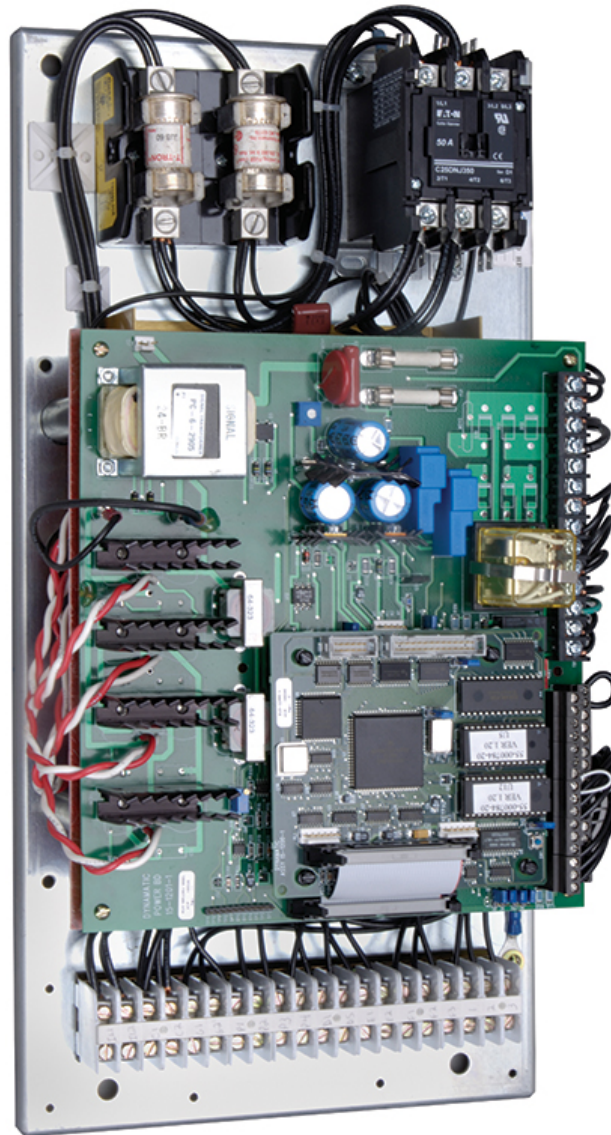


Ajusto-Spede® Controllers

EC-2000 HIGH POWER CONTROLLERS



Description

The EC-2000 power control board has been designed to allow the use of off-board power conversion assemblies for other output voltages and current ratings. A complete open sub panel design, based on the standard Mark-III base, has been assembled into a compact basic controller that can be used for applications requiring output currents of up to 32-amperes at voltages of 50-, 100-, or 200-volts. These standard panels may also be supplied in NEMA enclosures, or used as a basis for special engineered applications. These assemblies may be used as direct replacements for many standard and pre-engineered Mark-III and 4-58 controllers. Special high voltage, low current units are also available for replacement of the old V3A4, MA-440 and Louis Allis MD-9S controllers, permitting operation with coils rated to 220-volts at 2-amperes.

revised 4/12/2018

Ajusto-Spede[®] Controllers

STANDARD EC-2000 CONTROL FUNCTIONS

The control features provided in the standard EC-2000 8-amp version are also available in the high power series. These include:

- Speed – Torque Mode Select
- Manual – Automatic Signal Follower
- Local – Remote Operation
- Separately Adjustable Jog Input
- Two Channel Analog Signal Output
- Programmable Control parameters
- Manual Reference Potentiometer
- Digital Reference from Local Keypad
- Preset Control References
- Torque Limit Motor Protection
- Two Channel Meter Functions
- Password Security Protection

Ajusto-Spede[®] Controllers

STANDARD CONFIGURATIONS

1000-SERIES STANDARD OPEN PANEL SUB ASSEMBLIES

The EC-2000-HP control panels listed above are configured as open sub panel assemblies. The base panel measures 18.50-inches high by 9.38-inches wide by 6.12-inches deep, and is physically interchangeable with the Mark-III size 1, 2, 5, and 6 controllers. The basic 32-amp control units are jumper programmable for maximum output current ratings of 32-, 24-, and 16-amperes, while the 8-amp units may be jumpered for 8-, 5.5-, and 4-amperes maximum output current, expanding the list to fifteen standard sub panel controllers.

