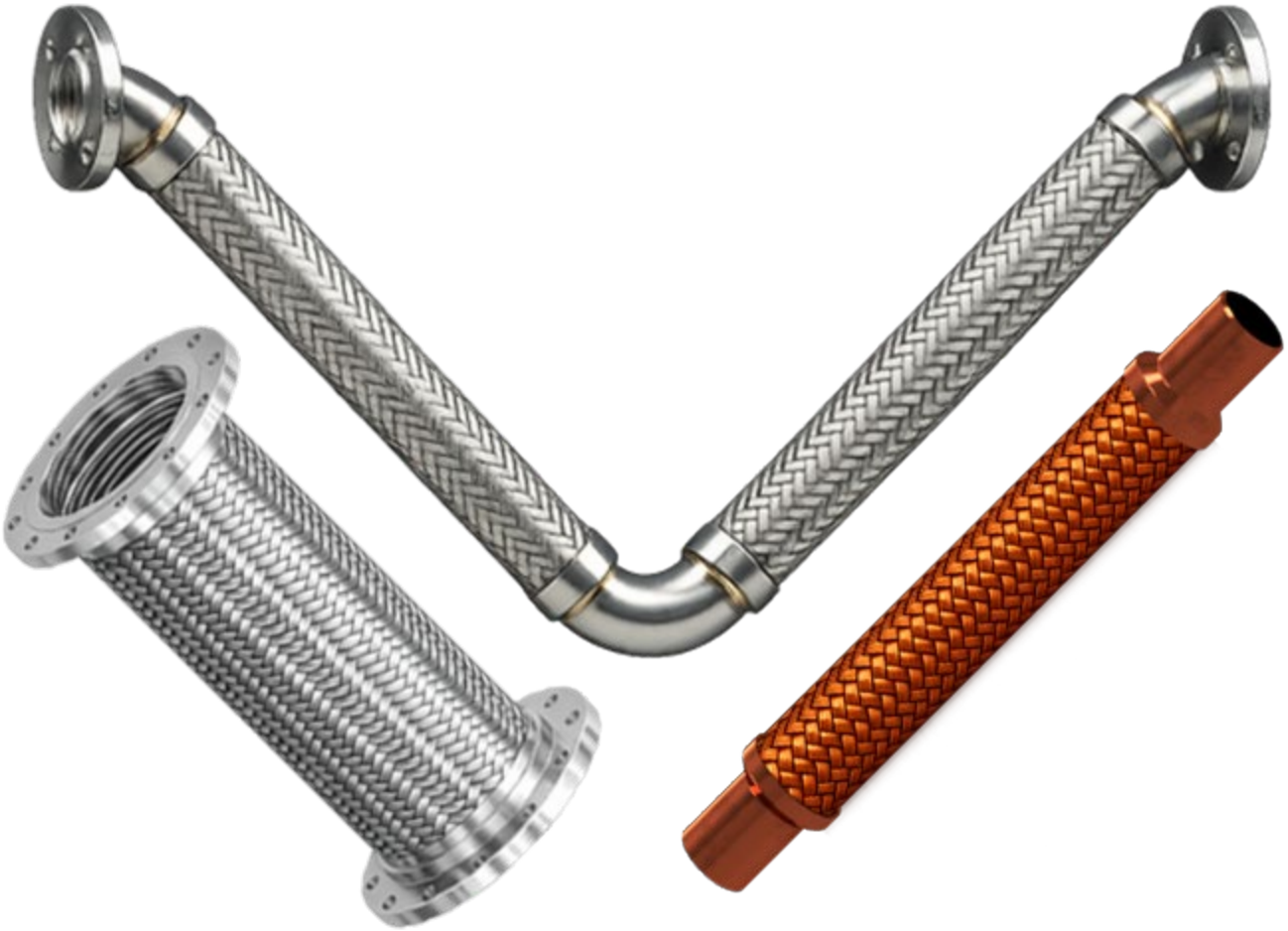
Hyspan

Engineered Motion. Proven Reliability.

Braided Metal Hose Assemblies

Hyspan Precision Products™
Product Catalog

Series 4500



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Hyspan

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Note: This catalog covers Hyspan Precision Products Series 4500 braided metal hose assemblies, including products manufactured by Universal Metal Hose (a Hyspan Group company). For metal bellows expansion joints, ball joints, slip joints, and specialty products, refer to the applicable Hyspan product catalogs.

Company Overview

Engineered Motion. Proven Reliability.

Hyspan Precision Products designs and manufactures metal expansion joints, flexible metal hose assemblies, and motion-control components for mission-critical piping and pressure systems worldwide. Founded in 1968 and headquartered in Chula Vista, California, Hyspan has built a 50+ year record of engineering quality and manufacturing capability across industrial, energy, defense, aerospace, and commercial markets.

As a member of the Expansion Joint Manufacturers Association (EJMA), Hyspan designs and manufactures in accordance with applicable ASME, military, and international codes and standards. Products are built to order in Hyspan's vertically integrated manufacturing facilities, with complete material traceability and documented inspection at every stage.

Core Capabilities

- All four expansion joint technologies
- Metal bellows expansion joints
- Flexible metal hose assemblies and braided connectors
- Ball joints and slip joints
- Venturis, VibraSnubbers, struts and pipe alignment guides
- Custom engineered assemblies — ¼" to 32 ft diameter, full vacuum to 5,000+ PSIG
- Exotic materials: Inconel 625, Hastelloy, Monel, Titanium, and others
- FEA/CFD analysis, fatigue life evaluation, seismic and vibration modeling

