

3A SERIES 3-AXIS LOAD CELLS (U.S. & 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 bio-mechanical).

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 3A120 (Shown)

ACCESSORIES



Model BSC4D (Shown)
4-Channel Digital Amplifier



Model BSC4A (Shown)
4-Channel USB Analog Amplifier

U.S. dimensions and capacities are provided for conversion only. Standard product will be sold in kN and Metric dimensions. U.S. capacities available upon special request and at an additional cost.

3A60A SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

SPECIFICATIONS

ACCURACY – (MAX ERROR*)							
Nonlinearity – %FS		±0.2					
Hysteresis – %FS		±0.02					
Creep, in 30 min – %		±0.5					
TEMPERATURE							
Effect on Zero – %RO / deg	°C	±0.02					
Effect on Output – % / def	°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 × 10 ⁹					
Electrical Connection		3 m Cable with 37-PIN Connector. Includes Mating Connector.					
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	20				50	
	lbf-in	177				443	
Crosstalk: x:y / y:x – %		±2					
Crosstalk: z:x/y – %		±2					
Crosstalk: x/y:z – %		±2					
Influence of Eccentric Load to FS – %FS / 10Nm		±1					

STANDARD CONFIGURATION



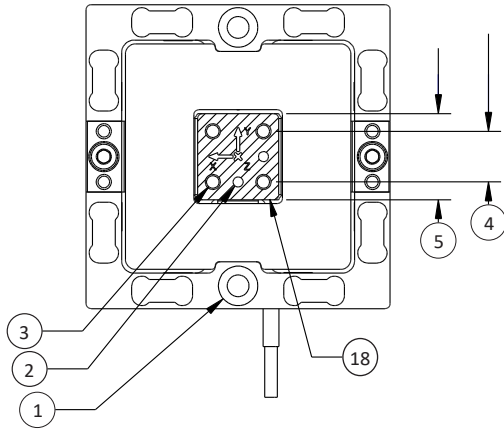
Model 3A60A (Shown)

FEATURES & BENEFITS

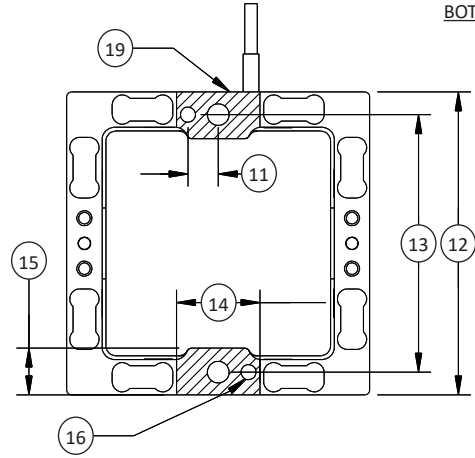
The 3A60A is a new and improved version of the original 3A60 with revised mounting holes and extended capacity ranges. The 3A60A is NOT backward compatible with the old 3A60.

3A60A SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

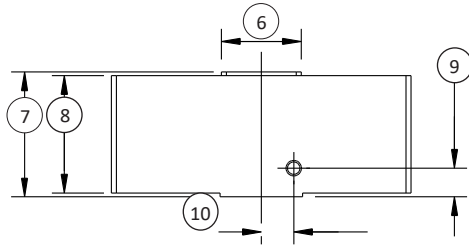
TOP VIEW



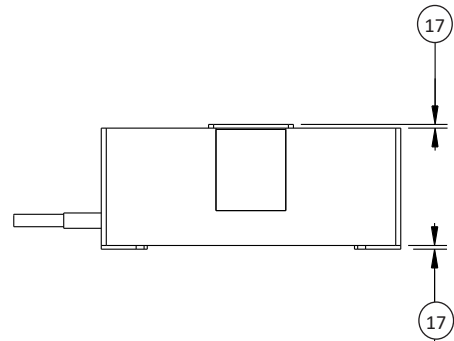
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