2000-SERIES AUGMENTED OPEN PANEL ASSEMBLIES

The standard sub panel controller may be mounted on the large Mark-III panel with an isolation step down transformer and a customer terminal block. This panel measures 23.00-inches high by 22.00-inches wide and is physically interchangeable with the Mark-III size 3, 4, 7, and 8 controllers. These assemblies are limited to controllers with ratings of 4-kva or less.

3000-SERIES NEMA-12 ENCLOSED ASSEMBLIES WITHOUT TRANSFORMERS

All standard sub panel controllers may be mounted in a NEMA-12 enclosure. All enclosed units are shipped complete with a door mounted, gasketed keypad/display unit. This 3000-series assembly does not include any step down or isolation transformer.

4000-SERIES NEMA-12 ENCLOSED ASSEMBLIES WITH TRANSFORMERS

All standard sub panel units may be mounted in a NEMA-12 enclosure, complete with a door mounted, gasketed keypad/display unit, and a properly sized step down isolation transformer. Smaller transformers are panel mounted. Transformers above 4-kva are mounted on the enclosure floor. Larger enclosures may be fitted with floor mounting kits.

5000-SERIES SPECIAL ENGINEERED ASSEMBLIES

Controllers for application-specific functions, or those requiring modifications to the standard features, are specified by adding an "E" prefix to the standard catalog number, along with a description of the required control functions. Part numbers indicating a 5000-series engineered controller will be assigned by our engineering department.

ORDERING CURRENT TRANSFORMERS AND STEP-DOWN TRANSFORMERS

Current transformers and step-down power transformers must be specified and purchased as separate line items when specifying a 1000-series or 3000-series control assembly. A step-down isolation transformer is included as part of a standard 2000-series open panel assembly, 4000-series NEMA-12 enclosed assembly, or 5000-series engineered package when the transformer is part of the specification. The cost of the included step down transformer is included in the selling price of the controller. However, the current transformer must be specified and purchased as a separate line item, specifying the motor current rating.

Ajusto-Spede® Controllers

STANDARD CONTROL ASSEMBLIES

FULL WAVE BRIDGE CONFIGURATION

These complete controllers provide for the most economical solution by connecting directly to 120-VAC or 240-VAC power mains without the use of transformers. **The 50-VDC controller is not available in the bridge configuration.**

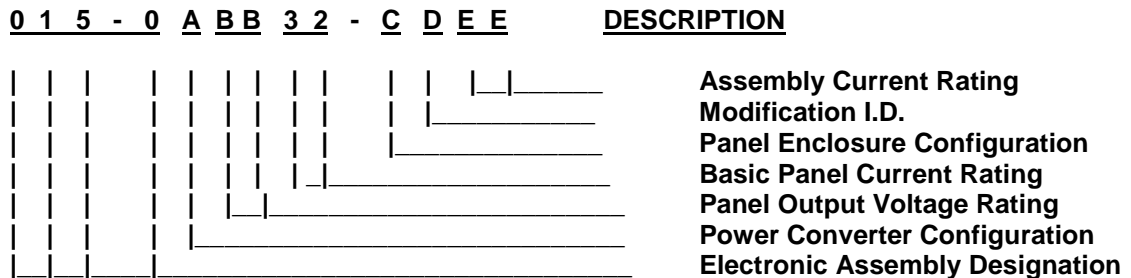
<u>BASIC PANEL</u>	<u>VOLTS IN</u>	<u>VOLTS OUT</u>	<u>AMPS OUT</u>
EC-42008-1000	240 VAC	200 VDC	4, 5.5, 8 ADC
EC-41032-1000	120 VAC	100 VDC	16, 24, 32 ADC
EC-42032-1000	240 VAC	200 VDC	16, 24, 32 ADC

FULL WAVE CENTER-TAPPED CONFIGURATION

These controllers require the use of a center-tapped transformer and feature the same power conversion scheme as the original Mark-III. The transformer provides step down and complete isolation from the high line mains, allowing the power assembly to be grounded.