Certifications

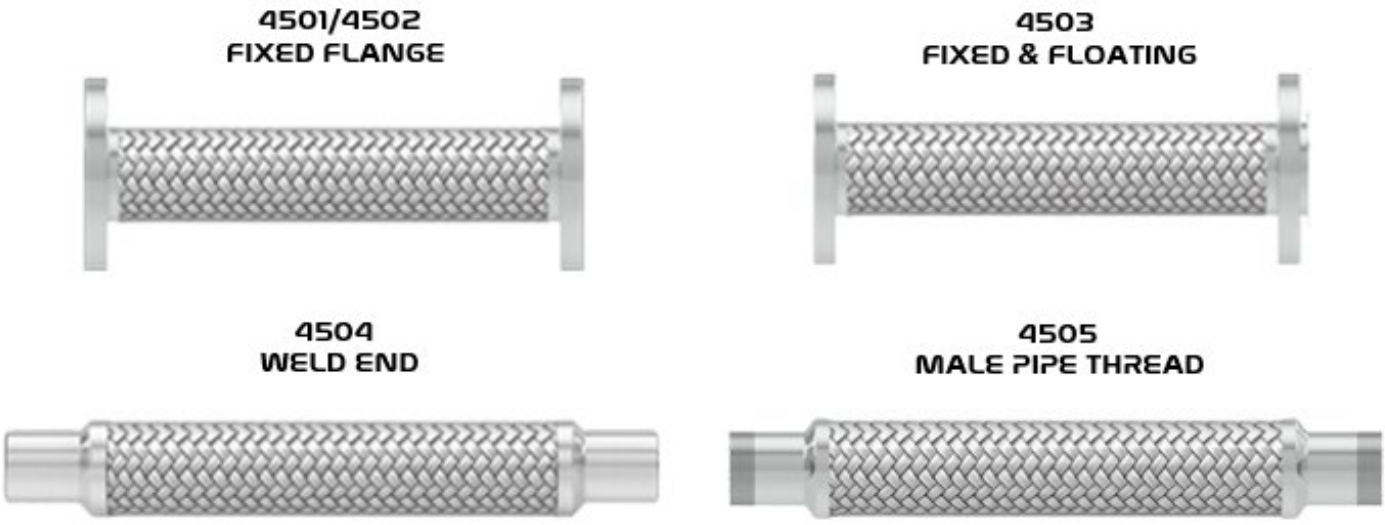
Markets Served

- Energy & Petrochemical — refineries, FCCU, piping systems
- Power & Utility — steam, hot water, district energy
- Defense & Maritime — NAVSEA-qualified, naval shipboard systems
- Aerospace — AS9100D certified, fatigue-rated precision bellows
- Advanced Technology & Development — UHV, R&D
- Commercial & Industrial — HVAC, mechanical rooms, building systems
- Automotive — OEM exhaust and flexible assembly manufacturing

For custom requirements, specification review, or application engineering support, contact Hyspan at websales@hyspan.com or +1 619.421.1355

Series 4500 – Metal Hose Pump Connectors

Hyspan Series 4500 Metal Hose Pump Connectors are manufactured by Universal Metal Hose, a Hyspan Group company.



Nominal Sizes	½" – 10" NPS
Working Pressure	150–300 PSIG (varies by size — see tables)
Design Temperature	500°F
Hose Construction	Type 321 S/S annular corrugated S/S hose with Type 304 S/S braid
End Connections	Fixed flange (4501/4502), fixed & floating flange (4503), weld end (4504), male pipe thread (4505)
Flange Standard	Carbon steel flat face plate flanges, OD and drilling per ASME B16.5
Fittings Standard	Carbon steel per ASME B16.9
Canadian Registration	CRN 0D9278.5
Warranty	Universal Metal Hose Limited Warranty — see Warranty section

Product Description

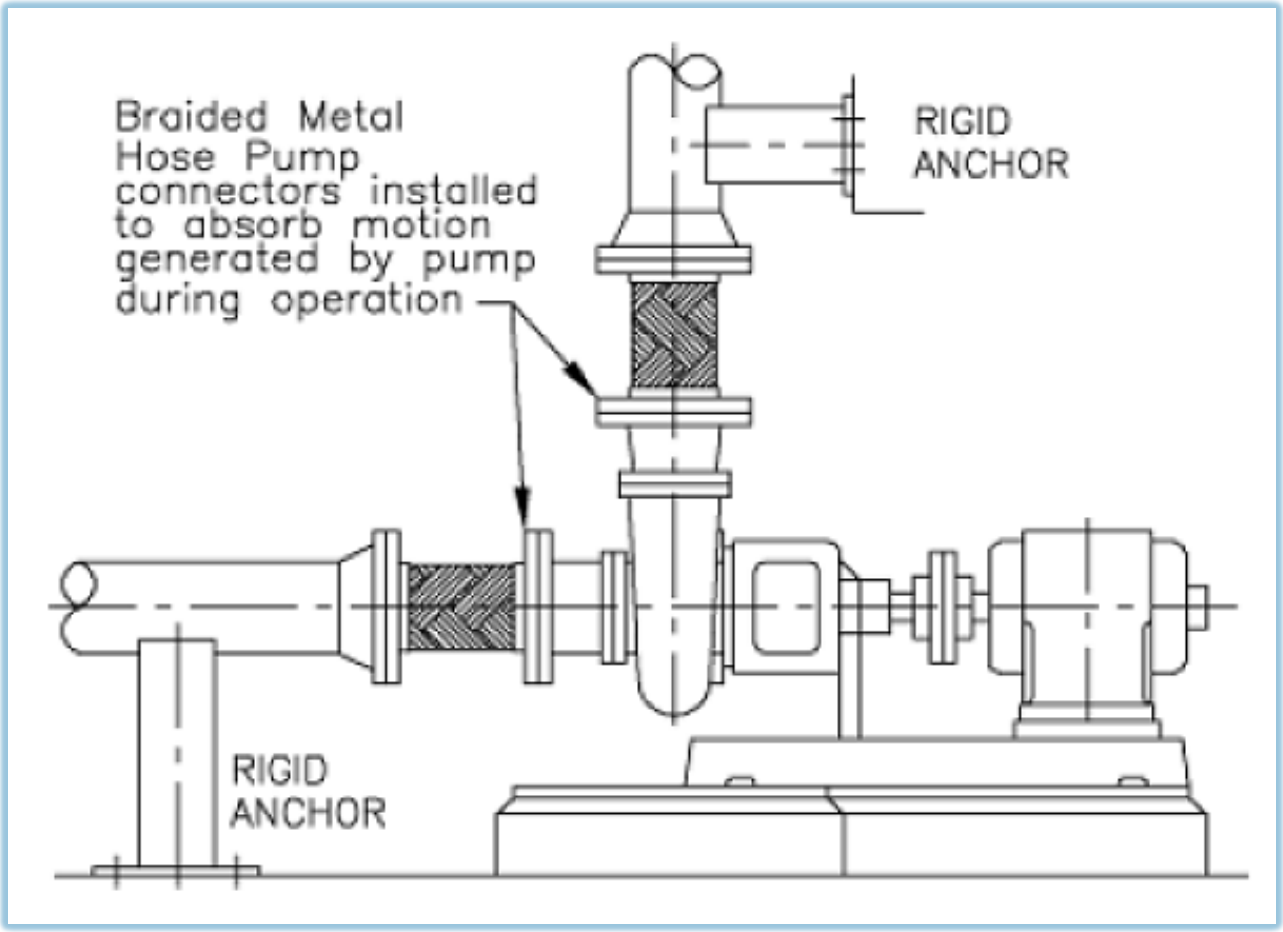
Series 4500 Metal Hose Pump Connectors are designed to be installed adjacent to mechanical equipment to isolate vibration, absorb small movements, and facilitate installation. The metal hose and braid are heavy-duty industrial-weight products rated for demanding industrial service.

