



# PORTLAND MAINE

*Strengthening a Remarkable City, Building a Community for Life • [www.portlandmaine.gov](http://www.portlandmaine.gov)*

**Planning and Urban Development**  
Penny St. Louis Littell, Director

**Planning Division**  
Alexander Jaegerman, Director

July 24, 2008

James Hartmann, Tenant Development Manager  
Landmark Healthcare Facilities, LLC  
Property Management Group  
839 North Jefferson Street, Suite 600  
Milwaukee, WI 53202

Michael Connelly  
Planning and Facilities Manager  
Mercy Hospital  
144 State Street  
Portland, ME 04101

**Mercy Phase 1 Development**  
**Medical Office Building- Proposed Generator**  
**Fore River Parkway**

Dear Sirs:

This letter is a follow up to discussions you have had with Jean Fraser, Planner, regarding the need for an external emergency generator to serve part of the Medical Office Building (MOB) on the Mercy Phase 1 site.

The need for a generator for the MOB was discussed with Mercy representatives on June 25, 2008 and the City confirmed at that time that any proposals for the generator and its placement would need to be reviewed, approved, and installed prior to the final CO for the Mercy Phase 1 site (including the MOB).

You recently inquired as to whether the City would approve fixed placement of an external generator in advance of a formal review of the permanent generator proposals. I am writing to confirm that the City is unable to consider any temporary placement of such a generator until all necessary permits and approvals are issued.

Based on the limited information provided to date, such a generator would require a number of City permits /approvals in relation to the structure/support pad/method of fixing, its use of flammable fuels and need for exhaust ventilation, its potential noise impacts including during regular tests, and its integration into the site plan which is also concerned with its appearance and screening.



# PORTLAND MAINE

*Strengthening a Remarkable City, Building a Community for Life* • [www.portlandmaine.gov](http://www.portlandmaine.gov)

**Planning and Urban Development**  
Penny St. Louis Littell, Director

**Planning Division**  
Alexander Jaegerman, Director

**DRAFT**

July 23, 2008

James Hartmann, Tenant Development Manager  
Landmark Healthcare Facilities, LLC  
Property Management Group  
839 North Jefferson Street, Suite 600  
Milwaukee, WI 53202

Michael Connelly  
Planning and Facilities Manager  
Mercy Hospital  
144 State Street  
Portland, ME 04101

**Mercy Phase 1 Development**  
**Medical Office Building- Proposed Generator**  
**Fore River Parkway**

Dear Sirs:

I refer to recent discussions regarding the need for an external emergency generator to serve part of the Medical Office Building (MOB) on the Mercy Phase 1 site.

The need for a generator for the MOB was discussed with Mercy representatives on June 25, 2008 and the City confirmed at that time that any proposals for the generator and its placement would need to be reviewed and approved prior to the final CO for the Mercy Phase 1 site (including the MOB).

You recently enquired as to whether the City would approve temporary placement of an external generator in advance of a formal review of the permanent generator proposals. I am writing to confirm that the City is unable to consider any temporary placement of such a generator until all necessary permits and approvals are issued.

Based on the limited information provided to date, such a generator would require a number of City permits /approvals in relation to the structure/support pad/method of fixing, its use of flammable fuels and need for exhaust ventilation, its potential noise impacts including during regular tests, and its integration into the site plan which is also concerned with its appearance and screening.

2.

The City would not normally issue a Building Permit or Electrical Permit for the generator until there is an approved amendment to the approved 2006 Site Plan (or City agreement that the proposal constitutes a Site Plan exemption).

Please note that any installation of a generator fixed to the ground/pad in the vicinity of the MOB prior to the issuance of the applicable permits and approvals would be considered a violation of the City's Land Use and Building Codes, and the City would consider initiating any and all actions, legal or equitable, that may be appropriate or necessary for the enforcement of these codes.

I understand that Jean Fraser has today provided you with the Inspections Division contacts (they are separate from this Division but within the same Department) and the Application Form for Exemption from Site Plan Review.

Please feel free to contact Jean Fraser or me (874 8699) should you have any questions.

Sincerely,

Barbara Barhydt  
Development Review Service Manager

Cc Penny St. Louis Littell, Director, Planning and Urban Development Department  
Alex Jaegerman, Director, Planning Division  
Barbara Barhydt, Development Review Manager  
Jeanie Bourke, Director, Inspections Division  
Marge Schmuckal, Zoning Administrator  
Greg Cass, Fire Prevention, Fire Department  
Jean Fraser, Planner

Ok electrical permits applied for.

Building permits - pad etc.

Friday - temp generator on wheels

submit application for exemption

~~perm~~ put in writing cc.

fuel

**From:** Jean Fraser  
**To:** Bushey, Steve  
**Date:** 7/23/2008 12:57:03 PM  
**Subject:** RE: Mercy Certificate of Occupancy

Hello Steve,

Am writing to bring you up to date on the items you mentioned below. I have annotated your e-mail below (in red) to make it simpler.

Jean

>>> "Steve Bushey" <SBushey@DelucaHoffman.com> 7/22/2008 9:40:17 AM >>>  
Hi Jean,

Just a follow up on status of various Mercy items:

1. How is the metal building to be handled relative to the C of O?  
I spoke with Tim Prince about this last week and offered two options: either the building is complete by the time of the final CO for the hospital in September or we are willing to consider it a separate approval (not just an amendment) with a separate timetable but in that case a separate and additional Performance Guarantee would be payable prior to the issuance of the Building Permit.

2. What is the status of the fence color decision for the north open space? Black is OK and it does not need to go to the Planning Board.

3. What is the status of the revised stone dust trail alignment on the east side of the basin. I currently have a verbal OK from the DEP regarding the realignment although I believe they will be looking for a bit more planting between the path and the top of bank. They are also requiring that the maintenance of the ground i.e. mowing, be minimized and the ground conditions allowed to revert to a more natural state between the path and the top of bank.

I anticipate that this will be acceptable but can not commit until we see the approval from MDEP and until the revised plans (which addresses any further concerns by MDEP) are submitted to us (for both the drainage changes and the trail). This is being reviewed as an administrative review and will not be forwarded to the Planning Board.

4. Are you OK with the Portland Trails signs being proposed? Will get back to you on this- just got the information. Do you have evidence that Portland Trails are happy?

5. What is the status of the C of O spreadsheet changes you suggested earlier that staff was making? It is done and will be sent today- it will include the following comments (in addition to some other smaller points) but in shorthand form- so I have listed these in a more detailed form here:

- a.) we would like all the details related to the bus stop (shelter design and location, crossing design etc) and the seating in the arcade area to be submitted as an amendment prior to the temporary CO being issued, and for these to be completed and in place prior to the final CO being issued;
- b.) we need to see the letter from METRO confirming the service will start when hospital opens;
- c.) We would like to have the generator noise levels checked on site with noise measuring taken at the

nearest property line- this asap so that if any further noise baffling is needed there is time to install prior to the CO (hopefully this is just a confirmation of the submitted info);

d) Regarding the screening of the service area, I believe all involved agreed that due to the change in levels and long view lines that this would need to wait for site visits and that it would be possible to move some planting if all agreed it would improve the screening. That discussion has not taken place yet and needs to be arranged;

e) the sewer service will need to be tested and inspected.

Also, I am this minute in the process of communicating a decision regarding the MOB generator- the City considers that if they need the generator in place urgently then they should obtain a generator on wheels so that it is clearly temporary. This would allow time for the paperwork to be properly processed prior to installation of what is essentially a permanent structure, as we require from all other developments (eg building and electrical permits, fire dept review of the fuel storage, and application for exemption from site plan (which needs to include the detailed screening and better noise baffling than what has been suggested to date). Letter confirming this is being prepared today. We would expedite the site plan side of this but I do not know what other issues might arise.

Please call me if you or others have any questions...

thanks

Stephen Bushey PE

Senior Engineer

DeLuca-Hoffman Associates, Inc.

778 Main Street, Suite 8

South Portland, Maine 04106

207- 775-1121

Fax 207-879-0896

[sbushey@delucahoffman.com](mailto:sbushey@delucahoffman.com)

[www.delucahoffman.com](http://www.delucahoffman.com)

-----Original Message-----

From: Jean Fraser [<mailto:JF@portlandmaine.gov>]

Sent: Monday, July 21, 2008 9:37 AM

To: Steve Bushey

Subject: RE: Mercy Certificate of Occupancy

Hi Steve,

No- it did not go out and I am working on it at the moment....

Jean

>>> "Steve Bushey" <[SBushey@DelucaHoffman.com](mailto:SBushey@DelucaHoffman.com)> 7/21/2008 10:00:56 AM

>>>

Hi Jean,

I am not sure if you were able to send out a track changed version of the spreadsheet on Friday. Our systems were impacted by the Thunderstorm Friday afternoon so email may have been lost. Please let me know.

thanks

Stephen Bushey PE

Senior Engineer

DeLuca-Hoffman Associates, Inc.

778 Main Street, Suite 8

South Portland, Maine 04106

207- 775-1121

Fax 207-879-0896

[sbushey@delucahoffman.com](mailto:sbushey@delucahoffman.com)

[www.delucahoffman.com](http://www.delucahoffman.com)

-----Original Message-----

From: Jean Fraser [<mailto:JF@portlandmaine.gov>]

Sent: Thursday, July 17, 2008 2:03 PM

No virus found in this outgoing message.

Checked by AVG.

Version: 7.5.524 / Virus Database: 270.5.0/1555 - Release Date:

07/16/2008 6:43 AM

**CC:** Alex Jaegerman ; Barhydt, Barbara; connollym@mercyme.com; DiPierro , Philip;  
MPoulin@GilbaneCo.com; PStevens@SMRTInc.com



**From:** "Steve Bushey" <SBushey@DelucaHoffman.com>  
**To:** "Jean Fraser" <JF@portlandmaine.gov>  
**Date:** 7/22/2008 8:43:00 AM  
**Subject:** RE: Mercy Certificate of Occupancy

Hi Jean,

Just a follow up on status of various Mercy items:

1. How is the metal building to be handled relative to the C of O?
2. What is the status of the fence color decision for the north open space?
3. what is the status of the revised stone dust trail alignment on the east side of the basin. I currently have a verbal OK from the DEP regarding the realignment although I believe they will be looking for a bit more planting between the path and the top of bank. They are also requiring that the maintenance of the ground i.e. mowing, be minimized and the ground conditions allowed to revert to a more natural state between the path and the top of bank.
4. Are you OK with the Portland Trails signs being proposed?
5. what is the status of the C of O spreadsheet changes you suggested earlier that staff was making?

thanks

Stephen Bushey PE

Senior Engineer

DeLuca-Hoffman Associates, Inc.

778 Main Street, Suite 8

South Portland, Maine 04106

207- 775-1121

Fax 207-879-0896

sbushey@delucahoffman.com

www.delucahoffman.com

-----Original Message-----

From: Jean Fraser [mailto:JF@portlandmaine.gov]  
Sent: Monday, July 21, 2008 9:37 AM  
To: Steve Bushey  
Subject: RE: Mercy Certificate of Occupancy

Hi Steve,

No- it did not go out and I am working on it at the moment....

Jean

>>> "Steve Bushey" <SBushey@DelucaHoffman.com> 7/21/2008 10:00:56 AM

>>>

Hi Jean,

I am not sure if you were able to send out a track changed version of the spreadsheet on Friday. Our systems were impacted by the Thunderstorm Friday afternoon so email may have been lost. Please let me know.

thanks

Stephen Bushey PE

Senior Engineer

DeLuca-Hoffman Associates, Inc.

778 Main Street, Suite 8

South Portland, Maine 04106

207- 775-1121

Fax 207-879-0896

sbushey@delucahoffman.com

www.delucahoffman.com

-----Original Message-----

From: Jean Fraser [mailto:JF@portlandmaine.gov]

Sent: Thursday, July 17, 2008 2:03 PM

To: PStevens@smrtinc.com

Cc: Steve Bushey; MPoulin@GilbaneCo.com; Alex Jaegerman ; Barbara

Barhydt; ch@portlandmaine.gov; Gregory Cass; Jeanie Bourke; Philip

DiPierro ; KDamuth@smrtinc.com

Subject: Re: Mercy Certificate of Occupancy

Hello Paul,

Just to let you know that the Planning Division has reviewed the attached spreadsheet in terms of the site plan and related issues and has a number of comments/corrections; I will send you a track-changed version that sets these out- I hope to get that to you tomorrow.

Jean (Fraser)

Planning

874 8728

>>> "Paul Stevens" <PStevens@SMRTInc.com> 7/16/2008 10:45:27 AM >>>

Please review the attached spread sheet which represents our current understanding of the requirements and tasks necessary to obtain a

temporary C of O as discussed in our meeting of June 25th. It is very important to Mercy Hospital and the community that the facility be opened on schedule. Please let me know if we have missed anything or have incorrectly described an item. Thanks for your cooperation and assistance.

No virus found in this outgoing message.

Checked by AVG.

Version: 7.5.524 / Virus Database: 270.5.0/1555 - Release Date:

07/16/2008 6:43 AM

**CC:** <MPoulin@GilbaneCo.com>, <connollym@mercyme.com>, <PStevens@SMRTInc.com>

**From:** Jim Hartmann <jhartmann@lhf.biz>  
**To:** Jean Fraser <JF@portlandmaine.gov>, Barbara Barhydt <BAB@portlandmaine.gov>  
**Date:** 7/22/2008 7:29:19 PM  
**Subject:** RE: Mercy Genset Approval

Barbara and Jean,

I am available to discuss the generator with you tomorrow at anytime. I plan on calling first thing in the morning as well as at 9:30 a.m. if I am unable to reach you.

Please keep in mind that this generator is temporary. The final location is pending the city's approval. Once it is finalized, we will relocate or install at the location approved. Ideally, it would be more cost efficient to install the generator temporarily in the likely permanent location.

The generator is a small back-up generator that only cycles approximately once a month. A generator like this typically does not even need to be cycled that much (bi-monthly).

The screening will be approved per the city's requirements on the final siteplan genset location. (Please keep in mind that this is indeed temporary).

I hope that tomorrow we can work to approve the temporary location. Upon the temporary location being finalized, Landmark will provide you with the revised site plan, per your requirements with all of the screening indicating.

Please contact me at anytime on my cell phone number listed below or via email if you have any questions. I look forward to speaking with you tomorrow.

Thanks,

---

James Hartmann | Tenant Development Manager  
 Landmark Healthcare Facilities, LLC | Property Management Group  
 839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
 Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
 Internet: www.lhf.biz | Email: jhartmann@lhf.biz  
 Assistant: Amy Stasiewski | Direct: 414.277.0500

---

-----Original Message-----

From: Jean Fraser [mailto:JF@portlandmaine.gov]  
 Sent: Tuesday, July 22, 2008 8:36 AM  
 To: Jim Hartmann  
 Cc: Barbara Barhydt  
 Subject: Re: Mercy Genset Approval

Hello

I can be reached at 207 874 8728.

However, the decision will rest with my managers: Barbara Barhydt (Development Review Services Manager) and Alex Jaegerman (Director of Planning) and I am gathering information on their behalf so we can

*yes!*

*testing - do testing/monitoring to determine screening/sound attenuation*

*urgency relates to the fact one tenant has patients scheduled next week.*

*ex. transformer 7'-8' high*

*5' clearance transformer*

*4'7" x 7'8" actual pad*

*generator 30" high 5' long 3' wide*

*\* could include transformer. 3' wide*

*hoping lose only CP space.*

consider the request and determine the scale of Site Plan Review involved.

