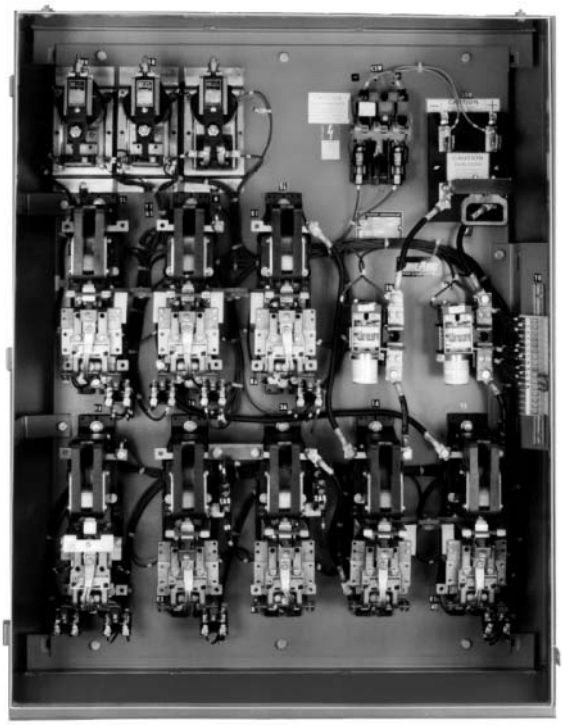
Crane Control Class 6131

Catalog

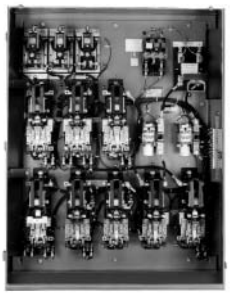
17



CONTENTS

The Electric Controller and Manufacturing Company, LLC

GENERAL INFORMATION AND PRICING



**Class 6131
Type ESH8
Hoist Controller**

Class 6131 controllers are recommended for use with DC series motors on hoist, bridge and trolley drives of general purpose overhead cranes. The hoist controllers are of the reversing dynamic lowering type and are designed for use on cranes without mechanical load brakes. The bridge and trolley controllers are of the reversing-plugging type and can also be used to control hoists with mechanical load brakes. Both the hoist and the bridge and trolley controllers are designed for use with series wound magnetic brakes. The bridge and trolley controllers can also be used with shunt wound brakes when an optional shunt brake relay is supplied.

- Standard controllers meet the requirements of NEMA Service Classification II (CMAA Service Classification B).
- To meet the requirements of NEMA Service Classification I (CMAA Service Classifications A,C, D, E and F), the controller must be priced from the Class 6121 catalog.
- Mill Duty Class 7004 Type M Line-Arc® contactors & Class 7001 Type K relays
- Class 7001 Type ST-1 static acceleration timers

**Class 6131
Type ESR8
Bridge or Trolley Controller**

Hoist Service

The standard single motor reversing dynamic lowering controller consists of:

1 Two pole fused control circuit knife switch with padlock clip (CSW)
1 Two pole unfused main line knife switch with padlock clip (LSW)
4 Type M single pole contactors with mechanical interlocks for hoisting and lowering circuits (H, 1L, 2L, 3L)
3 Type M single pole acceleration contactors (1A, 2A, 3A)
2 Type ST-1 static acceleration timers (1AR, 2AR)
1 Type KE voltage relay for acceleration lowering (VR)
1 Type KE limit switch relay (LSR)
1 Type M single pole spring-closed dynamic lowering contactor (DB)
1 Undervoltage relay (UV)
2 Magnetic overload relays (one instantaneous and one inverse time) (1OL, 2OL)

Bridge or Trolley Service

The standard single motor reversing plugging controller consists of:

1 Two pole fused control circuit knife switch with padlock clip (CSW)
1 Two pole unfused main line knife switch with padlock clip (LSW)
4 Type M single pole directional contactors with mechanical interlocks (1F, 2F, 1R, 2R)
3 Type M single pole acceleration contactors (including one for plugging) (1A, 2A, P)
2 Type ST-1 static acceleration timers (1AR, 2AR)
1 Type KP rectifier-plugging relay (PR)
1 Undervoltage relay (UV)
2 Magnetic overload relays (one instantaneous and one inverse time) (1OL, 2OL)