These connectors are designed for installation on the suction and discharge connections of pumps, compressors, and other mechanical equipment. The flexible element accommodates multi-directional movement and vibration without imposing rigid constraints on connected equipment.

Applications

Series 4500 pump connectors are designed for installations where vibration isolation and movement absorption are required. The piping system must include rigid anchors adjacent to each connector. Refer to Series 9500 Alignment Guides catalog for guide spacing requirements.

- Pump suction and discharge connections
- Compressor and mechanical equipment connections
- Vibration-sensitive piping in industrial plants and HVAC systems
- Locations requiring small axial, lateral, or angular movements



Type 4501 Metal Hose Pump Connectors installed on the suction and discharge of a pump.

Series 4500 – Design Data Tables

Table 1 — Type 4501: Fixed Flange (2"–10" NPS)

Design Temperature: 500°F. Type 321 S/S annular corrugated metal hose with Type 304 S/S braid. Carbon steel flat face plate flanges, OD and drilling per ASME B16.5.

Part Number	Nominal Size (NPS)	Overall Length (in.)	Working Pressure (PSIG)	Approx. Weight (lbs.)
4501-031	2	9	300	14
4501-035	2½	10	300	17
4501-040	3	10	300	20
4501-048	4	11	250	29
4501-055	5	12	200	35
4501-060	6	12	175	44
4501-067	8	14	175	69
4501-074	10	14	150	108

Table 2 — Types 4502 (Fixed Flange) & 4503 (Fixed & Floating Flange) (2"–10" NPS)

Design Temperature: 500°F. Type 321 S/S annular corrugated metal hose with Type 304 S/S braid. Carbon steel flat face plate flanges per ASME B16.5. Carbon steel fittings per ASME B16.9.

P/N 4502	P/N 4503	Nominal Size (NPS)	Overall Length (in.)	Working Pressure (PSIG)	Approx. Weight (lbs)
4502-031	4503-031	2	14	300	18
4502-035	4503-035	2½	16	300	20
4502-040	4503-040	3	16	300	23
4502-048	4503-048	4	18	250	31
4502-055	4503-055	5	18	200	36
4502-060	4503-060	6	20	175	45
4502-067	4503-067	8	22	175	70
4502-074	4503-074	10	24	150	110

Table 3 — Types 4504 (Weld End) & 4505 (Male Pipe Thread) (½"–4" NPS)

Design Temperature: 500°F. Type 321 S/S annular corrugated metal hose with Type 304 S/S braid. Carbon steel fittings per ASME B16.9.

P/N 4504	P/N 4505	Nominal Size (NPS)	Overall Length (in.)	Working Pressure (PSIG)	Approx. Weight (lbs)
4504-011	4505-011	½	10	500	0.6
4504-014	4505-014	¾	10	400	0.7
4504-019	4505-019	1	10	350	1.0
4504-024	4505-024	1¼	11	300	1.4
4504-027	4505-027	1½	12	300	2.0
4504-031	4505-031	2	14	300	3.0
4504-035	4505-035	2½	16	300	5.0
4504-040	4505-040	3	16	300	7.0
4504-048	4505-048	4	18	250	12.0

Series 4500 – Vibration Eliminators

Anaconda Vibration Eliminators are manufactured by Universal Metal Hose, a Hyspan Group company. These products are designed for refrigeration and HVAC applications and are available in bronze and stainless steel configurations with female copper tube ends.

Table 1 — Anaconda Bronze Vibration Eliminators with Female Copper Tube Ends

Nominal Copper Tube Size	Actual Tube O.D. in.(mm)	Model Number	Maximum Operating Pressure PSIG(barg)	Flexible Hose I.D. in.(mm)	Overall Length (+/-1/4) in.(mm)	Maximum Outside Diameter in.(mm)	Tube End Length (+/-1/8) in.(mm)	Part Identification Number (PIN) Bagged/Boxed	Weight lbs(kgs)
1/8	1/4 (6.4)	1418FZ	700 (47)	1/4 (6.4)	7-1/2 (191)	0.63 (15.9)	0.50 (12.7)	210073 211073	10(.05) 12(.05)
1/4	3/3 (9.5)	5614FZ	700 (47)	5/16 (7.9)	8-1/4 (210)	0.75 (19.0)	0.63 (15.9)	210093 211093	15(.07) 16(.07)
3/8	1/2 (12.7)	3638FZ	500 (33)	3/8 (9.5)	9 (229)	0.88 (22.2)	0.75 (19.0)	210113 211113	25(.11) 28(.13)
1/2	5/8 (15.9)	1212FY	450 (30)	1/2 (12.7)	9-3/4 (248)	1.13 (28.60)	0.88 (22.2)	210132 211132	45(.20) 47(.21)
5/8	3/4 (19.0)	1258FY	450 (30)	1/2 (12.7)	10 (254)	1.13 (28.6)	1.00 (25.4)	210142 211142	50(.23) 54(.24)
5/8	3/4 (19.0)	3458FY	450 (30)	3/4 (19.0)	11-1/4 (286)	1.50 (38.1)	1.13 (28.6)	210152 211152	85(.39) 95(.43)
3/4	7/8 (22.2)	3434FY	450 (30)	3/4 (19.0)	11-1/2 (292)	1.50 (38.1)	1.25 (31.8)	210162 211162	90(.41) 1.00(.45)
1	1-1/8 (28.6)	1010FY	450 (30)	1 (25.4)	13 (330)	1.88 (47.6)	1.50 (38.1)	210172 211172	1.25(.57) 1.35(.61)
1 ¼	1-3/8 (34.9)	5454FY	500 (33)	1-1/4 (31.8)	14-3/4 (375)	2.25 (57.2)	1.63 (41.3)	210192 211192	2.30(1.04) 2.40(1.09)

SUITABLE FOR USE WITH THE FOLLOWING REFRIGERANTS

R12 R125 R401B R404A R407C R410A R502
R22 R134A R402A R407A R408A R410B R507
R23 R401A R402B R407B R409A R412A R508
R509

NOT FOR USE WITH AMMONIA

Refrigerant saturation pressure at 125°F(52°C) maximum and 80°F(27°C) minimum must be equal to or less than the design pressure.

ORDERING INSTRUCTIONS

Vibration Eliminators can be ordered by indicating the Model Number (column 3), if they are bagged or boxed, or by the Part Identification Number (PIN) in Column 9.

