STANDARD
OPERATING PROCEDURE

Ref:	**SOP-0211-01-N-DEV**

Description:	**Mega Reel** **Starpoint Technical Information**

THIS IS AN UNCONTROLLED DOCUMENT

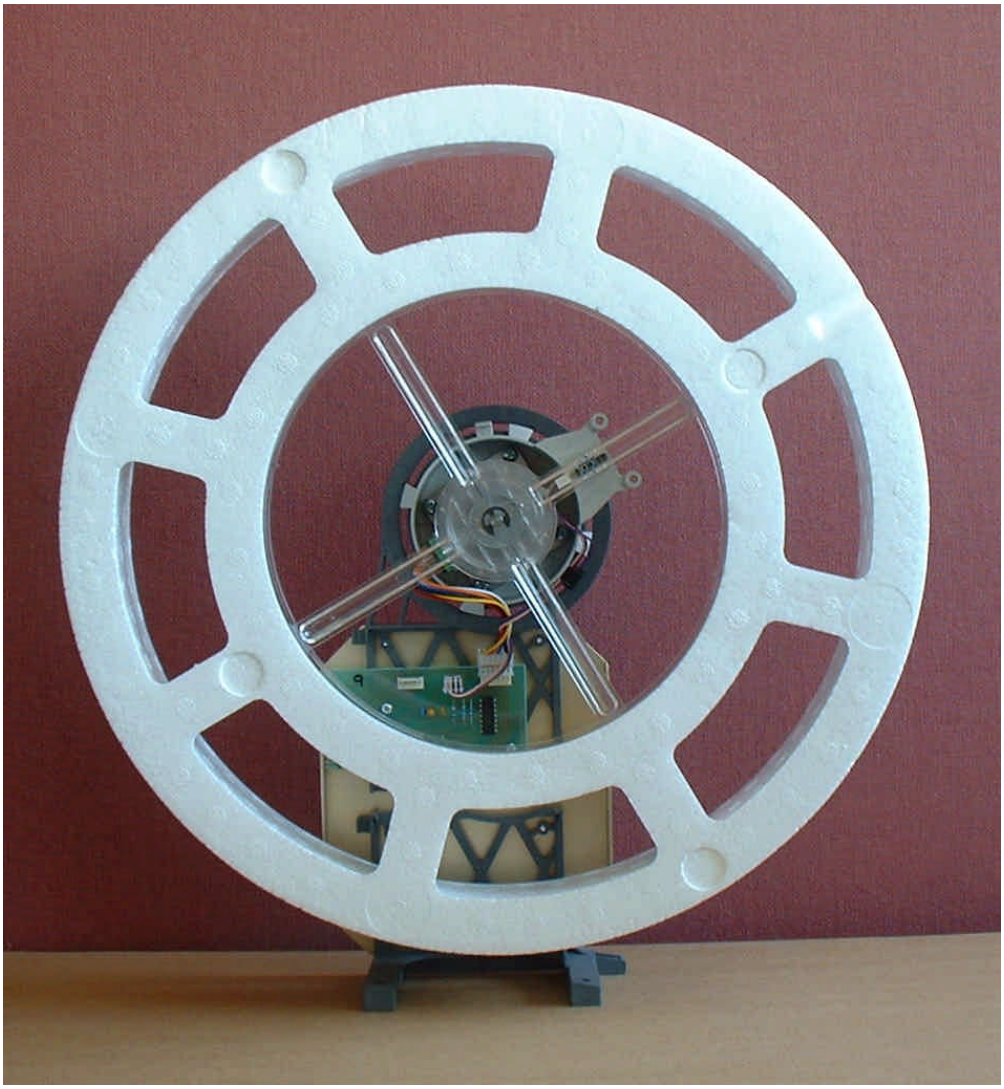
AND IS SUPPLIED FOR INFORMATION ONLY

IT IS THE USERS RESPONSIBILITY TO ENSURE THAT THE MOST UP TO DATE DOCUMENT IS BEING USED BY CONTACTING STARPOINT ELECTRICS LTD

sales@starpoint.uk.com

Tel: +44 (0)208 391 7700 or Fax: +44 (0)208 391 7760

Mega Reel - Technical Information



Starpoint Electrics Ltd.

Website: - www.starpoint.uk.com

Contact: - sales@starpoint.uk.com

Telephone: - +44 (0) 20 8391 7700

Fax: - +44 (0) 20 8391 7760

DISCLAIMER

1. Starpoint Electrics Limited ("**Starpoint**") has taken all reasonable care in preparing this technical information pack ("**Information Pack**") and has used all reasonable efforts to ensure the accuracy of the information contained in the Information Pack. However, the information contained in this Information Pack may be subject to change from time to time, and Starpoint shall have no liability whatsoever to any person arising out of or in connection with reliance on any information contained in this Information Pack.

2. Starpoint reserves the right at any time to amend or update the information contained in the Information Pack, or to withdraw the Information Pack in its entirety and/or to withdraw and/or replace the products referred to in the Information Pack, and Starpoint shall not be obliged to notify any person of any such changes. Before taking or implementing any action based on the information contained in the Information Pack, you must contact Starpoint at the address given above in order to ensure that the Information Pack is up-to-date.

3. The products may vary slightly from their description in the Information Pack, and Starpoint accepts no liability for such variances.

Contents

INTRODUCTION

The Mega Reel takes reel units into a new dimension. Based on the proven 12RM technology and using the powerful 200 step motor, the mega reel offers the designer the opportunity to display significantly larger symbols than can displayed on conventional reel units. The mega reel is constructed from a standard diameter plastic reel, which carries the optic tab, and a large lightweight polystyrene moulding adhered to it. The outside diameter of the mega reel is 400mm and the width of the band can range from 75mm to a maximum of 200mm. The mega reel can be used as a conventional game play unit or as a stand-alone feature reel.

CONDITIONS OF USE

1. Temperature Range

The Mechanism will operate satisfactorily in the temperature range 0?C to 50?C provided there is an unrestricted airflow and proper motor control is exercised

2. Humidity

The unit will operate in the range of 0% to 95% - relative humidity.

3. Continuous use

There is no practical limit to continuous use assuming normal motor temperature control procedures are followed. It is expected that normal operation is a minimum 12-hour day.

4. Operational Environment

It is recommended that the unit is not operated in an exposed environment if the public are present. The most suitable method of operation should be behind a glass or screen.

5. Operational Life

The units have been subjected to various accelerated life tests and a minimum operational life of one million cycles is assumed.

6. Tools & Installation

It is recommended that for ease of assembly and servicing, the Starpoint 'Quick Release' fixing feet are used when fixing the unit to a cabinet. Tools will therefore not be required for the installation or removal of the unit. For correct positioning of the fixing feet please refer to Starpoint Drawing G4G019-01-ZZZZ.

7. Handling

Whilst the Mega Reel of a robust plastic construction it is not recommended that the mechanism be handled by the periphery of the reel drum, always use the stand assembly when handling the reel mechanism.

It is not recommended that the power connection be removed from the unit while the unit is in operation. Failure to remove power will most likely result in damage to the devices in the unit.

8. Reel Band Construction

Details of reel band sizes and symbol pitches can be found in Drawing F3C085-01-ZZZZ. See MECHANICAL SPECIFICATION, Section 3 for information on how to fit the reel band to the reel drum.

9. Warranty

A guarantee of twelve months from the shipment date is available for the reel mechanism, subject to Starpoint's standard terms and conditions. This guarantee is offered irrespective of the number of operations of the unit during this period but subject to operation within the environmental conditions specified above. A unit, which may require return under the guarantee, should be returned direct to Starpoint or your local distributor.

