

# **GM2 Series General Purpose MicroDrive**

**2021 Product Catalog** 

Rapid Rugged Global



Benshaw's standard products are stocked in warehouses in the USA and Canada... ready for shipment to support your critical needs:

### Benshaw.com

In the USA, call or fax **Phone:** 412.968.0100 Fax: 412.968.5415

In Canada, call or fax **Phone:** 519.291.5112 Fax: 519.291.2595

### BenshawExpress.com

If you prefer to order online,
BenshawExpress.com provides
direct digital access to our complete
inventory of standard controls, drives
and spare parts - 24 hours a day,
seven days a week, 365 days a year.

# Save time with 24/7 online access at benshawexpress.com

Benshaw Express is a convenient, time-saving tool for Benshaw authorized distributors.

The Benshaw web store enables users 24/7 access to:

- Check price and availability
- Place orders
- Track open orders
- · Obtain tracking for shipped orders
- · View freight charges for recent shipments
- View invoices
- Customized levels of access

Access Benshaw Express by following the link on **Benshaw.com** or directly at **BenshawExpress.com.** 

## **GM2 SERIES GENERAL PURPOSE MICRODRIVE**

The Benshaw GM2 Series is a sensorless vector, variable frequency drive. This micro-drive may be small...but don't let looks fool you. The GM2 Series offers enhanced performance and reliable operation in a robust, yet compact, user-friendly design. Powerful, yet small...it is the ideal choice for cost sensitive OEM or end user requirements. And it is the ideal drive for Benshaw distributors to keep in stock because of its versatility. The GM2 Series is easy to install, simple to program and offers dual ratings for both normal and heavy duty applications.

### **STANDARD FEATURES - HARDWARE**

- Dual Rated Normal and Heavy Duty
  - 240V: 1HP~15 HP (ND), 0.5 HP~10HP (HD)
  - 480V: 1HP~15 HP (ND), 0.5 HP~10 HP (HD)
- Display 4 digit, 7 Segment with 4 LED Indicators
- Protected Chassis UL Open (IP20)
- DIN Rail mounting (up to 7.5 HP, 5.5 kW)
- EMC Filter (480V only)
- Internal Brake IGBT
- Single Phase Input (derating required)
- Built in Potentiometer
- RJ45 Port (Modbus-RTU)

### **STANDARD FEATURES - SOFTWARE**

- Modbus RTU
- Control V/Hz, Sensorless Vector, Slip Compensation
- Auto Tuning
- Torque Limits
- PID Control
- Regen Avoidance
- · Kinetic Energy Buffering (KEB), RideThrough



### **COMMUNICATIONS**

Standard: Modbus-RTU

Option: Ethernet/IP - Modbus-TCP

WinDRIVE: PC Based software for Commissioning and Monitoring

Feature	Benefit
Robust Design	Construction of the air flow design minimizes exposure of critical components (IGBT, PCB, etc.) to outside contaminants
Built-in EMC Filter	Embedded C3 EM filter to meet EN618000-3 standards and provide noise reduction
V/F Acceleration and Deceleration Function	<ul> <li>Auto torque boost (ATB) enhancing acceleration performance in V/F mode</li> <li>Flux braking enhancing deceleration performance in V/F mode</li> </ul>
Sensorless Vector Control	Performs enhanced high torque at low speed with sensorless vector control
KEB Oeration (Kinetic, Energy Buffering)	DC link voltage is maintained during power loss or brownout by using regenerative energy from the motor
Flying Start	Select optimal flying start operation for different applications
Fan Life-cycle Diagnosis	Keypad displays a replacement warning at 50,000 hours of fan operating time or user setting level of fan replacement
Material Design	Enhanced thermal resistance and increased thickness to prevent damage



# **GM2 SERIES - PRICING**

240V - Open Chassis		mal Duty OL / 1 min.		OL / 1min.	Dim	ensions (ir	nches)		
Model Number	HP	Amps	HP	Amps	Н	W	D	Weight (lbs)	List Price
VFD-RSI-001-GM2-2C	1.0	3.1	0.5	2.5	6.46	3.40	5.50	2.3	\$353
VFD-RSI-002-GM2-2C	2.0	6	1.0	5	6.46	3.40	5.50	2.3	\$371
VFD-RSI-003-GM2-2C	3.0	9.6	2.0	8	6.98	3.98	6.25	3.0	\$397
VFD-RSI-005-GM2-2C	5.0	12	3.0	11	6.98	3.98	6.25	3.1	\$413
VFD-RSI-007-GM2-2C	7.5	18	5.0	17	7.60	5.31	6.25	4.2	\$503
VFD-RSI-010-GM2-2C	10	30	7.5	24	9.46	7.10	6.00	6.8	\$790
VFD-RSI-015-GM2-2C	15	40	10	32	9.46	7.10	6.00	7.1	\$892

