

WE MAKE TRANSFER OPERATIONS SAFER

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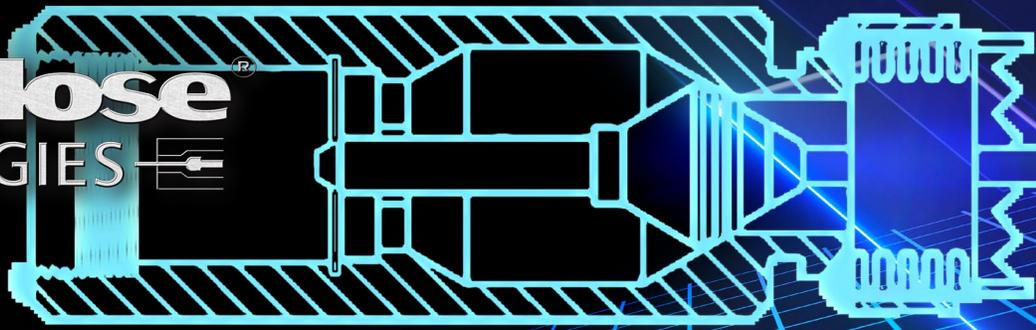
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Smart-Hose[®] TECHNOLOGIES



SH LL1 ENGINEERING DATA HOSE ASSEMBLIES

Smart-Hose[®] Safety System

LL1 incorporates an internal cable connected to normally unseated "Valve Plungers" located on each end of the cable. The integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

Features and Benefits

- ✓ Full flow technology.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.

Optional Apparatus

- ✓ Flanges ✓ CGA connections
- ✓ Armor ✓ Scuff Guard
- ✓ Acmes ... **and more!**



LL1

Diameters: ✓ 1/4" ✓ 3/8" ✓ 1/2" ✓ 3/4" ✓ 1"

Open

Flow

Closed

No Flow

•Recommended for gaseous flow and liquid applications.

Normal Flow - LL1 Valves Open

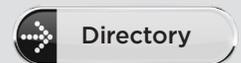
Coupling Ejection - LL1 Valves Closed

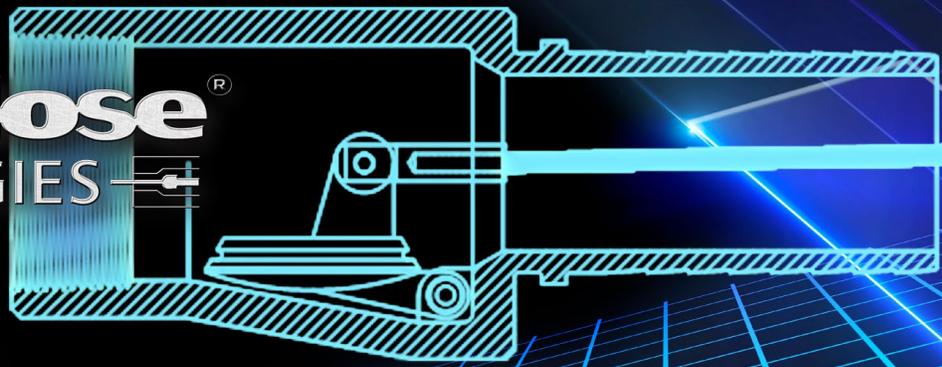
Hose ID	Alloys Offered	End Configurations	Weight / lbs. each	Length / Inches
1/4"	316-SS; Brass; Bronze	Male & Female NPT, BSPP, BSPT	.4	2.26"
3/8"	316-SS; Brass	Male & Female NPT, Flanges	.6	3.50"
1/2"	316-SS; Brass	Male & Female NPT, Flanges	.8	4.08"
3/4"	316-SS; Brass	Male & Female NPT, Flanges	1.6	5.72"
1"	316-SS	Male & Female NPT, Flanges	2.5	6.68"

NOTE: Additional sizes and options available upon request.



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 smarthose.com





SH LL3 ENGINEERING DATA HOSE ASSEMBLIES

Smart-Hose® Safety System

LL3 incorporates an internally coated cable connected to normally unseated "Valve Flappers" located on each end of the cable. The integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

Optional Apparatus

- ✓ Flanges ✓ CGA connections ✓ Acmes
- ✓ Cam lock ✓ Scuff Guard ... **and more!**

Coupling Data

- Chemical Version** : Wetted parts are 316 stainless steel
- HCL Version** : Wetted parts are Hastelloy
- Flammable Gas Version** : Wetted parts are 316 stainless steel
- O-ring** : All couplings use PTFE Teflon unless another material is required.

Features and Benefits

- ✓ Full flow technology.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.



LL3

Diameters: ✓ 1 ¼" ✓ 2" ✓ 4" ✓ 8"
 ✓ 1 ½" ✓ 3" ✓ 6"

Open

Flow

Closed

No Flow

Normal Flow - LL3 Valves Open

Coupling Ejection - LL3 Valves Closed

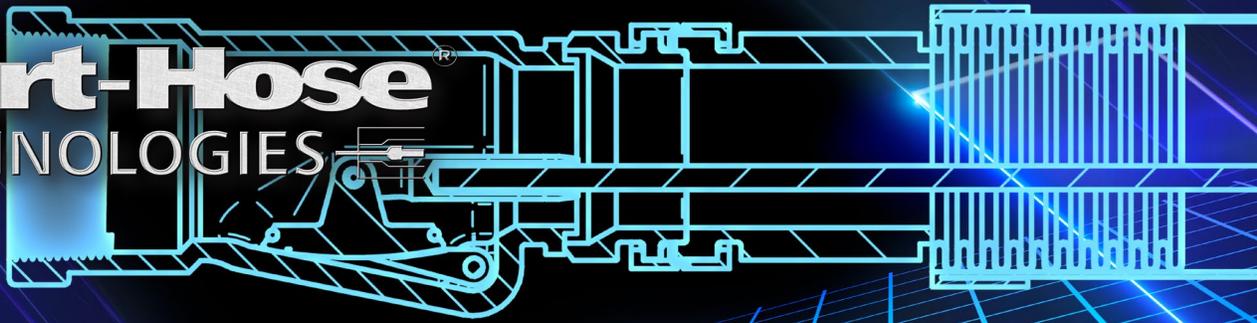
•Recommended for gaseous flow and liquid applications.

Hose ID	Alloys Offered	End Configurations	Weight / lbs. each	Length / Inches
1 ¼"	316-SS	Male & Female NPT, Flanges	2.6	3.97"
1 ½"	316-SS	Male & Female NPT, Flanges	3.4	4.74"
2"	316-SS; Hastelloy	Male & Female NPT, Flanges	4.7	5.36"
3"	316-SS	Male & Female NPT, Flanges	12.1	8.21"
4"	316-SS	Male & Female NPT, Flanges	20.7	9.10"
6"	316-SS	Male & Female NPT, Flanges	45.43	13.30"
8"	316-SS	Male & Female NPT, Flanges	75.0	15.00"

NOTE: Additional sizes and options available upon request.

Smart-Hose[®]

TECHNOLOGIES



LL3-B

ENGINEERING DATA

BREAK-AWAY HOSE ASSEMBLIES

Smart-Hose[®] Safety System

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. An engineered break-point is built into the end fitting. Specially designed to protect plant, tank truck, rail car, loading arms and workforce from hazardous consequences of a pull away incident.

Features and Benefits

- ✓ Full flow technology.
- ✓ No human intervention needed to activate.
- ✓ 360° engineered break-away point.
- ✓ Rugged shock proof design with annular seals.
- ✓ 316 SS Schedule 80 construction.
- ✓ Factory rebuild-able.
- ✓ Meets 5 to 1 burst specifications.
- ✓ Integrated to work with the Smart-Hose Safety System.
- ✓ Custom engineered break-points for specific applications.
- ✓ Priced significantly less than conventional break-away apparatus.

No special installation required!

