

iHC XT

PLASMA HEIGHT CONTROLLER

Operating Manual



Revision: AA

Issue Date: August 19, 2015

Manual No.: 0-5352

WE APPRECIATE YOUR BUSINESS!

Congratulations on your new Victor Thermal Dynamics product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency call 1-800-752-7622, or visit us on the web at www.thermal-dynamics.com.

This Operating Manual has been designed to instruct you on the correct use and operation of your Victor Thermal Dynamics product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

YOU ARE IN GOOD COMPANY!

The Brand of Choice for Contractors and Fabricators Worldwide.

Victor Thermal Dynamics is a Global Brand of manual and automation Plasma Cutting Products for Victor Technologies.

We distinguish ourselves from our competition through market-leading, dependable products that have stood the test of time. We pride ourselves on technical innovation, competitive prices, excellent delivery, superior customer service and technical support, together with excellence in sales and marketing expertise.

Above all, we are committed to developing technologically advanced products to achieve a safer working environment within the welding industry



WARNING

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment.

While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

iHC XT plasma Height Controller
Operating Manual No. 0-5352

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www.thermal-dynamics.com

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Original Publication Date: August 19, 2015

Record the following information for Warranty purposes:

Where Purchased: _____

Purchase Date: _____

Power Supply Serial #: _____

Torch Serial #: _____

**Be sure this information reaches the operator.
You can get extra copies through your supplier.**

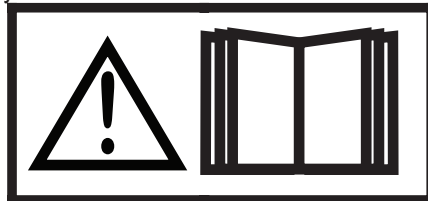
CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for arc welding and cutting equipment, we urge you to read our booklet, "Precautions and Safe Practices for Arc Welding, Cutting, and Gouging," Booklet 0-5407. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information. Be sure to read the Safety Precautions before installing or operating this equipment.

USER RESPONSIBILITY

This equipment will perform in conformity with the description thereof contained in this manual and accompanying labels and/or inserts when installed, operated, maintained and repaired in accordance with the instructions provided. This equipment must be checked periodically. Malfunctioning or poorly maintained equipment should not be used. Parts that are broken, missing, worn, distorted or contaminated should be replaced immediately. Should such repair or replacement become necessary, the manufacturer recommends that a telephone or written request for service advice be made to the Authorized Distributor from whom it was purchased.

This equipment or any of its parts should not be altered without the prior written approval of the manufacturer. The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, faulty maintenance, damage, improper repair or alteration by anyone other than the manufacturer or a service facility designated by the manufacturer.



**READ AND UNDERSTAND THE INSTRUCTION MANUAL BEFORE INSTALLING OR
OPERATING.**

PROTECT YOURSELF AND OTHERS!

**ASSUREZ-VOUS QUE CETTE INFORMATION EST DISTRIBUÉE À L'OPÉRATEUR.
VOUS POUVEZ OBTENIR DES COPIES SUPPLÉMENTAIRES CHEZ VOTRE
FOURNISSEUR.**

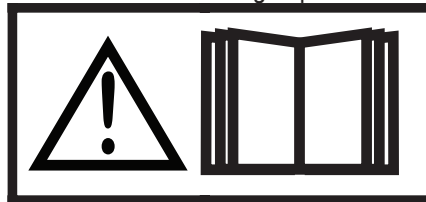
ATTENTION

Les INSTRUCTIONS suivantes sont destinées aux opérateurs qualifiés seulement. Si vous n'avez pas une connaissance approfondie des principes de fonctionnement et des règles de sécurité pour le soudage à l'arc et l'équipement de coupage, nous vous suggérons de lire notre brochure « Precautions and Safe Practices for Arc Welding, Cutting and Gouging, » Brochure 0-5407. Ne permettez PAS aux personnes non qualifiées d'installer, d'opérer ou de faire l'entretien de cet équipement. Ne tentez PAS d'installer ou d'opérer cet équipement avant de lire et de bien comprendre ces instructions. Si vous ne comprenez pas bien les instructions, communiquez avec votre fournisseur pour plus de renseignements. Assurez-vous de lire les Règles de Sécurité avant d'installer ou d'opérer cet équipement.

RESPONSABILITÉS DE L'UTILISATEUR

Cet équipement opérera conformément à la description contenue dans ce manuel, les étiquettes d'accompagnement et/ou les feuillets d'information si l'équipement est installé, opéré, entretenu et réparé selon les instructions fournies. Vous devez faire une vérification périodique de l'équipement. Ne jamais utiliser un équipement qui ne fonctionne pas bien ou n'est pas bien entretenu. Les pièces qui sont brisées, usées, déformées ou contaminées doivent être remplacées immédiatement. Dans le cas où une réparation ou un remplacement est nécessaire, il est recommandé par le fabricant de faire une demande de conseil de service écrite ou par téléphone chez le Distributeur Autorisé de votre équipement.

Cet équipement ou ses pièces ne doivent pas être modifiés sans permission préalable écrite par le fabricant. L'utilisateur de l'équipement sera le seul responsable de toute défaillance résultant d'une utilisation incorrecte, un entretien fautif, des dommages, une réparation incorrecte ou une modification par une personne autre que le fabricant ou un centre de service désigné par le fabricant.



**ASSUREZ-VOUS DE LIRE ET DE COMPRENDRE LE MANUEL D'UTILISATION AVANT
D'INSTALLER OU D'OPÉRER L'UNITÉ.**

PROTÉGEZ-VOUS ET LES AUTRES!

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Declaration of Conformity

We **Thermal Dynamics**
of **2800 Airport Road**
Denton, TX 76207 U.S.A.



in accordance with the following Directive(s):

2006/95/EC The Low Voltage Directive

2004/108/EC The Electromagnetic Compatibility Directive

hereby declare that:

Equipment: Plasma Cutting Height Controller

Model Name/Number: iHC XT

Market Release Date: August 19, 2015

is in conformity with the applicable requirements of the following harmonized standards:

Conforms to requirements of IEC 61326-1:2012

IEC 61000-4-2: 2008, Electro Static Discharge Immunity

IEC 61000-4-3:2006 +A1:2007 +A2:2010, Radiated, Radio-Frequency, Electromagnetic Immunity

IEC 61000-4-4:2012, Electrical Fast Transient/Burst Immunity

IEC 61000-4-6: 2008, Conducted Radio-Frequency Electromagnetic Immunity

IEC 61000-4-8:2009, Power Frequency Magnetic Field Immunity

CISPR 11:2009 +A1:2010, AC Mains Conducted Emissions

CISPR 11:2009 +A1:2010, Radiated Emissions

Meets IEC 61010-1:2010 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

*Classification: The equipment described in this document is **Class A** and intended for industrial use.*



WARNING

This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

Manufacturer's Authorized Representative

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Date: August 19, 2015

Steve Ward
Full Name

V.P. Europe and General Manager
(Position)



WARNING

This Class A equipment is not intended for use in residential locations where the electrical power is provided by the public low-voltage supply system. There may be potential difficulties in ensuring electromagnetic compatibility in those locations, due to conducted as well as radiated disturbances.

SECTION 1: SAFETY

1.01 Safety Precautions - ENGLISH



WARNING: These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.



PROTECT YOURSELF AND OTHERS -- Some welding, cutting, and gouging processes are noisy and require ear protection. The arc, like the sun, emits ultraviolet (UV) and other radiation and can injure skin and eyes. Hot metal can cause burns. Training in the proper use of the processes and equipment is essential to prevent accidents. Therefore:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, and goggles are also required.
2. Use a face shield fitted with the correct filter and cover plates to protect your eyes, face, neck, and ears from sparks and rays of the arc when operating or observing operations. Warn bystanders not to watch the arc and not to expose themselves to the rays of the electric-arc or hot metal.
3. Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high-topped shoes, and a welding helmet or cap for hair protection, to protect against arc rays and hot sparks or hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
4. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing.
5. Protect other personnel from arc rays and hot sparks with a suitable non-flammable partition or curtains.
6. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can fly far. Bystanders should also wear goggles over safety glasses.



FIRES AND EXPLOSIONS -- Heat from flames and arcs can start fires. Hot slag or sparks can also cause fires and explosions. Therefore:

1. Remove all combustible materials well away from the work area or cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire or fires on the floor below. Make certain that such openings are protected from hot sparks and metal.
3. Do not weld, cut or perform other hot work until the work piece has been completely cleaned so that there are no substances on the work piece which might produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, water pail, sand bucket, or portable fire extinguisher. Be sure you are trained in its use.
5. Do not use equipment beyond its ratings. For example, overloaded welding cable can overheat and create a fire hazard.
6. After completing operations, inspect the work area to make certain there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
7. For additional information, refer to NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", available from the National Fire Protection Association, Battery march Park, Quincy, MA 02269.



ELECTRICAL SHOCK -- Contact with live electrical parts and ground can cause severe injury or death. **DO NOT** use AC welding current in damp areas, if movement is confined, or if there is danger of falling.

1. Be sure the power source frame (chassis) is connected to the ground system of the input power.
2. Connect the work piece to a good electrical ground.
3. Connect the work cable to the work piece. A poor or missing connection can expose you or others to a fatal shock.
4. Use well-maintained equipment. Replace worn or damaged cables.
5. Keep everything dry, including clothing, work area, cables, torch/electrode holder, and power source.
6. Make sure that all parts of your body are insulated from work and from ground.
7. Do not stand directly on metal or the earth while working in tight quarters or a damp area; stand on dry boards or an insulating platform and wear rubber-soled shoes.
8. Put on dry, hole-free gloves before turning on the power.
9. Turn off the power before removing your gloves.
10. Refer to ANSI/ASC Standard Z49.1 (listed on next page) for specific grounding recommendations. Do not mistake the work lead for a ground cable.



ELECTRIC AND MAGNETIC FIELDS — May be dangerous. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding and cutting current creates EMF around welding cables and welding machines. Therefore:

1. Welders having pacemakers should consult their physician before welding. EMF may interfere with some pacemakers.
2. Exposure to EMF may have other health effects which are unknown.
3. Welders should use the following procedures to minimize exposure to EMF:
 - A. Route the electrode and work cables together. Secure them with tape when possible.
 - B. Never coil the torch or work cable around your body.
 - C. Do not place your body between the torch and work cables. Route cables on the same side of your body.
 - D. Connect the work cable to the work piece as close as possible to the area being welded.
 - E. Keep welding power source and cables as far away from your body as possible.



FUMES AND GASES -- Fumes and gases, can cause discomfort or harm, particularly in confined spaces. Do not breathe fumes and gases. Shielding gases can cause asphyxiation.

Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes from these materials.
2. Do not operate near degreasing and spraying operations. The heat or arc rays can react with chlorinated hydrocarbon vapors to form phosgene, a highly toxic gas, and other irritant gases.
3. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.
4. Refer to ANSI/ASC Standard Z49.1 (see listing below) for specific ventilation recommendations.
5. **WARNING:** This product contains chemicals, including lead, known to the State of California to cause birth defects and other reproductive harm. Wash hands after handling.



CYLINDER HANDLING -- Cylinders, if mishandled, can rupture and violently release gas. Sudden rupture of cylinder, valve, or relief device can injure or kill. Therefore:

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors. Maintain hoses and fittings in good condition. Follow manufacturer's operating instructions for mounting regulator to a compressed gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, undercarriages, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have valve protection cap in place if regulator is not connected. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, and flames. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", which is available from Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.



EQUIPMENT MAINTENANCE -- Faulty or improperly maintained equipment can cause injury or death. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not perform any electrical work unless you are qualified to perform such work.
2. Before performing any maintenance work inside a power source, disconnect the power source from the incoming electrical power.
3. Maintain cables, grounding wire, connections, power cord, and power supply in safe working order. Do not operate any equipment in faulty condition.
4. Do not abuse any equipment or accessories. Keep equipment away from heat sources such as furnaces, wet conditions such as water puddles, oil or grease, corrosive atmospheres and inclement weather.
5. Keep all safety devices and cabinet covers in position and in good repair.
6. Use equipment only for its intended purpose. Do not modify it in any manner.



ADDITIONAL SAFETY INFORMATION -- For more information on safe practices for electric arc welding and cutting equipment, ask your supplier for a copy of "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting".
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding".
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting".
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting".
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding".
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding".
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."
9. CSA Standard - W117.2 = Safety in Welding, Cutting and Allied Processes.



Meaning of symbols - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.

DANGER

Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

CAUTION

Means potential hazards which could result in personal injury or loss of life.

WARNING

Means hazards which could result in minor personal injury.

Enclosure Class

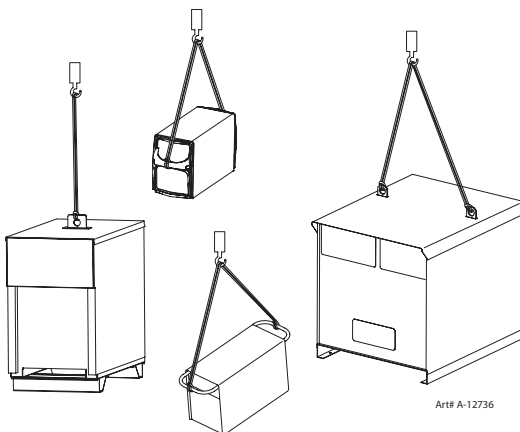
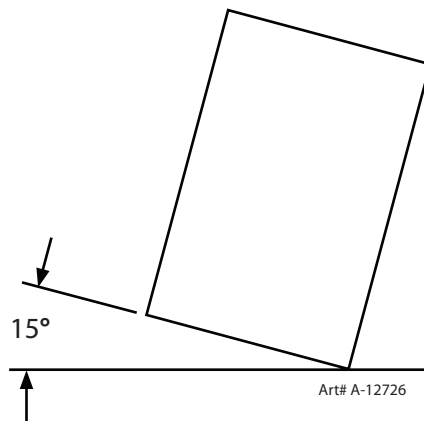
The IP code indicates the enclosure class, i.e. the degree of protection against penetration by solid objects or water. Protection is provided against touch with a finger, penetration of solid objects greater than 12mm and against spraying water up to 60 degrees from vertical. Equipment marked IP21S may be stored, but is not intended to be used outside during precipitation unless sheltered.

CAUTION

This product is solely intended for plasma cutting. Any other use may result in personal injury and / or equipment damage.

CAUTION

If equipment is placed on a surface that slopes more than 15°, toppling over may occur. Personal injury and / or significant damage to equipment is possible.



CAUTION

To avoid personal injury and/or equipment damage, lift using method and attachment points shown here.

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1.02 Précautions de sécurité - FRENCH CANADIAN



AVERTISSEMENT : Ces règles de sécurité ont pour but d'assurer votre protection. Ils récapitulent les informations de précaution provenant des références dans la section des Informations de sécurité supplémentaires. Avant de procéder à l'installation ou d'utiliser l'unité, assurez-vous de lire et de suivre les précautions de sécurité ci-dessous, dans les manuels, les fiches d'information sur la sécurité du matériel et sur les étiquettes, etc. Tout défaut d'observer ces précautions de sécurité peut entraîner des blessures graves ou mortelles.



PROTÉGEZ-VOUS -- Les processus de soudage, de coupage et de gougeage produisent un niveau de bruit élevé et exige l'emploi d'une protection auditive. L'arc, tout comme le soleil, émet des rayons ultraviolets en plus d'autre rayons qui peuvent causer des blessures à la peau et les yeux. Le métal incandescent peut causer des brûlures. Une formation reliée à l'usage des processus et de l'équipement est essentielle pour prévenir les accidents. Par conséquent:

1. Portez des lunettes protectrices munies d'écrans latéraux lorsque vous êtes dans l'aire de travail, même si vous devez porter un casque de soudeur, un écran facial ou des lunettes étanches.
2. Portez un écran facial muni de verres filtrants et de plaques protectrices appropriées afin de protéger vos yeux, votre visage, votre cou et vos oreilles des étincelles et des rayons de l'arc lors d'une opération ou lorsque vous observez une opération. Avertissez les personnes se trouvant à proximité de ne pas regarder l'arc et de ne pas s'exposer aux rayons de l'arc électrique ou le métal incandescent.
3. Portez des gants ignifugés à crispin, une chemise épaisse à manches longues, des pantalons sans rebord et des chaussures montantes afin de vous protéger des rayons de l'arc, des étincelles et du métal incandescent, en plus d'un casque de soudeur ou casquette pour protéger vos cheveux. Il est également recommandé de porter un tablier ininflammable afin de vous protéger des étincelles et de la chaleur par rayonnement.
4. Les étincelles et les projections de métal incandescent risquent de se loger dans les manches retroussées, les rebords de pantalons ou les poches. Il est recommandé de garder boutonnés le col et les manches et de porter des vêtements sans poches en avant.
5. Protégez toute personne se trouvant à proximité des étincelles et des rayons de l'arc à l'aide d'un rideau ou d'une cloison ininflammable.
6. Portez des lunettes étanches par dessus vos lunettes de sécurité lors des opérations d'écaillage ou de meulage du laitier. Les écailles de laitier incandescent peuvent être projetées à des distances considérables. Les personnes se trouvant à proximité doivent également porter des lunettes étanches par dessus leur lunettes de sécurité.



INCENDIES ET EXPLOSIONS -- La chaleur provenant des flammes ou de l'arc peut provoquer un incendie. Le laitier incandescent ou les étincelles peuvent également provoquer un incendie ou une explosion. Par conséquent :

1. Éloignez suffisamment tous les matériaux combustibles de l'aire de travail et recouvrez les matériaux avec un revêtement protecteur ininflammable. Les matériaux combustibles incluent le bois, les vêtements, la sciure, le gaz et les liquides combustibles, les solvants, les peintures et les revêtements, le papier, etc.
2. Les étincelles et les projections de métal incandescent peuvent tomber dans les fissures dans les planchers ou dans les ouvertures des murs et déclencher un incendie couvant à l'étage inférieur. Assurez-vous que ces ouvertures sont bien protégées des étincelles et du métal incandescent.
3. N'exécutez pas de soudure, de coupe ou autre travail à chaud avant d'avoir complètement nettoyé la surface de la pièce à traiter de façon à ce qu'il n'ait aucune substance présente qui pourrait produire des vapeurs inflammables ou toxiques. N'exécutez pas de travail à chaud sur des contenants fermés car ces derniers pourraient exploser.
4. Assurez-vous qu'un équipement d'extinction d'incendie est disponible et prêt à servir, tel qu'un tuyau d'arrosage, un seau d'eau, un seau de sable ou un extincteur portatif. Assurez-vous d'être bien instruit par rapport à l'usage de cet équipement.

