

claim construction disputes. The order will first briefly address the technology at issue in the case and then turn to the merits of the claim construction issues.

II. BACKGROUND OF THE TECHNOLOGY

The patents-in-suit are directed to power converters that have, typically, a regulation stage without isolation and a separate isolation stage that has no regulation. In general, an isolation stage has no electrical connection its input and output, and a regulation stage allows a circuit to control its output voltage. The claims of the '190, '083, and '702 patents are directed to "regulation" of the output voltage, while the '034 patent introduces the concept of "semi-regulation."¹ The continuation-in-part '021 patent introduces the concept of multiple "modes" of operation, including a "normal" mode of operation and a mode of operation." Each claim in the '021 patent recites that certain actions only occur "during normal operation."

The **abstract of the '190 patent** states:²

A power converter nearly losslessly delivers energy and recovers energy from capacitors associated with controlled rectifiers in a secondary winding circuit, each controlled rectifier having a parallel uncontrolled rectifier. First and second primary switches in series with first and second primary windings, respectively, are turned on for a fixed duty cycle, each for approximately one half of the switching cycle. Switched transition times are short relative to the on-state and off-state times of the controlled rectifiers. The control inputs to the controlled rectifiers are cross-coupled from opposite secondary transformer windings.

Claim 1 of the '190 patent is reproduced below:

A power converter system comprising:

¹ SynQor added "the output can be said to be semi-regulated" language in the specification of the '034 patent during prosecution and argued that it was already materially disclosed in the rest of the specification. Defendants contend that "semi-regulation" was an addition of new matter not previously disclosed. Figure 11 of the '034 patent is also new as compared to the original application.

² The abstracts for the '034, '083, and '702 patents are identical to the abstract of the '190 patent.

a DC power source;

a non-regulating isolation stage comprising:

- a primary transformer winding circuit having at least one primary winding connected to the source; and

- a secondary transformer winding circuit having at least one secondary winding coupled to the at least one primary winding and having plural controlled rectifiers, each having a parallel uncontrolled rectifier and each connected to a secondary winding, each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding to provide an output, each primary winding having a voltage waveform with a fixed duty cycle and transition times which are short relative to the on-state and off-state times of the controlled rectifiers; and

- a plurality of non-isolating regulation stages, each receiving the output of the isolation stage and regulating a regulation stage output while the fixed duty cycle of the isolation stage is maintained.

The **abstract of the '021 patent** states:

In a power converter, the duty cycle of a primary winding circuit causes near continuous flow of power through the primary and secondary winding circuits during normal operation. By providing no regulation during normal operation, a very efficient circuit is obtained with a synchronous rectifier in the secondary operating at all times. However, during certain conditions such as start up or a short-circuit, the duty cycle of the primary may be reduced to cause freewheeling periods. A normally non-regulating isolation stage may be followed by plural non-isolating regulation stages. To simplify the gate drive, the synchronous rectifiers may be allowed to turn off for a portion of the cycle when the duty cycle is reduced. A filter inductance of the secondary winding circuit is sufficient to minimize ripple during normal operation, but allows large ripple when the duty cycle is reduced. By accepting large ripple during other than normal operation, a smaller filter inductance can be used.

Claim 1 of the '021 patent is reproduced below:

A power converter system comprising:

- a normally non-regulating isolation stage comprising:

- a primary winding circuit;

- a secondary winding circuit coupled to the primary winding circuit, the secondary winding circuit comprising a secondary transformer winding in series with a controlled rectifier having a parallel uncontrolled rectifier, the secondary winding circuit providing a normally non-regulated output of the isolation stage; and
- a control circuit which controls duty cycle of the primary winding circuit, the duty cycle causing substantially uninterrupted flow of power through the primary and secondary winding circuits during normal operation; and
- a plurality of non-isolating regulation stages, each receiving the non-regulated output of the isolation stage and regulating a regulation stage output.

III. GENERAL PRINCIPLES GOVERNING CLAIM CONSTRUCTION

“A claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention.” *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996).

To ascertain the meaning of claims, the court looks to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. The specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. *Id.* A patent’s claims must be read in view of the specification, of which they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* “One purpose for examining the specification is to determine if the patentee has limited the scope of the claims.” *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee’s claims. Otherwise, there would be no need for claims. *SRI Int’l v. Matsushita*

Elec. Corp., 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388 (Fed. Cir. 1992). Although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

This court's claim construction decision must be informed by the Federal Circuit's decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that "the *claims* of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (emphasis added) (*quoting Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id.* The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention and that patents are addressed to and intended to be read by others skilled in the particular art. *Id.*

The primacy of claim terms notwithstanding, *Phillips* made clear that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular

claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of “a fully integrated written instrument.” *Id.* at 1315, quoting *Markman*, 52 F.3d at 978. Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id.* at 1314-17. As the Supreme Court stated long ago, “in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims.” *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.

Phillips, 415 F.3d at 1316. Consequently, *Phillips* emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. Like the specification, the prosecution history helps to demonstrate how the inventor and the PTO understood the patent. *Id.* at 1317. Because the file history, however, “represents an ongoing negotiation between the PTO and the applicant,” it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id.* Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor

understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. *Id.*

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Phillips*, 415 F.3d at 1319-24. The approach suggested by *Texas Digital*—the assignment of a limited role to the specification—was rejected as inconsistent with decisions holding the specification to be the best guide to the meaning of a disputed term. *Id.* at 1320-21. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of “focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent.” *Id.* at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.* What is described in the claims flows from the statutory requirement imposed on the patentee to describe and particularly claim what he or she has invented. *Id.* The definitions found in dictionaries, however, often flow from the editors’ objective of assembling all of the possible definitions for a word. *Id.* at 1321-22.

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The court did not impose any particular sequence of steps for a court to follow when it considers

disputed claim language. *Id.* at 1323-25. Rather, *Phillips* held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.

The patents-in-suit include claim limitations that are argued to fall within the scope of 35 U.S.C. § 112, ¶ 6. “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure. . . in support thereof, and such claim shall be construed to cover the corresponding structure . . . described in the specification and equivalents thereof.” 35 U.S.C. § 112, ¶ 6. When a claim uses the term “means” to describe a limitation, a presumption inheres that the inventor used the term to invoke § 112, ¶ 6. *Biomedino, LLC v. Waters Technologies Corp.*, 490 F.3d 946, 950 (Fed. Cir. 2007). “This presumption can be rebutted when the claim, in addition to the functional language, recites structure sufficient to perform the claimed function in its entirety.” *Id.*, citing *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1375 (Fed. Cir. 2003). By contrast, when a claim term does not use “means,” the term is presumptively not subject to § 112, ¶ 6. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002); *MIT v. Abacus Software*, 462 F.3d 1344, 1353 (Fed. Cir. 2006). A limitation lacking the term “means” may overcome the presumption if it is shown that “the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *MIT*, 462 F.3d at 1353, quoting *CCS Fitness*, 288 F.3d. at 1369. “What is important is whether the term is one that is understood to describe structure, as opposed to a term that is simply a nonce word or a verbal construct that is not recognized as the name of structure and is simply a substitute for the term

‘means for.’” *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1360 (Fed. Cir. 2004).

Once the court has concluded the claim limitation is a means-plus-function limitation, the first step in construing a means-plus-function limitation is to identify the recited function. *See Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999). The second step in the analysis is to identify in the specification the structure corresponding to the recited function. *Id.* The “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Medical Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003), *citing B. Braun v. Abbott Labs*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). The patentee must clearly link or associate structure with the claimed function as part of the quid pro quo for allowing the patentee to express the claim in terms of function pursuant to § 112, ¶ 6. *See id.* at 1211; *see also Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001). The “price that must be paid” for use of means-plus-function claim language is the limitation of the claim to the means specified in the written description and equivalents thereof. *See O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997). “If the specification does not contain an adequate disclosure of the structure that corresponds to the claimed function, the patentee will have ‘failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112,’ which renders the claim invalid for indefiniteness.” *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1382 (Fed. Cir. 2009), *quoting In re Donaldson Co.*, 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc). It is important to determine whether one of skill in the art would understand the specification itself to disclose the structure,

not simply whether that person would be capable of implementing the structure. *See Atmel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1382 (Fed. Cir. 1999); *Biomedino*, 490 F.3d at 953. Fundamentally, it is improper to look to the knowledge of one skilled in the art separate and apart from the disclosure of the patent. *See Medical Instrumentation*, 344 F.3d at 1211-12. “[A] challenge to a claim containing a means-plus-function limitation as lacking structural support requires a finding, by clear and convincing evidence, that the specification lacks disclosure of structure sufficient to be understood by one skilled in the art as being adequate to perform the recited function.” *Budde*, 250 F.3d at 1376-77.

At issue in this case is whether certain claims of the patents-in-suit are indefinite. A claim is invalid for indefiniteness if it fails to particularly point out and distinctly claim the subject matter that the applicant regards as the invention. 35 U.S.C. § 112, ¶ 2. To prevail on an indefiniteness argument, the party seeking to invalidate a claim must prove “by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as her knowledge of the relevant art area.” *Halliburton Energy Services, Inc. v. M-I LLC*, 514 F.3d 1244, 1249-50 (Fed. Cir. 2008). The primary purpose of the definiteness requirement is to ensure public notice of the scope of the patentee's legal right to exclude, such that interested members of the public can determine whether or not they infringe. *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005); *Halliburton*, 514 F.3d at 1249; *Honeywell Int'l Inc. v. Int'l Trade Comm'n*, 341 F.3d 1332, 1338 (Fed. Cir. 2003). Courts apply the general principles of claim construction in their efforts to construe allegedly indefinite claim terms. *Datamize*, 417 F.3d at 1348; *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007). A claim is indefinite only

when a person of ordinary skill in the art is unable to understand the bounds of the claim when read in light of the specification. *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875 (Fed. Cir. 1993); *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1371 (Fed. Cir. 2008). A determination of claim indefiniteness is a conclusion of law. *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375-76 (Fed. Cir. 2001); *Datamize*, 417 F.3d at 1347.

A claim is indefinite only if the claim is “insolubly ambiguous” or “not amenable to construction.” *Exxon*, 265 F.3d at 1375; *Young*, 492 F.3d at 1346; *Halliburton*, 514 F.3d at 1249; *Honeywell*, 341 F.3d at 1338-39. A court may find a claim indefinite “only if reasonable efforts at claim construction prove futile.” *Datamize*, 417 F.3d at 1347. A claim term is not indefinite solely because the term presents a difficult claim construction issue. *Id.*; *Exxon*, 265 F.3d at 1375; *Honeywell*, 341 F.3d at 1338. “If the meaning of the claim is discernable, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, ... the claim [is] sufficiently clear to avoid invalidity on indefiniteness grounds.” *Exxon*, 265 F.3d at 1375; *Halliburton*, 514 F.3d at 1249.

