



OHIO ELECTRIC CONTROL, INC.
2395 ROCK ROAD
ASHLAND, OH 44805
PH 419-289-1553
FAX 419-289-5555

***"THE LEADER IN INDUSTRIAL
CONTROL TECHNOLOGY."***

SCHEMATIC & SUBMITTAL DATA

SIMPLEX CONTROL PANEL

115/230V-1Ø-1HP

FOR

OUTDOOR PANEL

150812JA03

AMERICAN CONCRETE

This submittal is based upon our interpretation of the specifications supplied, and written and/or signed approval of this submittal will be required before production can begin.

COMPANY: _____

DATE: _____

SIGNED: _____

SUBMITTED: 10-8-15



OHIO ELECTRIC CONTROL, INC.
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One Year “Limited” Warranty

For a twelve (12) month period from date of invoice, subject to the terms and conditions herein after set forth, Ohio Electric Control, Inc. reserves the right and option, in its sole discretion, to repair or replace defective equipment, parts or components. Labor, shipping and expenses are not covered by this Warranty.

This warranty does not apply to the following:

- 1) To defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with good trade practices.
- 2) To defects or malfunctions resulting from abuse, accident or negligence.
- 3) To normal maintenance service and the parts and labor used in connection with same.
- 4) To units which are not installed in accordance with applicable local, state and federal codes or ordinances and good trade practices.
- 5) To units which are moved from their original installation location.
- 6) To units which are used for purposes other than what it was designed and manufactured for.
- 7) To units which are damaged by lightning, conditions beyond the control of Ohio Electric Control, Inc., or other “acts of God”.

Contact your nearest authorized Ohio Electric Control, Inc. dealer for warranty service. Any item to be replaced must be returned to Ohio Electric Control, Inc., 2395 Rock Road., Ashland, Ohio 44805, or such other places as Ohio Electric Control, Inc. may designate, freight prepaid.

AFTER THE EXPIRATION OF THE TIME PERIOD OF THIS WARRANTY, THERE ARE NO WARRANTIES OF ANY KIND, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. (**NOTE!** SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.)

IN NO EVENT SHALL OHIO ELECTRIC CONTROL, INC. BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY OHIO ELECTRIC CONTROL, INC. PRODUCT, PARTS OR SERVICE. (**NOTE!** SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU).

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND WHAT IS STATED ABOVE.



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SPECIFICATIONS

ELECTRICAL NOTES:

INCOMING POWER: 115/230V - 1 ϕ
CONTROL POWER: 115V - 1 ϕ
MOTOR HORSEPOWER: 1HP.
MOTOR FULL LOAD AMPS: 15F.L.A. MAX

CONTROL PANEL NOTES:

1. The control panel will be provided with aluminum back panel to mount contactor, fuses, silence relay, ground lugs and terminal blocks.
2. The SONALERT audible alarm will be mounted in exterior right side center of enclosure.
3. The control panel components, mounted on the inner door, will be labeled with engraved labels.
4. The control panel components will be labeled.



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OPERATIONS

SPECIAL NOTES:

- The alarm test switch, labeled "Test-Normal-Silence", allows personnel to test the audible and visual exterior alarms when the switch is placed in the "test" position.

MOTOR CONTROL:

Manual Mode:

Place the Hand-Off-Auto selector switch in the "Hand" position. The pump motor will run.

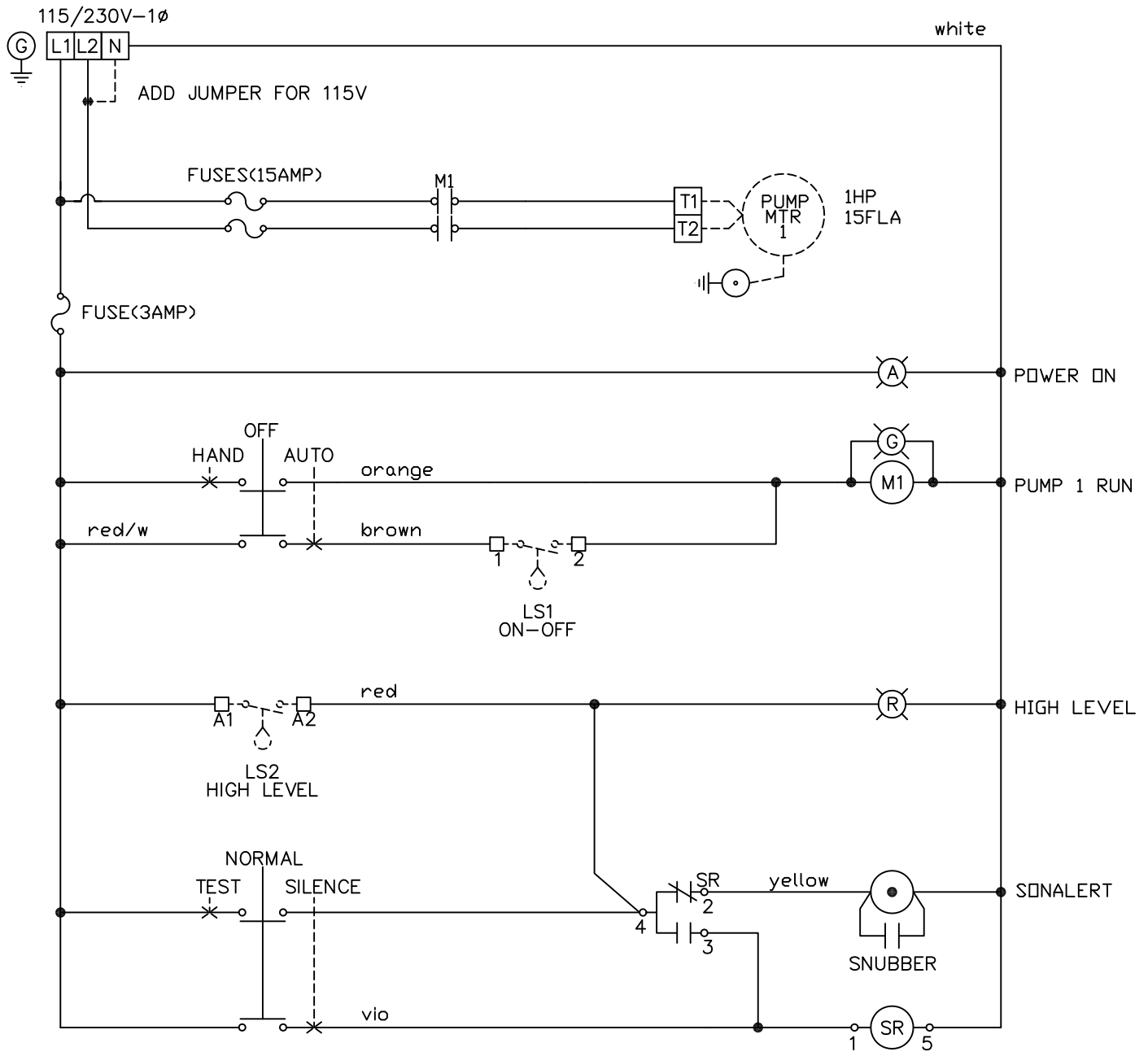
Auto Mode:

1. Place the Hand-Off-Auto selector switch in the "Auto" position.
2. When the liquid level in the wet well rises to the "off" and "on" levels, the lead pump will run.
3. The pump will stop when the liquid level drops below the "off" level.

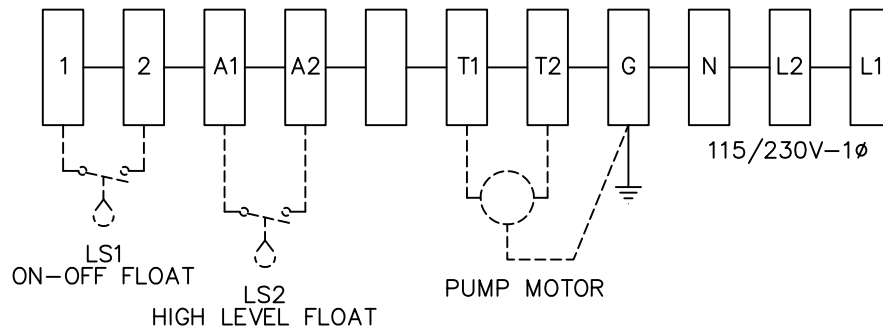
Alarm:

High Level: The liquid level rises above the "high" level.

- An indicator light on the outer-door will illuminate.
- The audible exterior alarm will sound and can be shut off by placing Test-Normal-Silence selector switch in the "Silence" position.



