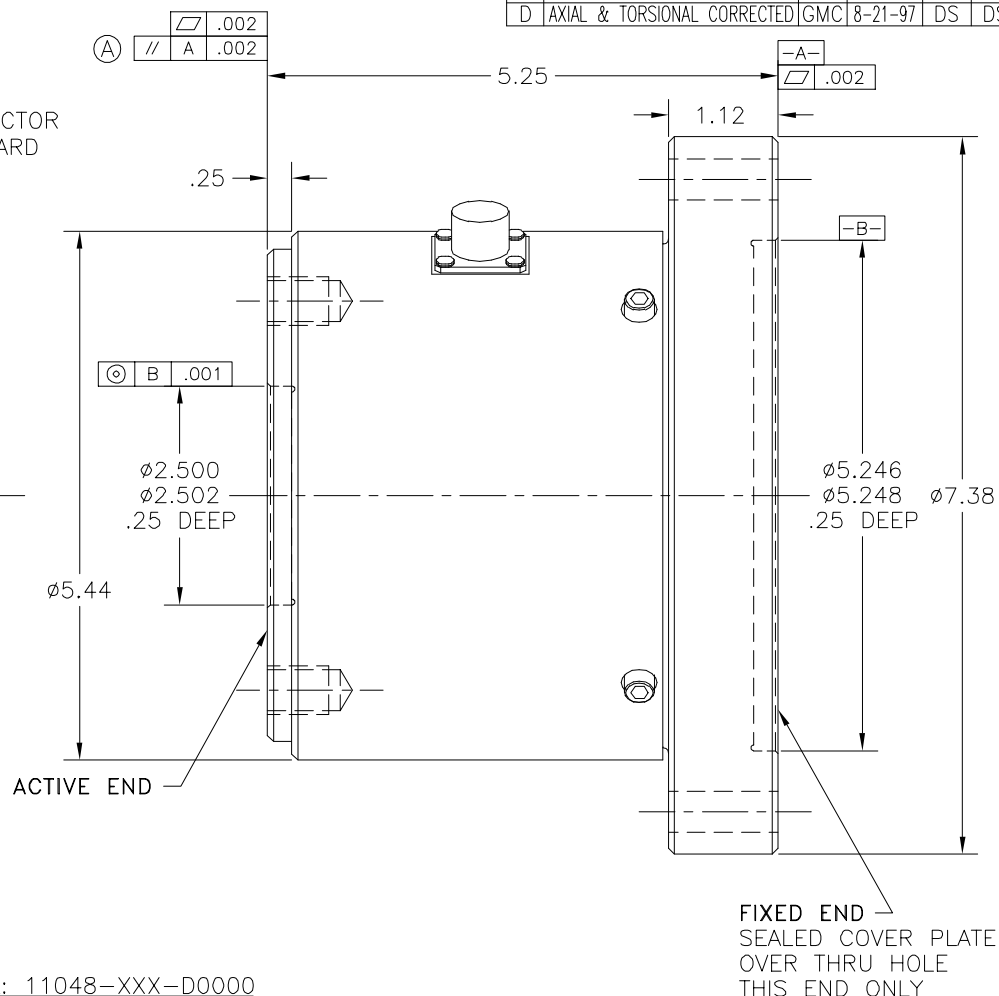
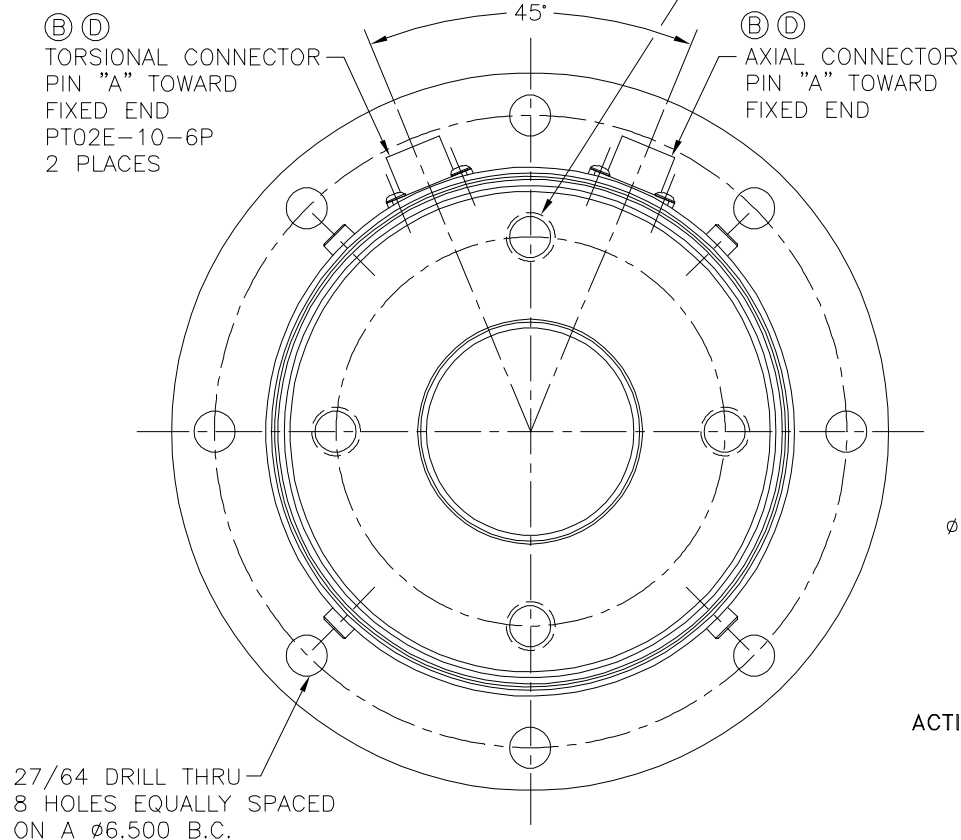


