Westinghouse
Electric Corporation
Distribution
Apparatus Division
Bloomington, IN 47401

Cancellation Notice
39-000

August 1978
New Information
E,D,C/2001,2002/DB

Descriptive Bulletin 39-250

Effective immediately Descriptive Bulletin 39-250, pages 1-8, dated November 1973, Dustproof and Weatherproof Industrial Capacitors, Indoor and Outdoor, is canceled and should be removed from your catalog and files.

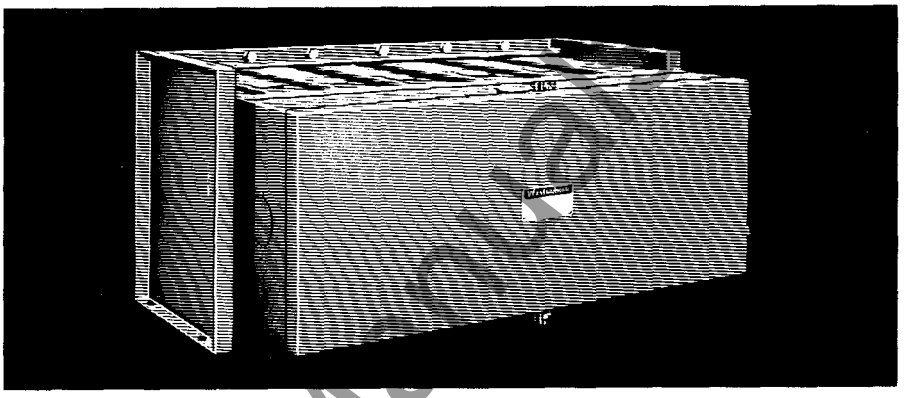
Refer to Descriptive Bulletin 39-231, dated October 1976, pages 1-8, Industrial Capacitors, for current descriptive information.

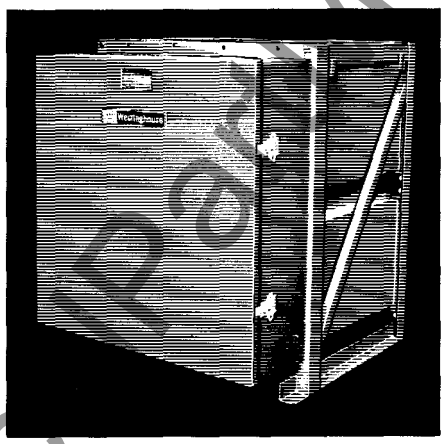
Westinghouse

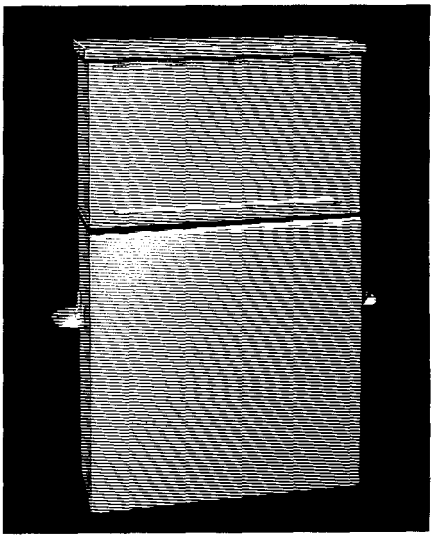
Dustproof and Weatherproof Industrial Capacitors

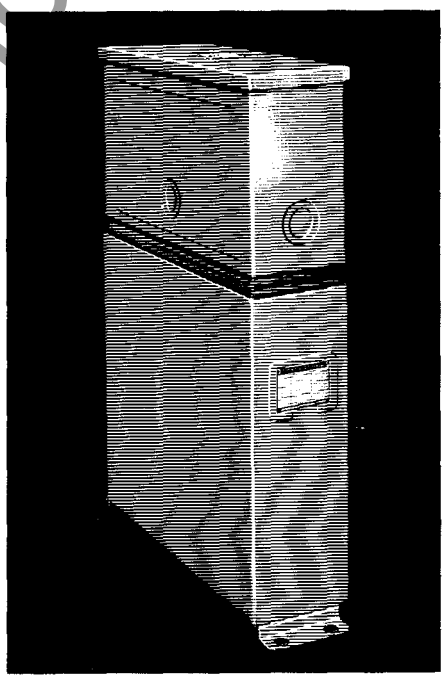
Indoor and Outdoor

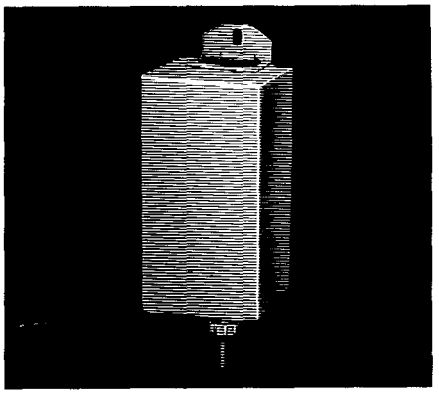
240, 480 and 600 Volts
Single and 3 Phase, 60 Cycles











Application

The Westinghouse dustproof and weatherproof designs meet all NEC requirements covering low voltage capacitor installations for power factor improvement in the average industrial plant.

