



|                                 |             |
|---------------------------------|-------------|
| 来 歴<br>HISTORY                  | 日 付<br>DATE |
| 納入仕様書<br>DELIVERY SPECIFICATION | 24・07・'07   |
|                                 | ・           |
| 工事図<br>WORKING PLAN             | 23・06・'08   |
|                                 | ・           |
| 完成図<br>FINISHED PLAN            | 14・11・'08   |
|                                 | ・           |

客 先  
CUSTOMER  
Messrs.  
  
SASEBO HEAVY INDUSTRIES CO., LTD.  
  
S. No. 762  
  
CUMMINS WATER COOLED DIESEL ENGINE  
6CTA8. 3D (M)  
175kVA  
EMERGENCY ENGINE GENERATOR SET

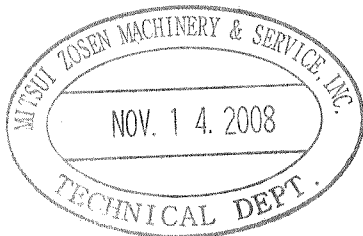
|                      |         |
|----------------------|---------|
| 工 事 番 号<br>WORK. NO. | FHA0108 |
|----------------------|---------|

三井造船マシナリー・サービス株式会社 昭島工場  
東京都昭島市拝島町 3928-3  
  
MITSUI ZOSEN MACHINERY & SERVICE, INC. AKISHIMA  
3928-3 HAIJIMA-CHO AKISHIMA TOKYO, JAPAN

技 術 部  
TECHNICAL DEPARTMENT

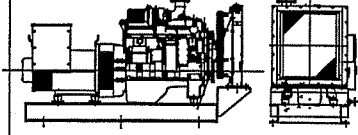
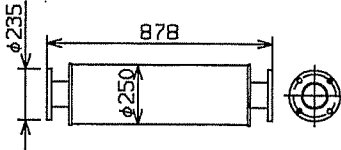
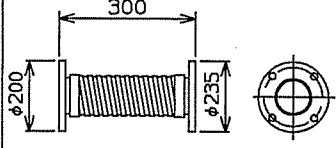
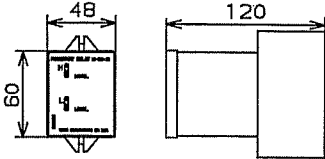
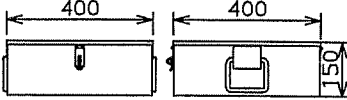
|                            |                  |
|----------------------------|------------------|
| 承 認<br>APPROVED            | <i>K. Futaba</i> |
| 検 認<br>CHECKED             | <i>J. Kuroki</i> |
| 担 当<br>STAFF               | <i>J. Mura</i>   |
| 作 成<br>DRAWING             | <i>S. Ejiri</i>  |
| 作 成 日<br>DATE OF DRAWING   | 24.07.'07        |
| 規 格<br>CLASSIFICATION      | ABS (ACCU)       |
| 発 行 番 号<br>PUBLICATION NO. | 997-62-02-62     |

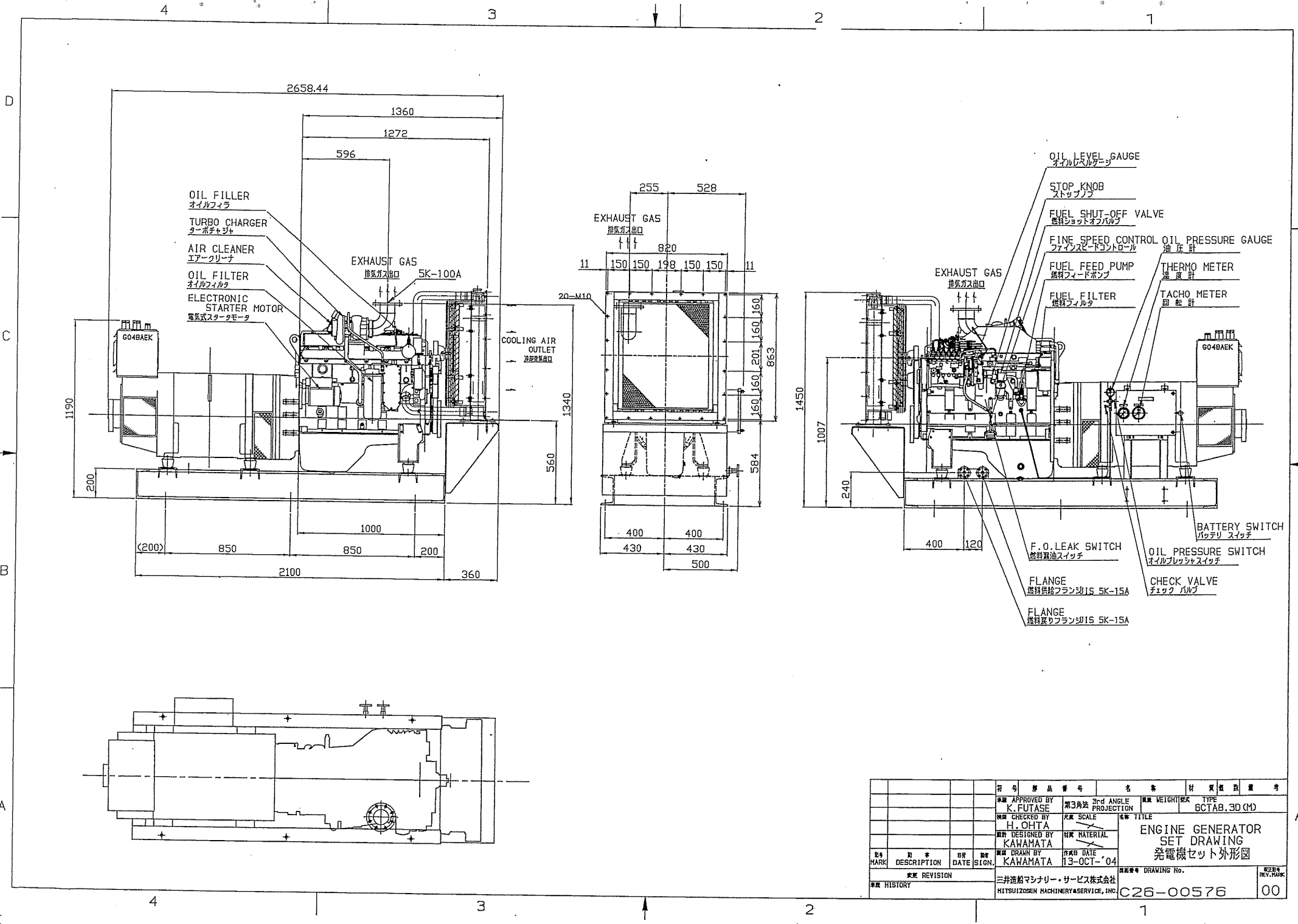
FINISHED PLAN



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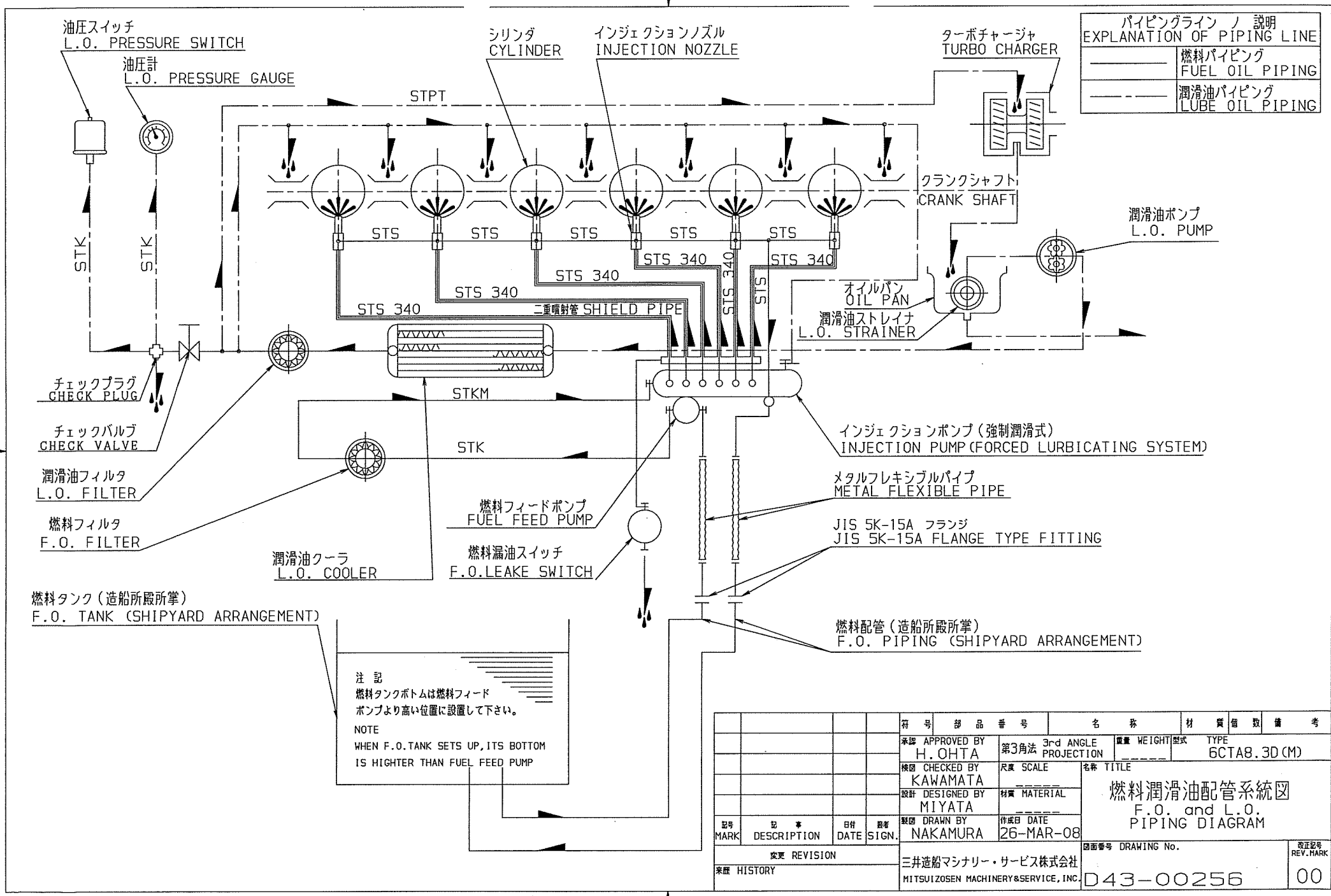
| No.              | TITLE                                 | DRAWING NO.                             | REV.                           | REMARKS |
|------------------|---------------------------------------|---|--------------------------------|---------|
| 1.               | Supply parts list                     | <sup>502</sup><br>P- <del>5073</del>    | 00                             |         |
| 2.               | Engine generator set drawing          | C26-00576                               | 00                             |         |
| Engine relation  |                                       |   |                                |         |
| 3. -1            | Engine specification                  | 6CTA-6019                               | 00                             |         |
| -2               | F.O&L.O. piping diagram               | <sup>256</sup><br>D43-00 <del>177</del> | 00                             |         |
| -3               | Cooling water diagram                 | D41-00032                               | 00                             |         |
| -4               | Air flow data                         | E44-00083                               | 00                             |         |
| -5               | Connection flange for radiator cooler | E60-00659                               | 01                             |         |
| -6               | Exhaust silencer                      | E9-979663                               | 00                             |         |
| -7               | Engine exhaust flexible pipe          | E60-00661                               | 00                             |         |
| Control relation |                                       |   |                                |         |
| 4. -1            | Outfitting specification              | M10226                                  | 02                             |         |
| -2               | Junction box outline                  | D61-00815                               | 00                             |         |
| -3               | Mutual connection                     | E40-03039                               | 01                             |         |
| -4               | Speed relay                           | Sheet No. 51-277                        | 01                             |         |
| Spare parts      |                                       |   |                                |         |
| 5. -1            | Spare parts list                      | <sup>4</sup><br>G6CTA-00 <del>1</del>   | <sup>03</sup><br><del>04</del> |         |
|                  |                                       |   |                                |         |
|                  |                                       |   |                                |         |
|                  |                                       |   |                                |         |
| REVISION         | 1                                     | 2                                       | 3                              | 4       |
| DATE             | 26-03-'08                             |   |                                |         |
| DRAWING          | S. Nakamura                           |   |                                |         |
| REMARKS          | No. 1, 3-1, 5-1                       |   |                                |         |

