

No-Air-Loss Compressed Air Drain Valve

Electric Powered with Three-Prong Plug, 1/2 NPT Female



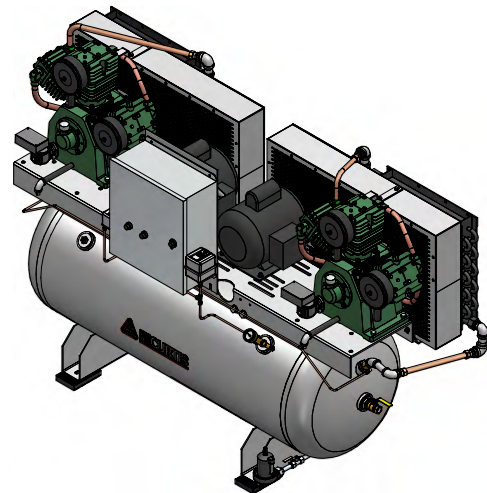
Actuation	Sensor
Power Source	Electric
Inlet	
Connection Type	Threaded
Pipe Size	1/2
Thread Type	NPT
Gender	Female
Outlet	
Connection Type	Barbed
For Tube ID	3/8"
Pipe Size	1/4
Thread Type	NPT
Gender	Male
Discharge Capacity	2.9 gpm
Maximum Pressure	230 psi
Overall	
Height	4 1/2"
Width	3 3/8"
Depth	7"
Housing Material	Aluminum
Drain Location	Internal
Maximum Temperature	120° F
Voltage	120V AC
Electrical Connection Type	Plug
Plug Type	Three Prong
Cord Length	6 ft.
Features	Alarm, Contact for Remote Signaling Device
RoHS	RoHS 3 (2015/863/EU) Compliant
REACH	REACH (EC 1907/2006) (06/25/2020, 209 SVHC) Compliant
DFARS	Specialty Metals COTS-Exempt



CA/CT Series

TWO STAGE RECIPROCATING AIR COMPRESSORS

Installation and Operations Manual



WARNING

Personal injury and/or equipment damage will result by failing to pay attention to the vital safety information and instructions

Model

Serial #

Please have your unit's model and serial number ready when calling for service. The model # is found on the tank decal and the serial number is located on the compressor nameplate.

For Customer Service, Technical Service, or to order replacement parts, please contact your local distributor.

FS Curtis, Inc.

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READ ME FIRST

Safety Precautions

The owner, lessor or operator of any compressor unit manufactured by FS Curtis, Inc. is hereby warned that failure to observe all safety precautions may result in serious injury of personnel and/or damage to property.

FS Curtis, Inc. neither states as fact, nor in any way implies that this list of safety precautions is an all-inclusive list, the observance of which will prevent all damage to property or injury to personnel.

Every reasonable effort has been taken to ensure that complete and correct instructions have been included in this manual. However, possible updates and changes may have occurred since this printing. FS Curtis, Inc. reserves the right to change specifications, without incurring any obligation for equipment previously or subsequently sold.

Compressors and/or units are assembled to comply with the customer's purchase order and in compliance with FS Curtis, Inc. specifications; alteration must not be made to the compressor or unit without FS Curtis' written approval.

DANGER!

Air used for breathing or food processing must meet O.S.H.A 29 C.F.R. 1910.134 or F.D.A. 21 C.F.R. 178.350 regulations. Failure to do so will cause severe injury or death.

WARNING!

Compressors are precision high-speed mechanical equipment requiring caution in operation to minimize hazard to property and personnel. Listed below are some safety precautions that must be observed.

- Use of FS Curtis Compressors to transfer toxic, radioactive, flammable, or explosive substances is prohibited.
- Do not install the compressor in an area where there is a risk of exposure to explosive gases or combustible dusts, such as flours, starches, coke, coal dust, etc. or in close proximity to corrosive substances.
- Release all air pressure from the system before working on the unit and red tag all electrical control switches.
- Do not operate compressor on a shipping skid or any other unapproved mounting surfaces.
- Do not by-pass motor over-current protection.
- Do not change the setting or in any way affect the operation of the safety valves.

- Turn off and lockout/tagout the main power disconnect switch before attempting to work or perform any maintenance.
- Do not attempt to service any part of this unit while it is running.
- Ensure that service personnel are properly grounded before attempting to service any part of the electrical system.
- Do not operate the unit with any of its safety guards, shields or screens removed.
- Do not remove or paint over any DANGER!, WARNING!, CAUTION!, or instructional materials attached to the compressor. Lack of information regarding hazardous conditions can cause property damage or personal injury.
- Do not change the pressure setting of the pressure relief valve, restrict the function of the pressure relief valve, or replace the pressure relief valve with a plug.
- Do not install a shutoff valve in the compressor discharge line without first installing a pressure relief valve of proper size and design between the shutoff valve and the compressor.
- Do not use plastic pipe, unapproved rubber hose, or lead-tin soldered joints in any part of the compressed air system.
- Alterations must not be made to this compressor without FS Curtis' expressed, written approval.
- Do not operate the compressor in excess of the A.S.M.E. pressure vessel rating for the receiver or the service rating of the compressor, whichever is lower.
- Surface temperatures can exceed 400 °F, power off the unit and allow it to cool before touching any surface of the compressor.
- Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If for any reason any part of the manual becomes illegible or the manual is lost, contact your local distributor.
- Your State and/or local OSHA regulations may require a Pressure Vessel Permit to operate this equipment. Obtaining a permit is the sole responsibility of the owner, lessor or operator of the equipment. Contact your State/Local OSHA for more information.

System Diagram

Simplex Units

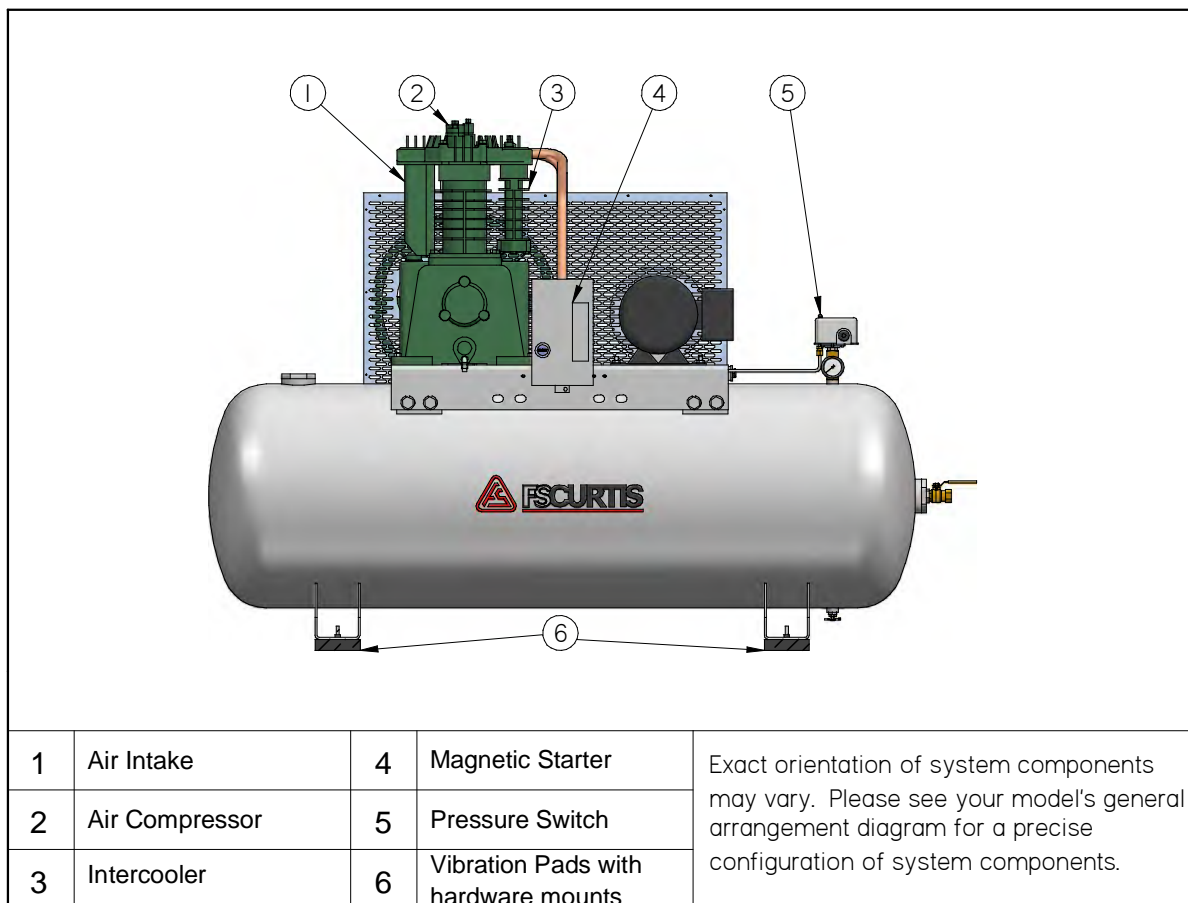


Fig. (1) Simplex, two stage air compressor process.

FS Curtis manufactures a broad array of compressor configurations to satisfy the needs of our diverse customer base. Despite this diversity, all FS Curtis two stage compressor configurations work off the same basic cycle. Air is drawn into the compressor through the air intake and filter assembly. The air enters the first stage, a low pressure chamber where it is compressed the first time. As air is compressed, its temperature increases, this hot air then enters the intercooler where the temperature is reduced.

Next, the cooled air enters the second stage, a high pressure chamber where the air is compressed a second time to even higher pressures and discharged into the tank. An Ultra Pack option can be purchased with an installed air-cooled after-cooler which, after the second compression stage, cools the air to a 20°F approach temperature before being stored in the tank.

When the compressor has filled the tank to its pressure rating, the pressure switch disengages which turns off the motor, preventing the tank from over pressurizing. Finally, the tank has a ball valve which is opened or closed by the operator and lets air out of the tank, the ball valve is depicted in Fig (1) in the “open” position.

Duplex Units

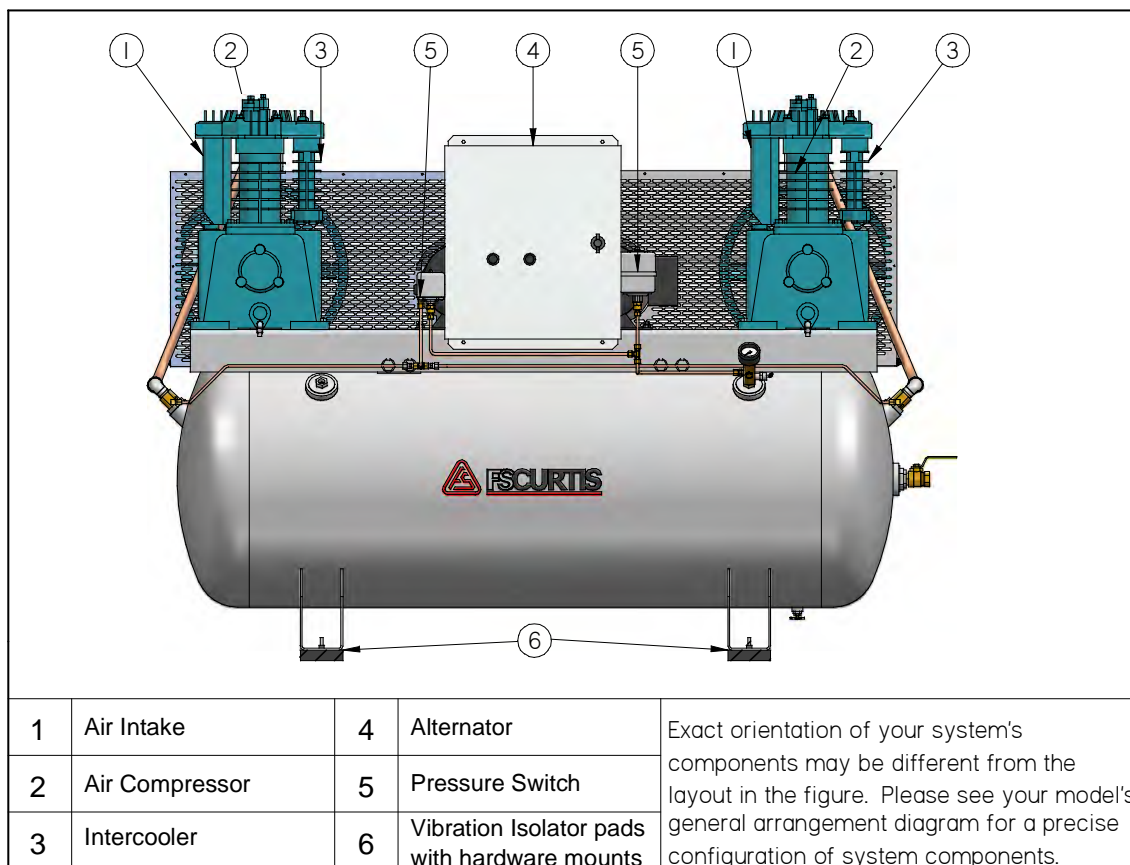


Fig. (2) Duplex unit system diagram.

Refer to the simplex diagram for a description of the compression cycle.

Duplex units operate in much the same way as simplex units, only there are two compressors. The key difference is in the pressure switch and starter. In a duplex unit, there are two pressure switches, a "lead" pressure switch and a "lag" pressure switch set 10 psi lower than the lead switch. The alternator utilizes both compressors to fill the tank. Once the tank approaches the cutoff "lag" pressure, the alternator selects one compressor to be the "lag" compressor and cycles it off, using only the "lead" compressor to provide the remaining pressure. The alternator then cycles between both compressors, switching the "lead" and "lag" compressor and ensuring roughly equal wear between them. If air usage exceeds the output of a single compressor, the alternator utilizes both the "lead" and the "lag" compressor to fulfill operating conditions, once again cycling off the "lag" compressor when its cutoff pressure is reached.

INSTALLATION

IMPORTANT NOTICE

Abide by all applicable state, local and regulations when mounting and installing the compressor. Failure to do so may result in injury or death and will void the manufacturer's warranty. Contact your local government for more information.

CAUTION!

Improper lifting can result in component or system damage or personal injury. Follow good shop practices and safety procedures when moving the unit.

Receiving

Immediately upon receipt of compressor equipment and prior to completely uncrating, the following steps should be taken:

1. Inspect compressor equipment for damage that may have occurred during shipment. If any damage is found, demand an inspection from the carrier. Ask the carrier how to file a claim for shipping damages. (Refer to **FREIGHT DAMAGE** for complete details.) Shipping damage is not covered by FS Curtis's compressor warranty.
2. Ensure that adequate lifting equipment is available for moving the compressor equipment and clear a path to the installation location to avoid damage to property or compressor.
3. Turn off & lock out the electrical disconnect switch before working on the unit to prevent the unit from starting unexpectedly.
4. Read the compressor nameplate to verify the model and size ordered.
5. Read the motor nameplate to be sure the motor is compatible with your electrical conditions (volts, phase, and hertz).
6. Read the pressure relief valve nameplate to be sure it does not exceed the working pressure of the compressor or any other component in the system.
7. Read and understand the safety precautions contained within this manual. The successful and efficient operation of compressor equipment depends largely upon the amount of care taken to install and maintain the equipment. FS Curtis strongly recommends that any or all person(s) in charge of installing, maintaining, or servicing one of our compressors read and understand the entire contents of this manual and the respective compressor installation and operating instruction manual in order to perform such duties safely and efficiently.
8. Remove all packing plastic, foam and shipping related materials.

FREIGHT DAMAGE

The transportation industry has adopted a modification with regard to the handling of obvious and concealed damage claims. Therefore, it is extremely important that you examine every carton and crate as soon as you receive it. If there is any obvious damage to the shipping container, have the delivering carrier sign the freights bill, noting the apparent damage, and request a damage report.

If concealed damage is discovered at a later date, the carrier must be notified within 15 days of initial receipt of freight. Contact the carrier as soon as possible, giving them an opportunity to inspect the shipment at the premises where the original delivery was made. Retain all containers and packing for inspection by the carrier. Do not move the freight.

Concealed shipping damage is not covered by the FS-Curtis warranty.

A claim form can be requested from the carrier. Your claim will need to be substantiated with the following documents.

- Original bill of lading
- Original paid freight bill
- Original invoice or certified copy
- Other particulars obtainable in proof of loss or damage (photos, damage inspection report, etc.)

We suggest these instructions be circulated to your shipping and receiving personnel.

Installation Procedure

Step 1 – Select a proper location for installation

Select a clean, dry, well lit area with a rigid floor strong enough to support the compressor and with adequate ventilation. Avoid placement of the compressor in an area that is excessively hot, dusty, humid or contaminated with foreign gases such as ammonia or acid fumes.

The unit should never be operated at ambient temperatures above 104°F or below 32°F. If the ambient temperature is below 40°F, FS Curtis recommends using Arctic oil. Maintenance checks are required daily, thus three (3) feet of space needs to be provided around the compressor for proper inspection.

Note – If the unit or air intake is to be located outdoors, please contact your local distributor for additional instructions.

Step 2 – Remove the skid

Remove and discard the shipping skid. The compressor should NEVER be operated on a skid.

Step 3 – Prepare the mounting surface

See Fig. (3) and Fig. (4) for the compressor's mounting pattern and prepare the surface accordingly. See Table (4) for acceptable installation methods

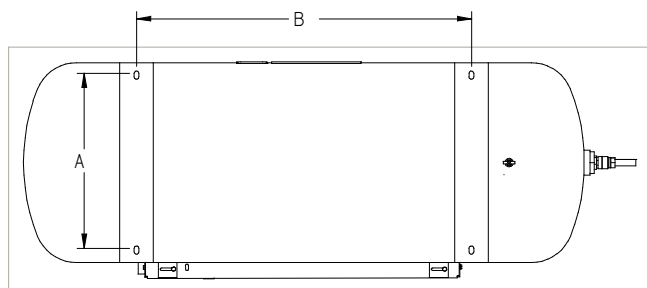


Fig. (3) Horizontal bolt hole pattern

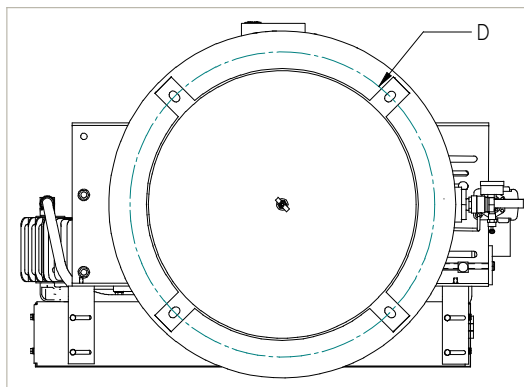


Fig. (4) Vertical bolt hole pattern

Horizontal Tank (gallons)	A (in)	B (in)	Base Hole Size (in)	Recommended Bolt Diameter (in)	Vertical Tank (gallons)	D (in)	Hole Size (in)	Recommended Bolt Diameter (in)
30	17.75	23	9/16	1/2"	60	17	9/16	1/2"
80	17.75	40	9/16	1/2"	80 (CT line)	17	9/16	1/2"
120	22	40	9/16	1/2"	80 (CA Line)	22.5	11/16	5/8"
200	28	40	7/8	3/4"	120	26.375	11/16	5/8"
240	40	54	3/4	5/8"				

Table (1) Bolt hole mounting patterns for various tank sizes.

Acceptable Mounting	Unacceptable Mounting
<ul style="list-style-type: none"> Concrete Anchor Bolts Threaded Rod or Floor Stud Steel flooring or supports (provided unit is bolted down and isolator pads are used) 	<ul style="list-style-type: none"> Skid Mounted Unanchored Bare Floor (no vibration pads)

Table (2) Compressor mounting methods

If you wish to utilize an installation method other than the approved methods described in Table (2), please contact your local distributor. FS Curtis neither states as fact, nor implies that the above list of Acceptable/Unacceptable mounting is all-inclusive. Contact your local distributor for more information.

Step 4 – Install Vibration Isolator pads and mount the compressor

Exposure to excessive vibrations can significantly shorten the life of the compressor. FS Curtis highly recommends mounting the unit on vibration isolator pads and the compressor should NEVER be operated without being securely fastened to the ground.

Using a level, please check for proper alignment of the compressor. Uneven installation will unbalance the compressor leading to excessive noise, vibrations, and wear. Place a steel shim between the concrete and vibration pads and shim down as necessary for leveling. Level the compressor so it can be bolted down securely. Before tightening the bolts, check to see that all four feet are resting on the foundation. See fig (5) for mounting instructions for a floor stud, and see fig (6) for mounting instructions for an anchor bolt.