(Applications) Individual Units

These individual units provide more corrective capacity near the load when connected directly on machine terminals or at load centers. The units may be located on the load side of the circuit and may be switched "on" or "off" with the load. By switching through the motor or load center controls, separate switches are not required. Such applications also provide semi-automatic control of corrective capacity to avoid overvoltage conditions during light load periods.

Multiple Units

The multiple dustproof equipments provide for larger amounts of capacity needed at power centers than could be economically obtained through large groups of individual dustproof units or through other types of installations.

Advantages

Protection: The dustproof and weatherproof designs protect against entrance of foreign matter such as dust and lint – also isolate live parts from accidental contact. Complies with all NEC requirements for low voltage capacitors.

Accessibility: Terminals, fuses and connections are readily accessible upon removal of the terminal enclosure cover.

Flexibility: One or more individual dustproof capacitors may be floor or platform mounted or suspended on mounting brackets from wall or ceiling.

The multiple equipments consist of parallel groups of capacitor units completely assembled and bussed to form a single or multitiered assembly having terminals and connections enclosed in a dustproof or weatherproof compartment.

The single-tier Type MDP equipments are designed to facilitate mounting of additional tiers of capacitor assemblies in the future, without requiring additional floor space. The additional tiers should have the same unit capacity as the bottom tier.

The capacity of either single or multiple equipments may be increased or decreased by adding or subtracting units, or by substituting units of other ratings as required. When the number of units supplied is less than the total capacity of the tier, dustproof covers are furnished for the vacant openings.

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November, 1973
New Information
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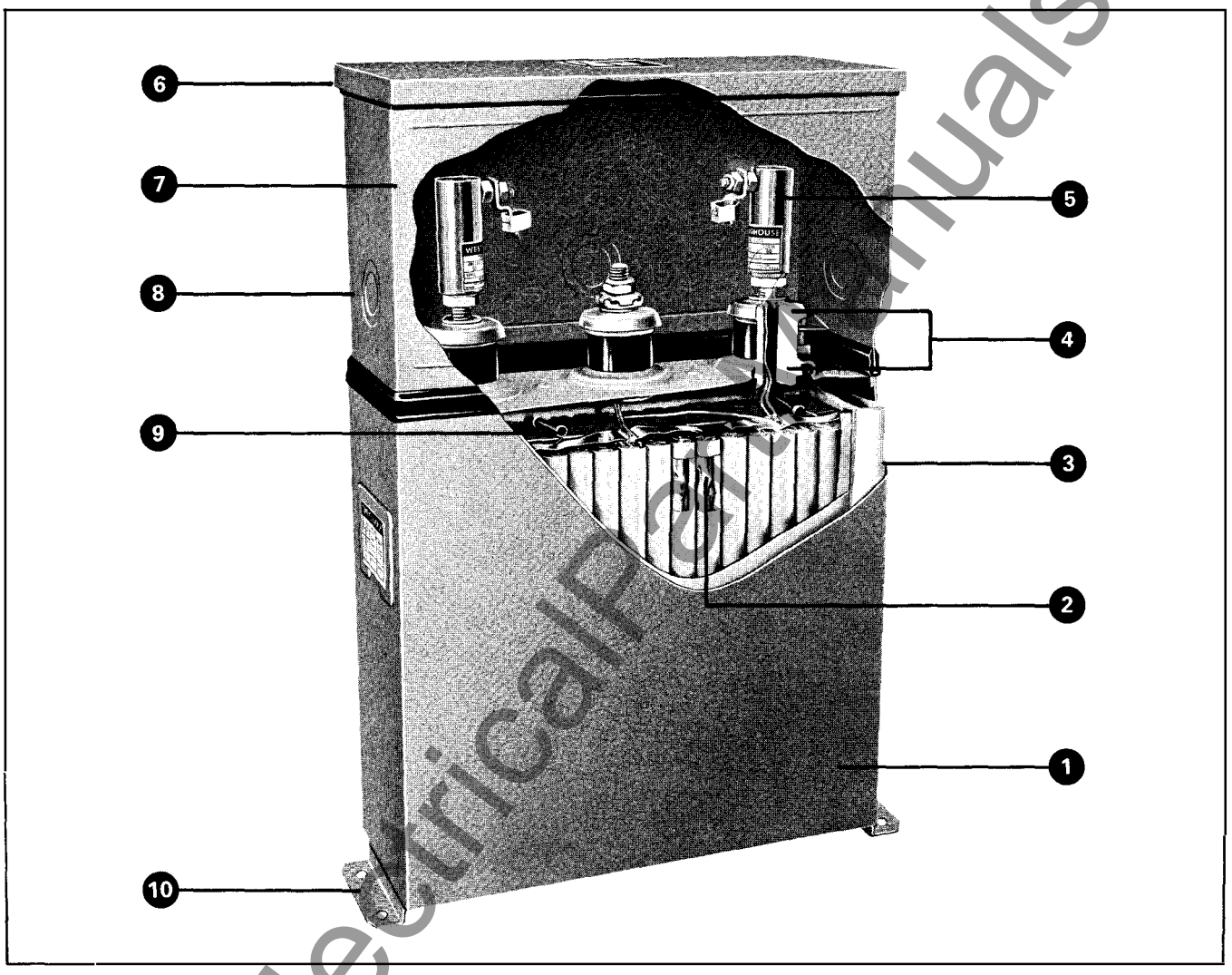
Westinghouse

