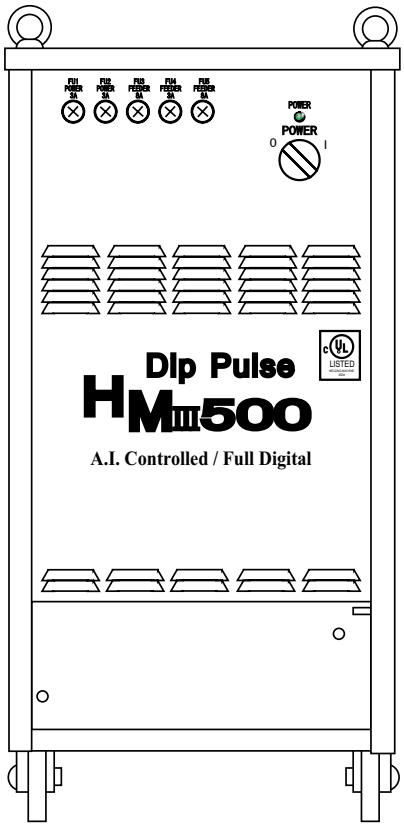
Panasonic

Pulsed GMAW Power Source

Operating Instructions

Model No. **YD-500HM3YLC**



Fully digital and A.I. controlled pulsed GMAW

Before operating this product, please read the instructions carefully and save this manual for future use.

OMDT6363E01

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♦Introduction

- This welding power source is applicable to automatic welding or robotic welding. It is not applicable to manual welding.
- It is necessary to connect the dedicated **controller; YD-00UDS1YAD**
- The **interface box; YC-00UD1YAD** is needed to connect this product to automatic welder or robot.

♦Cautions for your safety

Read and understand this manual before installing, operating or servicing this product. This equipment and instructions are for use only by persons trained and experienced in the safety operation of welding equipment. Do not allow untrained persons to install, operate or maintain this equipment. The wiring and grounding should be done by educated and/or skilled person.

♦Safety symbols

Read this manual carefully to use the machine properly. The cautions mentioned in this manual and on the product are important to operate the machine properly and prevent hazardous situation and damage to you and other personnel.
This document classifies all of these hazardous conditions into three levels, namely Danger, Warning or Caution, and indicates these levels by using symbols. Those Dangers, Warnings, Cautions as well as Mandatory Actions and Prohibitions mentioned must be followed without fail. It is also important to ensure that equipment functions correctly at all times. * The warning symbols and signal phrases are also used on the warning labels attached on the machine.

Warning symbol	Signal phrase	Description	Warning symbol	Signal phrase	Description
	**Danger**	A hazardous accident including death or serious personal injury is imminent, if directions are not followed carefully.		**Mandatory Action**	Action which MUST be performed without fail, such as grounding.
	**Warning**	The potential for a hazardous accident including death or serious personal injury is high, if directions are not followed carefully.		**Prohibition**	Action which MUST NOT be performed.
	**Caution**	The potential for hazardous accident including medium-level or light personal injury and/or the potential for property damage to the equipment are high if, directions are not followed carefully.	The above warning symbols are commonly used.		

"Serious personal injury" refers to loss of eyesight, burns (high-temperature and low-temperature burn), electrical shock, bone fractures and gas poisoning, as well as those that leave after-effects, which require hospitalization or necessitate medical treatment for an extended period of time. "Medium-level and light personal injury" refers to burns, electrical shock and injuries which do not require hospitalization or necessitate medical treatment for an extended period of time. "Property damage" refers to extensive damage to the surrounding items and equipment.

♦Exporting the machine into the EU

- This product does not meet the requirements specified in the EC Directives which are the EU safety ordinance. Please bear in mind that this product may not be brought as is into the EU.
- The same restriction also applies to any country which has singed the EEA accord.Please be absolutely sure to consult with us before attempting to relocate or resell this product to or in any EU member state or any other country which has signed the EEA accord.

- The description of this manual is based on the contents as of **March, 2008**.
- The contents of this manual are subject to change without further notice.

♦Table of Contents

1. About safety

1.1. Safety

Introduction

This manual is structured so that all the appropriate safety precautions relative to a particular task are placed at the beginning of each section. The purpose of this section is twofold:

First, we identify the symbols used to highlight the safety precautions and explain what they mean.

Second, we have provided names of resources which you can obtain to learn more about safe practices regarding the installation, operation, and maintenance of this type of equipment.

Symbols

⚠ WARNING

When you see this s ymbol it means that the potential for personal injury is high if directions are not followed carefully.

⚠ CAUTION

When you see this symbol it means that the potential for damage to the equipment is high if directions are not followed carefully.

IMPORTANT: This term is used to emphasize information which is critical to the success of the task being performed.

NOTE: This term is used to provide additional information to help clarify instructions.

⚠ WARNING

Failure to follow these precautions and safe practices can result in death or serious injury to personnel and damage to property. These instructions are for experienced operators thoroughly trained in the operation of gas welding equipment. Protect yourself and others. Be sure to read and fully understand these instructions before you install or operate this equipment. If you do not thoroughly understand these instructions, ask your supplier to explain them to you. When you work with this equipment, keep these instructions handy for ready reference and review.

Additional References

ANSI Z49.1 “Safety in Welding and Cutting” Available through the American Welding Society
550 N.W. LeJeune Rd. Miami, FL 33126

OSHA Safety and Health Standards, 29CFR 1910
Available through the U.S. Government Printing Office
Washington, DC 20402

1.2. Sécurité

Introduction

Ce manuel est structuré de façon à ce que les précautions de sécurité appropriées, relativement à une tâche particulière, soient placées au début de chaque section. L’objectif de cette section est double:

Tout d’abord, nous identifions les symboles utilizes pour souligner les précautions de sécurité et expliquer ce qu’elles signifient.

Deuxièmement, nous avons fourni les noms des ressources que vous pouvez obtenir pour en apprendre plus au sujet des pratiques de sécurité concernant l’installation, le fonctionnement et l’entretien de ce type d’équipement. résulter un décès ou des blessures graves et des dommages matériels.

Symboles

⚠ AVERTISSEMENT

Lorsque vous voyez ce symbole, cela signifie que risque de blessures est élevé si les instructions ne sont pas suivies correctement.

⚠ ATTENTION

Lorsque vous voyez ce symbole, cela signifie que potentiel de dommages à l’équipement est élevé les instructions ne sont pas suivies correctement.

IMPORTANT: Cette expression est utilisée pour souligner les informations qui sont importantes si l’on veut que la tâche puisse être réalisée avec succès.

REMARQUE: Cette expression est utilisée pour fournir des renseignements supplémentaires afin permettre de clarifier les instructions.

⚠ AVERTISSEMENT

Si ces précautions et ces pratiques de sécurité ne sont pas suivies, il peut en résulter un décès ou des blessures graves et des dommages matériels. Ces instructions sont conçues pour les opérateurs expérimentés qui ont été convenablement formés sur la façon d’utiliser l’équipement de soudage au gaz. Protégez-vous et protégez les autres. Avant d’installer ou de faire fonctionner cet équipement, lisez bien ces instructions et assurez-vous que vous les avez bien comprises. Si vous ne comprenez pas ces instructions à fond, demandez à votre fournisseur de vous les expliquer. Lorsque vous travaillez avec cet équipement, gardez bien ces instructions à portée de la main pour pouvoir vous y référer et les étudier au besoin.

Références supplémentaires

ANSI Z49.1 «Sécurité dans le soudage et la coupe»
Offerte par l’entremise de American Welding Society
550 N.W. LeJeune Rd. Miami, FL 33126
Normes de santé et de sécurité OSHA Safety and Health Standards, 29 CFR 1910
Fournies par l’entremise du U.S. Government Printing Office
Washington, DC 20402

2. Important safety items

The following instructions must be followed carefully in case of working near the robot performing arc welding operation.

1.1. Safety

Choosing a Work Site

⚠ WARNINGS:

Do not locate welding operation near degreasing operations. Vapors from chlorinated solvents can react with the heat of the arc to produce highly toxic gases such as Phosgene.

Never locate power source over combustible material. Heat from power source can ignite or cause material to explode resulting in potentially serious injury.

Ventilation

⚠ WARNINGS:

Do not locate the power source in a confined area without adequate ventilation. Fumes and vapors emitted while welding can pose substantial health threats if not properly ventilated.

Breathing fumes, vapors, or oxygen enriched/depleted air produced by the welding process can cause severe discomfort, health problems, and even death. Make sure the site has adequate ventilation relative to size. Refer to ANSI Z49.1.

Never ventilate with oxygen. Refer to ANSI Z49.1.

⚠ CAUTION

Never use filtering devices to cover vents of power source. Filters will restrict airflow and can cause unit to overheat. Use of filter voids warranty.

Electrical

⚠ WARNINGS:

ONLY qualified technicians should install electrical input power. Improper installation can result in serious injury or even death from electrical shock, and cause major damage to components.

Power input must be provided through a fusible distribution box, and must possess a power disconnect per NEC (National Electrical Code). Failure to provide adequate safety measures can result in serious injury or even death from electrical shock, and cause major damage to components.

Disconnect power at the distribution box before you begin installation. Red tag the switch to prevent accidental turning "on" the circuit. Failure to do this can result in serious injury or even death from electrical shock, and cause major damage to components.

The power source must be grounded and the work must be grounded in accordance with ANSI Z49.1.

Compressed Gas

⚠ WARNINGS:

Compressed gas cylinders should be handled with extreme care. Refer to your supplier's instructions on proper handling to avoid personal injury.

Be sure hoses, regulator and other apparatus are in good condition and are safe for operation.

Check the hose for cuts, burns, worn areas or damaged fittings. If you find any, replace the hose.

Make sure the torch, cylinder valves, regulator and hose connections are free of dust, dirt, oil and grease.

⚠ WARNINGS:

Check each component for damaged parts. Repairs to torches, valves, regulators and other welding equipment should be performed only by a qualified repair shop using original spare parts.

Pressure regulators should be operated as precision instruments. They should not be exposed to shock, vibration or sudden impact caused by the quick opening of the gas cylinder valve.

Be careful when opening cylinder valves.

Make sure that the cylinder is properly secured in a welding cart designed for that purpose or chain it to a wall, post or other appropriate structure.

NEVER apply full cylinder pressure to the torch. Always use a pressure regulator attached to the cylinder valve outlet.

NEVER operate the torch at pressures exceeding those recommended in these instructions.

NEVER open a cylinder valve near flames, sparks or other sources of ignition.

NEVER stand in front of or behind the regulator when opening a cylinder valve. Stand to one side of the regulator.

NEVER use a wrench to open a valve equipped with a handwheel; always use the handwheel.

CRACK the cylinder valve before installing the regulator. Open the valve slightly and then close. This will clear the valve of dust or dirt which may be carried to the regulator and cause damage or accident. Always crack the valve in a well-ventilated area.

Open the cylinder valve slowly, first cracking it open and then turning it to the operating position.

NEVER open a valve more that the specified

number of turns.

Make sure all connections are leak-tight. Test connections for leaks using soapy water or a commercial leak solution compatible with the gases being used.

NEVER use a cylinder or tank with a leaking valve.

NEVER use a flame to test for leaks of flammable gases or oxygen.

Take care to prevent injury or property damage when working with a torch.

ALWAYS wear appropriate protective clothing and equipment to protect from radiation, fumes, noise and spatter as prescribed by OSHA and other governing standards and regulations.

Never apply a torch to a container that contains or has contained flammable liquids or vapors, including gasoline, benzene, solvents and similar substances. First insure that container is thoroughly purged of all traces of the flammable materials or vapors.

AVOID starting fires. Be especially careful when working near combustible materials that cannot be moved.