	FLATNESS OF A SURFACE		PERPENDICULARITY
	STRAIGHTNESS OF A LINE		PARALLELISM
	ROUNDNESS		ANGULARITY
	CYLINDRICITY		CIRCULAR RUNOUT
	PROFILE OF A SURFACE		TOTAL RUNOUT
	PROFILE OF A LINE		TRUE POSITION
	SYMMETRY		CONCENTRICITY

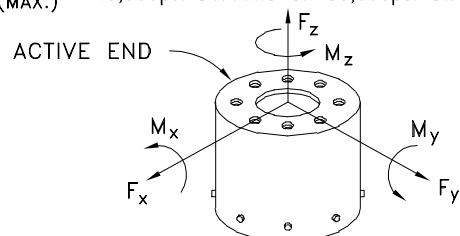
REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
—	REL. FOR PRODUCTION	—	—	—	—	5-19-94
A	1/2-13 TAP WAS 1/2-20; GEO. TOL. REVISED	GMC	5-24-94	DS	DS	5-26-94
B	AXIAL & TORSIONAL CORRECTED	GMC	8-9-94			-----
C	ADDED CHART & OOA CAPACITY	DG	7-1-97	DS	DS	7-5-97
D	AXIAL & TORSIONAL CORRECTED	GMC	8-21-97	DS	DS	8-21-97



EXTRANEOUS LOAD EQUATION (MAX. STRESS)

$$\sigma_{(MAX.)} = aF_x + bF_y + cF_z + dM_x + eM_y + fM_z$$

$$\sigma_{(MAX.)} = 40,000\text{psi DYNAMIC OR } 80,000\text{psi STATIC}$$



SPECIFICATIONS	MODEL: 11048-XXX-D0000
CAPACITY-TORQUE (IN. LBS.) F.S. ———	CHARTED
CAPACITY-AXIAL (LBS.) F.S. ———	CHARTED
OUTPUT (mV/V) NOM., F.S. ———	2.0
NON-LINEARITY-EACH AXIS (%F.S.O.) ———	.10
HYSTERESIS-EACH AXIS (%F.S.O.) ———	.10
TEMP. COMP. RANGE ———	+70° F to +170° F
OVERLOAD CAPACITY (%F.S.) ———	150