480V - Open Chassis		mal Duty OL / 1 min.		avy Duty OL / 1min.	Dim	ensions (ir	nches)		
Model Number	HP	Amps	HP	Amps	Н	W	D	Weight (lbs)	List Price
VFD-RSI-001-GM2-4C	1.0	2	0.5	1.3	6.46	3.40	5.50	2.3	\$371
VFD-RSI-002-GM2-4C	2.0	3.1	1.0	2.5	6.46	3.40	5.50	2.4	\$387
VFD-RSI-003-GM2-4C	3.0	5.1	2.0	4	6.98	3.98	6.25	3.2	\$407
VFD-RSI-005-GM2-4C	5.0	6.9	3.0	5.5	6.98	3.98	6.25	3.2	\$428
VFD-RSI-007-GM2-4C	7.5	10	5.0	9	7.60	5.31	6.25	4.4	\$484
VFD-RSI-010-GM2-4C	10	16	7.5	12	9.46	7.10	6.00	7.1	\$691
VFD-RSI-015-GM2-4C	15	23	10	16	9.46	7.10	6.00	7.2	\$738

# **GM2 Series - Accessories**

Model Number	Description	List Price
PC-100093-00	Ethernet / IP, Modbus - TCP option, dual port	\$270
KP-100002-00	Keypad / display, remote, w / 1M cable	\$95
KP-100002-01	Keypad / display, remote, w / 2M cable	\$95
KP-100002-02	Keypad / display, remote, w / 3M cable	\$98
KP-100002-03	Keypad / display, remote, w / 5M cable	\$102
EN-101036-00	Conduit box, 1HP - 2HP, 230V / 480V	\$64
EN-101036-01	Conduit box, 3HP - 5HP, 230V / 480V	\$66
EN-101036-02	Conduit box, 7.5HP, 230V / 480V	\$71
EN-101036-03	Conduit box, 10HP - 15HP, 230V / 480V	\$79

# **GM2 SERIES - INPUT AND OUTPUT SPECIFICATIONS**

# 240V Specifications Details

RSI-XXX-GM2-2C			001	002	003	005	007	010	015		
		HP	1	2	3	4	7.5	10	15		
	Normal Duty,	kW	0.75	1.5	2.2	4	5.5	7.5	11		
	120% OL	Amps	3.1	6	9.6	12	18	30	40		
240V,		KVA	1.2	2.3	3.8	4.6	6.9	11.4	15.2		
3Ø Input		HP	0.5	1	2	3	5	7.5	10		
	Heavy Duty,	kW	0.4	0.75	1.5	2.2	4	5.5	7.5		
	150% OL	Amps	2.5	5	8	11	17	24	32		
		KVA	1	1.9	3	4.2	6.5	9.1	12.2		
	Normal Duty	HP	-	0.75	1.5	2	3	5	7.5		
240V,	Normal Duty	Amps	2	3.6	5.9	6.7	9.8	16.3	22		
1Ø Input	Heavy Duty	HP	-	0.5	1	1.5	3	3	5		
	Heavy Duty	Amps	1.5	2.8	4.6	6.1	9.3	12.8	17.4		
	Output frequen	су	0-400 Hz (IM Sensorless: 0-120 Hz)								
	Output voltage	(V)	3-phase 200-240 V								
	Voltage (V)		3-phase 200-240 VAC (-15% to +10%)								
	voltage (v)		1-phase 240VAC (-5% to +10%)								
Rated Input	Input frequency	,	3-phase 50-60 Hz (±5%)								
nateu input	input irequency		1-phase 60Hz only ( <u>+</u> 5%)								
	Rated Current	Normal Duty	3	6.3	10.8	13.1	19.4	32.7	44.2		
	(A)	Heavy Duty	2.2	4.9	8.4	11.8	18.5	25.8	34.9		
Weight (lb / kg) lbs		2.3	2.3	3	3	4.2	6.8	7.1			
	kg		1.04	1.06	1.36	1.4	1.89	3.08	3.21		
Heat Di	ssipation (W)		22	45	79	117	208	281	382		
Degree	of Protection		UL Open Ty	pe (IP20), UL	Type 1 achiev	ved with op	tional condui	t box			



