
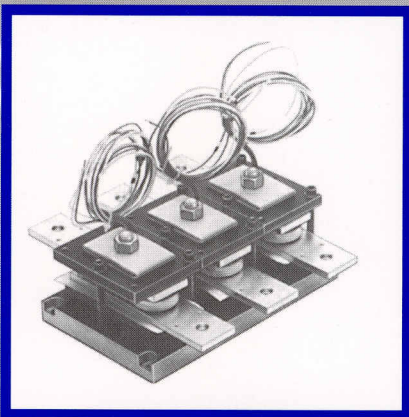
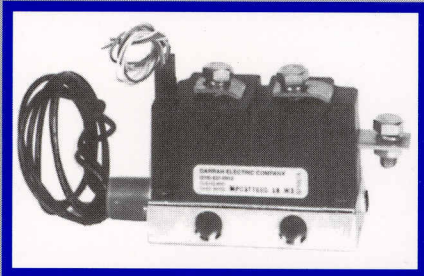
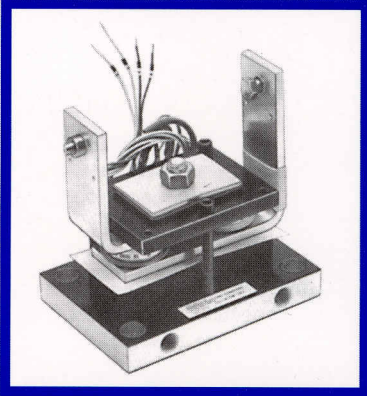
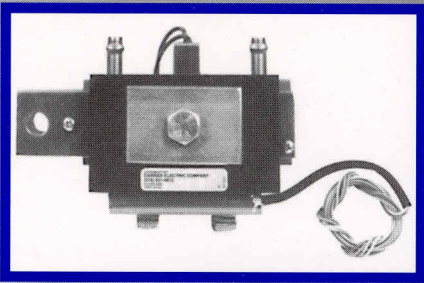


# DARRAH

## *SCR Contactors for Resistance Welding*

Designs that are cost effective solutions  
for your resistance welding controllers.



**DEC**

[www.darrahelectric.com](http://www.darrahelectric.com)

## Introduction

**DARRAH ELECTRIC COMPANY** was established in 1960 to serve the power semiconductor market in the U.S. and overseas. From the beginning, customers found that they could depend on **DARRAH** to have quality products when they need them. They also found fairness in pricing, dedication to service, and an exceptional ability for innovation and design.

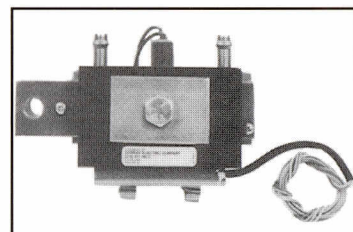
Today, **DARRAH ELECTRIC COMPANY** is "The Company" to call for resistance welding SCR Contactors. As our bulletin illustrates, **DARRAH** stocks assemblies that meet virtually every

SCR Contactor requirement from 5 KVA air-cooled mechanical contactor replacements through 1500 KVA liquid cooled seam welding contactors. **DARRAH ELECTRIC COMPANY** maintains one of the largest inventories of resistance welding SCR Contactors in the country.

Although this bulletin outlines the exceptional range of products available through **DARRAH**, additional information such as mechanical layouts and duty cycle curves are available upon request.

## DIRECT WATER COOLED

Undoubtedly the most popular resistance welding contactor for the past twenty years are **DARRAH**'s direct water-cooled SCR Contactors. The selections shown are in stock in welding current ratings to 4000 Amps RMS. Choose between single or double sided cooled, and in SCR voltages to 2600 Volts. These are the *workhorse* in medium to heavy KVA welding controllers.



DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SCR VOLTAGE RATING (PIV) (VRRM)	WATER COOLED	
				SGL	DBL
D09ST15	900	400	1500	X	-
D09ST18	900	400	1800	X	-
D13DT15	1300	695	1500	-	X
D13DT18	1300	695	1800	-	X
D13SE18	1300	695	1800	X	-
D13SE20	1300	695	2000	X	-
D18DE18	1800	970	1800	-	X
D18DE20	1800	970	2000	-	X
D21DM18	2100	1225	1800	-	X
D21DM20	2100	1225	2000	-	X
D21DM26	2100	1225	2600	-	X
D26DN18	2600	1710	1800	-	X
D26DN20	2600	1710	2000	-	X
D32DN18	3200	2075	1800	-	X
D32DN20	3200	2075	2000	-	X
D32DN26	3200	2075	2600	-	X
D40DD18	3996	2188	1800	-	X
D40DD26	2230	1946	2600	-	X

### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

### Water Connection:

Fits 3/8 inch hoses.

### Cooling Block:

Copper-Nickel Plated.

### Thermostat:

If required add suffix J to part number.

### MOV:

For MOV add suffix M to part number.

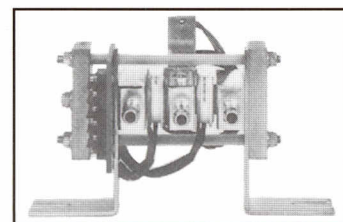
### Example:

13DT15JM, 1300 Amps RMS, 1500 Volt, with thermostat and MOV.

## HS-6 DESIGN

**DARRAH HS-6** design direct water cooled SCR Contactors have proven to be dependable for years in resistance welding controllers.

Choose between two popular current ratings with SCR voltages to 1800 Volts.



DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)
D08HS6-16	1200	800	5500	1600
D12HS6-18	1800	1200	7500	1800

### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

### Water Connection:

For 3/8 inch add suffix A to part number.

For 1/2 inch add suffix B to part number.

### Cooling Block:

Copper-Nickel Plated.

### Thermostat:

If required add suffix J to part number.

### MOV:

For MOV add suffix M to part number.

### Terminal Board:

For SCR gate cathode leads add suffix T to part number.

### Example:

D08HS6-16AJ, 1200 Amps RMS, 1600 Volt, with 3/8 inch water connection and thermostat.

# AUTOMOTIVE STYLE SCR CONTACTORS

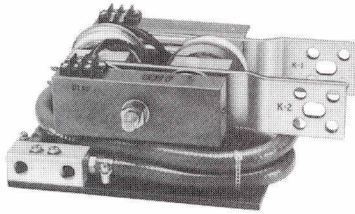
## Hose Type

DARRAH Automotive Style SCR Contactors are the chosen favorite among high current/high voltage resistance welding users. All contactors are rated at 100% continuous and are provided with 2600 Volt SCR's.

This series is popular for frequency converter, seam, and flash butt welding applications.

### TANG TYPE DESCRIPTION

Bus tang connections are standardized to fit all applications. Four holes plus center slot. Holes are on 1.06" centers. The center slot is .5" x .75"



### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

### Water Connection:

1/4-18 NPT tapped holes.

### Cooling Block:

Copper-Nickel Plated.

DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)
DPH7825-468	1200	10000	2600
DPH7844-468	1700	10000	2600
DPH7845-468	1750	18000	2600
DPH7842-468	2500	18000	2600

### Thermostat:

All contactors are supplied with a thermostat sensor, 70°C open on rise, recloses at 58°C, and is isolated to base to 2000 Volts. Thermostat leads are 12 inches long.

### MOV:

For MOV add suffix M to part number.

### Example:

DPH7824-468M, 2500 Amps RMS, 2600 Volt, with MOV.

**Service Tip:** It is recommended that power not be left on while water flow is off, as this is a cause for hose rupturing due to internal heating and arcing where water resistivity is low.

## 5000 AMP HEAVY DUTY CONTACTOR

DARRAH's Heavy Duty Contactor ranks as the largest found in the resistance welding industry. Capable of welding current ratings of 8972 Amps at 10% duty cycle, the DPH7847-470 delivers 5144 Amps continuously. This Contactor is in DARRAH's inventory with 2200 Volt rated SCR's. This is truly the choice for heavy seam and flash butt welder controls.

DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)
DPH7847-470	6526	5144	40000	2200

### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.8 gallons (7 liters) per minute at 40°C water temperature.

### Water Connection:

Fits 1/2 inch hoses.

### Cooling Block:

Copper-Nickel Plated.

