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Temporary Earth Stake - TEN

Hand drive the Earth stake for temporary earthing applications.

Features

- Slide hammer drive
- T-Handle lock screw secures sliding shaft for safety, transport and storage (TENW001)
- Non-slip rubber hand grips (TENW001)
- 16mm Stainless steel rod
- Heavy duty top bash cap
- Chiseled tip for easy driving
- Drive rod at a safe working height, minimise risk of back injury
- No pinch points internal hammer design
- 730mm to attachment point

Earth attachment



Earth clamp attachment



Part No.	Length OAL Extended/Retracted (mm)	Attachment Point (mm)	Rod OD (mm)	Wt (kg)
TENW001	1000 / 1040	720	1,4	6
TENW008	1820 / 1340	730	16	5

Earth Rod Drivers - iTOOLco

Part No. Various

Safely drive 9.5mm, 12.7mm, 14mm, 16mm and 19mm Earth rods into the ground in under a minute with iTOOLco's Ground Rod DawgTM. Once the rod is driven down far enough the tool can be used to hammer from top to finish the driving.

Features

- Hardened tool steel construction for long life
- Multiple size rods can be driven
- SDS Max driver bit for positive connection and secure driving of rods



Drive the rod down to a comfortable height



Then complete the driving by hammering from the top

Part No.	Description	Earth Rod Size (mm)	Driver shaft
GRD01	Earth Rod Driver	12.7 to 19	SDS Max
GRDXL34		19	D 11
GRDXL01		25	Demo Hammer

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HV Switch Assemblies



Select Your Switch Type (tick to select)



*Jumpers, Bonders and Clamp Assemblies are for "TEMPORARY USE ONLY" and should not be left exposed for extended periods in outdoor conditions

All switches labelled with rating, part number and serial number



600A, 38kV, 200 BIL, 66kN, with hooks -CHANCE



600A, 38kV, 200 BIL, 66kN, with load break arc chute & hooks - CHANCE



The NGK 2T Locking Grip (AL-2TON-GRIP-L) is ideal for holding conductor tension whilst installing Temporary switches See Pulling & Hauling Section for full details



Select Your Cable

(tick to select) 🗸

Replacement Arc Chute Assembly Part No. E816-0228P



1kV (LV) Dbl Ins Orange/White

35mm² - 172A

50mm² - 217A

70mm² - 273A

95mm² - 329A



1kV (LV) Clear

1/0 - 250A

2/0 - 300A

4/0 - 400A



15kV (HV) Orange

1/0 - 250A

4/0 - 400A





Contact TEN if you require an AMP Rating not listed

Choose a standard length of cable or custom length

1 metre

2 metre

Specify Custom Length

Please Note: Some cable sizes may incur a minimum order length - Please contact TEN for further information Due to metric and AWG cable types, not all combinations of cable and clamps are

Available Clamps

(tick to select) **V**













11190-A



13768

Gloving,

clear, 4-25mm,

400A continuous,

threaded ferrule,

HASTINGS



BPL12

5-19mm, screwdriver handle, M12 hole

USC12-H19

5-19mm, 19mm hex nut drive, M12 hole Duckbill, snap-on, 4-38mm, 400A, threaded ferrule, CHANCE

C600-0197

Duckbill, snap-on, 4-30mm, 400A,

10476

Screw type handle, serrated jaw, 3-32mm, 400A, threaded ferrule, bolted ferrule, **HASTINGS HASTINGS**

Includes Ferrules



2270

Gloving, pair, Orange, 4-32mm 400A continuous, threaded ferrule, Salcor SALISBURY

Includes Lugs

TENA511

TENA512

Jaw to Eye style (J-E), Welded to Jaw to Jaw style (J-J), Welded to ratchet podger, Folding handle ratchet podger, Folding handle

CLICK or SCAN the QR Code to download a copy of this form



Email this form to ales@tengroup.com.au



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Customise Your Jumper Assemblies

TEN custom assembles a range of common Jumpers, Bonders & Switches



Select Your Jumper / Bonder Type (tick to select) ✓







LV Only





Select Your Cable (tick to select)