# **GM2 SERIES - INPUT AND OUTPUT SPECIFICATIONS**

# **480V Specifications Details**

ı	RSI-XXX-GM2-2C		001	002	003	005	007	010	015	
		HP	1	2	3	5	7.5	10	15	
	Normal Duty,	kW	0.75	1.5	2.2	4	5.5	7.5	11	
	120% OL	Amps	2	3.1	5.1	6.9	10	16	23	
480V,		KVA	1.5	2.4	3.9	5.3	7.6	12.2	17.5	
3Ø Input		HP	0.5	1	2	3	5	7.5	10	
	Heavy Duty,	kW	0.4	0.75	1.5	2.2	4	5.5	7.5	
	150% OL	Amps	1.3	2.5	4	5.5	9	12	16	
		KVA	1	1.9	3	4.2	6.5	9.1	12.2	
	Normal Duty	HP	0.5	0.75	1~1.5	2	3	5	7.5	
480V,	Normal Duty	Amps	1.3	1.9	2.8	3.6	5.4	8.7	12.6	
1Ø Input	Heavy Duty	HP	-	0.5	1	1.5	3	3	5	
	Tieavy Duty	Amps	0.7	1.4	2.1	2.8	4.9	6.4	8.7	
	Output frequen	су	0-400 Hz (IM Sensorless: 0-120 Hz)							
	Output voltage	(V)	3-phase 380-480 V							
	Voltage (V)		3-phase 380-480 VAC (-15% to +10%)							
	voltage (v)	voitage (v)		1-phase 480VAC (-5% - +10%)						
Rated Input	Input frequency	,	3-phase 50-60 Hz (±5%)							
natou input	mpat frequency		1-phase 60 Hz only ( <u>+</u> 5%)							
	Rated Current	Normal Duty	2	3.3	5.5	7.5	10.8	17.5	25.4	
	(A)	Heavy Duty	1.1	2.4	4.2	5.9	9.8	12.9	17.5	
Weight (lb / kg) lbs		2.3	2.4	3.2	3.2	4.4	7.1	7.2		
kg			1.04	1.08	1.44	1.46	1.98	3.24	3.28	
Heat Di	ssipation (W)		24	42	71	99	176	231	315	
Degree of Protection			UL Open Ty	pe (IP20), UL	Type 1 achiev	ved with op	tional condui	t box		