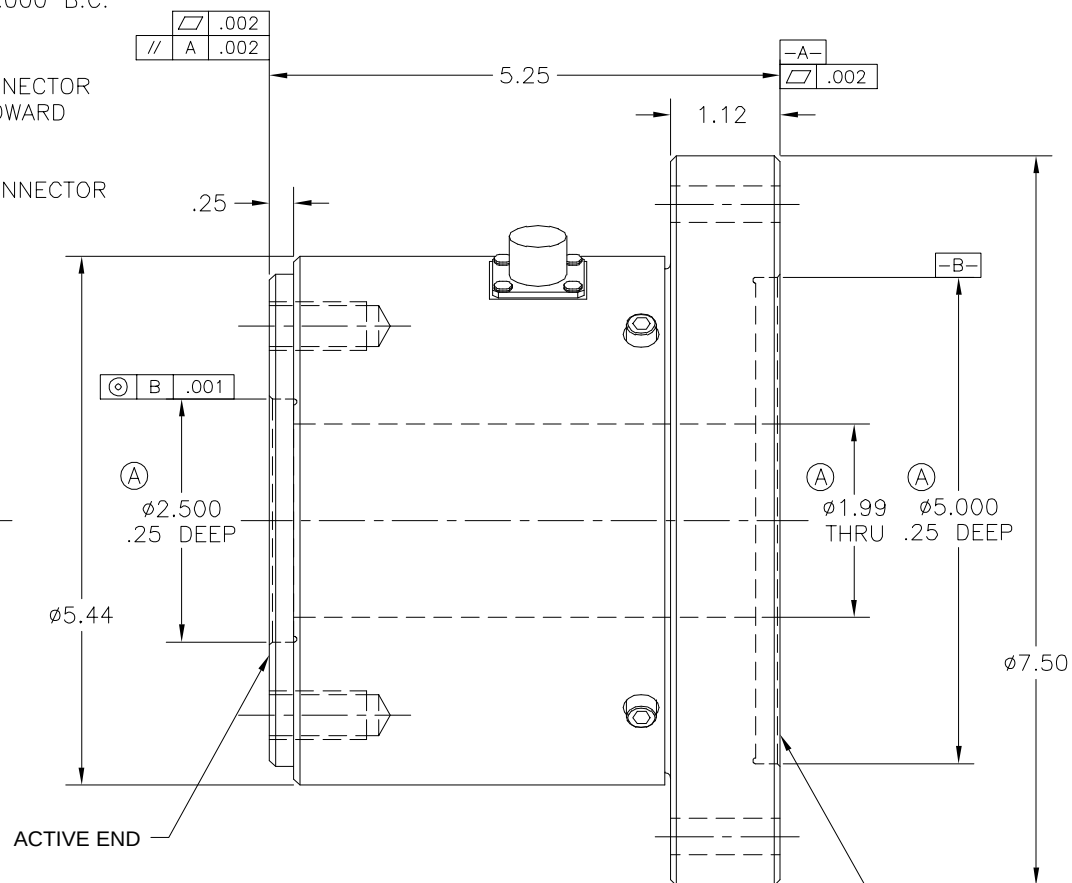
11048-052-D0000	500#/500IN#	60.4	51.3	49.2	41.4
11048-00A-D0000	5000#/2500IN#	21.4	3.4	2.8	8.5
MODEL NO.	CAPACITY F _z /M _z	a&b	c	d&e	f
EXTRANEQUS LOAD COEFFICIENTS					

POLARITY: C.W. TORQUE UPSCALE
COMPRESSION DOWNSCALE
ASSEMBLY DWG REF: 17493C0-*
*-INDICATES CURRENT REV

PIN CODE	
PIN	FUNCTION
A	+ EXC.
B	+ SIG.
C	- SIG.
D	- EXC.
E	N/C
F	N/C

INSTALLATION		CHECKED BY	D.S.
MODEL: 11048-XXX-D0000		PROJ. ENG.	D.S.
FINISH	SCALE	DRAWN BY	GMC
MATRL.		DATE	5-17-94
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		D.E. REVIEW	
X.X ±.03 X.XX ±.01 X.XXX ±.005 ANG. ±.5°		BY	DATE
Sensor Developments Inc. 1050 W SILVER BELL RD ORION, MI 48359		DRAWING NUMBER	16135C0-D

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
B	3/8 DRILL THRU WAS 13/32	GMC	10-30-06	-	-	10-30-06
C	CONNECTORS RELOCATED	GMC	1-4-07			- -
	TOWARD FIXED END					



FIXED END ↘
SEALED COVER PLATE
OVER THRU HOLE
THIS END ONLY

SPECIFICATIONS	MODEL: 11048-00B-D0000
CAPACITY-TORQUE Fz (IN. LBS.) F.S.	10,000
CAPACITY-AXIAL Mz (LBS.) F.S.	20,000
OUTPUT (mV/V) NOM., F.S.	2.0
NON-LINEARITY-EACH AXIS (%F.S.O.)	.10
HYSTERESIS-EACH AXIS (%F.S.O.)	.10
TEMP. COMP. RANGE	+70° F to +170° F
OVERLOAD CAPACITY (%F.S.)	150