VDC	Max. HP Crane Rating	Contactors NEMA Size	No. of Speed Points	General Purpose Enclosure NEMA Type 1 Gasketed		Outdoor Enclosure NEMA Type 3R	
				Controller Type	Price	Controller Type	
Single Motor Reversing Dynamic Lowering Hoist Control							
230	7-1/2	1	4	CSH8	**26280.**	CWH8	
	15	2	4	DSH8	**32220.**	DWH8	
	35	3	4	ESH8	**39288.**	EWH8	
	55	4	4	FSH8	**44832.**	FWH8	
Single Motor Reversing-Plugging Bridge Or Trolley Control							
230	7-1/2	1	4	CSR8	**23266.**	**C**WR8	
	15	2	4	DSR8	**25966.**	DWR8	
	35	3	4	ESR8	**32232.**	**E**WR8	
	55	4	4	FSR8	**37272.**	WR	

Ordering Information Required:

1. Class
2. Type
3. Motor Horsepower at 230 VDC
4. Motor Duty Rating
5. Controller Modifications: Specify Form Numbers
6. Resistor Service Classification
7. Master Switch Class, Type and Form

SCH	A

PRICING INFORMATION AND APPLICATION DATA

Class 6715
Tab-Weld® Resistor

A complete set of motor control equipment consists of a controller, separately mounted Tab-Weld® resistors, and a master switch. The following tables are for selecting the resistors and master switches used with Class 6131 controllers.

Tab-Weld® Resistor Selection Table ★ †

Maximum HP Rating Single Motor	Hoist	Bridge or Trolley	
	NEMA Class ●	NEMA Class ●	
		Without Armature Shunt	With Intermittent Duty Armature Shunt ▲
	162-DL	162-P	162-PAS
5	**4194.**	**2430.**	**3816.**
7-1/2	**6030.**	**2862.**	**4248.**
10	**6246.**	**2862.**	**4248.**
15	**6660.**	**3204.**	**4554.**
20	**7110.**	**3204.**	**4554.**
25	**7560.**	**3384.**	**4752.**
30	**8784.**	**3924.**	**5328.**
35	**9180.**	**4446.**	**5796.**
40	**11268.**	**4950.**	**6372.**
45	**12546.**	**5526.**	**7290.**
50	**13806.**	**5940.**	**7938.**
55	**16182.**	**7182.**	**8892.**

Class 9004
Type CG8
Master Switch

★ It is recommended that hoist resistors be selected based on the 1/2 hour motor horsepower rating unless specified otherwise. It is also recommended that bridge or trolley resistors be selected based on the 1 hour motor horsepower rating unless specified otherwise.

† For resistors mounted in racks, refer to Class 6715.

● Class 162 is recommended for standard crane duty. For explanation of NEMA Resistor Classifications – refer to Class 6715 Application Data.

▲ Armature shunt resistors are intermittent rated for use with an armature shunt contactor, (controller Form M51).

◆ Slowdown resistors are designed to limit Bridge drives to approximately 50% of their present free running speed. Complete motor nameplate data plus the free running current drawn by the motor must be provided to design the slowdown resistors.

Class 9004
Type VG9
Master Switch

Master Switch Selection Table

Drive	Speed Points	Control ~~Type~~ △	Class 9004 NEMA 1 Enclosed ■		
			VM		CM
			Type	Price	Type
Hoist	4	Y	VG9	**4758.**	CG8
Bridge or Trolley	4	Z	VG9	**4758.**	CG8

■ For pendant type push button stations, see Class 9004.

△ Substitute W for Y and U for Z if negative line contactor used.

