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APPENDIX A. SPECIFICATIONS

Table A-1. Control Voltage Capacities

This table shows the amount of current available from the power supply module at the three control voltages. It also gives the current consumption for some common Indramat components.

Power Supply	CURRENT AVAILABLE +15V (mA)	-15V (mA)	+24V (A)
TVM 1.2-50-220/300-W0	850	850	4.0*
TVM 2.1-50-220/300-W1	900	1000	8.0
TVM 2.2	1300	1000	8.0
KDV 1.3	1500	1200	8.0
KDV 2.1	2000	2000	12.0
KDV 2.2	2000	2000	12.0
KDV 3.1	2000	2000	11.5
KDV 4.1	2000	2000	11.5

*Unregulated Supply

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Table A-2. Specifications

Quantity	TVM 1.2	TVM 2.1	TVM 2.2	KDV 1.3	KDV 2.2	KDV 3.1	KDV 4.1
Line Volt. (3-phase)	220	220	220	220	220	220	380-460
Control Volt. (1-phase)	220/380 220/115	220/380 115/220	220/380 220/115	220/380 115/220	220	220	220
Line Freq. (Hz)	50-60	50-60	50-60	50-60	50-60	50-60	50-60
Average I (amps)	14	14	14	100	100	100	100
Peak I (amps)	150	150	150	300	300	300	300
Cont. Power (kW)	4.1	4.1	4.1	30	30	30	30
Peak Power (kW)	45	45	45	90	90	90	48

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Table A-4. Bleeder Specifications

Power Supply	Average Power Bleeder Power	Peak Bleeder Power
TVM 1.2	300W	10kW
TVM 1.2 w/TBM1.1	1200W	30kW
TVM 1.2 w/TBM1.2	2100W	50kW
TVM 2.1	450W	10kW
TVM 2.1 w/TBM1.1	1350W	30kW
TVM 2.1 w/TBM1.2	2250W	50kW
KDV 1.3	2000W	40kW
KDV 2.1	2000W	40kW
KDV 2.2	2000W	40kW
KDV 2.3	2000W	40kW
KDV 3.1	20000W	40kW
KDV 4.1	20000W	40kW

Table A-5. Miscellaneous Specifications

Allowable ambient temperature range at rated values.	-5 to 45°C (29 to 113°F)
Absolute maximum temperature. (Derated performance)	55°C (131°F)
Storage and transportation temperature range.	-30 to 85°C (-22 to 185°F)
Maximum operating altitude at rated values.	1000 meters (3280 ft.)
DC bus voltage.	300Vdc (+/- 15%)
Weights	TVM 1.2 - 32 lb (14.3 kg) TVM 2.1 - 33 lb (15 kg) TVM 2.2 - 33 lb (15 kg) KDV 1.3 - 46 lb (21 kg) KDV 2.1 - 38 lb (17 kg) KDV 2.2 - 38 lb (17 kg) KDV 2.3 - 38 lb (17 kg) KDV 3.1 - 47 lb (21.2 kg) KDV 4.1 - 47 lb (21.2 kg)

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Table A-10. Circuit Breakers

The following are circuit breakers that have been used succesfully for line overcurrent protection with Indramat TVM/KDV power supplies. Inclusion in this list does not constitute endorsement by Indramat in a particular application.

