

Features

- 0.01% F.S. accuracy
- Up to four pressure ranges, 0.36 to 1500 psig, 0 to 750psia
- Based on Mensor CPC6050 automated pressure controller
- Removable/interchangeable transducers
- Color touch screen
- Used for automated DSA, MPS, and ZOC calibrations
- Bench or rack mount
- Direct replacement for SPC4000 calibrators

System Overview

The SPC4050 pressure calibrator is a high-accuracy, multi-range pressure system designed to provide automated calibration of Scanivalve DSA, MPS, and ZOC series pressure scanners. The calibration system consists of two components:

1. The heart of the calibration system is the Scanivalve pressure calibrator, model SPC4050. The SPC4050 calibrator has up to two independent precision pressure regulators (otherwise known as channels). Each regulator, or channel, can have up to two gauge or absolute transducers, and up to four transducers per SPC4050. Transducers can be quickly removed for calibration or service.

Full-Scale Gauge pressure ranges are available between 0.36 psi and 1500 psi.

2. Scanivalve's Pneumatic Logic Unit (SPCPLU) is required when using the SPC4050 to calibrate Scanivalve pressure scanners. This unit contains the pneumatic solenoid valves and manifolds required for directing the applied pressures to the correct ports during calibrations, validations, and zero-offset corrections.

The SPC4050 system can be used with Scanivalve calibration utility software packages to perform automatic calibration and validations on Scanivalve pressure scanners. Software packages include CalExpress, PressCal, and self-calibrations performed by some MPS series pressure scanners. The SPC4050 system can also be used independent of Scanivalve pressure scanners to perform checks and calibrations on third-party equipment.



SPC4050 2 Channel System

Applications

This SPC4050 pressure calibrator is based on Mensor Corporation's model CPC6050 pressure calibrator. Specific changes were made to the calibrator to work with Scanivalve products. These changes include additional digital outputs to control the SPCPLU, modified OEM firmware to accept Scanivalve commands, and more.

The calibration system can be used for many applications including multi-point calibrations of Scanivalve pressure scanners (such as the DSA and MPS series), provide proper pneumatic connections for zero-offset corrections, and leak testing systems.

SPC4050 systems are typically installed in controlled metrology or calibration laboratories. Pressure scanners, or devices requiring calibration service, can be brought to the lab for service. The SPC4050 system can also be installed in measurement systems where it can be used on-condition, or quickly in between testing and data collection. This allows pressure scanners to be persistently connected to the SPC4050 system and used for validations or calibrations, and to provide the proper pneumatic connections for zero corrections.

High accuracy and stability, interchangeable plug-and-play transducers, and an intuitive GUI makes the SPC4050 an easy-to-use instrument with low maintenance. Coupled with a Scanivalve pressure scanning system, accuracies in pressure data can be maintained easily in the field with minimal user intervention.

Modular Calibrator Design

The SPC4050 brings a high degree of flexibility by having a variety of configurations available. It can have one or two independent pressure regulators, each regulator (or channel) providing up to two different pressure range outputs.

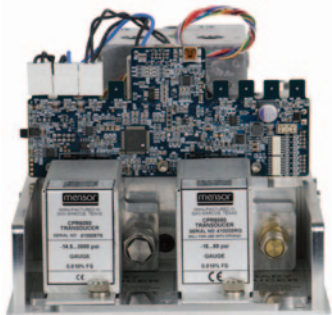
Each regulator can have up to two installed transducers. Each transducer can be of a different range compatible with the regulator, and contains all of the calibration, characterization, communication functions and information needed to communicate the pressure reading to the system electrical module.

Transducer modules can be easily changed, removed or replaced. Compatible spare transducers of the same or different range can be interchanged to increase utilization, expand the pressure range capabilities, or maintain a calibration cycles with no down-time.



Calibrator Chassis

The Regulator



Regulator (channel)

The SPC4050 has four unique pressure regulators available, depending on transducer pressure ranges selected.

The Pump Regulator utilizes a pump to both generate and regulate pressure. It can generate pressures as low as 0.5 psia and is generally used when extreme precision is needed at very low gauge pressures or when an external pressure source is not available.

The other three regulators are determined by the range of calibrator transducers selected. These regulators require an external pressure source that is approximately 10% above the full scale range of the highest internal pressure range.

Appropriate regulators will be matched for the specific transducer pressure ranges, typically based on the Scanivalve pressure scanner ranges. The chart below shows the minimum and maximum allowable ranges for the different regulators available.

Available Regulators	Min (PSIG)	Max (PSIG)
Pump (<i>very low pressure</i>)	0-0.36	0-15
Low Pressure	0-1	0-50
Medium Pressure	0-10	0-150
High Pressure	0-75	0-1500

All pump, low and medium pressure regulators utilize the standard SPC Pneumatic Logic Unit (PLU). All high pressure regulators are paired with a special high-pressure SPCPLU.