NEVER lay torch down unless that gas flow has been shut off.

Always handle and store cylinders properly.

STORE cylinders in a clean, well-ventilated area, making sure they are properly secured to keep them from falling or being knocked over. Cylinders with provision for a cap should have the cap in place during storage or handling.

NEVER abuse or drop cylinders or handle them roughly.

NEVER use a cylinder or tank as a roller or support.

NEVER attempt to lift a cylinder by its cap; the cap and its attaching device are not designed to support the weight of the cylinder.

In addition to this instruction booklet, you should also be thoroughly familiar with and have on-hand or available for ready reference, the following publications:

Instructions for any welding or cutting equipment you are using.

Current Material Safety Data Sheets (MSDSs) for the welding gases, rods, fluxes, etc. being used in the welding process.

⚠ WARNINGS:

Do not touch live electrical parts or work with wet gloves. You can receive an electrical shock that is potentially deadly.

Arc rays can damage your eyes and burn your skin. Prevent your eyes and skin injuries due to intensive light of welding arc in acordance with Practice for Occupational and Educational Eye and Face protection, ANSI Z87.1. Always wear a welding helmet and protective clothing.

Avoid breathing fumes. Make sure that the area is adequately ventilated or that the work area is exhausted. If the work is such that you cannot avoid the fumes and vapors, use an air supplied respirator.

Metals such as Lead, Zinc, and Beryllium can produce toxic fumes when welded or cut. Do not work on such materials without proper ventilation and respiration. All people within the area must also be equipped with air supplied respirators.

Welding wire can cause puncture wounds. Do not point torch toward any part of your body, and conductive surface or other people.

Hot metal, spatter and slag can cause fire and burns. Watch for fire, keep a fire extinguisher nearby and know how to use it. Do not weld near flammable material. Allow work and equipment to cool down before handling.

Magnetic fields from high currents can affect pacemaker operation. If you wear a pacemaker consult your physician before going near arc welding, gouging or spot welding operations.

⚠ CAUTION

Keep your work area and equipment clean. Metal particles can get into circuitry and cause a short.

1.2. Sécurité

Choix d'un emplacement de travail

⚠ AVERTISSEMENTS:

Ne placez pas une opération de soudage à proximité des opérations de dégraissage. Les vapeurs provenant des solvants chlorés peuvent réagir avec la chaleur de l'arc et produire des gaz hautement toxiques tels que le phosgène.
Ne placez pas la source de courant électrique sur des matériaux combustibles. La chaleur provenant de la source de courant peut enflammer le produit ou le faire exploser, ce qui pourrait entraîner la possibilité de blessures graves.

⚠ AVERTISSEMENTS:

Ne placez pas la source de courant électrique dans un endroit fermé sans une ventilation suffisante. Les fumes et les vapeurs émises durant le soudage peuvent poser des menaces substantielles à la santé si la ventilation n'est pas suffisante.

Le fait de respirer les fumées, les vapeurs ou l'air à oxygène enrichi ou appauvri par le processus de soudage peut causer des malaises graves, des problèmes de santé, et même la mort. On devra s'assurer que le site a une ventilation suffisante, relativement à sa dimension. Référez-vous à ANSI Z49.1.

Ne ventilez jamais avec de l'oxygène. Référez-vous à ANSI Z49.1.
La chaleur et les rayons produits durant le soudage à l'arc peuvent réagir avec les vapeurs des solvents pour former des gaz très toxiques.

De petites quantités de monoxyde de carbone (CO) et d'autres gaz toxiques sont produits durant les opérations de soudage. Lorsque les exigences de ventilation en fonction de l'espace ne sont pas respectées, il peut en résulter des blessures graves.

⚠ ATTENTION

N'utilisez jamais des dispositifs de filtrage pour couvrir les évents de la source de courant. Les filtres peuvent restreindre la circulation de l'air et causer une surchauffe de l'appareil. L'utilisation d'un filtre annulera la garantie.

Une forte humidité peut favoriser la formation de condensation et corroder les composants critiques de la source d'alimentation en courant. Les particules de poussière augmentent le problème parce qu'elles ont tendance à retenir l'humidité. N'essayez PAS de compenser un environnement poussiéreux en plaçant des filtres sur les orifices de ventilation de la source d'alimentation en courant. Ceci gênera le passage de l'air et causera la surchauffe du système.

Un débit d'air insuffisant peut causer la surchauffe de la source d'alimentation en courant, ce qui risque d'infliger des dommages sérieux aux composants internes.

Électricité

⚠ AVERTISSEMENT:

SEULS des techniciens qualifies pourront installer le courant électrique d'entrée. Une mauvaise installation risque d'entraîner des blessures graves ou même la mort dues à un choc électrique et causer des dommages matériels importants aux composants.

L'arrivée du courant électrique doit se faire par l'entremise d'une boîte de distribution avec fusibles, et doit posséder un système de débranchement du courant conforme au NEC (National Electrical Code). Si des mesures de sécurité suffisante ne sont pas respectées, il peut en résulter des blessures graves et même la mort dues à un choc électrique, et causer des dommages matériels sérieux aux composants.

Débranchez le courant à la boîte de distribution avant de commencer l'installation. Placez une étiquette rouge sur l'interrupteur pour éviter la «mise en marche» accidentelle du circuit. Si cette précaution n'est pas respectée, il pourrait en résulter des blessures graves ou même la mort dues à un choc électrique, et causer des dommages matériels sérieux aux composants.

La source de courant doit être mise à la terre et la pièce doit être mise à la terre conformément à ANSI Z49.1.

Le cadre de cette source de courant doit être mis à la terre pour protéger le technicien qui l'utilise contre des chocs électriques potentiellement mortels.

Ne tirez jamais sur le câble primaire et n'appliquez pas de force exagérée sur ce câble une fois qu'il est installé. Le câble pourrait se débrancher des bornes et poser un risque potentiel de choc électrique mortel.

Le courant doit être fermé à la boîte de distribution pour protéger le technicien contre un choc électrique potentiellement mortel.

⚠ ATTENTION

Vous devez raccorder votre câble d'alimentation en courant électrique à une boîte de distribution de courant électrique protégée par un fusible ou un disjoncteur et à un dispositif de débranchement de courant. Référez-vous au tableau des indices à la section 3 en ce qui concerne l'indice particulier de votre fusible de source de courant.

L'enlèvement du chalumeau MIG de l'unité d'alimentation pendant l'utilisation du pistolet à bobine est facultatif. Si le chalumeau MIG n'est pas enlevé, le chalumeau reste toujours sous tension durant le fonctionnement du pistolet à bobine et un arc se produira s'il n'est pas isolé convenablement de la pièce de travail.

Gaz comprimé

⚠ AVERTISSEMENTS:

La manutention des bouteilles de gaz comprimé devrait faire l'objet de grandes précautions. Référez-vous aux instructions du fournisseur en ce qui concerne la bonne manutention pour éviter les blessures.

Assurez-vous que les boyaux, le régulateur et autres appareils sont en bon état et peuvent permettre un fonctionnement en toute sécurité.

Vérifiez si les boyaux n'ont pas de coupures, parties brûlées ou usées ou raccords endommagés. Si vous trouvez une détérioration quelconque, remplacez le boyau.
Assurez-vous que le chalumeau, le robinet de la bouteille, le régulateur et les raccords de boyau ne comportent ni poussière, ni saleté, ni huile, ni graisse.

Vérifiez chaque composant pour voir si les pièces ne sont pas endommagées. Les réparations aux chalumeaux, robinets, régulateurs et autre équipement de soudage devraient être réalisées seulement par un atelier de réparation qualifié, utilisant des pièces de rechange d'origine.

Les détendeurs doivent être utilisés comme des instruments de précision. Ils ne devraient pas être exposés aux chocs ou aux vibrations ni aux impacts brutaux causés par l'ouverture rapide du robinet de la bouteille à gaz.

Faites très attention lors de l'ouverture des robinets de bouteille.

Assurez-vous que la bouteille est convenablement fixée dans un chariot de soudage conçu pour cet usage ou enchaînez-la à un mur, à un poteau ou à une autre structure appropriée.

N'appliquez JAMAIS la pression totale de la bouteille sur le chalumeau. Utilisez toujours un détendeur fixé au robinet de sortie de la bouteille.

N'utilisez JAMAIS le chalumeau à des pressions dépassant celles qui sont recommandées dans ces instructions.

N'ouvrez JAMAIS un robinet de bouteille près de flammes, étincelles ou autres sources d'allumage.

Ne vous tenez JAMAIS devant ou derrière le détendeur lors de l'ouverture du robinet de bouteille. Tenez-vous sur le côté du détendeur.

N'utilisez JAMAIS une clé pour ouvrir un robinet équipé d'un volant; utilisez toujours le volant.

OUVREZ légèrement le robinet de la bouteille avant d'installer le détendeur. Ouvrez légèrement le robinet, puis fermez-le. Ceci permettra de dégager toute trace de poussière ou de saleté dans le robinet qui pourrait être envoyée dans le détendeur et causer des dommages ou un accident. Ouvrez légèrement le robinet dans un endroit bien ventilé.

Ouvrez lentement le robinet de la bouteille, tout d'abord en l'ouvrant légèrement puis en l'amenant à la position de fonctionnement.
N'ouvrez JAMAIS un robinet à un nombre de tours supérieur à celui indiqué.

Assurez-vous que tous les raccordements sont étanches aux fuites. Vérifiez les raccordements en ce qui concerne les fuites en utilisant de l'eau savonneuse ou une solution commerciale pour les fuites, compatible aux gaz utilisés.

N'utilisez JAMAIS une bouteille ou un réservoir doté d'un robinet qui fuit.

N'utilisez JAMAIS de flamme pour vérifier la présence d'une fuite de gaz inflammable ou d'oxygène.

Veillez à éviter toute blessure ou tout dommage matériel lorsque vous travaillez avec un chalumeau.

Portez TOUJOURS des vêtements ou de l'équipement de protection adéquats contre le rayonnement, les fumées, le bruit et les éclaboussures comme prévu par OSHA et les autres normes et règlements en vigueur.

N'appliquez jamais un chalumeau à un contenant qui contient ou a contenu des liquides ou vapeurs inflammables y compris essence, benzène, solvants et substances similaires. Assurez-vous tout d'abord que le contenant a été entièrement purgé de toute trace de substance ou vapeurs inflammables.

ÉVITEZ tout risque d'incendie. Faites particulièrement attention en travaillant à côté de matériaux combustibles qui ne peuvent pas être déplacés.
Ne placez JAMAIS le chalumeau au sol, à moins que l'arrivée du gaz n'ait été complètement arrêtée.

Veillez à la manutention et à l'entreposage adéquats des bouteilles.

ENTREPOSEZ les bouteilles dans un endroit propre, bien aéré, en vous assurant qu'elles sont complètement fixées pour éviter qu'elles ne tombent ou ne soient renversées. Les bouteilles permettant l'installation d'un bouchon devraient avoir leur bouchon en place durant l'entreposage ou la manutention.

Ne soumettez JAMAIS les bouteilles à un usage abusif, ne les faites pas tomber et ne les soumettez pas à une manutention brutale.

N'utilisez JAMAIS une bouteille ou un réservoir comme rouleau ou support.

N'essayez JAMAIS de soulever une bouteille par son bouchon; le bouchon et son dispositif de fixation ne sont pas conçus pour supporter le poids de la bouteille.

En plus du livret d'instructions, vous devriez aussi vous familiariser avec les publications suivantes et les avoir sous la main ou disponibles pour pouvoir vous y référer facilement:

Les instructions pour l'équipement de soudage ou de coupe que vous utilisez.