| 納入部品リスト<br>SUPPLY PARTS LIST |                                |             |  | 整理番号<br>File No.  | P-5502                      | 改正数                        | 1/1 |
|------------------------------|--------------------------------|-------------|--|---|-----------------------------|----------------------------|-----|
| No.                          | 名称<br>Name                     | 数量<br>Q'ty  | 略図<br>Sketch   | 重量<br>Weight  | 塗装色<br>Color                | 備考<br>Remarks              |     |
| 01                           | 発電機セット<br>ENGINE GENERATOR SET | 1           |    | 約<br>APPROX.<br>1800<br>kg                                | マンセル<br>Munsell<br>7.5BG7/2 | 6CTA8.3D(M)                |     |
| 02                           | サイレンサー<br>SILENCER             | 1           |    | 約<br>APPROX.<br>33<br>kg                                  | 耐熱銀ペイント<br>Silver paint     | JIS 5K-125A                |     |
| 03                           | フレキシブルパイプ<br>FLEXIBLE PIPE     | 1           |    | 約<br>APPROX.<br>3.1<br>kg                                 | 耐熱銀ペイント<br>Silver paint     | JIS 5K-100A<br>JIS 5K-125A |     |
| 04                           | スピードリレー<br>SPEED RELAY         | 1           |   | 約<br>APPROX.<br>0.3<br>kg                                 | —                           |                            |     |
| 05                           | 予備品・工具<br>SPARE PARTS・TOOL     | 1           |  | 約<br>APPROX.<br>34<br>kg                                  | マンセル<br>Munsell<br>7.5BG7/2 |                            |     |
| 06                           |                                |             |  |   |                             |                            |     |
|                              |                                |             |  | 承認<br>APPROVED  | 担当<br>STAFF                 | 作成<br>DRAWING              |     |
|                              |                                |             |  | 26-03-'08<br>H.OHTA                                       | 26-03-'08<br>MIYATA         | 26-03-'08<br>NAKAMURA      |     |
| No.                          | 改正<br>REVISION                 | 担当<br>STAFF | 日付<br>DATE   | 三井造船マシナリー・サービス株式会社<br>MITSUIZOSEN MACHINERY&SERVICE, INC. |                             |                            |     |



|    |                          |  |                   |   |
|----|--------------------------|--|-------------------|---|
| 符号 | 部品番号                     | 名称   | 材質                | 製造者   |
| 承認 | APPROVED BY<br>K. FUTASE | 第三角法<br>3rd ANGLE<br>PROJECTION                              | 重量                | 型式<br>TYPE<br>BCTAB.3D(M)                             |
| 検査 | CHECKED BY<br>H. OHTA    | 尺規   | SCALE             | 名称  |
| 設計 | DESIGNED BY<br>KAWAMATA  | 材質   | MATERIAL          | TITLE<br>ENGINE GENERATOR<br>SET DRAWING<br>発電機セット外形図 |
| 製図 | DRAWN BY<br>KAWAMATA     | 作図日  | DATE<br>13-OCT-04 |   |
| 変更 | REVISION                 | 三井造船マシナリー・サービス株式会社<br>HITSUIZOSSEN MACHINERY & SERVICE, INC. |                   |   |
| 履歴 | HISTORY                  | DRAWING No.<br>C26-00576                                     |                   |   |
|    |                          |  |                   | 図番<br>REV. MARK<br>00                                 |

|                                     |   |       |               |                                    |  |         |        |
|-------------------------------------|---|-------|---------------|------------------------------------|--|---------|--------|
| エンジン仕様<br>Engine Specification      | 改正<br>Revision  | 00    | 作成日<br>Date   | '06<br>4/3                         | FUTASE   | H. OHTA | MIYATA |
| 製造元<br>Manufactory                  | 三井造船マシナリー・サービス株式会社<br>MITSUI ZOSEN MACHINERY & SERVICE, INC.            |       |               |                                    |  |         |        |
| MODEL                               | 6CTA8.3D (M)  |       |               |                                    |  |         |        |
| 一般、General                          | 燃料装置 Fuel System  |       |               |                                    |  |         |        |
| 船級<br>Classification                | ABS   |       |               | 燃焼方式<br>Combustion Process         | 直接噴射式<br>Direct Injection  |         |        |
| 適用規格<br>Standard                    | JIS, ISO, DIN   |       |               | 噴射ポンプ<br>Fuel Injection Pump       | ボッシュ式<br>BOSCH Type  |         |        |
| 周囲条件<br>Condition                   | 0~45°C, 101.3kPa, 60%   |       |               | 調速機<br>Governor                    | ボッシュ 遠心メカニカル<br>オールスピード調速機<br>BOSCH Centrifugal mechanical type  |         |        |
| 銘板<br>Name Plate                    | 和文<br>Japanese  | ○     | 英文<br>English | 燃料フィルタ<br>Fuel Oil Filter          | エレメント交換式<br>Changeable cartridge type of paper   |         |        |
| ネジ<br>Screw                         | ISO メートルネジ<br>ISO Metric screw  |       |               | 使用燃料油<br>Fuel Oil                  | ISO8217 : 1996<br>ISO-F-DMX or DMA<br>JIS 2号軽油 又は A重油 引火点≥65°C<br>JIS 2nd Gas Oil OR A-Heavy Oil<br>Flash point≥65°C 42.70 MJ/Kg |         |        |
| 諸元、性能 Performance Specification     | 燃料消費率<br>Specific Fuel Consumption                                      |       |               |                                    |  |         |        |
| 機関名称<br>Name of Engine              | カミンズ水冷ディーゼルエンジン<br>CUMMINS Water cooled Diesel Engine                   |       |               | 燃料消費率<br>Specific Fuel Consumption | 213 g/kWh + 5% (定格出力時)<br>(Cont. Rating)   |         |        |
| 型式<br>Model                         | 6CTA8.3D (M)  |       |               | 冷却装置 Cooling System                |  |         |        |
| 形式<br>Type                          | 4サイクルラジエタ水冷式ディーゼル機関<br>4-Cycle Water Cooled with Radiator Diesel Engine |       |               | 冷却方式<br>Cooling Method             | ラジエタ水冷式<br>Water Cooled with Radiator  |         |        |
| 気筒数<br>Number of Cylinders          | 6   |       |               | 冷却ファン<br>Cooling Fan               | 軸流式<br>Axial-flow blower   |         |        |
| 径×行程<br>Bore×Stroke                 | 114mm×135mm   |       |               | 駆動方式<br>Driving Method             | Vベルト駆動<br>V-Belt drive   |         |        |
| 総排気量<br>Swept Volume                | 8268cm <sup>3</sup>   |       |               | 潤滑装置 Lubrication System            |  |         |        |
| 回転方向<br>Direction of Rotation       | 反時計方向 (フライホイールより見る)<br>Counter Clockwise<br>(Seeing from Flywheel side) |       |               | 潤滑油ポンプ<br>Lubricating Oil Pump     | ギアポンプ<br>Gear pump   |         |        |
| 圧縮比<br>Compression Ratio            | 16.5 : 1  |       |               | 潤滑油クーラ<br>Lubricating Oil Cooler   | ラジエタ水冷式<br>Water Cooled with Radiator Type   |         |        |
| 定格回転数<br>Speed                      | 1800min <sup>-1</sup>   |       |               | 潤滑油フィルタ<br>Lubricating Oil Filter  | エレメント交換式<br>Changeable cartridge type of paper element   |         |        |
| 定格出力<br>Cont. Rating A to DIN 6270  | 188kW(255PS)  |       |               | 潤滑油量<br>Lubricating Oil Capacity   | 最大 Max. 18.9ℓ<br>最小 Min. 15.1ℓ   |         |        |
| 正味平均有効圧力<br>Effective Mean Pressure | 1.51MPa<br>(15.42kg/cm <sup>2</sup> )                                   |       |               | 推奨潤滑油<br>Recommended Lube Oil      | Grade class : CF or CF-4<br>SAE class : 10W-40 or 15W-40 or multi-grade<br>(Ambient Temp. -10°C and above)                       |         |        |
| 定格<br>Rating                        | 連続<br>Continuous  |       |               | 潤滑油消費率<br>Lube Oil Consumption     | 燃料消費量の0.7%<br>0.7% of Fuel consumption   |         |        |
| 許容傾斜角度<br>Permissible inclination   | 前後方向<br>Pitching  | 10°   |               | 速度変調率<br>Speed regulation          | 整定 5%以内<br>Permanent below 5%  |         |        |
|                                     | 左右方向<br>Rolling   | 22.5° |               |                                    | 瞬時 10%以内 (0→90→100%負荷時)<br>Momentary below 10% ((0→90→100%load)  |         |        |
|                                     |   |       |               | III                                |  |         |        |
|                                     |   |       |               | II                                 |  |         |        |
|                                     |   |       |               | I                                  |  |         |        |
|                                     |   |       |               | No.                                | REVISION   | STAFF   | DATE   |



| パイプラインノ説明<br>EXPLANATION OF PIPING LINE |                             |
|---|-----------------------------|
| ———                                     | 燃料パイピング<br>FUEL OIL PIPING  |
| - - - -                                 | 潤滑油パイピング<br>LUBE OIL PIPING |

