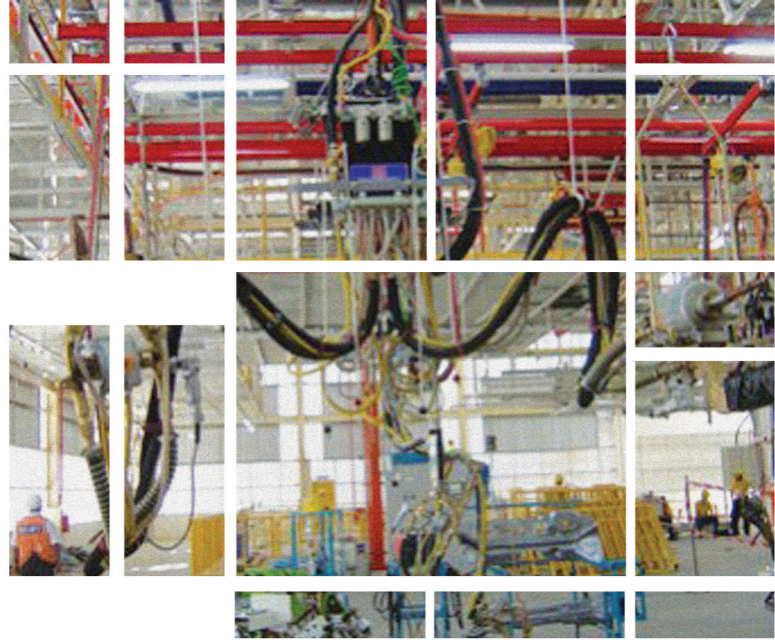


Secondary Cable For Resistance Welding

TSM



INOUE MANUFACTURING CO.,LTD



CONTENT

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• Water Cooling Cable / Water Cooling Cable, Auxiliary Cable	05
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Introduction

TSM Welding has wealth of experience in manufacturing and selling secondary conductor which are used on resistance welders. Regarding Shunts (Movable conductor), we manufacture various sizes of shunts from 20mm width to 150mm width with a central focus on use of transformer guns for Robot.

Water cooling secondary cables can be chosen from a large selection of 100sq, 150sq, 180sq, 200sq, 250sq, 325sq, 400sq and 500sq.

Terminal materials made by cast pure copper which used on water cooling secondary cable and straight type terminals made by Bs'BM are appropriate for various purposes.

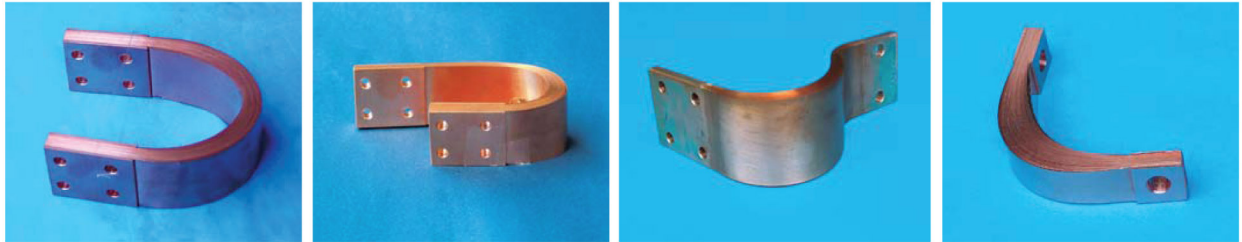
1. TSM secondary cables for resistance welding are developed and manufactured in accordance with the following goals.
2. Reduction of reactance drop in the cable between the transformer and the gun.
3. Creation of cables that have superlative handling and heat resistance characteristics.
4. Achievement of long life and the ability to withstand repeated flexing and electromagnetics kick.
5. Achievement of superlative cooling efficiency for extended periods of continuous use.
6. Concern for structures that allow easy replacement and Inspection for safety.
7. Development of superlative products that can withstand heat, pressure and abrasion.
8. Since secondary cables must be replaced regularly, reduction of the cost of the product.
9. Thorough quality control to assure user satisfaction.



our product

Shunt for Resistance Welding Machines

Standard types of shunt



U TYPE

J TYPE

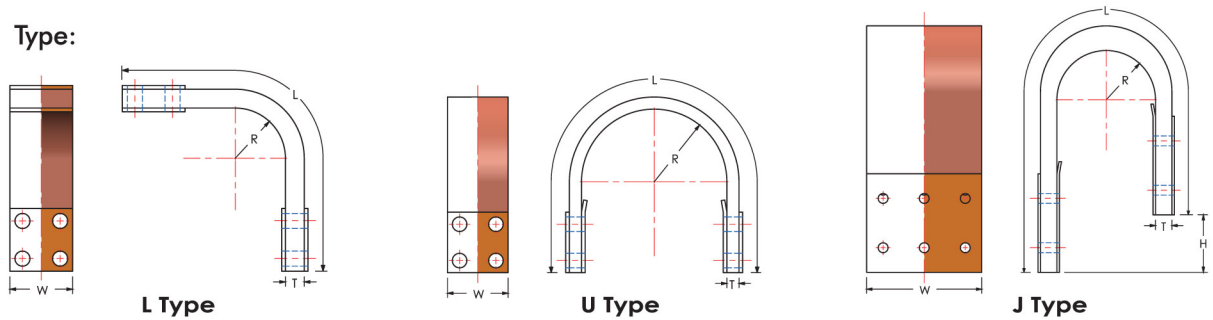
S TYPE

L TYPE

Standard Drawing

Make according to drawing / design

Type:



Hole pattern:

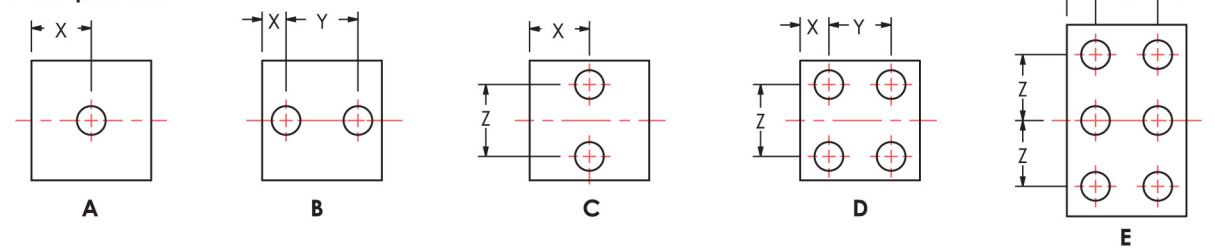
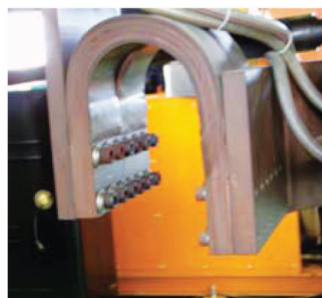


Table of Shunt

Unit: mm

SH	Description
1	W Width
2	T Thickness
3	L Length
4	- Type
5	- Hole Pattern
6	R 1/2 x shunt outside dia.
7	H Height

Code SH- ¹W- ²T- ³L- ⁴L- ⁵A- ⁶R- ⁷H



- Type
- 1: L
- 2: U
- 3: J
- Hole Pattern
- 1: A
- 2: B
- 3: C
- 4: D
- 5: E

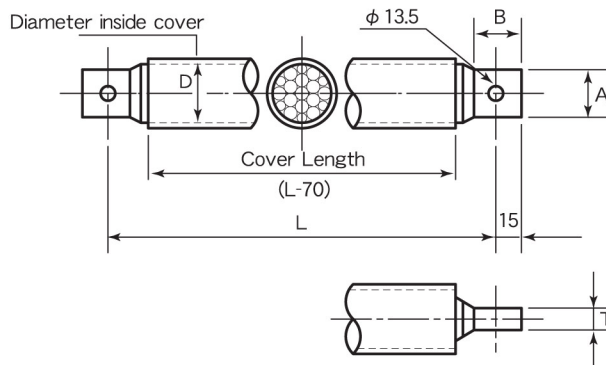
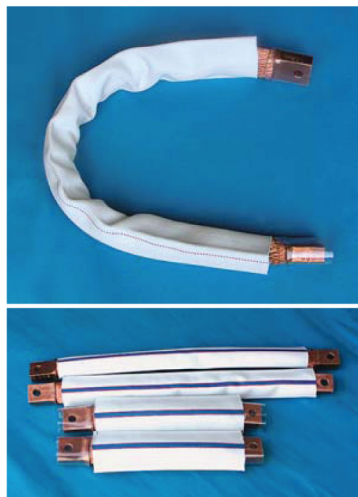
* Shunt sheet thickness width 60mm below - 0.1t

* Shunt sheet thickness width 60mm above - 0.2t

our product

Air Cooling Secondary Cable

Standard types and sizes of Air Cooling secondary cable



Code of model no.(Example) **ACJ - SQ x Lmm**

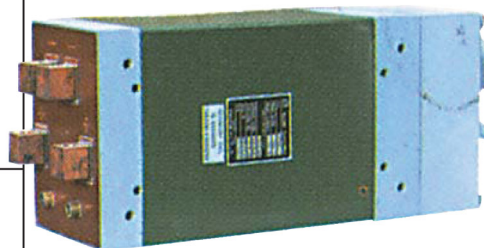
Type Sectional Area Length

Terminal Type and Terminal Direction

FF Type	FFR Type	FL Type	FV Type	LL Type	LV Type	LLO Type	VV Type

Standard Size

Type No	Cross section (sq)	T	D	A	B
WKA-150	150	9.5	32	32	36
WKA-180	180	10.5			
WKA-200	200	11.0			
WKA-250	250	13.0			
WKA-300	300	15.0			
WKA-350	350	17.0	38	38	38
WKA-375	375	18.0			
WKA-400	400	16.0			
WKA-500	500	19.0	43	38	38
WKA-600	600	22.0			
WKA-750	750	26.0			

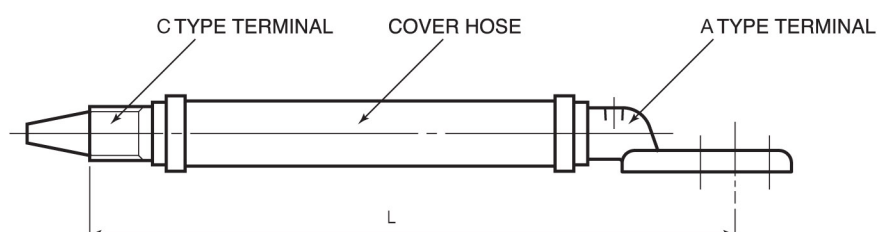


Multi-transformer

Water Cooling Cable



Water cooling cable is elastic and superior to flexibility which makes high workability. That's why these cables are extensively used for many special made welders including portable spot welding, robot welding, multi-welders and welding for reinforcing bars.



Code of Water Cooling Cable WCJ- × × ×

Cross Section Length Terminaltype

Features

1. Superior to cooling effect
2. Excellent in flexibility because of 0.26 size strand, which is specially compounded.
3. Vast ranges of sizes are available. We manufacture 8 types such as 100sq, 150sq, 180sq, 200sq, 250sq, 325sq, 400sq and 500sq.
4. Rubber hoses are good at flexibility and resist pressure.
5. Great varieties of terminal types are available.

Water Cooling Cable, Auxiliary Cable

Features



Two line type water cooling secondary cables are a rubber cable which both way conducting wires are set in.

It is lighter than Kickless cables and superior to flexibility which is the reason of widely used for workability focused portable spot welding.

These cables are features on water cooling effort which are extensively used for high-weld current multi welders and special made machines.

TSM Welding manufactures vast range of sizes from 100sq to 500sq.