Les fiches signalétiques sur la sécurité des produits (MSDS) pour les gaz de soudage, les tiges, les soudures, etc. qui sont utilisés dans le processus de soudage.

⚠ ATTENTION

Ne changez jamais le commutateur STICK/MIG (électrode enrobée/électrode au tungstène) pendant que le commutateur de courant est en marche.

Ne faites jamais de soudage à électrode enrobée (STICK) lorsque le câble de pièce est raccordé à la borne «MIG (+) (électrode de tungstène)».

Consultez le manuel de fonctionnement pour le bon réglage de soudage avec électrode enrobée (STICK).

⚠ AVERTISSEMENTS:

Ne touchez pas aux pièces électriques sous tension ou à la pièce de travail avec des gants mouillés. Vous pourriez recevoir un choc électrique qui peut être potentiellement mortel.

Les rayons de l'arc peuvent endommager vos yeux et brûler votre peau. Référez-vous à ANSI Z87.1. Portez toujours un casque de soudage et des vêtements protecteurs.

Évitez de respirer les fumées.
Assurez-vous que la zone est suffisamment ventilée ou qu'aucune évacuation se produit à la zone de travail. Si le travail est tel que vous ne pouvez pas éviter les fumées et les vapeurs, utilisez un respirateur à adduction d'air.

Des métaux tels que le plomb, le zinc et le béryllium peuvent produire des fumées toxiques lors du soudage ou du découpage. Ne travaillez pas avec de tels matériaux sans une ventilation et un systeme de respiration adéquats. Toutes les personnes se trouvant dans la zone doivent être équipées de respirateurs à adduction d'air.

Le fil de soudage peut causer des blessures de perforation. Ne pointez pas la torche vers une partie quelconque de votre corps, et une surface conductrice ou une autre personne.

Le métal chaud, les éclaboussures et les scories peuvent causer un incendie et des brûlures. Attention au feu,
gardez un extincteur à proximité et sachez comment l'utiliser. Ne soudez pas à côté de produits inflammables. Laissez la pièce et l'équipement se refroidir avant la manutention.

Les champs magnétiques provenant de courants élevés peuvent affecter le fonctionnement d'un régulateur cardiaque. Si vous portez un régulateur cardiaque, consultez votre médecin avant de vous placer à proximité des opérations de soudage à l'arc, de gougeage ou de soudage par points.

⚠ ATTENTION

Gardez votre zone de travail et votre équipement bien propres. Les particules de métal peuvent entrer dans le circuit électrique et causer un court-circuit.

3. Rated Specifications

Rated input voltage	V	460 AC
Rated input current	C	35 AC
Rated frequency	Hz	60Hz
Number of Phase		3-phase
Maximum non-load voltage	V	72 DC
Rated output current	A	500 DC
Rated output voltage	V	45 DC
Rated duty cycle	%	100
Power control method	-	IGBT inverter type
Computer interface	-	RS-232C, RS-422
Memory	-	32 ch, reproducible storages
Robot interface	-	Serial communication interface to Panasonic G2 series controllers
Applicable welding method	-	CO_2, MAG, Pulsed MAG
Waveform control method	-	Digital control: -7 (small) to +7 (large) (Standard: 0)
Sequence	-	Main welding, Main welding - Crater (“Crater repeat” is available), Initial - Main welding - Crater (“Crater repeat” is available), Arc spot
Applicable shielding gas	-	CO_2 (100%), MAG (80% argon and 20% CO_2)
Applicable wire size (diameter)	mm	1.2, 1.4, 1.6
Applicable wire material	-	Mild steel (MS) Mild steel_Flux cored wire (MS_FCW)
Welding wire jog	-	Jog (forward) and retract (backward)
Gas purge time	-	1 second - 1 minute / continuous
Pre-flow time	s	0.02 - 5.00 (Increment of 0.02) continuous
Post-flow time	s	0.10 - 5.00 (Increment of 0.02) continuous
Arc spot time	-	0.3 - 10.0 (Increment of 0.1) continuous
Input power terminal	-	4 conductors (including grounding conductor.), M6 bolting
Output terminal	-	M8 bolting
Dimension (Width x Depth x Height)	-	17.3” x 23.0” x 37.2” (440mm x 585mm x 945mm)
Mass	-	266 lbs. (122 kg.)

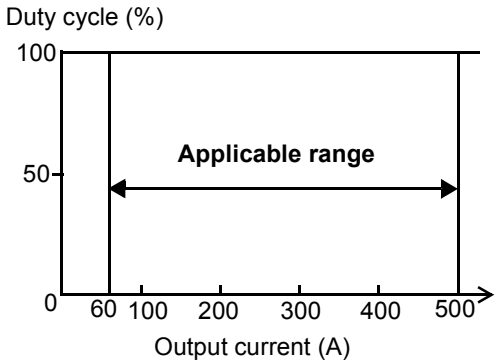
* It is necessary to use the controller to set the above times and functions. (See section “Setting welding conditions”.)

3.1 Standard accessories

Name	Product number	Q’ty	Remarks
Glass tube fuse (3A)	XBA2E30NS5	1	Front panel, For slow-blow* (*: Coiled element)
Glass tube fuse (3A)	XBA2E30NS5	1	Front panel
Glass tube fuse (8A)	XBA2E80NS5	1	Front panel

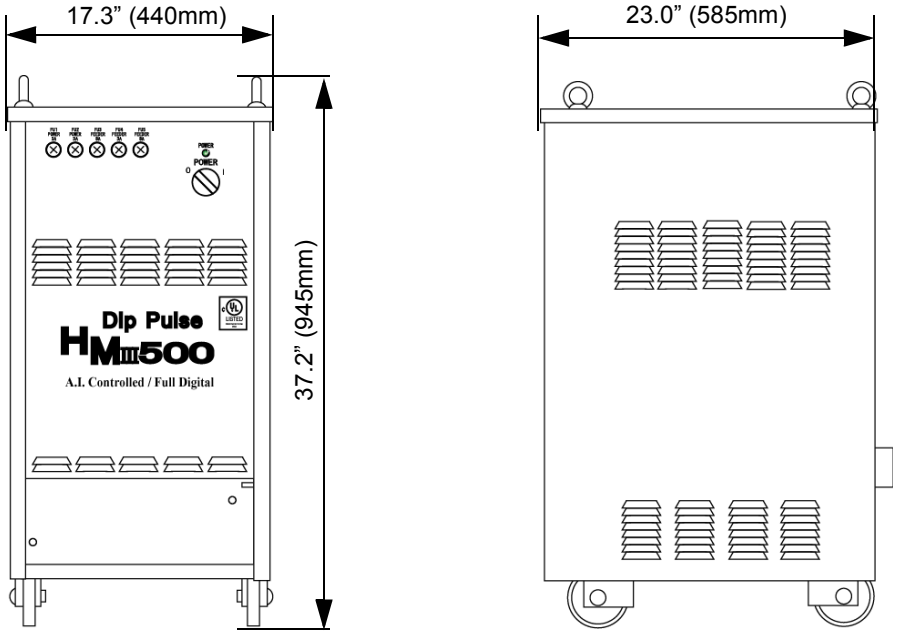
3.2 Duty cycle

- The rated duty cycle for this product is 100%.
  "The duty cycle is 100% at the rated output" means that the power source can maintain operation continuously with the rated output current without overheating.
- When using the product in combination with other devices, such as the welding torch, etc., use it at the lowest rated duty cycle among those devices
  Note:
  Using a product at a duty cycle over the rated duty cycle may cause the increase of equipment temperature over the permissible maximum, and result in the deterioration or burnout of the equipment.



For your reference**:**
Duty cycle: The percentage ratio of loading time to full time. A cycle of the full time shall be 10 minutes.
Rated duty cycle: means the rate of use when loading the rated output current intermittently at the rated input voltage of the rated frequency. Regarding the engine-driven welding power unit, however, it means when driving it at the rated number of revolution.

3.3 Dimensions



4. Installation site and transportation

⚠AVERTISSEMENT:

Consultez la portion ‹‹SÉCURITÉ›› de précédent section concernant les versions françaises des avertissements et precautions.

4.1 Installation site

Proper site location is a critical ingredient for trouble-free operation. Read and understand these directions before choosing a location for the power source.

WARNING		Heat and ray produced during arc welding can react with vapors of solvents to form highly toxic gases.
CAUTION		High humidity can cause condensation to form on and then corrode critical components of the power source. Dust particles compound the problem because of their tendency to hold moisture. DO NOT attempt to compensate for a dusty environment by placing filters over vent slots on the power source. This restricts air flow and will cause the unit to overheat.
CAUTION		Inadequate airflow can case the power source to overheat, and thereby inflict serious damage on internal components.

Selecting proper location is a critical factor for trouble-free operation of the power source. Read the following instructions to choose proper location.

(1) Indoors, not subject to direct sunlight or rain, with less moisture and dust.

(2) Ambient temperature
   (a) During welding:+14 to +104deg-F (-10 to 40deg-C)
   (b) After transport/storage: -4 to +131deg-F (-20 to +55deg-C)

(3) Humidity:
   (a) Up to 50% at 104deg-F (40deg-C)
   (b) Up to 90% at 68deg-F (20deg-C)

(4) Altitude above sea level: up to 3280.84 ft (1000 m)

(5) Maintain an appropriate distance to maintain adequate air-flow.
   (a) 8 in (20 cm) or more from any wall or other devices.
   (b) 12 in. (30 cm) or more between power sources installed side-by-side.

(6) Base of the welding power source inclined: Max. 10deg.

(7) Places where the welding arc area is not subject to wind. (Protect the area from wind by a partition, etc.)

(8) Free from abnormal amount of dust, acid, corrosive gases or substances etc. other than those generated by the welding process (especially, avoid where the metallic substance may get into the power source.)

4.2 Providing adequate ventilation

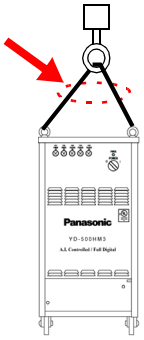
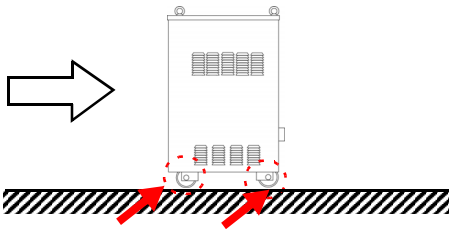
Just as site location is important, you must also be aware of the ventilation requirements to provide a safe environment for anyone near or at the welding site.

WARNING		Small amounts of Carbon Monoxide (CO) and other toxic gases are produced during welding operations. Improper space-to-ventilation requirements can cause serious injury.

Note: Refer to section "Important safety items: Safety for source of additional information on ventilation requirement."

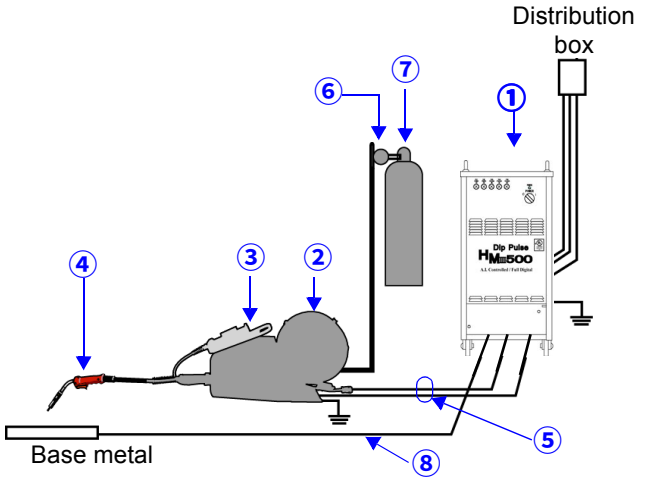
4.3 Transportation

		When lifting this product, make sure to use a crane or an equivalent. • In case of using a crane, etc., make sure to use the attached eyebolts. • When putting this product down, do not cause a shock to it.