注記  
 燃料タンクボトムは燃料フィーダ  
 ポンプより高い位置に設置して下さい。  
 NOTE  
 WHEN F.O. TANK SETS UP, ITS BOTTOM  
 IS HIGHTER THAN FUEL FEED PUMP

| 符号                        | 部品番号   | 名称  | 材質      | 個数          | 備考                      |
|---------------------------|--|---|---------|-------------|-------------------------|
| 承認 APPROVED BY<br>H. OHTA | 第3角法 3rd ANGLE<br>PROJECTION                                 | 重量 WEIGHT   | 型式 TYPE | 6CTA8.3D(M) |                         |
| 検閲 CHECKED BY<br>KAWAMATA | 尺度 SCALE   | 名称 TITLE<br>燃料潤滑油配管系統図<br>F.O. and L.O.<br>PIPING DIAGRAM |         |             |                         |
| 設計 DESIGNED BY<br>MIYATA  | 材質 MATERIAL  | 製図 DRAWN BY<br>NAKAMURA                                   |         |             |                         |
| 製図 DATE<br>26-MAR-08      | 図面番号 DRAWING No.<br>D43-00256                                |   |         |             |                         |
| 変更 REVISION               | 三井造船マシナリー・サービス株式会社<br>MITSUI ZOSEN MACHINERY & SERVICE, INC. |   |         |             | 改正記号<br>REV. MARK<br>00 |
| 履歴 HISTORY                |  |   |         |             |                         |





|   |  |           |                                     |
|---|--|-----------|-------------------------------------|
| エンジン型式<br>Engine Type   | 6CTA8.3D (M)   |           |                                     |
| 回転数<br>Engine speed   | min <sup>-1</sup>  | 1800      |                                     |
| 燃焼空気量<br>Combustion air volume ※1   | V <sub>k</sub> m <sup>3</sup> /h   | 780       |                                     |
| ラジエタ冷却空気量<br>Cooling air volume for-<br>radiator cooler ※1  | V <sub>r</sub> m <sup>3</sup> /h   | 13800     |                                     |
| 排気ガス量<br>Exhaust gas volume ※2  | V <sub>EX</sub> m <sup>3</sup> /h  | 2340      |                                     |
| 総必要空気量<br>Necessary air volume  | V <sub>I</sub> =V <sub>k</sub> +V <sub>r</sub> +V <sub>G</sub> m <sup>3</sup> /h | MIN 16040 |                                     |
| 吸入空気及び排気ガス管系の許容抵抗<br>Permissible vacuum pressure of intake system and resistances in<br>the exhaust system. |  |           |                                     |
| 室内空気<br>Room vacuum   | hPa<br>(mmAq)  | MAX -0.49 | (-5)                                |
| 機関排気ガス許容抵抗<br>Exhaust back press. (mmAq)  | hPa  | MAX 99.3  | (1013) (Including Exhaust silencer) |
| ラジエタ排風許容抵抗<br>Radiator back press. (mmAq)   | hPa  | MAX 1.25  | (12.8)                              |

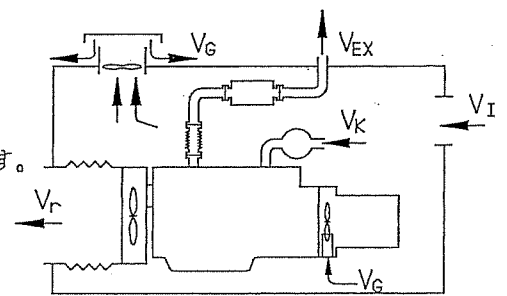
※1 燃焼空気量、冷却空気量は、25℃、100kPa (752mmHg) における量を示す。

Under condition of 25°C, 100kPa (752mmHg).

※2 排気ガス量は、定格出力運転時、排気マニホールド出口における温度、

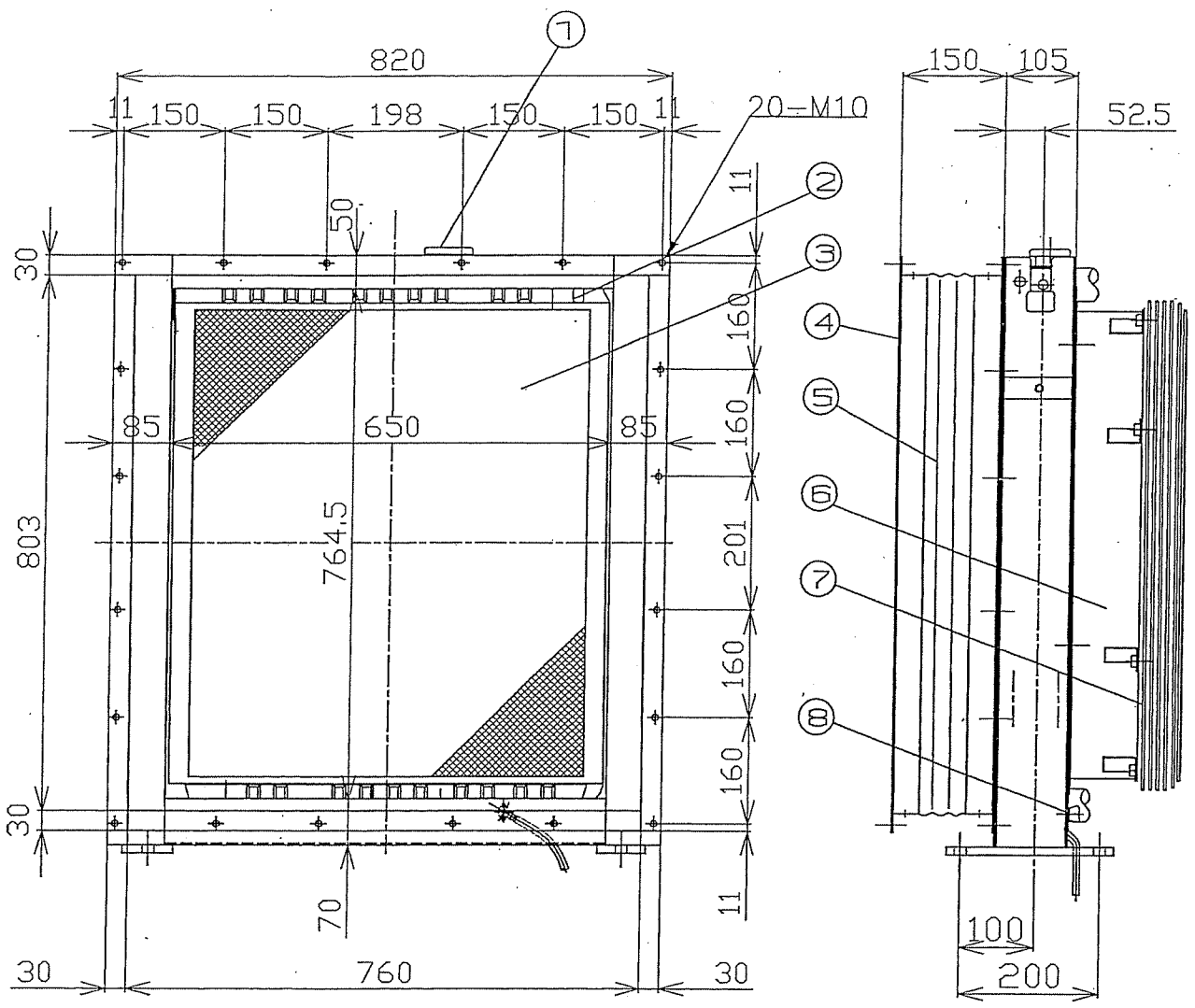
圧力100kPa (752mmHg) での値を示す。

Under condition of 100kPa (752mmHg) at the rated power  
and at temperature of exhaust gas manifold outlet.



