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# Refrigeration Relays, Overloads & Hard Starts

## For Refrigeration Systems Without Run Capacitors

SUPCO offers the most complete line of refrigeration relays, overloads and hard starts in the industry. For refrigeration systems with and without run capacitors, just choose the right combination for your application. All combinations are pre-wired for fast installation.



### ICG and PO Series Relays

#### Features/Benefits

- ICG Series features a “snap-on” bracket
- PO Series installs on compressors with “pin-type” terminals.
- Fastest cool down time of any solid state relays
- Can be used with and without start capacitor.

#### Applications

- One size for all compressors from 1/12 hp through 1/2 hp.
- Replaces all current type relays.



ICG



### RO & PRO Series Relay and Overload Combinations

- RO Series features “snap-on” bracket
- PRO Series installs on “pin-type” terminal.
- Locked rotor protection eliminates start winding overheating
- Can be used with and without start capacitor motors from 1/4 to 1/3 hp.

#### Applications

- Select the right match to replace refrigerator compressor relay and overload units from 1/12 through 1/2 hp, 115 – 230 VAC.



RO



### RSC Series Relay and Start Capacitor Combination

#### Features/ Benefits

- Replaces current-type relays
- Provides a boost for hard start and unbalanced systems
- Prevents low voltage starting problems

#### Applications

- One size for all compressors from 1/12 hp through 1/2 hp.
- For domestic and commercial refrigeration systems and freezers



RSC



### RCO Series 3 N' 1 Relay, Overload and Start Capacitor Combination

#### Features/Benefits

- Replaces relay, overload and provides a boost for hard start and unbalanced systems
- Prevents low voltage starting problems

### SS410 Super Start Relay Overload Combination

#### Features/Benefits

- Equipped with an electro-mechanical relay, locked rotor protector and a 255  $\mu$ F start capacitor.
- Increases torque to its maximum capacity



SS410

### Selection Table For Refrigeration Systems Without Run Capacitors

PART NO.	RELAY	OVERLOAD	START CAPACITOR	MOUNTING	hp RATING	VOLTAGE (VAC)
ICG1	*			Quick Connect	1/12 - 1/2	115
ICG-220	*			Quick Connect	1/12 - 1/2	230
PO115	*			Push - on	1/12 - 1/2	115
PO230	*			Push - on	1/12 - 1/2	230
RO81	*	*		Quick Connect	1/12 - 1/5	115
RO41	*	*		Quick Connect	1/4 - 1/3	115
RO82	*	*		Quick Connect	1/12 - 1/8	230
RO62	*	*		Quick Connect	1/6 - 1/5	230
RO42	*	*		Quick Connect	1/4 - 1/3	230
PRO81	*	*		Push - on	1/12 - 1/5	115
PRO41	*	*		Push - on	1/4 - 1/3	115
PRO21	*	*		Push - on	1/2	115
PRO82	*	*		Push - on	1/12 - 1/8	230
PRO62	*	*		Push - on	1/6 - 1/5	230
PRO42	*	*		Push - on	1/4 - 1/3	230
PRO22	*	*		Push - on	1/2 - 2/3	230
RSC20	*		*	Quick Connect	1/12 - 1/2	230
RC0810	*	*	*	Quick Connect	1/12 - 1/5	115
RC0410	*	*	*	Quick Connect	1/4 - 1/3	115
RC0210	*	*	*	Quick Connect	1/2	115
RC0820	*	*	*	Quick Connect	1/12 - 1/8	230
RC0620	*	*	*	Quick Connect	1/6 - 1/5	230
RC0420	*	*	*	Quick Connect	1/4 - 1/3	230
RC0220	*	*	*	Quick Connect	1/2	230
SS410	*	*	*	Quick Connect	1/4 - 1/3	115

### RCO/URCO/PRO/URPO/RO/URO Current Ratings

PART NO.	FULL LOAD AMPS	TRIP IN CURRENT AFTER 6-16 SEC.
RC0810/URCO810/PRO81/URP081/RO81/URO81	4.05Amps	12 Amps
RC0410/URCO410/PRO41/URP041/RO41/URO41	7.5 Amps	22 Amps
RC0210/URCO210	13.3 Amps	40 Amps
RC0820/URCO82/PRO82/URP082/RO82/URO82	1.66 Amps	6 Amps
RC0420/URCO42/PRO42/URP042/RO42/URO42	4.05 Amps	12 Amps
RC0620/URCO62/PRO62/URP062/RO62/URO62	1.66 Amps	6 Amps
RC0220/PRO22/UPRO22/URO22	7.5 Amps	22 Amps

#### Applications

- Select the right match to replace refrigerator compressor relay and overload units from 1/12 through 1/2 hp, 115 – 230 VAC.
- For all capillary systems

#### Applications

- For all motors including high starting torque motors from 1/4 to 1/3 hp.

#### Features/Benefits



# Refrigeration Relays, Overloads & Hard Starts

For Refrigeration Systems **WITH OR WITHOUT RUN Capacitors** Maintain a high efficiency system or save an old system with SUPCO's Ultimate Series.



## URCO Series Ultimate Relay Capacitor Overload

### Features/Benefits

- Replaces relay, capacitor and overload
- Available in popular sizes, ranging from 1/12 hp to 1/2 hp
  - "Push-on" compressor terminals, and 1/4" capacitor terminals
- Designed for modern high efficiency compressors
- Helps older compressors to start and run cooler
- Easy mount clip for quick installation
- Easy to read instructions
- Prevents low voltage starting problems

### Applications

- Domestic Refrigerator Compressors to 1/2 hp
- Light Commercial Refrigeration Compressors to 1/2 hp.

**3 N' 1 for High torque starts**  
**Run Capacitor Wiring for**  
**high efficiency systems**

PART NO.	hp RATING	VOLTS
URCO210	1/3 to 1/2	115
URCO410	1/4 to 1/3	115
URCO810	1/12 to 1/5	115

- Works on "RSIR", "CSIR", "PSC", & "CSR" compressors



## URCORC Series 4 N' 1 Ultimate Relay, Capacitor, Overload and Run Capacitor

### Features/Benefits

- Same Features and Benefits of the Ultimate URCO Series
- Adds a closely matches system Run Capacitor

**Replaces current-type relays**

PART NO.	hp RATING	RUN CAPACITOR	
		Size $\mu$ Fd	VOLTS
URCO810RC	1/12 to 1/5	12.5	115
URCO410RC	1/4 to 1/3	15	115
URCO210RC	1/3 to 1/2	20	115

## URO Ultimate Relay Overload

### Features/Benefits

- Replaces relay and overload
- Locked rotor protection, eliminates start winding overheating
- Available in popular sizes, ranging from 1/12 hp to 1/2 hp
- "Snap-on" bracket for easy mounting
- Quick and easy installation
- Wiring instructions on the package
- Instructions on adding a start capacitor and/or run capacitor
- Wire leads for those odd installations, Wire nuts included

**Replaces relay & overload**

PART NO.	hp RATING	VOLTS
URO41	1/4 to 1/3	115
URO81	1/12 to 1/5	115

### Applications

- Domestic Refrigerator Compressors to 1/2 hp
- Light Commercial Refrigeration Compressors to 1/2 hp.

- Works on "RSIR", "CSIR", "PSC", & "CSR" compressors

## UPRO Ultimate Push-on Relay

### Features/Benefits

- Replaces relay and overload
- Available in popular sizes, ranging from 1/12 hp to 1/2 hp
- "Push-on" relay overload
- Quick connect push-on terminals for run and/or start capacitor
- Wiring instructions on the package
- Instructions for adding a start capacitor and/or run capacitor

**Replaces relay & overload**

PART NO.	hp RATING	VOLTS
UPRO21	1/3 to 1/2	115
UPRO41	1/4 to 1/3	115
UPRO81	1/12 to 1/5	115

### Applications

- Domestic Refrigerator Compressors to 1/2 hp
- Light Commercial Refrigeration Compressors to 1/2 hp.

- Works on "RSIR", "CSIR", "PSC", & "CSR" compressors

## URSC10/URSC20 Ultimate Relay Start Capacitor

### Features/Benefits

- Replaces current-type relays
- Provides a boost for hard start and unbalanced systems
- No additional wires required

### Applications

- One size for all compressors from 1/20 hp to 1/2 hp
- For domestic and commercial refrigeration systems and freezers
- Works on "RSIR", "CSIR", "PSC", & "CSR" compressors

**Replaces current-type relays**

PART NO.	hp RATING	VOLTS
URSC10	1/20 to 1/2	120
URSC20	1/20 to 1/2	240





# Refrigeration Relays, Overloads & Hard Starts

## OV Series Universal Replacement Motor Protectors

### Features/Benefits

- Built in temperature activated disc opens and closes the motor overload protector's contacts.
- Excessive heat generated by the compressor, motor or crankcase heater will open the contacts to help protect the equipment from serious damage or burnout.
- UL and CSA Approved

### Applications

- Used in heat pumps, air conditioners, motors, refrigerators, freezers, pumps, water coolers, and heating applications.



### OVKIT Overload Kit

- Contains one of each overload (10 total)



PART NO.	LOCKED ROTOR		HORSEPOWER AT 120 VOLTS									GEM NO.	MARS NO.	
	AMPS		1/20	1/1	1/10	1/8	1/6	1/5	1/4	1/3	1/2	3/4		
OV32	12.0	13.5	•	•									MP359	35004
OV34	14.0	15.5		•	•	•	•	•					MP358	35007
OV36	16.0	18.0			•	•	•	•					MP357	35009
OV38	18.5	22.0			•	•	•	•	•				MP354	35010
OV40	22.5	26.5					•	•	•				MP360	35011
OV42	27.0	31.0					•	•	•				MP355	35012
OV44	31.5	35.5							•	•			MP361	35017
OV46	36.0	40.0							•	•	•		MP352	35018
OV48	40.5	44.5								•	•	•	MP351	35019
OV50	45.0	49.0									•	•	MP362	35020

PART NO.	LOCKED ROTOR		HORSEPOWER AT 120 VOLTS												GEM NO.	MARS NO.
	AMPS		1/10	1/8	1/6	1/5	1/4	1/4+	1/3	1/3+	1/2	1/2+	3/4	1		
OV32	12.0	13.5	•	•	•	•	•	•	•						MP359	35004
OV34	14.0	15.5	•	•	•	•	•	•	•						MP358	35007
OV36	16.0	18.0				•	•	•	•	•					MP357	35009
OV38	18.5	22.0				•	•	•	•	•	•				MP354	35010
OV40	22.5	26.5						•	•	•	•	•	•	•	MP360	35011
OV42	27.0	31.0						•	•	•	•	•	•	•	MP355	35012
OV44	31.5	35.5										•	•	•	MP361	35017
OV46	36.0	40.0										•	•	•	MP352	35018
OV48	40.5	44.5										•	•	•	MP351	35019
OV50	45.0	49.0												•	MP362	35020

This application guide is offered as a guide only when no other information is available.

The application will vary with compressor manufacturer's systems and condenser applications (static, fan, and water cooled, etc.)

Other factors include refrigerant, motor type, and efficiency.

### Application Note: Locked Rotor Amperage Measurement. To determine the locked rotor amperage use the following procedure:

1. Disconnect source of electrical supply.
2. By-pass defective overload with jumper.
3. Remove wire from start terminal of compressor.
4. Place hook-on ampmeter on wire going to common or run terminal of compressor.
5. Connect plug to source of current and read ampmeter.
6. If unit does not have a start capacitor, add 1/2 of ampere reading to obtain the locked rotor amps.  
Example: If ampere reading is 21, add 1/2 (+11.5) = 32.5 locked rotor amps.
7. If unit has a start capacitor, add 10% of ampere reading. Example: If ampere reading is 21, add 10% (+2.1) = 23.1 locked rotor amps.
8. Replace defective overload and replace wire removed from start terminal.

**NOTE:** The above procedure should only be used when the motor winding is at ambient temperature.

## Direct Replacement Solid State Relays, Overloads and Relay/Overload Combinations

- Direct Replacements for numerous OEM's
- Use OL Series Overloads with IC Series, PO Series and UR115



PART NO.	RELAY OVERLOAD	HORSEPOWER	VAC	# OF TERMINALS	COMPRESSOR CONNECTIONS	CAPATIBLE	CAPACITOR REPLACES OEM NO.
IC100	*	---	1/12 to 1/3	120	2	Yes	216594300, WR7X194, WR7X214, 4318083
IC102	*	---	1/2 to 1/3	120	3	Yes	5303007173, WR7X240, WR7X5142, 68857-1
OL1	---	*	1/5 to 1/4	120/240	1	---	5303299560, 216100110
OL2	---	*	1/4 to 1/3+	120/240	1	---	5303270406, WR8X122
OL3	---	*	1/6 to 1/5	120/240	1	---	5303276514
OL4	---	*	1/4 to 1/3+	120/240	1	---	5303206885, 2154945

\* IC100, IC102 replaces PON

# Refrigeration Relays, Overloads & Hard Starts

## Motor Protector Cross Reference

HP/TYPE	SUPCO OV	TECUMSEH O/L	HP/TYPE	SUPCO OV	TECUMSEH O/L	HP/TYPE	SUPCO OV	TECUMSEH O/L	HP/TYPE	SUPCO OV	TECUMSEH O/L
1/8 Fan	<b>OV34</b>	83281 / 83282 83316 / 83438 83441 / 83461 83473 / 83606 83628 / 83711	1/5 Fan	<b>OV38</b>	83030 / 83131 83183 / 83183-1 83290 / 83426 83439 / 83448 83743 / 83743-1 83746 / 83746-1 83771	1/4 Static	<b>OV44</b>	83013 / 83017 83036 / 83063 83145-1 / 83172 83172 / 83172-1 83192 / 83192-1 83321 / 83373 83376-1 / 83378 83400 / 83435 83459 / 83647 83681 / 83694 83736-1 / 83766 83376-1 / 83378 83789	1/3 Fan	<b>OV46</b>	83031 / 83074 83168 / 83168-1 83257 / 83257-1 83257-2 / 83293 83307 / 83332 83390 / 83413 83413-1 / 83415 83429 / 83430 83453 / 83454 83464 / 83498 83498-1 / 83625 83631 / 83637 83640 / 83708 83713 / 83714 / 83754
1/6 Fan	<b>OV36</b>	83018 / 83021 83042 / 83077 83091 / 83160 83160-1 / 83165 83165-1 / 83191 8191-1 / 83287 83463 / 83691 83006	1/6 Static			1/5 Static	<b>OV40</b>	8300MRT58 83047 / 83171 83171-1 / 83291 83366 / 83391 83392	1/3 Static	<b>OV48</b>	8300MRT26 8300MRT60 83219 83434 83673 83765
			1/5 Static	<b>OV40</b>	8300MRT58 83047 / 83171 83171-1 / 83291 83366 / 83391 83392						
			1/4 Fan	<b>OV42</b>	83011 / 83139 83161 / 83161-1 83163 / 83163-1 83259 / 83289 83292 / 83323						

## Valves & Fittings



### BPV Series Bullet® Piercing Valves

The *ONLY* valve with a permanent type, patented gasket application!



SUPCO's "Bullet® Piercing Valve" utilizes the same type of gasket found under the head plate of most air conditioning compressors. When installed, the gasket actually compresses the copper tubing .020" creating a permanent, leakproof seal that will withstand any pressure and temperature for the life of the unit.

#### Features

- Patented valve gasket application provides 50 times more sealing area than competitive "O" ring types
- A sealing force of over 180 inch lbs., torque tested with 500 lbs., pressure tested at 250°F
- Precision piercing needle is engineered for concentricity and hardness to insure perfect seating every time
- Nonpositional mounting — No adapter valve required
- Requires only a 2" clearance area for installation and operation
- Hex key wrench included — No additional tools required
- Corrosion resistant plated

#### Applications

- Install on the high side as a permanent valve on the job
- Install on round suction lines or uneven tubing

PART NO.	O.D. TUBING SIZE	PACKAGING
<b>BPV31*</b>	1/4", 5/16", 3/8"	12/Box
<b>BPV31D*</b>	1/4", 5/16", 3/8"	48/Box
<b>BPV21*</b>	1/2", 5/8"	8/Box
<b>BPV36</b>	3/16"	12/Box
<b>BPV14</b>	1/4"	12/Box
<b>BPV56</b>	5/16"	12/Box
<b>BPV38</b>	3/8"	12/Box
<b>BPV12</b>	1/2"	8/Box
<b>BPV58</b>	5/8"	8/Box
<b>BPV34</b>	3/4"	1/Box
<b>BPV78</b>	7/8"	1/Box

\*NOTE: BPV31 and BPV21 are furnished with adapter sleeves for indicated multiple use applications.

## Gasket "O" Rings



PART NO.	ID SIZE	DESCRIPTION	PART NO.	ID SIZE	DESCRIPTION
<b>SF0099</b>	5/32"	Used for SF5050 Valve	<b>SF1060</b>	3/16"	Used in brass caps.
<b>SF0101</b>	1/4"	—	<b>SF1090</b>	5/16"	Black rubber (used for SF2070)
<b>SF0111</b>	5/16"	Black rubber (used for SF3900)	<b>SF5501</b>	1/4"	White teflon (used for SF5500 Series)

# Valves & Fittings



## SA Series Adjustable Line Tap Valves

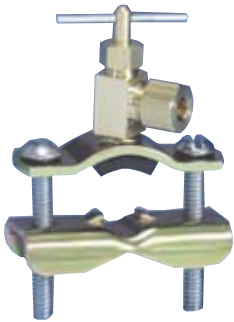
### Features

- Available in two sizes to accommodate five different OD tube sizes.
- Depressor valve action
- Can be mounted in any position
- Retracting needle ensures no restriction
- Throw away depressor pin simplifies line piercing
- Hex wrench included
- Adapter sleeves included
- Can be used with all refrigerants including R410A
- Maximum operating pressure 800 PSI
- Sold in 12 packs

### Applications

- Used to provide access fitting without having to remove refrigerant from air conditioning, refrigeration and heat pump systems.

PART NO.	TUBE SIZE OD	REPLACES
SA1	1/4", 5/16", 3/8"	A1 Watsco, A1 Diversitech, QTM1
SA2	1/2", 5/8"	A2 Watsco, A2 Diversitech, QTM2



## STV Series Self-Tapping Water Valves

### Features

- Self piercing on copper tubing or 0.035" wall hard PVC
- Fits 3/8" O.D. through 1 3/8" O.D. tubing or pipe
- Can be installed on pipe with existing hole
- Stainless steel piercing needle
- Molded gasket has a two stage seal on both tubing and valve
- Threaded bottom bracket for easy installation
- Includes all fittings for copper and plastic tubing
- Maximum water temperature 180°F/82°C

PART NO.	FLOW RATE	OUTLET	PIERCING NEEDLE	APPLICATION	COMMENTS
STV2	1 GPM	1/4" Comp.	1/8" Dia. (Hollow)	Ice Maker Kits	Reversible lower bracket
STV3	1 GPM	1/4" Comp.	1/8" Dia. (Hollow)	Humidifier Kits	
STV4	1 GPM	1/4" Comp.	3/32" Dia. (Solid, retractable)	Humidifier Kits	1/8" M.P.T. on body valve included



## STV2D Conventional "Drill" Type Valve

### Features

- Must pre-drill 1/4" hole in pipe or tubing
- Increased water flow from standard water valve
- Fits up to 1 3/8" O.D. Copper tubing
- Fits 1/2" or 3/4" galvanized iron water pipe
- Flow rate: 1 GPM
- Maximum water temperature 180°F/82°C
- Includes all fittings for 1/4" O.D. copper and plastic tubing

**Tech Tip:** Designed to be used on city water pressure only 30-40 psi.



## FTV Series Self-Tapping Valves

*TAP INTO ANY TUBE OR PIPE WITHOUT SHUTTING DOWN, DRILLING OR CUTTING!*

### Applications

Humidifiers, water coolers, vending machines, oil lines and steam systems.

- Maximum operating pressure 500 psi

PART NO.	BRANCH TAP FITTING	APPLICATION
FTV12	3/8" SAE Flare	1/2" Steel or brass pipe approx. 7/8" O.D.

Not intended for gas applications.

## Line Service Valves



PART NO.	DESCRIPTION	PIPE THREAD	PART NO.	DESCRIPTION	PIPE THREAD
SF1010	1/8" copper tubing, wrench cap and core	—	SF3603	3/16" copper tubing, wrench cap and core	1/8" m.
SF2525	1/4" copper tubing, wrench cap and core	—	SF3604	1/4" copper tubing, wrench cap and core	1/8" m.
SF3600	1/8" ID hole, 3/16", 1/4", 5/16" steps, 1/8" MPT below hex wrench cap and core	—	SF3605	5/16" copper tubing, wrench cap and core	—
SF3602	1/4" copper tubing, 3/16" & 1/8" copper bushings, wrench cap and core	1/8" m.	SF3606	3/8" copper tubing, wrench cap and core	—
			SF3608	1/8" copper tubing, wrench cap and core	1/8" m.

## SF5421 Tee Fitting Service Valve

SF5421 is a copper tee with the body brazed on. Furnished complete with core and wrench cap. The 1/4" I.D. x 5/16" O.D. will service 1/4", 5/16", and 3/8" tubing.

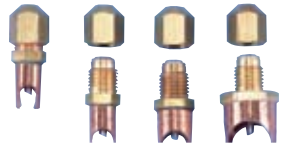


# Valves & Fittings

## SF5000 Series Saddle Valve Copper to Copper



Completely self tapping. Steel pin with core penetrates line and is locked into valve body in one operation, simply by tightening cap.



SF5514 SF5516 SF5538 SF5558



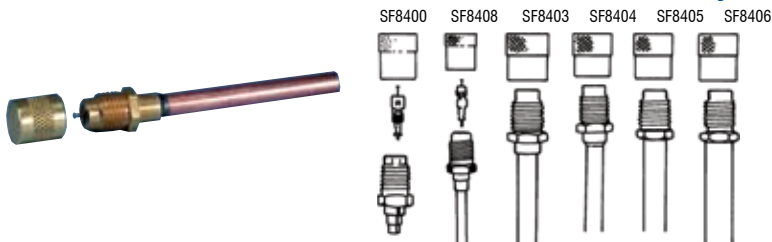
SF5518 SF5534 SF5578

PART NO.	TUBING	PART NO.	TUBING
SF5512	1/2" O.D.	SF5534	3/4" O.D.
SF5514	1/4" O.D.	SF5538	3/8" O.D.
SF5516	5/16" O.D.	SF5558	5/8" O.D.
SF5518	1 1/8" O.D.	SF5578	7/8" O.D.

## Replacement Gasket

PART NO.	
SF5501	25 per pack

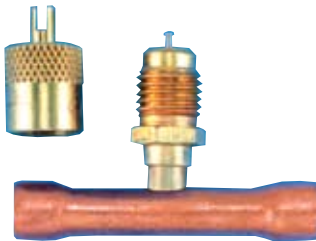
## SF8400 Series Economy Service Valves



PART NO.	I.D. HOLE	O.D.	MOUNTING
SF8400	1/8"	3/16", 1/4", 5/16" Step	Braze Only with SF1515 Core
SF8408	1/8" Tube, 3/16", 1/4", 5/16" Step		
SF8403	3/16" Tube, 1/4" Step		
SF8404	1/4" Tube		
SF8405	5/16" Tube		
SF8406	3/8" Tube		

## SF8000 Series Universal Line Valves

Available in various sizes. Copper Tee with the body brazed on. Two styles - a flared or straight end copper piece. (See chart below for exact size.)



### Straight Copper Piece

PART NO.	LENGTH	I.D.	O.D.
SF8418	1 7/8"	1 1/8"	1 1/4"
SF8434	1 5/16"	3/4"	13/16"
SF8478	1 9/16"	7/8"	1"

### Flared Copper Piece

PART NO.	LENGTH	I.D.	O.D.
SF8412	1 3/4"	1/2"	9/16"
SF8414	2 9/32"	1/4"	5/16"
SF8416	2"	5/16"	3/8"
SF8458	2"	5/8"	11/16"

## SF4040 Charging Hose Flow-Control Valve

- Reliable and easy to use
- Install on the end of a charging hose and minimize refrigerant loss during servicing
- A quarter turn of the handle makes quick work of turning on and off
- Straight flow through design offers maximum flow rate
- Brass depressor tip fully engages valve core



## SF1818 and SF1414 Brass Bodies

- Both bodies complete with neoprene seal, core and cap.
- Each is a quarter male flare above the hex.



SF1818  
(1/8" NPT-DRYSEAL)



SF1414  
(1/4" MPT-DRYSEAL)

## Valve Replacement Parts



PART NO.	DESCRIPTION
SF2235	Heavy duty hex brass cap with dual neoprene or metal seal
SF2245	Heavy duty round brass cap with neoprene seal
SF2250	Heavy duty round brass cap with handy core wrench on top and neoprene seal
SF4450	Valve core with neoprene seal compatible with most refrigerants (Replaces SF1515)
SF5161	5/16" OD neoprene hose gasket for charging hoses

# Valves & Fittings



## Adapters/Couplers

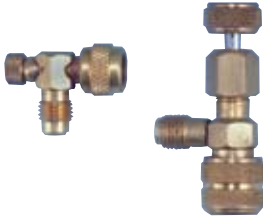
Quick coupler valve depressors complete with leakproof neoprene seal and depressor tips. Use to make connection between equipment with unlike threads. Made of CDA 360 brass. Available in straight and 90° configuration.

PART NO.	DESCRIPTION
SF2010	1/4" female flare swivel x 1/4" male flare access, 90° configuration. Depressor tip and seal, no valve core.
SF2012	1/4" female flare swivel x 1/2" Acme male, depressor tip and seal
SF2020	1/4" female flare hex x 1/2" Acme male
SF2028	1/4" male flare x 1/2" Acme female swivel, depressor tip seal



## SF2035 Hose Gas Retaining Coupler

- 1/4" female flare retainer Sure-seal x 1/4" male flare



## SF2060 & SF5050 Thumbscrew Core Depressors

For use on a 1/4" male flare to allow the core to be opened to the degree of flow desired. Solid brass construction. Compact design makes it ideal in close quarters.

PART NO.	DESCRIPTION
SF2060	For 1/4" male flares.
SF5050	For 1/4" male flares. Made small for use in close quarters



## SF2070 Hose Gas Retainer and Core Depressor Tool

This tool is attached to a charging hose, then it is coupled to an access fitting. Thumb screw the depressor tip down to depress the core and allow gas to flow through the hose. Thumb screw back to allow the core to shut off. The depressor tip rod will back seat in a Teflon gasket to retain the gas in the hose. There will be no loss of the gas in the hose when you disconnect from the access fitting.



## SF2090 Hose Gas Retaining Coupler

- 90° 1/4" female flare retainer x 1/4" male flare



## SF2595 and SF2597 Gauge Adapter

**SF2595** A 1 1/4" piece of 1/4" copper tubing, double flared on one end with a 1/4" female flare nut and a depressor tip. The end of the copper tube opposite the female flare has been swaged to allow 1/4" copper tube to enter for brazing.

**SF2597** A 1 1/4" piece of 1/4" copper tubing, double flared on one end with a 1/4" female flare and a depressor tip. The other end has a 1/4" male flare that has been brazed on. A core may be inserted in the 1/4" male flare, but is not provided.



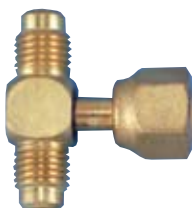
## Gauge Adapters

PART NO.	DESCRIPTION
SF5014	1/4" male flare to 3/16" fittings. Contains depressor pin.



## SF8725 Connector

The SF8725 has a gasket in the 1/4" hex nut. The valve body is stationary. When threads of existing system fittings are stripped and a new core won't go in, use this. It has a core and no depressor tip.

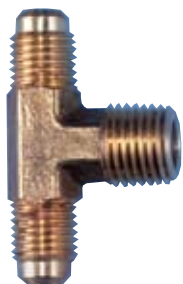


## Tee Connectors

PART NO.	DESCRIPTION
SF9601	1/4" m. flare x 1/4" flare nut with depressor tip x 1/4" m. flare on the branch with one valve core
SF9602	1/4" m. flare with valve core x 1/4" m. flare x 1/4" f. flare nut with depressor tip on the branch
SF9603	All brass connector tee. 1/4" m. flare with valve core and cap x 1/4" m. flare x 1/4" f. flare nut with depressor tip on the branch



# Valves & Fittings



## SF9600 Series 1/4" Flare Forged Access Tees

- Forged brass tee
- All 1/4" flares are threaded for valve cores

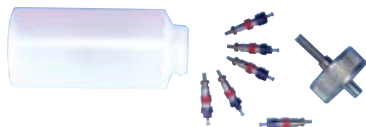
PART NO.	SIZE	MPT END I.D.
SF9613	1/4" m. flare x 1/4" m. flare x 1/4" m. flare, two valve cores, no caps	
SF9614	1/4" m. flare x 1/4" MPT x 1/4" m. flare access on branch, one cap and one valve core	5/16" for brazing a copper tube
SF9615	1/4" m. flare x 1/4" m. flare x 1/4" MPT on branch, one cap and one valve core	5/16" for brazing a copper tube
SF9616	1/4" m. flare x 1/8" MPT x 1/4" m. flare access on branch, one cap and valve core	1/4" for brazing a copper tube
SF9620	1/4" m. flare x 1/4" m. flare x 1/8" MPT on branch, one cap and valve core	1/4" for brazing a copper tube



## SF9644 Connector

2 - 1/4" male flares, one with core and cap, in a "U" shape. At the side is a 1/4" female flare with depressor tip and opposite that is an additional 1/4" male flare

## Valve Tools



## SF3800 Chaser

- Two tools, a core wrench and thread chaser, complete with a core carrying case and six cores
- Length with core wrench lid 3 1/2"



## SF3813 Valve Core Remover/Container

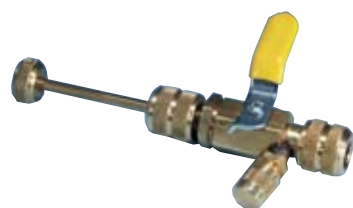
- Heavy-duty, all brass
- Length is 3"
- Includes 3 valve cores



## Core Removal Tools\*

PART NO.	DESCRIPTION
SF3900	Designed for removing and replacing a "Schrader" type core, without losing the charge. All brass construction.
SF3910	Same as above with an additional side port (1/4" male flare) with core.

\* Not compatible with R-410A



## Core Removal Tools (with Ball Valve)\*

PART NO.	DESCRIPTION
SF3920	Removes a valve core from a 1/4" male flare access fitting without loss of refrigerant. Because it has a ball valve inside rather than a stem-type valve, the tool can be closed with just a quarter turn.
SF3930	Same as above with an additional port
SF5555	CRT repair kit (o-rings)

\* Not compatible with R-410A



## SF3970 Internal Temperature Reading Tool\*

(Measures -58°F to +302°F)

This two piece tool provides a better way of obtaining a temperature reading inside the system. It allows you to insert the digital thermometer through an access fitting, and you can adjust for superheat while you're inside. Furnished complete with core extractor tool and digital thermometer. Easy to follow instructions included.

**Replaces SF3940 and SF3960**

\* Not compatible with R-410A



## SF4311 "FasTap" Tube Piercing Pliers

Fast refrigerant recovery with pliers that clamp on and pierce tube. Pliers work on copper tubing sizes ranging from 1/4" to 7/8" OD. They are simple to use and light weight. Adjust pliers to proper size, align tip to the center of tube, clamp down and pierce with quick action. Piercing tip is self-sharpening, but also easily replaceable.



## SF4314 Tube Piercing Pliers Replacement Tip



# Condensate Drain Pans



## Commercial Condensate Evaporator Pans

For condensate applications where no drain is available, choose from these popular, large capacity sized pans. SUPCO commercial refrigeration condensate evaporator pans are made from top quality materials for durable, long life.

### Features/Benefits:

- CP804-HD 20 guage stainless steel. All others use 22 guage.
- Corrosion resistant stainless steel construction.
- Made from top quality materials and components for longer more durable use.
- Positive evaporation
- High limit safety and float switch operation
- Available In 120 volts, 208 volts and 240 volts
- Warranty-One Year from date of installation
- Space saving

### Applications:

- Evaporates defrost and condensation where no drain is available.
- Used in supermarket refrigeration systems and elevators.
- These pans are used for water dissipation **ONLY! DO NOT OPERATE "DRY"**.
- Clean the pan and check the float every 30 days for optimum performance and operation.

### Specifications

PART NO.	CAPACITY	VOLTS	WATTS	AMPS	DIMENSIONS		DISSIPATION RATE	REPLACES
					L x W x H		PER DAY	
CP801	1 3/4 qt	120	400	3.3	10" x 7" x 2 1/2"		3 Gallon	DM04T1S
CP802	2 1/2 qt	120	800	6.6	13" x 7" x 2 1/2"		6 Gallon	DM08S1S
CP802-240	2 1/2 qt	240	800	3.3	13" x 7" x 2 1/2"		6 Gallon	
CP804	4 1/2 qt	120	1000	8.34	13" x 7" x 4"		10 Gallon	DM10MS1
CP804-240	4 1/2 qt	240	1000	4.17	13" x 7" x 4"		6 Gallon	
CP804HD	7 1/2 qt	120	1000	8.34	13" x 10" x 4"		6 Gallon	DM10W1D
CP804HD-240	7 1/2 qt	240	1000	4.17	13" x 10" x 4"		6 Gallon	
CP807	7 1/2 qt	120	1000	8.34	13" x 10" x 4"		10 Gallon	DM10W1S
CP807-240	7 1/2 qt	240	1000	4.8	13" x 10" x 4"		10 Gallon	DM10W3
CP815	15 qt	120	1440	12	21" x 13" x 4"		12 Gallon	DM15WW1D
CP815-240	15 qt	240	1500	6.28	21" x 13" x 4"		12 Gallon	DM15WW3
CP816	7 qt	120	500	4.17	13" x 10" x 4"		4.5 Gallon	DM05W1D
CP817	7 qt	208	1000	4.81	13" x 10" x 4"		8 Gallon	DM10W2D
CP818	7 qt	208	1000	4.81	13" x 10" x 4"		8 Gallon	DM10W2S
CP819	7 qt	120	1500	12.5	13" x 10" x 4"		12 Gallon	DM15W1D
CP820	7 qt	208	1500	7.21	13" x 10" x 4"		12 Gallon	DM15W2D
CP821	7 qt	208	1500	7.21	21" x 10" x 4"		12 Gallon	DM15WW2D

### Replacement Parts

PART NO.	FLOAT PART NO.	HEATER PART NO.	MICROSWITCH PART NO.	THERMOSTAT PART NO.
CP801	CPFLOAT	CPH801	CPS800	CPT800
CP802	CPFLOAT	CPH802	CPS800	CPT800
CP802-240	CPFLOAT	CPH802-240	CPS800	CPT800
CP804	CPFLOAT4	CPH8047	CPS800	CPT800
CP804-240	CPFLOAT4	CPH804-240	CPS800	CPT800
CP804HD	CPFLOAT4	CPH804HD	CPS800	CPT800
CP804HD-240	CPFLOAT4	CPH804HD-240	CPS800	CPT800
CP807	CPFLOAT4	CPH8047	CPS800	CPT800
CP807-240	CPFLOAT4	CPH807-240	CPS800	CPT800
CP815	CPFLOAT4	CPH815	CPS800	CPT800
CP815-240	CPFLOAT4	CPH815-240	CPS800	CPT800
CP816	CPFLOAT	CPH816	CPS800	CPT800
CP817	CPFLOAT	CPH817	CPS800	CPT800
CP818	CPFLOAT	CPH818	CPS800	CPT800
CP819	CPFLOAT	CPH819	CPS800	CPT800
CP820	CPFLOAT	CPH820	CPS800	CPT800
CP821	CPFLOAT	CPH821	CPS800	CPT800

**Cross Reference on page 129**

## 70 Condensate Drain

Authorized, cost effective replacement drain for most commercial refrigerators and freezers.