Table 2 — Anaconda Stainless Steel Vibration Eliminators with Female Copper Tube Ends

Nominal Copper Tube Size	Actual Tube O.D. in.(mm)	Model Number	Maximum Operating Pressure PSIG(barg)	Flexible Hose I.D. in.(mm)	Overall Length (+/-1/4) in.(mm)	Maximum Outside Diameter in.(mm)	Tube End Length (+/-1/8) in.(mm)	Part Identification Number (PIN) Bagged/Boxed	Weight lbs(kgs)
1 ½	1-5/8 (41.3)	6464FS	400 (27)	1-1/2 (38)	17.0 (432)	2.38 (60)	2.00 (50)	212200 212200BX	2.2(1.0) 2.4(1.1)
2	2-1/8 (54.0)	2020FS	360 (24)	2 (50)	20.0 (508)	3.25 (83)	2.50 (64)	212220 212220BX	3.6(1.6) 4.0(1.8)
2 ½	2-5/8 (66.7)	5252FS	300 (20)	2-1/2 (64)	24.0 (610)	3.88 (99)	3.00 (76)	212240 212240BX	5.2(2.4) 5.7(2.6)
3	3-1/8 (79.4)	3030FS	300 (20)	3 (76)	27.0 (686)	4.50 (114)	3.50 (89)	212260 212260BX	10.5(4.7) 11.0(5.0)
3 ½	3-5/8 (92.0)	7272FS	150 (10)	3-1/2 (89)	23.0 (584)	4.94 (125)	3.19 (82)	210280 211280	7.6(3.4) 8.1(3.7)
4	4-1/8 (104.8)	4040FS	150 (10)	4 (102)	25.0 (635)	5.75 (146)	4.38 (111)	210300 211300	9.5(4.3) 10.2(4.6)

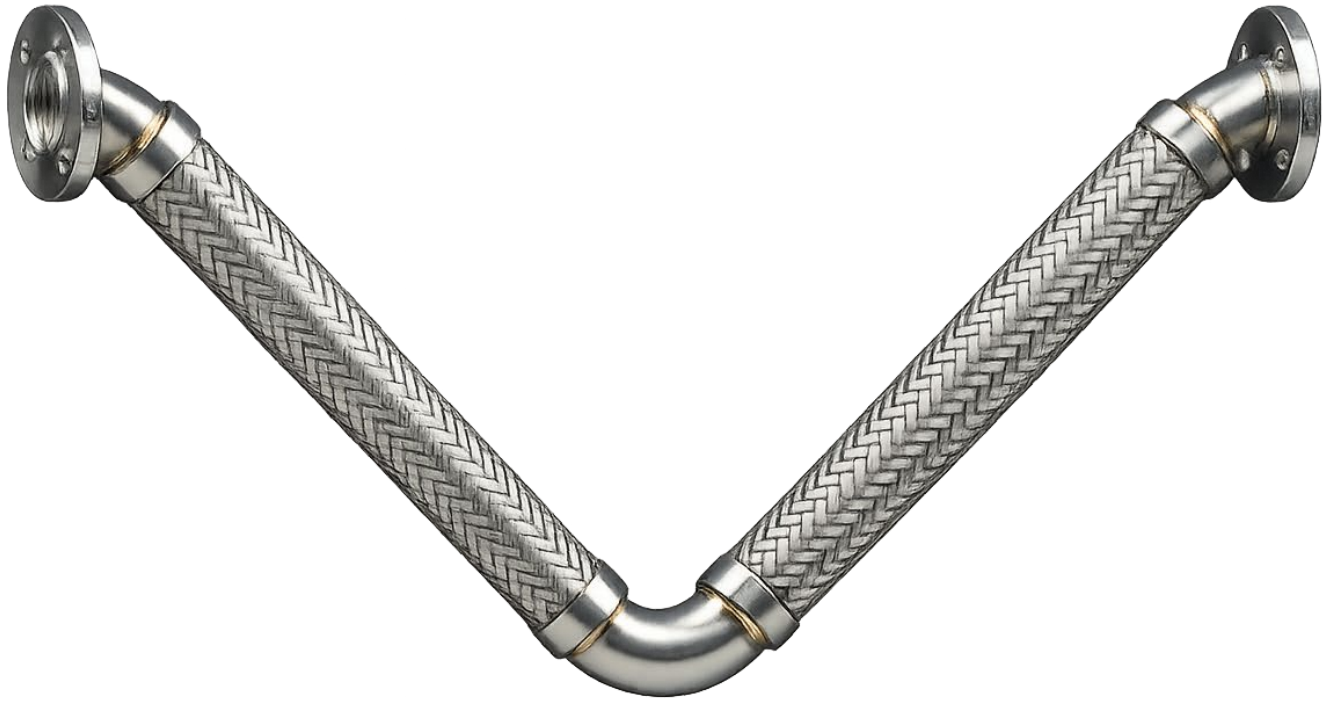
Notes

1. The designs tabulated are recognized under the component program of Underwriters Laboratories Inc. File No. SA 2585.
2. When purchased as "bagged" each vibration eliminator is cleaned and dehydrated for refrigeration service, and sealed in plastic film. When purchased as "boxed" each vibration eliminator is cleaned and dehydrated for refrigeration service, individually boxed and sealed in plastic film.
3. The maximum test pressure is 1.5 times the maximum operating pressure tabulated in Column 4.
4. The minimum burst pressure is 5 times the maximum operating pressure tabulated in Column 4.
5. The copper tube ends are designed as sweat connections for refrigeration tubing. The inside surface conforms to ASME/ANSI B16.18 and B16.22.
6. All configurations are available with male copper tube ends.

Synthetic covered Vibration Eliminators are available for use when problems exist from condensation and freezing of moisture on the outside surface of the Vibration Eliminator.

Series 4500 – V-Flex Connectors

Hyspan Series 4500 V-Flex Connectors are manufactured by Universal Metal Hose, a Hyspan Group company.



Series 4500: V-Flex Connectors

Nominal Sizes	½" – 4" NPS (steel pipe); ½" – 3" (copper tube)
Design Pressure	150 PSIG
Test Pressure	225 PSIG
Design Temperature	500°F
Travel	2", 3", or 4" axial extension/compression or lateral offset
Hose & Braid	Type 321 S/S hose, Type 304 S/S braid (steel); bronze hose/braid optional for ½"–3" copper tube sizes
Flanges	Plate or forged carbon steel (Type 4501 — 150 lb ASME B16.5)
Elbows	ASTM A234 carbon steel, long radius (steel); ASTM B88 with sweat connections per ASME B16.22 (copper)
End Types (Steel)	4501 Flanged, 4504 Beveled Weld End, 4505 Male Pipe Thread, 4508 Steel Pipe Grooved End
End Types (Copper)	4507 Female Copper Sweat End, 4509 Copper Tube Grooved End
Warranty	Universal Metal Hose Limited Warranty — see Warranty section

Product Description

Series 4500 V-Flex Connectors are designed to absorb thermal expansion or contraction, or for seismic isolation of steel pipe or copper tube installations. The braided metal hose elements incorporated into the design offer performance advantages that are not available in other products used for these applications. The unique Hyspan "V" configuration provides advantages over other metal hose connectors:

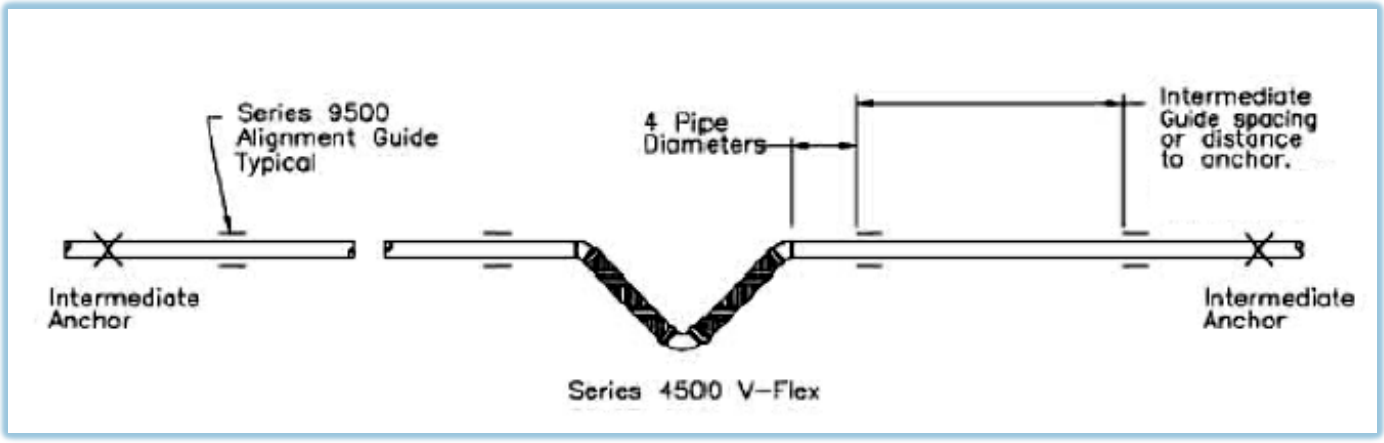
- Anchor forces are minimized because the pressure thrust is reacted by the wire braid.
- Anchor forces are minimized because of the inherent high flexibility of the metal hose.
- The "V" configuration allows adjacent piping to be nested to save space.
- V-Flex connectors can absorb in-plane extension and compression, or out-of-plane lateral offset.

Series 4500 V-Flex Connectors are available as standard products for ½" through 4" nominal pipe size with stainless steel braided hose and steel fittings — flanged, weld end, or grooved. Copper tube end configurations with bronze hose and braid are available ½" through 3" nominal size with female sweat ends or grooved ends. Design conditions are 150 PSIG and 500°F with a choice of 2", 3", or 4" of travel.

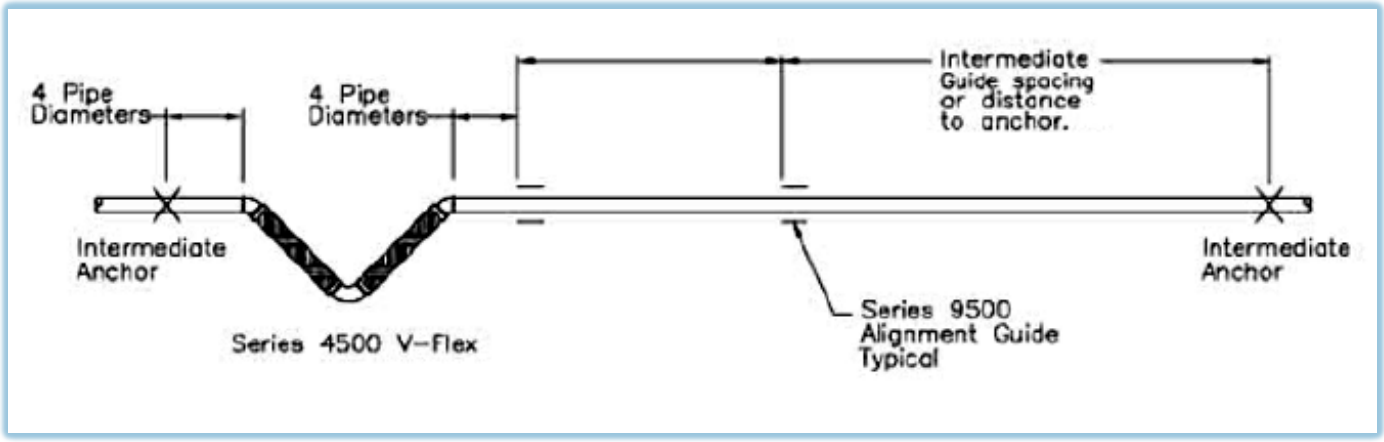
Thermal Expansion Applications

V-Flex connectors can be installed in vertical or horizontal pipe or tube runs. The installation must be anchored and properly guided adjacent to the connector and throughout the run. Intermediate guide spacing is given in Tables 1 & 2. Refer to Hyspan Series 9500 alignment guides for details on available guide sizes. The Intermediate Anchor must be designed to react a force equal to the connector spring force (Column 3 of Tables 3 & 4). This force is primarily the result of the stiffness of the connector caused by the internal pressure. If the system pressure is less than the 150 PSIG used for the tabulation, this force can be reduced proportionately.

