Mini Capstan

CONTENTS

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Introduction

The mini-capstan (start-up tractor) unit is used in the start-up process to draw fibre from the furnace at a rate which produces fibre of suitable diameter to thread up the coating applicator and then to maintain that diameter at a constant level during the remaining thread up procedure. Pneumatically actuated rollers grip the fibre and the line draw speed is controlled by a local potentiometer. A remote open/close mechanism allows the rollers to be released when the fibre is fed into the main capstan. When this operation has been completed, the mini-capstan is disengaged prior to feeding the fibre through the main Capstan.

The electrical and pneumatic services are supplied from the tower systems.

(Drawings 287185A, 284620A, 284975A, 287189A & 287192A refer).

Description

Mounted on a frame installed on the tower face, the mini-capstan unit consists of two carriage mounted rollers which move laterally on rails at right angles to the fibre axis. The rollers, one of which is motor driven, move on the rails under the action of pneumatic actuators. The rollers, pneumatic actuators and rails are mounted on a base plate which in turn is mounted on a support plate. These plates provide manual X-Y adjustment to align the mini capstan to the fibre axis between the furnace and the main capstan.

The motor driven roller may be adjusted laterally so that the roller, in the closed position, is on the fibre axis. The spring loaded free rotating roller closes on to motor driven roller and to ensure the roller faces are exactly parallel the contact angle of the free rotating roller may be adjusted horizontally.

A pair of small guide rollers, mounted eccentrically on the support posts and set at right angles to the main rollers, guides the fibre into the main rollers. These small rollers may be adjusted individually to be equidistant from the plumb axis thus maintaining the fibre in the centre of the main rollers.

Electrical power is supplied from the Motor Drive Box and the pneumatic supply is taken from the Gas Distribution Panel on the side of the tower frame.

In operation the fibre is clamped between the two rollers and pulled from the furnace at a speed controlled by the motorised roller. Consistent pressure between the two rollers is maintained by the pressure exerted by the spring loaded roller. The motorised roller speed is adjustable on a control panel mounted near the mini-capstan.

The mechanism is de-activated by reversing the thrust of the pneumatic pistons, thus moving the rollers away from the fibre. The motor start/stop and the carriage drive close/open controls are available both on the local control panel and the remote control panel located at the base of the tower near the main Capstan.

Operation

Warning ***Machinery.***

- ***The mini-capstan has high rotational speeds and represents a trap hazard. Personnel are to ensure that they have no loose items, i.e. clothing or jewellery, about their person which may become entangled in these components.***
- ***The mini-capstan is pneumatically operated and represents a crush hazard. Personnel are to ensure the area clear of the component before operation.***

Warning ***Eye Protection is to be worn at all times.***

At the commencement of the start-up procedure, ensure the capstan is open by pressing the OPEN pushbutton on the local or remote control panel. Press the START push switch and set the motorised roller speed to approximately 40% on the SET SPEED potentiometer.

Once the process has started and the fibre has thinned down to less than approximately 400µ it is threaded through the tower to the mini-capstan area. The fibre is then feed into the mini-capstan through the cover slot and roller guides. The rollers are now engaged by pressing the CLOSE pushbutton on the local or remote control. Fibre is drawn at a constant speed by the mini-capstan and when it has thinned to a constant diameter value of <=200µ, as indicated on the Bare Fibre Diameter Gauge, the motorised roller speed is reduced to approximately 20% on the SET SPEED potentiometer. Thread-up of the coating and curing system may now be started.

Caution ***The following precautions are process critical.***

- ***Do not engage fibre in the cap in excess of 400µ. This can cause surface micro fractures resulting in glass becoming embedded in the rollers resulting in damage to the production fibre during thread- up.***
- ***Under no circumstances attempt to begin thread-up with fibre in excess of 200µ as this can cause blockage of the coating dies.***

When thread-up has been completed as far as the main capstan, the mini-capstan is disengaged and rotation stopped using the remote controls at the base of the tower.

Alignment

Mounting brackets on the face of the tower provide the attachment points for the mounting support frame. The mini-capstan is mounted horizontally on the frame and adjusted in the X-Y plane about the fibre axis of the tower.

Maintenance

Personnel are to comply with the following warnings.

Warning ***The correct Personal Protective Equipment (PPE) is to be worn at all times.***

Warning ***Working at height and related safety.***

- ***Personnel are to remain behind guard rails at all times and/or wear an appropriate safety harness.***
- ***Personnel are to practice good housekeeping and methodical working practices to prevent items falling from the tower.***

General

The Mini Capstan requires on-condition servicing dependant on the results of routine maintenance inspections.

