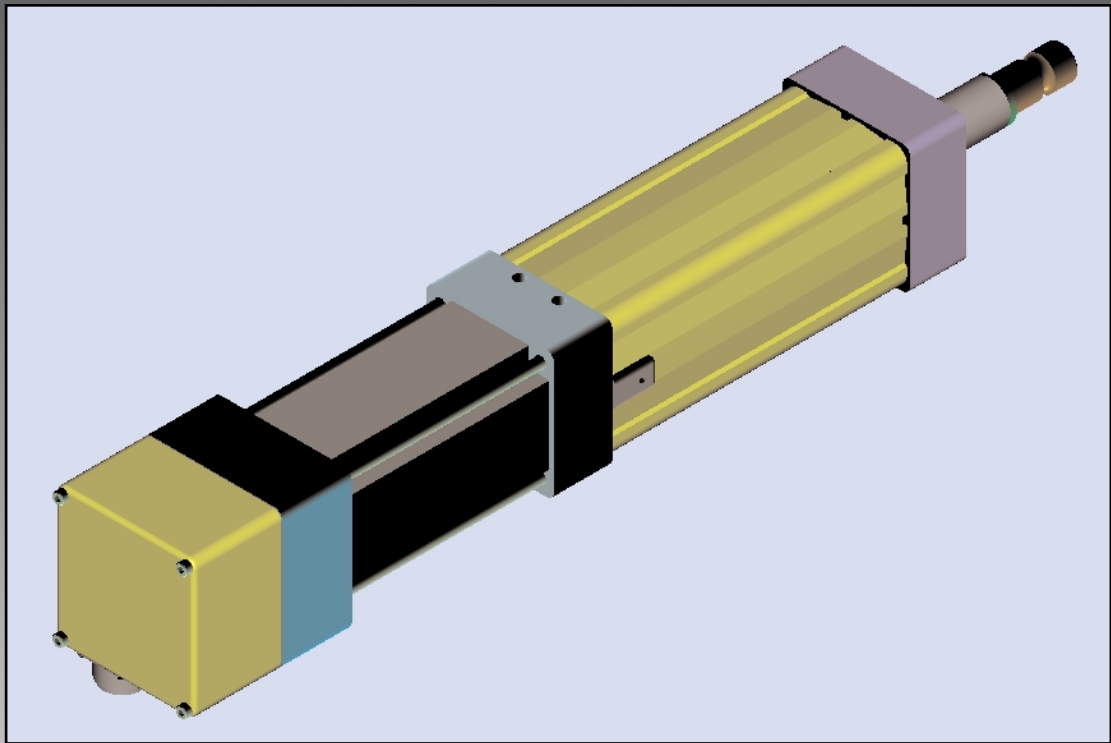


***Welding Actuator HT23
with Fanuc Pulse Coder
#2717-0001
User Manual***



Information furnished is believed to be accurate and reliable. However, Tol-O-Matic assumes no responsibility for its use or for any errors that may appear in this document. Tol-O-Matic reserves the right to change the design or operation of the equipment described herein and any associated motion products without notice. Information in this document is subject to change without notice.

Contents

Contents	i
List of Figures	ii
HEALTH AND SAFETY REGULATIONS	iii
General	
Warning for Hot Surfaces	iv
Modifications to the Equipment	iv
Requirements regarding Personnel	iv
Packing, Transport and Unpacking	iv
Risk Area and Personnel.....	iv
Repair and Maintenance	iv
1 General	
Machine Identification.....	1
Manufacturer	1
Intended Use	1
Storage	2
2 Function Description	3
3 Basic Installation	4
4 Inspection and Setting	5
5 Repair and Maintenance	6
6 Appendix	8

List of Figures

Figure	Description	Page
1.1	Actuator identification label	1
1.2	Examples of welding actuators installed on weldgun units.	2
4.1	Manual operation of welding actuator	5
5.1	Exploded view of welding actuator.	7
6.1	Motor Power Connections.....	8
6.2	Pulsecoder Connections.....	9

HEALTH AND SAFETY REGULATIONS

General

Read completely through the applicable sections of the manual before the equipment/unit is unpacked, installed or operated. Pay careful attention to all of the dangers, warnings, cautions and notes stated in the manual.

Serious injury to persons or damage to the equipment may result if the information in the manual is not followed.

Items that are specifically marked **DANGER!**, **WARNING!**, **CAUTION!**, OR **NOTE!** Are arranged in a hierarchical system and have the following meaning:



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



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



CAUTION! Indicates a potentially hazardous situation which, if not avoided, this situation may result in property damage or minor or moderate injury.

NOTE! Information that requires special attention is stated here.