Any location outside the building will require review and approval through a Site Plan Amendment application in some form, and then we will determine how it will be processed depending on the proposals. I understand that you were advised of this process some while ago.

Through Mike Connelly I raised a number of questions and would appreciate a better understanding of the proposals, including the timetable.

thank you

Jean (Fraser)  
Planner  
874 8728

>>> Jim Hartmann <jhartmann@lhf.biz> 7/22/2008 8:28:05 AM >>>  
Jean,

I am writing in regards to the temporary generator that Landmark would like to place on the site at 195 Fore River Parkway. Could you please provide me with your contact information so that we may discuss this?

Thank you,

Jim Hartmann

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: [www.lhf.biz](http://www.lhf.biz) <<http://www.lhf.biz/>> | Email:  
[jhartmann@lhf.biz](mailto:jhartmann@lhf.biz) <<mailto:jhartmann@lhf.biz>>  
Assistant: Amy Stasiewski | Direct: 414.277.0500

---

**CC:** Amy Stasiewski <[astasiewski@lhf.biz](mailto:astasiewski@lhf.biz)>, Michael Cleary <[mcleary@lhf.biz](mailto:mcleary@lhf.biz)>, Tom Beckes <[tbeckes@lhf.biz](mailto:tbeckes@lhf.biz)>

**From:** Jean Fraser  
**To:** Connolly, Michael  
**Date:** 7/21/2008 4:01:38 PM  
**Subject:** Re: FW: Genset

Mike,

I appreciate that you are assisting the MOB but this information is not enough for us to form a view. It is very difficult to read these plans to see what the total size and shape would be and how this would be integrated into the site and what it would look like.

I have spoken with others here and they have asked a number of questions which I am passing on:

I am not sure the plans show the sound baffling as well as the basic generator; we would need scaled/dimensioned plans showing all enclosures and surrounding landscape screening. Screening would need to be on all sides.

It appears 2 parking spaces are lost; are they going to be replaced elsewhere?

Why is this so urgent when I know it has been under discussion for several months? What assurances are there that this would be temporary?

We probably would want a higher level of sound baffling than what is indicated.

We understand that these generators need to be tested every week and may require limits on the timing of this.

So is it possible to provide fuller information, please? We are not saying it is not approvable but there are many questions.

Will talk to you tomorrow.

Jean (Fraser)  
Planner

>>> "Connolly, Michael" <ConnollyM@mercyme.com> 7/21/2008 11:40:36 AM >>>  
Here's the e-mail that we just discussed on the phone - Sorry for the confusion.

Mike

---

From: Jim Hartmann [<mailto:hartmann@lhf.biz>]  
Sent: Friday, July 18, 2008 10:43 AM  
To: Connolly, Michael  
Cc: Amy Stasiewski; Michael Cleary; Prince, Timothy W;  
[sbushey@delucahoffman.com](mailto:sbushey@delucahoffman.com); Morin, Gretchen  
Subject: Genset

Michael,

Per your request, please see the attached specs and site plan for the generator. I am working on tracking down the noise levels for this generator. I would go into it telling the city that this is a very small 25 KW generator that runs once a month for testing. The noise level for a generator this size is not substantial.

I will continue to follow-up on the exact noise level, but I think this information should help.

Please contact me via email or by phone if you need anything else.

Thanks,

---

James Hartmann | Tenant Development Manager

Landmark Healthcare Facilities, LLC | Property Management Group

839 North Jefferson Street, Suite 600, Milwaukee, WI 53202

Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346

Internet: [www.lhf.biz](http://www.lhf.biz) <<http://www.lhf.biz>> | Email: [hartmann@lhf.biz](mailto:hartmann@lhf.biz)

Assistant: Amy Stasiewski | Direct: 414.277.0500

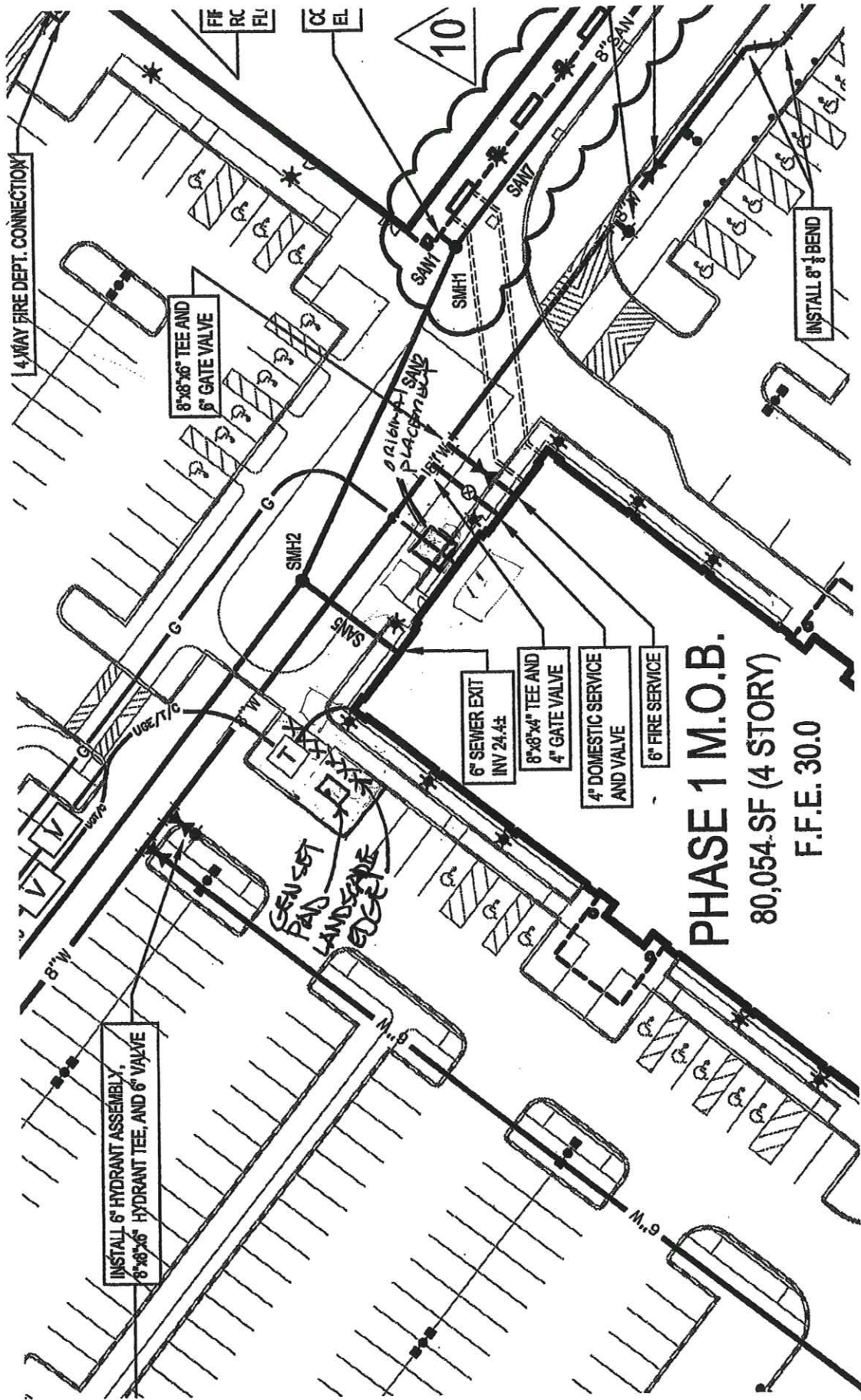
---



**Confidentiality Notice:**

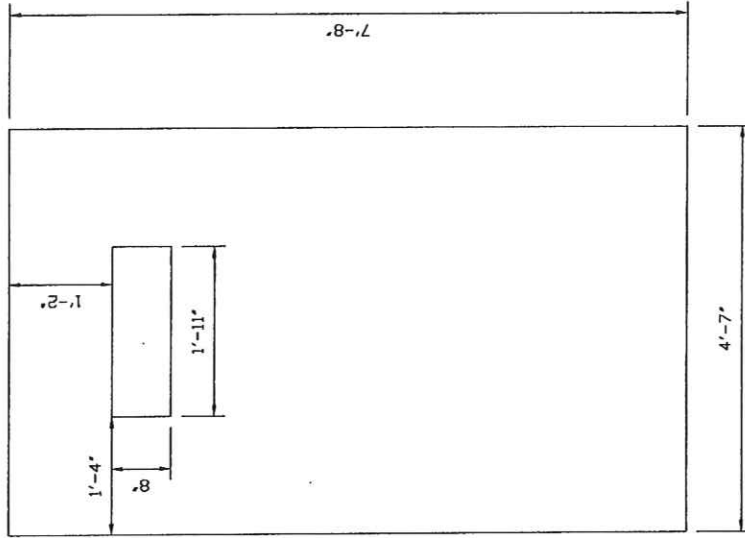
This email, including any attachments is the property of Catholic Health East and is intended for the sole use of the intended recipient(s). It may contain information that is privileged and confidential. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please reply to the sender that you have received the message in error, then delete this message.

"Temporary" generator  
MoB want to install this week



**PHASE 1 M.O.B.**  
80,054.SF (4 STORY)  
F.F.E. 30.0

*concrete pad*



**B.H. MILLIKEN**  
ELECTRICAL CONTRACTORS

175 ANDERSON STREET  
PORTLAND, MAINE 04101

PHONE 879-1877

5/13/2008 8:51:57 AM FAX: ~~774-1492~~ ~~Milliken~~ Rick Gardiner

REVISION #: 11708

DATE: 1/17/08

PROJECT: MOB

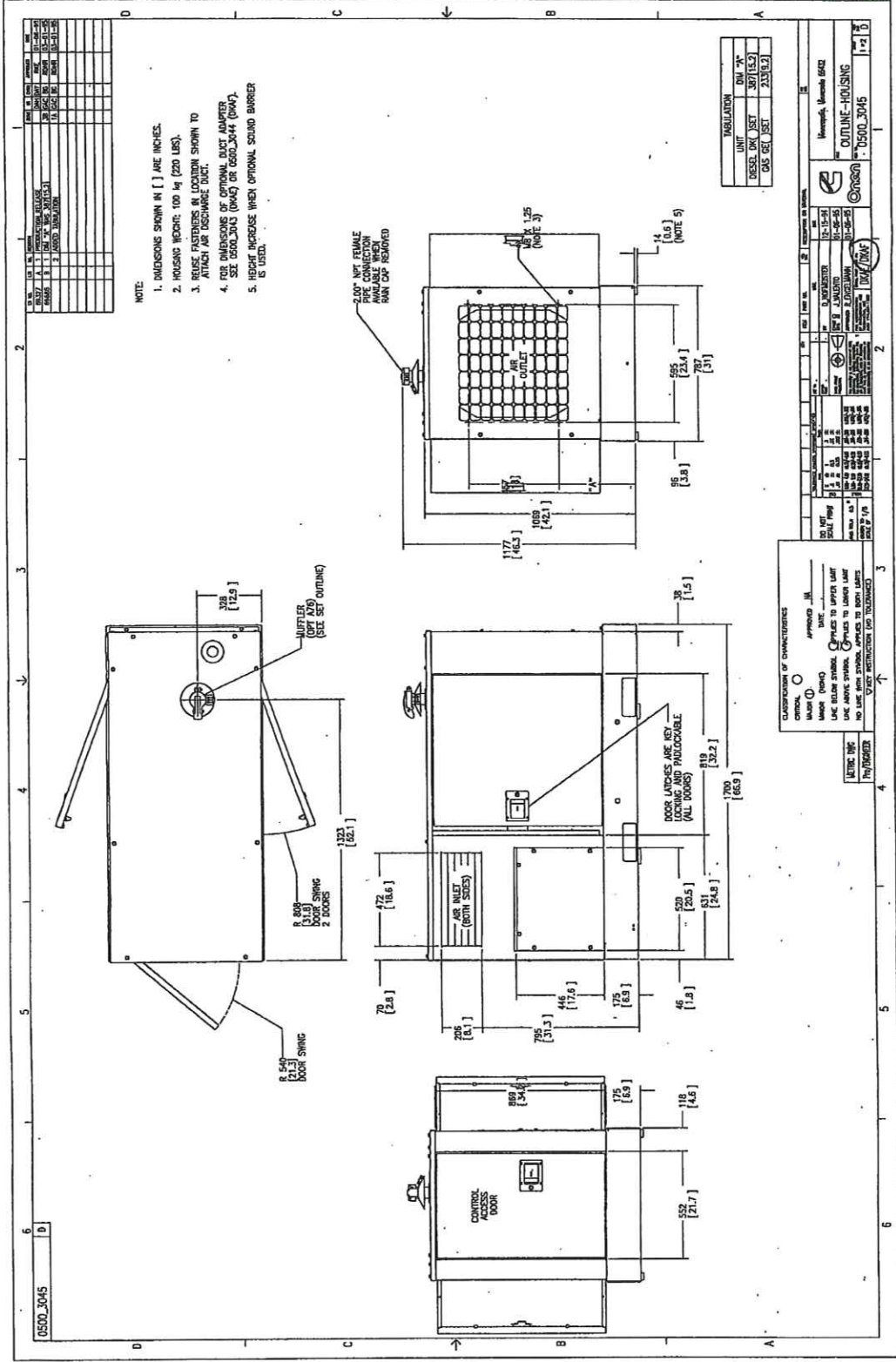
SCALE: 1/2" = 1'

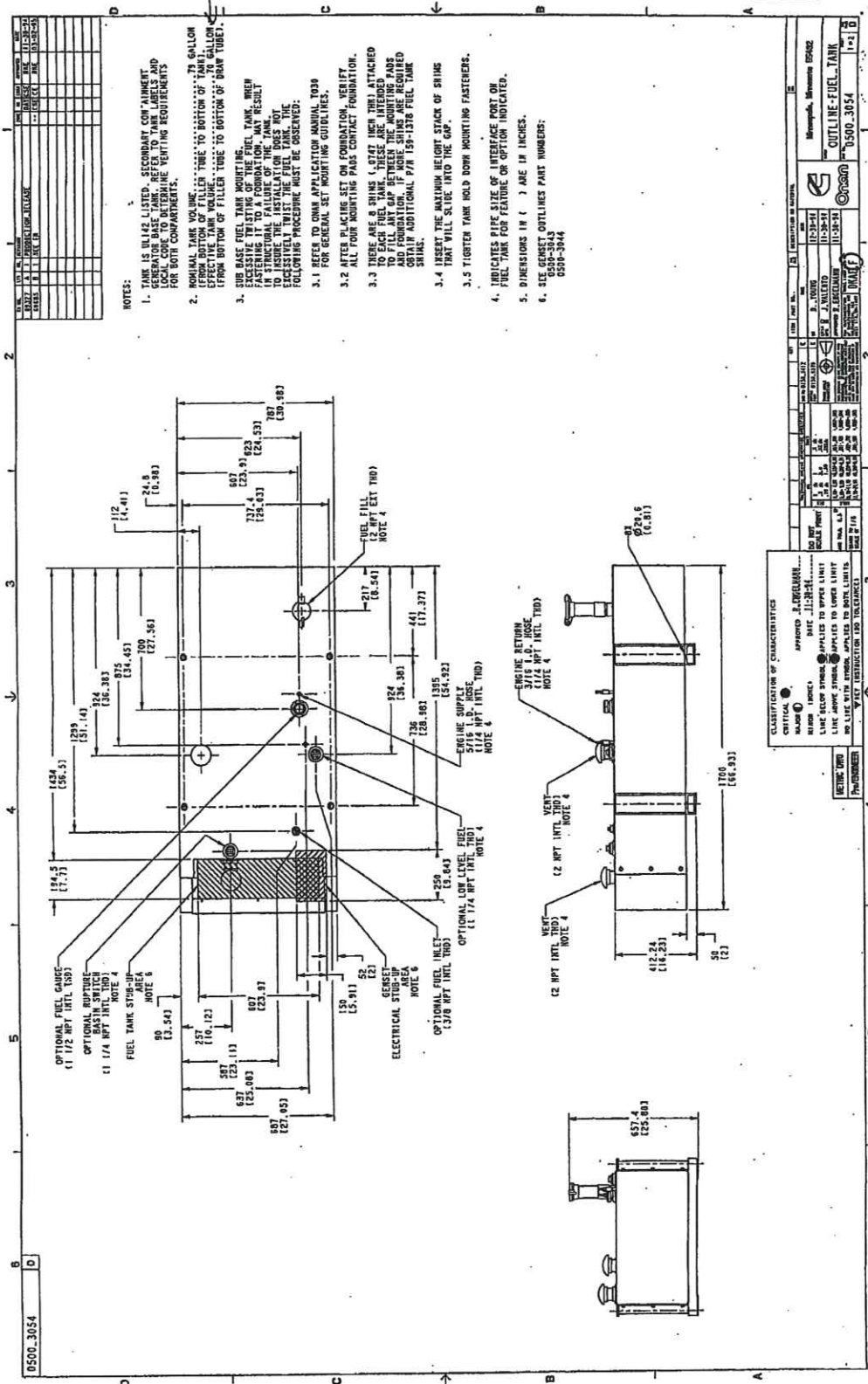
CHECKED BY: RHG

**ESK 1**



92" h x 55" w





CLASSIFICATION OF CHARACTERISTICS	
CRITICAL	APPLICABLE TO DIMENSIONS
MAJOR	APPLICABLE TO DIMENSIONS
MINOR	APPLICABLE TO DIMENSIONS
NON-CRITICAL	APPLICABLE TO DIMENSIONS
OPTIONAL	APPLICABLE TO DIMENSIONS
REVISION	APPLICABLE TO DIMENSIONS

**OUTLINE-FUEL TANK**

Part Number: 0500-3054

Scale: 1:1

Manufacturer: ...