TERMINAL BLOCK LAYOUT



VOLTAGE: 115/230	PHASE: 1	HERTZ: 60	HP/FLA: 1/15
ENCLOSURE TYPE: 4X			
SHORT CIRCUIT CURRENT: 5KA			
RMS SYMMETRICAL, 120V MAXIMUM			



OHIO ELECTRIC CONTROL, INC.
2395 ROCK ROAD
Ashland, Ohio 44805

TITLE: OUTDOOR PANEL		
PAGES: SHEET ___ OF ___		
DATE: 10-15	REV DATE:	DWG. NO.: 150812JA03



OHIO ELECTRIC CONTROL, INC.
 2395 ROCK ROAD
 ASHLAND, OHIO 44805
 PH 419-289-1553
 FAX 419-289-5555

Control Panel Customer Submittal Form

Quote Number: 150812JA03
Company: American Concrete
Contact Name: Dan Sinclair
Phone Number: 207-784-1388
Cell Number: 800-638-9000
E-mail / Fax: 207-783-4039
Job Name: Outdoor Panel

Quoted By: James Austen

CONTROL PANEL SPECIFICATIONS:

Station Type: Simplex
Pump Model: 1HP @ 15FLA maximum
Panel Voltage: 115V/230V 1Ø
SCCR Minimum Rating: 5000 Amps
UL Listed: None
PDF Specs Attached: Yes

OTHER REQUIREMENTS:

Quantity	Part Number	Part Description	Construction Notes	Manufacturer
1.0	AH864	ENCLOSURE	NEMA TYPE 4X POLYCARBONATE, 8" X 6" X 4"	ATTABOX
1.0	OEC7P3.5	BACK PANEL	ALUMINUM PLATE MOUNTED INSIDE ENCLOSURE	OEC
3.0	BTWP2.5	POWER BLOCK	FOR POWER DISTRIBUTION	WEG
2.0	BTWP2.5	PUMP T-BLOCK	FOR WIRING OF MOTOR LEADS	WEG
4.0	BTWP2.5	FLOAT T-BLOCK	2 FLOAT SYSTEM: OFF/ON, HIGH LEVEL; FOR WIRING OF FLOATS	WEG
1.0	GL4717	GROUND BAR	FOR INCOMING POWER AND PUMP GROUNDS	LUGS DIRCT
1.0	DP30C2P1	DEFINITE PURPOSE CONTACTOR 30 AMP 2 POLE 120V COIL		ABB
2.0	BKABC15R	MOTOR FUSE	MOUNT IN FUSE BLOCK	BUSSMANN
2.0	HKP	MOTOR FUSE HOLDER	MOUNTED IN OUTER DOOR	BUSSMANN
1.0	MDL3R	CONTROL/ALARM FUSE	MOUNTED IN FUSE BLOCK	BUSSMANN
1.0	BKHTB28I	CONTROL FUSE BLOCK	MOUNTED IN OUTER DOOR	BUSSMANN
1.0	RJ1SCA120	SILENCE RELAY	MOUNTED IN SOCKET ON BACK PANEL	IDEC
1.0	SJ1S05B	RJ RELAY SOCKET		IDEC
1.0	HW1S32TF20	HAND-OFF-AUTO SWITCH	22MM OIL-TIGHT MOUNTED IN OUTER DOOR	IDEC

1.0	HW1S33TF20	ALARM TEST-NORMAL-SILENCE SWITCH	22MM OIL-TIGHT MOUNTED IN OUTER DOOR	IDEC
1.0	HW1P2FQDG120	RUN LIGHT	GREEN 22MM OIL-TIGHT MOUNTED IN OUTER DOOR	IDEC
1.0	HW1P2FQDR120	HIGH LEVEL LAMP	RED 22MM OIL-TIGHT MOUNTED IN OUTER DOOR	IDEC
1.0	HW1P2FQDA120	POWER ON LAMP	RED 22MM OIL-TIGHT MOUNTED IN OUTER DOOR	IDEC
1.0	MW09201Q	ALARM SONALERT	MOUNTED IN EXTERIOR RIGHT SIDE CENTER OF ENCLOSURE	FLOYD BELL
1.0	ECQE2823JF	CAP FILM 0.082UF 250VDC RADIAL	SNUBBER	
1.0	LAMINATED	LAMINATED LABELS	MOUNTED ON OUTER DOOR	OEC
1.0	MISC SHOP MATERIALS	WIRING HARNESS		OEC
1.0				
1.0	*****	*****	*****	*****
2.0	BKABC15R	SPARE MOTOR FUSE	SHIPPED LOOSE	BUSSMANN
2.0	MDL3R	SPARE CONTROL FUSES	SHIPPED LOOSE	BUSSMANN
1.0	*****	*****	*****	*****
1.0				
1.0				
1.0	NOTE	NOTE: SCHEMATIC	SCHEMATIC PROVIDED IN POCKET ON ENCLOSURE DOOR	OEC



Made in the USA
With Texas Pride

UL/cUL-508A
UL/cUL-50E

Type 3R,4,4X,12
File: E319779

Rated IP68

-Protection from dust, rain, sleet, snow, splashing water, waves,
hose directed water with superior impact and flame protection!

Polycarbonate Enclosures



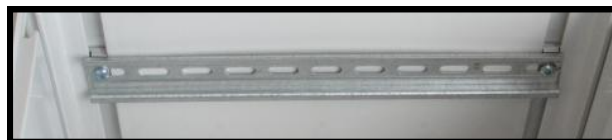
- Best NEMA 4X non-metallic enclosure available today
- Flat lid surface for easy HMI / pilot device mounting
- Latches and hinges do not penetrate enclosure
- Clear and opaque lids
- Easy to remove lid
- High performance inserts
- Integrated lock hasp
- Molded in bosses
- Multi-directional mounting feet



Rated
 IP68
 Type 3R, 4, 4X, 12
 F1 UV-light
 5VA flammability
 UL 1741 Compliant

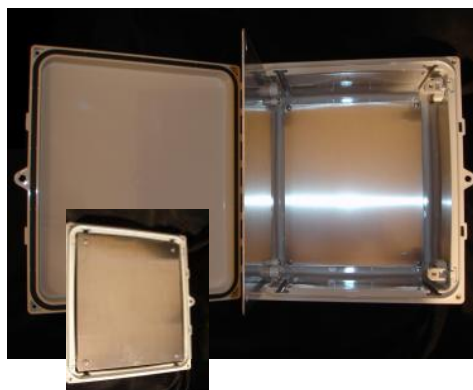
Side Mount Solutions

- Increases usable space
- Provides more mounting options
 - DIN rails
 - Side panels
 - Equipment
- Aluminum slot nuts
 - Variable mounting heights
 - 10/32 machine screw



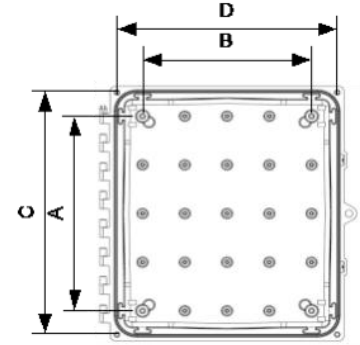
Panel Systems

- Sub-panel mounting solution – Revolutionary design
 - Variable height mounting
 - Swings open from any side
 - Panel locks into open position
 - Mounting holes are standard JIC
- 0.08" Aluminum panels
- Back panels are standard JIC

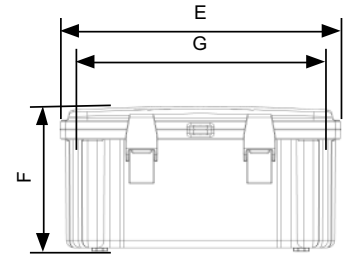
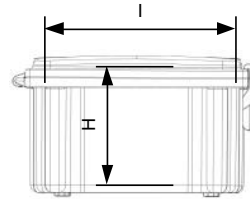


ATTABOX™

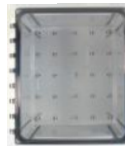
Rated IP68
 UL/cUL-508A
 UL/cUL-50E
 Type 3R,4,4X,12
 File: E319779