MECHANICAL SPECIFICATION

1. Construction

Overall dimensions of the Mega Reel are shown in Drawing G4G019-01-ZZZZ fixing feet positions are also shown in this drawing. The position of the win line can be set to the customer's requirement defined in the specification sheet, see section 2. This setting is in the range from 0? to 360? pre set by production during assembly of the mechanism, section 2 details how to adjust the win line when required. The unit will operate in any orientation but must be rigidly fixed to the cabinet with the viewing area in the correct position.

2. Adjustments & Calibration

The reel mechanism construction is such that the adjustments of the motor mounting, or lamp array position do not interact with each other; therefore secondary adjustments are not necessary.

The stepper motor has a cross pin in the shaft which is used to ensure consistent drive of the reel drum. This pin must be aligned to the optic sensor and this adjustment is called the "phase setting adjustment". The lamp array may be moved to a position between + or - 0? to 359? to align with game win line.

3. Reel Band Fixing Procedure

The method of fixing the reel band onto the drum is by the use of double-sided adhesive tape.

a. Method for fixing reel band using adhesive tape

i) The reel band artwork must be designed such that there is a small overlap sufficient to bond the two ends of the reel band together using double-sided adhesive tape.

ii) A clear area of band must be on the under lap area of the band.

iii) Carefully align the clear areas on the band with the centre line of the reel spoke as shown on Drawings F3C085-01-ZZZZ. Bond the end of the tape to the reel drum using double-sided adhesive tape.

iv) Carefully bring the reel band round the drum until the end of the band for overlap is in position. Bond into position using the double-sided adhesive tape**.**

ELECTRICAL SPECIFICATIONS

Electrical/electronic devices are situated on, or connected to, the Mega Reel module PCB located on the frame as follows: -

1. Connections

Connections to the user interface and the motor and lamps are contained on the reel module PCB as illustrated on Circuit Diagram G5D029-01-ZZZZ. The required configuration can be defined in the Speciation Sheet shown in Appendix A.

The machine connections are via a 15-way 0.1-inch pin pitch plug, as detailed in Circuit Diagram G5D029-01-ZZZZ

2. Stepper Motor

The motor connections are routed via a 6-way board connector through to the output connector as designated above. The motor is available as 200 step 12v. or 24vDC and the supplying company is NMB of Japan.

Motor details are contained on Drawings:

A1C016-01-ZZZZ 12v 200 steps
A1C020-01-ZZZZ 24v 200 steps

The motor is positioned so that when powered up on specified phases, the tab is centralised in the optic detector. This is normally a Starpoint manufacturing procedure but for information on how to carry out this adjustment see Section 9. Phase sequence tables for motor control are on motor circuit diagrams, as are winding resistance's and current requirements.

3. Position Control Sensor

The position control sensor is a self-contained photo optic sub-assembly complete with built in Schmitt trigger and open collector output (Manufactured by Omron type EE – SX 3239) . A low level denotes the optic is detected.

4. Stepper Motor Control

The reel drum is driven by the 200-step motor, which positions the reel band. Recommended symbols per reel band can be 20 or 25 Examples of Ramp Tables are shown in Appendix B. If difficulty is experienced in achieving the required effect or speed of rotation, please call Starpoint on +44 (0) 20 8391 7700.

With the mechanism at rest and full power applied to the motor, it is possible for the motor temperature to rise unnecessarily causing a loss of torque and in exceptional circumstances overheating. To avoid this situation it is strongly recommended the following controls be applied. **Failure to do this could invalidate the warranty.**

To limit heating effect and maintain high motor torque, it is advised that the power applied to the motor at standstill be pulsed or turned on & off. The switched power should be in the ratio of 50:50 mark space, based on the running time. This provides the required holding torque at standstill and will prevent inadvertent reel movement. It is also recommended that a short delay of 500mS be used before commencing this switching procedure after the reel has stopped & before starting the next cycle spin. The delays are to ensure that this on / off sequence does not influence the start and stop ramming.

5. Motor Drive Software

a) Reset Procedure

This procedure is recommended at power on or on occasion when the software identifies that the reel band is out of position.

i) Drive the motor forward at 50RPM (6mS full step rate).
ii) Every 1ms, monitor the optic output. Immediately the tab is detected, cease driving the motor and increment 3 steps – Reset the phases so that Black and Yellow are turned on – Check that the optic is covered by the tab.
iii) Now enter standstill mode or resume the game in play, as appropriate.

6. Motor Phase Setting

This adjustment may be required when due to exceptional circumstances the motor requires replacement.

Tools required: - Crosshead Screwdriver
12vdc 1.5A Power Supply
or 24vdc 1A Power Supply

Method: -

a. Loosen motor fixing screws in the motor housing moulding, 4 off screws shown on drawing G4G010-01-ZZZZ.
b. Rotate reel so that the widest tab is central in the optic device.
c. Apply 0V to the Yellow and Black phases of the motor via pins 11 and 14 on the 15-way edge connector. Apply +12Vdc (or 24vdc) to the motor common via pin 15 on the 15-way edge connector.
d. Tighten motor fixing screws
e. Disconnect supply from the mechanism.

The reel mechanism is now phase set and ready for use.

NB This phase setting method is part of Starpoint Manufacturing procedure.

ORDERING INFORMATION

This section deals with how to complete a Specification Sheet Appendix A. The document contains configuration information, which Starpoint uses for manufacture of the Mega Reel.

The Specification Sheet contains a series of options across with a corresponding clear box on the right hand side. Once the selection of option is made the letter corresponding to the required option should be entered in the correct box. The total combination of completion of all the empty boxes creates a unique build standard coding

The following deals with each section in order down the Specification Sheet.

Customer

Complete the purchasing Company's name.

Customer Part Number

Enter the Customer part number as this will be cross-referred to the Configuration / Specification Number. Both numbers are included on the order and invoice documents

Date

Complete the date spec sheet completed.

Quotation Required

Please indicate by deleting either the YES or NO if a formal quotation is required.

Quantity Required

If a quotation is required, please add the qty to the box.

Comments

Enter any comments if required

Mechanism Type

This is pre-defined. ND refers to the Mega Reel.

ORDERING INFORMATION - continued

Motor Type

The motor options available should be selected according to the application. Having decided on the motor type required, enter the letter corresponding to your selection in the right hand box. Note: The set up phase setting is standard with Black and Yellow windings energised.

PCB Type

This is a pre-defined option of 69.

Lamp Array Pointer Position

This setting is for the win line position on the amusement machine, and is a 3-digit figure as shown in the diagram.

Reel Band

This picks the required option for the reel band. There are 3 options available.

