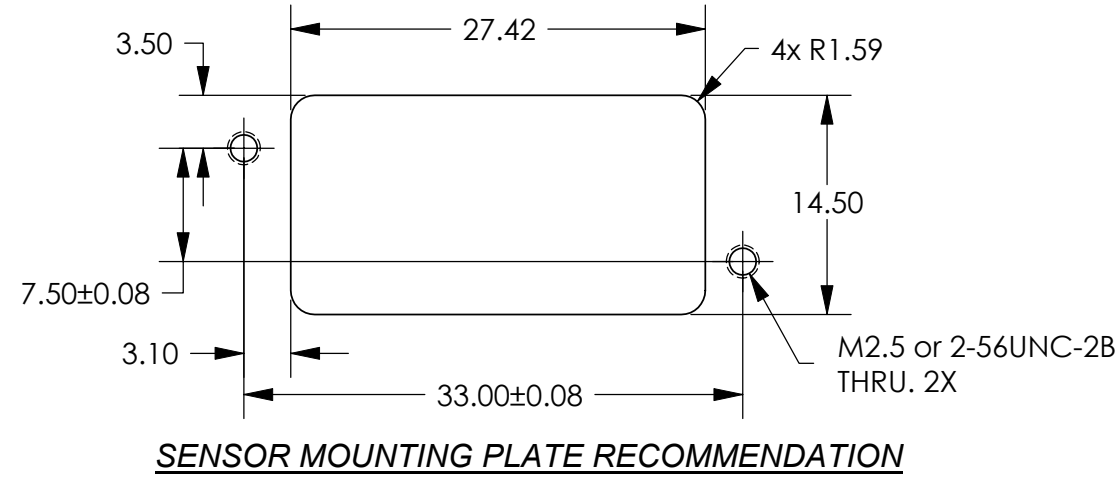
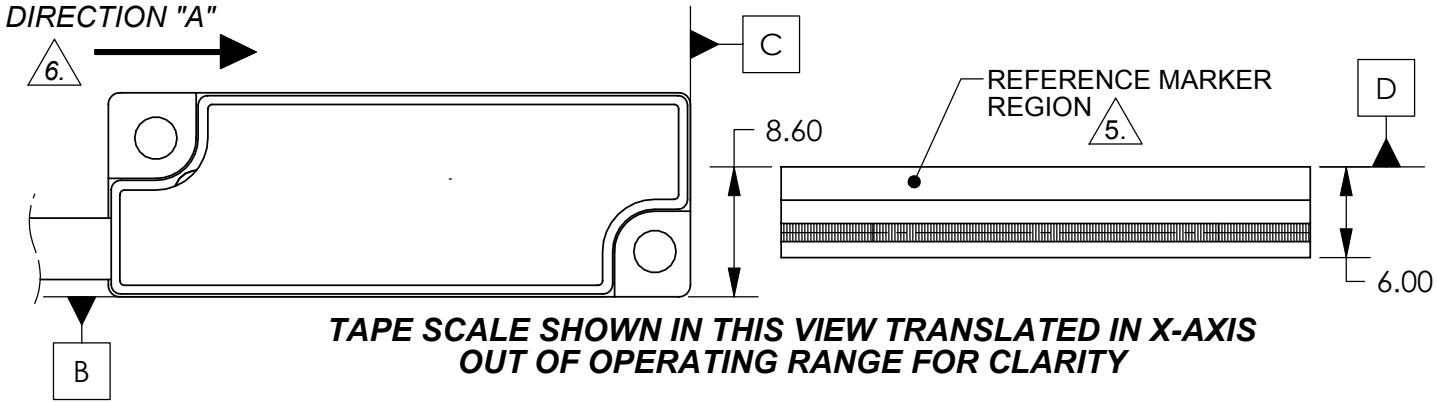
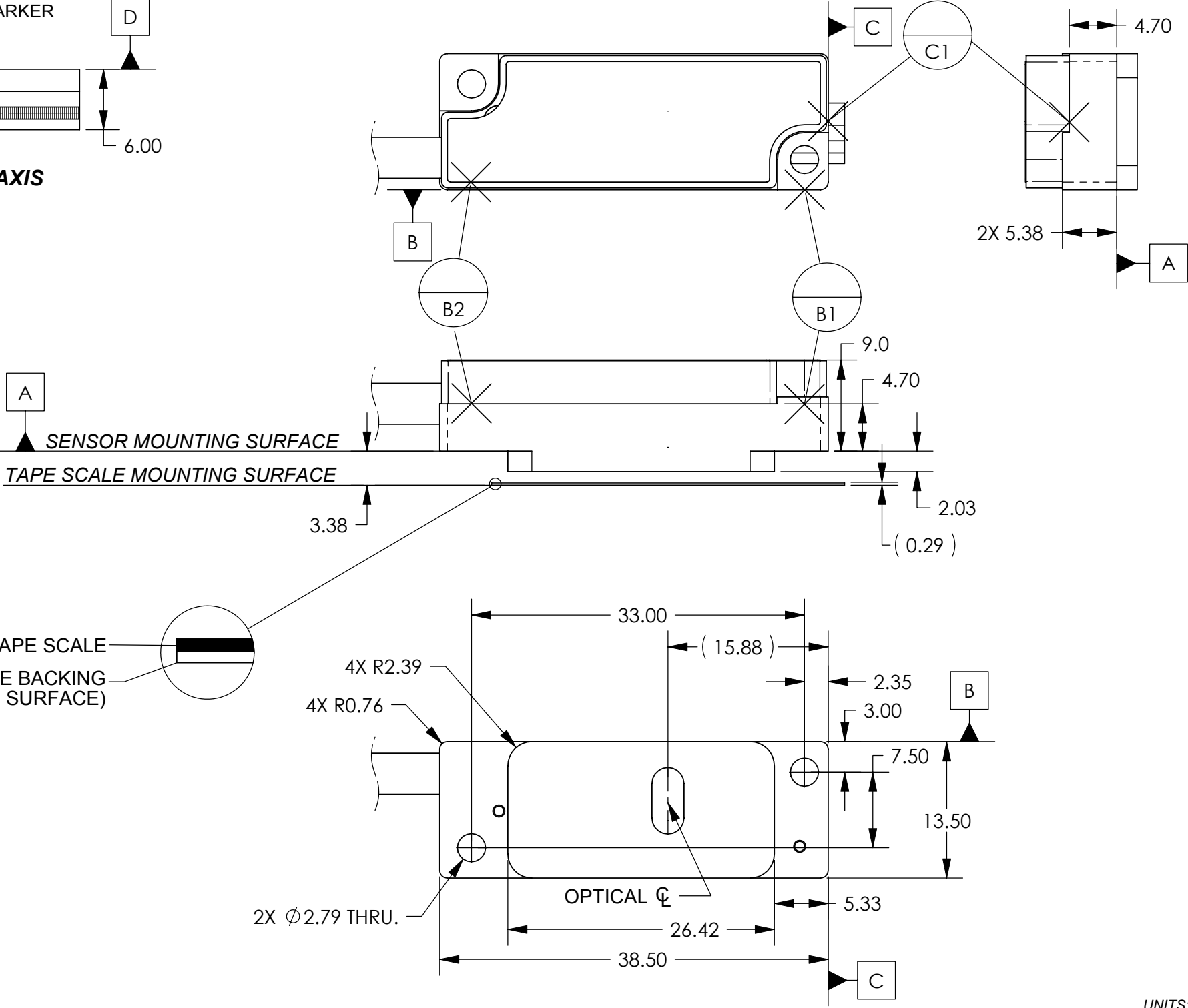




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REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
1	---	INITIAL	7/28/08	VB
2	2121	ADDED WIRE COLORS TO TABLES 2 & 3, MTG PLATE REC. UPDATED ADDRESS.	7/7/09	VB



- NOTES:**
1. RECOMMENDED MOUNTING HARDWARE:
2-56 or M2.5 SCREWS
 2. IF BENCHING PINS ARE TO BE USED, PINS MUST BE PLACED ALONG DATUM EDGES OF SENSOR FOR PROPER ALIGNMENT.
(REFERENCE DATUMS B1,B2 AND C1).
 3. HEIGHT OF SENSOR BENCHING PINS MUST NOT EXCEED HEIGHT OF SENSOR BODY (4.70mm).
 4. RECOMMENDED SENSOR MOUNTING PLATE THICKNESS:
MINIMUM: 4 SCREW THREADS
MAXIMUM: ALLOW FOR CLEARANCE TO SCALE AND SCALE MOUNTING HARDWARE
(BENCHING SURFACES, TRENCHES, ETC.)
5. SEE PAGE 3 FOR DIMENSIONS FOR LOCATIONS OF REFERENCE MARKERS.
6. WHEN SCALE MOVES IN DIRECTION "A" WITH RESPECT TO A STATIONARY SENSOR, OUTPUT SIGNAL A+ (PIN 14) LEADS OUTPUT SIGNAL B+ (PIN 13). THIS APPLIES TO QUADRATURE SENSOR ONLY.



UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994			APPROVALS		DATE		<div><div><div>GSI</div><div></div></div><div>MicroE Systems Division of GSI Group</div><div>125 Middlesex Tpk. Bedford, MA 01730</div></div>							
			DRAWN S.BUTURLIA		7/10/08									
			CHECKED A.GOLDMAN		7/23/08									
			ENGRG.											
TOLERANCES ARE: DECIMALS: .X ± .25 .XX ± .13			MFG ENG		DESCRIPTION: INTERFACE, ENCODER, 20um, TAPE SCALE w/INDEX AND REFERENCE MARKERS, MERCURY II 5000 SENSOR									
			QA											
							SIZE B		DWG. NO. ID-00353		REV. 2			
							SCALE:		CAD FILE:		 3rd ANGLE PROJECTION		SHEET 1 OF 4	

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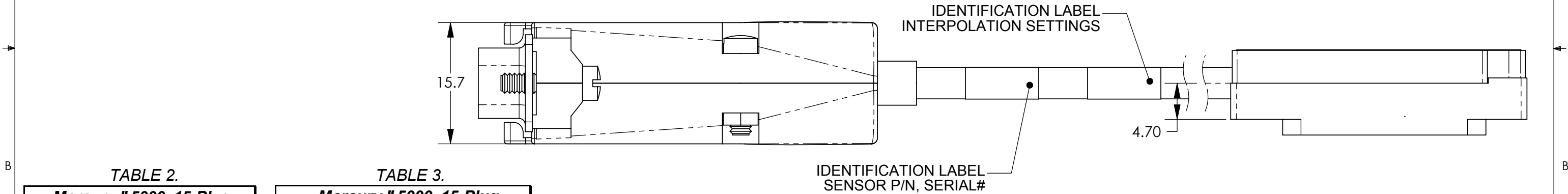
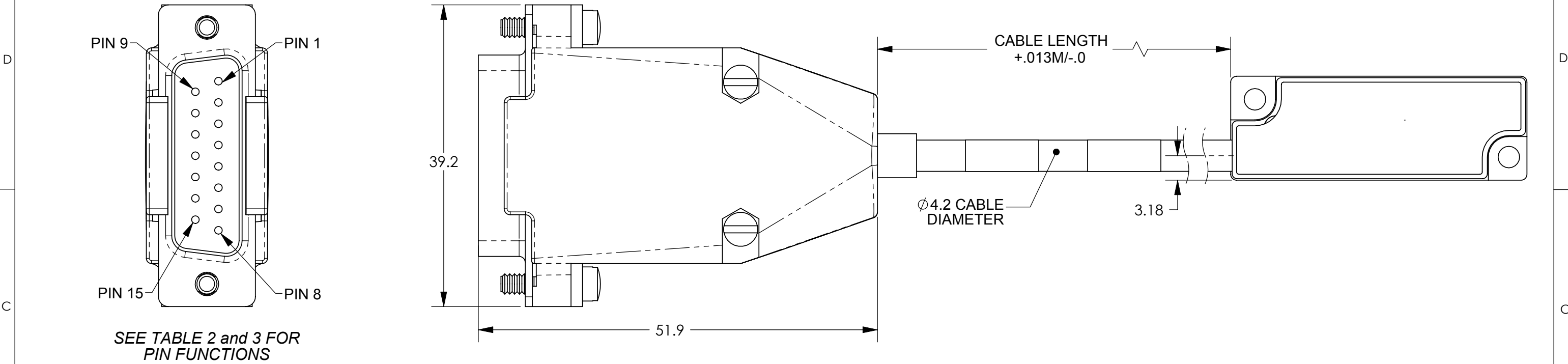


TABLE 2.

Mercury II 5000 15-Plug Quadrature Output		
Pin	Wire color	Function
1	Brown	RL+
3	White	RL-
2	Black	GND
7	Red	5V
4	White	I-
12	Green	I+
5	White	B-
13	Blue	B+
6	White	A-
14	Violet	A+
8	Red	5V
9	Black	GND
10	Gray	LL+
11	White	LL-
15	Black	Inner Shield*

TABLE 3.

Mercury II 5000 15-Plug Serial Output		
Pin	Wire color	Function
1	Brown	nCS+
3	White	nCS-
2	Black	GND
7	Red	5V
4	White	DIAG_IN_OUT-
12	Green	DIAG_IN_OUT+
5	White	SCLOCK_OUT-
13	Blue	SCLOCK_OUT+
6	White	SDATA_OUT-
14	Violet	SDATA_OUT+
8	Red	5V
9	Black	GND
10	Gray	SCLOCK_IN+
11	White	SCLOCK_IN-
15	Black	Inner shield*

NOTES:

* GND AND INNER SHIELD ARE INTERNALLY CONNECTED.

HIGHLIGHTED PINS ARE INTERNALLY CONNECTED INSIDE D-SUB WITH JUMPER WIRES.

TABLE 1.

Cable Lengths	
1 Meter	
3 Meter	
5 Meter	
Custom	

UNITS: mm

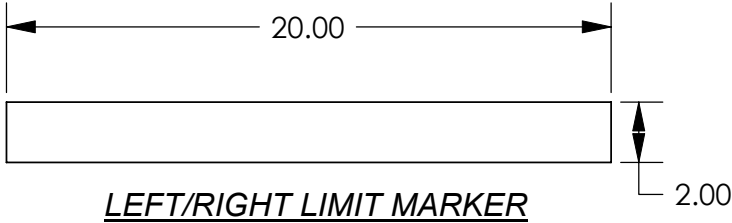
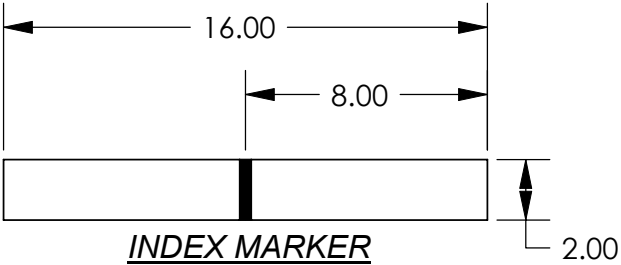
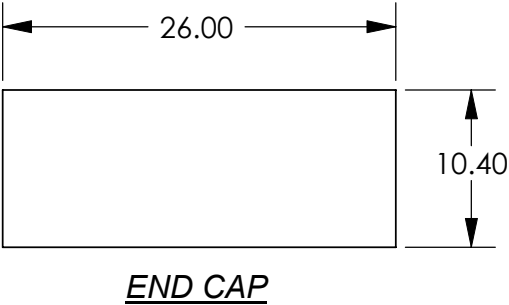
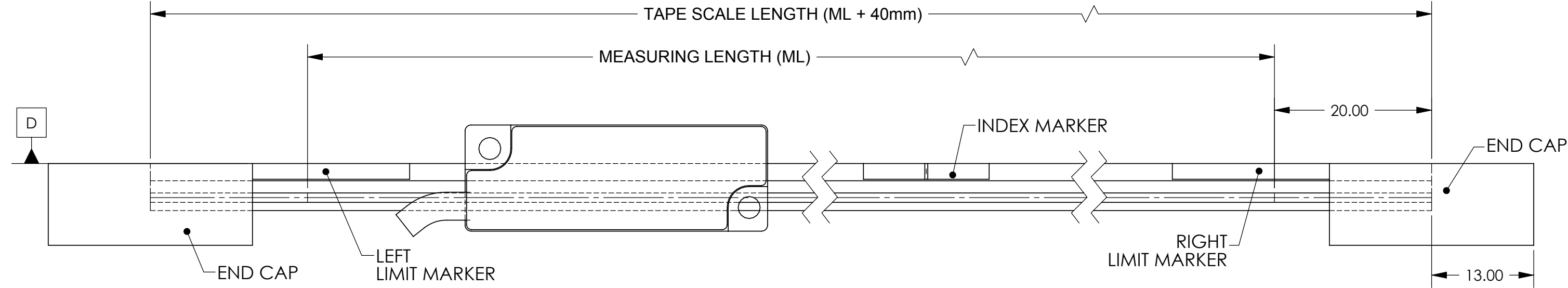
GSI MicroE Systems
Division of GSI Group

125 Middlesex Tpk.
Bedford, MA 01730

DESCRIPTION: INTERFACE, ENCODER, 20um,
TAPE SCALE w/INDEX AND
REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE B	DWG. NO. ID-00353	REV. 2
SCALE:	CAD FILE:	3rd ANGLE PROJECTION SHEET 2 OF 4

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- NOTES:
- BEFORE PLACING INDEX MARKERS, LIMIT MARKERS, AND END CAPS, REMOVE BLUE PROTECTIVE FILM FROM TAPE SCALE.
 - NOTE DATUM EDGE OF TAPE SCALE AND REFERENCE MARKER REGION BEFORE APPLYING MARKERS.
 - END CAPS, LIMITS AND INDEX MARKERS ARE OPTIONAL (SEE INSTALLATION MANUAL).
 - LIMIT MARKERS CAN BE PLACED AT ENDS OF TAPE SCALE WHEN END CAPS ARE NOT USED.
 - END CAPS, LIMITS AND INDEX MARKERS SHALL NOT OVERLAP (MAY CAUSE INTERFERENCE WITH SENSOR).
 - FOR LONGER OR SHORTER LENGTHS OF MARKERS CALL MICROE SYSTEMS FOR DETAILS.