Modifications

Description	Optional Feature Form Letter		
		VM	CM
Spring Return to Off Point	S		

Accessories

Brakes . . . . . see Class 5010 or 5015
Adjustable Torque Brakes . . . . . see Class 5060
Manual-Magnetic Disconnect Switch . . . . . see Class 6140
Youngstown® Power Limit Switch . . . . . see Class 6170

SCH	A

PRICING INFORMATION AND APPLICATION DATA

Controller Modifications ★

Form	Description	Max. HP Rating — Single Motor			
		7-1/2	15	35	55
B2 ▲	Shunt Brake Relay	3312.	3312.	3312.	3312.
B3 ▲	Shunt Brake Relay	3312.	3312.	3312.	3312.
B4 ▲	Shunt Brake Relay	3312.	3312.	3312.	3312.
M2 †	Negative Line Contactor	2106.	2106.	2106.	2718.
M3 †	Additional Acceleration Point	3492.	3492.	3492.	4104.
M52 ▲	Armature Shunt Contactor	1656.	1818.	2106.	2718.
Y17	Arc Suppressors (Required on Pendant and Radio Operated Controllers)	1980.	1980.	1980.	1980.

▲ For bridge and trolley controllers only. See Application Data for explanation of form number.
† Additional contacts are required in the master switch for these modifications. Select master switch from Class 6121 master switch selection tables.
