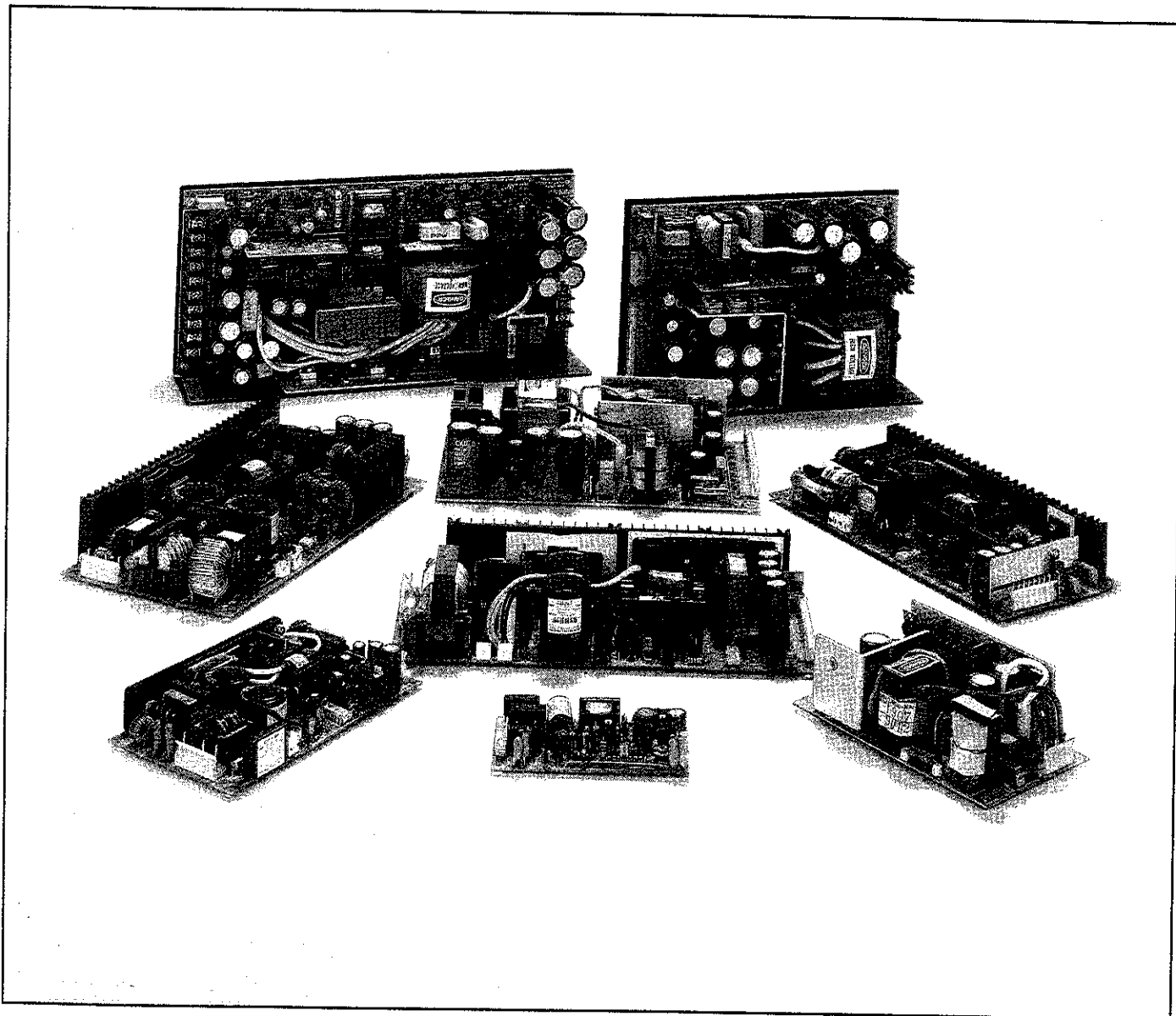


PART 1A—AC-TO-DC SWITCHING POWER SUPPLIES

LAMBDA'S COMMERCIAL Z AND H SERIES



IDEAL FOR HIGH VOLUME, LOW COST OFFICE AUTOMATION APPLICATIONS

Reliability and reproducibility are the essential results of any end manufactured item. And they become increasingly more critical when manufacturing in a high volume environment. Lambda's new H and Z Series of single, triple, quad and pent output off-line switching power supplies are designed and manufactured to ensure these parameters are consistently achieved.

