



HENRY
TECHNOLOGIES

Product Catalogue



DESIGNED FOR PERFORMANCE



www.henrytech.com

The information contained in this catalogue is correct at the time of publication.

Henry Technologies has a policy of continuous product development; we therefore reserve the right to change technical specifications without prior notice.

Extensive changes within our industry have seen products of Henry Technologies being used in a variety of new applications. We have a policy, where possible, to offer research and development assistance to our clients. We readily submit our products for assessment at the development stage, to enable our clients to ascertain product suitability for a given design application.

It remains the responsibility of the system designer to ensure all products used in the system are suitable for the application.

For details of our warranty cover, please refer to our standard terms and conditions of sale. Copies are available on our website.

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PRODUCT CATALOGUE E 1

Introduction	2
Manufacturing & Quality	3
Engineering & Product	4

Flow Controls

Ball Valves	5
Check Valves	8
Magnetic Check Valves	12
Expansion Valves	14
Flange Unions	15
Packed Shut Off Valves	17
Packed Line Valves	21
Industrial Shut Off Valves	23
Rotalock Valves	24
Rotalock Connectors	28
Capped Line Valves	29
Service Valves	32
Solenoid Valves	34
Solenoid Coils	36
Reversing Valves	38
Flow Switches	39
Moisture Indicators	40
Rotalock Sight Glasses	43
Sight Glasses	46
Liquid Indicators	47

Pressure Vessels

Liquid Receivers	48
Suction Accumulators	50

Safety Devices

Pressure Relief Valves	56
Pressure Relief Valves - X Series	58
Pressure Relief Valves - Transcritical CO ₂	60
Rupture Discs	62
Three Way Dual Shut Off Valves	64
Pressure Indicator	65
Sentry Safety Device Assemblies	66
Safety Device Kits	68

Compressor Protection Devices

Oil Management Systems	69
Helical Oil Separators	71
Impingement Type Oil Separators	75
Coalescent Oil Separators	78
Electronic Oil Controls	81
Oil Reservoirs	84
Reservoir Pressure Valves	86
Oil Strainers	87
Oil Filters & Oil Filter Driers	88
Discharge Mufflers	89
Vibration Eliminators	91

Liquid Management

Filter Drier & Strainers	93
Total Filtration Management Solutions	94
Sealed Filter Driers	95
Sealed Burnout Filter Driers	99
Pancake Filter Driers	101
Bi Flow Filter Driers	102
Replaceable Core Filter Driers	104

Fittings

Copper Fittings	107
Copper Couplings	109
Copper Bushes OD to ID	110
Copper Tees & Elbows	111
Copper Elbows & Return Bends	112
Copper Elbows, Bonnets & Y Pieces	113
Copper Stop Ends & Washers	114
Pipe Clips	115
Brass Fittings	116
Flare Nuts	117
Schrader Fittings	118
Brass Fittings	120
Unions	121
Forged Elbows	126
Forged Tees	128

Controls & Tools

Controls	130
Tools	131
Automotive	132

Terms & Conditions

133

Henry Technologies Group

Henry Technologies is a leading global manufacturer and supplier of air conditioning & refrigeration products, with an emphasis on refrigeration components and strengths in oil management controls and safety devices.

Since 1914 Henry Technologies continues to lead in the design and fabrication of products for a wide range of commercial and industrial applications, offering superior quality standards and technical leadership.

Through the consolidation of the Henry, AC&R and Heldon brands, Henry Technologies has one of the broadest component product portfolios in the commercial refrigeration industry, including refrigerant and oil flow control products, safety valves and system components.

With manufacturing facilities and operating subsidiaries in the USA, UK, Australia, China & Singapore, Henry Technologies markets its products globally to leading OEM's, wholesalers and contractors.

Henry Technologies' ability to serve their customers on a global basis is enhanced by their regional manufacturing operations and extensive sales and customer support.



Manufacturing

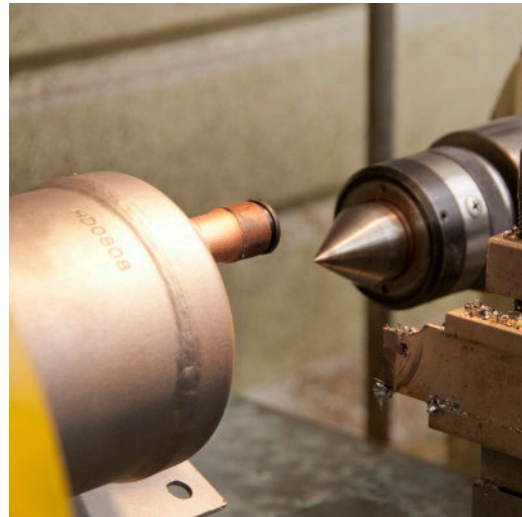
Henry Technologies remains committed to manufacturing in Australia and continues to invest in equipment and training to provide solutions to local challenges. Our engineers and technicians support a skilled staff of trade qualified welders, toolmakers and fitter/turners. Henry Technologies has a proven track record in Australia, in the production of quality pressure vessels to the AS/NZS standards, with customers across all areas of the HVAC&R industry.

Our firm belief in Australian manufacturing will be further evidenced by our largest ever investment in equipment during 2016.

Henry Technologies Pty Ltd is also supported by our other manufacturing locations in China, the UK and the USA. Henry Technologies Holdings have just invested over \$4 million USD in our China facilities together with our manufacturing partners in the Hendricks portfolio of investments. State of the art cutting, welding, brazing, helium testing and powder coating equipment is now used to produce the every-day products we sell to our markets worldwide.

Our Glasgow, UK factory has invested in new high pressure impulse technology for trans-critical CO2 components, while our USA factory continues to upgrade and re-invest in the factory in central Illinois.

We are proud that Henry Technologies continues a proud tradition of manufacturing, which spans a century and will continue to improve and invest in line with our strategic long term goals.



Quality

Henry Technologies Pty Ltd is an ISO 9001 accredited company, we do not have the certification for the sake of a piece of paper, we live and breathe the tenets of the standard and it forms part of our commitment to our excellent quality record. We understand that quality is a given for any customer and is not a luxury, we expect our products to perform to their design intent and to provide trouble free operation for our customers.

Our welding and brazing procedures are independently tested and qualified by Welding Technology Institute of Australia certified welding inspectors. The Henry Technologies Group worldwide enjoys an enviable reputation for quality and performance; we at Henry Technologies in Australia are committed to protecting our brand and the important brand names of our customers.

Engineering

Henry Technologies can boast over 75 years of engineering design experience in our Tullamarine facility, of which a combined 40 years are in the HVAC&R industry. Our engineers work closely with our customers to provide solutions and help to improve outcomes. Our products are “designed for performance” using the latest mathematical modelling and CAD software. Within the Henry group we have the following capabilities:

- Rapid prototyping
- Computer Flow Analysis (CFD)
- Finite Element Analysis
- Pressure vessel design software
- 3D scanning
- 3D Printing

Our engineers are also on hand to support technical questions from the industry and have representation or membership in all of the major industry organisations such as:

- AIRAH (Aus)
- AREMA (Aus)
- ASHRAE (USA)
- AHRI (USA)
- IIOR (International)
- IOR (UK)

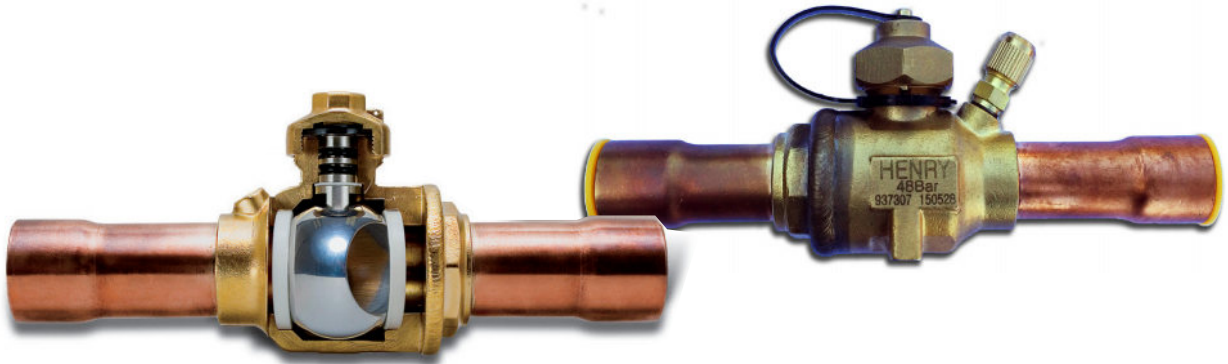
Product

Our products stand as testament to our philosophy as a company. The right materials, to the right dimensions, in the right order. Materials selection is the first point for all new products; it is the very foundation of our success. We offer one of the widest ranges of refrigeration components in the market, crucial to providing our customers with a “one stop shop” experience. Once you buy something from Henry you realise that many of your purchasing challenges simply go away. We offer fully kitted products such as safety devices and charging assemblies, as well as your driers, sight-glasses, separators, accumulators, receivers, flexible hoses, vibration absorbers, pipe and fittings. We fit rotalock valves and full flow valves to receivers, as well as liquid level probes and level sensors. We can even supply your fans and fan motors.

Our products are designed to provide the “best installed cost” for our customers, what does that mean? It doesn’t mean the cheapest purchase price; it means the least cost to get equipment up and running efficiently with no breakdowns and no call backs.



Ball Valves



Ball valves are used in a wide variety of air conditioning and refrigeration applications. They can be used for both liquid and gas applications. Ball valves are commonly used for isolating purposes. All ball valves are suitable for HCFC and HFC refrigerants, along with their associated oils. The SWP of these valves allows them to be used for R410A and sub-critical CO₂ applications.

Materials of Construction

The valve body, valve body adaptor, and seal cap are made from brass. The stem is made from stainless steel. The pipe extensions are made from copper. The ball seals are made from virgin PTFE, stem O-rings and cap seal from neoprene. The ball is made from electro-plated brass.

Installation – Main Issues

The valve body must be protected against excessive heat during installation, to prevent damage to the seals. Full instructions are given in the Product Instruction Sheet included with each valve.

Technical Specification

Allowable Operating Temperature = -40°C to +150°C

Allowable Operating Pressure = 0 to 4,800 kPag (0 to 700 psig)

Sealing Integrity Features

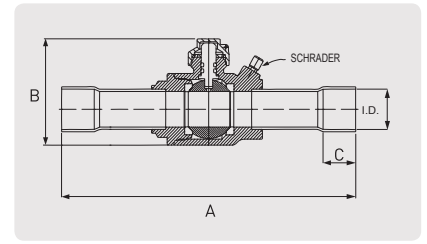
- Premium quality PTFE ball seals.
- Double O-ring stem seal design.
- Premium quality neoprene stem O-ring seals
- Neoprene cap seal (on new line)

Features

- Bi-directional flow.
- Mounting pad for easy installation.
- Extended copper tails.
- Indicator on stem shows valve position – open or closed.
- Fully opened or closed with a quarter turn of the valve stem.
- Positive stem stop ensures precise positioning in the open or closed position.
- Blow-out proof stem design.
- Double stem seal.
- Ball cavity vented to prevent over-pressure.
- Schrader Access options: 1/4" or 5/16"
- Integral Schrader access fitting on brass body.
- Full flow port design on Valves 3/8" to 3-1/8".
- Body is hermetically sealed.
- Hexagonal seal cap with plastic tether included.
- Helium tested to a maximum of 4.69 E⁻⁷ cm³/sec.

Benefits

- May be installed in any position.
- Can be mounted securely preventing undue stress on the connecting pipe work.
- Allows for quick and easy installation.
- At a glance the valves position can be determined when cap is removed.
- Quick & simple operation gives the operator full control.
- Flow indicator arrow ensures the valve is in the position it is meant to be in – open or closed.
- Cannot blow out under pressure due to its design.
- Double O-Ring stem seal provides a greater sealing surface.
- Provides equalisation of pressure surrounding ball to ensure smooth easy action. Allows for liquid expansion.
- Allow access to system pressure measurement.
- Schrader Access is positioned on the main body there is less chance of damage to the valve during installation.
- Full Flow means minimal pressure drop across the range of valves on offer.
- A streamlined design that is fully rated to 48 bar.
- Seal cap can be safely secured to valve body. The Neoprene seal in the cap is the final defence in the Henry Triple Stem Seal design.
- Helium leak tested: The smaller Helium molecule enables detection of minute leaks that may not be detected by other leak testing methods.

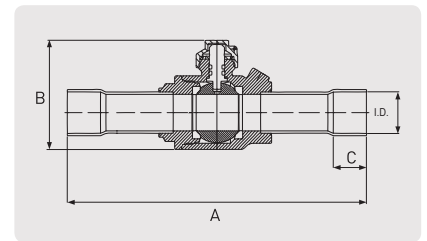


1/4" Schrader Access Port Fitted

Part No.	Conn. Size ID (Inch)	Dimensions (mm)			Mounting Hole Size	Ball Port Diameter (Inch)	Kv (m3/hr)**	Weight (kg)
		A	B	C				
937203	3/8	165	54	8	#8 -36 UNF	1/2	3.7	0.33
937204	1/2	165	54	10	#8 -36 UNF	1/2	6.0	0.33
937205	5/8	165	54	13	#8 -36 UNF	1/2	12.0	0.33
937306	3/4	184	67	16	#8 -36 UNF	3/4	18.1	0.62
937307	7/8	184	67	19	#8 -36 UNF	3/4	26.1	0.64
937409	1-1/8	216	76	23	#10 -32 UNF	1	52.9	0.95
937511	1-3/8	235	94	25	#10 -32 UNF	1-1/4	73.5	1.52
937613	1-5/8	254	109	28	1/4 -28 UNF	1-1/2	182.8	2.44
937617	2-1/8	289	132	34	1/4 -28 UNF	2	245.7	4.58
937721*	2-5/8	327	132	37	1/4 -28 UNF	2	205.2	5.04
937721FP	2-5/8	365	154	37	1/4 -28 UNF	2-1/2	259.5	8.73
937825FP	3-1/8	420	178	43	5/16-24 UNF	3-1/8	362.1	18.20

* Reduced Port

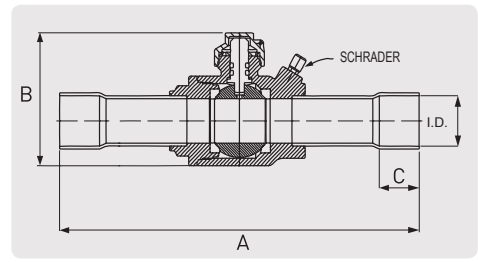
** Kv rating @ 1 bar pressure drop across valve



No Access Port Fitted

Part No.	Conn. Size ID (Inch)	Dimensions (mm)			Mounting Hole Size	Ball Port Diameter (Inch)	Kv (m3/hr)**	Weight (kg)
		A	B	C				
907203	3/8	165	54	8	#8 -36 UNF	1/2	3.7	0.33
907204	1/2	165	54	10	#8 -36 UNF	1/2	6.0	0.33
907205	5/8	165	54	13	#8 -36 UNF	1/2	12.0	0.33
907306	3/4	184	67	16	#8 -36 UNF	3/4	18.1	0.62
907307	7/8	184	67	19	#8 -36 UNF	3/4	26.1	0.64
907409	1-1/8	216	76	23	#10 -32 UNF	1	52.9	0.95
907511	1-3/8	235	94	25	#10 -32 UNF	1-1/4	73.5	1.52
907613	1-5/8	254	109	28	1/4 -28 UNF	1-1/2	182.8	2.44
907617	2-1/8	289	132	34	1/4 -28 UNF	2	245.7	4.58
907825FP	3-1/8	420	178	43	5/16-24UNF	3-1/8	362.1	18.20

** Kv rating @ 1 bar pressure drop across valve



5/16" Schrader Access Port Fitted

Part No.	Conn. Size ID (Inch)	Dimensions (mm)			Mounting Hole Size	Ball Port Diameter (Inch)	Kv (m3/hr)**	Weight (kg)
		A	B	C				
947203	3/8	165	54	8	#8 -36 UNF	1/2	3.7	0.33
947204	1/2	165	54	10	#8 -36 UNF	1/2	6.0	0.33
947205	5/8	165	54	13	#8 -36 UNF	1/2	12.0	0.33
947206	3/4	184	67	16	#8 -36 UNF	3/4	18.1	0.62
947307	7/8	184	67	19	#8 -36 UNF	3/4	26.1	0.64
947409	1-1/8	216	76	23	#10 - 32 UNF	1	52.9	0.95
947511	1-3/8	235	94	25	#10 - 32 UNF	1-1/4	73.5	1.52

** Kv rating @ 1 bar pressure drop across valve

Check Valves

Check Valves are used in refrigeration and air-conditioning when the liquid or vapour refrigerant is required to flow in one direction only. The Check Valve allows for full flow in the direction of operational flow while preventing flow in the opposite direction. A typical application would be to install a check valve downstream of an oil separator. This prevents condensed liquid refrigerant from returning down the discharge line and into the oil separator.

Please note that In-line Check Valves are not suitable for discharge lines of reciprocating compressors. This is due to the reciprocating compressors discharge pressure pulsations.

The Henry Technologies range includes both the Lift type and the In-line type Check Valves.

The Lift Check Valves are: 116, 205 & 2027 Series
(Note: 205 Series is replacing the old 2024 Series)

The In-line Check Valves are: 119 & 120 Series
(Note: 119 & 120 Series is replacing the old 2001 & 2006 Series)

Henry Technologies check valve are suitable for HCFC and HFC refrigerants, along with their associated oils. Typically, Henry Technologies Check Valves will start to open at 3.4 kPa and be fully open at 34 kPa.



Features

- Flow direction arrow.
- Minimum opening pressure required.
- Designed for maximum flow and minimum pressure drop.
- Robust design.
- Optimised seat material.
- Models available with copper extensions – 120 Series.
- Working Temperature range:
 - 116 & 205 Series = -40 °C to 150 °C
 - 119 & 120 Series = -30 °C to 90 °C
 - 2027 Series = -40 °C to 100 °C

Benefits

- Ensures correct installation.
- Does not impose a load on the system.
- Negligible loss in system efficiency.
- Provides stable platform when mounted in a system.
- Efficient sealing with negligible leak rate.
- Quick and easy installation.
- Suitable for a wide range of applications.

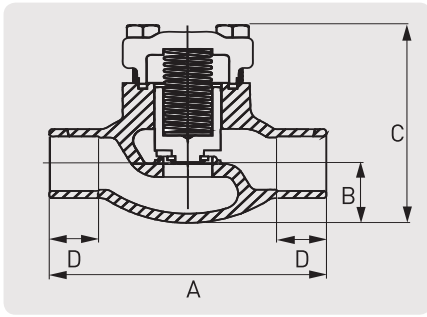
Installation – Main issues

- Valves must be installed in accordance with the flow direction arrow.
- The valve bodies and valve internals must be protected against damage during brazing. Full instructions are given in the Product Instruction Sheet, included with each valve.
- Series 205 valves up to 1 3/8" connector size can be installed in any position except bonnet down. For larger sizes, the bonnet must be positioned upwards. For all models, the recommended bonnet position is upwards.
- Discharge check valves should be positioned as far from the compressor as possible.

Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2, CE & UL

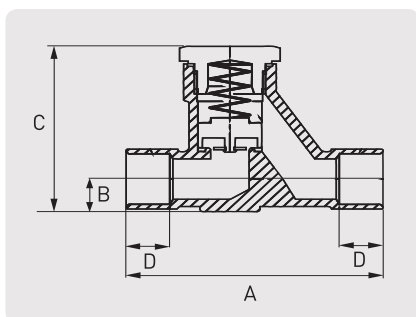
Safe Working Pressure	= 3,100 kPa / 205 Series
	= 3,500 kPa / 116, 119 & 120 Series
	= 4,200 kPa / 2027 Series



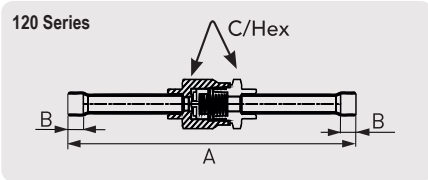
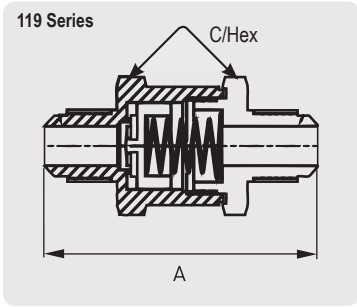
Part No.	Connection Size ID (Inch)	Dimensions (mm)				Kv (m3/Hr)	Weight (kg)	CE Cat
		A	B	C	D			
205-7/8	7/8	108	25	80	19	6.1	1.24	SEP
205-1-1/8	1-1/8	124	29	98	24	8.6	2.00	SEP
205-1-3/8	1-3/8	137	32	108	25	11.9	2.74	Cat I
205-1-5/8	1-5/8	165	38	129	29	15.4	4.23	Cat I
** 205-1-5/8-15	1-5/8	165	38	129	29	15.4	4.23	-
205-2-1/8	2-1/8	216	51	157	38	25.5	7.76	Cat I
205-2-5/8	2-5/8	279	57	183	43	42.3	12.44	Cat I

** Designed for Heat Reclaim Bypass

Part No.	Conn. Size (Inch)	Style	R404A		
			Liquid Lines (kW)	Suction Vapour (kW)	Hot Gas (m3/hr)
205-7/8	7/8	Globe, Bolted Bonnet	29.5	1.8	62.9
205-1-1/8	1-1/8	Globe, Bolted Bonnet	42.3	3.5	87.2
205-1-3/8	1-3/8	Globe, Bolted Bonnet	57.3	7.0	121.6
205-1-5/8	1-5/8	Globe, Bolted Bonnet	74.2	11.6	157.3
205-1-5/8-15	1-5/8	Globe, Bolted Bonnet	74.2	11.6	157.3
205-2-1/8	2-1/8	Globe, Bolted Bonnet	122.7	32.0	260.1
205-2-5/8	2-5/8	Globe, Bolted Bonnet	204.0	88.3	432.1
116007	7/8	Y Type Screwed Bonnet	47.1	4.8	100.0

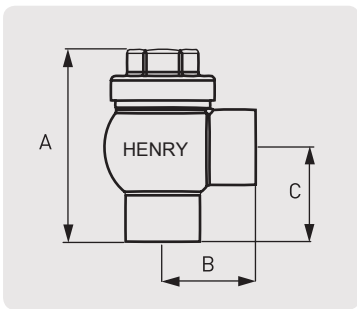


Part No.	Connection Size ID (Inch)	Dimensions (mm)				Kv (m3/Hr)	Weight (kg)	CE Cat
		A	B	C	D			
116007	7/8	98.6	16.0	74.7	22.4	3.1	0.93	SEP



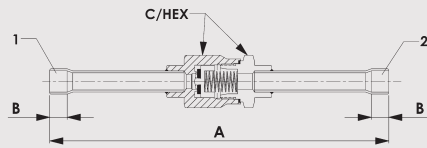
Straight Through Design

Part No.	Connection Size	Dimensions (mm)			Weight (kg)
		A	B	C/Hex	
119-3/8	3/8 FL	63.8	-	21	0.12
119-1/2	1/2 FL	76.2	-	32	0.13
120-3/8	3/8 ID	133.4	7.9	21	0.13
120-5/8	5/8 ID	159.5	12.7	32	0.29

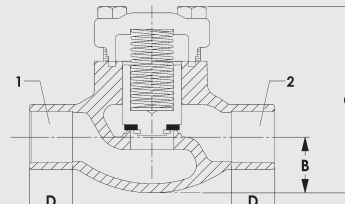


Angle Female Solder

Part No.	Connection Size ID (Inch)	Dimensions (mm)			Kv (m3/Hr)	Weight (kg)
		A	B	C		
2027-1414	7/8	96	47	40	8.95	0.82

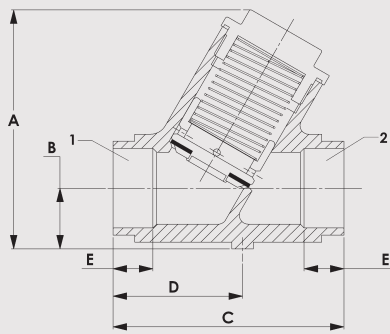


120 SERIES

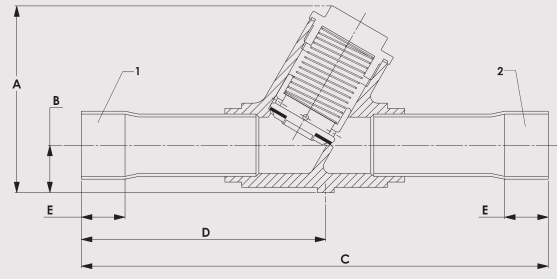


205 SERIES

- 1 Inlet ODS
- 2 Outlet ODS



NRV SERIES



NRV E SERIES

Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	Kv (m³/hr)	CE Cat
		A	B	C	D			
205-7/8	7/8 ODS	108	25	80	19	1.10	4.58	SEP
205-1 1/8	1 1/8 ODS	124	29	98	24	2.02	6.40	SEP
205-1 3/8-CE	1 3/8 ODS	137	32	108	25	2.64	8.90	Cat I
205-1 5/8-CE	1 5/8 ODS	165	38	129	29	4.43	11.50	Cat I
205-2 1/8-CE	2 1/8 ODS	216	51	157	38	7.75	19.03	Cat I
205-2 5/8-CE	2 5/8 ODS	279	57	183	43	12.50	31.57	Cat I

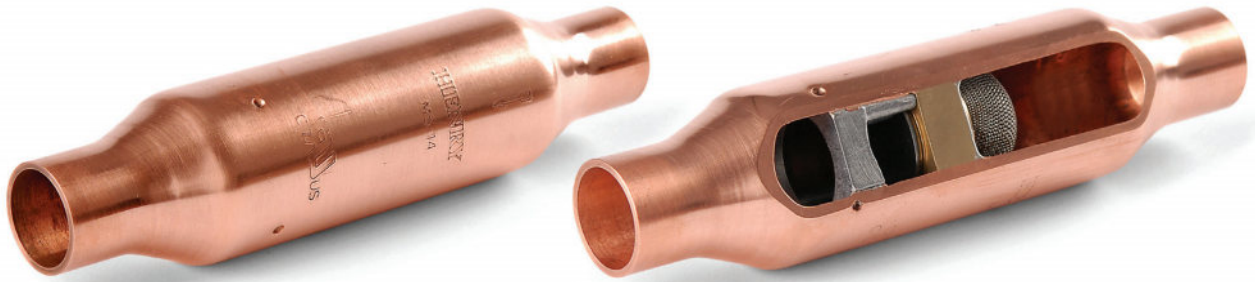
Part No	Conn Size (inch)	Dimensions (mm)					Weight (kg)	Kv (m³/hr)	CE Cat
		A	B	C	D	E			
NRV14	7/8 ODS	78	20	70	38	11	0.60	5	SEP
NRV18	1 1/8 ODS	78	20	70	38	11	0.53	8.5	SEP
NRV22-CE	1 3/8 ODS	106	27	102	57	17	1.30	13.5	Cat I
NRV26-CE	1 5/8 ODS	106	27	102	57	17	1.20	16	Cat I

Part No	Conn Size (inch)	Dimensions (mm)					Weight (kg)	Kv (m³/hr)	CE Cat
		A	B	C	D	E			
NRV14E	7/8 ODS	78	20	191	98	19	0.77	5.0	SEP
NRV18E	1 1/8 ODS	78	20	225	116	23	0.79	8.5	SEP
NRV22E-CE	1 3/8 ODS	106	27	264	138	25	1.70	13.5	Cat I
NRV26E-CE	1 5/8 ODS	106	27	270	138	28	1.60	16.0	Cat I

Installation – Main issues

1. Valves must be installed in accordance with the flow direction arrow.
2. The valve bodies and valve internals must be protected against damage during brazing. Full instructions are given in the Product Instruction Sheet, included with each valve.
3. Series 116 valves can be installed in any position except bonnet down. This is the same for 205 series up to 1 3/8" size. For larger sizes, the bonnet must be positioned upwards. The bonnet of the NRV series should be positioned upwards. For all models, the recommended bonnet position is upwards.
4. Discharge check valves should be positioned as far from the compressor as possible.

Magnetic Check Valves



The Henry Technologies check valve uses magnetic attraction to return the valve plate to its seat rather than spring pressure. A conventional type check valve requires an increase in pressure to force the valve plate off its seat leading to an increase in pressure drop. The magnetic check valve (MCV) has a decreasing force to move it away from its seat. The further it travels the magnetic attraction diminishes leading to a decrease in pressure drop. MCV's are therefore a more efficient option to the conventional check valves.

The Henry MCV uses the latest technology in Dura Form processing, a manufacturing method that eliminates the use of braze materials that can overheat and damage internal components. The body is 100% copper that has been spun into shape and the connections machined. The result is a valve that is hermetically sealed, can easily be installed with either soft or hard solder, with a near zero leak rate and exceptional performance.

Suitable for use in the Liquid, Suction, Discharge or Hot Gas lines employing fluorinated refrigerants, these valves are ideal in a new installation or as a replacement for conventional check valves.

MCV's are not recommended for Heat Reclaim applications with high differential pressures.

Features

- Designed for maximum flow and minimal pressure drop.
- Hermetically sealed copper body.
- Optimised seat material with a Neoprene coated valve plate.
- Multi orientation while maintaining flow direction.
- Built in 30 mesh strainer.
- Working Temperature range = 40 °C to 150 °C.
- Safe Working Pressure 5,200 kPa up to 5/8" sizes.

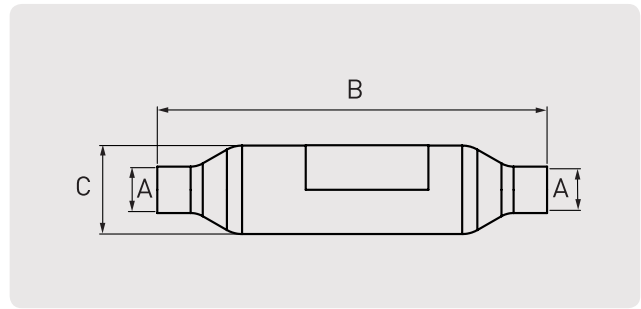
Benefits

- Negligible loss in system efficiency.
- Stable platform with no chance of a leak.
- Efficient sealing with a negligible leak rate.
- Able to be installed in any position.
- Strain debris out of the system and extend the valve service life.
- Suitable for a wide range of applications, including combination (muffler/check valve).
- Compatible with all fluorinated refrigerants and oils.

Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2

Safe Working Pressure: Please refer to table on next page for details.



Dimensions

Part No.	Connection Size A	Description	Valve Length (mm) B	Valve Dia. (mm) C	Weight (kg)
F6306	1/4	MS-4	102	22.3	0.09
F6307	3/8	MS-6	102	22.3	0.09
F6308	1/2	MS-8	127	28.6	0.15
F6309	5/8	MS-10	127	28.6	0.15
F6310	3/4	MS-12	178	41.3	0.39
F6311	7/8	MS-14	178	41.3	0.39
F6312	1-1/8	MS-18	213	54	0.67
F6314	1-5/8	MS-26	267	79.4	1.63
F6315	2-1/8	MS-34	305	92.1	2.47
F6316	2-5/8	MS-42	330	105	3.54

Capacities

	Suction (kW)			Liquid (kW)			SWP (kPa)	Kv m3/Hr
	R22	R134a	R404A	R22	R134a	R404A		
F6306	1.1	0.8	0.9	9.5	8.8	6.8	5,520	0.47
F6307	2.2	1.6	2.0	19.9	18.3	14.2	5,520	0.99
F6308	6.0	4.4	5.3	53.8	49.4	38.2	4,830	2.67
F6309	6.7	4.9	5.9	60	55.1	42.6	4,830	2.98
F6310	12.5	9.2	11	112.2	103.1	79.7	4,830	5.56
F6311	17	12.5	15	152.8	140.4	108.5	4,830	7.58
F6312	29.6	21.7	26.1	265.9	244.3	188.8	4,830	13.19
F6314	62.3	45.8	54.9	560.1	514.6	397.7	4,830	27.78
F6315	108.2	79.5	95.5	973.3	894.3	691.1	4,830	48.27
F6316	145.2	106.7	128.1	1,305.9	1,200	927.3	4,480	64.76

The rated liquid and suction capacities are based on an evaporating temperature: An average temperature of $t_e = -10^\circ\text{C}$, liquid temperature ahead of the valve $t = 25^\circ\text{C}$ and a pressure drop across the valve of $p = 15 \text{ kPa}$ (2.18 psi).

Expansion Valves

The function of an Expansion Valve is to meter liquid refrigerant and induce a large pressure drop causing the refrigerant to cool rapidly.

Applications

Expansion Valves are used immediately prior to the evaporator in a refrigeration or air conditioning system. These valves are suitable for use with ammonia, HCFC and HFC refrigerants and their associated oils, as well as other industrial fluids non-corrosive to steel and ductile iron.

Main Features

- Backseating stem to allow for replacing stem packing while under pressure
- Four bolt bonnet flange design
- Internal replacement parts available
- NPT connections

Technical Specifications

Maximum working pressure = 400 PSI (27.6 Bar)
 Allowable operating temperature = -20°F to +275°F (-29°C to +135°C)

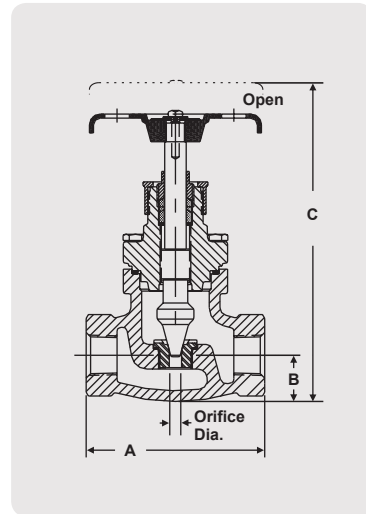
Materials of Construction

The body and bonnet are made from ductile iron. The stem is made from stainless steel. The seat insert is made from cold rolled steel. The bonnet gasket is made from Garlock 2930.



Stem Turns From Closed	*Cv Value						
	1/4	1/2	3/4	1	2	3	Full Open
Valve P/N							
320F-E	0.09	0.22	0.40	0.56	1.00	1.28	1.58
330F-E	0.20	0.42	0.71	0.95	1.50	2.09	2.60
340F-E	0.34	0.81	1.21	1.62	2.89	3.80	4.51

*Water GPM at 1 psi pressure drop at +86°F



Part No	NPT Conn (inch)	Dimensions (inch)			Orifice Diameter (inch)	Weight (lbs.)
		A	B	C		
320F-E	1/2	3.63	0.94	6.17	0.25	2.5
330F-E	3/4	3.63	0.94	6.17	0.38	2.5
340F-E	1	4.13	1.10	6.30	0.50	3.5

Flange Unions

Flange Unions offer a convenient method for connecting pipe and installing shut-off valves with identical groove patterns.

Applications

Flange Unions are a practical alternative to weld or screw end connections. Where shut-off valves are used in conjunction with the flanges the valves may be replaced without performing any cutting operations. NPT and Socket Weld Flanges are suitable for use with ammonia, HCFC and HFC refrigerants and their associated oils, as well as other industrial fluids non-corrosive to steel and Garlock #2930. Lead gaskets are also available for two bolt NPT and Socket Weld Flanges for chlorine service.

ODS Flanges are suitable for use with HCFC and HFC refrigerants and their associated oils, as well as other industrial fluids non-corrosive to steel, copper and Garlock #2930.

Main Features

- Two bolt flange design, connection sizes 1/2" to 1" nominal
- Four bolt flange design, connection sizes 1" to 4" nominal
- Connection types available: NPT, Socket Weld and ODS
- All flanges with the same nominal connection size and number of bolts are interchangeable
- All flange dimensions of the same type and nominal size are identical to those used on Henry Valve flanged handwheels and seal cap valves

Technical Specifications

NPT and Socket Weld Series

Maximum working pressure sizes 1/2" to 2" = 1500 PSI (103.4 Bar)

Maximum working pressure sizes 2-1/2" to 4" = 500 PSI (34.5 Bar)

Allowable operating temperature = -20°F to +275°F (-29°C to +135°C)

ODS Series

Maximum working pressure = 500 PSI (34.5 Bar)

Allowable operating temperature = -20°F to +275°F (-29°C to +135°C)

Materials of Construction

NPT and Socket Weld Series

The flange body is made from ASTM A105 forged steel. The bolts are made from SAE Grade 5 steel. The gasket is made from Garlock #2930.

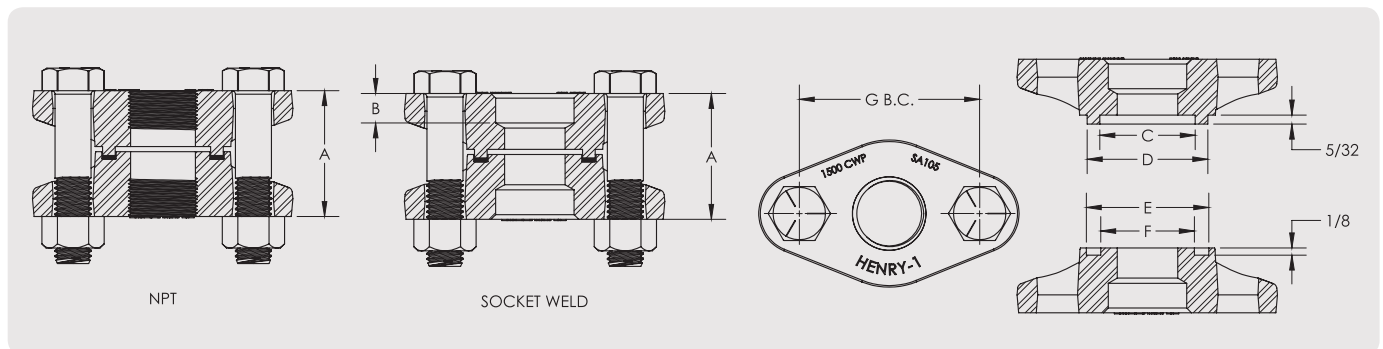
ODS Series

The flange body is made from ASTM A105 forged steel. The connections are made from solid copper. The gasket is made from Garlock #2930.

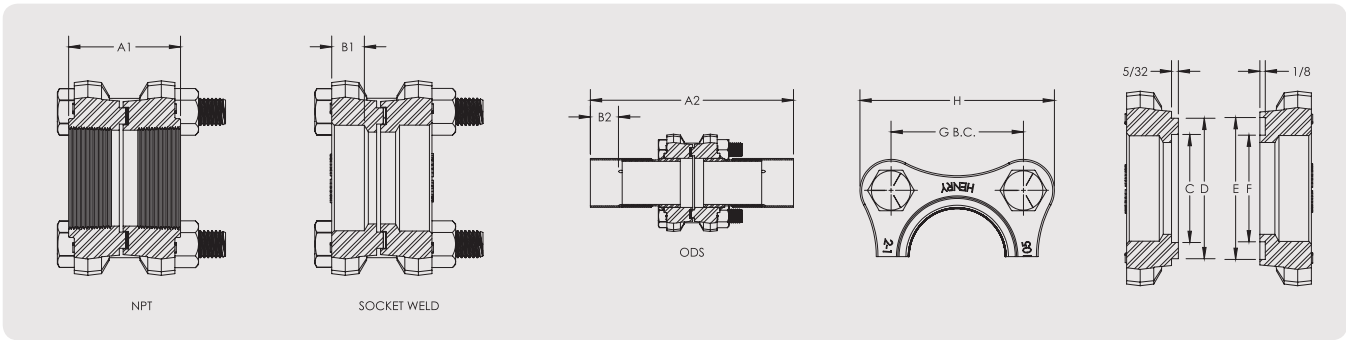


Additional Information

1. For single flanges only, add the suffix letter "F" (female) or "M" (male) to the flanges union catalogue number.
2. Hardware kits are available separately; includes nuts, cap screws and gasket.
3. Flanges for installation onto Henry valves up to 4" nominal - order the flanged union catalogue number. The appropriate number of additional bolts and nuts are provided with all flanged valves.
4. Flange kits include two gaskets.
5. Flanges designated for chlorine service, order lead gaskets, available only on 2-bolt designs. Lead Gasket part number is 5-023-097.



OVAL TYPE WITH FEMALE PIPE THREAD & SOCKET WELD DESIGN											
Part No		Conn Size (inch)	Dimensions (inch)							Weight (lbs)	
NPT	Socket Weld		A	B	C	D	E	F	G	NPT	Socket Weld
O2PT-1X1/2	O2SW-1X1/2	1/2	2.19	0.38	1.66	2.09	2.13	1.63	3.13	3.75	3.75
O2PT-1X3/4	O2SW-1X3/4	3/4	2.19	0.51	1.66	2.09	2.13	1.63	3.13	4.00	4.00
O2PT-1	O2SW-1	1	2.19	0.51	1.66	2.09	2.13	1.63	3.13	3.50	3.50



SQUARE TYPE WITH NPT & SOCKET WELD CONNECTIONS												
Part No		Conn Size (inch)	Dimensions (inch)								Weight (lbs)	
NPT	Socket Weld		A1	B1	C	D	E	F	G	H	NPT	Socket Weld
S2PT-1 1/4X1	S2SW-1 1/4X1	1	2.20	0.50	1.85	2.28	2.31	1.81	2.38	3.75	5.25	5.25
S2PT-1 1/4	S2SW-1 1/4	1 1/4	2.20	0.75	1.85	2.28	2.31	1.81	2.38	3.75	5.25	5.25
S2PT-2X1-1/2	S2SW-2X1-1/2	1 1/2	2.59	0.75	2.50	3.25	3.28	2.47	3.06	4.50	9.00	8.75
S2PT-2	S2SW-2	2	2.59	0.75	2.50	3.25	3.28	2.47	3.06	4.50	7.75	7.50
N/A	S2SW-2-1/2	2 1/2	2.97	1.00	3.00	3.75	3.78	2.97	4.00	5.63	N/A	13.25
N/A	S2SW-3	3	3.19	1.13	3.63	4.38	4.41	3.59	4.13	6.00	N/A	15.75
N/A	S2SW-4	4	3.19	1.13	4.75	5.50	5.53	4.72	5.00	7.00	N/A	22.00

SQUARE TYPE WITH ODS CONNECTIONS										
Part No	Conn Size (inch)	Dimensions (inch)								Weight (lbs)
ODS		A2	B2	C	D	E	F	G	H	ODS
S2OD-1-3/8	1 3/8	7.44	0.97	1.85	2.28	2.31	1.81	2.38	3.75	5.75
S2OD-2X1-5/8	1 5/8	8.40	1.09	2.50	3.25	3.28	2.47	3.06	4.50	9.75
S2OD-2-1/8	2 1/8	9.40	1.34	2.50	3.25	3.28	2.47	3.06	4.50	8.75
S2OD-2-5/8	2 5/8	10.40	1.47	3.00	3.75	3.78	2.97	4.00	5.63	15.00
S2OD-3-1/8	3 1/8	11.34	1.66	3.63	4.38	4.41	3.59	4.13	6.00	18.50
S2OD-4-1/8	4 1/8	13.50	2.16	4.75	5.50	5.53	4.72	5.00	7.00	28.00

*O.D. Solder connections are suitable for halocarbon refrigerants only

Hardware Kits	
Flange Union	Kit (Nuts, Cap Screws, Gasket)
O2PT-1X1/2	8-006-033
O2PT-1X3/4	8-006-033
O2PT-1	8-006-033
O2SW-1X1/2	8-006-033
O2SW-1X3/4	8-006-033
O2SW-1	8-006-033
S2PT-1-1/4X1	8-006-034
S2PT-1-1/4	8-006-034
S2PT-2X1-1/2	8-006-035
S2PT-2	8-006-035
S2OD-1-3/8	8-006-034
S2OD-2X1-5/8	8-006-035
S2OD-2-1/8	8-006-035
S2OD-2-5/8	8-006-036
S2OD-3-1/8	8-006-037
S2OD-4-1/8	8-006-037
S2SW-1-1/4X1	8-006-034
S2SW-1-1/4	8-006-034
S2SW-2X1-1/2	8-006-035
S2SW-2	8-006-035
S2SW-2-1/2	8-006-036
S2SW-3	8-006-037
S2SW-4	8-006-037

Packed Shut Off Valves

Packed valves are so called as the stem is sealed via a packed gland. The Henry Technologies range incorporates the 7, 926, 927 and 203 series.

Applications

Henry Technologies packed valves are used in a variety of air conditioning and refrigeration applications for isolating, flow control, charging and purging purposes.

All valves are suitable for HCFC and HFC refrigerants, along with their associated oils.

The 7761 to 7775 models are also suitable for ammonia.

Main features

- Wide range of inlet and outlet connection sizes
- Compact
- Back-seating options allow packing replacement in-situ

Technical Specification

Allowable operating pressure = 0 to 34.5 barg (77-B & 78 series)

Allowable operating pressure = 0 to 48.0 barg (92 brass series)

Allowable operating pressure = 0 to 31.0 barg (203 series)

Allowable operating pressure = 0 to 69.0 barg (77 steel series)

Allowable operating temperature = -29°C to +149°C
(All valves except 203 series)

Allowable operating temperature = -40°C to +163°C (203 series only)



Materials of Construction

For 77-B, 78 and 92 brass series:-

The valve body is made from brass. The stem is made from plated steel. A metal-to-metal seat seal is used. A graphite compound is used for the packing gland. The seal cap is made from moulded plastic.

For 203 brass series:-

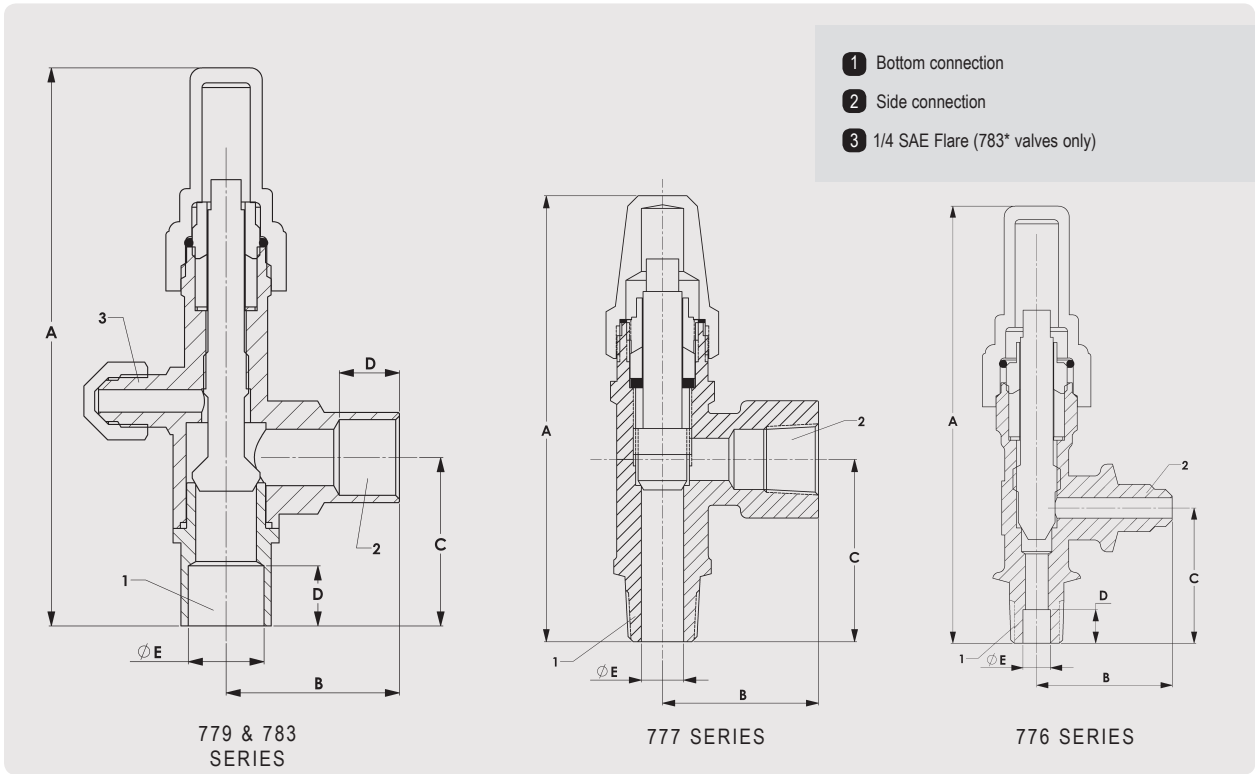
The valve body and bonnet are made from bronze and brass respectively. The stem is made from stainless steel. The seat seal material is PTFE.

A graphite compound is used for the packing gland. The seal cap is made from moulded plastic.

For 77 steel series:-

The valve body is made from steel. The stem is made from plated steel.

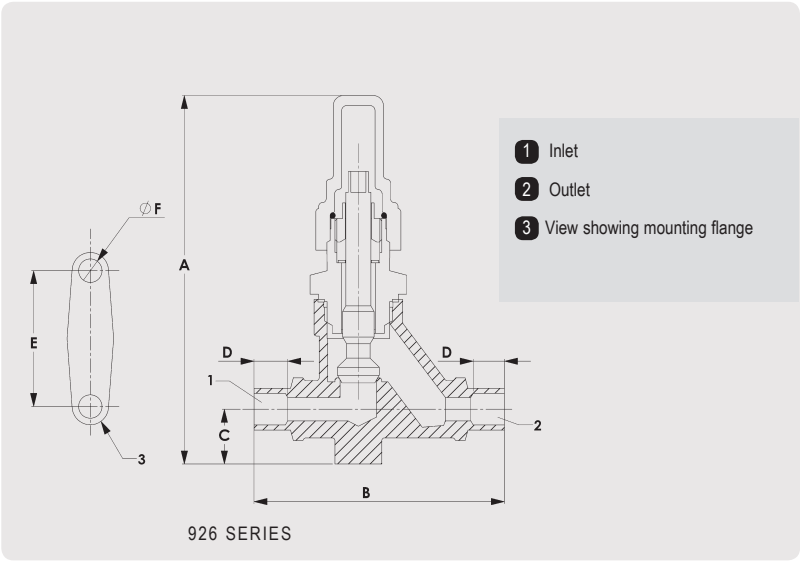
A metal-to-metal seat seal is used. A graphite compound is used for the packing gland. The seal cap is made from moulded plastic or steel.



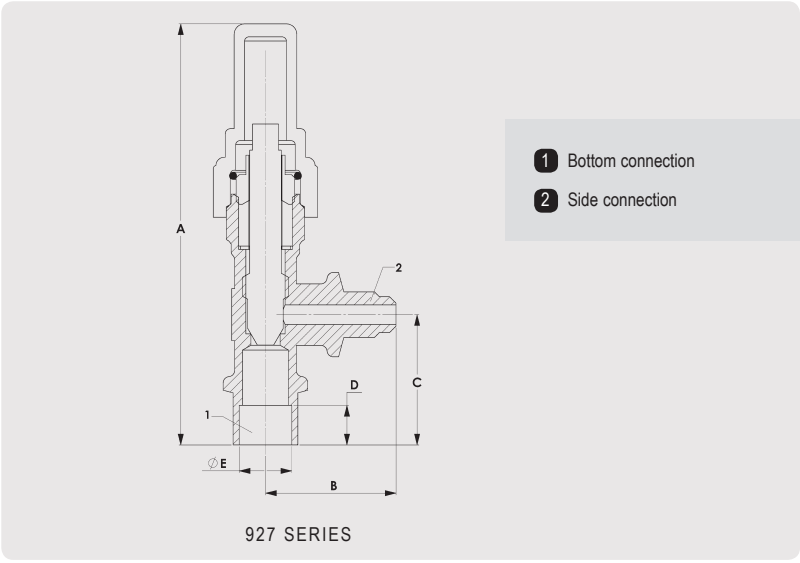
	Part No	Conn Size (inch)		Dimensions (mm)				Ø E (inch)	Weight (kg)	MWP (barg)	CE Cat
		Bottom	Side	A	B	C	D				
Non-backseating	7761-B	1/4 MPT	1/4 SAE Flare	98	32	32	8	1/4 ODS	0.15	34.5	SEP
	7771-B	1/4 MPT	1/4 FPT	98	32	32	8	5/16 ODS	0.15	34.5	SEP
	7763-B	1/4 MPT	3/8 SAE Flare	98	32	32	8	5/16 ODS	0.14	34.5	SEP
	7764-B	3/8 MPT	1/4 SAE Flare	98	32	32	8	3/8 ODS	0.15	34.5	SEP
	7766-B	3/8 MPT	3/8 SAE Flare	98	32	32	8	3/8 ODS	0.14	34.5	SEP
	7767-B	3/8 MPT	1/2 SAE Flare	98	32	32	8	3/8 ODS	0.15	34.5	SEP
	7768-AB	1/2 MPT	3/8 SAE Flare	99	33	35	10	1/2 ODS	0.32	34.5	SEP
	7768-B	1/2 MPT	5/8 SAE Flare	99	41	35	10	1/2 ODS	0.34	34.5	SEP
Backseating	7792-B	1/2 MPT	1/2 SAE Flare	122	37	40	N/A	1/2 ODS	0.31	34.5	SEP
	7793-B	1/2 MPT	5/8 SAE Flare	125	39	43	N/A	1/2 ODS	0.34	34.5	SEP
	7830*	3/8 ODS	3/8 ODS	110	33	29	8	3/8 ODS	0.24	34.5	SEP
	7831*	1/2 ODS	1/2 ODS	114	33	33	10	1/2 ODS	0.25	34.5	SEP
	7832*	5/8 ODS	5/8 ODS	117	32	36	13	5/8 ODS	0.26	34.5	SEP
	7833*	7/8 ODS	7/8 ODS	138	45	43	19	7/8 ODS	0.47	34.5	SEP
	7834*	1 1/8 ODS	1 1/8 ODS	180	45	51	24	1 1/8 ODS	0.79	34.5	SEP
	7835-CE*	1 3/8 ODS	1 3/8 ODS	188	51	57	25	1 3/8 ODS	1.10	34.5	Cat I
7836-CE*	1 5/8 ODS	1 5/8 ODS	232	54	62	28	1 5/8 ODS	1.60	34.5	Cat I	

* 1/4 SAE Flare above backseat

	Part No	Conn Size (inch)		Dimensions (mm)				Ø E	Weight (kg)	MWP (barg)	CE Cat
		Bottom	Side	A	B	C	D				
Non-backseating	7761	1/4 MPT	1/4 SAE Flare	98	32	32	N/A	8	0.14	69	SEP
	7771	1/4 MPT	1/4 FPT	98	32	32	N/A	8	0.15	69	SEP
	7772	1/4 FPT	1/4 FPT	98	32	32	N/A	8	0.15	69	SEP
	7773	3/8 MPT	3/8 FPT	109	38	44	N/A	10	0.38	69	SEP
	7774	3/8 FPT	3/8 FPT	109	38	44	N/A	10	0.38	69	SEP
	7775	1/2 MPT	1/2 FPT	109	38	44	N/A	12	0.39	69	SEP



Backsealing	Part No	Conn Size (inch)	Dimensions (mm)					ØF	Weight (kg)	MWP (barg)	CE Cat
			A	B	C	D	E				
	9261	1/4 ODS	112	70	17	8	41.4	7.1	0.36	48	SEP
	9263	3/8 ODS	112	76	17	10	41.4	7.1	0.36	48	SEP
	9264	1/2 ODS	112	81	17	11	41.4	7.1	0.36	48	SEP
	9265	5/8 ODS	114	86	18	18	41.4	7.1	0.36	48	SEP



Non-backsealing	Part No	Conn Size (inch)		Dimensions (mm)				E (inch)	Weight (kg)	MWP (barg)	CE Cat
		Bottom	Side	A	B	C	D				
	9270	1/4 ODS	1/4 SAE Flare	98	32	32	8	1/4 ODS	0.15	48	SEP
	9271	3/8 ODS	1/4 SAE Flare	98	32	32	8	3/8 ODS	0.15	48	SEP
	9272	3/8 ODS	3/8 SAE Flare	98	32	32	8	3/8 ODS	0.21	48	SEP
	9273	1/2 ODS	1/4 SAE Flare	98	32	32	10	1/2 ODS	0.15	48	SEP
	9274	1/2 ODS	3/8 SAE Flare	98	32	32	10	1/2 ODS	0.21	48	SEP

Packed Shut Off Valves

Packed, Globe, Back-Seating Design

The function of a Globe Valve is to control flow or provide isolation in liquid or gas applications that may require frequent use.