1kV (LV) Dbl Ins Orange/White

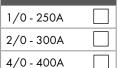
35mm² - 172A

50mm² - 217A

70mm² - 273A

95mm² - 329A











Contact TEN if you require an AMP Rating not listed

Choose a standard length of cable or custom length

2 metre 3 metre Specify Custom Length metres

Please Note: Some cable sizes may incur a minimum order length - Please contact TEN for further information



^{*}Jumpers, Bonders and Clamp Assemblies are for "TEMPORARY USE ONLY" and should not be left exposed for extended periods in outdoor conditions

Notes



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LV Jumpers and Bonders

Common LV Jumper Assemblies



- Double Insulated LV (0.6/1kV) Cable
- Highly flexible Class 6
- Lugged ends
- 5-19mm Screwdriver Handle Clamps
- 2m length Standard
- Custom lengths on request



Part No.	Cable Type	Description
TENA915	35mm² Orange Double Insulated	Jumper, LV, 1kV, 172A, 2.0m leads, 2 x 5-19mm Screwdriver handle clamp
TENA302	50mm² Orange Double Insulated	Jumper, LV, 1kV, 217A, 2.0m leads, 2 x 5-19mm Screwdriver handle clamp
TENA305	70mm ² Orange Double Insulated	Jumper, LV, 1kV, 273A, 2.0m leads, 2 x 5-19mm Screwdriver handle clamp

Common LV Bonder Assemblies



- Double Insulated LV (0.6/1kV) Cable
- Highly flexible Class 6
- Lugged ends
- 4 or 5 x 5-19mm
 Screwdriver Handle
 Clamps
- Custom lengths on request



Part No.	Cable Type	Description
TENA701	35mm ² Orange Double Insulated	Bonder, LV, 1kV, 172A, 1.5m leads, 5 x 5mm-19mm Screwdriver handle clamps
TENA702	70mm ² Orange Double Insulated	Bonder, LV, 1kV, 270A, 1.5m leads, 4 x 5mm-19mm Screwdriver handle clamps
TENA703	70mm ² Orange Double Insulated	Bonder, LV, 1kV, 270A, 1.5m leads, 5 x 5mm-19mm Screwdriver handle clamps

^{*}Jumpers, Bonders and Clamp Assemblies are for "TEMPORARY USE ONLY" and should not be left exposed for extended periods in outdoor conditions

Also Available





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Jumpers Insulated/Protected - 15-69kV

- 15kV rated cable is encapsulated in a 44mm OD fibreglass tube. The fibreglass tube gives additional insulation and mechanical protection for jumpering switch gear, reclosers and cutting in double dead-ends.
- Cable can be removed for inspection and replacement
- Fibreglass hanger brackets allow clamps to be secured for installation and removal of jumper
- Can be installed on wire sizes from 3mm diameter up to and including 32mm diameter
- Ratings 69kV rating applies to area on fibreglass tube between red bands which are from
 ends of the tube. 15kV ratings apply outside the red bands. Ratings apply for accidental
 brush contact only
- Other cable and Tube lengths available. Contact TEN for further information

Part No.	Description	Size AWG (Amps)	Wt (kg)
6752-3	4.26m Cable - 1.8m Tube	2/0 (300)	13.6
6752-7	4.87m Cable - 2.4m Tube	2/0 (300)	14.5

^{*}See Reference Section for further information on AWG









- Can be use as a jumper extension
- Allows line-worker greater control with all jumpering requirements
- Can be installed with all standard shotgun sticks or rubber gloves

Part No.	Fibreglass Dia & Length (mm)	Hanger Bar Dia (mm)	Description	Weight (kg)
\$1600-7	32 x 380	12.7	Chance Insulated jumper holder Fibreglass shaft & metal hanger bar	1.0
3477	32 x 305	12.7	Hastings Insulated jumper holder Fibreglass shaft & hanger bar	0.87
3478	32 x 610	12.7	Hastings Insulated jumper holder Fibreglass shaft & hanger bar	1.2



Earth Lifting Tool - Hastings

Part No. 13763

- Easily lift and lower heavy substation earths with this handy tool
- Reduces manual handling risks
- The earth lifting tool is supplied with a large opening coated "C" hook that has a universal sunrise end fitting
- Comes complete with hand-line block, adjustable block clamp and 15m of 9.5mm polypropylene rope
- The hook and block clamp are mounted on an 2.4m fibreglass pole with a male splice on the bottom end to allow additional lengths of extensions to be added as required.

