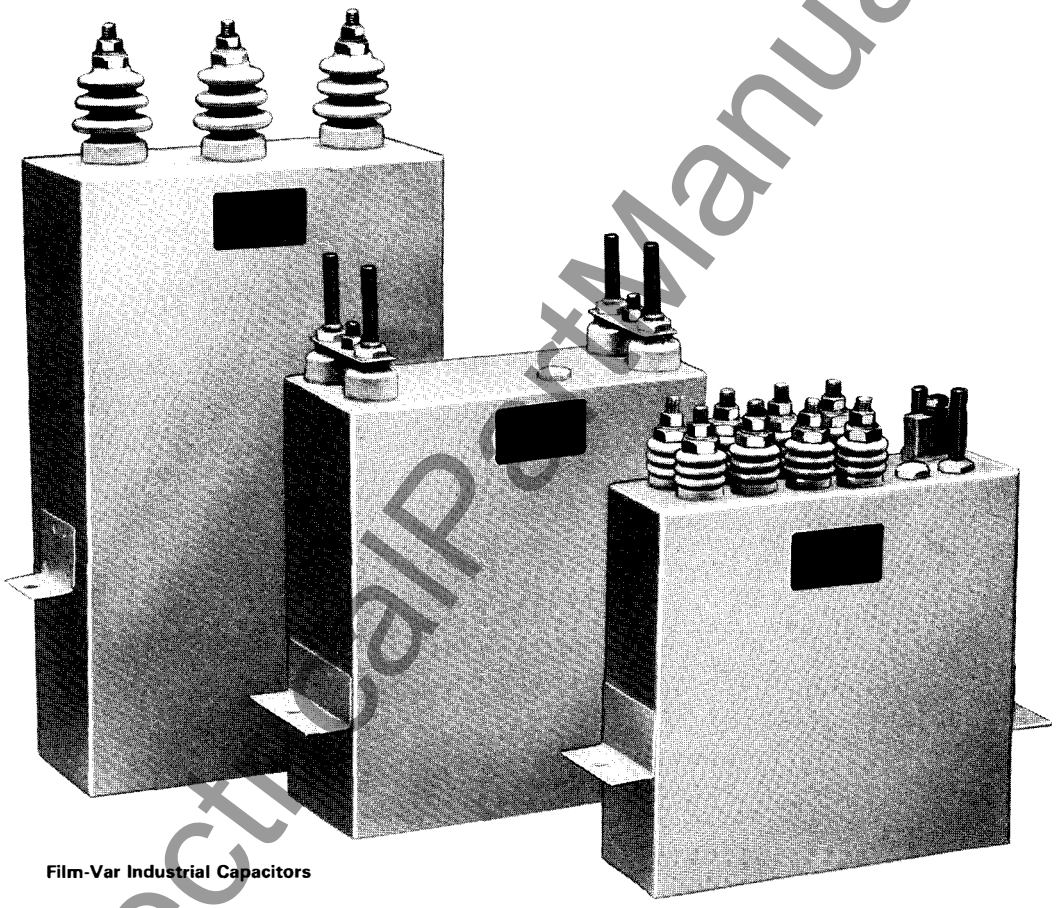
Westinghouse Electric Corporation
T&D Components Division
Bloomington, Indiana 47401 U.S.A.

May, 1986
New Information
Mailed to: E, D, C/39-000A, 39-000B

Water-Cooled
Air-Cooled
60 Hz-10 kHz

FILM-VAR Industrial Capacitors for Induction Heating and Melting
(WEMCOL Dielectric Fluid)



Film-Var Industrial Capacitors

Description

Westinghouse Film-Var High Frequency Water-Cooled Capacitors have been designed to improve the inherently low power factor associated with induction heating apparatus on melting furnaces, billet heating, forging and heat-treating applications.

The self-contained cooling system in this type of capacitor removes the excess heat incident to the high frequency and high operating kvar, leaving the case and internal dielectric working temperatures substantially equal to the temperatures reached on this type of unit operating with natural cooling at 60 cycles. The cooling coil is attached to the cover and to one end of the capacitor sections.

