

Apollo Engineering Company

Straightening Vanes for Gas, Liquid and Steam

Flow conditioning for

Turbine Meters

Orifice Meters

Pump Suctions

and other applications

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Apollo Engineering Company

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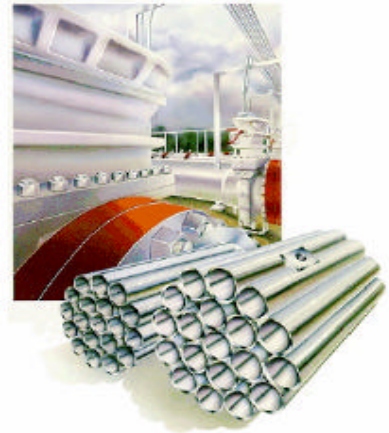
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Straightening Vanes for Gas, Liquid and Steam

*Flow conditioning for
Turbine Meters
Orifice Meters
Pump Suctions
and other applications*

Apollo Straightening Vanes are typically installed in piping in meter runs and piping systems to minimize flow disturbances in meters, pump suctions and other applications. Flow eddies, rotation swirls and other undesirable flow patterns are attenuated and minimized as the flow passes through the relatively small tubes of the vane. In addition to providing the correct inlet velocity profile, flow conditioning allows upstream piping lengths to be minimized thus saving space and reducing costs .



Apollo Straightening Vanes are available as Pin Type or Flange Type in carbon steel, stainless steel or other materials as required. They comply with the requirements of AGA, ASME and other trade group standards.

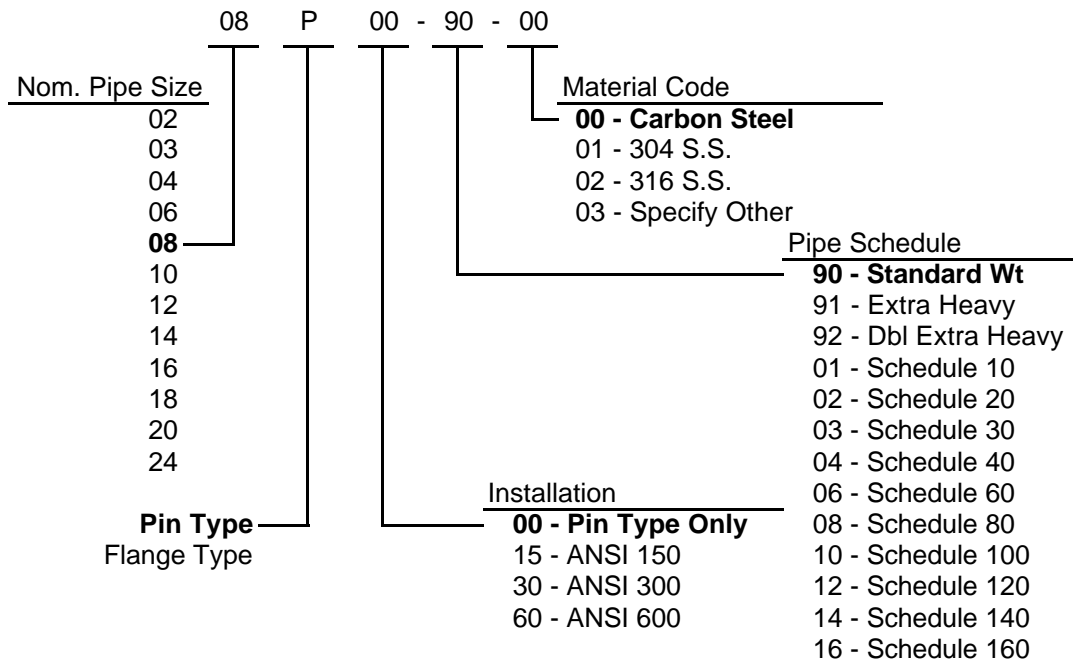
Contact your **Authorized Apollo Sales Representative** for all the details.

Example, How to Specify Apollo Model No.

8" Pin Type Carbon Steel Straightening Vane To Fit Standard Weight Pipe

Model No.