Routine

The following inspections and servicing procedures are to be carried out. The frequency of the inspections and servicing may be varied dependant on tower usage and the working environment.

Before use inspection

1. Inspect the rollers for embedded glass and cleanliness.
2. Clean main and guide rollers using a lint free tissue soaked in methanol.
3. Check motorized roller speed varies when SET SPEED potentiometer is adjusted.
4. Check operation of the mini-capstan from local and remote positions.

Weekly

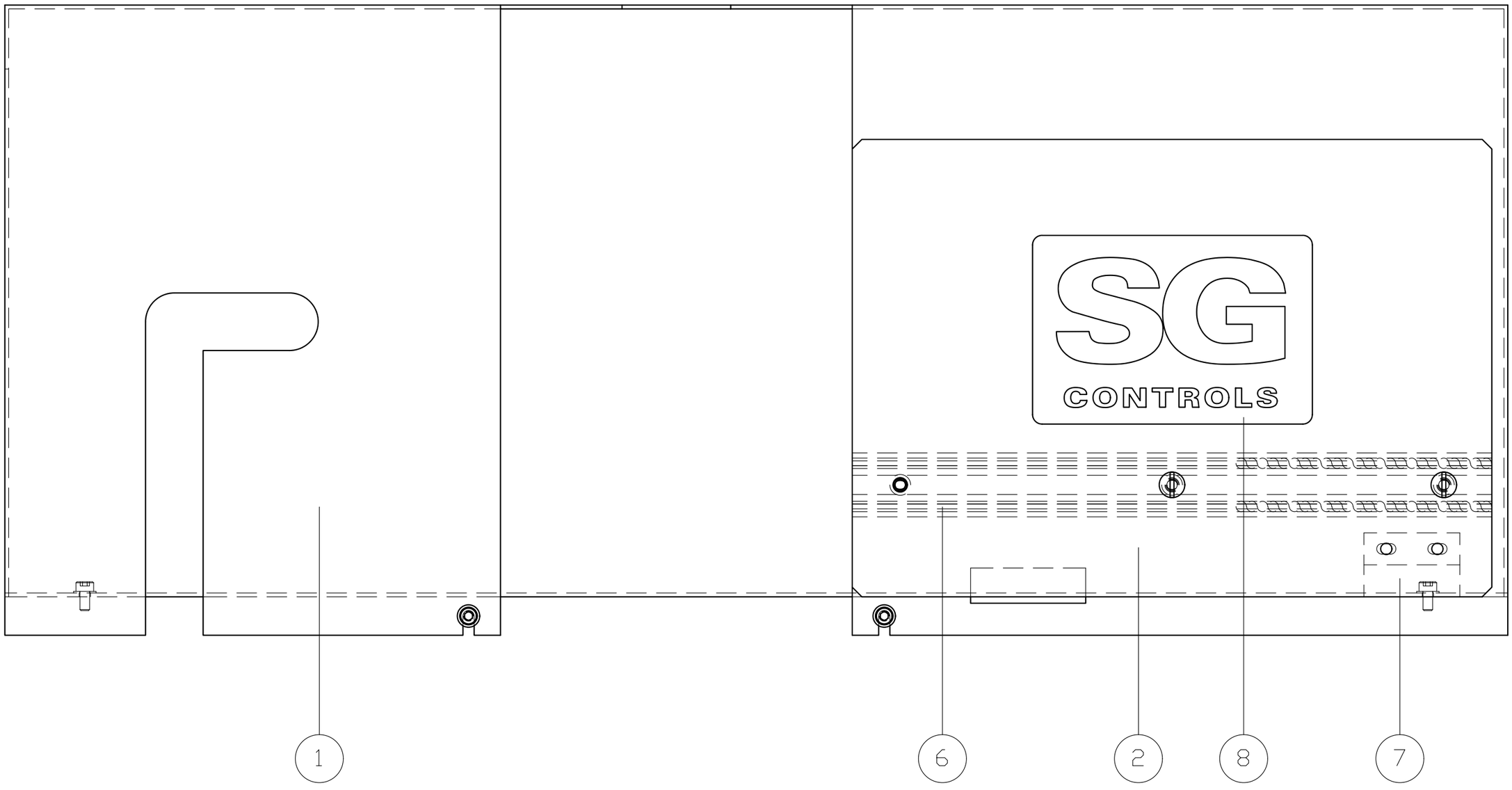
1. Inspect for general cleanliness.
2. Inspect for roller bearing wear.
3. Inspect for carriage roller bearing wear.

