

VLBA ACQUISITION MEMO #153

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

31 March 1989

Area Code 508

692-4764

To: A. Richard Thompson
From: Alan E.E. Rogers
Subject: Recommendations for DAR Protection Measures

1] Protective diodes

Install 1N1183A diodes from power to ground on all negative supplies and 1N1183RA diodes from power to ground on all positive supplies. These diodes can be mounted by enlarging the ground lug tapped hole to a 1/4-28 tapped hole. Ground lugs are then secured by the diode and the diode pin can be wired to the D.C. output on the adjacent connector.

2] A.C. thermal cut-out

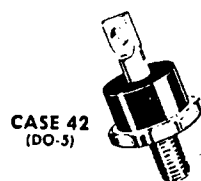
Install a Magnacraft W6240ASX-1 solid state relay in the A.C. line and use a Stancor ST0-110 thermostat in series with the control voltage from the a.c. line. Mount the thermostat to one of the power supply rear bin panels. (When the thermostat reaches 105-115°F the power will be shut down and will come back on again when temperature drops to 75-85°F.) Alternately the circuit breaker for the rack could be changed to be the "shunt trip" type. The shunt coil could be wired to a wall type thermostat located in the rack. Once tripped by over-temperature the breaker would have to be reset manually.

3] Fan

Install a Cornair Rotron type CL2T2 Caravel fan (Part No. 020189) in the top of the rack with a switch to the a.c. power input. This will allow the fan to be turned on for operation of the rack in the lab or at a site with inadequate air flow.

xc: J. Campbell
P. Napier
R. Simon

1N1183 thru 1N1190 (SILICON)



CASE 42
(DO-3)

Medium current silicon rectifiers. Unique double-case construction consists of hermetically sealed inner metallic case surrounded by molded external case; provides highest degree of ruggedness and reliability. Type numbers shown have cathode connected to case, but reverse-polarity units can be obtained by adding suffix "R" to standard type number, e.g. 1N1183R.

MAXIMUM RATINGS

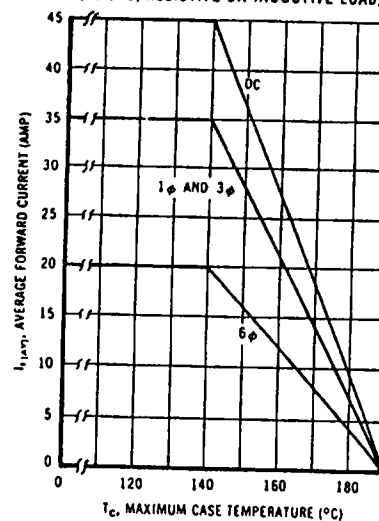
Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage and DC Blocking Voltage	$V_{RM} (rep)$ V_R	50 100 150 200 300 400 500 600	Volts
RMS Reverse Voltage	V_R	35 70 105 140 210 280 350 420	Volts
Average 1/2-Wave Rectified Forward Current (Resistive Load, 60 Hz, $T_C = 140^\circ C$)	I_O	35	Amp
Peak Repetitive Forward Current ($T_C = 140^\circ C$)	$I_{FM} (rep)$	150	Amp
Peak Surge Current ($T_C = 140^\circ C$, superimposed on Rated Current at Rated Voltage)	$I_{FM} (surge)$	400	Amp
Operating and Storage Temperature	T_J, T_{stg}	-65 to +190	$^\circ C$
Thermal Impedance	θ_{JC}	1.0	$^\circ C/W$, DC steady state

1N1183 thru 1N1190 (continued)

