PPC2+

PRESSURE CONTROLLER/CALIBRATOR

High Performance Pressure Measurement and Control in a Versatile, Compact and Easy to Use Package...

DHI®

Calibration Solutions
for Pressure and Flow™

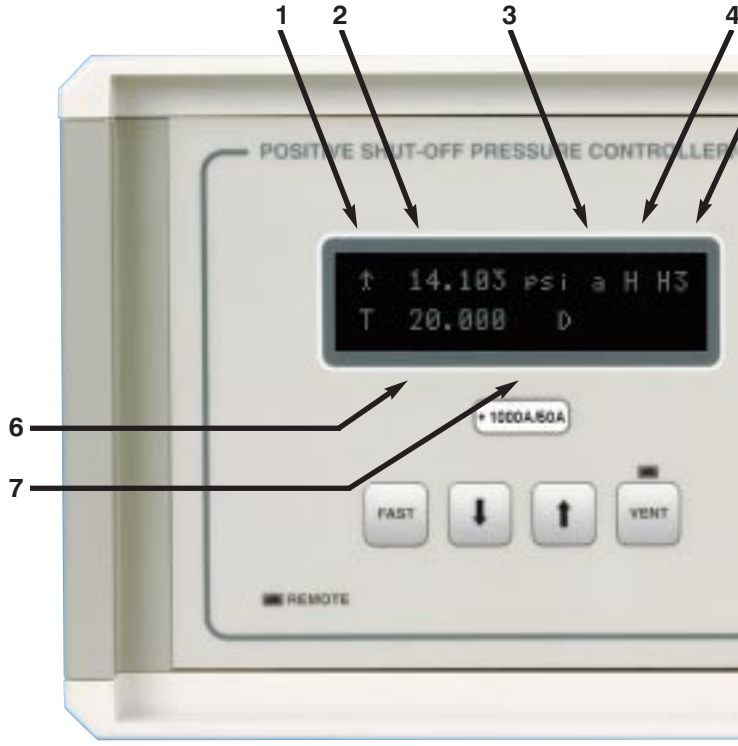
INTRODUCTION

DH Instruments changed the face of the pressure controller market with the introduction of the first PPC2 in the late 1980s. The innovative application of rapidly developing microprocessor and sensor technologies, along with the development of a new, patented, pressure control technique, made possible a high performance pressure controller with a host of new capabilities and at much lower cost than existing alternatives.

Now, PPC2+ takes PPC2's advances to a second generation. The experience gained in producing hundreds of units, extensive customer feeback and continued electronic and mechanical advances have all been used to achieve step change improvements in accuracy, speed, versatility and reliability. PPC2+ delivers the performance and features needed to face a new generation of pressure control and calibration challenges in automated test stands as well as in calibration laboratories and instrument shops.

PRESSURE CONTROL

Second generation positive shut-off pressure control sets new performance standards with very real benefits to the user. New rapid acting, low power solenoid valves, very high speed on–board processing and refined pressure control algorithms allow pressure control precision of 10 ppm F.S. of each range in multirange systems with up to a 30:1 min/max range ratio and without adjusting supply pressure. Control parameters adapt automatically to test volume and external leak rates at each set point to maintain optimum control at all times without user intervention. Typical pressure setting times are less than 30 seconds. Two control modes, static and dynamic, are supported for maximum versatility. A simple "ready/not ready" indication provides a continuous and objective "go/no go" criterion for determining when in–tolerance measurements can be made. Control parameters and "ready/not ready" criteria are easily customized by the user if desired.