CARRAIGE & DISTRIBUTION

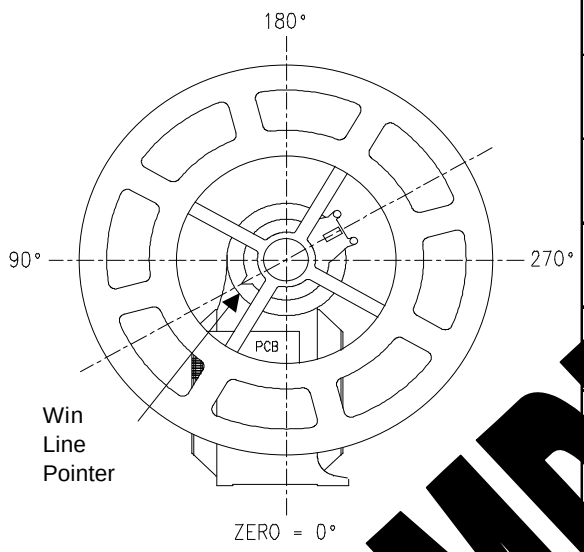
All Starpoint reel mechanisms are shipped in returnable cardboard packaging. Individual reel mechanisms are fixed by tie wraps to prevent movement in transit. They are packed in the following manor: -

2 Per box if no band fitted.
2 Per box if minimum width (70mm) band fitted.
1 Per box in all other cases.

The packaging is designed to use the minimal space when empty **and should be returned to Starpoint after use.**

Appendix A – Spec Sheet

STARPOINT — **MEGA REEL SPECIFICATION / QUOTATION SHEET**



CUSTOMER:	
CUSTOMER PART NUMBER:	
DATE:	
QUOTATION REQUIRED:	Yes/No
QUANTITY REQUIRED:	XXXX
COMMENTS:	

MECH				**ND**
MOTOR	VOLTAGE STEP	R	V 24V. 200 STEP NMB	
PCB	TYPE	NUMBER 9 BOARD		**69**
LAMP ARRAY	WIN LINE POINTER POSITION	**000 - 359** degrees (SEE PICTURE ABOVE)		
BAND	BAND FITTING	1 CUSTOMER BAND FITTED	Z BAND NOT FITTED	

STARPOINT

UNITS 1-5, KING GEORGES TRADING ESTATE, DAVIS ROAD, CHESSINGTON, KT9 1TT
TEL: +44 (0) 20 8391 7700 FAX: +44 (0) 20 8391 7760 E-MAIL: info@starpoint.uk.com

SOPF-0185-02-N-DEV

Appendix B

Ramp Table Examples

21 RPM

up	20,18,18,16,16,16
run	14
down	20,28

30 RPM

up	16,16,15,15,14,14,12,12,11,11
run	10
down	12,12,14,14,14,16,16

37 RPM

up	16,16,14,14,12,12,10,10,9,9
run	8
down	9,9,9,9,10,10,14,14,16,16

50RPM

up	16,16,14,14,12,12,10,10,8,8
run	6
down	7,10,8,8,10,10,14,14,16,16

60RPM

up	16,16,14,14,12,12,10,8,7,6
run	5
down	6,7,8,10,12,12,14,14,16,16

25 Symbol Full Step Nudge

22,20,18,16,24,34,44

20 Symbol Full Step Nudge

20,18,16,15,17,19,24,30,37

10 Symbol Full Step Nudge

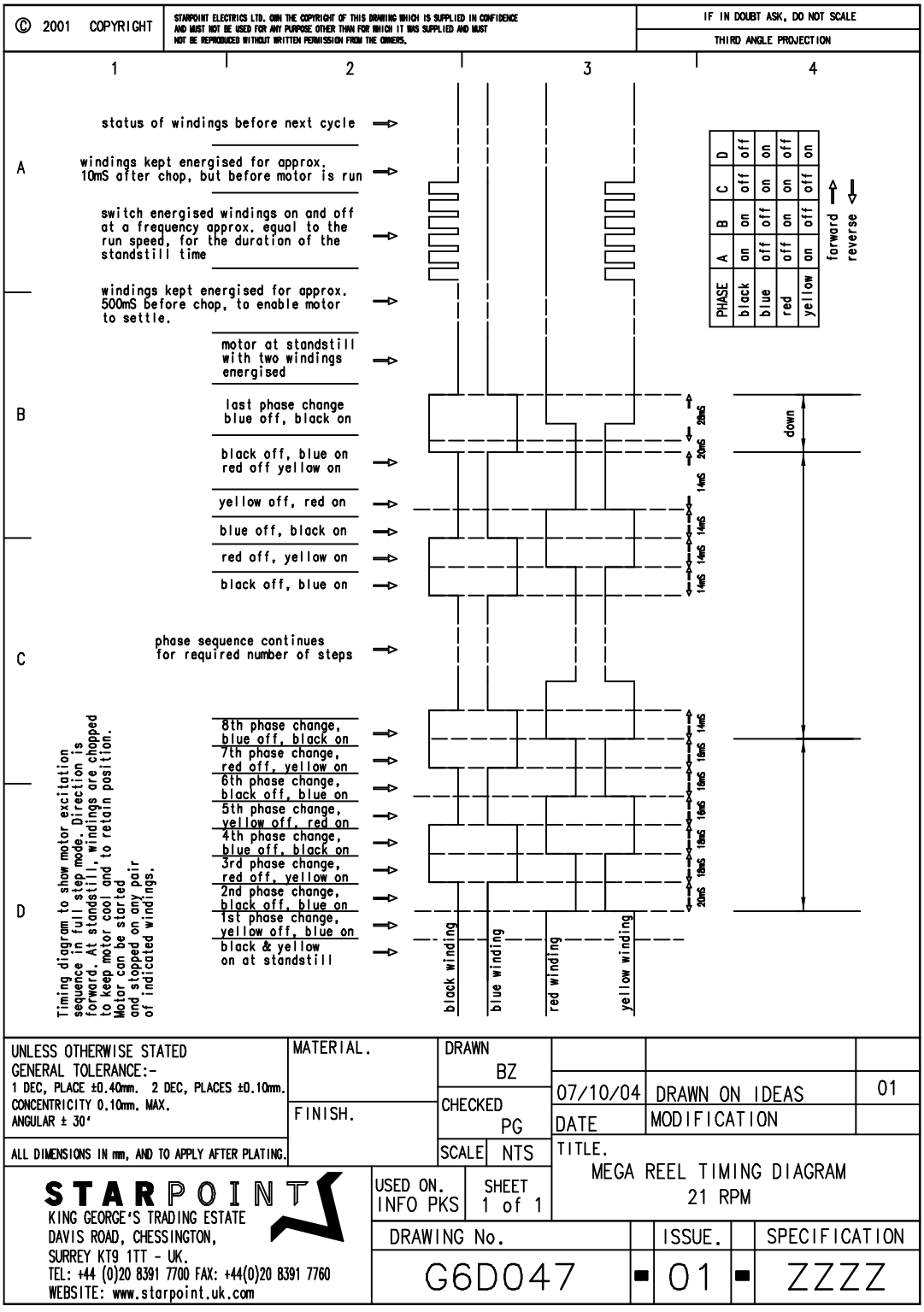
18,16,12,10,10,10,10,10,10,10,10,10,10,11,12,13,15,21,25