When hanging it for transportation	When pushing it for transportation
Make sure to hang it at 2 points.  **Note** Eyebolts are important safety parts. When they are lost or broken, please purchase safety approved eyebolts from local Panasonic welding distributors.	 As this product is provided with wheels (not universal wheels.) in the front and rear of its bottom, you can push to move it. **Note** When you go around the curve, do not curve sharply. Or wheel or floor may be damaged.

5. Configuration

5.1 Manual welding system



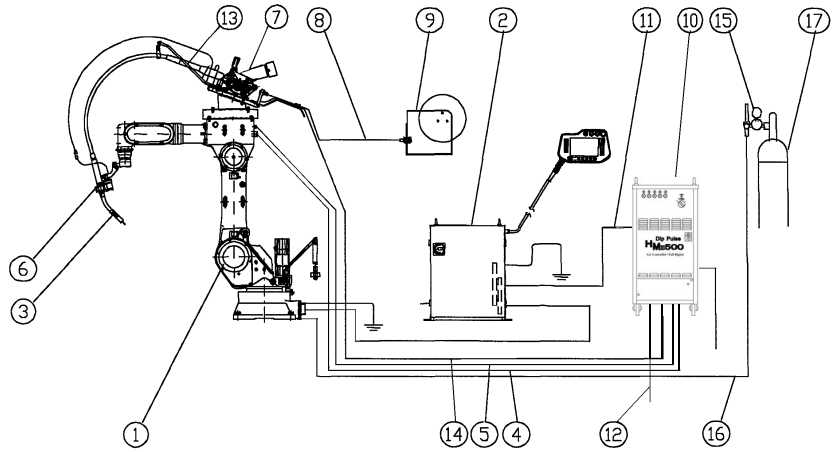
No.	Name	Note
1	**Welding power source**	*
2	Wire feeder	O
3	Remote controller	O
4	Welding torch	O
5	Connecting cables	O
6	Gas regulator	X
7	Gas cylinder (Shield gas)	O
8	Output cable	X

* Standard equipment components (at shipment)

O Available as optional units (separately sold)

X To be provided by customers.

5.2 Robot system

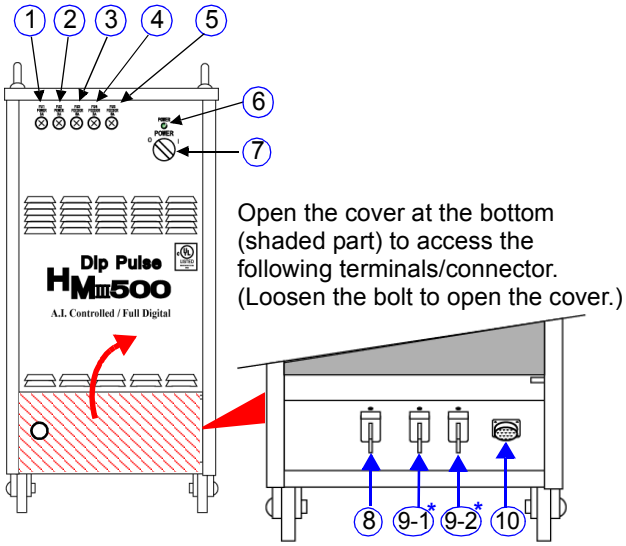


No.	Name
1	Robot manipulator
2	Robot controller
3	Welding torch
4	Communication cable
5	Control cable
6	Safety holder
7	Wire feed unit
8	Flexible conduit
9	Wire reel stand
10	**Welding power source**
11	Communication cable
12	Welding cable
13	Cable fixing unit
14	Power cable
15	Gas regulator
16	Gas hose (rear)
17	Gas cylinder

6. Names and functions

6.1 Front panel

WARNING	About handling of fuse
	Prior to handling a fuse, turn OFF power to the power source so as to prevent electric shock. (In case of handling fuses inside the power source (Fu6 to Fu8), disconnect power at the distribution box.



Caution: 8, 9-1 and 9-2
Make sure to turn OFF the power before connecting (or disconnecting) cable to (or from) them.

(1) **POWER 3A**: (for slow-blow)
Fuse for the control circuit

(2) **POWER 3A**:
Fuse for the wire feed control power circuit.

(3) **FEEDER 8A**:
Fuse for the wire feed motor circuit.

(4) **FEEDER 3A**:
Fuse for the wire feed control power circuit.

(5) **FEEDER 8A**:
Fuse for the wire feed motor circuit.

(6) **POWER**: Power lamp (green light)

(7) **POWER**: Power switch
Switch ON/OFF

(8) **-**: Output terminal (Base metal side)
Connect the output cable for base metal.

(9-1)* **+**: Output terminal for CO2/MAG (Torch side)
Connect the cable (power cable) for the wire feeder.

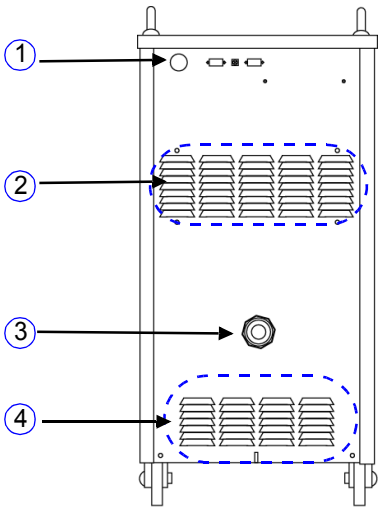
(9-2)* **+**: Output terminal for Pulsed MAG (Torch side)
Connect the cable (power cable) for the wire feeder.

(10) **FEEDER**: Feeder connector (16P)/C1
Connect the cable (control cable) from the wire feeder.

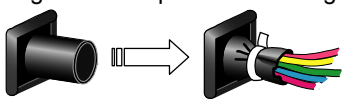
Note

*: Do not use both terminals (#9-1 and #9-2) at the same time. Use one terminal and cover the other one (not in use) with the attached insulation cap.

6.2 Rear side panel



(1) Wiring port for jig terminals (grommet-covered)
Note:
Make sure to tie the lead-in wires in a bundle over the boot of the grommet to prevent dust to get in.



(2) Air ventilator inlet for cooling fan(Note)

(3) Ground terminal (M6 bolt)

(4) Air ventilator outlet for cooling fan(Note)

Note Air ventilators

- Air ventilators are provided at the same height as 2 and 4 on the side panels for the same purpose respectively.
- Do not place anything around vents.

7. Connection

Important	● The installation shall be done by qualified installation personnel and should conform to all national and local codes. ● Type and capacity of protection devices, such as breaker and fuse, to be applied should conform to all national and local codes. ● Type and size of cables to be applied should conform to all national and local codes.

WARNING	**Touching any live electrical parts may cause fatal electric shocks or severe burns.** To prevent physical accidents like an electric shock, burn injury and so on, make sure to observe the followings.
	• Make sure to turn off the switches of this product and the distribution box before starting connections. • Do not perform any connection work with wet hands. • Make sure to insulate the exposed conductible portions such as connections by taping. • Do not apply undue force to the cables and wires. • Avoid contact with the welding arc part at wiring. • For safety reasons, provide base material with grounding work. Wiring and grounding work should be done by qualified electricians.

WARNING		Ground yourself such as touching metallic part of the case before handling the PC. Board to protect PC. Board from electrostatic discharge damage.

WARNING	**Observe the followings to prevent a fire caused by overheat of cables.** • Do not use undersized cables. • Connect cables completely - double-check connections.

CAUTION	Inadequate airflow can cause the power source to overheat, and thereby inflict serious damage on internal components.

7.1 Output side connection

Open the terminal cover at the bottom of the front panel to access the terminals and connector.
(Loosen the bolt to open the cover.)

Note

After completion of connecting cables to the terminals, insulate the cable connections with insulation tape.

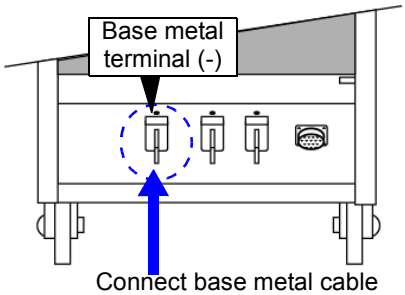
7.1.1 Connecting cable from base metal

Connect cable from the base metal to the base metal terminal (-) with the attached M8 bolt.

After connection, insulate the cable connections with insulation tape.

● About base metal cable (Customer preparation)

- Use a cable (38 mm^2 or more) for welding or a specified tough rubber sheath cable (excluding vinyl type)
- Cross section and the length of the base metal cable should conform to the applied connecting cable model.
- Make sure to attach the proper clamp terminal.

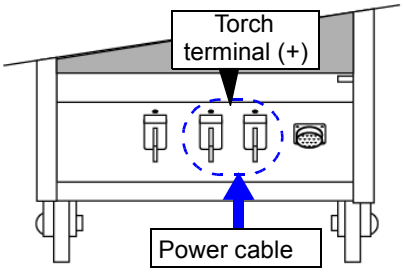


7.1.2 Connecting power cable

Connect power cable from the wire feeder to the torch terminal (+) with the attached M8 bolt.

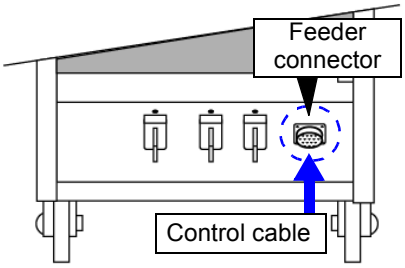
Note

Do not use both terminals at the same time. Use one terminal and cover the other one (not in use) with the attached insulation cap.

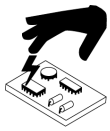


7.1.3 Connecting control cable

Connect control cable from the wire feeder to the feeder connector.



7.2 In case of using base metal voltage detection wire

WARNING		Ground yourself such as touching metal part of the case before handling the PC. Board to protect PC. Board from electrostatic discharge damage.

To compensate the voltage drop of the extension cable.

- Connect the base metal voltage detection wire to the “BASE METAL (-)” terminal in the front panel of the wire feeder.
- Set the SW1 on the PC. Board (ZUEP1401*A4) to “EXT” side.

<How to switch the SW1 to “EXT”>

(1) Turn off the power switches at the power source and power box.

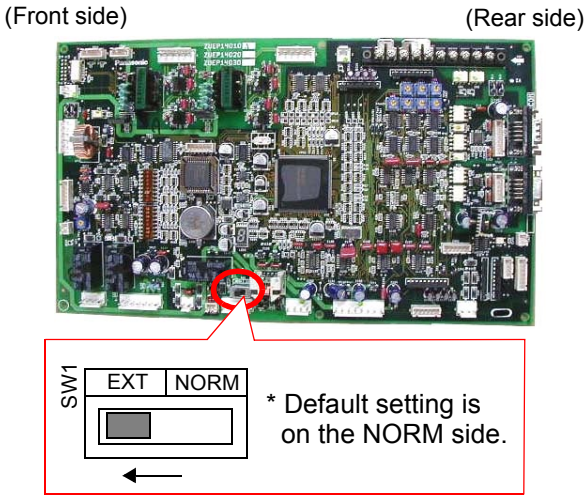
(2) Remove the top panel to access the PC Board inside the welding power source. (Panel is attached with 4 screws and 2-M8 screw covers)

(3) Switch the SW1 on the PC. Board to the “EXT” side.