Reduced Manual Handling Issues



CONTENTS

In-line Disconnect Switch Temporary LV

Folding Handle Ratchet Podger

Part No. TENA 103

- Used for Temporary LV switching
- Enclosed switch
- Double Insulation LV 95mm² Cable 1kV
- Max Current 300Amps

- 300mm Isolating link
- Turnbuckle with folding handle ratchet podger
- Sold in sets



Max Voltage (V)	1000
Cable	95mm ² Copper with clear insulation & clear heat-shrink over lugs
Cable Current (amps)	300 Continuous
Lead Length (mm)	750 each
Switch	Fully enclosed LV
Clamp Range (mm)	3 - 31 <i>.7</i> 5

ALSO AVAILABLE

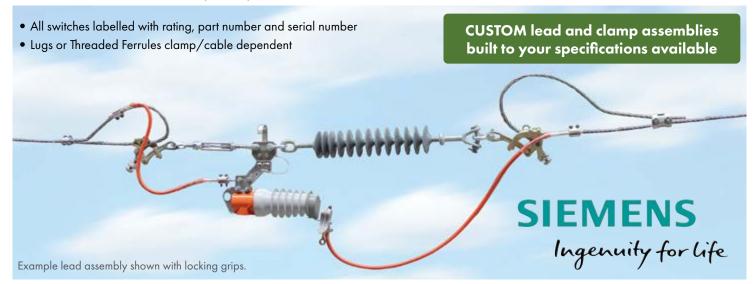
Complete range of substation clamps. Contact TEN for further information



CONTENTS



Portable Switch Unit (PSU) - Siemens



Siemens Portable Switch for Temporary Isolation

Part No. 3AX1350-5A-1F

Whilst traditional in-line tension disconnects provide line crews with a way to temporarily isolate a line at non-designated switching locations, however, the lack of a ganged switching capability creates operational inefficiencies due to:

- Restrictions in load breaking capability.
- Restrictions in load pickup.
- The risk of ferro-resonance due to single phase switching operations.
- The additional time to isolate upstream devices prior to operating the in-line disconnect.

Therefore, it is common that a switching sheet may require an additional 20 or more items to remove load or to provide precautionary isolation prior to breaking bridges or opening the in-line disconnect.

Siemens has addressed all these problems by adapting the switching unit of the proven Fusesaver circuit breaker into a pre-configured 3-phase synchronous portable switch kit. The switch units are suitable for in-line tension mounting for simple installation and visible isolation.

Key User Benefits

- Self powered from on board battery.
- No configuration required.
- Reduced day to day operating cost as switching crews can operate from an EWP or
- Reduced potential for operator error during switching procedures with simple one button operation.
- Complete self contained carry case.
- Access live data from the line using the Siemens Connect PC application

Standards

The Siemens Portable Switch is based on the Fusesaver Circuit Breaker that has been type tested to the applicable requirements of IEC 62271-100.

Kit Details - Part No. 3AX1350-5A-1F

Description	Quantity
Portable Switch Unit	3
Communications Module	6
Charger for Comm Module	3
Line Clamp Assembly	3
PC Antenna Kit	1
Rugged Case	1
Communications Module Attachment Tool	1

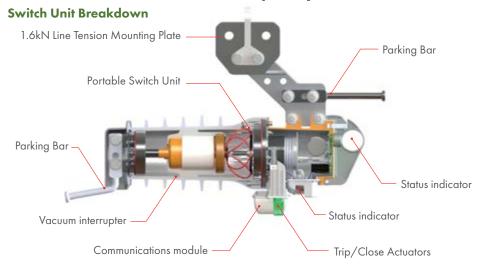
Lead and hardware assembly sold separately.