Applications

Henry Technologies' Packed Valves are used in a variety of air conditioning and refrigeration applications for isolating, flow control, charging and purging. The 203 series Globe Valves are suitable for use with HCFC and HFC refrigerants and their associated oils, as well as other industrial fluids non-corrosive to brass, steel, Teflon and synthetic rubber.

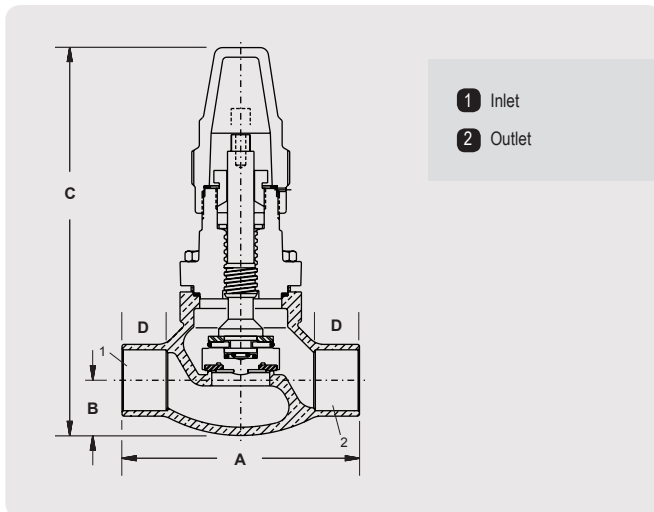
Main Features

- Brass construction
- ODS connections
- Compact design
- Backseating stem to allow for replacing stem packing while under pressure
- Non-rotating self-aligning swivel seat disc with fully retained Teflon seat ring

Technical Specifications

Maximum working pressure = 450 PSI (31 Bar)

Allowable operating temperature = -40°F to +275°F (-40°C to +135°C)



Materials of Construction

The valve body and bonnet are made from bronze and brass respectively. The stem is made from stainless steel. The seat seal material is PTFE. A graphite compound is used for the packing gland. The seal cap is made from moulded plastic.

Installation - Notes

Valves must be protected from heat damage during installation. Full instructions are given in the Product Instruction Sheet, included with each valve.

	Part No	ODS (inch)	Dimensions (mm)				Weight (kg)
			A	B	C	D	
Backseating	2030-AA	7/8	107.95	24.89	141.98	19.05	1.36
	2030-BA	1 1/8	123.95	28.95	149.09	23.87	2.13
	2031	1 3/8	136.65	32.00	222.50	25.40	3.33
	2032	1 5/8	161.10	38.10	257.47	28.70	4.73
	2033	2 1/8	215.90	50.80	270.00	38.10	7.58
	2034	2 5/8	279.40	57.15	303.27	42.92	12.78
	2035	3 1/8	304.80	66.80	336.55	44.45	19.99

Packless Line Valves

Packless valves are so called due to the absence of a packed gland for stem sealing. Instead, metal diaphragms are used to isolate the stem from the fluid area.

The Henry Technologies range includes three versions: 'Golden Bantam', 'Standard' and '2100B & 2111B'.

Applications

Henry Technologies packless valves are used in a variety of air conditioning and refrigeration applications for isolating, flow control, charging and purging purposes.

The valves are suitable for HCFC and HFC refrigerants, along with their associated oils. The 2100B & 2111B series are suitable for HCFC, HFC and CO₂ refrigerants along with their associated oils.

Main features

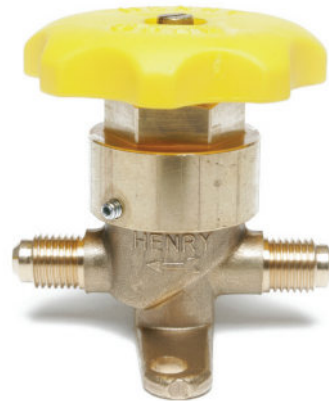
- Robust design
- Compact
- Heat stabilised nylon seat ring for positive shut-off
- Positive back-seating with valve in open position
- Raised seat reduces debris induced sealing issues
- Large diameter diaphragm for greater lift, better flow and longer life
- Hermetic seal between bonnet, diaphragms and body
- Suitable for vacuum applications

Technical Specification

Allowable working pressure = Vacuum up to 34.5 barg

Allowable working pressure = Vacuum up to 42 barg (2100B & 2111B)

Allowable working temperature = -29°C to +135°C



Materials of Construction - Golden Bantam series

The valve body, upper stem and bonnet are made from brass. The lower stem/seat ring is made from nylon and the diaphragm set is composed of both phosphor bronze and stainless steel. The valve spring is made from stainless steel. The hand-wheel is made from moulded plastic.

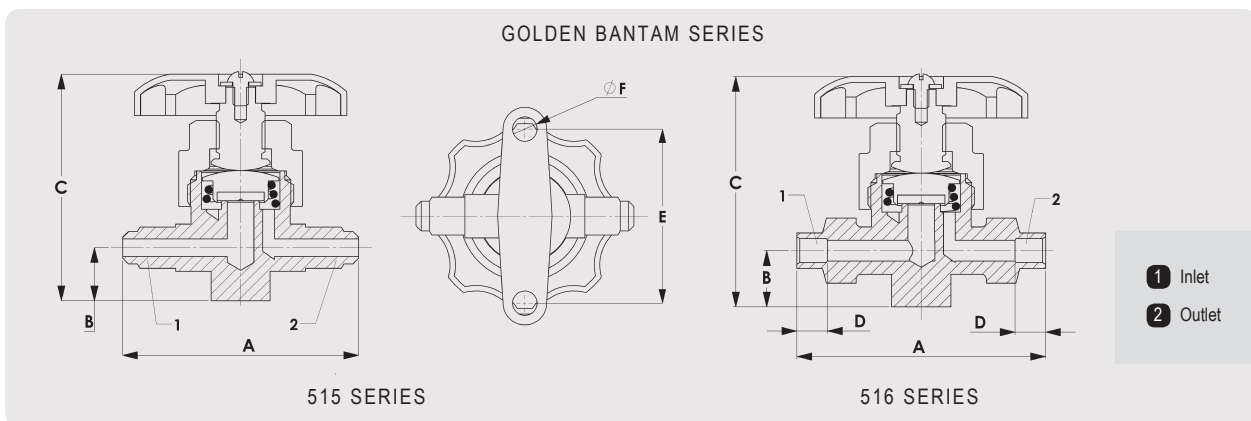
Materials of Construction - Standard series

The valve body and bonnet are made from brass. The lower stem is made from brass for all models except the 629 series, where the material is monel.

The upper stem, stem cap and valve springs are made from stainless steel. The seat ring is made from nylon for all models except the 629 series. These models use a stainless steel seat ring. The diaphragm set is composed of both phosphor bronze and stainless steel. The hand-wheel is made from white metal.

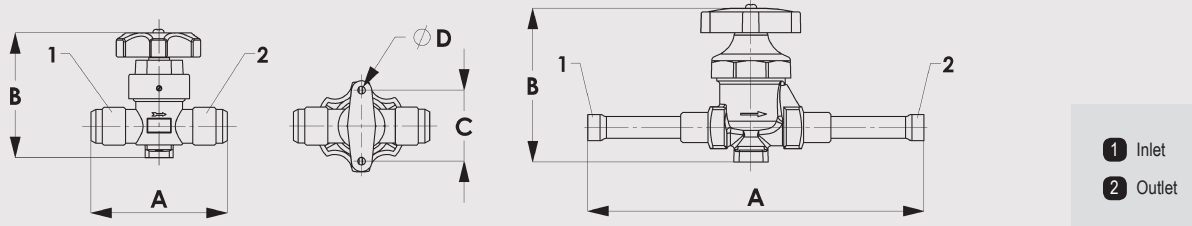
Materials of Construction - 2100B & 2111B series

The valve body, upper stem and bonnet are made from brass. The lower stem/seat ring is made from nylon and the diaphragm is made from stainless steel. The valve spring is made from stainless steel. The hand-wheel is made from moulded plastic.



TYPE	Part No	Conn Size (inch)	Dimensions (mm)						Weight (kg)	Kv (m ³ /hr)	CE Cat
			A	B	C (Open)	D	E	Ø F			
515	5151	1/4 SAE Flare	64	14	65	N/A	51	7	0.28	0.85	SEP
515	5153	3/8 SAE Flare	67	14	65	N/A	51	7	0.29	1.20	SEP
516	5161	1/4 ODS	67	14	65	8	51	7	0.29	0.85	SEP
516	5163	3/8 ODS	67	14	65	10	1	7	0.29	1.20	SEP

2100B & 2111B SERIES



Type	Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	Kv (m ³ /hr)	CE Cat
			A	B (Closed)	C	D			
2100B	2100B-0404	1/4 SAE Flare	58	60	35	4.5	0.18	0.25	SEP
2100B	2100B-0606	3/8 SAE Flare	70	68	38	4.5	0.30	0.80	SEP
2100B	2100B-0808	1/2 SAE Flare	72	68	38	4.5	0.32	1.50	SEP
2100B	2100B-1010	5/8 SAE Flare	78	68	38	4.5	0.32	2.20	SEP
2100B	2100B-1212	3/4 SAE Flare	95	80	50	4.5	0.80	2.90	SEP
2111B	2111B-0404	1/4 ODS	120	60	35	4.5	0.18	0.25	SEP
2111B	2111B-0606	3/8 ODS	130	68	38	4.5	0.32	0.80	SEP
2111B	2111B-0808	1/2 ODS	138	68	38	4.5	0.35	1.50	SEP
2111B	2111B-1010	5/8 ODS	158	68	38	4.5	0.38	2.20	SEP

Industrial Shut Off Valves

The main functions of the Shut-Off Valve are to start or stop fluid within the particular circuit it is installed.

Applications

The threaded end series are a lower cost option to manually control flow in a pipe. Henry Technologies' Shut-Off Valves are suitable for use with ammonia, HCFC and HFC refrigerants and their associated oils, as well as other industrial fluids non-corrosive to ductile iron, steel, Teflon and synthetic rubber.

The Henry Technologies' range of Globe and Angle Shut-Off Valves is used for isolation purposes, primarily within ammonia refrigeration systems.

Main Features

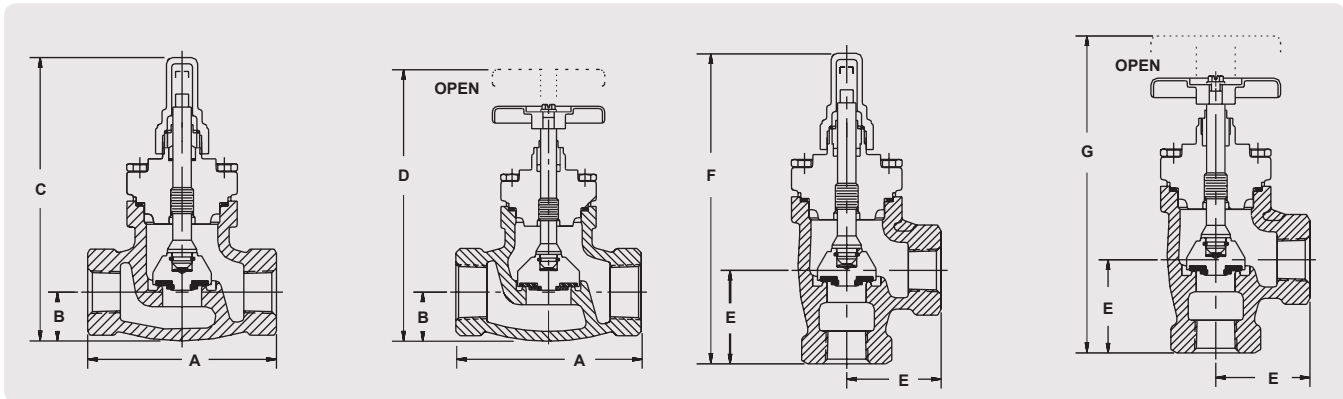
- Non-rotating self aligning swivel seat disc with fully retained Teflon seat ring
- Lower cost than flanged designs
- Backseating stem to allow for replacing stem packing while under pressure
- Protective painted finish
- Valve bonnets threaded to accept Henry Seal Cap

Technical Specifications

Maximum cold working pressure = 400 PSI (27.6 Bar)
 Allowable operating temperature = -20°F to +275°F (-29°C to +135°C)

Materials of Construction

The valve body is made from ductile iron. The valve bonnet is made from ductile iron. The seal caps are moulded plastic. The stem is made from stainless steel and is adaptive for hand-wheel mounting.



FPT (inch)	Part No				Dimensions (mm)							Weight (kg)	
	Globe Seal Cap	Angle Seal Cap	Globe Hand Wheel	Angle Hand Wheel	A	B	C	D	E	F	G	Globe	Angle
3/8	N/A	N/A	310G	N/A	92.20	23.87	N/A	138.17	N/A	N/A	N/A	0.90	N/A
1/2	C320G	C370G	320G	370G	92.20	23.87	138.68	138.17	45.97	150.87	151.63	1.13	0.90
3/4	C330G	C380G	330G	380G	92.20	23.87	138.68	138.17	45.97	150.87	151.63	1.13	0.90
1	C340G	C390G	340G	390G	104.90	27.68	146.30	145.79	45.97	152.90	153.67	1.58	1.13

Rotalock Valves

Rotalock Valves are widely used throughout the refrigeration and air-conditioning industry as a convenient removable connection point and service valve typically fitted to compressors and pressure vessels.

The Rotalock connection consists of male and female components that when joined compress a sacrificial Teflon washer. By compressing the Teflon washer a seal is created that can maintain its integrity with large changes in temperature and constant vibration.

Henry Technologies have taken these valves to a new level with the introduction of their Full Flow Rotalock design. This Patented design incorporates a number of unique features to benefit the user including a recessed polished steel spindle that allows for an uninterrupted flow through the valve when in the fully back seated position. Flow tests confirm that Full Flow Rotalock valves are up to 50% more efficient than the traditional type of Rotalock valves on the market today.

Available in a range of styles and connection sizes, these are the valves your system needs to deliver maximum capacity and efficiency.



Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2

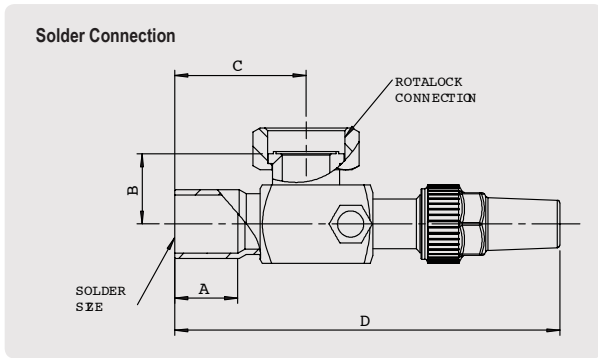
Safe Working Pressure: 4,200 kPa

Features

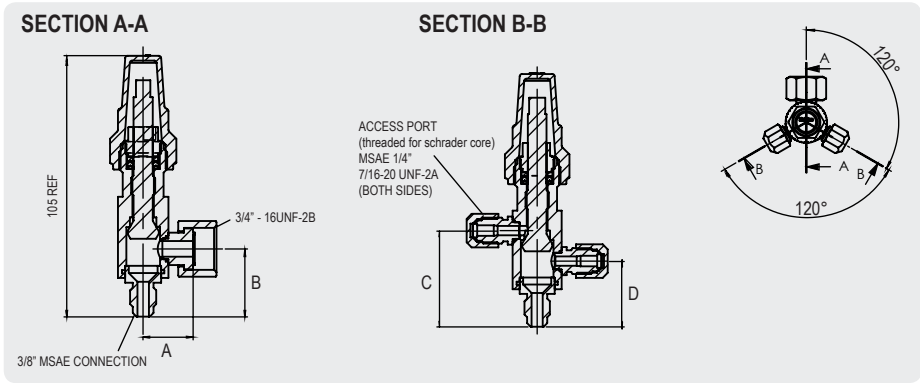
- Polished steel spindle with Teflon gland seal.
- Seat surfaces are copper.
- Optimum flow due to recessed spindle (back seat position).
- Zinc Blue Passivated coating (Salt spray tested to 300 hours).
- Dual ¼ MSAE access ports.
- Safe Working Pressure: 4,200 kPa.
- Suitable for all fluorinated refrigerants and oils.

Benefits

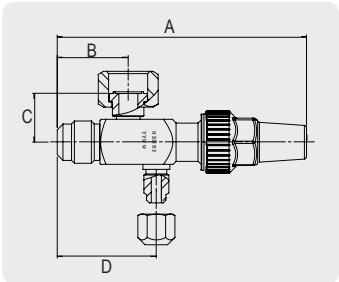
- Increased service life and less torque required when closing.
- Provides a superior seal with less sealing torque.
- Requires only low silver content solder with less heat for an improved leak proof joint.
- Delivers minimal pressure drop & improved system efficiency.
- Corrosion resistance superior to Nickel plating.
- Dual access ports accept Schrader cores to provide improved service flexibility.
- R410A compatible.
- Ideal for today's Refrigeration systems.



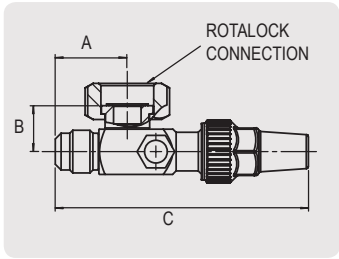
Part No.	Solder Size	Rotalock Thread	Dimensions (mm)			
			A	B	C	D
2606-041220	1/4"	3/4"-16 UNF	8	19	29	103
2606-061220	3/8"	3/4"-16 UNF	8	19	25	105
2606-061620	3/8"	1"-14UN	8	19	25	100
2606-081220	1/2"	3/4"-16 UNF	10	19	39	104
2606-081620	1/2"	1"-14 UN	10	19	30	104
2606-101620	5/8"	1"-14 UN	15	19	29	104
2606-102030	5/8"	1 1/4"-12 UNF	15	26.7	40	132
2606-122030	3/4"	1 1/4"-12 UNF	15	26.7	40	132
2606-142030	7/8"	1 1/4"-12 UNF	20	26.7	40	132
2606-182030	1 1/8"	1 1/4"-12 UNF	20	26.7	47	139
2606-142830	7/8"	1 3/4"-12 UN	20	27.7	40	133
2606-182835	1 1/8"	1 3/4"-12 UN	20	30.7	55	176
2606-222835	1 3/8"	1 3/4"-12 UN	22	30.7	56	177
2606-262835	1 5/8"	1 3/4"-12 UN	25	30.7	61	182
2606-263650	1 5/8"	2 1/4"-12 UN	25	41.5	74.5	214
2606-343650	2 1/8"	2 1/4"-12 UN	25	41.5	78.5	219



Part No.	Description	Dimensions (mm)			
		A	B	C	D
2616-061220-HEX	3/8 MSAE x 3/4 R/L Nut x 20 HEX BODY	19	31.5	41	28
2616-041220-HEX	1/4 MSAE x 3/4 R/L Nut x 20 HEX BODY	19	31	39.5	31



Part No.	Description	Dimensions (mm)			
		A	B	C	D
2616-061220-S	3/8 MSAE - 3/4 R/L NUT - Single Port	99 ±2	32.5	19	41

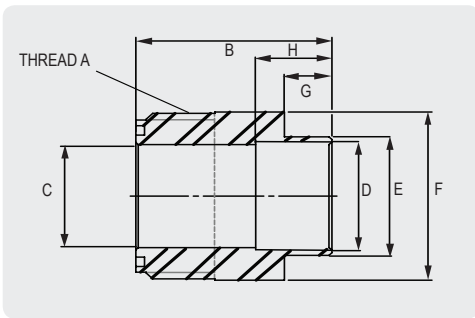


Part No.	Description	Dimensions (mm)		
		A	B	C
2616-061220	3/8 MSAE - 3/4 R/L NUT	31.5	19	105
2616-081620	1/2 MSAE - 1 R/L NUT	32	19	105
2616-101620	5/8 MSAE - 1 R/L NUT	40	19	114



Rotalock Teflon Gasket

Part No.	Description	Pk Q'ty
800-26XX-12	Suit 3/4" R/L Nut	10
800-26XX-16	Suit 1" R/L Nut	5
800-26XX-20	Suit 1-1/4" R/L Nut	5
800-26XX-28	Suit 1-3/4" R/L Nut	5
800-26XX-36	Suit 2-1/4" R/L Nut	5



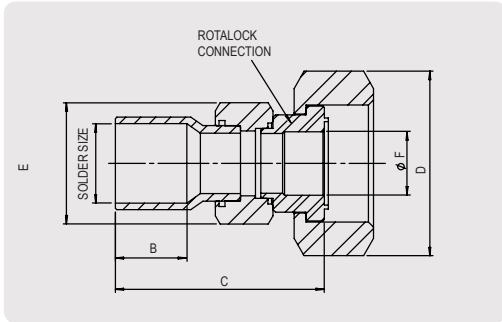
Rotalock Welding Spuds - Available as ASME - Female ID Weld to Male Rotalock Thread

Part No.	Description	Thread (Inch) A	Dimensions (mm)							Nominal Weight (kg)
			Overall Length B	I.D. C	I.D. D	O.D. E	Welded End O.D. F	Length G	Depth H	
965-26XX-12S	Suit 3/4 Rotalock	3/4-16 UNF	34	7.9	7.9	11.1	19.1	6	-	0.04
965-26XX-16S	Suit 1 Rotalock	1-14 UN	36	12.7	12.7	15.9	25.4	6	-	0.09
965-26XX-20S	Suit 1 1/4 Rotalock	1-1/4-12 UNF	38	19.0	19.0	22.2	31.8	8	-	0.09
965-26XX-28S	Suit 1 3/4 Rotalock	1-3/4-12 UN	38	31.75	34.9	38.1	44.5	8	15	0.18
965-26XX-36S	Suit 2 1/4 Rotalock	2-1/4-12 UN	39	41.3	41.3	47.6	57.2	8	-	0.27

Recommended Torque settings for Rotalock Nuts

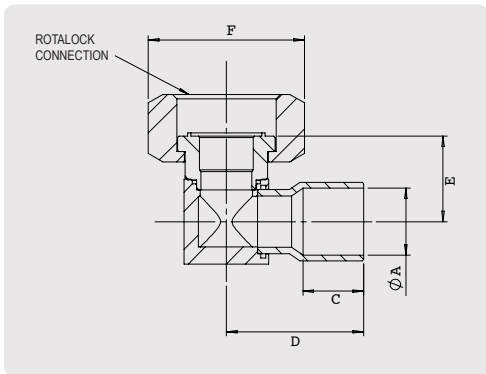
Rotalock Nut Size	Torque (Nm)
Rotalock 3/4-16 UNF	40-50
Rotalock 1-14 UNS	70-80
Rotalock 1-1/4-12 UNF	120-135
Rotalock 1-3/4-12 UNF	135-160
Rotalock 2-1/4-12 UNF	165-190

Rotalock Connectors



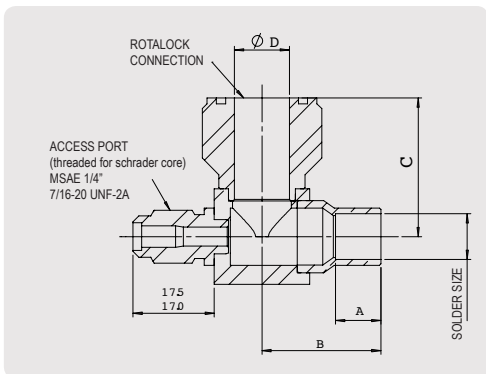
Straight Connector

Part No.	Nominal Size	Solder Size	B ±1	C ±1.5	D A/F	E A/F	Φ F
290-0816	1/2"	12.75~12.95	13	35	30	22	12
290-1016	5/8"	15.93~16.13	14	35	30	22	12
290-1216	3/4"	19.10~19.30	16	35	30	22	12
290-1020	5/8"	15.93~16.13	14	37.7	36	27	19
290-1220	3/4"	19.10~19.30	16	37.7	36	27	19
290-1420	7/8"	22.28~22.48	24	47.7	36	27	19
290-1820	1 1/8"	28.65~28.85	25	51.7	36	36	19
290-1828	1 1/8"	28.65~28.85	20	55.2	50	36	27
290-2228	1 3/8"	35.00~35.20	25	57.2	50	46	27



Elbow Connector

Part No.	ØA (ID)		Rotalock Connection	C ±1	D ±1	E ±1	F A/F
	Nominal Size	Solder Size					
291-0612	3/8"	9.58~9.78	3/4"	9.5	25	44	24
291-0812	1/2"	12.75~12.95	3/4"	13	25	44	24
291-0816	1/2"	12.75~12.85	1"	13	25	44	30
291-1016	5/8"	15.93~16.13	1"	14	32	44	30
291-1216	3/4"	19.10~19.30	1"	20	39	44	30
291-1416	7/8"	22.28~22.48	1"	24	44	44	30
291-1020	5/8"	15.93~16.13	1 1/4"	14	40	27	36
291-1420	7/8"	22.28~22.48	1 1/4"	24	50	27	36
291-1820	1 1/8"	28.65~28.85	1 1/4"	28	57	27	36
291-1828	1 1/8"	28.65~28.85	1 3/4"	23	50	30	50
291-2228	1 1/8"	28.65~28.85	1 3/4"	25	57	30	50



Male Elbow Connector

Part No.	Nominal Size	Solder Size	Rotalock Size	A±0.2	B±1.5	C±1	Φ D
297-0616	3/8"	Φ 9.58~9.78	1"	8	24.5	29	12
297-0816	1/2"	Φ12.75~12.95	1"	10	29.5	29	12
297-1220	3/4"	Φ19.1~19.3 16	1 1/4"	16	38.5	34.5	19
297-1420	7/8"	Φ22.28~22.48	1 1/4"	20	38.5	34.5	19

Capped Line Valves

Henry Technologies Capped Line Valves are designed and manufactured for a multitude of uses in refrigeration and air-conditioning systems. These forged brass valves provide easy accessibility, serviceability and isolation. Most of this range has been manufactured by Henry Tech for over 50 years and have a reputation second to none in pressure critical environments.

The valves use a forged brass body with polished stainless steel spindle. The gland sealing utilises the double O-Ring seal on selected models or Teflon gland rings as standard. The double O-Ring style is fully serviceable.

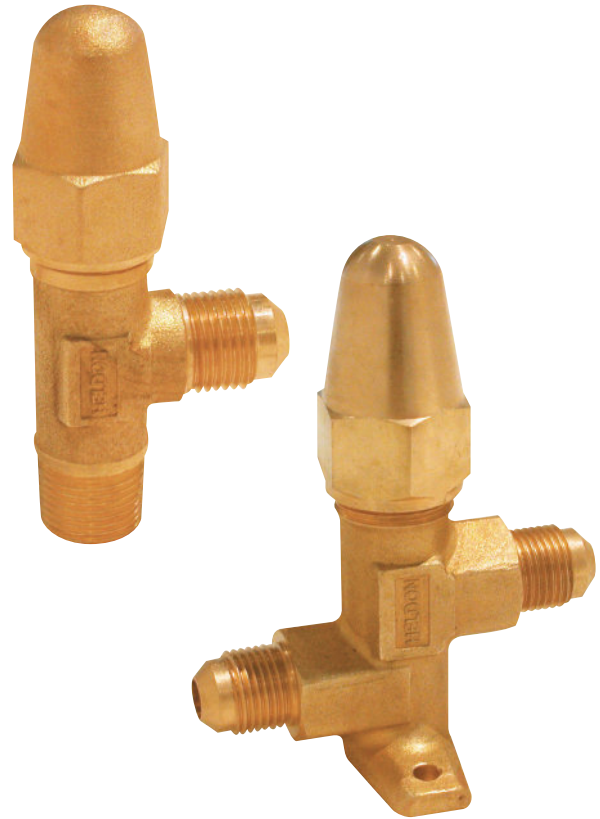
Suitable for all fluorinated refrigerants they are available in a number of configurations to suit most applications including right angle, (offset) straight through, with or without mounting foot and back seating.

Features

- Designed for maximum flow and minimal pressure drop.
- Strong forged brass or solid brass body.
- Precision ground and polished stainless steel stem.
- Integral foot mount mounting bracket.
- Available in a multitude of configurations.
- Safe Working Pressure of 4,200 kPa (R410A compatible).
- Stainless steel stem on swivel models.

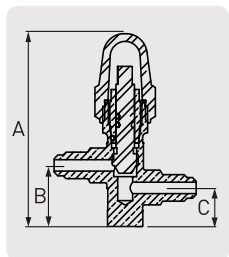
Benefits

- Negligible loss in system efficiency.
- Stable platform when mounted in a system.
- Accurate sealing and extended life.
- Easy installation.
- Suit most applications.
- Compatible with all fluorinated refrigerants and oils.
- Stronger and less susceptible to fatigue failure.



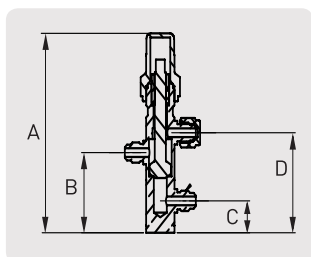
Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2
Safe Working Pressure: 4,200 kPa



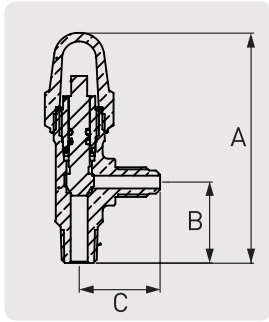
In-line foot mount - Male SAE Flare

Part No.	Conn Size (inch)	Dimensions (mm)			Weight (kg)
		A	B	C	
2220-0404	1/4 MSAE	80	25	16	0.20
2220-0606	3/8 MSAE	100	35	17	0.37
2220-0808	1/2 MSAE	102	35	19	0.38

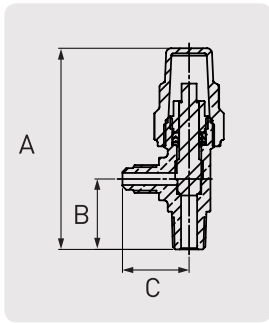


In-line foot mount with access (Front & Back seats) - Male SAE Flare

Part No.	Conn Size (inch)	Dimensions (mm)				Weight (kg)
		A	B	C	D	
2225-0606	3/8 MSAE	110	44	18	55	0.29

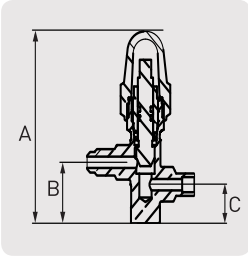


(Angle) Male SAE Side to Male BSP Bottom						
Part No.	Description	Dimensions (mm)			Weight (kg)	
		A	B	C		
2201-0404	1/4 MSAE x 1/4 MBSP	86	30	30	0.17	
2201-0406	1/4 MSAE x 3/8 MBSP	86	30	30	0.17	
2201-0408	1/4 MSAE x 1/2 MBSP	104	35	34	0.30	
2201-0604	3/8 MSAE x 1/4 MBSP	86	30	30	0.18	
2201-0606	3/8 MSAE x 3/8 MBSP	86	30	30	0.18	
2201-0608	3/8 MSAE x 1/2 MBSP	104	35	37	0.31	
2201-0806	1/2 MSAE x 3/8 MBSP	104	35	35	0.30	
2201-0808	1/2 MSAE x 1/2 MBSP	104	35	35	0.31	
2201-1008	5/8 MSAE x 1/2 MBSP	104	35	35	0.31	
2201-1012	5/8 MSAE x 3/4 MBSP	122	43	39	0.41	

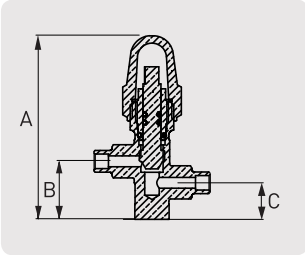


Male SAE Side to Male Taper NPT Bottom						
Part No.	Description	Dimensions (mm)			Weight (kg)	
		A	B	C		
2202-0606	3/8 MSAE x 3/8 MNPT	80	28	29	0.18	

Male SAE Flare to Female Solder

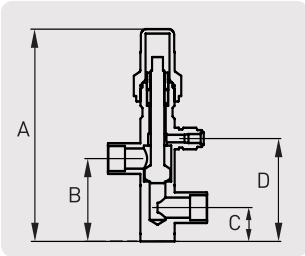


Part No.	Description	Dimensions (mm)			Weight (kg)
		A	B	C	
2227-0404A1	1/4 ID (lwr port) x 1/4 MSAE	80	25	16	0.19
2227-0606A1	3/8 ID (lwr port) x 3/8 MSAE	100	34	16	0.37



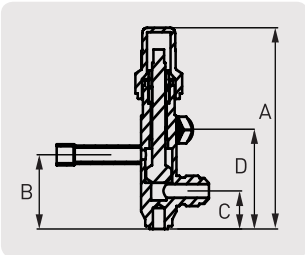
Part No.	Description	Dimensions (mm)			Weight (kg)
		A	B	C	
2230-0404	1/4 ID	80	25	18	0.19
2230-0606	3/8 ID	101	34	18	0.34
2230-0808	1/4 ID	100	34	18	0.33
2230-1010	5/8 ID	116	42	22	0.44
2230-1212	3/4 ID	116	42	22	0.46

Female Solder - Foot Mount



Part No.	Description	Dimensions (mm)				Weight (kg)
		A	B	C	D	
2235-0606	3/8 ID	110	44	18	55	0.29
2235-0808C	1/2 ID	114	44	18	54	0.30
2235-1010C	5/8 ID	114	44	18	54	0.31

Female Solder - Threaded Base



Part No.	Description	Dimensions (mm)				Weight (kg)
		A	B	C	D	
2254-0404	1/4 ID x 1/4 MSAE - Hex Base Mount c/w Access	110	41	22	52	0.20
2254-0606	3/8 ID x 3/8 MSAE - Hex Base Mount c/w Access	114	41	22	52	0.22

Service Valves

Service valves are used in refrigeration and air-conditioning systems to allow manufacturers to seal a pre-charge inside prefabricated units for shipping. They also aid in the safe servicing of installed units.

Henry Technologies Service Valves offer optimum flow characteristic and positive shut off for both front and back seat. The Henry Tech range are specially engineered to maximise the body chamber and optimise flow while minimising intrusion of the seat and stem mechanism in the back seat position, there by reducing pressure drop.

The brass bodies are forged or machined with copper extensions and all valves feature an isolatable access port. Available in a straight through offset square body version that has a tapped base for mounting and a right angle flange mount. These valves can be made to order in special configurations based on quantity.

Henry Tech's range of cast iron service/compressor valves offer complete isolation and high flow rates.

Features

- Designed for maximum flow and minimal pressure drop
- Strong forged brass or cast iron body
- Integral mounting bracket
- Available as made to order for OEM's
- Safe Working Pressure in excess of 4,200 kPa (R410A compatible)
- Complete with flange, bolts and brass spigot and gasket

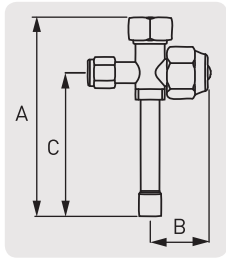
Benefits

- Negligible loss in system efficiency
- Stable platform when mounted in a system
- Easy installation as a flange or foot mount
- Suit most applications
- Compatible with all fluorinated refrigerants and Oils
- Complete kit for easy installation



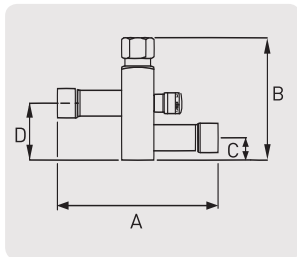
Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2
Safe Working Pressure: 4,200 kPa



A/C OEM Service Valve (copper ext) - Male to Access Valve

Part No.	Conn Size (inch)	Dimensions (mm)			Weight (kg)
		A	B	C	
2240-0404	1/4 MSAE x 1/4 SWEAT x SCHR	96	72	72	0.11
2240-0406	1/4 MSAE x 3/8 SWEAT x NO SCHR	96	72	72	0.14
2240-0606	3/8 MSAE x 3/8 SWEAT x SCHR	67	45	45	0.14
2240-0606-410A	3/8 MSAE x 3/8 SWEAT x SCHR-410A	67	39	39	0.13
2240-0808	1/2 MSAE x 1/2 SWEAT x SCHR	107	75	73	0.14
2240-1010	5/8 MSAE x 5/8 SWEAT x SCHR	110	77	77	0.27
2240-1212	3/4 MSAE x 3/4 SWEAT x SCHR	125	85	85	0.42



Square Body Service Valve - Solder

Part No.	Connection	Dimensions (mm)				Weight (kg)
		A	B	C	D	
2242R-1414C	7/8 ID	120	86	17	40	0.50



Cast Iron Service Valve - Four Bolt Flange Mount (c/w Flange)

Part No.	Connection	Weight (kg)
2242-7026	1-5/8" Outlet complete with flange, bush, gasket & screws	3.64
2242-8034	2-1/8" Outlet complete with flange, bush, gasket & screws	6.87
2242-9042	2-5/8" Outlet complete with flange, bush, gasket & screws	8.30



Flange Gasket

Part No.	Parts to Suit	Weight (kg)
700-002-005	Flange Gasket to suit 2242-7026 Cast Iron Comp. Valve 1-5/8 ID	0.01
700-022-005	Flange Gasket to suit 2242-8034 Cast Iron Comp. Valve 2-1/8 ID Flange Gasket to suit 2242-9042 Cast Iron Comp. Valve 2-5/8 ID	0.01



Brass Service Valve Caps with Copper Washer

Part No.	Parts to Suit	Weight (kg)
760-0404	1/4" Valve	0.07
760-1012	5/8" & 3/4" Valve	0.09

Solenoid Valves

Solenoid valves are used in refrigeration and air-conditioning to stop, interrupt or divert the flow of refrigerant. They operate by opening or closing the orifice directly or by pilot (Servo) operation. An electro-magnetic coil is used to open the valve when it is energised.

Henry Technologies' new style Solenoid valves (2402 & 2403 Series) are made from brass forgings and are available with extended copper or male SAE connections. A special diaphragm material is used for an extended service life, to be compatible with most fluorinated refrigerant and oil combinations.

These new style valves are matched to a range of "click-on" style coils, which, when installed with the supplied Hirschmann plug and O-ring, offer an IP65 rating. Another feature of these is the built-in LED, indicating power supply to the coil.

Note: Solenoid Coil to be purchased separately.



Manufacturing Standards

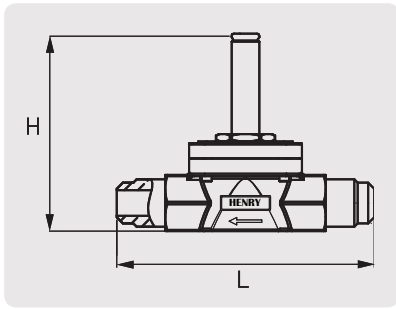
Manufactured in accordance with AS/NZS 1677.2

Features

- Solid forged brass construction.
- Range available from 1/4" to 1-1/8" connections.
- 1/4" valve is a Direct Operating type.
- 3/8" to 1-1/8" – Pilot (Servo) Operating Valves.
- Click-on style Solenoid Coils available in a range of voltages.
- Rigorously tested to 300,000 cycles.
- Available with extended copper tails and as reduced port versions.
- Built-in LED in the coil plug indicates power supply either on or off.
- Rated to IP65 when installed with supplied O-ring and plug.
- Safe Working Pressure = 3,200 kPa.
- Working Temperature Range:
 - Solenoid Valve -25°C to 100°C
 - Solenoid Coil -40°C to 80°C

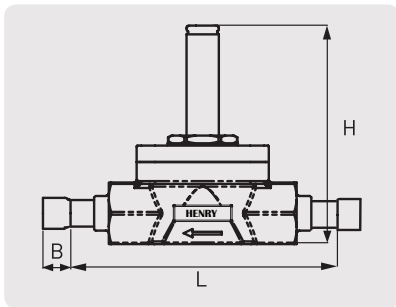
Benefits

- Provides a strong stable platform when mounted in a system.
- Delivers an extensive range of capacities in Liquid, Vapour and Hot Gas applications.
- No pressure drop required to operate - Direct action
- Easy and reliable operating action.
- Quick and easy to install.
- Reliability guaranteed.
- Provide more choice to suit your application.
- Safety and assists the technician in fault finding.
- Solenoid coil offers great protection and long life span.
- Suitable for use with a large range of HCFC and HFC refrigerants.
- Suits a wide range of applications.



Part No.	Flare Conn. Size (Inch)	Dimensions (mm)		Weight (kg)
		H	L	
2402-0404	1/4	63	67	0.125
2402-0606	3/8	69	75	0.220
2402-0808RP	1/2	69	79	0.23
2402-1010	5/8	78	107	0.490
2402-1212	3/4	80	126	0.840

Part No.	Flare Conn.	Liquid (kW)			Vapour (kW)			Hot Gas (kW)			Kv (m3/hr)	Opening Diff. Pressure (bar)	Maximum Operating Pressure Differential (bar)	
		R22	R134a	R404A	R22	R134a	R404A	R22	R134a	R404A			AC Coil	DC Coil
2402-0404	1/4	3.2	3.0	2.1	-	-	-	2.1	1.6	1.8	0.175	0	21	19
2402-0606	3/8	14.5	13.5	9.5	2.2	1.8	1.85	9.5	6.9	8.2	0.8	0.5	21	19
2402-0808RP	1/2	14.5	13.5	9.5	2.2	1.8	1.85	9.5	6.9	8.2	0.8	0.5	21	19
2402-1010	5/8	47.0	44.0	31.0	7.0	5.7	6.0	30.8	22.9	26.5	3.8	0.5	21	18
2402-1212	3/4	86.4	80.0	57.1	13.2	10.5	11.0	56.8	41.5	48.5	4.9	0.5	21	13



Part No.	Solder Conn. Size (Inch)	Dimensions (mm)			Weight (kg)
		H	L	B	
2403-0404	1/4	63	102	7	0.135
2403-0606	3/8	69	111	8	0.230
2403-0808	1/2	78	127	10	0.500
2403-1010	5/8	78	127	13	0.520
2403-1212	3/4	80	176	16	0.860
2403-1414	7/8	80	176	19	0.870
2403-1818RP	1-1/8	80	176	19	0.880

Part No.	Solder Conn. (Inch)	Liquid (kW)			Vapour (kW)			Hot Gas (kW)			Kv (m3/hr)	Opening Diff. Pressure (bar)	Maximum Operating Pressure Differential (bar)	
		R22	R134a	R404A	R22	R134a	R404A	R22	R134a	R404A			AC coil	DC Coil
2403-0404	1/4	3.2	3.0	2.1	-	-	-	2.1	1.6	1.8	0.155	0	21	19
2403-0606	3/8	14.5	13.5	9.5	2.2	1.8	1.9	9.5	6.9	8.2	0.8	0.5	21	19
2403-0808	1/2	39.6	37.1	26.2	6.0	4.8	5.0	26.0	18.9	22.4	2.3	0.5	21	19
2403-1010	5/8	47.0	44.0	31.0	7.0	5.7	6.0	30.8	22.9	26.5	3.8	0.5	21	19
2403-1212	3/4	87.0	80.5	58.0	13.2	10.5	11.0	56.8	41.5	48.5	4.9	0.7	21	19
2403-1414	7/8	105.0	99.0	69.0	15.5	12.8	13.4	67.5	49.2	58.2	5.9	0.7	21	19
2403-1818RP	1-1/8	105.0	99.0	69.0	15.5	12.8	13.4	67.5	49.2	58.2	5.9	0.7	21	19

Capacities based on; Hot gas capacities based on:

Evaporating temperature:	4°C	Suction temperature:	18°C
Condensing Temperature:	38°C	Pressure drop:	100 kPa
Pressure drop across valve:	15 kPa		

Solenoid Coils

Henry Technologies offer flexibility in their range of encapsulated solenoid coils by designing them to suit a number of alternative brands in addition to the Henry Tech range.

The range offered suits the following Normally Closed solenoid valves:

- 2406 series coils suit the 2402 & 2403 series Henry Tech solenoid valves as well as the Castel brand of solenoid valves.
- 2406-EVR coils fit the Danfoss type EVR solenoid valves.

The 2406 series coils come in various voltage combinations and provides the service market with the ability to stock less replacement coils due to the interchangeability of the Henry Tech coils.

In addition, the 2406 series solenoid valve coils have the added visual diagnostic feature of a LED light that is illuminated when power is supplied to the coil Din Plug.

The 2406 series solenoid coils are of rugged moisture proof design with a 2406 series featuring a simple click-on mounting. Both are IP65 rated with the CE mark to meet the low voltage directive of Europe (LVD) 72/23/EC where applicable.

In addition, Henry Tech also produce the 2405-MAG Permanent Magnet. This is a great asset for the Service Technician as it allows the solenoid valve to be energized without power supply. Ideal for trouble shooting, evacuating a system or for pressure testing purposes, when power is not available. Fits Henry Tech, Danfoss and most other popular brands of solenoid valve.



Manufacturing Standards

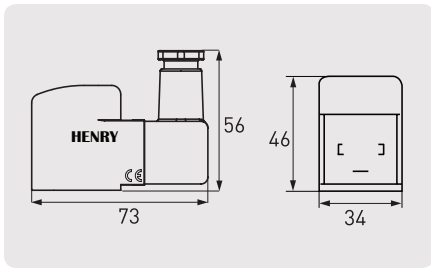
Manufactured in accordance with AS/NZS 1677.2

Features

- Compact Ergonomic Design.
- Low wattage coil.
- LED light feature.
- UV stabilised outer shell.
- Hirschmann style din plug.
- Coil operating temperature -40 °C to 80 °C.
- Fits multiple brands.

Benefits

1. Simple click-on with minimal space requirement.
2. Power saving costs.
3. Visual diagnostic feature.
4. Suits tough hot environments.
5. Quick and safe connection.
6. Suits Australian conditions.
7. Saves stocking costs.

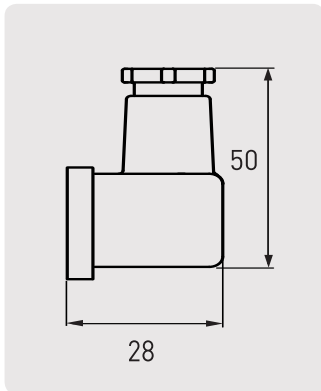


Part No.	Coils Description	Watts	Hz	Weight (kg)	Pack Qty
2406-012-DC	12 volt DC solenoid coil	9w	50/60 Hz	0.190	20
2406-024-DC	24 volt DC solenoid coil	9w	50/60 Hz	0.190	20
2406-24-AC	24 volt AC solenoid coil	9w	50/60 Hz	0.190	1
2406-240-AC	240 volt AC solenoid coil	9w	50/60 Hz	0.190	1

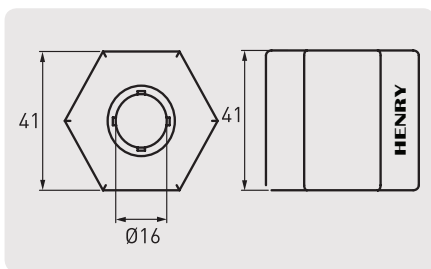
Solenoid Coil Range - 2406 Series (Fits new series 2402 & 2403 Solenoid Valves)

Part No.	Suit Valve Series	Brands Coil Fits	Supply Voltage V a.c / DC"	Frequency (Hz)	Power Cons. (a.c)	Power Cons. (DC)	Temp. Range	Weight (kg)
2406-EVR-240-AC	EVR Danfoss - Flare & Solder	Danfoss	240 V a.c	50/60	10W	-	-40/80°C	0.315
2406-DIN-LED	EVR Danfoss - Flare & Solder**	Danfoss	-	-	-	-	-40/80°C	0.020
2405-MAG	2405 / 2406 / EVR *	Heldon / Castel / Danfoss	-	-	-	-	-40/80°C	0.120

** Terminal Assemble for 2406-EVR



2406-DIN-LED



2405-MAG

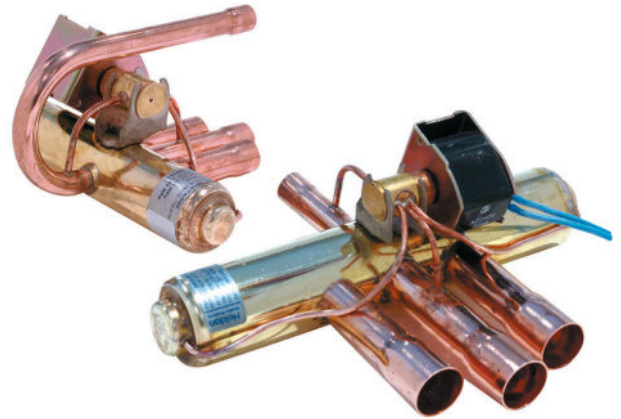
Note: Dimensions in mm.

Reversing Valves

The Reversing Valves are used in air-conditioning reverse cycle and heat pump systems to change the refrigerant direction of flow. By changing the refrigerant direction of flow the evaporator can become the condenser (the indoor coil) and the condenser can become the evaporator (the outdoor coil). This will lead to heat being rejected inside for heating in winter or outside for cooling in summer.

The cycle inversion is initiated by a small pilot solenoid valve that directs pressure to either end of the valve body forcing a piston and sliding valve to change ends altering the internal port configuration and reversing the flow direction of the refrigerant in the system. Due to the large port design of Henry Tech valves the changeover happens almost instantaneously with a minimal pressure differential, pressure drop and risk of internal leakage.

Henry Tech Reversing Valves are constructed from corrosion resistant brass with solid copper connectors and pilot tubes. Available in capacities from 4 to 45 kW with a maximum safe working pressure of 4,100 kPa for most models making those versions suitable for R410A.



Manufacturing Standards

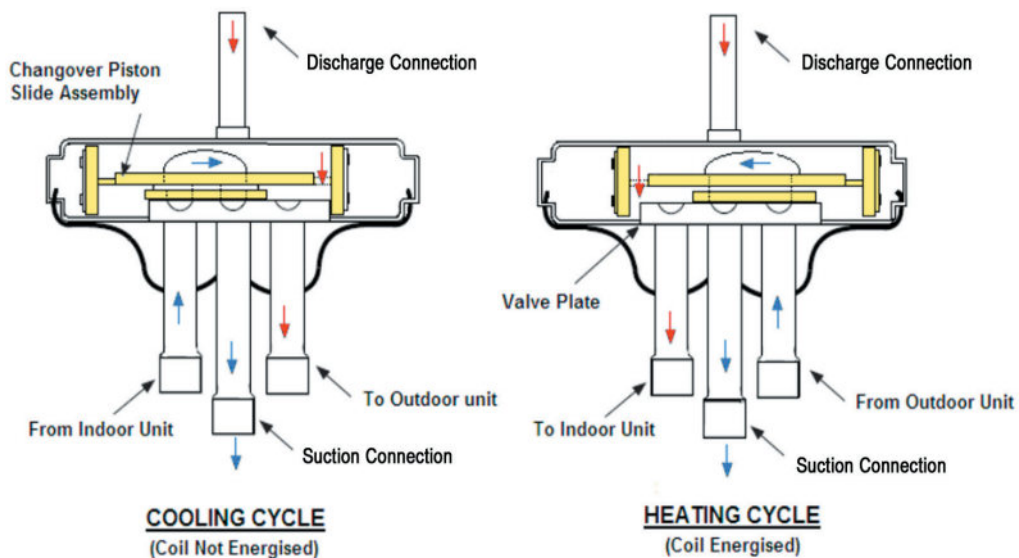
Manufactured in accordance with AS/NZS 1677.2

Features

- Designed for maximum flow and minimal pressure drop.
- Brass construction.
- Solid copper extended connectors.
- Suitable for all fluorinated refrigerants up to 4,100 kPa (most models).
- Wear resistant seals.
- Working range = -20°C to 50°C Ambient.
- High capacity pilot valve and tubes.

Benefits

- Negligible loss in system efficiency.
- Strong stable platform.
- Easy installation and soldering.
- Compatible with most fluorinated refrigerants and oils.
- Longer reliable working life.
- Suitable for a wide range of applications.
- Reduced chance of a blockage.



Part No.	Cap. (kW)	Refrig.	Disch. ID	Suction ID	Operating Diff. Pressure (Mpa)		Disch. Position	Disch. Style
					Min	Max		
2500-20A-46	20	ALL	1/2	3/4	0.3	3.10	Straight	Centre
2510-7A-34U	7	ALL	3/8	1/2	0.34	3.10	U shape	Centre
2510-9-35U	9	R22	3/8	5/8	0.34	3.10	U shape	Centre
2510-20A-47	20	ALL	1/2	7/8	0.34	3.10	Straight	Centre
2510-35A-67	35	ALL	3/4	7/8	0.34	3.10	Straight	Centre
2510-45-79	45	R22	7/8	1 1/8	0.34	2.50	Straight	Centre

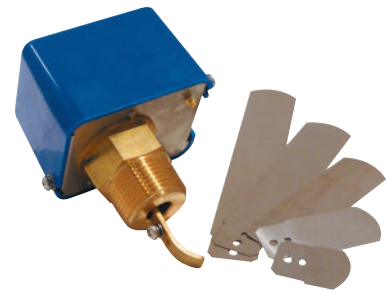
Nominal capacity kW based on 40°C condensing temperature, 5°C evaporator temperature, 15 kPa pressure differential across suction port for refrigerant R22. Reversing Valves come complete with 240V Coil. Other voltages sold separately.

Reversing Valve Solenoid Coil

Part No.	Description
2510-4-10A1	R/V Solenoid Coil - 240VAC Lead Wire
2510-4-10A4	R/V Solenoid Coil - 24VAC Lead Wire

Flow Switches

Henry Tech’s flow switches are used in liquid flow lines carrying water, ethylene glycol or any other fluid that is non-harmful to brass or phosphor bronze. They are used to sense the flow of liquid for the purpose of alarming or activating a lockout circuit should the flow stop for any reason. Commonly used in chillers or water sourced heat pumps they are responsible for shutting down the plant should the flow rate fall below a predetermined value and there is a risk of the fluid freezing in the evaporator heat evacuator.



Henry Tech’s flow switches are manufactured to withstand the rigors of being mounted directly to the pipe work, they consists of a solid brass body, a stainless steel frame and a splash proof plastic cover. The Omron® micro switch is completely sealed and isolated from the liquid by a copper alloy bellows. The paddle consists of five different length stainless steel segments that can be removed and trimmed for use in 1” to 6” diameter pipe. The maximum operating pressure is 980Kpa at an ambient of 80°C and with a maximum liquid temperature of 150°C.