Coupling Data

- Chemical Version** : Wetted parts are 316 stainless steel
- Flammable Gas Version** : Wetted parts are 316 stainless steel
- Break Seal** : Nitrile / Viton / EPDM / PTFE Teflon
- O-ring** : All break-aways use PTFE Teflon seals unless otherwise specified

Optional Apparatus

- ✓ Flanges ✓ CGA connections ✓ Cam lock
- ✓ Acmes ✓ Scuff Guard ... **and more!**

LL3-B

Break-Away Hose Assembly

Diameters: ✓ 1 ¼" ✓ 2" ✓ 3"

Open

Flow

Closed

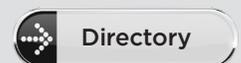
No Flow

Hose ID	Alloy	End Configurations	Weight / lbs. each	Length / Inches
1 ¼"	316-SS	Male & Female NPT, Flanges	2.6	3.97"
2"	316-SS	Male & Female NPT, Flanges	4.7	5.36"
3"	316-SS	Male & Female NPT, Flanges	12.1	8.21"

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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Smart-Hose® TECHNOLOGIES

SH LL3-BA Break-Away Adapter

Smart-Hose® Safety System

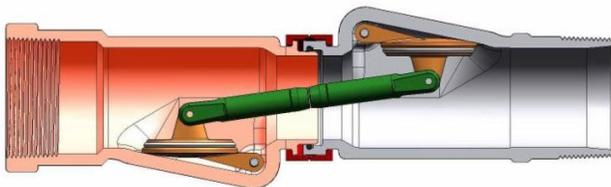
Designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident. Adapter/Coupler products provide break-away protection and offer the flexibility to be used with Smart-Hose® Assemblies, conventional hose assemblies, or, where no hose attachments are required.

LL3-BA Break-Away Adapter/Coupler

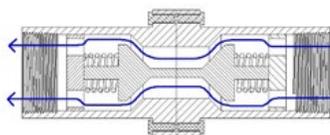
Diameters: ✓ 2" ✓ 3"

See the difference...

Smart-Hose® Break-Away



Conventional Break-Away Apparatus



- Creates flow restriction.
- Annual maintenance required.
- Higher cost.

Optional Apparatus

- ✓ Flanges ✓ Acmes ... *and more!*
- ✓ Additional sizes and options available on request.

Features and Benefits

- ✓ Full flow technology.
- ✓ Factory rebuild-able.
- ✓ Instantly stops product flow in the event of a pull-away.
- ✓ No annual maintenance required.
- ✓ No human intervention needed to activate.
- ✓ Priced significantly less than conventional break-away apparatus.

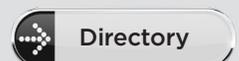
No special
installation
required!

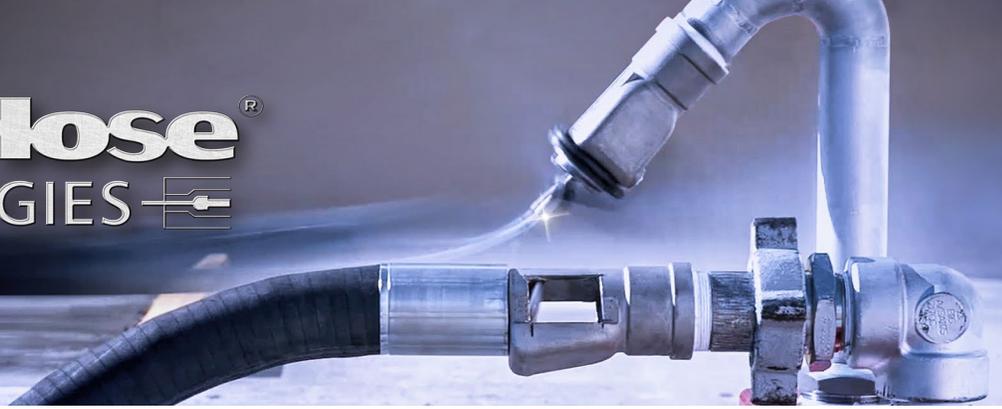
Part Number and Description	
LPG	A80-016-94-0012-0-00-00 Breakaway Adapter with Nitrile Seals, LL3-BA, 316-SS, Breakaway Adapter, FNPT X FNPT, 2" X 12 Inches, 350 psi.
	A80-016-97-0012-0-00-00 Breakaway Adapter with Nitrile Seals, LL3-BA, 316-SS, Breakaway Adapter, MNPT X MNPT, 2" X 12 Inches, 350 psi.
	A80-016-95-0012-0-00-00 Breakaway Adapter with Nitrile Seals, LL3-BA, 316-SS, Breakaway Adapter, FNPT X MNPT, 2" X 12 Inches, 350 psi.
NH3	A81-016-94-0012-0-00-00 Breakaway Adapter with EPDM Seals, LL3-BA, 316-SS, Breakaway Adapter, FNPT X FNPT, 2" X 12 Inches, 350 psi.
	A81-016-97-0012-0-00-00 Breakaway Adapter with EPDM Seals, LL3-BA, 316-SS, Breakaway Adapter, MNPT X MNPT, 2" X 12 Inches, 350 psi.
	A81-016-95-0012-0-00-00 Breakaway Adapter with EPDM Seals, LL3-BA, 316-SS, Breakaway Adapter, FNPT X MNPT, 2" X 12 Inches, 350 psi.

NOTE A: Serial numbered and shipped with a test certificate and operating booklet.
 NOTE B: Available for other chemical usage upon request.

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BREAK-AWAY

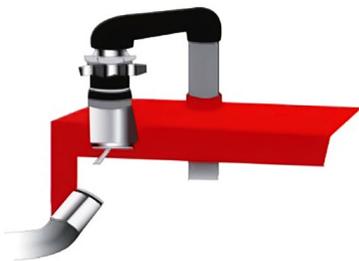
Pull-Away Forces vs. Angle of Pull



**Horizontal Pull Angle / Hose Port:
8900 lbs.**



**45 Degree Pull Angle / Hose Port:
1300 lbs.**



**90 Degree Pull Angle / Hose Port:
900 lbs.**

Three reasons why Smart-Hose[®] Technologies DOES NOT recommend horizontal hose ports:

- High pull-away forces.
- Safety concerns regarding accidental releases.
- Concentrated stress on hose assembly.

SH Chlorine Transfer HOSE ASSEMBLIES

Smart-Hose® Safety System

Chlorine Transfer Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose® Safety System is designed to work with a Monel metal hose for chlorine applications. Manufactured with a 400 Monel convoluted tube and braid, it is constructed to meet the demanding requirements of the chlorine industry.

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.



Double Braid

Hose Data

- Cover** : 316 Stainless Steel Armor
- Reinforcement** : 400 Monel braid - Double braid
- Tube** : 400 Monel corrugated metal tube

Optional Apparatus

- ✓ Nipples
- ✓ Flanges
- ... **and more!**



LL1

Diameters: ✓ 1"

Open

Flow

Closed

No Flow

*Recommended for gaseous flow and liquid applications.

Normal Flow - LL1 Valves Open

Coupling Ejection - LL1 Valves Closed

Hose ID	Braid Layers	Working Pressure PSI	Bend Radius (in.)	Hose Weight Per Ft (lb.)	Smart-Hose Part Number
1"	2	827	9.0"	1.20	M46-008-13-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.

SH CRYOGENIC METAL HOSE ASSEMBLIES

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ Full flow technology.
- ✓ Mass-spectrometer testing available.



Optional Apparatus

- ✓ Flanges
- ✓ CGA connections
- ✓ Acmes
- ✓ Armor
- ✓ Scuff Guard
- ... **and more!**

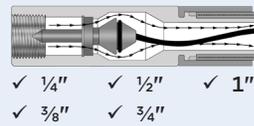
Hose Data



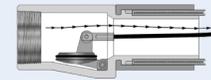
- Braids** : 304 Stainless Steel -Single
: Double (upon request)
- Construction** : P4 Series, Annular/Standard Pitch
: Series 700: Annular/Standard Pitch
: Series 800: Annular/Close Pitch
: Series 900: Annular/Close Pitch
- Tube** : 316L Stainless Steel
- Temperature** : Cryogenic to -450°F

Hose Assemblies and Diameters

LL1



LL3



P4 SERIES									
Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
1"	1	630	2520	9.00	2.75	0.79	FNPT / FNPT	2.5	M20-008-14-XXXX-0-00-00
	2	1000	4000				FNPT / FNPT		M21-008-14-XXXX-0-00-00
1 1/4"	1	575	2300	10.50	3.50	1.12	FNPT / FNPT	2.6	M20-010-33-XXXX-0-00-00
	2	920	3680				FNPT / FNPT		M21-010-33-XXXX-0-00-00
1 1/2"	1	500	2000	12.00	4.00	1.29	MNPT / MNPT	3.4	M20-012-32-XXXX-0-00-00
	2	800	3200				MNPT / MNPT		M21-012-32-XXXX-0-00-00
2"	1	532	2128	15.00	5.00	1.61	MNPT / FNPT	4.7	M20-016-3X-XXXX-0-00-00
	2	850	3400				MNPT / FNPT		M21-016-3X-XXXX-0-00-00
3"	1	400	1600	22.00	9.00	2.00	MNPT / MNPT	12.1	M20-024-32-XXXX-0-00-00
	2	600	2400				MNPT / MNPT		M21-024-32-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

Continued...