The new H and Z Series are designed for high volume, low cost office automation applications including: Terminal Systems, Data/Voice Multiplexers, Disk/Floppy/Tape Drives, Modems, Minicomputers and Computer Related Peripherals.

In addition, the H and Z Series are ideal for worldwide applications with user selectable 110/220VAC input.

- ☐ Single, triple, quad & pent output.
- ☐ 3750VAC input/output isolation.
- ☐ Molex connectors for ease of manufacturing and service.
- ☐ User selectable 110/220VAC input.
- ☐ EMI on Z Series meets FCC 20780 Class B; VDE 0871 Class B and UCCI-11.
- ☐ Designed for worldwide safety applications.
- ☐ Grade 4 design.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

LAMBDA'S COMMERCIAL Z AND H SERIES

DC OUTPUT

Voltage range shown in tables.

REGULATED VOLTAGE

regulation, line	0.4% maximum for ZT Series. 0.1% maximum for ZS Series. 0.4% typical for H Series. ($\pm 10\%$ AC line change on HSF200.)
regulation, load	0.8% maximum on ZT and ZS Series. 1.0% typical on main output of HVG and HVC Series. 3% on main output of HSF Series; 5% on auxiliary outputs, based on 50%-100% load change on main output and 50%-70% load change on auxiliaries.
ripple and noise (pk-pk)	120mV on 5V outputs of ZS Series, 150mV on 12V and 15V outputs of ZS and ZT Series. 1.0% typical on HVG Series and HVC50, 60, 80. 2% typical on HVC90, 100. 3% typical on HSF Series.

AC INPUT

line	95 to 130 VAC/190-260 VAC, 47-440 Hz on HVG and HVC Series. 100-135 VAC/200-270 VAC on HSF Series. 85-132 VAC/170-265 VAC, 47-440 Hz on ZS and ZT Series.
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DC INPUT

230 to 330 VDC on ZS and ZT Series only.

EFFICIENCY (Typical)

Package Model	Efficiency
HVC, HVG, HSF, ZS10, ZT30	70%
ZS15	71%
ZT60	72%
ZT90	74%
ZS50	75%
ZT160	76%
ZS30-12, -15, ZS75-5	77%
ZS30-24, -48, ZS75-12, -15, ZS100-5, ZS150-5	78%
ZS100-12, -15, ZS150-12, -15	79%
ZS75-24, -48, ZS100-24, ZS150-24	80%
ZS100-48, ZS150-48	81%

OPERATING TEMPERATURE RANGE

0°C to +70°C for H Series. -10°C to +60°C for ZS and ZT Series.

STORAGE TEMPERATURE RANGE

-20°C to +80°C for HVC and HVG Series. -20°C to +85°C for HSF Series.
-30°C to +85°C for ZS and ZT Series.

OVERLOAD PROTECTION

All outputs are short circuit protected. At no time should the average power (excluding transients) exceed the maximum continuous output power. Avoid operation in overload or dead short for sustained periods.

OVERVOLTAGE PROTECTION

Standard on main 5V output of all multiple output units and ZS Series.

PRE-LOAD REQUIREMENTS

All multiple output units require pre-load on main 5V output: 20% on HVC, HVG and HSF Series; 10% on ZT Series.

IN-RUSH CURRENT LIMITING

The typical turn-on in-rush current is as follows:

Series	In-Rush Current
HVG30, 40	20A
HVC50, 60, 80	25A
HVC90, 129	30A
ZS, ZT30, ZT170	15A @ 100VAC/30A @ 200VAC
ZT60, 90	30A
HSF200	40A

COOLING

All units are convection cooled except the HSF200 which is rated at 150W convection and 200W with 35 CFM of forced air; and the ZT170 which is rated as shown with forced air cooling. Contact the factory for free convection ratings.

