Schroeder INDUSTRIES

Advanced Fluid Conditioning Solutions®

Products Catalog

ACCESSORIES

Accessories

Quality Policy

Continuous improvement in our business to ensure a quality product, shipped on time, without compromise.

Leetsdale Facility

Limitations of Liability

The information contained in the catalog (including, but not limited to, specifications, configurations, drawings, photographs, dimensions and packaging) is for descriptive purposes only. Any description of the products contained in this catalog is for the sole purpose of identifying the products and shall not be deemed a warranty that the products shall conform to such description. No representation or warranty is made concerning the information contained in this catalog as to the accuracy or completeness of such information. Schroeder Industries LLC reserves the right to make changes to the products included in this catalog without notice. A copy of our warranty terms and other conditions of sale are available upon request. A placed order constitutes acceptance of Schroeder's terms and conditions.

Failure, improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury and property damage.

This catalog and other documentation from Schroeder Industries provides product information for consideration by users possessing technical expertise.

It is important that the user analyze all aspects of the specific application and review the current product information in the current catalog. Due to the variety of operating conditions and applications for these products, the user is solely responsible for making the final product selection and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, design, availability and pricing are subject to change at any time without notice.

Schroeder
INDUSTRIES
Advanced Fluid Conditioning Solutions®

Contents at a Glance

Contents at a Glance (pg 2)

Corporate Overview

Schroeder Industries, an ISO 9001:2008 certified company, focuses on developing filtration and fluid service products for our customers in the fluid power industry and is proud of our proven track record of providing quality products over the last sixty years. The designs you see in this catalog are the result of thousands of hours of field testing and laboratory research... and decades of experience.

Schroeder INDUSTRIES
Advanced Fluid Conditioning Solutions®

Schroeder was one of the first companies to demonstrate the need for, and benefits of, hydraulic filtration. We pioneered the development of micronic filtration, helping to set performance standards in industrial fluid power systems. As a result, Schroeder is now a leader in filtration and fluid conditioning—and the proof of our expertise lies in our broad mix of unsurpassed products. Our mission statement reflects our continuing commitment to excellence:

Partnerships

Innovating products, solutions, processes and services to improve performance and efficiency in industry.

We design solutions for industry and for the success of our customers by:

- Optimizing the use of technology with applications
- Using an efficient, timely customization process to fill specific customer needs
- Increasing manufacturing capacity and streamlining operations
- Preserving our reputation for reliability
- Expanding globally to support our customers and stay current with new technologies
- Leveraging and sharing our knowledge to meet challenges openly
- Nurturing a creative, cooperative culture committed to the individual and to providing the best solutions for our customers

Our goal is to be your filtration partner. Our expertise in filtration technology, our superior filter and element manufacturing capabilities, and our dedication to customer service and product support are the reasons we're considered experts in Advanced Fluid Conditioning Solutions®.

We are committed to providing the best available filter products to meet necessary cleanliness levels at a competitive price. As a cost-effective quality producer, we can work with your purchasing department to supply contamination control technology or develop long-range pricing programs that can improve your company's bottom line.

Visit Us Online...

Schroeder's web site, **www.schroederindustries.com**, is filled with helpful resources.

Replacing filter elements is simpler than ever before with our Online Cross-Reference Guide to Bestfit® replacement elements. With this user-friendly guide you can match 41,000 filter elements from 150 other manufacturers with appropriate Bestfit® replacements. Click the BestFit® link on our home page or got to the direct link at www.schroederindustries.info.

Corporate Overview

Product Distribution

Schroeder Industries has in place a strategically located international distribution network, supported by our professional and experienced sales and marketing team. Distributor personnel are trained in the important aspects of filter application by Schroeder in training sessions held at our factory and around the globe. The effectiveness of our product and service support is multiplied by utilizing Schroeder's extensive distributor network. All Schroeder Industries distributors meet very strict criteria to enhance our ability to serve the needs of our valued customers.

Schroeder's distributor network includes over 100 distributor locations throughout Europe, the United Kingdom, South Africa, Australia, Asia, North America and South America, so that customers worldwide can rely on Schroeder's exceptional support.

Manufacturing and Testing

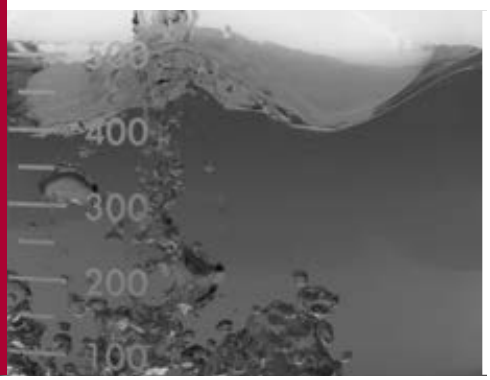
Schroeder Industries' corporate headquarters are located in Leetsdale, PA (USA) with an additional manufacturing facility in Cumberland, MD (USA). Filter housings and diagnostic and specialty products are manufactured at our Pittsburgh plant, while filter elements are manufactured in our Cumberland plant. Both facilities have the skilled workforce and the capacity to meet our customers' needs. Schroeder's research and development center as well as our contamination control laboratory are located at our corporate headquarters.

An Open Invitation

We invite you to present us with any specific filtration challenge you may experience. Schroeder will design and make filters to meet your specific requirements. To find out more, and/or obtain a quote, call us to speak with a sales representative or technical specialist. They can help determine the optimal filtration strategy for a given system. While the quantity of any product manufactured to fit a customer's needs will determine the economic feasibility of a particular project, in many cases, we can offer modified products in relatively small quantities at competitive prices and short lead times.

Over the years, Schroeder design engineers have encountered virtually every type of hydraulic system. We are proud of our continuing success in providing "value-added products" for our customers, that is, making or modifying our products to meet their specific needs. When customers order products from Schroeder, they are assured of a reliable source of supply, consistent and prompt service, and direct support. Pre and post-technical service is provided to ensure customer satisfaction.

So if you're faced with a filtration dilemma, call us.
Schroeder Industries: Advanced Fluid Conditioning Solutions®.



Capabilities

Accessories

Schroeder Industries offers a complete range of reservoir accessories, rotomolded reservoir subsystems and individual accessory components with unique value-added options. Schroeder's hydraulic accessories product offering consists of air breather (desiccant and phenolic resin impregnated cellulose media), pressure gauges, filler-strainers, fluid level monitors, oil sight glasses, suction strainers, magnetic suction separators, hydraulic test points and rotomolded reservoirs.

Along with the standard offerings, Schroeder Industries has the ability to tailor products into a custom sub-system solution for a customer's specific needs. Schroeder Industries also offers several patent protected technologies in our accessories line we can off as value added solutions.

Schroeder's continued commitment to developing technically relevant accessories continually expands the portfolio in both breadth as well as in technical complexity. When implementing any of Schroeder Industries accessories products customers can be confident that all products meet Schroeder Industries strict quality control standards.

From advanced technology desiccant breathers to metal fill caps to diagnostic test point and test kits, Schroeder fills the technology gap left by traditional accessory manufacturers.

Markets Served

Schroeder's products, technical expertise, commitment to research and development, and ongoing improvements in manufacturing enable us to provide products and services that improve performance and efficiency in many major industries, including:

- AGRICULTURE
- AUTOMOTIVE MANUFACTURING
- BULK FUEL FILTRATION
- CHEMICAL PROCESSING
- CONSTRUCTION
- INDUSTRIAL
- MACHINE TOOL
- MARINE
- MINING TECHNOLOGY
- MOBILE VEHICLES
- OFFSHORE
- POWER GENERATION
- PULP & PAPER
- RAILROAD
- STEEL MAKING
- WASTE WATER TREATMENT

Section 1:

SCHROEDER CHECK

Schroeder Check Test Point System

Introduction

Schroeder Check test points provide a fast easy and safe way to test pressures up to 10,000 psi (680 bar) in hydraulic systems under operation. They are available in both 1620 (M16x20) and 1215 (M12x1.5) reverse buttress connections threads with a variety of screw port threads. The standard poppet style features a primary and secondary seal, providing for absolute sealing of fluid. The design allows connection by hand at pressures up to 10,000 psi (680 bar) without any loss of fluid. Metal caps and Buna seals are standard and each hydraulic test point is individually checked for quality assurance.

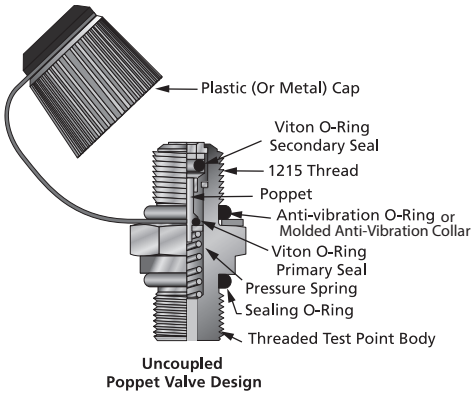
In addition to functioning as a secure access point for checking pressure, they can also be effectively used for collecting oil samples for subsequent testing or bleed air from a hydraulic system. Schroeder check test point can be used in conjunction with gauge adapters, pressure gauges, microflex hoses, and pressure gauge test kits.

Our hydraulic test point design allows easy, comfortable, and safe access to high pressure system enabling measuring , sampling, and filling without interfering with installation. Even connect and disconnect sensors at running installation for easy diagnosis and fluid condition monitoring.

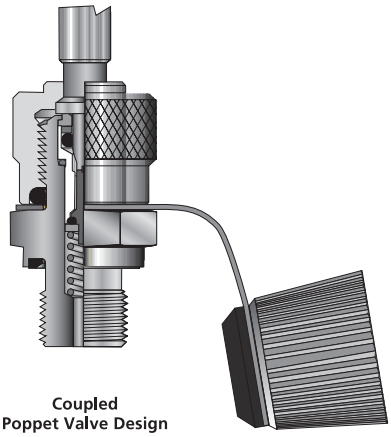
Benefits

- No mess, no-leak design means sealing is complete before connection is made to hydraulic system.
- No tools - simply hand tighten gauge, transducer or hose adapter onto Schroeder Check test points under full pressure to 10,000 psi (680 bar)
- No contamination - proper use of test points eliminates the introduction of contaminants into a hydraulic system

Schroeder Check Test Point System



Uncoupled
Poppet Valve Design


Coupled
Poppet Valve Design

Test Points

Description

Schroeder Check Test point provide an easy, efficient and Safe method for testing pressure up to 10,000 psi (680 bar) in a hydraulic system during operation. Available in 1620 threads as a standard and 1215 as an option, the test point are available in a variety threads for the circuit thread of the test point. Utilizing a dual seal poppet design, that incorporated a primary and secondary soft seal and a hard seal on the end of the piston Schroeder Check Test points are capable of sealing completely allowing no leakage in hydraulic applications. This design permits connection of Microflex hoses in tandem with the Schroeder Check test point during machine operation safely by hand up to 10,000 psi (680 bar) with no loss of fluid. All Schroeder Check Test Points are equipped with a standard Metal (or Plastic) cap.

In Addition to serving as a secure access point for checking pressure during trouble shooting, test points can also be used to obtain oil samples for testing or to bleed air from a hydraulic circuit. Schroeder Check test points can be used in conjunction with gauge adapters, pressure gauges, Microflex hoses and the pressure gauge kits.

Features

- No Mess
  No-leak design means sealing is complete before connection is made to hydraulic system.
- No Tools
  Simply hand tighten gauge, transducer or hose adapter onto Schroeder Check test points under full pressure to 10,000 psi (680 bar).
- No Contamination
  Proper use of test points eliminates the introduction of contaminants into a hydraulic system.

Applications

- Fluid sampling
- Air bleeding
- Connection for diagnostic products

Specifications

Maximum Working Pressure:	10,000 psi (680 bar)	
Materials:	Standard Body:	S12L14 AS 1442 (AISI-SAE composition)
	Metal Cap:	S12L14 AS 1442 (AISI-SAE composition)
	Poppet:	S12L14 AS 1442 (AISI-SAE composition)
	Secondary Seal:	Viton
	Ball:	Hard Chrome
	Seat:	Stainless Steel 316
Operating Temperature Range:	-22°F to +275°F (-30°C to +135°C)	

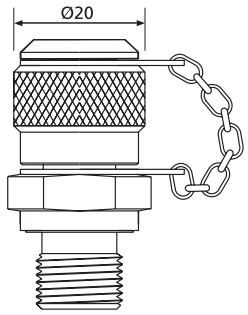
Optional materials include stainless steel body and stainless steel poppet.

Schroeder Check Test Point System

G Thread	Sealing System	Part Number
1/8" NPT	Thread	SP1620NPT18VM
1/4" NPT	Thread	SP1215NPT14VSSM SP1620NPT14VM
5/16"-24 UNF	Viton O-Ring	SP1215UN716VM
7/16"-20 UNF	Viton O-Ring	SP1620UN716VM SP1215UN716VSSM
9/16"-18 UNF	Viton O-Ring	SP1620UN916VM
1/8" BSPP	WD Seal NBR	SP1620G18WDM
1/4" BSPP	WD Seal NBR	SP1620G14WDM

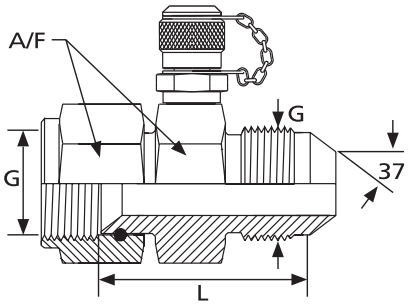
SP = Test point with poppet valve; SS = Stainless Steel; M = Metal Cap;
FP = Female Poppet
P = Plastic Cap
All Test Points have Viton® seals.

Preferred order codes designate shorter lead times and faster delivery.



Test Point with metal cap

JIC Male/ Female In-Line Test Points

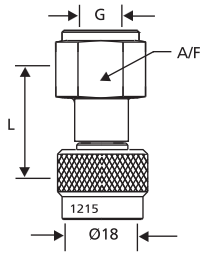


JIC according to SAE J514.
Male/female threads of the same size.

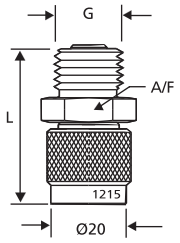
G Thread	Tube/Pipe dia	ΔP (max) psi (bar)	L in (mm)	A/F in (mm)	Part Number
7/16"-20 UNF	1/4"	4500 (315)	1.38 (35)	.51 (13)	SP1215L04JICP SP1620L04JICM
9/16"-18 UNF	3/8"	4500 (315)	1.38 (35)	.63 (16)	SP1215L06JICP SP1620L06JICM
3/4"-16 UNF	1/2"	4500 (315)	1.50 (38)	.83 (21)	SP1215L08JICVP SP1620L08JICM
1-1/16"-12 UNF	3/4"	4500 (315)	1.89 (48)	1.06 (27)	SP1215L12JICVP SP1620L12JICM
1-5/16"-12 UNF	1"	4500 (315)	1.97 (50)	1.38 (35)	SP1215L16JICP SP1620L16JICM

Preferred order codes designate shorter lead times and faster delivery.

Schroeder Check Test Point System



Type 1



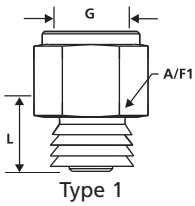
Type 2

Direct Gauge Adapters

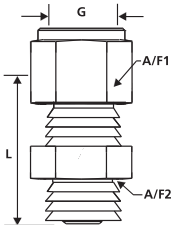
There is no internal check valve in these parts. They are used to connect gauges and pressure transducers directly onto test points without use of Schroeder Microflex hose.

G Thread	Type	ΔP (max) psi (bar)	L in (mm)	A/F in (mm)	Part Number
1/4" NPT	1	10,000 (680)	0.83 (21)	0.75 (19)	S1215DCNPT14 S1215DCNPT14SS S1620DCNPT14
1/4" BSPP	1	10,000 (680)	0.83 (21)	0.75 (19)	S1215DCG14CU S1620DCG14CU
7/16" UNF	1	10,000 (680)	0.83 (21)	0.75 (19)	S1215DCUN716 S1620DCUN716
1/4" NPT	2	10,000 (680)	0.83 (21)	0.75 (19)	S1215DCMNPT14

Preferred order codes designate shorter lead times and faster delivery.



Type 1



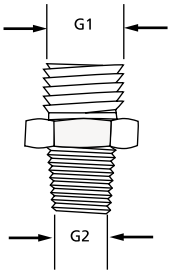
Type 2

Gauge to Hose Adapters

There is no internal check valve in this arrangement. Type 1 is for direct connection of gauge to hose. Type 2 is for bulkhead connection of gauge to hose with bulkhead mounting.

G Thread	Type	Gauge Seal	L in (mm)	A/F1 in (mm)	A/F2 in (mm)	Part Number
1/4" NPT	1	Thread	1.34 (34)	0.75 (19)	—	S1215GANPT14 S1620GANPT14

Preferred order codes designate shorter lead times and faster delivery.



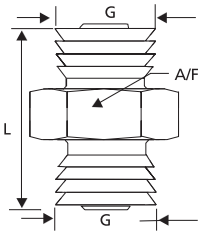
Change-Over Adapters

There is no internal check valve in this arrangement.

G1 Thread	G2 Thread	Part Number
M12 x 1.5	1/8" NPT Male	S1215NPT18P
M12 x 1.5	1/4" NPT Male	S1215NPT14
M12 x 1.5	1/4" NPT Male	S1215NPT14P

P = Plastic Cap

Preferred order codes designate shorter lead times and faster delivery.



Hose Joiners

G Thread	ΔP (max) psi (bar)	L in (mm)	A/F in (mm)	Part Number
System 1215	10,000 (680)	1.54 (39)	0.55 (14)	SJ1215
System 1620	10,000 (680)	1.54 (39)	0.55 (14)	SJ1620

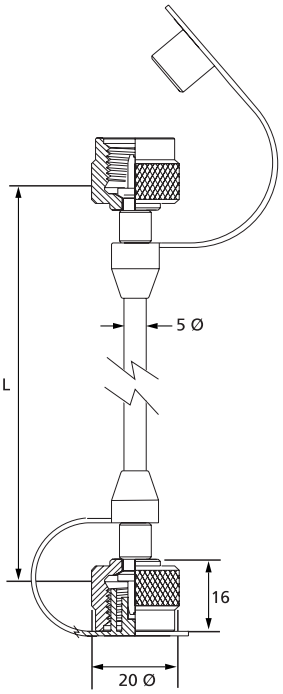
Preferred order codes designate shorter lead times and faster delivery.

Schroeder Check Test Point System

Microflex Hoses

Perforated polyamide / kevlar hose, 2 mm ID, 5 mm OD, plastic dust cap.

L in (mm)	ΔP (max) psi (bar)	Part Number
6 (150)	10,000 (680)	SM2-1215-006 SM2-1620-006
12 (300)	10,000 (680)	SM2-1215-012 SM2-1620-012
24 (610)	10,000 (680)	SM2-1215-024 SM2-1620-024
36 (915)	10,000 (680)	SM2-1215-036 SM2-1620-036
48 (1220)	10,000 (680)	SM2-1215-048 SM2-1620-048
72 (1830)	10,000 (680)	SM2-1215-072 SM2-1620-072
96 (2440)	10,000 (680)	SM2-1215-096 SM2-1620-096



Other lengths available on request.

Preferred order codes designate shorter lead times and faster delivery.

4mm hoses are available for use with the TMU to allow adequate flow.

L in (mm)	ΔP (max) psi (bar)	Part Number
6 (200)	10,000 (680)	SM4-1620-06
12 (300)	10,000 (680)	SM4-1620-12
35 (890)	10,000 (680)	SM4-1620-35
71 (1800)	10,000 (680)	SM4-1620-71

Stainless steel hose ends available. Insert "SS" after middle four digits.
Example: SM2-1215SS-006. Other hose ends available include:

Hose End	Description
NTP18	1/8 NPT (Male) Hose End
NPT14	1/4 NPT (Male) Hose End
NPFS14	1/4 NPT (Female Swivel) Hose End
J716	7/16 UNF (Male) Hose End
JFS716	7/16 UNF (Female Swivel) Hose End
J916	9/16 UNF (Male) Hose End

Adjustable Pressure Limiters

The Schroeder Pressure Limiters are engineered to pressure gauges, pressure switches, transducers, and any pressure sensitive component from system shocks and spikes utilizing a high speed valve ideal for protecting downstream components. Preset at the factory, the Schroeder Pressure Limiter is supplied in any of six standard ranges.

Standard seals are Viton® with other sealing materials available on request.

Housing is aluminum, other parts are zinc-plated steel.

Gauge Connector is 1/4" NPT Female.

Part Number	Adjustable Range
U1200-01-01	75 to 150 psi (5.2 to 10.4 bar)
U1200-01-02	150 to 350 psi (10.4 to 24.1 bar)
U1200-01-03	350 to 1000 psi (24.1 to 69.0 bar)
U1200-01-04	1000 to 1500 psi (69.0 to 103.0 bar)
U1200-01-05	1500 to 3600 psi (103.0 to 248.0 bar)
U1200-01-06	3600 to 6000 psi (248.0 to 414.0 bar)

Note: All units shipped will be preset at the minimum pressure of its range, unless otherwise specified at time of purchase.

Schroeder Check Test Point System

- Schroeder Pressure Test Kits are available in four configurations as shown below. Highest quality components were selected for versatility and long service life. Contents of each kit are listed below.
- The optional gauge range should be specified using the order code shown above.
  For example: UB102-1-2 specifies one (1) 100 psi gauge and one (1) 200 psi

Schroeder Pressure Test Kits

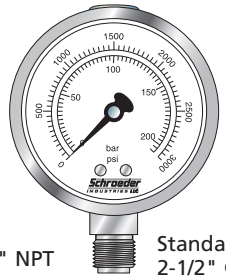
UB101-(*)	UB102-(*)-(*)	UB103-(*)-(*)-(*)	UB106-(*)-(*)-(*)-(*)-(*)-(*)
1 U401 Gauge (*)	2 U401 Gauges (*)-(*)	3 U401 Gauges (*)-(*)-(*)	6 U401 Gauges (*)-(*)-(*)-(*)-(*)-(*)
1 Microflex Hose 36"	2 Microflex Hoses 36"/72"	3 Microflex Hoses 12"/36"/72"	6 Microflex Hoses, 2x12"/2x36"/2x72"
1 Hose Joiner	1 Hose Joiner	1 Hose Joiner	3 Hose Joiners
1 (Hose) Gauge Adapter	1 (Hose) Gauge Adapter	1 (Hose) Gauge Adapter	3 (Hose) Gauge Adapters
1 Direct Gauge Adapter	1 Direct Gauge Adapter	1 Direct Gauge Adapter	3 Direct Gauge Adapters
3 Schroeder Check Test Points:	6 Schroeder Check Test Points:	6 Schroeder Check Test Points:	12 Schroeder Check Test Points:
1 ea. 1/4" NPT	2 ea. 1/4" NPT	2 ea. 1/4" NPT	4 ea. 1/4" NPT
1 ea. 7/16" UNF	2 ea. 7/16" UNF	2 ea. 7/16" UNF	4 ea. 7/16" UNF
1 ea. 9/16" UNF	2 ea. 9/16" UNF	2 ea. 9/16" UNF	4 ea. 9/16" UNF

Pressure test kits are also available with U400 all stainless steel gauges. Part numbers are U101–(*), U102–(*) -(*)…etc.

Schroeder Custom Test Kits

Custom Test Kits are designed for many special requirements. Utilizing components from Schroeder gauge and pressure test kits, these boxes are constructed for reliability and precision.

For additional information on custom test kits, please consult factory.



1/4" NPT Standard 2-1/2" Case

Pressure Gauges

With the Schroeder Check System, one top quality gauge can do the work previously done by many. Compromising on low cost, short life gauges with questionable accuracy is no longer necessary. A series of precision instruments, Schroeder gauges are fluid filled with full scale accuracy of ±1.5% (or better). Dual scale dial has a non-reflective white background and a high contrast matte black pointer. Cases and connections are stainless steel, internals are brass. Ideal for most liquids and gases under pressure or vacuum where contact with the liquid filling would not be hazardous. For additional applications, information, and pressure ranges, please consult the factory.

Part Number	Pressure	Order Code *(needed for test kits)*
U401-30/100-01*	30 in Hg VAC to 100 psi (6.9 bar)	0
U401-100-01	0 to 100 psi (6.9 bar)	1
U401-200-01	0 to 200 psi (13.8 bar)	2
U401-600-01	0 to 600 psi (41.2 bar)	6
U401-1000-01	0 to 1000 psi (70.0 bar)	10
U401-1500-01	0 to 1500 psi (103.0 bar)	15
U401-3000-01*	0 to 3000 psi (207.0 bar)	30
U401-5000-01	0 to 5000 psi (345.0 bar)	50
U401-6000-01*	0 to 6000 psi (414.0 bar)	60
U401-10000-01	0 to 10000 psi (689.0 bar)	100

*Also available is U400-XXX-01 gauge, identical to U401 except with stainless steel internals.

Preferred order codes designate shorter lead times and faster delivery.

Multi-Gauge

GS
Multi-Gauge

P/N GS-5

P/N GS-6U

Description

The Schroeder Multi-Gauge provides multiple pressure readings for hydraulic, transmission, and converter systems all in one compact enclosure. While one terminal connects all three gauges, the built-in gauge protector automatically protects the low and medium pressure gauges from high pressures. Each gauge is equipped with a high quality poppet valve. The Multi-Gauge is available with two types of connections: (1) the standard braided copper, flexible high pressure hose with male 1/8" pipe universal swivel fitting and (2) microbore flexhose and test point adapter (specified by U in the part number).

Features

- **Protects against overpressurization.** The 150 psi gauge can not be damaged when a 2500 psi system is being checked. This design feature eliminates the need to know the pressure before testing.
- **Simple yet rugged construction.** The dust and moisture proof steel case is provided with a rubber bumper for shock protection. A hanger is also provided on the case back for the user's convenience.
- **Compact and portable.** The GS-5 and GS-6 models are 6-1/2" and 8-1/2" in diameter. The GS-5 fits easily into the average tool box for instant availability.
- **Saves time.** The three pressure ranges and one vacuum range provided in one case meet most routine hydraulic maintenance requirements.

Specifications

	GS-5 & GS-5U	GS-6 & GS-6U
Case Diameter:	6.31 in (160 mm) O.D.	8.50 in (216 mm) O.D.
Gauge Diameter:	1.50 in (38 mm) O.D.	1.50 in (38 mm) O.D.
Approximate Weight:	3.25 lbs (1.47 kg)	4.5 lbs (2.0 kg)
Range:	Vacuum (30" Hg) to 5000 psi (345 bar)	Vacuum (30" Hg) to 6000 psi (3413 bar)
Case:	Steel with rubber bumper strip	Steel with rubber bumper strip
Vacuum Gauge:	30 in Hg	30 in Hg
Pressure Gauges:	0 to 150 psi (10 bar) 0 to 600 psi (41 bar) 0 to 5000 psi (345 bar)	0 to 300 psi (21 bar) 0 to 1000 psi (69 bar) 0 to 6000 psi (414 bar)

Model Number Selection

How to Build a Valid Model Number for a Schroeder GS:

BOX 1		BOX 2
GS	–	

Example: *???*

BOX 1		BOX 2
GS	–	5U

BOX 1

Model
GS

BOX 2

Options	
5	Standard Multi-Gauge
5U	Multi-Gauge with Microbore Flexhose and Test Point Adapter
6	Multi-Gauge with 2-1/2" Liquid Filled Gauges
6U	Multi-Gauge with 2-1/2" Liquid Filled Gauges, Microbore Flexhose and Test Point Adapter

Section 2:

SPECIALTY FLUID SAMPLING TOOLS

Reservoir Breather Fluid Sampling Adapter

RBSA
Reservoir Breather Oil Sampling Adapter

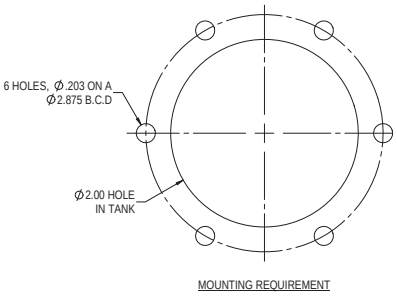
Features, Benefits and Description

- Drop-in reservoir breather retrofit for fluid sampling provides clean easy access to the reservoir through the existing breather part
- **Provides easy fluid quality sampling solution for HY-TRAX® and TMU suction and return ports**
- Hytrax adapter kit includes #6 & #4 JIC adapters with 6′ connection hoses included
- TMU adapter includes 1620 testpoint and 3′ connection hose to TMU
- 24″ SS drop tubes can be cut to length
- Standard 6 bolt breather pattern
- Anodized 6061 aluminum breather
- ¾″ NPT for breather element

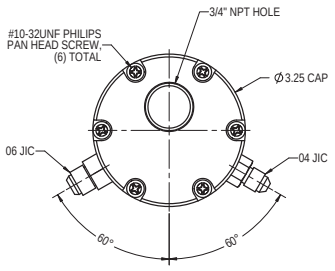
Market Applications

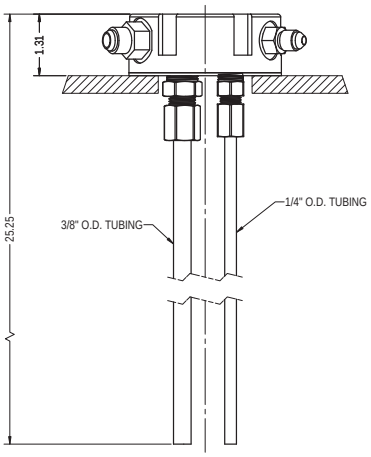
- All applications with a hydraulic reservoir utilizing a 6-bolt mounting connection

Mounting Requirement



MOUNTING REQUIREMENT



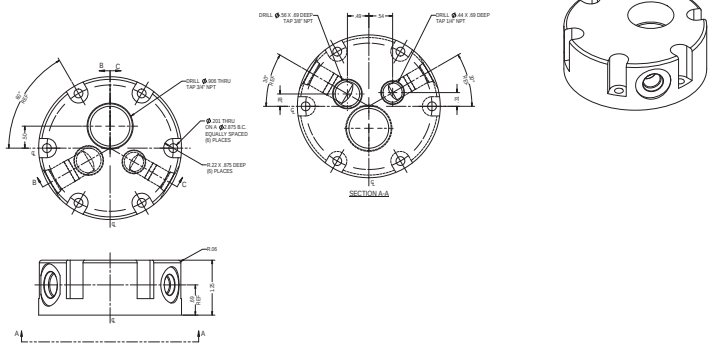


Specifications

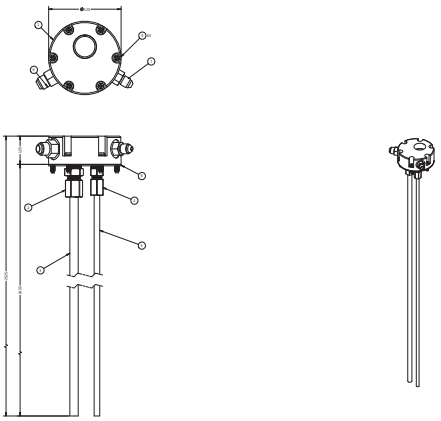
Reservoir Mounting Pattern:	Fits standard 6-bolt
Supply Port Thread Size:	9/16-18 UN
Return Port Thread Size:	7/16-20 UN
Breather Port Thread Size:	¾″ NPT
Fittings:	Option 1: Includes #4 & #6 JIC fittings. Optional #6 & #4 JIC fittings and 6′ supply/return hoses. Option 2: Includes 1620 test point and TMU connection hose.
Return Tubes:	Supplied with ⅜″ and ¼″ return tubes. Tubes are 24″ long and can be shortened if necessary. Housing constructed 6061 anodized aluminum.

Reservoir Breather Fluid Sampling Adapter

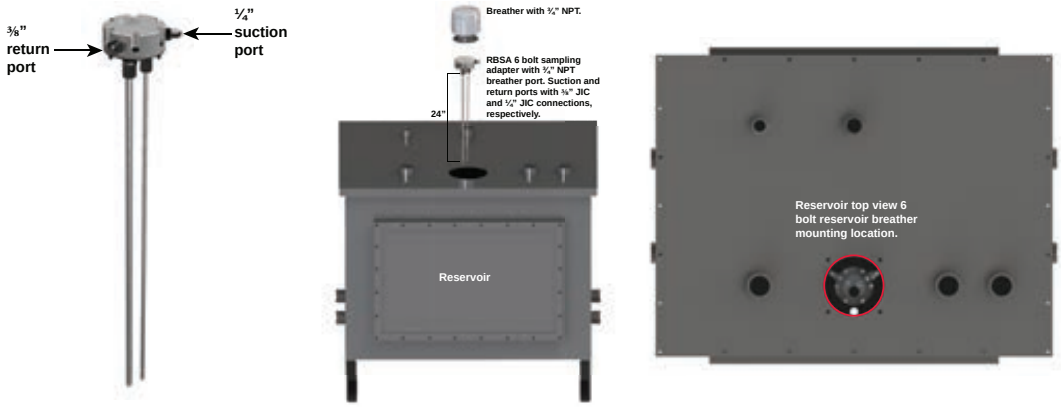
Application Example



Parts List Drawing



Reservoir Mounting Views



Model Number Selection

How to Build a Valid Model Number for a Schroeder Reservoir Breather Fluid Sampling Adapter RBSA:

BOX 1	BOX 2
RBSA –	

Example: *NOTE: Box 2 can have multiple options.*

BOX 1	BOX 2	
RBSA –	1	**= RBSA-1**

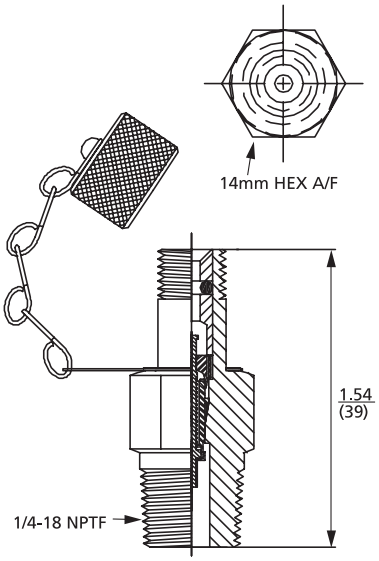
BOX 1	BOX 2
Model	**Options**
RBSA	1 = HY-TRAX® adapter fitting #6 & #4 JIC fittings and 6′ supply/return hoses 2 = TMU adapter (suction hose included)

Probalizer Sampling Test Point

Bottle and cap sold separately under P/N LF-7374.

