Troubleshooting Guide
CTTG #122

It.br Trip Code

This document pertains to all sizes of Unidrive SP

<u>Trip Description</u>: Braking Resistor Overload

The trip code **It.br** (Current x time on Brake) occurs when the I^2t modeling of the braking circuit timed out.

- Unidrive SP Braking is initiated at the following DC Bus levels
  - 690Vac SP brakes at 1120VDC
  - 575Vac SP brakes at 930VD C
  - 400Vac SP brakes at 780VDC
  - 200Vac SP brakes at 390VDC

Unidrive SP comes from the factory with parameter #10.30 and #10.31 defaulted at 0.02s and 2.0s respectively for 400V drives. Parameters #10.30 and #10.31 are defaulted at 0.09s and 2.0s for 200V drives. This sets up the braking resistor overload protection for a duty cycle of about 1% for 400V drives and 4.5% for 200V drives. This also configures the thermal model such that the cooling time is 100 times the full power on time for 400V drives and 22 times full power on time for 200V drives. In most cases this duty cycle is only acceptable for the heatsink mounted braking resistors available in the Performance drives Catalog. All of our E-Stop and Cyclic duty braking resistors can be viewed by clicking or going to the link below.

http://www.emersonct.com/download_usa/literature/06catalogpdfs/06cat_y_power_accessories.pdf

If there a braking resistor is not used and there are values in #10.30 and#10.31 the braking energy accumulator may prematurely rise resulting in an It.br trip. In many applications a braking resistor is not required or the braking resistor assembly has a thermal overload incorporated externally. It is acceptable in these cases to set #10.30 and #10.31 to a zero. This will eliminate the It.br trip.

Setting #10.30 and 10.31 to zero's with out a braking resistor may result in an **OV** trip. An **OV** trip occurs when the motor is over driven by the load (inertia). This causes the buss voltage to rise and eventually trip the drive. A braking resistor may be needed dissipate the energy created by the motor when a fast deceleration is attempted or an over hauling load is present. If you are sure your application does not require a braking resistor and you are still experiencing **OV** trips the download the following document for help: **CTTG108**

http://www.emersonct.com/download_usa/troubleshooting_guide/CTTG108.pdf

Here are some example results you may expect with different drive configurations. The motor/load was run to a trip point if possible.

#10.30	#10.31	#2.04	Drive Brakes	Trip	DB protected	Additional	Resistor Installed
0	0	Std	Yes	None	No		Yes
0.02	10	Std	Yes	it.br	Yes	it.br when 10.39 = 100	Yes
0.02	10	Fast	Yes	it.br	Yes	10.39 gets to 100 faster	Yes
0	0	Fast	Yes	None	No		Yes
0	0	Std	NA	OV	NA	10.39 always = 0	No
0.02	10	Std	NA	OV	NA	10.39 increments	No
0.02	10	Fast	NA	OV	NA	10.39 increments	No

*All the information above was taken with #0.03 = 0.5 and 0.04 = 0.1. The motor current rating was 50% of the drive rated current. Parameter #5.07 was set accordingly. There was no load on the motor shaft.

If a 10%, 25%, or 33% braking resistor was purchased from Control Techniques chances are the default values in #10.30 and #10.31 will not be sufficient. Set #10.30 and #10.31 in accordance with the duty cycle of the resistor you are using.

See charts below to select the braking resistor that matches your application.

Consult the application note E-Stop Duty Dynamic Braking Protection for further information regarding protecting the braking resistor from overloading and possible fire damage when using braking resistors.

E-Stop Duty Cycle DB Resistor – 460VAC

HP	Catalog Part #	Power (Watts)	Energy (Watts in 1 sec.)	On Time #10.30 Ton (Sec)	Time Period #10.31 Tp (Sec.)
1	8200-00151	400	4372	3.86	10.9
1.5	8200-00152	400	7384	4.34	18.5
2	8200-00153	400	8887	3.92	22.2
3	8200-00155	250	6561	1.93	26.2
5	8200-00156	250	7269	1.28	29.1
7.5	8200-00157	648	19550	2.30	30.2
10	8200-00158	1050	36883	3.26	35.1
15	8200-00159	1050	43752	2.88	41.7
20	8200-00161	1263	74184	3.27	58.7
25	8200-00162	1408	59569	2.11	42.3
30	8200-00163	1556	6775	0.20	4.4
40	8200-00164	2028	6691	0.15	3.3
50	8200-00165	3499	14485	0.25	4.1
60	8200-00167	3360	8155	0.12	2.4
75	8200-00166	4493	6120	0.07	1.4
100	8200-00203	4541	4235	0.04	0.9
125	8200-00204	5130	5174	0.04	1.0
150	8200-00205	6211	5174	0.04	0.8