IV. AGREED CONSTRUCTIONS

Based upon the joint submission of claim construction charts, the following terms of the patents-in-suit have been agreed to by the parties, and therefore adopted by this Court:

Claim term	Agreed Construction
“isolated output”	“an output that is isolated from the input”
“uncontrolled rectifier”	“diode (including MOSFET body diode) or other passive device used as a rectifier”
“primary transformer winding circuit”	“a circuit that includes a primary winding of a transformer”
“voltage value drops due to impedance of an output path”	“voltage whose decrease in value is due to increased current flowing through components (explicit or parasitic) having impedances in an output path”

V. TERMS IN DISPUTE³

1. “isolation” / “isolating” / “isolated” (‘190, ‘034, ‘083, and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
Isolation: “having insulation incorporated to prevent the flow of substantial DC current”	“the absence of an electric path permitting the flow of DC current between two points”
Isolating: “providing isolation”	
Isolated: “having isolation”	

SynQor argues that isolation is a well-known term in power electronics and that isolation is provided by using a transformer to insulate the output from the input. SynQor argues that the claim limitation is met if the power converter is configured to provide the function of isolation – allowing power to be transferred from the input to the output while preventing the flow of substantial DC current by using an insulated device, such as a transformer. SynQor argues that Defendants’ construction is inconsistent with how persons of ordinary skill would define an isolated converter and would cover any situation where there was no electric path for DC current between two points. SynQor argues that the specification confirms that the term isolation is defined by whether there is insulation, such as a transformer, within the stage that prevents the flow of DC current from the input to the output. *See* Fig. 2 of the ‘190 patent. SynQor argues that the specification never defines “isolation” by whether there is a path that might allow electric current to flow somewhere outside of the stage/converter, such as a common ground. Rather, it defines “isolation” as the presence of circuitry within the stage/converter itself that prevents the flow of substantial DC current within the stage/converter.

³ In all instances, one group of defendants proposes a certain construction for a term and the remaining defendants merely state that they do not oppose the construction. The defendants do not oppose each other’s constructions. Thus, the Court treats the proposed construction by a single group of defendants as the proposed construction by all of the defendants.

Defendants argue that isolation is a state or condition that can be changed. Defendants argue that isolation prevents the flow of all, or all but a *de minimis* amount of, DC current. Defendants argue that isolation is provided by creating an electric barrier between two components such that DC current cannot flow between them. Defendants argue that Figure 2 shows that there is no electric path from the input to the output of the isolation stage. Defendants argue that the term insulation, proposed by SynQor, is not used in the specification and is not descriptive, ambiguous, and circular. Defendants argue that the mere presence of insulation in the circuit does not guarantee that the input and output of the circuit will be isolated because an electrical connection could be provided elsewhere. Defendants further argue that prior art cited during prosecution, part of the intrinsic record of the '083 and '702 patents and listed on the face of those patents, confirms its construction. These prior art references have diagrams and expressly use the terms "isolated" and "non-isolated" when there is the absence or presence of a path permitting the flow of DC current from the input to the output of the circuit. Defendants further argue that the inventor confirmed this understanding during his deposition.

The word "insulation" is not used in the specification or the claims. In the specification, a transformer is used to provide isolation, but the specification never teaches that "isolation" means "insulation." As the prior art shows, a power converter can utilize a transformer, but if the circuit has a separate conducting path it is not viewed as "isolated." Thus, the presence of insulation is not determinative of whether the stage is isolated. The Court rejects SynQor's attempt to insert the term "insulation" and "substantial" to the construction without any clear support for those terms. The dictionary definition of isolation implies a separation or detachment from one component to another component. It is clear from the specification and the parties'

construction that the separation is that of electricity, and more specifically, DC current. The parties agree that isolation can allow the flow of a *de minimus* amount of DC current. The prior art and specification indicates that isolation for a circuit or stage is that where no electric path exists between the input and output of the circuit or stage. That is, the input is isolated from the output. SynQor’s concern, that isolation looks to the internal structure of the converter, circuit, or stage to determine whether it is isolated, is taken into account when the entire phrase of “non-isolating regulation stage” or “isolation stage” is considered. In these contexts, the stage itself must have internal isolation or be isolating itself, not necessarily that the stage must be isolated from another stage or structure. The claims provide that stages, circuits, converters, and transformers can be isolating. Thus, the Court construes the term “isolation” to mean “*the absence of an electric path permitting the flow of DC current (other than a de minimus amount) between an input and an output of a particular stage, component, or circuit.*” The Court finds that the terms “isolating” and “isolated” have the same meaning as the term “isolation.”

2. “regulation”/“regulating”/“regulated output(s)” (‘190, ‘034, ‘021, and ‘702 patents)

Claim Term	SynQor’s Proposed Construction	Defendants’ Proposed Construction
“regulated output / regulated DC output”	“a/an [DC] output that is controlled towards a predefined value during normal operation”	“a/an [DC] output that is controlled towards a predefined value”
“regulating”	“producing a regulated [DC] output during normal operation”	“controlling an output towards a predefined value”
“regulation”	“the state of regulating”	“controlling an output towards a predefined value”

The parties propose fairly similar constructions for these terms and agree that “regulation” generally means controlling the output voltage. The primary dispute is regarding

SynQor's "during normal operation" language. The phrase "during normal operation" only appears in the '021 patent as a result of added matter during the continuation-in-part application leading to the '021 patent. *See, e.g.*, '021 patent, 2:1-22. The phrase does not appear in any of the other patents' specifications or claims. During prosecution of the application leading to the '021 patent, the inventor explained that "[t]he claims are not limited with respect to potential control during system transients such as during turn on or turn off of the converter system. Such control may or may not be included." In the initial office action of the reexamination of the '021 patent, the PTO rejected claims in the '021 patent and found that the '021 patent claims were only entitled to a late priority date because the discussion of "normal" versus non-normal operation was not found in the original application.

SynQor argues that one of ordinary skill in the art would understand that "regulating" or "regulation" could not mean "all the time" regulation. Rather, one of ordinary skill would know that if a converter regulates during its normal operation, it is regulation, and it need not regulate under every conceivable condition or mode of operation. Thus, SynQor argues that a person skilled in the art would understand that the "regulation stage" would not regulate at voltage or current levels outside its normal operating range, or when the control circuit is first powered on. SynQor argues that the specification describes converters that "regulate" under specified operating conditions and that the prosecution history confirms that "regulation" does not require regulation "all the time." Further, SynQor argues that the claims do not require any particular operation during non-normal operating conditions. SynQor argues that no known power converter regulates under every conceivable condition, and that such a construction is absurd. SynQor argues that the finding by the examiner in reexamination is not conclusive in this case

and that it has not yet had a chance to respond.

Defendants argue that there is nothing in the term “regulation” or “regulating” or the claims themselves that suggests a limitation as to time or to specific modes of operation for these terms. Defendants argue that there is no hint as to how one would determine what is normal operation versus abnormal operation in any of the patents but for the ‘021 patent. Further, Defendants argue that there is no circuitry disclosed in these patents that would sense and differentiate between a “normal” mode of operation and another mode of operation. In the ‘021 patent, Defendants argue that when the patentee meant to modify “non-regulating” to mean “during normal operation,” the patentee did so explicitly by adding the word “normally” before “non-regulating” and discussing the control of the circuit as being only “during normal operation.” Defendants argue that when the patentee intended a claim term to apply only “during normal operation,” the patentee explicitly added those words to the claim. Defendants argue that the specification of the ‘021 patent supports their interpretation because the ‘021 patent specifically describes regulation during “other than normal operation,” and it would contradict the specification to construe the term “regulating” to mean “regulating during normal operation.” *See* ‘021 patent, 2:1-21. Thus, the Defendants argue that the term “regulation” is general and is not restricted to any particular mode or timeframe. Defendants argue that the examiner’s finding in reexamination that “normal operation” was not supported by the original filed application is directly contrary to SynQor’s argument that the terms “regulating” and “non-regulating” by themselves implicitly incorporate the concept of “during normal operation.”

The Court rejects SynQor’s attempts to add the “during normal language” limitation to these claim terms. The “during normal operation” language only appears in the ‘021 patent.

There is no support for such language in any of the other patents, and the Court rejects SynQor's arguments that there is such support. Further, in the '021 patent, the disputed "regulating" terms appear in the claims in addition to the "normal" operation language, implying that the "regulating" terms are not limited to just "during normal operation." It is not the Court's job to rewrite the claims, and where there is no support for the inclusion of such a term, either in the claim language or the specification, the Court will not do so. As the inventor stated during the prosecution history, whether control or regulation in the claims during system transients such as during turn on or turn off "may or may not be included." The Court finds that there is no temporal limitation in the term. Thus, "regulated" is not necessarily limited to only "during normal operation." The Defendants' proposal does not include the "all the time" limitation, and the Defendants stated during oral argument that they are not seeking to add the "all the time" limitation. The Court rejects the contention, if there is still such a contention, that the term requires regulating "all the time." Likewise, the Court rejects the addition of the phrase "during normal operation" in all other instances where that language is otherwise not present.

The parties are in agreement, but for the dispute of "during normal operation," that a "regulated output" is an output that is controlled towards a predefined value, and thus the Court adopts the parties' similar language for the term "regulated output." The Court finds that the construction for the term "regulating" should resemble the essentially undisputed language for the term "regulated output." "Regulation" is generally defined as "the act of regulating" or "the state of being regulated." Thus, the Court adopts the following constructions:

"regulated output" means "*an output that is controlled towards a predefined value;*"

“regulated DC output” means “a DC output that is controlled towards a predefined value;”

“regulating” means “controlling an output towards a predefined value;” and

“regulation” means “the act of controlling an output towards a predefined value.”

3. “non-regulated” / “non-regulating” / “without regulation” (‘190, ‘083, and ‘702 patents)

Claim Term	SynQor’s Proposed Construction	Defendants’ Proposed Construction
“non-regulated, isolated DC output / non-regulated output”	“an [isolated DC] output that is approximately proportional to the input voltage during normal operation even when faced with variations in input voltage and output current”	“does not control an output towards a predefined value”
“non-regulating”	“producing a non-regulated output during normal operation even when faced with variations in input voltage and output current”	Same as above.
“without regulation”	<i>See</i> construction of “regulation.”	Same as above.