The Probalizer Sampling Test Point provides a point of access for obtaining representative fluid samples from an operational hydraulic system. The downstream channel is specially sized to accept the sampling probe from a customized cap/probe assembly screwed onto a sample bottle. (See photo). Use of this system minimizes leakage and helps to maintain the integrity of the sample.

Part Number:	LF-7611
Flow Rate:	400 mL/min @ 35 psi; 1000 mL/min @ 100 psi
Burst Pressure:	4500 psi (310 bar) min
Sampling Pressure Range:	1 to 100 psi (0.07 to 6.89 bar)
Mounting Thread:	1/4" NPT



Part Number Selection

Part Number	Description
LF-7611	Probalizer Sampling Test Point
LF-7374	Bottle and cap (pictured above)

Section 3:

RESERVOIR ACCESSORIES

Reservoir Accessories

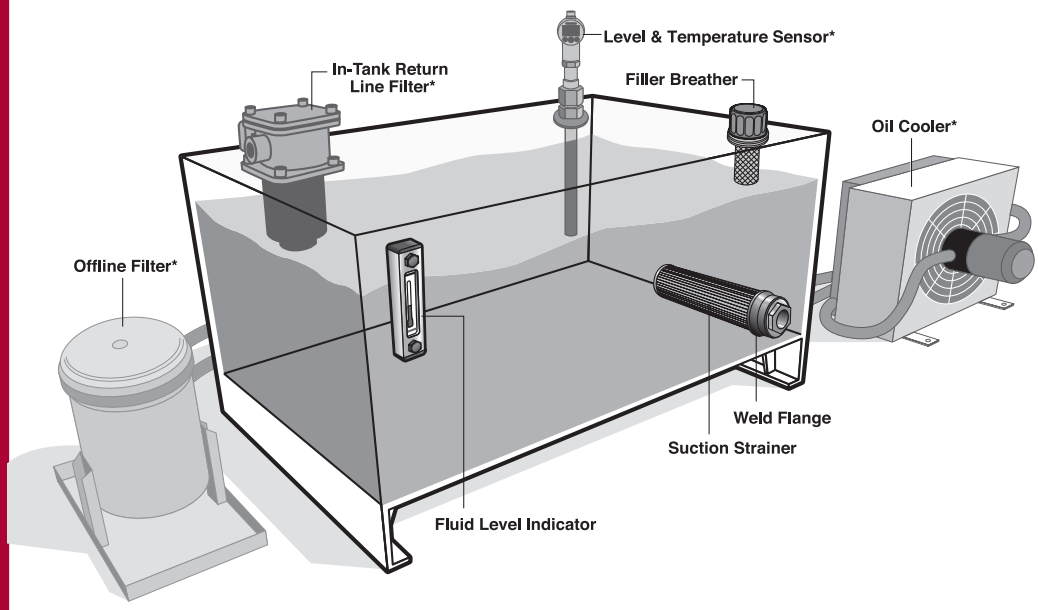
A hydraulic systems' reservoir can play a significant role in the ingression of contamination into the system. Concurrently, the reservoir presents great opportunities to correct the negative fluid conditions. The proper application of Schroeder reservoir accessories will greatly increase a system's cleanliness level. It's good to remember this rule of thumb: "it costs 10 times more to remove contamination from your system than it does to exclude it from your system."

Installing an efficient air breather is critical yet often overlooked when system filtration is considered. In systems operating in dusty atmospheric conditions, the use of an air breather will minimize the ingestion of airborne particles when reservoir levels experience significant change. The sole purpose of an air breather, as with any filtration device, is to reduce the cost of operation. By lowering the rate of ingression, the contamination level of the system will be reduced and the service life of the system fluid filters will be increased.

The fluid replenishment process is another opportunity for contamination to enter the system. Schroeder filler breathers can prevent large contaminants from entering the tank during filling. Most new oil does not meet the cleanliness recommendations of most components within a system when it is delivered from the manufacturer. Removal of the fine particles can be easily accomplished by using Schroeder filter carts. More information regarding filters carts can be found in the filter system catalog.

Protecting the pump is an integral step in ensuring system longevity. Installing a suction strainer will stop the larger pieces of unwanted debris from entering the suction line causing catastrophic problems downstream. Schroeder's magnetic suction separators offer unique protection for pumps suction line from all sizes of ferrous particles without starving the pump.

Designed for simple installation on most equipment, Schroeder oil sight glasses provide maintenance and lubrication management professionals a complete and immediate visual oil analysis. Although easy detection and discharge of water contamination are leading benefits, operators can also visually monitor the oil level and condition as discoloration or debris.



Complete Tank Solutions

TNK

TNK

TNK12 - 12 Gallons
TNK18 - 18 Gallons
TNK25 - 25 Gallons

100 psi *(7 bar)* Return Line Filter

Model No. of product in photograph is: TNK12HD8ZZ10P2FS2S.

Features and Benefits

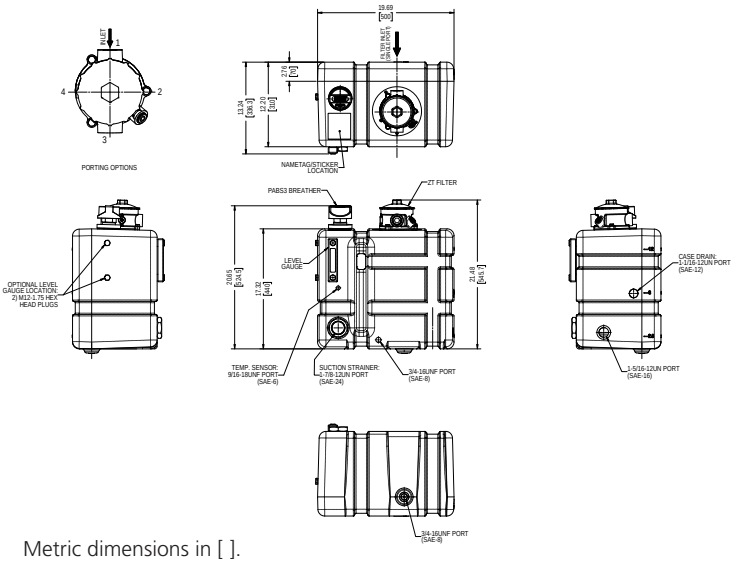
- Package solution comes complete with all accessories installed
- Patented insertion ring for filter head flange mounting prevents leakage
- Patented integrated baffle wall creates settling zone for returning oil (degassing) with simultaneous cooling effect
- Tested for leakage (no testing is required)
- High degree of cleanliness eliminates time-consuming flushing processes
- Lightweight and cost efficient
- No risk of corrosion
- Available in three different sizes and configurations
- GeoSeal® patented element technology

Specifications

Tank Materials:	High Density Polyethylene (HDPE) Nylon 6 (PA6)
Tank Volumes:	12 gal (45L), 18 gal (70L) or 25 gal (100L)
Operating Temperature:	High Density Polyethylene (HDPE) - 20°F to 180°F (-29°C to 82°C) Nylon 6 (PA6) - 20°F to 220°F (-29°C to 105°C)
Return Line Filter:	ZT & GZT available
Max. Return Flow:	TNK12: 40 GPM (150 L/min) TNK18: 40 GPM (150 L/min) TNK25: 40 GPM (150 L/min)
Breather:	3 µ phenolic resin impregnated paper element
Suction Filter:	100 µ wire mesh
Weight of TNK:	TNK12: 21 lbs (9,7 kg) TNK18: 33 lbs (15 kg) TNK25: 42 lbs (19 kg)
Element Change Clearance:	TNK12: 10" (254mm) TNK18: 10" (254mm) TNK25: 10" (254mm)
Ultra Violet Light Rating:	HPDE = UV-12 PA6 = UV-4 (Tank requires painting or placed out of direct sunlight for PA6 material)

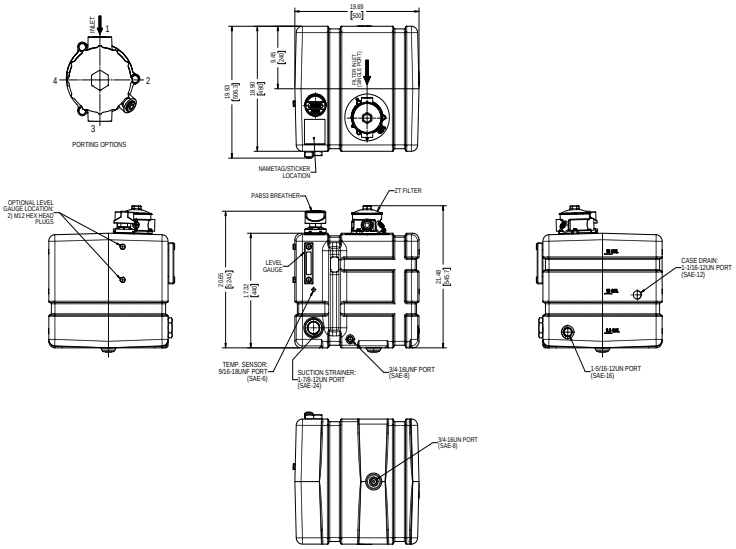
TNK Complete Tank Solutions

TNK12



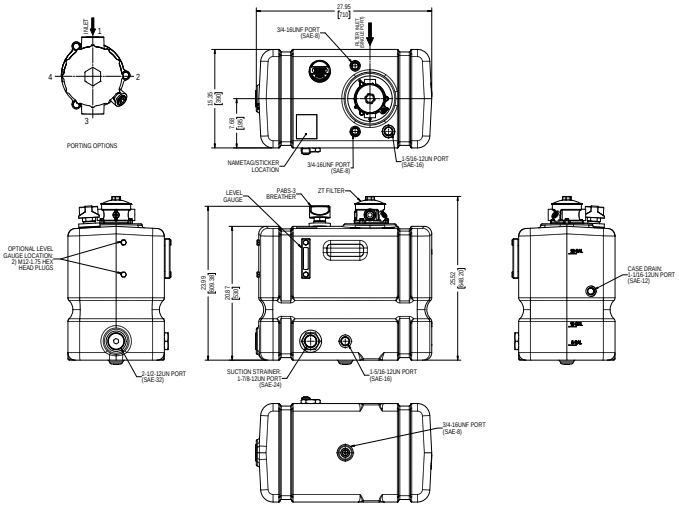
Metric dimensions in [ ].

TNK18



Metric dimensions in [ ].

TNK25



Metric dimensions in [ ].

Complete Tank Solutions

Element Performance Information

Element	Filtration Ratio Per ISO 4572/NFPA T3.10.8.8 Using automated particle counter (APC) calibrated per ISO 4402			Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171	
	$\beta_x \geq 75$	$\beta_x \geq 100$	$\beta_x \geq 200$	$\beta_{x(c)} \geq 200$	$\beta_{x(c)} \geq 1000$
8Z3	6.8	7.5	10.0	N/A	N/A
8Z10	15.5	16.2	18.0	N/A	N/A
8ZZ1	<1.0	<1.0	<1.0	<4.0	4.2
8ZZ3	<1.0	<1.0	<2.0	<4.0	4.8
8ZZ5	2.5	3.0	4.0	4.8	6.3
8ZZ10	7.4	8.2	10.0	8.0	10.0
8ZZ25	18.0	20.0	22.5	19.0	24.0

Element Dirt Holding Capacity

Element	DHC (gm)
8Z3	39
8Z10	32
8ZZ1	51
8ZZ3	52
8ZZ5	59
8ZZ10	55
8ZZ25	77

Element Collapse Rating: 150 psid (10 bar)

Flow Direction: Outside In

Element Nominal Dimensions: 3.2" (81 mm) O.D. x 9.25" (235 mm) long

Pressure Drop Information

Based on Flow Rate and Viscosity

Pressure	Element Series	Element Part No.	Element selections are predicated on the use of 150 SUS (32 cSt) petroleum based fluid and a 25 psi (1.7 bar) bypass valve.
Return Line -Tank-Mounted	E Media	8Z3 paper	8Z3 (cellulose media)
		8Z10 paper	8Z10 (cellulose media)
		8Z25 paper	8Z25 (cellulose media)
	Z-Media®	8ZZ3	8ZZ3
		8ZZ5	8ZZ5
		8ZZ10	8ZZ10
		8ZZ25	8ZZ25
	Flow	gpm	0 10 20 30 40
		(L/min)	0 50 100 150

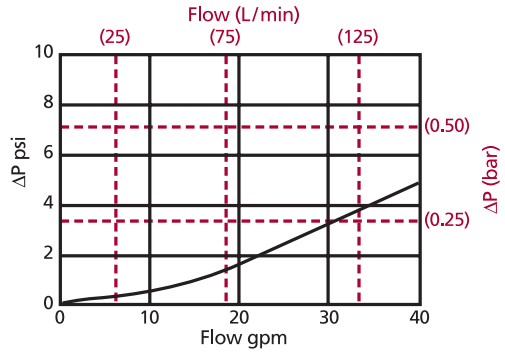
Shown above are the elements most commonly used in this housing.

Note: *Contact factory regarding use of E media in High Water Content, Invert Emulsion and Water Glycol Applications. For more information, refer to Fluid Compatibility: Fire Resistant Fluids, pages 21 and 22.*

Pressure Drop Information
Based on Flow Rate and Viscosity

$\Delta P_{housing}$

ZT $\Delta P_{housing}$ for fluids with sp gr = 0.86:



sp gr = specific gravity

$\Delta P_{element}$

$\Delta P_{element}$ = flow x element ΔP factor x viscosity factor

El. ΔP factors @ 150 SUS (32 cSt):

8Z3	.25
8Z10	.09
8Z25	.02
8ZZ1	.37
8ZZ3	.21
8ZZ5	.13
8ZZ10	.11
8ZZ25	.08

If working in units of bars & L/min, divide above factor by 54.9.

Viscosity factor: Divide viscosity by 150 SUS (32 cSt).

Sizing of elements should be based on element flow information provided in the Element Selection chart above.

Notes

$\Delta P_{filter} = \Delta P_{housing} + \Delta P_{element}$

Exercise:

Determine ΔP at 20 gpm (76 L/min) for ZT8ZZ1PES using 200 SUS (44 cSt) fluid.

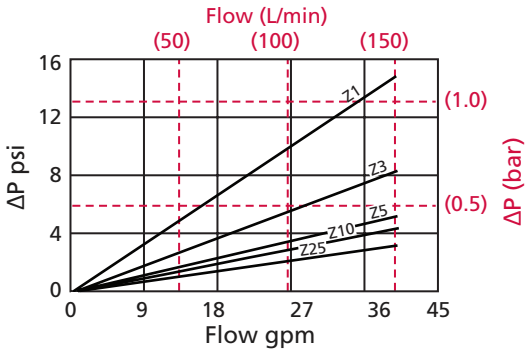
Solution:

$\Delta P_{housing}$ = 1 psi [.07 bar]

$\Delta P_{element}$ = 20 x .37 x (200÷150) = 9.8 psi
or
= [76 x (.37÷54.9) x (44÷32) = 0.7 bar]

ΔP_{total} = 1.0 + 9.8 = 10.8 psi
or
= [.07 + .7 = .77 bar]

Element Pressure Drop Information



Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder TNK:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
TNK										

Example: *Note: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11	
TNK	12	HD	8ZZ10	S	3	Y2	F	S	2	S	= TNK12HD8ZZ 10S3Y2FS2S

BOX 1

Product Series
TNK

BOX 2

Size
12 = 12 Gallon
18 = 18 Gallon
25 = 25 Gallon

BOX 3

Material
HD = HDPE
PA = Nylon 6 (PA6)

BOX 4

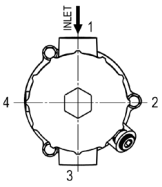
Return Filter & Element Micron Selection	
GZT (GeoSeal®)	ZT
8GTZZ1 (Synthetic)	8Z3 (Cellulose)
8GTZZ3 (Synthetic)	8Z10 (Cellulose)
8GTZZ5 (Synthetic)	8Z25 (Cellulose)
8GTZZ10 (Synthetic)	8ZZ1 (Synthetic)
8GTZZ25 (Synthetic)	8ZZ3 (Synthetic)
	8ZZ5 (Synthetic)
	8ZZ10 (Synthetic)
	8ZZ25 (Synthetic)

BOX 5

Inlet Porting
P = 1" NPTF
PP = Dual 1" NPTF
S = SAE-16
SS = Dual SAE-16
B = ISO 228 G-1"
BB = Dual ISO 228 G-1"

BOX 6

Filter Inlet Port Orientation
1 = Rear
2 = Right
3 = Front
4 = Left



Porting Options

BOX 7

Filter Dirt Alarm®	
	Omit = None
Visual	Y2 = Back-mounted tri-color gauge
	Y2C = Bottom-mounted gauge in cap
	Y5 = Back-mounted gauge in cap
Electrical	ES = Electric switch
	ES1 = Heavy-duty electric switch with conduit connection

BOX 8

Filler/Breather
F = PABS3

BOX 9

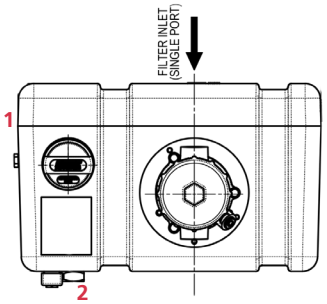
Sight Glass
S = SLG-5
N = No Sight Glass

BOX 10

Sight Glass Location
Omit = No Sight Glass
1 = Left
2 = Front

BOX 11

Suction Strainer
S = SAE-24, 100 Mesh Strainer
N = No Strainer / SAE-32 Open Port



NOTES:

Box 4. Micron Rating refers to the return filter element rating.

Tank Mounting Straps sold as a separate part number, please see next page for configurations and options.

FURTHER INFORMATION: PA6 Material must be painted or placed in a location out of direct sunlight to avoid UV degradation.

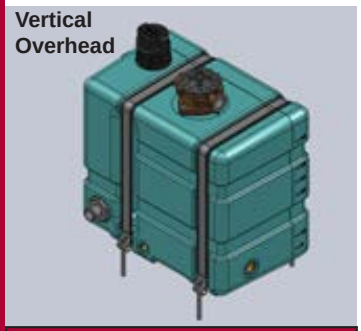
TNK Complete Tank Solutions

Plastic Tank Strap Arrangement Introduction

Mobile applications have unique requirements for hydraulic components. Often, these components need to be small, compact and as lightweight as possible. Making sure these reservoirs are secure is often overlooked. Schroeder Industries has taken the steps to ensure that customers have all the tools necessary to securely operate their mobile equipment. Schroeder's Plastic Tank (TNK) Reservoir, a money and time-saving solution with an integrated return filter and accessories in one compact package, also includes mounting straps. These mounting straps have been developed to assure a safe and secure connection to the frame or chassis of any mobile vehicle. These straps are offered in three configurations for both sizes of the Plastic Tank in a rubber coated steel strap.

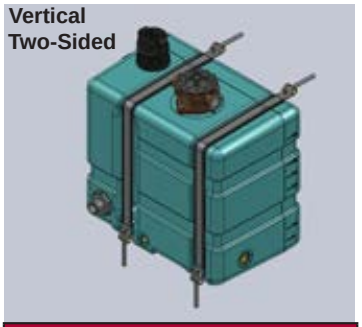
Mounting Possibility Standard Tank: 12 Gallon

Vertical Overhead



Rubber Coated Steel Straps
443868 41.9″ (1063 mm)

Vertical Two-Sided



Rubber Coated Steel Straps
443889 25.8″ (656 mm)

Horizontal

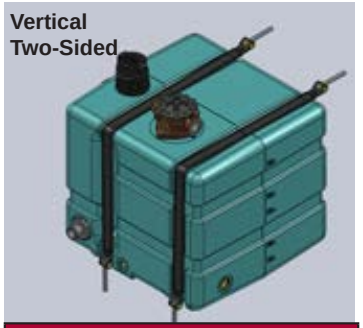
Rubber Coated Steel Straps
444066 33.8″ (859 mm)
444185 40.2″ (1022 mm)

Mounting Possibility Standard Tank: 18 Gallon

Vertical Overhead

Rubber Coated Steel Straps
3054998 49.8″ (1266 mm)

Vertical Two-Sided



Rubber Coated Steel Straps
444183 32.2″ (818 mm)

Horizontal

Rubber Coated Steel Straps
444490 46.7″ (1185 mm)
3521866 53.1″ (1348 mm)

Ordering Information:

TNK 12 Straps*			
Vertical Overhead	443868	**Horizontal Upper**	444066
Vertical Two-Sided	443889	**Horizontal Lower**	444185

TNK 18 Straps*			
Vertical Overhead	3054998	**Horizontal Upper**	444490
Vertical Two-Sided	444183	**Horizontal Lower**	3521866

*Straps are not sold in sets. Each part number designates one strap.

Section 4:

AIR BREATHERS

Air Breathers

Quality Air Breathers are Essential

Breathers are integral components of any hydraulic system. A common mistake is treating breathers as a commodity and selecting one based solely on price. Due to particulate contamination found in harsh industrial and mobile environments, this mistake can lead to system inefficiencies and component failures. We offer a portfolio of high quality, cost effective air breathers with various options for a wide range of applications. Choosing the proper breather combats the ingression of airborne contamination while increasing the efficiency and improving the reliability of your hydraulic system.

The Schroeder Difference

Breather elements are typically constructed with low-grade paper or low-quality sponge material, which tend to tear when exposed to moisture and provide insufficient filtration ratings. Conversely, our breather elements are constructed of phenolic resin impregnated paper or synthetic media. Both types provide high resistance to moisture and adequate micron ratings, ensuring proper filtration while extending the operational service life of the breather.

Recommendations

Increasing demands for fluid cleanliness levels are requiring more frequent use of high-quality media for the filtration of oils. Schroeder recommends selecting a breather with a filtration rating (micron rating) that is equivalent to or finer than your finest system filters.

Since breathers do get clogged over time, Schroeder recommends the following change-out schedules:

Breathers without pressure gauges or visual indicators change your breather every 6 months or with every service interval.

Breathers with pressure gauges change your breather at 3 psi pressure drop (at higher pressure drops, the pump can cavitate).

Air Breathers

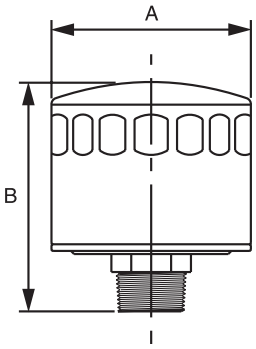
Air Breathers
Suction Separators and Strainers
Oil Sight Glasses

Schroeder offers high quality breathers to effectively combat the ingression of airborne contamination and moisture, therefore increasing the efficiency and reliability of the system.

Available breather series are ABF, PAB, SAB, and D-AB. Many are available with filler strainer, dipstick, indicator and check/relief valve options. The ABC air breather check can takes the guesswork out of when to change your breather.

Breathers with NPT Adapters

ABF-3/10 ABF-3/10-M-P12 ABF-S40 ABF-S40-M-P12
MBF-3-M-P20 MBF-10-M-P20



Features and Benefits

- Durable metal housing
- Optional dipstick or filler strainer
- Large pleated surface areas offers high dirt holding and air flow capacity
- NPT or Flange adapter available
- Available with three micron rating

Specifications

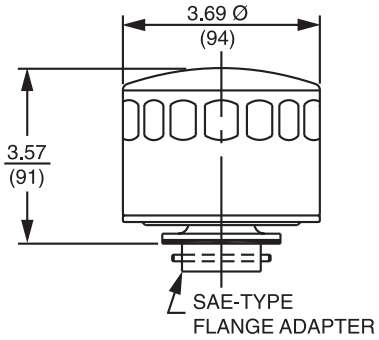
Model Number	A	B	Adapter Type	Minimal Micron Retention	Max Flow Rate	Air Flow/ psi Drop
ABF-3/10 ABF-3/10-M-P12	3.69 (94)	4.28 (109)	.75" NPT Nylon .75" NPT Steel	3 3	40 SCFM	0.4 psi at 20 SCFM- 1.25 psi at 40 SCFM
ABF-S40 ABF-S40-M-P12	3.69 (94)	4.28 (109)	.75" NPT Nylon .75" NPT Steel	40 40	40 SCFM	0.29 psi at 20 SCFM- 1.06 psi at 40 SCFM
MBF-3-M-P20 MBF-10-M-P20	5.06 (128)	8.31 (211)	1.25" NPT Steel	3 10	200 SCFM	0.3 psi at 70 SCFM- 1.25 psi at 200 SCFM

SCFM = Standard Cubic Feet per Minute

Breathers with Flange Adapters

ABF-3/10-F ABF-S40-F

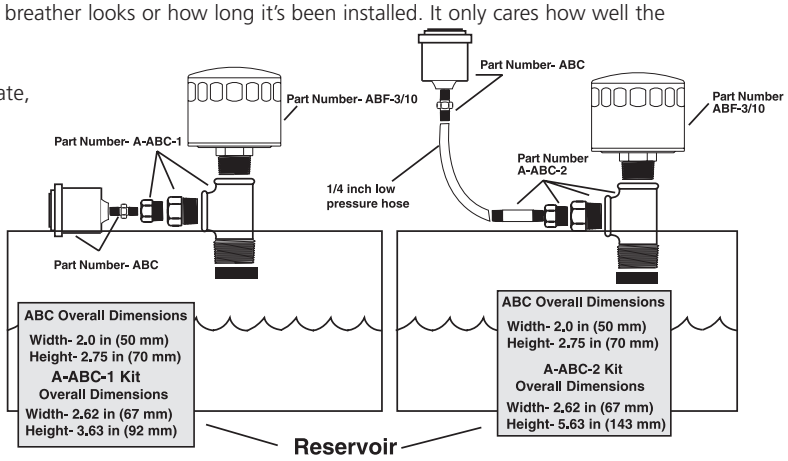
These breathers are designed for retrofit on hydraulic reservoirs using the SAE-type flange fill port assembly.



Air Breather Check (ABC)

An Indicator For Your Air Breather

The Air Breather Check (ABC) takes the guesswork out of when to change your air breather because it doesn't care how dirty the air breather looks or how long it's been installed. It only cares how well the breather is working. The air breather check is calibrated in inches of water and will activate, providing a visual indication, when a vacuum equivalent of 15 inches of water (3.75 kPa) is reached. The ABC can be reset simply by depressing the yellow button and used over and over again.



Air Breathers

Breathers with Dipstick

ABF-3/10FA, B, C **ABF-S40FA, B, C**

The air breathers above are also available with a dipstick up to 24 inches in length. The dimensions to the "add line" and the "fill line" must be specified in the model number ABF-3/10-F, A, B, C, where:

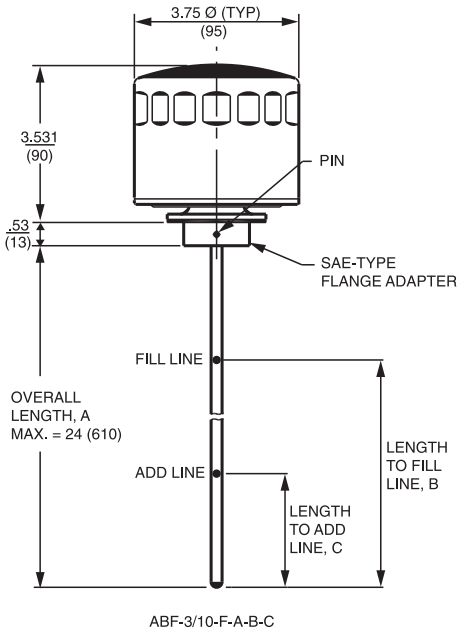
A = overall length of the dipstick in inches

B = length from tip of dipstick to fill line in inches

C = length from tip of dipstick to add line in inches

For safety reasons, the tip of the dipstick is rounded. No tools are needed for installation and removal. A quarter turn should snugly seal the breather in place.

Minimum order quantity is 12.



ABF-3/10-F-A-B-C

Filler Breather with Strainer

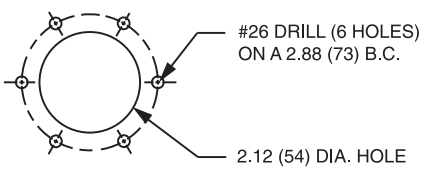
ABF-3/10-S **ABF-S40-S**
ABF-3/10-S6 **ABF-S40-S6**

The strainer used here is #24 mesh and is available in the lengths shown.

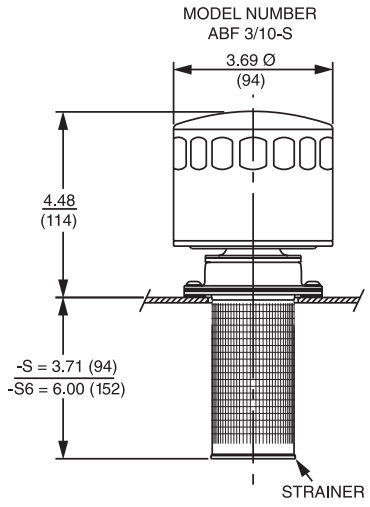
Model Number	Adapter Type	Minimal Micron Retention	Max Flow Rate	Air Flow/ psi Drop
ABF-3/10-S ABF-3/10-S6	SAE-type flange	10 10	40 SCFM	0.4 psi at 20 SCFM - 1.25 psi at 40 SCFM
ABF-S40-S ABF-S40-S6	SAE-type flange	40 40	40 SCFM	0.29 psi at 20 SCFM - 1.06 psi at 40 SCFM

SCFM = Standard Cubic Feet per Minute

To replace breather only, order ABF-3/10-F or ABF-S40-F.

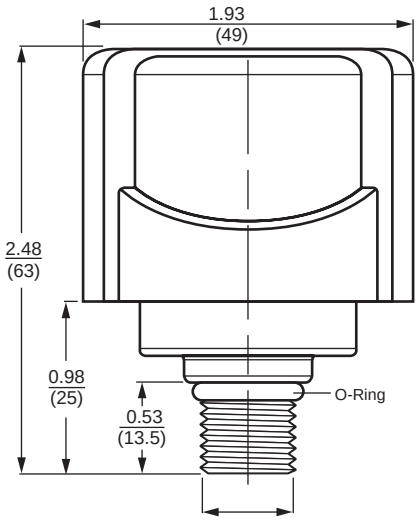


MOUNTING REQUIREMENT



Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Available with anti-splash or relief valve
- Optional customer logo (contact factory)
- Optional dipstick (contact factory)



PAB1 Breather

Specifications

Max. Flow Rate:	7 SCFM / 51 gpm at .15 psi 13SCM / 100 gpm at .6 psi
Filtration Rating:	3 µm absolute
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)

How to Build a Valid Model Number for a Schroeder PAB1:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
PAB1						

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
PAB1		P	3	N	.5	R6	**= PAB1P3N.5R6**

BOX 1

Model Number
PAB1

BOX 2

Replacement Element
Omit

BOX 3

Connection Type
P = NPT
S = SAE

BOX 4

Filtration Rating
3

BOX 5

Gauge Option
N = No Gauge

BOX 6

Connection Size
.5 = 1/2" NPT
12 = 3/4" SAE

BOX 7

Options
AS = Anti-Splash
R6 = 6 psi relief valve
D = Dipstick

Filter Model Number Selection

Same Day Shipment Model

NOTE:

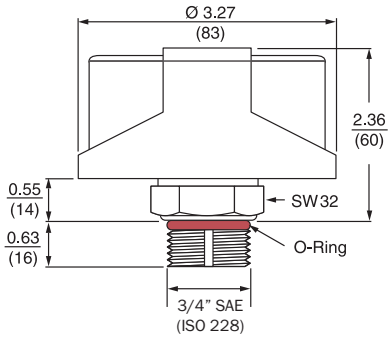
Contact factory for lead time and minimum order quantity for other models.

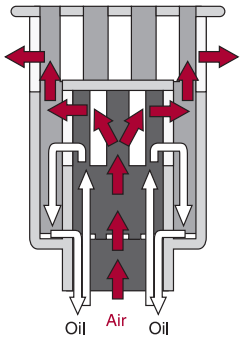
Air Breathers

PAB3 Breather

Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Available with anti-splash or relief valve
- Optional customer logo (contact factory)
- Optional dipstick (contact factory)





Specifications

Max. Flow Rate:	14 SCFM / 105 gpm at .15 psi 30 SCFM / 230 gpm at .6 psi
Filtration Rating:	3 µm absolute
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)

Filter Model Number Selection

Same Day Shipment Model

How to Build a Valid Model Number for a Schroeder PAB3:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
PAB3						

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
PAB3		P	3	N	12	R6	**= PAB3P3N12R6**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**	**Connection Size**
PAB3	Omit	P = NPT	3	N = No Gauge	1 = 1" NPT
		S = SAE			12 = 3/4" SAE

BOX 7

Options
AS = Anti-Splash
R6 = 6 psi relief valve
D = Dipstick

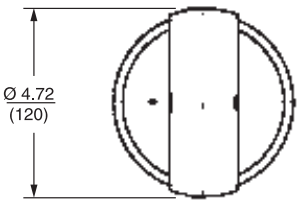
NOTE:

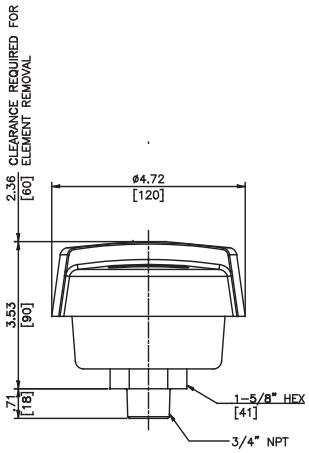
Contact factory for lead time and minimum order quantity for other models.