# **GM2 SERIES - SPECIFICATION DETAILS**

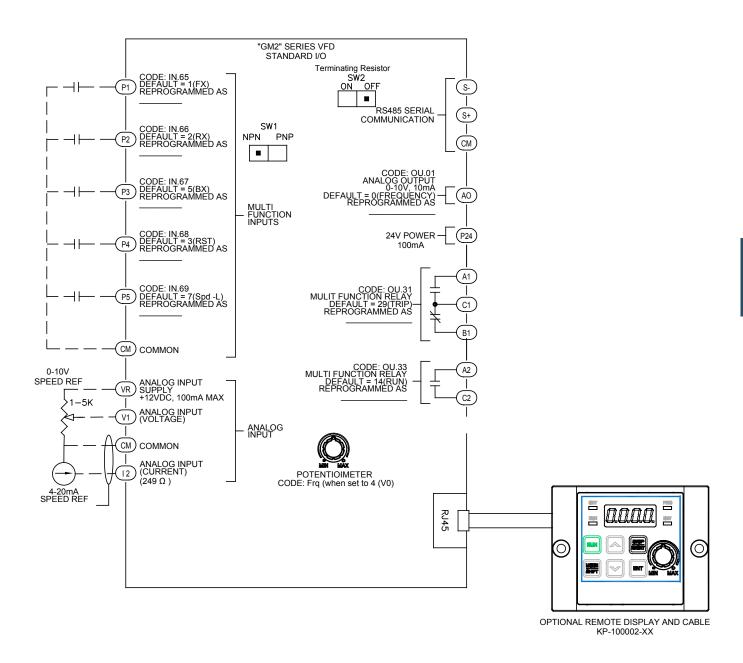
Feature			Des	scription				
	Control method		V/F control, Sensorless Vector, Slip C	Compensation				
			Digital command: 0.01 Hz					
	Frequency setting	ngs resolution	Analog command: 0.06 Hz (60 Hz standard)					
	Frequency accu	racy	1% of maximum output frequency					
Control	V/F pattern		Linear, Square Reduction, User V/F					
			Normal Duty: 120%, 1 minute					
	Overload capaci	ty	Heavy Duty: 150%, 1 minute					
	Torque boost		Manual torque boost, Automatic torc	que boost				
	Start/Stop		Keypad, terminal strip, or communic	ation operation				
	Fraguesay actti		Analog type: 0-10 V, 4-20 mA, -10-10	V (bipolar)				
	Frequency setting	igs	Digital type: keypad					
			Basic	Advanced				
			Start/Stop operation	Auto Tuning				
			Frequency Reference Sources	Sensorless Vector Control				
			Accel/Decel Times	Torque Limits				
			2nd Source (HOA)	Slip Compensation				
			Multi-Step Speeds	PID Control				
			Jog	Auxiliary Frequency Reference				
			Auto Start	Multi-Step Accel/Decel Times				
			Auto Reset/Restart	User V/Hz				
	Operation funct	iona	Accel/Decel Patterns	Dwell Frequency Operation				
	Operation funct	10115	V/Hz Control	Regen Avoidance				
			Linear, Squared	Stall Prevention				
			Motor Rotation Prohibit	Speed Search				
Operation			Torque Boost	VFD Fan Control				
			Start Modes	Loss of Power				
			Stop Modes	Ride Through (KEB)				
			Frequency Limits	Safe Stop				
			Jump Frequencies	Braking				
			3-Wire Control	DC Injection, Power Braking				
			Fire Mode	Flux Braking, External Brake				
			Select PNP (Source) or NPN (Sink) m	node				
			Functions of the digital inputs are se	t with parameters In. 65 - In. 69				
			Forward/Reverse	Run Enable (Interlock)				
			Reset	External trip				
	Input	(5) Multi-function	Emergency stop	Jog operation (FWD/REV)				
	Imput	terminals (P1 -P5)	Multi-Step frequencies	Multi-Step Acc/Dec				
			DC braking during stop	Second motor selection				
			Frequency increase	Up/Down Frequency				
			• 3-wire	Analog Hold (frequency)				
			Acc/Dec/Stop	Exit PID Operation				



# **GM2 SERIES - SPECIFICATION DETAILS**

Feature			Description					
			Programmable Output Relays	AC 050V 1A				
0		Multi-function relays	Relay 1 (A1-C1-B1)	AC 250V, 1A DC 30V, 1A				
Operation	Output		Relay 2 (A2-C2)	DC SOV, TA				
		Analog output	0-12 VDC: Programmable Anal	og Output				
			Motor Overload	Under Torque				
			Motor Under Load	Inverter Over Heat				
			Over Current (OC1)	Short Circuit (OC2)				
			Over Voltage	External Trip				
			Low Voltage	Hardware Fault				
	Trip		Ground Fault	Temperature Sensor (NTC)				
			Motor Over Heat (Eth)	Fan Fault				
Protection			Phase Open (In/Out)	Pre-PID Operation Failure				
Trotoction			Inverter Overload	External Brake Trip				
			No Motor Trip	Reference Loss				
			Over Torque	Option Board Trip				
	Alarm		Warnings: Reference Loss, Motor Overload, Motor Under Load, Inverter Overload, Fan, Dynamic Braking Rate Warning, Auto Tuning Error, Inverter Overheat					
			Normal Duty: Less than 8ms (~1/2 cycle)					
	Instantan	eous Power Outage	Heavy Duty: Less than 15ms (~1 cycle)					
			For longer outages use KEB operation and/or Auto Restart operation					
	Cooling t	ype	Forced fan cooling structure					
	Protectio	n structure	UL Open Type (IP20), UL Enclosed Type 1 is achieved with conduit box installation (option					
			14°F ~ +104°F (-10°C ~+40°C)					
	Ambient Temperat	Operating	Derating: 2% output amps for every degree above 104°F (40°C), maximum 122°F (50°C)					
	Tomporature		No ice or frost should be present					
	Ambient	humidity	Less than 95% RH (avoid condensation forming)					
Structure / Working Environment	Storage t	emperature	-4°F ~ +149°F (-20°C ~ +65°C)					
Environment	Environmental factors		Prevent contact with corrosive gases, flammable gases, oil stains, dust, and other pollutants (Pollution Degree 2 Environment)					
			3280 ft (1,000 m)					
	Operation	n /Altitude/Vibration	Apply derating of 1% voltage/output current for every 100 m above 1,000 m, maximum of 4,000 m					
			Less than 9.8 m/sec <sup>2</sup> (1G)					
	Air press	ure	10 ~ 15 PSI (70~106 kPa)					