4. Inspect for glass embedded in rollers.
5. Clean and lightly lubricate carriage guides and rollers.
6. Check for pneumatic leaks

DWG. No.	DO NOT SCALE	DRAWING TO BS308	DO NOT SCALE
287192A			

REVISION HISTORY

REV.	DESCRIPTION	DCR No.	DATE	APPROVED
1	FIRST ISSUE		9.8.12	AJW



DRAWN AJW	DATE 9-8-12	
CHECKED	DATE	
APPROVED	DATE	

SG controls — **SG Controls Limited**

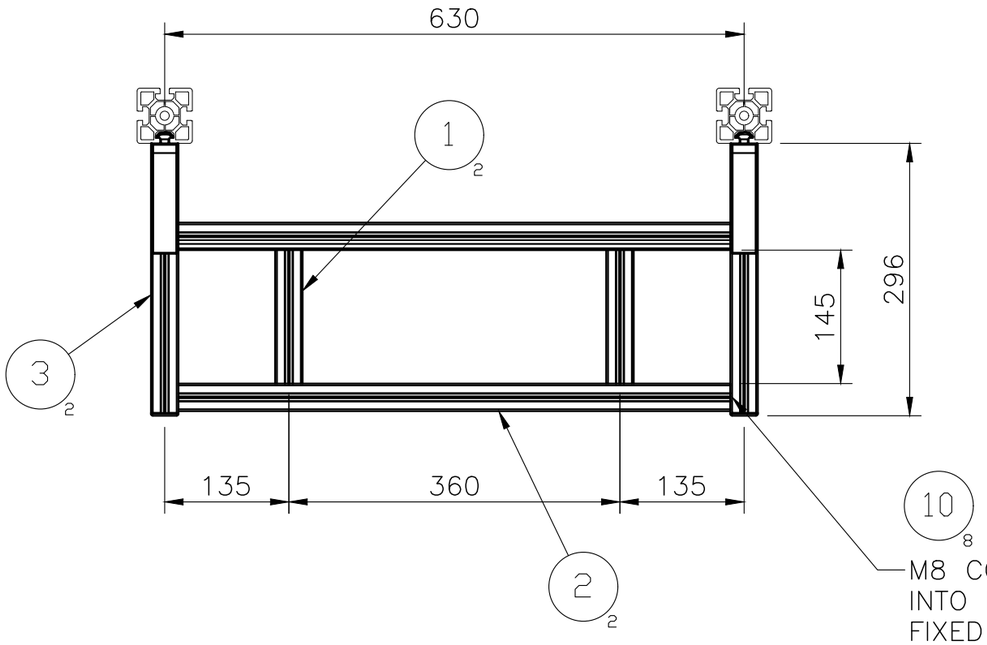
UNLESS OTHERWISE STATED DIMENSIONS ARE IN mm
DIM. TOL. 0 ±
0.0 ±
ANGULAR TOL. ±
SURFACE FIN. –
REMOVE ALL SHARP EDGES

