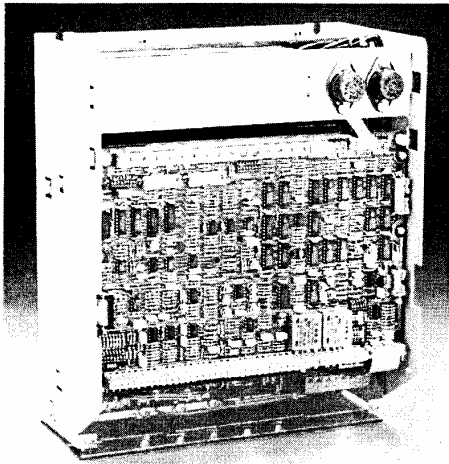


# TPy3A REGENERATIVE DC DRIVES



## TPy3A Regenerative DC Drives

The Amicon TYPACT Series TPy3A Regen allows the speed of a DC motor to be varied by armature voltage control. The TPy3A is a 4 quadrant regenerative, full-wave control designed to regulate the speed or torque of overhauling loads with electronic reversal capability. Motoring or braking torque is instantly available. Fully isolated control circuitry, picket fence SCR firing and conservative ratings assure excellent performance and reliability. These features are well suited for applications of material unwinds and related hold back equipment, tension control, overhauling loads, positioning and quick forward/reverse cyclic duty.

### STANDARD FEATURES:

- 4 Quadrant Operation with full regenerative torque capability.
- Electronic contactorless reversing.
- Inputs - all inputs are low level. No buffers or isolated cards required.
- Speed or torque control inputs.
- Full wave bridge.
- Modular Construction - ribbon cable interface.
- Tachometer feedback.
- Field loss and field economy.
- 1600 PIV rated SCR's with transient protection.
- 150% overcurrent capability for 60 seconds.
- Integral field supply.

## 1 - 1000HP

- THREE PHASE 50/60 Hz AC INPUT
- FULL WAVE OUTPUT
- FULLY ISOLATED
- TACH OR VOLTAGE FEEDBACK
- L.E.D. INDICATORS

# TYPACT

### ADJUSTMENTS:

- Maximum and minimum speed.
- Speed Loop -  
integral and proportional compensation.
- Current Loop -  
integral, proportional and adaptive compensation.
- Current Limit (positive and negative).
- Acceleration and deceleration rate.
- IR compensation.
- Current and Speed monitor output scaling.
- Zero Speed sensitivity.

### SWITCH SELECTABLE FUNCTIONS:

AC Input Voltage:  
220/240, 380, 415, 440/460, 480/500VAC  
50 or 60 Hz.  
DC Tach input level (5 to 300VDC).  
Internal/External current limit set point.  
Internal/External accel/decel control.

### CONTACT OUTPUTS:

Drive fault.  
Zero speed.

### OPTIONAL FEATURES:

The TPy3A series of drives can be supplied in chassis form, single drive preassembled panel or in multi-drive systems. Refer to the front of the DC Controls Section for a complete description of various panel options. Contact your AMICON local representative or distributor for multi-drive system quotations. Special field voltages are available in modular field packages, as well as field current regulators.

Standard "y" Control Interface Options mount behind the front board of the TPy3A series drives. Options for follower drives, dancer control, speed trip, winders, etc. are listed in the Standard "y" Control Interface Options Section of the catalog.

Refer to the Standard "y" Control Interface Options Section for other available options. Predesigned PD panels are available.

1

TPy3A REGENERATIVE DC DRIVES			
Model Number	Input Code	3 Phase AC Input	HP Range
TPy3A-16-	4A	230	1-5
	4B	460	1-10
TPy3A-32-	4A	230	7.5-10
	4B	460	15-20
TPy3A-56-	4A	230	15
	4B	460	25-30
TPy3A-88-	4A	230	20-25
	4B	460	40-50
TPy3A-112-	4A	230	30
	4B	460	60
TPy3A-148-	4A	230	40
	4B	460	75
TPy3A-224-	4A	230	50-60
	4B	460	100-125
TPy3A-280-	4A	230	75
	4B	460	150
TPy3A-336-	4B	460	200
TPy3A-400-	4B	460	250
TPy3A-560-	4B	460	300
TPy3A-760-	4B	460	400
TPy3A-1150-	4B	460	700
TPy3A-1450-	4B	460	900
TPy3A-1650-	4B	460	1000

**NOTES:**

Refer to the front of the DC Drives Controls Section for a complete explanation of the functional and panel options.