(参考図)  
V<sub>I</sub>=V<sub>k</sub>+V<sub>r</sub>+V<sub>G</sub> (Reference)

|                          |                              |   |   |                       |                        |
|--------------------------|------------------------------|---|---|-----------------------|------------------------|
| 符号                       | 部品番号                         | 名称                                      | 材質  | 個数                    | 備考                     |
| 承認 APPROVED BY<br>FUTASE | 第3角法 3rd ANGLE<br>PROJECTION | 重量 WEIGHT                               | 型式 TYPE<br>6CTA8.3D (M)                                     |                       |                        |
| 検図 CHECKED BY<br>H. OHTA | 尺度 SCALE                     | 名称 TITLE<br>燃焼・冷却空気等資料<br>AIR FLOW DATA |   |                       |                        |
| 設計 DESIGNED BY<br>MIYATA | 材質 MATERIAL                  |   |   |                       |                        |
| 記号 MARK                  | 記号 DESCRIPTION               | 日付 DATE                                 | 製者 SIGN.  | 製図 DRAWN BY<br>MIYATA | 作成日 DATE<br>27-SEP-'06 |
| 変更 REVISION              |                              |   | 図面番号 DRAWING No.  |                       | 種類 FORM.               |
| 来歴 HISTORY               |                              |   | 三井造船マシナリー・サービス株式会社<br>MITSUIZOSEN MACHINERY & SERVICE, INC. |                       | 改正記号 REV. MARK<br>00   |
|                          |                              |   |   |                       | E 44-00083             |



**FILLING CAPACITIES :**

- ENGINE COOLING WATER ABT : 12.3L

- COOLING WATER FOR RADITOR WITH PIPINGSYSTEM ABT : 9.8L

TOTAL : 22.1L

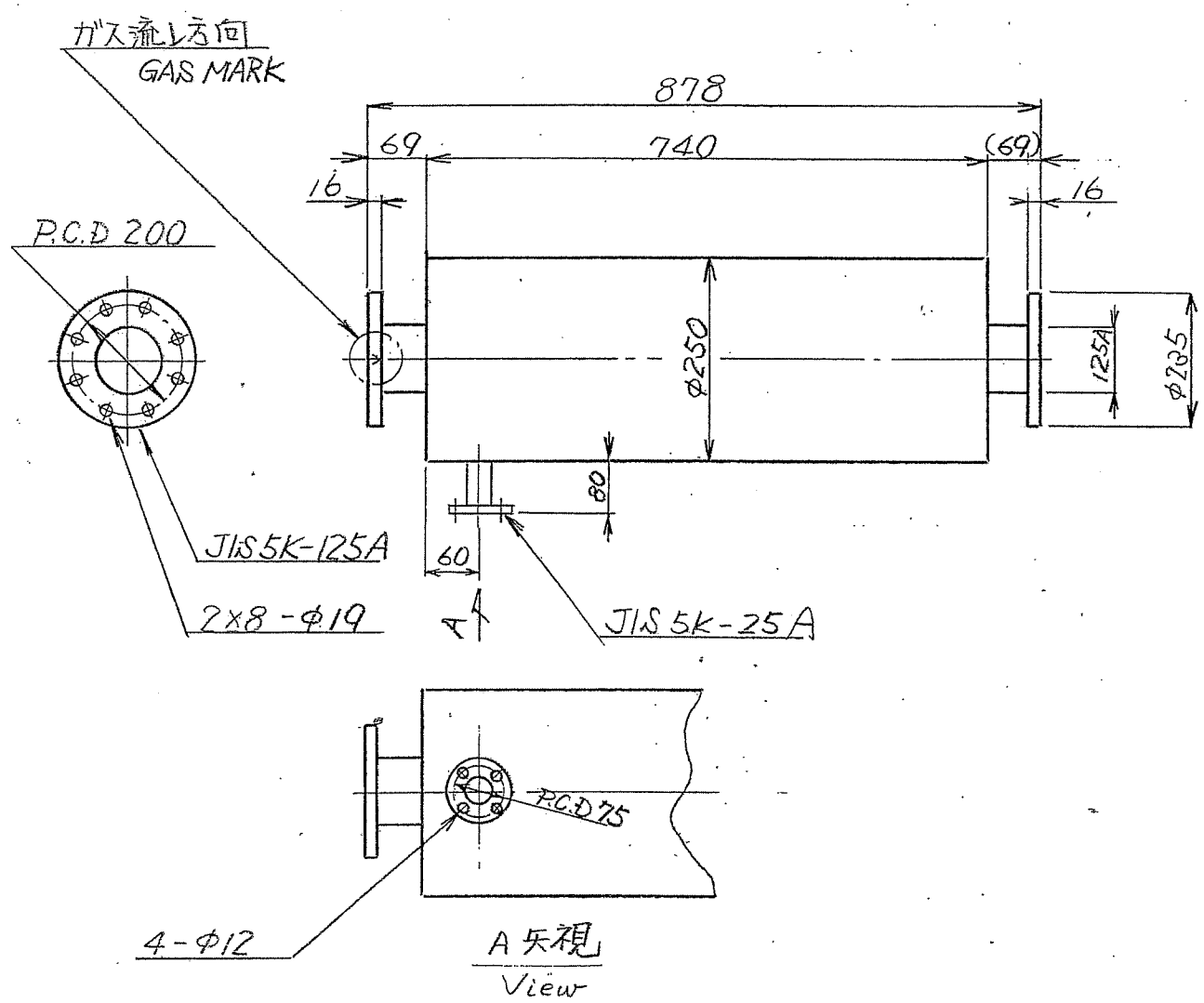
|   |       |               |                               |   |  |
|---|-------|---------------|-------------------------------|---|--|
| 8 | _____ | COCK          | ASSY                          | 1 |  |
| 7 | _____ | WIRE NET      | SS400                         | 1 |  |
| 6 | _____ | SHROUD        | SPHC                          | 1 |  |
| 5 | _____ | FLEXIBLE DUCT | ANTI HEAT AND FIREPROOF CLOTH | 1 |  |
| 4 | _____ | JOINT PLATE   | SS400                         | 1 |  |
| 3 | _____ | CORE          | ASSY                          | 1 |  |
| 2 | _____ | TANK COMP.    | SS400                         | 1 |  |
| 1 | _____ | PRESSURE CAP  | SUS304                        | 1 |  |

| 符号          | 部品番号                        | 名称   | 材質                   | 個数                                       | 備考             |
|-------------|-----------------------------|--|----------------------|--|----------------|
|             | 承認 APPROVED BY<br>H. AMANO  | 第3角法 3rd ANGLE PROJECTION                                    | 重量 WEIGHT            | 型式 TYPE<br>6CTA8.3D(M)                   |                |
|             | 検図 CHECKED BY               | 尺度 SCALE   | 名称 TITLE             |  |                |
| ▲           | COCK図追加<br>25-NOV-08 MIYATA | 設計 DESIGNED BY<br>KAWAMATA                                   | 材質 MATERIAL          | CONNECTION FLANGE FOR<br>RADIATOR COOLER |                |
| 記号 MARK     | 記事 DESCRIPTION              | 日付 DATE  | 製者 SIGN.<br>KAWAMATA |  |                |
| 変更 REVISION |                             | 図面番号 DRAWING No.   |                      | 種類 FORM.                                 | 改正記号 REV. MARK |
| 来歴 HISTORY  |                             | 三井造船マシナリー・サービス株式会社<br>MITSUIZOSSEN MACHINERY & SERVICE, INC. |                      | E60-00659                                | 00 01          |

|           |           |       |
|-----------|-----------|-------|
| 寸法公差      | 区         | 分     |
| JIS B0001 | 中級        | オコエ   |
| ±0.1      |           | 6     |
| ±0.2      | 6         | 30    |
| ±0.3      | 30        | 120   |
| ±0.5      | 120       | 315   |
| ±0.8      | 315       | 1,000 |
| ±1.2      | 1,000     | 2,000 |
| 一般        | JIS B0404 | 16級   |
| 特殊品       | JIS B0407 | 差級    |
| 鋼材        | JIS B0408 | D級    |
| 鋼材        | JIS B0410 | B級    |
| 鋼材        | JIS B0412 | 中級    |
| 鋼材        | JIS B0414 | 差級    |
| 鋼材        | JIS マートル  | 2級    |
| 表面粗さ      | JIS B0601 |       |
| 仕上げ記号     | 区分        |       |
| -         | 平面        |       |
| ▽         | 100S以下    |       |
| ▽▽        | 25S以下     |       |
| ▽▽▽       | 6.3S以下    |       |