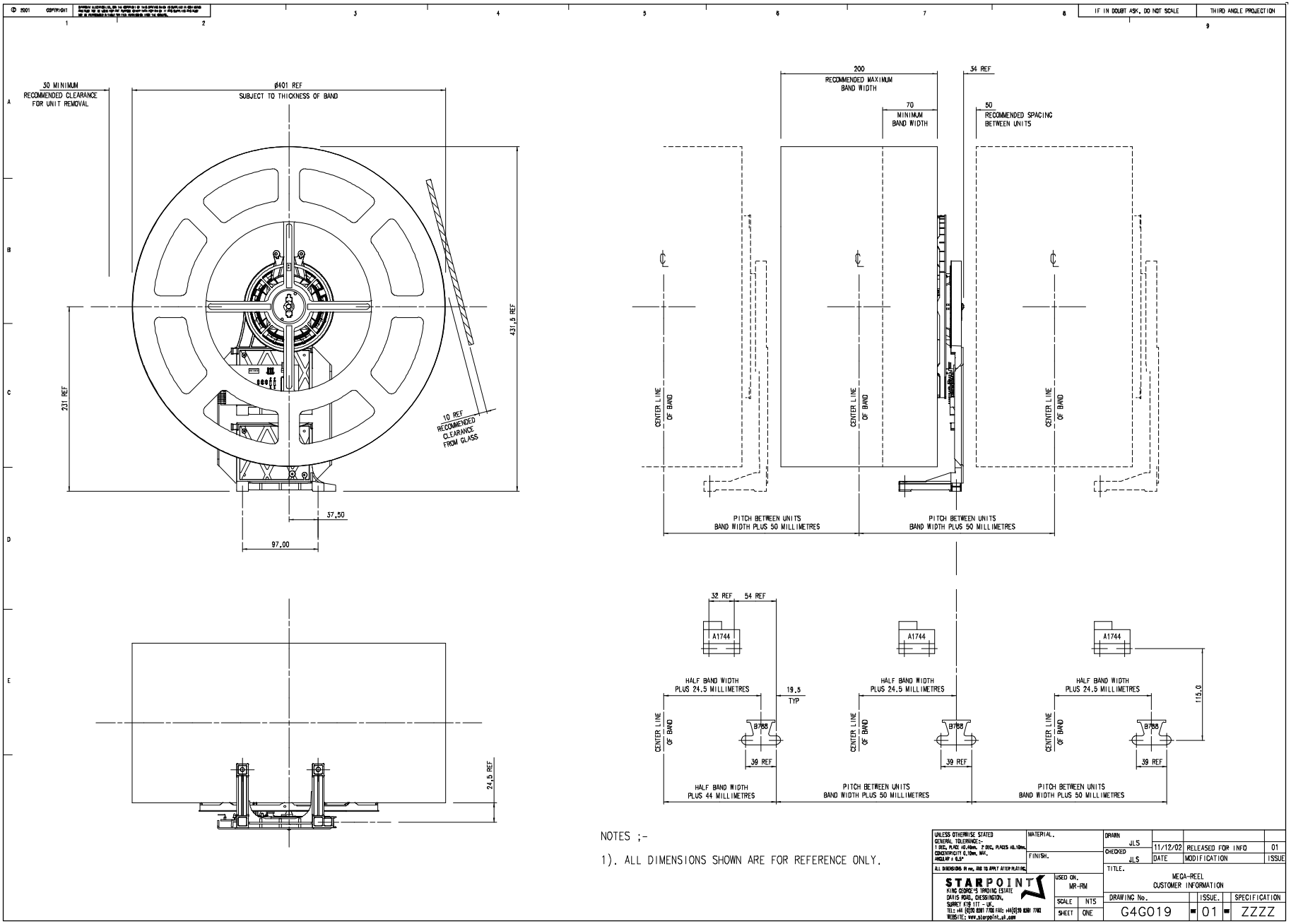
NOTE: -

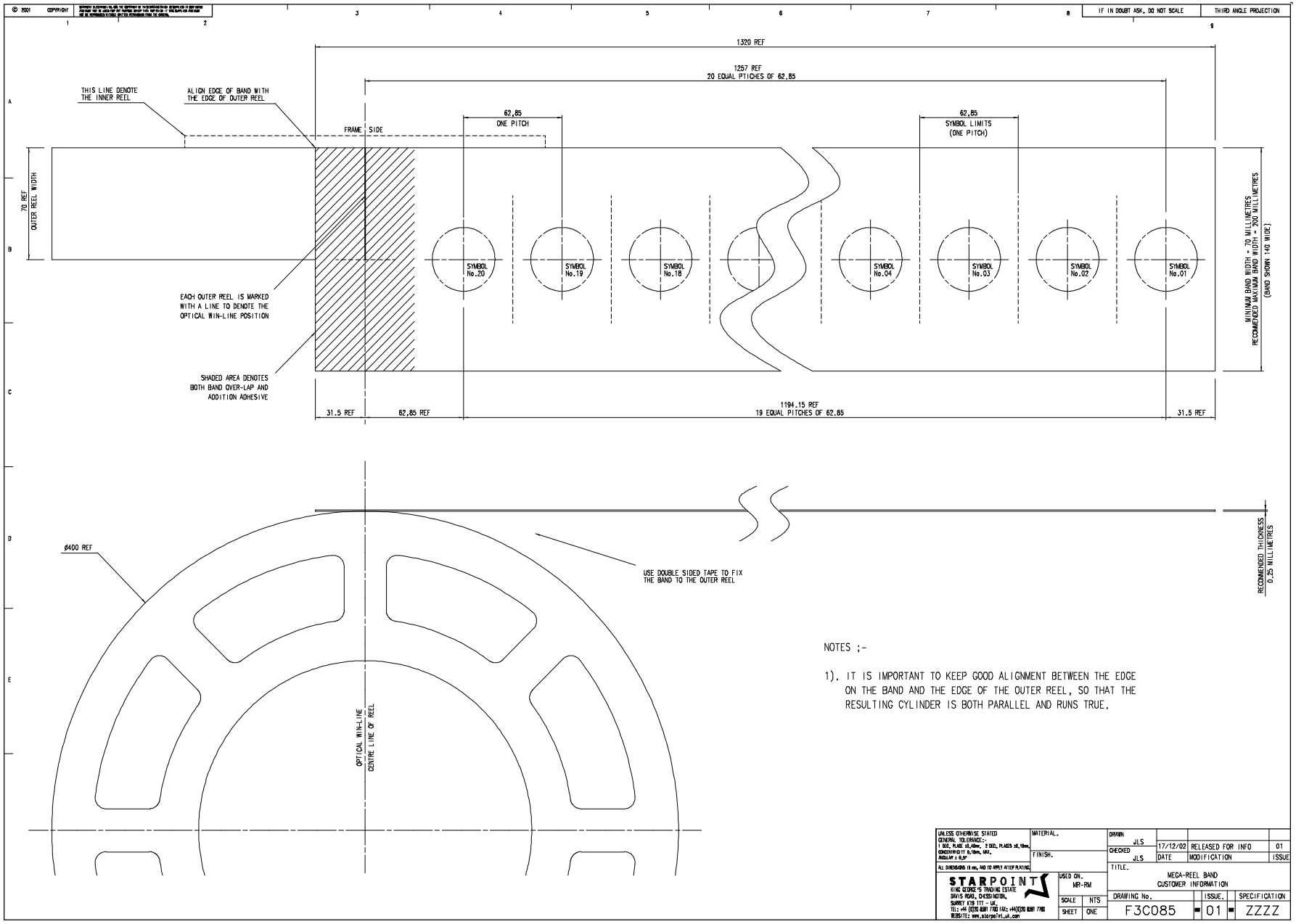
Examples of Ramp Tables to drive mech at the different speeds are shown above. These Ramp Tables are nominal values, which should be optimised to meet individual requirements with regard to reel drive characteristics, such as soft stop or sharp stop of the reel drum. To obtain the same characteristics in reel drive for different width reel drums the Ramp Tables may require some modification.

