

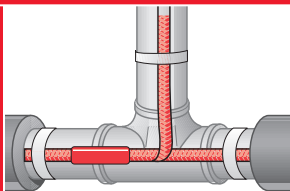
Thermwire®

Freeze Protection Heating Cable

Selection Guide

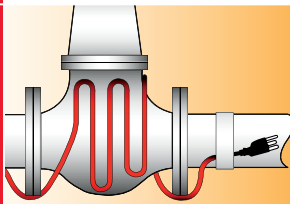
Thermwire - Wrap

Pipe Freeze Protection
Heating Cable



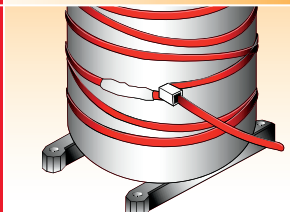
Thermwire - Wrap Pre-Assembled

Pipe Freeze Protection
Heating Cable with Attached
Cord & Plug



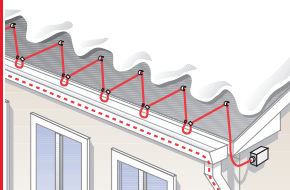
Thermwire - Comp

Refrigeration Compressor
Crankcase Heating Cable



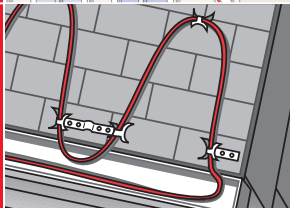
Thermwire - Melt

Roof, Downspout and Gutter
Heating Cable



Accessories

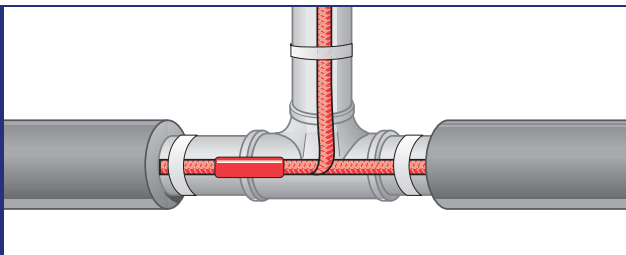
Complete Selection of
Compatible Heating Cable
Accessories for Each
Application



Which cable should I use?

FOR PIPES...

Thermwire®-Wrap



Thermwire-Wrap stops frozen pipes cold!
Apply it anywhere pipes are subject to below-freezing temperatures.



- Use it on plastic or metal pipes up to 8" diameter.
- Water, wastewater and HVAC piping.
- Heat output of 3 Watts/ft or 6 Watts/ft.
- 200 ft circuit lengths for 120 V cable.
- 350 ft circuit lengths for 240 V cable.
- Available in 50 ft and 250 ft reels and 100 ft E-Z Paks.



Construction

- 16 AWG Bus wires
- Self-regulating conductive core
- Insulating jacket
- Metallic braid

Applications

- Metal or plastic pipes (up to 8" diameter)
- Dry environments

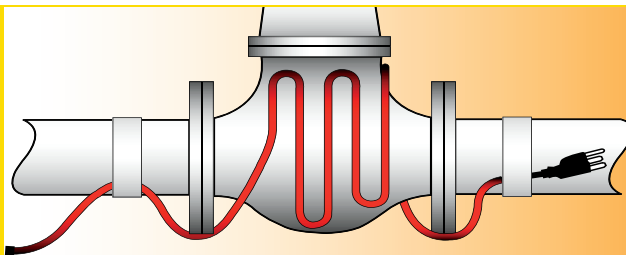
Note: TW-3 is UL Listed for metal pipes only. Insulation must remain dry for insulation to be effective in pipe freeze protection applications.

REFER TO PAGE 5 FOR MORE DETAILED INFORMATION ON SELECTING THE CORRECT CABLE FOR YOUR INSTALLATION.

Which cable should I use?

FOR PIPES...

Thermwire®-Wrap Preassembled



Thermwire-Wrap freeze protection complete with attached cord and plug for simple and quick installation.