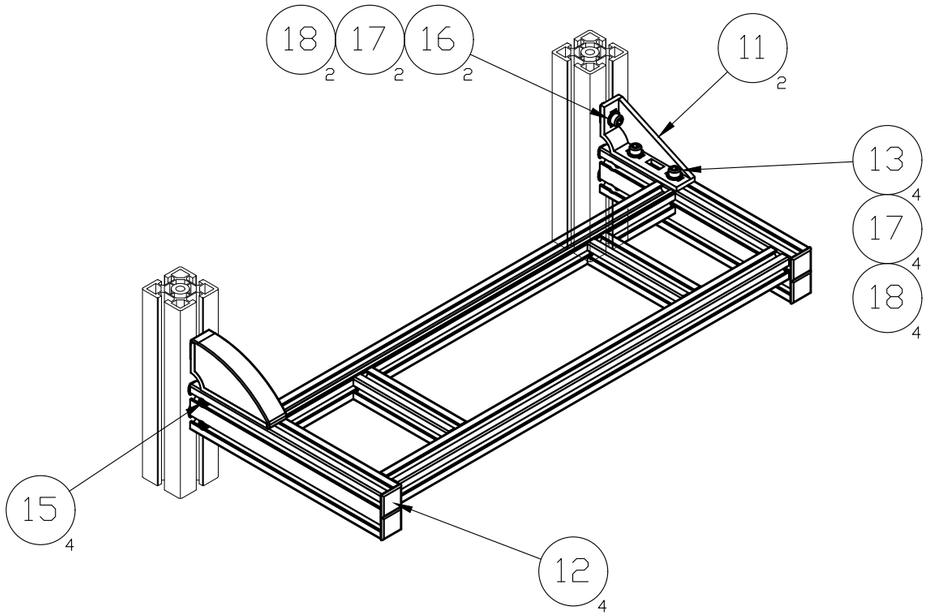
TITLE: COVER ASSEMBLY MINI CAPSTAN

USED ON 287185A	DWG. No. 287192A	SHEET 1 OF 1	REV 1
THIRD ANGLE PROJECTION	MATERIAL	ORIG. SCALE	1:1
	FINISH	ORIG. SHEET	A2

DWG. No.			
287189A	DO NOT SCALE	DRAWING TO BS308	DO NOT SCALE

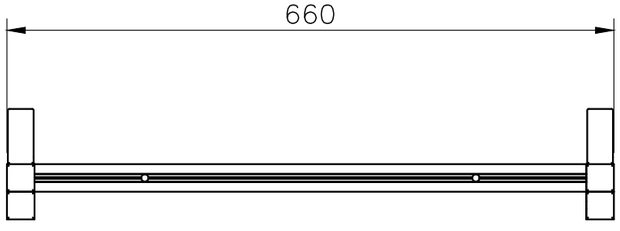
REVISION HISTORY				
REV.	DESCRIPTION	DCR No.	DATE	APPROVED
1	FIRST ISSUE		8.8.12	AJW

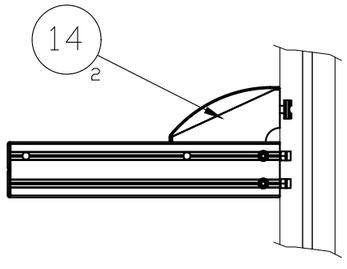




M8 CORE SCREWS TO BE SLID INTO EXTRUSION GROOVES & FIXED IN THE POSITION SHOWN.

M8 CORE SCREWS ARE SELF TAPPING AT EXTRUSION ENDS.





DRAWN	AJW	DATE 8-8-12
CHECKED		DATE
APPROVED		DATE

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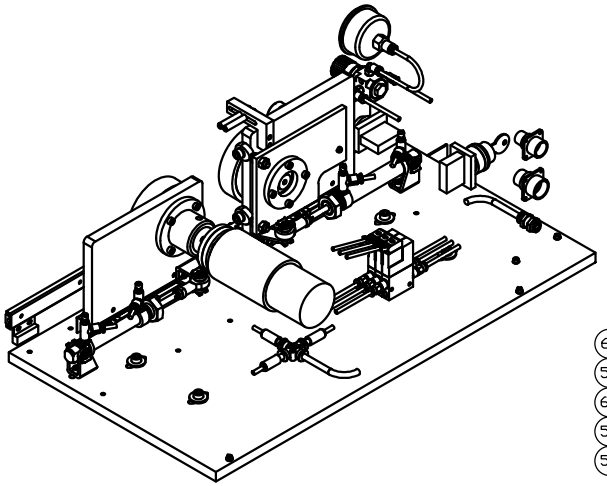
UNLESS OTHERWISE STATED DIMENSIONS ARE IN mm
DIM. TOL. 0 ±
0.0 ±
ANGULAR TOL. ±
SURFACE FIN. –
REMOVE ALL SHARP EDGES

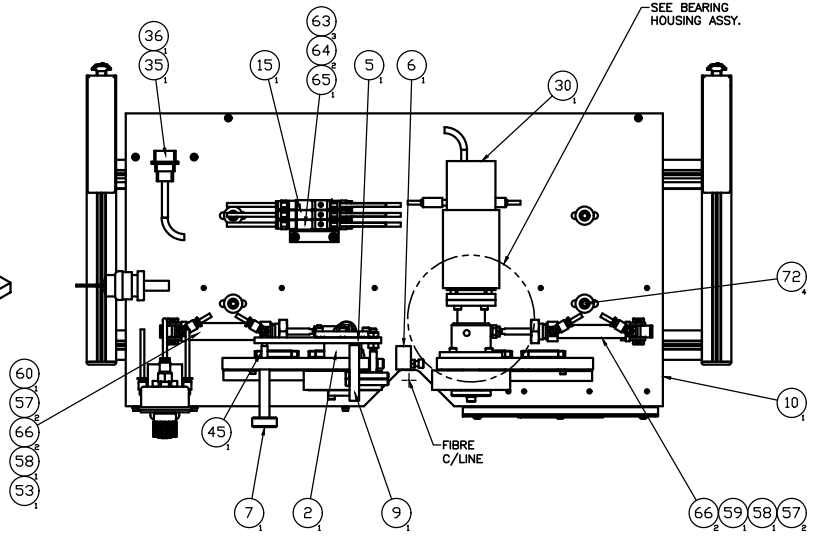
TITLE: MOUNTING BRACKET ASSY. MINI CAPSTAN