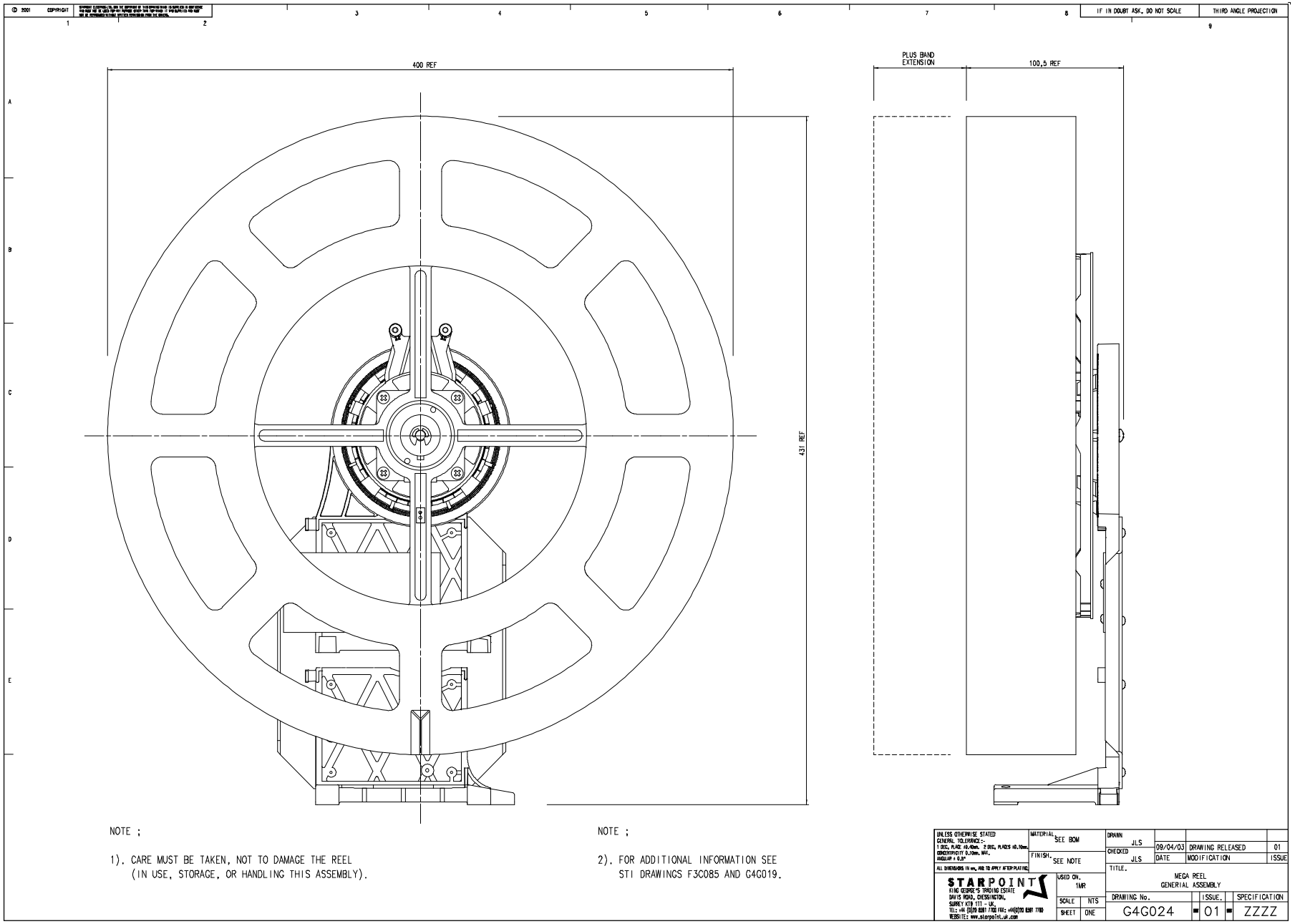
Appendix C

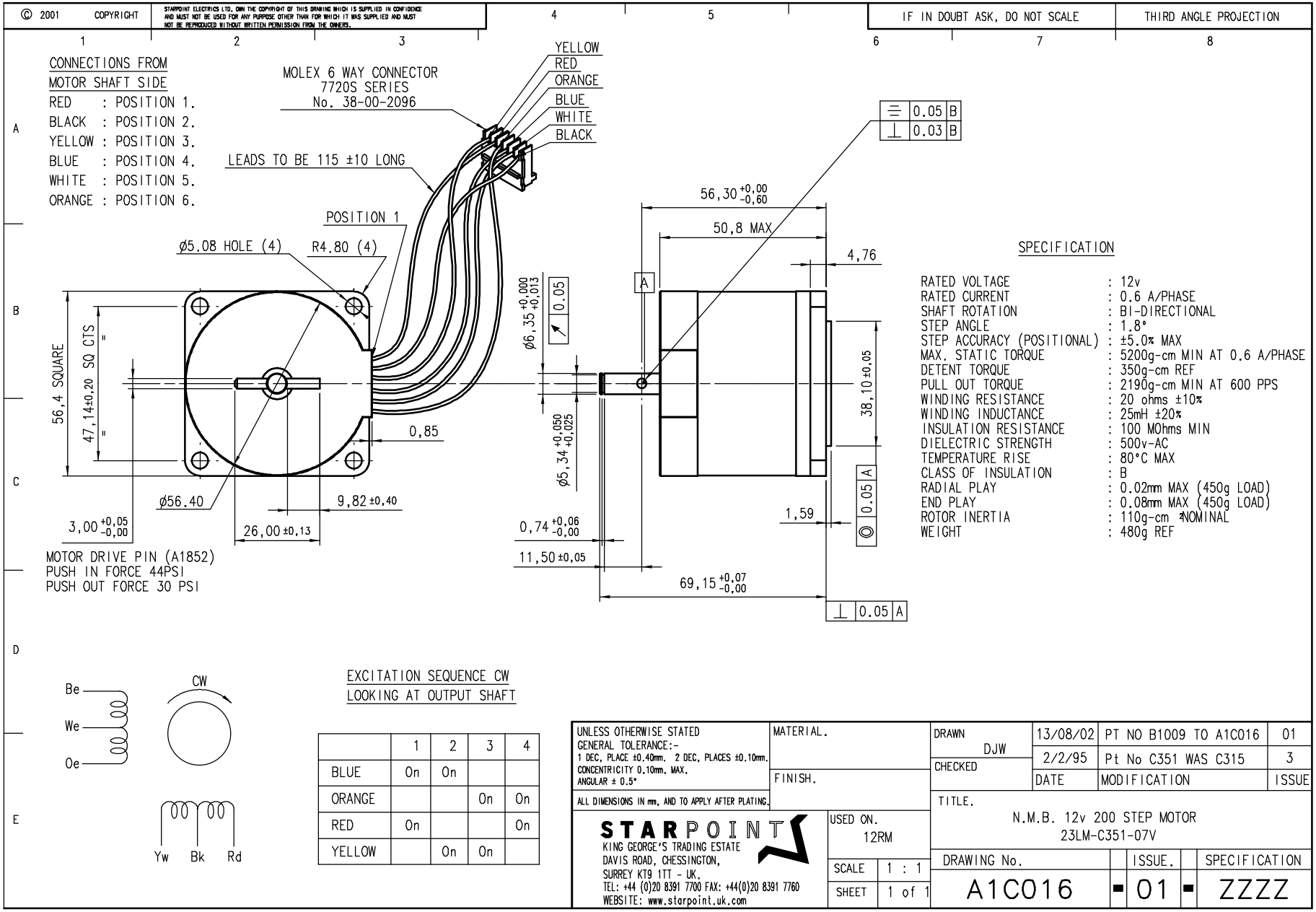
TIMING DIAGRAM

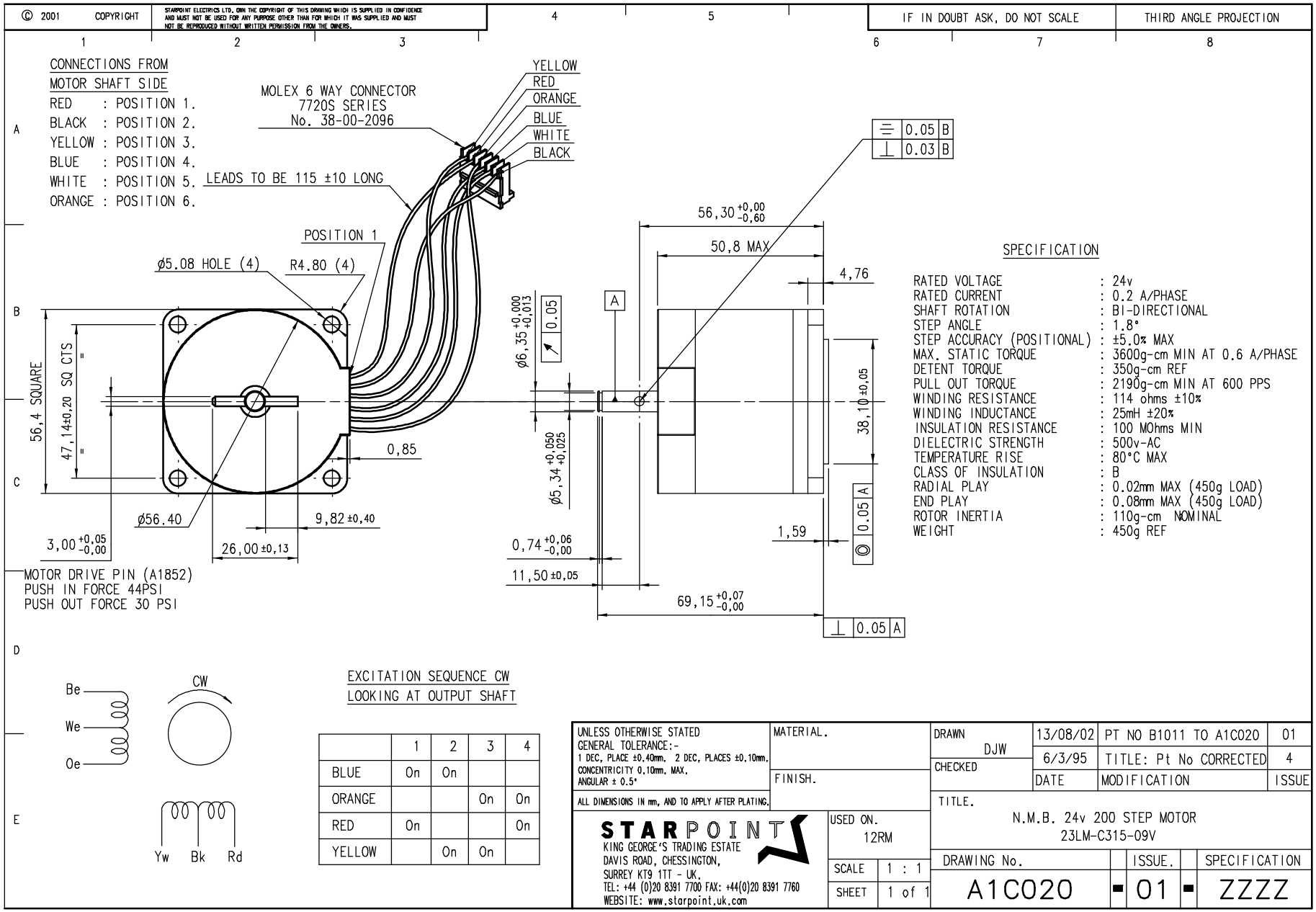



© 2001 COPYRIGHT
IF IN DOUBT ASK, DO NOT SCALE
THIRD ANGLE PROJECTION
30 MINIMUM
RECOMMENDED CLEARANCE
FOR UNIT REMOVAL
ø401 REF
SUBJECT TO THICKNESS OF BAND
431.5 REF
231 REF
10 REF
RECOMMENDED
CLEARANCE
FROM GLASS
37.50
97.00
24.5 REF
200
RECOMMENDED MAXIMUM
BAND WIDTH
70
MINIMUM
BAND WIDTH
34 REF
50
RECOMMENDED SPACING
BETWEEN UNITS
CENTER LINE
OF BAND
PITCH BETWEEN UNITS
BAND WIDTH PLUS 50 MILLIMETRES
PITCH BETWEEN UNITS
BAND WIDTH PLUS 50 MILLIMETRES
32 REF
54 REF
A1744
HALF BAND WIDTH
PLUS 24.5 MILLIMETRES
19.5
TYP
B788
39 REF
HALF BAND WIDTH
PLUS 44 MILLIMETRES
PITCH BETWEEN UNITS
BAND WIDTH PLUS 50 MILLIMETRES
PITCH BETWEEN UNITS
BAND WIDTH PLUS 50 MILLIMETRES
115.0
NOTES ;-
1). ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.
UNLESS OTHERWISE STATED
GENERAL TOLERANCE:-
1 DEC. PLACE ±0.40mm. 2 DEC. PLACES ±0.10mm.
CONCENTRICITY 0.10mm. MAX.
ANGULAR ± 0.5°
ALL DIMENSIONS IN mm, ARE TO APPLY AFTER PLATING.
MATERIAL.
FINISH.
STARPOINT
KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON,
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8391 7700 FAX: +44(0)20 8391 7703
WEBSITE: www.starpoint.co.com
USED ON.
MR-RM
SCALE NTS
SHEET ONE
DRAWN JLS
CHECKED JLS
11/12/02 RELEASED FOR INFO 01
DATE MODIFICATION ISSUE
TITLE.
MEGA-REEL
CUSTOMER INFORMATION
DRAWING No. ISSUE. SPECIFICATION
G4G019 - 01 - ZZZZ


© 2001 COPYRIGHT
IF IN DOUBT ASK, DO NOT SCALE