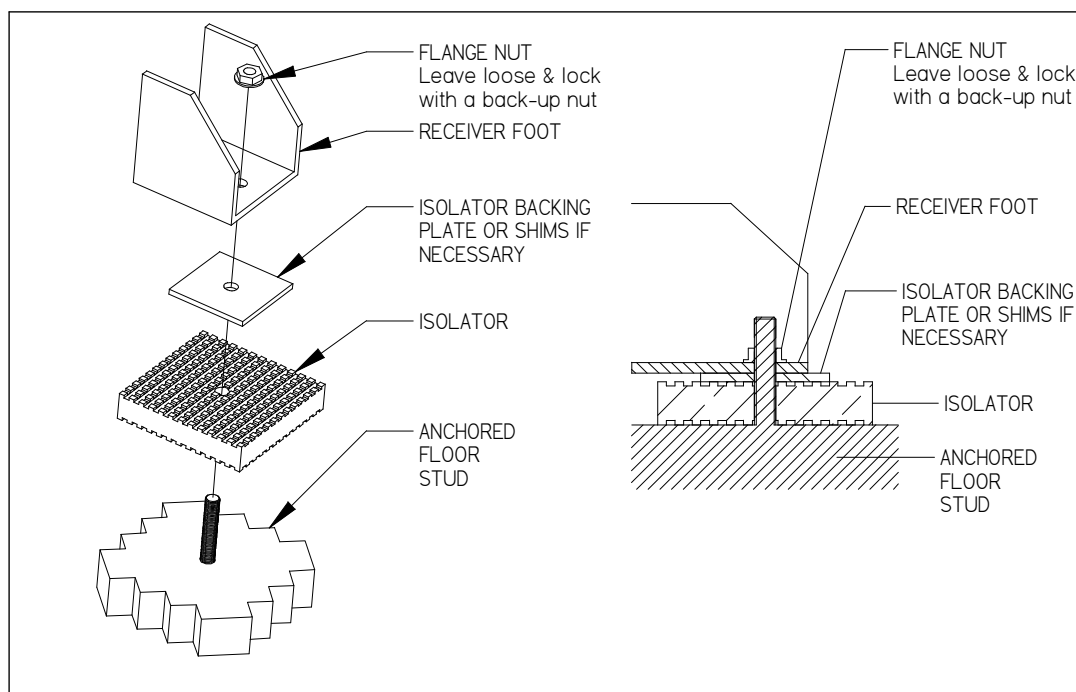


Fig. (5) Anchored Floor Stud installation

Recommended Installation – Use concrete anchor bolt

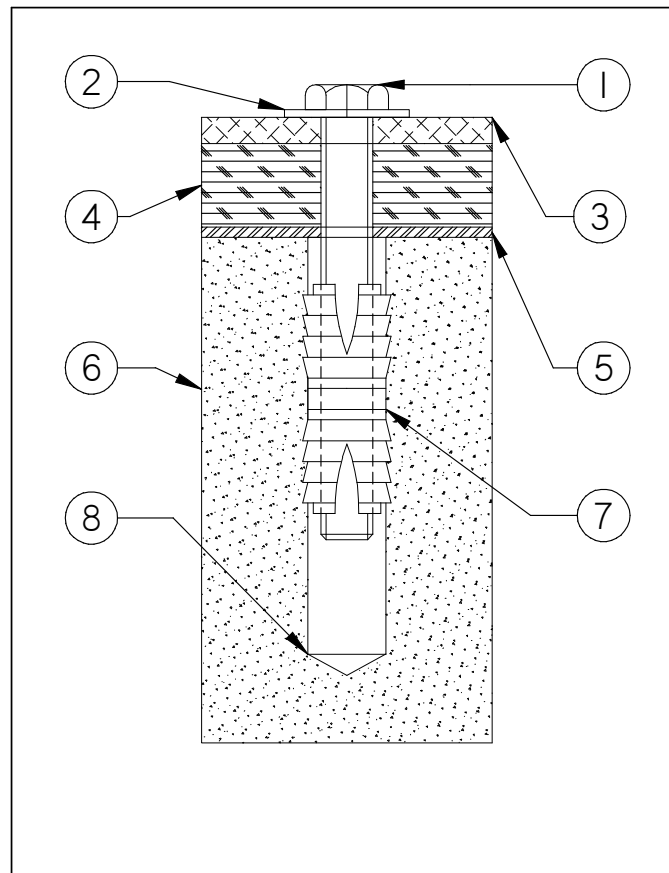


Fig. (6) Recommended Installation Method

1	Mounting bolt, see Table (3) for recommended sizes
2	Flat washer, sized for bolt
3	Compressor Base
4	Vibration Isolator Pads
5	Steel Shim (as necessary for leveling)
6	Concrete floor, see local codes for recommended concrete thickness and hole drilling depth
7	Heavy duty double expansion machine bolt anchor shield
8	1" diameter hole

Table (3) Anchor Bolt specifications

Step 5 – Tighten the fasteners

Incrementally tighten the mounting bolts evenly in a cross pattern. If necessary, after start up, continue incrementally tightening the mounting bolts in a crossing pattern until vibrations have been reduced to an acceptable level. After vibrations have been minimized, loosen ONE mounting bolt. The unit expands and contracts with changes in temperature, leaving ONE bolt loosened will allow for thermal expansion of the unit, reducing thermal stresses and vibrations on the tank. If after loosening one bolt the vibrations get worse, retighten bolt and select a different unit. Excessive vibrations can damage equipment.

Step 6 – Install piping network

Run a clean pipe to the tank discharge opening, bushing up or down as necessary with clean bushings and fittings. Note that the more bushings and fittings placed in the air distribution system, the greater the opportunity for air leaks and breaks. FS Curtis recommends the installation of drip legs in the distribution line.

Always install a safety relief valve in the distribution line between the compressor unit and in-line shutoff valves. If more than one compressor pumps into a common system, a check valve in the distribution line of each compressor unit is recommended to prevent moisture from entering the cylinder head(s) when one compressor is idle. A globe or gate valve (WOG rated) installed in the discharge line will allow compressor isolation from plant air system for compressor maintenance. (Note: A safety relief valve should be located between the compressor and the globe/gate valve.)

Step 7 – Install Compressor Intake (IF APPLICABLE)

If the compressor intake is to be located away from the unit, please use the following instructions to ensure safe and efficient operation.

Run a clean pipe to the compressor suction opening, bushing up or down as necessary with clean bushings and fittings. Note that the more bushings and fittings placed in the intake line, the greater opportunity for air leaks and breaks. If the run is over 10 feet in length, use a larger pipe diameter to avoid excessive pressure drops. When installing the pipes, please pitch the piping down and slightly away from the intake, to ensure that debris and condensation drains away from the compressor.

MOUNTING MOBILE UNITS

Gas engine driven compressors mounted to truck beds should be fastened to the truck bed in such a way so as not to create any stress to the air receiver tank. Truck beds, characteristically, have a tendency to flex and could cause damage to the receiver tank if the tank is fastened directly to the truck bed. It is the User's responsibility to provide an adequate means of fastening the unit in these applications.

Post Installation Checklist

WARNING!

Failure to perform the post installation checklist may result in mechanical failure, property damage, serious injury or even death.

Steps 1 through 9 should be performed prior to connecting the unit to a power source. If any condition on the checklist is not satisfied, make the necessary adjustments or corrections before starting the compressor.

1. Remove all installation tools from the compressor and check for installation debris. Abrasive dust can seriously damage the air intake and belt assemblies.
2. All FS Curtis compressors are shipped from the factory filled with the required amount of **Curtis Lube Plus** Compressor Lubricant specially formulated for Curtis Compressors. The oil level should register in the center of the oil sight glass or between the high and low marks on the dipstick. For additional lubricant contact your authorized Curtis distributor. Failure to use authorized lubricant will void the manufacturer's warranty.
3. Check inlet-piping installation.
4. Check all pressure connections for tightness.
5. Make sure all pressure relief valves in the air distribution are correctly installed.
6. Make sure all guards are in place and securely mounted.
7. Open all manual shutoff valves at and beyond the compressor and tank discharges.
8. Check and tighten all connections (mechanical and electrical) as they may have loosened during shipment.
9. After all the above conditions have been satisfied, the unit can be connected to the proper power source.

Electrical Requirements

The electrical installation of this unit should only be performed by a qualified electrician with knowledge of the National Electrical Code (N.E.C.), O.S.H.A. code and/or any local or state codes having precedence.

All FS Curtis compressors come with a factory installed, pre-wired starter, if you wish to provide your own starter, please contact your local distributor for more information. Check the electrical supply for voltage, phase, and frequency to see that they match the nameplate stampings on the motor, magnetic starter, solenoids, and other controls.

Before attempting to service electrical systems, ensure that maintenance personnel are properly qualified, and service procedures comply with NFPA 70-1984, National Electrical Code, National Electrical Safety Code, as well as any applicable state and local regulations. Failure to abide by the national, state and local codes may result in physical harm and/or property damage and will void the manufacturer's warranty.

DANGER!

High voltage may cause personal injury or death, per O.S.H.A. regulations 1910.137, disconnect and lockout/tagout all electrical power supplies before opening the electrical enclosure or servicing.

WARNING!

Never assume a compressor is safe to work on just because it is not currently operating. It could restart at any time. Follow all safety precautions outlined in the Safety Precautions section.

NEMA electrical enclosures and components must be appropriate to the area installed.

Safety and efficiency are the primary concerns when selecting components for compressed air systems. Products of inferior quality can not only hinder performance of the unit, but could cause system failures that result in bodily harm or even death. Select only top quality components for your system. Call your local FS Curtis Distributor for quality parts and professional advice.

CAUTION!

Turn off and lockout/tagout the main power disconnect switch before attempting to install the unit.

NOTE: At installation, the customer is to provide disconnect, branch circuit over-current protection, and grounding between the power supply and the electrical control enclosure in accordance with the National Electric Code and/or any local codes.

Wiring Diagrams: Simplex Single Phase and 3 Phase

TURN OFF / TAGOUT POWER BEFORE SERVICING

1	L1
2	L2
3	L3
4	Overload relay
5	Reset switch

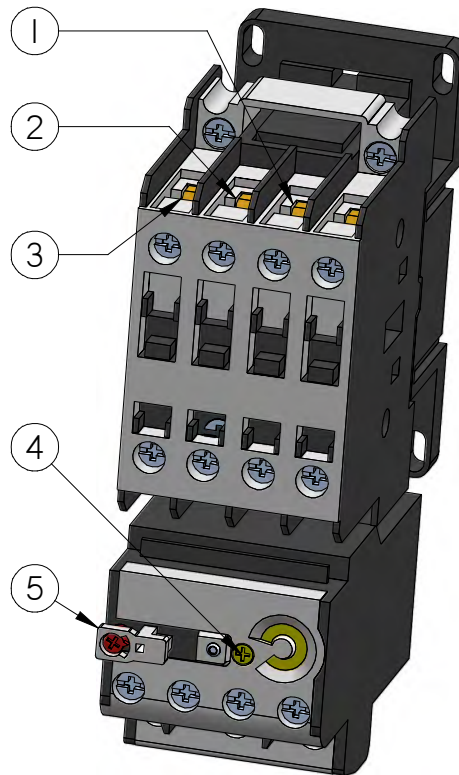


Fig (7) Simplex Starter

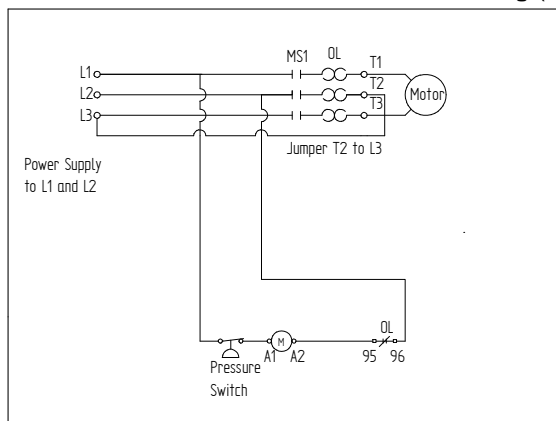


Fig (8) Single Phase wiring diagram

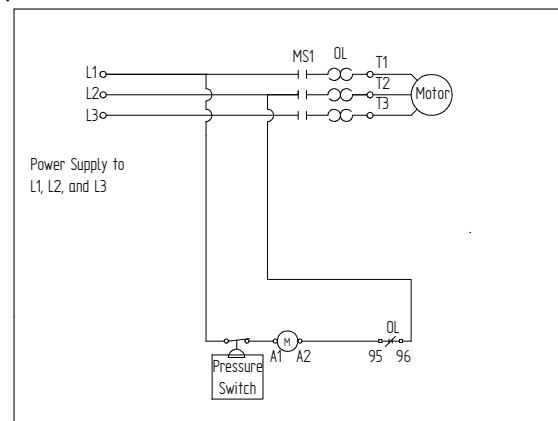


Fig (9) Three phase wiring diagram

NOTE: The above wiring diagrams are valid for standard models only. Contact your local distributor for wiring diagrams for factory installed options

Wiring Diagrams: Duplex Dual Source Alternator

TURN OFF / TAGOUT POWER BEFORE SERVICING

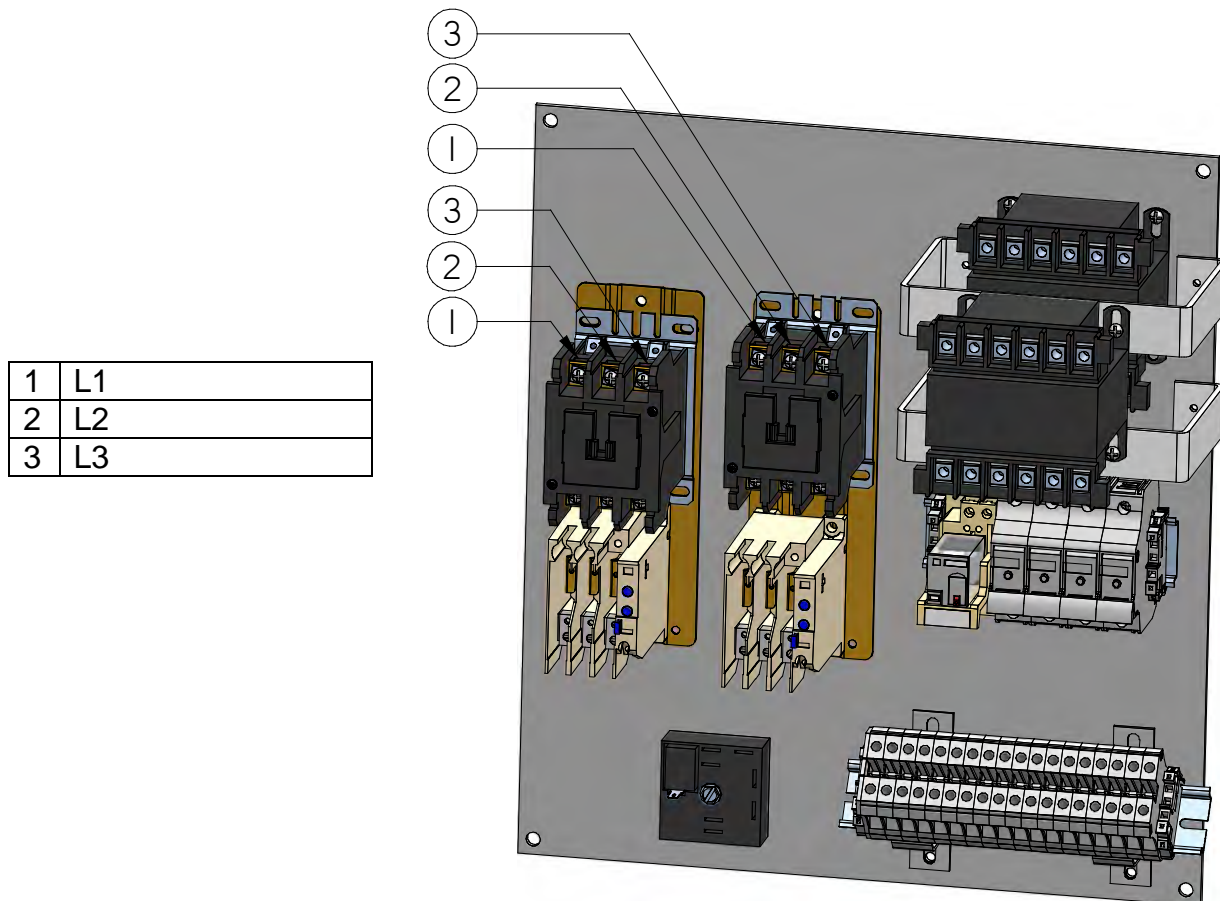


Fig (10) Duplex dual source alternator panel.

NOTE: Unit wiring diagram is located on the inside front cover of the alternator panel. If, over time, the diagram becomes illegible, please contact your local distributor.

Start Up

Pre Start Checklist

WARNING!

Do not proceed until the PRE-STARTING CHECKLIST and sub-section has been read and is thoroughly understood.

1. Check oil level in crankcase for proper level.
2. Drain liquid from the air receiver and moisture trap (if so equipped).
3. Check system pressure. Do not operate the compressor in excess of the A.S.M.E. pressure vessel rating for the receiver or the service rating of the compressor, whichever is lower.
4. Check cooling fan rotation. Fan blades of the compressor flywheel force ambient air across fins of the intercooler and cylinder heads.
5. Check all pressure relief valves for proper operation.
6. Check control system for proper operation and to ensure all connections (mechanical and electrical) are properly tightened.
7. Jog the starter switch to check the rotational direction of the compressor. The flywheel should rotate in the counterclockwise direction (as viewed when facing the flywheel).

INITIAL STARTING & OPERATION

This instruction manual, as well as any instructions supplied by manufacturers of supporting equipment, should be read and understood prior to starting the compressor. If there are any questions regarding any part of the instructions, please call your local FS Curtis distributor.

With the pre-starting checklist completed and satisfied, close the disconnect switch and start the compressor (for electric units) or engage the starter (for gas units). Watch and listen for excessive vibration and strange noises. If either exists, stop the compressor, look for and correct the problem before re-starting.

Observe compressor operation closely for the first eight hours of operation. If any abnormal conditions are witnessed, stop the compressor and correct the problem. After two days of operation check belt tension, oil level, and inspect the system for leaks. Additionally, all electrical connections and mechanical fasteners should be checked for tightness and torqued as needed.

For the first weeks, the compressor needs time to “break in.” The belt requires time to stretch and fit into the surface of the pulleys. The piston rings need time to seat themselves into the cylinder walls, and bearings need to wear into place. For the first 100 hours or so, the compressor will consume higher than normal amounts of oil until the break in process is complete.

FIRST MONTH MAINTENANCE

- Check oil level at the beginning of every week, fill as needed, see oil subsection.
- Check belt tension at the beginning of each week and tighten as required, see belt tension subsection.
- Check bolts, pulley clamp screws, and jam nuts for tightness. Torque if necessary (see bolt torques subsection)

START-UP

If the compressor is equipped with an automatic start-stop control (with pressure switch unloading), it is automatically unloaded upon starting, and will automatically load after attaining running speed. Simply throw the power switch to start the unit.

All gas units are equipped with pilot valve controls and should be manually unloaded prior to start up. To manually unload the compressor in order to achieve an unloaded start, release the pilot valve lever BEFORE starting the compressor.

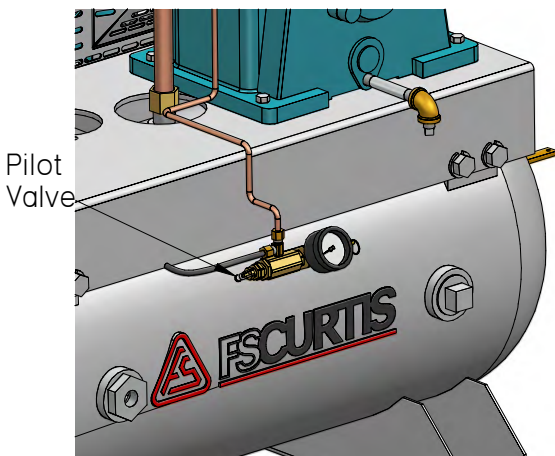


Fig (11) Challenge Air pilot valve location

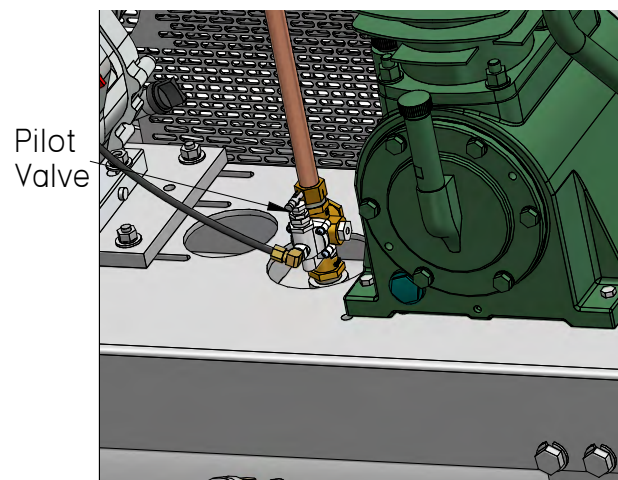


Fig (12) CT pilot valve location

Maintenance

Shut Down Procedure

The following procedures should be followed when stopping the compressor for maintenance or service.

WARNING!

Never assume a compressor is safe to work on just because it is not operating. It could start at any time.

1. Per O.S.H.A. regulation 1910.147; The Control of Hazardous Energy Source (Lockout/Tagout); disconnect and lockout the main power source. Display a sign in clear view at the main power switch that the compressor is being serviced.
2. Isolate the compressor from the compressed air supply by closing the manual shutoff valve upstream and downstream from the compressor. Display a sign in clear view at the shutoff valve stating that the compressor is being serviced.
3. Lock open a pressure relief valve within the pressurized system to allow the system to be completely de-pressurized. **NEVER** remove a plug to relieve the pressure.
4. Open all manual drain valves within the area to be serviced.
5. Wait for the unit to cool before starting to service. (Temperatures of 125°F can burn skin. Some surface temperatures exceed 350°F when the compressor is operating.)

Maintenance Schedule

To assure maximum performance and service life of your compressor, a routine maintenance schedule should be developed. A sample schedule has been included to help you develop a maintenance schedule designed for your particular application. Time frames may need to be shortened in harsher environments or during periods of extremely heavy use.

Make copies of this checklist and retain copy of the checklist, enter dates and maintenance person's initials in the appropriate spaces. Make copies of this checklist and retain copies of the completed checklists for potential warranty purposes. Enter the dates and maintenance person's initials in the appropriate spaces. Keep the checklist and this Operations Manual readily available near the compressor.

DAILY MAINTENANCE

- Check oil level. Check oil for discoloration and filth. Drain oil and replace if required.
- Drain drip legs and traps in air distribution system.
- Open drain cock located at the bottom of the tank to relieve condensation.
- Check for oil leaks.

WEEKLY MAINTENANCE

- Manually operate the pressure relief valves to be certain they are working.
- Clean the cooling surfaces of the intercooler and compressor.
- Check the compressor for air leaks.
- Check the compressed air distribution system for leaks.