UL1741 Compliant



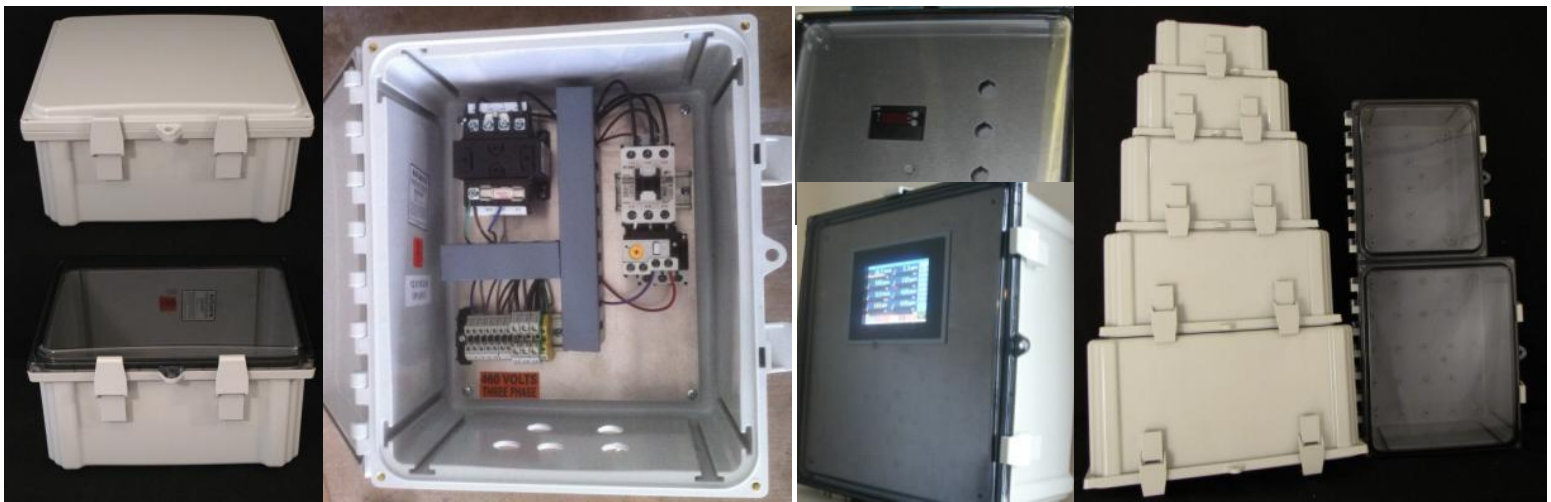
Part #	Size	Description
Opaque Cover Enclosures		
AH664	6 x 6 x 4	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH864	8 x 6 x 4	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH1084	10 x 8 x 4	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH12106	12 x 10 x 6	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH14126	14 x 12 x 6	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH16148	16 x 14 x 8	Attabox™ Polycarbonate Enclosure with Opaque Cover
AH181610	18 x 16 x 10	Attabox™ Polycarbonate Enclosure with Opaque Cover
Clear Cover Enclosures		
AH664C	6 x 6 x 4	Attabox™ Polycarbonate Enclosure with Clear Cover
AH864C	8 x 6 x 4	Attabox™ Polycarbonate Enclosure with Clear Cover
AH1084C	10 x 8 x 4	Attabox™ Polycarbonate Enclosure with Clear Cover
AH12106C	12 x 10 x 6	Attabox™ Polycarbonate Enclosure with Clear Cover
AH14126C	14 x 12 x 6	Attabox™ Polycarbonate Enclosure with Clear Cover
AH16148C	16 x 14 x 8	Attabox™ Polycarbonate Enclosure with Clear Cover
AH181610C	18 x 16 x 10	Attabox™ Polycarbonate Enclosure with Clear Cover
Back Panels		
BP66A	6 x 6	Aluminum Back Panel
BP86A	8 x 6	Aluminum Back Panel
BP108A	10 x 8	Aluminum Back Panel
BP1210A	12 x 10	Aluminum Back Panel
BP1412A	14 x 12	Aluminum Back Panel
BP1614A	16 x 14	Aluminum Back Panel
BP1816A	18 x 16	Aluminum Back Panel
Swing Panel Kits		
AH66SPK	6 x 6	Attabox™ 6x6 Swing Panel Kit (comes with mounts, screws and panel)
AH86SPK	8 x 6	Attabox™ 8x6 Swing Panel Kit (comes with mounts, screws and panel)
AH108SPK	10 x 8	Attabox™ 10x8 Swing Panel Kit (comes with mounts, screws and panel)
AH1210SPK	12 x 10	Attabox™ 12x10 Swing Panel Kit (comes with mounts, screws and panel)
AH1412SPK	14 x 12	Attabox™ 14x12 Swing Panel Kit (comes with mounts, screws and panel)
AH1614SPK	16 x 14	Attabox™ 16x14 Swing Panel Kit (comes with mounts, screws and panel)
AH1816SPK	18 x 16	Attabox™ 18x16 Swing Panel Kit (comes with mounts, screws and panel)
DIN Rail Kits		
AH6DRK		6" Din Rail Kit (includes two nuts, two screws, and din rail)
AH8DRK		8" Din Rail Kit (includes two nuts, two screws, and din rail)
AH10DRK		10" Din Rail Kit (includes two nuts, two screws, and din rail)
AH12DRK		12" Din Rail Kit (includes two nuts, two screws, and din rail)
AH14DRK		14" Din Rail Kit (includes two nuts, two screws, and din rail)
AH16DRK		16" Din Rail Kit (includes two nuts, two screws, and din rail)
AH18DRK		18" Din Rail Kit (includes two nuts, two screws, and din rail)
Accessories		
AHSNK		Slot Nut Kit (includes two nuts & two screws)
AHSPM		Swing Panel Mounts (4 per kit)
AHLK		Latch kit (2 latches per kit) - replacement only
AHAK		Accessory kit (includes all screws, inserts, and mounting feet) - replacement only
4XGlands		Cable glands of all sizes
Custom Solutions		Attabox™ custom services - modification & component installations



Enclosure	A x B	C	D	E	F	G	H	I	Back Panel	Sub-Panel
6x6x4	4.25x4.25	6.75	6.75	5.7	5.7	6.3	5	6.3	4.75x4.75	5.625x5.625
8x6x4	6.25x4.25	8.75	6.75	9.4	5.7	8.3	5	6.3	6.75x4.75	7.625x5.625
10x8x4	8.25x6.25	10.75	8.75	11.4	6.2	10.3	5.5	8.3	8.75x6.75	9.625x7.625
12x10x6	10.25x8.25	12.75	10.75	13.4	7.7	12.3	7	10.3	10.75x8.75	11.625x9.625
14x12x6	12.25x10.25	14.75	12.75	15.4	7.7	14.3	7	12.3	12.75x10.75	13.625x11.625
16x14x8	14.25x12.25	16.75	14.75	17.4	9.7	16.3	9	14.3	14.75x12.75	15.625x13.625
18x16x10	16.25x14.25	18.75	16.75	19.4	11.7	18.3	11	16.3	16.75x14.75	17.625x15.625

Engineering Properties

Typical Properties	Typical Values	Unit	Standard
Flammability (resin/component)	V-0 / 5V-A		UL 94
UV-light	F1		UL 746C
Enclosure Types	3R, 4, 4X, 12		UL 508A / UL 50E
Falling Dart Impact (D 3029), 73°F	1480	in-lb	ASTM D 3029
Izod Impact, unnotched, 73°F	60	ft-lb/in	ASTM D 4812
Tensile Impact, Type "S"	250	ft-lb/in²	ASTM D 1822
HDT, 264 psi, 0.250", unannealed	270	°F	ASTM D 648
CTE, flow, -40°F to 200°F	3.8E-05	1/°F	ASTM E 831
Flexural Stress, yld, 0.05 in/min, 2 in span	13100	psi	ASTM D 790
Normal Temperature Range	-40 - 260	°F	
Volume Resistivity	>1E+17	Ohm-cm	ASTM D 257