DIMENSIONS

See Drawing	Metric	U.S.
	mm	in
(1)	2 x $\varnothing 4.3 \downarrow 24.25$, $\square \varnothing 7.8 \downarrow 17.25$	2 x $\varnothing 0.17 \downarrow 0.955$, $\square \varnothing 0.31 \downarrow 0.679$
(2)	2 x $\varnothing 2 \text{ E7} \downarrow 5$, $\sphericalangle 118^\circ$	2x $\varnothing(0.0797/0.0793) \downarrow 0.2$, $\sphericalangle 118^\circ$
(3)	4 x (M3X0.5) $\downarrow 10$, $\sphericalangle 118^\circ$	4 x (M3X0.5) $\downarrow 0.4$, $\sphericalangle 118^\circ$
(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 $\varnothing 3 \text{ E7} \downarrow 5$, $\sphericalangle 118^\circ$	2x $\varnothing(0.1191/0.1187) \downarrow 0.2$, $\sphericalangle 118^\circ$
(17)	0.75	0.030
(18)	Bolting Surface / Measuring Platform	
(19)	Bolting Surface	

3A120 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

SPECIFICATIONS

STANDARD CONFIGURATION

ACCURACY – (MAX ERROR*)										
Nonlinearity – %FS		±0.2								
Hysteresis – %FS		±0.02								
Creep, in 30 min – %		±0.5								
TEMPERATURE										
Effect on Zero – %RO / deg	°C	±0.02								
Effect on Output – % / deg	°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 × 10 ⁹									
Electrical Connection	3 m Cable with 37-PIN Connector. Includes Mating Connector.									
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	250	300		
	lbf-in	885				1.77K	2.21K	2.66K		
Crosstalk: x:y / y:x – %	±1									
Crosstalk: z:x/y – %	±2									
Crosstalk: x/y:z – %	±1									
Influence of Eccentric Load to FS – %FS / 100Nm	±1									

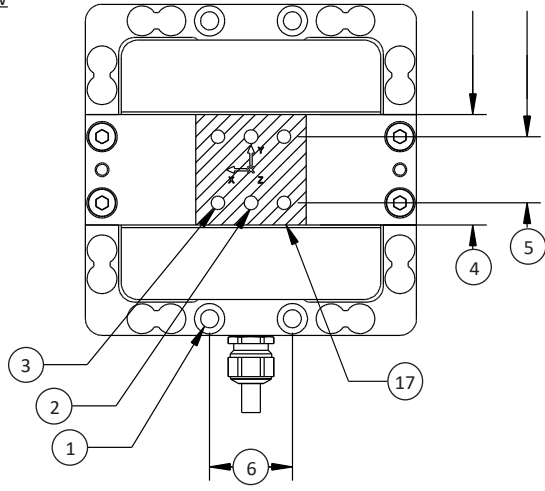


Model 3A120 (Shown)

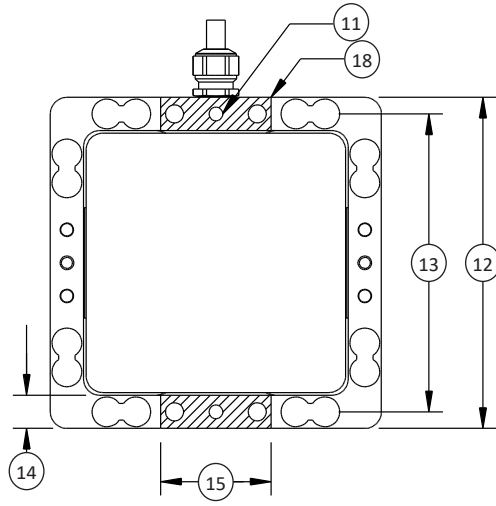
* Nominal
** Stainless Version denoted by 3A120S-1KN

3A120 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

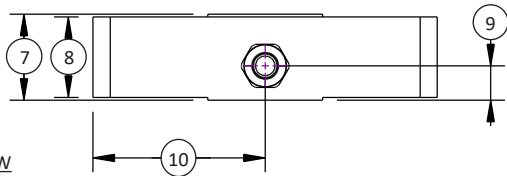
TOP VIEW



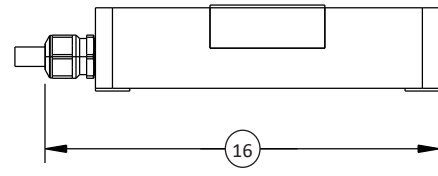
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



