TOKINARC®
TOKIN CORPORATION

Instruction Manual

ROBOTIC TIG TORCHES

TA-500 Series

TA-500HW
TA-500CDW

Please read this instruction manual before using the product.	Please be sure to deliver this instruction manual to the end user of this product.

TOKIN CORPORATION

Contents

NOTES REGARDING SAFETY

Be sure to read these instructions before using the welding torch.

- In order to ensure safe operation, this equipment should only be set up, inspected and maintained by a qualified person, or by someone who has a through understanding of the welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, this equipment should only be operated by people who have read these instructions throughly and understood their contents and who have the knowledge and ability to handle the equipment safely.
- It is recommended that instruction in all aspects of safe operation should be obtained from institutions snd associations which provide courses in proper welding techniques taught by qualified welding instructors.
- After reread these instructions, keep them in a safe and easily-accessible place so that they can be reread at a later date as required.
- Please contact TOKIN CORPORATION or its dealer if there are any unclear points in this manual. If there are any questions regarding service, contact the dealer of your purchase or TOKIN CORPORATION. The contact address and the telephone number are printed on the rear cover of this instructions.

1.Precautions for safety

- Different degrees of personal injury or equipment damage can occur if this welding torch is used incorrectly. The terms and symbols which appear in the "NOTES REGARDING SAFETY" section of these instructions are classified into three ranks according to the possible degree of danger or injury that each one warns against.

Symbol	Term	Definition
⚠	DANGER	The instructions which follow this term represent situations where failure to follow the instructions will almost certainly result in severe injury or death.
	WARNING	The instructions which follow this term represent situations where failure to follow the instructions can possibly result in severe injury or death.
	CAUTION	The instructions which follow this term represent situations where failure to follow the instructions may result in injury to the operator or physical damage.

In the above definitions, "severe injury" refers to cases of blindness, physical wounds, burns (high- and medium-temperature), electric shocks, fractures or poisoning which may leave scars or lasting ill-effects and for which medical treatment or prolonged hospitalization may be necessary. "Injury refers to cases of physical wounds, burns and electric shocks for which prolonged medical treatment and hospitalization are not necessary, and "physical damage" refers to extensive damage that may result in damaged property or broken equipment.

2.Items that must always be observed for safety

WARNING ⚠ **These items should be observed at all times in order to prevent the possibility of serious personal injury.**

- Welding torches have been designed and manufactured with full consideration given to safety; however, the warning and cautions given in this "Notes Regarding Safety" section must always be strictly observed during use. If they are not observed, severe injury or death through misoperation may result.
- Do not unauthorized personal come into the area where welding equipment is being used.
- When welding equipment is turned ON, it generates a magnetic field. This magnetic field may adversely affect the operation of some sensors and gauges. For the same reason, people who are using a heartbeat pace maker must not go close to operating welding equipment or go into workshops where welding equipment is being used unless prior medical approval has been obtained.
- In order to ensure safe operation, welding torch, wire feeder and the welding power supply equipment should only be set up, inspected, maintained and repaired by a qualified person, or by someone who has a through understanding of welding equipment and who has received sufficient training in its use.
- In order to ensure safe operation, welding torch should only be operated by people who have read these instructions and the instructions for the wire feeder and power supply equipment through and understood their contents and who have the knowledge and ability to handle the equipment safely.
- Do not use welding torch for any applications other than for arc welding as explained in these instructions and in the instructions for the wire feeder and power supply equipment.

WARNING ⚠ ↯ **These items should be observed at all times in order to prevent the possibility of electric shocks.**

*Touching the charged parts can cause fatal electric shocks or burns. Welding wire, contact tip and tip body are charged whenever the welding torch is turned ON and operating.

- Never Torch charged parts such as welding wire, or contact tip while welding torch is turned ON and operating.
- Grounding of welding power supply case and base metal and tools which are connected electrically to the base metal, must be carried out by a qualified electrician in accordance with the proper electrical engineering regulations.
- Turn OFF all input power supplies by turning OFF the switches in the distribution box before carrying out any inspections or maintenance.
- Inspections and maintenance should be carried out at periodic intervals, and the equipment must not be used until any damaged parts found have been repaired or replaced.
- Do not use cables that are damaged or that have exposed conductors, or that are rated lower than the specified level.
- Make sure that the cable is connected securely and that it is insulated.
- Welding cable should be connected as close as possible to the base metal being welded and it should be connected securely.
- Do not wear gloves which are torn or wet.
- Use a safety strap if welding in raised places.
- Turn OFF all power switches and the input power supply when not using.

CAUTION ⚠  **Wear protective equipment at all times to protect yourself and others against arc beam, welding flashes, flying spatter and slag, and noise.**

*Welding flashes contain harmful ultraviolet and infrared lights which can cause inflammation or burn to eyes.
*Flying spatter and slag can hurt the eyes and cause serious burns.
*The noise generated by welding can cause problems with hearing.