A diagram of a cylindrical piezoelectric actuator. The top surface is labeled "ACTIVE END". A vertical axis passes through the center of the cylinder. At the top of this axis, a curved arrow indicates a moment M_z and a vertical arrow indicates a force F_z . On the side of the cylinder, two horizontal axes are shown. One axis has a curved arrow for a moment M_x and a straight arrow for a force F_x . The other axis has a curved arrow for a moment M_y and a straight arrow for a force F_y . The cylinder has several small circles on its top and side surfaces, representing piezoelectric actuators.

5.20	1.03	.93	3.25
a&b	c	d&e	f
EXTRANEOUS LOAD COEFFICIENTS			

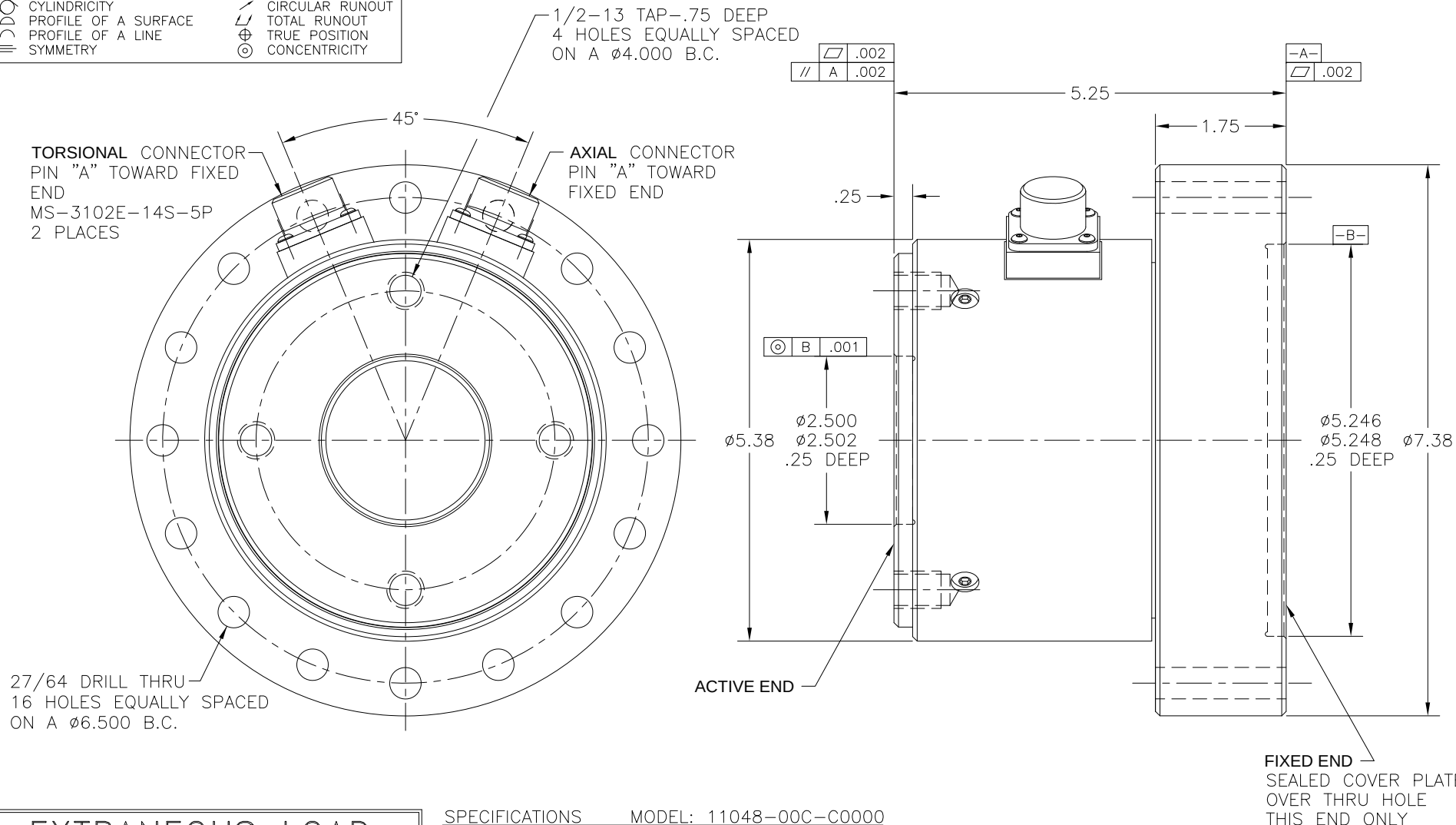
POLARITY: C.W. TORQUE UPSCALE
COMPRESSION DOWNSCALE
ASSEMBLY DWG REF: 19950C0-*
*-INDICATES CURRENT REV