There are two primary issues in dispute between the parties as to these terms. The first issue is whether the construction of the non-regulated terms should include the phrase “during normal operation.” The parties primarily rely on the same arguments as previously presented in regards to the “regulated” terms, and the Court will not rehash their arguments. The second issue is whether the non-regulated terms should be defined negatively as the Defendants propose or affirmatively as SynQor proposes. SynQor argues that the specification affirmatively describes a non-regulated output as being proportional to the input voltage. *See* ‘190 patent, 5:13-24; 15:4-11. SynQor argues that the term “approximately” is not indefinite and is supported by the

specification. Defendants argue that “non” means “not” or “the absence of.” Thus, Defendants argue that the terms, “non-regulated,” “non-regulating,” and “without regulation” simply mean not “regulated.” Because the parties have essentially agreed that the term regulated means “controlling an output towards a predefined value,” Defendants argue that these terms mean the opposite, i.e., “does not control the output towards a predefined value.” Defendants argue that SynQor agrees with this logic because for the term “without regulation” it merely proposes the opposite of regulation. Defendants further argue that the term “approximately” is not supported by the specification and there is no guidance as to the bounds of the term.

Consistent with previous terms and for the same reasons, the Court rejects SynQor’s attempt to add “during normal operation” to this term when there is no basis for it in the claims or the specification. The claims consistently use “regulation” terms and also “non-regulation” terms. The claims, the specification, and the terms themselves imply that the meanings of these terms are opposites. The Court does not find any support in the specification for SynQor’s “approximately proportional” language, and thus rejects SynQor’s attempts to add limitations that are not present. The Court notes that SynQor agrees that “without regulation” means no “regulation” or the absence of “regulation” as previously defined, but argues that the terms “non-regulated” and “non-regulating” mean something different. The Court is not persuaded by SynQor’s arguments. The Court finds that “without regulation” and “no regulation” and “non-regulated” have the same meanings as implied in the claims and the specification. The Court agrees with the Defendants and finds that these terms are the opposite of the “regulation” terms. Thus, similar to its constructions for the “regulation” terms, the Court adopts the following constructions:

“non-regulated output” means “*an output that is not controlled towards a predefined value;*”

“non regulated, isolated DC output” means “*an isolated DC output that is not controlled towards a predefined value;*”

“non-regulating” means “*not controlling an output towards a predefined value;*” and

“without regulation” means “*the act of not controlling an output towards a predefined value.*”

4. “during normal operation” / “normally non-regulated” (‘021 patent)

Claim Term	SynQor’s Proposed Construction	Defendants’ Proposed Construction
“during normal operation”	“the mode in which the device usually operates when it is on, which mode excludes, for instance, start-up and fault conditions such as over-current conditions”	“a mode of operation that excludes start-up and fault conditions such as over-current conditions”
“normally non-regulated output”	“an [isolated DC] output that is approximately proportional to the input voltage during normal operation even when faced with variations in input voltage and output current”	“non-regulating during normal operation”
“non-regulated output”	Same as above.	“non-regulating during normal operation”
“normally non-regulating”	“producing a non-regulated output during normal operation even when faced with variations in input voltage and output current”	“non-regulating during normal operation”

SynQor argues that operation in “normal” mode means how the device usually operates, and that it is proper to define the term in affirmative ways rather than negative ways. Thus, SynQor construes the term as “the mode in which the device usually operates when it is on.”

Defendants argue that the language “in which the device usually operates” proposed by SynQor has no support in the specification and adds confusion, not clarity, to the definition. Defendants also argue that it would render the claim indefinite because one would not know whether a system was covered by the patent until one monitored the system for a long enough time to determine what “usually” happened. Defendants argue that the specification only defines non-normal operation is exclusory terms, such as excluding start-up and fault conditions, whereby “normal operation” should be everything else.

The parties agree that during normal operation excludes “start-up and fault conditions such as over-current conditions.” Further, the parties agree that it also excludes “shutdown” conditions. The “during normal operation” language, and any differences between “normal” and other modes, is only found in the ‘021 patent. Regarding the term “during normal operation,” the parties agree when it is not normal operation, but disagree as to when the isolation stage is affirmatively in normal operation. The Court rejects the “usually operates” language proposed by SynQor because there is no support for such language and it is ambiguous. However, the ‘021 patent references both the “normal state of operation” and the “normal mode of operation.” See ‘021 patent 4:37, 5:60. The Court finds that affirmatively stating that it is a “normal mode of operation,” rather than just “a mode” of operation conforms to the language of the specification. Thus, the Court construes the term “normal operation” to mean “*a normal mode of operation that excludes start-up, shutdown, and fault conditions such as over-current conditions.*”

The Court has previously construed “non-regulated output.” Both parties agree that the term “normally non-regulated output” should be construed to include the phrase “during normal operation.” Consistent with its previous constructions, the Court construes the term “normally

non-regulated output” to mean “*non-regulated output that occurs during normal operation.*” While the term “the non-regulated output” does not have a proper antecedent basis based on the language used in the claim, the Court agrees with the parties in that it is shorthand for the antecedent term “a normally non-regulated output” in claim 1 of the ‘021 patent. Thus, the Court construes the “non-regulated output” of claim 1 to have the same meaning as the “normally non-regulated output” of claim 1, that is, “*non-regulated output that occurs during normal operation.*” Both parties likewise agree that the term “normally non-regulating” should be construed to include the phrase “during normal operation.” Thus, the Court construes the term “normally non-regulating” to mean “*non-regulating during normal operation.*”

5. “semi-regulation, isolated output” / “semi-regulation” (‘034 patent)

Claim Term	SynQor’s Proposed Construction	Defendants’ Proposed Construction
“Semi-regulated, isolated output”	“an isolated output that is controlled towards a predefined value during normal operation without sensing a signal on the secondary side of the isolation transformer and passing a feedback control signal across the isolation barrier to control circuitry on the primary side”	“providing a regulated voltage from a regulation stage to an isolation stage where the regulation stage regulates the provided voltage without sensing the isolated output of the isolation stage”
“Semi-regulation”	“the state of producing a semi-regulated output during normal operation without sensing a signal on the secondary side of the isolation transformer and passing a feedback control signal across the isolation barrier to control circuitry on the primary side”	Same as above.

SynQor argues that there is no requirement for a separate “regulation stage” as the Defendants contend. SynQor argues that the specification states that “the output can be said to be semi-regulated” where the drops between the voltage on the primary side and the output “are

small and proportional to the current flowing through the isolation stage.” See ‘034 patent, 15:7-13. SynQor argues that the specification never mandates that a particular circuitry is required to provide “semi-regulation,” much less a regulation stage preceding an isolation stage. SynQor argues that the specification describes an alternative approach that would allow for the sensing and control to occur anywhere on “the primary side of the isolation stage,” including in the isolation stage itself. SynQor also argues that the “during normal operation” language is proper because it clarifies that the claimed operation is not required “all the time” in every conceivable situation. Defendants argue that the specification is clear that “semi-regulation” only exists where the regulation stage precedes the isolation stage. Defendants argue that “semi-regulation” and an output “whose voltage value drops due to impedance of an output path” are two different and distinct concepts and SynQor is blending the two concepts. Defendants argue that the claims require two distinctly recited limitations: (i) semi-regulation, and (ii) an output “whose voltage value drops due to impedance of an output path.” Defendants argue that SynQor is attempting to broaden the concept of semi-regulation by extending it to multiple configurations. Defendants argue that there is nothing in the ‘034 patent that suggests the concept of semi-regulation involves the control of an isolated output.

Claims 1 and 20 of the ‘034 patent contain the disputed “semi-regulation” terms. Only the ‘034 patent uses the “semi-regulated” terms, as the “semi-regulation” language was inserted in the specification during prosecution of the ‘034 patent on the basis that it was shorthand for already-existing disclosures:

In some situations, it may be desirable to place the isolation stage first in the power flow, and to have the regulation stage follow. For example, as shown in FIG. 11, when there are many outputs sharing the total power, the circuit might be

configured as one isolation/step-down (or step-up) stage 501 followed by several DC-DC switching or linear regulators 503.

* * *

When the regulation stage precedes the isolation stage, **it is not necessary to sense the isolated output voltage to control the regulation**. An alternative approach is to sense the voltage on the primary side of the isolation stage, which may eliminate the need for secondary side circuitry and the need to bridge the feedback control signal across the isolation barrier.

For example, in FIG. 6 the voltage across C_B , the capacitor of the third-order output filter of the down converter, could be used. This voltage nearly represents the isolated output voltage (corrected for the turns-ratio). It differs only due to the resistive (and parasitic inductance commutation) drops between C_B and the output. Since these drops are small and proportional to the current flowing through the isolation stage, **the output can be said to be semi-regulated** and the error in output voltage they create can either be tolerated or corrected.

'034 patent, 14:49 – 15:13 (emphasis added). The specification also provides another example of “semi-regulated,” where the output voltages from multiple isolation stages are not used to provide feedback to the regulation stage. *See* '034 patent, 13:9-23.

Consistent with previous terms and for the same reasons, the Court rejects SynQor's attempt to add “during normal operation” to this term when there is no basis for it in the claims or the specification. The Court also rejects Defendants' argument that semi-regulation only exists where the regulation stage precedes the isolation stage. First, the claims expressly require the “isolation/semi-regulation circuitry” to come before the “switching regulators.” Second, while not referencing semi-regulation in the specification, it does so in the actual figure, Figure 11 is described as illustrating “an isolation stage followed by plural regulation stages.” '034 patent, 3:66-67. Figure 11 of the '034 patent depicts a structure similar to the claims, where the “isolation/semi-regulation” stage exists prior to the plural regulation stages. Third, the specification expressly states that in some situations “it may be desirable to place the isolation

stage first in the power flow, and to have the regulation stage follow.” ‘034 patent, 14:49-55.