All regulators can be tuned in the field to meet a specific customer external volume requirement. Specific control requirements, such as control speed, overshoot, and external volume, are just a few of the variables the regulator is able to accommodate.

Calibrator Transducers



Transducers

The transducers are configured in a proprietary process characterizing each pressure range over temperatures from 15 to 45° C. This process has been optimized to provide the greatest accuracy, stability, and reliability. Each range is calibrated with NIST traceable primary standards and provided with a calibration certificate.

Standard Transducer Ranges*

Gauge Transducers	
0.36 psig	200 psig
1 psig	250 psig
2.5 psig	300 psig
5 psig	500 psig
15 psig	600 psig
30 psig	750 psig
50 psig	1000 psig
100 psig	1500 psig

* Nominal ranges listed. Typical calibrated range is 15% over nominal for most ranges. For absolute transducers, please contact factory.

Calibration Interval

The SPC4050 transducers are the only part of the SPC4050 system that require calibration. Transducers can be easily removed from the SPC4050 chassis and returned for service and calibration without the need to return the SPC4050 chassis, regulator, or SPCPLU. Calibration cycle recommendations vary based on the transducers range.

Transducer Range	Accuracy	Cal Interval (days)
15 psi and up	0.01% FS	365
14.9 psi and below	0.01% FS	180

Backwards Compatibility

To support legacy SPC users, SPC4000 transducers can be used individually or together with the new SPC4050 transducers in the SPC4050 system.

The firmware and OEM command set in the SPC4050 replicates most SPC4000 commands, and some SPC3000 commands and functions to allow for easy replacement of legacy calibrators.

Standalone Pressure Application

Manual pressure application can be performed with the SPC4050 by using either the color touch screen or remote commands via Ethernet. The color touch screen provides an intuitive user interface that can be configured in 17 different languages. Buttons are provided to allow the selection of the transducer used, configure pressure set points, set filtering, rate and volume control, along with control buttons for applying pressure, trapping pressure, and venting pressure.



Applied pressure is displayed on the screen with configurable Engineering Units. Integral stability features notify the user when the pressure is deemed stable by showing the current applied pressure in green font, or when queried via software.

SPC Pneumatic Logic Unit (PLU)

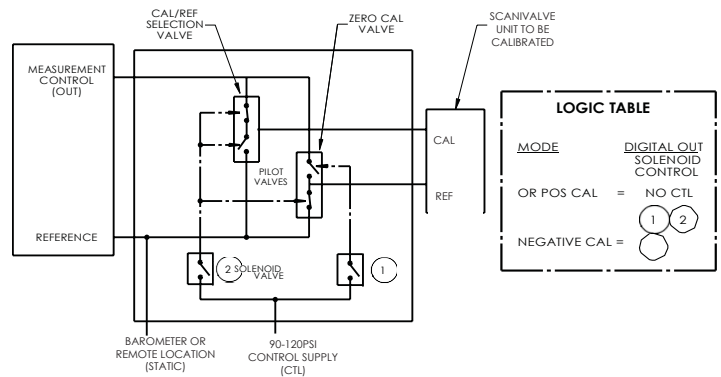
The SPCPLU is controlled by the SPC4050 pressure calibrator when using the integrated Scanivalve OEM command set. The PLU incorporates piloted high flow pneumatic valves that support:

- Multi-point calibrations of pressure scanners for up to four pressure ranges
- Positive or below atmospheric (vacuum) calibrations
- Zero offset correction logic
- Leak and response testing on pressure scanners



SPCPLU-2 shown

Solenoid valves direct the pressure output from the SPC4050 to the correct ports on the connected pressure scanners. While the SPC4050 outputs positive pressures, the PLU automatically directs the pressure to the scanners for both positive and negative calibrations (when using standard differential pressure scanners). The piloted valves are activated accordingly when Scanivalve specific commands are issued. This allows for the ease of connection to Scanivalve devices such as the DSA, MPS, and ZOC series scanners.



SPCPLU Configurations

The SPCPLU comes in two primary configurations: one and two channel. The channel configurations are based on the number of regulators installed in the SPC4050 chassis. Each channel allows the use for two transducer ranges.

All pneumatic connections are 1/4" compression fittings. A single electrical connector is provided for each channel, which connects directly to the SPC4050.

