

# Accessories

## for pressure calibrators

## Technical Data

### Manual pressure control packs



The manual pressure control pack provides a means of setting and fine tuning gas pressure, and vacuum, in a closed system. Typically, a manual pressure control pack is used to control pressure to both a pressure standard, which may be a gas piston (deadweight) gauge or a digital pressure indicator, and the device under test. The pressure control pack allows the operator to introduce the gas pressure from a source, such as a nitrogen bottle or air supply, using a cutoff and metering valve. Once the pressure is near the desired set-point, the operator can use the precise pressure adjuster which is integrated into the pressure control pack to fine tune the pressure to the actual set-point. The precise pressure adjuster has a minimum sensitivity of 0.00025 psi. The sensitivity improves as system volume increases.

In deadweight gauge applications, the manual pressure control pack is designed to conveniently generate pressures in the gauge, absolute and true negative gauge (vacuum) mode of operation. Prior to this design, significant changes were required to convert from gauge to negative gauge mode of operation. Now, with the simple turn of one valve, the manual pressure control pack is configured to allow negative gauge mode calibrations to be performed without any changes to the system.

Two manual pressure control packs are available: the 2465-800 which is can be used to adjust pressures from absolute up to 1 000 psi and the 2470-800 for absolute pressure to 3 000 psi. Both models provide a convenient reference gauge to provide a rough indication of the system pressure.

All pneumatic connections (1/4 in NPT female) are located on the back of the unit allowing a compact and neat installation. The user need only connect a gas pressure source and if vacuum measurements are required, a vacuum pump.

### Specifications and ordering information

<b>Model 2465-800</b>	Vacuum to 1 000 psi
<b>Model 2470-800</b>	Vacuum to 3 000 psi
All ports 1/4" NPT female	16 kg (36 lb)

## Precise pressure adjustors

The Series 3800 Precise Pressure Adjustors provide the ability to fine tune the pressure in a closed system to a minimum of 0.00025 psi. These pressure adjustors are typically used to complement existing equipment that is capable of roughly setting the pressure, and then using the Series 3800 to finely tune the pressure.

The system pressure is applied to two large chambers separated by an adjustable piston. A valve located on the pressure adjustor is closed separating the two chambers, and adjustment is achieved by rotating the large knob which applies micrometer precise movement to the piston. By moving the piston, the volume of the test system changes, therefore changing the pressure by a very small amount per turn. When the next pressure step is required, the operator simply opens the valve on the pressure adjustor and using existing equipment roughs into the

next point and then repeats the process of closing the valve and setting the precise pressure.

Three different precise pressure adjustors are available with pressure ranges to 1 000 psi, 3 000 psi and 10 000 psi. An optional mounting bracket is available for mounting the Precise Pressure Adjustor to a table top.



### Specifications and ordering information

Model	3891	3893	3898
Pressure range	Vacuum to 1 000 psi	Vacuum to 3 000 psi	0 to 10 000 psi
Resolution	0.00025 psi	0.00025 psi	0.0005 psi
Total rotation	53 turns	70 turns	80 turns
Internal volume	82 c <sup>3</sup> (5 in <sup>3</sup> )	45 c <sup>3</sup> (2.75 in <sup>3</sup> )	6.6 c <sup>3</sup> (0.4 in <sup>3</sup> )
Connection	1/8 NPTF	1/8 NPTF	1/8 NPTF
Optional bench mounting bracket, 3891-1-25 is available			

## Vacuum pumps

Ruska also provides vacuum pumps as an accessory to our products. Two models are offered, one with a capacity of 139 liters/minute (37 gallons/minute) and another with a capacity of 69 liters/minute (18 gallons/minute). Both pumps include an auto-vent valve to vent the vacuum on power loss and prevent the oil from contaminating the instruments attached to the pump, a backstream filter to prevent molecular migration of oil during normal operation, and a muffler for quiet operation. A 1/4 inch NPT female fitting is provided in addition to a KF16 vacuum connection.



### Specifications and ordering information

Model	99876	99875
Capacity	139 l/min (37 gal/min)	69 l/min (18 gal/min)
Type	Dual stage, rotary vane	Dual stage, rotary vane
Specify	115/230 V ac, 50 or 60 HZ	
Both pumps provided with auto-vent valve, backstream filter, muffler and one quart oil.		

## Vacuum gauge

The Model 99700 Vacuum Gauge is used to measure the vacuum in a contained system. It is typically used to allow zeroing of the Model 7010 Digital Pressure Controller, or to monitor the vacuum in the bell jar of the Model 2465 Gas Piston Gauge when not using the Model 2455 Deadweight Gauge Monitor or Autofloat configurations, which have their own built-in vacuum sensing systems.



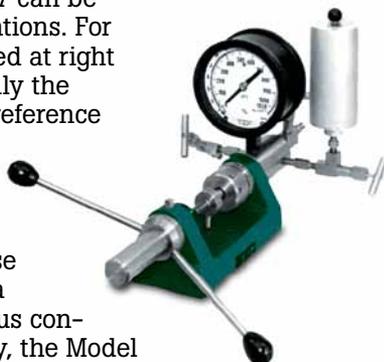
### Specifications and ordering information

Model 99700	
Type	thermocouple sensor with analog display in mtorr, supplied with certificate of calibration traceable to NIST.
Specify 115/230 V ac, 50 or 60 Hz	

## Hand pumps

Ruska hand operated pumps are positive displacement pumps that feature ease-of-use and long life. There are two basic models available, each with a variety of configurations to meet the customers specific needs. The Model 2426 provides precise pressure generation and adjustment to 15 000 psi whereas the Model 2427 is capable of generating pressures up to 40 000 psi.