The Court finds that “semi-regulation” is related to “regulation,” in that while there is not necessarily a measurement or regulation of the actual isolated output voltage, there is a type of regulation (i.e., “semi-regulation”) whereby a voltage can be sensed and regulated that represents the isolated output voltage without actually measuring the isolated output voltage. *See* ‘034 patent, 13:9-23, 14:49-15:13, Figure 11. The specification expressly states that “[w]hen the regulation stage precedes the isolation stage, it is not necessary to sense the isolated output voltage to control the regulation.” *Id.* at 14:64-66. The specification then provides an example of semi-regulation where it senses the voltage on the primary side of the isolation stage that represents the isolated output voltage. *Id.* at 14:64-15:13. Thus, with “semi-regulation,” regulation is provided where it is not necessary to sense the isolated output voltage to control the regulation. As further required by the claims, the semi-regulation circuitry “senses a voltage in the primary transformer winding circuit.” The Court rejects SynQor’s attempts to negatively define “semi-regulation” by the language “without sensing . . . and passing . . .”

The Court defined “regulation” to mean “the act of controlling an output towards a predefined value.” Thus, the Court construes the term “semi-regulation” to mean “*the act of controlling an output towards a predefined value by sensing a voltage in the primary transformer winding circuit without sensing the isolated output voltage.*” The Court defined “regulated output” to mean “an output that is controlled towards a predefined value.” Likewise, the Court construes the term “semi-regulated, isolated output” to mean “*an isolated output that is controlled towards a predefined value by sensing a voltage in the primary transformer winding circuit without sensing the isolated output voltage.*”

6. “connected” (‘190, ‘034, ‘083, and ‘702 patents)

SynQor proposes “electrically connected,” while Defendants propose “not isolated.” SynQor argues that the Court should make clear that the connection can be direct or indirect. SynQor argues that “connected” has been construed as electrically connected either directly or through intervening components. SynQor argues that “connected” should not be confused with “isolation” or any direct or physical connection. Defendants argue that, while they believe that no construction is necessary, the patents are clear that components are either connected to each other or they are isolated from each other. Defendants argue that they do not understand what “electrically” adds to the claim term itself. Defendants argue that the terms “connected” and “isolated” are opposite in the patents-in-suit.

The term “connected” is used extensively throughout the specification and the claims. It does not appear to have a different meaning other than its plain and ordinary meaning. The Court rejects Defendants’ construction to include the language “not isolated,” which is a negative construction on a term that does not require a negative construction. Further, Defendants are blending separate concepts, as “isolated” is a separate term that has no relevance to the word “connected.” “Connected” is simply not synonymous with “not isolated.” Further, the Court finds that a “direct” connection is not required. The Court agrees with SynQor that one of ordinary skill in the art, based upon the specification and the claims, would understand the term “connected” to mean an indirect or direct electrical connection. *See Texas Instruments, Inc. v. Linear Tech. Corp.*, No. 2:01-cv-03, Dkt. No. 133 at 13 (E.D. Tex. April 3, 2002). Thus, the Court construes the term “connected” to mean “*electrically connected, directly or indirectly.*”

7. “each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding” (‘190, ‘083, and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p><u>disputed phrase:</u> “at least two controlled rectifiers, each of which, during normal operation, is turned from off to on approximately when there is a transition in the primary winding voltage waveform and turned from on to off approximately when there is another transition in the primary winding voltage waveform.”</p> <p><u>“controlled rectifier”</u> “a semiconductor device (or a portion of a semiconductor device) that has a controllable conduction path, such as is found in a bipolar junction transistor (BJT) or a metal oxide semiconductor field effect transistor (MOSFET), which is used as a rectifier.”</p> <p><u>“primary winding”</u> “a winding on the primary side of a transformer.”</p>	<p>the rectifiers are “synchronous rectifiers”</p> <p>“synchronous rectifiers, namely rectifiers where the conduction state of each controlled rectifier changes—from ON to OFF or from OFF to ON—each time the voltage waveform across a primary winding changes from one voltage state to another”</p>

SynQor argues that, contrary to the Defendants’ assertions, the terms “synchronous rectifier” and “controlled rectifier” are not synonymous. SynQor argues that the term “synchronous rectifier” may refer to a device that contains a controlled rectifier plus other things, such as a body diode that is part of the structure of the synchronous rectifier. SynQor argues that the specification describes a MOSFET “synchronous rectifier” composed of a “controlled rectifier” (e.g. a transistor) and an “uncontrolled rectifier” (e.g. a diode). *See* ‘190 patent, 6:27-29. SynQor argues that other types of synchronous rectifiers do not include an uncontrolled rectifier. SynQor also argues that the claim language clearly indicates that the inventor did not use the terms “synchronous rectifier” and “controlled rectifier” synonymously. SynQor also argues that its proposed construction follows the same logic as the agreed upon construction for the term “uncontrolled rectifier.” Defendants argue that the clarity of the claim language is such that no construction is necessary other than to note that the rectifiers required by the claim are

“synchronous rectifiers.” Defendants argue that the language of the claims makes it clear that the recited rectifiers are “synchronous rectifiers.” Moreover, the specifications of the patents-in-suit repeatedly use the term “synchronous rectifiers” to describe the exact types of rectifiers recited in the claims. Defendants argue that the term “controlled rectifier” on its face is not limited to a “semiconductor” device and there is no language in the specification that would limit the concept of a “controlled rectifier” only to a semiconductor device. Further, Defendants argue that SynQor improperly injects “fact findings” into the proposed construction that is inconsistent with the specification and the claims. Defendants argue that while there are no references equating a MOSFET to a “controlled rectifier,” there are many references discussing “MOSFET synchronous rectifiers.”

The specification uses the terms “synchronous rectifier,” “controlled rectifier,” and “uncontrolled rectifier.” In contrast, the claims only use the terms “controlled rectifier” and “uncontrolled rectifier.” Defendants admitted during oral argument that a “controlled rectifier” is not always a “synchronous rectifier.” Rather, Defendants essentially argue that in the context of the claims and specification that the rectifiers as claimed are “synchronous rectifiers.” The Court rejects this argument. The Court has consistently held that when the claims and specification use different terms, that those different terms should normally not be given the same meaning. While there are portions of the specification that indicate a relationship between controlled rectifiers and synchronous rectifiers, the Court will not equate the two terms when the claims expressly require “controlled rectifiers.” Further, in certain dependent claims, such as claim 5, the “controlled rectifier” is a “voltage controlled field effect transistor,” which is not necessarily a synchronous rectifier.

The claims and the specification contrast “controlled” and “uncontrolled” rectifiers. In general, a diode is an uncontrolled device. In contrast, a “controlled rectifier” is a type of active device, represented by a transistor. The background of the invention states that diodes are sometimes replaced with transistors called synchronous rectifiers, which “are typically power MOSFETs for converters switching in the 100 kHz and higher range.” *See* ‘190 patent, 1:42-47. The specification provides that “the schematical drawings of Q3 and Q4 depict the need for a controlled rectifier (e.g. a transistor) and an uncontrolled rectifier (e.g. a diode) connected in parallel.” *Id.* at 6:25-27. Thus, both in the specification and dependent claims, a controlled rectifier is represented by a “transistor.” However, the specification repeatedly references a MOSFET with a synchronous rectifier. *Id.* at 1:45-46; 6:24-25; 12:24-26; 13:25-26; 16:8-10. While a MOSFET synchronous rectifier might be a controlled rectifier in some instances, the Court is hesitant to equate a MOSFET to a controlled rectifier in its construction when the specification treats a MOSFET as a synchronous rectifier and when SynQor ardently opposes equating a controlled rectifier with a synchronous rectifier. The parties agreed that the term “uncontrolled rectifier” means “diode (including MOSFET body diode) or other passive device used as a rectifier.” The Court will adopt a similar construction for the term “controlled rectifier” as the parties did for the term “uncontrolled rectifier.” Thus, the Court construes the term “controlled rectifier” to mean “*transistor or other active device used as a rectifier.*”

Regarding the entire phrase, consistent with previous terms and for the same reasons, the Court rejects SynQor’s attempt to add “during normal operation” to this term when there is no basis for it in the claims or the specification. The phrase requires the controlled rectifiers to act in synchronization with the voltage waveform across a primary winding. In general, the

dictionary definition of synchronization means to occur at the same time, to operate in unison, or to cause to agree in time of occurrence. Synchronization, as used in the claims, implies that the controlled rectifiers are turned on and off at the same time as a change of the *voltage waveform*, not a change from one *voltage stage* to another. SynQor attempts to add “approximately” in its construction for the term without support in the specification, and thus the Court denies such an attempt. However, the Court notes that one of ordinary skill in the art would not view “synchronization” to mean “at *exactly* the same time.” The Court also rejects Defendants’ insertions of the limitations “each time” and “voltage state” as unnecessary limitations not based on the specification or the claims. Both parties recognize that the controlled rectifiers can be turned from on to off and from off to on. Thus, the Court construes the term “each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding” to mean “*each controlled rectifier being turned from on to off or from off to on at the same time as a change of the voltage waveform across a primary winding.*”

8. “transition times which are short relative to the on-state and off-state times of the controlled rectifiers” (‘190, ‘083, and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p><u>transition times</u> “time periods during which a transition of a voltage waveform occurs”</p> <p><u>entire phrase</u> “the total of all the <u>transition times</u> in a switching cycle is less than 20% of the overall switching cycle, as distinct from the transitions in full resonant, quasi-resonant, or multi-resonant converters where the transitions last for a large portion, if not all, of the on-state and/or off-state time.”</p>	<p><u>transition times</u> “time periods required for a voltage waveform across a primary winding to change from one voltage state to another”</p> <p><u>entire phrase</u> “times which are less than 20% of the combined on-state and off-state times of the controlled rectifiers”</p>

The primary differences between the parties’ constructions as to the term “transition

times” is whether the “transition” is for a voltage waveform “across a primary winding” and whether “transition of a voltage waveform” means a “change from one voltage state to another.”

SynQor argues that the language around the term “transition times” in the asserted claims states that the relevant transition is of a voltage waveform “of a primary winding,” and that including that language in the disputed “transition times” term is not helpful. SynQor argues that unasserted claims of the patents-in-suit refer to “transitions times” of voltages for power MOSFET switches, not a primary winding, and thus Defendants’ proposal is incorrect to add the “across a primary winding” language. SynQor argues that “transition” is a common English word, just like “change,” and Defendants’ proposal adds nothing of substance to the construction. Defendants argue that SynQor’s proposed construction is deficient because it refers to a transition of “a voltage waveform” without identifying which waveform should be considered in determining the recited times. This generic reference to a “voltage waveform” implicitly suggests that any voltage waveform can be considered when determining the “transition times” required by the claims. Defendants argue that their construction is mandated by the claims because they are clear that the only voltage waveform relevant for determining the recited “transition times” is the voltage waveform across “a primary winding.”