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DESCRIPTION:
INTERFACE, ENCODER, 20um,
TAPE SCALE w/INDEX AND
REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE B	DWG. NO. ID-00353	REV. 2
SCALE:	CAD FILE:	3rd ANGLE PROJECTION
SHEET		3 OF 4

UNITS: mm

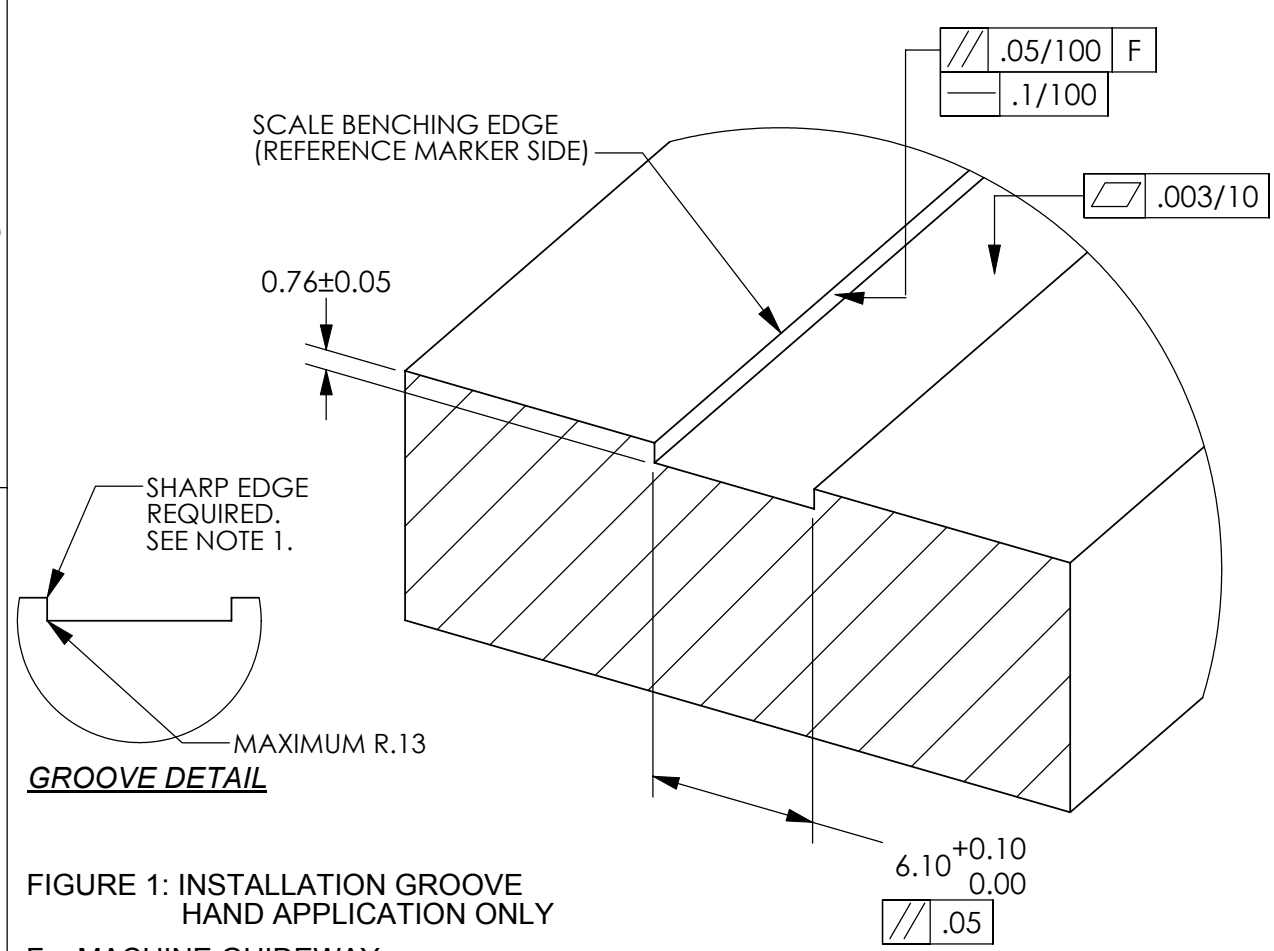


FIGURE 1: INSTALLATION GROOVE
HAND APPLICATION ONLY
F = MACHINE GUIDEWAY

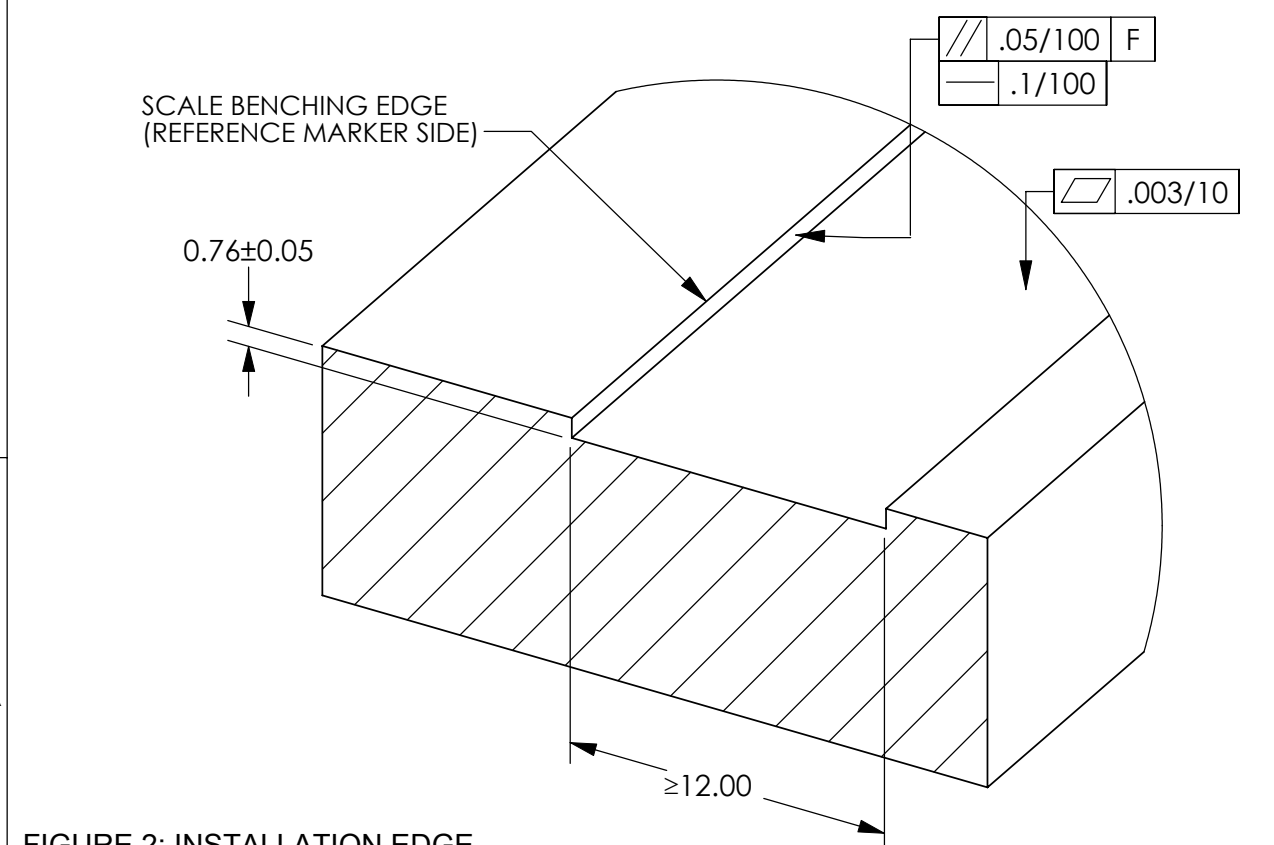


FIGURE 2: INSTALLATION EDGE
USE WITH TAPE APPLICATOR
F = MACHINE GUIDEWAY

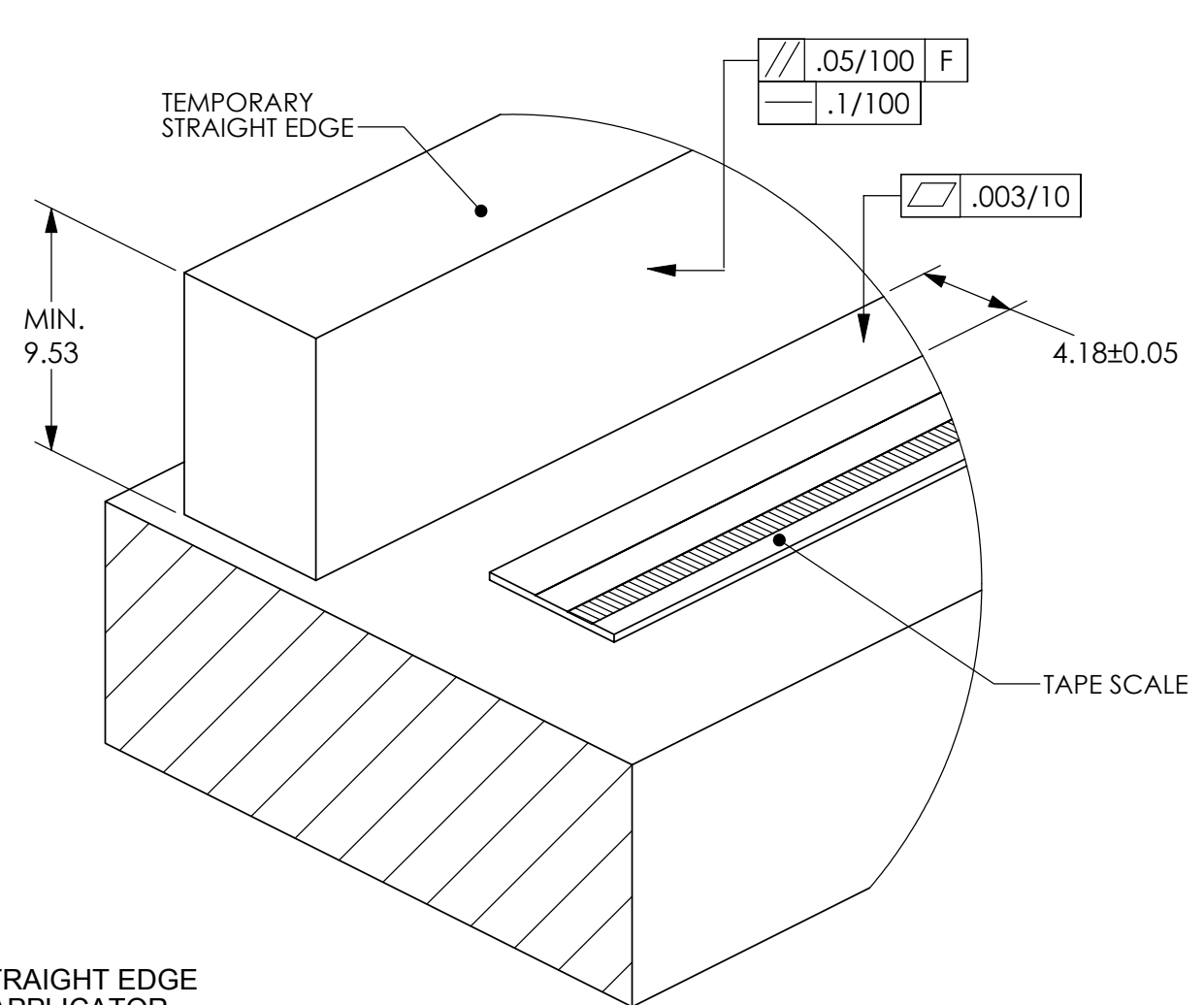


FIGURE 3: INSTALLATION STRAIGHT EDGE
USE WITH TAPE APPLICATOR
F = MACHINE GUIDEWAY

- NOTES:
1. MICROE SYSTEMS RECOMMENDS UTILIZING AN EDGE AS A GUIDE IN ORDER TO MAINTAIN STRAIGHTNESS OF THE SCALE DURING MOUNTING. THIS EDGE MAY BE TEMPORARY OR PERMANENT AND SHOULD FOLLOW THE APPLICATION GUIDELINES IN FIGURES 1-3.
 2. THE TAPE SCALE APPLICATOR TOOL IS RECOMMENDED FOR INSTALLATION OF SCALES AND, IN PARTICULAR, THOSE LONGER THAN 250 MILLIMETERS. SHORTER SCALES MAY BE APPLIED EITHER BY HAND OR WITH APPLICATOR TOOL. PLEASE SEE INSTRUCTION MANUAL FOR DETAILS.
 3. THE INSTALLATION METHOD SHOWN IN FIGURE 1 SHOULD INVOLVE HAND INSTALLATIONS ONLY. THE APPLICATOR TOOL IS NOT COMPATIBLE WITH THIS METHOD. IN ADDITION END CAPS CANNOT BE USED WITH THIS METHOD.