Warning for Hot Surfaces



WARNING! Normal operating temperature of weld actuator can reach 175 Degrees F.

Modifications to the Equipment



WARNING! The manufacturer takes no responsibility whatsoever if the equipment is modified or if the equipment is used in any way not intended at the time of delivery. Unauthorized modifications or changes to the equipment are strictly forbidden.

Requirement regarding Personnel

NOTE! All personnel must be completely informed regarding all safety regulations and the function of the equipment.

Packing, Transport and Unpacking

NOTE! Anchor and secure actuator in such a way as to prevent damage during transport. Also make sure the actuator is clean and dry and protected from moisture.

Risk Area and Personnel

When installed in a weld gun, pinch points are generated capable of severely damaging forces. The risk area surrounding the weld actuator must either be enclosed or clearly marked including display signage in accordance with all applicable national and international legal requirements for welding actuators. The risk area must be protected by a safety system that stops the equipment if anyone enters the risk area. Personnel who enter the risk area must be authorized, trained and qualified for the different tasks inside the risk area.

Repair and Maintenance

All supply media must be shut OFF (electricity) before any work is begun on any equipment that is associated with the welding gun application.

1.1 Machine Identification

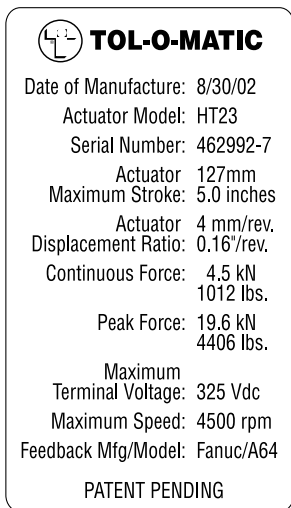


Figure 1.1: Actuator identification label

Do not remove the machine identification label and do not make it unreadable!

1.2 Manufacturer

Tol-O-Matic, Inc.
3800 County Road 116
Hamel, MN 55340
USA
763-478-8000

1.3 Material Composition

The weld actuator is made of conventional materials.

1.4 Intended Use

The HT 23 weld actuator (see figure 1.2) is a compact high force screw drive servo actuator for attachment to weld guns. The weld actuator controls the position of the weld gun tips and develops the required force for spot welding.



Figure 1.2: Examples of welding actuators installed on weldgun units.



WARNING! Before installation and commissioning of the equipment, this manual and all accompanying manufacturer documents and manuals **MUST** be completely read by the concerned personnel. All warning texts must be given special attention.

1.5 Storage

Pay attention to the following when storing the weld actuator:

- Perform repairs, maintenance and inspections before storing the gun to ensure that the gun is in good working order.
- Make sure the gun is placed in a suitable storage position to prevent damage to the connectors and electronics .

2.1 General

The weld actuator is mounted to a weld gun by means of a fixed attachment (see figure 1.2, page 2). The weld actuator is used for applying force between the fixed electrode and the moving electrode.



WARNING! The welding actuator stroke must be compatible with the weld gun tip opening

3

Basic Installation

3.1 Installing the Weld Actuator.

Please refer to your weld gun documentation for mechanical installation

3.2 Electrical Wiring

See the electrical circuit diagram that accompanied the weld gun at delivery.

4.1 General

Before commissioning the weld actuator, there are certain inspections and settings that must be carried out. Also after maintenance activities, the gun must be inspected before it is returned to service.

4.2 Inspection of Mechanical Travel Limits.

The mechanical travel limits of the actuator must be verified to ensure the actuator will not reach an internal hard limit during normal operation. Turn the controller power off (see documentation for controls system for details). With the actuator installed on a weld gun manually rotate the servo gun gear or pull the gun arms apart, extending the tube until the weld gun tips are closed and record the distance the rod is extended (d1). Remove one tip and manually rotate the servo gun gear or push the gun arms together, until the actuator reaches its end of travel and record the distance the rod is extended (d2). The difference between the two measurements minus the gun deflection (d3) should be greater than 5 mm ($d2 - d1 - d3 \geq 5\text{mm}$).