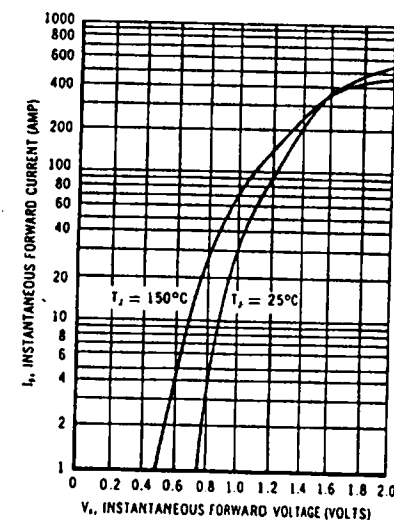
ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Max Full Cycle Average Forward Voltage Drop ($I_O (max)$, rated V_F , 60 Hz, $T_C = 140^\circ C$)	$V_{F(AV)}$	0.6	Volts
Max Instantaneous Forward Voltage Drop ($I_F = 100$ Amps, $T_J = 25^\circ C$)	V_F	1.3	Volts
Max Full Cycle Average Reverse Current ($I_O (max)$, rated V_R , 60 Hz, $T_C = 140^\circ C$)	$I_{R(AV)}$	10.0	mA
Max DC Reverse Current (Rated V_R , $T_C = 25^\circ$)	I_R	1.0	mA

MAXIMUM AVERAGE FORWARD CURRENT RATING
versus MAXIMUM CASE TEMPERATURE
(60 CPS, RESISTIVE OR INDUCTIVE LOAD)



TYPICAL FORWARD CHARACTERISTICS

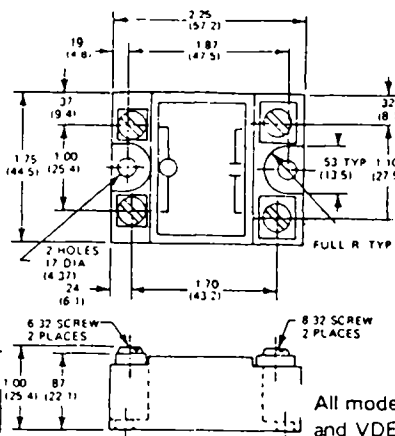
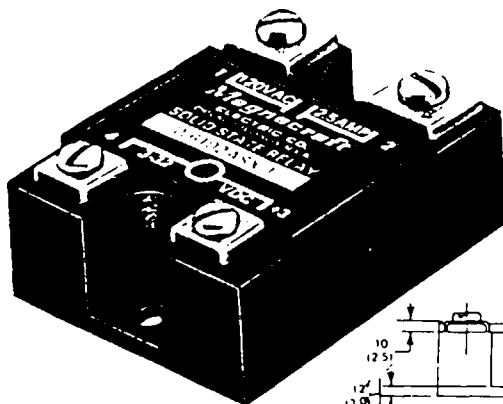


1N1191 thru 1N1198 1N1195A thru 1N1198A

For Specifications, See 1N248B Data.

SSR

CLASS 6
AC CONTROLLED
SCR OUTPUT SOLID STATE RELAYS.



HIGH RELIABILITY TYPE
AC CONTROLLED
90-280 VAC or 80-140 VDC INPUT
50/60 Hz AC OUTPUT

High Transient Capability— Single output features back to back SCR's and internally mounted RC (snubber) network for high dv/dt applications.

Photo-Isolated, Zero Switching— Optically coupled for 2500 VAC isolation between input and output and RFI suppression.

UL Recognized File No. E62636 **CSA Certified** File No. LR32053

All models conform to VDE 0160, VDE 0110 Group C, and VDE 0411 Class 1.