Material: ...

Weight: ...

Volume: ...

Dimensions: ...

Notes: ...

Cummins Northeast, Inc.  
10 Gibson Road  
Scarborough, ME  
207-883-8155  
207-883-~~5526~~ (fax)

5638

FAX Cover Sheet

To: Brian Scott  
Company: BH Milliken / Ledge wood

Fax Number 774-1492 Pages: 2

Message: Marcy MOB Project 767-1869

Generator enclosure w/ critical  
grade silencer.

From: Charlie Pitre Date: 7-18-08



# Power Generation

# Sound Data

**25DKAF 60 Hz**

## Sound Pressure Levels @ 7 meters dB(A)

Configuration	Position (Note 1)								8 Position Average
	1	2	3	4	5	6	7	8	
Standard - Unhoused	73.4	75.3	74.5	75.4	74.1	75.5	75.4	75.1	74.8
F171 - Weather and Sound	71.7	72.7	70.3	69.7	69.5	69.7	70.4	72.6	70.8
F172 - Quiet Site II First Stage	70.7	70.6	65.1	64.1	61.1	62.2	64.8	70.1	66.1
F173 - Quiet Site II Second Stage	62.1	64.1	63.4	62.6	61.1	61.8	61.7	63.9	62.6

Note:

1. Position 1 faces the engine front at 23 feet (7 m) from the center of the generator set. The positions proceed around the generator set in a counter-clockwise direction in 45° increments.
2. Data based on full rated load with standard radiator-fan package.
3. Sound data for generator set with infinite exhaust do not include exhaust noise.
4. Sound pressure levels per ANSI S1.13-1971 as applicable.
5. Reference sound pressure is 20 µPa.
6. Sound pressure levels are subject to instrumentation, measurement, installation and generator set variability.

## Sound Power Levels dB(A)

Configuration		Octave Band Center Frequency (Hz)								Sound Power Level
		63	125	250	500	1000	2000	4000	8000	
Standard - Unhoused (Note 3)	Infinite Exhaust	76.6	81.1	88.7	94.4	98.4	96.6	92.3	85.1	102.4
Standard - Unhoused with Muffler	Mounted Muffler	90.8	81.9	89.9	95.2	98.0	96.1	92.5	85.2	102.6
F171 - Weather and Sound	Infinite Exhaust	75.7	76.5	83.5	86.0	87.3	87.3	84.1	77.8	93.2
F171 - Weather and Sound	Mounted Muffler	89.0	82.4	85.4	91.5	90.1	88.4	85.3	80.3	96.9
F172 - Quiet Site II First Stage	Mounted Muffler	75.1	75.8	83.2	87.1	87.7	87.2	83.9	78.3	93.5
F173 - Quiet Site II Second Stage	Mounted Muffler	72.9	75.0	81.9	81.0	81.2	81.6	78.6	73.4	88.5

Note:

1. Data based on full rated load with standard radiator-fan package.
2. Sound power per ANSI S12.34-1988 and ISO 3744 as applicable.
3. Sound data for generator set with infinite exhaust do not include exhaust noise.
4. Reference sound power is  $1 \text{ pW} = 1 \times 10^{-12} \text{ W}$ .
5. Sound power levels are subject to instrumentation, measurement, installation and generator set variability.



**From:** Jean Fraser  
**To:** Connolly, Michael  
**Date:** 7/23/2008 1:48:07 PM  
**Subject:** RE: FW: Genset

Mike,

I was waiting for your call but gather you were in a meeting (probably with Jim!).

Re the MOB generator, I met with Jim Hartmann this morning and he provided most of the site plan information that we needed. But in discussion with my colleagues (particularly the Fire Dept who are concerned about fuel storage and provision as this is a diesel generator) it appears this requires a number of other permits (eg building permit for the concrete slab; electrical permit for the connections in addition to Fire sign off) besides site plan and therefore it must not be installed before these permits and the site plan review are completed.

I am writing a letter (addressed to both you and Jim) to confirm this.

I have advised Jim regarding this and who he needs to see in Inspections (Jeanie Bourke)- as I advised you last week.

In terms of the site plan, I have suggested that he submit an *application for exemption from site plan review*- and accompany it with plans showing (in addition to the structure/ pad etc) the proposed screening (all sides, to include the transformer if not already done) and better noise baffling. If there are other requirements re the other permits, they will need to be included/submitted too.

I trust you will appreciate that the issues of life safety and basic building requirements need to be considered properly (based on full information) and therefore if they need a temporary generator this week they need to get one on wheels that is truly temporary and ensure it is placed/used safely (I have advised Jim to check with Inspections re this too).

Please call if you have any questions.

Jean (Fraser)  
Planner  
874 8728

>>> "Connolly, Michael" <ConnollyM@mercyme.com> 7/22/2008 10:21:22 AM >>>  
Jean -

Jim Hartman (cc'd) from Landmark will be calling you later today to discuss the temporary generator. I'm going to remove myself from the middle of this process to hopefully help expedite things.

Thanks - Mike Connolly

-----Original Message-----

From: Jean Fraser [mailto:[JF@portlandmaine.gov](mailto:JF@portlandmaine.gov)]  
Sent: Monday, July 21, 2008 4:02 PM  
To: Connolly, Michael  
Subject: Re: FW: Genset

Mike,

I appreciate that you are assisting the MOB but this information is not enough for us to form a view. It is very difficult to read these plans to see what the total size and shape would be and how this would be integrated into the site and what it would look like.

I have spoken with others here and they have asked a number of questions which I am passing on:

I am not sure the plans show the sound baffling as well as the basic generator; we would need scaled/dimensioned plans showing all enclosures and surrounding landscape screening. Screening would need to be on all sides.

It appears 2 parking spaces are lost; are they going to be replaced elsewhere?

Why is this so urgent when I know it has been under discussion for several months? What assurances are there that this would be temporary?

We probably would want a higher level of sound baffling than what is indicated.

We understand that these generators need to be tested every week and may require limits on the timing of this.

So is it possible to provide fuller information, please? We are not saying it is not approvable but there are many questions.

Will talk to you tomorrow.

Jean (Fraser)  
Planner

>>> "Connolly, Michael" <[ConnollyM@mercyme.com](mailto:ConnollyM@mercyme.com)> 7/21/2008 11:40:36 AM  
>>>

Here's the e-mail that we just discussed on the phone - Sorry for the confusion.

Mike

---

From: Jim Hartmann [<mailto:jhartmann@lhf.biz>]  
Sent: Friday, July 18, 2008 10:43 AM  
To: Connolly, Michael  
Cc: Amy Stasiewski; Michael Cleary; Prince, Timothy W;  
[sbushey@delucahoffman.com](mailto:sbushey@delucahoffman.com); Morin, Gretchen  
Subject: Genset

Michael,

Per your request, please see the attached specs and site plan for the generator. I am working on tracking down the noise levels for this generator. I would go into it telling the city that this is a very small 25 KW generator that runs once a month for testing. The noise level for a generator this size is not substantial.

I will continue to follow-up on the exact noise level, but I think this information should help.

Please contact me via email or by phone if you need anything else.

Thanks,

---

James Hartmann | Tenant Development Manager

Landmark Healthcare Facilities, LLC | Property Management Group

839 North Jefferson Street, Suite 600, Milwaukee, WI 53202

Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346

Internet: [www.lhf.biz](http://www.lhf.biz) <<http://www.lhf.biz>> | Email:  
[jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)

Assistant: Amy Stasiewski | Direct: 414.277.0500

---

**Confidentiality Notice:**

This email, including any attachments is the property of Catholic Health East and is intended for the sole use of the intended recipient(s). It may contain information that is privileged and confidential. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please reply to the sender that you have received the message in error, then delete this message.

**Confidentiality Notice:**

This email, including any attachments is the property of Catholic Health East and is intended for the sole use of the intended recipient(s). It may contain information that is privileged and confidential. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please reply to the sender that you have received the message in error, then delete this message.

**From:** Jim Hartmann <jhartmann@lhf.biz>  
**To:** Gregory Cass <GEC@portlandmaine.gov>  
**Date:** 8/22/2008 3:17:40 PM  
**Subject:** RE: Mercy generator

Greg,

The tank is within the generator.

Jim

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: www.lhf.biz | Email: jhartmann@lhf.biz  
Assistant: Nicole Stubbs | Direct: 414.277.0500

---

-----Original Message-----

From: Gregory Cass [mailto:GEC@portlandmaine.gov]  
Sent: Friday, August 22, 2008 1:54 PM  
To: Jim Hartmann  
Cc: Jean Fraser  
Subject: Mercy generator

Mr Hartman

Is the diesel stored within the generator ? IE; tank on the bottom or is there a separate tank?

Captain Greg Cass  
Portland Fire Dept.  
Fire Prevention Officer

**CC:** Jean Fraser <JF@portlandmaine.gov>, Michael Cleary <mcleary@lhf.biz>, Nicole Stubbs <nstubbs@lhf.biz>



# General Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction:				
Total Square Footage of Proposed Structure/Area		Square Footage of Lot 168,923	Number of Stories 4	
Tax Assessor's Chart, Block & Lot Chart#      Block#      Lot#	Applicant * <b>must</b> be owner, Lessee or Buyer* Name Fore River Medical Complex, LLC Address 839 N. Jefferson Street suite 600 City, State & Zip Milwaukee WI, 53202		Telephone: 414 277-0500	
075      A      005				
Lessee/DBA (If Applicable)		Owner (if different from Applicant) Name Address City, State & Zip	Cost Of Work: \$ 28,000 C of O Fee: \$ Total Fee: \$ 300	
Current legal use (i.e. single family) _____ Number of Residential Units _____ If vacant, what was the previous use? _____ Proposed Specific use: <u>Permanent generator</u> Is property part of a subdivision? _____ If yes, please name _____ Project description: <u>Installation of permanent 25 kw generator on pad along with the installation of screening.</u>				
Contractor's name: <u>Ledgewood Construction</u>				
Address: <u>27 Main Street</u>				
City, State & Zip <u>South Portland, ME 04106</u>			Telephone: <u>(207) 767-1866</u>	
Who should we contact when the permit is ready: <u>Kevin McCosh</u>			Telephone: <u>(207) 767-1866</u>	
Mailing address: <u>27 Main Street South Portland, ME 04106</u>				

Please submit all of the information outlined on the applicable Checklist. Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at [www.portlandmaine.gov](http://www.portlandmaine.gov), or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature: [Signature] Date: 8-15-08

This is not a permit; you may not commence ANY work until the permit is issue

**From:** David Margolis-Pineo  
**To:** Jean Fraser  
**Date:** 8/22/2008 2:46:06 PM  
**Subject:** Fwd: RE: Medical Office Building, Mercy site- Generator

Short answer, Yes, I'm ok with the explanation.

Diesels burn dirtier. More particular matter.

However, Jim, are you trying to tell me natural gas have more btu's than diesel?

David Margolis-Pineo  
Deputy City Engineer  
Portland Public Works  
55 Portland St.  
Portland, ME 04101  
Office 207-874-8850  
Fax 207-874-8852  
Cell 207-400-6695  
dmp@portlandmaine.gov

>>> Jean Fraser 08/22 1:26 PM >>>  
David,

Are you OK with these explanations re their request for a site plan exemption for the permanent emergency generator that we discussed at Dev Rev this week?

>>> Jim Hartmann <[jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)> 8/21/2008 6:41:23 PM >>>  
Jean,

In response to your inquiry about a natural gas generator, gas engines burn hotter (higher btu of the fuel), you will see significantly shorter lives. A diesel generator has an uninterrupted supply.

Natural gas is not an "uninterruptible supply" of fuel. Many times, a power outage is caused in an area because of local construction cutting through/near power lines. Natural Gas commonly shares right-of-way underground w/ the power. In healthcare applications, for example there could be procedures or chemo drugs that rely on emergency back-up power to be accessible to physicians.

In regards to the diesel fuel for the generator, the most fuel that will be in the generator is approximately 70 gallons. The generator is refueled by a certified Cummins technician throughout the year.

In regards to the generator sound levels, NFPA 110 requires monthly testing for 30 minutes under the available emergency load. This would mean that the generator runs for a total of 6 hours per year spread over twelve months. The generator also can be set to test at times very early in the morning or late at night per whatever the City of Portland would like to see. The generator will be installed with an outdoor weather enclosure w/ critical silencer.

The screening will be installed per the requirements of the city to match the approved screening throughout the site.

Diesel generators are very common throughout the industry on our medical buildings on hospital campuses throughout the country.

I hope the above responses are acceptable and I look forward to receiving your approval.

Thanks,

Jim Hartmann

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: [www.lhf.biz](http://www.lhf.biz) | Email: [jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)  
Assistant: Nicole Stubbs | Direct: 414.277.0500

---

-----Original Message-----

From: Jean Fraser [<mailto:JF@portlandmaine.gov>]  
Sent: Wednesday, August 20, 2008 2:00 PM  
To: Jim Hartmann  
Cc: [SBushey@DelucaHoffman.com](mailto:SBushey@DelucaHoffman.com)  
Subject: Medical Office Building, Mercy site- Generator

Jim,

We are dealing with the application for an exemption for the permanent emergency generator at this site. I think we can deal with it as an exemption but our engineers have asked why you are using diesel fuel rather than tap into the nearby gas main. The gas would provide a less polluting installation and avoid the need for storage of diesel fuel on site.

