

Youngstown[®] Power Limit Switches

CONTENTS			
Description	Class	Page	
General Information and Selection	6170.....	2	
Application Information	6170	3	
Class 6715 Limit Switch Resistor Selection	6715.....	3	
Wiring Diagrams	6170.....	4-5	
Approximate Dimensions and Weights	6170.....	6-8	
Approximate Dimensions and Weights	6715.....	9	
Crane Control Selection Guide		11	



The Electric Controller and
Manufacturing Company, LLC

YOUNGSTOWN® POWER LIMIT SWITCHES FOR AC AND DC CRANES

GENERAL INFORMATION MILL DUTY HOIST SERVICE

YOUNGSTOWN® Power Limit Switches are used on crane hoist drives to limit over travel in the hoisting direction

- Operated by crane hoist hook block lifting a suspended counterweight
- Interrupts hoist motor current directly. Since interposing devices are not required, this device best meets OSHA standard 1910.179(g)(5)(iv) for use as a final hoist limit stop.

The standard limit switch is supplied for right hand operation and consists of:

- 2–Normally open and 2–normally closed mechanically interlocked power contacts for simplex switches
- 4–Normally open and 4–normally closed contacts for duplex switches
- 1–General purpose NEMA Type 1 enclosure
- 1–Standard straight operating arm



Class 6170 Type BG1 Limit Switch

POWER LIMIT SWITCH SELECTION TABLE

Limit Switch without Weight & Cable (Standard Operating Arm)♦	Weight & Cable Kit	EC&M Size	Nearest Equivalent NEMA Size	Max HP – Crane Rating			
				DC*		AC	
				230V	550V	230V	460V / 575V
SIMPLEX YOUNGSTOWNS® FOR SINGLE MOTOR OPERATION							
AG1	AW8	#5	3	26	25	25	50
BG1	BW8	#10	4	50	50	50	100
CG1	CW8	#20	5	100	100	100	200
DG1	DW8	#30	6	200	200	200	400
FG1	FW8	#50	8	500	660	--	--
DUPLEX YOUNGSTOWNS® FOR DUPLEX MOTOR OPERATION							
CCG1	CCW8	#20D	5	2-100	2-100	2-100	2-200
DDG1	DDW8	#30D	6	2-200	2-200	2-200	2-400
FFG1	FFW8	#50D	8	2-500	2-660	--	--

* A Class 6715 Limit switch resistor is required for DC hoist operations. See page 3 for Limit Switch Resistor Selection Table

♦ If 90° arm is required, consult factory.

MODIFICATIONS

Form	Description
B	Add Conduit Box
L	Operating arm arranged for left hand operation
X111	Control Circuit Interlock: 1 N.O. and 1 N.C. contacts, set to operate prior to main power contacts. Required for variable frequency drive applications. Available on size #5, #10, #20 & #30 Limit Switches only
X122	Control Circuit Interlock: 2 N.O. and 2 N.C. contacts, set to operate prior to main power contacts. Required for variable frequency drive applications. Available on size #5, #10, #20 & #30 Limit Switches only
Y781	Substitute silver (Ag) contact tips in place of standard tin-plated copper (Cu) tips. Available on EC&M Size #5, #10 & #20 Limit Switches only

ORDERING INFORMATION REQUIRED: Class and Type of limit switch; and of weight and cable kit, if required.

MODIFICATIONS TO LIMIT SWITCH: Specify Form number

APPLICATION INFORMATION: See Page 3

DIMENSIONAL INFORMATION: See Pages 4-6



YOUNGSTOWN® POWER LIMIT SWITCHES FOR AC AND DC CRANES

APPLICATION INFORMATION

RIGHT HAND OPERATION

The limit switch is arranged for right hand operation when the reset weight and cable are on the right side (as seen when facing the operating arm).

STANDARD OPERATING ARM

The standard operating arm is used when the weight and cable can be suspended beneath the limit switch.

HOIST FINAL LIMIT APPLICATION

Class 6170 Youngstown® power limit switches are designed as final hoist limit stops. As such, they are not to be used as a production stop when placed in the motor power circuit directly interrupting motor power.

HOIST PRODUCTION LIMIT APPLICATION

The Class 6170 Type AG1 Form Y781 Youngstown® limit switch is suitable for use as a weight activated production limit switch when wired into the control circuit of a hoist controller.

VARIABLE FREQUENCY DRIVE APPLICATIONS

Most AC variable frequency drive applications require a set of control circuit contacts to operate prior to the operation of the main power poles of the power limit switch. This function is served by optional Forms X111 or X122, Control Circuit Interlocks. Control circuit interlocks are provided on the power limit switch by an externally mounted control circuit limit switch, operated by the power limit switch operating arm.

TEMPERATURE AND ALTITUDE RATINGS

Class 6170 Youngstown® power limit switches are designed to meet the required NEMA maximum temperature rise at 40°C, and at 1000m (3300ft). For extended use in temperatures above 40°C or altitudes above 1000m, consult factory for maximum ratings which maintain the maximum NEMA allowable heat rise.

DC SERIES MOTOR APPLICATIONS

DC dynamic lowering series motor hoist circuits require the use of a separately mounted limit switch resistor or resistors. If required for a DC hoist application, select the limit switch resistor from the following table. For a duplex limit switch, two resistors are required, one resistor per motor. For DC series motor reversing hoists, consult factory.