Specifications

Capacitor units consist of individually-wound sections of low-loss polypropylene film and aluminum foil; dielectric fluid is Westinghouse WEMCOL non-PCB and is completely bio-degradable and does not bio-accumulate. WEMCOL is an OSHA Class IIIB combustible fluid (For further information on WEMCOL, refer to TD 39-212).

Ratings

High frequency water-cooled capacitors are rated in nominal continuous working kvar, voltage, and current. All capacitors are designed with 110% overvoltage capability. The operating conditions may be varied over a wide range as long as those ratings on the nameplate are not exceeded. The values are based on an outlet water temperature of 45°C. If at any time the outlet temperature is above 45°C, the voltage must be reduced 1½% for each degree above 45.

If the capacitor is to be operated at some voltage or frequency below the rated value, the kvar can be calculated by:

$$kvar = \frac{CE^2\ 2\ \pi\ f}{10_3}$$

where:
kvar = actual burden in kva
E = working voltage (kV)
C = rated capacitance (uf)
f = working frequency (Hz)

Film-Var Industrial Capacitors

Frequency (Hz)	Voltage (Volts)	Total KVAR	KVAR Per Trap 1	2	3	4	5	6	Style Number
60 Hz Air-Cooled									
	1200	200	50	150					**1N03800A04**
	2800	200	200						**1N03800A07**
	575	75	37.5	37.5					**1N03800A08**
	460	50	25	25					**1N02800A10**
	900	100	100						**1N03800A11**
	750	100	50	50					**1N03800A13**
	1200	150	75	75					**1N03800A14**
	1200	180	90	90					**1N03800A15**
	1250	200	100	100					**1N03800A18**
	2454	267	53	214					**1N03800A19**
	2800	150	150						**1N03800A26**
	575	75	37.5	37.5					**1N03800A34**
	460	50	25	25					**1N02800A35**
	750	100	50	50					**1N03800A36**
	2000	295	98	197					**1N03800A46**
	2800	230	230						**1N03800A52**
	1364	240	120	120					**1N03800A55**
	1225	222	111	111					**1N03800A70**
	3000	300	150	150					**1N03800A75**
60 Hz Water-Cooled									
	750	100	50	50					**1N03800A29**
	1200	120	120						**1N03800A31**
	1200	120	40	40	40	(3 phase)			**1N03800A32**
	1200	180	60	60	60	(3 phase)			**1N03800A33**
	2600	120	120						**1N03800A42**
	750	135	67.5	67.5					**1N03800A44**
Above 60 Hz Through 800 Hz Water-Cooled									
150	2200	700	700						**1N03800A93**
180	600	286	48	48	48	48	48	48	**1N03800A25**
	750	300	50	50	50	50	50	50	**1N03800A38**
	750	400	100	100	100	100			**1N03800A47**
	1500	700	175	175	117	117	58	58	**1N03800A48**
	1200	1000			250	250	250	250	**1N03800A87**
300	1500	1200	300	300	300	300			**1N03800A56**
	1250	1200	1200						**1N03800A83**
350	1250	1090	1090						**1N03800A97**
360	1250	1000	167	167	167	167	167	167	**1N03800A23**
540	1000	600	25	25	50	100	200	200	**1N03800A57**
	1250	800			133	133	133	133	**3HF13**
600	1800	2400	2400						**1N03800A76**
700	1500	1200	1200						**1N03800A27**
	1800	1200	1200						**1N03800A28**
	1800	1500			375	375	375	375	**1N03800A59**
	1500	1500			375	375	375	375	**1N03800A63**
800	1250	2500	2500						**1N03800A98**