Features

- Designed for accurate quick activation.
- Sealed Omron® switch.
- Solid brass/stainless steel body.
- Multi length paddles.
- Suitable for all non corrosive liquids.

Benefits

- Reliable plant protection.
- Enhanced reliability.
- Stable platform for longer life.
- Suitable for a wide range of pipe sizes.
- Able to be installed in most applications.

Part No.	Description	FLA	LRA	Max Ambient Temp.	Max Liquid Temp.
4200-1	AL 250V	2.5A	22A	80°	150°

Flow Rate Adjustment Instructions

- Flow switch is set at minimum flow rate at factory setting
- To increase flow rate turn flow adjusting nut Clockwise
- To decrease flow rate turn flow adjusting nut counter-clockwise
- Check operation of micro switch with paddle working to prevent unstable operation for excessive counter-clockwise turning
- Do not touch the factory initial calibrating screw

Typical Flow Rate m3/h at Different Line Pipe Sizes

Line Pipe Size (Inch)		3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
Minimum	Flow Increase m³/h	1.11	1.36	2.22	2.89	4.27	5.51	6.82	9.02	13.33	17.99
Adjust	Flow Decrease m³/h	0.66	0.82	1.27	1.59	2.13	2.63	2.72	4.49	6.65	8.99
Maximum	Flow Increase m³/h	2.12	2.32	3.80	5.22	7.45	9.63	11.83	16.69	26.12	37.70
Adjust	Flow Decrease m³/h	1.82	2.09	3.41	4.43	5.45	8.51	10.47	14.58	20.89	27.94
Paddle size (trimmed to pipe size)		3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"

Moisture Indicators

Liquid Moisture Indicators are used in refrigeration and air conditioning systems as a means of visually checking refrigerant quality and quantity.

This moisture indicator is particularly important with HFC refrigerants using POE oil due to the hygroscopic nature of the POE oil. The combination of HFC refrigerants and the potential moisture present in the POE oil can result in the formation of undesirable acids and alcohol which can be detrimental to the refrigeration and air-conditioning system. They are also ideally suited for installation in the oil return line between the oil separator and the compressor.

The Henry moisture indicator features a hermetically sealed glass, a large diameter viewing window and highly visible moisture indicator.

The Henry moisture indicator is machined from forged brass and the glass is hermetically sealed into the housing incorporating a double seal design to provide a superior seal on the glass and a longer service life.

Suitable for liquid, suction and oil lines with all fluorinated refrigerants and oils up to 4,200 kPa Safe Working Pressure.



Manufacturing Standards

Manufactured in accordance with AS/NZS 1677.2

Features

- Designed for maximum flow and minimal pressure drop.
- Solid forged brass construction.
- Solid copper extended connections. (Solder version)
- Suitable for all refrigerants up to 4,200 kPa (not NH₃).
- Large sight glass and indicator.
- Working range -40°C to 85°C .

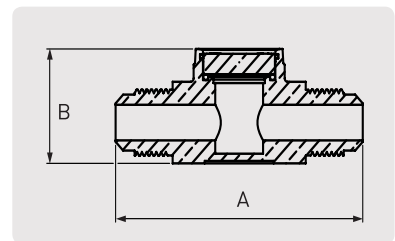
Benefits

- Negligible lost in system efficiency.
- Strong stable platform.
- Easy installation and soldering.
- Compatible with most fluorinated refrigerants and oils.
- Better viewing angle and clarity.
- Suitable for a wide range of applications.
- Quick identification of flow and liquid quantity.

Dimensions and Capacities

Male SAE to Male SAE

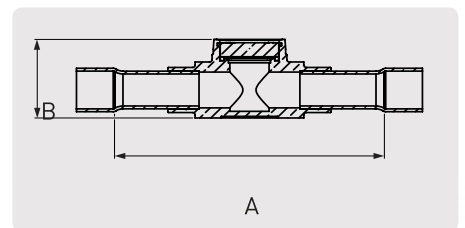
Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length		
		A	B	
650-0404H	1/4 MSAE x 1/4 MSAE	72	27	0.55
650-0606H	3/8 MSAE x 3/8 MSAE	76	27	0.18
650-0808H	1/2 MSAE x 1/2 MSAE	83	34	0.23
650-1010H	5/8 MSAE x 5/8 MSAE	88	34	0.24



650H Series

Female Solder with Extended Copper Tails

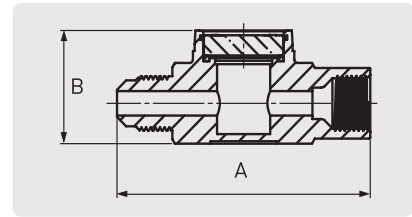
Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length A		
		A	B	
665-0404H	1/4 ID x 1/4 ID extended tails	85	27	0.17
665-0606H	3/8 ID x 3/8 ID extended tails	99	27	0.18
665-0808H	1/2 ID x 1/2 ID extended tails	122	27	0.18
665-1010H	5/8 ID x 5/8 ID extended tails	116	33	0.24
665-1212H	3/4 ID x 3/4 ID extended tails	141	33	0.26



665H Series

Male SAE to Female SAE

Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length A	B	
655-0404H	1/4 MSAE x 1/4 FSAE	61	27	0.55
655-0606H	3/8 MSAE x 3/8 FSAE	76	33	0.18
655-0808H	1/2 MSAE x 1/2 FSAE	72	33	0.23

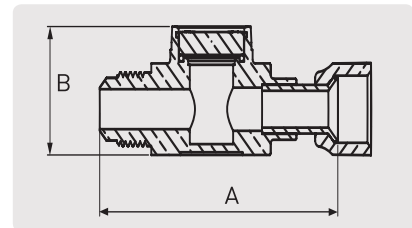


655 Series



Male SAE to Female SAE

Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length A	B	
658-0404H	1/4 MSAE x 1/4 F/Swivel	77	27	0.17
658-0606H	3/8 MSAE x 3/8 F/Swivel	82	27	0.20
658-0808H	1/2 MSAE x 1/2 F/Swivel	88	33	0.25
658-1010H	5/8 MSAE x 5/8 F/Swivel	94	33	0.26

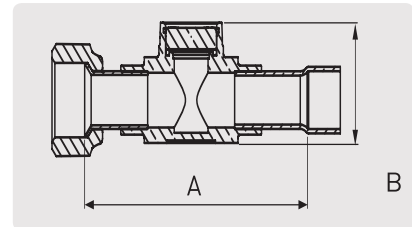


658 Series



Male SAE to Female SAE

Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length A	B	
659-0404H	1/4 ID SOLDER x 1/4 F/Swivel	82	27	0.17
659-0606H	3/8 ID SOLDER x 3/8 F/Swivel	94	27	0.20
659-0808H	1/2 ID SOLDER x 1/2 F/Swivel	107	27	0.20
659-1010H	5/8 ID SOLDER x 5/8 F/Swivel	108	33	0.25

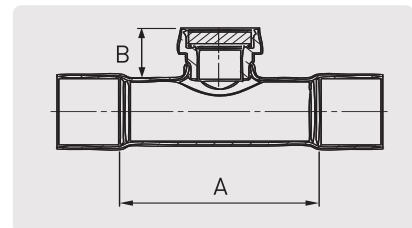


659 Series



Female Solder Single Port

Part No.	Connection	Dimensions (mm)		Weight (kg)
		Lay-In Length A	B	
670-1414	7/8 ID Solder	122	24	0.22
670-1818	1 1/8 ID Solder	114	24	0.29
670-2222	1 3/8 ID Solder	151	24	0.49
670-2626	1 5/8 ID Solder	145	24	0.51
670-3434	2 1/8 ID Solder	132	24	0.74

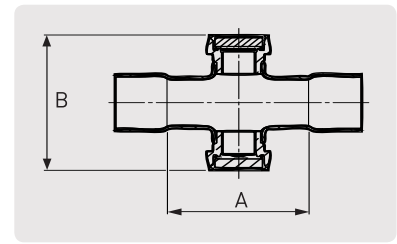


670 Series



Female Solder Dual Port

Part No.	Connection	Dimensions		Weight (kg)
		Lay-In Length A	B	
675-1414	7/8 ID Solder	122	72	0.41
675-1818	1 1/8 ID Solder	114	78	0.44
675-2222	1 3/8 ID Solder	151	84	0.50
675-2626	1 5/8 ID Solder	145	91	0.88
675-3434	2 1/8 ID Solder	132	104	0.65



675 Series



Moisture Content vs Colour Change

Indication (ppm of water) Liquid Temperature (°C)	Dry (Green)			Caution (Light Green)			Wet (Yellow)		
	25	40	50	25	40	50	25	40	50
R12	<5	<5	<5	5-25	5-40	5-70	>25	>40	>70
R134a (<20)	<35	<60	20-130	35-160	60-200	>130	>160	>200	-
R22	<25	<35	<50	25-145	35-200	50-290	>145	>200	>290
R407C(<25)	<40	<60	25-150	40-230	60-360	>150	>230	>360	-
R410A(<30)	<60	<75	30-170	60-280	75-420	>170	>280	>420	-
R404A/507 (<15)	<25	<45	15-120	25-150	45-180	>120	>150	>180	-
R502	<5	<5	<10	5-50	5-90	10-150	>50	>90	>150

Rotalock Sight Glasses

Sight Glasses are used throughout the refrigeration and air-conditioning industry as an easy means of visually checking the levels of liquid refrigerant and compressor oil in a system. Typically located on liquid receivers, suction accumulators, surge drums, liquid level columns and oil management systems, sight glasses provide a quick and easy means of determining the operating status of the system and its liquid levels.

Henry Tech is excited to announce the newest addition to their ever expanding range: Rotalock Sight Glasses.

In what will prove to be another step forward in the area of monitoring and serviceability for the industry, Heldon offer the convenience of a Sight Glass with the superior seal tight locking joint of a rotalock fitting.

A industry favourite, the rotalock utilises a connection that consists of both a male & female component, that when joined compress a sacrificial Teflon washer. By compressing this Teflon washer, a seal is created that can maintain its integrity regardless of large changes in temperature and constant system vibration.



Manufacturing Standards
Manufactured in accordance with AS/NZS 1677.2

Features

- A nickel plated steel body with a range of fused glass viewing lenses ensure excellent visibility for the operator.
- Sight Glass available with either 1 1/4" or 2 1/4" Rotalock nut. Combined with a dedicated Teflon washer, this assembly provides a superior seal tight locking joint.
- Simple 3 piece design incorporates a locking nut, glass lens assembly and "Quad-Ring" Teflon washer.
- Four different styles available: Clear lens/Dimple lens/Frost Shield/ Clear lens with Ball Float (on 1 1/4" only).
- The Rotalock Sight Glass range is suitable for all fluorinated refrigerants and their oils.

Benefits

- Nickel plating for outstanding corrosion resistance. Rugged fused glass can withstand the toughest conditions. Choose the lens to best suit your application.
- Rotalock fittings provides enhanced sealing capability and less chance of leakage. Rugged UNF thread ensures the nut hangs on tight.
- Easy installation with no special tooling required.
- A glass lens option to suit every need that is supplied ready for installation.
- The Rotalock Sight Glass is perfectly suited for use in today's industry.

Installation

When installing a Rotalock Sight Glass please observe the following precautions:

- The Rotalock Sight Glass is best positioned in an accessible location away from possible traffic and harm.
- A compatible male threaded spigot is required to be in place on the refrigeration plant.
- The refrigeration system must be pumped down or all refrigerant recovered before installation is to occur. If sight glasses are to be installed as part of an oil management system, oil must be isolated and equipment free of pressure before commencing work.
- Carefully remove assembly from packaging.

- Visually check parts before installation, for any signs of apparent damage.
- Make sure parts are clean and free of debris.
- Carefully fit new Quad-Ring Teflon washer into the rotalock spigots face groove. Lubricate the Teflon washer with clean refrigeration oil.
- Assemble sight glass and thread on rotalock nut finger tight. Tension to the recommended torque setting specified. Note that over-tensioning a Rotalock Sight Glass can result in fracturing the glass lens and so void warranty.
- Before putting into service, thoroughly leak test the complete assembly under pressure.

Caution

Only competent, trained refrigeration mechanics should install or service Rotalock Sight Glasses. The stated pressure and temperature limits should never be exceeded. Sight Glass lenses should be inspected routinely and replaced if damaged. Escaping refrigerant is hazardous to both the environment and to your health, installed as part of an oil management system, oil must be isolated and equipment free of pressure before commencing work.
Carefully remove assembly from packaging.

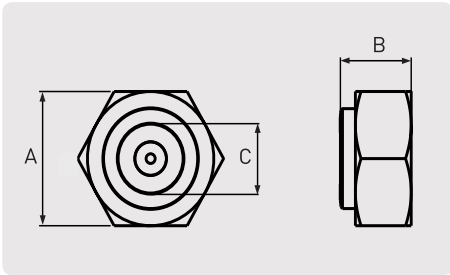
Specifications

Operating temperature range of -40oC to 85oC
Safe Working Pressure: 5,200 kPa
Burst Test Pressure: 26 MPa

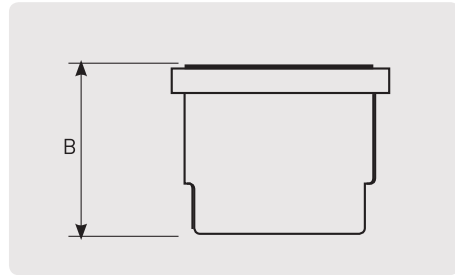
Dimensions and Capacities

Part No.	Description	Rotalock Connect.	Dimensions (mm)					Weight (kg)
			Nut Size	Lens Size	Lens Dia.	E	D	
			A	B	C	E	D	
647-2020-1	R/L Sight Glass - Dimpled	1 1/4" - 12 UNF	35	11	19	20	16	0.072
647-2020-2	R/L Sight Glass - with Ball Float	1 1/4" - 12 UNF	35	20	19	20	16	0.086
647-2020-3	R/L Sight Glass - Flat	1 1/4" - 12 UNF	35	11	19	29	16	0.072
647-2020-4	R/L Sight Glass - Frost Shield	1 1/4" - 12 UNF	35	25	17	35	16	0.135
647-3636-1	R/L Sight Glass -Frost Shield	2 1/4" - 12 UNF	65	31	38	46	25	0.454
647-3636-2	R/L Sight Glass - Dimpled	2 1/4" - 12 UNF	65	21	38	37	25	0.401

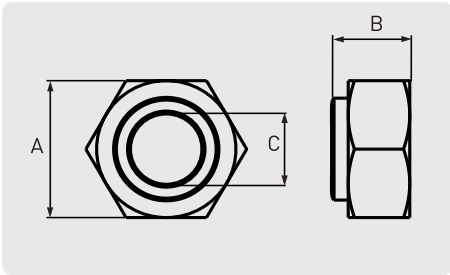
647-2020-1



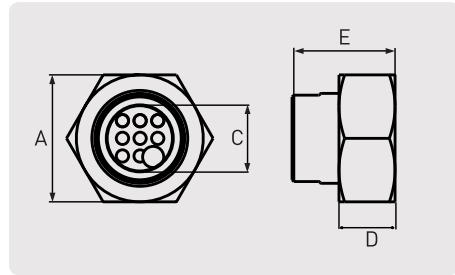
Sight Glass Frost Shield



647-2020-3



647-2020-2



Part Number Structure and Nomenclature

To demonstrate Henry Tech’s nomenclature, a typical part number would read #647-2020-1. The following table will explain further:

Nomenclature			
Series Number	Glass Body Size	Rotalock Connection Size	Glass Type
i.e. 647-XXXX-X	i.e 647-20XX-X	i.e 647-XX20-X	i.e 647 - XX20-1 or 2 or 3 or 4
	i.e 647-36XX-X	i.e 647-XX36-X	i.e 647 - XX36-1 or 2
647 = Rotalock Sight Glass	20 = 1 1/4" OD Body	20 = 1 1/4" - 12 UNF	20-1 = Bulls eye with frost shield
	36 = 2 1/4" OD Body	36 = 2 1/4" - 12 UNF	20-2 = Plain with Ball Float
			20-3 = Plain
			20-4 = Plain with frost shield
			36-1 = Plain
			36-2 = Bulls eye

Quad Ring Teflon Washer	
Part No.	Size
800-26XX-20	1 1/4" Sight Glass
800-26XX-36	2 1/4" Sight Glass

Henry Tech Recommended Rotalock Sight Glass Torque Settings

Rotalock Stub Size	Torque Setting (N.m)
Rotalock 1 1/4" - 12 UNF	120-135
Rotalock 2 1/4" - 12 UNF	165-190

Please note that all torque settings must be adhered to as over tensing the nut could result in fracturing the glass lens.

Sight Glasses

Introduction

Ideal for the visual inspection of liquid refrigerant or oil levels, Heldon now offer a complete range of plated steel bodies, MNPT threaded, Sight Glasses with built-in fused lense. Suitable for a wide variety of pressure vessel applications, these sturdy items are suited for most refrigerants and oils.

Applications

Sight glasses are used in refrigeration and air conditioning systems for both liquid refrigerant and oil applications.

The SG-12 series sight glasses are suitable for HCFC and HFC refrigerants, along with their associated oils.

The SG -10 and SG -11 series sight glasses are suitable for HCFC, FC and ammonia refrigerants, along with their oils.



Manufacturing Standards

Manufactured to UL207

Features

- Three sight glass lens options - Reflex, Clear and Clear with float ball.
- Hermetically sealed fused glass construction.
- Plated Steel body.

Benefits

- Provides flexibility of application.
- Avoids potential leakage path.
- Corrosion resistant.

Technical Specifications

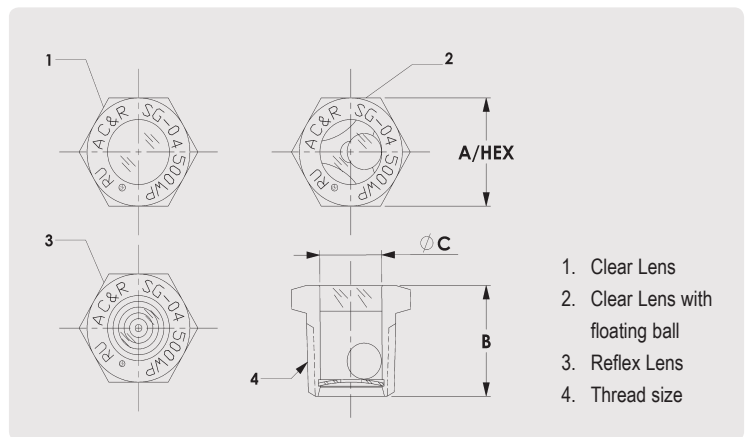
Safe Working Pressure = 3,450 kPa

SG-10 and SG-11 Series:

Allowable Operating Temperature = -40°C to 160°C

SG-12 Series:

Allowable Operating Temperature= -40°C to 90°C



Part No.			Thread Size NPT	Dimensions (mm)			Weight (kg)
Clear	Reflex	Clear W/Ball		A Hex	Length B	Dim. C	
SG-1004	SG-1104	SG-1204	1/2	23.9	24.3	14.3	0.03
SG-1006	SG-1106	SG-1206	3/4	28.4	26.9	19.1	0.06
SG-1008	SG-1108	SG-1208	1	35.1	33.6	23.8	0.12
SG-1010	SG-1110	SG-1210	1 1/4	44.5	35	30.2	0.20
SG-1012	SG-1112	SG-1212	1 1/2	50.8	35.9	33.4	0.29
SG-1016	SG-1116	SG-1216	2	63.5	36.1	41.4	0.46

SG-12 series is not suitable for use with ammonia

CAUTION: Overtightening should be avoided to prevent sight glass cracking

Liquid Indicator

Liquid Indicators are ideal for the visual inspection of refrigerant or oil levels. Henry Tech offer a new range of plated steel and ductile iron liquid indicators suitable for use with ammonia. Perfect for a wide variety of applications including pressure vessels.

LI-50 series

The LI-50 series incorporating a Bulls-Eye with reflex lens. These pieces have the ability to indicate the actual level of a liquid without requiring the installation of a second indicator for light admission. Their reflex lens configuration appears dark in the presence of liquid and light when liquid is absent.

Also, to properly view systems internal liquid levels under frosting conditions or when insulation material is present, a Frost Shield option is available. Easily press fitted in front of the Bulls-Eye, this clear perspex cylinder aids clarity of vision for the operator.

LI48 series

The LI48 series is an inline Liquid Indicator featuring double port glass viewing windows. Constructed from plated ductile iron and steel these pieces are recommended for use as a sight glass for oil, gas or liquid ammonia.



LI-50 series



LI48 series

Manufacturing Standards

Manufactured to accepted International Boiler and Pressure Vessel Codes.

Maximum Working Pressure: 3,450 kPa (LI-50 series)
3,510 kPa (LI48 series)

Allowable Operating Temperature: -40°C to 121°C (LI-50 series)
-29°C to 121°C (LI-48 series)

Features (LI-50 series)

1. Bulls-Eye with reflex lens.
2. Removable top of hermetically sealed fused glass construction.
3. Plated steel construction; weld type housing ASME SA36 (ASTM A36)
4. Frost Shield option available.

Benefits

1. Provides clear view of systems internal liquid levels.
2. Avoids potential leakage path.
3. The housing is designed to be permanently welded into the pressure vessel.
4. Allows clear viewing of liquid levels under frosting conditions or when insulation material is present.

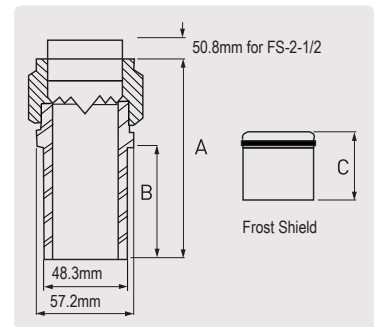
Features (LI48 series)

1. Double Port glass viewing windows.
2. Plated ductile iron and steel construction.
3. Fused glass viewing windows.

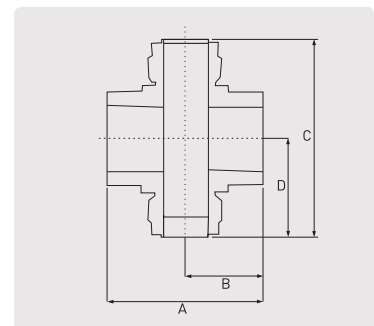
Benefits

1. Easy visual inspection.
2. Designed for long life.
3. Avoids potential leak paths.

Part No.	Item	Size & Type Connection	Dimensions (mm)		Weight (kg)
			A	B	
LI-50-2W	Reflex Lens	Weld	69.9	19.1	0.68
LI-50-4W	Reflex Lens	Weld	114.3	63.5	0.91
Part No.	Item		Use to Temperature	Dimension C (mm)	
FS-2-1/2	Frost Shield		-29°C	63.5	0.11



Part No.	Connection Size (Inch)	Dimensions (mm)			
		A	B	C	D
LI48A-1/2	1/2 FNPT	76.2	38.1	95.3	47.8
LI48A-3/4	3/4 FNPT	76.2	38.1	95.3	47.8
LI48A-1	1 FNPT	76.2	38.1	95.3	47.8



Liquid Receivers

Liquid Receivers collect the condensed liquid refrigerant exiting the condenser. Their internal volume allows them to store this refrigerant during fluctuating load conditions. Sized correctly they can store the entire refrigerant charge of a system during pump down. A pickup tube at the vessels outlet guarantees that a liquid seal is established ensuring only liquid refrigerant enters the liquid line.

Henry Tech manufacture a wide range of Liquid Receivers in both Vertical and Horizontal configurations. A Standard range of Vertical Receivers are available from 1.4 litres through to 14.5 litres. Larger Vertical or Horizontal configurations up to 250 litres in volume can be manufactured to suit individual customer needs, all with short lead times.

Built to either AS 1210 or AS 2971 standards, Henry Tech Tullamarine's manufacturing plant has the capability to produce pressure vessels with shell diameters ranging from 100mm through to 508mm. Suitable for use with all current refrigerants, vessels can be specifically made to suit R410A, CO² or Ammonia applications.

Made to order receivers can be fitted with a range of service valves, sight glass combinations, liquid level sensors and pressure relief valve access ports. Customised bracketery to suit customer specifications is also available.



Manufacturing Standards

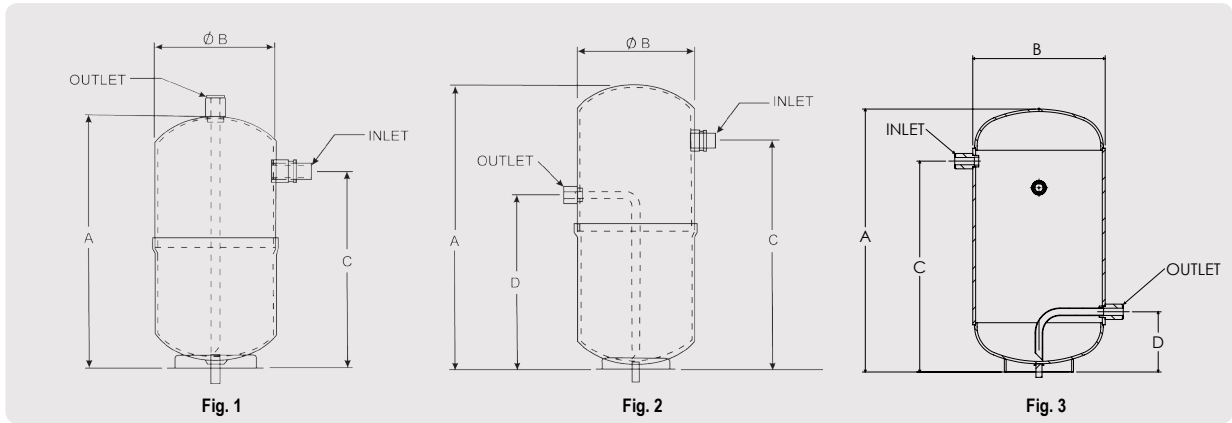
Manufactured in accordance with AS 1210 or AS2971.
Safe Working Pressure: 3,200 kPa, higher SWP available on request.

Features

- Designed for Maximum Flow & Minimum Pressure Drop.
- Manufactured & Tested to all relevant pressure vessel codes
- Ex-stock for standard receivers, short lead times for MTO receivers
- MTO Shell Diameters available: 100mm, 114mm, 165mm, 219mm, 273mm, 323mm, 357mm, 406mm, 457mm and 508mm.
- Large vessels can feature Full Flow Rotalock Valves with copper tails up to 1-5/8 ID.
- Cast Iron Service Valves with 1-5/8 or 2-1/8 ID Flange sweat connections available.
- Copper or Steel Pickup Tubes available in diameters of: 1/2, 3/4, 1-3/8 & 1-5/8 inches.
- 3/8 or 1/2 NPT PRV access ports available on larger vessels.
- Rotalock Sight Glasses or 2-1/4 Liquid Indicators can be specified on larger vessels.
- Custom bracketery available for larger vessels.
- Standard Operating Pressure's up to 4,800 kPa

Benefits

- Negligible loss in system efficiency.
- Verified vessel integrity and quality.
- Availability or quick turn-around guaranteed.
- Vessels can be made to suit your specific application.
- Offers flexibility of choice.
- Heavy Duty Service Valves for the toughest conditions.
- Custom made to your specifications.
- Liquid Level Alarms & Pressure Relief Valves can be installed easily.
- Visual inspection of liquid level provides valuable information of plant performance.
- Liquid Receiver can become the platform for system auxiliaries.
- Suitable for use with a wide range of refrigerants.



Standard Vertical Liquid Receivers

Part No.	Conn. Inlet (Inches)	Conn. Inlet Position	Conn. Outlet Inches	Conn. Outlet Position	Overall Height (mm) A	Dia. (mm) B	Inlet Height (mm) C	Outlet Height (mm) D	Volume (litres)	Weight (kg)	Design Pressure (kPa)	Fig. Ref.
3310-064014	1/4 ID copper tail	Side	To suit 3/4" R/L nut	Top	200	100	170	N/A	1.4	1.10	3200	Fig. 1
3310-064724	3/8 ID copper tail	Side	To suit 3/4" R/L nut	Side	249	120	195	195	2.4	2.30	3200	Fig. 2
3310-084724	3/8 ID copper tail	Side	To suit 3/4" R/L nut	Top	249	120	195	N/A	2.4	2.30	3200	Fig. 1
3310-105544	1/2 ID copper tail	Side	To suit 3/4" R/L nut	Side	337	140	272	207	4.4	3.30	3200	Fig. 2
3310-167082	To suit 1 R/L nut	Side	To suit 1" R/L nut	Side	396	180	317	317	8.2	6.10	3200	Fig. 2
3310-1670109	To suit 1 R/L nut	Side	To suit 1" R/L nut	Side	509	180	430	430	10.9	7.20	3200	Fig. 2
3310-1686145	To suit 1 R/L nut	Side	To suit 1" R/L nut	Side	430	219	344	95	14.5	10.30	3200	Fig. 3
3310-2070109	To suit 1 1/4 R/L nut	Side	To suit 1 1/4 R/L nut	Side	509	180	430	430	10.9	7.73	3200	Fig. 3

Large Vertical Liquid Receivers

Part No.	Volume (litres)	Pump Down* Capacity (kg)	Design Pressure (kPa)	Valve Style	Overall Height (mm) A	Dia. (mm) B	Standard
HVR-003	79	64	3000	Comp. Valve - 1 5/8	1143	324	AS1210.3
HVR-016	100	81	3000	Comp. Valve - 2 1/8	1186	356	AS1210.3
HVR-001	108	87	2800	RL - 1 3/8 ID x 1 3/4 Con.	1692	324	AS1210.3
HVR-008	1179	5	3000	Comp. Valve - 1 5/8	1377	356	AS1210.3
HVR-017	128	103	3000	Comp. Valve - 2 1/8	1481	356	AS1210.3
HVR-011	160	129	3000	Comp. Valve - 1 5/8	1481	406	AS1210.3
HVR-012	160	129	3000	Comp. Valve - 2 1/8	1481	406	AS1210.3
HVR-009	167	135	3200	Comp. Valve - 2 1/8	1481	406	AS1210.3
HVR-014	212	171	3000	Comp. Valve - 2 1/8	1567	457	AS1210.3

*At 80% full @ 32°C R404A

Large Horizontal Liquid Receivers

Part No.	Volume (litres)	Pump Down* Capacity (kg)	Design Pressure (kPa)	Valve Style	Overall Height (mm) A	Dia. (mm) B	Standard
HHR-018	42	34	3200	RL - 3/4 ID x 1 1/4 Con.	1264	219	AS1210.3
HHR-012	105	85	3000	RL - 1 5/8 ID x 1 3/4 Con.	976	406	AS1210.3
HHR-002	108	87	2800	RL - 1 3/8 ID x 1 3/4 Con.	1516	324	AS1210.3
HHR-011	135	109	3000	Comp. Valve - 2 1/8	1565	356	AS1210.3
HHR-008	150	121	3000	RL - 1 3/8 ID x 1 3/4 Con.	1270	406	AS1210.3
HHR-007	163	132	3000	Comp. Valve - 2 1/8	1465	406	AS1210.3
HHR-006	221	179	3200	Comp. Valve - 2 1/8	1465	457	AS1210.3

*At 80% full @ 32°C R404A

Note: RL = Full Flow Rotalock Service Valve
Comp. Valve = Cast Iron Service Valve

Suction Accumulators

The refrigeration compressor is designed to compress vapour only. A suction line accumulator prevents compressor damage from a sudden surge of liquid refrigerant and oil which could enter the compressor from the suction line. The suction line accumulator is a temporary reservoir for this mixture, designed to meter both the liquid refrigerant and oil back to the compressor at an acceptable rate. This prevents damage to the reed valves, pistons, rods, and crank shafts.

Features

- Designed for maximum flow and minimal pressure drop.
- Optimised metering device orifice for maximum mass flow.
- A 30 mesh screen fitted to the orifice of the metering device.
- U-tube inlet positioned is separated from the vessel inlet.
- Stamped inlet position.
- Powder coated finish.

Benefits

- Negligible loss in system efficiency.
- Positive oil return with controlled liquid injection
- Reduced chance of orifice blocking.
- Reduced risk of high velocity liquid carry over.
- Ensures correct installation orientation.
- Exceeds 500 hours ASTM salt spray tests.

Technical Specification

Manufactured in accordance with AS 2971, AS 1210 or UL207

Standard Suction Accumulators

Safe Working Pressure: 2,500 kPa

Minimum Burst Pressure: 12,500 kPa

SA-7 Series Suction Accumulators

Safe Working Pressure: 3,100 kPa

Minimum Burst Pressure: 15,500 kPa

The Design Temperature range of all suction accumulators is -30°C to 50°C. Copper tubing and fittings in accordance with AS 1571-1995 or ASTM B28. Vessel Classification (As 2971) is Class 2 Tier 1. Contents Hazard level: Non-Harmful.

Note: Henry Tech Suction Accumulators have the inlet connector clearly identified to avoid incorrect installation. If connected in the wrong orientation oil and/or liquid refrigerant will become trapped inside the accumulator resulting in catastrophic compressor failure from oil starvation to the compressor or slugging back to the compressor.



Accumulator Selection

Selection of a suction accumulator should be made based on the following:

1. The accumulator should have an adequate liquid holding capacity, which can vary with the system. Normally this should not be less than 50% of the system charge (for TXV systems).
2. The system designer must ensure that the refrigeration capacity is within the capacity of the suction accumulator.

Accumulator Location

Position the suction accumulator between the evaporator and the compressor. Installing at the same level of the compressor and as close to the compressor as possible will ensure the shortest pipe run between the outlet of the suction accumulator and the compressor service valve.

Effects Of Liquid "Slugging" On A Compressor

Liquid slugging occurs when a sudden surge of liquid refrigerant (or oil) is allowed to return to the compressor from the suction line.

If this sudden surge of liquid enters the compressor this could result in damage to the reed valves, pistons, rods, and crank shafts resulting in compressor failure.

New Refrigerants

New generation refrigerants & oils can be immiscible at lower temperatures and can actually separate into layers in the base of an accumulator. The Henry Tech suction accumulator provides active mixing through a combination of inlet flow direction, outlet U-tube positioning and dedicated metering device location.

Field Replacement

Henry Tech recommends to replace an accumulator after a compressor failure. System contaminants and “old” oil inside the vessel can significantly reduce the life span of the replacement compressor.

Effects of Pressure drop on system capacity on suction lines:

When sizing piping and components for refrigeration systems, there is a balance between costs imposed for larger piping and components, versus efficiency considerations due to pressure drop and oil entrainment.

Pressure drop in suction lines can cause a dramatic reduction in system capacity as Table 1 demonstrates.

Table 1.

Approximate Effect of Gas Line Pressure Drops on R-22 Compressor Capacity and Power *		
Line Loss, K Suction Line	Capacity %	Energy % **
0	100	100
1	96.8	104.3
2	93.6	107.3

* For an evaporating temperature of 5°C and 40°C condensing

** Energy rated @ kW power/kW cooling effect

Recommended system practices for Halocarbon refrigerants according to the ASHRAE Handbook R02 – Refrigeration, takes into consideration economic factors such as costs of materials and system efficiency. Pressure drop calculations for each segment of the system are based on change in saturation temperature of the refrigerant in suction lines the total drop should be limited to 1 K in equivalent pressure loss.

Description

Suction line accumulators are installed in air conditioning and refrigeration systems where a sudden return of liquid down the suction line is possible. They are installed immediately before the compressor.

The suction accumulator is designed to allow only refrigerant vapour to return to the compressor. This is achieved by utilising a U-tube design incorporated in the outlet of the vessel.

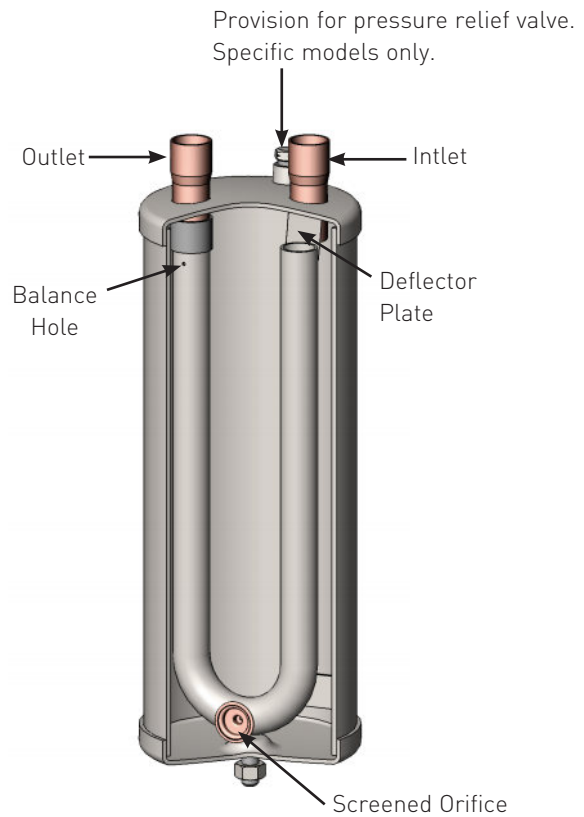
This design allows vapour to be drawn off even when the accumulator is almost completely full of liquid refrigerant.

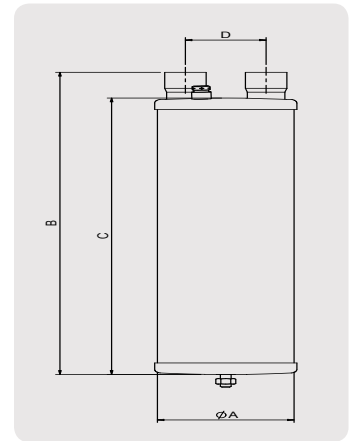
A screened orifice fitted to the lowest point of the U-tube allows any liquid (oil or refrigerant) to be metered back into vapour suspension to be returned safely to the compressor.

A vent hole positioned at the top of the U-tube prevents a flooded accumulator from “slugging” at system start-up. Flooding of the suction accumulator can occur during the off-cycle. Improved system balance can also be achieved with the installation of a correctly selected suction accumulator.

The suction accumulator also act as a storage vessel for any liquid refrigerant returning from the evaporator as a result of condenser or evaporator load variations as well as provide protection from liquid migration to the compressor during its off-cycle.

The Henry Tech suction accumulators come in a range of refrigeration capacities, holding volumes and connection sizes. The range is suitable for all popular refrigerants including R410A and CO².





Nominal Capacity kW @ +5°C set & 30°C sct, pressure drop = 7 kPa										
Part No.	Connection Size ID (Inch)	Volume (L)	R404A	R134a	R410A	Dimensions (mm)				Weight (kg)
						Dia. A	B	C	D	
3100-083007	1/2	0.7	3.1	1.6	3.1	76	200	172	41.2	1.10
3100-084015	1/2	1.5	3.1	1.6	3.1	102	250	214	52	1.5
3100-104016P	5/8	1.6	7.4	6.2	7.4	102	218	194	43.5	1.90
3100-104019	5/8	1.9	7.4	6.2	7.4	102	305	270	52	2.60
3100-124016P	3/4	1.6	13.4	11.2	13.4	102	244	220	43.5	2.20
3100-125024P	3/4	2.4	13.4	11.2	13.4	127	215	186	43.5	2.80
3100-125029P	3/4	2.6	13.4	11.2	13.4	127	255	222	43.5	3.20
3100-145034P	7/8	3.4	19.0	15.8	19.0	127	285	245	43.5	3.50
3100-145040	7/8	4.0	19.0	15.8	19.0	127	368	328	70	3.80
3100-185040	1 1/8	4.0	31.4	16.3	31.4	127	360	315	70	3.80
3100-185559	1 1/8	5.9	31.4	16.3	31.4	140	430	385	75	6.20
3100-186055P	1 1/8	5.5	31.4	16.3	31.4	159	390	340	60.5	5.90
3100-186063P	1 1/8	6.3	31.4	16.3	31.4	159	470	420	60.5	6.80
3100-186572	1 1/8	7.2	31.4	16.3	31.4	180	442	397	85	7.0
3100-226071P	1 3/8	7.1	95	49.3	95	160	460	406	60.5	7.40
3100-226563	1 3/8	6.3	95	49.3	95	160	350	305	85	6.20
3100-226596	1 3/8	9.6	95	49.3	95	159	569	524	85	8.1
3100-266510	1 5/8	10.5	201	109	201	160	575	525	85	9.30
3100-346013P	2 1/8	13.0	201	109	201	160	874	820	70.5	14.00
3100-348615	2 1/8	15.0	201	109	201	219	533	499	123	13.30
3100-348626	2 1/8	26.0	201	109	201	219	879	836	89	23

Nominal Capacity kW @ +5°C set & 30°C sct, pressure drop = 7 kPa										
Part No.	Conn. Size ID (Inch)	Volume (L)	R404A	R134a	R410A	Dimensions (mm)				Weight (kg)
						Dia. A	B	C	D	
SA-7044	1/2	1.0	3.1	1.6	3.1	102	168	143	63.5	1.27
SA-7045	5/8	1.0	7.4	6.2	7.4	102	165	143	63.5	1.27
SA-7045S	5/8	1.7	7.4	6.2	7.4	102	279	254	63.5	2.10
SA-7046	3/4	1.7	13.4	11.2	13.4	102	284	254	63.5	2.10
SA-7056	3/4	2.4	13.4	11.2	13.4	127	246	216	70	2.30
SA-7057S	7/8	2.4	19.0	15.8	19.0	127	251	216	70	2.90
SA-7057	7/8	3.7	19.0	15.8	19.0	127	374	340	70	3.22
SA-7051	1 1/8	4.8	31.7	31.1	31.7	127	466	429	70	3.80
SA-7053	1 3/8	4.8	42.2	38.9	42.2	127	470	430	70	3.80
SA-7065	1 5/8	11.0	102.0	87.3	102.0	160	680	635	75	10.30

Note: Suction Accumulators are to be mounted vertically

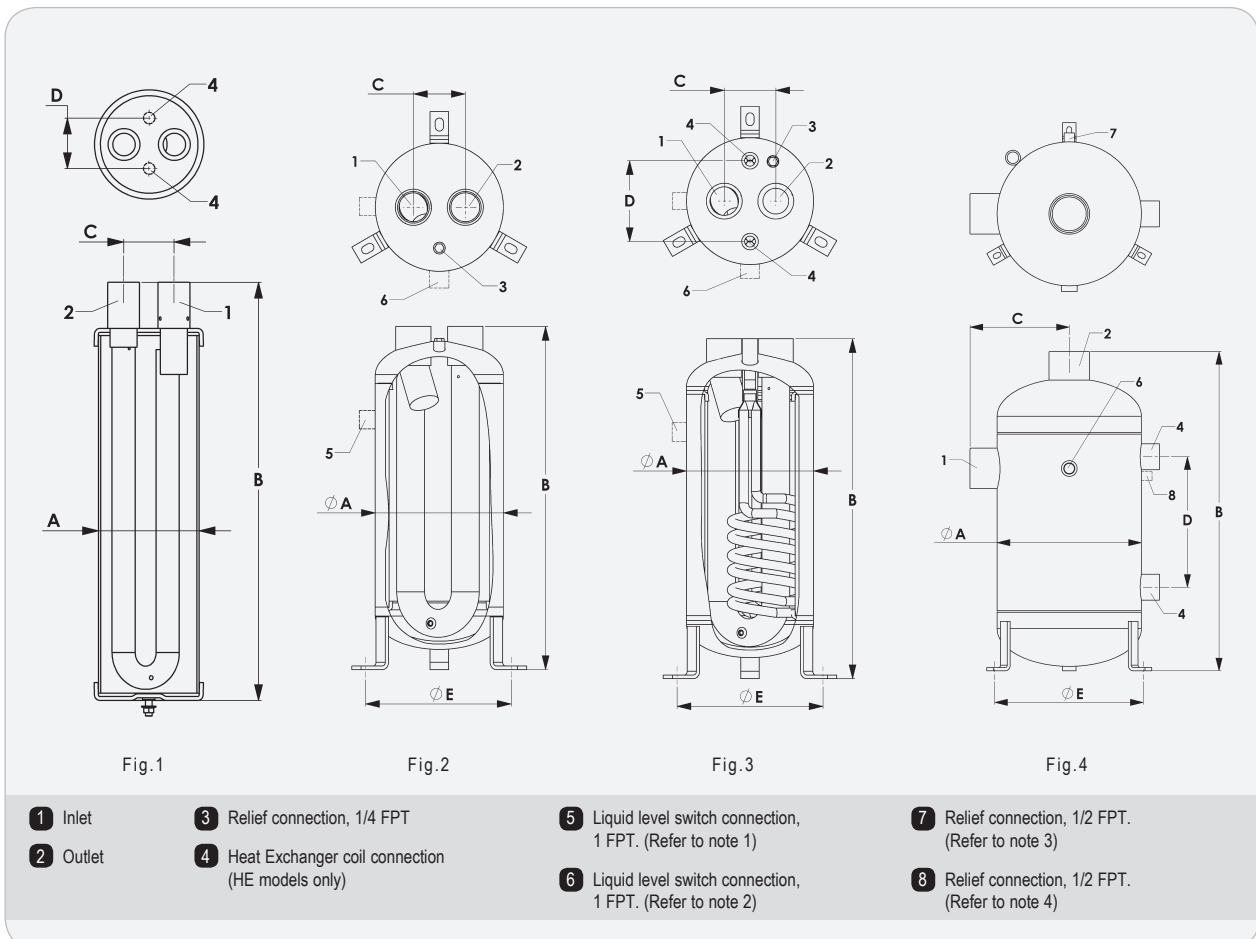
Part No	Conn Size (inch)	Dimensions (mm)					Mounting details	HE Coil Conn Size (inch)	Drawing Reference	Weight (kg)	CE Cat		
		A	B	C	D	E (Ø)							
S-7043	-	-	5/8 ODS	102	168	48	N/A	N/A	M10 stud & nut	N/A	fig.1	2	SEP
S-7044	-	S-7044-HP	1/2 ODS	102	264	48	N/A	N/A	M10 stud & nut	N/A	fig.1	2.5	SEP
S-7045	-	S-7045HP	5/8 ODS	102	264	48	N/A	N/A	M10 stud & nut	N/A	fig.1	2.5	SEP
-	S-7045HE	-	5/8 ODS	102	264	64	64	N/A	M10 stud & nut	3/8 ODS	fig.1	2.5	SEP
S-7046	-	S-7046HP	3/4 ODS	102	270	48	N/A	N/A	M10 stud & nut	N/A	fig.1	2.5	SEP
-	S-7046HE	-	3/4 ODS	102	270	64	64	N/A	M10 stud & nut	3/8 ODS	fig.1	2.5	SEP
S-7057-CE	S-7057HE-CE	S-7057HP-CE	7/8 ODS	152	252	57	70	N/A	M10 stud & nut	1/2 ODS	fig.1	6, 7 (HE)	Cat I
S-7061-CE	S-7061HE-CE	S-7061HP-CE	1 1/8 ODS	152	382	76	73	N/A	M10 stud & nut	5/8 ODS	fig.1	8, 9 (HE)	Cat I
S-7063-CE	S-7063HE-CE	S-7063HP-CE	1 3/8 ODS	152	629	76	73	N/A	M10 stud & nut	5/8 ODS	fig.1	11.5, 13.5 (HE)	Cat II
S-7065-CE	S-7065HE-CE	S-7065HP-CE	1 5/8 ODS	152	639	76	73	N/A	M10 stud & nut	3/4 ODS	fig.1	11.5, 13.5 (HE)	Cat II
S-7721-CE	-	-	2 1/8 ODS	219	588	89	140	282	3 Ø14mm x 22mm slots	N/A	fig.2	23	Cat II
-	S-7721HE-CE	-	2 1/8 ODS	219	588	89	140	282	3 Ø14mm x 22mm slots	7/8 ODS	fig.3	27	Cat II
S-7722-CE	-	-	2 1/8 ODS	219	588	89	140	282	3 Ø14mm x 22mm slots	N/A	fig.2	23	Cat II
-	S-7722HE-CE	-	2 1/8 ODS	219	588	89	140	282	3 Ø14mm x 22mm slots	7/8 ODS	fig.3	27	Cat II
S-7725-CE	-	-	2 5/8 ODS	273	578	118	140	337.4	3 Ø14mm x 22mm slots	N/A	fig.2	33.5	Cat II
-	S-7725HE-CE	-	2 5/8 ODS	273	578	118	140	337.4	3 Ø14mm x 22mm slots	1 3/8 ODS	fig.3	39.5	Cat II
S-7726-CE	-	-	2 5/8 ODS	273	578	118	140	337.4	3 Ø14mm x 22mm slots	N/A	fig.2	33.5	Cat II
-	S-7726HE-CE	-	2 5/8 ODS	273	578	118	140	337.4	3 Ø14mm x 22mm slots	1 3/8 ODS	fig.3	39.5	Cat II
S-7731-CE	-	-	3 1/8 ODS	324	635	140	149	388.4	3 Ø14mm x 22mm slots	N/A	fig.2	47	Cat IV
-	S-7731HE-CE	-	3 1/8 ODS	324	635	140	149	388.4	3 Ø14mm x 22mm slots	1 3/8 ODS	fig.3	52	Cat IV
S-7732-CE	-	-	3 1/8 ODS	324	635	140	149	388.4	3 Ø14mm x 22mm slots	N/A	fig.2	47	Cat IV
-	S-7732HE-CE	-	3 1/8 ODS	324	635	140	149	388.4	3 Ø14mm x 22mm slots	1 3/8 ODS	fig.3	52	Cat IV
S-7741-CE	S-7741HE-CE	-	4 1/8 ODS	406	902	279	368	470	3 Ø14mm x 22mm slots	2 5/8 ODS	fig.4	102	Cat III
S-7742-CE*	-	-	4 1/8 ODS	508	1130	330	N/A	457	4 x Ø16.3mm holes on square base	N/A	fig.4*	130	Cat IV

*S-7742-CE features a square mounting plate - not mounting brackets

Notes (to be read in conjunction with drawing legend):-

For liquid level switch and relief valve connection positions, see notes below for relevant models

1. S-7722, S-7722HE & S-7726 models
2. S-7726HE, S-7732, S-7732HE, S-7741, S-7741HE & S-7742 models
3. S-7741HE model
4. S-7741 & S-7742 models



Part No	Refrigerant Holding Capacity (kg at -18°C)				Recommended kW of refrigerant at Suction Evaporating Temp (°C)														
	R134a	R407F	R404A		R134a					R407F					R404A / R507				
					5°	-7°	-18°	-29°	-40°	5°	-7°	-18°	-29°	-40°	5°	-7°	-18°	-29°	-40°
S-7615-CE	10.6	9.7	8.8	MAX	53	35	Horizontal accumulators not suitable for applications below -10°C			145	98	Horizontal accumulators not suitable for applications below -10°C			100	57	Horizontal accumulators not suitable for applications below -10°C		
S-7621-CE	14.4	13	11.9	MAX	101	69	Horizontal accumulators not suitable for applications below -10°C			254	170	Horizontal accumulators not suitable for applications below -10°C			173	117	Horizontal accumulators not suitable for applications below -10°C		
S-7625-CE	21.2	19	17.6	MAX	176	123	Horizontal accumulators not suitable for applications below -10°C			481	323	Horizontal accumulators not suitable for applications below -10°C			328	217	Horizontal accumulators not suitable for applications below -10°C		
S-7043	1	0.9	0.7	MAX	3.2	2.3	1.5	1	0.6	10.5	7.1	4.7	2.9	1.7	6.3	4.3	2.8	1.8	1.1
				MIN	0.7	0.6	0.5	0.4	0.3	2.4	1.6	1.1	0.7	0.4	0.9	0.7	0.6	0.5	0.4
S-7044	2	1.9	1.7	MAX	1.6	1.2	0.8	0.5	0.6	5.8	3.9	2.6	1.6	1	3.1	2.2	1.5	0.9	0.6
				MIN	0.3	0.2	0.2	0.1	1.7	1.1	0.7	0.5	0.3	0.5	0.3	0.3	0.2	0.2	
S-7045	2	1.9	1.7	MAX	3.2	2.3	1.5	1	0.6	10.5	7.1	4.7	2.9	1.7	6.3	4.3	2.8	1.8	1.1
				MIN	0.7	0.6	0.5	0.4	0.3	2.4	1.6	1	0.7	0.4	0.9	0.7	0.6	0.5	0.4
S-7046	2	1.9	1.7	MAX	4.5	3.1	2.1	1.4	0.8	14.4	9.7	6.4	4	2.4	8.7	5.9	3.8	2.5	1.5
				MIN	0.9	0.7	0.6	0.5	0.4	3.2	2.2	1.4	0.9	0.5	1.3	1	0.8	0.6	0.5
S-7057-CE	4.2	3.8	3.5	MAX	7.7	5.4	3.6	2.3	1.4	24.2	16.3	10.7	6.7	4	14.9	10.2	6.5	4.2	2.6
				MIN	1.3	1.1	0.9	0.7	0.6	4.9	3.3	2.2	1.4	0.8	1.8	1.5	1.2	1	0.7
S-7061-CE	5.8	5.5	4.9	MAX	16.3	11.4	7.3	4.8	2.9	49.8	33.4	22.1	13.8	8.2	31.4	21.7	13.2	8.6	5.2
				MIN	2.1	1.8	1.5	1.2	1	7.5	5	3.3	2.1	1.2	2.9	2.4	2	1.6	1.2
S-7063-CE	9.9	9	8.3	MAX	27.8	18.8	12	7.6	4.7	82.1	55.1	36.4	22.8	13.4	53.9	35.9	21.8	13.8	8.6
				MIN	4.4	3.7	3.1	2.5	2	15.8	10.6	7	4.4	2.6	6	4.9	4	3.2	2.5
S-7065-CE	9.9	9	8.3	MAX	49.3	33.8	21.1	13.4	8.2	145	97.4	64.4	40.2	23.7	95	64.1	38	24.3	15
				MIN	7.6	6.3	5.3	4.4	3.5	28.7	19.3	12.7	8	4.7	10.3	8.4	7	5.7	4.4
S-7721-CE	14.7	13.4	12.3	MAX	109	70.4	49.3	26.4	17.6	322	216	143	89.2	52.7	201	134	84.5	56.3	35.2
				MIN	14.1	12.3	10.6	8.8	7	57.4	38.5	25.5	15.9	9.4	21.1	17.6	14.1	12.3	8.8
S-7722-CE	14.7	13.4	12.3	MAX	109	70.4	49.3	26.4	17.6	322	216	143	89.2	52.7	201	134	84.5	56.3	35.2
				MIN	14.1	12.3	10.6	8.8	7	57.4	38.5	25.5	15.9	9.4	21.1	17.6	14.1	12.3	8.8
S-7725-CE	22	19.9	18.2	MAX	172	113	75.7	42.2	22.9	480	322	213	133	78.6	308	204	132	88	47.5
				MIN	21.1	19.4	15.8	12.3	3.5	95.9	64.4	42.6	26.6	15.7	31.7	28.2	22.9	21.1	5.3
S-7726-CE	22	19.9	18.2	MAX	172	113	75.7	42.2	22.9	480	322	213	133	78.6	308	204	132	88	47.5
				MIN	21.1	19.4	15.8	12.3	3.5	95.9	64.4	42.6	26.6	15.7	31.7	28.2	22.9	21.1	5.3
S-7731-CE	36.4	32.9	30	MAX	253	194	130	84.5	33.4	712	478	316	197	117	456	308	197	125	70.4
				MIN	35.2	31.7	24.6	22.9	5.3	143	96	63.4	39.6	23.4	52.8	44	37	29.9	8.8
S-7732-CE	36.4	32.9	30	MAX	253	194	130	84.5	33.4	712	478	316	197	117	456	308	197	125	70.4
				MIN	35.2	31.7	24.6	22.9	5.3	143	96	63.4	39.6	23.4	52.8	44	37	29.9	8.8
S-7741-CE	62	58.8	55	MAX	401	259	156	107	69.7	1120	752	497	310	183	757	503	320	201	116
				MIN	109	89.4	75.7	59.8	47.2	362	243	160	100	59.2	174	113	73.9	45.8	24.6
S-7742-CE	127	121	114	MAX	401	259	156	107	69.7	1120	752	497	310	183	757	503	320	201	116
				MIN	109	89.4	75.7	59.8	47.2	362	243	160	100	59.2	174	113	73.9	45.8	24.6

Selection Guidelines

The accumulator should have adequate holding capacity. Normally, this should not be less than 50% of the total system charge.