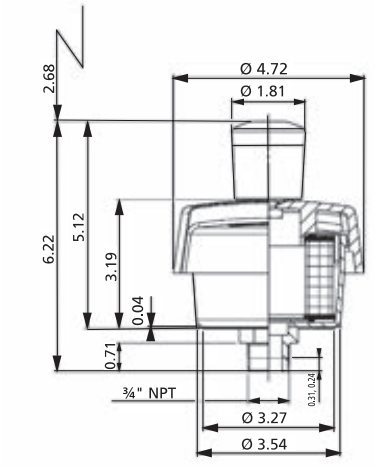
Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Integrated anti-splash insert
- Optional differential gauge
- Optional customer logo (contact factory)

PABR7 Breather







Specifications

Max. Flow Rate:	35 SCFM / 260 gpm at .15 psi 64 SCFM / 475 gpm at .6 psi
Filtration Rating:	3 µm
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)
Range of Indication:	0.5 psi

How to Build a Valid Model Number for a Schroeder PABR7:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
PABR7					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
PABR7	P	3	N	.75	AS	**= PABR7P3N.75AS**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
Model Number	**Connection Type**	**Filtration Rating**	**Gauge Option**	**Connection Size**	**Options**
PABR7	P = NPT	3	N = No Gauge	.75 = 3/4" NPT	AS = Anti-Splash
	S = SAE		W = With Gauge	16 = 1" SAE	

Replacement Elements: R-PAB7-3

Filter Model Number Selection

Same Day Shipment Model

NOTE:

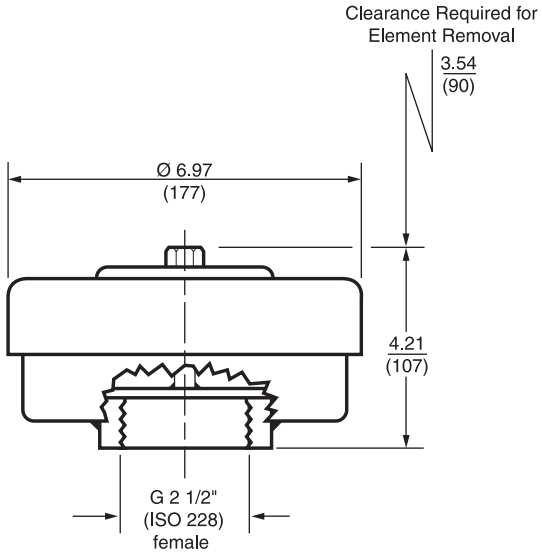
Contact factory for lead time and minimum order quantity for other models.

Air Breathers

SAB22 Breather

Features and Benefits

- Durable steel housing
- Wide range of flow rates
- Replaceable element



Specifications

Max. Flow Rate:	90 SCFM / 685 gpm at .15 psi 105 SCFM / 790 gpm at .6 psi
Filtration Rating:	3 µm absolute, Phenolic resin impregnated filter element
Connection:	G2 ½" female thread
Lid:	Removable lid to access fill port

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder SAB22:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
SAB22					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
SAB22	R	G	3	N	2.5	**= SAB22RG3N2.5**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**
SAB22	R = Replacement Elements	G = BSPP	3	N = No Gauge

BOX 6

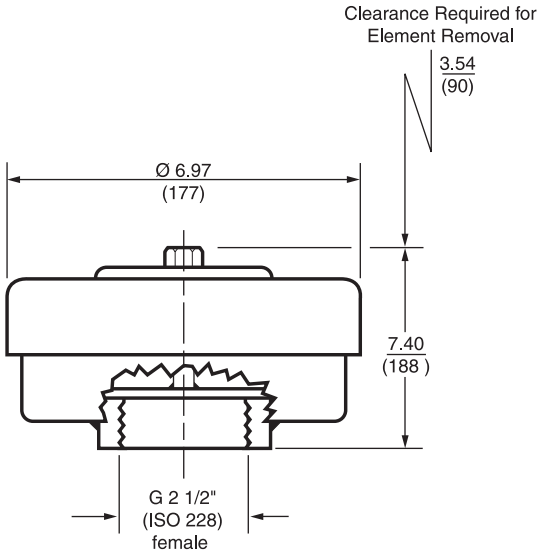
Connection Size
2.5 = Female BSPP

Replacement Elements:	R-SAB22-3

SAME DAY SHIPMENT MODEL AVAILABLE!

Features and Benefits

- Durable steel housing
- Wide range of flow rates
- Replaceable element



SAB35 Breather

Max. Flow Rate:	127 SCFM / 950 gpm at .15 psi 176 SCFM / 1320 gpm at .6 psi
Filtration Rating:	3 µm absolute, Phenolic resin impregnated filter element
Connection:	G2 ½" female thread
Lid:	Removable lid to access fill port

Specifications

How to Build a Valid Model Number for a Schroeder SAB35:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
SAB35 –	–	–	–	–	

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
SAB35 –	R –	G –	3 –	N –	2.5	= SAB35RG3N2.5

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**
SAB35	R = Replacement Elements	G = BSPP	3	N = No Gauge

BOX 6
Connection Size
2.5 = Female BSPP

Replacement Elements:	R-SAB22-3 (2 per breather)

Filter Model Number Selection

Same Day Shipment Model

NOTE:

Contact factory for lead time and minimum order quantity for other models.

Air Breathers

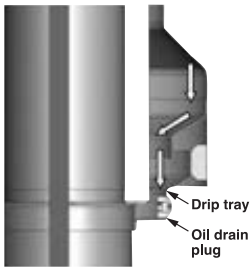
SAB70 Breather

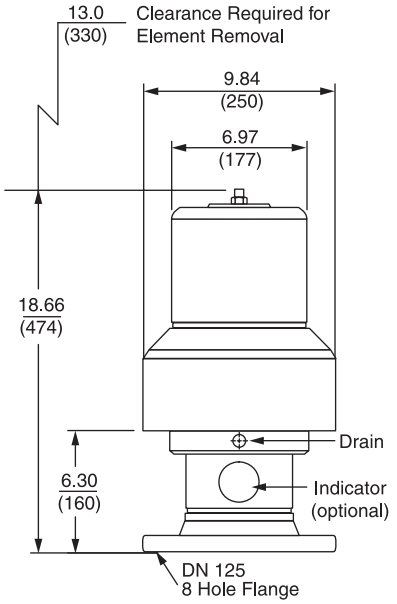
Features and Benefits

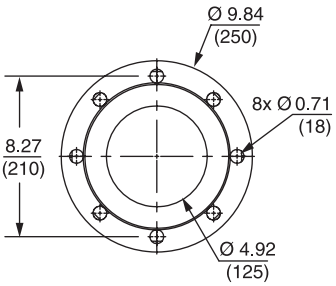
- Ideal for large reservoir with high return flow
- Durable steel housing
- Replaceable element
- Unique Oil Mist Trap design
- Optional pressure indicator

Oil Mist Trap

The oil mist in the filter is collected in a "drip tray"and is returned safely to the tank, or it can be drained via an oil drain plug.







Specifications

Max. Flow Rate:	340 SCFM / 2560 gpm at .15 psi 528 SCFM / 3960 gpm at .6 psi
Filtration Rating:	2 µm Excellement® Z-Media®
Connection:	8 bolt DN 125 flange

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder SAB70:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
SAB70					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
SAB70	R	F	2	N	1	**= SAB70RF2N1**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**
SAB70	R = Replacement Elements	F = Flanged	2	N = No Gauge W = With Gauge

BOX 6
Connection Size
1 = Standard (DN125)

Replacement Elements:	R-SAB70-2

Section 5:

FILLER BREATHERS

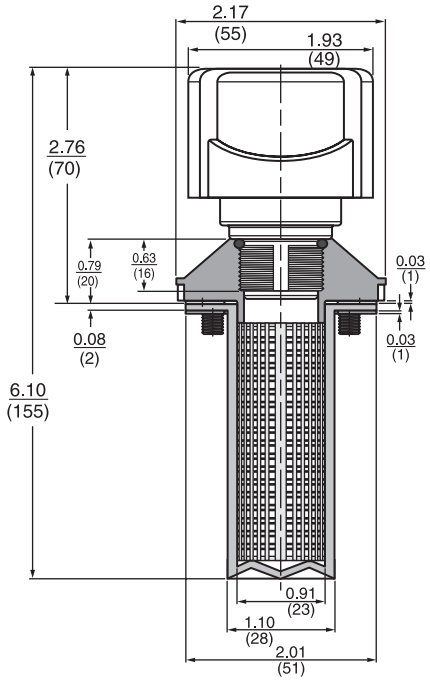
Air Breathers

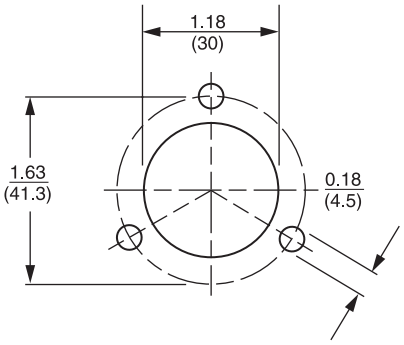
SAME DAY SHIPMENT MODEL AVAILABLE!

PABS1 Breather

Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Available with anti-splash or relief valve
- Optional customer logo (contact factory)





Specifications

Max. Flow Rate:	7 SCFM / 51 gpm at .15psi 13 SCFM / 100 gpm at .6 psi
Filtration Rating:	3 µm absolute
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)

Filter Model Number Selection

Same Day Shipment Model

How to Build a Valid Model Number for a Schroeder PABS1:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
PABS1 –		–		–		–

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
PABS1 –		– F	– 3	– N	– 1	– R6	**= PABS1F3N1R6**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**	**Connection Size**
PABS1	Omit	F = Flanged	3 µ	N = No Gauge	1 = Standard

BOX 7

Options
R6 = 6 psi relief valve
AS= Anti-Splash Insert

Replacement Breather:	PAB1M3N22

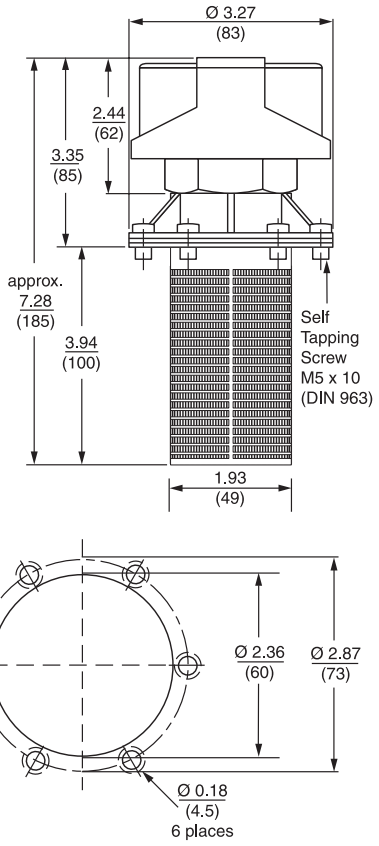
NOTE:

Contact factory for lead time and minimum order quantity for other models.

SAME DAY SHIPMENT MODEL AVAILABLE!

Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Available with anti-splash or relief valve
- Optional customer logo (contact factory)



PABS3 Breather

Specifications

Max. Flow Rate:	14 SCFM / 105 gpm at .15 psi 30 SCFM / 230 gpm at .6 psi
Filtration Rating:	3 µm absolute
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)

How to Build a Valid Model Number for a Schroeder PABS3:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
PABS3						

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
PABS3		F	3	N	1	R6	**= PABS3F3N1R6**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**	**Connection Size**
PABS3	Omit	F = Flanged	3 µ	N = No Gauge	1 = Standard

BOX 7
Options
R6 = 6 psi relief valve
AS= Anti-Splash Insert

Replacement Breather:	PAB3M3N42

Filter Model Number Selection

Same Day Shipment Model

NOTE:

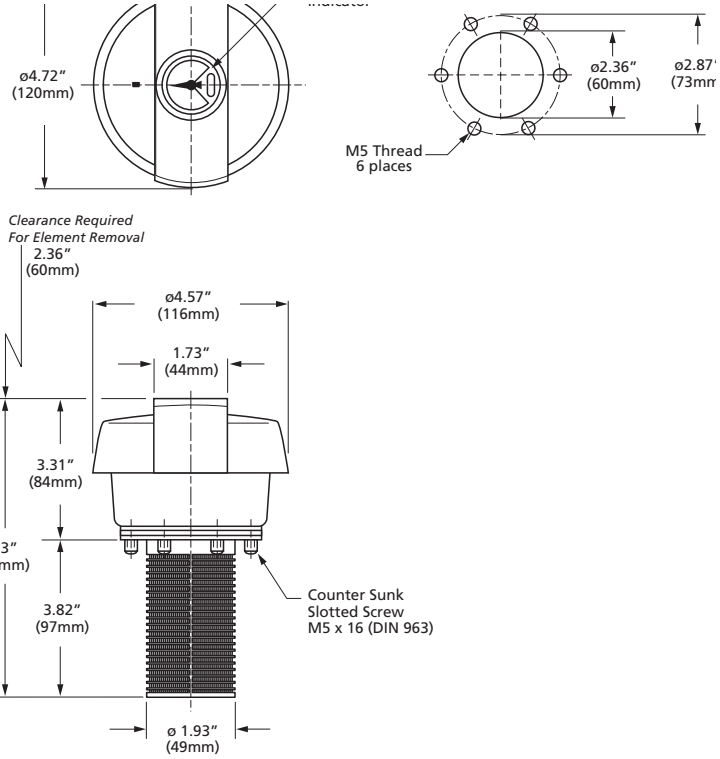
Contact factory for lead time and minimum order quantity for other models.

Air Breathers

PABSR7 Breather

Features and Benefits

- Durable synthetic Nylon 6 housing
- Phenolic resin impregnated filter element
- Standard Buna N O-Ring
- Optional differential gauge
- Optional customer logo (contact factory)



Specifications

Max. Flow Rate:	35 SCFM / 206 gpm at .15 psi 64 SCFM / 475 gpm at .6 psi
Filtration Rating:	3 µm
Operational Temperature:	-22˚ to 212˚F (-30˚ to 100˚C)
Range of Indication:	0.5 psi

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder PABSR7:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
PABSR7 –		–	–	

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	
PABSR7 –	F	– 3	– N	– 1	**= PABSR7F3N1**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Connection Type**	**Filtration Rating**	**Gauge Option**	**Connection Size**
PABSR7	F = Flanged	3 µ	N = No Gauge W = With Gauge	1 = Standard

Replacement Elements: R-PAB7-3

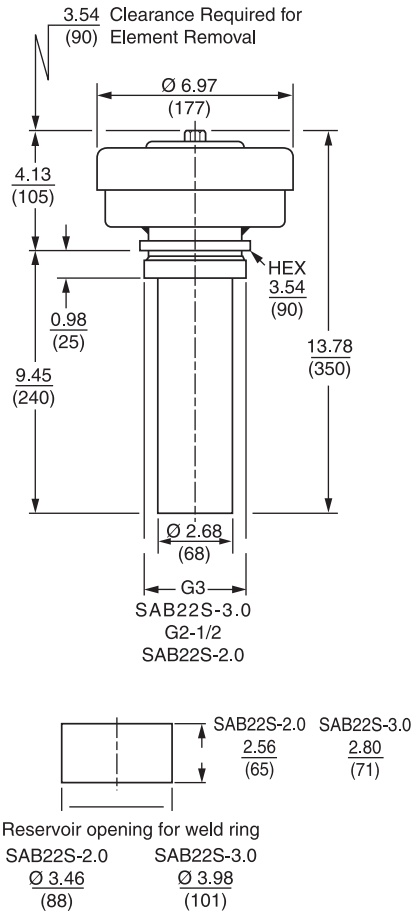
NOTE:

Contact factory for lead time and minimum order quantity for other models.

Air Breathers

Features and Benefits

- Durable steel housing
- Wide range of flow rates
- Replaceable element



SABS22 Breather

Specifications

Max. Flow Rate:	90 SCFM / 685 gpm at .15 psi 106 SCFM / 790 gpm at .6 psi
Filtration Rating:	3 µm absolute, Phenolic resin impregnated filter element
Connection:	G2 ½" female thread
Lid:	Removable lid to access fill port

How to Build a Valid Model Number for a Schroeder SABS22:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
SABS22					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
SABS22	R	G	3	N	2.5	**= SABS22RG3N2.5**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**
SABS22	R = Replacement Elements	G = BSPP	3 µ	N = No Gauge

BOX 6

Connection Size
2.5 = Female BSPP

Replacement Elements:	R-SAB22-3

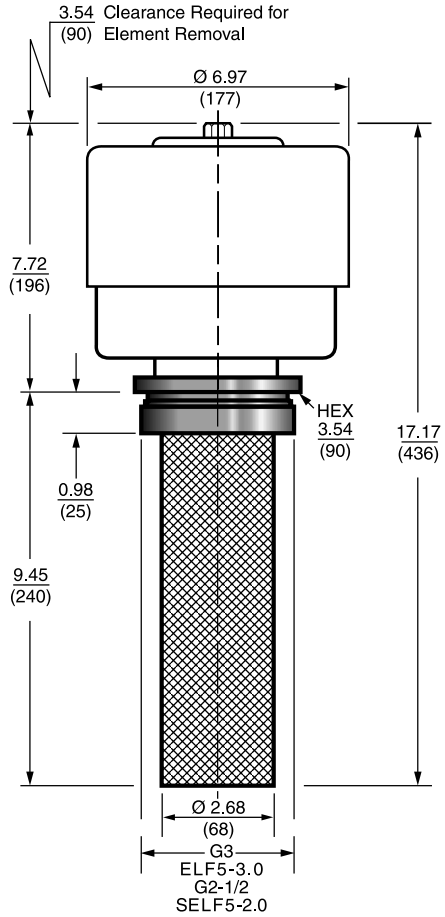
Filter Model Number Selection

Air Breathers

SABS35 Breather

Features and Benefits

- Durable steel housing
- Wide range of flow rates
- Replaceable element



Specifications

Max. Flow Rate:	127 SCFM / 950 gpm at .15 psi 176 SCFM / 1320 gpm at .6 psi
Filtration Rating:	3 µm absolute, Phenolic resin impregnated filter element
Connection:	G2 ½" female thread
Lid:	Removable lid to access fill port

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder SABS35:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
SABS35					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
SABS35	R	G	3	N	2.5	**= SABS35RG3N2.5**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Replacement Element**	**Connection Type**	**Filtration Rating**	**Gauge Option**
SABS35	R = Replacement Elements	G = BSPP	3	N = No Gauge

BOX 6
Connection Size
2.5 = Female BSPP

Replacement Elements:	R-SAB22-3 (2 per breather)

NOTE:

Contact factory for lead time and minimum order quantity for other models.

Section 6:

DESICCANT BREATHERS

Introduction

Schroeder Industries desiccant breathers are pivotal in keeping hydraulic fluid dry. Dry hydraulic fluid lasts longer and reduces wear and tear on components as well as reducing varnish formation in the hydraulic fluid. Maintaining a consistent fluid condition at the optimum level is critical for performance.

Schroeder Industries offers two types of desiccant breathers to our customers. Schroeder D-AB series desiccant breather has been a flagship of the breather portfolio for many years. Using silica gel, the D-AB series breathers remove moisture from the air as it passes through the breather into the reservoir. The D-AB desiccant breathers can hold up to 18.5 oz. of water. The silica gel changes color according to the color code on the package to indicate when the breather element has been spent and the breather needs replaced. The D-AB breather has a 2 micron sponge breather at the base of the element to prevent particulate contamination from entering the reservoir.

The second desiccant breather offered by Schroeder Industries is the DBE. This next generation desiccant breather expands on the capabilities of the D-AB. The DBE desiccant breather utilizes two stages of absorbent media to increase performance and optimizes the drying efficiency. The first stage of the drying process is Silica gel which is efficient at removing high humidity levels quickly. The second stage is a molecular sieve which can reduce low level humidity efficiently. Finally there is a Star pleated 3 micron phenolic resin impregnated media to filter our particulate contamination. All of these features improve the performance life of the DBE. However, the most important improvement made to the DBE is the addition of a base with integral inlet and outlet check valves. During operation, as air is drawn into the breather, the inlet valves open and the outlet valves close forcing the air through the breather media. But as the reservoir exhales, the outlet valves open and the inlet valves close allowing the air to vent directly to atmosphere without going through the media. This allows the media to last longer and for a reduction in operations costs.

Schroeder Industries Desiccant breathers will help maintain the cleanliness and condition of the fluid in the circuit by keeping the fluid dry and free from airborne particulate contamination

D-AB Desiccant Filter Breather

The Schroeder desiccant air breathers are designed to increase operational efficiency while reducing operating costs by protecting industrial systems from moisture and particle contaminants.

As fluid levels drop and pressure changes occur in a system, moist air is drawn through the breather (as shown in the diagram below). Air passes through a 2-micron solid contaminant filter and a diffuser to ensure maximum efficiency in the silica gel chamber. Water vapor in the air is absorbed by the silica gel before the dry air passes through a second 2-micron contaminant filter. The filtered air that enters the reservoir is void of moisture and contaminants.

Features

Bi-directional Air Flow

As moist air flows through the breather's filtration system, it is cleaned of impurities and dried. Expelled air partially regenerates the silica gel and "backflushes" the particulate to prolong the life of the breather.

Durable Construction

The desiccant air breathers are manufactured from rugged polycarbonate in D-AB-2, ABS plastic in D-AB-4 and D-AB-8, and impact-modified Plexiglas.

Water Vapor Absorbent

Silica gel is chemically inert, non-toxic, non-deliquescent, non-corrosive and environmentally disposable. Its internal structure of interconnected microscopic pores absorbs up to 40% of its weight. The operating temperature range is -20°F to 200°F (-29°C to 93°C).

Color Indicator

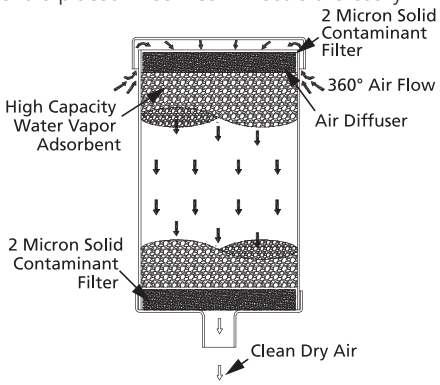
As the gold silica gel absorbs water, it turns green to indicate that it has reached its functional capacity and that replacement of the breather is required.

Dual Anti-static Filter System

The solid contaminant filters are designed to reduce the potential for explosion in dusty environments.

Safety Sealed

To ensure a long shelf life and premium operating performance, each desiccant breather is individually sealed and vacuum packed to protect it from moisture before it is placed in service. All seals are easily removable without the use of tools or sharp instruments.

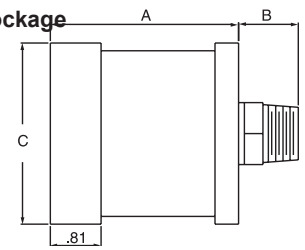


Benefits

- **Anti-static features to protect against fire ignition**
- **High water absorption capacity (D-AB-2 = 3.3 oz and D-AB-8=18.5 oz)**
- **Long operating life and low maintenance costs**
- **Environmentally safe disposable silica gel**
- **Compatibility with a variety of applications**
- **Prevents rust and oxidation**
- **Minimizes component wear and maintenance**
- **Curtails freezing and additive depletion**
- **Diminishes fluid degradation and orifice blockage**
- **Extends oil filter and hydraulic system life**

Applications

- **New and Retrofit Applications**
- **Gear Boxes**
- **Hydraulic Reservoirs**
- **Storage Tanks**



Specifications

D-AB-2 **D-AB-2-F** **D-AB-8**

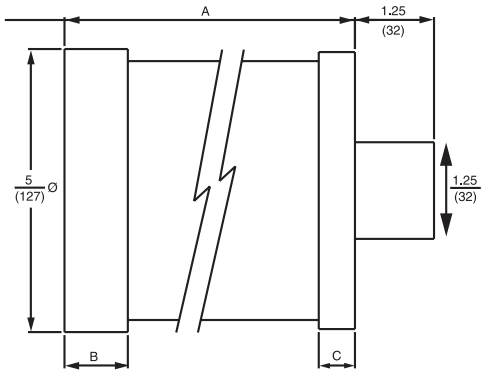
Model Number	Connection	Normal Capacity	Air Flow/ psi Drop	A	B	C
D-AB-2	.75" NPT Male	20 SCFM	2 psi at 20 SCFM	3.16 (80)	0.95 (24)	3.25 (83)
D-AB-2-F	2.25" SAE J829 Flange	20 SCFM	2 psi at 20 SCFM	3.16 (80)	Contact factory	3.25 (83)
D-AB-8	2" NPT Male	20 SCFM	0.5 psi at 20 SCFM	10.0 (254)	1.75 (44)	5.0 (127)

Desiccant Air Breathers

D-AB-4

R-AB-4

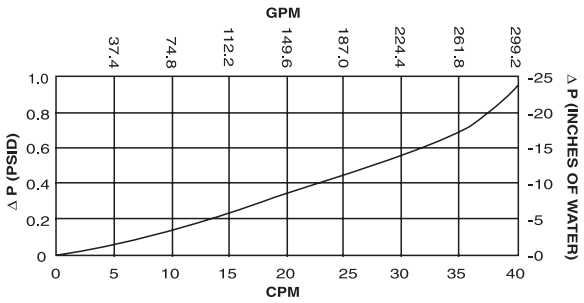
D-AB-4 **R-AB-4**



Specifications

Model Number	Max. Air Flow	Air Flow/ psi Drop	A	B	C
D-AB-4	20 SCFM	0.70 psi at 35 SCFM	8 (203)	1.75 (44)	0.75 (19)
R-AB-4	20 SCFM	0.70 psi at 35 SCFM	10 (254)	3.00 (76)	1.50 (38)

The R-AB-4 features inlet and outlet check valves located in the reusable cap (head), which control both the airflow into the reservoir and the airflow out of the reservoir and prolongs the life of the desiccant by allowing the air to flow through the breather only when needed to protect the integrity of the reservoir by establishing the thresholds of vacuum (air in) and pressure (air out). Check valve settings are 0.3 psi in and 2.1 psi out.

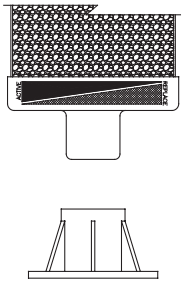


The R-AB-4 also includes a reusable top cap which allows for the economic replacement of the desiccant cartridge.

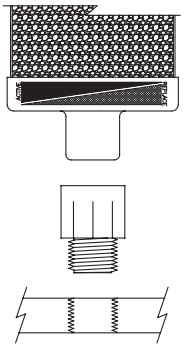
P/N for replacement cartridge is R-AB-ELE.

Both D-AB-4 and R-AB-4 require an adapter. Purchase separately. See below for Adapter Selection Guide.

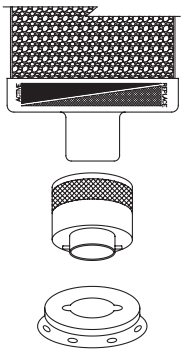
Adapter Selection Guide



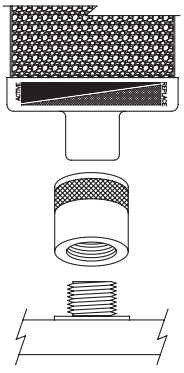
Flange Adapter
Part No. D-AB-FA (without holes)
Part No. D-AB-FA1 (with holes)



Threaded Adapter
Part No. D-AB-TA1 (1" MNPT)
Part No. D-AB-TA34 (3/4" MNPT)



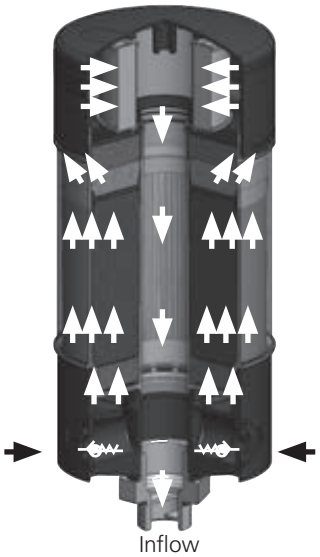
Bayonet Adapter
Part No. D-AB-BA



Spin On Adapter
Part No. D-AB-SOA1 (1" 12UNF)
Part No. D-AB-SOA112 (1-1/2" 16UNF)

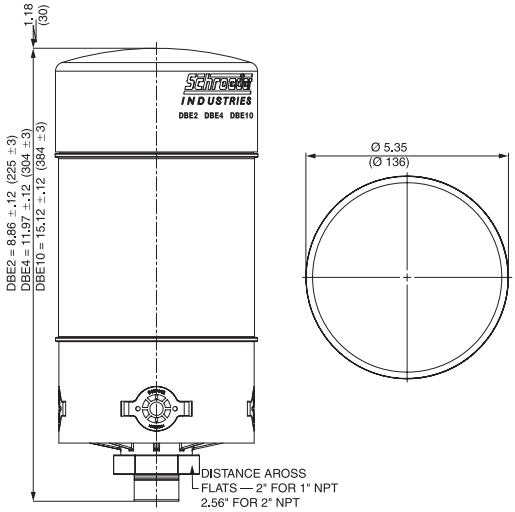
Features and Benefits

- Unique air flow design with suction tube as splash protection and protection against absorbent getting into the tank
- 2 stages of absorbent provide optimal combination of drying efficiency and water retention
- Pleated air filter with 2 µm filtration rating
- Reusable base with check (intake) and bypass (outflow) valves
- Check valves prevent absorbents being saturated during system downtime
- Bypass valves divert out flow away from water removal media to preserve its life
- Robust Zinc die-casting connection piece with integrated anti-splash baffles
- Replacement cartridge available in 3 different sizes



DBE-4

Dimensions



Applications

- New and Retrofit Applications
- Gear Boxes
- Hydraulic Reservoirs
- Wind Turbines

Element Contamination Retention Capacity:	(2 µm), 26g
Operating Temperature:	-20°F to 210°F (-29°C to 99°C)
Storage Temperature:	from -40°F(-40°C)

Specifications

Size	Water Retention Capacity (gallon) Max.	Water Retention Capacity (gallon) Actual	Optimal Air Flow Rate (SCFM)	Max. Drying Capacity at Medium Humidity (SCF)	Max. Drying Capacity at High Humidity (SCF)
DBE-2	.06	.05	21	350	210
DBE-4	.13	.08	28	880	530
DBE-10	.20	.13	35	1450	880

Filter Model Number Selection

How to Build a Valid Model Number for a Schroeder DBE:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
DBE							

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
DBE	4	R	P	2	N	1	R.04	**= DBE4RP2N1R.04**

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Model Number	**Size**	**Replacement *Element**	**Connection Type**	**Filtration *Rating**
DBE	2 4 10	R = Replaceable	P = NPT B = BSPT F = Flanged	2 µ

BOX 6	BOX 7	BOX 8
Gauge Options	**Connection Size**	**Check Valve Options**
N = None	Omit = Flange 1 = 1″ 2 = 2″ (NPT only)	Omit = None R.3 = 0.3 psi R.04 = 0.04 psi

How to Build a Valid Model Number for a Schroeder DBE Base:

BOX 1	BOX 2	BOX 3	BOX 4
DBE			

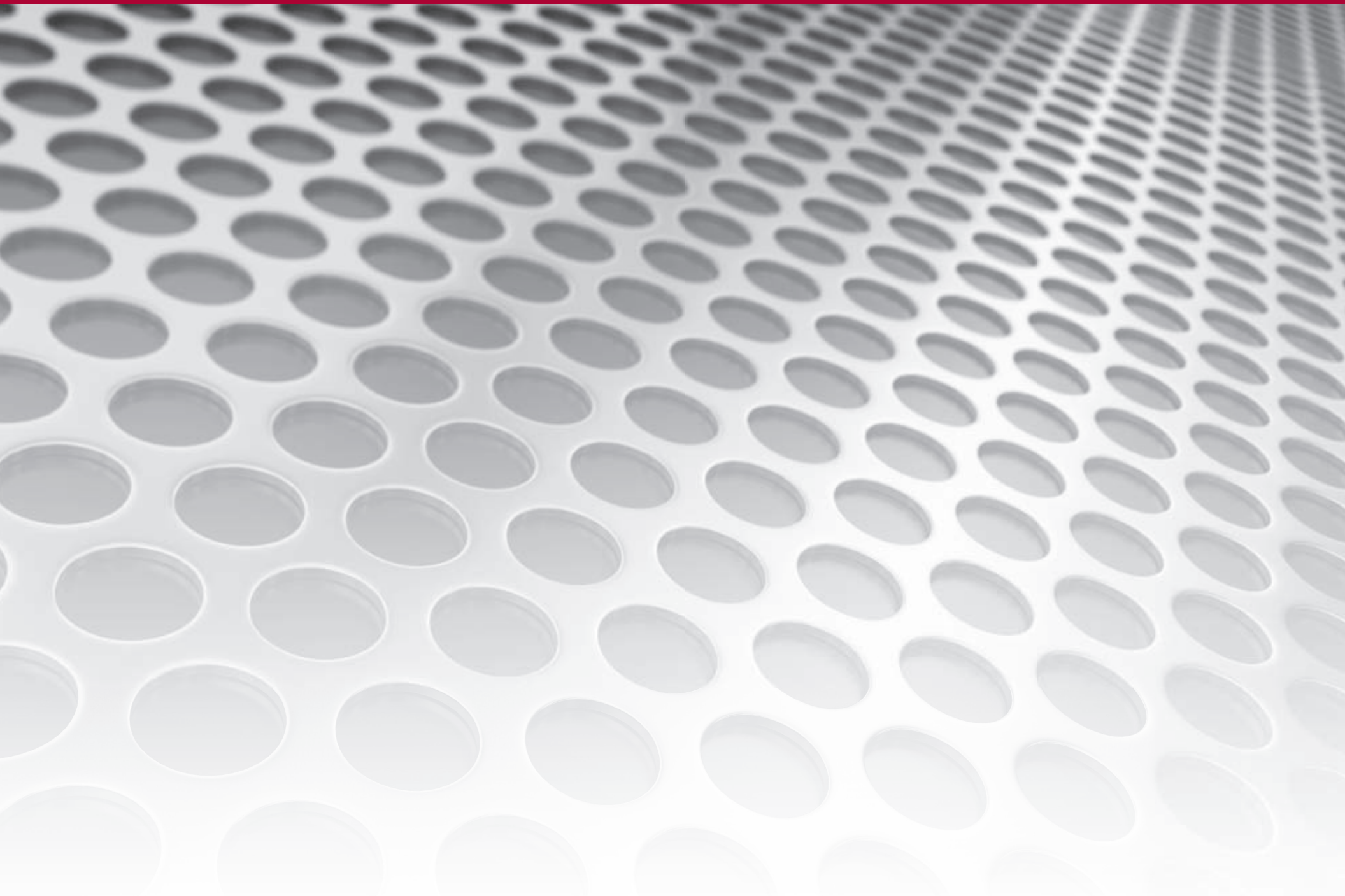
Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	
DBE	P	1	R.04	**= DBEP1R.04**

BOX 1	BOX 2	BOX 3	BOX 4
Model Number	**Connection Type**	**Connection Size**	**Check Valve Options**
DBE	P = NPT B = BSPT F = Flanged	Omit = Flange 1 = 1″ 2 = 2″ (NPT only)	Omit = None R.3 = 0.3 psi R.04 = 0.04 psi

Replacement Cartridge Only:

BOX 1	BOX 2	BOX 3
Replacement Element	**Model Number**	**Size**
R = Replaceable	DBE	2 4 10



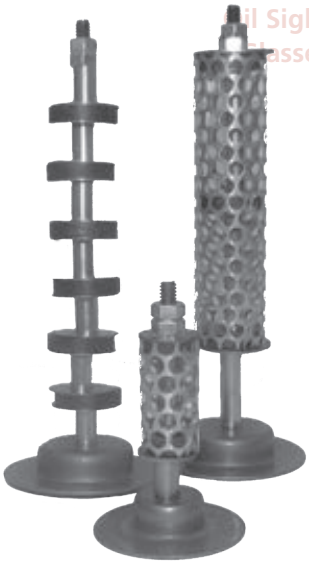
Introduction

Protecting the pump is an integral step in ensuring system longevity. Installing a suction strainer will stop the larger pieces of unwanted debris from entering the suction line causing catastrophic problems downstream. Schroeder Industries offer two types of strainers: standard metal based suction strainers and magnetic suction separators.