5. Assurez-vous de ne pas excéder la capacité de l'équipement. Par exemple, un câble de soudage surchargé peut surchauffer et provoquer un incendie.
6. Une fois les opérations terminées, inspectez l'aire de travail pour assurer qu'aucune étincelle ou projection de métal incandescent ne risque de provoquer un incendie ultérieurement. Employez des guetteurs d'incendie au besoin.
7. Pour obtenir des informations supplémentaires, consultez le NFPA Standard 51B, "Fire Prevention in Use of Cutting and Welding Processes", disponible au National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.



CHOC ÉLECTRIQUE -- Le contact avec des pièces électriques ou les pièces de mise à la terre sous tension peut causer des blessures graves ou mortelles. **NE PAS** utiliser un courant de soudage c.a. dans un endroit humide, en espace restreint ou si un danger de chute se pose.

1. Assurez-vous que le châssis de la source d'alimentation est branché au système de mise à la terre de l'alimentation d'entrée.
2. Branchez la pièce à traiter à une bonne mise de terre électrique.
3. Branchez le câble de masse à la pièce à traiter et assurez une bonne connexion afin d'éviter le risque de choc électrique mortel.
4. Utilisez toujours un équipement correctement entretenu. Remplacez les câbles usés ou endommagés.
5. Veillez à garder votre environnement sec, incluant les vêtements, l'aire de travail, les câbles, le porte-électrode/torche et la source d'alimentation.
6. Assurez-vous que tout votre corps est bien isolé de la pièce à traiter et des pièces de la mise à la terre.
7. Si vous devez effectuer votre travail dans un espace restreint ou humide, ne tenez vous pas directement sur le métal ou sur la terre; tenez-vous sur des planches sèches ou une plate-forme isolée et portez des chaussures à semelles de caoutchouc.
8. Avant de mettre l'équipement sous tension, isolez vos mains avec des gants secs et sans trous.
9. Mettez l'équipement hors tension avant d'enlever vos gants.
10. Consultez ANSI/ASC Standard Z49.1 (listé à la page suivante) pour des recommandations spécifiques concernant les procédures de mise à la terre. Ne pas confondre le câble de masse avec le câble de mise à la terre.



CHAMPS ÉLECTRIQUES ET MAGNÉTIQUES — comportent un risque de danger. Le courant électrique qui passe dans n'importe quel conducteur produit des champs électriques et magnétiques localisés. Le soudage et le courant de coupage créent des champs électriques et magnétiques autour des câbles de soudage et l'équipement. Par conséquent :

1. Un soudeur ayant un stimulateur cardiaque doit consulter son médecin avant d'entreprendre une opération de soudage. Les champs électriques et magnétiques peuvent causer des ennuis pour certains stimulateurs cardiaques.
2. L'exposition à des champs électriques et magnétiques peut avoir des effets néfastes inconnus pour la santé.
3. Les soudeurs doivent suivre les procédures suivantes pour minimiser l'exposition aux champs électriques et magnétiques :
 - A. Acheminez l'électrode et les câbles de masse ensemble. Fixez-les à l'aide d'une bande adhésive lorsque possible.
 - B. Ne jamais enrouler la torche ou le câble de masse autour de votre corps.
 - C. Ne jamais vous placer entre la torche et les câbles de masse. Acheminez tous les câbles sur le même côté de votre corps.
 - D. Branchez le câble de masse à la pièce à traiter le plus près possible de la section à souder.
 - E. Veillez à garder la source d'alimentation pour le soudage et les câbles à une distance appropriée de votre corps.



LES VAPEURS ET LES GAZ -- peuvent causer un malaise ou des dommages corporels, plus particulièrement dans les espaces restreints. Ne respirez pas les vapeurs et les gaz. Le gaz de protection risque de causer l'asphyxie.

Par conséquent :

1. Assurez en permanence une ventilation adéquate dans l'aire de travail en maintenant une ventilation naturelle ou à l'aide de moyens mécanique. N'effectuez jamais de travaux de soudage, de coupage ou de gougeage sur des matériaux tels que l'acier galvanisé, l'acier inoxydable, le cuivre, le zinc, le plomb, le beryllium ou le cadmium en l'absence de moyens mécaniques de ventilation efficaces. Ne respirez pas les vapeurs de ces matériaux.
2. N'effectuez jamais de travaux à proximité d'une opération de dégraissage ou de pulvérisation. Lorsque la chaleur ou le rayonnement de l'arc entre en contact avec les vapeurs d'hydrocarbure chloré, ceci peut déclencher la formation de phosgène ou d'autres gaz irritants, tous extrêmement toxiques.
3. Une irritation momentanée des yeux, du nez ou de la gorge au cours d'une opération indique que la ventilation n'est pas adéquate. Cessez votre travail afin de prendre les mesures nécessaires pour améliorer la ventilation dans l'aire de travail. Ne poursuivez pas l'opération si le malaise persiste.
4. Consultez ANSI/ASC Standard Z49.1 (à la page suivante) pour des recommandations spécifiques concernant la ventilation.
5. **AVERTISSEMENT** : Ce produit contient des produits chimiques, notamment du plomb, reconnu par l'État de la Californie pour causer des malformations congénitales et d'autres dommages touchant le système reproductif. **Se laver les mains après manipulation.**



MANIPULATION DES CYLINDRES -- La manipulation d'un cylindre, sans observer les précautions nécessaires, peut produire des fissures et un échappement dangereux des gaz. Une brisure soudaine du cylindre, de la soupape ou du dispositif de surpression peut causer des blessures graves ou mortelles. Par conséquent :

1. Utilisez toujours le gaz prévu pour une opération et le détendeur approprié conçu pour utilisation sur les cylindres de gaz comprimé. N'utilisez jamais d'adaptateur. Maintenez en bon état les tuyaux et les raccords. Observez les instructions d'opération du fabricant pour assembler le détendeur sur un cylindre de gaz comprimé.
2. Fixez les cylindres dans une position verticale, à l'aide d'une chaîne ou une sangle, sur un chariot manuel, un châssis de roulement, un banc, un mur, une colonne ou un support convenable. Ne fixez jamais un cylindre à un poste de travail ou toute autre dispositif faisant partie d'un circuit électrique.
3. Lorsque les cylindres ne servent pas, gardez les soupapes fermées. Si le détendeur n'est pas branché, assurez-vous que le bouchon de protection de la soupape est bien en place. Fixez et déplacez les cylindres à l'aide d'un chariot manuel approprié. Toujours manipuler les cylindres avec soin.
4. Placez les cylindres à une distance appropriée de toute source de chaleur, des étincelles et des flammes. Ne jamais amorcer l'arc sur un cylindre.
5. Pour de l'information supplémentaire, consultez CGA Standard P-1, "Precautions for Safe Handling of Compressed Gases in Cylinders", mis à votre disposition par le Compressed Gas Association, 1235 Jefferson Davis Highway, Arlington, VA 22202.



ENTRETIEN DE L'ÉQUIPEMENT -- Un équipement entretenu de façon défectueuse ou inadéquate peut causer des blessures graves ou mortelles. Par conséquent :

1. Efforcez-vous de toujours confier les tâches d'installation, de dépannage et d'entretien à un personnel qualifié. N'effectuez aucune réparation électrique à moins d'être qualifié à cet effet.
2. Avant de procéder à une tâche d'entretien à l'intérieur de la source d'alimentation, débranchez l'alimentation électrique.
3. Maintenez les câbles, les fils de mise à la terre, les branchements, le cordon d'alimentation et la source d'alimentation en bon état. N'utilisez jamais un équipement s'il présente une défektivité quelconque.

4. N'utilisez pas l'équipement de façon abusive. Gardez l'équipement à l'écart de toute source de chaleur, notamment des fours, de l'humidité, des flaques d'eau, de l'huile ou de la graisse, des atmosphères corrosives et des intempéries.
5. Laissez en place tous les dispositifs de sécurité et tous les panneaux de la console et maintenez-les en bon état.
6. Utilisez l'équipement conformément à son usage prévu et n'effectuez aucune modification.



INFORMATIONS SUPPLÉMENTAIRES RELATIVES À LA SÉCURITÉ -- Pour obtenir de l'information supplémentaire sur les règles de sécurité à observer pour l'équipement de soudage à l'arc électrique et le coupage, demandez un exemplaire du livret "Precautions and Safe Practices for Arc Welding, Cutting and Gouging", Form 52-529.

Les publications suivantes sont également recommandées et mises à votre disposition par l'American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126 :

1. ANSI/ASC Z49.1 - "Safety in Welding and Cutting".
2. AWS C5.1 - "Recommended Practices for Plasma Arc Welding".
3. AWS C5.2 - "Recommended Practices for Plasma Arc Cutting".
4. AWS C5.3 - "Recommended Practices for Air Carbon Arc Gouging and Cutting".
5. AWS C5.5 - "Recommended Practices for Gas Tungsten Arc Welding".
6. AWS C5.6 - "Recommended Practices for Gas Metal Arc Welding".
7. AWS SP - "Safe Practices" - Reprint, Welding Handbook.
8. ANSI/AWS F4.1, "Recommended Safe Practices for Welding and Cutting of Containers That Have Held Hazardous Substances."
9. CSA Standard - W117.2 = Safety in Welding, Cutting and Allied Processes.



SIGNIFICATION DES SYMBOLES - Ce symbole, utilisé partout dans ce manuel, signifie "Attention"! Soyez vigilant ! Votre sécurité est en jeu.

DANGER

Signifie un danger immédiat. La situation peut entraîner des blessures graves ou mortelles.

MISE EN GARDE

Signifie un danger potentiel qui peut entraîner des blessures graves ou mortelles.

AVERTISSEMENT

Signifie un danger qui peut entraîner des blessures corporelles mineures.

Classe de protection de l'enveloppe

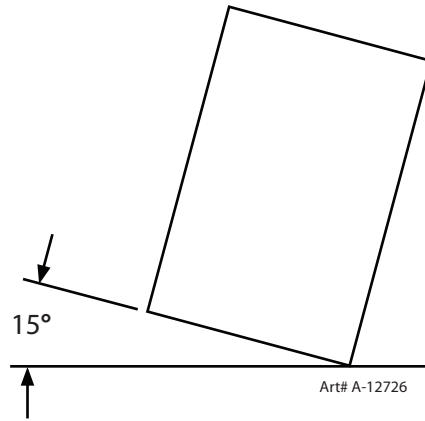
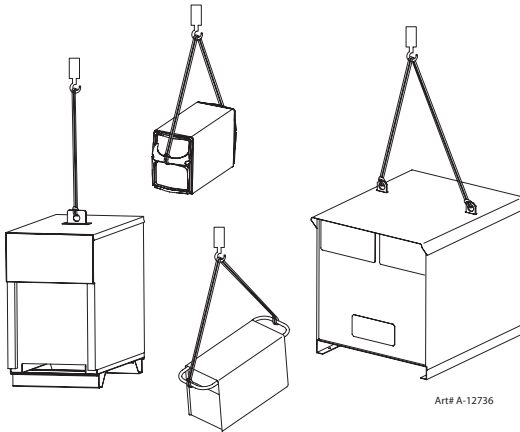
L'indice de protection (codification IP) indique la classe de protection de l'enveloppe, c'est-à-dire, le degré de protection contre les corps solides étrangers ou l'eau. L'enveloppe protège contre le toucher, la pénétration d'objets solides dont le diamètre dépasse 12 mm et contre l'eau pulvérisée à un angle de jusqu'à 60 degrés de la verticale. Les équipements portant la marque IP21S peuvent être entreposés à l'extérieur, mais ne sont pas conçus pour être utilisés à l'extérieur pendant une précipitation à moins d'être à l'abri.

MISE EN GARDE

Ce produit a été conçu pour la découpe au plasma seulement. Toute autre utilisation pourrait causer des blessures et/ou endommager l'appareil.

MISE EN GARDE

L'équipement pourrait basculer s'il est placé sur une surface dont la pente dépasse 15°. Vous pourriez vous blesser ou endommager l'équipement de façon importante.



MISE EN GARDE

Soulevez à l'aide de la méthode et des points d'attache illustrés afin d'éviter de vous blesser ou d'endommager l'équipement.

SECTION 2: SPECIFICATIONS

2.01 System Description

iHC XT is a torch height control designed for plasma cutting. iHC XT uses the plasma arc as a feedback to control the cutting height between the torch and work piece while cutting. Initial height sensing is done by ohmic sensing or by the use of collision sensor. iHC XT is made to be used with most plasma cutting systems.

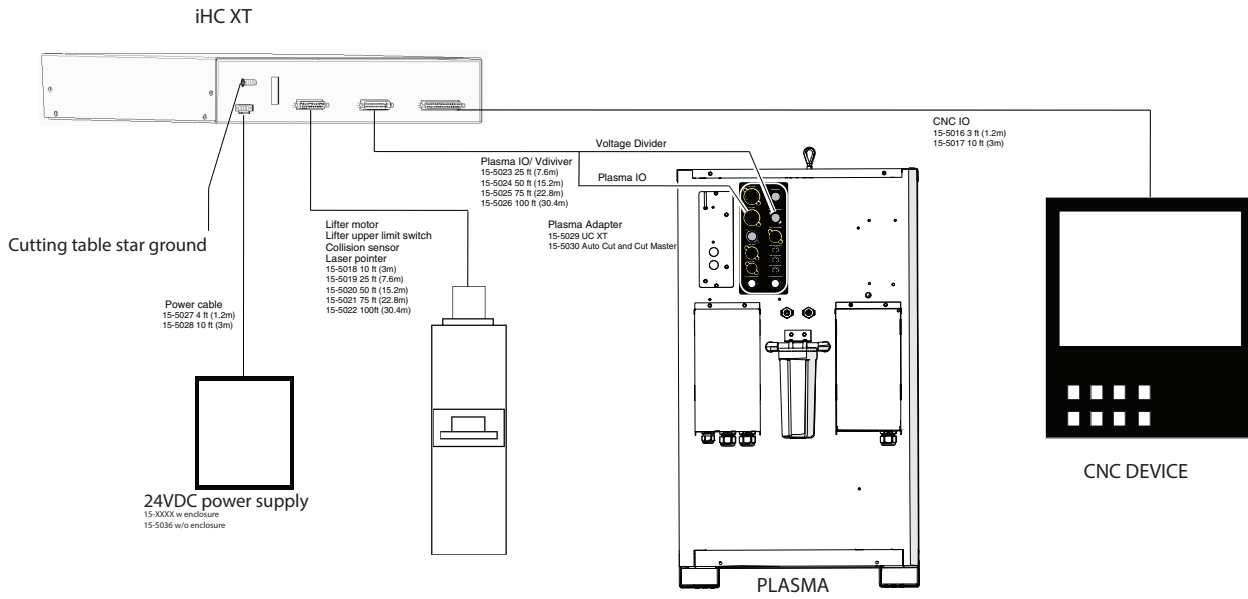
2.02 Specifications

Input power requirement	24VDC / 5A
Input fuse	5A, slow blow
Input power cable wire size	1.5mm ² , AWG 17
Dimensions	see "2.03 iHC XT Dimensions" on page <?>,
Weight	3kg
Display	40 x 4 LCD
Buttons	6 + 1 Up and Down, IHS Test, Find Plate, Menu, Enter, Digital potentiometer
Arc voltage division	1:80
Arc voltage measurement range	0 - 327V
Arc voltage measurement resolution	0.02V
Arc voltage measurement accuracy	± 0.2%
Arc voltage set range	50 - 300V
Motor type	Oriental Motor PKP266D28A-L
Motor step angle	1.8 °
Motor holding torque	1.4 Nm
Lifter max speed	>5000 mm/min with 5 mm ball screw lead (@ 1000rpm)

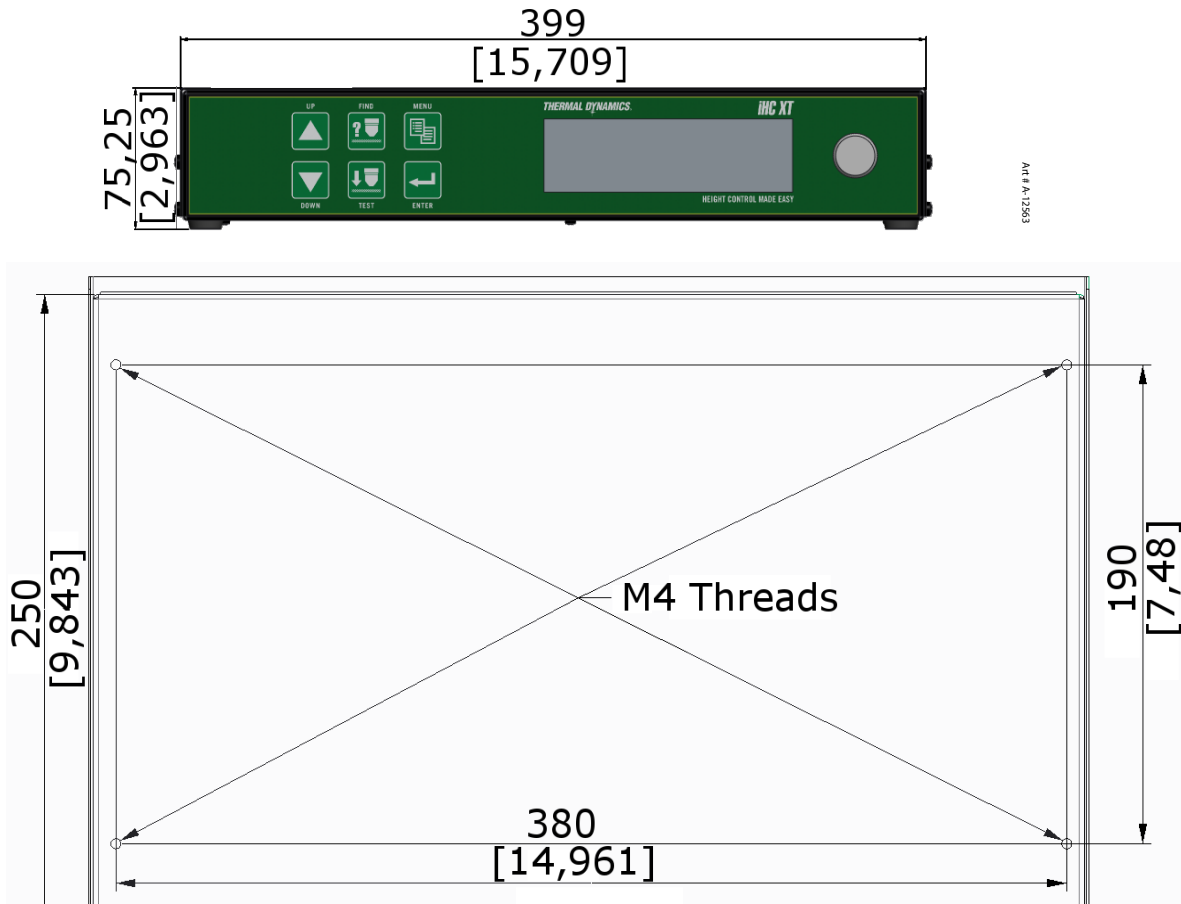

CAUTION

Wire sizes are for reference only. The installation must conform to national and local codes for the type and method of wire being used

2.03 Basic System Schematic

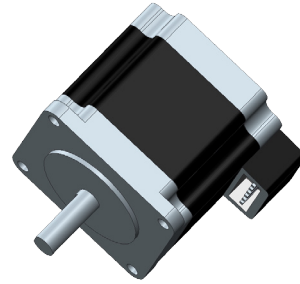
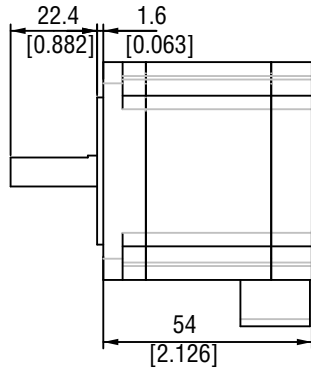


2.04 iHC XT Dimensions

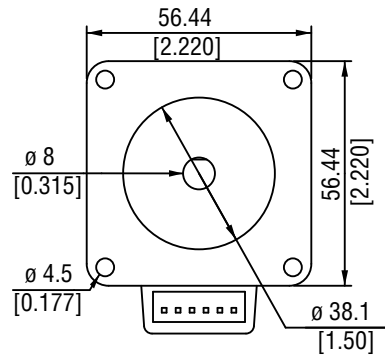
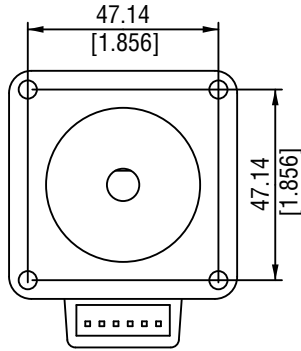


Dimensions do not take in account for cables or connectors.