Dustproof Individual Type IDP



Design Features

1 Individual Capacitor, Type FP
Available ratings are listed on page 3.

Case: The case is made from heavy gauge sheet steel with all joints welded and reinforced at points of wear. The heavy case protects the working element during handling, shipment and service.

Finish: Enclosures and capacitor units are finished with a protective coat of dark gray synthetic enamel which is attractive and durable – also provides high resistance to abrasion.

2 Working Element
Consists of individual sections wound with special Inertex® capacitor paper and dead soft aluminum foil.

Impregnant: After assembly, the complete unit is vacuum processed and impregnated with Inerteen® – the Westinghouse non-inflammable liquid dielectric.

3 Case Insulation
The working element is insulated from the case by means of heavy formed barriers made of material equal in quality to the paper used for the working dielectric.

4 Solder-Sealed Bushings
One piece, wet process porcelain bushings with metal fittings attached by the time-proven Westinghouse solder-to-porcelain process, are soldered directly to the steel case. Solder sealing eliminates the use of gaskets and provides a strong hermetic seal to protect the working element and dielectric against leaks or contamination.

5 Individual Indicating Fuses
Terminal mounted type BAC boric acid fuses or type CLC current limiting fuses complete with solderless connectors are supplied with each individual dustproof unit. High speed interruption provides maximum protection. Positive screw type mounting simplifies connections and eliminates the use of spring type fuse clips.

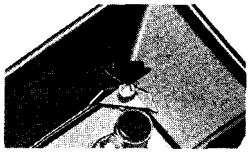
Industrial Capacitors Indoor Type IDP

240, 480 and 600 Volts to 60 KVAC

6 Cover

A bolt on steel cover compresses the top neoprene gasket to complete the dustproof seal, making the entire unit impervious to foreign matter such as dust and lint. The cover may be easily removed for inspecting fuses and connections.

7 Enclosure



A formed heavy sheet steel enclosure, with neoprene gaskets at the top and bottom, is bolted to the top of the capacitor unit by means of weld nuts and studs (see view above) enclosing the terminals, fuses and connections.

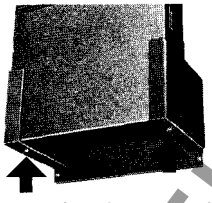
8 Knockouts

Knockouts are provided on all sides of the terminal enclosure for conduit entrance.

9 Discharge Resistors

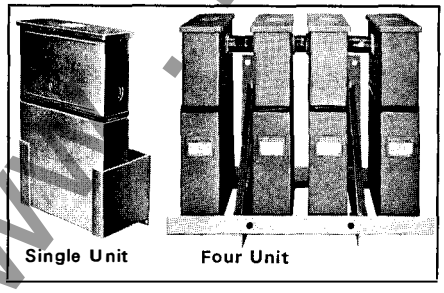
A suitable resistor is connected internally across the terminals of all dustproof capacitor units as a safety feature. Residual voltage is reduced to 50 volts or less within one minute after removal from the circuit.

10 Mounting



Mounting feet are provided with each unit for floor mounting only. Brackets are required for ceiling or wall mounting. In these installations, the mounting feet are discarded and units are bolted directly to the brackets by means of weld nuts and studs (see arrows).

Typical Wall Mounting



Conduit Connectors

Capacitor Units		Conduit Connectors Required③		
Volts	Kvac	2 Unit Brackets Style No. 402A508G01 Style No. 402A508G04	3 Unit Brackets Style No. 402A508G02 Style No. 402A508G05	4 Unit Brackets Style No. 402A508G03 Style No. 402A508G06
240	2½, 5, 20, 25	1 – Style No. 259B260G01	2 – Style No. 259B260G01	1 – Style No. 259B260G01
480	5, 7½, 10, 30, 40, 45, 50, 60			2 – Style No. 259B260G02
600	5, 10, 15, 30 40, 45, 50, 60			
240	7½, 10, 15	1 – Style No. 259B260G03	2 – Style No. 259B260G03	1 – Style No. 259B260G03
480	15, 20, 25			2 – Style No. 259B260G04
600	20, 25			

③ Styles indicated are used only when capacitor units all have same kvac rating. When units have different ratings, such as a 10 kvac and 15 kvac mounted in a two unit bracket, special combinations of connectors and adapters are required. Refer to Westinghouse.

