HENRY GROUP®

PRODUCT CATALOGUE EMEAI

AC&R COMPONENTS

www.henry-group.net

INTELLIGENT MANUFACTURING. INTELLIGENT PRODUCTS.

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

The Henry Group 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 the Henry Group 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.

Please refer to our standard terms and conditions of sale for details of our warranty cover. Copies are available on request.
Date of publication: November 2020

CONTENTS

Building a strategic platform to serve a global market.

It began more than a century ago.

In 1914 our founder, Guy Henry, started the company in Chicago, Illinois making gas lanterns and accessory gauges for Model "T" Ford automobiles.

By the end of its first decade, Henry had entered the refrigeration market, creating our first globe and angle valve, and filtration and dehydration devices for refrigeration systems.

Today, the Henry Group is being re-engineered to transform regional platforms into a single sustainable global platform and is evolving into a 21st century company that spans the globe. With a corporate office in Hong Kong and operations in Australia, China, Singapore, the United Kingdom and the United States, the Henry brand is truly global.

While any product from any region is available world-wide, we will also maintain full-service operations in multiple locations as detailed in the map. This will broaden our product offering while adding more depth to our customer service.

We invite you to explore our world.

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INTRODUCTION

The focus of the Henry Group is to continually improve our customers' experience in every aspect of service. We seek to build on over a century of experience, to ensure that our customers receive components that are delivered on time, perform to specification and are reliable in service.

In the cooling industry, intelligent manufacturing brings a level of value and advantage never before experienced, only imagined.

HENRY competitors talk about smart manufacturing. We're installing it. Right now, our engineers are completing the first phase of an intelligent manufacturing platform that interacts seamlessly between machines, between machines and people, and at all points in the manufacturing process.

Our engineers are deeply invested in the products that carry the Henry brand. They want to give you the assurance that you have purchased not just a product, but a promise.

At Henry we strive to make failure impossible. If a product has ever shown weakness, wear or inefficiencies, we've fixed it, improved it, recreated the product itself or the method that made it. But this uncompromising standard is only as good as our quality assurance process. If a product doesn't pass our intensive screening process, it doesn't earn the Henry imprimatur.

The journey, in many ways, has now just begun. The Henry brand promise is only achieved when a product arrives at its destination in perfect condition.

THE BRANDS

The Henry Valve Company, commenced production in Chicago in 1914. Today, The Henry Group is a leading manufacturer of low control products for the commercial refrigeration and air-conditioning industries. Products include:

- Ball Valves
- Check Valves
- Globe Valves
- Three-Way Shut-off Valves
- Pressure Relief Valves
- Rupture Discs
- Safety Device Assemblies

AC&R Components Inc. was acquired by Henry Valve Company in 1970. Today both products ranges are manufactured in production facilities in the Australia, China, United States and Scotland.

The AC&R Components brand is a world leader for quality, design and innovation of oil management controls and other compressor protective devices. Products include:

- Oil Separators
- Mechanical and Electronic Oil Level Regulators
- Suction Line Accumulators
- Mufflers
- Sight Glasses
- Filter Driers
- Vibration Eliminators

MANUFACTURING & QUALITY

MANUFACTURING

The majority of products are manufactured in our plant in Scotland where we have our own machining, fabrication, assembly and finishing facilities. The range is augmented by products from Henry facilities in Australia, China and the United States. Manufacturing is supported by a sophisticated local infrastructure of precision engineering suppliers.

The manufacturing philosophy in Scotland follows lean principles. Here we have embarked on a journey of waste elimination in order to leverage the skills and experience of our employees to develop new and better ways to deliver value to our customers. We see this as an unfinished task, but we are proud off our achievements and welcome customer visits where ideas may be shared.

QUALITY

The Henry and AC&R Components brands speak of quality. A systematic approach to design, material selection, sourcing, manufacture and testing has ensured that our products have an enviable reputation as the benchmark in our market. Management systems comply with various international standards including ISO 9001:2015, the pressure Equipment Directive and individual national standards

Henry is committed to business excellence. We continually review our processes in order to identify potential areas for improvement. In this way, we strive to continuously promote and improve quality. Employees are trained to ensure a good understanding of roles and responsibilities and customer feedback is used to highlight opportunities to refine our designs and procedures.

CERTIFICATES

- Certificate of Authorization - ASME UV


CERTIFICATE OF AUTHORIZATION

UV

The named company is authorized by the American Society of Mechanical Engineers (ASME) for the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the certification mark and the authority granted by this Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any construction stamped with this certification mark shall have been built strictly in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY:

Henry Technologies Ltd.
76 Mossland Road, Hillington Park
Glasgow G52 4XZ
United Kingdom

SCOPE:

Manufacture of pressure vessel pressure relief valves at the above location only.
(This authorization does not cover welding, brazing or fusing)

- The National Board of Boiler and Pressure Vessel Inspectors - NB


THE NATIONAL BOARD
OF
BOILER & PRESSURE VESSEL INSPECTORS
Certificate of Authorization

This is to certify that

Henry Technologies Ltd
Acceptable Abbrev.: HENRY
76 Mossland Road
Hillington Park, Glasgow, Scotland, G52 4XZ
United Kingdom

is authorized to use the "NB" mark in accordance with the provisions of NB-501, National Board Certification of Pressure Relief Devices.

The scope of Authorization is limited to National Board Certified devices which have been manufactured, assembled and marked in accordance with the following construction codes:

ASME Section VIII, Division 1: "UV" Stamp

Issue Date: November 8, 2013
Expiration Date: November 2, 2021

- Certificate of Quality System CE-0062-PED-D1-HEN


Bureau Veritas Services SAS is a Notified Body under the number 0062

BUREAU VERITAS

CERTIFICATE OF QUALITY SYSTEM APPROVAL
N° CE-0062-PED-D1-HEN 001-20-GBR-rev-A

Bureau Veritas Services SAS, acting within the scope of its notification (notified body number 0062) , attests that the quality system operated by the manufacturer for production, final product inspection and testing of the pressure equipment identified hereunder has been examined against the provisions of annex III, module D1, of the Pressure Equipment Directive n° 2014/68/EU, and found to satisfy the provisions of the directive which apply to it.

Manufacturer (name):	HENRY TECHNOLOGIES LIMITED
Address:	MOSSLAND ROAD HILLINGTON INDUSTRIAL ESTATE GS2 4XZ GLASGOW, United Kingdom
Trading Name - Mark:	As above.
Equipment description:	Pressure Equipment for Refrigeration System
Identification of equipment concerned (list on the back or attached where necessary)	See List of concerned equipment on page 2
This certificate will expire on (dd/mm/yyyy):	04/10/2021

The approval is conditional upon the surveillance audits, visits, tests and verifications to be carried out by the local Bureau Veritas entity that entered into a contract with the manufacturer, pursuant to the provisions of such contract.

This certificate shall be deemed to be void and the manufacturer shall alone bear any consequences pursuant to its use, where the manufacturer fails to comply with his undertakings detailed in application form in respect of (a) implementation of the approved quality system, (b) conformity of the equipment with the EC-type or design approval or EU-type type approval conditions and (c) inspection and tests on the final product, and generally where the manufacturer fails in particular to comply with any of his obligations under directive nr 2014/68/EU of 15 may 2014 as transposed in the applicable law(s).

- Certificate of Quality System CE-0062-PED-D-HEN


Bureau Veritas Services SAS is a Notified Body under the number 0062

BUREAU VERITAS

CERTIFICATE OF QUALITY SYSTEM APPROVAL
N° CE-0062-PED-D-HEN 001-20-GBR

Bureau Veritas Services SAS, acting within the scope of its notification (notified body number 0062) , attests that the quality system operated by the manufacturer for production, final product inspection and testing of the pressure equipment identified hereunder has been examined against the provisions of annex III, module D, of the Pressure Equipment Directive n° 2014/68/EU, and found to satisfy the provisions of the directive which apply to it.

Manufacturer (name):	HENRY TECHNOLOGIES LIMITED
Address:	MOSSLAND ROAD HILLINGTON INDUSTRIAL ESTATE GS2 4XZ, GLASGOW, United Kingdom
Trading Name - Mark:	As above.
Equipment description:	Pressure Equipment for Refrigeration Systems

View other data on the back of this page.

This certificate will expire on (dd/mm/yyyy): 04/10/2021

The approval is conditional upon the surveillance audits, visits, tests and verifications to be carried out by the local Bureau Veritas entity that entered into a contract with the manufacturer, pursuant to the provisions of such contract.

This certificate shall be deemed to be void and the manufacturer shall alone bear any consequences pursuant to its use, where the manufacturer fails to comply with his undertakings detailed in application form in respect of (a) implementation of the approved quality system, (b) conformity of the equipment with the EC-type or design approval or EU-type type approval conditions and (c) inspection and tests on the final product, and generally where the manufacturer fails in particular to comply with any of his obligations under directive nr 2014/68/EU of 15 may 2014 as transposed in the applicable law(s).

- Certificate of Registration - Quality Management System ISO 9001:2015


bsi.

By Royal Charter

Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that: Henry Technologies Limited
Mossland Road
Hillington Park
Glasgow
G52 4XZ
United Kingdom

Holds Certificate Number: FM 10696

and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

ENGINEERING

ENGINEERING

Henry has its own engineering team. These engineers are responsible for providing technical support to both our in-house manufacturing team and our customers. In addition, they are responsible for new product development. A systematic design approach is taken to ensure each new product meets or exceeds customer requirements. Our design process focuses on delivering both innovative and robust new products.

The latest design tools are employed including 3D modelling, Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD). Each new design is rigorously tested before product release.

GENERAL INFORMATION

To ensure reliability, all products are leak tested in line with in-house manufacturing and quality procedures. Functional testing is also conducted where appropriate.

A powder coat paint system is applied as an external finish to all tank products. This paint system provides excellent corrosion protection, passing the 500-hour ASTM B117 salt spray test.

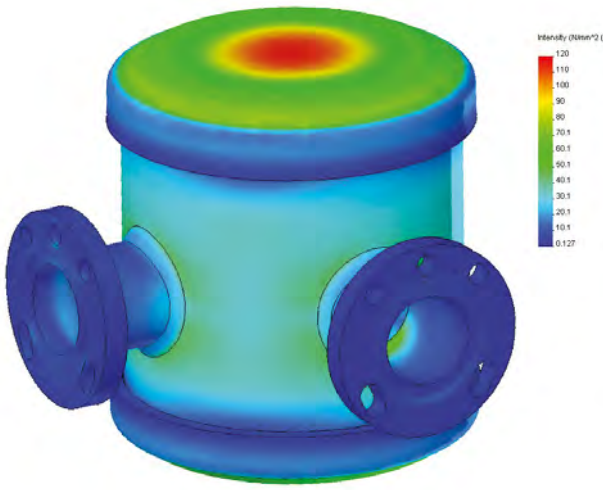
This catalogue lists standard products for use with conventional refrigerants. If you have a requirement for customised products, please contact us. At Henry we are able to design and manufacture a range of customised products for special applications.

Technical notes

1. All dimensions stated in catalogue are nominal.
   All product dimensions are subject to manufacturing tolerances.
2. Catalogue line drawings only show main dimensions and features. If additional information is required, please contact the factory. 3D solid models and 2D drawings are available on request.
3. Abbreviations:-

- MWP = Maximum working pressure (allowable). Used on pressure relief valve and other product connections to aid 'dryseal' performance.
- NPTF = American National 'Fuel' Taper Pipe Thread. Typically used on pressure relief valve connections to aid 'dryseal' performance. The 'F' in this nomenclature does not signify a female thread.
- SAE = Straight threaded connection, in accordance with SAE J513-92; ASME B1.1-89.
- ODS = Female soldering connection. This size is equal to the outside diameter of the mating pipe.
- Kv or Kvs = Valve constant. The rate of water flow, m^3/hr, for a differential pressure ΔP of 1 barg, at the rated full opening.

4. All weights listed in the catalogue are net dry weights.



FEA - OIL LEVEL REGULATOR

CFD - PRESSURE RELIEF VALVE

STANDARD, HIGH PRESSURE (HPBV) AND SIGHT GLASS (BVSG) BALL VALVES

HIGH PRESSURE BALL VALVE

BALL VALVE WITH SIGHT GLASS

Applications

Ball valves are used in a wide variety of air conditioning and refrigeration applications. They can be used for both liquid and gas applications. This type of valve is commonly used for isolating purposes. All valves are suitable for CO_2, HCFC and HFC refrigerants along with their associated oils. Additionally, standard models up to and including 3 1/8 and 76mm sizes are suitable for R290 and A2L gases compatible with the valve materials.

The BVSG combines the traditional ball valve with a sight glass and moisture indicator. A typical location for this combination product is in the liquid refrigerant line. The ball valve is used for isolating purposes, the sight glass for a visual display inside the line and the moisture indicator monitors the moisture content in the system.

The HPBV is suitable for transcritical CO_2 applications.

Main Features

Construction Features

- Bi-directional flow
- Indicator on stem shows valve position - open or closed
- Positive stem stop ensures precise positioning in the open or closed position
- Blow-out proof stem
- Ball cavity vented to prevent over-pressure
- Vented seal cap
- Schrader valve option (not applicable to HPBV)
- Mounting pad
- Large clear sight glass (BVSG only)
- Positive colour contrast indicator (BVSG only)
- Plastic protection cap for sight glass supplied as standard (BVSG only)
- UL Listed (standard range 907 and 937 models only - excludes BVSG)

Sealing integrity features

- Premium quality PTFE ball seals
- Premium quality TFM™ ball seals (HPBV only)
- Double O-ring stem seal design
- Premium quality neoprene stem O-ring seals (not HPBV)
- Premium quality HNBR stem O-ring seals (HPBV)
- Seal cap retainer – prevents loss of cap
- PTFE cap seal – acts as a secondary seal
- Hermetically sealed sight glass (BVSG only)

Technical Specification

Allowable operating temperature = -40°C to +120°C

Allowable operating temperature = -40°C to +150°C (HPBV)

Allowable operating pressure = 0 to 48 barg / 60 barg depending on model

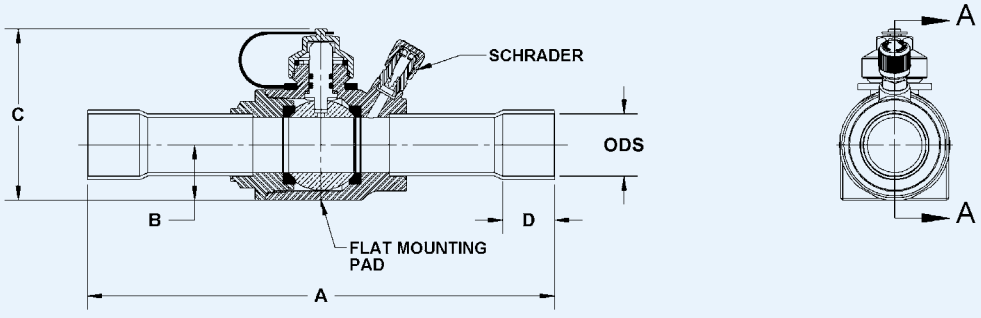
Allowable operating pressure = 0 to 130 barg (HPBV)

Materials of Construction

The valve body, valve body adaptor, ball and seal cap are made from brass. The stem is made from brass or plated steel. The pipe extensions are made from copper/K65 copper alloy. The ball seals are made from virgin PTFE/TFM, stem O-rings from neoprene/HNBR and cap seal from PTFE.

Installation – Main issues

The valve body must be protected against excessive heat during installation to prevent damage to the seals. Full details are provided in the installation sheet, included with each valve.



Standard Ball Valve with Schrader valve

Ball Valves Imperial

Part No		ODS (inch)	Dimensions (mm)					Port Size (mm)	Weight (kg)	MWP (barg)	Kv Value (m^3/hr)	CE Cat
Standard	Schrader Valve		A	B	C	D	Mounting pad hole thread details -2 off					
907202	937202	1/4	165	16	58	8	8-36 UNF-2B X 20 pitch	12.70	0.33	60	1.81	SEP
907203	937203	3/8	165	16	58	8	8-36 UNF-2B X 20 pitch	12.70	0.33	60	3.70	SEP
907204	937204	1/2	165	16	58	10	8-36 UNF-2B X 20 pitch	12.70	0.33	60	6.02	SEP
907205	937205	5/8	165	16	58	13	8-36 UNF-2B X 20 pitch	12.70	0.33	60	11.95	SEP
907306	937306	3/4	184	21	71	16	8-36 UNF-2B X 32 pitch	19.05	0.62	60	18.06	SEP
907307	937307	7/8	184	21	71	19	8-36 UNF-2B X 32 pitch	19.05	0.64	60	26.06	SEP
907409	937409	1 1/8	216	25	80	23	10-32 UNF-2B X 40 pitch	25.40	0.95	60	52.72	Cat II
908511	938511	1 3/8	235	31	98	25	10-32 UNF-2B X 48 pitch	31.75	1.52	60	73.27	Cat II
908613	938613	1 5/8	254	39	113	28	1/4"-28 UNF-2B X 60 pitch	38.10	2.44	60	182.32	Cat II
908617	938617	2 1/8	289	47	136	34	1/4"-28 UNF-2B X 75 pitch	50.80	4.58	60	245.10	Cat II
908721	938721	2 5/8	327	47	136	37	1/4"-28 UNF-2B X 75 pitch	50.80	5.04	60	204.68	Cat II
908721FP	937821FP	2 5/8	365	60	158	37	1/4"-28 UNF-2B X 75 pitch	63.50	8.73	60	258.86	Cat II
908725	938725	3 1/8	365	60	158	42	1/4"-28 UNF-2B X 75 pitch	63.50	8.73	60	278.64	Cat II
908825FP	-	3 1/8	420	72	182	43	5/16-24 UNF-2B X 104 pitch	80.00	18.20	48	361.20	Cat II
908829*	-	3-5/8	420	72	182	43	5/16-24 UNF-2B X 104 pitch	80.00	18.20	48	439.46	Cat I
908833*	-	4-1/8	420	72	182	56	5/16-24 UNF-2B X 104 pitch	80.00	18.20	48	447.20	Cat I

*Unsuitable for hazardous fluids.

Ball Valves Metric

Part No		ODS (mm)	Dimensions (mm)					Port Size (mm)	Weight (kg)	MWP (barg)	Kv Value (m^3/hr)	CE Cat
Standard	Schrader Valve		A	B	C	D	Mounting pad hole thread details -2 off					
907206M	937206M	6	165	16	58	8	8-36 UNF-2B X 20 pitch	12.70	0.33	60	1.81	SEP
907210M	937210M	10	165	16	58	8	8-36 UNF-2B X 20 pitch	12.70	0.33	60	3.70	SEP
907212M	937212M	12	165	16	58	10	8-36 UNF-2B X 20 pitch	12.70	0.33	60	6.02	SEP
907205	937205	16	165	16	58	13	8-36 UNF-2B X 20 pitch	12.70	0.33	60	11.95	SEP
907318M	937318M	18	184	21	71	17	8-36 UNF-2B X 32 pitch	19.05	0.62	60	18.06	SEP
907307	937307	22	184	21	71	20	8-36 UNF-2B X 32 pitch	19.05	0.64	60	26.06	SEP
908428M	938428M	28	216	25	80	24	10-32 UNF-2B X 40 pitch	25.40	0.95	60	52.72	Cat II
908511	938511	35	235	31	98	25	10-32 UNF-2B X 48 pitch	31.75	1.52	60	73.27	Cat II
908642M	938642M	42	254	39	113	28	1/4"-28 UNF-2B X 60 pitch	38.10	2.44	60	182.32	Cat II
908617	938617	54	289	48	136	35	1/4"-28 UNF-2B X 75 pitch	50.80	4.58	60	245.10	Cat II
908764M	938764M	64	327	48	136	35	1/4"-28 UNF-2B X 75 pitch	50.80	5.04	60	204.68	Cat II
908764MFP	938764MFP	64	365	60	158	35	1/4"-28 UNF-2B X 75 pitch	63.50	8.73	60	258.86	Cat II
908776M	938776M	76	365	60	158	43	1/4"-28 UNF-2B X 75 pitch	63.50	8.73	60	278.64	Cat II
907889M*	-	89	420	72	182	43	5/16-24 UNF-2B X 104 pitch	80.00	18.20	48	361.20	Cat I
9078108M*	-	108	420	72	182	58	5/16-24 UNF-2B X 104 pitch	80.00	18.20	48	439.46	Cat I

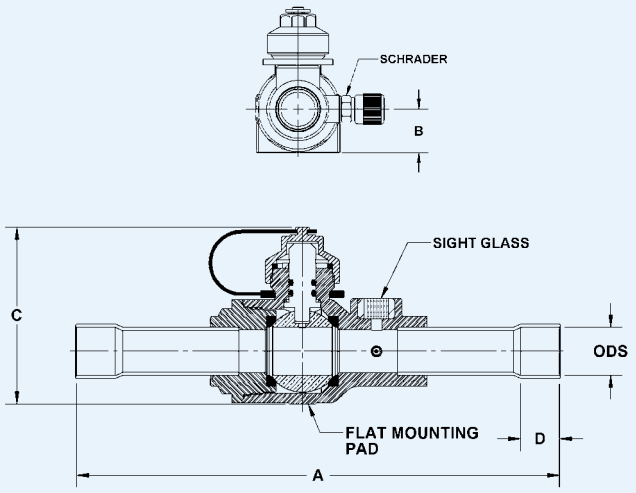
*Unsuitable for hazardous fluids.

Ball Valve with Sight Glass

Part No		ODS (inch)	ODS (mm)	Dimensions (mm)					Port Size (mm)	Weight (kg)	MWP (barg)	Kv Value (m^3/hr)	CE Cat
Standard	Schrader Valve			A	B	C	D	Mounting pad hole thread details -2 off					
907202SG	937202SG	1/4	–	185	16	59	8	8-36 UNF-2B X 20 pitch	12.70	0.42	60	1.81	SEP
907203SG	937203SG	3/8	–	185	16	59	8	8-36 UNF-2B X 20 pitch	12.70	0.42	60	3.70	SEP
907204SG	937204SG	1/2	–	185	16	59	10	8-36 UNF-2B X 20 pitch	12.70	0.42	60	6.02	SEP
907205SG	937205SG	5/8	16	185	16	59	13	8-36 UNF-2B X 20 pitch	12.70	0.42	60	11.95	SEP
907306SG	937306SG	3/4	–	211	21	71	19	8-36 UNF-2B X 32 pitch	19.05	0.80	60	18.06	SEP
907307SG	937307SG	7/8	22	211	21	71	20	8-36 UNF-2B X 32 pitch	19.05	0.80	60	26.06	SEP
907409SG	937409SG	1 1/8	–	237	26	80	24	10-32 UNF-2B X 40 pitch	25.40	1.20	60	52.72	Cat II

Moisture Colour Table

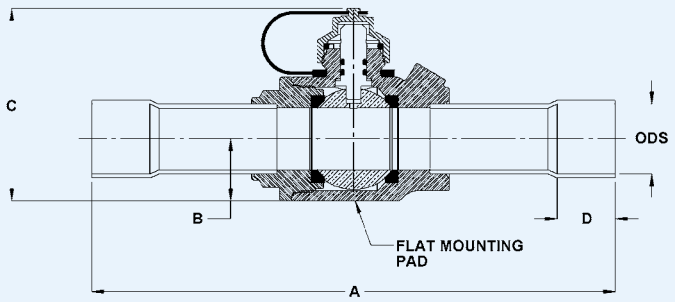
Refrigerant	Moisture content (parts per million)			
	Temp (°C)	Indicator Colour		
		Green	Chartreuse	Yellow
R404A	24	below 20	20-100	above 100
	38	below 35	35-130	above 130
	52	below 45	45-200	above 200
R410A	24	below 20	20-100	above 100
	38	below 30	30-120	above 120
	52	below 50	50-150	above 150
R134a	24	below 30	30-90	above 90
	38	below 50	50-120	above 120
	52	below 70	70-150	above 150
R22	24	below 20	20-85	above 85
	38	below 30	30-90	above 90
	52	below 45	45-110	above 110
R744	24	below 15	15-80	above 80
	38	below 20	20-90	above 90
	52	below 35	35-110	above 110



Ball Valve with Sight Glass

High Pressure Ball Valves

Part No		ODS (inch)	ODS (mm)	Dimensions (mm)					Port Size (mm)	Weight (kg)	MWP (barg)	Kv Value (m^3/hr)	CE Cat
Imperial	Metric			A	B	C	D	Mounting pad hole thread details -2 off					
907202TH	-	1/4	-	165	16	58	8	8-36 UNF-2B X 20 mm pitch	12.70	0.33	130	1.81	SEP
907203TH	-	3/8	-	165	16	58	8	8-36 UNF-2B X 20 mm pitch	12.70	0.33	130	3.70	SEP
907204TH	-	1/2	-	165	16	58	10	8-36 UNF-2B X 20 mm pitch	12.70	0.33	130	6.02	SEP
907205TH	-	5/8	16	165	16	58	13	8-36 UNF-2B X 20 mm pitch	12.70	0.33	130	11.95	SEP
907306TH	-	3/4	-	184	21	71	16	8-36 UNF-2B X 32 mm pitch	19.05	0.62	130	18.06	SEP
907307TH	-	7/8	22	184	21	71	19	8-36 UNF-2B X 32 mm pitch	19.05	0.64	130	26.06	SEP
907409TH	-	1-1/8	-	216	25	80	23	10-32 UNF-2B X 40 mm pitch	25.40	0.95	130	52.72	SEP
907511TH	-	1-3/8	35	235	31	98	25	10-32 UNF-2B X 48 mm pitch	31.75	1.52	130	73.27	Cat I
907613TH	-	1-5/8	-	254	39	113	28	1/4"-28 UNF-2B X 60 mm pitch	38.10	2.44	130	182.32	Cat I



High Pressure Ball Valve

MINI BALL VALVES

Applications
Ball valves are used in a wide variety of air conditioning and refrigeration applications. They can be used for both liquid and gas applications. This type of valve is commonly used for service purposes. All valves are suitable for CO_2, HCFC, HFC and A2L refrigerants along with their associated oils.

Main Features
Construction Features
- Bi-directional flow
- Stem actuator shape indicates valve position – open or closed
- Positive stem stop ensures precise positioning in the open or closed position
- Ball cavity vented to prevent over-pressure

Sealing integrity features
- Premium quality PTFE ball seals
- Premium quality neoprene stem O-ring seal

Technical Specification
Allowable operating temperature = -40°C to +120°C

Allowable operating pressure = 0 to 60 barg

Materials of Construction

The valve body, valve adaptor, ball and stem are made from brass. The stem actuator is made from plated brass. The pipe extensions are made from copper. The ball seals are made from virgin PTFE and O-rings from super neoprene.

Installation – Main issues

Where appropriate, the valve body must be protected against excessive heat during installation to prevent damage to the seals.

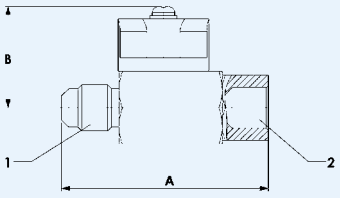


Fig. 1

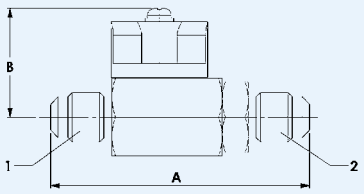


Fig. 2

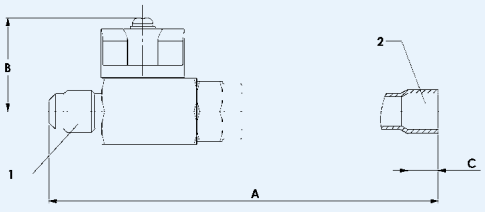


Fig. 3

Part No	Conn Size (inch)		Dimensions (mm)			Drawing reference	Port Size (mm)	Weight (kg)	MWP (barg)	CE Cat
	1	2	A	B	C					
MBV-02-MF	1/4 SAE Flare (Male)	1/4 SAE Flare (Female)	50	24	N/A	Fig.1	4.76	0.09	60	SEP
MBV-02-MM	1/4 SAE Flare (Male)	1/4 SAE Flare (Male)	58	24	N/A	Fig.2	4.76	0.09	60	SEP
MBV-02S	1/4 SAE Flare (Male)	1/4 ODS	101	24	8	Fig.3	4.76	0.10	60	SEP
MBV-03S	1/4 SAE Flare (Male)	3/8 ODS	101	24	8	Fig.3	4.76	0.10	60	SEP

CHECK VALVES

The function of a check valve is to allow fluid flow in one direction only. The Henry Technologies range are lift check valves.

Applications

Henry Technologies check valves are suitable for HCFC and HFC refrigerants, along with their associated oils. 116 series valves and NRV14/18 models are also suitable for use with A2L refrigerants compatible with their materials of construction.

A typical application is to install a check valve downstream of an oil separator. This prevents condensed liquid refrigerant returning down the discharge line and into the separator.

Main features

- Robust design
- Flow direction arrow
- Quiet and efficient operation
- Minimum opening pressure
- Models with copper extensions – NRV E
- UL listed 116 series

Technical Specification

Allowable operating pressure = 0 to 34.5 barg (205 and NRV series)

Allowable operating pressure = 0 to 60 barg (116 series)

Allowable operating temperature:-

116 series = -40°C to +150°C

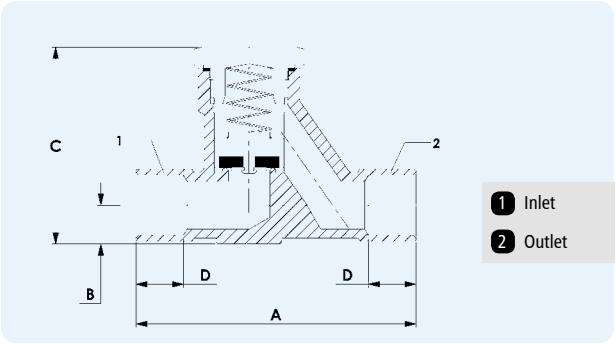
205 series = -29°C to +150°C

NRV series = -40°C to +120°C

Typically, Henry check valves will start to open at 0.034 barg and be fully open at 0.34 barg pressure differential.

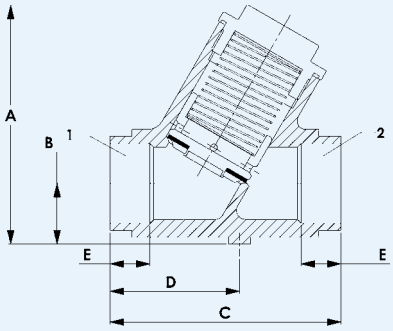
Materials of Construction

The valve body for the 205 series is made from cast bronze. All other check valve bodies are made from brass. All pistons are made from brass. Springs are made from stainless steel. The seat seal material is PTFE for the 116, 205 and NRV series.

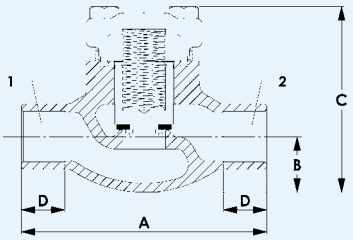


116 SERIES

Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	Kv (m^3/hr)	CE Cat
		A	B	C	D			
116003	3/8 ODS	75	10	52	8	0.24	1.38	SEP
116004	1/2 ODS	75	10	52	10	0.23	1.90	SEP
116005	5/8 ODS	75	10	52	13	0.22	2.25	SEP
116007	7/8 ODS	99	16	75	22	0.92	3.10	SEP

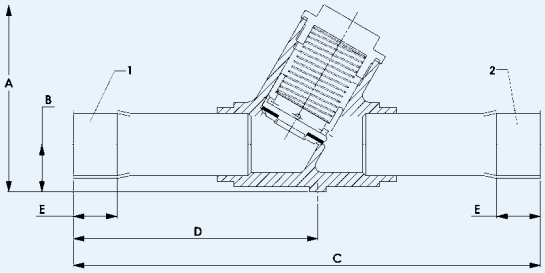


NRV SERIES



205 SERIES

1 Inlet ODS
2 Outlet ODS



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	Cat I
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	Cat I
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.

MAGNI-CHEK VALVES™

How It Works

A Magni-Chek Valve™ uses magnetic attraction to return the valve plate to its seat rather than spring pressure. A conventional check valve requires an increase in pressure to force the valve plate off its seat thus causing an increase in pressure drop. The Magni-Chek Valve™ has a decreasing force to move it away from its seat. The further it travels the more the magnetic attraction diminishes resulting in a decrease in pressure drop.

Applications

Magni-Chek Valves™ can be installed in discharge, liquid and suction lines where it is necessary to ensure fluid flow only occurs in one direction. The valves are suitable for use with HCFC, HFC and CO_2 refrigerants along with their associated oils. In addition, valve part numbers F6306 to F6311 inclusive are also suitable for use with A2L refrigerants compatible with their materials of construction.

Note these valves are not suitable for use in heat reclaim applications with high differential pressures.

Main Features

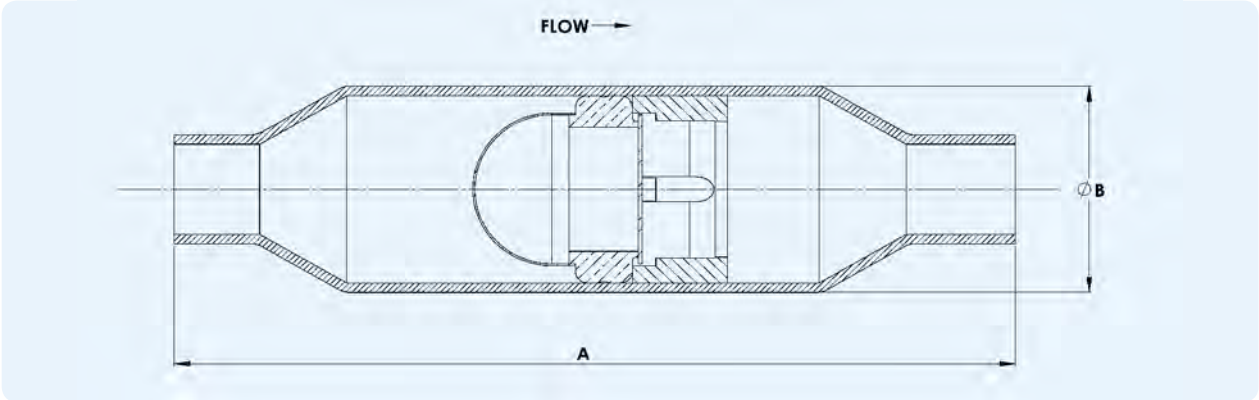
- Maximum flow and minimum pressure drop
- Can be installed in any orientation
- Cost effective
- 30 mesh strainer – extends valve service life
- Optimised seat material with a neoprene-coated valve plate
- Suitable for a wide range of applications

Technical Specification

Allowable operating temperature = -40°C to + 120°C
Allowable operating pressure = Minimum 0 barg, Maximum as per table below.

Opening pressure < 0.07 barg

Refer to the table for maximum operating pressure differential (MOPD)



Magni-Chek Valves™

Part No	Model No	Conn Size (inch)	Dimensions (mm)		Kv (m3/hr)	MOPD (Bar)	MWP (Barg)	Weight (kg)	CE Cat
			A	B					
F6306	MS-4	1/4 ODS	102	22	0.47	20.7	55.2	0.10	SEP
F6307	MS-6	3/8 ODS	102	22	0.99	20.7	55.2	0.10	SEP
F6308	MS-8	1/2 ODS	127	29	2.67	20.7	48.3	0.17	SEP
F6309	MS-10	5/8 ODS	127	29	2.98	20.7	48.3	0.17	SEP
F6310	MS-12	3/4 ODS	178	41	5.56	17.2	48.3	0.43	SEP
F6311	MS-14	7/8 ODS	178	41	7.58	17.2	48.3	0.42	SEP
F6312	MS-18	1 1/8 ODS	213	54	13.19	13.8	48.3	0.75	SEP
F6313	MS-22	1 3/8 ODS	240	67	16.26	13.8	48.3	1.27	Cat I
F6314	MS-26	1 5/8 ODS	267	80	27.78	13.8	48.3	1.80	Cat I
F6315	MS-34	2 1/8 ODS	305	92	48.27	13.8	48.3	1.80	Cat I
F6316	MS-42	2 5/8 ODS	330	105	64.76	6.9	44.8	3.70	Cat I
F6085	MS-50	3 1/8 ODS	330	105	64.76	6.9	44.8	3.70	Cat I

GLOBE VALVES

Globe Valves are used for isolating purposes. The Henry Technologies range includes two versions; with and without copper extensions.

Applications

Globe valves are used in both low and high side applications.