- Always wear protective goggles or welding masks which have sufficient shielding properties when doing welding or when observing welding being done.
- Wear protective glasses to protect the eyes from spatter and slag.
- Hang a curtain around the area where welding is being carried out to prevent welding flashes from affecting passers-by.
- Wear protective clothing such as leather gloves, longsleeves, leg covers and a leather apron for protection while welding.
- Wear noise proof ear protectors if the noise level is too high.

CAUTION ⚠  **Use protective equipment at all times to protect yourself and others against any fumes and gases that may be generated from welding.**

*Fumes and gases are generated when welding is carried out. Inhaling fumes and gases can be dangerous to your health.
*Welding in confined spaces can reduce the oxygen content in the air, which can result in suffocation.

- To provent gas poisoning and suffocation, always use a proper ventilation equipment to vent gases locally or entirely as stipulated by labor safety regulations and air contamination prevention regulations, or use an adequate breathing apparatus.
- When welding in a confined space, make sure that the air is circulating freely, wear some kind of breathing apparatus, and work only under the supervision of a properly trained supervisor.
- Toxic gases may be generated if welding is carried out near where degreasing, cleaning or demisting operations are also being carried out. Avoid welding near places where such operations are being carried out.
- Welding metal which has been plated with zinc will cause toxic fumes. Remove the plating before welding, or wear adequate absorption equipment for protection.

CAUTION ⚠  **Be sure to observe the following to avoid burns from the nozzle and tip or injury from fine wire ends.**

*The nozzle or contact tip becomes very hot after use, and it can cause serious burns if touched.

- Do not touch the nozzle or tip immediately after welding has been completed.
- Do not bring the tip of the welding torch close to your face during wire inching.

CAUTION ⚠  **Be sure to observe the following to avoid fires, explosions and rupturing.**

*Fires can be caused by spatter and base metals which are hot after welding.
*Fire can occur as a result of heat generated by the flow of current if the cable has not been correctly connected or there is an incomplete contact in the current path at the base metal being used.
*Explosions can occur if an arc is generated near containers that contain flammable substances such as gasoline.
*Ruptures can occur if welding sealed objects such as tanks and pipes.

- Do not use the welding torch in places where flying spatter can cause flammable materials to ignite.
- Do not use the welding torch near places where flammable gases are present.
- Keep base metals away from flammable materials immediately after welding as they may have become hot.
- Remove any flammable materials on the other side of ceilings, floors and walls that are being welded as sparks from welding could cause such materials to ignite.
- The welding cable should be connected as close as possible to the base metal being welded, and it should be connected securely.
- Do not weld gas cylinders which still contain gas.
- Do not weld sealed tanks or pipes.
- Keep a fire extinguisher close by the place where welding is being carried out in case a fire starts.

[1]Specifications

TA-500 Robotic TIG Torches

Torch Model		TA-500HW	TA-500CDW
Guidance		Robot/Mechanical	Robot/Mechanical
Rated Current	A	500	500
Duty Cycle	%	100	100
Tungsten Electrode	mm	3.2,4.0	3.2,4.0
Electode Fastener		Manual Type	Double Acting Type
Cooling Method		Water Cooled	Water Cooled
Weight(without cable)	g	1000	1200
Cable Length	m	6,8	6,8

The standard set is large-gaslens nozzle NO.10 and tungsten electrode diameter 4.0.

[2]Model Notation

TA-500 CDW-A-6 (Special Instruction)

※1 ※2 ※3 ※4

※1

Torch Model
TA-500

※2

Fastener Method	
Symbol	Specification
HW	Manual Type
CDW	Double Acting Type

※3

Cable	
Symbol	Specification
A	Water cooled power cable
B	Cabtyre cable

※4

Cable Length m 6:6m 8:8m

Set Item list	
Parts NO.	Model
3W50HW06A	TA-500HW-A-6
3W50HW08A	TA-500HW-A-8
3W50HW06B	TA-500HW-B-6
3W50HW08B	TA-500HW-B-8
3W50CD06A	TA-500CDW-A-6
3W50CD08A	TA-500CDW-A-8
3W50CD06B	TA-500CDW-B-6
3W50CD08B	TA-500CDW-B-8

[3]Operation

[3]-1 Electrode Clamp and Unclamp Method

TA-500HW

Identical to conventional TIG torches the electrode is locked in using the rear clamp.
When replacing or adjusting the length of the electrode, loosen the handle to unclamp.
Before using please verify the handle is firmly tightened.