16P00-90-00



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Straightening Vane Data

Line Size (inches)	Bundle Type	Line I.D. (inches)	Length A-Dim. (inches)	Vane O.D. B-Dim. (inches)	Tube O.D. (inches)	Tube W.T. (inches)	Number of Tubes	Set Screws No. & Size	Weight Approx. (lbs)
2	7A	2.067	6	1-31/32	21/32	0.095	7	1--1/2 x 1 1/2	2 1/2
3	19A	3.068	8	2-7/8	19/32	0.049	7	1--1/2 x 1 1/2	4
4	19A	4.026	10	3-31/32	13/16	0.049	19	1--1/2 x 1 1/2	7 1/2
6	19B	6.065	12	5-15/16	1-3/16	0.049	19	1--1/2 x 1 1/2	20 1/2
8	19A	7.981	16	7-29/32	1-5/8	0.065	19	1--1/2 x 1 1/2	37
10	19B	10.020	20	9-3/4	2	0.083	19	1--1/2 x 1 1/2	57
12	19B	12.000	24	11-7/8	2-3/8	0.083	19	2--1/2 x 1 1/2	81
14	19A	13.250	28	13-1/8	2-5/8	0.083	19	2--1/2 x 1 1/2	105
16	19B	15.250	32	15	3	0.188	19	2--1/2 x 1 1/2	274
18	19A	17.250	36	17-1/32	3-1/2	0.188	19	2--1/2 x 1 1/2	386
20	19A	19.250	40	18-27/32	3-7/8	0.188	19	2--1/2 x 1 1/2	477
24	19A	23.250	48	25	4-3/4	0.188	19	2--1/2 x 1 1/2	704
30	19B	29.250	60	28-3/4	5-3/4	0.188	19	2--1/2 x 1 1/2	1295
36	19B	35.250	72	35	7	0.188	19	2--1/2 x 1 1/2	1582

Assembly Details for Flange Type Straightening Vanes

Assembly Details for Pin Type Straightening Vanes, Side View

Assembly Details for Pin Type Straightening Vanes, End View

When ordering Apollo Straightening Vanes, you must always specify the correct model number. It is very important to specify the pipe I.D.

Other materials, shapes and custom modifications are available. Consult your **Authorized Apollo Sales Representative** for details.

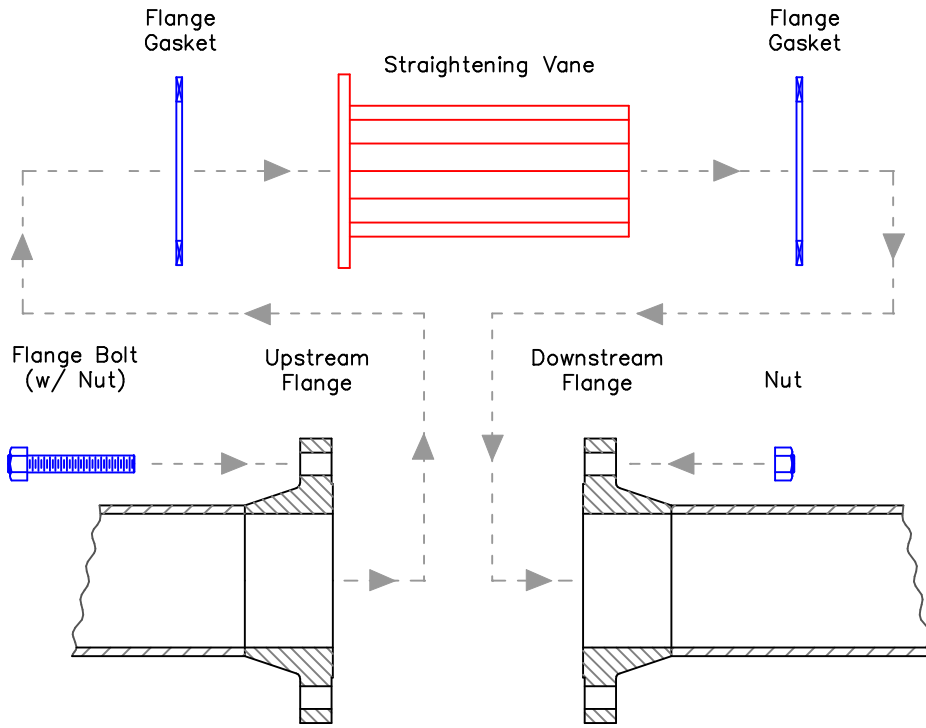
All specifications are subject to change without notice.