If you determine that it is essential for it to be a diesel generator, please provide information as to how and where the fuel will be stored and in what quantities; and how it will be transported to the generator.

Re the generator itself, we would require it to have a super critical silencer (as mentioned before the sound pressure levels on the first page are not acceptable) and a heavy duty muffler.

The planting schedule has not been provided so I need to locate the one that Deluca Hoffman used for the sketch CSK-29 that we received - I anticipate that this will not be an issue but need to find out what plants are proposed.

Please note that although the Contractor has applied for a Building Permit on 8.15.08, any Building Permit will not be issued until the Exemption from Site Plan Review is granted; and the Exemption Application can not be determined until we receive the information and revisions requested above (e-mail/pdf OK).

Please call me if you have any questions

Jean (Fraser)  
Planner



**From:** David Margolis-Pineo  
**To:** Jean Fraser  
**Date:** 8/22/2008 2:46:06 PM  
**Subject:** Fwd: RE: Medical Office Building, Mercy site- Generator

Short answer, Yes, I'm ok with the explanation.

Diesels burn dirtier. More particular matter.

However, Jim, are you trying to tell me natural gas have more btu's than diesel?

David Margolis-Pineo  
Deputy City Engineer  
Portland Public Works  
55 Portland St.  
Portland, ME 04101  
Office 207-874-8850  
Fax 207-874-8852  
Cell 207-400-6695  
dmp@portlandmaine.gov

>>> Jean Fraser 08/22 1:26 PM >>>  
David,

Are you OK with these explanations re their request for a site plan exemption for the permanent emergency generator that we discussed at Dev Rev this week?

>>> Jim Hartmann <[jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)> 8/21/2008 6:41:23 PM >>>  
Jean,

In response to your inquiry about a natural gas generator, gas engines burn hotter (higher btu of the fuel), you will see significantly shorter lives. A diesel generator has an uninterrupted supply.

Natural gas is not an "uninterruptible supply" of fuel. Many times, a power outage is caused in an area because of local construction cutting through/near power lines. Natural Gas commonly shares right-of-way underground w/ the power. In healthcare applications, for example there could be procedures or chemo drugs that rely on emergency back-up power to be accessible to physicians.

In regards to the diesel fuel for the generator, the most fuel that will be in the generator is approximately 70 gallons. The generator is refueled by a certified Cummins technician throughout the year.

In regards to the generator sound levels, NFPA 110 requires monthly testing for 30 minutes under the available emergency load. This would mean that the generator runs for a total of 6 hours per year spread over twelve months. The generator also can be set to test at times very early in the morning or late at night per whatever the City of Portland would like to see. The generator will be installed with an outdoor weather enclosure w/ critical silencer.

The screening will be installed per the requirements of the city to match the approved screening throughout the site.

Diesel generators are very common throughout the industry on our medical buildings on hospital campuses throughout the country.

I hope the above responses are acceptable and I look forward to receiving your approval.

Thanks,

Jim Hartmann

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: [www.lhf.biz](http://www.lhf.biz) | Email: [jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)  
Assistant: Nicole Stubbs | Direct: 414.277.0500

---

-----Original Message-----

From: Jean Fraser [<mailto:JF@portlandmaine.gov>]  
Sent: Wednesday, August 20, 2008 2:00 PM  
To: Jim Hartmann  
Cc: [SBushey@DelucaHoffman.com](mailto:SBushey@DelucaHoffman.com)  
Subject: Medical Office Building, Mercy site- Generator

Jim,

We are dealing with the application for an exemption for the permanent emergency generator at this site. I think we can deal with it as an exemption but our engineers have asked why you are using diesel fuel rather than tap into the nearby gas main. The gas would provide a less polluting installation and avoid the need for storage of diesel fuel on site.

If you determine that it is essential for it to be a diesel generator, please provide information as to how and where the fuel will be stored and in what quantities; and how it will be transported to the generator.

Re the generator itself, we would require it to have a super critical silencer (as mentioned before the sound pressure levels on the first page are not acceptable) and a heavy duty muffler.

The planting schedule has not been provided so I need to locate the one that Deluca Hoffman used for the sketch CSK-29 that we received - I anticipate that this will not be an issue but need to find out what plants are proposed.

Please note that although the Contractor has applied for a Building Permit on 8.15.08, any Building Permit will not be issued until the Exemption from Site Plan Review is granted; and the Exemption Application can not be determined until we receive the information and revisions requested above (e-mail/pdf OK).

Please call me if you have any questions

Jean (Fraser)  
Planner

**From:** Gregory Cass  
**To:** jhartmann@lhf.biz  
**Date:** 8/22/2008 2:54:14 PM  
**Subject:** Mercy generator

Mr Hartman

Is the diesel stored within the generator ? IE; tank on the bottom or is there a separate tank?

Captain Greg Cass  
Portland Fire Dept.  
Fire Prevention Officer

**CC:** Jean Fraser

**From:** Jim Hartmann <jhartmann@lhf.biz>  
**To:** David Margolis-Pineo <DMP@portlandmaine.gov>  
**Date:** 8/22/2008 3:55:15 PM  
**Subject:** RE: RE: Medical Office Building, Mercy site- Generator

By design, a diesel is a lean-burn engine. It doesn't even have a throttle plate to restrict the airflow through the engine. This is one reason for its higher efficiency - minimal intake pumping losses (it takes power on a gasser to generate intake manifold vacuum at an idle). Other reasons are the diesel's higher expansion ratio and the higher BTU content in a gallon of diesel fuel versus a gallon of gasoline.

Jim

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: [www.lhf.biz](http://www.lhf.biz)<<http://www.lhf.biz/>> | Email: [jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)<<mailto:jhartmann@lhf.biz>>  
Assistant: Nicole Stubbs | Direct: 414.277.0500

---

---

From: David Margolis-Pineo [<mailto:DMP@portlandmaine.gov>]  
Sent: Friday, August 22, 2008 1:46 PM  
To: Jean Fraser  
Cc: Jim Hartmann  
Subject: Fwd: RE: Medical Office Building, Mercy site- Generator

Short answer, Yes, I'm ok with the explanation.

Diesels burn dirtier. More particular matter.

However, Jim, are you trying to tell me natural gas have more btu's than diesel?

David Margolis-Pineo  
Deputy City Engineer  
Portland Public Works  
55 Portland St.  
Portland, ME 04101  
Office 207-874-8850  
Fax 207-874-8852  
Cell 207-400-6695  
[dmp@portlandmaine.gov](mailto:dmp@portlandmaine.gov)<<mailto:dmp@portlandmaine.gov>>

>>> Jean Fraser 08/22 1:26 PM >>>  
David,

Are you OK with these explanations re their request for a site plan exemption for the permanent emergency generator that we discussed at Dev Rev this week?

>>> Jim Hartmann <jhartmann@lhf.biz<<mailto:jhartmann@lhf.biz>> > 8/21/2008 6:41:23 PM >>>  
Jean,

In response to your inquiry about a natural gas generator, gas engines burn hotter (higher btu of the fuel), you will see significantly shorter lives. A diesel generator has an uninterrupted supply.

Natural gas is not an "uninterruptible supply" of fuel. Many times, a power outage is caused in an area because of local construction cutting through/near power lines. Natural Gas commonly shares right-of-way underground w/ the power. In healthcare applications, for example there could be procedures or chemo drugs that rely on emergency back-up power to be accessible to physicians.

In regards to the diesel fuel for the generator, the most fuel that will be in the generator is approximately 70 gallons. The generator is refueled by a certified Cummins technician throughout the year.

In regards to the generator sound levels, NFPA 110 requires monthly testing for 30 minutes under the available emergency load. This would mean that the generator runs for a total of 6 hours per year spread over twelve months. The generator also can be set to test at times very early in the morning or late at night per whatever the City of Portland would like to see. The generator will be installed with an outdoor weather enclosure w/ critical silencer.

The screening will be installed per the requirements of the city to match the approved screening throughout the site.

Diesel generators are very common throughout the industry on our medical buildings on hospital campuses throughout the country.

I hope the above responses are acceptable and I look forward to receiving your approval.

Thanks,

Jim Hartmann

---

James Hartmann | Tenant Development Manager  
Landmark Healthcare Facilities, LLC | Property Management Group  
839 North Jefferson Street, Suite 600, Milwaukee, WI 53202  
Main: 414.277.0500 | Direct: 414.277.0500 | Mobile: 414.232.8346  
Internet: [www.lhf.biz](http://www.lhf.biz) | Email: [jhartmann@lhf.biz](mailto:jhartmann@lhf.biz)  
Assistant: Nicole Stubbs | Direct: 414.277.0500

---

-----Original Message-----

From: Jean Fraser [mailto:[JF@portlandmaine.gov](mailto:JF@portlandmaine.gov)]  
Sent: Wednesday, August 20, 2008 2:00 PM  
To: Jim Hartmann  
Cc: [SBushey@DelucaHoffman.com](mailto:SBushey@DelucaHoffman.com)  
Subject: Medical Office Building, Mercy site- Generator

Jim,

We are dealing with the application for an exemption for the permanent emergency generator at this site. I think we can deal with it as an exemption but our engineers have asked why you are using diesel fuel rather than tap into the nearby gas main. The gas would provide a less polluting installation and avoid the need for storage of diesel fuel on site.

If you determine that it is essential for it to be a diesel generator,

please provide information as to how and where the fuel will be stored and in what quantities; and how it will be transported to the generator.

Re the generator itself, we would require it to have a super critical silencer (as mentioned before the sound pressure levels on the first page are not acceptable) and a heavy duty muffler.

The planting schedule has not been provided so I need to locate the one that Deluca Hoffman used for the sketch CSK-29 that we received - I anticipate that this will not be an issue but need to find out what plants are proposed.

Please note that although the Contractor has applied for a Building Permit on 8.15.08, any Building Permit will not be issued until the Exemption from Site Plan Review is granted; and the Exemption Application can not be determined until we receive the information and revisions requested above (e-mail/pdf OK).

Please call me if you have any questions

Jean (Fraser)  
Planner  
(207) 874 8728

**CC:** Jean Fraser <JF@portlandmaine.gov>, Nicole Stubbs <nstubbs@lhf.biz>, Michael Cleary <mcleary@lhf.biz>

**From:** Jean Fraser  
**To:** Barhydt, Barbara; Cass, Gregory; DiPierro, Philip; Schmuckal, Marge  
**Date:** 8/20/2008 3:01:30 PM  
**Subject:** Fwd: Medical Office Building, Mercy site- Generator

>>> Jean Fraser 8/20/2008 3:00:02 PM >>>  
Jim,

We are dealing with the application for an exemption for the permanent emergency generator at this site. I think we can deal with it as an exemption but our engineers have asked why you are using diesel fuel rather than tap into the nearby gas main. The gas would provide a less polluting installation and avoid the need for storage of diesel fuel on site.

If you determine that it is essential for it to be a diesel generator, please provide information as to how and where the fuel will be stored and in what quantities; and how it will be transported to the generator.

**Re the generator itself, we would require it to have a super critical silencer (as mentioned before the sound pressure levels on the first page are not acceptable) and a heavy duty muffler.**

The planting schedule has not been provided so I need to locate the one that Deluca Hoffman used for the sketch CSK-29 that we received - I anticipate that this will not be an issue but need to find out what plants are proposed.

Please note that although the Contractor has applied for a Building Permit on 8.15.08, any Building Permit will not be issued until the Exemption from Site Plan Review is granted; and the Exemption Application can not be determined until we receive the information and revisions requested above (e-mail/pdf OK).

Please call me if you have any questions

Jean (Fraser)  
Planner  
(207) 874 8728

Meray MOB  
Perm. Emergency Generator

8/20/08

Discussed at Dev Rev.

Engs (D M-P) require:

super critical silence.

(first page noise eval. not OK)

heavy duty muffler

where diesel to be stored -

pref to tie into nearby gas

main - less pollution + no fuel

storage

loss of parking space OK

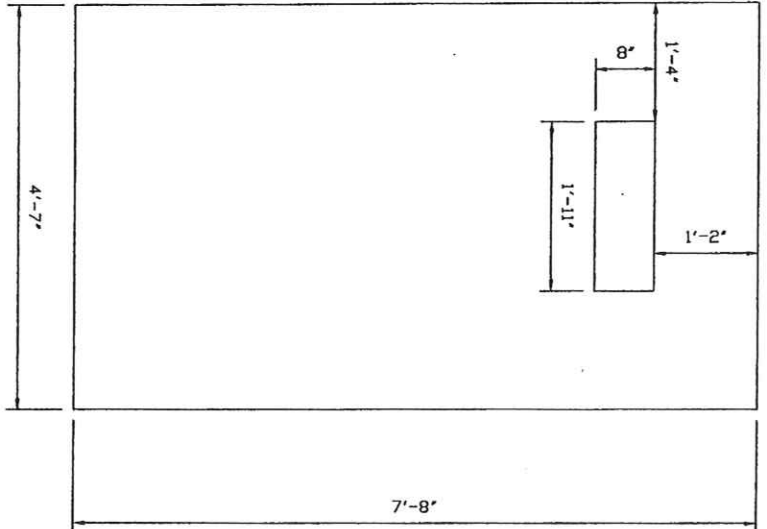
Screen planning? abbrev + Jeff not here

prob. OK.

Concrete pad OK.



Concrete Pad



# B.H.MILLIKEN

ELECTRICAL CONTRACTORS

175 ANDERSON STREET  
PORTLAND, MAINE 04101  
PHONE 879-1877

5/13/2008 8:51:52 AM FAX: 774-1492 Rick Gardiner

REVISION #: 11708

DATE: 1/17/08

PROJECT: MOB

SCALE: 1/2" = 1'

CHECKED BY: RHG

# ESK 1



# Power Generation

## Sound Data

**25DKAF 60 Hz**

### Sound Pressure Levels @ 7 meters dB(A)

Configuration	Position (Note 1)								8 Position Average
	1	2	3	4	5	6	7	8	
Standard - Unhoused	73.4	75.3	74.5	75.4	74.1	75.5	75.4	75.1	74.8
F171 - Weather and Sound	71.7	72.7	70.3	89.7	69.5	69.7	70.4	72.6	70.8
F172 - Quiet Site II First Stage	70.7	70.6	65.1	64.1	61.1	62.2	64.8	70.1	66.1
F173 - Quiet Site II Second Stage	62.1	64.1	63.4	62.6	61.1	61.8	61.7	63.9	62.6

Note:

1. Position 1 faces the engine front at 23 feet (7 m) from the center of the generator set. The positions proceed around the generator set in a counter-clockwise direction in 45° increments.
2. Data based on full rated load with standard radiator-fan package.
3. Sound data for generator set with infinite exhaust do not include exhaust noise.
4. Sound pressure levels per ANSI S1.13-1971 as applicable.
5. Reference sound pressure is 20 µPa.
6. Sound pressure levels are subject to instrumentation, measurement, installation and generator set variability.

