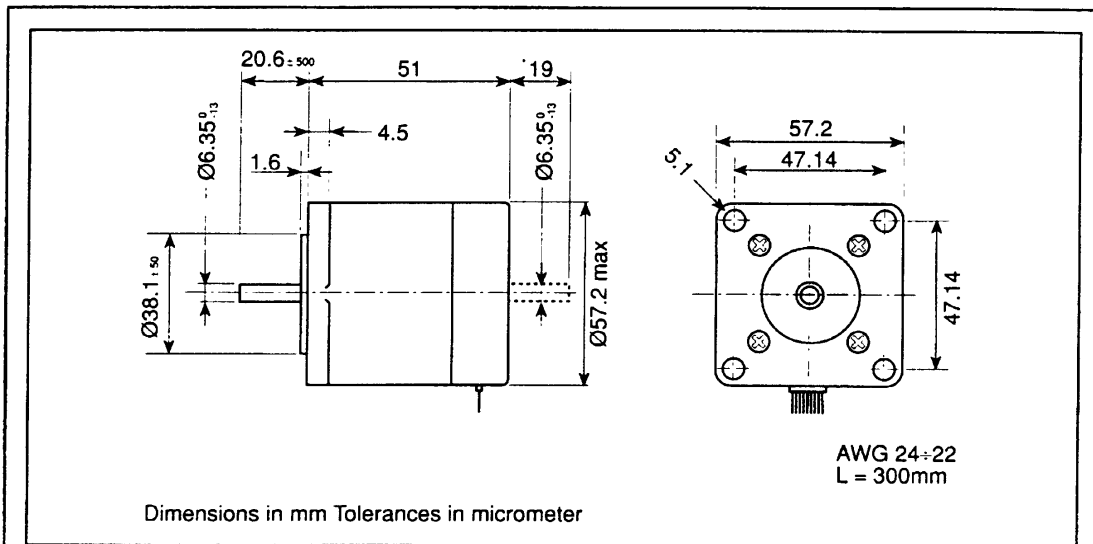


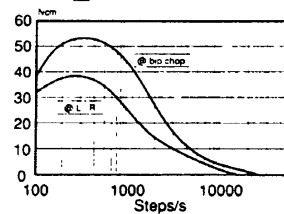


ASTROSYN

TECHNICAL DATA



| Specifications | | Y163/Y164 |
|---------------------|--------------------|-----------|
| Step angle | | 1.8° |
| Step angle accuracy | % | 5 |
| Rated phase current | A | 1.0 |
| Phase resistance | Ω | 5 |
| Phase inductance | mH | 9.5 |
| Holding torque* | Ncm | 50 |
| Detent torque | Ncm | 6 |
| Rotor inertia | gr cm ² | 124 |
| Mass | Kg | 0.5 |
| Insulation class | | B |
| * Two phases "ON" | | |



