | 30 | BW125JAGU-3P030SB |
| GS21X-20P5 | 1/2 | 1 | 230 | 8.3 | 15 | TJN15 | JHL15 | 16 | G3P-015 |
| GS21X-21P0 | 1 | 1 | 230 | 11.3 | 20 | TJN20 | JHL20 | 25 | G3P-025 |
| GS21X-22P0 | 2 | 1 | 230 | 18.5 | 35 | TJN35 | JHL35 | 45 | G3P-040 |
| GS21X-23P0 | 3 | 1 | 230 | 27.5 | 50 | TJN50 | JHL50 | 63 | G3P-060 |
| GS23X-20P5 | 1/2 | 3 | 230 | 3.8 | 15 | TJN15 | JHL15 | 10 | FAZ-C10-3-NA |
| GS23X-21P0 | 1 | 3 | 230 | 6 | 20 | TJN20 | JHL20 | 15 | G3P-015 |
| GS23X-22P0 | 2 | 3 | 230 | 9.6 | 35 | TJN35 | JHL35 | 25 | G3P-025 |
| GS23X-23P0 | 3 | 3 | 230 | 15 | 50 | TJN50 | JHL50 | 40 | G3P-040 |
| GS23X-25P0 | 5 | 3 | 230 | 23.4 | 80 | TJN80 | JHL80 | 60 | G3P-060 |
| GS23X-27P5 | 7 1/2 | 3 | 230 | 32.4 | 60 | TJN60 | JHL60 | 63 | G3P-060 |
| GS23X-40P5 | 1/2 | 3 | 460 | 2.5 | 10 | TJS10 | JHL10 | 6 | FAZ-C5-3-NA |
| GS23X-41P0 | 1 | 3 | 460 | 4.2 | 15 | TJS15 | JHL15 | 10 | FAZ-C10-3-NA |
| GS23X-42P0 | 2 | 3 | 460 | 6.4 | 20 | TJS20 | JHL20 | 16 | G3P-015 |
| GS23X-43P0 | 3 | 3 | 460 | 7.2 | 25 | TJS25 | JHL25 | 16 | G3P-015 |
| GS23X-45P0 | 5 | 3 | 460 | 11.6 | 35 | TJS35 | JHL35 | 30 | G3P-030 |
| GS23X-47P5 | 7 1/2 | 3 | 460 | 17.3 | 35 | TJS35 | JHL35 | 30 | G3P-030 |
| GS23X-4010 | 10 | 3 | 460 | 22.6 | 45 | TJS45 | JHL45 | 45 | G3P-040 |

* High-speed Class J.

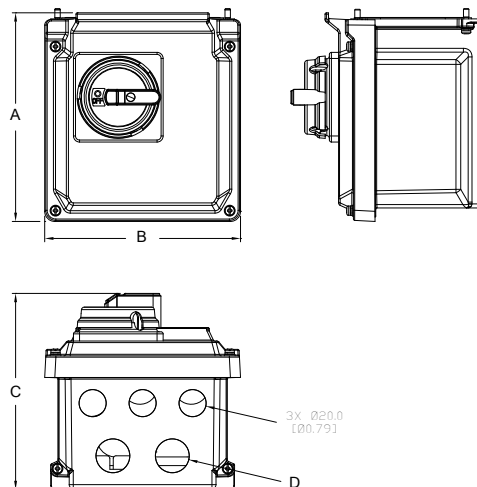
Note: JHL fuses can be used with GS and DURAPULSE drives in non-UL applications. Fuse the drive according to NEC guidelines (NEC Article 430). For UL applications, GS, and DURAPULSE drives require Class T fuses (refer to the drive's user manual for details).

GS20(X) Series Optional Accessories – General

GS20(X) Disconnect Switch

The GS20XA-DSx series disconnect switch provides a local on/off disconnect switch that is easily mounted to the GS20(X) drive. This accessory provides an easy, quick, single hasp lockout point to isolate power to the drive. For more information and installation instructions, see the GS20(X) User Manual.