- Use on metal or plastic pipes up to 2.5" diameter.
- Outdoor spigots.
- Heat output of 5 Watts/ft.
- Pre-assembled ready for use up to 50 ft in length.
- Includes 3 ft, 120 V, 15 Amp power cord and water tight end seal



Construction

- 20 AWG Bus wires
- Self-regulating conductive core
- Insulating jacket
- Metallic braid
- 3 ft, 120 V, 15 Amp cord set
- Water tight end sea

Applications

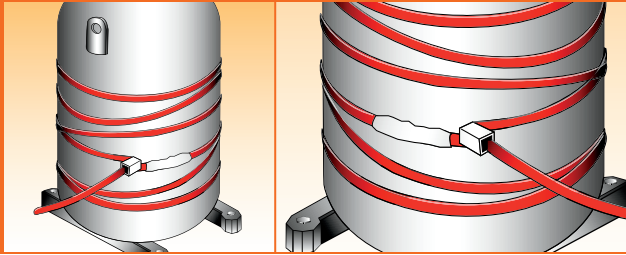
- Water supply lines
- Condensate lines
- Drain lines
- Outdoor spigots

REFER TO PAGE 5 FOR MORE DETAILED INFORMATION ON SELECTING THE CORRECT CABLE FOR YOUR INSTALLATION.

Which cable should I use?

**FOR REFRIGERATION COMPRESSOR
CRANKCASE HEATING**

Thermwire®-Comp



Thermwire-Comp heaters are used to prevent migration of refrigerant into crankcase oil when compressors are operated in cold temperatures. Use of these heaters can prevent excessive wear and loss of refrigerant efficiency.

- Rugged factory sealed water tight connections.
- 120 V and 208-277 V models.
- Self-regulating heater can be closely coiled without burnout.
- Self-regulating heater can be single overlapped without burnout.



Construction

- 16 AWG Bus wires
- Self/regulating conductive core
- Insulating jacket
- Metallic braid
- UV/stabilized waterproof overjacket
- 16 AWG pre stripped power and ground leads
- Water tight end seal
- Zip tie fastener

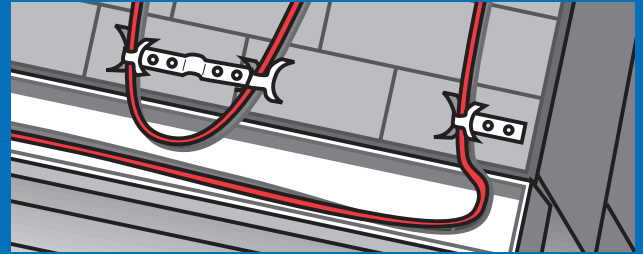
Applications

- Use on compressors up to 48" diameter
- Do not expose heater to temperatures above 150°F

Which cable should I use?

FOR ROOFS, DOWNSPOUTS & GUTTERS

Thermwire®-Melt



Thermwire-Melt prevents costly structural damage to roofs, gutters and downspouts caused by ice and snow. Apply anywhere melting snow and ice can penetrate roof surface and refreeze, lifting shingles, pulling gutters away, and breaking gutters and downspouts.

- Rugged construction assures reliable operation.
- Heat output up to 12 Watts/ft in snow, water and ice.
- 150 ft circuit lengths for 120 V cable.
- 250 ft circuit lengths for 240 V cable.
- Available in 100 ft E-Z Paks, 250, 500 & 1000 ft reels.



Construction

- 16 AWG Bus wires
- Self-regulating conductive core
- Insulating jacket
- Metallic braid
- UV-stabilized waterproof overjacket

Applications

- Roof & Gutter de-icing
- Snow melting
- Metal or plastic pipes (up to 8" dia.)
- Wet environments

**REFER TO PAGE 5 FOR MORE DETAILED INFORMATION ON
SELECTING THE CORRECT CABLE FOR YOUR INSTALLATION.**

How much Thermwire-Wrap do I need?

To select Thermwire-Wrap for pipe applications, use the tables on the opposite page. Use Table 1 for insulated metal pipes and Table 2 for insulated plastic pipes.

- 1) Find your pipe size across the top of the table.
- 2) Read down the left column to find the coldest expected ambient temperature and the insulation thickness you plan to use.
- 3) Follow the table down and across to get the recommended cable type (3 Watts/ft or 6 Watts/ft)
- 4) Straight trace the pipe unless a spiraling ratio is indicated in the cable selection box (Spiraling Ratio 2.5 = 2.5 x total pipe length to be traced).

