

Regenerative DC Common Bus Supply

The Regenerative DC Common Bus Supply supplies both motoring and regenerative current to the DC bus of one or more AC drives without the need of rectifier front end in each AC drive. When the overall power requirements of the attached common DC bus drives require motoring power, energy flows from the utility to the common DC bus. When the overall power requirements of the attached common DC bus drives require regenerative power, energy flows from the common DC bus to the utility.



Typical Applications that require regeneration are:

- High Inertia Loads that must be stopped or slowed down quickly - Saws, Fans, Flywheels and Centrifuges.
- Unwind Stands of all types - Uncoilers, Payoffs
- Overhauling Loads - Hoists, Cranes, Downhill Conveyors and Holdback Rolls in Process Line Applications.
- Machine applications with fast cycle times that require rapid deceleration.

Our Regenerative DC Common DC Bus Supply Module is easy to use. There are only five wires to connect: 3 - AC Power and 2 - DC Bus.

Our Regenerative DC Common Supply Modules are 99% efficient and operate at near unity power factor. Modules are easily paralleled for higher power applications.

- **ELIMINATES THE NEED FOR ENERGY WASTING BRAKING RESISTORS**
- **PROVIDES CONTINUOUS REGENERATION ON OVERHAULING LOADS**
- **INSTANTANEOUS ENERGY FLOW BETWEEN LOAD & UTILITY**
- **PREVENTS AC DRIVES FROM OVERVOLTAGE TRIPPING**
- **ALLOWS RAPID STOPPING OF HIGH INERTIA LOADS**
- **USES THE LATEST GENERATION OF IGBT POWER DEVICES**
- **DELIVERS SUBSTANTIAL ENERGY SAVINGS**
- **PHASE INSENSITIVE TO THE AC POWER LINE**



REGEN DC COMMON BUS SUPPLY

SPECIFICATIONS AND FEATURES

Electrical Specifications:

Rated Input Voltage:	200-250Vac, 380-500Vac, 500-600Vac -10% of minimum, +10% of maximum.
Frequency Tolerance:	47-63 Hz
Number of Phases:	3
Efficiency:	99% or greater
Max. Short Circuit Current Rating:	200,000A rms symmetrical, 600 volts (when used with AC input line fuses specified in tables 1 to 3).
Noise Immunity:	IEEE C62.41-1991 Category B (Formerly known as IEEE 587) - 6000V tests EN50082-1, 2 Generic Immunity Standards IEC 1000-4-2 (IEC 801-2) IEC 1000-4-3 (IEC 801-3) IEC 1000-4-4 (IEC 801-4) IEC 1000-4-5 (IEC 801-5) IEC 1000-4-6 (IEC 801-6) IEC 1000-4-8 (IEC 801-8)

Environmental Specifications:

Ambient Temperature:	-10°C to 55°C (14°F to 131°F) Nema type 1 enclosed.
Storage Temperature:	-40°C to 70°C (-40°F to 158°F) Nema type 1 enclosed.
Altitude:	Sea level to 3000 Feet [1000m] without derating.
Humidity:	95% relative humidity non-condensing.
Vibration:	9.8m/sec ² (1.0G) peak.

Physical attributes:

Mounting:	Though hole or panel mount.
Nema Rating:	Type 1 (IP20) as standard, Type 12 (IP54) optional.
Construction:	Steel construction (reduces E.M.I.)

Control I/O:

• 2 Digital Inputs:	Regen Enable & Regen Reset
• 2 Digital Outputs:	Form C dry contacts rated 115Vac @ 5A; 30Vdc @ 3.5A.
• 1 meter output:	Use with 100µA movement analog meter.
• 24Vdc source:	Use to power operator pushbuttons and US Drives option boards: 24Vdc @ 100 mA max.

Protective Features:

- Peak output current monitoring to protect against line-to-line shorts and line-to-ground shorts.
- Ground fault monitoring.
- Heatsink over-temperature monitoring.
- AC line & DC bus over-voltage protection.
- AC line & DC bus under-voltage protection.
- Control power supply power ride-thru.
- Internal power supply monitoring.
- AC phase loss detection.