### Thermostat:

If required add suffix J to part number.

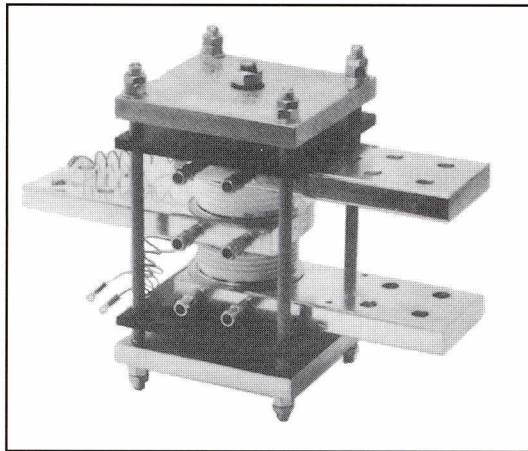
### MOV:

For MOV add suffix M to part number.

### Net Weight:

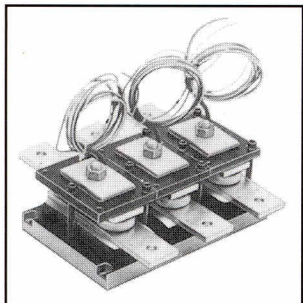
75 pounds.

❖ DARRAH's DPH7847-470 Heavy Duty Contactor can also be used to replace two ignitron tubes. Call DARRAH for wiring diagrams and installation instructions.



## TRI-PACK ASSEMBLIES

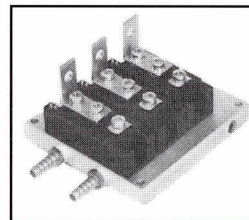
### For Three Phase or Cascade Controls



For three phase controls, dual or three cascade controls, DARRAH offers its line of indirect water cooled Contactors mounted on a triple chill block. Choose from either of the three bus tang connections and have DARRAH mount them on our specially designed triple heat sink. This means

one pair of water connections cools three Contactors.

DARRAH's Tri-Pack design is compact, thus eliminating bulky cabinets and excessive water connections.



For lighter KVA systems, DARRAH provides Isolated Tri-Pack Module Assemblies. A single water connection provides cooling for three SCR Contactors in a small convenient package.

Choose between 500 Amp or 1000 Amp RMS rated SCR Modules.

Bus bars, thermostat and MOV's are included.

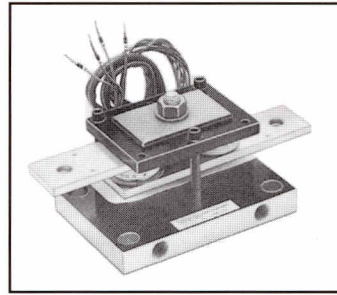
# INDIRECT WATER COOLED

DARRAH offers the resistance welding industry our line of indirect water cooled Contactors. Indirect water cooling refers to SCR Contactors that isolate the welding voltage from the water cooling.

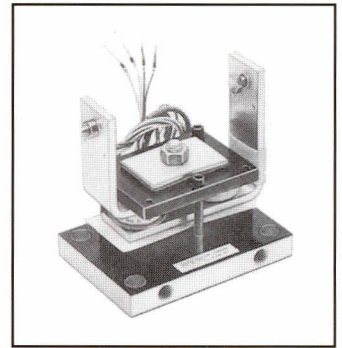
These switches are manufactured in such a way that once installed in a controller, if servicing is required, the Contactor is disassembled with a simple allen wrench. The SCR puck assembly can be removed, leaving the water cooled chill block intact, thus eliminating any need to disconnect or reconnect any water lines. The puck assemblies can be replaced or repaired within minutes of a failure with simple tools. Since the puck assemblies are pre-assembled, there is no need to be concerned about special torquing or mounting techniques.

DARRAH currently offers three types of indirect water cooled SCR Contactors. All three types have the same water cooled chill block, but offer different bus tang or power connections. Cooling blocks are available in aluminum or copper.