XFMR PWR IN KVA	POWER SUPPLY	ADDITIONAL CAPACITANCE IN uF	SMOOTHING INDUCTOR WITH	SMOOTHING INDUCTOR W/O	In - PRIMARY NOM CURRENT IN AMPS 460V 3Ø	SUGGESTED CIRCUIT BREAKER SIEMENS: 3VE	BREAKER CURRENT SETTINGS IN AMPS	ACTUAL CURRENT SETTING (1.5 x In) IN AMPS
2.0	TVM	--		X	2.5	3VE3000-2LA00	6.3...10	6.3 (2.5 x In)
2.0	TVM	max, 8000		X	2.5	3VE3000-8LA00	8 ...12.5	8 (3.2 X In)
2.5	TVM	--		X	3.1	3VE3000-2LA00	6.3...10	6.3 (2.0 x In)
2.5	TVM	max, 8000		X	3.1	3VE3000-8LA00	8 ...12.5	8 (2.6 x In)
3.0	TVM	--		X	3.8	3VE3000-2LA00	6.3...10	6.3 (1.7 x In)
3.0	TVM	max, 8000		X	3.8	3VE3000-2MA00	10 ...16	10 (2.6 x In)
3.5	TVM	--		X	4.4	3VE3000-2MA00	10 ...16	10 (2.3 x In)
3.5	TVM	max, 8000		X	4.4	3VE3000-2MA00	10 ...16	10 (2.3 x In)
4.0	TVM	--		X	5.0	3VE3000-2MA00	10 ...16	10 (2.0 x In)
4.0	TVM	max, 8000		X	5.0	3VE3000-2MA00	10 ...16	10 (2.0 x In)
5.0	TVM	--		X	6.3	3VE3000-2MA00	10 ...16	10 (1.6 x In)
5.0	TVM	max, 8000		X	6.3	3VE3000-2MA00	10 ...16	10 (1.6 x In)
7.5	TVM	--		X	9.4	3VE3000-8MA00	12.5..20	14.1
7.5	KDV	--	X	X	9.4	3VE3000-8MA00	12.5..20	14.1
7.5	KDV	max, 8000	X	X	9.4	3VE3000-2NA00	16 ...25	16.0 (1.7 x In)
10.0	TVM	--		X	12.6	3VE3000-2NA00	16 ...25	18.9
10.0	KDV	--	X	X	12.6	3VE3000-2NA00	16 ...25	18.9
10.0	KDV	max, 8000	X	X	12.6	3VE3000-2PA00	22 ...32	18.9
12.5	KDV	--	X	X	15.7	3VE3000-2PA00	22 ...32	23.6
12.5	KDV	max, 8000	X	X	15.7	3VE3000-2PA00	22 ...32	23.6
15.0	KDV	--	X	X	18.8	3VE3000-2PA00	22 ...32	28.2
15.0	KDV	max, 8000	X	X	18.8	3VE4200-.CR..	28 ...40	28.2
20.0	KDV	--	X		25.1	3VE4200-.CS..	36 ...50	37.7
20.0	KDV	max, 8000	X		25.1	3VE4200-.CS..	36 ...50	37.7
25.0	KDV	--	X		31.4	3VE4200-.CS..	36 ...50	47.1
25.0	KDV	max, 8000	X		31.4	3VE4200-.CT..	45 ...63	47.1
35.0	KDV	--	X		43.9	3VE5201-.CS..	63 ...80	65.9
35.0	KDV	max, 8000	X		43.9	3VE5201-.CS..	63 ...80	65.9
50.0	KDV	--	X		62.8	3VE5201-.CT..	80 ..100	94.2
50.0	KDV	max, 8000	X		62.8	3VE5201-.CT..	80 ..100	94.2