DIMENSIONS

See Drawing	Metric	U.S.
	mm	in
(1)	4 x $\varnothing 6.6 \downarrow 29 \sphericalangle 118^\circ$, $\square \varnothing 11.0 \downarrow 22.5$	4 x $\varnothing 0.26 \downarrow 1.1 \sphericalangle 118^\circ$, $\square \varnothing 0.43 \downarrow 0.89$
(2)	2 x $\varnothing 5 \text{ E7} \downarrow 12$, $\sphericalangle 118^\circ$	2 x $\varnothing (0.1981/0.1976) \downarrow 0.5$, $\sphericalangle 118^\circ$
(3)	4 x (M6x1) $\downarrow 12$	4 x (M6x1) $\downarrow 0.5$
(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 $\varnothing 5 \text{ E7} \downarrow 3$	2 x $\varnothing (0.1981/0.1976) \downarrow 0.1$
(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 (U.S. & METRIC)

SPECIFICATIONS

STANDARD CONFIGURATION

ACCURACY – (MAX ERROR*)					
Nonlinearity – %FS		±0.2			
Hysteresis – %FS		±0.1			
Creep, in 30 min – %		±0.5			
TEMPERATURE					
Effect on Zero – %RO / deg		°C	±0.02		
Effect on Output – % /deg		°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		3 m Cable with 37-PIN Connector. Includes Mating Connector.			
MECHANICAL					
Rated Capacity (FS)		N	2K, 5K, 10K	20K	50K
		lbf	450, 1.2K, 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	1K	2K	
		lbf-in	8.85K	17.7K	
Crosstalk: x:y / y:x – %		±1			
Crosstalk: z:x/y – %		±2			
Crosstalk: x/y:z – %		±2			

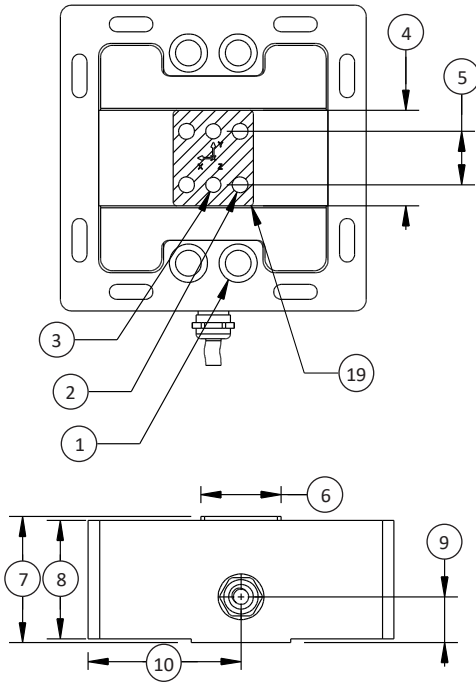


Model 3A160 (Shown)

* Nominal

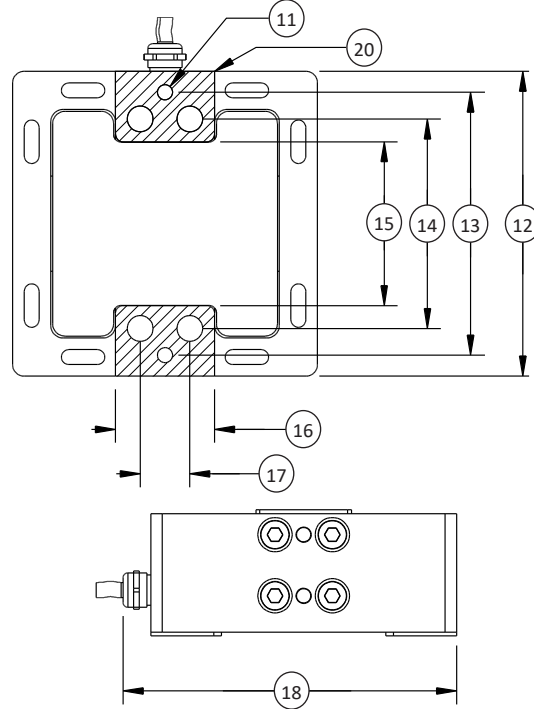
3A160 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