<u>BASIC PANEL</u>	<u>VOLTS IN</u>	<u>VOLTS OUT</u>	<u>AMPS OUT</u>
EC-20532-1000	120 V CT	50 VDC	16, 24, 32 ADC
EC-21032-1000	240 V CT	100 VDC	16, 24, 32 ADC

EC-2000-HP Part Number Structure



A: Number of controlled SCR's: "2" indicates Center-Tap configuration, "4" is Bridge configuration

B: "05" = 50-VDC, "10" = 100-VDC, "20" = 200-VDC

C: "1" = Standard Mark-III type open sub panel assembly
 "2" = Standard sub panel assembly mounted on Large Mark-III panel with Transformer and Terminal Block
 "3" = Standard sub panel assembly mounted in NEMA-12 Enclosure WITHOUT Transformer
 "4" = Standard sub panel assembly mounted in NEMA-12 Enclosure WITH Transformer
 "5" = Special Engineered assembly per specification

D: "0" = Standard universal configuration

E: "16" = 16-amps, "24" = 24-amps, "32" = 32-amps

revised 4/12/2018

Ajusto-Spede[®] Controllers

STANDARD CONTROLLER ENGINEERING INFORMATION

PREFERRED CONFIGURATIONS:	50-VDC Output:	EC-20532-1000
	100-VDC Output:	EC-41032-1000
	200-VDC Output:	EC-42008-1000
		EC-42032-1000

NEMA-12 ENCLOSURE SIZES & TRANSFORMERS

FULL WAVE BRIDGE CONFIGURATION

<u>BASIC PANEL</u>	<u>PANEL P/N</u>	<u>DCV OUT</u>	<u>DCA OUT</u>	<u>ENCLOSURE SIZE AND (TRANSFORMER)</u>		
EC-41032-1000	015-041032-1016	100-VDC	16-ADC	1 None	3	64-429
EC-41032-1000	015-041032-1024	100-VDC	24-ADC	2 None	4	64-401
EC-41032-1000	015-041032-1032	100-VDC	32-ADC	3 None	*	64-402
EC-42008-1000	015-042008-1004	200-VDC	4-ADC	1 None	2	64-362
EC-42008-1000	015-042008-1006	200-VDC	5.5-ADC	1 None	3	64-428
EC-42008-1000	015-042008-1008	200-VDC	8-ADC	1 None	3	64-428
EC-42032-1000	015-042032-1016	200-VDC	16-ADC	2 None	*	64-431
EC-42032-1000	015-042032-1024	200-VDC	24-ADC	3 None	*	(2) 64-401
EC-42032-1000	015-042032-1032	200-VDC	32-ADC	3 None	*	(2) 64-402

FULL WAVE CENTER-TAPPED CONFIGURATION

<u>BASIC PANEL</u>	<u>PANEL P/N</u>	<u>DCV OUT</u>	<u>DCA OUT</u>	<u>ENCLOSURE SIZE AND (TRANSFORMER)</u>		
EC-20532-1000	015-020532-1016	50-VDC	16-ADC	1 (None)	2	64-429
EC-20532-1000	015-020532-1024	50-VDC	24-ADC	1 (None)	3	64-430
EC-20532-1000	015-020532-1032	50-VDC	32-ADC	1 (None)	4	64-401
EC-21032-1000	015-021032-1016	100-VDC	16-ADC	1 (None)	3	64-431
EC-21032-1000	015-021032-1024	100-VDC	24-ADC	1 (None)	4	64-431
EC-21032-1000	015-021032-1032	100-VDC	32-ADC	2 (None)	*	64-432

<u>ENCL. SIZE</u>	<u>AREA (SQ.IN.)</u>	<u>SIZE (H-W-D)</u>	<u>DSI PART NO.</u>
1	1840	24x20x10	31-672
2	2304	24x24x12	31-662
3	3744	36x30x12	31-630
4	6144	48x36x16	31-647

* Consult factory for alternate cooling options

Ajusto-Speede[®] Controllers

STANDARD CURRENT TRANSFORMERS FOR USE WITH THE EC-2000 AND EC-2000-HP

Drive Source International, Inc. offers four standard motor current transformer assemblies for use with the EC-2000 and EC-2000-HP controllers for motors with full load current ratings to 500-amperes. These current transformers may also be used with the 4000/4050 and DSI-700 controllers.

<u>Current Transformer p/n</u>	<u>Motor FLA</u>
015-000203-0003	0 to 70 amps
015-000203-0125	60 to 125 amps
015-000203-0250	125 to 250 amps
015-000203-0500	250 to 500 amps

The motor full load current rating is necessary to order the proper current transformer. The actual motor full load amps (FLA) may be obtained from the motor name plate. If this information is not available, enter the "TYPICAL MOTOR FULL LOAD CURRENT" table below with the motor horsepower rating and line voltage to determine the typical motor current .

