3A SERIES 3-AXIS LOAD CELLS (US & METRIC)

FEATURES & BENEFITS

- 3-Axis – Fx Fy Fz; independent bridges
- 20N to 500kN (4.5 to 112K lbf) force range
- Compact size
- Low crosstalk
- Temperature compensated

Interface's 3-axis load cell measures forces simultaneously in 3 mutually perpendicular axes: X, Y, and Z - tension and compression. Each axis provides a unique mV/V output and requires no mathematical manipulation. The 3-axis load cell is built to minimize eccentric loading effects and crosstalk between axes.

The 3A Series 3-axis load cell is ideally suited to many industrial and scientific applications, such as aerospace, robotics, automotive and medical research (orthopedics and biomechanical).

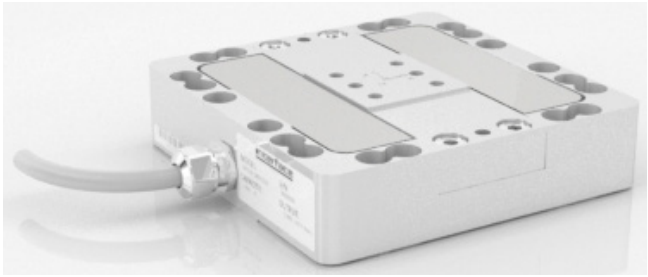
The load cell is provided in various capacity ranges and sizes with each of the three axes providing the same capacity.

We are happy to work with your design needs – providing a custom design if warranted for varying capacities (between X, Y, and Z), higher temperature capability, or OEM/private labeling if needed.

WIRING DIAGRAM

	Description	Wire Color	37-pin D-SUB	16-pin M23
Shield	Shield	Shield	1	N/C
X-Axis	+ Excitation	Brown	20	2
	- Excitation	White	27	1
	+ Output	Green	22	3
	- Output	Yellow	25	4
Y-Axis	+ Excitation	Pink	2	6
	- Excitation	Gray	9	5
	+ Output	Blue	4	7
	- Output	Red	7	8
Z-Axis	+ Excitation	Purple	11	10
	- Excitation	Black	18	9
3A60A	+ Output	Orange	13	11
	- Output	Transparent	16	12
3A120, 3A160, 3A300, & 3A400	+ Output	Gray/Pink	13	11
	- Output	Red/Blue	16	12

STANDARD CONFIGURATION



Model 3A60A (shown)

ACCESSORIES

Model BSC4D (shown)
4-Channel Analog Amplifier

Model BSC4A (shown)
4-Channel USB Digital Amplifier

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3A60A SERIES 3-AXIS LOAD CELL (US & METRIC)

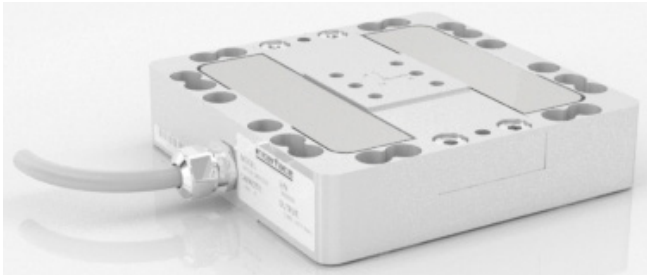
FEATURES & BENEFITS

The 3A60A is a new and improved version of the original 3A60 with revised mounting holes and extended capacity ranges. The 3A60A is NOT backward compatible with the old 3A60.