MONTHLY MAINTENANCE

- Check bolt torques, pulley clamp screws, and jam nuts for tightness. Torque if necessary.
- Inspect entire air distribution system for leaks.
- Check all connections (mechanical and electrical) and tighten as necessary.

EVERY THREE MONTHS

- Change oil (more frequently in harsher environments or under heavy use).
- Inspect valves for rust, wear, and carbon build up, if necessary replace with kit
- Check air filter for cleanliness and replace as necessary.
- Check belt tension.

EVERY SIX MONTHS

- Replace air filter.

Oil OIL RECOMMENDATION

Use Genuine **CURTIS-LUBEPLUS** Lubricants. Specially formulated for Curtis Reciprocating Air Compressors. Non-Detergent type with anti-foam, anti-rust and oxidation inhibitors.

In areas with very hot ambient air temperatures, FS Curtis recommends using **ISO100 RC-1000A CURTIS-LUBEPLUS**.

1. For proper lubrication the compressor shall not be operated below the minimum or above the maximum R.P.M. recommended for the various models.
2. Maintain oil level mid-way between the upper and lower lines of the crankcase sight gage.

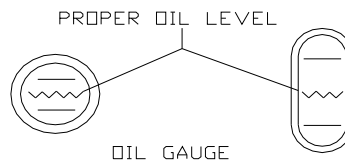


Fig (13) Oil sight glass reading

3. Stop compressor to add and gauge oil.
4. Do not fill above the upper line and do not operate compressor with oil level below the lower line.

MODEL NUMBER	HORSEPOWER (hp)	OIL CAPACITIES		OIL CAPACITY
		MIN RPM	MAXIMUM RPM	
E50	5	500	1050	1½ QUARTS
E57	5 – 7½	500	1250	2 QUARTS
E71	10	500	1050	2½ QUARTS
E15	15	500	1050	5 QUARTS
CT55	5	500		1 ½ QUARTS
CT75	7.5-10 electric 13-14 gas	500		3 QUARTS

Table (4)

Bolt Torques

Challenge Air and CT Compressors

	E50		E57		E71		E15	
	Size	Torque (CM-FT)	Size	Torque (CM-FT)	Size	Torque (CM-FT)	Size	Torque (CM-FT)
Head Bolts	M10-1.5	300-21.7	M10-1.5	320-23.1	M10-1.5	320-23.1	M10-1.5	320-23.1
Cylinder Case	M10-1.5	280-20.35	M10-1.5	280-20.25	M10-1.5	280-20.25	M10-1.75	350-25.3
Rod Bolts	M8-1.5	280-20.25	M8-1.25	280-20.25	M8-1.5	300-21.7	M10-1.5	300-23.1
Front Cover	M8-1.5	280-20.25	M10-1.5	300-21.7	M8-1.5	300-21.7	M10-1.5	320-23.1
Rear Cover	M10-1.5	280-20.25	M8-1.25	300-21.7	M10-1.5	280-20.25	M10-1.5	280-20.25
Inlet and Outlet Push Covers	M8-1.25	225-16.3			M8-1.25	225-16.3	M10-1.5 M8-1.25	320-23.1 225-16.3

Table (5) Challenge air bolt torque specifications

MODEL NO.	FLYWHEEL BOLTS		FAN BOLTS	
	TORQUE FT.-LBS.	TORQUE IN.-LBS.	TORQUE FT.-LBS.	TORQUE IN.-LBS.
E57	23	276	-	-
E50	40	480	-	-
E71	45	540	24	288
E15	50	600	24	288

Table (6) Challenge air bolt torque specifications

TORQUE SPECIFICATIONS		
DESCRIPTION	CT-55 (ft/lbs.)	CT-75 (ft/lbs.)
CONNECTING-ROD BOLTS TORQUE	16.28	22.2
CYLINDER HEAD SCREWS TORQUE	37	45
CYLINDER TO CRANKCASE SCREWS TORQUE	37	45
FLYWHEEL BOLT TORQUE	37	37

Table (7) CT compressor bolt torque specifications

BELT TENSION

CAUTION: Over tightening the v-belt(s) will result in overloading of the motor, and/or belt and pulley failure. A loose belt will result in an unstable speed, premature belt wear, “throwing” belts and a high amp draw. To change tension, turn the adjusting bolt at the end of the base, shown in figure 13. Retighten motor hold-down bolts. Grease both the motor and compressor pulleys once a year with lithium ball bearing grease.

Proper belt tensioning requires the use of a belt tension gauge to measure belt tension. This tool is available at your local auto parts or hardware store.

1	Motor Mounts
2	Take Up Bolt

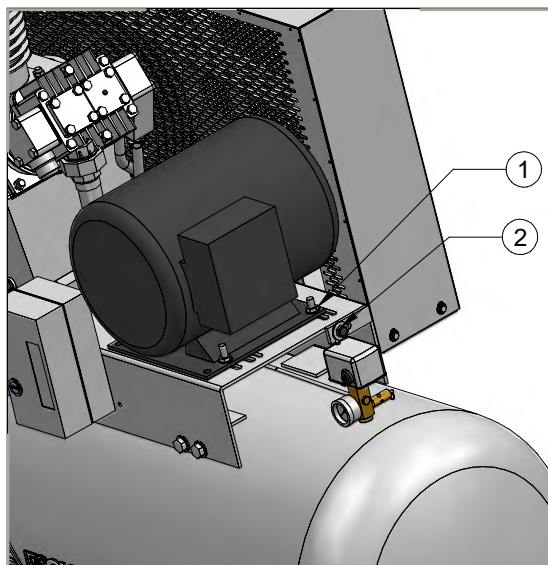


Fig 14 Motor mounts and take up bolt.

BELT TENSIONING INSTRUCTIONS

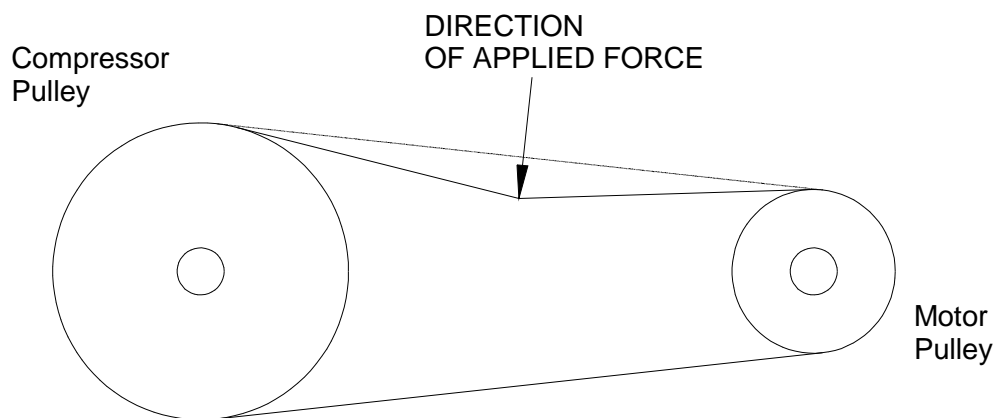
1. Loosen the motor mounting bolts, but do NOT remove the nuts. See fig (12) for the mounting bolt locations. **Do NOT attempt to adjust the take-up bolt before loosening all of the motor mounting bolts, attempting to do so will damage the unit.**
2. Consult Table (7) for the appropriate deflection and tension values for Challenge Air units. Table (8) contains deflection and tension values for CT units.

Model	HP	Gage Deflection	Average Tension	Minimum	Maximum
CA E57	5	1/4"	10lb	9lb	12lb
CA E50	5	1/4"	10lb	9lb	12lb
CA E57	7.5	1/4"	8lb	7lb	10lb
CA E71	10	3/8"	12lb	11lb	14lb
CA E15	15	3/8"	11lb	10lb	13lb
CA Gas E57	13-14	3/8"	20lb	18lb	23lb

Table (7) Challenge Air Belt Tensioning Guide

Model	HP	Gage Deflection	Average Tension	Minimum	Maximum
555VT6	5	1/4"	13lb	11lb	14lb
555VT8	5	1/4"	10lb	9lb	12lb
775VT8	7.5	1/4"	10lb	9lb	12lb
1075HT12	10	1/4"	8lb	7lb	10lb
CT Gas	13-14	3/8"	20lb	18lb	23lb

Table (8) CT Belt Tensioning Guide



3. Fig (15) Proper belt tensioning

4. At the center of the span, perpendicular to the belt, apply pressure to the outer surface of the belt tension gauge as shown in figure (13). Apply force to the belt until the rubber ring on the deflection gauge is located at the original position of the belt. Record the reading on the belt tension gauge and compare to the chart. Reset the rubber ring on the belt tension gauge before taking another reading.
5. Adjust the take-up bolt to tighten or loosen the belt tension as required.
6. Finger-tighten ONE motor mounting bolt. Using a straight-edge, check that pulleys are aligned and adjust motor as necessary.
7. Finger tighten the remaining motor mounting bolts.
8. Using a wrench or air tool, incrementally tighten the mounting bolts in a basic crossing pattern.
9. Re-mount the belt guard. DO NOT attempt to operate the unit without the belt guard securely in place.
10. Recheck the tension of the new belts several times in the first month of operation and adjust if necessary. Thereafter, check belt tension every three months.

Maintenance Parts and Rebuild Kits

To order replacement parts for routine maintenance, please contact your local distributor.

CHALLENGE AIR REBUILD KITS

	<i>E57 Kit Number</i>	<i>E50 Kit Number</i>	<i>E71 Kit Number</i>	<i>E15 Kit Number</i>
Oil (1 gallon bulk)	VO411-4	VO411-4	VO411-4	VO411-4
Air Filter	2601540300	2601540410	2601694350	2601540410
Gasket Kit (all gaskets)	2601694360	2601694340	2501694350	2601694330
Breather Kit (oil breather)	2601694830	2601694840	2601694810	2601694880
Valve/Gasket Kit (wearable parts)	2601693870	2601693880	2601693890	2601693910
Ring Kit (all rings)	2601694650	2601694690	2601694720	2601694750
Lower End Kit (contains Gasket Kit, Valve Kit, and Ring Kit)	2601694580	2601694600	2601694530	2601694550

Table (9) Routine Maintenance Parts and Rebuild Kits for Challenge Air compressors

CT REBUILD KITS

	<i>CT55 Kit Number</i>	<i>CT75 Kit Number</i>
Oil (1 gallon bulk)	VO411-4	VO411-4
Air Filter	VA1163	VA1165
Gasket Kit	CCC1793	CCC1794
Valve Plate Kit	CCC1795	CCC1796
LP Ring Kit	CCC1797	CCC1799
HP Ring Kit	CCC1798	CCC1800

Table (10) Routine Maintenance Parts and Rebuild Kits for CT Compressors

Troubleshooting

	Problem	Cause	Remedy
1	Unit won't start	<ul style="list-style-type: none"> • Power not on • Fuse blown • Low voltage supplied • Worn pressure switch contacts • Starter overload tripped • Broken / loose electrical connections 	<ul style="list-style-type: none"> • Check breaker and / or disconnect • Replace the fuse or disconnect • Contact distributor • Replace • Reset starter overload • Check electrical connections
2	Flywheel / motor rotating clockwise	<ul style="list-style-type: none"> • Incorrect lead connection 	<ul style="list-style-type: none"> • Reverse the leads
3	Flywheel /motor rotating slowly	<ul style="list-style-type: none"> • Excessively dirty oil • Heavy lubrication oil • Oil thick due to low temperature • Belt slipping • Incorrect voltage 	<ul style="list-style-type: none"> • Change the oil • Use correct oil • Increase ambient temperature above 40°F • See 6 • Contact distributor
4	Excessive Vibrations	<ul style="list-style-type: none"> • Vibration pads not installed • Unit not leveled • Unit not securely fastened 	<ul style="list-style-type: none"> • Install vibration pads • Level unit with metal shims • Check for loose bolts on foundation, compressor, and motor
5	Compressor overheats	<ul style="list-style-type: none"> • Ambient air temperature too high • Degraded oil • Incorrect oil • Clogged Air Intake • Interior or exterior fouling of the intercooler 	<ul style="list-style-type: none"> • Ensure adequate ventilation • Change oil • Use correct oil • Replace filter and clean intake • Clean intercooler
6	Belt slipping	<ul style="list-style-type: none"> • Working pressure too high • Low belt tension • Worn belt • Incorrect belt • Worn or misaligned pulley 	<ul style="list-style-type: none"> • Lower working pressure • Adjust belt tension • Replace • Install correct belt • Replace or align pulley

	Problem	Cause	Remedy
7	Low discharge pressure	<ul style="list-style-type: none"> • Manual drain not fully closed (standard model) • Automatic drain not fully closed (if applicable) • Clogged air filter / intake • Leaks in air distribution system • Clogged air distribution system • Worn out pressure switch • Belt slipping • Worn piston rings • Worn head gasket • Worn valves 	<ul style="list-style-type: none"> • Close the drain cock • Clean or replace automatic drain • Replace the filter • Check fittings, bushings and connections for leaks • Clean air distribution system • Replace pressure switch • See 6 • Replace with ring kit • Replace with gasket kit • Replace with valve kit
8	Excessive belt wear	<ul style="list-style-type: none"> • Belt too tight or too loose • Incorrect belt • Exposure to abrasive dust • Working pressure too high • Worn or misaligned pulley 	<ul style="list-style-type: none"> • Adjust belt tension • Use correct belt • Eliminate dust or relocate unit • Lower working pressure • Replace or realign pulley
9	Lubricant appears milky	<ul style="list-style-type: none"> • Water in the crankcase • Incorrect oil • Water contaminated oil • Water leaking back through discharge valve 	<ul style="list-style-type: none"> • Compressor not running long enough to prevent condensation • Use correct oil • Replace oil • Re-pipe with drip legs and pitch piping away from the compressor
10	Excessive oil in compressed air	<ul style="list-style-type: none"> • Oil level too high • Incorrect oil • Piston ring not fully seated • Worn piston ring 	<ul style="list-style-type: none"> • Bleed excess oil • Use correct oil • Allow 100 hours to break in rings • Replace with ring kit
11	Motor overloads	<ul style="list-style-type: none"> • Working pressure too high • Incorrect voltage 	<ul style="list-style-type: none"> • Lower working pressure • Contact distributor

If your problem is not resolved after performing troubleshooting, or not listed above, please contact your local distributor for more assistance.

Maintenance Checklist

NOTE: Please keep a record of changes and have this list available when calling technical service.

OIL CHANGED

[illegible]

BELT TENSIONING

[illegible]

Maintenance Checklist

NOTE: Please keep a record of changes and have this list available when calling technical service.

Valve Inspected

[illegible]

Air Leak Checks

[illegible]

NOTE: Please keep a record of changes and have this list available when calling technical service.

[illegible][illegible]

FS Curtis

1905 Kienlen Ave., St. Louis, MO 63133

(800) 925-5431 FAX (314) 381-1439

EMAIL: info@curtistoledo.com

Website: www.fscurtis.com

Container Dimensions								
Container	Exterior			Internal			Door Openings	
	Length (ft)	Width (ft)	Height (ft)	Length (ft)	Width (ft)	Height (ft)	Width (ft)	Height (ft)
20 ft	19'10"	8'	8'6"	19'4"	7'8"	7'10"	7'6"	7'8"
20 ft High Cube	19'10"	8'	9'6"	19'4"	7'8"	8'10"	7'6"	8'8"
40 ft	40'	8'	8'6"	39'6"	7'8"	7'10"	7'6"	7'8"
40 ft High Cube	40'	8'	9'6"	39'6"	7'8"	8'10"	7'6"	8'8"
45 ft High Cube	45'	8'	9'6"	44'5"	7'8"	8'10"	7'6"	8'8"
20 ft Rfr	19'10"	8'	8'6"	17'10"	7'6"	7'10"	7'5"	7'4"
40 ft Rfr	40'	8'	8'6"	37'11"	7'6"	7'10"	7'5"	7'4"
40 ft HCRfr	40'	8'	9'6"	37'11"	7'6"	8'10"	7'5"	8'4"

Container Weights / Capacities				
Container	Capacity (cubic feet)	Tare WT (lbs)	MAX Gross (lbs)	MAX Payload (lbs)
20 ft	1,150	5,000	53,000	48,000
20 ft High Cube	1,550	5,400	52,500	47,500
40 ft	2,350	8,150	67,350	59,200
40 ft High Cube	2,700	8,400	66,850	58,450
45 ft High Cube	3,000	10,550	73,550	63,000
20 ft Rfr	1,000	6,450	52,850	46,400
40 ft Rfr	2,050	9,750	67,200	57,450
40 ft HCRfr	2,350	8,850	72,930	64,080

TECHNICAL DATA SHEET

Material Specification Criteria | Project Submittal Data



BAYSEAL® CCX

Medium Density - Closed Cell Foam

BaySeal® CCX is a two-component, medium density, one to one by volume spray applied polyurethane foam. To produce BaySeal® CCX requires the use of an “A” component (ISO) and a blended “B” component (RESIN) which contains ZERO ozone depleting blowing agents, catalysts, polyols and fire retarding materials. BaySeal® CCX is an insulation system designed for use in residential, commercial and industrial applications. Use in lieu of more traditional forms of insulating materials such as fiberglass, cellulose or other loose fill products.

Typical area's where spray polyurethane foam is applied are:

**EXTERIOR WALLS • VENTED ATTICS • UN-VENTED ATTIC ASSEMBLIES • BETWEEN FLOORS • FOUNDATIONS • CRAWLSPACES
HVAC DUCTS • FLUID TANKS • COLD STORAGE UNITS**

TYPICAL PHYSICAL PROPERTIES:

PROPERTY	BAYSEAL CCX	TEST
R-VALUE	6.9 @ 1" 21 @ 3"	ASTM C-518
CORE DENSITY	2.0 LB/ Cubic Foot	ASTM D-1622
CLOSED CELL CONTENT	> 90%	ASTM D-2856
SOUND TRANSMISSION COEFFICIENT	41	ASTM E-90-85/E 413
WATER ABSORPTION	< 2% by volume	ASTM D-2842
WATER VAPOR TRANSMISSION - PERMEANCE	0.8 perms @ 1" 0.23 perms @ 3.5"	ASTM E-96
AIR IMPERMEABLE @75PA	< 0.02 (L/s-m²) @ 1"	ASTM E-2178
TENSILE STRENGTH	60 psi	ASTM D-1623
DIMENSIONAL STABILITY	< 9%	ASTM D-2126
COMPRESSIVE STRENGTH	47 psi	ASTM D-1621

BUILDING CODE CERTIFICATIONS/ FIRE TEST DATA		
EVALUATION SERVICE REPORT	ICC-ES IAMPO	ESR - 2072 UES - 0522
BUILDING TYPES	Approved	I, II, III, IV, V-B: Nonstructural Insulation material
FLAME SPREAD	ASTM E84	Class I < 25
SMOKE DEVELOPMENT	ASTM E84	Class I < 450
ASTM C 1029	Spray Applied Polyurethane Thermal Insulation	Meets or Exceeds Type II
NFPA 285	Pass	Compliant For Use In Building Types: I, II, III, IV, V
NFPA 286	Pass: Can be used without a 15-minute thermal barrier when covered with one of the approved intumescent coatings as shown on page 2.	
NFPA 286 AC377 APPENDIX X	Pass: Complies with the applicable requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces without a prescriptive ignition barrier.	
UL 1715	Pass: Can be used without a Code prescribed 15-minute thermal barrier when included as a component in tested alternative thermal barrier assemblies. See THERMAL BARRIER on page 2.	
GREENGUARD GOLD	GOLD: UL 2818 – 2013 Standard for Chemical Emissions for Building Materials, Finishes and furnishings	



BAYSEAL® CCX

GENERAL PROPERTIES: BaySeal® CCX is a 2.0 pcf density closed cell insulating material. BaySeal® CCX is designed for use where insulation systems require superior air barrier characteristics along with the ability to minimize moisture infiltration. BaySeal® CCX has a 6.9 per inch R-value rating while providing structural enhancement due to its semi-rigid nature when cured. When properly installed by a professional application company BaySeal® CCX quickly expands to fill the cracks, crevices, gaps and voids that exist in every structure. In addition BaySeal® CCX will conform to the curves, irregular surfaces and spaces to form a superior thermal envelope around your entire structure.

EQUIPMENT AND COMPONENT RATIOS: The mix ratio is 1 to 1 by volume. The pre-heater temperatures should be set between 105°F - 130°F and able to maintain +/- 5°F.

THERMAL BARRIER: Current International Building Code (IBC) and International Residential Code (IRC) require that spray polyurethane foam be separated from the building interior by a Code prescribed 15-minute thermal barrier or a Code-approved alternative. Gypsum board at a minimum thickness of 1/2" is a Code-prescribed 15-minute thermal barrier. The following products when installed per manufacturer specifications are alternative thermal barrier assemblies containing BaySeal® CCX:

APPROVED INTUMESCENT COATINGS:

DC315™ manufactured by:
International Fireproof Technology, Inc

Application Rates:
14 Wet Mils - 9 Dry Mils

IGNITION BARRIER: BaySeal® CCX meets the requirements of ICC-ES AC377 and Appendix X for use in attics and crawlspaces without the use of a prescriptive ignition barrier or Intumescent Coating under the following conditions.

A	Entry is only to service utilities in the attic or crawlspace and no storage is permitted.
B	Attic or crawlspace areas cannot be connected.
C	Air from the attic or crawlspace cannot be circulated to other parts of the building.
D	In accordance with IBC Section 1203.3 or IRC Section R408.1, under floor (crawlspace) ventilation is provided as applicable.
E	In accordance with IBC 1203.2 or IRC Section R806, attic ventilation is provided as applicable.
F	In accordance with 2012 and 2009 IMC (International Mechanical Code®) Section 701, or 2006 IMC Sections 701 and 703, combustion air is provided.
G	The foam plastic insulation is limited to the maximum thickness and density tested..
H	The installed coverage rate of coatings, if part of the insulation system shall be equal or greater than that tested.

