DOUGHTY Engineering Ltd

Doughty Trigger Clamps

User Manual

IMPORTANT – READ CAREFULLY BEFORE USE – KEEP FOR FUTURE REFERENCE

User Manual Version A Issued March 2018

Doughty Engineering Ltd
Crow Arch Lane, Ringwood, Hampshire BH24 1NZ
Tel: +44 (0) 1425 478961

sales@doughty-engineering.co.uk
www.doughty-engineering.co.uk

Contents

1. SAFETY NOTES

BEFORE installing and operating clamps, please read this manual carefully and pay attention to the information provided. Use this manual to familiarise yourself with the clamp, its proper use and safety regulations.

⚠ DANGER

DANGER: Indicates a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ WARNING

WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE: address practices not related to personal injury.

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS: is used for lists of steps, procedures or instructions that might otherwise substitute a DANGER, WARNING or CAUTION notification.

2. GENERAL

Doughty Trigger clamps series consist of various clamps used to lift loads or make structural connections. Clamps are used in the entertainment market. They can be used for permanent support structures in places of entertainment such as museums, event venues, theatres etc.

Lifting loads is inherently dangerous so Doughty Trigger clamps are strictly for professional use only. Only competent persons are permitted to install and use Doughty Trigger clamps. A competent person in this respect is an individual with relevant technical education, training and/or experience enabling him or her to perceive risks and to avoid hazards occurring during use of a product.

The load capacity differs depending on the model and the safety factor required. Trigger clamps are suitable to fit steel or aluminium tubes with diameters ranging from 48 - 51mm. Clamps stamped with the maximum working load.

Most clamps are available in Silver (polished aluminium) and black powder coated.

Special attention has been taken to safety. Therefore the TUV test certificates indicate multiple Working loads. Depending on the application or local applicable legislation max working load can be chosen.
Clamps can be judged as a lifting accessories under the EU machine Directive 2006/42/EC as well as German DGUV-BGV-C1 for lifting and holding loads above persons. They can also be used as a joining part in constructions. For this application no harmonised standard is available no CE Declaration of Performance can be provided.

Doughty has endeavoured to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Doughty Policy. Therefore, product specifications are subject to change without notice.

Readers and users are encouraged to notify Doughty of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this manual and changes to our products.

Some models of clamp are composed of different elements each with an individual Working Load. The lowest of the working loads determines the overall strength and thus shall be used as max working Load for the application.

Resulting forces in the structure attached shall be verified before applying a load.

For the ease of reading this document the word “Clamps” or “Clamp” is used to cover all Doughty Trigger clamp series and models.

3. SCOPE

The intended use of clamps is to be used as a lifting accessory to hang loads or create a connection between structural elements. Loads can be, but not limited to, lighting fixtures, video projectors, sound systems and stage sets.
Structural elements can be pipes, trusses, tubular frame works or lifting brackets.
Any use other than that mentioned is considered to be a case of misuse. The user/operator and not the manufacturer shall be liable for any damage or injury resulting from such cases of misuse.

The use of clamps for scaffolding purposes under EN74 is explicitly excluded from the intended use.

⚠ WARNING

Check local legislation for the application of use and adapt the use where ever necessary.

4. LIMITATIONS OF USE

- The Clamps can be operated in -20° Celsius up to +60° Celsius.
- Clamps shall only be used on steel or aluminium tubes or bars.
- When used permanently outdoors it is advised to use the versions with stainless steel hardware in order to avoid galvanic corrosion.
- Salt water environments require cleaning with fresh water at least once per week
- The use of Aluminium clamps in conjunction with steel tubes shall be minimised to 2 months in order to avoid galvanic corrosion
- When used for moving loads above persons, self-locking nuts shall replace the standard nut plus wingnut
- The use of Clamps is the sole responsibility of the user.

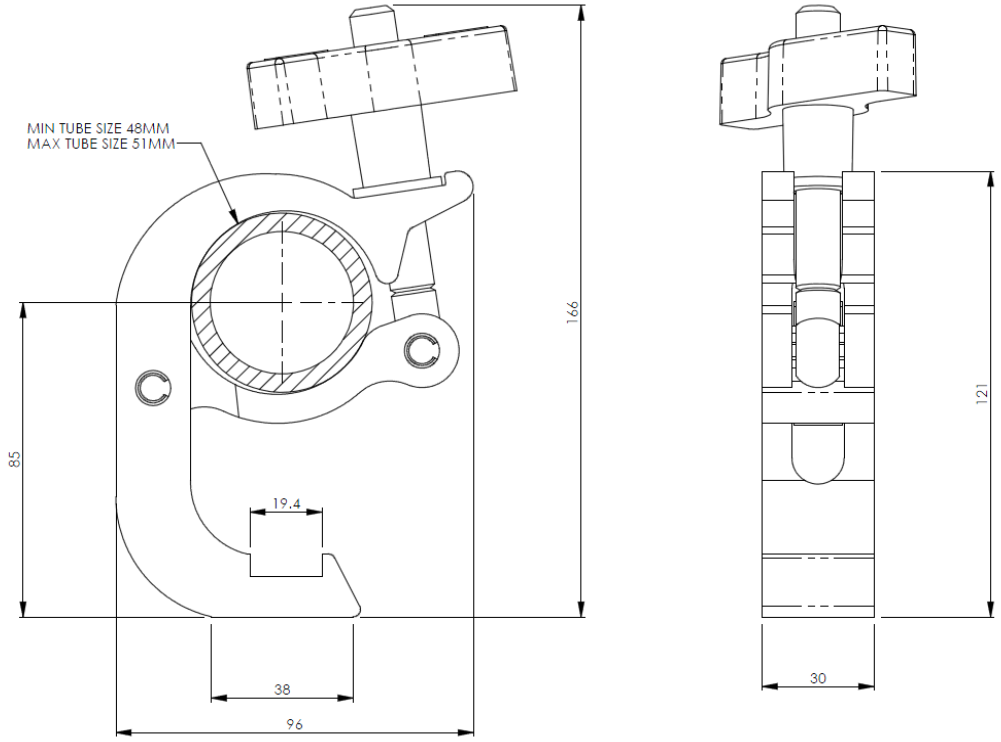
- To use the Clamps the user must also observe the safety regulation, the assembly and dis-assembly instructions to be found in this manual.
- All persons who use and service this device have to be acquainted with this manual and must be informed about its potential hazards.
- It is also imperative to observe the local accident prevention regulations and/or occupational health and safety regulations.
- The manufacturer is not liable for indirect consequential damage and financial loss. The manufacturer shall not be liable for any changes made to the device nor for any damage resulting from such changes.