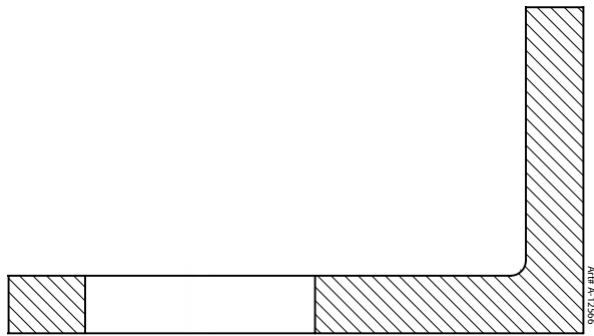
2.05 Motor Dimensions



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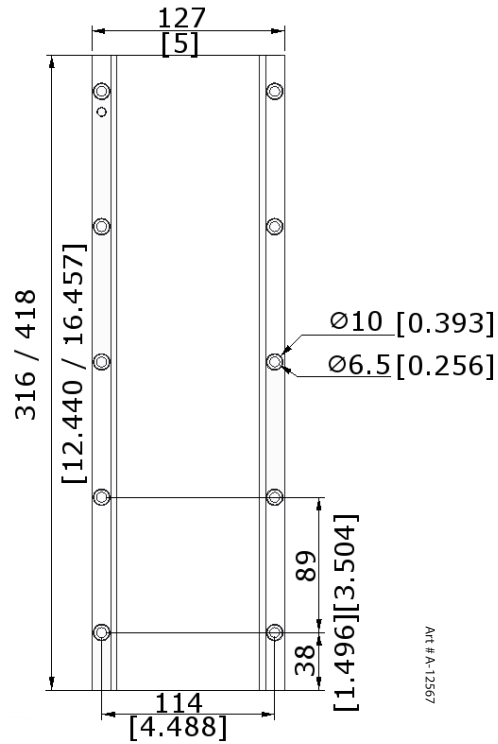


2.06 Lifter Dimensions



Collision Sensor

Height: 85 mm [3.35in]
 Width: 100 mm [3.93in]
 Depth: 125 mm [4.92in]



Lifter Dimensions

Height: 316/418 mm [12.44/16.47in]
 Width: 127 mm [5.00in]
 Depth: 100 mm [3.93in]

- Dimensions are measurements without motor or other appliances.
- The base plate's first mounting holes are 38 mm from the bottom. All other mounting holes are distributed evenly after that with 89 mm spacing in accordance to the hole center line. Horizontally the distance between the holes is 114 mm. Use M6 screws with the base plate.
- 8 inch stroke base plate is longer (418 mm instead of 316 mm) and it has one more set of mounting holes on top for M6 screws (again 89 mm up from the pair below).
- Torch holder is available for both 50 mm and 35 mm torch heads.
- Torch holder mounting surface is 100 mm out from the bottom of the Lifter base plate.

SECTION 3: INSTALLATION

3.01 Installation IO requirements

Signal name	Description	Requirement
Ok To Move	Input from plasma device	Required (See details below)
Hold	Input from CNC device	Required (See details below)
External stop	Output to CNC device	Required (See details below)
IHS start	Input from CNC device	Required (See details below)
Limit switch	Input from lifter	Required (if using other than Victor Technologies provided lifter)
Collision	Input from collision sensor	Required (if using other than Victor Technologies provided collision sensor). (See details below)
Voltage divider	Victor Technologies provided voltage divider	Required (See details below)
Plasma start	Output to plasma device	Optional
IHS active	Output to plasma device	Optional



NOTE!

Not providing the connections and functionality related to signals marked as "Required" will void warranty. See IO and cable info from section 6.

Ok To Move (Motion, Main arc) This needs to be a dry contact signal from a plasma device. This signal is used to determine that the plasma arc has been established and still on.

Hold (Corner Freeze) This needs to be a dry contact signal from a CNC device. This signal is used to lock the height for example slowing down in corners.

External Stop This is a dry contact signal from iHC XT to a CNC device input. This signal is used to tell the CNC device that example a torch crash has happened. CNC device should stop all motion and turn off outputs when this signal is triggered.

IHS Start This needs to be a dry contact signal from a CNC device. This signal is used to start the piercing process and must stay on to the end of cut.

Limit Switch This needs to be a dry contact signal from the lifter upper limit. This signal is used as a position reference when powered up. The Victor Technologies provided lifter and cables has this signal wired.

Collision This needs to be a dry contact signal from the collision sensor. Please note that the sensor must be usable for vertical plate sensing while the iHC uses this signal also as a safety backup for ohmic plate sensing.

Collision trigger during cutting will open external stop contacts, drive the torch to upper limit, removes main arc output, turns plasma on output OFF. External stop output contacts will remain open 2 seconds after the torch has reached upper limit. When this happens IHS start needs to be recycled in order to continue cutting.

Collision trigger during transfer height will move the torch to upper limit.

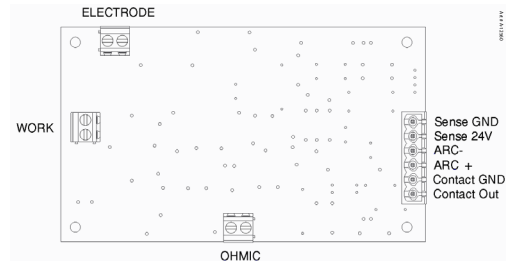
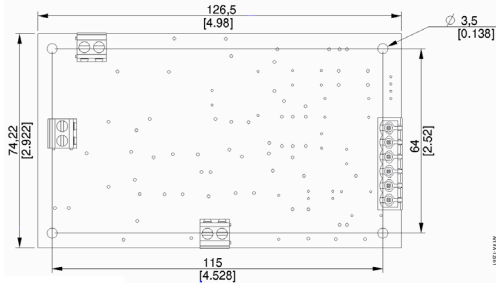
Voltage Divider Victor Technologies provided voltage divider must be used and wires connected (ohmic sensing is required unless collision sensor can be reliably used for IHS). Victor Technologies provided cables have all signals wired.

Plasma Start (Start/Stop) This is a dry contact signal to a plasma device. This signal is used to start the plasma arc. Victor Technologies provided cables has this signal wired.

IHS Active (Preflow) This is a dry contact signal to a plasma device. This signal is used to start preflow when torch starts to find the plate, this will reduce over all piercing time.

3.02 Mechanical

1. Start by mounting the iHC XT cabinet. See “2.03 iHC XT Dimensions” on page <?>.
2. Screw the cabinet in place with M4 screws from the bottom.
3. Mount the lifter. See “Lifter Dimensions” on page <?>.

3.03 Voltage Divider and Plasma IO

1. Locate a suitable location for the V-D Board inside the plasma and drill out mounting holes if needed.
2. Install the V-D board standoffs and the V-D Board. Connect the V-D cable 15-1210 or connect the voltage divider wires to the 6 pin screw terminal.
3. Connect your plasma IO cables or prepare your plasma IO cable, see “SECTION 6: PINOUTS AND CABLE EXAMPLES” on page <?> and route your cable from the iHC XT connector J55 Plasma to the plasma power supply.
4. Connect wires to the voltage divider board marked Work and Electrode to the appropriate terminal inside the plasma. Note that work has to be a low ohm connection to the table work (under 5 ohm).

Ohmic or Shield (cup) cable.

Some height controls including the iHC XT find the plate using an electrical or resistance measurement, thus “ohmic”, contact between the conductive end of the torch and the metal or “plate” being cut. A wire, usually a single highly flexible wire that withstands the reflective heat from the arc, is connected between the V-D board and the torch shield cup.

Ferrite cores

It is recommended that the Ohmic Sensing wire be wrapped through a ferrite core with several turns, at least 3 but more is better, to reduce the energy conducted to the V-D board and into the plasma supply. The ferrite core should be located on the wire where it enters the plasma supply. A second ferrite core added several feet (couple of meters) from the torch will further reduce the conducted EMI that may couple to other cable/wires and cause interference.

3.04 Lifter Cable

1. Route your lifter cable or prepare the lifter cable according to the example picture on page <?>.
2. Connect the motor terminal to the motor.
3. Connect the upper limit and collision sensor connector.
4. Route cables to the iHC XT connector J54 Lifter.

3.05 Collision Sensor

1. Make sure the collision sensor sits tight in its place. Adjust the springs and alignment screws if necessary.
2. Make sure that the possible inductive sensors are correctly aligned so they detect the metal pressing against them.

3.06 CNC IO

1. Locate the CNC connector J53 CNC IO at the back of the iHC XT.
2. Route CNC IO cable 15- according to the example picture on page <?>.
3. Route the cable between the iHC XT and the CNC device.

3.07 Power and E-Stop

1. Connect the power cable or connect your 24VDC power supply to pins 24VDC and GND. See more details on section 6
2. Wire a dry normally closed switch to pins E1 and E2. Note that the device will not power up without a closed contact between these pins.

3.08 Software Setups

If you purchased the full package containing the lifter from Victor technologies you can skip to step “4. Plasma selection”.

1. Encoder value

Navigate to

Menu --> System --> Parameters

Encoder pulses: Press ENTER and set up the encode value by the calculation below. Press ENTER again to save and exit.

Encoder value is 6400000 / lifter screw rise in mm

Example lifter screw is 5 mm rise per 1 motor rotation

$6400000 / 5 \text{ mm} = 1280000$

Encoder value = 1280000

3. Collision sensor polarity

Navigate to

Select NO/NC based on your configuration

4. Plasma selection

Navigate to

Menu --> System and scroll down to:

Plasma: Press ENTER and select your plasma type from the list. Press ENTER again to select and exit.

Note that if you set the plasma to Unknown all selections below will become hidden. See “4.04 Basic Operation without Embedded Cut Charts” on page <?>.

Materials: Press ENTER and select the materials you want to be shown in the process selection in the main screen.

Categories: Press ENTER and select the processes you want to be shown in the process selection in the main screen.

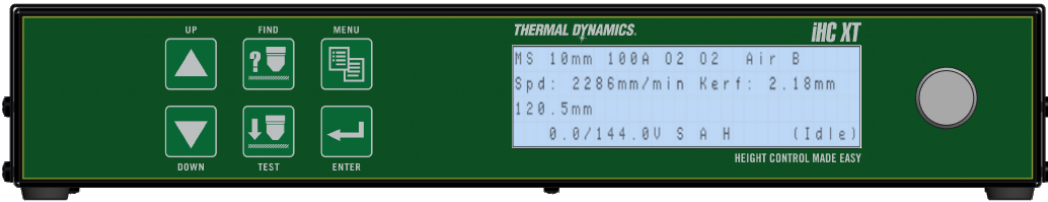
Amperage/Gasses: The appearing list has already filtered out the processes excluded by the selections above.

Press ENTER and deselect individual processes you want to exclude from the process selection in the main screen.

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SECTION 4: OPERATION

4.01 Buttons



UP: Move torch up

DOWN: Move torch down

FIND: Click to find the plate

TEST: Click to do IHS test

MENU: Click to switch between Set Arc Voltage and Process Selection. If pressed over 1 second opens Parameters window. Navigate backwards in menus.

ENTER: Click to apply. If pressed in while rotating the digital potentiometer values will change in multiples of 10. Navigate forward in menus.

Digital potentiometer

Process Selection: When rotating digital potentiometer, scrolling processes up and down.

Set arc voltage: Rotating digital potentiometer will change Set arc voltage (step 0.5V).

If ENTER is not pressed within 10 seconds of last adjustment, displayed value is changed back to last used value. When ENTER is pressed at the same time while scrolling, value will be accepted and saved immediately. Changing the arc voltage while cutting will change torch height in real time, accept the correct height by pressing ENTER or keep ENTER pressed IN while adjusting.

4.02 Main Display

Row 1	MS	10 mm	100 A	02	Air	Air	B	
Row 2	Spd:	2286 mm/min	Kerf:	2.18 mm				
Row 3	120.5 mm							
Row 4	0.0/144.0 V	S	A	H			(Idle)	

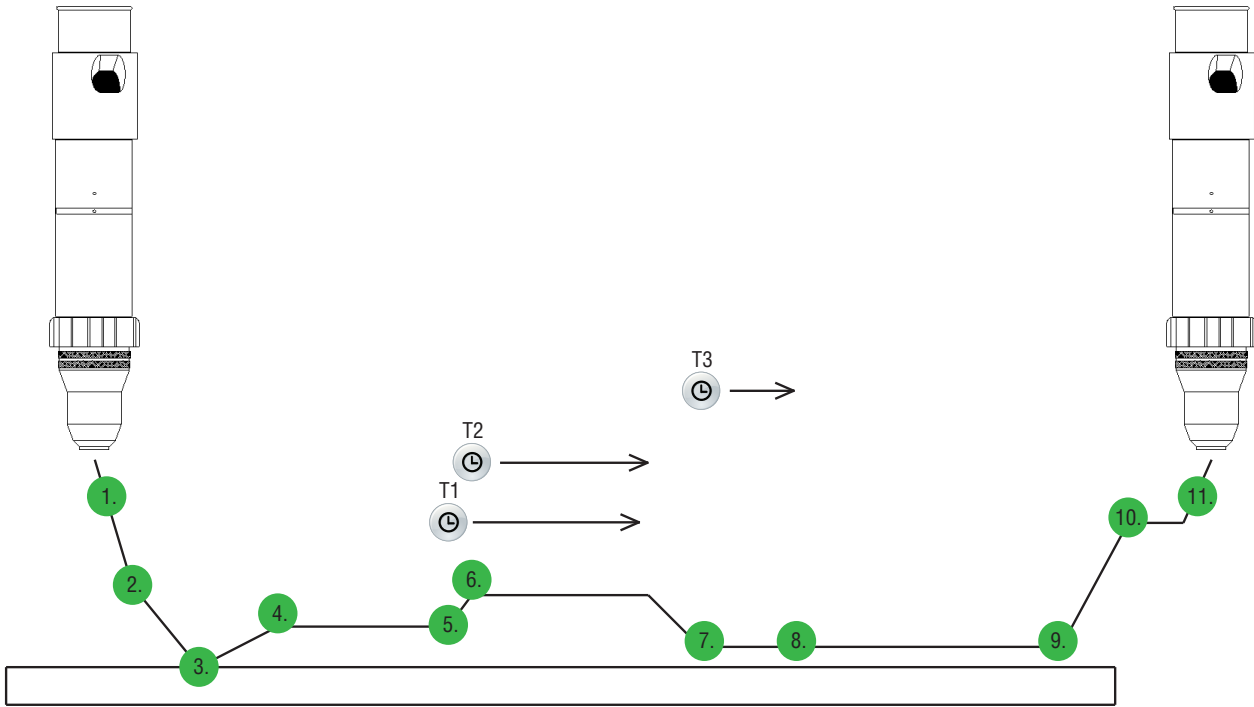
1st row = Selected process (Material, Thickness, Amperage, Plasma Gas, Shield Gas, Preflow Gas, Category).

2nd row = System operation status messages and process speed/kerf when selecting the process.

3rd row = Torch distance from plate and error messages. Torch distance is measured from the last plate sensing. Example with a warped plate the distance can show a negative value in AVC control, if the pierce point where plate has been sensed is higher than the current cutting path.

4th row = Measured arc voltage, process set arc voltage, IHS start status, AVC status, Hold status and height controller state.

* Indicates the active selection.



Pierce/Cut Flow Sequence:

1. IHS Start activated torch starts to find the plate.
2. Torch reaches slowdown height and starts to move slowly.
3. Torch touches the plate.
4. Torch moves to ignition height and gives command to start the plasma.
5. Plasma arc ignites and gives ok to move signal to the height controller. Pierce time T1 starts
6. Torch moves to pierce height. Pierce height delay T2 starts
7. After Pierce time T1 ends iHC XT Ok to move signal output activates and cutting motion starts. Torch moves to cut height after pierce height timer ends.
8. AVC control starts after AVC delay T3 ends.
9. Cuth path ends.
10. Torch moves to retract height.
11. If idle for long enough torch retracts to home position.

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Pierce/Cut Flow Sequence

4.03 Basic Operation with Embedded Cut Charts

The instructions below are for systems where plasma type has been set to any of the pre-configured ones, see “4. Plasma selection” on page <?>

1. Press MENU so that * indicates to the process.
2. Use the Digital potentiometer to scroll to the wanted process.
3. Press ENTER to select the process.
4. Set the speed and kerf at the CNC.
5. Find the initial plate position by pressing FIND PLATE.
6. Cut part.