VAPOR RETARDER: When installed at a minimum thickness of 1" BaySeal® CCX is considered a vapor retarder. Consult local building code officials for specific requirements. Climate zone tables are available in current IBC and IRC publications.

APPLICATION GUIDELINES: Polyurethane foam systems should be processed through commercially available spray equipment designed for that purpose by a qualified professional applicator. Consult the current Accella™ Polyurethane Systems, LLC application guidelines for BaySeal® CCX (Grade: Summer or Winter) OR BaySeal® CCXP (Grade: Arctic) prior to installation. It is the responsibility of the professional applicator to thoroughly understand all equipment technical information and safe operating procedures that pertain to a spray polyurethane foam application.

MATERIAL HANDLING: Due to the reactive nature of these components respiratory protection is mandatory. The vapors and liquid aerosols present during application and for a short period thereafter must be considered – and appropriate protective measures taken – to minimize potential risks from overexposure through inhalation, skin, or eye contact. These protective measures include: adequate ventilation, safety training for installers and other workers, use of appropriate personal protective equipment, and a medical surveillance program. It is imperative that the applicator read and become familiar with all available information on proper use and handling of spray polyurethane foam. Additional Information is available at spraypolyurethane.org, polyurethane.org or by contacting the Accella™ Technical Services dept. of Accella™ Polyurethane Systems, LLC.

PROPER STORAGE OF RAW MATERIALS: Shelf life is Six (6) months from date of manufacture when stored indoors, in the original unopened containers and between the temperatures of 50°-80°F.

TECHNICAL ASSISTANCE: For additional assistance please contact the Accella™ Technical Services dept. of Accella™ Polyurethane Systems, LLC. at (844) 922-2355.

DISCLAIMER: To the best of our knowledge, all technical data contained herein is true and accurate as of the date of issuance and subject to change without prior notice. User must contact Accella™ to verify correctness before specifying or ordering. We guarantee our products to conform to the quality control standards established by Accella™. We assume no responsibility for coverage, performance or injuries resulting from use. Liability, if any, is limited to replacement of the product. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY ACCELLA™ EXPRESSED OR IMPLIED; STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

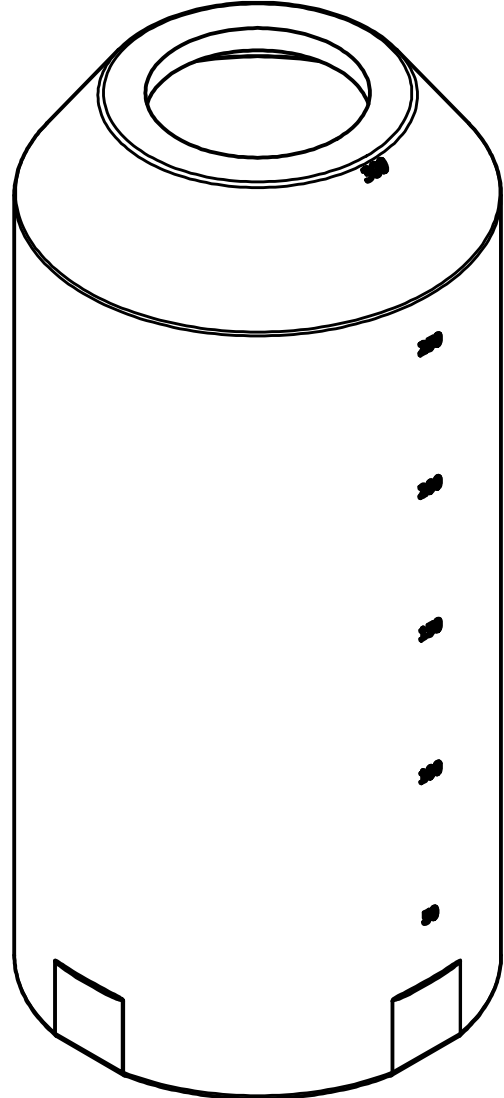
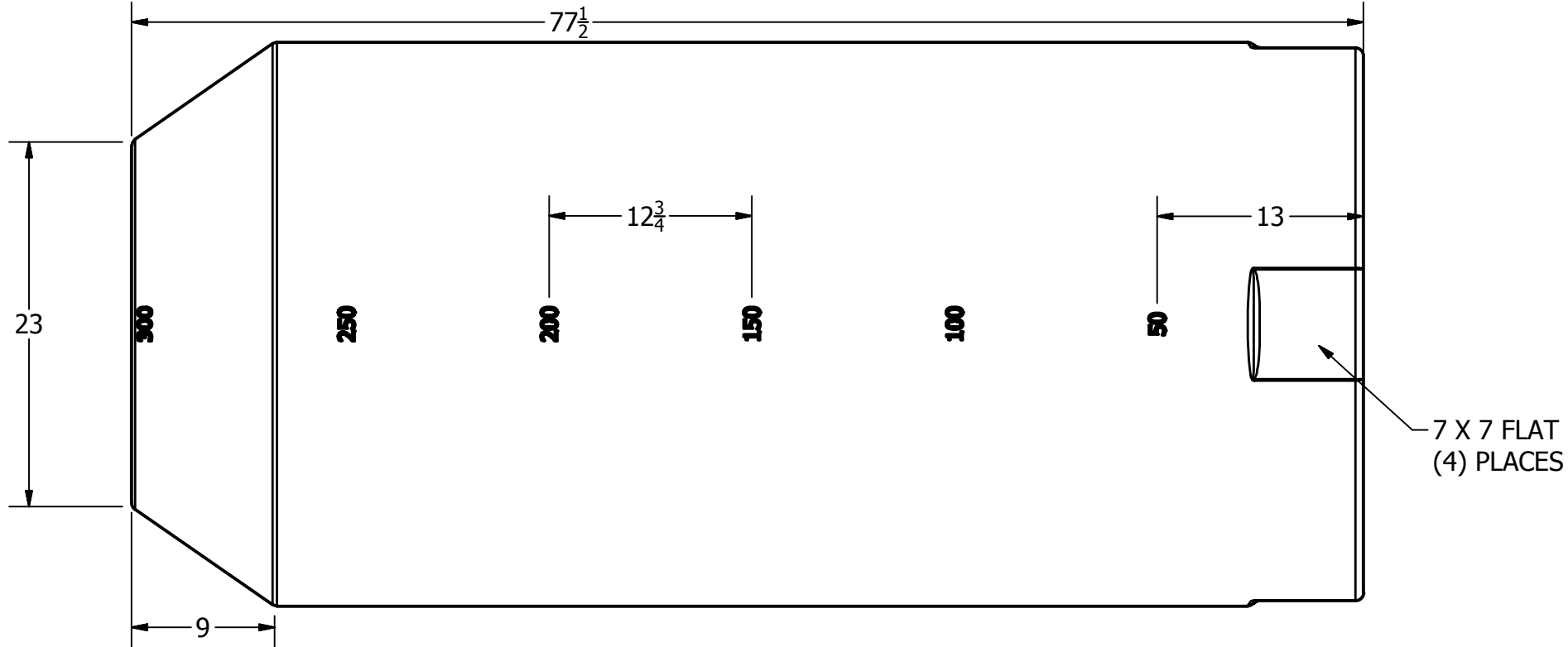
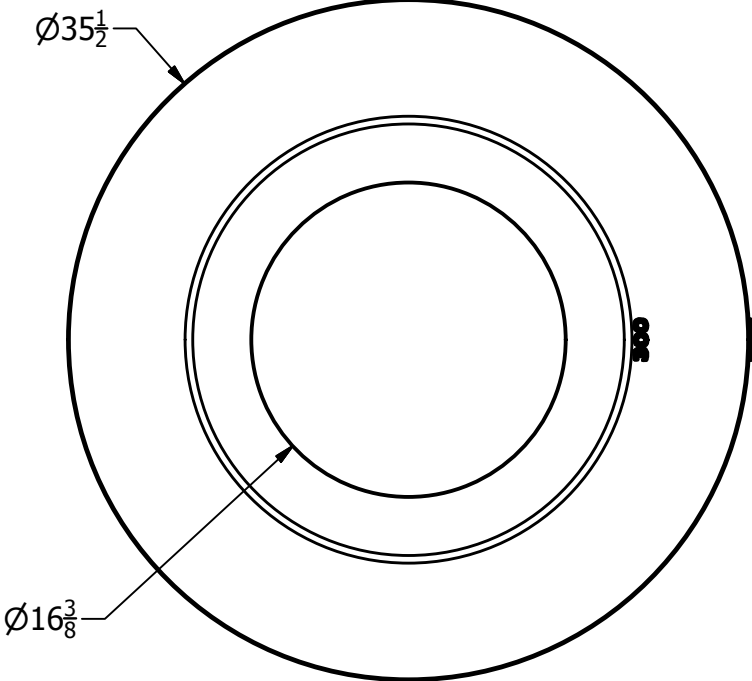


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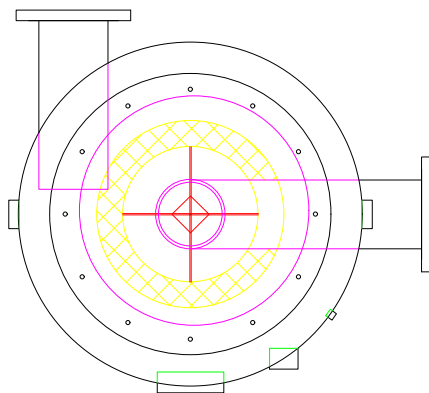
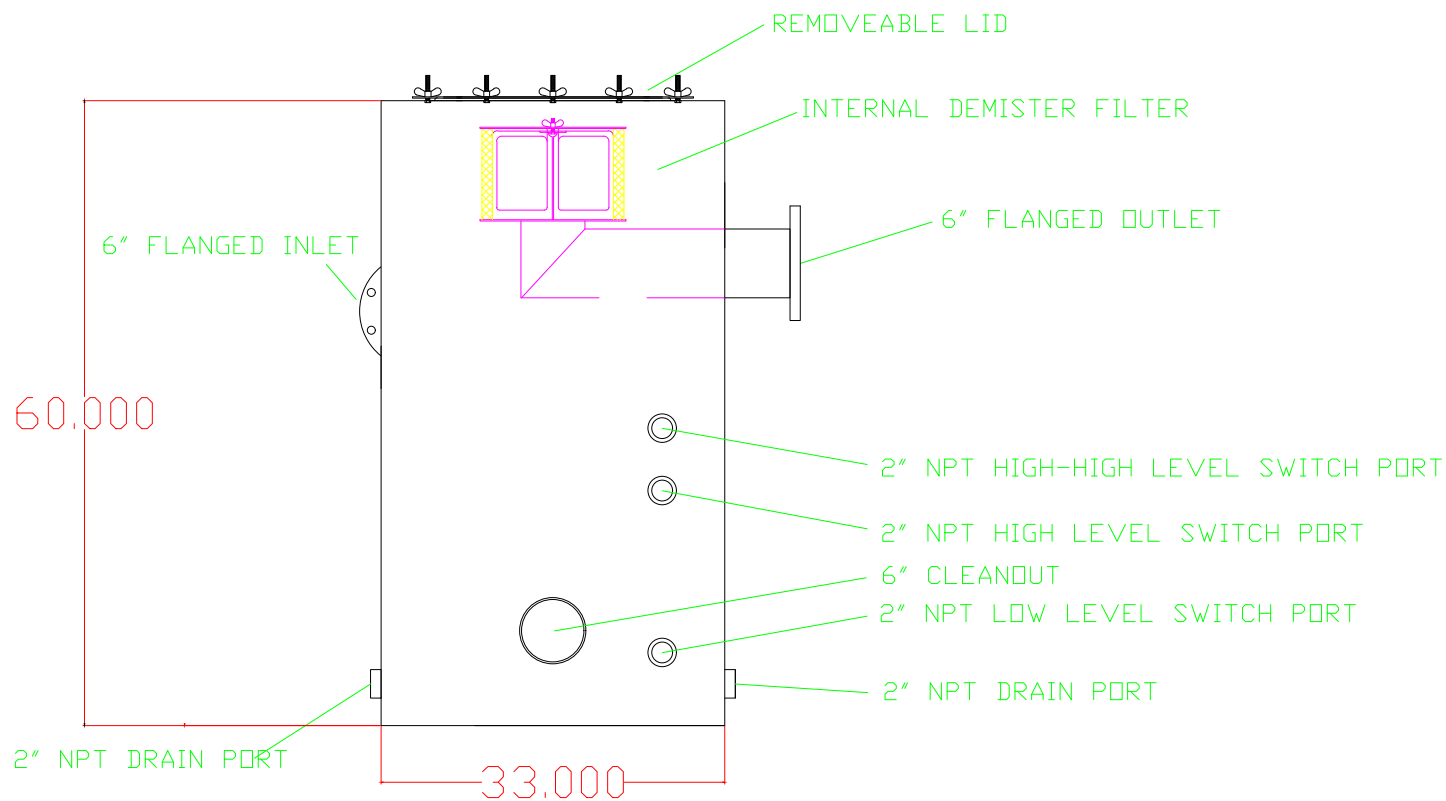
ACCELLA™ POLYURETHANE SYSTEMS, LLC
2400 Spring Stuebner Rd. Spring, TX 77389
(844) 922-2355 • AccellaCorp.com

EMERGENCY NOTIFICATIONS:

CHEMTREC : Material Leaks, Spills or Fire (800) 424-9300



REVISION HISTORY					
REV		DESCRIPTION		DATE	
A		REDRAWN		11/9/1995	
B		REDRAWN		7/1/2013	
DRAWN Jerry Paulson		11/9/1995		Michael Holden	
CHECKED					
QA					
MFG					
APPROVED					
		SIZE B		DWG NO	
		SCALE: 1/16		SHEET 1 OF 1	



WIRE MESH DEMISTER FILTER

- NOMINAL CAPACITY 1,100 ACFM
- CLEAN ELEMENT PRESSURE DROP 1.6" WC AT 100% OF RATED FLOW
- MAX. OPERATING TEMPERATURE 200° F
- EFFICIENCY 93% AT 10 MICRONS

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9/27/18

220 GALLON K.O. TANK

FLITEWAY

SIZE FSCM NO. DWG NO.

SCALE NONE

SHEET 1 OF 1



200 SERIES LIQUID FILLED GAUGE

Glycerine filled for added durability in applications where vibration or pulsation is present
Stainless steel case and bezel, copper alloy internals

2



201L SERIES



202L SERIES



203L SERIES



204L SERIES

STANDARD DIAL CONFIGURATIONS FOR 200 SERIES

Dial Range	Figure Intervals	Graduation Intervals	Dial Range	Figure Intervals	Graduation Intervals	Dial Range	Figure Intervals	Graduation Intervals
30/0"hg Vac	5" hg	0.5" hg	0/60 psi	10 psi	0.5 psi	0/1000 psi	200 psi	20 psi
30/0/15 psi	10" hg/5 psi	1" hg/0.5 psi	0/100 psi	20 psi	2 psi	0/1500 psi	200 psi	20 psi
30/0/30 psi	10" hg/5psi	1" hg/0.5 psi	0/160 psi	20 psi	2 psi	0/2000 psi	400 psi	40 psi
30/0/60 psi	30" hg/10psi	2" hg/1 psi	0/200 psi	40 psi	5 psi	0/3000 psi	500 psi	50 psi
30/0/100 psi	30" hg/20psi	5" hg/2 psi	0/300 psi	50 psi	5 psi	0/4000 psi	500 psi	50 psi
30/0/150 psi	30" hg/30psi	5" hg/2 psi	0/400 psi	50 psi	5 psi	0/5000 psi	1000 psi	100 psi
30/0/300 psi	30" hg/50psi	10" hg/5 psi	0/500 psi	100 psi	10 psi	0/6000 psi	1000 psi	100 psi
0/15 psi	2 psi	0.1 psi	0/600 psi	100 psi	10 psi	0/10,000 psi	2000 psi	200 psi
0/30 psi	5 psi	0.5 psi	0/800 psi	100 psi	10 psi	0/15,000 psi	2000 psi	200 psi

NOTE: Because of continuing improvements, increments/specifications are subject to change without notice. Stock ranges vary by dial size and configuration. Consult PIC for availability.

201L LIQUID FILLED LOWER MOUNT

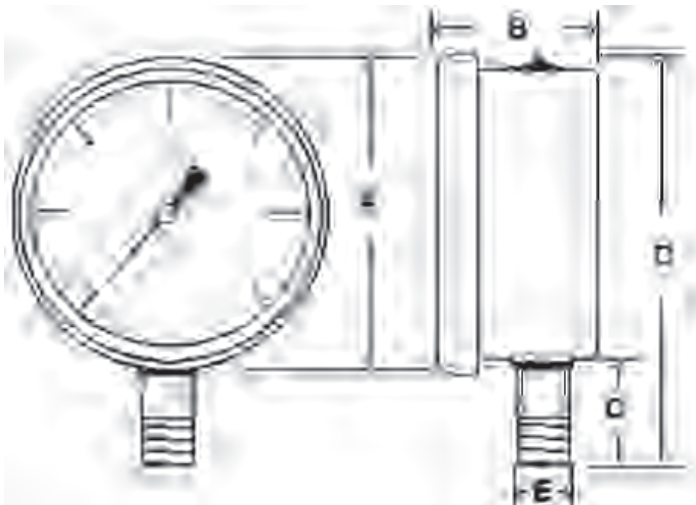


Glycerine filled for added durability in applications where vibration or pulsation is present
Stainless steel case and bezel, copper alloy internals

SPECIFICATIONS

Dial	1 1/2" (40 mm), 2" (50 mm), 2 1/2" (63 mm), 4" (100 mm)
Case	Stainless steel, glycerine filled
Wetted Parts	Copper alloy
Bezel	Stainless steel, fixed
Lens	Polycarbonate
Pointer	Black aluminum
Connection	Lower mount 1 1/2" dial = 1/8" NPT 2" dial = 1/8" or 1/4" NPT 2 1/2" dial = 1/4" NPT 4" dial = 1/4" or 1/2" NPT
Scale	Standard: psi/BAR (x 100 = kPa) Single scale psi available from stock
Accuracy	3-2-3% of span 1 1/2" & 2" ASME B40.1 Grade B 2-1-2% of span 2 1/2" & 4" ASME B40.1 Grade A
Ambient Temp	Glycerine Filled = 30° F to 160° F Dry = -30° F to 180° F

Design meets or exceeds ASME B40.100 pressure gauge standard.



Dial	Unit	A	B	C	D	E
1 1/2"	In.	1.85"	1.00"	0.67"	2.28"	1/8" NPT
	mm	47	25	17	58	
2"	In.	2.27"	1.20"	0.91"	2.95"	1/8" or 1/4" NPT
	mm	58	31	23	75	
2 1/2"	In.	2.80"	1.40"	1.07"	3.55"	1/4" NPT
	mm	71	36	27	90	
4"	In.	4.29"	1.75"	1.17"	5.21"	1/4" or 1/2" NPT
	mm	109	45	30	132	



2

AVAILABLE OPTIONS*

- Certificate of Accuracy, NIST traceable
- Custom Dial
- Liquid Fill Options, see page 176
- Anti-Vibration Movement, see page 109
- Glass Lens
- Dry, Fillable Case
- Cleaned for Oxygen Service (dry only)
- Special Connection Size
- Protective Rubber Cover, see page 121
- Max/Min Pointer, see page 122

*Lead times/minimums may apply

APPROXIMATE SHIPPING WEIGHTS/ BOX QUANTITIES

Dial Size	Est. Unit Weight	Box Qty
1 1/2"	0.20 lbs (0.10 kg)	100
2"	0.40 lbs (0.18 kg)	100
2 1/2"	0.55 lbs (0.24 kg)	50
4"	1.5 lbs (0.68 kg)	30



PART NUMBERING SYSTEM

SERIES TYPE
1 = Steel Case with Chrome Ring, Brass Internals
2 = Stainless Steel Case, Brass Internals
3 = Stainless Steel Case, 316 SS Internals
4 = Ammonia Gauge
5 = Brass Case, Brass Internals
6 = Forged Brass Case, Brass Internals
7 = Black Poly Case, Brass Internals

SPECIAL FEATURES
0 = Standard Gauge
1 = Removable Ring, Adjustable Pointer

MOUNTING STYLE
1 = Lower Mount
2 = Center Back Mount
3 = Back Connection, U-clamp Panel Mount
4 = Back Connection, Front Flange, Panel Mount
5 = Bottom Connection, Back Flange, Wall Mount
9 = Back Connection, Back Flange

CASE FILLING
D = Dry
L = Glycerine Filled
S = Silicone Filled

CONNECTION
8 = 1/8" NPT Male
4 = 1/4" NPT Male
2 = 1/2" NPT Male

DIAL SIZE
10 = 1" Diameter
15 = 1 1/2" Diameter
20 = 2" Diameter
25 = 2 1/2" Diameter
35 = 3 1/2" Diameter
40 = 4" Diameter
45 = 4 1/2" Diameter
60 = 6" Diameter
85 = 8 1/2" Diameter

RANGE
A = 30/0" Hg Vac
CB = 30" Hg Vac/0/15 psi
CC = 30" Hg Vac/0/30 psi
CD = 30" Hg Vac/0/60 psi
CE = 30" Hg Vac/0/100 psi
CF = 30" Hg Vac/0/150 psi
CG = 30" Hg Vac/0/200 psi
CH = 30" Hg Vac/0/300 psi
B = 0/15 psi
C = 0/30 psi
D = 0/60 psi
E = 0/100 psi
F = 0/160 psi
G = 0/200 psi
H = 0/300 psi
I = 0/400 psi
J = 0/500 psi
K = 0/600 psi
L = 0/800 psi
M = 0/1000 psi
N = 0/1500 psi
O = 0/2000 psi
P = 0/3000 psi
Q = 0/4000 psi
R = 0/5000 psi
S = 0/6000 psi
T = 0/7500 psi
U = 0/10,000 psi
V = 0/15,000 psi
W = 0/20,000 psi

EXAMPLE: "201L-254E"

2 = Stainless Steel Case, Brass Internals
0 = Standard Gauge
1 = Lower Mount
L = Glycerine Filled

25 = 2 1/2" Diameter Dial Size
4 = 1/4" NPT male
E = 0/100 psi

LP1 LOW PRESSURE LOWER MOUNT

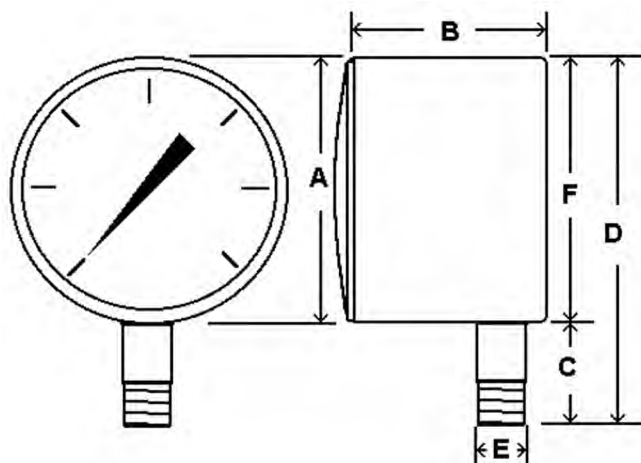


Capsule type pressure gauge for accurate measurement of low pressures
Suitable for air, water, oil, gas or any other media not corrosive to copper alloy

SPECIFICATIONS

Dial	2 ½" (63 mm)
Case	Chrome plated steel, dry non-fillable
Wetted Parts	Copper alloy
Lens	Plastic, removable twist lock
Pointer	Adjustable, black aluminum Adjustment screw at rear of case
Connection	Lower mount ¼" NPT
Scale	Standard: single scale inches of water column or psi
Accuracy	3-2-3% of span, ASME B40.1 Grade B
Ambient Temp	-30° F to 180° F

Design meets or exceeds ASME B40.100 pressure gauge standard.