### Features/Benefits:

- PTC Control supplies only required heat to evaporate water.
- Thermostat and float NOT required
- Self regulating
- Uniform heating
- Die cast aluminum eliminates corrosion
- Removable cord set for easy cleaning
- Die cast aluminum eliminates corrosion
- Removable cord set for easy cleaning
- Die cast aluminum eliminates corrosion
- Removable cord set for easy cleaning
- Fast evaporation rate (6 oz./ hour)
- Low Profile(3") to fit tight spaces
- NSF, UL and CSA(where noted) approved



PART NO.	CAPACITY	VOLTS	WATTS	AMPS	EVAPORATE. RATE	SIZE
70	50 oz	115	300	2.61	6 oz/hr	12 1/4" x 4 3/4" x 3"
70-220	50 oz	220	300	1.36	6 oz/hr	12 1/4" x 4 3/4" x 3"
70CSA*	50 oz	115	190	1.65	6 oz/hr	12 1/4" x 4 3/4" x 3"
70CSA220*	50 oz	220	190	.86	6 oz/hr	12 1/4" x 4 3/4" x 3"

\*CSA indicates CSA approval. \*\* All are 50/60 HZ

## 30-OS, 31 & 75 Condensate Drains

- Standard cast aluminum condensate drains complete with long life heating element and mounting legs.
- Designed for continuous use.



PART NO.	CAPACITY	VOLTS	WATTS	AMPS	EVAPORATE. RATE	SIZE
30-OS*	38 oz	120	160	1.33	8 oz/hr	10" x 4" x 2 7/8"
30-220-OS*	38 oz	220	160	.73	8 oz/hr	10" x 4" x 2 7/8"
31	50 oz	120	160	1.33	6 oz/hr	10" x 4 1/2" x 3 3/8"
31-220	50 oz	220	160	.73	6 oz/hr	10" x 4 1/2" x 3 3/8"
75	75 oz	120	320	2.67	14 oz/hr	10" x 9" x 2 3/4"
75-220	75 oz	220	320	1.45	14 oz/hr	10" x 9" x 2 3/4"

\* Indicates NSF listing \*\* All are 50/60 HZ

## Wall Mount Brackets

PART NO.	CONDENSATE DRAIN NO.
30WM	30-OS Series, 75 Series
31WM	31 Series

# Condensate Drain Pans

## DP34 Drain Plus HVAC Condensate Drain

Visit [www.drainplus.com](http://www.drainplus.com) for complete information.

A drain solution defined for HVAC condensate lines. Negative coil pressure needs some type of drain trap. Drain Plus was developed specifically for this purpose.



### Features/Benefits

- Lifetime Warranty
- Prevents Dry Trap Syndrome
- Easy installation
- Removable cap for easy cleaning and inspection of the condensate line.
- Replaces conventional PVC P-Traps.

### Specifications

- 3/4" PVC
- Durable Schedule 40 PVC material.



**NEW**

## Drain Heaters

All SUPCO Drain and Door Heaters are designed for continuous use to protect drains against ice build up which leads to clogging. All of these heaters cannot be cut, spliced, extended or altered in any way.



## SH200 Series Flexible Braided Aluminum Drain Heaters

### Features/Benefits

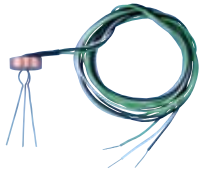
- Aluminum Construction
- Variety of Lengths and Wattage's Available

### Applications

- Domestic and Commercial Refrigeration
- Air Conditioner & Heat Pump Systems
- Condensate Drain Pans, Tubes and Troughs

Part numbers SH201 thru SH207

- Available in 220 Volts (Special Order)



## SH250 Universal Drain Heater

### Features/Benefits

- Used With Existing Heater or Where No Heater Exists
- Available in 220 Volts (Special Order)

### Tech Tip

- The SH250 Universal Drain Heater is designed for "series wiring connection" only.

PART NO.	DIAMETER	PRONG LENGTH	WIRE LEADS
SH250	0.91"	2.25"	56"



## SH250 Series Silicone Drain Heaters

### Features/Benefits

- Silicone Construction
- Designed For Waterproof Low Wattage Heat
- GE Serpentine Coil Heater Applications

### Tech Tip

- The SH252 Silicone Drain Heater is designed for "series wiring connection" only.
- SH251 replaces GE WR51X72, Frigidaire 6582706  
SH252 replaces Frigidaire 7517924

Part numbers SH251 and SH252



## SH500 Series Drain Heaters

### Features/Benefits

- Durable Metal Braid
- Available In 220 Volts (Special Order)
- Heater Tip 7/16" Diameter

- Silicone Construction
- Designed For Waterproof Low Wattage Heat

Part numbers SH500 thru SH505

## Foil Heaters



## SH220 Series Aluminum Foil Heaters

### Features/Benefits

- Pressure Sensitive Adhesive Backing For Easy Installation
- Six Assorted Shapes and Wattage's
- Available in 220 Volts (Special Order)

### Applications

- Commercial & Domestic Refrigeration
- Mullions
- Drain Troughs
- Drain Pans
- Spot Heating

### Heater Specifications

PART NO.	VOLTS	WATTS	SIZE	PART NO.	VOLTS	WATTS	SIZE
SH201	115	15	18" 23"	SH250	120	3	
SH202	115	45	29" 23"	SH251	115	8	heater tip - 3"
SH203	115	55	44" 23"	SH281	120	3	36 1/2' ft.
SH204	115	75	48" 23"	SH282	120	3	18' ft.
SH205	115	65	56" 23"	SH283	220	3	36' ft.
SH206	115	80	70" 23"	SH284	220	3	18' ft.
SH207	115	110	86" 23"	SH500	120	11	9" 18"
SH221	115	6	10" x 1"	SH502	120	15	13" 18"
SH222	115	10	24" x 1 1/4"	SH503	240	15	13" 18"
SH223	115	10	14 1/2" x 5 1/2"	SH504	120	25	21" 18"
SH225	115	15	10 1/2" x 10 1/2"	SH505	240	25	21" 18"
SH226	115	40	10 1/2" x 10 1/2"				

## Door Heaters



## SH280 Series Door Heaters Mullion & Dew Point

### Features/Benefits

- Prevents Moisture on Glass Display Doors
- Eliminates Frost Build Up On Doors & Cabinet Fronts

### Applications

- Commercial & Domestic Refrigerators & Freezers

Part numbers SH281 thru SH284

**Tech Tip** - These heaters are water resistant only, not water proof. These heaters can get wet, but they cannot sit in water for any period of time.

# Vacuum & Pressure Gauges



## VG64 Digital Vacuum Gauge

Suitable for field or laboratory use, the VG64 delivers high precision at a low price.

### Features/Benefits

- Ultra fine resolution: (1 Micron when vacuum  $\leq$  200 Microns)
- Reads vacuum in 7 international units
- Display updates every 1/2 second
- Convenient built in hanger
- Cleaning port provides quick cleaning and drying of sensor
- Low battery Indicator



## VGC Vacuum Gauge Coupler

- Eliminates leaks during service



## VG64S Single Port Digital Vacuum Gauge

Same great features and specifications with single port connection.



### Accessories

#### PART NO.

**10475** 120 V Power Adapter

**MFDCASE** Soft Pouch

**VGC** Vacuum Gauge Coupler

See page 129 for  
Connection Application Note



## VG60 Electronic Vacuum Gauge

10 segment color coded LED readout provides fast response of vacuum measurements.

### Features/Benefits

- Pocket size—only 5 1/2" x 1 3/4" x 1 1/2"
- Cleanable sensor
- Single switch operation
- Low battery indication
- Color coded LED display
- Built-in hanger
- Soft case included (MFDCASE)



### Accessories

#### PART NO.

**DPGT** 120 V Power Adapter



## VG61 Electronic Vacuum Gauge

Enjoy the same features as the VG60 in a durable hard case. Sensor cord extends to 5 feet.

### Features/Benefits

- Cleanable sensor
- Single switch operation
- Low battery indication
- Color coded LED display



## VG65 Professional Series Digital Vacuum Gauge

Same great specifications as the VG64 in a rugged service case.

### Features/Benefits

- Extendable service card



## VG66 Professional Series Analog Vacuum Gauge

### Features/Benefits

- Vacuum range 50 – 5000 microns
- 5 inch Analog meter
- Cleanable Vacuum Sensor
- 500 psi maximum overpressure
- Low battery indicator
- Expandable sensor cord (up to 6 feet)
- Sensor cord extendable using standard telephone cord
- Rugged Service case



# Vacuum & Pressure Gauges

## Vacuum Gauge Specifications

	VG64/VG64S	VG60	VG61	VG65	VG66
Sensor Type	Thermistor	Thermistor	Thermistor	Thermistor	Thermistor
Connector Type	Standard 1/4" male flare fitting.	Standard 1/4" male flare fitting.	Standard 1/4" male flare fitting.	Standard 1/4" male flare fitting.	Standard 1/4" male flare fitting.
Vacuum Range	0 – 12,000 Microns (0 – 1,600 Pascals)	50 – 5,000 Microns	50 – 5,000 Microns	0 – 12,000 Microns (0 – 1,600 Pascals)	10 – 5,000 Microns
Scale	Microns, PSI, InHg, milliBars, Pascals, Torr, milliTorr	Microns - 10 LED segments atmosphere to 50 Microns	Microns - 10 LED segments atmosphere to 50 Microns	Microns, PSI, InHg, milliBars, Pascals, Torr, milliTorr	Microns, Torr
Resolution	0-200: 1 Micron 201-500: 5 Microns 501-1,000: 10 Microns 1,001-2,000: 50 Microns 2,001-5,000: 250 Microns 5,001-8,000: 500 Microns 8,001-12,000: 1,000 Microns		8,001-12,000: 1,000 Microns	0-200: 1 Micron 201-500: 5 Microns 501-1,000: 10 Microns 1,001-2,000: 50 Microns 2,001-5,000: 250 Microns 5,001-8,000: 500 Microns	
Operating Temperature Range	35°F to 125°F ( 2°C to 52°C)		35°F to 125°F ( 2°C to 52°C)		
Overpressure	500 PSI Max (20 Bar)	500 PSI Max (20 BAR)	500 PSI Max (20 BAR)	500 PSI Max (20 BAR)	500 PSI Max (20 BAR)
Accuracy	±10% (100-1000 Microns)			±10% (100-1000 Microns)	
Power Source	9 V Battery (not included)	9 V battery (not included)	9 V battery (not included)	9 V battery (not included)	9 V battery (not included)
Auto Shutoff	Yes	No	No	Yes	N/A
Dimensions	5 1/2" x 3" x 1 1/4"	5 1/2" x 1 3/4" x 1 1/2"	9 1/2" x 6 3/4" x 2 3/4"	5 1/2" x 3" x 1 1/4"	9 1/4" x 7 1/2" x 2 3/4"
Weight	6.7 oz	6.8 oz	1.8 lbs.	1 lb 11 oz	2 lbs 6 oz

## DPG25V/DPG100/DPG1000 - Digital Pressure Gauges



MADE IN THE  
USA



The DPG Series are digital pressure gauges featuring multiple units, selectable zero reference and automatic power off to conserve battery power. The DPG100/DPG1000 can be used with any media compatible with 17-4PH stainless steel.

### Features/Benefits

- High Accuracy
- Measurement Units PSI, Bar, Kg/cm , ATM
- Easy To Use
- Stainless Steel Sensor
- No Welds or "O" Rings
- 1/8 NPT Female Connection
- Long Battery Life
- 1 Hour Auto Off

### Applications

- HVAC Refrigerant Lines
- Steam Pipes
- Process Piping
- Compressed Air Lines
- Specialty Gas Piping

### Product Specifications

	DPG25V	DPG100	DPG1000
Pressure Range	-14.7 to 25 PSI	-14 to + 100 PSI	-14 to + 1000 PSI
Measurement Units	InHg PSI Kg/cm, ATM	PSI, BAR, Kg/cm, ATM	PSI, BAR,
Resolution	PSI: 0.1 InHg: 0.01 BAR: * Kg/cm: * Atm: *	0.1 * 0.01 0.01 0.01	1.0 * 0.1 0.1 0.1
Accuracy	< ± 0.5% BFSI (includes Non-linearity, Hysteresis and Non-repeatability)		
Stability (1 year)	±0.25% FS (typ)		
Overrange Protection	2X Rated Pressure		
Burst Pressure	5X or 20,000 psi whichever is less.		
Pressure Cycles	> 100 Million		
Operating Temperature Range	32°F to 130°F (0°C to 55°C)		
Storage Temperature Range	-40°F to 150°F (-40°C to 65°C)		
Compensated Temperature Range	32°F to 130°F (0°C to 55°C)		
Temperature Compensation Zero	< ± 1.5% of FS		
Temperature Compensation Span	< ± 1.5% of FS		
Pressure Sensor Connection	1/8 NPT Female		
Update Rate	3 Samples per Second (typ)		
Power	9 Volt Alkaline Battery		
Automatic Power Off	1 Hour		
Battery Life	100 Hours Continuous Operation (typ)		

# Temperature, Humidity Testers & Thermometers

## Infrared Thermometers



### PIT1

- 1:1 Optical Ratio
- Pocket Size
- Min/Max Measurements



### LIT6

- 6:1 Optical Ratio
- Laser Pointer
- Backlight



### LIT8B

- 8:1 Optical Ratio
- Laser Pointer
- Trigger Style
- Backlight
- Minimum/Maximum Measurements



### LIT11TC

- 11:1 Optical Ratio
- Laser Pointer
- High & Low Temperature Range
- Backlight
- Carrying Case Included
- K-Type Thermocouple (probe included)
  - Temperature Range 58°F to 482°F (14°C to 250°C)
  - Full range: -83.2°F to 1999°F (-64°C to 1400°C)
  - Temperature Accuracy  $\pm 1\%$  of reading or 2°F

Laser Infrared Thermometers offer precise, non-contact measurement in a lightweight, hand held instrument. With one hand operation, they are ideal for a wide variety of applications.

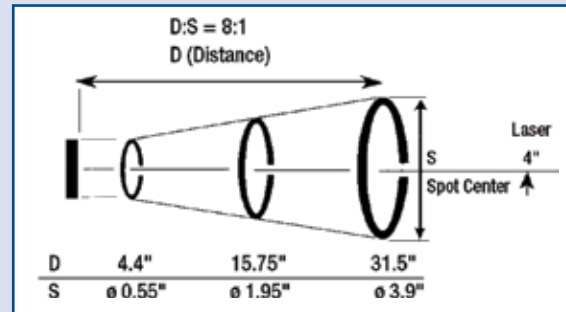
### Applications

- Refrigeration Systems
- Heating Systems
- Supply and Return Registers
- Circuit Breaker Panels
- Motors/Bearings
- Transformers
- Ducts
- And More

### Application Note:

#### What is Distance to Spot Ratio (D:S)?

This is the size of the measurement field that a non-contact infrared thermometer uses to provide a temperature reading. The infrared thermometer averages the temperature of that field to calculate the temperature reading. For example, a D:S ratio of 8:1 means that the measurement field measures approximately 1 foot in diameter when the target is approximately 8 feet away.



### Emissivity:

The ability of a surface to reflect the infrared radiation relative to an ideal surface. A flat black surface is as close to ideal as you can get. Most infrared thermometers have a fixed emissivity of .95. The more reflective the surface the lower the emissivity adjustment should be.

## Infrared Specifications

	PIT1	LIT6	LIT8B	LIT11TC
Optical Ratio	1:1	6:1	8:1	11:1
Temperature Range	-27°F to 428°F (-33°C to +220°C)	0°F to 500°F (-18°C to 260°C)	-4°F to 662°F (-20°C to 350°C)	-76 °F to 932°F (-60°C to 500°C)
Best Resolution	.1°F (.1°C)	.1°F (.1°C)	1°F (1°C)	.1°F (.1°C)
Accuracy	$\pm 2\%$ of reading or +4°F (2°C)	$\pm 2\%$ of reading or +4°F (2°C)	$\pm 2\%$ of reading or $\pm 4^\circ\text{F}$ (2°C)	$\pm 2^\circ\text{F}$ ( $\pm 1^\circ\text{C}$ )
Emissivity	0.95 adjustable	0.95 fixed	0.95 fixed	0.95 adjustable
Automatic shut off	Yes	Yes	Yes	Yes
Power Supply	CR2032 (Included)	9V Battery (Not Included)	9V Battery (Included)	2 AAA Batteries (Included)
Weight	1.3 oz. (32g)	5.3 oz. (150g)	5.8 oz. (180g)	6.3 oz. (179g)
Dimensions	.7" X 1.5" X 2.7" (18mm X 37mm X 68mm)	5.1" X 2" X 1.25" (18mm X 50mm X 42mm)	6.4" X 3.2" X 2.4" (159mm X 79mm X 57mm)	6.9" X 1.5" X 2.8" (175 X 39 X 71mm)



# Temperature, Humidity Testers & Thermometers



## DSP1000 Digital Psychrometer

The DSP1000 provides fast, accurate measurements for analysis of critical environmental conditions.

- Temperature
- Humidity
- Fast Response
- Dual Display
- Max Hold
- No Twirling
- No Reading Charts
- No Water Necessary

### Features

- Fast Response Time
- High Accuracy
- Temperature
- Humidity
- Dewpoint Temperature
- Wet Bulb Temperature
- Max Hold
- Data Hold Function
- Micro Processor-based Design
- Dual Display Temperature & Humidity
- Auto Power Off (Disable Sleep Mode)
- Backlight
- 1 Year Warranty

### Applications

- Cellophane
- Chemical
- Laboratory
- Pharmaceuticals
- Textile
- Paper
- Photographic
- Printing
- Snowmaking
- Tobacco
- Indoor Air Quality
- Wine Storage
- Floral
- Meat

### Specifications

RANGE	
Humidity	0-100% RH (Non-Condensing)
Temperature	-22°F to 212°F (-30°C to 100°C)
Dewpoint Temperature	-22°F to 212°F (-30°C to 100°C)
Wet Bulb Temperature	32°F to 176°F (0°C to 80°C)
ACCURACY	
Humidity	±2% RH (20% RH to 80% RH) ±2.5% RH (all other ranges)
Temperature	±0.9°F/±0.5°C (at 77°F/25°C) ±1.5°F/±0.8°C (all other ranges)
Resolution	0.01% RH, 0.01°F/0.01°C
Response Time	10s (90% at +77°F (+25°C) still air)
Battery Type	9V Battery NEDA 1604, IEC 6F22 (included)
Operation Temperature	32°F to 104°F/0°C to 40°C (<80%RH)
Storage Temperature	14°F to 140°F/-10°C to 60°C (<70%RH)
Size (H X W X D)	8.86" X 1.77" X 1.34" (225mm X 45mm X 34mm)
Weight	7.05oz (200g)



## DDT2 Digital Differential Thermometer

With its Dual Display, the DDT2 provides instant measurements for two Temperature points (T1,T2) and their difference (T1-T2).

### Features/Benefits

- Dual K-Type Thermocouple Inputs
- Temperature Differential Measurement (T1-T2)
- Records Up to 8 Min/Max/Avg Measurements
- Relative Function provides instant Temperature Difference between successive measurements
- Dual Display
- Auto-Ranging
- Data Hold
- Auto Power Off
- Vinyl Case Included

### Applications

- Superheat Measurements (T1-T2)
- Ambient Temperature Measurements
- Food Service
- Oven Temperature measurements
- Surface Temperature Measurements
- Measure HVAC and Refrigeration System Temperatures

## PT100 Digital Pocket Surface Thermometer



### Features/Benefits

- Ultra sensitive air and surface reading probe
- Provides fast response—within seconds
- Temperature "HOLD" switch—keeps readings fixed

### Applications

- Speedy recovery - reclaim temperature measurement
- Measures evaporator plate and condensing temperatures
- Air inlet, outlet and surrounding air

PART NO.	DESCRIPTION
PT100	Fahrenheit Model
PT100C	Celsius Model
PT100H	High Temp. Fahrenheit
PT100HC	High Temp. Celsius



# Temperature, Humidity Testers & Thermometers

## Temperature and Humidity Tester Specifications

	DDT2	PT100	TPM110	THP2	THC120	STD5-105
# of inputs	2	1	1	1 Temp./1 Hum.	1 Temp./1 Hum.	1
Thermo - couple Type	K		J			
Differential	*					
Data Hold	*	*				
Min/ Max	*				*	
Dual Display	*				Triple Display	
Auto-Off	*					
Temp. Range	-328°F to 2498°F -200°C to 1370°C	PT100/PT100C -40°F to 199.9°F -40°C to 93.28°C PT100H/PT100HC -40°F to 250°F -40°C to 120°C	-70°F to 199°F -56.67°C to 93.28°C	-4°F to 122°F -20°C to 50°C	+32°F to 120°F 0°C to 50°C	-60°F to +160°F -51°C to 107°C
Temp. Resolution	0.1°F -200°F to 200°F 1°F otherwise	0.1°F -40°F to 199.9°F 1.0°F (-40° to 250°F)	1.0°F	0.1°F	0.1°F	0.1°F
Temp. Accuracy	±0.5% Rdg + 2°F	0.2 Surface 1.0 Air	±1°F	±2°F	±1.8°F or 1.0°C	
Humidity Range				10% to 90% RH	+10% to 9% RH	
Humidity Resolution				1% RH	1% RH	
Humidity Accuracy				±5% for -40% to 80% RH otherwise	±5% RH ±8%	
Power	9V Alkaline	9V Alkaline	120/240V 50/60 Hz	Button cell (1) LR44	AAA (1) Batteries	Solar
Size (HxLxW)	7.25" X 2.5" X 1.4"	1.5" X 6.75" X 0.8"	3.38" X 3.38"	6.5" X 1.75" X .6"	3.75" X 4 1/8" X 7/8"	4 1/2" X 1 1/8" X 9/16"
Weight	7.2 oz	7.2 oz	7.4 oz	2 oz	3 oz	2 oz
Warranty	1 year	1 year	1 year	1 year	1 year	1 year

## K-Type Thermocouple Probes



TPFDA



TPP



TPS

### Temperature Probe Specifications

	TPFDA	TPP PIERCING	TPS SURFACE
Temp. Range:	-40°F to 550°F -40°C to 288°C	-58°F to 482°F -50°C to 250°C	-58°F to 1202°F -50°C to 650°C
Subminiature connector	*	*	*
4' bead tip probe with FDA approved insulation	*		
3.7" heavy duty chisel tip insertion probe with handle and 4' cord			
4" heavy duty spring loaded tip surface probe with handle and 4' cord		*	

## STD5-105 Solar Powered Digital Thermometer



### Features/Benefits

- 60°F to +160°F
- 51°C to 107°C
- 36" Probe Length
- Selector Switch for °F or °C
- 4 1/2" W x 1 1/8" H x 9/16" D
- 3/8" High LCD Display
- 10 Second Update

### Applications

- Refrigerator/Freezer
- Food Processing
- Environmental Temperature Measurement



# Temperature, Humidity Testers & Thermometers



## THP2 Thermo-Hygrometer Pen

### Features/Benefits

- Measures Temperature & Humidity, Simultaneously
- Dual Display
- Temperature in °F or °C
- Pocket Clip
- Battery Included
- Min/Max Memory



## THC120 Indoor Digital Thermo-Hygrometer w/ Clock

### Features/Benefits

- Table top or wall mount
- Measure Temperature and Humidity Simultaneously
- Real Time Clock
- Large Display
- Temperature Range: 32°F to 120°F (0°C to 50°C)
- Humidity Range: 10% to 90%
- °F/°C Switchable
- Min/Max Temperature and Humidity memory function



## TPM110 Temperature Indicator

A highly reliable, extremely accurate temperature indicator. Custom designed faceplates with your company name or logo are available with quantity orders.

### Features/Benefits

- Large LCD display
- Easy installation
- Thermocouple wire can be extended to 500'
- Can calibrate in the field
- Direct replacement for old style 2 1/4" and 2 1/2" dial gauges
- Commercial Refrigeration/Freezer Panels
- Hospital/Laboratory Control Panels

### Applications

### PART NO.

TPM110 110 VAC Fahrenheit Model

### Specifications

Ambient Operating Range	32°F to 150°F
Line Voltage	120 VAC
Probe	Encapsulated Sensor w/6' long cord
Case	High Impact Thermoplastic
Scale	-40°F to 199°F (-40°C to 93.28°C)

## Pocket Digital Thermometers

### ST09

- 40°F to 392°F (-40°C to 200°C)
- Accuracy:  $\pm 2^\circ\text{F}$  Full Scale
- Min/Max
- °F/°C Switch
- Protective Sheath
- Data Hold
- ON/OFF Switch
- Pocket Clip
- Battery Included (STBAT)
- Drop Resistant
- Waterproof
- 2 1/2" Long Stem
- Auto Off (20 min.)

### Applications

- Refrigerators/Freezers
- Food Processing/Prep.
- Heating/Ventilating



### ST10

- 50°F to 392°F (-45°C to 200°C)
- Accuracy:  $\pm 2^\circ\text{F}$  or  $\pm 1^\circ\text{C}$
- °F/°C Switch
- Large LCD
- Display updates every second
- Battery included. Free Spare Battery (STBAT)
- Pocket Clip
- 4 23/32" (12cm) Stainless Steel Stem

### Applications

- Refrigerators/Freezers
- Food Processing/Prep.
- Heating/Ventilating



## Pocket Dial Thermometers

### ST01/ST02

- 1" dial
- 5" stem
- °F only
- Recalibration adjustment
- Temperature Range:
- ST01 -40°F to 160°F
- ST02 0°F to 220°F

### Application

- Refrigerators/Freezers
- Air Conditioners



### ST07/ST08

- 1 3/4" dial
- 5" stem
- °F and °C
- Recalibration adjustment
- Temperature Range:
- ST07 0°F to 220°F (-18°C to 105°C)
- ST08 -40°F to 160°F (-40°C to 70°C)

### Application

- Air Conditioners
- Refrigerators/Freezers



## Appliance Thermometers

### ST03/ ST04

- Stainless Steel Construction
- Hangs or stands
- °F and °C
- Unbreakable lens

### ST06

- Horizontal design
- °F and °C

PART NO.	TEMPERATURE RANGE	APPLICATION
ST03	-20°F to 80°F (-30°C to 27°C)	Refrigerators
ST04	100°F to 600°F (38°C to 315°C)	Ovens
ST06	-40° to 80°F (-40° to 27°C)	Refrigerators/Freezers

- Stainless steel wire clips for easy hanging



ST04



ST06

# Temperature Alarms & Controls

## TA Series Temperature Alarms



All of your temperature sensitive areas are protected with the broadest line of temperature alarms: single and dual set point, wireless remote, battery operated and multi-channel. Select the right one for your application.

### Features/Benefits

- Adjustable alarm temperature ranges
- Audible and visual alarm
- Built-in terminals for remote alarm or telephone dialer connection (except TA7)
- Alarm switch for 'No delay' or '1 hour delay'

### Applications

- Food Markets, Convenience Stores, Supermarkets
- Restaurants, Florists, Greenhouses
- Laboratories, Pharmaceutical Storage Facilities
- Refrigerated Transport, Cold Storage Facilities
- Computer



### TA22

#### Digital Display Single Set Temperature Alarm

The easy to read display features Current Temperature, Alarm Status, Over/ Under mode indicator, Alarm Set Point and Temperature Units (°F or °C).

- Adjustable range from -40°F to +160°F (-40°C to +71°C)
- 80 db Audible Alarm
- AC Adapter included



### TA2

#### Single Set Point Temperature Alarm

A reliable, inexpensive alarm for refrigerators and freezers.

Just flip a switch to activate alarm on a rise or fall in temperature.

- Adjustable range from -10°F to +80°F (-25°C to +30°C)
- 90 db audible alarm
- AC Adapter included

#### MODEL NO.

**TA2** 120 VAC Fahrenheit Model

**TA2C** 120 VAC Celsius Model

**TA2-220** 220 VAC Fahrenheit Model

**TA2-220C** 220 VAC Celsius Model



### TA6

#### Dual Set Point Temperature Alarm

Alarms on a rise **AND** fall in temperature.

- Adjustable Range from -10°F to +80°F (-25°C to +30°C)
- 90 db Audible Alarm
- AC Adapter included

#### MODEL NO.

**TA6** 120 VAC Fahrenheit Model

**TA6C** 120 VAC Celsius Model

**TA6220** 220 VAC Fahrenheit Model

**TA6C220** 220 VAC Celsius Model



### TA7

#### Battery Operated Temperature Alarm

For sensitive temperature applications in remote areas, this battery operated unit is inexpensive and easy to install.

Alarms on rise in temperature only.

- Adjustable Range from -10°F to 80°F (-25°C to 30°C)
- 70 db Audible Alarm

#### MODEL NO.

**TA7** Fahrenheit Model

**TA7C** Celsius Model

### Temperature Alarm Specifications

	TA2	TA6	TA7	TA22
Alarm Channels	1	1	1	1
Alarm Adjustment Range	-10°F to 80°F (-25°C to 30°C, Celsius model)	-10°F to 80°F (-25°C to 30°C, Celsius model)	-10°F to 80°F (-25°C to 30°C, Celsius model)	-40°F to 160°F (-40°C to 71°C)
Probe	Encapsulated sensor with 6 ft. cord	Encapsulated sensor with 15 ft. cord	Encapsulated sensor with 6 ft. cord	Precision thermistor with 6 ft. cord
Sensor Type	Thermistor	Thermistor	Thermistor	Thermistor
Maximum Probe extension	200 ft.	200 ft.	100 ft.	
Temperature Accuracy (Display)	±2°F (+/- 1°C)	±2°F (+/- 1°C)	±2°F (+/- 1°C)	±2°F (+/- 1°C)
Remote Alarm Connections	Screw type, 120 VAC, 5 Amp (dry contacts)	Screw type 120 VAC, 5 Amp max., (dry contacts)	None	Screw type, 120 VAC 5 Amp max
Power	120 VAC (220 V optional)	120 VAC (220 V optional)	9 V alkaline battery (not included)	120 VAC (220 V optional)
Case	Hi-impact thermoplastic	Hi-impact thermoplastic	Hi-impact thermoplastic	Hi-impact thermoplastic
Mounting	Surface, external holes provided	Surface, external holes provided	Surface, adhesive pads/ key hole slot	Surface, external holes provided
Dimensions	3" x 4 7/8" x 1 5/8"	3" x 4 7/8" x 1 5/8"	5 3/4" x 1 1/2" x 1"	3" x 5" x 1 1/2"
Weight	13 oz	13 oz	5 oz	13 oz
Warranty	1 year	1 year	1 year	1 year

# Temperature Alarms & Controls



## THA2 Temperature Humidity Alarm with logging capability

The THA2 is a multi-function product that monitors Temperature, Humidity and Dew Point, provides alarms for out of range conditions and continuously logs data. No computer setup is needed.

### Benefits

Measures and Logs

- Temperature
- Humidity
- Dew Point

### Applications

- Food Markets, Convenience Stores, Supermarkets
- Restaurants, Florists, Greenhouses
- Laboratories, Pharmaceutical Storage Facilities
- Refrigerated Transport, Cold Storage Facilities
- Computer Rooms

### Features

- Audible and Visual Alarm for Temperature, Humidity and Dew Point (condensation)
- Digital Display
- Log up to 170 Days of Data
- Relay Contacts for Remote Alarm or Auto Dialer (ADTA)
- PC Software Included
- Serial Port Connection (for USB connection use optional USBS adapter)
- Remote Sensor Up to 300 ft

### REPLACEMENT PROBE

THA2P 15' Cable Length

### ACCESSORIES

19994 100' Cable Extension

19955 300' Cable Extension

## THA2 Specifications

Stand alone front panel operation, with user lockout for security. PC software is provided with the unit for viewing data history.

SENSOR PROBE	
Operating Temperature Range	-40°F to 140°F (-40°C to 60°C)
Operating Humidity Range	0 to 95% RH, non condensing
Temperature Accuracy	±2°F (+/- 1°C)
Temperature Resolution	0.1°F or °C
Humidity Accuracy	±2% RH
Humidity Resolution	0.1% RH
Calibration	User calibration for Temperature and Humidity
Dimensions	3.8" L x 1.1" D
Weight	0.9 oz.
Cable Length 15' Included	300 ft. maximum
BASE UNIT	
Operating Temperature Range	32°F to 130°F (0°C to 54°C)
Storage Temperature	0°F to 130°F (-18°C to 54°C)
Operating Humidity	0% RH to 95% RH, non condensing*
Power Source	12V to 24 VAC/VDC, 0.78W alarm active
Battery Backup	9V alkaline battery for 35 hours operation during power outage
Clock Battery	CR2032, 10 years typical
Relay	N.O and N.C dry contact 5A 250V, resistive load
Dimensions	5.5" x 4.5" x 1.6"
Weight (without battery backup)	8.6 oz.

ALARM SPECIFICATIONS	
Temperature Alarm	High and Low Temperature and Humidity alarms. Condensation alarm
Alarm Delay	User selectable, up to 2 hours
Alarm Indication	Audio, Visual and a relay for remote alarm and phone dialer
LOGGING SPECIFICATIONS	
Sample Rate	1 second to 30 minutes
Data History Storage	2 hours to 170 days, depending on the sample rate
Memory Capacity	8150 samples for Temperature, Humidity and Dew Point

\* The sensor probe is not designed for continuous exposure to high humidity or caustic and or corrosive chemicals such as, but not limited, to concrete or chlorine.



## ADTA Auto Dialer For Temperature Alarms

- Call up to 4 telephone numbers
- 16 second message
- Non-Volatile memory for numbers and voice message
- Internal 9V back up battery (not included)
- LCD display
- 120V power adapter (included)

### Temperature Alarm Accessories

		TA2	TAL2	TA4	TA6	TA7	TA3	TAP4
SW25	25' Extension Wire	*	*		*	*		*
SW50	50' Extension Wire	*	*		*	*		*
SW75	75' Extension Wire	*	*		*	*		*
SW100	100' Extension Wire	*	*		*	*		*
TCW25	25' Type J Thermocouple Wire			*			*	
TCW50	50' Type J Thermocouple Wire			*			*	
TCW75	75' Type J Thermocouple Wire			*			*	
TCW100	100' Type J Thermocouple Wire			*			*	
TA3P	Probe w/ 6' Type J Thermocouple Wire						*	

### Temperature Alarm Accessories

		TA2	TAL2	TA4	TA6	TA7	TA3	TAP4
11093	Probe w/ 6' extension wire	*			*			
TA7PROBE	Probe w/ 4' extension wire					*		
14265	Replacement Sensor		*					*
USBS	USB to Serial Interface		*					
13495	Serial Port Cable		*					
ADTA	Auto Dialer	*	*	*	*		*	*
14263	120 V Power Adapter (Supplied)	*			*			*
20540	Replacement Sensor	*			*			
	6' new style metal tip (after serial #) 405-099						412-029	

# Temperature Alarms & Controls



## TAP4 Four (4) Probe Temperature Alarm

Set alarms for 4 separate temperature applications. Provides a quick alert for a multitude of temperature problems.