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

Main features

- Angled body combines compact design with low pressure drop
- Vented seal cap
- Non rising stem
- Flow direction arrow on valve body
- Premium quality neoprene O-ring seals

Technical Specification

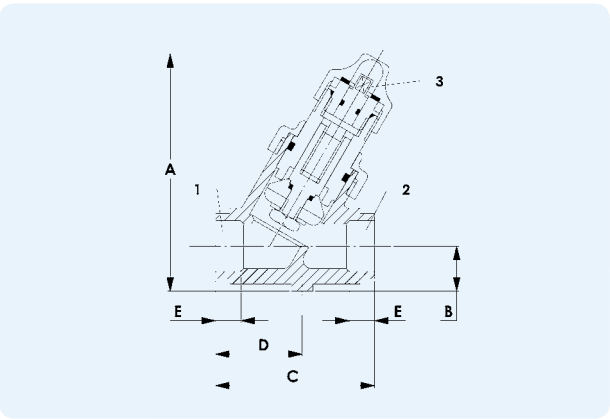
Allowable operating pressure = 0 to 34.5 barg
Allowable operating temperature = -40˚C to +120˚C

Materials of Construction

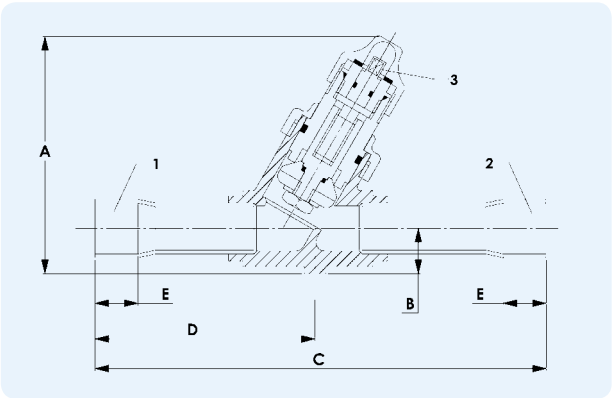
The valve body, bonnet and seal cap are made from brass. The stem is made from plated steel. The seat seal is made from nylon. The ODS extensions for the "E" models are made from copper.

Installation – Main issues

1. During brazing, the valve must be protected against excessive heat to prevent damage to the machined bores and seals. Full instructions are given in the Product Instruction Sheet, included with each valve.



RLV SERIES



RLV E SERIES

1. Inlet ODS
2. Outlet ODS
3. 6.4mm square drive

Part No	Conn Size (inch)	Dimensions (mm)					Weight (kg)	Kv (m³/hr)	CE Cat
		A	B	C	D	E			
RLV14	7/8 ODS	110	20	70	38	11	0.87	6.5	SEP
RLV18	1 1/8 ODS	110	20	70	38	11	0.80	11	SEP
RLV22-CE	1 3/8 ODS	134	27	102	58	17	1.75	18.1	Cat I
RLV26-CE	1 5/8 ODS	134	27	102	58	17	1.60	22	Cat I

Part No	Conn Size (inch)	Dimensions (mm)					Weight (kg)	Kv (m³/hr)	CE Cat
		A	B	C	D	E			
RLV14E	7/8 ODS	110	20	188	97	19	1.06	6.5	SEP
RLV18E	1 1/8 ODS	110	20	225	116	23	1.08	11	SEP
RLV22E-CE	1 3/8 ODS	134	27	265	138	25	2.10	18.1	Cat I
RLV26E-CE	1 5/8 ODS	134	27	271	143	28	2.10	22	Cat I

PACKLESS 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. In addition, the 2100B and 2111B series are suitable for A2L 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

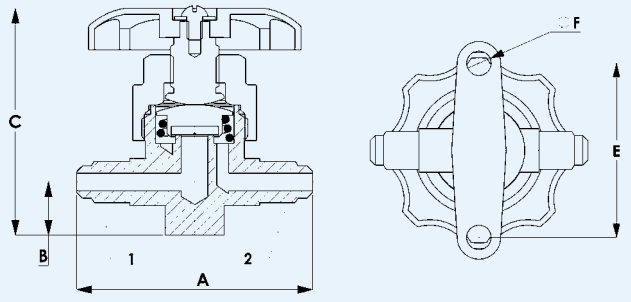
The valve body and bonnet are made from brass. The lower stem is made from brass for all models except the 629 series, where the material is monel.

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.

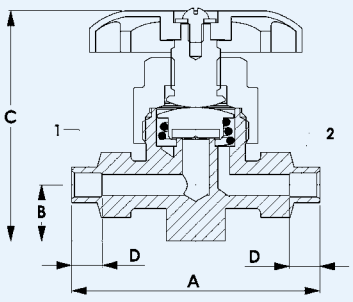
Materials of Construction - 2100B & 2111B series

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.

GOLDEN BANTAM SERIES



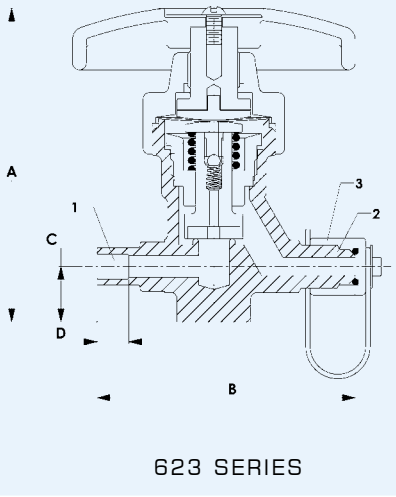
515 SERIES



516 SERIES

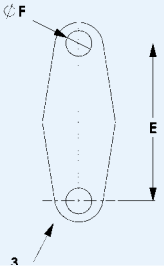
1 Inlet
2 Outlet

Golden Bantam Valves											
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	51	7	0.29	1.20	SEP

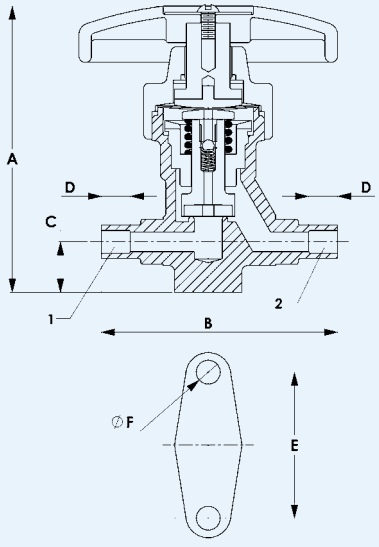


623 SERIES

1. Inlet ODS connection
2. Outlet SAE flare connection
3. Integral seal cap
4. Mounting flange detail



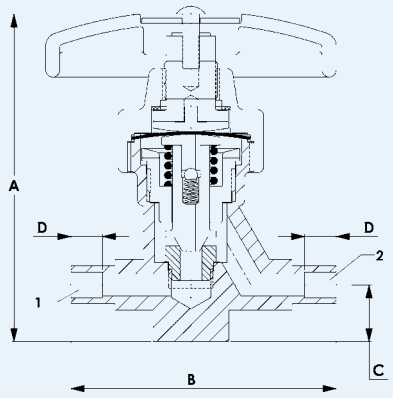
Part No	Conn Size (inch)	Dimensions (mm)						Weight (kg)	CE Cat
		A	B	C	D	E	ØF		
6231N	1/4 ODS x 1/4 SAE Flare	86	67	14	8	41.4	6.9	0.47	SEP
6232N	3/8 ODS x 3/8 SAE Flare	86	67	14	11	41.4	6.9	0.55	SEP
6233N	1/2 ODS x 1/2 SAE Flare	90	83	16	14	44.5	7	0.62	SEP



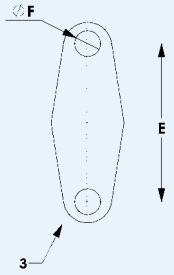
626 SERIES

1. Inlet
2. Outlet

Part No	Conn Size (inch)	Dimensions (mm)						Weight (kg)	CE Cat
		A	B	C	D	E	ØF		
6261N	1/4 ODS	86	67	14	8	41.4	6.9	0.47	SEP
6263N	3/8 ODS	86	67	14	11	41.4	6.9	0.51	SEP
6264N	1/2 ODS	90	80	16	14	44.5	7	0.57	SEP
6265N	5/8 ODS	95	89	19	18	50.8	7	0.65	SEP
6266N	3/4 ODS	127	111	18	19	57.2	8.6	1.42	SEP
6267N	7/8 ODS	137	122	19	22	63.5	10.4	1.6	SEP
6268N	1 1/8 ODS	165	151	24	25	82.6	10.4	2.63	SEP

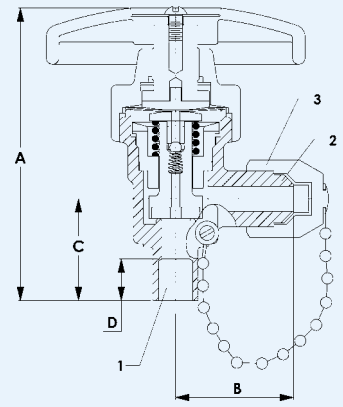


1. Inlet
2. Outlet
3. Mounting flange detail



629 SERIES

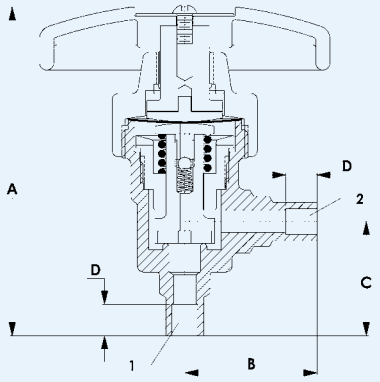
Part No	Conn Size (inch)	Dimensions (mm)						Weight (kg)	CE Cat
		A	B	C	D	E	ØF		
6291N	1/4 ODS	86	67	14	8	41.4	6.9	0.47	SEP
6293N	3/8 ODS	86	67	14	11	41.4	6.9	0.47	SEP
6294N	1/2 ODS	86	67	14	14	41.4	6.9	0.47	SEP
6295N	5/8 ODS	90	86	16	18	44.5	7	0.58	SEP
6297N	7/8 ODS	127	113	18	19	57.2	8.6	1.25	SEP
6298N	1 1/8 ODS	137	122	19	21	63.5	10.3	1.48	SEP



1. Bottom ODS connection
2. Side SAE flare connection
3. Integral seal cap

643 SERIES

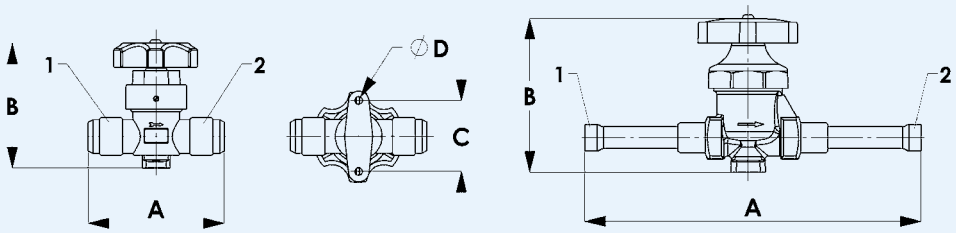
Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	CE Cat
		A	B	C	D		
6432N	3/8 ODS X 3/8 SAE Flare	86	33	29	11	0.44	SEP
6433N	1/2 ODS x 1/2 SAE Flare	89	41	30	14	0.6	SEP
6434N	5/8 ODS x 5/8 SAE Flare	97	44	35	18	0.8	SEP



1 Bottom connection
2 Side connection

647 SERIES

Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	CE Cat
		A	B	C	D		
6471N	1/4 ODS	87	33	29	8	0.39	SEP
6473N	3/8 ODS	87	33	29	11	0.4	SEP
6474N	1/2 ODS	90	38	30	14	0.5	SEP
6475N	5/8 ODS	97	38	35	18	0.6	SEP
6476N	3/4 ODS	124	48	36	19	1.19	SEP
6477N	7/8 ODS	137	53	45	22	1.34	SEP
6478N	1 1/8 ODS	165	64	57	25	2.01	SEP



1 Inlet
2 Outlet

2100B & 2111B SERIES

Type	Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	Kv (m³/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
2111B	2111B-1212	3/4 ODS	178	80	50	4.5	0.70	2.90	SEP

Additional Information

1. For series 623*, 626*, 643* and 647*: Valves are bi-directional up to 24.1 barg. Above this pressure, the direction of flow should be with the inlet under the valve seat.
2. For series 629*: For hand expansion or throttling service, the direction of flow should be with the inlet under the valve seat.

Installation – Main Issues

1. Valves must be protected against excessive heat when installing to prevent damage to the seals. Full instructions are given in the Product Instruction Sheet, included with each valve.

PACKED SHUT-OFF VALVES

Packed valves are so called as the stem is sealed via a packed gland. The Henry Technologies range incorporates the 77, 77-B and 92 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 series)

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

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

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

Materials of Construction

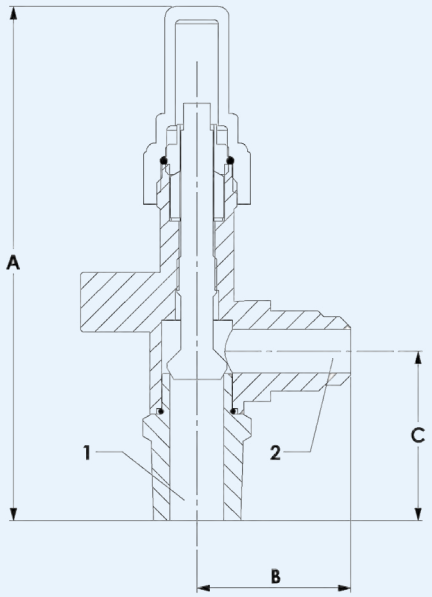
For 77-B and 92 brass series:

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.

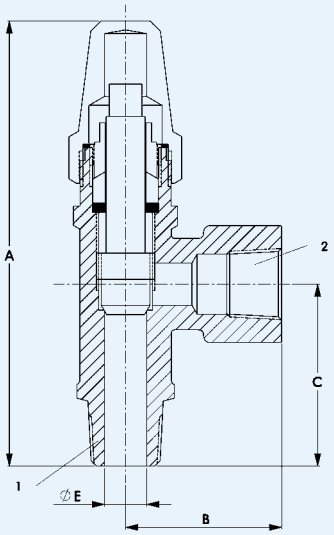
For 77 steel series:

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.

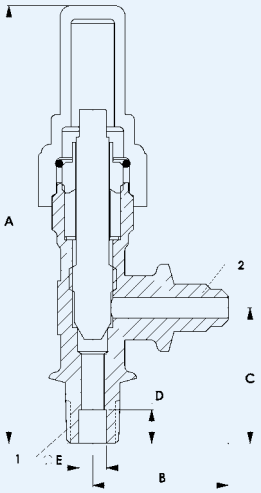
1 Bottom connection
2 Side connection



779 SERIES



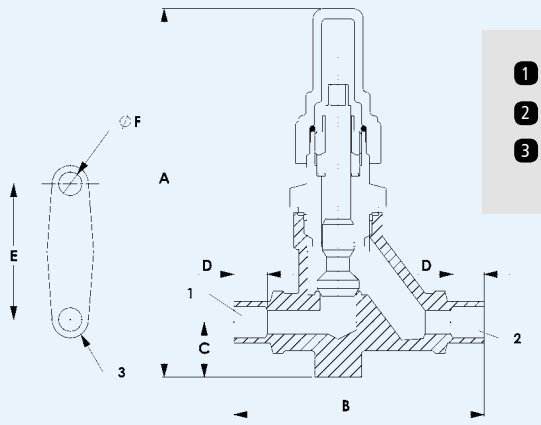
777 SERIES



776 SERIES

	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
Backseating	7792-B	1/2 MPT	1/2 SAE Flare	122	37	40	N/A	1/2 ODS	0.31	34.5	SEP

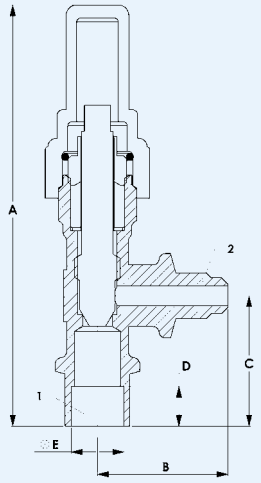
	Part No	Conn Size (inch)		Dimensions (mm)					Weight (kg)	MWP (barg)	CE Cat
		Bottom	Side	A	B	C	D	Ø E			
Non-backseating	7761	1/4 MPT	1/4 SAE Flare	98	32	32	N/A	8	0.14	69	SEP
	7771	1/4 MPT	1/4 FPT	98	32	32	N/A	8	0.15	69	SEP
	7772	1/4 FPT	1/4 FPT	98	32	32	N/A	8	0.15	69	SEP
	7773	3/8 MPT	3/8 FPT	109	38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



1. Inlet
2. Outlet
3. View showing mounting flange

926 SERIES

	Part No	Conn Size (inch)	Dimensions (mm)						Weight (kg)	MWP (barg)	CE Cat
			A	B	C	D	E	ØF			
Backseating	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



1. Bottom connection
2. Side connection

927 SERIES

	Part No	Conn Size (inch)		Dimensions (mm)				E (inch)	Weight (kg)	MWP (barg)	CE Cat
		Bottom	Side	A	B	C	D				
Non-backseating	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

POSITIVE OIL EXCHANGE VALVES

The Positive Oil Exchange Valve is an efficient and timesaving servicing tool for the removal and replacement of compressor crankcase oil.

Applications

The valves are primarily intended for semi-hermetic type compressors.

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

Main features

- Easy to install
- Reduces service time and cost
- Designed for oil charge and drain
- Pressure gauge connection with Schrader valve
- Full port valve for fast charging and draining
- Designed to be permanently fitted to the compressor, for future servicing

Technical Specification

Allowable operating pressure = 0 to 34.5 barg

Allowable operating temperature = -29°C to +120°C

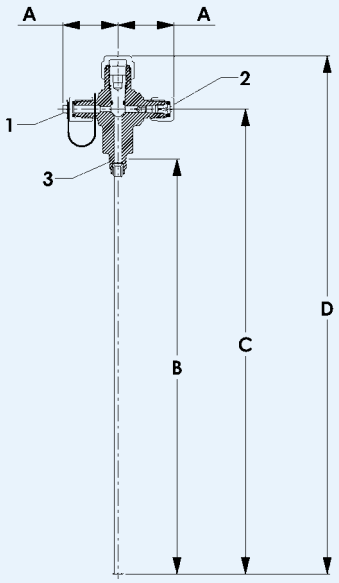
Materials of Construction

The valve body is made from brass and the stem from plated steel. The stem seal cap is made from moulded plastic. The SAE Flare and Schrader port seal caps are made from nylon. The draw pipe is made from Teflon tube.

Installation – Main issues

1. For safety reasons, the SAE Flare seal cap, complete with strap, should not be pressurised.

2. Full instructions are given in the Product Installation Sheet, included with each valve.



1. Side connection - oil outlet
2. Side connection - Schrader service port
3. Compressor connection

Note: 9297 valve illustrated. 9298 valve has a longer cap as per photograph.

Part No	Conn Size (inch)		Dimensions (mm)				Weight (kg)	CE Cat
	Side	Bottom	A	B	C	D		
9297	1/4 SAE Flare	1/8 MPT	34	254	285	317	1.93	SEP
9298	1/4 SAE Flare	1/4 MPT	34	257	284	350	2.20	SEP

PRESSURE RELIEF VALVES

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

Applications

Henry Technologies Pressure Relief Valves (PRVs) are designed to protect system components such as receivers, heat exchangers and vessels from dangerous overpressure. Uncontrolled pressure increase inside a system can occur due to refrigerant expansion as a result of a fire, other heat sources or compressor overrun. In these scenarios, the PRV will discharge, lowering the system pressure back to safe levels, before closing again.

Henry Technologies PRVs 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 atmospheric pressure.

All models are suitable for use with HCFC, HFC, HFO, CO_2 and R290 refrigerants along with their associated oils. Stainless steel (53--) models are also suitable for ammonia.

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.

Main features

- Category IV PED Certified (CE mark)
- ASME Certified (ASME-UV & NB Stamps)
- Set Pressure Tolerance = +/-3%
- Maximum Overpressure = 10%
- Proven safe design
- Precision machined parts for maximum reliability
- Compact design
- Blow-out proof seal design
- Tamper proof

Maintenance & Service Life

Henry Technologies PRVs are designed to be maintenance-free and are secured with a tamper-proof security seal once set at the factory. Removal of this seal, or any attempt to service or replace components of the PRV, will void the product warranty.

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.

Once a PRV has discharged, replacement is recommended as the set pressure can no longer be guaranteed. This is due to the likely presence of system debris and particles embedding into the valve seat during discharge, as well as the force of the reclosing action itself.

Customisation

Henry Technologies PRVs can be customised to meet individual system or regulatory requirements in the following ways:

- A number of common valve and pressure setting combinations are produced as standard models - built to stock. If a system requires an uncommon pressure setting, non-standard pressures are available on all valve models on request. See pages 27 and 28 for standard valve tables.
- All PRVs are supplied with an EU Declaration of Conformity as standard. If local regulations or insurance providers require a bespoke test certificate, these can be provided and linked via serial number to a specific valve.
- All models except the 526E can be ordered and marked with either metric (barg and kg Air/min) or imperial (PSIg and lbs Air/min) units as required.

Installation Notes

1. Connect the PRV at a location above the liquid refrigerant level in the vapour space.
2. Stop valves should not be located between the vessel and the PRV, except the three-way dual shut-off type.
3. Do not discharge the PRV prior to installation or when pressure testing the system. The EN 378 Standard advises that PRVs should be removed or isolated during the system pressure test.
4. PRVs should be mounted as close to vertical as possible to avoid the possibility of liquid refrigerant or oil pooling at the valve inlet.
5. The pipe work must not impose loads on the PRV. Loads can occur due to misalignment, thermal expansion, discharge gas thrust etc.
6. Henry PRVs are 'back pressure dependant', meaning that they are designed to discharge to atmospheric pressure. Any built-up back pressure due to outlet piping should be limited to a maximum of 10% as stipulated in the European Standard EN 13136.
7. It is recommended to implement measures discouraging liquid (including rain) from entering the outlet of the valve and pooling inside it. For external installations, attaching a short elbow fitting to the outlet is common practice – noting point 6 above on back pressure.

PRESSURE RELIEF VALVES STANDARD RANGE

How it works

A conventional PRV will start to lift within +/-3% of the stamped set pressure. This set point is defined by a minimum of one bubble per second when testing to API Standard 527. Following this initial lift the valve will then 'pop' fully open within a further 10%. This is achieved through the design of the valve internals, which utilise local static pressure increases and fluid flow phenomena to achieve the characteristic pop action. Once pressure in the system decreases to a safe level, the spring in the PRV will force the valve to reclose again, ensuring some system charge is maintained. A PRV is a safety device and should only be open under abnormal system operating conditions.

Materials of construction

- For all 52-- models, the main pressure shell of the valve (body & outlet) is made from brass. Valve internal components are made from brass, plated steel, or stainless steel.
- For all 53-- models, the main pressure shell of the valve (body & outlet) is made from stainless steel. Valve internal components are made from plated steel or stainless steel.
- All models use a non-stick and chemically-inert bespoke PTFE seal.

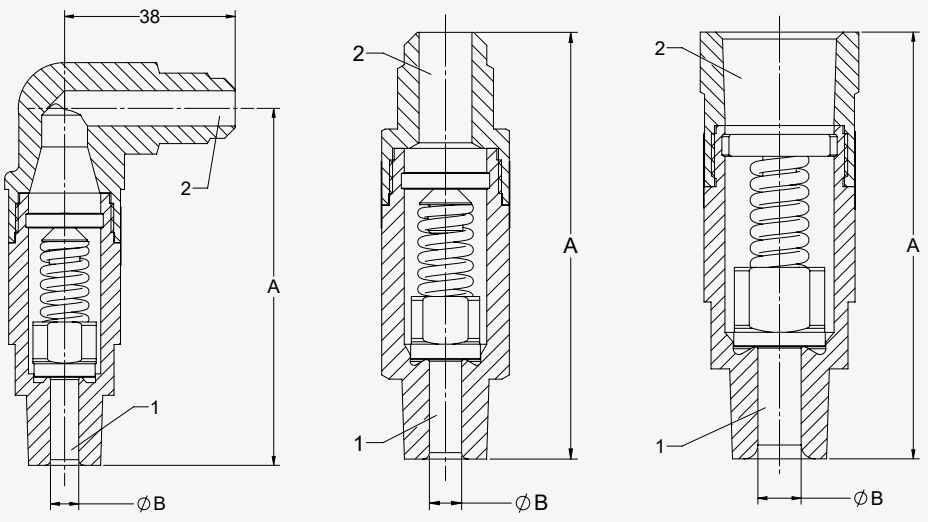
Technical Specification

All models are fully designed and certified to ASME VIII Division 1, with the exception of the 526E, which is designed to intent of the same code.

Set Pressure Range:	10.3 barg to 31.0 barg*
	150 PSIg to 450 PSIg*
52-- Temperature Range:	-40°C to +107°C
	-40°F to +225°F
53-- Temperature Range:	-29°C to + 135°C
	-20°F to + 275°F

*526E, 5230A, 5231A & 5231B minimum pressure setting is 14.0 barg (203 PSIg)

5244, 5244A, 5344 & 5344A maximum pressure setting is 27.6 barg (400 PSIg)



Relief Valves - Brass									
Model	Connection Type		Dimensions (mm)		Flow Area (mm^2)	K_{dr}	Weight (kg)	ASME UV	CE Cat
	Inlet	Outlet	A	ØB					
526E	3/8" NPTF	3/8" SAE Flare	80	6.35	31.67	0.41	0.3	No	Cat IV
5230A	1/4" NPTF	1/2" SAE Flare	84	6.35	31.67	0.69	0.2	Yes	
5231A	3/8" NPTF	1/2" SAE Flare	84	6.35	31.67	0.69	0.2	Yes	
5231B	1/2" NPTF	5/8" SAE Flare	90	6.35	31.67	0.69	0.2	Yes	
5232A	1/2" NPTF	3/4" SAE Flare	108	9.53	71.26	0.67	0.4	Yes	
5240	1/2" NPTF	3/4" NPTF (Female)	94	9.53	71.26	0.67	0.4	Yes	
5242	3/4" NPTF	3/4" NPTF (Female)	94	9.53	71.26	0.67	0.5	Yes	
5244A	3/4" NPTF	1" NPTF (Female)	105	12.70	126.68	0.70	0.7	Yes	
5244	1" NPTF	1" NPTF (Female)	105	12.70	126.68	0.70	0.7	Yes	
5245	1" NPTF	1 1/4" NPTF (Female)	146	17.86	250.41	0.76	1.5	Yes	
5246	1 1/4" NPTF	1 1/4" NPTF (Female)	145	17.86	250.41	0.76	1.6	Yes	

Relief Valves - Stainless Steel									
Model	Connection Type		Dimensions (mm)		Flow Area (mm^2)	K_{dr}	Weight (kg)	ASME UV	CE Cat
	Inlet	Outlet	A	ØB					
5340	1/2" NPTF	3/4" NPTF (Female)	94	9.53	71.26	0.67	0.4	Yes	Cat IV
5342	3/4" NPTF	3/4" NPTF (Female)	94	9.53	71.26	0.67	0.4	Yes	
5344A	3/4" NPTF	1" NPTF (Female)	105	12.70	126.68	0.70	0.6	Yes	
5344	1" NPTF	1" NPTF (Female)	105	12.70	126.68	0.70	0.6	Yes	
5345	1" NPTF	1 1/4" NPTF (Female)	146	17.86	250.41	0.76	1.3	Yes	
5346	1 1/4" NPTF	1 1/4" NPTF (Female)	145	17.86	250.41	0.76	1.4	Yes	

Valve Model / Setting Combinations										
Setting (barg)	526E	5230A	5231A	5231B	5232A	5240	5242	5244	5340	5342
10.3	N/A	N/A	N/A	N/A				■		
14.0		■	■	■	■	■				
16.2	■		■	■	■				■	
17.2					■					
20.7			■	■	■			■	■	
24.1	■	■	■	■	■			■		
24.8		■	■	■	■				■	
25.0				■	■	■				
25.9				■						
27.6	■	■	■	■	■	■		■		
29.3				■				N/A		
31.0		■	■	■	■	■		N/A		

Note: Blue indicates build-to-stock models.

PRESSURE RELIEF VALVES X-SERIES

How It Works

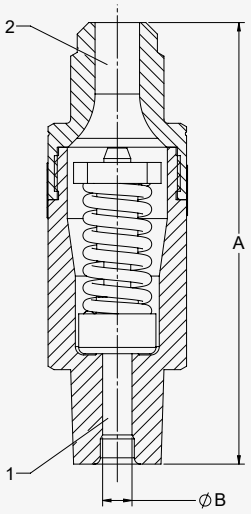
An X-Series PRV from Henry Technologies works in exactly the same way as a conventional PRV. The significant difference is that the 'X' signifies these models have been additionally certified to the EN ISO 4126-1 standard. The main benefit of this is that the PRV will close within 15% of the set pressure following a discharge, meaning that a reduced amount of system charge is lost in an overpressure event.

Material of Construction

The main pressure shell of the valve (body & outlet) is made from brass. All internal components are made from brass except for the spring, which is plated steel, and the seal, which is made from a highly-resilient and robust fluoroelastomer material.

Additional Features

- Certified to EN ISO 4126-1
- High Flow Capacity
- Enhanced seat tightness from Fluoroelastomer soft seal.



1 Inlet
2 Outlet

CE 0062 NB ASME UV EN ISO 4126-1 COMPLIANT

Technical Specification

All models are fully designed and certified to ASME VIII Division 1 and EN ISO 4126-1.

Set Pressure Range:	10.3 barg to 46.0 barg 150 PSIg to 667 PSIg
Temperature Range:	-40°C to +120°C -40°F to +248°F

Valve Model / Setting Combinations			
Setting (barg)	5230AX	5231AX	5231BX
20.7			
24.1			■
24.8			■
25.0			
27.6		■	■
31.0			■
40.0		■	■
42.0	■		■
45.0			■
46.0			■

Note: Blue indicates build-to-stock models

Relief Valves - X-Series									
Part No	Connection Type		Dimensions (mm)		Flow Area (mm²)	K_{dr}	Weight (kg)	ASME UV	CE Cat
	Inlet	Outlet	A	ØB					
5230AX	1/4" NPTF	1/2" SAE Flare	94	7.00	38.48	0.77	0.4	Yes	Cat IV
5231AX	3/8" NPTF	1/2" SAE Flare	94	7.00	38.48	0.77	0.4		
5231BX	1/2" NPTF	5/8" SAE Flare	105	7.00	38.48	0.77	0.4		

PRV Air Capacity Reference Table (kg Air/min) @ 20°C.											
Part No	Pressure Setting (barg/*PSIg*)										
	10.3 *150*	14.0 *203*	17.2 *250*	20.7 *300*	24.1 *350*	27.6 *400*	31.0 *450*	40.0 *580*	42.0 *609*	45.0 *653*	46.0 *667*
526E	N/A	3.0	3.7	4.4	5.1	5.8	6.5	N/A			
5230A	N/A	5.1	6.2	7.4	8.5	9.7	10.9	N/A			
5231A											
5231B											
5230AX	5.2	6.9	8.4	10.0	11.5	13.2	14.7	18.9	19.8	21.2	21.7
5231AX											
5231BX											
5232A	8.3	11.1	13.5	16.1	18.6	21.2	23.7	N/A			
5240											
5242											
5340											
5342											
5244A	15.5	20.6	25.0	29.9	34.6	39.4	N/A				
5244											
5344A											
5344											
5245	33.3	44.2	53.7	64.1	74.2	84.5	94.6	N/A			
5246											
5345											
5346											

Selection Guidelines

For safety reasons, PRV selection should only be carried out by suitably qualified engineers. The European Standards EN 378 and EN 13136 are recommended.

Selection Guidelines example as per EN 13136

A liquid receiver containing R407F refrigerant is to be protected from overpressure due to fire. The receiver is 2.1m long (L_1) and 0.84m in diameter (d_1). The set pressure of the PRV is to be 27.6barg.

Calculate actual relieving pressure, p_0:

$$p_o = 1.1p_{set} + p_{atm} = 31.4 \text{ bara}$$

Calculate vessel external surface area, A_{surf}:

$$A_{surf} = 2 \times \left(\frac{\pi \times d_1^2}{4}\right) + (\pi \times d_1 \times L_1)$$

$$A_{surf} = 6.65m^2$$

Calculate the minimum required discharge capacity, Q_{md} using the heat of vaporization, h_{vap} from refrigerant data tables at p_0:

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

$$Q_{md} = \frac{3600 \times 10 \times 6.65}{107.21} = 2{,}233 \text{ kg/h}$$

Select an appropriate PRV to exceed Q_{md}. For this example, a 5232A has been used.

Calculate the discharge capacity of the PRV, Q_m using the specific volume of vapour, v_0 from refrigerant data at p_0, the function of the isentropic exponent, C for the specific refrigerant and PRV parameters from the tables here (flow area, A and de-rated coefficient of discharge, k_{dr}). The correction factor, K_b is 1 for critical flow:

$$Q_m = 0.2883 \times C \times A \times K_{dr} \times K_b \times \sqrt{\frac{p_o}{v_o}}$$

$$Q_m = 0.2883 \times 2.52 \times 71.26 \times 0.67 \times 1 \times \sqrt{\frac{31.4}{0.00521}}$$

$$Q_m = 2{,}692 \text{ kg/h}$$

$Q_m > Q_{md}$, so the 5232A would be a suitable PRV for the application.

Important Selection Notes:

1. It is important not to grossly oversize a PRV so that Q_{md} is less than 20% of Q_m as this can adversely affect PRV performance.
2. Henry Technologies recommends that all inlet and outlet piping for PRVs is sized in accordance with EN 13136 to avoid excessive pressure losses.
3. If Henry Technologies Rupture Disc is used in conjunction with a Henry Technologies PRV, the discharge capacity, Q_m should be de-rated by 10%.

PRESSURE RELIEF VALVES
HIGH PRESSURE RANGE

The high pressure relief valve range is specifically designed for high pressure applications up to 130 bar and in particular, transcritical CO_2 systems. The range has been developed from the ground up, utilising the latest computational, simulation and experimental methods. The valves are manufactured from Brass.

The 5701AX & 5701GX models have been developed to suit the majority of applications and carry the added benefit of EN ISO 4126-1 certification. The 5700 is intended specifically for protection of pipework and small vessels whilst the 5702 models are sized to deal with large vessels or multiple compressor discharges.

Main Features

- Maximum pressure setting of 130 bar
- Set pressure tolerance = +/-3%
- Maximum overpressure = 10%
- In accordance with EN ISO 4126-1, the 5701AX valve reseats within 15% of set pressure following a discharge
- TFM second generation PTFE seal
- Allowable operating temperature = -40°C to +150°C
- Suitable for HFC, HCFC, HFO and CO_2 refrigerant gases

Standard pressure settings (barg): 31*,40*,42*,45*,46, 50, 60, 70, 80, 90,100, 110, 120, 130

* Not available on 5701AX model.

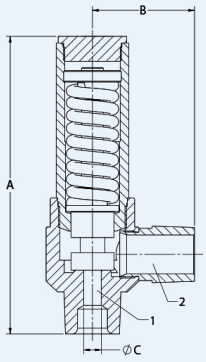


Fig. 1

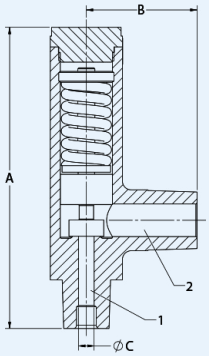


Fig. 2

1 Inlet
2 Outlet

High Pressure Relief Valve Range											
Part No.	Conn Size (inch)		Dimensions (mm)			Flow Area (mm^2)	k_{dr}	Drawing reference	Weight (kg)	ASME UV	CE Cat
	Inlet	Outlet	A	B	ØC						
5700	3/8 NPTF	3/8 NPTF	87.0	30.7	3.5	9.62	0.81	fig. 1	0.27	No	Cat IV
5701AX	1/2 NPTF	3/4 NPTF	132.5	50.6	7.1	39.59	0.71	fig. 2	0.86	Yes	
5701GX	G-1/2	3/4 NPTF	132.5	50.6	7.1	39.59	0.71	fig. 2	0.86	Yes	
5702	1/2 NPTF	1 NPTF	179.5	61.4	10.5	86.59	0.81	fig.1	2.15	Yes	
5702A	3/4 NPTF								2.18	Yes	
5702B	1 NPTF								2.21	Yes	
5702C	1 1/4 NPTF								2.29	Yes	

Valve Capacity Ratings (kg Air/min) @ 20°C										
Part No.	Standard Pressure Setting (barg)									
	31.0	40.0	42.0	45.0	46.0	60.0	80.0	100.0	120.0	130.0
5700	3.9	5.0	5.2	5.6	5.7	7.4	9.8	12.2	14.7	15.9
5701AX / 5701GX	N/A*	N/A*	N/A*	N/A*	20.5	26.7	35.4	44.2	52.9	57.3
5702 (A/B/C)	34.9	44.7	46.9	50.2	51.3	66.5	88.4	110.2	132.1	143.0
* 5701AX minimum pressure setting is 46.0 barg.										

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.

ISO 5149, AS/NZS 5149 and EN 378 are the Standards for Safety and environmental requirements of Refrigerating systems and heat pumps.

A valve selection example using the recommended approach from European Standards EN 378 (reference 1) and EN 13136 (reference 2) is outlined below for an external fire case.

