7615

SERIES 7615

Hydraulic Pressure Controllers

- Precision to 0.01%
- Pressure ranges up to 40,000 psi
- Six pressure ranges available in one instrument
- High speed version controls to setpoint in 5 seconds or less!
- Automate cyclic and fatigue testing with high speed control
- Automate high pressure test and calibration

A Druck Company

SERIES 7615

Hydraulic Pressure Controllers

The Series 7615 Hydraulic Pressure Controllers introduce a new approach to automatic testing of high pressure components, sensors and instruments. The Series 7615 is the result of combining technologies developed by Ruska and Druck over the last 10 years. Utilizing the pulse-width modulated valves (the same used in the Ruska Series 7215 and Druck DPI 515 pneumatic pressure controllers), Ruska has developed a unique pneumatic to hydraulic intensifier which allows simple, automated high pressure control of pressures up to 40,000 psi.

The Series 7615 consists of two models: the Model 7615C and the 7615H.

The Model 7615C is available for applications requiring an economical approach to automation where a control speed of 30 seconds to setpoint is acceptable. This is referred to as Normal control mode operation.

The Model 7615H provides a Fast control mode where the pressure setpoint is achieved in typically 5 seconds or less, even when controlling into a 50 cc load volume! This combination of speed, pressure range and compatibility with virtually any liquid media is unique to the Model 7615H.

The 7615H is an excellent choice for automated life cycle/fatigue testing applications, high volume transducer manufacturing such as diesel fuel rail sensors and transducers, high pressure automotive transducers such as those used in braking systems and throttle body sensors along with virtually any application that involves high pressure test or calibration using a liquid media for safety, compatibility or other concerns. The 7615H increases throughput and reduces cost through speed and automation without sacrificing performance. In addition to Fast mode, the 7615H also allows the option of operating in the Normal control mode as found in the 7615C above.

Both models offer a variety of pressure ranges to 40,000 psi, with IEEE-488 and RS-232 digital interfaces for a complete automated solution. The remote communication syntax uses the SCPI format and is compatible with the Model 7610 hydraulic controller as well as Ruska's other Series 7000 pressure indicators and controllers.

In any hydraulic system the presence of entrapped air should be minimized. The 7615C and 7615H provide the following two methods to assist with removing air from the device under test:

Bleed Priming provides an automated approach where the 7615 will pump the fluid into the system for either a preset number of cycles or until the operator ends the priming operation. Any excessive pressure rise will also end the priming cycle.

High Speed Prime is an optional feature that adds a second hydraulic pump (Fill Pump) to the 7615 which can provide a high liquid flow at low pressure. Due to the high flow rate, a larger volume can be filled in less time compared to Bleed Priming. However, the prime can only be set for a limited time period. A return line from the system must be connected back to a reservoir for the excess oil.

The Model 7615 Hydraulic Pressure Controller features a compatibility with a variety of media. Almost any liquid can be used as the pressure medium. Some of the fluids that can be used in the 7615 include:

- Spinnestic 22 oil
- DOS (dioctyl sebacate) oil
- monoplex DOS oil
- silicon oil DOW 210H hi-temp
- hydraulic fluid oil MIL-H-5606 or MIL-H-83282C
- SKYDROL 500b-4-1
- automobile transmission fluid
- Fluorinert FC-77 or FC-70
- other media available - consult factory about your application

The Model 7615 is compact and can be placed on a bench top, rack mounted in a 19 inch EIA instrument, or provided in a cart mounted cabinet with casters. The 7615 is ideal for various applications including:

Automotive
- Fuel rail sensors
- Braking systems
- Throttle body sensor testing

Aerospace
- braking systems
- surface control systems
- rocket motor sensors

Industrial
- Transducer/transmitter testing
- Automated test equipment
- Pressure/temperature sensor characterization

and many others

Control Modes
The Model 7615C and 7615H allow operation in the Normal mode. In this mode, the control parameters and setpoint slew rate are optimized to provide the fastest rate of pressure change with minimal overshoot. At the end of the test, the pressure can be vented to the reservoir for rapid depressurization or reduced under control. If the piston reaches the end of travel before the minimum setpoint pressure is achieved, then there will be an automatic recharge cycle, with corresponding time increases.

Time for 10% step: < 30 seconds (typical)
Time to vent pressure: < 5 seconds
Recycle time (if required): 10 seconds/cycle
Control stability: 0.01% of full scale
Accuracy of pressure measurement: 0.01% of range

The **Model 7615H** offers the following additional modes of operation:

Fast Control Mode
This mode represents the primary capability of the 7615H and is suitable for applications where speed and time are the critical factors. This mode allows the setpoint to be reached to within 0.25% in typically 5 seconds into a 50 cc load volume. If this is within the required tolerance limits of the device under test, the next pressure can be set. Or, given 20 more seconds the 7615H will reach a control stability of 0.01%. Therefore, the operator can determine the optimum time for the pressure to stabilize before taking pressure readings, depending on the accuracy required.