THIRD ANGLE PROJECTION
1320 REF
1257 REF
20 EQUAL PITCHES OF 62.85
THIS LINE DENOTE THE INNER REEL
ALIGN EDGE OF BAND WITH THE EDGE OF OUTER REEL
FRAME SIDE
62.85
ONE PITCH
62.85
SYMBOL LIMITS
(ONE PITCH)
70 REF
OUTER REEL WIDTH
SYMBOL No.20
SYMBOL No.19
SYMBOL No.18
SYMBOL No.04
SYMBOL No.03
SYMBOL No.02
SYMBOL No.01
MINIMUM BAND WIDTH = 70 MILLIMETRES
RECOMMENDED MAXIMUM BAND WIDTH = 200 MILLIMETRES
(BAND SHOWN 140 WIDE)
EACH OUTER REEL IS MARKED WITH A LINE TO DENOTE THE OPTICAL WIN-LINE POSITION
SHADED AREA DENOTES BOTH BAND OVER-LAP AND ADDITION ADHESIVE
31.5 REF
62.85 REF
1194.15 REF
19 EQUAL PITCHES OF 62.85
31.5 REF
RECOMMENDED THICKNESS
0.25 MILLIMETRES
ϕ400 REF
USE DOUBLE SIDED TAPE TO FIX THE BAND TO THE OUTER REEL
OPTICAL WIN-LINE
CENTRE LINE OF REEL
NOTES ;-
1). IT IS IMPORTANT TO KEEP GOOD ALIGNMENT BETWEEN THE EDGE ON THE BAND AND THE EDGE OF THE OUTER REEL, SO THAT THE RESULTING CYLINDER IS BOTH PARALLEL AND RUNS TRUE.
UNLESS OTHERWISE STATED
GENERAL TOLERANCE:-
1 DEC. PLACE ±0.40mm, 2 DEC. PLACES ±0.10mm.
CONCENTRICITY 0.10mm. MAX.
ANGULAR ± 0.5°
ALL DIMENSIONS in mm, AND TO APPLY AFTER PLATING
MATERIAL.
FINISH.
DRAWN JLS
CHECKED JLS
17/12/02 RELEASED FOR INFO 01
DATE MODIFICATION ISSUE
TITLE.
MEGA-REEL BAND
CUSTOMER INFORMATION
STARPOINT
KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON,
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8391 7700 FAX: +44(0)20 8391 7700
WEBSITE: www.starpoint.uk.com
USED ON.
MR-RM
SCALE NTS
SHEET ONE
DRAWING No. F3C085
ISSUE. 01
SPECIFICATION ZZZZ