We also provide various types of terminals.

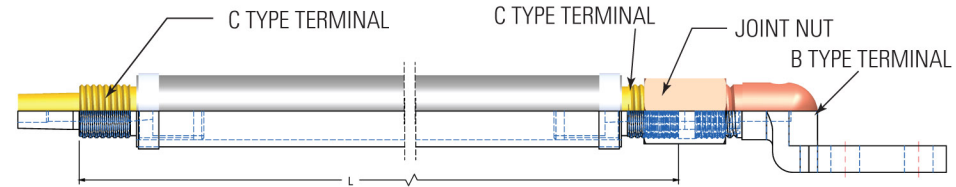
our product

Two-line Type Water Cooling Secondary Cable

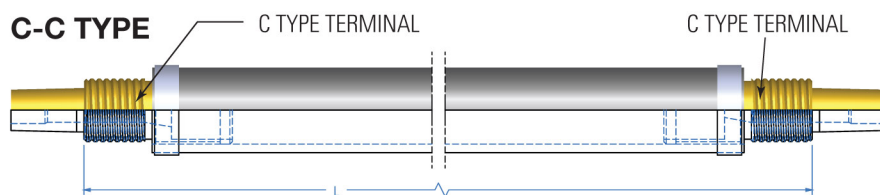


C+B TERMINAL

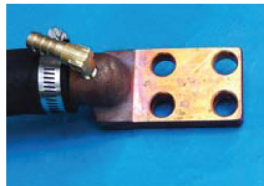
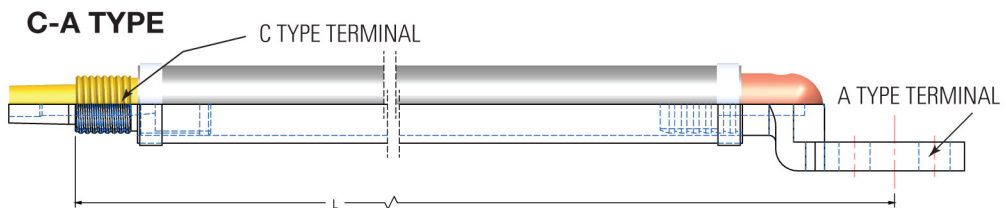
C-C+B TYPE



C-C TYPE

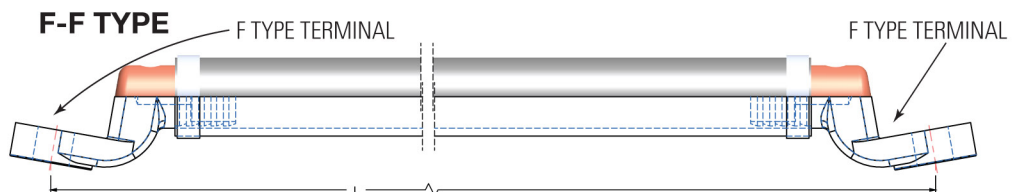


C-A TYPE



A TERMINAL

F-F TYPE



Specification

Cross section(sq)	Length(m)	Gun side Terminal	Trans side Terminal
150 250	0.6 1.5 4.0	C • WF	A, C+B
180	0.8 2.0 5.0		
200	1.0 2.5 6.0		
	1.2 3.0 8.0		
	3.5		

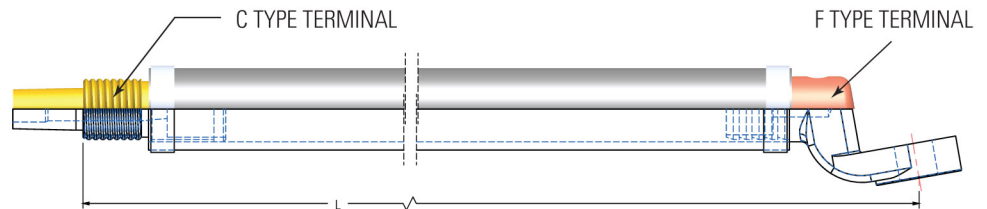
our product

Water Cooling Auxiliary Cable



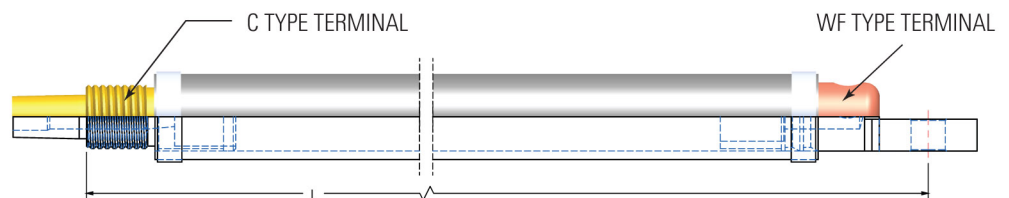
C TERMINAL

C-F TYPE



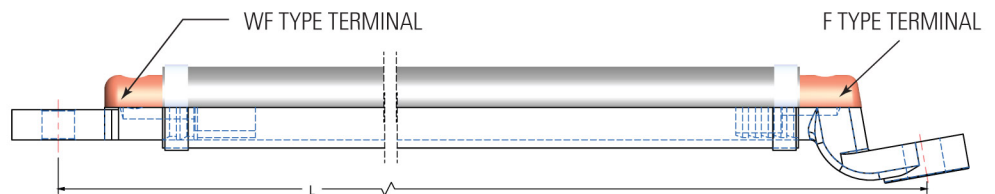
WF TERMINAL

C-WF TYPE



F TERMINAL

WF-F TYPE



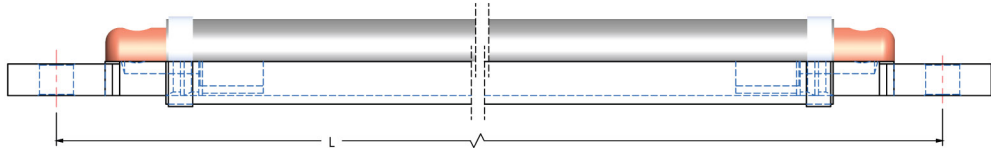
Specification

Cross section(sq)	Length(m)	Gun side Terminal	Kickless cable side Terminal
150	0.4 1.0	C -WF	WF-F
180	0.5 1.2		
200	0.6 1.5		
	0.8		