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Table A-7. Fuses

Fuse Number	Fuse Type	Function
TVM Power Supply		
F1	NEOZED 25A/380V	DC bus
F2	10A/250V 5x20mm	+24 Vdc supply
F3	6A/250V 5x20mm	220 or 380 Vac
F4	6.3A/250V 5x20mm	control voltage
F3	10A/250V 5x20mm	115 or 230 Vac
F4	10A/250V 5x20mm	contol voltage
F5*	.315A/250V 5x20mm	220 Vac Internal Blower
F5*	.630A/250V 5x20mm	115 Vac Internal Blower
TBM Bleeder Module		
F5*	.315A/250V 5x20mm	220Vac Internal Blower
F5*	.630A/250V 5x20mm	115Vac Internal Blower
KDV 1.3 Power Supply		
F1	NEOZED 100A/380V	DC Bus
F2	10A/250V 5x20mm	24Vdc Supply
F3	6.3A/250V 5x20mm	220 or 380Vac
F4	6.3A/250V 5x20mm	Control Voltage
F3	10A/250V 5x20mm	115 or 220Vac
F4	10A/250V 5x20mm	Control Voltage
F5*	.630A/250V 5x20mm	220Vac Internal Blower
F5*	1.25A/250V 5x20mm	115Vac Internal Blower
KDV 2.2 & 3.1 Power Supply		
F2	12A	External 24V
F3	10A/250V 5x20mm	220 or 380Vac
F4	10A/250V 5x20mm	Control Voltage
F7	10A/250V 5x20mm	Internal Blower
F8	10A/250V 5x20mm	Internal Blower
KDV 2.3 Power Supply		
F2	12A	External 24V
F3	10A/250V 5x20mm	220 or 380Vac
F4	10A/250V 5x20mm	Control Voltage
KDV 4.1 Power Supply		
F2	12A/250V 5x20mm	+24 V_{lext} (output)
F3	10A/250V 5x20mm	Aux. Voltage (L1)
F4	10A/250V 5x20mm	Aux. Voltage (L3)
F6	0.63A/250V 5x20mm	External Heat Sink
F7	10A/250V 5x20mm	Fan Fuse (L1)
F8	10A/250V 5x20mm	Fan Fuse (L3)

KDV 2.1
F1 100A BUS
F2 24V DC 12A
F3 220 LINE 10A
F4 220 LINE 10A
F5 BLOWER

*Note: These fuses are used only when blowers are installed.

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Table A-6. Single Phase Power Requirements

Device	Power Requirement
Internal Blower for TBM, TVM, KDS, KDA, KDV, KDW	15VA
Internal Blower for TDM, TWM	30VA
External Blower for KDV, KDS, KDA	80VA
Motor Blower for MAC 90 and MAC 112	55VA
Motor Blower for MAC 132	77VA
Motor Blower for 1AD 132M	135VA
Motor Blower for 1AD 160M, 1AD 160L, 1AD 180M, and 1AD 180L	195VA
TVM 1.2	500 VA
TVM 2.1	750 VA
TVM 2.2	750 VA
KDV 1.3	750 VA
KDV 2.1	750 VA
KDV 2.2	750 VA
KDV 3.1	750 VA

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Table A-3. Power Dissipation

Device	Power Dissipation at Rated Performance (Inside Enclosure)
TVM 1.2	400W*
TVM 2.1	580W*
TVM 2.2	580W*
KDV 1.3	150W*
KDV 2.1	150W
KDV 2.2	150W
KDV 3.1	500W
TDM 1.2- 30-300-W0	160W
TDM 1.2- 30-300-W1	190W
TDM 1.2- 50-300-W1	250W
TDM 1.2-100-300-W1	400W
TDM 2.1- 15-300-W0	110W
TDM 2.1- 30-300-W0	160W
TDM 2.1- 30-300-W1	190W
TDM 3.1- 20-300-W0	110W
TDM 3.2- 20-300-W0	110W
KDS 1.1- 30-300-W0	60W
KDS 1.1- 50-300-W0	70W
KDS 1.1- 50-300-W1	85W
KDS 1.1-100-300-W0	90W
KDS 1.1-100-300-W1	150W
KDS 1.1-150-300-W1	160W
KDA 1.1-100-300-W1	150W
KDA 1.1-150-300-W1	160W
KDA 2.1-100-300-W1	150W
KDA 2.1-150-300-W1	160W
KDW 1.1- 50-300-W1	85W
KDW 1.1-100-300-W1	150W
KDW 1.1-150-300-W1	160W
TWM 1.1- 50-300-W1	250W
TWM 1.1-100-300-W1	400W
KDF 1.1- 50-300-Wx	60W
KDF 1.1-100-300-W1	100W
KDF 1.1-150-300-W1	150W

*Note: These figures do not include additional bleeder power dissipation.