Dial	Unit	A	B	C	D	E	F
2 ½"	In.	2.62"	1.85"	.85"	3.45"	¼"	2.6"
	mm	67	47	22	88	NPT	66

AVAILABLE OPTIONS*

- Certificate of Accuracy, NIST Traceable
- Custom Dial
- Special Connection Size
- Cleaned for Oxygen Service
- Protective Rubber Cover, see page 121
- Dual Scale

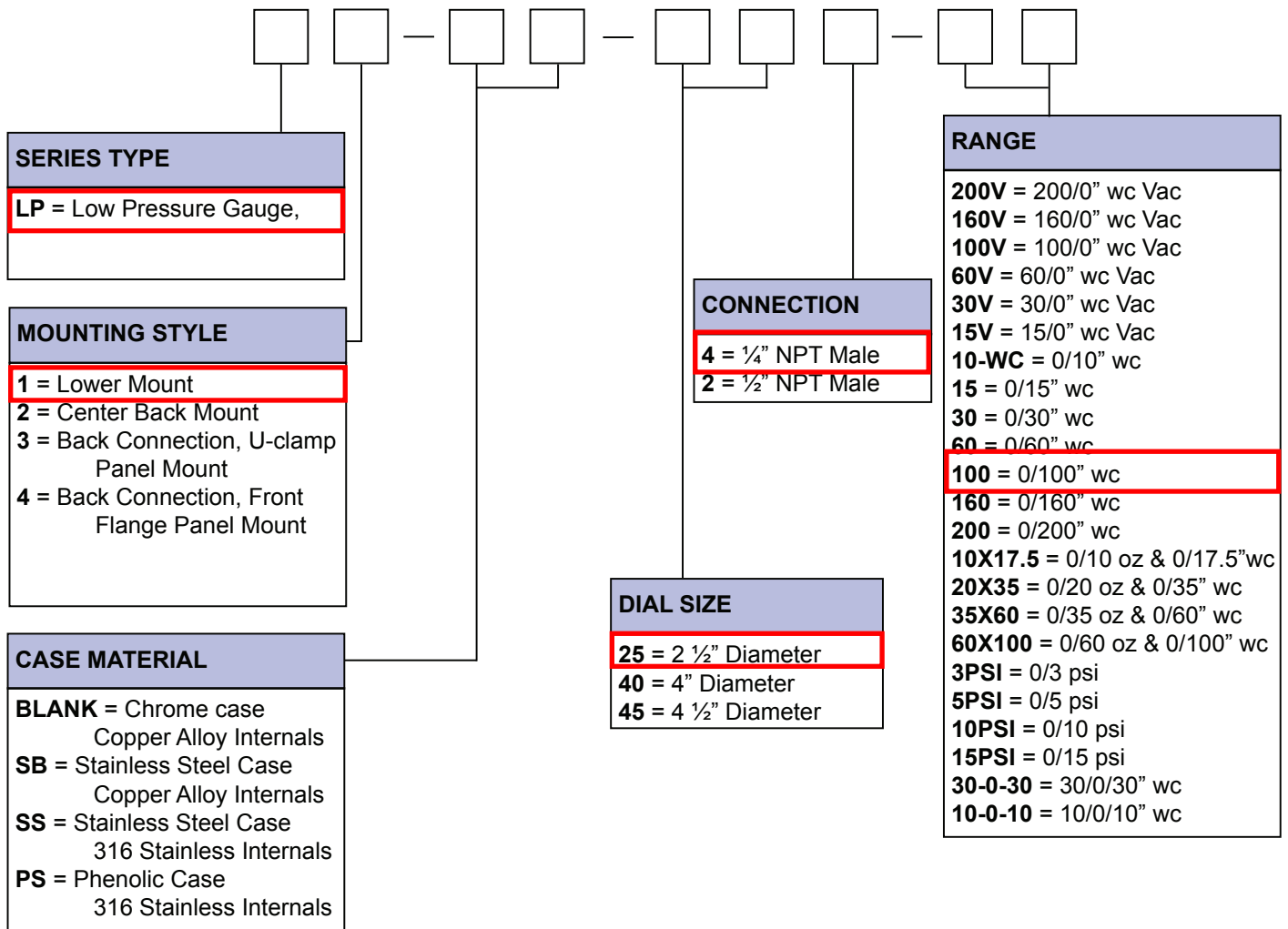
*Lead times/minimums may apply

APPROXIMATE SHIPPING WEIGHTS/ BOX QUANTITIES

Dial Size	Est. Unit Wt.	Box Qty
2 ½"	0.50 lbs (0.24 kg)	100



LOW PRESSURE SERIES PART NUMBERING SYSTEM



EXAMPLE: "LP1-SB-254-100"

LP = Low Pressure Gauge

1 = Lower Mount

SB = Stainless Steel Case, Copper Alloy Internals

25 = 2 1/2" Diameter

4 = 1/4" NPT Male

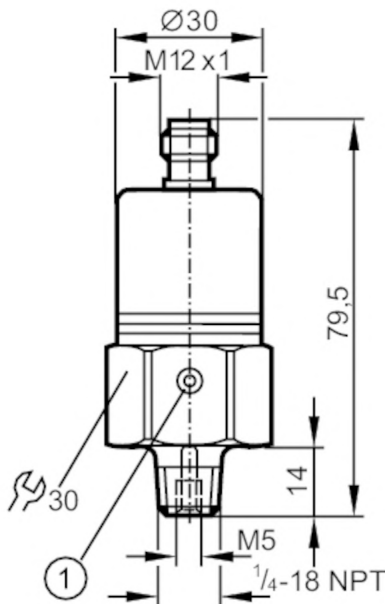
100 = 0/100" wc

PX3244



Pressure transmitter with ceramic measuring cell

PA-015PRBN14-A-ZVG/US/ IV



1 ventilation



Product characteristics		
Output signal		analog signal
Measuring range	[psi]	0...150
Process connection		threaded connection 1/4 NPT external thread Internal threadM5
Application		
System		gold-plated contacts
Application		for industrial applications
Media		liquids and gases
Medium temperature	[°C]	-25...90
Pressure rating	[psi]	1087
Min. bursting pressure	[psi]	2175
Type of pressure		relative pressure
Electrical data		
Operating voltage	[V]	9.6...32 DC
Min. insulation resistance	[MΩ]	100; (500 V DC)
Protection class		III
Reverse polarity protection		yes
Inputs / outputs		
Number of inputs and outputs		Number of analog outputs: 1



Pressure transmitter with ceramic measuring cell

PA-015PRBN14-A-ZVG/US/ IV

Outputs		
Total number of outputs		1
Output signal		analog signal
Number of analog outputs		1
Analog current output [mA]		4...20
Max. load [Ω]		720; (U _b = 24 V; (U _b - 9,6 V) / 20 mA)
Overload protection		yes
Measuring/setting range		
Measuring range [psi]		0...150
Accuracy / deviations		
Repeatability [% of the span]		< 0,15; (with temperature fluctuations < 10 K)
Characteristics deviation [% of the span]		< ± 0,35 (BFSL) / < ± 0,75 (LS); (incl. linearity, zero and span error (limit value setting))
Long-term stability [% of the span]		< ± 0,05; (per 6 months)
Temperature coefficient zero point [% of the span / 10 K]		0,2; (0...80 °C)
Temperature coefficient span [% of the span / 10 K]		0,3; (0...80 °C)
Reaction times		
Step response time analogue output [ms]		3
Operating conditions		
Ambient temperature [°C]		-25...80
Storage temperature [°C]		-40...100
Protection		IP 65
Tests / approvals		
EMC	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	30 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-6 HF conducted	10 V
	radiation of interference	according to the automotive directive 2004/104/EC / CISPR 25
	noise immunity	according to the automotive directive 2004/104/EC / ISO 11452-2
	HF radiated	100 V/m
	pulse resistance	ISO 7637-2 / severity level 3
Shock resistance	DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF [years]		555
Pressure equipment directive		sound engineering practice; can be used for group 2 fluids; group 1 fluids on request

PX3244



Pressure transmitter with ceramic measuring cell

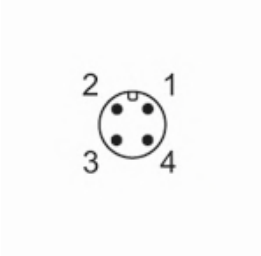
PA-015PRBN14-A-ZVG/US/ /V

Mechanical data		
Weight	[g]	212
Material	stainless steel (1.4404 / 316L); FKM; PA; EPDM/X	
Materials (wetted parts)	stainless steel (1.4305 / 303); ceramics; FKM	
Min. pressure cycles	100 million	
Process connection	threaded connection 1/4 NPT external thread Internal threadM5	
Restrictor element integrated	no (can be retrofitted)	

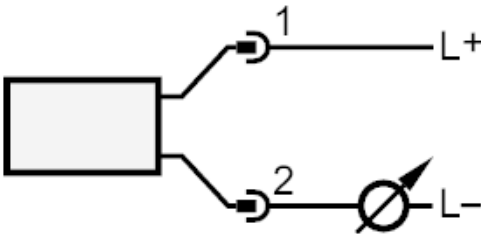
Remarks		
Pack quantity	1 pcs.	

Electrical connection

Connector: 1 x M12; Contacts: gold-plated



Connection

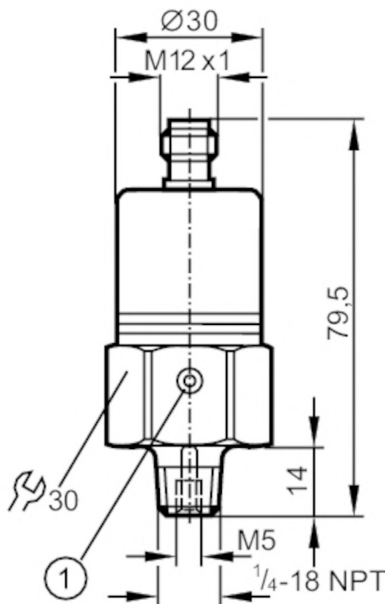


PX3234



Pressure transmitter with ceramic measuring cell

PA-020PRBN14-A-ZVG/US/ IV



1 ventilation



Product characteristics		
Output signal		analog signal
Measuring range	[psi]	0...200
Process connection		threaded connection 1/4 NPT external thread Internal threadM5
Application		
System		gold-plated contacts
Application		for industrial applications
Media		liquids and gases
Medium temperature	[°C]	-25...90; (on request: -40...90 °C)
Pressure rating	[psi]	1087
Min. bursting pressure	[psi]	2175
Type of pressure		relative pressure
Electrical data		
Operating voltage	[V]	9.6...32 DC
Min. insulation resistance	[MΩ]	100; (500 V DC)
Protection class		III
Reverse polarity protection		yes
Inputs / outputs		
Number of inputs and outputs		Number of analog outputs: 1



Pressure transmitter with ceramic measuring cell

PA-020PRBN14-A-ZVG/US/ IV

Outputs		
Total number of outputs		1
Output signal		analog signal
Number of analog outputs		1
Analog current output [mA]		4...20
Max. load [Ω]		720; (U _b = 24 V; (U _b - 9,6 V) / 20 mA)
Overload protection		yes
Measuring/setting range		
Measuring range [psi]		0...200
Accuracy / deviations		
Repeatability [% of the span]		< 0,1; (with temperature fluctuations < 10 K)
Characteristics deviation [% of the span]		< ± 0,35 (BFSL) / < ± 0,75 (LS); (BFSL = Best Fit Straight Line; LS = limit value setting)
Long-term stability [% of the span]		< ± 0,05; (per 6 months)
Temperature coefficient zero point [% of the span / 10 K]		0,15; (0...80 °C)
Temperature coefficient span [% of the span / 10 K]		0,2; (0...80 °C)
Reaction times		
Step response time analogue output [ms]		3
Operating conditions		
Ambient temperature [°C]		-25...80
Storage temperature [°C]		-40...100
Protection		IP 65
Tests / approvals		
EMC	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	30 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-6 HF conducted	10 V
	radiation of interference	according to the automotive directive 2004/104/EC / CISPR 25
	noise immunity	according to the automotive directive 2004/104/EC / ISO 11452-2
	HF radiated	100 V/m
	pulse resistance	ISO 7637-2 / severity level 3
Shock resistance	DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF [years]		555
Pressure equipment directive		sound engineering practice; can be used for group 2 fluids; group 1 fluids on request

PX3234



Pressure transmitter with ceramic measuring cell

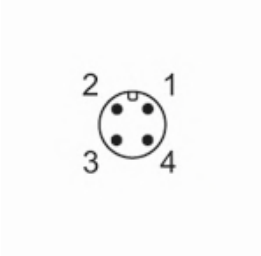
PA-020PRBN14-A-ZVG/US/ /V

Mechanical data		
Weight	[g]	215.5
Material	stainless steel (1.4404 / 316L); FKM; PA; EPDM/X	
Materials (wetted parts)	stainless steel (1.4305 / 303); ceramics; FKM	
Min. pressure cycles	100 million	
Process connection	threaded connection 1/4 NPT external thread Internal threadM5	
Restrictor element integrated	no (can be retrofitted)	

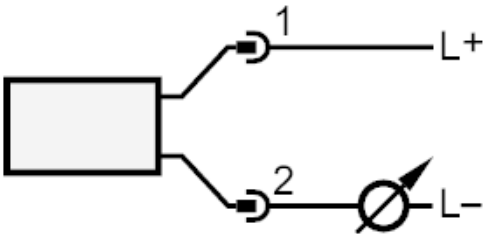
Remarks		
Pack quantity	1 pcs.	

Electrical connection

Connector: 1 x M12; Contacts: gold-plated



Connection

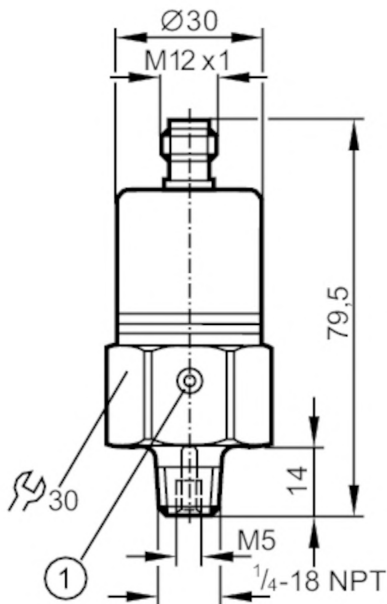


PX3228



Pressure transmitter with ceramic measuring cell

PA-010WRBN14-A-ZVG/US/ /V



1 ventilation



Product characteristics		
Output signal		analog signal
Measuring range [inH ₂ O]		0...100
Process connection		threaded connection 1/4 NPT external thread Internal threadM5
Application		
Media		liquids and gases
Medium temperature [°C]		-25...90
Pressure rating [inH ₂ O]		2400
Min. bursting pressure [inH ₂ O]		12043
Type of pressure		relative pressure
Electrical data		
Operating voltage [V]		9.6...32 DC
Min. insulation resistance [MΩ]		100; (500 V DC)
Protection class		III
Reverse polarity protection		yes
Inputs / outputs		
Number of inputs and outputs		Number of analog outputs: 1



Pressure transmitter with ceramic measuring cell

PA-010WRBN14-A-ZVG/US/ /V

Outputs		
Total number of outputs		1
Output signal		analog signal
Number of analog outputs		1
Analog current output [mA]		4...20
Max. load [Ω]		720; (U _b = 24 V; (U _b - 9,6 V) / 20 mA)
Overload protection		yes
Measuring/setting range		
Measuring range [inH ₂ O]		0...100
Accuracy / deviations		
Repeatability [% of the span]		< 0,15; (with temperature fluctuations < 10 K)
Characteristics deviation [% of the span]		< ± 0,35 (BFSL) / < ± 0,75 (LS); (BFSL = Best Fit Straight Line; LS = limit value setting)
Long-term stability [% of the span]		< ± 0,05; (per 6 months)
Temperature coefficient zero point [% of the span / 10 K]		0,2; (0...80 °C)
Temperature coefficient span [% of the span / 10 K]		0,3; (0...80 °C)
Reaction times		
Step response time analogue output [ms]		3
Operating conditions		
Ambient temperature [°C]		-25...80
Storage temperature [°C]		-40...100
Protection		IP 65
Tests / approvals		
EMC	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	30 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-6 HF conducted	10 V
	radiation of interference	according to the automotive directive 2004/104/EC / CISPR 25
	noise immunity	according to the automotive directive 2004/104/EC / ISO 11452-2
	HF radiated	100 V/m
	pulse resistance	ISO 7637-2 / severity level 3
Shock resistance	DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF [years]		555
Pressure equipment directive		sound engineering practice; can be used for group 2 fluids; group 1 fluids on request

PX3228



Pressure transmitter with ceramic measuring cell

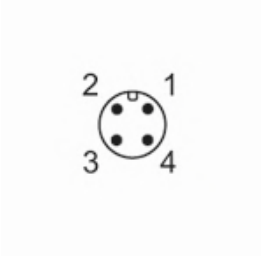
PA-010WRBN14-A-ZVG/US/ /V

Mechanical data		
Weight	[g]	212
Material	stainless steel (1.4404 / 316L); FKM; PA; EPDM/X	
Materials (wetted parts)	stainless steel (1.4305 / 303); ceramics; FKM	
Min. pressure cycles	100 million	
Process connection	threaded connection 1/4 NPT external thread Internal threadM5	
Restrictor element integrated	no (can be retrofitted)	

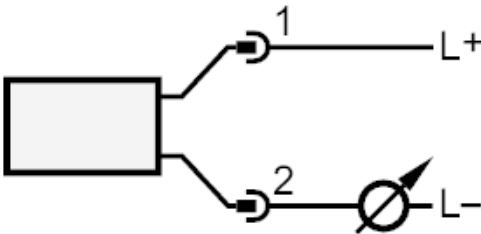
Remarks	
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; Contacts: gold-plated



Connection

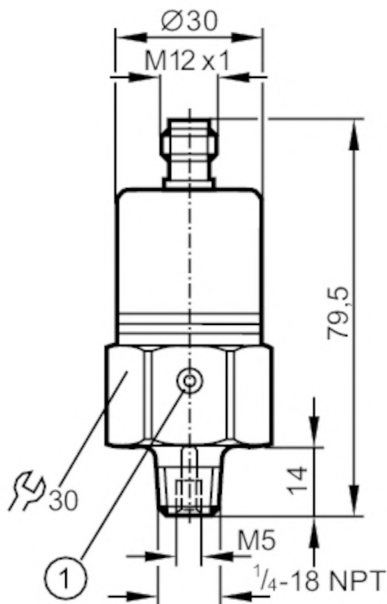


PX3229



Pressure transmitter with ceramic measuring cell

PA-0-1PRBN14-A-ZVG/US/ IV



1 ventilation



Product characteristics		
Output signal		analog signal
Measuring range	[psi]	-14.5...0
Process connection		threaded connection 1/4 NPT external thread Internal threadM5
Application		
System		gold-plated contacts
Application		for industrial applications
Media		liquids and gases
Medium temperature	[°C]	-25...90
Pressure rating	[psi]	145
Min. bursting pressure	[psi]	450
Type of pressure		relative pressure; vacuum
Electrical data		
Operating voltage	[V]	9.6...32 DC
Min. insulation resistance	[MΩ]	100; (500 V DC)
Protection class		III
Reverse polarity protection		yes
Inputs / outputs		
Number of inputs and outputs		Number of analog outputs: 1



Pressure transmitter with ceramic measuring cell

PA-0-1PRBN14-A-ZVG/US/ IV

Outputs		
Total number of outputs		1
Output signal		analog signal
Number of analog outputs		1
Analog current output [mA]		20...4
Max. load [Ω]		720; (U _b = 24 V; (U _b - 9,6 V) / 20 mA)
Overload protection		yes
Measuring/setting range		
Measuring range [psi]		-14.5...0
Accuracy / deviations		
Repeatability [% of the span]		< 0,1; (with temperature fluctuations < 10 K)
Characteristics deviation [% of the span]		< ± 0,25 (BFSL) / < ± 0,5 (LS); (BFSL = Best Fit Straight Line; LS = limit value setting)
Long-term stability [% of the span]		< ± 0,05; (per 6 months)
Temperature coefficient zero point [% of the span / 10 K]		0,15; (0...80 °C)
Temperature coefficient span [% of the span / 10 K]		0,2; (0...80 °C)
Reaction times		
Step response time analogue output [ms]		3
Operating conditions		
Ambient temperature [°C]		-25...80
Storage temperature [°C]		-40...100
Protection		IP 65
Tests / approvals		
EMC	EN 61000-4-2 ESD	4 kV CD / 8 kV AD
	EN 61000-4-3 HF radiated	30 V/m
	EN 61000-4-4 Burst	2 kV
	EN 61000-4-6 HF conducted	10 V
	radiation of interference	according to the automotive directive 2004/104/EC / CISPR 25
	noise immunity	according to the automotive directive 2004/104/EC / ISO 11452-2
	HF radiated	100 V/m
	pulse resistance	ISO 7637-2 / severity level 3
Shock resistance	DIN IEC 68-2-27	50 g (11 ms)
Vibration resistance	DIN IEC 68-2-6	20 g (10...2000 Hz)
MTTF [years]		555
Pressure equipment directive		sound engineering practice; can be used for group 2 fluids; group 1 fluids on request

PX3229



Pressure transmitter with ceramic measuring cell

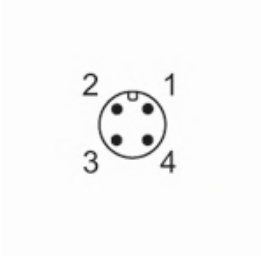
PA-0-1PRBN14-A-ZVG/US/ IV

Mechanical data		
Weight	[g]	212.5
Material	stainless steel (1.4404 / 316L); FKM; PA; EPDM/X	
Materials (wetted parts)	stainless steel (1.4305 / 303); ceramics; FKM	
Min. pressure cycles	100 million	
Process connection	threaded connection 1/4 NPT external thread Internal threadM5	
Restrictor element integrated	no (can be retrofitted)	

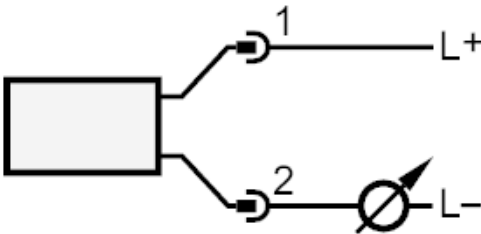
Remarks	
Pack quantity	1 pcs.