SERIES 700

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	1	2116	8464	5.00	1.00	0.17	FNPT / FNPT	0.4	M03-002-11-XXXX-0-00-00
	2	3125	12500						M04-002-11-XXXX-0-00-00
½"	1	1075	4301	6.00	1.50	0.34	FNPT / FNPT	0.6	M03-004-11-XXXX-0-00-00
	2	1720	6880						M04-004-11-XXXX-0-00-00
¾"	1	792	3168	8.00	2.25	0.59	FNPT / FNPT	0.8	M03-006-11-XXXX-0-00-00
	2	1267	5069						M04-006-11-XXXX-0-00-00

SERIES 800

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	1	2562	10250	5.00	2.50	0.17	FNPT / FNPT	0.4	M11-002-11-XXXX-0-00-00
	2	4099	16400						M12-002-11-XXXX-0-00-00
½"	1	2194	8777	8.00	4.00	0.63	FNPT / FNPT	0.6	M11-004-11-XXXX-0-00-00
	2	3510	14040						M12-004-11-XXXX-0-00-00
¾"	1	1311	5244	8.00	4.00	0.79	FNPT / FNPT	0.8	M11-006-11-XXXX-0-00-00
	2	2098	8392						M12-006-11-XXXX-0-00-00
1"	1	1069	4276	9.00	4.50	1.20	FNPT / FNPT	2.5	M11-008-14-XXXX-0-00-00
	2	1710	6840						M12-008-14-XXXX-0-00-00
1¼"	1	1110	4443	10.00	5.00	1.66	FNPT / FNPT	2.6	M11-010-33-XXXX-0-00-00
	2	1776	7040						M12-010-33-XXXX-0-00-00
1½"	1	868	3472	10.00	5.00	2.11	MNPT / MNPT	3.4	M11-032-32-XXXX-0-00-00
	2	1388	5552						M12-032-32-XXXX-0-00-00
2"	1	810	3240	11.50	5.75	2.56	MNPT / FNPT	4.7	M11-016-3X-XXXX-0-00-00
	2	1296	5184						M12-016-3X-XXXX-0-00-00

SERIES 900

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	2	4406	17627	12.00	6.00	0.36	FNPT / FNPT	0.4	M14-002-11-XXXX-0-00-00
½"	2	3510	14040	14.00	7.00	0.76	FNPT / FNPT	0.6	M14-004-11-XXXX-0-00-00
¾"	2	3192	12769	15.00	7.50	1.19	FNPT / FNPT	0.8	M14-006-11-XXXX-0-00-00
1"	2	2558	10234	16.00	8.00	1.94	FNPT / FNPT	2.5	M14-008-14-XXXX-0-00-00
1¼"	2	2107	8431	18.00	9.00	2.48	FNPT / FNPT	2.6	M14-010-33-XXXX-0-00-00
1½"	2	1698	6795	19.00	9.50	3.30	MNPT / MNPT	3.4	M14-032-32-XXXX-0-00-00
2"	2	1346	5388	24.00	12.00	3.91	MNPT / FNPT	4.7	M14-016-3X-XXXX-0-00-00



SH Cryogenic Break-Away METAL ASSEMBLIES

Smart-Hose® Safety System

Cryogenic Break-Away Hose Assemblies:

The Smart-Hose® Cryogenic Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during the transfer of low temperature liquefied gas. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

LL3-BC Cryogenic Break-Away Hose Assembly

Diameters: ✓ 2" ✓ 3"



Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
2"	1	532	2128	15.00	5.00	1.61	MNPT / FNPT	4.7	M20-016-8X-XXXX-0-00-00
3"	1	400	1600	22.00	9.00	2.00	MNPT / MNPT	12.1	M20-024-87-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.

Hose Data



- Braids** : 304 Stainless Steel - Single Double (upon request)
- Construction** : P4 Series, annular hose; standard pitch
- Tube** : 316L Stainless Steel
- Temperature** : Cryogenic to -450°F

Features and Benefits

- ✓ No human intervention needed to activate.
- ✓ 360° engineered break-away point.
- ✓ Rugged welded metallic seal.
- ✓ 316 SS Schedule 80 construction.
- ✓ Oxygen and food-grade service cleaning offered.
- ✓ Custom engineered break-points for specific applications.
- ✓ Priced significantly less than conventional break-away apparatus.
- ✓ Full flow technology.

Optional Apparatus

- ✓ Flanges ✓ CGA connections
- ✓ Armor ✓ Scuff Guard
- ... **and more!**



Smart-Hose[®]

TECHNOLOGIES

SH LPG

Propane Transfer HOSE ASSEMBLIES

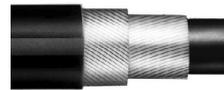
Smart-Hose[®] Safety System

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose[®] Safety System integrated into LPG/Propane transfer hose assemblies is designed to meet the demands of the most rugged applications in the LPG/Propane industry.

Optional Apparatus

- ✓ Flanges
- ✓ Acmes
- ✓ Armor
- ✓ Scuff Guard ... **and more!**



Hose Data

- Cover** : Black chloroprene perforated wrapped finish
- Reinforcement** : Multiple textile braids
- Tube** : Black Nitrile
- Temperature** : -40°F to 180°F
- Electrically Conductive** : Available upon request

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ Meets NFPA 58 & 59, US Passive Shutoff Mandate for MC330/331 Transports, CSA Cert. #2143659, and CRN OD16092.5C.

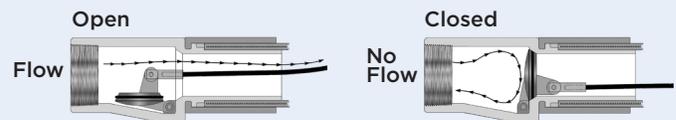
No special installation required!

Hose Assemblies and Diameters

LL1 Diameters: ✓ 1"



LL3 Diameters: ✓ 1 ¼" ✓ 1 ½" ✓ 2" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose Hose Assembly Part Number
1"	350	1750	R09-008-14-XXXX-0-00-00
1 ¼"	350	1750	R09-010-33-XXXX-0-00-00
1 ½"	350	1750	R09-012-32-XXXX-0-00-00
2"	350	1750	R09-016-3X-XXXX-0-00-00
3"	350	1750	R18-024-32-XXXX-0-00-00

NOTE A: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

NOTE B: All hose assemblies through 3" ID are designed to meet UL21 Standards.

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Smart-Hose® TECHNOLOGIES

SH LPG Propane Transfer Break-Away HOSE ASSEMBLIES

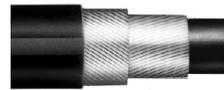
Smart-Hose® Safety System

LPG Break-Away Hose Assemblies:

The Smart-Hose® LPG Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

The Smart-Hose® Safety System integrated into LPG/Propane transfer hose assemblies is designed to meet the demands of the most rugged applications in the LPG/Propane industry.

LL3-B Break-Away Hose Assembly



Hose Data

Cover	Black chloroprene perforated wrapped finish
Reinforcement	Multiple textile braids
Tube	Black Nitrile
Temperature	-40°F to 180°F
Electrically Conductive	Available upon request

Features and Benefits

- ✓ Meets NFPA 58 & 59, US Passive Shutoff Mandate for MC330/331 Transports, CSA Cert. #2143659, and CRN OD16092.5C.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.

No special installation required!