Example

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

Receiver dimensions = 2.0m long (L) x 1.3m outside diameter (D)

Refrigerant = R744 (CO_2)

Pressure Setting = 120 barg

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

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

φ = Density of heat flow rate (kW/m^2). The standards assume a value of 10 kW/m^2 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 (m^2)

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

Note:

For Transcritical and Supercritical CO_2 selections, the following excerpt from EN 13136 (reference 2) applies:

If the set pressure of the pressure relief valve times 1.1, is higher than the saturated pressure of the refrigerant at (critical temperature minus 5k) then h_{vap} and v_0 shall be taken at critical temperature minus 5k. If the temperature, at 1.1 times the set pressure of the pressure relief device is higher than the saturated temperature (superheated gas), then h_{vap} shall be taken at saturated condition.

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

$$A_{surf} = (\pi \times 1.3 \times 2.0) + 2\left(1.3^2 \times \frac{\pi}{4}\right) = 10.8 m^2$$

Calculate P_0:

$$P_o = (P_{set} \times 1.1) + P_{atmos} = (120 \times 1.1) + 1.013 = 133.0 \ _{bar\ a}$$

At this pressure for R744:

h_{vap} = 112.28 kJ/kg

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

$$Q_{md} = \frac{3600 \times \varphi \times A_{surf}}{h_{vap}} = \frac{3600 \times 10 \times 10.8}{112.28} = \underline{3{,}462.8 \text{ kg/hr, R744}}$$

For relief valve discharge capacity, Q_m:

$$Q_m = 0.2883 \times C \times A \times K_{dr} \times K_b \times \sqrt{\frac{P_0}{V_0}}$$

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

C = Function of the isentropic exponent

A = Flow area of PRV (mm^2)

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_0 = Actual relieving pressure of PRV (bar a)

V_0 = Specific volume of saturated vapour at P_0 (m^3/kg)

Refrigerant data should be referenced for values of C and V_0. 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 mm^2
K_{dr} = 0.71

$$Q_m = 0.2883 \times 2.63 \times 39.59 \times 0.71 \times 1 \times \sqrt{\frac{133.0}{0.00393}} = \underline{3{,}920.8 \text{ kg/hr, R744}}$$

$Q_m > Q_{md}$, 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 five or more 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 3,528.7 kg/hr (3,920.8 x 0.9).

References

1. BS EN 378-2:2016* 2. BS EN 13136:2013+A1:2018*

*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 as close to vertical as possible to avoid the possibility of liquid pooling at the valve inlet.
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 CO_2 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, A2L and CO_2 refrigerant gases. The stainless steel 56 series models are also suitable for ammonia and HFO refrigerant gases.

In line with the Institute of Refrigeration Guidelines (UK), it is recommended that at least every 5 years all low and high 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 60 barg (55 series)

Set pressure range = 10.3 to 130 barg (56 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. 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 that 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.

Accessories

The 2 x 1/8 NPT pressure ports can be used for aftermarket accessories. (see page 37 to 39). If unused, the ports may be closed using a 1/8'' NPT plug. If this is required, the Henry Technologies part number is A0624.

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)					Maximum Setting pressure (barg)	Weight (kg)	CE Cat
	Inlet	Outlet	A	B	ØC	D	MNFA, mm² (note 1)			
5525	3/8 NPT	3/8 FPT	65	31.8 A/F	9.7	20	64.5	60	0.28	Cat IV
5526	1/2 NPT	1/2 FPT	73	31.8 A/F	12.7	23	109.7	60	0.30	Cat IV
5625	3/8 NPT	3/8 FPT	65	Ø28.6	9.7	20	64.5	130	0.20	Cat IV
5626	1/2 NPT	1/2 FPT	73	Ø28.6	12.7	23	109.7	130	0.20	Cat IV
5627	3/4 NPT	3/4 FPT	81	Ø38.1	19	29	187.1	130	0.34	Cat IV
5628	1 NPT	1FPT	93	Ø44.5	25.5	32	335.5	130	0.56	Cat IV
5629	1 1/4 NPT	1 1/4 FPT	95	50.8 A/F	33.3	33	683.9	130	0.76	Cat IV

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

Nominal standard rupture disc settings at 22˚C (barg)
Bold denotes typical stock models

5525 series: 16.2, 20.7, 24.1, 25.9, 27.6, 31.0, 40.0
5526 series: 14.0, 16.2, 20.7, 24.1, 24.8, 25.9, 27.6, 31.0, 40.0, 42.0, 45.0
5626 series: 10.3, 17.2, 20.7
5627 series: 10.3, 17.2, 20.7
5628 series: 10.3, 17.2, 20.7
5629 series: 10.3, 17.2, 20.7

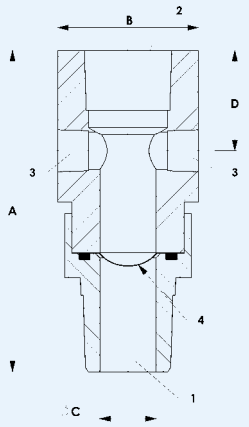
Selection Guidelines

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 92 & 802 SERIES

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, HFC, CO_2 and A2L 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 CE Category II, III and IV. 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 46 barg (92 series)
Allowable operating pressure = 0 to 130 barg (802 series)
Allowable operating temperature = -29°C to +150°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 either moulded plastic (92 series) or steel (802 series).

Installation – Main issues

1. Assemble the three-way valve to a vessel using a high strength pipe nipple, suitable for the maximum operating pressure.
2. The pipework must not impose loads on the valve. Loads can occur due to misalignment, thermal expansion, discharge gas thrust, etc.
3. The three-way valve should be front or back seated, not left with both pressure relief devices exposed.

Fig. 1

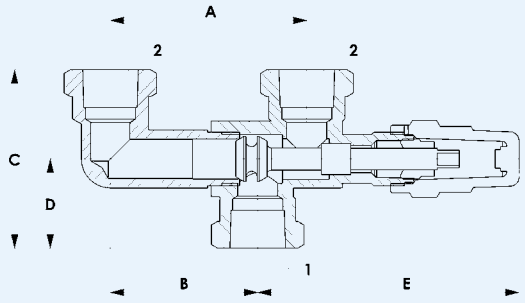
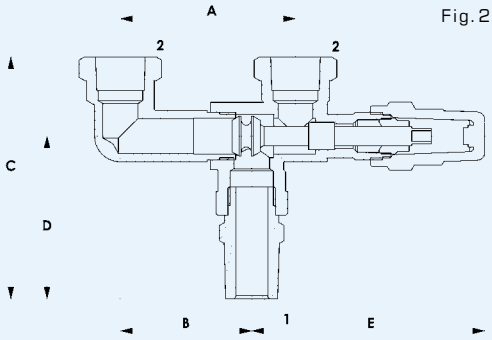


Fig. 2



Type	Part No	Inlet Conn Size (inch)	Outlet Conn Size (inch)	Dimensions (mm)					Drawing reference	Weight (kg)	Kv (m³/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	8021TH	1/2 FPT	1/2 FPT	92	59	86	44	148	fig.1	1.62	4.78	SEP
802	8022TH	3/4 FPT	3/4 FPT	92	59	86	44	148	fig.1	1.45	7.60	SEP
802	8024TH	1 FPT	1 FPT	148	94	99	51	196	fig.1	3.86	10.07	Cat II
802	8025TH	1 1/4 FPT	1 1/4 FPT	148	94	99	51	196	fig.1	3.44	14.36	Cat II

THREE-WAY DUAL SHUT-OFF VALVES 93 SERIES

The function of a three-way valve is to permit replacement of one of the pressure relief devices, whilst the other continues to be active on the system. 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

Refrigeration standard, EN 378, specifies that a three-way valve is required on vessels of CE Category II, III and IV. EN 378 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.

All 93 series three-way valves are suitable for use with HCFC, HFC, HFO, CO_2, A2L gases and R290 refrigerants along with their associated oils.

The 93 series of three-way valves have been designed to optimise flow efficiency for a given connection size. Designs are fine-tuned using the latest computational analysis and simulation techniques to ensure that pressure drop upstream of the relief device is minimised. Minimal pressure drop upstream of a PRV in particular is essential to maintain safe and reliable behaviour during a discharge situation. The design utilises a rotatable ball to guide the flow and this has the added advantage of allowing both outlet ports access to a full-bore flow area.

Main Features

- Very high flow capacity (Kvs) for a given connection size
- Maximum full-bore flow on both outlet ports
- Compact geometry minimises required installation space
- 'M', 'R' and 'MR' models offer Rotalock-style connections on the inlet and/or outlets for optimum angle PRV positioning
- Premium quality PTFE and HNBR sealing materials
- Double O-ring stem seal design
- Blow-out proof design

Technical Specification

Allowable operating pressure = 0 to 130 barg
Allowable operating temperature = -40°C to +150°C

Materials of Construction

The valve bodies and balls are made from brass. The stem is made from plated steel.

Installation – Main issues

1. If using a female inlet connection model, assemble the three-way valve to a vessel using a high strength pipe nipple, suitable for the maximum operating pressure.
2. The pipework must not impose loads on the valve. Loads can occur due to misalignment, thermal expansion, discharge gas thrust, etc.
3. The three-way valve should only be used with a single outlet port fully engaged. Do not leave the valve with both outlet ports partially open as this will impair the flow and can result in insufficient discharge capacity through the PRVs.

Rotalock-Style Adaptors

Inlet and outlet Rotalock-style adaptors can be supplied individually. Each adaptor includes the connection, locking nut and PTFE seal.

- 933 3/8" NPT Female 933-ORK
- 933 3/8" NPT Male 933-IRK
- 935 1/2" NPT Female 935-ORK
- 935 1/2" NPT Male 933-IRK

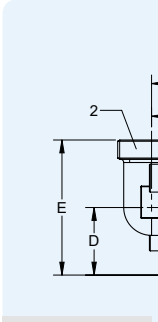


Fig. 1

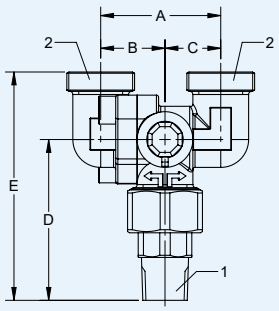


Fig. 2

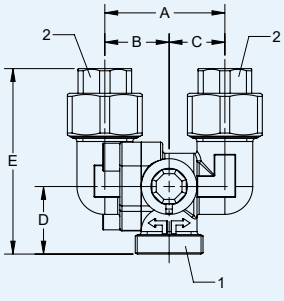


Fig. 3

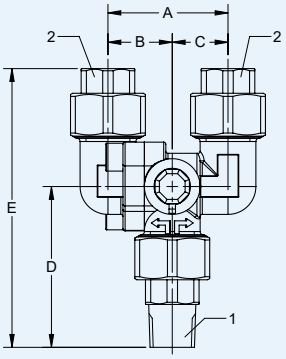


Fig. 4

Part No	Inlet Conn (inch)	Outlet Conn (inch)	Adjustment		Dimensions (mm)					Drawing Reference	Weight (kg)	K_{VS} Value (m^3/hr)	CE Cat
			Inlet	Outlet	A	B	C	D	E				
933	3/8 NPT (Female)	3/8 NPT (Female)	Fixed	Fixed	56	30	26	31.5	63.0	fig. 1	0.69	3.68	SEP
933M	3/8 NPT		Rotalock					69.5	101.0	fig. 2	0.82		
933R	3/8 NPT (Female)		Fixed	Rotalock				31.5	85.0	fig. 3	0.89		
933MR	3/8 NPT		Rotalock					69.5	123.0	fig. 4	1.02		
935	1/2 NPT (Female)	1/2 NPT (Female)	Fixed	Fixed				31.5	63.0	fig. 1	0.67	4.82	
935M	1/2 NPT		Rotalock					75.0	106.5	fig. 2	0.85		
935R	1/2 NPT (Female)		Fixed	Rotalock				31.5	86.5	fig. 3	0.91		
935MR	1/2 NPT		Rotalock					75.0	130.0	fig. 4	1.09		

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.

Applications

The units are suitable for use with HCFC, HFC, A2L, CO_2 and ammonia refrigerants, along with their associated oils.

Main features

- Easy to read large indicator dial
- Stainless steel movement

Technical Specification

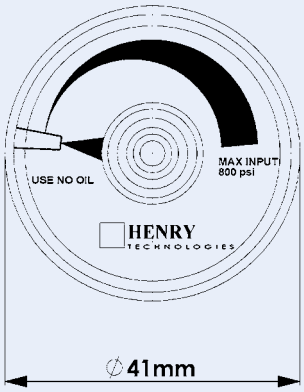
Allowable operating temperature = -40°C to + 65°C

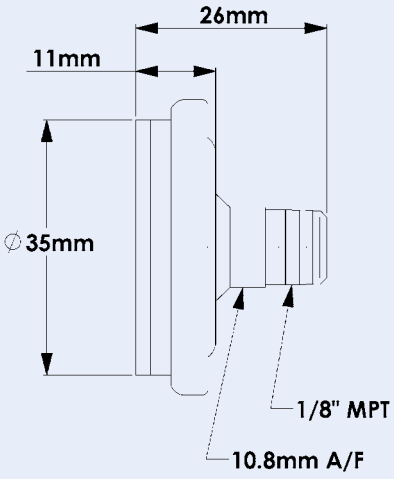
Materials of Construction

Stainless steel case and movement.

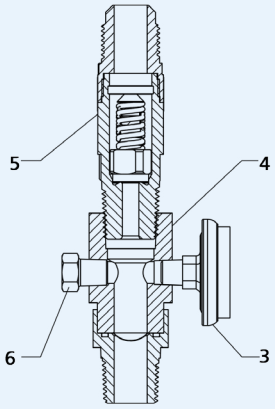
Plexiglas dial window.

Part No	MWP (barg)	Weight (g)	CE Cat
G16	55	27	SEP
G20	200	27	SEP

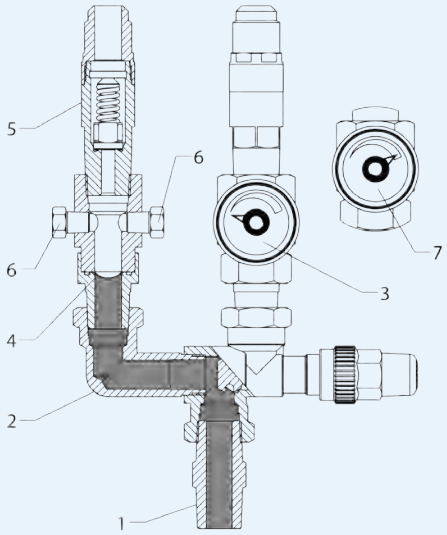




SENTRY SAFETY DEVICE ASSEMBLIES



SENTRY SINGLE SAFETY DEVICE ASSEMBLY



SENTRY DUAL SAFETY DEVICE ASSEMBLY

1. Pipe nipple
2. Three-way valve
3. G16 gauge (no pressure applied)
4. Rupture disc
5. Relief valve
6. Plug, 1/8 NPT
7. 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 EN 378.

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 and a pressure indicator gauge.

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

Note: Each pressure relief device must have the required capacity to protect the vessel from over-pressure. A three-way valve should never be used in the mid-way position. Always fully engage one port.

For both assemblies, a 1/8" NPT rupture disc blanking plug are if the user does not fit the pressure gauge. 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 rupture discs be replaced at least every 5 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:** The pressure gauge provides a visual indication if the relief has discharged.
6. **Inter-space monitoring:** The pressure gauge 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.
7. **System Intelligence:** Each rupture disc is supplied with two 1/8" NPT ports; one for the visual pressure gauge, and the other to allow connection of an electronic transducer (not included) to automatically trigger an alarm or system action when a discharge is detected.

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

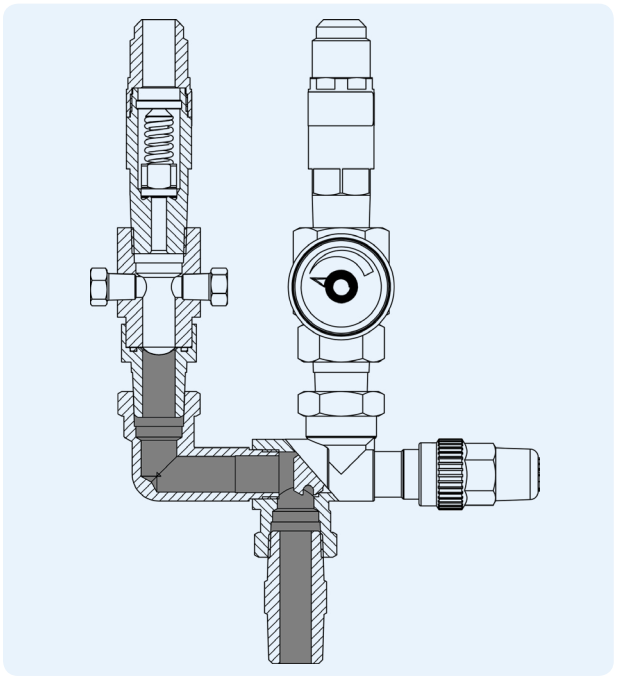
The table shows the recommended relief valve, rupture disc and three-way valve combinations. Please refer to the relief valve catalogue pages for outlet connection sizes.

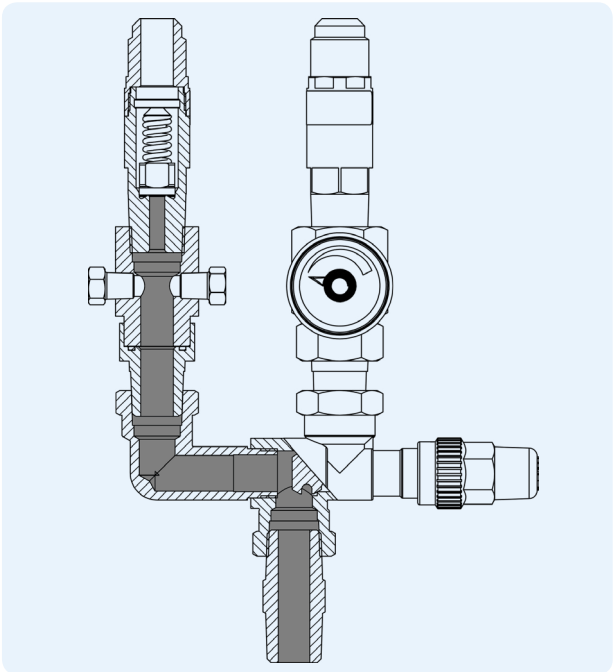
Conn Size inch (NPT)	Relief Valve Part No	Rupture Disc Part No	Three-Way Valve Part No
3/8	526E, 5231A	5525	923 or 933**
	5231AX		
	5700	5525 or 5625*	933R or 933MR
1/2	5231B, 5232A, 5240	5526	925 or 935**
	5231BX		
	5340	5526	8021TH
	5701AX	5526 or 5626*	935R or 935MR
	5702		
3/4	5242, 5244A	5627	8022TH
	5342, 5344A		
	5702A		
1	5244, 5245	5628	8024TH
	5344, 5345		
	5702B		
1 1/4	5246	5629	8025TH
	5346		
	5702C		

Note: *Depending on pressure setting - see rupture disc pages for more info **93-series three way valve provides greater flexibility and higher kvs flow rating if required.

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 gauge, if fitted, would indicate that pressure is acting in the chamber between the rupture disc and the relief valve. 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 and SDK2X.

The SDK1 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 SDK2/X 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, HFC and CO2 refrigerants, along with their associated oils.

Main features

- Combines Henry Technologies relief devices in one easy-to-order kit
- Components packed into compact 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		Three-Way Valve	
	Part No	Qty	Part No	Qty	Part No	Qty	Part No	Qty
SDK1-xx.x BAR	5231B	1	5526	1	G16	1	N/A	-
SDK2-xx.x BAR	5231B	2	5526	2	G16	2	925	1
SDK2X-xx.x BAR-CE	5231BX	2	5526	2	G16	2	925	1

Pressure Setting	Part No.		
barg	SDK1	SDK2	SDK2X
14.0			
16.2			
17.2			
20.7			
24.1			
24.8			
25.9			
27.6			
31.0			
40.0			
42.0			
45.0			
46.0			

Note: Blue indicates available models.

Y STRAINER

The function of a Y strainer is to remove system debris from refrigerant and oil.

Applications

The Y Strainer can be fitted anywhere in a refrigeration or air – conditioning system where equipment needs to be protected from debris.

The unit is suitable for HCFC and HFC refrigerants, along with their associated oils. The 896TH model is also suitable for use in transcritical CO_2 systems.

Main features

- Large screen area for low pressure drop and long life
- Removable screen for cleaning
- Solder connection

Technical Specification

Allowable operating pressure = 0 to 34.5 barg (896A models)
Allowable operating pressure = 0 to 130 barg (896TH model)
Allowable operating temperature = -29°C to +93°C

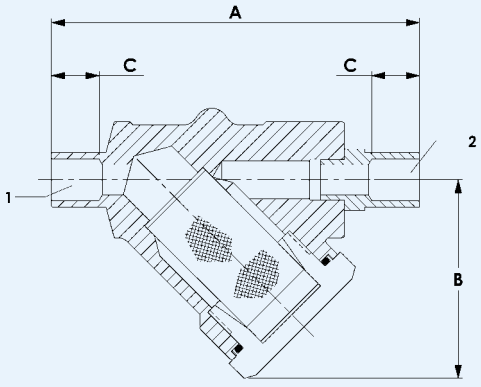
Materials of Construction

The strainer assembly is made from brass with a stainless steel mesh screen.

The O-ring is made from neoprene.

Installation – Main issues

1. Install strainer in the correct orientation. It is recommended to install valves on either side of the unit to ease replacement, in the event that the mesh screen becomes blocked.



1 Inlet ODS
2 Outlet ODS

896-S SERIES

Part No	Conn Size (inch)	Dimensions (mm)			Screen data		Weight (kg)	CE Cat
		A	B	C	Area (mm²)	Mesh		
896A-3/8S	3/8 ODS	86	46	11	2030	100	0.38	SEP
896A-1/2S	1/2 ODS	87	46	13	2030	100	0.38	SEP
896A-5/8S	5/8 ODS	90	46	16	2030	100	0.36	SEP
896TH-3/8	3/8 ODS	90	46	16	2030	100	0.38	SEP

REPLACEMENT COMPONENTS

CHECK VALVES

Replacement parts kits for NRV series Check valves

Kit includes brass cap, O-ring, plunger assembly, spring, plastic cap and instruction sheet.

Part No	Suitable for Check valves
NRV 14/18-S1	NRV14 and NRV18
NRV 22/26-S1	NRV22 and NRV26

GLOBE VALVES

Replacement parts kits for RLV series Globe valves

Gasket spares kit comprising: 3-off O-rings and Teflon cap gasket. Main spares kit comprising: bonnet, spindle, spindle sleeve, brass back seat, nylon seat ring, retaining nut and washer, gland nut, 4-off O-rings, Teflon cap gasket and instruction sheet.

Part No	Description
RLV 14/18 S1	Gasket spares for RLV14/18 valves
RLV 14/18 S2	Main spares for RLV14/18 valves
RLV 22/26 S1	Gasket spares for RLV22/26 valves
RLV 22/26 S2	Main spares for RLV22/26 valves

BALL VALVES AND BALL VALVES WITH SIGHT GLASS

Replacement caps and cap gaskets for Ball Valves

Cap & Retainer

Part No	Dimensions
SC-001	1/4" to 5/8" and 6 mm to 16 mm ODS
SC-005	3/4" to 1 1/8" and 18 mm to 28 mm ODS
SC-008	1 3/8" to 1 5/8" and 35 mm to 48 mm ODS
SC-010	2 1/8" to 3 1/8" and 54 mm to 76 mm ODS

Cap Gasket

Part No	Dimensions
TG-001	1/4" to 5/8" and 6 mm to 16 mm ODS
TG-005	3/4" to 1 1/8" and 18 mm to 28 mm ODS
TG-008	1 3/8" to 1 5/8" and 35 mm to 48 mm ODS
TG-010	2 1/8" to 3 1/8" and 54 mm to 76 mm ODS

Replaceable Cartridges for discontinued Filter Driers

Replaceable DRI-COR© cartridges for discontinued brass shell series suction line filters.

Part No.	Drier Dia (Inches)	Cartridge Type	Volume (cm^3)	A.R.I. Cap Ratings Drops of water		Cartridge	
				R22 (60ppm)			
				Liquid Line Temperature °C		Length (mm)	Weight (kg)
				24°C	52°C		
873-NMS	3	DRI-COR Filter Drier	738	441	314	229	0.96
876-NMS	4 1/4		1788	1069	760	267	2.18

NOTES

OIL MANAGEMENT SYSTEMS

This guide is intended for oil management systems installed with scroll or reciprocating compressors using HCFC, HFC & A2L refrigerants. For other systems, please contact Henry Technologies for guidance.

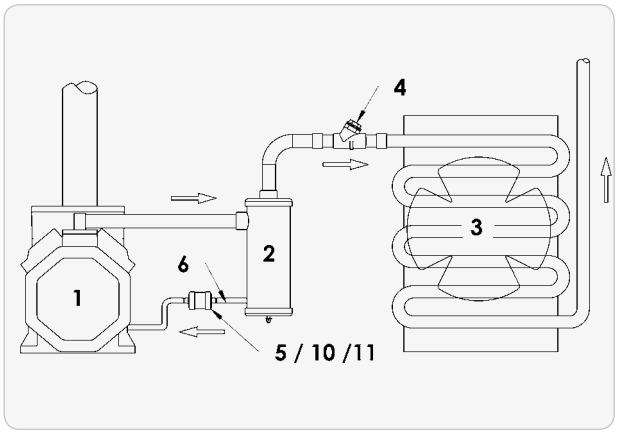
A proper oil management system is essential to ensure compressor lubrication and energy efficient cooling.

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

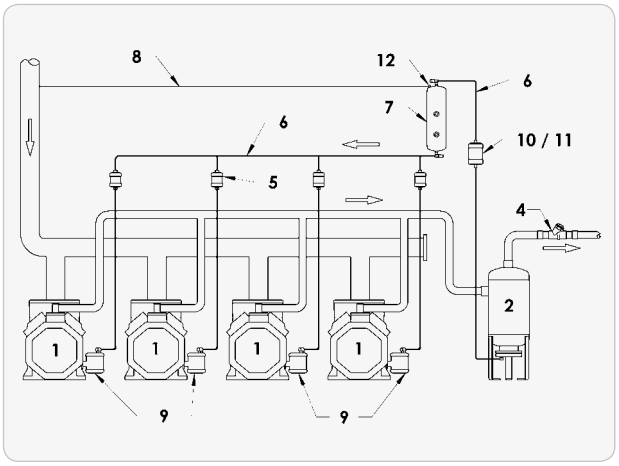
Single Compressor System

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, IntelOil Controllers 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 an 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

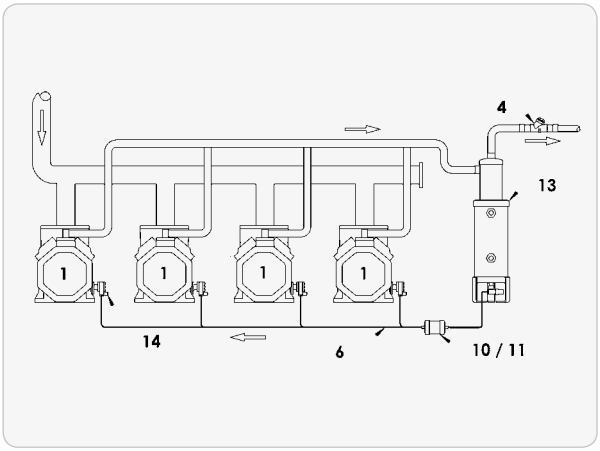
High pressure oil systems remove the need for a separate oil reservoir. This type of system also reduces the amount of pipework and fittings.

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 IntelOil Controller is recommended for this application. 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 two different types of oil separator, Helical and Conventional.
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. Various pressure settings are available. 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. **IntelOil Controller** – The function of the IntelOil controller is to control the oil level in the compressor crankcase. This protects the compressors from damage. This controller 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.

A higher level of efficiency is to be expected compared to a conventional type oil separator.

Applications

Helical oil separators can be used in a wide variety of applications. Common applications 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 standard product range is designed for use with HCFC, HFC, R290 & A2L gases and their associated oils, compatible with the vessel materials. Note that the S-5411 and S-5414 models are not currently suitable for use with R290 and A2L gases. The SN range is additionally suitable for use with ammonia. The SH high pressure range is intended for use with R410A, sub-critical CO_2 and A2L gases compatible with the vessel materials.

Please contact Henry Technologies for new or special applications.

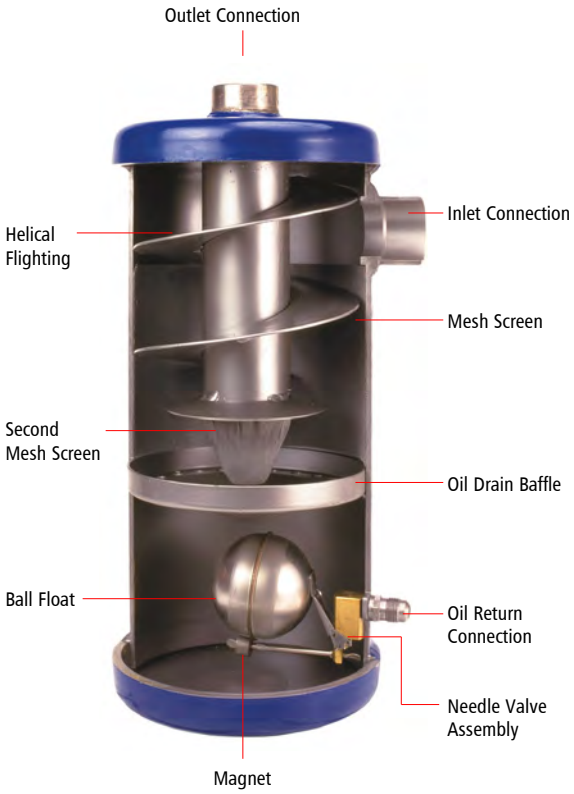
How it works

Upon separator entry, refrigerant gas containing oil in aerosol form encounters the leading edge of the helical flighting. The gas/oil mixture is centrifugally forced along the spiral path of the helix causing heavier oil particles to spin to the perimeter, where impingement with a screen layer occurs. The screen layer functions as both an oil stripping and draining medium. Separated oil flows downward along the boundary of the shell through a baffle and into an oil collection chamber at the bottom of the separator.

The specially engineered baffle isolates the oil chamber and eliminates oil re-entrapment by preventing turbulence. The virtually oil free refrigerant gas then exits through a second screen fitting just below the lower edge of the helical flighting. A float activated oil return needle valve allows the separated oil to return to the compressor crankcase or oil reservoir. There is a permanent magnet positioned at the bottom of the oil collection chamber to capture any system metal debris, which could impair the operation of the needle valve. With proper selection, an oil separation efficiency of up to 99% can be achieved.

Main Features

- 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
- Cleanable/replaceable oil float assemblies for S-5288, SN-52* and S-54* models



Technical Specification

For all models excluding SH series:

Allowable operating pressure = 0 to 31 barg
Allowable operating temperature = -10˚C to +130˚C

For SH models:

Allowable operating pressure = 0 to 48 barg
Allowable operating temperature = -10˚C to +130˚C

Materials of Construction

The main components; shell, end caps and connections are made from carbon steel. The oil float is made from stainless steel. The needle valve seat is made from either brass or steel, dependent on model.

STANDARD 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					
S-5180	1/4 ODS	64	162	44	43	N/A	17.5	N/A	3/8"	fig.1	1.3	0.11	SEP
S-5181	3/8 ODS	64	191	44	71	N/A	16.5	N/A	3/8"	fig.1	1.4	0.11	SEP
S-5182	1/2 ODS	102	330	70	64	N/A	60	N/A	M10	fig.2	3.6	0.6	Cat II
S-5185	5/8 ODS	102	381	70	64	N/A	60	N/A	M10	fig.2	4.1	0.6	Cat II
S-5187	7/8 ODS	102	433	76	77	N/A	60	N/A	M10	fig.2	4	0.6	Cat II
S-5188	1 1/8 ODS	102	483	76	78	N/A	60	N/A	M10	fig.2	4	0.6	Cat II
S-5190	1 3/8 ODS	152	385	107	91	N/A	60	N/A	M10	fig.2	8.8	1.45	Cat II
S-5192	1 5/8 ODS	152	429	109	97	N/A	60	N/A	M10	fig.2	9	1.45	Cat II
S-5194	2 1/8 ODS	152	437	111	105	N/A	60	N/A	M10	fig.2	9	1.45	Cat III
S-5288	1 1/8 ODS	102	614	76	78	97	N/A	120.7	2 x Ø14mm holes	fig.3	7.4	0.71	Cat II
SN-5290	1 3/8 ODS	152	510	108	92	101	N/A	111	2 x Ø14mm slots	fig.3	10.8	0.71	Cat II
SN-5292	1 5/8 ODS	152	556	108	99	101	N/A	111	2 x Ø14mm slots	fig.3	11.7	0.71	Cat II
SN-5294	2 1/8 ODS	152	566	111	107	101	N/A	111	2 x Ø14mm slots	fig.3	11.9	0.71	Cat II
S-5411-CE	1 5/8 ODS	219	650	148	164	100	N/A	168	3 x Ø14mm slots	fig.4	26	0.7	Cat II
S-5412	2 1/8 ODS	203	650	137	164	102	N/A	162	3 x Ø14mm slots	fig.4	20	0.71	Cat III
S-5413	2 5/8 ODS	256	758	166	202	102	N/A	210	3 x Ø14mm slots	fig.4	30	0.71	Cat III
S-5414-CE	3 1/8 ODS	324	831	215	229	100	N/A	273	3 x Ø14mm slots	fig.4	56	0.7	Cat III

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-5182	1/2 ODS	102	352	70	81	N/A	60	N/A	M10	fig.2	5.7	0.6	Cat II
SH-5185/P	5/8 ODS	102	402	70	81	N/A	60	N/A	M10	fig.2	6.5	0.6	Cat II
SH-5187/P	7/8 ODS	102	453	76	94	N/A	60	N/A	M10	fig.2	7.1	0.6	Cat II
SH-5188/P	1 1/8 ODS	102	500	76	93	N/A	60	N/A	M10	fig.2	7.4	0.6	Cat II
SH-5190/P	1 3/8 ODS	152	570	108	135	98	N/A	112	3 x Ø14mm slots	fig.5	14.5	1.45	Cat III
SH-5192	1 5/8 ODS	152	615	108	140	99	N/A	112	3 x Ø14mm slots	fig.5	15	1.45	Cat III
SH-5194	2 1/8 ODS	152	623	111	145	99	N/A	112	3 x Ø14mm slots	fig.5	16	1.45	Cat III

Note: 'P' Models include a 3/8" NPT fitting for PRV. 'P' models are the standard stock models.

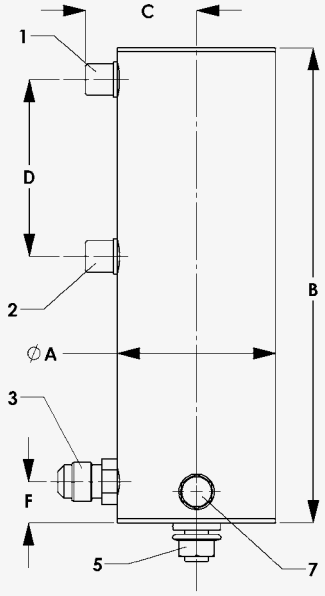


Fig. 1

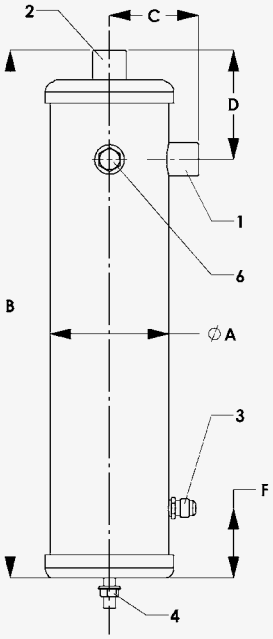


Fig. 2

1. Inlet
2. Outlet
3. Oil return, 3/8 SAE Flare
4. M10 stud and nut
5. 3/8 NPT stud and nut
6. 3/8 NPT fitting ('P' models only)
7. 1/8 NPT drain port & plug (protrudes 19mm from side of shell)

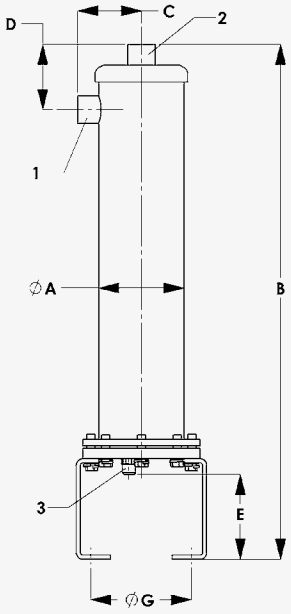


Fig. 3

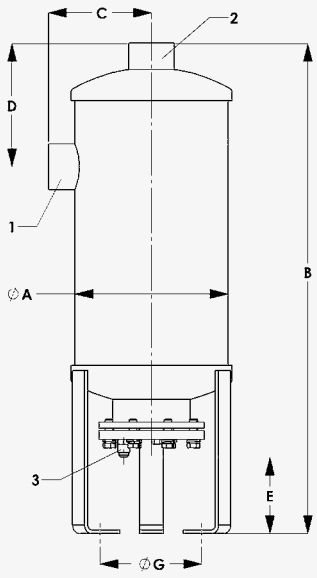


Fig. 4

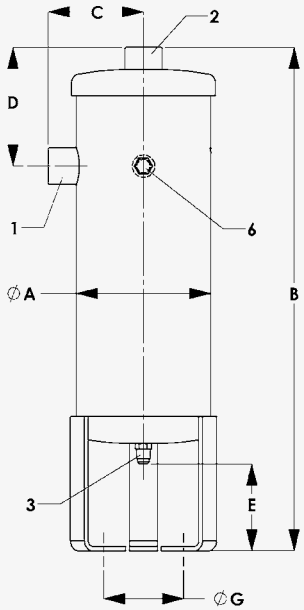


Fig. 5

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.