Electrical connection

Connector: 1 x M12; Contacts: gold-plated



Connection

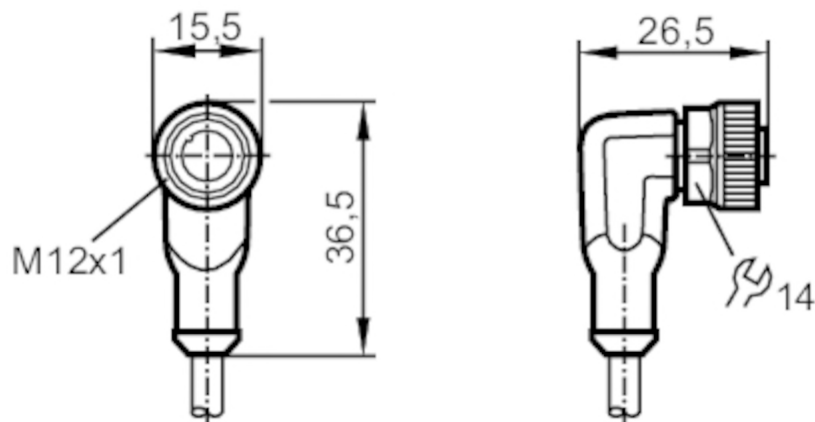


EVC005



Female cordset

ADOAH040MSS0005H04



Application

Free from silicone yes

Electrical data

Operating voltage [V] < 250 AC / < 300 DC

Protection class II

Max. current load total [A] 4

Operating conditions

Ambient temperature [°C] -25...90

Note on ambient temperature cULus: ...75

Ambient temperature (moving) [°C] -25...90

Note on ambient temperature (moving) cULus: ...75

Protection IP 65; IP 67; IP 68; IP 69K

Mechanical data

Weight [g] 176.6

Dimensions [mm] 26.5 x 15.5 x 36.5

Material housing: TPU (urethane) orange; sealing: FKM

Material nut brass, nickel-plated

Drag chain suitability yes

Drag chain suitability	Bending radius for flexible applications	min. 10 x cable diameter
	Travel speed	max. 3.3 m/s for a horizontal travel length of 5 m and max. acceleration of 5 m/s ²
	Bending cycles	> 5 Mio.
	Torsional strain	± 180 °/m

EVC005



Female cordset

ADOAH040MSS0005H04

Remarks

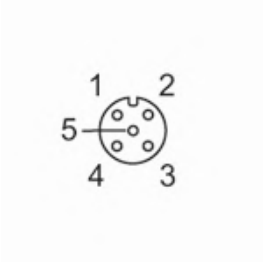
Pack quantity	1 pcs.
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Electrical connection

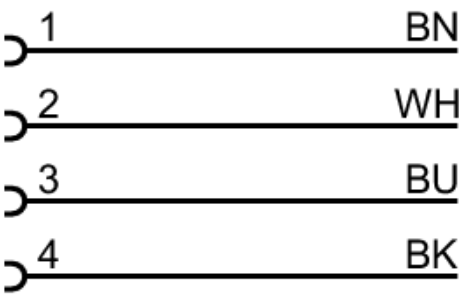
Cable: 5 m, PUR, Halogen-free, black, Ø 4.9 mm; 4 x 0.34 mm² (42 x Ø 0.1 mm)

Electrical connection - Socket

Connector: 1 x M12, angled; Locking: brass, nickel-plated; Contacts: gold-plated; Tightening torque: 0.6...1.5 Nm



Connection



- Core colors :
- BK =

black
- BN =

brown
- BU =

blue
- WH =

white

EVC005

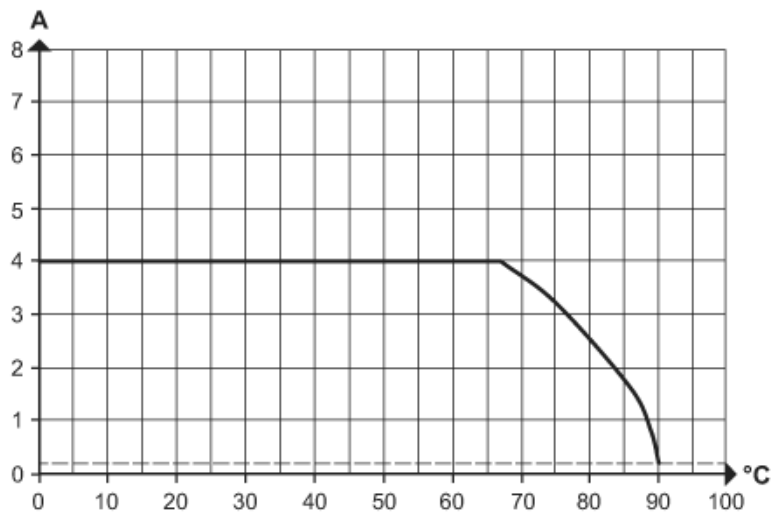


Female cordset

ADOAH040MSS0005H04

Diagrams and graphs

Characteristic curve for derating



Derating $I_{max} * 0.8$ (DIN EN 60512-5-2)

X Ambient temperature [°C]

Y Current [A]

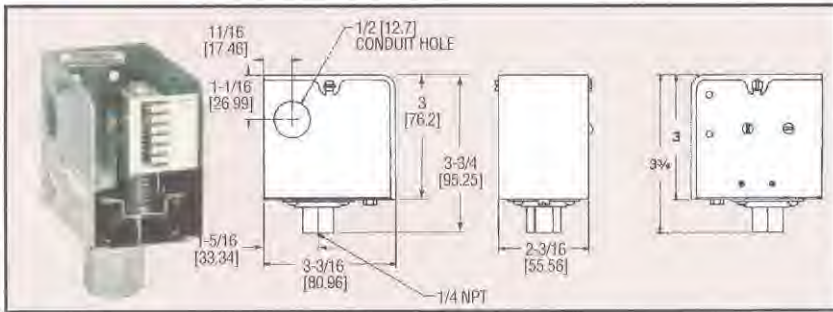
LVS



Series
CS, CD

Low Cost Diaphragm Pressure Switches

Visible Set Points, Fixed or Adjustable Deadband



Series CS, CD combines advanced design and precision construction with small size and low price. Unit is ideal for instrument panels, small compressors and general industrial applications. Visible set point and easy to wire SPDT snap switch reduce installation time. Operates in any position and is vibration resistant.

SPECIFICATIONS

Wetted Materials: Nylon reinforced Buna-N and steel.

Temperature Limits: -30 to 150°F (-35 to 66°C).

Pressure Limit: 30 psig (2.1 bar) for ranges 1, 3, and 10. 50 psig (3.5 bar) for range 30. 175 psig (12.1 bar) for range 150.

Enclosure Rating: General purpose.

Switch Type: SPDT snap switch.

Electrical Rating: 15A @ 120 VAC, 8A @ 240 VAC.

Electrical Connections: Screw terminal.

Conduit Connection: 1/2" hole for conduit hub.

Process Connection: 1/4" female NPT.

Mounting Orientation: Any position.

Set Point Adjustment: Internal screw.

Weight: .5 lb (0.23 kg).

Deadband: See model chart.

Agency Approvals: CE, UL.

STOCKED MODELS in bold

Model No.	Adjustable Operating Range	Deadband	Deadband Value
CS-1	1-30" Hg. Vac. (25.4-762 mm Hg)	Fixed	1.5" Hg. (38 mm Hg)
CS-3	1-100" w.c. (.25-24.9 kPa)	Fixed	7" w.c. (1.74 kPa)
CS-10	1-10 psig (.07-.69 bar)	Fixed	0.4 psig (0.03 bar)
CS-30	1-30 psig (.07-2.1 bar)	Fixed	1.0 psig (0.07 bar)
CS-150	10-150 psig (.69-10.3 bar)	Fixed	5 psig (0.35 bar)
CD-10	1-10 psig (.07-.69 bar)	Adjustable	Min: 1.5 psig (.1 bar), Max: 11.5 psig (.79 bar)
CD-30	1-30 psig (.07-2.1 bar)	Adjustable	Min: 2 psig (.14 bar), Max: 12 psig (.83 bar)
CD-150	10-150 psig (.69-10.3 bar)	Adjustable	Min: 14 psig (.97 bar), Max: 24 psig (1.7 bar)

Proven pump cycle counter delivers easy, accurate flow totalization, remotely.

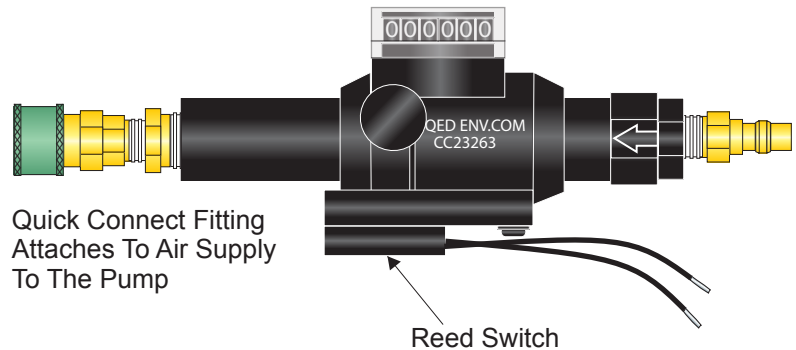
Conventional fluid meters are not reliable for measuring the pulsing type of flow produced by pneumatic displacement pumps. In the past, this made it difficult to totalize flow for site management, reporting or regulatory requirements.

Now with QED's Pump Cycle Counters, accurate flow measurement is easy for users of controllerless AutoPump pumps. These pumps deliver a consistent volume of liquid with each cycle. Counting the pump cycles and multiplying by the cycle volume gives the flow total.

In addition, dividing the pump cycles by the time interval tells you how fast the pump is cycling. Our second-generation counters have been engineered for a wider range of site conditions. Because they work on the compressed air line, the counters are ideal for cold weather applications where typical water flow meters have potential freezing problems.

With the reed switch installed in the 39532 Flow Counter and connected to a PLC you are able to remotely count the number of cycles pumped.

QED mechanical cycle counters have been widely accepted and proven in use on a large variety of cleanup and landfill sites.



**Model 39532 Flow Counter
With Optional Reed Switch Attached**

SPECIFICATIONS:

Model No.:	Special
Operation:	Mechanical Pneumatic
Display:	Rotating Number Wheels
Dimensions:	2.25" H x 4.5" W x 2.13" D (5.7 x 11.4 x 5.4 cm)
Materials:	Anodized Aluminum, Brass, Plastic
Weight:	1 lb. (.45 kg) Shipping Weight
Temp. Range:	0° - 140° F (-18° - 60° C)
Max. Pressure:	200 P.S.I. (1380 kPa)
Flow Capacity:	Normal Flow 5 SCFM (8.5 m3/h); Maximum Flow 20 SCFM (34 m3/h)
No. Of Counts:	0 - 999,999
Optional Reed Switch Rated:	10 Watts, 200VDC, 0.5 Amps
End Options:	39532 - NPT 39534 - Barbs For 3/8" Hose or 1/2" O.D. Tube 39535 - Quick Connects

FCI ST50 Series Flow Meters

**Low Cost, Low Maintenance
Air, Compressed Air and Nitrogen Flow Measurement
for Process and Plant Applications**



FCI ST50 FLOW METER

Wastewater Treatment Aeration Control
Blower and Dryer Air Flow Control
Burner and Furnace Air Flow Control
Lake, Pond and Aquaculture Aeration
HVAC Duct/Damper Control
Compressed Air Distribution Measurements

FCI FLUID COMPONENTS
INTERNATIONAL LLC

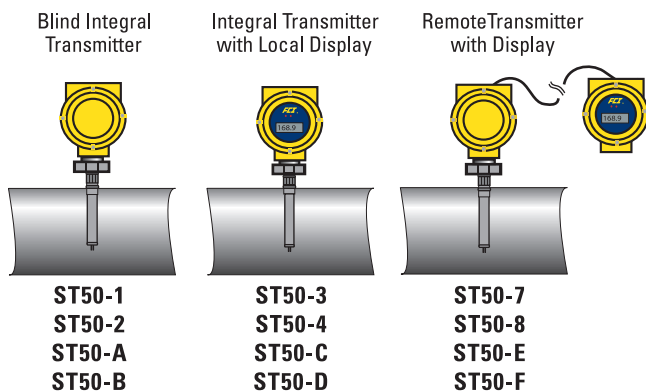
FCI ST50 Series Flow Meters

Easy to Install, Easy to Use

The ST50 Flow Meter is an accurate, easy to install, no moving parts solution for measuring and controlling air, compressed air or nitrogen flow. ST50 utilizes FCI proven thermal dispersion technology to provide direct mass flow measurement resulting in higher performance at a lower cost than orifice plates, DP, Vortex shedding and other thermal devices. The meter installs in line sizes ranging from 2 inches to 24 inches [51 mm to 610 mm] with 1/2" or 3/4" NPT.

ST50 uses precision, lithography structured platinum RTD sensors embedded in FCI's equal mass small diameter, all metal thermowells. Combined with microprocessor electronics and precision calibration, the ST50 achieves excellent accuracy, fast response and virtually maintenance free operation.

To serve a variety of application and installation requirements the ST50 is available in three standard configurations as shown below. (Other display options are described in Accessory Remote Digital Display section.)



To provide convenient and easy access for wire-up and signal isolation, the instrument's enclosure features dual conduit ports in either NPT or M20 threads, as well as removable front and rear covers. ST50 can be ordered for DC (18V to 36V) or AC (85V to 265V) power.

The ST50 is available with four calibration and final set-up selections. Two are standard calibrations suitable for final ranging and set-up in the field and two are for factory custom calibration with factory performed final ranging and set-up. All final set-up and flow ranges are subject to 100:1 maximum and 3:1 minimum turndowns.

Two standard calibrations include one for air or nitrogen flow rates between 1.25 SFPS to 125 SFPS [0.4 NMPS to 38 NMPS] in service pressures between 10 psia to 50 psia [0.7 bar(a) to 3.5 bar(a)] and one for compressed air, air or nitrogen flows between 4 SFPS to 400 SFPS [1.2 NMPS to 122 NMPS] in service pressures between 50 psia to 165 psia [3.5 bar(a) to 11.4 bar(a)]. All final user configurations for flow

Features

- Direct mass, volumetric or velocity flow measurement
- Dual 4-20 mA analog outputs
- Line/pipe sizes from 2" to 24" [51 mm to 610 mm]
- Non-clogging, no moving parts sensor
- RS232 and wireless IR communications
- 4-digit digital display option
- Small, compact design
- Easy installation

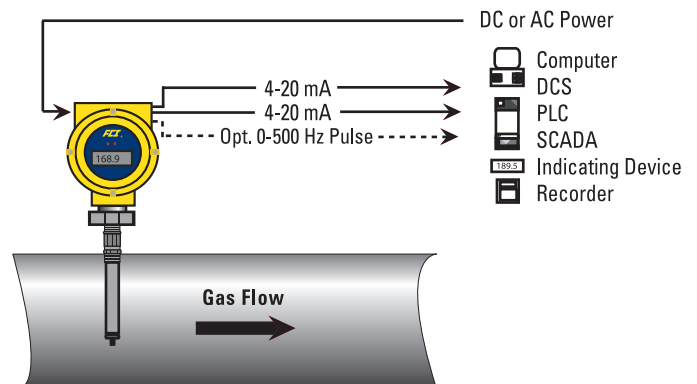
range, specific line size, standard volumetric or mass flow and engineering units are easily set-up in the field with a PC, PDA or FC88 programmer.

Alternatively, custom factory calibration and set-up is available for air or nitrogen with flow between 0.8 SFPS to 150 SFPS [0.2 NMPS to 46 NMPS] at service pressure between 10 psia to 50 psia [0.7 bar(a) to 3.5 bar(a)] or compressed air, air or nitrogen flow between 2.5 SFPS to 400 SFPS [0.8 NMPS to 122 NMPS] with service pressure between 50 psia to 165 psia [3.5 bar(a) to 11.4 bar(a)]. Custom calibration applications are subject to validation by FCI's AVAL flow meter optimizer program and a submittal of a completed FCI Application Data Sheet.

Extensive Outputs Ensure Application Compatibility

The ST50 includes dual 4-20 mA analog outputs which are field assignable as flow rate or temperature. Flow rate is selectable for reading in standard volumetric or mass flow engineering units. Optionally available as a third output, is a 0-1000 Hz pulse output of total flow.

In all models a standard RS232C serial I/O link is provided for instrument configuration, service/troubleshooting data, and measured readings. Also included in all models is a wireless IR sensor to enable wireless connectivity to PDA devices.





Exclusive "Wireless" Communications Option

With FCI's unique new IR link option, any Palm-OS based PDA can be used to communicate with the ST50 without contact. This wireless IR link features a password protected, easy-to-follow menu driven program to access all its features. Parameters include measured readings and totalizer values, configuration settings, calibration downloads, diagnostic service codes, and more. This wireless interface is ideal to save cost and time when the ST50 will be mounted in a hard to reach location. Requires FCI software accessory kit P/N 019819-01 for the PDA.

Designed and Built to Last

The all stainless steel element with Hast-C tips, provides protection from invasive conditions within the pipe and ensures long service life. The electronics are housed in an all metal NEMA 4X (IP67) rated enclosure for ruggedness and dust/weather proof service in industrial plant installations.

Whether adding flow measurement to improve the process or replacing high-maintenance flow meters, the ST50 provides an accurate, fast response and no-maintenance solution for air, compressed air and nitrogen flow measurement.



Precision Calibration in FCI Flow Laboratory

To ensure optimum accuracy, performance and quality, FCI owns and operates a best-in-class test and NIST traceable calibration laboratory. FCI product developments are subject to rigorous testing and calibration integrity validation using high-speed data acquisition systems and precision flow calibration equipment. Every FCI flow meter is also extensively tested and then calibrated using actual gases under customer conditions to assure their quality and performance.

- NIST traceability
- Automated data acquisition
- ISO 9001 certified
- Flow, pressure and temperature calibrations

Accessory Remote Digital Displays

For remote mounted digital readouts of flow, temperature and /or total flow, three types of accessory displays are available.



Model DM10 is a LCD readout meter which can be inserted and located anywhere in the 4-20 mA output loop from the ST50. It requires no separate power as it derives its power directly from the 4-20 mA loop. The DM10 is user scalable to ± 1999 digits and features oversized, 1 inch H [25 mm] characters for an easy-to-read display. NEMA 4X rated. FM and CSA certified models optional

Size: 3.15" H x 5.51" W x 2.56" D [80 mm H x 140 mm W x 65 mm D]

Mounting: Wall. Panel mount or pipe mount kit optional

Wire-Up: Screw terminals via 1/2" conduit hole at bottom of case



Model DM15 is a high accuracy, 1/8 DIN panel mount, AC line powered meter with a bright red LED readout. It features a user scalable, ± 9999 digit display and will accept both the 4-20 mA or 0-10 Vdc signals from the ST50. Optionally available with DM15 is a user programmable alarm setpoint with a Form C relay output.

Size: 1.89" H x 3.78" W x 5.35" D [48 mm H x 96 mm W x 136 mm D]

Mounting: Panel. Standard 1/8 DIN, 45 mm H x 92 mm W cutout

Wire-Up: Screw terminals at rear of instrument



Model DM20 is a miniature sized, totalizer counter that accepts the pulse output from the ST50. It features an 8-digit (0 to 99999999 counts) LCD that can be reset via its front-panel push-button. It is a panel-mount style that can be located in the field, in a separate enclosure or in the control room. It is self-powered by a lithium battery (included, 10 year life).