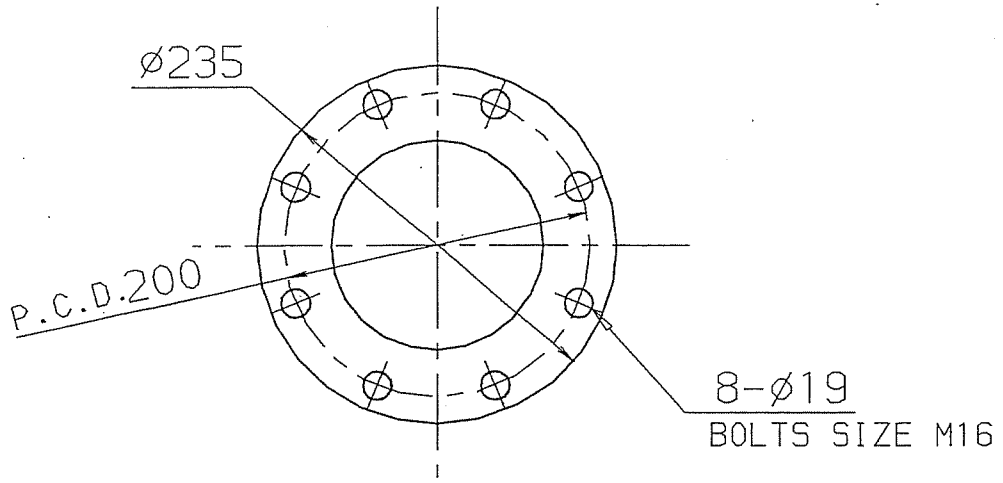
塗装 : 耐熱銀色塗装

PAINTING : SILVER COLORED HEATPROOF PAINT



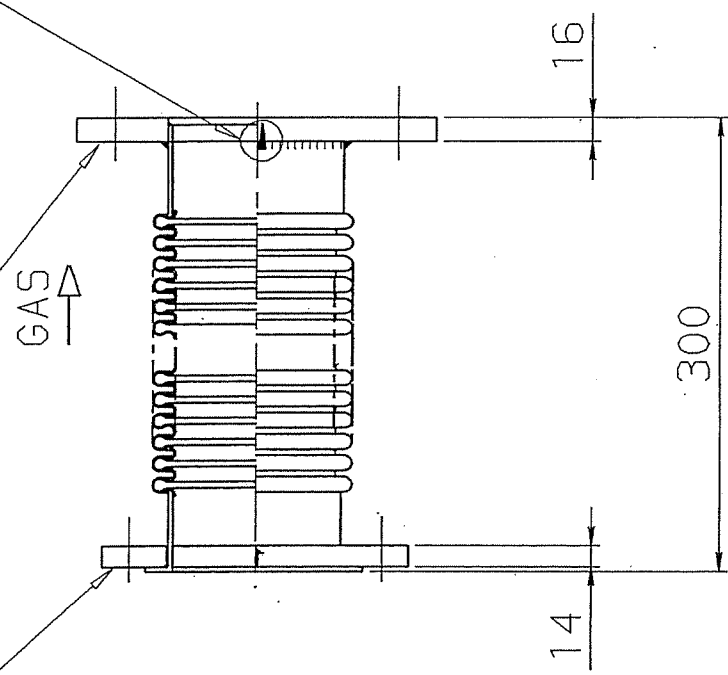
TYPE KN-125 F

|                             |             |      |       |                |                           |   |             |           |                    |    |    |
|-----------------------------|-------------|------|-------|----------------|---------------------------|---|-------------|-----------|--------------------|----|----|
| III                         |             |      |       | 符号             | 部                         | 番 | 名           | 称         | 材質                 | 個数 | 備考 |
| II                          |             |      |       | 承認 APPROVED BY | 第1角法 1st ANGLE PROJECTION |   |             | 重量 WEIGHT | 型式 TYPE            |    |    |
| I                           |             |      |       | 検閲 CHECKED BY  | 尺度 SCALE                  |   | 名称 TITLE    |           |                    |    |    |
| MF                          | 記号          | 記事   | 日付    | 検者             | 設計 DESIGNED BY            |   | 材質 MATERIAL |           | サイレンサー<br>SILENCER |    |    |
| マーク                         | DESCRIPTION | DATE | SIGN. | 製図 DRAWN BY    | 作成日 DATE                  |   | CF. CODE    |           |                    |    |    |
| 変更 REVISION                 | No. 41-76   |      |       | F201289        |                           |   | 11.4.89     |           | 図面番号 DRAWING No.   |    |    |
| イツ・ディーゼル・エンジン株式会社           |             |      |       | 部品番号 PARTS No. |                           |   | CF. CODE    |           | 改正記号 REVMARK       |    |    |
| PUTZ DIESEL ENGINE CO.,LTD. |             |      |       | 04141060       |                           |   | E9-979663   |           |                    |    |    |

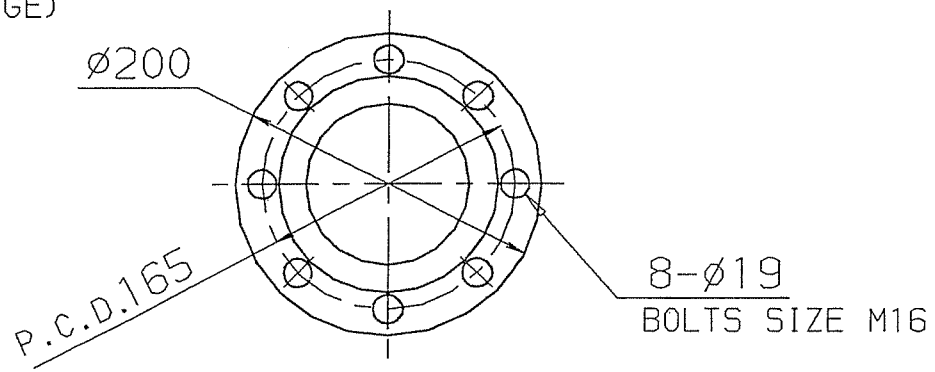


GAS MARK  
ガス流れ方向

JIS 5K-125A  
フランジ (FLANGE)

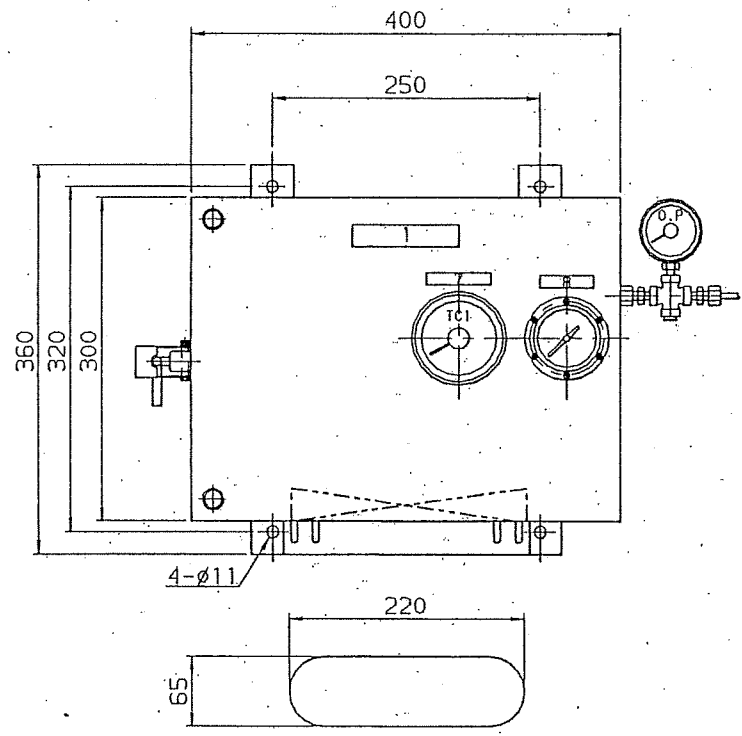
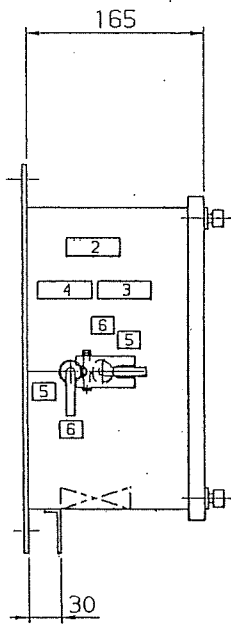


JIS 5K-100A  
フランジ (FLANGE)



|             |                    |            |             |  |                              |                            |             |                   |     |  |
|-------------|--------------------|------------|-------------|--|------------------------------|----------------------------|-------------|-------------------|-----|--|
|             |                    |            |             | 符 号  | 部 品 番 号                      | 名 称                        | 材 質         | 個 数               | 備 考 |  |
|             |                    |            |             | 承認 APPROVED BY<br>H. AMANO                                   | 第3角法 3rd ANGLE<br>PROJECTION | 重量 WEIGHT                  | 型式 TYPE     | ALL               |     |  |
|             |                    |            |             | 検図 CHECKED BY  | 尺 度 SCALE<br>1/5             | 名 称 TITLE<br><br>フレキシブルパイプ |             |                   |     |  |
|             |                    |            |             | 設計 DESIGNED BY<br>KAWAMATA                                   | 材 質 MATERIAL<br>SS41, SUS    |                            |             |                   |     |  |
| 記号<br>MARK  | 記 事<br>DESCRIPTION | 日付<br>DATE | 発者<br>SIGN. | 製図 DRAWN BY<br>KAWAMATA                                      | 作成日 DATE<br>11-DEC-01        |                            |             |                   |     |  |
| 変更 REVISION |                    |            |             | 三井造船マシナリー・サービス株式会社<br>MITSUIZOSSEN MACHINERY & SERVICE, INC. |                              | 図面番号 DRAWING No.           | 種類<br>FORM. | 改正記号<br>REV. MARK |     |  |
| 未履 HISTORY  |                    |            |             |  |                              | E60-00661                  | EE          | 00                |     |  |

|  |  | 整理番号<br>File No.  |    | M10226  |                     |                                    |
|--|--|---|----|---|---------------------|------------------------------------|
| 非常用発電機セット<br>Emergency Generator Set     |  | 改正<br>Revision  | II | 作成日<br>Date   | 10/18               | H. AMANO KAWAMATA KAWAMATA         |
| 機装仕様<br>Outfitting Specification         |  | 三井造船マシナリー・サービス株式会社<br>MITSUI ZOSEN MACHINERY & SERVICE, INC.<br>技 術 部<br>TECHNICAL DEPARTMENT |    |   |                     |                                    |
| 始動装置<br>Starting System                  |  | 電気式スタータモータ<br>Electric starter motor<br>24V-7.8kW   |    | 保護スイッチ Safety Switch  |                     |                                    |
| 始動装置<br>Starting System                  |  | 空気式スタータ<br>Air starter  |    | 保護スイッチ<br>Safety Switch   | 付<br>Provided       | 警報<br>Alarm                        |
| 調速装置<br>Speed Control Device             |  | 微調速<br>Fine Speed Control   |    | 冷却水温度スイッチ<br>温度106±5℃ ≤ "ON"<br>Cooling Water Thermo Switch<br>Temperature 106±5℃ ≤ "ON"                  | ○                   | ESB<br>○<br>*                      |
| 調速装置<br>Speed Control Device             |  | 微調速ノブ<br>Fine speed control knob  |    | 始動渋滞<br>Start Failure   | —                   | —                                  |
| 停止装置<br>Stop Control Device              |  | ストップピン<br>Stop pin  |    | 潤滑油圧カスイッチ<br>圧力 0.08±0.02MPa ≥ "ON"<br>Oil Pressure Switch<br>Pressure 0.08±0.02MPa ≥ "ON"                | ○                   | ESB<br>○<br>*                      |
| 停止装置<br>Stop Control Device              |  | シャットオフバルブ<br>Shutoff Valve  |    | 過速度スイッチ<br>回転数115±3%min <sup>-1</sup> ≤ "ON"<br>Over Speed Switch<br>Speed 115±3%min <sup>-1</sup> ≤ "ON" | ○                   | ESB<br>○<br>*<br>ESB<br>○<br>*     |
| 操作パネル<br>Control Panel (Engine side)     |  | 回転計<br>Tachometer   |    | 漏油スイッチ<br>燃料噴射管漏油時 "OFF"<br>Flowt Switch<br>Injection pipe leak "OFF"                                     | ○                   | ESB<br>○<br>MONITOR                |
| 潤滑油圧計<br>Oil Pressure Gauge              |  | 電気式<br>Electrical   |    | * COMMON ALARM ON MONITOR   |                     |                                    |
| 潤滑油圧計<br>Oil Pressure Gauge              |  | ブルドン管式<br>Bourdon tube type   |    | その他 Others  |                     |                                    |
| 冷却水温度計<br>Cooling Water Thermo Indicator |  | 液封式<br>Capillary tube type  |    | バッテリーチャージャ<br>Battery Charger   | ○                   | 造船所手配<br>Shipyards Supply          |
| 排気温度計<br>Exhaust Thermo Indicator        |  | 無<br>Without  |    | 回転体保護<br>Protect of Rotative Parts  | ○                   | V-ベルトガード<br>V-Belt Guard           |
| 排気温度計<br>Exhaust Thermo Indicator        |  | 棒状<br>Rod type  |    | エアークリーナ<br>Air Cleaner  | ○                   | ドライ式<br>Dry type                   |
| 排気温度計<br>Exhaust Thermo Indicator        |  | ゲージ状<br>Gauge type  |    | 防振材<br>Vibration insulator  | ○                   | 防振ゴム<br>Rubber Insulator           |
| 時間計<br>Hours                             |  | 付 電気式<br>Provided Electrical  |    | 工具<br>Tool  | ○                   | 標準<br>Standard                     |
| 時間計<br>Hours                             |  | 無<br>Without  |    | 予備品<br>Spare Parts List   | ○                   | 船級標準<br>Standard of Classification |
| バッテリースイッチ<br>Battery Switch              |  | 無<br>Without  |    |   |                     |                                    |
| バッテリースイッチ<br>Battery Switch              |  | 付<br>Provided   |    |   |                     |                                    |
| バッテリースイッチ<br>Battery Switch              |  | 標準<br>standard  |    |   |                     |                                    |
| バッテリースイッチ<br>Battery Switch              |  | 2群<br>Two bands   |    |   |                     |                                    |
| 制御盤<br>Engine Control Panel              |  | 無<br>Without  |    | II  | 潤滑油圧S.W設定許容値訂正      | EJIRI 14-02-'06                    |
| 制御盤<br>Engine Control Panel              |  | 付<br>Provided   |    | I   | 油圧S.W設定値, 温度S.W動作変更 | EJIRI 14-05-'02                    |
| 制御盤<br>Engine Control Panel              |  |   |    | No.   | REVISION            | STAFF DATE                         |