our product

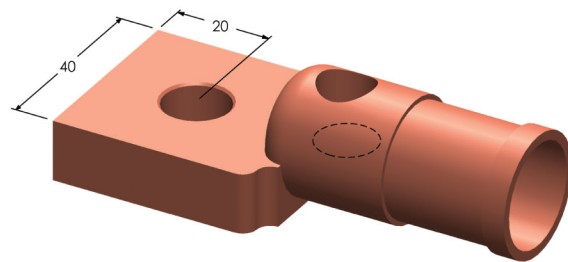
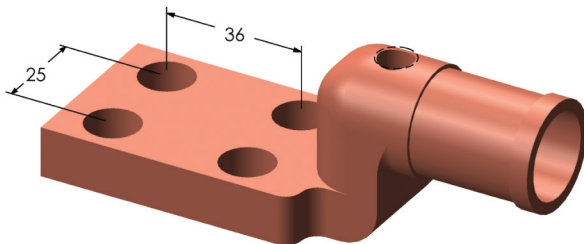
Water Cooling Cable for Multiple Welding Machines

WF TYPE CABLE



WF - TERMINAL TYPE

WFL - TERMINAL TYPE



Specification

Unit: mm

Terminal Type	Outsidedia of Terminal (Ø)	Cross Section (sq)
WF-250 WF-250L	Ø30	250
WF-325 WF-325L	Ø32	325, 350
WF-400 WF-400L	Ø40	375, 400



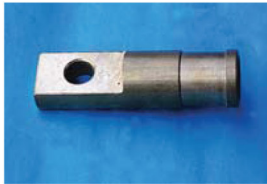
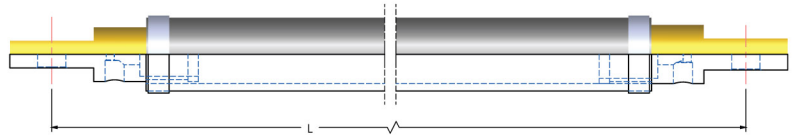
Cable cross sction(sq)	Length(m)
250	0.5, 0.6, 0.8, 1.0
325	1.2, 1.5, 1.8, 2.0
350	2.2, 2.5, 2.8, 3.0
400	3.5, 4.0, 4.5, 5.0
500	



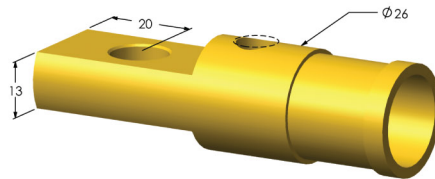
our product

Water Cooling Cable for Multiple Welding Machines

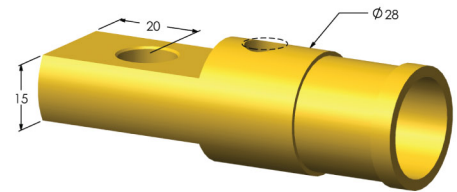
WF TYPE CABLE



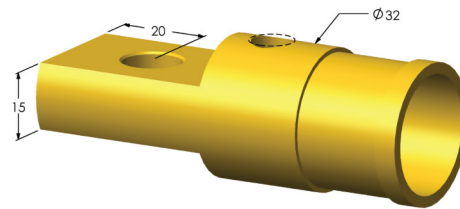
WF-1 terminal type



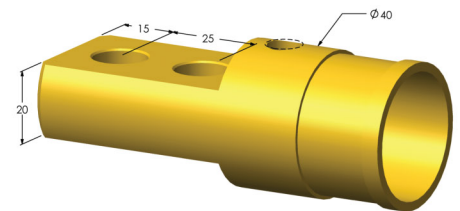
WF-2 terminal type



WF-3 terminal type



WF-4 terminal type



Specification

Cable cross section(sq)	Terminal Type	Length(m)
180, 200	WF-1	0.5, 0.6, 0.8
250	WF-2	1.0, 1.2, 1.5
325	WF-3	1.8, 2.0, 2.2
350, 400	WF-4	2.5, 2.8, 3.0
		3.5, 4.0, 5.0