All sales are subject to the Apollo Limited Warranty and the Apollo RGA Policy.

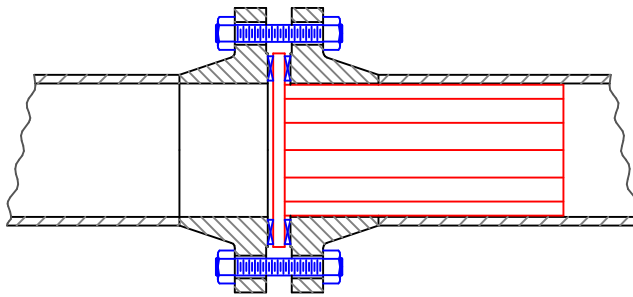
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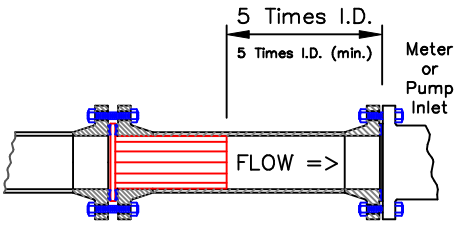
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EXPLODED VIEW



ASSEMBLY



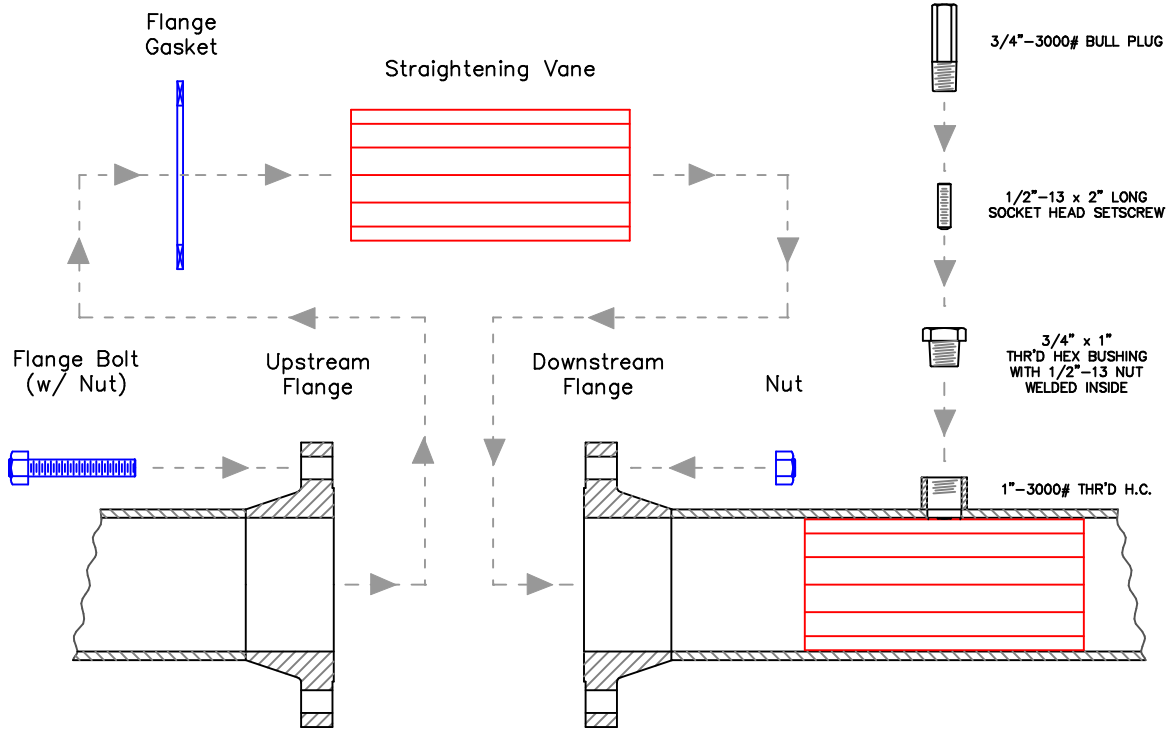
TYPICAL INSTALLATION

SEE APPLICABLE CODE FOR SPECIFIC REQUIREMENTS.