(4) Set the top cover back in place, and turn on the power again.

Note

The change is applied the next time you turn on the power.



7.3 Input and ground (PE) cable connection

WARNING		The frame of this power source must be grounded to protect operating technician from portentially deadly electrical shock.

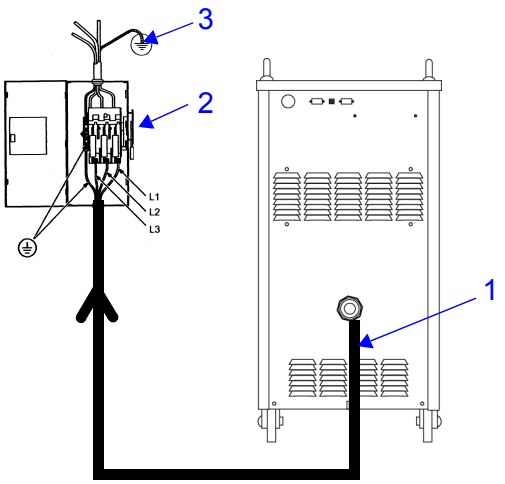
WARNING		Never pull or apply undue force on primary cable once it has been installed. Cable could disconnect from terminals and pose a threat of portentially deadly electric shock.

WARNING	TURN OFF the power switch at the power distribution box before connecting ground and input cables

CAUTION	The wiring and grounding work should be performed by educated and/or skilled person.

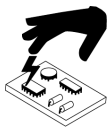
Input power cable	Diameter	Length	Note
	AWG 8	8.2 ft. (2.5 m)	4 conductors (including grounding conductor.)
Ground cable	Make sure to use one with diameter equal to or larger than that of the input power cable.		

(1) Turn off power at the distribution box.
(2) Connect grounding conductor to supply grounding terminal.
(3) Connect input power conductors to (-) minus terminals of the power box.



1	Input power cable	Customer preparation
2	Power box	Customer preparation
3	GND/PE	-

7.4 Jig terminals connections

WARNING		When touching a printed circuit board, observe the following item to prevent electrostatic destruction of the printed circuit board. Before starting an operation, for example, touch any metal part of the case with your hand to discharge static electricity.

7.4.1 Connecting jig terminals

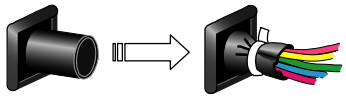
Jig terminals for controlling emergency stop or temporary stop from external equipment such as a robot, or of sending current detection signal from the welding power source to a jig or a robot are provided on the PC. Board (ZUEP1401*A4).

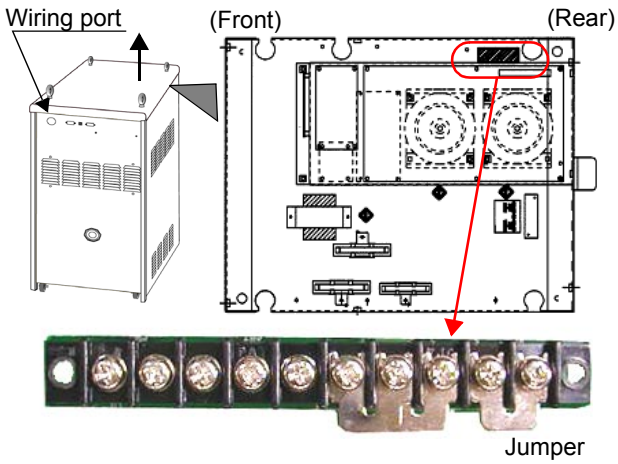
Remove the top panel to access the jig terminals.
(The top panel is attached with eye bolts and 2-M8 screw covers.)
Make sure to re-install the top panel back in place after the connection work.

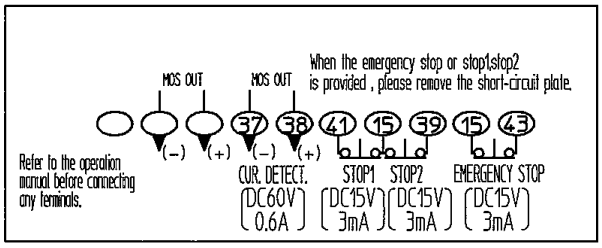
Note

- Lead the wires into the welding power source through the wiring port (with grommet) (* Make a cut in the grommet wall to insert wires.)
- Then tie the lead-in wires in a bundle with a binding band (15 cm) over the boot of the grommet to prevent dust to get in.

Wiring port with grommet







	Name	Function
INPUT	Emergency stop	• When the terminals are opened, the product comes to an emergency stop. At that time, the welding output, gas supply and wire feed are also stopped. • To release the emergency stop, turn off the power, close these terminals, and then turn on the power again.
	Stop 1 and Stop 2	• When the terminals are opened, the product comes to a hold state. At that time, welding output, gas supply, wire feed, gas purge, wire jogging and wire retract are also stopped. • Connect a signal for reduced-gas-level detection, etc. • In case that a water cooled torch is used, connect a signal for reduced-water-level detection, etc. • To release the hold state, close these terminals.
OUTPUT	Current detection	• Between these terminals, the normally-open contact of a photo MOS relay is connected, and it is closed while welding current flows. • Use it when there is a jig whose operation should be synchronized with the flow of the welding current.
	User output	• Between these terminals, the normally-open contact of a photo MOS relay is connected. • This is provided for special use. (As to the product with standard specification, nothing is output.

● Input terminals

- To these terminals, make sure to connect a no-voltage contact signal or an open-collector transistor signal. (Connecting a signal with voltage may cause a circuit burnout to this product.)
- Between these terminals, the voltage of 15VDC is applied when the circuit is open, and the current of DC 3mA is generated when the circuit is closed.

[Connect a signal not likely to cause any damage or contact failure under this voltage or current to these terminals.]

● Output terminals

- Do not exceed the following contact ratings.
  Load voltage: 60 VDC
  Load current: 0.6 ADC

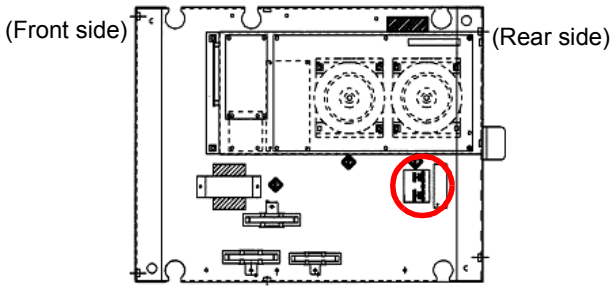
AC (alternating current) is not applicable.

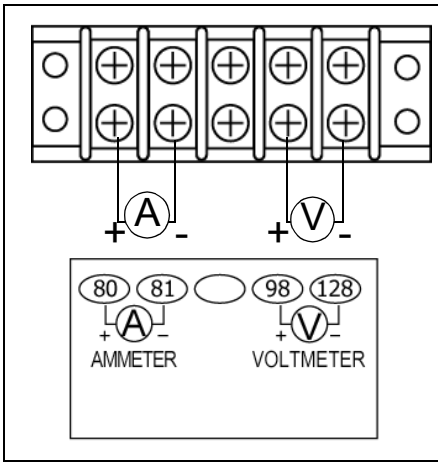
7.4.2 Connecting jig terminals for gauges

Note

As terminals for ammeter and voltmeter are directly connected to the output circuit of the product, work with caution when connecting gauges to prevent any effects to be on the product including electrical insulation, earth fault, short-circuit or noise, from a circuit of the peripherals.

Top view of the power source without top panel.





Terminal		Functions
80(+)	Ammeter	Connect those terminals to a DC ammeter to display the output current. • Use a DC ammeter with external shunt resistor (400A/60mV) that can display up to 400 A. *This product is provided with built-in shunt resistor. • In order to prevent any indication error, make sure that the applied connecting cable to the ammeter has correct section area and length specified by its manufacturer.
81(-)		
98(+)	Voltmeter	Connect those terminals to a DC voltmeter to display the output voltage. • Use a DC voltmeter that can display 100 V or more.
128(-)		

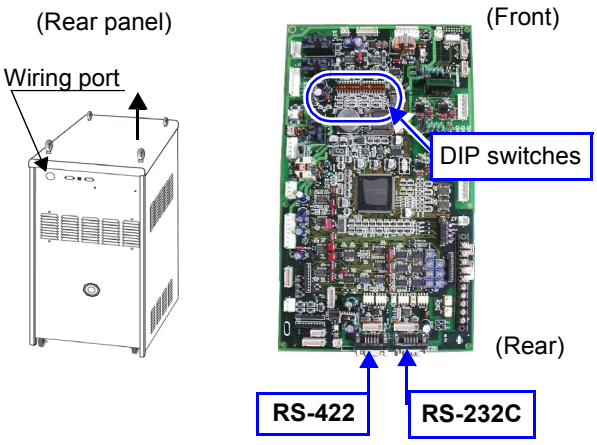
7.4.3 Connecting Personal computer / Robot

Note To avoid possible noise trouble, make sure to place the communication cable away from welding arc part, welding torch or base metal cable.

To connect to a personal computer or a robot, it is necessary
(1) to connect communication cable to a connector, and
(2) to change settings of DIP switches (DSW1).

	Connecting connector	DIP switches settings (DSW1)
PC	RS-232C(CN23)	Only #7 and #8 are ON
Robot	RS-422(CN22)	Only #6 is ON

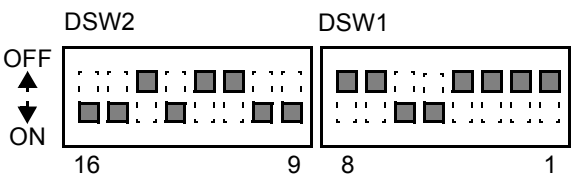
* Both connectors and DIP switches are located on the PC. Board (ZUEP1401*A4) inside the welding power source. Open the top panel to access the PC. Board.



Note

- **The change is applied the next time the power is turned on.**
- Draw wires through the wiring port (rear panel).
  * Make a cut in the grommet wall to insert wires.
- To enable the function of communication, make sure to turn the power off, and then set the DIP switches.
  (When not using the function of communication, turn off the DIP switches #7 and #8.)
- Turn the switches on and off over the orange cover.

<DIP switches settings at shipment>



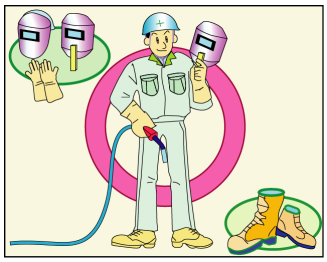
8. Operation

8.1 Preparation steps

8.1.1 Use of protective equipment

WARNING	To protect you and other people from gases, fumes and lack of oxygen that may be generated during the welding operation, make sure to prepare ventilation facilities and use protective equipment, etc.
	● Welding operations in narrow spaces may cause asphyxia due to lack of oxygen. ● Prepare ventilation facilities to prevent the inhalation of gases and fumes generated during the welding operation. Otherwise, wear a respirator.

CAUTION	To protect you and other people from arc light, flying spatters, slag, and arc noises generated by welding, use protective equipment.
	● Wear leather gloves and safety shoes to protect the exposed parts of your eyes and skin. ● Prepare light-shielding glasses or a welding face-shield with a light-shielding filter plate appropriate to the applied welding current. ● Prepare the ear protection device.



8.1.2 Pre-operation check

- Check if all connections are correct and complete.
- Check if system configuration is correct.
- Check if the terminal cover at the front panel is closed.

8.1.3 Turning on power

(1) Turn of the power to the distribution box.

(2) Turn on the POWER switch of this product.
The “POWER” lamp is turned on, and in about three seconds, the electromagnetic switch is turned on.