The Court finds that the claim language at issue requires that the voltage waveform of the primary winding has (i) a fixed duty cycle and (ii) transition times which are short relative to the on-state and off-state times of the controlled rectifiers. Thus, the Court agrees with the Defendants that the language “across a primary winding” is necessary and appropriate, because it is clear from the claims that the only voltage waveform relevant for determining the recited “transition times” is the voltage waveform across “a primary winding.” Like in the previous

term, the Court rejects Defendants’ insertion of the language “voltage stage” when such a limitation appears unnecessary and not based on the claims or the specification. The term “transition” itself generally means to change. Thus, rather than repeating the word “transition” as SynQor proposes in its construction, the Court finds that the term “change” proposed by Defendants is accurate. Thus, the Court construes the term “transition times” to mean “*time periods during which a change of a voltage waveform occurs across a primary winding.*”

Regarding the entire phrase, the specification expressly provides that “[t]hese transitions are short compared to the overall on-state and off-state portions of the switching cycle (e.g., less than 20% of the time is taken up by the transition).” ‘190 patent, 8:11-19; *see also* Abstract and 2:29-34. SynQor attempts to add the limitation “as distinct from . . . full resonant, quasi-resonant, or multi-resonant converters...” based on a different sentence in the specification where it is not clear that such a limitation is necessary for the construction of the term. Rather, this portion of the specification distinguishes the characteristics of “nearly lossless and relatively short transitions” and does not state that it is a necessary requirement for the definition of the disputed phrase. Thus, the Court may construe the phrase “transition times which are short relative to the on-state and off-state times of the controlled rectifiers” to mean “*transition times which are less than 20% of the overall on-state and off-state times of the controlled rectifiers.*”

9. “nearly losslessly delivered to and recovered from capacitors associated with the controlled rectifiers” (‘190, ‘083, and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
“no more than 30% of the energy delivered to and recovered from capacitors associated with the controlled rectifiers is dissipated”	“no more than 30% of the energy stored in capacitors associated with the controlled rectifiers is dissipated”

The parties have similar constructions for this term in that both agree that “no more than

30% of the energy ... associated with the controlled rectifiers is dissipated.” The parties dispute the location where the energy is dissipated. SynQor argues that the energy is dissipated when it is “delivered to and recovered from capacitors,” whereas Defendants argue that the energy is dissipated when it is “stored in capacitors.” SynQor argues that “stored” and “delivered to and recovered from” are not synonymous. Defendants argue that the specification states that “the energy stored in these parasitic components is nearly losslessly delivered to and recovered from them.” See ‘190 patent, 8:2-6. Defendants argue that SynQor’s construction does not make sense because energy that is delivered to and recovered from the capacitors cannot then be dissipated. It is between delivery and recovery that energy is lost, i.e., during storage.

The claim language uses “delivered to and recovered from” and not “stored.” The Court finds that SynQor’s proposal follows the claim language, whereas Defendants improperly seek to rewrite the claims when the claim language and specification clearly treats the language differently. The Court finds that the term “stored” and “delivered to and recovered from” are not synonymous. See ‘190 patent, Abstract, 2:35-38, 8:2-19. Thus, the Court construes the term “energy is nearly losslessly delivered to and recovered from capacitors associated with the controlled rectifiers” as “*no more than 30% of the energy delivered to and recovered from capacitors associated with the controlled rectifiers is dissipated.*”

10. “down converter” (‘190 and ‘021 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
“a switching regulator where the output voltage is lower than the input voltage”	“a converter where the output voltage is lower than the input voltage”

The parties have very similar constructions, but disagree as to whether the down converter is a “converter” or a “switching regulator.” Both parties agree that it is an item “where

the output voltage is lower than the input voltage.” SynQor argues that the specification defines the down converter at issue as a non-isolated switching regulator as illustrated in Figure 2. *See* ‘190 patent, 4:51-53. SynQor argues that the “regulation stage” is a non-isolated switching regulator that steps-down the input voltage to a lower output voltage. *Id.* at Fig. 2. Defendants argue that because the claimed phrase specifies a “down converter,” that the construction should use the term converter, not a different switching regulator.

The Court finds that the specification never equates a “converter” to a “switching regulator.” In addition, the dependent claims of the patents-in-suit show that there is a difference between “switching regulators” and “down converters.” For example, dependent claim 2 of the ‘190 patent requires that the regulation stages of claim 1 be switching regulators, whereas claim 3 requires that the regulation stages of dependent claim 2 (i.e., switching regulators) be down converters. Further, while claim 2 of the ‘190 patent states that the regulations stages are “switching regulators,” other claims also using the term “down converter,” such as claims 21 of the ‘190 and ‘021 patents, do not have the “switching regulator” limitation. Thus, requiring a “down converter” to be a “switching regulator” is not only without support in the specification but is inconsistent with the claims. Thus, the Court construes the term “down converter” to mean *“a converter where the output voltage is lower than the input voltage.”*

11. “voltage whose value drops with increasing current flow” (‘190 patent)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p>“voltage whose decrease in value, as output current increases, is not corrected by sensing a signal on the secondary side of the isolation transformer and passing a feedback control signal across the isolation barrier to control circuitry on the primary side”</p> <p><u>“feedback control signal”</u> “a signal used to provide feedback to a control circuit”</p>	<p>“to provide an output that is non-regulated (as opposed to, for example, a regulated output whose value drops)”</p>

This term appears in asserted claim 27 of the ‘190 patent, as well as claims 32 and 33 of the ‘190 patent. The parties dispute whether this term is intended to have the same meaning as the “non-regulated” term in the other independent claims of the ‘190 patent. Both parties agree that it does not include “regulation,” but disagree as to whether it covers “semi-regulation” in addition to “non-regulation.”

SynQor argues that Defendants’ attempt to define the phrase as synonymous with “non-regulated” is flawed and unsupported by the intrinsic evidence. SynQor argues that when the inventors intended to limit the claims to an isolation stage as being “non-regulated,” they did so by expressly using the term “non-regulating.” SynQor argues that its construction is consistent with the specification and is broad enough to capture both non-regulated and semi-regulated converters, both of which lack a feedback loop from the secondary side, while excluding regulated converters, which have such a feedback loop. Defendants argue that SynQor erroneously attempts to expand this term to cover the semi-regulated, isolated converters which are the subject of the ‘034 patent. Defendants argue that the intent of the ‘190 patent was to capture the same concept in the independent claims with different words. Defendants argue that the voltage value drops in each embodiment precisely because there is no regulation to correct

for the drop in the isolation stage. On the other hand, a regulated circuit, whether it is fully regulated or semi-regulated, will correct for, and reduce, the voltage drop. Thus, Defendants argue that only the unregulated circuit provides no correction for the voltage drop and that this phrase is synonymous with “unregulated.”

The Court rejects both parties’ constructions for this term. The Defendants’ construction improperly reads out limitations in the claim and attempts to improperly equate the phrase to merely “non-regulation.” When the claims were intended to limit the claims to an isolation stage as being “non-regulated,” the claims do so by expressly using the term “non-regulating.” The Court will not equate the disputed phrase to “non-regulating” when there is no support in the specification or claims to do so. This interpretation is confirmed by claims 30 and 32. Claim 30 of the ‘190 patent is a method claim that provides an “isolated output without regulation” from a DC power source, but then dependent claim 32 specifies that the “isolated output is a voltage whose value drops with increasing current flow.” If non-regulated, or without regulation, were to be equivalent to “voltage whose value drops with increasing current flow,” then dependent claim 32 would have a meaningless limitation. The disputed phrase might be a potential characteristic of a non-regulated system, but being a characteristic of a particular system does not equate the phrase to actually being that particular system. The Court likewise rejects SynQor’s construction, because it also improperly includes limitations that have no relation to the disputed phrase. The disputed phrase has nothing to do with semi-regulation. The Court finds that the phrase “to provide an output voltage whose value drops with increasing current flow” does not need any interpretation and means exactly what it says it means: an output voltage is provided from the isolation stage whose value drops with increasing current flow through the isolation

stage. No construction of the term is necessary.

12. “means for controlling duty cycle of the power to the primary winding, the duty cycle causing substantially uninterrupted flow of power through the primary and secondary windings during normal operation to provide an isolated output without regulation” (‘021 patent)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p>Agrees that it is a means-plus-function clause governed by 35 U.S.C. § 112 ¶6.</p> <p><u>Structure:</u> Control circuit (‘021 patent at abstract, col. 2, lines 13-18, and col. 1, lines 20-21 (incorporating by reference, among others, the ’190 patent); ’190 patent at col. 4, lines 15-16, 41-47, col. 12, lines 2-10, and figure 1), power switches (‘021 patent at figures 1, 2 and 3 (components labeled 101, 102, 103 and 104), and col. 3, lines 10-11, and col. 1, lines 20-21 (incorporating by reference, among others, the ’190 patent); ’190 patent at figures 2, 3, 5, 6A, 6B and 9 (components labeled Q1 and Q2), col. 4, lines 16-23, and col. 17, lines 12-15) and interconnections of the preceding with the primary winding(s) of the disclosed square-wave topologies (‘021 patent at figures 1, 2 and 3, col. 3, lines 6-17, 24-27, and col. 1, lines 20-21 (incorporating by reference, among others, the ’190 patent); ’190 patent at figures 2, 3, 5, 6A, 6B and 9, col. 4, line 62 – col. 5, line 12, col. 15, lines 21-32, and col. 17, lines 15- 18), disclosed as part of the “isolation stage” at column 5, lines 6-12 of the ’021 patent and column 14, lines 50-55 of the ’190 patent.</p>	<p>Agree that it is a means-plus-function clause governed by 35 U.S.C. § 112 ¶6.</p> <p>INVALID for failure to meet 35 U.S.C. § 112 because no structure is disclosed.</p>

This disputed term appears in claim 47 of the ‘021 patent. The parties have agreed, and the Court concludes, that this term is a means-plus-function limitation. Next, the Court must construe the function of the means-plus-function limitation. *See Micro Chem.*, 194 F.3d at 1258. The parties dispute the function of the means-plus-function limitation. SynQor argues that the claimed function is “controlling the application of power to a primary winding.” Defendants argue that the claimed function is “controlling the duty cycle of the power to the primary winding such that the duty cycle causes substantially uninterrupted flow of power through the

primary and secondary windings during normal operation to provide an isolated output without regulation.” SynQor argues that although it described the claimed function as controlling “application of power” rather than “duty cycle of the power,” that is a distinction without a difference. SynQor also argues that the “substantially uninterrupted flow of power” language after the comma was not included in the claimed function because that language describes the result of the limitation in the claim, not the function. Defendants argue that SynQor’s recited function ignores the express limitations of the claims. Defendants argue that SynQor seeks a broad function because there is no corresponding structure found in the specification that performs the actual recited function.