Refer to the Custom System Options Section for speed meters, potentiometers, operator stations, pilot lights, etc.

Refer to the Standard "y" Control Interface Option Section for interface option cards, i.e.: preset speeds, dancer, follower, relay cards, etc.

PC BOARDS	
Part No.	Description
Ry34	Regulator Board
MY34	Modulator Board
Sy3	Supply Board
Py34 ★	Power Board
FEy ★	Field Supply Board
PTy34	Pulse Transformer Board

\* Provide drive model # when ordering

2

FUNCTIONAL OPTIONS	
Option Code	Description (Choose only one functional option)
- C	Chassis Only
- F	- C with AC input fuses and mounting block
- PD	Predesigned PD Panel
- FC	Field Current Regulator

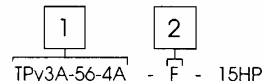
3

PANEL OPTIONS	
Option Code	Predesigned "PD" Panel Options
- DB	Dynamic Braking
- CB	Circuit Breaker
- N1	NEMA 1 Enclosure
- N4	NEMA 4 Enclosure (custom) *
- N12	NEMA 12 Enclosure (custom) *

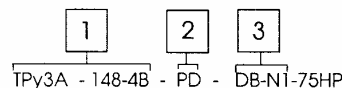
\* Contact Factory for NEMA 4 or 12 custom enclosures.

**ORDERING INSTRUCTIONS****Example #1**

The model number for a 15HP regenerative control chassis with fuse protection, 230VAC input is:

**Example #2**

The model number for a 75HP regenerative control with fuse protection, PD panel, dynamic braking and NEMA 1 enclosure, 460VAC input is:

**SPARES**

MISC. PARTS	
Part No.	Description
PP1040	Field Bridge (240 VDC)
PP1013/12	Field Bridge (150 or 300 VDC)

**CONTROL FUSES**

Part No.	Circuit	Designation
Omega 1.6A, 250V	±15, +24VDC, Sy3	F1, F2
Omega 250mA, 500V	Sync. Supply, Sy3	F7, F8, F9
Omega 4A, 500V	Snubber Circuit, Py34	F11, F12, F13
Bussman KTK4	Field 4 Amps	F14, F15
Bussman KTK8	Field 8 Amps	F14, F15

## FUSE AND SCR PART NUMBERS

Control Model/Part No.	AC Input Fuse	DC Arm Fuse	SCR
TPy3A-16	A70P 25 FWP 25	A70P 25 FWP 25	RSD0018-16
TPy3A-32	XL70F 40 A70P 40 FWP 40	XL70F 50 A70P 50 FWP 50	RSD0026-16
TPy3A-56	A70P 80 FWP 80	A70P 80 FWP 80	RSD0040-16
TPy3A-88	A70P 100 FWP 100	A70P 150 FWP 150	RSD0040-16
TPy3A-112	XL70F 150 A70P 150 FWP 150	XL70F 175 A70P 175 FWP 175	RSD0055-16
TPy3A-148	XL70F 175 A70P 175 FWP 175	XL70F 200 A70P 200 FWP 200	RSD0090-16
TPy3A-224	XL70F 300 A70P 300 FWP 300	XL70F 350 A70P 350 FWP 350	RSD0130-16
TPy3A-280	XL70F 350 A70P 350 FWP 350	XL70F 400 A70P 400 FWP 400	RSD0160-16
TPy3A-336	XL70F 400 A70P 400 FWP 400	XL70F 500 A70P 500 FWP 500	RSD0210-16
TPy3A-400	XL70F 500 A70P 500 FWP 500	A70P 600	RSD0250-16
TPy3A-560	A70P 600	A70P 700	RSD0250-16