PART NO.	
TAP4	-40°F to 60°F; 0°F to 100°F, 120V
TAP4-220	-40°F to 60°F; 0°F to 100°F, 220V
TAP4C	-18°C to 38°C; -40°C to 16°C, 120V
TAP4C-220	-18°C to 38°C; -40°C to 16°C, 220V

### TAP4 Specifications

TAP4	
Alarm Channels	4
Alarm Adjustment Range	-40°F to 60°F and 0°F to 100°F (-18°C to 38°C and -40°C to 16°C, Celsius model)
Probe (14265)	Encapsulated sensor with 15 ft. cord (4 included)
Sensor Type	Thermistor
Maximum Probe extension	300 ft.
Remote Alarm Connections	Terminal strip screw connection 120VAC, 5 Amp max., (dry contacts)
Power	110V or 220V power adapter supplied
Battery Backup	9V alkaline battery (not included)
Case	NEMA 3 Type
Mounting	Surface, keyhole or recessed screws
Dimensions	6" x 7 1/2" x 3"
Weight	1.9 Lbs (0.86kg)
Warranty	1 year



## TA3 Digital Temperature Alarm

This panel mounted temperature alarm with digital display provides both an audible and visual alarm.

Alarms on rise or fall in temperature.

- Adjustable Range from -50°F to +170°F (-25°C to +96°C)

PART NO.		
TA3	120 VAC	Fahrenheit Model
TA3C	120 VAC	Celsius Model
TA3-220	220 VAC	Fahrenheit Model
TA3C220	220 VAC	Celsius Model

### TA3 Specifications

TA3	
Alarm Channels	1
Alarm Adjustment Range	-50°F to 170°F (-30°C to 96°C, for Celsius model)
Probe	Encapsulated sensor with 6 ft. cord (TA3P)
Sensor Type	J-Type Thermocouple
Maximum Probe extension	2000 ft.
Remote Alarm Connections	Screw type 120 VAC, N.O., 0.1 Amps max., (dry contacts)
Power	120 VAC (220 V optional)
Battery Backup	9V alkaline battery (not included)
Case	Panel Mount (1 3/4" x 3 5/8" cut out required)
Dimensions	1 11/16" x 3 9/16" x 5 3/16"
Weight	24 oz
Warranty	1 year



## TAL2 Dual Temperature Alarm Logger

Set high and low alarms for two (2) temperature sensitive applications, and track their temperature trends, simultaneously.



### Logger Functions

- Programmable interval (1 sec. to 18 hrs.)
- Data rollover
- Store 32,250 (single temp.) or 16,125 (dual temp.) data points
- Battery backup
- Software and cable included
- Minimum System Requirements: 8MB of RAM, 2M of disk space, 800 x 600 resolution, 1 free COM port or a free USB port (optional USB interface is required, p/n USBS)

### Alarm Functions

- Adjustable Range from -50°F to 86°F (-45°C to 30°C)
- Audible alarm & Relay contacts
- Relay contacts can connect to remote alarm dialer
- Programmable alarm delay
- Alarm event storage (up to 45 events)

### TAL2 Specifications

TAL2		TAL2	
Alarm Channels	2	Power	110V or 220VEU power adapter supplied (p/n 14950)
Alarm Adjustment Range	-50°F to 86°F (-45°C to 30°C)	Battery Backup	9V alkaline battery (not included)
Accuracy	±2%	Case	Hi-Impact thermoplastic
Probe (p/n 14265)	Encapsulated sensor with 15 ft. cord	Dimensions	3" x 2.5" x 1.1"
Sensor Type	Thermistor	Weight	2.5 oz
Maximum Probe extension	300 ft. 48 volts, 100mA maximum	Warranty	1 year
		Remote Alarm Connections	Normally Open (N.O.) Closed on alarm.



# Specialty Meters



## M500 Insulation Tester/Electronic Megohmmeter

An inexpensive alternative to expensive taut band (swing needle) megohmmeters, the M500 provides fast and accurate measurements to verify the condition of insulation.



### Features/Benefits

- Measure insulation values up to 1000 megohms @ 500 VAC
- Zone scale to indicate insulation condition
- Hand held
- Test Leads store in case
- Operates on 2 C batteries (not included)
- Impact resistant
- Soft carrying case included

### Applications

Test motor winding insulation and diagnose heat damaged, deteriorating insulation in...

- Hermetic Refrigeration compressors
- Appliances
- Panel boards
- Relay control circuits
- Motors

### Specialty Instrument Selection Guide

- Measurement/Function - Insulation Resistance
- Range - 20 to 1000 megohms

### Standard Accessories

#### PART NO.

MCASE Soft Case



## M501 Insulation Tester/Electronic Megohmmeter

Enjoy the same great features of the M500 in a sturdy service case.



### Specialty Instrument Selection Guide

- Measurement/Function - Insulation Resistance
- Range - 20 to 1000 megohms

### Application Note:

#### Testing HVAC and Refrigeration Compressors and Motors

Many HVAC and Refrigeration motors require special test parameters since the winding operates in an oil and refrigerant atmosphere.

In a hermetic motor, under normal conditions the oil and refrigerant have a high electrical resistance. However, when they are contaminated with moisture, the electrical resistance changes and a low megohm reading of the winding terminal to ground may actually be the resistance of the contaminants in the oil and not in the winding insulation.

Newer motors have an insulation resistance value of more than 100 megohms, typically. Measurements of 50 megohms or less indicate a problem. Either the winding insulation is deteriorating or the oil/refrigerant is contaminated.

Installing an oversized drier may clean up the system or another possible solution could be replacing all the compressor oil. In either case, if the megohm tests show even the slightest improvement in resistance values the remedy may have checked a declining condition.

A good 'rule of thumb' is to smell a small sample of the oil. If the motor was ever severely overloaded, it will leave a tell tale trace in the oil that can only be removed by changing all of it.

The odor of burnt insulation is easily recognized and a low resistance value of 20 megohms or less will verify that the motor insulation may be severely damaged.



## MFD10 Digital Capacitor Tester

With one hand operation, the MFD10 provides the fastest measurements for capacitor values.



### Features/Benefits

- Range 0.01 to 10,000 mF
- Accuracy  $\pm 5\%$
- Test clip storage within case
- Alligator clips to capacitor terminals
- LED display
- One button operation
- Operates on one 9V Battery (not included)
- Soft carrying case included

### Applications

- Verification of Start and Run Capacitors
- Checks for open and short capacitors
- Identify unmarked capacitors
- Confirms weak capacitors
- Use as continuity tester

### Specialty Instrument Selection Guide

- Measurement/Function - Capacitance
- Range - 0.01 to 10,000 MFD

### Standard Accessories

#### PART NO.

MFDCase Soft Case

MFDfuse Fuse



# Specialty Meters

## DAVM+ Digital Air Flow/Volume Meter

Measure Air Flow (FPM) and Volume (CFM) in the palm of your hand. Compact and easy to use, the DAVM+ also measures Temperature, Humidity and Light. Ideal for air balancing and other indoor air quality applications.

### Features/Benefits

- Measures Feet per Minute (FPM) and Cubic Feet per Minute (CFM)
- Easy CFM Set-Up Flow Chart with Grille Free Area Chart (Included)
- Measures Temperature and Humidity
- °F/°C Selectable
- Standard K-Type Thermocouple Connector
- Measures Light Levels (LUX)
- Multi-Channel Display
- Data Hold
- One-Hand Operation
- Carrying Case (SCASE) Included

### Applications

- Identify Air Flow Problems
- Air Quality
- Air Balancing
- Measure Light Levels

### General Specifications

Measurement	Anemometer, Humidity, Temperature, Light, Air flow (CFM/CMM).
Operating Humidity	80% RH Max
Operating Temperature	32° to 122°F (0 to 50°C)
Over Input Display	Indication of " - - - "
Power Supply	9V battery (not included)
Power Consumption	Approx. 6.2 mA DC
Weight	5.6 oz (160g)
Dimension	6.14" x 2.36" x 1.29" 156 x 60 x 33 mm

### Measurement Specifications

MEASUREMENT		RANGE	RESOLUTION	ACCURACY
Air Velocity	ft/min	80 to 5,910 ft/min	1 ft/min	≤ 20 m/s : ± 3% F.S. > 20 m/s : ± 4% F.S.
	m/s	0.4 to 30.0 m/s	0.1 m/s	
	km/h	1.4 to 108.0 km/h	0.1 km/h	
	MPH	0.9 to 67.0 mile/h	0.1 MPH	
	knots	0.8 to 58.3 knots	0.1 knots	
Temperature (thermistor)	° F	32° to 122 °F	0.1 °F	± 2.5 °F
	° C	0° to 50 °C	0.1 °C	± 1.2 °C
Air Flow	CFM	1,908,400 CFM	0.001 to 100	0.001 to 1
	(cube feet/min)	CFM		
	CMM (cube meter/min)	CMM	54,000 CMM	
Humidity	% RH	10 to 95 % RH	0.1 % RH	< 70% RH : > 70% RH : : ± (4%rdg + 1.2%RH)
		10 to 95% RH		
		± 4% RH		
Light	Lux	0 to 2,200 Lux	1 Lux	± 5% rdg ± 8 dgt
		1,800 to 20,000 Lux	10 Lux	
		0 to 20,000 Lux		
		0 to 2,000 Fc		
Temperature (Type K)		-148 to 2,372 °F		+ (1% rdg + 2°F) + (1% rdg + 1°C)
		-100 to 1,300 °C		
		*auto range		
	Ft-cd	0 to 204.0 Fc	1 Ft-cd	
		170 to 2,000 Fc	1 Ft-cd	

### Accessories

#### STANDARD

SCASE Soft Carrying Case

#### OPTIONAL

TPFDA FDA Approved Thermocouple Probe

TPP Thermocouple Piercing Probe

TPS Thermocouple Surface Probe

#### MEASUREMENT AREA SET

CFM	0.01 to 322.92 feet square
CMM	0.001 to 30.000 meter square



## RPT61 Pressure Temperature Chart Master

For instant information, the PT Chart Master eliminates the need for traditional pressure/temperature charts. Accurate and easy to use, the RPT61 provides pressure and temperature correlation for 66 different refrigerants.

### Features/Benefits

- Choose Pressure in PSI, BAR or Mpa
- Choose Temperature in °F or °C.
- 66 Refrigerant Tables
- Large LCD
- Auto off (after 5 min.)
- Pocket size
- Battery Included Power: 3 V (CR2032)
- Soft carrying case included
- 1 year Warranty

### Applications

- For calculating Superheat or Sub-Cooling



### Specifications

PRESSURE UNITS	RANGE
PSI	5.1 to 462.5
BAR	0.35 to 31.88
MPa	0.035 to 3.188
TEMPERATURE UNITS	
Fahrenheit	-40°F to 155°F
Celsius	-40°C to 68°C



## IAQ Series Indoor Air Quality Instruments

SUPCO's IAQ Series measure Carbon Dioxide (CO<sub>2</sub>), Temperature and Humidity with Dew Point and Wet Bulb. Ideal for air quality

diagnosis, they can be useful in identifying sick building syndrome due to high levels of CO<sub>2</sub>. Choose from a hand held meter or a wall mounted/ desktop monitor.



IAQ50

### Common Features/ Benefits

- Non-Dispersive Infrared (NDIR) Sensor
- Visible/ Audible (80db) CO<sub>2</sub> Alarm
- Large Triple Function LCD Display
- Min./ Max., Average Recall
- Alarm Output Relay
- Long Time Drift Compensation
- Non-Dispersive Infrared (NDIR) Sensor
- 12 VDC Power Adapter (120 VAC Supplied)
- TWA (Time-Weighted Average) 8 HRS
- STEL (Short-term exposure limit) 15 Minutes

### Applications

- Residential
- Offices
- Restaurants
- Warehouses
- Garages
- Green Houses



IAQ55

### IAQ50 Wall Mounted Indoor Air Quality Monitor

...for continuous monitoring of important IAQ parameters.

- Desktop or Wall Mounting
- Alarm Output Relay
- 12 V Power Adapter (included)

### IAQ55 Handheld Indoor Air Quality Monitor

...for pinpointing IAQ problem areas

- Portable
- Backlight LCD Display Function
- Auto Shut-off

### Specifications

CO2		IAQ55	IAQ50
Range	0-2000ppm 2001-9999 (out of scale)		
Resolution	1ppm		
Accuracy	±75ppm±5%rdg (0-2000 ppm) Not specified for out of scale		±50ppm±5%rdg (0-2000 ppm) Not specified for out of scale
Pressure Dependence	+ 1.6% reading per kPa deviation from normal pressure, 100kPa		
TEMPERATURE			
Range	14 to 140°F (-10.0 to 60.0°C)		
Resolution	0.1°F (0.1°C)		
Accuracy	±0.9°F (± 0.6°C)		
HUMIDITY			
Range	0.0 to 99% Non-Condensing		
Resolution	0.1%		
Accuracy	+ -3% (10 to 90%) + -5% (others)		
GENERAL			
Warm Up	30 seconds		
Operating	+ 32 to 122°F (0 to 50°C) 0-95% RH Non-Condensing		
Storage	-4 to 140°F (-20 to 60°C) 0-99% RH Non-Condensing		
Power	4 AA batteries (Included)	12V adapter (Included)	
Battery Life			24 hours (Alkaline)

## CO1000 Carbon Monoxide Meter

Measure CO quickly and easily in working and living environments.



### Features/Benefits

- Backlit LCD
- Automatic calibration
- Max Hold and Data Hold
- Auto Power Off
- Audible Alarm
- From 35 PPM to 200 PPM, the beeper sounds periodically
- Above 200 PPM, the beeper sounds continuously

### Applications

- Check dangerous CO levels
- Identify malfunctioning equipment

### Specifications

Measurement Range	0 to 1000 PPM
Measurement Resolution	1 PPM
Accuracy	5% or ±10 PPM (0-100 PPM) 10% ± 10 PPM (>100PPM)
Warm Up Period	< 2 Seconds
Operating Temperature	32°F to 122°F (0°C to 50°C)
Storage Temperature	-22°F to 140°F (-30° to 60°C)
Operating Humidity	0-99% Relative Humidity (non-condensing)
Battery	9V (included)
Auto Power Off	After 15 minutes of inactivity
Sensor Type	Stabilized electrochemical Gas-specific (CO)
Typical Sensor Life	3 years

## CL50 Combustible Gas Leak Detector

Detect Combustible Gas quickly and easily. With Audible and Visual alarms, the inexpensive, pocket-size CL50 Provides accurate and instantaneous response in a combustible environment.



### Features/Benefits

- Detects Combustible Gases and Static Electricity
- Audible and Visual Alarms
  - Green LED Indicates Power is On
  - Red LED and Buzzer Indicates Presence of Combustible Gas
  - Yellow LED and Buzzer Indicates Static Electricity is Detected
- Pocket Size • Easy to Use • 1 Year Warranty

### SPECIFICATIONS

Operating Temperature	14°F to 122°F (-10°C to 50°C)
Operating Humidity	95% RH or Lower (non-condensing)
Natural Gas Sensitivity	500 ppm min, 6500 ppm max
Propane Sensitivity	1000 ppm min, 6500 ppm max
Power Consumption	DC 200mA
Battery	1.5V X 2(AAA Size)
Duration of Use	Approximately 4 hours continuously
Dimensions	6.5 in. X 0.08 in. (164 mm X 21mm)
Weight	.88 oz. (25g)

# Specialty Meters

## DDM55 Dual Digital Manometer

Isolate difficult pressure problems in natural gas and propane systems with the DDM55 dual input Digital Manometer. Providing a differential measurement, the DDM55 accurately tests for leaks in low-pressure gas systems and more.



### Features/Benefits

- Dual input
- Range: -55.0 to +55.0 Inches Water Column
- Resolution to 0.01"
- Provides Differential Measurements
- 11 Units of Measure
- Data Hold
- LCD Display w/ Backlight
- Auto Power Off
- 9 V Battery Included
- Soft Carrying Case Included

### Applications

- Confirm Pressure Switch Operation
- Regulator Adjustments
- Set Delivery Pressures
- Leakage Tests

### Specifications

FUNCTION	RANGE	RESOLUTION
InH <sub>2</sub> O	+/-55.40	0.01
psi	+/-2.000	0.001
Mbar	+/-137.8	0.1
kPa	+/-137.9	0.01
inHg	+/-0.407	0.001
mmHg	+/-103.4	0.1
ozin <sup>2</sup>	32.00	0.01
ftH <sub>2</sub> O	4.612	0.001
cmH <sub>2</sub> O	140.6	0.1
Kgcm <sup>2</sup> .140	0.001	
Bar	0.137	0.001

## MTM1028 Moisture Test Meter

Moisture is the #1 reason for mold problems. The MTM1028 provides details to moisture levels in virtually all materials. Use the piercing probes with 3 foot cable to test for moisture anywhere.



### Features/Benefits

- Indicates 10% to 28% moisture levels
- Dual scale for maximum resolution
- Dual piercing probes
- 3 foot coiled cable

### Applications

- Pinpoint areas ideal for mold growth
- Locate water leaks and check for wet rot
- Find out if potentially damaging excess moisture is present
- Detect moisture level in wood, concrete, plaster, carpet and more.



## WA100 Water Alarm w/Remote Sensor

Protect property and valuable possessions. With its 85dB alarm, the WA100 will alert you immediately of the presence of water.

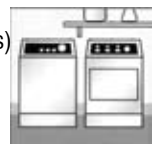


### Features/Benefits

- 85 dB alarm sounds for up to 3 days.
- Remote sensor has 6 foot wire
- Dual position sensor
- Test button
- Wall mountable alarm

### Applications

- Warns of leaks and overflows
- Alerts user when desired water level is reached (i.e. pools)
- Kitchen, laundry, furnace, computer room, pools, aquariums, more...



## DHS55 Digital Handheld Scale

This compact handheld scale provides quick measurements for your refrigeration applications.



### Features/Benefits

- 55 lbs max scale
- 2% accuracy
- One button operation
- Lbs/Kgs switchable
- 9 V battery included

### Specialty Instrument Selection Guide

- Measurement/Function - Weight
- Range - 0 to 55 lbs

## CTC3 Cap Tube Computer

Calculate the flow rate of a defective cap tube and duplicate that flow rate with cap tubes that have a different I.D.



### Features/Benefits

- Computes inside diameter, length, refrigerant, horse power, application and flow rate
- Shows temperature/pressure charts for 12 refrigerants
- Compact, light weight & easy to use!
- Converts Cap Tubing used with refrigerants R12, 134A, R22, and R502

### Specialty Instrument Selection Guide

- Measurement/Function - Cap Tube parameters
- Range - Various

**Note:** See Cap Tubing Section pages 29-31 for a complete listing of Cap Tubing Replacements used with alternative refrigerants.

# Multimeter & Current Probes



## DM10T Economy Digital Multimeter with Temperature

The DM10T Digital Multimeter provides an economical solution to your everyday electrical and temperature measurement needs.

### Features/Benefits

- 1000 Volts DC
- Continuity
- 2M W Resistance
- 10 Amps DC
- 750 Volts AC
- Temperature

## Current Probes



## CPH100 HVAC Current Probe

### Features/Benefits

- 400 Amps AC
- DC  $\mu$ Amps
- AC/DC Volts
- Resistance
- Capacitance
- Temperature
- Frequency
- Continuity
- Auto Shut off
- 1 year Warranty
- Includes Test Leads

### Applications

- HVAC Equipment Consumption
- Flame Safeguard circuits (CPH100)
- Branch Circuit Current
- AC Line and Control Voltages
- Continuity Check
- Temperature Testing
- Capacitor Testing



## CP070 Open Jaw Multi Probe

### Features/Benefits

- Simultaneous measurements: 200 Amps AC and one of the following:
  - AC or DC Volts
  - Resistance
  - Capacitance
  - Frequency
- Two LCD displays
- 3 year Warranty

### Digital Multimeters and Current Probe Specifications

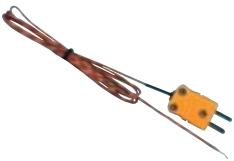
	DM10T	CP070	CPH100
Volts AC	750	600	600
Volts AC Best Resolution	1 V	1mV	0.1mV
Volts DC	1000	600	600
Volts DC Best Resolution	0.1 mV	0.1mV	0.1mV
Amps AC	10	200A	400A
Amps AC Best Resolution	0.1mA	100mA	0.1A
Frequency (Hz)		9.999MHz	150.0KHz
Frequency Best Resolution		0.001Hz	0.001Hz
Base Accuracy (DC Volts) (AC Amps)	$\pm 0.5\% \pm 2$ dgts	$\pm 1.2\% \pm 2$ dgts $\pm 3.0\% \pm 3$ dgts	$\pm (1.5\% + 3$ dgts) $\pm (2.0\% + 3$ dgts)
Resistance max. (Ohms)	2 M	40M	40M
Continuity	Yes	Yes	Yes
Capacitance		200 $\mu$ F	100.0 $\mu$ F
Best Resolution		1pF	0.01nF
Temperature	-4 °F to 2498° F (-20° C to 1370 °C)		-50°F to 2372°F -5°C to 1300°C
Temperature Accuracy	$\pm 3 \pm 2$ digits		$\pm (3\% + 5$ digits)
Display (Counts)	2,000	2,000	4,000
Data Hold		Yes	Yes
Sleep Mode			Auto Shut Off
Operating Temperature	32° F to 74° F (0°C to 23°C)	14°F to 122°F (-10°C to 50°C)	14°F to 122°F (-10°C to 50°C)
Storage Temp. Temperature		-22°F to 140°F (-30°C to 60°C)	-22°F to 140°F (-30°C to 60°C)
Relative Humidity	0% to 75% RH	0% to 90% RH	0% to 90% RH
Fuse Protection	mA: 0.2A/ 250V		
Power	9 V Battery (included)	2 AA Batteries (included)	2 1.5V AAA Batteries (included)
Size	5.5"L x 3"W x 1.5"D (140mm x 76mm x 36mm)	8.5"L x 2.0"W x 1.7"D (216mm x 51mm x 43mm)	7.9"L x 2.0"W x 1.4"D (200mm x 50mm x 35mm)
Weight	8 oz (227 g)	16 Oz. (454g)	7.1oz (200g)
Warranty	1 Year		1 Year

## Optional Accessories



## TLA Test Leads

- 1000V AC or DC max
- 10 Amps max
- Includes screw-on alligator clips



## TPFDA FDA Approved Temperature Probe



## SCDM/SCCP Soft Deluxe Cases

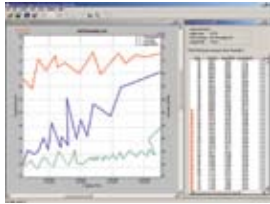
### Features/Benefits

- Rugged Cordura Case
- Zippered Case

### Soft Case Dimensions

PART NO.	DIMENSIONS
SCDM	6 1/4" Wide 9 3/4" Long 2 1/2" Deep
SCCP	5 1/4" Wide 7 1/4" Long 2 1/2" Deep

# Data Loggers



## DVTH Data View Data Logger Temperature Humidity Logger with Display



Record and INSTANTLY display trends for temperature, humidity and dew point with the DVTH. Monitor real time measurements for instant environmental conditions. When you're ready, download over 40,000 data points to your PC for further analysis. Data logging has never been this visual!

### Features/ Benefits

- Text Display: Real time temperature, humidity and dew point. Logging summary, sample rate, memory used and memory left
- Graph Display: Shows measurement trends graphically, with scrolling feature.
- Visual over and under alarm indicators for temperature and humidity
- USB connection (cable included)
- Compatible with Windows™ 98SE, ME, 2000, XP, Vista and above
- Calibration through software

### Applications:

- Refrigerators/Freezers
- Commercial Refrigeration Systems
- Wine Storage
- Greenhouses
- Florists
- Museums
- Medical Storage Facilities
- Laboratories

### Logger Specifications

Text Display	Displays real time temperature, humidity and dew point. Displays logging summary, sample rate, memory used and memory left.
Graph Display	Shows measurement trends graphically. Graph can be scrolled through the entire logged data.
Sample Point Capacity	43,344 points for temperature only. 21,672 points for temperature, humidity and dew point.
Alarms	Visual over and under alarm indicator for temperature and humidity. Dew point alarms are not available
Calibration	User single point offset calibration is available through software for both temperature and humidity. Calibration is password protected.
Operating Temperature	15°F to 150°F (-10°C to 65°C)
Storage Temperature	-5°F to 160°F (-20°C to 70°C)
Time Accuracy	±100ppm @75°F
Relative Humidity Range	0% to 99%RH, non condensing.
Relative Humidity Accuracy	± 2%RH, from 10% to 90% RH
Relative Humidity Resolution	0.01%RH
Temperature Accuracy	±1°F (0.5°C)
Temperature Resolution	0.01°F or 0.01°C
Dimensions	4" x 3.05" x 1.5" (10.2cm x 7.7cm x 3.8cm)
Weight	7.0 oz (200g)
Power Source	3 AA Alkaline or Lithium batteries
Battery Life (average use)	2 Years

### Software Specifications

PC Interface	USB port. USB cable is included
Sampling Interval	User selectable from 1 second to 18 hours, in 1 second increments.
Data Security	Unique factory set logger ID. Recording session counter. Password protected calibration.
Operating System Compatibility	Windows 98SE, Windows ME, Windows 2000, Windows XP, Vista and above. <u>Not compatible with Windows NT or Windows 95.</u>
Minimum System Requirements	5MB of free disk space, 800 x 600 screen resolution, 1 free USB port.
Recording Start	On button press, immediate after setup, or at a user specified date and time.
Recording Mode	Stop on memory full, or continuous recording with memory rollover
Real Time Status	Visual indication through the status LED. Software real time status.
User Calibration	Password protected calibration for each channel.
User Information	Up to 30 characters
Logger Channels	User selectable. Disabling channels increases the storage capacity of the other channels.
Units	US and Metric
Data Format	Exportable to text or Excel files.



## Super Vision Series - 5 in 1 Temperature and Humidity Printer Logger

The VLT Loggers are feature packed, strip recorder/alarm devices. Models with 1 to 4 channels to monitor temperature, humidity or switches with programmability for each. The Large digital display, PC Interface without additional software, 4 modes of printing and remote alarm dialer contacts give these devices features found on products costing much more.



EN 2830

VLCELL (optional)  
Cellular Data  
Transfer

### VLT Temperature Data Logger Recorder

#### Features/Benefits

- Monitoring, logging, alarms and printing in real time
- Up to 4 input channels of temperature, humidity and switches
- Reading intervals from 1 to 120 minutes, 1 min. increments
- Over and under alarms plus delay setting for each channel
- Operating and setting by means of 6 function keys
- Printed help and instruction messages on request during unit setup
- 1 channel printing in auto scale graph mode, including alarms
- 1 to 4 channel printing full reports in 3 text modes, including alarms
- On line display/minimum or maximum on request
- Exporting real time data thru RS-232 PC port- no software needed
- °F or °C degrees, date format: dd/mm/yy or mm/dd/yy
- Battery back up
- Low battery, chart end and probe error indicators and alarms buzzer
- Remote alarm output via relay contacts of 0.5A, 115V
- Remote probes 33' (10 meters) cable length, extendible up to 100'
- Data and settings retained after power failure
- Base unit operating humidity: 0 to 95% RH, non-condensing

### Specification

Base Unit	
Operating Temperature Range	32°F to +140°F (-0°C to +60°C) with alkaline battery 0°F to +150°F (-18°C to +65°C) with lithium battery
Operating Humidity	0 to 95% RH, non-condensing
Storage Temperature	-40°F to +150°F (-40°C to +65°C)
Battery Back-up	9 volt
Clock battery	3.6 volt lithium
Dimensions	8.2" X 5.3" X 2.7" (208.6 mm X 135 mm X 69 mm)
Weight	2.6 lbs. (1.8 kg)

PART NO.	INPUT	MEASURING OPTIONS	INCLUDED PROBES 33'	SAMPLE CAPACITY
<b>VLT4-12</b>	12 VAC/DC	Any combination of temperature and switches up to 4 channels	1 "VLT PROBE" (for temperature)	16,200 points of temperature and switches (4 probes)
<b>VLT4-115</b>	115 VAC		1 "VLS CABLE" (on/off indication)	
<b>VLT4-230</b>	220 VAC			
<b>VLTH-12</b>	12 VAC/DC	Temp., humidity and switch or 2 channels of temp. and humidity	1 "VLTH PROBE" (temp./humidity)	16,200 points temperature, and humidity (4 channel)
<b>VLTH-115</b>	115 VAC		1 "VLS CABLE" (on/off indication)	
<b>VLTH-230</b>	220 VAC			

### Accessories

<b>VLPAPER</b>	2" Thermal chart roll 131'
<b>VLWPCASE</b>	Water proof case + lock
<b>VLSK</b>	Remote alarm silencer
<b>CABLE10H</b>	Sensor extension 10'
<b>CABLE33H</b>	Sensor extension 33'
<b>VPR</b>	Power reducer 24 to 12V
<b>ADTA</b>	Auto phone dialer
<b>VLCEL</b>	Cellular adaptor to internet

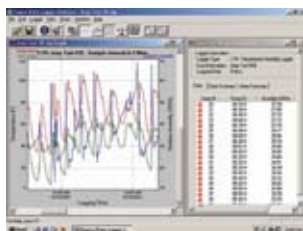
PROBE MODEL	WORKING RANGE	RESOLUTION	ACCURACY	REPEATABILITY	RESPONSE
<b>VLT PROBE</b>	-40°/130°C	0.1°C	±0, 3°C	±0.1°C	5-30
Temperature	-40°/266°F	0.2°F	±0.6°F	±0.2°F	Sec.
<b>VLTH PROBE</b>	-40°/85°C	0.1°C	±0, 5°C	±0.1°C	5-30
Temperature	-40°/185°F	0.1°F	±1, 0°F	±0.2°F	Sec.
and Humidity	10.0/89.9% RH	0.1% RH	±2% RH	±0.1% RH	6-10
	0.1-9.9/90-100%	0.1% RH	±4% RH	±0.5% RH	Sec.
<b>VLS CABLE</b>	Recognized dry contacts - for On/Off indication switch				1 Sec.



# Data Loggers

## LOGiT Series

Select the right Logger for your application...



### Features/Benefits

- Stores over 10,000 measurement points
- 1 second to 18 hour sample rate; 1 second increments
- Custom user identification (30 characters)
- Real Time data monitoring
- Over/Under Alarm threshold settings
- Visual alarm indication
- User selectable Recording Start (Specify date & time, immediate after setup or on door close)
- Tamper proof
- 20 month battery life (at 1 minute sample rate)
- Data rollover option
- Unique logger ID
- One PC Software operates with all loggers (LLS not included)
- Graphic or text data
- Zoom capability
- USB interface optional (USBS)
- 1 year warranty

### Application Note:

The LOGiT Series Data Loggers have one common PC Software and Interface Kit (LLS or LLSU).

Choose one or more LOGiT Data Loggers and the appropriate PC Software Interface Kit to complete your Data Logger selection. See page 87 for details.

### For Temperature and Temperature/Humidity Sensitive Applications:

- Refrigerators/Freezers
- Commercial Refrigeration Systems
- Medical Storage Facilities
- Laboratories
- Greenhouses
- Florists
- Museums



### LT2 Temperature Logger (Internal & External)

- One Internal and One External Temperature Measurement, simultaneously



### LTT Dual Temperature Logger

- 2 Independent External Temperature Measurements & Temperature Differential
- 2 DLTP6 Sensors (Included)



### LTC Thermocouple Temperature Logger

- One Internal and One External (J, K, E, T, R, S Thermocouples) Temperature Measurement



### LTH Temperature and Humidity Logger

- Integral Temperature, Humidity and Dew Point Measurements



### LPT Pressure and Temperature Logger

- External Pressure and Temperature Measurements

### For Pressure and Temperature Sensitive Applications:

- Compressor Run Cycles
- Testing New Installations
- Pneumatic air lines
- Tracking Intermittent Problems
- Superheat Measurements



### LCV Current and Voltage Logger

- External Current Probe and Voltage Measurements

### For Simultaneous Single Phase Current and Voltage Monitoring:

- Verification of Power Conditions
- Use three LCV's for Three Phase Applications
- Compressor and Fan Run Cycles



### L420 4 – 20 ma Logger

- Connection for 4 – 20 ma loop measurements

### For Monitoring 4 – 20 ma Process control loops in:

- Manufacturing
- Package Handling
- Automated Test Systems

## LT2, LTH, LTC & LTT Data Logger Specifications

	LT2	LTH	LTC	LTT
Sample Point Capacity	21,500 points (Single channel) 10,750 points and differential (Dual channel)	21,500 for temperature only 10,750 points for Temperature, Humidity and Dew Point	10,750 points for external and internal temperature	21,500 temperature points (1 probe) 10,750 temperature points and differential (2 probes)
Sampling Rate	1 second to 18 hours	1 second to 18 hours	1 second to 18 hours	1 second to 18 hours
Alarms	Over and under alarms for each probe.	Over and under alarms for temperature & humidity.	Over and under alarms for each probe	Over and under alarms for each probe.
Temperature Range (Internal Sensor)	32°F to 140°F (0°C to 60°C) w/ Alkaline Battery -40°F to 150°F (-40°C to 65°C) w/ Lithium Battery	32°F to 140°F (0°C to 60°C) w/ Alkaline Battery -40°F to 150°F (-40°C to 65°C) w/ Lithium Battery	32°F to 140°F (0°C to 60°C) w/ Alkaline Battery -40°F to 150°F (-40°C to 65°C) w/ Lithium Battery	
Temperature Range (External Sensor)	-40°F to 150°F (-40°C to 65°C)		Depends on thermocouple J,K,E,I,R,S	-50°F to 300°F (-46°C to 150°C) 2DLTP6
Accuracy	±1.0°F (0.5°C)	±2°F (1°C)	Depends on thermocouple	±2°F (1°C)
Resolution	0.1°F (0.05°C)	0.1°F (0.05°C)	0.1°F (0.05°C)	0.1°F (0.05°C)
Time Accuracy	±100ppm @75°F	±100ppm @75°F	±100ppm @75°F	±100ppm @75°F
Relative Humidity Range		0% to 99.9% RH, Non-condensing.		0% to 95% RH, non-condensing
Relative Humidity Accuracy		±2% full scale, from 0% to 95% RH for temperatures between 32°F and 140°F (0°C to 60°C)		
Relative Humidity Resolution		0.1% RH		
Temperature using Alkaline Battery	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)
Temperature using Lithium Battery	-40°F to 150°F (-40°C to 65°C)	-40°F to 150°F (-40°C to 65°C)	-40°F to 150°F (-40°C to 65°C)	-40°F to 150°F (-40°C to 65°C)
Operating Range Humidity	0% to 95% RH, Non-condensing	0% to 99.9% RH, Non-condensing		
Storage Temperature	-40°F to 170°F (-40°C to 77°C)	-40°F to 170°F (-40°C to 77°C)	-40°F to 170°F (-40°C to 77°C)	-40°F to 170°F (-40°C to 77°C)
Calibration	Single point offset calibration available through software.	Single point offset calibration available through software. Humidity is factory calibrated.	Single point offset calibration available through software.	Single point offset calibration available through software.
Dimensions	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)
Weight	2.5 oz (71g)	2.5 oz (71g)	2.5 oz (71g)	2.5 oz (71g)
Power Source	9V Alkaline or Lithium battery (not included)	9V Alkaline or Lithium battery (not included)	9V Alkaline or Lithium battery (not included)	9V Alkaline or Lithium battery (not included)
Battery Life (average use)	18 Months using Alkaline Battery 36 Months using Lithium Battery	20 Months using Alkaline Battery 40 Months using Lithium Battery	20 Months using Alkaline Battery 40 Months using Lithium Battery	20 Months using Alkaline Battery 40 Months using Lithium Battery

**\*Note:** Logger needs optional **LLS** or **LLSU** Software package to program data logger and download data for analysis. It is not included with any LOGit data logger.