Controls

Terminal Blocks - BTWP Series

BTWP Series - Terminal Blocks with screw connection terminals

MULTIPLIER SYMBOL for BTW Series- -Z9

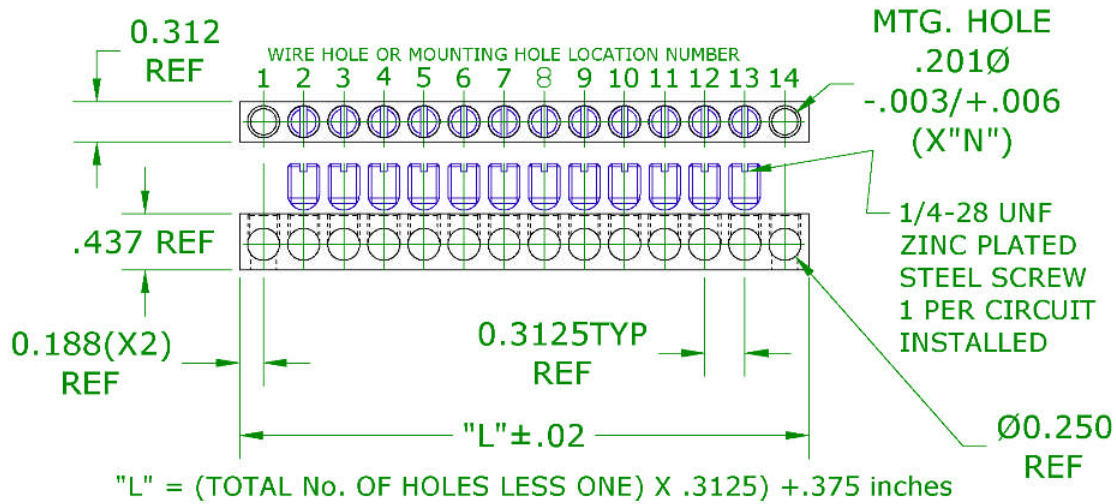
		BTWP 2.5 5 mm width			BTWP 4 6 mm width			BTWP 6 8 mm width		
		CEC			CEC			CEC		
Technical data		Voltage / Current / Cross section			Voltage / Current / Cross section			Voltage / Current / Cross section		
IEC 60947-7-1		750 V~ / 24 A / 2.5 mm ²			750 V~ / 32 A / 4 mm ²			630 V~ / 41 A / 6 mm ²		
UL / CSA		600 V~ / 20 A / AWG 26 ... 12			600 V~ / 30 A / AWG 26 ... 10			600 V~ / 50 A / AWG 26 ... 8		
Rated Surge Voltage		8kV			8kV			8kV		
Pollution degree		3			3			3		
Cable stripping		10 mm			10 mm			12 mm		
Tightening torque		0.4 Nm / 3.54 lb - in			0.5 Nm / 4.42 lb - in			0.8 Nm / 7.08 lb - in		
Connection capacity		Connection capacity			Connection capacity			Connection capacity		
Rigid wire		0.5 ... 4 mm ²			0.5 ... 6 mm ²			0.5 ... 10 mm ²		
Flexible cable		1.5 ... 2.5 mm ²			1.5 ... 4 mm ²			1.5 ... 6 mm ²		
AWG Conductor		26 ... 12			26 ... 10			26 ... 8		
Terminal Block	Color	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
	Gray	BTWP 2.5	100	\$130.00	BTWP 4	100	\$160.00	BTWP 6	100	\$210.00
	Blue	BTWP 2.5 (AZ)	100	\$130.00	BTWP 4 (AZ)	100	\$160.00	BTWP 6 (AZ)	100	\$210.00
	Green	BTWP 2.5 (VD)	100	\$130.00	BTWP 4 (VD)	100	\$160.00	BTWP 6 (VD)	100	\$210.00
Accessories										
End plate	Color	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
1.5 mm width	Gray	TF-BTWP 2.5-10	100	\$65.00	TF-BTWP 2.5-10	100	\$65.00	TF-BTWP 2.5-10	100	\$65.00
	Blue	TF-BTWP 2.5-10 (AZ)	100	\$65.00	TF-BTWP 2.5-10 (AZ)	100	\$65.00	TF-BTWP 2.5-10 (AZ)	100	\$65.00
	Green	TF-BTWP 2.5-10 (VD)	100	\$65.00	TF-BTWP 2.5-10 (VD)	100	\$65.00	TF-BTWP 2.5-10 (VD)	100	\$65.00
Separating Board	Color	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
	Gray	PD-BTWP 2.5-10	25	\$17.50	PD-BTWP 2.5-10	25	\$17.50	PD-BTWP 2.5-10	25	\$17.50
Connecting bridge	Nº. of poles	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
	2	PC-BTWP 2.5/2	25	\$47.50	PC-BTWP 4/2	25	\$47.50	PC-BTWP 6/2	25	\$47.50
	3	PC-BTWP 2.5/3	20	\$56.00	PC-BTWP 4/3	20	\$56.00	PC-BTWP 6/3	20	\$56.00
	4	PC-BTWP 2.5/4	15	\$57.00	PC-BTWP 4/4	15	\$57.00	PC-BTWP 6/4	15	\$57.00
	10	PC-BTWP 2.5/10	5	\$44.00	PC-BTWP 4/10	5	\$44.00	PC-BTWP 6/10	5	\$44.00
End bracket	Color	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
8 mm width	Gray	PF3-BTW	100	\$120.00	PF3-BTW	100	\$120.00	PF3-BTW	100	\$120.00
	Gray	PF4-BTW	100	\$120.00	PF4-BTW	100	\$120.00	PF4-BTW	100	\$120.00
Din rail / Support	Type	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
Din EN 50022	Flat	MR 35x7.5	2 m busbars	\$14.00	MR 35x7.5	2 m busbars	\$14.00	MR 35x7.5	2 m busbars	\$14.00
	Support	ST-BTW	25	\$75.00	ST-BTW	25	\$75.00	ST-BTW	25	\$75.00
Group identifier	Assembly	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
	Din rail	IG-BTW	50	\$75.00	IG-BTW	50	\$75.00	IG-BTW	50	\$75.00
	End Bracket	IG22-BTW ⁽¹⁾	25	\$37.50	IG22-BTW ⁽¹⁾	25	\$37.50	IG22-BTW ⁽¹⁾	25	\$37.50
Identifier ⁽²⁾		Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack	Catalog Number	Qty/Pack.	List Price/Pack
		IDG10/5-BTW	44	\$6.00	IDG10/6-BTW	36	\$6.00	IDG10/6-BTW	36	\$6.00
		IDB5-BTW	50	\$5.00	IDG10/5-BTW	44	\$6.00	IDG10/5-BTW	44	\$6.60
		IDG6/5-BTW	40	\$5.00	IDB5-BTW	50	\$5.00	IDB5-BTW	50	\$5.00
					IDG6/5-BTW	40	\$5.00	IDG6/5-BTW	40	\$5.00

⁽¹⁾ For assembly on PF4-BTW end bracket only.

⁽²⁾ Further details about identifiers on page B-279

TERMINAL BLOCKS

STANDARD STOCK NEUTRAL BARS WITH MOUNTING HOLES



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UL & CSA AGENCY APPLICATION NOTES:

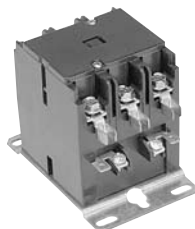
- UL Recognized ("UR" mark) Class ZMVV2 and "CSA" Certified (CSA mark)
- Installation must be carried out only by qualified electricians in accordance with all applicable NEC & UL/CSA standards for the approved application.
- Approved for 90 ° C Temperature Rating Wire, CU9AL
- Amp Rated at 85 Amps for Copper wire and 70 Amps for Aluminum wire
- Wire range, American Wire Gauge AWG 4-14 CU (copper wire), 4-12 Al (aluminum wire) Dual Rated, Solid & Stranded, industrial rigid stranding wire.
- Tightening torques, 4-6 AWG = 45 lb-in, 8 AWG = 40 lb-in, 10-14 AWG = 35 lb-in
- The bar shall be prevented from turning by close fitting walls, or other turn preventive features such as two mounting holes.
- The bar shall not be mounted to a bus bar to act as a power distribution means to or from that bar.
- The bar is designed to be used as a neutral bar for ground or power.
- The bar is for use only in complete equipment where the suitability of the combination is determined & approved by UL
- The mounting screw is to be size #10-32 UNF. The proper use of washers to distribute screw clamping forces on the aluminum should be employed. Bellevilles and lock nuts should be considered in case of vibration.
- The screw will hold the smaller wires when the appropriate torque for the small wire is fully applied
- Dry locations only.

CONSTRUCTION NOTES:

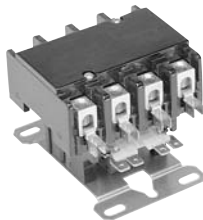
- The tolerance between mounting holes is +/- .015"
- The mounting hole is .201 +.006/- .003.
- The listed overall length of each bar is +/- .020
- Material is High Strength Tempered aluminum 6160 with conductivity approx. 43% IACS.
- Aluminum body is Tin Plated to resist oxidation and galvanic corrosion.
- Screws are Zinc Plated Steel with Trivalent (Cr+3) Chromate conversion top layer.

GL4717

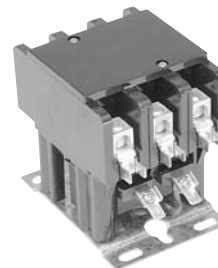
30A, 40A & 60A



DP30C3P-F



DP40C4P-F



DP60C3P-F

30A, 40A & 60A

Full load amps	Number of poles	Locked rotor amps			Resistive amps	Maximum HP 1 phase		Maximum HP 3 phase				Bulk pack ①	Catalog number qty.	Individual pack list price	Bulk pack list price
		240/277V	480V	600V		120V	240V	200/208V	240/277V	480V	600V				
30	1	150	75	50	40	1	2	—	—	—	—	50	DP30C1P-F	\$ 30	\$ 27
30	2	150	125	100	40	2	3	—	—	—	—	50	DP30C2P-F	38	34
30	3	180	150	120	40	2	5	10	10	15	20	25	DP30C3P-F	55	50
30	4	180	150	120	40	2	5	10	10	10	—	20	DP30C4P-F	75	68
40	2	240	200	160	50	2	3	—	—	—	—	50	DP40C2P-F	46	42
40	3	240	200	160	50	3	7.5	10	10	20	25	25	DP40C3P-F	60	54
40	4	240	200	160	50	3	7.5	10	10	10	—	20	DP40C4P-F	100	90
60	3	360	300	240	75	2	10	25	25	30	30	10	DP60C3P-F	147	140

Coil voltage selection chart

Voltage	24VAC	120VAC	208/240VAC	277VAC	480VAC	575VAC
Suffix #	F	1	2	C	4	5

Coil voltage selection

All catalog numbers include a 24VAC coil. To select other coil voltages, substitute the code from the Coil Voltage Selection Chart for the first digit after the dash in the catalog number.

Auxiliary contact blocks (3 pole only)

Description	Catalog number 30A - 40A	Catalog number 60A	List price
NO or NC SPDT 1 NO & 1 NC	CADP40-10 CADP40-11	CADP60-10 CADP60-11	\$ 10

M1

Contact rating of 1 NO & 1 NC

		120V	240V	480V	600V
Break	A	3.0	1.5	.75	.6
Make	A	30	15	7.5	6
Continuous	A	10	10	10	10

Quick connect terminals on all auxiliary switches are .250 wide.