Size: 0.944" H x 1.89" W x 1.20" D [24 mm H x 48 mm W x 30.5 mm D]

Mounting: Panel. 22.5 mm H x 45 mm W cutout

Wire-Up: Screw-terminals at rear of instrument

ST50 Specifications

Instrument

Media Compatibility: Air, compressed air, and nitrogen

Pipe/Line Size Compatibility: 2" to 24" [51 mm to 610 mm]

Range: Air, compressed air, or nitrogen: 0.75 SFPS to 400 SFPS [0.23 MPS to 122 MPS]

Accuracy: Standard: $\pm 2\%$ of reading, $\pm 0.5\%$ of full scale
Optional: $\pm 1\%$ of reading, $\pm 0.5\%$ of full scale

Repeatability: $\pm 0.5\%$ of reading

Temperature Compensation:

Standard: 40 °F to 100 °F [4 °C to 38 °C]

Optional: 0 °F to 250 °F [-18 °C to 121 °C]

Turndown Ratio: 3:1 to 100:1

Agency Approvals:¹

FM/CSA: Nonincendive for use in Class 1, Division 2, Groups A, B, C and D T4 Ta = 60°C Indoor Hazardous (Classified) Locations.

ATEX/IECEX: II 3 G EEx nA II T6; II 3 D T65°C (DC input power only)

CPA, CE Marking, PED

Warranty: One year

Flow Element

Installation: Insertion, variable length with 1/2" or 3/4" MNPT compression fitting

Type: Thermal dispersion

Material of Construction: 316 stainless steel body with Hastelloy C thermowell sensors, 316 stainless steel compression fitting with Teflon or stainless steel ferrule

Pressure (Maximum Operating without Damage):

Stainless steel ferrule: 500 psig [34 bar(g)]

Teflon ferrule: 150 psig [10 bar(g)]

Temperature (Maximum Operation):

Stainless steel ferrule: 0 °F to 250 °F [-18 °C to 121 °C]

Teflon ferrule: 0 °F to 200 °F [-18 °C to 93 °C]

Process Connection: 1/2" MNPT or 3/4" MNPT with stainless steel or teflon ferrule

Insertion Length: Field adjustable lengths: 1" to 6" [25 mm to 152 mm]; 1" to 12" [25 mm to 305 mm]; or 1" to 18" [25 mm to 457 mm]

Transmitter

Enclosure: NEMA 4X [IP67], aluminum, dual conduit ports with either 1/2" NPT or M20x1.5 entries. Epoxy coated.

Output Signal:

Standard: (2) 4-20 mA, user assignable to flow rate and/or temperature

Optional: 0-500 Hz pulse for total flow

Communication Port: RS232C; wireless IR to PDA.²

Input Power:

DC: 18 Vdc to 36 Vdc (6 watt maximum)

AC: 85 Vac to 265 Vac (12 watt maximum)

(CE Marking Approval from 100Vac to 240Vac)

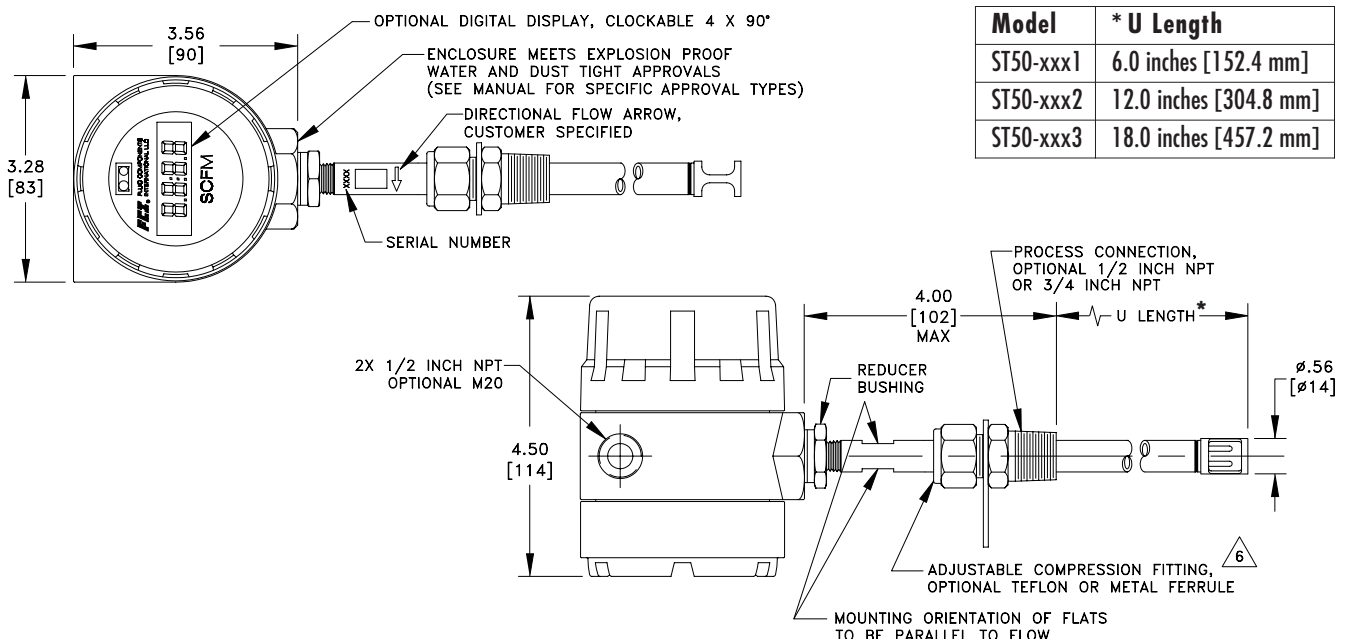
Operating Temperature: 0 °F to 140 °F [-18 °C to 60 °C]

Digital Display: ± 9999 Counts LCD, 0.45" H [11.4 mm] characters, user scalable to flow rate units or as 0-100%.¹

¹ For applications in Div. 1 / Zone 1 environments and/or for dual-line digital display with built-in totalizer display, see FCI Model ST51

² Requires user supplied PDA and FCI software P/N 019819-01

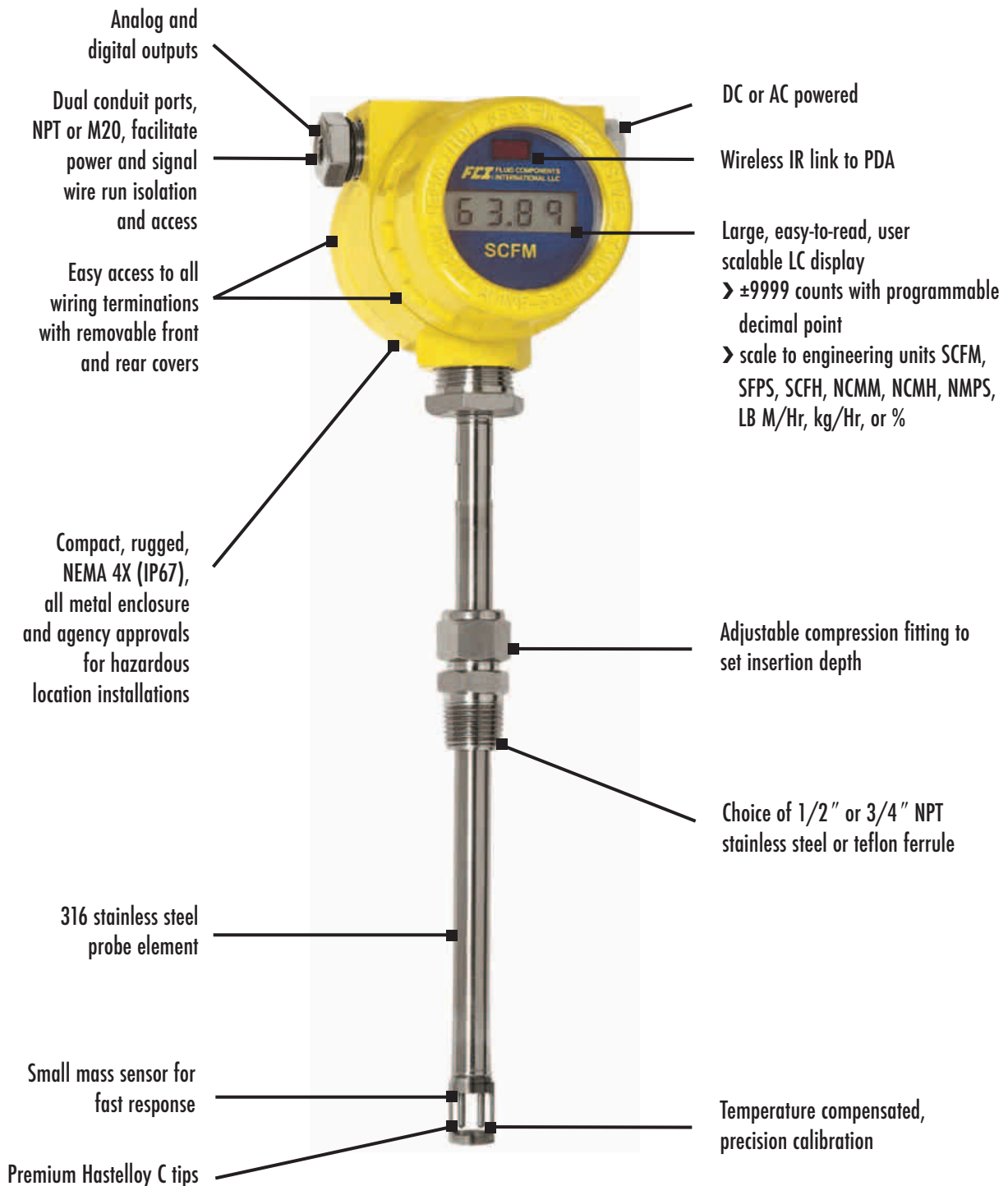
ST50 Dimension Drawing



ST50 Flow Meter

Single Insertion Point, Mass Flow Measurement

With premium components and attention to detail FCI's ST50 series provides long-lasting flow meter quality and value. It's features and functions ensure application compatibility, maximum installation convenience, superior industrial durability and lowest maintenance.



Companion FCI Flow Meters in the ST50/ST75 Series



■ ST51 Flow Meter

Insertion style flow meter similar to Model ST50 for biogas, digester gas and other methane composition gases, also with enhanced features for air applications.

- Two-line, Flow Rate + Totalizer Digital Display
- Agency Approvals for Div.1/Zone 1 Installations
- Pulse Output for External Totalizers is standard
- Special Low Flow Rate Calibration Option



■ ST75 Flow Meter Series

In-line (spool-piece) version for applications with smaller line sizes, 1/4" to 2" [6 to 51mm] and for all air and gases.

- For all air and gases including hydrocarbons and hydrogen
- Two-line, Flow Rate + Totalizer Digital Display
- Agency Approvals for Div.1/Zone 1 Installations

Data sheets and full product details for Model ST51, ST75 Series and other FCI models are available at www.fluidcomponents.com



Locally Represented By:

Visit FCI online at www.FluidComponents.com | FCI is ISO 9001:2000 and AS9100 Certified

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Rosemount® 8750W Magnetic Flowmeter System

for Utility, Water, and Wastewater Applications





- Best in class value with performance, reliability, and diagnostics suited for monitoring applications
- Reliable all welded coil housing and lightweight sensor design rated to IP68
- Available in 4–20mA with HART®, FOUNDATION™ Fieldbus, Modbus® RS-485, Process Diagnostics, and SMART™ Meter Verification to improve reliability and performance
- Available with drinking water certifications

Product Selection Guide

The Rosemount 8750W Magnetic Flowmeter sensor is available in a flanged style and transmitter is available in remote and integral transmitter configurations to ensure compatibility with all utility, water, and wastewater applications.

Transmitter selection

Transmitter	General characteristics
Field mount 	<ul style="list-style-type: none"> ■ Integral and remote configurations available ■ HART/Analog and Pulse outputs available ■ FOUNDATION™ Fieldbus and pulse output available ■ Modbus RS-485 and Pulse output available ■ Advanced Diagnostics available ■ LCD display (optional) <ul style="list-style-type: none"> — With optional optical switch local operator interface⁽¹⁾ ■ Two discrete channels (optional)
Wall mount 	<ul style="list-style-type: none"> ■ Wall mount configuration ■ HART/Analog and Pulse outputs available ■ Modbus RS-485 and Pulse output available ■ FOUNDATION™ Fieldbus and pulse output available ■ Advanced Diagnostics available ■ Local LCD display (optional) <ul style="list-style-type: none"> — With optional 15 button tactile key pad⁽¹⁾ ■ Two discrete channels (optional)


(1) HART or Modbus protocol only.

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Magmeter Diagnostics.....	3
Magnetic Flowmeter Sizing.....	4
Ordering Information.....	7
Product Specifications.....	18
Product Certifications.....	33
Dimensional drawings.....	33

Sensor selection

Table 1: Sensor Selection

Sensor	General characteristics
Flanged 	<ul style="list-style-type: none"> Flanged process connections Welded coil housing ½-in. (15 mm) to 48-in. (1200 mm) Standard, reference, and bullet-nose electrodes available

Selecting materials

For guidance on selecting materials, refer to the *Rosemount™ Magnetic Flowmeter Material Selection Guide (00816-0100-3033)*, available at www.emerson.com/rosemount.

Magmeter Diagnostics

Rosemount diagnostics reduce cost & improve output by enabling new practices

Rosemount Magnetic Flowmeters provide device diagnostics that detect and warn of abnormal situations throughout the life of the meter - from installation to maintenance and meter verification. With Rosemount Magnetic Flowmeter diagnostics enabled, plant availability and throughput can be improved, and costs through simplified installation, maintenance and troubleshooting can be reduced.

Table 2: Magnetic flowmeter diagnostics

Diagnostic name	Diagnostic category	Product capability
Basic diagnostics		
Tunable Empty Pipe	Process	Standard
Electronics Temperature	Meter Health	Standard
Coil Fault	Meter Health	Standard
Transmitter Fault	Meter Health	Standard
Reverse Flow	Process	Standard
Coil current	Maintenance	Standard
Electrode saturation	Process/Maintenance	Standard
Advanced diagnostics		
High Process Noise	Process	Suite 1 (DA1)
Grounding and Wiring Fault	Installation	Suite 1 (DA1)
Coated Electrode Detection	Process	Suite 1 (DA1)
Commanded Smart Meter Verification	Meter Health	Suite 2 (DA2)
Continuous Smart Meter Verification	Meter Health	Suite 2 (DA2)

Table 2: Magnetic flowmeter diagnostics (continued)

Diagnostic name	Diagnostic category	Product capability
4-20 mA Loop Verification ⁽¹⁾	Installation	Suite 2 (DA2)

(1) Available with HART output only.

Options for accessing diagnostics

Rosemount Magmeter Diagnostics can be accessed through the Local Operator Interface (LOI), ProLink® III v3.1, a HART Field Communicator⁽¹⁾, and AMS® Suite: Intelligent Device Manager⁽¹⁾. Contact your local Rosemount representative to activate diagnostics or for diagnostic availability on existing transmitters.

Access diagnostics through the LOI for quicker installation, maintenance, and meter verification

Rosemount Magnetic Flowmeter Diagnostics are available through the LOI to simplify maintenance.

Access diagnostics through ProLink III v. 3.0 (HART)/ProLink III v. 3.1 (HART, Modbus)

Simplify maintenance and troubleshooting practices by utilizing ProLink III v3.0/v3.1 to access diagnostics and troubleshooting information, log variable data, run SMART Meter Verification, and print verification reports.

Access diagnostics through AMS Intelligent Device Manager⁽¹⁾ for the ultimate value

The value of the diagnostics increases significantly when AMS Intelligent Device Manager is used. AMS Intelligent Device Manager provides a simplified screen flow and procedures for how to respond to the diagnostic messages.

Magnetic Flowmeter Sizing

Selecting the appropriate sensor size is an important step when considering a magnetic flowmeter. The physical properties of the process fluid, as well as the fluid velocity should be considered. It may be necessary to select a flow sensor that is larger or smaller than the adjacent piping to ensure the fluid velocity is in the recommended flow range for the application.

- Operation outside these guidelines may also give acceptable performance.

Table 3: Sizing guidelines

Application	Velocity range (ft/s)	Velocity range (m/s)
Normal Service	0–39	0–12
Preferred Service	2–20	0.6–6.1

Note

Operation outside these guidelines may also give acceptable performance.

To convert flow rate to velocity, use the appropriate factor listed in [Table 4](#) and the following equation:

$$\text{Velocity} = \frac{\text{Flow Rate}}{\text{Factor}}$$

(1) Available with HART output only.

Example: English units	Example: SI units
Magmeter Size: 4 in. (factor from Table 4 = 39.679) Normal Flow Rate: 300 GPM $\text{Velocity} = \frac{300 \text{ (gpm)}}{39.679}$ $\text{Velocity} = 7.56 \text{ ft/s}$	Magmeter Size: 100 mm (factor from Table 4 = 492.78) Normal Flow Rate: 800 L/min $\text{Velocity} = \frac{800 \text{ (L/min)}}{492.78}$ $\text{Velocity} = 1.62 \text{ m/s}$

Table 4: Line size vs. conversion factor

Nominal line size—Inches (mm)	Gallons per minute factor	Liters per minute factor
½ (15)	0.947	11.762
1 (25)	2.694	33.455
1½ (40)	6.345	78.806
2 (50)	10.459	129.89
2 ½ (65)	14.923	185.33
3 (80)	23.042	286.17
4 (100)	39.679	492.78
5 (125)	62.356	774.42
6 (150)	90.048	1,118.3
8 (200)	155.93	1,936.5
10 (250)	245.78	3,052.4
12 (300)	352.51	4,378.0
14 (350)	421.70	5,237.3
16 (400)	550.80	6,840.6
18 (450)	697.19	8,658.6
20 (500)	866.51	10,761
24 (600)	1,253.2	15,564
30 (750)	2006.0	24,913
36 (900)	2,935.0	36,451
40 (1000)	3,652.1	45,357
42 (1050)	4,115.1	51,107
48 (1200)	5,407.6	67,159

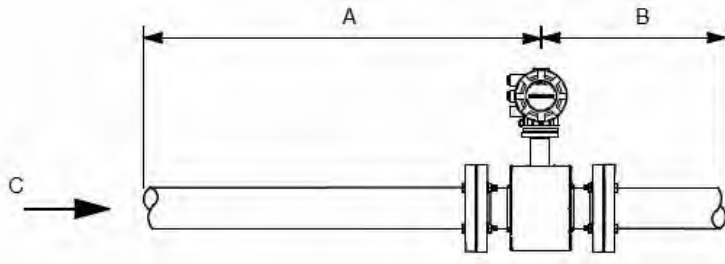
Table 5: Line size vs. velocity/rate

Nominal line size in inches (mm)	Minimum/maximum flow rate							
	Gallons per minute				Liters per minute			
	at 0.04 ft/s (low-flow cutoff)	at 1 ft/s (min range setting)	at 3 ft/s	at 39.37 ft/s (max range setting)	at 0.012 m/s (low-flow cutoff)	at 0.3 m/s (min range setting)	at 1 m/s	at 12 m/s (max range setting)
½ (15)	0.038	0.947	2.841	37.287	0.141	3.529	11.76	141.15
1 (25)	0.108	2.694	8.081	106.05	0.401	10.04	33.45	401.46
1½ (40)	0.254	6.345	19.04	249.82	0.946	23.64	78.81	945.67
2 (50)	0.418	10.459	31.38	411.77	1.559	38.97	129.89	1,558.7
2½ (65)	0.597	14.923	44.77	587.51	2.224	55.60	185.33	2,224.0
3 (80)	0.922	23.042	69.13	907.17	3.434	85.85	286.17	3,434.0
4 (100)	1.587	39.679	119.04	1,562.2	5.913	147.84	492.78	5,913.4
5 (125)	2.494	62.356	187.07	2,454.9	9.293	232.33	774.42	9,293.0
6 (150)	3.602	90.048	270.14	3,545.2	13.42	335.50	1,118.3	13,420
8 (200)	6.237	155.93	467.79	6,138.9	23.24	580.96	1,936.5	23,238
10 (250)	9.831	245.78	737.34	9,676.3	36.63	915.73	3,052.4	36,629
12 (300)	14.10	352.51	1,057.5	13,878	52.54	1,313.4	4,378.0	52,535
14 (350)	16.87	421.71	1,265.1	16,603	62.85	1,571.2	5,237.3	62,848
16 (400)	22.03	550.80	1,652.4	21,685	82.09	2,052.2	6,840.6	82,087
18 (450)	27.89	697.19	2,091.6	27,448	103.90	2,597.6	8,658.6	103,903
20 (500)	34.66	866.51	2,599.5	34,114	129.14	3,228.4	10,761	129,137
24 (600)	50.13	1,253.2	3,759.6	49,339	186.77	4,669.2	15,564	186,769
30 (750)	80.24	2,006.0	6,018.0	78,976	298.96	7,474.0	24,913	298,959
36 (900)	117.40	2,935.0	8,805.1	115,553	437.42	10,935	36,451	437,416
40 (1000)	146.09	3,652.1	10,956	143,785	544.29	13,607	45,357	544,286
42 (1050)	164.60	4,115.1	12,345	162,011	613.28	15,332	51,107	613,278
48 (1200)	216.30	5,407.6	16,223	212,898	805.91	20,148	67,159	805,908

Upstream and downstream piping

To ensure specified accuracy over widely varying process conditions, install the sensor with a minimum of five straight pipe diameters upstream and two pipe diameters downstream from the electrode plane.

Figure 1: Upstream and downstream straight pipe diameters



- A. Five pipe diameters (upstream)
- B. Two pipe diameters (downstream)
- C. Flow direction

Installations with reduced upstream and downstream straight runs are possible. In reduced straight run installations, the meter may not meet accuracy specifications. Reported flow rates will still be highly repeatable.