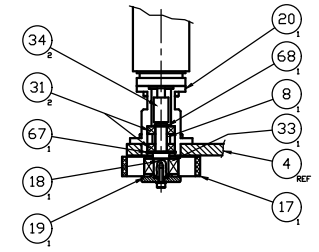
USED ON 287185A	DWG. No. 287189A	SHEET 1 OF 1	REV 1
THIRD ANGLE PROJECTION	MATERIAL	ORIG. SCALE	1:5
	FINISH	ORIG. SHEET	A2

DWG. No. 287185A | DO NOT SCALE | DRAWING TO BS308 | IF IN DOUBT ASK

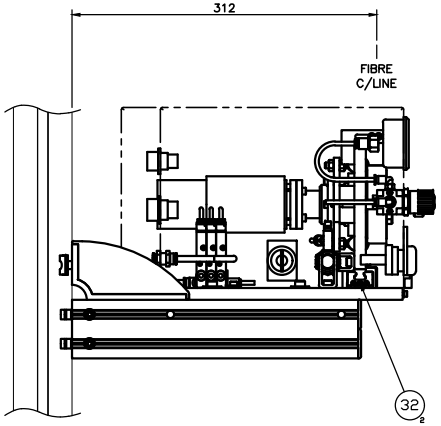
REVISION HISTORY				
REV.	DESCRIPTION	DCR No.	DATE	APPROVED
1	FIRST ISSUE		9.8.12	AJW