# **GM2 SERIES - WIRING**

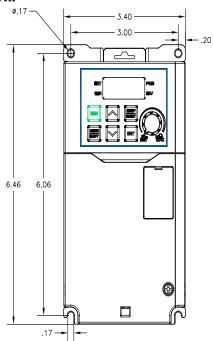




# **GM2 SERIES - DRAWINGS**

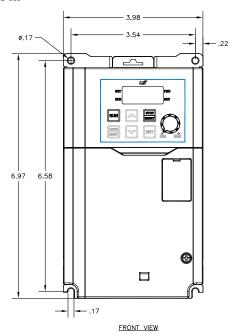
# 240V - 480V

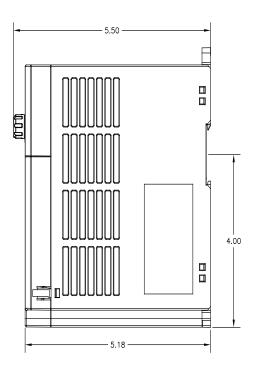
### 1 HP - 2 HP



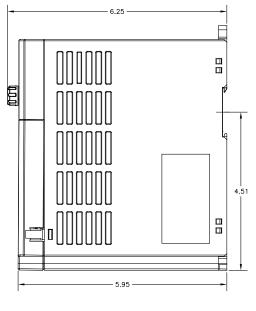
FRONT VIEW

### 3 HP - 5 HP





SIDE VIEW

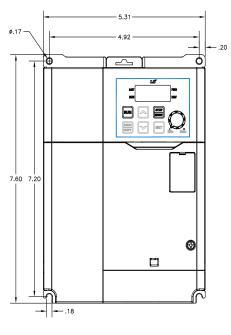


SIDE VIEW

# **GM2 SERIES - DRAWINGS**

# 240V - 480V

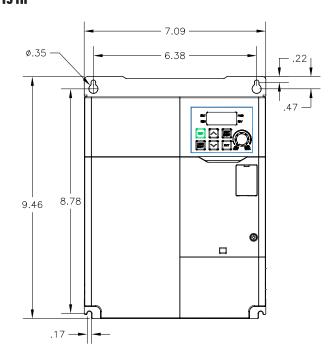
### 7.5 HP



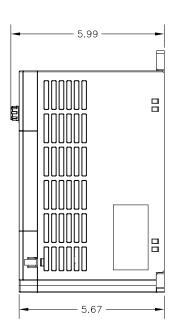
FRONT VIEW

5.13
SIDE VIEW

### 10 HP - 15 HP



FRONT VIEW



SIDE VIEW

### 24/7 Technical Support

Benshaw is dedicated to providing comprehensive 24-hour-a-day, 7-day-a-week phone support. Benshaw provides repair, spare parts, field engineering, retrofit and training services, when and where you need us. You can count on our experienced team, backed by the latest diagnostics and repair tools and an extensive part inventory to support your operations.

Call 1.800.203.2416

24/7 Hotline Support from our operations in Pittsburgh and Listowel (Canada):

- Technical phone support
- Overnight parts shipment
- 24-hour service dispatch
- Coordination of all service capabilities

### Repairs

Repairs are made on Benshaw equipment by trained, experienced personnel, using the latest diagnostic and test equipment.

Field Services are performed on-site by skilled technicians, engineers or complete team if needed, including:

- Start-up commissioning
- Field repairs
- Field analysis/data collection
- Preventative maintenance
- Retrofits

The Benshaw Product Line

A wide range of motor controls and drives is available.

- Solid-state starters fractional up to 30,000HP at 15kV
- LV AC drives to 800HP, MV AC drives to 10.000HP
- Electromechanical controls to 800A

Benshaw express is a 24/7 online inventory and order entry system for authorized Benshaw distributors:

- 24/7 shipment
- Air or truck delivery

Visit us online at Benshaw.com and benshawexpress.com, or contact:

### BENSHAW, Inc.

615 Alpha Drive Pittsburgh, PA 15238 Phone: 412.968.0100 Fax: 412.968.5415

### **BENSHAW Canada**

550 Bright Street East Listowel, Ontario N4W 3W3

Phone: 519.291.5112 Fax: 519.291.2595