Individual Type IDP

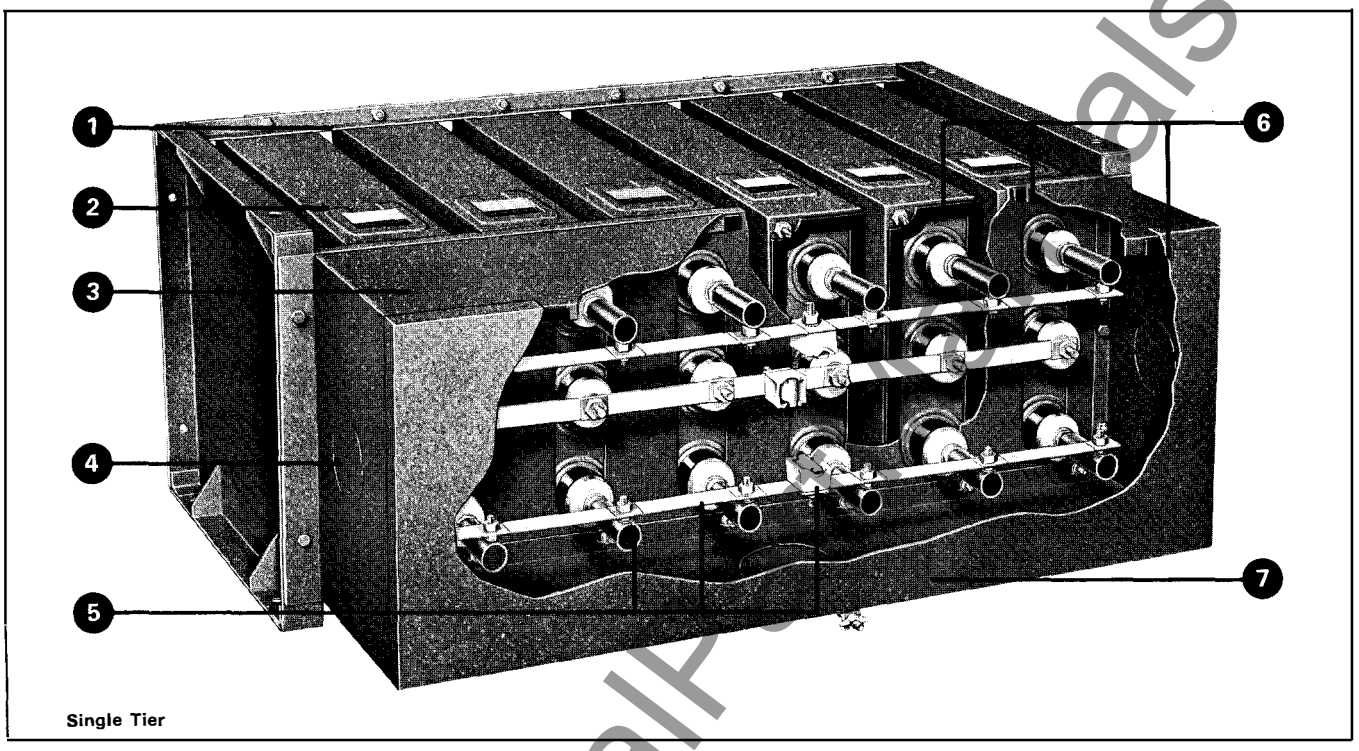
Kvac	Approx. Weight Lbs Net	Shipping
240 Volts①②		
2.5	30	34
5	55	60
7.5	72	76
10	73	78
15	83	89
20	122	132
25	150	163
480 Volts		
2	15	19
3	27	31
4	31	35
5	34	38
6	38	42
7.5	54	58
10	54	58
15	70	75
20	83	89
25	83	89
30	83	89
35	92	101
40	101	112
45	110	122
50	122	132
60	145	158
600 Volts		
5	34	38
7.5	40	45
10	54	58
15	70	75
20	83	89
25	83	89
30	83	89
35	92	101
40	101	112
45	110	122
50	122	132
60	145	158

① For 208 and 216 volt applications, refer to Westinghouse.
② Single phase units can be supplied – refer to Westinghouse.

Further Information:
Prices: PL 39-210

Westinghouse

Multiple Type MDP



Single Tier

Design Features

1 Frame

A heavy frame, jig-fabricated to assure proper alignment, supports the capacitor units and provides spacing to insure proper ventilation.

2 Individual Capacitor, Type FP

The basic unit of multiple dustproof equipments is the same capacitor unit as used in the individual dustproof equipments and incorporates all the features of solder-sealed bushings, internal discharge resistors, case construction and durable finish. The units are mounted on edge by means of weld nuts and studs with the terminals projecting through a sheet steel panel of the bolted frame assembly.

3 Enclosure

A single wrap-around enclosure is bolted to the sheet steel panel of the frame assembly, enclosing the terminals, fuses and connections of the capacitor units.

Finish: Enclosures and capacitor units are finished with a protective coat of gray synthetic enamel which is attractive and durable – also provides high resistance to abrasion.