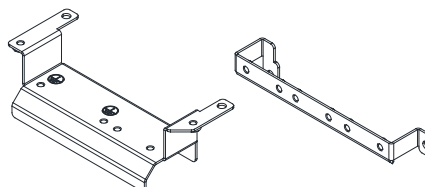
| GS20X Disconnect Switch Selection | | | | | | |
|-----------------------------------|----------------------------|----------|----------------------|-----------------|-----------------|---------------------|
| Frame | Part Number | Price | Dimensions (mm [in]) | | | |
| | | | A | B | C | D |
| A | GS20XA-DSA | \$127.00 | 154.5 [6.08] | 145.0 [5.71] | 145.2 [5.72] | 2x Ø25.0 [Ø0.98] |
| B | GS20XA-DSB | \$132.00 | 164.5 [6.48] | 165.0 [6.50] | 152.5 [6.01] | 2x Ø32.4 [Ø1.28] |
| C | GS20XA-DSC | \$219.00 | | | | |



GS20X Earthing Plate

Earthing plates are available for use with shielded cable and your GS20X drive. For GS20 drives, please use EMC shield plates. Each earthing plate is compatible with all GS20X drives of that frame size. For more information and installation instructions, see the GS20(X) User Manual.

| Earthing Plate Selection | | | |
|--------------------------|-------|----------------------------|---------|
| Drive Series | Frame | Earthing Plate Model | Price |
| GS20X | A | GS20XA-EPA | \$40.00 |
| GS20X | B | GS20XA-EPB | \$46.00 |
| GS20X | C | GS20XA-EPC | \$46.50 |



Example Earthing Plate - GS20XA-EPA

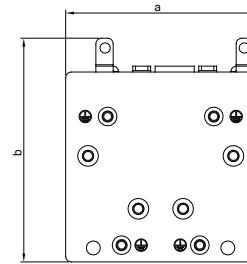
DuraPulse Optional Accessories – General

EMC Shield Plate

EMC Shield Plates are available for use with shielded cable and your GS10/GS20/GS30 drive. For GS20X drives, please use Earthing Plates. Each shield plate is compatible with all GS10, GS20, and GS30 drives of that frame size. For more information and installation instructions, see your GSxx series User Manual.

| EMC Shield Plate Selection | | | |
|----------------------------|-------|-----------------------------|---------|
| Drive Series | Frame | EMC Shield Plate Model | Price |
| GS10/20/30 | A | GS20A-ESP-A | \$28.00 |
| GS10/20/30 | B | GS20A-ESP-B | \$29.00 |
| GS10/20/30 | C | GS20A-ESP-C | \$29.00 |
| GS10/20/30 | D | GS20A-ESP-D | \$31.00 |
| GS20/30 | E | GS20A-ESP-E | \$43.00 |
| GS20/30 | F | GS20A-ESP-F | \$43.00 |
| GS30 | G | GS30A-ESP-G | \$47.00 |
| GS30 | H | GS30A-ESP-H | \$50.00 |
| GS30 | I | GS30A-ESP-I | \$54.00 |

| EMC Shield Plate Dimensions | | |
|-----------------------------|----------------------|---------------|
| Model | Dimensions mm [inch] | |
| | a | b |
| GS20A-ESP-A | 69.3 [2.73] | 80.0 [3.15] |
| GS20A-ESP-B | 67.7 [2.67] | 79.7 [3.14] |
| GS20A-ESP-C | 78.0 [3.07] | 91.0 [3.58] |
| GS20A-ESP-D | 103.4 [4.07] | 97.0 [3.82] |
| GS20A-ESP-E | 124.3 [4.89] | 77.4 [3.05] |
| GS20A-ESP-F | 168.0 [6.61] | 80.0 [3.15] |
| GS30A-ESP-G | 243.5 [9.59] | 154.9 [6.10] |
| GS30A-ESP-H | 262.0 [10.31] | 201.9 [7.95] |
| GS30A-ESP-I | 304.0 [11.97] | 260.7 [10.26] |

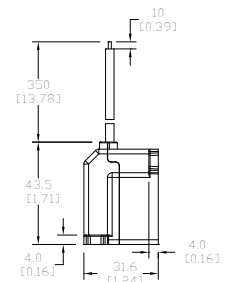
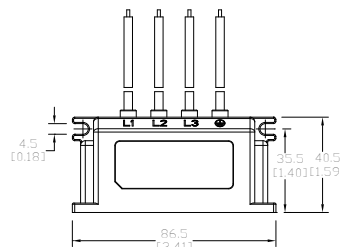
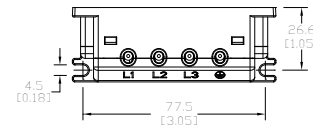


Capacitive Filter

The GS20A-CAPF capacitive filter supports basic filtering and noise interference reduction for all GS10, GS20(X), and GS30 models, 460V and below. For more information and installation instructions, please see your GSxx series User Manual.