TOP VIEW



FRONT VIEW

BOTTOM VIEW



SIDE VIEW

DIMENSIONS

See Drawing	Metric	U.S.
	mm	in
(1)	4 x $\varnothing 14$ THRU, $\sqcup \varnothing 20 \downarrow 13$	4 x $\varnothing 0.6$ THRU, $\sqcup \varnothing 0.8 \downarrow 0.5$
(2)	4 x (M10x1.5) $\downarrow 15, \sphericalangle 118^\circ$	4 x (M10x1.5) $\downarrow 0.6, \sphericalangle 118^\circ$
(3)	2 x $\varnothing 8$ H7 $\downarrow 15, \sphericalangle 118^\circ$	2 x $\varnothing(0.3156/0.3150) \downarrow 0.6, \sphericalangle 118^\circ$
(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 $\varnothing 8$ H7 $\downarrow 5, \sphericalangle 118^\circ$	2 x $\varnothing(0.3156/0.3150) \downarrow 0.2, \sphericalangle 118^\circ$
(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 (U.S. & METRIC)

SPECIFICATIONS

STANDARD CONFIGURATION

ACCURACY – (MAX ERROR*)				
Nonlinearity – %FS		±0.2		
Hysteresis – %FS		±0.1		
Creep, in 30 min – %		±0.5		
TEMPERATURE				
Effect on Zero – %RO / deg	°C	±0.02		
Effect on Output – % / deg	°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 × 10 ⁹		
Electrical Connection		16-PIN Connector. 3 m 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	4K	8K	12K
	lbf-in	35.4K	70.8K	106K
Crosstalk: x:y / y:x – %		±1		
Crosstalk: z:x/y – %		±1		
Crosstalk: x/y:z – %		±2		
Influence of Eccentric Load to FS – %FS / 500Nm		±1		

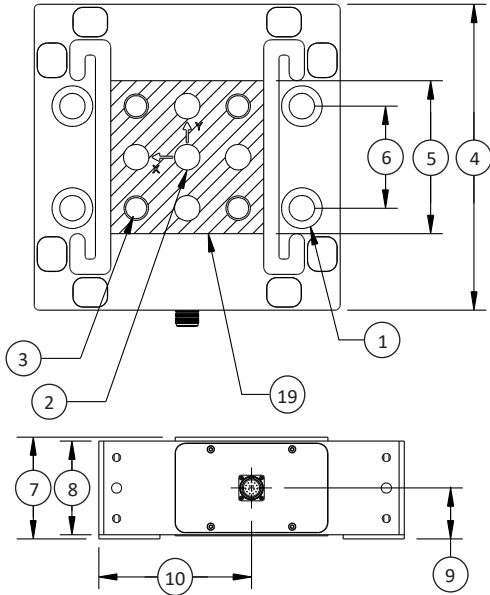


Model 3A300 (Shown)

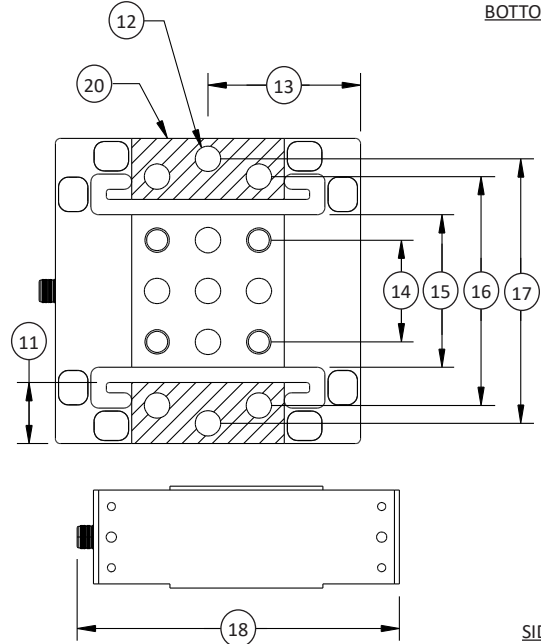
* Nominal

3A300 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

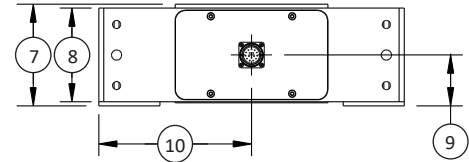
TOP VIEW



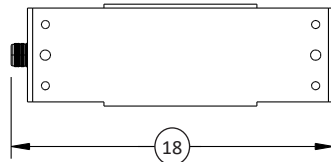
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