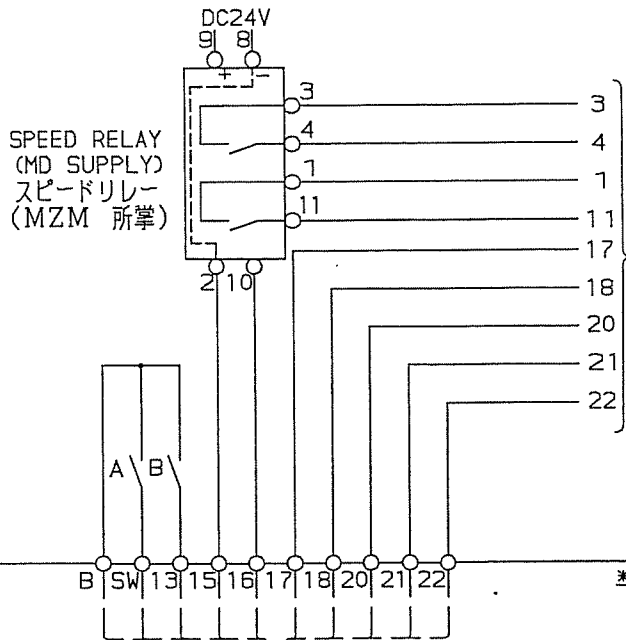


| No | 日本語         | ENGLISH         |
|----|-------------|-----------------|
| 1  | 接続箱         | JUNCTION BOX    |
| 2  | バッテリースイッチ   | BATTERY SWITCH  |
| 3  | No. 1 バッテリー | No.1 BATTERY    |
| 4  | No. 2 バッテリー | No.2 BATTERY    |
| 5  | 入           | ON              |
| 6  | 切           | OFF             |
| 7  | 回転計         | TACHO METER     |
| 8  | 冷却水温度計      | C.W. TEMP METER |

|             |  |                |  |         |  |          |  |   |  |                           |  |  |  |         |  |                 |  |          |  |                |  |
|-------------|--|----------------|--|---------|--|----------|--|---|--|---------------------------|--|--|--|---------|--|-----------------|--|----------|--|----------------|--|
| 記号 MARK     |  | 記号 DESCRIPTION |  | 日付 DATE |  | 検査 SIGN. |  | 符号 部品番号   |  | 名称                        |  | 材質   |  | 図数      |  | 備考              |  |          |  |                |  |
|             |  |                |  |         |  |          |  | 承認 APPROVED BY<br>H. AMANO                                |  | 第3角法 3rd ANGLE PROJECTION |  | 重量 WEIGHT                                  |  | 型式 TYPE |  | ALL             |  |          |  |                |  |
|             |  |                |  |         |  |          |  | 検査 CHECKED BY   |  | 尺規 SCALE<br>1/5.          |  | 名称 TITLE<br>JUNCTION BOX OUTLINE<br>接続箱外形図 |  |         |  |                 |  |          |  |                |  |
|             |  |                |  |         |  |          |  | 設計 DESIGNED BY<br>KAWAMATA                                |  | 材料 MATERIAL               |  |  |  |         |  |                 |  |          |  |                |  |
|             |  |                |  |         |  |          |  | 製図 DRAWN BY<br>KAWAMATA                                   |  | 作図日 DATE<br>19-DEC-01     |  |  |  |         |  |                 |  |          |  |                |  |
| 改訂 REVISION |  |                |  |         |  |          |  | 三井造船マシナリー・サービス株式会社<br>HITSUIZOSEN MACHINERY SERVICE, INC. |  |                           |  |  |  |         |  | 図番号 DRAWING No. |  | 仕番 FORH. |  | 改訂記号 REV. MARK |  |
| 履歴 HISTORY  |  |                |  |         |  |          |  |   |  |                           |  |  |  |         |  | D61-00815       |  | 00 00    |  |                |  |

NOTE 注記

- A: Engine start signal : ON  
クランキング時
- B: Engine stop signal : ON  
ソレノイド作動時
- 3-4: Engine running (above 500min<sup>-1</sup>) : ON  
エンジン運転時
- 1-11: Over speed (above 2070min<sup>-1</sup>) : ON  
過速度時
- 17-18: L.O. Low press (0.08±0.01MPa) : ON  
油圧低下時
- 17-20: C.W. High temp (106±5C) : ON  
冷却水温度上昇
- 21-22: F.O. LEAK : OFF  
燃料漏油時



CONTROL PANEL (SHIPYARD ARRANGEMENT)  
コントロールパネル (造船所殿所掌)

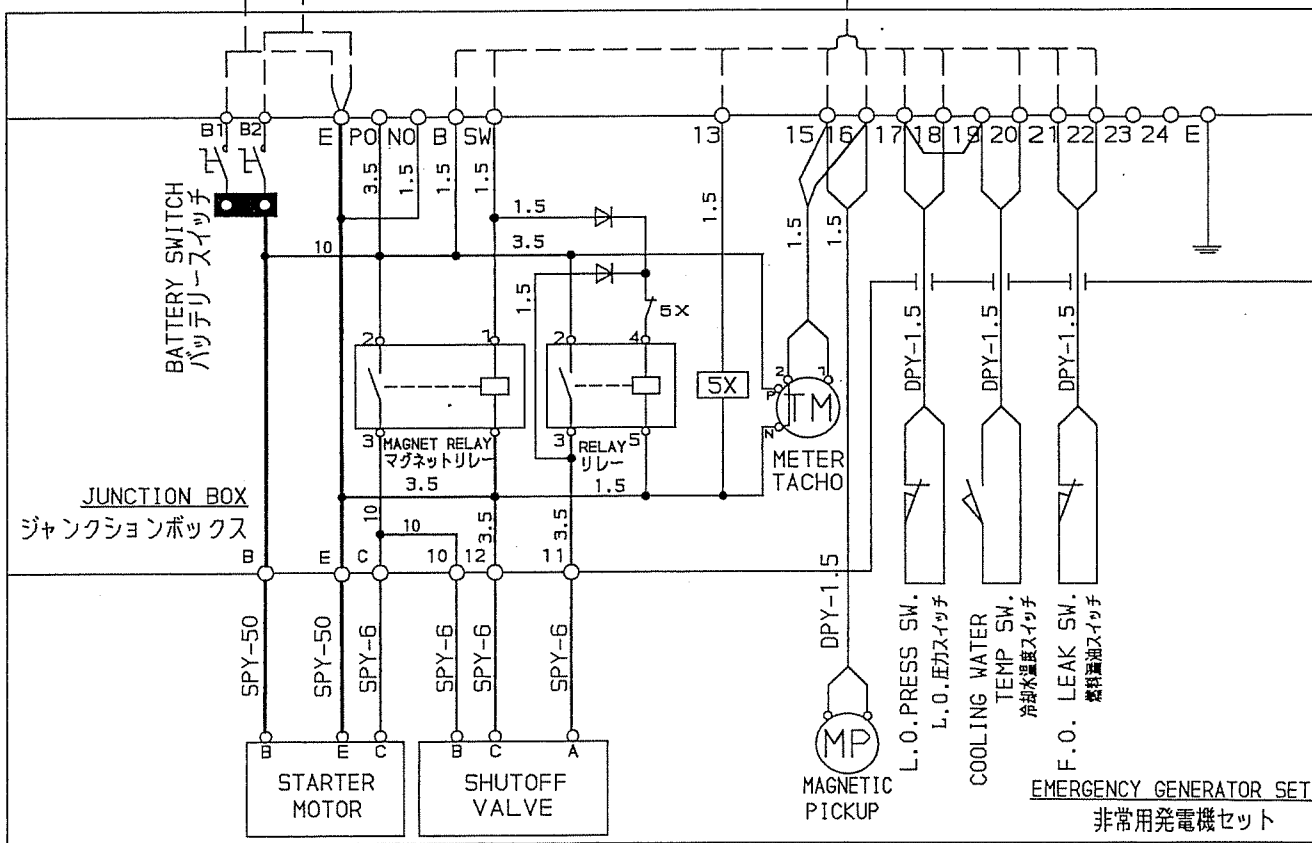
\*ALL DOTTED CABLE SHALL BE PROVIDE BY SHIPYARD

\*点線ニテ示シタ配線材ハ造船所ニテ御用意下サイ

TO BATTERY (DC24V)  
バッテリーへ

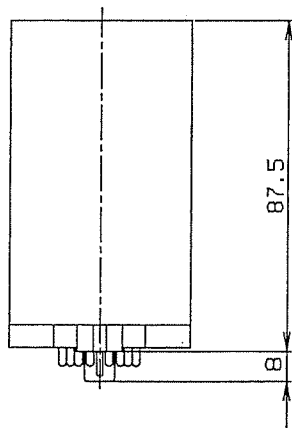
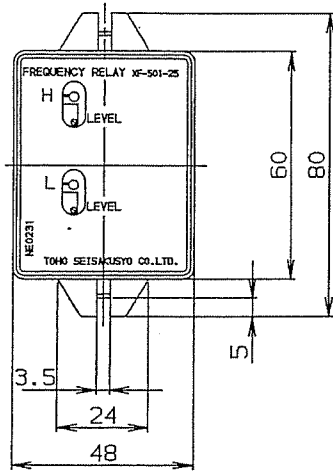
\*250V-MPYC-12