SPECIFICATIONS

ACCURACY - (MAX ERROR*)								
Nonlinearity – % FS		± 0.2						
Hysteresis – % FS		± 0.02						
Creep, in 30 min – %		± 0.1						
TEMPERATURE								
Effect on Zero – %RO / °C		± 0.02						
Effect on Output – % / °C		± 0.02						
Compensated Range	°C	-10 to +70						
	°F	+14 to +158						
Operating Range	°C	-10 to +85						
	°F	+14 to +185						
ELECTRICAL								
Rated Output (Nominal) – mV/V		±0.5						
Max. Excitation Voltage – V		10						
Zero balance – mV/V		0.1						
Input resistance, x/y axis – Ω		395 ±5				375 ±5		
Output resistance, z axis – Ω		355 ±5						
Insulation Resistance – Ω		> 5 × 10⁹						
Electrical Connection – m		3 Cable with 37-PIN Connector. Includes Mate						
MECHANICAL								
Rated Capacity (FS)	N	10	20	50	100	200	500	
	lbf	2.25	4.5	11.2	22.5	45	112	
Material		Aluminum				Stainless steel		
Deflection – Fx, Fy	mm	0.10				0.20		
	in	0.004				0.008		
Deflection – Fz	mm	0.15						
	in	0.006						
Total Weight	kg	0.110				0.2		
	lbs	0.2425				0.44		
Safe Overload – %RO		150						
Ultimate Overload – %RO		300						
Protection Level		IP54						
ECCENTRICITY AND MOMENT*								
Allowable moment – Nm	Nm	5				10		
	lbf-in	44.3				88.5		
Crosstalk: x:y / y:x – %		±2						
Crosstalk: z:x/y – %		±2						
Crosstalk: x/y:z – %		±2						
Eccentric Load Sensitivity – %FS @ 20mm (0.8 in)		±1						

STANDARD CONFIGURATION

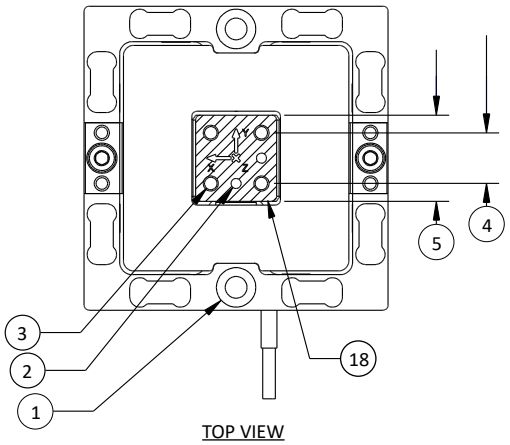


Model 3A60A (shown)

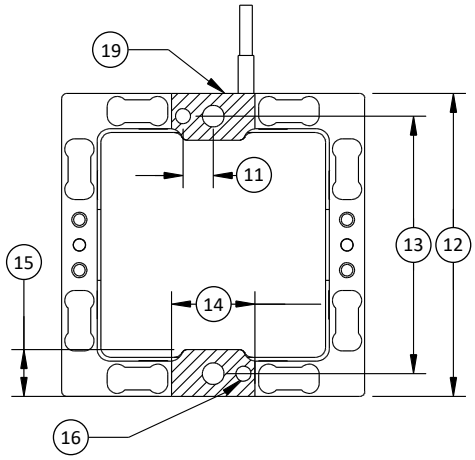
**** Nominal***

3A60A SERIES 3-AXIS LOAD CELL (US & METRIC)