PIN CODE	
PIN	FUNCTION
A	+ EXC.
B	+ SIG.
C	- SIG.
D	- EXC.
E	N/C
F	N/C

INSTALLATION		CHECKED BY	D.S.
MODEL: 11048-00B-D0000		PROJ. ENG.	D.S.
FINISH	SCALE	DRAWN BY	
	FULL	GMC	
MATRL.		DATE	9-27-06
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES		D.E. REVIEW	
X.X ±.03 X.XX ±.01 X.XXX ±.005 ANG. .5°		BY	DATE
Sensor Developments Inc. 1050 W SILVER BELL RD ORION, MI 48359		DRAWING NUMBER	
		19951C0-C	

	FLATNESS OF A SURFACE		PERPENDICULARITY
	STRAIGHTNESS OF A LINE		PARALLELISM
	ROUNDNESS		ANGULARITY
	CYLINDRICITY		CIRCULAR RUNOUT
	PROFILE OF A SURFACE		TOTAL RUNOUT
	PROFILE OF A LINE		TRUE POSITION
	SYMMETRY		CONCENTRICITY

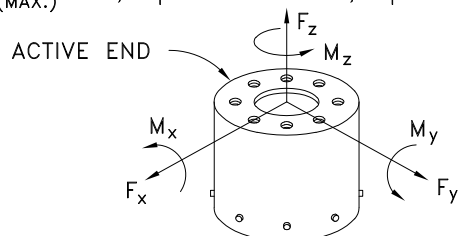
REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
-	REL. FOR PRODUCTION	-	-	-	-	6-3-10



EXTRANEOUS LOAD EQUATION (MAX. STRESS)

$$\sigma_{(MAX.)} = aF_x + bF_y + cF_z + dM_x + eM_y + fM_z$$

$$\sigma_{(MAX.)} = 40,000\text{psi DYNAMIC OR } 80,000\text{psi STATIC}$$



SPECIFICATIONS MODEL: 11048-00C-C0000

CAPACITY-TORQUE (IN. LBS.) F.S. 2,500

CAPACITY-AXIAL (LBS.) F.S. 2,500

OUTPUT (mV/V) NOM., F.S. 2.0

NON-LINEARITY-EACH AXIS (%F.S.O.) .10

HYSTERESIS-EACH AXIS (%F.S.O.) .10

TEMP. COMP. RANGE +70° F to +170° F

OVERLOAD CAPACITY (%F.S.) 150

16.5	8.0	7.9	5.7
a&b	c	d&e	f
EXTRANEOUS LOAD COEFFICIENTS			

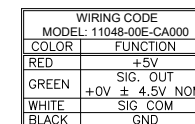
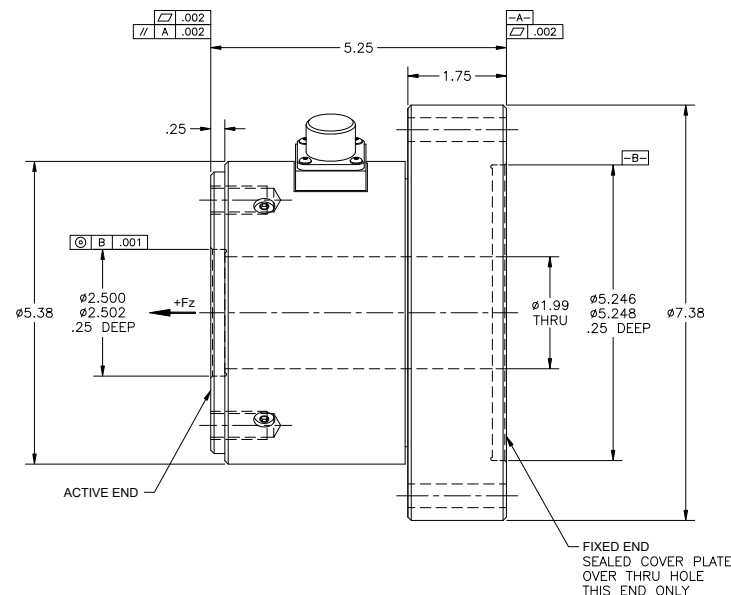
POLARITY: C.W. TORQUE UPSCALE
COMPRESSION DOWNSCALE
ASSEMBLY DWG REF: 20559C0-*
*-INDICATES CURRENT REV

