Hubbell Industrial Controls, Inc.

TYPE 4013 COUNTER TORQUE CONTROL FOR HOIST SERVICE

Counter torque type c ontrol is recommended for applications such as bucket hoists, boom hoists and magnet cranes, where a fixed minimum load exists which insures an overhauling condition at all times.

The Counter Torque system uses reverse power to control speed in the lowering direction without the need of a load brake.

Control in the hoisting direction is the standard secondary resistor method with frequency responsive type acceleration. In the lowering direction, the master swit ch is not effective until the third point. If the load is heavy enough, it will begin to lower. If the load is not heavy enough, it will try to hoist, but a frequency-sensing relay will prevent hoisting. The operator does not have to reset the control by returning the master switch to the off point. Moving the master switch to the fifth-point lower will accelerate the motor to full speed under control of the frequency responsive accelerating relays and drive the load down in regeneration. The operation in fourth-point lowering is the same as described for the third-point.

Type 4013 counter torque control panels are suitable for use with ac wound rotor motors on crane hoist drives.

Type 4013 controllers are for use on hoists or other overhauling drives that do not user mechanical or electric load brakes, and where accurate positioning and slow steady speeds are not required. These panels are suitable only for use with fixed overhauling loads such as magnets and buckets, etc.

Panels are arranged for use with a power limit switch and separate ac or rectifier operated dc brakes.

Suitable for all NEMA and CMAA service classes.

Recommended for: NEMA service Class I, CMAA service Classes A1, C, D, E, F

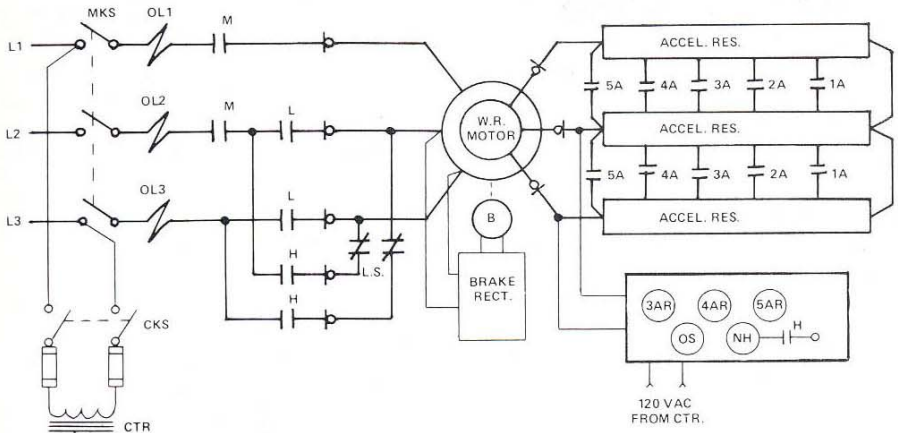
MATERIAL LIST FOR TYPE 4013 SINGLE MOTOR CONTROLLER WITH PROTECTION

1 — Three pole main knife switch.
1 — Two pole fused control knife switch.
3 — Magnetic overload relays, inverse time.
1 — Two pole mainline contactor.
2 — Two pole directional contactors with mechanical interlock.
4 or 5 or 6 or 7 — Two pole accelerating contactors.
4 or 5 or 6 or 7 — Frequency relays.
1 — Control circuit transformer 480-240/240-120V single phase
1 — Control circuit rectifier.
1 — Undervoltage relay.
1 — Control relays, counter torque, and lowering
1 — Timing relay.