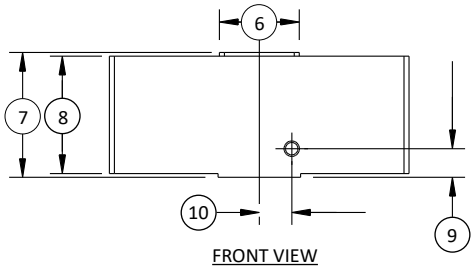
DIMENSIONS



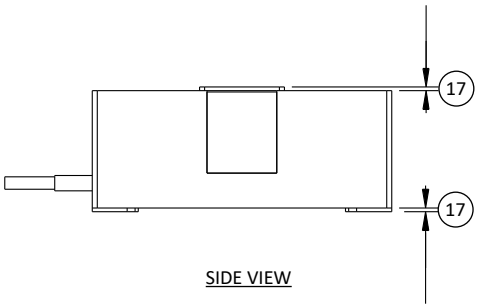
TOP VIEW



BOTTOM VIEW



FRONT VIEW



SIDE VIEW

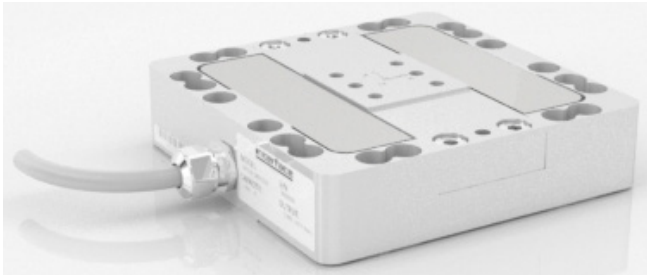
See Drawing	Metric	U.S.
	mm	in
1	2 x Ø4.3 ↧ 24.25, ⌴ Ø7.8 ↧ 17.25	2 x Ø0.17 ↧ 0.955, ⌴ Ø0.31 ↧ 0.679
2	2 x Ø2 E7 ↧ 5, ⌵ 118°	2x Ø(0.0797/0.0793) ↧ 0.2, ⌵ 118°
3	4 x (M3X0.5) ↧ 10, ⌵ 118°	4 x (M3X0.5) ↧ 0.4, ⌵ 118°
4	10	0.4
5	17	0.7
6	16	0.6
7	25	1.0
8	23.5	0.9
9	5.75	0.226
10	6.5	0.3
11	6	0.2
12	60	2.4
13	51	2.0
14	16.5	0.6
15	9.25	0.4
16	2 x Ø3 E7 ↧ 5, ⌵ 118°	2x Ø(0.1191/0.1187) ↧ 0.2, ⌵ 118°
17	0.75	0.030
18	Bolting Surface / Measuring Platform	
19	Bolting Surface	

3A120 SERIES 3-AXIS LOAD CELL (US & METRIC)

SPECIFICATIONS

ACCURACY - (MAX ERROR*)									
Nonlinearity – % FS		± 0.2							
Hysteresis – % FS		± 0.02							
Creep, in 30 min – %		± 0.1							
TEMPERATURE									
Effect on Zero – %RO / °C		± 0.02							
Effect on Output – % / °C		± 0.02							
Compensated Range	°C	-10 to +70							
	°F	+14 to +158							
Operating Range	°C	-10 to +85							
	°F	+14 to +185							
ELECTRICAL									
Rated Output (Nominal) – mV/V		±0.5	±1						
Max. Excitation – V		10							
Zero balance – mV/V		0.1							
Input resistance, x/y axis – Ω		780 ±5					740 ±5		
Output resistance, z axis – Ω		700 ±5							
Insulation Resistance – Ω		> 5 × 10⁹							
Electrical Connection – m		3 Cable with 37-PIN Connector. Includes Mate							
MECHANICAL									
Rated Capacity (FS)	N	50	100	200	500	1K	1K **	2K	5K
	lbf	11.2	22.5	45	112	225	225	450	1.12K
Material		Aluminum					Stainless steel		
Deflection – Fx, Fy	mm	0.06					0.08		
	in	0.002					0.003		
Deflection – Fz	mm	0.12					0.16		
	in	0.005					0.006		
Total Weight	kg	1.1					2.0		
	lbs	2.43					4.41		
Safe Overload – %RO		150							
Ultimate Overload – %RO		300							
Protection Level		IP54 (option IP68)							
ECCENTRICITY AND MOMENT*									
Allowable moment	Nm	100					200		
	lbf-in	885					1.77K		
Crosstalk: x:y / y:x – %		±1							
Crosstalk: z:x/y – %		±2							
Crosstalk: x/y:z – %		±1							
Eccentric Load Sensitivity – %FS @ 100mm (3.9 in)		±1							

STANDARD CONFIGURATION



Model 3A120 (shown)