The Court rejects SynQor’s arguments as to the claimed function. While there might be a relationship between the claimed language of “controlling the duty cycle” and SynQor’s “controlling the application of power,” the Court is not at liberty to change the express claim language of the recited function. The language after the comma is not merely describing a result of the limitation in the claim without adding anything of substance, but is rather describing the function of the claim and includes important limitations. *See Lockheed Martin Corp. v. Space Systems/Loral, Inc.*, 324 F.3d 1308, 1319 (Fed. Cir. 2003) (finding that “a whereby clause that merely states the result of the limitations in the claim adds nothing to the substance of the claim”). For example, the entire recited function includes “during normal operation” and “without regulation,” two important functional limitations that would be wholly absent with SynQor’s proposed construction. Thus, the Court finds that the claimed function of the “means for controlling” limitation in claim 47 of the ‘021 patent is “*controlling the duty cycle of the power to the primary winding such that the duty cycle causes substantially uninterrupted flow of*

power through the primary and secondary windings during normal operation to provide an isolated output without regulation.”

The Court must next construe the corresponding structure. *See Micro Chem.*, 194 F.3d at 1258. The parties dispute whether any structure is disclosed. Defendants argue that there is no structure disclosed for the entire recited function and thus the term is indefinite. The “structure disclosed in the specification is ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *See Medical Instrumentation*, 344 F.3d at 1210. SynQor relies heavily on figures and structures generally disclosed in the ‘190 patent, which is incorporated by reference in the ‘021 patent. The Court finds that one of skill in the art would not find that any of these structures in the ‘190 patent are clearly linked or associated with the claimed function. First, the recited function includes the limitation “during normal operation,” and this Court has previously rejected any arguments that there is such language in the ‘190 patent. Second, SynQor cannot pick and choose any disclosure relevant to a control circuit or the idea of generally controlling the duty cycle, particularly in an incorporated by reference patent, and argue that it is corresponding structure when such structure is not clearly linked or associated to the recited function.

Regarding any potential corresponding structures in the ‘021 patent, the specification of the ‘021 patent expressly provides that a “control circuit” performs the claimed function. *See* ‘021 patent, 2:13-18. The specification teaches that Figures 4A-4D show a control circuit for the circuits embodying the present invention. *Id.* at 2:63-65. Further, the corresponding specification of these figures provides further structure and characteristics of the control circuit. *Id.* at 4:32-5:5. While Defendants argue that there is no disclosure of any structure clearly linked

to the claimed function, in the alternative, Defendants argue that these figures disclose more than any structure SynQor has provided and that they could be corresponding structure, despite the fact that it is unclear how these control circuits provide a substantially uninterrupted power flow. While the actual operation of the disclosed control circuits may be less than clear to the Court, it is clear that the disclosed “control circuit” is clearly linked to and associated with the claimed function. *See* ‘021 patent, 2:13-18. Thus, the Court finds that the claim is not invalid. Further, 35 U.S.C. § 112 ¶ 6 provides that the corresponding structure can include “equivalents thereof.” Thus, the Court finds that one of ordinary skill in the art would understand that the corresponding structure for the “means for controlling” limitation in claim 47 of the ‘021 patent includes “*Figures 4A, 4B, 4C, and 4D of the ‘021 patent, column 4, line 32 through column 5, line 5 of the ‘021 patent, and equivalents thereof.*”

13. “means for providing plural regulated outputs, without further isolation, from the isolated output” (‘021 patent)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p>Agrees that it is a means-plus-function clause governed by 35 U.S.C. § 112 ¶6.</p> <p><u>Structure:</u> Non-isolated DC-DC switching or linear regulators (‘021 patent at col. 5, line 12, col. 2, lines 38-42 (down converter), and col. 1, lines 20-21 (incorporating by reference, among others, the ’190 patent); ’190 patent at col. 14, line 55, figure 2 (“regulation stage”), and col. 4, lines 51-61 (description of figure 2, and noting optional filters, use of synchronous rectifier, and resonant elements)), as disclosed at column 5, lines 6-12 of the ’021 patent and column 14, lines 50-55 of the ’190 patent.</p>	<p>Agree that it is a means-plus-function clause governed by 35 U.S.C. § 112 ¶6.</p> <p><u>Structure:</u> DC-DC switching or linear regulators 503 of Figure 5</p>

This disputed term appears in claim 47 of the ‘021 patent. The parties have agreed, and the Court concludes, that this term is a means-plus-function limitation. Next, the Court must

construe the function of the means-plus-function limitation. *See Micro Chem.*, 194 F.3d at 1258. The parties essentially agree on the claimed function of the “means for providing” limitation. Thus, the Court adopts the agreed upon function for this limitation to mean “*providing plural regulated outputs, without further isolation, from the isolated output.*”

The Court must next construe the corresponding structure. *See Micro Chem.*, 194 F.3d at 1258. Both parties agree that the structure is “DC-DC switching or linear regulators.” However, SynQor contends that the structure is limited to “non-isolated” structures whereas Defendants contend that the switching or linear regulators can be either isolated or non-isolated. SynQor relies on the specification from both the ‘021 patent and the incorporated by reference ‘190 patent. SynQor argues that even if the specification portion that Defendants rely upon supports structures that are isolated or non-isolated, the claimed function compels that the corresponding structure must be “non-isolated.” SynQor argues that in the context of the ‘021 patent the “DC-DC switching or linear regulators” are equated with non-isolated regulation stages in this instance. *See* ‘021 patent, 2:3-6. Defendants argue that the ‘021 specification provides no guidance on the isolation state of these regulators, but rather describes “several DC-DC switching or linear regulators 503.” ‘021 patent, 5:10-12; Fig. 5. Defendants argue that the recited function does not require that the structure be non-isolated. Rather, it merely requires that the plural regulated outputs are provided without further isolation.

The Court finds that both parties agree that the structure is “DC-DC switching or linear regulators,” but disagree whether the structure is limited to “non-isolated” structures or can be either “isolated” or “non-isolated.” *See* ‘021 patent, 5:6-12; Figure 5 (item 503). While the corresponding structure does not expressly recite that it is non-isolated, the Court finds that one

of ordinary skill in the art would understand that the corresponding structure is non-isolated. First, the claimed function states that the “means for providing” is “without further isolation,” implying that the structure is non-isolated. Second, the abstract of the ‘021 patent states that “[a] normally non-regulating isolation stage may be followed by plural non-isolating regulation stages.” Third, the Summary of the Invention section states that “[i]n certain embodiments of the invention, a power converter system comprises a normally non-regulating isolation stage and a plurality of non-isolating regulation stages, each receiving the output of the isolation stage and regulating a regulation stage output.” ‘021 patent, 2:3-6. This is not an instance where the Court is using one of ordinary skill in the art to completely determine the corresponding structure without any clearly linked structure. Rather, the Court finds that one of ordinary skill in the art would recognize that the clearly linked and associated structure provided is a non-isolating structure based upon the claim and the specification. Further, 35 U.S.C. § 112 ¶ 6 provides that the corresponding structure can include “equivalents thereof.” Thus, the Court finds that one of ordinary skill in the art would understand that the corresponding structure for the “means for providing” limitation in claim 47 of the ‘021 patent includes “*non-isolated DC-DC switching or linear regulators (element 503 of Figure 5 of the ‘021 patent) and equivalents thereof.*”

14. “control circuit which controls duty cycle of the primary winding circuit” (‘021 patent)

While there was an initial dispute as to whether this term is a means-plus-function limitation or not, SynQor has stated that Defendants are apparently not contending that it is a means-plus-function limitation. Further, Defendants did not provide any arguments in the briefs or during oral arguments for this term. Thus, there is no dispute as to the construction of this term. Nonetheless, the Court finds that, because the claim element “control circuit which

controls...” does not use the word “means,” there is a rebuttable presumption that § 112, ¶ 6 does not apply. *MIT*, 462 F.3d at 1353-54. The Court finds that the “control circuit” term recites sufficient structure and has a reasonably well understood meaning. The Court finds that there has been no rebuttal of the presumption. Thus, it is not a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. SynQor argues that no construction of this phrase is required besides the term “primary winding circuit.” Defendants have not argued anything to the contrary for this term. Thus, in this instance, the Court finds that “primary winding circuit” means the agreed upon definition for “primary transformer winding circuit.”

15. “control circuitry determining when the power MOSFET switches are turned on and off in a switching cycle at a switching frequency” (‘083 and ‘702 patents)

While there was an initial dispute as to whether this term is a means-plus-function limitation or not, SynQor has stated that Defendants are apparently not contending that it is a means-plus-function limitation. Further, Defendants did not provide any arguments in the briefs or during oral arguments for this term. Thus, there is no dispute as to the construction of this term. Nonetheless, the Court finds that, because the claim element “control circuit determining...” does not use the word “means,” there is a rebuttable presumption that § 112, ¶ 6 does not apply. *MIT*, 462 F.3d at 1353-54. The Court finds that the “control circuit” term recites sufficient structure and has a reasonably well understood meaning. The Court finds that there has been no rebuttal of the presumption. Thus, it is not a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6. The parties have not provided any terms within the phrase that need to be construed. Thus, the Court finds that this phrase does not need a construction.

16. “control circuit that senses a voltage in the primary transformer winding circuit to provide a feedback control signal without bridging an isolation barrier between the primary and secondary transformer winding circuits” (‘034 patent)

Claim Terms	SynQor’s Proposed Construction	Defendants’ Proposed Construction
“senses/sensing a voltage in the primary transformer winding circuit”	No further construction necessary.	“sensing the voltage applied to the primary winding of an isolation transformer to provide a feedback signal used to adjust the duty cycle of a transistor that determines the voltage applied to the primary winding”
“without bridging an isolation barrier”	“without passing a control signal created on the secondary side of an isolation transformer to the primary side”	See above.
“feedback control signal”	“a signal used to provide feedback to a control circuit”	See above.

