

## OVERLOAD RELAY HEATER & CURRENT TRANSFORMER SELECTIONS 2400V & 4160V MOTOR CONTROLLERS

SCOPE This bulletin describes the thermal overload relay optionally included in the Type 230 and 230-PM controllers and tabulates the heater and current transformer selections.

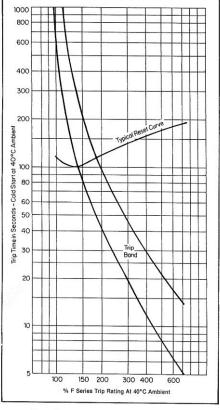
OVERLOAD RELAY The thermal overload relay, designated symbol "OL" on schematic diagrams, is Cutler Hammer Type AA13 ambient compensated type, 3-element, intended to protect the motor against running overloads and stalled rotor. When tested at 600% of its trip rating, the relay trips in less than 20 seconds (Class 20). The relay is a bimetallic device, and the strip bimetals are indirectly heated by the replaceable heater elements, energized from current transformers.

RESET Reset may be effected after the strip bimetals cool in about 2-3 minutes after tripout as shown by Typical Reset Curve. The relay may be arranged for either "HAND" or "AUTO" reset, whichever is specified. Automatic reset may be used with 3-wire control circuits but not with 2-wire control circuits where automatic re-starting of the motor may be hazardous. When "HAND" reset is specified, the relay enclosure is equipped with an external reset mechanism operated by reset handle on the door.

OVERLOAD HEATERS Heaters are selected for actual full load current and motor service factor, after considering current transformer ratio provided, as shown in Heater Selection Table below. The trip rating in a 40C ambient of each size heater is shown in this table. The trip rating of a specific heater element can be adjusted over a range of 85%-115% by turning an adjustment knob on the bottom of the relay. The factory setting is 100%.

CURRENT TRANSFORMER SELECTION Current transformers are usually selected so that the full load current will read as high as practical on the ammeter, as shown in CT Ratio Table. Other ratios may be used, so long as heater may still be selected according to Heater Selection Table.

4				HEATER SE	ELECTION	TABLE				
SERVICE	HEATER	TRIP	SECONDARY	D CURR	CURRENTS, RANGE OR MAXIMUM					
FACTOR	CODE	RATING	AMPS	50:5	75:5	100:5	150:5	200:5	300:5	400:5
1.15	FH23	2.24	1.79-1.95	17.9-	26.8-	35.8-	53.7-	71.5-	107.4-	143.2-
				19.5	29.2	39.0	58.5	78.0	117.0	156.0
	FH24	2.45	1.96-2.15	21.5	32.25	43.0	64.5	86.0	129.0	172.0
	FH25	2.70	2.16-2.35	23.5	35.2	.47.0	70.5	94.0	141.0	188.0
	FH26	2.95	2.36-2.58	25.8	38.7	51.6	77.4	103.2	154.8	206.4
	FH27	3.24	2.59-2.83	28.3	42.4	56.6	84.9	113.2	169.8	226.4
	FH28	3.55	2.84-3.11	31.1	46.6	62.2	93.3	124.4	186.6	248.8
	FH29	3.90	3.12-3.42	34.2	51.3	68.4	102.6	136.8	205.2	273.6
	FH30	4.29	3.43-3.73	37.3	55.9	74.6	111.9	149.2	223.8	298.4
	FH31	4.68	3.74-4.07	40.7	61.0	81.4	122.1	162.8	244.2	325.6
	FH32	5.10	4.08-4.39	43.9	65.8	87.8	131.7	175.6	263.4	351.2
1.0	FH23	2.24	1.99-2.17	19:9-	29.8-	39.8-	59.7-	79.6-	119.4-	159.2-
				21.7	32.5	43.4	65.1	86.8	130.2	173.6
	FH24	2.45	2.18-2.38	23.8	35.7	47.6	71.4	95.2	142.8	190.4
	FH25	2.70	2.39-2.61	26.1	39.1	52.2	78.3	104.4	156.6	208.8
	FH26	2.95	2.62-2.87	28.7	43.0	57.4	86.1	114.8	172.2	229.6
	FH27	3.24	2.88-3.14	31.4	47.1	62.8	94.2	125.6	188.4	251.2
	FH28	3.55	3.15-3.45	34.5	51.7	69.0	103.5	138.0	207.0	276.0
	FH29	3.90	3.46-3.80	38.0	57.0	76.0	114.0	152.0	228.0	304.0
	FH30	4.29	3.81-4.14	41.4	62.1	82.8	124.2	165.6	248.4	331.2
	FH31	4.68	4.15-4.52	45.2	67.8	90.4	135.6	180.8	271.2	361.6
	FH32	5.10	4.53-4.87	48.7	73.0	97.4	146.1	194.8	292.2	389.6



Time/Current Trip and Reset Curves

		C.	L KATTO	TABLE	
FUL		LOAD	AMPS	CT	RATIO
18	-	40		5	0:5
41	-	60		7	5:5
61	-	80		10	0:5
81	-	125		15	0:5
126	-	170		20	0:5
171	-	250		30	0:5
251	-	350		40	0:5