Class 6715 Tab-Weld® Resistors[♦]

230VDC		
HP	Open Type	▲Enclosed Type
5-10	TW16F	TW16FG
11-13.5	TW21F	TW21FG
14-26	TW27F	TW27FG
27-33	TW32F	TW32FG
34-45	TW37F	TW37FG
46-65	TW42F	TW42FG
66-100	TW62E	TW62EG
101-135	TW85E	TW85EG
136-200	TW120D	TW120DG
201-265	TW150D	TW150DG
266-360	51237-251-50 (2-TW120D)	51237-251-51 (2-TW120D, enclosed)
361-550	51237-271-50 (2-TW150D)	51237-271-51 (2-TW150D, enclosed)
550VDC		
HP	Open Type	▲Enclosed Type
36-56	TW27E	TW27EG
66-110	TW42D	TW42DG
101-135	TW50D	TW50DG
136-265	TW62D	TW62DG
266-360	TW72D	TW72DG
361-500	TW120D	TW120DG
501-660	TW150D	TW150DG

♦Other system voltages are available, consult factory

▲Suitable for indoor or outdoor applications

YOUNGSTOWN® POWER LIMIT SWITCHES

FOR AC AND DC CRANES

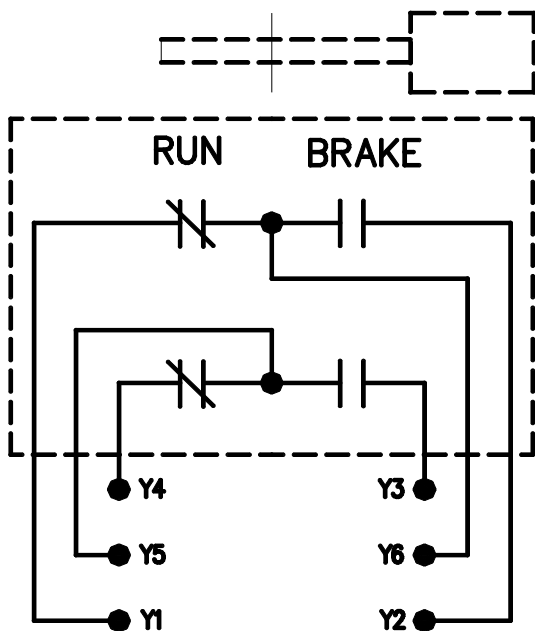
APPLICATION INFORMATION

WIRING DIAGRAMS

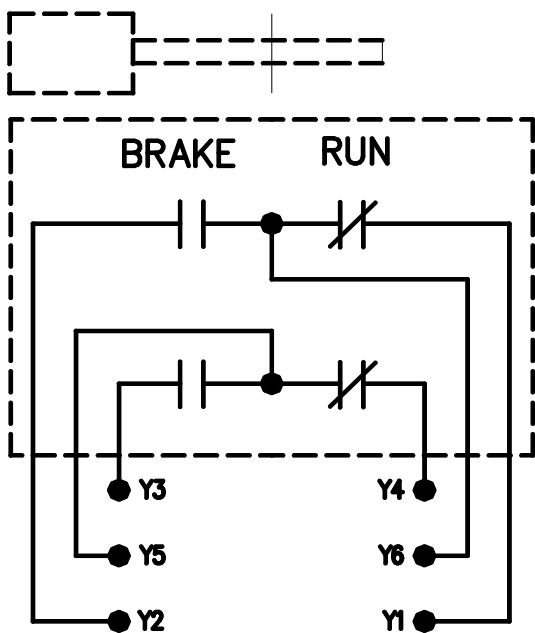
Connections shown with switch in "RUN" or "RESET" position

CLASS 6170
TYPE AG1

RIGHT HAND OPERATION

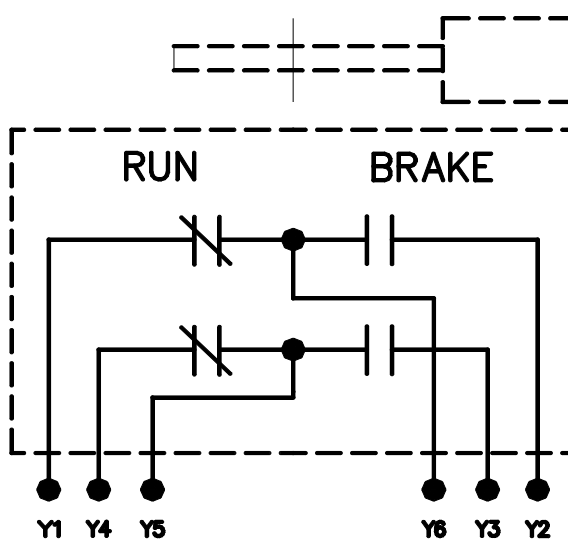


LEFT HAND OPERATION (FORM L)

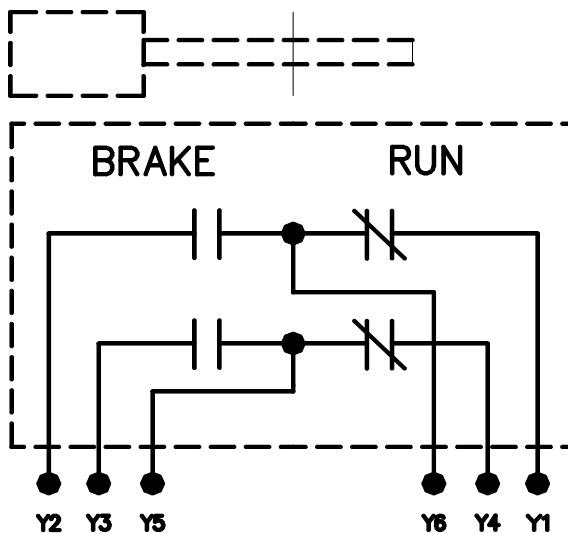


CLASS 6170
TYPES BG1

RIGHT HAND OPERATION



LEFT HAND OPERATION (FORM L)