Specify actual line voltage and motor HP when ordering. (Example: 230V or 460V, not 230/460V)

Typical Motor Full Load Current

3 Phase AC Induction Type – Squirrel Cage and Wound Rotor				
HP	200V	230V	460V	575V
½	2.3	2	1	0.8
¾	3.2	2.8	1.4	1.1
1	4.15	3.6	1.8	1.4
1½	6	5.2	2.6	2.1
2	7.8	6.8	3.4	2.7
3	11	9.6	4.8	3.9
5	17.5	15.2	7.6	6.1
7½	25	22	11	9
10	32	28	14	11
15	48	42	21	17
20	62	54	27	22
25	78	68	34	27
30	92	80	40	32
40	120	104	52	41
50	150	130	65	52
60	177	154	77	62
75	221	192	96	77
100	285	248	124	99
125	358	312	156	125
150	415	360	180	144
200	550	480	240	192

revised 4/12/2018

Ajusto-Spede[®] Controllers

EC2000 High Power Pump Controller Selection Table

Full Wave Center Tapped Configuration				
Rating	Model	Part #	Enclosure	XFMR #
50VDC 16A	EC-20532-1000	015-020532-1016	Chassis	64-429
50VDC 24A	EC-20532-1000	015-020532-1024	Chassis	64-430
50VDC 32A	EC-20532-1000	015-020532-1032	Chassis	64-401
100VDC 16A	EC-21032-1000	015-021032-1016	Chassis	64-431
100VDC 24A	EC-21032-1000	015-021032-1024	Chassis	64-431
100VDC 32A	EC-21032-1000	015-021032-1032	Chassis	64-432

Full Wave Bridge Configuration				
100VDC 16A	EC-41032-1000	015-041032-1016	Chassis	64-429
100VDC 24A	EC-41032-1000	015-041032-1024	Chassis	64-401
100VDC 32A	EC-41032-1000	015-041032-1032	Chassis	64-402
200VDC 4A	EC-42008-1000	015-042008-1004	Chassis	64-362
200VDC 5.5A	EC-42008-1000	015-042008-1006	Chassis	64-428
200VDC 8.0A	EC-42008-1000	015-042008-1008	Chassis	64-428
200VDC 16A	EC-42032-1000	015-042032-1016	Chassis	64-431
200VDC 24A	EC-42032-1000	015-042032-1024	Chassis	(2) 64-401
200VDC 32A	EC-42032-1000	015-042032-1032	Chassis	(2) 64-402

Keypad			
Keypad Kit with cable & Mounting Hardware	037-000544-0100	NEMA 4	

Current Transformers For EC-2000-HP & EC-2000			
0 to 70 Amp		015-000203-0003	Open
60 to 125 Amp		015-000203-0125	Open
125 to 250 Amp		015-000203-0250	Open
250 to 500 Amp		015-000203-0500	Open



DRIVE SOURCE INTERNATIONAL, INC.

1-800-548-2169

www.dynamatic.com

World's leading manufacturer of Eddy Current drives, brakes and controls

7900 Durand Avenue, Bldg. 3
Sturtevant, Wisconsin, U.S.A. 53177
Tel: 262-554-7977 Fax: 262-554-7041
Toll Free: 1-800-548-2169
E-Mail: sales@dynamatic.com

DSI - STANDARD TERMS AND CONDITIONS OF SALE

1. PRICE BOOKS

Price books are intended only as sources of general information. They are not to be construed as quotations or as representations that products described therein are available, or will be made available for immediate delivery.

2. QUOTATIONS

Seller may make quotations verbally or in writing. Verbal quotations shall expire automatically unless Seller receives Buyer's purchase order number on the day the quotation is made. Written quotations shall expire automatically unless Seller receives Buyer's written purchase order within 15 days after the date appearing on the quotation. No quotation is to operate as an offer to sell but only as a description of products. Accordingly, even prior to its expiration date, any quotation is subject to change by Seller at any time upon verbal or written notice to Buyer. All quotations are deemed to incorporate Seller's Standard Terms and Conditions of Sale.