4 Knockouts

Knockouts are provided on all four sides of the terminal enclosure for power entrance cable.

5 Indicating Fuses and Connectors

Individual unit type CLC current limiting fuses are mounted on the capacitor terminals. Connections between the units are completed with solid bus. Solderless phase connectors are provided for power connection.

6 Gaskets

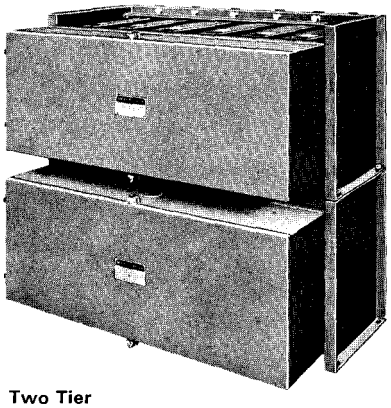
Three sets of composition gaskets are provided to complete the dustproof seal. These are located: (1) between each capacitor unit and the frame side panel; (2) between the frame side panel and the base of the terminal enclosure; (3) between the front of the terminal enclosure and the enclosure cover.

7 Enclosure Cover

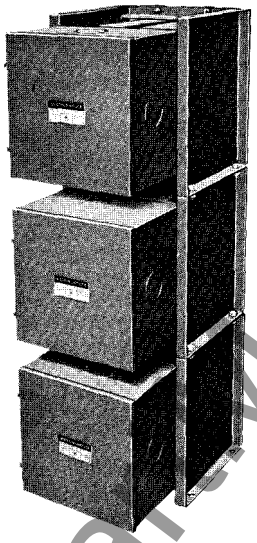
A formed sheet steel cover is fastened to the terminal enclosure. The cover may be easily removed for inspecting fuses and connections.

Industrial Capacitors Indoor Type MDP

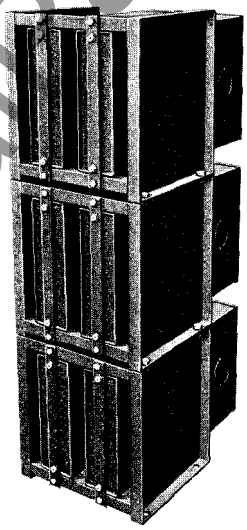
240, 480 and 600 Volts
to 300 KVAC



Two Tier



Three Tier (Front View)



Three Tier (Rear View)

Multiple Tier MDP Equipments

Recommended bank ratings up to 300 kvac at 240 volts, and 600 kvac at 480 and 600 volts, may be obtained by stacking individual tiers above one another up to a maximum of three tiers high (see MDP assembly, in right column). The individual tiers are designed to bolt directly together but only tiers of the same unit capacity can be stacked. They are shipped as single tiers, completely wired and assembled.

Installation

Floor Mounting: Single or multiple tier assemblies should be placed in a suitable location and bolted to the floor with the terminal compartment toward the front. Clearance should be allowed at the rear of the assembly to permit removal of the individual capacitor units.

Note: Do not mount the tiers on end.

Wall Mounting: Fig. 1 shows the wall mounting arrangement for single tier equipments only. Single tiers may be bolted directly to the wall with the terminal compartment up. Clearance should be allowed at the bottom of the equipments to permit removal of the individual capacitor units.

Multi-tier wall mounting arrangements require mounting with the terminal cover toward the front. The assembly must be supported from the bottom by a platform bracket (to be supplied by the purchaser). Adequate space must be allowed between the wall and the back of the tiers to permit removal of units.

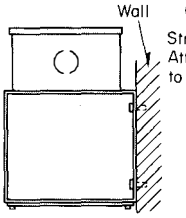


Fig. 1. Wall Mounting, Single Tier

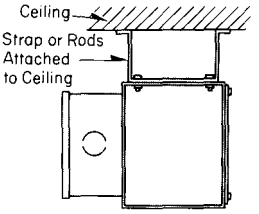


Fig. 2. Ceiling Mounting, Single Tier

Ceiling Mounted: Fig. 2 shows the ceiling mounting arrangement for single tier equipments only. The assembly is suspended from the ceiling by screws, rods, or bolts through the top flange on the ends of the rack. (Suspension rods or straps are to be supplied by the purchaser.)

Multi-tier ceiling mounting is not recommended.