TA-500CDW

This TIG torch uses a built-in dual air cylinder with front and near driving force for clamping and unclamping the electrode.
When you supply air to the intake the shaft will push the electrode out from the front and clamp it in place.
When replacing or adjusting the length of the electrode, supply air to the intake and the shaft will pull in the electrode clamping it in place.
Even if air is not supplied the electrode won't fall out thanks to the retention spring internal.
In the unlikely event that while the robot is operating air cannot be supplied, the electrode still won't fall out.
However, there won't be enough retention strength to weld. Whenever you perform welding please be sure to push the air supply.
Before operating please verify that air is being supplied. (The air hose diameter is 6mm.)

Additional Note:
(1)As written above, in order to retain the electrode the shaft is always pushed-out.
When exchanging consumable parts, if the gas lense collet body is not in the correct position the collet will be damaged.
Please make sure the electrode is unclamped when exchanging end consumables (i.e. collet, gas lense collet body).

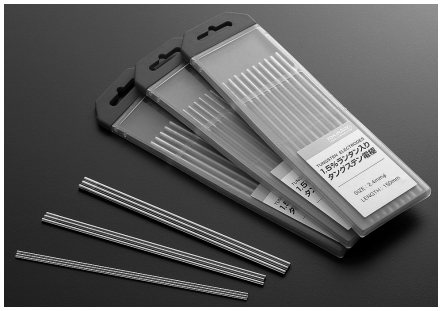
(2)Please use air pressure within 0.4 ～ 0.7MP. The recommended pressure is 0.5MP.

[3]-2 Tungsten Electrode

(1) This torch may be used with the following tungsten electrode diameters 3.2mm, 4.0mm.
The standard electrode set is Tungsten with 1.5% Lantana 4.0mm. For other desired sizes please specify.
(2) If using the TA-500CDW electrode changer please round the electrode ends for easy insertion.
Also, it is important to separate electrode ends by classification and to remove any coating in advance.
(3) Besides Tungsten with 1.5% Lantana, Tungsten with 2% Cerium and Pure Tungsten are available.

Tungsten with 1.5% Lantana

For Non-ferrous metal except aluminum and iron



- Contains no radioactive substances.
- Good arc starting.
- Maintains the preset current and voltage for a stable arc.
- Excellent durability and long service life.

Size ϕ × L (mm)	Parts No.
ϕ1.0×150	018320
ϕ1.6×150	018321
ϕ2.0×150	018322
ϕ2.4×150	018323
ϕ3.2×150	018324
ϕ4.0×150	018325

Tungsten with 2% Cerium

For Non-ferrous metal and iron

- Contains no radioactive substances.
- Good arc starting at low current.
- AC aluminum welding ensures good durability and minimal electrode contamination.
- Optimal for welding copper or copper alloys.

Size ϕ × L (mm)	Parts No.
ϕ1.0×150	018340
ϕ1.6×150	018341
ϕ2.0×150	018342
ϕ2.4×150	018343
ϕ3.2×150	018344
ϕ4.0×150	018345

Pure Tungsten

For Aluminum

- For AC welding
- Uniform and high purity materials.

Size ϕ × L (mm)	Parts No.
ϕ1.0×150	018336
ϕ1.6×150	018330
ϕ2.0×150	018331
ϕ2.4×150	018333
ϕ3.2×150	018334
ϕ4.0×150	018335

[3]-3 Collet and Gas Lens Collet Body

This torch collet and gas lens collet body are for dedicated use only.
These cannot be used with a hand welding torch.

[3]-4 Ceramic Nozzle

The standard large-gas lens nozzle is NO.10 (16mm aperture).
For other desired sizes please specify.

Nozzle					
Material	Applicable torch	Appearance overall length×outer diameter(mm)	Parts No.	Size No.	Exit innner diameter(mm)
Large-gas lens ceramic nozzle	TA-500	 47.5×30.5	57N75	6	10
			57N74	8	12.5
			53N88	10	16
			53N87	12	19

[3]-5 Torch Mounting Method

Please anchor the torch body by the 35mm diameter section.

[3]-6 Welding Machine Connection

(1) Cable Specification A (Water-Cooled Power Cable)

For as is installation use [018015 Power Cable Adapter] and [018018 Adapter Hose].

For Hitachi welding machines [018811 Hitachi Water-Cooled Adapter Set] is required.

Also, for the following models dedicated adapters are required. For these models, Cable Specification B (Cabtyre) cannot be used.

① Panasonic Full Digital Welding Machine [YC-300BP4] [YC-300BZ3] the「018803 TA-18 Digital Coupler N」is required.