3. ACCEPTANCE OF PURCHASE ORDERS.

Notwithstanding any contrary language contained in Buyer's purchase order, each purchase order shall be subject to acceptance by an authorized employee of Seller's plant, and each purchase and sale transaction shall be governed exclusively by these Standard Terms and Conditions of Sale. Seller reserves the right at any time before delivery and payment to correct clerical, stenographic or other errors in quotations, purchase orders or acknowledgments.

4. PRICE POLICY

Regardless of prices set forth in quotations, acknowledgments or elsewhere, Buyer shall pay a purchase price as follows:

- (a) For the following products: Fractional Horsepower Ajusto-Spede®, AC Motors, renewal parts and service, Buyer shall pay Seller's published prices in effect on the date when shipment is made or service performed.
- (b) For all other products, Buyer shall pay a purchase price equal to the smaller of: (a) Seller's published prices in effect on the date when shipment is made or (b) the prices set forth in Seller's acknowledgment increased by 1% for each month or fraction thereof that elapses between the date when the acknowledgment is mailed from Seller's factory to Buyer (designated as the "Issue Date" on the acknowledgment) and the date when shipment is made or the date for which shipment was originally scheduled (as stated on the acknowledgment) by Seller, whichever occurs sooner. However, in the event that shipment is originally scheduled to occur in excess of 12 months after Issue Date, Buyer shall pay Seller's published prices in effect on the date when shipment is made; and in any case where shipment is delayed beyond Seller's originally scheduled date for shipment by Buyer's actions or at Buyer's request,

Buyer shall pay escalation charges based on the revised delivery schedule.

5. MINIMUM BILLING

The minimum billing for each purchase order shall be \$100.00 net.

6. TAXES

Any and all sales, use, personal property or other excise taxes which the Seller may be required to pay or collect, including first destination taxes, will be added to each invoice and shall be payable by Buyer on the same terms as the purchase price unless the Buyer has furnished the Seller a tax exemption certificate acceptable to the taxing authority.

7. PAYMENT TERMS

Payment terms shall be net 30 days except for International orders, which will be cash in advance. However, on orders of \$100,000.00 or more and having delivery schedule 6 months or longer from date of order, the payment terms shall be as specified by Seller at time of quotation.

8. SHIPPING TERMS

Except as otherwise agreed, Seller shall be entitled to select carrier and make delivery in more than one shipment, in which event Buyer shall pay separately for each partial shipment.

All shipments shall be made F.O.B. point of shipment. Seller shall prepay freight (UPS shipments only), which shall be billed to Buyer as a separate item on the product invoice at Seller's standard rates applicable to the destination, or at Buyer's option, shipment shall be made freight collect. All truck shipments shall be made freight collect, unless otherwise agreed.

9. PACKAGING

At no additional charge, all products shall be packaged for domestic shipment in accordance with Seller's standard specifications. Additional charge shall be made if Buyer specifies special domestic packaging, packaging in accordance with government or military standards, overseas packaging or other special packaging. Refer to Seller's plant, nearest sales office or representative for further information.

10. TITLE AND RISK OF LOSS

Risk of loss in transit shall be borne entirely by Buyer at all times after the products are delivered to the carrier for shipment. However, title to the products and right to stop delivery in transit shall remain with Seller until Seller receives payment in full.

11. DELAYS OR DEFAULT IN DELIVERY

Seller shall have no liability to Buyer, and Buyer shall not be entitled to cancel any purchase order, for Seller's delay or default in delivery due to strikes, secondary boycotts, riots,

wars, accidents, fires, floods, explosions, vandalism, government embargoes, priorities or regulations, shortages of labor, fuel, materials, supplies, power or transportation facilities, or other similar or dissimilar causes beyond Seller's reasonable control. Under no circumstances shall Seller have any liability for penalties or consequential damages of any kind resulting in whole or in part from Seller's delay in delivering, or failure to deliver, any products ordered by Buyer.

12. CHANGES TO ORDERS IN PROCESS

There shall be a charge for any and all changes in specification after an order is in process, based on the status of the order at the time the change is made. The additional charge shall be a minimum of \$50 net per item when engineering has not been started or is not required and a minimum of \$100 net per item when re-engineering is required. The additional charge shall be in addition to any change in the price of the product resulting from the change in specification. The order "Issue Date" will be moved forward to the date of the change and shipment will be rescheduled in accordance with the then current lead times. Buyer shall pay escalation charges based on the new "Issue Date" and scheduled shipping date as defined in paragraph B.

