



MICROE 3100 SERIES
LINEAR ENCODER

CABLE CARRIER
MUST ALLOW ROTATION AND TRANSLATION

Ø.906 [23.00mm] THROUGH HOLE

LINEAR SCALE ROTATES
WITH BALL SPLINE HOUSING

Ø1.260 [32.00mm] HOLLOW SHAFT

5.906 [150.00mm]

THK BNS 3232 BALL SCREW-SPLINE ASSEMBLY
32mm [1.260"] LEAD

MICROE 3100 SERIES ROTARY ENCODER

BALL SPLINE
THE BALLS ARE CAPTIVE IN THE SPLINE HOUSING
AND THUS CAN BE DISASSEMBLED EASILY WITHOUT
LOSE OF PRE-LOAD OR ACURRACY.

BELLVILLE SPRINGS
FORCE=576 LBS

GAP OPENS UP WHEN BELLVILLE
SPRINGS ARE OVER POWERED BY PISTON

COMPRESSION SPRING(8X)
FORCE=77 LBS

MOTOR CABLE

PISTON
FORCE AT 80 PSIG=1000 LBS

PISTON AIR INLET

PISTON HOUSING

GAP CLOSSES WHEN AIR IS APPLIED

TEFLON O-RING SEAL
APPROX DRAG DURING
THETA MOTION= 5 IN-LBS

ETEL TMA 0140-050 MOTOR
95 IN-LBS CONTINUOUS TORQUE
386 IN-LBS PEAK TORQUE

BALL SCREW NUT

MICROE 3100 SERIES ROTARY ENCODER

INTERIA DYNAMICS SAB 180 SPRING
APPLIED ELECTRIC BRAKE (FAIL SAFE)

THE SERVO MOTOR NORMALLY ROTATES THE
BALL SCREW NUT, RESULTING IN Z AXIS
TRAVEL OF THE HOLLOW SHAFT. THE BALL
SPLINE IS PREVENTED FROM ROTATING BY THE
BELLVILLE SPRINGS LOCKING IT TO THE
HOUSING.

WHEN AIR IS APPLIED TO THE PISTON, THE
PISTON HOUSING FIRST MOVES DOWN TO
CONTACT THE BALL SCREW NUT. WHEN THE
PRESSURE BUILDS THE PISTON OVER POWERS
THE BELLVILLE SPRINGS AND THE BALL
SPLINE IS FREE TO ROTATE WITH THE BALL
SCREW NUT AND THUS THETA ROTATION CAN
OCCUR.

THIS DESIGN ALLOWS ONE MOTOR TO DRIVE
BOTH Z AND THETA MOTIONS.

THE DESIGN ALSO INSURES THAT THE BALL
SPLINE IS EITHER LOCKED TO THE FIXED
HOUSING OR LOCKED TO THE BALL SCREW
NUT. IT IS NEVER FREE TO ROTATE
UNCONTROLLED.

FLANGE, SAME INTERFACE AS CURRENT DESIGN