Contact rating of SPDT

Voltage	Current rating
125VAC	10A, 1/3 HP
120VAC	4A on lamp load
250VAC	10A, 1/3 HP
125VDC	.5A
250VDC	.25A

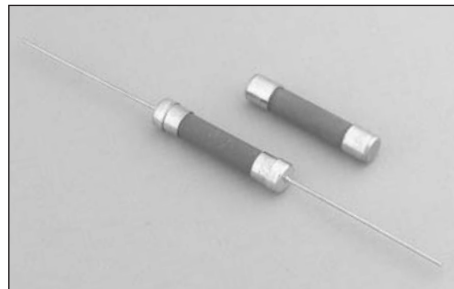
① Must be ordered in standard pack quantities as shown. Add suffix "/B" to the catalog number.

1/4" x 1 1/4" Fast-Acting Ceramic Tube Fuses

ABC Series

Description

- Fast-acting
- Optional axial leads available
- 1/4" x 1 1/4" (6.4 x 31.7mm) physical size
- Ceramic tube, nickel-plated brass endcap construction
- UL Listed product meets standard 248-14



Electrical Characteristics	
% of Amp Rating	Opening Time
100%	4 Hours Minimum
135%	60 Minutes maximum
200%	120 Seconds Maximum

Agency Information

- UL Listed: Guide JDYX & File E19180.
- UL Recognition: Guide JDYX2 & File E19180.
- CSA Certification: Class 1422-01 & 1422-03, File 53787.

Environmental Data

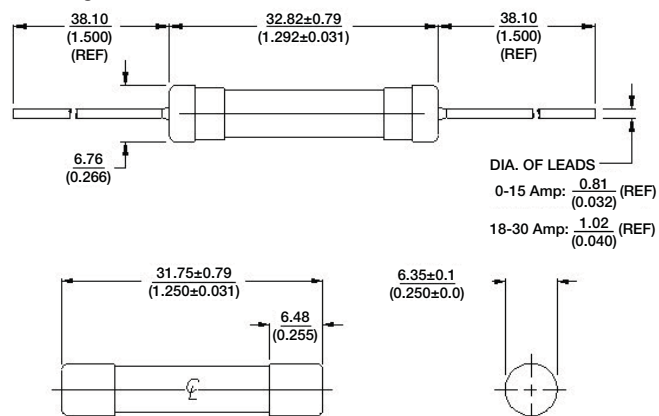
- Shock: 1/4-30A – MIL-STD-202, Method 213, Test Condition J
- Vibration: 1/4-30A – MIL-STD-202, Method 204, Test Condition C (Except 5g, 500HZ)

Ordering

- Specify packaging, product, and option code

Dimensions - mm (in)

Drawing Not to Scale



Specifications

Part Number	Voltage Ratings		Vac Interrupting Ratings* (amps)		Vdc Interrupting Ratings (amps)		Typical DC Cold Resistance (Ω)**	Typical Pre-Arc I ² t AC†	Typical Voltage Drop (mV)‡	Agency Approvals		
	Vac	Vdc	250	125	125	75				UL	UR	CSA
ABC-1/4-R	250	125	35	10,000	10,000	–	2.950	0.0020	0.35	X		X
ABC-1/2-R	250	125	35	10,000	10,000	–	0.587	0.0390	0.41	X		X
ABC-3/4-R	250	125	35	10,000	10,000	–	0.300	0.1450	0.32	X		X
ABC-1-R	250	125	35	10,000	10,000	–	0.1950	0.4310	0.3	X		X
ABC-1-1/2-R	250	125	100	10,000	10,000	–	0.131	1.1630	0.28	X		X
ABC-2-R	250	125	100	10,000	10,000	–	0.0890	2.1670	0.31	X		X
ABC-2-1/2-R	250	125	100	10,000	10,000	–	0.061	4.4670	0.23	X		X
ABC-3-R	250	125	100	10,000	10,000	–	0.047	6.55	0.14	X		X
ABC-4-R	250	125	200	10,000	10,000	–	0.031	22.28	0.17	X		X
ABC-5-R	250	125	200	10,000	10,000	–	0.026	32.83	0.22	X		X
ABC-6-R	250	125	200	10,000	10,000	–	0.021	58	0.19	X		X
ABC-7-R	250	125	200	10,000	10,000	–	0.016	109.33	0.17	X		X
ABC-8-R	250	125	200	10,000	10,000	–	0.014	116.5	0.19	X		X
ABC-10-R	250	125	200	10,000	10,000	–	0.011	208.8	0.15	X		X
ABC-12-R	250	125	750	10,000	10,000	–	0.0068	133.3	0.1	X		X
ABC-15-R	250	125	750	10,000	10,000	–	0.00553	200.2	0.1	X		X
ABC-18-R	250	–	400	1000	–	–	0.00465	400	0.1		X	X
ABC-20-R	250	125	400	1000	10,000	–	0.00366	550.8	0.1		X	X
ABC-25-R	250	125	200	1000	400	1000	0.0028	839.3	0.09		X	X††
ABC-30-R	250	125	200	1000	400	1000	0.002225	1429	0.09		X	X††

* Interrupting ratings measured at 70% - 80% power factor on AC. The interrupting ratings for 18A and 20A were measured at 85% - 95% power factor on AC. The interrupting ratings for 25A and 30A were measured at 89% power factor on AC.

** Typical DC cold resistance measured at <10% of rated current.

† Typical melting I²t measured at listed interrupting rating and rated voltage.

‡ Typical voltage drop measured at 25°C±3°C ambient temperature at rated current.

†† CSA approvals for 25A and 30A are at 125Vac - IR 1000A and 125Vdc - IR 400A (IR 1000A at 75Vdc)

1/4" x 1 1/4" Fuse Holders

HKP Panel-Mount Series

Description

- For 1/4" x 1 1/4" (6.3 x 32mm) fuses
- Maximum panel thickness 5/16" (7.9mm) thick
- Bayonet-type knob
- Vibration resistant
- Military version is designated FHN26G1
- Standard plastic nut
- Optional metal nut
- Cap - 9435-1/2
- Neoprene washer - 9732

Agency Information

- UL Recognized: IZLT2, E14853
- CSA Component Acceptance:
Class 6225-01, File 47235
- CE (HKP, HKP-L, HKP-W, HKP-OO)

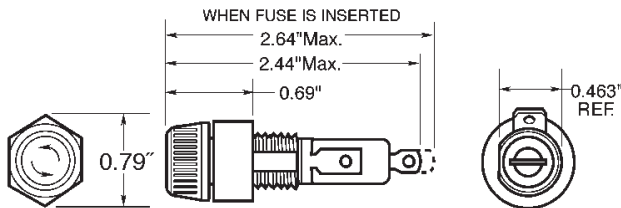
Ordering

- Specify packaging, product, and option code
- Optional metal nut, order separately part number BK/1A4806-2 (100 parts minimum)

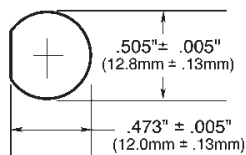
Dimensions - in (mm)

Drawing Not to Scale

HKP-BBHH, HKP-HH, HKP-LW-HH



Punched Mounting Hole



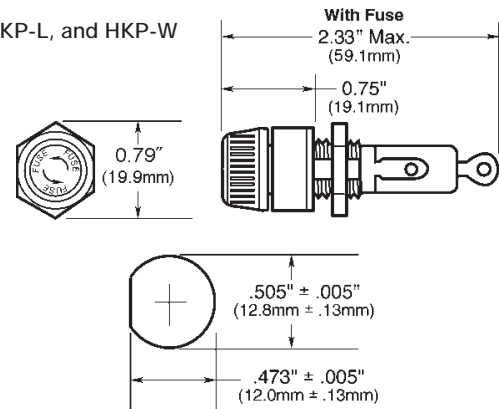
Component	Material
Terminal	Tin-Plated Brass
Body	Thermoset
Cap	Thermoset
Nut	Thermoplastic



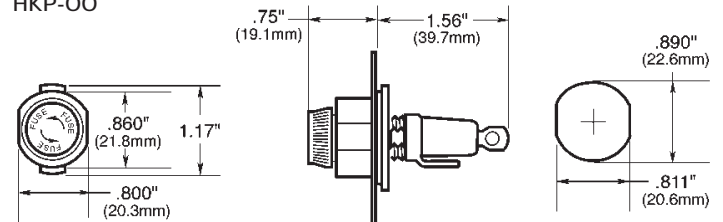
Environmental Data

- Temperature rating (RTI): The mounting body for all devices has a temperature rating of 150°C. The knob for these devices are molded plastic with a temperature rating of 150°C.
- Meets UL 94HB
- Terminal Strength: 5 pounds
- Torque: Mounting - 20 inch-pound
- Salt Spray (corrosion): Test condition B

HKP, HKP-L, and HKP-W



HKP-OO



Specifications			
Product Code	Feature	Voltage Rating	Current Rating
HKP	Standard	250V	30A
HKP-BBHH	¼" Quick-Connects, nut and washer assembled	250V	15A
HKP-HH	¼" Quick-Connects	250V	15A
HKP-L	2250 stand-off barrier	250V	30A
HKP-LW-HH	Drip-proof knob, 2250V stand-off barrier and ¼" quick connects	250V	15A
HKP-OO	Snap-lock	250V	30A
HKP-W	Drip-proof knob	250V	30A