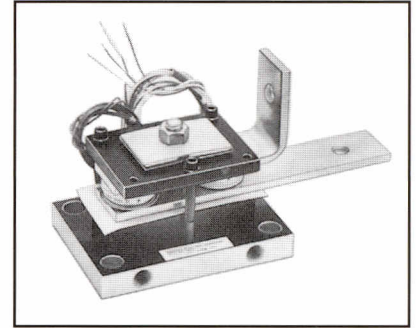
Another advantage of DARRAH's line of indirect water cooled SCR Contactors is that the chill blocks are isolated or electrically dead, therefore eliminating the need for hoses in your control cabinet.



DEC12ISM-18J



DEC17ISM-18J



DEC14ISM-18J

DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)	BUS TANG TYPE
DEC12ISM-18J	1100	600	10000	1800	STRAIGHT
DEC14ISM-18J	1100	600	10000	1800	1 STRAIGHT, 1 90° BEND
DEC17ISM-18J	1100	600	10000	1800	BOTH 90° BEND

### Thermostat:

All Contactors are supplied with a thermostat sensor, 70°C open on rise, recloses at 58°C and is isolated to base to 2000 Volts. Thermostat leads are 12 inches long.

### MOV:

For MOV add suffix M to part number.

### Copper Cooling Block:

Change M to C in part number. *Example: DEC14ISC-18J*

### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

### Water Connections:

1/4-18 NPT tapped holes.

# SOLID STATE MECHANICAL CONTACTOR REPLACEMENTS – Air Cooled

DARRAH now offers a complete line of AIR COOLED SOLID STATE MECHANICAL CONTACTOR REPLACEMENTS for welding controls thru 60 KVA.

These compact replacements feature encapsulated modules mounted on air cooled heat sink extrusions. Each heat sink is cut 4-1/2 inches long and has a gold irridite finish. These replacements are completely assembled and tested prior to shipping.

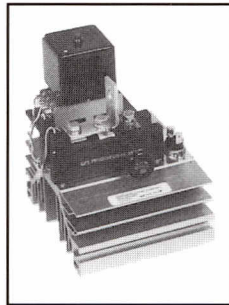
DARRAH's mechanical Contactor replacements easily wire into existing circuits and are operated by external contact closure.

### Cooling:

Convection cooled, rated at 40°C ambient temperature.

### Welding Ratings:

Suggested transformer KVA is based on the maximum secondary voltage at 50% duty cycle, typically, spotwelding applications.



CMB175-16JM

### Thermostat:

If required add suffix J to part number.

### MOV:

For MOV add suffix M to part number.

### Example:

CMB175-12JM, 75 Amps RMS, 1200 Volts with thermostat and MOV.

### EXTRUSION #5731/4.5" LONG

DARRAH PART NUMBER	WELDING RATING AMPS RMS AT VARIOUS DUTY CYCLES				SCR VOLTAGE	SUGGESTED MAXIMUM TRANSFORMER KVA (2)	
	10%	20%	50%	100%		230 LINE VOLTS	460 LINE VOLTS
CMB175-12	310	205	115	60	1200	20	-
CMB175-16	310	205	115	60	1600	-	40
CMB275-12	450	275	140	70	1200	25	-
CMB275-18	450	275	140	70	1800	-	50
CMB300-12	500	330	160	75	1200	30	-
CMB300-16	500	330	160	75	1600	-	60

*Consult factory for seam, projection, or frequency converter welding requirements.*

## ISOLATED SCR MODULES

### Integral Water Cooled

This product line features industry standard dual SCR modules with integral water cooled bases. Our improved design has eliminated thermal barriers associated with separate cooling bases. This has increased current ratings by as much as 15%. In addition, because the water connections are directly tapped to the module base, water leaks are virtually eliminated. To further enhance water integrity, each unit is 100% pressure tested at 150 PSI for one minute.

Another significant feature is that the modules are vacuum filled with a high performance, flame retardant silicone-based material at final assembly which eliminates hidden voids inside the package and prevents dust and dirt from penetrating which may cause premature failure. All cooling bases are copper, then nickel plated.

Our modules are recognized under the Recognized Component Program of Underwriters Laboratories, Inc. USA.

#### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

#### Water Connections:

1/4-18 NPT tapped holes

#### Thermostat:

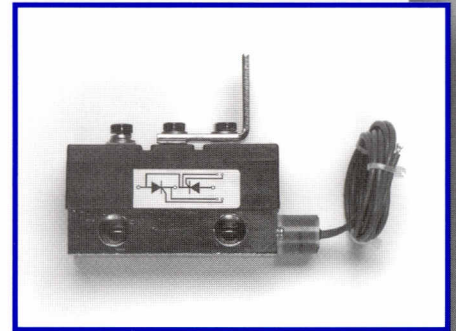
All modules are supplied with an encapsulated thermostat sensor, 50°C open on rise and isolated to base to 2000 Volts.

Thermostat leads are 24 inches long.

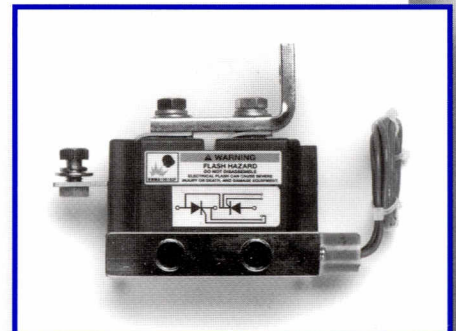
**Options include:** R/C snubber, MOV's and bus bars.

*Duty Cycles and mechanical drawings are available for each model.*

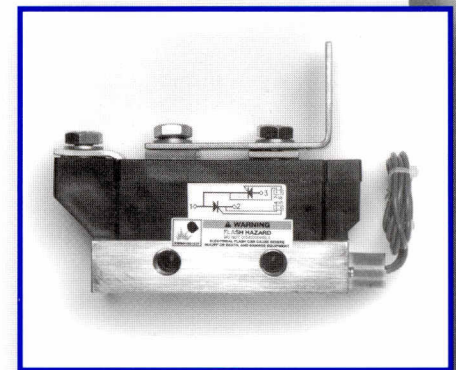
*All Modules are also available in BSPT pipe threads.*



Q20008



Q20001



Q20013

DARRAH PART NUMBER	WELDING RATING AMPS RMS AT 10% DUTY CYCLE	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	WELDING RATING AMPS RMS AT 100% DUTY CYCLE	SCR VOLTAGE RATING (PIV) (VRRM)	WATER CONNECTION LOCATION	PACKAGE DESIGN
Q20001	1592	1278	717	1800V	SIDE 1-1/2" CENTERS	MPO3
Q20002	1592	1278	717	1800V	BOTTOM 1-1/2" CENTERS	MPO3
Q20003	1592	1278	717	1800V	SIDE 2" CENTERS	MPO3
Q20006	1592	1278	717	1800V	SIDE 1-1/2" CENTERS	MPO3
Q20008	1068	755	450	1800V	SIDE 2" CENTERS	MPO2
Q20009	1068	755	450	1800V	BOTTOM 2" CENTERS	MPO2
Q20011	2797	1522	1097	1800V	SIDE 1-1/2" CENTERS	MPO4
Q20012	2797	1522	1097	1800V	BOTTOM 1-1/2" CENTERS	MPO4
Q20013	2797	1522	1097	1800V	SIDE 2" CENTERS	MPO4

# SOLID STATE IGNITRON TUBE REPLACEMENTS

## One Darrah SCR unit replaces two Ignitron tubes!

**NO MORE MERCURY! NO MORE IGNITRON TUBES!**  
**NO MORE WORN OUT CONTACTS! NO MORE HIGH PRICES!**

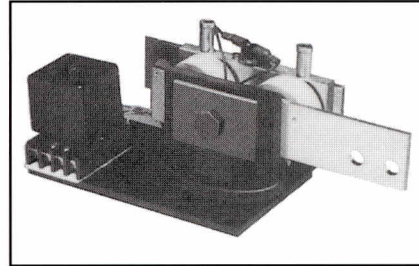
Now you can quickly replace all your ignitron tubes or mechanical Contactors with DARRAH's solid state replacements.

DARRAH provides a complete line of SOLID STATE SCR IGNITRON TUBE REPLACEMENTS. Replacements are available in both water cooled and air cooled designs, and easily mount on existing Ignitron Tube brackets.