Selection Guidelines

The most important parameter for selection is the discharge volumetric flow rate, expressed in m^3/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. These graphs have been compiled for the common refrigerants R404A/R507A, R134a, R407F, R448A/R449A, R450A, R407A and R407C.

Graphs for other refrigerants are available on request.

The graphs are based on a simplified refrigeration cycle and hence the corresponding calculation of discharge volume flow rate is approximate. Although approximate, this method of selection has been used successfully for many years for standard refrigeration systems.

Where a higher degree of accuracy is required to calculate the m^3/hr, the flow rate calculation method is recommended. The flow rate calculation method is also recommended for CO_2 cascade and special applications.

HELICAL OIL SEPARATORS

Part No	Capacity in kW of refrigeration at nominal evaporator temperature						Maximum discharge volume (m^3/hr)
	R404A/507A		R134a		R407F		
	-40°C	5°C	-40°C	5°C	-40°C	5°C	
S-5180	2.6	3.5	1.8	2.6	3.4	4	1.3
S-5181	3.5	5.3	2.6	3.5	4.5	5.2	1.7
S-5182, SH-5182	5.3	7	3.5	5.3	6.8	8	2.6
S-5185, SH-5185P	14.1	19.4	10.6	14.1	17.8	20.8	6.8
S-5187, SH-5187P	23	30	15.8	19.4	26.7	31.3	10.2
S-5188, S-5288, SH-5188P	29.8	38.7	21.1	26.4	35.6	41.7	13.6
S-5190, SN-5290 & SH-5190P	42.2	52.8	28.2	35.2	49	57.3	18.7
S-5192, SN-5292 & SH-5192	52.8	66.9	38.7	45.8	62.4	72.9	23.8
S-5194, SN-5294, S-5411-CE & SH-5194	84.4	109	63.4	73.8	98	115	37.4
S-5412	109	144	77.4	95	129	151	49.3
S-5413	225	292	162	197	267	312	102
S-5414-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

Helical 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 = 40 kW
Minimum refrigeration capacity = 25 kW
Evaporating temperature = -35°C
Condensing temperature = +40°C

From the R404A graph, follow the -35°C evaporator temperature line to the intersection of the 40°C condensing temperature line. Extend a line horizontally from this point to the m^3/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 [m^3/hr/kW factor] = 0.42

Therefore:
Maximum discharge volume flow rates = (0.42 x 40) = 16.8 m^3/hr
Minimum discharge volume flow rates = (0.42 x 25) = 10.5 m^3/hr

The maximum and minimum m^3/hr figures should be compared with the rated capacity of the helical separator. Refer to the Performance Data Table for the rated capacities.

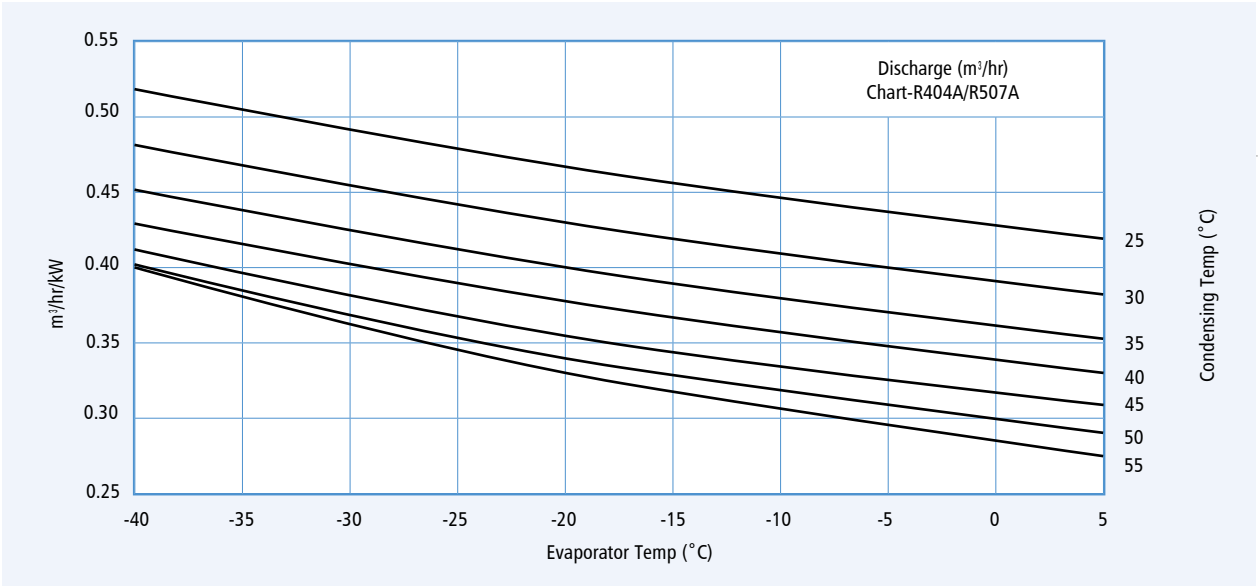
The general recommendation is that the calculated maximum flow should not exceed the rated capacity of the separator. Also, the minimum flow should not be below 25% of the rated capacity. Using these m^3/hr figures, the recommended helical separator selection is either model S-5190 or SN-5290, both with a rated capacity of 18.7 m^3/hr. The final selection depends on whether or not the user requires a separator model with a removable/cleanable oil float assembly.

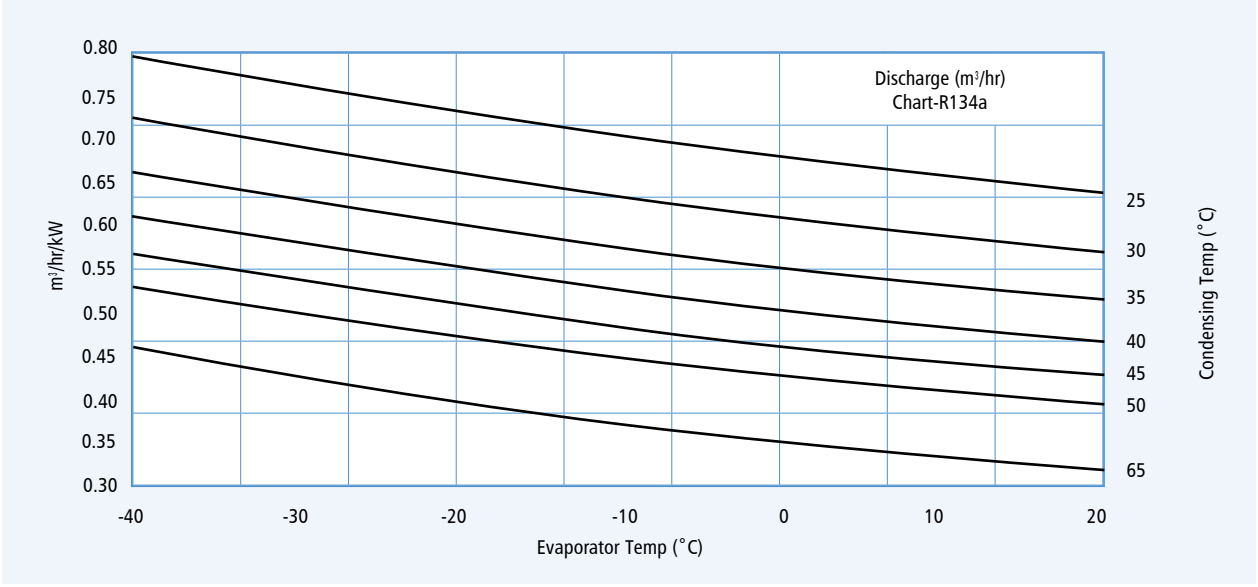
Additional notes on selection:

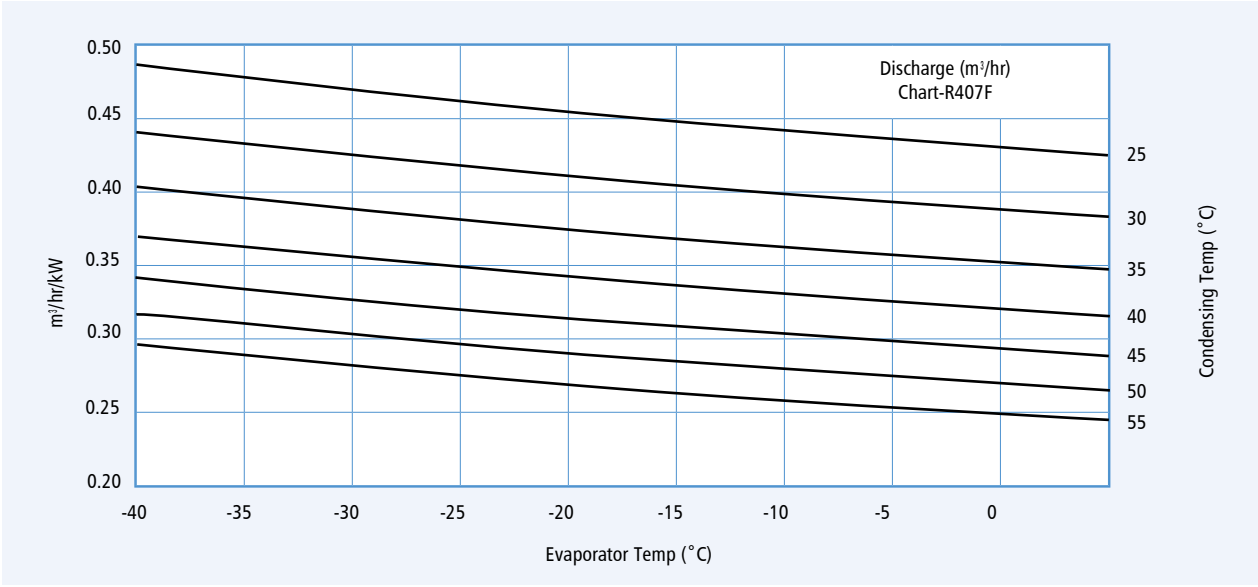
1. The 25% of minimum rated recommendation capacity rule is to optimise efficiency. Below this load factor, the efficiency of the separator will decrease. On systems with extreme unloading conditions, one separator per compressor should be used rather than one separator for a common discharge line.

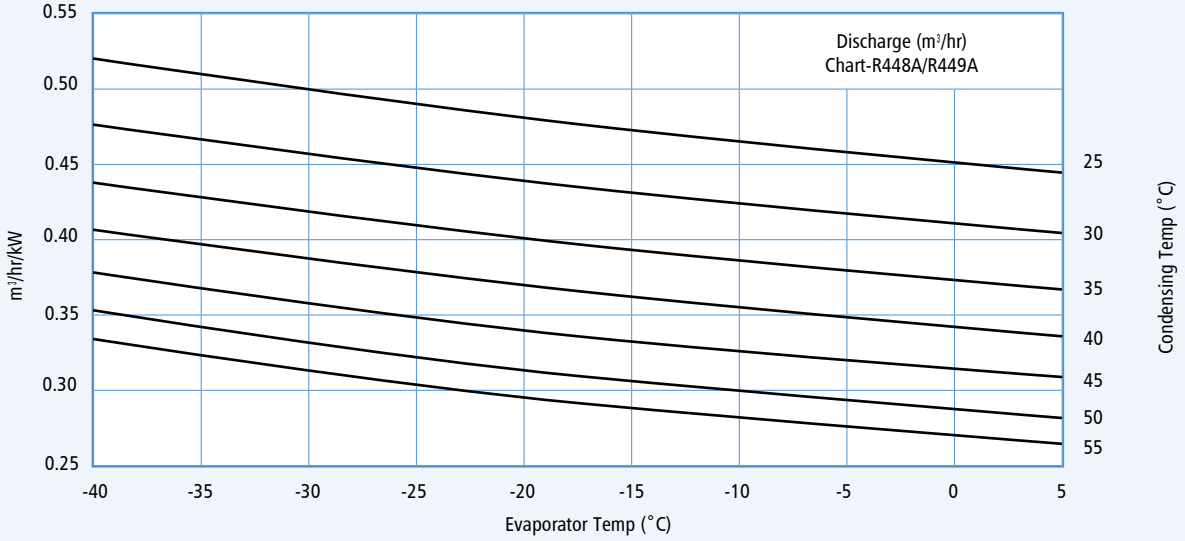
2. Understanding the system refrigeration capacity and the percentage of full and low load run times can also be helpful in selecting the separator.

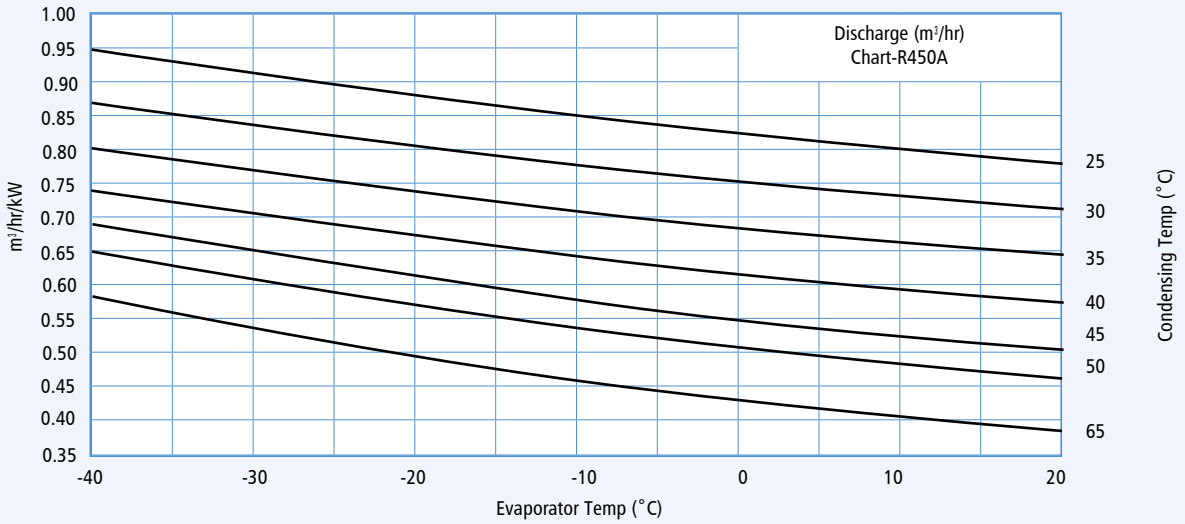
3. In cases where the maximum discharge has been exceeded by only a minimal amount and the system has unloading characteristics, select the smaller separator. It is not recommended to oversize.

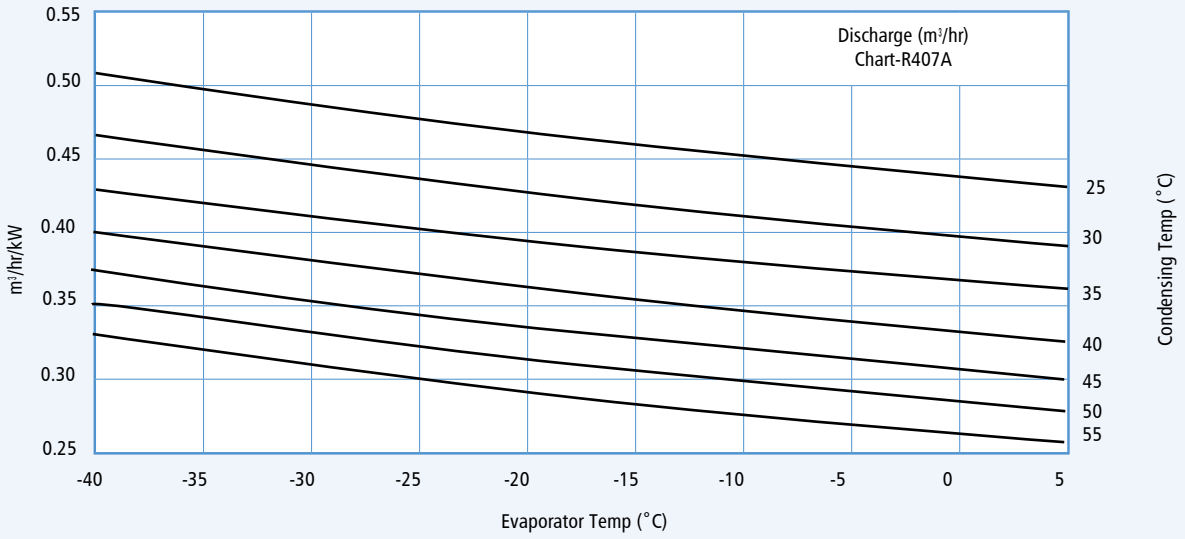

Discharge (m³/hr)
Chart-R404A/R507A
m³/hr/kW
0.55
0.50
0.45
0.40
0.35
0.30
0.25
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporator Temp (°C)
Condensing Temp (°C)
25
30
35
40
45
50
55

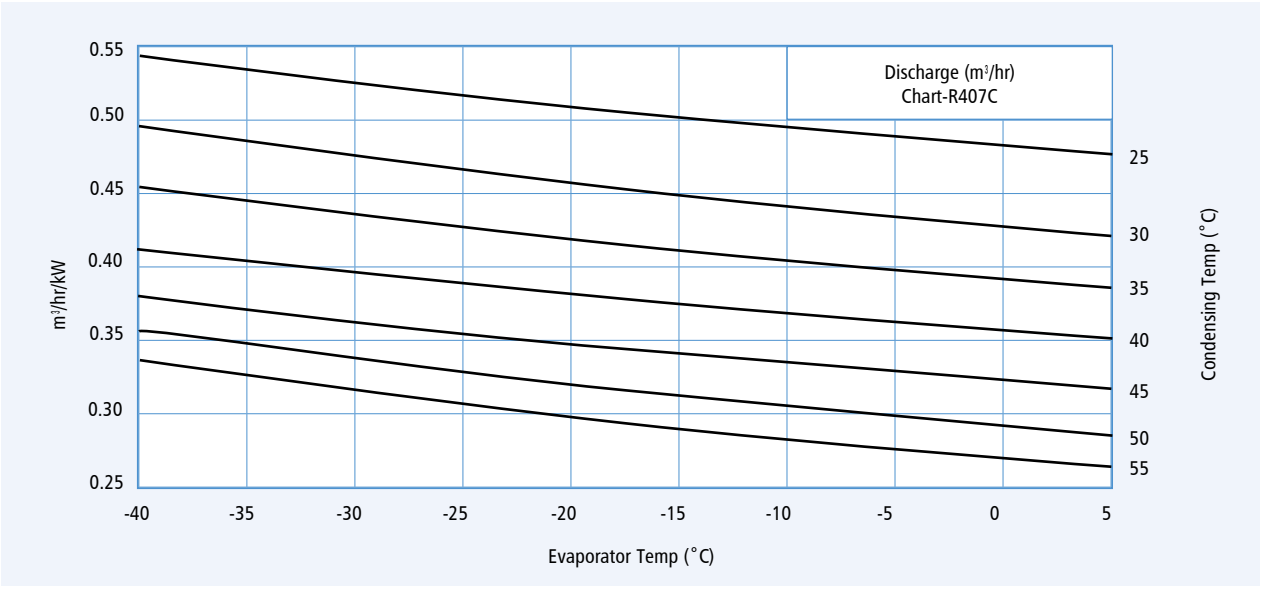

Discharge (m³/hr)
Chart-R134a
m³/hr/kW
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
-40
-30
-20
-10
0
10
20
Evaporator Temp (°C)
Condensing Temp (°C)
25
30
35
40
45
50
65

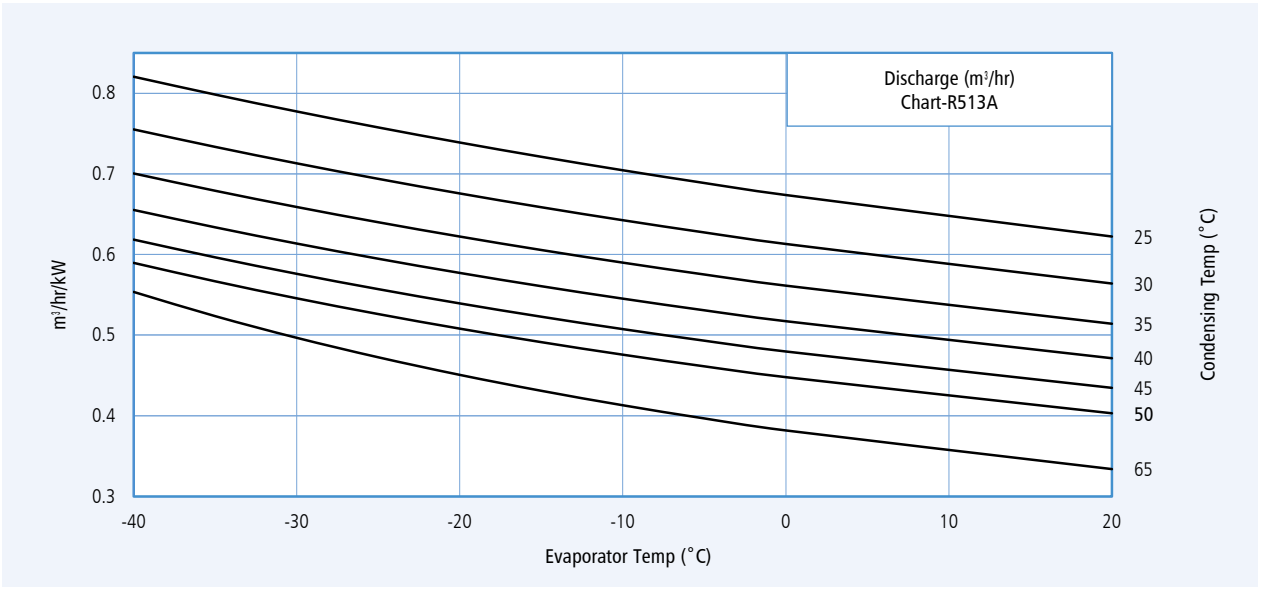

Discharge (m³/hr)
Chart-R407F
m³/hr/kW
0.50
0.45
0.40
0.35
0.30
0.25
0.20
-40
-35
-30
-25
-20
-15
-10
-5
0
Evaporator Temp (°C)
Condensing Temp (°C)
25
30
35
40
45
50
55

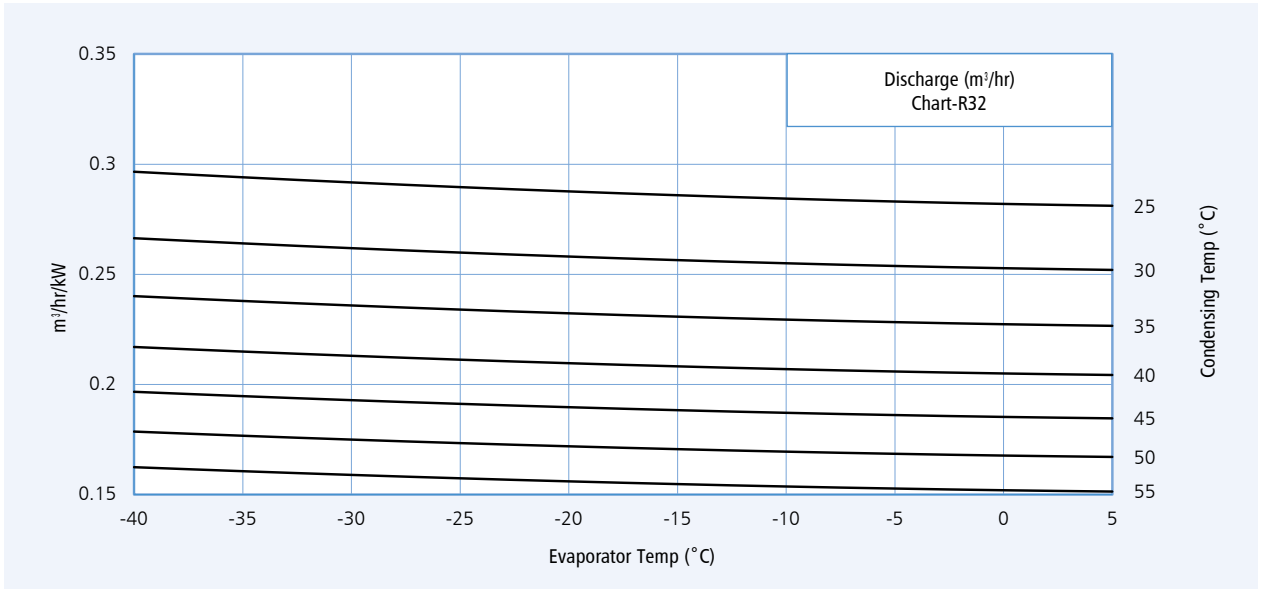

Discharge (m³/hr)
Chart-R448A/R449A
m³/hr/kW
0.55
0.50
0.45
0.40
0.35
0.30
0.25
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporator Temp (˚C)
25
30
35
40
45
50
55
Condensing Temp (˚C)


Discharge (m³/hr)
Chart-R450A
m³/hr/kW
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
-40
-30
-20
-10
0
10
20
Evaporator Temp (˚C)
25
30
35
40
45
50
65
Condensing Temp (˚C)


Discharge (m³/hr)
Chart-R407A
m³/hr/kW
0.55
0.50
0.45
0.40
0.35
0.30
0.25
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporator Temp (˚C)
25
30
35
40
45
50
55
Condensing Temp (˚C)


Discharge (m³/hr)
Chart-R407C
m³/hr/kW
0.55
0.50
0.45
0.40
0.35
0.30
0.25
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporator Temp (°C)
25
30
35
40
45
50
55
Condensing Temp (°C)


Discharge (m³/hr)
Chart-R513A
m³/hr/kW
0.8
0.7
0.6
0.5
0.4
0.3
-40
-30
-20
-10
0
10
20
Evaporator Temp (°C)
25
30
35
40
45
50
65
Condensing Temp (°C)


Discharge (m³/hr)
Chart-R32
m³/hr/kW
0.35
0.3
0.25
0.2
0.15
-40
-35
-30
-25
-20
-15
-10
-5
0
5
Evaporator Temp (°C)
25
30
35
40
45
50
55
Condensing Temp (°C)

HELICAL OIL SEPARATOR-RESERVOIRS

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

Applications

Helical oil separator-reservoirs can be used in a variety of applications. Common applications include multi-compressor racks. Helical oil separator-reservoirs are intended for High 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 range is designed for use with HFC refrigerants, along with their associated oils.

The S-5387-6L, S-5388-6L and S-5388 models are also suitable for use with A2L gases compatible with the vessel materials.

Please contact Henry Technologies for new or special applications.

How it works

Upon separator entry, refrigerant gas containing oil in aerosol form encounters the leading edge of the helical flighting. The gas/oil mixture is centrifugally forced along the spiral path of the helix causing heavier oil particles to spin to the perimeter, where impingement with a screen layer occurs.

The screen layer functions as both an oil stripping and draining medium. Separated oil flows downward along the boundary of the shell through a baffle and into an oil collection chamber at the bottom of the separator.

The specially engineered baffle isolates the oil chamber and eliminates oil re-entrapment by preventing turbulence. The virtually oil free refrigerant gas then exits through a screen fitting just below the lower edge of the helical flighting.

Oil separator-reservoirs do not have an oil float assembly. Instead, a dip tube is located in the oil chamber that feeds oil to the compressor, via a rotalock valve. With proper selection, an oil separation efficiency of up to 99% can be achieved.

Main Features

- 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
- Integrated oil reservoir

Technical Specification

Allowable operating pressure = 0 to 31 barg
Allowable operating temperature = -10˚C to +130˚C

Materials of Construction

The main components; shell, end caps and connections are made from carbon steel.

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	7/8 ODS	102 & 152	699	76	78	50	222	201	108	3 x Ø14mm slots	fig.1	5.2	12.1	Cat III
S-5388-6L	1 1/8 ODS	102 & 152	681	76	78	49	207	201	108	3 x Ø14mm slots	fig.2	5.2	11.8	Cat III
S-5388	1 1/8 ODS	102 & 152	812	76	78	50	222	311	108	3 x Ø14mm slots	fig.3	7	14.1	Cat III
S-5390	1 3/8 ODS	152	851	103	91	51	222	311	108	3 x Ø14mm slots	fig.4	7	16	Cat II
S-5392	1 5/8 ODS	152	902	108	100	51	222	311	108	3 x Ø14mm slots	fig.4	7	17	Cat II
S-5394	2 1/8 ODS	152	902	111	107	48	222	311	108	3 x Ø14mm slots	fig.4	7	17	Cat II
S-5302	2 1/8 ODS	203	648	137	124	N/A	127	108	278	3 x Ø14mm slots	fig.5	7.5	21	Cat II
S-5423-CE	2 5/8 ODS	273	790	183	201	N/A	161	173	337	3 x Ø14mm slots	fig.6	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.6	17	63	Cat III

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 (m^3/hr)
	R404A/507		R134a		R407F		
	-40°C	5°C	-40°C	5°C	-40°C	5°C	
S-5387-6L	23	30	15.8	19.4	26.7	31.3	10.2
S-5388-6L, S-5388	29.8	38.7	21.1	26.4	35.6	41.7	13.6
S-5390	42.2	52.8	28.2	35.2	49	57.3	18.7
S-5392	52.8	66.9	38.7	45.8	62.4	72.9	23.8
S-5394	84.4	109	63.4	73.8	98	115	37.4
S-5302	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:
1. 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

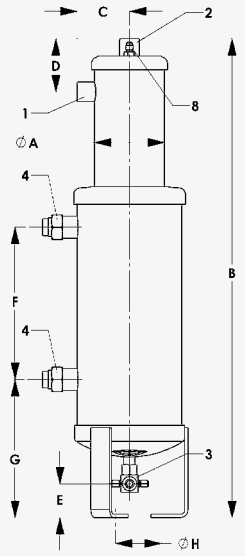


Fig. 1

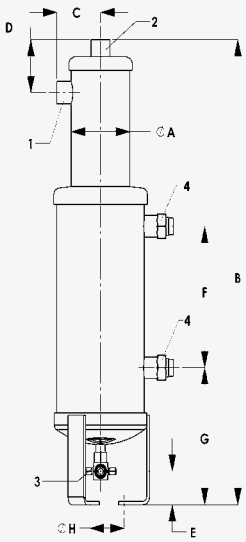


Fig. 2

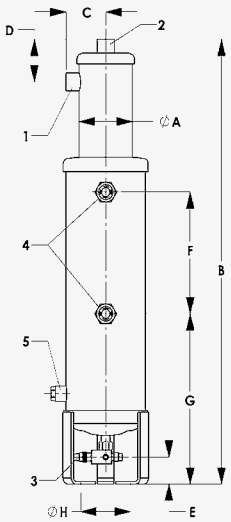


Fig. 3

1. Inlet
2. Outlet
3. Oil return, Rotalock valve, 3/8 SAE Flare
4. Sight glass
5. 1/2 FPT connection
6. Oil return, 3/8 ODS
7. M10 stud and nut
8. 1/4 SAE Flare connection

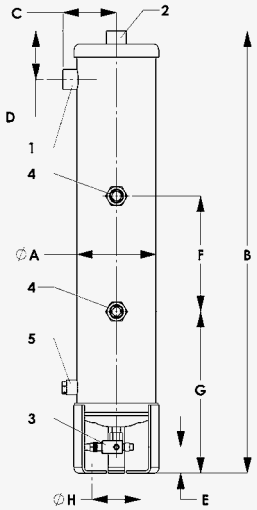


Fig. 4

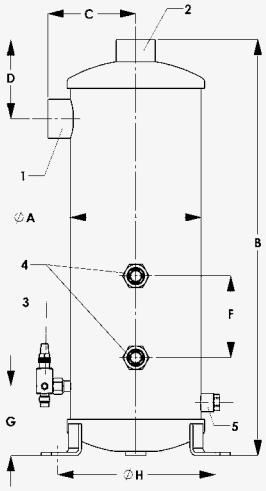


Fig. 5

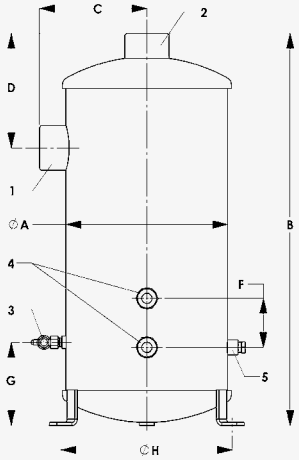


Fig. 6

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.

CONVENTIONAL OIL SEPARATORS

The function of a Conventional 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.

Applications

Conventional oil separators can be used in a wide variety of applications.

Common applications include multi-compressor racks and remote condensing units.

Conventional oil separators are intended for Low Pressure Oil Management Systems, using HCFC, HFC, R290 & A2L gases and their associated oils, compatible with the vessel materials.

These separators are designed for use with scroll and reciprocating type compressors. They are not recommended for screw or rotary vane compressors.

How it works

Oil-laden refrigerant gas from the compressor enters the separator and passes through an inlet screen. On entering the separator, the velocity of the gas is reduced. This reduction in velocity causes a change in momentum. The fine oil particles collide with one another to form heavier particles, which adhere to the inlet screen and inside wall of the separator.

The gas then passes through an outlet screen where final separation takes place. Refrigerant gas, with the majority of oil removed, then exits the separator.

The separated oil falls to the bottom of the separator where a float operated needle valve returns the oil to the crankcase or oil reservoir in the same way as the helical oil separator.

With proper selection, oil separation efficiency is typically 80%.

Main Features

- Low pressure drop
- Cleanable/replaceable oil float assemblies for S-19* models

Technical Specification

Allowable operating pressure = 0 to 31 barg

Allowable operating temperature = -10°C to +130°C

Materials of Construction

The main components; shell, end caps and connections are made from carbon steel. The oil float is made from stainless steel. The needle valve seat is made from steel.

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					
S-5580	1/4 ODS	102	210	48	N/A	N/A	M10	fig.1	2.5	0.4	Cat I
S-5581	3/8 ODS	102	208	48	N/A	N/A	M10	fig.1	2.4	0.4	Cat I
S-5582	1/2 ODS	102	260	48	N/A	N/A	M10	fig.1	2.9	0.4	Cat I
S-5585	5/8 ODS	102	362	48	N/A	N/A	M10	fig.1	3.6	0.4	Cat II
S-5587	7/8 ODS	102	451	48	N/A	N/A	M10	fig.1	4.2	0.4	Cat II
S-5588	1 1/8 ODS	102	532	48	N/A	N/A	M10	fig.1	4.8	0.4	Cat II
S-5590	1 3/8 ODS	102	539	48	N/A	N/A	M10	fig.1	4.9	0.4	Cat II
S-5690	1 3/8 ODS	152	397	76	N/A	N/A	3/8	fig.1	7.9	0.9	Cat II
S-5692	1 5/8 ODS	152	473	76	N/A	N/A	3/8	fig.1	8.9	0.9	Cat III
S-5694	2 1/8 ODS	152	486	76	N/A	N/A	3/8	fig.1	9.3	0.9	Cat III
S-1901/P	1 5/8 ODS	203	534	89	99	162	3 x Ø 14mm slots	fig.2	16	0.7	Cat III
S-1902/P	2 1/8 ODS	203	534	89	99	162	3 x Ø 14mm slots	fig.2	16	0.7	Cat III
S-1903/P	2 5/8 ODS	256	545	118	76	213	3 x Ø 14mm slots	fig.3	20	0.7	Cat III
S-1904/P	3 1/8 ODS	305	654	141	81	266	3 x Ø 14mm slots	fig.3	36	0.7	Cat III

Note: S-1903P and S-1904P include 2 x 3/8" NPT fittings for PRVs.