Loading Table

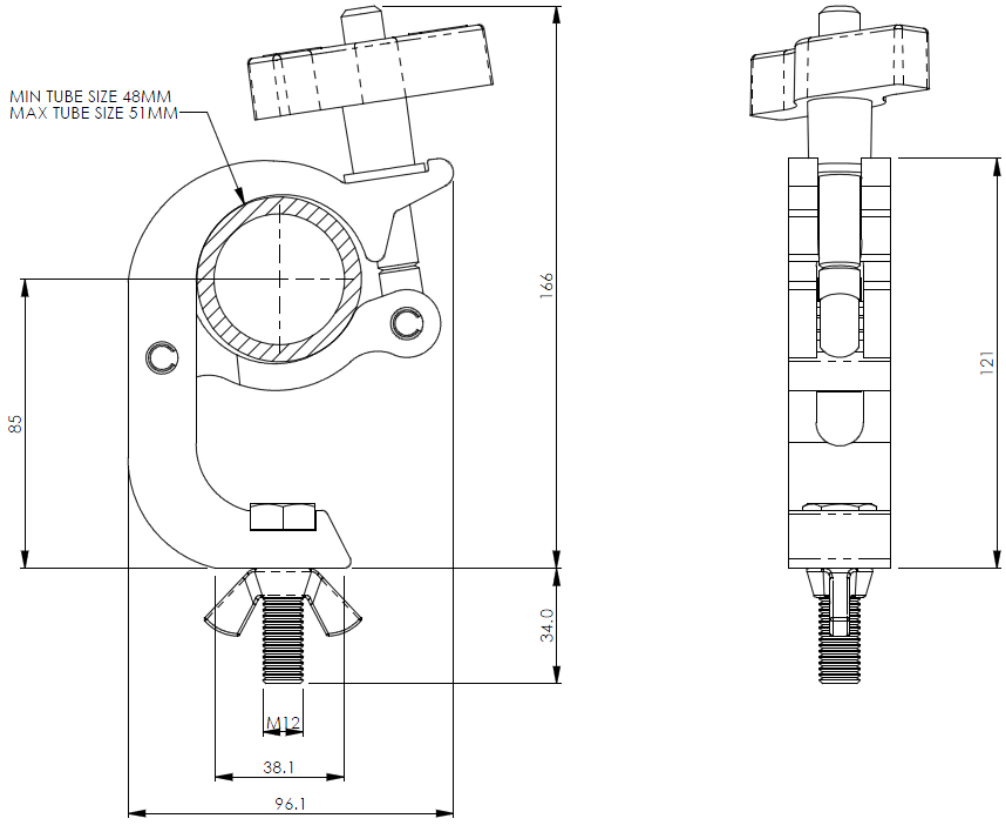
Rated Load with a Safety Factor of 10:1 WLL_1 DGUV17/BGV C1 for Lifting Load
Rated Load with a Safety Factor of 5:1 WLL_2 2006/42/ES for Static Load

PART NO	TUBE DIA	DESCRIPTION	FINISH	ACCESSORY	WLL1 (KG) LIFTING (CE)	WLL2 (KG) STATIC
T588860	Ø48 - 51mm	Trigger Clamp	Polished	None	100	200
T588601	Ø48 - 51mm	Trigger Clamp	Black	None	100	200
T58861	Ø48 - 51mm	Trigger Hook Clamp	Polished	M12 X 45 Fixing Kit	100	200
T5886101	Ø48 - 51mm	Trigger Hook Clamp	Black	M12 X 45 Fixing Kit	100	200
T58862	Ø48 - 51mm	Trigger Hanging Clamp	Polished	M12 Eyenut (340Kg WLL)	100	200
T5886201	Ø48 - 51mm	Trigger Hanging Clamp	Black	M12 Eyenut (340Kg WLL)	100	200
T58866	Ø48 - 51mm	Trigger Beamer Clamp	Polished	M12 Beamer Spigot	100	200
T58865	Ø48 - 51mm	Trigger Big Ben Clamp - Din	Polished	M12 Female TV Spigot	100	200
T58867	Ø48 - 51mm	Trigger Big Ben Clamp - Euro	Polished	M12 Female TV Spigot	100	200
T58869	Ø48 - 51mm	Trigger TV Clamp	Polished	M12 Receiver Assembly	100	200
T5886901	Ø48 - 51mm	Trigger TV Clamp	Black	M12 Receiver Assembly	100	200