Sensor grounding

A reliable ground path is required between the sensor and the process fluid. Optional grounding rings or process reference electrodes are available with the sensor to ensure proper grounding. See Table 5 and Table 6.

Ordering Information

Rosemount 8750W Magnetic Flowmeter Platform



The Rosemount 8750W Magnetic Flowmeter is available in a flanged sensor design. The sensors are fabricated from stainless and carbon steel and welded to provide a sealed coil housing that protects against moisture or other contaminants. Sizes range from 1/2-in. (15 mm) to 48-in. (1200 mm). The field mount transmitter has a die cast aluminum housing for excellent reliability. The wall mount transmitter features an easy to use operator interface. Both transmitter styles are available with advanced diagnostics to provide the best insight into the process and the meter's health.

Note

The starred (★) offerings represent the most common options, and should be selected for best delivery.

Model code structure

Example model code with one selection out of each category:
8750W D M T 1 A 1 F P S A 010 C A1 Z5 DA2 AX M4 BD G5 B6 R15 V1 Q4 HR7 WG YF

Table 6: Requirements - select one from each available choice

Example code	Category
8750W	Base model—Magnetic Flowmeter System (utility, water, and wastewater)
D	Sensor design revision—Revision "D"
M	Transmitter class (Table 8)
T	Transmitter mount (Table 9)
1	Transmitter power (Table 10)

Table 6: Requirements - select one from each available choice (continued)

Example code	Category
A	Transmitter outputs (Table 11)
1	Conduit entries (Table 12)
F	Sensor style (Table 13)
P	Lining material (Table 14)
S	Electrode material (Table 15)
A	Electrode type (Table 16)
010	Line size (Table 17)
C	Flange type and material (Table 18)
A1	Flange rating (Table 19)

Table 7: Options - select only as needed

Example code	Category
Z5	Hazardous area certifications (Table 20)
DA2	Advanced diagnostics (Table 21)
AX	Discrete input/output (Table 22)
M4	Display (Table 23)
BD	Certifications (Table 24)
G5	Grounding rings (Table 25)
B6	Miscellaneous (Table 26)
R15	Submergence protection (Table 27)
V1	Special paint (Table 28)
Q4	Quality certificates (Table 29)
HR7	Revision configuration (Table 30)
WG	Witness inspection (Table 31)
Yx	Quick Start Guide language (Table 32)

Requirements

Table 8: Rosemount 8750W transmitter class

Code	Description	
M	Revision 4 electronics	★
0	Spare sensor, no transmitter	

Table 9: Rosemount 8750W transmitter mount

Code	Description	
T	Integral field mount	★
R	Remote field mount	★

Table 9: Rosemount 8750W transmitter mount (continued)

Code	Description	
W	Remote wall mount	★

Table 10: Rosemount 8750W transmitter power

Code	Description	
1	AC Power Supply (90 -250VAC, 50/60Hz)	★
2	DC Power Supply (12 - 42VDC)	★
0	Spare sensor, no transmitter	

Table 11: Rosemount 8750W transmitter outputs

Code	Description	
A	4-20mA output with digital HART protocol & scalable pulse output	★
F	FOUNDATION™ Fieldbus & scalable pulse output	★
M	Modbus RS-485 electronics, scalable pulse	★
0	Spare sensor, no transmitter	

Table 12: Rosemount 8750W conduit entries

Code	Description	Integral mount quantity	Remote mount quantity	
1	½–14 NPT	2	4	★
2	M20–1.5 adapters	2	4	★
4 ⁽¹⁾	½–14 NPT, additional entry	3	5	
5 ⁽¹⁾	M20–1.5, additional entry	3	5	
0	Spare sensor, integral mount only, no transmitter	N/A	N/A	

(1) Not available with the wall mount transmitter.

Table 13: Rosemount 8750W sensor style

Code	Description	
F	Flanged	★
0	Spare transmitter, no sensor	

Table 14: Rosemount 8750W lining material

Code	Description	
T ⁽¹⁾	PTFE	★
p ⁽²⁾	Polyurethane	★
N ⁽³⁾	Neoprene	★
0	Spare transmitter, no sensor	

(1) Available in ½ - to 36-in. (15 mm to 900 mm) line sizes.

(2) Available in line sizes 1- to 36-in., 42-in., and 48-in. (25 mm to 900 mm, 1050 mm, and 1200 mm) line sizes.

(3) Available in line sizes 1- to 48-in. (25 mm to 1200 mm) line sizes.

Table 15: Rosemount 8750W electrode material

Code	Description	
S	316L stainless steel	★
H	Nickel alloy 276 (UNS N 10276)	★
0	Spare transmitter, no sensor	

Table 16: Rosemount 8750W electrode type

Code	Description	
A	2 Measurement electrodes – standard	★
B ⁽¹⁾	2 Measurement electrodes – bulletnose	★
E	2 Measurement electrodes plus 1 reference electrode – standard	★
F ⁽¹⁾	2 Measurement electrodes plus 1 reference electrode – bulletnose	★
0	Spare transmitter, no sensor	

(1) Not available in ½-in. (15mm).

Table 17: Rosemount 8750W line size

Code	Line size	Liner availability In this table, the starred (★) offerings represent available liner based on line size. Consult factory for additional Flange Type/Rating sensor availability		
		PTFE code T	Poly code P	Neoprene code N
005	½-in. (15 mm)	★		
010	1-in. (25 mm)	★	★	★
015	1 ½-in. (40 mm)	★	★	★
020	2-in. (50 mm)	★	★	★
025	2 ½-in. (65 mm)	★		★
030	3-in. (80 mm)	★	★	★
040	4-in. (100 mm)	★	★	★
050	5-in. (125 mm)	★		★
060	6-in. (150 mm)	★	★	★
080	8-in. (200 mm)	★	★	★
100	10-in. (250 mm)	★	★	★
120	12-in. (300 mm)	★	★	★
140	14-in. (350 mm)	★	★	★
160	16-in. (400 mm)	★	★	★
180	18-in. (450 mm)	★	★	★
200	20-in. (500 mm)	★	★	★
240	24-in. (600 mm)	★	★	★
300	30-in. (750 mm)	★	★	★

Table 17: Rosemount 8750W line size (continued)

Code	Line size	Liner availability In this table, the starred (★) offerings represent available liner based on line size. Consult factory for additional Flange Type/Rating sensor availability		
		PTFE code T	Poly code P	Neoprene code N
360	36-in. (900 mm)	★	★	★
400	40-in. (1000 mm)			★
420	42-in. (1050 mm)		★	★
480	48-in. (1200 mm)		★	★
000	Spare transmitter, no sensor			

Table 18: Rosemount 8750W flange type and material

Code	Description (see Table 33 for line size vs. flange type and rating)	
C	Slip-on, raised-face, carbon steel	★
S	Slip-on, raised-face, 304/304L SST	★
F	Slip-on, flat-face, carbon steel	
G	Slip-on, flat-face, 304/304L SST	
0	Spare transmitter, no sensor	

Table 19: Rosemount 8750W flange rating

Code	Description (see Table 33 for line size vs. flange type and rating)
A1	ASME B16.5, Class 150
A3	ASME B16.5, Class 300
AD	AWWA C207 Class D; line size 30-in. and above; flat face flange only
AE	AWWA C207 Class E; line size 30-in. and above; flat face flange only
DD	EN1092-1, PN10
DE	EN1092-1, PN16
DF	EN 1092-1, PN25
DH	EN 1092-1, PN40
GD	GB/T9119, PN10
GE	GB/T9119, PN16
GH	GB/T9119, PN40
JP	JISB2220, 10K
JR	JISB2220, 20K
KU	AS4087, PN16
KW	AS4087, PN21
KY	AS4087, PN35
TK	AS2129, Table D

Table 19: Rosemount 8750W flange rating (continued)

Code	Description (see Table 33 for line size vs. flange type and rating)
TL	AS2129, Table E
00	Spare transmitter, no sensor

Options

Note

These are not required, but they must be included in the model number if desired.

Table 20: Rosemount 8750W hazardous area certifications

Code	Description	
.(1)	Ordinary Locations - (no code required)	★
Z5	US Approvals, Class I Div 2, Non-Incendive and Dust for Non-Flammable Fluids	★
Z6	Canadian Approvals, Class I Div 2, Non-Incendive and Dust for Non-Flammable Fluids	★
ND	ATEX Dust	★
Z1	ATEX Non-Sparking and Dust for Non-Flammable Fluids	★
NF	IECEX Dust	★
Z7	IECEX Non-Sparking and Dust for Non-Flammable Fluids	★
Z2	INMETRO Non-Sparking and Dust for Non-Flammable Fluids	★
Z3	NEPSI Non-Sparking and Dust for Non-Flammable Fluids	★

(1) CSA (C/US) marked, CE marked, EAC marked and C-tick marked.

Table 21: Rosemount 8750W advanced diagnostics

Code	Description	
DA1	Process Diagnostics, High Process Noise Detection, Ground/Wiring Fault Detection, and Electrode Coating	★
DA2	Smart Meter Verification	★

Table 22: Rosemount 8750W discrete input/discrete output

Code	Description	
AX ⁽¹⁾⁽²⁾	Two Discrete Channels (DI/DO 1, DO 2)	★

(1) Requires Conduit Entry code 4 or 5 when ordered with field mount transmitter.

(2) Not available with FOUNDATION Fieldbus (output code F).

Table 23: Rosemount 8750W display

Code	Description	
M4 ⁽¹⁾	LCD with Local Operator Interface	★
M5	LCD display only	

(1) Not available with FOUNDATION Fieldbus (output code F).

Table 24: Rosemount 8750W certifications

Code	Description	
PD	European Pressure Equipment Directive Certification (PED)	★
CR	Canadian Registration Number (CRN) Certification	
BD	ASME B31.3 Process Piping Standard	
DW ⁽¹⁾	NSF Drinking Water Certification	

(1) NSF drinking water certification is available with the PTFE liner in line sizes 0.5- to 36-in (15 mm to 900 mm) and the polyurethane liner in line sizes 4- to 36-in., 42-in., and 48-in. (80 mm to 900 mm, 1050 mm, and 1200 mm).

Table 25: Rosemount 8750W grounding rings

Code	Description	
G1	316L stainless steel (Qty 2)	★
G2	Nickel alloy C-276; UNS N 10276 (Qty 2)	
G5	316L stainless steel (Qty 1)	★
G6	Nickel alloy C-276; UNS N 10276 (Qty 1)	

Table 26: Rosemount 8750W miscellaneous

Code	Description
C1	Custom Configuration (completed CDS form required with order)
D1	High Accuracy Calibration (base ref accuracy 0.25% of rate)
B6	316 SST Mounting Bracket with U-bolt Kit for 2-in. Pipe Mount
P05 ⁽¹⁾	5-point verification
P10 ⁽²⁾	10-point verification

(1) Available for ½ - to 24-in (15 mm to 600 mm) at velocities 1, 3, 5, 7, 10 ft/s; 30-in. (700 mm) at velocities 1, 3, 5, 7, 9.5 ft/s; 36-in. (900 mm) at velocities 1, 2, 3, 5, 6.5 ft/s; 40- to 48-in. (1000 mm to 1200 mm).

(2) Available for ½ - to 24-in. (15 mm to 600 mm) at velocities 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ft/s; 30- to 48-in. (700 mm to 1200 mm) not available.

Table 27: Rosemount 8750W submergence protection

Code	Description
R05	Potted junction box with 50 feet of combo cable/cable gland for use in conduit
R10	Potted junction box with 100 feet of combo cable/cable gland for use in conduit
R15	Potted junction box with 150 feet of combo cable/cable gland for use in conduit
R20	Potted junction box with 200 feet of combo cable/cable gland for use in conduit
R25	Potted junction box with 250 feet of combo cable/cable gland for use in conduit
R30	Potted junction box with 300 feet of combo cable/cable gland for use in conduit
S05	Potted junction box with 50 feet of submersible combo cable/cable gland
S10	Potted junction box with 100 feet of submersible combo cable/cable gland
S15	Potted junction box with 150 feet of submersible combo cable/cable gland
S20	Potted junction box with 200 feet of submersible combo cable/cable gland
S25	Potted junction box with 250 feet of submersible combo cable/cable gland

Table 27: Rosemount 8750W submergence protection (continued)

Code	Description
S30	Potted junction box with 300 feet of submersible combo cable/cable gland

Table 28: Rosemount 8750W special paint

Code	Description
V1	Coal tar paint (submersible/direct burial)

Table 29: Rosemount 8750W quality certificates

Code	Description
Q4	Calibration certificate per ISO 10474 3.1B/EN 10204 3.1
Q8	Material traceability per ISO 10474 3.1B/EN 10204 3.1

Table 30: Rosemount 8750W revision configuration

Code	Description
HR7	HART Revision 7

Table 31: Rosemount 8750W witness inspection

Code	Description
WG	Witness Inspection

Table 32: Rosemount 8750W Quick Start Guide language

Code	Description	
YF	French	★
YG	German	★
YI	Italian	★
YM	Chinese (Mandarin)	★
YP	Portuguese (Brazil)	★
YR	Russian	★
YS	Spanish	★

Table 33: Slip on flange options by line size

	Flange code and rating																	
	A1	A3	AD	AE	DD	DE	DF	DH	GD	GE	GH	JP	JR	KU	KW	KY	TK	TL
Size code	ASME Class 150	ASME Class 300	AWWA Class D	AWWA Class E	EN PN10	EN PN16	EN PN25	EN PN40	GB/T PN 10	GB/T PN 16	GB/T PN 40	JIS 10K	JIS 20K	AS4087 PN16	AS4087 PN21	AS4087 PN35	AS2129 Table D	AS2129 Table E
005	★	★						★			★	★	★				★	★
010	★	★						★			★	★	★				★	★

Table 33: Slip on flange options by line size (continued)

	Flange code and rating																	
	A1	A3	AD	AE	DD	DE	DF	DH	GD	GE	GH	JP	JR	KU	KW	KY	TK	TL
Size code	ASME Class 150	ASME Class 300	AWWA Class D	AWWA Class E	EN PN10	EN PN16	EN PN25	EN PN40	GB/T PN 10	GB/T PN 16	GB/T PN 40	JIS 10K	JIS 20K	AS4087 PN16	AS4087 PN21	AS4087 PN35	AS2129 Table D	AS2129 Table E
015	★	★						★			★	★	★				★	★
020	★	★				★		★			★	★	★	★	★	★	★	★
025	★	★				★		★			★	★	★	★	★	★	★	★
030	★	★				★		★			★	★	★	★	★	★	★	★
040	★	★				★		★		★	★	★	★	★	★	★	★	★
050	★	★				★		★		★	★	★	★	★	★	★	★	★
060	★	★				★		★		★	★	★	★	★	★	★	★	★
080	★	★			★	★	★	★	★	★	★	★	★				★	★
100	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
120	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
140	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
160	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
180	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
200	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
240	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★
300			★	★										★	★	★	★	★
360			★	★	★	★			★	★				★	★	★	★	★
400			★	★	★	★			★	★				★	★		★	★
420			★	★														
480			★	★	★												★	★

Ordering flowmeter equipment

Ordering procedure

To order, select the desired sensor and/or transmitter by specifying model codes from the ordering table.

For remote transmitter applications, note the cable specification requirements.

Standard configuration

Unless the Configuration Data Sheet is completed, the transmitter will be shipped as follows:

Engineering units:	ft/sec
4mA:	0
20mA:	30
Sensor size:	3-in.
Empty pipe:	On
Sensor calibration number:	1000005010000000

Integrally mounted transmitters are factory configured with the paired sensor size and appropriate calibration number.

Custom configuration (option code C1)

If Option Code C1 is ordered, the Configuration Data Sheet (CDS) must be submitted at the time of order.

Standard tagging

Instrument tags for the transmitter and sensors are as follows:

- 316SST laser etched label, permanently attached
- Main label - Tag name: 1 line 21 characters
- Additional 316SST 'wire-on' tag available: 5 lines, 17 characters per line (6mm height)

Interconnecting cable

Interconnecting cables are required to connect a remote mount transmitter to the sensor. When ordering cable, review the hazardous area approval requirements and the installation location requirements for proper cable selection.

- Cables can be ordered as individual component cables or a combination coil drive/electrode cable.
- Cables can be ordered as part of the transmitter model number or as a spare parts kit. Integrally mounted transmitters are factory wired and do not require additional interconnecting cables.
- Individual component cables require equal lengths of coil drive cable and electrode cable and should be limited to less than 500 feet (152 m). Consult Technical Support for lengths between 500-1000 feet (152-304 m).
- Combination coil drive/electrode cable is only available for Ordinary Locations and should be limited to less than 330 feet (100 m).

Component cable kits

Standard temp (-20 °C to 75 °C)				
Cable kit #	Description	Component	Rosemount p/n	Alpha p/n
08732-0065-0001 (feet)	Kit, Component Cables, Std Temp, (includes Coil and Electrode)	Coil	08732-0060-0001	2442C
		Electrode	08732-0061-0001	2413C

Standard temp (-20 °C to 75 °C)				
08732-0065-0002 (meters)	Kit, Component Cables, Std Temp (includes Coil and Electrode)	Coil	08732-0060-0002	2442C
		Electrode	08732-0061-0002	2413C
08732-0065-0003 (feet)	Kit, Component Cables, Std Temp (includes Coil and I. S. Electrode)	Coil	08732-0060-0001	2442C
		I. S. Electrode	08732-0061-0003	Not available
08732-0065-0004 (meters)	Kit, Component Cables, Std Temp (includes Coil and I. S. Electrode)	Coil	08732-0060-0002	2442C
		I.S. Electrode	08732-0061-0004	Not available

Extended temp (-50 °C to 125 °C)				
Cable kit #	Description	Component	Rosemount p/n	Alpha p/n
08732-0065-1001 (feet)	Kit, Component Cables, Ext Temp (includes Coil and Electrode)	Coil	08732-0060-1001	Not available
		Electrode	08732-0061-1001	Not available
08732-0065-1002 (meters)	Kit, Component Cables, Ext Temp (includes Coil and Electrode)	Coil	08732-0060-1002	Not available
		Electrode	08732-0061-1002	Not available
08732-0065-1003 (feet)	Kit, Component Cables, Ext Temp (includes Coil and I. S. Electrode)	Coil	08732-0060-1001	Not available
		I. S. Electrode	08732-0061-1003	Not available
08732-0065-1004 (meters)	Kit, Component Cables, Ext Temp (includes Coil and I. S. Electrode)	Coil	08732-0060-1002	Not available
		I.S. Electrode	08732-0061-1004	Not available

Combo cable kits

Coil/electrode cable (-20 °C to 80 °C)	
Cable Kit # ⁽¹⁾	
08732-0065-2001 (feet)	Kit, Combo Cable, Standard
08732-0065-2002 (meters)	
08732-0065-3001 (feet)	Kit, Combo Cable, Submersible ⁽²⁾
08732-0065-3002 (meters)	

(1) Only available for Ordinary Locations.


(2) 80 °C dry/60 °C wet/33ft continuous submergence.

Product Specifications

Basic specifications


The tables below outline some of the basic performance, physical, and functional specifications.

Table 34: Wall mount transmitter Specifications

	Style	Wall mount
	Base accuracy ⁽¹⁾	0.5% Standard 0.25% High Accuracy Option
	Mounting	Remote
	Power supply	Global AC or DC
	User interface	LCD display with 15 button tactile keypad (optional) LCD display only (optional) No display (standard)
	Communication protocol	HART with 4–20mA FOUNDATION™ fieldbus Modbus RS-485
	Diagnostics	Basic, DA1, DA2
	Sensor compatibility	All Rosemount plus other manufacturers
	Detailed specifications	Transmitter specifications
	Ordering information	Ordering Information


(1) For complete accuracy specifications, please refer to [Transmitter functional specifications](#).

Table 35: Field mount transmitter specifications

	Style	Field mount
	Base accuracy ⁽¹⁾	0.5% Standard 0.25% High Accuracy Option
	Mounting	Integral or Remote
	Power supply	Global AC or DC
	User interface	LCD display with 4 Optical Switch LOI (optional) LCD display only (optional) No display (standard)
	Communication protocol	HART FOUNDATION™ fieldbus Modbus RS-485
	Diagnostics	Basic, DA1, DA2
	Sensor compatibility	All Rosemount plus other manufacturers
	Detailed specifications	Transmitter specifications
	Ordering information	Ordering Information

(1) For complete accuracy specifications, please refer to [Transmitter functional specifications](#).

Table 36: Sensor specifications

	Style	Flanged
	Base accuracy ⁽¹⁾	0.5% Standard 0.25% High Accuracy Option
	Line sizes	½-in. to 48-in. (15 mm to 1200 mm)
	Design features	Standard Process Design
	Detailed specifications	Sensor specifications
	Ordering information	Ordering Information

(1) For complete accuracy specifications, refer to the sensor detailed specifications.

Table 37: Lining Material Selection


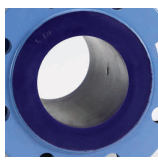
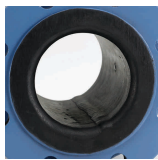
Liner material	General characteristics
PTFE 	Process temperature: 0 to +248 °F (-18 to +120 °C)
Polyurethane 	Process temperature: 0 to +140 °F (-18 to +60 °C) Typically applied in clean water
Neoprene 	Typically applied in water with chemicals, and sea water Process temperature: 0 to 176 °F (-18 to 80 °C)

Table 38: Electrode Material

Electrode material	General characteristics
316L Stainless Steel	Good corrosion resistance
	Good abrasion resistance
Nickel Alloy 276 (UNS N10276)	Better corrosion resistance
	High strength

Table 39: Electrode Type

Electrode type	General characteristics
Standard Measurement	Lowest cost
	Good for most applications
Measurement + Reference Electrode	Low cost grounding option especially for large line sizes