Packaging	
Packaging Code Prefix	Description
Blank	10 fuseholders packed into a carton
BK	100 fuseholder components packed separately into a carton

Option Code	
Option Code Suffix	Description
-R	RoHS compliant version

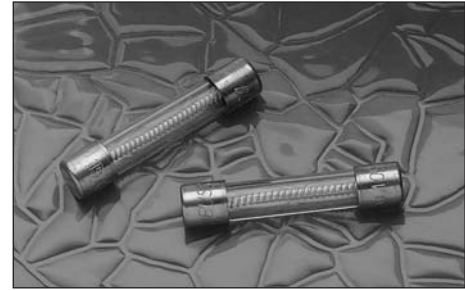
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1/4" x 1 1/4" Time-Delay, Glass Tube Fuses MDL Series

Description

- Time-delay
- Optional axial leads available
- 1/4" x 1 1/4" (6.4 x 31.7mm) physical size
- Glass tube, nickel-plated brass endcap construction
- UL Listed product meets standard 248-14



Electrical Characteristics		
Rated Current	% of Amp Rating	Opening Time
1/16 - 30A	100%	None
	135%	60 minutes maximum
	200%	120 seconds maximum
1/16 - 3A	200%	5 seconds minimum
3-2/10 - 8A	200%	12 seconds minimum

Agency Information

- UL Listed Card: MDL 1/16 - 8A (Guide JDYX, File E19180)
- UL Recognized Card: MDL 9 - 30A (Guide JDYX2, File E19180)
- CSA Certification Card: MDL 1/16 - 8A (Class No. 1422-01)
- CSA Component Acceptance: MDL 9-30A (Class No. 1422-30)
- CE

Environmental Data

- Shock: 1A thru 30A – MIL-STD-202, Method 207, (HI Shock)
- Vibration: 1/4A thru 30A – MIL-STD-202, Method 204, Test Condition C (Except 5g, 500HZ)

Ordering

Specify packaging code

- Insert packaging code prefix before part number. E.g., BK (or BK1)-MDL-5-R

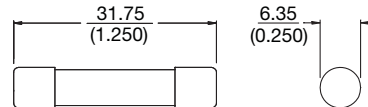
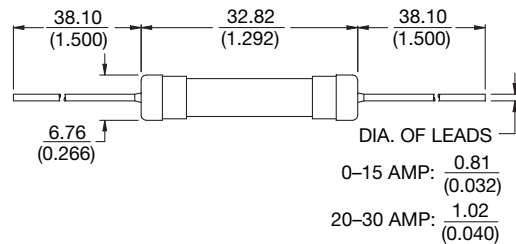
Specify option codes if desired

- For axial leads, insert "V" between catalog series and amp rating. E.g., BK-MDL-V-5-R

- For board washable, insert "B" between catalog series and amp rating. E.g., BK-MDL-B-5-R
- For axial leads and board washable, insert "B" then "V" between catalog series and amp rating. E.g., BK-MDL-BV-5-R

Dimensions - mm (in)

Drawing Not to Scale



Specifications

Part Number	Voltage Rating Vac	AC Interrupting Rating* (amps)@			Typical DC Cold Resistance** (Ω)	Typical Melting I ² t†† AC	Typical Voltage Drop‡
		250Vac	125Vac	32Vac			
MDL-1/16-R	250	35	10000	-	45.6	0.0046	2.79
MDL-1/10-R	250	35	10000	-	15.68	0.0420	1.95
MDL-1/8-R	250	35	10000	-	12.238	0.0422	1.52
MDL-3/16-R	250	35	10000	-	4.81	0.116	1.05
MDL-2/10-R	250	35	10000	-	5.234	0.314	0.972
MDL-1/4-R	250	35	10000	-	3.208	0.447	0.965
MDL-3/10-R	250	35	10000	-	2.046	0.412	0.808
MDL-3/8-R	250	35	10000	-	1.567	0.982	1.46
MDL-1/2-R	250	35	10000	-	0.943	1.656	1.27
MDL-3/4-R	250	35	10000	-	0.397	4.343	1.01
MDL-1-R	250	35	10000	-	0.273	11.498	0.995
MDL-1-1/4-R	250	100	10000	-	0.205	86.2	0.722
MDL-1-1/2-R	250	100	10000	-	0.156	22.7	0.721
MDL-2-R	250	100	10000	-	0.116	62.3	0.644
MDL-2-1/4-R	250	100	10000	-	0.096	49.6	0.535
MDL-2-1/2-R	250	100	10000	-	0.081	63.1	0.410
MDL-3-R	250	100	10000	-	0.057	67.5	0.345
MDL-4-R	250	200	10000	-	0.038	19.3	0.187
MDL-5-R	250	200	10000	-	0.025	32.0	0.160
MDL-6-R	250	200	10000	-	0.022	37.4	0.155
MDL-6-1/4-R	250	200	10000	-	0.02	38.7	0.152
MDL-7-R	250	200	10000	-	0.018	42.7	0.140
MDL-8-R	250	200	10000	-	0.015	47.8	0.119
MDL-9-R	32	-	-	1000	0.012	51.5	0.124
MDL-10-R	32	-	-	1000	0.01	64.4	0.114
MDL-15-R	32	-	-	1000	0.005	354.0	0.130
MDL-20-R	32	-	-	1000	0.004	2914.0	0.530
MDL-25††	32	-	-	1000	0.01225	15221.0	0.30
MDL-30††	32	-	-	1000	0.0011	15581.0	0.40

* Interrupting Ratings (Interrupting ratings were measured at 70% - 80% power factor on AC)

** DC Cold Resistance (Measured at ≤10% of rated current)

† Typical Melting I²t (A²Sec) (I²t was measured at listed interrupting rating and rated voltage.)

‡ Typical Voltage Drop (Voltage drop was measured at 25°C±3°C ambient temperature at rated current)

†† MDL-25 & MDL-30 not available in RoHS compliant construction.

RJ Series Slim Power Relays

Compact and rugged power relays. Large switching capacity.

- Compact housing only 12.7-mm wide.
Large contact rating
RJ1 (1-pole): 16A (UL general use rating @250V AC)
RJ2 (2-pole): 8A
- Non-polarized LED indicator available on blade type. IDEC's unique light guide structure enables high visibility of coil status from any direction.
- Excellent electrical and mechanical life.
Electrical life: 200,000 operations (AC load)
Mechanical life: 30 million operations (AC coil)
- RoHS directive compliant (EU directive 2002/95/EC). Contains no lead, cadmium, mercury, hexavalent chromium, PBB or PBDE).
- Diode model:
Diode reverse withstand voltage: 1000V
- UL recognized, CSA certified, EN compliant.



UL508
UL File No. E55996



CSA C22.2 No. 14
1608322
CSA File No. LR35144





EN61810-1
VDE (REG.-Nr B312)



EN61810-1
EC Low Voltage Directive

Part Number Selection

	Terminal	Contact	Model	Part Number	Coil Voltage Code (Standard Stock in bold)
	Blade	SPDT	Standard	RJ1S-C-	A24, A110, A120 , A220, A240 , D12, D24 , D48, D100
			with LED	RJ1S-CL-	
			with Surge Suppression Diode	RJ1S-CD-	
			with LED & Surge Suppression Diode	RJ1S-CLD-	
		DPDT	Standard	RJ2S-C-	A24, A110, A120 , A220, A240 , D12, D24 , D48, D100
			with LED	RJ2S-CL-	
			with Surge Suppression Diode	RJ2S-CD-	
			with LED & Surge Suppression Diode	RJ2S-CLD-	
	PCB	SPDT	Standard	RJ1V-C-	A24, A110, A120 , A220, A240 , D5, D6, D12, D24 , D48, D100
			High Capacity	RJ1V-CH-	
		SPST-NO	Standard	RJ1V-A-	
			High Capacity	RJ1V-AH-	
		DPDT	Standard	RJ2V-C-	
			Standard	RJ2V-A-	

Ordering Information

When ordering, specify the Part No. and coil voltage code:



Coil Voltage Table

Coil Voltage Code	A12	A24	A110	A120	A220	A240	D5	D6	D12	D24	D48	D100
Coil Rating	12V AC	24V AC	110V AC	120V AC	220V AC	240V AC	5V DC	6V DC	12V DC	24V DC	48V DC	100-110V DCV DC



Switches & Pilot Lights

Display Lights

Relays & Sockets




Timers

Terminal Blocks

Circuit Breakers

Sockets

	Relays	Standard DIN Rail Mount	Finger-safe DIN Rail Mount	PCB Mount
Blade Models	RJ1S (Std)	SJ1S-05B	SJ1S-07L	SJ1S-61
	RJ2S (Std)	SJ2S-05B	SJ2S-07L	SJ2S-61
PCB Models	RJ1V (Std)	—	SQ1V-07B*	SQ1V-63*
	RJ1V (HC) RJ2V	—	SQ2V-07B*	SQ2V-63*

Replacement Hold Down Springs

Part Number	Used With Socket
SJ9Z-C1	SJ1S-05B, SJ1S-07L, SJ2S-05B, SJ2S-07L
SQ9Z-C	SQ1V-07B, SQ2V-07B
SQ9Z-C63	SQ1V-63, SQ2V-63



Jumpers for SJ Sockets

Poles	Part Number	Quantity
2	SJ9Z-JF2	Must purchase in quantities of 10.
5	SJ9Z-JF5	
8	SJ9Z-JF8	
10	SJ9Z-JF10	



*Hold-down clip or spring must be removed to use with RJ PCB relays.