The GS20A-CAPF cannot be used with 575V models.

| Capacitive Filter | | | | | |
|---------------------------|----------------------------|---------|--------------------|-------------------|----------------------------------|
| Drive Series | Model | Price | Applicable Voltage | Temperature Range | Capacitance |
| GS10/ GS20(X)/ GS30 | GS20A-CAPF | \$24.00 | 110–480 VAC | –40–85°C | Cx: 1uF ± 20% Cy: 0.1uF ± 20% |

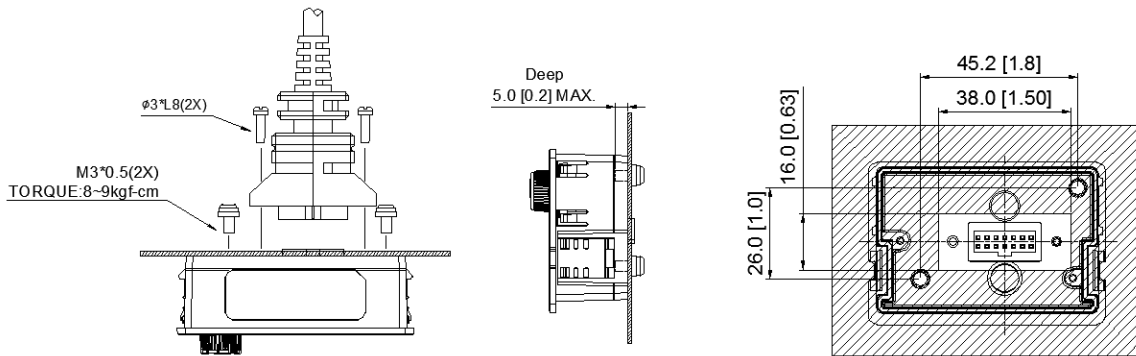


GS20(X) Optional Accessories – Keypad

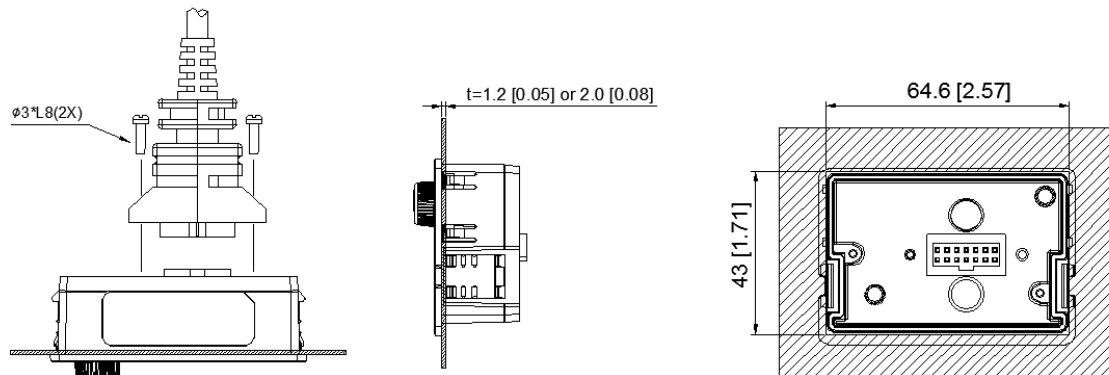
GS20(X) Replacement Keypad

The GS20A-KPD can be used to replace the keypad that comes with each GS20 drive. The replacement keypad can be plugged directly into the drive (no screws needed) or mounted remotely using M3 screws and a keypad extension cable.

| GS20-KPD Replacement Keypad | | | |
|-----------------------------|---------------------------|-------|---|
| Price | Part | Screw | Torque |
| \$29.00 | GS20A-KPD | M3 | 8–9 kg·cm (6.947.81 lb-in.) [0.78–0.88 N·m] |



Direct Mounting on Plate



Embedded Mounting in Plate

GS20 Keypad Extension Cables

The default GS20 keypad is removable and can be remote installed if desired. Use one of the cables below to connect the remotely installed keypad back to the GS20 drive.