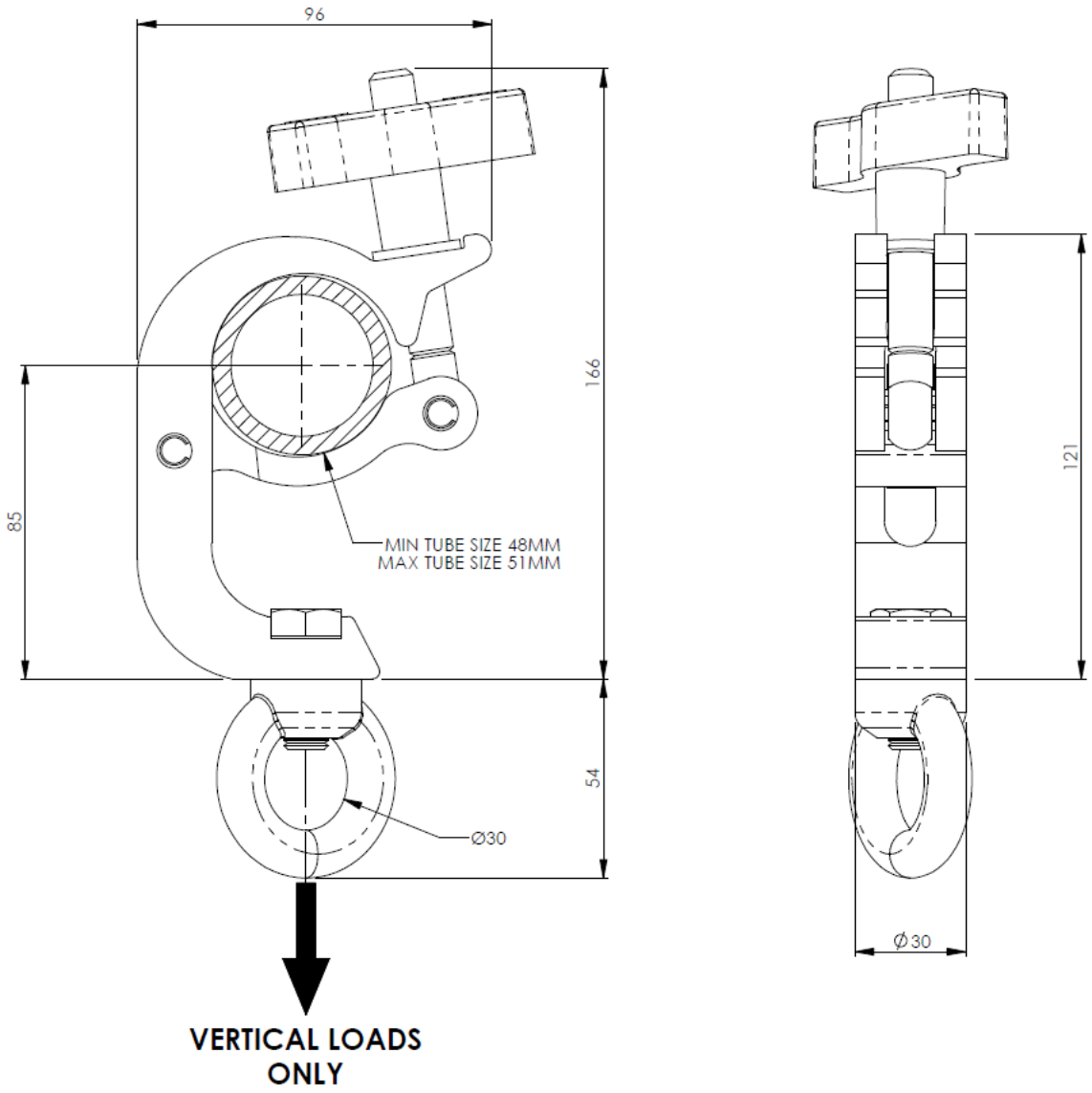
5. IDENTIFICATION OF THE PRODUCT



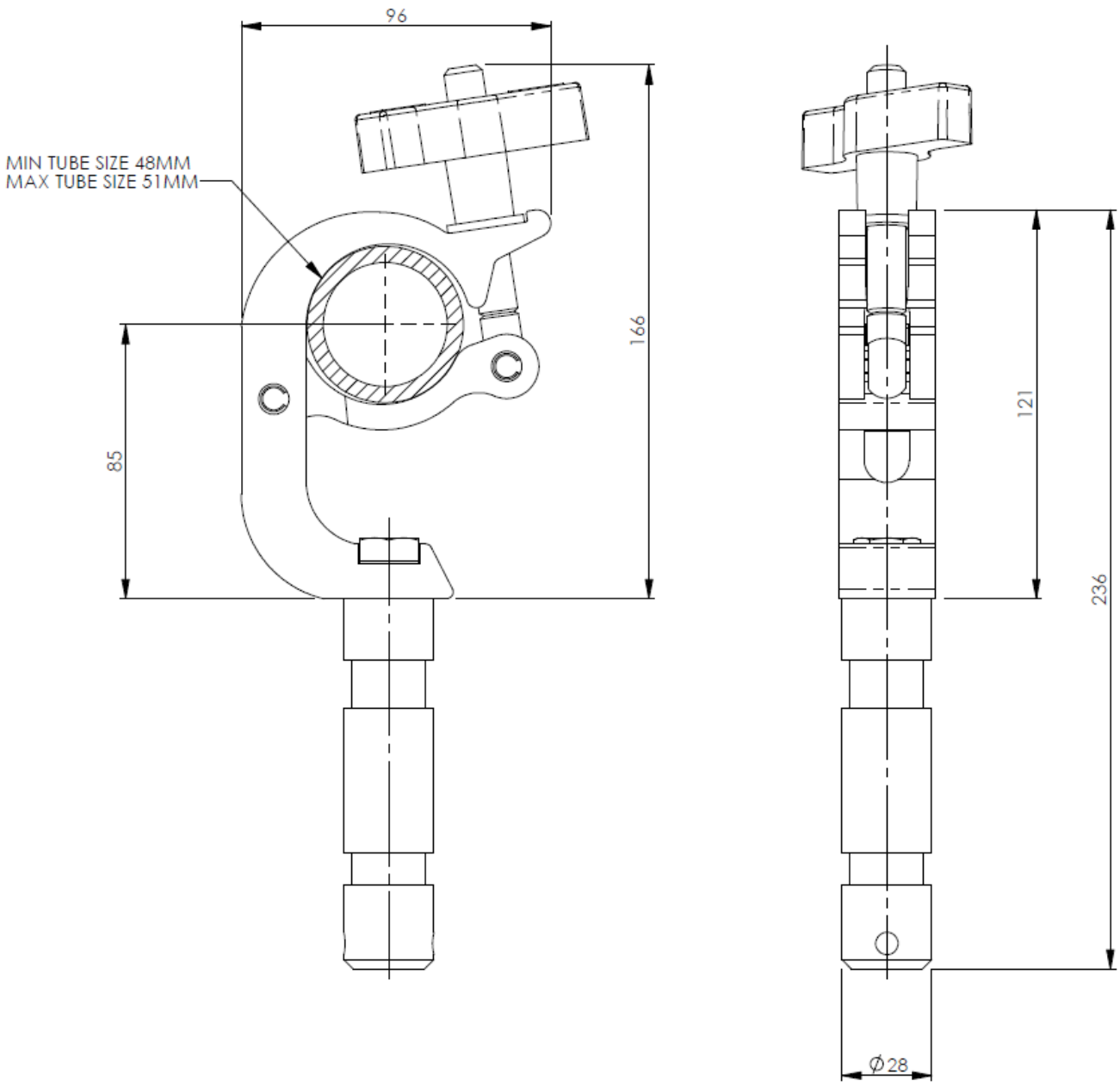
TRIGGER CLAMP



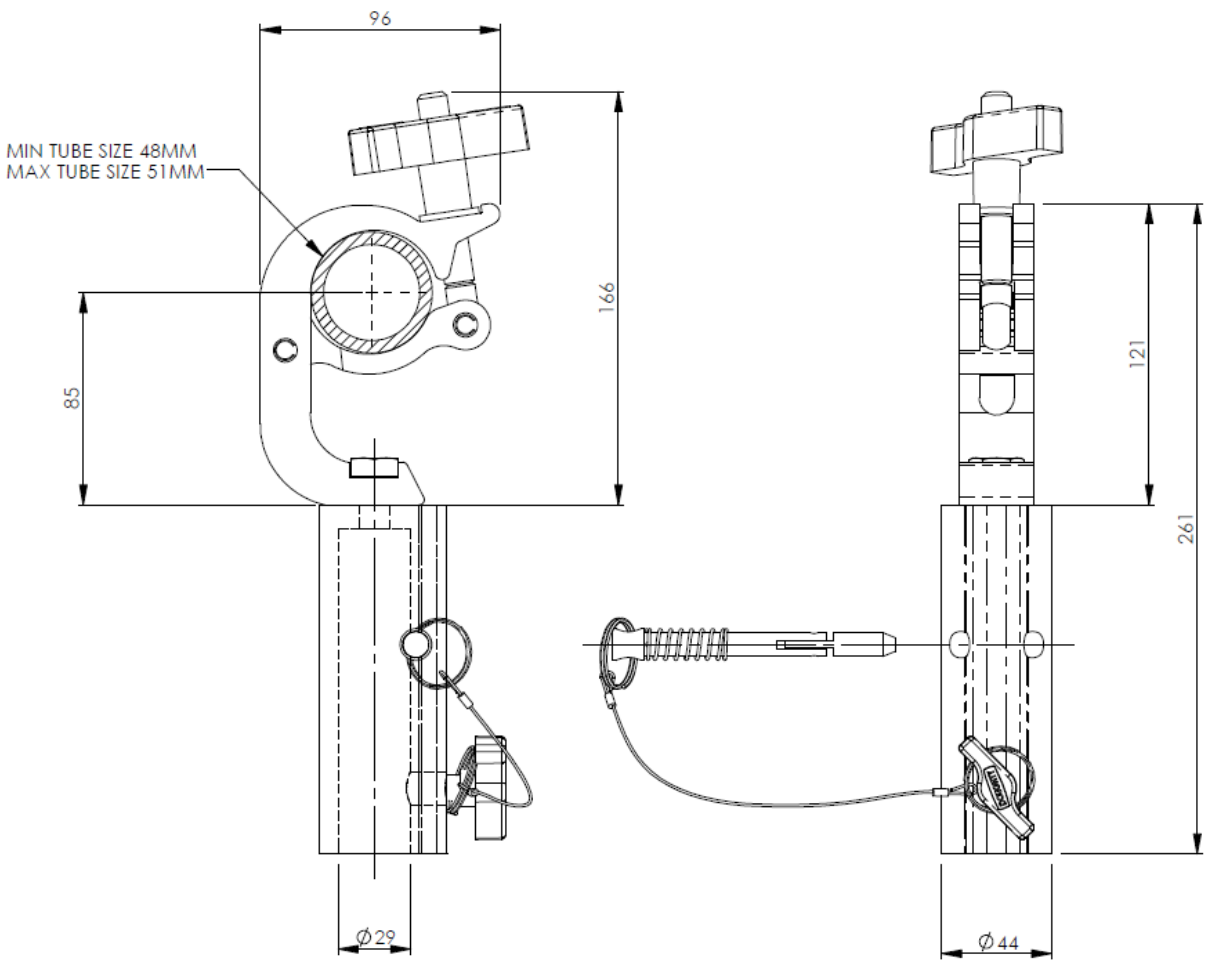
TRIGGER HOOK CLAMP



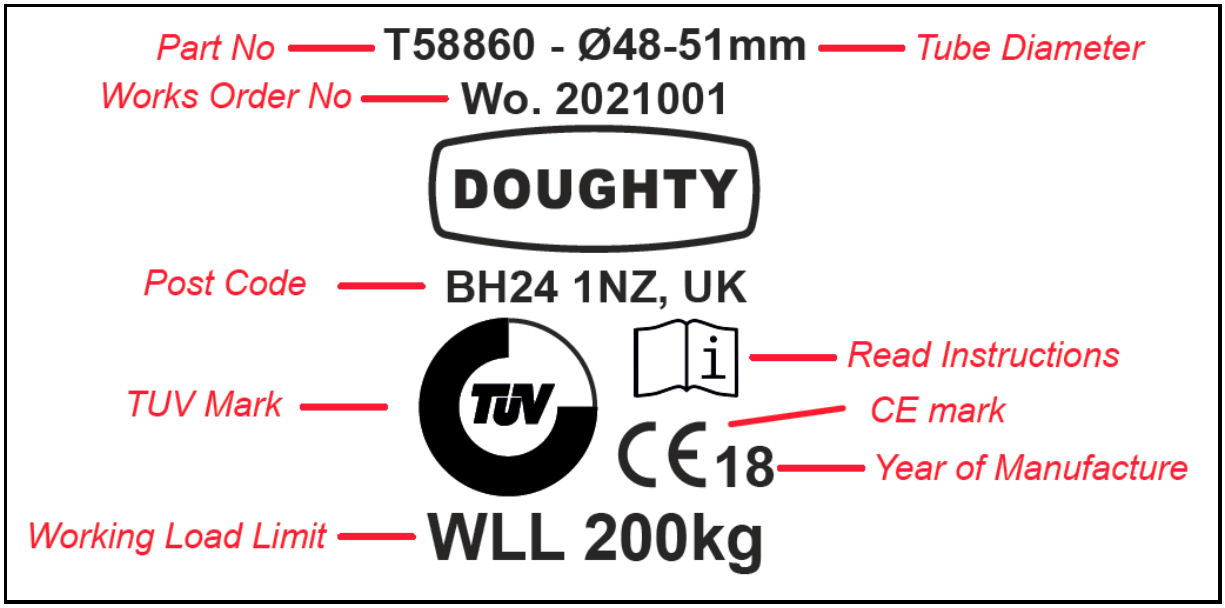
TRIGGER HANGING CLAMP (NOT CE MARKED)



TRIGGER BIG BEN CLAMP (NOT CE MARKED)



TRIGGER TV CLAMP (NOT CE MARKED)



TYPICAL TRIGGER CLAMP CE LABEL

6. MODIFICATION

The following modifications are allowed to be executed by third parties.

Nut replacement: Standard bolt and wing-nut shall be replaced by a self-locking nuts when

- Loads are predominantly dynamic.