The system designer should check that the minimum and maximum system refrigeration capacities are within the limits of the accumulator.

The recommended minimum and maximum kW capacities are listed in the table. The maximum kW capacities are based on accumulator pressure loss and oil return. The pressure loss is equivalent to 1/2° C. The minimum kW capacities are to ensure proper oil return.

Example:

Refrigerant R404A

System maximum refrigeration capacity = 170 kW

System minimum refrigeration capacity = 65 kW

Evaporating temperature = -18°C

System Charge = 55 kg

Recommended accumulator is model S-7731-CE with a refrigerant holding capacity of 30 kg and a minimum/maximum rating of 37/197 kW.

Additional selection information

The heat exchanger models can be used on low temperature systems to sub-cool the liquid line while helping to boil off liquid refrigerant in the accumulator by passing the liquid line through the heat exchanger coil. This can increase system efficiency while helping oil flow in the suction line. Do not use discharge gas through the heat exchange coil as there is a risk of overheating the compressors.

Heat pump systems must use the HP accumulator models. Winter heating can cause too much liquid refrigerant to slug back to the compressor. Heat pump accumulators incorporate a smaller orifice to prevent excessive liquid flow.

Two accumulators can be piped in series to increase holding capacity. Oil will be metered from one accumulator to the next to ensure proper oil flow to the compressors. Adding a second identical accumulator will effectively double the holding capacity of a single accumulator.

Piping two identical accumulators in parallel will double the kW capacity. Two identical accumulators must be used.

On low temperature systems (-18°C and below) a heater band should be installed to help boil off the liquid refrigerant and aid oil flow. Do not add too much heat or there is a risk of overheating the compressors.

Horizontal accumulators should not be used when the liquid refrigerant temperature is less than -10°C.

Installation – Main issues

1. Install the accumulator after the suction line filter.
2. A pressure relief device connection is provided at the top of the vessel. The user must ensure that the vessel is protected from over-pressure. Over-pressure will occur if the liquid refrigerant is evaporated e.g. external fire case.
3. Heater bands should be installed at the bottom of a vertical accumulator and at the outlet end of a horizontal accumulator.

Pressure Relief Valves

The function of a Pressure Relief Valve is to protect against over-pressure. For safety reasons, excessive over-pressure in any part of the refrigeration system must be avoided

Applications

A typical application for a Henry Technologies pressure relief valve (PRV) is to protect a liquid receiver from being over-pressurised. In the event of a fire, any liquid refrigerant inside the receiver will evaporate resulting in an increase in pressure. The PRV will safely control this increase in pressure by venting the vapour from the receiver. Another application is to protect equipment from compressor over-pressure.

Henry Technologies pressure relief valves are designed to discharge vapour and should not be used to vent liquid refrigerant. The valves are "back-pressure dependent" and are therefore required to discharge to atmosphere.

The brass and stainless steel series valves are suitable for use with HCFC and HFC refrigerant gases. The stainless steel series valves are also suitable for ammonia.

Once a PRV has discharged, replacement is recommended, as the set pressure can no longer be guaranteed. Refer to Installation Section for further information.

In line with the Institute of Refrigeration Guidelines (UK), Henry Technologies recommend that a PRV should be replaced at least every 5 years. These intervals may have to be reduced if other regulations apply.

It is recommended to have a relief valve pressure setting at least 25% higher than the maximum system operating pressure. The PRV set pressure should not be higher than the design pressure (MWP) of the vessel.

How it works

A conventional PRV is designed to open at a predetermined pressure - the set pressure. A spring exerts a sealing force on a valve seat via a piston seal assembly. At a pressure equal to the set pressure, the piston will start to lift resulting in a small amount of flow through the valve. From this point, the pressure force acting on the piston increases significantly and overcomes the spring force. This imbalance of forces causes the valve to "pop" fully open. By design, the difference in pressure from the valve set point to the fully open condition is no more than 10%. System pressure is controlled/reduced by venting the refrigerant vapour through the valve. The valve then re-closes at a pressure where the spring force overcomes the piston force. Under normal system operating conditions, the pressure at the valve inlet is below the set pressure.

Only under abnormal operating conditions should the PRV be open.

Main features

- Proven safe design
- Category IV PED compliant
- Precision machined parts for reliability
- High flow capacity
- Compact
- Non-stick teflon valve seal
- Blow-out proof seal design
- Seal material with high chemical resistance
- Tamper proof
- Test Certificates available on request
- Non-standard pressure settings available on request



Technical Specification

All Henry Technologies standard range PRV's are designed and manufactured to the intent of ASME VIII Division 1.

For 526, 5230 and 5231 series models:-

Set pressure range = 14 to 31 barg
Allowable operating temperature = -40°C to +107°C

For 5232 and 524 series models:-

Set pressure range = 10.3 to 31 barg
Allowable operating temperature = -40°C to +107°C

For 53 series models:-

Set pressure range = 10.3 to 31 barg
Allowable operating temperature = -29°C to +135°C

Materials of Construction

For all 52 series valves, the main body and outlet connection are made from brass. Valve internals such as the piston and adjusting gland are either made from brass, plated steel or stainless steel.

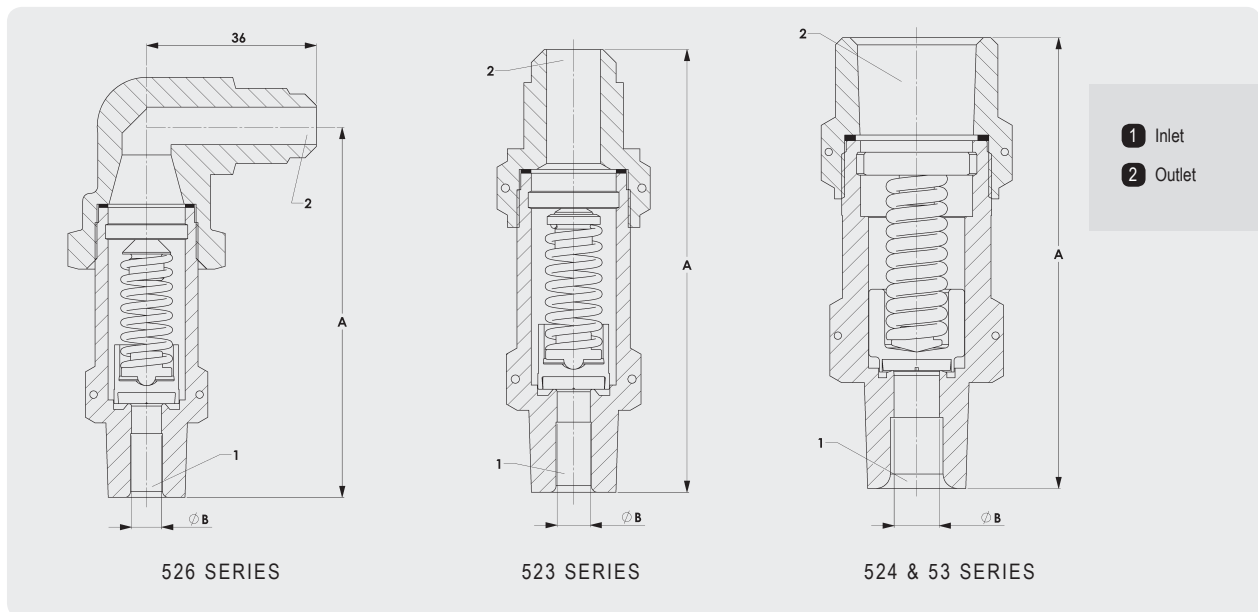
For the 53 series valves, the main body is made from stainless steel. The outlet connection and valve internals are made from either plated steel or stainless steel.

For all valves, the seal is made from premium quality teflon (PTFE). All springs are made from high strength plated alloy steel.

Angle Relief Valve - Brass								
Part No	Conn Size (inch)		Dimensions (mm)		Flow Area (mm ²)	K _{dr}	Weight (kg)	CE Cat
	Inlet	Outlet	A	ØB				
526E-xx.x BAR-CE	3/8 NPTF	3/8 SAE Flare	78	6.35	31.67	0.41	0.26	Cat IV

Straight-through Relief Valves - Brass								
Part No	Conn Size (inch)		Dimensions (mm)		Flow Area (mm ²)	K _{dr}	Weight (kg)	CE Cat
	Inlet	Outlet	A	ØB				
5230A-xx.x BAR-CE	1/4 NPTF	1/2 SAE Flare	85	6.35	31.67	0.68	0.18	Cat IV
5231A-xx.x BAR-CE	3/8 NPTF	1/2 SAE Flare	85	6.35	31.67	0.68	0.19	Cat IV
5231B-xx.x BAR-CE	1/2 NPTF	5/8 SAE Flare	91	6.35	31.67	0.68	0.22	Cat IV
5232A-xx.x BAR-CE	1/2 NPTF	3/4 SAE Flare	109	9.5	71.26	0.67	0.44	Cat IV
5240-xx.x BAR-CE	1/2 NPTF	3/4 NPTF (female)	95	9.5	71.26	0.67	0.41	Cat IV
5242-xx.x BAR-CE	3/4 NPTF	3/4 NPTF (female)	95	9.5	71.26	0.67	0.45	Cat IV
5244-xx.x BAR-CE	1 NPTF	1 NPTF (female)	106	12.7	126.68	0.68	0.66	Cat IV
5246-xx.x BAR-CE	1 1/4 NPTF	1 1/4 NPTF (female)	145	17.9	250.41	0.60	1.48	Cat IV

Straight-through Relief Valves - Stainless Steel								
Part No	Conn Size (inch)		Dimensions (mm)		Flow Area (mm ²)	K _{dr}	Weight (kg)	CE Cat
	Inlet	Outlet	A	ØB				
5340-xx.x BAR-CE	1/2 NPTF	3/4 NPTF (female)	94	9.5	71.26	0.67	0.39	Cat IV
5342-xx.x BAR-CE	3/4 NPTF	3/4 NPTF (female)	94	9.5	71.26	0.67	0.43	Cat IV
5344A-xx.x BAR-CE	3/4 NPTF	1 NPTF (female)	106	12.7	126.68	0.68	0.56	Cat IV
5344-xx.x BAR-CE	1 NPTF	1 NPTF (female)	106	12.7	126.68	0.68	0.62	Cat IV
5345-xx.x BAR-CE	1 NPTF	1 1/4 NPTF (female)	149	17.9	250.41	0.60	1.25	Cat IV
5346-xx.x BAR-CE	1 1/4 NPTF	1 1/4 NPTF (female)	145	17.9	250.41	0.60	1.37	Cat IV



Standard settings are (barg): 10.3, 13.8, 14.0, 16.2, 17.2, 20.7, 24.1, 24.8, 25.0, 25.9, 27.6, 29.3 and 31.0

Pressure Relief Valves - X Series

The 'X' Series of Pressure Relief Valves is based on the proven design of the standard range with some enhanced features. The valves are EN ISO 4126 compliant and will reseal within 15% of set pressure following a discharge. Consequently a minimum amount of refrigerant is lost to the atmosphere. The 523 series can also be used at pressures up to 46 bar.

NOTE:

Most systems are subject to accumulations of debris & particles of metal and dirt are generally blown onto relief valve seats during discharge.

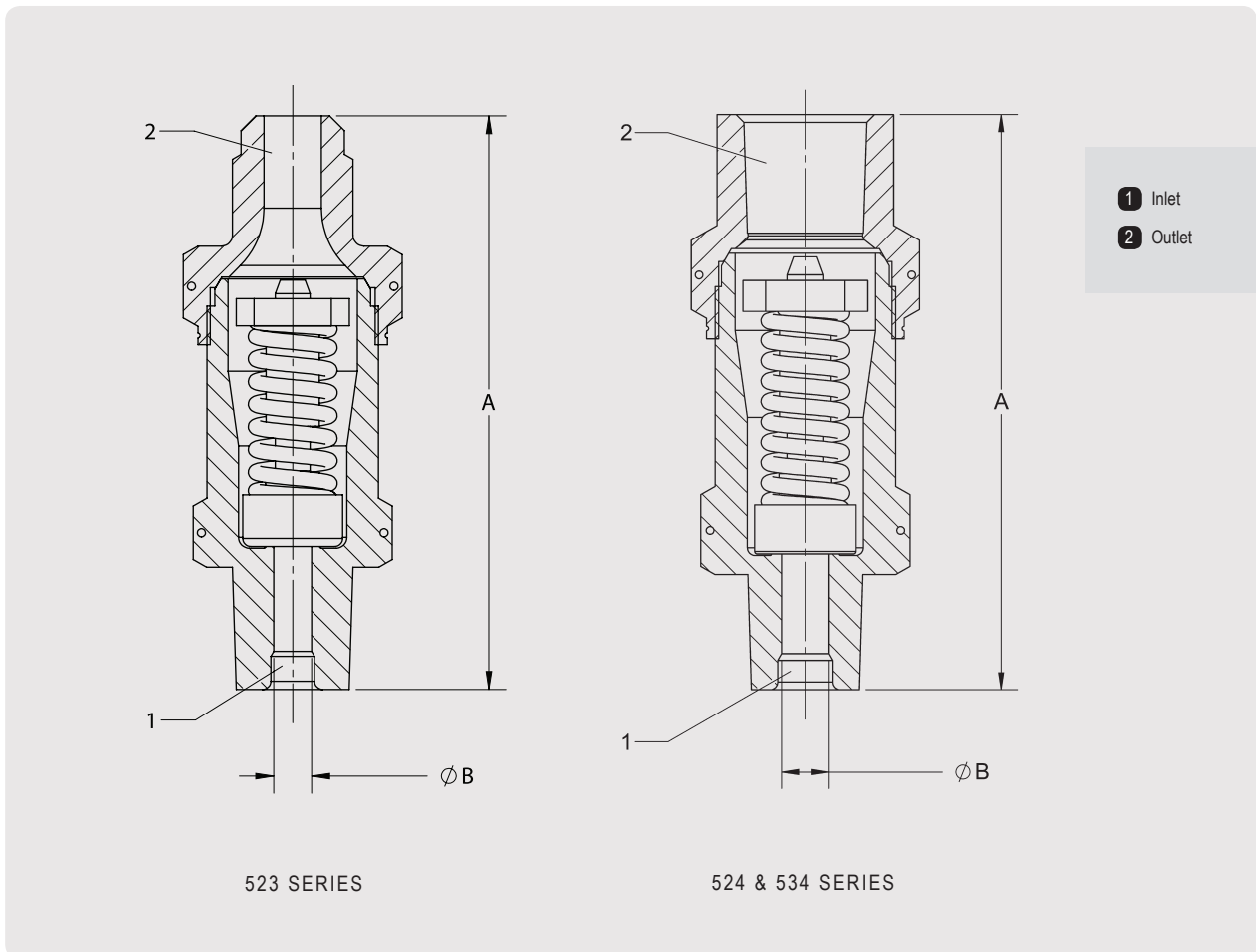
This can inhibit the relief valve from re-sealing.

Main features

- In accordance with EN ISO 4126 the valve reseats within 15% of set pressure following a discharge
- High flow capacity
- Fluoroelastomer soft seat material provides excellent sealing characteristics
- Allowable operating temperature = -40°C to +120°C
- Suitable for HFC, HCFC and CO₂ refrigerant gases
- 53 Series also suitable for R717

Part No	Connection Size (inch)		Dimensions (mm)		Flow Area (mm ²)	Kdr	Weight (kg)	CE Cat
	Inlet	Outlet	A	ØB				
	5230AX-xx.x BAR	1/4 NPTF	1/2 SAE Flare	94				
5231AX-xx.x BAR	3/8 NPTF	1/2 SAE Flare	94	7	38.48	0.71	0.39	Cat IV
5231BX-xx.x BAR	1/2 NPTF	5/8 SAE Flare	106	7	38.48	0.71	0.42	Cat IV
5232AX-xx.x BAR	1/2 NPTF	3/4 SAE Flare	119	9	63.62	0.76	0.56	Cat IV
5240X-xx.x BAR	1/2 NPTF	3/4 NPTF (female)	111	9	63.62	0.76	0.55	Cat IV
5242X-xx.x BAR	3/4 NPTF	3/4 NPTF (female)	111	9	63.62	0.76	0.58	Cat IV
5340X-xx.x BAR	1/2 NPTF	3/4 NPTF (female)	111	9	63.62	0.76	0.53	Cat IV
5342X-xx.x BAR	3/4 NPTF	3/4 NPTF (female)	111	9	63.62	0.76	0.57	Cat IV

xx.x = set pressure



Standard pressure settings (barg): 10.3, 13.8, 14.0, 16.2, 17.2, 20.7, 24.1, 24.8, 25.0, 25.9, 27.6, 29.3, 31.0, 40.0*, 42.0*, 45.0*, 46.0*

*523 series only.

Valve Capacity Ratings (kg Air/min) @ 20°C.										
Part No	Standard Pressure setting (barg)									
	10.3	14.0	16.2	20.7	24.1	24.8	27.6	31.0	40.0	46.0
526E-CE	N/A	2.9	3.3	4.2	4.9	5.1	5.7	6.4	N/A	N/A
5230A-CE	N/A	4.8	5.5	7.0	8.2	8.4	9.4	10.5	N/A	N/A
5231A-CE										
5231B-CE										
5230AX	4.4	6.0	7.0	8.9	10.4	10.7	11.9	13.4	17.2	19.8
5231AX										
5231BX										
5232A-CE	7.8	10.5	12.2	15.6	18.2	18.7	20.8	23.4	N/A	N/A
5240-CE										
5242-CE										
5340-CE										
5342-CE	7.9	10.7	12.4	15.8	18.4	18.9	21.1	23.7	N/A	N/A
5232AX										
5240X										
5242X										
5340X										
5342X										
5244-CE	14.0	19.0	22.0	28.1	32.8	33.7	37.5	42.1	N/A	N/A
5344-CE										
5344A-CE										
5246-CE	24.4	33.2	38.4	49.1	57.1	58.8	65.4	73.5	N/A	N/A
5345-CE										
5346-CE										

N/A denotes a pressure setting unavailable for this model. See product description pages for max and min available settings.

Valve Capacity Table

Discharge capacities for each PRV model are given in the table for a range of standard pressure settings. This table is intended as a reference guide only. Final selection of a relief valve using the method described in EN13136 is recommended.

All capacities shown in the table have been calculated in accordance with the relief valve capacity calculation outlined in EN13136 and using air at 20°C as a reference medium.

If a conversion from air to refrigerant is required, the following formula can be used:

$$W_r = \frac{W_{air}}{r_w}$$

Where:-

W_r = Mass flow of refrigerant, kg/min

W_{air} = Mass flow of air, kg/min

r_w = Conversion factor

r- factors are presented for a number of common refrigerants. These can be used in conjunction with the table to provide an approximation of valve capacity.

Refrigerant	r _w
R-11	0.49
R-12	0.51
R-13	0.46
R-22	0.59
R-23	0.52
R-113	0.43
R-114	0.45
R-123	0.47
R-134a	0.56
R-236fa	0.47
R-245fa	0.50
R-290	0.84
R-404A	0.56
R-407C	0.59
R-407F	0.60
R-410A	0.62
R-500	0.56
R-502	0.52
R-507A	0.55
R-600	0.76
R-717	1.28
R-718	1.28
R-744	0.65

ANSI/ASHRAE standard 15-2007

Current European Refrigeration Standards do not use air capacity for valve selection. The information included here is presented for reference purposes and to enable a comparison between valve models to be easily attained.

In line with current European standards, the valve selection procedure outlined in EN13136 is recommended by Henry Technologies. This method uses the valve flow area, A, and de-rated coefficient of discharge, K_{d,r}, which are listed in the dimension tables for each valve.

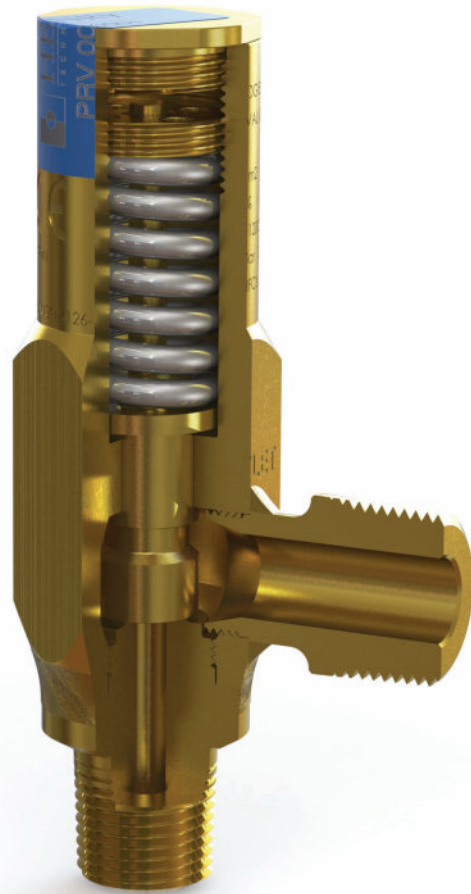
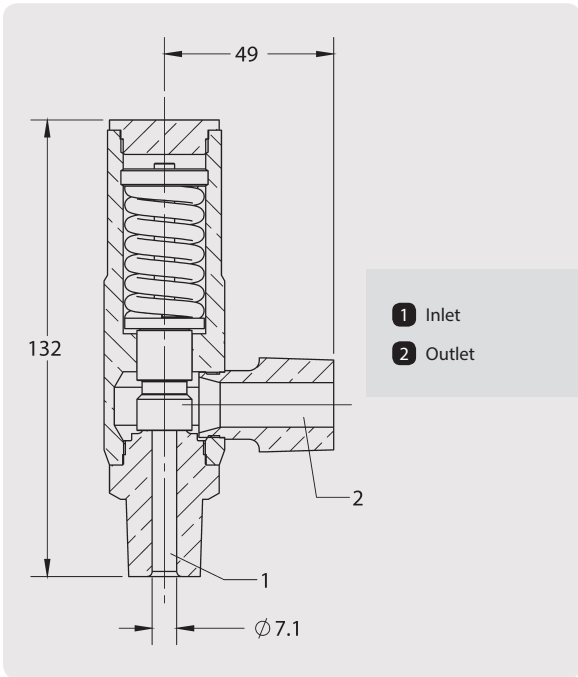
Pressure Relief Valves - Transcritical CO₂

The 5701AX pressure relief valve is specifically designed for high pressure applications from 46 bar up to 130 bar and in particular, transcritical CO₂ systems. The valve is manufactured from Brass.

Main features

- Maximum pressure setting of 130 bar
- In accordance with EN ISO 4126, the valve reseats within 15% of set pressure following a discharge
- High flow capacity
- Fluoroelastomer soft seat material provides excellent sealing characteristics
- Allowable operating temperature = -40°C to +120°C
- Suitable for HFC, HCFC and CO₂ refrigerant gases

Standard pressure settings (barg): 46, 60, 80, 100, 120, 130



Valve Capacity Ratings (kg Air/min) @ 20°C						
Part No.	Standard Pressure Setting					
	46.0	60.0	80.0	100.0	120.0	130.0
5701AX	20.4	26.6	35.5	44.4	53.2	57.7

High Pressure Angle Relief Valve - Brass						
Part No.	Conn Size (inch)		Flow Area (mm ²)	K _{dr}	Weight (kg)	CE Cat
	Inlet	Outlet				
5701AX	1/2 NPTF	3/4 NPTF	39.59	0.71	0.82	Cat IV

Note: High pressure rupture disc (with pressure settings up to 130 barg) available on request.

Selection Guidelines

For safety reasons, relief valve selection should only be carried out by suitably qualified engineers.

Henry Technologies pressure relief valves are designed to discharge refrigerant vapour and are not recommended for liquid use.

The European Standards EN378 (reference 1) and EN13136 (reference 2) are recommended for PRV selection.

Example

A liquid receiver is to be protected from over-pressure due to fire.

Receiver dimensions = 2.016m long (L) x 0.841m outside diameter (D)

Refrigerant = R744 (CO₂)

Pressure Setting = 50.0 barg

$$Q_{md} = \frac{3600 \times \theta \times A_{surf}}{h_{vap}}$$

Q_{md} = Minimum required discharge capacity, of refrigerant, of the pressure relief valve (kg/hour).

θ = Density of heat flow rate (kW/m²). The standards assume a value to 10 kW/m² but state that a higher value can be used if necessary. This figure relates to an un-lagged vessel.

A_{surf} = External surface area of the vessel (m²)

h_{vap} = Heat of vaporisation calculated at 1.1 times the set pressure, in bar a, of the pressure relief valve (kJ/kg)

Note:

When the relief valve setting is close to the critical pressure of the refrigerant, this sizing method may not be applicable.

$$A_{surf} = (\pi \times D \times L) + 2 \left(\frac{D^2 \times \pi}{4} \right)$$

$$A_{surf} = (\pi \times 0.841 \times 2.016) + 2 \left(\frac{0.841^2 \times \pi}{4} \right) = 6.44 \text{ m}^2$$

Calculate the heat of vaporisation, h_{vap} , taken at 1.1 times set pressure:

$$P_o = (P_{set} \times 1.1) + P_{atmos} = (50.0 \times 1.1) + 1.013 = 56.01 \text{ bar a}$$

From refrigerant property tables, use saturated vapour and liquid enthalpies at P_o .

Vapour = 410.59 kJ/kg

Liquid = 252.44 kJ/kg

$$h_{vap} = 410.59 - 252.44 = 158.15 \text{ kJ/kg}$$

The minimum required discharge rate of R744 can now be calculated for this vessel and set pressure:

$$Q_{md} = \frac{3600 \times \theta \times A_{surf}}{h_{vap}} = \frac{3600 \times 10 \times 6.44}{158.15} = 1,465.95 \text{ kg/hr, R744}$$

For relief valve discharge capacity, Q_m :

$$Q_m = 0.2883 \times C \times A \times K_{dr} \times K_b \times \sqrt{\frac{P_o}{V_o}}$$

Q_m = Discharge capacity, of refrigerant, of the pressure relief valve (kg/hr)

C = Function of the isentropic exponent

A = Flow area of PRV (mm²)

K_{dr} = De-rated coefficient of discharge of PRV

K_b = Theoretical capacity correction factor for sub-critical flow.
A value of 1 is used for critical flow.

P_o = Actual relieving pressure of PRV (bar a)

V_o = Specific volume of saturated vapour at P_o (m³/kg)

Refrigerant data should be referenced for values of C and V_o .

The objective is to select a PRV which results in $Q_m > Q_{md}$. In this way, the relieving capacity of the PRV is greater than required thus avoiding excessive vessel pressure.

For this example, a 5701AX has been selected:

$A = 39.59 \text{ mm}^2$

$K_{dr} = 0.71$

$$Q_m = 0.2883 \times 2.63 \times 39.59 \times 0.71 \times 1 \times \sqrt{\frac{56.01}{0.0054}} = 2,170.6 \text{ kg/hr, R744}$$

$Q_m > Q_{md}$, therefore the 5701AX would be suitable for this system.

Important selection notes:

1. It is important not to grossly over-size a PRV so that Q_m is many times greater than Q_{md} as the performance of the PRV can be affected. Contact Henry Technologies for further guidance.
2. Henry Technologies recommends inlet and outlet piping for all PRVs are sized in accordance with EN13136 (reference 2) to avoid excessive pressure losses which can affect valve performance.
3. If a Henry Technologies rupture disc is used in conjunction with a Henry Technologies PRV, the PRV capacity should be de-rated by 10%. In the above example, the PRV capacity would be de-rated to 1,953.5 kg/hr (2,170.6 x 0.9).

References:-

1. BS EN 378-2:2008+A2:2012*
2. BS EN 13136:2001*

*Latest revisions at the time of publication. The user should ensure the latest revisions are referenced.

Installation – Main issues

1. Connect the relief valve at a location above the liquid refrigerant level, in the vapour space. Stop valves should not be located between the vessel and the relief valve except the three-way type.
2. Do not discharge the relief valve prior to installation or when pressure testing the system.
3. Pressure relief valves should be mounted vertically.
4. Relief valves should be changed out after discharge. Most systems are subject to accumulations of debris and particles of metal and dirt are generally blown onto relief valve seats during discharge. This can inhibit the relief valve from re-sealing at the original set pressure. A valve can also relieve at a lower pressure than the stamped setting due to the force of the re-closing action.
5. The pipe-work must not impose loads on the relief valve. Loads can occur due to misalignment, thermal expansion, discharge gas thrust, etc.
6. Transcritical CO₂ systems should generally be sized with the shortest length and largest bore outlet pipe work practical to avoid solids forming downstream of the PRV during a discharge.

Rupture Discs

The function of a Rupture Disc is to protect against over-pressure. For safety reasons, excessive over-pressure in any part of the refrigeration system must be avoided. A rupture disc is generally used in combination with a Henry Technologies pressure relief valve.

Applications

A rupture disc protects against any leakage or weeping of refrigerant through a relief valve. A rupture disc can also be used in combination with a pressure gauge and/or pressure switch to detect if a relief valve has discharged.

Henry Technologies rupture discs are designed to operate with gases and should not be used to prevent liquid over-pressure.

The brass 55 series models are suitable for use with HCFC, HFC and CO₂ refrigerant gases. The stainless steel 56 series models are also suitable for ammonia.

In line with the Institute of Refrigeration Guidelines (UK), it is recommended that at least every 2 years all high side bursting discs should be replaced. At least every 5 years all low side bursting discs should be replaced. These intervals may have to be reduced if other regulations apply.

How it works

A foil disc is clamped in a holder. The disc is designed to burst at a pre-determined pressure - the set pressure. A reverse acting disc is used.

This means that the disc is domed against the direction of the fluid pressure and designed to buckle due to compression forces, prior to bursting. Advantages of a reverse acting disc include being less sensitive to temperature, high operating pressures and improved fatigue life.

Each disc is manufactured with a precision score mark. This score mark in combination with the buckling action causes the disc to burst.

At burst, the disc is designed to hinge resulting in a large available flow area. The disc is designed to be non-fragmenting after rupturing.

Main features

- Proven safe design
- CE marked
- High flow capacity
- Compact
- Reverse acting, non-fragmenting disc
- 2 x 1/8 NPT pressure ports
- Helium leak tested
- Pressure settings up to 130 barg available on request
- EN ISO 4126-2 Compliant

Technical Specification

Set pressure range = 10.3 to 31 barg
Set pressure range = 10.3 to 130 barg (5526 series)
Allowable operating temperature = -40°C to +107°C

Materials of Construction

For 55 and 56 series, the main bodies are made from brass and stainless steel respectively.

The foil disc is made from Nickel alloy.



Tolerance Guidelines

As per industry standards, rupture disc rated burst pressures are subject to a performance tolerance.

When specifying a disc, the nominal pressure setting should be quoted as part of the part number (see table below). The rupture disc will be provided with a rated burst pressure stamped on the body, which is the average of all burst tests carried out on the batch of discs. As a result, the rated burst pressure may differ slightly from the nominal setting depending on the manufacturing tolerance for the specific batch of discs. This manufacturing tolerance will never be greater than +/-5% and in the majority of cases is significantly less.

The rated burst pressure is subject to a performance tolerance of +/-5%. Examples of actual burst pressure ranges are shown in the table below for a selection of typical rated pressure settings.

Performance Tolerance Examples	
Rated Burst Pressure (barg)	Burst Pressure Range (barg)
10.3	9.8 - 10.8
14	13.3 - 14.7
16.2	15.4 - 17.0
17.2	16.3 - 18.0
20.7	19.7 - 21.7
24.1	22.9 - 25.3
24.8	23.6 - 26.0
25.9	24.6 - 27.2
27.6	26.2 - 29.0
31	29.5 - 32.6
40	38 - 42

Part No	Conn Size (inch)		Dimensions (mm)					Nominal rupture disc setting at 22°C (barg)	Weight (kg)	CE Cat
	Inlet	Outlet	A	B	ØC	D	MNFA, mm² (note 1)			
5525-16.2 Bar-CE	3/8 MPT	3/8 FPT	65	31.8 A/F	9.7	20	64.5	16.2	0.28	Cat IV
5525-20.7 Bar-CE								20.7		
5525-24.1 Bar-CE								24.1		
5525-25.9 Bar-CE								25.9		
5525-27.6 Bar-CE								27.6		
5525-31.0 Bar-CE								31.0		
5525-40.0 Bar-CE								40.0		
5526-14.0 Bar-CE	1/2 MPT	1/2 FPT	73	31.8 A/F	12.7	23	109.7	14.0	0.30	Cat IV
5526-16.2 Bar-CE								16.2		
5526-20.7 Bar-CE								20.7		
5526-24.1 Bar-CE								24.1		
5526-24.8 Bar-CE								24.8		
5526-25.9 Bar-CE								25.9		
5526-27.6 Bar-CE								27.6		
5526-31.0 Bar-CE								31.0		
5526-40.0 Bar-CE								40.0		
5626-10.3 Bar-CE								10.3		
5626-17.2 Bar-CE	1/2 MPT	1/2 FPT	73	Ø28.6	12.7	23	109.7	17.2	0.20	Cat IV
5626-20.7 Bar-CE								20.7		
5627-10.3 Bar-CE								10.3		
5627-17.2 Bar-CE	3/4 MPT	3/4 FPT	81	Ø38.1	19	29	187.1	17.2	0.34	Cat IV
5627-20.7 Bar-CE								20.7		
5628-10.3 Bar-CE								10.3		
5628-17.2 Bar-CE	1MPT	1FPT	93	Ø44.5	25.5	32	335.5	17.2	0.56	Cat IV
5628-20.7 Bar-CE								20.7		
5629-10.3 Bar-CE								10.3		
5629-17.2 Bar-CE	1 1/4 MPT	1 1/4 FPT	95	50.8 A/F	33.3	33	683.9	17.2	0.76	Cat IV
5629-20.7 Bar-CE								20.7		

Note 1: MNFA = Minimum net flow area. The MNFA is the net area after a complete disc burst, taking into account any structural members which reduce the nominal flow area. MNFA should be used as the flow area, A, in flow capacity calculations

Selection Guidelines

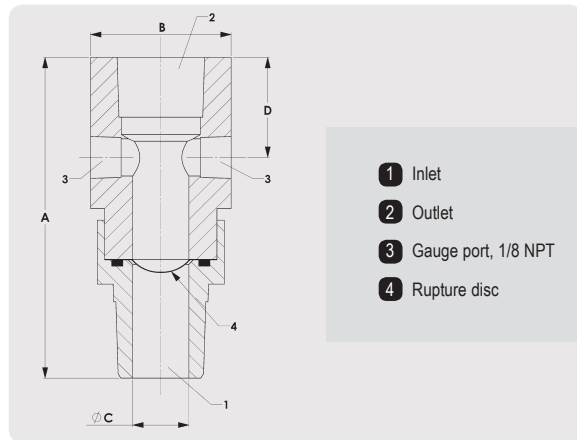
1. The rupture disc pressure setting should be the same as the Henry Technologies pressure relief valve setting.
2. The rated burst pressure is subject to a performance tolerance of +/- 5 %. This tolerance should be taken into account when specifying a rupture disc setting (refer to table).
3. The burst pressure is affected by operating fluid temperature. Refer to table for temperature adjustment factors. At higher operating temperatures the disc burst pressure is reduced while at sub-zero temperatures it is increased. This factor should be taken into account when specifying a rupture disc setting.

Temperature range, °C	Temperature adjustment factor
-40 to -18	1.05
-17 to -1	1.04
0 to +45	1
+46 to +80	0.98
+81 to +107	0.97

4. It is recommended that the maximum operating pressure of the system is no more than 80% of the rated burst pressure, in order to minimise the risk of premature fatigue failure of the disc. If operating pressures exceed 90% of the rated burst pressure, the disc should be replaced immediately.
5. The design fatigue strength of each disc is 100,000 pressure cycles. Fatigue life will be reduced by excessive pressures or temperatures, corrosion, damage, etc.

Example

Rupture disc rated burst pressure = 31 barg @ 22°C
 Minimum actual burst pressure, using performance tolerance = 0.95 x 31 = 29.45 barg
 Maximum actual burst pressure, using performance tolerance = 1.05 x 31 = 32.55 barg
 Maximum operating fluid temperature = 40°C



To determine the recommended maximum operating pressure, the user should consider the -5% performance tolerance and the de-rate factors for both temperature and fatigue life.

Therefore:-

Minimum actual burst pressure = 29.45 barg
 Temperature de-rate factor = 1.0
 Fatigue life de-rate factor = 0.8
 Recommended maximum operating pressure for rupture disc = 29.45 x 1.0 x 0.8 = 23.6 barg.

Installation – Main Issues

1. Connect the rupture disc either directly to the pressure vessel or to a three-way valve above the liquid refrigerant level in the vapor space.
2. The rupture disc comprises of a two-piece body design. To avoid damage during assembly or removal, the product Installation Instructions must be followed.
3. The pipework must not impose loads on the rupture disc. Loads can occur due to misalignment, thermal expansion, discharge gas thrust, etc.

Three Way Dual Shut-Off Valves

The function of a three-way valve is to permit replacement of one of the pressure relief devices while the other is protecting the pressure vessel. In this way, a vessel is protected from over-pressure during servicing. It also allows a pressure relief device to be replaced in-situ, without removing the system refrigerant charge.

Applications

All three-way valves are suitable for HCFC and HFC refrigerants along with their associated oils. The 802 series is also suitable for ammonia.

Refrigeration standard, EN378, specifies that a three-way valve is required on vessels of a certain size. EN378, or an equivalent National Standard, should be consulted for further guidance. It should be recognised however that a three-way valve can be fitted to a vessel of any size, to enable safe, easy and economical replacement of pressure relief devices.

Main features

- Proven robust design
- Compact

Technical Specification

Allowable operating pressure = 0 to 31 barg (802 series)

Allowable operating pressure = 0 to 46 barg (92 series)

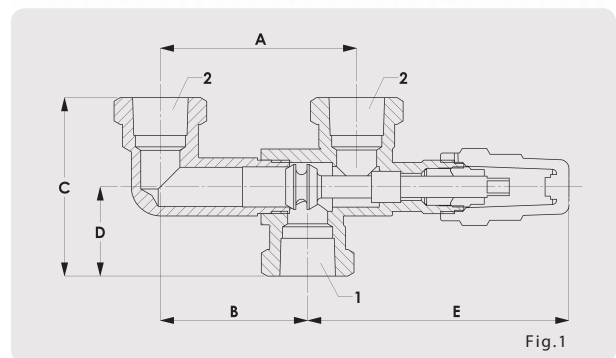
Allowable operating temperature = -29°C to +149°C

Materials of Construction

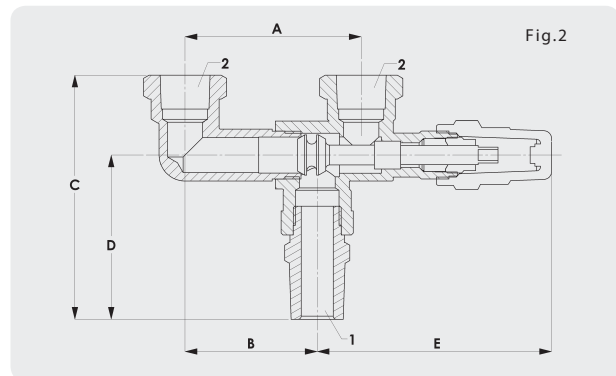
The 92 and 802 series valve bodies are made from brass and carbon steel respectively. The stem is made from plated steel. The stem seal packing is made from either PTFE or graphite based material. The seal cap is made from moulded plastic.

Installation – Main issues

1. Assemble the three-way valve to a vessel using a high strength pipe nipple.
2. The pipework must not impose loads on the valve. Loads can occur due to misalignment, thermal expansion, discharge gas thrust, etc



- 1 Inlet
- 2 Outlet



Type	Part No	Inlet Conn Size (inch)	Outlet Conn Size (inch)	Dimensions (mm)					Drawing reference	Weight (kg)	Kv (m ³ /hr)	CE Cat
				A	B	C	D	E				
92	923	3/8 FPT	3/8 FPT	70	52	64	32	93	fig.1	0.51	2.80	SEP
92	923M	3/8 MPT	3/8 FPT	70	52	90	57	93	fig.2	0.57	2.80	SEP
92	925	1/2 FPT	1/2 FPT	70	52	64	32	93	fig.1	0.47	2.83	SEP
92	925M	1/2 MPT	1/2 FPT	70	52	97	65	93	fig.2	0.57	2.83	SEP
92	927	3/4 FPT	3/4 FPT	70	52	70	35	100	fig.1	0.70	3.48	SEP
802*	8021A	1/2 FPT	1/2 FPT	92	59	86	44	146	fig.1	1.47	4.78	SEP
802*	8022A	3/4 FPT	3/4 FPT	92	59	86	44	146	fig.1	1.33	7.60	SEP
802*	8024-CE	1 FPT	1 FPT	148	94	99	51	191	fig.1	3.70	10.07	SEP (Cat I)
802*	8025-CE	1 1/4 FPT	1 1/4 FPT	148	94	99	51	191	fig.1	3.25	14.36	Cat I (Cat II)

*Suitable for Ammonia. Brackets indicate CE category for Ammonia use.

Pressure Indicator

The function of the Pressure Indicator is to provide visual indication in the event of a rupture disc burst. If the disc has ruptured, the pressure relief valve will have discharged and must be replaced. (refer to Sentry safety device information).

Applications

The G16 Pressure Indicator is intended to be used as part of the Henry Sentry safety device assembly.

The unit is suitable for use with HCFC, HFC and ammonia refrigerants, along with their associated oils.

Main features

- Easy to read large indicator dial
- Stainless steel movement

Technical Specification

Allowable operating pressure = 0 to 55 barg

Allowable operating temperature = -40°C to + 65°C

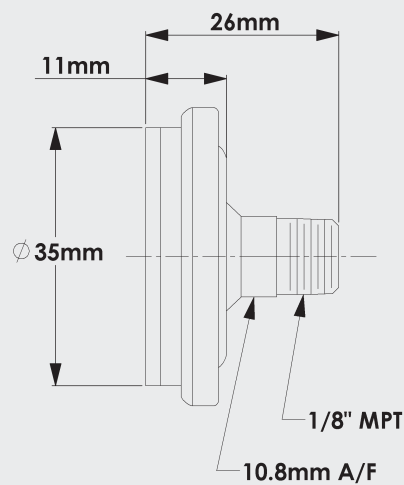
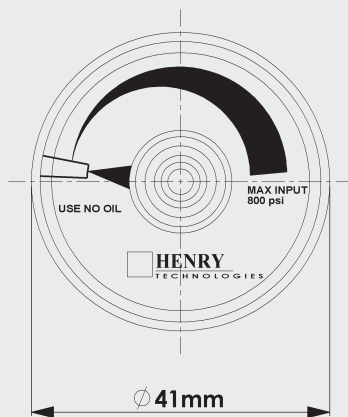
Materials of Construction

Stainless steel case and movement.

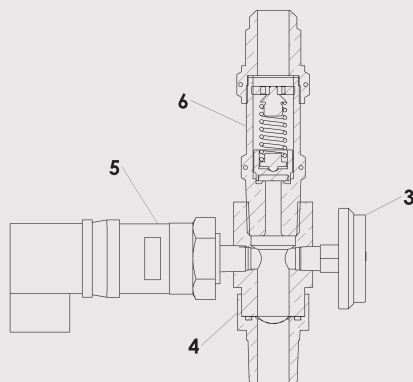
Plexiglas dial window.



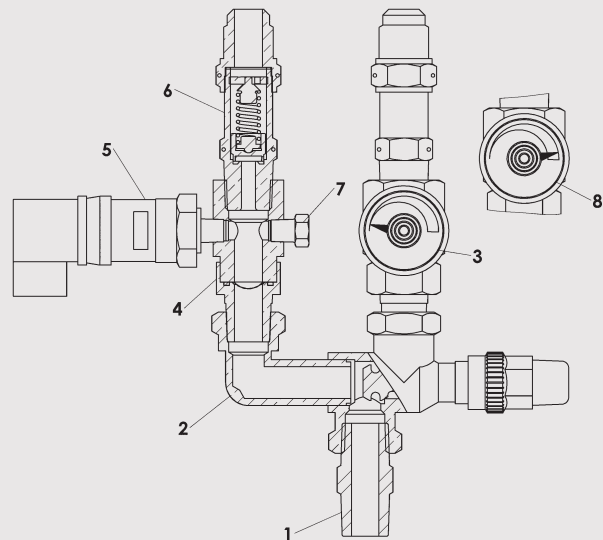
Part No	Weight (g)	CE Cat
G16	27	SEP



Sentry Safety Device Assemblies



SENTRY SINGLE SAFETY
DEVICE ASSEMBLY



SENTRY DUAL SAFETY
DEVICE ASSEMBLY

- | | | | |
|-------------------|-----------------------------------|------------------------------|--------------------------------|
| 1 Pipe nipple | 3 G16 gauge (no pressure applied) | 5 Pressure switch (optional) | 7 Plug, 1/8" NPT |
| 2 Three-way valve | 4 Rupture disc | 6 Relief valve | 8 G16 gauge (pressure applied) |

Refer to relevant catalogue pages for information on each component.

The primary purpose of a Sentry safety device assembly is to provide a positive seal between the system and atmosphere and facilitate an indicating device to be fitted. The indicating device notifies the user if the pressure relief valve has discharged. This is a requirement of Refrigeration Standard EN378.

A dual Sentry safety device assembly also provides a safe and economical method for replacing safety devices on a pressure vessel. Typically, this vessel will be a refrigerant liquid receiver. The Sentry assembly protects the receiver from over-pressure.

The Sentry safety device assemblies comprise a number of items from the Henry Technologies product range. There are two versions; a single safety device assembly and a dual safety device assembly.

The single safety device assembly comprises of a pressure relief valve, rupture disc, pressure indicator gauge and an optional pressure switch.

The dual safety device assembly comprises two pressure relief valves, two rupture discs, two pressure indicator gauges, two optional pressure switches and a three way valve.

Note: Each pressure relief device must have the required capacity to protect the vessel from over-pressure.

For both assemblies, a 1/8" NPT rupture disc blanking plug is required if the user does not fit both the pressure gauge and pressure switch. For the dual assembly, a pipe nipple is normally required to assemble the three-way valve to the pressure vessel.

In general, the user needs to order the individual items in each assembly. For popular combinations, SDK safety device kits are available.

Applications and Features

In line with the Institute of Refrigeration Guidelines (UK), Henry Technologies recommend that pressure relief valves and low side rupture discs be replaced at least every 5 years. All high side rupture discs should be replaced every 2 years. These intervals may have to be reduced if other regulations apply. The dual Sentry assembly provides a convenient solution for the replacement of safety devices along with other user benefits.

The features of a dual Sentry Assembly are:-

1. Safe, easy and economical maintenance: The three-way valve permits replacement of one of the relief devices, while the other is protecting the pressure vessel. In this way, a vessel is protected from over-pressure during servicing. It also allows a pressure relief device to be replaced in-situ, without removing the system refrigerant charge.
2. Protection against over-pressure: the rupture disc and relief valve will open at a pre-determined value to prevent excessive pressure.
3. Code Compliance: Refrigeration Codes specify that a three-way valve is required on vessels of a certain size.
4. Hermetic sealing: During normal operation, the rupture disc prevents any leakage or weeping of refrigerant through the relief valve.
5. Warning of safety device discharge: Both the pressure gauge and pressure switch indicate if the relief valve has discharged. The pressure gauge provides a visual indication. The pressure switch provides an electrical signal which can be used as an alarm.
6. Inter-space monitoring: The pressure gauge and pressure indicator can be used to check that the bursting disc is intact. This provides a warning in case there is a build up of pressure behind the disc, as a result of damage. Any back pressure will increase the design relief pressure of the rupture disc.

In comparison, the features of a single Sentry assembly are; protection against over-pressure, hermetic sealing, warning of safety device discharge and inter-space monitoring.

Sentry Assembly Combinations

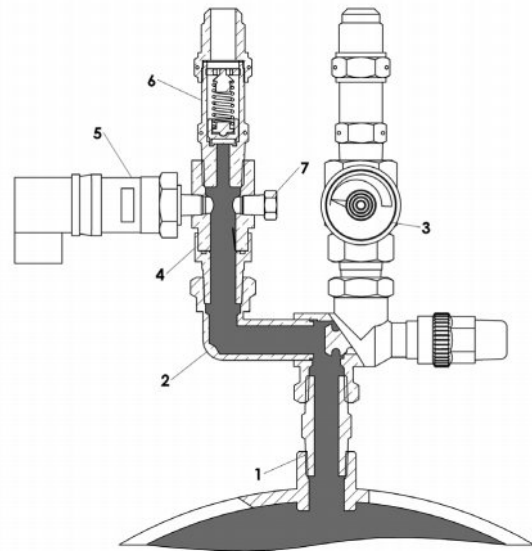
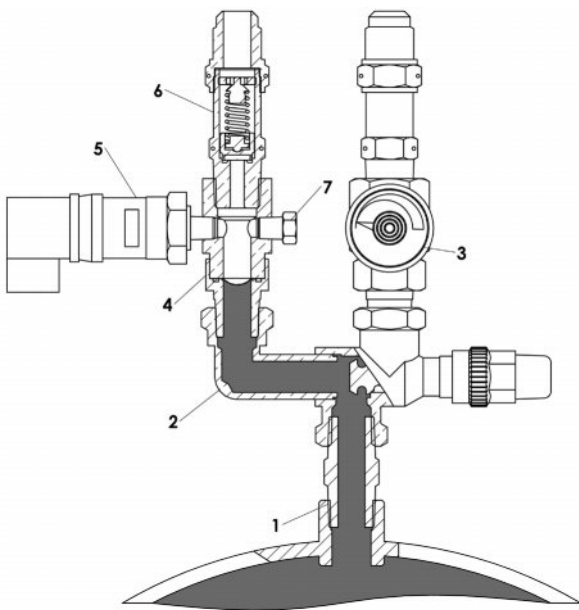
The table shows the recommended relief valve, rupture disc and three-way valve combinations. Please refer to the relief valve catalogue pages for outlet connection sizes.

Relief Valve Part No	Rupture Disc Part No	Three-Way Valve Part No	Conn Size, inch (NPT)
526E	5525	923	3/8
5231A	5525	923	3/8
5231AX	5525	923	3/8
5231B	5526	925	1/2
5231BX	5526	925	1/2
5232A, 5240, 5232AX, 5240X	5526	8021A or 925 (see note)	1/2
5340, 5340X	5626	8021A	1/2
5242, 5242X	5627	8022A or 927 (see note)	3/4
5342, 5342X, 5344A	5627	8022A	3/4
5244, 5344, 5345	5628	8024-CE	1
5246, 5346	5629	8025-CE	1 1/4

Note: Where possible, it is best to select the three way valve model with the larger K_v value.

How it works

The diagram (below) shows the rupture disc intact. Normal system pressure acts on the rupture disc. There is no pressure in the chamber between the rupture disc and relief valve. Note that the pressure is diverted to one side of the three-way valve only, allowing the valve on the other side to be safely removed, if required.



The diagram (above) shows the rupture disc burst. The pressure is now contained by the relief valve only. The pressure switch would now detect the pressure in the chamber between the rupture disc and relief valve. The gauge, if fitted, would indicate that pressure is acting in this chamber. In this condition, the relief valve will have discharged due to system over-pressure. Both the relief valve and rupture disc now need to be replaced.

Safety Device Kits

The function of a Safety Device Kit is to protect against over-pressure. For safety reasons, excessive over-pressure in any part of the refrigeration system must be avoided. The 'X' denotes that the kit includes an 'X' series PRV.

Four kits are available, SDK1, SDK2, SDK1X and SDK2X.

The SDK1X kit is a single safety device assembly. It comprises of a pressure relief valve, rupture disc, pressure indicator gauge and a 1/8" NPT rupture disc blanking plug.

The SDK2X kit is a dual safety device assembly. It comprises of two pressure relief valves, two rupture discs, two pressure indicator gauges, two blanking plugs, a three-way valve and a 1/2" NPT pipe nipple.

Applications

A typical application for a Henry Technologies Safety Device Kit is to protect a liquid receiver from being over-pressurised. Refer to the catalogue pages for a description on the function of each individual component. The kits are designed for use with HCFC and HFC refrigerants, along with their associated oils

Main features

- Combines Henry Technologies relief devices in one easy-to-order kit
- Components packed into compact display carton
- Easy to store

Technical Specification

Refer to the catalogue pages for the maximum operating pressures and temperatures for each item.

Materials of Construction

The main components for the SDK kits are made from brass and steel. Refer to individual catalogue pages for details on each component.

Selection Data

Selection of relief devices should be as outlined in respective catalogue pages. Ensure that relief valve selection guidance is followed prior to ordering of kits.



Part No	Relief Valve		Rupture Disc		Indicator Gauge	
	Part No	Qty	Part No	Qty	Part No	Qty
SDK1-14.0BAR-CE	5231B-14.0BAR-CE	1	5526-14.0BAR-CE	1	G16	1
SDK1-16.2BAR-CE	5231B-16.2BAR-CE	1	5526-16.2BAR-CE	1	G16	1
SDK1-17.2BAR-CE	5231B-17.2BAR-CE	1	5526-17.2BAR-CE	1	G16	1
SDK1-20.7BAR-CE	5231B-20.7BAR-CE	1	5526-20.7BAR-CE	1	G16	1
SDK1-24.1BAR-CE	5231B-24.1BAR-CE	1	5526-24.1BAR-CE	1	G16	1
SDK1-24.8BAR-CE	5231B-24.8BAR-CE	1	5526-24.8BAR-CE	1	G16	1
SDK1-25.9BAR-CE	5231B-25.9BAR-CE	1	5526-25.9BAR-CE	1	G16	1
SDK1-27.6BAR-CE	5231B-27.6BAR-CE	1	5526-27.6BAR-CE	1	G16	1
SDK1-31.0BAR-CE	5231B-31.0BAR-CE	1	5526-31.0BAR-CE	1	G16	1
*SDK1X-40.0BAR-CE	5231BX-40.0BAR-CE	1	5526-40.0BAR-CE	1	G16	1

SDK1X versions also available. *SDK1X only at this pressure.