CONNECTIONS

All input and output connections are via Molex type connectors (barrier strips on HVC129 and HSF200).

MOUNTING

Ratings are for horizontal mounting, component side up. For other mounting configurations consult factory for rating information.

ISOLATION RATING

3750VAC input to output.
1500VAC input to ground on H Series.
2500VAC input to ground on ZS and ZT Series.
500VAC output to ground.

EMI

Conducted EMI on the input of the ZS and ZT units conform to FCC docket 20780 Class B and VDE 0871 Class B. Many H Series units conform to FCC and VDE EMI specifications. Consult factory for information on specific H Series models.

PHYSICAL DATA

Package Model	Lbs. Net	Lbs. Ship	Construction	Size Inches
HVG30	.77	.90	PCB	5.0 × 3.012 × 1.57
HVG40	1.10	1.25	PCB	6.89 × 4.14 × 2.37
HVC50	1.32	1.45	PCB	7.72 × 4.25 × 2.0
HVC60	1.53	2.53	L-Bracket	8.0 × 4.45 × 2.52
HVC80	1.57	1.75	L-Bracket	7.99 × 5.12 × 2.36
HVC90	1.88	2.05	L-Bracket	7.99 × 4.42 × 2.32
HVC100	2.04	2.21	L-Bracket	8.0 × 6.5 × 2.4
HVC129	2.50	2.70	U-Bracket	10.5 × 5 × 2.54
HSF200	3.20	3.40	L-Bracket	11 × 5 × 2.5
ZS10	.27	.4	PCB	.83 × 2.36 × 5.12
ZS15	.31	.4	PCB	.83 × 2.36 × 5.63
ZS30	.60	.75	PCB	1.02 × 2.36 × 6.77
ZS50	.80	.95	PCB	1.02 × 2.95 × 7.87
ZS75	1.00	1.15	PCB	1.26 × 2.95 × 8.74
ZS100	1.32	1.4	PCB	1.46 × 3.15 × 8.74
ZS120P	1.10	1.40	PCB	8.19 × 3.15 × 1.57
ZS150	1.45	1.7	PCB	1.69 × 3.54 × 8.74
ZT30	.48	.70	PCB	5.51 × 3.15 × 1.02
ZT60	.77	1.00	PCB	7.28 × 3.54 × 1.02
ZT90	1.08	1.30	PCB	8.07 × 3.70 × 1.41
ZT170	1.54	1.80	PCB	8.46 × 4.33 × 1.61

GUARANTEE

90 day guarantee includes parts as well as labor.

UL/CSA/TUV

Under evaluation. The H Series is UL recognized.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

COMMERCIAL SWITCHING SELECTOR GUIDE

110/220VAC Single Input. Single Output.