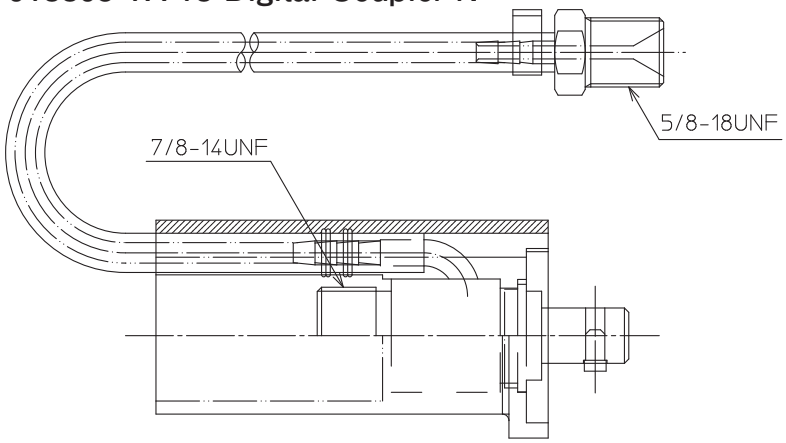
② Daihen Digital Welding Machine [DA300P][DT300P Ⅱ] the「018804 TA-18 Digital Coupler D」is required.

(2) Cable Specification B (Cabtyre)

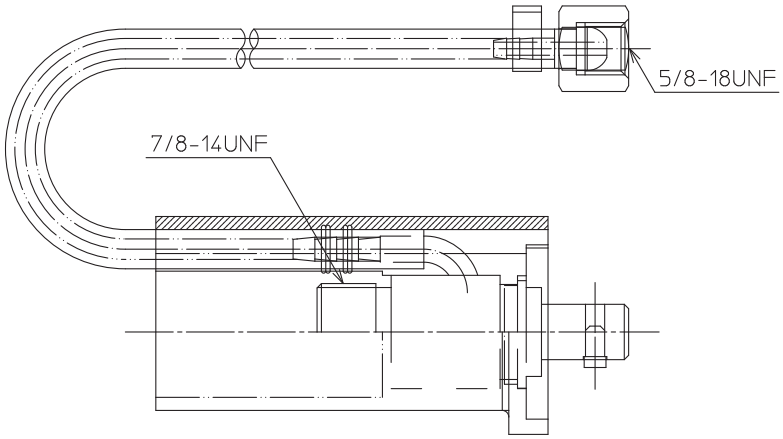
The cable may be mounted as is, but it's necessary to change the water flow route.

For Hitachi welding machines [018812 H Gas Connection Metal Fitting] and [018813 H Water Connection Metal Fitting] are required.

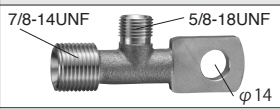
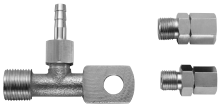
018803 TA-18 Digital Coupler N



018804 TA-18 Digital Coupler D



Optianal

Power cable adapter/Adapter gas hose		
Applicable torch	Appearance overall	Parts No.
water cooled		018015 Power cable adapter
		018018 Adapter hose
Hitachi water-cooled adapter set		018811
H gas connection fittings		018812
H water connection fittings		018813

[3]-7 Filler Unit (Option)

Filler unit wire option includes the filler unit.

15428A 45 − 12B − 1.5m − N

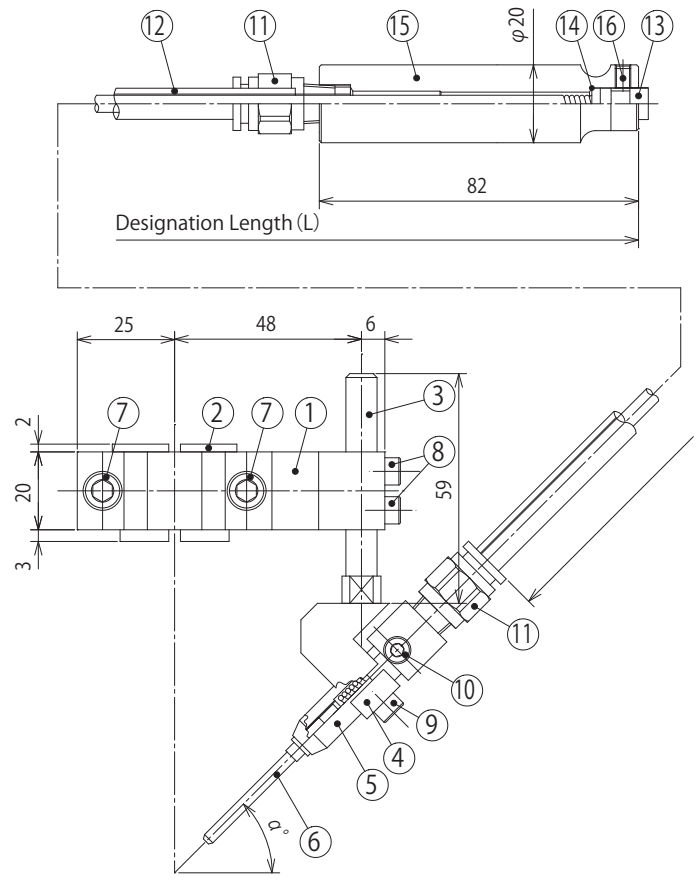
Model
TA-500 Filler Unit ASSY

Insert Angle	α°	Guide Receiver
25	25°	TX1811171
30	30°	TX1601061
45	45°	TX1512013
60	60°	DX1105092

