



## What is the difference between DIN "200 BAR" and DIN "300 BAR" valves?

The Deutsches Institut Für Normung (DIN) is a German standards setting organization similar to our American National Standards Institute (ANSI) and Compressed Gas Association (CGA). DIN 477 is a specification that recommends cylinder valve outlet and connector designs for specific types of gases and pressures based upon safety considerations. These various designs have deliberate incompatibilities to preclude the possibility of errors when handling different types of compressed gases at differing working pressures. The two valve outlets and connectors of interest for divers are the DIN 477 No. 13 and the DIN 477 No. 56 (formerly No. 50), both designated for use with compressed air. The DIN 477 valve and regulator fittings are most widely used outside the U.S. The regulator first stage DIN connector is a male screw type, and instead of clamping on to the outside of the valve as does the yoke, it screws directly into the female DIN outlet of the valve. The sealing O-ring is held in the end of the regulator connector rather than in the face of the outlet. The DIN 477 system, with its captured o-ring design, has proven to be very reliable for use with SCUBA. Outlet/Connector #13 is from DIN 477 part 1 - for cylinders with test pressure ratings up to 300 BAR and is commonly referred to in the SCUBA industry by the slang term "200 BAR", probably because most cylinders with 300 BAR test pressures have working pressures in the 200 BAR range. Outlet/Connector #56 is from DIN 477 part 5 - for cylinders with test pressure ratings up to 450 BAR and is commonly referred to in the SCUBA industry by the slang term "300 BAR". The two designs are nearly identical, but the #56 valve outlet is deliberately deeper so the shorter #13 connector will not be long enough to seat properly. This is a safety feature to prevent connecting a low pressure device to a high pressure supply. It's important to understand that the "200 BAR" or "300 BAR" descriptions are just slang terms that have nothing to do with the pressure ratings of the outlets and connectors themselves.

### Frequently Asked Questions about 200 BAR vs. 300 BAR

*Is a 300 BAR SCUBA valve outlet stronger than 200 BAR?*

No, they are the same. Only the first few threads in both the 200 BAR and 300 BAR outlet designs are doing the work, the remaining threads on the 300 BAR outlet are there simply to create a deliberate incompatibility with a 200 BAR connector. In fact, in practice, the 300 BAR valve outlet has proven itself to be more fragile than the 200 BAR valve outlet. The 300 BAR valve outlet is so long that the smallest 'ding' on the edge of the opening can slightly warp the cylindrical opening, causing the regulator to become difficult or impossible to completely seat. This problem does not seem nearly as pronounced with the 200 BAR valve outlets; although it remains an issue and all DIN outlets should be protected from dings.

*If a SCUBA regulator has a 300 BAR connector does it need a 300 BAR SCUBA valve?*

No, the 300 BAR connector of the regulator is designed to work just fine with a 200 BAR valve outlet on a cylinder. The regulator connector will require fewer turns to seat with a 200 BAR outlet and is much more convenient to use in that regard. Once fully seated in a

200 BAR valve outlet, two threads of the regulator 300 BAR connector are visible; this is completely harmless and normal -- two exposed threads are not going to 'weaken' anything.

*If I have 200 BAR valve outlets on my cylinders, should I purchase a regulator with a 200 BAR connector?*

The DIN connectors seen on modern regulators sold in the US are always the 300 BAR variety that fit a 200 BAR outlet just fine. We have (very rarely) seen regulators, usually hand carried into the US by individuals from Europe, that have 200 BAR connectors. We also have seen a few special order DIN 200 BAR retrofit kits to change yoke regulators to DIN. However, there is no reason to seek out and use a 200 BAR connector on your regulator.

*Is the 300 BAR SCUBA valve "better"?*

No, not in any way that engineering science can justify. The 300 BAR valve is in NO way better than a 200 BAR valve for the SCUBA applications for which they are being used. The 200 BAR DIN outlet actually has the advantage that it can accept an insert that allows it to be used with the very common GGA V-1 connector, aka "Yoke" or "A-clamp", in wide use on regulators in the US. Because 200 BAR valves are more widely used than 300 BAR, they benefit from economies of scale in production and distribution, meaning that 300 BAR valves are more difficult to find and more costly. Since 200 BAR valves can be adapted to Yoke, are more convenient to use and less susceptible to damage, some feel the 200 BAR outlet is better than the 300 BAR outlet.

*Is it safe to use a 200 BAR SCUBA valve on the new 3442 psi SCUBA cylinders?*

Yes, it's fine for use with DIN regulators and modern Yoke regulators. We have seen a few yoke regulators with the yoke assembly marked for 3000 psi max service (or unmarked), and we do not recommend using the yoke adapter with those yoke regulators on the 3442 psi cylinders. While 3442 psi is approximately 230 BAR, keep in mind the '200 BAR' term is meaningless so far as the pressure rating of the valve outlet itself is concerned, it is a DIN 477 #13 valve outlet and the outlet itself does not have a pressure rating. Because of confusion about the 200 BAR slang description for the valve and the 3442 psi cylinder pressure, we have noticed that some literature has taken to referring to the DIN 477 #13 valve outlet as '230 BAR', even though the valve outlet is unchanged.

*Can I replace the 300 BAR SCUBA valve on my 3500 psi "Genesis" cylinder with a 200 BAR valve?*

No. Many divers would like to have the option of using yoke regulators on their 3500 psi cylinders. However, the older design 3500 psi "Genesis" steel SCUBA cylinders are forced to use a 300 BAR valve because a 200 BAR valve with the proper 7/8 UNF stem threads to fit the cylinder is not available. (See the next section for more details about neck threads.)

*Does a yoke adapter insert exist for my 300 BAR valve?*

No. An adapter insert does not exist, and even if it were made, we have never seen a yoke clamp long enough to fit over the 300 BAR SCUBA valve. There is a yoke-to-din fill adapter device for 300 BAR valves, but it is strictly for filling only.

*Is there any reason I should use a 300 BAR SCUBA valve?*

For the sake of uniformity, some divers who started with 300 BAR valves continue to select them when purchasing new cylinders, just so all their cylinder valves have the same type of outlet. Some individuals in diving leadership roles may insist their students and peers use 300 BAR valves, usually with the vague justification they are 'better' because 300 BAR is a higher pressure than 200 BAR. A common misconception is that DIR philosophy or GUE training standards require 300 BAR valves, which is untrue. If using the 300 BAR valve outlet will provide uniformity, peace-of-mind or peer acceptance then do so, because there is no major reason to avoid using 300 BAR SCUBA valves.