**** Nominal***
***** Stainless Version denoted by 3A120S-1KN***

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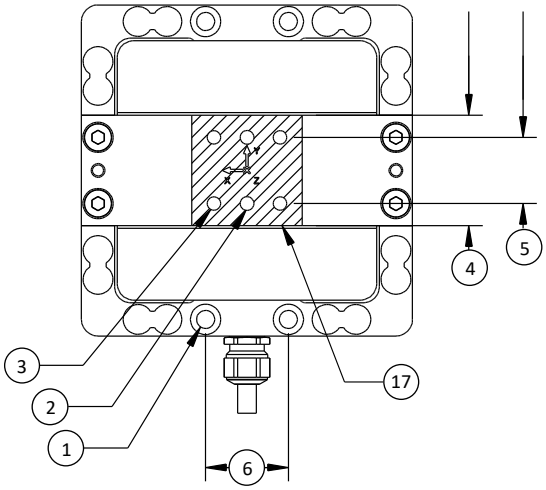
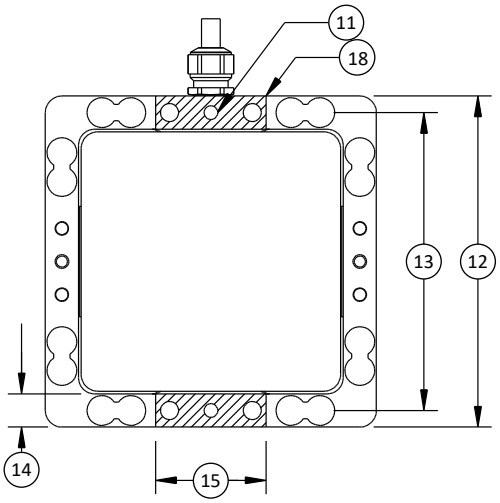
3A120 SERIES 3-AXIS LOAD CELL (US & METRIC)

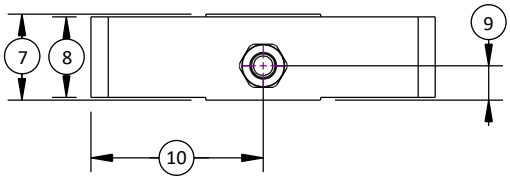
DIMENSIONS



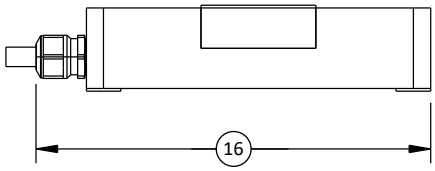
TOP VIEW



BOTTOM VIEW



FRONT VIEW



SIDE VIEW

See Drawing	Metric	U.S.
	mm	in
1	4 x Ø6.6 ↧ 29 ⌵ 118°, ⌴ Ø11.0 ↧ 22.5	4 x Ø0.26 ↧ 1.1 ⌵ 118°, ⌴ Ø0.43 ↧ 0.89
2	2 x Ø5 E7 ↧ 12, ⌵ 118°	2 x Ø(0.1981/0.1976) ↧ 0.5, ⌵ 118°
3	4 x (M6x1) ↧ 12	4 x (M6x1) ↧ 0.5
4	40	1.6
5	24	0.9
6	30	1.2
7	30	1.2
8	28	1.1
9	12	0.5
10	60	2.4
11	2 x Ø5 E7 ↧ 3	2 x Ø(0.1981/0.1976) ↧ 0.1
12	120	4.7
13	108	4.3
14	12	0.5
15	40	1.6
16	137.5	5.4
17	Bolting Surface / Measuring Platform	
18	Bolting Surface	

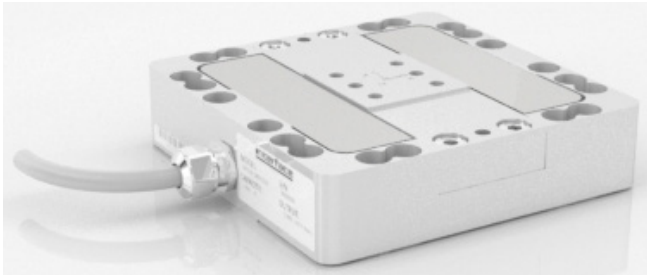
3A160 SERIES 3-AXIS LOAD CELL (US & METRIC)