DARRAH's replacements are engineered so that no modifications are required to existing controls or timer. All wiring and assembly is complete and Darrah Ignitron Tube Replacements are supplied with MOV and normally closed thermostat. Installation instructions are provided upon request.

### WATER COOLED - DHE SERIES

IGNITRON SIZE	DARRAH PART NUMBER	WELDING TRANSFORMER SIZE	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)
A/B	DHE800-22M	100KVA	1300	7500	2200
C	DHE1200-22M	200KVA	1700	9000	2200
J/C	DHE1500-22M	300KVA	1800	11200	2200
D	DHE1700-22M	550KVA	2300	11200	2200
D/E	DHE2500-22M	650KVA	2600	16400	2200
E	DHE3300-22M	750KVA	3200	21000	2200
SUPER E	DHE7847-22M	1500KVA	6526	40000	2200



SINGLE SIDED WATER COOLED UNIT

#### Water Requirements:

Amps RMS is achieved with a cooling flow rate of 1.2 gallons (4.5 liters) per minute at 40°C water temperature.

#### Water Connection:

Fits 3/8 inch hoses.

#### Cooling Block:

Copper-Nickel Plated.

#### Welding Ratings:

Suggested transformer KVA is based on the maximum secondary voltage at 50% duty cycle, 460 Volt incoming A.C. line or higher; typically, spotwelding applications.

#### Thermostat:

All switches are supplied with a thermostat sensor, 50°C open on rise and isolated to base for 2000 Volts. Thermostat leads are 12 inches long.

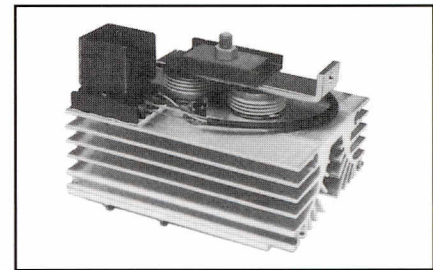
#### MOV:

Included.

*Consult factory for seam, projection, or frequency converter welding requirements.*

### AIR COOLED - DAHE SERIES

IGNITRON SIZE	DARRAH PART NUMBER	WELDING TRANSFORMER SIZE	WELDING RATING AMPS RMS AT 5% DUTY CYCLE	WELDING RATING AMPS RMS AT 50% DUTY CYCLE	SGL. CYCLE SURGE CURRENT (ITSM)	SCR VOLTAGE RATING (PIV) (VRRM)
A/B	DAHE180-22M	125KVA	1540	300	7500	2200
C	DAHE195-22M	250KVA	1810	500	9000	2200
D/E	DAHE055-22M	500KVA	2630	700	16400	2200



SINGLE SIDED AIR COOLED UNIT

#### Cooling:

Convection cooled, at 45°C maximum ambient temperature.

#### Welding Ratings:

Suggested transformer KVA is based on the maximum secondary voltage at 5% duty cycle, 460 Volt incoming A.C. line or higher; typically, spotwelding applications.

#### Thermostat:

All Contactors are supplied with a thermostat sensor, 50°C open on rise and isolated to base for 2000 Volts. Thermostat leads are 12 inches long.

#### MOV:

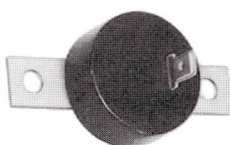
Included.

*Consult factory for duty cycle curves, mechanical drawings or installation instructions.*

# ACCESSORIES

## METAL OXIDE VARISTOR (MOV)

Have Darrah mount a metal oxide varistor to your Contactor to protect your SCR's from transient voltage surges. MOV's are ideally suited to welding applications. Their high clamping efficiency and low steady state power dissipation offer considerable advantages in protecting the SCR Contactor and control circuitry. DARRAH's MOV's feature high surge current capability, instantaneous response in a compact and robust package. Selection of the MOV is governed by incoming line voltage and SCR voltage rating (PIV). Available in PA or LA Series types.



