



**Selecting a Machine Tool Transformer Selection Process**

- Total steady-state (sealed) VA is the volt-amperes that the transformer must deliver to the load circuit for an extended period of time — the amount of current required to hold the contact in the circuit.
- Total inrush VA is the volt amperes that the transformer must deliver upon initial energization of the control circuit. Energization of electromagnetic devices takes 30...50 milliseconds. During this inrush period, the electromagnetic control devices draw many times normal current — 3...10 times normal is typical.
- Inrush load power factor is difficult to determine without detailed vector analysis of all the load components. Such an analysis is generally not feasible. Therefore, a safe assumption is 40% power factor.

For proper transformer selection, three characteristics of the load circuit must be determined in addition to the minimum voltage required to operate the circuit. These are total steady-state (sealed) VA, total inrush VA, and inrush load power factor.

- Total steady-state (sealed) VA is the volt-amperes that the transformer must deliver to the load circuit for an extended period of time — the amount of current required to hold the contact in the circuit.
- Total inrush VA is the volt amperes that the transformer must deliver upon initial energization of the control circuit. Energization of electromagnetic devices takes 30...50 milliseconds. During this inrush period, the electromagnetic control devices draw many times normal current — 3...10 times normal is typical.
- Inrush load power factor is difficult to determine without detailed vector analysis of all the load components. Such an analysis is generally not feasible. Therefore, a safe assumption is 40% power factor.

1. Determine the total inrush VA of the control circuits from the table below. Do not neglect the current requirements of indicating lights and other devices that do not have an inrush VA but are re-energized at the same time as the other components in the circuit. Their total VA should be added to the total inrush VA.
2. Refer to the table below, *Regulation Data — Inrush VA*. If the supply circuit voltage (Step 1) is reasonably stable and fluctuates not more than  $\pm 5\%$ , refer to the 90% secondary voltage column. If it fluctuates as much as  $\pm 10\%$ , refer to the 95% secondary voltage column. Go down the column selected until at the inrush VA closest to, but not less than, the inrush VA of the control circuit.

3. Read to the far left side of the chart. The transformer's continuous nominal VA rating is now selected. The secondary voltage that will be delivered under inrush conditions will be either 85%, 90%, or 95% of the rated secondary voltage, depending on the column selected from the table below, *Regulation Data — Inrush VA*. The total sealed VA of the control circuit must not exceed the nominal VA rating of the transformer selected from the table below.
4. Refer to the specification tables on the following pages to select a transformer according to the required continuous nominal VA, and primary and secondary voltage combinations.

**Regulation Data — Inrush VA**

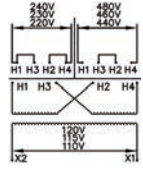
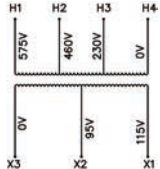
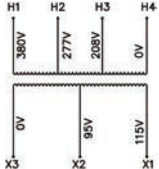
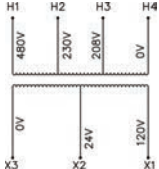
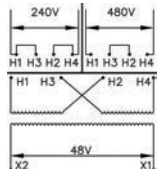
Nominal VA Rating	Inrush VA at 40% Power Factor			Power Factor Adjustments	
	85%	90%	95%	Power Factor	Multiply By
50	158	139	116	100%	0.63
75	242	213	177	90%	0.65
100	346	302	249	80%	0.70
150	528	461	379	70%	0.75
200	869	743	585	60%	0.82
250	1057	904	719	50%	0.90
300	1418	1200	937	40%	1.00
350	1620	1361	1047	30%	1.12
500	2681	2221	1648	20%	1.27
750	4560	3718	2700	10%	1.45
1000	7568	6118	4185	—	—
1500	15724	12423	8203	—	—
2000	16941	13660	9484	—	—
3000	25680	20180	13797	—	—

# Machine Tool Transformers

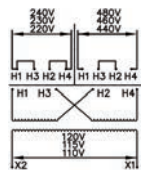
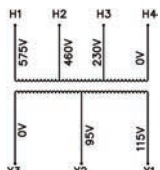
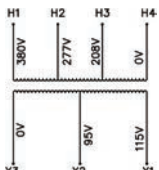
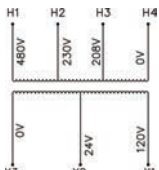
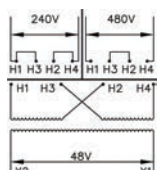
## Product Selection

Note: Refer to 8-47 for information on how to select a machine tool transformer.