Time for 10% step to 0.25%: < 5 seconds (typical)
Time for 10% step to 0.01%: < 30 seconds
Time to vent pressure: <5 seconds
Recycle time (if required): 10 seconds/cycle

Cyclic Mode
This mode is ideal for fatigue testing or extended proof pressure cycling. First, the user sets the desired maximum pressure value for the cycle. The 7615 controls to the maximum pressure and once achieved, it moves the pump to the home or starting position to establish the minimum pressure value for the cycle. The minimum value obtainable is dependent on the device under test volume and media and therefore can not be defined by the operator in this mode (if the lower pressure value must be defined, please see Sweep operation below). The pressure is then cycled between the maximum and minimum pressure values. The 7615 will cycle between the maximum and minimum pressure until the preset number of cycles defined by the operator have been achieved. The profile of the cycle (rate of pressure change and dwell time at maximum and minimum pressure values) can also be defined.

Time to maximum pressure: < 3 seconds (typical)
Time to minimum pressure: < 6 seconds (typical)

Sweep Mode
This is similar to cyclic mode except that in sweep mode the lower pressure point is also controlled.

Time to full pressure: < 3 seconds (typical)
Time to minimum pressure: < 6 seconds (typical)
Recycle time (if required): 10 seconds/cycle

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Specifications

PRESSURE RANGES

The following ranges are available for both the Model 7615C and 7615H:
3000, 6000, 10,000, 15,000, 20,000, 30,000 and 40,000 psia
Tare mode allows operation in gauge mode
All the above ranges can be provided with the Triple Scale option (see table below).
Both the 7615C and 7615H can be supplied in a dual sensor configuration. Select any two ranges shown above.

PERFORMANCE

Measure

7615C and 7615H, ranges to 20,000 psia
Precision[1]: 0.01% of range
Stability: 0.01% per year
Total Uncertainty[2]: 0.015% of range per year
7615C and 7615H, ranges above 20,000 psia
Precision[1]: 0.02% of range
Stability: 0.02% per year
Total Uncertainty[2]: 0.028% of range per year

Control

7615C and 7615H, ranges to 20,000 psia: 0.01% FS
7615C and 7615H, ranges above 20,000 psia: 0.02% FS
7615H Fast Mode: 0.25% in 5 seconds, 0.01% in 30 seconds
Low control point:
when controlling up in pressure 0 psig can be controlled.
when controlling from a higher pressure to a lower pressure, low control point is 400 psi. Unit can be vented to 0 psig.

Triple Range Option

All above ranges can be supplied with the Triple Scale option to provide 3 ranges with a single sensor configuration and 6 ranges with the dual sensor configuration. For each selected sensor, the performance will be 0.01% of each range up to 20,000 psi and 0.02% for 30,000 and 40,000 psi.

	Triple Scale Ranges (PSI)		
Full Scale	Low	Mid	High
3000	1000	2000	3000
6000	2000	4000	6000
10,000	3000	6000	10,000
15,000	5000	10,000	15,000
20,000	6000	12,000	20,000
30,000	10,000	20,000	30,000
40,000	12,000	25,000	40,000

OPTIONS

Triple Scale Option
Dual Sensor
High Speed Prime (Fill Pump)
External priming vent valve
Rack mount kit
Cart system with casters

GENERAL

Pressure Supply
100-110 psi dry air @ 5 SCFM peak (150 SCLM)

Test Port Connection
Autoclave F250C

Supply Pressure Connection
1/4" NPTF

Display
Vacuum fluorescent, graphical

Electrical Power
110/220 VAC, 50/60 Hz

Communication
RS-232 standard, IEEE-488 optional

Temperature
Operating : 0 to 50 °C
Storage : -20 to 50 °C

Humidity
5% to 95% relative humidity, non-condensing

Dimensions
14" H x 17" W x 26" D
Weight: 150 lbs

1 Precision is defined as the combined effects of linearity, repeatability hysteresis and temperature effects over the entire operating temperature range (0 to 50 °C).

2 Expression of accuracy (uncertainty) conforms with the recommendations of the ISO Guide to the Expression of Uncertainty in Measurement and includes RSS of precision, stability, temperature effects, and the calibration standard to 2 sigma (95%).

Other Products and Services

In addition to a wide range of digital pressure controllers and indicators from 1 to 40,000 psi, Ruska manufactures primary standard piston gauges from 0.2 to 72,500 psi.

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Due to Ruska Instrument's process of continuous improvements, printed specifications are subject to change without notice.

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