YOUNGSTOWN® POWER LIMIT SWITCHES FOR AC AND DC CRANES

**CLASS
6170**

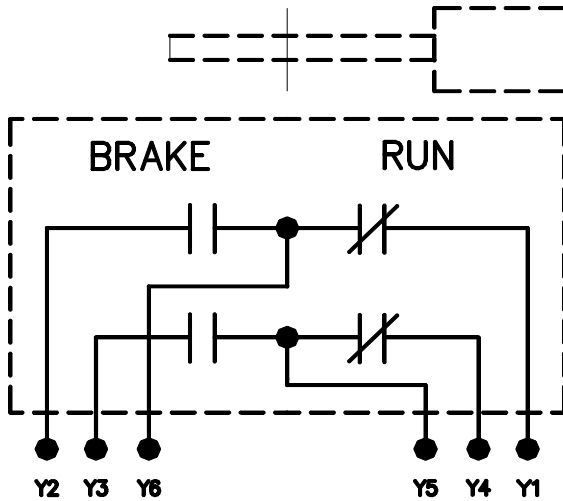
APPLICATION INFORMATION
WIRING DIAGRAMS

Connections shown with switch in "RUN" or "RESET" position

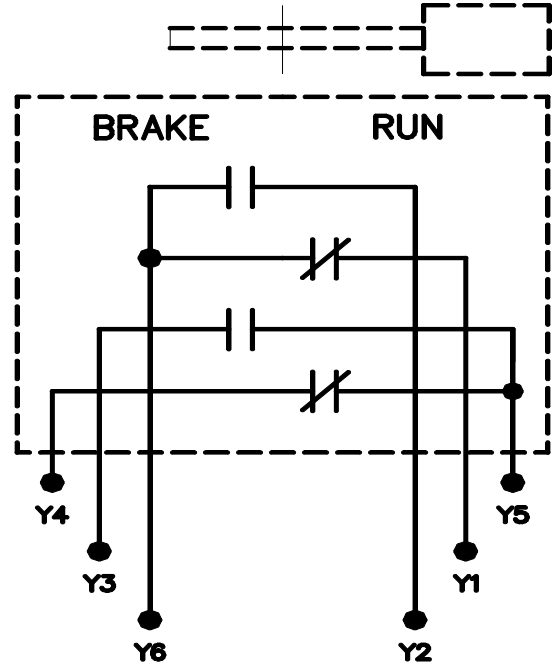
CLASS 6170
TYPES CG1 THROUGH DG1

CLASS 6170
TYPE FG1

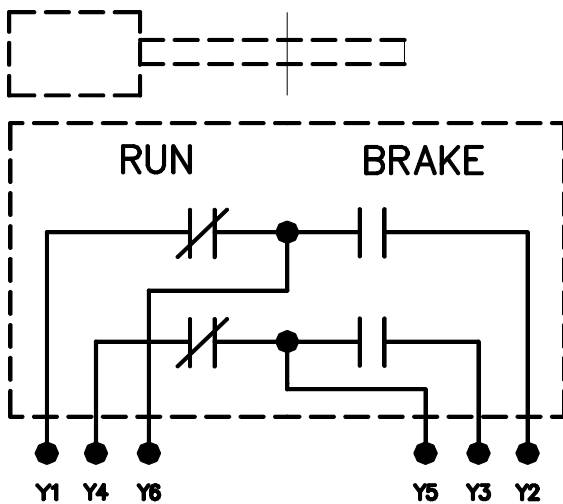
RIGHT HAND OPERATION



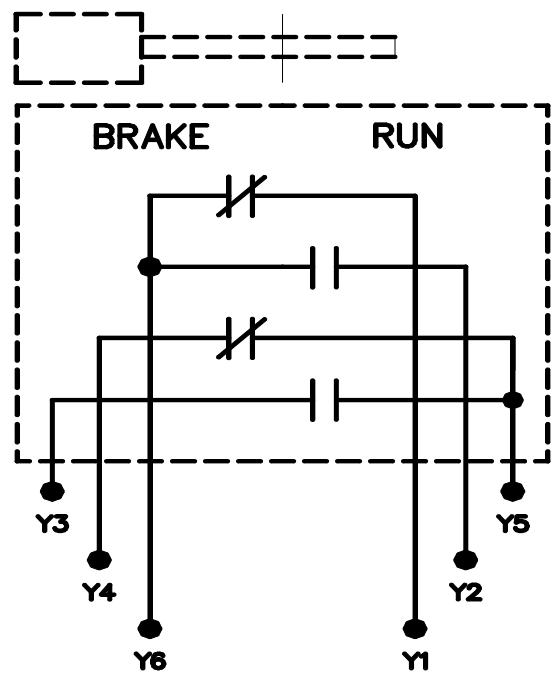
RIGHT HAND OPERATION



LEFT HAND OPERATION (FORM L)



LEFT HAND OPERATION (FORM L)