Standard Regen Features

- Latest generation IGBT.
- Nema type 1 (IP20) as standard for all models.
- 55°C ambient with standard Nema type 1 (IP20) enclosure.
- High voltage ratings: 250Vac+10% , 500Vac+10% models, and 600Vac+10% models
- Input line suppression: Metal oxide varistors for line-to-line and line-to-ground voltage surge protection.
- No programming or hardware jumper for all voltages.



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Table 1

**Class 200 Regenerative DC Common Bus Supply Models
(Typical Voltage 208/230/240 VAC)**

200-250VAC (-10% to +10%)							
Frame Designation	NEMA 1 (IP20) Catalog Number	Drive HP ²	Continuous Regen DC Bus Current (Amps)	Continuous Motoring DC Bus Current (Amps)	AC Current (Amps)	Maximum Recommended AC Line Fuses ³ (Amps)	Total Power Losses ⁴ (W)
SIZE 1	RGB-0200-0030-N1	15	30	37	39	60	176
	RGB-0200-0045-N1	20	45	49	50	70	239
	RGB-0200-0060-N1	30	60	73	63	90	302
	RGB-0200-0090-N1	40	90	98	97	125	428
	RGB-0200-0120-N1	60	120	146	143	200	554
SIZE 2	RGB-0200-0180-N1	75	180	183	179	250	806
	RGB-0200-0240-N1	100	240	244	231	350	1058
	RGB-0200-0300-N1	125	300	305	290	400	1300
	RGB-0200-0360-N1	150	360	366	335	500	1562
SIZE 3	RGB-0200-0480-N1	200	480	488	446	600	2066
	RGB-0200-0540-N1	250	540	610	560	800	2318
	RGB-0200-0600-N1	300	600	732	670	900	2570
	RGB-0200-0720-N1	350	720	854	781	1000	3074
	RGB-0200-0840-N1	400	840	976	893	1200	3578
	RGB-0200-0960-N1	450	960	1098	1004	1500	4082
	RGB-0200-1080-N1	500	1080	1220	1116	1500	4586

¹ KW based on 240Vac AC Power line.

² Drive HP ratings are calculated for 230 VAC Motors based on 100% Continuous Regeneration and 150% Regeneration for 1 Minute or Less. Consult Factory for Module sizing when Regeneration requirements are less than or greater than these values.

³ Semiconductor Fuses: Ferraz Shawmut A50P, A60X, Bussmann FWH.

⁴ Total Power Loss shown is for continuous operation at full regeneration.

Table 2

**Class 400 Regenerative DC Common Bus Supply Models
(Typical Voltage 380/415/480 VAC)**

380-500VAC (-10% to +10%)							
Frame Designation	NEMA 1 (IP20) Catalog Number	Drive HP ²	Continuous Regen DC Bus Current (Amps)	Continuous Motoring DC Bus Current (Amps)	AC Current (Amps)	Maximum Recommended AC Line Fuses ³ (Amps)	Total Power Losses ⁴ (W)
SIZE 1	RGB-0400-0030-N1	30	30	37	37	50	200
	RGB-0400-0045-N1	40	45	49	48	70	275
	RGB-0400-0060-N1	60	60	73	72	100	350
	RGB-0400-0090-N1	75	90	91	89	125	500
	RGB-0400-0120-N1	100	120	122	115	175	650
SIZE 2	RGB-0400-0180-N1	150	180	183	167	250	950
	RGB-0400-0240-N1	200	240	244	223	350	1250
	RGB-0400-0300-N1	300	300	366	336	450	1525
	RGB-0400-0360-N1	350	360	427	385	600	1850
SIZE 3	RGB-0400-0480-N1	450	480	549	502	800	2450
	RGB-0400-0540-N1	500	540	610	558	800	2750
	RGB-0400-0600-N1	600	600	732	670	900	3050
	RGB-0400-0720-N1	700	720	854	781	1000	3650
	RGB-0400-0840-N1	800	840	976	893	1200	4250
	RGB-0400-0960-N1	900	960	1098	1004	1500	4850
	RGB-0400-1080-N1	1000	1080	1220	1116	1500	5450

¹ KW based on 480Vac AC Power line.