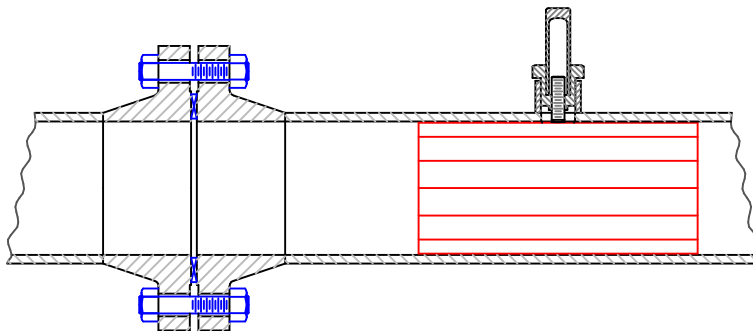
APOLLO ENGINEERING COMPANY
BROKEN ARROW, OKLAHOMA

ASSEMBLY DETAILS
FLANGED TYPE STRAIGHTENING VANES

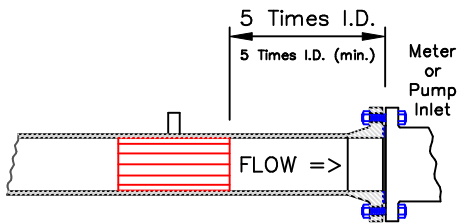
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FILE: VSPL-Flange-01.dwg	JOB No.		



EXPLODED VIEW



ASSEMBLY



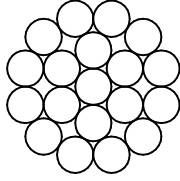
TYPICAL INSTALLATION

SEE APPLICABLE CODE FOR SPECIFIC REQUIREMENTS.

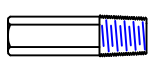
APOLLO ENGINEERING COMPANY
BROKEN ARROW, OKLAHOMA

ASSEMBLY DETAILS
PIN TYPE STRAIGHTENING VANES

DWG No.	DRAWN BY: DATE:	APP'D BY: DATE:	REVISION No. DATE:
FILE: VSPL-Pin-01.dwg	JOB No.		



7A
19A
TUBE ARRANGEMENTS AS APPLICABLE



3/4" - 3000# BULL PLUG



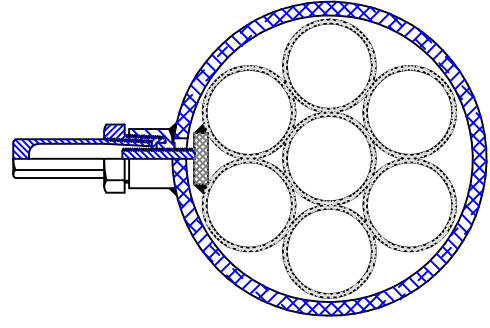
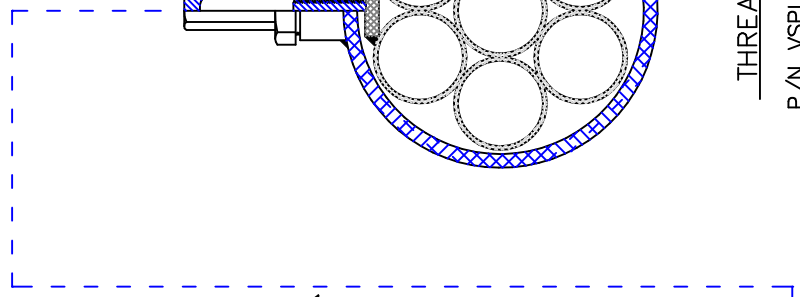
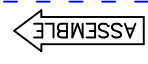
3/4" x 1" THRD HEX BUSHING



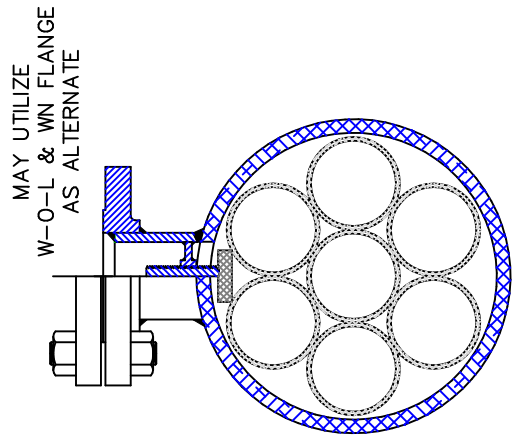
1/2" - 13 x 2" LONG SOCKET HEAD SETSCREW