| GS20 Keypad Compatible Extension Cables | | |
|---|----------------------------|-----------------|
| Price | Cable | Length (m [ft]) |
| \$20.00 | GS-CBL2-1L | 1 [3.28] |
| \$26.00 | GS-CBL2-3L | 3 [9.84] |
| \$31.00 | GS-CBL2-5L | 5 [16.4] |

GS20(X) Optional Accessories – Line Reactors/ VTF Filters

GS20(X) Line Reactors/Voltage Time Filters

Installing an AC Line Reactor on the input side of an AC motor drive can increase line impedance, improve the power factor, reduce input current, increase system capacity, and reduce interference generated from the motor drive.

Installing a load reactor or voltage time filter on the drive's output side can increase the high-frequency impedance to reduce the dV/dT and terminal voltage to protect the motor. Use output filters if the motor cable length exceeds 100ft.

| GS20(X) Line/Load Reactor, AC Output Filter, & DC Reactor Selections | | | | | | |
|--|---------------------|-----------------------|----------|----------------------|----------------------|--------------------------|
| GS20(X) Model | CT Input Amps (rms) | Saturation Amps (rms) | Motor HP | Line Reactor (LR2)** | Load Reactor (LR2)** | AC Output Filter (VTF)** |
| GS21-10P2 | 1.6 | 3.2 | 1/4 | LR2-10P2-1PH | LR2-20P2 | VTF-46-DE |
| GS21-10P5 | 2.5 | 5 | 1/2 | LR2-10P5-1PH | LR2-20P5 | VTF-246-CFG |
| GS21-11P0 | 5 | 9.6 | 1 | LR2-11P5-1PH | LR2-21P0 | VTF-24-FH |
| GS21-20P2 | 1.6 | 3.2 | 1/4 | LR2-20P5-1PH | LR2-20P2 | VTF-46-DE |
| GS21-20P5 | 2.8 | 5.6 | 1/2 | LR2-20P5-1PH | LR2-20P5 | VTF-246-CFG |
| GS21-21P0 | 4.8 | 9.6 | 1 | LR-23P0 | LR2-21P0 | VTF-24-FH |
| GS21-22P0 | 7.5 | 15 | 2 | LR2-22P0-1PH | LR-22P0 | VTF-246-HKL |
| GS21-23P0 | 11 | 22 | 3 | LR-27P5 | LR-25P0 | VTF-24-JL |
| GS23-20P2 | 1.6 | 3.2 | 1/4 | LR2-20P2 | LR2-20P2 | VTF-46-DE |
| GS23-20P5 | 2.8 | 5.6 | 1/2 | LR2-20P5 | LR2-20P5 | VTF-246-DGH |
| GS23-21P0 | 4.8 | 9.6 | 1 | LR2-20P7 | LR2-20P7 | VTF-24-FH |
| GS23-22P0 | 7.5 | 15 | 2 | LR-22P0 | LR-22P0 | VTF-246-HKL |
| GS23-23P0 | 11 | 22 | 3 | LR-25P0 | LR-25P0 | VTF-24-JL |
| GS23-25P0 | 17 | 34 | 5 | LR-27P5 | LR-25P0 | VTF-46-LM |
| GS23-27P5 | 25 | 50 | 7 1/2 | LR-2010 | LR-2010 | VTF-46-NP |
| GS23-2010 | 33 | 66 | 10 | LR-2015 | LR-2010 | VTF-246-LPQ |
| GS23-2015 | 46 | 92 | 15 | LR-2020 | LR-2020 | VTF-246-NRS |
| GS23-2020 | 65 | 130 | 20 | LR-2025 | LR-2025 | VTF-246-PSU |
| GS23-40P5 | 1.5 | 3 | 1/2 | LR2-40P5 | LR2-40P5 | VTF-46-DE |