YOUNGSTOWN® POWER LIMIT SWITCHES

FOR AC AND DC CRANES

March, 2012

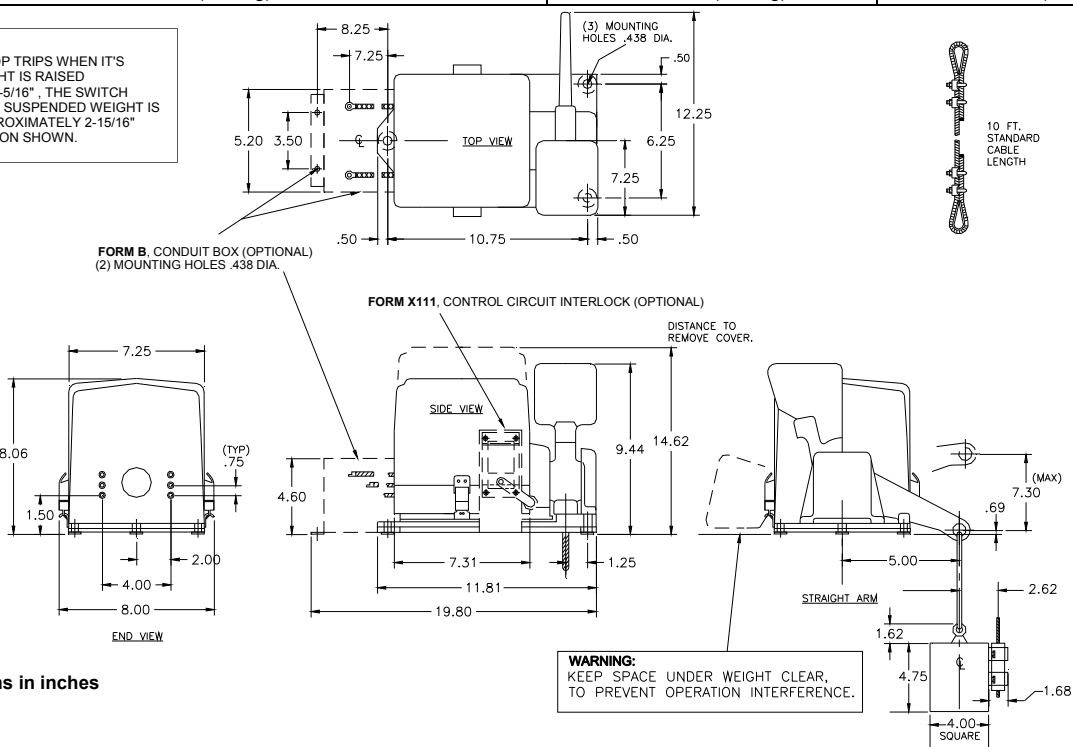
APPROXIMATE DIMENSIONS AND WEIGHTS

NOTE: Unless otherwise ordered, all limit stops are assembled for right-hand operation and horizontal mounting as shown.

EC&M #5 YOUNGSTOWN® POWER LIMIT

Type AG1	Type AW8	
Limit Switch Weight Only	Operating Weight Only	Cable & Cable Hardware only
50 lbs. (22.7 kg)	22.5 lbs. (10.2 kg)	1.75 lbs. (0.79kg)

NOTE:
THE AG1 LIMIT STOP TRIPS WHEN IT'S SUSPENDED WEIGHT IS RAISED APPROXIMATELY 5-5/16", THE SWITCH RESETS WHEN IT'S SUSPENDED WEIGHT IS LOWERED TO APPROXIMATELY 2-15/16" ABOVE THE POSITION SHOWN.

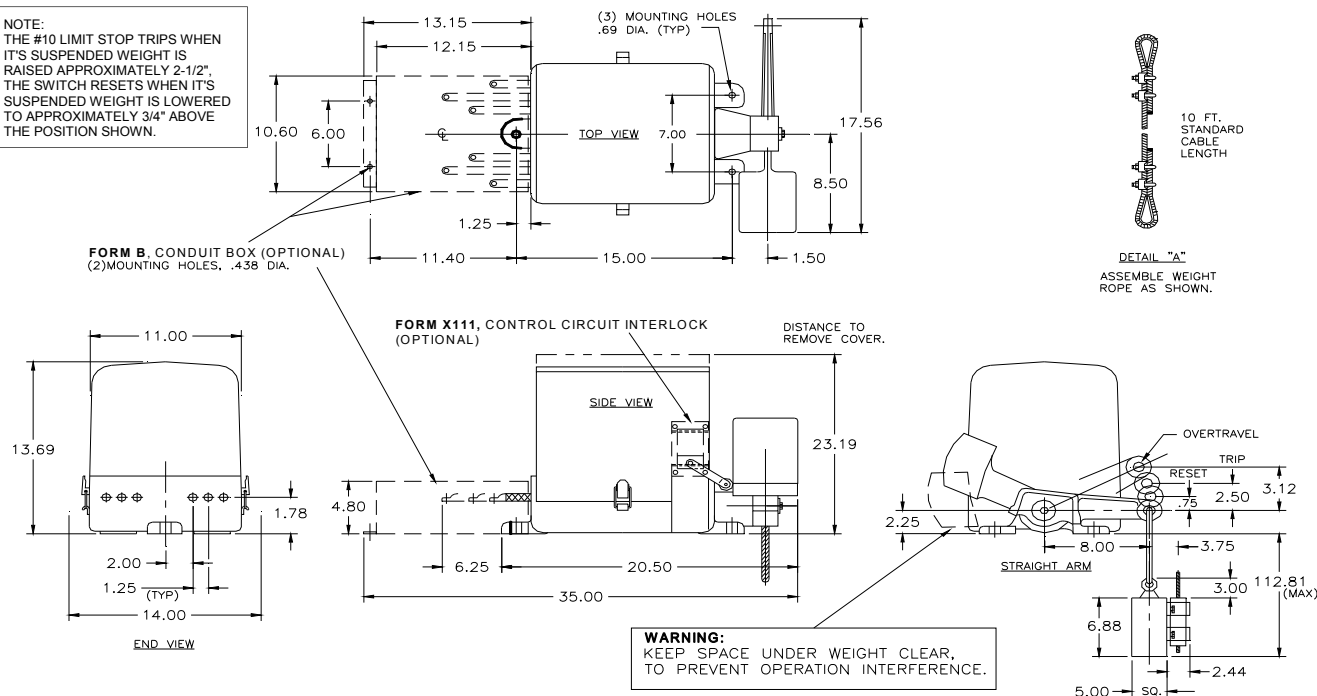


All dimensions in inches

EC&M #10 YOUNGSTOWN® POWER LIMIT

Type BG1	Type BW8
Limit Switch Weight Only	Operating Weight, with Cable & Cable hardware
170 lbs. (77.1 kg)	54 lbs. (24.5 kg)

NOTE:
THE #10 LIMIT STOP TRIPS WHEN IT'S SUSPENDED WEIGHT IS RAISED APPROXIMATELY 2-1/2", THE SWITCH RESETS WHEN ITS SUSPENDED WEIGHT IS LOWERED TO APPROXIMATELY 3/4" ABOVE THE POSITION SHOWN.