NOTE! Pierce delay is set as default by iHC XT. Put pierce delay to 0 sec at the CNC.

4.04 Basic Operation without Embedded Cut Charts

The instructions below are for systems where plasma type has been set to Unknown, see “4. Plasma selection” on page <?>. Numbers inside parenthesis refer to the “Pierce/Cut Flow Sequence” illustration.

1. Long press MENU so that you get to basic parameters.
2. Use the Digital potentiometer to scroll to the wanted parameter.
3. Press ENTER on the selected parameter.
4. Use the digital potentiometer to set the value and press ENTER to apply.
5. Repeat steps 2-3 for:

Ignition height (4.): Height when igniting the pilot arc. Typical value is 50-70% less than pierce height.

Set arc voltage (9.): Arc voltage to be used in cutting process.

Cut height (8.): Height for cutting when not in arc voltage control.

Pierce height (6.): Height when piercing.

Pierce height time (7.- 8.): Time the torch stays in pierce height before moving to cut height (usually same as Pierce delay).

Pierce delay (7. - 8.): Time after the height control gives ‘OK to Move’ to the CNC device.

AVC ON : Set arc voltage control during cutting ON or OFF.

AVC Delay (8. - 9.): Delay after torch has reached cut height and will begin arc voltage control.

6. Find the initial plate position by pressing FIND PLATE.
7. Cut part.



NOTE!

Pierce delay is set as default by iHC XT. Put pierce delay to 0 seconds at the CNC. If you want to set the pierce delay at the CNC please put Pierce delay to 0 at iHC XT.

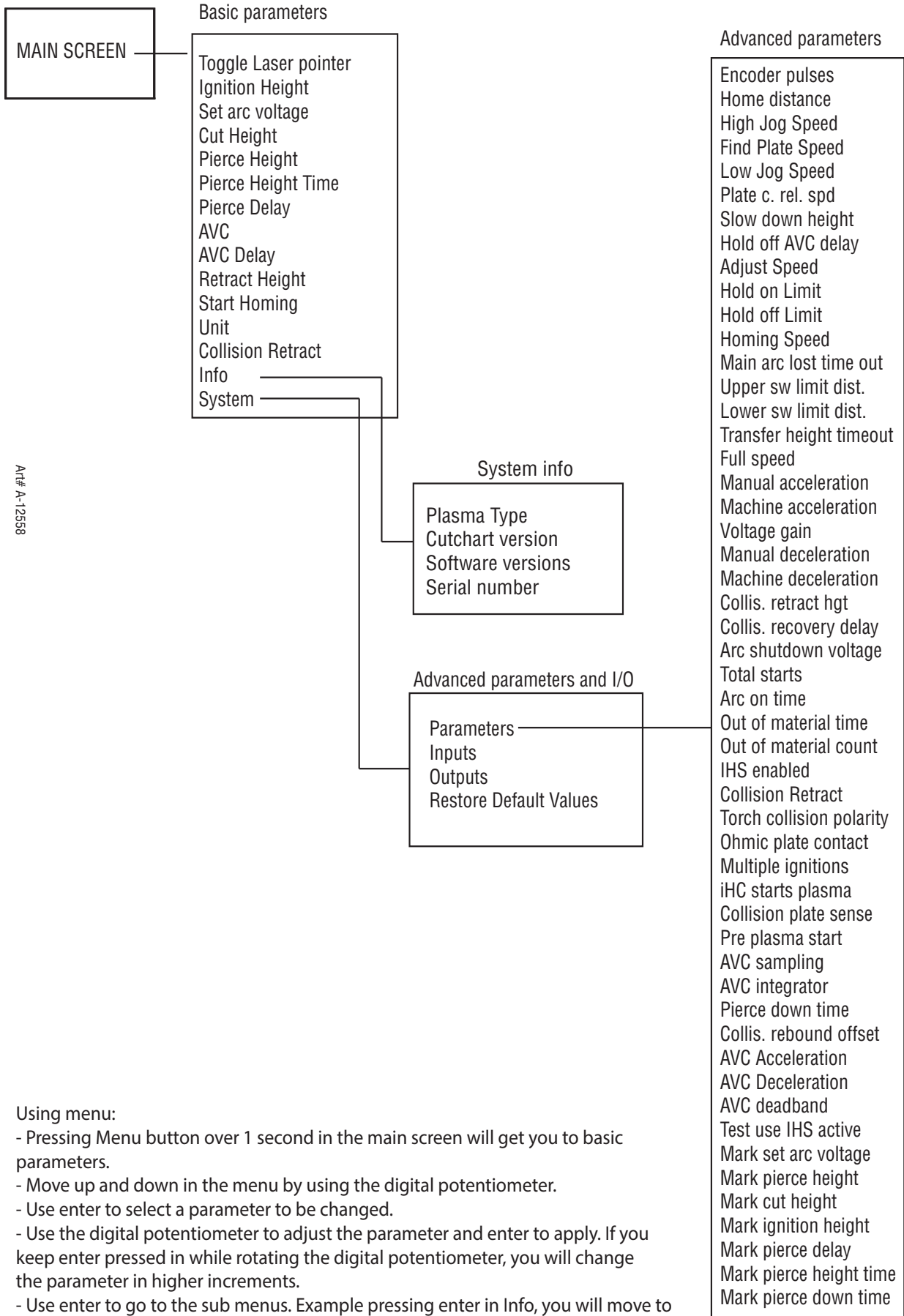


NOTE!

Some cut charts do not have all the values explained above. Below are some examples on finding usable parameters.

8. Ignition height can usually be set lower than pierce height or use the same value. Too high value can cause ignition problems. Too low values can damage consumables.
9. Pierce height should be set as high as possible for best consumable life. Too high value can cause pierce problems. Too low value can damage consumables.
10. Pierce height time is usually set equal to pierce delay. Too low value can cause the torch to crash to the slag puddle created when piercing. Too high value can affect cut quality at the beginning of the cut.
11. AVC delay will keep the torch in cut height at the beginning of the cut. Too low value can cause the torch to crash. Too high value can affect cut quality at the beginning of the cut.

4.05 Menu Structure



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Using menu:

- Pressing Menu button over 1 second in the main screen will get you to basic parameters.
- Move up and down in the menu by using the digital potentiometer.
- Use enter to select a parameter to be changed.
- Use the digital potentiometer to adjust the parameter and enter to apply. If you keep enter pressed in while rotating the digital potentiometer, you will change the parameter in higher increments.
- Use enter to go to the sub menus. Example pressing enter in Info, you will move to the System info screen.
- Use Menu button to go backwards from sub menus or from parameter change.

4.06 Basic Parameters

Parameter	Description
Toggle Laser Pointer	Turn Laser pointer ON/OFF
Ign. Height	Height from plate where the plasma arc is ignited
Set Arc Voltage	Arc voltage value used when cutting
Cut Height	Cut height used while not in arc voltage control
Pierce Height	Height from plate when piercing
Pierce Height Time	Time to stay in pierce height before moving to cut height (usually same as pierce delay)
Pierce Delay	Time to pierce the plate (after timer ends OK to Move is given to CNC)
AVC	Arc voltage control ON/OFF
AVC Delay	Delay after torch has reached cut height and will begin arc voltage control
Retract Height	Height from plate where torch will retract after end of cut
Start homing	Perform homing procedure
Unit	Shown units, metric or imperial
Collision Retract	Automatically retract from plate if plate contact has happened during cutting
Info	System info
System	Enter System menu

4.07 Status and State Messages

Status	Description
Homing	Lifter performing homing
Cutting	Lifter in cutting mode
Find Plate	Lifter finding the initial plate position
To Ignition	Lifter moving to ignition height
To Pierce	Lifter moving to pierce height
Manual Jog	Manual up/down movement active
Parking	Lifter moving to parking position
End of Cut	Lifter in the end of the cutting path
IHS test completed	IHS test performed
Find plate completed	Find plate action completed

4.08 Error Messages

Message	Description
No Arc Voltage	Cutting started but no arc voltage detected
Collision retract	Collision retract feature active
Lower soft limit	Lifter reached lower software limit
Upper soft limit	Lifter reached upper software limit
Continuous plate contact	Plate contact has been ON over 5 sec
Continuous torch collision	Torch collision has been ON over 5 sec
E-Stop Active	E-stop input active

4.09 Advanced Parameters

Parameter name	Default	Description
Encoder pulses		Motor steps/meter
Home distance		Distance from upper limit switch
High jog speed		Manual up/down speed while not cutting
Low jog speed		Manual up/down speed while cutting
Plate c. rel. speed		Speed when retracting from plate
Slow down height		Height to slow down during IHS
Hold off AVC delay		Delay to enable AVC after hold signal goes OFF
Adjust speed		Maximum speed in AVC control
Hold on limit		Voltage to disable AVC control on kerf crossing
Hold off limit		Voltage to recover AVC control on kerf crossing
Transfer height		Raise height between pierces
Homing speed		Speed during lifter homing
Main arc lost time out		Time to stop cutting after main arc signal is lost
Upper sw limit distance		Upper software limit distance from hardware switch
Lower sw limit distance		Lower software limit distance from hardware switch
Transfer height time-out		Time after the lifter moves from transfer height to home position
Full Speed		Maximum speed
Manual acceleration		Acceleration when moving torch manually
Machine acceleration		Acceleration when in automatic mode
Voltage gain		Gain setting in AVC
Manual deceleration		Deceleration when moving torch manually
Machine deceleration		Deceleration when in automatic mode
Collis. retract height		Distance moved to prevent collision
Collis. recovery delay		Time to recover to AVC from retract height
Arc shutdown voltage		Voltage level to determine plasma arc is OFF
Total starts		Number of plasma starts detected
Arc on time		Time that plasma arc has been ON
Out of material time		Time cut out of material
Out of material count		Number of cuts out from plate
IHS enabled		Initial height sensing enabled/disabled
Collision retract		Automatically retract from plate if plate contact has happened during cutting
Torch collision polarity		Torch collision sensor input polarity
Ohmic plate contact		Ohmic sensing enabled/disabled

Parameter name	Default	Description
Multiple ignitions		Automatic plasma re-start enabled/disabled
iHC starts plasma		Height controller commands plasma ON/OFF enabled/disabled
Collision plate sense		Use collision sensor for plate sensing enabled/disabled
Pre plasma start		Apply IHS and plasma start on at the same time enabled/disabled
AVC sampling		Use measured arc voltage instead of cut chart value enabled/disable
AVC integrator		Arc voltage integrator
Pierce down time		Time to move from pierce height to cut height
Collision rebound offset		Offset when using collision sensor to detect plate
AVC acceleration		Acceleration used in AVC
AVC deceleration		Deceleration used in AVC
AVC deadband		Deadband value for AVC
AVC integrator limit		Max used integrator gain
AVC integrator divider		Integrator divider value
Tests use IHS active		
Mark set arc voltage		Marking arc voltage
Mark pierce height		Marking pierce height
Mark cut height		Marking cut height
Mark ignition height		Marking ignition height
Mark pierce delay		Marking pierce delay
Mark pierce height time		Marking pierce height time
Mark pierce down time		Time to move from marking pierce height to marking cut height

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SECTION 5: TROUBLESHOOTING AND MAINTENANCE

5.01 Maintenance

Once a week

- Check for tears in cables

Once a month

- Check motor to lifter axis coupler tightness
- Clean lifer guides and ball screw
- Lubricate ballscrew and bearings. Grease recommendation Hiwin G02 Grease. Grease should be compatible with plastics and steel, have a low dust generation, wide temperature range, be wear resistant and have a NLGI grade of 2.

5.02 Troubleshooting

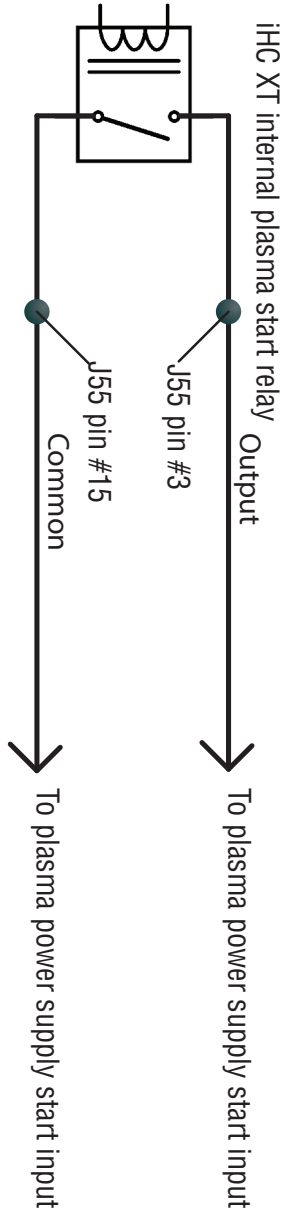
Symptom	Possible Cause
System will not power up	1. E-Stop input not connected. Check that you have a NC connection on power connector pins E1 and E2
	2. Fuse blown. Check fuse T5.
	3. Defective power supply. Measure voltage on power connector pins 24V and GND for 24VDC.
No arc voltage	1. Loose or poor connections to voltage divider. Check for loose and broken cables.
Arc voltage reading wrong	1. None or poor connection to table work from iHC XT ground stud. Measure ohms from iHC XT chassis to table work, reading should be under 5ohm.
Lifter stalls	1. Maximum speed too high. Reduce maximum speed.
	2. Acceleration too high. Reduce acceleration.
	3. Lifter jammed. Check for smooth movement by moving the lifter up and down by hand.
Lifter does not move	1. Poor or no connection to lifter motor. Check cable and wires.
	2. Loose or broken axis coupler. Open the lifter cover and check axis coupler.
	3. Lifter above upper limit switch and hitting hard stop after power ON. Turn power OFF and push lifter to middle position. Turn power ON and observe for proper homing.
	4. Limit switch trip dog loose or incorrectly placed and lifter is jamming to hard stop. Open lifter cover and check the trip dog.
	5. Upper limit switch broken. Open lifter cover and remove the motor. If the motor spins correctly when free check limit switch operation.
Lifter crashes to the plate after piercing	1. Bad Consumables. Replace consumables
	2. AVC delay too short. Increase AVC delay.
Lifter sits in pierce point	1. Pierce delay set both in CNC and iHC XT. Change either pierce delay to 0sec
Process missing from list	1. Process filtered out. Check your filter settings.

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SECTION 6: PINOOTS AND CABLE EXAMPLES

6.01 IO example connections

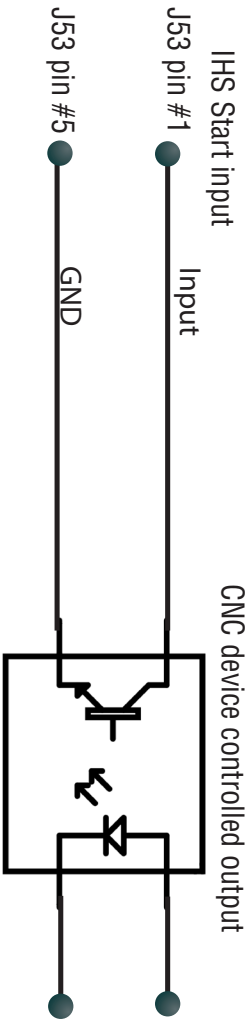
Output example



Input example using a relay

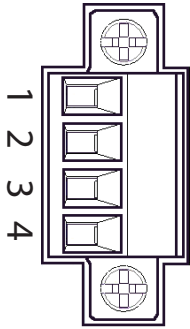
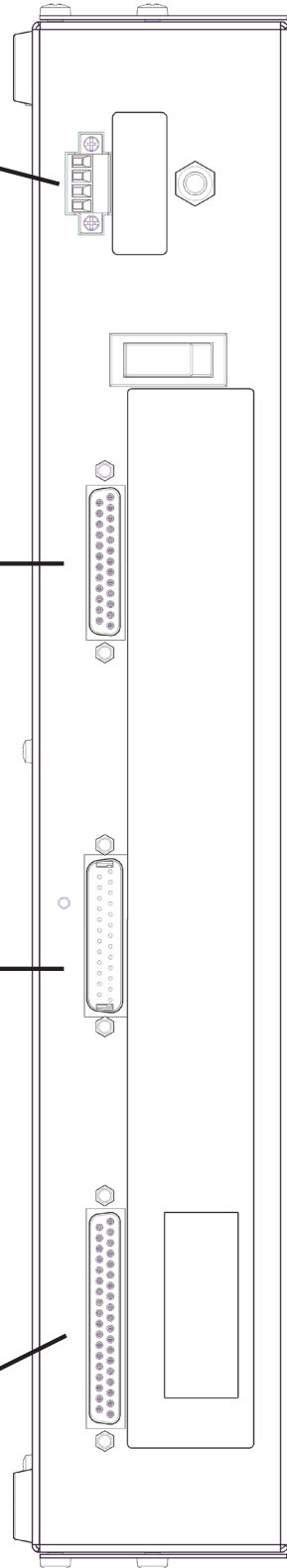


Input example using an optocoupler

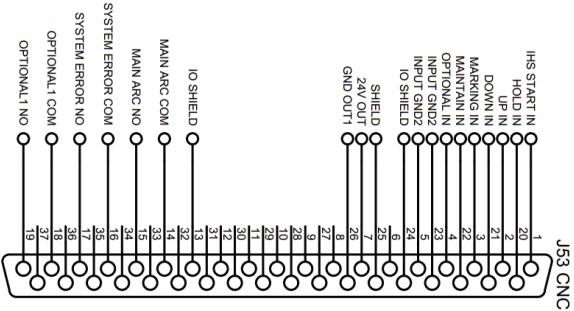
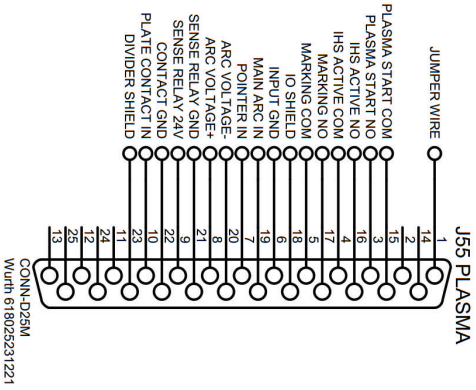
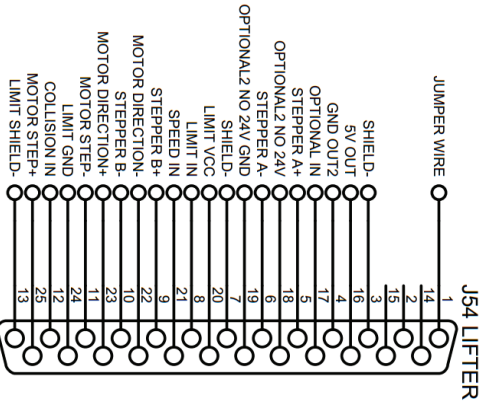


Art# A-12577

6.02 Connector locations



- 1 = 24VDC +
- 2 = GND
- 3 = E1
- 4 = E2



Art# A-12578

6.03 Power and E-stop connector

Pin	Name	Description
1	24VDC	24VDC power input, 5A
2	GND	Power input GND
3	E1	Force motor power OFF, provide a dry closing contact to E2 to enable motor power
4	E2	Force motor power OFF, provide a dry closing contact to E1 to enable motor power

Mating connector: WR-TBL, Wurth p/n 691364300004

6.03.1 Power supply mains connector

iHC XT comes with a 24VDC 5A power supply. The mains connector type to the power supply is IEC C13, cable should be rated for 10A 250V.