EXAMPLE

Assume that the Metal Pipe Size for your application is 4”in diameter, the minimum anticipated temperature is -20°F, and you will use a 1” thick insulation.

FIND THERMWIRE TYPE AND SPIRALING RATIO:

Table 1 (upper right) indicates you should use TW6, 6 Watts/ft Thermwire with a spiraling ratio of 1.3.

Spiraling Ratio = 1.3

MEASURE TOTAL PIPE LENGTH:

Assume Total Pipe Length to be traced is 230 ft.

Total Pipe Length= 230 ft

MULTIPLY THE SPIRALING RATIO BY THE TOTAL PIPE LENGTH:

Total TW6 Cable Required = 1.3 x 230 ft = 299 ft

CIRCUIT BREAKER SELECTION TABLE				
TW3-1C WRAP	120V	15A	20A	30A
Start up	0°	240	250	N/R
°F	-20°	200	250	N/R
TW6-1C WRAP	120V	15A	20A	30A
Start up	0°	100	130	200
°F	-20°	85	110	170
TW6-2C WRAP	240V	15A	20A	30A
Start up	0°	150	200	250
°F	-20°	130	175	250

Table 1
Metal Pipe

Min. Ambient Temp.	Insulation Thickness	Pipe Size										
		.50	.75	1.0	1.25	1.5	2.0	2.5	3.0	4.0	6.0	8.0
0°F	0.5								1.3	1.6	2.2	
	1.0										1.2	1.5
	1.5											
-20°F	0.5					1.1	1.3	1.6	1.9	2.3		
	1.0									1.3	1.8	2.2
	1.5										1.3	1.6
	2.0											1.2
-40°F	0.5			1.1	1.3	1.5	1.8	2.1	2.5	3.1		
	1.0							1.2	1.4	1.7	2.4	3.0
	1.5									1.2	1.7	2.1
	2.0										1.3	1.6

Color of box indicates cable type. Number in box indicates spiraling ratio.

	TW3 3 Watts/ft.		TW6 6 Watts/ft.		Not Recommended
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Note: TW3 is UL Listed for metal and plastic pipes. TW6 is UL listed for metal pipe only.

Table 2
Plastic Pipe

Min. Ambient Temp.	Insulation Thickness	Pipe Size										
		.50	.75	1.0	1.25	1.5	2.0	2.5	3.0	4.0	6.0	8.0
0°F	0.5								1.3	1.6	2.2	
	1.0										1.2	1.5
	1.5											
-20°F	0.5					1.1	1.3	1.6	1.9	2.3		
	1.0									1.3	1.8	2.2
	1.5										1.3	1.6
	2.0											1.2
-40°F	0.5			1.1	1.3	1.5	1.8	2.1	2.5	3.1		
	1.0							1.2	1.4	1.7	2.4	3.0
	1.5									1.2	1.7	2.1
	2.0										1.3	1.6

Color of box indicates cable type. Number in box indicates spiraling ratio.

	TW3 3 Watts/ft.		TW6 6 Watts/ft.		Not Recommended
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Note: TW3 is UL Listed for metal and plastic pipes. TW6 is UL listed for metal pipe only.

How do I select a Pre-assembled Thermwire®-Wrap for my application?

THERMWIRE-WRAP PREASSEMBLED

Pipe freeze protection made simple.

To select the type of cable you need see the tables at right. For metal pipe refer to Table 1. For plastic pipe refer to Table 2. Locate the diameter and length of pipe on the appropriate table. The letter at the intersection indicates the model number needed (see key).

IMPORTANT NOTES ON CABLE SELECTION

- 1) All cable selection tables are based on standard installation – cable fastened to pipe and covered with thermal insulation and weather barrier. For any “non-standard” installations please contact Chromalox, Inc. U.S.A. at 800-443-2640.
- 2) The tables assume a minimum ambient temperature of 0°F and a thermal insulation of 1/2” thick fiberglass wrap or equivalent. For protection to – 20° F minimum ambient use 1” thick fiberglass wrap or equivalent.
- 3) Add 1 foot of heating cable for every valve or spigot in the pipeline – make sure to apply this extra cable at each valve/spigot when installing.
- 4) If your pipe diameter does not appear in the table, round up to the next pipe size.
- 5) If your selected cable length is longer than your pipe length – spiral the cable evenly along the length of the pipe.