STOCK NUMBERS	W6110 ASX-1	W6125 ASX-1	W6140 ASX-1	W6202 ASX-1	W6210 ASX-1	W6225 ASX-1	W6240 ASX-1
INPUT CHARACTERISTICS							
Input Voltage Range (over operating temperature range)	90 to 280 VAC (Also can be used with 80 to 140 VDC)						
Maximum Pickup Voltage (over operating temperature range)	90 VAC (80 VDC)						
Minimum Dropout Voltage (over operating temperature range)	10 VAC (10 VDC)						
Input Impedance (See Curve)	60,000 ohms minimum						
Reverse Polarity Protected	Not Applicable						
Input Filtered for transients less than one millisecond.	Yes						
Response time	1/2 Cycle						
OUTPUT CHARACTERISTICS							
Nominal Off State Voltage V_D (RMS)	120			240			
Maximum Off State Voltage $V_{D_{MAX}}$ (RMS)	140			280			
Minimum Off State Voltage $V_{D_{MIN}}$ (RMS)	20			40			
Non-Repetitive Peak Voltage V_{DSM} (Blocking Voltage)	300			500			
Maximum Rate of Rise of Off State Voltage dv/dt	200 Volts per microsecond						
Rated Load Current I_T (RMS) ...	10.0	25.0	40	2.5	10.0	25.0	40
U/L Incandescent Lamp Ampere Rating	8.0	16.0	30	2.0	8.0	16.0	30
U/L Motor Load Ampere Rating	4.5	7.2	10	1.0	4.5	7.2	10
Minimum Load Current $I_{T_{MIN}}$ (RMS) to maintain "On"	20 ma						
Non-Repetitive Surge Current I_{TSM} (one Cycle Surge)	120	250	625	22.5	120	250	625
Maximum RMS Overload current for 1 second	24	40	80	5	24	40	80
Maximum Off State Leakage Current I_D (RMS)	8 ma			10 ma			
Maximum RMS On-State Voltage V_T (RMS) (Maximum Voltage drop across relay output @ rated current)	1.6	1.6	1.6	3.5	1.6	1.6	1.6
MISCELLANEOUS CHARACTERISTICS							
Dielectric Strength V_{ISO} (Input-Output Isolation)	2,500 VAC ****						
Insulation Resistance R_{ISO}	$10^{10} \Omega$						
Operating temperature Range	-30°C to + 80°C						
Storage temperature Range	-30°C to + 100°C						
Suggested Heat Sink	16-790 or 16-793			16-789	16-790 or 16-793		
Weight	4 oz. (113.4 g)						

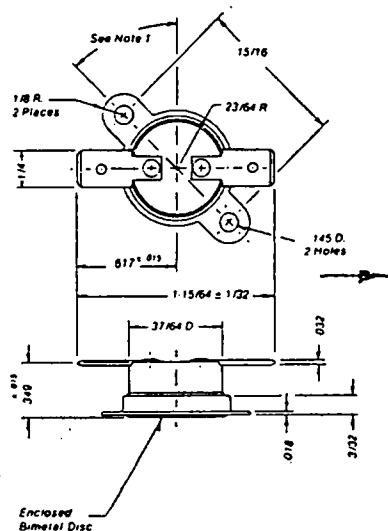
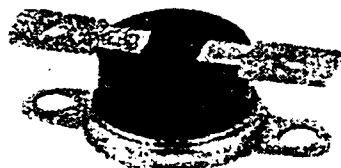
*** All current ratings are based on use of suitable thermally conductive compound (e.g. silicone grease between the SSR mounting base and mounting surface of suitable heat sink).

**** Up to 3750VAC available on special order.

\$37.49
from
Gerber

Snap Action Disc Thermostats

TYPE 430 SNAP-ACTION DISC THERMOSTATS



These direct-sensing thermistors are the answer to modern day electronic temperature control applications. They feature a bimetal disc for positive snap action, providing instantaneous opening or closing of electrical circuits. Typical applications include temperature control in computers, business machines, telecommunications equipment, alarm circuits, instrumentation, medical electronics, microwave ovens, power supplies, fan controls, temperature limits/controls, and other applications requiring close temperature tolerance. Available as limit switches to open on temperature rise, or fan switches to close on temperature rise. All units come with 1/4" quick connect terminals; special terminals allow solder connection of wire (and smaller) through dent hole of terminal; other terminations available on special order. Standard loose ring mounting allows rotation to any position. Unit clamps down when hold down screws are positioned.

AEG Recognized, File #MH6883 and E23581. CSA Certified, File #12619 and 20339. A.G.A. approved.