| GS23-41P0 | 2.7 | 5.4 | 1 | LR2-41P0 | LR2-41P0 | VTF-246-CFG |
| GS23-42P0 | 4.2 | 8.4 | 2 | LR2-43P0 | LR2-42P0 | VTF-24-FH |
| GS23-43P0 | 5.5 | 11 | 3 | LR2-45P0 | LR2-43P0 | VTF-24-FH |
| GS23-45P0 | 9 | 18 | 5 | LR2-47P5 | LR2-45P0 | VTF-246-HKL |
| GS23-47P5 | 13 | 26 | 7 1/2 | LR-4010 | LR2-47P5 | VTF-24-JL |
| GS23-4010 | 17 | 34 | 10 | LR-4015 | LR-4010 | VTF-24-JL |
| GS23-4015 | 25 | 50 | 15 | LR-4015 | LR-4015 | VTF-246-LPQ |
| GS23-4020 | 32 | 64 | 20 | LR-4020 | LR-4020 | VTF-246-LPQ |
| GS23-4025 | 38 | 76 | 25 | LR-4025 | LR-4025 | VTF-246-MQR |
| GS23-4030 | 45 | 90 | 30 | LR-4030 | LR-4030 | VTF-246-NRS |
| GS23-51P0 | 1.7 | 3.4 | 1 | LR2-51P0 | LR2-51P0 | VTF-46-DE |
| GS23-52P0 | 3 | 6 | 2 | LR2-52P0 | LR2-52P0 | VTF-246-CFG |
| GS23-53P0 | 4.2 | 8.4 | 3 | LR2-53P0 | LR2-53P0 | VTF-246-DGH |
| GS23-55P0 | 6.6 | 13.2 | 5 | LR2-55P0 | LR2-55P0 | VTF-246-GJJ |
| GS23-57P5 | 9.9 | 19.8 | 7 1/2 | LR-5010 | LR2-57P5 | VTF-246-HKL |
| GS23-5010 | 12.2 | 24.4 | 10 | LR-4010 | LR-5010 | VTF-246-HKL |
| GS21X-20P5 | 2.8 | 5.6 | 1/2 | LR2-20P5-1PH | LR2-20P2 | VTF-246-DGH |
| GS21X-21P0 | 4.8 | 9.6 | 1 | LR2-21P0-1PH | LR2-20P7 | VTF-24-FH |
| GS21X-22P0 | 7.5 | 15.0 | 2 | LR2-22P0-1PH | LR2-22P0 | VTF-246-HKL |
| GS21X-23P0 | 11.0 | 22.0 | 3 | LR-27P5 | LR-25P0 | VTF-24-JL |
| GS23X-20P5 | 2.8 | 5.6 | 1/2 | LR2-20P2 | LR2-20P2 | VTF-246-DGH |
| GS23X-21P0 | 4.8 | 9.6 | 1 | LR2-21P5 | LR2-21P0 | VTF-24-FH |
| GS23X-22P0 | 7.5 | 15.0 | 2 | LR2-22P0 | LR2-22P0 | VTF-246-GJJ |
| GS23X-23P0 | 11.0 | 22.0 | 3 | LR-25P0 | LR-25P0 | VTF-24-JL |
| GS23X-25P0 | 17.0 | 34.0 | 5 | LR-27P5 | LR-27P5 | VTF-4-M |
| GS23X-27P5 | 25.0 | 50.0 | 7 1/2 | LR-2010 | LR-2010 | VTF-246-KMN |
| GS23X-40P5 | 1.5 | 3.0 | 1/2 | LR2-40P5 | LR2-40P5 | VTF-46-DE |
| GS23X-41P0 | 2.7 | 5.4 | 1 | LR2-41P5 | LR2-41P0 | VTF-246-CFG |
| GS23X-42P0 | 4.2 | 8.4 | 2 | LR2-43P0 | LR2-42P0 | VTF-24-FH |
| GS23X-43P0 | 5.5 | 11.0 | 3 | LR2-44P0 | LR2-43P0 | VTF-24-FH |
| GS23X-45P0 | 9.0 | 18.0 | 5 | LR2-47P5 | LR2-45P0 | VTF-246-HKL |
| GS23X-47P5 | 13.0 | 26.0 | 7 1/2 | LR-4010 | LR2-47P5 | VTF-24-JL |
| GS23X-4010 | 17.0 | 34.0 | 10 | LR-4015 | LR-4010 | VTF-46-LM |

* Not available at AutomationDirect.com

** Reactor sizing is based on rated HP NEMA motor load, not drive output amp load. Size the reactor based on the motor nameplate current. All specs for the LR2 and VTF can be found at www.automationdirect.com