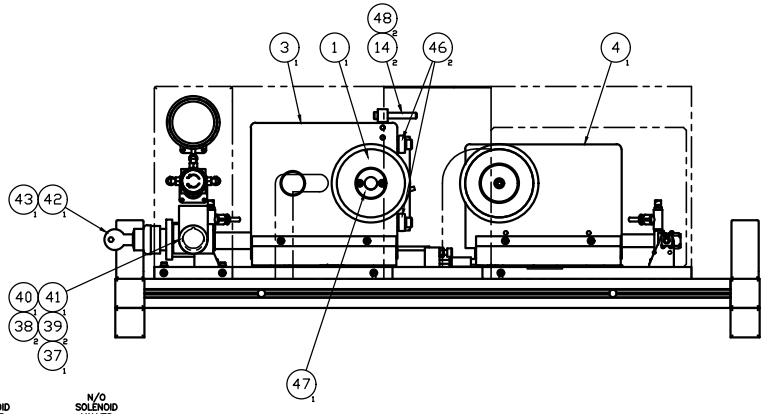


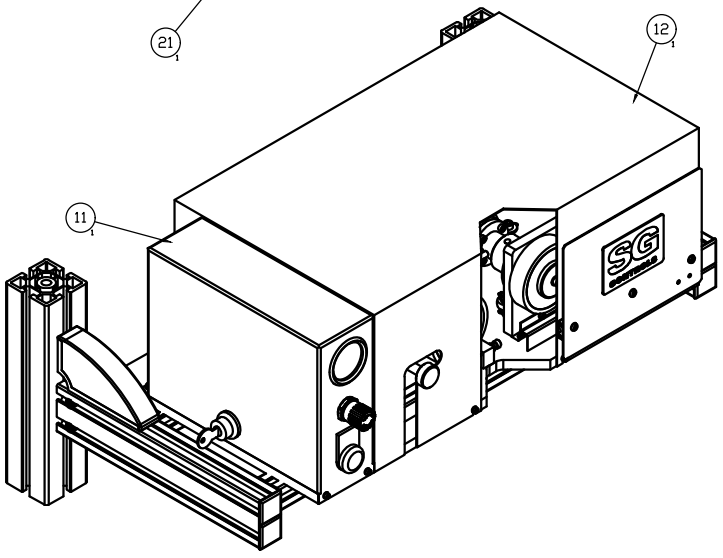


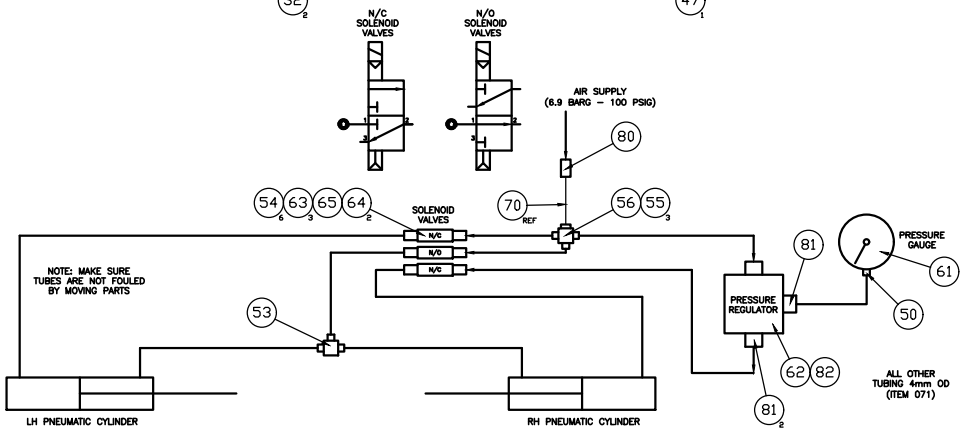


BEARING HOUSING ASSEMBLY









PNEUMATIC DIAGRAM

DRAWN	AJW	9-8-12
CHECKED		
APPROVED		

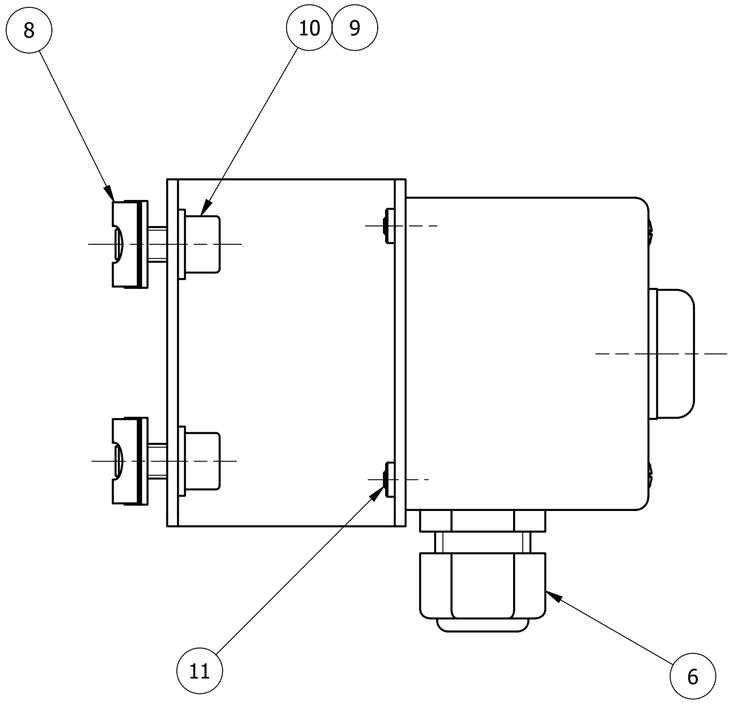
TITLE: MINI CAPSTAN ASSEMBLY

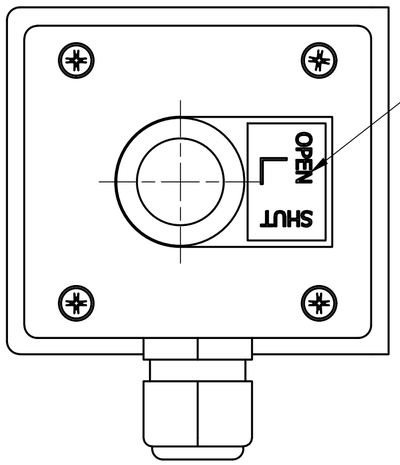
SG controls — SG Controls Limited

UNLESS OTHERWISE STATED DIMENSIONS ARE IN mm
DIM. TOL. 0 ± 0.0 ± 0.00
ANGULAR TOL. ±
SURFACE FIN. √6
REMOVE ALL SHARP EDGES