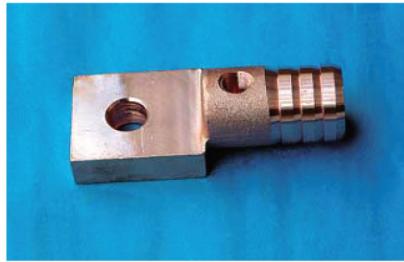
our product

Terminal Lug for Water Cooling Cable

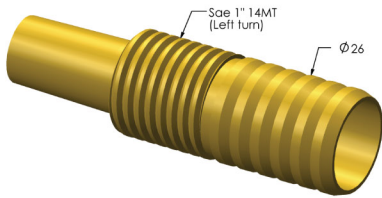
Gun side terminal



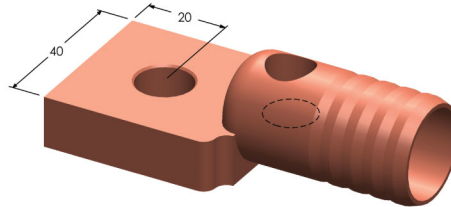
T-C TYPE



WF TYPE



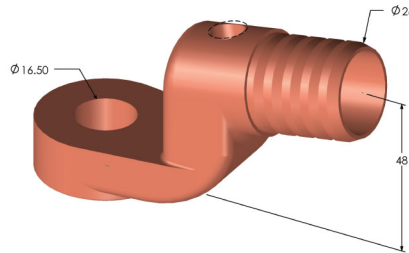
T-C TYPE



Kickless cable side terminal

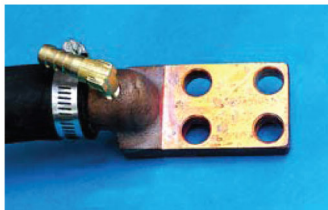


T-F TYPE

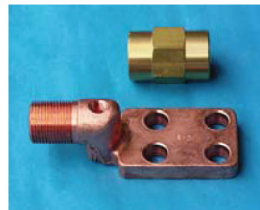


T-F TYPE

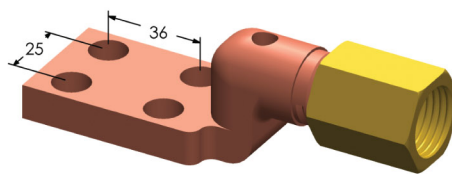
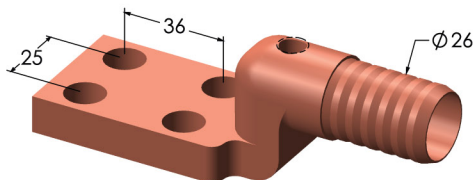
Trans side terminal



T-A TYPE



T-CB TYPE



our product

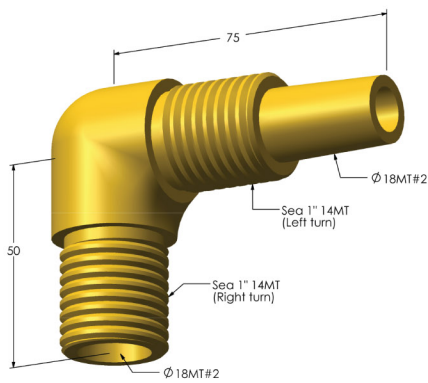
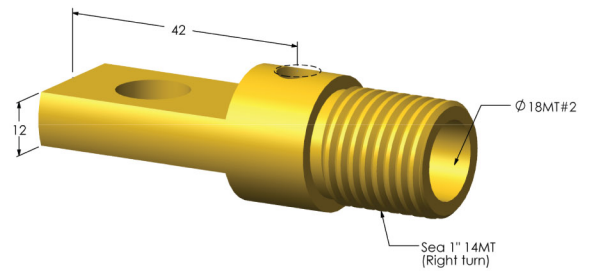
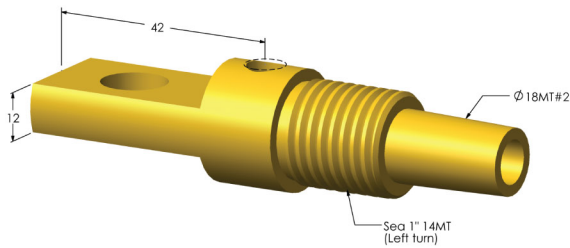
Terminal and Nut for Connecting Gun and Cable



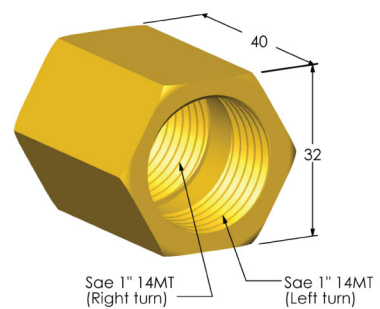
T-H TYPE



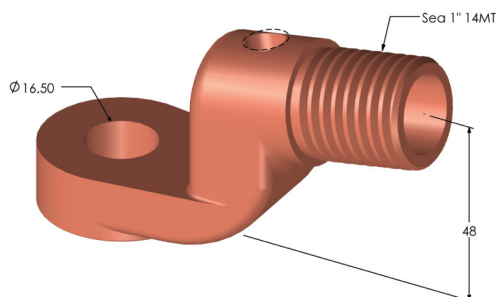
T-SA-2 TYPE



T-SA-3 TYPE



Joint Nut



T-FB TYPE

our product

Rubber Hose of Water Cooling Cable



We adapt the rubber hose, which is excellent in flexibility, strength and resist pressure against water cooling pressure.

Specification

unit:mm

cross section(sq)	inside dia(ϕ)	outside dia(ϕ)	normal pressure(MPa)	weight(g/M)
150	25.4	35	0.5	480
180	25.4	35	0.5	480
200	28.6	37	0.5	640
250	31.8	42	0.5	790

Specification of water cooling cables

unit:mm

cross section(sq)	outside dia(ϕ)	weight(kg/M)
150	21	1.50
180	22	1.80
200	24	2.00
250	25	2.50



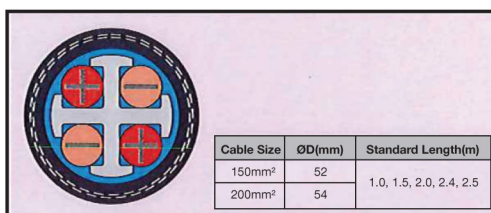
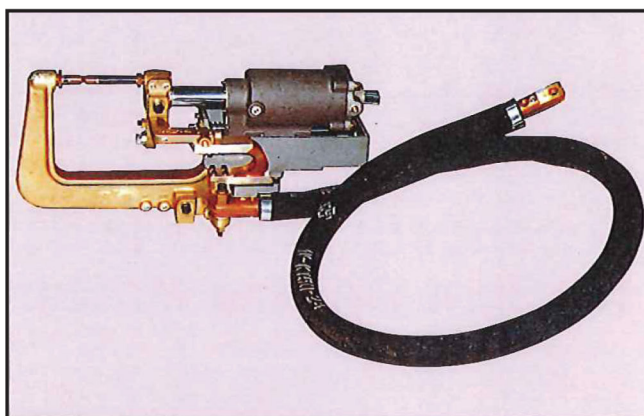
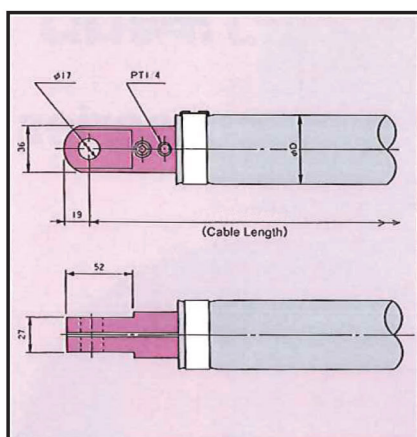
our product

KC-4C Kickless Cable

- Extremely long life and low cost.
- Almost no water pressure drop for excellent cooling.
- Low impedance.
- High power factor.
- Minimal kick.
- High flexibility.
- Minimal down time during cable replacement.
- Less electricity used per individual weld due to superlative conductivity.
- High-conductivity terminals used. These terminals are reusable.