Load	120 VAC	240 VAC	277 VAC
Resistive	15 Amps	10 Amps	8.7 Amps
Inductive	5.6 FLA - 34.8 LRA	2.9 FLA - 17.4 LRA	2.5 FLA - 15.6 LRA
Pilot Duty	125 VA	125VA	125 VA

Stancor No.	Operating Range		Function	Differential		Net Each, Lots of			
	°F	°C				1-9	10-24	25-49	50-99
STO-60	55 to 65	13 to 18	Opens	20°F	12°C	\$10.25	\$9.15	\$8.20	\$7.50
STO-85	80 to 90	27 to 32	Opens	15°F	8°C	10.25	9.15	8.20	7.50
STO-100	95 to 105	35 to 41	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-100	93 to 107	34 to 42	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-110	105 to 115	41 to 46	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-120	115 to 125	46 to 52	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-120	113 to 127	45 to 53	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-140	135 to 145	57 to 63	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-140	133 to 147	56 to 64	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-150	145 to 155	53 to 68	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-160	155 to 165	68 to 74	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-170	165 to 175	74 to 79	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-170	162 to 178	72 to 81	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-175	170 to 180	77 to 82	Opens	15°F	8°C	10.25	9.15	8.20	7.50
STO-180	175 to 185	79 to 85	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-180	172 to 188	78 to 87	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-190	185 to 195	85 to 91	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-190V*	183 to 197	84 to 92	Opens	30°F	17°C	11.00	9.50	8.60	7.75
STC-200	192 to 208	89 to 98	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-210	204 to 216	96 to 102	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-220	214 to 226	101 to 108	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-225	217 to 232	103 to 111	Closes	30°F	17°C	10.25	9.15	8.20	7.50
STO-230	224 to 236	107 to 113	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STC-240	229 to 251	109 to 122	Closes	100°F	56°C	10.25	9.15	8.20	7.50
STO-250	254 to 256	123 to 124	Opens	30°F	17°C	10.25	9.15	8.20	7.50
STO-325	315 to 335	157 to 169	Opens	50°F	28°C	10.25	9.15	8.20	7.50

*VDE approved unit; overall height, .533".

gerber
ELECTRONICS

**128 Carnegie Row
Norwood, MA 02062
617-769-6000
TWX—710-336-1987
FAX 617-762-8931**

TOLL FREE
New England, New York,
and New Jersey, 1-800-225-1800.
Massachusetts, 1-800-232-8100.
Other Areas, 1-800-225-8290.
FAX 1-800-3GERBER

VECTOR

TRONIC COMPANY



UNIVERSAL PLUG 0

...prototype, test, and short-run plug-in circuits. A 100-mil overall grid of 0.042" holes on 0.1" centers is used. The area above contact area is tinned for easy soldering. Contact arrangements and mating connections terminate in independent hole pads.

	Size (In.)	Contacts	
		No.	Spacing
	4.5 x 6.5	44	.156
	4.5 x 9.6	44	.156
	4.5 x 4.5	44	.156
	4.5 x 6.5	44	.156
	4.5 x 6.5	44	.156
	7.98 x 9.6	80	.125
	4.5 x 9.6	44	.156
	4.5 x 5.5	44	.156
	4.5 x 8.1	None	
	4.5 x 9.6	44	.156
	4.5 x 6.5	44	.156
	4.5 x 6.5	44	.156
	4.5 x 6.5	72	.100
	4.5 x 6.5	72	.100
	4.5 x 6.5	72	.100
	4.5 x 9.6	72	.100
	4.5 x 4.5	72	.100
	4.5 x 6.5	72	.100
	2.73 x 4.5	44	.100
	2.73 x 4.5	44	.100
	2.73 x 4.5	30	.156
	2.73 x 4.5	30	.156
	4.5 x 6.5	44	.156
	4.5 x 6.5	44	.156
	4.5 x 6.5	72	.100
	4.5 x 6.5	72	.100
	4.5 x 9.6	44	.156
	4.5 x 6.5	44	.156
	4.5 x 4.5	44	.156
	4.5 x 6.5	72	.100
	4.5 x 9.6	72	.100
	4.5 x 6.5	44	.156
	4.5 x 6.5		
	4.5 x 6.5		
	4.5 x 6.5		
	4.5 x 6.5		

MATING CONTACTS	
Model No.	Net Each
R630	\$ 7.73
R636-1	8.91
R636-2	10.95
R644	5.23