8.2 Settings and operation

8.2.1 Setting welding conditions

Use either controller or robot controller of our industrial robot to set welding conditions and other settings.

* Refer to the operating instructions of the controller or robot controller for details.

Note

It is not possible to connect the controller direct to the this welding power source. The controller should be connected to the wire feeder.

● Initial welding conditions settings at shipment

Welding schedule	: No Crater (Main weld only)
Pulse mode	: Hybrid pulse
Low pulse set	: No Low Pulse
Voltage setting	: Unitary input
Cur. & Volt. set	: Main weld set
Manual / Auto	: Manual
Arc spot time	: 2.00 seconds
Pulse	: Pulsed weld

8.3 Steps after welding operation

8.3.1 Shutting off gas

First of all, close the main valve of the gas bottle, and then do the “gas purge” to take the residual pressure out of the pipe.

8.3.2 Shutting off power

Important	To allow the inside of this product to cool down, turn the power off at least 5 minutes after the completion of welding operations.

(1) Turn off “POWER” switch.
The “POWER” lamp is turned off, and then the electromagnetic switch is turned off.

(2) Turn off the power to the distribution box.

Note

At that time, even if the “Err-5: Low primary voltage” appears, it does not mean that an error has occurred. (The message appears because the reduction of the primary voltage has been detected due to the shutdown of the power switch.)

9. Maintenance and inspection

Safety

⚠ WARNINGS:

Do not perform any inspection before turning off power at distribution box. Red tag disconnect switch once power is disconnected. Turning off the power source main power switch does not guarantee that there will be no voltage present at terminals, so it is imperative that the power be cut off at the distribution box. Failure to follow this warning could result in potentially deadly shock.

Wear eye protection when using compressed air to prevent injury from airborne particles.

⚠ CAUTION

Clear compressed air hose of any water or oil that may be present before using on internal components of power source. One burst of air will usually clear the line.

Sécurité

⚠ AVERTISSEMENTS:

Ne réalisez pas d'inspection avant d'avoir fermé le courant à la boîte de distribution. Mettez une etiquette rouge sur le commutateur de débranchement une fois le courant débranché. Le fait de fermer le courant à l'interrupteur principal ne garantit pas qu'il n'y aura pas de tension aux bornes. Il est donc impératif que le courant soit coupé à la boîte de distribution. Si cet avertissement n'est pas suivi, il pourrait en résulter un choc potentiellement mortel.

Portez une protection pour les yeux lorsque vous utilisez de l'air comprimé pour éviter des blessures causées par les particules en suspension dans l'air.

⚠ ATTENTION

Nettoyez le boyau d'air comprimé de toute eau ou huile qui pourrait rester à l'intérieur avant de l'utiliser sur des composants internes de source d'alimentation. Un seul jet d'air suffira pour dégager le conduit.

9.1 Daily check

 **WARNING**	**Touching any current-carrying parts may cause a fatal electric shock or burn injury** To prevent a fatal accident, such as an electric shock, burn injury, etc., make sure to observe the followings.
	Make sure to turn off the power switch and the switch of the power box before making a daily check. (However, any external check made without touching current-carrying parts or their surrounding area is excluded.)

- The daily check is important to make the most of the performance of this product and to secure the safety of daily operations.
- Perform the daily check for sections indicated in the following table, and conduct the cleaning and replacement of parts when necessary.
- For replacement of parts, make sure to use our genuine parts for Panasonic welding machine to keep its performance and functions

9.1.1 Welding machine (This product)

Check item		Check point	Remarks
Front	Devices (such as switch, indicating lamp, fuse holder, output terminal, connector)	Check for breakage and loose attachment.	If there is any defect, an inside check, additional fastening, parts replacement, etc. are required.
	Indication lamps	If it functions correctly.	
	Eyebolts, cases (such as top panel), output terminal cover	Check for loose attachment.	
Rear	Devices (such as switch)	Check for breakage and loose attachment.	
Surroundings	Air ventilators	If air is sucked in from the upper vents and exhausted from the lower vents all right.	
	Cooling fan	Check for unusual rotation noise.	
Overall	• Check if there is any trace of heat generation, such as discoloration, on enclosure. • Check if wear or other damage is apparent. • After power “ON”, check if there is any unusual vibrations, beats or odor.		If there is any unusual events, an inside check is required.

9.1.2 Cables

Check item	Check point	Remarks
Grounding wires	Check grounding wires for this product and base metal if each grounding wire is connected all right and fastened securely.	To prevent a physical accident caused by electric leakage, make sure to check it.
Input cables	Check cable film for damage or wear.	Replace if damaged. To secure the physical safety and stable arc, check those cables in an appropriate manner according to the conditions of shop floors. • Daily check: Inspect roughly and quickly by the daily check. • Period check: Inspect in details.
	Check cables if any undue force is applied.	
	Check cable connections for tightness.	
Output cables	If any current-carrying parts except base metal side connection is exposed.	
	Check cable film for damage or wear.	
	Check cables if any undue force is applied.	
	Check cable connections for tightness.	
Control cables	Check connectors if connections are secure.	
	Check cable film for damage or wear.	
	Check cables if any undue force is applied.	
Gas hose	Check leakage. Check for wear or other damages.	

9.2 Periodic check

WARNING	Touching any current-carrying parts may cause a fatal electric shock or burn injury. To prevent a fatal accident, such as an electric shock, burn injury, etc., make sure to observe the followings.
	● To secure physical safety, make sure that a qualified person or a person who is familiar with the welding machine takes care of a regular check. ● Make sure to turn off the power and other switches of all devices* for safety reasons before starting a regular check, unless there is the absolute necessity of keeping them turned on. *: Means this product, distribution box and any other related devices (a jig, robot, etc.) ● In case of performing the inside inspection, make sure to work at least five minutes after the power is turned off (for capacitor discharge). ● When removing the case's top panel, etc., take measures so that no other person approaches this product without discretion (for example, by enclosing the product).

CAUTION	To prevent the electrostatic destruction of semiconductor parts and the printed circuit board, observe the following.
	Allow static electricity to escape by, for example, touching the metal parts of the case with your hand before touching the equipment, the conductor of wire and/or the printed circuit board.

Notice	About cleaning of plastic parts

- Plastic parts may be melted or deformed when they are subjected to organic solvent (benzine, toluene, kerosene, gasoline, etc.).
- When cleaning them, soak a soft cloth with a small amount of water or diluted mild detergent for home use, and wring it and use for wiping those parts.

- Daily checks are not enough to keep the proper performance of this product for a long time.
- In the regular check, a careful and detailed inspection including the checking and cleaning of the inside of this product is performed.
- As for the regular check, conducted it every 6 months normally.
  [If there is a mass of fine dust, oily smoke, etc. around this product, perform the regular check every 3 months as a guideline.]

9.2.1 Check guideline

- While details for checking are shown below table, consider any additional check items according to your conditions of use.

Check item	Guideline
Removal of inside dust	• Remove the top and both sides panels to check inside. • Use dry air to blow out dust or dirt accumulated.
Overall check	• Remove the top and both sides panels before checking. • Check the followings and other items that are not covered by the daily check intensively. - The presence of odor, discoloration, and traces of heat generation - Poor connections - Loose mountings
Cables	Carefully check connections, damage, wear, undue force and so on of all cables; such as grounding wire (for this product, base material, etc.), input and output cables, cables for the torch switch, remote control unit, etc., and hoses (for gases, and for water supply and drainage when using the water-cooling torch).
Inspection and maintenance of consumable parts	• A cooling fan and electrolytic capacitor have electrical and mechanical service lives of 10,000 hours and 8,000 hours at rated specification respectively. (* Please note that each service life depends on operating conditions.) • In periodic check and maintenance, treat the cooling fan and electrolytic capacitor as expandable parts. • In order to maintain high performance and function, use the welding genuine parts of Panasonic as replacement.

9.2.2 Precautions on long storage

In case of storing the unit for long period while retaining the parameters set by customers, energize the unit for about 10 minutes every two weeks. (No welding operation is required.

It is about 3 weeks without the power turned on.
In about three weeks without the power turned on, each set condition returns to the factory setting.

9.3 Precautions in performing withstand voltage test and insulation resistance measurement

This product uses semiconductor components such as transistor. Executing withstand voltage test or insulation resistance measurement casually may cause serious physical injury or mechanical failure. In case of necessity, contact our sales distributors or Panasonic representatives.

♦Attention of sales distributors / Panasonic representatives

Prior to conducting withstand voltage test and insulation resistance test, prepare the followings and also connect ground wire (cross section: about 1.25 mm^2).

Area	Operation
Input power cable	Draw out the input power cable from the power box, and short the connecting terminals of the cable.
Output terminal of welding power source	Disconnect the cables connected to the output terminal except one for welding main circuit, and then short-circuit the output terminals with conductor cable.
Connecting connector	Disconnect all connecting cables and signal wires for external devices from jig terminal, welding torch, wire feeder connector, communication connector and so on.
Ground wire for case	Disconnect all ground wires inside of the case connected to the case.
Main circuit	Short-circuit between the emitter and collector of the main transister IGBT, and between anode and cathode of the secondary diode with conductor cable.
Control circuit	Disconnect all connectors connected to the P.C. Board.

Note

After completion of the test(s) and prior to re-installing the case or cover, do the followings without fail.

- Remove all conductor cables for short-circuit.
- Reconnect all cables, connectors and ground wires that have been disconnected before the tests to the original condition.

Make sure to conduct the above. If the power has been turned on without removing the conductor cables for the test, the equipment may be burnt.

10. Troubleshooting

Safety

⚠ WARNINGS:

Do not perform any inspection before turning off power at distribution box. Red tag disconnect switch once power is disconnected. Turning off the power source main power switch does not guarantee that there will be no voltage present at terminals, so it is imperative that the power be cut off at the distribution box. Failure to follow this warning could result in potentially deadly shock.

Sécurité

⚠ AVERTISSEMENTS:

Ne réalisez pas d'inspection avant d'avoir fermé le courant à la boîte de distribution. Mettez une etiquette rouge sur le commutateur de débranchement une fois le courant débranché. Le fait de fermer le courant à l'interrupteur principal ne garantit pas qu'il n'y aura pas de tension aux bornes. Il est donc impératif que le courant soit coupé à la boîte de distribution. Si cet avertissement n'est pas suivi, il pourrait en résulter un choc potentiellement mortel.

WARNING	**Touching the current-carrying parts may cause a fatal electric shock or burn injury.** To prevent a physical accident, such as an electric shock, burn injury, etc., make sure to observe the followings.
	● To ensure safety, troubleshooting work shall be done by qualified personnel. ● Make sure to turn off the power and other switches of all devices* for safety reasons before taking any actions for correcting an error. *: Includes this product, the distribution box and other related devices (jigs, robots, etc.). ● In case of performing the inside inspection, make sure to work at least five minutes after the power is turned off (for capacitor discharge).

10.1 Error codes

When the power source has detected abnormal state of the electric circuit, it automatically stops the functions and displays the error code on the 7-segment LCD* inside of the power source (on the P.C. Board ZUEP1402) (Fig.1) and the error code and error status on the controller (Indicators "a", "b" and "c" in Fig.2)

* For example, "Err-01" is display cyclically shows "E→0→1"

Note

When the power switch is turned off, "Err-01" is momentarily lit, which is not an error.

* For any abnormal state of the welding power source with no indication of error code, refer to the troubleshooting table in the next section.