- Loads are moving and change position.

Painting:

- To paint a clamp, cover all bolts and nut with tape.
- Use blasting to roughen the surface and to degrease the clamp.
- Use a wet-paint or powder coating paint system to colour the part.

7. SAFETY INFORMATION

SAFETY INSTRUCTIONS

For health and safety reasons people assembling, disassembling, transporting, maintaining and cleaning Clamps should wear adequate Personal Protection Equipment such as, but not limited to; gloves, hard hats and safety shoes.

⚠ WARNING

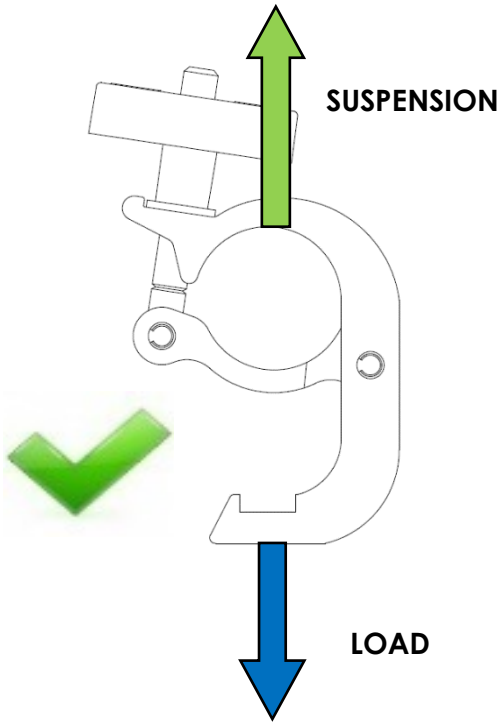
DO NOT lift people or loads above people without the following precautions
Use a Self-locking nut instead of the wingnuts on the eye bolts when loads are predominantly dynamic and loads are moving and change position.

- ⚠ Clamps shall be solely used for the range of pipe diameters as stated the clamp. The use of a clamp on other diameter pipes will lower the maximum working load
- ⚠ Do not exceed the maximum working load engraved on the clamp.
- ⚠ Make sure the resulting forces on the supporting structure are approved by a competent person.
- ⚠ All loads imposed shall be considered. E.g. dynamic forces caused by the lifting machinery.