Rated Voltage (kV)	27
Rated Impulse Withstand Voltage of Portable Switch Unit (kV)	125
Rated power frequency withstand voltage dry (kV)	60
Rated Continuous Current (A)	400
Rated Short Circuit Breaking Current (kA/s)	6.3 @ 0.5
Rated short time current (kA/s)	6.3 @ 0.5
Rated Mechanical Operations	2,000
Working Load Limit (WLL) (kg)	1,600



CONTENTS

Siemens Portable Switch for Temporary Isolation - Cont.





CLICK or SCAN to see the Siemens Portable Switch video made in conjunction with UK Power Networks.

CUSTOM Jumpers, Hardware & Hanging Assemblies built to your specifications by TEN



Accessories



Utilise the Nagaki (NGK) 2 ton double locking grips to secure the conductor during installation.



Quick pin bracket for fast and easy installation.



Leads available with stalk, clamp, ferrule or lug.

Order Guide

ltem	Kit Part No.	Component Part No.	Description	QTY	
		-	Portable Switch Unit	3	
		3AX1350-1E	Communications Module	6	
		3AX1350-1F	Charger for Comm Module	3	
1	3AX1350-5A-1F	3AX1350-3A	Line Clamp Assembly	3	
			3AX1350-1C	PC Antenna Kit	1
		-	Rugged Case	1	
		3AX1350-1G	Communications Module Attachment Tool	1	
Additional Company					

Additional Components				
	Part No. e.g.	Description	QTY	
2	TENK960 (Victoria Spec)*	Line Tension Hanging Assembly	3	
3	Made to order*	Jumper Assemblies	6	
4	TENA949	Quick Pin Bracket	3	
5	AL-2TON-GRIP-L AL-MIDDLE-GRIP-L	Nagaki Grip 5 - 20mm Nagaki Grip 5 - 25mm	6	

 $^{^\}star \textsc{Contact}$ TEN for options on jumpers, hardware & hanging assemblies sold separately.

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See Storage Section for further information





RBG-351R

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Portable Earthing Devices (PED) - Overview

Commonly known as "Earth-sets, Earth-sticks, Earthing Devices, Portable Earthing Devices or PED's". These devices attach temporarily to de-energised conductors or contact points and a known earth.

PED's are safety devices that are type tested and manufactured to withstand the maximum fault current for the specific portion of the network being worked on in the event that the conductor or contact point becomes energised.

PED's are designed so that they provide enough time, usually several milliseconds to carry fault current long enough for a circuit breaker or fuse to interrupt the flow of current. Consult your local network or asset owner for applicable legislative requirements.

Order by completing the adjacent PED sheet

Storage, Care & Maintenance of PED's

Storage

To prolong the life of your PED's they should be:

- Neatly coiled in a protective carry bag
- Stored in a dedicated area away from sharp or heavy objects
- Stored in a cool dry area

Care & Maintenance

PED's should be visually inspected and cleaned with a suitable cleaning product before each use. Ensure that bolted connections are still tight, clamps are operating correctly and that there is no damage to cable or joints.

Remove from service and tag accordingly any PED with visual defects such as:

- Cuts
- Badly mashed or flattened cable
- Cracked or broken ferrules and clamps
- Exposed or broken strands
- Extensively damaged sheath material



SCAN or CLICK to download a copy of the PED order form

- Swollen jacket or soft spots indicating internal corrosion
- PED's should never be modified under any circumstance without the consent of the manufacturer.
- Components and assembly methods used are fault current type tested, so exact manufacturer specifications must be used at all times.

NOTE: PED's are intended to carry fault current once. After being subjected to fault current they should be removed from service and destroyed.

References: IEC 61230, ASTM F855

Cleaner - Rubber Goods

A specially formulated cleaner for removing GREASE - DIRT - CARBON

- No mixing required
- Excellent cleaning power
- Harmless to all elastomers (rubbers)
- Multiple package options
- Environmentally friendly
- Non-toxic and non-corrosive

Rubber Goods cleaner contains no hazardous ingredients and is pH neutral

Part No.	Description
RBG-1	Individual Sachet
RBG-D72	Dispenser of 72 saturated wipes
RBG-35LR	950ml Bottle with sprayer
RBG-128	3.8L Bottle
RBG-640	18.9L Drum