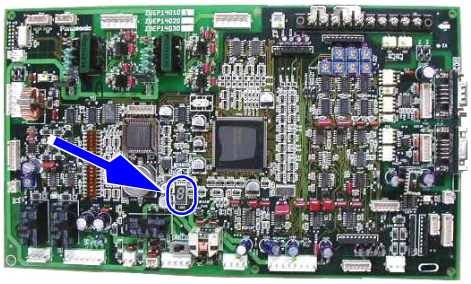


Fig.1

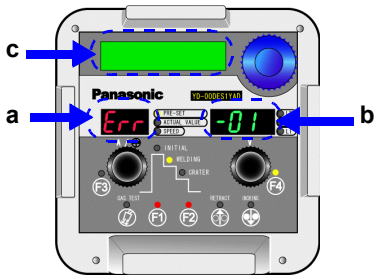


Fig.2

Power source	Controller side			Probable causes and countermeasures
	a	b	c	
E01	Err	-01	Emergency Stop	Emergency stop from the external equipment connected to the jig terminal. Turn off power switch, remove the causes and then turn power switch on again.
E02	Err	-02	Sec. OverCurrent	Short-circuit in the secondary circuit, or welding current exceeds rated value. Turn off power switch, remove the causes and then turn power switch on again.
E03	Err	-03	Abnormal Temp.	The power source is over-heated. Keep the input power in no load state and wait for a while. The error code indication automatically turned off when the power source is cooled down. Check and remove causes of over-heat. • Over duty cycle, • Air flow blocking at ventilation and cooling fan windows
E04	Err	-04	Pri. OverVoltage	The input voltage exceeds the allowable upper limit. Turn power switch off and set the input voltage to within +10 % of the rated value. Then turn power switch back on again.
E05	Err	-05	Pri. Low Voltage	The input voltage is below the allowable lower limit. Turn power switch off and set the input voltage to within -10 % of the rated value. Then turn power switch back on again.
E06	Err	-06	Arc Start	The torch switch is turned on but the welding arc is not started (in four seconds after torch switch ON.) <Note> When this “Arc Start” error occurs, the output and rotation of the wire feed motor and shielding gas flow stop automatically. 1. Release the torch switch to clear the error indication. 2. Remove causes of the arc start error. When using the detection of base metal voltage; • Check if the detection wire is disconnected or severed. • Check if the slide switch “SW1” on the P.C. Board is set to “EXT” side.
E07	Err	-07	Startup Signal	The torch switch was turned on before turning on the power switch. Turn off the power switch and the torch switch, and turn on only the power switch again. **Note** For safety, let the product stand for about three seconds after turning ON the power and then operate the torch switch.
E08	Err	-08	Curr.DetectError	Output current or voltage is detected when the power switch is turned on. • This product is defective. • Check if current or voltage is applied to the secondary side of this product from an external device.
E09	Err	-09	Pri. ShutDown	Instantaneous input power failure for 0.5 seconds or more. Turn off power switch, remove the causes and then turn power switch on again.
E11	Err	-11	Outside Stop 1	Received “HOLD.1” signal from the external equipment. Remove the cause. The error is automatically reset with removal of the input signal.
E12	Err	-12	Outside Stop 2	Received “HOLD.2” signal from the external equipment. Remove the cause. The error is automatically reset with removal of the input signal.

Power source	Controller side			Probable causes and countermeasures
	a	b	c	
E13	Err	-13	DetectRevolution	The wire feed motor is not rotating correctly or the encoder signal is disconnected. Do inching or retract operation from the controller to check if the motor is correctly functioning. If it does, then the encoder wire or encoder itself is damaged.
E14	Err	-14	Motor Uncontrol	The motor rotation detection signal is not matched with the feed signal. When the motor is actually turning, the control PCB in the wire feed unit is defective.
E15	Err	-15	Motor Uncontrol2	The motor rotation exceeds the maximum limit. If the error occurs in low welding current setting, check cross wire of the controller cable and PCB in the wire feeder.
E20	Err	-20	WatchDogTimerErr	The CPU of this product does not function correctly or is out of control. Turn off the power switch of this product, let it stand for at least three seconds and then on again. If the same error occurs, contact sales distributor or Panasonic representatives.

In the event of the following errors:
Check if communication cables connecting the controller, wire feeder and the welding power source is damaged. And if the same error occurs repeatedly, contact sales distributor or Panasonic representatives, in addition to the specific countermeasures to the individual error item if mentioned.

Power source	Controller side			Probable causes and countermeasures
	a	b	c	
E31	Err	-C31	SerialComm(422) CommandError	A code disaccord with communication command is detected on RS 422 communication with controller.
E32	Err	-C32	SerialComm(422) SendingError	Transmission from controller is not accepted on RS 422 communication with controller.
E33	Err	-C33	SerialComm(422) ParityError	Parity error occurs on RS 422 communication with controller.
E34	Err	-C34	SerialComm(422) OverRunError	Buffer overrun occurs on RS 422 communication with controller
E35	Err	-C35	SerialComm(422) TimeOutError	No response is received from controller in a preset time on RS 422 communication with controller.
-	Err	-C36	SerialComm(422) ReceiveError	Controller fails to accept the data sent from this product on RS 422 communication with controller.
E37	Err	-	-	No response is received from robot in a preset time on RS 422 communication with robot.
-	Err	-S- (Flashing)	-	Torch switch is turned ON while the communication with controller remains incomplete due to breaking wire or the like.
-	*	*	SBI Error Break Down	Controller detects power cut or noise. If resetting power switch does not reset the error code indication, a P.C. Board in the controller may be defective.

- No specific indication is displayed.

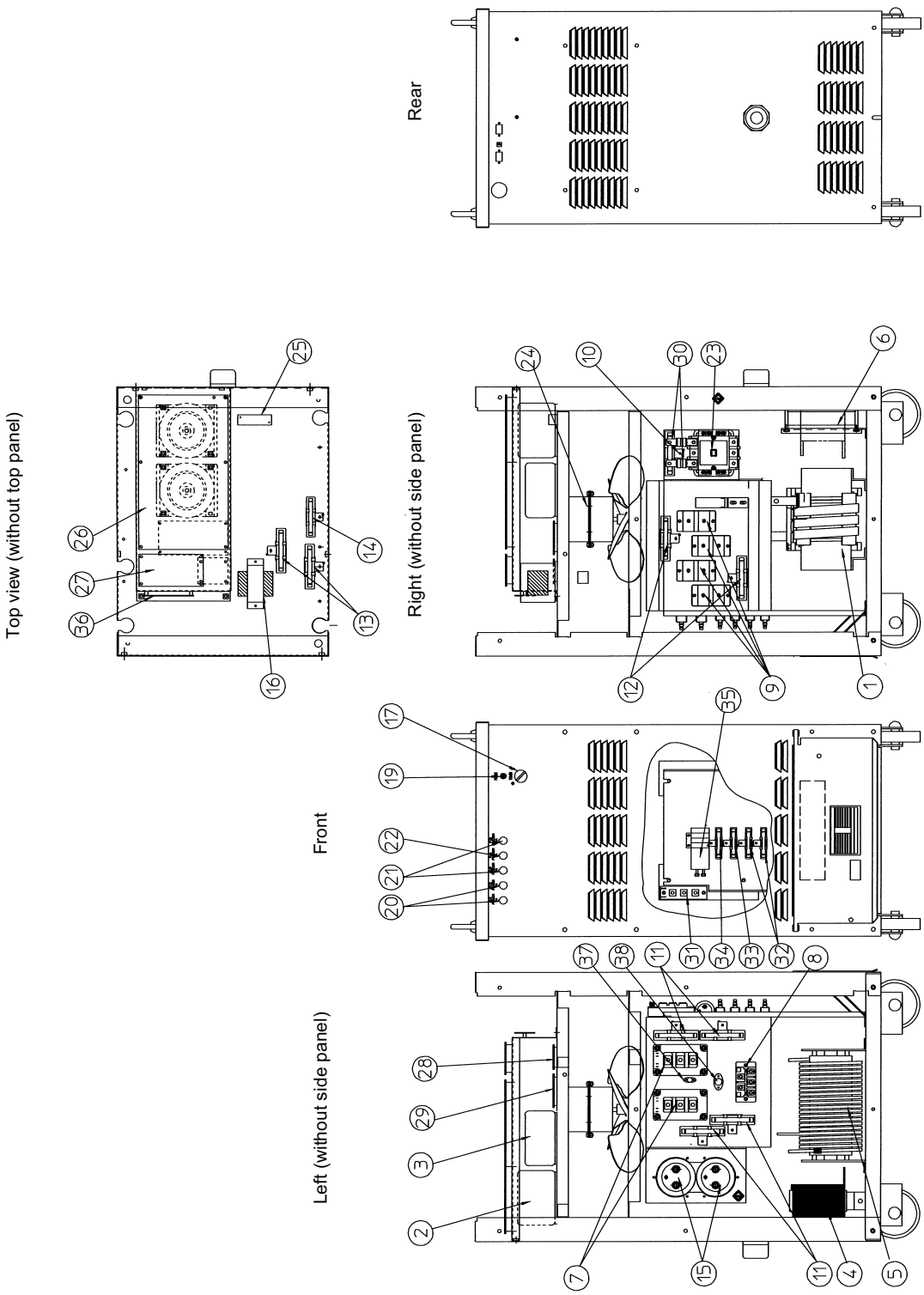
* : Displays the value of preset display item.
(For example, the welding amperage is shown on “a” (LCD).)

10.2 Troubleshooting table

* In the case of welding errors without any error (Err) indication, refer to the following table to search for their causes.

Check item	Probable causes	● Blowholes	● Welded tip	● Wire runs into the base metal	● Bead turns black.	● Unstable arc	● Unstable arc start	● No wire feeding	● No gas supply	● No arc generation
Distribution box (Input protection device)	• Switch is not ON. (Tripping of circuit breaker) • Blown fuse. • Loose connection • No phase.	O	O	O						
Input cable	• Cable is disconnected or severed. • Loose connections.	O	O	O						
This product	• Switch is not ON. • Fuse at front panel is blown.	O	O	O						
Gas cylinder Gas regulator	• Main cock is not open. • Gas nearly runs short. • Insufficient gas pressure and flow rate setting. • Loose connections.		O			O				O
Gas hose	• Loose connections • Hose is damaged or has burnt hole.		O							O
Wire feeder	• Size of the wire for feed roller is wrong. • Crack, clogging or breakage at the feed roller. • Insufficient fastening of pressure rod. • Accumulation of wire powder at the guide inlet.			O	O	O	O		O	
Torch cable	• Cables for power and torch switch are damaged. • Connector pin for torch switch is broken. • Poor connection to wire feeder. • Signs of dropping impact.	O	O	O		O		O		
Welding torch	• Loose connection of tip, nozzle or insulation tube. • Bad connection or clamping of the torch body to the power cable.						O		O	
	• Tip or liner is worn, clogged, distorted or wrong in size for the applied wire diameter. • Cable is winded up or bent at acute angle. • Rough conductive surface of the connector.				O	O	O			O
Cables on the base metal side	• Cable size (cross section area) is too small. • Loose connections • Poorly energized base metal.				O	O	O			
Extension cable,	• Insufficient cable size (cross section area). • Coiled while using. • Using a cable longer than 20 m with no base metal voltage detection wire.				O	O	O	O	O	
Welding conditions	• Improper welding conditions, such as welding current/voltage, torch angle, welding speed, wire extension length.Wrong wavelength control. • Wrong waveform control				O	O	O	O	O	
Base metal surface and wire extension	• Dirty with oil, contamination, rust or painting film.				O	O	O	O		O