DIMENSIONS

See Drawing	Metric	U.S.
	mm	in
(1)	4 x \varnothing 25 THRU, \sqcup \varnothing 40 \downarrow 30	4 x \varnothing 1.0 THRU, \sqcup \varnothing 1.6 \downarrow 1.2
(2)	5 x \varnothing 25 H7 THRU	5 x \varnothing (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 \varnothing 25 H7 \downarrow 40	2 x \varnothing (0.9851/0.9842) \downarrow 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	

3A400 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

SPECIFICATIONS

ACCURACY – (MAX ERROR*)		
Nonlinearity – %FS		±0.2
Hysteresis – %FS		±0.1
Creep, in 30 min – %		±0.5
TEMPERATURE		
Effect on Zero – %RO / deg	°C	±0.02
Effect on Output – % / deg	°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		16-PIN Connector. 3 m 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	264.5
Safe Overload – %RO		150
Ultimate Overload – %RO		300
Protection Level		IP54
ECCENTRICITY AND MOMENT*		
Allowable Moment	Nm	15K
	lbf-in	133K
Crosstalk: x:y / y:x – %		±1
Crosstalk: z:x/y – %		±1
Crosstalk: x/y:z – %		±1
Influence of Eccentric Load to FS – %FS / 500Nm		±1

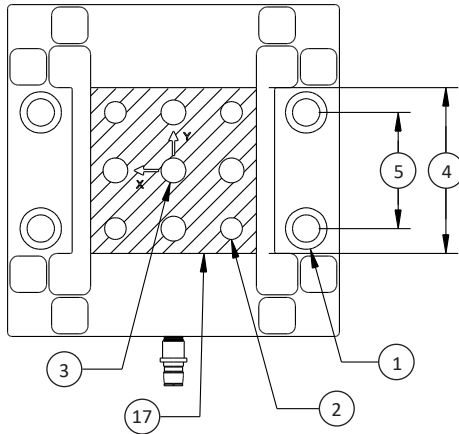
STANDARD CONFIGURATION



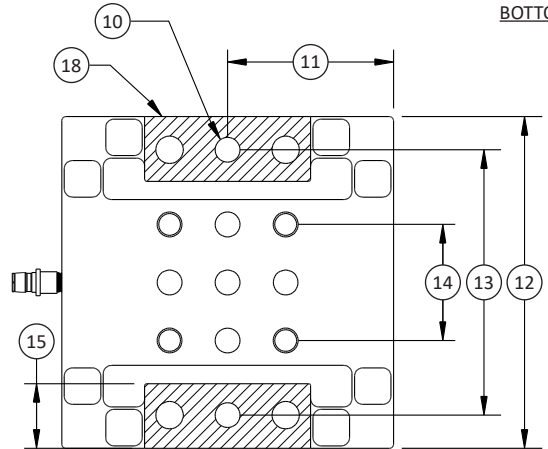
Model 3A400 (Shown)

3A400 SERIES 3-AXIS LOAD CELL (U.S. & METRIC)

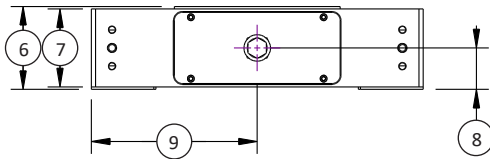
TOP VIEW



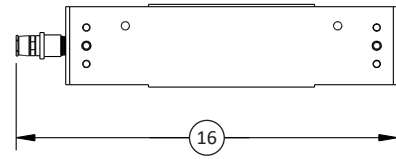
BOTTOM VIEW



FRONT VIEW



SIDE VIEW



DIMENSIONS

See Drawing	Metric	U.S.
	mm	in
(1)	4 x \varnothing 33 THRU, \sqcup \varnothing 50 \downarrow 36	4 x \varnothing 1.3 THRU, \sqcup \varnothing 2.0 \downarrow 1.4
(2)	4 x (M30x3.5) THRU	4 x (M30x3.5) THRU
(3)	5 x \varnothing 30 E7 THRU	5 x \varnothing (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 \varnothing 30 E7 \downarrow 40	2 x \varnothing (1.1835/1.1827) \downarrow 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	