### Transformer without Primary or Secondary Fuse Block/Clip‡

Continuous VA	Cat. Nos.				
	Primary 220x440V, 230x460V, 240x480V (50/60 Hz) 	Primary 230/460/575V (50/60 Hz) 	Primary 208/277/380V (50/60 Hz) 	Primary 208/230/480V (50/60 Hz) 	Primary 240x480V (50/60 Hz) 
	Secondary 110, 115, 120V	Secondary 115/95V	Secondary 115/95V	Secondary 120/24V	Secondary 48V
50	1497A-A1-M6-0-N	1497A-A1-M7-0-N	1497A-A1-M8-0-N	1497A-A1-M18-0-N	1497A-A1-M19-0-N
75	1497A-A2-M6-0-N	1497A-A2-M7-0-N	1497A-A2-M8-0-N	1497A-A2-M18-0-N	1497A-A2-M19-0-N
100	1497A-A3-M6-0-N	1497A-A3-M7-0-N	1497A-A3-M8-0-N	<b>1497A-A3-M18-0-N</b>	1497A-A3-M19-0-N
150	<b>1497A-A4-M6-0-N</b>	1497A-A4-M7-0-N	1497A-A4-M8-0-N	1497A-A4-M18-0-N	1497A-A4-M19-0-N
200	1497A-A5-M6-0-N	1497A-A5-M7-0-N	1497A-A5-M8-0-N	1497A-A5-M18-0-N	<b>1497A-A5-M19-0-N</b>
250	1497A-A6-M6-0-N	1497A-A6-M7-0-N	1497A-A6-M8-0-N	1497A-A6-M18-0-N	1497A-A6-M19-0-N
300	1497A-A7-M6-0-N	1497A-A7-M7-0-N	1497A-A7-M8-0-N	1497A-A7-M18-0-N	<b>1497A-A7-M19-0-N</b>
350	1497A-A8-M6-0-N	1497A-A8-M7-0-N	1497A-A8-M8-0-N	1497A-A8-M18-0-N	1497A-A8-M19-0-N
500	<b>1497A-A9-M6-0-N</b>	1497A-A9-M7-0-N	1497A-A9-M8-0-N	—	1497A-A9-M19-0-N
750	1497A-A10-M6-0-N	1497A-A10-M7-0-N	1497A-A10-M8-0-N	—	<b>1497A-A10-M19-0-N</b>
1000	<b>1497A-A11-M6-0-N</b>	1497A-A11-M7-0-N	1497A-A11-M8-0-N	—	1497A-A11-M19-0-N
1500	1497A-A12-M6-0-N	1497A-A12-M7-0-N	1497A-A12-M8-0-N	—	—
2000	<b>1497A-A13-M6-0-N</b>	1497A-A13-M7-0-N	1497A-A13-M8-0-N	—	—
3000	<b>1497A-A14-M6-0-N</b>	—	—	—	—

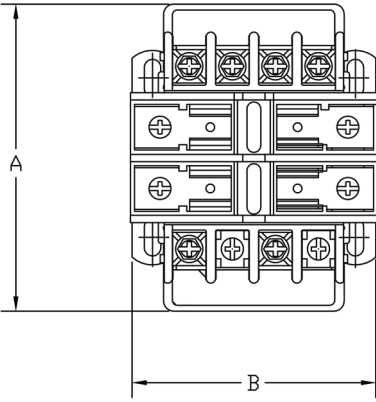
### Transformer with 1 Secondary Fuse Block/Clip‡