V _o ADJ. RANGE	MAX CURRENT AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	QTY. 1	QTY. 10	PRICE				QTY. 1000	MODEL
	25°C	40°C*	50°C	60°C						QTY. 25	QTY. 100	QTY. 250	QTY. 1000		
5V ADJ.															
±10%	2.00	2.00	2.00	1.40	67	177	.83 × 2.36 × 5.12	\$ 41	\$ 37	\$ 34	\$ 31	\$ 30	\$28	28	ZS10-5
±10%	3.00	3.00	3.00	2.10	67	177	.83 × 2.36 × 5.63	48	46	43	36	33	31	31	ZS15-5
±10%	6.00	6.00	6.00	4.20	67	177	1.02 × 2.36 × 6.77	62	58	54	44	41	37	37	ZS30-5
±10%	10.00	10.00	10.00	7.00	67	177	1.02 × 2.95 × 7.87	78	73	67	54	51	45	45	ZS50-5
±10%	15.00	15.00	15.00	9.00	67	177	1.26 × 2.95 × 8.74	99	94	87	69	63	57	57	ZS75-5
±10%	20.00	20.00	20.00	14.00	67	177	1.46 × 3.15 × 8.74	121	115	106	86	79	69	69	ZS100-5
±10%	30.00	27.00*	24.00	21.00	67	177	1.69 × 3.54 × 8.74	181	172	159	128	117	85	85	ZS150-5
12V ADJ.															
±10%	.85	.85	.85	.60	67	177	.83 × 2.36 × 5.12	41	37	34	31	30	28	28	ZS10-12
±10%	1.25	1.25	1.25	.88	67	177	.83 × 2.36 × 5.63	48	46	43	36	33	31	31	ZS15-12
±10%	2.50	2.50	2.50	1.75	67	177	1.02 × 2.36 × 6.77	62	58	54	44	41	37	37	ZS30-12
±10%	4.30	4.30	4.30	3.01	67	177	1.02 × 2.95 × 7.87	78	73	67	54	51	45	45	ZS50-12
±10%	6.30	6.30	6.30	3.78	67	177	1.26 × 2.95 × 8.74	99	94	87	69	63	57	57	ZS75-12
±10%	8.50	8.50	8.50	5.95	67	177	1.46 × 3.15 × 8.74	121	115	106	86	79	69	69	ZS100-12
±10%	12.50	11.25*	10.00	8.75	67	177	1.69 × 3.54 × 8.74	181	172	159	128	117	85	85	ZS150-12
15V ADJ.															
±10%	.70	.70	.70	.49	67	177	.83 × 2.36 × 5.12	41	37	34	31	30	28	28	ZS10-15
±10%	1.00	1.00	1.00	.70	67	177	.83 × 2.36 × 5.63	48	46	43	36	33	31	31	ZS15-15
±10%	2.00	2.00	2.00	1.40	67	177	1.02 × 2.36 × 6.77	62	58	54	44	41	37	37	ZS30-15
±10%	3.50	3.50	3.50	2.45	67	177	1.02 × 2.95 × 7.87	78	73	67	54	51	45	45	ZS50-15
±10%	5.00	5.00	5.00	3.00	67	177	1.26 × 2.95 × 8.74	99	94	87	69	63	57	57	ZS75-15
±10%	6.70	6.70	6.70	4.69	67	177	1.46 × 3.15 × 8.74	121	115	106	86	79	69	69	ZS100-15
±10%	10.00	9.00*	8.00	7.00	67	177	1.69 × 3.54 × 8.74	181	172	159	128	117	85	85	ZS150-15
24V ADJ.															
±10%	.45	.45	.45	.32	67	177	.83 × 2.36 × 5.12	41	37	34	31	30	28	28	ZS10-24
±10%	.65	.65	.65	.46	67	177	.83 × 2.36 × 5.63	48	46	43	36	33	31	31	ZS15-24
±10%	1.30	1.30	1.30	.91	67	177	1.02 × 2.36 × 6.77	62	58	54	44	41	37	37	ZS30-24
±10%	2.10	2.10	2.10	1.47	67	177	1.02 × 2.95 × 7.87	78	73	67	54	51	45	45	ZS50-24
±10%	3.20	3.20	3.20	1.92	67	177	1.26 × 2.95 × 8.74	99	94	87	69	63	57	57	ZS75-24
±10%	4.30	4.30	4.30	3.01	67	177	1.46 × 3.15 × 8.74	121	115	106	86	79	69	69	ZS100-24
±5%	5.00	5.00	3.50	—	67	177	1.50 × 3.15 × 8.19	125	111	100	81	72	84	84	ZS120P-24
±10%	6.30	5.67*	5.04	4.41	67	177	1.69 × 3.54 × 8.74	181	172	159	128	117	85	85	ZS150-24

*Ratings are at 35°C for ZS150

For exact input voltage range, see electrical specifications pages.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

COMMERCIAL SWITCHING SELECTOR GUIDE

110/220 VAC Single Input. Single Output.