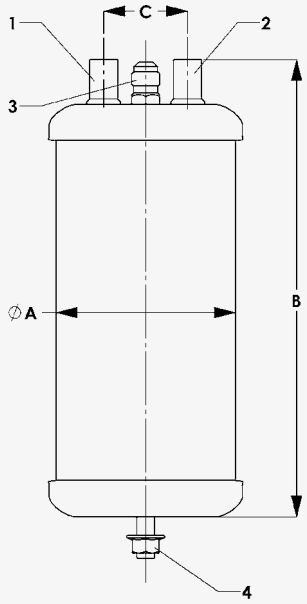


Fig. 1

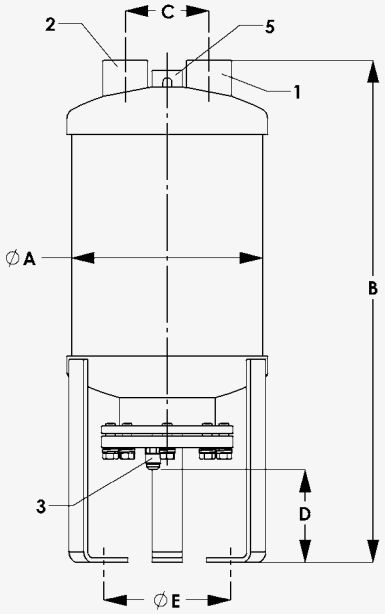


Fig. 2

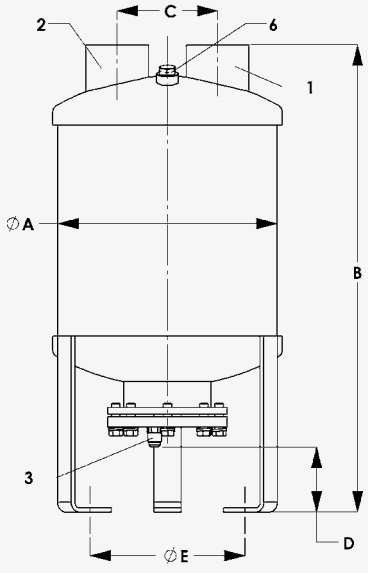


Fig. 3

1. Inlet
2. Outlet
3. Oil return, 3/8 SAE Flare
4. M10 or 3/8 stud and nut
5. Lifting lug (Ø 9.5 mm slotted hole)
6. 3/8 NPT plug and socket (2-off)

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 conventional oil 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	
S-5580	2.9	3.7	3.1	3.5	3.4	4	1.3
S-5581	3.8	4.9	4.2	4.7	4.5	5.2	1.7
S-5582	5.7	7.4	6.3	7.1	6.8	8	2.6
S-5585	15.2	19.7	16.8	19	17.8	20.8	6.8
S-5587	22.8	29.5	25.1	28.4	26.7	31.3	10.2
S-5588	30.4	39.3	33.5	37.8	35.6	41.7	13.6
S-5590	38	49.2	42	47.3	44.5	52.1	17
S-5690	41.8	54.1	46.1	52	49	57.3	18.7
S-5692	53.2	68.8	58.6	66.1	62.4	72.9	23.8
S-5694	85.6	110	94.3	106	100	117	38.3
S-1901/P	68.4	88.5	75.4	84	80.2	93.7	30.6
S-1902/P	102	132	113	127	120	141	45.9
S-1903/P	186	240	205	231	218	255	83.3
S-1904/P	258	334	284	321	301	352	115

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

The most important parameter for selection is the discharge volumetric flow rate, expressed in m^3/hr. This is the calculated volumetric 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 m^3/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 m^3/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 [m^3/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 m^3/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 S-5694 with a rated capacity of 38.3 m³/hr.

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 then 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

Refer to helical oil separators section.

TRANSCRITICAL CO_2

OIL SEPARATOR,SEPARATOR-RESERVOIR & OIL RESERVOIR

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.

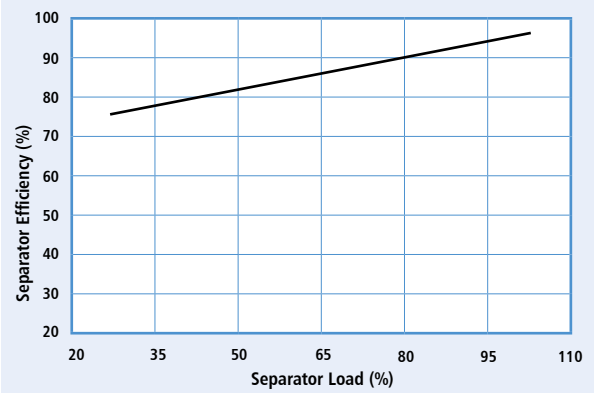
The function of an Oil Reservoir is to provide a holding charge of oil. The amount of oil circulating in a system varies depending on the operating conditions and the oil reservoir caters for these fluctuations by providing additional storage capacity.

Efficiency

To establish the oil separator efficiency when used on transcritical CO_2 applications, Henry Technologies commissioned independent testing. The chart shows the resultant oil separator efficiency at capacities of 25% to 103%. Efficiency levels of up to 97% were recorded. The tests utilised a semi-hermetic compressor with a variable speed drive motor to enable the capacity to be adjusted.

There are many factors that affect oil separator efficiency such as; discharge gas temperature and pressure; compressor oil carry-over and the density of the discharge gas and oil. Consequently oil separator efficiency varies on each system.

Separation Efficiency



Main Features

Separator/Separator-Reservoir

- High oil separation efficiency - up to 97%
- Consistent low pressure drop
- No clogging elements because of too much oil in the system
- No oil blow-out at start up from oil left in a coalescing element
- Maintenance-free
- Oil level sensor port

Oil Reservoir

- Two sizes available, 6.0 litres and 11.0 litres
- Clear sight glasses
- Oil level sensor port

Materials of Construction

The main components; shell, end caps and connections are made from carbon steel.

Technical Specifications

Allowable operating temperature = 0°C to +150°C

Allowable operating pressure = 0 to 130 barg

Oil Separator

Part No	Conn Size (Inch)	Dimensions (mm)								Mounting details	Drawing reference	Pre-charge qty (l)	Weight (kg)	CE Cat
		ØA	B	C	D	ØE	F	G	H					
STH-5193	1/2 NPT	168.3	638	191	202	231	202	N/A	45	3 x 14mm slots	fig.1	0.6	31.0	Cat III
STH-5196	3/4 NPT	168.3	697	191	261	231	261	N/A	41	3 x 14mm slots	fig.1	0.6	31.0	Cat III
STH-5198	1 NPT	168.3	747	191	261	231	261	N/A	45	3 x 14mm slots	fig.1	0.6	21.0	Cat III
STH-5199	1 NPT	168.3	791	191	261	231	261	N/A	40	3 x 14mm slots	fig.1	0.6	35.7	Cat III
STH-5410	1 1/4 NPT	168.3	752	196	261	231	261	N/A	39	3 x 14mm slots	fig.1	0.6	34.5	Cat III

Oil Separator-Reservoir

Part No	Conn Size (Inch)	Dimensions (mm)								Mounting details	Drawing reference	Capacity (l)	Weight (kg)	CE Cat
		ØA	B	C	D	ØE	F	G	H					
STH-5392	1/4 NPT	73	695	605	137	N/A	N/A	N/A	N/A	2 x 14mm slots	fig.2	1.1*	6.2	Cat II
STH-5398	1 NPT	168.3	992	191	261	231	271	265	45	3 x 14mm slots	fig.2	6.7*	45.2	Cat III

*Indicates reservoir capacity

Oil Reservoir

Part No	Conn Size (Inch)	Dimensions (mm)								Mounting details	Drawing reference	Capacity (l)	Weight (kg)	CE Cat
		ØA	B	C	D	ØE	F	G	H					
STH-9109	3/8 NPT	168.3	623	199	240	231	209	120	120	3 x 14mm slots	fig.3	6.0*	28.0	Cat III
STH-9108	3/8 NPT	168.3	930	199	547	231	209	269	278	3 x 14mm slots	fig.3	11.0*	41.5	Cat III
*Indicates reservoir capacity														

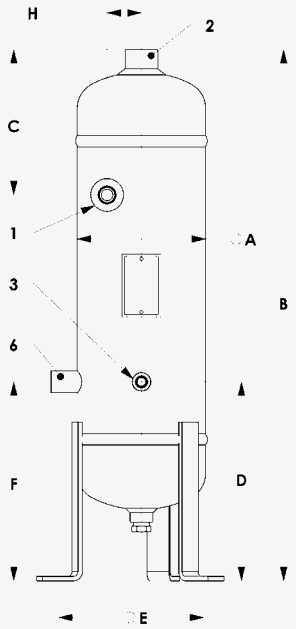


Fig. 1

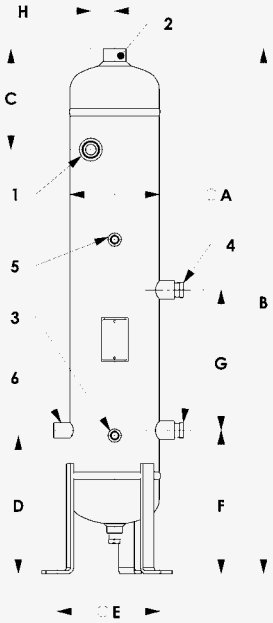


Fig.2

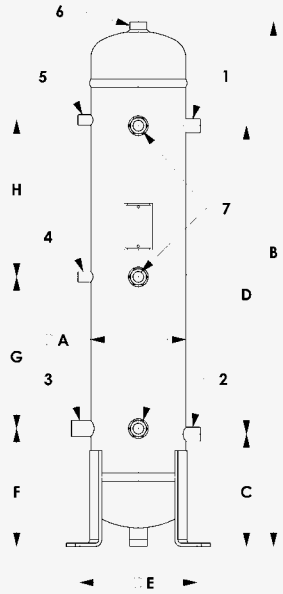


Fig.3

1. Inlet
2. Outlet
3. Oil return, 3/8 NPT
4. Sight glass
5. Port, 3/8 NPT
6. Level control conn, 1/2 NPT

1. Inlet
2. Outlet
3. Level control conn, 1/2 NPT
4. Charging conn, 1/4 NPT
5. Vent valve conn, 1/4 NPT
6. Relief valve conn, 1/2 NPT
7. Sight glass (centre sight glass on STH-9108 only)

Performance Data

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

Separator performance data

Part No	Capacity in kW of refrigeration at nominal evaporator temperature (°C)						Vol discharge (m^3/h)
	-30	-20	-10	0	10	15	
STH-5193	14	15.3	16.6	17.9	19.1	19.7	2.6
STH-5196	36.6	39.9	43.4	46.7	49.9	51.4	6.8
STH-5198	54.9	59.9	65.1	70.1	74.9	77.1	10.2
STH-5199	73.2	79.9	86.8	93.5	100	103	13.6
STH-5410	128	140	152	163	175	180	23.8
All data is based on 90 bar high pressure, 35°C gas cooler, 8K suction gas superheat and 5K useful superheat							

Separator-Reservoir performance data

Part No	Capacity in kW of refrigeration at nominal evaporator temperature (°C)						Vol discharge (m^3/h)
	-30	-20	-10	0	10	15	
STH-5392	9.2	10	10.9	11.7	12.5	12.9	1.7
STH-5398	54.9	59.9	65.1	70.1	74.9	77.1	10.2
All data is based on 90 bar high pressure, 35°C gas cooler, 8K suction gas superheat and 5K useful superheat							

COALESCENT OIL SEPARATOR

The purpose of a coalescing oil separator is to remove oil particles from a stream of refrigerant vapour and allow the oil to be returned, directly or indirectly, to the compressor. Coalescent separation describes the merging of smaller liquid droplets to form increasingly larger droplets, which then gather sufficient mass to be removed from the gas stream through gravitational separation in the filter walls. The oil subsequently drains from the filter to the bottom of the vessel where it can be returned to the compressor. Upon saturation, filters can be replaced to ensure separator efficiency is maintained. This ensures a clean and efficient refrigeration system.

Applications

The separators are specifically designed for the demands of a high pressure transcritical CO_2 (R744) system.

Main Features

- Micro-borosilicate fibre filters enable highly efficient separation, even at low fluid velocities.
- Flange face sealing ensures no loss of charge even at lower pressures which can be critical with other seal designs. Face seal design also reduces the risk of seal damage on installation.
- 3/4 NPT connection for use with Henry Liquid Level Switch or Liquid Level Sensor.

Installation Recommendations

Whilst the HCOS range filters are designed to separate oil from refrigerant vapour, the nature of the filter will also remove small system debris. It is possible that on removal of the filter this accumulated debris will remain within the separator, likely within the refrigerant oil at the bottom of the separator. It is recommended that a Henry transcritical Y-strainer, **896TH-3/8**, is fitted to the oil return line to prevent these solids returning to the compressor. This strainer has a removable screen to allow any debris to be removed from the oil return line.

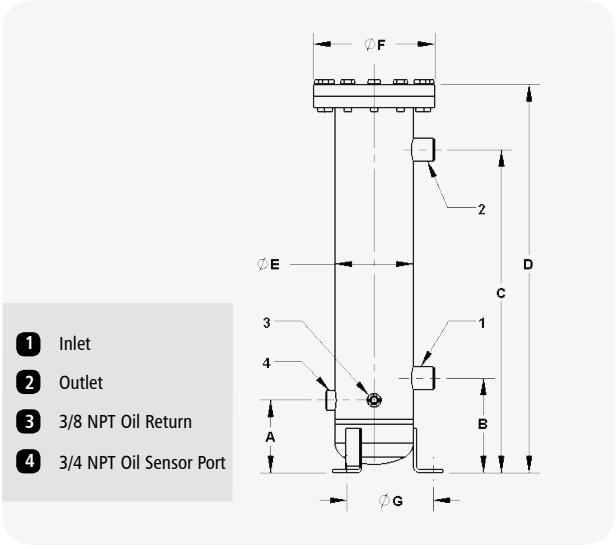
To warn against excessive oil build up in the vessel a Henry Oil Level switch, **STH-9424DN-3/4**, or Oil Level Sensor, **HLSH series** with **H12073** adapter, can be used.

Technical Specification

Allowable Operating Temperature = -10°C to +150°C
Allowable Operating Pressure= 0 to 130 Bar

Materials of Construction

The main components; shell, end cap, connections, flange ring and cover plate are made from carbon steel. The face seal O-ring is high temperature HNBR.



Model Number	Conn Size (inch)	Dimensions (mm)							Mounting Details	Total Volume (l)	Oil Pre-charge Volume (l)	Weight (kg)	Bolt Torque (Nm)	CE Cat
		A	B	C	D	ØE	F	ØG						
HCOS-37-1MPT	1 NPT Male	131	171	584	702	141	219	211	3 x 14mm Slots	8.5	0.95	26.5	84	Cat III
HCOS-37-1BW	1 BW													
HCOS-37-1-1/4MPT	1-1/4 NPT Male													
HCOS-37-1-1/4BW	1-1/4 BW													
HCOS-37-1-1/8	1-1/8 ODS													
HCOS-37-1-3/8	1-3/8 ODS													
HCOS-38-1-1/2MPT	1-1/2 NPT Male			752	870					10.6		30		
HCOS-38-1-1/2BW	1-1/2 BW													
HCOS-38-1-5/8	1-5/8 ODS													

Separator Performance Data

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

	Sizing criteria	Evaporating Temprature, °C						Volumetric Flow Rate, m³/hr
		-25	-20	-10	0	10	20	
HCOS-37 Series	Mass flow [kg/hr]	8647	9035	9892	10895	12111	13658	65
	Refrigeration [kW]	354	371	405	440	474	507	
HCOS-38 Series	Mass flow [kg/hr]	11972	12510	13697	15085	16769	18911	90
	Refrigeration [kW]	490	513	561	609	656	701	

Data based on 35°C gas cooler outlet temperature, 90 bar gas cooler , 8K evaporator superheat and 2K suction line superheat.

Selection Guidelines

The most important parameter for selection is the discharge volumetric flow rate, expressed in m^3/hr. This is the calculated volumetric flow rate at entry to the oil separator. It is not to be confused with the compressor displacement or swept volume.

To calculate the discharge volumetric flow rate, the maximum and minimum system mass flow rates are required along with the density of the gas at the inlet to the separator.

These mass flow rates can either be calculated from first principles or by using refrigeration cycle analysis software. In this way, superheating (useful and un-useful) can be accounted for in the mass flow rate calculation.

The gas density at inlet to the separator is a function of both pressure and temperature. The inlet gas temperature is dictated by a number of system design factors including compressor performance. The gas will be in a superheated state.

Example

Refrigerant CO_2 (R744)
Maximum refrigeration capacity = 320 kW
Minimum refrigeration capacity = 210 kW
Evaporating temperature = -15 °C
Gas cooler outlet = 35 °C
High pressure = 90barg (a)
Suction gas superheat = 5K
Useful superheat = 5K

From analysis software:
Maximum mass flow rate = 8004 kg/hr
Minimum mass flow rate = 5252 kg/hr
Gas density, superheated, at inlet to separator = 146 kg/m^3
Note: Mass flow rate = [(kW refrigeration/ refrigerating effect) x 3600]

Use the equation:

$$\text{Discharge volume flow rate} = \frac{\text{Mass flow rate}}{\text{Gas density}}$$

Hence for this example:

$$\text{Calculated maximum discharge volume flow rate} = \frac{8004}{146} = 54.8 \text{ m}^3\text{/hr}$$

$$\text{Calculated minimum discharge volume flow rate} = \frac{5252}{146} = 36.0 \text{ m}^3\text{/hr}$$

Using these m^3/hr figures, the recommended coalescent separator selection is model HCOS-37 series model.

Additional Notes on Selection:

1. It is recommended that the separator is **not** operated below 25% of its rated maximum capacity. This is to optimise efficiency. 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

1. Oil separators are not 100% efficient, so installing an oil separator should not be viewed as a replacement for oil traps, suction line accumulators or good oil return piping practices.
2. An initial oil pre-charge of 0.6L and 0.95L is required for the helical and coalescent separator models respectively.
3. Install the oil separator 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 bottom mounting feet interface.
4. A check valve should be located downstream of the outlet connection. This check valve is to prevent liquid refrigerant migrating from the condenser/gas cooler.

Replacement Components

Part No	Description
7-043-5000	HCOS-37 Series filter complete with sealing washer
7-043-5001	HCOS-38 Series filter complete with sealing washer
2-023-5000	Face seal O-ring for HCOS 37/38 Series separators

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 compressor from damage.

There are two main types of Mechanical oil level regulators - fixed level and adjustable level.

Applications

Mechanical oil level regulators are used in Low Pressure Oil Management Systems. They are designed for use with reciprocating compressors. They are not recommended for scroll compressors.

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

How it works

Oil is fed to the regulator via an inlet connection. An internal needle valve either allows or shuts off an oil supply to the regulator. An internal ball float controls the position of the needle valve. During compressor operation, the crankcase oil level reduces. A reduction in oil level activates the regulator, which ensures the correct crankcase oil level is achieved and maintained.

The adjustable regulator has an in-built mechanism that allows the ball float to be adjusted up or down. This means that the crankcase oil level can be adjusted, in line with the compressor manufacturer's guidelines. The fixed level regulator does not have an adjusting feature hence the crankcase will be maintained at a fixed oil level.

Some regulator models are fitted with an equalisation connection that enables the oil levels between several compressors to be balanced.

In the majority of cases, Henry Technologies oil level regulators can be fitted directly to the compressor sight glass port. Where direct mounting is not possible, a separate adaptor can be used. Refer to Adaptor Kit table.

Main Features

- Proven needle valve design
- Stainless steel ball float
- Special mounting flange - allows direct fitting to standard compressors
- Premium quality neoprene seals
- Seal adaptor kit supplied with each model
- Visual indication of oil level via large sight glass
- Double O-ring stem seal design - adjustable model
- Easy adjustment mechanism - adjustable model

Technical Specification

Allowable operating pressure = 0 to 31 barg

Allowable operating temperature = 0°C to +130°C

Refer to table for the allowable oil pressure differential for the Henry range of regulators.

Important information

1. As a result of a modification to the Bitzer oil ventura device in May 1997, it is no longer necessary to provide an oil guard on the oil level regulator.
2. Copeland confirm a 1/2 sight glass oil level is acceptable, rather than 1/4 sight glass, for all compressors fitted with an oil management system.

Materials of Construction

The main components; shell, end caps and connections are made from carbon steel. The ball float is made from stainless steel. The needle valve seat is made from brass.

Part No	Regulator type	Sight glass oil level	Equalisation	Allowable oil pressure differential, bar	Drawing reference	MWP (barg)	Weight (kg)	Compressor sight glass connection	CE Cat
S-9510	Fixed	1/2	No	0.35 to 2.1	fig.1	31	2.20	3-Bolt 1.7/8" B.C. & 4-Bolt 50mm B.C.	SEP
S-9510E	Fixed	1/2	Yes	0.35 to 2.1	fig.1	31	2.20		SEP
S-9510V	Fixed	1/2	No	0.35 to 2.1	fig.2	31	2.10		SEP
S-9530	Adjustable	1/4 to 5/8	No	0.35 to 6.2	fig.3	31	2.30		SEP
S-9530E	Adjustable	1/4 to 5/8	Yes	0.35 to 6.2	fig.3	31	2.30		SEP

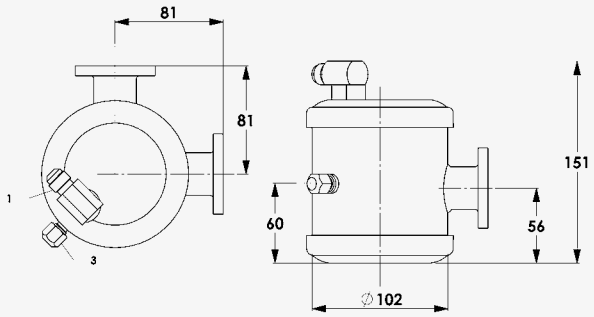


Fig. 1

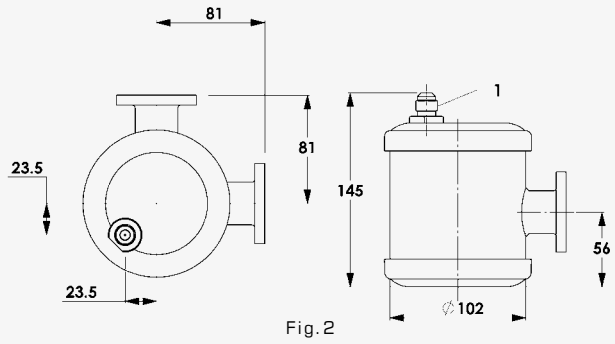


Fig. 2

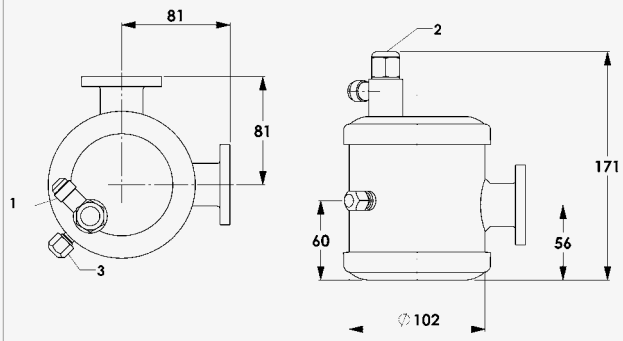


Fig. 3

1. 3/8 SAE Flare inlet
2. Adjustment
3. 1/4 SAE Flare equalisation (optional)

Dimensions in mm

Selection Guidelines

The correct selection depends on the refrigerant type, differential oil pressure acting on the regulator, and the user's preference for crankcase oil level control. Some users prefer the simplicity of model S-9510 while others prefer model S-9530E, owing to the larger pressure differential, oil level adjustment and equalisation features.

Note: Differential oil pressure is the difference between the supply pressure at inlet to the regulator and the pressure inside the compressor crankcase. Gravity pressure head should be included also, if applicable.

Installation – Main issues

1. To protect the regulator from system debris, an oil strainer, oil filter or oil filter drier is recommended.
2. The regulator can be fitted directly to 2, 3 and 4 cylinder compressors and to most 6-cylinder compressors that use a standard 3 or 4 bolt sight glass. For other compressor configurations, an adaptor will be required.
3. The regulator should not be subjected to excessive vibration. The operating differential oil pressure should be within the range of the regulator's specification.
4. The oil level must be set and controlled in line with the compressor manufacturer's guidelines.
5. Full instructions are given in the Product Instruction Sheet included with each regulator.

Compressor Model	Sight Glass Configuration	Adaptor Kit Part Number	CE Cat
Bitzer Octagon	1 1/8"- 18 Thread	3-033-262	SEP
Carrier models (EA,ER,OBE & OBCC)	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
Copeland (8R & 8D)	3 Bolt 1 7/8" B.C.	3-033-212	SEP
Copeland Discus (4R,6R,9R,MD,MR,NR)	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
Copeland (HA,KA,EA,3A,LA,ER & 3R)	1 1/8"- 12 Thread	3-033-202	SEP
Dunham (Bush Big 4)	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
Frascold	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
Prestcold (K)	1 1/8"- 12 Thread	3-033-202	SEP
Tecumseh (P,R,S,PA,RA,SA,CK,CM,CH,CG)	1 1/8"- 12 Thread	3-033-202	SEP
Trane (M,R)	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
York (GC,GS,JS)	3 Bolt 1 7/8" B.C.	3-033-201-HPT*	-
Standard seal kit	N/A	3-033-201-HPT*	-

Warning: Regulators should not be operated at 1/4 sight glass or below when using an adaptor with an inside diameter smaller than the regulator flange port.

*Note: This is standard seal kit supplied with each S-95 series regulator. It includes all the parts previously included in adaptor kit 3-033-201 along with a special sandwich piece and O-ring for sealing a Bitzer 4 bolt sight glass.

INTELOIL CONTROLLERS

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, A2L and CO_2 refrigerants and their associated oils. It is also approved for use with R290 and R1270 refrigerants.

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
- 100 micron filter mesh on oil inlet

Models

- **HOC1-24-3** (24V AC with 3m power and relay cables)*
- **HOC1-230-3** (230V AC with 3m power and relay cables)*
- **HOC2H-24-3** (24V AC with 3m power and relay cables)*
- **HOC2H-230-3** (230V AC with 3m power and relay cables)*
- **HOC3H-230-3** (230V AC with 3m power and relay cables)*

*Adapter kits sold separately.

Tropical versions available on request for use in areas with high humidity.

Technical Specification

Allowable operating pressure:	0 to 60 barg (HOC1) 0 to 120 barg (HOC2H, HOC3H)
Maximum differential pressure:	40 bar (HOC1) 80 bar (HOC2H) 100 bar (HOC3H)
Maximum ambient temperature:	50°C
Maximum fluid temperature:	80°C
Supply voltage:	24V AC or 230V AC 50/60 Hz (HOCI & HOC2H) 230V AC 50/60Hz (HOC3H)
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: Power supply: Alarm contact:	Flying leads on designated cables Brown, blue & green-yellow wires Blue, black & brown wires
Protection class:	IP 65
Status LED's:	3
Oil inlet connection:	1/4 SAE Flare
Weight:	HOC1: 0.94 kg HOC2H & HOC3H: 1.0 kg

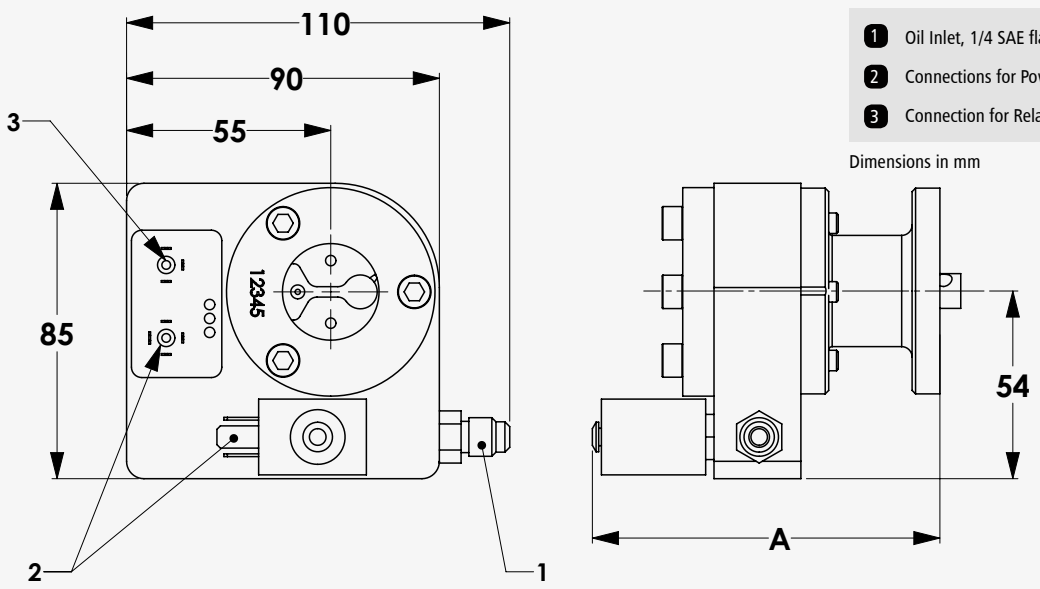
CE marked for EMC and Low Voltage Directive

Approvals: EAC

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

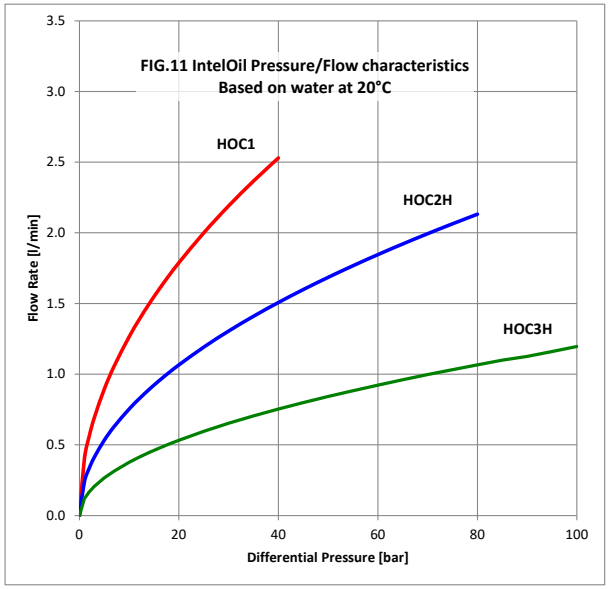
Materials of Construction

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.



INTELOIL CONTROLLER

Adapter	A(mm) Installed
H12070	101
H12071	85
H12072	85
H12073	81
H12074	100
H12075	96
H12076	85
H12077	104
H12078	101
H12079	81



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 with 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
H12077	Bock & Bitzer (120 bar)	1 1/8"-18 UNEF thread with O-ring - extended length	0.10
H12078	Dorin	6/6 hole mounting	0.12
H12079	N/A	1/2"- 14 NPTF	0.07

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

***Supplied with each IntelOil.

OIL RESERVOIRS

The function of an Oil Reservoir is to provide a holding charge of oil, as part of the 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 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 reservoirs are suitable for HCFC and HFC refrigerants, along with their associated oils.

Main Features

- Three sizes available in both standard and high pressure ranges
- Robust construction
- All models supplied with Rotalock valves
- Sight glass with floating ball
- Models supplied with mounting brackets

Technical Specification

Allowable operating pressure = 0 to 31 barg

Allowable operating temperature = -10°C to +130°C

Materials of Construction

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

Selection Guidelines

Henry reservoirs include three different oil holding capacities of approximately 6.7, 10.4 and 14.2 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, a simple selection guide can be used. For other systems, please contact Henry Technologies. The selection guide uses total compressor theoretical displacement, V_h, as an indicator of required oil reservoir capacity.

Example:

8 compressors each with a theoretical displacement of 17 m^3/hr.

Therefore V_h (total) = 136 m^3/hr.

The selected model is S-9109, with a V_h rating of up to 150 m^3/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 reservoir.

Installation – Main issues

1. Full instructions are given in the Product Instruction Sheet, included with each reservoir.

OIL RESERVOIR CAPACITY TABLE

Part No	Reservoir capacity within dimension shown (litres)			
	D	E	F	A
S-9109	2.5	2.7	N/A	6.7
S-9108U	2.5	6.5	N/A	10.4
S-9108	2.5	5.2	5.2	14.2

Part No	Dimensions (mm)						Drawing reference	Weight (kg)	MWP (barg)	CE Cat
	A	B	C	D	E	F				
S-9109	430	511	152	167	165	N/A	fig.1	9.4	31	Cat II
S-9108U	655	735	152	177	394	N/A	fig.1	12.8	31	Cat II
S-9108	883	965	152	165	311	311	fig.2	16.0	31	Cat II

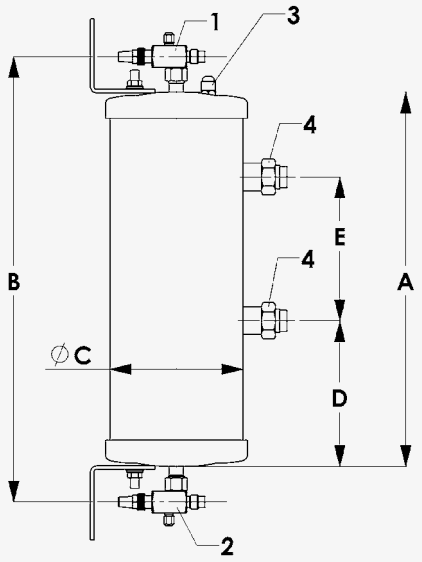


Fig. 1

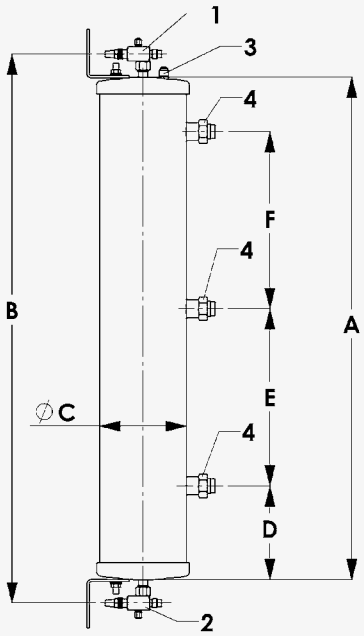


Fig. 2

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

OIL RESERVOIR SELECTION TABLE		
Part No	Capacity (litres)	V_h, total (m^3/hr)
S-9109	6.7	up to 150
S-9108U	10.4	150-300
S-9108	14.2	300-400
Note: V_h = 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 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, HFO and CO_2 refrigerants, along with their associated oils.

Main Features

- Proven design
- Five pressure settings
- Premium quality Neoprene or PTFE seal

Technical Specification

Allowable operating pressure = 0 to 130 barg

Allowable operating temperature = -10°C to +150°C

Materials of Construction

The valve body components are made from brass, the spring from stainless steel and the seal from Neoprene or PTFE (STH-9104-2.4 upwards).

Part No	Drawing reference	Pressure Setting (barg)	Conn Size (inch)		Weight (kg)	CE Cat
			Inlet	Outlet		
STH-9104-0.35 BAR	Fig.1	0.35 fixed	3/8" SAE Flare Female	3/8" SAE Flare Male	0.11	SEP
STH-9104-1.4 BAR		1.4 fixed				
STH-9104-2.4 BAR		2.4 fixed				
STH-9104-4.5 BAR		4.5 fixed				
STH-9104-25 BAR		25 fixed				

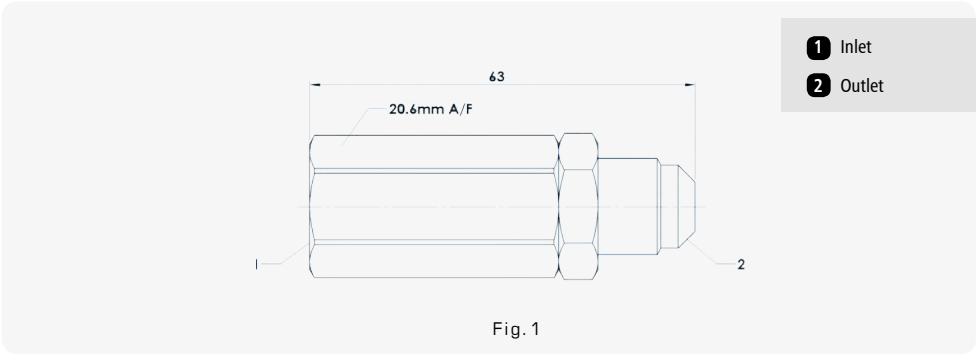


Fig. 1

RESERVOIR PRESSURE VALVE

Selection guidelines

The models provide 0.35, 1.4 and 2.4, 4.5 and 25 bar pressure differentials as required. 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 use a low differential pressure setting.

OIL REGULATOR SHUT-OFF VALVES

The function of Oil Regulator Shut-off valves is to provide a means for equipment isolation. Horizontal and vertical models are available.

Applications

These valves are positioned on the oil inlet and equalisation pipe lines of Henry Technologies Oil Level Regulators. This allows each oil level regulator to be isolated in the event that servicing is required on the compressor, oil level regulator, strainer, etc.

The valves are suitable for HCFC, HFC and A2L refrigerants, along with their associated oils.

Main features

- Two mounting options – horizontal and vertical
- 360° positioning via swivel connection

Technical Specification

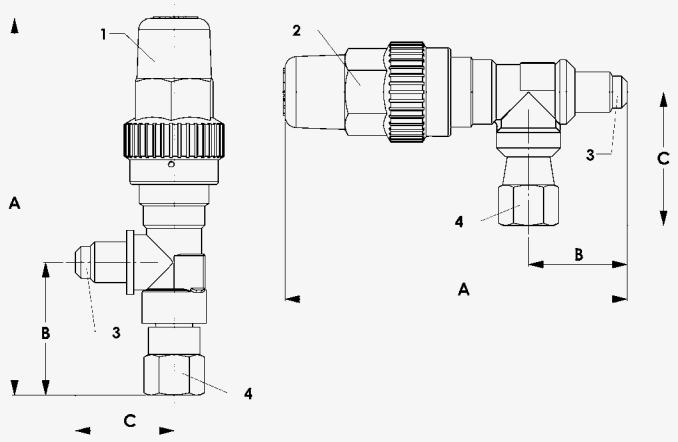
Allowable operating pressure = 0 to 45 barg

Allowable operating temperature = -10°C to +100°C

Materials of Construction

The main body and swivel nut are made from brass. The stem is made from plated steel. The stem seal cap is made from moulded plastic.