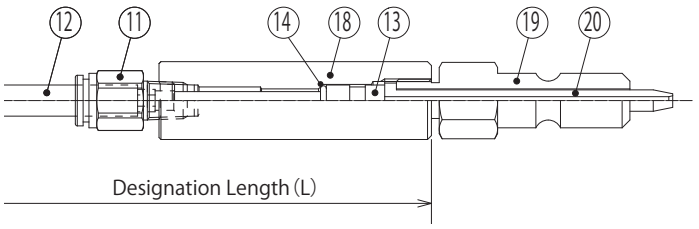
Length (L)
m

Inlet Type	Feeder Maker
N	Panasonic
DD	Daihen

Wire Class	Wire Diameter	Aiming Guide	Liner Dimension
08A	φ 0.8	023103	1.3*1.6*4.2
09A	φ 0.9	023104	1.3*1.6*4.2
10B	φ 1.0	023102	1.3*1.8*4.4
12B	φ 1.2	023100	1.3*1.8*4.4
14C	φ 1.4	023101	1.2*2.2*4.6
16C	φ 1.6	023107	1.2*2.2*4.6



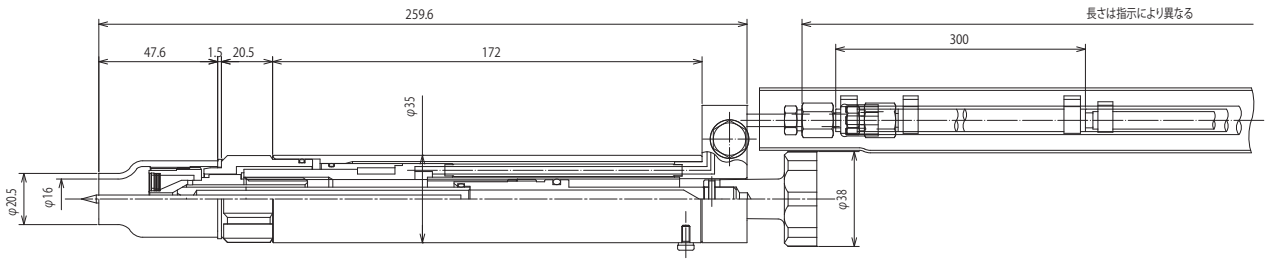
In case of DAIHEN wire feederCMRE741/742,the Parts used will change.