Optional Apparatus

- ✓ Flanges ✓ Scuff Guard ✓ Acmes ... **and more!**

LL3-B Break-Away Hose Assembly

Diameters: ✓ 1 ¼" ✓ 2" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose LL3-B Break-Away Assembly Part Number
1 ¼"	350	1750	RXX-010-80-XXXX-0-00-00
2"	350	1750	RXX-016-8X-XXXX-0-00-00
3"	350	1750	RXX-024-83-XXXX-0-00-00

NOTE A: Serial numbered and shipped with a test certificate and operating booklet.

NOTE B: All hose assemblies through 3" ID are designed to meet UL21 Standards.

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SH METAL HOSE ASSEMBLIES

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ Mass-spectrometer testing available.

Optional Apparatus

- ✓ Flanges
- ✓ CGA connections
- ✓ Acmes
- ✓ Armor
- ✓ Scuff Guard
- ... **and more!**

NOTE: For 6" and 8" ID Hoses, please call for quote.



Hose Data



- Braids** : 304 Stainless Steel - Single
: Double (upon request)
- Construction** : P4 Series, Annular/Standard Pitch
: Series 700: Annular/Standard Pitch
: Series 800: Annular/Close Pitch
: Series 900: Annular/Close Pitch
- Tube** : 316L Stainless Steel
- Cover** : SS Armor Available

Hose Assemblies and Diameters

LL1



- ✓ 1/4"
- ✓ 3/8"
- ✓ 1/2"
- ✓ 3/4"
- ✓ 1"

LL3



- ✓ 1 1/4"
- ✓ 1 1/2"
- ✓ 2"
- ✓ 3"
- ✓ 4"
- ✓ 6"
- ✓ 8"

P4 SERIES

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.) Dyn. Static	Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
1"	1	630	2520	9.00 2.75	0.79	FNPT / FNPT	2.5	M20-008-14-XXXX-0-00-00
	2	1000	4000					M21-008-14-XXXX-0-00-00
1 1/4"	1	575	2300	10.50 3.50	1.12	FNPT / FNPT	2.6	M20-010-33-XXXX-0-00-00
	2	920	3680					M21-010-33-XXXX-0-00-00
1 1/2"	1	500	2000	12.00 4.00	1.29	MNPT / MNPT	3.4	M20-012-32-XXXX-0-00-00
	2	800	3200					M21-012-32-XXXX-0-00-00
2"	1	532	2128	15.00 5.00	1.61	MNPT / FNPT	4.7	M20-016-3X-XXXX-0-00-00
	2	850	3400					M21-016-3X-XXXX-0-00-00
3"	1	400	1600	22.00 9.00	2.00	MNPT / MNPT	12.1	M20-024-32-XXXX-0-00-00
	2	600	2400					M21-024-32-XXXX-0-00-00
4"	1	300	1200	27.00 13.00	2.68	MNPT / MNPT	20.7	M20-032-32-XXXX-0-00-00
	2	444	1776					M21-032-32-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

Continued...

SERIES 700

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	1	2116	8464	5.00	1.00	0.17	FNPT / FNPT	0.4	M03-002-11-XXXX-0-00-00
	2	3125	12500						M04-002-11-XXXX-0-00-00
½"	1	1075	4301	6.00	1.50	0.34	FNPT / FNPT	0.6	M03-004-11-XXXX-0-00-00
	2	1720	6880						M04-004-11-XXXX-0-00-00
¾"	1	792	3168	8.00	2.25	0.59	FNPT / FNPT	0.8	M03-006-11-XXXX-0-00-00
	2	1267	5069						M04-006-11-XXXX-0-00-00

SERIES 800

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	1	2562	10250	5.00	2.50	0.17	FNPT / FNPT	0.4	M11-002-11-XXXX-0-00-00
	2	4099	16400						M12-002-11-XXXX-0-00-00
½"	1	2194	8777	8.00	4.00	0.63	FNPT / FNPT	0.6	M11-004-11-XXXX-0-00-00
	2	3510	14040						M12-004-11-XXXX-0-00-00
¾"	1	1311	5244	8.00	4.00	0.79	FNPT / FNPT	0.8	M11-006-11-XXXX-0-00-00
	2	2098	8392						M12-006-11-XXXX-0-00-00
1"	1	1069	4276	9.00	4.50	1.20	FNPT / FNPT	2.5	M11-008-14-XXXX-0-00-00
	2	1710	6840						M12-008-14-XXXX-0-00-00
1¼"	1	1110	4443	10.00	5.00	1.66	FNPT / FNPT	2.6	M11-010-33-XXXX-0-00-00
	2	1776	7040						M12-010-33-XXXX-0-00-00
1½"	1	868	3472	10.00	5.00	2.11	MNPT / MNPT	3.4	M11-032-32-XXXX-0-00-00
	2	1388	5552						M12-032-32-XXXX-0-00-00
2"	1	810	3240	11.50	5.75	2.56	MNPT / FNPT	4.7	M11-016-3X-XXXX-0-00-00
	2	1296	5184						M12-016-3X-XXXX-0-00-00

SERIES 900

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
¼"	2	4406	17627	12.00	6.00	0.36	FNPT / FNPT	0.4	M14-002-11-XXXX-0-00-00
½"	2	3510	14040	14.00	7.00	0.76	FNPT / FNPT	0.6	M14-004-11-XXXX-0-00-00
¾"	2	3192	12769	15.00	7.50	1.19	FNPT / FNPT	0.8	M14-006-11-XXXX-0-00-00
1"	2	2558	10234	16.00	8.00	1.94	FNPT / FNPT	2.5	M14-008-14-XXXX-0-00-00
1¼"	2	2107	8431	18.00	9.00	2.48	FNPT / FNPT	2.6	M14-010-33-XXXX-0-00-00
1½"	2	1698	6795	19.00	9.50	3.30	MNPT / MNPT	3.4	M14-032-32-XXXX-0-00-00
2"	2	1346	5388	24.00	12.00	3.91	MNPT / FNPT	4.7	M14-016-3X-XXXX-0-00-00



SH METAL Break-Away HOSE ASSEMBLIES

Smart-Hose® Safety System

Metal Break-Away Hose Assemblies:

The Smart-Hose® Metal Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

Optional Apparatus

- ✓ Flanges
- ✓ CGA connections
- ✓ Acmes
- ✓ Armor
- ✓ Scuff Guard
- ... **and more!**

LL3-B Break-Away Hose Assembly



Hose Data



- Braids** : 304 Stainless Steel - Single
Double (upon request)
- Construction** : P4 Series, annular hose;
standard pitch
- Tube** : 316L Stainless Steel
- Cover** : SS Armor Available

Features and Benefits

- ✓ Full flow. No human intervention needed.
- ✓ 360° engineered break-away point.
- ✓ Designed with metal seal.
- ✓ 316 SS Schedule 80 construction.
- ✓ Custom engineered break-points for specific applications.
- ✓ Priced significantly less than conventional break-away apparatus.



LL3-B Break-Away Hose Assembly

Diameters: ✓ 2" ✓ 3"

Open

Flow

Closed

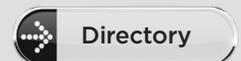
No Flow

Hose ID	Braid Layers	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in.)		Hose Weight Per Ft (lb.)	End Fittings LL3-B / LL3	End Fitting Weight (lb.)	Smart-Hose Part Number
				Dyn.	Static				
2"	1	532	2128	15.00	5.00	1.61	MNPT / FNPT	4.7	M20-016-8X-XXXX-0-00-00
3"	1	400	1600	22.00	9.00	2.00	MNPT / MNPT	12.1	M20-024-87-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.

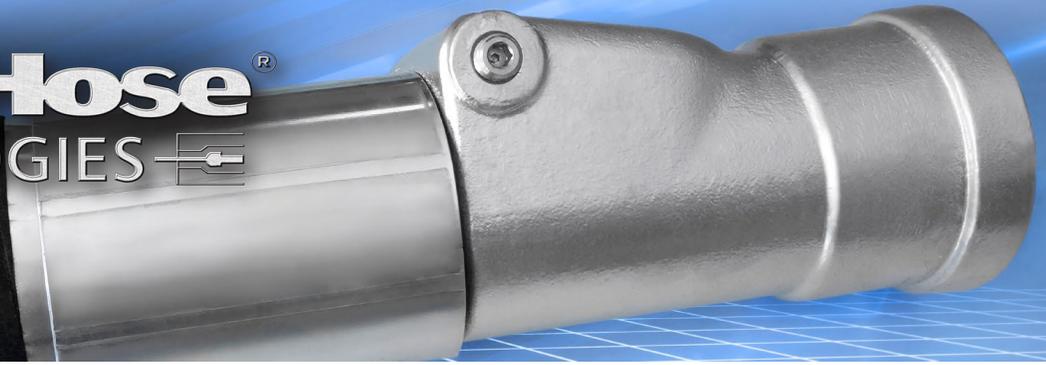


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SH NH₃

Anhydrous Ammonia HOSE ASSEMBLIES

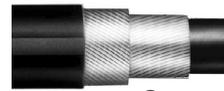
Smart-Hose® Safety System

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose® Safety System integrated into NH₃ transfer hose assemblies is designed to meet the demands of the most rugged applications.