 4. FOR APPLICATIONS WHERE MACHINING THE MOUNTING SURFACE IS NOT DESIRED, A TEMPORARY STRAIGHTEDGE CAN BE USED. A STAINLESS STEEL RULE MAY BE USED AS IN FIGURE 2 IF THE RULE MEETS THE THICKNESS REQUIREMENT. OTHERWISE, THE TEMPORARY STRAIGHTEDGE MAY BE USED AS SHOWN IN FIGURE 3.
 5. IN FIGURE 3, THE OUTSIDE REFERENCE SURFACE OF THE TOOL SLIDES AGAINST THE TEMPORARY STRAIGHTEDGE, AND THE TAPE SCALE IS THEREFORE OFFSET FROM THE EDGE AS SHOWN. IF THIS OFFSET IS TOO SMALL FOR THE APPLICATION, THE CUSTOMER MAY DESIRE TO CREATE A SPACER THAN CAN ATTACH TO THE OUTSIDE SURFACE OF THE TOOL. PLEASE SEE INSTRUCTION MANUAL FOR DETAILS.
 6. IN FIGURES 1 AND 2, THE SCALE BENCHING EDGE IS INTENDED TO AID THE INSTALLATION OF REFERENCE MARKERS. FOR APPLICATIONS SUCH AS IN FIGURE 3, THE CUSTOMER MAY USE A TEMPORARY BENCHING SURFACE TO INSURE THE PROPER INSTALLATION OF THE REFERENCE MARKERS. PLEASE SEE INSTRUCTION MANUAL FOR DETAILS. THE EDGE OF THE GROOVE OR STRAIGHTEDGE MUST BE SHARP ON BENCHING SIDE IN ORDER FOR APPLICATOR TO USE AS A GUIDE. IN ORDER FOR THE TAPE SCALE TO MOUNT CLOSE TO THIS EDGE, A MAXIMUM RADIUS OF .13 SHOULD BE USED WHERE THE EDGE MEETS THE BOTTOM OF THE MOUNTING SURFACE.

UNITS: mm

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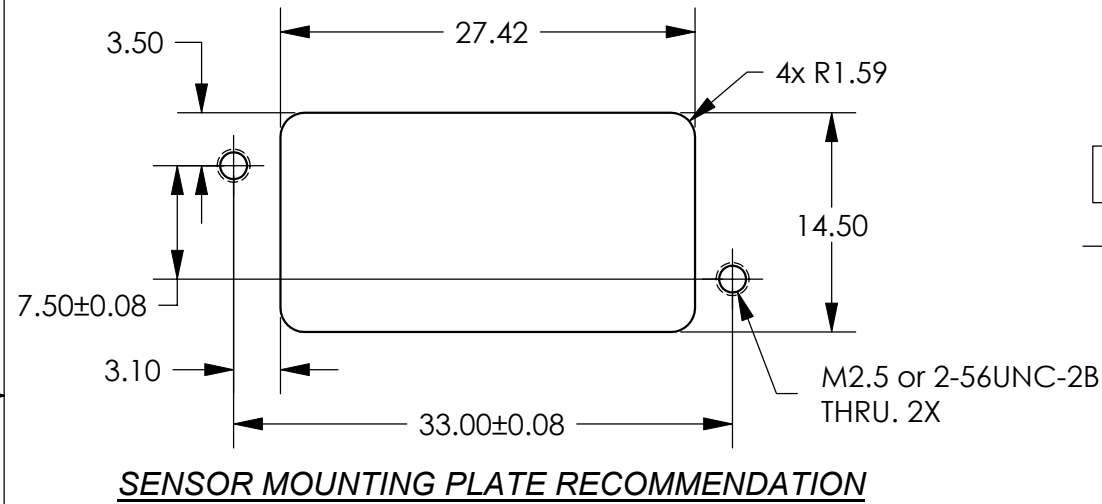
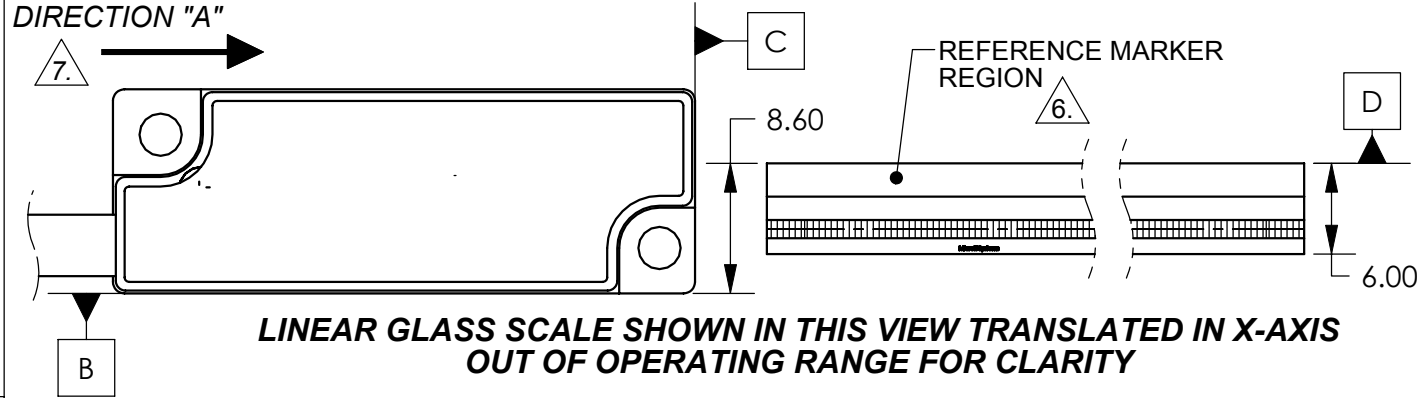
125 Middlesex Tpk.
Bedford, MA 01730