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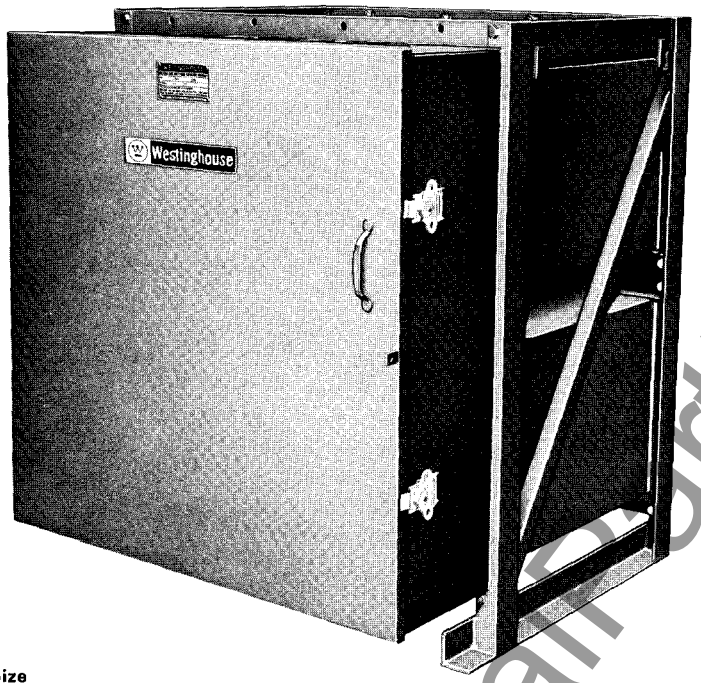
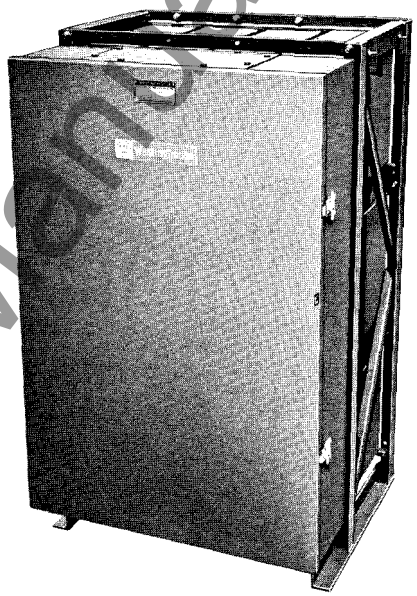
Design Features

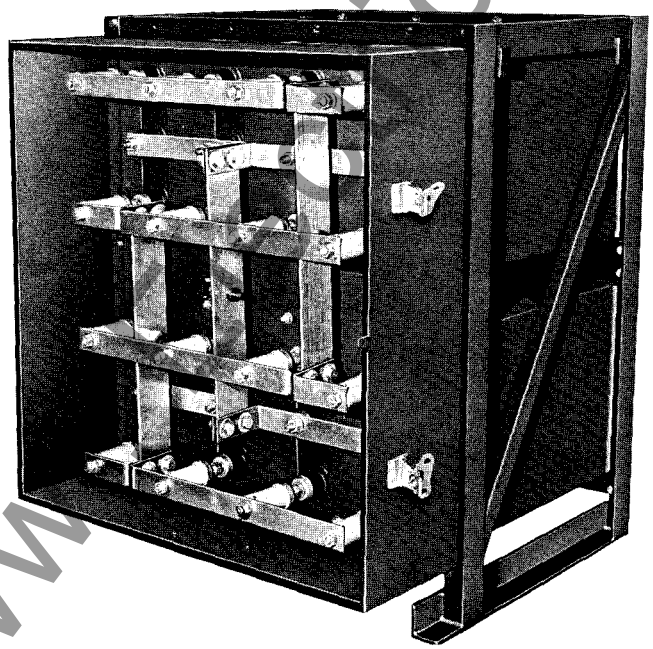
Multiple Type MDP – Typical Arrangements



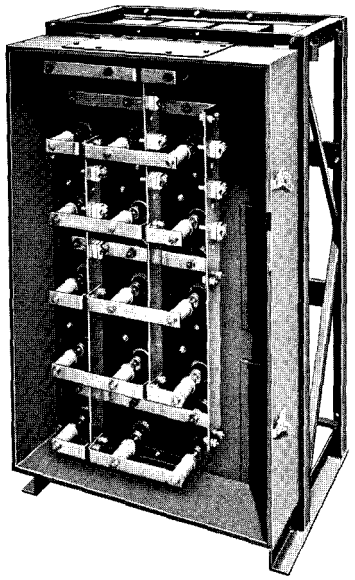
8 Unit Size



12 Unit Size



8 Unit Size



12 Unit Size

Industrial Capacitors Indoor Free Standing MDP

240, 480 and 600 Volts
to 600 KVAC

Application

The Free-Standing MDP capacitor assembly incorporates all of the salient features of the conventional single-tier MDP into a multi-tier assembly that can be shipped completely assembled, ready to set in place and connect to the purchaser's system.

This equipment is ideally suited for indoor installations requiring minimum floor space and maximum safety for personnel working nearby.

Construction

Depending on the capacity required, the assembly provides a choice of either a two- or three-tier dustproof frame with a hinged door over the terminal compartment.

Individual terminal mounted indicating type fuses are provided on each capacitor unit, and solderless connectors are provided for incoming power cables. Standard power entrance is provided by a removable plate on top of the terminal compartment. (Bottom entrance available, if specified.)

The hinged door, suitable for padlocking, isolates all live parts from accidental contact and provides ready access to the terminal compartment for inspection and maintenance.

Mounting

The Free-Standing MDP assembly is designed for floor mounting only; and mounting lugs are furnished with the equipment.