Part No	Relief Valve		Rupture Disc		Indicator Gauge		Three-way Valve	
	Part No	Qty	Part No	Qty	Part No	Qty	Part No	Qty
SDK2-14.0BAR-CE	5231B-14.0BAR-CE	2	5526-14.0BAR-CE	2	G16	2	925	1
SDK2-16.2BAR-CE	5231B-16.2BAR-CE	2	5526-16.2BAR-CE	2	G16	2	925	1
SDK2-17.2BAR-CE	5231B-17.2BAR-CE	2	5526-17.2BAR-CE	2	G16	2	925	1
SDK2-20.7BAR-CE	5231B-20.7BAR-CE	2	5526-20.7BAR-CE	2	G16	2	925	1
SDK2-24.1BAR-CE	5231B-24.1BAR-CE	2	5526-24.1BAR-CE	2	G16	2	925	1
SDK2-24.8BAR-CE	5231B-24.8BAR-CE	2	5526-24.8BAR-CE	2	G16	2	925	1
SDK2-25.9BAR-CE	5231B-25.9BAR-CE	2	5526-25.9BAR-CE	2	G16	2	925	1
SDK2-27.6BAR-CE	5231B-27.6BAR-CE	2	5526-27.6BAR-CE	2	G16	2	925	1
SDK2-31.0BAR-CE	5231B-31.0BAR-CE	2	5526-31.0BAR-CE	2	G16	2	925	1
*SDK2X-40.0BAR-CE	5231BX-40.0BAR-CE	2	5526-40.0BAR-CE	2	G16	2	925	1

SDK2X versions also available. *SDK2X only at this pressure.

Oil Management Systems

This guide is intended for oil management systems installed with scroll or reciprocating compressors using HCFC or HFC refrigerants. For other systems, please contact Henry Technologies for guidance.

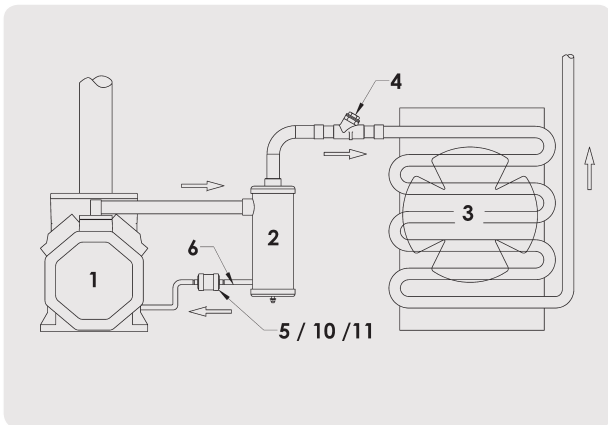
A proper oil management system is essential to ensure compressor lubrication and energy efficient cooling.

An oil management system is a cost effective alternative to replacing expensive compressors due to incorrect lubrication. If selected and installed correctly, an oil management system will give years of trouble free operation, protecting the compressors from both low and excess oil levels, with little or no maintenance. Excessive oil within the system can lead to a slug of oil returning to the compressor. A slug of oil can be as damaging to a compressor as a slug of liquid refrigerant.

By removing oil from the discharge gas, the system efficiency is increased. Oil in a refrigeration or air conditioning system reduces the efficiency of the system by:-

1. A reduction in heat transfer due to oil coating of the condenser and evaporator walls.
2. Displacing refrigerant volume resulting in an increase in system mass flow.

Oil does not change phase from liquid to gas and is therefore a very poor refrigerant. A minimal amount of oil flowing through the system is necessary to provide lubrication to valves, but a very small amount is needed.



SINGLE COMPRESSOR SYSTEM

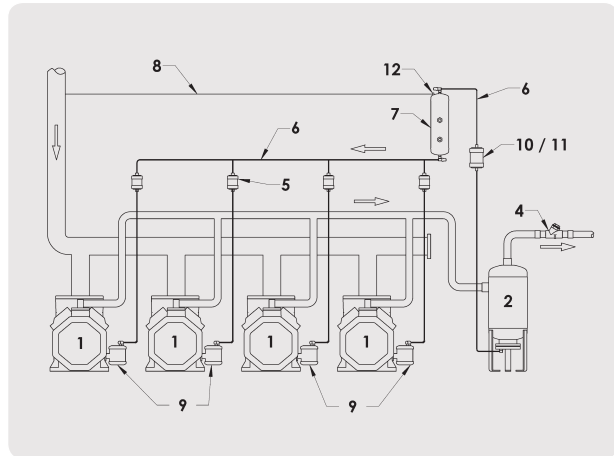
Single Compressor System

A single compressor has the most basic oil system. The compressor discharge is piped to the inlet of an oil separator (2) and the outlet of the oil separator is piped to the condenser (3). A discharge check valve should be fitted (4). An oil return line (6) is connected from the oil separator through an oil strainer (5), oil filter (10) or oil filter drier (11), to the compressor crankcase.

A float valve in the oil separator opens and feeds a small amount of oil by-passing the rest of the cooling system. The oil is returned under discharge pressure to the crankcase. The float valve prevents hot gas from bypassing to the crankcase by closing when the oil level falls.

It is recognised best practice to fit a solenoid valve, sight glass, and shut-off valve in the oil return line. These components are not shown in the diagram.

Refer to equipment list for further details on each component in the oil system



LOW PRESSURE OIL MANAGEMENT SYSTEM

Low Pressure Oil Management System

This system is normally used for parallel compressors and uses three main components; Oil Separator (2), Oil Reservoir (7) and Oil Level Regulators (9). The common discharge is piped to the inlet of the oil separator and the outlet of the oil separator is piped to the condenser via a discharge check valve (4). An oil return line is connected from the oil separator to the top valve of the oil reservoir (7). A vent line (8) is installed to the suction line, using a pressure valve (12), to reduce the pressure in the reservoir. This makes a low pressure system. The pressure valve will maintain the reservoir at a set pressure above suction. Although mechanical oil level regulators (9) are shown in the diagram, Electro-mechanical and Optronic oil level regulators can also be used.

The bottom valve of the oil reservoir is piped to the oil level regulators mounted on the compressor crankcases. These regulators open to feed oil as the oil level drops and close as the oil level rises to the set level.

In this way, the oil level in each compressor is controlled. An oil strainer (5) per regulator should be used to remove debris from the oil. One oil strainer is installed between the oil reservoir and each regulator. Alternatively, the oil strainers may be replaced by one oil filter (10) or one oil filter drier (11). The oil filter or oil filter drier must however be installed between the separator and oil reservoir. Due to the scavenging nature of POE oil, it is recommended to install either an oil filter or oil filter drier on a HFC/POE system instead of individual oil strainers.

On dual temperature and satellite systems, ensure that all regulators see positive oil differential pressures within their allowable operating range.

It is recognised best practice to fit a solenoid valve, sight glass, and shut-off valve in the oil return line. These components are not shown in the diagram.

Refer to equipment list for further details on each component in the oil system

High Pressure Oil Management System

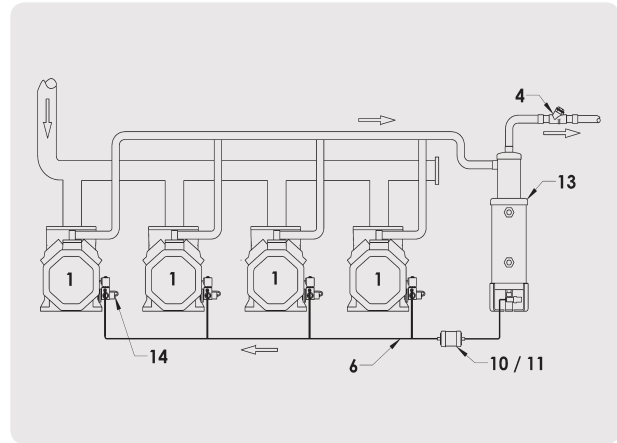
High pressure oil systems remove the need for a separate oil reservoir. This type of system also reduces the amount of pipework and fittings.

A high pressure oil system relies on the oil level regulators being able to operate with a high pressure differential. Mechanical oil level regulators should not be used on this type of system. The Optronic oil level regulator is recommended for this application. Electro-mechanical regulators can also be used, depending on the model. A high pressure system is not recommended for HCFC/mineral oil systems due to potential foaming problems.

A discharge check valve should be fitted (4). An oil separator-reservoir (13) is fitted in the discharge line similar to an oil separator. The oil return connection, positioned at the bottom of the vessel, is piped to the oil level regulators. An oil filter (10) or oil filter drier (11) should be installed between the oil separator-reservoir and the regulators (14).

It is recognised best practice to fit a solenoid valve, sight glass, and shut-off valve in the oil return line. These components are not shown in the diagram.

Refer to equipment list for further details on each component in the oil system



HIGH PRESSURE OIL MANAGEMENT SYSTEM

EQUIPMENT LIST FOR OIL LEVEL CONTROL

1. Compressor.
2. Oil Separator – The function of an Oil Separator is to remove oil from the discharge gas and return it to the compressor, either directly or indirectly. This helps maintain the compressor crankcase oil level and raises the efficiency of the system by preventing excessive oil circulation. Oil separators are not 100% efficient, so installing an oil separator should not be viewed as a replacement for oil traps, accumulators, or good oil return piping practices. Henry Technologies manufacture 3 different types of oil separator, Helical, Impingement & Coalescent type.
3. Condenser.
4. Discharge Check Valve – The function of a Check Valve is to allow fluid flow in one direction only. This prevents condensed liquid refrigerant returning down the discharge line into the separator. If this check valve is not installed the separator can feed excessive liquid refrigerant to the compressor on start up. This can cause oil dilution, excessive foaming, erratic oil pressures and possible compressor damage. The check valve must be installed after the oil separator.
5. Oil Strainer – The function of an Oil Strainer is to remove system debris from the refrigerant oil. Their purpose is to protect compressors and oil level regulators from damage. For recommendations on HFC/POE systems, refer to section on oil filters and oil filter driers.
6. Oil Return Line.
7. Oil Reservoir – The function of an Oil Reservoir is to provide a holding charge of oil as part of a Low Pressure Oil Management System. The amount of oil circulating in a system varies depending on the operating conditions. The oil reservoir caters for these fluctuations by providing additional storage capacity.
8. Vent Line.
9. Mechanical Oil Level Regulators – The function of a Mechanical Oil Level Regulator is to control the oil level in the compressor crankcase. This protects the compressors from damage. There are two main types of oil level regulators, fixed level and adjustable level. The fixed level regulators have an allowable oil pressure differential range of 0.35 to 2.1 barg. The adjustable level regulators have an allowable oil pressure differential range of 0.35 to 6.2 barg. Oil pressure differential is the difference between the crankcase pressure and the pressure in the oil reservoir. Gravity pressure head should be included also, if applicable. Some regulator models are fitted with an equalisation connection that enables the oil levels between several compressors to be balanced.
10. Oil Filter – The function of an Oil Filter is to remove system debris from the refrigerant oil. An oil filter is recommended for HFC/POE systems instead of individual oil strainers, where filtration only is required.
11. Oil Filter Drier –The function of an Oil Filter Drier is to remove both system debris and moisture from the refrigerant oil. An oil filter drier is recommended for HFC/POE systems instead of individual oil strainers, where both filtration and moisture removal is required.
12. Pressure Vent Valve – The function of a Pressure Vent Valve is to maintain a positive pressure in the Oil Reservoir above the compressor crankcase pressure. Three different pressure settings are available; 0.35 barg, 1.4 barg and 2.4 barg. A higher pressure differential will increase the oil flow rate from the oil reservoir back to the compressors. The pressure setting should be selected taking into account the allowable oil pressure differential of the oil level regulator type.
13. Oil Separator-Reservoir – The function of an Oil Separator-Reservoir is to provide a Separator and Oil Reservoir in one unit. It is designed for high pressure systems and eliminates the need for a separate Oil Reservoir and its associated piping.
14. Optronic Oil Regulator – The function of the Optronic Oil Regulator is to control the oil level in the compressor crankcase. This protects the compressors from damage. This regulator can be used on high pressure systems.

Helical Oil Separators

The function of a Helical Oil Separator is to efficiently remove oil from the discharge gas and return it to the compressor, either directly or indirectly. This helps maintain the compressor crankcase oil level and raises the efficiency of the system by preventing excessive oil circulation.

The Helical oil separator features a centrifugal flow path that achieves approximately 99% efficiency of oil separation with a low pressure drop. Independent testing has found that only 0.006% oil by volume was being discharged into the system after leaving a Helical oil separator. Virtually oil-free refrigerant vapour exits the oil separator.

A higher level of efficiency is to be expected compared to an Impingement type separator.

Applications

Helical oil separators can be used in a wide variety of applications. These can include multi-compressor racks and remote condensing units.

Helical oil separators are intended for Low Pressure Oil Management Systems. These products are designed for use with scroll and reciprocating type compressors. They are not recommended for screw or rotary vane compressors.

The product range is designed for use with HCFC and HFC refrigerants, along with their associated oils.



Features

- Patented Henry Technologies Design*
- High oil separation efficiency – up to 99%.
- Low pressure drop.
- No blocked elements because of too much oil in the system.
- No oil blow-out at start up from oil left in a coalescing element.

*US Patents 5113671, 5404730 & 5271245; Mexico 173552; Denmark, France, UK & Italy 0487959; Germany P69106849.6-08; Taiwan UM-7863; & other worldwide patents pending.

Technical Specification

S-5 Series:

Safe Working Pressure = 3,100 kPa

Allowable Operating Temperature = -10°C to 130°C

SH-5 Series:

Safe Working Pressure = 4,000 kPa

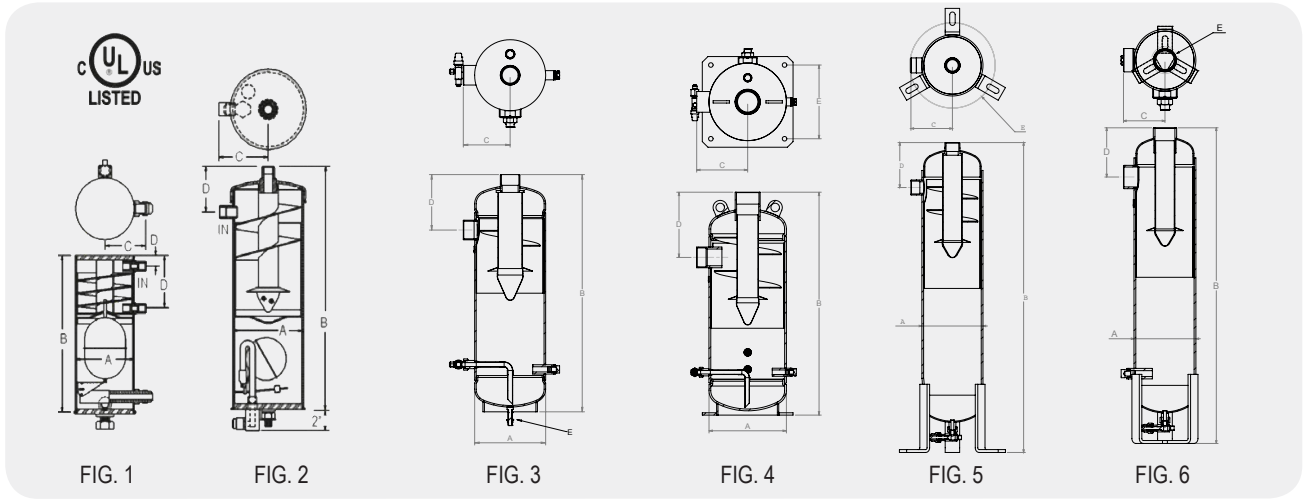
Allowable Operating Temperature = -10°C to 110°C

Benefits

- A proven design that works.
- Guaranteed performance.
- Negligible loss in system efficiency.
- Dependable operation.
- Oil is metered back to the compressor as required.

Materials of Construction

- Shell, end caps and connections: Carbon steel
- Oil float: Stainless steel
- Needle valve seat: Brass



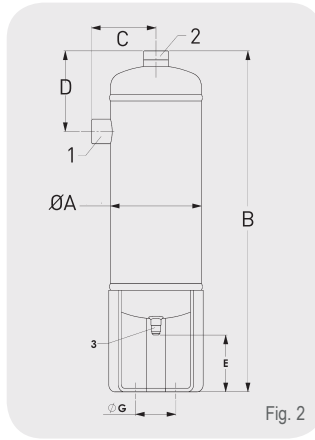
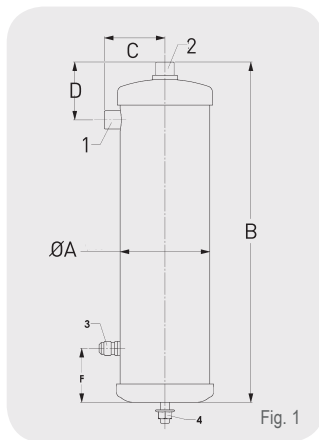
Helical Range

Part No	Conn Size (inch)	Dimensions (mm)				Mounting details	Drawing reference	Weight (kg)	Pre-charge qty (l)
		Ø A	B	C	D				
S-5181	3/8 ODS	64	195	45	71	M10	fig.1	1.5	0.1
S-5182	1/2 ODS	102	333	69	64	M10	fig.2	4	0.4
S-5188	1 1/8 ODS	102	483	75	78	M10	fig.2	4	0.4

Notes: 1. For use with ammonia, the CE Category increases to II

Oil Separator/Reservoir Range

Part No	Conn Size (inch)	Dimensions (mm)					Drawing reference	Weight (kg)	Maximum oil capacity (Ltr)
		A	B	C	D	E (Mounting details)			
S-5302	2 1/8 ODS	219	732	145	171	M12	fig.3	23	7.5
S-5303	2 5/8 ODS	273	770	180	214		fig.4	43	9.5
S-5390	1 3/8 ODS	168	854	114	124		fig.5	20	6
S-5392	1 5/8 ODS	168	857	117	127		fig.5	20	6
S-5394	2 1/8 ODS	168	859	113	134		fig.6	20	6



1. Inlet
2. Outlet
3. Oil return, 3/8 MSAE
4. M10 stud and nut

High Pressure Range

Part No	Conn Size (inch)	Dimensions (mm)							Mounting details	Drawing reference	Weight (kg)	Pre-charge qty (l)	CE Cat
		Ø A	B	C	D	E	F	Ø G					
SH-5188-CE	1 1/8 ODS	102	500	75	93	N/A	61	N/A	M10	fig.2	4.5	0.4	Cat I
SH-5188X-CE	1 1/8 ODS	102	500	75	93	N/A	61	N/A	M10	fig.1	4.5	0.4	Cat I
SH-5190-CE	1 3/8 ODS	152	570	108	135	95	N/A	100	3 x Ø14mm slots	fig.5	9.5	1.1	Cat II

HELICAL OIL SEPARATOR-RESERVOIRS														
Part No	Conn Size (inch)	Dimensions (mm)								Mounting details	Drawing reference	Oil Capacity (l)	Weight (kg)	CE Cat
		ØA	B	C	D	E	F	G	ØH					
S-5387-6L-CE	7/8 ODS	102 & 152	699	74	76	48	222	201	113	3 x Ø14mm slots	fig.1	5.7	11	Cat II
S-5388-6L-CE	1 1/8 ODS	102 & 152	682	75	78	48	207	201	113	3 x Ø14mm slots	fig.2	5.4	11	Cat II
S-5388-CE	1 1/8 ODS	102 & 152	813	75	78	48	222	311	113	3 x Ø14mm slots	fig.3	7.6	13	Cat II
S-5390-CE	1 3/8 ODS	152	850	108	91	48	222	311	113	3 x Ø14mm slots	fig.4	7.6	16	Cat II
S-5392-CE	1 5/8 ODS	152	900	108	98	48	222	311	113	3 x Ø14mm slots	fig.4	7.6	16	Cat II
S-5394-CE	2 1/8 ODS	152	902	114	105	48	222	311	113	3 x Ø14mm slots	fig.4	7.6	16	Cat II
S-5422-CE	2 1/8 ODS	219	699	148	164	N/A	127	149	282	3 x Ø14mm slots	fig.5	8.4	40	Cat II
S-5423-CE	2 5/8 ODS	273	790	183	201	N/A	161	173	339	3 x Ø14mm slots	fig.5	14.8	52	Cat III
S-5424-CE	3 1/8 ODS	324	784	215	229	N/A	99	166	388	3 x Ø14mm slots	fig.5	17	63	Cat III

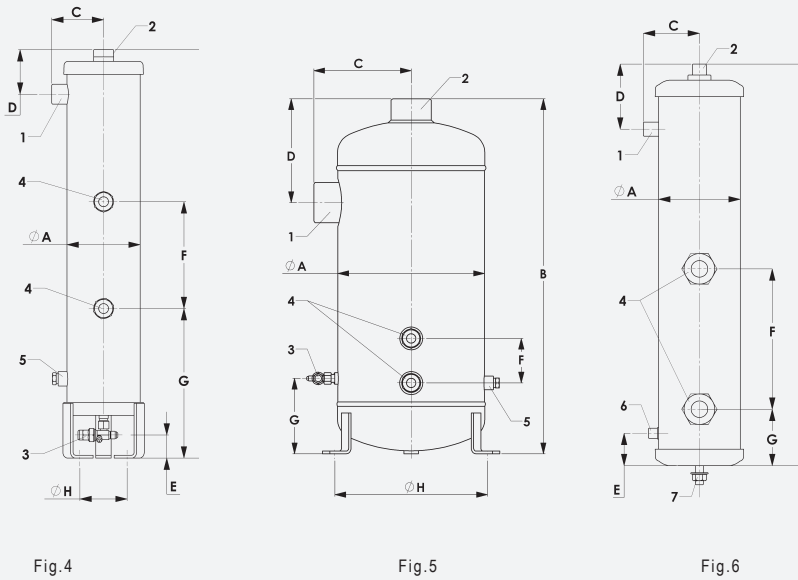
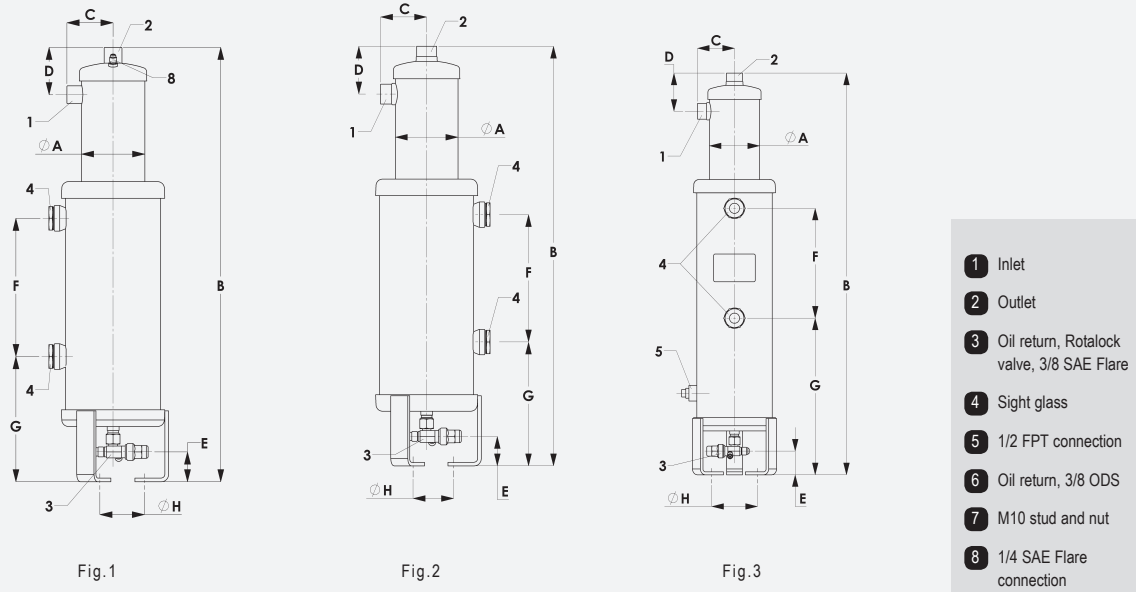
HIGH PRESSURE RANGE • HELICAL OIL SEPARATOR-RESERVOIRS														
Part No	Conn Size (inch)	Dimensions (mm)								Mounting details	Drawing reference	Oil Capacity (l)	Weight (kg)	CE Cat
		ØA	B	C	D	E	F	G	ØH					
SH-5382-1.5L-CE	1/2 ODS	102	501	70	81	41	175	71	N/A	M10	fig.6	1.5	4.6	Cat I
SH-5388-1.5L-CE	1 1/8 ODS	102	472	70	85	51	142	71	N/A	M10	fig.6	1.5	4.6	Cat I
SH-5388-2.5L-CE	1 1/8 ODS	102	625	75	85	51	282	71	N/A	M10	fig.6	2.5	5.6	Cat I
SH-5390-CE	1 3/8 ODS	152	947	108	140	51	222	362	100	3 x Ø14mm slots	fig.4	7.7	15.5	Cat II
SH-5392-CE	1 5/8 ODS	152	998	108	143	51	222	362	100	3 x Ø14mm slots	fig.4	7.7	16.2	Cat II

Performance data

This table provides a summary of the kW capacity of each separator for fixed evaporating and condensing temperatures. This table can be used as a quick reference guide. However, the Selection Guidelines are recommended for helical separator sizing.

Part No	Capacity in kW of refrigeration at nominal evaporator temperature						Maximum discharge volume (m³/hr)
	R404A/507		R134a		R407F		
	-40°C	5°C	-40°C	5°C	-40°C	5°C	
SH-5382-1.5L-CE	5.3	7	3.5	5.3	6.8	8	2.6
S-5387-6L-CE	23	30	15.8	19.4	26.7	31.3	10.2
S-5388-6L-CE, S-5388-CE, CE SH-5388-1.5L-CE & SH-5388-2.5L-CE	29.8	38.7	21.1	26.4	35.6	41.7	13.6
S-5390-CE & SH-5390-CE	42.2	52.8	28.2	35.2	49	57.3	18.7
S-5392-CE & SH-5392-CE	52.8	66.9	38.7	45.8	62.4	72.9	23.8
S-5394-CE	84.4	109	63.4	73.8	98	115	37.4
S-5422-CE	109	144	77.4	95	129	151	49.3
S-5423-CE	225	292	162	197	267	312	102
S-5424-CE	352	461	253	310	419	490	159.8

Notes: All data is for a 38°C condensing temperature, 18°C suction temperature and on connection size being the same as the compressor discharge valve



Selection Guidelines

Refer to Helical Oil Separator Section for guidance. The same rules apply.

Installation – Main Issues

1. Oil separator reservoirs are not 100% efficient, so installing this product should not be viewed as a replacement for oil traps, suction line accumulators or good oil return piping practices.
2. Install the unit vertically and reasonably close to the compressor. Proper piping practice should be adopted to prevent excessive loads or vibration at the inlet and outlet connections. The separator must be properly supported at the mounting feet interface.
3. A check valve should be located downstream of the outlet connection. This check valve is to prevent liquid refrigerant migrating from the condenser.

Impingement Type Oil Separators

Oil separators are used in refrigeration systems that require the compressor lubricating oil to be returned directly to the compressor crankcase under all operating conditions. Using an oil separator will prevent lubricating oil from circulating throughout the system with the refrigerant making the condenser and evaporator more efficient.

Henry Impingement type oil separators are designed for maximum flow with minimal pressure drop while efficiently removing oil suspended in the refrigerant. Oil removal is achieved using stainless steel screens that have been optimised for both flow and oil removal. A baffle plate allows separated oil to de-aerate while remaining warm and viscous. A stainless steel ball float and precision needle and seat are used to achieve automatic oil return to the compressor crankcase.

Henry conventional oil separators are constructed from steel with solid copper connections.

Manufacturing Standards

Manufactured in accordance with AS 2971

Safe Working Pressure: 3,200 kPa for models: 3210 - 6410 and above.

Safe Working Pressure: 4,200 kPa for models: 3210 - 6406S

3210 - 6406

3210 - 6408



Features

- Designed for maximum flow and minimal pressure drop.
- Solid copper connectors.
- Optimised separation membrane.
- Precision needle and seat ball valve allows accurate metering of oil to return to the compressor crankcase.
- Internal baffle plate.
- Hermetically sealed stainless steel float.
- Powder coated finish.

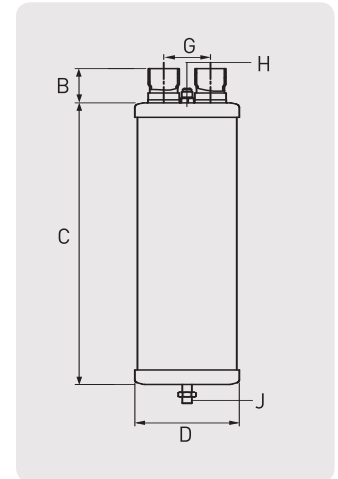
Benefits

- Negligible loss in system efficiency.
- Easier installation.
- Efficient removal of oil from the refrigerant flow.
- Allows only the correct amount of oil to return to the crankcase.
- Improves quality of returning oil.
- Extended service life.
- Exceeds 500 hours salt spray tests.

Nominal Capacity kW at Evaporating Temperature °C															
Part No.	R22					R404A					R134a				
	-30	-20	-10	0	5	-30	-20	10	0	5	-30	-20	-10	0	5
3210-6406S	3.0	3.2	3.6	3.8	4.2	3.0	3.2	3.6	3.8	4.2	2.7	2.9	3.2	3.4	3.8
3210-6406	4.1	4.3	5.0	5.1	5.4	4.1	4.3	5.0	5.1	5.4	3.7	3.9	4.5	4.6	4.9
3210-6408	5.8	6.2	6.5	6.8	7.0	5.8	6.2	6.5	6.8	7.0	5.2	5.6	5.9	6.1	6.3
3210-6410	16.9	17.5	18.2	18.8	19.3	15.4	16.4	17.5	18.5	19.3	15.2	15.8	16.4	16.9	17.4
3210-6414	25.4	26.2	26.9	27.6	28.1	24.0	25.2	26.6	28.0	28.8	22.9	23.8	24.2	24.8	25.3
3210-6418	33.1	34.3	35.3	36.4	37.0	31.7	33.4	35.0	36.6	37.4	29.8	30.9	31.8	32.8	33.3
3210-6422	42.1	43.6	44.8	46.3	47.5	40.1	43.3	47.5	47.7	49.0	37.9	39.2	40.3	41.7	42.8
3210-9622	46.7	47.4	48.0	48.6	49.3	43.1	45.2	48.3	49.5	50.8	42.0	42.7	43.2	43.8	44.4
3210-9626	57.7	58.9	60.5	62.0	63.2	54.2	57.3	60.5	63.6	65.1	51.9	53.0	54.4	55.8	56.9
3210-9634	100.1	102.3	103.5	104.6	105.5	93.4	98.4	102.2	106.0	108.6	90.0	92.0	93.1	94.1	95.0

Capacity figures based on;
 Evaporator temperature $t_e = 5^\circ\text{C}$
 Condensing temperature $t_c = 30^\circ\text{C}$
 Pressure drop $P = 7 \text{ kpa (1 psi)}$

3210 - Series



Note: Oil separator must be installed vertically

Part No.	Connection Size I.D. (Inch)	Dimensions						Oil Pre-charge (ml) *	Weight (kg)
		B	C	D	G	H MSAE	J THREAD		
3210-6406S	3/8	32	148	107	48	1/4	M10 x 1.5	480	1.8
3210-6406	3/8	32	245	107	48	1/4	M10 x 1.5	480	2.2
3210-6408	1/2	33.5	245	107	48	1/4	M10 x 1.5	480	2.5
3210-6410	5/8	38.5	300	107	48	1/4	M10 x 1.5	480	2.9
3210-6414	7/8	40	344	107	48	1/4	M10 x 1.5	480	3.2
3210-6418	1 1/8	45	370	107	48	1/4	M10 x 1.5	480	3.6
3210-6422	1 3/8	49	475	107	48	1/4	M10 x 1.5	480	4.5
3210-9622	1 3/8	43	352	153	75	3/8	M10 x 1.5	1230	3.2
3210-9626	1 5/8	50	429	153	75	3/8	M10 x 1.5	1230	3.5
3210-9634	2 1/8	55	432	153	75	3/8	M10 x 1.5	1230	3.6

* Oil pre-charge to be added to oil separator before installation

Selection Guidelines

The most important parameter for selection is the discharge volumetric flow rate, expressed in m³/hr. This is the calculated volume flow rate at entry to the oil separator. It is not to be confused with the compressor displacement or swept volume.

A quick method is to use the selection graphs. For HCFC and HFC refrigerants, the same graphs apply for both conventional and helical oil separators. Conventional separators are not suitable for use with ammonia hence the R717 graph should not be used.

As with the helical separators, where a higher degree of accuracy is required to calculate the m³/hr, the flow rate calculation method is recommended. The flow rate calculation method is also recommended for special applications.

Conventional Separator Selection using the Graphs

To use the selection graphs, the refrigerant type, maximum refrigeration capacity, minimum refrigeration capacity, evaporating temperature and the condensing temperature is required.

Example:

Refrigerant R404A

Maximum refrigeration capacity = 100 kW

Minimum refrigeration capacity = 50 kW

Evaporating temperature = -10°C

Condensing temperature = +40°C

From the R404A graph, follow the -10°C evaporator temperature line to the intersection of the 40°C condensing temperature line.

Extend a line horizontally from this point to the m³/hr/kW factor.

Multiply this factor by the maximum and minimum refrigeration capacities to compute the maximum and minimum discharge volume flow rates.

From the R404A graph, the [m³/hr/kW factor] = 0.355

Therefore:-

Maximum discharge volume flow rates = (0.355 x 100) = 35.5 m³/hr

Minimum discharge volume flow rates = (0.355 x 50) = 17.75 m³/hr

The maximum and minimum m³/hr figures should be compared with the rated capacity of the conventional separator. Refer to the Performance Data Table for the rated capacities.

The general recommendation is that the calculated maximum flow should not exceed the rated capacity of the separator. Also, the minimum flow should not be below 33% of the rated capacity.

Using these m³/hr figures, the recommended conventional separator selection is model 3210-9634 (sealed unit only) with a rated capacity of 38.3 m³/hr. The final selection depends on whether or not the user requires a separator model with a removable/cleanable oil float assembly.

Additional notes on selection:-

1. The 33% minimum recommendation rule is to optimise efficiency. Below this load factor, the efficiency of the separator will decrease. On systems with extreme unloading conditions, one separator per compressor should be used rather than one separator for a common discharge line.
2. Understanding the system refrigeration capacity and the percentage of full and low load run times can also be helpful in selecting the separator.
3. In cases where the maximum discharge has been exceeded by only a minimal amount and the system has unloading characteristics, select the smaller separator. It is not recommended to oversize.

Installation – Main issues

Same as for helical oil separators.

Coalescent Oil Separators

Specially designed for Australian Conditions - High pressure as standard, the word coalesce means to bring many pieces together to form a mass.

In regard to Oil Separators, coalesce means to bring the tiny droplets that are present in the discharge gas of the compressor, together to form a mass of oil, heavy enough to separate from the gas stream and drop into the retaining sump under the filter.

Fine micron filtration strips oil of any contaminant and sludge. Built in Differential pressure sensor can determine when filter is required to be changed.

Features

- Designed for maximum flow and minimal pressure drop
- Large filtration surface area
- Replaceable filter

Benefits

- Legible loss in system efficiency
- Filtration to 0.3 micron
- Easy to change filter when required

Materials of construction

- Shell and end caps are carbon steel
- Connections are carbon steel
- Filter is proprietary composition



Manufacturing standards

Manufactured in accordance with AS2971.2
Safe working pressure: 4500 kPa

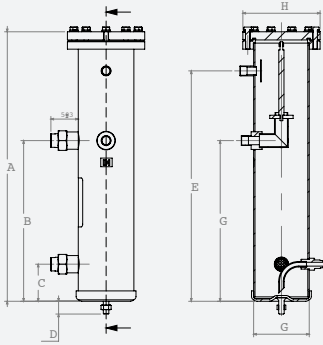


FIG. 1

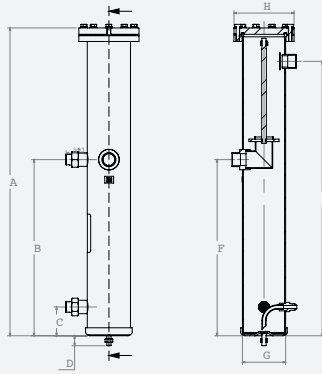


FIG. 2

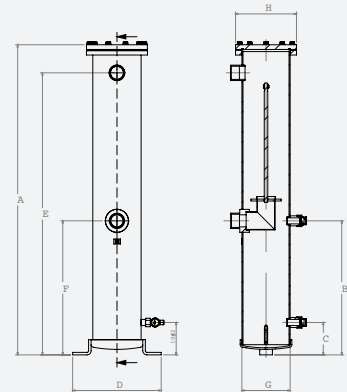


FIG. 3

Part No.	Connection Size I.D. (Inch)	A	B	C	D	E	F	G	H	Drawing Reference
HCOS-022R	5/8	495	295	68	24	423	295	102	142	fig 1
HCOS-023R	7/8	495	295	68	24	419	295	102	142	fig 1
HCOS-024R	1 1/8	727	416	68	24	648	416	102	142	fig 2
HCOS-025R	1 3/8	727	416	68	24	644	416	102	142	fig 2
HCOS-026R	1 5/8	977	422	102	279	888	422	152	192	fig 3
HCOS-027R	2 1/8	977	422	102	279	883	422	152	192	fig 3

Ordering Info.			R134a Evaporating (kW)				R404A Evaporating (kW)					†R744 Evaporating (kW)			Pressure rating	
Model	Filter Number	Line Size	-10	-5	0	5	-40	-30	-20	-15	-10	-5	-40	-30	-20	(Bar. Guage)
HCOS-022R	3500-34000	5/8" ODS	14.0	14.3	14.6	15.0	15.5	17.0	18.4	19.0	19.7	20.3	35.0	35.1	35.2	45
HCOS-023R	3500-34000	7/8" ODS	31.6	32.3	33.0	33.7	35.0	38.3	41.4	42.9	44.4	45.8	78.5	79.0	79.2	45
HCOS-024R	3500-37000	1-1/8" ODS	49.4	50.5	51.6	52.7	54.8	59.8	64.7	67.1	69.4	71.6	123.0	123.5	123.8	45
HCOS-025R	3500-37000	1-3/8" ODS	87.8	89.8	91.8	93.8	97.4	106.5	115.0	119.3	123.4	127.4	218.7	219.5	220.1	45
HCOS-026R	3500-28000	1-5/8" ODS	126.4	129.4	132.2	135.1	140.3	153.2	165.5	171.6	177.6	183.5	315.0	316.8	317.0	45
HCOS-027R	3500-28000	2-1/8" ODS	224.8	230.0	235.1	240.2	249.0	272.5	294.4	305.4	316.0	326.0	560.0	563.2	563.6	45
HCOS-028R	3500-28000	2-5/8" ODS	351.3	359.5	367.4	375.3	389.0	425.0	460.0	477.0	493.0	509.5	-	-	-	32

Filter efficiency = 0.3 Micron at a 45 Bar stagnation pressure within the limits of the table
 Table is based on 45°C Condensing Temperature/ -10 for R744 Cascade condenser
 kW = Maximum kW for line size and pressure drop

†Cascade only

DISCHARGE (HOT-GAS) LINES

Hot-gas lines should be designed to:

- Avoid trapping oil at part-load operation.
- Prevent condensed refrigerant and oil in the line from draining back to the head of the compressor.
- Have carefully selected connections from a common line to multiple compressors
- Avoid developing excessive noise or vibration from hot-gas pulsations, compressor vibration, or both.

Note:

Although a low pressure drop is desired, oversized hot-gas lines can reduce gas velocities to a point where the refrigerant will not transport oil. Therefore, when using multiple compressors with capacity control, hot-gas risers must transport oil at all possible loadings. The previous table gives max load only (Refer below for min loads)

Minimum kW for Hot gas risers, Based on R134a @ 45°C Condensing and 0°C Evap.

Model	Line size	Minimum kW
HCOS-022R	5/8" ODS	1.0
HCOS-023R	7/8" ODS	2.4
HCOS-024R	1-1/8" ODS	4.6
HCOS-025R	1-3/8" ODS	8.2
HCOS-026R	1-5/8" ODS	13.3
HCOS-027R	2-1/8" ODS	25.5
HCOS-028R	2-5/8" ODS	44.0

Accessories / Spare parts

Differential pressure gauge / switch

Part No: 1002PIS-4A-2.5M-C 1.5 Bar

Operating pressure: 200 Bar (Max)

Operation Temperature: 66 Deg C (Max)

Max differential pressure: 1.5 Bar



Electronic Oil Control

The function of the IntelOil Controller is to monitor and maintain the oil level in the compressor crankcase using proven high resolution float sensor technology. This protects the compressor from damage.

Applications

The IntelOil Controller is suitable for low and high pressure oil management systems. It is designed for use with both scroll and reciprocating compressors. The oil controller is approved for HCFC, HFC and CO₂ refrigerants and their associated oils.

How it works

The IntelOil Controller regulates the oil level in the compressor crankcase by means of a Hall effect sensor and a float assembly with built-in magnets. As the oil level rises or falls, variations in the magnetic field strength of the float assembly are detected by the sensor. These are converted to a variable voltage and read by the electronic unit. This, in turn, updates the status LEDs and, if necessary, triggers the solenoid valve to feed oil to the compressor. If the required oil level is not reached in the allotted time, the alarm contact switches and can be used to operate an alarm or shut down the compressor.

Oil level controllers are designed to attach to the sight glass housing on the compressor crankcase. Adapter kits are available for both scroll and reciprocating compressors. Oil supply to the IntelOil unit is via a 1/4" flare connection.

Main Features

- High resolution float sensor
- Integral diagnostics
- Supplied with 3m power and relay cables
- Reliable performance even with foaming or dirty oil
- Compact and lightweight
- Precise level sensing
- Low energy solenoid valve
- Easy to install adapters
- Alarm relay

Models

- HOC1-24-3 (24V AC with 3m power and relay cables)*
- HOC1-230-3 (230V AC with 3m power and relay cables)*
- HOC1H-24-3 (24V AC with 3m power and relay cables)*
- HOC1H-230-3 (230V AC with 3m power and relay cables)*

*Adapter kits sold separately.



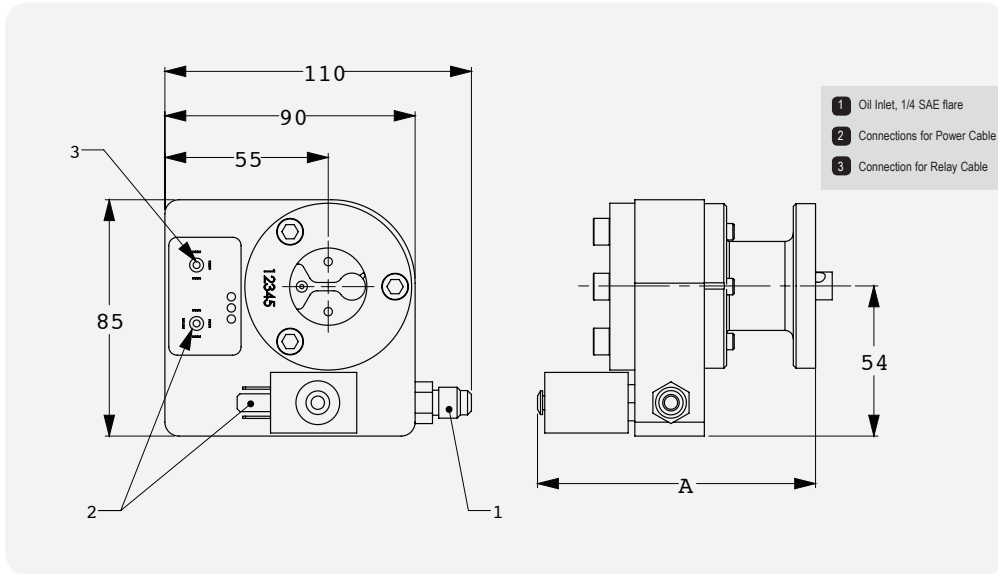
Technical Specification

Allowable operating pressure:	0 to 60 barg (HOC1) 0 to 120 barg (HOC1H)
Maximum differential pressure:	25 barg (HOC1) 45 barg (HOC1H)
Maximum ambient temperature:	50°C
Maximum fluid temperature:	80°C
Supply voltage:	24V AC or 230V AC 50/60 Hz
Rated operating current:	0.4 Amps (24V AC) 0.04 Amps (230V AC)
Electrical connection:	Moulded plugs connect to oil controller
Alarm contact:	Volt free, normally closed**
Alarm contact rating:	Max. 3 A, 230V AC, voltage free
Wiring:	Flying leads on designated cables
Power supply:	Brown, blue & green-yellow wires
Alarm contact:	Blue, black & brown wires
Protection class:	IP 65
Status LED's:	3
Oil inlet connection:	1/4 SAE Flare
Weight: HOC1:	0.94 kg
HOC1H:	1.0 kg
CE marked for EMC and Low Voltage Directive	
Approvals: EAC	

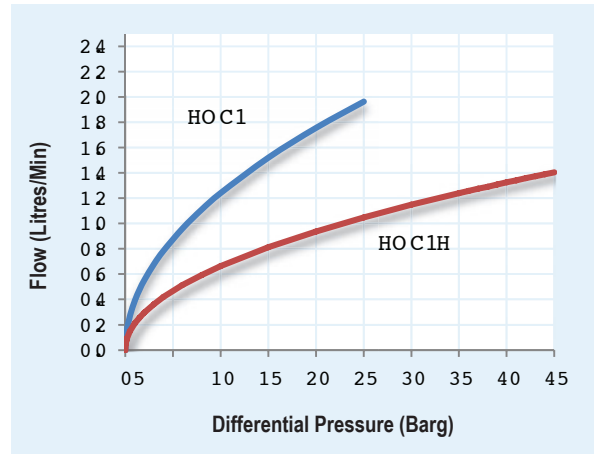
**Alarm contacts are open when power is applied and oil level is good.

Materials of Construction

The main pressure retaining parts are made from aluminium alloy and plated steel (sight glass). The electronic control module's cover is made from polycarbonate.



Adapter	A(mm) Installed
H12070	101
H12071	85
H12072	85
H12073	81
H12074	100
H12075	96
H12076	85



Flow rate data

The flow rate of oil through the IntelOil Controller is dependent on the pressure differential between the supply line and the compressor crankcase. If applicable, gravity pressure level should be included. The graph illustrates typical flow rates at various pressures. The flow rates shown are measured in water at a temperature of 20°C.

Installation - Main issues

1. The electronic module will be damaged if the 24V/230V supply voltage is exceeded.
2. Power to the unit should be maintained during compressor running, stand-by and shutdown modes.
3. To protect the oil controller from system debris, a filter drier is recommended.

INTELOIL ADAPTERS			
Part No.	Compressor Type	Mounting Style	Weight (kg)
H12070	Multi-Adapter	3 & 4 bolt combination flange O-ring	0.13
H12071	Bitzer/Bock/Copeland	1 1/8"-18 UNEF thread with O-ring	0.08
H12072	Dorin	1 1/8"-18 UNEF thread with aluminium seal	0.08
H12073	Copeland Scroll	3/4"-14 NPTF	0.07
H12074	Copeland Scroll	1 3/4"-12 UN thread Rotalock with teflon gasket	0.14
H12075	Copeland Scroll	1 1/4"-12 UNF thread Rotalock with teflon gasket	0.11
H12076	Danfoss/Maneurop	1 1/8"-18 UNEF thread with O-ring and adapter ring	0.08

INTELOIL CABLES	
Part No.	Description
HOC-P300***	Power cable 3mtr
HOC-S300***	Relay Cable 3mtr
HOC-P600	Power cable 6mtr
HOC-S600	Relay Cable 6mtr

***Supplied with each IntelOil.

Oil Reservoirs

The function of an Oil Reservoir is to provide a holding charge of oil, as part of a Low Pressure Oil Management System. The amount of oil circulating in a system varies depending on the operating conditions. The Oil Reservoir caters for these fluctuations by providing additional storage capacity.

Rotalock valves are supplied with each Oil Reservoir to facilitate easy oil fill and drain. A connection is provided at the top of the unit for fitting a pressure vent valve. Models are provided with either two or three sight glasses for visual indication of oil level.

Applications

The standard range of Oil Reservoirs are suitable for HCFC and HFC refrigerants, along with their associated oils. The SH range, with a higher MWP, is also suitable for sub-critical CO₂ applications.



Features

- Three sizes available in both standard and high pressure ranges.
- Robust construction.
- All models supplied with Rotalock Valves.
- Sight glass with floating ball.
- Double seal on sight glass for leak integrity.
- Standard models supplied with mounting brackets.
- Mounting brackets available on request (SH models only).

Technical Specification

Standard models:

Allowable Operating Pressure = 0 to 3,100 kPa

Allowable Operating Temperature = -10°C to 130°C

SH models:

Allowable Operating Pressure = 0 to 4,000 kPa

Allowable Operating Temperature = -10°C to 110°C

Materials of Construction

The shell, end caps and fitting connections are made from carbon steel.

Installation – Main Issues

Full instructions are given in the Product Instruction Sheet included with each Oil Reservoir.

Benefits

- Select the model appropriate for the application.
- Suitable for harsh environments.
- Supplied ready for installation.
- Quick and easy means to identify liquid level.
- Minimises risk of leakage.
- No additional accessories required.
- Secure installation.

Selection Guidelines

Both ranges of Henry Technologies Oil Reservoir include three different oil holding capacities of approximately 7.5, 11.5 and 15 litres.

The required holding capacity is dependent on a number of system design factors such as oil return piping practice, compressor type, number of compressors, compressor run times, etc....

For single stage parallel systems the oil reservoir capacity can be selected using the simple example calculation below. This simple calculation is a guide only based on the total compressor (theoretical) displacement (V_h). For other system types please contact Henry Technologies.

Example:-

8 compressors each with a theoretical displacement of 17 m³/hr.

Therefore V_h (total) = 136 m³/hr.

The selected V_h model is S-9109, with a V_h rating of up to 150 m³/hr.

Refer to selection table.

Note: It is known that some users select Oil Reservoir capacity using different rules from the above or from field experience. The method presented above is for guidance purposes only. If in doubt, select a larger capacity Oil Reservoir.

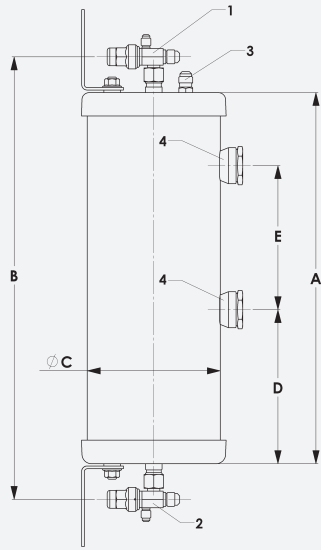


Fig.1

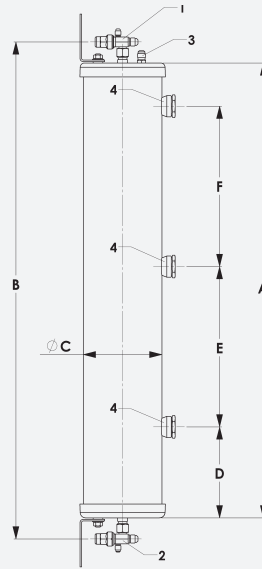


Fig.2

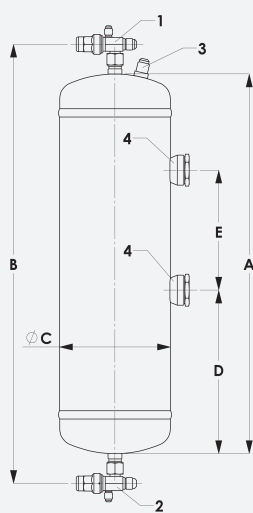


Fig.3

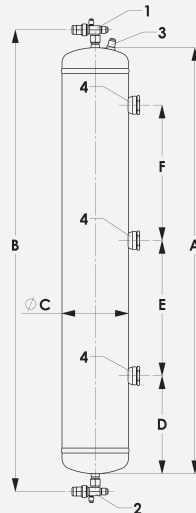


Fig.4

- 1 Inlet, Rotalock valve, 3/8 SAE Flare*
- 2 Outlet, Rotalock valve, 3/8 SAE Flare*
- 3 Vent, 3/8 SAE Flare
- 4 Sight glass

Part No	Dimensions (mm)						Drawing reference	Weight (kg)	MWP (barg)	CE Cat
	A	B	C	D	E	F				
S-9109-CE	426	507	152	177	165	N/A	fig.1	9	31	Cat II
S-9108U-CE	654	735	152	177	394	N/A	fig.1	12.5	31	Cat II
S-9108-CE	883	965	152	177	311	311	fig.2	15.5	31	Cat II
SH-9109-CE	522	604	152	225	165	N/A	fig.3	9	45	Cat II
SH-9108U-CE	751	832	152	225	394	N/A	fig.3	12.5	45	Cat II
SH-9108-CE	980	1061	152	225	311	311	fig.4	15.5	45	Cat II

* ODS Rotalock valve connections available on request

OIL RESERVOIR SELECTION TABLE		
Part No	Capacity (litres)	V _n , total (m ³ /hr)
S-9109-CE	6.9	up to 150
S-9108U-CE	10.7	150-300
S-9108-CE	14.5	300-400
SH-9109-CE	8.2	up to 150
SH-9108U-CE	12.0	150-300
SH-9108-CE	15.8	300-400

Note: V_n = Summation of the theoretical displacement for all compressors in system

Reservoir Pressure Valves

The function of a Reservoir Pressure Valve is to control pressure in an oil reservoir.

Applications

A reservoir pressure valve is used in a Low Pressure Oil Management System. It is used to vent pressure in the oil reservoir while still maintaining a positive pressure differential between the reservoir and the compressor crankcase. This positive pressure ensures an adequate oil supply to the oil level regulators. The reservoir pressure valve is piped to suction pressure.

These valves are suitable for use with HCFC, HFC and CO₂ refrigerants, along with their associated oils.

Main Features

- Proven design
- Three different pressure settings
- Premium quality neoprene seal

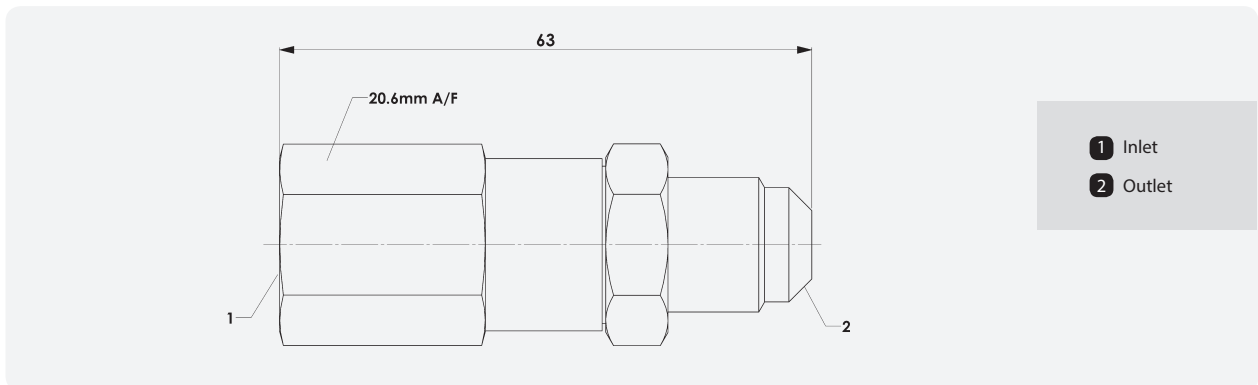
Technical Specification

Allowable operating pressure = 0 to 45 barg

Allowable operating temperature = -10°C to +120°C

Materials of Construction

The valve body components are made from brass, the spring from stainless steel and the seal from neoprene or PTFE (S-9104XHT).