V-Flex Connector installed in the middle of a run

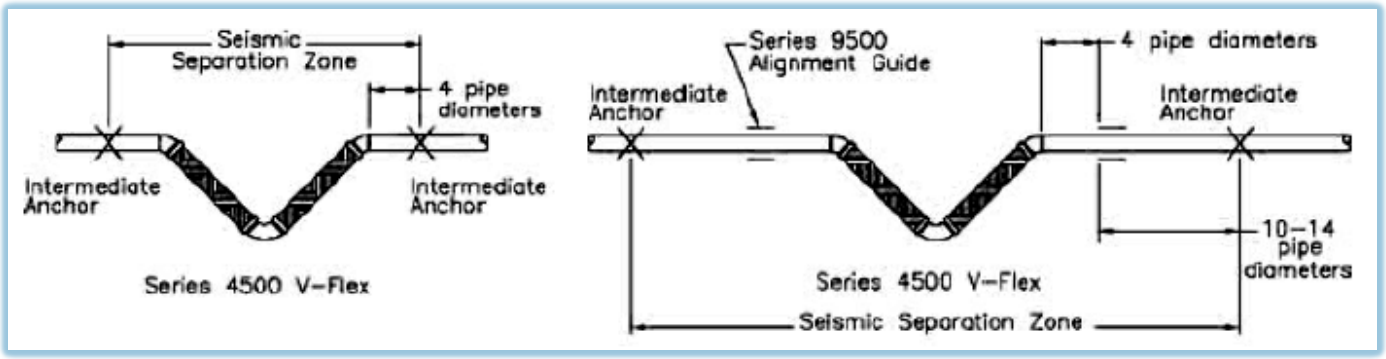


V-Flex Connector installed adjacent to an anchor



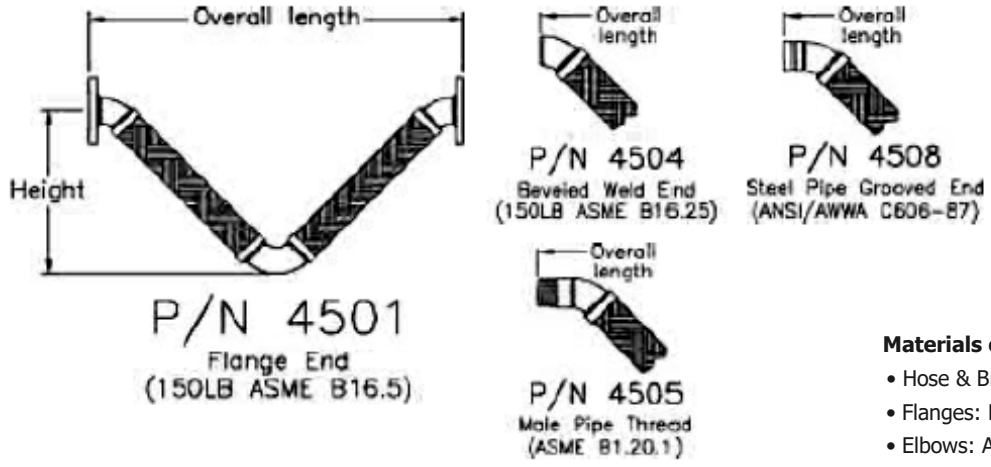
Seismic Applications

V-Flex connectors installed for seismic separation require an Intermediate Anchor on each side if the separation is no greater than the overall length of the V-Flex (Tables 3 & 4) plus four pipe diameters on each side. If the separation is greater, an alignment guide (Series 9500) must be installed within four pipe diameters from the V-Flex. The Intermediate Anchor must be designed to react a force equal to the connector spring force (Column 3 of Tables 3 & 4). If the system pressure is less than the 150 PSIG used for the tabulation, this force can be reduced proportionately.



Series 4500 V-Flex – Design Data Tables

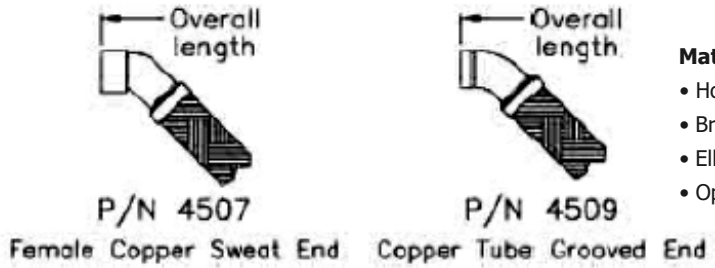
V-Flex Steel Pipe Connectors



Materials of Construction:

- Hose & Braid: Type 321SS
- Flanges: Plate or forged carbon steel
- Elbows: ASTM A234 carbon steel, long radius

V-Flex Copper Tube Connectors



Materials of Construction:

- Hose: Type 321SS
- Braid: Type 304SS
- Elbows & Tube: ASTM B88 with sweat connections per ASME B16.22
- Optional: Type C505 bronze hose & braid for sizes ½" through 2-½"

Table 1 — Intermediate Alignment Guide Spacing

V-Flex Steel Pipe Connectors

Nominal Size (NPS)	Part Number 4501, 4504 4505, 4508	Guide Spacing (feet)
½	-V11-2 -V11-3 -V11-4	14
¾	-V14-2 -V14-3 -V14-4	20
1	-V19-2 -V19-3 -V19-4	29
1 ¼	-V24-2 -V24-3 -V24-4	39
1 ½	-V27-2 -V27-3 -V27-4	48
2	-V31-2 -V31-3 -V31-4	67
2 ½	-V35-2 -V35-3 -V35-4	98
3	-V40-2 -V40-3 -V40-4	132
4	-V48-2 -V48-3 -V48-4	178

Table 2 — Intermediate Alignment Guide Spacing

V-Flex Copper Tube Connectors

Nominal Size (NPS)	Part Number 4507, 4509	Guide Spacing (feet)
½	-V08-2 -V08-3 -V08-4	5
¾	-V12-2 -V12-3 -V12-4	8
1	-V16-2 -V16-3 -V16-4	12
1 ¼	-V20-2 -V20-3 -V20-4	15
1 ½	-V23-2 -V23-3 -V23-4	20
2	-V29-2 -V29-3 -V29-4	31
2 ½	-V33-2 -V33-3 -V33-4	45
3	-V37-2 -V37-3 -V37-4	59

Note: The alignment guide spacing tabulated in Tables 1 & 2 was calculated in accordance with the recommendations of the Standards of the Expansion Joint Manufacturers Association solely on the basis of the V-Flex spring force. Alignment guides do not provide support for the weight of the system, and it may be necessary to install additional guides for long flexible runs to ensure alignment