Both the Model 2426 and 2427 can be provided in a variety of configurations. For example, the Model 2426 (pictured at right with accessories) includes not only the pump, but also a dial indicating reference gauge, a 100 cubic centimeters (39 cubic inches) reservoir to recharge the pump when fluid is lost or compressed, and three high pressure cutoff valves. Please refer to ordering information for a complete description of the various configurations available. Additionally, the Model 2426 Hand Pump can be used in a high pressure gas system for fine tuning the system pressure.



### Specifications and ordering information

Model	Description	Pressure range
2426-1	Hand Pump, no accessories	15 000 psi
2426-801	Hand Pump with 100 c <sup>3</sup> ( 39 in <sup>3</sup> ) reservoir, 3 valves and reference gauge	
2426-802	Hand Pump with 3 valves and reference gauge	
2426-803	Hand Pump for Gas service with 1 metering vent valve and reference gauge	
2426-822	Hand Pump for Water service with 3 valves	40 000 psi
2427-800	Hand Pump, no accessories	
2427-801	Hand Pump with 3 valves and reference gauge	
2426-801-59900	Hand Pump for Water service with 3 valves and reference gauge	
2427-803	Hand Pump with 4 valves and reference gauge	

## Manometers

Open tube reference manometers in hydraulic systems provide a point in the system which can be opened to atmosphere, thereby eliminating any unknown pressure bias and providing a reproducible reference level for the device under test. They are commonly used in conjunction with the Ruska Model 2413 Differential Pressure Null Indicator (see separate brochure), where a multimedia calibration system is required. The Model 2409 is available for system pressures up to 15 000 psi. Otherwise, the Model 2421 should be used which is rated for system pressures to 40 000 psi.



### Specifications and ordering information

Model	Description	Pressure range
2409-800	Manometer, no accessories	15 000 psi
2409-801	Manometer with isolation valve	
2421-800	Manometer, no accessories	40 000 psi

## Connector blocks

Ruska Connector Blocks provide a convenient means of connecting the device under test into the system. The Model 2405 is rated to 15 000 psi and is available in a variety of configurations along with models for hydraulic or gas service. The Model 2424 is available for high pressure systems to 40 000 psi.



### Specifications and ordering information

Model	Description	Pressure range
2405-801	Connector block with isolation valve	15 000 psi
2405-802	Connector block with isolation and metering valve	
2424-800	Connector block, no accessories	40 000 psi

## Filter traps

A filter trap is recommended in hydraulic systems to isolate the device under test from the calibrator, and therefore preventing possible contaminants in the device under test from damaging a precision calibrator, such as a deadweight gauge. The Model 2414 is available for pressures to 15 000 psi and the Model 2436 Filter Trap is available for high pressure systems up to 40 000 psi.



### Specifications and ordering information

Model	Description	Pressure range
2414-800	Filter trap	15 000 psi
2436-800	Filter trap	40 000 psi

## Pressure intensifier and monitor

The Model 2440 Pressure Intensifier is typically used in oil to gas deadweight gauge systems and provides a means to boost standard air or nitrogen bottle pressure to as high as 15 000 psi. The unit is designed for mounting under the bench top of a multimedia (typically oil to gas) deadweight gauge system utilizing the Model 2413 Differential Pressure Null Indicator. The non-lubricated compression cylinder eliminates contamination and provides a small volume of high pressure gas suitable for most requirements. The simplicity of operation and long life make the Model 2440 an excellent choice for oil to high pressure gas calibration systems.

The Model 2444 Pressure Monitor is recommended for use with the Pressure Intensifier to provide the operator with a rough indication of the output pressure. The Pressure Monitor incorporates a dial indicating gauge to 15 000 psi and a vent valve for returning to atmosphere or for a downward calibration run.



### Specifications and ordering information

<b>Model 2440</b>	Pressure Intensifier with control manifold
Max. Output Pressure	15 000 psi
Max. Input Pressure	1 700 psi
Min. Input Pressure	1 450 psi
Material	400 series stainless steel
Specify 115 or 230 V ac	
<b>Model 2444-804</b>	Pressure Monitor
Dial Gauge indicator for monitoring system output of gas booster	
Range	0 psi to 15 000 psi, gas service

All items rated to 15,000 psi have 1/8 in NPT female connections. Items rated to 40,000 psi have AE SF250C/HIP LF4 equivalent connection(s).

## Reservoirs

The 1500 cubic centimeters (0.4 gallons) capacity of the Model 2419 Reservoir provides a convenient storage of hydraulic fluid that must be added to the system to replace fluid lost during the calibration process. The standard reservoir has a Lucite tank with a stainless steel bottom. Other reservoirs are available depending on the fluid type.



### Specifications and ordering information

Model	Description
<b>2419-800</b>	Oil Reservoir, 1500 c <sup>3</sup> (0.4 gal)
<b>2419-806</b>	Fluid Reservoir (stainless steel tank)

## Adapters

Model	Description
<b>2169-5-37</b>	1/8 in RIC male x 1/4 in AE or HIP male
<b>2169-5-6</b>	1/8 in RIC male x 1/4 in AE or HIP female
<b>2169-5-21</b>	3/16 in RIC male x 1/4 in AE or HIP male
<b>2169-5-5</b>	3/16 in RIC male x 1/4 in AE or HIP male
<b>2169-5-44</b>	1/8 in NPT male x 1/4 in AE or HIP male
<b>2169-5-42</b>	1/8 in NPT male x 1/4 in AE or HIP male
<b>2169-5-54</b>	1/8 in RIC male x 1/4 in AE or HIP male
<b>2169-5-55</b>	3/16 in RIC female x 1/4 in AE or HIP male

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