Optional Apparatus

- ✓ Flanges
- ✓ Acmes
- ✓ Scuff Guard
- ... **and more!**



Hose Data

- Cover** : Black EPDM perforated wrapped finish
- Reinforcement** : Multiple textile braids
- Tube** : Black EPDM
- Temperature** : -40°F to 180°F
- Electrically Conductive** : Available upon request

Features and Benefits

- ✓ Meets DOT HM 225 Standards and US Passive Shutoff Mandate for MC330/331 Transports and CRN OD16092.5C.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ Full flow technology.



Hose Assemblies and Diameters

LL1 Diameters: ✓ 1"



LL3 Diameters: ✓ 1 ¼" ✓ 1 ½" ✓ 2" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose Hose Assembly Part Number
1"	350	1750	RXX-008-14-XXXX-0-00-00
1 ¼"	350	1750	RXX-010-33-XXXX-0-00-00
1 ½"	350	1750	RXX-012-32-XXXX-0-00-00
2"	350	1750	RXX-016-3X-XXXX-0-00-00
3"	350	1750	RXX-024-32-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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TECHNOLOGIES



NH₃ Anhydrous Ammonia Break-Away HOSE ASSEMBLIES

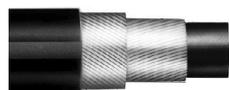
Smart-Hose® Safety System

NH₃ Break-Away Hose Assemblies:

The Smart-Hose® NH₃ Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

The Smart-Hose® Safety System integrated into NH₃ transfer hose assemblies is designed to meet the demands of the most rugged applications.

LL3-B Break-Away Hose Assembly



Hose Data

Cover	: Black EPDM perforated wrapped finish
Reinforcement	: Multiple textile braids
Tube	: Black EPDM
Temperature	: -40°F to 180°F
Electrically Conductive	: Available upon request

Features and Benefits

- ✓ Meets DOT HM 225 Standards and US Passive Shutoff Mandate for MC330/331 Transports and CRN OD16092.5C.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.

Optional Apparatus

- ✓ Flanges ✓ Scuff Guard
- ✓ Acmes ... **and more!**

No special installation required!

LL3-B Break-Away Hose Assembly

Diameters: ✓ 1 ¼" ✓ 2" ✓ 3"

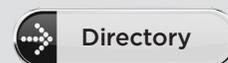


Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose LL3-B Break-Away Assembly Part Number
1 ¼"	350	1750	RXX-010-80-XXXX-0-00-00
2"	350	1750	RXX-016-8X-XXXX-0-00-00
3"	350	1750	RXX-024-83-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.



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TECHNOLOGIES



Petroleum TRANSFER HOSE ASSEMBLIES

Smart-Hose® Safety System

Petroleum Transfer Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose® Safety System integrated into petroleum transfer hose assemblies is designed to meet the demands of the most rugged applications in the petroleum industry.

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ Full flow technology.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.



Hose Data

- Cover** : Black (red spiral stripe)
Synthetic rubber (oil resistant);
Smooth cover, wrapped finish
- Reinforcement** : Spiral-plied synthetic fabric with wire dual helix
- Tube** : Nitrile synthetic rubber
ARPM Class A (high oil resistant)
- Electrically Conductive** : Available upon request
- Temperature** : -35°F to 200°F



Optional Apparatus

- ✓ Flanges
- ✓ Acmes
- ✓ Scuff Guard
- ... **and more!**

LL3

Diameters: ✓ 1 1/2" ✓ 2" ✓ 3" ✓ 4"



• Recommended for gaseous flow and liquid applications.



Normal Flow - LL3 Valves Open



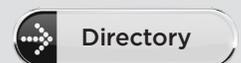
Coupling Ejection - LL3 Valves Closed

Hose ID	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in)	Hose Weight per ft. (lb)	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose Hose Assembly Part Number
1 1/2"	150	600	4.0	0.86	MNPT / MNPT	3.4	RXX-012-32-XXXX-0-00-00
2"	150	600	5.0	1.11	FNPT / MNPT	5.1	RXX-016-3X-XXXX-0-00-00
3"	150	600	8.0	2.00	MNPT / MNPT	12.1	RXX-024-32-XXXX-0-00-00
4"	150	600	12.0	2.71	MNPT / MNPT	20.7	RXX-032-32-XXXX-0-00-00

NOTE A: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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Petroleum TRANSFER BREAK-AWAY HOSE ASSEMBLIES

Smart-Hose[®] Safety System

Petroleum Break-Away Hose Assemblies:

The Smart-Hose[®] Petroleum Transfer Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

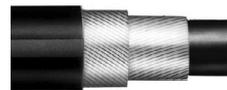
The Smart-Hose[®] Safety System integrated into petroleum transfer hose assemblies is designed to meet the demands of the most rugged applications in the petroleum industry.

Optional Apparatus

- ✓ Flanges ✓ Scuff Guard
- ✓ Acmes ... **and more!**



LL3-B Break-Away Hose Assembly



Hose Data

- Cover** : Black (red spiral stripe)
: Synthetic rubber (oil resistant);
: Smooth cover, wrapped finish
- Reinforcement** : Spiral-plyed synthetic fabric
: with wire dual helix
- Tube** : Nitrile synthetic rubber
: ARPM Class A (high oil resistant)
- Temperature** : -35°F to 200°F
- Electrically Conductive** : Available upon request

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ Full flow technology.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.

LL3-B Break-Away Hose Assembly

Diameters: ✓ 2" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in)	Hose Weight per ft. (lb)	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose Hose Assembly Part Number
2"	150	600	5.0	1.11	FNPT / MNPT	5.1	RXX-016-8X-XXXX-0-00-00
3"	150	600	8.0	2.00	MNPT / MNPT	12.1	RXX-024-83-XXXX-0-00-00

NOTE A: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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SH Ship Transfer HOSE ASSEMBLIES

Smart-Hose[®] Safety System

Ship Transfer Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

Large bore ship loading/unloading hose assemblies are exposed to a tremendous amount of stress. The weight of the material being transferred, coupled with the high end force can lead to a catastrophic hose failure, possibly resulting in an uncontrolled release of a hazardous material spilling into the waterway. The Smart-Hose[®] Safety System can protect your facility, workforce, and the environment from the devastating consequences associated with a catastrophic ship hose failure.

Features and Benefits

- ✓ Tested to working and test pressure.
- ✓ No human intervention required to activate the system.
- ✓ All hoses are serial numbered.
- ✓ All hoses are shipped with a test certificate and operating booklet.
- ✓ Full flow technology.



Optional Apparatus

- ✓ Flanges
- ✓ Armor
- ✓ Scuff Guard
- ... **and more!**

LL3

Diameters: ✓ 6" ✓ 8"



*Recommended for gaseous flow and liquid applications.



Normal Flow - LL3 Valves Open



Coupling Ejection - LL3 Valves Closed

Hose ID	Reinforcement	Tube	Smart-Hose Part Number
6"	Metal / Rubber	Metal / Rubber	Call for Details/Quote
8"	Metal / Rubber	Metal / Rubber	Call for Details/Quote

NOTE: Additional sizes and options available upon request.

Smart-Hose[®]

TECHNOLOGIES



SH

TEFLON

Chemical Transfer HOSE ASSEMBLIES

Smart-Hose[®] Safety System

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose[®] Safety System is designed to work with rubber covered Teflon (PTFE) chemical hose. Manufactured with an EPDM rubber cover and a helical wire, the hose can meet the demands of extreme abrasion applications and full vacuum applications.