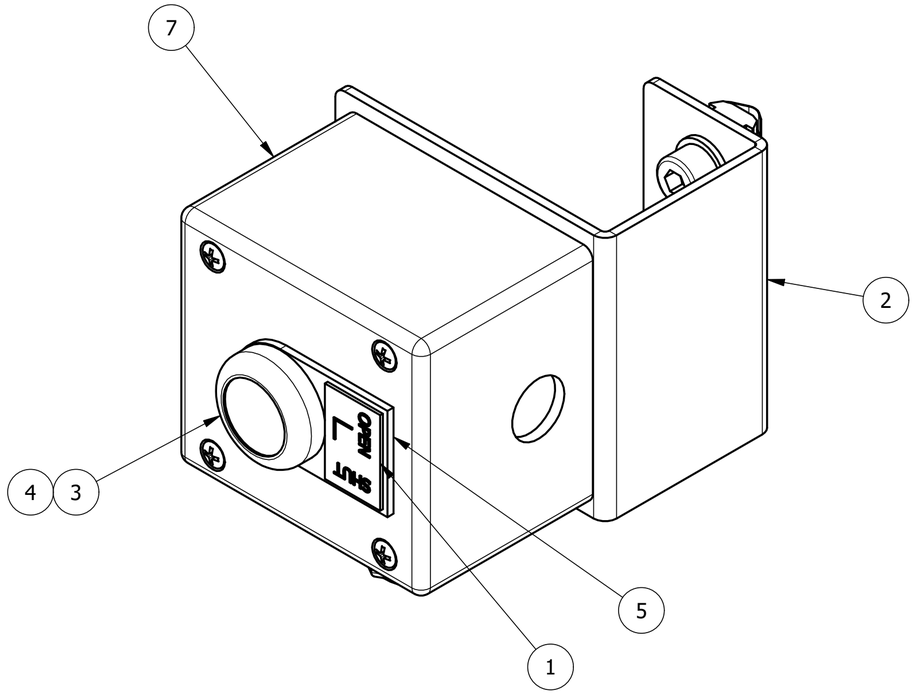
USED ON 287182A	DWG. No. 287185A	SHEET 1 OF 1	REV 1
THIRD ANGLE PROJECTION	MATERIAL	ORIG. SCALE	1:2
	FINISH	ORIG. SHEET	AO

REVISION HISTORY				
REV	DESCRIPTION	DCR No.	DATE	APPROVED
1	FIRST ISSUE		29.08.18	T.H.





TEXT ALIGNMENT AS SHOWN



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	283830-8	LABEL - OPEN/SHUT
2	1	380820	MOUNTING BRACKET
3	1	EE048199	ACTUATOR RMQ WHT-MOM, M22-DL-W
4	1	EE048203	ACTUATOR FXG ADAPTOR, FRONT FIXING, RMQ, M22-A
5	1	EE048248	LEGEND PLATE
6	1	EE067092	GLAND M20 & NUT
7	1	EE067135	MOUNTING ENCLOSURE 1 SWITCH
8	2	H04608	M8 TEE NUT 10 GRV
9	2	K00065	Washer 8mm Std S/S
10	2	K00405	HxCpHd M8x16 S/S
11	4	K00621	HxCpHd M4x8 S/S

SG Controls Limited

T.Hedger 29/08/2018

DO NOT SCALE

IF IN DOUBT ASK

UNLESS OTHERWISE STATED
DIMENSIONS ARE IN mm
DIM TOL 0 ± 0.3
0.0 ± 0.1
ANGULAR TOL ± 0.5
SURFACE FINISH - um1.6
REMOVE ALL SHARP EDGES