Part No	Conn Size (inch)		Dimensions (mm)			Type	Weight (kg)	CE Cat
	Fixed	Swivel	A	B	C			
S-9106E	1/4 SAE Flare	1/4 SAE Female Flare	102	37	27	Vertical	0.14	SEP
S-9106EH	1/4 SAE Flare	1/4 SAE Female Flare	92	27	36	Horizontal	0.15	SEP
S-9106V	3/8 SAE Flare	3/8 SAE Female Flare	104	39	32	Vertical	0.17	SEP
S-9106H	3/8 SAE Flare	3/8 SAE Female Flare	92	27	39	Horizontal	0.16	SEP



1 Vertical type
2 Horizontal type
3 Fixed connection
4 Swivel connection

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 series oil strainer can be used in both Low and High Pressure Oil Management Systems. The SH-9105 series is suitable for HCFC, HFC, A2L and CO_2 refrigerants and 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 a filter or filter drier element than with a mesh strainer.

Typically, a 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.

Main features

- Large screen area ensuring maximum capacity and long service
- Low pressure drop
- Stainless steel screen
- SAE or ODS connections available

Technical Specification

SH-9105 Series

Allowable operating temperature = 0°C to +100°C

Allowable operating pressure = 0 to 45 barg

Screen = 100 mesh, 91cm^2 filter area.

Materials of Construction

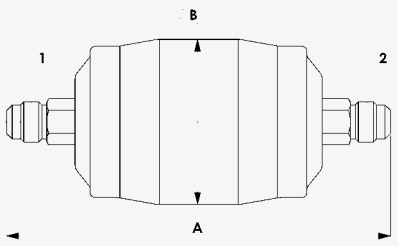
The main body and connections are made from carbon steel. The mesh screen is made from stainless steel.

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 unit to ease replacement, in the event that the mesh screen becomes blocked.

Part No	Conn Size (inch)		Dimensions (mm)		Screen Data		Weight (kg)	CE Cat
	Inlet	Outlet	A	Ø B	Area (mm2)	Mesh		
SH-9105	3/8 SAE Flare	3/8 SAE Flare	156	66	9100	200	0.37	SEP
SH-9105X	3/8 ODS	3/8 ODS	145	66	9100	200	0.32	SEP

SH-9105



1 Inlet
2 Outlet

OIL FILTERS AND 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/SH-4005 oil filter driers can be used in both Low and High Pressure Oil Management Systems.

Models are suitable for HCFC, HFC, A2L and CO_2 refrigerants along with their associated oils.

The unique drying features of the S-4005/SH-4005 models 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/SH-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 = -10°C to +100°C

Filter surface area = 3065 cm^2

Filter particle retention = 10 micron

S-4005 model

Allowable operating pressure = 0 to 31 barg

Allowable operating temperature = -10°C to +100°C

Filter surface area = 3000 cm^2

Filter particle retention = 6 micron

Drier = 131cm^3 of XH9 desiccant

SH-4005 model

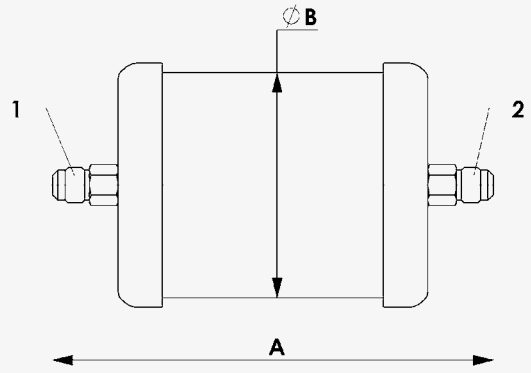
Same as S-4005, except

Allowable operating pressure = 0 to 60 barg

Installation – Main issues

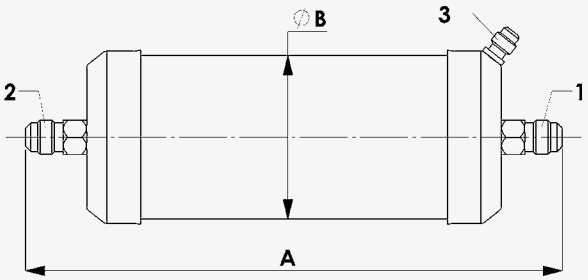
1. The oil filter or filter drier must be installed in accordance with the flow direction arrow.
2. Units should be replaced after a 1 barg (15 psig) pressure drop has been detected. Pressure drop can be detected by fitting Schrader valves before and after the unit. It is recommended to install valves 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 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	199	102	2.22	31	SEP



S-4004 OIL FILTER

1. Inlet
2. Outlet
3. Schrader valve (S-4005 model only)



S-4005/SH-4005 OIL FILTER DRIER

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	260	76	1.48	31	SEP
SH-4005	3/8 SAE Flare	3/8 SAE Flare	255	76	1.87	60	SEP

LIQUID LEVEL SWITCHES

The function of a Liquid Level Switch is detect and monitor liquid levels.

Applications

The level switch can be installed in a number of locations in the refrigeration system such as liquid receivers, suction line accumulators and compressor crankcases.

The range is designed for use with HCFC, HFC, A2L, CO_2 and ammonia refrigerants, along with their associated oils. A 1" NPT level switch is recommended for ammonia applications. For other refrigerant/oil combinations, please contact Henry Technologies.

How it works

The S-94 series electronic level switches use infrared light reflecting from a conical glass prism as a means of detecting the absence of fluid at the level of the glass cone. An integral part of the switch is an infrared module, containing a light emitter and receiver.

When no fluid covers the lower half of the cone, infrared light from the emitter reflects from the inner surface of the cone back to the receiver. This signals the module to switch. When fluid covers the lower half of the cone, the light from the emitter disperses into the fluid. The resulting absence of reflected light is detected by the receiver and the module switches in the opposite direction.

Main Features

- Patented optical sensor technology#
- Robust design
- Serviceable without refrigerant loss
- No moving parts
- Fused glass hermetic seal
- Flying leads and DIN connector options

US patent 5278426

Technical Specification

Allowable operating pressure:	0 to 46 barg 0 to 130 barg (STH Models)
Allowable operating temperature:	-40°C to +99°C
Mounting:	Horizontal only
Supply voltage:	Refer to table
Switch inductive rating:	36VA pilot duty rated
Contact life:	Over 1 million cycles at rated electrical load
Power for operation:	3.5mA AC, 5.5mA DC
Minimum load:	2mA (without bleed resistor)
Resistive rating:	Refer to table
Contacts, power off:	Normally Open (NO)
Contacts, power on: (liquid present)	Refer to table
Customer interface:	Refer to table
Protection class:	IP 65 DIN models only

Materials of Construction

The switch consists of a plated steel body with a built-in fused glass prism.

Adapter to fit 3/4'' Level Switch to 1-1/4''-12 UNF (Copeland Scroll) is available. Part Number A5065

** Part No	Voltage	Resistive rating	Contacts - power on & liquid present	Customer interface	Wire colour codes	Drawing reference	Dimensions			Replacement Module/kit number	Weight (kg)	CE Cat
							A (mounting thread)	B across flats (mm)	C (mm)			
S-9400	120V 50/60 HZ	0.5 A	closed	flying leads	Yellow & White	fig.1	1/2" NPT	28.6	192	2-044-012	0.22	SEP
S-9420	208/240V 50/60 HZ	0.25A	closed	flying leads	Red & White	fig.1	1/2" NPT	31.8	192	A4416	0.22	SEP
S-9420A	208/240V 50/60 HZ	0.25A	open	flying leads	Red & White/Stripe	fig.1	1/2" NPT	31.8	192	A4415	0.22	SEP
S-9424	24V AC/DC	0.5A	closed	flying leads	Orange & White	fig.1	1/2" NPT	31.8	192	A4414	0.22	SEP
S-9424A	24V AC/DC	0.5A	open	flying leads	Orange & White/Stripe	fig.1	1/2" NPT	31.8	192	A4417	0.22	SEP

**A 1" NPT connection is available for the S-9400 series by ordering with a "-1" suffix (i.e. S-9424-1)
Note: load is to be wired between black and coloured leads.

Note: The optional 1" NPT level switches allow the unit to be mounted closer to the inner wall of the vessel. This eliminates the potential for a pool of liquid next to the glass prism, which can be detrimental to performance. A 1" NPT level switch is recommended for ammonia applications where residue can build up on the glass prism.

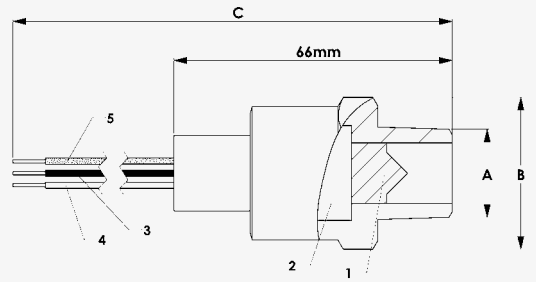


Fig. 1

1. Fused glass prism
2. Relay module (replaceable)
3. Black lead; L1/AC, (+)/DC
4. White (or White with a stripe) lead; L2/AC, (-)/DC
5. Relay output, see table for lead colour

** Part No	Voltage	Resistive rating	Contacts - power on & liquid present	Customer interface	Wire colour codes	Drawing reference	Dimensions		Replacement Module number	Weight (kg)	CE Cat
							A (mounting thread)	B (mm)			
S-9420DN	208/240V 50/60 HZ	0.25 A	closed	DIN socket	Red & White	fig.2	1/2" NPT	105	A4425	0.23	SEP
S-9424DN	24V AC/DC	0.5 A	closed	DIN socket	Orange & White	fig.2	1/2" NPT	105	A4414	0.23	SEP
S-9424ADN	24V AC/DC	0.5A	open	DIN socket	Orange & White/stripe	fig.2	1/2" NPT	105	A4417	0.23	SEP
S-9424-3/4UK	24V AC/DC	0.5A	closed	DIN plug	Orange & White	fig.3	N/A	N/A	A4414	0.23	SEP
STH-9424DN	24V AC/DC	0.5A	closed	DIN socket	Orange & White	fig.2	1/2" NPT	105	A4414	0.23	SEP
STH-9424DN-3/4	24V AC/DC	0.5A	closed	DIN socket	Orange & White	fig.2	3/4" NPT	107	A4414	0.23	SEP

NOTE: load is to be wired between black and coloured leads.

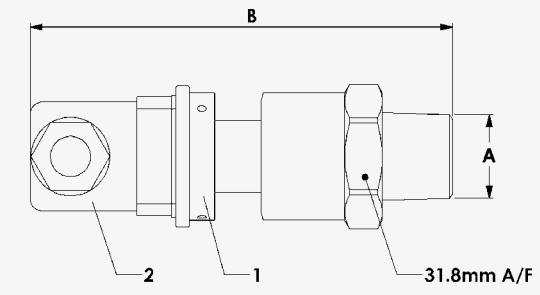


Fig. 2

1. Adaptor
2. Socket connector

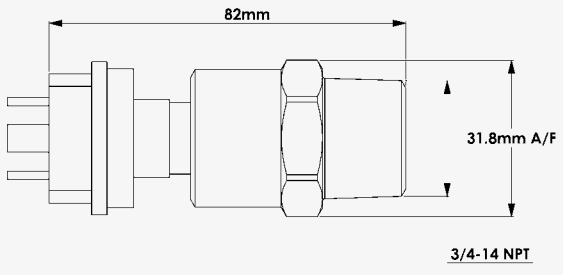


Fig. 3

Installation – Main issues

1. Install a level switch horizontally. If the unit is mounted at an angle or vertically, liquid can be trapped which will cause switching problems.
2. Ensure that no object is within 50 mm of the glass prism.
3. Wiring diagrams are included in the Product Instruction sheets.
4. The switches should not be used with very dirty liquids.
5. Full instructions are given in the Product Instruction sheet, provided with each unit.

INTELOIL LIQUID LEVEL SENSORS

The function of the IntelOil Liquid Level Sensor is to monitor the liquid level in a vessel and generate an alarm signal if the level either exceeds or falls below an acceptable limit. To achieve this, the unit uses proven high resolution float sensor technology. Each unit can be used for either low or high level sensing simply by rotating through 180° when mounting.

Applications

The IntelOil Liquid Level Sensor is suitable for both high and low pressure systems and is approved for HCFC, HFC, A2L and CO_2 refrigerants and their associated oils. It is also approved for use with R290 and R1270 refrigerants.

How it works

The IntelOil Liquid Level Sensor measures the level by means of a Hall effect sensor and a float assembly with built-in magnets. As the 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 which updates the green (normal), yellow (control) and red (alarm) status LEDs.

When a unit is being used for high level sensing, if the liquid goes above approx. 50% sight glass level, both the green and yellow LEDs will be lit and the output signal S will be switched on following a 10 second delay. This signal can be used to switch an actuator. If the level continues to rise, the green LED will be extinguished and both yellow and red LEDs will be lit and the unit relay will switch after a 90 second delay and can be used to shut down the system.

Where a unit is being used for low level sensing, if the liquid drops below approx. 50% sight glass level, the output signal S will be switched on after a 10 second delay and, if it continues to fall, the unit relay will switch after 90 seconds.

A range of adapter kits is available to allow mounting of the unit.

Main Features

- High resolution float sensor
- Units can be used for either high or low level monitoring
- Integral diagnostics
- Supplied with 3m power and relay cables
- Reliable performance even with foaming or dirty oil
- Compact and lightweight
- Precise level sensing
- Easy to install adapters

Models

- **HLS-24-3** (24V AC with 3m power and relay cable)*
- **HLS-230-3** (230V AC with 3m power and relay cable)*
- **HLSH-24-3** (24V AC with 3m power and relay cable)*
- **HLSH-230-3** (230V AC with 3m power and relay cable)*

*Adapter kits sold separately

INTELOIL LIQUID LEVEL SENSOR CABLES	
Part No	**Description**
HOC-N300**	**Power Cable 3mtr.**
HOC-S300**	**Relay Cable 3mtr.**
HOC-N600	**Power Cable 6 mtr.**
HOC-S600	**Relay Cable 6 mtr.**

**Supplied with each IntelOil Liquid Level Sensor

Technical Specification

Allowable operating pressure:	0 to 60 barg (HLS) 0 to 120 barg (HLSH)
Minimum required fluid density:	0.5 kg/l
Ambient temperature:	-40°C min/+50°C max
Fluid temperature:	-40°C min/+80°C max
Supply voltage:	24V AC or 230V AC 50/60 Hz
Current consumption:	0.02 Amps
Electrical connection:	Moulded plugs connect to Liquid Level Sensor
Alarm contact:	Max. 3A, 230V AC, floating
Sensor output:	0.5A inductive, 1A resistive
Wiring: Power supply: Alarm contact:	Flying leads on designated cables Brown, blue, yellow-green and black (signal S) wires Blue, black and brown wires
Protection class:	IP 65 (IEC529/EN 60529)
Status LED's:	3
Weight:	HLS: 0.47 kg HLSH: 0.54 kg

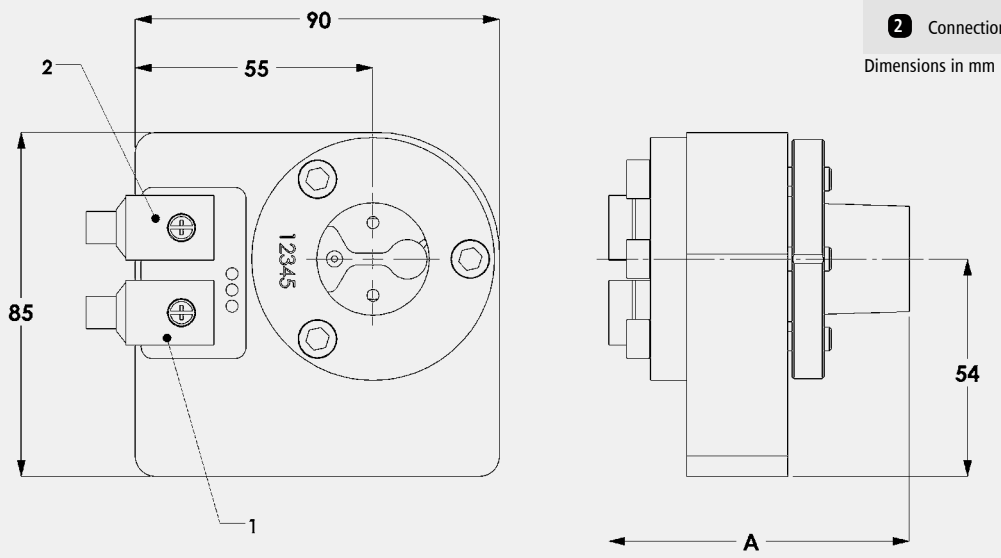
CE marked for EMC and Low Voltage Directive

Approvals: EAC

Tropical versions available on request for use in areas with high humidity.

Materials of Construction

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



INTELOIL LIQUID LEVEL SENSOR

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 standby and shutdown modes.
3. The unit should be mounted in the horizontal position.
4. To protect the liquid level sensor from system debris, adequate system filtration should be employed.

Adapter	A (mm) Installed
H12070	85
H12071	69
H12072	69
H12073	65
H12074	84
H12075	80
H12076	69
H12077	88
H12078	85
H12079	85

INTELOIL LIQUID LEVEL SENSOR ADAPTERS		
Part No	Mounting Style	Weight (kg)
H12070	3 & 4 bolt combination flange with O-ring	0.13
H12071	1 1/8"-18 UNEF thread with O-ring	0.08
H12072	1 1/8"-18 UNEF thread with aluminium seal	0.08
H12073	3/4"-14 NPTF	0.07
H12074	1 3/4"-12 UN thread Rotalock with Teflon gasket	0.14
H12075	1 1/4"-12 UNF thread Rotalock with Teflon gasket	0.11
H12076	1 1/8"-18 UNEF thread with O-ring and adapter ring	0.08
H12077	1 1/8"-18 UNEF thread with O-ring - extended length	0.10
H12078	6/6 hole mounting	0.12
H12079	1/2''- 14 NPTF	0.07

LIQUID LEVEL PROBES

The function of a Liquid Level Probe is to measure and display refrigerant or oil level in a vessel.

Applications

Henry Technologies' Liquid Level Probes are designed for use in a variety of refrigeration and air conditioning applications.

The Liquid Level Probe uses either a 3/4" MPT or a 1 1/4"-12 Rotalock fitting to mount on liquid receivers or oil reservoirs and provide a 0-5V output of fluid level. Probes are custom ordered based on specific application and desired features.

The Liquid Level Probes are suitable for use with HCFC, HFC, A2L and CO_2 refrigerants along with their associated oils. Each Probe should be ordered based on the specific application to ensure proper calibration.

How it works

The Liquid Level Probe measures refrigerant or oil level by sensing a change in capacitance between the LLP probe rod and the receiver/ reservoir wall. As the fluid changes in level, the output voltage varies between 0 and 5 volts.

For example, at the 0% set level the output would read OV, at the 50% set level the output would read 2.5V, and at the 100% mark (typically set at 90% of vessel capacity) the output would read 5V.

All Liquid Level Probes come factory calibrated based on the order specification but are easily recalibrated in the field if required.

Main Features

- 3/4" MPT or 1 1/4"-12 Rotalock connection
- Continuous accurate measurement
- DIN cable connector
- 3.6m, 3-wire 20 AWG cable
- Options include:
  - ° LCD Display
  - ° 1-6V output
- For units, which may be subject to condensation, a sealed option is available. Note however, that the LCD display is not available with this option.

Technical Specification

Allowable operating pressure = 0 to 90 barg

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

Supply voltage = 12-32V DC

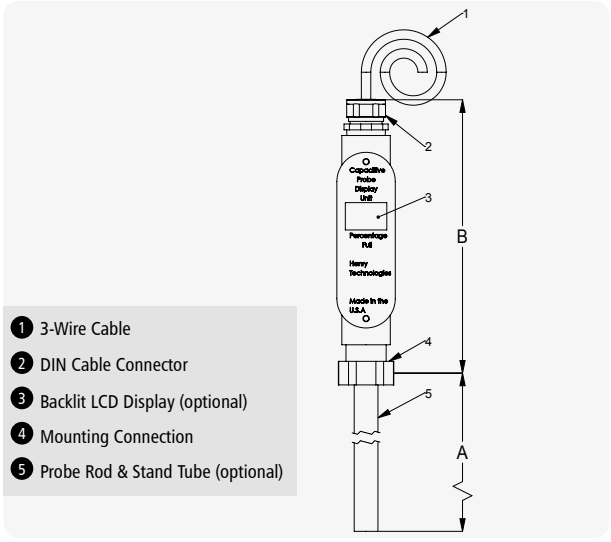
Maximum load = up to 2 kΩ with less than a 5% shift

Materials of Construction

The probe rod is made from stainless steel and the stand tube is made from aluminium. The Rotalock connection is made from plated steel.

Installation - Main issues

1. Liquid Level Probes are factory calibrated based on order specifications.
2. Re-calibration procedure and wiring diagrams are included with the full instructions given in the Product Instruction Sheet, supplied with each unit.



1. 3-Wire Cable
2. DIN Cable Connector
3. Backlit LCD Display (optional)
4. Mounting Connection
5. Probe Rod & Stand Tube (optional)

Part No	Conn Size (inch)	Dimensions (mm)		Weight (kg)
		A	B	
LLP Series	3/4" MPT or 1 1/4"-12 Rotalock	254-1524	196.9	1.13

SUCTION LINE ACCUMULATORS

The primary function of a Suction Line Accumulator is to prevent a sudden surge of liquid refrigerant, or oil, from returning down the suction line and into a compressor. The suction line accumulator is a temporary reservoir for liquid refrigerant and oil.

The accumulator is designed to meter both the liquid refrigerant and oil back to the compressor at a controlled rate. This prevents compressor damage. By metering the liquid refrigerant and oil back to the compressor, the accumulator also helps maintain system efficiency and proper crankcase oil levels. Heat Exchanger (HE) models are also available.

Applications

Suction line accumulators are installed in air conditioning and refrigeration systems where a sudden return of liquid down the suction line is possible. The product range is designed for use with HCFC, HFC and CO_2 refrigerants, along with their associated oils. S-70 series models up to and including S-7061 units are also suitable for use with A2L refrigerants.

How it works

Refrigerant vapour from the evaporator enters the suction line accumulator, along with any liquid refrigerant or oil. The outlet side of each accumulator is designed to allow refrigerant vapour to return to the compressor. Vapour return is achieved by a special U tube arrangement. On certain models, a tube within a tube arrangement is used as an alternative. Liquid is held at the bottom of the accumulator ready for metering back to the compressor.

Liquid is metered to the compressor via a screened orifice at the bottom of the tube. The vapour carries the metered liquid back to the compressor. Metering of liquid only occurs when the compressor is running.

Main features

- Prevents liquid slugging
- Controlled liquid return
- Large flow capacity
- Low pressure drop
- Screen protected orifice
- Heat exchanger option
- SA models UL listed

Technical Specification

SA-70, S-704, S-705 & S-706 series:
MWP = 31 bar (-30°C to +50°C)

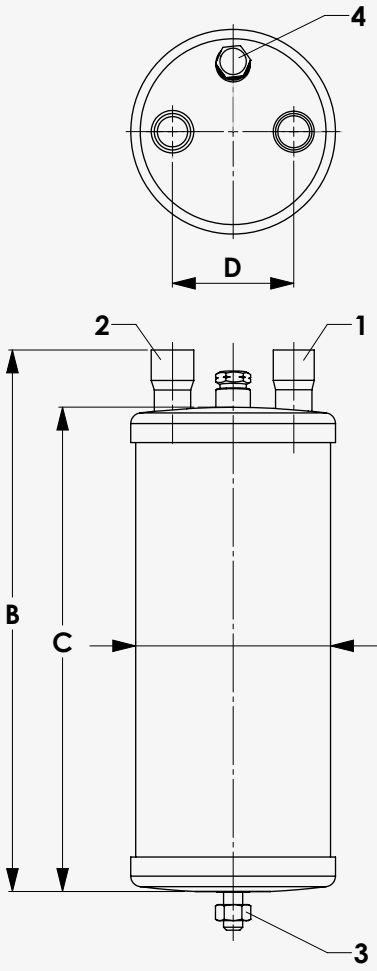
S-772 & S-773 series:
MWP =31 bar (-10°C to +80°C), 10 bar (-25°C to < -10°C)

S-774 series:
MWP = 27.6 barg (-10°C to +80°C), 10 bar (-25°C to <-10°C)

Materials of Construction

The shell and end caps are made from carbon steel. Branch connections are made from steel or copper (SA-70 & S-70 series).

Part No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	CE Cat
		Ø A	B	C	D		
SA-7044	1/2 ODS	102	163	138	63.5	2	SEP
SA-7043	5/8 ODS	102	167	138	63.5	2	SEP
SA-7045	5/8 ODS	102	278	249	63.5	2.9	Cat I
SA-7046	3/4 ODS	102	281	249	63.5	2.9	Cat I
SA-7056	3/4 ODS	127	252	222	70	3.6	Cat I
SA-7057S	7/8 ODS	127	256	222	70	3.6	Cat I
SA-7057	7/8 ODS	127	378	344	70	5.1	Cat I
SA-7051	1 1/8 ODS	127	476	438	70	6.3	Cat I
SA-7053	1 3/8 ODS	127	479	438	75	6.3	Cat I
SA-7065	1 5/8 ODS	152	678	633	75	13	Cat II



1. Inlet
2. Outlet
3. M10 stud & nut
4. Relief conn, 1/4 FPT

SA SERIES

Part No		Conn Size (inch)	Dimensions (mm)					Mounting details	HE Coil Conn Size (inch)	Drawing Reference	Weight (kg)	CE Cat
			Ø A	B	C	D	E (Ø)					
S-7043	-	5/8 ODS	102	167	63.5	N/A	N/A	M10 stud & nut	N/A	fig.1	2	SEP
S-7044	-	1/2 ODS	102	260	63.5	N/A	N/A	M10 stud & nut	N/A	fig.1	2.7	SEP
S-7045	-	5/8 ODS	102	264	63.5	N/A	N/A	M10 stud & nut	N/A	fig.1	2.8	Cat I
-	S-7045HE	5/8 ODS	102	264	63.5	63.5	N/A	M10 stud & nut	3/8 ODS	fig.1	3.5	Cat I
S-7046	-	3/4 ODS	102	273	63.5	N/A	N/A	M10 stud & nut	N/A	fig.1	2.8	Cat II
-	S-7046HE	3/4 ODS	102	273	63.5	63.5	N/A	M10 stud & nut	3/8 ODS	fig.1	3.2	Cat II
S-7057	S-7057HE	7/8 ODS	127	330	70	70	N/A	M10 stud & nut	1/2 ODS	fig.1	4.5, 5.1 (HE)	Cat II
S-7061	S-7061HE	1 1/8 ODS	152	381	75	73	N/A	M10 stud & nut	5/8 ODS	fig.1	7.8, 8,5 (HE)	Cat II
S-7063	S-7063HE	1 3/8 ODS	152	630	75	73	N/A	M10 stud & nut	5/8 ODS	fig.1	12.4, 12.9 (HE)	Cat II
S-7065	S-7065HE	1 5/8 ODS	152	630	75	73	N/A	M10 stud & nut	3/4 ODS	fig.1	12.2, 13.1 (HE)	Cat II
S-7721	-	2 1/8 ODS	219	588	89	N/A	283	3 Ø14mm x 22mm slots	N/A	fig.2	23	Cat II
-	S-7721HE	2 1/8 ODS	219	588	89	140	283	3 Ø14mm x 22mm slots	7/8 ODS	fig.3	27	Cat II
S-7725	-	2 5/8 ODS	273	578	118	N/A	338	3 Ø14mm x 22mm slots	N/A	fig.2	33.5	Cat II
-	S-7725HE	2 5/8 ODS	273	578	118	140	338	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	N/A	388.4	3 Ø14mm x 22mm slots	N/A	fig.2	47	Cat III
-	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 III
S-7732-CE	-	3 1/8 ODS	324	635	140	N/A	388.4	3 Ø14mm x 22mm slots	N/A	fig.2	47	Cat III
-	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 III
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-7721, S-7721HE, S-7725 & S-7725HE models
2. S-7732, S-7732HE, S-7741, S-7741HE & S-7742 models
3. S-7741HE-CE model
4. S-7741 & S-7742 models

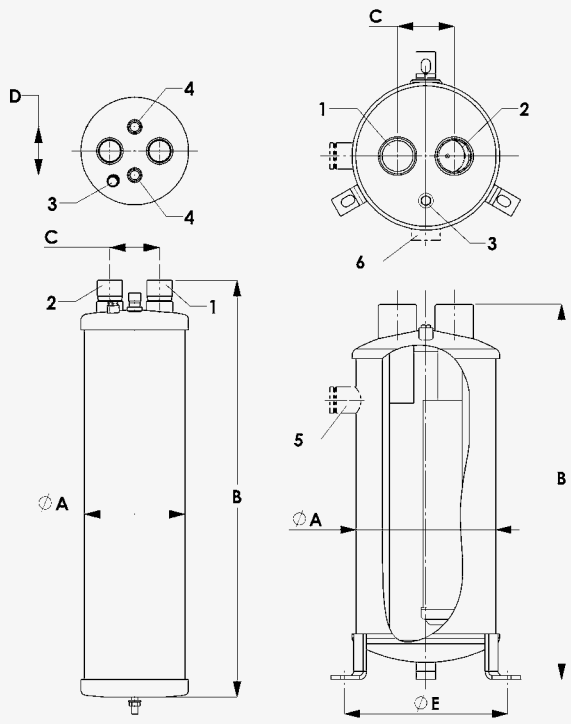


Fig. 1 Fig. 2 Fig. 3 Fig. 4

1 Inlet
2 Outlet
3 Relief connection, 1/4 FPT
4 Heat Exchanger coil connection (HE models only)
5 Liquid level switch connection (hermetic), 1 FPT. (Refer to note 1)
6 Liquid level switch connection, 1 FPT. (Refer to note 2)
7 Relief connection, 1/2 FPT (Refer to note 3)
8 Relief connection, 1/2 FPT (Refer to note 4)

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 maximum kW capacities are based on accumulator pressure loss and oil return. The pressure loss is equivalent to a maximum of 1/2°C. The minimum kW capacities are to ensure proper oil return.

Example: SA Series

Refrigerant R404A

System maximum refrigerant capacity = 12 kW
Evaporating temperature = -18°C
System charge = 8 kg

Recommended accumulator is model SA-7051 with a refrigerant holding capacity of 5.4 kg and a maximum rating of 13.2 kW.

Additional Selection Information

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.

Installation - Main Issues

1. Install the accumulator after the suction line filter.
2. A pressure relief device connection is fitted at the top of the vessel. The user must ensure that the vessel is protected from over-pressure.
3. Heater bands should be installed at the bottom of the accumulator.

Part No	Refrigerant Holding Capacity (kg at -18°C)				Recommended kW of refrigerant at Suction Evaporating Temp (°C)											
					R134a				R407F				R404A/R507			
	R134a	R407F	R404A		5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°
SA-7044	1	1	0.9	MAX	1.6	1.2	0.8	0.5	5.8	3.9	2.6	1.6	3.1	2.2	1.5	0.9
				MIN	0.3	0.2	0.2	0.2	1.7	1.1	0.7	0.5	0.5	0.3	0.3	0.2
SA-7043	1	1	0.9	MAX	3.2	2.3	1.5	1	10.5	7.1	4.7	2.9	6.3	4.3	2.8	1.8
				MIN	0.7	0.6	0.5	0.4	2.4	1.6	1	0.7	0.9	0.7	0.6	0.5
SA-7045	2.1	2	1.9	MAX	3.2	2.3	1.5	1	10.5	7.1	4.7	2.9	6.3	4.3	2.8	1.8
				MIN	0.7	0.6	0.5	0.4	2.4	1.6	1	0.7	0.9	0.7	0.6	0.5
SA-7046	2.1	2	1.9	MAX	4.5	3.1	2.1	1.4	14.4	9.7	6.4	4	8.7	5.9	3.8	2.5
				MIN	0.9	0.7	0.6	0.5	3.2	2.2	1.4	0.9	1.3	1	0.8	0.6
SA-7056	2.8	2.7	2.5	MAX	4.5	3.1	2.1	1.4	14.4	9.7	6.4	4	8.7	5.9	3.8	2.5
				MIN	0.9	0.7	0.6	0.5	3.2	2.2	1.4	0.9	1.3	1	0.8	0.6
SA-7057S	2.7	2.6	2.4	MAX	7.7	5.4	3.6	2.3	24.2	16.3	10.7	6.7	14.9	10.2	6.5	4.2
				MIN	1.3	1.1	0.9	0.7	4.9	3.3	2.2	1.4	1.8	1.5	1.2	1
SA-7057	4.6	4.4	4.1	MAX	7.7	5.4	3.6	2.3	24.2	16.3	10.7	6.7	14.9	10.2	6.5	4.2
				MIN	1.3	1.1	0.9	0.7	4.9	3.3	2.2	1.4	1.8	1.5	1.2	1
SA-7051	6.1	5.8	5.4	MAX	16.3	11.4	7.3	4.8	49.8	33.4	22.1	13.8	31.4	21.7	13.2	8.6
				MIN	2.1	1.8	1.5	1.2	7.5	5	3.3	2.1	2.9	2.4	2	1.6
SA-7053	6.1	5.8	5.4	MAX	27.8	18.8	12	7.6	82.1	55.1	36.4	22.8	53.9	35.9	21.8	13.8
				MIN	4.4	3.7	3.1	2.5	15.8	10.6	7	4.4	6	4.9	4	3.2
SA-7065	13.1	12.4	11.5	MAX	49.3	33.8	21.1	13.4	145	97.4	64.4	40.2	95	64.1	38	24.3
				MIN	7.6	6.3	5.3	4.4	28.7	19.3	12.7	8	10.3	8.4	7	5.7

Part No	Refrigerant Holding Capacity (kg at -18°C)				Recommended kW of refrigerant at Suction Evaporating Temp (°C)															
					R448A/R449A				R450A				R407C				R407A			
	R448A/ R449A	R450A	R407C	R407A		5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°
SA-7044	1	1	1	1	MAX	5.8	3.9	2.6	2	3.3	2.2	1	0.9	5.2	3.5	2.3	1.4	5.6	3.8	2.5	1.6
					MIN	1.7	1.1	0.7	0.5	1	0.6	0.4	0.2	1.5	1	0.7	0.4	1.6	1.1	0.7	0.4
SA-7043	1	1	1	1	MAX	10.5	7.1	4.7	3	6.1	4	2.6	1.6	9.5	6.4	4.2	2.6	10.2	6.9	4.5	2.8
					MIN	2.4	1.6	1.1	0.7	1.4	0.9	0.6	0.4	2.1	1	0.9	0.6	2.3	1.5	1	0.6
SA-7045	2	2	2	2	MAX	10.5	7.1	4.7	3	6.1	4	2.6	1.6	9.5	6.4	4.2	2.6	10.2	6.9	4.5	2.8
					MIN	2.4	1.6	1.1	0.7	1.4	0.9	0.6	0.4	2.1	1	0.9	0.6	2.3	1.5	1	0.6
SA-7046	2	2	2	2	MAX	14.4	9.8	6.4	4.1	8.3	5.5	3.5	2.2	13	8.8	5.7	3.6	13.9	9.4	6.1	3.9
					MIN	3.2	2.2	1	0.9	1.9	1.2	0.8	0.5	2.9	2	1.3	0.8	3.1	2.1	1.4	0.9
SA-7056	2.6	2.8	2.7	2.7	MAX	14.4	9.8	6.4	4.1	8.3	5.5	3.5	2.2	13	8.8	5.7	3.6	13.9	9.4	6.1	3.9
					MIN	3.2	2.2	1	0.9	1.9	1.2	0.8	0.5	2.9	2	1.3	0.8	3.1	2.1	1.4	0.9
SA-7057S	2.5	2.7	2.6	2.6	MAX	24.2	16.4	10.8	6.8	14	9.3	6	3.7	21.9	14.7	9.6	6	23.5	15.8	10.3	6.5
					MIN	4.9	3.3	2.2	1.4	2.8	1.9	1.2	0.7	4	3	1.9	1.2	4.7	3.2	2.1	1.3
SA-7057	4.3	4.5	4.5	4.4	MAX	24.2	16.4	10.8	6.8	14	9.3	6	3.7	21.9	14.7	9.6	6	23.5	15.8	10.3	6.5
					MIN	4.9	3.3	2.2	1.4	2.8	1.9	1.2	0.7	4	3	1.9	1.2	4.7	3.2	2.1	1.3
SA-7051	5.7	5.9	5.9	5.8	MAX	49.8	33.8	22.2	14.1	28.9	19.2	12.3	7.5	45	30.3	19.7	12.3	48.3	32.5	21.1	13.4
					MIN	7.5	5.1	3.3	2.1	4.3	2.9	1.8	1.1	6.8	4.6	3	1.9	7.3	4.9	3.2	2
SA-7053	5.7	5.9	5.9	5.8	MAX	82.1	55.7	36.6	23.2	47.6	31.6	20.2	12.4	74.2	50	32.5	20.3	79.6	53.6	34.8	22
					MIN	15.8	10.7	7.1	4.5	9.2	6.1	3.9	2.4	14.3	9.6	6.3	3.9	15.3	10.3	6.7	4.2
SA-7065	12.1	12.7	12.6	12.4	MAX	145	98.4	64.7	41	84.1	55.8	35.7	21.9	131	88.2	57.4	35.9	141	94.7	61.5	39
					MIN	28.7	19.5	12.8	8.1	16.6	11	7.1	4.3	25.9	17.5	11.4	7.1	27.8	18.7	12.2	7.7