No.1 BATTERY (H-DPYC-50)  
No.2 BATTERY (H-DPYC-50)

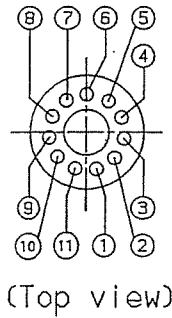


|             |                |         |          | 符号                                    | 部品番号                         | 名称                         | 材質      | 個数  | 備考 |                |
|-------------|----------------|---------|----------|---------------------------------------|------------------------------|----------------------------|---------|-----|----|----------------|
|             |                |         |          | 承認 APPROVED BY<br>H. AMANO            | 第3角法 3rd ANGLE<br>PROJECTION | 重量 WEIGHT                  | 型式 TYPE | ALL |    |                |
|             |                |         |          | 検図 CHECKED BY                         | 尺度 SCALE                     | 名称 TITLE                   |         |     |    |                |
|             |                |         |          | 設計 DESIGNED BY<br>KAWAMATA            | 材質 MATERIAL                  | MUTUAL CONNECTION<br>相互配線図 |         |     |    |                |
|             |                |         |          | 製図 DRAWN BY<br>KAWAMATA               | 作成日 DATE<br>28-MAR-02        |                            |         |     |    |                |
| 記号 MARK     | 記事 DESCRIPTION | 日付 DATE | 製者 SIGN. | 図面番号 DRAWING No.                      |                              |                            |         |     |    | 改正記号 REV. MARK |
| 変更 REVISION |                |         |          | 三井造船マシナリー・サービス株式会社                    |                              |                            |         |     |    | 01             |
| 来歴 HISTORY  |                |         |          | MITSUIZOSEN MACHINERY & SERVICE, INC. |                              |                            |         |     |    |                |
| E 40-03039  |                |         |          |                                       |                              |                            |         |     |    |                |

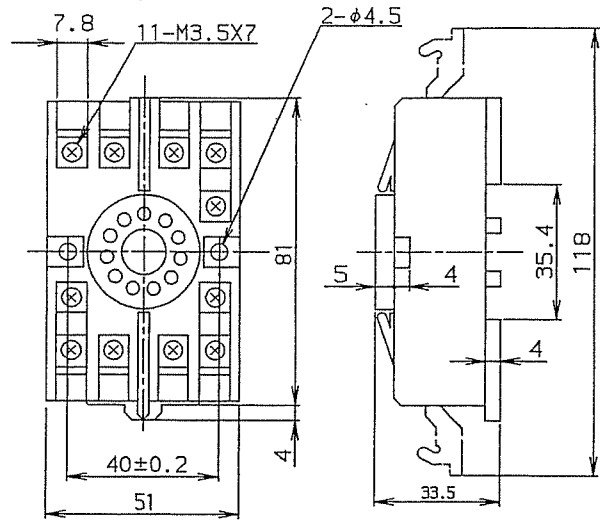
SPEED RELAY  
スピードリレー



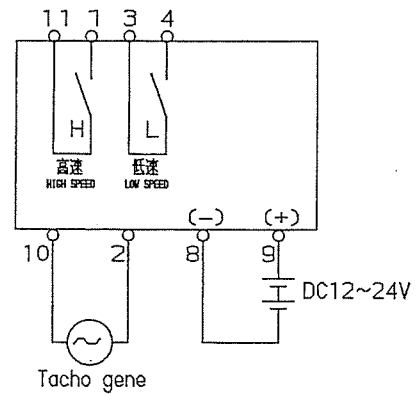
Terminal No.  
配子番号



Socket  
ソケット



Wiring diagram  
内部回路図



SPECIFICATION  
仕様

|                               |                      |
|-------------------------------|----------------------|
| RATED VOLTAGE<br>定格電圧         | : DC12~24V           |
| CONTACTOR CAPACITY<br>接点容量    | : AC125V 0.4A        |
|                               | DC 30V 2A            |
|                               | Minimum load<br>最小負荷 |
|                               | DC10mV 10μA          |
| INPUT FREQUENCY<br>入力周波数      | : 700~6000Hz         |
| AMBIENT TEMPERATURE<br>許容周囲温度 | : -10~+50°C          |
| RELAY TYPE<br>リレー型式           | : XF-501-26          |

| 名称          | XF-501-26 |
|-------------|-----------|
|             | 部品番号      |
| スピードリレーアシイ  | 005133590 |
| スピードリレー     | 005133300 |
| ソケット(11PFA) | 004839190 |

|    |       |
|----|-------|
| 1  | 97    |
| 記号 | 07/24 |
| 変更 |       |

|    |    |    |       |           |
|----|----|----|-------|-----------|
| 承認 | 検認 | 担当 | 作成日付  |           |
| 天野 | 中島 | 佐藤 | 天野(知) | 09-09-'96 |



# 予 備 品 リ ス ト

## SPARE PARTS LIST

ENGINE TYPE : CUMMINS 6CTA8.3D(M)

三井造船マシナリー・サービス株式会社  
MITSUI ZOSEN MACHINERY & SERVICE, INC.

|            |                    |    |        |                           |                      |         |          |
|------------|--------------------|----|--------|---------------------------|----------------------|---------|----------|
| K表No.      | 船級                 | 用途 | 仕 様    |                           |                      |         |          |
| 5050-20670 |                    |    |        |                           |                      |         |          |
|            |                    |    |        | 船 番 (Ship No.)            | 761                  |         |          |
|            |                    |    |        | リスト番号(List No.)           | G6CTA-004            |         |          |
|            |                    |    |        | 作成日 (DATE)                | 12-Apr-'06           |         |          |
| 3          | 7部品番号変更            |    | MIYATA | <small>2007/10/16</small> | 技 術 部 TECHNICAL DEPT |         |          |
| 2          | 7部品番号変更            |    | MIYATA | <small>2007/5/25</small>  |                      |         |          |
| 1          | 1,3,4部品番号変更        |    | MIYATA | <small>2006/11/29</small> |                      |         |          |
|            |                    |    |        | APPROVED                  | CHECKED              | DRAWING |          |
| NO.        | 改 正 内 容 (REVISION) |    | 担 当    | 日 付                       | K.FUTASE             | H.OHTA  | KAWAMATA |

カミンス 水冷式ディーゼルエンジン  
CUMMINS WATER-COOLED DIESEL ENGINE

リスト番号  
(List No.)

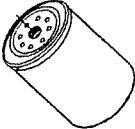
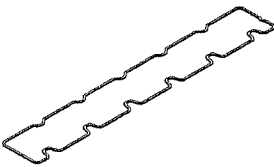
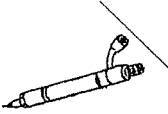
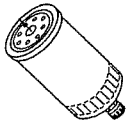

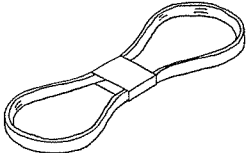
G6CTA-004

エンジン型式  
Engine Type

6CTA8. 3D(M)

船番  
(Ship No.)

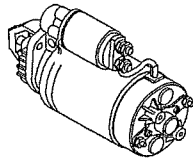
761

| No. | 名称<br>Name                  | 略 図<br>Sketch   |               | 材質<br>Material  | Supply<br>Per Eng. |       | 部品番号<br>Drawing |           | 記事<br>Remarks       |
|-----|-----------------------------|---|---------------|-----------------|--------------------|-------|-----------------|-----------|---------------------|
|     |                             | 重量 (Weight)   | 約 (Approx) kg |                 | Working            | Spare | No.             | Part No   |                     |
| 1   | Corrosion-resistor          |    |               | Comp            | 1                  | 1     |                 | 002003190 | 4058964             |
| 2   | Seal for Rocker Lever Cover |    |               | Special packing | 1                  | 1     |                 | 000805940 | 3905449             |
| 3   | Needle for Injection Nozzle |   |               | Comp            | 6                  | 1     |                 | 004203970 | 3802648             |
| 4   | Fuel filter-element         |  |               | Comp            | 1                  | 1     |                 | 002003200 | 3843760/<br>3286503 |
| 5   | Lube oil filter-element     |  |               | Comp            | 1                  | 1     |                 | 001522780 | 3401544             |
| 6   | Fan-belt                    |  |               | Special-gam     | 1                  | 1     |                 | 004204000 | 3289235             |

三井造船マシナリー・サービス株式会社  
MITSUI ZOSEN MACHINERY & SERVICE, INC.

|  |                     |                  |
|--|---------------------|------------------|
| <b>カミンス 水冷式ディーゼルエンジン</b><br>CUMMINS WATER-COOLED DIESEL ENGINE | リスト番号<br>(List No.) | <b>G6CTA-004</b> |
|--|---------------------|------------------|

|                       |                     |                   |            |
|-----------------------|---------------------|-------------------|------------|
| エンジン型式<br>Engine Type | <b>6CTA8. 3D(M)</b> | 船 番<br>(Ship No.) | <b>761</b> |
|-----------------------|---------------------|-------------------|------------|

| No. | 名称<br>Name             | 略 図<br>Sketch   |               | 材 質<br>Material | Supply<br>Per Eng. |       | 部品番号<br>Drawing |           | 記事<br>Remarks             |
|-----|------------------------|---|---------------|-----------------|--------------------|-------|-----------------|-----------|---------------------------|
|     |                        | 重量 (Weight)   | 約 (Approx) kg |                 | Working            | Spare | No.             | Part No   |                           |
| 7   | Electric starter motor |  |               | Comp            | 1                  | 1     |                 | 004423240 | Motor type:<br>39MT (24V) |
|     |                        |   | 26            |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |
|     |                        |   |               |                 |                    |       |                 |           |                           |

18E

CUSTOMER

MESSRS: SASEBO HEAVY INDUSTRIES CO., LTD.