DuraPulse Optional Accessories – Replacement Cooling Fans

Cooling Fans for GSxx Series Drives (Spare/Replacement)

NOTE: The fans described below are included with the applicable GS10, GS20(X), and GS30 AC Drive, and are also available for purchase separately as spare/replacement components.

| GS10, GS20(X), GS30 – Fan Selection Table | | | | | | | |
|--|---|--|------------------------------|----------|--|---------------|---------|
| Drive Model | | | Fan Model * | | Description | Size | Voltage |
| GS10 Series | GS20(X) Series | GS30 Series | Part # | Price | | | |
| GS13N-22P0 GS13N-42P0 | GS23-22P0 GS23-42P0 GS23-52P0 | GS31-21P0 GS33-22P0 GS33-42P0 | GS20A-FAN-B | \$24.00 | GS20 series main cooling fan, replacement. | 40x40x15 mm | 12VDC |
| – | GS21X-23P0 GS23X-23P0 GS23X-25P0 GS23X-45P0 | – | GS20XA-FAN-B | \$56.00 | GS20X series main cooling fan, replacement | 60x60x25 mm | |
| GS11N-11P0 GS11N-23P0 GS13N-23P0 GS13N-25P0 GS13N-43P0 GS13N-45P0 | GS21-11P0 GS21-22P0 GS21-23P0 GS23-23P0 GS23-25P0 GS23-43P0 GS23-45P0 GS23-53P0 GS23-55P0 | GS31-22P0 GS31-23P0 GS33-23P0 GS33-25P0 GS33-43P0 GS33-45P0 | GS20A-FAN-C | \$26.00 | GS20 series main cooling fan, replacement. | 50x50x20 mm | |
| – | GS23X-27P5 GS23X-47P5 GS23X-4010 | – | GS20XA-FAN-C | \$57.00 | GS20X series main cooling fan, replacement | 60x60x25 mm | |
| GS13N-27P5 GS13N-47P5 GS13N-4010 | GS23-27P5 GS23-47P5 GS23-4010 GS23-57P5 GS23-5010 | GS33-27P5 GS33-47P5 GS33-4010 | GS20A-FAN-D | \$30.00 | GS20 series main cooling fan, replacement. | 60x60x25 mm | |
| – | GS23-2010 GS23-2015 GS23-4015 GS23-4020 | GS33-2010 GS33-2015 GS33-4020 | GS20A-FAN-E | \$41.00 | GS20 series main cooling fan, replacement. | 92x92x28 mm | 24VDC |
| – | GS23-2020 GS23-4025 GS23-4030 | GS33-2020 GS33-4025 GS33-4030 | GS20A-FAN-F | \$45.00 | GS20 series main cooling fan, replacement. | 92x92x38 mm | |
| – | – | GS33-2025 GS33-2030 GS33-4040 | GS30A-FAN-G | \$52.00 | GS30 series main cooling fan, replacement | 204x87x50 mm | |
| – | – | GS33-4050 GS33-4060 | GS30A-FAN-H | \$98.00 | GS30 series main cooling fan, replacement | 206x95x50 mm | |
| – | – | GS33-2040 GS33-2050 GS33-4075 GS33-4100 | GS30A-FAN-I | \$151.00 | GS30 series main cooling fan, replacement | 260x121x50 mm | |

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



Example GS20A replacement Fan

DuraPulse Optional Accessories – RF Filter

RF Filter

Zero phase reactors, (aka RF noise filters) help reduce radiated noise from the inverter wiring. The wiring must go through the opening to reduce the RF component of the electrical noise. Loop the wires three times (four turns) to attain the full RF filtering effect. For larger wire sizes, place multiple zero-phase reactors (up to four) side by side for a greater filtering effect. These are effective for noise reduction on both the input and output sides of the inverter. Attenuation quality is good in a wide range from 500kHz to 10MHz.