² Drive HP ratings are calculated for 460 VAC Motors based on 100% Continuous Regeneration and 150% Regeneration for 1 Minute or Less. Consult Factory for Module sizing when Regeneration requirements are less than or greater than these values.

³ Semiconductor Fuses: Ferraz Shawmut A50P, A60X, Bussmann FWH.

⁴ Total Power Loss shown is for continuous operation at full regeneration.

Table 3
**Class 500 Regenerative DC Common Bus Supply Models
(Typical Voltage 525/575/600 VAC)**

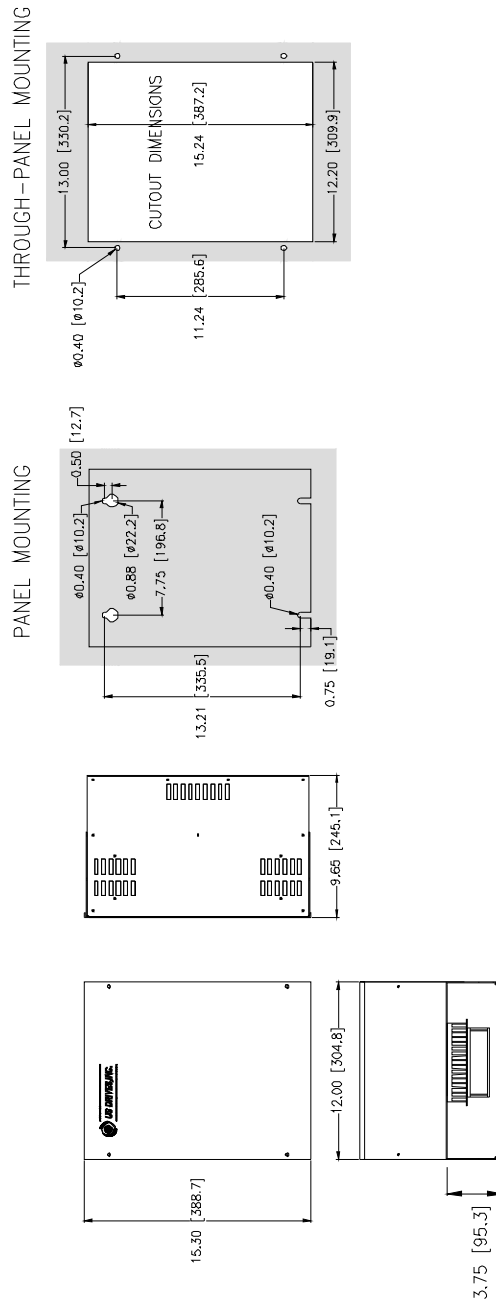
525-600VAC (-10% to +10%)							
Frame Designation	NEMA 1 (IP20) Catalog Number	Drive HP ²	Continuous Regen DC Bus Current (Amps)	Continuous Motoring DC Bus Current (Amps)	AC Current (Amps)	Maximum Recommended AC Line Fuses ³ (Amps)	Total Power Losses ⁴ (W)
SIZE 1	RGB-0500-0030-N1	30	30	32	35	40	236
	RGB-0500-0045-N1	50	45	49	48	70	329
	RGB-0500-0060-N1	75	60	73	72	100	422
	RGB-0500-0090-N1	100	90	98	92	125	608
	RGB-0500-0120-N1	125	120	122	116	175	794
SIZE 2	RGB-0500-0180-N1	200	180	195	179	250	1166
	RGB-0500-0240-N1	250	240	244	225	350	1538
	RGB-0500-0300-N1	350	300	342	312	450	1900
	RGB-0500-0360-N1	400	360	390	355	600	2282
SIZE 3	RGB-0500-0480-N1	500	480	488	439	700	3026
	RGB-0500-0540-N1	600	540	586	536	800	3390
	RGB-0500-0600-N1	700	600	683	625	900	3770
	RGB-0500-0720-N1	800	720	781	714	1000	4514
	RGB-0500-0840-N1	900	840	878	804	1200	5250
	RGB-0500-0960-N1	1000	960	976	893	1200	6002
	RGB-0500-1080-N1	1300	1080	1269	1161	1500	6746

¹ KW based on 600Vac AC Power line.