Accessories

Description	Appearance	Use with	Part No.	Remarks
Aluminum DIN Rail (1 meter length)		All DIN rail sockets	BNDN1000	IDEC offers a low-profile DIN rail (BNDN1000). The BNDN1000 is designed to accommodate DIN mount sockets. Made of durable extruded aluminum, the BNDN1000 measures 0.413 (10.5mm) in height and 1.37 (35mm) in width (DIN standard). Standard length is 39" (1,000mm).
DIN Rail End Stop		DIN rail	BNL5	9.1 mm wide.

Specifications

Model		RJ1	RJ2
Number of Poles		1-pole	2-pole
Contact Configuration		SPDT	DPDT
Contact Material		Silver-nickel alloy	
Degree of Protection		IP40	
Contact Resistance (initial value) (*1)		50 mΩ maximum	
Operate Time (*2)		15 ms maximum	
Release Time (*2)		10 ms maximum (with diode: 20 ms maximum)	
Dielectric Strength	Between contact and coil	5000V AC, 1 minute	5000V AC, 1 minute
	Between contacts of the same pole	1000V AC, 1 minute	1000V AC, 1 minute
	Between contacts of different poles	—	3000V AC, 1 minute
Vibration Resistance	Operating extremes	10 to 55 Hz, amplitude 0.75 mm	
	Damage limits	10 to 55 Hz, amplitude 0.75 mm	
Shock Resistance	Operating extremes	NO contact: 200 m/s ² , NC contact: 100 m/s ²	
	Damage limits	1000 m/s ²	
Electrical Life (rated load)		AC load: 200,000 operations minimum (operation frequency 1800 operations per hour) DC load: 100,000 operations minimum (operation frequency 1800 operations per hour)	
Mechanical Life (no load)		AC coil: 30,000,000 operations minimum (operation frequency 18,000 operations per hour) DC coil: 50,000,000 operations minimum (operation frequency 18,000 operations per hour)	
Operating Temperature (*3)		-40 to +70°C (no freezing)	
Operating Humidity		5 to 85% RH (no condensation)	
Weight (approx.)		19g (blade type), 17g (PCB form C type), 16g (PCB form A type)	



Note: Above values are initial values.

1. Measured using 5V DC, 1A voltage drop method.
2. Measured at the rated voltage (at 20°C), excluding contact bounce time.
3. 100% rated voltage.

Selector Switches 3-Position (Assembled)



3-Position Selector Switches

Contact	Mounting	Operator Position			Handle	Maintained	Spring Return from Right	Spring Return from Left	Spring Return Two-Way
		L	C	R					
<i>Operator Only</i>					<i>Knob Lever</i>	HW⊙S-3T* HW⊙S-3L	HW⊙S-31T HW⊙S-31L	HW⊙S-32T HW⊙S-32L	HW⊙S-33T HW⊙S-33L
1NO-1NC	1 2	0 0	X 0	X X	Knob Lever	HW⊙S-3TF11 HW⊙S-3LF11	HW⊙S-31TF11 HW⊙S-31LF11	HW⊙S-32TF11 HW⊙S-32LF11	HW⊙S-33TF11 HW⊙S-33LF11
2NO	1 2	X 0	0 0	0 X	Knob Lever	HW⊙S-3TF20 HW⊙S-3LF20	HW⊙S-31TF20 HW⊙S-31LF20	HW⊙S-32TF20 HW⊙S-32LF20	HW⊙S-33TF20 HW⊙S-33LF20
2NC	1 2	0 X	X X	X 0	Knob Lever	HW⊙S-3TF02 HW⊙S-3LF02	HW⊙S-31TF02 HW⊙S-31LF02	HW⊙S-32TF02 HW⊙S-32LF02	HW⊙S-33TF02 HW⊙S-33LF02
2NO-1NC	1 2 3	X 0 0	0 0 X	0 X 0	Knob	HW⊙S-3JTF21N1	-	-	-
2NO-2NC	1 2 3 4	X 0 0 X	0 0 X X	0 X X 0	Knob	HW⊙S-3TF22	HW⊙S-31TF22	HW⊙S-32TF22	HW⊙S-33TF22
2NO-2NC	1 2 3 4	0 X X 0	0 X X 0	X 0 0 X	Knob	HW⊙S-3STF22N9	-	-	-
4NO	1 2 3 4	X 0 X 0	0 0 0 0	0 X 0 X	Knob	HW⊙S-3TF40	HW⊙S-31TF40	HW⊙S-32TF40	HW⊙S-33TF40
4NO	1 2 3 4	X 0 X 0	0 X 0 0	0 X X X	Knob	HW⊙S-3STF40N2	-	-	-
4NC	1 2 3 4	0 X 0 X	X X X X	X 0 X 0	Knob	HW⊙S-3TF04	HW⊙S-31TF04	HW⊙S-32TF04	HW⊙S-33TF04

HAND-OFF-AUTO
TEST-NORMAL-SILENCE

⑤ Bezel Type

Type	Code
Plastic	1
Metal	4

- In place of ⊙ enter 1 for plastic bezel or 4 for metal bezel.
- Knob operator includes black knob/lever operator includes black lever.
- * Three position operator is available with three different cams.
HW⊙S-3T: Maintained (standard cam)
HW⊙S-3ST: Maintained (S cam)
HW⊙S-3JT: Maintained (J cam)
- Operator cams are color coded (white=standard cam, red=S cam, black=J cam).
- For nameplates, see page 546.
- For contact assembly part numbers, see page 550.

- All assembled part numbers in catalog include standard fingersafe (HW-F...) contacts.
- Assembled units with spring-up terminals (HW-G...) can be ordered by removing an "F" from the part number (Ex. HW1B-M1F11-R becomes HW1B-M111-R).
- Units with exposed screw terminals (HW-C...) must be ordered as sub-components.
- Standard color for knob and lever is black.
- Optional colors available for lever type. Must order in components. See next page for part numbers.
- Additional contact configurations available (up to 6 total contacts).
- For Truth Tables see page 558.

Switches & Pilot Lights

Display Lights

Relays & Sockets

Timers

Terminal Blocks

Circuit Breakers

Pilot Lights (Assembled)



		Round Flush		Dome	
		Plastic Bezel	Metal Bezel	Plastic Bezel	Metal Bezel
<i>Operator Only</i>		HW1P-1FQ0-②	HW4P-1FQ0-②	HW1P-2FQ0-②	HW4P-2FQ0-②
Full Voltage		HW1P-1FQ④-②-③	HW4P-1FQ④-②-③	HW1P-2FQ④-②-③	HW4P-2FQ④-②-③
Transformer	120V AC	HW1P-1FH2④-②	HW4P-1FH2④-②	HW1P-2FH2④-②	HW4P-2FH2④-②
	240V AC	HW1P-1FM4④-②	HW4P-1FM4④-②	HW1P-2FM4④-②	HW4P-2FM4④-②
	480V AC	HW1P-1FT8④-②	HW4P-1FT8④-②	HW1P-2FT8④-②	HW4P-2FT8④-②
DC-DC Converter*	110V DC	HW1P-1D2D-②	—	HW1P-2D2D-②	—



		Square Flush
		Plastic Bezel
<i>Operator Only</i>		HW2P-1FQ0-②
Full Voltage		HW2P-1FQ④-②-③
Transformer	120V AC	HW2P-1FH2④-②
	240V AC	HW2P-1FM4④-②
	480V AC	HW2P-1FT8④-②
DC-DC Converter*	110V DC	HW2P-1D2D-②

② Lens/LED Color Code

Color	Code
Amber	A
Green	G
Red	R
Blue	S
White	W
Yellow	Y

③ Full Voltage Code

Voltage	Code
6VAC/DC	6V
12VAC/DC	12V
24VAC/DC	24V
120V AC (LED only)	120V
240V AC (LED only)	240V

④ Lamp Type Code

Lamp	Code
Incandescent	Blank
LED	D



- In place of ②, specify the Lens/LED Color Code from table below.
- In place of ③ specify the Full Voltage Code from table below.
- In place of ④ specify Lamp Type Code from table below.
- *DC-DC convertor voltage input from 90-140V DC, comes with spring-up terminals only.
- DC-DC converter models with LED lamps only.
- For nameplates and accessories, see page 546 and 549.
- For dimensions, see page 551.
- Pilot lights do not come with anti-rotation ring.**
- Operator models come with operator and lens.
- Yellow pilot light comes with white LED.**

AudioLarm II

MW-09-201-Q



More Information

Warble Tone



[Spec Sheet](#)



[UL Recognized](#)



RoHS Compliant

Specifications

Revision: 10.14

Medium Loud Warble Tone; Extra Fast Rate; Panel Mount Case and Quick Connect Blades Termination

