

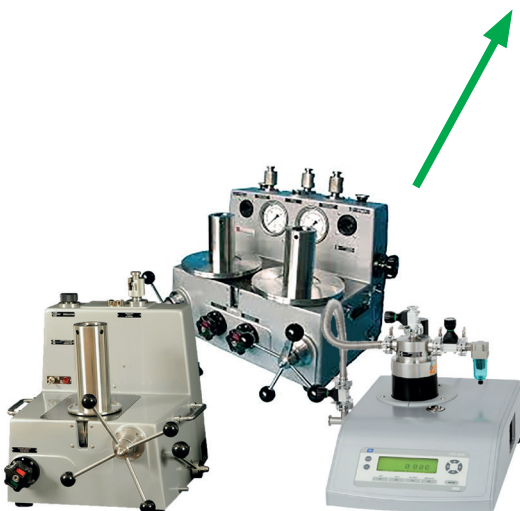
# Minerva Upgrade Kits

## MNR 520 - DHxx & MNR 530 - DHxx

*UPGRADE KITS FOR INSTALLING DESGRANGES & HUOT PISTON/CYLINDERS  
IN FLUKE PG7000 PISTON GAUGES PLATFORM*

Users of D&H Type 5000 piston gauges can now enjoy the benefits of PG7000's features without losing their investment in Type 5000 metrology and the continuity of their metrological elements.

- Upgrade D&H piston gauge system to latest metrological technology
- Maintain continuity of your metrological elements/data
- Use the enhancements in fundamental metrological performance with new functions and features
- Reduced investment
- Plug & play solution
- Provided with accredited calibration certificate before and after upgrade



Type 5000 piston cylinders can be used with PG7000 piston gauge platforms.

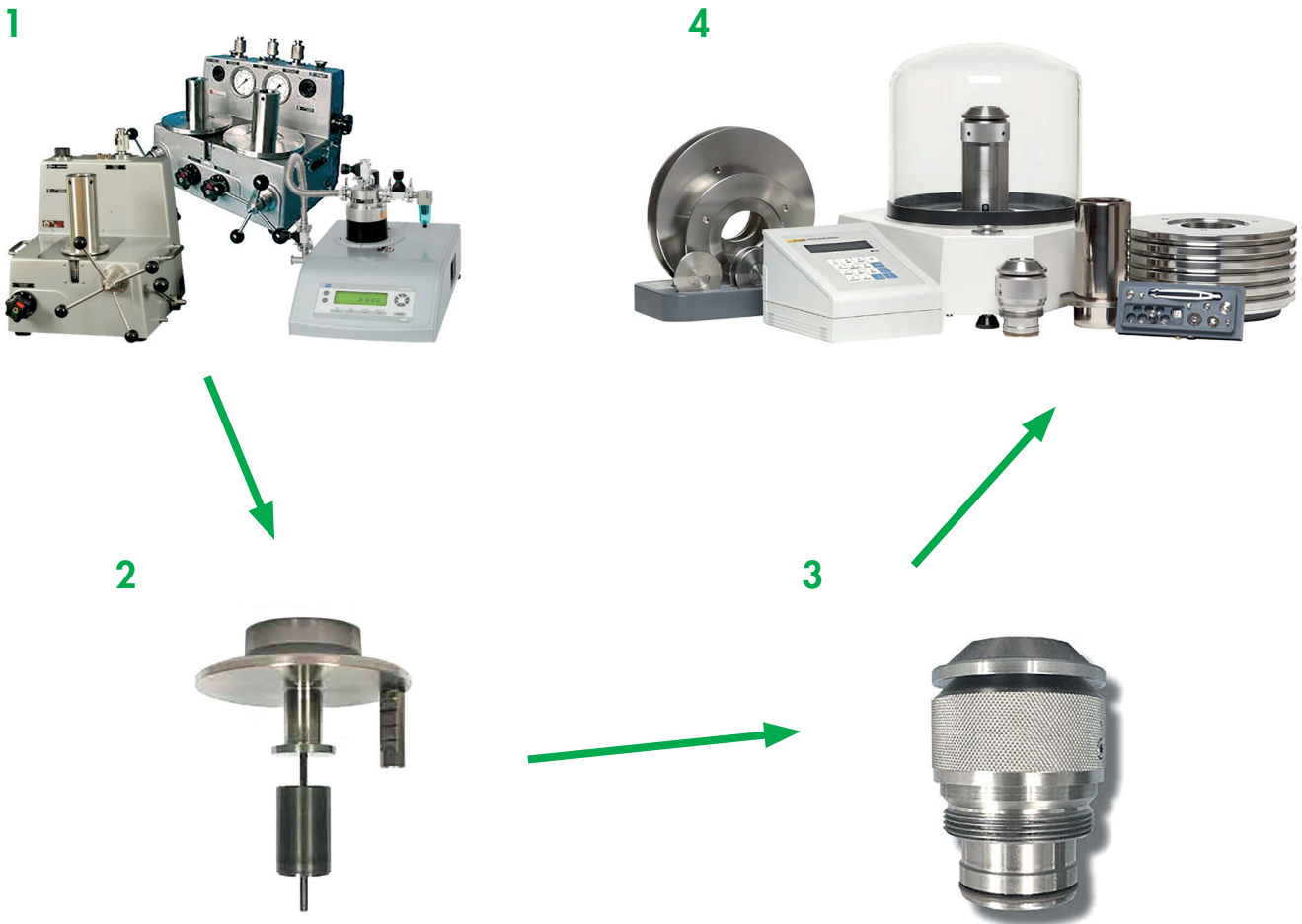
Type 5000 oil (5300 Series) or gas operated (5200 Series) piston-cylinders, can be converted into PG7302 (oil) or PG7202 (gas) piston-cylinder modules.