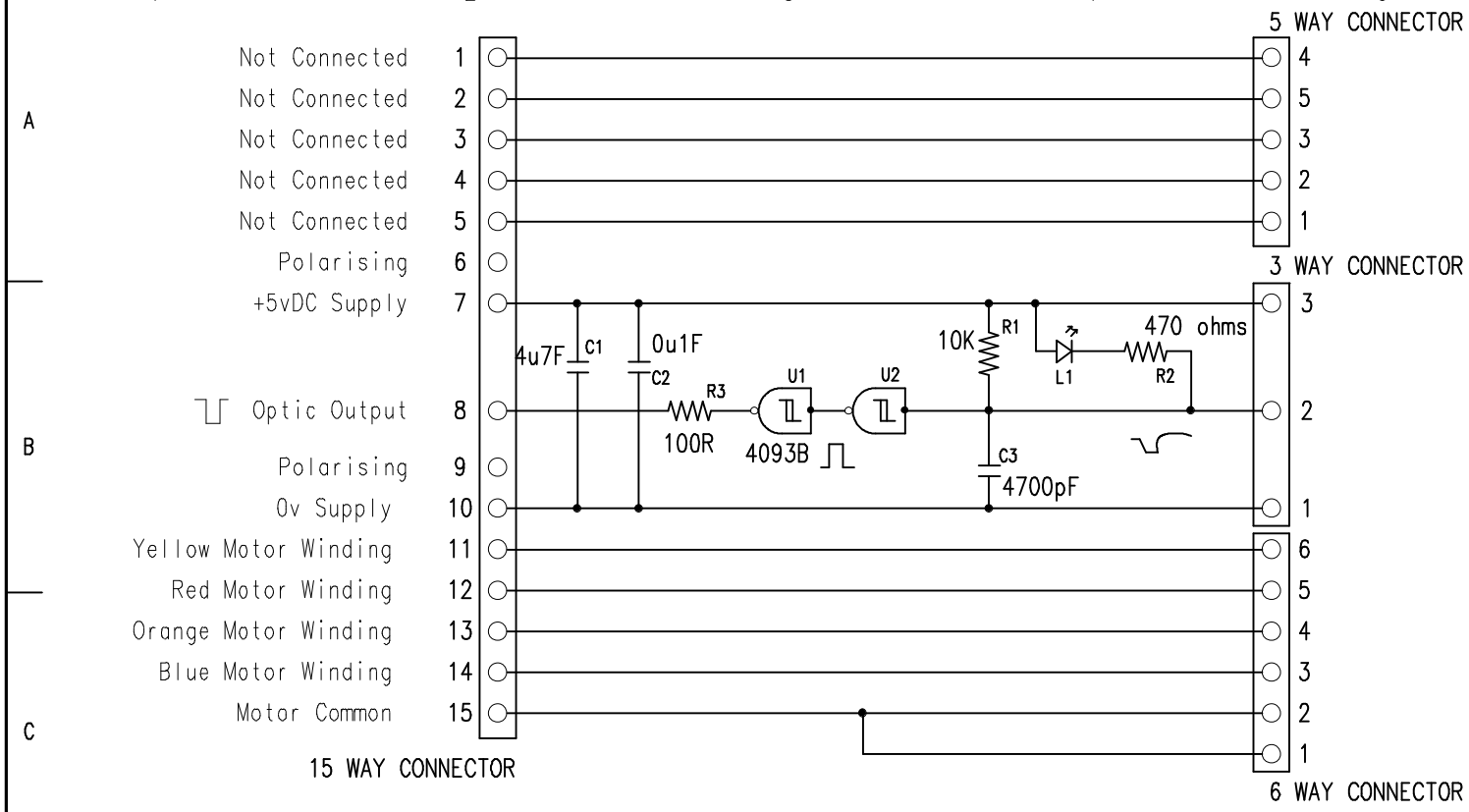

© 2001 COPYRIGHT
IF IN DOUBT ASK, DO NOT SCALE
THIRD ANGLE PROJECTION
400 REF
431 REF
PLUS BAND EXTENSION
100,5 REF
NOTE ;
1). CARE MUST BE TAKEN, NOT TO DAMAGE THE REEL (IN USE, STORAGE, OR HANDLING THIS ASSEMBLY).
NOTE ;
2). FOR ADDITIONAL INFORMATION SEE STI DRAWINGS F3C085 AND G4G019.
UNLESS OTHERWISE STATED
GENERAL TOLERANCE :-
1 DEC. PLACE ±0.10mm. 2 DEC. PLACES ±0.10mm.
CONCENTRICITY 0.10mm. MAX.
ANGULAR ± 0.5°
ALL DIMENSIONS IN mm, ARE TO APPLY AFTER PLATING.
MATERIAL SEE BOM
FINISH SEE NOTE
USED ON. 1MR
SCALE NTS
SHEET ONE
STARPOINT
KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON,
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8397 7700 FAX: +44(0)20 8397 7710
WEBSITE: www.starpoint.uk.com
DRAWN JLS
CHECKED JLS
09/04/03 DRAWING RELEASED 01
DATE MODIFICATION ISSUE
TITLE.
MEGA REEL
GENERIAL ASSEMBLY
DRAWING No. G4G024
ISSUE. 01
SPECIFICATION ZZZZ