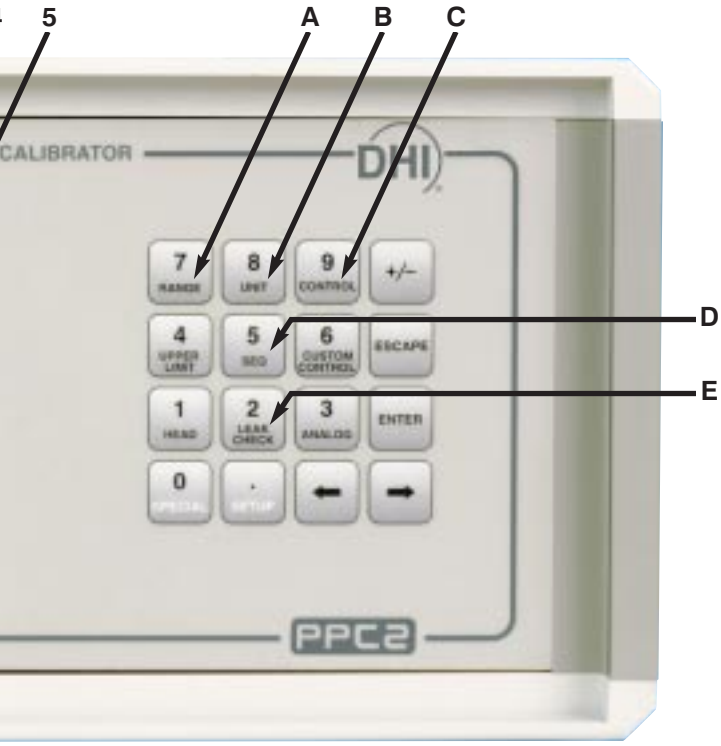
1. Ready/Not Ready Indication
2. Controlled Pressure
3. Absolute or Gauge Pressure
4. Head Correction On/Off
5. Autozero On/Off
6. Current Deviation from Target Value
7. Control Mode, Active/Inactive

A. Select betwee
B. Select any pre at will.
C. Static and d parameters.
D. Run quick or f
E. Special leak c

TRUE MULTI-RANGING

The combination of second generation positive shut-off pressure control technology and transfer standard quality reference sensors make PPC2+ the first truly multiranging pressure controller. One controller supports up to six ranges with a turndown ratio of 30:1 in both measurement and control without deteriorating accuracy. True multi-ranging drastically reduces system cost and complexity and expands the pressure controller field of application by making it possible to use a single PPC2+ where multiple controllers have traditionally

been required. Use the ranging chart on the overleaf to configure a multi-range PPC2+ to best fit your application.



n up to six ranges at the simple push of a button.
essure unit and between gauge or absolute measurement mode

ynamic control modes and freedom to customize control

file based calibration sequences.
heck screen and function to purge test device of contaminants.

TRANSFER STANDARD QUALITY REFERENCE PRESSURE MEASUREMENT

PPC2+'s reference pressure transducers (RPTs) use state of the art oscillating quartz crystal technology to provide extraordinary pressure measurement cability. These are more costly than the "super compensated" commodity sensors used by some controller manufacturers, but the benefits in precision, stability and accuracy are well worth it. They also offer the advantages of zero warm up time, gas species independence, isolation of the measuring element from the test medium and minimal sensitivity to orientation. Dynamic atmospheric compensation using an independent on-board barometer allows simple switching between gauge and absolute measurement modes at any time without extra vacuum pumps and gauges. An on-board autozeroing feature further improves long term stability.

FEATURES, FEATURES, FEATURES

PPC2+ includes all the features you expect in today's state of the art instruments, and more... automatic head corrections for maximum accuracy... automatic gas supply shut-off to conserve gas at rest... on–board programmable calibration sequences... valve driver option for systems design... COM2 extra RS232 port for reading DUTs, a multimeter or another remote device... self purging liquid trap option for protection against liquid contaminated test systems... rugged construction for standard shipment without special packaging... flash memory for simple software upgrades from a PC... optional handle/stand or rack mount kit.

A WORD ABOUT SPECIFICATIONS

We've designed PPC2+ to be the best high end pressure controller in the business. Maybe that's why we're the only supplier to provide the complete measurement and control specifications you'll find on the next page... not just a few uncertainty components such as precision or measurement stability, but the overall values that you need in the real world, including accuracy on delivered pressure. Before you select a pressure controller, we hope you'll compare our complete specifications to the information available from others. Looking beyond the big number on the front page, we're confident you'll find that no controller outdoes the combination of performance and features available from PPC2+.

