



PRODUCT BROCHURE

Crane Control Class 6131

Frontline® DC Crane Control





Crane Control Class 6131

Class 6131 controllers are recommended for use with DC series motors on hoist, bridge and trolley drives of general purposes 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 are designed for use with series when an optional shunt brake is relay is supplied.

Applications

- 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 Brochure
- Mill duty Class 7004 Type M Line-Arc® contactors & Class 7001 Type K relays
- Class 7001 Type Type ST-1 static acceleration timers

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 (CSW)

(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) (10L, 20L)



Type ESH8

Bridge or Trolley Service

The standard single motor reversing plugging controller consists of:

(1) Two pole fused control circuit knife switch 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)

(4) Undervoltage relay (UV)

(2) Magnetic overload relays (one instantaneous and one inverse time) (10L, 20L)



Type ESR8

Crane Control Class 6131 Selection

VDC	Max. HP Crane	Contactors	No. of Speed	General Purpose Enclosure NEMA Type 1 Gasketed	Outdoor Enclosure NEMA Type 3R			
	Rating	NEMA Size	Points	Controller Type	Controller Type			
Single Motor Reversing Dynamic Lowering Hoist Control								
230	7-1/2	1	4	CSH8	CWH8			
	15	2	4	DSH8	DWH8			
	35	3	4	ESH8	EWH8			
	55	4	4	FSH8	FWH8			
Single Motor Reversing-Plugging Bridge or Trolley Control								
	7-1/2	1	4	CSR8	CWR8			
230	15	2	4	DSR8	DWR8			
	35	3	4	ESR8	EWR8			
	55	4	4	FSR8	WR			

Order 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

Application Data

A complete set of motor control equipment consists of a controller, separately mounted Tab-Weld® resistors and a master switch.



Class 6715 Tab-Weld® Resistor



Class 9004 Type CG8 Master Switch



Class 9004 Type VG9 Master Switch

Tab-Weld® Resistor

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 based on the 1 hour motor horsepower rating unless specified otherwise.

For resistors mounted in racks, refer to Class 6175.

Class 162 is recommended for standard crane duty. For explanation of NEMA Resistor Classifications – refer to Class 6175 Application Data.

Armature shunt resistors are intermittent rated for use with an armature shunt contactor (controller Form M51) or continuous rated (used with Armature Shunt Contactor Form M52).

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

Note: For assistance with Resistor set selection, please consult factory

Master Switch Selection - Class 9004 NEMA 1 Enclosure*

Drive	Speed Points	Control Type**	Vertical Mounted Master Switch	Console Mounted Master Switch	
Hoist	4	Y	VG9	CG8	
Bridge or Trolley	4	Z	VG9	CG8	

Notes

*For pendant type push button stations, see Bulletin 2015, 2016, 2017 **Substitute W for Y and U for Z if negative line contactor used

Modifications

Description	Optional Features Form Letter		
Spring Return to Off Point	S		

Accessories

Item	Description		
Brakes	See Class 5010 or 5015		
Adjustable Torque Brakes	See Class 5060		
Manual-Magnetic Disconnected Switch	See Class 6140		
Youngstown® Power Limit Switch	See Class 6170		

Controller Modifications***

Form	Description			
B2*	Shunt Brake Relay			
B3*	Shunt Brake Relay			
B4*	Shunt Brake Relay			
M2**	Negative Line Contactor			
M3**	Additional Acceleration Point			
M52*	Armature Shunt Contactor			
Y17	Arc Suppressors (Required on Pendant and Radio Operated Controllers			

*For bridge and trolley controllers only. See Application Data for explanation of form numbers.

Additional contacts are required in the master switch for these modifications. Select master switch from Class 6121 master switch selection table * For additional controller modifications consult factory

Application Data

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

B2, B3, and B4

These forms 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 shut brake to be manually applied by the crane operator whenever necessary.
- B4: Relay connected in a 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

This form 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



	Contactor Sequence (X = Power Tips Closed)										
Device	Hoist					Off		Lower			
		4	3	2	1		1	2	3	4	
Н		X	Х	X	X						
DB						X	X				
1L							X	X	X	X	
2L								X	X		
3L										X	
1A		X	X	X							
2A		X	X					X			
3A		X					X	X			



Reversing Plugging

Elementary Wiring Diagram for Bridge or Trolley Control



	Contactor Sequence (X = Power Tips Closed)									
Device		Rev	erse		Off	Forward				
	4	3	2	1		1	2	3	4	
1F						X	X	X	X	
2F						X	X	X	X	
1R	X	X	X	X						
2R	X	X	X	X						
Р	X	X	X				X	X	X	
1A	X	X						X	X	
2A	X								X	

Contactors 1F & 1R and 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 table 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.

	Hoist	Bridge or Trolley					
Maximum HP Rating Single Motor (230V)	162-DI	Without Armature Shunt	With Armature Shunt	Continuous Duty			
		162-P	162-PAS	Slowdown Resistors			
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 6175 Tab-Weld® Resistor Section





Standard Wall Mounted Controllers

Approximate Dimensions and Weights



Table Title

	Maximum HP	Enclosed Type						
Drive	(230V)	H in. (mm)	W in. (mm)	D in. (mm)	Net Weight Ibs (kg)			
	7-1/2	42.0 (1067)	30.0* (762)	15.0 (381)	300 (136.1)			
Hoist Bridge	15	42.0 (1067)	30.0* (762)	15.0 (381)	300 (136.1)			
or Trolley	35	42.0 (1067)	36.0** (914)	15.0 (381)	385 (174.6)			
	55	42.0 (1067)	36.0** (914)	15.0 (381)	385 (174.6)			

*Add 6" (152mm) for controllers with Forms B2, B3, or B4)

**Add 6" (152mm) for controllers with Form M3 — Additional Acceleration Point and/or Form M2 — Negative Line Contactor



Experience you can rely on to get your crane back up to full speed quickly and easily.

GET IN TOUCH:



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