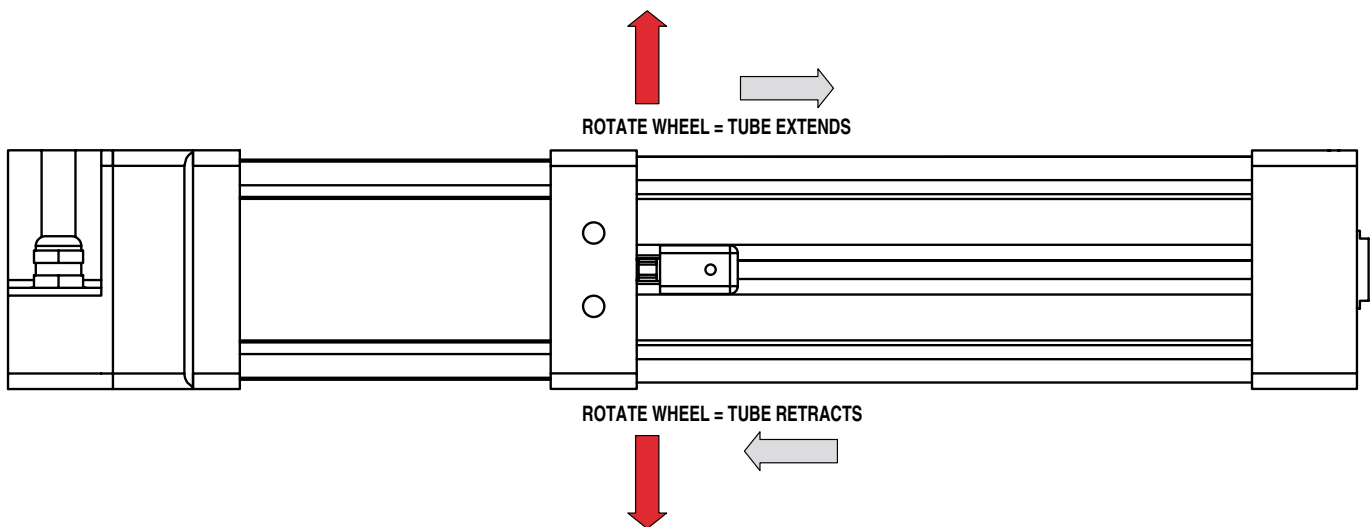


Figure 4.1: Manual operation of welding actuator

5

Repair and Maintenance

NOTE! Before starting any maintenance activities, make sure that the supply voltage is shut OFF.

- No lubrication is required during the service life of the weld actuator.

- The only user serviceable component in the weld actuator is the Fanuc Pulsecoder. The pulsecoder is aligned to the weld actuator motor by an Oldham coupling. One segment of the Oldham coupling is pressed onto the weld actuator shaft during manufacturing of the weld actuator. Should this press fitting become altered, it is recommended that the actuator be returned to Tol-O-Matic for realignment. The remaining Oldham components assure appropriate motor phasing alignment between the Pulsecoder and motor windings through slotted connections. See figure 5.1 for an exploded assembly view.

Disassembly of the weld actuator is not recommended. Weld Actuators should be returned to Tol-O-Matic for evaluation and repair.

Contact the weldgun manufacturer for instructions on how to return the weld actuator for evaluation.



WARNING! Never rotate the actuator via the Pulsecoder connection. Doing so may result in the loss of phasing between the Pulsecoder and motor windings.