All dimensions in inches



The Electric Controller and
Manufacturing Company, LLC

YOUNGSTOWN® POWER LIMIT SWITCHES

FOR AC AND DC CRANES

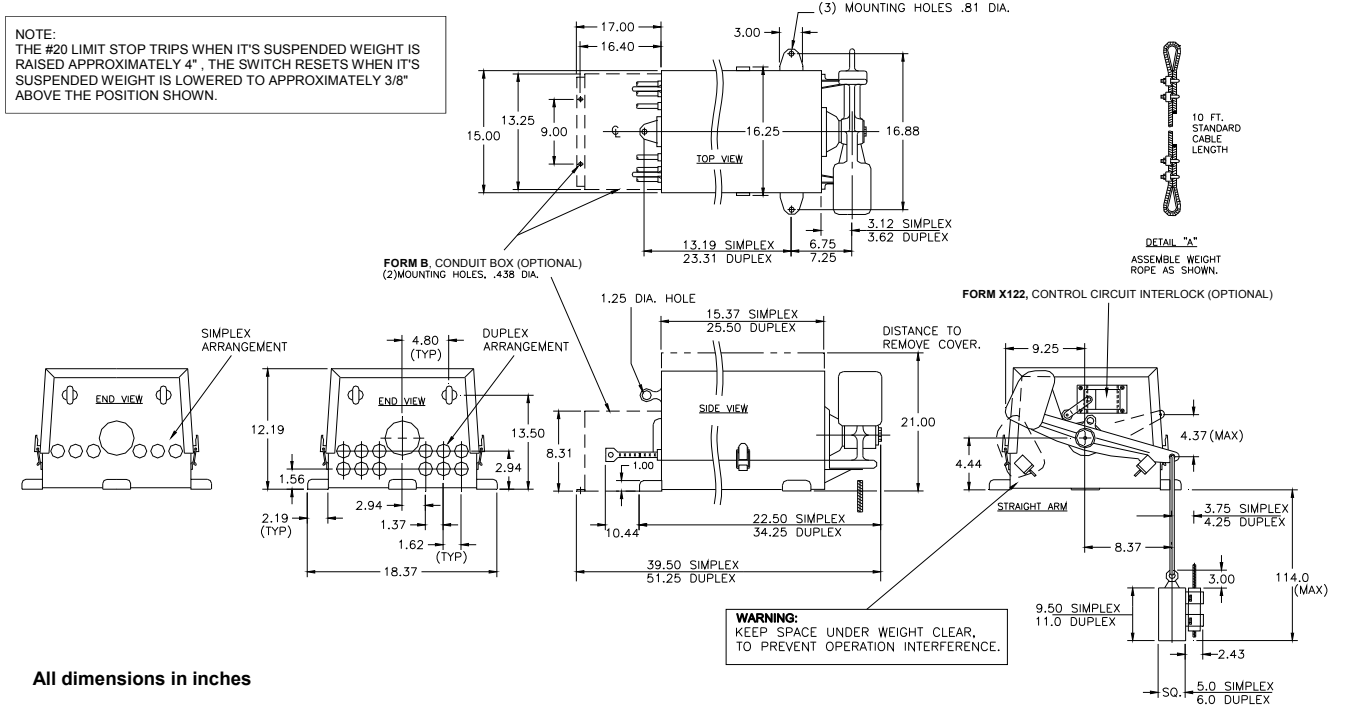
CLASS 6170

APPROXIMATE DIMENSIONS AND WEIGHTS

NOTE: Unless otherwise ordered, all limit stops are assembled for right-hand operation and horizontal mounting as shown.

EC&M #20 YOUNGSTOWN® POWER LIMIT			
Type CG1	Type CCG1	Type CW8	Type CCW8
Simplex Limit Switch Weight Only	Duplex Limit Switch Weight Only	Simplex Operating Weight & Cable	Duplex Operating Weight & Cable
275lbs. (124.7 kg)	540lbs. (245 kg)	67 lbs. (30.4 kg)	111 lbs. (50.354 kg)

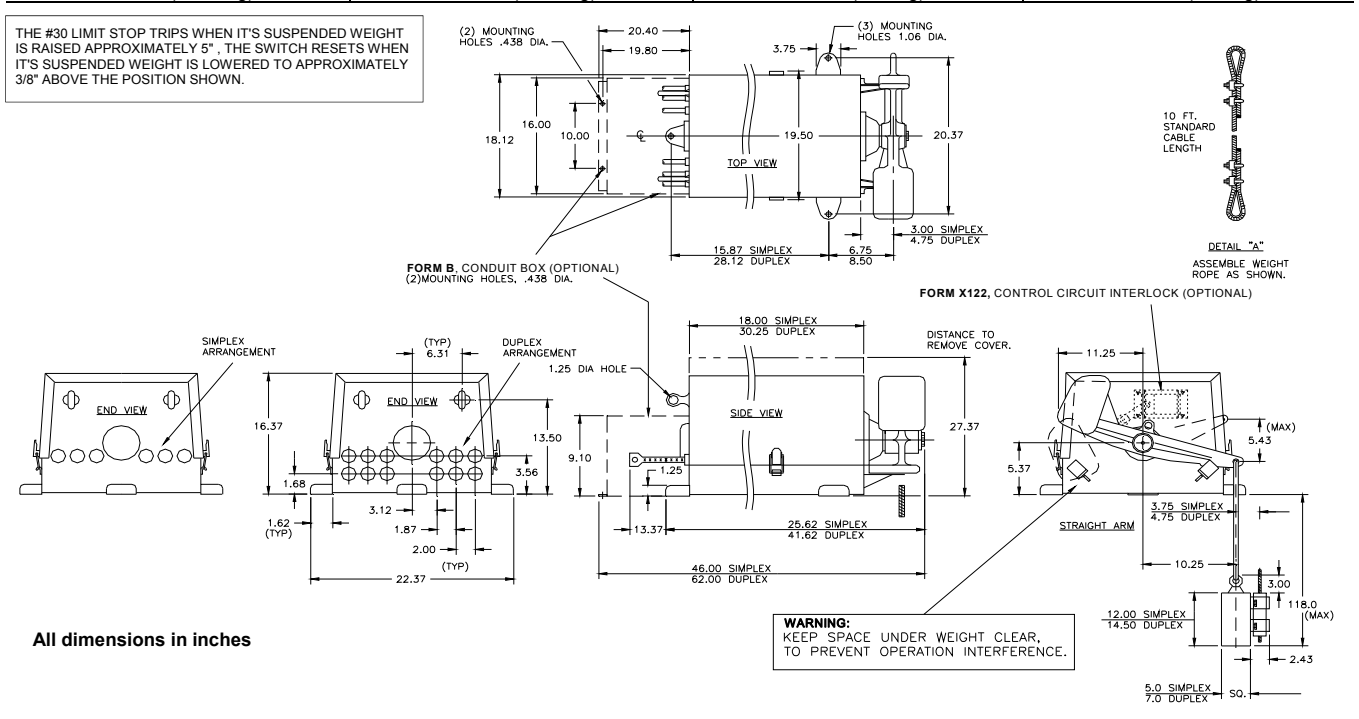
NOTE:
THE #20 LIMIT STOP TRIPS WHEN IT'S SUSPENDED WEIGHT IS RAISED APPROXIMATELY 4", THE SWITCH RESETS WHEN IT'S SUSPENDED WEIGHT IS LOWERED TO APPROXIMATELY 3/8" ABOVE THE POSITION SHOWN.



