

Portable Wattmeters

Thruline® RF Directional



43

Power Range	100 mW - 10 kW using Bird® Plug-in Elements.*
Frequency Range	450 kHz - 2.7 GHz (depending on element)
Insertion VSWR	with N Connectors 1.05 max. to 1000 MHz
Accuracy	±5% of full scale
Connectors	QC Type (Female N normally supplied)
Finish	Light Gray powder coat
Nominal Size includes connectors	6 7/8" H x 5 1/8" W x 3 5/8" D, (175 mm x 130 mm x 92 mm)
Weight	3 lbs. (1,4 kg)
Elements	Tables 1, 2, 3, 3A, 4, 6



43P (with Peak Power Retrofit Kit 4300-400)

Power Range	100 mW - 10 kW using Bird® Plug-in Elements.*
Frequency Range	450 kHz - 2.7 GHz (depending on element)
Accuracy	CW Mode: ±5% full scale, Peak mode: ±8% full scale
Modulation	Normal voice audio; or (Peak Mode) Rectangular Pulses; Duty cycle: 2% (min); Repetition rate: 100 pps (min); Pulse width: 200 µs (min)
Connectors	QC Type (Female N normally supplied)
Battery (Life)	48 hours typical
Weight	Adds 1 lb. to Model 43



4431 (Variable RF TAP)

Power Range	5 kW max. 2 - 30 MHz
Frequency Range	1 kW max. 30 - 1000 MHz** using Bird® Plug-in Elements*
Insertion VSWR	with N Connectors 1.07 max.** to 1000 MHz
Accuracy	±5% of full scale
Insertion Loss	0,1 dB max. (2-512 MHz), 0,2 dB max. (512-1000 MHz)*
RF Sample Output	Variable -15 to -70 dB from BNC (Female) port
Connectors	QC Type (Female N normally supplied)
Finish	Gray powder coat
Nominal Size includes connectors	6 7/8" H x 5 1/8" W x 3 5/8" D, (175 mm x 130 mm x 92 mm)
Weight	3 1/2 lbs. (1,6 kg)
Elements	Tables 1, 2, 3, 3A, 4, 6 (within power/frequency range limits stated above)
Accessories	Case

*Quoted accuracy only when used with other Bird® Products

**Applies only when coupling is less than 30 dB



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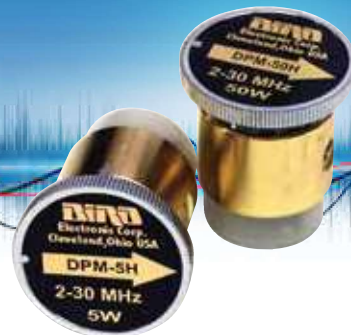
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Plug-In Elements

Selection Guide



Model Select Element From Table(s)

- 3128A** 1, 2, 3, 3A, 4, 6, 14*
- 3170B** 1, 2, 3, 3A, 4, 6, 14*
- 43** 1, 2, 3, 3A, 4, 6, 14*
- 43P** 1, 2, 3, 3A, 4, 5, 6
- 4305A** 4305A Elements, 1 5/8AA
- 4314C** 1, 2, 3, 3A, 4, 5, 6, 14*

Model Select Element From Table(s)

- 4391A** 1, 2, 3, 3A, 4, 5, 6, 14*
- 4410A, 4412A** (see page 24)
- 4431** 1, 2, 3, 3A, 4, 6, 14*
- 4521, 4522** 1, 2, 3, 3A, 4, 6, 14*
- 4526** 1, 2, 3, 3A, 4, 6, 14*
- 4527** 2 MHz to 512 MHz elements in 1, 2, 6, 14*

*Table 14 describes coupler elements used for RF sampling. The instrument meter does not read when these elements are installed, but simply serves as a line section.