### Sound Power Levels dB(A)

Configuration		Octave Band Center Frequency (Hz)								Sound Power Level
		63	125	250	500	1000	2000	4000	8000	
Standard - Unhoused (Note 3)	Infinite Exhaust	76.6	81.1	88.7	94.4	98.4	96.6	92.3	85.1	102.4
Standard - Unhoused with Muffler	Mounted Muffler	90.8	81.9	89.9	95.2	98.0	96.1	92.5	85.2	102.6
F171 - Weather and Sound	Infinite Exhaust	75.7	76.5	83.5	86.0	87.3	87.3	84.1	77.8	93.2
F171 - Weather and Sound	Mounted Muffler	89.0	82.4	85.4	91.5	90.1	88.4	85.3	80.3	96.9
F172 - Quiet Site II First Stage	Mounted Muffler	75.1	75.8	83.2	87.1	87.7	87.2	83.9	78.3	93.5
F173 - Quiet Site II Second Stage	Mounted Muffler	72.9	75.0	81.9	81.0	81.2	81.6	78.6	73.4	88.5

- Note:
1. Data based on full rated load with standard radiator-fan package.
  2. Sound power per ANSI S12.34-1988 and ISO 3744 as applicable.
  3. Sound data for generator set with infinite exhaust do not include exhaust noise.
  4. Reference sound power is  $1\text{pW}=1 \times 10^{-12}\text{ W}$ .
  5. Sound power levels are subject to instrumentation, measurement, installation and generator set variability.

Cummins Northeast, Inc.

10 Gibson Road

Scarborough, ME

207-883-8155

207-883-~~5526~~ (fax)

5638

FAX Cover Sheet

To: Brian

Company: BH Milliken

Fax Number 774-1492 Pages: 2

Message: Mercy MOB Project

Generator enclosure w/ critical  
grade silencer.

From: Charlie Pitre Date: 7-18-08

SUBMITTAL

CUMMINS/ONAN POWER SYSTEMS

PROJECT:  
Mercy MOB Building

CONTRACTOR:  
B.H. Milliken

PREPARED BY:

CUMMINS NORTHEAST, INC.  
10 Gibson Road  
Scarborough, ME 04074  
207.883.8155

January 14, 2008

BILL OF MATERIAL

Mercy, MOB Building

One Cummins Model 25 DKAD diesel generator set, rated at 25 K.W., 120/208 Volt, 3 phase, 60Hz., 1800 R.P.M..

**ENGINE:**  
\* Kubota diesel-fueled, 5 cylinder, 4 cycle, 3.4" bore, 3.6 stroke, 167 C.I.D.  
\* Radiator cooled with pusher fan  
\* Full pressure lube system with spin-on full flow filter  
\* 12 Volt starting system including lead-acid battery, rack, cables, and battery charging alternator with ammeter  
\* Engine coolant heater - 120 Volt  
\* Governor, mechanical-5% droop

**GENERATOR:**  
\* Revolving field, brushless, single bore, 4 pole, drip proof construction, 105 degree c. rise  
\* Closed coupled to engine flywheel  
\* Automatic voltage regulator, 1%  
\* Class F insulation  
\* Main line output circuit breakers - 3 pole, 100 amp.

**CONTROL PANEL:**  
\* PCC1301 Control  
\* Shock mounted on generator end of unit.  
\* Selector switch, run-stop-remote  
\* Engine Instruments (digital display):  
Oil pressure gauge, voltmeter, frequency and ammeter  
High water temperature shutdown  
Low oil pressure shutdown  
Overcrank

**FUEL SUPPLY:**  
24 hour capacity, dual wall, subbase fuel tank w/rupture basin switch.

**HOUSING:**  
Outdoor weather enclosure w/critical silencer.

*super-critical  
heavy duty muffler  
diesel storage/pollution  
why not gas*

One Cummins OTEC 150, 150 amp., 120/208 VAC, 3 phase automatic transfer

switch.

Includes:

Four pole switching  
Auxiliary contacts  
Time delay start/stop  
Time delay transfer/retransfer  
Manual operator  
NEMA 1 cabinet  
Key operator test/normal/retransfer  
Normal emergency lamps  
Frequency and over voltage sensing  
Digital display  
Battery charger and exercise clock

Start up with operational test.

**WARRANTY:** One Year Standby



# Prototype Test Supported Emergency/Standby Generator Sets Certification



Onan Corporation certifies that industrial Cummins®/Onan® brand generator sets bearing the Prototype Test Supported (PTS) seal have been subjected to a design and development process that includes extensive prototype testing and evaluation. A PTS production model is engineered and manufactured according to documentation developed through comprehensive research, design and design verification.

Design verification is based on tests of pre-production prototype models manufactured specifically for prototype test purposes and not sold as new equipment. To be certified as a PTS model, the generator set must satisfy these prerequisites:

**DESIGN:** The PTS certified generator set must be designed specifically for emergency/standby applications that require high reliability and rapid response.

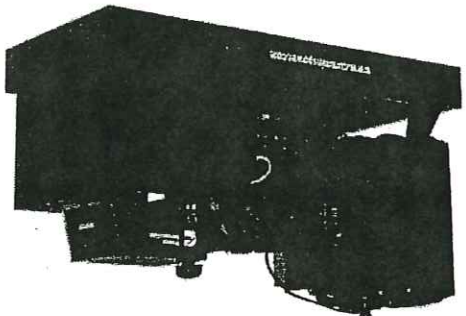
**PROTOTYPE TESTING:** Design suitability of the PTS certified generator set must be proven by tests on pre-production prototype models. The prototype test program is intended to:

1. Confirm the engine and generator have reserve capacity beyond rating to minimize the potential of damage or shutdown during steady state or transient loading conditions, including momentary overloads.
2. Demonstrate generator set, controls and accessories capability to perform reliably and compatibly in service during disturbances common in actual load circuits.
3. Verify the integrity of the generator and excitation system insulation systems and electrical components to withstand heating under rated load and transient overcurrent conditions.
4. Evaluate generator set mechanical and electrical strength to perform without damage during abnormal operating conditions, such as short circuits or out-of-phase paralleling. While operating at rated load, the generator set must be subjected to several 3-phase short circuits of 20 second duration. After the tests, the generator set is inspected to verify that no electrical or mechanical damage was incurred by any components.
5. Determine by endurance testing that no resonance conditions exist in the generator set or accessories that will cause premature failure of components on production units.
6. Investigate and identify failure modes to minimize the risk of any single component failure or human error that could lead to lack of essential electrical supply.
7. Provide a margin of safety, by actual trials, between the generator set component design and protection systems so that the components are not damaged before the protective devices activate a shutdown.

**DOCUMENTATION AND SOFTWARE:** The PTS certified generator set must be documented in a single drawing package with all components identified with Onan part numbers. A PTS test certificate must be created for each PTS generator set certifying the PTS testing performed.

**QUALITY ASSURANCE:** Engineering drawings, specifications and test requirements for a PTS certified generator set must be classified by components and assembly quality characteristics. A component and process inspection and test plan must be developed and maintained to measure product conformance to documentation requirements.

**PRODUCTION MODEL TESTING:** PTS certified generator sets must be subjected to complete production tests that demonstrate conformance to specifications at all rated conditions, including start-up, full load pick-up and a performance run at full rated load and power factor.



## Diesel Generator Set Model DKAF 60 Hz EPA Emissions

25 kW, 31 kVA Standby \*  
23 kW, 29 kVA Prime

## Description

The Cummins Power Generation DK-series commercial generator set is a fully integrated power generation system providing optimum performance, reliability, and versatility for stationary standby or prime power applications.

A primary feature of the DK GenSet is strong motor-starting capability and fast recovery from transient load changes. The torque-matched system includes a heavy-duty Kubota 4-cycle liquid-cooled diesel engine, an AC alternator with high motor-starting kVA capacity, and an electronic voltage regulator for precise regulation under steady-state or transient loads. The DK GenSet accepts 100% of the nameplate standby rating in one step, in compliance with NFPA110 requirements.

The standard PowerCommand® digital electronic control is an integrated system that combines engine and alternator controls for high reliability and optimum genset performance. Optional weather-protective enclosures and coolant heaters shield the generator set from extreme operating conditions. Environmental concerns are addressed by low exhaust silencers, and dual-wall fuel tanks.

A wide range of options, accessories, and services are available, allowing configuration to your specific power generation needs.

Every production unit is factory tested at rated load and power factor. This testing includes demonstration of rated power and single-step rated load pickup. Cummins Power Generation manufacturing facilities are registered to ISO9001 quality standards, emphasizing our commitment to high quality in the design, manufacture, and support of our products. The generator set is CSA certified and is available as UL 2200 Listed.

All Cummins Power Generation systems are backed by a comprehensive warranty program and supported by a worldwide network of 170 distributors and service branches to assist you with warranty, service, parts, and planned maintenance support.

## Features

**UL Listed Generator Set** - The complete generator set assembly is available Listed to UL 2200.

**Low Exhaust Emissions** - Engine certified to U.S. EPA Nonroad Source Emission Standards, 40 CFR 89, Tier 2.

**Kubota Heavy-Duty Engine** - Rugged 4-cycle, liquid-cooled, industrial diesel engine delivers reliable power, low emissions, and fast response to load changes.

**Alternator** - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads, fault clearing short-circuit capability, and class H insulation. The alternator electrical insulation system is UL 1446 Recognized.

**Control Systems** - The PowerCommand electronic control is standard equipment and provides total genset system integration including automatic starting/stopping and precise frequency and voltage regulation. Optional features include alarm and status message display, output metering, auto-shutdown at fault detection, and NFPA110 Level 1 compliance.

**Cooling Systems** - Standard cooling package provides reliable running at the rated power level, at up to 50°C ambient temperature.

**Integral Vibration Isolation** - Robust skid base supports the engine, alternator, and radiator on isolators, minimizing transmitted vibration. \*

**E-coat Finish** - Dual electro-deposition paint system provides high resistance to scratches, corrosion, or fading. Enclosures - Optional weather-protective enclosures are available.

**Fuel Tanks** - Dual wall sub-base fuel tanks and in-skid day tanks are also offered.

**Certifications** - Generator sets are designed, manufactured, tested, and certified to relevant UL, NFPA, ISO, IEC, and CSA standards.

**Warranty and Service** - Backed by a comprehensive warranty and world wide distributor network.

411-232-8540



## Generator Set

The general specifications provide representative configuration details. Consult the outline drawing for installation design.

## Specifications – General

See outline drawing 500-4224 for installation design specifications.

Unit Width, in (mm)	31.0 (787)
Unit Height, in (mm)	38.6 (980)
Unit Length, in (mm)	66.9 (1699)
Unit Dry Weight, lb (kg)	1314 (596)
Unit Wet Weight, lb (kg)	1371 (622)

Rated Speed, rpm

1800

Voltage Regulation, No Load to Full Load

±2.0%

Random Voltage Variation

±1.0%

Frequency Regulation

5%

Random Frequency Variation

±0.5% (isochronous optional ± 0.25%)

Radio Frequency Interference

Meets requirements of most industrial and commercial applications

## Cooling

Fan Load, HP (kW)	3.4 (2.5)	Prime
Coolant Capacity with radiator, US Gal (L)	3.1 (11.7)	Standby
Coolant Flow Rate, Gal/min (L/min)	13.0 (49.2)	Prime
Heat Rejection To Coolant, Btu/min (MJ/min)	2055.0 (2.2)	Standby
Heat Rejection To Room, Btu/min (MJ/min)	420.0 (0.4)	Prime
Maximum Coolant Friction Head, psi (kPa)	3.1 (21.4)	Standby
Maximum Coolant Static Head, ft (m)	29.5 (9.0)	Prime

Air		
Combustion Air, scfm (m <sup>3</sup> /min)	74.2 (2.1)	Prime
Alternator Cooling Air, scfm (m <sup>3</sup> /min)	250.0 (7.1)	Standby
Radiator Cooling Air, scfm (m <sup>3</sup> /min)	3500.0 (99.0)	Prime
Max. Static Restriction, in H <sub>2</sub> O (Pa)	0.50 (124.50)	Standby

## Rating Definitions

**Standby Rating based on:** Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

**Prime (Unlimited Running Time) Rating based on:** Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

**Base Load (Continuous) Rating based on:** Applicable for supplying power continuously to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating. (Equivalent to Continuous Power in accordance with ISO8528, ISO3046, AS2789, DIN6271, and BS5514). This rating is not applicable to all generator set models.

## Site Derating Factors

Rated power available up to 1600 ft (488 m) at ambient temperatures up to 77°F (25°C). Above 1600 ft (488 m), derate at 4% per 1000 ft (305 m) and 1% per 10°F (2% per 11°C) above 77°F (25°C).



## Alternator

Several alternators are available for application flexibility based on the required motor starting kVA and other requirements. Larger alternator sizes have lower temperature rise, for longer life of the alternator insulation system. In addition, larger alternator sizes can provide a cost-effective use of engine power in across-the-line motor starting applications and can be used to minimize voltage waveform distortion caused by non-linear loads.

These single-bearing alternators couple directly to the engine flywheel with flexible discs, for drive/train reliability and durability. No gear reducers or speed changers are used. Two-thirds pitch windings eliminate third-order harmonic content of the AC voltage waveform and provide the standardization desired for paralleling of generator sets. The excitation system is a self (shunt) excited system with the voltage regulator powered directly from the generator set output.

## Alternator Application Notes

**Alternator Sizes** - On any given model, various alternator sizes are available to meet individual application needs. Alternator sizes are differentiated by maximum winding temperature rise, at the generator set standby or prime rating, when operated in a 40°C ambient environment. Available temperature rises range from 80°C to 125°C. Not all temperature rise selections are available on all models. Lower temperature rise is accomplished using larger alternators at lower current density. Lower temperature rise alternators have higher motor starting kVA, lower voltage dip upon load application, and they are generally recommended to limit voltage distortion and heating due to harmonics induced by non-linear loads.

**Alternator Space Heater** - is recommended to inhibit condensation.

## Available Output Voltages

<u>Three Phase Reconnectable</u>	<input checked="" type="checkbox"/>	120/208
	<input type="checkbox"/>	139/240
	<input type="checkbox"/>	120/240 Delta
	<input type="checkbox"/>	240/416
	<input type="checkbox"/>	277/480
<u>Single Phase Non-Reconnectable</u>	<input type="checkbox"/>	120/240
<u>Three Phase Non-Reconnectable</u>	<input type="checkbox"/>	220/380
	<input type="checkbox"/>	347/600

# Specifications – Alternator

Design

Revolving field, single bearing, 4-pole, brushless, drip-proof construction.

Stator

Skewed stator and 2/3 pitch windings minimize field heating and voltage harmonics.

Rotor

Dynamically balanced assembly. Direct coupled to engine by a flexible drive disc. Complete amortisseur (damper) windings help minimize voltage deviations and heating effects under unbalanced loads. The rotor is supported by a pre-lubricated, maintenance-free ball-bearing.

Insulation System

Class H per NEMA MG1-1.65 and BS2757

Standard Temperature Rise

At rated load is less than 125°C at standby rating, per NEMA MG1.22.40, IEEE115 and IEC 34-1.

Exciter Type

The excitation system derives its power from the main output of the generator, eliminating the need for a separate excitation power source.

Phase Rotation

A (U), B (V), C (W)

AC Waveform Total Harmonic Distortion

Direct drive centrifugal blower  
Less than 7% total no load to full linear load, and less than 3% for any single harmonic

Telephone Influence Factor (TIF)  
Telephone Harmonic Factor (THF)

Less than 40 per NEMA MG1-22.43  
Less than 3

Three Phase Table	80° C	80° C	80° C	80° C	80° C	105° C	105° C	105° C	105° C	105° C	125° C	125° C	125° C	125° C	125° C	
Feature Code	B257	B269	B386	B305	B256	B268	B385	B304	B255	B267	B384	B303				
Voltage Ranges	120/208 Thru 139/240	120/208 Thru 139/240	220/380 Thru 240/416	347/600 Thru 347/600	120/208 Thru 139/240	120/208 Thru 139/240	220/380 Thru 240/416	347/600 Thru 347/600	120/208 Thru 139/240	120/208 Thru 139/240	220/380 Thru 240/416	277/480 Thru 277/480				
Surge kW	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	
Motor Starting kVA (at 90% sustained voltage)	111	111	111	111	111	111	111	111	111	111	111	111	111	111	111	
Full Load Current - Amps at Standby - Rating	120/208 139/240 87	220/380 240/416 43	277/480 347/600 30		120/208 139/240 75	120/240 120/240 69	120/240 120/240 104		120/240 120/240 69	120/240 120/240 104						

Notes:

1. Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor. Also see Note 2 below.