BOTH BRIDGES

PIN CODE	
PIN	FUNCTION
A	+ EXC.
B	+ SIG.
C	- SIG.
D	- EXC.
E	N/C

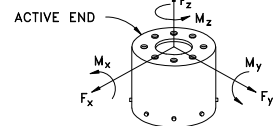
INSTALLATION		CHECKED BY D.S.	
MODEL: 11048-00C-C0000		PROJ. ENG. D.S.	
FINISH	SCALE FULL	DRAWN BY GMC	
MATRL.		DATE 5-28-10	
UNLESS OTHERWISE SPECIFIED DIM'S ARE IN INCHES X.X ±.03 X.XX ±.01 X.XXX ±.005 ANG. ±.5°		D.E. REVIEW	
BY		DATE	
Sensor Developments Inc. ORION, MI 48359		DRAWING NUMBER	
		20560C0-0	

REV	DESCRIPTION	BY	DATE	CHK	ENG	REL DATE
-	REL. FOR PRODUCTION	-	-	-	-	10-27-16



WIRING CODE	
MODEL: 11048-00E-CB000	
COLOR	FUNCTION
RED	+11V - +15V
GREEN	SIG. OUT
WHITE	+0V $\pm$ 10V NOM
BLACK	SIG COM
	GND

$$\sigma_{(MAX.)} = aF_x + bF_y + cF_z + dM_x + eM_y + fM_z$$

$$\sigma_{(MAX.)} = 40,000\text{psi DYNAMIC OR } 80,000\text{psi STATIC}$$


21.3	3.2	2.8	12.9	.80E6	10.3E6	27.8E6	4.3E6
a=b	c	d=e	f	Kx=Ky	Kz	KMx=KM _y	KMz
EXTRANEOUS LOAD VALUES				SPRING RATES (#/IN OR IN #/RAD)			

(2) SEPARATE CABLES FOR TORQUE & THRUST
FOR MODELS 11048-00E-CA000 & 11048-00E-CB000

MODEL: 11048-00E-CX000

CAPACITY-TORQUE (IN. LBS.) F.S.	4,000
CAPACITY-AXIAL (LBS.) F.S.	4,000
OUTPUT (mV/V) NOM., F.S.-TORQUE	2.0
OUTPUT (mV/V) NOM., F.S.-AXIAL	1.25
NON-LINEARITY-EACH AXIS (%F.S.O.)	.10
HYSTERESIS-EACH AXIS (%F.S.O.)	.10
TEMP. COMP. RANGE	+70° F to +170° F
OVERLOAD CAPACITY (%F.S.)	150

POLARITY: C.W. TORQUE UPSCALE
COMPRESSION DOWNSCALE
ASSEMBLY DWG REF: 21882D0-*
*-INDICATES CURRENT REV

BOTH BRIDGES		INSTALLATION		CHECKED BY D.S.	
PIN CODE MODEL: 11048-00E-C0000		MODEL: 11048-00E-CX000		PROJ. ENG. D.S.	
FINISH		SCALE FULL		DRAWN BY GMC	
PIN	FUNCTION	MATRL.		DATE 10-13-16	
A + EXC.		UNLESS OTHERWISE SPECIFIED DIMS ARE IN INCHES X.X ± 0.03 XXX ± 0.01 XXXX ± 0.005 ANG. ± 5		D.E. REVIEW	
B + SIG.	BY DATE				
C - SIG.					
D - EXC.					
E N/C		Sensor Developments Inc.		DRAWING NUMBER 218R300-0	
		1050 W SILVER BELL RD ORON, MI 48359			



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