13. CANCELLATION

After Seller accepts Buyer's purchase order by faxing Seller's written acknowledgment, Buyer's cancellation of any order or portion thereof may be accomplished only upon (i) Seller's receipt of written cancellation notice at Seller's plant (cancellation notice by telephone will be deemed only as authorization for Seller temporarily to suspend performance on Buyer's order pending written confirmation of cancellation) and ii) Buyer's payment of the following cancellation charges:

Notwithstanding anything to the contrary contained herein, the minimum cancellation charges for products shall be 50% per line item or 50% per complete order.

With respect to all costs and expenses described above, Seller shall provide such substantiating documentation as Buyer may reasonably request, and Seller's computations, thus documented, and shall be conclusive and binding between the parties. With respect to all canceled products, materials and supplies described above, Seller shall, upon payment of the applicable cancellation charges, make such disposition as Buyer may specify in writing within 30 calendar days after Seller notifies Buyer of the applicable cancellation charges. Buyer's failure to so specify within said 30-day period shall constitute Buyer's authorization for Seller to make such disposition as Seller chooses with no further obligation to Buyer.

14. PATENT INFRINGEMENT

With respect to all products manufactured to Buyer's design, Buyer shall indemnify and hold Seller harmless from and against any and all loss, cost, expense, claims, demands, suits and judgments resulting from actual or alleged patent infringements. With respect to all other products sold by Seller, Seller shall defend any suit or proceeding brought against Buyer on a claim that such a product, or any part thereof when employed in the manner intended by Seller, infringes any U.S. patent, provided that Seller is notified promptly in writing and given all necessary information, assistance and authority to defend same. Seller shall pay all damages and costs awarded against Buyer as a result thereof. If the court finds such an infringement, and the use

of any product, in the manner intended by Seller is enjoined, Seller shall at its sole expense, at Buyer's option (a) procure for Buyer the right to continue using said product, (b) replace said product with a non-infringing product, (c) modify said product so that it becomes non-infringing or (d) remove said product and refund its purchase price and transportation and installation costs. Seller shall have no further liability for actual or alleged patent infringement except as provided herein.

15. PRODUCT WARRANTY AND DISCLAIMER

Seller warrants to Buyer, subject to the limitations, conditions and disclaimers stated herein, that all new products manufactured by Seller shall be free from defect in material and workmanship and shall deliver their rated output as indicated on the nameplates for a period of one (1) year from the date of shipment to the Buyer. Buyer must notify Seller in writing of defect or failure to deliver rated output within the applicable warranty period and give Seller the opportunity to determine that the defect or failure exists. Buyer shall, at Buyer's expense, make each allegedly defective product available for Seller's inspection at Buyer's place of business or, at Seller's option, return each such product to Sellers plant or service center as designated by Seller, freight both ways to be paid by Buyer. No products shall be returned to Seller's plant or service center except in accordance with Seller's prior written instructions. Determination of any defect is made at Seller's sole discretion and Seller's decision is final. To remedy any defect, the Seller may at its option, repair, rebuild or replace the defective component or complete product, using new or re-manufactured components or complete product. In any case the repaired, rebuilt or replaced product shall be warranted hereunder for the then non-expired portion of the original warranty period. Seller's sole obligation to Buyer, and Buyer's sole remedy against Seller, for any breach of this warranty shall be Seller's obligation to repair or replace the product as provided herein or, at Seller's option, to repay, upon return of the defective product, the price paid for such product by Buyer.

Any tampering, misuse, mis-application, and/or improper installation of the product by Buyer or Buyer's representatives may void warranty. Additionally, any service/repair work performed by any personnel not pre-authorized by Seller to perform the service/repair work will void warranty. Products sold by Seller, but not manufactured by Seller, shall be warranted as to defects in material and workmanship consistent with the warranty policy of the original manufacturer of the products. In no event shall Seller have any liability for incidental or consequential damages of any kind resulting from a breach of this warranty. THIS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY FOR MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

16. RETURNS

No products shall be returned to Seller, whether for inspection, repair, replacement or any other reason, without prior written consent from Seller's plant, sales office or representative

Revised April 12, 2018