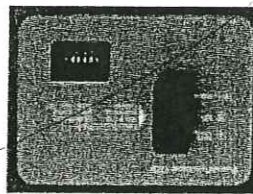
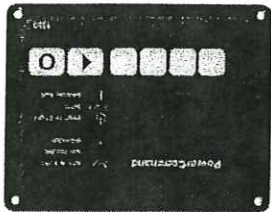
Single Phase Table	80° C	80° C	80° C	80° C	105° C	105° C	105° C	105° C	105° C	125° C	125° C	125° C	125° C
Feature Code	B275	B257	B269	B274	B256	B268	B273	B255	B267				
Voltage Ranges	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240	120/240 Thru 120/240				
Surge kW	25	26	26	25	26	26	25	26	26				
Motor Starting kVA (at 90% sustained voltage)	62	83	83	44	44	44	44	44	44				
Full Load Current - Amps at Standby - Rating	120/240 120/240 69	120/240 120/240 104											

Notes:

1. The broad range alternators can supply single phase output up to 2/3 set rated 3-phase kW at 1.0 power factor.  
2. The extended stack (full single phase output) and 4 lead alternators can supply single phase output up to full set rated 3-phase kW at 1.0 power factor.

# Control System

PowerCommand (1301) Control



Standard Operator Panel

Optional Operator/Display Panel

## PowerCommand Control

- The PowerCommand Control is an integrated generator set control system providing isochronous governing (optional), voltage regulation, engine protection, generator protection, and operator interface.
- Control provides battery monitoring and testing features, and Smart-Starting control system.
- InPower PC-based service tool available for detailed diagnostics
- Standard PCNet RS485 network interface to devices such as remote annunciator for NFPA110 applications.
- Control boards are potted for environmental protection.
- Suitable for operation in ambient temperatures from -40C to +70C, and altitudes to 13,000 feet (5000 meters)
- Prototype tested; UL, CSA, and CE compliant

## AC Protection

- Over current warning and shutdown\*
- Over and under voltage shutdown
- Over and under frequency shutdown
- Over Excitation (loss of sensing) fault
- Field Overload

## Engine Protection

- Overspeed shutdown
- Low oil pressure warning and shutdown\*
- High coolant temperature warning and shutdown\*
- Low coolant level warning or shutdown\*
- Low coolant temperature warning\*
- High, low, & weak battery voltage warning\*
- Fail to start (overcrank) shutdown
- Redundant start disconnect
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown

## Other Data

- Manual Off switch
- Alpha-numeric display with pushbutton access, for viewing engine and alternator data and providing setup, controls, and adjustments (English or International symbols)
- LED lamps indicating genset running, not in auto, common warning, common shutdown, manual run mode, remote start
- Suitable for operation in ambient temperatures from -20C to +70C

## Alternator Data

- Line to Neutral AC Volts\*
- Line to Line AC Volts\*
- 3-phase AC current\*
- Frequency\*
- Total kVA\*

## Digital Governing (Optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

## Digital Voltage Regulation

- Integrated digital electronic voltage regulator
- 2-phase line to line sensing
- Configurable Torque Matching

## Control Functions

- Time delay start and cooldown
- Glow plug control (some models)
- Cycle cranking
- (2) Configurable inputs
- (2) Configurable outputs
- Remote Emergency Stop

\*Optional Operator/Display Panel required to display warnings and sensor data, and for NFPA 110 and CSA 282 applications.

## Options

- Local Operator/Display Panel
- Digital Electronic Governing
- Auxiliary output relays (2)
- 120/240 V, 100 W anti-condensation heater
- Emergency Stop Switch
- Remote Annunciator with (3) configurable inputs & (4) configurable outputs
- PowerCommand for Windows remote monitoring software. (Direct connect) Auxiliary, configurable signal inputs (8) and configurable relay outputs (8)

## Generator Set Options

- Engine 120 V, 1000 W coolant heater (thermostatically controlled)
- 240 V, 1000 W coolant heater (thermostatically controlled)
- Electronically controlled governor
- Fuel System
  - 24 hour dual wall sub-base fuel tank
  - 48 hour dual wall sub-base fuel tank
- Alternator
  - 80°C rise alternator
  - 105°C rise alternator
  - 120/240 V, 100 W anti-condensation heater
  - Extended stack (full single phase output)
  - Full single phase output (Non-Reconnectable)
  - Single phase - 4 lead

## Exhaust System

- Critical grade exhaust silencer
- Industrial grade exhaust silencer
- Residential grade exhaust silencer
- Set mounted critical grade exhaust silencer

## Generator Set

- Batteries
- Battery charger
- Export box packaging
- UL 2200 Listed
- In-skid fuel tank
- Main line circuit breaker
- Sound attenuated enclosures with mounted silencer
- Spring isolators
- Weather protective enclosure with mounted silencer
- 2 year prime power warranty
- 2 year standby warranty
- 5 year standby power warranty

## Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Power Generation products and services include:

- Transfer Switches
- Bypass Switches
- Parallel Load Transfer Equipment
- Digital Paralleling Switchgear
- PowerCommand Network and Software
- Distributor Application Support
- Planned Maintenance Agreements

## Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

## Certifications

UL - The generator set is available Listed to UL 2200 Stationary Engine Generator Assemblies.



CSA - This generator set is CSA certified to product class 4215-01.



PTS - The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFPA 110 to verify the design integrity and performance under both normal and abnormal operating conditions including short circuit, endurance, temperature rise, torsional vibration, and transient response, including full load pickup.



ISO9001 - This generator set was designed and manufactured in facilities certified to ISO9001.



## See your distributor for more information



Cummins Power Generation

1400 73rd Avenue N.E.

Minneapolis, MN 55432

Fax: 763.574.5298

www.cumminspower.com

Cummins, Onan and PowerCommand are registered trademarks of Cummins Inc. Detector and AmpSentry are trademarks of Cummins Inc.

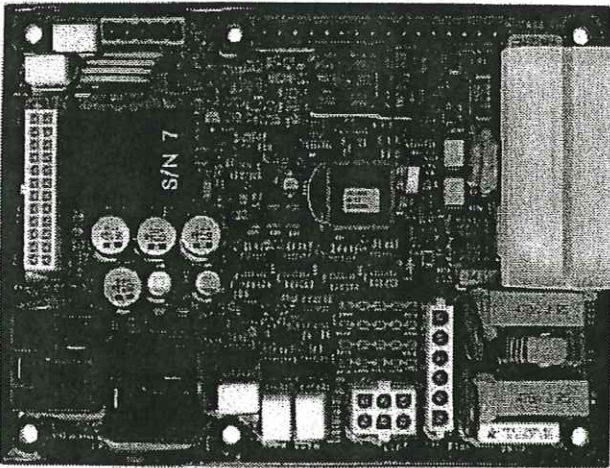
Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

Drawing #	Description	Amps	Feature
	Alrpx Trip Free E-Frame 209 Series 3P Companion Trip	10	KG49
	Hydraulic Magnetic Trip recognized per UL1077 and CSA Certified	15	KG50
320-1931	50/60 Hz Delay 66 Trip characteristics for motor circuits 277/480 VAC	20	KG51
		25	KG52
		30	KG54
		35	KG55
		40	KG56
		45	KG57
		50	KG58
		55	KG59
		60	KG60
		65	KG61
		70	KG62
		75	KG63
		80	KG64
		85	KG65
		90	KG66
		95	KG67
		100	KG68
		1250	KH36
	Merlin Gerin CMHH, 1600 AF, SS Trip, 600V, 3P, UL, STD206D Trip Unit	1600	KH39
	Merlin Gerin CMHH, 2500 AF, SS Trip, 600V, 3P, UL, STD206D Trip Unit	2000	KH43
		2500	KH48
		1600	KH62
320-1699	Merlin Gerin CMHH, 2000 AF, SS Trip, 600V, 3P, IEC, STD206D Trip Unit	1600	KH63
		2000	KH79
	Merlin Gerin CMHH, 2000 AF, SS Trip, 600V, 4P, IEC, STD206D Trip Unit	2000	KH80
		400	KK50
	Merlin Gerin Disconnect Switches, 400 AF, 600V, 3P, UL	600	KK51
320-1990	Merlin Gerin Disconnect Switches, 600 AF, 600V, 3P, UL	800	KK52
	Merlin Gerin Disconnect Switches, 800 AF, 600V, 3P, UL	1200	KK54
320-1992	Merlin Gerin Disconnect Switches, 1200 AF, 600V, 3P, UL	1600	KK55
	Merlin Gerin Disconnect Switches, 1600 AF, 600V, 3P, UL	2000	KK56
320-1907	Merlin Gerin Disconnect Switches, 2000 AF, 600V, 3P, UL	10	KM01
	Merlin Gerin CE106N, 100 AF, 100A, TM Trip, 600/660V, 3P, UL/IEC	20	KM02
320-1975		30	KM03
		40	KM04
		45	KM05
		50	KM06
		60	KM07
		70	KM08
		80	KM09
		90	KM10
		100	KM11
		125	KM12
320-1970	Merlin Gerin CF250N, 250 AF, 250A, TM Trip, 600/660V, 3P, UL/IEC	150	KM13
		175	KM14
		200	KM15
		225	KM16
		250	KM17
		300	KM18
320-1963	CJ400N, 400 AF, 400A, TM Trip, 600/660V, 3P, UL/IEC	350	KM19
		400	KM20
		400	KM21
320-1963	CJ600N, 600 AF, 600A, TM Trip, 600/660V, 3P, UL/IEC	500	KM22
		600	KM23

Cummins Power Generation Circuit Breaker Matrix Sorted by Feature Code



## PowerCommand™ Digital Generator Set Control



### Description

The PowerCommand™ (1301) Control is a microprocessor-based generator set monitoring, metering, and control system. The control provides a simple operator interface to the generator set, digital voltage regulation, digital engine speed governing, start / stop control, 12V/24V battery operation and generator set protective functions. The integration of all functions into a single control system provides enhanced reliability and performance compared to conventional generator set control systems.

The PowerCommand™ 1301 generator set control is suitable for use on a wide range of generator sets in non-parallel applications. The PowerCommand™ Control is compatible with reconnectable alternators up to 600VAC line to line, and can be configured for any frequency, voltage, and power connection configuration from 120-600VAC line to line.

The PowerCommand™ 1301 is designed for mounting on the generator set.

Power for the control is derived from the generator set starting batteries. The control functions over a voltage range from 8VDC to 30 VDC.

The control offers a wide range of standard control and optional display panel features so custom control configurations are not needed to meet application specifications.

- ### Features
- 12 and 24 VDC Battery Operation.
  - Digital Voltage Regulation Full wave rectified single phase (line to line) sensing.
  - Digital Engine Speed Governing (optional) to provide isochronous frequency regulation.
  - Generator Set Monitoring Monitors status of all critical engine and alternator functions. Configurable for single or three phase AC metering.
  - Engine Starting includes relay drivers for start, fuel shut off (FSO), and glow plug. Start disconnect is achieved by monitoring the battery charging alternator.
  - Generator Set Monitoring. Monitors status of all critical engine and alternator conditions functions.
  - Generator Set Protection. Engine and alternator.
  - Operator Display Panel (optional). Provides easy to use symbolic operator display of critical generator set parameters and operating history.
  - Advanced Serviceability using InPower™, a PC-based software service tool.
  - Environmental Protection. The control system is designed for reliable operation in harsh environments. The core control board is an encapsulated module that is fully protected from the elements.
  - Configurable Inputs and Outputs. Two discrete inputs and two dry contact relay outputs.



## Internal Control Functions

### Engine Control

**12 VDC/24VDC Battery Operations** – Power Command will operate either on 12 VDC or 24 VDC batteries.

**Isynchronous Governing** – (optional) Controls engine speed within plus or minus 0.25% for any steady state load from no load to full load. Frequency drift will not exceed plus or minus 0.5% for a 60F (33C) change in ambient temperature over an 8 hour period.

### Temperature Dependent Governing Dynamics

(with governing option) Modifies the engine governing control parameters as a function of engine temperature. Allows engine to be more responsive when warm, and more stable when operating at lower temperature levels.

**Remote Start Mode** - Power Command 1301 accepts a ground signal from remote devices to automatically start the generator set and immediately accelerate to rated speed and voltage.

The control can incorporate a time delay start.

**Remote Emergency Stop** – The control accepts a ground signal from an external emergency stop down.

The generator set is prevented from running or cranking with the switch engaged.

**Sleep Mode** -The control is configured to include a sleep mode. When the mode select switch is in the OFF position, the control will revert to a low-power-consumption mode until the Run/Off/Auto control switch or any button on the optional display panel is operated.

**Engine Starting** - The control system supports automatic engine starting, including a 30 amp relay contact for the starter motor and fuel shutoff. Primary and backup start disconnects are achieved by one of three methods, magnetic pickup, battery charging alternator feedback, or main alternator output frequency. The control also supports programmable glow plug control. This feature can be disabled when not required.

**Cycle Cranking** - Configurable for number of starting cycles (1 to 7) and duration of crank and rest periods. Control includes starter protection algorithms to prevent the operator from specifying a starting sequence that might be damaging.

### Time Delay Start and Stop (Cooldown) -

Configurable for time delay of 0-300 seconds prior to starting after receiving a remote start signal, and for time delay of 0-600 seconds prior to ramp to idle or shut down after signal to stop in normal operation modes. Default for both time delay periods is 0 Sec.

### Alternator Control

Power Command 1301 includes an integrated line-to-line sensing voltage regulation system that is compatible with shunt excitation systems. The voltage

**Data Logs** - Engine run time, controller on time, number of runs, and number of start attempts are available from the optional display panel or through InPower.

**Fault History** - Provides a record of the most recent fault conditions with control hours time stamp. Up to 5 events are stored in the control non-volatile memory.

### Alternator Data

Voltage (single or 3 phase Line-Line and Line-Neutral)  
Current (3 phase)  
KVA  
Frequency

### Engine Data

Starting Battery Voltage  
Engine Speed  
Engine Temperature  
Engine Oil pressure

### Service Adjustments

The operator panel includes provisions for adjustment and calibration of generator set control functions. Adjustments are protected by a password. Functions include:

Engine speed governor adjustments  
12 VDC/24 VDC battery operations  
Voltage regulation adjustments  
Cycle cranking  
Configurable fault set up  
Configurable output set up  
Meter calibration  
Display language and units of measurement

### Other Information

Control Not Communicating  
Pop-up Timers to indicate time remaining on time delays in the system.

regulation system is full wave rectified and has a SCR output for good motor starting capability. Major system features include:

**Digital Output Voltage Regulation** - Power Command 1301 will regulate output voltage to within plus or minus 1.0% for any loads between no load and full load. Voltage drift will not exceed plus or minus 1.5% for a 104°F (40°C) change in temperature in an 8 hour period. On engine starting, or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level.

This feature can be disabled to allow the use of an external voltage regulator.

**Torque-Matched Volts/Hz Overload Control** - The voltage roll-off set point and rate of decay (i.e., the slope of the Volts/Hertz curve) is adjustable in the control.