FEATURE FOR KC-4C KICKLESS CABLE

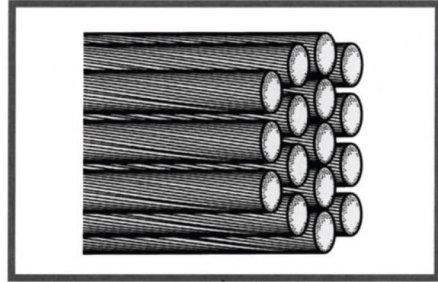
- A swaged copper pipe connector is used to minimize bending concentrated at the conductor and prevent disconnections. This is because the twisting and turning of the gun that occurs during the welding operation causes bending in the cable that is concentrated at base of the terminal on the gun. This bending could easily break the cable.
- There are three reason the KC-4C cable has a low impedance and a high power factor. (1) Materials with a high conductivity are used for the cable terminals. (2) The terminals are crimped onto the cable. (3) As a final step, they are also soldered to the cable.
- The cooling water that enters the KC-4C cable first enters a holding chamber and then flows to the plus and minus sides. As a result, the water pressure does not fall and excellent cooling is achieved.



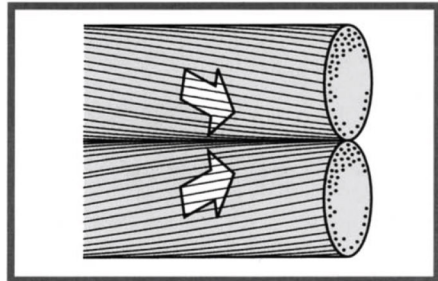
our product

KC-4C Kickless Cable

- KC-4C cable adopts a special twisting method that prevents the individual wires from crossing and rubbing against each other. This is to prevent reduction of cooling efficiency and cable breakage due to individual wire strand breakage during use for extended periods.



- The reason KC-4C cables are so flexible is that the positive and negative conductors are completely separated by their insulator tubes so that plenty of space is provided between the conductors and the outer hose. Furthermore, since mild stainless steel hose clamps are used, these clamps are powerful and maintain a fixed clamping pressure. Thus there is no need to worry about water leaking from the cables.



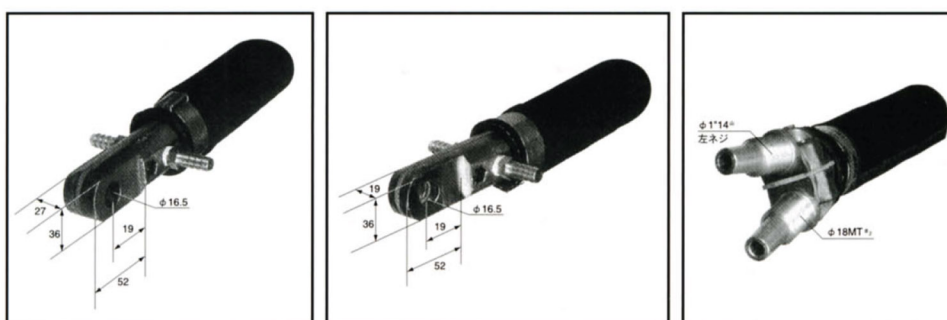
KC-4C Kickless Cable Specification

Item	Cable Size		150sq	200sq	Remark
	2.0m	2.4m			
Impedance (25°C 50Hz)	2.0m		480±15μΩ	358±20μΩ	Test method by JIS C9318
	2.4m		593±15μΩ	445±20μΩ	
Resistance (DC)	2.0m		475μΩ	355μΩ	Measured by Calculation
	2.4m		587μΩ	440μΩ	
Reactance	2.0m		69μΩ	46μΩ	Measured by Calculation
	2.4m		84μΩ	66μΩ	
Power Factor			= 0.99		
Cooling Water Quantity			7L/min		Pressure Loss 0.7kg/cm ²
Temperature Rise	2.0m		45°C/5900A	45°C/6800A	
	2.4m		45°C/5400A	45°C/6200A	
Total Weight	2.0m		10.4kg	13.2kg	Average Figure
	2.4m		12.2kg	15.3kg	