V _o ADJ. RANGE	MAX CURRENT AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	QTY. 1	QTY. 10	PRICE				QTY. 1000	MODEL
	25°C	40°C*	50°C	60°C						QTY. 25	QTY. 100	QTY. 250	QTY. 1000		
48V ADJ.															
±10%	.70	.70	.70	.49	67	177	1.02 × 2.36 × 6.77	62	58	54	44	41	37	37	ZS30-48
±10%	1.10	1.10	1.10	.77	67	177	1.02 × 2.95 × 7.87	78	73	67	54	51	45	45	ZS50-48
±10%	1.60	1.60	1.60	.96	67	177	1.25 × 2.95 × 8.74	99	94	87	69	63	57	57	ZS75-48
±10%	2.10	2.10	2.10	1.47	67	177	1.46 × 3.15 × 8.74	121	115	106	86	79	69	69	ZS100-48
±10%	3.20	2.88*	2.56	2.24	67	177	1.69 × 3.54 × 8.74	181	172	159	128	117	85	85	ZS150-48

*Ratings are at 35°C for ZS150

For exact input voltage range, see electrical specifications pages.

NOTES: 1. Output #1 requires a 1.0A minimum load on the LWD-50-0512 and LWD-50-0524 models; 0.4A minimum load on the LWD-50-1224; 0.3A minimum load on the LWD-50-1515.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

COMMERCIAL SWITCHING SELECTOR GUIDE

Triple Output.

VOLT V _o	MAX CURRENT AT OPERATING TEMPERATURE OF				MAX POWER AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (Inches)	PRICE						MODEL
	25°C	40°C	50°C	60°C	25°C	40°C	50°C	60°C				QTY. 1	QTY. 10	QTY. 25	QTY. 100	QTY. 250	QTY. 1000	
5V, +12V, -12V																		
+5	3.00	3.00	3.00	2.10	33.00	33.00	33.00	23.10	67	177	5.51 × 3.15 × 1.02	82	78	72	58	53	47	ZT30-522
+12	1.20	1.20	1.20	.84														
-12	.30	.30	.30	.21														
+5	5.00	5.00	5.00	3.50	61.00	61.00	61.00	42.70	67	177	7.28 × 3.54 × 3.54	99	94	87	69	64	58	ZT60-522
+12	2.50	2.50	2.50	1.75														
-12	.50	.50	.50	.35														
+5	10.00	10.00	10.00	7.00	92.00	92.00	92.00	64.40	67	177	8.07 × 3.70 × 1.41	131	125	116	93	86	72	ZT90-522
+12	3.00	3.00	3.00	2.10														
-12	.50	.50	.50	.35														
+5	20.00	20.00	20.00	14.00	172.00	172.00	172.00	120.40	67	177	8.46 × 4.33 × 1.61	198	188	174	139	129	119	ZT170-522*
+12	5.00	5.00	5.00	3.50														
-12	1.00	1.00	1.00	.70														

*Ratings for ZT-170 Series apply when operated with forced air cooling. Consult factory for applicable ratings without forced air cooling.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

COMMERCIAL SWITCHING SELECTOR GUIDE

Triple Output.

VOLT V _o	MAX CURRENT AT OPERATING TEMPERATURE OF				MAX POWER AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	PRICE						MODEL
	25°C	40°C	50°C	60°C	25°C	40°C	50°C	60°C				QTY. 1	QTY. 10	QTY. 25	QTY. 100	QTY. 250	QTY. 1000	
5V, +15V, -15V																		
+5	3.00	3.00	3.00	2.10	34.50	34.50	34.50	24.15	67	177	5.51 × 3.15 × 1.02	82	78	72	58	53	47	ZT30-SFF
+15	1.00	1.00	1.00	.70														
-15	.30	.30	.30	.21														
+5	5.00	5.00	5.00	3.50	62.50	62.50	62.50	43.75	67	177	7.28 × 3.54 × 1.02	99	94	87	69	64	58	ZT60-SFF
+15	2.00	2.00	2.00	1.40														
-15	.50	.50	.50	.35														
+5	10.00	10.00	10.00	7.00	95.00	95.00	95.00	66.50	67	177	8.07 × 3.70 × 1.41	131	125	116	93	86	72	ZT90-SFF
+15	2.50	2.50	2.50	1.75														
-15	.50	.50	.50	.35														
+5	20.00	20.00	20.00	14.00	175.00	175.00	175.00	122.50	67	177	8.46 × 4.33 × 1.61	198	188	174	139	129	119	ZT170-SFF*
+15	4.00	4.00	4.00	2.80														
-15	1.00	1.00	1.00	.70														
5V + 12V, -5V																		
+5	3.00	3.00	3.00	2.10	30.90	30.90	30.90	21.63	67	177	5.51 × 3.15 × 1.02	82	78	72	58	53	47	ZT30-S25
+12	1.20	1.20	1.20	.84														
-5	.30	.30	.30	.21														