All dimensions in inches

EC&M #30 YOUNGSTOWN® POWER LIMIT			
Type DG1	Type DDG1	Type DW8	Type DDW8
Simplex Limit Switch Weight Only	Duplex Limit Switch Weight Only	Simplex Operating Weight & Cable	Duplex Operating Weight & Cable
480lbs. (217.7 kg)	750lbs. (340.2 kg)	90 lbs. (40.8 kg)	218 lbs. (98.9 kg)

THE #30 LIMIT STOP TRIPS WHEN IT'S SUSPENDED WEIGHT IS RAISED APPROXIMATELY 5", THE SWITCH RESETS WHEN IT'S SUSPENDED WEIGHT IS LOWERED TO APPROXIMATELY 3/8" ABOVE THE POSITION SHOWN.



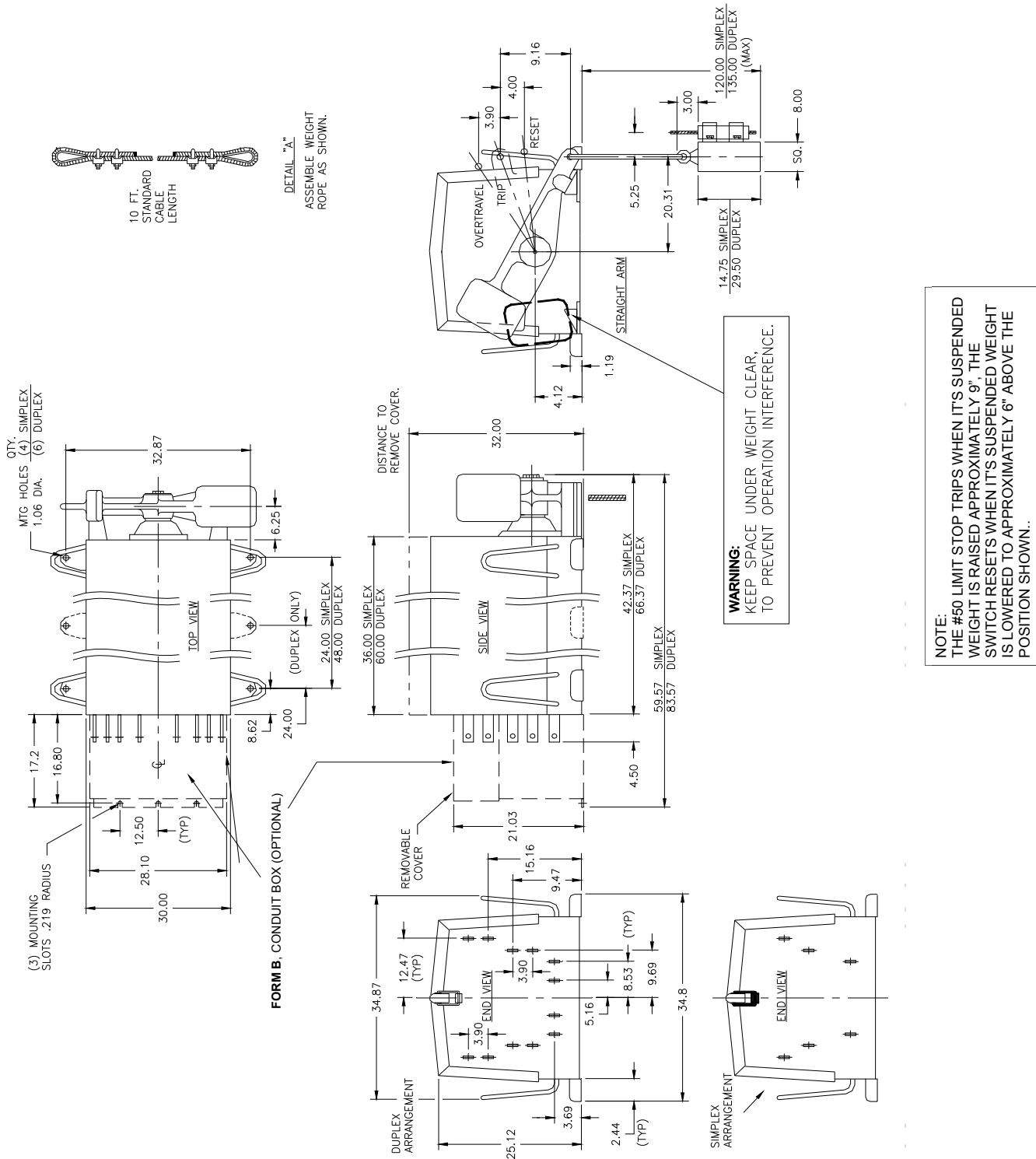
All dimensions in inches

YOUNGSTOWN® POWER LIMIT SWITCHES FOR AC AND DC CRANES

APPROXIMATE DIMENSIONS AND WEIGHTS

NOTE: Unless otherwise ordered, all limit stops are assembled for right-hand operation and horizontal mounting as shown.