**\*Note:** The SUPCO LOGit and DL Series Loggers are NOT compatible.

# Data Loggers

## LPT, LCV & L420 Data Logger Specifications

	LPT	LCV	L420
Sample Point Capacity	10,750 points for Pressure & Temperature 21,500 points for Pressure OR Temperature	10,750 points for Current & Voltage 21,500 points for Current OR Voltage	21,500 points
Sampling Rate	1 second to 18 hours	1 second to 18 hours	1 second to 18 hours
Alarms	Over and under alarms for Pressure & Temperature	Over and under alarms for current and voltage	Over and under alarm
Temperature Range (External Sensor)	-40°F to 150°F (-40°C to 65°C)		
Accuracy	±1°F (0.5°C)		
Resolution	0.1°F (0.05°C)		
Time Accuracy	±100ppm @75°F	±100ppm @75°F	±100ppm @75°F
Pressure Range	0-500 psi		
Pressure Sensor	-4°F to 185°F		
Temperature Range	-20°C to 85°C		
Compensated	32°F to 130°F		
Temperature Range	0°C to 55°C		
Pressure Accuracy	±3 psi		
Pressure Resolution	0.15 psi		
Pressure Connection	1/4" MPT Pressure Sensor Connection		
Input Current Range		0-300 Amps	0-40 ma
Current Accuracy		±5%	±0.05 ma
Current Resolution		0.1 Amp AC	0.01 ma
Voltage Range		0-500 Volts AC	
Voltage Accuracy		±1 VAC	
Voltage Resolution		0.1 VAC	
Temperature using Alkaline Battery	32°F to 130°F (0°C to 54°C)	32°F to 130°F (0°C to 54°C)	32°F to 140°F (0°C to 60°C)
Temperature using Lithium Battery	-40°F to 150°F (-40°C to 65°C)	-40°F to 150°F (-40°C to 65°C)	-40°F to 150°F (-40°C to 65°C)
Operating Range Humidity	Non-condensing	0% to 95% RH, Non-condensing	0% to 95% RH, 0% to 95%, Non-condensing
Storage Temperature	-40°F to 170°F (-40°C to 77°C)	-40°F to 170°F (-40°C to 77°C)	-40°F to 170°F (-40°C to 77°C)
Calibration	Single point offset calibration available through software. Pressure is factory calibrated.	Single point offset calibration available through software. Current and Voltage are factory calibrated.	Single point offset calibration available through software.
Dimensions	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)	3" x 2.5" x 1.1" (7.6cm x 6.4cm x 2.8cm)
Weight	2.5 oz (71g)	2.5 oz (71g)	2.5 oz (71g)
Power Source	9V Alkaline or Lithium battery (not included)	9V Alkaline or Lithium battery (not included)	9V Alkaline or Lithium battery (not included)



## LLS

### LOGiT PC Software and Interface for Serial Connection

- PC Software on CD ROM
- LINT Interface
- Cable for LOGiTs to Serial Port (CABLE6)



## LLSU

### LOGiT PC Software and Interface for USB Connection

- PC Software on CD ROM
- LINTU Interface
- Cable for LOGiTs to USB Port (19449)

#### Benefits/Specifications

- Compatible with Windows 95 and above
- Graphic and Text Data
- 3 Memory modes: Stop on full, record continuously, or memory rollover
- Real time monitoring
- Password protected calibration of each channel
- Data exportable to Text or Excel
- Maximum Serial Interface 50 feet.
- Minimum System Requirements: 8MB RAM, 2MB Disk Space, 800 x 600 Resolution, COM port or USB port

#### LOGiT Accessories

Standard Accessories	LT2	LTH	LTC	LTT	LPT	LCV	L420
<b>14265-001</b> 15' Remote Temperature Sensor	*				*		
<b>DLTP6</b> 4" Stainless Steel 6' Temperature Sensor				(2)			
<b>TPFDA</b> K-type Thermocouple with 4' FDA Approved Insulation			*				
<b>12867</b> 300 A Current Probe†						*	

Optional Accessories	LT2	LTH	LTC	LTT	LPT	LCV	L420
<b>LITH9B</b> Lithium Battery	*	*		*	*	*	*
<b>USBS</b> USB to Serial Interface	*	*		*	*	*	*
<b>LLS</b> LOGiT PC Software & Interface	*	*	*	*	*	*	*
<b>LLSU</b> LOGiT PC Software & Interface	*	*	*	*	*	*	*
<b>SW25</b> 25' Temperature Sensor Extension Wire	*				*		
<b>SW50</b> 50' Temperature Sensor Extension Wire	*				*		
<b>SW75</b> 75' Temperature Sensor Extension Wire	*				*		
<b>SW100</b> 100' Temperature Sensor Extension Wire	*				*		
<b>CABLE10T</b> 10' Sensor Extension Wire					*		
<b>CABLE10H</b> 10' Sensor Extension Wire (Max 3)				*			

†Pressure probe must be factory calibrated with LPT logger

\*Current sensor must be factory calibrated with LCV logger

# Data Loggers

## SL Series Miniature Data Loggers

Choose from Temperature, Humidity and Dew Point, or Temperature only Data Logging in a miniature, self-contained device. The SL Series Data Loggers provide concise measurements for critical environmental conditions.



### For Temperature and/or Humidity Sensitive Applications:

- Refrigerators/Freezers
- Greenhouses
- Wine Storage
- Museums
- Commercial Refrigeration Systems
- Florists
- Medical Storage Facilities
- Laboratories

### SL300TH

Measures Temperature, Humidity and Dew Point simultaneously

#### Features/Benefits

- Windows™ 98SE, ME, 2000, XP, Vista and above compatible software (included)
- Not compatible with Windows™ 95 or NT**
- PC, delayed start or push button recording control
- Temperature and Humidity alarm with visual indication on demand
- User selectable stop on memory full or memory rollover for continuous recording
- Real time monitoring
- View graph and text simultaneously
- Can calibrate through software
- Displays temperature in °F or °C
- USB Interface standard (Cable Included)

	SL300TH
Sample Point Capacity	43,344 for Temperature only. 21,672 for Temperature, Humidity and Dew Point
Sample Rate	1 second to 18 hours
Alarms	High and low temperature and humidity alarms w/visual indication on demand
Temperature Range	-40°F to 160°F (-40°C to 70°C)
Temperature Accuracy	±1°F (±0.5°C)
Temperature Resolution	0.1°F or 0.1°C
Relative Humidity Range	0% to 99% RH, non condensing
Relative Humidity Accuracy	±2% RH from 10% to 90% RH
Relative Humidity Resolution	0.01% RH
Calibration:	Single point offset calibration available through software For both Temperature and Humidity
Time Accuracy	±100 ppm @ 75°F
Dimensions	3" x 1.6" x 0.6" (7.6cm x 4.0cm x 1.5cm)
Weight	1.0 oz (28g)
Power Source	3 V (CR2032) Lithium battery (Included)
Battery Life	6 years typical



### SL300T

Measures Temperature only

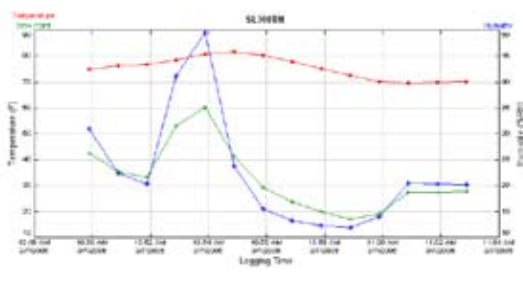
#### Features/Benefits

- Windows™ 98SE, 2000, ME, XP and Vista and above compatible software (included)
- Not compatible with Windows™ 95 or NT**
- PC, delayed start or push button recording control
- Temperature alarm with visual indication on demand
- User selectable stop on memory full or memory rollover for continuous recording
- Real time monitoring
- View graph & text simultaneously
- Can calibrate through software
- Displays temperature in °F or °C
- USB Interface Standard (Cable Included)

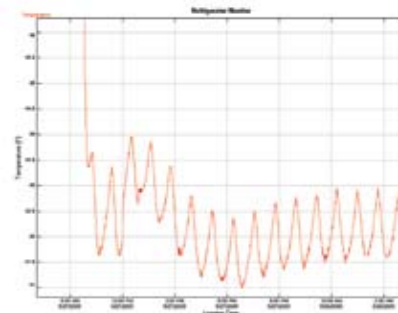
	SL300T
Sample Point Capacity	43,344 Temperature Samples
Sample Rate	1 second to 18 hours
Alarms	High and low Temperature alarms w/visual indication on demand
Temperature Range	-40°F to 185°F (-40°C to 85°C)
Temperature Accuracy	±1°F (±0.5°C)
Calibration	Single point offset calibration available through software for Temperature. Password protected
Time Accuracy	±100 ppm @ 75°F
Dimensions	3" x 1.6" x 0.6" (7.6cm x 4.0cm x 1.5cm)
Weight	1.0 oz (28g)
Power Source	3.0 V (CR2032) Lithium battery (Included)
Battery Life	Up to 6 years



SL300TH Graph



SL300T Graph





## CRTH2

### Temperature/Humidity/Dew Point Recorder

Selectable chart speeds from 1 1/2 hours to 31 days. Temperature ranges from -40°F to 130°F (-40°C to 55°C). With a 6- foot remote probe, 115V operation and battery back-up, the CRTH2 provides the ultimate in versatility and reliability.



#### Features/ Benefits

- Measures Temperature, Humidity and Dew Point
- Advanced, reliable micro-controller design
- Built – in “Last Setting” memory
- Two (2) line LCD display
- Easy-to-use membrane keypad
- All functions user selectable from front panel.
- °F / °C selectable
- Remote combination temperature/humidity probe with 6 foot cable
- Field calibration of probe
- Combination of 24 Speed and Temperature Ranges
- 6” circular chart
- Chart number displayed when Time & Temperature Ranges selected

- Single turn or continuous chart rotation
- Two (2) independent pens
- Alarm with delay for over and under temperature & humidity
- Audible and Visual Alarm indication
- Remote Alarm or telephone dialer connection (Optional Auto-dialer – ADTA)
- Standard 115 VAC operation
- Optional 12 VDC operation for auto or marine
- 48 hour battery back-up
- Low battery warning on display
- Durable polycarbonate case with full-view cover
- Free Standing or Wall mount
- Snap-on extra support legs
- Fold away carrying handle

#### CRTH2 Specifications

Temp Range/Accuracy	-40°F to 130°F $\pm 2^\circ\text{F}$ (-40°C to 55°C $\pm 1^\circ\text{C}$ )
RH Range/ Accuracy	0 to 95% (non condensing) at 32°F to 130°F $\pm 2\%$ (0°C to 55°C) ambient
Dew Point Range	32°F to 130°F (0° to 55°C)
Chart Diameter	6 inches
Chart Rotation Mode	Continuous or Single turn
Chart Rotation Speed	1.5, 3, 6, 12 & 24 hrs, 7 & 31 days
Chart Speed Accuracy	$\pm 1\%$
Charts	60 assorted included
Display	LCD 16 characters x 2 lines
Temperature Alarm Range	-20°F to 120°F (-30°C to 50°C)
Relative Humidity Alarm Range	0 to 100%
Alarm Delay	NO DELAY, 10 mins., 30 mins., 1 hr. or 2 hrs.
Remote Alarm Connection	NO, 48 VAC/DC, 0.1 A resistive load
Ambient Operating Temperature	32°F to 120°F (0°C to 49°C)
Primary Power	115 VAC, 50/60 Hz (230 VAC, 50/60 Hz optional)
Alternate Power	12 V vehicle operation (need optional adapter)
Battery backup	8 AA alkaline batteries (not included)
Battery Life	48 hrs. continuous
Dimensions	9 1/4" x 7 1/4" x 2 3/4"
Weight	4 lbs. 15 oz.

#### CRTH2 Accessories

PART NO.	DESCRIPTION
KTH	Temperature/ Humidity Probe
CABLE10H	Extension cable for KTH (2 max)
CRPENR	Red Recorder Pen
CRPENB	Blue Recorder Pen
CRT	115 VAC Power Adapter
CRT220	220 VAC Power Adapter
CRTH2	115V 50/60 Hz
CRTH2-220	220V 50/60 Hz
ADTA	Auto-Phone Dialer (Page 75)



#### Recorder Charts

TEMPERATURE RANGE 1	HUMIDITY RANGE 2	12 HR	24 HR	7 DAY	31 DAY
-20°F to 120°F	0-100% Humidity	E20120F12	E20120F24	E20120F7	E20120F31
-20°F to 50°F	0-100% Humidity	E2050F12	E2050F24	E2050F7	E2050F31
40°F to 110°F	0-100% Humidity	E40110F12	E40110F24	E40110F7	E40110F31
-30°C to 50°C	0-100% Humidity	E3050C12	E3050C24	E3050C7	E3050C31
-30°C to 10°C	0-100% Humidity	E3010C12	E3010C24	E3010C7	E3010C31
5°C to 45°C	0-100% Humidity	E545C12	E545C24	E545C7	E545C31

# Chart Recorders

## SR Series Strip Chart Recorders

The SR Series Strip Chart Recorders provide long length recordings with maximum detail. Choose the model that suits your application.



### Features/ Benefits:

- LCD alphanumeric display
- Adjustable chart speed (1/4 inch per hour to 2 inches per minute)
- Recording length: 2 hours to 40 days
- Over / Under Alarm with 100ma N.O. Relay and audible alarm
- Delay / No Delay Alarm
- Battery backup

- 220 V operation (optional)
- RS-232C port
- Use inches or mm charts
- Field calibrated with user adjustment
- Free standing or wall mount
- Chart length 20' (2 included)



### SRB - Temperature Recorder

#### Applications

- Refrigeration/Freezer, Laboratory and Environmental applications
- Measures and records temperature in air, gas, liquids, powders, solids and semi-solids

#### Features/Benefits

- Temperature Ranges: -40°F to 150°F (-40°C to 60°C)
- Remote readings from up to 100 ft. (CABLE 10T optional)
- Programmable speed and temperature ranges



### SRTB - Temperature/ Humidity Recorder

#### Applications

- Monitor critical temperature and humidity simultaneously

#### Features/Benefits

- Temperature Ranges: -40°F to 150°F (-40°C to 60°C)
- Humidity Range: 0 to 95% RH
- Programmable speed and temperature ranges



### SRJ - J-Type Thermocouple Temperature Recorder

#### Applications

- Broad temperature range
- Measures and records temperature in air, gas, liquids, powders, solids and semi-solids

#### Features/Benefits

- Temperature Ranges: -40°F to 1000°F (-40°C to 500°C)
- Remote readings from up to 2000 ft. (Use TCW25, TCW50, TCW75, TCW100)
- Programmable speed and temperature ranges



### SR4-20 4 to 20 mA and DC Voltage Recorder

#### Applications

- Verification of process control loops

#### Features/Benefits

- Current Range: 0 to 20 mA, 4 to 20 mA
- Voltage Range: 0 to 5 VDC, 0 to 100 mV
- Programmable speed and current and voltage ranges



### SRV - AC Voltage Recorder

#### Applications

- Line voltage
- Intermittent voltage problems

#### Features/Benefits

- Voltage Range: 0 to 500 VAC, single phase
- Programmable speed and voltage ranges
- Use 3 recorders for 3 phase applications



### SRC - AC Current Recorder

#### Applications

- Load distribution
- Compressor and fan run cycles

#### Features/Benefits

- Current Range: 0 to 300 Amps AC, single phase (current probe included)
- Programmable speed and current ranges
- Use 3 recorders for 3 phase applications

# Chart Recorders

## SR Series Common Specifications

Display	Alphanumeric LCD 16 Characters 2 Line	
Chart	Strip chart (20' x 4 3/4")	
Chart Speeds	1/4 inch/hour	1/2 cm/hour
	1 inch/hour	2 cm/hour
	2 inches/hour	4 cm/hour
	4 inches/hour	8 cm/hour
	8 inches/hour	16 cm/hour
	1/4 inch/minute	1/2 cm/minute
	1/2 inch/minute	1 cm/minute
	1 inch/minute	2 cm/minute
	2 inches/minute	4 cm/minute
Chart Speed Accuracy	±1%	
Alarm Delay Range	No Delay, 10 Min., 30 Min., 1 Hr., 90 Min. or 2 Hr.	
Remote Alarm Connection	N.O. 48 VAC/DC, 0.1 Amp Dry Contacts	

Operating ambient temperature range	32°F to 125°F (0° to 50°C)
Storage temperature	0° to 125°F (-18° to 50°C)
Primary power	115 VAC, 50/60 Hz Adapter (220-240 VAC, 50 Hz. optional)
Backup power	8 AA alkaline batteries (not supplied)
Alternative power	12 Volt vehicle operation with optional adapter
Power Consumption	3.5 Watts Max.
Mounting	Vertical or Horizontal, Free Standing or Wall Mounted
Dimensions	9.25" x 7.25" x 2" (235mm X 184mm X 51mm)
Weight	2.5 lb. (1.3 kg)

## SR Series Specifications

	SRB	SRJ	SRV	SRC	SR420	SRTH
Range	-40°F to 150°F (-40°C to 60°C)	-40° to 1000°F (-40° to 500°C)	0 to 500 VAC	0 to 300 Amps AC using supplied clamp-on probe	0-5.0 Volts DC 0-20ma DC 4-20ma DC	-40 to 150°F (0 to 60°C) 0 - 100% RH
Chart Ranges	-40°F to 60°F -40°C to 60°C 50°F to 150°F -30°C to 20°C 0°F to 100°F 0°C to 50°C	-40°F to 60°F -40°C to 60°C 0°F to 250°F -30°C to 20°C 50°F to 150°F 0°C to 50°C 0°F to 100°F 0°C to 100°C 0°F to 500°F 0°C to 500°C 0°F to 1000°F	0 to 50 VAC 0 to 100 VAC 50 to 150 VAC 0 to 250 VAC 0 to 500 VAC	0 to 10 AMP 0 to 50 AMP 0 to 100 AMP 50 to 150 AMP 0 to 250 AMP	0 to 5.00 Volts 0 to 100 mV 0 to 20 mA 4 to 20 mA ±0.01 Volt ±1 mV ±0.1 mA ±0.1mA	-40°F to 60°F -40°C to 60°C 50°F to 150°F -30°C to 20°C 0°F to 99°F 0°C to 50°C
Accuracy	±2°F (±1°C)	±2°F (±1°C)	±0.5 VAC	±5%	0 to 5.00 Volts 0 to 100 mV 0 to 20 ma 4 to 20 ma ±0.01 Volt ±1 mV ±0.1 mA ±0.1mA	±2°F (±1°C) ±2% (0 - 95% RH)
Probe	TP15 Temperature probe with 15' cable (cable extension is available)	6' High Temperature Thermocouple Probe	3' Voltage leads with Alligator clips	0-300 Amp AC Current Probe		KTH Temperature/ Humidity with 6' cable 95% RH (Non-Condensing)
Alarm Range	-40°F to 150°F (-40°C to 60°C)	-40°F to 1000°F (-40°C to 500°C)	0 to 500 VAC	0 to 300 AMP	0 to 20 ma (DC) 0 to 5 Volts (DC) 0 to 100 mV (DC)	40°F to 150°F (-40°F to 60°C) 0 to 100% RH

## SR Series Accessories

PART NO.	DESCRIPTION	SRB	SRJ	SRV	SRC	SR420	SRTH
ADTA	Automatic Dialer	*	*	*	*	*	*
CABLE10H	Extension cable for KTH						*
CABLE10T	10' cable	*					
CABLE15	15' cable for sensor probes						*
CABLE25	25' cable for sensor probes						*
CABLE6	6' cable for sensor probes						*
CRPEN	Black Pen	*	*	*	*	*	*
CRPENB	Blue Pen	*	*	*	*	*	*
CRPENR	Red Pen	*	*	*	*	*	*
CRT	Power Adapter	*	*	*	*	*	*
CRT220	Power Adapter	*	*	*	*	*	*
CRT220UK	Power Adapter	*	*	*	*	*	*
HTP5	6' high temperature thermocouple wire		*				
HTP5100	100' high temperature thermocouple wire		*				
HTP515	15' high temperature thermocouple wire		*				
HTP525	25' high temperature thermocouple wire		*				
HTP550	50' high temperature thermocouple wire		*				
KTH	Temperature Humidity Probe						*
SCR11	Strip Chart (American Scale) (20')	*	*	*	*	*	*
SCR12	Strip Chart (Metric Scale) (20')	*	*	*	*	*	*
SRVLA	Voltage leads with Alligator clips			*			
TCW100	Type J Thermocouple Wire - 100' wire only		*				
TCW25	Type J Thermocouple Wire - 25' wire only		*				
TCW50	Type J Thermocouple Wire - 50' wire only		*				
TCW75	Type J Thermocouple Wire - 75' wire only		*				
TP15	15' wire with 4" stainless steel sensor	*					

**Note:**  
Replacement current probe must be calibrated at factory.

# Chart Recorders

## Circular Chart Recorders

The CR87 Six(6) Inch Chart Recorder Series set the standard for reliable and rugged trend reporting. Choose the right model for your application.

### Common Features/Benefits

- Micro-controller design
- Large LED Display
- Front Panel controls
- Single or continuous chart rotation
- Choose from 120V or 220V models (see chart)
- Battery Backup
- 12 Volt operation. Allows use in vehicular or marine operations.
- Comes with 2 cartridge pens & 60 (6" dia.) assorted charts
- Convenient folding handle
- Fold-out support stand
- Free standing or wall mount



### NEW DESIGN



## CR87B - Temperature Recorder

### Applications

- Designed for Refrigerators/Freezers, Laboratory and Environmental Applications
- Measures and records temperature in air, gas, liquids, powders, solids, and semi-solids

### CR87B Series Recording Charts

TEMP. RANGE	6 Hrs.	24 Hrs.	7 Days	31 Days
-40°F to 30°F	CR87-4	CR87-1	CR87-7	CR87-19
-20°F to 50°F	CR87-5	CR87-2	CR87-8	CR87-20
50°F to 120°F	CR87-6	CR87-3	CR87-9	CR87-21
-40°C to 0°C	CR87-13	CR87-10	CR87-16	CR87-22
-30°C to 10°C	CR87-14	CR87-11	CR87-17	CR87-23
10°C to 50°C	CR87-15	CR87-12	CR87-18	CR87-24

### Features/Benefits

- Temperature range: -40°F to 120°F (-40°C to 50°C)
- Remote readings from up to 100 ft. (optional sensor wire p/n CABLE10T)
- Programmable speed and temperature ranges

PART NO.	TEMP. READING	OPERATING VOLTAGE
CR87B	Fahrenheit	110-120V, 50/60 Hz
CR87BC	Celsius	110-120V, 50/60 Hz
CR87B220	Fahrenheit	220-240V, 50/60 Hz
CR87B220C	Celsius	220-240V, 50/60 Hz

### Extension Cable for CR87B Temperature Sensor

PART NO.	DESCRIPTION
CABLE10T	10' cable 100 ft. max

### Temperature Sensor for CR87B (31 Day Version)

PART NO.	DESCRIPTION
TP15	15' wire with 4" stainless steel sensor

## CR87J - Temperature Recorder

### Applications

- Designed for Refrigerators/Freezers, Laboratory and Environmental Applications
- Measures and records temperature in air, gas, powders, solids, and semi-solids

### Features/Benefits

- Type J Thermocouple
- Temperature range: -40°F to 120°F (-40°C to 50°C)
- Remote readings
- Programmable speed and temperature ranges
- Snap-on support legs
- Remote Readings from up to 200ft (see accessory table)

PART NO.	TEMP. READING	OPERATING VOLTAGE
CR87J	Fahrenheit	110-120V, 50/60 Hz
CR87JC	Celsius	110-120V, 50/60 Hz
CR87J220	Fahrenheit	220-240V, 50/60 Hz
CR87J220C	Celsius	220-240V, 50/60 Hz

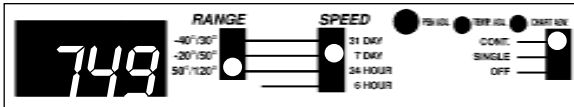
### CR87J Series Recording Charts

TEMP. RANGE	6 Hrs.	24 Hrs.	7 Days
-40°F to 30°F	CR87-4	CR87-1	CR87-7
-20°F to 50°F	CR87-5	CR87-2	CR87-8
50°F to 120°F	CR87-6	CR87-3	CR87-9
-40°C to 0°C	CR87-13	CR87-10	CR87-16
-30°C to 10°C	CR87-14	CR87-11	CR87-17
10°C to 50°C	CR87-15	CR87-12	CR87-18

### Temperature Sensor for CR87J

PART NO.	DESCRIPTION
CR15B	15' wire with 4" stainless steel sensor

Front Panel View



## CR87HT - High Temperature Recorder

### Applications

- Broad range of Temperature Applications
- Measures and records temperature in air, gas, liquids, powders, solids, and semi-solids

### Features/Benefits

- Temperature range: 0°F to 1000°F (0°C to 500°C)
- Remote readings from up to 2000 ft. (See accessory table)
- Programmable speed and temperature ranges
- Snap-on support legs

### High Temperature Sensor for CR87HT

PART NO.	DESCRIPTION
HTP5	6' high temperature thermocouple wire
HTP515	15' high temperature thermocouple wire
HTP525	25' high temperature thermocouple wire
HTP550	50' high temperature thermocouple wire
HTP5100	100' high temperature thermocouple wire

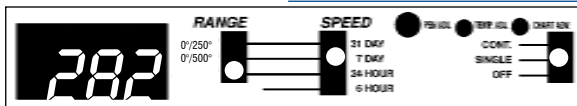
PART NO.	TEMP. READING	OPERATING VOLTAGE
CR87HT	Fahrenheit	110-120V, 50/60 Hz.
CR87HT220C	Celsius	220-240V, 50/60 Hz.
CR87HT220	Fahrenheit	220-240V, 50/60 Hz.
CR87HTC	Celsius	110-120V, 50.60 Hz.

### CR87HT Series Recording Charts

TEMP. RANGE	6 Hrs.	24 Hrs.	7 Days	31 Days
0°F to 250°F	CR1000-4	CR1000-1	CR1000-7	CR1000-19
0°F to 500°F	CR1000-5	CR1000-2	CR1000-8	CR1000-20
500° to 1000°F	CR1000-6	CR1000-3		
0°C to 120°C	CR1000-13	CR1000-10	CR1000-16	CR1000-22
0°C to 250°C	CR1000-14	CR1000-11	CR1000-17	CR1000-23
250° to 500°C	CR1000-15	CR1000-12	CR1000-18	CR1000-24



Front Panel View





# Chart Recorders

## CR87P - Pressure Recorder

### Applications

- Run Cycles
- Pneumatic air lines
- Test new installations
- Track intermittent problems

### Features/Benefits

- Pressure Range 0 to 500 PSI (0 to 35 BAR)
- Stainless steel 17-4 Pressure sensor with port 1/4 NPT
- 2500 PSI burst pressure
- Rated for any gas or fluid compatible with 17-4 stainless steel
- Programmable speed and pressure ranges
- Snap-on support legs

PART NO.	TEMP	OPERATING
READING IN VOLTAGE		
CR87P	PSI	110-120V, 50/60Hz.
CR87P220	PSI	220-240V, 50/60Hz.
CR87PB	BAR	110-120V, 50/60 Hz.
CR87PB220	BAR	220-240V, 50/60 Hz.

### CR87P Series Recording Charts

RANGE	6 HRS.	24 HRS.	7 DAYS	31 DAYS
0 - 500 PSI	6H500PSI	24H500PSI	7D500PSI	31D500PSI
0 - 150 PSI	6H150PSI	24H150PSI	7D150PSI	31D150PSI
0 - 50 PSI	6H50PSI	24H50PSI	7D50PSI	31D50PSI

### CR87PB Series Recording Charts

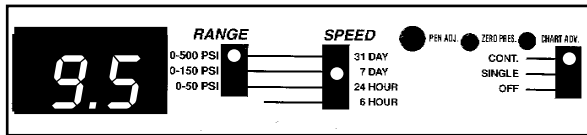
PRESSURE RANGE	6 HRS.	24 HRS.	7 DAYS	31 DAYS
0 - 35 BAR	6H35BAR	24H35BAR	7D35BAR	31D35BAR
0 - 10 BAR	6H10BAR	24H10BAR	7D10BAR	31D10BAR
0 - 3.5 BAR	6H3.5BAR	24H3.5BAR	7D3.5BAR	31D3.5BAR

### Pressure Sensor For CR87P, CR87PB

PART NO.	DESCRIPTION
CR87PA	Replacement pressure sensor and adapter



Front Panel View



## CR87E - Event Recorder

### Applications

- Time Studies
- Usage Tests
- Verification Tests

### Features/Benefits

- Complete with probes for Voltage, Sound and Light
- Displays length of event, time between events or total events
- Programmable speed and event information
- Snap-on support legs

PART NO.	OPERATING VOLTAGE
CR87E	110-120 VAC, 50/60 Hz
CR87E220	220-240 VAC, 50/60 Hz

### CR87E Series Recording Charts

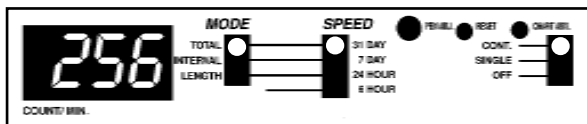
6 Hrs.	24 Hrs.
EVENT-6H	EVENT-24H
7 Days	31 Days
EVENT-7D	EVENT-31D

### Event Sensors For CR87E

PART NO.	DESCRIPTION
KEV	Replacement voltage sensor with adapter
KEL	Replacement light sensor with adapter
KES	Replacement sound sensor with adapter



Front Panel View



## CR87V - Voltage Recorder

### Applications

- Low Voltage or 4-20 ma control circuits
- Process control applications
- Manufacturing

### Features/Benefits

- Choose voltage or current measurements
- Voltage Range 0 - 5V, 0-10 mV
- Current Range 0 - 20 mA, 4-20 mA
- Programmable speed and voltage or current ranges
- Snap-on support legs

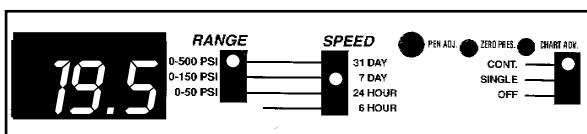
PART NO.	OPERATING VOLTAGE
CR87V	110-120V, 50/60Hz.
CR87V220	220-240V, 50/60Hz.

### CR87V Series Recording Charts

6 HRS.	24 HRS.
CR87-57	CR87-58
7 DAYS	31 DAYS
CR87-59	CR87-60



Front Panel View





# Chart Recorders



## Custom Series - Temperature Recorder

The Custom Series 6 Inch Temperature Recorders have the same general features as the CR87 Series, with the ability to customize your temperature measurement range. The custom unit has an internal temperature sensor and can be placed directly in the environment that it will monitor.

### Custom Series Specifications

- Chart Speed Accuracy -  $\pm 1.5\%$
- Chart Diameter - 6 inches
- Case Size - 9 1/4" x 7" x 2 3/4"
- Weight - 5 lbs.
- Battery Life - One Year
- Temperature Accuracy -  $\pm 2^\circ\text{F}$
- Temperature Sensor - Sensor Bi-metal

### Applications

- Designed for Refrigerators/ Freezer, Storage areas, Laboratories, Computer Rooms, etc.
- Custom temperature range means exact application needs.

### Features/Benefits

- Internal Bi-metal Sensor
- Custom Temperature and Speed Selection
- 9V Battery Operation (not included)
- AC Adapter (included)
- Snap-on support legs

PART NO. WITH DISPLAY	TEMP. RANGE	RECORD TIME
SD120F7	-20°F to 120°F	7 Days
SD120F24	-20°F to 120°F	24 Hrs
SD100F7	0°F to 100°F	7 Days
SD50C7	-30°C to 50°C	7 Days

### Custom Series Recording Charts

SD MODELS	7 DAYS	24 HOURS
TEMP RANGE		
-20°F to 120°F	S20120F7	S20120F24
0°F to 100°F	S0100F7	S0100F24
45°F to 90°F	S4590F7	S4590F24
-30°C to 50°C	S3050C7	S3050C24
0°C to 45°C	S045C7	S045C24

**Note:** Standard 6" diameter recording charts are available for Fahrenheit and Celsius Recorders, and are packaged in quantities of 60 per box.