★ For additional controller modifications, consult factory.

Application Data

Special features to be added to standard controllers are identified by Form number.

Forms B2, B3, and B4 cover various shunt brake relay applications. These modifications are for Bridge and Trolley controllers only and in each case a double-pole, 25-ampere brake relay is supplied. The three modifications differ from each other in the way the relay is wired and controlled. Each is as follows:

B2: Relay interlocked with reversing contactors through N.O. electrical interlocks. With this arrangement, the shunt brake will set whenever the master switch is moved to the off point.

B3: Relay controlled from external push button, foot switch, etc. This arrangement allows the shunt brake to be manually applied by the crane operator whenever necessary.

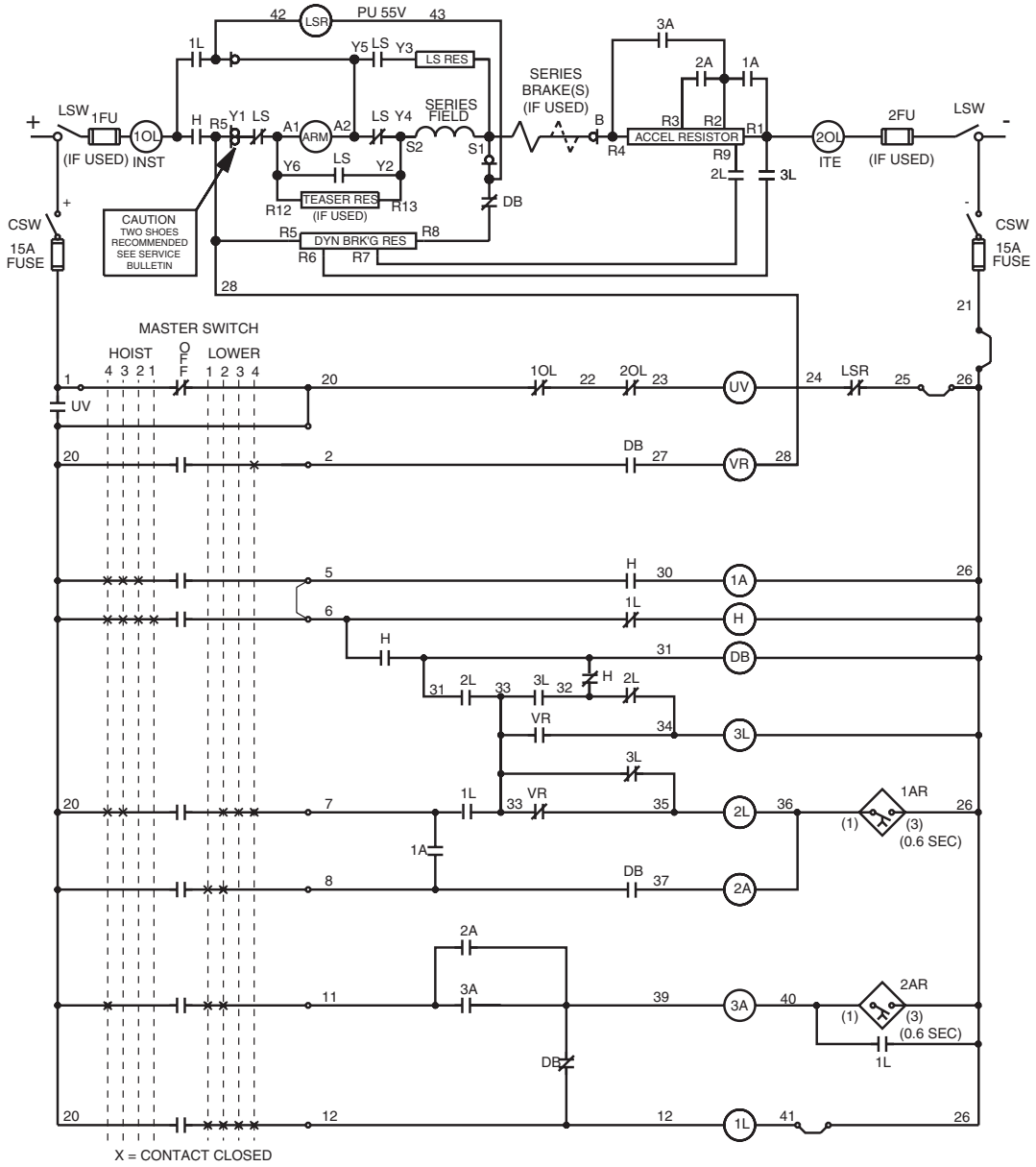
B4: Relay connected in parallel with undervoltage relay. The arrangement allows the shunt brake to set only when the main disconnect for the crane is opened or upon power failure.