## Protective Functions

On operation of a protective function the control will indicate a fault by flashing the fault code on the status LED on the base control board. On systems with an optional display panel, the warning or shutdown LED will light and fault symbol, name, and code will be indicated. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower service tool provide service keys and procedures based on the service codes provided. PowerCommand™ provides the following system protective functions:

- **Configurable Alarm and Status Inputs** - Power Command 1301 will accept up to two alarm or status inputs (configurable contact closed to ground or open) to indicate customer-specified conditions. The control is programmable for warning, shutdown or status indication, and for labelling the input.
- **Emergency Stop** - Announced whenever the emergency stop signal is received from external switch.

## Engine Protection

- **OverSpeed Shutdown** - Default setting is 115% of nominal.

- **Low Lube Oil Pressure Warning/Shutdown** - Level is preset (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance shutdown signals.
- **High Engine Temperature Warning/Shutdown** - Level is preset (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance shutdown signals.
- **Low Coolant Temperature Warning** - Indicates that engine temperature may not be high enough for a 10-second start or proper load acceptance.

**Low and High Battery Voltage Warning** - Indicates status of battery charging system (failure) by continuously monitoring battery voltage.

- **Weak Battery Warning** - The control system will test the battery each time the generator set is signaled to start, and indicate a warning if the battery indicates impending failure.

- **Fail to Start (Overcrank) Shutdown**
- **Fail to Crank Shutdown** - Control has signaled starter to crank engine but engine does not rotate.
- **Cranking Lockout** - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

- **Sensor Failure Indication** - Logic is provided on the base control to detect analog sensor or interconnecting wiring failures.

## Alternator Protection

- **High/Low AC Voltage Shutdown** - High default to 110% for 10 seconds, instantaneous 130%. Low default to 85% for 10 seconds
- **Overcurrent Warning/Shutdown** - Warning default to 110% for 60 seconds. Shutdown default to 150% for 10 seconds.
- **Under/Over Frequency** - Under default to -6Hz for 10 seconds. Over default +6Hz for 10 seconds.
- **Loss Of Sensing Voltage Shutdown**
- **Field Overload Shutdown**

## Environment

The control is designed for proper operation without recalculation in ambient temperatures from -40 Deg C to +70 Deg C. Control will operate with humidity up to 95%, non-condensing.

The optional display panel is designed for proper operation in ambient temperatures from -20 Deg C to +70 Deg C, and for storage from -30 Deg C to +80 Deg C

The control board is fully encapsulated to provide superior resistance to dust and moisture. The optional display panel has a single membrane surface, which is impervious to effects of dust, moisture, oil, and exhaust fumes. This panel uses a sealed membrane to provide long reliable service life in harsh environments.

The control system is specifically designed and tested for resistance to RFI/EMI, and to resist effects of vibration to provide a long reliable life when mounted on a generator set. The control includes transient voltage surge suppression to provide compliance to referenced standards.

## Certifications

PowerCommand™ meets or exceeds the requirements of the following codes and standards:

- **Remote Start Signal**
- **Remote Emergency Stop**
- **Configurable Inputs** - Control includes (2) input signals from customer discrete devices that are configurable for warning, shutdown, or status indication, as well as message displayed. Output signals from the PowerCommand™ control include:
- **Configurable relay outputs** - Control includes (2) relay outputs rated at 2 amps. These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning, and common shutdown.
- **Ready to Load (generator set running) signal** - Operates when the generators set has reached 90% of rated speed and voltage and latches until generator set is switched to off or idle mode. (B+ signal output).
- **Communications connections include:**
  - **PC Tool Interface** - This RS-485 communication port is to allow the control to communicate with a personal computer running InPower or PowerCommand™ for Windows software. Also this RS-485 port is to allow the control to communicate with external devices like PLC on MODBUS protocol.
  - Note – A RS-232 to RS-485 Converter is required for communication between PC to Control.
  - **Networking** - This RS-485 communication port is to allow connection from the control to the other Cummins Power Generation products.

## Options and Accessories

**Display Panel** - Provides a local or remote operator display of engine and alternator. Includes set up and generator set history information.

- **NFPA110** for Level 2 or 3 systems.
- **ISO 8528-4: 1993 Compliance, Controls and Switchgear**
- **CE Marking:** The control system is suitable for use on generator sets to be CE-marked.
- **EN 50081-1,2 Residential/Light Industrial emissions, or Industrial Emissions**
- **EN 50082-1,2 Residential/Light Industrial or Industrial susceptibility**
- **ISO 7637-2, level 2; DC supply surge voltage test; Fog test**
- **ISO Std 202C, Method 101 and ASTM B117: Salt**
- **PowerCommand™ control systems and generator sets are designed and manufactured in ISO9001 certified facilities. The control is suitable for use on generator sets that are UL 2200 listed.**

## Software

**InPower** (beyond 4.5 version) is a PC-based software service tool that is designed to directly communicate to PowerCommand™ generator sets and transfer switches, to facilitate service and monitoring of these products.

**PowerCommand™ for Windows** is a software tool that is used primarily by operators to remotely monitor and control generator sets, transfer switches, and other on-site power system devices.

## Control Interface

Input signals to the base control include:

- **Run/Off/Auto Switch** - Required when the optional display panel is not used.
- **Generator Set Status Lamp**

## Warranty

All components and subsystems are covered by an express limited one-year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available. Contact your distributor/dealer for more information.

## Certifications



ISO9001 - This product set was designed and manufactured in facilities certified to ISO9001.



PTS - The Prototype Test Support (PTS) program verifies the performance integrity of a generator set design. Products bearing the PTS symbol have been subjected to demanding tests in accordance to NFA 110 to verify the design integrity and performance under both normal and abnormal operating conditions.



UL - The control is suitable for use on generator sets that are listed to UL2200, Stationary Engine Generator Assemblies.



CE - This product is suitable for use on generator sets that are CE marked.

See your distributor for more information



Cummins Power Generation

1400 73rd Avenue N.E.

Minneapolis, MN 55432

763.574.5000

Fax: 763.574.5298

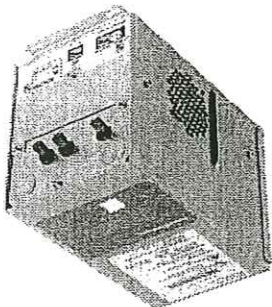
[www.cumminspowergeneration.com](http://www.cumminspowergeneration.com)

Cummins and PowerCommand™ are registered trademarks of Cummins Inc. InPower and AmpSentry are trademarks of Cummins Inc.

Important: Backfeed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

## Four-Stage Battery Charger

15 Amp @ 12 Volt  
12 Amp @ 24 Volt →



### Description

**Applications -** Cummins Power Generation fully automatic battery chargers – using switched mode power electronics – are constant voltage/constant current chargers incorporating a 4-stage charging algorithm. Designed for use in applications where battery life and reliability is important; these chargers, complete with built-in equalize charge capability, are ideal for stationary or portable starting battery charging service.

**Four-Stage Charging –** To achieve optimum battery life, a 4-stage charging cycle is implemented. The four charging stages are trickle, bulk, absorption, and float. The trickle stage safely charges overly discharged batteries. It protects a damaged or shorted battery from excessive current. During bulk charge a constant current is applied to quickly restore the maximum battery charge level in the shortest amount of time. The absorption stage applies a constant voltage to the battery to bring the battery to 100% capacity. The float stage tailors the constant voltage output to maintain the battery at full capacity while serving DC operated loads.

**Temperature Compensation –** An optional temperature sensor may be used to adjust charging rate based on internal battery temperature in the absorption and float stages. Use of a battery temperature sensor helps to increase battery life by preventing over or under charging of the battery. The battery temperature sensor also protects the battery from overheating. Temperature compensation is recommended in all applications, but is particularly valuable for generator sets in outdoor applications.

**Operating Voltages –** Battery chargers are field-configurable for charging either 12 or 24 volt battery systems and for operation at 50 or 60 hertz. Output voltage and battery type selection is done through the alphanumeric display.

### Features

- **Protection –** All models include a 20 amp DC output breaker. Resettable breakers are used for input voltages 240 VAC and lower. For over 240 VAC branch circuit rated fuses are used.
- **Easy installation –** Clearly marked terminal blocks and panel knockouts provide convenient connections of input and output leads.
- **User Display –** Output voltage and current, fault information, and configuration options are indicated on the alphanumeric display.
- **Monitoring –** An LED indicates the condition of the charger. Green indicates normal charging operation, amber indicates equalizing, and red indicates a fault condition.
- **Faults –** The charger senses and annunciates the following fault conditions: Input Overvoltage, Input Undervoltage, AC Power Loss, Battery Overvoltage, Battery Undervoltage, Charger Circuitry Over Temperature, Battery Over Temperature, Unrecoverable Battery, Overload/Overcurrent
- **Output Relay –** Output contacts are closed in a fault condition. 30 Volt 2 Amp contacts.
- **Temperature Compensation –** An optional external sensor is available for temperature compensated battery charging.
- **Corrosion Resistant Aluminum Enclosure**
- **Vibration Resistant Design –** complies with UL991 vibration resistance requirements.
- **RFI/EMI and Voltage Surge Resistant**
- **UL1236 (BBHH) Listing –** for use with lead acid batteries in generator set installations. Also suitable for use with gel, AGM, and NiCad batteries.

# Specifications

## Performance and Physical Characteristics

Output:	
Nominal Voltage	12 or 24 Volt DC
Float Voltage	13.5 or 27.0 Volts
Equalize-Voltage	15.5 or 31.0 Volts
Output Voltage Regulation	±1%
Maximum Output Current	15 Amp @ 12 VDC or 12 Amp @ 24 VDC
Equalize Charger Time	0-12 hrs.
Input:	
Voltage AC	120, 208, 240, 277, 380, 416, 480, 600
Frequency	50 or 60 Hz
Approximate Net Weights:	11.6 lbs (5.3 Kg)
Approximate Dimensions:	9.75 x 5.56 x 6.14 (248 x 141 x 156)
Height x Width x Depth - inches (mm)	
Ambient Temperature Operation:	-22° F to 122° F (-30° C to 50° C)



Input Volts	Genset Kit Part Number	ATS Kit Part Number
120/208/240	0300-5878-01	0300-5878-13
277	0300-5878-02	0300-5878-14
380	0300-5878-03	0300-5878-15
416	0300-5878-04	0300-5878-16
480	0300-5878-05	0300-5878-17
600	0300-5878-06	0300-5878-18
Temperature Sensor Kit	0541-0918-00	0541-0918-00

**Enclosure**  
 The NEMA 1, corrosion resistant, aluminum enclosure is designed for wall mounting. When wall mounted, louvers protect cooling holes in the sides of the enclosure. Use 1/4 inch (6.35 mm) diameter bolts for mounting.

## RFI/EMI and Voltage Surge Compliance

Charger complies with the requirements of EN61000-4-5 for voltage surge resistance, EN50082-2 (Heavy Industrial) for immunity, EN61000-4-2 for ESD, EN61000-4-3 for radiated immunity, ANSI/IEEE C62.41 Category B & EN 61000-4-4 for electrically fast transient, EN61000-4-6 for conducted, and FCC Part 15 Class A for emissions.

See your distributor for more information



Cummins Power Generation

1400 73rd Avenue N.E.  
 Minneapolis, MN 55432

Fax: 763.574.5298  
 763.574.5000

www.cumminspowergeneration.com

Cummins Power Generation is a subsidiary of Cummins Inc.

**WARNING**

For Professional Use Only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

**WARNING**

Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.



Part Number  
333-0469

**Battery Heater**

Description  
Increases battery starting capability in lower than optimum ambients. Heater is a 6" x 9" pad installed in the battery rack directly under the battery case. Comes complete with an 8' cord and standard duplex plug. 200 watts @ 120 VAC

Part Number  
416-0527

**Battery racks (not recommended for mounting on skids)**

Description  
Holds one #416-0439 (8D) Battery. (Includes hold down bracketry). Holds two 416-0457 (1H) Batteries. (Loose rack, not intended for anchoring).

Part Number  
416-0534

Description  
1.265 specific gravity.

**Electrolyte**

This package listed below is a 6 quart (5.7 liters) single plastic container with a convenient filler tube.

Note: Unless indicated, batteries are shipped dry (less electrolyte).

\* - Battery is shipped filled with electrolyte.

Part Number	416-0363	416-0795	416-0823	416-0796	416-0848	416-0439
Cranking Amps at 0° F.	545	560	620	660	700	N/A
Volts	6	12	12	12	12	12
AMP/HR	135	N/A	N/A	80	180	225
Plates/Cell	19	14	17	16	21	29
Length (inches)	10 -1/8	13	13.45	13	20.80	20-3/4
Width (inches)	6 -7/8	6.80	6.78	6.80	8.80	11
Height (inches)	8-3/4	9-1/2	9.16	9-1/2	9-1/2	9-1/2
SAE #	2H	31	30H	31	4D	8D
Ship Weight (Lbs)	30	56	42	62	85	110
QTS. Electrolyte	5	Maint.Free*	Maint.Free*	Maint.Free*	13	15.6

**Specifications**

Part Number	416-0367	416-0457	416-0774	416-0365	416-0579	416-0717
Cranking Amps at 0° F.	150	300	325	364	380	460
Volts	12	6	12	12	12	12
AMP/HR	77	105	90	74	74	57
Plates/Cell	11	15	13	11	11	11
Length (inches)	19 -5/16	8 -7/8	13	13.06	10 -1/4	9.24
Width (inches)	4 -11/32	6-7/8	5.56	6.31	6.80	6.80
Height (inches)	8-7/8	8-3/4	9	8-7/8	9	8.28
SAE #	3EE	1H	29NF	60	24	22F
Ship Weight (Lbs)	37	24	30	33	28	27
QTS. Electrolyte	5.2	4.7	5.1	6.3	5.9	4.7

**Specifications**



## Transfer Switches

OTEC  
40 - 1000 Amp  
3 Pole and 4 Pole



### Description

OTEC series transfer switches provide normal and generator set source monitoring, generator set starting, and load transfer functions for emergency, standby, and optional standby applications. OTEC transfer switches are continuously rated, so they can be applied in applications up to their nameplate rating. The transfer switch power contacts are silver alloy composition with high-pressure design that can withstand thousands of switching cycles without burning, pitting, or welding. They require no routine contact maintenance and provide 100% continuous current ratings.

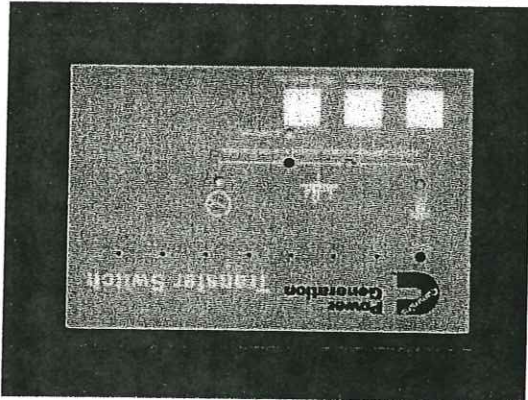
The transfer switch control is reliable and easy to understand, utilizing LED lamps for status indications, and push-button controls for operator functions. The control is field-programmable without use of service tools.