11. Parts list



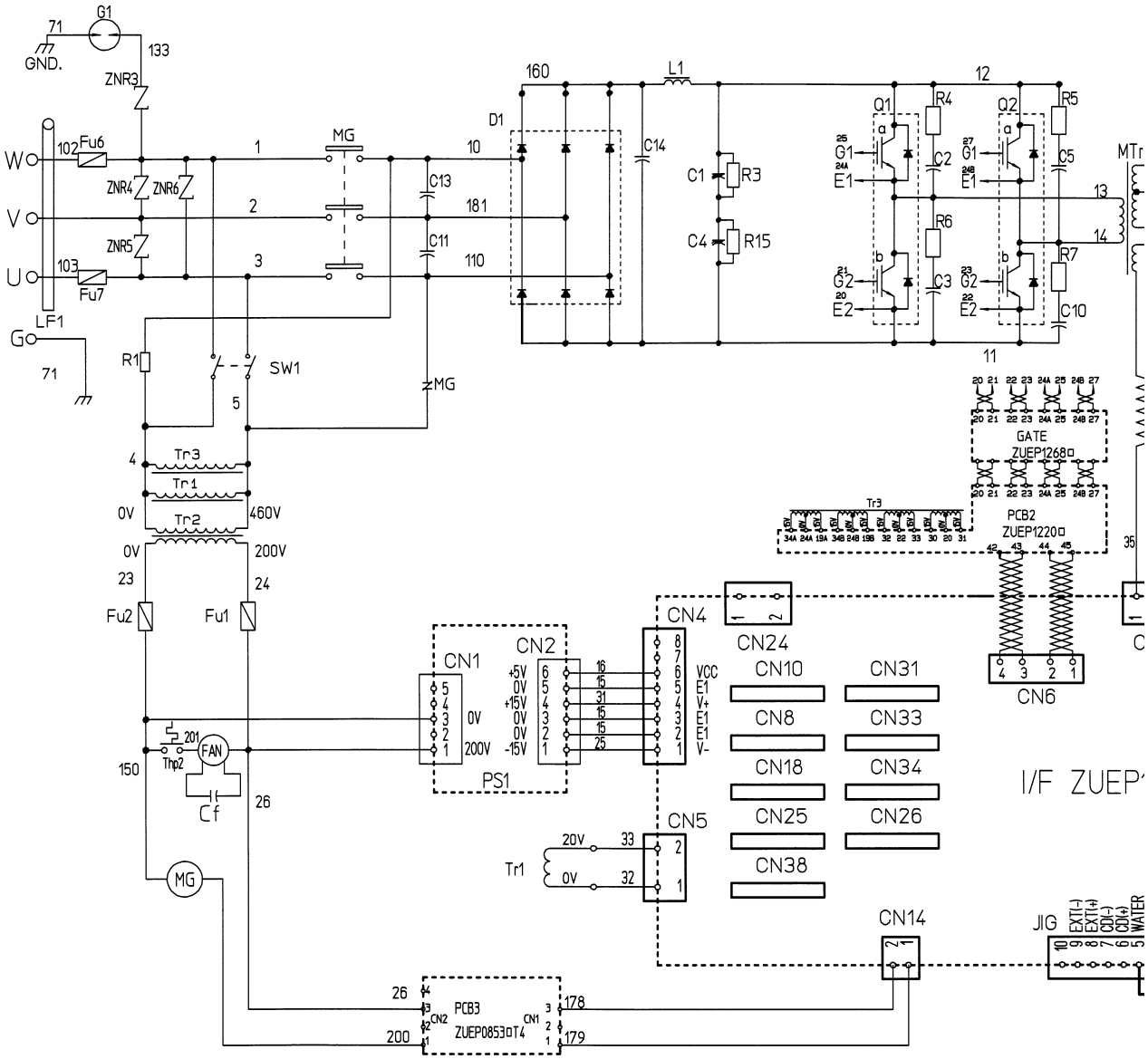
Model number: YD-500HM3YLC

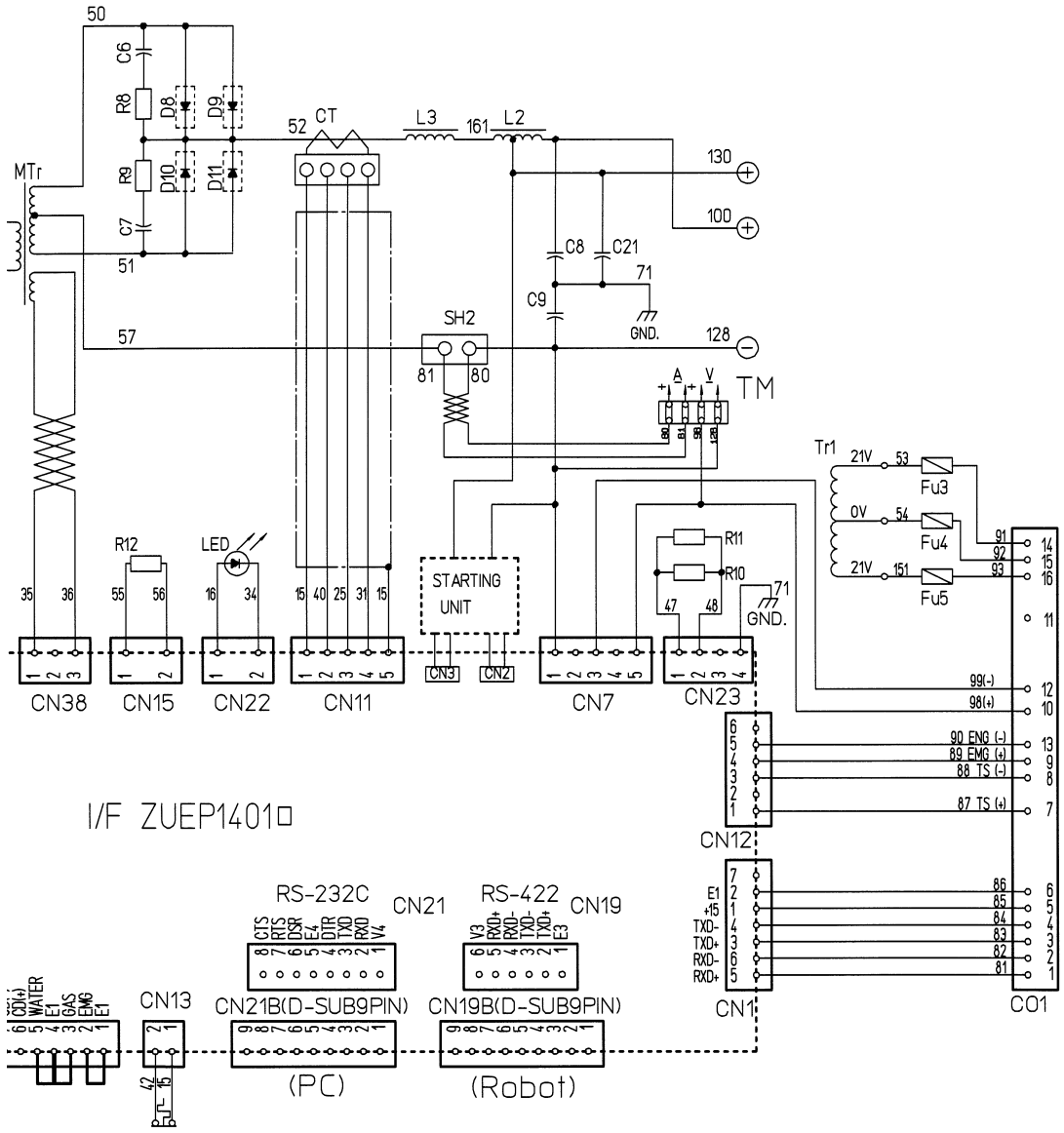
No.	Mark	Parts number	Description	Q'ty	Note	Internal code
1	MTr	DTU00197	Main transformer	1		DTU00197
2	Tr1	UTU21600	Control transformer	1		UTU21600
3	Tr2	UTU21610	Control transformer	1		UTU21610
4	L1	DLU00070	FCH	1		DLU00070
5	L2	DLU00106	DCL	1		DLU00106
6	L3	DLU00105	CL	1		DLU00105
7	Q1, Q2	CM200DU24HF	IGBT	2		CM200DU24HF
8	D1	DF100LB160F	Diode	1		DF100LB160F
9	D8-D11	YCAD99	Diode	4		FRS300BA50F
10	R1	SFW40A501	Resistor	1		SFW40A501
11	R4-R7	MFS40A100KN	Resistor	4	40W,10Ω	MFS40A100KN
12	R8, R9	SFW40A5R0AP	Resistor	2		SFW40A5R0AP
13	R10, R11	SFW40E201	Resistor	2		SFW40E201
14	R12	SFW20E101	Resistor	1		SFW20E101
15	C1, C4	ECST451LGC23	Capacitor	2		ECST451LGC23
16	Tr3	UTU20811	Control transformer	1		UTU20811
17	SW1	HW1S2T20	Power switch	1		HW1S2T20
18						
19	LED	DB40BG	LED	1		DB40BG
20	Fu1,Fu2	XBA2E30NS5	Fuse	2		XBA2E30NS5
21	Fu3, Fu5	XBA2E80NS5	Fuse	2		XBA2E80NS5
22	Fu4	XBA2E30NS5	Fuse	1		XBA2E30NS5
23	MS	BMR6352	Magnetic switch	1		BMR6352
24	FAN	SF200-25-4D	Fan motor	1		SF200-25-4D
25	TM	UF13-20A5PCA	Terminal	1		UF13-20A5PCA
26		ZUEP1401*A4	PC Board	1		ZUEP1401*A4
27		ZUEP1220	PC Board	1	Driver	ZUEP1220
28		ZUEP0853*T4	PC Board	1		ZUEP0853*T4
29	PS1	YCAD46	DC power supply	1		LDC30F2-1
30	Fu6, Fu7	660GH80	Fuse	2		660GH80
31	SCR	PK25F40	Thyristor	1		PK25F40
32	R11S, R12S	SFW20A391	Resistor	2		SFW20A391
33	R13S	SFW20A4R7	Resistor	1		SFW20A4R7
34	R14S	SFW20A300	Resistor	1		SFW20A300
35	C12S	ESME101LGY47	Capacitor	1	100V4700μF	ESME101LGY47
36		ZUEP1268	P.C. Board	1		ZUEP1268
37	Thp1	OHD3-90B02	Thermal switch	1		OHD3-90B02
38	Thp2	YZA/ESL003	Thermal switxh	1		5003F35CM1UL

Note

- #30 to #34 are parts for “STARTING UNIT”. (Also see section “Circuit diagram”.)
- Parts number required when ordering parts

12. Circuit diagram

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C6
R8
D8
D9
52
CT
L3
161
L2
130
100
MTr
R9
D10
D11
C7
51
C8
C21
71
C9
GND.
SH2
57
128
81
80
A
V
TM
Tr1
21V
53
Fu3
0V
54
Fu4
21V
151
Fu5
91
92
93
14
15
16
11
R12
LED
R11
R10
71
GND.
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36
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40
25
31
15
STARTING
UNIT
47
48
CN3
CN2
CN38
CN15
CN22
CN11
CN7
CN23
99(-)
98(+)
12
10
90 ENG (-)
89 EMG (+)
88 TS (-)
87 TS (+)
13
9
8
7
CN12
I/F ZUEP1401□
RS-232C
CN21
RS-422
CN19
CTS
RTS
DSR
E4
DTR
TXD
RXD
V4
V3
RXD+
RXD-
TXD-
TXD+
E3
E1
+15
TXD-
TXD+
RXD-
RXD+
86
85
84
83
82
81
6
5
4
3
2
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CN1
CO1
WATER
E1
GAS
EMG
E1
CN13
CN21B(D-SUB9PIN)
CN19B(D-SUB9PIN)
(PC)
(Robot)