Schroeder's Magnetic Suction Separators offer unique protection for pumps suction line from all sizes of ferrous particles without starving the pump.

The all metal suction strainers are furnished with optimized pleat size and screen area for extended life and low pressure drop. 100 mesh stainless steel screens (140 micron) has 33.3% open area. Porting head is carbon steel; center core is plated perforated steel. End cap is heavy gauge zinc plated steel. These strainers can handle temperatures up to 250°F (121°C). 60 mesh (238 micron) and 200 mesh (74 micron) models also available – contact factory

Magnet Inserts for Filters

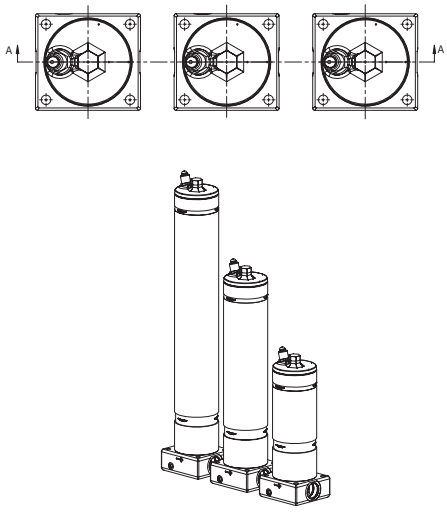


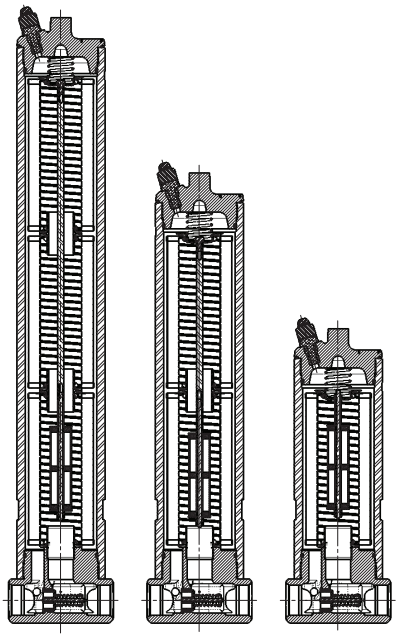
KF30, KF50, KC50, KC65 and TF50 are available with magnet inserts to trap ferrous material that passes through the filter element.

These inserts are removed with the element each time service is performed and cleaned before being reinserted with new elements.

Replacements are available by ordering parts:

	Single Element	Double Element	Triple Element
KF30, KF50, KC50, KC65, KF3, LF1, MLF1	A-LF-1592	A-LF-1593	A-LF-1594
TF50	A-TF-301-1	A-TF-302-1	





SAE Weld Flanges

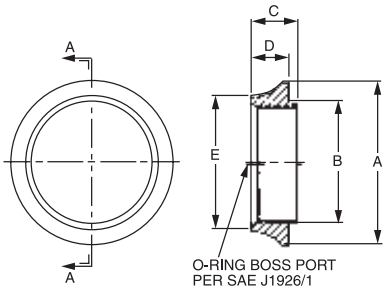
SAE Weld Flanges

Available immediately, Schroeder has a line of reservoir weld flanges. These flanges have SAE female O-ring port threads and are intended to be welded into a reservoir.

- Fewer leaks
- Cleaner installation
- Reduced cavitation of pumps/aeration of oil when used on suction lines
- Faster assembly time
- Reduced contamination (no pipe dope or Teflon tape being introduced into the system)

Specifications

Flange material: Forged steel
Flange finish: Black phosphate (suitable for welding)
Port sizes: See chart below for listing of available port sizes



SECTION A-A

Part Number	SAE Size	Port Thread Size	Dimensions - inches (mm)				
			A	B	C	D	E
WF-4	SAE-4	7/16"- 20 UNF-2B	1.50 (38)	0.93 (24)	0.56 (14)	0.31 (8)	1.00 (25)
WF-5	SAE-5	1/2"- 20 UNF-2B	1.50 (38)	0.93 (24)	0.56 (14)	0.31 (8)	1.00 (25)
WF-6	SAE-6	9/16"-18 UNF-2B	1.50 (38)	0.93 (24)	0.56 (14)	0.31 (8)	1.00 (25)
WF-8	SAE-8	3/4"- 16 UNF-2B	1.50 (38)	0.93 (24)	0.56 (14)	0.31 (8)	1.00 (25)
WF-10	SAE-10	7/8"- 14 UNF-2B	2.13 (54)	1.38 (35)	0.69 (18)	0.44 (11)	0.44 (11)
WF-12	SAE-12	1 1/16"- 12 UNF-2B	2.13 (54)	1.38 (35)	0.69 (18)	0.44 (11)	0.44 (11)
WF-14	SAE-14	1 3/16"- 12 UNF-2B	2.38 (60)	1.66 (42)	0.75 (19)	0.50 (13)	1.75 (44)
WF-16	SAE-16	1 5/16"- 12 UNF-2B	2.38 (60)	1.66 (42)	0.75 (19)	0.50 (13)	1.75 (44)
WF-20	SAE-20	1 5/8"- 12 UNF-2B	2.69 (68)	2.00 (51)	0.75 (19)	0.50 (13)	2.13 (54)
WF-24	SAE-24	1 7/8"- 12 UNF-2B	3.00 (76)	2.25 (57)	0.75 (19)	0.50 (13)	2.38 (60)
WF-32	SAE-32	2 1/2"- 12 UNF-2B	3.50 (89)	2.63 (67)	0.84 (21)	0.59 (15)	2.88 (73)
WF-48	SAE-48	3 3/8"- 12 UNF-2B	4.63 (118)	3.66 (93)	1.00 (25)	0.81 (21)	3.94 (100)

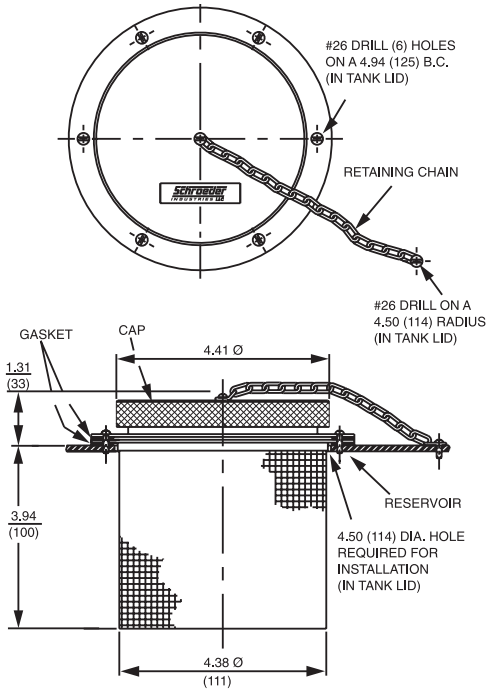
NOTE:

WF-48 has 33/8-12 O-ring thread that was extrapolated from SAE standard threads

Filler Strainer Assemblies

A-TB-779 **A-TB-780**

Speed the process of adding fluid to a reservoir by using our rapid fill cap and strainer. The strainer is 4.38" in diameter and designed to accept cold viscous fluids easily. Choose from two strainer mesh sizes: A-TB-779, which features #24 mesh, and A-TB-780, which is supplied with #70 mesh. The cap completely seals the opening. All assemblies are supplied with necessary hardware, including retaining chain for cap and self tapping screws for installation.



Specifications: A-TB's

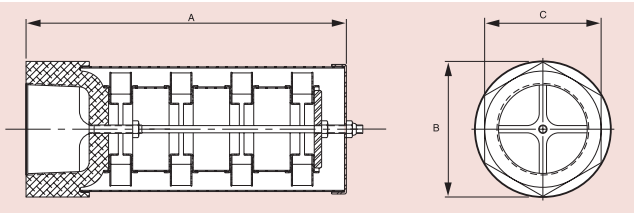
Model Number	Mesh Size	Strainer O.D.	Strainer Height	Flange Diameter
A-TB-780	70	4.38	3.94	5.56
A-TB-779	24	(111)	(100)	(141)

Metric dimensions in ( ).

Magnetic Suction Separators

With the use of Schroeder's Magnetic Suction Separators, suction line filtration is provided without starving the pump. They offer unique protection for pumps from all sizes of ferrous particles, some of which have the potential of destroying a pump in a single pass. Large ceramic magnets are spaced along the length of the separator. All hydraulic fluid entering the pump must move at low velocity through a powerful magnetic field. This field traps large quantities of micronic ferrous particles. The viscous properties of the fluid can cause some non-ferrous particles to adhere to the magnetically trapped particles.

Schroeder SKB's are available in sizes ranging from one to three inches. The chart below shows the part numbers, specifications, and dimensions of available models.



Complete Model Number	Pipe Size	Flow gpm	Δ psi at Max. gpm	Dimensions		
				A	B	C
SKB-1	1"	15 (55)	0.05	5.25 (133)	3.25 (83)	1.62 (41)
SKB-1.25	1¼"	25 (95)	0.05	8.25 (210)	3.50 (89)	3.00 (76)
SKB-1.5	1½"	35 (135)	0.08	8.25 (210)	3.50 (89)	3.00 (76)
SKB-2	2"	50 (190)	0.10	8.25 (210)	3.50 (89)	3.00 (76)
SKB-3	3"	100 (380)	0.02	10 (254)	4.75 (121)	4.00 (102)

Metric dimensions in ( ).

The standard outer screen has adequate open area (.079 inch diameter perforations) to eliminate the possibility of pump starvation. All models are also available with a pleated 20 mesh screen (850 micron) by adding SS20 to the model number. (Example SKB-1-SS20.)

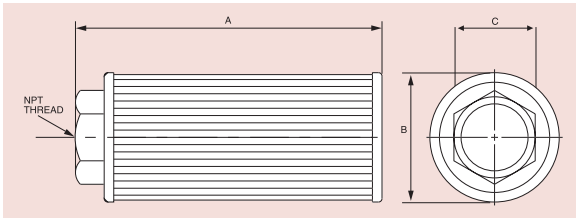
Please note that we also offer in-line filter housings equipped with SKB elements. See In-Line Magnetic Suction Separators and Tank-Mounted Magnetic Suction Separators (pages 287-290) for details.

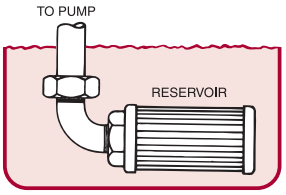
Suction Strainer Elements

SS Tank Mounted Suction Strainer Elements

These all metal suction strainers are furnished with optimized pleat size and screen area for extended life and low pressure drop. 100 mesh stainless steel screen (140 micron) has 33.3% open area. Porting head is carbon steel, center core is plated perforated steel. End cap is heavy gauge zinc plated steel. These strainers can handle temperatures up to 250°F (121°C).

60 mesh (238 micron) and 200 mesh (74 micron) models also available – contact factory.





Model Number				Other Information			
				Dimensions			
Basic Model	Optional 3 psi Bypass	Pipe Size	Flow* gpm (L/min)	A	B	C	Screen Area in2 (cm2)
SS-.5-100	(Omit) = None	½"	5 (19)	3.10 (79)	2.63 (67)	1.12 (28)	68 (439)
SS.75-100		¾"	8 (30)	3.55 (90)	2.63 (67)	1.31 (33)	68 (439)
SS-1-100		1"	10 (38)	5.35 (136)	2.63 (67)	1.62 (41)	112 (723)
SS-1.25-100	-3 = Bypass valve	1¼"	20 (76)	6.85 (174)	3.38 (89)	1.88 (48)	165 (1065)
SS-1.5-100		1½"	30 (114)	8.01 (204)	3.38 (89)	2.12 (54)	251 (1619)
SS-2-100		2"	50 (189)	9.85 (250)	3.94 (100)	2.75 (70)	351 (2265)
SS-2.5-100		2½"**	75 (284)	10.10 (257)	5.12 (130)	3.22 (82) Round Coupling	405 (2613)
SS-3-100		3"**	100 (379)	11.83 (300)	5.12 (130)	4.00 (102) Round Coupling	502 (3239)

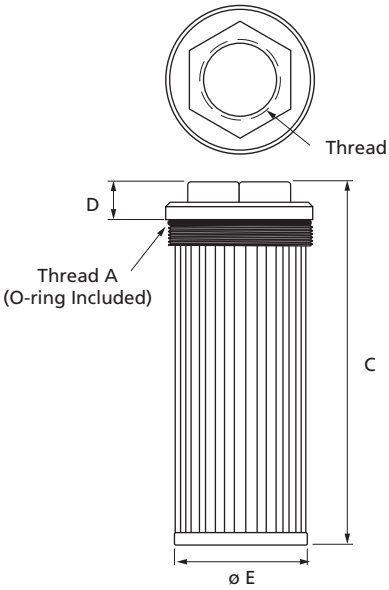
*Flow rating based on 5 FPS or less.

**denotes coupling instead of bushing

Metric dimensions in ( ).

Examples: SS-2-100 SS suction strainer, 2" NPT, without bypass valve.
SS-1-100-3 SS suction strainer, 1" NPT, with 3 psi bypass valve.

SSO Tank Mounted Suction Strainer Elements

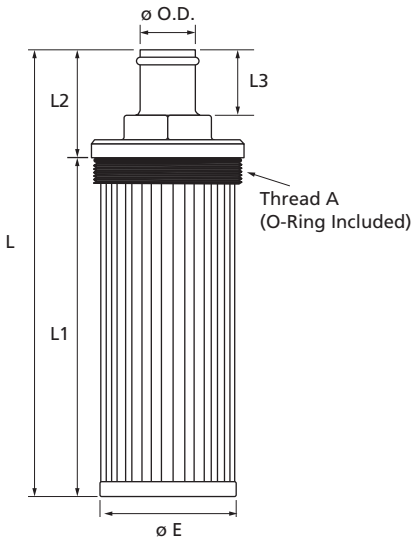


These suction strainers have O-ring built in for a more secure fitting. The suction strainers can be supplied with a bypass valve to reduce high pressure drop caused by contaminated elements or high viscosity fluids during cold starting.

Model Code	Optional 3 psi Bypass	Per SAEJ514		Hex Size	GPM	Screen Area (Sq. In.)	Dimensions		
		THD A	THD B				C	D	ØE
SSO-20-100	(Omit) = None	2-1/2"-12	1-5/8"-12	2.13"	9	90	9.00"	0.75"	2.24"
SSO-24-100	(-3) = Bypass valve	3-3/8"-12	1-7/8"-12	2.50"	21	230	8.80"	0.90"	3.22"
SSO-32-100		3-3/8"-12	2-1/2"-12	3.00"	39	230	9.30"	0.98"	3.22"

Suction Strainer Elements

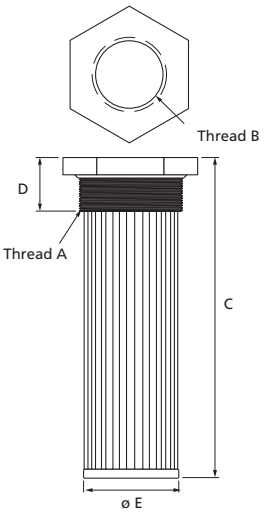
Hose Barb | SSHB Tank Mounted Suction Strainer Elements



These suction strainers have additional fittings attached for hose barb settings.

Model Code	Optional 3 psi Bypass	Per SAEJ514 THD A	Per SAEJ514 O.D.	Hex Size	GPM	Dimensions L	L1	L2	L3	E
SSHB-1.25-100	(Omit) = None	2-1/2"-12	1.25"	1.50"	14	10.00"	8.00"	2.00"	1.25"	2.12"
SSHB-2-100	(-3) = Bypass valve	3-3/8"-12	2.00"	2.50"	40	10.80"	7.84"	2.97"	2.00"	3.22"

NPT Tank Mounted Suction Strainer Element



These suction strainers have external fitting installed for male NPT ports.

Model Code	Optional 5 psi Bypass	GPM	Screen Area (Sq. In.)	THD A	THD B	Hex Size	Dimensions C	D	ØE
SSP-2-100	(Omit) = None	50	260	3" NPT	2" NPT	3.30	10.25"	1.70"	3.03"
SSP-3-100	(-5) = Bypass valve	100	315	4" NPT	3" NPT	5.00	11.30"	1.80"	3.78"

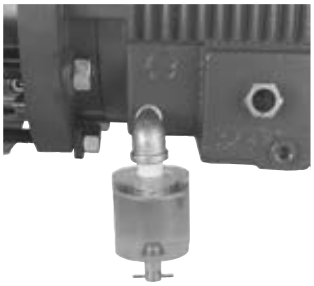
Section 8:

OIL SIGHT GLASSES

Oil Sight Glasses

Schroeder Oil Sight Glasses provide maintenance and lubrication management professionals a complete and immediate visual oil analysis. Constructed of durable cast acrylic, they withstand most petroleum products to remain crystal clear. Although easy detection and discharge of water contamination are leading benefits, operators can also visually monitor the oil for discoloration or debris. The drain valve is made from brass with a vulcanized rubber seal. Both materials have excellent resistance to hydrocarbon and petroleum-based products, hydraulic fluids, most silicone fluids, and fuels. A detailed chemical resistance chart is available upon request.

Our Oil Sight Glass product line includes models for vertical and horizontal mounting, high temperature applications, large volume bowls, level indication and the all encompassing Oil Sight Glass and Level Monitor. The revolutionary 3-D Oil Sight Glass can replace the problematic, old-fashioned sight plug on your oil reservoir to provide greater visibility.



Benefits

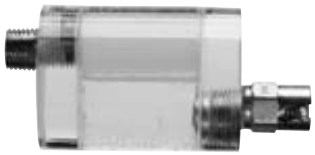
- Withstand most petroleum products to remain crystal clear
- Continuously monitor oil level and condition
- Extremely low maintenance
- Low purchase and installation costs
- Save expensive equipment through early detection and action

For many systems the 1 oz. Oil Sight Glass is adequate. The 3 oz. Oil Sight Glass provides additional volume and should be used when the condensation or water spillover is excessive. Schroeder also offers 16 oz. and 32 oz. Oil Sight Glasses for special applications that require the ability to accumulate substantial volumes of water due to large oil reservoirs, high condensation problems or excessive water spillover. Even larger sizes and unique configurations are available for special applications.

VERTICAL

	1 oz. Oil Sight Glass	3 oz. Oil Sight Glass
Outside Diameter:	1.75 (44)	2.50 (64)
Length:	2.38 (60)	2.38 (60)
Maximum psi (bar):	225 (16)	200 (14)
Operating Temperature:	-40°F to 165°F	-40°F to 165°F
-40°C to 74°C	-40°C to 74°C	
Specifications:	Commercial grade acrylic Brass drain valve ¼", ⅜" or ½" NPT brass nipples Vertical and horizontal styles Available in 16 oz and 32 oz sizes Stainless steel hardware available	

Metric dimensions in ( ).



HORIZONTAL

Horizontal Oil Sight Glass

The *Horizontal* Oil Sight Glass is designed to be installed on equipment that has restricted vertical clearance. The design has the mounting nipple and drain valve eccentrically machined and oriented 180° apart. This provides the same ability to discharge any accumulated water.

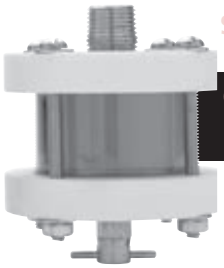
How to Order

Part No.	Description	Part No.	Description
OSG1X250	Vertical 1 oz ¼" NPT	OSG1X250HZ	Horizontal 1 oz ¼" NPT
OSG1X375	Vertical 1 oz ⅜" NPT	OSG1X375HZ	Horizontal 1 oz ⅜" NPT
OSG1X500	Vertical 1 oz ½" NPT	OSG1X500HZ	Horizontal 1 oz ½" NPT
OSG3X250	Vertical 3 oz ¼" NPT	OSG3X250HZ	Horizontal 3 oz ¼" NPT
OSG3X375	Vertical 3 oz ⅜" NPT	OSG3X375HZ	Horizontal 3 oz ⅜" NPT
OSG3X500	Vertical 3 oz ½" NPT	OSG3X500HZ	Horizontal 3 oz ½" NPT
OSG16X500	Vertical 16 oz ½" NPT		
OSG32X500	Vertical 32 oz ½" NPT		

Oil Sight Glasses

High Temperature Oil Sight Glass

When oil operating temperatures or radiant heat from adjacent equipment are continually in excess of 165°F, you should consider utilizing the Schroeder High Temperature Oil Sight Glass.



	1 oz. Oil Sight Glass	3 oz. Oil Sight Glass
Outside Diameter:	2.75 (70)	3.50 (89)
Length:	2.50 (64)	2.50 (64)
Maximum psi (bar):	225 (16)	225 (16)
Operating Temperature:	450°F 232°C	450°F 232°C
Specifications:	Heavy-walled Pyrex glass Teflon™ end plates Stainless steel nuts and bolts Viton® O-rings Brass drain valve ¼", ⅜" or ½" NPT brass nipples Vertical style only Stainless steel hardware available	

Metric dimensions in ( ).

How to Order

Part No.	Description
OSG1X250HT	High Temp 1 oz ¼" NPT
OSG1X375HT	High Temp 1 oz ⅜" NPT
OSG1X500HT	High Temp 1 oz ½" NPT
OSG3X250HT	High Temp 3 oz ¼" NPT
OSG3X375HT	High Temp 3 oz ⅜" NPT
OSG3X500HT	High Temp 3 oz ½" NPT

Magnet Option

Any oil sight glass can be equipped with a rare earth magnet that attracts and holds microscopic ferrous particles in your oil. Further analysis of these particles can help determine what component is failing for replacement. The magnet drain valve is easily interchanged with the standard drain valve on any OSG product.

Oil Sight Glasses

Oil Sight Glass & Level Monitor

When seeing and maintaining the level of oil in your reservoir is critical, the Oil Sight Glass and Level Monitor (OSGL) provides all the benefits of the OSG plus the ability to constantly monitor the level of the reservoir oil. The dual port model has a second ⅜" NPT thread at 180° to allow the installation of a drain valve or access to the oil reservoir utilizing a pilot tube and a pitot sample adapter. This all-in-one product provides continuous monitoring of the clarity, color, sediment, water contamination and level of the oil.

Outside Diameter:	1.75 (44)
Length:	3" (76), 6" (152), 9" (229), 12" (305), 15" (381), 18" (457), 24" (610), or custom available
Maximum psi (bar):	225 (16)
Operating Temperature:	-40°F to 165°F -40°C to 74°C
Specifications:	Commercial grade acrylic Brass drain valve ⅜" NPT brass nipples Available in dual port version with a second ⅜" NPT port Stainless steel hardware available

Metric dimensions in ( ).

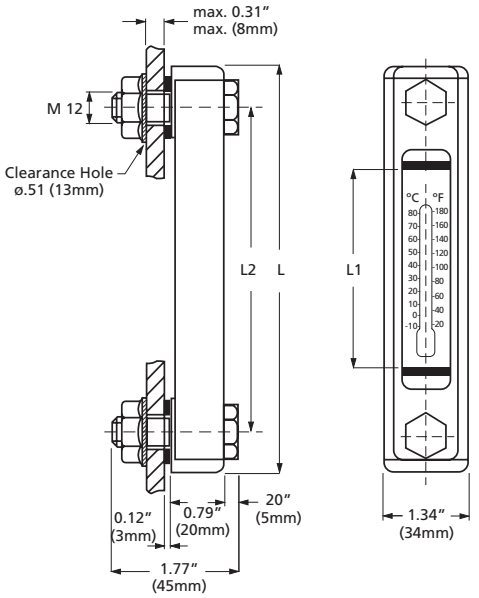
How to Order

Part No.	Description
OSGL3	OSG and Level Monitor 3" (76)
OSGL6	OSG and Level Monitor 6" (152)
OSGL9	OSG and Level Monitor 9" (229)
OSGL12	OSG and Level Monitor 12" (305)
OSGL3DP	OSG and Dual Port Level Monitor 3" (76)
OSGL6DP	OSG and Dual Port Level Monitor 6" (152)
OSGL9DP	OSG and Dual Port Level Monitor 9" (229)
OSGL12DP	OSG and Dual Port Level Monitor 12" (305)
OSGL15	OSG and Level Monitor 15" (381)
OSGL18	OSG and Level Monitor 18" (457)
OSGL24	OSG and Level Monitor 24" (610)
OSGL15DP	OSG and Dual Port Level Monitor 15" (381)
OSGL18DP	OSG and Dual Port Level Monitor 18" (457)
OSGL224DP	OSG and Dual Port Level Monitor 24" (610)

Oil Sight Glasses

SLG Fluid Level Indicator

When seeing and maintaining the level of oil in your reservoir is critical, the Sight Level Gauge (SLG) provides constantly monitoring of the oil level in the reservoir.



Model Code	Size	Dimensions		
		L	L1	L2
SLG-3	76	4.25"	1.46"	2.99"
SLG-5	127	6.26"	2.99"	5.00"
SLG-10	254	11.26"	7.99"	10.00"

Oil Sight Glasses

3-D Oil Sight Glass

The 3-D Oil Sight Glass is machined from one solid piece of impact resistant, high strength, stain-resistant cast acrylic. It has excellent resistance to hydrocarbon and petroleum-based products, hydraulic fluids, most silicone fluids, and fuels. Replaces problematic, old-fashioned oil level sight plugs. Fits virtually every oil reservoir. Revolutionary easy view design is visible from virtually any angle, minimizing false positives.

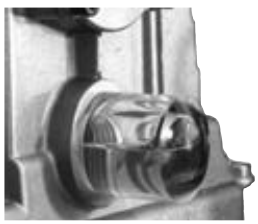
NPT:	**½", ¾", 1", 1¼", 1½", 2"**
Outside Diameter:	⅞", 1⅛", 1⅜", 1¾", 2", 2½"
Length:	1", 1½" from last thread. Metric and custom sizes available.
Maximum psi (bar):	300 (21)
Operating Temperature:	200°F (93°C) at 66 psi (5 bar) 230°F (110°C) at atmospheric pressure

Metric dimensions in ( ).

How to Order

Part No.	Description	Part No.	Description
3DBM10X1.0	Metric 10 x 1.0	3DB0250	¼" NPT
3DBM10X1.5	Metric 10 x 1.5	3DB0375	⅜" NPT
3DBM12X1.5	Metric 12 x 1.5	3DB0500	½" NPT
3DBM16X1.5	Metric 16 x 1.5	3DB0750	¾" NPT
3DBM20X1.5	Metric 20 x 1.5	3DB1000	1" NPT
3DBM22X1.5	Metric 22 x 1.5	3DB1250	1¼" NPT
3DBM24X1.5	Metric 24 x 1.5	3DB1500	1½" NPT
3DBM26X1.5	Metric 26 x 1.5	3DB2000	2" NPT
3DBM27X1.5	Metric 27 x 1.5		
3DBM30X2.0	Metric 30 x 2.0		
3DBM33X1.5	Metric 33 x 1.5		

BEFORE



AFTER

Section 9:

ELECTRONIC SENSORS

Electronic Sensors

Introduction

Today's modern hydraulic systems need a variety of different conditions measured at all times for a safe and uninterrupted operation. Schroeder Industries electronic sensors cover a wide range of functions and are an important part in any system for control and diagnostic functions. The sensors cover the following areas:

Pressure Transducers and Switches

Electronic pressure sensors are used for recording pressures in fluid technology systems. Functionality and form of execution are determined by the respective utilization conditions. In order to fulfil these requirements, Schroeder Industries offers a comprehensive program of pressure transducers and pressure switches.

Electronic pressure transducers record the measured pressure variable and convert it into a proportional output signal. Electronic pressure switches record the measured pressure variable, process it and output a switching signal in accordance with the presetting. Electronic pressure switches offer a multitude of advantages in comparison with mechanical pressure switches and contact manometers. They convince though greater accuracy, freedom from wear, long-term stability, simpler operation and the high number of switching cycles, among other things.

Flow rate Transmitters and Monitors

Schroeder Industries offers different flow rate measuring transmitters and flow switches for recording the flow rate in machines and hydraulic systems. The flow rate measuring transducer works in accordance with the turbine principle (recording the rpm of an impeller wheel rotating in the media flow). Depending on the version, additional connection openings for pressure and/or temperature transmitters are available. The flow monitors are based on the buoyancy transmitter measurement principle. Under these circumstances, the measurement medium deflects a spring-charged buoyancy transmitter in the flow direction, depending on the flow rate. A reed contact is fitted outside of the device. This will switch when the magnet integrated in the buoyancy transmitter reaches the preset position.

Level Transmitters and Switches

Electronic level sensors of are used for recording fill levels in fluid technology systems. In order to fulfil the wide-ranging customer requirements, Schroeder Industries offers an extensive range of capacitive and contact-free level switches.
Electronic level switches record the fill level and output one or more switching signals in accordance with the presetting. As an option, the fill level can also be permanently output as an analogue signal.

Temperature Sensors and Switches

For recording and evaluating temperatures, Schroeder Industries offers temperature transducers and temperature switches for installation in pressure lines or for tank mounting. Temperature measurement transducers record the temperature and convert it into a proportional output signal. Electronic temperature switches record the temperature, process it and output a switching signal in accordance with the presetting.

HSI Sensor Interface

The HSI sensor versions, indicated with 'H' in the model code, have been specifically design to be automatically recognized by the Schroeder HMG data recorder device, for easy Plug-and-Play set-up. The sensor is recognized immediately after plugged into the HMG and all the necessary basic settings are taken from the sensor. For more information about the HMG, please refer to the Schroeder Filter Systems catalog.

Pressure Transmitter

The pressure transmitter series HDA 4100 has a ceramic pressure measurement cell with thick-film strain gauge which has been specially developed for measuring absolute pressure in the low-pressure range.

The 4 .. 20 mA or 0 .. 10 V output signals enable connection to all Schroeder Industries measurement and control devices as well as standard control and evaluation systems.

The main areas of application are low-pressure applications in hydraulics and pneumatics, particularly in refrigeration and air-conditioning technology, the food and pharmaceutical industries

HDA-4100

Features and Benefits

- Accuracy ≤ ± 0.5% FS type
- Very small temperature error
- Excellent EMC characteristics
- Very compact design
- Persuasive price / performance ratio

Specifications

Input Data	
Measuring Ranges:	14.5 psi (1 bar); 36.3 psi (2.5 bar)
Overload Pressures:	43.5 psi (3 bar); 116 psi (8 bar)
Burst Pressures:	72.5 psi (5 bar); 174 psi (12 bar)
Mechanical Connection:	G 1/4 A DIN 3852; G 1/2 B DIN-EN 837
Torque Value:	20 Nm (G1/4); 45 Nm (G1/2)
Parts in Contact w/ Medium:	Mech. Connection: Stainless Steel Sensor Cell: Ceramic Seal: Copper (G1/2) / FPM / EPDM (as per model code)
Output Data	
Output Signal, Permitted Load Resistance:	4 .. 20 mA, 2 conductor $R_{Lmax}= U_B$ - 8V)/ 20 mA [kΩ] 0 .. 10 V, 3 Conductor R_{Lmin}= 2 kΩ
Accuracy to DIN 16086, Max Setting:	≤ ± 0.5% FS typ. ≤ ± 1.0% FS max.
Accuracy at min. Setting B.F.S.L.:	≤ ± 0.25% FS typ. ≤ ± 0.5% FS max.
Temperature Compensation Zero Point:	≤ ± 0.02% FS / °C typ. ≤ ± 0.03% FS / °C max.
Temperature Compensation Over Range:	≤ ± 0.02% FS / °C typ. ≤ ± 0.03% FS / °C max.
Non-linearity at Max. Setting to DIN 16086:	≤ ± 0.5% FS max.
Hysteresis:	≤ ± 0.4% FS max.
Repeatability:	≤ ± 0.1% FS
Rise Time:	≤ 1 ms
Long-term Drift:	≤ ± 0.3% FS typ. / year
Environmental Conditions	
Compensated Temperature Range:	-13°F to 185°F (-25°C to 85 °C)
Operating Temperature Range:	-13°F to 185°F (-25°C to 85 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range[1]:	-40°F to 212°F / -13°F to 212°F (-40°C to 100 °C / -25°C to 100°C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark[2]:	Certificate No. E318391
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz:	≤ 20 g
Protection Class to IEC 60529:	IP 65 (for male EN175301-803 (DIN 43650) and Binder 714 M18) IP 67 (for M12x1, when an IP 67 connector is used)
Other Data	
Supply Voltage for Use Acc. to UL Spec:	8..30 V DC 2 Conductor 12..30 V DC 3 Conductor - Limited energy - according to 9.3 UL 61010; Class 2; UL 1310/1585; LPS UL 60950
Residual Ripple of Supply Voltage:	≤ 5%
Current Consumption:	≤ 25 mA
Life Expectancy:	> 10 million cycles 0 .. 100% FS
Weight:	0.32 lbs (0.145 kg)

Notes:
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.
FS (Full Scale) = relative to complete measuring range
B.F.S.L.= Best Fit Straight Line
1) -25 °C with FPM seal, -40 °C on request
2) Environmental conditions according to 1.4.2 UL 61010-1; C22.2 No 61010-1

Pressure Transmitter

HDA-4700

The pressure transmitter series HDA 4700 has a very accurate and robust sensor cell with a thin-film strain gauge on a stainless steel membrane.

The 4 .. 20 mA or 0 .. 10 V output signals enable connection to all measurement and control devices of Schroeder Industries as well as standard evaluation systems (e.g. PLC controls).

The main areas of application are in the mobile or industrial sectors of hydraulics and pneumatics, particularly in applications with restricted installation space.