REFERENCE PRESSURE TRANSDUCERS (RPTs) AND RANGES

SELECTING PRESSURE RANGES

PPC2+ pressure ranges and specifications are determined by the selection of the reference pressure transducer(s) which are used to measure pressure. One or two reference pressure transducers (RPTs) may be included in a single controller. When two RPTs are installed, PPC2+ will automatically switch between them when necessary and will protect the low pressure RPT when the high pressure RPT is in use.

The table below provides a list of the RPTs available. In the US version, ranges are defined in and the default unit is psi; ranges in other units are the equivalent of the psi ranges. In the SI version, ranges are defined and the default unit is kPa; ranges in other units are the equivalent of the kPa ranges.

Any two RPTs may be selected for use in one PPC2+ but when the ratio of the maximum to the minimum range exceeds 30:1, control precision on the lower range may be reduced.

	US UNITS VERSION (psi)						SI UNITS VERSION (kPa)					
RPT Designation	Range1 (Lo) Absolute	Range1 (Lo) Gauge	Range2 (Mid) Absolute	Range2 (Mid) Gauge	Range3 (Hi) Absolute	Range3 (Hi) Gauge	Range1 (Lo) Absolute	Range1 (Lo) Gauge	Range2 (Mid) Absolute	Range2 (Mid) Gauge	Range3 (Hi) Absolute	Range3 (Hi) Gauge
A1500	500	500	1 000	1 000	1 500	1 500	3 000	3 000	6 000	6 000	10 000	10 000
A1000	300	300	600	600	1 000	1 000	2 000	2 000	4 000	4 000	7 000	7 000
A0500	150	150	300	300	500	500	1 000	1 000	2 000	2 000	3 500	3 500
A0300	100	100	200	200	300	300	600	600	1 200	1 200	2 000	2 000
A0200	50	50	100	100	200	200	400	400	800	800	1 400	1 400
A0100	30	15	60	50	100	100	200	100	400	300	700	700
A0050	15	0	30	15	50	35	100	0	200	100	350	250
A0030	10	-5	20	5	30	15	60	-40	120	20	200	100
A0023	7	-8	15	0	23	8	50	-50	100	0	160	60
A0015	5	-10	10	-5	15	0	30	-70	60	-40	100	0
G0030	NA	10	NA	20	NA	30	NA	60	NA	120	NA	200
G0015	NA	5	NA	10	NA	15	NA	30	NA	60	NA	100

"One controller supports up to six ranges..."

"True multiranging drastically reduces system cost and complexity..."

PPC2+

SPECIFICATIONS

GENERAL

Power Requirements: 85 to 264 VAC, 47 to 440 Hz, 30 VA max consumption

Operating Temperature Range: 15 to 35 °C

Vibration: Meets MIL-T-28800D

Weight: 12.7 kg (28.2 lb)

Dimensions: 18 cm H x 32 cm W x 40 cm D (7.1" x 12.6" x 15.8")

Microprocessor: Motorola 68302, 16 MHz

Communications Ports: RS-232 (COM1, COM2), IEEE-488.2

Pressure Ranges: Vacuum to 1 500 psi
Up to six ranges per controller using two reference pressure transducers and an on-board barometer

Operating Medium: Clean, dry, non-corrosive gas

Pressure Connections:

Supply: 1/8" NPT F

Test (+), Test (-), Vent, Exhaust: 1/4" NPT F

CE Conformance: Available, must be specified for delivery outside Europe

PRESSURE MEASUREMENT (± F.S. of Active Range)

Warm Up Time: None required

Resolution: To 1 ppm, user setable by individual range

Temperature Effect: Fully compensated with active independent temperature measurement from - 20 to 100 °C
± 0.005% maximum temperature effect in normal ambient 15 to 35 °C operating range

Acceleration Affect: ± 0.008% /g maximum, worst axis
Allows operation at ± 20 ° from reference plane without significant effect

Precision[1]: ± 0.005%

Stability:	90 day	1 year
Gauge Mode (w/Autozero):	0.003 %	0.009 %
Absolute Mode (w/Autozero):	0.003 %	0.009 %
Absolute Mode (w/out Autozero):	0.006 %	0.015 %