Part No	Pressure Setting (barg)	Conn Size (inch)		Weight (kg)	CE Cat
		Inlet	Outlet		
S-9104	0.35 fixed	3/8 SAE Flare Female	3/8 SAE Flare Male	0.13	SEP
S-9104H	1.4 fixed	3/8 SAE Flare Female	3/8 SAE Flare Male	0.13	SEP
S-9104XH	2.4 fixed	3/8 SAE Flare Female	3/8 SAE Flare Male	0.13	SEP
S-9104XHT	2.4 fixed	3/8 SAE Flare Female	3/8 SAE Flare Male	0.13	SEP

RESERVOIR PRESSURE VALVE

Selection guidelines

The S-9104, S-9104H and S-9104XH models provide 0.35, 1.4 and 2.4 barg pressure differentials respectively.

A higher pressure differential will increase the oil flow rate from the oil reservoir back to the compressors.

The user should select a model taking into account individual compressor crankcase pressures along with the differential pressure range of the oil regulators. If foaming is a concern do not use the S-9104XH model.

Oil Strainers

The function of an Oil Strainer is to remove system debris from the refrigerant oil. Their purpose is to protect compressors and oil level regulators from damage.

Applications

The Henry Technologies SH-9105 oil strainer can be used in both Low and High Pressure Oil Management Systems. The strainer is suitable for HCFC and HFC refrigerants, along with their associated oils.

Although the strainer is compatible with HFC/POE refrigerant/oil combinations, Henry Technologies recommends the use of an oil filter or oil filter-drier. This is due to the scavenging nature of POE oil.

Greater system protection will be achieved using an oil filter or oil filter driers over a traditional oil strainers.

Typically, an oil strainer is fitted immediately upstream of a mechanical oil level regulator in order to protect the float needle valve from debris. This in turn protects the compressor from damage.



Features

- Large screen area ensuring maximum capacity and long service.
- Low pressure drop.
- Stainless steel screen.
- 3/8" MSAE connections.

Benefits

- Provides trouble free service for longer periods.
- No performance penalties.
- Efficient removal of harmful particulates.
- Easy installation and replacement.

Technical Specification

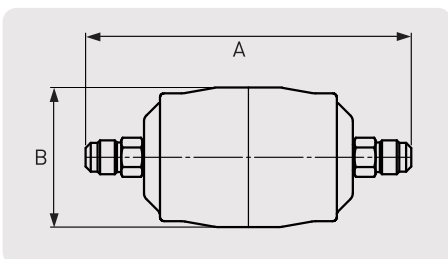
Allowable Operating Pressure = 4,500 kPa
 Manufactured in Accordance with: UL207 & PED97/23
 Allowable Operating Temperature: -10°C to 120°C

Materials of Construction

The main body and connections are made from carbon steel.
 The mesh screen is made from stainless steel.

Installation - Main Issues

1. The oil strainer must be installed in accordance with the flow direction arrow.
2. It is recommended to install valves on either side of the oil strainer to allow the oil strainer to be isolated for easier replacement should the mesh screen become blocked.



Part No.	Conn. Size (Inch)		Dimensions (mm)		Screen Data		Weight (kg)
	Inlet	Outlet	A	B	Area mm ²	Mesh	
SH-9105	3/8 SAE Flare	3/8 SAE Flare	153	66	8,952	200	0.37

Oil Filters & Oil Filter Driers

The function of an Oil Filter is to remove system debris from the refrigerant oil. The function of an Oil Filter Drier is to remove both system debris and moisture from the refrigerant oil. Their purpose is to protect compressors and oil level regulators from damage.

Applications

The Henry Technologies S-4004 oil filter and S-4005 oil filter drier can be used in both Low and High Pressure Oil Management Systems. Models are suitable for HCFC and HFC refrigerants along with their associated oils. The unique drying features of the S-4005 model are particularly suited for systems using POE oil. This type of oil is more hydroscopic than mineral oil. This means that POE oil absorbs moisture at a much higher rate. Moisture in a refrigeration system can produce problems and/or harmful conditions. One S-4004 or S-4005 model can be fitted in the oil return line between the oil separator and oil reservoir, instead of fitting one oil strainer per oil level regulator. These models will also remove more debris than traditional oil strainers.



Main Features

S-4004 model

- High flow capacity with low pressure drop
- Large filter area
- Micronic filtration
- Eliminates the need to fit individual oil return line strainers

S-4005 and SH-4005 models

- High flow capacity with low pressure drop
- Large filter area
- Micronic filtration
- High level of drying
- Eliminates the need to fit individual oil return line strainers

Technical Specification

S-4004 model

Allowable operating pressure = 0 to 31 barg
 Allowable operating temperature = -10oC to +100oC
 Filter surface area = 3065 cm²
 Filter particle retention = 10 micron

S-4005 model

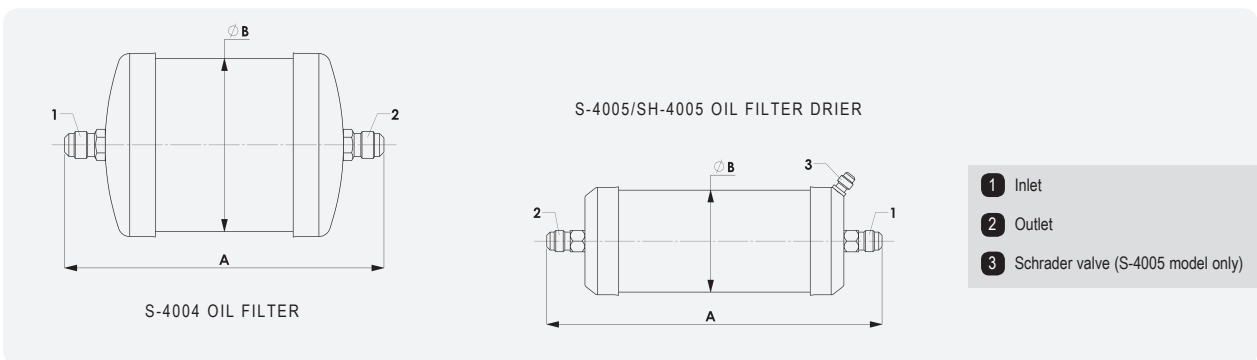
Allowable operating pressure = 0 to 31 barg
 Allowable operating temperature = -10oC to +100o C
 Filter surface area = 3000 cm²
 Filter particle retention = 6 micron
 Drier = 131cm³ of XH9 desiccant

SH-4005 model

Same as S-4005, except it has a higher operating pressure. Allowable operating pressure = 0 to 45 barg

Installation – Main issues

1. The oil filter or filter drier must be installed in accordance with the flow direction arrow.
2. Units should be replaced after a 1 barg (15 psig) pressure drop has been detected. Pressure drop can be detected by fitting Schrader valves before and after the unit. It is recommended to install valves on either side of the unit to ease replacement, in the event that the filter becomes blocked.
3. For low pressure oil management systems, oil filters and oil filter driers should be located between the oil separator and oil reservoir, not between the oil reservoir and the oil regulator.



Part No	Conn Size (inch)		Dimensions (mm)		Weight (kg)	MWP (barg)	CE Cat
	Inlet	Outlet	A	Ø B			
S-4004	3/8 SAE Flare	3/8 SAE Flare	188	102	1.93	31	SEP

Part No	Conn Size (inch)		Dimensions (mm)		Weight (kg)	MWP (barg)	CE Cat
	Inlet	Outlet	A	Ø B			
S-4005	3/8 SAE Flare	3/8 SAE Flare	251	76	1.55	31	SEP
SH-4005	3/8 SAE Flare	3/8 SAE Flare	251	76	1.55	45	SEP

Discharge Mufflers

The function of a Discharge Muffler is to reduce noise in the discharge line of a refrigeration or air-conditioning system. Mufflers have internal baffles designed for minimum pressure drop. These baffles change the velocity of the discharge gases passing through the muffler. Resulting in a dampening effect on high frequency sound waves on high speed compressors. Pulsating waves are also muffled in both low speed and high speed compressors.

The muffler is designed to be installed directly after the compressor. They are sized to the discharge line of the compressor.

The product range is designed for use with HCFC and HFC refrigerants, along with their associated oils.



Features

- Designed for maximum flow and minimal pressure drop.
- Robust design.
- Bi-directional flow.
- Special baffle design.
- Manufactured and tested to relevant pressure vessel codes.
- Powder coated finish.
- Oil drain passage.

Benefits

- Negligible loss in system efficiency.
- Guaranteed long life.
- Flexibility of installation.
- Cuts out the harmonic pulse.
- Quality and verified vessel integrity.
- Exceeds 500 hour salt spray tests.
- No oil collection when installed in the correct orientation.

Installation - Main Issues

- Install the mufflers as close as possible to the compressor and before the oil separator.
- When mounted in a horizontal or angled position, the connectors should always be installed in the low position to help prevent oil collection inside the muffler. Oil inside the muffler will reduce the performance along with causing a loss of oil in the compressor crankcase. Positioning the muffler at a slight angle so that the outlet port is below the inlet will also help prevent oil collection. Mufflers that are mounted vertically will not collect oil.

- A vibration eliminator should be installed between the compressor and the muffler to prevent transmitted vibration. The muffler should be supported at each side to prevent discharge pipe vibration, due to the weight of the muffler.
- Mufflers will only remove noise due to discharge gas pulsations. If the noise is due to vibration, vibration eliminators should be added to the discharge line and possibly the suction line.
- A single muffler may be installed on a common discharge line. However, some customers prefer to install one muffler per compressor on parallel racks.

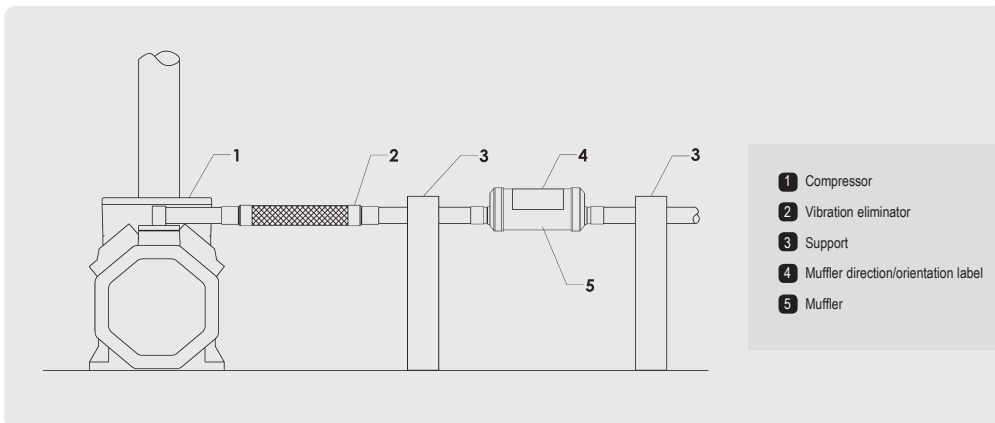
Materials of Construction

The main body and internal baffles are made from carbon steel. The connections are made from plated carbon steel.

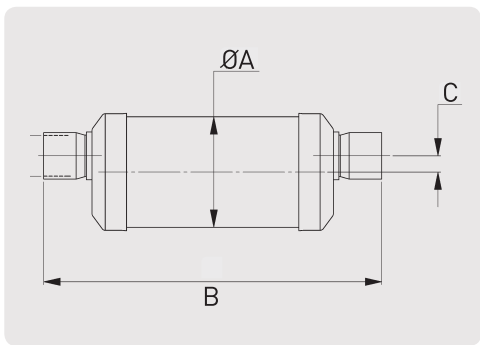
Technical Specification

Allowable Operating Pressure = 0 to 3,100 kPa
 Allowable Operating Temperature = 0°C to 120°C (1/2 to 7/8 ID)
 Allowable Operating Temperature = -15°C to 120°C (1-1/8 to 3-1/8 ID)

CORRECT MUFFLER SUPPORT



- 1 Compressor
- 2 Vibration eliminator
- 3 Support
- 4 Muffler direction/orientation label
- 5 Muffler



Part No.	Connection Size (Inch)	Dimensions (mm)			Weight (kg)
		A	B	C	
S-6304	1/2	76	197	19	1.06
S-6305	5/8	76	197	19	1.08
S-6311	1 1/8	76	246	11	1.32
S-6407	7/8	102	178	24	1.62
S-6411	1 1/8	102	324	24	2.30
S-6413	1 3/8	102	349	24	2.62
S-6415	1 5/8	102	464	19	3.35
S-6621	2 1/8	152	533	32	8.20
S-6625	2 5/8	152	533	25	9.00
S-6631	3 1/8	152	568	19	10.0

Vibration Eliminators

The function of a Vibration Eliminator is to absorb compressor vibration.

By installing a vibration eliminator, the risk of damage to system equipment and pipework is reduced.

The V Series

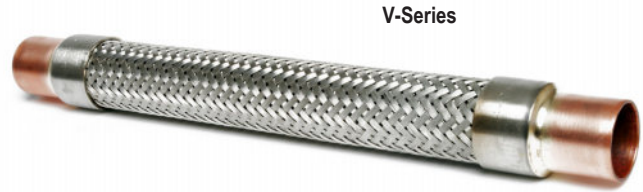
Each unit is constructed of a deep pitch corrugated hose covered with a stainless steel braid. The hose and braid are reinforced by ferrules at each end and connected to copper tube ends by a high temperature braze alloy.

The VS Series

The VS series is based on the proven design of the V series with a few modifications. The VS series is constructed entirely of stainless steel and all joints are tig welded. Consequently there is no need to wet-rag the product during the installation process. The maximum working pressures are higher, as detailed in the table.

A vibration eliminator is suited for installation in both the suction and discharge lines of refrigeration and air-conditioning systems.

Vibration eliminators are suitable for HCFC, HFC and CO₂ refrigerants, along with their associated oils.



V-Series



VS-Series

Manufacturing Standards

Manufactured to CE and UL classifications

Safe Working Pressure: As per table

Allowable Operating Temperature: -40°C to 120°C

Features

- Proven design.
- Large hose ID.
- Stainless steel hose and braid.
- Stainless steel ferrules.
- Helium leak tested.
- CE marked and UL listed (V series only).
- VS Series constructed entirely of stainless steel.
- Features VS Series rated to 60 bar MWP up to 1-3/8" I.D.

Benefits

- Long service life.
- Minimal pressure drop.
- Corrosion resistant.
- Superior strength.
- Leak proof.
- Fully tested to recognised international standards.
- No need to wet rag the VS series during installation.
- Ideal for CO₂ (sub-critical) applications.

Installation – Main issues

Take special care to install vibration eliminators horizontally when used in suction lines or where operating temperatures are below freezing point. Condensation may form on the outside of the unit and if installed vertically this may accumulate in the lower braid collar. In subsequent freezing this may deform and destroy the unit. If vertical installation is the only option, or indeed if condensation is possible with horizontal mounting, the entire flexible section, ferrules and braided hose, must be covered with a watertight synthetic material e.g. a heat shrinkable PVC sleeve.

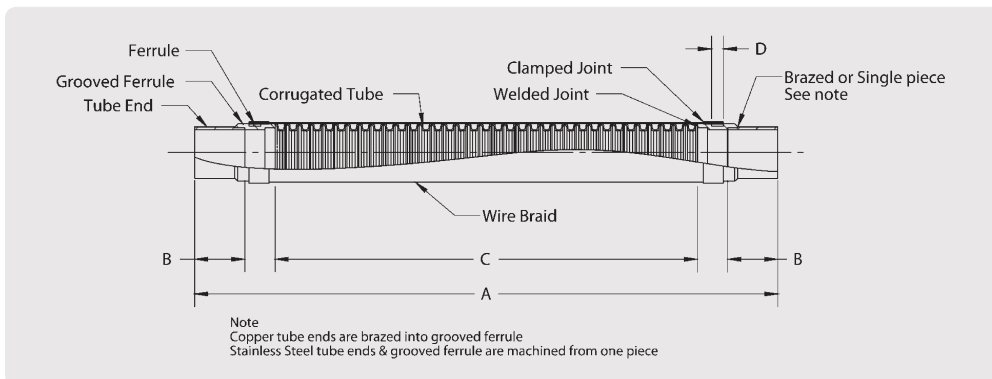
The ferrule and start of braid must be wet-ragged for brazing when installing the V series to prevent overheating and subsequent damage.

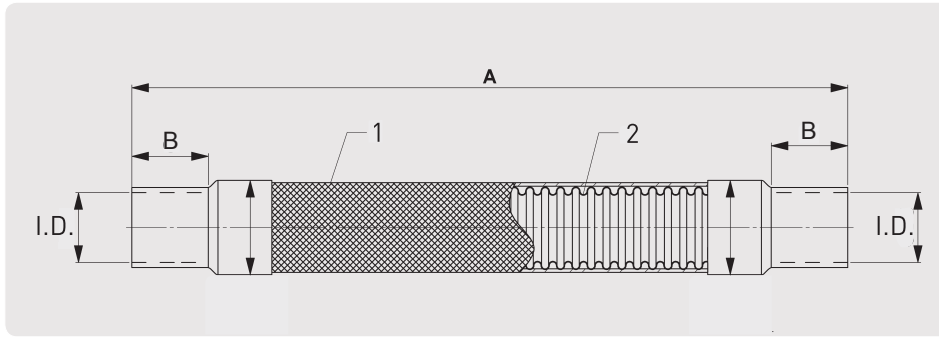
The V Series

Each unit is constructed of a deep pitch corrugated hose covered with a stainless steel braid. The hose and braid are reinforced by ferrules at each end and connected to copper tube ends by a high temperature braze alloy.

The VS Series

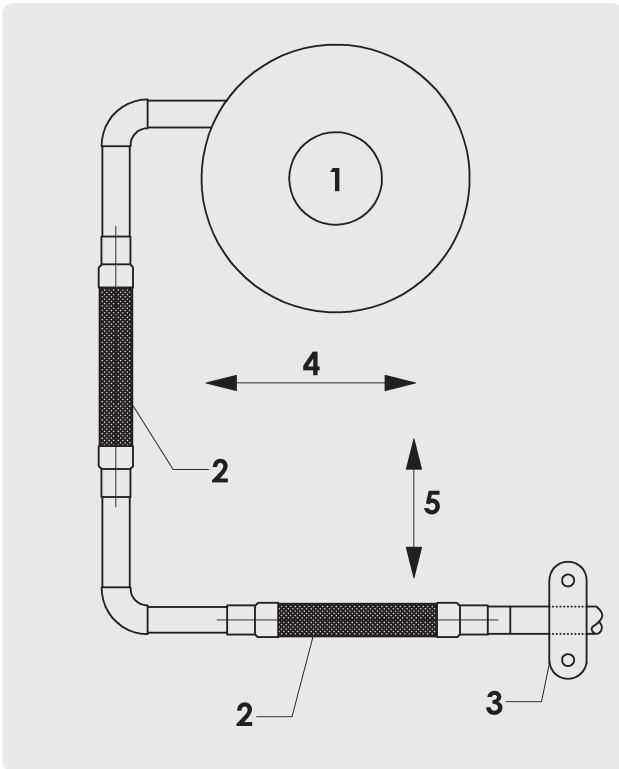
The VS Series is based on the proven design of the V series with a few modifications. The VS series is constructed entirely of stainless steel and all joints are TIG welded. Consequently there is no need to wet-rag the product during the installation process. The maximum working pressures are higher, as detailed in the table.



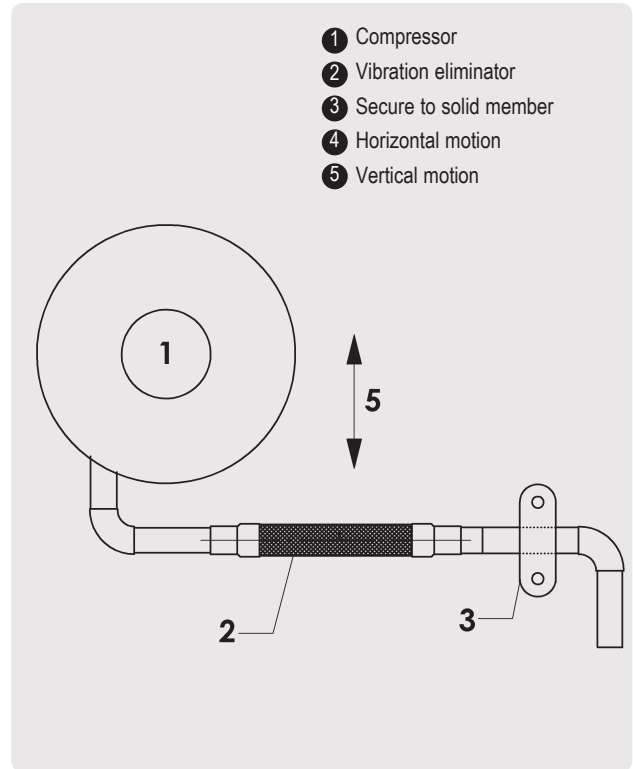


Part No.		Connection Size ID (Inch)	Dimensions		Hose Internal Dia.	MWP (kPa)		Weight (kg)
V Series	VS Series		A	B		V Series	VS Series	
V-3/8	VS-3/8	3/8	215	18	10	4480	6000	0.14
V-1/2	VS-1/2	1/2	225	18	13	4480	6000	0.15
V-5/8	VS-5/8	5/8	247	20	16	4480	6000	0.21
V-3/4	-	3/4	266	23	19	4480	6000	0.32
V-7/8	-	7/8	301	25	23	4480	6000	0.31
V-1-1/8	VS-1-1/8	1 1/8	329	32	29	4130	6000	0.42
V-1-3/8	VS-1-3/8	1 3/8	392	35	35	3790	6000	0.66
V-1-5/8	-	1 5/8	425	40	42	3510	6000	0.98
V-2-1/8	-	2 1/8	520	50	55	2750	-	1.46
V-2-5/8	-	2 5/8	613	60	67	2410	-	2.60
V-3-1/8	-	3 1/8	680	70	80	2200	-	3.60

Single system



Double system



- ① Compressor
- ② Vibration eliminator
- ③ Secure to solid member
- ④ Horizontal motion
- ⑤ Vertical motion

Filter Driers & Strainers

Introduction

New refrigerants and synthetic oils (such as POE/PAG) demand a more precise operating environment than ever before. Excessive moisture and contamination levels can quickly lead to a loss of refrigeration capacity, system efficiency or even breakdown.

The Solution?

Trust time-tested Henry Tech Filter Driers & Drier Cores to offer reliable, long lasting protection, for both food service and air conditioning applications, whether it's a new installation, field replacement or retrofit.

The First Line of System Protection

The Filter Drier & Drier Core in a refrigeration or air conditioning system is often referred to as the system protector. It removes harmful elements from the circulating refrigerants and lubricants before serious damage results.

1. Moisture

Moisture or water can come from many sources:

- Improper dehydration of new equipment
- Improper field assembly or poor service procedures
- Refrigerant leaks
- Wet refrigerant
- Wet oil, Poly-ol Ester (POE) which is much more "moisture loving" (Hygroscopic) than mineral oils

Note: If the moisture content of the POE oil is greater than 75 PPM (parts per million), the POE reverts back to its original chemical – an alcohol and an organic acid. Alcohol reduces the Filter Drier's effectiveness with water and acid attacks the refrigeration system's internals.

A leading international compressor manufacturer's experience with Poly-ol Ester Oil is presented in Fig. 1.

The seriousness of POE's hygroscopic nature is depicted as the compressor with its oil, moves its way from manufacture, to rack fabrication, to field installation and finally commissioning.

For the most cost effective method of removing the harmful effects of moisture, simply choose a Henry Tech Filter Drier/Drier Core.



The Filter Driers & Drier Cores Function

The primary contaminants which Filter Driers & Drier Cores are expected to remove are:

- Moisture
- Acids
- Solid contaminants such as metal filings, flux, dirt, oxides and wax
- Sludges and Varnish

2. Acids

Acids are formed by a combination of refrigerants being heated to elevated temperatures and the presence of high moisture content in the system. This Hydrolysis forms both Hydrochloric and Hydrofluoric (inorganic) acids. Organic acids are also created from the lubricant's breakdown in the presence of moisture. Since acids attack and corrode the metals in a refrigeration system, it is crucial that they be removed as quickly as possible to minimise damage.

It is crucial to be aware of the harmful effects of high discharge or condensing temperatures on refrigeration systems, as they act as the major catalyst in the production of acids. It is good trade practice to replace the Filter Drier or Core whenever a system has operated for extended periods under high operating temperatures.

Henry Tech Filter Driers/Cores have a critical mission, to remove this acid, prolonging the life of compressors and refrigerants.

3. Solid Contaminants

These include dirt, copper oxide scale, sludges, flux, metallic particles etc... Such contaminants can be introduced during manufacture, field assembly or service. They can damage compressor cylinder walls, bearings and cause blockages of capillary tubes or TX Valve strainers. These contaminants create the conditions necessary for the decomposition of the refrigerant/lubricant mixture at high temperatures.

The effective removal of contaminants is difficult due to the wide range of particle sizes that can be encountered in a system.

A refrigeration system demands:

- Thorough flow micron filtration to capture these particles.
- Guaranteed uniform porosity through the entire Filter Drier Core.
- A core shaped to give maximum surface area with negligible pressure drop.
- Improved filtration and long lasting results.

Henry Tech Filter Driers/Cores offer thorough flow filtration with less chance of total core blockage.

4. Sludges and Varnish

Even the cleanest system when subjected to unusually high discharge temperatures will suffer from lubricant breakdown. Sludge, varnish and carbon deposits are some of the by-products of this occurrence. A refrigeration system can feature certain catalytic metals (iron & copper) that can further contribute to the refrigerant/lubricant mixture's breakdown.

Compressor/Polyol Ester Oil
Moisture Content Versus Time

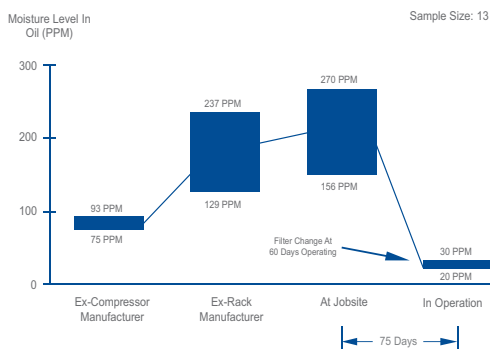


Fig. 1.

Total Filtration Management Solutions

Henry Tech's range of Filter Driers/Drier Cores are manufactured from the desiccants 3A Molecular Sieve, Activated Alumina and Activated Carbon. The most suitable desiccant is chosen for the Filter Drier's intended application and its location within the refrigeration system. Henry Tech's vast experience has resulted in the creation of proprietary mixtures to target the removal of system contaminants before they can do damage and cause breakdowns to the refrigeration system. Designed in conjunction with the Suction Filter Element, Henry Tech delivers total filtration management solutions for the benefit of customers.

3A Molecular Sieve (MS)

Used for maximum moisture removal, the 3A Molecular Sieve traps and removes water molecules from the circulating refrigerant and oil. Tested in accord with ARI 710-86, when installed in the Liquid Line these Filter Driers provide the drying capacity necessary to keep the moisture content of the circulating fluids below 75 parts per million (ppm). This therefore avoids the creation of acids in POE oils.

Henry Tech's 3A Molecular Sieve Filter Driers/Drier Cores are suitable for the traditional refrigerants (including R717) as well as the modern refrigerants including high pressure R410A and CO₂. 3A MS Filter Driers/Drier Cores deliver the most cost effective means of removing the harmful effects of moisture from the refrigeration system.

3A MS and Activated Alumina (AL) mixtures

For high performance moisture, acid and contaminant removal, Henry Tech provides its customers with Filter Drier Cores that contain a mixture of both 3A MS and Activated Alumina. The Activated Alumina chemically attracts acids that may be present in the refrigeration system, locking them away so as to prolong the life of compressors, refrigerants and oils.

Note: High percentage mixes of AL are not recommended for long term use with POE oils, as they can strip the compressor manufacturer's oil additives from the systems lubricant.

3A MS, AL and Activated Carbon (AC) mixtures

Best suited for clean up after burnout and for severely contaminated systems plagued with moisture, acids, sludge/varnish and other contaminant issues. Working in conjunction with the other desiccants present in this type of Filter Drier, the Activated Carbon cleans the operating system of the deposits that contribute to the breakdown of refrigerant and lubricants. When fitted, these Filter Driers/Drier Cores provide the best insurance policy available for any compressor replaced in the field.

Suction Core – 100% Molecular Sieve

Targets moisture & particulate removal from the suction line before these contaminants can reach the compressor. Ideal for commissioning purposes, these replaceable Cores feature a unique design that delivers both low pressure drop, in conjunction with high refrigerant flow rates.

Compressor manufacturers know that motor burnouts can be caused by system contaminants returning down the suction line. Foreign particles including copper oxides, metal and copper pieces enter the compressor and become embedded in the motor windings themselves. As the compressor starts and stops, these windings flex and move. The particles present scrape the insulation of the motor windings leading to motor burnout, system downtime and possible stock losses.

To extend the life span of the compressor, adequate filtration is required before the suction service valve.

Specially designed for such an application, the Suction Filter Element removes returning contaminants down to 10 microns (Filter Beta rating = 10: ISO 4548-12). Its fluted design keeps the collected debris safely embedded in the filter whilst its large surface area keeps pressure drop to a minimum.

Henry Tech Suction Filter Element provides the compressor with the particulate protection it needs to prevent breakdowns caused by a contaminated system.

Note: Good trade practice dictates that the Maximum recommended pressure drop in the Suction Line Filter for commercial refrigeration (R134a) is 10.3 kPa.



Sealed Filter Driers

Applications

Sealed Filter Driers are designed to protect refrigeration and air-conditioning systems by removing moisture, acids and solid particles. Sealed Filter Driers are for use in the liquid line of the system. The range is suitable for use with HCFC, HFC and CO₂ refrigerants (see core data).

Main features

- Available with solid copper solder connections or steel flare connections
- Solid core for drying/acid removal
- Filter pad and mesh to remove solid particles
- Suitable for HCFC, HFC and CO₂ refrigerants

Cores

'M' Core

- 100% Molecular Sieve
- High drying capacity
- Suitable for HCFC, HFC and CO₂ refrigerants

'A' Core

- 80% Molecular Sieve and 20% Activated Alumina
- Absorbs moisture and acid in the system
- Not suitable for oils containing additives
- Suitable for HCFC, HFC and CO₂ refrigerants

Materials of Construction

The shell is constructed from carbon steel and powder coated for corrosion resistance. Connections are available as either copper ODS or steel flare type. Each core is constructed from a moulded composite of desiccant materials bonded to provide very high mechanical strength, micron filtration and high moisture absorption. The 'A' core also provides acid removal.



Technical Specification

Allowable operating temperature = -40°C to +100°C

Allowable operating pressure = 0 to 45 barg

Selection Guidelines

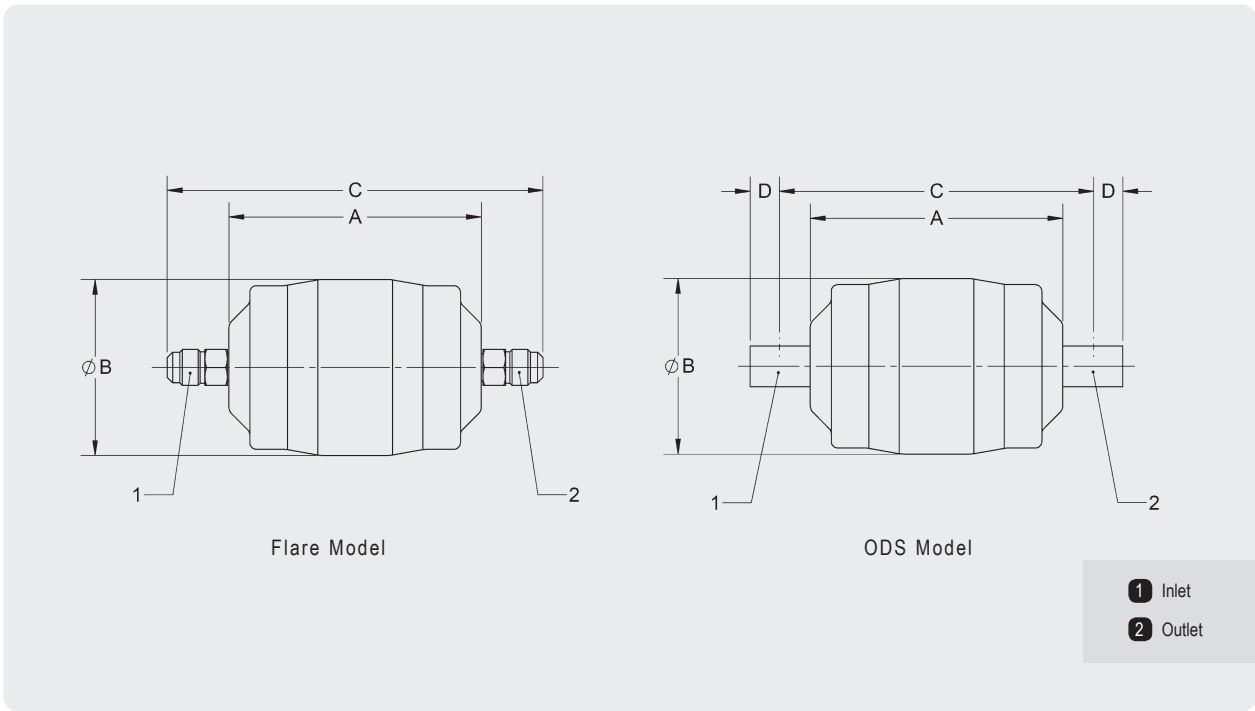
The user should select the appropriate core based on refrigerant and oil types (see note). The model should then be selected based on the required drying and liquid capacities.

Note: Cores with Activated Alumina (type 'A') are not recommended for use with oils containing additives.

Installation – Main Issues

1. Install the filter drier upstream of the liquid line controls to give maximum protection. Locate upstream of moisture indicator so that drying effectiveness can be measured.
2. Ensure the indicated flow direction is complied with.





SAE FLARE MODELS

Part No	Conn Size (inch)	Shell Diameter (mm)	A (mm)	$\varnothing B$ (mm)	C (mm)	Weight (kg)	CE Cat
SDM/SDA-032	1/4	46	63	46	110	0.26	SEP
SDM/SDA-033	3/8	46	63	46	120	0.31	SEP
SDM/SDA-052	1/4	65	72	65	119	0.40	SEP
SDM/SDA-053	3/8	65	72	65	129	0.44	SEP
SDM/SDA-082	1/4	65	98	65	145	0.52	SEP
SDM/SDA-083	3/8	65	98	65	155	0.55	SEP
SDM/SDA-084	1/2	65	98	65	163	0.58	SEP
SDM/SDA-162	1/4	78	112	78	159	0.75	SEP
SDM/SDA-163	3/8	78	112	78	169	0.79	SEP
SDM/SDA-164	1/2	78	112	78	177	0.83	SEP
SDM/SDA-165	5/8	78	112	78	185	0.90	SEP
SDM/SDA-303	3/8	78	185	78	242	1.24	SEP
SDM/SDA-304	1/2	78	185	78	250	1.29	SEP
SDM/SDA-305	5/8	78	185	78	258	1.35	SEP
SDM/SDA-306	3/4	78	185	78	264	1.37	SEP
SDM/SDA-413	3/8	92	192	92	249	1.87	Cat I
SDM/SDA-414	1/2	92	192	92	257	1.89	Cat I
SDM/SDA-415	5/8	92	192	92	265	1.94	Cat I
SDM/SDA-416	3/4	92	192	92	271	1.97	Cat I

ODS MODELS

Part No	Conn Size (inch)	Shell Diameter (mm)	A (mm)	$\varnothing B$ (mm)	C (mm)	D (mm)	Weight (kg)	CE Cat
SDM/SDA-032S	1/4	46	63	46	81	13	0.23	SEP
SDM/SDA-033S	3/8	46	63	46	85	13	0.26	SEP
SDM/SDA-052S	1/4	65	72	65	90	13	0.36	SEP
SDM/SDA-053S	3/8	65	72	65	94	13	0.38	SEP
SDM/SDA-082S	1/4	65	98	65	116	13	0.48	SEP
SDM/SDA-083S	3/8	65	98	65	120	13	0.49	SEP
SDM/SDA-084S	1/2	65	98	65	122	13	0.50	SEP
SDM/SDA-162S	1/4	78	112	78	130	13	0.76	SEP
SDM/SDA-163S	3/8	78	112	78	134	13	0.81	SEP
SDM/SDA-164S	1/2	78	112	78	136	13	0.82	SEP
SDM/SDA-165S	5/8	78	112	78	134	13	0.90	SEP
SDM/SDA-303S	3/8	78	185	78	207	13	1.21	SEP
SDM/SDA-304S	1/2	78	185	78	209	13	1.25	SEP
SDM/SDA-305S	5/8	78	185	78	220	13	1.27	SEP
SDM/SDA-306S	3/4	78	185	78	209	15	1.29	SEP
SDM/SDA-413S	3/8	92	192	92	214	13	1.81	Cat I
SDM/SDA-414S	1/2	92	192	92	216	13	1.82	Cat I
SDM/SDA-415S	5/8	92	192	92	214	13	1.83	Cat I
SDM/SDA-416S	3/4	92	192	92	216	15	1.84	Cat I

DRYING AND LIQUID CAPACITY TABLE - 'M' CORE

Model Details		Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn Size (inch)	R22		R134a		R404A/R507		R407C/R410A		R-22	R-134a	R-404A	R-407C	R-410A	CO ₂
		24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C						
SDM-032/S	1/4	4.9	4.6	5.3	5	7.8	4.8	5.3	4.6	6.1	5.8	3.2	6.1	6.5	8.9
SDM-033/S	3/8	4.9	4.6	5.3	5	7.8	4.8	5.3	4.6	20.8	17.7	10.3	20.8	22.1	27.1
SDM-052/S	1/4	9.8	9.1	10.6	10.1	15.6	9.6	10.6	9.1	7.7	6.4	3.5	7.7	8.2	9.8
SDM-053/S	3/8	9.8	9.1	10.6	10.1	15.6	9.6	10.6	9.1	19	17.2	10.2	19	20.2	26.3
SDM-082/S	1/4	15.8	14.6	16.9	16.1	24.9	15.4	17	14.6	7.9	6.6	3.6	7.9	8.5	10.1
SDM-083/S	3/8	15.8	14.6	16.9	16.1	24.9	15.4	17	14.6	21.7	18.7	10.5	21.7	23.1	28.7
SDM-084/S	1/2	15.8	14.6	16.9	16.1	24.9	15.4	17	14.6	31.1	26.7	15.6	31.1	33.2	40.8
SDM-162/S	1/4	24.6	22.8	26.4	25.2	38.9	24.1	26.6	22.8	8.6	7.2	3.9	8.6	9.2	11
SDM-163/S	3/8	24.6	22.8	26.4	25.2	38.9	24.1	26.6	22.8	23	20.1	11.1	23	24.5	30.8
SDM-164/S	1/2	24.6	22.8	26.4	25.2	38.9	24.1	26.6	22.8	34.9	30.3	16.9	34.9	37.3	46.4
SDM-165/S	5/8	24.6	22.8	26.4	25.2	38.9	24.1	26.6	22.8	34.4	30.1	16	34.4	36.7	46.1
SDM-303/S	3/8	51.2	47.4	55	52.3	81	50	55.3	47.4	23.2	20.2	11	23.2	24.7	31
SDM-304/S	1/2	51.2	47.4	55	52.3	81	50	55.3	47.4	35.7	31.1	16.8	35.7	38.1	47.6
SDM-305/S	5/8	51.2	47.4	55	52.3	81	50	55.3	47.4	43.5	38.2	21.3	43.5	46.4	58.4
SDM-306/S	3/4	51.2	47.4	55	52.3	81	50	55.3	47.4	64.3	56	30.9	64.3	68.5	85.6
SDM-413/S	3/8	76.8	71.2	82.4	78.5	121.4	75	82.9	71.1	26.3	23.2	12.7	26.3	28	35.5
SDM-414/S	1/2	76.8	71.2	82.4	78.5	121.4	75	82.9	71.1	41.6	36.4	19.9	41.6	44.4	55.6
SDM-415/S	5/8	76.8	71.2	82.4	78.5	121.4	75	82.9	71.1	58.3	50.9	27.1	58.3	62.2	77.9
SDM-416/S	3/4	76.8	71.2	82.4	78.5	121.4	75	82.9	71.1	67.7	59.1	31.4	67.7	72.2	90.4

DRYING AND LIQUID CAPACITY TABLE - 'A' CORE

Model Details		Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn Size (inch)	R22		R134a		R404A/R507		R407C/R410A		R-22	R-134a	R-404A	R-407C	R-410A	CO ₂
		24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C						
SDA-032/S	1/4	4.3	4	4.6	4.4	7.4	4	4.5	3.9	6.1	5.8	3.2	6.1	6.5	8.9
SDA-033/S	3/8	4.3	4	4.6	4.4	7.4	4	4.5	3.9	20.8	17.7	10.3	20.8	22.1	27.1
SDA-052/S	1/4	8.6	8	9.2	8.8	14.8	8	9.1	7.7	7.7	6.4	3.5	7.7	8.2	9.8
SDA-053/S	3/8	8.6	8	9.2	8.8	14.8	8	9.1	7.7	19	17.2	10.2	19	20.2	26.3
SDA-082/S	1/4	13.8	12.8	14.8	14.1	23.7	12.8	14.5	12.4	7.9	6.6	3.6	7.9	8.5	10.1
SDA-083/S	3/8	13.8	12.8	14.8	14.1	23.7	12.8	14.5	12.4	21.7	18.7	10.5	21.7	23.1	28.7
SDA-084/S	1/2	13.8	12.8	14.8	14.1	23.7	12.8	14.5	12.4	31.1	26.7	15.6	31.1	33.2	40.8
SDA-162/S	1/4	21.5	19.9	23.1	22	37	19.9	22.6	19.3	8.6	7.2	3.9	8.6	9.2	11
SDA-163/S	3/8	21.5	19.9	23.1	22	37	19.9	22.6	19.3	23	20.1	11.1	23	24.5	30.8
SDA-164/S	1/2	21.5	19.9	23.1	22	37	19.9	22.6	19.3	34.9	30.3	16.9	34.9	37.3	46.4
SDA-165/S	5/8	21.5	19.9	23.1	22	37	19.9	22.6	19.3	34.4	30.1	16	34.4	36.7	46.1
SDA-303/S	3/8	44.8	41.5	48.1	45.7	77	41.5	47.1	40.2	23.2	20.2	11	23.2	24.7	31
SDA-304/S	1/2	44.8	41.5	48.1	45.7	77	41.5	47.1	40.2	35.7	31.1	16.8	35.7	38.1	47.6
SDA-305/S	5/8	44.8	41.5	48.1	45.7	77	41.5	47.1	40.2	43.5	38.2	21.3	43.5	46.4	58.4
SDA-306/S	3/4	44.8	41.5	48.1	45.7	77	41.5	47.1	40.2	64.3	56	30.9	64.3	68.5	85.6
SDA-413/S	3/8	67.1	62.2	72.1	68.6	115.5	62.2	70.6	60.2	26.3	23.2	12.7	26.3	28	35.5
SDA-414/S	1/2	67.1	62.2	72.1	68.6	115.5	62.2	70.6	60.2	41.6	36.4	19.9	41.6	44.4	55.6
SDA-415/S	5/8	67.1	62.2	72.1	68.6	115.5	62.2	70.6	60.2	58.3	50.9	27.1	58.3	62.2	77.9
SDA-416/S	3/4	67.1	62.2	72.1	68.6	115.5	62.2	70.6	60.2	67.7	59.1	31.4	67.7	72.2	90.4

Drying Capacity is based on the following moisture content before and after drying:

R22: From 1050 ppm W to 60 ppw W in accordance with ARI 710-86

R134a: From 1050 ppm W to 75 ppm W. If refrigerant is to be dried to 50 ppm W, reduce the stated capacities by 15%

R404A, R407C, R507: From 1020 ppm W to 30 ppm W

R410A: From 1050 ppm W to 60 ppm W

Liquid Capacity is based on:

Evaporating temperature of $t_e = -15^\circ\text{C}$ (-30°C for CO_2)

Condensing temperature of $t_c = +30^\circ\text{C}$ (-5°C for CO_2)

Pressure drop across filter drier of $\Delta p = 0.07$ bar

SURFACE AND VOLUME INFORMATION

Model	Core surface area	Core Volume	Shell Volume
	cm ²	cm ³	ltr
SDM/SDA-03	64	43	0.1
SDM/SDA-05	127	90	0.2
SDM/SDA-08	180	146	0.3
SDM/SDA-16	290	219	0.5
SDM/SDA-30	442	451	0.9
SDM/SDA-41	551	649	1.3

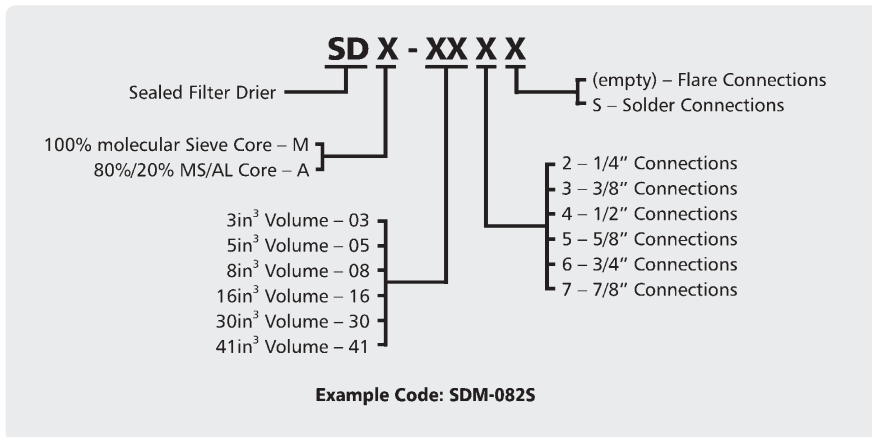
ACID CAPACITY INFORMATION

Model	Acid Capacity*
	g
SDA-03	0.8
SDA-05	1.6
SDA-08	2.6
SDA-16	4
SDA-30	8.3
SDA-41	12.5

*Absorption capacity of oleic acid at 0.05 TAN (Total Acid Number)

PART NUMBER CROSS REFERENCE

NEW - Henry Tech Park No.		OLD - Heldon Part No.	
Flare	Solder	Flare	Solder
SDM-032	SDM-032S	3000-032	3001-032S
SDM-033	SDM-033S	3000-033	3001-033S
SDM-052	SDM-052S	3000-052	3001-052S
SDM-053	SDM-053S	3000-053	3001-053S
SDM-082	SDM-082S	3000-082	3001-082S
SDM-083	SDM-083S	3000-083	3001-083S
SDM-084	SDM-084S	3000-084	3001-084S
SDM-162	SDM-162S	3000-162	3001-162S
SDM-163	SDM-163S	3000-163	3001-163S
SDM-164	SDM-164S	3000-164	3001-164S
SDM-165	SDM-165S	3000-165	3001-165S
SDM-303	SDM-303S	3000-303	3001-303S
SDM-304	SDM-304S	3000-304	3001-304S
SDM-305	SDM-305S	3000-305	3001-305S
SDM-306	SDM-306S	3000-306	3001-306S
-	SDM-307S	-	3001-307S
-	SDM-413S	3000-413	3001-413S
SDM-414	SDM-414S	3000-414	3001-414S
SDM-415	SDM-415S	3000-415	3001-415S
SDM-416	SDM-416S	3000-416	3001-416S
-	SDM-417S	-	3001-417S



Sealed Burnout Filter Driers

Henry Tech Sealed Burnout Filter Driers offer a high level of contaminant removal from refrigeration and air-conditioning systems following a compressor motor burnout. Designed to remove moisture, acids and solid particles that can lead to the premature failure of the replacement compressor.

Employing a solid core design, Henry Tech Sealed Burnout Filter Driers deliver minimal pressure drop via total core utilisation. This results in quicker uptake of inorganic acids and other contaminants. The solid core itself is formed through a binding process that maximizes surface area and protects the core from acid decomposition.

Available in both standard and short lay-in lengths these models feature inlet and outlet access Schrader ports for the monitoring of pressure drop. For smaller suction pressure drop critical systems, the 3026 series is supplied with a replacement jumper tube.

Note: It is good practice to remove suction burnout driers after performing a successful acid test, in order to prevent loss of system performance and the risk of catalytic hydrolysis in POE oil systems.

Features

- Maximum Working Pressure = 42 bar
- Designed for use in both the liquid and suction lines of refrigerated systems employing fluorinated refrigerants and CO₂
- Solid copper connections (7/8" through to 2-1/8")
- Single core through to 4 core models available
- Accepts a range of 48 cu. in desiccant filter cores to specifically target the removal of system contaminants
- Designed for the long term usage with Pleated Suction Filter Elements
- Perfect for supermarket installations
- Incorporates a 100 mesh stainless steel strainer in the internal assembly
- The internal assembly end plate provides a unique filter cup that cleans the internal wall of the shell during its removal for service
- Standardised to replace other manufacturers units and cores
- Powder Coated Shell
- Capacities from 10 kW through to 509 kW available
- End plate options are aluminium, zinc plated steel or stainless steel

Benefits

- Increased operating life in low temperature application due to corrosion protection
- Ideal for HP refrigerants including CO₂
- Flexibility of application
- Full flow connections provide easy brazing for the installer
- Large range of both Refrigeration and Drying capacities available
- Henry Tech provides a total filtration management system via its comprehensive range of Replaceable Cores & Filters
- Suction filter elements capture foreign particles returning to the compressor before they can destroy motor winding insulation and cause burnout
- Provides secondary particulate filtration & retention
- Creates the cleanest possible environment in which the Filter Drier Cores can operate
- Drop in replacement for common brands
- Suitable for harsh environments
- Large range available to suit most applications

Note: Larger connection sizes are available on request, please consult with Henry Tech sales for further information.



Manufacturing Standards

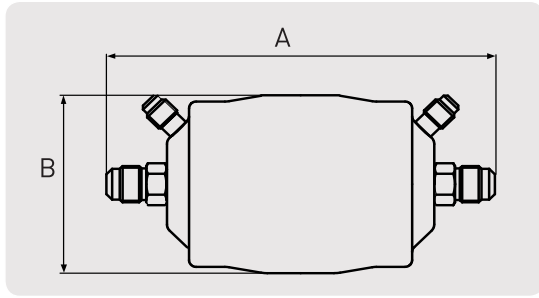
Manufactured to AS2971, UL207 + CE

Safe Working Pressure: 4,200 kPa

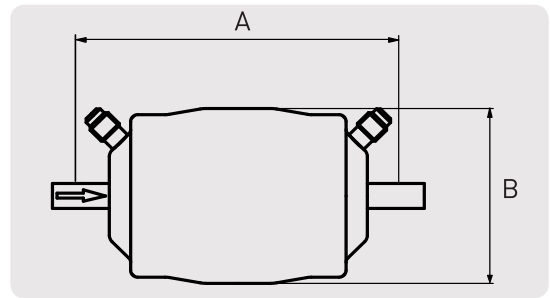
PART NUMBER CROSS REFERENCE

NEW - Henry Tech Part No.		OLD - Heldon Part No.	
Flare	Solder	Flare	Solder
SDCS-082	SDAS-082S	3021-082	3022-082S
SDCS-083	SDAS-083S	3021-083	3022-083S
SDCS-084	SDAS-084S	3021-084	3022-084S
SDCS-162	SDAS-162S	3021-162	3022-162S
SDCS-163	SDAS-163S	3021-163	3022-163S
SDCS-164	SDAS-164S	3021-164	3022-164S
SDCS-165	SDAS-165S	3021-165	3022-165S
-	SDAS-166S	-	-
-	SDAS-167S	-	-
-	SDAS-304S	3021-304	3022-304S
SDCS-305	SDAS-305S	3021-305	3022-305S
SDCS-306	SDAS-306S	3021-306	3022-306S
-	SDAS-307S	-	3022-307S
-	SDAS-309S	-	3022-309S
-	SDAS-311S	-	3022-311S
SDCS-414	SDAS-414S	3021-414	3022-414S
SDCS-415	SDAS-415S	3021-415	3022-415S
SDCS-416	SDAS-416S	3021-416	3022-416S
-	SDAS-417S	-	3022-417S

Flare



Solder



Burnout Filter Drier

Connection (Inch)	Flare Part No.	Dimensions (mm)		Weight (kg)	Capacity kW			Solder Part No.	Dimensions (mm)		Weight (kg)
		Length (Lay-In) A	B		R22 R407C	R134a	R404A		Length (Lay-In) A	B	
3/8	-	-	-	-	4.0	3.0	3.0	SDAS-033S	85	46	0.34
1/4	SDCS-082	146	65.5	0.57	6.0	3.5	4.0	SDAS-082S	120	65	0.57
3/8	SDCS-083	156	65.5	0.60	6.0	3.5	4.5	SDAS-083S	120	65	0.60
1/2	SDCS-084	163	65.5	0.64	10.0	5.5	8.0	SDAS-084S	122	65	0.64
1/4	SDCS-162	160	78	0.80	10.5	5.0	7.5	SDAS-162S	130	78	0.80
3/8	SDCS-163	170	78	0.86	13.0	5.5	8.0	SDAS-163S	134	78	0.86
1/2	SDCS-164	177	78	0.88	15.0	6.0	8.5	SDAS-164S	134	78	0.88
5/8	SDCS-165	186	78	0.96	20.0	9.5	13.0	SDAS-165S	134	78	0.96
1/2	SDCS-304	250	78	1.40	17.0	10.0	15.0	SDAS-304S	209	78	1.40
5/8	SDCS-305	259	78	1.46	18.0	12.5	15.0	SDAS-305S	220	78	1.46
3/4	SDCS-306	265	78	1.44	22.0	14.0	19.0	SDAS-306S	209	78	1.44
7/8	-	-	-	-	26.0	16.0	22.0	SDAS-307S	215	78	1.50
1 1/8	-	-	-	-	31.0	20.0	27.0	SDAS-309S	215	78	1.55
1 3/8	-	-	-	-	31.0	20.0	27.0	SDAS-311S	225	78	1.55
1/2	-	-	-	-	25.0	14.5	23.0	-	-	-	-
1/2	SDCS-415	266	92	1.96	26.5	16.0	24.5	-	-	-	-
3/4	SDCS-416	272	92	-	29.5	17.5	25.0	SDAS-416S	216	92	2.00

- Designed for use after motor burnout or mechanical failure; for clean up of the most contaminated systems.
- Activated Alumina and Carbon removes acids and waxes.
- Stainless steel mesh and a post core non-woven fine Polyester Filter provide additional filtering for the best in system protection.
- Suitable for use in either the liquid or suction lines. Best practice is to install Burnout Filter Driers in the suction line to protect the replacement compressor.
- With POE and PAG oils, burnout driers should be removed as soon as all contaminants are absorbed from the system. This will reduce the risk of catalytic hydrolysis and the formation of new acids.
- Safe Working Pressure 4,200 kPa (610 psi).
- Fitted with dual access ports to measure pressure drop.