PA SERIES



LA SERIES

### METAL OXIDE VARISTOR (MOV) PA SERIES

DARRAH PART NUMBER	INCOMING LINE VOLTAGE	MINIMUM SCR VOLTAGE (PIV) (VRRM)
Z320PA40C	220/230/240	1000
Z480PA80A	380	1200
Z550PA80A	440/460/480	1500
Z660PA100A	550	1800
Z750PA100A	600	2000

### METAL OXIDE VARISTOR (MOV) LA SERIES

DARRAH PART NUMBER	INCOMING LINE VOLTAGE	MINIMUM SCR VOLTAGE (PIV) (VRRM)
Z350LA40A	220/230/240	1000
Z480LA80A	380	1200
Z550LA80A	440/460/480	1500
Z660LA100A	550	1800

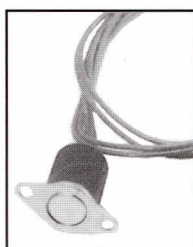
Consult factory for frequency converter requirements.

## THERMOSTATS

DARRAH stocks the full line of thermostats commonly found on resistance welding contactors. Choose from non-encapsulated or encapsulated packages in various temperature ratings.

DARRAH's exclusive encapsulated thermostat is available in 50°C and 70°C, normally closed, and tested for 2000 Volt isolation.

These thermostats are ideal for moist areas or where Contactors commonly sweat.



ENCAPSULATED TYPE

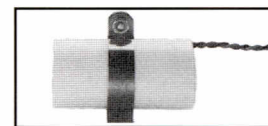


UNENCAPSULATED TYPE

## R/C SNUBBER

DARRAH's encapsulated Resistor and Capacitor Snubber is ideal for SCR protection from false firing and high voltage surges commonly found in resistance welding applications.

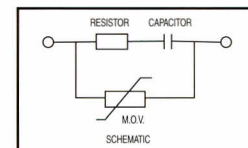
Available off the shelf, DARRAH R/C SNUBBERS can be added for use across all SCR Contactors to 600 Volt A.C. mains.



DARRAH PART NUMBER	R/C SNUBBER PART NUMBER	RESISTOR	CAPACITOR
V15010	RC1522	15 Ohm/ 4 Watt	.22 UF/660 VAC

## R/C/M SNUBBER

DARRAH's new encapsulated Resistor, Capacitor and MOV Snubber further reduces labor and simplifies welding controller wiring. All three components are encapsulated and pre-wired in the same convenient package.



DARRAH PART NUMBER	SNUBBER PART NUMBER	RESISTOR	CAPACITOR	MOV
V15020	RCM1522	15 Ohm 4 Watt	.22 UF 660 VAC	Z660LA100A 680 VAC

## PORTABLE DIODE AND SCR TESTER

DARRAH's Diode and SCR Tester puts the sophisticated testing capability of high-priced, specialized units into a portable package that is economically priced and easy to use. It includes provisions for checking diodes and SCR's for opens, shorts, leaks, and breakdown under actual operating conditions.

The TESTER is a compact 6 x 12 x 17 inches, weighs 14 pounds, and operates on 120 Volt A.C. current.

Comes complete with test leads and clamp for checking flatpack DIODES and SCR's.



DARRAH PART NUMBER	TESTER RATING
X10001	2000 VOLT
X10002	3000 VOLT

## DARRAH'S SERVICE CENTER

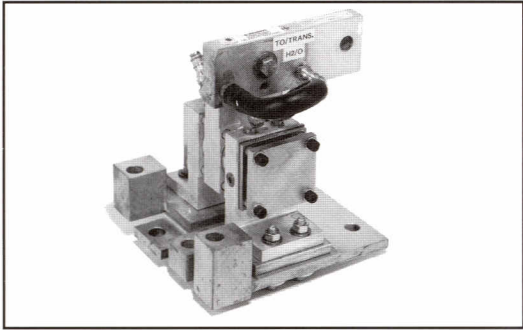
Darrah offers a complete repair service for all brands and makes of SCR Contactors.

- Contactors are tested under actual operating conditions. Darrah positively identifies SCR's that are open, shorted, leaking, breaking down, or gating improperly.
- SCR's are matched according to gate-current characteristics prior to shipping.