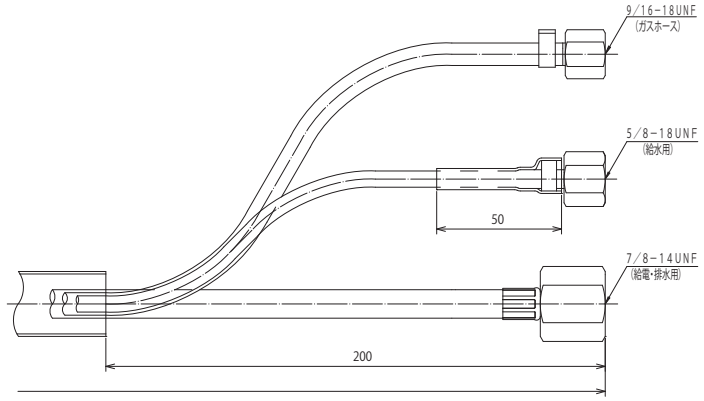
Parts List

NO.	Parts Number	Parts Name
1	TX1601294	TA-500 Filler Body (Including Bolt)
2	TX1601295	TA-500 Filler Body Sleeve
3	TX1601296	TA-500 Guide Shaft
4	TX1811171	Guide Bearing 25° (Including Bolt)
	TX1601061	Guide Bearing 30° (Including Bolt)
	TX1512013	Guide Bearing 45° (Including Bolt)
	DX1105092	Guide Bearing 60° (Including Bolt)
5	TX1603121	Guide Body (Including Bolt)
6	023103	TCC Aiming Guide 0.8
	023104	TCC Aiming Guide 0.9
	023102	TCC Aiming Guide 1.0
	023100	TCC Aiming Guide 1.2
	023101	TCC Aiming Guide 1.4
	023107	TCC Aiming Guide 1.6
7	① Included	Hex Socket Bolt M6-20
8	① Included	Hex Socket Bolt M4-12
9	④ Included	Hex Socket Bolt M4-12
10	⑤ Included	Hex Socket Bolt M4-8
11	⑤⑭⑱ Included	One Push Coupler WCEC8-PT1/8
12		Teflon Tube φ 5 × φ 8
13		Filler Liner
14	⑬ Included	O ring
15	TX1603122	Filler Tap for N(PANA)
16	⑮ Included	Liner Locking Screw
17		
18	018986	TIG Filler DD Tap
19	023024	CMRE741 Guide Adapter
20	023022	Outlet Guide
1 ～ 11 Wire Insert Angle 25°		TA-500 Filler Unit 25° -08A
		TA-500 Filler Unit 25° -09A
		TA-500 Filler Unit 25° -10B
		TA-500 Filler Unit 25° -12B
		TA-500 Filler Unit 25° -14C
		TA-500 Filler Unit 25° -16C
1 ～ 11 Wire Insert Angle 30°		TA-500 Filler Unit 30° -08A
		TA-500 Filler Unit 30° -09A
		TA-500 Filler Unit 30° -10B
		TA-500 Filler Unit 30° -12B
		TA-500 Filler Unit 30° -14C
		TA-500 Filler Unit 30° -16C
1 ～ 11 Wire Insert Angle 45°		TA-500 Filler Unit 45° -08A
		TA-500 Filler Unit 45° -09A
		TA-500 Filler Unit 45° -10B
		TA-500 Filler Unit 45° -12B
		TA-500 Filler Unit 45° -14C
		TA-500 Filler Unit 45° -16C
1 ～ 11 Wire Insert Angle 60°		TA-500 Filler Unit 60° -08A
		TA-500 Filler Unit 60° -09A
		TA-500 Filler Unit 60° -10B
		TA-500 Filler Unit 60° -12B
		TA-500 Filler Unit 60° -14C
		TA-500 Filler Unit 60° -16C
11 ～ 16		TA-301・500 Filler Guide N
11～14,18～20		TA-301・500 Filler Guide DD