ELEMENT TABLE FREQUENCY & POWER LIMITS

Element Table	Min. Power (Watts F.S.)	Max. Power (Watts F.S.)	Min. Freq (MHz)	Max. Freq (MHz)
APM	1	1000	2	2300
1	5	5000	2	1000
2	1	2.5	25	1000
3	1	250	950	2700
3A	0.1	0.5	950	2600
4	1000	10,000	0.45	2.5
5	500	10,000	2	1260
6	0.1	0.5	45	1000

ELEMENT TABLE FREQUENCY & POWER LIMITS

Element Table	Min. Power (Watts F.S.)	Max. Power (Watts F.S.)	Min. Freq (MHz)	Max. Freq (MHz)
8	50	25,000	0.45	2300
9	0.01	10	30	1000
9A	0.001	1	864	970
10	0.1	100	25	2300
11	1	1000	2	1000
12	10	10,000	0.2	30
14	1000	1000	50	1250

TABLE 1 STANDARD ELEMENTS

Power Range	Frequency Bands (MHz)					
	2-30	25-60	50-125	100-250	200-500	400-1000
5 W	—	5A	5B	5C	5D	5E
10 W	—	10A	10B	10C	10D	10E
25 W	—	25A	25B	25C	25D	25E
50 W	50H	50A	50B	50C	50D	50E
100 W	100H	100A	100B	100C	100D	100E
250 W	250H	250A	250B	250C	250D	250E
500 W	500H	500A	500B	500C	500D	500E
1000 W	1000H	1000A	1000B	1000C	1000D	1000E
2500 W	2500H	—	—	—	2500D	—
5000 W	5000H	—	—	—	—	—

TABLE 2 LOW POWER ELEMENTS

Part No.	1 Watt Frequency (MHz)											
	40-50	50-60	60-80	80-90	95-125	110-160	150-250	200-300	275-450	425-850	800-1000	
	040-1	050-1	060-1	080-1	095-1	110-1	150-1	200-1	275-1	425-1	801-1	
Part No.	2.5 Watt Frequency (MHz)											
	25-30	30-40	40-50	50-60	60-80	80-95	95-150	150-250	200-300	250-450	400-850	800-1000
	025-2	030-2	040-2	050-2	060-2	080-2	095-2	150-2	200-2	250-2	400-2	801-2

Table 3 HIGH-FREQUENCY ELEMENTS, ENTIRE TABLE ±8% FS

Power Range	Frequency Bands (MHz)								
	950-1260	1100-1800	1700-1990	1990-2200	2200-2300	2300-2400	2400-2500	2500-2600	2600-2700
1 W	1J	1K	1L1	1L2	1M	431-17	431-20	431-23	431-120
2.5 W	2.5J	2.5K	2.5L1	2.5L2	2.5M	431-110	431-107	431-108	431-117
5 W	5J	5K	5L1	5L2	5M	432-15	432-28	432-2	432-12
10 W	10J	10K	10L1	10L2	10M	432-125	432-141	432-102	432-104
25 W	25J	25K	25L1	25L2	25M	433-19	433-20	433-35	433-36
50 W	50J	50K	50L1	50L2	50M	433-37	433-38	433-163	433-164
100 W	100J	—	—	—	—	—	—	—	—
250 W	250J	—	—	—	—	—	—	—	—

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Plug-In Elements

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TABLE 3A		HIGH-FREQUENCY MILLIWATT ELEMENTS						
		Frequency Bands (MHz)						
		950-1260	1250-1500	1500-1700	1700-2200	2300-2400	2400-2500	2500-2600
Power Range	100 mW	430-82	430-209	430-210	430-178	430-211	430-182	—
	250 mW	—	—	—	430-1	430-239	430-240	430-241
	500 mW	—	430-259	—	430-95	—	430-159	—

TABLE 4		LOW-FREQUENCY ELEMENTS
		Frequency Band (MHz)
		.45 - 2.5 MHz
Power Range	1000 W	1000P
	2500 W	2500P
	5000 W	5000P
	10000 W	10000P

TABLE 5		PULSE-POWER ELEMENTS, ENTIRE TABLE ±8% OF FULL SCALE					
		Frequency Bands (MHz)					
		2-30	25-60	50-125	100-250	400-1000	950-1260
Power Range	500 W	—	—	—	—	—	500J
	1000 W	—	—	—	—	—	1000J
	2500 W	—	2500A	2500B	2500C	2500E	2500J
	5000 W	—	5000A	5000B	5000C	5000E	5000J
	10000 W	10000H	—	10000B	—	10000E	—

Refer to "Transmission Power Rating Chart" for max. power ratings. Elements are capable of reading peak and average power.