*Ratings for ZT-170 Series apply when operated with forced air cooling. Consult factory for applicable ratings without forced air cooling.
5V + 12V, -5V models continued on next page.

PART IA—AC-TO-DC SWITCHING POWER SUPPLIES

COMMERCIAL SWITCHING SELECTOR GUIDE

Triple Output.

VOLT V _o	MAX CURRENT AT OPERATING TEMPERATURE OF				MAX POWER AT OPERATING TEMPERATURE OF				COMPLETE ELEC. SPEC. PG.	COMPLETE MECH. SPEC. PG.	DIMENSIONS (inches)	PRICE						MODEL
	25°C	40°C	50°C	60°C	25°C	40°C	50°C	60°C				QTY. 1	QTY. 10	QTY. 25	QTY. 100	QTY. 250	QTY. 1000	
5V + 12V, - 5V (continued)																		
+ 5	5.00	5.00	5.00	3.50	57.50	57.50	57.50	40.25	67	177	7.28 × 3.54 × 1.02	\$ 99	\$ 94	\$ 87	\$ 69	\$ 64	\$ 58	ZT60-525
+12	2.50	2.50	2.50	1.75														
- 5	.50	.50	.50	.35														
+ 5	10.00	10.00	10.00	7.00	88.50	88.50	88.50	61.95	67	177	8.07 × 3.70 × 1.41	131	125	116	93	86	72	ZT90-525
+12	3.00	3.00	3.00	2.10														
- 5	.50	.50	.50	.35														
+ 5	20.00	20.00	20.00	14.00	165.00	165.00	165.00	115.50	67	177	8.46 × 4.33 × 1.61	198	188	174	139	129	119	ZT170-525*
+12	5.00	5.00	5.00	3.50														
- 5	1.00	1.00	1.00	.70														

*Ratings for ZT-170 Series apply when operated with forced air cooling. Consult factory for applicable ratings without forced air cooling.