CAUTION

Wire sizes are for reference only. The installation must conform to national and local codes for the type and method of wire being used.

6.04 J54 Lifter

Pin	Name	Description
1	Jumper	Jumper to J55 pin #1
2	N/A	Not in use
3	Shield	Cable shield
4	GND Out 2	GND for 5VDC in pin #16
5	Stepper A+	Motor current output max 40V 2.5A
6	Stepper A-	Motor current output max 40V 2.5A
7	Shield	Cable shield
8	Limit In	Upper limit input
9	Stepper B+	Motor current output max 40V 2.5A
10	Stepper B-	Motor current output max 40V 2.5A
11	Motor Step -	Step pulse - output
12	Collision In	Collision sensor input
13	Limit Shield	Cable shield
14	N/A	Not in use
15	N/A	Not in use
16	5V Out	5VDC output max 0.5A
17	Optional In	Optional input
18	Optional 2 NO 24VDC	Optional 24VDC output, max 0.5A
19	Optional 2 NO 24V GND	Optional 24VDC GND output
20	Limit VCC	Limits switch 24VDC output
21	N/A	Reserved for future use
22	Motor direction -	Motor direction - output
23	Motor direction +	Motor direction + output
24	Limit GND	Limit switch GND
25	Motor Step +	Motor Step + output

Mating connector: D-sub male 25pin, Wurth p/n 618 025 248 23

6.05 J55 Plasma

Pin	Name	Description
1	Jumper	Jumper to connector J54 pin #1
2	N/A	Not in use
3	Plasma Start NO	NO Relay contact, max 48V 0.5A
4	IHS active COM	NO Relay contact, max 48V 0.5A
5	Marking COM	NO Relay contact, max 48V 0.5A
6	Input GND	Input gnd
7	Optional In	Optional input, activate by providing a dry closing contact to Input GND pin
8	Arc voltage +	Input from voltage divider board
9	Sense relay 24VDC	Output to voltage divider board
10	Plate contact in	Input from voltage divider board
11	N/A	Reserved for future use
12	N/A	Reserved for future use
13	N/A	Reserved for future use
14	N/A	Not in use
15	Plasma Start COM	NO Relay contact, max 48V 0.5A
16	IHS Active NO	NO Relay contact, max 48V 0.5A
17	Marking NO	NO Relay contact, max 48V 0.5A
18	IO Shield	IO cable shield
19	OK to Move In	OK to Move signal input, activate by providing a dry closing contact to Input GND pin
20	Arc voltage -	Input from voltage divider board
21	Sense relay GND	Output to voltage divider board
22	Plate contact GND	Input from voltage divider board
23	Divider shield	Cable shield
24	N/A	Reserved for future use
25	N/A	Reserved for future use

Mating connector: D-sub female 25pin, Wurth p/n 618 025 249 23

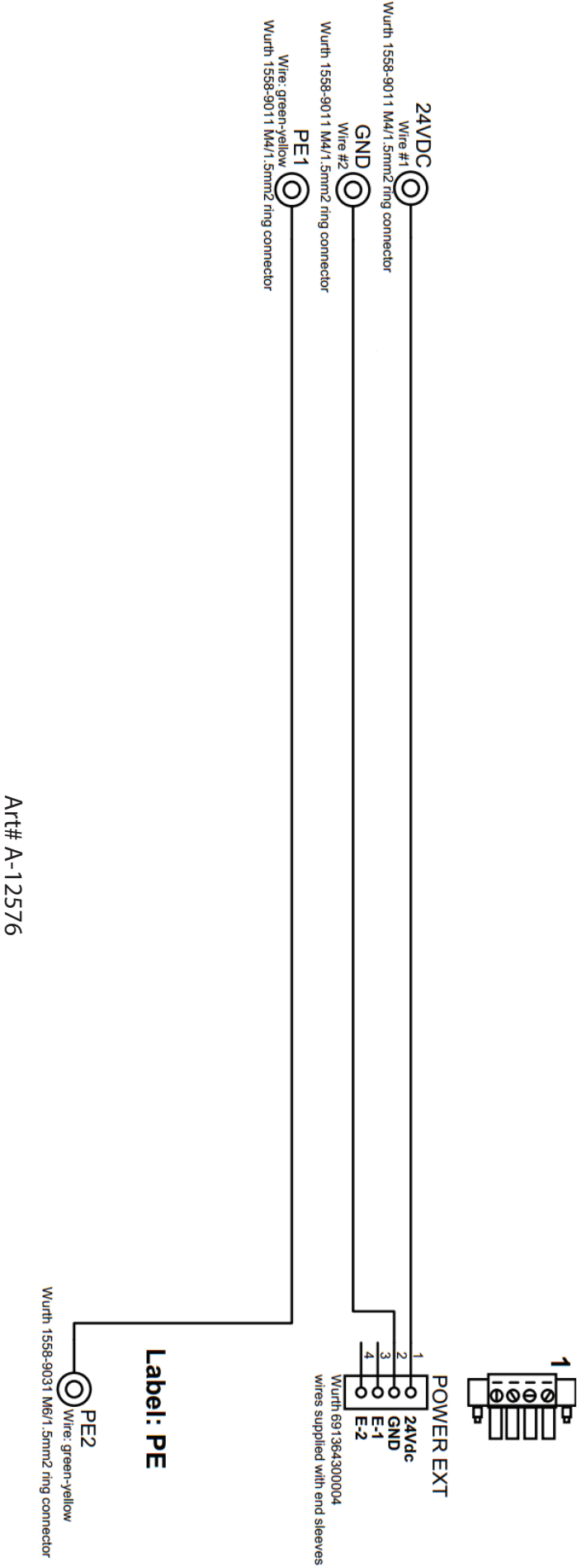
6.06 J53 CNC

Pin	Name	Description
1	IHS Start In	IHS Start input, activate by providing a dry closing contact to Input GND2 pin
2	Up In	Torch Up input, activate by providing a dry closing contact to Input GND2 pin
3	Marking In	Marking input, activate by providing a dry closing contact to Input GND2 pin
4	Optional In	Optional input, activate by providing a dry closing contact to Input GND2 pin
5	Input GND2	Input GND2
6	N/A	Not used
7	24VDC Out	24VDC Output max 0.5A
8	N/A	Not used
9	N/A	Not used
10	N/A	Not used
11	N/A	Not used
12	N/A	Not used
13	IO Shield	Cable shield
14	OK to Move COM	OK to Move output, NO Relay contact, max 48V 0.5A
15	OK to Move NO	OK to Move output, NO Relay contact, max 48V 0.5A
16	System Error COM	System error output NO Relay contact, max 48V 0.5A
17	System Error NO	System error output, NO Relay contact, max 48V 0.5A
18	Optional 1 COM	Optional output, NO Relay contact, max 48V 0.5A
19	Optional 1 NO	Optional output, NO Relay contact, max 48V 0.5A
20	Hold In	Hold input, activate by providing a dry closing contact to Input GND2 pin
21	Down In	Torch down input, activate by providing a dry closing contact to Input GND2 pin
22	Maintain In	Reserved for future use
23	Input GND2	Input GND2
24	IO Shield	Cable shield
25	Shield	Cable shield
26	GND Out1	GND for 24VDC output in pin #7
27	N/A	Not used
28	N/A	Not used
29	N/A	Not used
30	N/A	Not used
31	N/A	Not used
32	N/A	Not used
33	N/A	Not used
34	N/A	Not used
35	N/A	Not used
36	N/A	Not used
37	N/A	

Mating connector: D-sub male 37pin, 618 037 248 23

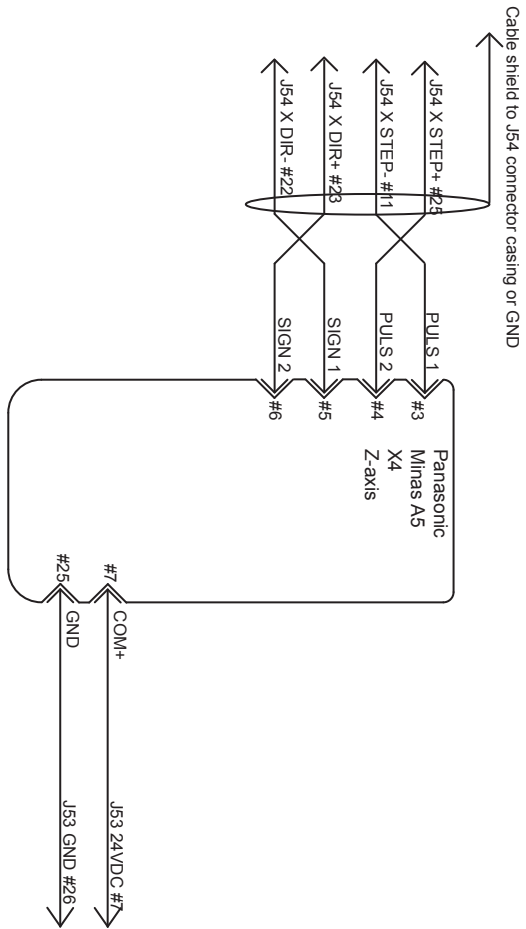
6.07 Power cable general example

iHC XT power cable, general example



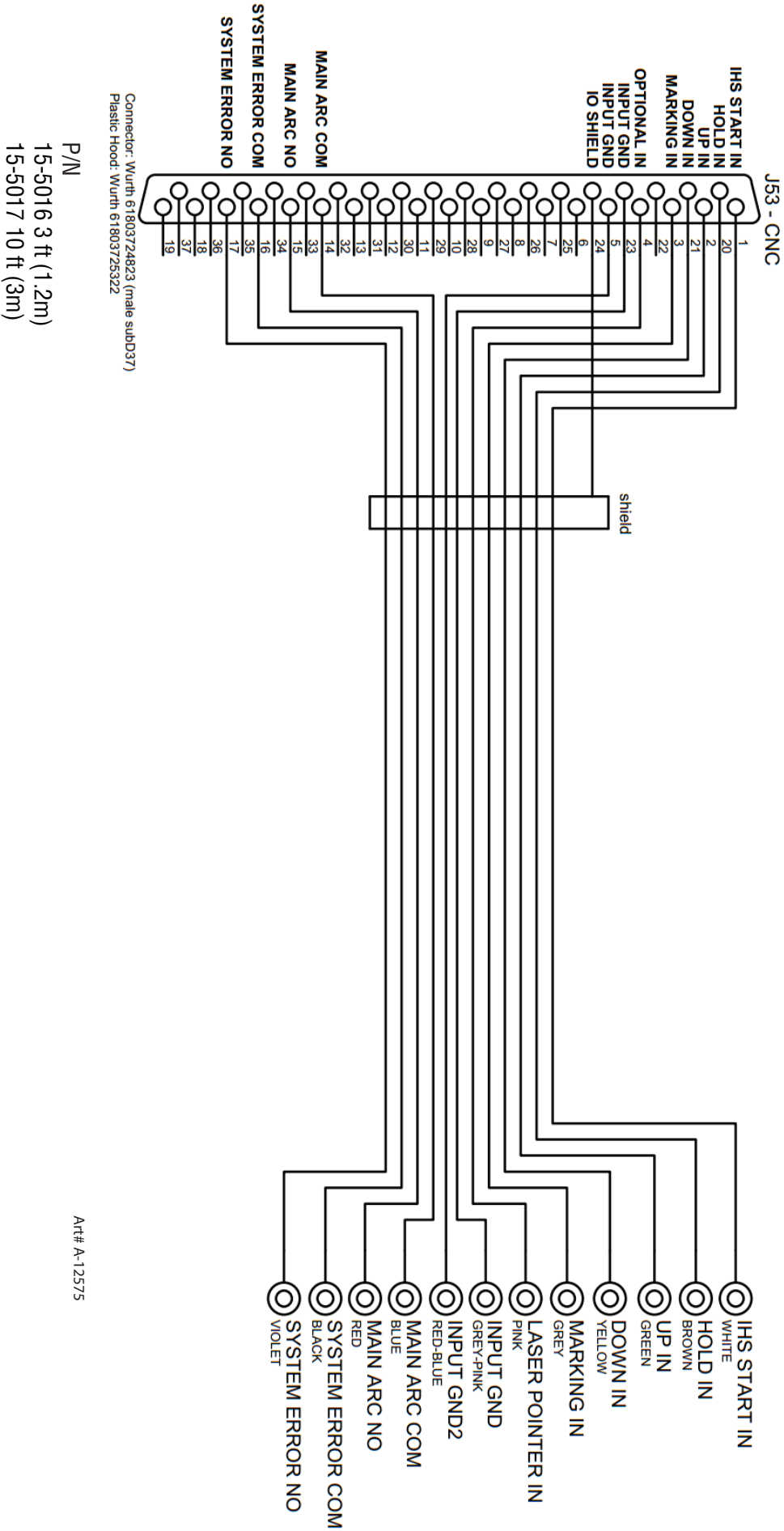
6.08 iHT XT with servo motor cable

iHC XT with servo motor example



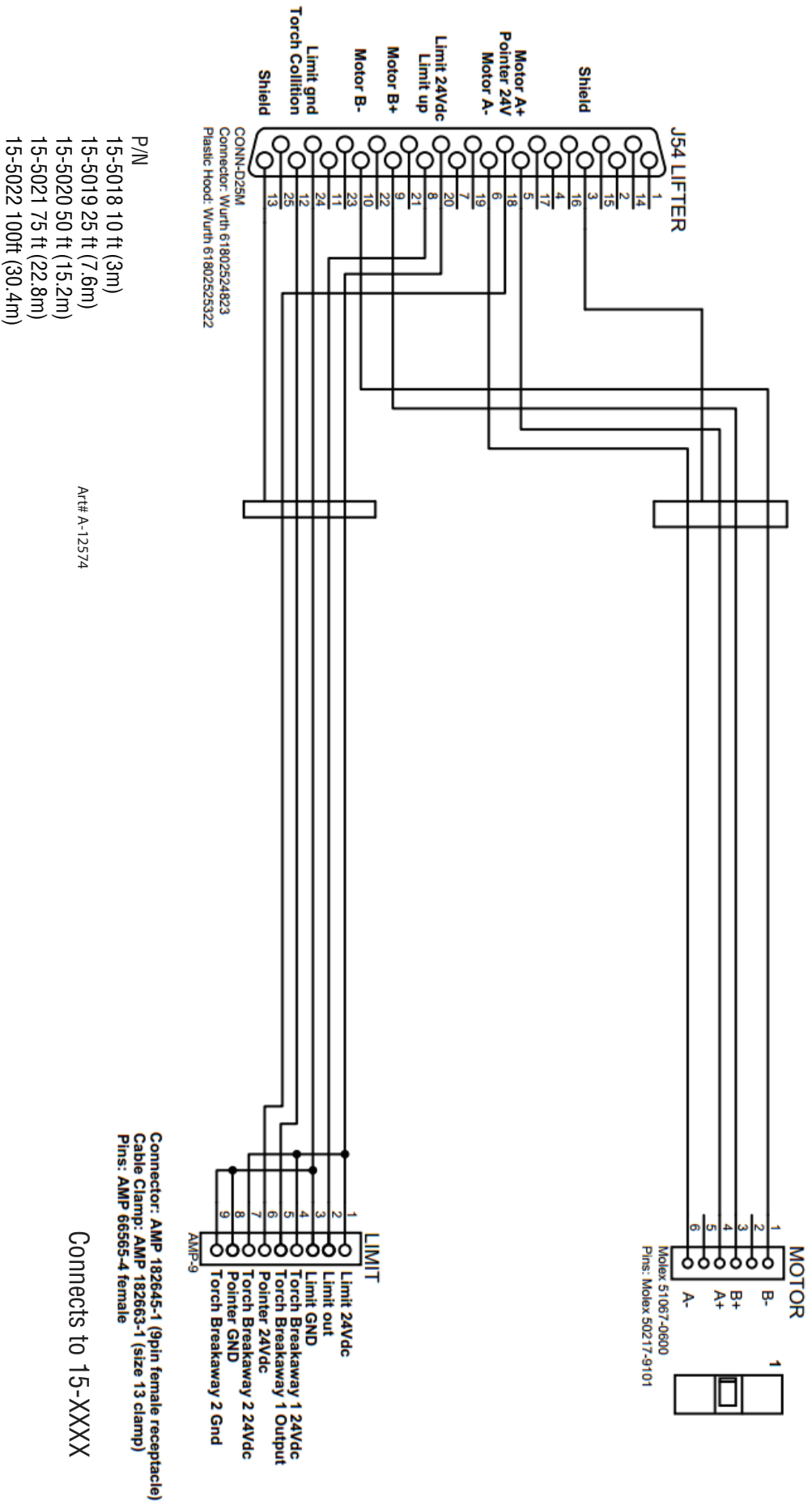
- Height control does not provide a servo enable signal
- Motor rotation direction should be adjusted in servo drive parameters.
- Maximum step frequency 146KHz