**Type 5000 piston cylinders can be upgraded to PG7000 piston-cylinder modules at competitive cost.**

## Upgrade your Type 5000 Piston Gauge and enjoy the high-end benefits!

From early 1980, the type 5000 piston gauges were manufactured by Desgranges et Huot from France. In the early 1990s, Fluke/DHI introduced its own line of piston gauges, designed and manufactured in Phoenix Arizona: the PG7000 piston gauges.

These were the first, and truly new high-end piston gauges introduced since the late 1970s. They offer a number of enhancements in fundamental metrological performance as well as modern functions and features that conventional piston gauges lack.



## Upgrade Procedure

Users of Type 5000 piston gauges enjoy the benefits of PG7000's features without losing their investment in Type 5000 metrology and the continuity of their metrological elements by following this procedure:

- Your Desgranges & Huot Type 5000 piston/cylinder<sup>1</sup> are checked on performance at Minerva.
- The piston is modified to fit the PG7000 module.
- Once installed in the PG7000 module, the piston mass is tared and calibrated using the Minerva standard PG7000 module calibration procedure. It will be delivered with an ISO/IEC 17025 accredited calibration report. The calibration report shows true mass and effective area.

<sup>1</sup> note: if you own a 20.000 or 24.000 digital pressure balance, please check with Minerva to discuss the upgrade options

## Integrated piston-cylinder metrological modules

Each PG7000 piston-cylinder is an integrated metrological assembly that includes the critical piston-cylinder mounting components. To change piston-cylinders, the complete module is installed and removed from the piston gauge mounting post.

All of the mechanical parts that affect piston-cylinder metrology are associated with the individual piston-cylinder rather than being common parts of the piston gauge platform. This unique design provides many practical and metrological benefits.

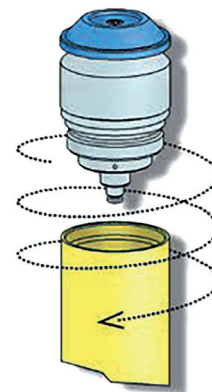


The piston-cylinder defines effective area and is the piston gauge's principal metrological element. The piston-cylinder's intrinsic characteristics and how it is mounted and exploited are the keys to piston gauge performance.

Each upgrade piston-cylinder kit is a complete, integrated metrological assembly that includes the critical piston-cylinder mounting components. This approach improves metrological performance as well as offering many practical advantages.