© 2001 COPYRIGHT
STARPOINT ELECTRICS LTD. OWN THE COPYRIGHT OF THIS DRAWING WHICH IS SUPPLIED IN CONFIDENCE AND MUST NOT BE USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS SUPPLIED AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION FROM THE OWNERS.
IF IN DOUBT ASK, DO NOT SCALE
THIRD ANGLE PROJECTION
CONNECTIONS FROM MOTOR SHAFT SIDE
RED : POSITION 1.
BLACK : POSITION 2.
YELLOW : POSITION 3.
BLUE : POSITION 4.
WHITE : POSITION 5.
ORANGE : POSITION 6.
MOLEX 6 WAY CONNECTOR
7720S SERIES
No. 38-00-2096
YELLOW
RED
ORANGE
BLUE
WHITE
BLACK
LEADS TO BE 115 ±10 LONG
POSITION 1
ø5.08 HOLE (4)
R4.80 (4)
56,4 SQUARE
47,14±0,20 SQ CTS
0,85
ø56.40
9,82 ±0,40
3,00 +0,05 -0,00
26,00 ±0,13
MOTOR DRIVE PIN (A1852)
PUSH IN FORCE 44PSI
PUSH OUT FORCE 30 PSI
ø6,35 +0,000 +0,013
0.05
ø5,34 +0,050 +0,025
0,74 +0,06 -0,00
11,50 ±0,05
56,30 +0,00 -0,60
50,8 MAX
4,76
38,10 ±0,05
1,59
69,15 +0,07 -0,00
0.05 B
0.03 B
0.05 A
0.05 A
SPECIFICATION
RATED VOLTAGE : 12v
RATED CURRENT : 0.6 A/PHASE
SHAFT ROTATION : BI-DIRECTIONAL
STEP ANGLE : 1.8°
STEP ACCURACY (POSITIONAL) : ±5.0% MAX
MAX. STATIC TORQUE : 5200g-cm MIN AT 0.6 A/PHASE
DETENT TORQUE : 350g-cm REF
PULL OUT TORQUE : 2190g-cm MIN AT 600 PPS
WINDING RESISTANCE : 20 ohms ±10%
WINDING INDUCTANCE : 25mH ±20%
INSULATION RESISTANCE : 100 MOhms MIN
DIELECTRIC STRENGTH : 500v-AC
TEMPERATURE RISE : 80°C MAX
CLASS OF INSULATION : B
RADIAL PLAY : 0.02mm MAX (450g LOAD)
END PLAY : 0.08mm MAX (450g LOAD)
ROTOR INERTIA : 110g-cm² NOMINAL
WEIGHT : 480g REF
Be
We
Oe
CW
Yw Bk Rd
EXCITATION SEQUENCE CW
LOOKING AT OUTPUT SHAFT
1 2 3 4
BLUE On On
ORANGE On On
RED On On
YELLOW On On
UNLESS OTHERWISE STATED GENERAL TOLERANCE:- 1 DEC, PLACE ±0.40mm. 2 DEC, PLACES ±0.10mm. CONCENTRICITY 0.10mm, MAX. ANGULAR ± 0.5°
ALL DIMENSIONS IN mm, AND TO APPLY AFTER PLATING.
MATERIAL.
FINISH.
STARPOINT
KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON,
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8391 7700 FAX: +44(0)20 8391 7760
WEBSITE: www.starpoint.uk.com
USED ON. 12RM
SCALE 1 : 1
SHEET 1 of 1
DRAWN DJW 13/08/02 PT NO B1009 TO A1C016 01
CHECKED 2/2/95 Pt No C351 WAS C315 3
DATE MODIFICATION ISSUE
TITLE. N.M.B. 12v 200 STEP MOTOR 23LM-C351-07V
DRAWING No. A1C016 - ISSUE. 01 - SPECIFICATION ZZZZ


© 2001 COPYRIGHT
STARPOINT ELECTRICS LTD. OWN THE COPYRIGHT OF THIS DRAWING WHICH IS SUPPLIED IN CONFIDENCE AND MUST NOT BE USED FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS SUPPLIED AND MUST NOT BE REPRODUCED WITHOUT WRITTEN PERMISSION FROM THE OWNERS.
IF IN DOUBT ASK, DO NOT SCALE
THIRD ANGLE PROJECTION
CONNECTIONS FROM MOTOR SHAFT SIDE
RED : POSITION 1.
BLACK : POSITION 2.
YELLOW : POSITION 3.
BLUE : POSITION 4.
WHITE : POSITION 5.
ORANGE : POSITION 6.
MOLEX 6 WAY CONNECTOR 7720S SERIES No. 38-00-2096
YELLOW
RED
ORANGE
BLUE
WHITE
BLACK
LEADS TO BE 115 ±10 LONG
POSITION 1
ø5.08 HOLE (4)
R4.80 (4)
56,4 SQUARE
47,14±0,20 SQ CTS
0,85
ø56.40
9,82 ±0,40
3,00 +0,05 -0,00
26,00 ±0,13
MOTOR DRIVE PIN (A1852)
PUSH IN FORCE 44PSI
PUSH OUT FORCE 30 PSI
ø6,35 +0,000 +0,013
0.05
A
ø5,34 +0,050 +0,025
56,30 +0,00 -0,60
50,8 MAX
4,76
38,10 ±0,05
0.05 A
1,59
0,74 +0,06 -0,00
11,50 ±0,05
69,15 +0,07 -0,00
0.05 B
0.03 B
0.05 A
SPECIFICATION
RATED VOLTAGE : 24v
RATED CURRENT : 0.2 A/PHASE
SHAFT ROTATION : BI-DIRECTIONAL
STEP ANGLE : 1.8°
STEP ACCURACY (POSITIONAL) : ±5.0% MAX
MAX. STATIC TORQUE : 3600g-cm MIN AT 0.6 A/PHASE
DETENT TORQUE : 350g-cm REF
PULL OUT TORQUE : 2190g-cm MIN AT 600 PPS
WINDING RESISTANCE : 114 ohms ±10%
WINDING INDUCTANCE : 25mH ±20%
INSULATION RESISTANCE : 100 MOhms MIN
DIELECTRIC STRENGTH : 500v-AC
TEMPERATURE RISE : 80°C MAX
CLASS OF INSULATION : B
RADIAL PLAY : 0.02mm MAX (450g LOAD)
END PLAY : 0.08mm MAX (450g LOAD)
ROTOR INERTIA : 110g-cm NOMINAL
WEIGHT : 450g REF
Be
We
Oe
CW
Yw Bk Rd
EXCITATION SEQUENCE CW
LOOKING AT OUTPUT SHAFT
1 2 3 4
BLUE On On
ORANGE On On
RED On On
YELLOW On On
UNLESS OTHERWISE STATED GENERAL TOLERANCE:-
1 DEC, PLACE ±0.40mm. 2 DEC, PLACES ±0.10mm.
CONCENTRICITY 0.10mm. MAX.
ANGULAR ± 0.5°
ALL DIMENSIONS IN mm, AND TO APPLY AFTER PLATING.
MATERIAL.
FINISH.
STARPOINT
KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON,
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8391 7700 FAX: +44(0)20 8391 7760
WEBSITE: www.starpoint.uk.com
USED ON. 12RM
SCALE 1 : 1
SHEET 1 of 1
DRAWN DJW 13/08/02 PT NO B1011 TO A1C020 01
CHECKED 6/3/95 TITLE: Pt No CORRECTED 4
DATE MODIFICATION ISSUE
TITLE. N.M.B. 24v 200 STEP MOTOR 23LM-C315-09V
DRAWING No. A1C020
ISSUE. 01
SPECIFICATION ZZZZ

IF IN DOUBT ASK, DO NOT SCALE

THIRD ANGLE PROJECTION



STARPOINT

KING GEORGE'S TRADING ESTATE
DAVIS ROAD, CHESSINGTON
SURREY KT9 1TT - UK.
TEL: +44 (0)20 8391 7700
FAX: +44 (0)20 8391 7760
WEBSITE: www.starpoint.uk.com

UNLESS OTHERWISE STATED
GENERAL TOLERANCE:-
1 DEC, PLACE ±0.40mm. 2 DEC, PLACES ±0.10mm.
CONCENTRICITY 0.10mm. MAX.
ANGULAR ± 0.5°

ALL DIMENSIONS IN mm, TO APPLY AFTER PLATING.

MATERIAL.

FINISH.

TITLE.
CIRCUIT DIAGRAM

DRAWN	DJW			
CHECKED	TJ	17/04/03	DRAWN	01
SCALE	NTS	DATE	MODIFICATION	ISSUE
		USED ON. MEGA REEL		SHEET 1 of 1

DRAWING No.	ISSUE.	SPECIFICATION
G5D029	01	ZZZZ