iHC XT CNC IO cable



6.10 Lifter cable

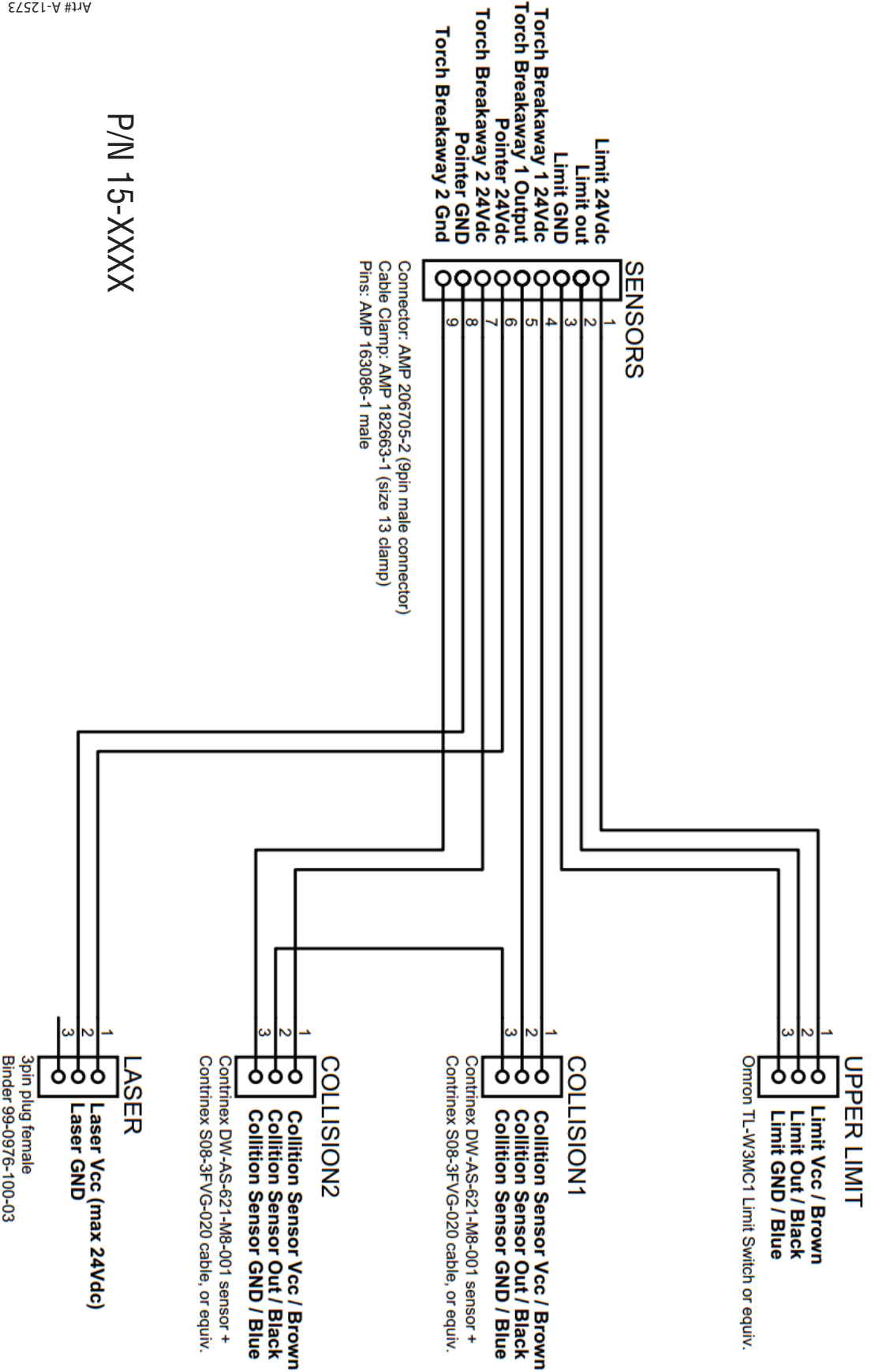
IHC XT lifter cable



6.11 Limit, Collision, Laser pointer cable

Art#-A-12573

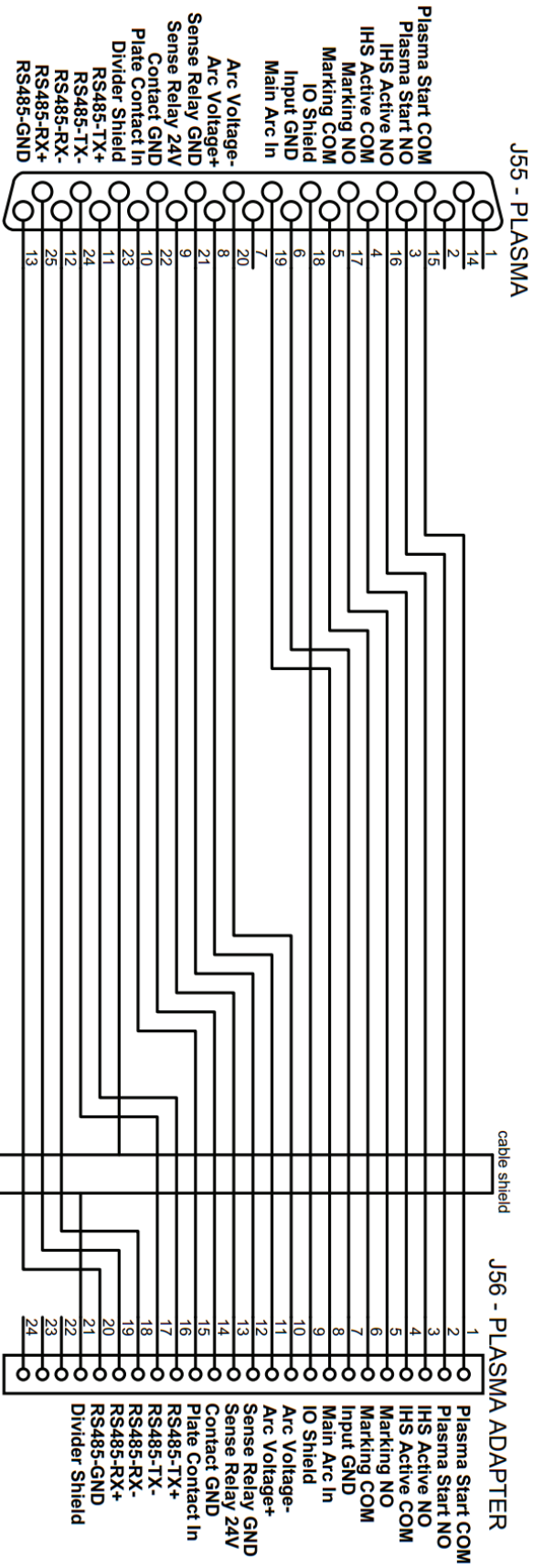
iHC XT Limit, Collision sensor, Laser pointer cable



iHC XT plasma adapter cable

6.12 Plasma adapter cable

Art# A-12572



Connector: Wurth 61802524923 (female subD25)
 Plastic Hood: Wurth 61802525322

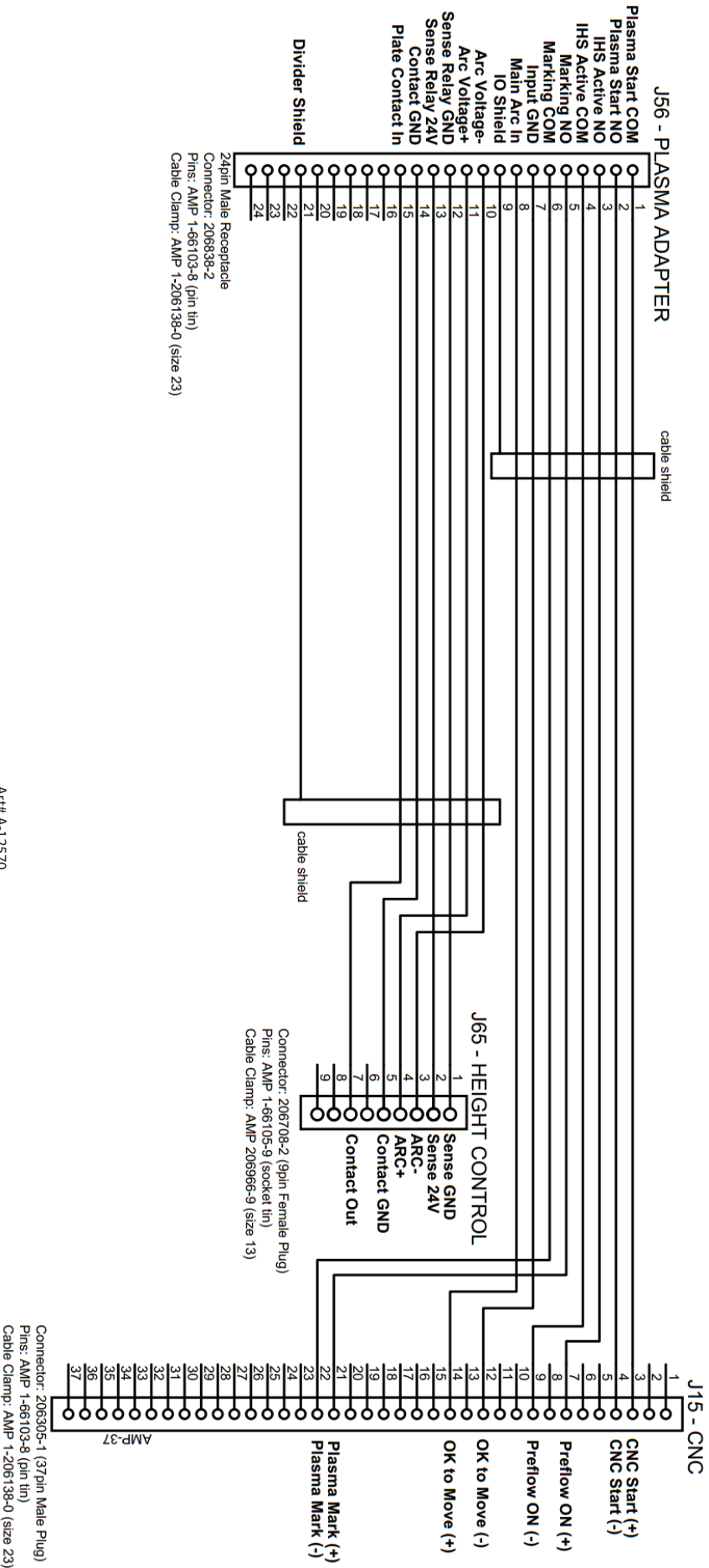
Connector: AMP 206837-1 (24pin Female Plug)
 Pins: AMP 1-66105-9 (socket 1in)
 Cable Clamp: AMP 1-206138-0 (size 23)

- P/N**
- 15-5023 25 ft (7.6m)
 - 15-5024 50 ft (15.2m)
 - 15-5025 75 ft (22.8m)
 - 15-5026 100 ft (30.4m)

- Connects to P/N**
- 15-5029 UC XT
 - 15-5030 Auto Cut and Cut Master

6.13 Plasma cable with UC XT

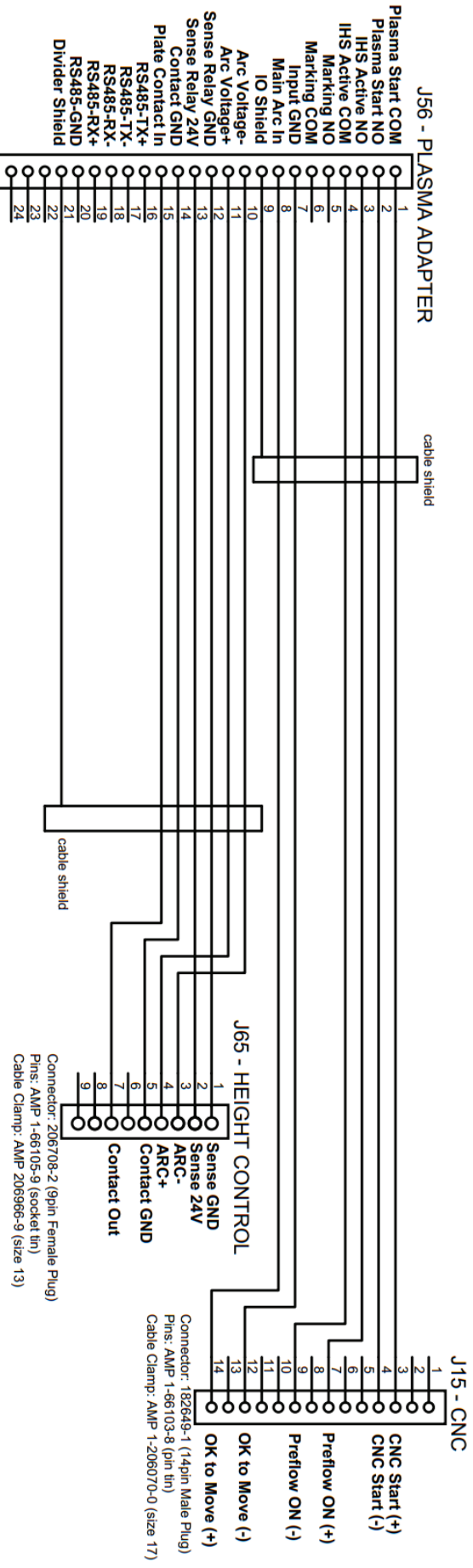
IHC XT plasma cable used with UltraCut XT



Art# A-12570

6.14 Plasma cable with AC XT

IHC XT plasma cable used with AutoCut XT



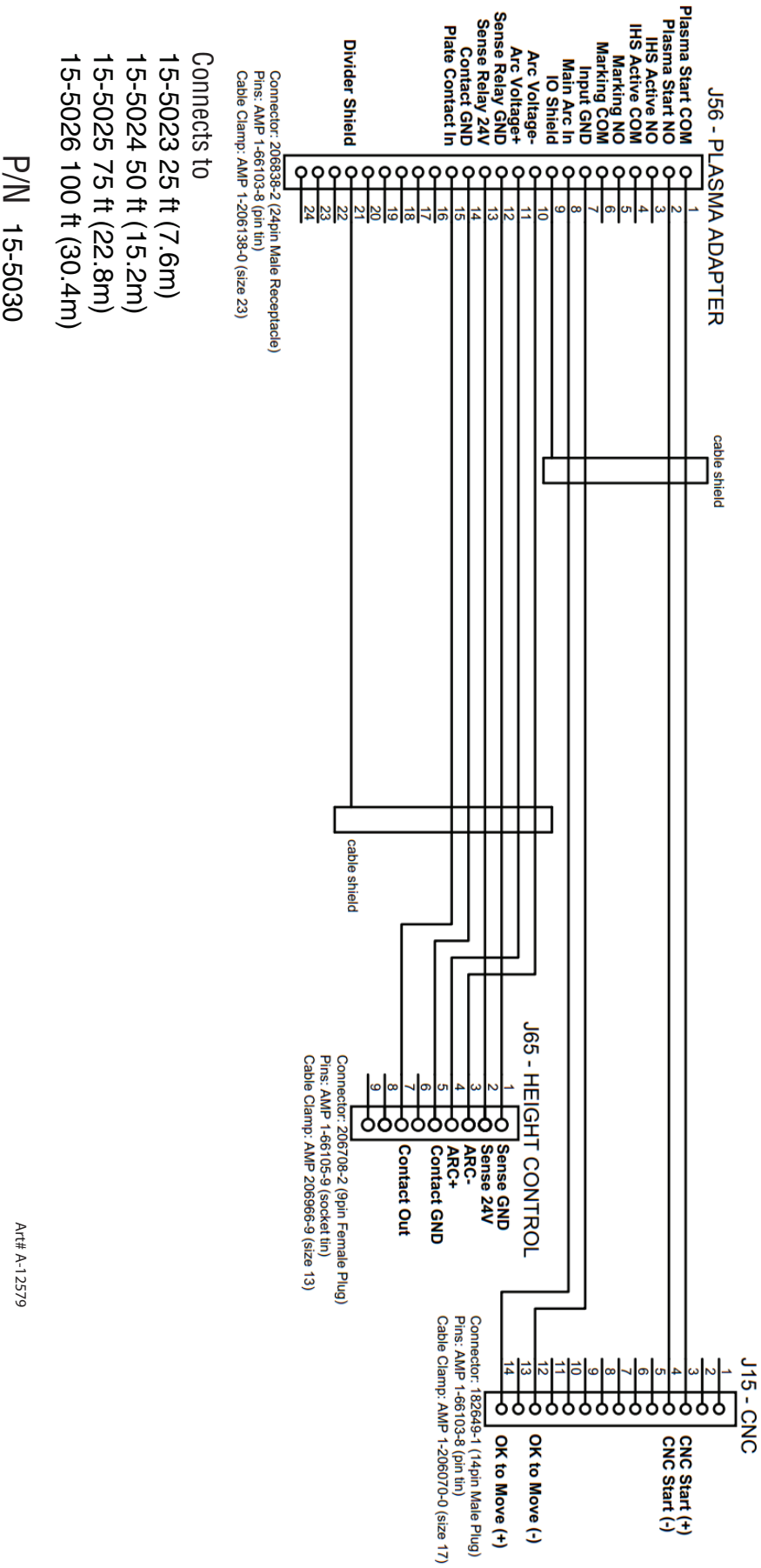
- Connects to
- 15-5023 25 ft (7.6m)
 - 15-5024 50 ft (15.2m)
 - 15-5025 75 ft (22.8m)
 - 15-5026 100 ft (30.4m)