Freq. (Hz)	Voltage (Volts)	Total KVAR	Total MFD	Capacitance (Microfarads) per Tap 1	2	3	4	5	6	7	8	Style Number
960 Hz Through 10 KHz, Water-Cooled												
960	400	200	204	5	10	21	42	63	63			**3HF01**
	450	160	131							65.5	65.5	**3HF02**
	800	300	78	2	4	8	16	24	24			**3HF03**
	800	300	78			26	26	26				**3HF04**
	800	450	116.5	5.2	7.8	15.5	44	44				**3HF05**
	800	450	117	3	6	12	24	36	36			**3HF06**
	900	215	44							22	22	**3HF07**
	1000	215	35.7							22.3	13.4	**3HF08**
	1000	300	49.8	3.3	6.6	13.2	26.4					**3HF09**
	1000	480	79.6	13.3	13.3	26.5	26.5					**3HF10**
	1200	345	39.2		3.3	6.5	9.8	19.6				**3HF11**
	1000	320	53.2	13.3	13.3	13.3	13.3					**3HF12**
1000	400	210	210	52.5	52.5	52.5	52.5					**3HF17**
	800	335	83.2	20.8	20.8	20.8	20.8					**3HF18**
	1250	150	15.3			7.65	7.65					**3HF19**
	1250	245	25			9.4	15.6					**3HF20**
	1250	750	76.3	3.2	3.2	3.2	3.2	12.7	13.7	19.1	19.1	**3HF21**
1200	625	883	300			9.7	19.4	38.7	77.4	77.4	77.4	**3HF14**
	800	1100	228			38	38	38	38	38	38	**3HF15**
	1250	2000	169.8			28.3	28.3	28.3	28.3	28.3	28.3	**3HF16**
	1250	1200	102			17	17	17	17	17	17	**3HF22**
	500	800	424.6			70.8	70.8	70.8	70.8	70.8	70.8	**3HF23**