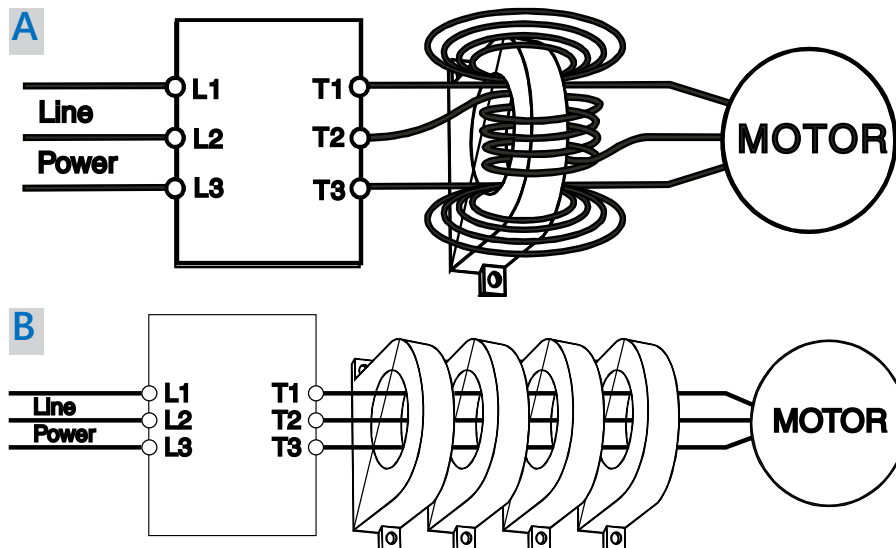


Wiring Method

Wind each wire four times around the core, as shown in diagram A to the right. The reactor must be put at inverter side as closely as possible.

If you are unable to wire as above due to wire size or another aspect of your application, put all wires through four cores in series without winding, as in diagram B to the right.

| RF Filter Selection | | | |
|-----------------------|--------------|---------------------|----------|
| Drive Series | Filter Model | Drawing | Price |
| GS10 / GS20(X) / GS30 | RF008X00A | PDF | \$40.00 |
| GS30 | RF004X00A | PDF | \$47.00 |
| GS30 (Frame H-I) | RF002X00A | PDF | \$235.00 |



DuraPulse Accessories – Software

GSoft2 Drive Configuration Software

GSoft2 Drive Configuration Software

Available for *FREE* Download

| DURAPULSE Drives GSOFT2 Drive Configuration Software | | | |
|---|---------------|---|--|
| Part Number | Price* | Description | For GS Drive |
| GSOFT2 | \$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 GS10 – all GS20(X) – all GS30 – all |
| USB-485M | \$69.00 | PC adapter, USB A to RS-485 (RJ45/RJ12). | GS4/GS10 |
| USB-CBL-AB3 | \$12.00 | Programming cable, USB A to USB B, 3ft cable length. | GS4 – all (for Drive FW only) GS20(X) – all 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 |
| GSLOGIC | \$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 GS20(X) - all GS30 - all |
| USB-485M | \$69.00 | PC adapter, USB A to RS-485 (RJ45/RJ12). | GS4 - all |
| USB-CBL-AB3 | \$12.00 | Programming cable, USB A to USB B, 3ft cable length. | GS20(X) - all GS30 - all |
| * GSLOGIC can be downloaded for free 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:

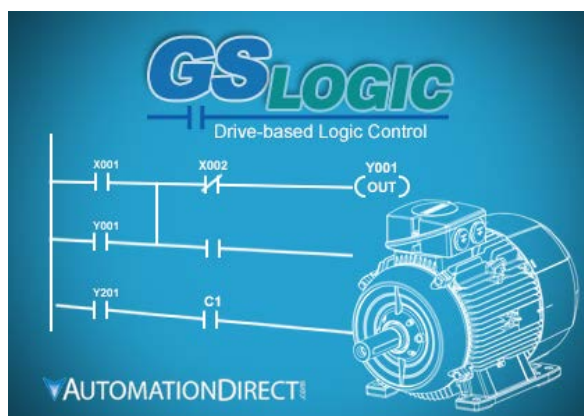
- Upload/download drive PLC program files to the onboard PLC
- Create new drive PLC programs
- Edit drive PLC programs
- Archive/store multiple drive PLC programs on your PC or the GS4-KPD drive keypad
- Control drive PID loops (FPID instructions)
- View in real time all drive PLC registers
- Print drive 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 DURA ^{PULSE} Drives Keypad and Keypad Panel-Mounting Kit | | | |
|--|----------|--|--|
| Part Number | Price | Description | For GS Drive |
| GS4-KPD* | \$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 GS10 – all GS20(X) – all GS30 – all |
| GS4-BZL** | \$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 GS10 – all GS20(X) – all 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.