PART V—MECHANICAL DRAWINGS

V-SERIES AND Z-SERIES

TABLE 1 DIMENSIONS ARE IN $\frac{\text{INCHES}}{(\text{MM})}$

SEE FIGURE 1

ZS SERIES	ZS10	$\frac{2.36}{(60)}$	$\frac{1.969}{(50)}$	$\frac{.197}{(5)}$	$\frac{4.724}{(120)}$			THESE FIGURES NOT AVAILABLE	$\frac{.83}{(21)}$	THESE FIGURES NOT AVAILABLE	$\frac{1.84}{(46.75)}$	$\frac{5.12}{(130)}$	$\frac{1.49}{(37.75)}$	
	ZS15	$\frac{2.36}{(60)}$	$\frac{1.969}{(50)}$	$\frac{.197}{(5)}$	$\frac{5.236}{(133)}$				$\frac{.83}{(21)}$		$\frac{1.68}{(42.75)}$	$\frac{5.63}{(143)}$	$\frac{1.51}{(38.25)}$	
	ZS30	$\frac{2.36}{(60)}$	$\frac{1.969}{(50)}$	$\frac{.197}{(5)}$	$\frac{6.378}{(162)}$	$\frac{.138}{(3.5)}$	$\frac{3.228}{(82)}$		$\frac{1.02}{(26)}$		$\frac{1.13}{(28.75)}$	$\frac{5.77}{(172)}$	$\frac{1.02}{(26.00)}$	
	ZS50	$\frac{2.95}{(75)}$	$\frac{2.559}{(65)}$	$\frac{.197}{(5)}$	$\frac{7.480}{(190)}$	$\frac{2.343}{(59.5)}$	$\frac{2.972}{(75.5)}$		$\frac{1.02}{(26)}$		$\frac{.79}{(18.75)}$	$\frac{7.87}{(200)}$	$\frac{1.56}{(39.50)}$	
	ZS75	$\frac{2.95}{(75)}$	$\frac{2.559}{(65)}$	$\frac{.197}{(5)}$	$\frac{8.346}{(212)}$	$\frac{2.146}{(54.5)}$	$\frac{2.972}{(75.5)}$		$\frac{1.26}{(32)}$		$\frac{1.75}{(44.5)}$	$\frac{8.74}{(222)}$	$\frac{1.56}{(39.50)}$	
	ZS100	$\frac{3.15}{(80)}$	$\frac{2.756}{(70)}$	$\frac{.197}{(5)}$	$\frac{8.346}{(212)}$	$\frac{2.106}{(53.5)}$	$\frac{3.996}{(101.5)}$		$\frac{1.46}{(37)}$		$\frac{1.32}{(33.5)}$	$\frac{8.74}{(222)}$	$\frac{1.67}{(42.50)}$	
	ZS150	$\frac{3.54}{(90)}$	$\frac{3.150}{(80)}$	$\frac{.197}{(5)}$	$\frac{8.346}{(212)}$	$\frac{2.677}{(68)}$	$\frac{5.433}{(138)}$		$\frac{1.69}{(43)}$		$\frac{.91}{(23)}$	$\frac{8.74}{(222)}$	$\frac{2.62}{(66.5)}$	$\frac{1.95}{(49.5)}$
ZT SERIES	ZT30	$\frac{3.15}{(80)}$	$\frac{2.756}{(70)}$	$\frac{.197}{(5)}$	$\frac{5.118}{(130)}$			$\frac{3.66}{(93)}$	$\frac{1.02}{(26)}$	$\frac{.61}{(15.5)}$	$\frac{.87}{(22)}$	$\frac{5.51}{(140)}$	$\frac{1.02}{(26)}$	
	ZT60	$\frac{3.54}{(90)}$	$\frac{3.152}{(80)}$	$\frac{.197}{(5)}$	$\frac{6.890}{(175)}$	$\frac{.827}{(21)}$	$\frac{4.803}{(122)}$	$\frac{5.61}{(142.5)}$	$\frac{1.02}{(26)}$	$\frac{.55}{(14)}$	$\frac{1.30}{(33)}$	$\frac{7.28}{(185)}$	$\frac{.83}{(21)}$	
	ZT90	$\frac{3.70}{(94)}$	$\frac{3.307}{(84)}$	$\frac{.197}{(5)}$	$\frac{7.677}{(195)}$	$\frac{.945}{(24)}$	$\frac{4.626}{(117.5)}$	$\frac{5.10}{(129.5)}$	$\frac{1.42}{(36)}$	$\frac{.71}{(18)}$	$\frac{1.09}{(27.75)}$	$\frac{8.07}{(205)}$	$\frac{1.11}{(28.25)}$	
	ZT170	$\frac{4.33}{(110)}$	$\frac{3.937}{(100)}$	$\frac{.197}{(5)}$	$\frac{8.071}{(205)}$	$\frac{1.535}{(39)}$	$\frac{4.449}{(113)}$	$\frac{4.49}{(114)}$	$\frac{1.61}{(41)}$	$\frac{.18}{(4.5)}$	$\frac{1.36}{(34.5)}$	$\frac{8.46}{(215)}$	$\frac{3.41}{(86.5)}$	$\frac{2.58}{(65.5)}$