TABLE 6		MILLIWATT ELEMENTS												
		100 mW Frequency (MHz)												
		40-50	72-76	108-136	135-175	320-340	328-336	400-420	420-450	450-470	600-800	800-1000		
Cat. No.		430-266	430-2	430-57	430-86	430-205	430-3	430-7	430-208	430-8	430-169	430-263		
		250 mW Frequency (MHz)												
		72-76	88-108	105-120	116-126	130-150	190-210	450-470	800-1000					
Cat. No.		430-22	430-217	430-20	430-48	430-13	430-65	430-61	430-264					
		500 mW Frequency (MHz)												
		72-76	88-108	105-120	120-136	136-150	240-290	290-340	340-360	350-400	400-450	450-500	600-800	800-1000
Cat. No.		430-33	430-247	430-26	430-248	430-249	430-27	430-253	430-157	430-254	430-255	430-256	430-258	430-265

NONDIRECTIONAL SAMPLER ELEMENTS FOR QC-TYPE OR 7/8" EIA LINE

	Frequency Band (MHz)	Nominal Coupling	Max. Main Line Power
4274-025	25-1000	-50 dB ± 2 dB (-66 dB @ 2 MHz)	500 W
4274-050	100-400	-35 to -48 dB (±1 dB) Adjustable	500 W

TABLE 14		DIRECTIONAL COUPLER ELEMENTS FOR QC-TYPE OR 7/8" EIA LINE		
		Frequency Bands (MHz)		
		Freq Band (MHz)	Nominal Coupling	Max. Main Line Power
Model No.	400-50	50-100	-40 dB	1 kW
	400-75	75-150	-40 dB	1 kW
	400-125	125-250	-40 dB	1 kW
	400-225	225-450	-40 dB	1 kW
	400-400	400-800	-40 dB	1 kW
	400-750	750-1250	-40 dB	1 kW

TABLE 16		DIRECTIONAL COUPLER ELEMENTS FOR 3 1/8" EIA LINE		
		Frequency Bands (MHz)		
		Freq Band (MHz)	Nominal Coupling	Max. Main Line Power
Model No.	553-25	25-40	-55 dB	25 kW
	553-50	50-100	-55 dB	25 kW
	553-75	75-150	-55 dB	25 kW
	553-125	125-250	-55 dB	25 kW
	553-225	225-450	-55 dB	25 kW
	553-401	400-800	-55 dB	15 kW
	553-750	750-1250	-55 dB	10 kW

TABLE 15		DIRECTIONAL COUPLER ELEMENTS FOR 1 5/8" EIA LINE		
		Frequency Bands (MHz)		
		Freq Band (MHz)	Nominal Coupling	Max. Main Line Power
Model No.	501-50	50-100	-50 dB	10 kW
	501-75	75-150	-50 dB	10 kW
	501-125	125-250	-50 dB	10 kW
	501-225	225-450	-50 dB	10 kW
	501-400	400-800	-50 dB	5 kW

TABLE 17		DIRECTIONAL COUPLER ELEMENTS FOR 6 1/8" EIA LINE		
		Frequency Bands (MHz)		
		Freq Band (MHz)	Nominal Coupling	Max. Main Line Power
Model No.	606-50	50-100	-60 dB	60 kW
	606-75	75-150	-60 dB	60 kW
	606-125	125-250	-60 dB	60 kW
	606-225	125-250	-60 dB	60 kW
	606-400	400-870	-60 dB	60 kW

NOTE: For use in any line section including BPME



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