XL = Brush

A = Gould Shawmut

FWP = Bussman  
Consult Factory

### TERMINAL INPUT AND OUTPUTS

Term	Designation	Function	I/O
1	DT	Tach input - High	I
2	OV	Circuit Common	-
3	+10	Ref. Supply	O
4	-10	Ref. Supply	O
5	RIF 1	Ref. Input (No ramp)	I
6	RIF 2	Ref. Input (Aux. Unscaled)	I
7	n <sub>0</sub>	Min. Speed Pot	O
8	OV	Circuit Common	-
9	HI	Ext. I Ref. Input (Unscaled)	I
10	Qn	Speed Loop Output	O
11	IRI	Scaled I Reference Input	I
12	RLI	Factory Use	I
13	Qlan	Current Monitor	O
14	QDTn	Speed Monitor	O
15	Imax (-)	I Limit Input -	I
16	Idn (-)	I Limit External Trim -	O
17	Imax (+)	I Limit Input +	I
18	Idn (+)	I Limit External Trim +	O
19	+24	Enable Voltage Supply	O
20	BIN	Block Integrator	I
21	BLG	Drive Enable	I
22	-	Aux -10V Supply	O
25	QEn	Armature Voltage Feedback	O
26	ZAG	O Reference To Ramp	I
27	BAG	Block Accel	I
28	IAG	Accel Ref. Input	I
29	QJ	Inertia Comp. Output	O
30	QAG	Accel Rate Output	O
31	-	Aux. +10V Supply	O
32	n = O	Speed = O Aux. Output	O
33	NO	Speed = O Relay Output	O
34	C	Speed = O Relay Output	O
35	NO	Fault Relay Output	O
36	C	Fault Relay Output	O
37	AL	Fault Aux. Output	O
	+24		O
	+15		O
	-15		O
	OV	Circuit Common	-

I = Current

n = Speed

### ADJUSTMENTS

n <sub>max</sub>	Max. Speed
I <sub>n</sub>	Speed regulator integral
n <sub>min</sub>	Minimum speed
P <sub>n</sub>	Speed regulator proportional
I <sub>Ac</sub>	Current regulator adaptation
I <sub>i</sub>	Current regulator integral
P <sub>i</sub>	Current regulator proportional
I <sub>act</sub>	Current monitor output
DT <sub>N</sub>	Speed monitor output
-I <sub>gn</sub>	Neg. Current limit
+I <sub>gn</sub>	Pos. Current limit
Rxl	IR Compensation
n = O	Zero speed monitor
-a	Deceleration time
+a	Acceleration time
Offset n	Speed regulator offset
Offset 2	Speed = O offset
Offset 3	Reference = O offset

### LEDS

I <sub>sc</sub>	Operation in current limit
RSH	±10V short circuit
I <sub>sc</sub> = O	Armature Current = O
AL	Fault
n = O	Speed = O
AR	Alarm Regulator
BAG	Ramp function disabled
BLG	Regulation section disabled
AF	Fuse failure on power board
MN	Motor Negative
MP	Motor Positive
SI	Firing pulses disabled
±15	15V voltage supply
UVW	Phase sequence