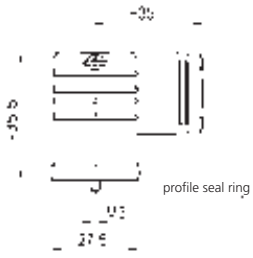
Features and Benefits

- Accuracy ≤ ± 0.25% FS type
- Highly robust sensor cell
- Very small temperature error
- Excellent EMC characteristics
- Very compact design
- Persuasive price / performance ratio

Specifications

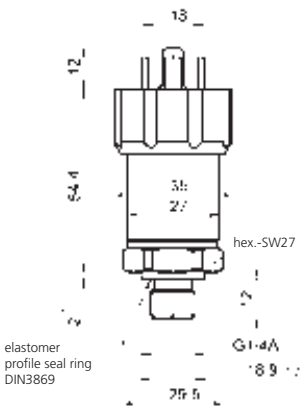
Input Data	
Measuring Ranges[1]:	87 psi (6 bar); 232 psi (16 bar); 870 psi (60 bar); 1450 psi (100 bar); 3626 psi (250 bar); 5801 psi (400 bar); 8702 psi (600 bar); 14503 psi (1000 bar)
Overload Pressures:	217 psi (15 bar); 464 psi (32 bar); 1740 psi (120 bar); 2900 psi (200 bar); 7252 psi (500 bar); 11603 psi (800 bar); 14503 psi (1000 bar); 23206 psi (1600 bar)
Burst Pressures:	1450 psi (100 bar); 2900 psi (200 bar); 4351 psi (300 bar); 7252 psi (500 bar); 14503 psi (1000 bar); 29007 psi (2000 bar); 43511 psi (3000 bar)
Mechanical Connection[1]:	G 1/4 A DIN 3852; G 1/2 A DIN 3852
Torque Value:	20 Nm (G1/4); 45 Nm (G1/2)
Parts in Contact w/ Medium:	Mech. Connection: Stainless Steel Seal: FPM
Output Data	
Output Signal, Permitted Load Resistance:	4 .. 20 mA, 2 conductor $R_{Lmax} = U_B$ - 8V)/ 20 mA [kΩ] 0 .. 10 V, 3 Conductor R_{Lmin}= 2 kΩ
Accuracy to DIN 16086, Max Setting:	≤ ± 0.25% FS typ. ≤ ± 0.5% FS max.
Accuracy at min. Setting B.F.S.L.:	≤ ± 0.15% FS typ. ≤ ± 0.25% FS max.
Temperature Compensation Zero Point:	≤ ± 0.008% FS / °C typ. ≤ ± 0.015% FS / °C max.
Temperature Compensation Over Range:	≤ ± 0.008% FS / °C typ. ≤ ± 0.015% FS / °C max.
Non-linearity at Max. Setting to DIN 16086:	≤ ± 0.3% FS max.
Hysteresis:	≤ ± 0.1% FS max.
Repeatability:	≤ ± 0.05% FS
Rise Time:	≤ 1 ms
Long-term Drift:	≤ ± 0.1% FS typ. / year
Environmental Conditions	
Compensated Temperature Range:	-13°F to 185°F (-25°C to 85 °C)
Operating Temperature Range[2]:	-40°F to 185°F / -13°F to 185°F (-40°C to 85°C / -25°C to 85 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range[2]:	-40°F to 212°F / -13°F to 212°F (-40°C to 100 °C / -25°C to 100°C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark[3]:	Certificate No. E318391
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz:	≤ 20 g
Protection Class to IEC 60529:	IP 65 (for male EN175301-803 (DIN 43650) and Binder 714 M18) IP 67 (for M12x1, when an IP 67 connector is used)
Other Data	
Supply Voltage for Use Acc. to UL Spec:	8..30 V DC 2 Conductor 12..30 V DC 3 Conductor - Limited energy - according to 9.3 UL 61010; Class 2; UL 1310/1585; LPS UL 60950
Residual Ripple of Supply Voltage:	≤ 5%
Current Consumption:	≤ 25 mA
Life Expectancy:	> 10 million cycles 0 .. 100% FS
Weight:	0.32 lbs (0.145 kg)

Notes:
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.
FS (Full Scale) = relative to complete measuring range
B.F.S.L.= Best Fit Straight Line
1) 1000 bar only with mechanical connection G 1/2 A DIN 3852 and vice versa
2) -25 °C with FPM seal, -40 °C on request
3) Environmental conditions according to 1.4.2 UL 61010-1; C22.2 No 61010-1

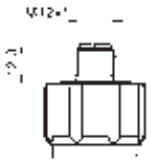


male electr. conn.
Binder series 714 -4 pole

male electr. conn.
3pole+PE EN175301-803 (DIN 43650)



male electr. conn.
4 pole



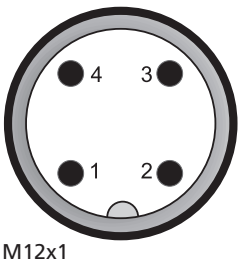
Pin Connections

Binder Series 714 M18

Pin	HDA 47X4-A & HDA 41X4A	HDA 47X4-B & HDA 41X4-B
1	n.c.	$+U_B$
2	Signal+	Signal
3	Signal-	0 V
4	n.c.	n.c.

EN175301-803 (DIN 43650)

Pin	HDA 47X5-A & HDA 41X5-A	HDA 47X5-B & HDA 41X5-B
1	Signal+	$+U_B$
2	Signal-	0 V
3	n.c.	Signal
Ground	Housing	Housing



M12x1

Pin	HDA 47X6-A & HDA 41X6-A	HDA 47X6-B & HDA 41X6-B
1	Signal+	$+U_B$
2	n.c.	n.c.
3	Signal-	O V
4	n.c.	Signal

NOTES:

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.

Pressure Transmitter

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder HDA41:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
HDA41							

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
HDA41	1	4	A	01.0	000	F	1	**= HDA4114A01.0000F1**

BOX 1

Model Number
HDA41

BOX 2

Mechanical Connection
1 = G1/2 B DIN-EN 837 (Male)
4 = G1/4 A DIN 3852 (Male)

BOX 3

Electrical Connection
4 = Male, 4 pole Binder Series 714 M18 (connector not supplied)
5 = Male, 3 pole + PE, EN175301-803 (DIN 43650) (connector supplied)
6 = Male, M12x1, 4 pole (connector not supplied)

BOX 4

Signal
A = 4..20 mA, 2 conductor
B = 0..10 V, 3 conductor

BOX 5

Pressure Range
01.0 bar (14.5 psi)
02.5 bar (36.2 psi)

BOX 6

Modification Number
000 = Standard

BOX 7

Seal Material (in contact with fluid)
F = FPM Seal (e.g.:for hydraulic oils)
E = EPDM Seal (e.g.: for refrigerants)

BOX 8

Material of Connection (in contact with fluid)
1 = Stainless Steel

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder HDA47:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
HDA47					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
HDA47	2	4	A	006	000	**= HDA4724A006000**

BOX 1

Model Number
HDA47

BOX 2

Mechanical Connection
2 = G1/2 A DIN 3852 (only for "1000 bar press. range)
4 = G1/4 A DIN 3852 (Male)

BOX 3

Electrical Connection
4 = Male, 4 pole Binder Series 714 M18 (connector not supplied)
5 = Male, 3 pole + PE, EN175301-803 (DIN 43650) (connector supplied)
6 = Male, M12x1, 4 pole (connector not supplied)

BOX 4

Signal
A = 4..20 mA, 2 conductor
B = 0..10 V, 3 conductor

BOX 5

Pressure Range
006 bar (87.02 psi)
016 bar (232.06 psi)
060 bar (870.23 psi)
100 bar (1450.38 psi)
250 bar (3625.94 psi)
400 bar (5801.51 psi)
600 bar (8702.26 psi)
1000 bar (14503.77 psi)

BOX 6

Modification Number
000 = Standard

NOTE:

BOX 5: Only in conjunction with mechanical connection type "2'.

Pressure Transmitter with HSI-Sensor Recognition

The pressure transmitter HDA 4748-H with HSI sensor recognition has been specially developed for use in conjunction with measuring instruments HMG 2500 or HMG 4000. For data transmission, the HDA 4748-H has an HSI interface (Sensor Interface). The HSI sensors are automatically recognized via the HSI interface by the above-mentioned measuring instruments and all necessary basic device settings are taken from each sensor.

Like all pressure transmitters of the HDA 4700 series, the HDA 4748-H also has a very accurate and robust sensor cell with a thin-film strain gauge on a stainless steel membrane. It combines excellent technical specifications with a very compact design.

HDA-4748-H

Features and Benefits

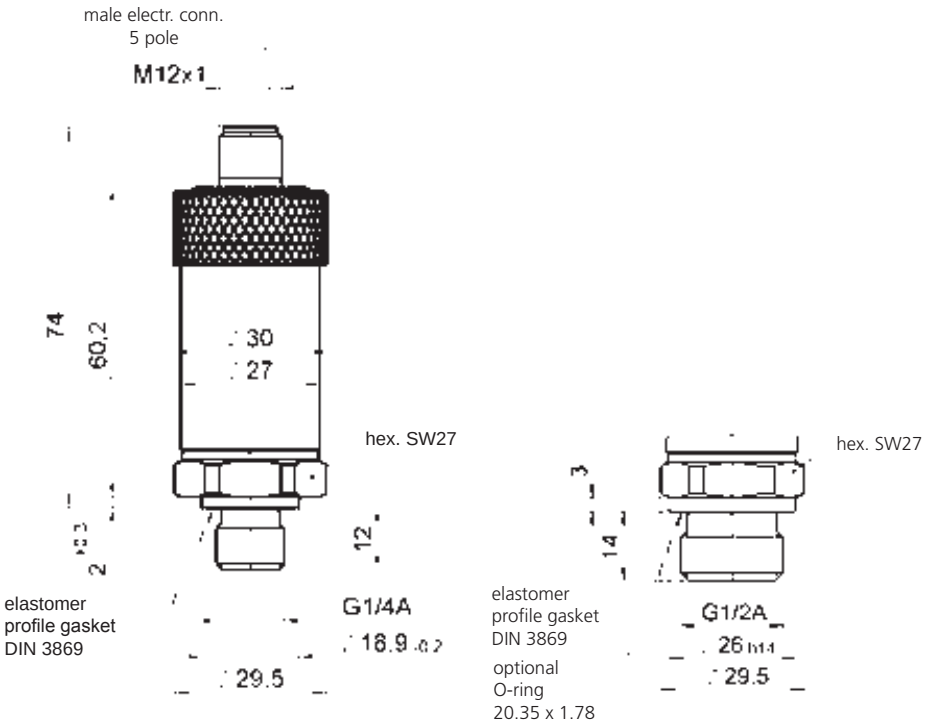
- Fully automatic recognition by, and voltage supply from measuring instruments HMG 2500 or HMG 4000
- Automatic transfer of measuring range, measured value and measurement unit
- Accuracy ≤ ± 0.25% FS type
- Highly robust sensor cell
- Very small temperature error
- Excellent EMC characteristics
- Very compact design
- Excellent long term stability

Specifications

Input Data	
Measuring Ranges[1]:	-14.5 to 130.5 psi (-1 to 9 bar); 232 psi (16 bar); 870 psi (60 bar); 1450 psi (100 bar); 3626 psi (250 bar); 5801 psi (400 bar); 8702 psi (600 bar); 14503 psi (1000 bar)
Overload Pressures:	290 psi (20 bar); 464 psi (32 bar); 1740 psi (120 bar); 2900 psi (200 bar); 7252 psi (500 bar); 11603 psi (800 bar); 14503 psi (1000 bar); 23206 psi (1600 bar)
Burst Pressures:	1450 psi (100 bar); 2900 psi (200 bar); 4351 psi (300 bar); 7252 psi (500 bar); 14503 psi (1000 bar); 29007 psi (2000 bar); 43511 psi (3000 bar)
Mechanical Connection[1]:	G 1/4 A DIN 3852 ; G 1/2 A DIN 3852
Torque Value:	20 Nm (G1/4); 45 Nm (G1/2)
Parts in Contact w/ Medium:	Mech. Connection: Stainless Steel Seal: FPM
Output Data	
Output Signal:	HSI (Sensor Interface) Automatic Sensor Recognition
Accuracy to DIN 16086, Max Setting:	≤ ± 0.25% FS typ. ≤ ± 0.5% FS max.
Accuracy at min. Setting B.F.S.L.:	≤ ± 0.15% FS typ. ≤ ± 0.25% FS max.
Temperature Compensation Zero Point:	≤ ± 0.008% FS / °C typ. ≤ ± 0.015% FS / °C max.
Temperature Compensation Over Range:	≤ ± 0.008% FS / °C typ. ≤ ± 0.015% FS / °C max.
Non-linearity at Max. Setting to DIN 16086:	≤ ± 0.3% FS max.
Hysteresis:	≤ ± 0.1% FS max.
Repeatability:	≤ ± 0.05% FS
Rise Time:	≤ 0.5 ms
Long-term Drift:	≤ ± 0.1% FS typ. / year
Environmental Conditions	
Compensated Temperature Range:	-13°F to 185°F (-25°C to 85 °C)
Operating Temperature Range[2]:	-40°F to 185°F / -13°F to 185°F (-40°C to 85°C / -25°C to 85 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range[2]:	-40°F to 212°F / -13°F to 212°F (-40°C to 100 °C / -25°C to 100°C)
CE Mark:	EN 61000-6-1/2/3/4
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz:	≤ 20 g
Protection Class to IEC 60529:	IP 67 (when an IP 67 connector is used)
Other Data	
Voltage Supply:	via measuring instruments HMG2500 or HMG4000
Life Expectancy:	> 10 million cycles 0 .. 100% FS
Weight:	0.33 lbs (0.15 kg)

Notes:
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.
FS (Full Scale) = relative to complete measuring range
B.F.S.L.= Best Fit Straight Line
1) 1000 bar only with mechanical connection G 1/2 A DIN 3852 and vice versa
2) -25 °C with FPM seal, -40 °C on request

Pressure Transmitter with HSI-Sensor Recognition



Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder HDA47:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
HDA47					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
HDA47	2	8	H	0009	000	**= HDA474828H0009000**

BOX 1

Model Number
HDA47

BOX 2

Mechanical Connection
2 = G1/2 A DIN 3852 (male) (only for "1000 bar press. range)
4 = G1/4 A DIN 3852 (Male)

BOX 3

Electrical Connection
8 = Male, M12x1, 5 pole (connector not supplied)

BOX 4

Signal
H = HSI (automatic sensor recognition)

BOX 5

Pressure Range
0009 bar (130.5 psi)
0016 bar (232.06 psi)
0060 bar (870.23 psi)
0100 bar (1450.38 psi)
0250 bar (3625.95 psi)
0400 bar (5801.51 psi)
0600 bar (8702.26 psi)
1000 bar (14503.77 psi)

BOX 6

Modification Number
000 = Standard

NOTE:

BOX 5: Only in conjunction with mechanical connection type "4".

14505.77 psi (1000 bar) Only in conjunction with mechanical connection type "2".

Electronic Pressure Switch

EDS-3300

The EDS 3300 is a compact electronic pressure switch with integrated digital display for relative pressure measurement in the low-pressure range. It has a ceramic measuring cell with thick-film strain gauge. The instrument can have one or two switching outputs, and there is the option of an additional switchable analogue output signal (4 .. 20 mA or 0 .. 10 V). A special design feature of the EDS 3300 is that the display can be moved in two planes (axes). The instrument can be installed in almost any mounting position and the display can be turned to the optimum position without the usual additional expense of a mechanical adapter. The 4-digit display can indicate the pressure in bar, psi or MPa. The user can select the particular unit of measurement. When changing to a different measurement unit, the instrument automatically converts all the switching settings to the new unit of measurement.

The main applications of the EDS 3300 are primarily in hydraulics and pneumatics, as well as in refrigeration and air conditioning technology.

Features and Benefits

- 1 or 2 PNP transistor switching outputs, up to 1.2 A load per output
- Accuracy ≤ ± 1% FS
- Optional switchable analogue output (4..20 mA /0.. 10V)
- 4-digit digital display
- Optimum alignment - can be rotated in two planes (axes)
- Measured value can be displayed in bar, psi or MPa
- User-friendly due to key programming
- Switching points and switchback hystereses can be adjusted independently

Specifications

Input Data	
Measuring Ranges:	-14.5 psi to 14.5 psi (-1 to 1 bar); 36.26 psi (2.5 bar); 87.02 psi (6 bar); 145.03 psi (10 bar); 232.06 psi (16 bar)
Overload Pressures:	43.51 psi (3 bar); 116.03 psi (8 bar); 261.07 psi (18 bar); 435.11 psi (30 bar); 696.18 psi (48 bar)
Burst Pressures:	72.52 psi (5 bar); 174.05 psi (12 bar); 435.11 psi (30 bar); 725.19 psi (50 bar); 1160.30 psi (80 bar)
Mechanical Connection:	G 1/4 A DIN 3852; G 1/2 B DIN-EN 837; Threaded port DIN 3852-G 1/4
Torque Value:	20 Nm (G1/4); 45 Nm (G1/2)
Parts in Contact w/ Medium:	Mech. Connection: Stainless Steel Sensor Cell: ceramic Seal: copper (G1/2) / FPM / EPDM (as per model code)
Output Data	
Accuracy to DIN 16086, Max Setting (display, analog output):	≤ ± 0.5% FS typ. ≤ ± 1% FS max.
Repeatability:	≤ ± 0.25% FS max.
Temperature Drift:	≤ ± 0.025% FS / °C max. zero point ≤ ± 0.025% FS / °C max. range
Analog Output (optional)	
Signal:	Selectable: 4..20 mA load resistance max. 500Ω; 0..10 V load resistance min. 1kΩ
Switch Outputs	
Type:	PNP transistor output
Switching Current:	Max. 1.2 A
Switching Cycles:	> 100 million
Reaction Time:	< 10 ms
Long-term Drift:	≤ ± 0.3% FS typ. / year
DESINA® diagnostic signal (Pin 2)	
Function:	OK: HIGH level / not OK: LOW level
Level:	HIGH: approx. $+U_B$ / LOW: <+0.3 V
Environmental Conditions	
Compensated Temperature Range:	14°F to 158°F (-10°C to 70 °C)
Operating Temperature Range:	-13°F to 176°F / -13°F to 140°F (-25°C to 80°C / -25°C to 60°C to UL spec.)
Storage Temperature Range:	-40°F to 176°F (-40°C to 80 °C)
Fluid Temperature Range:	-13°F to 176°F (-25°C to 80 °C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark[1]:	Certificate No. E318391
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz:	≤ 10 g
Shock resistance to DIN EN 60068-2-29 (11 ms):	≤ 50 g
Protection Class to IEC 60529:	IP 67
Other Data	
Voltage Supply for use acc. to UL spec:	9..35 V DC without analog output 18..35 V DC with analog output - limited energy - according to 9.3 UL 61010: Class 2; UL 1310/1585; LPS UL 60950
Current consumption:	max. 2.455 A total max. 35 mA with inactive switching outputs max. 55 mA with inactive switching outputs and analog outputs
Display:	4-digit, LED, 7 segments, red, height of digits 7 mm
Weight:	0.26 lbs (0.12 kg)

NOTES:
Excess voltage, override and short circuit protection are provided.
FS (Full Scale) = relative to complete measuring range
1. Environmental conditions according to 1.4.2 UL 61010-1; C22.2 No 61010-1

Electronic Pressure Switch

EDS-3400

The EDS 3400 is a compact electronic pressure switch with integrated digital display for relative pressure measurement in the high-pressure range. The instrument has a stainless steel measurement cell with thin-film strain gauge. The instrument can have one or two switching outputs and there is the option of an additional switchable analogue output signal (4 .. 20 mA or 0 .. 10 V).

A special design feature of the EDS 3400 is that the display can be moved in two planes. The device can be installed in almost any position and the display can be turned to the optimum position without the usual additional expense of a mechanical adapter. The 4-digit display can indicate the pressure in bar, psi or MPa. The user can select the particular unit of measurement. When changing to a different measurement unit, the instrument automatically converts all the switching settings to the new unit of measurement. The main applications of the EDS 3400 are primarily in hydraulics and pneumatics, as well as in refrigeration and air conditioning technology.

Features and Benefits

- 1 or 2 PNP transistor switching outputs, up to 1.2 A load per output
- Accuracy ≤ ± 1% FS
- Optional switchable analogue output (4..20 mA /0.. 10V)
- 4-digit digital display
- Optimum alignment - can be rotated in two planes (axes)
- Measured value can be displayed in bar, psi or MPa
- User-friendly due to key programming
- Switching points and switchback hystereses can be adjusted independently

Specifications

Input Data	
Measuring Ranges:	580.15 psi (40 bar); 1450 psi (100 bar); 3626 psi (250 bar); 5801 psi (400 bar); 8702 psi (600 bar)
Overload Pressures:	1160.30 psi (80 bar); 2900 psi (200 bar); 7252 psi (500 bar); 11603 psi (800 bar); 14503 psi (1000 bar)
Burst Pressures:	2900 psi (200 bar); 7252 psi (500 bar); 14503 psi (1000 bar); 29007 psi (2000 bar)
Mechanical Connection:	G 1/4 A DIN 3852 ; Threaded port DIN 3852-G 1/4
Torque Value:	20 Nm
Parts in Contact w/ Medium:	Mech. Connection: Stainless Steel Seal: FPM (G1/4 A DIN 3852)
Output Data	
Accuracy to DIN 16086, Max Setting (display, analog output):	≤ ± 0.5% FS typ. ≤ ± 1% FS max.
Repeatability:	≤ ± 0.25% FS max.
Temperature Drift:	≤ ± 0.025% FS / °C max. zero point ≤ ± 0.025% FS / °C max. range
Analog Output (optional)	
Signal:	Selectable: 4..20 mA load resistance max. 500Ω; 0..10 V load resistance min. 1kΩ
Switch Outputs	
Type:	PNP transistor output
Switching Current max. 1.2 A:	≤ ± 0.25% FS max.
Switching Cycles:	> 100 million
Reaction Time:	< 10 ms
Long-term Drift:	≤ ± 0.3% FS type / year
DESINA® diagnostic signal (Pin 2)	
Function:	OK: HIGH level / not OK: LOW level
Level:	HIGH: approx. $+U_B$ / LOW: <+0.3 V
Environmental Conditions	
Compensated Temperature Range:	14°F to 158°F (-10°C to 70 °C)
Operating Temperature Range:	-13°F to 176°F / -13°F to 140°F (-25°C to 80°C / -25°C to 60°C to UL spec.)
Storage Temperature Range:	-40°F to 176°F (-40°C to 80 °C)
Fluid Temperature Range:	-13°F to 176°F (-25°C to 80 °C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark[1]:	Certificate No. E318391
Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz:	≤ 10 g
Shock resistance to DIN EN 60068-2-29 (11 ms):	≤ 50 g
Protection Class to IEC 60529:	IP 67
Other Data	
Voltage Supply for use acc. to UL spec:	9..35 V DC without analog output 18..35 V DC with analog output - limited energy - according to 9.3 UL 61010: Class 2; UL 1310/1585; LPS UL 60950
Current consumption:	max. 2.455 A total max. 35 mA with inactive switching outputs max. 55 mA with inactive switching outputs and analog outputs
Display:	4-digit, LED, 7 segments, red, height of digits 7 mm
Weight:	0.26 lbs (0.12 kg)

NOTE:

1: Environmental conditions according to 1.4.2 UL 61010-1; C22.2 No 61010-1

Electronic Pressure Switch

Setting Options

All settings available on the EDS 3300/3400 are grouped in 2 easy-to-navigate menus. In order to prevent unauthorized adjustment of the device, a programming lock can be set.

Setting ranges for the switch outputs:

Switching point function: EDS-3300

Meas. Range in Bar	Switch point in bar	Hysteresis in bar	Increment in bar*
-1..1	-0.97..1	-0.99..0.98	0.01
0..1	0.016..1	0.006..0.99	0.002
0..2.5	0.04..2.5	0.015..2.475	0.005
0..6	0.09..6	0.3..5.94	0.01
0..10	0.16..10	0.06..9.9	0.02
0..16	0.25..16	0.1..15.8	0.05

Window function: EDS-3300

Meas. Range in Bar	Lower switch value in bar	Upper switch value in bar	Increment in bar*
-1..1	-0.97..0.96	-0.95..0.98	0.01
0..1	0.016..0.982	0.024..0.99	0.002
0..2.5	0.04..2.455	0.06..2.475	0.005
0..6	0.09..5.89	0.14..5.94	0.01
0..10	0.18..9.82	0.24..9.9	0.02
0..16	0.25..15.7	0.4..15.8	0.05

Setting ranges for the switch outputs:

Switching point function: EDS-3400

Meas. Range in Bar	Switch point in bar	Hysteresis in bar	Increment in bar*
0..40	0.6..40	0.2..39.6	0.1
0..100	1.6..100	0.6..99.0	0.2
0..250	4.0..250	1.5..247.5	0.5
0..400	6.0..400	2.0..396	1
0..600	9.0..600	3.0..594	1

Window function: EDS-3400

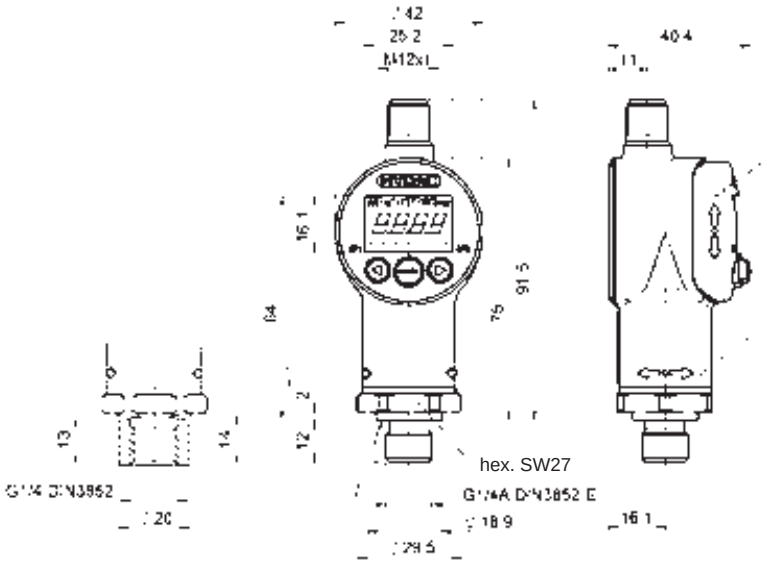
Meas. Range in Bar	Lower switch value in bar	Upper switch value in bar	Increment in bar*
0..40	0.6..39.2	0.9..39.6	0.1
0..100	1.6..98.2	2.4..99	0.2
0..250	4.0..245.5	6.0..247.5	0.5
0..400	6.0..392	9.0..396	1
0..600	9.0..589	14..594	1

*All ranges given in above tables are adjustable by increments shown.

Additional Functions

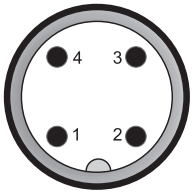
- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O function)
- Switch-on and switch-off delay adjustable from 0.00..99.99 seconds
- Choice of display (actual pressure, peak value, switch point 1, switch point 2, display off)
- Display filter for smoothing the display value during pressure pulsations
- Optional analog output signal selectable 4..20 mA or 0..10 V
- Pressure can be displayed in the measurement units bar, psi, MPa. The scaling can also be adapted to indicate force, weight, etc.

Electronic Pressure Switch



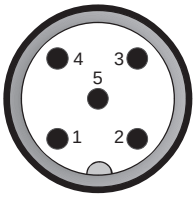
Pin Connections

Pin	EDS 33X6-1 & EDS 34X6-1	EDS 33X6-2 & EDS 34X6-2	EDS 33X6-3 & EDS 34X6-3
1	$+U_B$	$+U_B$	$+U_B$
2	n.c.	SP 2	Analog
3	0 V	0 V	0 V
4	SP 1	SP 1	SP 1



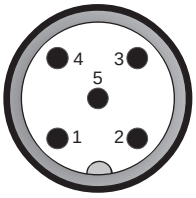
M12x1, 4 pole

Pin	EDS 33X8-5 & EDS 34X8-5
1	$+U_B$
2	Analog
3	O V
4	SP1
5	SP2



M12x1, 5 pole

Pin	DESINA® Compliant EDS 33X8-1	Can be connected to DESINA® EDS 33X8-3
1	$+U_B$	$+U_B$
2	Diagnostics	Diagnostics
3	O V	O V
4	SP 1	SP 1
5	n.c.	Analog



M12x1, 5 pole

NOTES:

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder EDS33:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
EDS33							

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
EDS33	1	6	1	01.0	000	F	1	**= EDS3316101.0000F1**

BOX 1

Model Number
EDS33

BOX 2

Mechanical Connection
1 = G1/2 B DIN-EN 837 (Male)
4 = G1/4 A DIN 3852 (Male)
9 = Threaded port DIN 2852-G1/4

BOX 3

Electrical Connection
6 = Male M12x1, 4 pole only possible on output models "1", "2" and "3"
8 = Male, M12x1, 5 pole only possible on output model "5"

BOX 4

Output
1 = 1 switching output (only in conjunction w/ electrical connection type "6")
2 = 2 switching outputs (only in conjunction w/ electrical connection type "6")
3 = 1 switching output & 1 analog output (only in conjunction w/ electrical connection type "6")
5 = 2 switching outputs & 1 analog output (only in conjunction w/ electrical connection type "8")

BOX 5

Pressure Range
0001 = -1.0-1 bar (-14.5-14.5 psi)
01.0 bar (14.5 psi)
02.5 bar (36.26 psi)
06.0 bar (87.02 psi)
0010 bar (145.04 psi)
0016 bar (232.06 psi)

BOX 6

Modification Number
000 = Standard

BOX 7

Seal Material (in contact w/ fluid)
F = FPM seal (e.g.: for hydraulic oils)
E = EPDM seal (e.g.: for water; refrigerants)

BOX 8

Material of Connection (in contact w/ fluid)
1 = Stainless Steel

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder EDS34:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
EDS34					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
EDS34	4	6	1	0400	000	**= EDS344610400000**

BOX 1

Model Number
EDS34

BOX 2

Mechanical Connection
4 = G1/4 A DIN 3852 (Male)
9 = Threaded port DIN 2852-G1/4

BOX 3

Electrical Connection
6 = Male M12x1, 4 pole only possible on output models "1", "2" and "3"
8 = Male, M12x1, 5 pole only possible on output model "5"

BOX 4

Output
1 = 1 switching output (only in conjunction w/ electrical connection type "6")
2 = 2 switching outputs (only in conjunction w/ electrical connection type "6")
3 = 1 switching output & 1 analog output (only in conjunction w/ electrical connection type "6")
5 = 2 switching outputs & 1 analog output (only in conjunction w/ electrical connection type "8")

BOX 5

Pressure Range
0040 bar (580.15 psi)
0100 bar (1450.38 psi)
0250 bar (3625.94 psi)
0400 bar (5801.51 psi)
0600 bar (8702.26 psi)

BOX 6

Modification Number
000 = Standard

Electronic Flow Rate Transmitter

EVS 3100

The flow rate transmitters of the EVS 3100 series (aluminum series) are specially designed for use in hydraulic and other fluid technology systems. They operate according to the turbine principle, i.e. the speed of an impeller turning in the fluid flow is measured and converted into a 4 ... 20 mA analog signal.

Two further G1/4 threaded holes in the turbine housing allow additional units to be connected, e.g. temperature and pressure transmitters.

Features and Benefits

- Pressure resistant to 5800 psi (400 bar) (depending on the model)
- Viscosities of 1 .. 100 cSt (32-456 SUS)
- Output signal 4 .. 20 mA
- Additional connection of temperature and / or pressure transmitters possible

Specifications

Input Data	
Operating Pressure[1]:	EVS 310X-A-0020 - 5801.51 psi (400 bar) EVS 310X-A-0060 - 5801.51 psi (400 bar) EVS 310X-A-0300 - 5801.51 psi (400 bar) EVS 310X-A-0600 - 4568.69 psi (315 bar)
Measuring Ranges:	EVS 310X-A-0020 - 0.31 - 5.28 gpm (1.2 - 20.0 L/min) EVS 310X-A-0060 - 1.58 - 15.85 gpm (6.0 - 60.0 L/min) EVS 310X-A-0300 - 3.96 - 79.25 gpm (15.0 - 300.0 L/min) EVS 310X-A-0600 - 10.56 - 158.50 gpm (40.0 - 600.0 L/min)
Additional Connection Options:	2 x G1/4 female threads for pressure and/or temperature sensors
Output Data	
Output Signal, Permitted Load Resistance:	4..20 mA, 2 conductor $R_{Lmax} = (U_B - 10\ V) / 20\ mA\ [k\Omega]$
Accuracy:	≤ 2% of the actual value
Environmental Conditions	
Compensated Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Operating Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range:	-4°F to 194°F (-20°C to 90 °C)
CE Mark:	EN 61000-6-1/2/3/4
Protection class to IEC 60529:	IP 65 (Binder 714 M18) IP 67 (M12x1, when an IP 67 connector is used)
Other Data	
Housing Material:	Aluminium
Measuring Medium[2]:	Hydraulic Oils
Viscosity Range:	1 .. 100 cSt (32-456 SUS)
Calibration Viscosity:	30 cSt (141 SUS)
Supply Voltage:	10..32 V DC
Residual Ripple of Supply Voltage:	≤ 5%
Weight:	EVS 310X-A-0020 - 1.61 lbs (0.73 kg) EVS 310X-A-0060 - 1.90 lbs (0.86 kg) EVS 310X-A-0300 - 3.10 lbs (1.41 kg) EVS 310X-A-0600 - 3.37 lbs (1.53 kg)

Notes:
1) Other measuring ranges on request
2) Other fluids on request

Electronic Flow Rate Transmitter

EVS-3110

The flow rate transmitters in the EVS 3110 series (stainless steel series) are specially designed for use in hydraulic and other fluid technology systems.

They operate according to the turbine principle, i.e. the speed of an impeller turning in the fluid flow is measured and converted into a 4 ... 20 mA analog signal.

On the EVS 3110 stainless steel range, the impeller has a carbide bearing and the resulting increased robustness also makes it suitable for use in pulsating, dynamic applications.

Two further G1/4 threaded holes in the turbine housing allow additional devices to be connected, e.g. temperature and pressure transmitters.