P/N
 15-5030

ART# A-12569

6.15 Plasma cable with CutMaster

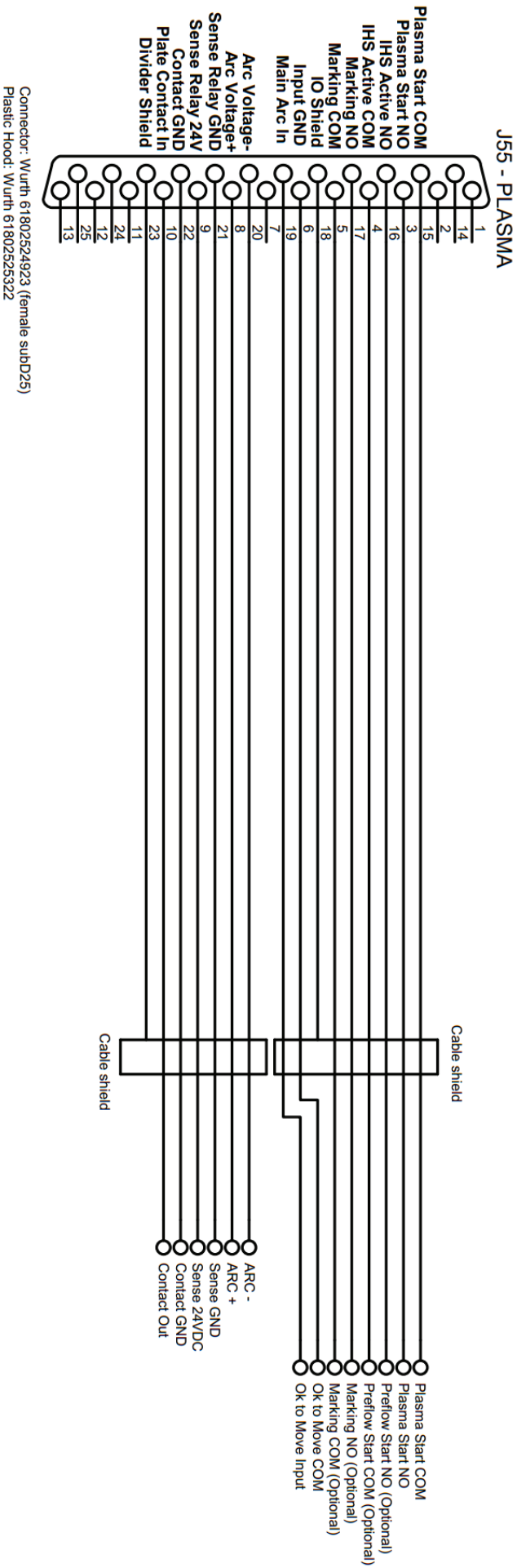
iHC XT plasma cable used with CutMaster



Art# A-12379

6.16 Plasma and VDC general example

IHC XT plasma IO and VDC general example

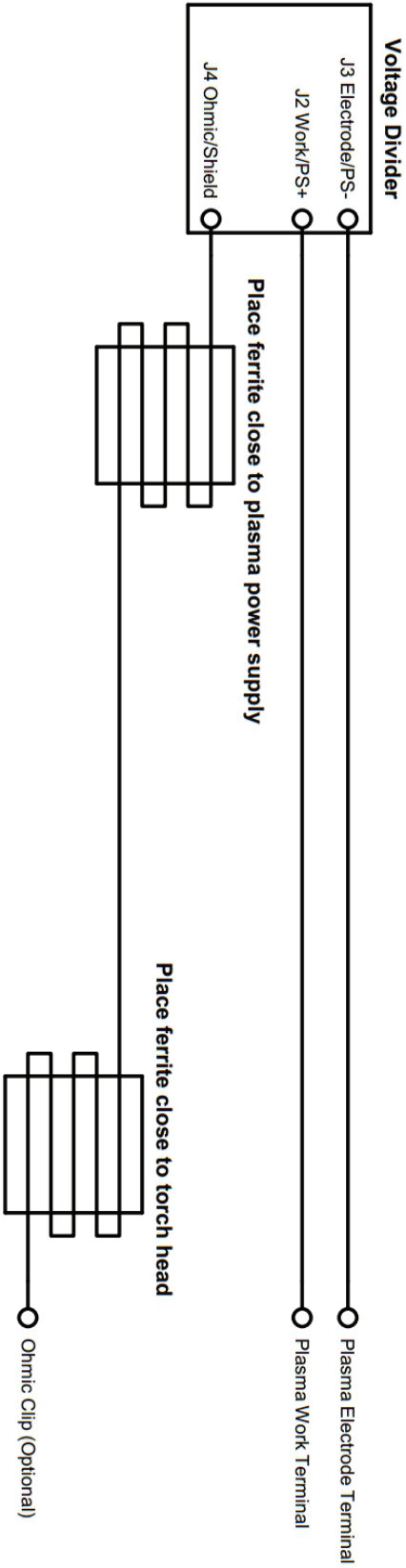


Connects to J55

Cable material: shielded and twisted pair, example Igus CF211-02-04-02, 24AWG,

Art# A-12580

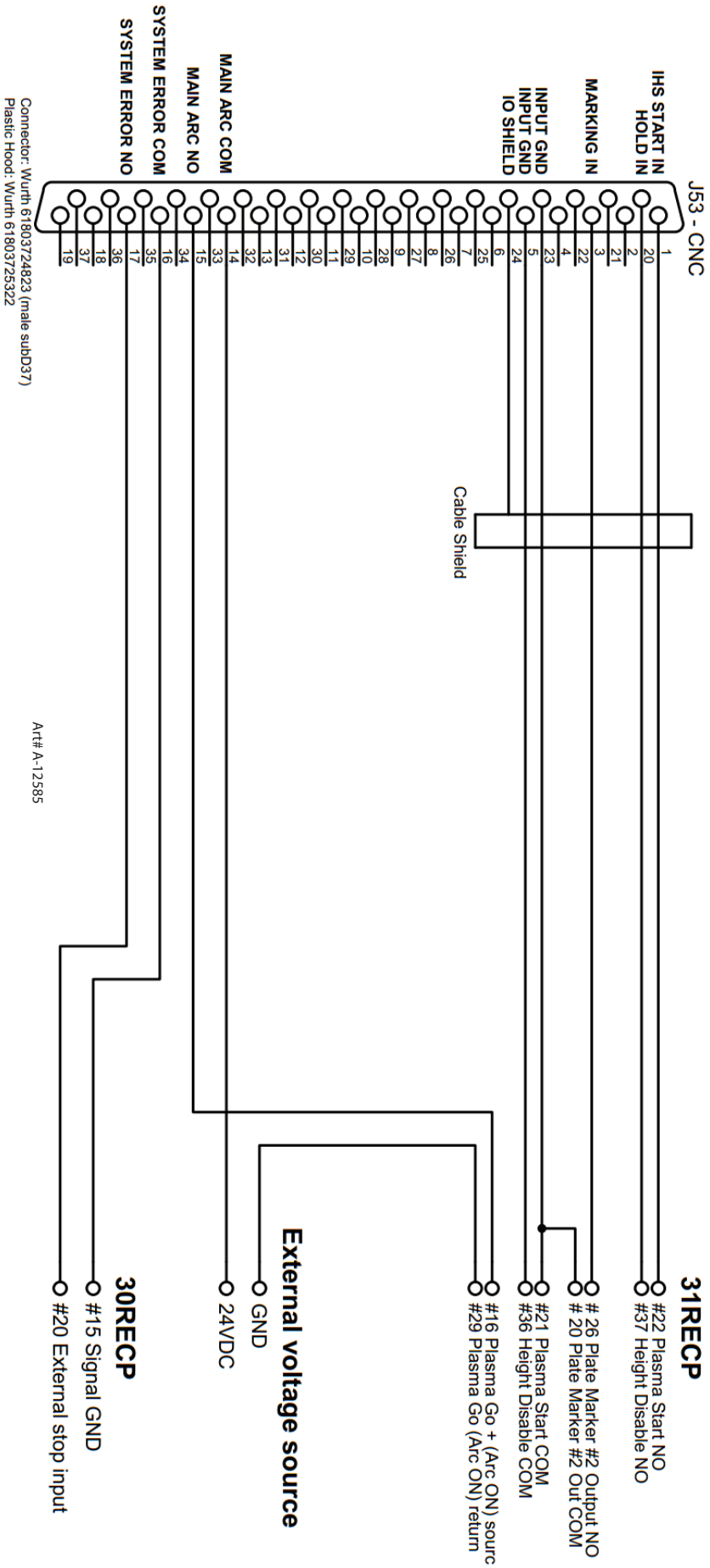
iHC XT voltage divider



Art# A-12581

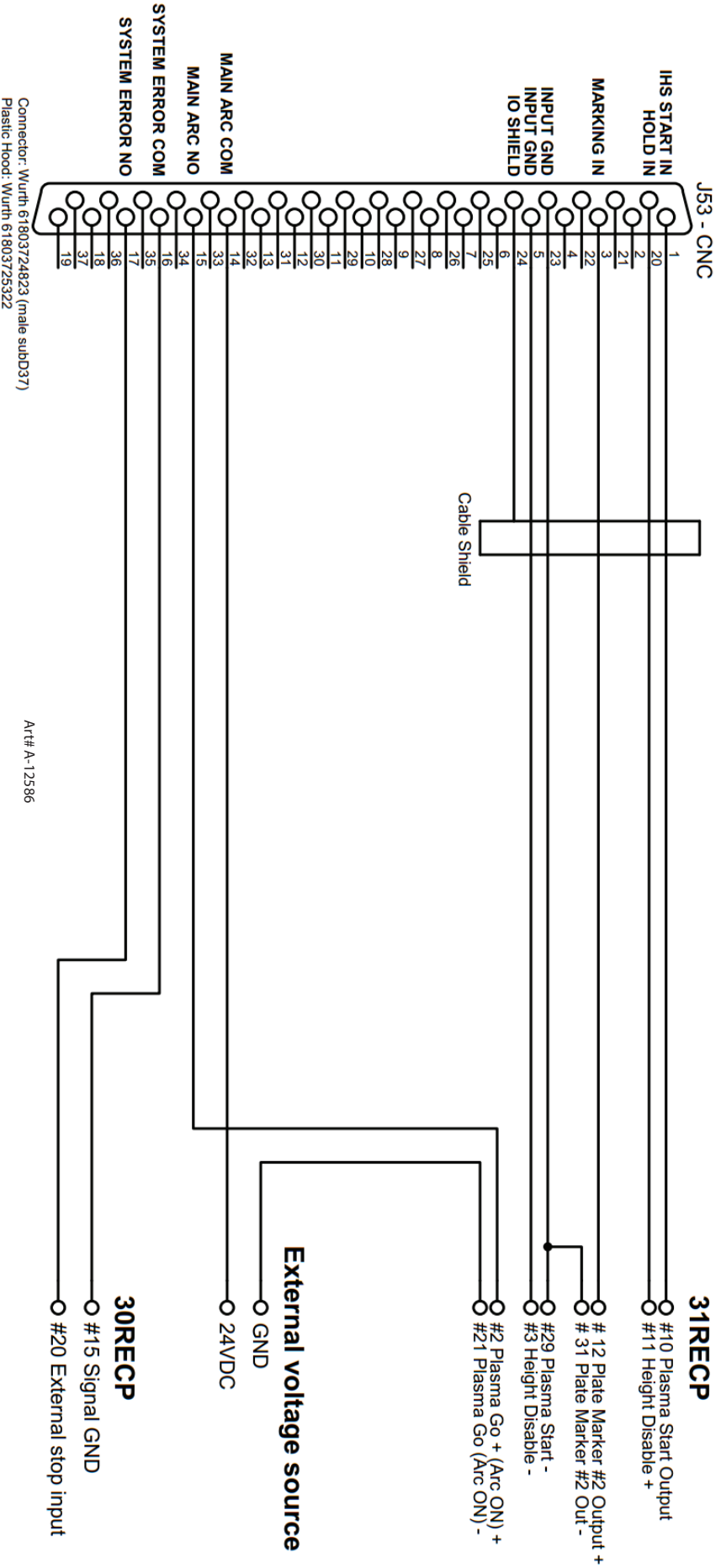
6.18 CNC IO to Burny 10 LCD Plus example

iHC XT CNC IO to Burny 10 LCD Plus



Picture for reference only, always verify connections from latest manuals. Please take care on the wiring of external stop signal as it may already have other e-stop functions connected. Plate marker connection is optional.

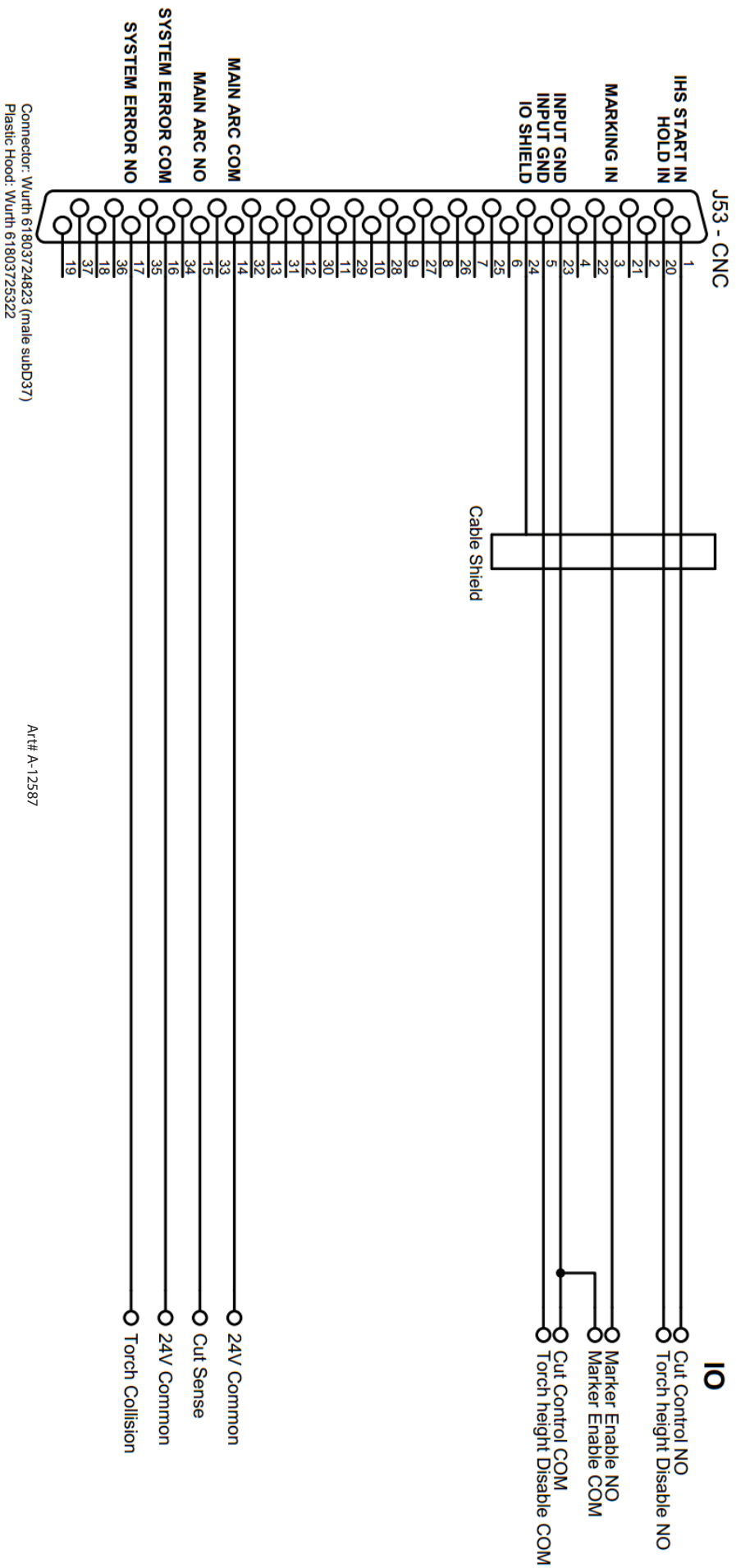
iHC XT CNC IO to Burny 10 LCD Plus OEM



Picture for reference only, always verify connections from latest manuals. Please take care on the wiring of external stop signal as it may already have other e-stop functions connected. Plate marker connection is optional.

6.20 CNC IO to Hypertherm MicroEdge example

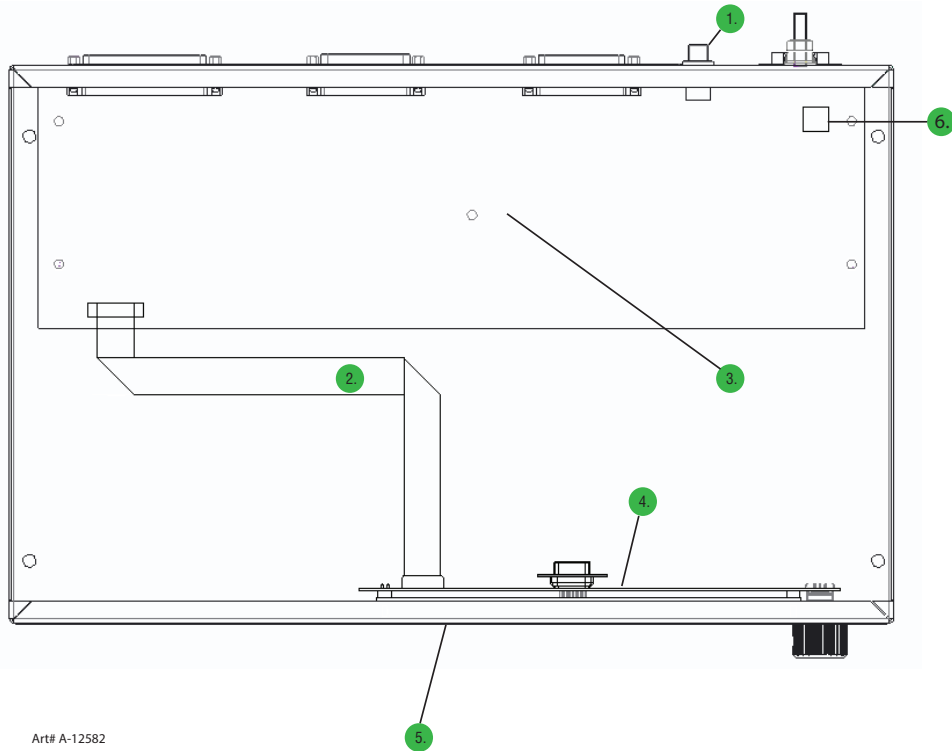
iHC XT CNC IO to Hypertherm MicroEdge



Picture for reference only, always verify connections from latest manuals. Marker connection is optional

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SECTION 7: REPLACEMENT PARTS



Item	Name	Part number
1	Power switch	15-5037
2	Remote cable	15-5014
3	iHC XT PCB	15-5012
4	iHC XT Remote PCB	15-5013
5	Button sticker	15-5011
6	FUSE 5A 250V SLOW-BLOW 5X20mm	N/A

Item	Name	Part number
Power Supply	24VDC PSU	15-6025
Lifter motor	Stepper motor	15-2044
Axis coupler	Axis coupler	15-XXXX
Collision sensor	Inductive sensor 1pc.	15-2119
Collision sensor cable	Inductive sensor cable 1pc.	15-2114
Laser pointer	Laser pointer	15-2091
Voltage divider board	Voltage divider board	15-5005

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SECTION 8: SOFTWARE UPDATE

8.01 Preparations

1. You need a serial cable with a male D9 connector
(Example)



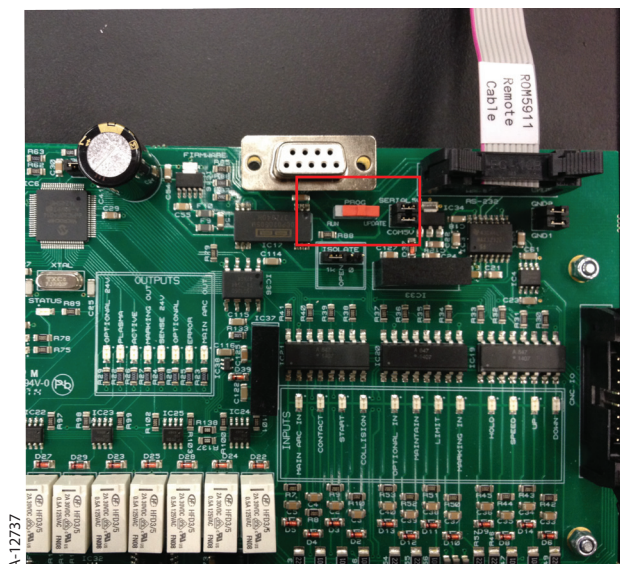
2. You need to find out your COM port number
3. You need to install a bootloader software to run the update.