Measurement Accuracy2:	90 day	1 year
Gauge Mode (w/Autozero):	0.008 %	0.012 %
Absolute Mode (w/Autozero):	0.008 %	0.012 %
Absolute Mode (w/out Autozero):	0.010 %	0.017 %

PRESSURE CONTROL (± F.S. of Active Range)

Modes and Ready Indication:

Static: Sets pressure within hold limit and stops active control until hold limit is exceeded
Pressure is "ready" when within hold limit and stability test is met

Dynamic: Sets pressure within hold limit and continuously adjusts as close as possible to target
Pressure is "ready" when within hold limit

Control Parameters: Hold limit, stability limit (optimum values set by default, can be customized independently for each measurement range)

Control Precision[3]: ± 0.001% (with 30:1 maximum ratio between highest and lowest range)

Normal Test Volume:

Lo (max range <300 psi): 100 to 1 000 cc (500 cc optimal)

Hi (max range >300 psi): 0 to 500 cc (250 cc optimal)

Control Speed:

Slew Rate (0 to Controller F.S.) in Optimal Volume with No Control: 10 to 30 seconds

Pressure Setting (Typical Time To Ready Indication in Dynamic Mode): 20 to 30 seconds
(lower for low, higher for high ranges)
Reduced by increasing hold limit

Delivered Pressure Accuracy[4]:	90 day	1 year
Gauge Mode:	0.010 %	0.013 %
Absolute Mode (w/Autozero):	0.010 %	0.013 %
Absolute Mode (w/out Autozero):	0.012 %	0.018 %

[1] Measurement Precision:Combined linearity, hysteresis, repeatability of measurements made by the reference pressure transducer.

[2] Measurement Accuracy:Maximum deviation of the reference pressure transducer indication from the true value of measured pressure including precision, stability, temperature effect and calibration standard accuracy of ± 0.0035% of reading.

[3] Control Precision:Minimum useable hold limit in dynamic control mode.

[4] Maximum deviation from the true value of pressure applied to the device under test in dynamic control mode with default control limits and assuming measurement accuracy as above. In static control mode, control errors can be elimated making accuracy of delivered pressure the same as measurement accuracy.

Note: When using an absolute reference pressure transducer for gauge mode measurements in a gauge range of <200 kPa (30 psi), add ± 8 Pa (0.001 psi) to the measurement specification to take into account the resolution of the on-board barometer.

ORDERING INFORMATION

PPC2+ may be configured as a single or dual reference pressure transducer (RPT) model. The single RPT model has three ranges, the dual RPT model has six ranges. RPTs available and their corresponding ranges are listed in the table on the preceeding page.

To configure a PPC2+, define the model number following instructions for single or dual RPTs below and add options as separate line items as needed.

SINGLE RPT MODELS

Specify the model number as:

PPC2+ MXXXX

Where: MXXXX indicates the RPT designation (see RPT and range table)

For example: PPC2+ A1000 is a pressure controller with a single reference pressure transducer whose designation is A1000. It has three ranges (those of an A1000 RPT as listed in the RPT and ranges chart).

DUAL RPT MODELS

Specify the model number as:

PPC2+ D-MXXXX1/MXXXX2

Where: MXXXX1 indicates the RPT designation of the Hi RPT.

MXXXX2 indicates the RPT designation of the Lo RPT.

PPC2+ is able to accept dual RPTs. Without the second RPT installed, use MXXXX for MXXXX2.

For example: PPC2+ D-A1000/A0100 is a pressure controller with two RPTs whose designations are A1000 and A0100. It has six ranges (those of an A1000 RPT and an A0100 RPT as listed in the RPT and ranges chart).

OPTIONS

PPC2+-004: Rack mount kit

PPC2+-006: Special range

Specify range(s) to be special and special range value and mode (e.g. H3: 0 to 25 psi absolute)

PPC2+-012: External valve drivers

PPC2+-017: SI units version

PPC2+-018: Self purging liquid trap

PPC2+-019: Lateral recessed handles (019-1)

Full size padded front cross bar handle/stand (019-2)

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