² Drive HP ratings are calculated for 575 VAC Motors based on 100% Continuous Regeneration and 150% Regeneration for 1 Minute or Less. Consult Factory for Module sizing when Regeneration requirements are less than or greater than these values.

³ UL Class T, High Speed/Class J, and Semiconductor Fuses (preferred): Ferraz Shawmut A60X, A70P, Bussmann FWP.

⁴ Total Power Loss shown is for continuous operation at full regeneration.

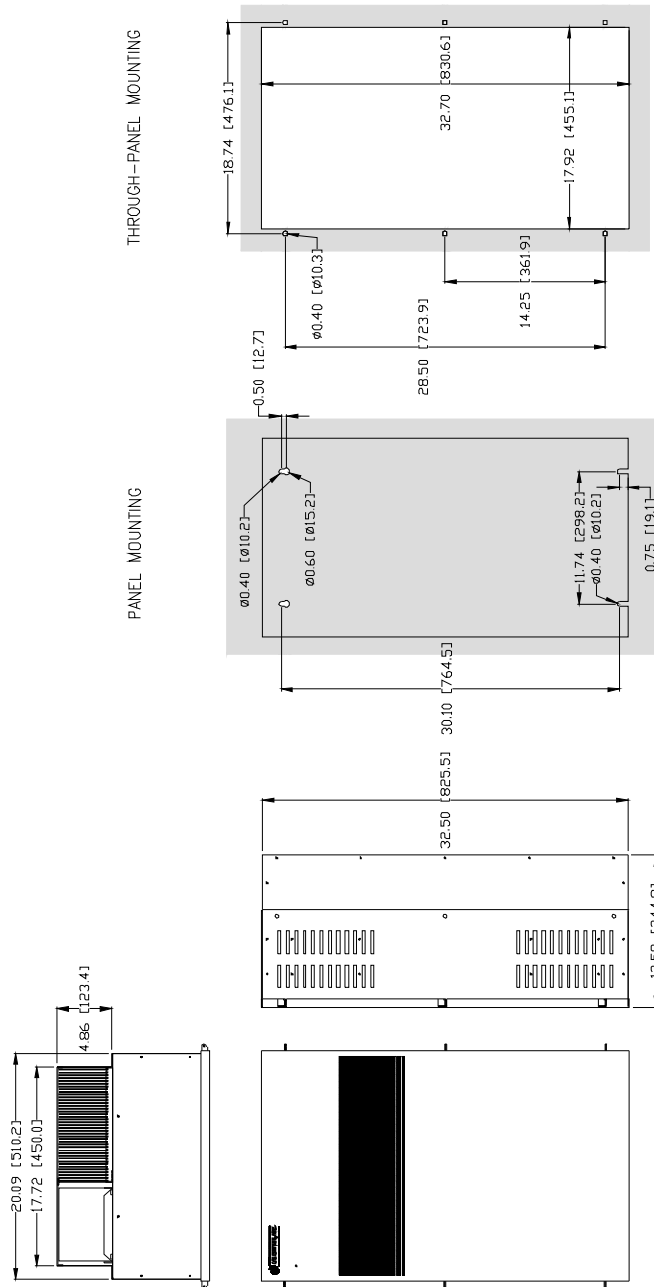


Approximate Weight: 35 Lbs. [16 Kgs]

Notes:

- Top and bottom endplates are removable to gain access inside the drive and to punch holes for conduits.
- Endplates must be removed from the drive before drilling and punching holes to avoid metal dust inside the drive enclosure. Failure to do so will cause damage to the drive.
- For through-panel mounting, customer is to seal for gap on all side of cutout. Provided by customer, aluminum angle 1" x 1" x 0.050" can be used to attach to all sides of drive to help seal and secure the drive.