Continuous VA	Cat. Nos.				
	Primary 220x440V, 230x460V, 240x480V (50/60 Hz) 	Primary 230/460/575V (50/60 Hz) 	Primary 208/277/380V (50/60 Hz) 	Primary 208/230/480V (50/60 Hz) 	Primary 240x480V (50/60 Hz) 
	Secondary 110, 115, 120V	Secondary 115/95V	Secondary 115/95V	Secondary 120/24V	Secondary 48V
50	1497A-A1-M6-1-N	1497A-A1-M7-1-N	1497A-A1-M8-1-N	1497A-A1-M18-1-N	1497A-A1-M19-1-N
75	1497A-A2-M6-1-N	1497A-A2-M7-1-N	1497A-A2-M8-1-N	1497A-A2-M18-1-N	1497A-A2-M19-1-N
100	1497A-A3-M6-1-N	1497A-A3-M7-1-N	1497A-A3-M8-1-N	1497A-A3-M18-1-N	1497A-A3-M19-1-N
150	1497A-A4-M6-1-N	1497A-A4-M7-1-N	1497A-A4-M8-1-N	1497A-A4-M18-1-N	1497A-A4-M19-1-N
200	1497A-A5-M6-1-N	1497A-A5-M7-1-N	1497A-A5-M8-1-N	1497A-A5-M18-1-N	1497A-A5-M19-1-N
250	1497A-A6-M6-1-N	1497A-A6-M7-1-N	1497A-A6-M8-1-N	1497A-A6-M18-1-N	1497A-A6-M19-1-N
300	1497A-A7-M6-1-N	1497A-A7-M7-1-N	1497A-A7-M8-1-N	1497A-A7-M18-1-N	1497A-A7-M19-1-N
350	1497A-A8-M6-1-N	1497A-A8-M7-1-N	1497A-A8-M8-1-N	1497A-A8-M18-1-N	1497A-A8-M19-1-N
500	<b>1497A-A9-M6-1-N</b>	1497A-A9-M7-1-N	1497A-A9-M8-1-N	—	1497A-A9-M19-1-N
750	<b>1497A-A10-M6-1-N</b>	1497A-A10-M7-1-N	1497A-A10-M8-1-N	—	1497A-A10-M19-1-N
1000	1497A-A11-M6-1-N	1497A-A11-M7-1-N	1497A-A11-M8-1-N	—	1497A-A11-M19-1-N
1500	<b>1497A-A12-M6-1-N</b>	1497A-A12-M7-1-N	1497A-A12-M8-1-N	—	—
2000	1497A-A13-M6-1-N	1497A-A13-M7-1-N	1497A-A13-M8-1-N	—	—
3000	1497A-A14-M6-1-N	—	—	—	—

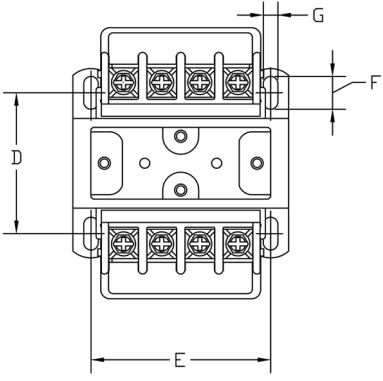
‡ Secondary Fuse Block/Clip: Transformers rated 350VA and below use secondary fuse clips. Transformers rated 500VA and above use secondary fuse blocks.



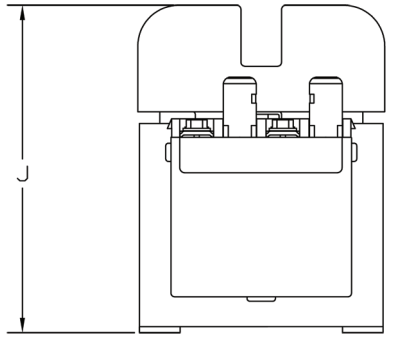
Dimensions are shown in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.



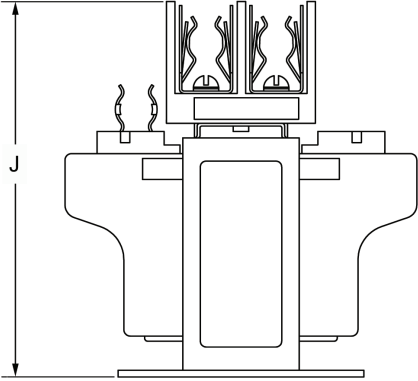
Transformer with 2 Primary Fuse Blocks and 0 or 1 Secondary Fuse Block/Clip (Top View)



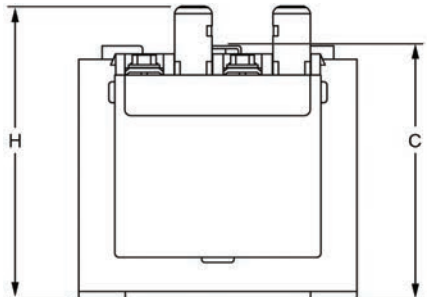
Transformer with 0 Primary Fuse Blocks and 0 or 1 Secondary Fuse Block/Clip (Top View)



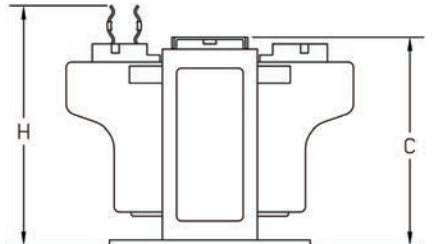
Transformer with 2 Primary Fuse Blocks and 1 Secondary Fuse Block/Clip (Side View)