DESCRIPTION: INTERFACE, ENCODER, 20um,
TAPE SCALE w/INDEX AND
REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE B	DWG. NO. ID-00353	REV. 2
SCALE:	CAD FILE:	3rd ANGLE PROJECTION SHEET 4 OF 4

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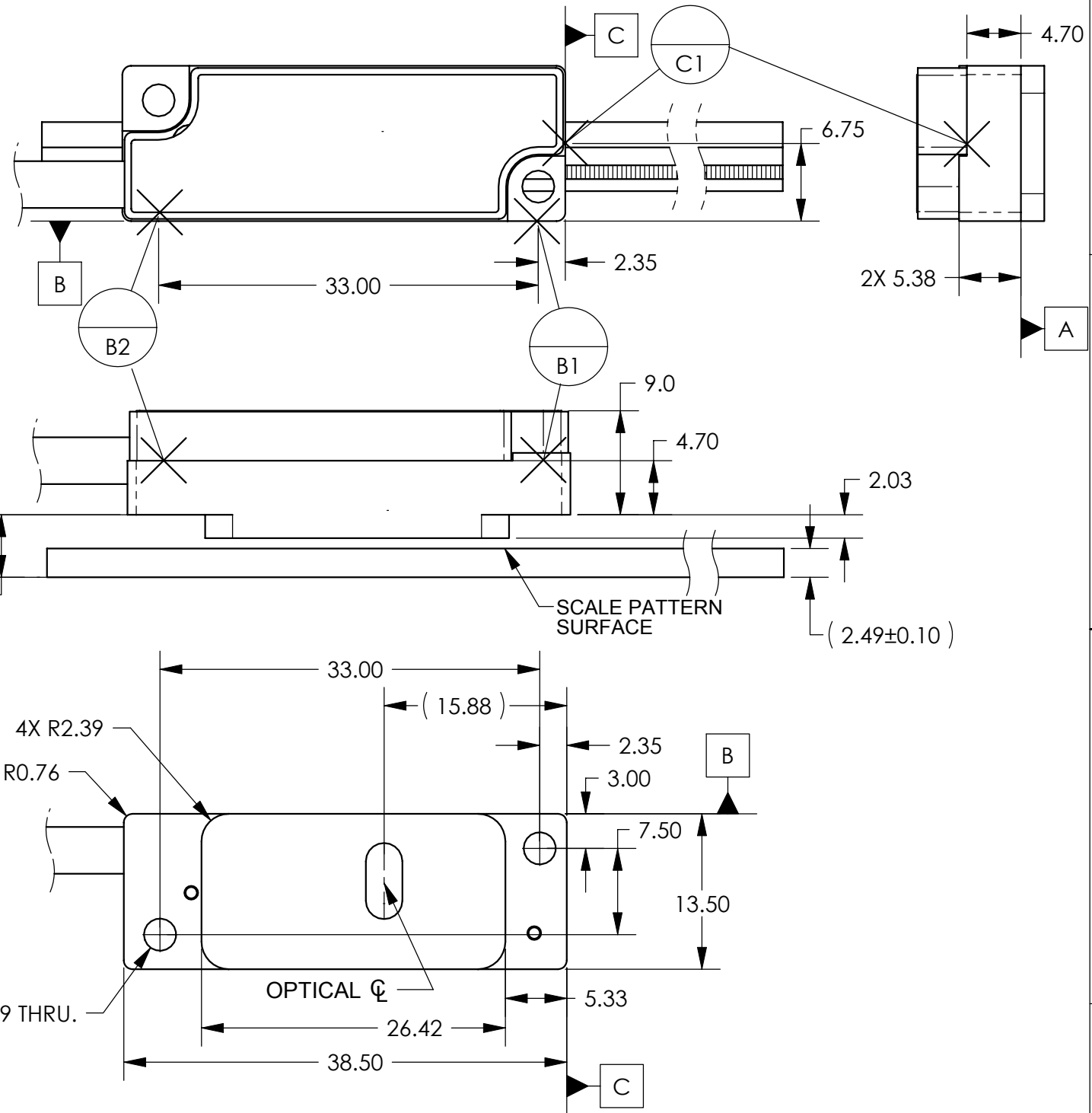
REVISIONS				
LTR	ECO	DESCRIPTION	DATE	APPROVED
1	---	INITIAL	7/28/08	VB
2	2121	ADDED WIRE COLORS TO TABLES 2 & 3, MTG PLATE REC., UPDATED ADDRESS.	7/7/09	VB



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 3. HEIGHT OF SENSOR BENCHING PINS MUST NOT EXCEED HEIGHT OF SENSOR BODY (4.70mm).
 4. HEIGHT OF SCALE BENCHING PINS NOT TO EXCEED THE THICKNESS OF THE SCALE.
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(BENCHING SURFACES, TRENCHES, ETC.)

6. SEE PAGE 3 FOR DIMENSIONS FOR LOCATIONS OF REFERENCE MARKERS.

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UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994			APPROVALS		DATE		<div><div><div><div><div></div><div>GSI</div></div><div><div><div><div></div><div>MicroE Systems</div><div>Division of GSI Group</div></div><div>125 Middlesex Tpk. Bedford, MA 01730</div></div></div><div>DESCRIPTION: INTERFACE, ENCODER, 20um, SHORT LINEAR SCALE w/INDEX and REFERENCE MARKERS, MERCURY II 5000 SENSOR</div></div></div></div>		
			DRAWN S.BUTURLIA		7/11/08				
			CHECKED A.GOLDMAN		7/23/08				
			ENGRG.						
			MFG ENG						
TOLERANCES ARE: DECIMALS: .X ± .25 .XX ± .13			ANGULAR: ±30 MIN.						
			QA						

UNITS: mm

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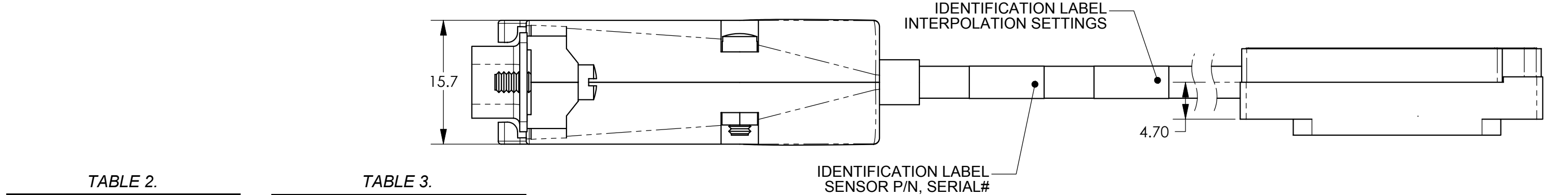
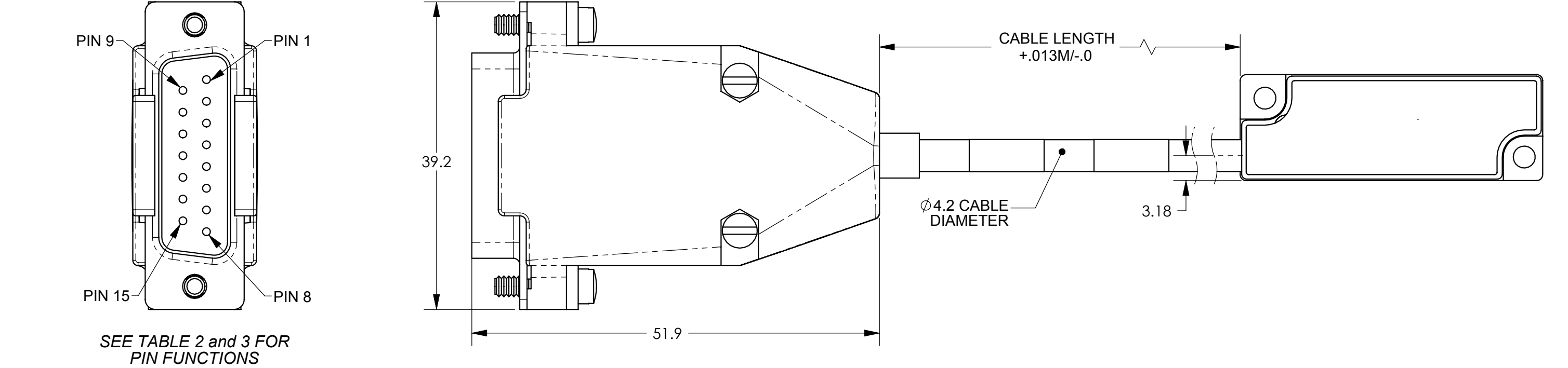


TABLE 2.