1" - 3000# THRD H.C. WITH 1/2" - 13 NUT WELDED INSIDE



THREADED
P/N VSPL-PIN-T



FLANGED
P/N VSPL-PIN-F

MAY UTILIZE W-O-L & WN FLANGE AS ALTERNATE

TYPICAL SECTION

EXPLODED VIEW OF PARTS

INSTALLATION INSTRUCTIONS

1. DRILL 9/16" DIAMETER HOLE IN PIPE.
2. WELD HALF COUPLING (or NUT & NOZZLE) TO PIPE.
3. ASSEMBLE AS SHOWN.

APOLLO ENGINEERING COMPANY
BROKEN ARROW, OKLAHOMA

ASSEMBLY DETAILS
SETScrew FOR PIN TYPE STRAIGHTENING VANES

DWG No. VSPL-PIN.DWG	DRAWN BY: JAC	APPD BY:	REVISION No.
FILE: VSPL-PIN.DWG	DATE: 27 MAR 01	DATE:	DATE:
JOB No.			

Apollo Limited Warranty

LIMITED WARRANTY. All products sold by Apollo Engineering Company are sold for resale or use in business or original equipment manufacture and are warranted against defects in workmanship and material for a period of one (1) year from date of shipment from Apollo. Any merchandise which is returned to an Authorized Apollo Service Center and which is deemed defective by Apollo will be repaired or replaced by Apollo as the exclusive remedy to the warranty.

WARRANTY DISCLAIMER. Apollo has made diligent effort to illustrate and describe the products accurate. Such illustrations and descriptions are for the sole purpose of identification and do not express or imply a warranty that these products are MERCHANTABILITY or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. No warranty or affirmation of fact, express or implied, is made or authorized except as set forth in the aforesaid limited warranty statement. Apollo reserves the right to correct publishing errors.

LIMITATION OF LIABILITY. Apollo expressly disclaims any consequential and incidental damages. The liability of Apollo shall be limited to and not exceed the purchase price paid for the product(s).

PROMPT DISPOSITION. Within the warranty period, Apollo will make a prompt and good faith effort to correct or adjust any product covered by this limited warranty. A written Returned Goods Authorization (RGA) must be issued by Apollo prior to the return of any product(s). The limited warranty shall be entirely and retroactively voided to date and time of creation for products returned without a valid RGA. Title and risk of loss pass to the buyer upon delivery by Apollo to any common carrier, other contract carrier or any customer designated delivery system. Recipient shall be liable for all claims of damage while in transit.

PRODUCT SUITABILITY. Several state and municipal jurisdictions have codified laws and regulations governing the sales, construction and/or use of products for specific purposes. These laws and

regulations vary from jurisdiction to jurisdiction. While Apollo attempts to insure compliance with applicable codes, Apollo cannot guarantee compliance in every instance, it is therefore the responsibility of the purchaser that the installation and use of the product(s) comply with all federal, state and local laws and regulations.

NO WARRANTIES TO CONSUMERS. Apollo make no warranties to parties defined as consumers in the Magunuson-Moss Warranty - Federal Trade Commission Improvement Act.

MANUFACTURER'S WARRANTIES AND SALES LITERATURE. Most products are warranted to the consumer by the equipment manufacturer. Such warranties are supplied with the product or are available from the manufacturer. As a consumer service, Apollo will obtain consumer warranties from the warrantor and provide them free of charge to consumers that request them. Requests must include Apollo serial numbers and manufacturer's catalog numbers for each product. By performing this service, Apollo assumes no responsibility for the content of such warranties or sales literature.

CROSS REFERENCE INFORMATION.

Product cross-reference comparisons do not imply that all products are available or identical in form to other manufacturer's or , in the case of functional equivalency, that performance and other characteristics are identically comparable. Customer shall review all specifications prior to purchase.

OSHA HAZARDOUS SUBSTANCE PRODUCT INFORMATION.