Part No	Refrigerant Holding Capacity (kg at -18°C)				Recommended kW of refrigerant at Suction Evaporating Temp (°C)											
					R134a				R407F				R404A / R507			
	R134a	R407F	R404A		5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°
S-7043	1	0.9	0.7	MAX	3.2	2.3	1.5	1	10.5	7.1	4.7	2.9	6.3	4.3	2.8	1.8
				MIN	0.7	0.6	0.5	0.4	2.4	1.6	1.1	0.7	0.9	0.7	0.6	0.5
S-7044	2	1.9	1.7	MAX	1.6	1.2	0.8	0.5	5.8	3.9	2.6	1.6	3.1	2.2	1.5	0.9
				MIN	0.3	0.2	0.2	0.2	1.7	1.1	0.7	0.5	0.5	0.3	0.3	0.2
S-7045	2	1.9	1.7	MAX	3.2	2.3	1.5	1	10.5	7.1	4.7	2.9	6.3	4.3	2.8	1.8
				MIN	0.7	0.6	0.5	0.4	2.4	1.6	1	0.7	0.9	0.7	0.6	0.5
S-7046	2	1.9	1.7	MAX	4.5	3.1	2.1	1.4	14.4	9.7	6.4	4	8.7	5.9	3.8	2.5
				MIN	0.9	0.7	0.6	0.5	3.2	2.2	1.4	0.9	1.3	1	0.8	0.6
S-7057	4.2	3.8	3.5	MAX	7.7	5.4	3.6	2.3	24.2	16.3	10.7	6.7	14.9	10.2	6.5	4.2
				MIN	1.3	1.1	0.9	0.7	4.9	3.3	2.2	1.4	1.8	1.5	1.2	1
S-7061	5.8	5.5	4.9	MAX	16.3	11.4	7.3	4.8	49.8	33.4	22.1	13.8	31.4	21.7	13.2	8.6
				MIN	2.1	1.8	1.5	1.2	7.5	5	3.3	2.1	2.9	2.4	2	1.6
S-7063	9.9	9	8.3	MAX	27.8	18.8	12	7.6	82.1	55.1	36.4	22.8	53.9	35.9	21.8	13.8
				MIN	4.4	3.7	3.1	2.5	15.8	10.6	7	4.4	6	4.9	4	3.2
S-7065	9.9	9	8.3	MAX	49.3	33.8	21.1	13.4	145	97.4	64.4	40.2	95	64.1	38	24.3
				MIN	7.6	6.3	5.3	4.4	28.7	19.3	12.7	8	10.3	8.4	7	5.7
S-7721	14.7	13.4	12.3	MAX	109	70.4	49.3	26.4	322	216	143	89.2	201	134	84.5	56.3
				MIN	14.1	12.3	10.6	8.8	57.4	38.5	25.5	15.9	21.1	17.6	14.1	12.3
S-7725	22	19.9	18.2	MAX	172	113	75.7	42.2	480	322	213	133	308	204	132	88
				MIN	21.1	19.4	15.8	12.3	95.9	64.4	42.6	26.6	31.7	28.2	22.9	21.1
S-7731-CE	36.4	32.9	30	MAX	253	194	130	84.5	712	478	316	197	456	308	197	125
				MIN	35.2	31.7	24.6	22.9	143	96	63.4	39.6	52.8	44	37	29.9
S-7732-CE	36.4	32.9	30	MAX	253	194	130	84.5	712	478	316	197	456	308	197	125
				MIN	35.2	31.7	24.6	22.9	143	96	63.4	39.6	52.8	44	37	29.9
S-7741-CE	62	58.8	55	MAX	401	259	156	107	1120	752	497	310	757	503	320	201
				MIN	109	89.4	75.7	59.8	362	243	160	100	174	113	73.9	45.8
S-7742-CE	127	121	114	MAX	401	259	156	107	1120	752	497	310	757	503	320	201
				MIN	109	89.4	75.7	59.8	362	243	160	100	174	113	73.9	45.8

Part No	Refrigerant Holding Capacity (kg at -18°C)					Recommended kW of refrigerant at Suction Evaporating Temp (°C)													
	R448A/ R449A	R450A	R407C	R407A		R448A/R449A				R450A				R407C				R407A			
						5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°	5°	-7°	-18°	-29°
S-7043	0.9	0.9	0.9	0.9	MAX	10.5	7.1	4.7	3	6.1	4	2.6	1.6	9.5	6.4	4.2	2.6	10.2	6.9	4.5	2.8
					MIN	2.4	1.6	1.1	0.7	1.4	0.9	0.6	0.4	2.1	1.4	0.9	0.6	2.3	1.5	1	0.6
S-7044	1.8	1.9	1.9	1.8	MAX	5.8	3.9	2.6	1.6	3.3	2.2	1.4	0.9	5.2	3.5	2.3	1.4	5.6	3.8	2.5	1.6
					MIN	1.7	1.1	0.7	0.5	1	0.6	0.4	0.2	1.5	1	0..7	0.4	1.6	1.1	0.7	0.4
S-7045	1.8	1.9	1.9	1.8	MAX	10.5	7.1	4.7	3	6.1	4	2.6	1.6	9.5	6.4	4.2	2.6	10.2	6.9	4.5	2.8
					MIN	2.4	1.6	1.1	0.7	1.4	0.9	0.6	0.4	2.1	1.4	0.9	0.6	2.3	1.5	1	0.6
S-7046	1.8	1.9	1.9	1.8	MAX	14.4	9.8	6.4	4.1	8.3	5.5	3.5	2.2	13	8.8	5.7	3.6	13.9	9.4	6.1	3.9
					MIN	3.2	2.2	1.4	0.9	1.9	1.2	0.8	0.5	2.9	2	1.3	0.8	3.1	2.1	1.4	0.9
S-7057	3.7	3.9	3.9	3.8	MAX	24.2	16.4	10.8	6.8	14	9.3	6	3.7	21.9	14.7	9.6	6	23.5	15.8	10.3	6.5
					MIN	4.9	3.3	2.2	1.4	2.8	1.9	1.2	0.7	4.4	3	1.9	1.2	4.7	3.2	2.1	1.3
S-7061	5.2	5.4	5.4	5.3	MAX	49.8	33.8	22.2	14.1	28.9	19.2	12.3	7.5	45	30.3	19.7	12.3	48.3	32.5	21.1	13.4
					MIN	7.5	5.1	3.3	2.1	4.3	2.9	1.8	1.1	6.8	4.6	3	1.9	7.3	4.9	3.2	2
S-7063	8.8	9.2	9.1	9	MAX	82.1	55.7	36.6	23.2	47.6	31.6	20.2	12.4	74.2	50	32.5	20.3	79.6	53.6	34.8	22
					MIN	15.8	10.7	7.1	4.5	9.2	6.1	3.9	2.4	14.3	9.6	6.3	3.9	15.3	10.3	6.7	4.2
S-7065	8.8	9.2	9.1	9	MAX	145	98.4	64.7	41	84	55.8	35.7	21.9	131	88.2	57.4	35.9	141	94.7	61.5	39
					MIN	28.7	19.5	12.8	8.1	16.6	11	7.1	4.3	25.9	17.5	11.4	7.1	27.8	18.7	12.2	7.7
S-7721-CE	13.1	13.7	13.6	13.3	MAX	322	218	144	90.9	186	124	79.2	48.5	291	196	127	79.6	312	210	136	86.3
					MIN	57.4	38.9	25.6	16.2	33.3	22.1	14.1	8.7	51.9	34.9	22.7	14.2	55.6	37.5	24.3	15.4
S-7725-CE	19.4	20.3	20.1	19.8	MAX	480	325	214	136	278	184	118	72.4	434	292	190	119	465	313	203	129
					MIN	95.9	65.1	42.8	27.1	55.6	36.9	23.6	14.5	86.7	58.4	38	23.8	93	62.6	40.7	25.7
S-7731-CE	32.1	33.6	33.3	32.7	MAX	712	483	318	201	413	274	175	107	643	433	282	176	690	465	302	191
					MIN	143	96.9	63.8	40.4	82.8	55	35.2	21.6	129	87	56.6	35.4	139	93.3	60.6	38.4
S-7732-CE	32.1	33.6	33.3	32.7	MAX	712	483	318	201	413	274	175	107	643	433	282	176	690	465	302	191
					MIN	143	96.9	63.8	40.4	82.8	55	35.2	21.6	129	87	56.6	35.4	139	93.3	60.6	38.4
S-7741-CE	57.5	60.2	59.6	58.6	MAX	1120	759	499	316	649	430	276	169	1012	681	443	277	1085	731	475	300
					MIN	362	245	161	102	210	139	89	54.5	327	220	143	89.5	350	236	153	97
S-7742-CE	119	124	123	121	MAX	1120	759	499	316	649	430	276	169	1012	681	443	277	1085	731	475	300
					MIN	362	245	161	102	210	139	89	54.5	327	220	143	89.5	350	236	153	97

DISCHARGE LINE MUFFLERS

The function of a Discharge Line Muffler is to reduce noise in the discharge line of a refrigeration or air-conditioning system

Applications

The muffler is designed to be installed directly after the compressor. The product range is designed for use with HCFC and HFC refrigerants, along with their associated oils. In addition, models S-6304 up to and including S-6415 are suitable for use with A2L refrigerants.

How it works

The muffler reduces noise, due to gas pulsations, by allowing the gas to expand inside muffler chambers. Mufflers have internal baffles which are designed to dampen and smooth out low and high frequency compressor gas sound waves.

Main Features

- Robust design
- Bi-directional flow
- UL listed

Technical Specification

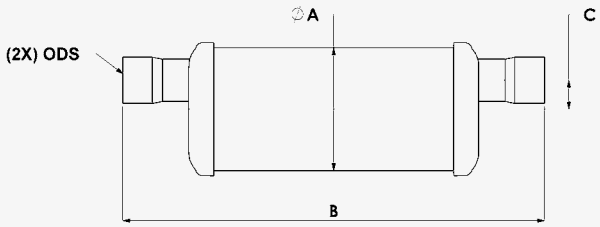
Allowable operating pressure = 0 to 31 barg

Allowable operating temperature = 0°C to + 121°C

Materials of Construction

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

Part No	ODS (inch)	Dimensions (mm)			Weight (kg)	CE Cat
		Ø A	B	C		
S-6304	1/2	76	197	19	1.2	SEP
S-6305	5/8	76	197	19	1.2	SEP
S-6307	7/8	76	246	11	1.4	SEP
S-6311	1 1/8	76	246	11	1.5	SEP
S-6405	5/8	102	171	24	1.9	SEP
S-6407	7/8	102	178	24	1.9	SEP
S-6411	1 1/8	102	322	24	2.9	Cat II
S-6413	1 3/8	102	349	24	2.9	Cat II
S-6415	1 5/8	102	464	19	3.8	Cat II
S-6621	2 1/8	152	533	32	8.8	Cat II
S-6625	2 5/8	152	533	25	8.8	Cat II
S-6631	3 1/8	152	568	19	9.5	Cat II



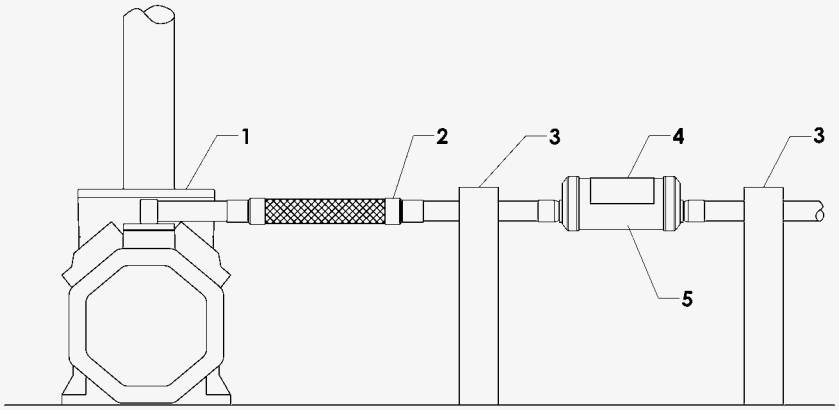
DISCHARGE LINE MUFFLER

Selection Guidelines

Select a muffler with a connection size that matches or exceeds the discharge line size. Larger mufflers will tend to remove more pulsations due to the larger internal volume.

Installation – main issues

1. Install the muffler as close as possible to the compressor and before the oil separator.
2. When mounted in a horizontal or angled position, the side with the label must be top centre 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.
3. 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.
4. 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.
5. A single muffler may be installed on a common discharge line. However, some customers prefer to install one muffler per compressor on parallel racks.



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

CORRECT MUFFLER SUPPORT

SIGHT GLASSES

The function of a Sight glass is to allow visual inspection of liquid levels.

Applications

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

The SG-12 series sight glasses are suitable for HCFC, HFC and A2L refrigerants, along with their associated oils.

The SG-10 and SG-11 series sight glasses are suitable for HCFC, HFC , A2L and ammonia refrigerants, along with their associated oils.

Main Features

- Three sight glass lens options- Reflex, Clear and Clear with float ball
- Fused glass hermetic seal

Technical Specification

Allowable operating pressure = 0 to 68.9 barg

SG-10 & SG-11 series:

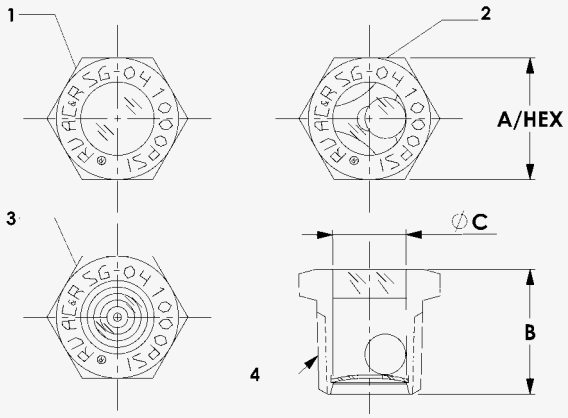
Allowable operating temperature = -40°C to +120°C

SG-12 series:

Allowable operating temperature = -40°C to +120°C

Materials of Construction

The sight glass consists of a plated steel body with a built-in fused glass lens. The S-12 series is fitted with a stainless steel screen and plastic float ball.



1. Clear Lens
2. Clear Lens with floating ball
3. Reflex Lens
4. Thread size

SIGHT GLASSES

Part No			Thread Size (NPT)	Dimensions (mm)			Weight (kg)
Clear	Reflex	*Clear W/Ball		A Hex	B	ØC	
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. **Higher working pressures available on request.

Installation – Main issues

1. Over-tightening should be avoided to prevent sight glass cracking.

VIBRATION ELIMINATORS

V SERIES

VS SERIES

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.

Applications

A vibration eliminator can be installed in both the suction and discharge lines of air-conditioning and refrigeration systems.

Vibration eliminators are suitable for use with HCFC, HFC and CO2 refrigerants along with their associated oils. In addition, models in the Imperial range are suitable for use with A2L gases. Also suitable for use with A2L gases are models listed in the Metric range up to and including the V-7/8 & VS-7/8 sizes.

Main Features

- Proven design
- Large hose ID
- Stainless steel hose and braid
- Stainless steel ferrules for superior strength
- Helium leak tested
- CE marked
- UL listed (V series only)

Technical Specification

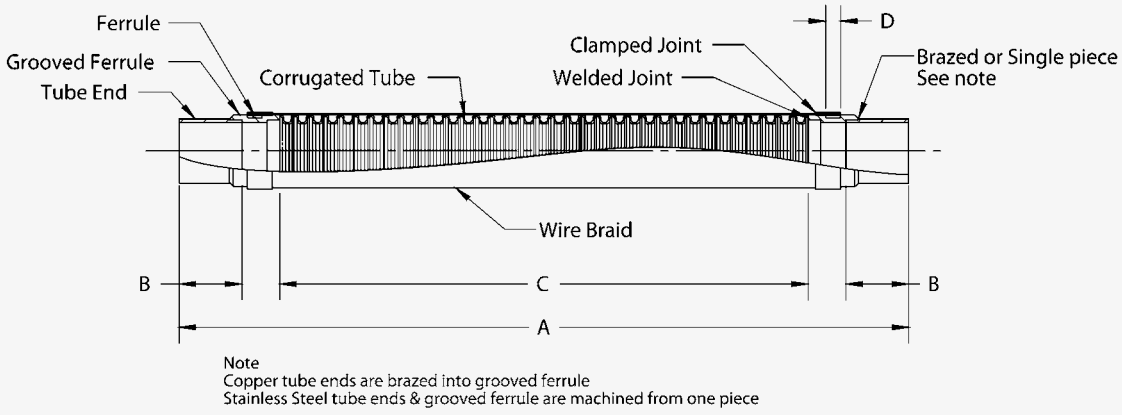
Allowable operating pressure = As per table
Allowable operating temperature = -40°C to +120°C (V & VS models)

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.



Note
Copper tube ends are brazed into grooved ferrule
Stainless Steel tube ends & grooved ferrule are machined from one piece

V and VS Series (Imperial range)

Part No		ODS (inch)	Dimensions (mm)				MWP (barg)		Weight (kg)	CE Cat
			A	B	C	D				
V Series	VS Series		(+/-6)	(+/-3)	(+/-3)	(+/-1.5)	V Series	VS Series		
V-1/4	VS-1/4	1/4	202	17	133	10	44.8	60.0	0.14	SEP
V-3/8	VS-3/8	3/8	215	18	141	10	44.8	60.0	0.14	SEP
V-1/2	VS-1/2	1/2	225	18	151	10	44.8	60.0	0.15	SEP
V-5/8	VS-5/8	5/8	247	20	169	10	44.8	60.0	0.21	SEP
V-3/4	VS-3/4	3/4	266	23	180	11	44.8	60.0	0.32	SEP
V-7/8	VS-7/8	7/8	301	25	211	11	44.8	60.0	0.31	SEP
V-1-1/8	VS-1-1/8	1-1/8	329	32	223	12	41.3	60.0	0.42	Cat II
V-1-3/8	VS-1-3/8	1-3/8	392	35	274	14	37.9	60.0	0.66	Cat II
V-1-5/8	VS-1-5/8	1-5/8	425	40	295	16	35.1	45.0	0.98	Cat II
V-2-1/8	VS-2-1/8	2-1/8	520	50	370	16	27.5	40.0	1.46	Cat II
V-2-5/8	VS-2-5/8	2-5/8	613	60	434	19	24.1	35.0	2.60	Cat II
V-3-1/8	VS-3-1/8	3-1/8	680	70	481	19	22.0	30.0	3.60	Cat II
V-3-5/8	VS-3-5/8	3-5/8	812	85	579	21	13.0	20.0	4.70	Cat II
V-4-1/8	VS-4-1/8	4-1/8	832	90	589	21	13.0	20.0	5.50	Cat II

V and VS Series (Metric range)

Part No		ODS (mm)	Dimensions (mm)				MWP (barg)		Weight (kg)	CE Cat
			A	B	C	D				
V Series	VS Series		(+/-6)	(+/-3)	(+/-3)	(+/-1.5)	V Series	VS Series		
V-6M	VS-6M	6	202	17	133	10	44.8	60.0	0.14	SEP
V-10M	VS-10M	10	215	18	141	10	44.8	60.0	0.14	SEP
V-12M	VS-12M	12	225	18	151	10	44.8	60.0	0.15	SEP
V-5/8	VS-5/8	16	247	20	169	10	44.8	60.0	0.21	SEP
V-7/8	VS-7/8	22	301	25	211	11	44.8	60.0	0.31	SEP
V-28M	VS-28M	28	329	32	223	12	41.3	60.0	0.42	SEP
V-1-3/8	VS-1-3/8	35	392	35	274	14	37.9	60.0	0.66	Cat I
V-42M	VS-42M	42	425	40	295	16	35.1	45.0	0.98	Cat I
V-2-1/8	VS-2-1/8	54	520	50	370	16	27.5	40.0	1.46	Cat I
V-64M	VS-64M	64	613	60	434	19	24.1	35.0	2.60	Cat I
V-67M	-	67	613	60	434	19	24.1	-	2.60	Cat I
V-76M	VS-76M	76	680	70	481	19	22.0	30.0	3.60	Cat I
V-80M	-	80	680	70	481	19	22.0	-	3.60	Cat I
V-89M	VS-89M	89	812	85	579	21	13.0	20.0	4.70	Cat I
V-108M	VS-108M	108	832	90	589	21	13.0	20.0	5.50	Cat I

Note: The V Series is dual CE and UL approved where applicable.

Installation – main issues

1. The vibration eliminator should be fitted as close to the compressor as possible and must be installed in a straight line. Vibration eliminators are not designed to compensate for pipework misalignment.
2. Care should be taken to allow sufficient space for the vibration eliminator to avoid static compression or tension, after brazing in place. Vibration eliminators are not designed to absorb axial or torsional stress.
3. Vibration eliminators should be installed perpendicular to the direction of vibration. When vibration exists in two planes, two vibration eliminators should be used. Refer to Figs 1 and 2.
4. For optimum absorption of vibration, the refrigerant line should be anchored at the end of the vibration eliminator furthest from the vibration source.
5. 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.
6. The ferrule and start of braid must be wet-ragged for brazing when installing the V series to prevent overheating and subsequent damage.

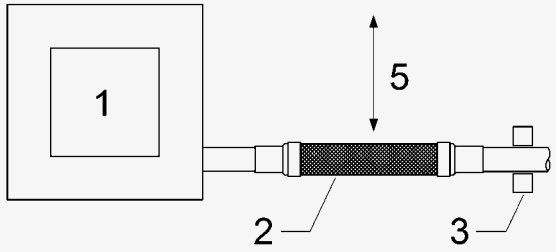


FIG. 1 SINGLE SYSTEM

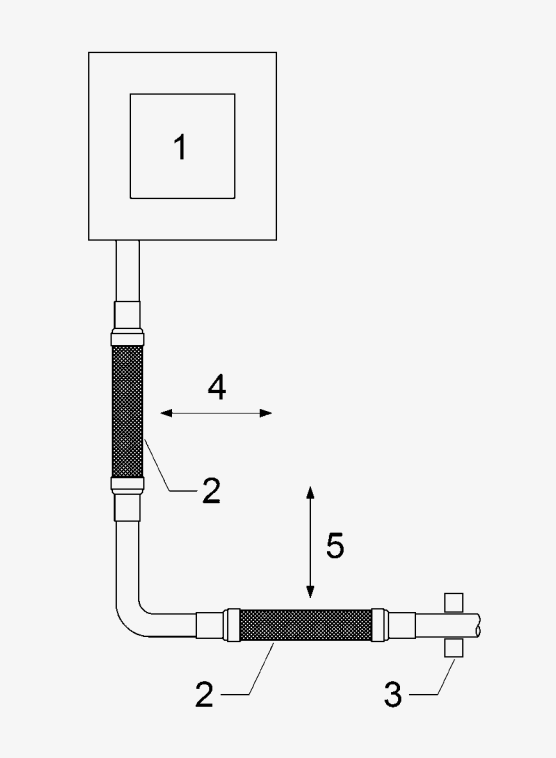


FIG. 2 DOUBLE SYSTEM

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

SEALED FILTER DRIERS

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

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 CO_2 refrigerants (see core data). A2L models available on request.

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
- 1000 hour salt spray tested to ASTM B117

Cores

'M' Core

- 100% Molecular Sieve
- High drying capacity
- Suitable for HCFC, HFC, A2L and CO_2 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. A2L and CO_2 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, micronic 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

Sealed Filter Driers are UL and C-UL Listed by Underwriters Laboratories, Inc.

Selection Guidelines

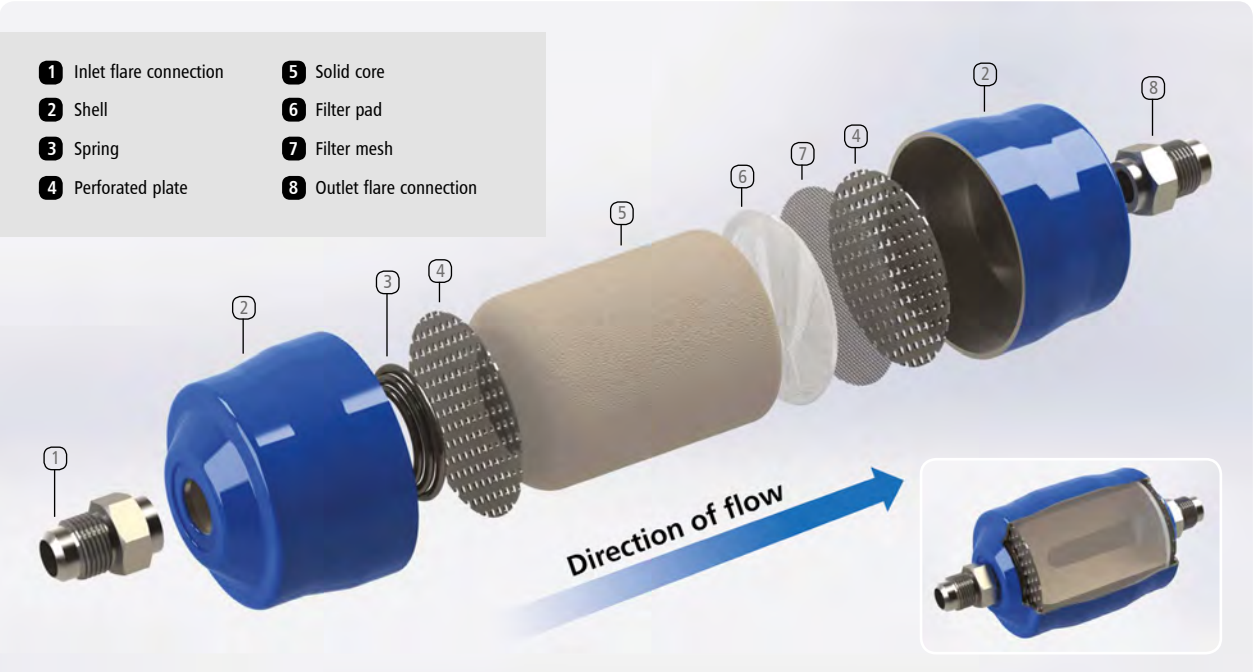
The user should select the appropriate core based on refrigerant and oil types (see note). The model should then be selected based on the required drying and liquid capacities.

Note: Type 'A' cores 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 (IMPERIAL)

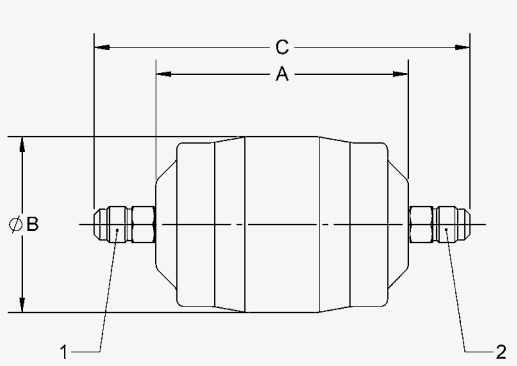
Part No	Conn Size (inch)	A (mm)	ØB (mm)	C (mm)	Weight (kg)	CE Cat
SDM/SDA-032	1/4	63	46	110	0.26	SEP
SDM/SDA-033	3/8	63	46	120	0.31	SEP
SDM/SDA-052	1/4	72	65	119	0.40	SEP
SDM/SDA-053	3/8	72	65	129	0.44	SEP
SDM/SDA-082	1/4	98	65	145	0.52	SEP
SDM/SDA-083	3/8	98	65	155	0.55	SEP
SDM/SDA-084	1/2	98	65	163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

ODS MODELS (IMPERIAL)

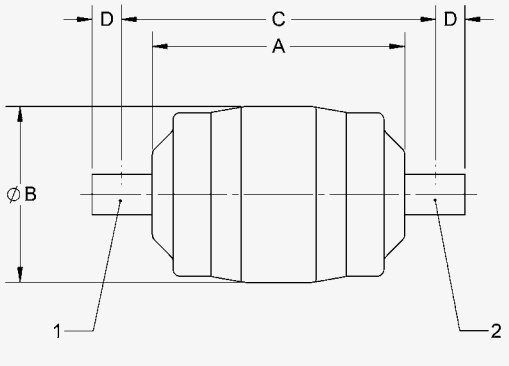
Part No	Conn Size (inch)	A (mm)	ØB (mm)	C (mm)	D (mm)	Weight (kg)	CE Cat
SDM/SDA-032S	1/4	63	46	81	13	0.23	SEP
SDM/SDA-033S	3/8	63	46	85	13	0.26	SEP
SDM/SDA-052S	1/4	72	65	90	13	0.36	SEP
SDM/SDA-053S	3/8	72	65	94	13	0.38	SEP
SDM/SDA-082S	1/4	98	65	116	13	0.48	SEP
SDM/SDA-083S	3/8	98	65	120	13	0.49	SEP
SDM/SDA-084S	1/2	98	65	122	13	0.50	SEP
SDA-162S	1/4	112	78	130	13	0.76	SEP
SDM/SDA-163S	3/8	112	78	134	13	0.81	SEP
SDM/SDA-164S	1/2	112	78	136	13	0.82	SEP
SDM/SDA-165S	5/8	112	78	134	13	0.90	SEP
SDM/SDA-303S	3/8	185	78	207	13	1.21	Cat I
SDM/SDA-304S	1/2	185	78	209	13	1.25	Cat I
SDM/SDA-305S	5/8	185	78	220	13	1.27	Cat I
SDM/SDA-306S	3/4	185	78	209	15	1.29	Cat I
SDM/SDA-307S	7/8	185	78	209	15	1.41	Cat I
SDM/SDA-414S	1/2	192	92	216	13	1.82	Cat II
SDM/SDA-415S	5/8	192	92	214	13	1.83	Cat II
SDA-416S	3/4	192	92	216	15	1.84	Cat II
SDM/SDA-417S	7/8	192	92	216	15	1.85	Cat II

ODS MODELS (METRIC)

Part No	Conn Size (mm)	A (mm)	ØB (mm)	C (mm)	D (mm)	Weight (kg)	CE Cat
SDA-0306M	6	63	46	81	13	0.23	SEP
SDA-0310M	10	63	46	85	13	0.26	SEP
SDA-0510M	10	72	65	94	13	0.38	SEP
SDM/SDA-0810M	10	98	65	120	13	0.49	SEP
SDA-0812M	12	98	65	122	13	0.50	SEP



Flare Model



ODS Model

1 Inlet
2 Outlet

DRYING AND LIQUID CAPACITY TABLE - 'M' CORE (IMPERIAL)

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	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-307S	7/8	51.2	47.4	55	52.3	81	50	55.3	47.4	70.1	61.2	33.8	70.1	74.8	93.6
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-417S	7/8	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 (IMPERIAL)

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-307S	7/8	44.8	41.5	48.1	45.7	77	41.5	47.1	40.2	70.1	61.2	33.8	70.1	74.8	93.6
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
SDA-417S	7/8	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 AND LIQUID CAPACITY TABLE - 'M' CORE (METRIC)

Model Details		Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn Size (mm)	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-0810M	10	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

DRYING AND LIQUID CAPACITY TABLE - 'A' CORE (METRIC)

Model Details		Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn Size (mm)	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-0306M	6	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-0310M	10	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-0510M	10	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-0810M	10	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-0812M	12	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

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 capacites 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 $t_e = -15°C$ (-30°C for CO_2)
Condensing temperature of $t_c = +30°C$ (-5°C for CO_2)
Pressure drop across filter drier of $\Delta p = 0.07$ bar

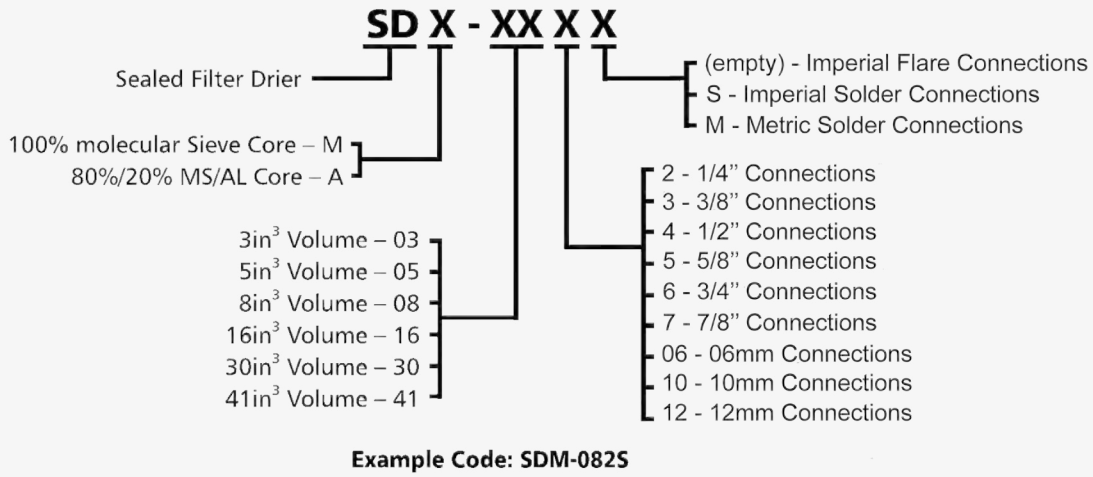
SURFACE AND VOLUME INFORMATION

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)



Example Code: SDM-082S

BI-FLOW FILTER DRIERS

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

Applications

Bi-Flow Filter Driers are designed to protect refrigeration and air-conditioning systems by removing moisture, acids and solid particles. Bi-Flow Filter Driers are for use in the liquid line of the system. The range is suitable for use with HCFC, HFC and CO_2 refrigerants (see core data). A2L models available on request.

Main Features

- Solid copper ODS connections
- Solid core construction of 100% Molecular Sieve
- Alumina desiccant
- Solid particle filtration down to 150 microns
- Powder coated finish suitable for UV rays and harsh environments
- 1000 hour salt spray tested to ASTM B117

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 galvanised steel. The core is made from 100% Molecular Sieve. The filter pad is made from woven polyester. The filter mesh is made from stainless steel.

Technical Specifications

Allowable operating temperature = -40°C to +100°C
Allowable operating pressure = 0 to 45 barg

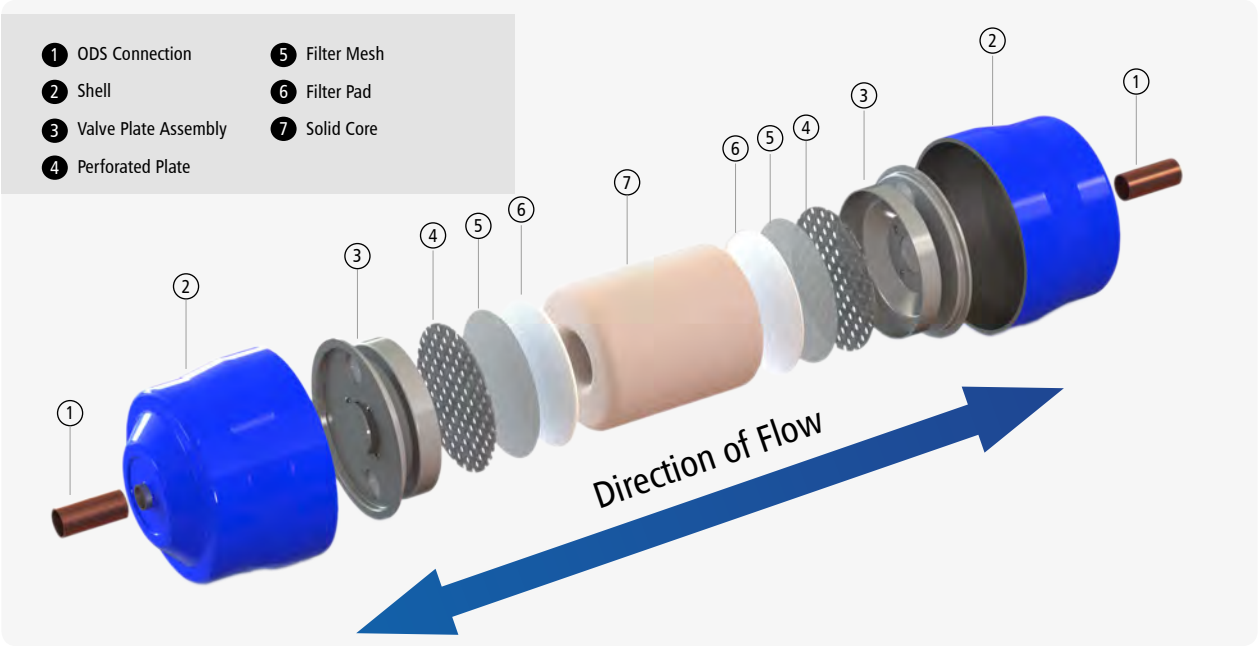
Bi-Flow Filter Driers are UL and C-UL Listed by Underwriters Laboratories, Inc. Additionnaly, Bi-FLow FIlter Driers are CE marked in accordance with PED.

