XPR300 – Plasma Cutting System
Gouging Acoustic Noise Level Measurements

Cutting with a plasma arc can exceed acceptable noise levels as defined by local codes in many applications. Prolonged exposure to excessive noise will damage hearing. Always wear proper ear protection when cutting or gouging, unless sound pressure level measurements taken at the installed site have verified personal hearing protection is not necessary. See also "***Noise Can Damage Hearing***" in the *Safety* section of the operator manual.

Notes for Machinery Designers and Manufacturers:
All relevant international, regional, national and local codes must be considered and adhered to as appropriate, in particular if introducing this plasma power source and torch as part of a machine/mechanized solution.

If incorporating this plasma arc cutting equipment as part of a mechanized cutting machine, a hierarchy of noise control should be adopted based primarily on elimination or control of noise 'at source' as part of the machine design in order to protect people who operate within the workplace or who may enter the workplace at any given time.

Metal cutting is noisy, using a plasma arc to cut metal is no exception. The noise measurements taken by Hypertherm are intended to provide a worst-case indication of maximum potential sound pressure levels 1 meter from the plasma arc without the benefit of any noise controls in the design or operation of cutting machines. The A-weighted sound pressure level was taken during a short duration of 1 minute of continuous cutting. Actual values measured in typical cutting applications for longer durations may be much lower. Shield the plasma arc where practical. Significant engineering design improvements can be obtained by adding simple engineering controls to cutting tables such as barriers or curtains positioned between the plasma arc and the workstation; and/or locating the workstation more than 1 meter away from the plasma arc. Customers can also implement additional administrative controls in the workplace to restrict access, limit operator exposure time or screen off noisy working areas or take measures to reduce reverberation in working areas by putting up noise absorbers.

During cutting table design and/or customer site preparation, an assessment should be made to see whether the cutting table, process or production set-up can be modified to reduce the noise levels. If the noise level is questionable, have a certified safety specialist or Industrial Hygienist take measurements and make recommendations. If engineering and administrative control methods fail to reduce noise to acceptable levels, in some countries local workplace regulations may require a Hearing Conservation Program (e.g. in the USA OSHA requires a Hearing Conservation Program if noise levels reach 85 dB on an 8-hour, Time Weighted Average (TWA) basis).

Use ear protectors if the noise is disruptive or if there is a risk of hearing damage after all other engineering and administrative controls have been implemented. If hearing protection is required, wear only approved personal protective devices such as earmuffs or ear plugs with a noise reduction rating appropriate for the situation. In addition, ear protection can prevent hot spatter from entering the ear. Warn others in area of possible noise hazards. If the noise in your work area becomes uncomfortable, causing a headache or discomfort of the ears, you could be damaging your hearing and should immediately put on earmuffs or plugs.

NOTE: The following noise measurements, which were set at 300A, were performed using an XPR460 power source; the findings would have been comparable if an XPR300 power source had been used with the identical setup.

Sound Pressure measurements taken in Hypertherm Research & Development Labs

PRODUCT	Output current (typical or worse case)	Process	Measurement distance from source	Peak C-weighted instantaneous sound pressure (L_{Cpeak} in dB) MaxP	A-weighted sound pressure (L_{pA} in dB) Lav5	Table type and water level if wet (workpiece above/below water)	Workpiece material & thickness	Date measurement taken
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	1 meter from in front of arc 1.5 meters above floor	118.4	103.7	Wet, 6" above water	1.250" mild steel	30 October 2025

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PRODUCT	Output current (typical or worse case)	Process	Measurement distance from source	Peak C-weighted instantaneous sound pressure (L_{Cpeak} in dB) MaxP	A-weighted sound pressure (L_{pA} in dB) Lav5	Table type and water level if wet (workpiece above/below water)	Workpiece material & thickness	Date measurement taken
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	1.5 meters from left of arc 1.5 meters above floor	119.4	106.2	Wet, 6" above water	1.250" mild steel	30 October 2025
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	1.4 meters from right of arc 1.5 meters above floor	119.0	106.0	Wet, 6" above water	1.250" mild steel	30 October 2025
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	2 meters from right of arc 1.5 meters above floor	118.9	105.6	Wet, 6" above water	1.250" mild steel	30 October 2025
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	3 meters from right of arc 1.5 meters above floor	118.1	104.4	Wet, 6" above water	1.250" mild steel	30 October 2025
XPR460	300A	Gouging, O_2 plasma Air shield (85/70 psi), Gouge speed 20 IPM, Standoff 0.5", Maximum arc voltage 190V	5 meters from right of arc 1.5 meters above floor	115.1	101.6	Wet, 6" above water	1.250" mild steel	30 October 2025
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	1 meter from front of arc 1.5 meters above floor	114.1	100.9	Wet, 2" above water	0.75" mild steel	24 March 2026
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	1 meter from left of arc 1.5 meters above floor	113.9	100.3	Wet, 2" above water	0.75" mild steel	24 March 2026
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	1 meter from right of arc 1.5 meters above floor	115.6	101.7	Wet, 2" above water	0.75" mild steel	24 March 2026

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PRODUCT	Output current (typical or worse case)	Process	Measurement distance from source	Peak C-weighted instantaneous sound pressure (L_{Cpeak} in dB) MaxP	A-weighted sound pressure (L_{pA} in dB) Lav5	Table type and water level if wet (workpiece above/below water)	Workpiece material & thickness	Date measurement taken
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	2 meters from right of arc 1.5 meters above floor	114.1	99.9	Wet, 2" above water	0.75" mild steel	24 March 2026
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	3 meters from right of arc 1.5 meters above floor	112.0	98.5	Wet, 2" above water	0.75" mild steel	24 March 2026
XPR460	300A	Gouging, 50/50 H2/Ar plasma N2 shield (55/43 psi), Gouge speed 20 IPM, Standoff 0.393", Maximum arc voltage 200V	5 meters from right of arc 1.5 meters above floor	110.4	97.5	Wet, 2" above water	0.75" mild steel	24 March 2026

Revision	Date	Section	History Change
1	4-November-2025	-	Initial release
2	8-December-2025	-	Include a NOTE explaining that an XPR460 power source output at 300A was used for the measurements.
3	2-April-2026	-	Add Mixed Gas Gouging

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