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ORDER FORM				lastas a silva a sa assa sa a		da aa attawa
Network Properti		or quotation,	please enter d	lara where rec	quested or circ	cie sections
Maximum Fault (16 25 33	45 /0.5 S ec	Max	cimum Voltago (LVI
Maximum rauir (16 25 33 cate kA rating	45 / 0.5 Sec		kimum Voltage (ick length purposes	KV)
PED Assembly Typ	oe .					
PED Configuration		₩ 				
Description	3 Phase with separate down-lead	3 Phase with centre attached down-lead	3 Phase trifurcating plate with attached down-lead	Down-lead only, Single	3 Phase linked down-lead	2 Phase, Jumper earth
Cable Type & Leng	gth Required					
2	<u>*</u> Ту	pe of Cable	Aluminium 1. Phase to Phas		opper o Phase3. Ph	ase to Ground
3	Length o	of Cable (m)				
			tly longer cable length th use cable to flick out with			
Phase/Conductor	r Clamps to suit (E	inter a value)				
95000	Circular (mm) Nin OD		Flat B (m Min OD Max OD			ixed Ball Joint DD of Ball (mm) 20 25 Other
Phase/Conductor	r Clamp Fitting					
Snap On	Shotgun Screw	Up Ba	yonet Screw Up			" Handle
¹ Reference Chart over	HEX Screw	Up	Taplin Screw Up	* Stick Leng	yth (m)	Handle
Downlead/Earth	· ·					
	Circular (mm) Nin OD		Flat Bi (mi Min OD Max OD			ixed Ball Joint D of Ball (mm) 20 25 Other
Downlead/Earth	Tail Fitting					
Snap On	Shotgun Screw	Uр Ва	yonet Screw Up			" Handle
¹ Reference Chart over	HEX Screw	Up	Taplin Screw Up	*Stick Leng	gth (m)	Handle
Customer Contact	Details			PED Protecti	•	
Name:	Co	ompany:		- ' '	or TEN can recommend	a suitable bag
Address:				Carry Bag		
Phone No.:	Er	mail:				
Plage	agil this form t	o sales@tener	oup com au			

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ORDER FORM - Reference Chart



Phase Clamps:

Please Note: Other clamps available



Rated to 25kA /0.5 sec

Suitable for - Circular

- 3 to 33mm - Snap-On



MT-815-E*



- 5 to 40mm



MT-815-EH*



Flat - 5 to 40mm



MT-815-5*



- 5 to 40mm



Rated to 10kA $/0.5 \, \mathrm{sec}$ Suitable for

- Circular

- 10 to 30mm

- Snap-On



MT-736-085



- Circular - 16 to 85mm



MT-1921-E

Rated to 45kA $/0.5 \, \mathrm{sec}$

Suitable for - Circular & Ball

- 5 to 40mm



MT-701

Rated to 45kA $/0.5 \, \mathrm{sec}$

Suitable for - Circular

- 12 to 48mm

- Snap-On

Choose the end fitting by changing the PREFIX on the Part No., as indicated above - C = Hex - E = Bayonet - S = Shotgun - EH = Handle

Earth Clamps:

MT-612

Please Note: Other clamps available



MT-840/1

Rated to 16kA /0.5 sec Suitable for - Circular & Flat

- 0 to 25mm



MT-843



- 0 to 35mm

Flat

- Circular &



MT-847



- Flat - 0 to 13mm



MT-870

Rated to 25kA $/0.5\,\mathrm{sec}$ Suitable for

- Circular & Flat

- 0 to 25mm

- Lockable

Fixed Points:



Brass Stubs:

	Rating kA /0.5 sec	Bolt Size	Stub OD (mm)	Stub Length (mm)
M12/22 BRS STUB	25	M12	22	60
M12/25 BRS STUB	25	M12	25	60
M16/22 BRS STUB	45	M16	22	60
M16/25 BRS STUB	45	M16	25	60

Fixed Earthing

Earthing Stubs

Temporary Earth Rod Driver

PED Application Accessories:





Clamp removal adaptor CRA-K **SUNRISE**



MT-630-K **SUNRISE**



SANDBAG-ACC LANYARD 12M

Stick Accessories:

Stick/s	Min Height	Max Height	Ask TEN to re	commend a Kit	
Stick Type	Universal	Shotgun	Bayonet	Hex	
Adaptors	Shotgun	Bayonet	Snap On	Line Clamp	



KRI-TECH



Operate Switches Safely

EARTHING, JUMPERS & SWITCHES

Equipotential Earth Mats

Part No. Various

The Kri-Tech Bond Mat System is designed and high voltage tested to protect workers who come in contact or have the potential for electrical contact.