Click this link---→E-Stop Duty Dynamic Braking Protection

Or search for **CTAN192** using Google

10% Duty Cycle DB Resistor – 460VAC

HP	Catalog Part #	Power (Watts)	Energy (Watts in 1 sec.)	On Time #10.30 Ton (Sec)	Time Period #10.31 Tp (Sec.)
1	8200-00043	289	4,372	3.86	15.1
1.5	8200-00044	433	7,384	4.34	17.1
2	8200-00045	578	11,391	5.03	19.7
3	8200-00046	867	19,076	5.61	22.0
5	8200-00047	1445	46,539	8.22	32.2
7.5	8200-00048	2167	78,293	9.21	36.1
10	8200-00049	2889	93,106	8.22	32.2
15	8200-00050	4334	176,018	11.57	40.6
20	8200-00051	5778	11,355	0.50	2.0
25	8200-00052	7223	29,051	1.03	4.0
30	8200-00053	8668	31,265	0.92	3.6
40	8200-00054	11557	23,925	0.53	2.1
50	8200-00055	14446	57,940	1.02	4.0
60	8200-00056	17335	62,041	0.91	3.6
75	8200-00057	21669	20,709	0.25	1.0
100	8200-00058	28892	80,123	0.71	2.8
125	8200-00059	36116	60,152	0.54	1.7
150	9650-8118	43339	153,533	1.39	3.5

25% Duty Cycle DB Resistor – 460VAC

HP	Catalog Part #	Power (Watts)	Energy (Watts in 1 sec.)	On Time #10.30 Ton (Sec)	Time Period #10.31 Tp (Sec.)
1	8200-00060	457	4,372	3.86	9.6
1.5	8200-00061	685	13,122	7.72	19.2
2	8200-00062	914	18,239	8.05	20.0
3	8200-00063	1370	30,717	9.03	22.4
5	8200-00064	2284	73,766	13.02	32.3
7.5	8200-00065	3426	124,234	14.62	36.3
10	8200-00066	4568	148,589	13.12	32.5
15	8200-00067	6852	22,146	1.30	3.2
20	8200-00068	9137	36,246	1.60	4.0
25	8200-00069	11421	37,546	1.33	3.3
30	8200-00070	13705	32,031	0.94	2.3
40	8200-00071	18273	49,780	1.10	2.7
50	8200-00072	22841	74,812	1.32	3.3
60	8200-00073	27410	108,414	1.59	4.0
75	8200-00074	34262	113,056	1.34	3.3
100	8200-00075	45683	150,741	1.34	3.3
125	8200-00076	57104	119,349	1.08	2.1
150	9650-8268	68524	183,837	1.66	2.7

33% Duty Cycle DB Resistor – 460VAC

HP	Catalog Part #	Power (Watts)	Energy (Watts in 1 sec.)	On Time #10.30 Ton (Sec)	Time Period #10.31 Tp (Sec.)
1	8200-00077	525	12,357	10.90	23.5
1.5	8200-00078	787	13,122	7.72	16.7
2	8200-00079	1050	18,239	8.05	17.4
3	8200-00080	1575	30,717	9.03	19.5
5	8200-00081	2624	73,560	12.99	28.0
7.5	8200-00082	3936	124,165	14.61	31.5
10	8200-00083	5249	52,296	4.62	10.0
15	8200-00084	7873	15,147	0.89	1.9
20	8200-00085	10497	59,697	2.63	5.7
25	8200-00086	13121	29,159	1.03	2.2
30	8200-00087	15746	53,537	1.58	3.4
40	8200-00088	20994	36,619	0.81	1.7
50	8200-00089	26243	43,760	0.77	1.7
60	8200-00090	31491	178,557	2.61	5.7
75	8200-00091	39364	106,830	1.26	2.7
100	8200-00092	52486	117,179	1.04	2.2
125	8200-00093	65607	183,837	1.66	2.8
150	9650-8348	78729	471,353	4.26	6.0

For questions call Control Techniques Technical Support-USA
at 716-774-1193
Grand Island, NY 14072

SCIENCE GATE
Your Automation Partner
SCIGATE AUTOMATION (S) PTE LTD
No.1 Bukit Batok Street 22 #01-01 Singapore 659592
Tel: (65) 6561 0488 Fax: (65) 6562 0588
Email: sales@scigate.com.sg Web: www.scigate.com.sg
Business Hours: Monday - Friday 8.30am - 6.15pm