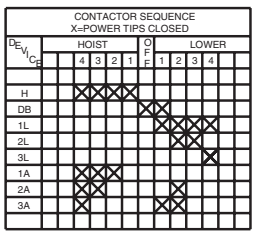
Form M52 is an armature shunt contactor for use on bridge and trolley controllers only. This modification consists of a single-pole, normally-open contactor of equal NEMA size to the contactors in the basic controller. The operation is as follows:

The contactor is arranged to provide slowdown of bridge drives during floor operation of cab/floor operated cranes. A customer supplied contact, maintained closed during floor operation, initiates the slowdown.This modification is to be used with NEMA Class 162P accelerating resistors plus a continuous duty bridge slowdown resistor.

DYNAMIC LOWERING

Elementary Wiring Diagram For Hoist Control

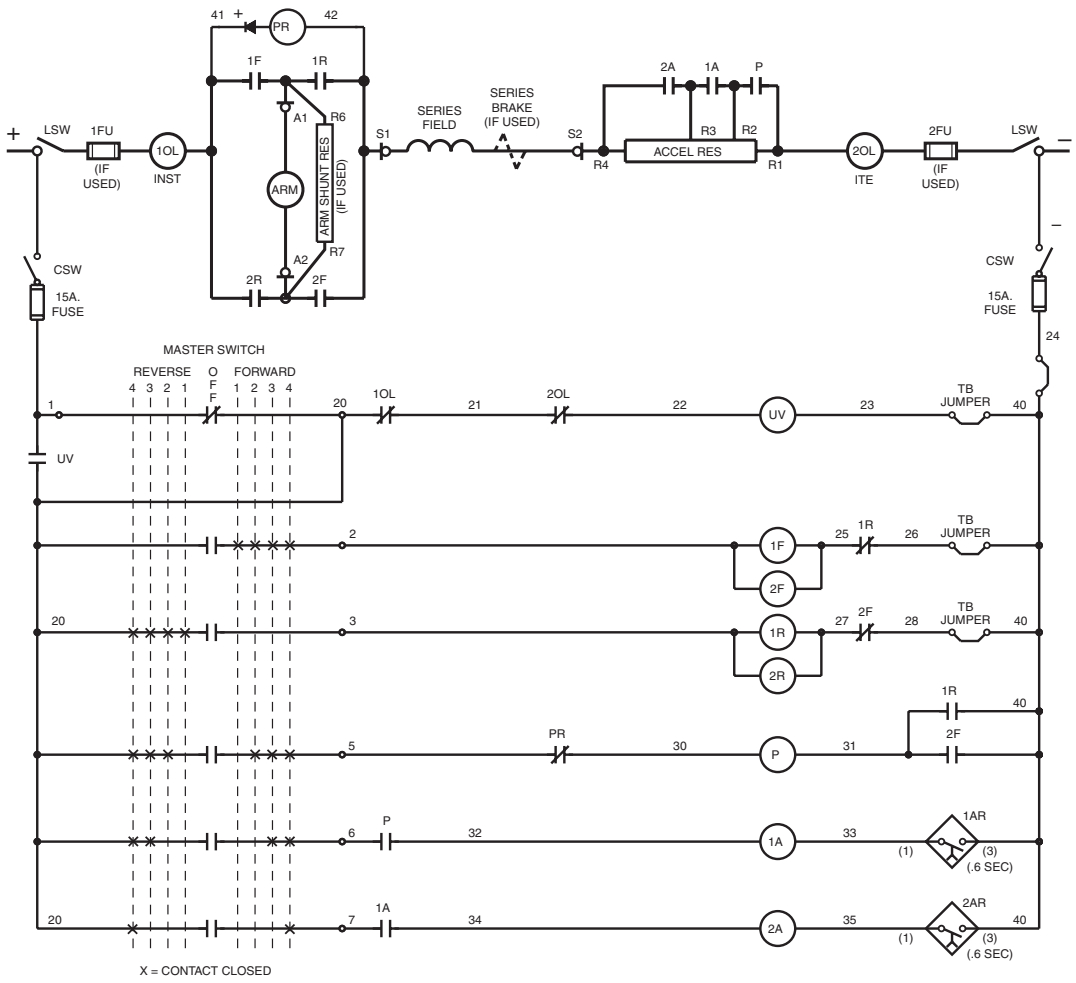




CONTACTORS 1A & 1L, 3L & H, H & 2L, ARE MECHANICALLY INTERLOCKED.

REVERSING PLUGGING

Elementary Wiring Diagram for Bridge or Trolley Control



X = CONTACT CLOSED

CONTACTOR SEQUENCE
X=POWER TIPS CLOSED

DEVICE	REVERSE 4	3	2	1	OFF	FORWARD 1	2	3	4
1F						X	X	X	X
2F						X	X	X	X
1R	X	X	X	X					
2R	X	X	X	X					
P	X	X	X				X	X	X
1A	X	X	X				X	X	X
2A	X								X

CONTACTORS 1F & 1R, 2F & 2R
ARE MECHANICALLY INTERLOCKED.