This term appears in asserted claims 1 and 20 of the ‘034 patent. While there was an initial dispute as to whether this term is a means-plus-function limitation or not, SynQor has stated that Defendants are apparently not contending that it is a means-plus-function limitation. Further, Defendants did not provide any arguments in the briefs or during oral arguments for this term that it is a means-plus-function limitation. Nonetheless, the Court finds that, because the claim element “control circuit that senses...” does not use the word “means,” there is a rebuttable presumption that § 112, ¶ 6 does not apply. *MIT*, 462 F.3d at 1353-54. The Court finds that the “control circuit” term recites sufficient structure and has a reasonably well understood meaning. The Court finds that there has been no rebuttal of the presumption. Thus, it is not a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6.

The parties dispute certain terms within the disputed phrase. SynQor argues that Defendants attempt to add limitations and subtract other limitations from the disputed claim

term. SynQor argues that Defendants provide no justification for limiting the phrase to sensing only the voltage *applied* to primary winding as opposed to a voltage *in* the primary transformer winding circuit, the term in the claim. SynQor further argues that Defendants provide no justification for eliminating the express language in the phrase stating that the feedback control signal is provided “without bridging an isolation barrier of the primary and secondary windings.” SynQor argues that Defendants do not dispute the definition of “without bridging an isolation barrier” as “without passing a control signal created on the secondary side of an isolation transformer to the primary side.”

Defendants argue that there is only one description in the ‘034 patent of a circuit that senses a voltage in a primary transformer winding circuit to provide a feedback signal without bridging an isolation barrier, which overlaps with the description for the “semi-regulation” limitation. *See* ‘034 patent, 14:64–15:13. Defendants argue that this description is exclusively in the context of a circuit having a regulation stage that precedes an isolation stage where the voltage that is provided to the isolation stage is the voltage that is sensed for purposes of regulation. Defendants argue that, in light of the agreed upon construction for the term “primary transformer winding circuit,” the voltage that is sensed must be a voltage in a circuit that includes, as one component, the primary winding. Such a voltage will be one that is ultimately applied across the primary winding. Defendants argue that this construction is consistent with the written description in the ‘034 patent where the only feedback signal that is consistent with the language of the claims is one where a regulation stage precedes an isolation stage and where the voltage provided across the primary winding is sensed and used for regulation. *See* ‘034 patent, Figures 6A and 6B, 14:64–15:13. Defendants argue that the remainder of the proposed

construction tracks the language of the claims at issue which indicate that the feedback signal is used for “control of duty cycle of a transistor in the primary transformer winding circuit.” Defendants argue that SynQor’s construction of the term “feedback control signal” is meaningless because it essentially repeats the words of the claim in a different order.

The Court rejects Defendants’ attempt to limit the phrase to sensing only the “voltage *applied to* the primary winding” as opposed to the required claim language of a “voltage *in* the primary transformer winding circuit.” Regarding the “feedback control signal,” the Court finds SynQor’s proposed language for that term not particularly helpful, as it merely rearranges the term to be construed and expressly uses the “control circuit” term of which the “feedback control” term is part of. Feedback in the context of the claims and specification means, in general, providing data on the operation or output of a circuit to a control device so that ongoing operations or output of the circuit can be altered. The “feedback control signal” language implies that it is a feedback signal that provides control over something. The subsequent claim language indicates that the feedback signal is used for “control of duty cycle of a transistor in the primary transformer winding circuit.” Similar to the claimed language, the specification provides that “[a]n alternative approach is to sense the voltage on the primary side of the isolation stage, which may eliminate the need for secondary side circuitry and the need to bridge the feedback control signal across the isolation barrier.” ‘034 patent, 14:66-15:3. The Court construes the phrase “senses a voltage in the primary transformer winding circuit to provide a feedback control signal without bridging an isolation barrier between the primary and secondary transformer winding circuits” in claim 1 of the ‘021 patent to mean “*senses a voltage in the primary transformer winding circuit to provide a feedback signal that is used to control the duty*

cycle of a transistor in the primary transformer winding circuit without passing the feedback signal across the isolation barrier of the primary and secondary transformer winding circuits.”

17. “filter inductor directly connected to plural of the windings of the at least one transformer” (‘083 and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
<p><u>“Filter inductor”</u> “an inductor that provides a filtering function”</p> <p><u>“Plural of the windings of the at least one transformer”</u> “two or more of the windings of the at least one transformer”</p>	<p>INDEFINITE due to lack of antecedent basis</p>

This term is also subject to a motion for summary judgment of indefiniteness filed by some of the Defendants. *See* Dkt. No. 432. Defendants argue that it is indefinite because it lacks proper antecedent basis and there is no way for a person of ordinary skill in the art to understand what the claims are intended to cover. This term appears in claims 9, 22, 40, and 49, and 51 of the ‘083 patent and claims 4, 11, 22, 24, 31, 38, 49, 51, 57, 65, 79, 83, and 87 of the ‘702 patent.⁴

Claim 22 of the ‘083 patent is an illustrative claim for the purposes of this term:

A non-regulating isolating step-down DC-DC power converter through which power flows from a DC input to provide a non-regulated, isolated DC output having a non-regulated voltage, comprising:

i) at least one isolating step-down transformer that is not driven into saturation, **the at least one transformer having plural windings including at least one primary winding and at least one secondary winding;** . . . and

v) **a filter inductor directly connected to plural of the windings of the at least one transformer,** all current that flows through the inductor flowing through a first of the plural windings during the first portion of the switching cycle, and a second of the plural windings during the second portion of the switching cycle.

⁴ The list of claims where this term appears in the patents-in-suit may be more extensive than the asserted claims in this case.

Claim 22 of the '083 patent (emphasis added). The claim requires the filter inductor to be directly connected to “plural of the windings of the at least one transformer,” and the “plural windings [includes] at least one primary winding and at least one secondary winding.” Importantly, both parties agree that if the filter inductor were to be connected to the only recited “plural windings” of the claim, a primary winding and a secondary winding, then such a connection would be inoperable. Thus, both parties agree that the “plural of the windings of the at least one transformer” has an improper antecedent basis in the claims and that the claims need to be essentially rewritten.

Defendants argue that the “plural of the windings of the at least one transformer” has no antecedent basis in the claims at issue and it is impossible to determine from the claims or the specification which windings are being referenced. Thus, Defendants argue that the filter inductor must be connected to additional windings that are not required by or specifically recited in the claims. The parties have presented three additional configurations, rather than the expressly recited a primary winding and a secondary winding, over which the claims might read: (1) wherein the filter inductor is connected to plural of the primary windings of the single transformer; (2) wherein the filter inductor is connected to plural of the secondary windings of the single transformer; or (3) wherein the filter inductor is connected to plural of the primary windings of multiple transformers. Defendants argue that each has a different scope and that one of ordinary skill would not be able to determine which option was intended. In particular, Defendants argue that there is no disclosure in the patents for option one or two of the potential configurations. Defendants argue that while there is disclosure in the patent on the third option requiring multiple transformers, that it is in direct contradiction to the claims which require

operability with “at least one transformer.” SynQor argues that the claim is not insolubly ambiguous. SynQor argues that the claims show that the power converter can have one or more primary windings and one or more secondary windings, indicating that the claims can have plural primary windings and plural secondary windings. SynQor argues that the filter inductor can be connected to *either* the plural primary windings or the plural secondary windings based upon the disclosure in the specification.

“[A] claim term could be indefinite if a term does not have proper antecedent basis where such basis is not otherwise present by implication or the meaning is not reasonable ascertainable.” *Halliburton*, 514 F.3d t 1249. Both parties agree, and this Court finds, that there is an antecedent problem in the claims that creates a technical defect. If the filter inductor were to be connected to the only recited “plural windings” of the claim, a primary winding and a secondary winding, then such a connection would be indisputably inoperable. Because of the undisputed defect in the claim, the question presented to the Court is whether one of skill in the art would be able to ascertain the missing antecedent for the limitation upon review of the specification. *See Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370-71 (Fed. Cir. 2006) (a claim can be found not indefinite, despite the absence of explicit antecedent basis, “if the scope of a claim would be reasonably ascertainable by those skilled in the art”). For the reasons provided below, the Court finds that one of ordinary skill in the art would not be able to determine the missing antecedent and thus the claims reciting this limitation are indefinite.

The parties have presented three alternative configurations where the missing antecedent might be added to the claims. The first option requires connecting the filter inductor to plural of the primary windings of a single transformer. SynQor argues that Figure 9 provides a disclosure

of this embodiment. However, this figure describes an inductor in the regulation stage of the converter, whereas the claims require a filter inductor to be part of a non-regulating isolation stage. The Court agrees with Defendants in that there is no disclosure in the specification of connecting a filter inductor to two primary windings of a single transformer. The second option requires connecting the filter inductor to plural of the secondary windings of a single transformer. Defendants argue that there is no disclosure covering such a configuration in the specification, and SynQor has not presented or argued that any such disclosure exists. The Court cannot find any disclosure in the specification to support the second option where a filter inductor is connected to two secondary windings of a single transformer. The claims cannot be construed to cover these non-disclosed features where one of ordinary skill in the art would have no basis to rewrite the claims on a feature or configuration that is not disclosed. SynQor argues that even if there is no disclosure in the specification for these options, that the absence of disclosure is irrelevant for a finding of indefiniteness and the need for disclosure is only relevant in a written description analysis. The Court disagrees with SynQor. It may be true that in a situation where the Court is attempting to interpret a claim without rewriting or correcting for an antecedent problem that it should not consider whether there is written description support for that interpretation. However, that argument does not apply to the situation at hand where this Court must rewrite an admittedly defective claim to cover a configuration or feature not disclosed in the specification. The issue is precision and the ability of one of ordinary skill in the art to discern the claim scope, not lack of written description. The Court finds that one of ordinary skill in the art would have no basis or incentive to rewrite an ambiguous claim to cover an undisclosed feature. Accordingly, the Court rejects options one and two as potential

configurations or antecedent basis for the disputed phrase.

The last option covers a configuration where the filter inductor is connected to plural of the primary windings of multiple transformers. The parties do not dispute that there is disclosure in the specification for such a configuration. However, the parties do dispute whether the claims would allow such a configuration. SynQor argues that the language “plural of the windings of the at least one transformer” means that the filter inductor can be connected to windings of more than one transformer. Defendants argue that such a configuration or interpretation is in direct contradiction to the claims which require the claims are operable with only “at least one transformer.” The Court agrees with Defendants. The antecedent basis problem is in relation to the “plural windings,” not to the “at least one transformer.” The claim requires only “at least one transformer having plural windings,” not that there are “more than one” transformers or “at least two” transformers. Thus, while the claim can cover situations where there are multiple transformers (e.g., “at least one transformer”), the claim must be operable or feasible in a situation where there is only one transformer because that is the express language of the claim. To accept SynQor’s construction is doing much more than making a reasonable interpretation by one of ordinary skill in the art and would completely rewrite the claim language and delete important limitations.