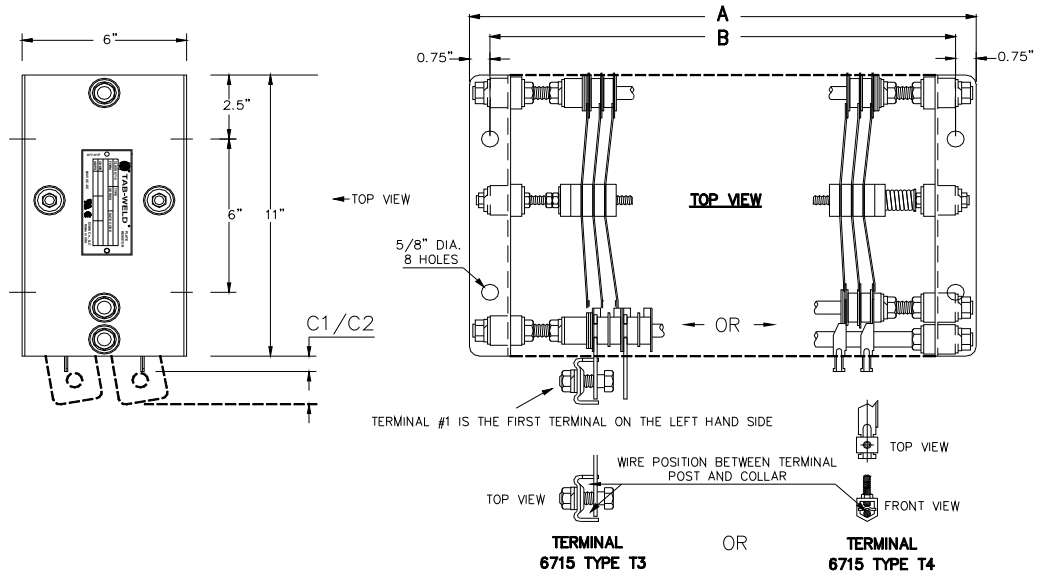
EC&M #50 YOUNGSTOWN® POWER LIMIT			
Type FG1	Type FFG1	Type FW8	Type FFW8
Simplex Limit Switch Weight Only	Duplex Limit Switch Weight Only	Simplex Operating Weight & Cable	Duplex Operating Weight & Cable
1350lbs. (612 kg)	2350lbs. (1065 kg)	265 lbs. (120.2 kg)	530 lbs. (240.4 kg)



YOUNGSTOWN® POWER LIMIT SWITCHES FOR AC AND DC CRANES

**CLASS
6715**

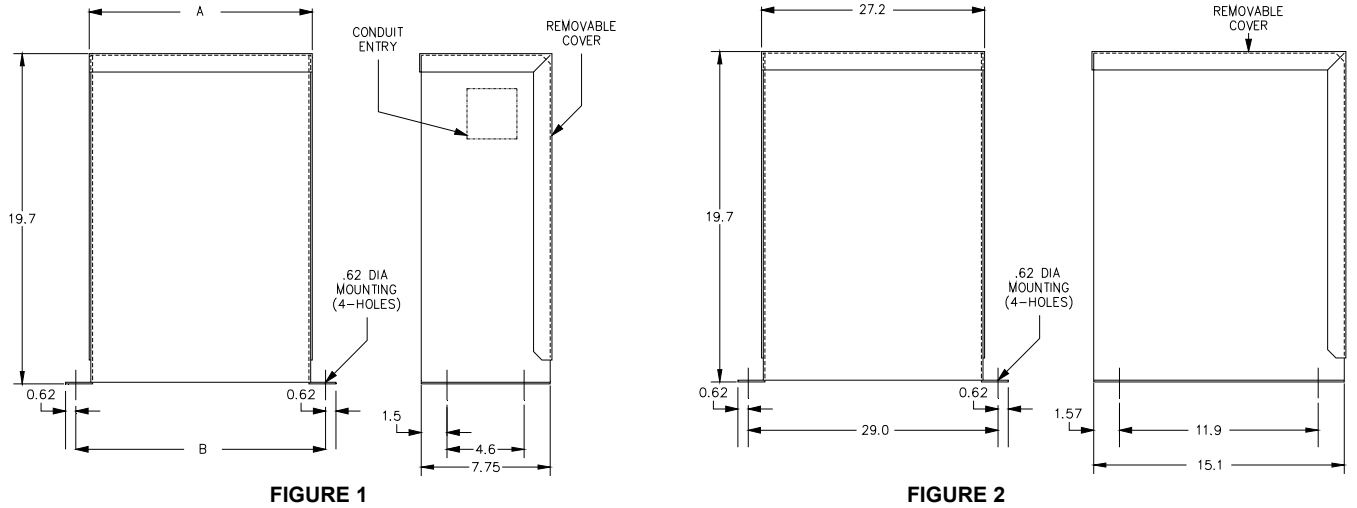
APPROXIMATE DIMENSIONS AND WEIGHTS CLASS 6715 TYPE TAB-WELD® RESISTORS OPEN TYPE



CLASS 6715 TYPE	SECTION LENGTH	A	B	NET WEIGHT LBS. (KG)
TW D	26.5"	26.5"	25"	35 (15.9)
TW E	18"	18"	16.5"	22 (10)
TW F	12.5"	12.5"	11"	18 (8.2)