SPECIFICATIONS

ACCURACY - (MAX ERROR*)						
Nonlinearity – % FS		± 0.2				
Hysteresis – % FS		± 0.1				
Creep, in 30 min – %		± 0.05				
TEMPERATURE						
Effect on Zero – %RO / °C		± 0.02				
Effect on Output – % / °C		± 0.02				
Compensated Range	°C	-10 to +70				
	°F	+14 to +158				
Operating Range	°C	-10 to +85				
	°F	+14 to +158				
ELECTRICAL						
Rated Output (Nominal) – mV/V		±1				
Max. Excitation Voltage – V		10				
Zero balance – mV/V		0.1				
Input resistance, x/y axis – Ω		740 ±5				
Output resistance, z axis – Ω		700 ±5				
Insulation Resistance – Ω		> 5 × 10^9				
Electrical Connection – m		3 Cable with 37-PIN Connector. Includes Mate				
MECHANICAL						
Rated Capacity (FS)	N	2K	5K	10K	20K	50K
	lbf	450	1.12K	2.25K	4.5K	11.2K
Material		Nickel plated steel				
Deflection – Fx, Fy – mm	mm	0.08				
	in	0.003				
Deflection – Fz – mm	mm	0.16				
	in	0.006				
Total Weight – kg	kg	8.2				
	lbs	18.08				
Safe Overload – %RO		150				
Ultimate Overload – %RO		300				
Protection Level		IP54				
ECCENTRICITY AND MOMENT*						
Allowable moment	Nm	500	1000	2000		
	lbf-in	4.43K	8.85K	17.7K		
Crosstalk: x:y / y:x – %		±1				
Crosstalk: z:x/y – %		±2				
Crosstalk: x/y:z – %		±2				
Eccentric Load Sensitivity – %FS @ 20mm (2.0 in)		±1				

**** Nominal***

STANDARD CONFIGURATION



Model 3A160 (shown)

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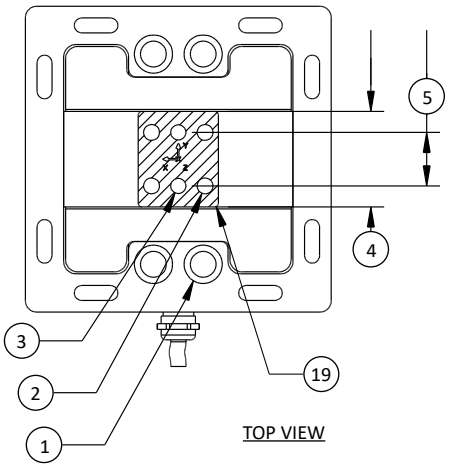
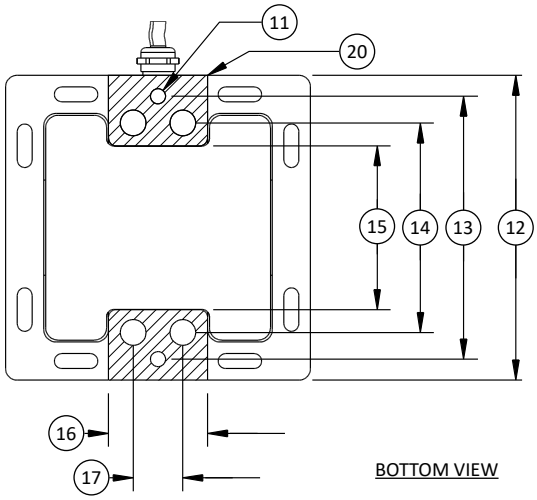
3A160 SERIES 3-AXIS LOAD CELL (US & METRIC)