Optional Apparatus

✓ Flanges ✓ Acmes ✓ Scuff Guard ... **and more!**

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ Full flow technology.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.
- ✓ No human intervention required to activate the system.

No special installation required!

Hose Assemblies and Diameters

LL1 Diameters: ✓ 1"

LL3 Diameters: ✓ 1 ¼" ✓ 2" ✓ 4"
✓ 1 ½" ✓ 3"

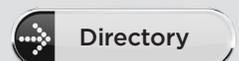


Hose ID	Working/Burst Pressure PSI	Bend Radius (in)	Hose Weight per ft. (lb)	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose Hose Assembly Part Number
1"	400/1600	9	0.69	FNPT / FNPT	2.5	RXX-008-14-XXXX-0-00-00
1 ¼"	375/1500	11	0.75	FNPT / FNPT	2.6	RXX-010-33-XXXX-0-00-00
1 ½"	350/1400	12	1.11	MNPT / MNPT	3.4	RXX-012-32-XXXX-0-00-00
2"	300/1200	16	1.57	FNPT / MNPT	4.7	RXX-016-3X-XXXX-0-00-00
3"	200/800	30	2.86	MNPT / MNPT	12.1	RXX-024-32-XXXX-0-00-00
4"	150/600	42	4.28	MNPT / MNPT	20.75	RXX-032-32-XXXX-0-00-00

NOTE: Additional sizes and options available upon request.

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SH TEFLON Chemical Transfer BREAK-AWAY HOSE ASSEMBLIES

Smart-Hose[®] Safety System

Teflon Break-Away Hose Assemblies:

The Smart-Hose[®] Teflon Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

The Smart-Hose[®] Safety System is designed to work with an EPDM covered Teflon (PTFE) chemical hose. The hose can meet the demands of extreme abrasion applications, and full vacuum applications.

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.
- ✓ Full flow technology.



Optional Apparatus

- ✓ Flanges
- ✓ Scuff Guard
- ... **and more!**

* **Electrically conductive available upon request.**

LL3-B Break-Away Hose Assembly



LL3-B Break-Away Hose Assembly

Diameters: ✓ 1 ¼" ✓ 2" ✓ 3"



Hose ID	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose LL3-B Break-Away Hose Assembly Part Number
1 ¼"	FNPT	2.6	RXX-010-80-XXXX-0-00-00
2"	FNPT / MNPT	4.7	RXX-016-8X-XXXX-0-00-00
3"	MNPT	12.1	RXX-024-83-XXXX-0-00-00

NOTE A: Additional sizes and options available upon request.



SH UHMW Chemical Transfer HOSE ASSEMBLIES

Smart-Hose® Safety System

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

The Smart-Hose® Safety System integrated into UHMW chemical transfer hose assemblies is designed to meet the demands of the most rugged applications in the chemical industry.

Optional Apparatus

- ✓ Flanges
- ✓ Acmes
- ✓ Scuff Guard
- ... **and more!**

Features and Benefits

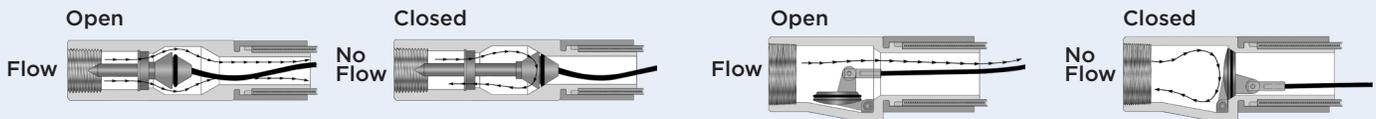
- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ Full flow technology.
- ✓ All hoses are serial numbered.
- ✓ Shipped with a test certificate and operating booklet.

No special installation required!

Hose Assemblies and Diameters

LL1 Diameters: ✓ 1"

LL3 Diameters: ✓ 1 ¼" ✓ 2" ✓ 4"
 ✓ 1 ½" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in)	Hose Weight per ft. (lb)	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose Hose Assembly Part Number
1"	250	1000	4.0	0.58	FNPT / FNPT	2.5	RXX-008-14-XXXX-0-00-00
1 ¼"	250	1000	4.5	0.72	FNPT / FNPT	2.6	RXX-010-33-XXXX-0-00-00
1 ½"	250	1000	5.0	0.82	MNPT / MNPT	3.4	RXX-012-32-XXXX-0-00-00
2"	250	1000	6.0	1.03	FNPT / MNPT	4.7	RXX-016-3X-XXXX-0-00-00
3"	200	800	9.0	1.87	MNPT / MNPT	12.1	RXX-024-32-XXXX-0-00-00
4"	200	800	10.0	4.09	MNPT / MNPT	20.75	RXX-032-32-XXXX-0-00-00

NOTE: Additional sizes and options available upon request.

Smart-Hose[®]

TECHNOLOGIES



SH UHMW Chemical Transfer BREAK-AWAY HOSE ASSEMBLIES

Smart-Hose[®] Safety System

UHMW Break-Away Hose Assemblies:

The Smart-Hose[®] UHMW Break-Away Hose Assembly has been designed to protect plant, tank truck, rail car, loading arms and workforce from the potentially hazardous consequences of a pull away incident during transfer. An engineered break-point is built into the end fitting and works in conjunction with integrated valves to instantaneously stop product flow.

The Smart-Hose[®] Safety System integrated into UHMW chemical transfer hose assemblies is designed to meet the demands of the most rugged applications in the chemical industry.

LL3-B Break-Away Hose Assembly



Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ 316 Stainless Steel fittings are designed for reuse on a new hose.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.
- ✓ Full flow technology.

Optional Apparatus

- ✓ Flanges ✓ Scuff Guard
- ... **and more!**

* **Electrically conductive available upon request.**



LL3-B Break-Away Hose Assembly

Diameters: ✓ 1 ¼" ✓ 2" ✓ 3"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Bend Radius (in)	Hose Weight per ft. (lb)	Smart-Hose End Fitting	End Fitting Weight (lb) each	Smart-Hose LL3-B Break-Away Hose Assembly Part Number
1 ¼"	250	1000	4.5	1.07	FNPT / FNPT	2.6	RXX-010-80-XXXX-X-00-00
2"	250	1000	6.0	1.53	FNPT / MNPT	4.7	RXX-016-8X-XXXX-X-00-00
3"	200	800	9.0	2.78	MNPT / MNPT	12.1	RXX-024-83-XXXX-X-00-00

NOTE A: Additional sizes and options available upon request.

Smart-Hose[®]

TECHNOLOGIES

SH HIGH PRESSURE Acetylene HOSE ASSEMBLIES

Smart-Hose[®] Safety System

High Pressure Acetylene Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure acetylene hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose[®] Safety System can protect your facility and workforce from the potentially devastating consequences associated with hose failures.

The Smart-Hose[®] Safety System is designed to work within high pressure industrial hose assemblies with a PTFE tube typically used for acetylene applications.



Hose Data

- Cover** : 304 Stainless Steel - Double Braid
- Design** : High pressure anti-static smooth bore PTFE tube with high tensile 304 stainless steel braid
- Tube** : Medium wall anti-static smooth bore PTFE tube.
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.

No special installation required!

Optional Apparatus

- ✓ Armor ✓ CGA connections
- ✓ Scuff Guard ... **and more!**

LL1

Diameters: ✓ ¼" ✓ ½"



• Recommended for gaseous flow and liquid applications.



Normal Flow - LL1 Valves Open



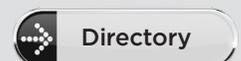
Coupling Ejection - LL1 Valves Closed

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
¼"	3500	14000	Brass FNPT / Acetylene Service	0.40	P02-002-16-XXXX-0-00-00
¼"	4500	18000	Bronze FNPT / Acetylene Service	0.40	P04-002-29-XXXX-0-00-00
½"	4000	16000	Brass FNPT / Acetylene Service	0.80	P03-004-16-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

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SH HIGH PRESSURE Helium HOSE ASSEMBLIES

Smart-Hose[®] Safety System

High Pressure Helium Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure helium hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose[®] Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures. The system is designed to work within high pressure helium hose assemblies with an ETFE post sintered tube for applications requiring lower effusion, typically used for high pressure hydrogen and helium applications.