Mercury II 5000 15-Plug Quadrature Output		
Pin	Wire color	Function
1	Brown	RL+
3	White	RL-
2	Black	GND
7	Red	5V
4	White	I-
12	Green	I+
5	White	B-
13	Blue	B+
6	White	A-
14	Violet	A+
8	Red	5V
9	Black	GND
10	Gray	LL+
11	White	LL-
15	Black	Inner Shield*

TABLE 3.

Mercury II 5000 15-Plug Serial Output		
Pin	Wire color	Function
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5	White	SCLOCK_OUT-
13	Blue	SCLOCK_OUT+
6	White	SDATA_OUT-
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8	Red	5V
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NOTES:

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- HIGHLIGHTED PINS ARE INTERNALLY CONNECTED INSIDE D-SUB WITH JUMPER WIRES.

TABLE 1.

Cable Lengths	
1 Meter	
3 Meter	
5 Meter	
Custom	

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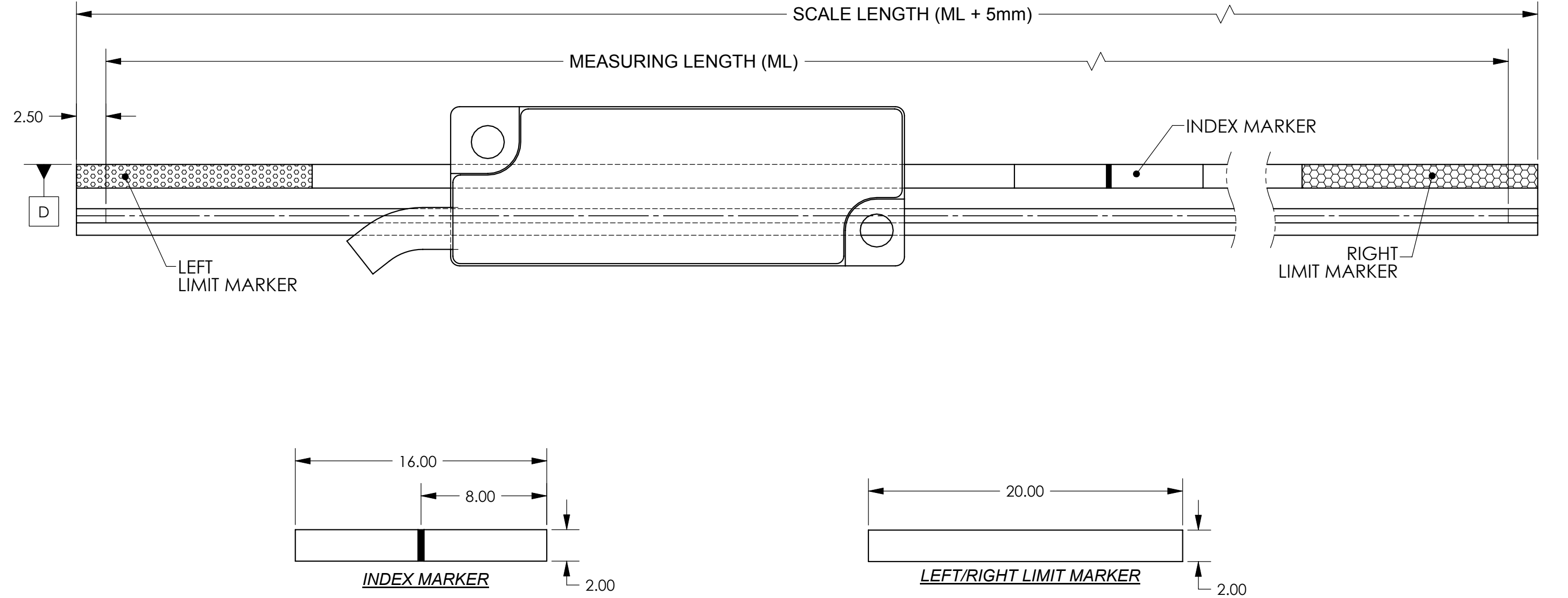
DESCRIPTION: INTERFACE, ENCODER, 20um,
SHORT LINEAR SCALE w/INDEX
and REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE B DWG. NO. ID-00354 REV. 2

SCALE: CAD FILE: 3rd ANGLE PROJECTION SHEET 2 OF 3

UNITS: mm

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 4. FOR LONGER OR SHORTER LENGTHS OF MARKERS CALL MICROE SYSTEMS FOR DETAILS.
 5. FOR SHORTER LENGTHS OF LINEAR GLASS THAN 70mm CONTACT MICROE SYSTEMS FOR REQUIREMENTS.
 6. LINEAR GLASS SCALES CAN HAVE INDEX AND LIMIT MARKERS PRINTED ON THEM IN LOCATION DESIRED BY CUSTOMER, CONTACT MICROE SYSTEMS FOR FURTHER DETAILS.

Scale		
Identification	Measuring Length (ML)	Scale Length
MILXXX	XXXmm - 5mm	XXXmm
(Min.) MIL70	70mm - 5mm = 65mm	70mm
(Max.) MIL130	130mm - 5mm = 125mm	130mm

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DESCRIPTION: INTERFACE, ENCODER, 20um,
SHORT LINEAR SCALE w/INDEX
and REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE B DWG. NO. ID-00354 REV. 2

SCALE: CAD FILE: 3rd ANGLE PROJECTION SHEET 3 OF 3

UNITS: mm

SIZE B	DWG. NO. ID-00355			REV. 2
SCALE:	CAD FILE:	 3rd ANGLE PROJECTION	SHEET	1 OF 3

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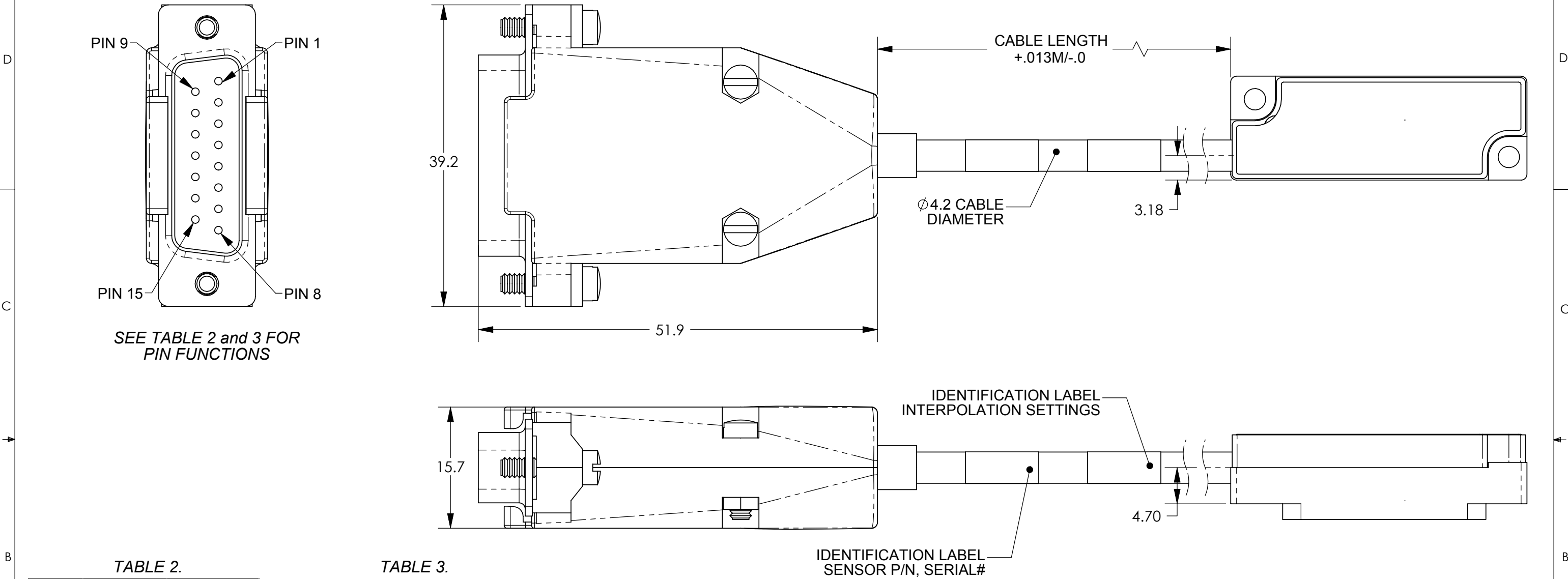


TABLE 2.