In summary, the Court has been presented with three potential options to correct the ambiguous and defective claim. None of these options are reasonable interpretations because they would either completely rewrite the claims by ignoring express language of the claims or would cover concepts and features where there is no such disclosure in the specification. *See Novo Industries, L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1358 (Fed. Cir. 2003) (“Since we

cannot know what correction is necessarily appropriate or how the claim should be interpreted, we must hold [the claim] invalid for indefiniteness in its present form.”) For these reasons, the Court finds that the scope of the claim is not reasonably ascertainable by those of skill in the art. The claim is invalid for indefiniteness because it is “insolubly ambiguous” and not “amenable to construction.” *See Exxon*, 265 F.3d at 1375. Thus, the claims with the disputed language, and any claims dependent on such claims, are rendered indefinite and invalid.

18. “multiple non-regulating isolating step down converters providing plural nonregulated, isolated DC outputs, plural of the non-isolating down-converter switching regulators receiving power from one of the non-regulated, isolated DC outputs” (‘702 patent)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
“two or more non-regulating isolating step down converters through which power from the DC input flows first before flowing through any regulation stage, each providing a non-regulated, isolated DC output, wherein at least one of those non-regulated, isolated DC outputs is provided to two or more non-isolating down-converter switching regulators”	INDEFINITE.

This term is also subject to a motion for summary judgment of indefiniteness filed by some of the Defendants. *See* Dkt. No. 432. Claim 1 of the ‘702 patent recites, among other things, “a non-regulating isolating step-down converter through which power from the DC input flows first before flowing through any regulation stage.” Claim 26, dependent upon claim 1, includes the disputed limitation of “multiple non-regulating isolating step-down converters.” Thus, claim 26 essentially states that one must add at least one more “non-regulating isolating step-down converter” to the system of claim 1.

Defendants argue that the claim limitation is indefinite because it claims multiple isolation stages in a void, with no disclosure of how these multiple stages are to be connected to

each other or otherwise incorporated into the claimed power converter system. Defendants theorize four different options for a configuration of the system with the additional “non-regulating isolating step-down converter.” Defendants argue that technically they are all possible configurations, and without any disclosure of which configuration is appropriate, that the claim is indefinite because one cannot choose between equally plausible possibilities. SynQor argues that the fact that the claim is broad and allows the “non-regulating isolating step-down converters” to be connected in multiple ways or configurations does not make itself indefinite. SynQor argues that the claim is understandable to a person of ordinary skill in the art.

The Court finds that the mere fact that the claim is broad and can potentially cover multiple configurations of the “non-regulating isolating step-down converter” does not make it indefinite. *See Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1352 (Fed. Cir. 2009) (“Merely claiming broadly does not render a claim insolubly ambiguous, nor does it prevent the public from understanding the scope of the patent.”). “The test for indefiniteness does not depend on a potential infringer's ability to ascertain the nature of its own accused product to determine infringement.” *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1340-41 (Fed. Cir. 2005) (“Even if a claim is broad enough to embrace undetectable trace amounts of the claimed invention, breadth is not indefiniteness.”) (internal citations omitted). The parties clearly contemplate multiple configurations of the claim that indicate its breadth, not its indefiniteness. Thus, the Court need not rewrite the claims, as in the previous term where there was an admitted antecedent basis problem, but must only interpret the claim as written. In this situation, the mere fact that the claim does not specify every aspect of how the additional “non-regulating isolating step-down converter” is connected does not make the claim

indefinite. The Court finds that the term is not indefinite. A claim is indefinite only if the “claim is insolubly ambiguous, and no narrowing construction can properly be adopted.” *Exxon*, 265 F.3d at 1375; *Honeywell*, 341 F.3d at 1338-39. This term is not “insolubly ambiguous” so as to prevent construction. *See Young*, 492 F.3d at 1346 (claims are considered indefinite when they are “not amenable to construction or are insolubly ambiguous”); *Exxon*, 265 F.3d at 1375 (“If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.”).

Whereas claim 1 requires only one non-regulating isolating step down converter, claim 26 requires multiple non-regulating isolating step-down converters wherein plural of the non-isolating down-converter switching regulators receive power from one of the non-regulated, isolated DC outputs. The Court finds that SynQor’s proposed construction makes various changes to the recited limitations without any clear justification or support in the specification, and thus rejects those changes to the express claim language. Defendants do not provide a construction for the term and only argue that it is indefinite. The Court construes the phrase “multiple non-regulating isolating step down converters providing plural non-regulated, isolated DC outputs, plural of the non-isolating down-converter switching regulators receiving power from one of the non-regulated, isolated DC outputs” to mean “*two or more non-regulating isolating step down converters, each providing a non-regulated, isolated DC output, wherein two or more of the non-isolating down-converter switching regulators receives power from one of the non-regulated, isolated DC outputs.*”

19. “transformer that is not driven into saturation” (‘083 and ‘702 patents)

SynQor’s Proposed Construction	Defendants’ Proposed Construction
“transformer connected in a power converter in a manner and configuration such that the transformer’s magnetic flux density level is less than its saturation flux density level during normal operation”	INDEFINITE for system claims.

This term is also subject to a motion for summary judgment of indefiniteness filed by some of the Defendants. *See* Dkt. No. 432. Defendants argue that the term is indefinite in apparatus claims because the claim limitation describes a method of use of the transformer. Defendants rely on the Federal Circuit case of *IPXL Holdings, L.L.C. v. Amazon, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005) (holding that the claim language of “the user uses the input means” is indefinite). In that case, the Federal Circuit held that an apparatus claim cannot claim a particular use of an apparatus because determination of infringement of an apparatus claim should be determinable at the time the apparatus is made and sold. *See id.* In other words, claims that mix method and apparatus limitations are indefinite because they present a lack of clarity as to when the subject matter claim would be infringed. *See id.* Defendants argue that driving or not driving a transformer into saturation is an act which may or may not occur during the use of a product. Defendants argue that there is nothing inherent to the structure disclosed in the specification or the claim that would guarantee that the transformer would not saturate. Defendants argue that a transformer might or might not be driven into saturation, depending on how the transformer is used, and thus, there would be no way to predict if the product when sold will eventually infringe this limitation. Defendants argue that if the claim had stated “cannot be driven into saturation”, or “adapted to” or “capable of,” as opposed to “*is not* driven into

saturation,” then it would not be indefinite. Defendants argue that even though an accused power converter’s transformer may be capable of being driven into saturation, the power converter meets the limitation if when actually used it “is not driven into saturation” during certain types of uses. Defendants argue that SynQor’s addition of the term “during normal operation” makes the claim even more problematic, because then one has to watch how the product operates in a particular environment to see how the product is used.

SynQor argues that the *IPXL* case is narrow and rarely applied. SynQor argues that many courts have rejected attempts to invalid claims by *IPXL* on claims containing functional language. SynQor argues that *IPXL* does not apply to functional language that is used by the patentee to describe the functions of, or to further elaborate on capabilities of, the underlying claimed apparatus. SynQor argues that the language at issue is clearly used to describe the structure and capabilities of the claimed apparatus and is not a method step. SynQor argues that it was well-known in the art that the structure of the transformer, as well as related circuitry, could vary depending on whether it was designed to be driven into saturation or not. SynQor argues that the claim language is part of a description of comparable structure in the claims which describe the functions performed by the control circuitry in combination with the other structural elements of the “non-regulating isolating step-down converter.” SynQor argues that the specification describes the structural aspects of the circuit that cause the transformer not to be driven into saturation. SynQor argues that the claimed language is clearly not a method step but describes how the “control circuitry” and related power components, such as the transistor and the transformer, are configured to be capable of operating in a particular way, i.e., “not driven into saturation.”

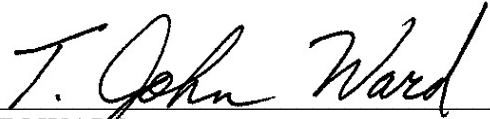
The Court agrees with numerous other courts in that the holding in the *IPXL* case is very limited. For the instant dispute the Court finds that the *IPXL* case does not apply because the single claim does not improperly cover both an apparatus and a method of use of that apparatus. Claim 1 of the '083 patent, illustrative of the disputed term, claims “[a] non-regulating isolating step-down DC-DC power converter . . . comprising: i) at least one isolating step-down transformer that is not driven into saturation, . . .” The Court finds that the language “is not driven into saturation” does not describe a method step and instead is used to describe the structure and capabilities of the claimed apparatus. Such use of language in the claims is not improper. See *Microprocessor Enhancement Corp. v. Texas Instruments, Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008). Further, the specification provides that it is well-known in the art “to keep the lengths of the two halves of the cycle well balanced to avoid imposing an average voltage across the core and driving it into saturation.” '083 patent, 15:40-44. The Court finds that one of ordinary skill in the art would understand the specification to describe structural aspects of the circuit that insure that the transformer does not saturate. Still further, SynQor offers various prior art references, including references cited during prosecution of the patents-in-suit, providing support for the proposition that it is well known in the art that transformers and related circuitry in a power converter can be designed to not saturate. This Court agrees and finds that one of ordinary skill in the art would understand that power converters are designed to insure that the transformer does not saturate. The Court rejects Defendants’ arguments to the contrary. Thus, the Court finds that one of ordinary skill in the art would understand that the claimed language describes the structure and capabilities of the claimed apparatus and is not merely a method step.

Finding that the term is not indefinite, the Court must next construe the term. Defendants have provided no competing construction to SynQor's proposed construction. Consistent with previous terms and for the same reasons, the Court rejects SynQor's attempt to add "during normal operation" to this term when there is no basis for it in the claims or the specification. SynQor argues, without any dispute from Defendants, that saturation is a phenomenon that occurs when the magnetizing current flowing through a transformer exceeds a certain threshold, at which point the magnetic material no longer amplifies the applied magnetic field and an increase in the applied external magnetizing field cannot increase the magnetization of the transformer. The court finds that one of ordinary skill in the art would understand the term saturation in the context of the claims to generally mean the concept advanced by SynQor. The Court construes "transformer that is not driven into saturation" to mean "*transformer that is connected in a manner such that the transformer's magnetic flux density level is less than its saturation flux density level.*"

VI. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 26th day of July, 2010.



T. JOHN WARD
UNITED STATES DISTRICT JUDGE