## Additional Recorder Accessories



### Type J Thermocouple Wire with Sensor for CR86/CR87

PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
CR15B	15' wire with 4" stainless steel sensor (included)	CR75B	75' wire with 4" stainless steel sensor
CR25B	25' wire with 4" stainless steel sensor	CR100B	100' wire with 4" stainless steel sensor
CR50B	50' wire with 4" stainless steel sensor		



### Power Adapters

(FOR CR87B, CR87E, CR87P, CR87HT, CR86, CRTH2 & CRTT2)

PART NO.	INPUT	OUTPUT
CRT (USA)	120 VAC	12 VDC
CRT220 (Europe)	220 VAC	12 VDC
CRT220UK (England)	220 VAC	12 VDC

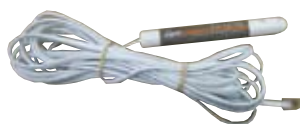
(FOR CUSTOM SERIES)

PART NO.	INPUT	OUTPUT
DPGT (USA)	120 VAC	9 VDC
DPGT220US (USA)	220 VAC	9 VDC
DPGT220UK (England)	220 VAC	9 VDC
DPGT220EU (Europe)	220 VAC	9 VDC



### Extension Cable for Event Sensors (KEV, KEL, KES) and CR87PA Pressure Sensor

PART NO.	DESCRIPTION
CABLE6	6' cable
CABLE15	15' cable
CABLE25	25' cable



### Nonsubmersible Type Air Sensor for CRTH2 & CRTT2

PART NO.	DESCRIPTION
THP5(CRTH2)	15' with plug-in jack
TTP5(CRTT2)	15' with plug-in jack



### Type J Thermocouple Wire for Sensors CR87J

PART NO.	DESCRIPTION
TCW25	25' wire only
TCW50	50' wire only
TCW75	75' wire only
TCW100	100' wire only



### Replacement Pens

PART NO.	DESCRIPTION
CRPEN	Black pen
CRPENR	Red pen
CRPENB	Blue pen

# Chart Recorders

## Recorder Specifications

	CR87B/J	CR87HT	CR87P	CR87V	CR87E
Ambient operating temperature range	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)	32°F to 140°F (0°C to 60°C)
Ambient operating relative humidity	96% maximum	96% maximum	96% maximum	96% maximum	96% maximum
<b>CR87B</b> chart speed selectable	6 hours, 24 hours, 7 days, 31 days	6 hours, 24 hours, 7 days, 31 days	6 hours, 24 hours, 7 days, 31 days	6 hours, 24 hours, 7 days, 31 days	6 hours, 24 hours, 7 days, 31 days
<b>CR87J</b> chart	6 hours, 24 hours, 7 days	6 hours, 24 hours, 7 days	6 hours, 24 hours, 7 days	6 hours, 24 hours, 7 days	6 hours, 24 hours, 7 days
Chart rotation mode	Single turn or continuous	Single turn or continuous	Single turn or continuous	Single turn or continuous	Single turn or continuous
Chart speed accuracy	±1%	±1%	±1%	±1%	±1%
Chart diameter	6 inches	6 inches	6 inches	6 inches	6 inches
Display	3 digit LED 0.5"	3 digit LED 0.5"	3 digit LED 0.5"	3 digit LED 0.5"	3 digit LED 0.5"
Primary power supply	120 VAC, 50/60Hz. (220-240 VAC, 50/60Hz. optional CR87B-220) 12 Volt vehicle operation with optional adapter	120 VAC, 50/60Hz. (220-240 VAC, 50/60Hz. optional - CR87HT22C) 12 Volt vehicle operation with optional adapter	120 VAC, 50/60Hz. (220-240 VAC, 50/60Hz. optional - CR87PB) 12 Volt vehicle operation with optional adapter	120 VAC, 50/60Hz. (220-240 VAC, 50/60Hz. optional - CR87V-220)	120 VAC, 50/60Hz. (220-240 VAC, 50/60Hz. optional - CR87V-220)
Battery backup	(8) AA Alkaline batteries (not supplied)	(8) AA Alkaline batteries (not supplied)	(8) AA Alkaline batteries (not supplied)	(8) AA Alkaline batteries (not supplied)	(8) AA Alkaline batteries (not supplied)
Battery Life	48 hours continuous use	48 hours continuous use	48 hours continuous use	48 hours continuous use	48 hours continuous use
Recording Pen	Ink type	Ink type	Ink type	Ink type	Ink type
Case Size	9 1/4" x 7 1/4" x 2 3/4"	9 1/4" x 7 1/4" x 2 3/4"	9 1/4" x 7 1/4" x 2 3/4"	9 1/4" x 7 1/4" x 2 3/4"	9 1/4" x 7 1/4" x 2 3/4"
Weight	4 lbs., 7 oz.	4 lbs., 7 oz.	4 lbs., 7 oz.	4 lbs., 7 oz.	4 lbs., 7 oz.
Pressure Range			0 to 500 PSI, 0 to 150 PSI		
PSI Model			0 to 50 PSI,		
Pressure Range BAR Model			0 to 35 BAR, 0 to 10 BAR		
Voltage Ranges (Selectable)				0-100mv 0-5V	
Current Range				0-20ma, 4-20ma	
LED Display				0-5.00 Volts 0-100 mV, 0-20.0 ma	
Voltage Accuracy				0-5.00 Volts ±0.01 Volt 0-100mV ±1mV	
Current Accuracy				0-20ma ±0.1mA 4-20ma ±0.1mA	
Temp. Scale Selectable (Fahrenheit)	-40°F to 30°F, -20°F to 50°F 50°F to 120°F	0°F to +250°F, 0°F to 500°F, 500°F to 1000°F			
Temp. Scale Selectable (Celsius)	-40°C to 0°C, -30°C to 10°C 10°C to 50°C	0°C to 120°C, 0°C to 250°C 250°C to 500°C			
Temperature Accuracy	±1°C or ±2°F	±1°C or ±2°F			
Pressure Accuracy			±1% F.S.		
Temperature Sensor	15' long sensor wire with 4" Stainless Steel submersible temperature probe	6' long high temperature type "J" thermocouple wire probe. Can not be used in liquid or semi-solid.	±1% F.S.		
KEV Range					24 VAC to 270 VAC (50/60Hz.) 24 VDC to 180 VDC
KEL Range					Illumination threshold range 18 Lux to 1900 Lux ±20
KES Range					Sound threshold range 40 dB to 114 dB @ 1KHz ±20%
<b>EVENT PROBES</b>					
KEV					AC/DC Voltage detecting with two wire clip leads
KEL					A sensitive photocell
KES					A sensitive audio transducer

# Chart Recorders

## Universal Recorder/Service Logger

The CR4 six (6) inch Universal Chart Recorder offers the ultimate in flexibility. Choose one of 5 sensors for your application, connect it to the CR4 Universal Recorder, make desired speed selection and start recording.

When your application calls for a different sensor, just change probes for the same recorder.

If you prefer to log data and download to a computer for analysis, the SL4 Service Logger has the same great flexibility as the CR4. The same probes can be used with the SL4.



CR4



SL4

### Features/ Benefits

- Automatic Probe recognition
- Front panel touch pad
- Full Time data view
- Battery backup (CR4)
- Interchangeable replaceable probes
- Field calibration of probes
- Independent Channel Alarms (CR4)
- PC software included (SL4) (Windows 95 & 98 compatible only)

### 5 Interchangeable Probes

- KTH Temperature and Humidity Probe
- KTT Dual Temperature Probes
- KTP Temperature and Pressure Probes
- KPP Dual Pressure Probes
- KTE Temperature/Event Probes

### CR4 & SL4 Specifications

	CR4	SL4
Chart Diameter	6 inches	
Recording Time		5 hrs. to 40 days
Chart Rotation Mode	Continuous or Single turn	
Memory		16 K non-volatile
Chart Rotation Speed	1.5, 3, 6, 12 & 24 hrs, 7 & 31 days	
Printer Interface		Parallel (centronics compatible)
Chart Speed Accuracy	±1%	
Charts	60 assorted included	
Display	LCD (2 line)	LCD (2 line)
Temperature Alarm Range	-20°F to 120°F (-30°C to 50°C)	
Relative Humidity Alarm Range	0 to 95% (Non-Condensing)	0 to 95% (Non-Condensing)
Pressure Alarm Range	0 to 500 PSI ( 0 to 35 Bar)	
Alarm Delay	NO DELAY, 10 mins., 30 mins., 1 hr. or 2 hrs.	
Remote Alarm Connection	NO, 48 VAC/DC, 0.1 A resistive load	
Operating Temperature	32°F to 120°F (0°C to 49°C)	32°F to 150°F (0°C to 65°C)
Primary Power	115 VAC, 50/60 Hz (230 VAC, 50/60 Hz optional)	115 VAC, 50/60 Hz (230 VAC, 50/60 Hz optional)
Alternate Power	12 V vehicle operation (need optional adapter)	12 V vehicle operation (need optional adapter)
Battery backup	8 AA alkaline batteries	9 V battery
Battery Life	48 hrs. continuous	24 hrs.

### CR4 & SL4 Accessories

PART NO.	DESCRIPTION	CR4	SL4	KTH	KTT	KTP	KPP	KTE
KTH	Temperature/ Humidity Probe	*	*					
KTT	Dual Temperature Probes	*	*					
KTP	Temperature and Pressure Probes	*	*					
KPP	Dual Pressure Probes	*	*					
KTE	Temperature/ Event Probes	*	*					
CABLE10H	Extension cable for KTH (2 max)			*				
CABLE6	6 ft. cable for sensor probes				*	*	*	*
CABLE15	15 ft. cable for sensor probes				*	*	*	*
CABLE25	25 ft. cable for sensor probes				*	*	*	*
TP6	Temperature sensor with 6 ft. wire				*	*		
TP15	Temperature sensor with 15 ft. wire				*	*		
CRPEN	Black Recorder Pen	*						
CRPENR	Red Recorder Pen	*						
CRPENB	Blue Recorder Pen	*						
CR4CABLE	RS232 Data Cable	*						
PC6	6 ft. Printer cable		*					
CC6	6 ft. Computer Transfer cable		*					
CRT	115 VAC Power Adapter	*	*					
CRT220	220 VAC Power Adapter	*	*					
MCASE	Carrying Case		*					

## Universal Recorder Probes



### KTH - Temperature/Humidity Probe

Complete with combination temperature, humidity probe. Allows for precision measurement of temperature, humidity and dew point. (Non-Condensing). Probe can be extended up to 25 feet, use p/n CABLE10H (max)



### KTT - Dual Temperature Probes

Complete with two precision temperature probes. Allows for two independent temperature measurements. Includes adapter and connecting cable. Perfect for refrigerators, freezers, indoor-outdoor recording, etc. Temperature probe can be extended 20', use P/N CABLE10T (2 max/probe)



### KTP - Temperature/ Pressure Probes

Complete with independent precision pressure and temperature probes. Measures and records temperature and pressure simultaneously. Ideal for solving intermittent compressor problems. Includes a connecting cable and adapter. Perfect for refrigerators, freezers, indoor-outdoor recording, etc. Temperature probe can be extended 20', use P/N CABLE10T (2 max/probe)



### KPP - Dual Pressure Probes

Complete with two pressure probes. Measure and record two pressures simultaneously. Includes connecting cable and adapter.



### KTE - Temperature/Event Probes

Complete with precision temperature probe, event probe, a connecting cable and adapter. Allows the service engineer to analyze various equipment running cycles.

#### Interchangeable\* Probes for CR4 and SL4

PROBE TYPE	PART NO.	TEMP RANGE/ ACCURACY	VOLTAGE RANGE	RH RANGE/ ACCURACY	PRESS RANGE/ ACCURACY	DEW POINT RANGE
Temp/RH	KTH	-40°F to 130°F ±2°F (-40° to 55°C ±1°C)	—	0-95% at 32° to 130°F ±2% (0° to 55°C) ambient	—	32° to 130°F (0° to 55°C)
Temp/Temp	KTT	-40°F to 130°F ±2°F (-40° to 55°C ±1°C)	—	—	—	—
Temp/Press	KTP	-40°F to 130°F ±2°F (-40° to 55°C ±1°C)	—	—	0-500 PSI (0-35 BAR) ±1%FS	—
Press/Press	KPP	—	—	—	0-500 PSI (0-35 BAR) ±1%FS	—
Temp/Event	KTE	-40°F to 130°F ±2°F (-40° to 55°C ±1°C)	24 VAC-270VAC (24 VDC-180VDC)	—	—	—

\*All probes can be used with the Service Logger and the Universal Recorder.

## DR Series

The DR disposable temperature recorder is an inexpensive, one time use temperature recorder - indispensable for HVAC/R uses. It gives an accurate strip chart recording of a wide ambient temperature range. It can be easily changed on the job!

### Applications

- Monitoring temperature sensitive goods in-transit, walk-in boxes, warehouses, HACCP and more.

### Features

- Pull TAB to start
- Detachable three part water resistant job information form
- Unique serial number on chart and recorder for positive identification
- HACCP documentation
- NIS traceable calibration
- ABS Plastic enclosure



PART NO.	
DR10	10 days
DR40	40 days

### Specifications

Temperature Range	-20°F to 100°F (-28°C to 38°C)
Temperature Accuracy	±2°F (±1°C) or better
Day Spans	DR10 10 Day (°F & °C) DR40 40 Day (°F & °C)
Chart Resolution	10 Day 2.50" per day
Power/Shelf Life	1.5 volt AA battery 1 year from date of purchase
Calibration	NIST Traceable
Tamper-Proof	Pre-sealed at the factory
Security Seal	
Case Quantity	40 instruments
Enclosure	ABS plastic
Weight/Dimensions	10.5 oz (297.7 gm) 6.50" L x 3.50" W x 2.56"H 16.51 cm x 6.50 cm x 8.89 cm

1 - Hazard Analysis Critical Control Points  
2 - HACCP Required \* DR10 - Replaces DR5

# Chart Recorders

## Universal Recorder Charts

KTH RANGE 1	KTH RANGE 2	12 HR	24 HR	7 DAY	31 DAY
-20°F to 120°F	0-100% HUMIDITY	E20120F12	E20120F24	E20120F7	E20120F31
-20°F to 50°F	0-100% HUMIDITY			E2050F7	E2050F31
40°F to 110°F	0-100% HUMIDITY	E40110F12	E40110F24	E40110F7	E40110F31
-30°C to 50°C	0-100% HUMIDITY	E3050C12	E3050C24	E3050C7	E3050C31
-30°C to 10°C	0-100% HUMIDITY	E3010C12	E3010C24	E3010C7	E3010C31
5°C to 45°C	0-100% HUMIDITY	E545C12	E545C24	E545C7	E545C31
KTT RANGE 1	KTT RANGE 2	12 HR	24 HR	7 DAY	31 DAY
-20°F to 120°F	-20°F to 50°F	CRTT2-2	CRTT2-1	CRTT2-3	CRTT2-21
-20°F to 50°F	40°F to 110°F	CRTT2-5	CRTT2-4	CRTT2-6	CRTT2-19
40°F to 110°F	-20°F to 120°F	CRTT2-8	CRTT2-7	CRTT2-9	CRTT2-20
-30°C to 50°C	5°C to 45°C	CRTT2-11	CRTT2-10	CRTT2-12	
5°C to 45°C	-30°C to 10°C	CRTT2-14	CRTT2-13	CRTT2-15	CRTT2-24
-30°C to 10°C	-30°C to 50°C	CRTT2-17	CRTT2-16	CRTT2-18	CRTT2-23
KTE RANGE 1	KTE RANGE 2	12 HR	24 HR	7 DAY	31 DAY
-20°F to 120°F	ON/OFF			V20120F7D	V20120F31
-20°F to 50°F	ON/OFF	V2050F12		V2050F7	V2050F31
40°F to 110°F	ON/OFF	V40110F12	V40110F24	V40110F7	V40110F31
-30°C to 50°C	ON/OFF	V3050C12	V3050C24	V3050C7	V3050C31
5°C to 45°C	ON/OFF	V545C12	V545C24	V545C7	V545C34
-30°C to 10°C	ON/OFF	V3010C12	V3010C24	V3010C7	V3010C31
KPP RANGE 1	KPP RANGE 2	12 HR	24 HR	7 DAY	31 DAY
0-50 PSI	0-150 PSI	CRPP2-1	CRPP2-7	CRPP2-13	CRPP2-19
0-50 PSI	0-500 PSI		CRPP2-8	CRPP2-14	CRPP2-20
0-150 PSI	0-500 PSI	CRPP2-3	CRPP2-9	CRPP2-15	
0-3.5 BAR	0-10 BAR	CRPP2-4	CRPP2-10	CRPP2-16	CRPP2-22
0-3.5 BAR	0-35 BAR	CRPP2-5	CRPP2-11	CRPP2-17	CRPP2-23
0-10 BAR	0-35 BAR	CRPP2-6	CRPP2-12	CRPP2-18	CRPP2-24
KTP RANGE 1	KTP RANGE 2	12 HR	24 HR	7 DAY	31 DAY
-20°F to 120°F	0-50 PSI	CRTP2-1			
-20°F to 120°F	0-150 PSI		CRTP2-11	CRTP2-38	
-20°F to 120°F	0-500 PSI	CRTP2-3	CRTP2-12	CRTP2-39	
-20°F to 50°F	0-50 PSI	CRTP2-4	CRTP2-13	CRTP2-40	CRTP2-58
-20°F to 50°F	0-150 PSI	CRTP2-5	CRTP2-14	CRTP2-41	CRTP2-59
-20°F to 50°F	0-500 PSI	CRTP2-6	CRTP2-15	CRTP2-42	CRTP2-60
40°F to 110°F	0-50 PSI	CRTP2-7	CRTP2-16	CRTP2-43	CRTP2-61
40°F to 110°F	0-150 PSI	CRTP2-8	CRTP2-17	CRTP2-44	CRTP2-62
40°F to 110°F	0-500 PSI	CRTP2-9	CRTP2-18	CRTP2-45	CRTP2-63
-30°C to 50°C	0-3.5 BAR	CRTP2-19	CRTP2-28	CRTP2-46	CRTP2-64
-30°C to 50°C	0-10 BAR	CRTP2-20	CRTP2-29	CRTP2-47	CRTP2-65
-30°C to 50°C	0-35 BAR		CRTP2-30	CRTP2-48	CRTP2-66
-30°C to 10°C	0-3.5 BAR	CRTP2-22	CRTP2-31	CRTP2-49	CRTP2-67
-30°C to 10°C	0-10 BAR	CRTP2-23	CRTP2-32	CRTP2-50	CRTP2-68
-30°C to 10°C	0-35 BAR	CRTP2-24	CRTP2-33	CRTP2-51	CRTP2-69
5°C to 45°C	0-3.5 BAR	CRTP2-25	CRTP2-34	CRTP2-52	CRTP2-70
5°C to 45°C	0-10 BAR	CRTP2-26	CRTP2-35	CRTP2-53	CRTP2-71
5°C to 45°C	0-35 BAR	CRTP2-27	CRTP2-36	CRTP2-54	CRTP2-72



## DA86420 4 in 1 Multi-Socket

### Features/Benefits

- Replaces the four most common nut drivers. SAE socket sizes 1/4", 3/8", 5/16", 7/16".
- Telescoping action provides two socket sizes at each end.
- High-torque grip textured, non-slip surface.
- 12/display box



## Security Multi-Driver

### Features/Benefits

- Features extra-long 3" nosepiece reaches even recessed fasteners.
- Includes 14 security tips plus 2 standard tips on eight 3" long, double-ended bits.



### Bits Included

HEX SECURITY	1/8", 9/64", 5/32", 3/16"
SPANNER	4, 6, 8, 10
ROBERTS SECURITY	1, 2
TORX SECURITY	10, 15, 20, 25
PHILLIPS	2
SLOT	7/32"

### PART NO.

<b>SAB454</b>	Countertop Display of 12
<b>SAB444</b>	Clamshell Packaging

## Classic Multi-Driver

### Features/Benefits

- Standard size driver. Replaces 16 of the most frequently used bits.



### Bits Included

HEX	3/32", 1/8", 5/32", 3/16"
ROBERTS	2, 3
SLOT	1/4", 3/16"
TORX	15, 20, 25, 30
PHILLIPS	0, 1, 2, 3

### PART NO.

<b>SAB243</b>	Countertop Display of 12
<b>SAB233</b>	Clamshell Packaging

## Ratchet Multi-Driver

### Features/Benefits

- Heavy-duty reversible ratchet mechanism.
- Adjustable angle nosepiece swivels 180° and locks into the angle you need.
- Also available with a 7-piece SAE socket set which includes these sockets: 3/16", 5/16", 3/8", 7/16", 11/32", 1/2", Plus adapter bit.



### Bits Included

HEX	3/32", 1/8", 5/32", 3/16"
ROBERTS	2, 3;
SLOT	1/4", 3/16"
TORX	15, 20, 25, 30
PHILLIPS	0, 1, 2, 3

### PART NO.

<b>DA86400</b>	Clamshell Packaging
<b>SAB515</b>	Driver with SAE Socket Set (Clamshell Packaging)

## SAB710 Ratio Multi-Driver

### Features/Benefits

- Multi-driver replaces 16 screwdrivers.
- 4 to 1 ratio nosepiece turns four times with each turn of the handle.
- 1 to 1 ratio nosepiece turns with the handle.
- Reversible ratchet changes direction quickly with one hand, even during use.
- 8 extra-long (3") double-ended bits. Bits store in the handle and a 1/4" nut driver in the nose.



### Bits Included

HEX	3/32", 1/8", 5/32", 3/16"
ROBERTS	2, 3
SLOT	1/4", 3/16"
TORX	15, 20, 25, 30
PHILLIPS	0, 1, 2, 3



## Hi Torq 6 in 1 Driver

### Features/Benefits

- 6 in 1 driver available with standard or security (tamper-proof) bits. Has a nut driver on each end and double-ended bits.
- Handle ergonomic. Oversized, tapered, three-sided, maximizes torque force, minimizes exertion for less hand fatigue.
- Kraton rubber grip handle coating tacky, non-sticky surface, for a non-slip grip—even when wet or oily.

### Standard Bit Load

PHILLIPS	1, 2;
SLOT	3/16", 1/4"
NUT DRIVER	1/4", 5/16"

### Security Bit Load

TORX SECURITY	15, 20, 25, 30
NUT DRIVER	1/4", 5/16"

### PART NO.

**DA76440** Standard

**DA76450** Security



## DA76460 Flexible Lighted Magnet Pickup

### Features/Benefits

- LED technology. Super-bright lights, no light bulbs to replace.
- Efficient illumination of the search area. Light is located at the magnet end; 23" total length.
- Strong 5 pound magnet.
- Magnet is encased in a brass shield. Directs the magnetic force to the tip, won't attract peripheral objects.
- Flexible pickup. Thin shaft that bends to any angle without breaking.
- Uses 3 button cell batteries (357/SR4 – included).



## Telescoping Lighted Magnet Pickup

### Features/Benefits

- Telescoping magnet pickup telescopes to 26", collapses to 7"
- Telescoping pickup and mirror.
- Oversized mirror (2.25" diameter) with a universal joint that adjusts to any angle telescopes to 36", collapses to 8"

### PART NO.

**ELB913** Telescoping Magnet Pickup (Pickup Only)

**ELB910** Telescoping Pickup & Mirror (3 pc. Set Includes Pickup, Mirror, Case)



## ELB717 Nut Driver Set, 7 pc. SAE

### Features/Benefits

- Color-coded hollow shafts accommodate longer fasteners.
- Extra-deep sockets securely grip nuts and bolts.
- Includes 7 SAE sizes: 3/16", 1/4", 5/16", 11/32", 3/8", 7/16", 1/2".



## RC5003 Utility Jack Knife

### Features/Benefits

- Lock-back design holds blade securely during use, folds to 3.5".
- Patented quick change blade mechanism allows you to slide in a new blade without disassembling the knife or using tools.
- No special blades to order. Accepts double-notched standard-and contractor- blades.
- Includes 5 spare blades in reusable blade holder.
- Stainless steel belt clip.



## RC5010 Mini Utility Jack Knife

### Features/Benefits

- Folds to 2.5". Compact, fits conveniently on an included key ring.
- Same quick change mechanism and heavy-duty construction
- 10 spare blades in reusable blade holder are included. Mini replacement blades are sold separately.

PART NO.	DESCRIPTION
<b>RC5010</b>	Mini Utility Knife
<b>RC5019</b>	Mini Replacement Blades



## 2 in 1 Cutter/Stripper

### Features/Benefits

- Cuts wire with one end, grabs and strips wire with the other.
- Stripper self-adjusts to wire; no stripping holes.
- 5" model strips stranded wire sizes 26 to 14 awg.
- 6" model strips electrical wire sizes 14 to 10 awg.
- Cutting head is full-flush cutting and low profile with stainless steel, induction-hardened jaws.

PART NO.	DESCRIPTION
ELB250	5" for Low Voltage Wire
ELB251	6" for Electrical Wire



## RC4300 3 in 1 Multi Pliers

### Features/Benefits

- Three interchangeable plier heads lock into place, won't slip during use.
- Double lever design yield twice the force of standard pliers.
- Handle of chrome molybdenum and PVC, warranted for life.
- Plier heads are induction-hardened carbon steel, which carry a three-year warranty.
- Set includes long nose, diagonal cutting and combination plier heads in a Velcro-close ripstop nylon holster.



## Heavy Duty Pliers Assortment

### Features/Benefits

- Super heavy-duty oversized cross section, induction-hardened cutting edges and hot-riveted joints.
- Two-color textured non-slip handles.
- Professional quality materials and construction make this assortment a great value.

PART NO.	DESCRIPTION
ELB305	8" Diagonal Cutter
ELB304	7" Diagonal Cutter
ELB301	10" Crimping
ELB312	8.5" Linesman



## Heavy Duty Pliers-11" Extended

### Features/Benefits

- Specialty pliers, 11" reach and a choice of nose angles.
- Professional quality.
- Two-color textured handles.
- Model selection includes straight nose, or curves of 20°, 45°, or 90°.

PART NO.	DESCRIPTION
ELB320	Straight
ELB321	45° Angle



## ELB714 Torpedo Level 9"

### Features/Benefits

- Three 360° vials are tinted for easy reading: one plumb, one level, one 45°.
- Magnetic strip and top read window.



## ELB340 Dual Snap Ring Pliers

### Features/Benefits

- Lighten your toolbox.
- All-in-one tool removes both internal and external snap rings.
- Spring-loaded over sized handle, cushioned for comfortable use.



## Heavy Duty Pliers-Telecom

### Features/Benefits

- The most efficient pliers for telecom use - cut, strip and crimp with one tool.
- Long nose pliers, one skinning hole to strip 22 awg wire and feature a cross-jaw grip.
- Diagonal cutting pliers, two skinning holes for stripping 16 and 22 AWG wire.
- Quality construction, drop-forged chrome vanadium steel with hot-riveted joint.
- Both models have induction-hardened cutting edges and crimper features between handles.
- Velcro-close ripstop nylon holster included with each tool.

PART NO.
ELB101 Long Nose

# Tools



## Ratcheting Pipe Wrench

### Features/Benefits

- Oversized jaws automatically set-to-fit for one-handed operation.
- Ratcheting jaw doesn't require resetting between turns.
- Power jaw clamps tighter as you increase torque force.
- 360° Swivel head allows full leverage in tight spots.
- Heavy-gauge chrome vanadium steel has excellent durability.

### PART NO.

**RC3110** 10" Wrench Opens to 4.5"

**RC3114** 14" Wrench opens to 2.5"



## Precision Adjustable Wrench

### Features/Benefits

- Oversized jaw opens 18% wider than standard wrenches
- Dual calibrated jaw.
- Oversized grip has superior balance to reduce hand fatigue.
- Constructed of heavy-gauge, industrial-quality steel insuring durability.

### PART NO.

**RC2106** 6" spans 15/16"

**RC2108** 8" spans 1 1/8"

**RC2110** 10" spans 1 5/16"

**RC2112** 12" spans 1 9/16"



## DA76210 12" Box Joint Pump Pliers

### Benefits/Features

- Heavy-duty box joint construction can't torque out, won't loosen with use.
- Self-gripping jaw pattern provides tight, secure grip, even on slippery pipes.
- Cushioned, non-slip grip.
- Industrial quality chrome vanadium steel with induction-hardened teeth.



## ELB713 Electrician's Fish Stick Set

### Features/Benefits

- Economical, efficient, and snarl-free way to pull or push wire.
- Safe, non-conductive flexible PVC plastic, bends easily around obstacles.
- Five-piece set contains 5 connectable rods, 24" long and 3/8" diameter.
- Includes 2 bull tip slotted heads for attaching wire.
- Rods feature rust-resistant internal connectors.
- Set includes nylon carrying case.



## ELB402 Quick Release Tubing Cutter

### Features/Benefits

- Auto ratchet closure sets to pipe automatically.
- Quick release, spring-loaded retractor releases pipe instantly.
- Lightweight aluminum body with built-in reamer feature.
- Cuts 1/4" to 2" o.d. copper tubing.



## RC1220 Pry-Angle™ Adjustable Prybar

### Features/Benefits

- Clawhead is indexed to lock into 5 positions: 180° (straight), 155°, 130°, 105°, 80°.
- Super tough locking mechanism with thumb lever allows one handed angle changes.
- Industrial quality high carbon steel construction meets ANSI standard, rated at 300 foot/lbs. torque.



## ELB400 Mini Tubing Cutter

### Features/Benefits

- Tough, lightweight aluminum cutter for copper pipe 1/8" – 7/8" o.d.
- One Spare wheel included.



## ELB721 Mini Cable Tie Gun

### Features/Benefits

- The right cable tie gun for small jobs.
- Compact size accommodates plastic cable ties up to 0.25" in width.
- Twist cable gun to cut and trim off excess cable tie length.



## Fish Tape

### Features/Benefits

- Trigger for constant tension and finger grips around the reel keep the tape under control and retracting tightly.
- Tape reel cleans the tape as it retracts.
- Refills sold separately.

PART NO.	DESCRIPTION
ELB710	50' Length
ELB711	100' Length



## ELB701-L Cable Splicing Knife

### Features/Benefits

- Coping-type blade is machined from fine cutlery steel.
- Non-slip, textured rubberized handle.
- Heavy-duty leather carrying sheath included.



## ELB400

### Features/Benefits

- Prevent injuries from sharp cable ties—the safety cutter has a square cutting profile that blunt-cuts wire ties and other plastics.
- Professional quality, spring-loaded handles with precision ground, hardened steel jaws.
- To leave a blunt edge on wire tie bundles, place flush edge of cutter head toward the bundle, then cut.



## FBP100 - Fan Blade Puller

### Features/Benefits

- Sturdy, heavy duty steel
- 5/8" steel center shaft
- 4 pull fingers
- Alignment tool included
- Has flats for wrench
- Fine thread version provides additional torque & pulling power



## Blower Wheel Pullers

A fast and easy method to remove blower wheel from shaft without damage to the blower, blower motor or shaft.

PART NO.	DESCRIPTION
SF3500	Drive bolt shank and 1 1/4" hub
SF3510	Drive bolt shank and 1 3/8" hub
SF3515	1 3/8" hub only
SF3525	1 1/2" hub only
SF3535	1 5/8" hub only
SF3570	Blower wheel puller kit



# Tools & Accessories



## CTP1- Capillary Tube Cutter

5" stripper and cutter. Fast, efficient and all purpose.



## TC2 - Heavy Duty Tube Cutter

- For clean cuts in hard or soft copper aluminum, brass, thin wall steel and stainless steel.
- Rollers have flared cut off groove
- Complete with foldaway reamer blade and spare cutting wheel.
- Cuts tubes from 1/8" thru 1 1/8" O.D.
- Replacement cutting wheel p/n TC2W



## UFC1 - Fin Comb

Cleans and straightens fins for better operating efficiency.



## FPT10, FPT13 & FPT15 Fin Jack

Straightens and separates bent fins quickly and easily. One tool can be used for up to 3 sizes of fins.

PART NO.	DESCRIPTION
FPT10	9 & 10 Fins per inch
FPT13	11, 12 & 13 Fins per inch
FPT15	14, 15 & 16 Fins per inch



## FCR6 - Handy Ring Fin Comb Set

Six of the most popular Fin Combs covering twelve different size fins on a convenient ring. Includes FC0810, FC0915, FC1113, FC1214, FC1617, and FC1820.



## Fin Combs

Straighten and clean evaporator and condensor fins.

FINS PER			FINS PER		
PART NO.	INCH	COLOR	PART NO.	INCH	COLOR
FC0810	8 and 10	Orange	FC1617	16 and 17	Lime
FC0915	9 and 15	Yellow	FC1820	18 and 20	Red
FC1113	11 and 13	Blue	FC2224	22 and 24	Purple
FC1214	12 and 14	Green			



## SF4311- "FasTap" Tube Piercing Pliers

- Fast refrigerant recovery: Just clamp and recover
- Tubing sizes 1/4" to 7/8" OD
- Replaceable self-sharpening tip
- Simple to use
- Light weight



## SF4314 - Tube Piercing Pliers Replacement Tip



## SF3970 - Internal Temperature Reading Tool

Take Internal Temperatures of Refrigerant Lines digitally.

- Accurately adjust superheat
- Simple instructions
- Inserts through access fitting (supplied)

Includes: Core Removal Tool and Digital Thermometer  
**Replaces SF3940 AND SF3960**



## DHS55 - Digital Handheld Scale

This compact handheld scale provides quick measurements for your refrigeration applications.

### Features/Benefits

- 55 lbs max scale
- 2% accuracy
- One button operation
- Auto shut off
- Lbs/Kgs switchable
- Max weight memory
- 9 V battery included



## HVT2 - Safe-T-Tester Screwdriver

- 110-220 VAC
- Light in handle indicates power



## P89 - Voltage Detector

- 12-440 VAC

- Non-contact Voltage Detection



# Tools & Accessories



## Telescoping Tools

Match Clip, Magnet, and Inspection Mirrors

### Features/Benefits

- Double ball joint head adjustment
- Extendable/retractable design
- Magnified glass mirror available with IM4
- Carry pouch included
- Glass Mirrors

PART NO.	DESCRIPTION	EXTENDED LENGTH
IM1	1.25" Round Glass Mirror, Pocket Clip	27"
IM2	1" x 2" Oval Glass Mirror, Pocket Clip	28"
IM3	2.25" Round Glass Mirror, Vinyl Grip Handle	14.5"
IM4	2.25" Round Magnifying Glass Mirror, Vinyl Grip Handle	14.5"
IM5	2.25" x 3.25" Rectangular Glass Mirror, Vinyl Grip Handle	15.5"
IMK3	Combination Tool, Pocket Clip Includes: Match Clip, Magnet, 2" Round Mirror & PVC Pouch	27"



## FWB1 - Fin Wisk Brush

### Features

- Long lasting, sturdy Bristle Design



## RCB1 - Refrigeration Coil Brush

### Features

- 27 1/2" long
- 12" brush length
- 1 1/2" and 3/4" bristle length



## Air Conditioning & Refrigeration Wrenches

PART NO.	DESCRIPTION
RW516	1/4" - 3/16" Sq. x 3/8" - 5/16" Hex
RW916	1/4" - 3/16" Sq. x 1/2" - 9/16" Hex
RWA10	Hex adapter for refrigeration wrenches



## UW1- Universal Wrench

Ranges in sizes from 1/4", 5/16", 11/32", and 3/8".



## HK7 - Hex Key Wrench Set

Consists of seven 12" long hex wrenches: 5/64", 3/32", 1/8", 5/32", 3/16", 7/32" and 1/4".



## BJ10 - Belt-Jack Instant Belt Tightener

Designed to set belt tension and to help align pulleys on all belt driven units including blower motors, compressors, transmissions, and automotive components.

- Opens from 4 1/2" to 15" with extender
- Heavy duty 3/8-16 thread

## BJ10PLUS - Belt-Jack Instant Belt Tightener

Same as BJ10 Plus an extra 6" extension

# Tools & Accessories



## TC103 Test Cord

- 6', heavy duty, 16 gauge wire
- Male plug to medium duty spring clips
- 2 wire, black/red



## TC104

- 24", heavy duty, 16 gauge wire
- Female plug to medium size spring clips
- 3 wire, black/red/green



## TA3001

- 15' long, 1" nylon webbing
- Adjusts from 1' to 15'
- Ratchet handle w/ quick release
- Vinyl coated "S" hooks at each end
- 3000 lb. capacity



## THS60

- 5' long, 3/4" polypropylene web strap
- Reinforced grommet
- Spring loaded buckle at one end



## SR6N1- 6 in 1 Ratchet Screwdriver

**Sold in 12 pack display!**

- Ratchet Action
- 3-Settings:
  - Forward
  - Manual
  - Reverse
- Bit Sizes
  - Slotted: 3/16" (5mm) and 1/4" (6mm)
  - Phillips: #1 and #2
  - Nut Driver: 1/4" and 5/16"



## SAR21- 21 in 1 Angling Ratchet Screwdriver

**Sold in 6 pack display!**

- 21 Bit Sizes
- Multi-Position Angle
- Bit Storage

### Accessories

<b>70056A</b>	Replacement socket w/holder
<b>70056B</b>	Replacement bits w/holder

# Terminals & Connectors

**SUPCO Terminals, Cable Clamps, Grommets, Heat Shrink Tubing, Cable and Duct Ties are available in three convenient packages:**

- The service pack is handy and low priced, ideal for small jobs.
- The BX (Box) which includes 50 or 100 pieces.
- The C Pack (Bag) which include 100 pieces.