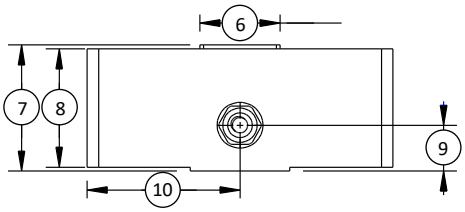
DIMENSIONS



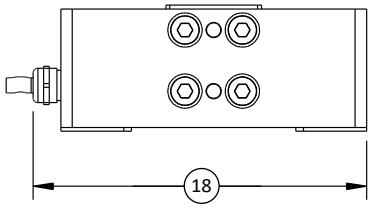
TOP VIEW



BOTTOM VIEW



FRONT VIEW



SIDE VIEW

See Drawing	Metric	U.S.
	mm	in
1	4 x Ø14 THRU, ⌴ Ø20 ↧ 13	4 x Ø0.6 THRU, ⌴ Ø0.8 ↧ 0.5
2	4 x (M10x1.5) ↧ 15, ⌵ 118°	4 x (M10x1.5) ↧ 0.6, ⌵ 118°
3	2 x Ø8 H7 ↧ 15, ⌵ 118°	2 x Ø(0.3156/0.3150) ↧ 0.6, ⌵ 118°
4	50	2.0
5	28	1.1
6	42	1.7
7	66	2.6
8	62	2.4
9	24	0.9
10	80	3.1
11	2 x Ø8 H7 ↧ 5, ⌵ 118°	2 x Ø(0.3156/0.3150) ↧ 0.2, ⌵ 118°
12	160	6.3
13	138	5.4
14	110	4.3
15	86	3.4
16	52	2.0
17	26	1.0
18	174.5 (+1)	6.9 (+0.04)
19	Bolting Surface / Measuring Platform	
20	Bolting Surface	

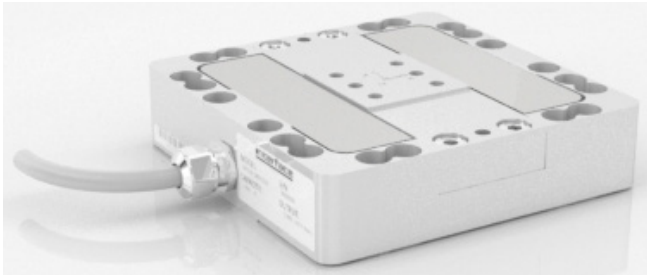
3A300 SERIES 3-AXIS LOAD CELL (US & METRIC)

SPECIFICATIONS

ACCURACY - (MAX ERROR*)				
Nonlinearity – %FS		± 0.2		
Hysteresis – % FS		± 0.1		
Creep, in 30 min – %		± 0.5		
TEMPERATURE				
Effect on Zero – %RO / °C		± 0.02		
Effect on Output – % / °C		± 0.02		
Compensated Range	°C	-10 to +70		
	°F	+14 to +158		
Operating Range	°C	-10 to +85		
	°F	+14 to +185		
ELECTRICAL				
Rated Output (Nominal) – mV/V		±1		
Max. Excitation Voltage – V		10		
Zero balance – mV/V		0.1		
Input resistance, z axis – Ω		740 ±5		
Output resistance, z axis – Ω		700 ±5		
Input resistance, x/y axis – Ω		370 ±5		
Output resistance, x/y axis – Ω		350 ±5		
Insulation Resistance – Ω		$> 5 \times 10^9$		
Electrical Connection – m		16-PIN Connector. Includes 3 mating cable with 37-PIN connector		
MECHANICAL				
Rated Capacity (FS)	N	50K	100K	200K
	lbf	11.2K	22.5K	45K
Material		Nickel plated steel		
Deflection – Fx, Fy	mm	±0.2		
	in	±0.008		
Deflection – Fz	mm	±0.4		
	in	±0.016		
Total Weight	kg	45		
	lbs	99.2		
Safe Overload – %RO		150		
Ultimate Overload – %RO		300		
Protection Level		IP54		
ECCENTRICITY AND MOMENT*				
Allowable moment	Nm	4000	8000	16000
	lbf-in	35.4K	70.8K	142K
Crosstalk: x:y / y:x – %		±1		
Crosstalk: z:x/y – %		±1		
Crosstalk: x/y:z – %		±2		
Eccentric Load Sensitivity – %FS @ 100mm		±1		