TITLE

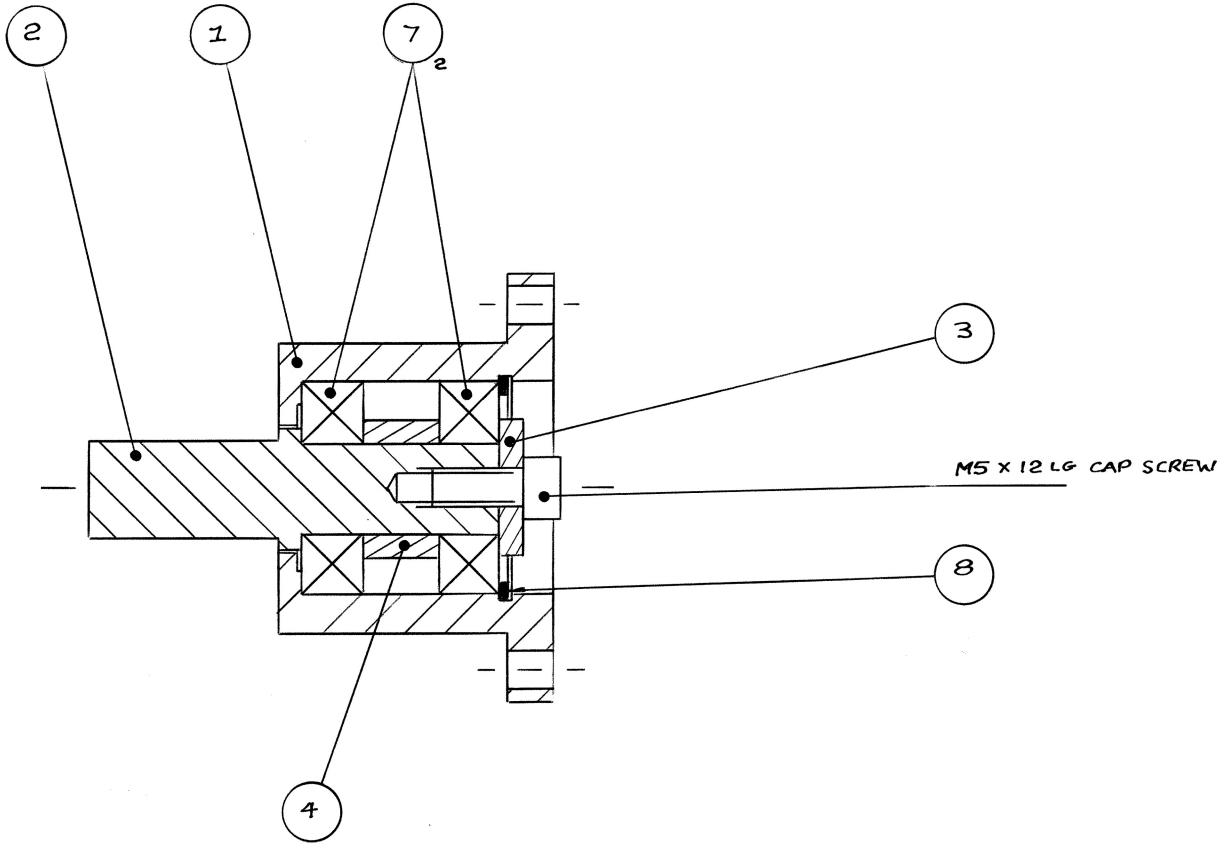
MINI CAPSTAN REMOTE CONTROL BOX ASSEMBLY

USED ON	DRG No.	SHEET	REV
380000A	284975A	1 OF 1	1
	MATERIAL:	ORIG SCALE	1:1
	FINISH:	ORIG SHEET	A2

CONFIDENTIAL

DRG. No. A2-284620-A

CHANGE DETAILS



ASSEMBLY

HEAT BEARING HOUSING TO ABOUT 100°C TO FIT BEARING SPINDLE ASSY.

GEOMETRIC TOLERANCE SYMBOLS			
Characteristic	Sym	Characteristic	Sym
Straightness	—	Angularity	∠
Flatness	▱	Run out	↗
Roundness	○	Position	⌖
Cylindricity	⌭	Concentricity	◎
Profile of a line	⌒	Symmetry	⌯
Profile of a surface	⌓	MMC	Ⓜ
Parallelism	//		
Squareness	⊥		

DO NOT SCALE

DIMENSIONS IN MILLIMETRES (mm)
SURFACE TEXTURE VALUES IN mm
MACHINE WHERE MARKED
REMOVE BURRS • SHARP EDGES

DRAWN B. TURNER | CHECKED
TRACED | CHECKED
APPROVED | DATE 13-6-08

TOLERANCES UNLESS STATED
DIMENSIONAL 0 ±
DIMENSIONAL 0.0 ±
ANGULAR ±

FOR EXPLANATION OF DIMENSIONS, TOLERANCES, NOTES ETC - SEE BS. 308

MATERIAL
SPEC
TREATMENT
FINISH

TITLE
BEARING HOUSING ASSY.

PROJECTION THIRD ANGLE

SCALE 2-1

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SHEET 1 OF 1 A2

H & K 57