Freq. (Hz)	Voltage (Volts)	Total KVAR	Total MFD	Capacitance (Microfarads) per Tap 1	2	3	4	5	6	7	8	Style Number
1200	1500	1200	118			19.7	19.7	19.7	19.7	19.7	19.7	**3HF24**
	1800	1200	49.2			4.1	4.1	8.2	8.2	12.3	12.3	**3HF25**
	1500	1200	70.8			5.9	5.9	11.8	11.8	17.7	17.7	**3HF26**
	1000	900	120	10	10	10	10	20	20	20	20	**3HF27**
	1250	1200	102			17	17	17	17	17	17	**3HF28**
	1450	570	120	20	20	40	40					**3HF29**
	625	883	300			9.7	19.4	38.7	77.4	77.4	77.4	**3HF31**
	1800	2000	82					20.5	20.5	20.5	20.5	**3HF62**
	800	1225	—	1225 KVAR								**1N03800A91**
	1250	1600	—	1600 KVAR								**1N03800A92**
2000	625	300	61.2			30.6	30.6					**3HF32**
	1250	300	15.3			10.2	5.1					**3HF33**
3000	1250	2500	—	2500 KVAR								**1N03800A30**
	1250	1200	40.8	1.7	1.7	1.7	1.7	6.8	6.8	10.2	10.2	**3HF34**
	1250	1200	40.8	3.4	3.4	6.8	6.8	10.2	10.2			**3HF35**
	1250	1200	40.8	3.4	3.4	3.4	3.4	6.8	6.8	6.8	6.8	**3HF36**
	275	300	210					52.5	52.5	52.5	52.5	**3HF37**
	275	300	210	52.5	52.5	52.5	52.5					**3HF38**
	400	300	100	25	25	25	25					**3HF39**
	400	300	100	3	3	11	21	31	31			**3HF40**
	400	300	100	7	13	27	53					**3HF41**
	400	450	150	4	4	16	32	47	47			**3HF42**
	400	450	149	3	3	13	30	50	50			**3HF43**
	500	400	84	2	5	5	24	24	24			**3HF44**
	625	300	41	3	6	11	21					**3HF45**
	625	300	40			20	20					**3HF46**
	800	300	24.8	6.2	6.2	6.2	6.2					**3HF47**
	800	300	25	1	3	5	8	8				**3HF48**
	800	450	37.3	2	3.9	7.8	11.8	11.8				**3HF49**
	800	450	37.3	1.7	2.5	5	14.1	14.1				**3HF50**
	625	600	82.5				5.5	11	22	22	22	**3HF51**
	800	900	74.6		18.7	18.7	18.7	18.7				**3HF52**
	800	1000	82.8		20.7	20.7	20.7	20.7				**3HF53**
	100	300	15.7	2	3.9	3.9	5.9					**3HF54**
	1250	300	10.2		1.5	2.9	5.8					**3HF55**
	1250	150	5		1.25	1.25	2.5					**3HF56**
	1250	300	10.2		5.9	2.9	1.4					**3HF57**
	400	600	199	13.3	26.5	53	53	53				**3HF58**
	440	255	70	20	10	5	5	10	20			**3HF59**
	1000	1200	63.6	2.7	2.7	2.7	2.7	10.6	10.6	15.9	15.9	**3HF60**
	1200	1350	49.8	2.6	5.2	8.4	8.4	12.6	12.6			**3HF61**
	1000	1922	102			17	17	17	17	17	17	**3HF63**
	1250	1450	49.3			8.2	8.2	8.2	8.2	8.2	8.2	**3HF64**
	1500	2333	55	4.6	4.6	4.6	4.6	9.2	9.2	9.2	9.2	**3HF65**
3300	800	1100	82.9		20.7	20.7	20.7	20.7				**3HF66**
3600	200	180	200	50	50	50	50					**3HF69**
	400	300	82	20.5	20.5	20.5	20.5					**3HF70**
4200	400	300	72	4.8	9.6	19.2	38.4					**3HF74**
6000	800	900	37	7.4	7.4	7.4	7.4	7.4				**3HF71**
	800	1200	50	10	10	10	10	10				**3HF72**
	220	230	80	2	4	8	16	25	25			**3HF75**
9600	220	230	80	2	4	8	16	25	25			**3HF76**
	440	300	25.9	.6	1.3	2.7	5.3	8	8			**3HF77**
	440	450	39	1	2	4	8	12	12			**3HF78**
	440	450	38.6	.9	1.7	3.4	6.9	12.8	12.8			**3HF79**
	800	300	7.8	.8	.8	1.6	2.3	2.3				**3HF80**
	440	300	25.9	.6	1.3	2.7	5.3	8	8			**3HF81**
	800	300	8	2	2	2	2					**3HF82**
	800	450	11.8	1.2	1.2	2.4	3.5	3.5				**3HF83**
	800	1200	31	6.2	6.2	6.2	6.2	6.2				**3HF84**
	1250	300	3.2	.3	.3	.7	.9	.9				**3HF85**
	1250	1260	13.4	.7	.7	.7	.7	2.7	2.7	2.7	2.7	**3HF86**
	440	900	77	12.8	12.8	12.8	12.8	12.8	12.8			**3HF87**
	440	450	39	1	2	4	8	12	12			**3HF88**
	622	653	28	8	4	2	2	4	8			**3HF89**
	1500	1221	9	.75	.75	.75	.75	1.5	1.5	1.5	1.5	**3HF90**
	625	600	25.4	.6	1.3	2.6	5.2	7.8	7.8			**3HF91**
	800	800	20	1	1	4.5	4.5	4.5	4.5			**3HF96**
10,000	800	1600	—	1600 KVAR								**1N03800A79**
	1250	2000	—	2000 KVAR								**1N03800A88**
	440	300	24.5	.7	1.3	2	4.1	8.2	8.2			**3HF92**
	600	396	17.5	.5	1	2	4	4	6			**3HF93**
	800	320	8				4	4				**3HF94**
	1200	1200	13.6	1.3	1.3	2.7	2.7	2.7	2.7			**3HF95**
	800	1250	31.1	5.2	5.2	5.2	5.2	5.2	5.2			**3HF97**

For Further Information, refer to Price List PL 39-220 and Dimension Sheets DS 39-222.

Printed in U.S.A.
May, 1986