DRIVE BIPOLAR CHOPPER 35V - 1.4 A/ph
DRIVE UNIPOLAR L/R 35V - R_s = 29 OHM



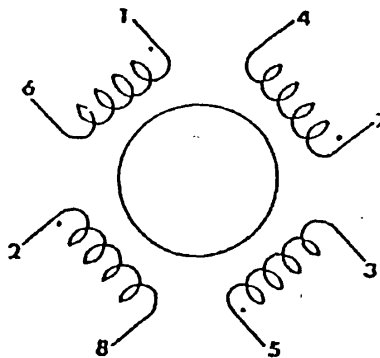
ASTROSYN

STEPPER MOTOR TYPE
Y163/4

TECHNICAL DATA

NEW CONNECTION

| UNIPOLAR | TERMINAL | COLOUR |
|-------------------------|----------|----------------------|
| $\overline{A1}$ | 1 | ORANGE |
| $\overline{B1}$ | 3 | YELLOW |
| $\overline{A1}$ COMMON | 5 & 6 | BROWN-RED - (LINK) |
| $\overline{A2}$ | 2 | BLUE |
| $\overline{B2}$ | 4 | GREEN |
| $\overline{A2}$ COMMON | 7 & 8 | BLACK-WHITE - (LINK) |
| BIPOLAR SERIES | | |
| $\overline{A1}$ | 1 | ORANGE |
| $\overline{B1}$ | 3 | YELLOW |
| $\overline{A2}$ | 2 | BLUE |
| $\overline{B2}$ | 4 | GREEN |
| ISOLATE - (LINK) | 5 & 6 | BROWN-RED |
| ISLOATE - (LINK) | 7 & 8 | BLACK-WHITE |
| BIPOLAR PARALLEL | | |
| $\overline{A1}$ | 1 & 5 | BROWN-ORANGE |
| $\overline{B1}$ | 3 & 6 | RED-YELLOW |
| $\overline{A2}$ | 2 & 7 | BLACK-BLUE |
| $\overline{B2}$ | 4 & 8 | GREEN-WHITE |

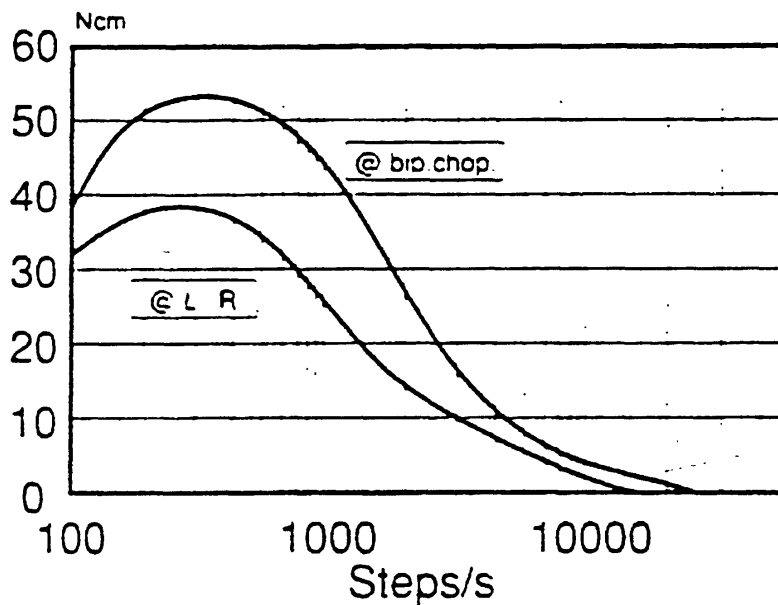


REVISED CONNECTION DETAILS FOR STEPPER MOTOR TYPE Y163/4
AS FROM PRODUCTION BATCH RECEIVED 22.04.97

The Old Courthouse, New Road Avenue, Chatham, Kent, ME4 4QJ. Telephone Medway (01634) 815175 Fax (01634) 826552

**STEPPER MOTOR Y163**

PERFORMANCE CHARACTERISTICS FOR UNIPOLAR AND BIPOLAR DRAWING.



DRIVE: BIPOLAR CHOPPER 35V - 1.4 A/ph
DRIVE: UNIPOLAR L/R 35V - $R_s \approx 29$ OHM

FROM THE DATA SHEET YOU WILL SEE THAT THE MOTOR HAS A RESISTANCE PER PHASE OF 5 OHMS. IF A RESISTANCE OF 29 OHMS IS PLACED IN SERIES WITH THE WINDING RESISTANCE, WE HAVE A TOTAL OF 34 OHMS IN THE CIRCUIT. IF 35 VOLTS IS APPLIED THE CIRCUIT WILL DRAW 1 AMP APPROXIMATELY. IF THE AVAILABLE CURRENT IS LIMITED TO LESS THAN 1 AMP, THE AVAILABLE TORQUE FROM THE MOTOR WILL BE ATTENUATED.

WE CAN ASSUME THAT THE SAME SITUATION WILL EXIST IN A PULSE WIDTH MODULATED UNIPOLAR DRIVE CIRCUIT i.e. RESTRICTING THE CURRENT AVAILABLE TO THE MOTOR RESULTS IN THE MOTOR HAVING TO PERFORM CLOSER TO ITS LIMIT THEREFORE LESS POWER TO DISSIPATE ELSEWHERE.