- ⚠ Bolts and nuts shall be tightened by means of a spanner in such a manner they cannot be released by man power.
- ⚠ When loads are using electrical power, equip-potential bonding shall be put in place.
- ⚠ The choice of clamp must be adapted to the load.
- ⚠ When used as lifting accessory, clamps shall be inspected by a competent person as often as required but with a minimum of once a year.
- ⚠ Inspect equipment before every use. Damaged clamps shall be taken out of service.
- ⚠ A clamp must be taken out of service immediately if, during use, repair or maintenance any serious damage is discovered.
- ⚠ Maintenance and repairs can be undertaken only by authorized personnel. If in any doubt contact the manufacturer.
- ⚠ Do not throw clamps.

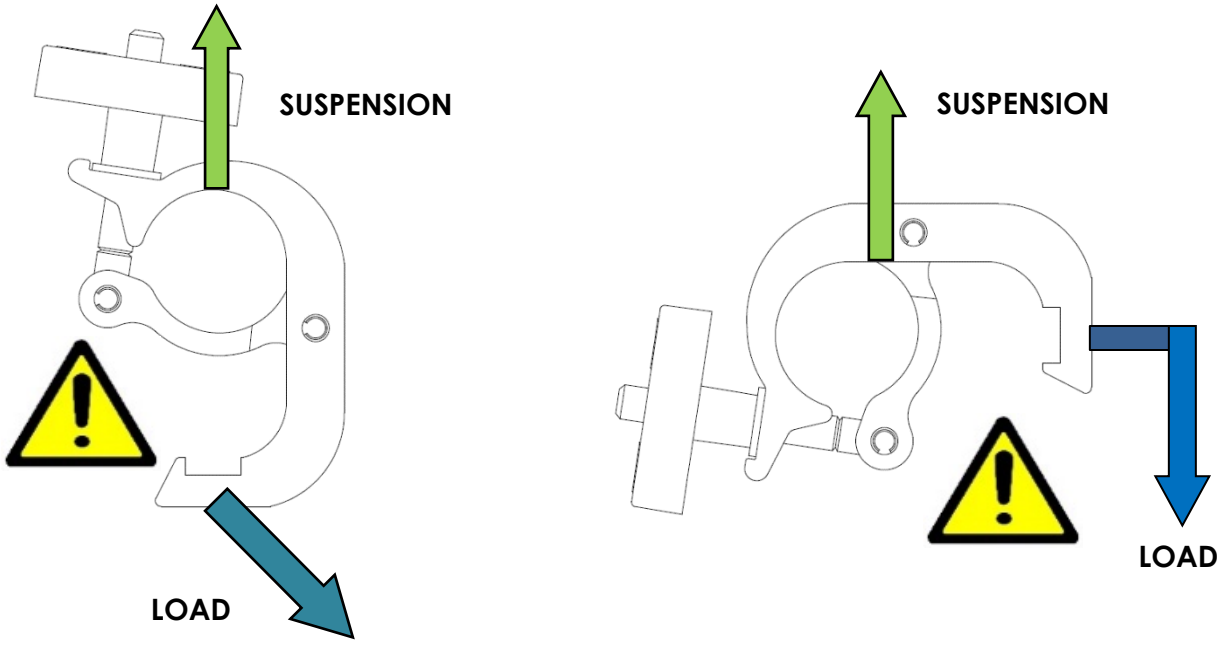
⚠ WARNING

THE WORKING LOAD ENGRAVED ON THE CLAMP ARE SOLELY FOR A STRAIGHT PULL BETWEEN THE SUPPORTING PIPE AND CONNECTION POINT ON THE CLAMP



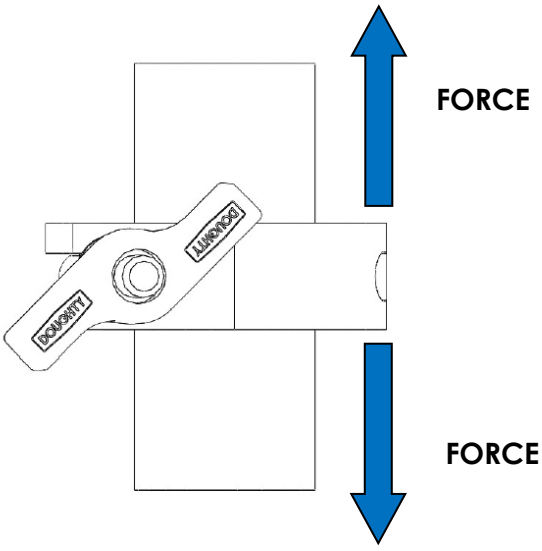
⚠ WARNING

THE METHODS OF SUSPENSION SHOWN BELOW CREATES TORSIONAL FORCES, INFLUENCE THE STABILITY OF THE SUPPORTING STRUCTURE AND LOWERS THE WORKING LOAD OF THE CLAMP. THIS NEEDS TO BE CHECKED BY A COMPETENT PERSON.



⚠ WARNING

THE USE OF CLAMPS WHEN LOADED PARALLEL TO THE TUBE DEPENDS ON, BUT NOT LIMITED TO, CONTACT SURFACE, MATERIAL, FRICTION RESISTANCE, APPLIED TORQUE TO THE CLAMP'S WINGNUT / NUT. THIS USE SHALL BE AVOIDED.