our product

KC-4C Kickless Cable

• Terminal



27F TYPE

19F TYPE

Y TYPE

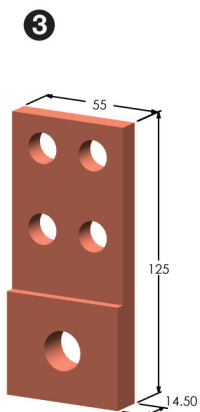
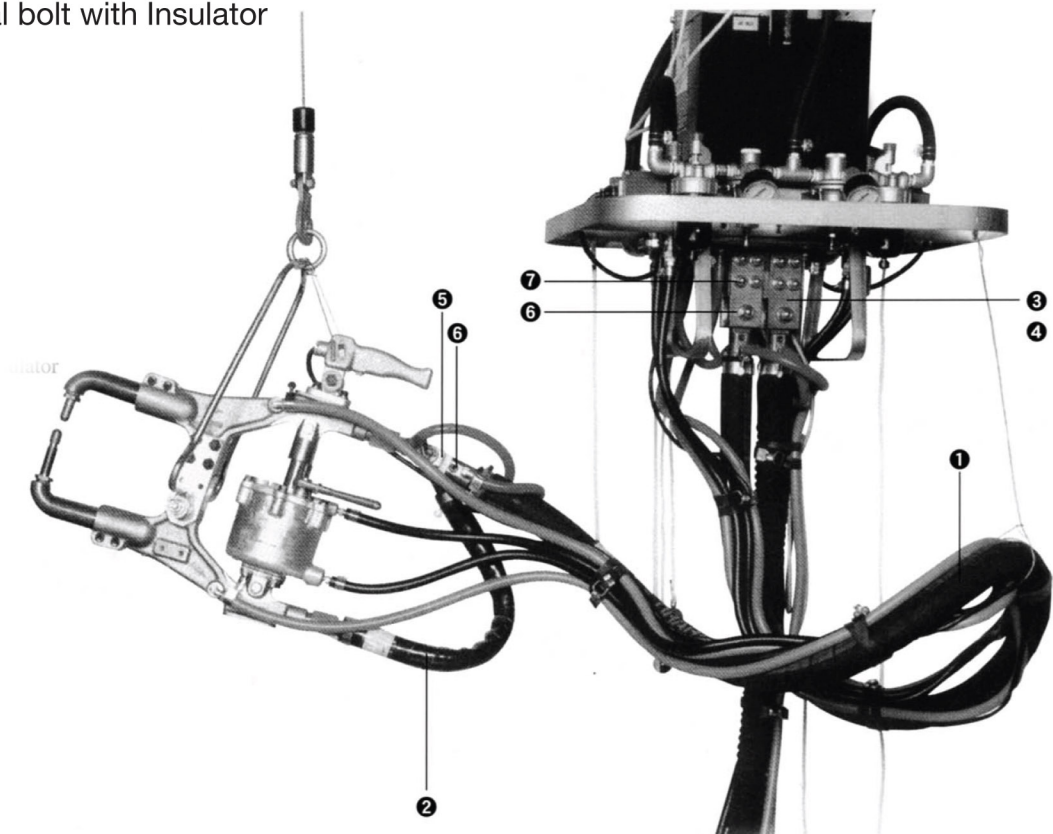
• Specification

Section area	Length	Terminal	Cover Hose
150	1.0 1.2 1.5 2.0	27F 19F Y	S (Standard) C (Convolutud)
200	2.4 3.0	Blank indicates 27F	Blank indicates S (Standard)

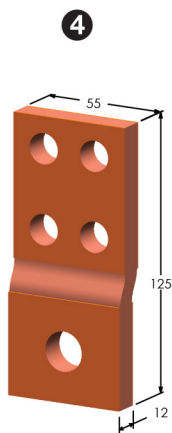
our product

Accessories for KC-4C Kickless Cable

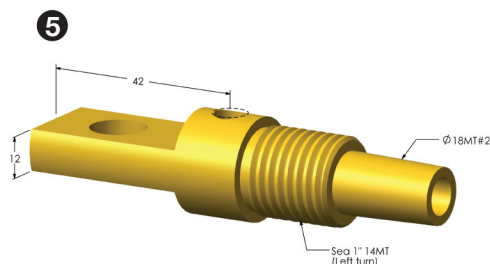
1. Kickless Cable
2. Water Cooled Jumper Cable
3. G Type Terminal
4. I Type Terminal
5. H Type Terminal
6. Kickless bolt with Insulator
7. Trans-terminal bolt with Insulator



G TYPE Terminal

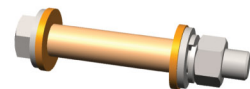


I TYPE Terminal

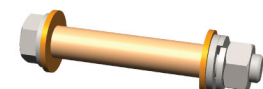


H TYPE Terminal

- 6**
Kickless bolt with insulator
 M12 x 80 F or 27F
 M12 x 75 F or 19F

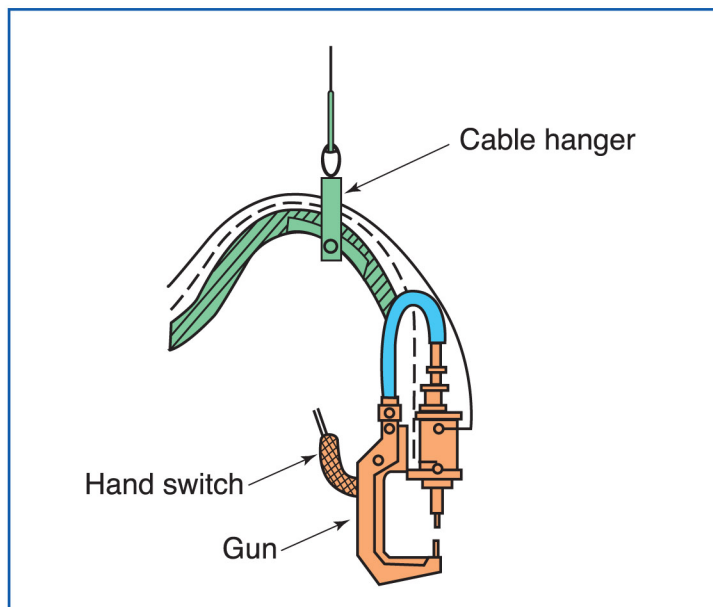


- 7**
Trans-terminal bolt with insulator
 M10 x 80



our product

Accessories for KC-4C Kickless Cable



These bands are used to hang Kickless cables. Inside is made by rubber, which prevents the cable surface from hurt. Moreover, the wide breadth protects outer circumference and protects from any change in shape.