### Features

- **Microprocessor Control** - A fully featured microprocessor control is standard. All features, settings, and adjustments are software-enabled for ease of setup and accuracy.
- **Advanced Transfer Switch Mechanism** - Unique bi-directional linear actuator provides virtually friction-free, constant force, straight-line transfer switch action during automatic operation.
- **Manual Operation** - Manual operating handles, shielded termination, and over-center type contact mechanisms allow effective, manual operation.
- **Positive Interlocking** - Mechanical and electrical interlocking prevent source-to-source connection through the power or control wiring.
- **Main Contacts** - Heavy-duty silver alloy contacts with separate arcing surfaces and multi-leaf arc chutes are rated for total system transfer including overload interruption.
- **Easy Service/Access** - Plug connections, door-mounted controls, ample access space, and compatible terminal markings. The control is field programmable.
- **Product lines, Accessories and Services** - Cummins Power Generation offers a wide range of accessories and services to suit your requirements.
- **Certifications** - Cummins Power Generation OTEC Transfer Switches are certified to a wide range of standards.
- **Warranty** - Cummins Power Generation offers single-source responsibility at both the factory and distributor levels for warranty, service, and parts support.

## Microprocessor-based Control

- Simple, easy-to-use control provides transfer switch information and operator controls
- LED lamps for source availability and source connected indication, exercise mode, and test mode. LED status lamps also provided for control set-up and configuration.
- Control pushbuttons to initiate test, override time delays, and set exercise time.
- Field-configurable for phase check or programmed transition operation.
- Integral exerciser clock
- Control is prototype-tested to withstand voltage surges per EN 60949-6-1.
- Gold flashed generator start contacts



## Control Functions

**Voltage Sensing:** All phases on the normal source, and single phase on the generator source. Normal Source Pickup: adjustable 90-95%, Dropout: adjustable 70-90% of nominal voltage; Generator Source Pickup: 90%, Dropout: 75% of nominal voltage.

**Frequency Sensing:** Generator Source Pickup: 90% of nominal frequency; Dropout: 75% of nominal frequency.

**Operating Modes:** Open transition with programmed transition (adjustable 0-10 seconds); Open transition with phase check monitor and programmed transition backup; Exercise mode; and Test mode.

**Phase Check:** Configurable for initiation of transfer functions when sources are in phase, and including ability to enable a programmed transition backup to the function so that if sources are not in-phase within 120 seconds the system will activate the programmed transition function.

**Exerciser Clock:** Integral exerciser configurable for operation on 7, 14, 21, or 28-day cycle. Includes 12-hr offset for more convenient setting of exercise time. Fixed 20 minute exercise duration.

## Time-Delay Functions

**Engine Start:** Prevents nuisance genset starts due to momentary power system variation or loss. Adjustable set-points, 0-10 seconds, default 3 seconds.

**Transfer Normal to Emergency:** Allows genset to stabilize before application of load. Prevents power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems. Adjustable set-points, 0-300 seconds, default 5 seconds.

**Retransfer Emergency to Normal:** Allows the utility to stabilize before retransfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems. Adjustable set-points, 0-30 minutes, default 10 minutes.

**Genset Stop:** Maintains availability of the genset for immediate reconnection in the event that the normal source fails shortly after transfer. Allows gradual genset cool down by running unloaded. Not included in utility-to-utility systems. Adjustable set-points, 0-30 minutes, default 10 minutes.

**Programmed Transition:** Controls the speed of operation of the transfer switch power contacts to allow load generated voltages from inductive devices to decay prior to connecting a live source. Transfer switch and control design prevents the device from being "stuck in neutral" position. Adjustable set-points, 0-10 seconds, default 0 seconds.

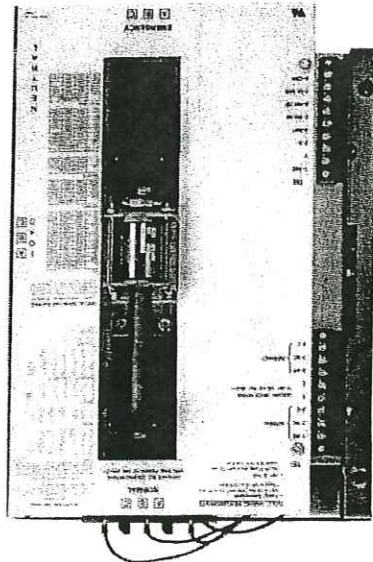
**Elevator Signal:** Provides an adjustable time delay to prevent interruption of power during elevator operation or as a load disconnect signal. Adjustable set-points, 0-300 seconds, default 0 seconds. Configurable for pre-transfer only, or pre-transfer through post-transfer. (Requires optional elevator signal relay for use.)

## Options

**Elevator Signal Relay:** Provides 2 N/O and 2 N/C contacts for the elevator signal function. Contact rating is 10A @ 600VAC.

**Programmable Exerciser Clock:** Provides a fully-programmable 7 day clock to provide greater flexibility in scheduling exercise periods and exercise duration, than standard integral exerciser.

## Transfer Switch Mechanism



- A bi-directional linear motor actuator powers OTEC Transfer Switches. This design provides virtually friction-free, constant force, straight-line transfer switch action with no complex gears or linkages.
- Independent break-before-make action is used for both 3-pole and 4-pole/switched neutral switches. On 3-pole/switched neutral switches, this action also prevents the objectionable ground currents and nuisance ground fault tripping that can result from overlapping designs.
- A mechanical interlock prevents simultaneous closing of a normal and emergency contacts.
- Electrical interlocks prevent simultaneous closing signals to normal and emergency sources and interconnection of normal and emergency sources through the control wiring.
- Long-life, high pressure, silver alloy contacts resist burning and pitting. Separate arcing surfaces further protect the main contacts. Contacts are mechanically held in both normal and emergency positions for reliable, quiet operation.

## Specifications: Transfer Switch Mechanism

- Voltage Rating  
Transfer switches rated from 40 A through 1000 A are rated up to 600 VAC, 50 or 60 Hz.
- Arc Interruption  
Multiple leaf arc chutes cool and quench the arcs. Barriers prevent interphase flashover.
- Neutral Bar  
A full current-rated neutral bar with lugs is standard on enclosed 3-pole transfer switches.
- Auxiliary Contacts  
Two contacts (one for each source) are provided for customer use. Wired to terminal block for easy access. Rated at 10A continuous and 250 VAC maximum.
- Operating Temperature  
-22°F (-30°C) to 140°F (60°C)
- Storage Temperature  
-40°F (-40°C) to 140°F (60°C)
- Humidity  
Up to 95% relative, non-condensing
- Altitude  
Up to 10,000 ft (3,000 m) without derating
- Total Transfer Time  
Will not exceed 6 cycles at 60 Hz with normal voltage applied to the actuator and without programmed transition enabled.
- Manual Operation Handles  
Transfer switches are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation.

## Transfer Switch Lug Capacities

All lugs accept copper or aluminum wire unless indicated otherwise. Do not run control wiring through power cable conduit or raceway.

Amp Rating	Cables Per Phase	Size
40-70, 125	1	#12 AWG-2/0
150, 225	1	#6 AWG - 300 MCM
260	1	#6 AWG - 400 MCM
300, 400	1	3/0 - 600 MCM
300, 400	2	3/0 - 250 MCM
600	2	250 - 500 MCM
800 - 1000	4	250 - 500 MCM

Amp Rating	Cabinet Type	Outline Drawing	Height		Width		Depth, Door Closed		Depth, Door Open		Weight	
			in	mm	in	mm	in	mm	in	mm	lb	kg
40, 70, 125	3R, 12	310-0453	34.0	864	26.5	673	12.5	318	36.5	927	125	57
			4	310-0445	42.5	1080	30.5	775	46.0	1118	215	97
150, 225	3R, 12	310-0454	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102
			4	310-0446	59.0	1499	27.5	699	41.5	1054	275	125
260	3R, 12	310-1315	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186
			4	310-0457	4	310-1316	4	310-1315	4	310-0447	4	310-0455
300, 400, 600	3R, 12	310-1315	59.0	1499	27.5	699	16.5	419	41.5	1054	275	125
			4	310-1316	4	310-1315	4	310-0447	4	310-0455		
800, 1000	3R, 12	310-0457	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186
			4	310-0449	4	310-0457	4	310-1316	4	310-1315		

Enclosure Dimensions - Transfer Switch in U.L. Type 3R, 4 or 12 Enclosure

Amp Rating	Outline Drawing	Height		Width		Depth Door Closed		Depth Door Open		Weight	
		in	mm	in	mm	in	mm	in	mm	lb	kg
40-70, 125	310-0544	27.0	686	20.5	521	12.0	305	31.5	800	82	37
150, 225	310-0414	35.5	902	26.0	660	16.0	406	41.0	1042	165	75
260	310-0540	43.5	1105	28.5	724	16.0	406	43.0	1093	170	77
300, 400, 600	310-1307	54.0	1372	25.5	648	18.0	457	42.0	1067	225	102
800, 1000	310-0417	68.0	1727	30.0	762	19.5	495	48.5	1232	360	163

Enclosure Dimensions - Transfer Switch in U.L. Type 1 Enclosure

The transfer switch and control are mounted in a single-door key-locking enclosure. Enclosures are all UL tested and type-rated. Wire bend space complies with 2002 NEC.

**Enclosures**

Transfer Switch Ampere	Max WCR@Volts with Current Limiting Fuses	Max Fuse, Size and Type	Drawing Reference
40 - 125	200,000 @ 600	200 A Class, J, RK1, RK5, T	098-6885
150, 260	200,000 @ 600	1200 A Class L or T, or 600 A Class J, RK1, RK5	098-6886
300 - 600	200,000 @ 600	1200 A Class L or T, or 600 A Class J, RK1, RK5	098-6887
800 - 1000	200,000 @ 600	2000 A Class L or 1200 A Class T or 600 A Class J, RK1, RK5	098-6888

**FUSE PROTECTION**

Transfer Switch Ampere	Max WCR@Volts with Specific MCCBs	Max MCCB Rating	Drawing Reference	With Specific Current Limiting Breakers (CLB)	Max CLB Rating	Drawing Reference
40 - 125	14,000 @ 600	225 A	098-6885	200,000 @ 600	225 A	098-6918
150, 260	30,000 @ 600	400 A	098-6886	200,000 @ 600	400 A	098-6919
300 - 600	65,000 @ 600	1200 A	098-6887	200,000 @ 600	1200 A	098-6920
800 - 1000	50,000 @ 600	1400 A	098-6888	200,000 @ 600	1400 A	098-6921

**MCCB PROTECTION**

**CURRENT LIMITED BREAKER PROTECTION**

The transfer switches listed below must be protected by circuit breakers or fuses. Reference drawings include detailed listings of specific breakers or fuse types that must be used with the respective transfer switches. Consult with your Distributor/Dealer to obtain the necessary drawings. Withstand and Closing Ratings (WCR) are stated in symmetrical RMS amperes.

**UL Withstand and Closing Ratings**

# Submittal Detail

Feature Code

Current Ratings (Amps)

[ ]	NA	40
[ ]	NA	70
[ ]	NA	125
[ ]	NA	150
[ ]	NA	225
[ ]	NA	260
[ ]	NA	300
[ ]	NA	400
[ ]	NA	600
[ ]	NA	800
[ ]	NA	1000

## Voltage (Line-Line) Ratings

[ ]	R020	120
[ ]	R038	190
[ ]	R021	208
[ ]	R022	220
[ ]	R023	240
[ ]	R024	380
[ ]	R025	416
[ ]	R035	440
[ ]	R026	480
[ ]	R027	600

## Pole Configuration

[ ]	A028	Poles - 3 (Solid Neutral)
[ ]	A029	Poles - 4 (Switched Neutral, 150A +)

## Frequency

[ ]	A044	60 Hertz
[ ]	A045	50 Hertz

## Application

[ ]	A035	Utility to Genset
[ ]	A041	Single Phase, 2-wire or 3-wire
[ ]	A042	Three Phase, 3-wire or 4-wire

## Enclosure

[ ]	B001	Type 1: General purpose indoor (similar to IEC type IP30)
[ ]	B002	Type 3R: Intended for outdoor use (dustproof and rainproof, similar to IEC type IP34)
[ ]	B003	Type 4: Indoor or outdoor use (water-tight, similar to IEC type IP65)
[ ]	B010	Type 12: Indoor use (dust-tight and drip-tight, similar to IEC type IP61)

## System Options

[ ]	L101	Aux. Relay - 24 VDC Coil - Installed, not wired (for customer use)
[ ]	L102	Aux. Relay - Emergency Position - Relay energized when OTEC in Source 2 (Emergency) position
[ ]	L103	Aux. Relay - Normal Position - Relay energized when OTEC in Source 1 (Normal) position
[ ]	L201	Aux. Relay - 12 VDC Coil - Installed, not wired (for customer use)
[ ]	L202	Aux. Relay - Emergency Position - Relay energized when OTEC in Source 2 (Emergency) position
[ ]	L203	1 Aux. Relay - Normal Position - Relay energized when OTEC in Source Normal position

## Auxiliary Relays

Relays are UL-Listed and factory installed. All relays provide rated 10A @ 600 VAC Relay terminals accept (1) 18 Ga. to (2) normally open and (2) normally closed isolated contacts (2) 12 Ga. wires per terminal.

## Warranty

[ ]	G002	Warranty, 1 year Basic
[ ]	G004	Warranty, 2 year Comprehensive
[ ]	G006	Warranty, 5 year Basic
[ ]	G007	Warranty, 5 year Comprehensive
[ ]	G008	Warranty, 10 year Major Components

## Shipping Option

[ ]	A051	Packing - Export Box (800-1000A)
-----	------	----------------------------------

## Applications Modules

[ ]	M002	Terminal Block - Battery Charger Alarms
[ ]	M003	Terminal Block - 30 points (not wired)

## Battery Chargers

[ ]	K001	Battery Charger - 2 Amps, 12/24 Volts
[ ]	K002	Battery Charger - 10 Amps, 12 Volts
[ ]	K003	Battery Charger - 10 Amps, 24 Volts

## Control Options

[ ]	J030	Clock, External Exercise
[ ]	M032	Relay, Elevator Signal

## Control Voltage

[ ]	M033	12V, Genset Starting Voltage
[ ]	M034	24V, Genset Starting Voltage

## Listing

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Feature Code

[ ]	A046	Listing - UL 1008/CSA Certification
-----	------	-------------------------------------

## Available Products and Services

A wide range of products and services is available to match your power generation system requirements. Cummins Power Generation products and services include:

- Diesel and Spark-ignited Generator Sets
- Transfer Switches
- Bypass Switches
- Parallel Load Transfer Equipment
- Digital Paralleling Switchgear
- PowerCommand Network and Software
- Distributor Application Support
- Planned Maintenance Agreements

## Warranty

All components and subsystems are covered by an express, limited one-year warranty. Extended factory warranties and local distributor maintenance agreements are also available.

## Certifications

Transfer switches meet or exceed leading code requirements:

NEMA - All switches comply with NEMA ICS 10

ISO9001 - This transfer switch was designed and manufactured in facilities certified to ISO9001

CSA - All switches are CSA certified up to 600 VAC

NFPA Testing - A complete representative prototype transfer switch has been subjected to a number of demanding tests to verify the design integrity and performance under both normal and abnormal operating conditions per the requirements of NFPA 70, 99, and 110

UL - All switches are UL 1008 Listed, and factory or field installed switch accessories comply with UL Listing; UL Type Rated cabinets; UL Listed CU-AL terminals



## See your distributor for more information



Cummins Power Generation

1400 73rd Avenue N.E.

Minneapolis, MN 55432

763.574.5000

Fax: 763.574.5298

Cummins Power Generation is a subsidiary of Cummins Inc.

**Warning:** Backfeed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