## Benefits

- Change ranges (piston-cylinders) in seconds, without using tools.
- Handle and interchange piston-cylinders without exposing critical surfaces to contamination.
- Protect the piston-cylinder from damage due to accidental shock or impact when handling.
- Improve measurement reproducibility by avoiding frequent assembly/disassembly of mounting components and assuring that each piston-cylinder is always used with the same mounting hardware, even when used in a different platform.
- Improve piston-cylinder mounting design by allowing each mounting system to be optimized for a piston cylinder size and range rather than accepting the compromises of a single, interchangeable mounting system.



### Installing a piston-cylinder module

All upgrade kits use free deformation mounting systems in which the cylinder is allowed to deform under the influence of applied pressure without O-rings or seals along the cylinder length. For the gas operated piston-cylinders (5200 series), a new mounting system has been developed for designated negative free deformation. Negative free deformation applies the measured pressure uniformly along the full length of the cylinder. This reduces deformation under pressure so that piston drop rates remain low, even at high operating pressures while avoiding the unpredictable strain points of conventional reentrant designs.

## TECHNICAL SPECIFICATIONS & ORDERING DETAILS

All piston-cylinders are integrated modules including mounting hardware delivered in individual shipping and storage bullet cases.		
<b>Mounting system</b>	MNR 520-DHxxxx	Negative free deformation
	MNR 530-DHxxxx	Simple free deformation



### Oil lubricated piston cylinder for gas piston gauge

Ordering code:	Description:
MNR-520-DH200KPa-upgkit	Upgrade kit D&H 5200 p/c (Kn 200 KPa/kg) for PG7200
MNR-520-DH500KPa-upgkit	Upgrade kit D&H 5200 p/c (Kn 500 KPa/kg) for PG7200
MNR-520-DH1,0MPa-upgkit	Upgrade kit D&H 5200 p/c (Kn 1,0 MPa/kg) for PG7200
MNR-520-DH2,0MPa-upgkit	Upgrade kit D&H 5200 p/c (Kn 2,0 MPa/kg) for PG7200
MNR-520-DH50psi-upgkit	Upgrade kit D&H 5200 p/c (Kn 50 psi/kg) for PG7200
MNR-520-DH100psi-upgkit	Upgrade kit D&H 5200 p/c (Kn 100 psi/kg) for PG7200
MNR-520-DH200psi-upgkit	Upgrade kit D&H 5200 p/c (Kn 200 psi/kg) for PG7200
MNR-520-DH250psi-upgkit	Upgrade kit D&H 5200 p/c (Kn 250 psi/kg) for PG7200
MNR-520-DH300psi-upgkit	Upgrade kit D&H 5200 p/c (Kn 300 psi/kg) for PG7200

### Oil lubricated piston cylinder for hydraulic piston gauge

Ordering code:	Description:
MNR-530-DH100KPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 100 KPa/kg) for PG7300
MNR-530-DH200KPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 200 KPa/kg) for PG7300
MNR-530-DH500KPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 500 KPa/kg) for PG7300
MNR-530-DH1,0MPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 1,0 MPa/kg) for PG7300
MNR-530-DH2,0MPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 2,0 MPa/kg) for PG7300
MNR-530-DH5,0MPa-upgkit	Upgrade kit D&H 5300 p/c (Kn 5,0 MPa/kg) for PG7300
MNR-530-DH20psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 20 psi/kg) for PG7300
MNR-530-DH50psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 50 psi/kg) for PG7300
MNR-530-DH100psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 100 psi/kg) for PG7300
MNR-530-DH200psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 200 psi/kg) for PG7300
MNR-530-DH250psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 250 psi/kg) for PG7300
MNR-530-DH300psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 300 psi/kg) for PG7300
MNR-530-DH500psi-upgkit	Upgrade kit D&H 5300 p/c (Kn 500 psi/kg) for PG7300

your distributor:

Minerva Metrology and Calibration

Chrysantstraat 1

3812 WX Amersfoort, the Netherlands

tel. +31 33 46 22 000

info@minerva-calibration.com

www.minerva-calibration.com