Hose Data

- Cover** : SS Armor available on request
- Reinforcement** : Double Braid 304 SS
- Tube** : ETFE Post Sintered Tube
* for applications requiring low effusion
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.

No special installation required!

Optional Apparatus

- ✓ CGA connections ✓ Scuff Guard ... **and more!**

LL1

Diameters: ✓ 1/4" ✓ 3/8" ✓ 1/2"



• Recommended for gaseous flow and liquid applications.



Normal Flow - LL1 Valves Open



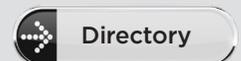
Coupling Ejection - LL1 Valves Closed

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
1/4"	3500	14000	Brass FNPT 316-SS FNPT	0.40	P51-002-17-XXXX-0-00-00 P51-002-11-XXXX-0-00-00
3/8"	4000	16000	Brass FNPT 316-SS FNPT	0.60	P52-003-17-XXXX-0-00-00 P52-003-11-XXXX-0-00-00
1/2"	4000	16000	Brass FNPT 316-SS FNPT	0.80	P52-004-17-XXXX-0-00-00 P52-004-11-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

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TECHNOLOGIES

SH HIGH PRESSURE Hydrogen HOSE ASSEMBLIES

Smart-Hose[®] Safety System

High Pressure Hydrogen Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure hydrogen hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose[®] Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures. The system is designed to work within high pressure hydrogen hose assemblies with an ETFE post sintered tube for applications requiring lower effusion, typically used for high pressure hydrogen and helium applications.



Hose Data

- Cover** : SS Armor available on request
- Reinforcement** : Double Braid 304 SS
- Tube** : ETFE Post Sintered Tube
* for applications requiring low effusion
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.

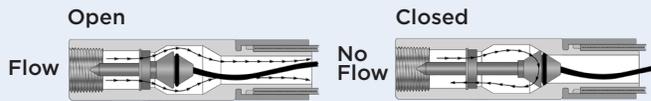
No special installation required!

Optional Apparatus

- ✓ CGA connections ✓ Scuff Guard ... **and more!**

LL1

Diameters: ✓ 1/4" ✓ 3/8" ✓ 1/2"



• Recommended for gaseous flow and liquid applications.



Normal Flow - LL1 Valves Open



Coupling Ejection - LL1 Valves Closed

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
1/4"	3500	14000	Brass FNPT 316-SS FNPT	0.40	P51-002-17-XXXX-0-00-00 P51-002-11-XXXX-0-00-00
3/8"	4000	16000	Brass FNPT 316-SS FNPT	0.60	P52-003-17-XXXX-0-00-00 P52-003-11-XXXX-0-00-00
1/2"	4000	16000	Brass FNPT 316-SS FNPT	0.80	P52-004-17-XXXX-0-00-00 P52-004-11-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

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Smart-Hose[®]

TECHNOLOGIES



Smart-Hose[®] Safety System

High Pressure Oxygen Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose[®] Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures.

The Smart-Hose[®] High Pressure Oxygen hose assembly is designed to work with a high pressure PTFE hose and utilizes an internal cable that is designed specifically for high pressure oxygen gas applications.



Hose Data

- Cover** : SS Armor available on request
- Reinforcement** : Double Braid 304 SS
- Tube** : Teflon PTFE Tube; True ID; Post Sintered PTFE Tube
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.



Optional Apparatus

- ✓ CGA connections ✓ Scuff Guard ... *and more!*

Hose Assemblies and Diameters

LL1 Diameters: ✓ 1/4" ✓ 3/8" ✓ 1/2"

Open

Flow

Closed

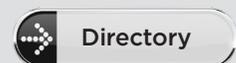
No Flow

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
1/4"	3500	14000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.40	P02-002-17-XXXX-0-00-00 P02-002-11-XXXX-0-00-00 P02-002-19-XXXX-0-00-00
1/4"	4500	18000	Bronze FNPT 316-SS FNPT Bronze Heat Dissipater FNPT	0.40	P04-002-12-XXXX-0-00-00 P04-002-11-XXXX-0-00-00 P04-002-21-XXXX-0-00-00
3/8"	4000	16000	Brass FNPT 316-SS FNPT	0.60	P03-003-17-XXXX-0-00-00 P03-003-11-XXXX-0-00-00
1/2"	4000	16000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.80	P03-004-17-XXXX-0-00-00 P03-004-11-XXXX-0-00-00 P03-004-19-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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SH HIGH PRESSURE ETFE HOSE ASSEMBLIES

Smart-Hose® Safety System

High Pressure ETFE Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose® Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures.

The Smart-Hose® High Pressure ETFE hose assembly is designed to work with a high pressure ETFE hose and utilizes an internal cable that is designed specifically for high pressure ETFE gas applications.



Hose Data

- Cover** : SS Armor available on request
- Reinforcement** : Double Braid 304 SS
- Tube** : Teflon ETFE Tube; True ID; Post Sintered ETFE Tube
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.



Optional Apparatus

- ✓ CGA connections ✓ Scuff Guard ... **and more!**

Hose Assemblies and Diameters

LL1 Diameters: ✓ ¼" ✓ ⅜" ✓ ½"



Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
¼"	3500	14000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.40	P02-002-17-XXXX-0-00-00 P02-002-11-XXXX-0-00-00 P02-002-19-XXXX-0-00-00
¼"	4500	18000	Bronze FNPT 316-SS FNPT Bronze Heat Dissipater FNPT	0.40	P04-002-12-XXXX-0-00-00 P04-002-11-XXXX-0-00-00 P04-002-21-XXXX-0-00-00
⅜"	4000	16000	Brass FNPT 316-SS FNPT	0.60	P03-003-17-XXXX-0-00-00 P03-003-11-XXXX-0-00-00
½"	4000	16000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.80	P03-004-17-XXXX-0-00-00 P03-004-11-XXXX-0-00-00 P03-004-19-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.

Smart-Hose®

TECHNOLOGIES

SH HIGH PRESSURE PTFE HOSE ASSEMBLIES

Smart-Hose® Safety System

High Pressure PTFE Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When a high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose® Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures.

The Smart-Hose® High Pressure PTFE hose assembly is designed to work with a high pressure PTFE hose and utilizes an internal cable that is designed specifically for high pressure PTFE gas applications.



Hose Data

- Cover** : SS Armor available on request
- Reinforcement** : Double Braid 304 SS
- Tube** : Teflon PTFE Tube; True ID; Post Sintered PTFE Tube
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; various ends available

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.



Optional Apparatus

- ✓ CGA connections ✓ Scuff Guard ... **and more!**

Hose Assemblies and Diameters

LL1 Diameters: ✓ ¼" ✓ ⅜" ✓ ½"

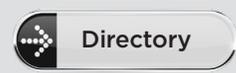
Open Flow Closed No Flow

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	End Fitting Weight (lb.)	Smart-Hose Part Number
¼"	3500	14000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.40	P02-002-17-XXXX-0-00-00 P02-002-11-XXXX-0-00-00 P02-002-19-XXXX-0-00-00
¼"	4500	18000	Bronze FNPT 316-SS FNPT Bronze Heat Dissipater FNPT	0.40	P04-002-12-XXXX-0-00-00 P04-002-11-XXXX-0-00-00 P04-002-21-XXXX-0-00-00
⅜"	4000	16000	Brass FNPT 316-SS FNPT	0.60	P03-003-17-XXXX-0-00-00 P03-003-11-XXXX-0-00-00
½"	4000	16000	Brass FNPT 316-SS FNPT Brass Heat Dissipater FNPT	0.80	P03-004-17-XXXX-0-00-00 P03-004-11-XXXX-0-00-00 P03-004-19-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet. Additional sizes and options available upon request.



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SH HIGH PRESSURE Stainless Steel HOSE ASSEMBLIES

Smart-Hose® Safety System

Ultra High Pressure Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When high pressure hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose® Safety System can protect your facility and workforce from the potentially devastating consequences associated with high pressure hose failures.

The Smart-Hose® Safety System is designed to work within high pressure stainless steel industrial hose assemblies.