Table A-1. DC Control Voltage Capacities, Cont'd.

Component	CURRENT REQUIRED +15V (mA)	-15V (mA)	+24V (A)
MAC Tachometer unit	24	3	--
MAC Incremental Encoder	8	95	--
TDM 1.2 - 30	140	50	0.75
TDM 1.2 - 50	140	50	0.95
TDM 1.2 - 100	140	50	1.45
TDM 2.1 - 30	140	50	0.75
TDM 3.2 - 20	120	50	0.40
TDM 3.2 - 30	125	55	0.65
TDM 3.3 - 30	125	55	0.65
TDM 4.1 - 30	125	55	0.65
TDM 4.3 - 30	125	55	0.65
KDS 1.1 - 30	140	50	0.75
KDS 1.1 - 50	140	50	0.95
KDS 1.1 - 100	140	50	1.45
KDS 1.1 - 150	140	50	1.95
KDA 1.x - 50	130	25	0.95
KDA 1.x - 100	130	25	1.45
KDA 1.x - 150	130	25	1.85
TWM 1.x - 50	210	95	1.00
TWM 1.x - 100	210	95	1.50
KDW 1.x - 50	210	95	1.00
KDW 1.x - 100	210	95	1.50
KDW 1.x - 150	210	95	2.00
CDM (1)	65	60	0.75
Trans Module (1)	60	60	1.80

Notes:
1. These current requirements are exclusive of external loads.

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Tables A-8 and A-9 are contactors which have been used successfully with Indramat TVM/KDV power supplies. Inclusion in these lists does not constitute endorsement by Indramat in a particular application.

Table A-8. Main Contactors

XFMR PWR IN KVA	ADDITIONAL CAPACITANCE IN uF	PEAK INRUSH CURRENT ON TRANSFORMER PRIMARY WITHOUT SOFT-START RESISTOR (IN AMPS)*	SUGGESTED CONTACTOR: SQUARE D DEFINITE PURPOSE CLASS 8910	
			W/O SOFT-START RESISTOR	WITH SOFT-START RESISTOR
2.0	--	190	LO-3	JO-3
2.0	max, 8000	223	MO-3	JO-3
2.5	--	215	MO-3	JO-3
2.5	max, 8000	273	NO-3	JO-3
3.5	--	264	NO-3	JO-3
3.5	max, 8000	363	PO-3	JO-3
4.0	--	281	NO-3	JO-3
4.0	max, 8000	372	PO-3	JO-3
5.0	--	330	PO-3	JO-3
5.0	max, 8000	446	QO-3	JO-3
7.5	--	388	QO-3	JO-3
7.5	max, 8000	558	SYD 138	JO-3
10.0	--	413	QO-3	JO-3
10.0	max, 8000	636	SYD 138	JO-3
12.5	--	438	QO-3	JO-3
12.5	max, 8000	661	SYD 138	JO-3
15.0	--	454	SYD 138	JO-3
15.0	max, 8000	677	SYD 138	JO-3
20.0	--	487	SYD 138	KO-3
20.0	max, 8000	710	SYD 138	KO-3
25.0	--	525	SYD 138	LO-3
25.0	max, 8000	743	SYD 138	LO-3
35.0	--	603	SYD 138	MO-3
50.0	--	702	SYD 138	PO-3

* Peak inrush current limited to 100 Amps when soft-start resistor is used.

Table A-9. Dynamic Braking Contactors

DYNAMIC BRAKING RESISTOR IN OHMS	DC PEAK CURRENT IN AMPS	SUGGESTED CONTACTOR: JOSLYN CLARK:
2.2	143.2	7001-5150-11
5.0	71.6	7001-5150-11
10.0	35.8	7001-5150-11

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