Mounting: Panel Mount

Operating Mode: Medium Loud Extra Fast Warble Tone

Operating Voltage: 30-120 Vac

Operating Frequency:

5 mA at 30 Vac

20 mA at 120 Vac

Typical Operating Current: 85±5 dB(A), at 30 Vac, at 24 inches (61 cm), at 25°C

95±5 dB(A), at 120 Vac, at 24 inches (61 cm), at 25°C

Termination: Quick Connect Blades

Termination Strength: Pull test with a maximum of 22 pounds (10 kg) load

Operating Temperature: -20_C to +65_C

Storage Temperature: -40_C to +85_C

Surge Voltage: 20% over maximum rated voltage for less than 5 minutes

Reverse Voltage Protection: To the maximum operating voltage

Construction Materials:

Internal Circuit- Audio-oscillator and piezoelectric driver

Potting- 2 parts epoxy resin or silicone, black

Diaphragm- Stainless Steel 304

Gasket:

Environmental Durability: ASTM B117 Certified - Withstands exposure to salt spray for 300 hours

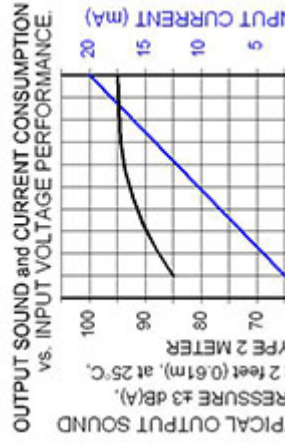
IP 68 Certified - Withstands water submergence and dust exposure

Humidity- 95% relative humidity at +40_C continuously for 100 hours.

Vibration- Withstands vibration between 0 and 55 Hz. on all axes.

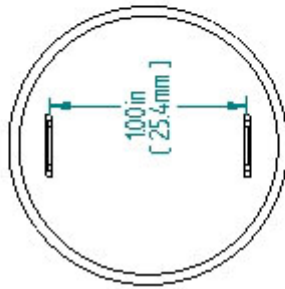
Life Expectancy: 10 years under normal operating conditions.

Warranty: For a period of two years from the date of manufacture under normal operating conditions.

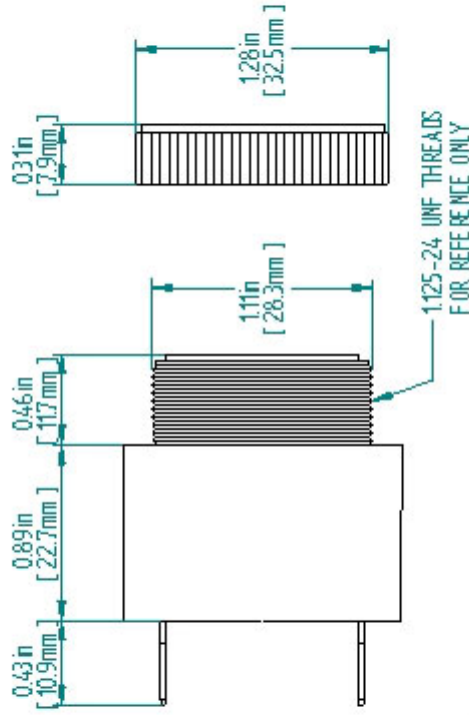


Dimensions

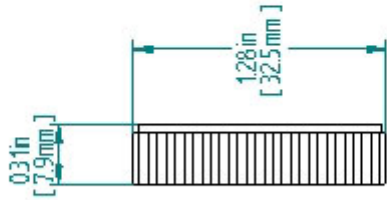
REAR



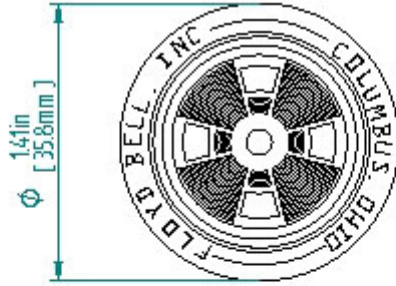
SIDE



RING



FRONT



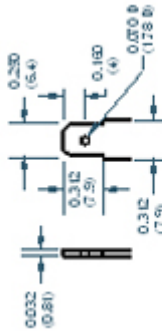
PANEL MOUNTING



FITS PANELS UP TO 0.25in [6.35mm] THICK

TOLERANCES ARE: ±0.03in. [±0.76mm]

"Q" TERMINALS



Metallized Polyester Film Capacitor

Type: **ECQE(F)**

Non-inductive construction using metallized Polyester film with flame retardant epoxy resin coating



■ Features

- Self-healing property
- Excellent electrical characteristics
- Flame retardant epoxy resin coating
- RoHS directive compliant

■ Recommended Applications

- General purpose usage
- *Please contact us when applications are CD I, ignitor etc.

PART # ECQE2823JF

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12																																
E	C	Q	E							F																																	
Product code		Dielectric & construction		Rated volt.		Capacitance			Cap. Tol.	Suffix	Suffix																																
				<table border="1" style="font-size: small; text-align: left;"> <tr> <td>1</td><td>100 VDC</td><td>10</td><td>1000 VDC</td></tr> <tr> <td>2</td><td>250 VDC</td><td>12</td><td>1250 VDC</td></tr> <tr> <td>4</td><td>400 VDC</td><td>1A</td><td>125 VAC</td></tr> <tr> <td>6</td><td>630 VDC</td><td>2A</td><td>250 VAC</td></tr> </table>		1	100 VDC	10	1000 VDC	2	250 VDC	12	1250 VDC	4	400 VDC	1A	125 VAC	6	630 VDC	2A	250 VAC				<table border="1" style="font-size: small; text-align: left;"> <tr> <td>J</td><td>±5 %</td></tr> <tr> <td>K</td><td>±10 %</td></tr> </table>	J	±5 %	K	±10 %	<table border="1" style="font-size: small; text-align: left;"> <tr> <th>Suffix</th><th>Lead Form</th></tr> <tr> <td>Blank</td><td>Straight</td></tr> <tr> <td>B</td><td>Crimped lead</td></tr> <tr> <td>Z</td><td>Cut lead</td></tr> <tr> <td>3</td><td>Crimped taping (Ammo)</td></tr> <tr> <td>6</td><td>Crimped taping (Ammo)</td></tr> </table>		Suffix	Lead Form	Blank	Straight	B	Crimped lead	Z	Cut lead	3	Crimped taping (Ammo)	6	Crimped taping (Ammo)
1	100 VDC	10	1000 VDC																																								
2	250 VDC	12	1250 VDC																																								
4	400 VDC	1A	125 VAC																																								
6	630 VDC	2A	250 VAC																																								
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6	Crimped taping (Ammo)																																										

● Explanation of Part Number for Odd Size Taping

1	2	3	4	5	6	7	8	9	10	11	12	
E	C	Q	E							R		F
Product code		Dielectric & construction		Rated volt.		Capacitance			Suffix	Cap. Tol.	Suffix	

■ Specifications

Category temp. range (Including temperature-rise on unit surface)	100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 125 VAC, 250 VAC	-40 °C to +105 °C -40 °C to +105 °C
Rated voltage	100 VDC, 250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1250 VDC, (Derating of rated voltage by 1.25 %/°C at more than 85 °C) 125 VAC, 250 VAC	
Capacitance range	0.0010 μF to 10 μF (E12)	
Capacitance tolerance	±5 % (J), ±10 % (K)	
Dissipation factor (tanδ)	tanδ ≤ 1.0 % (20 °C, 1 kHz)	
Withstand voltage	<ul style="list-style-type: none"> ● Rated volt. 100 V to 630 VDC Between terminals : Rated volt.(VDC)×150 % 60 s 	
	<ul style="list-style-type: none"> ● Rated volt. 1000 VDC, 1250 VDC Between terminals : Rated volt. (VDC)×175 % 2 s to 5 s or 1000 VAC 60 s Between terminals to enclosure : 1500 VAC 60 s 	
	<ul style="list-style-type: none"> ● Rated volt. 125 VAC, 250 VAC Between terminals : Rated volt.(VAC)×230 % 60 s Between terminals to enclosure : 1500 VAC 60 s 	
Insulation resistance (IR)	100 V to 630 VDC:	C ≤ 0.33 μF : IR ≥ 9000 MΩ (20 °C, 100 VDC, 60 s) C > 0.33 μF : IR ≥ 3000 MΩ · μF
	1000 VDC, 1250 VDC:	IR ≥ 10000 MΩ (20 °C, 100 VDC, 60 s) IR ≥ 2000 MΩ (20 °C, 500 VDC, 60 s)
	125 VAC, 250 VAC:	C ≤ 0.47 μF : IR ≥ 2000 MΩ (20 °C, 500 VDC, 60 s) C > 0.47 μF : IR ≥ 3000 MΩ · μF (20 °C, 100 VDC, 60 s)

* In case of applying voltage in alternating current (50 Hz or 60 Hz sine wave) to a capacitor with DC rated voltage, please refer to the page of "Permissible voltage (R.M.S) in alternating current corresponding to DC rated voltage".

* Voltage to be applied to ECQE1A (F) & ECQE2A (F) is only sine wave (50 Hz or 60 Hz).

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use. Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.