Features and Benefits

- Suitable for pressures up to 5800 psi (400 bar)
- Viscosities of 1 .. 100 cSt (32-456 SUS)
- Output signal 4 .. 20 mA
- Additional connection of temperature and / or pressure transmitters possible

Specifications

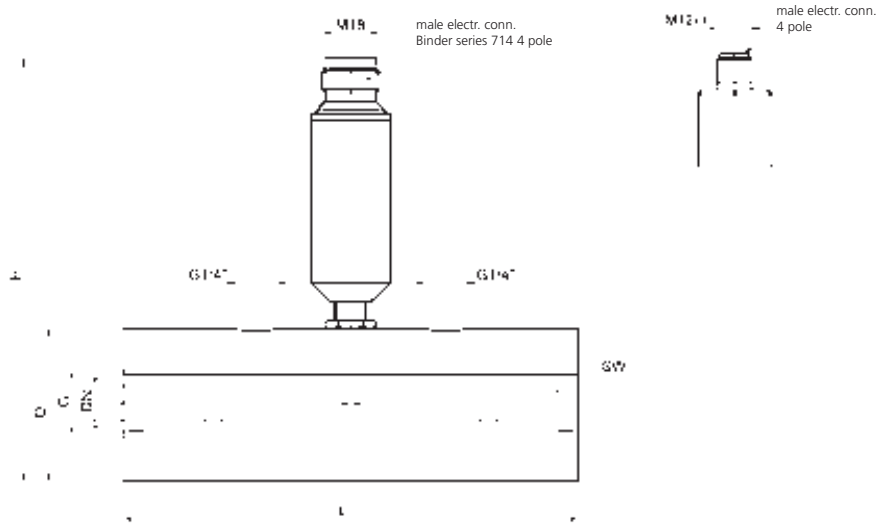
Input Data	
Operating Pressure[1]:	EVS 311X-A-0020 - 5801.51 psi (400 bar) EVS 311X-A-0060 - 5801.51 psi (400 bar) EVS 311X-A-0300 - 5801.51 psi (400 bar) EVS 311X-A-0600 - 5801.51 psi (400 bar)
Measuring Ranges:	EVS 311X-A-0020 - 0.31 - 5.28 gpm (1.2 - 20.0 L/min) EVS 311X-A-0060 - 1.58 - 15.85 gpm (6.0 - 60.0 L/min) EVS 311X-A-0300 - 3.96 - 79.25 gpm (15.0 - 300.0 L/min) EVS 311X-A-0600 - 10.56 - 158.50 gpm (40.0 - 600.0 L/min)
Additional Connection Options:	2 x G1/4 female threads for pressure and/or temperature sensors
Output Data	
Output Signal, Permitted Load Resistance:	4..20 mA, 2 conductor $R_{Lmax} = (U_B - 10\ V) / 20\ mA\ [k\Omega]$
Accuracy:	≤ 2% of the actual value
Environmental Conditions	
Compensated Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Operating Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range:	-4°F to 194°F (-20°C to 90 °C)
CE Mark:	EN 61000-6-1/2/3/4
Protection class to IEC 60529:	IP 65 (Binder 714 M18) IP 67 (M12x1, when an IP 67 connector is used)
Other Data	
Housing Material:	Stainless Steel
Test Medium[2]:	Water-based fluids
Viscosity Range:	1 .. 100 cSt (32-456 SUS)
Calibration Viscosity:	5 cSt (42 SUS)
Supply Voltage:	10..32 V DC
Residual Ripple of Supply Voltage:	≤ 5%
Weight:	EVS 311X-A-0020 - 3.95 lbs (1.79 kg) EVS 311X-A-0060 - 4.63 lbs (2.1 kg) EVS 311X-A-0300 - 7.32 lbs (3.32 kg) EVS 311X-A-0600 - 7.72 lbs (3.5 kg)

Notes:
1) Other measuring ranges on request
2) Other fluids on request

Electronic Flow Rate Transmitter

NOTE:

For dimensions see table for flow rate transmitter EVS-3100-H / EVS-3110-H flow, next page

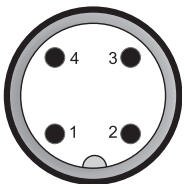


Pin Connections

Pin	EVS 31X4-A
1	Reserved
2	Signal+
3	Signal-
4	Reserved

Binder Series 714 M18

Pin	EVS 31X6-A
1	Signal+
2	Reserved
3	Signal-
4	Reserved



M12x1

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder EVS31

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
EVS31					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
EVS31	0	4	A	0020	000	**= EVS3104A0020000**

BOX 1

Model Number
EVS31

BOX 2

Housing Material
0 = Aluminum
1 = Stainless Steel

BOX 3

Electrical Connection
4 = Male, 4 Pole Binder Series 714 M18 (connector not supplied)
6 = Male, M12x1, 4 Pole (connector not supplied)

BOX 4

Signal
A = 4..20 mA, 2 Conductor

BOX 5

Measuring Range
0020 = 1.2..20 L/min
0060 = 6.0..60 L/min
0300 = 15.0..300 L/min
0600 = 40.0..600 L/min

BOX 6

Modification Number
000 = Standard

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Electronic Flow Rate Transmitter with HSI-Sensor Recognition

The flow rate transmitters in the series EVS 3100-H and EVS 3110-H with HSI sensor recognition have been specially developed for use in conjunction with measuring instruments HMG 2500 or HMG 4000.

For data transmission, the EVS 31x0-H has an HSI interface (Sensor Interface). The HSI sensors are recognized automatically via the HSI interface by the above-mentioned measuring instruments, and all the necessary basic settings are taken from each instrument.

As with all flow rate transmitters in the series EVS 3100 and EVS 3110, the EVS 31x0-H also operates according to the turbine principle. The speed of an impeller turning in the fluid flow is measured and converted into an electronic signal.

Features and Benefits

- Fully automatic recognition by, and voltage supply from measuring instruments HMG 2500 or HMG 4000
- Automatic transfer or measuring range, measured value and measurement unit
- Viscosities of 1..100 cSt (32-456 SUS)
- Additional connection of temperature and / or pressure transmitters possible

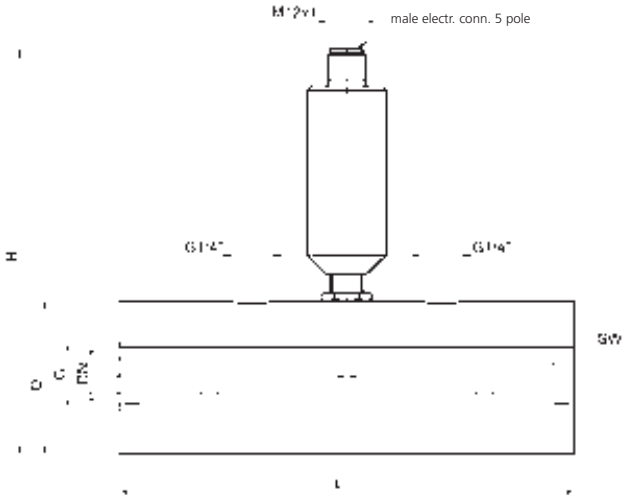
EVS-3100-H
EVS-3110-H

Specifications

Input Data	
Operating Pressure:	EVS 3108-H-0020 - 5801.51 psi (400 bar) EVS 3118-H-0020 - 5801.51 psi (400 bar) EVS 3108-H-0060 - 5801.51 psi (400 bar) EVS 3118-H-0060 - 5801.51 psi (400 bar) EVS 3108-H-0300 - 5801.51 psi (400 bar) EVS 3118-H-0300 - 5801.51 psi (400 bar) EVS 3108-H-0600 - 4568.69 psi (315 bar) EVS 3118-H-0600 - 5801.51 psi (400 bar)
Measuring Ranges[1]:	EVS 3108-H-0020 - 0.31 - 5.28 gpm (1.2 - 20.0 L/min) EVS 3118-H-0020 - 0.31 - 5.28 gpm (1.2 - 20.0 L/min) EVS 3108-H-0060 - 1.58 - 15.85 gpm (6.0 - 60.0 L/min) EVS 3118-H-0060 - 1.58 - 15.85 gpm (6.0 - 60.0 L/min) EVS 3108-H-0300 - 3.96 - 79.25 gpm (15.0 - 300.0 L/min) EVS 3118-H-0300 - 3.96 - 79.25 gpm (15.0 - 300.0 L/min) EVS 3108-H-0600 - 10.56 - 158.50 gpm (40.0 - 600.0 L/min) EVS 3118-H-0600 - 10.56 - 158.50 gpm (40.0 - 600.0 L/min)
Additional Connection Options:	2 x G1/4 female threads for pressure and/or temperature sensors
Output Data	
Output Signal:	HSI (Sensor Interface) Automatic sensor recognition
Accuracy:	≤ 2% of the actual value
Environmental Conditions	
Compensated Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Operating Temperature Range:	-4°F to 158°F (-20°C to 70 °C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range:	-4°F to 194°F (-20°C to 90 °C)
CE Mark:	EN 61000-6-1/2/3/4
Protection class to IEC 60529:	IP 67 (when an IP 67 connector is used)
Other Data	
Housing Material:	EVS 3100-H: Aluminium EVS 3110-H: Stainless Steel
Measuring Medium[2]:	EVS 3100-H: Hydraulic oils EVS 3110-H: Water-based medial
Viscosity Range:	1 .. 100 cSt (32-456 SUS)
Calibration Viscosity:	EVS 3100-H: 30 cSt (141 SUS) EVS 3110-H: 5 cSt (42 SUS)
Supply Voltage:	Via measuring instruments HMG2500 or HMG4000

Notes:
1) Other measuring ranges on request
2) Other fluids on request

Electronic Flow Rate Transmitter with HSI-Sensor Recognition



Model	Measuring range [l/min]	L [mm]	H [mm]	D / SW [mm]	G [mm]	Torque value [Nm]	DN [mm]
EVS 3108-H-0020	1.2 .. 20	117	135	47 / 46	G¼"	60	7
EVS 3108-H-0060	6 .. 60	144	135	48.5 / 46	G½"	130	11
EVS 3108-H-0300	15 .. 300	155	150	63.5 / 60	G1¼"	500	22
EVS 3108-H-0600	40 .. 600	181	150	63.5 / 60	G1½"	600	30
EVS 3118-H-0020	1.2 .. 20	117	135	47 / 46	G¼"	60	7
EVS 3118-H-0060	6 .. 60	144	135	48.5 / 46	G½"	130	11
EVS 3118-H-0300	15 .. 300	155	150	63.5 / 60	G1¼"	500	22
EVS 3118-H-0600	40 .. 600	181	150	63.5 / 60	G1½"	600	30

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder EVS31

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
EVS31					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
EVS31	0	8	H	0020	000	**= EVS3108H0020000**

BOX 1 — Model Number

EVS31

BOX 2 — Housing Material

0 = Aluminum

1 = Stainless Steel

BOX 3 — Electrical Connection

8 = Male, M12x1, 5 pole (Connector not supplied)

BOX 4 — Signal

H = HSI (Automatic Sensor Recognition)

BOX 5 — Measuring Range

0020 = 1.2..20 L/min
0060 = 6.0..60 L/min
0300 = 15.0..300 L/min
0600 = 40.0..600 L/min

BOX 6 — Modification Number

000 = Standard

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Electronic Flow Rate Transmitter

HFT-2100

The HFT 2100 series of flow transmitters is based on the variable area float principle. Irrespective of the installation position, the test medium deflects a spring-loaded float in the direction of flow, depending on the flow rate. A Hall sensor which detects the position of the float, is fitted to the outside of the instrument and is therefore separate to the flow circuit. In proportion to the deflection of the float, the sensor produces an analogue signal which corresponds to the particular measuring range.

The device is calibrated for vertical installation and for an upwards flow direction. The transmitter is designed to give reliable measurements within its accuracy range, even with changes in viscosity. The kinematic viscosity may vary between 30 and 600 cSt (141-2727 SUS).

The areas of application include:

- Central lubrication systems
- Oil circuit lubrication systems
- Transformers
- Pumps
- Cooling systems and circuits
- Lubrication circuits
- Hydraulic systems
- Welding machines and laser systems
- Chemical industry
- Research & development

Features and Benefits

- Accuracy ≤ ± 10 % FS
- Viscosity compensation from 30..600 cSt (141-2727 SUS)
- Any mounting position
- High level of functional reliability
- High pressure resistance
- Threaded connection

Specifications

Input Data		
Measuring Ranges:	Size 1:	Size 2:
	0.13 - 0.42 gpm (0.5 - 1.6 L/min)	0.13 - 0.39 gpm (0.5 - 1.5 L/min)
	0.21 - 0.79 gpm (0.8 - 3.0 L/min)	0.26 - 1.05 gpm (1 - 4 L/min)
	0.53 - 1.85 gpm (2.0 - 7.0 L/min)	0.53 - 2.11 gpm (2 - 8 L/min)
		0.79 - 2.64 gpm (3 - 10 L/min)
		1.32 - 3.96 gpm (5 - 15 L/min)
		2.11 - 6.34 gpm (8 - 24 L/min)
		2.64 - 7.92 gpm 10 - 30 L/min)
		3.96 - 11.88 gpm (15 - 45 L/min)
		5.28 - 15.85 gpm (20 - 60 L/min)
		7.92 - 23.77 gpm (30 - 90 L/min)
		9.24 - 29.05 gpm (35 - 110 L/min)
Operating Pressure:		
Brass Version	4351 psi (300 bar)	3625 psi (250 bar)
Stainless Steel Version	5076 psi (350 bar)	4351 psi (300 bar)
Pressure Drop:	0.3 - 3 psi (0.02-0.2 bar)	5076 psi (350 bar)
Mechanical Connection:	See dimensions	
Parts in Contact with Medium:		
Brass Version	Stainless Steel 1.4571; FPM[1]; Brass, Nickel-plate; Brass; Hard Ferrite	
Stainless Steel Version	Stainless Steel 1.4571; FPM[1]' Hard Ferrite	
Output Data		
Output Signal:	4 .. 20 mA, 3 Conductor	
	0 .. 10 V, 3 Conductor	
Accuracy[2]:	≤ ± 10% FS	
Repeatability:	1% FS max.	
Environmental Conditions		
Operating Temperature Range:	-4°F to 158°F (-20°C to 70 °C)	
Fluid Temperature Range:	-4°F to 158°F (-20°C to 70 °C)	
Viscosity Range:	30 .. 600 cSt (141 - 2727 SUS)	
CE Mark:	Directive 2004 / 108 / EC	
Protection class to IEC 60529:	IP 67	
Other Data		
Supply Voltage:	18 .. 30 V	
Power Consumption:	< 1 W	
Electrical Connection:	Male Connection M12x1	
Housing Material:		
Measuring Body	Brass (nickel-plated) or st. steel 1.4571	
Transmitter	Brass (nickel-plated)	

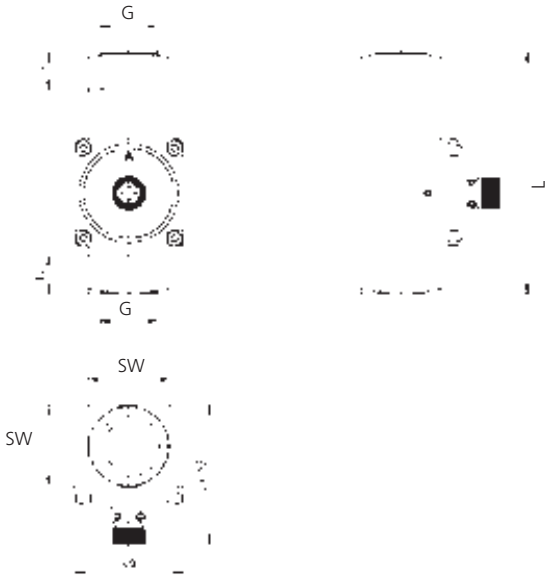
Notes:
1) Other seal materials available upon request
2) 3% possible with calibration to a certain viscosity

Electronic Flow Rate Transmitter

Size 1

Type [l/min]	Installation Dimensions [mm]				Weight (approx.) [g]
	DN	SW	G	L	
0.5 .. 1.6	8	24	1/4"	98	610
	10	24	3/8"	119	660
	15	30	1/2" *	90	560
0.8 .. 3.0	15	30	1/2"	90	560
2.0 .. 7.0					

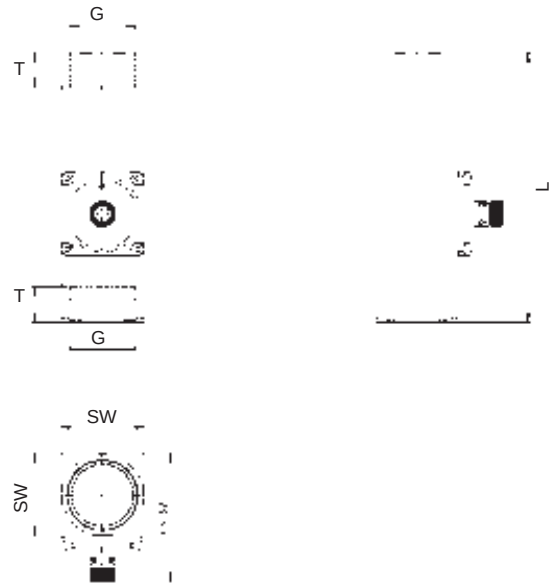
* = Standard



Size 2

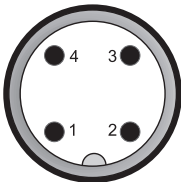
Type [l/min]	Installation dimensions [mm]					Weight (approx.) [g]
	DN	SW	G	L	T	
0.5 .. 1.5	8	34	1/4"	152	10	1510
	15	34	1/2"	152	14	1435
1 .. 4	20	34	3/4"	152	15	1350
	25	40	1" *	130	17	1170
2 .. 8	15	34	1/2"	152	14	1435
3 .. 10	20	34	3/4"	152	15	1350
5 .. 15	25	40	1" *	130	17	1170
8 .. 24						
10 .. 30	20	34	3/4"	152	15	1350
15 .. 45	25	40	1" *	130	17	1170
20 .. 60						
30 .. 90	25	40	1"	130	17	1170
35 .. 110						

* = Standard



Pin Connections

Pin	HFT 21X6-C	HFT 21X6-B
1	$+U_B$	$+U_B$
2	Reserved	Reserved
3	GND	GND
4	4 .. 20 mA	0 .. 10 V



M12x1

Electronic Flow Rate Transmitter

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder HFT:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
HFT										

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11	
HFT	2	1	1	5	B	0001 -0004	7	B	0	000	**= HFT2115B0001-00047B000**

BOX 1 — Model Number

HFT

BOX 2 — Measuring Principle

2 = Variable area float

BOX 3 — Measuring Medium

1 = Oils / Viscous Fluids

BOX 4 — Mechanical Connection

1 = 1/4" BSPP
2 = 3/8" BSPP
3 = 1/2" BSPP
4 = 3/4" BSPP
5 = 1" BSPP

BOX 5 — Electrical Connection

6 = Male M12x1, 4 pole (connector not supplied)

BOX 6 — Output Signal

B = 0 .. 10 V, 3 Conductor
C = 4 .. 20 mA, 3 Conductor

BOX 7 — Measuring Ranges Oil 10%

Size 1 = 00.5 - 01.6 L/min (0.13 - 0.42 gpm)
00.8 - 03.0 L/min (0.21 - 0.79 gpm)
02.0 - 07.0 L/min (0.53 - 1.85 gpm)

Size 2 = 00.5 - 01.5 L/min (0.13 - 0.39 gpm)
0001 - 0004 L/min (0.26 - 1.05 gpm)
0002 - 0008 L/min (0.53 - 2.11 gpm)
0003 - 0010 L/min (0.79 - 2.64 gpm)
0005 - 0015 L/min (1.32 - 3.96 gpm)
0008 - 0024 L/min (2.11 - 6.34 gpm)
0010 - 0030 L/min (2.64 - 7.92 gpm)
0015 - 0045 L/min (3.96 - 11.88 gpm)
0020 - 0060 L/min (5.28 - 15.85 gpm)
0030 - 0090 L/min (7.92 - 23.77 gpm)
0035 - 0110 L/min (9.24 - 29.05 gpm)

BOX 8 — Accuracy

7 = ≤ ± 10% FS

BOX 9 — Housing Material

B = Brass, nickel-plated
S = Stainless Steel

BOX 10 — Mechanical Indicator

0 = Without Indicator

BOX 11 — Modification Number

000 = Standard

NOTES:

Box 4. Mechanical connection options depend on housing type (see Dimensions) and other models available upon request

Electronic Temperature Switch

ETS-320

The ETS 320 is a compact electronic temperature switch with a 3-digit display. Pressure-resistant to 8702 psi (600 bar) with an integrated 18 mm temperature probe, this model can be installed directly inline or on the hydraulic block and has a measuring range of -13°F to 212°F (-25 °C to 100 °C).

Different output models with one or two switching outputs, and with the possible option of an additional analog output signal of 4 .. 20 mA offer a variety of application opportunities. The switching points and the associated hystereses can be adjusted very quickly and easily using the keypad.

For optimum adaptation to the particular application, the unit has many additional adjustment parameters (e.g. switching delay times, N/C / N/O function, etc.).

Features and Benefits

- Compact temperature switch with integral temperature probe
- 2 transistor switching outputs, up to 1.2 A load per output
- Optional analog output signal 4 .. 20 mA
- 3-digit display
- Switching point or window function
- Switching/switch-back points and many useful additional functions can be set using the keypad

Specifications

Input Data	
Measuring Range:	-13°F to 212°F (-25 °C to 100 °C)
Probe Length:	0.71" (18 mm)
Pressure Resistance:	8702.26 psi (600 bar)
Mechanical Connection:	G1/2 A DIN 3852
Torque Value:	45 Nm
Parts in Contact with Medium:	Mechanical Connection - Stainless Steel Seal - FPM
Output Data	
Accuracy (display, analog output):	≤ ± 2.0°F (≤ ± 1.0 °C)
Temperature Drift:	≤ ± 0.015% FS/°C max. zero point ≤ ± 0.015% FS/°C max. zero range
Analog Output (optional)	
Signal:	4 .. 20 mA load resistance max. 400Ω corresponds to -13°F to 212°F (-25 °C to 100 °C)
Switch Outputs	
Type:	PNP transistor switching outputs
Switching Current:	Max. 1.2 A per output
Switching Cycles:	> 100 million
Rise time to DIN EN 60751	t_{50}: 3 s t_{90}: 9 s
Environmental Conditions	
Ambient Temperature Range:	-13°F to 176°F (-25°C to 80 °C)
Storage Temperature Range:	-40°F to 176°F (-40°C to 80 °C)
Fluid Temperature Range (for the probe)[1]:	-40°F to 212°F/-13°F to 212°F (-40°C to 100 °C/-25°C to 100°C)
CE Mark:	EN 61000-6-1/2/3/4
Vibration Resistance to DIN EN 60068-2-6 (0 .. 500 Hz):	≤ 10 g
Shock Resistance to DIN EN 60068-2-29 (1 ms):	≤ 50 g
Protection class to IEC 60529:	IP 65
Other Data	
Supply Voltage:	20 .. 32 V DC
Current Consumption:	Approx. 100 mA without switch output
Residual Ripple of Supply Voltage:	≤ 5%
Display:	3-digit, LED, 7 segment, red, height of digits 9.2 mm
Weight:	0.66 lbs (0.3 kg)

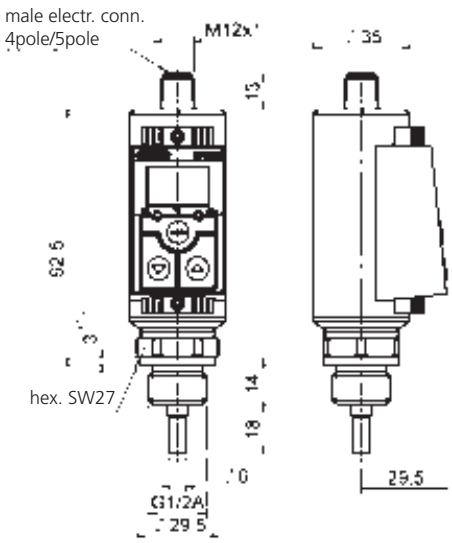
Notes:

Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

FS (Full Scale) = relative to complete measuring range

Available upon request:
1.) -25 °C with FPM seal, -40 °C

Electronic Temperature Switch



Setting Options

All the settings available on the ETS 320 are combined in 2 easy-to-navigate menus. To prevent unauthorized adjustment of the instrument, a programming lock can be set

Setting range of the switching points and switch-back hystereses:

Switching Point Function

Unit	Switching point	Hysteresis	Increment*
°C	-22.0 .. 100.0	1.0 .. 178.0	1.0
°F	-10.0 .. 212.0	2.0 .. 320.0	2.0

Window Function

Unit	lower Switch Value	Upper Switch Value	Increment*
°C	-23.0 .. 99.0	-22.0 .. 100.0	1.0
°F	-12.0 .. 210.0	-10.0 .. 212.0	2.0

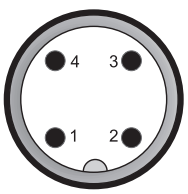
* All ranges given in above tables are adjustable by increments shown

Additional Functions

- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O)
- Switch-on and switch-off delay adjustable from 0 .. 750 seconds
- Choice of display (actual temperature, peak temperature, switching point 1, switching point 2, display off)

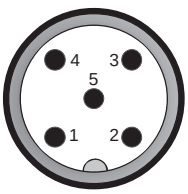
Pin Connections

Pin	ETS 326-2	ETS 326-3
1	+U_B	+U_B
2	SP 2	Analog
3	O V	O V
4	SP 1	SP 1



M12x1, 4 pole

Pin	ETS 328-5
1	+U_B
2	Analog
3	O V
4	SP 1
5	SP 2



M12x1, 5 pole

Electronic Temperature Switch

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder ETS3

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
ETS3					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
ETS3	2	6	2	100	400	**= ETS3262100400**

BOX 1

Model Number
ETS3

BOX 2

Mechanical Connection
2 = G1/2 A DIN 3852 (male)

BOX 3

Electrical Connection
6 = Male, M12x1, 4 pole (only possible on output models 2 & 3)
8 = Male, M12x1, 5 pole (only possible on output model 5)

BOX 4

Output
2 = 2 switching outputs (only in conjunction with electrical connection type 6)
3 = 1 switching output and 1 analog output (only in conjunction with electrical connection type 6)
5 = 2 switching outputs and 1 analog output (only in conjunction with electrical connection type 8)

BOX 5

Measuring Range
100 = -13°F to 212°F (-25 °C to 100 °C)

BOX 6

Modification Number
000 = Display in °C
400 = Display in °F

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Electronic Temperature Switch

The ETS 3200 is a compact electronic temperature switch with digital display. With its integrated temperature probe, the ETS 3200 is particularly suitable for direct tank installation and is available in various lengths. Different output models with one or two switching outputs, optionally with an additional analog output signal, offer a variety of application possibilities.

The switching points and the associated hystereses can ne adjusted very quickly and easily using the keypad.

For optimum adaptation to the particular application, the instrument has many additional adjustment parameters (e.g. switching delay times, N/C / N/O function, etc.).

ETS-3200

Features and Benefits

- 2 Switching outputs, up to 1.2 A load per output
- Optional analog output signal selectable (4 .. 20 mA, 0 .. 10 V)
- 4-digit display
- Optimum alignment - display can be rotated in two planes (axes)
- Switching / switch-back points and many useful additional functions can be set using the keypad.
- Display of temperature and unit of measurement in °F or °C

Specifications

Input Data	
Measuring Range:	-13°F to 212°F (-25 °C to 100 °C)
Probe Length:	3.94" (100 mm); 9.84" (250 mm); 13.78" (350 mm)
Pressure Resistance:	725.19 psi (50 bar)
Mechanical Connection:	G1/2 A DIN 3852
Torque Value:	45 Nm
Parts in Contact with Medium:	Mechanical Connection - Stainless Steel Seal - FPM
Output Data	
Accuracy (display, analog output):	≤ ± 2.0°F (≤ ± 1.0 °C)
Temperature Drift:	≤ ± 0.015% FS/°C max. zero point ≤ ± 0.015% FS/°C max. range
Analog Output (optional)	
Signal:	Selectable: 4 .. 20 mA ohmic resist. max. 500 Ω 0 .. 10 V ohmic resist. min. 1 kΩ corresponds in each case to -13°F to 212°F (-25 °C to 100 °C)
Switch Outputs	
Type:	PNP transistor switching outputs
Switching Current:	Max. 1.2 A per output
Switching Cycles:	> 100 million
Rise time to DIN EN 60751	t_{50}: 8 s t_{90}: 15 s
Environmental Conditions	
Ambient Temperature Range:	-13°F to 176°F (-25°C to 80 °C) (-13°F to 140°F (-25°C to 60 °C) acc. to UL spec.)
Storage Temperature Range:	-40°F to 176°F (-40°C to 80 °C)
Fluid Temperature Range (for the probe)[1]:	-40°F to 212°F/-13°F to 212°F (-40°C to 100 °C/-25°C to 100°C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark[2]:	Certificate No. E318391
Vibration Resistance to DIN EN 60068-2-6 (0 .. 500 Hz):	≤ 10 g
Shock Resistance to DIN EN 60068-2-29 (11 ms):	≤ 50 g
Protection class to IEC 60529:	IP 67
Other Data	
Supply Voltage for use acc. to UL spec.:	9 .. 35 V DC without analog output 18 .. 35 V DC with analog output - limited energy - according to 9.3 UL 61010; Class 2; UL 1310/1585; LPS UL 60950
Current Consumption:	max. 2.455 A total max. 35 mA with inactive switching outputs max. 55 mA with inactive switching outputs and analog output
Residual Ripple of Supply Voltage:	≤ 5%
Display:	4-digit, LED, 7 segment, red, height of digits 7 mm
Weight:	Probe Length 3.94" (100 mm); 0.22 lbs (0.1 kg) Probe Length 9.84" (250 mm); 0.55 lbs (0.25 kg) Probe Length 13.78" (350 mm); 0.77 lbs (0.35 kg)

Notes:

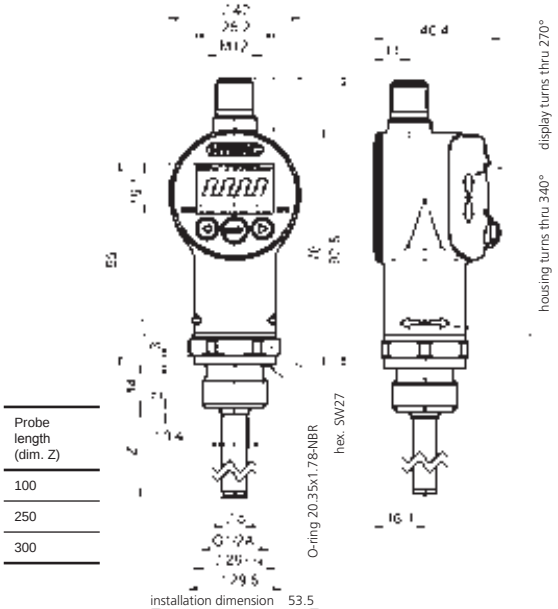
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

FS (Full Scale) = relative to complete measuring range

1.) Available upon request: -25 °C with FPM seal, -40 °C

2.) Environmental conditions according to 1.4.2 UL 61010-1; C22.2 no 61010-1

Electronic Temperature Switch



Probe length (dim. Z)
100
250
300

male electr. conn. M12x1 4 pole/5 pole

Setting Options

All the settings available on the ETS 3200 are combined in 2 easy-to-navigate menus. To prevent unauthorized adjustment of the instrument, a programming lock can be set

Setting range of the switching points and switch-back hystereses:

Switching Point Function

Unit	Switching point	Hysteresis	Increment*
°C	-23.0 .. 100.0	1.0 .. 123.5	0.5
°F	-9 .. 212	2 .. 222	1

Window Function

Unit	lower Switch Value	Upper Switch Value	Increment*
°C	-23.0 .. 97.5	-22.0 .. 98.5	0.5
°F	-9 .. 208	-7.. 209	1

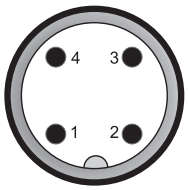
* All ranges given in above tables are adjustable by increments shown

Additional Functions

- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O)
- Switch-on and switch-off delay adjustable from 0.00 .. 99.99 seconds
- Choice of display (actual temperature, peak temperature, switching point 1, switching point 2, display off)

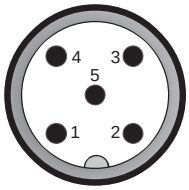
Pin Connections

Pin	ETS 3226-2	ETS 3226-3
1	+U_B	+U_B
2	SP 2	Analog
3	O V	O V
4	SP 1	SP 1



M12x1, 4 pole

Pin	ETS 3228-5
1	+U_B
2	Analog
3	O V
4	SP 1
5	SP 2



M12x1, 5 pole

Electronic Temperature Switch

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder ETS32

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
ETS32					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
ETS32	2	6	2	100	000	**= ETS32262100000**

BOX 1

Model Number
ETS32

BOX 2

Mechanical Connection
2 = G1/2 A DIN 3852 (male)

BOX 3

Electrical Connection
6 = Male, M12x1, 4 pole (only possible on output models 2 & 3)
8 = Male, M12x1, 5 pole (only possible on output model 5)

BOX 4

Output
2 = 2 switching outputs (only in conjunction with electrical connection type 6)
3 = 1 switching output and 1 analog output (only in conjunction with electrical connection type 6)
5 = 2 switching outputs and 1 analog output (only in conjunction with electrical connection type 8)

BOX 5

Measuring Range
100 = 3.94" (100 mm)
250 = 9.84" (250 mm)
350 = 13.78" (350 mm)

BOX 6

Modification Number
000 = Standard

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Electronic Temperature Transmitter with HSI Sensor Recognition

ETS-4148-H

The electronic temperature transmitter ETS 4148-H with HSI sensor recognition has been specially developed for use in conjunction with measuring instruments HMG 2500 or HMG 4000.

For data transmission, the ETS 4148-H has an HSI interface (Sensor Interface). The HSI sensors are automatically recognized by the above-mentioned measuring instruments and all necessary basic settings are taken from each sensor.

Like all temperature transmitters of the ETS 4000 series, the ETS 4148-H features a robust design and excellent EMC properties. Based on corresponding evaluation electronics, the temperature sensor is designed to measure temperatures in the range -13°F to 212°F (-25 °C to 100 °C).