Secondary cable union band



unit:mm		
thickness	wide	length
3	20	365
2	19	530

Insulating tube (Cotton contained Bake)

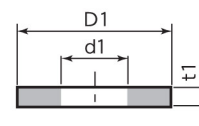
絶縁チューブ(布入りベーク)



Bolt Dia	Parts Code No.	D1	d2	L
M6	61P×50	9.0	6.5	50
M8	81P×50	11.0	8.5	50
M10	101P×50	14.0	11.0	50
M12	121P×50	16.0	13.0	50

Insulating washer (Cotton contained Bake)

絶縁ワッシャ(布入りベーク)



Bolt Dia	Parts Code No.	D1 φ	d2 φ	t1
M6	61W	15	6.5	2.0
M8	81W	20	8.5	2.0
M10	101W	24	11.0	2.0
M12	121W	28	13.0	2.0

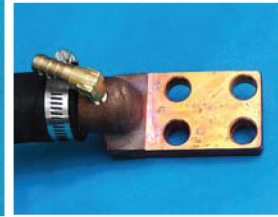
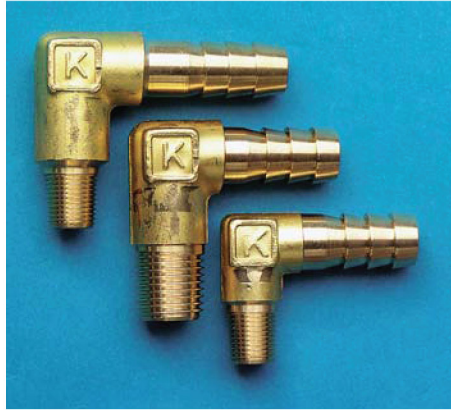
This is used to tie Kickless cable or Two line type cables, air pressure hoses and cooling hoses.

This also works to prevent the shock on the cables when welding.

our product

Accessories for Water Cooling Cable

Hose Nipple Straight type



L type(90°)

Cord No	Size	Thread	Outside dia(Ø)
KS-113	1/8 x 9	PT 1/8	9
KS-115	1/8 x 10.5	PT 1/8	10.5
KS-116	1/8 x 11	PT 1/8	11
KS-125	1/4 x 10.5	PT 1/4	10.5
KS-126	1/4 x 11	PT 1/4	11
KS-132	3/8 x 11	PT 3/8	11
KS-133	3/8 x 12	PT 3/8	12
KS-141	1/2 x 12	PT 1/2	12
KS-152	3/4 x 20.5	PT 3/4	20.5

unit:mm

Cord No	Size	Thread	Outside dia(Ø)
KL-113	1/8 x 11	PT 1/8	11.0
KL-212	1/4 x 11	PT 1/8	11.0
KL-312	3/8 x 11	PT 3/8	11.0
KL-410	1/2 x 11	PT 1/2	11.0

unit:mm

L type (45°)



Mini-Clamps



- Bandwidth 8.13mm.
- Ideal clamp for the use of minimum diameter.
- Zinc plated carbon steel screw.
- SUS 301 stainless steel band and saddle.

Cord No	Size	Thread	Outside dia(Ø)
KH-110	1/8 x 11	PT 1/8	11.0
KH-210	1/4 x 11	PT 1/4	11.0

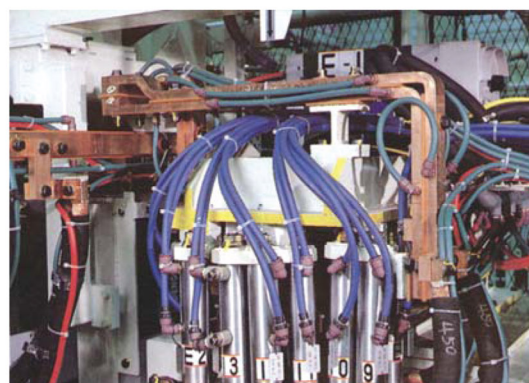
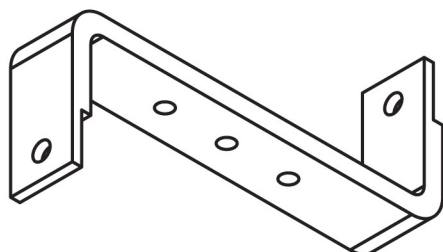
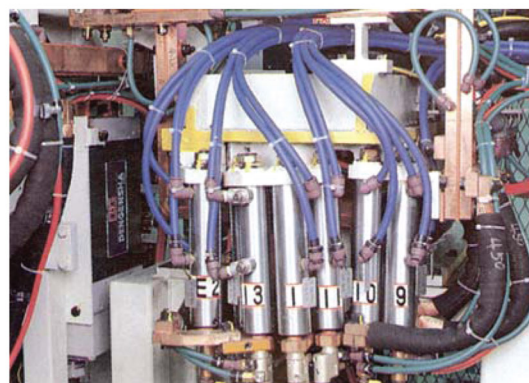
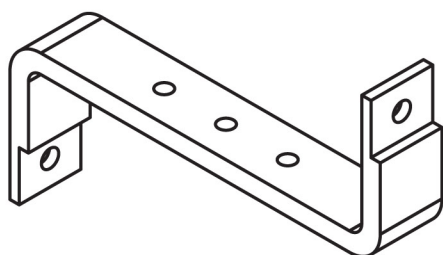
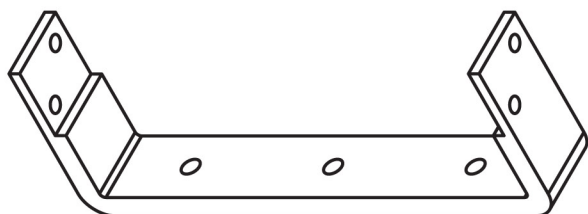
unit:mm

• Size

	Minimum	Maximum
Series	mm	mm
MM4SS	6	16
MM5SS	8	23

our product

Various Kinds of Secondary Bars and Busbars



The sizes of Secondary bar and Busbar are used CUP 10t, 15t, 20t and so on.

Process of the water hole for cooling down is also available for those section where the welding conditions are hard. Various shapes of products are used on multi welders and other special made welders.



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