Specifications

Pneumatic Connections:	1/4" Compression
Weight:	50lbs [22.7kg] <i>(will all added options)</i>
Digital Display:	10.1" color, touchscreen
Resolution:	4 to 6 significant digits <i>(user selectable)</i>
Interface:	Ethernet (primary) RS-232
Ethernet:	10/100baseT, auto-MDIX
Ranges Available:	0.36 to 1500PSI
Accuracy:	0.01% Full-scale <i>(typical - for most ranges)</i>
Precision:	0.004% Full-scale
Control Stability:	0.003% Full-scale <i>(typical - based on active range)</i>
Power Requirements:	100-240VAC, 50/60Hz 210VA (Max)
Max Supply Pressure:	110% of primary sensor range
Max Reference Pressure:	Atmosphere
Max Exhaust Pressure:	Ambient to full vacuum
Max Altitude:	10,000ft [3,048m] <i>(above sea level)</i>

Operating Temperature:	0° to 50°C
Compensated Temperature:	15° to 45°C
Storage Temperature:	-20° to 70°C
Media Compatibility:	Clean, dry, non-corrosive, non-combustible, non-oxidizing gas <i>(not suitable for oxygen use)</i>
Compliance:	RoHS, EN61326-1:A1:1998, EN61326-1:A2:2001, EN55024:1998, and EN61010-1-1

Ordering Information

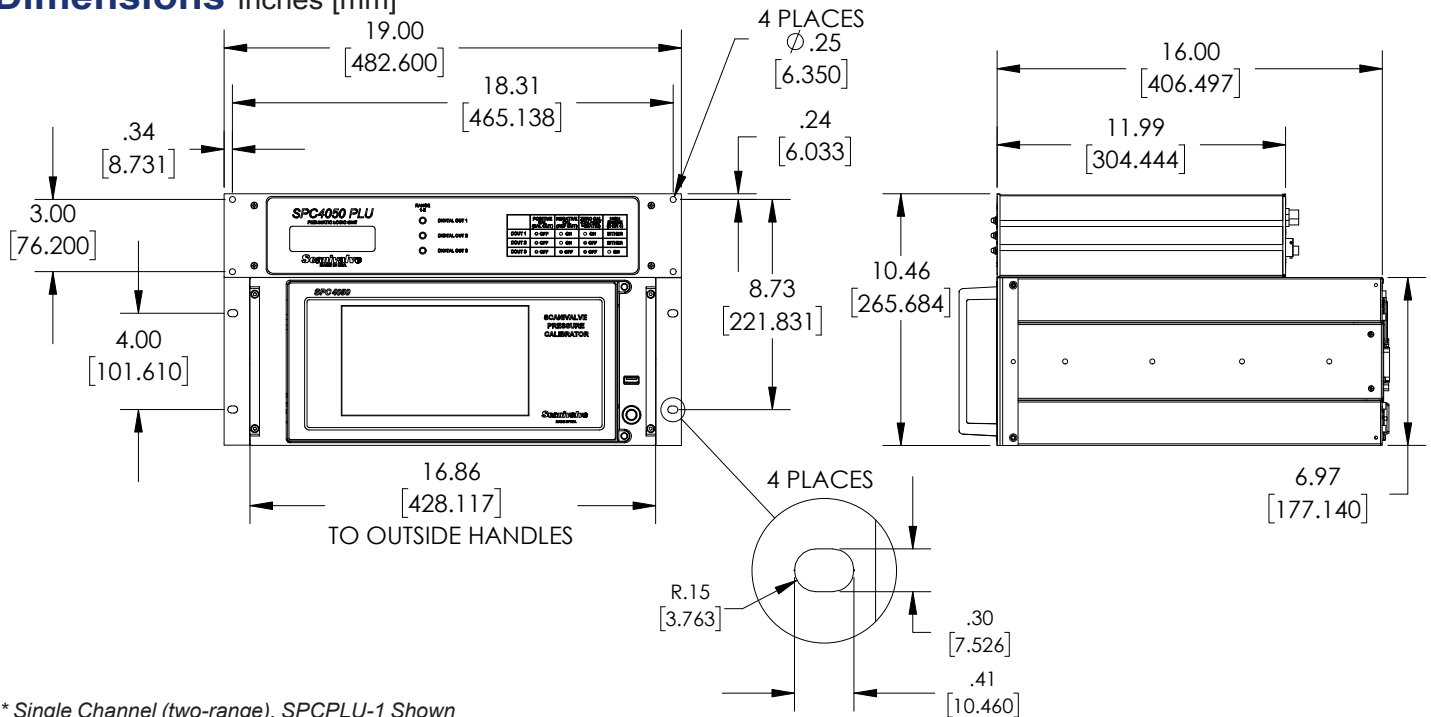
Please Specify:

SPC4050 1 or 2 Channel	(for Chassis)
Transducer Pressure Range(s)	(see page 2 for available ranges)
Add Barometer Transducer	(optional)

Scanivalve's technical sales staff is available to provide assistance with the SPC4050 configuration, if needed. Please let us know the desired pressure range(s), or the pressure range(s) of your Scanivalve pressure scanners (DSA, MPS, ZOC) and if any additional equipment may be needed. Spare or additional transducers can be supplied, but it must be verified that the transducer is compatible with the regulator installed in the SPC4050 chassis.

Dimensions

Inches [mm]



* Single Channel (two-range), SPCPLU-1 Shown

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