Material Safety Data Sheets (MSDS) for OSHA defined hazardous substances are available through Apollo Engineering Company. The information and recommendations contained on the MSDS is considered to be accurate and reliable, however, Apollo makes no warranty with respect to the accuracy or reliability of the information or suitability of the recommendations. Apollo disclaims any and all liability to any user thereof.

Sales and Freight Terms

WHOLESALE ONLY

All products sold by Apollo are intended exclusively for resale or use in business or original equipment manufacture.

PRICES

Prices are subject to change without notice. Market sensitive products will be priced according to existing market conditions at time of sale.

QUOTATIONS

Quantity discounts and other special pricing arrangements may be available. Contact your Authorized Apollo Sales Representative for details.

FORCE MAJEURE

Apollo shall not be liable for any delay or impairment in performance resulting in whole or in part from Acts of God, labor disruptions, shortages, inability to procure product, material or supplies, severe weather conditions or any other circumstance or control of Apollo in the conduct of business.

CANCELLATION

Cancellation of all pending purchase orders is subject to prior written approval by Apollo and Any be subject to restocking and other charges.

SALES TAX

Apollo is required to collect state and local sales tax for all items for which a sales tax exemption certificate has not been supplied. When ordering, please clearly indicate which items are sales tax exempt.

PAYMENT TERMS

Payment terms are net thirty (30) days after shipment for established accounts except as negotiated for specific orders. Export orders will be subject to conditions specified by Apollo prior to sale. Apollo accepts MasterCard and Visa credit cards, cash, cashier's checks and wire transfer funds. All funds are in U.S. dollars.

PACKAGING

All products will be suitably packaged for domestic shipment in accordance with Apollo standard practice. Additional charges may be required packaging requirements outside the scope of Apollo standard practice.

FREIGHT POLICY

All shipments are f.o.b. point of origin unless specified otherwise. Any charges for additional services or handling, such as customer's carrier or special handling charges, shall be paid by consignee. Title and risk of loss pass to the customer upon tender of the shipment to the carrier. Customer shall be responsible for all claims of in transit damage.

Apollo Engineering Company
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Telephone: 918.251.6780 FAX: 918.251.5986

Return Goods Authorization Policy and Procedures

Effective July 22, 2003

ALL GOODS RETURNED TO APOLLO ENGINEERING MUST COMPLY WITH THE FOLLOWING RULES AND PROCEDURES. NONCOMPLIANCE WILL INVALIDATE AND MAKE VOID ALL PRIVILEGES OF CUSTOMER TO RETURN GOODS.

All returned goods shall be subject to a minimum restocking charge of twenty-five percent (25%) except that all welded products shall be subject to a minimum restocking charge of fifty percent (50%), depending on the type and condition of the goods being returned and the current Apollo Engineering policies in effect at the time of return. Apollo will evaluate each RGA incident based on the issues and circumstance of each specific incident. The actual restocking charge will then be determined based on this evaluation.

All goods manufactured to meet the specific requirements of the Customer shall be nonreturnable in their entirety.

Prior to return of goods, Customer shall complete a REQUEST FOR RETURN GOODS AUTHORIZATION (Apollo Form RGA-FORM.CDR). All information fields must be properly completed. It is important to note that this is a "request" and is not an actual authorization to return goods.

All requests for RGA must be implemented within forty-five (45) days of receipt of goods by Customer. After this time of prescription, all goods will be subject no return.

Apollo will then issue a RETURN GOODS AUTHORIZATION (Apollo Form RGA-PLCY.CDR) based on the information listed in the Customers REQUEST FOR RETURN GOODS AUTHORIZATION. Conditions and stipulations for the return of goods shall be governed exclusively by the RETURN GOODS AUTHORIZATION. All goods must be shipped to Apollo Engineering within 21 days of issuance of the Return Goods Authorization.

All return shipments must be freight prepaid by Customer. All goods must arrive at Apollo Engineering in a new and unused condition. Requisite refurbishing and repackaging costs will be for Customer's account.

Goods returned without a Return Authorization Number will not be accepted by Apollo Engineering and will be returned freight collect to the Customer.

Customer shall be liable for all reasonable incidental costs associated with refusal to take delivery and all other costs resultant from failure to follow each and every requirement of the RGA Policy.

All changes, exceptions, alterations, modifications or revisions to the provisions of this policy, except as granted with written approval of Apollo Engineering Company, are prohibited and are void in effect.

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