EXAMPLE

Assume you want to freeze protect a 2 inch diameter, 24 foot metal pipe line.

- Use table 1 for metal pipes
- Read pipe length across the top of the chart – locate 24 ft
- Read down to 2” pipe diameter
- Choose code E, STW51-50P
- Spiral 50 ft, STW51-50P evenly along 24 ft pipe length

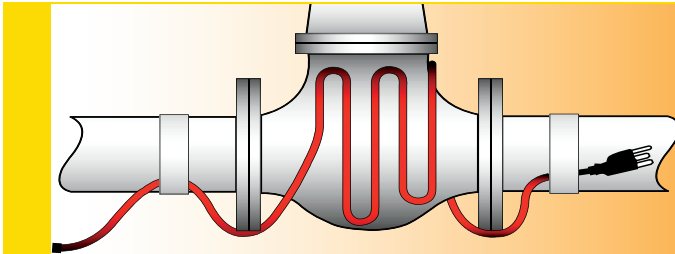
NOTE: All pre-assembled Thermwire-wrap cables should be connected to a minimum 10 Amp GFCI protected circuit breaker.

ITEMS REQUIRED FOR PROPER INSTALLATION

- Thermal insulation - 1/2” Fiberglass® or equivalent
- Weatherproof covering for the insulation
- Glass cloth tape to fasten cable to piping
- Cable tie for power cord strain relief

TOOLS REQUIRED

- Utility knife - used to cut insulation, weather barrier & glass cloth tape
- 2500 VDC megger - used to test electric heating cable insulation resistance



Metal Pipes

(for freeze protection to 0°F minimum ambient with 0.5” insulation of -20°F with 1” insulation)

Key: A = STW51-6P C = STW51-18P E = STW51-50P
B = STW51-12P D = STW51-24P NR = Not Recommended. Consult Factory

Pipe Diameter	Pipe Length	3'	6'	9'	12'	15'	18'	21'	24'	27'	30'	40'	50'
	0.5"	A	A	B	C	C	D	D	E	E	E	E	E
	1.0"	A	A	B	B	C	C	D	D	E	E	E	E
	1.5"	A	A	B	B	C	C	D	E	E	E	E	E
	2.0"	A	A	B	B	C	C	D	E	E	E	E	NR
	2.5	A	B	B	C	C	D	E	E	E	E	E	NR

Plastic Pipes

(for freeze protection to 0°F minimum ambient with 0.5” insulation of -20°F with 1” insulation)

Key: A = STW51-6P C = STW51-18P E = STW51-50P
B = STW51-12P D = STW51-24P NR = Not Recommended. Consult Factory

Pipe Diameter	Pipe Length	3'	6'	9'	12'	15'	18'	21'	24'	27'	30'	40'	50'
	0.5"	A	A	B	B	C	C	D	D	E	E	E	E
	1.0"	A	B	B	C	C	D	D	E	E	E	E	E
	1.5"	A	B	C	C	D	D	E	E	E	E	NR	NR
	2.0"	A	B	C	D	E	E	E	E	E	NR	NR	NR
	2.5	A	C	D	D	E	E	E	NR	NR	NR	NR	NR

How much Thermwire®-Melt do I need?

For roof and gutter applications, use 6 Watt Thermwire- Melt, 120 or 240 Volts (TW6-1CR-Melt or TW6-2CR-Melt). The protective, waterproof outer jacket is suitable for wet applications in downspouts and roof drains.

- 1) To calculate the amount of Thermwire-Melt needed, multiply the roof edge length to be heat traced by the spacing factor. The spacing factor, the feet of cable required per foot of roof edge, is determined by the roof overhang, heating width (A) and heating height (B). Please see illustration and example on opposite page:

Roof Overhang	A	B	Spacing Factor
	Heating Width	Heating Height	
12 inches	2 feet	18 inches	2
24 inches	2 feet	30 inches	3
36 inches	2 feet	42 inches	4

- 2) Add the total gutter length and twice total downspout length to the figure calculated in step 1 to get the total length of cable required.
- 3) Determine how many circuits are required. Divide the total length of cable by the maximum heater length per circuit (see Specifications). Round that number up (for example, 2.1 to 3) to get the total number of circuits.