## SWC Series - Nylon Cable Clamps



PART NO.	DESCRIPTION	PKG QTY
<b>SWC03</b>	Nylon Cable Clamp 3/16" (.187)	40
<b>SWC04</b>	Nylon Cable Clamp 1/4" (.250)	35
<b>SWC05</b>	Nylon Cable Clamp 5/16" (.3125)	35
<b>SWC08</b>	Nylon Cable Clamp 1/2" (.500)	25
<b>SWC110</b>	Nylon Cable Clamp 5/8"	20
<b>SWCA1</b>	Cable Clamps, Assorted, 1/8" to 1"	26

## SGV Series - Grommets, Vinyl (by panel hole size)



PART NO.	DESCRIPTION	PKG QTY
<b>SGV05</b>	Grommets 5/16" (.3125)	15
<b>SGV06</b>	Grommets 3/8" (.375)	13
<b>SGV07</b>	Grommets 7/16" (.437)	12
<b>SGV08</b>	Grommets 1/2" (.500)	12
<b>SGV14</b>	Grommets 7/8"	4
<b>SGVA1</b>	Assorted Grommets - Small	15
<b>SGVA2</b>	Assorted Grommets - Large	5

## SHS Series - Heat Shrink Tubing, Polyolefin 50% Shrink



PART NO.	DESCRIPTION	PKG QTY
<b>SHS03</b>	Heat Shrink Tubing 3/16" ID x 4"	8
<b>SHS04</b>	Heat Shrink Tubing 1/4" ID x 4"	7
<b>SHS012</b>	Heat Shrink Tubing 3/4" ID x 4"	4
<b>SHS16</b>	Heat Shrink Tubing 1" ID x 4"	3
<b>SHSA1</b>	Assorted 3/16", 1/4", 3/8" x 4"	7
<b>SHSA2</b>	Assorted 1/2", 3/4", 1" x 4"	4



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1001</b>	12-10 .250 (1/4") female tab	15
<b>T1001C</b>	12-10 .250 (1/4") female tab	100
<b>T1002</b>	16-14 .250 (1/4") female tab	20
<b>T2002</b>	16-14 .187 (3/16") female tab	20
<b>T2002C</b>	16-14 .187 (3/16") female tab	100
<b>T2004</b>	22-18 .250 (1/4") female tab	20
<b>T2004C</b>	22-18 .250 (1/4") female tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1005</b>	16-14 .250 (1/4") female fully insulated	10
<b>T1005C</b>	16-14 .250 (1/4") female fully insulated	100
<b>T1007</b>	18-22 .250 (1/4") female fully insulated	10
<b>T1009</b>	12-10 .250 (1/4") female fully insulated	10
<b>T1009C</b>	12-10 .250 (1/4") female fully insulated	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1021</b>	.250 (1/4") double male tab	10
<b>T1021C</b>	.250 (1/4") double male tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1023</b>	.250 (1/4") triple male tab	10
<b>T1023C</b>	.250 (1/4") triple male tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1003</b>	16-14 .250 (1/4") male tab	20
<b>T1004</b>	12-10 .250 (1/4") male tab	15
<b>T1004C</b>	12-10 .250 (1/4") male tab	100
<b>T2003</b>	16-14 .187 (3/16") male tab	20
<b>T2003C</b>	16-14 .187 (3/16") male tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1006</b>	16-14 .250 (1/4") male fully insulated	10
<b>T1010</b>	12-10 .250 (1/4") male fully insulated	10
<b>T1010C</b>	12-10 .250 (1/4") male fully insulated	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1022</b>	.250 (1/4") double male tab	10
<b>T1022C</b>	.250 (1/4") double male tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1104</b>	16-14 .250 (1/4") flag	20
<b>T1104C</b>	16-14 .250 (1/4") flag	100
<b>T1106</b>	16-14 .187 (3/16") flag	20
<b>Quick Disconnects - High Temp to 900 F</b>		
<b>T1113</b>	16-14 .250 (1/4") female x 90 degree flag	20
<b>T1113C</b>	16-14 .250 (1/4") female x 90 degree flag	100

# Terminals & Connectors



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1102</b>	16-14 .250 (1/4") female tab	20
<b>T1102C</b>	16-14 .250 (1/4") female tab	100
<b>T1105</b>	16-14 .187 (3/16") female tab	20
<b>T1105C</b>	16-14 .187 (3/16") female tab	100
<b>T1107</b>	22-18 .110 (7/64") female tab	20
<b>T2001</b>	22-18 .110 (1/4") female tab	20
<b>T2001C</b>	22-18 .110 (1/4") female tab	100
<b>Quick Disconnects - High Temp to 900°F</b>		
<b>T1111</b>	16-14 .250 (1/4") female tab	20
<b>T1111C</b>	16-14 .250 (1/4") female tab	100
<b>T1112</b>	12-10 .250 (1/4") female tab	15
<b>T1112C</b>	12-10 .250 (1/4") female tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1110</b>	16-14 .157 (5/32") bullet female	20
<b>T1110C</b>	16-14 .157 (5/32") bullet female	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1109</b>	16-14 .250 (1/4") female tab w/insulation crimp	20
<b>T1120</b>	16-14 .312 (5/16") female tab w/insulation crimp	10
<b>T1120C</b>	16-14 .312 (5/16") female tab w/insulation crimp	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - High Temp to 900°F</b>		
<b>T1114</b>	12-10 .250 (1/4") female x 90 degree flag	20
<b>T1114C</b>	12-10 .250 (1/4") female x 90 degree flag	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Spade Flanged - Insulated</b>		
<b>T1042</b>	22-18 #8 stud 11/64" I.D.	20
<b>T1042C</b>	22-18 #8 stud 11/64" I.D.	100
<b>T1043</b>	16-14 #8 stud 11/64" I.D.	20
<b>T1043C</b>	16-14 #8 stud 11/64" I.D.	100
<b>T1044C</b>	16-14 #10 stud 13/64" I.D.	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Spade - Insulated</b>		
<b>T1047</b>	22-18 #8 stud 11/64" I.D.	20
<b>T1047C</b>	22-18 #8 stud 11/64" I.D.	100
<b>T1048</b>	16-14 #10 stud 13/64" I.D.	20
<b>T1049</b>	12-10 #10 stud 13/64" I.D.	15
<b>T1049C</b>	12-10 #10 stud 13/64" I.D.	100
<b>T1050</b>	12-10 #8 stud 11/64" I.D.	15
<b>T1050C</b>	12-10 #8 stud 11/64" I.D.	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Insulated</b>		
<b>T1027</b>	16-14 .250 (1/4") male/female p.b.	10
<b>T1027C</b>	16-14 .250 (1/4") male/female p.b.	100
<b>T1028C</b>	22-18 .250 (1/4") male/female p.b.	100
<b>T1029</b>	12-10 .250 (1/4") male/female p.b.	10



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1103</b>	16-14 .250 (1/4") male tab	20
<b>T1103C</b>	16-14 .250 (1/4") male tab	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Quick Disconnects - Non Insulated</b>		
<b>T1108C</b>	16-14 .157 (5/32") bullet male	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Rings - Insulated</b>		
<b>T1030</b>	22-18 #6 stud 9/64" I.D.	10
<b>T1030C</b>	22-18 #6 stud 9/64" I.D.	100
<b>T1031C</b>	22-18 #8 stud 11/64" I.D.	100
<b>T1032C</b>	22-18 #10 stud 13/64" I.D.	100
<b>T1033</b>	16-14 #8 stud 11/64" I.D.	20
<b>T1034</b>	16-14 #10 stud 13/64" I.D.	20
<b>T1035</b>	16-14 1/4 stud 17/64" I.D.	15
<b>T1035C</b>	16-14 1/4 stud 17/64" I.D.	100
<b>T1036</b>	12-10 #8 stud 11/64" I.D.	15
<b>T1036C</b>	12-10 #8 stud 11/64" I.D.	100
<b>T1037</b>	12-10 #10 stud 13/64" I.D.	15
<b>T1037C</b>	12-10 #10 stud 13/64" I.D.	100
<b>T1038</b>	12-10 1/4 stud 17/64" I.D.	15
<b>T1039</b>	16-14 3/8 stud 25/64" I.D.	15
<b>T1039C</b>	16-14 3/8 stud 25/64" I.D.	100
<b>T1040C</b>	12-10 3/8 stud 25/64" I.D.	100
<b>T2033</b>	16-14 #6 stud 9/64" I.D.	20
<b>T2033C</b>	16-14 #6 stud 9/64" I.D.	100
<b>T2065</b>	#8 1/4 stud 17/64" I.D.	15
<b>T2065C</b>	#8 1/4 stud 17/64" I.D.	100
<b>T2066C</b>	#6 1/4 stud 17/64" I.D.	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Spade Flanged - Insulated</b>		
<b>T1141</b>	22-18 #8 stud 11/64" I.D.	20
<b>T1141C</b>	22-18 #8 stud 11/64" I.D.	100
<b>T1142</b>	22-18 #10 stud 13/64" I.D.	20
<b>T1143</b>	16-14 #8 stud 11/64" I.D.	20
<b>T1143C</b>	16-14 #8 stud 11/64" I.D.	100
<b>T1144</b>	16-14 #10 stud 13/64" I.D.	20



# Terminals & Connectors



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Spade - Non Insulated</b>		
T1145	22-18 #10 stud 13/64" I.D.	10
T1145C	22-18 #10 stud 13/64" I.D.	100
T1146	16-14 #10 stud 13/64" I.D.	10
T1147	10-12 #10 stud 13/64" I.D.	10
T1147C	10-12 #10 stud 13/64" I.D.	100
T114750	WIRE CNCTR, SM, GRAY	50



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Rings - Non Insulated</b>		
T1131	22-18 #8 stud 11/64" I.D.	20
T1131C	22-18 #8 stud 11/64" I.D.	100
T1133C	16-14 #8 stud 11/64" I.D.	100
T1134	16-14 #10 stud 11/64" I.D.	20
T1134C	16-14 #10 stud 11/64" I.D.	100
T1135	16-14 1/4" stud 17/64" I.D.	20
T1135C	16-14 1/4" stud 17/64" I.D.	100
T1136	12-10 #8 stud 11/64" I.D.	20
T1136C	12-10 #8 stud 11/64" I.D.	100
T1137	12-10 #10 stud 13/64" I.D.	20
T1137C	12-10 #10 stud 13/64" I.D.	100
T1138	12-10 1/4" stud 17/64" I.D.	15
T1138C	12-10 1/4" stud 17/64" I.D.	100
<b>Rings - High Temp to 900°F</b>		
T1115	16-14 #10 stud 13/64" I.D.	20
T1115C	16-14 #10 stud 13/64" I.D.	100
T1116	16-14 1/4" stud 17/64" I.D.	20
T1116C	16-14 1/4" stud 17/64" I.D.	100
T1117	12-10 #10 stud 13/64" I.D.	20
T1117C	12-10 #10 stud 13/64" I.D.	100
T1118	12-10 1/4" stud 17/64" I.D.	15



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Line Tap Connector</b>		
T1061	22-18 line tap connector	10
T1061C	22-18 line tap connector	100
T1062C	16-14 line tap connector	100
T1064	12-10 line tap connector	5
T1064C	12-10 line tap connector	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Butt Connectors</b>		
T1051	22-18 insulated - red	20
T1051C	22-18 insulated - red	100
T1052	16-14 insulated - blue	20
T1052C	16-14 insulated - blue	100
T1053	12-10 insulated - yellow	15
T1053C	12-10 insulated - yellow	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
T1121	.250 (1/4") 2 male x 1 female	10
T1121C	.250 (1/4") 2 male x 1 female	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Butt Connectors</b>		
T1119	22-18 non insulated	20
T1119C	22-18 non insulated	100
T2067	#8 non insulated	20
T2067C	#8 non insulated	100
T2068	#6 non insulated	20
T2068C	#6 non insulated	100
T2111	16-14 non insulated	20
T2111C	16-14 non insulated	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
T1122	.250 (1/4") 2 male x 1 female	10



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Wire Connectors</b>		
T1150	Small blue wire nut with spring insert	20
T1150C	Small blue wire nut with spring insert	100
T1151	Medium orange wire nut with spring insert	15
T1151C	Medium orange wire nut with spring insert	100
T1152	Large yellow wire nut with spring insert	15
T1152C	Large yellow wire nut with spring insert	100
T1153	Extra large red wire nut with spring insert	10
T1153C	Extra large red wire nut with spring insert	100
T1161C	Small yellow wire nut without insert	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Line Tap with Disconnect</b>		
T1065	18-14 line taps only	10



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
T1124	.250 (1/4") female x #6 screw	10
T1124C	.250 (1/4") female x #6 screw	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Closed End Connectors</b>		
T1056	22-18 insulated crimp type	20
T1056C	22-18 insulated crimp type	100
T1057	16-14 insulated crimp type	15
T1057C	16-14 insulated crimp type	100
T1058	12-10 insulated crimp type	15
T1058C	12-10 insulated crimp type	100
T1059	#8 insulated crimp type	15
T1059C	#8 insulated crimp type	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
T1123	.250 (1/4") x #10 stud	10
T1123C	.250 (1/4") x #10 stud	100

# Terminals & Connectors



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
<b>T1125</b>	.250 (1/4") 2 male x 1 female	10



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Connectors and Adapters</b>		
<b>T1129</b>	12-8 .250 (1/4") compressor terminal	10
<b>T1129C</b>	12-8 .250 (1/4") compressor terminal	100
<b>T1130</b>	16-14 .250 (1/4") compressor terminal	10



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>High Heat Porcelain Wire Connectors (Up To 1800 F)</b>		
<b>T1164</b>	Small #1 high heat porcelain wire nut 18 - 14 wire	15
<b>T1164C</b>	Small #1 high heat porcelain wire nut 18 - 14 wire	100
<b>T1165</b>	Small #3 high heat porcelain wire nut 12 - 10 wire	15
<b>T1165C</b>	Small #3 high heat porcelain wire nut 12 - 10 wire	100
<b>T2070</b>	Small #1 high heat porcelain wire nut 8 - 10 wire	10
<b>T2070C</b>	Small #7 high heat porcelain wire nut 8 - 10 wire	100



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Alligator Clips</b>		
<b>T1196</b>	small includes black and red insulators	3 pair



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Banana Plug</b>		
<b>T1179</b>	includes black and red insulators	1 pair



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Heavy Duty Alligator Clips</b>		
<b>T1186</b>	small includes black and red insulators	1 pair
<b>T1187</b>	medium includes black and red insulators	1 pair



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Scotchlok Electrical Spring Connectors</b>		
<b>T1166</b>	Small yellow	15
<b>T1166C</b>	Small yellow	100
<b>T1167</b>	Medium red	10
<b>T1167C</b>	Medium red	100
<b>T1168</b>	Large gray	5
<b>T1168L</b>	Large gray	50
<b>T1169</b>	Extra large blue	5
<b>T1169L</b>	Extra large blue	50



PART NO.	SIZE / DESCRIPTION	PKG QTY
<b>Alligator Clips</b>		
<b>T1191</b>	Small standard clips	10
<b>T1192</b>	Medium standard clips	5
<b>T1193</b>	Medium for use with test leads	5



12 per case

## M44 Aerosol Lubricant & Metal Protectant

Specially created and perfected for Professional technicians and mechanics everywhere... and there is nothing like it in the world!

- Turns old tools into new ones
- Can be used on cars, trucks, bicycles, fishing gear, marine gear, electrical and electronic gear, machinery, appliances etc.

### Applications

- Lubricates
- Prevents Rust and Corrosion
- Repels Moisture
- Restores Tools and Equipment



M098



M044

## M098 Zoom Spout® Oiler

A paraffin base, non-gumming, high quality lubricating oil

- All-Purpose Lubricating Oil
- Flexible spout extends and retracts, adjusts to any "in-between" length
- Withstands high temperatures without breaking down
- Viscosity 92-99 @ 140°F

### Applications

- All types of motors, blowers, oil burner bearings, linkages, appliance pumps, etc...
- Normal and High speed shaft bearings

## Rust Buster® Solvent

Dissolves Rust

- Telescoping Pullout Spout
- Loosens rust in seconds
- No lingering odor
- Counter Display Case

PART NO.	BOTTLE SIZE	PACKAGING
M098	4 oz	12/Case
M044	4 oz	12/Case

## SUPCO88 Oil Additive

Introduced in 1954 and valued worldwide, this super lubricant is a "must use" in repair and preventative maintenance programs.

- Compatible with all refrigeration oils
- Dissolves sludge buildup on bearing and valve surfaces
- Prevents binding of high speed compressors
- Prevents excess wear in motors and compressors

PART NO.	BOTTLE SIZE	PACKAGING
S8 8 OZ.	24/Case	

### Application Notes:

To Prevent Excess Wear on Expansion Valves and Capillaries Mix one part SUPCO88 to 9 parts refrigeration oil.

- Prevents excess wear on expansion valve needles and seats.
- Penetrates the pores of ALL moving metal parts of the expansion valve for constant lubrication.

Extend the Life of ALL Motors (i.e. for Blowers and Air Conditioners)

- A few drops will help free a "frozen" or sticking motor shaft
- Mix 9 to one for regular bearing maintenance.
- Decreases "bearing to shaft" friction and sludge accumulation when mixed 9 to one.

More Efficiency for High Speed Compressors

- Increases the lubricating capability of mineral oils in high speed compressors.
- Used in new units to reduce current draw by reducing friction and preventing overloading.
- SUPCO88 can be left in the system permanently.



## S0100/ST200

### Slimeout®

## Condensate Pan Conditioning Tablets

- Slimeout® tablets prevent plugging of the air conditioning condensate drip pans and drain lines
- Slimeout® does not release any chlorine or other noxious fumes
- Slimeout® eliminates odors
- Slimeout® easily solves problems

	PART NO.	PART NO.
	S0100	ST200
Description	Slime Out	Slime Tab
Tablets Jar	100	200
Tablet Size	35 grams	20 grams
Initial Application	2 tabs/3 tons	3 tabs/3 tons
Maintenance	2 per month	3 per month

# Chemicals



## Leak Lock and Leak Lock GOLD with Teflon

A resin based soft setting brushable paste pipe joint compound resistant to all refrigerants, oils, water and most chemicals, liquids and gases.



- Use with pressures to 10,000 PSI to full vacuums.
- Temperature range -200°F to 400°F, (-93°C) to (204°C).
- It never hardens and it never becomes brittle.
- Ideal for joining all metals, plastics and other materials.
- Will stick to all clean surfaces.
- GUARANTEES A PERFECT SEAL... UNDER ALL CONDITIONS
- Will stick to all clean surfaces.
- Prevent vibration from loosening nuts, bolts, plugs and fittings.
- Non Toxic

### Regular

PART NO.	SIZE	PKG
HS10001	1 1/3 oz Tube	12/Case
HS10004	4 oz Brush Top Plastic Jar	12/Case
HS10016	16 oz Brush Top Plastic Jar	12/Case
HS10128	1 Gallon Can	1

### Teflon

PART NO.	SIZE	PKG
HS11001	1 1/3 oz TUBE	12/Case
HS11004	4 oz Brush Top Plastic Jar	12/Case
HS11016	16 oz Brush Top Plastic Jar	12/Case
HS11128	1 Gallon Can	1

## Red Epoxy

When you need a sealant you can count on. High Performance, Heat Cured, Two Part, Epoxy Kit

- Exhibits a Color Change When Cured (Turns Gold)
- May Be Cured With a Hot Air Gun or Open Flame in Minutes
- -100°F to 300°F, (-73°C to 149°C)
- Working Pressure in Excess of 3000 PSI
- Tensile Strength: 6000 PSI
- Works on Vertical Surfaces
- Pressure Tested to 3000 PSI
- Simple, Quick Mixing & Application
- Oil, Gas, Fuel & Solvent Resistant
- No Rush, No Wait, You Control Curing Time
- Equipment is Serviceable Immediately
- Use on All Metals and Rigid Plastics
- HVAC & Refrigeration
- Plumbing & Appliances
- Automotive & Marine
- Petrochemical, Manufacturing
- Industrial, Commercial, Institutional



PART NO.	SIZE	PKG
HS12001	Kit Including 2 1/2 oz Tubes	12/Case

## Solderlene

High Quality, Paste Type, Non-Acid Soldering Flux.

- Industrial strength wetting agents to promote solder flow
- For use with low and mid-temp. soft solders, both lead and lead-free
- Effective on all metals except aluminum and magnesium.
- Brush Top Plastic Jars



PART NO.	SIZE	PKG
HS30004	4 oz	12/Case
HS30016	16 oz	12/Case

## Thawzone (New Formula)

The original liquid dehydrant, frees your frozen system in minutes. It seeks out moisture and chemically bonds to it.

- Enhanced moisture control in even the most advanced systems.
- Aids with oil return in low temperature systems.
- Compatible with all refrigerants and refrigeration lubricants.
- Helps prevent the formation of acid.
- No Methanol
- Environmentally Sound

- Safer
- Biodegradable, non-polluting
- Non-Poisonous

PART NO.	SIZE	PKG
HS17001	1 oz	24/Case
HS17004	4 oz	12/Case
HS17016	16 oz	6/Case

Add 1/8 fluid ounce ( 3.75 ml ) of THAWZONE directly to the refrigerant of any system for every 1 lb. of refrigerant in the system.

\*HIGHSIDE SYSTEM INJECTOR (part no. HSINJ001) IS RECOMMENDED FOR INTRODUCING THAWZONE INTO AN OPERATING SYSTEM.

## Spiro Lite UV Bulb

120 Volt Florescent UV Light Source  
For Your Light Trouble

PART NO.	PKG
HSUVB001	1







## Highside System Injector

Use for introducing any liquid into the low side of a charged hermetic system.

- Entirely reusable
- Constructed of rugged aluminum for long life
- Designed for use with any standard manifold gauge and requires no extra valves or fittings
- Drip proof, no spill design takes the mess out of maintenance
- Helps prevent the venting of refrigerants into the atmosphere.
- Prevents the introduction of air into an operating system.
- It can be used on sealed operating systems to avoid shutdowns.
- Use with Trace, Trace 2, Thawzone and Acid Neutralizer
- Compatible with all refrigerants

PART NO.	PKG
HSINJ001	1



## Gas Leak Detector Low Temp

Leaks appear as large strong bubbles which cling to the surface and are fluorescent under a black light.

- Non-freezing
- Fluorescent
- Rated to -30°F (-34°C)
- Non-toxic
- Non-hazardous
- Bubble-type gas leak detector

### Use On:

- Hot and cold piping
- Natural Gas
- Most Gases
- Air
- All Refrigerants

PART NO.	SIZE	TYPE	PKG
<b>LOW TEMP</b>			
HS22008	8 oz	Plastic Bottle w/Dauber	24/Case
HS22032	32 oz	Trigger Sprayer Bottle	12/Case
HS22128	1 Gal.	Plastic Bottle	6/Case
<b>MID TEMP</b>			
HS23008	8 oz	Plastic bottle w/Dauber	24/Case
HS23032	32 oz	Trigger Sprayer Bottle	12/Case
HS23128	1 Gal.	Plastic Bottle	6/Case

## Gas Leak Detector Mid Temp

Same as above except:

- Rated to 27°F (-3°C)



## Trace2

A red penetrant dye in a polyolester base that is completely compatible with all refrigerants and lubricants, old and new. Use to locate the hardest to find leaks under the toughest conditions in low light or dark areas.

- Leaks show as bright red stains
- For refrigeration and hydraulic systems
- Florescent with any ultraviolet light source
- Non-volatile and will not sludge or deposit gum
- Clearly visible, even through ice and frost
- Locates leaks exactly, no false positives

## Trace

A red penetrant dye in a mineral oil base that is completely harmless to refrigeration, air conditioning and hydraulic equipment.

## Hydro Trace

Locate hard-to-find leaks in any closed system containing water and/or antifreeze compounds such as Propylene Glycol and Ethylene Glycol. When added to a system leaks are easily visible as bright red stains under normal lighting conditions and as a bright orange glow when exposed to an ultraviolet light source.

### Applications Include:

- Refrigeration
- Hydronics
- Automotive
- Process Cooling
- Chemically Inert
- Will not harm equipment or seals



WITH SUPERBRITE UV TRACER		
PART NO.	SIZE	PKG
<b>TRACE2</b>		
HS21004	4 oz Plastic Bottle	12/Case
HS21016	16 oz Plastic Bottle	6/Case
HS21128	1 Gallon Can	4/Case
<b>TRACE</b>		
HS20004	4 oz Plastic Bottle	12/Case
HS20016	16 oz Plastic Bottle	6/Case
HS20128	1 Gallon Can	4/Case
<b>HYDRO TRACE</b>		
HS26004	4 oz Plastic Bottle	12/Case
HS26016	16 oz Plastic Bottle	6/Case
HS26128	1 Gallon Can	4/Case

Trace2 and Trace are the easiest and least expensive way to locate leaks in an operating system and are for use in systems where the lubricants travel with refrigerants.



# Chemicals



## Trax

Bubble-type liquid leak detector formulated to produce long lasting bubbles under 'job-site' conditions.

- Clear
- No Cleanup
- Environmentally Friendly
- Evaporates Leaving No Residue
- Temp Range: 27°F to 200°F (-3°C to 93°C).

- Non-Toxic
- Does Not Pit Surfaces
- Detects Leaks as Small as 1 Micron
- Oxygen Compatible



**Meets the performance requirements of Military specifications: MIL 25567 Type I A, B & C.**

PART NO.	SIZE	TYPE	PKG
HS24000	1 1/3 oz	Squeeze Bottle	24/Case
HS24010	10 oz	Squeeze Bottle w/ Extensible Spout	12/Case
HS24128	1 GAL.	Bottle	6/Case



## Dye Wash

Removes any type of leak detecting dye from equipment and Pipe surfaces to prevent false readings during future and follow-up leak detection.

- Non-Toxic
- Environmentally Friendly
- Non-Corrosive
- Easy To Use

PART NO.	SIZE	PKG
HS51032	32 oz Spray Bottle	12/Case

## Oil Checker

Highside Chemicals introduces the newest chemical tool for easily identifying all refrigeration, air conditioning and heat pump lubricants in just seconds.



### Features/Benefits

- Easy to use two step process that identifies all types of oils.
- Test results within seconds
- Each kit includes two complete tests.
- Should be used to check the type of oil in a system before adding any additional oil.
- Compatible with Mineral, Alkybenzene and Polyolester type oils.
- Saves time and money by eliminating the need for a refractometer or expensive laboratory tests.
- Avoids the costly mistake of mixing POE and Mineral refrigeration oils.

PART NO.	PKG
HS16501	12/Case



## The Acid Test - 4 COMPLETE TESTS IN EACH KIT

For detecting the presence and formation of acid in air conditioning and refrigeration systems.

- Easy to use
- No Complicated Charts
- Results in Seconds
- Very Inexpensive
- Non-Toxic
- Non-Hazardous
- Accurate Results
- Eliminates Guess Work
- Safe Formula

- Biodegradable
- Non-Flammable
- For use with all Refrigerants

PART NO.	PKG
HS16001	12/Case

### Simple to Understand Color Change Indicators!

- BLUE OR VIOLET . No Acid Present
- GREEN..... Moderately Acidic
- YELLOW ..... Acidic

## Acid Neutralizer

The BEST Acid Treatment available neutralizes residual acid caused by compressor burnout. *The Cure for Acid Problems.*

- Works Fast
- Circulates Quickly
- Compatible with ALL Lubricants
- Safe, Will Not Harm System Components
- No Complicated Charts
- No Solids or Solid Residuals
- Compatible with ALL Refrigerants
- Neutralizes Acid in Recovery Equipment
- Easy to Use
- Can Prevent Compressor Burnout



A vital part of any preventative maintenance program.

PART NO.	SIZE	PKG
HS18004	4 oz.	12/Case

\* MSDS Sheets are available for all chemicals, visit [www.supco.com](http://www.supco.com)

## Super Flush AC/R Internal System Cleaner

Neutralizes and Removes Acid Caused By Compressor Burnout

- Biodegradable
- Easy to Use
- Cleans in a Single Treatment
- Compatible with All Refrigerants and Refrigeration Oils
- Does Not Contain Halogenated Solvents
- Cleaning Agent for all A/C and Refrigeration Parts
- Environmentally Safe
- Non-Flammable
- Saves Time and Money

### One Treatment Cleans and Removes:

- Sludge
- Gum
- Debris
- Moisture
- Carbon Deposits
- Tar
- Grease
- Organic Acids
- Soot
- Mineral Acids

### Use:

- Before a system retrofit
- After a compressor burnout
- Recovery, Recycling and Reclamation Equipment
- On automotive (Remove immediately)



PART NO.	SIZE	PKG
HS55032	32 oz Plastic Bottle	12/Case
HS55128	1 Gal. Plastic Bottle	6/Case

## Coil Tamer Products Made For The Professionals

### PINK STUFF

Heavy Duty, Foaming, Acid Based Concentrated Liquid Coil Cleaner Foaming Action Pushes Dirt Out of Coils to be Rinsed Away.

- Non Flammable
- Easy to Use
- Non Oily
- Biodegradable

### Cleans and Brightens:

- Condenser Coils
- Evaporator Coils
- Equipment Surfaces

### Effective On:

- Heavy Oxidation
- Mold
- Lint
- Oily Dirt
- Algae
- Mildew
- Grease
- Oils

Easily Applied Using Standard Low Pressure Sprayer

PART NO.	SIZE	PKG
HS58128	1 Gal. Plastic Bottle	4/Case



### GREEN STUFF

Concentrated Alkaline Based Liquid Coil Cleaner

- Non Flammable
- Fast Acting
- Non Oily
- Biodegradable
- Brightens

### For Heavy Duty Cleaning and Degreasing of:

- Condenser Coils
- Evaporator Coils
- Fins
- Permanent Filters
- Equipment Surfaces
- Electronic Cells

### Effective On:

- Grease
- Lint
- Tar
- Mold
- Dirt
- Mildew
- Oil
- Dust
- Algae
- Nicotine

Self Rinsing on Evaporator Coils and is Easily Applied with a Low Pressure Sprayer.

PART NO.	SIZE	PKG
HS59128	1 Gal. Plastic Bottle	4/Case



### EV Coil Max

Powerful Coil Cleaner in Powder Form to Avoid Dangerous Liquid Spills.

- Environmentally Friendly
- Virtually Odorless
- Easy to Use and Clean Up
- Lowers Freight Costs
- Extra Long Shelf Life
- Its powder form is a safer alternative to liquid coil cleaners
- No Acidic Residue
- Fast Acting
- Prevents Corrosion
- Less Storage Space

\*16 oz equals 1 gallon 6:1 (9 lbs or 144oz weight) solution

PART NO.	SIZE	PKG
HS56011	16 oz Plastic Jar	12/Case



### HL Coil Brite Coil Cleaner

Acid Based, Powder Coil Cleaner with Controlled Foaming Action

- Clean the Toughest Coils
- Mild Odor
- Indefinite Shelf Life
- Nonflammable
- Lowers Freight Costs
- Less Storage Space
- Easy to Use
- No Dangerous Liquid Spills
- Makes Old Coils Look New
- Easy Rinse for Quick Cleaning

\*14oz equals 1 gallon 6:1 (9 lbs or 144oz weight) solution

PART NO.	SIZE	PKG
HS57014	14 oz Plastic Bottle	12/Case



# Chemicals



## Coil Blaster Solvent

Solvent Based High Pressure Aerosol Coil Cleaner

- Pleasantly Scented
- Nonflammable
- Degreases
- Fast Drying
- Nonconductive
- Safe To Use On Equipment While Running

- Basting Aerosol Nozzle
- No Residue
- Easy To Use
- No Cleanup

### Use On:

- Evaporator Coils
- Electrical Equipment
- Condenser Coils
- Automotive Parts
- All HVAC/R Equipment
- Electrical Components

### Effective On:

- Dirt
- Grime
- Grease
- Oil

PART NO.	SIZE	PKG
HS58520	18 oz Aerosol Can	12/Case



## HD Jet Foamer Coil Cleaner

Heavy Duty Foaming Coil Cleaner in an aerosol can

- Convenient
- Pleasant Scent
- Environmentally Friendly
- No Ozone Depleters
- 360
- No Chlorinated Solvents
- Easy to Store
- Water Based
- Nonflammable
- Corrosion Inhibitors
- Spray Nozzle

### Use On:

- Evaporator Coils
- Condenser Coils

Will Not Harm Plastics, Metals or Surrounding Equipment

### Quickly and Easily Liquifies:

- Dirt
- Oil
- Deposits
- Grease
- Residues

PART NO.	SIZE	PKG
HS59520	19 oz Aerosol Can	12/Case



## ICEMAX Nickel Safe Ice Machine Cleaner

High Performance Ice Machine Cleaner in a Powder avoids dangerous and messy spills that can damage your facility, vehicles and destroy other valuable inventory. Prevents liquid spills that can attract unnecessary regulatory attention.

- Inhibits Formation of Scale
- Prevents Corrosion
- Environmentally Friendly
- Will Not Separate or Chemically Change Over Time
- Indefinite Shelf Life (When Kept Sealed)
- Saves Freight Costs
- Maximum Scale Removing Power
- No Acidic Residue
- Makes 1 Gallon of Concentrated Cleaner

PART NO.	SIZE	PKG
HS50004	4.4 oz	12/Case



## Filter Fan & Vent Cleaner

Heavy duty cleaner specifically formulated for the heating, ventilation, air-conditioning and refrigeration industry.

- Biodegradable
- Non-Corrosive
- Easy to Use
- Environmentally Friendly
- Non-Toxic
- Safe & Effective

### Removes:

- Dust
- Grease
- Tar Deposits
- Dirt
- Oil

### Use On:

- Electronic Cells
- Permanent Air Filters
- All Vents & Vent Surfaces
- Equipment Surfaces
- Most Air Cleaning Equipment
- Permanent Pre-Filters
- Fan Blades, Plastic & Metal

PART NO.	SIZE	PKG
HS52032	32oz Plastic Spray Bottle	12/Case
HS52128	1 Gal. Plastic Refill	6/Case

## CDC Anti-Clog

Condensate Drainpan Conditioner

Laboratory proven to kill 99% of Legionnaire's Disease bacteria and a broad spectrum of harmful bacteria including those causing the common cold and other respiratory ailments.

- EPA Registered
- Improved Chemical Formulation
- Water activated timed-release
- 3 to 6 months, 24 hours/day service
- Works in equipment of all sizes (Available in 2 Sizes)
- Filter material meters biocide for consistent chemical release
- Sealed, tamper proof housing prevents skin contact w/ biocide
- Designed not to clog drain hole
- Can be placed vertically or horizontally
- Ph neutralizers help protect drainpan against corrosion
- 40% more high efficiency biocide (by weight)

Use CDC ANTI-CLOG\* wherever there is Air Conditioning and Refrigeration Equipment

PART NO.	SIZE	PKG
HS52105	Units up to 5 Tons	24/Case
HS52115	Units up to 15 Tons	12/Case

\* MSDS Sheets are available for all chemicals, visit [www.supco.com](http://www.supco.com)



## ICE BLOCK Heat Transfer & Anti-Freeze

Propylene Glycol based anti-freeze and heat transfer fluid capable of providing pipe burst protection to temperatures as low as -100°F (-73°C). All ingredients are generally regarded as safe by the FDA, making ICE BLOCK the recommended anti-freeze protection where there is possible contact with potable water sources.