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Pin	Wire color	Function
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5	White	B-
13	Blue	B+
6	White	A-
14	Violet	A+
8	Red	5V
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Mercury II 5000 15-Plug Serial Output		
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TABLE 1.

Cable Lengths

1 Meter
3 Meter
5 Meter
Custom

UNITS: mm

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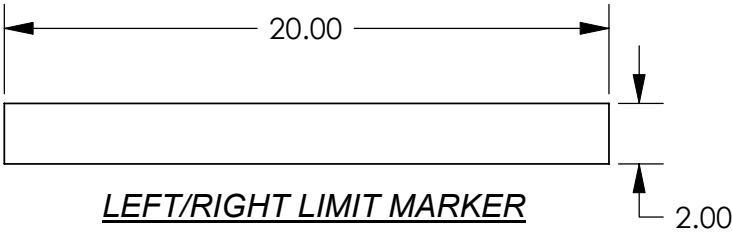
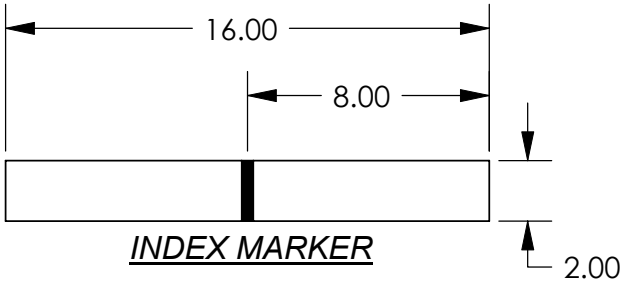
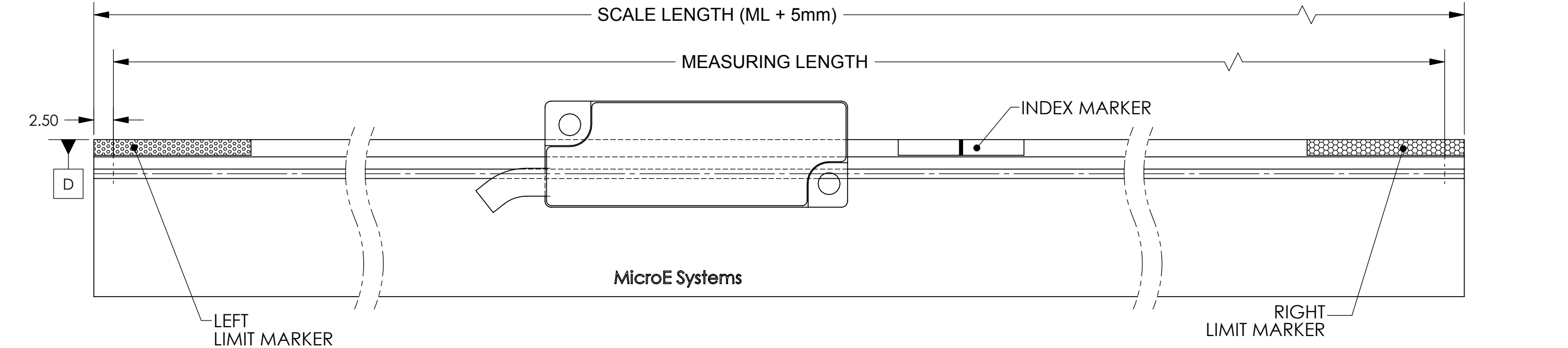
125 Middlesex Tpk.
Bedford, MA 01730

DESCRIPTION: INTERFACE, ENCODER, 20um, LONG LINEAR SCALE w/INDEX and REFERENCE MARKERS, MERCURY II 5000 SENSOR

SIZE B DWG. NO. ID-00355 REV. 2

SCALE: CAD FILE: 3rd ANGLE PROJECTION SHEET 2 OF 3

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Scale		
Identification	Measuring Length (ML)	Scale Length
MIILXXXX	XXXXmm - 5mm	XXXXmm
(Min.) MIIL135	135mm - 5mm = 130mm	135mm
(Max.) MIIL1000	1000mm - 5mm = 995mm	1000mm

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125 Middlesex Tpk.
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DESCRIPTION: INTERFACE, ENCODER, 20um,
LONG LINEAR SCALE w/INDEX
and REFERENCE MARKERS,
MERCURY II 5000 SENSOR

SIZE
B

DWG. NO.
ID-00355

REV.
2

SCALE:

CAD FILE:

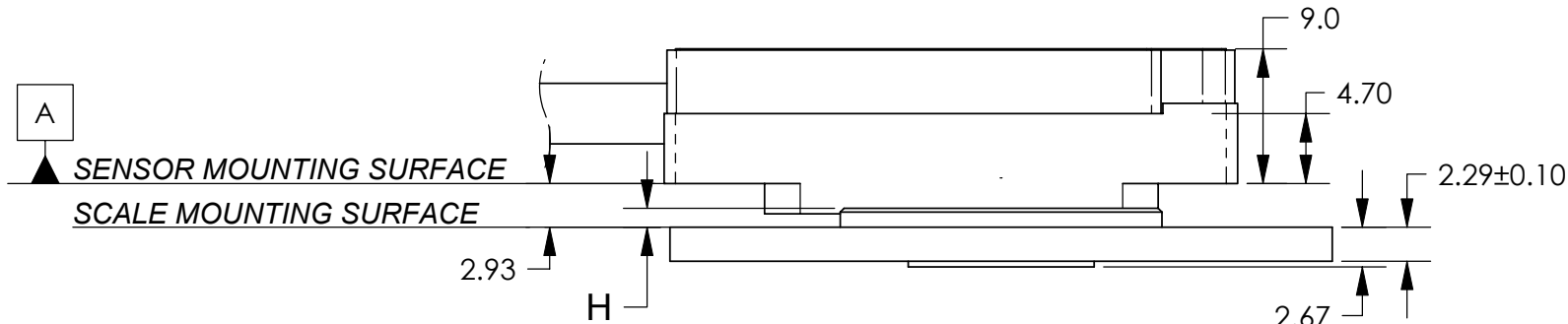
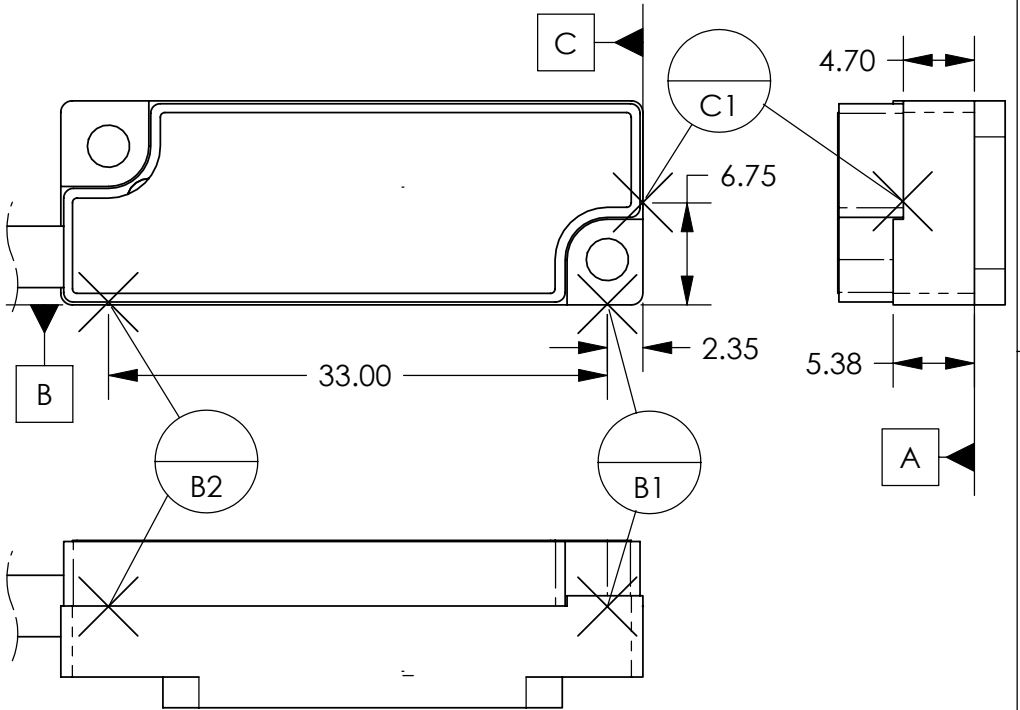
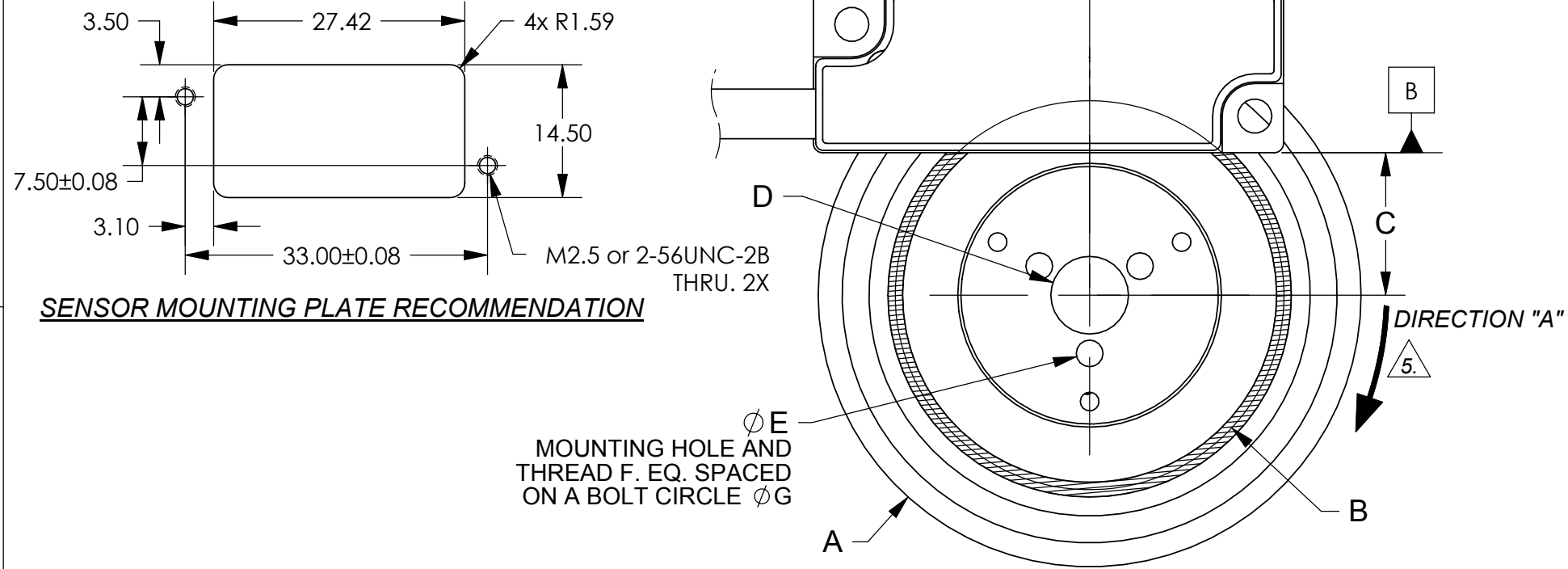
3rd ANGLE
PROJECTION