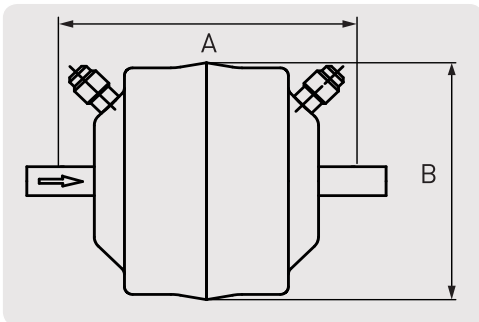
Pancake Filter Driers

- Designed for a compact fit in the suction line.
- Core composition is a combination of Molecular Sieve, Activated Alumina and Activated Carbon.
- Features dual access ports.
- Safe Working Pressure 2,500 kPa (350 psi).



PART NUMBER CROSS REFERENCE

NEW - Henry Tech Part No.	OLD - Heldon Part No.
SDCP-403S	3025-403S
SDCP-404S	3025-404S
SDCP-405S	3025-405S
SDCP-406S	3025-406S
SDCP-707S	3025-407S
SDCP-409S	3025-409S



Pancake Burnout Filter Drier							
Connection (Inch)	Part No.	Dimensions (mm)		Capacity kW			Weight (kg)
		Length (Lay-In) A	Dia. B	R22 R407C	R134a	R404A	
1/2	SDCP-404S	106	91	17.0	14.0	15.0	0.65
5/8	SDCP-405S	117	91	23.0	17.5	19.5	0.65
3/4	SDCP-406S	106	91	23.0	17.5	19.5	0.65
7/8	SDCP-407S	112	91	25.0	19.0	21.0	0.70
1 1/8	SDCP-409S	112	91	27.0	21.0	23.0	0.70

Bi Flow Filter Driers

The function of a Bi-Flow Filter Drier is to capture and retain system contaminants and moisture in order to protect system components and prevent the harmful formation of acid in refrigerant systems requiring bi-directional flow.

Applications

Henry Technologies' Bi-Flow Filter Driers offer a high level of protection for refrigeration and air-conditioning systems. They are specifically designed to capture and retain moisture and solid particles from circulating throughout the system, which can create acid that causes damage to the compressor and other components piped within the circuit. Bi-flow filter driers are suitable for HCFC, HFC and CO₂ refrigerants including R-410A, and their associated oils.

Main Features

- Solid copper ODS connections
- Increased drying capacity over 80% Molecular Sieve and 20% Activated Alumina cores
- Solid particle filtration down to 150 microns
- Powder coat finish suitable for UV exposure and harsh environments
- 1000 hour salt spray tested to ASTM B117
- Solid core construction of 100% Molecular Sieve desiccant

Materials of Construction

The shell is constructed from carbon steel and powder coated for corrosion resistance. The connection is ODS and made from solid copper. The valve plate assembly and perforated plate are made from galvanized steel. The core is made from 100% molecular sieve. The filter pad is made from nonwoven polyester. The filter mesh is made from stainless steel.

Technical Specifications

Maximum working pressure = 650 PSI (45 Bar)
 Allowable operating temperature = -40°F to +212°F (-40°C to +100°C)

Bi-Flow Filter Driers are UL and C-UL Listed by Underwriters Laboratories, Inc. Additionally, Bi-Flow Filter Driers are CE marked in accordance with PED.

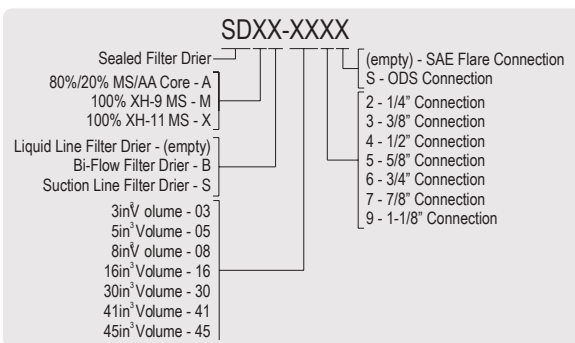


Selection Guidelines

Sealed Filter Driers should be selected for a particular application based on a number of factors. Full dimensional specifications are provided to ensure easy installation. Models should be selected based both on drying capacity and liquid capacity to ensure adequate drying and minimal pressure drop.

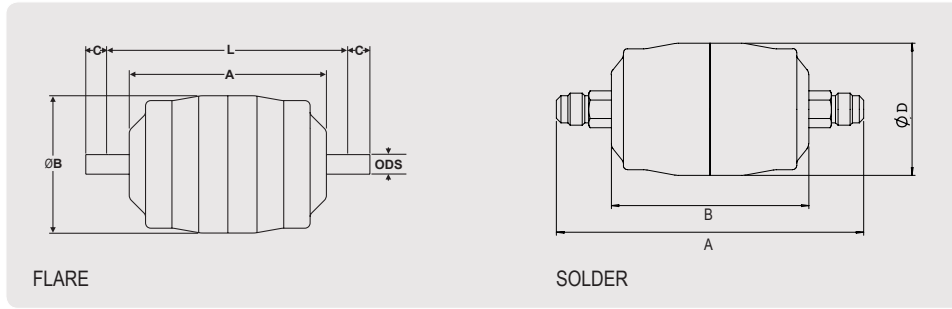
Installation - Notes

1. A moisture indicator should be installed in conjunction with each filter drier in order to monitor drying effectiveness.
2. Full instructions are given in the Product Instruction Sheet, included with each filter drier.



PART NUMBER CROSS REFERENCE

NEW - Henry Tech Part No.		OLD - Heldon Part No.	
Flare	Solder	Flare	Solder
SDXB-082	-	3040-082	3040-082S
SDXB-083	SDXB-083S	3040-083	3040-083S
SDXB-084	-	3040-084	3040-084S
SDXB-163	SDXB-163S	3040-163	3040-163
SDXB-164	SDXB-164S	3040-164	3040-164S
SDXB-165	-	3040-165	3040-165S
-	SDXB-305S	-	-



Part No	ODS (inch)	Dimensions (mm)				CE Cat	Weight (kg)
		L	A	ØB	C		
SDXB-083S	3/8	119.88	98.04	66.04	12.95	SEP	0.43
SDXB-163S	3/8	134.11	112.01	77.97	12.95	SEP	0.63
SDXB-164S	1/2	135.89	112.01	77.97	12.95	SEP	0.63
SDXB-305S	5/8	219.96	184.91	77.97	12.95	SEP	1.29
SDXB-456S	3/4	230.12	203.96	91.94	14.98	CAT I	1.29

DRYING AND LIQUID CAPACITY RATINGS

Model Details	Drying Capacity* (kg of refrigerant)							
	R22		R134a		R404A/R507		R407C/R410A	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C
SDXB-083S	8.9	8.2	9.5	9.1	14.0	8.7	9.6	8.2
SDXB-163S	14.8	13.7	15.9	15.1	23.4	14.4	15.9	13.7
SDXB-164S	14.8	13.7	5.9	15.1	23.4	14.4	15.9	13.7
SDXB-305S	30.5	28.3	32.8	31.2	48.3	29.8	33.0	28.3
SDXB-456S	58.1	53.8	62.4	59.4	91.9	56.8	62.7	53.8

Model Details	Drying Capacity** (drops of water)											
	R22		R134a		R507		R404A		R407C		R410A	
	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C	24°C	52°C
SDXB-083S	159.5	147.8	168.6	160.6	252.2	155.8	252.2	1558	172.3	147.6	172.3	147.6
SDXB-163S	265.8	246.3	281.1	267.6	420.4	259.7	420.4	259.7	287.1	246.1	287.1	246.1
SDXB-164S	265.8	246.3	281.1	267.6	420.4	259.7	420.4	259.7	287.1	246.1	287.1	246.1
SDXB-305S	549.4	509.0	580.8	553.0	868.8	536.8	868.8	536.8	593.3	508.6	593.3	508.6
SDXB-456S	1045.6	968.8	1105.5	1052.5	1653.5	1021.7	1653.5	1021.7	1129.2	967.9	1129.2	967.9

*Drying Capacity is based on the following moisture content before and after drying:

R22: From 1050 ppm W to 60 ppm W in accordance with ARI 710-86

R134a: From 1050 ppm W to 75 ppm W. If refrigerant is to be dried to 50 ppm W, reduce the stated capacities by 15%

R404A, R407C, R507: From 1020 ppm W to 30 ppm W

R410A: From 1050 ppm W to 60 ppm W

**20 drops = 1 gram in accordance with ARI 710-86

Model Details	Liquid Capacity*											
	R22		R134a		R404A		R407C		R410A		CO ₂	
	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW
SDXB-083S	2.3	8.0	2.1	7.4	1.2	4.1	2.3	8.0	2.3	8.0	2.8	10.0
SDXB-163S	5.4	18.9	4.8	17.0	2.7	9.4	5.4	18.9	5.4	18.9	6.7	23.7
SDXB-164S	8.5	30.0	7.7	27.0	4.3	15.0	8.5	30.0	8.5	30.0	10.7	37.6
SDXB-305S	10.2	35.8	9.2	32.3	5.1	18.0	10.2	35.8	10.2	35.8	12.8	44.9
SDXB-456S	15.9	56.1	13.9	48.9	7.7	27.1	15.9	56.1	17.0	59.8	21.3	74.9

*Liquid capacity is based on the following conditions:

Evaporating temperature of t_e = +5°F (-15°C) (-22°F (-30°C) for CO₂)

Condensing temperature of t_c = +86°F (+30°C) (+23°F (-5°C) for CO₂)

Pressure drop across filter drier of Δp = 1 PSI (0.07 bar)

Part No.	Size	Dimensions		
		A ±2	B ±2	ØD ±1
SDXB-082	1/4 MSAE	145	98	66
SDXB-083	3/8 MSAE	155	98	66
SDXB-084	1/2 MSAE	163	98	66
SDXB-163	3/8 MSAE	169	112	78
SDXB-164	1/2 MSAE	177	112	78
SDXB-165	5/8 MSAE	185	112	78

Replaceable Core Filter Driers

The function of a filter drier is to remove system contaminants, acid and moisture.

Applications

The Henry Technologies range of replaceable core filter driers are designed to be used in both the liquid and suction lines of refrigeration and air-conditioning systems. The product range is suitable for use with HCFC, HFC and CO₂ refrigerants (see core data).

Main features

- Proven system protector
- High filtering capability
- High moisture absorption and acid removal
- Stainless steel mesh screen
- Solid copper full flow connections
- Interchangeable cores
- Corrosion-resistant, powder coated shells
- 1/4 NPT Pressure Tapping (Optional)
- Nickel Plated Steel Cover Plate

Cores

S-848-CM

- 100% molecular sieve
- High drying capacity
- Suitable for HCFC, HFC and CO₂ refrigerants

S-848-C

- 80% molecular sieve and 20% activated alumina
- Absorbs moisture and acid in the system
- Suitable for HCFC, HFC and CO₂ refrigerants
- Not suitable for oils containing additives

S-848-CC

- 47/48/5% molecular sieve/activated alumina/activated carbon
- High acid absorption
- Suitable for use after compressor burnout
- Suitable for HCFC, HFC and CO₂ refrigerants
- Not suitable for oils containing additives

S-848-SC

- 100% molecular sieve
- Low pressure drop
- Suitable for HCFC, HFC and CO₂ refrigerants

S-848-F

- Filter element
- Low pressure drop
- Use when moisture removal is not required

Note: Cores not included with drier shells - to be ordered separately



Materials of Construction

Drier Shells

The main shell and fixed end cap are constructed from carbon steel and are powder coated for corrosion resistance. The cover plate is constructed from nickel plated steel. The ODS connections are copper.

Cores

Each core is constructed from a moulded composite of desiccant material(s) bonded to provide very high mechanical strength, micronic filtration, high moisture absorption and acid removal where applicable. Each core is fully activated and placed in a hermetically sealed container.

Technical Specification

Allowable operating temperature = -40°C to +70°C

Allowable operating pressure = 0 to 42 barg

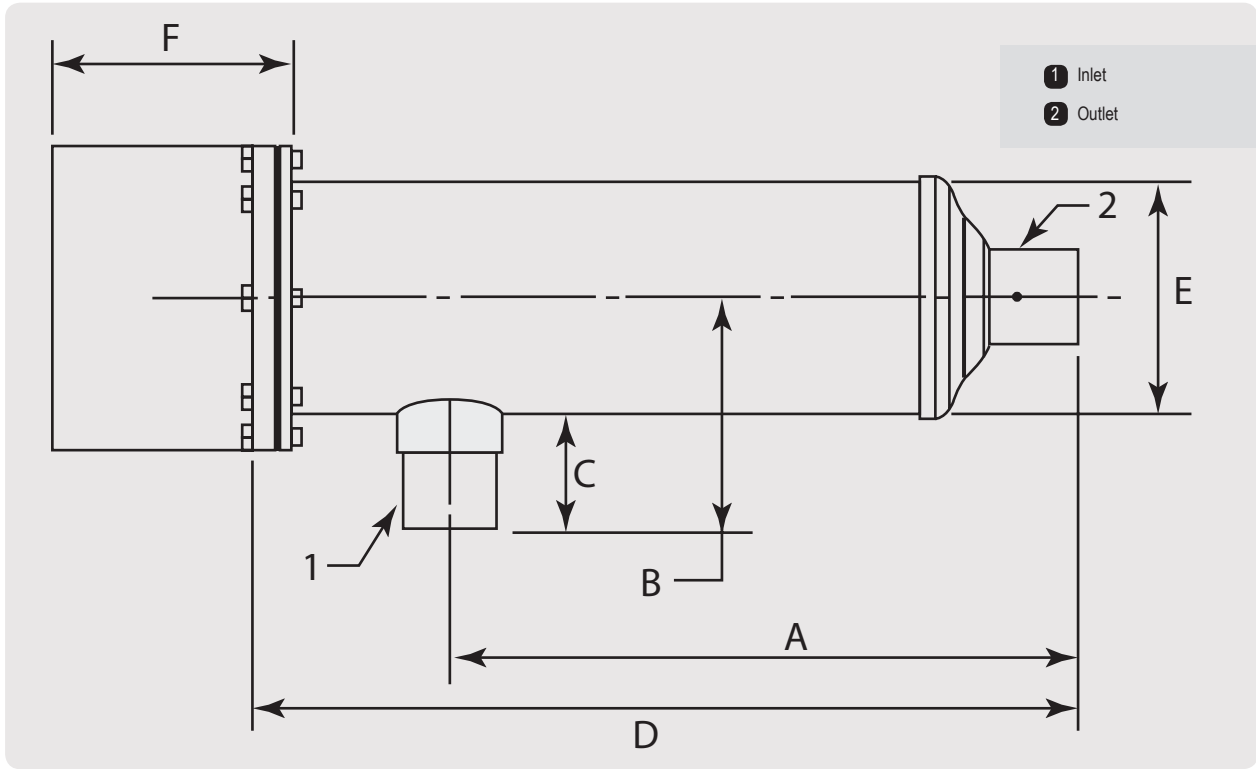
Selection Guidelines

The user should select a model based on refrigerant type, refrigeration capacity and the preferred degree of moisture/acid removal required. The preferred connection size can then be matched to the system requirements to establish which model is best. Alternatively, the user may select a connection size first and then check that the application is within the refrigeration capacity limits of the selected model.

Note: The user may decide to oversize the filter drier based on experience or if the system contamination level is likely to be higher than normal.

Installation – Main Issues

1. Install the filter drier upstream of the liquid line controls to give maximum protection. Locate upstream of moisture indicator so that drying effectiveness can be measured.
2. Ensure dimension 'F' is complied with in order to remove cores.
3. It is recommended to install the unit horizontally for easier core replacement.



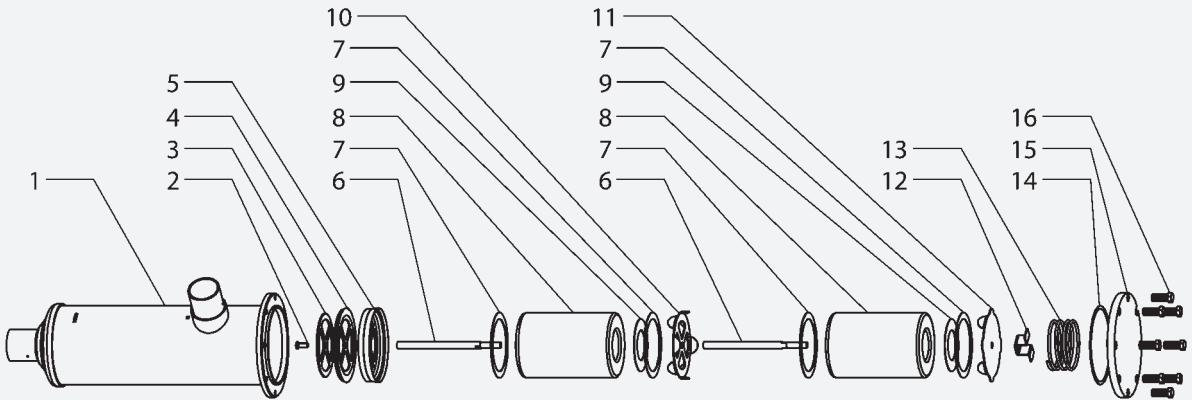
Replaceable Core Filter Drier Shells

Model Details			Core Data		Dimensions (mm)						Weight (kg)	CE Cat
Part No	Conn. Size (inch)	Cores	Surface Area (cm ²)	Volume (cm ³)	A	B	C	D	E	F*		
SRC-485	5/8	1	683	716	172	115	58	274	114	172	4.78	Cat I
SRC-965	5/8	2	1366	1432	312	115	58	414	114	312	6.12	Cat I
SRC-1445	5/8	3	2049	2148	456	115	58	558	114	456	7.49	Cat II
SRC-1925	5/8	4	2732	2864	599	115	58	701	114	599	9.00	Cat II
SRC-487	7/8	1	683	716	172	115	58	274	114	172	4.81	Cat I
SRC-967	7/8	2	1366	1432	312	115	58	414	114	312	6.15	Cat I
SRC-1447	7/8	3	2049	2148	456	115	58	558	114	456	7.52	Cat II
SRC-1927	7/8	4	2732	2864	599	115	58	701	114	599	9.02	Cat II
SRC-489	1 1/8	1	683	716	172	115	58	274	114	172	4.83	Cat I
SRC-969	1 1/8	2	1366	1432	312	115	58	414	114	312	6.23	Cat I
SRC-1449	1 1/8	3	2049	2148	456	115	58	558	114	456	7.64	Cat II
SRC-1929	1 1/8	4	2732	2864	599	115	58	701	114	599	9.10	Cat II
SRC-4811	1 3/8	1	683	716	172	115	58	274	114	172	4.93	Cat I
SRC-9611	1 3/8	2	1366	1432	312	115	58	414	114	312	6.30	Cat I
SRC-14411	1 3/8	3	2049	2148	456	115	58	558	114	456	7.68	Cat II
SRC-19211	1 3/8	4	2732	2864	599	115	58	701	114	599	9.12	Cat II
SRC-4813	1 5/8	1	683	716	172	115	58	274	114	172	4.99	Cat I
SRC-9613	1 5/8	2	1366	1432	312	115	58	414	114	312	6.32	Cat I
SRC-14413	1 5/8	3	2049	2148	456	115	58	558	114	456	8.01	Cat II
SRC-19213	1 5/8	4	2732	2864	599	115	58	701	114	599	9.16	Cat II
SRC-4817	2 1/8	1	683	716	172	115	58	274	114	172	5.03	Cat I
SRC-9617	2 1/8	2	1366	1432	312	115	58	414	114	312	6.47	Cat I
SRC-14417	2 1/8	3	2049	2148	456	115	58	558	114	456	7.83	Cat II
SRC-19217	2 1/8	4	2732	2864	599	115	58	701	114	599	9.26	Cat II
SRC-4821	2 5/8	1	683	716	172	115	58	274	114	172	5.34	Cat I
SRC-9621	2 5/8	2	1366	1432	312	115	58	414	114	312	6.71	Cat I
SRC-14421	2 5/8	3	2049	2148	456	115	58	558	114	456	8.02	Cat II
SRC-19221	2 5/8	4	2732	2864	599	115	58	701	114	599	9.58	Cat II

*'F' is the minimum space required to remove the filter drier cores from the shell.

S-848-CM Core

Model Details			Drying Capacity (kg of refrigerant)						Liquid Capacity (kW)					
Part No	Conn. Size (inch)	Cores	R134a		R404A/R507		R407C/R410A		R134a	R404A	R507	R407C	R410A	CO ₂
			24 °C	52 °C	24 °C	52 °C	24 °C	52 °C						
SRC-485	5/8	1	83.5	79.5	123	76	84	72	78.2	57.6	55.8	81.9	85.3	125.9
SRC-965	5/8	2	167	159	246	152	168	144	73.1	53.4	51.7	76.1	79.0	117.6
SRC-1445	5/8	3	250.5	238.5	369	228	252	216	73.1	53.4	51.7	76.1	79.0	117.6
SRC-1925	5/8	4	334	318	492	304	336	288	73.1	53.4	51.7	76.1	79.0	117.6
SRC-487	7/8	1	83.5	79.5	123	76	84	72	124.2	89.7	86.9	128.6	132.7	197.0
SRC-967	7/8	2	167	159	246	152	168	144	116.0	83.1	80.5	119.5	122.8	184.1
SRC-1447	7/8	3	250.5	238.5	369	228	252	216	116.0	83.1	80.5	119.5	122.8	184.1
SRC-1927	7/8	4	334	318	492	304	336	288	116.0	83.1	80.5	119.5	122.8	184.1
SRC-489	1 1/8	1	83.5	79.5	123	76	84	72	178.8	128.6	124.5	184.7	190.0	283.7
SRC-969	1 1/8	2	167	159	246	152	168	144	178.1	128.2	124.0	183.9	189.1	282.7
SRC-1449	1 1/8	3	250.5	238.5	369	228	252	216	173.3	124.7	120.8	179.1	184.2	275.1
SRC-1929	1 1/8	4	334	318	492	304	336	288	173.3	124.7	120.8	179.1	184.2	275.1
SRC-4811	1 3/8	1	83.5	79.5	123	76	84	72	236.8	171.5	166.1	245.6	253.5	375.9
SRC-9611	1 3/8	2	167	159	246	152	168	144	241.5	174.1	168.7	249.8	257.3	383.3
SRC-14411	1 3/8	3	250.5	238.5	369	228	252	216	253.4	183.1	177.4	262.4	270.5	402.2
SRC-19211	1 3/8	4	334	318	492	304	336	288	263.9	192.6	186.6	275.1	284.9	418.8
SRC-4813	1 5/8	1	83.5	79.5	123	76	84	72	273.7	199.8	193.6	285.4	295.7	434.3
SRC-9613	1 5/8	2	167	159	246	152	168	144	298.7	216.7	210.0	310.2	320.5	474.1
SRC-14413	1 5/8	3	250.5	238.5	369	228	252	216	299.3	217.2	210.4	310.8	321.1	475.0
SRC-19213	1 5/8	4	334	318	492	304	336	288	309.4	225.1	218.1	321.8	332.8	491.1
SRC-4817	2 1/8	1	83.5	79.5	123	76	84	72	399.6	298.2	289.2	422.6	442.2	634.1
SRC-9617	2 1/8	2	167	159	246	152	168	144	419.9	307.2	297.7	438.4	454.6	666.4
SRC-14417	2 1/8	3	250.5	238.5	369	228	252	216	367.1	268.1	259.8	382.9	396.7	582.6
SRC-19217	2 1/8	4	334	318	492	304	336	288	429.8	311.1	301.4	445.7	459.9	682.0
SRC-4821	2 5/8	1	83.5	79.5	123	76	84	72	294.9	215.6	209.1	307.7	318.9	460.4
SRC-9621	2 5/8	2	167	159	246	152	168	144	316.5	238.1	230.7	341.1	351.7	517.6
SRC-14421	2 5/8	3	250.5	238.5	369	228	252	216	282.4	221.7	214.8	317.0	327.8	482.0
SRC-19221	2 5/8	4	334	318	492	304	336	288	337.4	273.5	264.9	391.3	404.2	598.8



- 1 Filter Drier Shell
- 2 Retaining Bolt
- 3 End Plate
- 4 Mesh Screen & Rubber Seal
- 5 Core Holder
- 6 Central Rod
- 7 Large Gasket
- 8 Drier Core
- 9 Small Gasket
- 10 Core Plate
- 11 Core End Plate
- 12 Wing Nut
- 13 Spring
- 14 Cover Gasket
- 15 Cover Plate
- 16 Cover Plate Bolts

Copper Fittings

Heldon branded copper fittings by Henry Tech are engineered and manufactured to meet or exceed Australian and International Standards in ISO 9000-2001 certified facilities as verified by:

1. Proof Testing to exceed 4 times Safe Working Pressure.
2. Sectioning and dimensional testing.
3. Stringent quality control measures and rigorously tested to ensure minimum wall thickness's and the removal of stress and fatigue focus points.

Heldon branded copper fittings are suitable for use with the American "Copper Tubes for Air-conditioning & Refrigeration Field Service - ASTM B280" and the "Australian and New Zealand Standard AS/NZS 1571 – Copper Seamless tube for Air-conditioning and Refrigeration".

A large range of Refrigeration Fittings are available to suit all popular refrigerants including R410A and CO₂ (sub-critical) refrigerants.



Standard Fittings

Heldon branded standard copper fittings are substantially thicker on average than other fittings on the market today as they are manufactured to exceed B 16.22-1989. Consequently they also have a higher pressure rating. Burst tests further indicate that Heldon branded copper fittings are more than 10% stronger than other fittings on the local market. A range of sizes up to 4 1/8" is available.

R400 Series Fittings

Heldon branded R400 Series fittings are packed or stamped R400 and are suitable for R410A with a Safe Working Pressure (SWP) of approximately 5,000 kPa at ambient temperature. A range of sizes of up to 1 5/8" are currently available.

Wall Thickness and Pressure Ratings

Working pressure is a function of the wall thickness, diameter and working temperature. Often it appears that fittings are thinner than the tube they are joining, but this may be explained by the allowance designed into the tube for thinning when it is bent or formed. This can be as much as 25%, but the average is 20% for fittings up to 2 5/8". Also, some standard tubes may be thicker than required, due to the limited tube availability versus optimum design.

Tubing

In summary, the Standards AS/NZS 1571, 4041 and ASME B280, give a Safe Working Pressure for annealed tube, with a 5 times safety factor to the Nominal Pressure.

Tswp = Tube Safe Working Pressure

= Burst Pressure approx. / 5

Large Diameter High Pressure Fittings

Heldon's new range of large diameter copper fittings are now available.

Consisting of a selection of Couplings, 90 degree Elbows and Stop Ends, these Fittings are rated to a Safe Working Pressure of 3,200 kPa up to 50 degrees Celsius. This makes them ideal for the Low Pressure side of R410A and CO₂ systems below 3.2MPa).

Special Fittings

Can be designed and made to customer requirements in many sizes.

Contact Henry Technologies for further information.

Fittings

Fittings have a wall thickness reduction of approximately 20%, but a similar Safe Working Pressure. This is because fittings have a 4 times safety factor, as specified by ASME B16.22 2001.

Fswp = Fitting Safe Working Pressure

= Burst Pressure min. / 4.

Joining

Strong, leak-free connections for copper can be made easily by brazing with "filler metals". Employing "silver brazing alloys" (silver solder), competent tradespeople can install copper pipe work & fittings in accordance with the methodologies as recommended in AS HB40. The use of 15% silver solder is recommended when brazing copper tubing or fittings for use with R410A or other high pressure refrigerants.

Note that in order for silver brazing alloys to melt and flow properly, 620°C to 790°C is required. At these high temperatures the copper will react with oxygen in the air and form copper oxide (scale) on the inner walls of the copper components.

This scale will be broken off into flakes by liquid refrigerant passing through the pipe work. These flakes will produce a fine powder which can cause blockages in filter driers, strainers and capillary tubes.

It is recommended to use an inert gas such as Dry Nitrogen, to displace any air inside the pipe work when silver brazing copper and avoid the creation of copper oxide.

Suitability for Application

Copper can work harden. These product specifications are based on static in-house tests, calculated data, information from material suppliers and relevant standards. Henry Tech cannot predict the conditions or unique dynamics created in the working environment by the combination of temperature, pressure, vibration and pulsation that will vary for each particular application. The end user or system designer must satisfy themselves of a part's suitability for use in their systems application.

Once satisfied in this regard, they can enjoy the benefits of having chosen a quality Heldon branded copper fittings.

Copper has a considerable drop in allowable stress with increased operating temperatures, reducing by 17% between 50°C and 75°C. Safe Working Pressure tables are listed for most fitting types.

R410A fittings, according to AIRAH, should be rated for 4,200 kPa at 65°C. This is equivalent to 4,670. kPa at 50°C based on allowable stress. Most Heldon branded R410A fittings meet 5,000 kPa which gives a SWP of 4,150 kPa at 75°C.

Note: Stop Ends, U Bends and Y-pieces have a lower SWP due to their design shape. Consult Henry Technologies for details.

Note: R410A SWP equals 4,200 kPa. CO₂ SWP equals 5,200 kPa.

Capacities

Safe Working Temperatures at Working Temperatures									
Standard Fittings					R410A Fittings				
Conn. Size (Inch)	Safe Working Pressure (kPa)				Conn. Size (Inch)	Safe Working Pressure (kPa)			
	-29°C to 50°C	up to 65°C	up to 75°C	up to 120°C		-29°C to 50°C	up to 65°C	up to 75°C	up to 120°C
3/16	10000	8900	8300	8000	3/16	10000	8900	8300	8000
1/4	10000	8900	8300	8000	1/4	10000	8900	8300	8000
5/16	8500	7565	7055	6800	5/16	8500	7565	7055	6800
1/2	6000	5340	4980	4800	1/2	6000	5340	4980	4800
5/8	5600	4984	4648	4480	5/8	5600	4984	4648	4480
3/4	5000	4450	4150	4000	3/4	5000	4450	4150	4000
7/8	4500	4005	3735	3600	7/8	5000	4450	4150	4000
1	4500	4005	3735	3600	1	5000	4450	4150	4000
1 1/8	4000	3560	3320	3200	1 1/8	5000	4450	4150	4000
1 1/4	3900	3471	3237	3120	1 1/4	5000	4450	4150	4000
1 3/8	3500	3115	2905	2800	1 3/8	5000	4450	4150	4000
1 1/2	3500	3115	2905	2800	1 1/2	5000	4450	4150	4000
1 5/8	3300	2937	2739	2640	1 5/8	5000	4450	4150	4000
1 3/4	3500	2937	2739	2640	Large Diameter High Pressure Copper Fittings SWP (kPa)				
2	3100	2759	2573	2480					
2 1/8	2900	2407	2320	2236	2 1/8	3200	Note: For temperatures greater than 50°C, please consult with Henry Technologies.		
2 1/4	2700	2403	2241	2160	2 5/8	3200			
2 1/2	2700	2403	2241	2160	3 1/8	3200			
2 5/8	2700	2403	2241	2160					
3	2200	1958	1826	1760					
3 1/8	2180	1940	1809	1744					
3 1/2	2100	1869	1743	1680					
3 5/8	2090	1860	1735	1672					
4	2050	1825	1702	1640					
4 1/8	2020	1825	1702	1616					

Copper Couplings



Part No.	ID to ID	Pack Q'ty
1009-0303	3/16 x 3/16	MTO
1009-0404	1/4 x 1/4	10
1009-0505	5/16 x 5/16	10
1009-0604	3/8 x 1/4	10
1009-0606	3/8 x 3/8	10
1009-0804	1/2 x 1/4	10
1009-0806	1/2 x 3/8	10
1009-0808	1/2 x 1/2	10
1009-1006	5/8 x 3/8	10
1009-1008	5/8 x 1/2	10
1009-1010	5/8 x 5/8	10
1009-1206	3/4 x 3/8	5
1009-1208	3/4 x 1/2	5
1009-1210	3/4 x 5/8	5
1009-1212	3/4 x 3/4	5
1009-1408	7/8 x 1/2	5
1009-1410	7/8 x 5/8	5
1009-1412	7/8 x 3/4	5
1009-1414	7/8 x 7/8	5
1009-1608	1 x 1/2	5
1009-1612	1 x 3/4	5
1009-1614	1 x 7/8	5
1009-1616	1 x 1	5
1009-1808	1 1/8 x 1/2	2
1009-1810	1 1/8 x 5/8	2
1009-1810-410A	1 1/8 x 5/8	2
1009-1812	1 1/8 x 3/4	2
1009-1812-410A	1 1/8 x 3/4	2
1009-1814	1 1/8 x 7/8	2
1009-1814-410A	1 1/8 x 7/8	2
1009-1816	1 1/8 x 1	2
1009-1818	1 1/8 x 1 1/8	2
1009-1818-410A	1 1/8 x 1 1/8	2
1009-2016	1 1/4 x 1	2
1009-2018	1 1/4 x 1 1/8	2
1009-2020	1 1/4 x 1 1/4	2
1009-2020-410A	1 1/4 x 1 1/4	2
1009-2210	1 3/8 x 5/8	2
1009-2212	1 3/8 x 3/4	2
1009-2214	1 3/8 x 7/8	2
1009-2216	1 3/8 x 1	2
1009-2218	1 3/8 x 1 1/8	2
1009-2218-410A	1 3/8 x 1 1/8	2
1009-2222	1 3/8 x 1 3/8	2
1009-2222-410A	1 3/8 x 1 3/8	2

Copper Couplings		
Part No.	ID to ID	Pack Q'ty
1009-2416	1 1/2 x 1	2
1009-2420	1 1/2 x 1 1/4	2
1009-2424	1 1/2 x 1 1/2	2
1009-2614	1 5/8 x 7/8	1
1009-2618	1 5/8 x 1 1/8	1
1009-2622	1 5/8 x 1 3/8	1
1009-2622-410A	1 5/8 x 1 3/8	1
1009-2626	1 5/8 x 1 5/8	1
1009-2626-410A	1 5/8 x 1 5/8	1
1009-3218	2 x 1 1/8	1
1009-3222	2 x 1 3/8	1
1009-3224	2 x 1 1/2	1
1009-3232	2 x 2	1
1009-3418	2 1/8 x 1 1/8	1
1009-3422	2 1/8 x 1 3/8	1
1009-3422-HP	2 1/8 x 1 3/8	1
1009-3426	2 1/8 x 1 5/8	1
1009-3426-HP	2 1/8 x 1 5/8	1
1009-3434	2 1/8 x 2 1/8	1
1009-4218	2 5/8 x 1 1/8	1
1009-4222	2 5/8 x 1 3/8	1
1009-4222-HP	2 5/8 x 1 3/8	1
1009-4226	2 5/8 x 1 5/8	1
1009-4226-HP	2 5/8 x 1 5/8	1
1009-4234	2 5/8 x 2 1/8	1
1009-4234-HP	2 5/8 x 2 1/8	1
1009-4242	2 5/8 x 2 5/8	1
1009-4834	3 x 2 1/2	1
1009-4840	3 x 2 1/8	1
1009-4842	3 x 2 5/8	1
1009-4848	3 x 3	1
1009-5034	3 1/8 x 2 1/8	1
1009-5034-HP	3 1/8 x 2 1/8	1
1009-5042	3 1/8 x 2 5/8	1
1009-5042-HP	3 1/8 x 2 5/8	1
1009-5050	3 1/8 x 3 1/8	1
1009-5656	3 1/2 x 3 1/2	1
1009-6442	4 x 2 5/8	1
1009-6464	4 x 4	1

Note: HP = High Pressure Copper Fittings

Copper Bushes OD to ID

Copper Bushes		
Part No.	OD to ID	Pack Q'ty
1004-0604	3/8 x 1/4	5
1004-0804	1/2 x 1/4	5
1004-0806	1/2 x 3/8	5
1004-1006	5/8 x 3/8	5
1004-1008	5/8 x 1/2	5
1004-1208	3/4 x 1/2	5
1004-1210	3/4 x 5/8	5
1004-1408	7/8 x 1/2	5
1004-1410	7/8 x 5/8	5
1004-1412	7/8 x 3/4	5
1004-1418	7/8 x 1 1/8	5
1004-1422	7/8 x 1 3/8	MTO
1004-1608	1 x 1/2	5
1004-1610	1 x 5/8	5
1004-1612	1 x 3/4	5
1004-1614	1 x 7/8	5
1004-1808	1 1/8 x 1/2	2
1004-1810	1 1/8 x 5/8	2
1004-1810-410A	1 1/8 x 5/8	2
1004-1812	1 1/8 x 3/4	2
1004-1812-410A	1 1/8 x 3/4	2
1004-1814	1 1/8 x 7/8	2
1004-1814-410A	1 1/8 x 7/8	2
1004-1816-410A	1 1/8 x 1	2
1004-2008	1 1/4 x 1/2	2
1004-2010	1 1/4 x 5/8	MTO
1004-2012	1 1/4 x 3/4	2
1004-2016	1 1/4 x 1	2
1004-2016-410A	1 1/4 x 1	MTO
1004-2210	1 3/8 x 5/8	2
1004-2212	1 3/8 x 3/4	2
1004-2214	1 3/8 x 7/8	2
1004-2214-410A	1 3/8 x 7/8	2
1004-2216	1 3/8 x 1	MTO
1004-2218	1 3/8 x 1 1/8	2
1004-2218-410A	1 3/8 x 1 1/8	2
1004-2412	1 1/2 x 3/4	2
1004-2416	1 1/2 x 1	2
1004-2418	1 1/2 x 1 1/8	MTO
1004-2420	1 1/2 x 1 1/4	2
1004-2614	1 5/8 x 7/8	1
1004-2618	1 5/8 x 1 1/8	1
1004-2622	1 5/8 x 1 3/8	1
1004-2622-410A	1 5/8 x 1 3/8	1



1004 Series

Copper Bushes		
Part No.	OD to ID	Pack Q'ty
1004-2824	1 3/4 x 1 1/2	1
1004-3216	2 x 1	MTO
1004-3220	2 x 1 1/4	1
1004-3224	2 x 1 1/2	1
1004-3418	2 1/8 x 1 1/8	1
1004-3422	2 1/8 x 1 3/8	1
1004-3426	2 1/8 x 1 5/8	1
1004-4226	2 5/8 x 1 5/8	1
1004-4234	2 5/8 x 2 1/8	1
1004-4832	3 x 2	MTO
1004-4834	3 x 2 1/8	1
1004-4842	3 x 2 5/8	1
1004-5034	3 1/8 x 2 1/8	1
1004-5042	3 1/8 x 2 5/8	1
1004-5048	3-1/8 x 3	1
1004-5050	3-1/8 x 3 1/8	1
1004-6664	4-1/8 x 4	1

Copper Tees & Elbows



1049 Series



1080 Series

Copper Tees		
Part No.	ID to ID Line/Line/ Branch	Pack Q'ty
1049-030303	3/16 x 3/16 x 3/16	10
1049-040404	1/4 x 1/4 x 1/4	10
1049-050504	5/16 x 5/16 x 1/4	10
1049-050505	5/16 x 5/16 x 5/16	10
1049-060604	3/8 x 3/8 x 1/4	10
1049-060606	3/8 x 3/8 x 3/8	10
1049-080804	1/2 x 1/2 x 1/4	10
1049-080806	1/2 x 1/2 x 3/8	10
1049-080808	1/2 x 1/2 x 1/2	10
1049-080810	1/2 x 1/2 x 5/8	5
1049-101006	5/8 x 5/8 x 3/8	5
1049-101008	5/8 x 5/8 x 1/2	5
1049-101010	5/8 x 5/8 x 5/8	5
1049-101012	5/8 x 5/8 x 3/4	5
1049-121206	3/4 x 3/4 x 3/8	5
1049-121208	3/4 x 3/4 x 1/2	5
1049-121210	3/4 x 3/4 x 5/8	5
1049-121212	3/4 x 3/4 x 3/4	5
1049-141408	7/8 x 7/8 x 1/2	2
1049-141410	7/8 x 7/8 x 5/8	2
1049-141414	7/8 x 7/8 x 7/8	2
1049-161608	1 x 1 x 1/2	2
1049-161612	1 x 1 x 3/4	2
1049-161616	1 x 1 x 1	2
1049-181818	1 1/8 x 1 1/8 x 1 1/8	1
1049-181818-410A	1 1/8 x 1 1/8 x 1 1/8	1
1049-202020	1 1/4 x 1 1/4 x 1 1/4	1
1049-202020-410A	1 1/4 x 1 1/4 x 1 1/4	1
1049-222222	1 3/8 x 1 3/8 x 1 3/8	1
1049-242424	1 1/2 x 1 1/2 x 1 1/2	1
1049-262614	1 5/8 x 1 5/8 x 7/8	1
1049-262626	1 5/8 x 1 5/8 x 1 5/8	1
1049-323232	2 x 2 x 2	1
1049-343434	2 1/8 x 2 1/8 x 2 1/8	1
1049-424242	2 5/8 x 2 5/8 x 2 5/8	1
1049-484848	3 x 3 x 3	1
1049-505050	3 1/8 x 3 1/8 x 3 1/8	1
1049-646464	4 x 4 x 4	1

Copper P-Traps		
Part No.	ID to ID	Pack Q'ty
1080-10	5/8 x 5/8	5
1080-12	3/4 x 3/4	5
1080-14	7/8 x 7/8	5
1080-18	1 1/8 x 1 1/8	2
1080-22	1 3/8 x 1 3/8	2
1080-26	1 5/8 x 1 5/8	2
1080-34	2 1/8 x 2 1/8	1



1022 Series

Copper Elbows - 90° Elbow (Male to Female)		
Part No.	OD to ID	Pack Q'ty
1022-0606	3/8 x 3/8	10
1022-0808	1/2 x 1/2	10
1022-1010	5/8 x 5/8	10
1022-1212	3/4 x 3/4	5
1022-1414	7/8 x 7/8	5
1022-1616	1 x 1	2
1022-1818	1 1/8 x 1 1/8	2
1022-2020	1 1/4 x 1 1/4	1
1022-2222	1 3/8 x 1 3/8	1
1022-2424	1 1/2 x 1 1/2	1
1022-2626	1 5/8 x 1 5/8	1
1022-3434	2 1/8 x 2 1/8	1
1022-4242	2 5/8 x 2 5/8	1

Copper Elbows & Return Bends



1024S Series



1024 Series

Copper Elbows - Short Radius

Part No.	ID to ID	Pack Q'ty
1024S-0606	3/8 x 3/8	10
1024S-0808	1/2 x 1/2	10
1024S-1010	5/8 x 5/8	10
1024S-1212	3/4 x 3/4	5
1024S-1414	7/8 x 7/8	5
1024S-1616	1 x 1	2
1024S-1818	1 1/8 x 1 1/8	2
1024S-2020	1 1/4 x 1 1/4	1
1024S-2222	1 3/8 x 1 3/8	1
1024S-2424	1 1/2 x 1 1/2	1
1024S-2626	1 5/8 x 1 5/8	1
1024S-3434	2 1/8 x 2 1/8	1
1024S-4242	2 5/8 x 2 5/8	1
1024S-4848	3 x 3	1
1024S-5050	3 1/8 x 3 1/8	1

Copper Elbows - 90° Elbow (Female)

Part No.	ID to ID	Pack Q'ty
1024-0404	1/4 x 1/4	10
1024-0505	5/16 x 5/16	10
1024-0606	3/8 x 3/8	10
1024-0806	1/2 x 3/8	10
1024-0808	1/2 x 1/2	10
1024-1008	5/8 x 1/2	10
1024-1010	5/8 x 5/8	10
1024-1208	3/4 x 1/2	5
1024-1212	3/4 x 3/4	5
1024-1414	7/8 x 7/8	5
1024-1612	1 x 3/4	2
1024-1616	1 x 1	2
1024-1818	1 1/8 x 1 1/8	2
1024-1818-410A	1 1/8 x 1 1/8	2
1024-2020	1 1/4 x 1 1/4	1
1024-2020-410A	1 1/4 x 1 1/4	1
1024-2222	1 3/8 x 1 3/8	1
1024-2222-410A	1 3/8 x 1 3/8	1
1024-2424	1 1/2 x 1 1/2	1
1024-2622	1 5/8 x 1 3/8	MTO
1024-2626	1 5/8 x 1 5/8	1
1024-2626-410A	1 5/8 x 1 5/8	1
1024-3232	2 x 2	1
1024-3434	2 1/8 x 2 1/8	1
1024-3434-HP	2 1/8 x 2 1/8	1
1024-4040	2 1/2 x 2 1/2	1
1024-4242	2 5/8 x 2 5/8	1
1024-4242-HP	2 5/8 x 2 5/8	1
1024-4848	3 x 3	1
1024-5050	3 1/8 x 3 1/8	1
1024-5050-HP	3 1/8 x 3 1/8	MTO
1024-5656	3 1/2 x 3 1/2	MTO
1024-6464	4 x 4	1



1062 Series

Copper Return Bends (Female to Female)

Part No.	ID x CTR	Pack Q'ty
1062-0620	3/8 x 1 1/2	1
1062-0824	1/2 x 1 1/2	1
1062-1032	5/8 x 2	1
1062-1048	5/8 x 3	1
1062-1232	3/4 x 2	1
1062-1244	3/4 x 2 3/4	MTO
1062-1436	7/8 x 2 1/4	1
1062-1636	1 x 2 1/4	MTO
1062-2048	1 1/4 x 3	1

Note: HP = High Pressure Copper Fittings

Copper Elbows, Bonnets & Y Pieces



1025 Series



1130 Series

Copper Elbows - 45° Elbow (Female)

Part No.	ID to ID	Pack Q'ty
1025-0606	3/8 x 3/8	10
1025-0808	1/2 x 1/2	10
1025-1010	5/8 x 5/8	10
1025-1212	3/4 x 3/4	5
1025-1414	7/8 x 7/8	5
1025-1616	1 x 1	2
1025-1818	1 1/8 x 1 1/8	2
1025-1818-410A	1 1/8 x 1 1/8	2
1025-2020	1 1/4 x 1 1/4	2
1025-2020-410A	1 1/4 x 1 1/4	2
1025-2222	1 3/8 x 1 3/8	1
1025-2222-410A	1 3/8 x 1 3/8	1
1025-2424	1 1/2 x 1 1/2	1
1025-2626	1 5/8 x 1 5/8	1
1025-2626-410A	1 5/8 x 1 5/8	1
1025-3232	2 x 2	1
1025-3434	2 1/8 x 2 1/8	1
1025-4242	2 5/8 x 2 5/8	1
1025-4848	3 x 3	1
1025-5050	3 1/8 x 3 1/8	1
1025-5656	3 1/2 x 3 1/2	1

Copper Y Pieces

Part No.	ID Inlet/Outlet/Outlet	Pack Q'ty
1130-060606	3/8 x 3/8 x 3/8	5
1130-080606	1/2 x 3/8 x 3/8	5
1130-080808	1/2 x 1/2 x 1/2	5
1130-100808	5/8 x 1/2 x 1/2	5
1130-101010	5/8 x 5/8 x 5/8	5
1130-120808	3/4 x 1/2 x 1/2	5
1130-121010	3/4 x 5/8 x 5/8	5
1130-121212	3/4 x 3/4 x 3/4	5
1130-141010	7/8 x 5/8 x 5/8	5
1130-141414	7/8 x 7/8 x 7/8	5
1130-161010	1 x 5/8 x 5/8	MTO
1130-161212	1 x 3/4 x 3/4	5
1130-181010	1 1/8 x 5/8 x 5/8	5
1130-181212	1 1/8 x 3/4 x 3/4	5
1130-181414	1 1/8 x 7/8 x 7/8	5
1130-181818	1 1/8 x 1 1/8 x 1 1/8	MTO
1130-201010	1 1/4 x 5/8 x 5/8	5
1130-201212	1 1/4 x 3/4 x 3/4	MTO
1130-221818	1 3/8 x 1 1/8 x 1 1/8	5
1130-261818	1 5/8 x 1 1/8 x 1 1/8	1
1130-342626	2 1/8 x 1 5/8 x 1 5/8	MTO
1130-483434	3 x 2 1/8 x 2 1/8	1



1105 Series

Copper Bonnets

Part No.	SAE	Pack Q'ty
1105-04	1/4 SAE	10
1105-05	5/16 SAE	10
1105-06	3/8 SAE	10
1105-08	1/2 SAE	10
1105-10	5/8 SAE	10
1105-12	3/4 SAE	10

Copper Stop Ends & Washers



1120 Series

Copper Stop Ends		
Part No.	ID	Pack Q'ty
1120-06	3/8 ID	5
1120-08	1/2 ID	5
1120-10	5/8 ID	5
1120-12	3/4 ID	5
1120-14	7/8 ID	5
1120-16	1 ID	5
1120-18	1 1/8 ID	2
1120-20	1 1/4 ID	2
1120-22	1 3/8 ID	2
1120-24	1 1/2 ID	2
1120-26	1 5/8 ID	2
1120-32	2 ID	2
1120-34	2 1/8 ID	2
1120-34-HP	2 1/8 ID	2
1120-40	2 1/2 ID	1
1120-42	2 5/8 ID	1
1120-42-HP	2 5/8 ID	1
1120-48	3 ID	1
1120-50	3 1/8 ID	1
1120-50-HP	3 1/8 ID	1
1120-56	3 1/2 ID	1
1120-64	4 ID	1
1120-80	5 ID	1
1120-96	6 ID	1



96 Series

Flare Washer to suit 96 Series Flare Adaptor		
Part No.	ID	Pack Q'ty
1107-04	1/4 SAE	10
1107-06	3/8 SAE	10
1107-08	1/2 SAE	10
1107-10	5/8 SAE	10
1107-12	3/4 SAE	10



1110 Series

Flare Washer to fit SAE Standard Flare		
Part No.	ID	Pack Q'ty
1110-04	1/4 SAE	10
1110-05	5/16 SAE	10
1110-06	3/8 SAE	10
1110-08	1/2 SAE	10
1110-10	5/8 SAE	10
1110-12	3/4 SAE	10

Note: HP = High Pressure Copper Fittings

Pipe Clips



1115 Series



1150 Series

Pipe Clips

Part No.	Diameter	Pack Q'ty
1115-04	1/4	10
1115-05	5/16	10
1115-06	3/8	10
1115-08	1/2	10
1115-10	5/8	10
1115-12	3/4	10
1115-14	7/8	10
1115-16	1	10
1115-18	1 1/8	10
1115-20	1 1/4	10
1115-22	1 3/8	10
1115-24	1 1/2	10
1115-26	1 5/8	10
1115-28	1 3/4	10
1115-32	2	10
1115-34	2 1/8	10
1115-40	2 1/2	10

Capillary Tubes

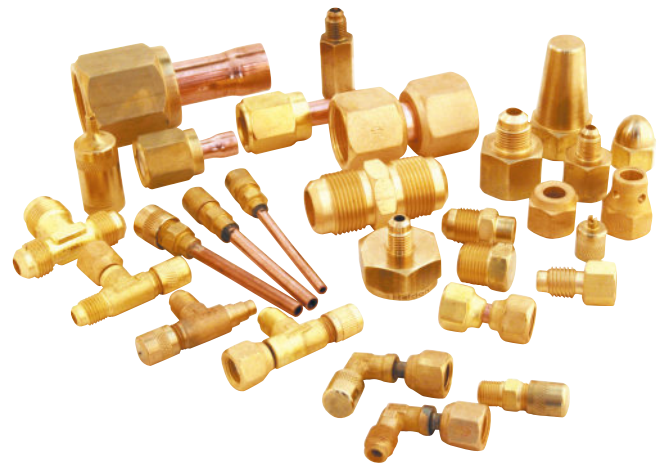
Part No.	Connection	Pack Q'ty
1150-0404	1/4 FSAE Tube - 900mm Long	1
1150-0404D	1/4 FSAE Tube - Depressor 900mm Long	1

Brass Fittings

Henry Technologies has been a specialist in manufacturing Heldon branded brass fittings for over 80 years with precision computerised NC lathes.

Using only A grade materials and manufacturing to tight tolerances for threads, clearances and sealing faces, Heldon branded brass fittings are ideal for the demanding requirements of modern refrigerants and other critical industries. Flared connections from 1/8" OD to 3/4" OD can have a safe working pressure up to 4,200 kPa (610 psi) depending on size and a temperature range from -50°C to 120°C.

Heldon branded brass fittings are chemically cleaned for contaminant free installations. Oxygen cleaning is also available.



Flare Nuts

- With the high cost of refrigerants, higher pressures and more extremes in the range of working temperatures Heldon branded forged brass flare nuts are your best insurance policy for reducing the chance of leaks and fractures at these critical joints.
- Heldon branded "Frost-proof" series of flare nuts are the ultimate solution, and a must where condensation and frosting could lead to pipe damage or nut creep.
- Henry Tech's range of Heldon branded forged flare nuts, (501,502) are stronger than machined nuts, and will withstand maximum system pressures.

Schrader Fittings

- Henry Tech manufactures Heldon branded Schrader access and depressor valves in a variety of configurations for many purposes. Other thread size or combinations are available on request.
- Schrader valves used in all Heldon branded fittings feature Heldoprene™ seats that are suitable for all fluorinated refrigerants up to a safe working pressure of 4,200 kPa (610 psi).
- R410A designated fittings have a 5/16" male flare at the Schrader end.
- All fittings are supplied with one cap and core. Additional caps, cores and tools are available separately.