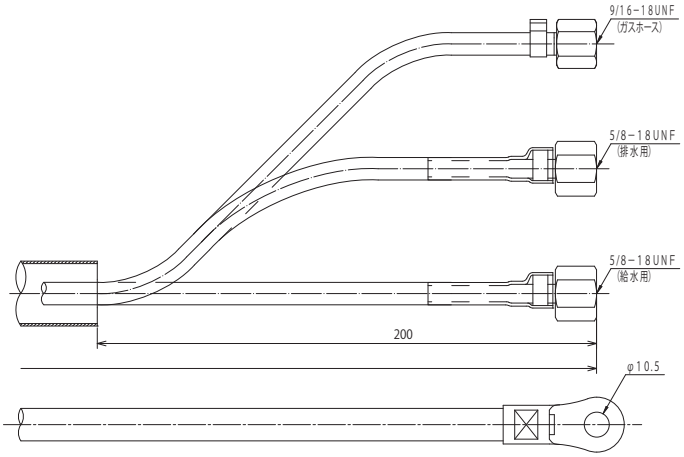
[4]Out Drawing

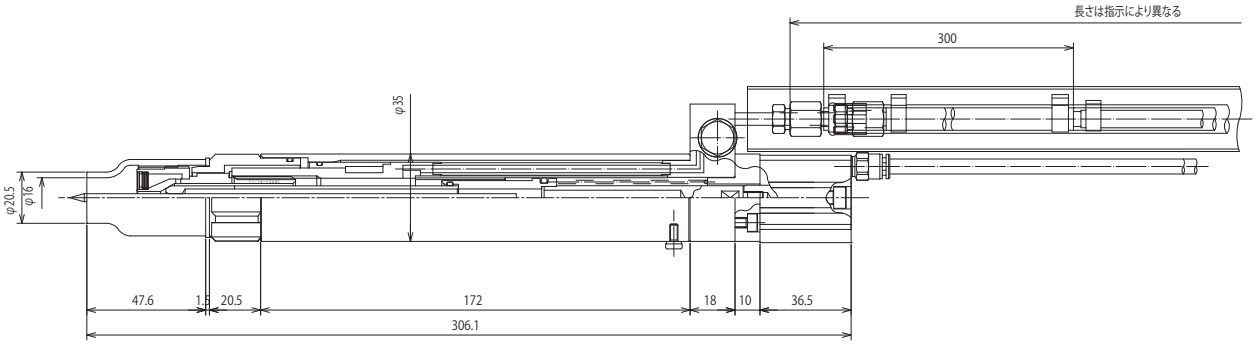


TA-500 HW-A

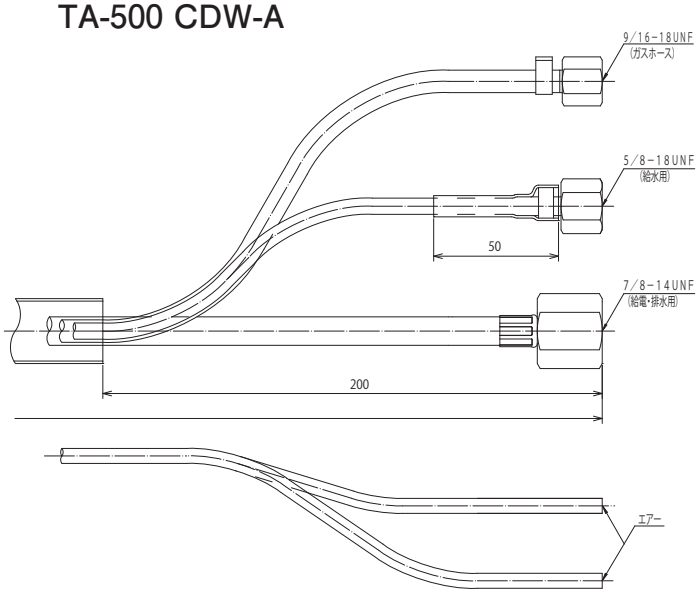


TA-500 HW-B

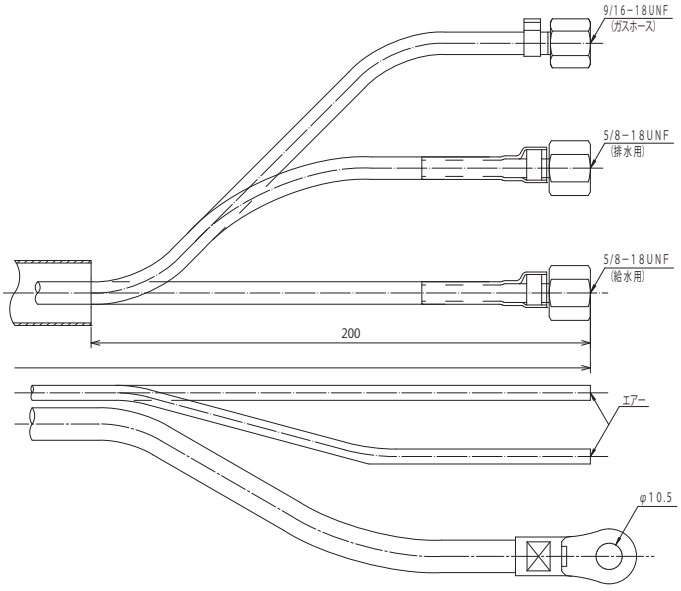




TA-500 CDW-A



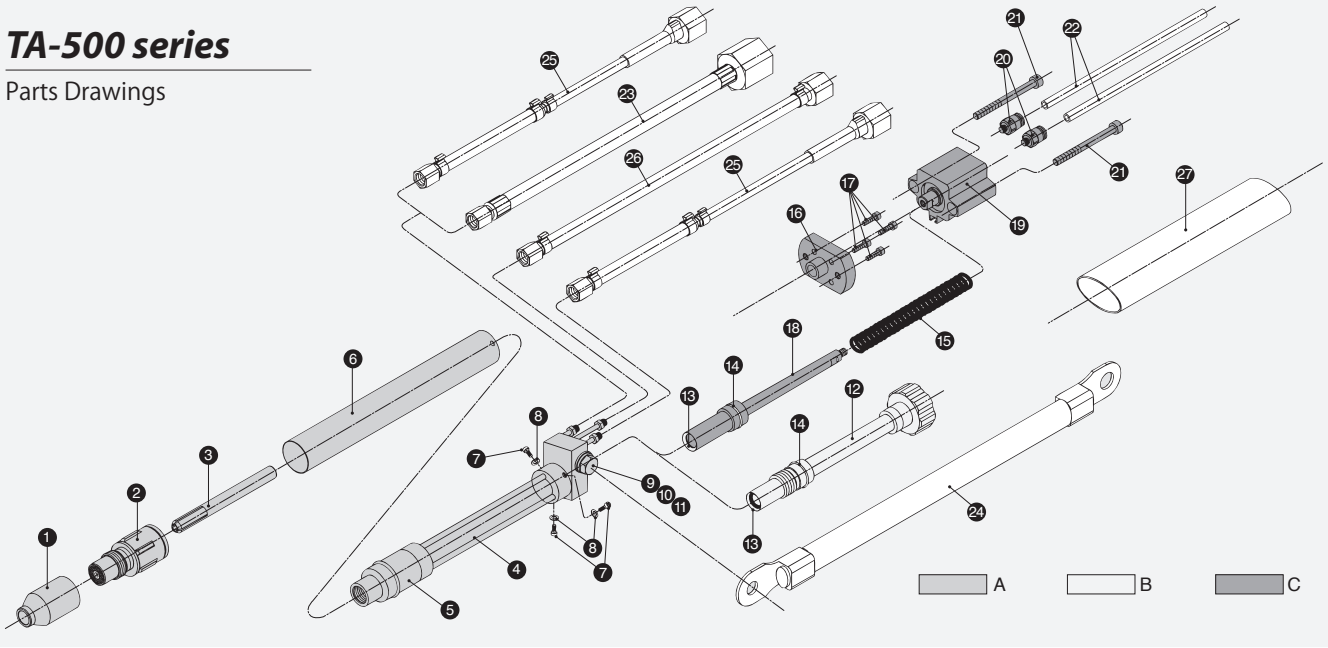
TA-500 CDW-B



[5]Parts List

TA-500 series

Parts Drawings



TA-500HW PARTS LIST

Code	Parts No.	Parts Name	Size	Qty
1	53N88	TA-17 Large-diameter gas lens nozzle	No.10	1
2	018910	TA-500GL Body	3.2mm	1
	018909	〃	4.0mm	1
3	018904	TA-500 Collet	3.2mm	1
	018903	〃	4.0mm	1
4	018913	TA-500 Torch body	With O-ring	1
5	OS25-01A	O-Ring	S-25	1
6	018914	TA-500 Holder		1
7	018918	Plastic screw	M4*0.7-L8	3
8	018919	Washer		3
9		Hex bolt	M8*1.25-L12	1
10		Flat washer		1
11		Spring washer		1
12	05975A	TA-500HW Shaft	With O-ring	1
13	Y90201009	O-Ring	P-9	1
14	OW1516-9-04D	O-Ring	P-11	1
A+B	018998	TH-500HW Torch body assembly		

A B C

TA-500CDW PARTS LIST

Code	Parts No.	Parts Name	Size	Qty
1	53N88	TA-17 Large-diameter gas lens nozzle	No.10	1
2	018910	TA-500GL Body	3.2mm	1
	018909	〃	4.0mm	1
3	018904	TA-500 Collet	3.2mm	1
	018903	〃	4.0mm	1
4	018913	TA-500 Torch body	With O-ring	1
5	OS25-01A	O-Ring	S-25	1
6	018914	TA-500 Holder		1
7	018918	Plastic screw	M4*0.7-L8	3
8	018919	Washer		3
9		Hex bolt	M8*1.25-L12	1