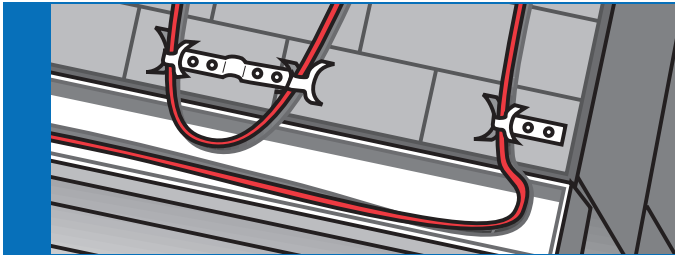
Roof Clips and Downspout Hangers are available to assist in installation (see Accessories on back page).

Note: Agency approval voided if T-Splices are used in roof gutter applications. Allowances for continuous runs must be made.

CIRCUIT BREAKER SELECTION TABLE				
TW6-1CR MELT	120V	15A	20A	30A
Start up °F	0°	90	120	175
	-20°	75	100	150
TW6-2CR MELT	240V	15A	20A	30A
Start up °F	0°	135	185	250
	-20°	85	110	170

FORMULA

$$\begin{aligned} &\text{Roof Edge Length} \times \text{Spacing Factor} \\ &+ \text{Total Gutter Length} \\ &+ (2 \times \text{Total Downspout Length}) \\ &= \text{Total Cable Length} \end{aligned}$$



EXAMPLE

MEASURE ROOF EDGE LEDGE

Assume Roof Edge Length is 100 ft.
Assume that the Roof Overhang for your application is 24 inches. Using the chart in Step 1 (left), you should install the cable with a Heating Width (A) of 2 feet and a Heating Height (B) of 30 inches. The Spacing Factor (from table) would be 3.

Multiply Roof Edge Length (100 ft) x Spacing Factor (3) = 300 ft

MEASURE GUTTERS

Assume Gutter Length is 100 ft.

Gutter Length = 100 ft

MEASURE DOWNSPOUTS

Assume Gutter Length is 12 ft.

Downspout Length x 2 = 12 ft x 2 = 24 ft

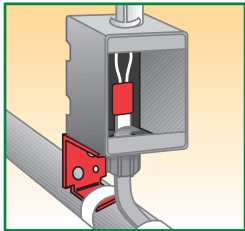
Total Cable Length = 300 ft + 100 ft + 24 ft = 424 ft

To select the circuit breaker size and number of circuits, assume that your ambient start-up temperature is 0°F, you are using 120 V cable, and you are using 30A circuit breakers. The maximum circuit length (from table) would be 175 feet.

Divide the total Cable Length (in this example 424 ft) by the maximum Circuit Length (in the is example 175 ft) to determine the number of circuits.

Total Cable Length 424 ft / Max Circuit Length 175 ft = 2.4 circuits (round up to 3 circuits)

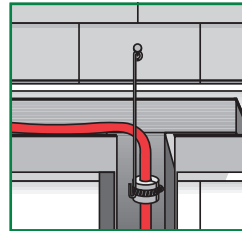
Accessories



POWER CONNECTION KIT

RG-PK-PAK

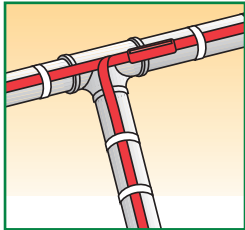
Use to terminate one powered end of Thermwire heating cable. Includes end seal kit and 5 caution labels.



DOWNSPOUT HANGER KIT

RG-RDK-PAK

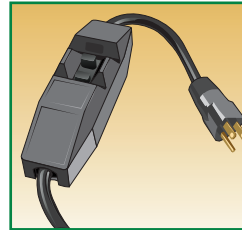
Use to suspend Thermwire-Melt heating cable in a downspout. Protects cable from mechanical damage.



SPLICE & TEE KIT

RG-SK-PAK

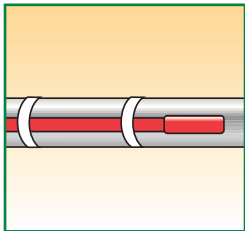
Use to make water resistant seal for connecting two or three heating cables together at one point. Includes materials for two splice or two tee connections.



CORDSET with GFCI

TW-GFI-CS

Use to terminate one Thermwire cable with 3 foot cord set and end seal. Cord set contains GFCI with 27 mA trip, test, reset and power on indicator light.