Standard Thread Table

SAE		JIC		BSP		NPT	
Tube Size	Thread Size	Tube Size	Thread Size	Tube Size	Thread Size	Tube Size	Thread Size
1/8	5/16 - 24	1/8	5/16 - 24	1/8	1/8 - 28	1/8	1/8 - 27
3/16	3/8 - 24	3/16	3/8 - 24	1/4	1/4 - 19	1/4	1/4 - 18
1/4	7/16 - 20	1/4	7/16 - 20	3/8	3/8 - 19	3/8	3/8 - 18
5/16	1/2 - 20	5/16	1/2 - 20	1/2	1/2 - 14	1/2	1/2 - 14
3/8	5/8 - 18	3/8	9/16 - 18	3/4	3/4 - 14	3/4	3/4 - 14
1/2	3/4 - 16	1/2	3/4 - 16	1	1 - 11	1	1 - 11.5
5/8	7/8 - 14	5/8	7/8 - 14	1 1/4	1 1/4 - 11	1 1/4	1 1/4 - 11.5
3/4	1 1/16 - 14	3/4	1 1/16 - 12	1 1/2	1 1/2 - 11	1 1/2	1 1/2 - 11.5
7/8	1 1/4 - 12	7/8	1 3/16 - 12	2	2 - 11	2	2 - 11.5
1	1 3/8 - 12	1	1 5/16 - 12	2 1/2	2 1/2 - 11	2 1/2	2 1/2 - 8
-	-	-	-	3	3 - 11	3	3 - 8
-	-	-	-	3 1/2	3 1/2 - 11	3 1/2	3 1/2 - 8
-	-	-	-	4	4 - 11	4	4 - 8

Flare Nuts



501 Series



95 Series

Forged Brass Short Barrel Nuts FSAE

Part No.	Connection/ID	Pack Q'ty
501-0404	1/4 FLARE x 1/4 ID	10
501-0504	5/16 FLARE x 1/4 ID	10
501-0505	5/16 FLARE x 5/16 ID	10
501-0604	3/8 FLARE x 1/4 ID	10
501-0605	3/8 FLARE x 5/16 ID	10
501-0606	3/8 FLARE x 3/8 ID	10
501-0808	1/2 FLARE x 1/2 ID	5
501-1010	5/8 FLARE x 5/8 ID	2
501-1212	3/4 FLARE x 3/4 ID	2

Swivel Connectors FSAE to FSAE

Part No.	Connection	Pack Q'ty
95-04	1/4 FSAE x 1/4 FSAE	2
95-05	5/16 FSAE x 5/16 FSAE	2
95-06	3/8 FSAE x 3/8 FSAE	2
95-0604	3/8 FSAE x 1/4 FSAE - Reducing	2
95-08	1/2 FSAE x 1/2 FSAE	2
95-0806	1/2 FSAE x 3/8 FSAE - Reducing	2
95-10	5/8 FSAE x 5/8 FSAE	1
95-1008	5/8 FSAE x 1/2 FSAE - Reducing	2
95-12	3/4 FSAE x 3/4 FSAE	2



502 Series



96 Series

Forged Brass Frostproof Long Barrel Nuts FSAE

Part No.	Connection/ID	Pack Q'ty
502-0404	1/4 FLARE x 1/4 ID	10
502-0504	5/16 FLARE x 1/4 ID	MTO
502-0505	5/16 FLARE x 5/16 ID	10
502-0604	3/8 FLARE x 1/4 ID	10
502-0606	3/8 FLARE x 3/8 ID	10
502-0806	1/2 FLARE x 3/8 ID	5
502-0808	1/2 FLARE x 1/2 ID	5
502-1006	5/8 FLARE x 3/8 ID	2
502-1008	5/8 FLARE x 1/2 ID	2
502-1010	5/8 FLARE x 5/8 ID	2
502-1210	3/4 FLARE x 5/8 ID	MTO
502-1212	3/4 FLARE x 3/4 ID	2

Swivel Flare Adaptors FSAE to Copper Tail

Part No.	Connection	Pack Q'ty
96-04	1/4 FSAE x 1/4 ID	2
96-06	3/8 FSAE x 3/8 ID	2
96-08	1/2 FSAE x 1/2 ID	2
96-10	5/8 FSAE x 5/8 ID	2
96-12	3/4 FSAE x 3/4 ID	2

Schrader Fittings

Components



59/60 Series



Schrader Components

Part No.	Connection	Pack Q'ty
55-1-410A	SCHR VALVE CORE-410A	10
55-2	SCHR CAP & O RING	10
55-2-410A	SCHR CAP & O RING-410A	10
55-3	SCHR CAP WITH TOOL	10
55-5	SCREW DEPRESSOR & 3 Gaskets	1
55-6	SCHR KIT - Core Remover & 6 Valve Cores	1
55-2AL	SCHR CAP ALUMINIUM	10

Schrader Step Unions

Part No.	Connection	Pack Q'ty
59-0403-3	1/4 SCHR - 3 STEP 3/16 TO 3/8	5
59-0404	1/4 SCHR x 1/4 ID (3/8 OD SPIGOT) Incl. Cap & Core	5
59-0504-410A	5/16 SCHR x 1/4 ID (3/8 OD SPIGOT) Incl. Cap & Core	5
60-04-5	1/4 SCHR - 5 STEP 1/8 TO 1/2	5

55/56/57 Series



61/62/63 Series



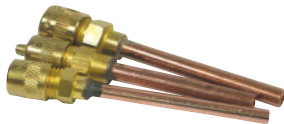
Schrader Unions

Part No.	Connection	Pack Q'ty
55-0404	1/4 SCHR x 1/4 MSAE	10
56-0402	1/4 SCHR x 1/8 MBSP	10
56-0404	1/4 SCHR x 1/4 MBSP	10
57-0402	1/4 SCHR x 1/8 MNPT	10
57-0404	1/4 SCHR x 1/4 MNPT	10

Schrader Elbows

Part No.	Connection	Pack Q'ty
61-0402	1/4 SCHR x 1/8 MBSP Incl. Cap & Core	2
61-0404	1/4 SCHR x 1/4 MBSP Incl. Cap & Core	2
62-0402	1/4 SCHR x 1/8 MNPT - Incl. Cap & Core	2
62-0404	1/4 SCHR x 1/4 MNPT Incl. Cap & Core	2
63-0404	1/4 SCHR x 1/4 F/SWL SAE Incl. Cap & Core	2

58 Series



64 Series



Schrader Unions to Copper Tail 60mm Extension

Part No.	Connection	Pack Q'ty
58-0402	1/4 SCHR x 1/8 CU Tail with Cap & Core	MTO
58-0403	1/4 SCHR x 3/16 CU Tail with Cap & Core	5
58-0404	1/4 SCHR x 1/4 CU Tail with Cap & Core	5
58-0404A1	1/4 SCHR x 1/4 CU Tail No Cap & Core	5
58-0405	1/4 SCHR x 5/16 CU Tail with Cap & Core	5
58-0504-410A	5/16 SCHR x 1/4 CU Tail - 410A with Cap & Core	5

Schrader Swivel Tees (Swivel Nut on branch)

Part No.	Connection	Pack Q'ty
64-040404	1/4 SCHR x 1/4 SCHR x 1/4 FSAE	2
64-040404D	1/4 SCHR x 1/4 SCHR x 1/4 FSAE with Depressor and seal in nut	2
64-050505D-410A	5/16 SCHR x 5/16 SCHR x 5/16 FSAE Incl. Cap & Core	2

65 Series



68 Series

Schrader Swivel Tees (Swivel Nut on run)

Part No.	Connection	Pack Q'ty
65-040404	1/4 FSAE x 1/4 SCHR x 1/4 SCHR	2
65-040404D	1/4 FSAE x 1/4 SCHR x 1/4 SCHR with depressor and seal in nut	2

Schrader Tees (Schrader Flare to MBSP)

Part No.	Connection	Pack Q'ty
68-040404	1/4 SCHR x 1/4 SCHR x 1/4 MBSP	MTO

66 Series



69 Series

Schrader Step Tees (Swivel Nut on run)

Part No.	Connection	Pack Q'ty
66-040404	SCHR x 1/4, 5/16 Step Line x SCHR Incl. Cap & Core	2

Schrader Tees (Schrader Flare to MNPT)

Part No.	Connection	Pack Q'ty
69-040402	1/4 SCHR x 1/4 SCHR x 1/8 MNPT	2
69-040404	1/4 SCHR x 1/4 SCHR x 1/4 MNPT	2

67 Series



274 Series

Schrader Tee (Schrader on run lines to Female SAE branch)

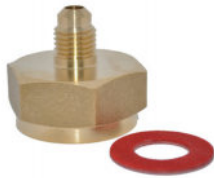
Part No.	Connection	Pack Q'ty
67-040404	1/4 SCHR x 1/4 SCHR x 1/4 FSAE Incl. Cap & Core	2

Schrader Unions (R410A)

Part No.	Connection	Pack Q'ty
274-0405D-410A	1/4 MSAE SCHR x 5/16 FSAE Depressor - R410A	2
274-0504D-410A	5/16 MSAE SCHR x 1/4 FSAE Depressor - R410A	2
274-0506-410A	5/16 MSAE SCHR x 3/8 FSAE Depressor - R410A	2

Brass Fittings

20 Series



Cylinder Adaptors - Male SAE Flare x Female Parallel BSP

Part No.	Connection	Pack Q'ty
20-0404	1/4 MSAE x 1/4 FBSPP	1
20-0408	1/4 MSAE x 1/2 FBSPP	1
20-0410	1/4 MSAE x 5/8 FBSPP	1
20-0412	1/4 MSAE x 3/4 FBSPP	2
20-0512-410A	5/16 MSAE x 3/4 FBSPP - R410A	1
20-0512-LH	5/16 MSAE x 3/4 FBSPP-R32, LH Thread	1
20-0604	3/8 MSAE x 1/4 FBSPP	1
20-0606	3/8 MSAE x 3/8 FBSPP	MTO
20-0610	3/8 MSAE x 5/8 FBSPP	1
20-0612	3/8 MSAE x 3/4 FBSPP	2
20-0812	1/2 MSAE x 3/4 FBSPP	1
20-1010	5/8 MSAE x 5/8 FBSPP	1
20-1012	5/8 MSAE x 3/4 FBSPP	1

21 Series



Cylinder ACME Adaptors - Male ACME to Female BSP Parallel

Part No.	Connection	Pack Q'ty
21-0812	1/2 MACME x 3/4 FBSPP	2
21-08	1/2 ACME SEALING CAP TO SUIT	5

Cylinder Caps - Suit Male Parallel BSP

Part No.	Connection	Pack Q'ty
26-12	3/4 FBSPP	2
977-1507	Fibre Washer - To suit 3/4 FBSPP Adapter	10

Fusible Safety Plugs - Male Taper

Part No.	Connection	Pack Q'ty
50-02160	1/8 MBSP FUSIBLE PLUG - 71°C	2
50-02200	1/8 MBSP FUSIBLE PLUG - 93°C	2
53-02200	1/8 MNPT FUSIBLE PLUG - 93°C	MTO

70 Series



Seal Plugs - Male SAE Flare

Part No.	Connection	Pack Q'ty
70-04	1/4 MSAE	5
70-05	5/16 MSAE	5
70-06	3/8 MSAE	5
70-08	1/2 MSAE	5
70-10	5/8 MSAE	2
70-12	3/4 MSAE	2

75 Series



Seal Caps - Female SAE Flare

Part No.	Connection	Pack Q'ty
75-03	3/16 FSAE	10
75-04	1/4 FSAE	10
75-05	5/16 FSAE	5
75-06	3/8 FSAE	5
75-08	1/2 FSAE	5
75-10	5/8 FSAE	2
75-12	3/4 FSAE	1

80/85 Series



Pipe Plugs - Male Taper BSP

Part No.	Connection	Pack Q'ty
80-02	1/8 MBSP	5
80-04	1/4 MBSP	5
80-06	3/8 MBSP	5
80-08	1/2 MBSP	1
80-12	3/4 MBSP	1
80-16	1 MBSP	1

Pipe Plugs - Male Taper NPT

Part No.	Connection	Pack Q'ty
85-02	1/8 MNPT	5
85-04	1/4 MNPT	5
85-06	3/8 MNPT	5
85-08	1/2 MNPT	5

Unions

200 Series



Unions - Male SAE Flare to Male SAE Flare		
Part No.	Connection	Pack Q'ty
200-0303	3/16 MSAE x 3/16 MSAE	5
200-0404	1/4 MSAE x 1/4 MSAE	5
200-0504	5/16 MSAE x 1/4 MSAE	5
200-0505	5/16 MSAE x 5/16 MSAE	5
200-0604	3/8 MSAE x 1/4 MSAE	5
200-0605	3/8 MSAE x 5/16 MSAE	5
200-0606	3/8 MSAE x 3/8 MSAE	5
200-0804	1/2 MSAE x 1/4 MSAE	5
200-0805	1/2 MSAE x 5/16 MSAE	MTO
200-0806	1/2 MSAE x 3/8 MSAE	5
200-0808	1/2 MSAE x 1/2 MSAE	5
200-1004	5/8 MSAE x 1/4 MSAE	2
200-1006	5/8 MSAE x 3/8 MSAE	2
200-1008	5/8 MSAE x 1/2 MSAE	2
200-1010	5/8 MSAE x 5/8 MSAE	2
200-1208	3/4 MSAE x 1/2 MSAE	1
200-1210	3/4 MSAE x 5/8 MSAE	1
200-1212	3/4 MSAE x 3/4 MSAE	1

201 Series



Unions - Male SAE Flare to Male Taper BSP		
Part No.	Connection	Pack Q'ty
201-0302	3/16 MSAE x 1/8 MBSP	MTO
201-0304	3/16 MSAE x 1/4 MBSP	MTO
201-0402	1/4 MSAE x 1/8 MBSP	5
201-0404	1/4 MSAE x 1/4 MBSP	5
201-0406	1/4 MSAE x 3/8 MBSP	2
201-0408	1/4 MSAE x 1/2 MBSP	2
201-0412	1/4 MSAE x 3/4 MBSP	2
201-0602	3/8 MSAE x 1/8 MBSP	2
201-0604	3/8 MSAE x 1/4 MBSP	2
201-0606	3/8 MSAE x 3/8 MBSP	2
201-0608	3/8 MSAE x 1/2 MBSP	2
201-0612	3/8 MSAE x 3/4 MBSP	2
201-0804	1/2 MSAE x 1/4 MBSP	2
201-0806	1/2 MSAE x 3/8 MBSP	2
201-0808	1/2 MSAE x 1/2 MBSP	2
201-0812	1/2 MSAE x 3/4 MBSP	1
201-1006	5/8 MSAE x 3/8 MBSP	1
201-1008	5/8 MSAE x 1/2 MBSP	1
201-1012	5/8 MSAE x 3/4 MBSP	1
201-1016	5/8 MSAE x 1 MBSP	MTO
201-1208	3/4 MSAE x 1/2 MBSP	1
201-1212	3/4 MSAE x 3/4 MBSP	1
201-1216	3/4 MSAE x 1 MBSP	1
201-1616	1 MSAE x 1 MBSP	1

203 Series



Unions - Male SAE Flare to Male Long Taper BSP		
Part No.	Connection	Pack Q'ty
203-0402	1/4 MSAE x 1/8 MBSPLT	2
203-0404	1/4 MSAE x 1/4 MBSPLT	1

210 Series



Thread Converter - Male BSP to Female NPT		
Part No.	Connection	Pack Q'ty
210-0404	1/4 MBSP x 1/4 FNPT	2
210-0606	3/8 MBSP x 3/8 FNPT	2
210-0808	1/2 MBSP x 1/2 FNPT	2
210-1212	3/4 MBSP x 3/4 FNPT	1
210-1616	1 MBSP x 1 FNPT	MTO

209 Series



Thread Converters - Male Taper NPT to Female Taper BSP		
Part No.	Connection	Pack Q'ty
209-0404	1/4 MNPT x 1/4 FBSP	2
209-0606	3/8 MNPT x 3/8 FBSP	2
209-0808	1/2 MNPT x 1/2 FBSP	2
209-1212	3/4 MNPT x 3/4 FBSP	1

204 Series



Unions - Male SAE Flare to Male Taper NPT

Part No.	Connection	Pack Q'ty
204-0402	1/4 MSAE x 1/8 MNPT	5
204-0404	1/4 MSAE x 1/4 MNPT	5
204-0406	1/4 MSAE x 3/8 MNPT	5
204-0504	5/16 MSAE x 1/4 MNPT	5
204-0506	5/16 MSAE x 3/8 MNPT	5
204-0604	3/8 MSAE x 1/4 MNPT	5
204-0606	3/8 MSAE x 3/8 MNPT	5
204-0804	1/2 MSAE x 1/4 MNPT	2
204-0806	1/2 MSAE x 3/8 MNPT	2
204-0808	1/2 MSAE x 1/2 MNPT	2
204-0812	1/2 MSAE x 3/4 MNPT	1
204-1004	5/8 MSAE x 1/4 MNPT	1
204-1006	5/8 MSAE x 3/8 MNPT	MTO
204-1008	5/8 MSAE x 1/2 MNPT	1
204-1012	5/8 MSAE x 3/4 MNPT	1
204-1208	3/4 MSAE x 1/2 MNPT	1
204-1212	3/4 MSAE x 3/4 MNPT	1
204-1412	7/8 MSAE x 3/4 MNPT	1

206 Series



Unions - Male SAE Flare to Female Taper BSP

Part No.	Connection	Pack Q'ty
206-0402	1/4 MSAE x 1/8 FBSP	2
206-0404	1/4 MSAE x 1/4 FBSP	2
206-0406	1/4 MSAE x 3/8 FBSP	2
206-0408	1/4 MSAE x 1/2 FBSP	1
206-0504	5/16 MSAE x 1/4 FBSP	1
206-0604	3/8 MSAE x 1/4 FBSP	1
206-0606	3/8 MSAE x 3/8 FBSP	1
206-0608	3/8 MSAE x 1/2 FBSP	1
206-0804	1/2 MSAE x 1/4 FBSP	1
206-0806	1/2 MSAE x 3/8 FBSP	1
206-0808	1/2 MSAE x 1/2 FBSP	1
206-1008	5/8 MSAE x 1/2 FBSP	1
206-1012	5/8 MSAE x 3/4 FBSP	1

205 Series



Unions - Male SAE Flare to Female SAE Flare

Part No.	Connection	Pack Q'ty
205-0304	3/16 MSAE x 1/4 FSAE	2
205-0403	1/4 MSAE x 3/16 FSAE	2
205-0404	1/4 MSAE x 1/4 FSAE	2
205-0405	1/4 MSAE x 5/16 FSAE	2
205-0406	1/4 MSAE x 3/8 FSAE	2
205-0408	1/4 MSAE x 1/2 FSAE	2
205-0410	1/4 MSAE x 5/8 FSAE	2
205-0504	5/16 MSAE x 1/4 FSAE	2
205-0604	3/8 MSAE x 1/4 FSAE	2
205-0606	3/8 MSAE x 3/8 FSAE	2
205-0608	3/8 MSAE x 1/2 FSAE	2
205-0610	3/8 MSAE x 5/8 FSAE	2
205-0804	1/2 MSAE x 1/4 FSAE	2
205-0806	1/2 MSAE x 3/8 FSAE	2
205-0808	1/2 MSAE x 1/2 FSAE	MTO
205-0810	1/2 MSAE x 5/8 FSAE	1
205-0812	1/2 MSAE x 3/4 FSAE	1
205-1006	5/8 MSAE x 3/8 FSAE	1
205-1008	5/8 MSAE x 1/2 FSAE	1
205-1010	5/8 MSAE x 5/8 FSAE	1
205-1012	5/8 MSAE x 3/4 FSAE	1
205-1208	3/4 MSAE x 1/2 FSAE	1
205-1210	3/4 MSAE x 5/8 FSAE	1

207 Series



Unions - Male SAE Flare to Female Taper NPT

Part No.	Connection	Pack Q'ty
207-0402	1/4 MSAE x 1/8 FNPT	2
207-0404	1/4 MSAE x 1/4 FNPT	2
207-0406	1/4 MSAE x 3/8 FNPT	2
207-0408	1/4 MSAE x 1/2 FNPT	2
207-0602	3/8 MSAE x 1/8 FNPT	1
207-0604	3/8 MSAE x 1/4 FNPT	1
207-0606	3/8 MSAE x 3/8 FNPT	1
207-0608	3/8 MSAE x 1/2 FNPT	1
207-0804	1/2 MSAE x 1/4 FNPT	1
207-0808	1/2 MSAE x 1/2 FNPT	1
207-1006	5/8 MSAE x 3/8 FNPT	1
207-1008	5/8 MSAE x 1/2 FNPT	1
207-1212	3/4 MSAE x 3/4 FNPT	MTO

211 Series



Nipples - Male Taper BSP to Male Taper BSP

Part No.	Connection	Pack Q'ty
211-0202	1/8 MBSP x 1/8 MBSP	5
211-0402	1/4 MBSP x 1/8 MBSP	5
211-0404	1/4 MBSP x 1/4 MBSP	5
211-0604	3/8 MBSP x 1/4 MBSP	5
211-0606	3/8 MBSP x 3/8 MBSP	5
211-0804	1/2 MBSP x 1/4 MBSP	2
211-0806	1/2 MBSP x 3/8 MBSP	2
211-0808	1/2 MBSP x 1/2 MBSP	2
211-1208	3/4 MBSP x 1/2 MBSP	1
211-1212	3/4 MBSP x 3/4 MBSP	1
211-1612	1 MBSP x 3/4 MBSP	1
211-1616	1 MBSP x 1 MBSP	1

216 Series



Unions - Male Taper BSP to Female Taper BSP

Part No.	Connection	Pack Q'ty
216-0402	1/4 MBSP x 1/8 FBSP	2
216-0406	1/4 MBSP x 3/8 FBSP	2
216-0408	1/4 MBSP x 1/2 FBSP	2
216-0602	3/8 MBSP x 1/8 FBSP	2
216-0604	3/8 MBSP x 1/4 FBSP	2
216-0608	3/8 MBSP x 1/2 FBSP	1
216-0804	1/2 MBSP x 1/4 FBSP	2
216-0806	1/2 MBSP x 3/8 FBSP	2
216-1204	3/4 MBSP x 1/4 FBSP	1
216-1208	3/4 MBSP x 1/2 FBSP	1
216-1608	1 MBSP x 1/2 FBSP	1
216-1612	1 MBSP x 3/4 FBSP	1

212 Series



Brass Nipples - Male NPT to Male NPT

Part No.	Connection	Pack Q'ty
212-0404	1/4 MNPT x 1/4 MNPT	5
212-0606	3/8 MNPT x 3/8 MNPT	2
212-0808	1/2 MNPT x 1/2 MNPT	2

272 Series



Union - Male ACME to Female SAE Flare

Part No.	Connection	Pack Q'ty
272-0804	1/2 MACME x 1/4 FSAE	2

214 Series



Unions - Male Taper BSP to Female SAE Flare

Part No.	Connection	Pack Q'ty
214-0204	1/8 MBSP x 1/4 FSAE	2
214-0404	1/4 MBSP x 1/4 FSAE	2
214-0808	1/2 MBSP x 1/2 FSAE	2
214-1210	3/4 MBSP x 5/8 FSAE	2

275 Series



276 Series



Unions - Male SAE Flare to Female ACME (with o'ring)

Part No.	Connection	Pack Q'ty
275-0408	1/4 MSAE x 1/2 FACME	1
276-0408	1/4 MSAE SCHR x 1/2 FACME	1

270 Series



Unions - Male ACME to Male NPT

Part No.	Connection	Pack Q'ty
270-0802	1/2 MACME x 1/8 MNPT	2
270-0804	1/2 MACME x 1/4 MNPT	2
271-0802	1/2 MACME SCHR x 1/8 MNPT	2
271-0804	1/2 MACME SCHR x 1/4 MNPT	MTO

279 Series



Union - Male Metric to Female ACME

Part No.	Connection	Pack Q'ty
279-01008	MALE M10 - 1.5 x 1/2 FACME	2

217 Series



Reducing Bush Unions - Male Taper BSP to Female BSP

Part No.	Connection	Pack Q'ty
217-0402	1/4 MBSP x 1/8 FBSP	5
217-0602	3/8 MBSP x 1/8 FBSP	5
217-0604	3/8 MBSP x 1/4 FBSP	5
217-0804	1/2 MBSP x 1/4 FBSP	5
217-0806	1/2 MBSP x 3/8 FBSP	5
217-1204	3/4 MBSP x 1/4 FBSP	MTO
217-1206	3/4 MBSP x 3/8 FBSP	2
217-1208	3/4 MBSP x 1/2 FBSP	2
217-1604	1 MBSP x 1/4 FBSP	1
217-1606	1 MBSP x 3/8 FBSP	1
217-1608	1 MBSP x 1/2 FBSP	1
217-1612	1 MBSP x 3/4 FBSP	1

218 Series



Reducing Bush Unions - Male Taper NPT to Female Taper NPT

Part No.	Connection	Pack Q'ty
218-0202	1/8 MNPT x 1/8 FNPT	5
218-0204	1/8 MNPT x 1/4 FNPT	5
218-0402	1/4 MNPT x 1/8 FNPT	5
218-0602	3/8 MNPT x 1/8 FNPT	2
218-0604	3/8 MNPT x 1/4 FNPT	2
218-0804	1/2 MNPT x 1/4 FNPT	2
218-0806	1/2 MNPT x 3/8 FNPT	2
218-1204	3/4 MNPT x 1/4 FNPT	1
218-1206	3/4 MNPT x 3/8 FNPT	MTO



220 Series

Sweat Unions - Male Taper NPT to Solder

Part No.	Connection	Pack Q'ty
220-0406	1/4 MNPT x 3/8 ID	5
220-0608	3/8 MNPT x 1/2 ID	5



208 Series

Sweat Unions - Male SAE Flare to Solder

Part No.	Connection	Pack Q'ty
208-0404	1/4 MSAE x 1/4 ID	5
208-0406	1/4 MSAE x 3/8 ID	5
208-0504	5/16 MSAE x 1/4 ID	5
208-0606	3/8 MSAE x 3/8 ID	5
208-0608	3/8 MSAE x 1/2 ID	5
208-0610	3/8 MSAE x 5/8 ID	5
208-0612	3/8 MSAE x 3/4 ID	5
208-0806	1/2 MSAE x 3/8 ID	5
208-0808	1/2 MSAE x 1/2 ID	5
208-0810	1/2 MSAE x 5/8 ID	2
208-1008	5/8 MSAE x 1/2 ID	2
208-1010	5/8 MSAE x 5/8 ID	2
208-1012	5/8 MSAE x 3/4 ID	1
208-1208	3/4 MSAE x 1/2 ID	1
208-1212	3/4 MSAE x 3/4 ID	1
208-1214	3/4 MSAE x 7/8 ID	1
208-1216	3/4 MSAE x 1 ID	1



219 Series

Sweat Unions - Male Taper BSP to Solder

Part No.	Connection	Pack Q'ty
219-0404	1/4 MBSP x 1/4 ID	5
219-0406	1/4 MBSP x 3/8 ID	5
219-0606	3/8 MBSP x 3/8 ID	5
219-0608	3/8 MBSP x 1/2 ID	5
219-0806	1/2 MBSP x 3/8 ID	2
219-0808	1/2 MBSP x 1/2 ID	2
219-0810	1/2 MBSP x 5/8 ID	2
219-0812	1/2 MBSP x 3/4 ID	2
219-1210	3/4 MBSP x 5/8 ID	2
219-1212	3/4 MBSP x 3/4 ID	2
219-1216	3/4 MBSP x 1 ID	1
219-1616	1 MBSP x 1 ID	1
219-2020	1 1/4 MBSP x 1 1/4 ID	1
219-2424	1 1/2 MBSP x 1 1/2 ID	1

226 Series



Socket Unions - Female SAE Flare to Female SAE Flare

Part No.	Connection	Pack Q'ty
226-0404	1/4 FSAE x 1/4 FSAE	2
226-0606	3/8 FSAE x 3/8 FSAE	2
226-0808	1/2 FSAE x 1/2 FSAE	1

227 Series



Socket Unions - Female SAE Flare to Female Taper BSP

Part No.	Connection	Pack Q'ty
227-0402	1/4 FSAE x 1/8 FBSP	2
227-0404	1/4 FSAE x 1/4 FBSP	2
227-0406	1/4 FSAE x 3/8 FBSP	1
227-0606	3/8 FSAE x 3/8 FBSP	1
227-0806	1/2 FSAE x 3/8 FBSP	1

231 Series



Socket Unions - Female Taper BSP to Female Taper BSP

Part No.	Connection	Pack Q'ty
231-0202	1/8 FBSP x 1/8 FBSP	2
231-0404	1/4 FBSP x 1/4 FBSP	2
231-0606	3/8 FBSP x 3/8 FBSP	2
231-0808	1/2 FBSP x 1/2 FBSP	1
231-1212	3/4 FBSP x 3/4 FBSP	1

232 Series



Socket Unions - Female Taper NPT to Female Taper NPT

Part No.	Connection	Pack Q'ty
232-0202	1/8 FNPT x 1/8 FNPT	2
232-0404	1/4 FNPT x 1/4 FNPT	MTO
232-0606	3/8 FNPT x 3/8 FNPT	2
232-0808	1/2 FNPT x 1/2 FNPT	MTO

233 Series



Unions - Female Taper BSP to Solder

Part No.	Connection	Pack Q'ty
233-0404	1/4 FBSP x 1/4 ID	5
233-0406	1/4 FBSP x 3/8 ID	5
233-0408	1/4 FBSP x 1/2 ID	5
233-0606	3/8 FBSP x 3/8 ID	2
233-0808	1/2 FBSP x 1/2 ID	2
233-0812	1/2 FBSP x 3/4 ID	1
233-1212	3/4 FBSP x 3/4 ID	1
233-1216	3/4 FBSP x 1 ID	1

234 Series



Unions - Female Taper NPT to Solder

Part No.	Connection	Pack Q'ty
234-0204	1/8 FNPT x 1/4 ID	5
234-0404	1/4 FNPT x 1/4 ID	5
234-0406	1/4 FNPT x 3/8 ID	5
234-0606	3/8 FNPT x 3/8 ID	1
234-0608	3/8 FNPT x 1/2 ID	1
234-0610	3/8 FNPT x 5/8 ID	1

Forged Elbows

300 Series



Forged Elbows - Male SAE Flare to Male SAE Flare		
Part No.	Connection	Pack Q'ty
300-0404	1/4 MSAE x 1/4 MSAE	2
300-0505	5/16 MSAE x 5/16 MSAE	2
300-0604	3/8 MSAE x 1/4 MSAE	2
300-0606	3/8 MSAE x 3/8 MSAE	2
300-0804	1/2 MSAE x 1/4 MSAE	2
300-0806	1/2 MSAE x 3/8 MSAE	2
300-0808	1/2 MSAE x 1/2 MSAE	2
300-1006	5/8 MSAE x 3/8 MSAE	1
300-1008	5/8 MSAE x 1/2 MSAE	1
300-1010	5/8 MSAE x 5/8 MSAE	1
300-1208	3/4 MSAE x 1/2 MSAE	1
300-1210	3/4 MSAE x 5/8 MSAE	1
300-1212	3/4 MSAE x 3/4 MSAE	1

304 Series



Forged Elbows - Male SAE Flare to Male Taper NPT		
Part No.	Connection	Pack Q'ty
304-0402	1/4 MSAE x 1/8 MNPT	1
304-0404	1/4 MSAE x 1/4 MNPT	1
304-0406	1/4 MSAE x 3/8 MNPT	MTO
304-0604	3/8 MSAE x 1/4 MNPT	1
304-0606	3/8 MSAE x 3/8 MNPT	1
304-0608	3/8 MSAE x 1/2 MNPT	1
304-0804	1/2 MSAE x 1/4 MNPT	1
304-0806	1/2 MSAE x 3/8 MNPT	MTO
304-0808	1/2 MSAE x 1/2 MNPT	1
304-1006	5/8 MSAE x 3/8 MNPT	1
304-1008	5/8 MSAE x 1/2 MNPT	1
304-1012	5/8 MSAE x 3/4 MNPT	1
304-1212	3/4 MSAE x 3/4 MNPT	MTO

302 Series



Forged Elbows - Male SAE Flare to Male Taper BSP		
Part No.	Connection	Pack Q'ty
302-0402	1/4 MSAE x 1/8 MBSP	2
302-0404	1/4 MSAE x 1/4 MBSP	2
302-0406	1/4 MSAE x 3/8 MBSP	2
302-0604	3/8 MSAE x 1/4 MBSP	2
302-0606	3/8 MSAE x 3/8 MBSP	2
302-0608	3/8 MSAE x 1/2 MBSP	1
302-0806	1/2 MSAE x 3/8 MBSP	MTO
302-0808	1/2 MSAE x 1/2 MBSP	1

306 Series



Forged Elbows - Male SAE Flare to Female SAE Flare		
Part No.	Connection	Pack Q'ty
306-0404	1/4 MSAE x 1/4 FSAE	1
306-0406	1/4 MSAE x 3/8 FSAE	1
306-0604	3/8 MSAE x 1/4 FSAE	1
306-0606	3/8 MSAE x 3/8 FSAE	1
306-0608	3/8 MSAE x 1/2 FSAE	1
306-0808	1/2 MSAE x 1/2 FSAE	1
306-0810	1/2 MSAE x 5/8 FSAE	1
306-1010	5/8 MSAE x 5/8 FSAE	1
306-1212	3/4 MSAE x 3/4 FSAE	1

305 Series



Forged Elbows - Male SAE Flare to Male NPT - 45° Deg.		
Part No.	Connection	Pack Q'ty
305-0402	1/4 MSAE x 1/8 MNPT	2
305-0404	1/4 MSAE x 1/4 MNPT	MTO

312 Series



Forged Elbows - Male SAE Flare to Female Solder

Part No.	Connection	Pack Q'ty
312-0404	1/4 MSAE x 1/4 ID	1
312-0408	1/4 MSAE x 1/2 ID	MTO
312-0606	3/8 MSAE x 3/8 ID	1
312-0608	3/8 MSAE x 1/2 ID	1
312-0610	3/8 MSAE x 5/8 ID	MTO
312-0806	1/2 MSAE x 3/8 ID	MTO
312-0808	1/2 MSAE x 1/2 ID	1
312-0810	1/2 MSAE x 5/8 ID	1
312-1010	5/8 MSAE x 5/8 ID	1
312-1208	3/4 MSAE x 1/2 ID	1

351 Series



Forged Elbows - Female Taper BSP to Female Taper BSP

Part No.	Connection	Pack Q'ty
351-0404	1/4 FBSP x 1/4 FBSP	1
351-0606	3/8 FBSP x 3/8 FBSP	MTO
351-0808	1/2 FBSP x 1/2 FBSP	1

319 Series



Forged Elbows - Male Taper BSP to Male Taper BSP

Part No.	Connection	Pack Q'ty
319-0404	1/4 MBSP x 1/4 MBSP	1
319-0604	3/8 MBSP x 1/4 MBSP	1
319-0606	3/8 MBSP x 3/8 MBSP	MTO
319-0808	1/2 MBSP x 1/2 MBSP	MTO

327 Series



Forged Elbows - Male Taper BSP to Female Taper BSP

Part No.	Connection	Pack Q'ty
327-0202	1/8 MBSP x 1/8 FBSP	MTO
327-0404	1/4 MBSP x 1/4 FBSP	1
327-0606	3/8 MBSP x 3/8 FBSP	1
327-0808	1/2 MBSP x 1/2 FBSP	1
327-1212	3/4 MBSP x 3/4 FBSP	MTO

Forged Tees

400 Series



Forged Tees - Male SAE Line to Male SAE Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
400-040404	1/4 MSAE x 1/4 MSAE x 1/4 MSAE	2
400-040406	1/4 MSAE x 1/4 MSAE x 3/8 MSAE	1
400-050505	5/16MSAE x 5/16MSAE x 5/16MSAE	MTO
400-060604	3/8 MSAE x 3/8 MSAE x 1/4 MSAE	MTO
400-060606	3/8 MSAE x 3/8 MSAE x 3/8 MSAE	2
400-060608	3/8 MSAE x 3/8 MSAE x 1/2 MSAE	1
400-060610	3/8 MSAE x 3/8 MSAE x 5/8 MSAE	MTO
400-080408	1/2 MSAE x 1/4 MSAE x 1/2 MSAE	1
400-080804	1/2 MSAE x 1/2 MSAE x 1/4 MSAE	1
400-080606	1/2 MSAE x 3/8 MSAE x 3/8 MSAE	1
400-080608	1/2 MSAE x 3/8 MSAE x 1/2 MSAE	1
400-080804	1/2 MSAE x 1/2 MSAE x 1/4 MSAE	1
400-080806	1/2 MSAE x 1/2 MSAE x 3/8 MSAE	1
400-080808	1/2 MSAE x 1/2 MSAE x 1/2 MSAE	1
400-080810	1/2 MSAE x 1/2 MSAE x 5/8 MSAE	1
400-080812	1/2 MSAE x 1/2 MSAE x 3/4 MSAE	1
400-100610	5/8 MSAE x 3/8 MSAE x 5/8 MSAE	MTO
400-100810	5/8 MSAE x 1/2 MSAE x 5/8 MSAE	1
400-101004	5/8 MSAE x 5/8 MSAE x 1/4 MSAE	1
400-101006	5/8 MSAE x 5/8 MSAE x 3/8 MSAE	1
400-101008	5/8 MSAE x 5/8 MSAE x 1/2 MSAE	1
400-101010	5/8 MSAE x 5/8 MSAE x 5/8 MSAE	1
400-121208	3/4 MSAE x 3/4 MSAE x 1/2 MSAE	1
400-121012	3/4 MSAE x 5/8 MSAE x 3/4 MSAE	MTO
400-121210	3/4 MSAE x 3/4 MSAE x 5/8 MSAE	MTO
400-121212	3/4 MSAE x 3/4 MSAE x 3/4 MSAE	1
400-141414	7/8 MSAE x 7/8 MSAE x 7/8 MSAE	MTO

401 Series



Forged Tees - Male SAE Line to Male Taper BSP Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
401-040402	1/4 MSAE x 1/4 MSAE X 1/8 MBSP	2
401-040404	1/4 MSAE x 1/4 MSAE x 1/4 MBSP	2



403 Series

Forged Tees - Male SAE Line to Male NPT Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
403-040402	1/4 MSAE x 1/4 MSAE x 1/8 MNPT	
403-040404	1/4 MSAE x 1/4 MSAE x 1/4 MNPT	1



408 Series

Forged Tees - Male SAE Line to Female SAE Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
408-040404	1/4 MSAE x 1/4 MSAE x 1/4 FSAE	1



409 Series

Forged Tees - Male SAE Line to Female Taper BSP Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
409-040402	1/4 MSAE x 1/4 MSAE X 1/8 FBSP	2
409-040404	1/4 MSAE x 1/4 MSAE x 1/4 FBSP	2



428 Series

Forged Tees - Male BSP Line to Male Taper BSP Branch		
Part No.	Connection (Line x Line x Branch)	Pack Q'ty
428-040404	1/4 MBSP x 1/4 MBSP x 1/4 MBSP	MTO
428-060606	3/8 MBSP x 3/8 MBSP x 3/8 MBSP	MTO

465 Series



Forged Swivel Tees - MSAE Line to F/Swivel to MSAE Branch

Part No.	Connection (Line x Line x Branch)	Pack Q'ty
465-040404	1/4 MSAE x 1/4 F/NUT x 1/4 MSAE	2

466 Series



Forged Swivel Tees - Male SAE Line to F/Swivel Branch

Part No.	Connection (Line x Line x Branch)	Pack Q'ty
466-040404	1/4 MSAE x 1/4 MSAE x 1/4 F/NUT	2



472 Series

Forged Tees - Female BSP Line to Female BSP Branch

Part No.	Connection (Line x Line x Branch)	Pack Q'ty
472-040404	1/4 FBSP x 1/4 FBSP x 1/4 FBSP	1
472-060606	3/8 FBSP x 3/8 FBSP x 3/8 FBSP	MTO
472-080808	1/2 FBSP x 1/2 FBSP x 1/2 FBSP	1

Controls

Henry Tech offer a complete range of service replacement thermostats designed to give equivalent if not superior performance to the OEM units that they are designed to replace.

Quality Henry Tech service replacement thermostats are available to cover the requirements of domestic, light commercial and commercial refrigeration and air conditioning applications.

Simply contact Henry Technologies for all your service replacement thermostat needs.

For domestic and light commercial refrigeration,

Twelve models of replacement thermostats have been developed by Henry Tech, featuring greater regulating ranges than other brands suited to common domestic and light commercial refrigeration equipment. In addition, the Henry Tech 4000 series thermostats feature a wider differential ensuring sufficient compressor 'off-time' between restarts.

Features

- Snap action contacts rated to 6 amps inductive load at 250V (16 amps for 4000-08).
- All connections are spade terminals.
- All kits come with the necessary components for trouble free fitting.
- The knobs supplied are multi indexed.

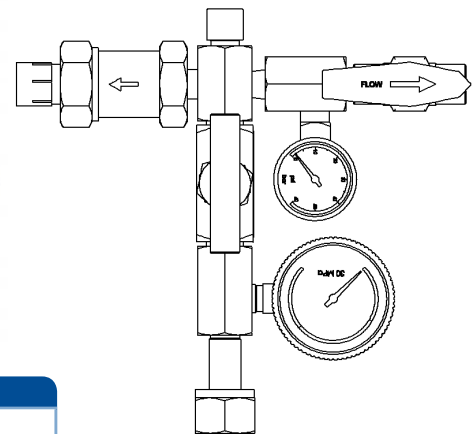
Benefits

- Components designed to deliver long service life.
- For quick and easy change over.
- Everything you need comes with the kit.
- Enables correct calibration so that original cabinet design characteristics can be maintained.

Heldon Part No.	Ranco Part No.	Application	Dial Kit	Cold		Warm		Def. Term °C	Normal		Signal Op °C	Length (mm)
				Out °C	In °C	Out °C	In °C		Out °C	In °C		
4000-01	VC-1	Compressor Refrigerator Single Door	Yes	-23			+2		-14.5	-5		1200
4000-02	VA-2	Electric Absorption Refrigerator	Yes	-18			+3.5		-4.5	-0.5		2000
4000-03	VF-3	Freezer and Ice Cream Cabinet	Yes	-34		-16.5	-12		-2.4	-18		2000
4000-05	VS-5	Freezer with Standard Signal	Yes	-34		-16.5	-12		-24	-18	Cut in 5.5 above	2000
4000-06	VR-6	Freezer with Reverse Signal	Yes	-34		-16.5	-12		-24	-18	Cut out 5.5 above	2000
4000-07	VB-7	Bottle or Beverage Cooler	Yes	-3	+2		+12.5				Cut out 5.5 above	1200
4000-08	VW-8	Window Air Conditioner (Cooling Only)	Yes	+15	+18		+34					1200
4000-09	VT-9	Two Door Cyclic Defrost Refrigerator	Yes	-26		-11	+3.5				Constant Cut In	1200
4000-12	-	Suit Commercial B6138	No	-12	5	-5.2	5				Constant Cut In	950
4000-31		Moist Cold	No	-31	3.5	-17	3.5				Constant Cut In	1150

Tools

Part No.	Description	Pack Q'ty
HT-0055	Deburrer with replaceable blades	1
HT-0056	Replacement blades.	1
HT-0057	Inner outer reamer 1/16" x 1-1/2"	1
4000-FINCOMB	FIN COMB	1



Part No.	Description	Pack Qty
HCH-744-SC	Charging Hose Assembly - Sub Critical CO2 Systems	1

Automotive

Retrofit Charging Adaptors - High and Low

Part No.	Description	Pack Q'ty
282-03	3/16 R12 CHARGING ADAPT - H	5
282-04	1/4 R12 CHARGING ADAPT - H	5
284-04	1/4 R12 CHARGING ADAPT - L	5



Quick Couplers - High & Low

Part No.	Description	Pack Q'ty
2260-04	R134a Low Profile Coupler-High MSAE	1
2261-014	R134a Low Profile Coupler-High FM14	1
2265-04	R134a Low Profile Coupler-Low MSAE	1
2266-01	R134a Low Profile Coupler-Low FM14	1
280-04014	Coupler-Adaptor - MSAE to M14	1



Quick Couplers - High & Low

Part No.	Description	Pack Q'ty
HTT-055	Deburrer with replacement blades	1
HT-0056	Replacement blades for deburrer	1
HT-0057	Inner/Outer reamer 1 1/16" x 1 1/12"	1



1. Henry Technologies TERMS AND CONDITIONS

These terms and conditions apply to the supply of goods by Henry Technologies Pty Ltd (ACN: 142 726 118, ABN: 71 142 726 118) to the Customer. By ordering or accepting goods or services from us, the Customer agrees to be bound by these terms.

2 DEFINITIONS AND INTERPRETATION

2.1 In these conditions the following expressions shall have the meanings, unless the context indicates otherwise:

ACL	means the Australian Consumer Law as set out in Schedule 2 of the Competition and Consumer Act 2010 (Cth)
Business Day	means a day on which banks are open for business in Melbourne, Victoria;
Company	means Henry Technologies Pty Ltd (ACN: 142 726 118, ABN: 71 142 726 118).
Contract	means the agreement between the Company and the Customer for the supply of Goods, taken to mean any order with terms and conditions.
Customer	means the persons, firm or company from whom an application for credit or purchase order is received or its legal assigns or successors.
Ex Works	Ex Works (Melbourne) - The seller's only responsibility is to make the goods available at his premises, (ie works or factory). The buyer bears the full cost and risk involved in bringing the goods from there to the desired destination and the buyer must be able to carry out any required export formalities. The term represents the minimum obligation for the seller.
FIS	FIS means product delivery Free into Store indicating that the seller's price includes all costs up to delivery to the buyer.
Goods	Goods means all the goods specified in the Customer's order accepted by the Company
GST	GST means GST within the meaning of the GST Act;
GST Act	means A New Tax System (Goods and Services Tax) Act 1999;
GST Amount	in relation to a taxable supply, as that term is defined in the GST Act (excluding the reference to section 84-5 of that Act), means the amount payable in respect of that taxable supply
HHR	HHR means Henry Horizontal Receiver (AS1210)
HVR	HVR means Henry Vertical Receiver (AS1210)
Penalty Interest Rate	the penalty rate fixed under the Penalty Interest Rates Act 1983 (Vic)
Personal Property Securities Register	has the meaning given to it in the PPSA;
PPSA	means the Personal Property Securities Act 2009
Purchase Moneys Security Interest	has the meaning given to it in the PPSA
Quote	means a quotation in writing we have given to the Customer setting out details of the Goods and/or Services to be supplied
Security Agreement and Security Interest	each have the meaning given to it in the PPSA
Services	means the services provided by the Company to the Customer at the Customer's request;
Terms	These terms and conditions

2.2 Where appropriate the singular shall include the plural, the plural the singular and where there are two or more persons comprised in the definition of the Customer, then the obligations imposed herein on the Customer shall be deemed to be joint and several.

3. ORDERING, DELIVERY AND ACCEPTANCE OF GOODS

3.1 All Goods and/or Services we supply to the Customer are supplied on these Terms and any other Terms set out in a Quote. These Terms take precedence over any inconsistent terms in a Quote.

3.2 All orders made by a Customer must be in writing or submitted by EDI (electronic data interface) and orders will only be accepted by the Company in writing or by delivery of the Goods ordered from the Company by the Customer.

3.3 The Customer accepts that these conditions shall apply to all relations between it and the Company to the exclusion of any other terms including any conditions, warranties or representations written or oral, expressed or implied. No condition contained in any of the Customer's documents which purport to take precedence over these terms shall prevail. No variation of these conditions shall be valid unless agreed to in writing and signed by an authorised person on behalf of the Company and the Customer.

3.4 We may vary these Terms at any time by written notice to the Customer. The Terms, as varied, will apply to all orders placed by the Customer after the date of the notice.

3.5 The Company reserves the right to amend the order placed by the Customer for products designed and manufactured to the Customers specific requirements (Made to Order Parts) and the Company will then advise the Customer who may only on seven days' written notice cancel the Contract. In all other cases of cancellation of these made to order or customer specific parts the Customer will be liable to the Company for all costs or work carried out and parts or materials ordered by the Company up to the date of cancellation. Due to the unique nature of these orders for customer specific parts, Customers are required to accept under production or over production of up to 3% of the quantity ordered. These variations in the quantity of parts will be charged or credited at the contracted price.

3.6 Notwithstanding anything else contained in this Contract, the Company is under no obligation to deliver the Goods, if the Company has reasonable doubts as to the solvency of the Customer. The Company shall in those circumstances not be liable if it elects to withhold the Goods until it has received payment for the Goods and such retention shall not amount to a repudiation of the Contract.

3.7 Whilst the Company shall make every effort to place the goods at the disposal of the Customer in accordance with any times stated in the Contract, time shall not be of the essence in this regard.

3.8 If the Customer does not take delivery of the Goods on the date specified in the Contract otherwise than through any act or omission on the part of the Company, then payment for the Goods shall be due from the Customer on the date given in the Contract for delivery of the Goods together with interest charged at the Penalty Interest Rate to the date of payment.

3.10 Delivery to the Customer and the passing of the risk to it shall take place as provided in the International Chamber of Commerce standard definition of "ex-works, except in so far as that definition is inconsistent with the specific terms of the Contract.

3.11 Customer orders in excess of \$1000 incl. GST shall be delivered free into store (FIS) to all Australian capital cities (excluding Darwin) for clarification contact Henry Technologies

3.12 Minimum order value \$50.00 will continue to be implemented in relation to one order – Not including freight.

3.13 All AS1210 products manufactured in Melbourne, including but not limited to Headers, Oil Separators, Accumulators and Liquid Receivers HVR and HHR quoted and ordered will be priced

Ex-works Melbourne unless otherwise agreed and delivery terms negotiated.

3.14 Where the cubic volume of a customer order exceeds the dead weight volume of such order, the greater will be used to calculate freight costs, unless otherwise agreed and delivery terms negotiated.

4. PPSA PROVISIONS

4.1 The Customer acknowledges that these Terms and Contract shall comprise a Security Agreement for the purposes of the PPSA.

4.2 The Customer acknowledge that until such time as we receive full payment in cleared funds for all Goods we have supplied to the Customer, these Terms and Conditions and a Contract create a Purchase Monies Security Interest in the Goods as security for the Customers obligations to the Company under the Contract and the Purchase Monies Security Interest is registrable on the Personal Property Securities Register.

4.3 Until the Company has been paid in full for all Goods supplied by it to the Customer under any Contract whatsoever between the Customer and the Company:

(a) the legal and equitable rights in the Goods shall remain in the Company;

(b) should the Goods or any of them be affixed or added to any other item, such affixation shall in no way affect the right of the Company to ownership of the Goods, or its right to detach them from any items to which they have been affixed;

(c) the Customer shall store the Goods separately and in such a way that they can be readily identified as being the property of the Company, should the Company so require;

(d) subject to (e) and (f) below the Customer shall be at liberty to sell the Goods in the ordinary course of business on the basis that the Customer shall be under a fiduciary duty to the Company to account to the Company for the proceeds of such sale but may deduct from such proceeds the amount by which the proceeds exceed the total amount due from the Customer to the Company under any contract whatsoever, provided that the Customer shall have no authority to enter into any contract of sale on behalf of the Company. Any contract of sale shall be accordingly concluded in the name of the Customer;

(e) the Company may at any time revoke the Customer's power of sale by notice to the Customer if the Customer is in default for longer than seven days in payment of any sum whatsoever due to the Company by the Customer, or if any bill of exchange, cheque or any other negotiable instrument drawn or accepted by the Customer in favour of the Company is dishonored on presentation for payment or if the Company has reasonable doubts as to the solvency of the Customer;

(f) the Customer's power of sale shall automatically cease if a receiver is appointed over any, or all of the assets or undertaking of the Customer or winding up order is made against the Customer or the Customer goes into voluntary liquidation (otherwise than for the purpose of reconstruction or amalgamation) or calls a meeting of, or makes any arrangement or composition with creditors or commits any act of bankruptcy;

(g) upon determination of the Customer's power of sale under (e) or (f) above the Customer shall place the Goods at the disposal of the Company who shall be entitled to enter upon any premises of the Customer for the purpose of removing such Goods and to remove such Goods from the premises;

(h) where payment is made by means of a bill of exchange, cheque or other negotiable instrument, the Company shall not be deemed to have received the payment until all funds are cleared.

5. PAYMENT

5.1 The Customer shall pay in full for all Goods supplied to it by the Company pursuant to any Contract whatsoever between the Customer and the Company within 30 days of the end of the month in which the invoice is issued or as otherwise agreed in writing between the Customer and the Company.

5.2 In the event that the Customer fails to pay the whole amount or any part in the time prescribed then:

(a) the whole or any part of the monies outstanding on the invoice shall become immediately due and payable;

(b) interest on the whole or any part of the monies outstanding on the invoice shall accrue at the rate of four percent over the minimum lending rate of the Commonwealth Bank as varied from time to time to the date of payment, and shall be compounded on a daily basis;

5.3 Credit may be withdrawn at any time after 30 days unless prior arrangements have been made in writing. Continued non-compliance may result in the withdrawal of the Customers credit facility.

5.4 The Company reserves the right to waive or enforce the provision of clause 5 at its absolute discretion.

6. RETURN, REPAIR AND REPLACEMENT OF GOODS

6.1 Unless any complaints about the quality or quantity of Goods are received by the Company within 30 days of delivery the Customer shall be deemed to have accepted the Goods.

6.2 In order to claim any loss or damage, notification must be made to the Company and the carriers within three days of receipt, and within 14 days of date of dispatch in the case of non-delivery.

6.3 Customers wanting to discuss returning Goods for credit should first contact the Company quoting the invoice number, order number, Henry Part number and reason for return. If agreed by the Company, the Customer will be issued with a "Return Authority Number". These details must accompany any returned Goods.

6.4 Any Goods returned are subject to the Company's inspection and investigation.

6.5 The Company will at its sole discretion either approve or reject the Customer's claim for credit. In the case of Goods which are returned for any reason other than that they are defective:

(a) the Company may impose a handling fee equal to 25% of the invoiced price of those Goods; and

(b) the Customer will be responsible for the freight and other costs of returning the Goods to the Company

6.6 If the Goods other than defective Goods are not in sealable condition when returned, all or part of the credit claimed can be refused by the Company.

6.7 Goods which are 'Made to Order' items or which are the subject of specialised runs shall not be accepted for credit.

6.8 To ensure the product integrity remains absolute, any Safety Relief Valves and Rupture Discs will not be accepted if returned and the Customers' claim for credit will be rejected, unless otherwise deemed defective by quality and approved by the Company.

7. WARRANTIES AND LIABILITY

7.1 Any representation, warranty, condition, guarantee or undertaking that would be implied into the Terms or a Contract by legislation, common law, equity, trade, custom or usage or otherwise is excluded to the fullest extent permitted by law.

7.2 The Company does not warrant or represent the performance, accuracy, reliability or continued availability of any Services or that any Services will operate free from faults, errors or interruptions.

7.3 The Company is never liable to the Customer for economic loss, business interruption, loss of revenue, profits, actual or potential business opportunities or contracts, anticipated savings, loss of profits, loss of data, indirect or consequential loss, (including but not limited to loss of refrigerant) an act or omission by a party for whom the Company is not responsible in law, a fault in or failure of premises the Company does not control or operate, any loss arising from circumstances beyond the Company's reasonable control; or the Company's failure to continue to provide any Services to the Customer for any reason whatsoever, and otherwise, the Company's maximum aggregate liability to the Customer under, in connection with or arising out of the supply of Goods and/or Services under a Contract (whether pleaded in contract, tort, breach of statutory duty or on any other basis, whether arising from acts or omissions, and whether in relation to damage or loss the risk of which the Company was or should have been aware) is limited to the aggregate charges the Customer actually paid to the Company for the supply of the Goods and/or Services the subject of the claim.

7.4 No employee or agent of the Company has any authority to make or give any representation or warranty whatsoever, whether verbal or written, in relation to the Goods. The provision of any quotation or estimate by the Company does not form part of any offer or representation made by it. All specifications, drawings, descriptions and catalogues issued by, or on behalf of the Company are intended merely to give a general description of items supplied by the Company and any person reading them may not rely on anything contained as being a representation of fact concerning the Goods produced by the Company or a warranty relating to the Goods, whether as to their condition or otherwise.

8. INDEMNITIES

The Customer shall indemnify the Company in respect of any harm, loss, injury, expense or claim of whatsoever nature we suffer arising from or in connection with the Customers breach of the Terms or a Contract, or the Customers Customer's unlawful, willful or negligent act or omission, and howsoever arising out of the Contract or the Goods, or their storage, installation, use, operation or maintenance. Save to the extent that the same is caused by the negligence of the Company, its servants or agents, including the Company's subcontractors.

9. FORCE MAJEURE

If the Company is prevented, or delayed from, or in performing any of its obligations under the Contract by force majeure, which shall include but not be limited to strikes, lock-outs or other industrial action, whether or not by, or involving employees of the Company, then the Company may give notice in writing to the Customer of the circumstances constituting force majeure and of the obligation, performance of which is delayed or prevented and shall be excused from compliance with such obligations for as long as such circumstances may continue. If by virtue of this Clause either party is excused from compliance with any obligation for a continuous period of four calendar months then without prejudice to any other right or remedy either party may forth with terminate the Contract by giving notice in writing to the other.

10. GOVERNING LAW

These conditions shall be governed by the laws of the State of Victoria.



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