Figure 2
AC Regen Mounting Information:
Size 1 (Nema Type 1)

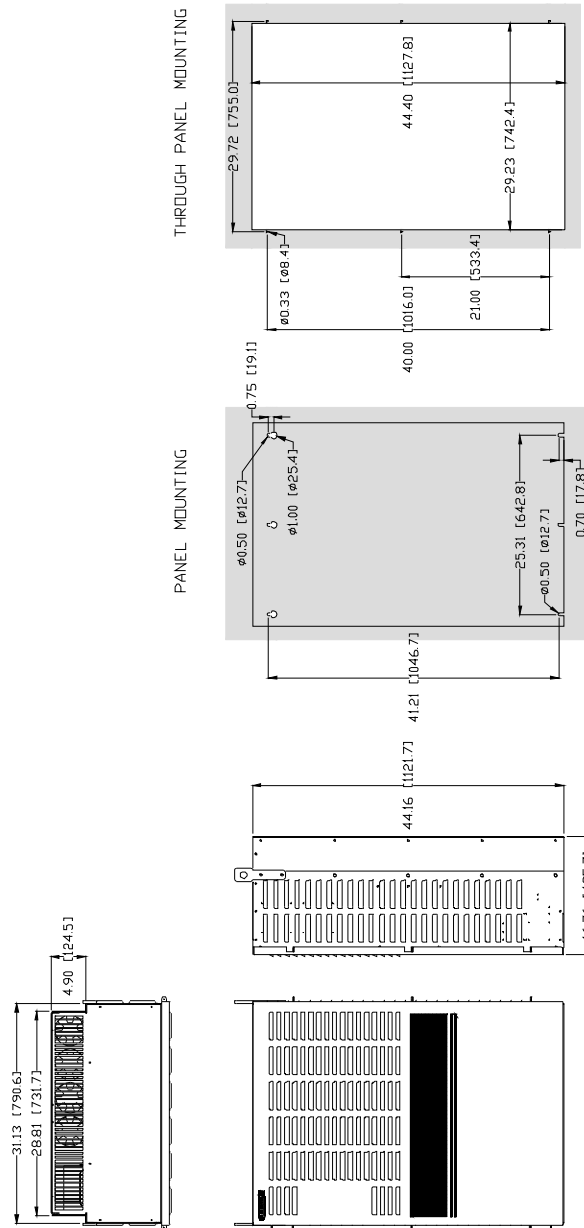


Approximate Weight: 150 Lbs. [68 Kgs]

Notes:

- Top and bottom endplates are removable to gain access inside the drive and to punch holes for conduits.
- Endplates must be removed from the drive before drilling and punching holes to avoid metal dust inside the drive enclosure. Failure to do so will cause damage to the drive.
- For through-panel mounting, customer is to seal for gap on all side of cutout. Provided by customer, aluminum angle 1" x 1" x 0.050" can be used to attach to all sides of drive to help seal and secure the drive.

**Figure 2-2a
AC Regen Mounting Information:
Size 2 (Nema Type 1)**



Approximate Weight: 450 Lbs. [204 Kgs]

Notes:

- Top and bottom endplates are removable to gain access inside the drive and to punch holes for conduits.
- Endplates must be removed from the drive before drilling and punching holes to avoid metal dust inside the drive enclosure. Failure to do so will cause damage to the drive.
- For through-panel mounting, customer is to seal for gap on all side of cutout. Provided by customer, aluminum angle 1" x 1" x 0.050" can be used to attach to all sides of drive to help seal and secure the drive.
- Size 3 enclosure can also be free-standing with optional floor stand kit from US Drives, Inc.

**Figure 2-2b
AC Regen Mounting Information:
Size 3 (Nema Type 1)**