10		Flat washer		1
11		Spring washer		1
15	018917	TA-500CDW Spring	PWP-A 5380(SAMINI)	1
16	018915	TA-500CDW Cylinder mount		1
17		Hex bolt	M4*0.7-L12	4
18	018923	TA-500CDW Guide shaft	With O-ring	1
13	Y90201009	O-Ring	P-9	1
14	OW1516-9-04D	O-Ring	P-11	1
19	018961	Air cylinder	CDQP2B20-5D	1
20		One-touch pipe joint	KQH06-M5(SMC)	2
21		Hex bolt	M5*0.8-L35	2
22	018935	TA-301CD Air hose 6m	ϕ6-ϕ4(6300L)	2
	018936	〃 8m	ϕ6-ϕ4(8300L)	2
A+C	018999	TA-500CDW Torch body assembly		

CABLE SPECIFICATIONS

A TYPE (water-cooled power cable type)

Code	Parts No.	Parts Name	Size	Qty
23	018052	TA-18 Water-cooled power cable	6m	1
	018024	〃	8m	1
25	018941	TA-301, 500 Coolant hose 6m	ϕ4.5-ϕ6.5 (6100L)	1
	018942	〃 8m	ϕ4.5-ϕ6.5 (8100L)	1
26	018946	TA-301, 500 Coolant hose 6m	4.7*1B(6100L)	1
	018947	〃 8m	4.7*1B(8100L)	1
27	018053	TA-18 Hose sheath	6m	1
	018036	〃	8m	1

B TYPE (cabtyre type)

Code	Parts No.	Parts Name	Size	Qty
24	018956	TA-500 Cabtyre cable 6m	EWRCT6O	1
	018957	〃 8m	EWRCT6O	1
25	018941	TA-301, 500 Coolant hose 6m	ϕ4.5-ϕ6.5 (6100L)	2
	018942	〃 8m	ϕ4.5-ϕ6.5 (8100L)	2
26	018948	TA-500 Gas hose 6m	4.7*1B(L+100)	1
	018949	〃 8m	4.7*1B(8100L)	1
27	018053	TA-18 Hose sheath	6m	1
	018036	〃	8m	1

MEMO

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