Ratings

Recommended bank ratings up to 300 Kvac at 240 volts, and 600 Kvac at 480 and 600 volts may be obtained by utilization of its 8- and 12-unit basic enclosures. When the equipments are shipped with less than a full component of capacitor units, cover plates are installed over the back panel openings to allow for future installation and uprating of the equipment with the addition of capacitor units, fuses and bus connections.

Intermediate Ratings

Intermediate ratings not listed in the selector guide may be obtained by omitting units or substituting units of smaller kvac ratings. (For pricing, refer to Westinghouse.) When the number of individual units supplied is less than the total capacity of the tier, dustproof steel covers are furnished for the vacant openings. When individual units of lower kvac ratings are included, adapters are supplied for accommodating mounting the units within the assembly.

Frame

A heavy frame of welded and bolted construction, jig fabricated to assure proper alignment, supports the capacitor units and provides spacing to insure proper ventilation. Lifting lugs are on integral part of the frame.

Individual Capacitor, Type FP

The basic unit of multiple dustproof equipments is the same capacitor unit as used in the individual dustproof equipments and incorporates all the features of solder-sealed bushings, internal discharge resistors, case construction and durable finish. The units are mounted on edge by means of weld nuts and studs with the terminals projecting through a sheet steel panel of the bolted frame assembly.

Enclosure

A single wrap-around enclosure is bolted to the sheet metal panel of the frame assembly, enclosing the terminals, fuses and connections of the capacitor units. A hinged door with suitcase type latches gives excellent accessibility to the fuses, interconnecting buswork and cable terminals. Facility for padlocking is a part of the latch mechanism.

Finish

Enclosures and capacitor units are finished with two coats of outdoor dark gray synthetic enamel which is attractive and durable – also provides high resistance to abrasion.

Conduit Entrance

Standard conduit entrance can be accommodated from above by means of a removable plate in the top of the terminal compartment. (Bottom entrance available if specified.)

Indicating Fuses and Connectors

Individual unit boric acid fuses or type CLC current limiting fuses are mounted on the capacitor terminals. Connections between the units are completed with solid bus. Solderless phase connectors are provided for power connection.

Gaskets

Three sets of gaskets are provided to complete the seal of the enclosed terminal chamber. These are located: 1. Between each capacitor unit and the back enclosure panel, 2. Between the back enclosure panel and the sides of the terminal enclosure, and 3. Around the inside of the front hinged door that bears against the enclosure sides.

Selector Guide

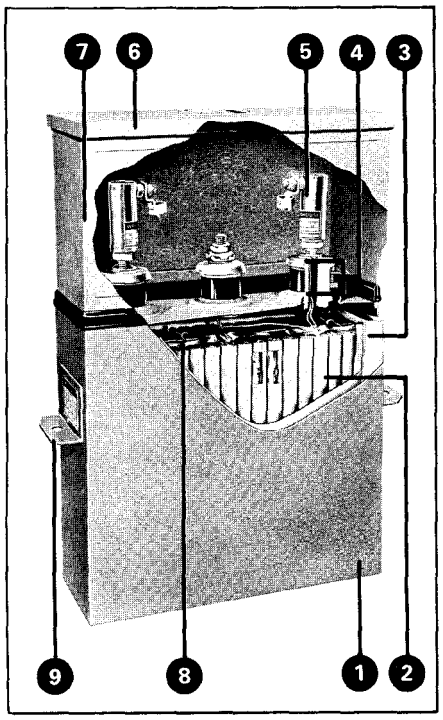
Free-Standing Capacitor Equipment

8 Unit or 12 Unit Size

Rating Kvac	Capacitor Units (Total Required)	Approximate Weight, Lbs. Net	Shipping
240 Volts			
40 **8 Unit**	2 – 20 Kvac	260	280
50 **Cabinet**	2 – 25 Kvac	305	325
60	3 – 20 Kvac	380	400
75	3 – 25 Kvac	455	475
80	4 – 20 Kvac	520	540
100	4 – 25 Kvac	615	645
125	5 – 25 Kvac	755	785
150	6 – 25 Kvac	920	955
175	7 – 25 Kvac	1070	1100
200	8 – 25 Kvac	1225	1250
225 **12 Unit**	9 – 25 Kvac	1375	1400
250 **Cabinet**	10 – 25 Kvac	1525	1550
275	11 – 25 Kvac	1675	1700
300	12 – 25 Kvac	1825	1850
480 Volts			
100 **8 Unit**	2 – 50 Kvac	245	260
150 **Cabinet**	3 – 50 Kvac	370	400
200	4 – 50 Kvac	500	530
250	5 – 50 Kvac	620	650
300	6 – 50 Kvac	740	775
350	7 – 50 Kvac	865	905
400	8 – 50 Kvac	990	1030
450 **12 Unit**	9 – 50 Kvac	1115	1155
500 **Cabinet**	10 – 50 Kvac	1240	1290
550	11 – 50 Kvac	1365	1415
600	12 – 50 Kvac	1490	1560
600 Volts			
100 **8 Unit**	2 – 50 Kvac	245	260
150 **Cabinet**	3 – 50 Kvac	370	400
200	4 – 50 Kvac	500	530
250	5 – 50 Kvac	620	650
300	6 – 50 Kvac	740	775
350	7 – 50 Kvac	865	905
400	8 – 50 Kvac	990	1030
450 **12 Unit**	9 – 50 Kvac	1115	1155
500 **Cabinet**	10 – 50 Kvac	1240	1290
550	11 – 50 Kvac	1365	1415
600	12 – 50 Kvac	1490	1560