- Non-Toxic
- Chemically Stable - Will Not Separate
- Maximum Heat Transfer
- Protects Pipes and Other System Components From Freeze Damage
- Safe and Easy to Use
- Lubricates As It Works
- Safe For Use Where Contact with Potable Water is Possible
- Maximum Corrosion Protection
- Will Not Leave Deposits

### Applications Include:

- Refrigeration Systems
- Chilled Water Systems
- Coil Defrosting
- Ice Making Machines
- Water Based Heat Extraction System
- Snow Melting Systems
- Winterization of Any Water Based Systems
- Hydronic Heating Systems
- Solar Heating & Hot Water Systems
- Cooling Systems & Chillers
- Immersion Freezing
- Air Hydronic, Heat Pumps & Furnaces.
- Process Cooling
- Ground Water Coupled Heat Pumps
- Cooling Towers
- Industrial Heat Transfer Systems
- Fire Hydrant & Sprinkler System

PART NO.	SIZE	PKG
HS15128	1 Gallon	6/Case



## KLEEN-AIR Odor Absorber

- Simply open the spout to absorb and remove all kinds of odors.
- One 8 ounce bottle works for 1 year in a 9' x 12' room

PART NO.	SIZE	PKG
KA12	8 oz.	12/Case



## Epoxy Putty

- Cures Wet or Dry - will cure underwater
- Mixes like clay hardens like steel
- After curing, can be sanded, drilled, tapped, machined, sawn, or painted.
- Initial set in 10 to 15 minutes, hard set 1 hour, with full cure in 24 hours.
- Temperature range -65°F to +250°F
- Works on glass, wood, plastic, fiberglass, tile, concrete, and many more.

PART NO.	DESCRIPTION	QUANTITY PER CARTON	REPLACES GEM NO.
9900H	Tan Epoxy Putty 4" blocks	24	—
9904H	White Epoxy Putty 4" blocks	24	EP8002 Half-size
9904K	White Epoxy Putty 8" blocks	24	EP8002
9906H	Aluminum Epoxy Putty 4" blocks	24	EP8001 Half-size
9906K	Aluminum Epoxy Putty 8" blocks	24	EP8001
9915K	White Fast Set Epoxy Paste	24	—

## English Conversion Factors & Data

### To Convert Measurements

From	To	Multiply By
Cubic Feet	Cubic Inches	1728.
Cubic Inches	Cubic Feet	0.00058
Cubic Feet	Gallons	7.480
Gallons	Cubic Feet	0.1337
Cubic Inches	Gallons	0.00433
Gallons	Cubic Inches	231.
Barrels	Gallons	42.
Gallons	Barrels	0.0238
Imperial Gallons	U.S. Gallons	1.2009
U.S. Gallons	Imperial Gallons	0.8326
Feet	Inches	12.
Inches	Feet	0.0833
Square Feet	Square Inches	144.
Square Inches	Square Feet	0.00695
Short Tons	Pounds	2000.
Liters	U.S. Gallons	0.2642

### To Convert Pressure (at 32° F)

From	To	Multiply By
Inches of Water	Pounds per Sq. Inch	0.03612
Pounds per Sq. Inch	Inches of Water	27.686
Feet of Water	Pounds o Sq. Inch	0.4334
Pounds per Sq. Inch	Feet of Water	2.307
Inches of Mercury	Pounds per Sq. Inch	0.4912
Pounds per Sq. Inch	Inches of Mercury	2.036
Atmospheres	Pounds per Sq. Inch	14.696
Pounds per Sq. Inch	Atmospheres	0.06804

### To Convert Power

From	To	Multiply By
Horsepower	Metric Horsepower	1.014
Horsepower	Ft./Power per Minute	33000.
Horsepower	Kilowatts	0.746
Kilowatts	Horsepower	1.3404
British Thermal Units	Foot/Pounds	778.177
Foot/Pounds	British Thermal Units	0.001285
British Thermal Units	Horsepower Hours	0.0003927
Horsepower Hours	British Thermal Units	2544.1
British Thermal Units	Kilowatt Hours	0.0002928
Kilowatt Hours	British Thermal Units	3415.
Watt Hours	British Thermal Units	3.415

### Volume-Weight Conversions

wt. lbs.

1 Cubic Foot of Water.....	62.4*
1 Cubic Inch of Water.....	0.0361*
1 Gallon of Water .....	8.33*
1 Cubic Foot of Air .....	.075+
1 Cubic Inch of Steel .....	0.284
1 Cubic Foot of Brick (Building) .....	112-120
1 Cubic Foot of Concrete .....	120-140
1 Cubic Foot of Earth .....	70-120

\* at 32° F

+ at 70° F. -29.92" Hg.

## English to Metric Conversion Factors

### To Convert Measurements

From	To	Multiply By
Cubic Feet	Cubic Centimeters	28317.0
Cubic Inches	Cubic Centimeters	16.387
Cubic Feet	Liters	28.32
Gallons	Liters	3.7854
Cubic Inches	Liters	0.0164
Gallons	Cubic Centimeters	3785.4
Barrels	Cubic Meters	1.0551
Imperial Gallons	Cubic Meters	0.0045461
U.S. Gallons	Cubic Meters	0.0037854
Feet	Meters	0.3048
Inches	Meters	0.0254
Square Feet	Square Meters	0.0929
Square Inches	Square Centimeters	6.452
Ton (Short, 2000 lb.)	Kilograms	907.2
Liter	Cubic Meters	0.001
Pounds	Kilograms	0.45359

### To Convert Pressure (at 32° F)

From	To	Multiply By
Inches of Water	Newton/Sq. Meter	249.082
Pounds per Sq. Inch	Newton/Sq. Meter	6894.8
Feet of Water	Newton/Sq. Meter	2988.98
Pounds per Sq. Inch	Kilograms/Sq. Cent	0.07031
Inches of Mercury	Newton/Sq. Meter	3386.4
Pounds per Sq. Inch	Dyne/Sq. Cent.	68948.0
Atmospheres	Newton/Sq. Meter	101325.0
Pascal	Newton/Sq. Meter	1.0

### To Convert Energy, Heat and Power

From	To	Multiply By
Horsepower	Watt	745.7
British Thermal Units	Joule	1054.35
Foot-Pounds	Joule	1.3558
British Thermal Units	Calorie	252.0
British Thermal Units	Watt-Second	1054.35
Watt-Second	Joule	1.0
Calorie	Joule	4.184
Watt-Hours	Joule	3600.0
Kilocalorie/Minute	Watt	69.73
Ton (Refrigeration)	Watt	3516.8
BTU/Hour	Watt	0.29288
BTU/In./Hr. Ft. (2) ° F	Watt/Meter K	0.14413
BTU/Hr. at 10° F TD	Kcal/Hr. at 6° C. TD	0.252
BTU/Hr. at 15° F TD	Kcal/Hr. at 8° C. TD	0.252

### Volume-Weight Conversions

Wt. Kilograms

1 Cubic Foot of Water.....	28.3*
1 Cubic Inch of Water.....	0.0164*
1 Gallon of Water .....	3.788
1 Cubic Foot of Air .....	0.034+
1 Cubic Inch of Steel .....	0.1288
1 Cubic Foot of Brick (Building) .....	51-54
1 Cubic Foot of Concrete .....	54-64
1 Cubic Foot of Earth .....	32-54

\* at 32° F

+ at 70° F. -29.92" Hg.

## Single Phase Heating Element Conversion Chart

240 Volts	208 Volts	120 Volts
6000 Watts	4500 Watts	1500 Watts
5000 Watts	3750 Watts	1250 Watts
4000 Watts	3000 Watts	1000 Watts
3000 Watts	2250 Watts	750 Watts
2500 Watts	1875 Watts	625 Watts
2000 Watts	1500 Watts	500 Watts

**Always use a higher voltage element to replace a lower voltage element  
To calculate the wattage at a lower voltage see formula's below.**

Convert 480V to 240V, Multiply wattage at 480V times 25%.

Convert 240V to 208V, Multiply wattage at 240V times 75%.

Convert 240V to 120V, Multiply wattage at 240V times 25%.

Convert 208V to 120V, Multiply wattage at 208V times 33%.

For use in single phase 60hz. applications only.



### Ohms Law Wheel



This chart shows four ways to figure each value:

Amps (I), Volts (E), Ohms (R), or Watts (W)

#### Example:

A 4800 watt electric heat element is connected to a 240 volt circuit. How many Amps (I) does it draw?

#### Solution:

Locate Amps section of chart-  
 $\frac{\text{Watts (W)}}{\text{Volts (E)}} = \text{Amps (I)}$

Thus  $4800 / 240 = 20$  Amps. Carried further, what is the resistance?

$\frac{\text{Volts}^2 (E^2)}{\text{Watts (W)}} = \text{Ohms (R)}$   $240 \times 240 / 4800 = 12$  Ohms

### Horse Power - Ampere Table

Approximate Horsepower		120 Volts		240 Volts	
		Full Load	Locked Rotor	Full Load	Locked Rotor
1/4	AC	4.4	26.4	2.2	13.2
	DC	—	—	—	—
1/4	AC	5.8	34.8	2.9	17.4
	DC	2.9	29.0	1.5	15.0
1/3	AC	7.2	43.2	3.6	21.6
	DC	3.6	36.0	1.8	18.0
1/2	AC	9.8	58.8	4.9	29.4
	DC	5.2	52.0	2.6	26.0
3/4	AC	13.8	82.8	6.9	41.4
	DC	7.4	74.0	3.7	37.0
1	AC	16.0	96.0	8.0	48.0
	DC	9.4	94.0	4.7	47.0
1 1/2	AC	20.0	120.0	10.0	60.0
	DC	13.2	132.0	6.6	66.0
2	AC	24.0	144.0	12.0	72.0
	DC	17.0	170.0	8.5	85.0
3	AC	34.0	204.0	17.0	102.0
	DC	25.0	250.0	12.2	122.0
5	AC	56.0	366.0	28.0	168.0
	DC	—	—	20.0	200.0
7 1/2	AC	80.0	480.0	40.0	240.0
	DC	—	—	29.0	290.0

\* Locked rotor ratings shown are 6 times full load on AC and 10 times full load on DC. The above chart is offered as a guide only, as all motors do not necessarily come within the maximum ratings shown in the chart.

Thermal Units		
Latent heat of ice	= 144 BTU/lb	= 288,000 BTU/ton
1 ton refrigeration	= 12,000 BTU/hr	= 288,000/24 hours
1 British Thermal Unit (BTU)		= .252 kcal
1 kilo - calorie (kcal)		= 3.97 BTU
1 BTU/lb		= 0.555 kcal/kg
1 watt		= 1.8 BTU/lb
		= 1 kcal/kg°C.
		= 3.413 BTU/hr
Heat, Energy, Work		
1 ft lb	= .001285 BTU	= 0.13826 kg-meter
1 joule	= 1 watt - second	= .000948 BTU
1 BTU	= 778.1 ft lb	= .252 kcal
1 KCAL	= 3.968 BTU	= 1000 cal
1 hp-hr	= .746 kw-hr	= 2544.7 BTU
1 kw-hr	= 1.341 hp-hr	= 3413 BTU
1 boiler horsepower	= 33479 BTU/hr	= Evaporation of 34.5 water/hr at 212° F.

## Approximate Temperature Guide

Application	Average Temperature	Difference Between Coil and Room
Wet produce walk-in	40°	10°
Dry produce walk-in	40°	13°
Produce cases	40°	18°
Mortuary vaults - Blower coil	32° to 35°	18°
Enclosed service meat case	35°	15°
Open shelf service meat case	29°	25°
Dairy case	35° to 38°	25°
Freezer cases - General	-5° to -10°	10°
Ice cream - Holding	-15°	10°
Ice cream - Dipping		
Vanilla	8°	10°
Chocolate	6°	10°
Fruit	4°	10°
Soda fountains - Fruits and syrup	35° to 38°	10°
Air conditioning	75°	40°
Fruit boxes	50° to 55°	20°
Water chillers - Air conditioning	45°	10°
Water coolers - Drinking	38° to 50°	10°
Refrigerators	35°	20°
Biscuit cases	35°	20°
Milk coolers	40°	10°
Work rooms	35° to 50°	10° to 20°

## Temperature Conversion Chart

Fahrenheit	Celsius	Fahrenheit	Celsius
500	260.0	150	65.6
475	246.1	145	62.8
450	232.2	140	60.0
425	218.3	135	57.2
400	204.4	130	54.4
390	198.8	125	51.7
380	193.3	120	48.9
370	187.8	115	46.1
360	182.2	110	43.3
350	176.7	105	40.6
340	171.1	100	37.8
330	165.6	95	35.0
320	160.0	90	32.2
310	154.4	85	29.4
300	148.9	80	26.7
290	143.3	75	23.9
280	137.8	70	21.1
270	132.2	65	18.3
260	126.7	60	15.6
250	121.1	55	12.8
245	118.3	50	10.0
240	115.6	45	7.2
235	112.8	40	4.4
230	110.0	35	1.7
225	107.2	32	0.0
220	104.4	30	-1.1
215	101.7	25	-3.9
212	100.0	20	-6.7
210	98.9	15	-9.4
205	96.1	10	-12.2
200	93.3	5	-15.0
195	90.6	0	-17.8
190	87.8	-5	-20.6
185	85.0	-10	-23.3
180	82.2	-15	-26.1
175	79.4	-20	-28.9
170	76.7	-25	-31.7
165	73.9	-30	-34.4
160	71.1	-35	-37.2
155	68.3	-40	-40.0

Conversion Factors:

Fahrenheit to Celsius: Degrees Fahrenheit minus 32 x 5/9 (0.556)

Celsius to Fahrenheit: Degrees Celsius times 9/5 (1.8) plus 32

## Decimal Equivalents

Inch Fraction	Inch Decimal	Millimeters
1/16	0.0625	1.588
5/64	0.07812	1.984
3/32	0.09375	2.381
7/64	0.10937	2.778
1/8	0.1250	3.175
9/64	0.14062	3.572
5/32	0.15625	3.969
11/64	0.17187	4.366
3/16	0.1875	4.763
13/64	0.20312	5.159
7/32	0.21875	5.556
15/64	0.23437	5.953
1/4	0.2500	6.350
17/64	0.26562	6.747
9/32	0.28125	7.144
19/64	0.29687	7.541
5/16	0.3125	7.938
21/64	0.32812	8.334
11/32	0.34375	8.731
23/64	0.35937	9.128
3/8	0.3750	9.525
25/64	0.39062	9.922
13/32	0.40625	10.319
27/64	0.42187	10.716
7/16	0.4375	11.113
29/64	0.45312	11.509
15/32	0.46875	11.906
31/64	0.48437	12.303
1/2	0.5	12.700
33/64	0.51562	13.097
17/32	0.53125	13.494
35/64	0.54687	13.891
9/16	0.5625	14.288
37/64	0.57812	14.684
19/32	0.59375	15.081
39/64	0.60937	15.478
5/8	0.625	15.875
41/64	0.64062	16.272
21/32	0.65625	16.669
43/64	0.67187	17.066
11/16	0.6875	17.463
45/64	0.70312	17.859
23/32	0.71875	18.256
47/64	0.73437	18.653
3/4	0.750	19.050
49/64	0.76562	19.447
25/32	0.78125	19.884
51/64	0.79687	20.241
13/16	0.8125	20.638
53/64	0.82812	21.034
27/32	0.84375	21.431
55/64	0.85937	21.828
7/8	0.875	22.225
57/64	0.89062	22.622
29/32	0.90625	23.019
59/64	0.92187	23.416
15/16	0.9375	23.813
61/64	0.95312	24.209
31/32	0.96875	24.606
63/64	0.98437	25.003
	1.000	25.400

# Refrigerant Temperature Pressure Chart

Figures = Vacuum      Black Figures = Vapor (PSIG)

**Bold Figures = Liquid (PSIG)**

°F	R-12	R-134a	R-401A	R-409A	R-22	R-410A	R-502	R-404A	R-507	R-402A	R-408A	R-717
-50	15.4	18.4	18.5	—	6.2	5.8	0.2	0.0	0.9	1.2	2.4	14.3
-48	14.6	17.7	17.7	—	4.8	6.9	0.7	0.8	1.7	2.1	1.0	13.1
-46	13.8	17.0	17.0	—	3.4	8.0	1.5	1.6	2.6	2.9	.3	12.1
-44	12.9	16.2	16.0	—	2.0	9.2	2.3	2.5	3.5	3.9	1.1	11.0
-42	11.9	15.4	15.0	13.7	0.5	10.4	3.2	3.4	4.5	4.9	1.9	9.9
-40	11.0	14.5	14.5	12.9	0.5	11.7	4.1	5.5	5.5	5.9	2.8	8.7
-38	10.0	13.7	13.5	12.0	1.3	13.0	5.0	6.5	6.5	6.9	3.7	7.4
-36	8.9	12.8	12.5	11.0	2.2	14.4	6.0	7.5	7.6	8.0	4.6	6.1
-34	7.8	11.8	11.5	10.0	3.0	15.9	7.0	8.6	8.7	9.2	5.6	4.7
-32	6.7	10.8	10.6	9.0	4.0	17.3	8.1	9.7	9.9	10.3	6.6	3.2
-30	5.5	9.7	9.0	7.9	4.9	18.9	9.2	10.8	11.1	11.6	7.6	1.6
-28	4.3	8.6	8.3	6.8	5.9	20.5	10.3	12.0	12.4	12.8	8.7	0.0
-26	3.0	7.7	7.0	5.6	6.9	22.2	11.5	13.2	13.7	14.1	9.8	0.6
-24	1.6	6.2	6.0	4.4	7.9	23.9	12.7	14.5	15.0	15.5	11.0	1.7
-22	0.3	4.9	4.5	3.2	9.0	25.7	14.0	15.8	16.4	16.9	12.2	2.6
-20	0.6	3.6	3.5	1.9	10.1	27.5	15.3	17.1	17.8	18.4	13.5	3.6
-18	1.3	2.3	2.0	.5	11.3	29.4	16.7	18.5	19.3	19.9	14.7	4.6
-16	2.1	0.8	0.5	.5	12.5	31.4	18.1	20.0	20.9	21.5	16.1	5.6
-14	2.8	0.3	0.4	1.2	13.8	33.5	19.5	21.5	22.5	23.1	17.5	6.7
-12	3.7	1.1	1.4	2.0	15.1	35.6	21.0	23.0	24.1	24.8	18.9	7.9
-10	4.5	1.9	2.2	2.8	16.5	37.8	22.6	24.6	25.8	26.5	20.4	9.0
-8	5.4	2.8	3.1	3.6	17.9	40.0	24.2	26.3	27.6	28.3	22.0	10.3
-6	6.3	3.6	3.9	4.4	19.3	42.4	25.8	28.0	29.4	30.2	23.6	11.6
-4	7.2	4.5	4.8	5.3	20.8	44.8	27.5	29.8	31.3	32.1	25.2	12.9
-2	8.2	5.5	5.7	6.2	22.4	47.3	29.3	31.6	33.2	34.1	26.9	14.3
0	9.2	6.5	6.7	7.2	24.0	49.8	31.1	33.5	35.2	36.1	28.7	15.7
2	10.2	7.5	8.0	8.2	25.6	52.5	32.9	34.8	37.3	38.1	30.5	17.2
4	11.2	8.5	8.8	9.2	27.3	55.2	34.9	37.4	39.4	40.4	32.3	18.8
6	12.3	9.6	9.9	10.2	29.1	58.0	36.9	39.4	41.6	42.6	34.3	20.4
8	13.5	10.8	11.0	11.3	30.9	60.9	38.9	41.6	43.8	44.9	36.3	22.1
10	14.6	12.0	12.2	12.5	32.8	63.9	41.0	43.7	46.2	47.3	38.3	23.8
12	15.8	13.1	13.4	13.6	34.7	67.0	43.2	46.0	48.5	49.7	40.4	25.6
14	17.1	14.4	14.6	14.8	36.7	70.2	45.4	48.3	51.0	52.5	42.6	27.5
16	18.4	15.7	15.9	16.1	38.7	73.4	47.7	50.7	53.5	54.8	44.9	29.4
18	19.7	17.0	17.2	17.4	40.9	76.8	50.0	53.1	56.1	57.5	47.2	31.4
20	21.0	18.4	18.6	18.7	43.0	80.2	52.5	55.6	58.8	60.2	49.5	33.5
22	22.4	19.9	20.0	20.0	45.3	83.8	54.9	58.2	61.5	63.0	52.0	35.7
24	23.9	21.4	21.5	21.5	47.6	87.4	57.5	60.9	64.3	65.9	54.5	37.9
26	25.4	22.9	23.0	22.9	49.9	91.2	60.1	63.6	67.2	68.9	57.1	40.2
28	26.9	24.5	24.6	24.4	52.4	95.1	62.8	66.5	70.2	72.0	59.8	42.6
30	28.5	26.1	26.2	26.0	54.9	99.0	65.6	69.4	73.3	75.1	62.5	45.0
32	30.1	27.8	27.9	27.6	57.5	103.1	68.4	72.3	76.4	78.3	65.3	47.6
34	31.7	29.5	29.6	29.2	60.1	107.3	71.3	75.4	79.6	81.6	68.2	50.2
36	33.4	31.3	31.3	30.9	62.8	111.6	74.3	78.5	82.9	85.0	71.2	52.9
38	35.2	33.2	33.2	32.7	65.6	116.0	77.4	81.8	86.3	88.5	74.2	55.7
40	36.9	35.1	35.0	34.5	68.5	120.5	80.5	85.1	89.8	92.1	77.4	58.6
42	38.8	37.0	37.0	36.3	71.5	125.1	83.8	88.5	93.4	95.7	80.6	61.6
44	40.7	39.1	39.0	38.2	74.5	129.9	87.0	91.9	97.0	99.5	83.9	64.5
46	42.7	41.1	41.0	40.2	77.6	134.8	90.4	95.5	100.8	103.4	87.3	67.9
48	44.7	43.3	43.1	42.2	80.7	139.8	93.9	99.2	104.6	107.3	90.7	70.9
50	46.7	45.5	45.3	44.3	84.0	144.9	97.4	102.9	108.6	111.4	94.3	74.5
52	48.8	47.7	47.0	46.6	87.3	150.2	101.0	109.0	112.6	120.0	99.4	77.7
54	51.0	50.1	50.0	49.2	90.8	155.6	104.8	113.0	116.7	124.0	103.0	81.5
56	53.2	52.3	52.0	51.0	94.3	161.1	108.6	117.0	121.0	129.0	107.1	85.0
58	55.4	55.0	54.0	53.0	97.9	166.7	112.4	121.0	125.3	133.0	111.0	89.0
60	57.7	57.5	56.0	55.0	101.6	172.5	116.4	125.0	129.7	138.0	113.5	92.9
62	60.1	60.1	58.0	57.0	105.4	178.5	120.4	130.0	134.3	142.0	119.2	96.9
64	62.5	62.7	60.0	59.0	109.3	184.5	124.6	134.0	139.0	147.0	123.5	100.7
66	65.0	65.5	62.0	61.0	113.2	190.7	128.8	139.0	143.7	152.0	127.0	105.3
68	67.6	68.3	64.0	63.0	117.3	197.1	133.2	144.0	148.6	157.0	132.0	109.3
70	70.2	71.2	66.0	65.0	121.4	203.6	137.6	148.0	153.6	160.4	135.1	114.1
72	72.9	74.2	68.0	67.0	125.7	210.3	142.2	153.0	158.7	168.0	141.5	118.7
74	75.6	77.2	70.0	69.0	130.0	217.1	146.8	158.0	163.9	173.0	146.2	123.4
76	78.4	80.3	72.0	71.0	134.5	224.0	151.5	164.0	169.3	179.0	151.0	128.3
78	81.3	83.5	74.0	73.0	139.0	231.1	156.3	169.0	174.7	184.0	156.0	133.2
80	84.2	86.8	76.0	75.0	143.6	238.4	161.2	174.0	180.3	190.0	159.4	138.3
82	87.2	90.2	78.0	77.0	148.4	245.9	166.2	180.0	186.0	196.0	166.4	143.6
84	90.2	93.6	80.0	79.0	153.2	253.5	171.4	185.0	191.9	202.0	171.0	149.0
86	93.3	97.1	82.0	81.0	158.2	261.2	176.6	191.0	197.8	208.0	177.0	154.5
88	96.5	100.7	84.0	83.0	163.2	269.2	181.9	197.0	203.9	214.0	182.0	160.1
90	99.8	104.4	86.0	85.0	168.4	277.3	187.4	203.0	210.2	220.0	186.4	165.9
92	103.1	108.2	88.0	87.0	173.7	285.5	192.9	209.0	216.6	227.0	194.2	171.9
94	106.5	112.1	90.0	89.0	179.1	294.0	198.6	215.0	223.1	234.0	200.1	178.0
96	110.0	116.1	92.0	91.0	184.6	302.6	204.3	222.0	229.8	240.0	206.2	184.2
98	113.5	120.1	94.0	93.0	190.2	311.4	210.2	229.0	236.6	247.0	212.3	190.6
100	117.2	124.3	96.0	95.0	195.9	320.4	216.2	235.0	243.5	254.0	216.6	197.2
102	120.9	128.5	98.0	97.0	201.8	329.6	222.3	242.0	250.6	261.0	225.1	203.4
104	124.7	132.9	100.0	99.0	207.7	339.0	228.5	249.0	257.9	269.0	231.6	210.2
106	128.5	137.3	102.0	101.0	213.8	348.5	234.9	256.0	265.3	276.0	238.3	217.3
108	132.4	142.8	104.0	103.0	220.0	358.3	241.3	264.0	272.9	284.0	245.2	224.4
110	136.4	148.5	106.0	105.0	226.4	368.2	247.9	271.0	280.6	292.0	250.0	232.3
112	140.5	151.3	108.0	107.0	232.8	378.3	254.6	279.0	288.6	299.0	259.2	239.3
114	144.7	156.1	110.0	109.0	239.4	388.7	261.5	286.0	296.6	307.0	266.0	247.0
116	148.9	161.1	112.0	111.0	246.1	399.2	268.4	294.0	304.9	316.0	273.0	254.8
118	153.2	166.1	114.0	113.0	252.9	410.0	275.5	302.0	313.3	324.0	281.0	262.9
120	157.7	171.3	116.0	115.0	259.9	420.9	282.7	311.0	321.9	332.0	286.8	271.7
122	162.2	176.6	118.0	117.0	267.0	432.1	290.1	319.0	330.7	341.0	296.9	279.5
124	166.7	182.0	120.0	119.0	274.3	443.5	297.6	328.0	339.7	350.0	304.9	288.0
126	171.4	187.5	122.0	121.0	281.6	455.1	305.2	336.0	348.9	359.0	313.0	296.8
128	176.2	193.1	124.0	123.0	289.1	466.9	313.9	345.0	358.2	368.0	321.3	305.7
130	181.0	198.9	126.0	125.0	296.8	478.9	320.8	354.0	367.8	377.0	327.4	315.0
132	185.9	204.7	128.0	127.0	304.6	491.2	328.9	364.0	377.6	387.0	338.3	324.2
134	191.0	210.7	130.0	129.0	312.5	503.7	337.1	373.0	387.5	394.6	347.1	333.7
136	196.1	216.8	132.0	131.0	320.6	516.4	345.4	383.0	397.7	406.0	356.0	343.5
138	201.3	223.0	134.0	133.0	328.9	529.4	353.9	392.0	408.1	416.0	365.0	353.4
140	206.6	229.4	136.0	135.0	337.3	542.5	362.6	402.0	418.7	426.0	371.9	365.0
142	212.0	235.8	138.0	137.0	345.8	556.0	371.4	413.0	429.6	436.0	383.7	373.9
144	217.5	242.4	140.0	139.0	354.5	569.6	380.4	423.0	440.6	447.0	393.3	384.4
146	223.1											

# Refrigerant Temperature Pressure Chart

°C	°F	R-12	R-134A	R-401A	R-22	R-410A	R-502	R-404A	R-507
-46	-50	15.4	18.4	18.5	6.2	5.8	0.2	0.0	0.9
-44	-48	14.6	17.7	17.7	4.8	6.9	0.7	0.8	1.7
-43	-46	13.8	17.0	17.0	3.4	8.0	1.5	1.6	2.6
-42	-44	12.9	16.2	16.0	2.0	9.2	2.3	2.5	3.5
-41	-42	11.9	15.4	15.0	0.5	10.4	3.2	3.4	4.5
-40	-40	11.0	14.5	14.5	0.5	11.7	4.1	5.5	5.5
-39	-38	10.0	13.7	13.5	1.3	13.0	5.0	6.5	6.5
-38	-36	8.9	12.8	12.5	2.2	14.4	6.0	7.5	7.6
-37	-34	7.8	11.8	11.5	3.0	15.9	7.0	8.6	8.7
-36	-32	6.7	10.8	10.6	4.0	17.3	8.1	9.7	9.9
-34	-30	5.5	9.7	9.0	4.9	18.9	9.2	10.8	11.1
-33	-28	4.3	8.6	8.3	5.9	20.5	10.3	12.0	12.4
-32	-26	3.0	7.7	7.0	6.9	22.2	11.5	13.2	13.7
-31	-24	1.6	6.2	6.0	7.9	23.9	12.7	14.5	15.0
-30	-22	0.3	4.9	4.5	9.0	25.7	14.0	15.8	16.4
-29	-20	0.6	3.6	3.5	10.1	27.5	15.3	17.1	17.8
-28	-18	1.3	2.3	2.0	11.3	29.4	16.7	18.5	19.3
-27	-16	2.1	0.8	0.5	12.5	31.4	18.1	20.0	20.9
-26	-14	2.8	0.3	0.4	13.8	33.5	19.5	21.5	22.5
-24	-12	3.7	1.1	1.4	15.1	35.6	21.0	23.0	24.1
-23	-10	4.5	1.9	2.2	16.5	37.8	22.6	24.6	25.8
-22	-8	5.4	2.8	3.1	17.9	40.0	24.2	26.3	27.6
-21	-6	6.3	3.6	3.9	19.3	42.4	25.8	28.0	29.4
-20	-4	7.2	4.5	4.8	20.8	44.8	27.5	29.8	31.3
-19	-2	8.2	5.5	5.7	22.4	47.3	29.3	31.6	33.2
-18	0	9.2	6.5	6.7	24.0	49.8	31.1	33.5	35.2
-17	2	10.2	7.5	8.0	25.6	52.5	32.9	34.8	37.3
-16	4	11.2	8.5	8.8	27.3	55.2	34.9	37.4	39.4
-14	6	12.3	9.6	9.9	29.1	58.0	36.9	39.4	41.6
-13	8	13.5	10.8	11.0	30.9	60.9	38.9	41.6	43.8
-12	10	14.6	12.0	12.2	32.8	63.9	41.0	43.7	46.2
-11	12	15.8	13.1	13.4	34.7	67.0	43.2	46.0	48.5
-10	14	17.1	14.4	14.6	36.7	70.2	45.4	48.3	51.0
-9	16	18.4	15.7	15.9	38.7	73.4	47.7	50.7	53.5
-8	18	19.7	17.0	17.2	40.9	76.8	50.0	53.1	56.1
-7	20	21.0	18.4	18.6	43.0	80.2	52.5	55.6	58.8
-6	22	22.4	19.9	20.0	45.3	83.8	54.9	58.2	61.5
-4	24	23.9	21.4	21.5	47.6	87.4	57.5	60.9	64.3
-3	26	25.4	22.9	23.0	49.9	91.2	60.1	63.6	67.2
-2	28	26.9	24.5	24.6	52.4	95.1	62.8	66.5	70.2
-1	30	28.5	26.1	26.2	54.9	99.0	65.6	69.4	73.3
0	32	30.1	27.8	27.9	57.5	103.1	68.4	72.3	76.4
1	34	31.7	29.5	29.6	60.1	107.3	71.3	75.4	79.6
2	36	33.4	31.3	31.3	62.8	111.6	74.3	78.5	82.9
3	38	35.2	33.2	33.2	65.6	116.0	77.4	81.8	86.3
4	40	36.9	35.1	35.0	68.5	120.5	80.5	85.1	89.8
6	42	38.8	37.0	37.0	71.5	125.1	83.8	88.5	93.4
7	44	40.7	39.1	39.0	74.5	129.9	87.0	91.9	97.0
8	46	42.7	41.1	41.0	77.6	134.8	90.4	95.5	100.8
9	48	44.7	43.3	43.1	80.7	139.8	93.9	99.2	104.6
10	50	46.7	45.5	45.3	84.0	144.9	97.4	102.8	108.6
11	52	48.8	47.7	60.0	87.3	150.2	101.0	109.0	112.6
12	54	51.0	50.1	62.0	90.8	155.6	104.8	113.0	116.7
13	56	53.2	52.3	65.0	94.3	161.1	108.6	117.0	121.0
14	58	55.4	55.0	68.0	97.9	166.7	112.4	121.0	125.3
16	60	57.7	57.5	70.0	101.6	172.5	116.4	125.0	129.7
17	62	60.1	60.1	73.0	105.4	178.5	120.4	130.0	134.3
18	64	62.5	62.7	76.0	109.3	184.5	124.6	134.0	139.0
19	66	65.0	65.5	79.0	113.2	190.7	128.8	139.0	143.7
20	68	67.6	68.3	82.0	117.3	197.1	133.2	144.0	148.6
21	70	70.2	71.2	85.0	121.4	203.6	137.6	148.0	153.6
22	72	72.9	74.2	89.0	125.7	210.3	142.2	153.0	158.7
23	74	75.6	77.2	92.0	130.0	217.1	146.8	158.0	163.9
24	76	78.4	80.3	95.0	134.5	224.0	151.5	164.0	169.3
26	78	81.3	83.5	99.0	139.0	231.1	156.3	169.0	174.7
27	80	84.2	86.8	102.0	143.6	238.4	161.2	174.0	180.3
28	82	87.2	90.2	106.0	148.4	245.9	166.2	180.0	186.0
29	84	90.2	93.6	109.0	153.2	253.5	171.4	185.0	191.9
30	86	93.3	97.1	113.0	158.2	261.2	176.6	191.0	197.8
31	88	96.5	100.7	117.0	163.2	269.2	181.9	197.0	203.9
32	90	99.8	104.4	121.0	168.4	277.3	187.4	203.0	210.2
33	92	103.1	108.2	125.0	173.7	285.5	192.9	209.0	216.6
34	94	106.5	112.1	129.0	179.1	294.0	198.6	215.0	223.1
36	96	110.0	116.1	133.0	184.6	302.6	204.3	222.0	229.8
37	98	113.5	120.1	138.0	190.2	311.4	210.2	229.0	236.6
38	100	117.2	124.3	142.0	195.9	320.4	216.2	235.0	243.5
39	102	120.9	128.5	146.0	201.8	329.6	222.3	242.0	250.6
40	104	124.7	132.9	151.0	207.7	339.0	228.5	249.0	257.9
41	106	128.5	137.3	156.0	213.8	348.5	234.9	256.0	265.3
42	108	132.4	142.8	160.0	220.0	358.3	241.3	264.0	272.9
43	110	136.4	146.5	165.0	226.4	368.2	247.9	271.0	280.6
44	112	140.5	151.3	170.0	232.8	378.3	254.6	279.0	288.6
46	114	144.7	156.1	175.0	239.4	388.7	261.5	286.0	296.6
47	116	148.9	161.1	180.0	246.1	399.2	268.4	294.0	304.9
48	118	153.2	166.1	185.0	252.9	410.0	275.5	302.0	313.3
49	120	157.7	171.3	191.0	259.9	420.9	282.7	311.0	321.9
50	122	162.2	176.6	196.0	267.0	432.1	290.1	319.0	330.7
51	124	166.7	182.0	202.0	274.3	443.5	297.6	328.0	339.7
52	126	171.4	187.5	207.0	281.6	455.1	305.2	336.0	348.9
53	128	176.2	193.1	213.0	289.1	466.9	312.9	345.0	358.2
54	130	181.0	198.9	219.0	296.8	478.9	320.8	354.0	367.8
56	132	185.9	204.7	225.0	304.6	491.2	328.9	364.0	377.6
57	134	191.0	210.7	231.0	312.5	503.7	337.1	373.0	387.5
58	136	196.1	216.8	237.0	320.6	516.4	345.4	383.0	397.7
59	138	201.3	223.0	243.0	328.9	529.4	353.9	392.0	408.1
60	140	206.6	229.4	250.0	337.3	542.5	362.6	402.0	418.7
61	142	212.0	235.8	256.0	345.8	556.0	371.4	413.0	429.6
62	144	217.5	242.4	263.0	354.5	569.6	380.4	423.0	440.6
63	146	223.1	249.2	269.0	363.3	583.6	389.5	434.0	451.9
64	148	228.8	256.0	277.0	372.3	597.7	398.9	444.0	462.0
66	150	234.6	263.0	283.0	381.5	612.1	408.4	449.0	475.3

# The E Class Advantage

## Are Compressor Hard Start Devices Needed?

Compressor hard start devices are a luxury item for service technicians to use in rectifying a myriad of compressor start problems. It is true that the majority of hard start device applications result from the marginal voltages delivered by electric utilities during peak demand periods. As the predominant application is air conditioning, the hard start device can serve as an insurance policy for compressor starts when voltages drop to 90% of rated line conditions. The ability to ensure a compressor start under low voltage conditions can serve to minimize the number of “nuisance” service calls and allow a service contractor to focus on true problem events.