8. COMPLIANCE

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CLAMPS USED AS LIFTING ASSESSORY:

2006/42/EC	Machinery directive
DGUV Rules 115-002	Regulations for stages and studios (Formerly known as BGVc1)
DGUV Information 215-313	Safety at productions and events for television, radio, film, theatre, exhibitions: Loads above persons (Formerly known as BGI 810-3)
BS 7905-1	Lifting equipment for performance broadcast and similar applications. Part 1 specifications for the design and manufacture of above stage equipment

9. TRANSPORT AND STORAGE

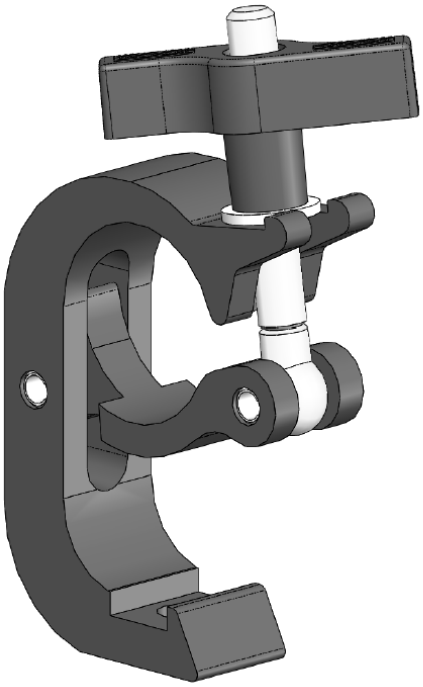
- Due to the relatively high self-weight it is advised to keep storage bins as small as possible in such a manner they can be lifted by one person. Local legislation for maximum load to be lifted by persons shall be adhered.
- Before clamps are put into storage they shall be checked for defects. Defective clamps shall be clearly marked and put aside is such a way they cannot be re-used.
- Ensure the product is stored and kept in a dry, ventilated environment to avoid corrosion.
- Do not store aluminium clamps in steel bins.

10. INSTALLATION

⚠ WARNING

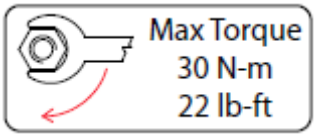
Inspect the clamp before every use. If damaged do not use.

Doughty Trigger Clamps



Trigger clamps are used to suspend or make structural connections between truss or barrel and a variety of objects using an M12 fixing.

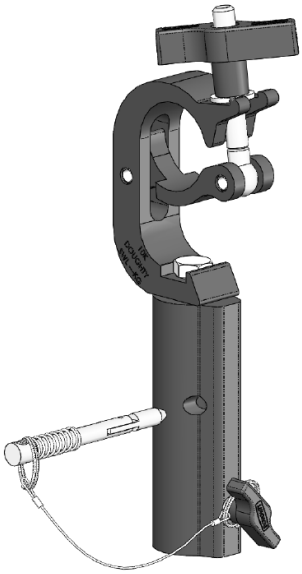
a. Determine the bolt size and length needed to connect the Doughty Trigger clamp to the object.
b. Use low head hexagon socket bolts or standard hexagon bolts. Minimum 8.8 grade.
c. Tighten the bolt connection using the appropriate tool.
d. Unwind the Doughty knob to open the clamp.
e. Hang the clamp in the desired position. Tighten the bolt before the load is supported fully.
f. Do NOT tighten the Doughty knob with a spanner. Firmly hand tight should be enough.
g. Use a secondary safety if legislation requires.



⚠ WARNING

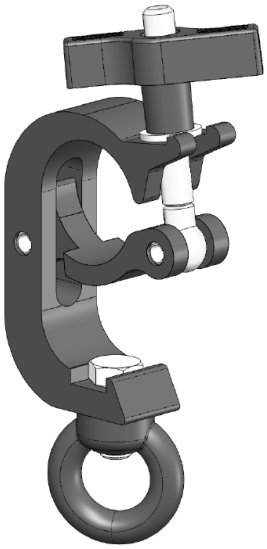
Over tightening the nut or bolt might lead to permanent deformation of the tubes to which they are attached.

TV Trigger Clamp



TV Trigger Clamps consist of 29mm receiver fitted to a Trigger clamp.
Commonly TV clamps will be mounted to a section of barrel or truss following the instructions set out in Sections 10d to 10g. The objects to be suspended will typically be fitted with a 28mm TV spigot which should be inserted into the receiver and secured with the Doughty knob. The sword pin should also be inserted into the receiver

Hanging Clamps



These clamps are commonly used to secure rope directly or via shackles, karabiners, hooks etc.
Hanging clamps will be mounted to a section of barrel or truss following the instructions set out in Sections 10d to 10h. The rope is then secured to the eye as required.

11. COMMISSIONING

⚠ Before applying a load check that all connections are properly made.
⚠ Before lifting check that all connections are still correct.
⚠ Check if all parts are in good order.

12. DISSASSEMBLY INSTRUCTION

1. Take the weight of the clamp.
2. Release the Doughty knob to open the clamp.
3. Remove the load.
4. Check if the clamps are in good order. If not, mark them clearly and put aside.

13. INDICATIONS OF FAULTS

The following faults could be an indication of overload or misuse. Remove those clamps from service.

- Nuts which cannot be turned by hand.
- Eyebolt which does not hinge properly.
- Trigger which does not hinge properly.
- Clamp does not fit around the pipe.
- Load is hanging out of plumb while clamp is positioned vertically.

14. INSPECTION, DISCARD AND REJECTION CRITERIA

⚠ WARNING

If any fault is found, mark the product clearly and remove from service.