Transformer with 2 Primary Fuse Blocks and 1 Secondary Fuse Block/Clip (Side View)



Transformer with 0 Primary Fuse Block and Secondary Fuse Block/Clip (Side View)



Transformer with 0 Primary Fuse Blocks and 1 Secondary Fuse Block/Clip (Side View)

VA	Cat. No.	A	B	C	D	E	F	G	H	J	Approx. Shipping Wt. lb (kg)
50	1497A-A1-M6-__-N	3-25/32 (96)	3 (76)	2-23/32 (69)	1-31/32 (50)	2-1/2 (64)	15/32 (12)	1/5 (5)	3-9/64 (80)	4-1/32 (102)	3 (1.4)
	1497A-A1-M7-__-N	4-1/32 (102)			2-1/5 (56)						4 (1.8)
	1497A-A1-M8-__-N	4-17/32 (115)			2-53/64 (72)						4 (1.8)
	1497A-A1-M18-__-N	3-25/32 (96)			1-31/32 (50)						4 (1.8)
	1497A-A1-M19-__-N	4-1/32 (102)			2-27/64 (61)						4 (1.8)
75	1497A-A2-M6-__-N	4-1/32 (102)	3 (76)	2-23/32 (69)	2-27/64 (61)	2-1/2 (64)	15/32 (12)	1/5 (5)	3-9/64 (80)	4-1/32 (102)	4 (1.8)
	1497A-A2-M7-__-N	4-17/32 (115)			2-5/8 (67)						5 (2.3)
	1497A-A2-M8-__-N	4-17/32 (115)	3-3/8 (86)	3-3/64 (77)	3 (76)	2-13/16 (71)			3-15/32 (88)	4-23/64 (110)	5 (2.3)
	1497A-A2-M18-__-N	4-1/32 (102)	3 (76)	2-23/32 (69)	2-27/64 (61)	2-1/2 (64)			3-9/64 (80)	4-1/32 (102)	5 (2.3)
	1497A-A2-M19-__-N	4-1/32 (102)	3 (76)	2-23/32 (69)	2-27/64 (61)	2-1/2 (64)			3-9/64 (80)	4-1/32 (102)	5 (2.3)
100	1497A-A3-M6-__-N	4 (102)	3-3/8 (86)	3-3/64 (77)	2-27/64 (61)	2-13/16 (71)	15/32 (12)	1/5 (5)	3-15/32 (88)	4-23/64 (110)	5 (2.3)
	1497A-A3-M7-__-N	4-1/16 (103)	3-3/4 (95)	3-23/64 (85)	2-13/16 (71)	3-5/16 (80)			3-49/64 (96)	4-21/32 (118)	6 (2.7)
	1497A-A3-M8-__-N	4-17/32 (115)			3 (76)				6 (2.7)		
	1497A-A3-M18-__-N	4-17/32 (115)	3-3/8 (86)	3-3/64 (77)	2-27/64 (61)	2-13/16 (71)			3-15/32 (88)	4-23/64 (110)	6 (2.7)
	1497A-A3-M19-__-N	4 (102)	3-3/8 (86)	3-3/64 (77)	2-27/64 (61)	2-13/16 (71)			3-15/32 (88)	4-23/64 (110)	6 (2.7)