Optional Apparatus

- ✓ Flanges
- ✓ CGA connections
- ✓ Acmes
- ✓ Armor
- ✓ Scuff Guard
- ... **and more!**



Hose Data

Braid	:	T304 Stainless Steel - Double
Hose	:	T316L Stainless Steel
Aarmor	:	T304 Stainless Steel
Temperature	:	Cryogenic to 1500°F

Features and Benefits

- ✓ Tested under water with CDA or nitrogen to working and test pressure.
- ✓ All high pressure hose assemblies are oxygen cleaned to industry standards.
- ✓ All hoses are serial numbered and shipped with a test certificate and operating booklet.
- ✓ No human intervention is needed to activate.

No special installation required!

LL1

Diameters: ✓ 1/4" ✓ 3/8" ✓ 1/2" ✓ 3/4" ✓ 1"



*Recommended for gaseous flow and liquid applications.



Normal Flow - LL1 Valves Open



Coupling Ejection - LL1 Valves Closed



SH ETFE Ultra

HIGH PRESSURE HOSE ASSEMBLIES

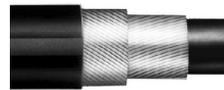
Smart-Hose® Safety System

ETFE Ultra High Pressure Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When an ultra high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose® Safety System can protect your facility and workforce from the potentially devastating consequences associated with ultra high pressure hose failures.

The Smart-Hose® Safety System is designed to work within ultra high pressure industrial hose assemblies with an ETFE tube typically used for ultra high pressure oxygen and inert gas applications.



Hose Data

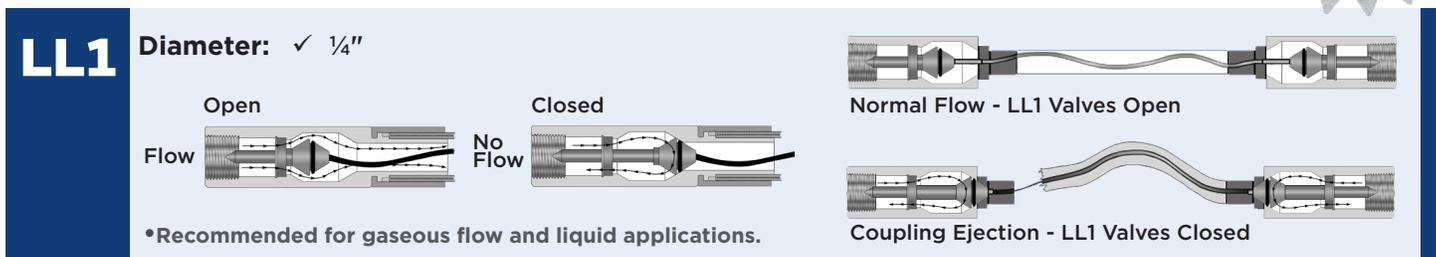
- Cover** : Smooth, tough abrasion resistant polyester cover (black)
- Design** : Smooth bore gas quality ETFE tube with aramid braid and one high tensile Stainless Steel 304 braid
- Tube** : Gas quality smooth bore ETFE tube
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; Various ends

Features and Benefits

- ✓ All ultra high pressure hose assemblies are oxygen cleaned to industry standards.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.

Optional Apparatus

- ✓ CGA connections
- ✓ Scuff Guard ... **and more!**



Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	Smart-Hose Part Number
¼"	6000	24000	Bronze FNPT	P18-002-12-XXXX-0-00-00
¼"	6000	24000	316-SS FNPT	P18-002-11-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.



SH PTFE Ultra HIGH PRESSURE HOSE ASSEMBLIES

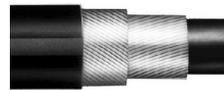
Smart-Hose® Safety System

PTFE Ultra High Pressure Hose Assemblies:

Integrated valves will instantly stop product flow if a **catastrophic** failure occurs. No human intervention is needed to activate.

When an ultra high pressure cylinder filling hose assembly fails, the hose can whip violently resulting in property damage, personnel injury, and even death. The Smart-Hose® Safety System can protect your facility and workforce from the potentially devastating consequences associated with ultra high pressure hose failures.

The Smart-Hose® Safety System is designed to work within ultra high pressure industrial hose assemblies with a PTFE tube typically used for ultra high pressure oxygen and inert gas applications.



Hose Data

- Cover** : Smooth, tough abrasion resistant polyester cover (black)
- Design** : Smooth bore gas quality PTFE tube with aramid braid and one high tensile Stainless Steel 304 braid
- Tube** : Gas quality smooth bore PTFE tube
- Accessories** : Safety loops; External Cable; Bend Restrictors; CGA; Various ends

Features and Benefits

- ✓ All ultra high pressure hose assemblies are oxygen cleaned to industry standards.
- ✓ Tested under water with CDA or nitrogen to working and test pressure.

Optional Apparatus

- ✓ CGA connections
- ✓ Scuff Guard ... **and more!**



LL1

Diameter: ✓ ¼"

Open

Flow

Closed

No Flow

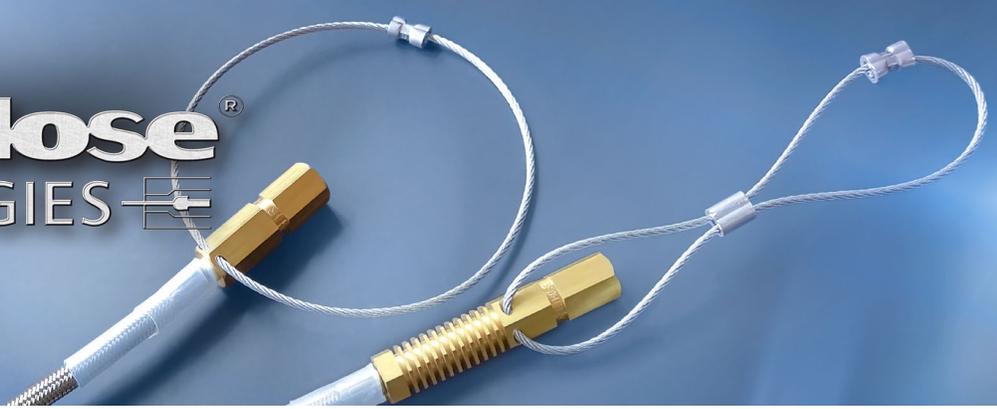
• Recommended for gaseous flow and liquid applications.

Normal Flow - LL1 Valves Open

Coupling Ejection - LL1 Valves Closed

Hose ID	Working Pressure PSI	Burst Pressure PSI	Smart-Hose End Fittings	Smart-Hose Part Number
¼"	6000	24000	Bronze FNPT	P17-002-12-XXXX-0-00-00
¼"	6000	24000	316-SS FNPT	P17-002-11-XXXX-0-00-00

NOTE: Serial numbered and shipped with a test certificate and operating booklet.



SH HIGH PRESSURE pigtail ACCESSORIES

Smart-Hose® Safety System



High Pressure Live Swivel

The high pressure live swivel is integrated into the end fitting and designed to work in conjunction with the Smart-Hose® Safety System. If a **catastrophic** failure occurs, the integrated valves will instantly stop product flow. No human intervention is needed to activate.

High Pressure Hose assemblies often experience premature hose failure due to excessive hose torque or twisting. The Smart-Hose® Live Swivel fitting is designed to allow the high pressure hose assembly the ability to maintain neutral torque during pressurization while extending the functional life of the hose assembly.

Features and Benefits

- ✓ The Live Swivel is integrated into, and works in conjunction with, the Smart-Hose® Safety Hose Assembly.
- ✓ Incorporates a robust dual o-ring seal design.
- ✓ Eliminates premature hose failure due to excessive hose torque or twisting.
- ✓ Allows the high pressure hose assemblies to maintain neutral torque during pressurization.
- ✓ Helps to extend the life of high pressure Smart-Hose® hose assemblies.

AND MORE Pigtail Accessories...

- ✓ Spring Guard
- ✓ Scuff Guard
- ✓ Safety Loops
- ✓ Bend Restrictors
- ✓ CGA Fittings
- ✓ Male NPT
- ✓ SS BSPP/BSPT Adapters
- ✓ Brass BSPP/BSPT Adapters
- ✓ Heat Dissipater Fittings
- ✓ External Anti-Whip Cable (with safety loops)
- ✓ Live Swivel Fitting (built into the end fitting)
- ✓ Live Swivel Adapter (threaded into standard fitting)