As the air conditioning industry has expanded and diversified, numerous types and models of air conditioning units and compressors have entered the marketplace. This diverse proliferation has resulted in the need to provide a one-size-fits-all compressor start device. Investigations recently undertaken by SUPCO indicate that a start device should be closely matched to the compressor, and a one size for all approach may actually cause damage to a compressor if applied incorrectly. All SUPCO technology employs the appropriate safeguards to ensure against compressor damage due to misapplied start devices. This situation does not exist for most other start device manufacturers.

## General Function

It is pertinent to discuss the general application and function of a hard start device. A capacitor in conjunction with a switching device (typically a relay) is introduced across the start windings of a single-phase compressor. Figure 1. illustrates the typical wiring arrangement for a 2-wire and a 3-wire connection.

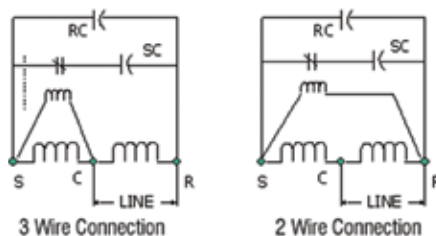


Figure 1. Wiring Configurations

When the compressor is called upon to start, the start capacitor provides a voltage boost to the start winding of the motor (effectively simulating the phasor lead/lag of a three-phase motor) and causes the motor rotor to turn. At some point, when the capacitor is released from the start winding, the motor continues to run.

*In a 3 wire configuration, the potential relay opens at a manufacturer's specified voltage across the start winding of the motor, effectively removing the start capacitor from the circuit. A third wire is necessary to connect to the run winding. In a 2 wire configuration, the potential relay and start capacitor are connected across the run and start winding. The potential relay opens at a specified increment above line voltage, thus removing the start capacitor from the circuit. There is no need for a third wire.*

The size of the capacitor significantly impacts the characteristics of the start winding. Figure 2. shows the generalized impedances for the compressor motor and start devices. As such, the start capacitor should be carefully matched to the specific compressor.

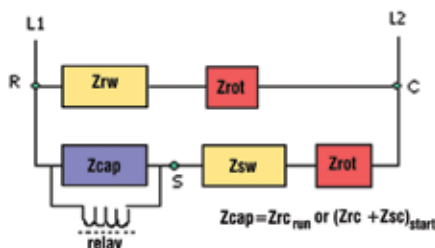


Figure 2.

2 Wire Potential Relay Equivalent Circuit

## Hard Start Technology

Two main types of start devices exist in the marketplace today. SUPCO has developed a full range of products in both types to provide a customer with all applicable choices. Both types have their own desirable applications and each have specific advantages. The two types of start devices discussed below are

1. PTC – Positive Temperature Coefficient devices
2. Potential Relay devices – voltage sensing and current sensing

## PTC Devices

The PTC device has been successfully employed in a number of applications for many years. SUPCO models SPP, SPP5, SPP6, SPP7S employ PTC technology to ensure that the start capacitor has dropped from the start circuit after an appropriate amount of time has elapsed. This device utilizes a ceramic element with a predictable thermal response to the introduction of electric current. As current is introduced across the start windings, the PTC element begins to warm. When the PTC device reaches approximately 250° F (corresponding to 0.6-0.8 seconds), the resistance in the element increases and creates an open switch that releases the start winding from the circuit. The 0.6-0.8 seconds that the PTC device allows the start windings to be engaged is generally enough time to enable the compressor to start. The advantage of this device is its simplicity. A two-wire connection between the run and start terminals on the compressor is all that is required to provide reliable starts in most cases.

However, this device has several limitations that should be considered if the application is critical.

- The PTC device has no ability to sense whether the compressor has actually started.
- The amount of time provided for a start boost is dictated solely by the temperature of the ceramic device, which has warmed due to the introduction of the starting current.
- If the compressor does not start before the temperature threshold has been reached, it will not start until the PTC device cycles through a cool-down period (usually 2 - 3 minutes). Many view this start approach as an appropriate safety measure. The PTC effectively limits the continued unsuccessful cycling of the start windings that can often result in a motor burnout. Others will argue that a start device should be able to re-cycle immediately. If this feature is desired, a PTC is not the correct start device application.

## Potential Relay Devices

The Potential Relay start device has recently been the subject of considerable attention in the market place. Several manufacturers are promoting products with a variety of technologies. The primary distinction between the potential relay devices relates to a voltage sensing or current sensing capability.

The voltage sensing method monitors start winding developed voltage and actuates a mechanical or electronic potential relay to disengage the start capacitor. The electronic potential relay is inherently more reliable and precise than the older type mechanical potential relay. SUPCO employs voltage sensing technology with an electronic potential relay.

The current sensing approach senses current through the run winding and drops the start capacitor out of the circuit based upon a threshold value. Both methods have proven effective in providing devices that are able to “sense” when a compressor has started and thus providing more reliable compressor starts in marginal conditions. However, the current sensing method must employ an internal fuse to protect the motor from potential damage and is more difficult to connect than the 2-wire voltage sensing approach.

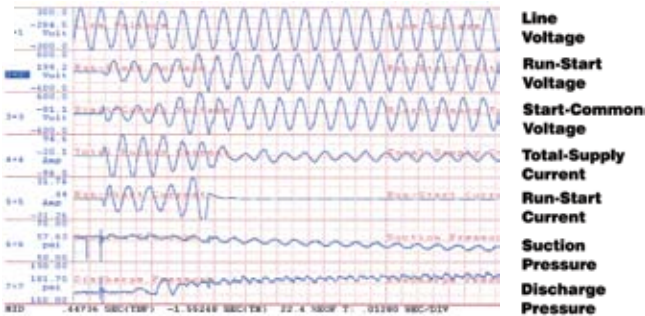
## Capacitor Size

The proliferation of potential relay type devices has resulted in the notion that one capacitor can be employed to start all compressors. That is, use the biggest capacitor and give the compressor a “big kick” to get it started. The sensing characteristic will drop the capacitor out of the start circuit when necessary and thus the compressor will not be harmed. This idea, however, is flawed. The use of a capacitor that is too large for the impedance characteristics of the windings in some compressors can actually result in significant compressor damage. Recent investigations indicate that this situation is particularly evident in voltage sensing devices.

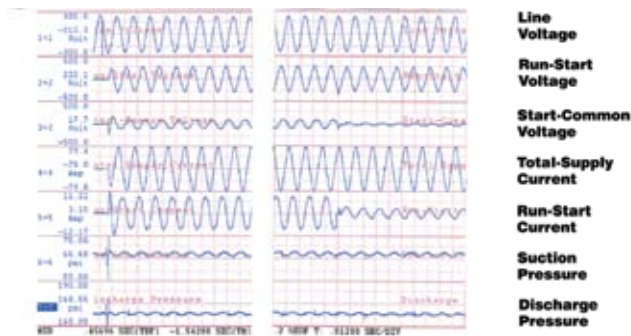


Figure 3. shows a successful compressor start. The run-start and start-common voltages increase to a maximum value and the total supply current drops to operating conditions when the start device is dropped from the circuit. While Figure 4. shows an unsuccessful (locked rotor) compressor start. In this figure, the run-start voltage never increases to a point indicating motor start. The total supply current remains at a maximum and the motor never starts.

**Figure 3. Good Start**

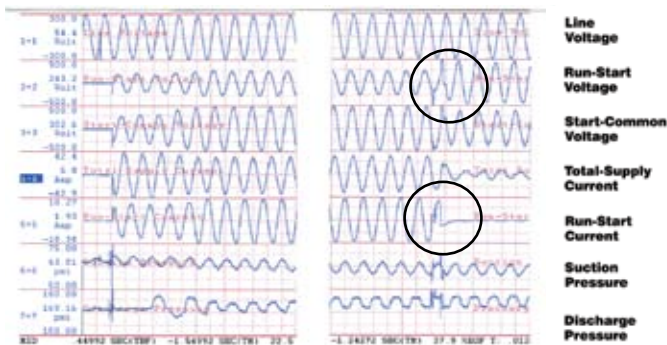


**Figure 4. No Start**



If the start capacitor is too large for the application, the capacitor can actually mask the developed voltage in the start windings and keep the start capacitor in the circuit continuously. Figure 5. illustrates a compressor start with a capacitor that is too large. The motor is actually running, but the run-start voltage is suppressed below the trigger voltage of the start device. As a result, the start capacitor remains in the circuit as the motor runs. A secondary, fail-safe method is necessary to ensure that the start device is ultimately removed from the circuit. This event can be seen at the end of the time duration of the run-start current highlighted in Figure 5.

**Figure 5. Start with Oversized Capacitor with Safety Timing Circuit**



A start device that fails to remove the start capacitor from the circuit has the potential to cause premature failure of the start windings in the compressor.

Figure 6 shows the same compressor start using an oversized capacitor without a safety timing circuit. The run – start voltage is suppressed by the combined characteristics of the motor windings and the extra large capacitor. It never reaches the prescribed threshold voltage defined by the internal relay for removing the start capacitor from the circuit. The total supply current remains near the locked rotor value even after the motor has started (as highlighted in Figure 6).



**Figure 6. Start with Oversized Capacitor with out Safety Timing Circuit**

If the capacitor is never removed from the start windings, premature winding failure could occur. As such, care should be taken when selecting capacitor sizes for an application. Care should also be taken regarding products that tout a “bigger capacitor is better” approach to compressor starting. SUPCO E-Class devices provide a secondary timing safety device to ensure that the start capacitor is dropped from the circuit in a fail-safe mode. Figure 5. also shows that the start winding voltage drops appropriately after the start capacitor has been removed in a SUPCO E-Class device.

### The E Class Advantage

Compressor start devices are available in a variety of forms. Specific applications call for specific products. SUPCO is one of very few manufacturers in the marketplace who provide a complete line of start devices to fit any application. PTC devices fulfill and will continue to fulfill specific needs in the industry. Potential relay devices can be found in a wide assortment. Care should be employed in selecting potential relay devices to ensure that all state-of-the-art developments are included in the product. The SUPCO E-Class Series comprise the most advanced developments in start device technology:

1. Voltage sensing technology that monitors for motor start (current sensing devices require internal fuse protection).
2. A 2-wire connection that simplifies installation
3. A secondary timing circuit that ensures that the capacitor is not permanently left in the start winding circuit
4. A fully electronic device – minimizing the limitations of mechanical devices and secondary fusing associated with triac devices
5. A start device matched with an appropriately sized capacitor to cover the range of compressors for the intended application (one size does not fit all)

The use of compressor start devices results from a need to ensure that a compressor (usually air conditioning) will start under voltage conditions that are less than ideal. As discussed, several options exist in the market to address compressor start concerns. Start devices exist in many forms for specific applications. SUPCO provides a full range of products in all relevant technologies to effectively match the proper start device to the application. Care should be taken to utilize a device that meets the requirements of the job. Extra caution should be observed when employing the “one-size-fits-all” and “a bigger capacitor is better” approach to applying a start device. Consult SUPCO, a manufacturer with a complete product range, to ensure the greatest success in the start device application.

# SUPCO HT Series Cross Reference to Potential Relay & Start Capacitor Combinations

110/220/330 V Capacitor	(88/106) & (108/130) $\mu$ F	(124/149) & (130/157) $\mu$ F (145/175), (161/193), (189/227) $\mu$ F	(216/259) & (270/324) $\mu$ F
<b>Mars Potential Relay &amp; Start Cap</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>
63	HT70	HT80	HT100
64	HT70	HT80	HT100
65	HT70	HT80	HT100
66	HT70	HT80	HT100
67	HT70	HT80	HT100
68	HT70	HT80	HT100
69	HT70	HT80	HT100
70	HT70	HT80	HT100
71	HT70	HT80	HT100
<b>Copeland Potential Relay &amp; Start Cap</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>
040-0001-00	HT70	HT80	HT100
040-0001-01	HT70	HT80	HT100
040-0001-03	HT70	HT80	HT100
040-0001-04	HT70	HT80	HT100
040-0001-05/940-0001-71	HT70	HT80	HT100
040-0001-08	HT70	HT80	HT100
040-0001-09	HT70	HT80	HT100
040-0001-10/940-0001-72	HT70	HT80	HT100
040-0001-11/040-0001-51	HT70	HT80	HT100
040-0001-12/040-0001-64	HT70	HT80	HT100
040-0001-17/040-0001-53	HT70	HT80	HT100
040-0001-18/040-0001-63	HT70	HT80	HT100
040-0001-19/040-0001-54	HT70	HT80	HT100
040-0001-20/040-0001-55	HT70	HT80	HT100
040-0001-22/940-0001-75	HT70	HT80	HT100
040-0001-23/940-0001-76	HT70	HT80	HT100
040-0001-24/940-0001-77	HT70	HT80	HT100
040-0001-25	HT70	HT80	HT100
040-0001-27/940-0001-78	HT70	HT80	HT100
040-0001-30	HT70	HT80	HT100
040-0001-31/040-0001-52	HT70	HT80	HT100
040-0001-34/040-0001-68	HT70	HT80	HT100
040-0001-35/040-0001-59	HT70	HT80	HT100
040-0001-36/040-0001-58	HT70	HT80	HT100
040-0001-37/040-0001-70	HT70	HT80	HT100
040-0001-38/040-0001-60	HT70	HT80	HT100
040-0001-41/040-0001-80	HT70	HT80	HT100
040-0001-43/940-0001-84	HT70	HT80	HT100
040-0001-46/940-0001-85	HT70	HT80	HT100
040-0001-48/940-0001-48	HT70	HT80	HT100
040-0001-49/940-0001-49	HT70	HT80	HT100
040-0001-50/940-0001-50	HT70	HT80	HT100
040-0001-51/940-0001-51	HT70	HT80	HT100
040-0001-52/9400001-52	HT70	HT80	HT100
040-0001-53/940-0001-53	HT70	HT80	HT100
040-0001-54/940-0001-54	HT70	HT80	HT100
040-0001-55/940-0001-55	HT70	HT80	HT100
040-0001-56/940-0001-56	HT70	HT80	HT100
040-0001-57/940-0001-57	HT70	HT80	HT100
040-0001-59/940-0001-59	HT70	HT80	HT100
040-0001-60/940-0001-60	HT70	HT80	HT100
040-0001-61/940-0001-61	HT70	HT80	HT100
040-0001-62/940-0001-62	HT70	HT80	HT100
040-0001-63/940-0001-63	HT70	HT80	HT100
040-0001-64/940-0001-64	HT70	HT80	HT100
040-0001-65/940-0001-65	HT70	HT80	HT100
040-0001-66/940-0001-66	HT70	HT80	HT100
040-0001-67/940-0001-67	HT70	HT80	HT100
040-0001-68/940-0001-68	HT70	HT80	HT100
040-0001-69/940-0001-69	HT70	HT80	HT100
040-0001-70	HT70	HT80	HT100
040-0001-71/940-0001-71	HT70	HT80	HT100
040-0001-72	HT70	HT80	HT100
040-0001-73	HT70	HT80	HT100
040-0001-74	HT70	HT80	HT100
040-0001-75/940-0001-75	HT70	HT80	HT100
040-0001-76	HT70	HT80	HT100
040-0001-77	HT70	HT80	HT100
040-0001-78	HT70	HT80	HT100
040-0001-79/940-0001-79	HT70	HT80	HT100
040-0001-80/940-0001-80	HT70	HT80	HT100
040-0001-82	HT70	HT80	HT100
040-0001-83	HT70	HT80	HT100
040-0001-84	HT70	HT80	HT100
040-0001-85	HT70	HT80	HT100

# SUPCO HT Series Cross Reference to Potential Relay & Start Capacitor Combinations

110/220/330 V Capacitor	(88/106) & (108/130) $\mu$ F	(124/149) & (130/157) $\mu$ F	(145/175), (161/193), (189/227) $\mu$ F	(216/259) & (270/324) $\mu$ F
<b>Copeland Potential Relay &amp; Start Cap</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>
040-0001-85	HT70	HT80	HT100	HT100
040-0001-86	HT70	HT80	HT100	HT100
040-0001-87	HT70	HT80	HT100	HT100
040-0001-88	HT70	HT80	HT100	HT100
040-0001-89	HT70	HT80	HT100	HT100
040-0007-00	HT70	HT80	HT100	HT100
040-0007-02	HT70	HT80	HT100	HT100
040-0007-04/940-0007-04	HT70	HT80	HT100	HT100
040-0046-00/940-0046-18	HT70	HT80	HT100	HT100
040-0046-01/940-0046-19	HT70	HT80	HT100	HT100
040-0046-02	HT70	HT80	HT100	HT100
040-0046-05/999-9999-99	HT70	HT80	HT100	HT100
040-0046-07	HT70	HT80	HT100	HT100
040-0046-08/940-0046-20	HT70	HT80	HT100	HT100
040-0046-09/940-0046-21	HT70	HT80	HT100	HT100
040-0046-10/940-0046-10	HT70	HT80	HT100	HT100
<b>Tecumseh Potential Relay &amp; Start Cap</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>
P82960	HT70	HT80	HT100	HT100
P82961	HT70	HT80	HT100	HT100
P82962	HT70	HT80	HT100	HT100
P82963	HT70	HT80	HT100	HT100
P82964	HT70	HT80	HT100	HT100
P82965	HT70	HT80	HT100	HT100
P82966	HT70	HT80	HT100	HT100
P82967	HT70	HT80	HT100	HT100
P82968	HT70	HT80	HT100	HT100
P82969	HT70	HT80	HT100	HT100
P82970	HT70	HT80	HT100	HT100
P82972	HT70	HT80	HT100	HT100
P82973	HT70	HT80	HT100	HT100
<b>Bristol Potential Relay &amp; Start Cap</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>	<b>SUPCO</b>
650058	HT70	HT80	HT100	HT100
650097	HT70	HT80	HT100	HT100
650143	HT70	HT80	HT100	HT100
650153	HT70	HT80	HT100	HT100
650155	HT70	HT80	HT100	HT100
650160	HT70	HT80	HT100	HT100
650169	HT70	HT80	HT100	HT100
350304	HT70	HT80	HT100	HT100
650409	HT70	HT80	HT100	HT100
650410	HT70	HT80	HT100	HT100
650512	HT70	HT80	HT100	HT100
650567	HT70	HT80	HT100	HT100
650568	HT70	HT80	HT100	HT100
650569	HT70	HT80	HT100	HT100
650570	HT70	HT80	HT100	HT100
650571	HT70	HT80	HT100	HT100
650855	HT70	HT80	HT100	HT100
650879	HT70	HT80	HT100	HT100
650887	HT70	HT80	HT100	HT100
650889	HT70	HT80	HT100	HT100
650919	HT70	HT80	HT100	HT100
650926	HT70	HT80	HT100	HT100
650929	HT70	HT80	HT100	HT100
650942	HT70	HT80	HT100	HT100
950943	HT70	HT80	HT100	HT100
650944	HT70	HT80	HT100	HT100
650945	HT70	HT80	HT100	HT100
650946	HT70	HT80	HT100	HT100
650947	HT70	HT80	HT100	HT100
650948	HT70	HT80	HT100	HT100
650949	HT70	HT80	HT100	HT100
650950	HT70	HT80	HT100	HT100
650951	HT70	HT80	HT100	HT100
650959	HT70	HT80	HT100	HT100
650962	HT70	HT80	HT100	HT100
650965	HT70	HT80	HT100	HT100
650968	HT70	HT80	HT100	HT100
650971	HT70	HT80	HT100	HT100
650972	HT70	HT80	HT100	HT100
650975	HT70	HT80	HT100	HT100
650976	HT70	HT80	HT100	HT100
650977	HT70	HT80	HT100	HT100
650978	HT70	HT80	HT100	HT100
650979	HT70	HT80	HT100	HT100

# SUPCO HT Series Cross Reference to Potential Relay & Start Capacitor Combinations

110/220/330 V Capacitor	(88/106) & (108/130) $\mu$ F	(124/149) & (130/157) $\mu$ F	(216/259) & (270/324) $\mu$ F
White Rodgers/RBM Potential Relay & Start Cap Cross Reference To Supco			
90-1	HT70	HT80	HT100
90-2	HT70	HT80	HT100
90-3	HT70	HT80	HT100
90-4	HT70	HT80	HT100
90-5	HT70	HT80	HT100
90-6	HT70	HT80	HT100
90-7	HT70	HT80	HT100
90-8	HT70	HT80	HT100
90-9	HT70	HT80	HT100
90-10	HT70	HT80	HT100
90-11	HT70	HT80	HT100
90-12	HT70	HT80	HT100
90-13	HT70	HT80	HT100
90-14	HT70	HT80	HT100
90-15	HT70	HT80	HT100
90-16	HT70	HT80	HT100
90-17	HT70	HT80	HT100
90-18	HT70	HT80	HT100
90-19	HT70	HT80	HT100
90-20	HT70	HT80	HT100
90-21	HT70	HT80	HT100
90-22	HT70	HT80	HT100
90-23	HT70	HT80	HT100
90-24	HT70	HT80	HT100
90-25	HT70	HT80	HT100
90-26	HT70	HT80	HT100
90-27	HT70	HT80	HT100
90-40	HT70	HT80	HT100
90-41	HT70	HT80	HT100
90-63	HT70	HT80	HT100
90-64	HT70	HT80	HT100
90-65	HT70	HT80	HT100
90-66	HT70	HT80	HT100
90-67	HT70	HT80	HT100
90-68	HT70	HT80	HT100
90-69	HT70	HT80	HT100

## SUPCO To OEM Cross Reference

SUPCO	Kickstart	Coleman/Fraser Johnson/Luxaire/Source One	
HT70	KS8	024-32005-000	
HT80	TO5	024-31994-000	
HT90	MP1	N/A	
HT100	KS1	024-31995-000	
SUPCO	Intercity Products	Maneurop/Danfoss	Rheem/Ruud
HT70	N/A	N/A	42KS8
HT80	1160725	N/A	42-102004-02-00
HT90	N/A	7305543	N/A
HT100	N/A	N/A	42-102004-01-00
SUPCO	Trane	Whirlpool	York
HT70	N/A	8088840	N/A
HT80	CPT00697	8088838	161485
HT90	N/A	N/A	N/A
HT100	KIT2786	8088839	N/A
SUPCO	Goodman	Lennox	
HT70	N/A	N/A	
HT80	TO5	89P36	
HT90	N/A	N/A	
HT100	KS1	77N48	

## SUPCO To Wholesale Cross Reference

SUPCO	Kickstart	Barsco	Fidelitone
HT70	KS8	N/A	N/A
HT80	TO5	3370020	96--TO-5P
HT90	MP1	N/A	N/A
HT100	KS1	33770010	N/A
SUPCO	Insko	Johnson Supply	Johnstone
HT70	4680110	N/A	B13-545
HT80	4680500	509950	B11-947
HT90	N/A	N/A	B12-856
HT100	4680098	509710	B12-855
SUPCO	Protech		
HT70	42-KS8		
HT80	42-TO5		
HT90	N/A		
HT100	42-KS1		

# SCM/SCMPLUS - Surge Protector Installation, Warranty & Connected Equipment Guarantee Information

## INSTALLATION INSTRUCTIONS:

\*Note: The SCMPLUS uses an LED diagnostics connected at each phase wire to indicate power, ground and surge protection activity.  
LED Sequence

1 LED = 120 VAC L-G operation

2 LED = 240 VAC L-L operation

**These devices do not protect electronic appliances such as TV's, computers, microwaves, etc. They only protect dedicated electromechanical devices such as air conditioners. If whole house protection is required use SUPCO p/n DTK-WH5. Which will protect AC power, coaxial and two telephone lines.**

## WIRING DIAGRAM:

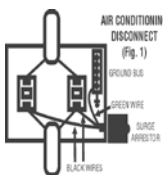
These devices include two black wires and one green wire. A surge protector works by shunting the voltage surge to ground. A good ground is imperative. The National Electric Code (NEC) maximum resistance at ground is 25 ohms.

240 Volt Wiring	120 Volt Wiring
Black to Hot	Black to Hot
Black to Hot	Black to Neutral
Green to Ground	Green to Ground

A/C Disconnect Installation (For HVAC Applications): (Fig. 1)

Although the SCM or SCMPLUS can be installed at the main breaker panel, SUPCO recommends installation at the service disconnect for the A/C condenser. The surge arrester is a simple three (3) wire installation that should take no more than 5 minutes to complete.

1. Turn off the main power to the service disconnect and meter test for safety.
2. Remove a knockout from the disconnect.
3. Remove the retaining ring from the nipple on the SCM or SCM PLUS.
4. Feed the nipple and wire into the service disconnect.
5. Re-secure with the retaining ring.
6. Route the green wire to the Grounding lug and secure.
7. Securely 'Piggyback' them



Once power is restored the green LED will light (SCM PLUS Only) to indicate SURGE PROTECTION PRESENT.

Electrical Panel Installation: (Fig. 2)

1. Turn off main breaker
2. Remove the front cover from the panel.
3. Remove 3/4" knockout on side of panel box.
4. Mount unit through the knockout to the side of the panel.
5. Secure green wire to the grounding bus.
6. Connect the black wires to the load side of the closest two pole breaker.
7. Connected wiring must be kept short.
8. Replace front cover of panel box.

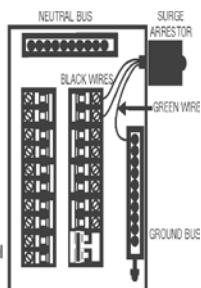
## INSTALLATION TIPS:

1. Never sharply bend the surge arrester wires during termination. Offer the surge as straight a pathway to ground as possible.
2. Always keep the surge arrester wires as short as possible to increase the effectiveness and response time of the unit.
3. Always keep the protector at least 3 ft. from the equipment that you want to protect. This allows response time for the protector to do its job before the transient gets to the protected equipment.

FOR FURTHER INFORMATION  
CONTACT TECHNICAL SUP-

PORT AT  
1-800-333-9125

Electrical Panel  
(Fig. 2)



## LIMITED LIFETIME WARRANTY FOR STANDARD INDOOR RESIDENTIAL AND COMMERCIAL SURGE PROTECTORS

Thank you for choosing a SUPCO surge protection product to protect your equipment. You will be pleased to know that SUPCO surge arrestors will proved you with years of security and protection.

LIMITED LIFETIME WARRANTY AGAINST MANUFACTURING DEFECTS; SUPCO warrants these surge arrestors to be free of all defects in workmanship or material for the lifetime of the original purchaser, and that SUPCO will repair or replace any defective unit. Warranty registration must be filled out complete and mailed to SUPCO within 15 days of installation.

SUPCO surge arrestors are designed to dissipate the damaging effects of momentary voltage spikes or other transient power surges including impulses from lightning. They are not warranted against direct lightning, continuous over voltage, over current nor dropped neutrals.

Proper Installation:

SUPCO AC surge arrestors must be connected in accordance with SUPCO's installation instructions. Building wiring must conform to National Electric Code or Canadian Electric Code. All wires leading into the protected equipment must pass through a single SUPCO surge arrester.

## CONNECTED EQUIPMENT GUARANTEE SUPCO SCM & SCMPLUS

Connected Equipment Guarantee:

SUPCO will replace or pay to repair, up to \$500 per occurrence\* with a lifetime cap of \$10,000, any electromechanical or motor-driven appliance that is damaged by a voltage surge passing through the surge protector to the equipment. The SUPCO Surge Protector must show signs of surge damage or be operating outside of design specifications. In order to be eligible for this connected equipment coverage the surge protector must be installed in the immediate vicinity of the equipment being protected. For instance, an A/C compressor unit must be protected inside the compressor box or no further away than the disconnect. The inside air handler may be protected at the nearest panel box but inside the same building.

**Period of coverage: 3 years from date of installation.**

**\* \$500 per occurrence for the SCM.**

**\* \$1000 per occurrence for the SCMPLUS.**

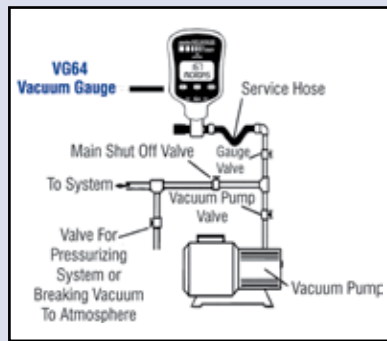
Claim Procedure:

If you want to make a claim you must first contact customer service at 1-800-333-9125 for a return authorization number to return the defective surge protector. You must notify SUPCO at this time if you believe you have a connected equipment claim. SUPCO will send you an information packet to be completed and returned within 20 days. SUPCO reserves the right to inspect the damaged equipment. Once SUPCO has determined that you are entitled to compensation for your claim, SUPCO will at its option, pay the present fair market value of the damaged equipment, send you replacement equipment or pay for the cost of the repair. All of the foregoing is subject to a cap of \$500.00 per occurrence for the SCM and \$1000.00 per occurrence for the SCMPLUS, with a lifetime cap of \$10,000 for both.



## Commercial Refrigeration Condensate Evaporator Pans Cross Reference

SUPCO NO.	FISHER EVAPOWAY P/N	BIRMINGHAM
CP801	DM04T-1S	840111
CP804	DM10M-S1	810134
CP804-240	DM10M-3S	***
CP802	DM08S-1S	880111
CP804HD	DM10W-1D	810114
CP804HD-240	DM10W-3D	***
CP807	DM10W-1S	***
CP815	DM15WW-1D	815134
CP807-240	DM10W-3	810244
CP815-240	DM15WW-3	815244
CP816	DM05W1D	850114
CP817	DM10W2D	810214
CP818	DM10W2S	***
CP819	DM15W1D	815114
CP820	DM15W2D	815214
CP821	DM15WW2D	815234



### Application Note: CONNECTING THE VG64 TO THE VACUUM SYSTEM

A vacuum gauge should be connected to the vacuum system at the vacuum port. The "Auxiliary Port" is primarily for cleaning and should normally be closed with the supplied cap. It is possible to connect the vacuum gauge in-line, however, it may restrict flow and increase the evacuation time.

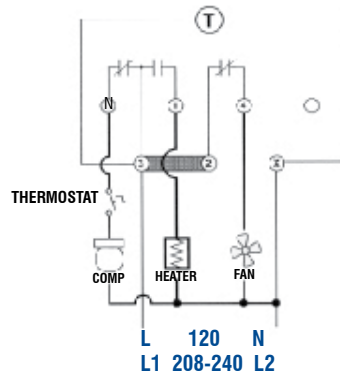
### CHECKING HVAC SYSTEMS FOR LEAKS CHECKING HVAC SYSTEMS FOR

When checking a system for leaks use only copper tubing and a vacuum proof valve. Generally, standard hoses will not hold a vacuum. If using the blank-off valve on the vacuum pump check it for leaks periodically. At the beginning of the test the vacuum gauge reading may increase due to a system equalization. The vacuum reading should hold after a minimum of 5 minutes. If the reading continues to increase it may indicate a leak in the system.

## Commercial Defrost Control Wiring Diagrams

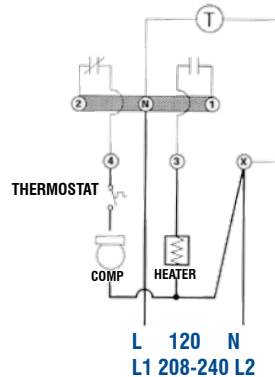
### Wiring Diagrams Electric Heat Defrosting S8041 & S8045 Series

S804100 & S804120



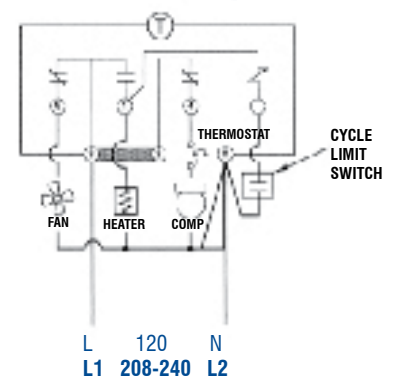
Fan and compressor loads not to exceed 2 hp. Heater not to exceed 4000 watts at 120V AC or 8000 watts at 240V AC.

S804500 & S804520



Heater not to exceed 4000 watts at 120V AC or 8000 watts at 240V AC.

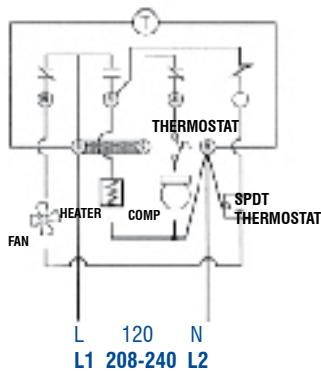
S814100 & S814120



Wiring using 120V or 240V single phase line with auxiliary fan circuit.

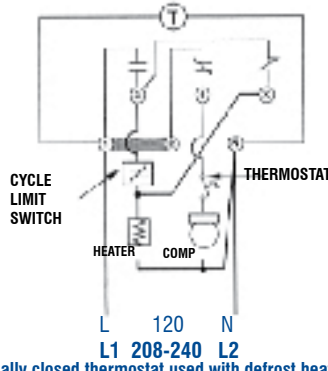
### Wiring Diagrams Electric Heat Defrosting S8141 & S8145 Series

S814100 & S814120



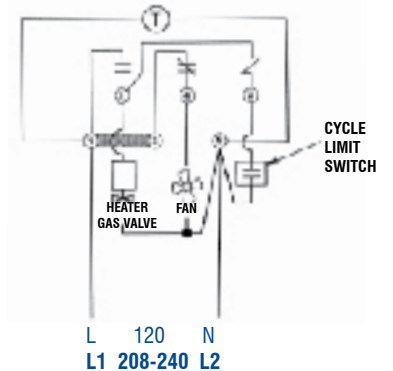
Wiring using differential of SPDT thermostat to delay fan after defrosting.

S814500 & S814520



Normally closed thermostat used with defrost heater. Wiring using 120V or 240V single phase line compressor voltage common to timer.

### Wiring Diagrams Hot Gas Defrosting S8145Series S814500 & S814520



Wiring using 120V or 240V single phase line compressor thermostat closed during defrost.