END SEAL KIT

RG-EK-PAK

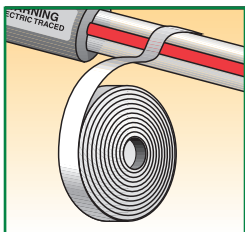
Use to terminate and seal non-powered ends of Thermwire cable. Includes materials for three end seals.



PLUG IN GFI ADAPTER

TW-GFI-PA

Plug in 4-6 mA trip level adapter. Converts standard outlet to GFI protected outlet. For use with Thermwire pre-assembled cables only.



APPLICATION TAPE KIT

ATK-PAK

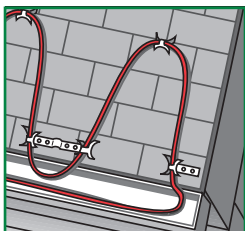
1/2" by 66 ft roll & 10 caution labels. Use to fix Thermwire cables to pipe.



THERMOCUBE OUTLET ADAPTER

TW-TC-35

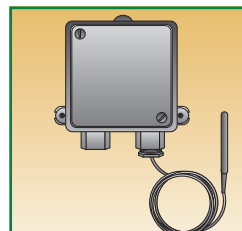
Converts standard outlet to power plus temperature controlled switch. Pre-set to turn power on at 35°F. Power off at 45°F. Measures ambient air temp. Must be located at same temperature as pipe to be protected. Use w/Thermwire pre-assembled cables only.



ROOF CLIP KIT

RG-RCK-PAK

Use to securely attach Thermwire cable to roof surface.



THERMOSTAT

PIT-15

Rain tight bulb and cap thermostat. 0-100°F setpoints. 22 Amp, 120-277 VAC rated.

Accessories

PCN	Model Number	Description	for use with		
			TW-Wrap	TW-Melt	TW-Pre Assembled
386505	RG-PK-PAK	Power Connection Tee	y	y	N
386513	RG-SK-PACK	Splice & Tee Kit	y	y	N
386521	RG-EK-PAK	End Seal Kit	y	y	N
386548	ATK-PAK	Application Tape & Caution Labels	y	y	y
386530	RCK-PAK	Roof Clip Kit	N	y	N
386411	RDK-PAK	Downspout Hanger Kit	N	y	N
193473	TW-GFI-CS	Cordset with GFI	y	y	N
393490	TW-PA-GFI	Plug-In GFI Adapter	N	N	y
393502	TW-TC-35	Thermocube Outlet Adapter	N	N	y
140610	PIT-15	Thermostat (0 – 100°F) 22 amp, 120-277 VAC	y	y	N

Use the table above to choose proper power connection, end-seal and other accessories for your heating cable application.

Installation Tips

Thermwire-Wrap/Thermwire-Melt

- Do not twist bus wires together at end of circuit
- Insulate all conductive parts
- Seal all electrical connections against moisture
- Seal exposed ends of cable during cable installation
- Do not expose cables to temperatures above their maximum ratings
- Install cable with aluminum tape for use on plastic pipes
- Locate temperature sensors in coldest expected area
- Use sufficient cable to trace additional heat sinks (valves, flanges, supports)
- Insure insulation is present, dry, and weatherproofed
- All installations must be wired to Ground Fault Equipment Protection circuit breakers (GFEP 30 mA trip)
- Follow all product installation instructions carefully
- Follow and document all required product start-up tests

Thermwire Pre-Assembled

- Follow all installation instructions carefully
- Follow and document all required product start-up tests
- All installations must be connected to Ground Fault Circuit Protection devices (see Thermwire accessories for suggested ground fault circuit protection devices)
- Insure insulation is present, dry, and weatherproofed
- Do not use extension cords with this product
- Install on outside of pipes only
- Install thermal insulation – fiberglass or equivalent
- Use weatherproof covering for insulation
- Use glass cloth tape to fasten cable to pipe
- Use cable tie for power cord strain relief
- Use GFI protected power receptacle

Installation Tips

Thermwire-Wrap/Thermwire-Melt

- Wire cutters/strippers
- 2500 VDC megger
- Phillips head screw driver
- Standard screw driver
- Multimeter
- Utility knife
- Hammer

Thermwire-Wrap/Thermwire-Melt

- Utility knife
- 2500 VDC megger