- Establishes temporary equipotential zone during energised and de-energised work
- Prevents workers from being exposed to hazardous differences in electrical
- Portable, versatile and lightweight
- Non-slip black matting also available ideal for use in wet environments
- Manufactured from high amperage tinned copper braid sewn into grid pattern onto vinyl/polyester fabric

Suitable for a wide range of applications including:

- Making cable terminations on transformers and in cubicles
- Opening or closing overhead air breaks
- Working on control boxes of regulators, reclosers, capacitors, pad mounted switches
- Stringing Operations

Part No.	Size (m)	Colour	Description
KTMNS5-5-1.5NT-A	1.5 x 1.5	Black (Non-slip)	Earth, mat, equipotential, 1.5m lead term to Screwdriver Clamp, Kri-Tech
KTM5-5-1.5NT-A	1.5 x 1.5	Orange	Earth, mat, equipotential, 1.5m lead term to Screwdriver clamp, Kri-Tech
KTM1010-2X1NT-A	3.0 x 3.0	Orange	Earth, mat, equipotential, 2 x 1 m leads term to Screwdriver clamp, Kri-Tech

Non-terminated options available on request Custom Sizes & Options available



Black Non-Slip Mat



See Storage Section for further information



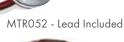


Contact TEN for information on the range of custom Stringing **Machine Earthing solutions**

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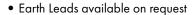






Earths - Stringing (Rolling)

• Consider Conductor OD & Fault Current



 Ideal for stringing c 	and re-conductoring
---	---------------------

Part No.	Description	Conductor OD (mm)	Downlead	Fault Rating (kA/sec)	Manufacturer
MTR052	Stringing Earth	Max 70	6m x 50mm ² CU	10/0.4	Tesmec
9738	Stringing Earth	4.1 to 28.5	*Sold separately	19.1/.05	Hastings
78000	Stringing Earth	3 to 41	*Sold separately	25/0.5	Salisbury
A78000	Stringing Earth with 2 earth studs	3 to 41	*Sold separately	25/0.5	Salisbury

^{*}Contact TEN for your earth lead requirements





Discharge Kits

Discharge Stick - Hastings

- Safely drains capacitive charge after a circuit has been de-energised
- Safely drains static discharge
- Insulating stick with hand-guard and rubber end cap
- Stainless steel hook
- Earth lead included

- Supplied with or without clamp
- Stick tested to ASTM F-711
- Discharge limiting resistor sold separately
- Earth cable is copper with yellow neoprene jacket
- LCM 12H/12 Clamp used

Part No.	Stick Length/OD (mm)	Hook Opening/OD (mm)	Lead Length (mm)	
A1004-CLCM			1.8	
A1006-CLCM	600/32	34.9/6.35	3.0	
A1008-CLCM			6.0	
Part No.	Description	Rating		
6753	Discharge Limiting Resistor	10kV, 10MegOhm		



Volt Meter & Discharge Kit AC System DC Link Capacitor

- Used to safely detect and drain capacitive charge after a circuit has been de-energised
- Detector used to properly measure the AC system DC link voltage before performing any work on any high voltage components, and to provide a discharge procedure for the AC system DC link capacitors in the case of failure of the built-in discharge circuits.

Customisable kits to suit your electric vehicle

Example Kit Includes:

- DVM-80UVM Universal Digital Voltmeter with Second Probe
- 3.65m Coiled Interconnecting Cable
- 2 x Brass Cup Probe Tips
- 1 set Discharge Probes
- 2 x 600mm Extension Sticks

- 2 x 600mm Universal Sticks
- 2 x Hand Guards
- Class 1 Insulating Gloves
- Leather Outer Gloves
- Cotton Inner Gloves
- Carry Case





NOTES