SHEET 3 OF 3

UNITS: mm

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1	---	INITIAL	7/28/08	VB
2	2121	ADDED WIRE COLORS TO TABLES 2 & 3, MTG PLATE REC., UPDATED ADDRESS.	7/7/09	VB



- NOTES:
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SCALE/HUB IDENTIFICATION AND SIZE

Scale/Hub Identification	Counts/ Rev	Dim. A Scale O.D.	Scale I.D.	Dim. B Optical Dia.	Dim. C Mounting Dim.	Dim D. Hub I.D.	Dim E. Mounting Hole Dia.	Thread F	Dim G. Bolt Circle	Dim. H Hub Height
R4513 / HI	5,000	44.45	12.70+/-0.13	31.83	11.66+/-0.05	6.358+.013/-0.000	1.78	2-56	9.53	1.27
R6425 / HJ	8,192	63.50	25.40+/-0.13	52.15	21.82+/-0.05	12.708+.013/-0.000	3.45	8-32	19.05	1.52
R12151 / HK	16,384	120.65	50.80+/-0.13	104.30	47.90+/-0.05	25.408+.013/-0.000	3.45	8-32	38.10	2.03

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETERS DIM. APPLY AFTER PROCESSING INTERPRET ALL GEOMETRIC TOLS. PER ANSI Y14.5M-1994		APPROVALS	DATE	GSI MicroE Systems Division of GSI Group 125 Middlesex Tpk. Bedford, MA 01730	
		DRAWN S.BUTURLIA	7/11/08		
		CHECKED A.GOLDMAN	7/23/08		
		ENGRG.			
TOLERANCES ARE: DECIMALS: .X ± .25 .XX ± .13		MFG ENG		DESCRIPTION: INTERFACE, ENCODER, 20um, ROTARY SCALE/ w/INDEX and HUB, MERCURY II 5000 SENSOR	
		QA		SIZE B	DWG. NO. ID-00356
		SCALE:	CAD FILE:	3rd ANGLE PROJECTION	REV. 2
				SHEET 1 OF 2	

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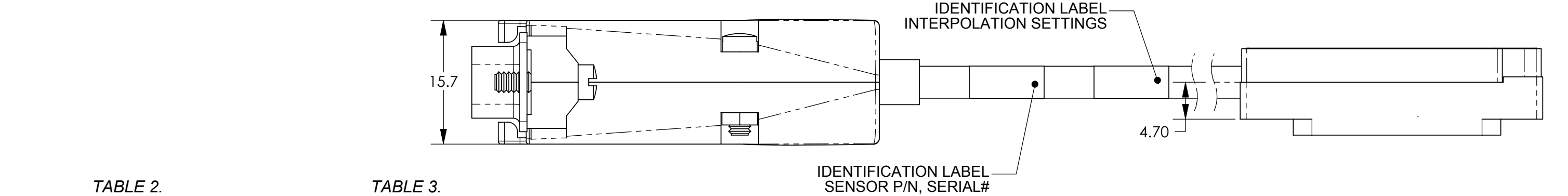
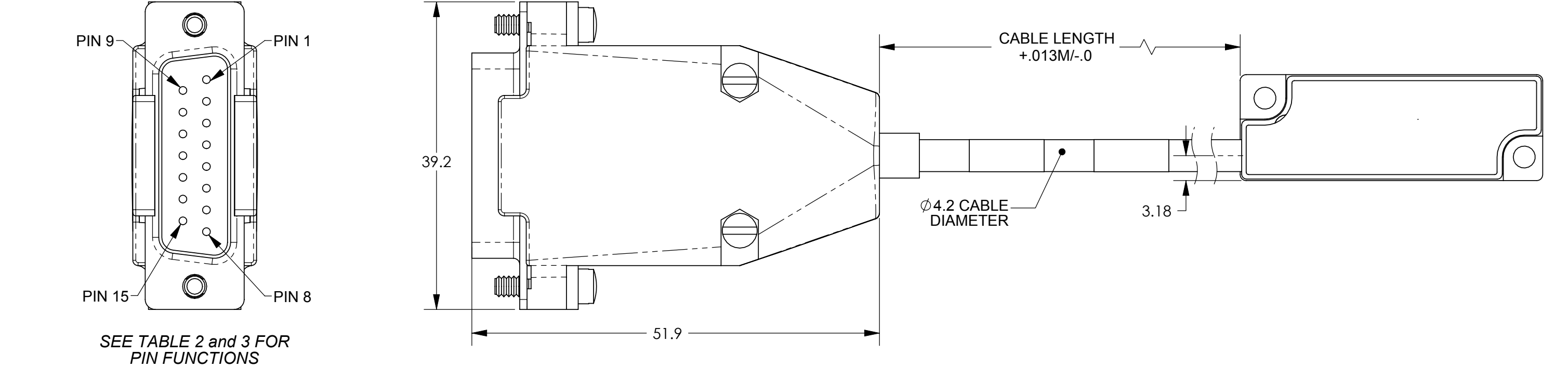


TABLE 2.

Mercury II 5000 15-Plug Quadrature Output		
Pin	Wire color	Function
1	Brown	RL+
3	White	RL-
2	Black	GND
7	Red	5V
4	White	I-
12	Green	I+
5	White	B-
13	Blue	B+
6	White	A-
14	Violet	A+
8	Red	5V
9	Black	GND
10	Gray	LL+
11	White	LL-
15	Black	Inner Shield*

TABLE 3.

Mercury II 5000 15-Plug Serial Output		
Pin	Wire color	Function
1	Brown	nCS+
3	White	nCS-
2	Black	GND
7	Red	5V
4	White	DIAG_IN_OUT-
12	Green	DIAG_IN_OUT+
5	White	SCLOCK_OUT-
13	Blue	SCLOCK_OUT+
6	White	SDATA_OUT-
14	Violet	SDATA_OUT+
8	Red	5V
9	Black	GND
10	Gray	SCLOCK_IN+
11	White	SCLOCK_IN-
15	Black	Inner shield*

NOTES:

* GND AND INNER SHIELD ARE INTERNALLY CONNECTED.

HIGHLIGHTED PINS ARE INTERNALLY CONNECTED INSIDE D-SUB WITH JUMPER WIRES.

TABLE 1.

Cable Lengths	
1 Meter	
3 Meter	
5 Meter	
Custom	

GSI
MicroE Systems
Division of GSI Group

125 Middlesex Tpk.
Bedford, MA 01730

UNITS: mm

DESCRIPTION:
INTERFACE, ENCODER, 20um,
ROTARY SCALE w/INDEX and HUB,
MERCURY II 5000 SENSOR

SIZE
B

DWG. NO.
ID-00356

REV.
2

SCALE:

CAD FILE:

3rd ANGLE PROJECTION

SHEET 2 OF 2