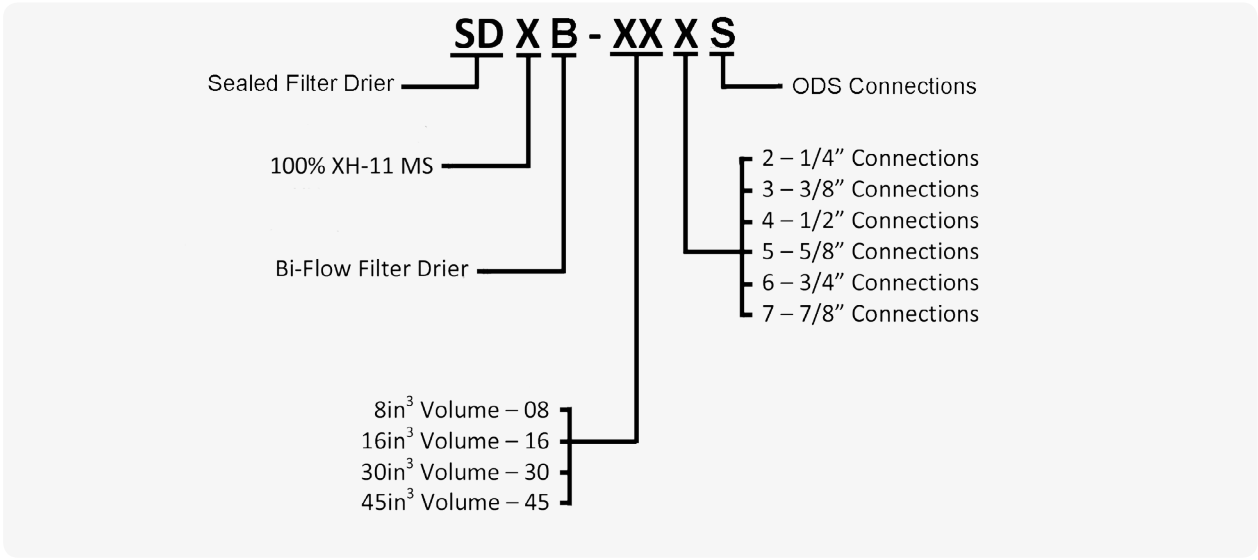
Selection Guidelines

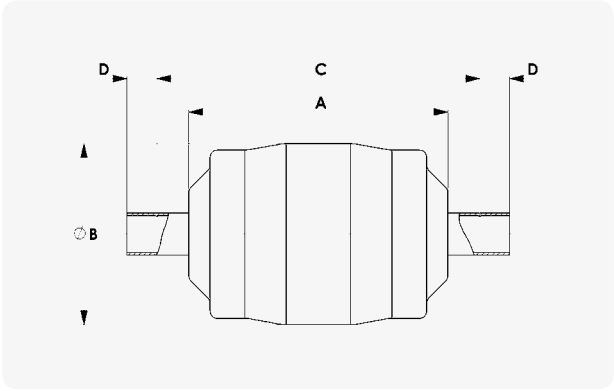
Bi-Flow filter driers should be selected for a particular application based on a number of factors. Full dimensional specifications are provided to ensure easy installation. Models should be selected based on drying capacity and liquid capacity to ensure adequated drying and minimal pressure drop.

Installation - Main issues

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 No	Conn Size (inch)	Dimensions (mm)				Weight (kg)	CE Cat
		A	B	C	D		
SDXB-082S	1/4 ODS	98	66	116	13	0.52	SEP
SDXB-083S	3/8 ODS	98	66	120	13	0.43	SEP
SDXB-084S	1/2 ODS	98	66	122	13	0.53	SEP
SDXB-163S	3/8 ODS	112	78	134	13	0.64	SEP
SDXB-164S	1/2 ODS	112	78	136	13	0.64	SEP
SDXB-165S	5/8 ODS	112	78	134	13	0.82	SEP
SDXB-305S	5/8 ODS	185	78	220	13	1.3	SEP
SDXB-307S	7/8 ODS	185	78	215	15	1.29	SEP
SDXB-456S	3/4 ODS	204	92	230	15	1.80	Cat I

DRYING AND LIQUID CAPACITY RATINGS

Model Details	Drying Capacity*(kg of refrigerant)							
Part No	R22		R134a		R404A/R507		R407C/R410A	
	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C
SDXB-082S	8.9	8.2	9.5	9.1	14.0	8.7	9.6	8.2
SDXB-083S	8.9	8.2	9.5	9.1	14.0	8.7	9.6	8.2
SDXB-084S	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	15.9	15.1	23.4	14.4	15.9	13.7
SDXB-165S	14.8	13.7	15.9	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-307S	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

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

R22: From 1050 ppm W to 60 ppm W in accordnce 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 ARI710-86

Model Details	Drying Capacity**(Drop of water)							
Part No	R22		R134a		R404A/R507		R407C/R410A	
	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C
SDXB-082S	159.5	147.8	168.6	160.6	252.2	155.8	172.3	147.6
SDXB-083S	159.5	147.8	168.6	160.6	252.2	155.8	172.3	147.6
SDXB-084S	159.5	147.8	168.6	160.6	252.2	155.8	172.3	147.6
SDXB-163S	265.8	246.3	281.1	267.6	420.4	259.7	287.1	246.1
SDXB-164S	265.8	246.3	281.1	267.6	420.4	259.7	287.1	246.1
SDXB-165S	265.8	246.3	281.1	267.6	420.4	259.7	287.1	246.1
SDXB-305S	549.4	509.0	580.8	553.0	868.8	536.8	593.3	508.6
SDXB-307S	549.4	509.0	580.8	553.0	868.8	536.8	593.3	508.6
SDXB-456S	1045.6	968.8	1105.5	1052.5	1653.5	1021.7	1129.2	967.9

Model Details	Liquid Capacity*											
Part No	R22		R134a		R404A		R407C		R410A		CO_2	
	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW	Tons	kW
SDXB-082S	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-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-084S	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-165S	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc
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-307S	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc	Tbc
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
Tbc = To be confirmed												

* Liquid capacity is based on the following conditions:

Evaporating temperature of t_e = -15°C, -30°C for CO_2
Condensing temperature of t_c = +30°C , -5°C for CO_2
Pressure drop accross filter drier of Δp = 0.07 bar

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 CO_2 refrigerants (see core data). In addition, all units up to and including 3-core models are also suitable for use with A2L refrigerants.

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
- Nickel Plated Steel Cover Plate
- 1000 hour salt spray tested to ASTM B117

Cores

S-848-CM

- 100% molecular sieve
- High drying capacity
- Suitable for HCFC, HFC, A2L and CO_2 refrigerants

S-848-C

- 80% molecular sieve and 20% activated alumina
- Absorbs moisture and acid in the system
- Suitable for HCFC, HFC, A2L and CO_2 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, A2L and CO_2 refrigerants
- Not suitable for oils containing additives

S-848-SC

- 100% molecular sieve
- Low pressure drop
- Suitable for HCFC, HFC, A2L and CO_2 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

Replaceable Core Filter Driers are UL and C-UL Listed by Underwriters Laboratories, Inc.

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 (Imperial)

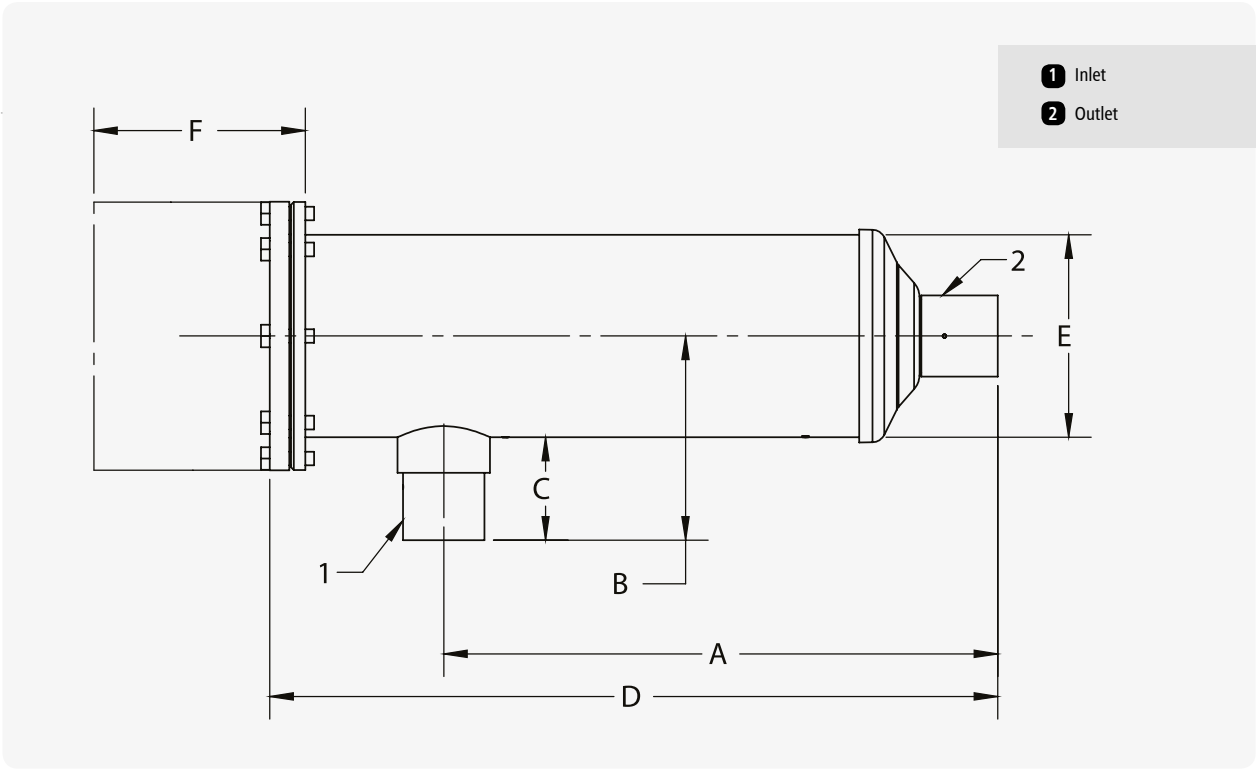
Model Details			Core Data		Dimensions (mm)						Weight (kg)	CE Cat
Part No	Conn. Size (inch)	Cores	Surface Area (cm^2)	Volume (cm^3)	A	B	C	D	ØE	F*		
SRC-485	5/8	1	683	716	172	115	58	274	114	172	4.78	Cat II
SRC-965	5/8	2	1366	1432	312	115	58	414	114	312	6.12	Cat II
SRC-1445	5/8	3	2049	2148	456	115	58	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 II
SRC-967	7/8	2	1366	1432	312	115	58	414	114	312	6.15	Cat II
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 II
SRC-969	1 1/8	2	1366	1432	312	115	58	414	114	312	6.23	Cat II
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 II
SRC-9611	1 3/8	2	1366	1432	312	115	58	414	114	312	6.30	Cat II
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 II
SRC-9613	1 5/8	2	1366	1432	312	115	58	414	114	312	6.32	Cat II
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 II
SRC-9617	2 1/8	2	1366	1432	312	115	58	414	114	312	6.47	Cat II
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 II
SRC-9621	2 5/8	2	1366	1432	312	115	58	414	114	312	6.71	Cat II
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.

Replaceable Core Filter Drier Shells (Metric)

Model Details			Core Data		Dimensions (mm)						Weight (kg)	CE Cat
Part No	Conn. Size (mm)	Cores	Surface Area (cm^2)	Volume (cm^3)	A	B	C	D	ØE	F*		
SRC-486M	18	1	683	716	172	115	58	274	114	172	4.78	Cat II
SRC-966M	18	2	1366	1432	312	115	58	414	114	312	6.12	Cat II
SRC-1446M	18	3	2049	2148	456	115	58	558	114	456	7.49	Cat II
SRC-1926M	18	4	2732	2864	599	115	58	701	114	599	9.00	Cat II
SRC-489M	28	1	683	716	172	115	58	274	114	172	4.83	Cat II
SRC-969M	28	2	1366	1432	312	115	58	414	114	312	6.23	Cat II
SRC-1449M	28	3	2049	2148	456	115	58	558	114	456	7.64	Cat II
SRC-1929M	28	4	2732	2864	599	115	58	701	114	599	9.10	Cat II
SRC-4813M	42	1	683	716	172	115	58	274	114	172	4.99	Cat II
SRC-9613M	42	2	1366	1432	312	115	58	414	114	312	6.32	Cat II
SRC-14413M	42	3	2049	2148	456	115	58	558	114	456	8.01	Cat II
SRC-19213M	42	4	2732	2864	599	115	58	701	114	599	9.16	Cat II
SRC-4821M	64	1	683	716	172	115	58	274	114	172	5.34	Cat II
SRC-9621M	64	2	1366	1432	312	115	58	414	114	312	6.71	Cat II
SRC-14421M	64	3	2049	2148	456	115	58	558	114	456	8.02	Cat II
SRC-19221M	64	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.

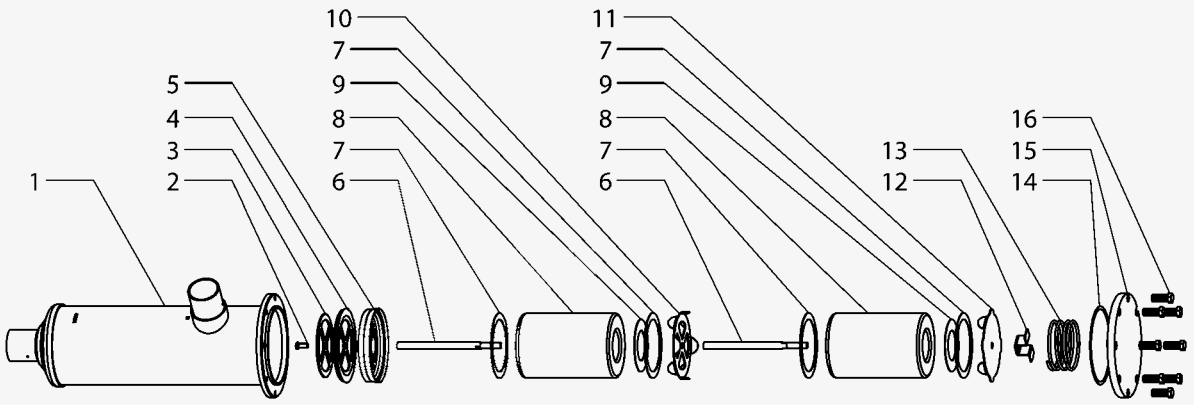


S-848-CM Core (Imperial)

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

S-848-CM Core (Metric)

Model Details			Drying Capacity (kg of refrigerant)						Liquid Capacity (kW)					
Part No	Conn. Size (mm)	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-486M	18	1	83.5	79.5	123	76	84	72	78.2	57.6	55.8	81.9	85.3	125.9
SRC-966M	18	2	167	159	246	152	168	144	73.1	53.4	51.7	76.1	79.0	117.6
SRC-1446M	18	3	250.5	238.5	369	228	252	216	73.1	53.4	51.7	76.1	79.0	117.6
SRC-1926M	18	4	334	318	492	304	336	288	73.1	53.4	51.7	76.1	79.0	117.6
SRC-489M	28	1	83.5	79.5	123	76	84	72	178.8	128.6	124.5	184.7	190.0	283.7
SRC-969M	28	2	167	159	246	152	168	144	178.1	128.2	124.0	183.9	189.1	282.7
SRC-1449M	28	3	250.5	238.5	369	228	252	216	173.3	124.7	120.8	179.1	184.2	275.1
SRC-1929M	28	4	334	318	492	304	336	288	173.3	124.7	120.8	179.1	184.2	275.1
SRC-4813M	42	1	83.5	79.5	123	76	84	72	273.7	199.8	193.6	285.4	295.7	434.3
SRC-9613M	42	2	167	159	246	152	168	144	298.7	216.7	210.0	310.2	320.5	474.1
SRC-14413M	42	3	250.5	238.5	369	228	252	216	299.3	217.2	210.4	310.8	321.1	475.0
SRC-19213M	42	4	334	318	492	304	336	288	309.4	225.1	218.1	321.8	332.8	491.1
SRC-4821M	64	1	83.5	79.5	123	76	84	72	294.9	215.6	209.1	307.7	318.9	460.4
SRC-9621M	64	2	167	159	246	152	168	144	316.5	238.1	230.7	341.1	351.7	517.6
SRC-14421M	64	3	250.5	238.5	369	228	252	216	282.4	221.7	214.8	317.0	327.8	482.0
SRC-19221M	64	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

S-848-C Core (Imperial)

Model Details			Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn. Size (inch)	Cores	R22		R134a		R404A/R507		R407C/R410A		R134a	R404A	R507	R22 / R407C	R410A	CO_2
			24˚C	52˚C	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C						
SRC-485	5/8	1	68	63	73	69.5	117	63	71.5	61	83.7	57.6	55.8	81.9	85.3	127.6
SRC-965	5/8	2	136	126	146	139	234	126	143	122	78.2	53.4	51.7	76.1	79.0	119.2
SRC-1445	5/8	3	204	189	219	208.5	351	189	214.5	183	78.2	53.4	51.7	76.1	79.0	119.2
SRC-1925	5/8	4	272	252	292	278	468	252	286	244	78.2	53.4	51.7	76.1	79.0	119.2
SRC-487	7/8	1	68	63	73	69.5	117	63	71.5	61	124.2	89.7	86.9	128.6	132.7	197.0
SRC-967	7/8	2	136	126	146	139	234	126	143	122	116.0	83.1	80.5	119.5	122.8	184.1
SRC-1447	7/8	3	204	189	219	208.5	351	189	214.5	183	116.0	83.1	80.5	119.5	122.8	184.1
SRC-1927	7/8	4	272	252	292	278	468	252	286	244	116.0	83.1	80.5	119.5	122.8	184.1
SRC-489	1 1/8	1	68	63	73	69.5	117	63	71.5	61	178.8	128.6	124.5	184.7	190.0	283.7
SRC-969	1 1/8	2	136	126	146	139	234	126	143	122	178.1	128.2	124.0	183.9	189.1	282.7
SRC-1449	1 1/8	3	204	189	219	208.5	351	189	214.5	183	173.3	124.7	120.8	179.1	184.2	275.1
SRC-1929	1 1/8	4	272	252	292	278	468	252	286	244	173.3	124.7	120.8	179.1	184.2	275.1
SRC-4811	1 3/8	1	68	63	73	69.5	117	63	71.5	61	236.8	171.5	166.1	245.6	253.5	375.9
SRC-9611	1 3/8	2	136	126	146	139	234	126	143	122	241.5	174.1	168.7	249.8	257.3	383.3
SRC-14411	1 3/8	3	204	189	219	208.5	351	189	214.5	183	253.4	183.1	177.4	262.4	270.5	402.2
SRC-19211	1 3/8	4	272	252	292	278	468	252	286	244	263.9	192.6	186.6	275.1	284.9	418.8
SRC-4813	1 5/8	1	68	63	73	69.5	117	63	71.5	61	273.7	199.8	193.6	285.4	295.7	434.3
SRC-9613	1 5/8	2	136	126	146	139	234	126	143	122	298.7	216.7	210.0	310.2	320.5	474.1
SRC-14413	1 5/8	3	204	189	219	208.5	351	189	214.5	183	299.3	217.2	210.4	310.8	321.1	475.0
SRC-19213	1 5/8	4	272	252	292	278	468	252	286	244	309.4	225.1	218.1	321.8	332.8	491.1
SRC-4817	2 1/8	1	68	63	73	69.5	117	63	71.5	61	399.6	298.2	289.2	422.6	442.2	634.1
SRC-9617	2 1/8	2	136	126	146	139	234	126	143	122	419.9	307.2	297.7	438.4	454.6	666.4
SRC-14417	2 1/8	3	204	189	219	208.5	351	189	214.5	183	367.1	268.1	259.8	382.9	396.7	582.6
SRC-19217	2 1/8	4	272	252	292	278	468	252	286	244	429.8	311.1	301.4	445.7	459.9	682.0
SRC-4821	2 5/8	1	68	63	73	69.5	117	63	71.5	61	294.9	215.6	209.1	307.7	318.9	460.4
SRC-9621	2 5/8	2	136	126	146	139	234	126	143	122	316.5	238.1	230.7	341.1	351.7	517.6
SRC-14421	2 5/8	3	204	189	219	208.5	351	189	214.5	183	282.4	221.7	214.8	317.0	327.8	482.0
SRC-19221	2 5/8	4	272	252	292	278	468	252	286	244	337.4	273.5	264.9	391.3	404.2	598.8

S-848-C Core (Metric)

Model Details			Drying Capacity (kg of refrigerant)								Liquid Capacity (kW)					
Part No	Conn. Size (mm)	Cores	R22		R134a		R404A/R507		R407C/R410A		R134a	R404A	R507	R22 / R407C	R410A	CO_2
			24˚C	52˚C	24˚C	52˚C	24˚C	52˚C	24˚C	52˚C						
SRC-486M	18	1	68	63	73	69.5	117	63	71.5	61	83.7	57.6	55.8	81.9	85.3	127.6
SRC-966M	18	2	136	126	146	139	234	126	143	122	78.2	53.4	51.7	76.1	79.0	119.2
SRC-1446M	18	3	204	189	219	208.5	351	189	214.5	183	78.2	53.4	51.7	76.1	79.0	119.2
SRC-1926M	18	4	272	252	292	278	468	252	286	244	78.2	53.4	51.7	76.1	79.0	119.2
SRC-489M	28	1	68	63	73	69.5	117	63	71.5	61	178.8	128.6	124.5	184.7	190.0	283.7
SRC-969M	28	2	136	126	146	139	234	126	143	122	178.1	128.2	124.0	183.9	189.1	282.7
SRC-1449M	28	3	204	189	219	208.5	351	189	214.5	183	173.3	124.7	120.8	179.1	184.2	275.1
SRC-1929M	28	4	272	252	292	278	468	252	286	244	173.3	124.7	120.8	179.1	184.2	275.1
SRC-4813M	42	1	68	63	73	69.5	117	63	71.5	61	273.7	199.8	193.6	285.4	295.7	434.3
SRC-9613M	42	2	136	126	146	139	234	126	143	122	298.7	216.7	210.0	310.2	320.5	474.1
SRC-14413M	42	3	204	189	219	208.5	351	189	214.5	183	299.3	217.2	210.4	310.8	321.1	475.0
SRC-19213M	42	4	272	252	292	278	468	252	286	244	309.4	225.1	218.1	321.8	332.8	491.1
SRC-4821M	64	1	68	63	73	69.5	117	63	71.5	61	294.9	215.6	209.1	307.7	318.9	460.4
SRC-9621M	64	2	136	126	146	139	234	126	143	122	316.5	238.1	230.7	341.1	351.7	517.6
SRC-14421M	64	3	204	189	219	208.5	351	189	214.5	183	282.4	221.7	214.8	317.0	327.8	482.0
SRC-19221M	64	4	272	252	292	278	468	252	286	244	337.4	273.5	264.9	391.3	404.2	598.8

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

R22: From 1050 ppm W to 60 ppm W according to ARI 710-86
R134a: From 1050 ppm W to 75 ppm W
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 $t_e = -15˚C$ (-30˚C for CO_2)
Condensing temperature of $t_c = +30˚C$ (-5˚C for CO_2)
Pressure drop across filter drier of $\Delta p = 0.07$ bar

S-848-CC

Cores	Drying Capacity (kg of refrigerant)											
	Evaporating Temperature t_e (°C)											
	-40	-20	4.4	-30	-20	4.4	-40	-20	4.4	-40	-20	4.4
	R22			R134a			R404A/R507			R407C/R410A		
1	29	20	13	46	39	27	47	31	19	43	35	25
2	58	40	26	92	78	54	94	62	38	86	70	50
3	87	60	39	138	117	81	141	93	57	129	105	75
4	116	80	52	184	156	108	188	124	76	172	140	100

Drying Capacity is expressed during drying in:

R22: EDP = 10 ppm W, corresponding to a dew point temperature of -50°C
R134a: EDP = 50 ppm W, corresponding to a dew point temperature of -37°C
R404A: EDP = 10 ppm W, corresponding to a dew point temperature of -40°C
R407C: EDP = 10 ppm W, corresponding to a dew point temperature of -40°C

Model	Refrigerant	Acid adsorb capacity (drops)	Acid capacity (grams)
S-848-C (80%/20% MS/AA)	R134a	196	10.24
	R410A	232	12.12
S-848-CC (47%/48%/5% MS/AA/C)	R134a	465	24.30
	R410A	523	27.33
Test Condition: T = 25°C, TAN = 0.3mgKOH/g of oil, Humidity = 2%			

Recommended Plant Capacity in suction line (kW) S-848-CC (Burn Out) - (Imperial)

Model Details			Evaporating Temperature t_e°C											
Part No	Conn. Size (inch)	Cores	-40	-20	4.4	-30	-20	4.4	-40	-20	4.4	-40	-20	4.4
			R22			R134a			R404A/R507			R407C/R410A		
SRC-485	5/8	1	3.0	8.6	20.4	2.9	5.2	12.6	2.3	6.9	17.0	3.0	8.6	20.4
SRC-965	5/8	2	3.2	8.8	20.8	3.1	5.5	13.0	2.4	7.2	17.5	3.2	8.9	21.0
SRC-1445	5/8	3	3.4	9.7	22.1	3.3	5.8	13.6	2.6	7.5	18.3	3.4	9.7	22.1
SRC-1925	5/8	4	4.1	11.2	266.9	3.9	6.9	16.3	3.1	8.9	22.0	4.1	11.2	26.5
SRC-487	7/8	1	5.6	15.6	36.7	5.4	9.6	22.7	4.4	12.5	30.3	5.6	15.6	36.7
SRC-967	7/8	2	5.6	15.7	37.0	5.4	9.6	22.9	4.4	12.5	30.5	5.6	15.7	37.0
SRC-1447	7/8	3	6.4	18.3	41.6	6.1	10.9	25.6	4.9	14.1	34.5	6.4	18.3	41.6
SRC-1927	7/8	4	7.7	21.0	49.9	7.4	13.0	30.7	5.9	16.9	41.4	7.7	21.0	49.9
SRC-489	1 1/8	1	7.6	21.0	49.2	7.3	12.9	30.6	5.8	16.7	40.5	7.6	21.0	49.2
SRC-969	1 1/8	2	8.2	23.1	54.8	7.9	14.1	33.7	6.4	18.5	45.2	8.2	23.1	54.8
SRC-1449	1 1/8	3	8.3	23.6	53.8	7.9	14.1	33.1	6.4	18.2	44.7	8.3	23.6	53.8
SRC-1929	1 1/8	4	10.0	27.2	64.8	9.6	16.9	39.6	7.7	21.9	53.8	10.0	27.2	64.8
SRC-4811	1 3/8	1	9.5	25.9	60.1	9.1	16.0	37.5	7.3	20.7	49.3	9.5	25.9	60.1
SRC-9611	1 3/8	2	11.1	31.1	73.7	10.6	19.0	45.5	8.6	24.9	60.8	11.1	31.1	73.7
SRC-14411	1 3/8	3	12.3	35.4	85.7	11.8	21.4	52.3	9.6	28.6	71.2	12.3	35.4	85.7
SRC-19211	1 3/8	4	13.5	38.0	90.5	13.0	23.2	55.7	10.6	30.6	74.8	13.5	38.0	90.5
SRC-4813	1 5/8	1	9.0	24.6	57.0	8.6	15.1	35.6	6.9	19.6	46.7	9.0	24.6	57.0
SRC-9613	1 5/8	2	12.7	35.9	85.7	12.2	21.9	52.7	9.9	28.8	70.8	12.7	35.9	85.7
SRC-14413	1 5/8	3	11.6	33.5	81.1	11.2	20.2	49.5	9.1	27.0	67.4	11.6	33.5	81.1
SRC-19213	1 5/8	4	15.5	43.9	105.0	15.0	26.7	64.5	12.1	35.3	86.9	15.5	43.9	105.0
SRC-4817	2 1/8	1	9.2	25.1	58.2	8.8	15.5	36.3	7.1	20.1	47.7	9.2	25.1	58.2
SRC-9617	2 1/8	2	12.4	35.1	83.8	12.0	21.4	51.5	9.7	28.2	69.3	12.4	35.1	83.8
SRC-14417	2 1/8	3	11.0	31.6	76.5	10.5	19.1	46.6	8.5	25.5	63.6	11.0	31.6	76.5
SRC-19217	2 1/8	4	15.3	43.4	103.8	14.8	26.4	63.8	12.0	34.9	85.9	15.3	43.4	103.8
SRC-4821	2 5/8	1	9.2	25.2	58.4	8.9	15.5	36.5	7.1	20.1	47.9	9.2	25.2	58.4
SRC-9621	2 5/8	2	12.1	34.0	81.1	11.6	20.7	49.9	9.4	27.3	67.0	12.1	34.0	81.1
SRC-14421	2 5/8	3	11.6	33.5	81.1	11.2	20.2	49.5	9.1	27.0	67.4	11.6	33.5	81.1
SRC-19221	2 5/8	4	14.7	41.8	99.7	14.3	25.5	61.3	11.6	33.6	82.5	14.7	41.8	99.7

Recommended plant capacity is based on:

Evaporating temperature of t_e = +4.4°C
Condensing temperature of t_c = +32.2°C

Recommended Plant Capacity in suction line (kW) S-848-CC (Burn Out) - (Metric)

Model Details			Evaporating Temperature t_e °C											
Part No	Conn. Size (mm)	Cores	-40	-20	4.4	-30	-20	4.4	-40	-20	4.4	-40	-20	4.4
			R22			R134a			R404A/R507			R407C/R410A		
SRC-486M	18	1	3.0	8.6	20.4	2.9	5.2	12.6	2.3	6.9	17.0	3.0	8.6	20.4
SRC-966M	18	2	3.2	8.8	20.8	3.1	5.5	13.0	2.4	7.2	17.5	3.2	8.9	21.0
SRC-1446M	18	3	3.4	9.7	22.1	3.3	5.8	13.6	2.6	7.5	18.3	3.4	9.7	22.1
SRC-1926M	18	4	4.1	11.2	266.9	3.9	6.9	16.3	3.1	8.9	22.0	4.1	11.2	26.5
SRC-489M	28	1	7.6	21.0	49.2	7.3	12.9	30.6	5.8	16.7	40.5	7.6	21.0	49.2
SRC-969M	28	2	8.2	23.1	54.8	7.9	14.1	33.7	6.4	18.5	45.2	8.2	23.1	54.8
SRC-1449M	28	3	8.3	23.6	53.8	7.9	14.1	33.1	6.4	18.2	44.7	8.3	23.6	53.8
SRC-1929M	28	4	10.0	27.2	64.8	9.6	16.9	39.6	7.7	21.9	53.8	10.0	27.2	64.8
SRC-4813M	42	1	9.0	24.6	57.0	8.6	15.1	35.6	6.9	19.6	46.7	9.0	24.6	57.0
SRC-9613M	42	2	12.7	35.9	85.7	12.2	21.9	52.7	9.9	28.8	70.8	12.7	35.9	85.7
SRC-14413M	42	3	11.6	33.5	81.1	11.2	20.2	49.5	9.1	27.0	67.4	11.6	33.5	81.1
SRC-19213M	42	4	15.5	43.9	105.0	15.0	26.7	64.5	12.1	35.3	86.9	15.5	43.9	105.0
SRC-4821M	64	1	9.2	25.2	58.4	8.9	15.5	36.5	7.1	20.1	47.9	9.2	25.2	58.4
SRC-9621M	64	2	12.1	34.0	81.1	11.6	20.7	49.9	9.4	27.3	67.0	12.1	34.0	81.1
SRC-14421M	64	3	11.6	33.5	81.1	11.2	20.2	49.5	9.1	27.0	67.4	11.6	33.5	81.1
SRC-19221M	64	4	14.7	41.8	99.7	14.3	25.5	61.3	11.6	33.6	82.5	14.7	41.8	99.7

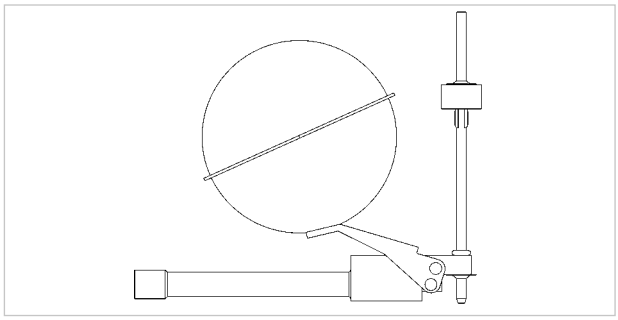
Cores

Part No.	Material	Description	Suitability
S-848-CM	100% MS	High Drying capacity	HCFC, HFC & CO_2 Refrigerants
S-848-C	80%/20% MS/AA	Moisture & Acid Absorption	Not suitable for oils containing additives
S-848-CC	47%/48%/5% MS/AA/C	Burn-Out Core	Not suitable for oils containing additives
S-848-SC	100% MS	Low Pressure Drop	HCFC, HFC & CO_2 Refrigerants

REPLACEMENT COMPONENTS

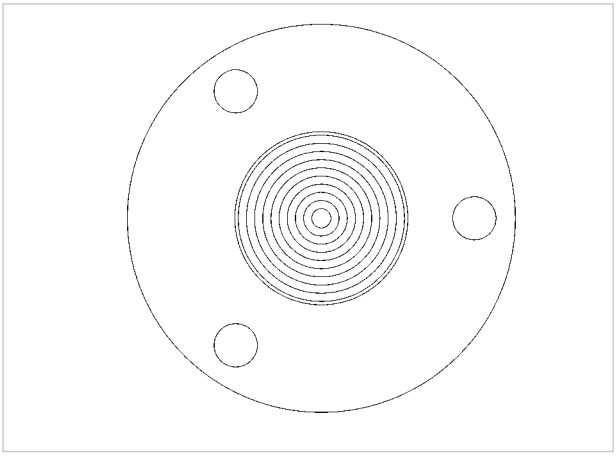
OIL SEPARATORS

Vessel Part No	Replacement Float Assy + Gasket	Gasket only
S-520*	SN-1900-30S	2-023-001
S-190*		
S-541*		
SN-529*		
S-290*		
Vessel Part No	Replacement Float Assy + Gasket	Gasket only
S-528*	A-5700-30	2-023-001
S-579*		



Vessel Part No	Replacement Float Assy + Gasket	Gasket only
S-58*	A-5000-30	2-023-001

OIL LEVEL REGULATORS



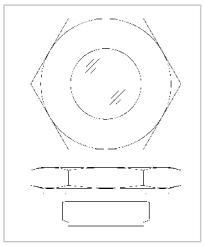
Part No	Description
2-020-006	Reflex Lens Sight Glass
S81-3-125	O-ring
2-023-003	Quad-ring
3-033-201-HPT	Standard Seal Kit (note 1)

Note 1. This is the standard seal kit supplied with each S-95 series regulator. It includes bolts, nuts, quad and O-rings.

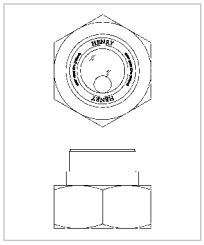
INTELOIL CONTROLLER

Part No	Description
H12101	Oil Connector/Filter

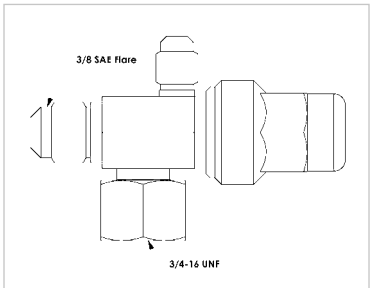
OIL RESERVOIRS / SEPARATOR-RESERVOIRS



Standard Sight Glass
3-020-079 (1.50 A/F Hex) O-ring S81-3-123



Rotalock-style Sight Glass & Gasket
647-2020-2



3/8 SAE Flare Rotalock
Valve 2616-061220
Teflon seal Gasket
800-26XX-12

REPLACEABLE CORE FILTER DRIERS

Cover plate Gasket: A5011

Replaceable Core Inners:

1 Core: 720-3017-01

2 Core: 720-3017-02

3 Core: 720-3017-03

4 Core: 720-3017-04

ACCESSORIES

HEAT ELEMENTS

Heat elements add heat to oil separators to prevent migration of refrigerant to the vessel during off cycles of the compressor.

4" diameter heat bands can be installed on the sump of the S-520*, S-190*, S-541*, SN-529*, S-529*, S-290*, S-528* & S-579* series Oil Separators.

Heat elements can also be used on suction line accumulators to warm the oil and allow oil return to the compressor on low temperature applications.

Part No	Vessel Diameter (inch)	Wattage (W)	Volts (V)
S-9101	4	25	110 AC
S-9111	4	25	220 AC
S-9112	6	50	220 AC

NOTES

NOTES

HENRY GROUP

NOTES

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