# Machine Tool Transformers

## Approximate Dimensions

VA	Cat. No.	A	B	C	D	E	F	G	H	J	Approx. Shipping Wt. lb (kg)							
150	1497A-A4-M6-__-N	4-1/16 (103)	3-3/4 (95)	3-23/64 (85)	2-13/16 (71)	3-5/16 (80)	15/32 (12)	1/5 (5)	3-49/64 (96)	4-21/32 (118)	6 (2.7)							
	1497A-A4-M7-__-N	4-17/32 (115)			3-3/16 (81)				3-25/32 (96)		7 (3.2)							
	1497A-A4-M8-__-N	5-1/16 (129)							3-49/64 (96)		7 (3.2)							
	1497A-A4-M18-__-N	4-1/16 (103)									2-13/16 (71)	7 (3.2)						
	1497A-A4-M19-__-N																	
200	1497A-A5-M6-__-N	4-3/8 (111)	4-1/2 (114)	3-31/32 (101)	2-5/8 (67)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)	5-9/32 (134)	10 (4.5)							
	1497A-A5-M7-__-N				2-63/64 (76)						10 (4.5)							
	1497A-A5-M8-__-N										2-5/8 (67)	10 (4.5)						
	1497A-A5-M18-__-N																	
	1497A-A5-M19-__-N																	
250	1497A-A6-M6-__-N	4-3/8 (111)	4-1/2 (114)	3-31/32 (101)	2-53/64 (72)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)	5-9/32 (134)	10 (4.5)							
	1497A-A6-M7-__-N				3-15/32 (88)						10 (4.5)							
	1497A-A6-M8-__-N										2-53/64 (72)	10 (4.5)						
	1497A-A6-M18-__-N											4-3/4 (120)						
	1497A-A6-M19-__-N										4-3/8 (111)							
300	1497A-A7-M6-__-N	4-3/4 (120)	4-1/2 (114)	3-31/32 (101)	3-3/16 (81)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)	5-9/32 (134)	12 (5.4)							
	1497A-A7-M7-__-N				6-7/64 (155)						12 (5.4)							
	1497A-A7-M8-__-N										5-1/4 (133)	12 (5.4)						
	1497A-A7-M18-__-N											6-7/64 (155)	5-15/16 (151)	12 (5.4)				
	1497A-A7-M19-__-N										4-3/4 (120)	4-1/2 (114)	3-31/32 (101)	3-3/16 (81)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)
350	1497A-A8-M6-__-N	4-3/4 (120)	4-1/2 (114)	3-31/32 (101)	3-3/16 (81)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)	5-9/32 (134)	12 (5.4)							
	1497A-A8-M7-__-N	4-63/64 (128)			3-3/4 (95)						14 (6.4)							
	1497A-A8-M8-__-N	6-7/64 (155)									14 (6.4)							
	1497A-A8-M18-__-N										5-1/4 (133)	4-5/8 (118)	3-7/8 (98)	4-3/8 (111)	1-1/16 (27)	5/16 (8)	4-2/5 (112)	5-15/16 (151)
	1497A-A8-M19-__-N	4-3/4 (120)									4-1/2 (114)	3-31/32 (101)	3-3/16 (81)	3-3/4 (95)	15/32 (12)	1/5 (5)	4-2/5 (112)	5-9/32 (134)
500	1497A-A9-M6-__-N	6-7/64 (155)	5-1/4 (133)	4-5/8 (118)	3-7/8 (98)	4-3/8 (111)	1-1/16 (27)	5/16 (8)	4-2/5 (112)	5-15/16 (151)	19 (8.6)							
	1497A-A9-M7-__-N										18 (8.2)							
	1497A-A9-M8-__-N											18 (8.2)						
	1497A-A9-M19-__-N																	
	1497A-A10-M6-__-N											7-39/64 (193)	5-1/4 (133)	4-5/8 (118)	5-7/8 (149)	4-3/8 (111)	1-1/16 (27)	5/16 (8)
1497A-A10-M7-__-N	8-7/64 (206)	32 (14.5)																
1497A-A10-M8-__-N	7-39/64 (193)	31 (14.1)																
1497A-A10-M19-__-N			31 (14.1)															
1000	1497A-A11-M6-__-N	7-7/64 (181)	6-3/4 (171)	5-55/64 (149)	4-31/32 (126)	6-1/8 (155)	9/10 (23)	5/16 (8)	4-2/5 (112)	7-3/16 (183)	40 (18.1)							
1497A-A11-M7-__-N	53 (24)																	
1497A-A11-M8-__-N		41 (18.6)																
1497A-A11-M19-__-N		41 (18.6)																
1497A-A12-M6-__-N		8-7/64 (206)									6-3/4 (171)	5-55/64 (149)	6-1/8 (155)	6-1/8 (155)	7/8 (22)	5/16 (8)	4-2/5 (112)	7-3/16 (183)
1497A-A12-M7-__-N	55 (24.9)																	
1497A-A12-M8-__-N	54 (24.5)																	
1497A-A13-M6-__-N	8-7/64 (206)	9 (229)	5-55/64 (149)	6-1/8 (155)	6-1/8 (155)	7/8 (22)	5/16 (8)	4-2/5 (112)	7-3/16 (183)	53 (24)								
1497A-A13-M7-__-N	61 (27.7)																	
1497A-A13-M8-__-N	58 (26.3)																	
3000	1497A-A14-M6-__-N	8 (203)	9 (229)	7-41/64 (194)	5-1/4 (133)	7-1/2 (191)	9/10 (23)	7/16 (11)	4-2/5 (112)	8-61/64 (227)	72 (32.7)							

8