Industrial Capacitors
Outdoor Weatherproof
Type OF and Type EWP

Weatherproof Type EWP



Design Features

1 Individual Capacitor, Type FP

Case: The case is made from heavy gauge sheet steel with all joints welded and reinforced at points of wear. The heavy case protects the working element during handling, shipment and service.

Finish: Enclosures and capacitor units are finished with two protective coats of gray synthetic enamel which is attractive and durable – also provides high resistance to abrasion.

2 Working Element

Consists of individual sections wound with special Inertex® capacitor paper and dead soft aluminum foil.

Impregnant: After assembly, the complete unit is vacuum processed and impregnated with Inerteen® – the Westinghouse non-inflammable liquid dielectric.

3 Case Insulation

The working element is insulated from the case by means of heavy formed barriers made of material equal in quality to the paper used for the working dielectric.

4 Solder-Sealed Bushings

One piece, wet process procelain bushings with metal fittings attached by the time-proven Westinghouse solder-to-porcelain process, are soldered directly to the steel case. Solder sealing eliminates the use of gaskets and provides a strong hermetic seal to protect the working element and dielectric against leaks or contamination.

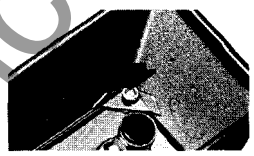
5 Individual Indicating Fuses

Terminal mounted type BAC boric acid fuses or type CLC current limiting fuses complete with solderless connectors are supplied with each individual weatherproof unit. High speed interruption provides maximum protection. Positive screw type mounting simplifies connections and eliminates the use of spring type fuse clips.

6 Cover

A bolt on top cover, compresses the top neoprene gasket to complete the weatherproof seal, making the entire unit impervious to foreign matter. The cover may be easily removed for inspecting fuses and connections.

7 Enclosure



A formed heavy sheet steel enclosure, with neoprene gaskets at the top and bottom, is bolted to the top of the capacitor unit by means of weld nuts and studs (see view above) enclosing the terminals, fuses and connections.

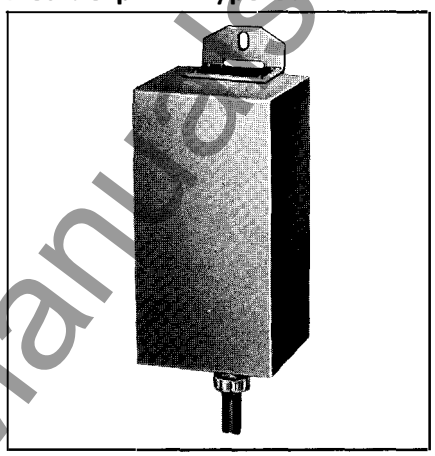
8 Discharge Resistors

A suitable resistor is connected internally across the terminals of all dustproof capacitor units as a safety feature. Residual voltage is reduced to 50 volts or less within one minute after removal from the circuit.

9 Mountings

Mounting brackets are provided on each capacitor unit. Brackets for either crossarm or wall mounting are available in single or multiple unit assemblies.

Weatherproof Type OF



Westinghouse weatherproof capacitor units are designed for outdoor or indoor application on 3 phase, low voltage power distribution systems. Compact design in a wide range of ratings make them ideal for power factor improvement on small isolated oil field or irrigation pumping installations.

Applied on the load side of a motor starter, they do not require a separate switch, resulting in minimum installed cost per kvac.

Aluminum Cases

These ratings have an aluminum case for permanent protection against corrosion and weather. Mounting flanges on the case permit installation on any flat surface without using brackets. The units are unfused and include a 48 inch, 4 conductor neoprene cable with watertight bushings.

Approximate Weights

KVAC	Net Wt. Lbs.	Ship. Wt. Lbs.
Type OF – 480 and 830 Volts		
2	10	12
3	13	15
4	20	23
5	22	25
6	25	29
Type EWP – 240 Volts		
2.5	30	34
5	55	60
7.5	72	76
10	73	78
15	83	89
20	125	135
25	155	168
Type EWP – 480 and 600 Volts		
7.5	50	58
10	53	61
15	71	76
20	84	90
25	86	92
30	88	94
35	94	103
40	105	116
45	114	126
50	125	135
60	150	163

Further Information

Prices: PL 39-210, Dimensions: DS 39-202

Westinghouse Electric Corporation
Distribution Apparatus Division, Bloomington, Indiana 47401
Printed in USA