Table 3 — V-Flex Steel Pipe Connectors

Design Pressure: 150 PSIG • Test Pressure: 225 PSIG • Design Temperature: 500°F

				P/N 4501 Flanged		P/N 4504 Welded		P/N 4505 Threaded		P/N 4508 Grooved	
Nominal Size (NPS)	Part Number 4501, 4504 4505, 4508	Spring Force (lbs.)	Height (inches)	Overall Length (inches)	Weight (lbs.)	Overall Length (inches)	Weight (lbs.)	Overall Length (inches)	Weight (lbs.)	Overall Length (inches)	Weight (lbs.)
1/2	-V11-2 -V11-3 -V11-4	31 36 40	9.69 11.38 12.88			21.00 24.38 27.38	1 1 1	26.00 29.38 32.38	2 2 2		
3/4	-V14-2 -V14-3 -V14-4	33 37 42	9.94 11.81 13.38			20.69 24.44 27.56	2 2 2	25.69 29.44 32.56	2 3 3	20.69 24.44 27.56	2 2 2
1	-V19-2 -V19-3 -V19-4	37 42 47	10.81 12.75 14.44			22.81 26.69 30.06	3 3 3	27.81 31.69 35.06	3 4 4	22.81 26.69 30.06	3 3 3
1 1/4	-V24-2 -V24-3 -V24-4	46 52 59	12.50 14.63 16.44			26.50 30.75 34.44	4 5 5	31.50 35.75 39.44	5 6 6	26.50 30.75 34.44	4 5 5
1 1/2	-V27-2 -V27-3 -V27-4	48 56 63	13.25 15.44 17.31			28.31 32.69 36.44	6 7 7	35.31 37.69 41.44	7 8 9	28.31 32.69 36.44	6 7 7
2	-V31-2 -V31-3 -V31-4	54 62 70	15.06 17.50 19.63	33.25 38.13 42.38	20 22 23	32.75 37.63 41.88	10 11 12	37.69 42.63 46.88	12 13 14	32.75 37.63 41.88	10 11 12
2 1/2	-V35-2 -V35-3 -V35-4	57 66 74	16.88 19.50 21.81	37.56 42.88 47.50	31 33 34	36.94 42.25 46.88	17 19 20	43.69 49.00 53.63	20 22 24	36.94 42.25 46.88	17 19 20
3	-V40-2 -V40-3 -V40-4	62 72 81	18.81 21.81 24.25	42.19 48.19 53.13	39 41 42	41.56 47.56 52.50	23 25 27	48.31 54.31 59.25	27 28 31	41.56 47.56 52.50	23 25 27
4	-V48-2 -V48-3 -V48-4	83 95 107	20.69 23.88 26.56	47.50 53.81 59.13	61 64 67	46.88 53.19 58.50	40 43 45	53.63 59.69 65.25	46 49 51	46.88 53.19 58.50	40 43 45
1	2	3	4	5	6	7	8	9	10	11	12

Table 4 — V-Flex Copper Tube Connectors

Design Pressure: 150 PSIG • Test Pressure: 225 PSIG • Design Temperature 500°F

				P/N 4507 Sweat		P/N 4509 Grooved	
Copper Tube Size	Part Number 4507 4509	Spring Force (lbs.)	Height (inches)	Overall Length (inches)	Weight (lbs.)	Overall Length (inches)	Weight (lbs.)
1/2	-V08-2 -V08-3 -V08-4	29 33 37	10.25 11.81 13.38	22.06 25.56 28.63	1 1 1	39.94 45.25 49.88	9 11 12
3/4	-V12-2 -V12-3 -V12-4	31 34 39	12.00 13.75 15.50	25.75 29.88 33.38	2 2 3	41.25 47.63 52.50	12 13 15
1	-V16-2 -V16-3 -V16-4	34 39 44	12.63 14.75 16.63	28.00 32.25 36.00	3 3 4	45.13 51.50 56.75	16 18 20
1 1/4	-V20-2 -V20-3 -V20-4	43 48 55	14.44 16.75 18.75	32.19 36.75 40.88	4 5 5		
1 1/2	-V23-2 -V23-3 -V23-4	45 52 58	15.19 17.56 19.63	34.50 39.25 43.25	6 7 7		
2	-V29-2 -V29-3 -V29-4	50 58 65	17.63 20.25 22.63	39.94 45.25 49.88	9 11 12		
2 1/2	-V33-2 -V33-3 -V33-4	53 61 69	18.31 21.50 24.00	41.25 47.63 52.50	12 13 15		
3	-V37-2 -V37-3 -V37-4	58 67 75	19.88 23.00 25.63	45.13 51.50 56.75	16 18 20		
1	2	3	4	5	6	7	8

Notes:

(1) The Dash Number in Column 2 indicates the maximum rated travel — dash 2 is 2" axial extension, axial compression, or lateral offset.
(2) The Spring Force in Column 3 is the force to displace the connector the rated travel at 150 PSIG.

Installation Instructions

Metal Hose Pump Connectors — Installation

Install pump connectors directly adjacent to the pump suction and discharge nozzles. The piping system must include rigid main anchors properly sized to react both pressure thrust and hose spring force.

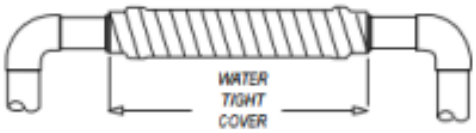
1. Brazing and soldering flux must be removed immediately after installation. Chlorides will cause premature failure of stainless steel hose components.
2. Wrap ferrule ends and approximately 2” of braid with a wet cloth to prevent overheating during brazing and soldering.
3. Direct the torch away from the ferrule and braided section. Avoid contact of the flame with the ferrule and braid.
4. If condensation will collect and freeze, the entire flexible section, ferrules, and braided hose must be covered with watertight material.
5. Vibration eliminators are most effective when installed perpendicular to the major motion. The fixed end should be securely anchored as close as possible to the vibration eliminator. When major motion exists in two planes, two vibration eliminators should be installed.

1. Brazing and soldering flux must be removed immediately after installation. Chlorides will cause premature failure of stainless steel vibration eliminators.

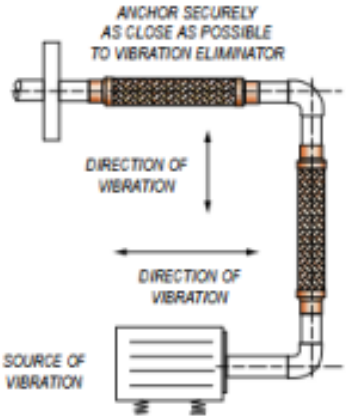
2. Wrap the ferrule and approximately 2" of the braid with a wet cloth to prevent overheating during brazing and soldering.

3. Direct the torch away from the ferrule and braided section. Avoid contact of the flame with the ferrule and braid.

4. If condensation will collect and freeze: the entire flexible section, ferrules and braided hose, must be covered with water tight material.



5. Vibration Eliminators are most effective when installed perpendicular to the major motion. The fixed end should be securely anchored as close as possible to the Vibration Eliminator. When major motion exists in two planes two Vibration Eliminators should be installed.



V-Flex Connectors — Installation Procedure

Application

V-Flex connectors are designed to absorb thermal or seismic movements as axial motion (direction of pipe or tube centerline) or lateral motion in all planes (perpendicular to the pipe or tube centerline).

Operating Conditions

All V-Flex connectors are designed for 150 PSIG at 500°F, and factory tested to 225 PSIG. Standard connectors are designed for 2", 3", or 4" of axial extension or compression, and 2", 3", or 4" of lateral offset in any plane. Be certain that the system requirements do not exceed the design travel for the connector to be installed.

Guides, Supports, Anchors

V-Flex connectors require anchors, guides, and supports. Refer to the Thermal Expansion Applications or Seismic Applications sections for guide and anchor requirements. It may be necessary to support the center elbow of the connector — refer to the illustrations for horizontal and vertical installations.

Flow Direction

The flow can be in either direction.