* Replaces Catalog 4000, Oct. 1980

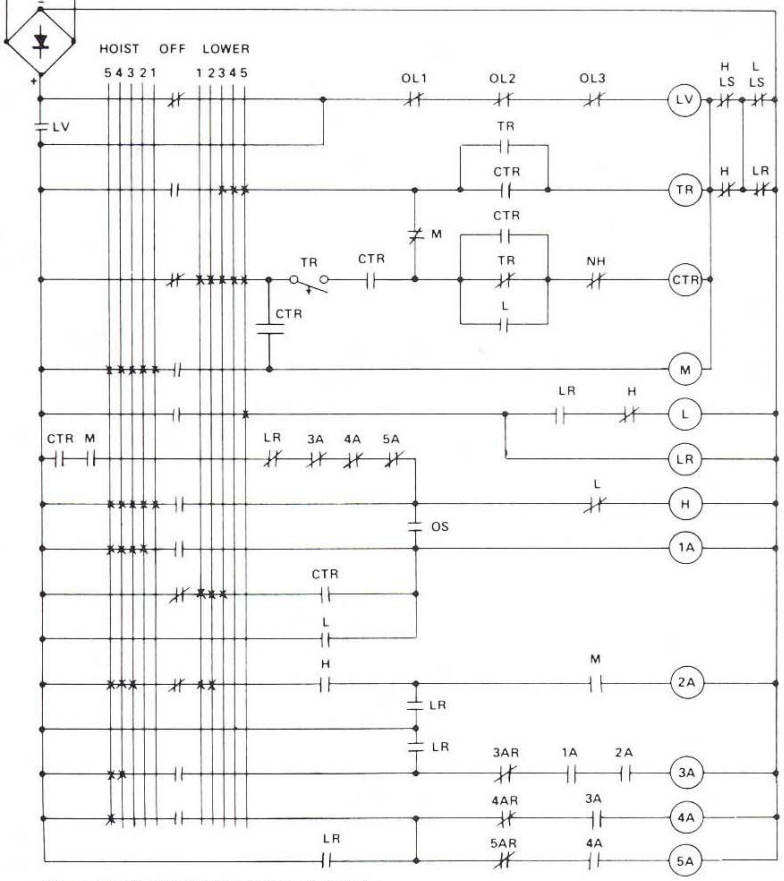
TYPE 4013 COUNTER TORQUE

ELEMENTARY DIAGRAM FOR HOIST CONTROL



CONTACTOR	SEQUENCE									
	HOIST					OFF	LOWER			
	5	4	3	2	1		1	2	3	4	5
M	X	X	X	X	X		①	①	X	X	X
L											X
H	X	X	X	X	X		①	①	X	X	
1A	X	X	X	X			①	①	X	②	X
2A	X	X	X				①	①			X
3A	X	X									X
4A	X										X
5A	X										X

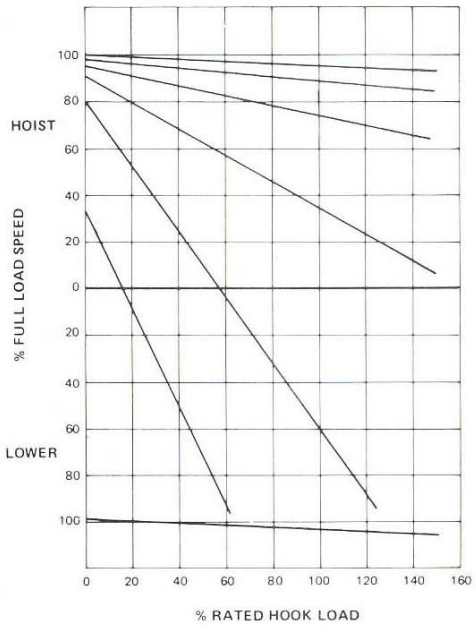
① OPERATES ONLY AFTER RETURN FROM THIRD POINT FOR TIME "TR" OR OPERATION OF "NH" RELAY.
② CONTROLLED BY "OS" RELAY.



X = DENOTES CONTACTORS CLOSED

CONTACTORS H AND L ARE MECHANICALLY INTERLOCKED.

TYPICAL CRANE PERFORMANCE CURVES
TYPE 4013 COUNTER TORQUE CONTROL



CURVES ARE BASED ON AN ASSUMED HOIST DRIVE EFFICIENCY OF 80%

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