### STANDARD "y" CONTROL INTERFACE OPTIONS

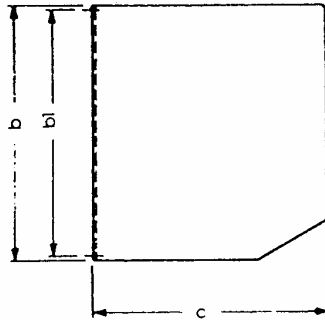
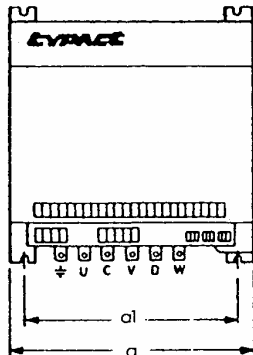
Option Code	Description	Option Code	Description	Option Code	Description
Ay	Auxiliary Amplifier	*BDAY	Binary to Analog Converter or Multiplying Converter	IMTy	Input Scaling
Ay (P)	Auxiliary Amplifier (High Power)			MTy	Tach Loss Indicator
*ACUy	Analog Mathematical Calculation	*CLC	Closed Loop Controller (PID)	RAY4	4 Parallel Relay Board
ADy	Analog to Encoder Simulator	CVy	At Speed Signal	RAY41	4 Individual Relay Board
AGy	Ramp Function Generator	*DDAy	BCD to Analog Converter	RRy411-1	4 Reed Relay, Form "C" Board
AGy (P)	Ramp Function Generator (High Power)	*FSy-1	Frequency Synchronizer	RSy	Quad Analog Switch
*ALy	Power Supply	*FVy	Encoder to Analog Signal Converter or Differential Pulse Train Input to Analog Converter	RVy	Speed Level Detector
*ALy-P	Power Supply (Precision)			TVO-1	High Voltage Feedback Isolator
APSy	Speed Range Extender			XMy	Ribbon Cable to Terminal Adaptor

Note: A maximum of (3) option slots are available. Options with \* are double wide providing space for a maximum of (1) double and (1) single wide option card.

### TPy3A Regenerative Dimensions (Inches)

Model No.	Chassis						Panel			NEMA 1 or 1A Enclosed		
	a"	a1"	b"	b1"	c"	lbs.	H"	W"	D"	H"	W"	D"
TPy3A-16	10.55	8.86	12.28	11.81	6.14	24	30	24	7.64	30	24	15
32	10.55	8.86	12.28	11.81	7.56	25	30	24	9.06	30	24	15
56	10.55	8.86	12.28	11.81	10.23	26	30	24	11.73	30	24	15
88	10.55	8.86	12.28	11.81	10.23	30	30	24	11.73	30	24	15
112	10.55	8.86	12.28	11.81	10.23	30	30	24	11.73	30	24	15
148	10.55	8.86	12.28	11.81	10.23	30	30	24	11.73	30	24	15
224	12.16	10.83	13.38	12.8	11.53	60	43	30	13.03	43	30	15
280	12.16	10.83	13.38	12.8	11.53	60	43	30	13.03	43	30	15
336	12.16	10.83	13.38	12.8	11.53	65	43	30	13.03	43	30	15
400	12.16	10.83	13.38	12.8	11.53	65	43	30	13.03	43	30	15
560-1650	Available in Panel Mount Only						Dimensions are Dependent on Functional Options Chosen. Consult Factory for Dimensions					

### SPECIFICATIONS



#### SERVICE CONDITIONS

Altitude (Standard) ..... 3,300 ft(1000m) Max.  
 Ambient Temperatures ..... 0 to 40°C (32° to 104°F)  
 AC Line Voltage Variation ..... ±10%  
 AC Line Frequency Variation ..... ±2Hz  
 Service Factor ..... 1.0  
 Maximum Load ..... 150% for 1 minute  
 Speed Reference Potentiometer ..... 1 to 10K, 1/2 W  
 2K typical  
 AC Input Voltages (50 or 60Hz) ..... 220/240, 380,415,  
 440/460,480/500

#### ADJUSTMENT RANGE

Maximum Speed ..... 80 to 120%  
 Minimum Speed ..... 0 to 20% with 2K pot  
 Accel/Decel (individual adjustment) ..... 0.5 to 5 sec  
 Selectable Range ..... 0.5 to 5 sec.  
 3 to 30 sec., or 5 to 150 sec.  
 Current Limit (positive & negative) ..... 0 to 150%  
 IR (load) compensation ..... 0 to 10%

#### PERFORMANCE CHARACTERISTICS

Operating Range ..... 0 to rated speed  
 Range for quoted regulation  
 Armature feedback with IR Comp ..... 20:1  
 DC Tachometer Feedback ..... 100:1  
 Speed Regulation for a 95% load change  
 Armature feedback with IR Comp ..... 2 to 5%  
 Type APY DC Tachometer ..... 1%\*

\*% of motor base speed