8.02 Installing the bootloader software

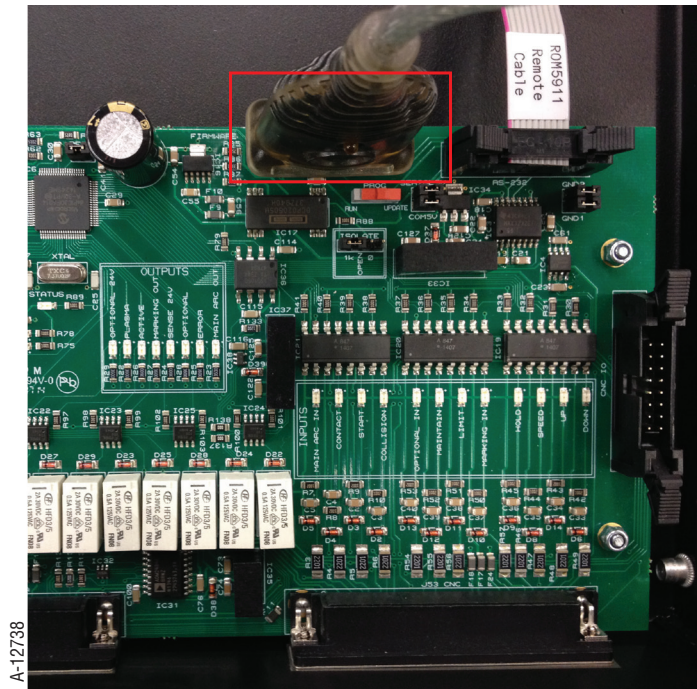
1. You should receive the bootloader software with the software updates. If you did not receive it ask it from your dealer.
2. Run ingeniadsPICbootloader.exe
3. Copy ibl_dspiclist.xml that you got with the email to C:\Program Files\Ingenia\ingeniadsPIC bootloader\ and over write the existing one.

8.03 Updating iHC XT processor card

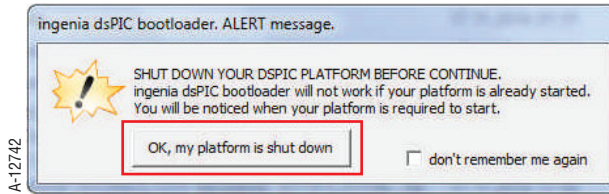
1. Make sure iHC XT is not powered on!
2. Put the dip switch to UPDATE



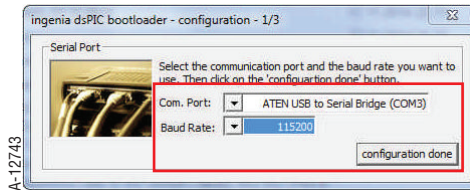
3. Connect the serial cable



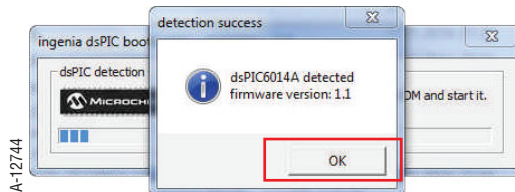
- 4. Navigate to Start --> All programs --> Ingenia --> dsPIC bootloader
- 5. Click OK, my platform is shut down



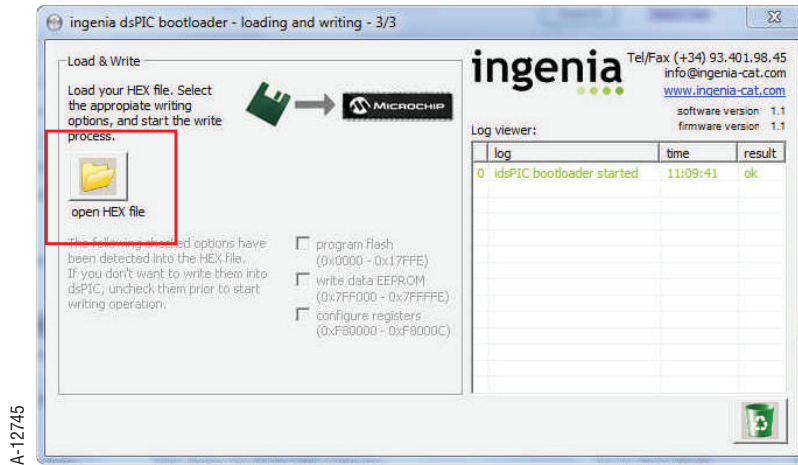
- 6. Select correct comport where the iHC is connected
- 7. Click configuration done




- 8. Wait 5s. and turn on the power to iHC XT
- 9. Click OK



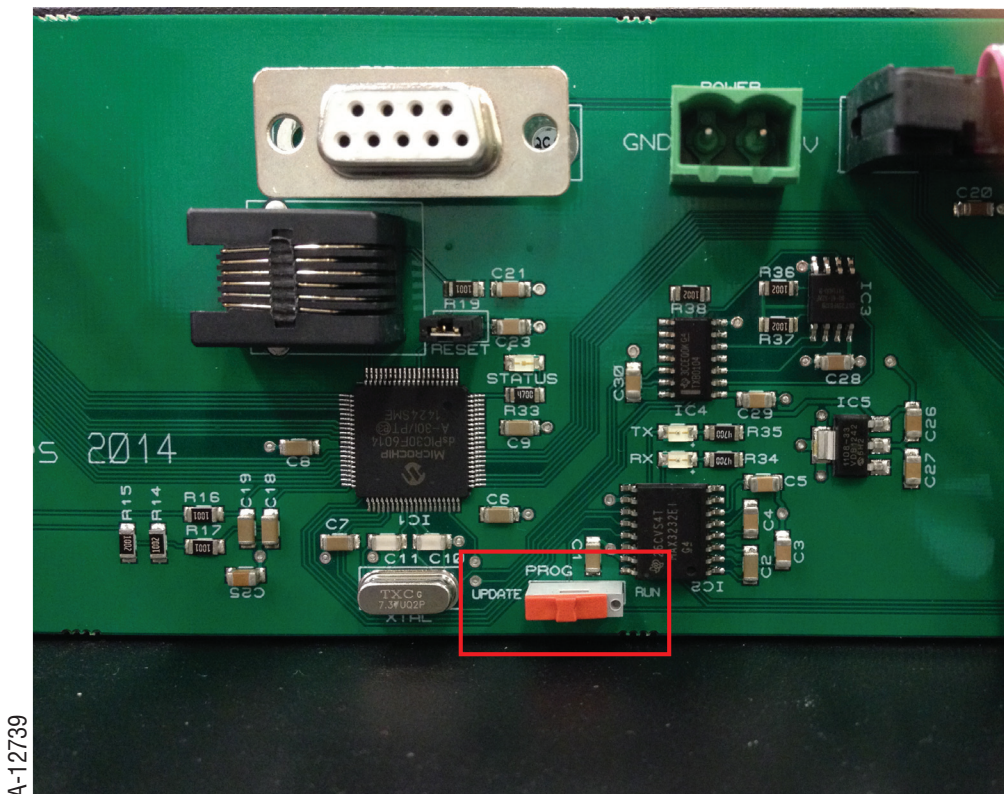
10. Click open HEX file, navigate to the folder where you have the .hex file.



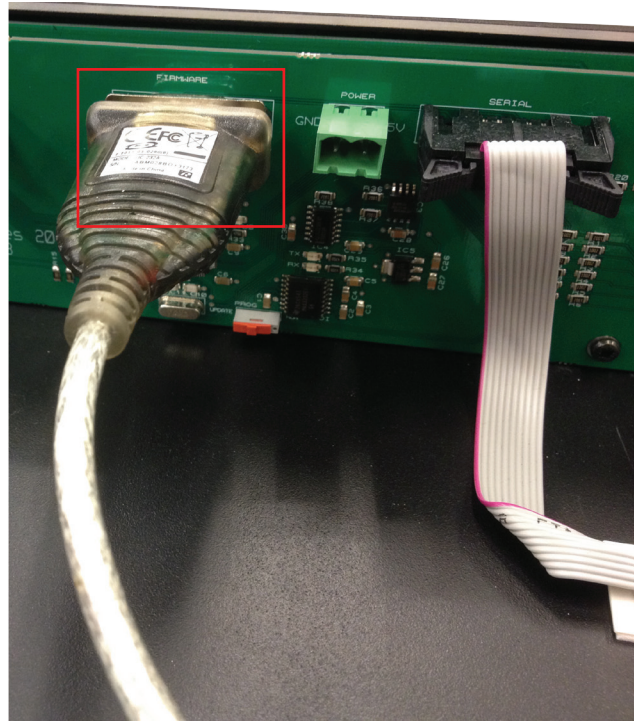
 **CAUTION**
The correct .hex file will have remote in its name. DO NOT USE anything without remote in the name.

8.04 Updating iHC XT remote

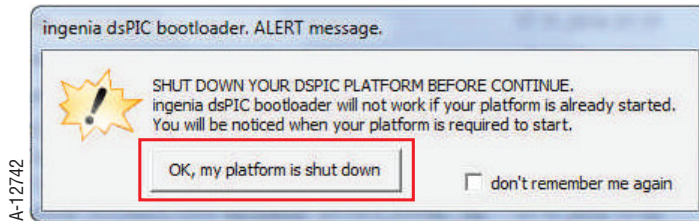
1. Make sure iHC XT is not powered on!
2. Put the dip switch to UPDATE



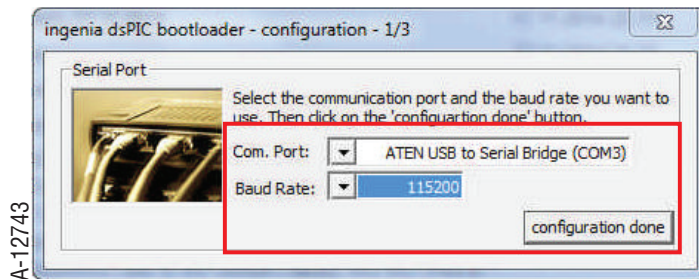
- 2. Connect the serial cable



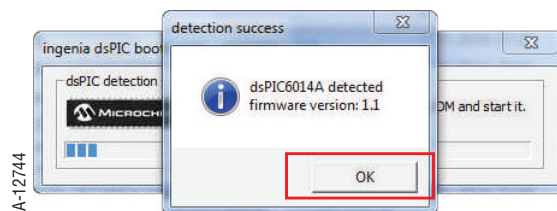
- 4. Navigate to Start --> All programs --> Ingenia --> dsPIC bootloader
- 5. Click OK, my platform is shut down



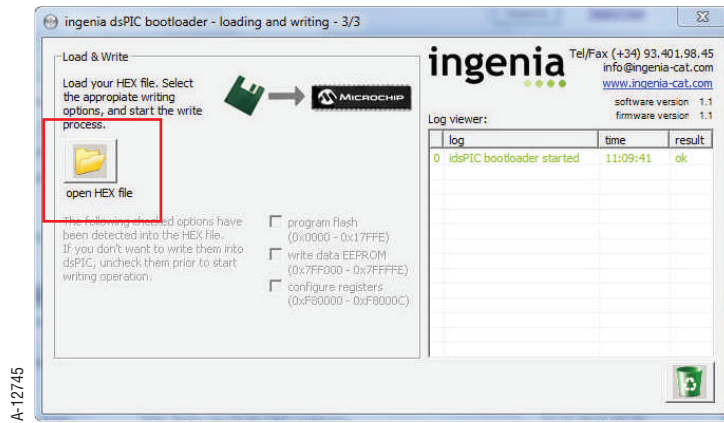
- 6. Select correct comport where the iHC is connected
- 7. Click configuration done



- 8. Wait 5s. and turn on the power to iHC XT
- 9. Click OK



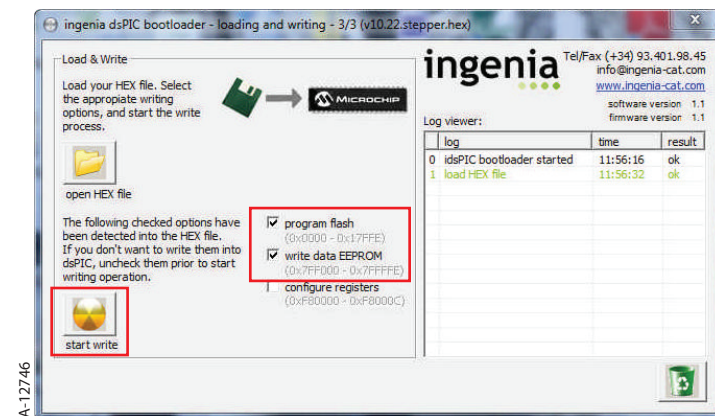
10. Click open HEX file, navigate to the folder where you have the .hex file.



CAUTION

The correct .hex file will have remote in its name. DO NOT USE anything without remote in the name.

10. Make sure program flash and write data EEPROM boxes are checked



12. Click start write

13. When the update is done you can exit.

14. Turn off the power

15. Remove the serial cable

16. Put the dip switch back to RUN

8.05 Installing the cut chart server

1. You should receive the cut chart software with the cut chart update. If you did not receive it ask it from your dealer.
2. Create a folder
3. Copy files to the folder you created

Your folder should look like this:

charts (folder)

CutChartServer.exe

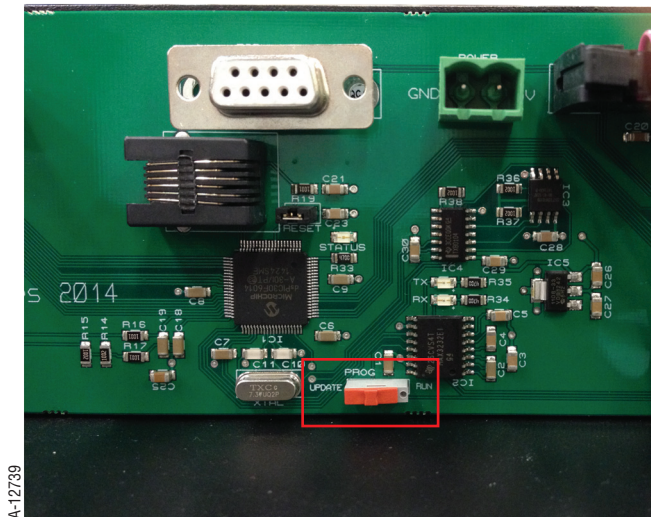
Plasma.dll

ProMotion.dll

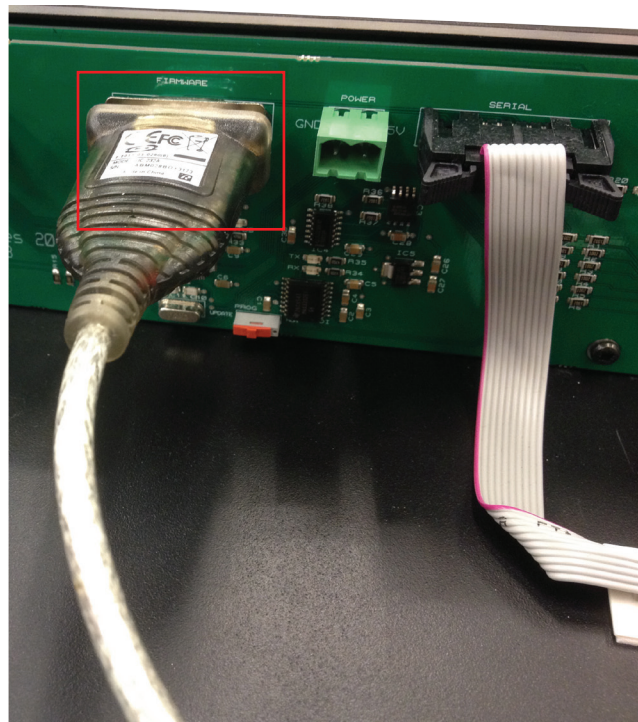
Query.dll

8.06 Updating the cut chart

1. Make sure iHC XT is not powered on!
2. Put the dip switch to UPDATE



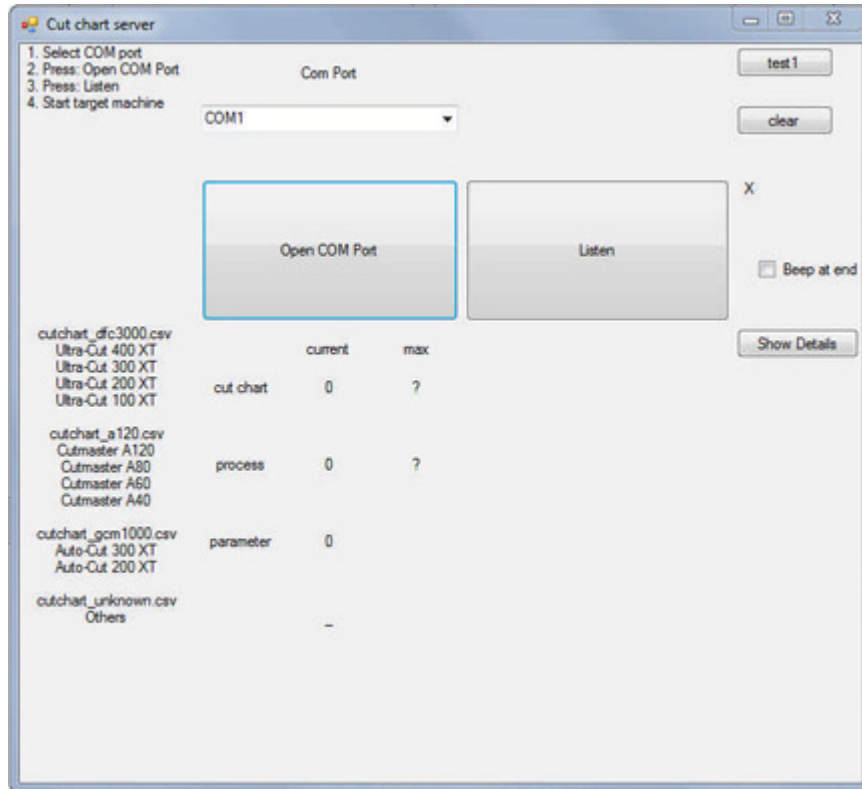
2. Connect the serial cable



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3. Run CutChartServer.exe
4. Select correct com port and click Open COM Port
5. Click Listen
6. Power On the iHC XT

7. You can check the box Beep at end to get a beeping sound after update is finished. Cut chart update can take up to 30min.
8. When the update is done you can exit.
9. Turn off the power
10. Remove the serial cable
11. Put the dip switch back to RUN
12. Done



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