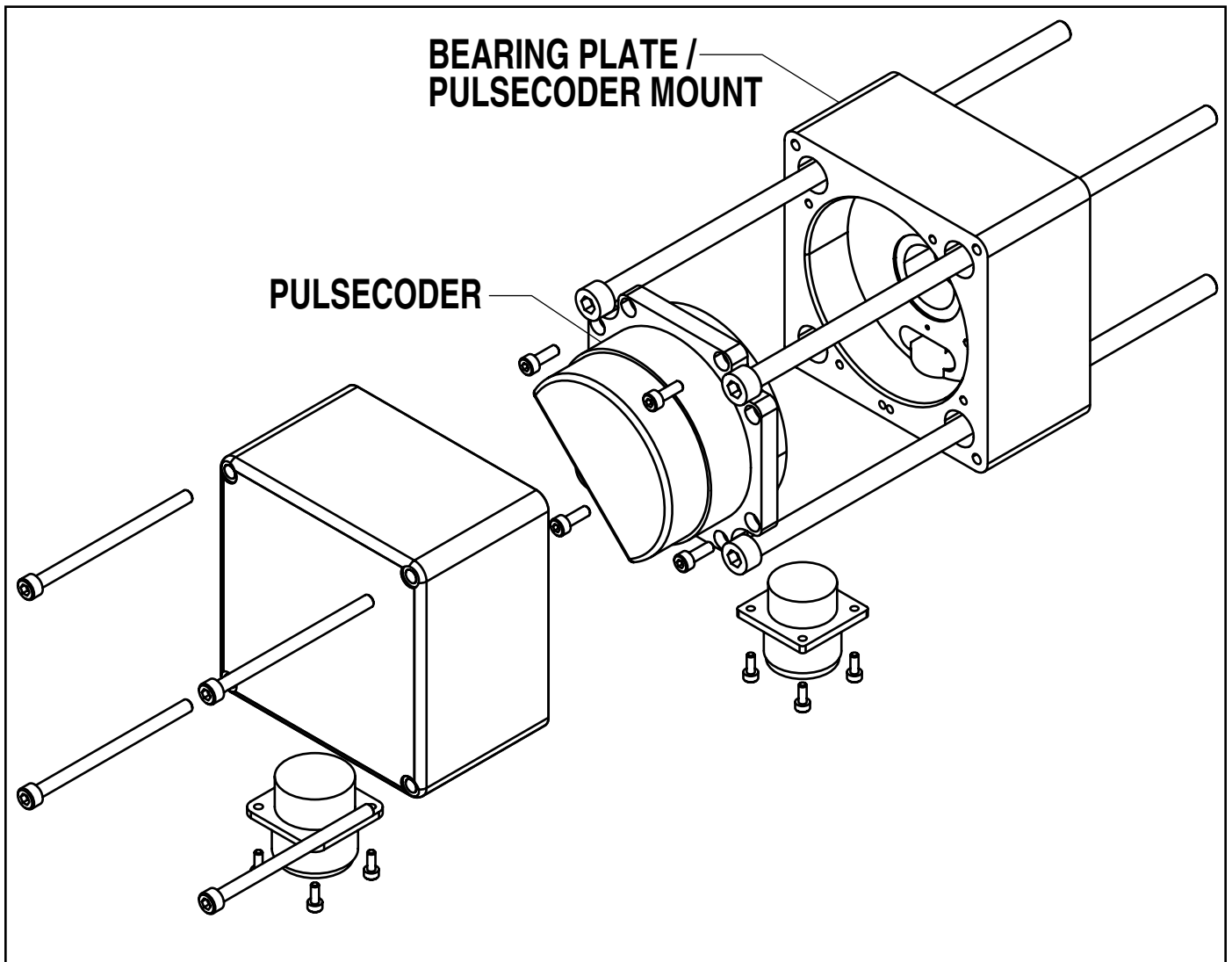


Figure 5.1: Exploded view of Pulsecoder section welding actuator.

6 Appendix

6.1 Motor Specifications

HT23 Motor Specifications

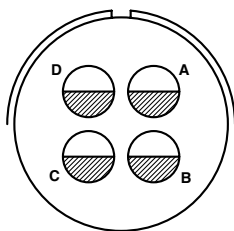
Continuous Stall Torque	5.0 Nm
Peak Stall Torque	24.9 Nm
Thermal Resistance	0.56 celsius/watt
Stall Current	7.55 A RMS
Peak Current	37.8 A RMS
Number of Poles	4
Kt	0.69 Nm/amp per phase RMS
Ke	0.396 V/rad/s L-L RMS
Resistance @ 25 C	1.4 ohms L-L
Stator Inductance	5.1 mH L-L
Maximum Bus Voltage	325 Vdc
Rated Speed @ Maximum Voltage	4500 RPM
Demagnetization Current	45 amps

6.2 Thermal sensor specifications

The current thermal sensor will shut down the motor at 311 degrees F. However the motor should not perform a duty cycle that repeatedly generate motor temperatures above 175 degrees F, or premature bearing failure will result.

6.3 Connector pinout

MOTOR POWER CONNECTIONS



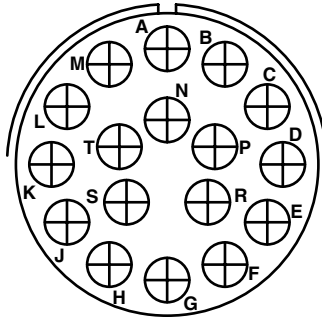
MS3102A-18-10P

MOTOR CONNECTOR	SERVO AMP. PHASE	MOTOR LEAD
A	U	RED
B	V	BLK
C	W	WHT
D	GND	GRN/YEL

Figure 6.1: Motor Power Connections

6.3 Connector pinout (cont.)

A64 PULSECODER CONNECTIONS AS SUPPLIED BY FANUC



MS3102A-20-29PW

PULSECODER	
SIGNAL	PIN NO.
SD	A
*SD	D
REQ	F
*REQ	G
+5V	J,K
0V	N,T
SEALED	H
+5VA	R
0VA	S

Figure 6.2: Pulsecoder Connections

© Copyright 2002
Tol-O-Matic, Incorporated. All rights reserved.
Axidyne, Axiom, Tol-O-Matic and Excellence In
Motion are registered trademarks of Tol-O-
Matic Incorporated. All other products or brand
names are trademarks of their respective
holders.

10/02 LC



TOL-O-MATIC, INC.

3800 County Road 116

Hamel, MN 55340

763.478.8000 Telephone

763.478.8080 Fax

1.800.328.2174 Toll Free

<http://www.tolomatic.com>