Features and Benefits

- Fully automatic sensor recognition by, and voltage supply from, measuring instruments HMG 2500 or HMG 4000.
- Automatic transfer of measuring range, measured value and measurement unit
- Accuracy ≤ ± 0.8% FS
- Robust design
- Excellent EMC characteristics
- Excellent long term stability
- Standard protection class IP 67

Specifications

Input Data	
Measuring Principle:	PT 1000
Measuring Range:	-13°F to 212°F (-25 °C to 100 °C)
Probe Length:	0.24" (6 mm)
Probe Diameter:	0.18" (4.5 mm)
Pressure Resistance:	8702.26 psi (600 bar)
Overload Pressure:	13053.4 psi (900 bar)
Mechanical Connection:	G1/4 A DIN 3852
Torque Value:	20 Nm
Parts in Contact with Medium[1]:	Mechanical Connection - Stainless Steel Seal - FPM
Output Data	
Output Signal:	HSI Automatic sensor recognition through HMG
Accuracy (at room temperature):	≤ ± 0.4% FS typ. ≤ ± 0.8% FS max
Temperature Drift:	≤ ± 0.01% FS/°C
Rise time to DIN EN 60751	t_{50}: ~4 s t_{90}: ~8 s
Environmental Conditions	
Operating Temperature Range[2]:	-40°F to 185°F/-13°F to 185°F (-40°C to 85°C/-25°C to 85°C)
Storage Temperature Range:	-40°F to 212°F (-40°C to 100 °C)
Fluid Temperature Range:	-40°F to 257°F/-13°F to 257°F (-40°C to 125 °C/-25°C to 125°C)
CE Mark:	EN 61000-6-1/2/3/4
Vibration Resistance to DIN EN 60068-2-6 (10 .. 500 Hz):	≤ 25 g
Protection class to IEC 60529:	IP 67 (when IP 67 connector is used)
Other Data	
Electrical Connection:	M12x1, 5 pole
Voltage Supply:	Via measuring instrument HMG2500 or HMG4000
Weight:	0.44 lbs (0.2 kg)

Notes:

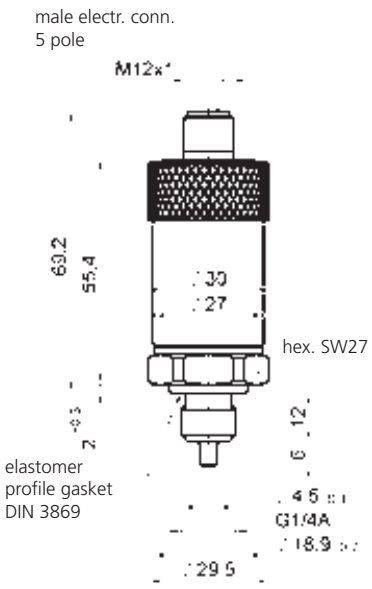
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

FS (Full Scale) = relative to complete measuring range

1) Other seal materials available on request

2) -25°C with FPM seal, -40°C on request

Electronic Temperature Transmitter with HSI Sensor Recognition



How to Build a Valid Model Number for a Schroeder ETS41

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6
ETS41					

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	
ETS41	4	8	H	006	000	**= ETS4148H00600**

BOX 1	BOX 2	BOX 3	BOX 4
Model Number	**Mechanical Connection**	**Electrical Connection**	**Signal**
ETS41	4 = G1/4 A DIN 3852 (male)	8 = Male, M12x1, 5 pole (connector not supplied)	H = HSI (automatic sensor recognition)

BOX 5	BOX 6
Probe Length	**Modification Number**
006 = 0.24" (6 mm)	000 = Standard

Sensor Model Number Selection

Electronic Level Switch

ENS-3000

The ENS 3000 is an electronic level switch with integrated display. The instrument has 1, 2 or 4 switching outputs and an analog output signal is available as an option.

In addition to the standard minimum and maximum switching signals, with the 4 switching output version it is possible to set additional warning signals to prevent problems such as tank overflow or aeration of the pump. The ENS 3000 can be used for oil as well as water. The fluid type can be selected for specific applications via the menu. The main applications of the ENS 3000 are primarily in hydraulics, e.g. for fluid level monitoring of a tank.

The ENS 3000 is available in standard probe lengths of 250 mm, 410 mm,520 mm and 730 mm. The instrument is also available with or without an integrated temperature sensor.

Features and Benefits

- 1, 2 or 4 independent PNP transistor switching outputs
- Selectable for use with oil or water
- User-selectable switch outputs based on the measured value
- Switching and switch-back points can be adjusted independently
- Selectable analog output (optional)
- 4-digit display
- Simple to operate due to menu-based key operation

Specifications

Input Data	
Sensor Type:	Capacitive Fluid Level Sensor
Probe Length:	9.84" (250 mm); 16.14" (410 mm); 20.47" (520 mm); 28.74" (730 mm)
Active Zone:	6.70" (170 mm); 11.42" (290 mm); 15.35" (390 mm); 23.23" (590 mm)
Max. Speed of Change in Fluid Level:	40; 60; 80; 100 mm/s
Repeatability (1):	≤ ± 2 % FS
Switching Point accuracy:	≤ ± 2 % FS
Temperature (Optional)	
Sensor Type:	Semiconductor Sensor
Measuring Range:	-13°F to 212°F (-25 °C to 100 °C)
Accuracy:	± 34.7°F (1.5 °C)
Reaction Time (t_{90}):	180 s
Output Data	
Analog Output (optional)	
With 1 or 2 SP Selectable:	4 .. 20 mA ohmic resist. ≤ 500 Ω 0 .. 10 V ohmic resist. ≥ 1 kΩ corresponds to measuring range selected
With 4 SP Selectable (only with temperature sensor):	0 .. 10 V ohmic resist. ≥ 1 kΩ corresponds to measuring range selected
Switch Outputs	
Type:	PNP transistor switching output Programmable as N/O / N/C
Assignment:	On version with temperature measurement, user can select temperature or fluid level
Switching Current:	1 or 2 SP: max. 1.2 A per output 4 SP: max. 0.25 A per output
Switching Cycles:	> 100 Million
Environmental Conditions	
Compensated Temperature:	0 °F to 140°F (0 °C to 60 °C)
Operating Temperature Range:	0 °F to 140°F (0 °C to 60 °C)
Storage Temperature Range:	-40 °F to 176°F (-40 °C to 80 °C)
Fluid Temperature Range:	0 °F to 140°F (0 °C to 60 °C)
CE Mark:	EN 61000-6-1/2/3/4
cULus Mark(2):	Certificate No. E318391
Vibration Resistance to DIN EN 60068-2-6 (0 .. 500 Hz):	≤ 5 g
Shock Resistance to DIN EN 60068-2-29 (1 ms):	≤ 25 g
Protection class to IEC 60529:	IP 67
Other Data	
Supply Voltage for use acc. to UL spec.:	9 .. 35 V DC without analog output 18 .. 35 V DC with analog output - limited energy - according to 9.3 UL 61010; Class 2; UL 1310/1585; LPS UL 60950
Current Consumption:	max. 2.47 A total max. 90 mA with inactive switching outputs and 2 analog outputs
Residual Ripple of Supply Voltage:	≤ 5%
Fluids(3):	Hydraulic oils (mineral based), synth. oils, fluids containing water
Parts in Contact with Medium:	Ceramic
Display:	4-digit, LED, 7 segment, red, height of digits 7 mm
Weight:	0.40 lbs (0.18 kg); 0.49 lbs (0.22 kg); 0.55 lbs (0.25 kg); 0.66 lbs (0.3 kg)

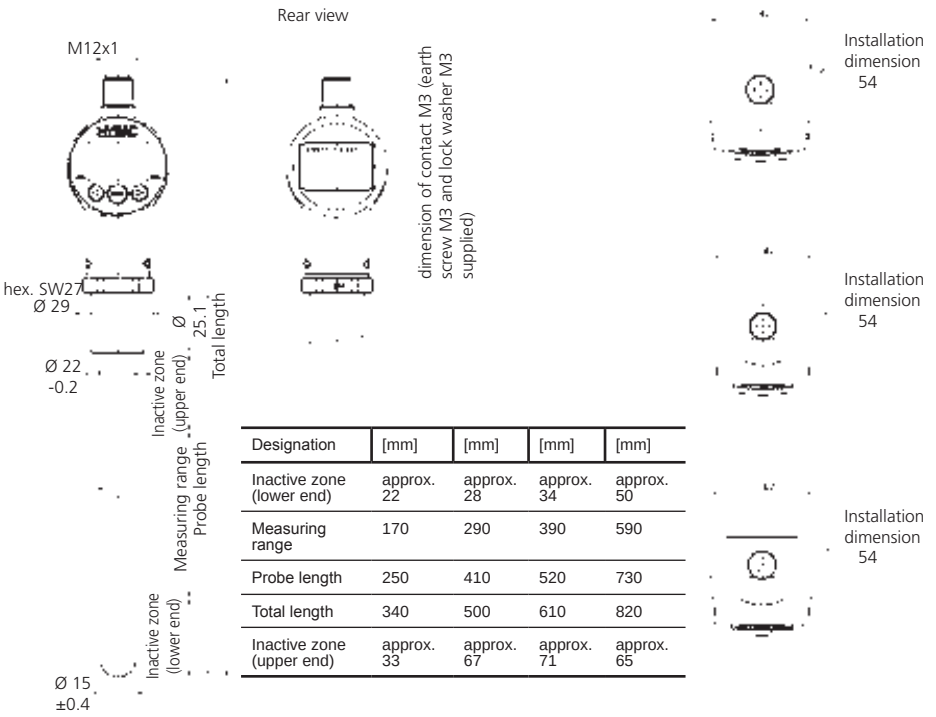
Notes:

Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

FS (Full Scale) = relative to complete measuring range

1) Specified for calm, non-turbulent fluid
2) Environmental conditions according to 1.4.2 UL 61010-1; C22.2 No. 61010-1
3) Other fluids on request

Electronic Level Switch



Designation	[mm]	[mm]	[mm]	[mm]
Inactive zone (lower end)	approx. 22	approx. 28	approx. 34	approx. 50
Measuring range	170	290	390	590
Probe length	250	410	520	730
Total length	340	500	610	820
Inactive zone (upper end)	approx. 33	approx. 67	approx. 71	approx. 65

Setting Options

All the settings available on the ETS 3000 are combined in 2 easy-to-navigate menus. To prevent unauthorized adjustment of the instrument, a programming lock can be set

Setting range of the switching points and switch-back hystereses:

Fluid Level Switching Point Function

Probe Length in cm	Meas. Range in cm	Switching Point in cm*	Hysteresis in cm*
25.0	17.0	0.3 .. 17.0	0.1 .. 16.8
41.0	29.0	0.5 .. 29.0	0.2 .. 28.7
52.0	39.0	0.6 .. 39.0	0.2 .. 38.6
73.0	59.0	0.9 .. 59.0	0.3 .. 58.4

The increment for all units is 0.1 cm

Temperature Switching Point Function

Unit	Meas. Range	Switching Point	Hysteresis
°C	-25 .. 100	-23.0 .. 100.0	1.0 .. 123.5

The increment for all units is 0.5 °C

Fluid Level Window Function

Probe Length in cm	Lower Switch Value in cm*	Upper Switch Value in cm*
25.0	0.3 .. 16.7	0.4 .. 16.8
41.0	0.5 .. 28.4	0.7 .. 28.7
52.0	0.6 .. 38.3	0.9 .. 38.6
73.0	0.9 .. 57.9	1.4 .. 58.4

The increment for all units is 0.1 cm

Temperature Window Function

Unit	Lower Switch Value	Lower Switch Value
°C	-23.5 .. 97.5	-22.0 .. 98.5

The increment for all units is 0.5 °C

Fluid Level Offset Function

Probe Length in cm	Meas. Range in cm	Offset in cm*
25.0	17.0	0 .. 68.0
41.0	29.0	0 .. 116.0
52.0	39.0	0 .. 156.0
73.0	59.0	0 .. 177.0

The increment for all units is 0.1 cm

NOTE:

*All ranges given in the table are adjustable by the increments shown.

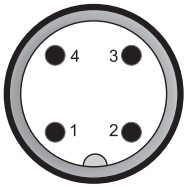
Electronic Level Switch

Additional Functions

- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O)
- Switching outputs can be assigned to fluid level or temperature, as required
- Switch-on and switch-off delay adjustable from 0.00 .. 99.99 seconds
- Display can be adjusted (actual fluid level, actual temperature, peak values, switching point 1, 2, 3, 4 or display off)
- Analog output can be assigned to fluid level or temperature as required (depending on model)

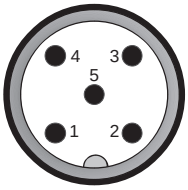
Pin Connections

Pin	ENS 3X16-2	ENS 3X16-3
1	$+U_B$	$+U_B$
2	SP 2	Analog
3	O V	O V
4	SP 1	SP 1



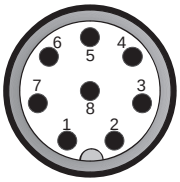
M12x1, 4 pole

Pin	ENS 3X18-5
1	$+U_B$
2	Analog
3	O V
4	SP 1
5	SP 2



M12x1, 5 pole

Pin	ENS 3X1P-8
1	$+U_B$
2	SP 2
3	O V
4	SP 1
5	SP 3
6	SP 4
7	Analog fluid level
8	Analog temperature



M12x1, 8 pole

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder ENS3

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
ENS3							

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
ENS3	1	1	6	2	250	000	K	**= ENS31162250000K**

BOX 1 — Model Number

ENS3

BOX 2 — Temperature Sensor

1 = With Temp. Sensor

2 = Without Temp. Sensor

BOX 3 — Mechanical Connection

1 = 22 mm collar to fit cutting ring coupling G22L

BOX 4 — Electrical Connection

6 = Male M12x1, 4 pole (only possible on output models "2" & "3")

8 = Male M12x1, 5 pole (only possible on output model "5")

P = Male M12x1, 8 pole (only possible on output model "8")

BOX 5 — Output

2 = 2 switching outputs (only in conjunction with electrical conn. type "6")

3 = 1 switching output & 1 analog output (only in conjunction with electrical conn. type "6")

5 = 2 switching outputs & 1 analog output (only in conjunction with electrical conn. type "8")

8 = 4 switching outputs & 2 analog outputs (only in conjunction with electrical conn. type "P")

BOX 6 — Probe Length (physical) in mm

250 = 9.84"

410 = 16.14"

520 = 20.47"

730 = 28.74"

BOX 7 — Modification Number

000 = Standard

BOX 8 — Probe Material

K = Ceramic

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Electronic Level Switch

HNS-526

The level switch HNS 526 is a non-contact, highly compact sensor for fluid level measurement in stationary applications. By definition, its functional principle (measurement of sound transmission time) means that it operates with an extremely high resolution and measurement rate.

The HNS 526 is available for measurement ranges up to 6400 mm and is obtainable in different signal output variants (2 switching outputs; 1 switching output and 1 analog output, either 4 .. 20 mA or 0 .. 10 V).

The sensor can be adjusted simply and conveniently via two push-buttons and a self-explanatory menu structure according to VDMA.

The actual fluid level can be displayed in a 3-digit digital display either in absolute value or in percent (selectable); 2 three-color LEDs also indicate the operating status.

Features and Benefits

- Non-contact distance measurement
- Measurement range up to 6400 mm
- Various signal output versions available
- Very high resolution and measurement rate
- Integrated temperatures compensation
- 3-digit digital display to show the actual distance
- 2 three color LEDs to display the operating status
- Switching and switch-back points can be adjusted independently
- Selectable analog output (optional)
- Only for use in depressurized applications
- Must be installed vertically to the fluid surface

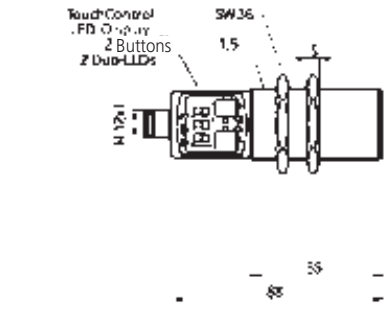
Specifications

Input Data	
Operating Range:	11.02" (280 mm); 18.90" (480 mm); 63.00" (1600 mm); 157.48" (4000 mm); 252.00" (6400 mm)
Blind Zone:	0"-1.18" (0-30 mm); 0"-3.35" (0-85 mm); 0"-7.87" (0-200 mm); 0"-13.78" (0-350 mm); 0"-23.62" (0-600 mm)
Maximum Range:	13.78" (350 mm); 23.62" (600 mm); 78.74" (2000 mm); 196.85" (5000 mm); 314.96" (8000 mm)
Resolution:	≤ 0.18 mm
Output Data	
Accuracy:	≤ ± 1% of the actual measured value
Repeatability:	± 0.15% of the actual measured value
Analog Output (optional)	
Signal(short-circuit resistant):	Selectable: 4 .. 20 mA R_{Lmax} 100 Ω (U_b ≤ 20 V) R_{Lmax} 500 Ω (U_b > 20 V) 0 .. 10 V R_{Lmin} 100 Ω (U_b ≥ 20 V)
Switch Outputs	
Type:	PNP transistor output (short-circuit resistant)
Switching Current:	Max. 200 mA per switching output
Switching Directions:	N/O or N/C, adjustable
Switching Cycles:	> 100 million
Reaction Time:	32; 64; 92; 172; 240 ms
Environmental Conditions	
Operating Temperature:	-13°F to 158°F (-25°C to 70 °C)
Storage Temperature Range:	-40°F to 185°F (-40°C to 85 °C)
CE Mark:	DIN EN 60947-5-2 DIN EN 60947-5-7
Vibration Resistance to DIN EN 60068-2-6 (10 .. 55 Hz):	≤ 2 g
Shock Resistance to DIN EN 60068-2-27 (11 ms):	≤ 30 g
Protection class to IEC 60529:	IP 67
Other Data	
Supply Voltage:	9 .. 30 V DC without analog output 20 .. 30 V DC with analog output
Time Delay Before Availability:	< 300 ms
Residual Ripple:	± 10%
No-load Current Consumption:	≤ 80 mA
Electrical Connection:	Male M12x1, 4 pole
Housing:	Brass, Nickel-plated; Ultrasonic Transducer with PEEK film
Display:	3-digit, LED Display, 2 three-color-LEDs
Controls:	2 push-buttons
Weight:	0.33 lbs (0.15 kg); 0.46 lbs (0.21 kg); 0.60 lbs (0.27 kg)

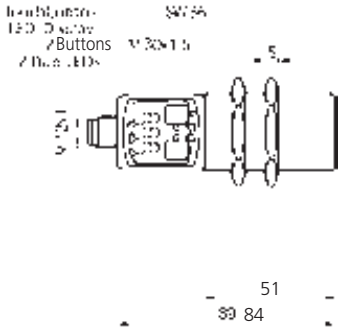
Notes:
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

Electronic Temperature Switch

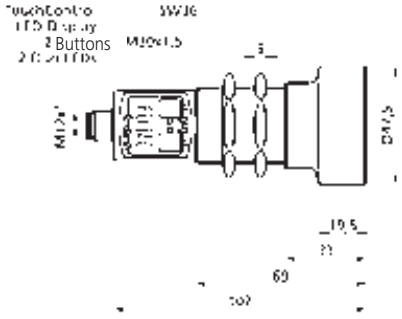
Operational scanning range:
280 mm



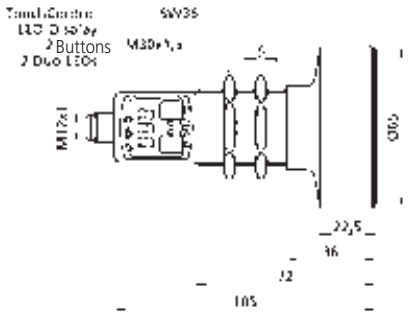
480 mm,1600 mm



Operational scanning range:
4000 mm



6400 mm



Setting Options

All of the terms and symbols used for setting the HNS 526 as well as the menu structure comply with the specifications of the German Engineering Federation Standard (VDMA 24574-4) for level switches. In order to prevent unauthorized adjustment of the device, a key-lock can be set.

Setting ranges of the switching points or switch-back points:

Switching Point Function Distance and Window Function Distance

Operating Scanning Range	SP1, SP2, FH1, FH2*	RP1, RP2, FL1, FL2*
280 mm	2-13 inch (2-32 cm)	1-12 inch (1-31 cm)
480 mm	2-23 inch (2-59 cm)	1-22 inch (1-58 cm)
1600 mm	2-71 inch (2-180 cm)	1-70 inch (1-179 cm)
4000 mm	2-183 inch (2-465 cm)	1-182 inch (1-464 cm)
6400 mm	2-291 inch (2-740 cm)	1-290 inch (1-739 cm)

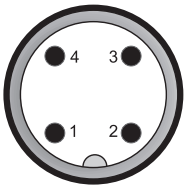
Switching Point Function:
SP1, SP2 = Switching points 1 or 2
RP1, RP2 = Switch-back points 1 or 2

Window Function:
FH1, FH2 = Upper switch values 1 or 2
FL1, FL2 = Lower Switch values 1 or 2

*The increment for all devices is 1 cm or 1 inch.

Pin Connections

Pin	HNS 526-2	HNS 526-3
1	$+U_B$	$+U_B$
2	SP 2	I/U
3	O V	O V
4	SP 1	SP 1



M12x1, 4 pole

Electronic Level Switch

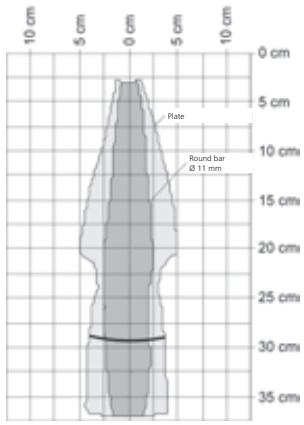
Additional Functions

- Switching mode of the switching outputs adjustable (switching point function or window function)
- Switching direction of the switching outputs adjustable (N/C or N/O)
- Switch-on delay adjustable from 0-20 seconds
- Energy saving mode

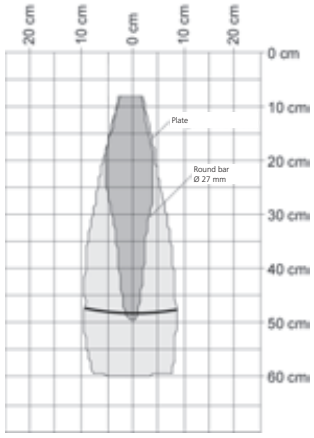
Recording Ranges

The grey areas show the detection range for a very large reflector, e.g. a fluid surface, providing the sensor is ideally positioned. Outside the grey area, it is not possible to evaluate the ultrasonic reflections.

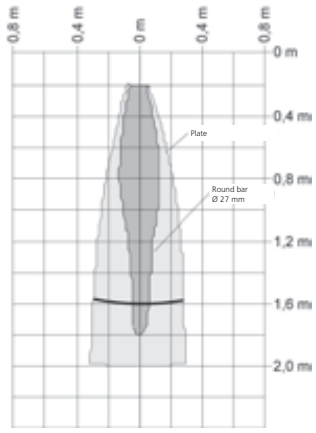
Operational scanning range 280 mm:



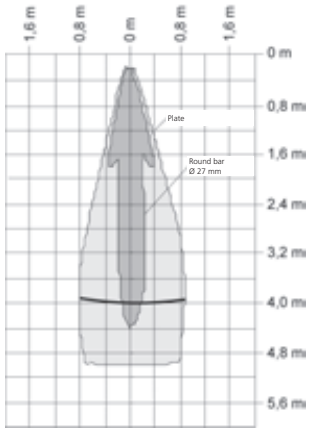
Operational scanning range 480 mm:



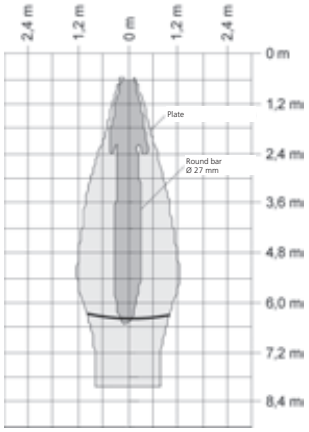
Operational scanning range 1600 mm:



Operational scanning range 4000 mm:



Operational scanning range 6400 mm:



Electronic Temperature Switch

Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder HNS5

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
HNS5						

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
HNS5	2	6	2	0280	000	F	**= HNS52620280000F**

BOX 1 — Model Number

HNS5

BOX 2 — Mechanical Connection

2 = M30x1.5

BOX 3 — Electrical Connection

6 = Male M12x1, 4 pole (connector not supplied)

BOX 4 — Output

2 = 2 switching outputs

3 = 1 switching output and 1 analog output

BOX 5 — Operational Scanning Range in mm

0280
0480
1600
4000
6400

BOX 6 — Modification Number

000 = Standard

BOX 7 — Design, Font Face of Sensor

F = Foil

NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Fluid Level Indicators

FSK

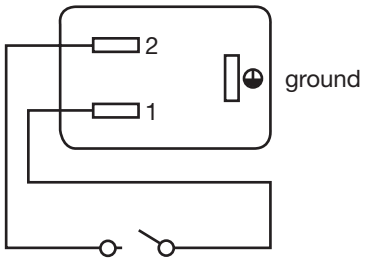
The FSK fluid level sensor monitors the tank fluid level via an electrical switching signal. This switch signal can be used for a warning or to control the fluid level. The fluid enters the unit via the lower connection bore and pushes a float up the tube. The float now shows the fluid level in the tank. If the level of the fluid drops again, the float will activate a switch contact. Switching contacts can either be Type O (opens when fluid is at low level), Type C(closes when fluid is at low level), or type W(dual switching mode) which can be used either to close on contact or to open on contact.

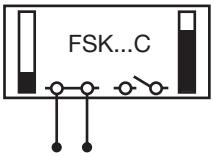
Specifications

Contact Ratings:	Max. BW
Maximum Voltage:	50V AC or DC
Maximum Current:	200 mA (magnetic float inside the tube trips switch when fluid level drops within 50mm of lower bolt. See illustration

NOTE: FSA/FSK not suitable for use with glycol or fluids containing glycol.

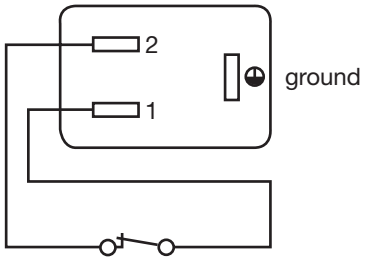
FSK...C *(open at normal level)*

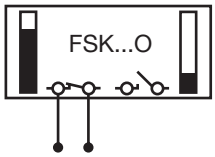




Contacts **CLOSE** when fluid level drops **BELOW** switching level

FSK...O *(closed at normal level)*





Contacts **OPEN** when fluid level drops **BELOW** switching level

Electrical Specifications

Contact Ratings

- Max. 8W

Maximum Voltage

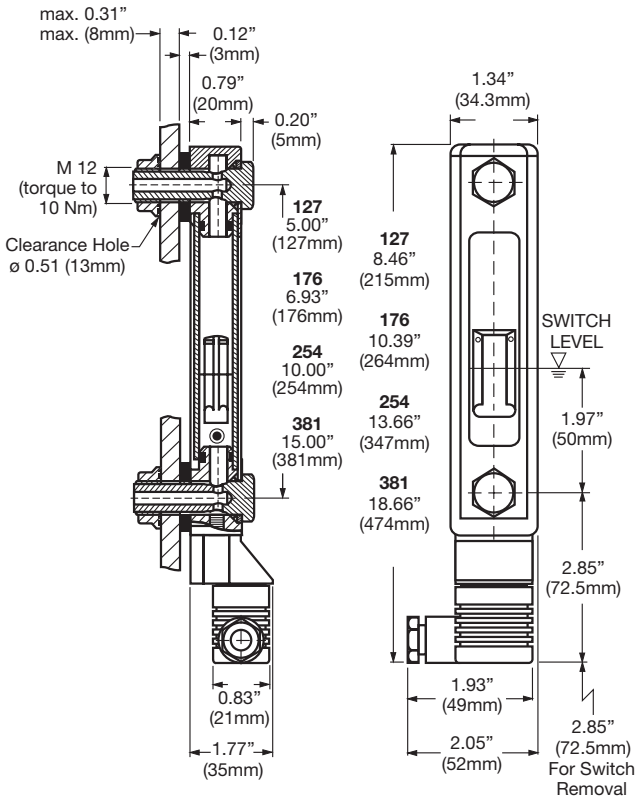
- 50V AC or DC

Maximum Current

- 200 mA

Magnetic Float inside tube trips switch when fluid level drops within 50mm of lower bolt. *(see illustration)*

Fluid Level Indicators



Sensor Model Number Selection

How to Build a Valid Model Number for a Schroeder FSK

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8
FSK							

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	
FSK	127	2	4	C		12		**= FSK12724C12**

BOX 1

Model Number
FSK

BOX 2

Size (mounting hole centers)
127 = 5″
176 = 7″
254 = 10″
381 = 15″

BOX 3

Seals
2 = Fluorocarbon

BOX 4

Modification Number
4 = FSK (determined by manufacturer)

BOX 5

Electrical Switch
C = Open at normal level
O = Closed at normal level

BOX 6

Thermometer
Omit = No thermometer (standard)
FT 100 = 3.94″ (100 mm)
FT 200 = 7.87″ (200 mm)
FT 300 = 11.87″ (300 mm)
TS = Thermo Switch

BOX 7

Hex Head Bolt
12 = M12 x 1.75 bolt

BOX 8

Sight Tube
Omit = Polyamide construction
SO14 = Glass tube construction

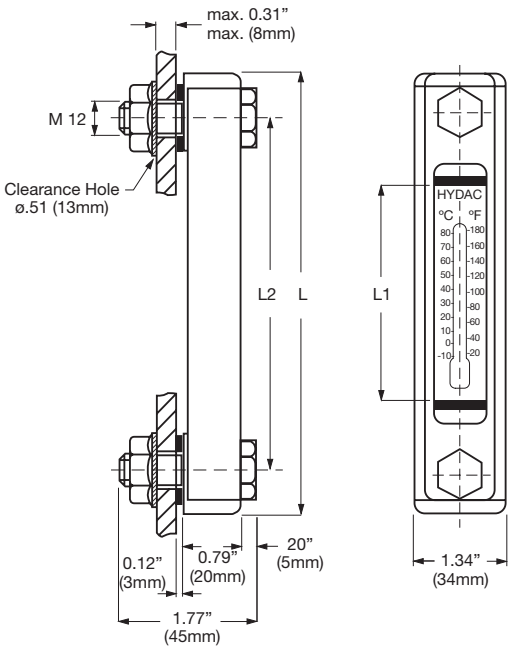
NOTE:

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

Fluid Level Indicators

By Using the FSA, The fluid level can be easily seen on the outside of the tank. The fluid enters the unit via the lower connection bore and is clearly vi-sable in the tube. By selecting the right size, the tank fluid level can be visually monitored.

FSA



Size	L	L1	L2
76	4.25" (108mm)	1.46" (37mm)	2.99" (76mm)
127	6.26" (159mm)	2.99" (76mm)	5.00" (127mm)
176	8.19" (208mm)	4.92" (125mm)	6.93" (176mm)
254	11.26" (286mm)	7.99" (203mm)	10.00" (254mm)
381	16.26" (413mm)	12.99" (330mm)	15.00" (381mm)

NOTE: FSA/FSK not suitable for use with glycol or fluids containing glycol.

How to Build a Valid Model Number for a Schroeder FSK

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
FSA						

Example: *NOTE: One option per box*

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
FSA	76	1	0		12		**= FSA761012**

BOX 1 — Model Number

FSA

BOX 2 — Size (mounting hole centers)

76 = 3"
127 = 5"
176 = 7"
254 = 10"
381 = 15"

BOX 3 — Seals

1 = NBR
2 = Fluorocarbon

BOX 4 — Housing Material

0 = Steel (only for SO14 glass tube construction)
1 = Aluminum
2 = ABS Plastic

BOX 5 — Thermometer

Omit = No thermometer (standard)
T = Built-in Tube
FT 100 = 3.94" (100 mm)
FT 200 = 7.87" (200 mm)
FT 300 = 11.87" (300 mm)
TS = Thermo Switch

BOX 6 — Hex Head Bolt

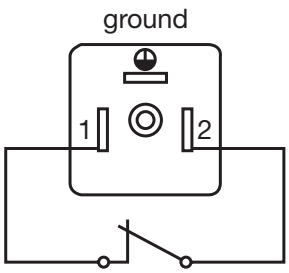
12 = M12 x 1.75 bolt

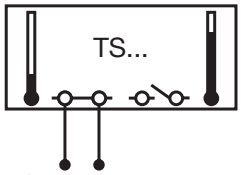
BOX 8 — Sight Tube

Omit = Polyamide construction
SO14 = Glass tube construction

Fluid Level Indicators

Electric Thermo Switch | TS





Contacts **OPEN**
when fluid temperature rises
ABOVE switching temperature

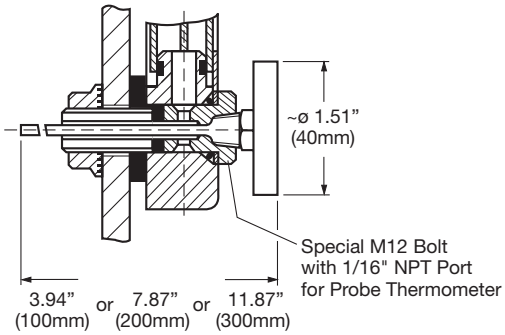
Features and Benefits

- Analog dial type thermometer for visual temperature indication
- Temperature Range (Dual Scale) 0° to 212°F and 0° to 100°F

Electrical Specifications

Maximum Voltage:	50V AC or DC
Maximum Current:	50 mA
Contact:	Normally Closed
Switching Tolerance:	±10°F
Hysteresis:	TS 60/70 27°F (15°C) TS 80 36°F (20°C)
Expected Life Cycle:	at 25 A / 50 V 10,000 cycles at 0.5 A / 50 V 100,000 cycles

Detail of Lower Connection

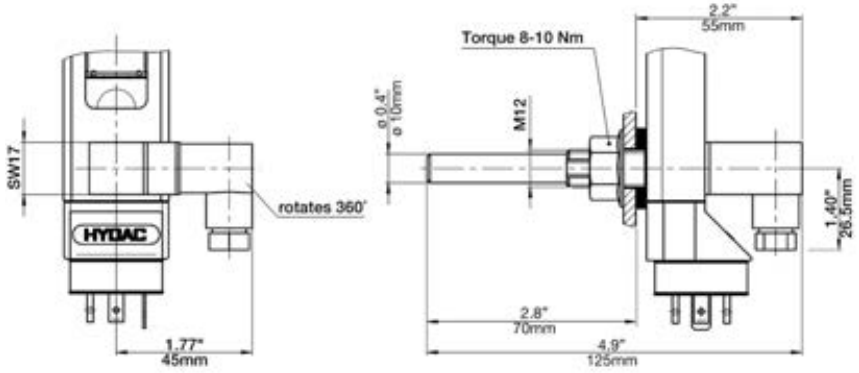


Probe Thermometers

Thermo Switch Code	Model Code	Part Number	Mounting Thread
FT100	FT-100 TEMP PROBE W/M12 BOLT	02067556	M 12
FT200	FT-200 TEMP PROBE W/M12 BOLT	00086740	M 12
FT300	FT-300 TEMP PROBE W/M12 BOLT	00086741	M 12

Thermo Switch

(Normally Closed Contact)



Thermo Switch Code	Model Code	Part Number	Switch Opens @	Switch Closes @	Mounting Thread
TS60	TS-L-60/X/12	03252752	60°C/140°F	45°C/113°F	M 12
TS70	TS-L-70/X/12	03252766	70°C/158°F	55°C/131°F	M 12
TS80	TS-L-80/X/12	03252767	80°C/176°F	60°C/140°F	M 12

Fluid Level Indicators

Technical Data

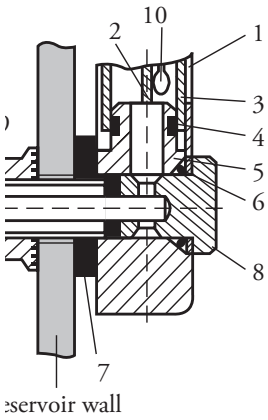
Material	
Housing:	Anodized Aluminum or ABS Plastic
Sight tube:	Polyamide or Glass
Seals:	Fluorocarbon, NBR
Nuts/Bolts:	Steel, Zinc plated
Thermometer Range	
Type T (FSA only):	14°F to 176°F (-10°C to 80°C)
Type FT100:	32°F to 212°F (0°C to 100 °C)
Type FT200:	32°F to 212°F (0°C to 100 °C)
Type FT300:	32°F to 212°F (0°C to 100 °C)
Other Data	
Fluid Temperature:	-4°F to 176°F (-20°C to 80 °C)
Maximum Pressure:	14.5 PSI (1 bar)
Bolting Torque:	Max. 8 lb-ft+1 (10 Nm +2) see installation instructions below

Recommended Installation Process

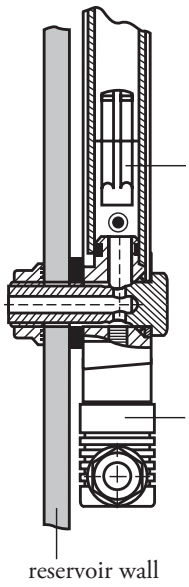
1. Drill mounting holes (13 mm) according to dimension L2.
2. Torque the Nut, item 9, to 8+ 1 LB-FT. If it is not possible to torque the nut, the bolt head must be torqued. To avoid damaging the indicator a washer is recommended to be used under the bolt head. This washer is available from HYDAC: Part Number 00001689. Washer Dimensions: øD 18.8 mm, ID 13.10 mm, 0.5 mm thick

Component Parts

FSA & FSK



FSK Only



Item	Description		Part No.	Quantity FSA	Quantity FSK
1	Housing		-	1	1
2	Name Plate		-	1	-
3	Tube		-	1	1
4*	O-ring 13X2.5	FPM-70 (Fluorocarbon)	00601916	2	2
		NBR-70 (Buna)	00601047		
5	Tube Connector		-	2	2
6*	O-ring 12.3X2.4	FPM-70 (Fluorocarbon)	00601531	2	2
		NBR-70 (Buna)	00601045		
7*	Washer FSA/FSK	FPM (Fluorocarbon)	22183158	2	2
		NBR (Buna)	00271948		
8*	Bolt M12 SW17 FSA		22183153	2	2
9*	Nut Hex M12 FSA		22183151	2	2
10	Thermometer *(In Tube)*		-	1	-
11*	Probe Thermometer		See pg. 141	1	1
12*	Bolt FSA/K M12 SW17 for FT Temp Probe		03126743	1	1
13	Magnetic Float		-	-	1
14	Base Assembly w/Type "C" Switch		-	-	1
15	Base Assembly w/Type "O" Switch		-	-	1
16*	Washer FSA/FSK Steel		00001689	2	2

* items may be purchased individually.