**** Nominal***

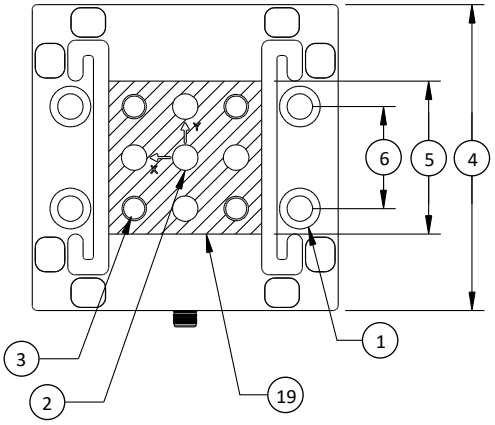
STANDARD CONFIGURATION



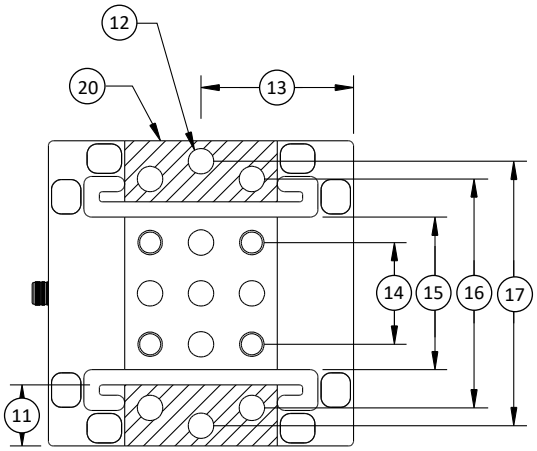
Model 3A300 (shown)

3A300 SERIES 3-AXIS LOAD CELL (US & METRIC)

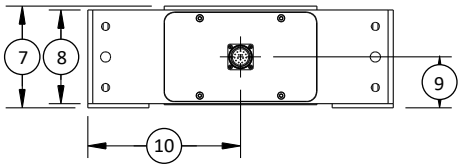
DIMENSIONS



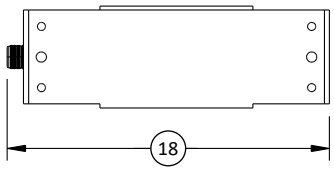
TOP VIEW



BOTTOM VIEW



FRONT VIEW



SIDE VIEW

See Drawing	Metric	U.S.
	mm	in
1	4 x Ø25 THRU, ⌴ Ø40 ↧ 30	4 x Ø1.0 THRU, ⌴ Ø1.6 ↧ 1.2
2	5 x Ø25 H7 THRU	5 x Ø(0.9851/0.9842) THRU
3	4 x (M24x3) THRU	
4	300	11.8
5	150	5.9
6	100	3.9
7	100	3.9
8	92	3.6
9	50	2.0
10	150	5.9
11	60	2.4
12	2 x Ø25 H7 ↧ 40	2 x Ø(0.9851/0.9842) ↧ 1.6
13	150	5.9
14	100	3.9
15	150	5.9
16	225	8.9
17	260	10.2
18	316	12.4
19	Bolting Surface / Measuring Platform	
20	Bolting Surface	

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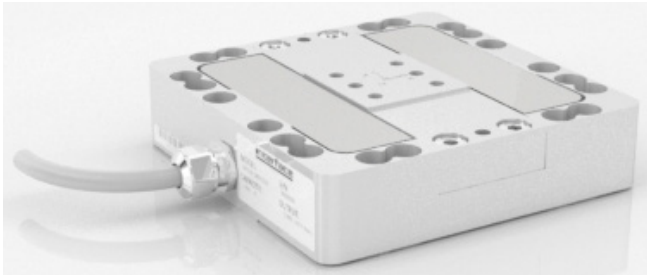
3A400 SERIES 3-AXIS LOAD CELL (US & METRIC)