CLASS 6715 TYPE	TERMINAL TYPE	C1	C2	WIRE SIZE	
	CLASS 6715			MIN.	MAX.
TW13, TW16, TW21, TW27, TW37	TYPE T4	0.38"		#8 AWG	#2AWG
TW32, TW42 THROUGH TW150	TYPE T3		2.13"	#2 AWG	#4/0AWG

ENCLOSED TYPE



CLASS 6715 TYPE	SINGLE SECTION ENCLOSURE: SEE FIGURE 1		NET WEIGHT LBS. (KG)
	A	B	
TW DG	27.2"	29.0"	85 (35.6)
TW EG	18.5"	20.5"	25 (11.3)
TW FG	13.3"	15.0"	20 (9.1)

PART NUMBER	TWO SECTION ENCLOSURE: SEE FIGURE 2	NET WEIGHT LBS. (KG)
51237-251-51 OR 51237-271-51		120 (54.4)

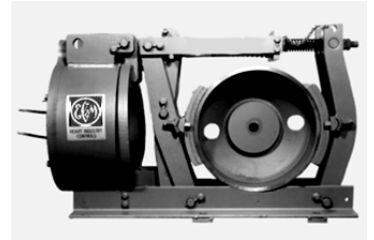
INTENTIONALLY LEFT BLANK

Crane Control Selection Guide

For more details, please see our crane control catalog, on-line at www.ECandM.net

CLASS 5010 FIXED TORQUE and CLASS 5060 ADJUSTABLE TORQUE DRUM BRAKES

- AIST rated and mounting dimensions, suitable for all crane classes
- Spring set, electrically released, DC drum type brakes
- Available for AC operation with brake rectifier or AC control panel
- Hold motor stationary when motor is off
- Class 5010 WB Type F Drum Brakes:
 - ◆ Available in 8" to 30" wheel diameters, Torque ratings 100 through 9000 ft-lbs
 - ◆ Available with optional self-adjuster
- Class 5060 "AT" Type A electrically operated adjustable torque brakes replace hydraulic braking systems:
 - ◆ Used on bridge and trolley (horizontal travel) drives
 - ◆ Provide fixed holding torque for parking
 - ◆ Provide electrically controlled adjustable torque for stopping
 - ◆ Available in 10", 13", and 16" wheel diameters
 - Parking torque ratings up to 200, 550 and 1000 ft-lbs respectively
 - Stopping torque ratings up to 300, 850 and 1500 ft-lbs respectively

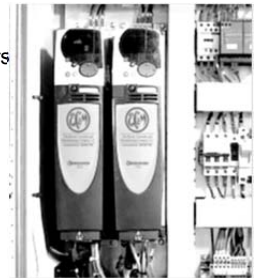


"EXTEND THE LIFE": EC&M's EQUIPMENT REBUILD PROGRAM

- Returns EC&M and former Square D brand mill duty crane control equipment to factory specifications
- All devices and components are OEM original: inspected, tested and certified to the same level, using the same methods as newly manufactured devices
- Devices rebuilt by EC&M will meet all industry specifications and national standards
- Recent design upgrades included where feasible, at no additional cost
- Significant cost savings over new equipment
- Suitable for EC&M (formerly Square D) built Brakes, Power Limit Switches, Master Switches, and large Contactors

CLASS 6417 to CLASS 6418 AC VARIABLE FREQUENCY CRANE CONTROLS

- Used with wound rotor or inverter duty squirrel cage motors
- Closed loop drives for hoists, open loop for bridge and trolley (travel) drives
- Meets AIST Technical Report #6, Classes 1 to 4 and NEMA Service Classification I and II
- Available through 400HP for single or multiple motor systems
- Panels are rated 50°C, without air conditioning, at altitude less than 1000m (3300ft)
- Supplied with mill duty DB resistors



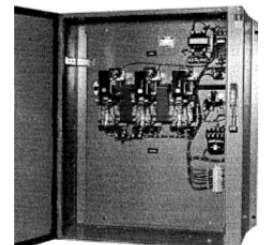
CLASS 6805 MAGNIFIER^{AC} & CLASS 6845 MAGNIFIER^{DC} DIGITAL MAGNET CONTROLS

- **MAGNIFIER^{AC}** provides complete programmable magnet controls directly from AC power
- **MAGNIFIER^{DC}** provides complete programmable magnet controls directly from DC power
- Patented AC to DC control for full or partial voltage magnets
- Voltage and current control for full control of magnet lift and drop operations
- Available auxiliary contacts set to operate prior to main contacts, for variable frequency hoist applications
- Ratings to 750A magnets
- 60°C ambient rated as enclosed, with no external air forced through the enclosure



CLASS 6140 DC and 6440 AC MANUAL MAGNETIC DISCONNECT SWITCHES

- Meet OSHA & NEC requirements for crane disconnect switch
- Available in continuous ratings of 150 to 2700 Amperes DC; and 150 to 1350 Amperes AC
- Operated remotely by pushbutton or by the enclosure handle
- Mechanical & electrical interlocks prevent switch operation with handle in the OFF position



Please visit our website www.ECandM.net for additional details on:
**DC MILL DUTY CONTACTOR CONTROL, DIGITAL DC DRIVES,
DC DISCONNECT SWITCHES, DC MAGNET CONTROL, DC REDUCED VOLTAGE STARTERS,
MASTER SWITCHES, MILL DUTY RELAYS, OVERLOAD RELAYS, AC CONTACTORS,
AND OTHER MILL DUTY CONTROL COMPONENTS**



SEE SEPARATE PRICE SHEET OR CONTACT
EC&M FOR PRICE AND LEAD-TIME AT
www.ECandM.net OR CALL **803-874-3922**

©Copyright The Electric Controller and Manufacturing Company, LLC. 2012
Printed in the USA