Items listed in RED are not sold as spare parts.

HMG 2500 TestMate® Series

Features and Benefits

- Simple and user-friendly operation
- Large, full color graphics display
- Quick and independent basic setting by use of automatic sensor recognition
- HMG 2500 can only be used with Schroeder HSI and Schroeder SMART sensors
- Up to 4 sensors and 32 measurement channels can be connected simultaneously
- Sampling rates up to 0.1 ms
- Very large data memory for archiving measurement curves
- Various measurement modes: Normal measuring, Fast curve recording, Long-term measurement
- 2 independent triggers, can be linked logically
- Simple sensor connection with M12x1 push-pull connector
- PC connection: USB and RS 232
- Convenient visualization, archiving and data processing using the HMGWIN software supplied

Description

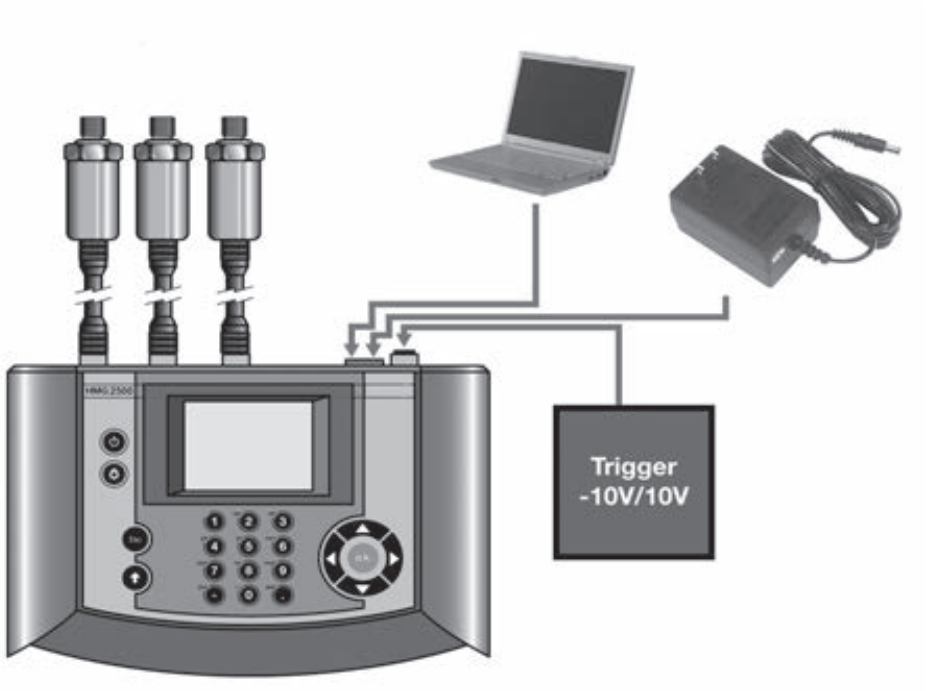
Automated setting procedures, a simple, self-explanatory operator guide and many comprehensive functions ensure the operator is able to carry out a wide range of measurement tasks within a very short time. This makes the HMG 2500 an ideal companion for employees in maintenance, commissioning and service.

The device is designed primarily to record pressure, temperature and flow rate values, which are the standard variables in hydraulics and pneumatics. For this purpose, special sensors are available. The HMG 2500 recognizes the measured variable, measuring range and the unit of these sensors and automatically carries out the basic device settings accordingly.

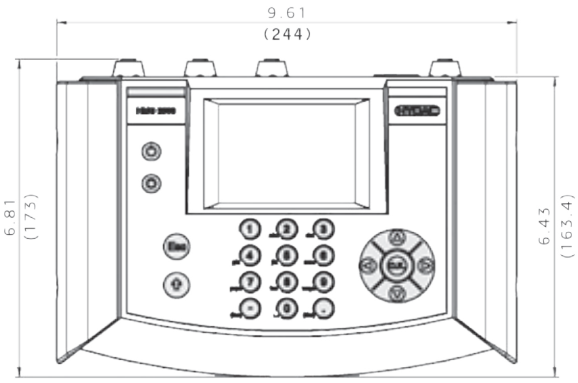
In addition to this, the HMG 2500 has a digital input, e.g. for frequency or speed measurement, as well as a virtual measurement channel for the measurement of difference or performance.

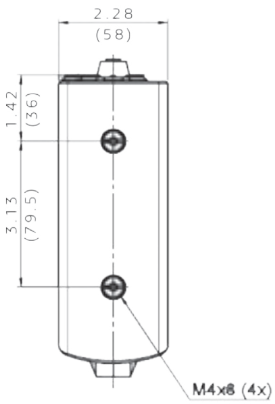
Due to the wide range of functions and its simple handling, the HMG 2500 is just as appropriate for users who take measurements only occasionally as it is for professionals for whom measuring and documentation are routine.

The HMG 2500 is designed to accept future upgrades of the device software.

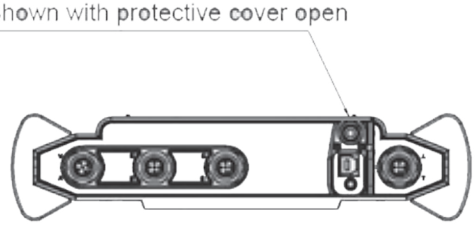


Dimensions



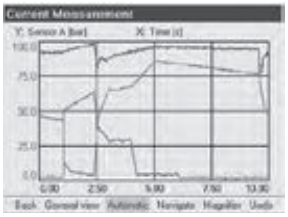


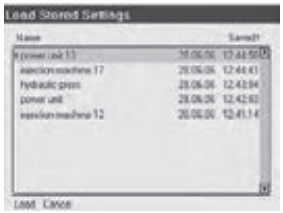
Shown with protective cover open



Function

- Clear and graphical selection menus guide the operator intuitively to all the device functions available. A navigation pad on the keypad ensures rapid operation
- The HMG 2500 can monitor signals from up to 4 **sensors simultaneously**.
- The following sensors can be connected to 3 of these input sockets:
  - 3 analogue sensors (e.g. for pressure, temperature and flow rate) with the special digital HSI interface (Sensor Interface); this means the basic device settings (measured variable, measuring range and unit of measurement) are undertaken automatically
  - 3 analogue sensors (e.g. for pressure, temperature and flow rate) with the special digital HSI interface (Sensor Interface); *reference HSI information above*
- Frequency measurements, counter functions or triggers for data logging can be implemented via the fourth input socket with one digital input
- Additionally, the HMG 2500 has a virtual measurement channel which enables a differential measurement or a performance measurement by means of the sensors connected to the measurement channels "A" & "B"
- All input channels can operate simultaneously at a **sampling rate** of 0.5 ms (1.0 ms for SMART sensors). For the recording of highly dynamic processes, a sampling rate of 0.1 ms can be achieved
- The most impressive function of the HMG 2500 is without doubt its ability to record dynamic processes as a **measurement curve** "online", i.e. in real-time, and to render them as graphs in the field
- The **data memory** for recording curves or logs can hold up to 500,000 measured values per recording. Over 100 of such data recordings in full length can be stored in an additional archiving memory
- For specific, **event-driven curves or logs**, the HMG 2500 has two independent triggers, which can be linked together logically
- User-specific device settings can be stored and re-loaded at any time as required. This means that repeat measurements can be carried out on a machine again and again using the same device settings
- Measured values, curves or texts are visualized on a **full color graphics display** in different selectable formats and display forms
- Numerous useful and easy-to-use **auxiliary functions** are available, e.g. zoom, ruler tool, differential value graph creation and individual scaling, which are particularly for use when analyzing the recorded measurement curves





Software

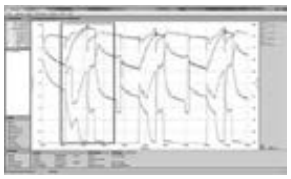
The HMG 2500 communicates with a computer via a USB or RS 232 port. Schroeder offers HMGWIN 2500, the matching software for the HMG 2500, for convenient post-processing, rendering, and evaluation of measurements on a pc. It also enables the HMG 2500 to be operated directly from a computer in real time.

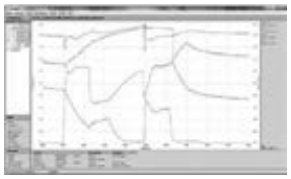
The HMG 2500 is equipped with specially developed software providing for fast data collection and processing. A measurement curve can comprise up to 500,000 measured values. The HMG 2500's measured value memory is capable of storing at least 100 of these curves.

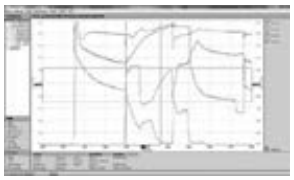
The Schroeder software, CMWIN, is also supplied that allows direct communication with SMART (HSI) sensors connected to the HMG 2500 from your PC.

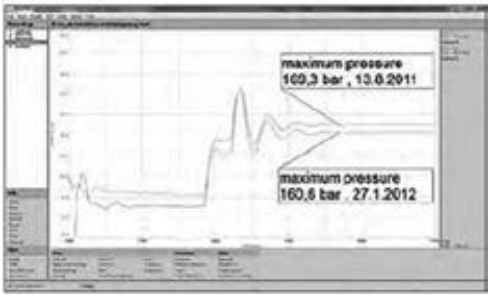
Some examples of the numerous useful additional functions:

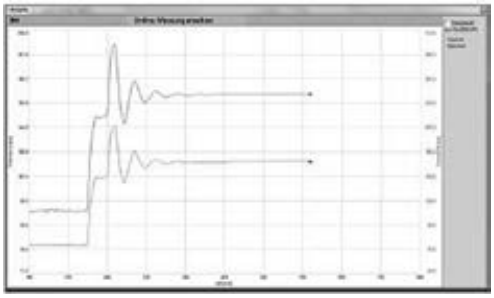
- Transfer and archiving of measurements recorded using the HMG 2500
- Display of the measurements in graph form or as a table
- **Zoom function:** Using the mouse, a frame is drawn around an interesting section of a measurement curve, which is then enlarged and displayed
- **Accurate measurement** of the curves using the ruler tool (time values, amplitude values and differentials)
- Individual **comments** and measurement information can be added to the graph
- **Overlay** of curves, for example to document the wear of a machine (new condition/current condition)
- Using mathematical operations (calculation functions, filter functions), new curves can be added
- Snap-shot function: Comparable to the function of a digital camera, a picture can be taken immediately of any graph and saved as a .jpg file
- A professional measurement report can be produced at the click of a mouse: HMGWIN has an automatic layout function. Starting with a table of contents, all recorded data, descriptions and graphics and/or tables are combined into a professional report and saved as a .pdf file
- Online function (HMGWIN only): Starting, recording, and online display of measurements (similar to the function of an oscilloscope)
- Change of axis assignment of the recorded measurement parameters in graph mode (e.g. to produce a p-Q graph)











Technical Data

Analog Inputs	
Input signals	HSI analogue sensors
3 channels M12x1 Ultra-Lock flange sockets (5-pin) channel A to channel C	HSI SMART sensors
Accuracy	≤ ± 0.1% FS
Digital Input	
1 channel via M12x1 Ultra-Lock flange socket Channel D	Digital status (high/low) Frequency (0.01 to 30,000 Hz)
Calculated channel	
Quantity	1 channel via virtual channel E
Sampling rate (dependent on number of active channels)	0.1 ms, max. 1 input channel 0.2 ms, max. 2 input channels 0.5 ms, all 3 input channels 1.0 ms, for SMART sensors
Resolution	12 bit
Memory	Min. 100 measurement curves, each with 500,000 measured values
Display	3.5" color display 7-segment display
Interfaces	1 USB, 1 serial interface RS 232
CE mark	EN 61000-6-1 / 2 / 3 / 4
Safety	EN 61010
IP class	IP 40
Ambient conditions	
Operating temperature	32°F to 122°F (0°C to 50°C)
Storage temperature	-4°F to 140°F (-20°C to 60°C)
Relative humidity	70%, non-condensing max
Weight	approx. 2.43 lb (1.1 kg)

Order Details

Model Code

Description: HMG 2500 - 000 - US
P/N 7634365

Operating manual and documentation

US = English

Scope of delivery

- HMG 2500
- Power supply for 90 to 230 V AC
- Operating Instructions
- Data carrier with USB drivers. HMGWIN software
- USB connector cable

Accessories

- Additional accessories, such as electrical and mechanical connection adapters, power adapters, etc. can be found in the "Accessories for HMG Series" catalog pages.

HMG 4000 TestMate® Series

Features and Benefits

- Large, full graphics color display 5.7" touch screen
- Capable of recording up to 38 sensors at once, 8 analog, 2 digital sensors and 28 HSCI sensors via CAN bus
- Up to 100 measurement channels can be depicted simultaneously
- High-speed measuring rate, up to 8 sensors at 0.1 ms at a time
- Rapid and automatic basic setting of the device by means of automatic sensor detection
- Analog inputs 0.. 20 mA, 4 .. 20 mA Voltage 0 .. 50V, -10 .. 10 V
- PT 100/1000 input
- Connection to a CAN bus system (also J1939)
- Simple and user-friendly operation, intuitive menu
- Very large data memory for archiving measurement curves enables the storage of 500 measurements with up to 8 Million measured values
- Various measurement modes: Measuring, Fast curve recording, Long term measurements
- Recording of dynamic processes "online" in real time
- Event-driven measurements with several triggering options
- PC interface via USB
- USB Host connection for USB memory sticks
- Convenient visualization, archiving and data processing using the HMGWIN software

Description

The HMG 4000 hand–held measuring unit is a portable measuring and data logging device. It was mainly developed for all values measured in relation with hydraulic systems, such as pressure, temperature, flow rate and position. Moreover, it provides a very high flexibility, even when it comes to evaluating other measuring values. The main applications are servicing, maintenance or test rigs.

The HMG 4000 has a very easy-to-operate user interface due to its large 5.7" touchscreen. The operator can access all of the unit's functions and settings by means of clearly presented selection menus.

The HMG 4000 can record the signals of up to 38 sensors at once. For this purpose, Schroeder Industries offer special sensors, which are automatically detected by the HMG 4000 and whose parameters such as measurement values, measuring ranges and measuring units can be set.

On the one hand, there are the HSI Sensors (Sensor Interface) for the measurement of pressure, temperature and flow rate, for the connection of which there are 8 analog input channels. Furthermore, there is the option of connecting Schroeder SMART sensors to these inputs. SMART senors can display several different measured variables at a time.

Up to 28 special HCSI-Sensors (CAN Sensor Interface) can be connected additionally via the CAN bus Port, also supporting automatic sensor detection.

HMG 4000 can optionally be connected to an existing CAN network. This enables the recording of measured data transmitted via CAN bus (e.g. motor speed, motor pressure) in combination with the measured data from the hydraulic system.

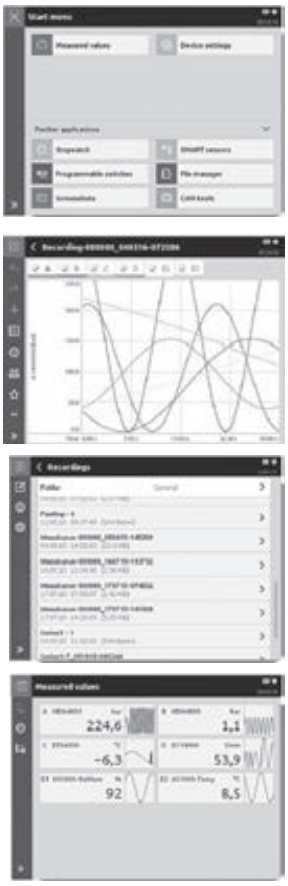
The device also offers measurement inputs for standard sensors with current and voltage signals. The HMG 4000 rounds off the application, providing two additional digital inputs (e.g. for frequency or rpm measurements).

The most impressing feature of the HMG 4000 is its ability to record the dynamic processes of a machine in the form of a measurement curve and render them as a graph — and, moreover, online and in real-time.

Schroeder software HMGWIN which is specific to the HMG 4000, is supplied for convenient postprocessing, rendering and evaluation of measurements on your computer.

Function

- Clear and graphical selection menus intuitively guide the operator to all the device functions available and ensure fast implementation.
- HMG 4000 can detect the signals of up to **38 sensors simultaneously**. 11 Push-pull M12x1 input sockets are available as sensor interfaces. Apart from the push-pull sensor connection cable, M12x1 standard cables can also be used.
- The following sensors can be connected to 8 of these input sockets:
  - 8 analogue sensors (e.g. for pressure, temperature and flow rate) with the special digital HSI interface (Sensor Interface); this means the basic device settings (measured variable, measuring range and unit of measurement) are performed automatically.
  - 8 standard analog sensors with current and voltage signals
  - 8 condition monitoring sensors (SMART sensors), the basic device settings are also performed automatically.
- The blue input socket provides 2 digital inputs, i.e. for 1 or 2 speed sensors (2nd speed sensor connection via Y adapter). Frequency measurements, counting functions or triggers can as well be implemented for data recording.
- Different **CAN bus** functions can be utilized via the red input socket.
  - Connection of up to 28 HCSI sensors (CAN Sensor Interface) by setting up a CAN bus with HCSI sensors and the relevant connection accessories, also with automatic parameterization.
  - Connecting to a CAN bus, you have the option of evaluating up to 28 CAN messages
  - Configuration of **CAN Sensors**, the parameterization is performed by means of EDS files, which can be stored and administrated in the HMG 4000
- The yellow input socket serves as the interface for pressure, temperature or level switches with **I/OLink** as well as for the programming device HPG P1. These devices can be parameterized by means of the HMG 4000.
- The most impressive function of the HMG 4000 is its ability to record dynamic processes “online”, i.e. in real-time, as a **measurement curve** and to render them as graphs. During the recording process of a measuring curve, you can zoom in the curve sections of interest using gestures on the touchscreen.
- For the purpose of recording highly dynamic processes, all 8 analog input channels can be operated simultaneously at a **measuring rate** of 0.1 ms.
- The **data memory** for the recording of curves or logs can memorize up to 8 million measured values. At least 500 of such data recordings in full length can be stored in an additional archiving memory.
- For the targeted **event-driven curve or log recording**, the HMG 4000 has two independent triggers which can be linked together logically. In addition, there is a “start/stop” condition, by means of which a measurement can be initiated or finished.



- User-specific instrument settings can be stored and re-loaded at any time as required. This means that repeat measurements can be carried out on a machine again and again using the same device settings.
- Measured values, curves or texts are visualized on a **full-graphics color display** in different selectable formats and display forms.
- Numerous useful and easy-to-use auxiliary functions are available, e.g. zoom, ruler tool, differential value graph creation and individual scaling, which are particularly for use when analyzing the recorded measurement curves.
- The communication between the HMG 4000 and a PC is performed via the built-in USB port.
- A HMG 4000 connected to your PC is recognized and depicted as a directory by the PC. You can conveniently move measured data to your PC. Optionally, data transfers can be carried out via a file manager by means of a USB memory stick.

Software

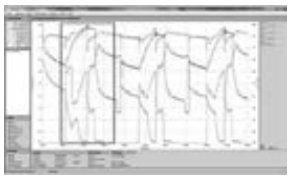
The PC software HMGWIN is also supplied with the device. This software is a convenient and simple package for analyzing and archiving curves and logs which have been recorded using the HMG 4000, or for exporting the data for integration into other PC programs if required. In addition it is also possible to operate the HMG 4000 directly from the computer. Basic settings can be made, and measurements can be started online and displayed directly on the PC screen in real-time as measurement curves progress.

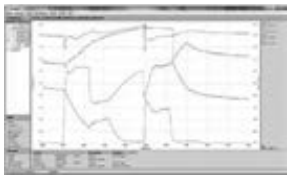
HMGWIN can be run on PCs with Windows 7, Windows 8.1 as well as Windows 10 operating systems.

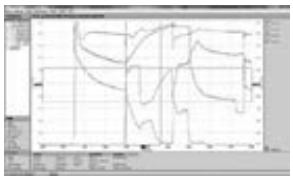
*) SMART sensors (Condition Monitoring Sensors) are a generation of sensors which can provide a variety of different measurement variables.

Some examples of the numerous useful additional functions:

- Display of the measurements in graph form or as a table
- **Zoom function:** Using the mouse, a frame is drawn around an interesting section of a measurement curve, which is then enlarged and displayed
- **Accurate measurement** of the curves using the ruler tool (time values, amplitude values and differentials)
- Individual **comments** and measurement information can be added to the graph
- **Overlay** of curves, for example to document the wear of a machine (new condition/current condition)
- Using mathematical operations (calculation functions, filter functions), new curves can be added
- Snap-shot function: Comparable to the function of a digital camera, a picture can be taken immediately of any graph and saved as a .jpg file
- A professional measurement report can be produced at the click of a mouse: HMGWIN has an automatic layout function. Starting with a table of contents, all recorded data, descriptions and graphics and/or tables are combined into a professional report and saved as a .pdf file
- Online function (HMGWIN only): Starting, recording, and online display of measurements (similar to the function of an oscilloscope)
- Change of axis assignment of the recorded measurement parameters in graph mode (e.g. to produce a p-Q graph)







Technical Data

Analog Inputs	
Input signals	HSI analogue sensors
8 channels M12x1 Ultra-Lock flange sockets (5 pole) channel A to channel H	HSI SMART sensors Voltage signals: i.e. 0.5 .. 4.5 V, 0 .. 10 V etc. (input ranges for 0 .. 50 V, 0 .. 10 V, 0 .. 4.5 V, -10 .. 10 V) Current signals, i.e. 4 .. 20mA, 0 .. 20mA (input range 0 .. 20 mA) 1 x PT 100 / PT 1000 (on Channel H)
Accuracy dependence of the input range	≤ ± 0.1% FS at HSI, voltage, current ≤ ± 1 % FS at PT 100 / PT 1000
Digital Inputs	
Input signals 2 channels via M12x1 Ultra-Lock flange socket (5 pole) Channel I, J	Digital status (high/low) Frequency (0.01 to 30,000 Hz) PWM duty cycle Durations (i.e. Period length)
Level	Switching threshold / switch-back threshold: 2 V/1 V Max input voltage: 50 V
Accuracy	≤ ± 0.1 %
CAN	
Input signals 28 channels M12x1 Ultra-Lock flange socket (5 pole) channel K1 to K28	HCSI sensors, CAN, J1939, CANopen PDO, CANopen SDO
Baud rate	10 kbit/s to 1 Mbit/s
Accuracy	≤ ± 0.1 %
Calculated channels	
Quantity	4 channels via virtual port L (channel L1 to channel L4)

Technical Data

Programming interface	
For O-Link devices	1 channel via M12x1 Ultra-Lock flange socket (5 pole)
Voltage supply	
Network operation	9 to 36 V DC via standard round plug 2.1 mm
Battery	Lithium-Nickel-Kobalt-Aluminum-Oxide 3.6 V; 9300 mAh
Battery charging time	approx. 5 hours
Service Life	without sensors: approx. 11 hours with 2 sensors: approx. 9 hours with 4 sensors: approx. 7 hours with 8 sensors: approx. 4 hours
Display	
Type	TFT-LCD Touchscreen
Quantity	5.7"
Resolution	VGA 640 x 480 Pixel
Backlight	10 to 100% adjustable
Interfaces	
USB Host	
Plug-in connection	USB socket, Type A, screened
USB Standard	2.0 (USB Full speed)
Transmission rate	12 Mbit/s
Voltage supply	5 V DC
Power supply	100 mA max.
Protection	short circuit protection to GND (0 V)
USB Slave	
Plug-in connection	USB socket, Type B, screened
USB Standard	2.0 (USB High speed)
Transmission rate	480 Mbit/s
Voltage supply	5 V DC
Power supply	100 mA max.
Protection	short circuit protection to GND (0 V)
Memory	
Measured value memory	16 GB for min. 500 measurements, each containing 8 Million measured values
Technical Standards	
EMC	IEC 61000-4-2 / -3 / -4 / -5 / -6 / -8
Safety	EN 61010
IP class	IP 40
Ambient conditions	
Operating temperature	32°F to 122°F (0°C to 50°C)
Storage temperature	-4°F to 140°F (-20°C to 60°C)
Relative humidity	70%, non-condensing max
Dimensions	approx. 11.22 x 7.44 x 3.43 in (B x H x T)
Weight	approx. 4.08 lb (1.85 kg)
Housing material	Plastic (Elastollan® R 3000 - TPU-GF)

Model Code
Description: HMG 4000 - 000 - US
P/N 7634366

Scope of delivery
- HMG 4000
- Power supply for 90 to 230 V AC
- Strap

Operating manual and documentation
US = English

- Operating Instructions
- Data storage medium containing USB drivers HMGWIN and CMWIN software
- USB connector cable

Order Details
Additional accessories, such as electrical and mechanical connection adapters, power adapters, etc. can be found in the "Accessories for HMG Series" catalog pages.

HMG Accessories for HMG Series

Available Accessories

- Pressure, temperature and flow rate transmitters with HSI sensor detection as well as CAN pressure transmitters with HCSI sensor detection, see below and next page:

Pressure Transducer with HSI
(Sensor Interface)

Model Code	Description	Part No.
HDA 4748-H-0016-000	-14.5 to 130.5 psi (-1 to 9 bar)	909429
HDA 4748-H-0016	0 to 230 psi (0 to 16 bar)	909425
HDA 4748-H-0060-000	0 to 870 psi (0 to 60 bar)	909554
HDA 4748-H-0100-000	0 to 1450 psi (0 to 100 bar)	909426
HDA 4748-H-0250-000	0 to 3625 psi (0 to 250 bar)	909337
HDA 4748-H-0400-000	0 to 5800 psi (0 to 400 bar)	909427
HDA 4748-H-0600-000	0 to 8700 psi (0 to 600 bar)	909428
HDA 4778-H-0135-000	-14.5 to 135.5 psi (-1 to 9.34 bar)	920755
HDA 4778-H-0150-000	0 to 150 psi (0 to 10 bar)	920663
HDA 4778-H-1500-000	0 to 1500 psi (0 to 103 bar)	920757
HDA 4778-H-3000-000	0 to 3000 psi (0 to 207 bar)	920756
HDA 4778-H-6000-000	0 to 6000 psi (0 to 144 bar)	920664
HDA 4778-H-9000-000	0 to 9000 psi (0 to 621 bar)	920665

HCSI Pressure Measuring Transducer (HMG 4000 only CANbus)

Model Code	Description	Part No.
HDA 4748-HC-0009-000 (-1...+9 bar)	-1 ... 9 bar	925287
HDA 4748-HC-0016-000	0 ... 16 bar	925298
HDA 4748-HC-0060-000	0 ... 60 bar	925305
HDA 4748-HC-0100-000	0 ... 100 bar	925299
HDA 4748-HC-0160-000	0 ... 160 bar	925286
HDA 4748-HC-0250-000	0 ... 250 bar	925304
HDA 4748-HC-0400-000	0 ... 400 bar	925303
HDA 4748-HC-0600-000	0 ... 600 bar	925301
HDA 4748-HC-1000-000	0…1000 bar	925300

HCSI Temperature Measuring Transducer (HMG 4000 only CANbus)

Model Code	Description	Part No.
ETS 4148-HC-006-000	-13 to +212 °F	925302

Speed Sensors

Model Code	Description	Part No.
HDS 1000-002	Rpm Sensor (plug M12x1) 2M; Includes HDA 1000 Reflector Set (part no. 904812)	909436
HDS 1000 Reflector Set	Reflective foil set 25 pieces	904812
SSH 1000 (HMG 2500 only)	Sensor simulator for 2 HSI (ideal for training purposes)	909414
HSS 210-3-050-000 (HMG 4000 only)	Rpm Sensor (in connection with ZBE 46)	923193
HSS 220-3-046-000 (HMG 4000 only)	Rpm Sensor (in connection with ZBE 46)	923195

Temperature Transducer with HSI
(Sensor Interface)

Model Code	Description	Part No.
ETS-4148-H-006-000	-13° to 212°F (-25° to 100°C)	923398

NOTES:

The information in this catalog relates to the operating conditions and applications described. For applications or operating conditions not described, please contact us a filtersystemsmanger@schroederindustries.com.

Subject to technical modifications

Accessories for HMG Series

Sensor Cables (HMG 4000 only)

Model Code	Description	Part No.
Push-pull connection on plug-side		
ZBE 40-02	(CABLE M12X1/5P, PUSH-PULL) 2M length	6177158
ZBE 40-05	(CABLE M12X1/5P, PUSH-PULL) 5M length	6177159
ZBE 40-10	(CABLE M12X1/5P, PUSH-PULL) 10M length	6177160
Screw connection		
ZBE 30-02	(Sensor cable M12x1, 5-pin) 2M length	6040851
ZBE 30-05	(Sensor cable M12x1, 5-pin) 5M length	6040852

Flow Sensor with HSI
(Sensor Interface)

Model Code	Description	Part No.
Aluminum		
EVS 3108-H-0020-000	0.26 to 5.28 gpm (1.2 to 20 L/min)	909405
EVS 3108-H-0060-000	1.59 to 15.9 gpm (6 to 60 L/min)	909293
EVS 3108-H-0300-000	3.96 to 79.3 gpm (15 to 300 L/min)	909404
EVS 3108-H-0600-000	10.6 to 159 gpm (40 to 600 L/min)	909403
Stainless Steel		
EVS 3118-H-0020-000	0.26 to 5.28 gpm (1.2 to 20 L/min)	909409
EVS 3118-H-0060-000	1.59 to 15.9 gpm (6 to 60 L/min)	909406
EVS 3118-H-0300-000	3.96 to 79.3 gpm (15 to 300 L/min)	909408
EVS 3118-H-0600-000	10.6 to 159 gpm (40 to 600 L/min)	909407

Other Accessories

Model Code	Description	Part No.
Pelican Case	for HMG 2500 and accessories	2702730
Case for HMG 4000	Case for HMG 4000 and accessories	6179836
USB Cable (HMG 2500 only)	Connection to PC	6040585
ZBE 30-02 (HMG 2500 only)	cable for M12x1 - 6'	6040851
ZBE 30-05 (HMG 2500 only)	cable for M12x1 - 15'	6040851
ZBE 36 (HMG 2500 only)	TWS (TestMate® Water Sensor) Adapter	909737
Power Supply	DC Charging unit for HMG 2500	6054296
ZBE 31	Car charger for HMG Unit	909739
HCSI Y splitter	Y splitter for HCSI sensors	6178196
HCSI bus termination	Termination connector for HCSI Sensors	6178198
ZBE 46	Pin adapter HMG (for three-wire signals, AS, ...)	925725
ZBE 100	Adapter for TFP 100	925726
ZBE 38	Y adapter, black for jack I/J	3224436
ZBE 26	Y adapter, blue for HLB 1000	3304374
ZBE 41	Y adapter, yellow for TCM sensor	910000
UVM 3000	Universal connection module for HMG 4000 only	909752
Hydraulic Adapter set	Adapter hose DN 2 / 1620/1620, 400 mm and 1000 mm, pressure gauge connection 1620/ G1/4, adapter 1615/ 1620, bulkhead couplings 1620/ 1620	903083

Notes Section:

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Notes Section:

Reference List

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CETOP - RP 94 H - Determination of solid particulates in hydraulic fluids using an automatic particle counter employing the light extinction principle

ISO 4407:1991 Hydraulic fluid power - Fluid contamination - Determination of particulate contamination by the counting method using a microscope

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