14.1 INITIAL INSPECTIONS

When first acquired, whether they are new or used, clamps should be inspected in accordance with Table 16 and a record of the inspection maintained.

REGULAR INSPECTIONS

Regular visual inspections should be carried out in accordance with Table 16. Regular inspections should be performed by a competent person and should be carried out prior to each incident of use.

PERIODIC INSPECTIONS
Periodic visual inspections should be carried out in accordance with Table 16 and a record of the inspections maintained. Periodic inspections should be performed by a competent person and should be conducted at least once each year or in accordance with an inspection routine established by a qualified person.

Clamps which are subject to any accident must be inspected according to the requirements per periodic inspection and in accordance with table below.

14.2 INSPECTION FREQUENCY

TRUSS IN REGULAR SERVICE
Clamps in regular service should be subjected to regular and periodic inspections.

PERMANENT INSTALLATIONS, STATIONARY
Periodic inspections should be carried out on all Clamps that are permanently installed in a stationary (not moving) configuration. The frequency of inspections should be determined on the basis of the prevalent conditions.

PERMANENT INSTALLATIONS, MOVING
Periodic inspections should be carried out every three months, or in accordance with an inspection routine established by a qualified person, on all clamps that are installed in a permanent configuration where movement of the truss system is an integral part of use.

RECORDS
Records of initial inspections and periodic inspections should be kept by the owner for each clamp and should be signed and dated by the person carrying out the inspections.

	INSPECTION LEVEL			ITEMS TO BE INSPECTED					
	INITIAL	REGULAR	PERIODIC	TRIGGER	BODY	EYEBOLT	KNOB	ROLL PINS	ID
MISSING PARTS	Y	Y	Y						Y
HOLES	Y	Y	Y	Y	Y				
ABRASION	Y	Y	Y	Y	Y			Y	
CORROSION			Y	Y	Y	Y	Y	Y	
DEFORMATION	Y	Y	Y	Y	Y	Y	Y	Y	
EXCESSIVE WEAR		Y	Y		Y	Y	Y	Y	
CRACKS	Y	Y	Y	Y	Y	Y	Y	Y	

15. MAINTENANCE

SAFETY INSTRUCTIONS

Although under normal use and environmental circumstances, clamps need little maintenance, for safety reasons, all parts must be checked regularly for damages, cracks and corrosion.

NOTICE

The Clamp shall be checked in compliance with the local law by a competent person. Checking shall take place as often as required but at a minimum of once a year. If in doubt contact the manufacturer.

- ⚠ Check all components for damage and corrosion. Damaged and corroded parts shall be removed and disposed of.
- ⚠ Check roll pins for cracks. If cracked, replace the pins.
- ⚠ Burrs and sharp edges shall be removed using fine sandpaper or a file.
- ⚠ Maintenance and repairs must only be carried out by a competent person. If in doubt, contact the manufacturer.
- ⚠ Do not use any mechanical abrasive machine to remove sharp edges from clamps.
- ⚠ Use hot water and soap to remove any dirt from clamps.
- ⚠ Do not use abrasive fluids to remove dirt or paint from clamps.

16. REPAIRS and REPLACEMENT OF PARTS

- Damaged clamps should be returned to an authorised Doughty service agent for repair.

17. IF THE PRODUCT IS NO LONGER NEEDED

Products that are no longer needed can be scrapped. Preferably remove all steel parts, store part separately before offering them to a scrapping company.

The following alloys are used:

- Aluminium ENAW 6060 or 6082
- Steel 8.8
- Stainless 304

18. WARRANTY

- For a period of 12 months we undertake to repair, free of charge any damage attributable to faulty materials or workmanship, provided that the appliance is forwarded, freight paid, to our works or one of the Doughty appointed service agents.
- The guarantee-period begins on the day of the delivery, proven by a purchase receipt like an invoice or delivery note or their copies.
- The guarantee only is applicable for new equipment.
- The guarantee does not cover damage due to transport damage, negligent handling, overload or parts subject to normal wear and tear. Nor damages that originate from a case of misuse because of non-observance the instructions in this manual.
- The fitting of non-original replacement parts or modifications of design by third parties invalidates the guarantee.
- Guarantee repairs do not renew nor extend the guarantee-period.
- In case of a claim under the guarantee or spare part requirements please contact your Doughty service agent.
- The manufacturer is not liable for indirect consequential damage or financial loss.
- The manufacturer is not liable for any changes made to the clamp or for any damage resulting from such changes.

19. INSPECTION LIST

ITEM	FAULT	REPAIR	DATE	SIGNATURE

20. EC CERTIFICATE

DOUGHTY Engineering Ltd

EC-DECLARATION OF CONFORMITY

According to the Machinery Directive 2006/42/EEC Annex II

Doughty Engineering Ltd
Crow Arch Lane
Ringwood
Hampshire
BH24 1NZ

CE

Herewith declares that:

Trigger Clamps, T58860, T588601, T58861, T5886101, T58862, T5886201, T58869, T5886901.

are in compliance with the following harmonized standards/standards/regulations

Machinery Directive 2006/42/EEC annex II

BS7905-1:2001 Lifting equipment for performance, broadcast and similar applications

DGUV 17 Safety at production & events for television, radio, film, theatre, exhibtions and loads above persons

Signed for and behalf of **Doughty Engineering Ltd**

Name **Stuart Rodgers** Date 10/11/2017

Position **General Manager** being the person responsible appointed by the manufacturer.

Company Registration No. London 972614
Registered Office: Crow Arch Lane, Ringwood, Hants, BH24 1NZ
Directors: M.B. Lister. J.C.G. Chiverton. S.C. Wright