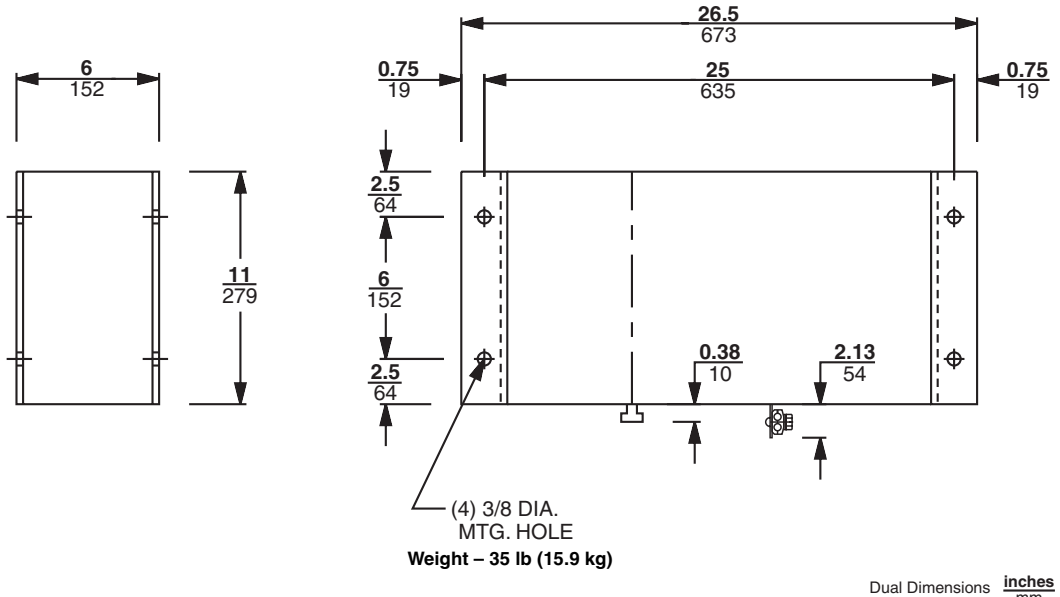
APPLICATION DATA

Approximate Number of Separately Mounted Standard Class 6715 Tab-Weld® Resistor Sections Furnished with Class 6131 Controllers

This tabulation is based on Square D resistor designs for use with Class 6131 controllers only. This tabulation is for typical drive loading and may vary for a specific application.

Maximum HP Rating Single Motor (230V)	Hoist	Bridge or Trolley		
		Without Armature Shunt	With Armature Shunt	Continuous Duty Slowdown Resistors
	162-DL	162-P	162-PAS	
5	5	1	2	1
7-1/2	2	1	2	1
10	2	1	2	1
15	3	2	3	2
20	3	2	3	3
25	4	2	3	4
30	4	2	3	4
35	5	2	3	5
40	6	3	4	5
45	6	3	4	6
50	8	3	4	6
55	9	4	5	7

Standard Class 6715 Tab-Weld® Resistor Section



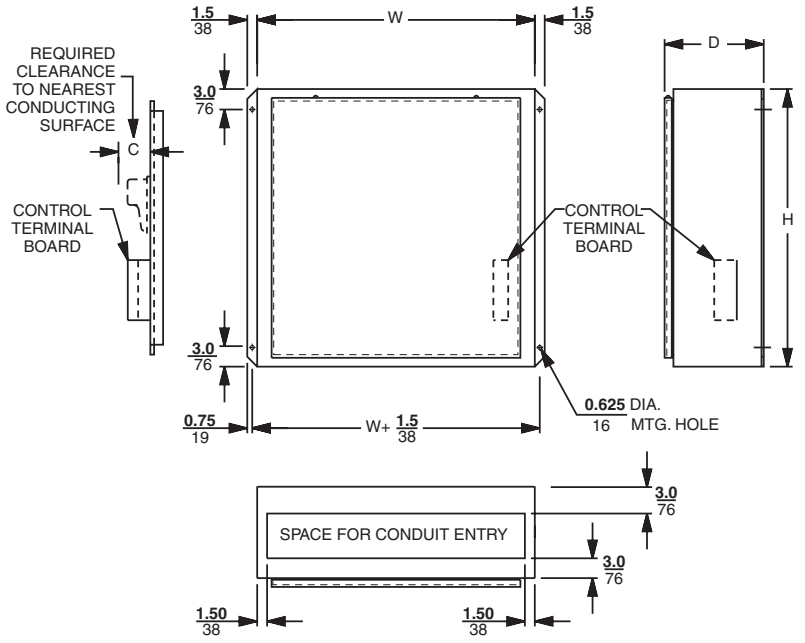
Weight – 35 lb (15.9 kg)

Dual Dimensions inches / mm

STANDARD WALL MOUNTED CONTROLLERS

Approximate Dimensions and Weights

Enclosed Type



Dual Dimensions inches / mm

Drive	Maximum HP (230V)	Enclosed Type			
		H	W	D	Net Weight lbs (kg)
Hoist Bridge or Trolley	7-1/2	42 / 1067	30.0 / 762 ▲	15.0 / 381	300 (136.1)
	15	42 / 1067	30.0 / 762 ▲	15.0 / 381	300 (136.1)
	35	42 / 1067	36.0 / 914 ●	15.0 / 381	385 (174.6)
	55	42 / 1067	36.0 / 914 ●	15.0 / 381	385 (174.6)

▲ Add 6" (152 mm) for controllers with Forms B2, B3, or B4.
● Add 6" (152 mm) for controllers with Form M3 – Additional Acceleration Point and/or Form M2 – Negative Line Contactor.