SPECIFICATIONS

ACCURACY – (MAX ERROR*)		
Nonlinearity – % FS		± 0.2
Hysteresis – % FS		± 0.1
Creep, in 30 min – %		± 0.05
TEMPERATURE		
Effect on Zero – %RO / °C		± 0.02
Effect on Output – % / °C		± 0.02
Compensated Range	°C	-10 to +70
	°F	+14 to +158
Operating Range	°C	-10 to +85
	°F	+14 to +185
ELECTRICAL		
Rated Output (Nominal) – mV/V		±1
Max. Excitation Voltage – V		10
Zero balance – mV/V		0.1
Output resistance, z axis – Ω		340 ±5
Input resistance, x/y axis – Ω		370 ±5
Insulation Resistance – Ω		> 5 × 10^9
Electrical Connection – m		16-PIN Connector. Includes 3 mating cable with 37-PIN connector
MECHANICAL		
Rated Capacity (FS)	N	500K
	lbf	112K
Material		Nickel plated steel
Deflection – Fx, Fy	mm	0.3
	in	0.01
Deflection – Fz	mm	0.6
	in	0.02
Total Weight	kg	120
	lbs	4.7
Safe Overload – %RO		150
Ultimate Overload – %RO		300
Protection Level		IP54
ECCENTRICITY AND MOMENT*		
Allowable moment	Nm	25000
	lbf-in	221K
Crosstalk: x:y / y:x – %		±1
Crosstalk: z:x/y – %		±1
Crosstalk: x/y:z – %		±1
Eccentric Load Sensitivity – %FS @ 100mm		±1

**** Nominal***

STANDARD CONFIGURATION



Model 3A400 (shown)

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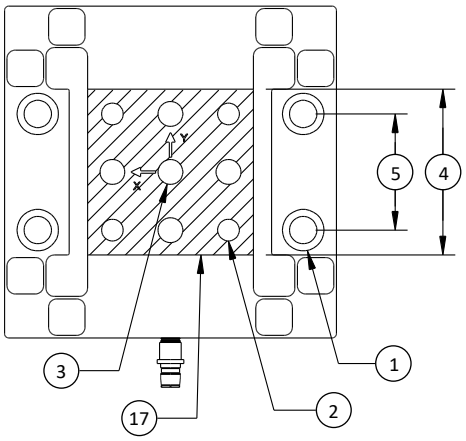
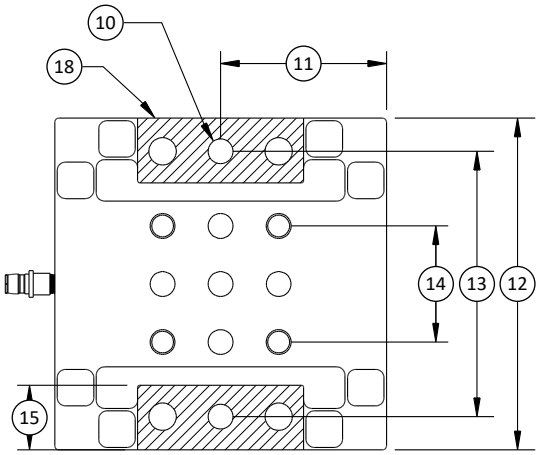
3A400 SERIES 3-AXIS LOAD CELL (US & METRIC)

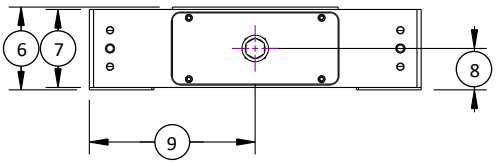
DIMENSIONS



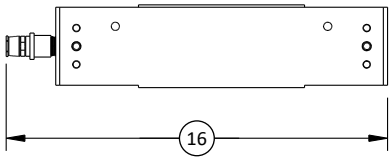
TOP VIEW



BOTTOM VIEW



FRONT VIEW



SIDE VIEW

See Drawing	Metric	U.S.
	mm	in
1	4 x Ø33 THRU, ⌴ Ø50 ↧ 36	4 x Ø1.3 THRU, ⌴ Ø2.0 ↧ 1.4
2	4 x (M30x3.5) THRU	4 x (M30x3.5) THRU
3	5 x Ø30 E7 THRU	5 x Ø(1.1835/1.1827) THRU
4	200	7.9
5	140	5.5
6	100	3.9
7	94	3.7
8	50	2.0
9	200	7.9
10	2 x Ø30 E7 ↧ 40	2 x Ø(1.1835/1.1827) ↧ 1.6
11	200	7.9
12	400	15.7
13	320	12.6
14	140	5.5
15	78	3.1
16	460 (+5)	18.1 (+0.2)
17	Bolting Surface / Measuring Platform	
18	Bolting Surface	

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