Shipping Restraints

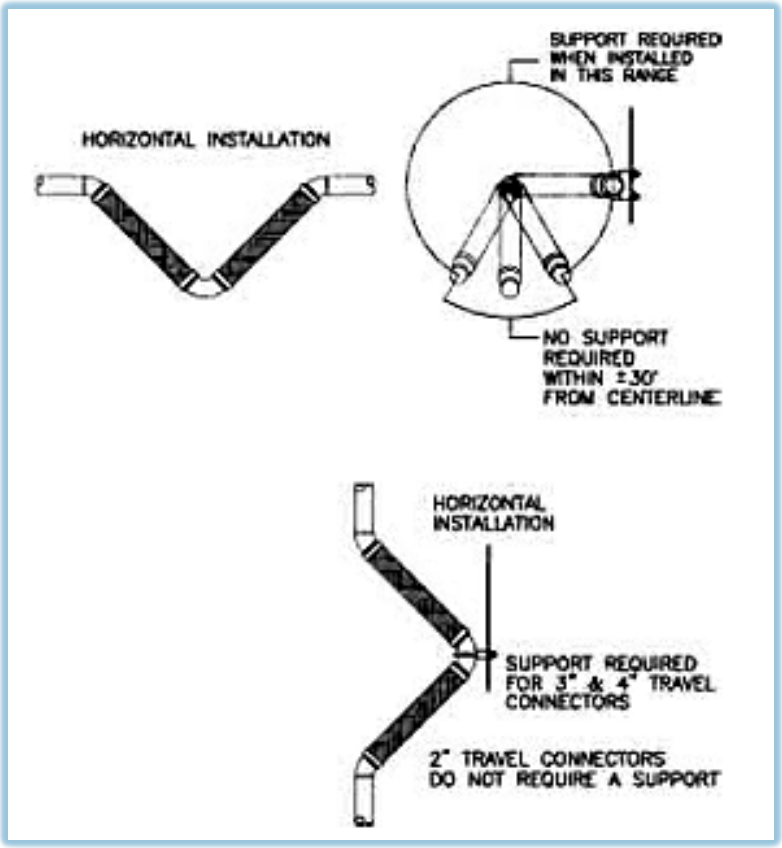
V-Flex connectors are normally not supplied with shipping restraints. Be certain that the connector is installed at the neutral length unless otherwise specified. Refer to the tabulated data, Tables 3 & 4, for the correct installed length.

Welding, Brazing & Soldering

V-Flex connectors must be protected from welding arc strikes, sparks, slag, flux, and other debris resulting from installation or other activity in the vicinity. Model 4507 requires brazing or soldering for installation. Do not exceed a temperature of 1000°F and be certain the flux or acid is neutralized.

Post-Installation Inspection

1. Inspect the connector for damage with special attention to the wire braid.
2. Is the connector at the correct location as specified?
3. Are the anchors and guides correctly installed? Are the guides free to move?
4. Confirm that the connector length is correct.
5. Is the center elbow of the connector supported — if required?



Engineering Support

Custom Engineered Solutions

Hyspan's engineering team supports specification review, reverse engineering of legacy components, replacement of discontinued product lines, and development of application-specific hose assemblies and motion-control systems for new installations, retrofits, and replacement programs.

Size Range	¼" to 32 ft diameter
Pressure Range	Full vacuum to 5,000+ PSIG
Temperature Range	Cryogenic to 1,250°F
Materials	Inconel 625, Hastelloy X, Monel, Titanium, Beryllium Copper, and others
Analysis Tools	SolidWorks, ANSYS FEA, Inventor — stress, fatigue, cycle life, thermal, vibration
Standards	EJMA, ASME B31.1, B31.3, BPVC Sec. VIII Div. 1, NAVSEA, MIL-STD-2035, PED, ITAR

Contact Hyspan

Headquarters	1685 Brandywine Avenue, Chula Vista, CA 91911
Phone	619.421.1355
Email	websales@hyspan.com
Website	hyspan.com
LinkedIn	linkedin.com/company/hyspan-precision-products-inc-/

Legacy Product Line Support

Hyspan maintains the engineering drawings, specifications, and production rights for acquired product lines including American BOA, Anaconda/Anamet, Barco, and Flexider USA. Original data and tooling are preserved to ensure long-term replacement continuity and system upgrade capability.

Ordering Guidance

To place an order or request a quotation, contact Hyspan with the following information:

- Product series and model/type designation (e.g., Series 4500 Type 4501)
- Nominal pipe or tube size (NPS or OD)
- Design pressure and temperature
- End connection type and flange class
- Travel or movement required (if applicable)
- Special materials, coatings, or certifications required
- Applicable code or standard (ASME, EJMA, NAVSEA, etc.)
- Quantity and requested delivery

Warranty

Limited Warranty — Series 4500

Series 4500 Metal Hose Pump Connectors, V-Flex Connectors, and Anaconda Vibration Eliminators are manufactured by Universal Metal Hose (Universal), a Hyspan Group company, located at 2133 South Kedzie, Chicago, Illinois 60623-3393, (773) 277-0700. The following warranty is given by Universal for the benefit of the first purchaser of the product to which the warranty applies. This warranty applies only to those parts which are manufactured and delivered by Universal.

The warranty is that the parts manufactured and delivered by Universal will be free from defects in material or workmanship under normal use and service for the time specified below.

In the event of failure of a part due to such a covered defect, Universal will repair or replace, at its option, the defective part at its factory location at 2133 South Kedzie, Chicago, Illinois 60623-3393.

The part must be returned to the factory by and at the expense of the person claiming the benefit of the warranty.

The warranty shall be for a period of twenty-four (24) months after the date of delivery of the product, twelve (12) months after commencement of use of the product, or the specified service life of the product, whichever is the shortest. All products for which warranty claims are made must be returned as provided above to the factory within thirty (30) days from the date of claimed malfunction in order for this warranty to be effective.

The only entity authorized to do any warranty repair is the manufacturer.

The repairs or replacement by Universal will be accomplished within forty-five (45) days from receipt of the defective parts at the factory.

This warranty is expressed in lieu of all other warranties, expressed or implied, including the warranty of merchantability, the implied warranty of fitness for a particular purpose, and of all other obligations or liabilities on the part of Universal. Universal neither assumes nor authorizes any other persons to assume for Universal any other liabilities in connection with the sale of the products.

This warranty does not cover parts of products made by others or products or any part thereof which have been repaired or altered, except by Universal, or which shall have been subjected to misuse, negligence, or accident.

Universal shall not be liable for damage or delay suffered by the purchaser regardless of whether such damages are general, special, or consequential in nature, whether caused by defective material or workmanship or otherwise, or whether caused by Universal's negligence regardless of the degree.

To make a warranty claim, contact Hyspan at websales@hyspan.com or +1 619.421.1355. Hyspan will coordinate with Universal Metal Hose to provide return goods authorization and shipping directions.

Hyspan

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