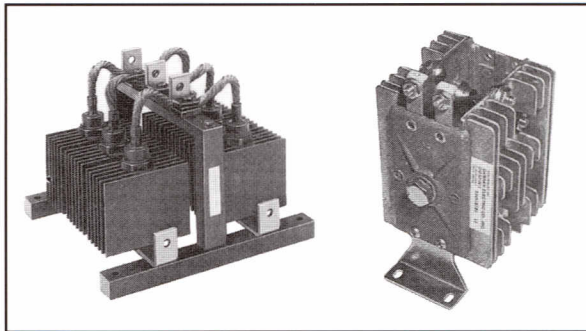
- Water cooled SCR Contactors are leak tested to manufacturer's recommended pressures.

**Replacement Parts:** Off-the-shelf delivery for SCR's, chill blocks, thermostats, hoses and manifolds.

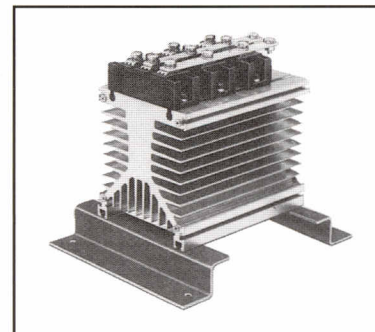
# ADDITIONAL DARRAH CAPABILITIES



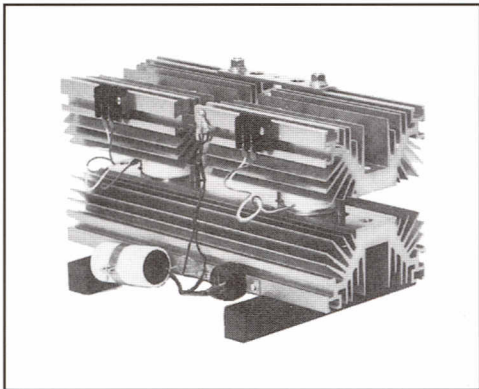
Darrah is now introducing a full line of **Center Tap Rectifier Stacks** for Fixture Type Welding Transformers. Ask for our Bulletin #0500.



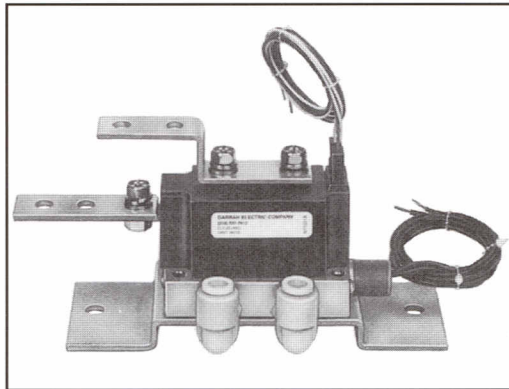
Darrah offers a complete line of **Stud Mounted Air Cooled Heat Sink Assemblies**. Choose from all circuit diagrams in current ratings from 10 thru 750 amps. Ask for our Bulletin #7404.



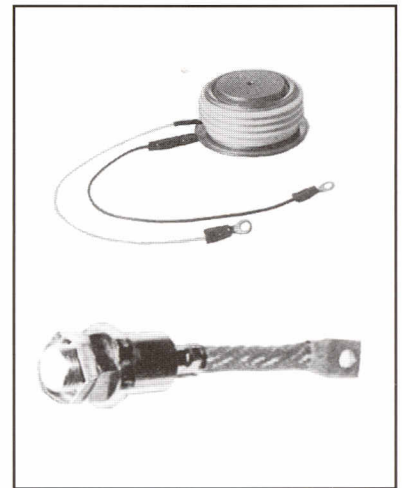
Darrah Electric offers a complete line of **Module Assemblies** for air cooled designs. Circuits include Diodes, SCR's, MOSFETs, IGBTs, and Transistors. Call for our Bulletin #7396 or fax us your design for quotation.



Darrah's line of Hockey Puck **Air Cooled Assemblies** provide you with off the shelf custom designed products including all the features you need. Ask for our "Darrah Gold" Bulletin #7403 for complete details.



**Custom Assemblies** - Send Darrah your drawings or tell us your ideas for made-to-order products to meet your production needs.



**Silicon Diodes, SCR's, Transistors, MOSFETs and Modules** are available from Darrah stock with ratings from 1.5 amps to 4800 amps.

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