EMERGENCY ENGINE-GENERATOR

SHOP TEST RESULT

S. No. 762



20-Aug-08

MITSUI ZOSEN MACHINERY & SERVICE, INC.

|                 |                  |                 |
|-----------------|------------------|-----------------|
| <i>K. Saito</i> | <i>A. Uehara</i> | <i>I. Saeki</i> |
|-----------------|------------------|-----------------|

## Particulars of Emergency Engine Generator

Classification            **ABS**

## Engine

Maker                    :    CUMMINS ENGINE COMPANY LIMITED  
Equipment&Modification    :    MITSUI ZOSEN MACHINERY & SERVICE, INC.  
Type                     :    6CTA8. 3D (M)  
Serial                    :    21808709  
No. of cylinder            :            6  
Cylinder bore             :            114 mm  
Piston stroke             :            135 mm  
Rated out put             :            188 kW  
Derating for fan          :            6. 7 kW  
Rated speed               :            1800 min<sup>-1</sup>

## Generator                    (SHIPYARD SUPPLY)

Maker                    :    NISHISHIBA ELECTRIC CO. , LTD.  
Model                    :    NTAKL-VEK  
Machine No.               :    252170A2A  
No. of phase             :            3  
Out put                  :            175 kVA  
Frequency                :            60 Hz  
Voltage                  :            450 V  
Rating                    :            cont.  
Cos  $\phi$                 :            0. 8

## 1. Starting test

|  |                |                 |
|--|----------------|-----------------|
| • Temperature                            | Room : 16.0 °C | L. O. : 18.0 °C |
| • Condition of Battery [Before starting] | (12V-120Ah×2)  |                 |
| Temperature of electrolyte               | : 17.0 °C      |                 |
| Specific gravity of electrolyte          | : 1.260        |                 |
| Voltage of Battery                       | : 25.1 V       |                 |
| • Result of starting ( 6th times )       | : GOOD         |                 |

## 2. Load test (Power Factor=1.0)

• Specific gravity of F. O. = 0.828 ( 17.0 °C)

※1 For Generator Out put

| Time                          |                  | 8:30<br>~8:40        | ~9:00             | ~9:20 | ~9:40 | ~9:55 | ~10:10 | ~10:25 | ~10:40 | ~11:10 |       |
|-------------------------------|------------------|----------------------|-------------------|-------|-------|-------|--------|--------|--------|--------|-------|
| Load                          | %                | 0                    | 25                | 50    | 75    | 100   | 100    | 100    | 100    | 110    |       |
| Generator                     | Out put          | kW                   | 0                 | 35.0  | 70.0  | 105.0 | 140.0  | 140.0  | 140.0  | 154.0  |       |
|                               | Voltage          | V                    | 450               | 450   | 450   | 450   | 450    | 450    | 450    | 450    |       |
|                               | Frequency        | Hz                   | 60                | 60    | 60    | 60    | 60     | 60     | 60     | 60     |       |
|                               | Current          | A                    | 0                 | 44.9  | 89.8  | 134.7 | 179.6  | 179.6  | 179.6  | 197.6  |       |
|                               | Temperature (°C) | Bearing, anti-c side | 30.0              | 31.6  | 32.2  | 32.7  | 33.0   | 33.0   | 33.3   | 33.3   | 35.0  |
|                               |                  | Cooling air inlet    | 17.0              | 17.5  | 18.0  | 18.5  | 19.0   | 19.0   | 19.5   | 19.5   | 23.0  |
|                               |                  | Cooling air outlet   | 20.0              | 21.5  | 22.5  | 24.0  | 26.5   | 27.0   | 27.0   | 27.5   | 33.0  |
|                               |                  | Frame                | 18.5              | 19.5  | 21.5  | 23.0  | 26.0   | 27.0   | 27.0   | 28.0   | 32.5  |
|                               | Engine           | Engine speed         | min <sup>-1</sup> | 1800  | 1800  | 1800  | 1800   | 1800   | 1800   | 1800   | 1800  |
|                               |                  | Fuel consumption     | Capacity          | mℓ    | —     | 100   | 200    | 200    | 300    | 300    | 300   |
| Time                          |                  |                      | s                 | —     | 24.8  | 32.8  | 23.9   | 28.5   | 28.6   | 28.7   | 28.9  |
| Consumption                   |                  |                      | ℓ/h               | —     | 14.51 | 21.92 | 30.10  | 37.93  | 37.76  | 37.59  | 37.42 |
| Specific F. O. ※1 consumption |                  |                      | g/kWh             | —     | 343   | 259   | 237    | 224    | 223    | 222    | 221   |
| L. O. pressure                |                  | MPa                  | 0.41              | 0.37  | 0.35  | 0.33  | 0.30   | 0.30   | 0.30   | 0.30   | 0.28  |
| Temperature (°C)              |                  | L. O.                | 91.0              | 95.5  | 98.5  | 101.0 | 106.5  | 107.5  | 107.5  | 107.5  | 109.5 |
|                               |                  | Intake air           | 17.5              | 18.0  | 19.0  | 20.0  | 22.0   | 22.0   | 22.0   | 22.0   | 25.0  |
|                               |                  | Exhaust gas          | 185               | 280   | 345   | 390   | 430    | 430    | 430    | 430    | 450   |
|                               |                  | Cooling water        | 82.0              | 82.0  | 82.0  | 82.0  | 82.0   | 82.0   | 82.0   | 82.0   | 82.0  |
|                               |                  |                      |                   |       |       |       |        |        |        |        |       |
|                               | Room             | 18.0                 | —                 | —     | —     | 18.5  | —      | —      | —      | 20.0   |       |
| Atomospheric pressure         | kPa              | 100.4                | —                 | —     | —     | 100.4 | —      | —      | —      | 100.4  |       |

## 3. Performance test (Power factor=1.0)

|              |                     |      |      |      |       |       |       |
|--------------|---------------------|------|------|------|-------|-------|-------|
| Load         | : %                 | 0    | 25   | 50   | 75    | 100   | 110   |
| Out put      | : kW                | 0    | 35.0 | 70.0 | 105.0 | 140.0 | 154.0 |
| Voltage      | : V                 | 452  | 452  | 452  | 451   | 450   | 450   |
| Frequency    | : Hz                | 62.3 | 61.4 | 61.0 | 60.5  | 60.0  | 59.6  |
| Current      | : A                 | 0    | 44.7 | 89.4 | 134.4 | 179.6 | 197.6 |
| Engine speed | : min <sup>-1</sup> | 1870 | 1840 | 1830 | 1815  | 1800  | 1790  |

## 4. Governor test

| Time | Item           | Load<br>100% | 100→0%    |           | 0→90%     |           | 90→100%   |           |
|------|----------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
|      |                |              | Momentary | Permanent | Momentary | Permanent | Momentary | Permanent |
| 1    | Frequency Hz   | 60.0         | 63.0      | 62.3      | 58.3      | 60.2      | 59.8      | 60.0      |
|      | Regulation %   | -            | + 5.0     | + 3.8     | - 6.7     | - 3.5     | - 0.7     | - 0.3     |
|      | Recover time s | -            | -         | 2.8       | -         | 2.4       | -         | 2.3       |
| 2    | Frequency Hz   | 60.0         | 63.0      | 62.3      | 58.3      | 60.2      | 59.8      | 60.0      |
|      | Regulation %   | -            | + 5.0     | + 3.8     | - 6.7     | - 3.5     | - 0.7     | - 0.3     |
|      | Recover time s | -            | -         | 2.8       | -         | 2.4       | -         | 2.3       |

## 5. Voltage regulation test

| Time | Item         | Load<br>100% | 100→0%    |           | 0→90%     |           | 90→100%   |           |
|------|--------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
|      |              |              | Momentary | Permanent | Momentary | Permanent | Momentary | Permanent |
| 1    | Voltage V    | 450          | 454       | 452       | 448       | 450       | 449       | 450       |
|      | Regulation % | -            | + 0.9     | + 0.4     | - 0.9     | - 0.4     | - 0.2     | 0.0       |
| 2    | Voltage V    | 450          | 454       | 452       | 448       | 450       | 449       | 450       |
|      | Regulation % | -            | + 0.9     | + 0.4     | - 0.9     | - 0.4     | - 0.2     | 0.0       |

## 6. Safety device working test

| Item                        | Specifications              | Data                   | Result   |              |             |
|-----------------------------|-----------------------------|------------------------|----------|--------------|-------------|
|                             |                             |                        | Provided | Alarm (Test) | Engine stop |
| Cooling Water Thermo switch | 106 ± 5 °C                  | 106 °C                 | Good     | Good         | -           |
| Start failure               | 3 times                     | - times                | -        | -            | -           |
| L. O. pressure switch       | 0.08 ± 0.02 MPa             | 0.07 MPa               | Good     | Good         | -           |
| Over speed                  | 2070 - 54 min <sup>-1</sup> | 2070 min <sup>-1</sup> | * Good   | -            | -           |
| Switch for fan belt broken  | ON                          | -                      | -        | -            | -           |
| F. O. high press. pipe leak | OFF                         | OFF                    | Good     | Good         | -           |
|                             |                             |                        |          |              |             |

\*Parts supplied loose

File No. 21808709

# TEST RECORD 試験成績表

|               |                                   |                           |       |
|---------------|-----------------------------------|---------------------------|-------|
| Customer 注文主  | SASEBO HEAVY INDUSTRIES CO., LTD. |                           |       |
| Article 機器名   | 175 kVA                           | SYNCHRONOUS GENERATOR     | 同期発電機 |
| Test No. 試験番号 | 252170A2A                         | Ship No. 船番               | 761   |
| Use 用途        | EMERGENCY GENERATOR               |                           |       |
| Quantity 台数   | 1                                 | Standard Specification 規格 | ABS   |

## RATING 定格

|                              |   |                                      |                           |                 |       |
|------------------------------|---|--------------------------------------|---------------------------|-----------------|-------|
| Type, Form 型式                | NTAKL-VEK (Brush-less Excitation System)            |                                      | Phases 相数                 | 3               |       |
| No. of Poles 極数              | 4 P   | Speed 回転速度                           | 1800 min <sup>-1</sup>    | Frequency 周波数   | 60 Hz |
| Voltage 電圧                   | 450 V   | Current 電流                           | 225 A                     | Power Factor 力率 | 0.8   |
| Service 定格の種類                | CONT.   |                                      | Class of Insulation 絶縁の種類 | F               |       |
| Excitation 励磁                | 90 V 30 A   | Excitation of A. C. Exciter 交流励磁機 励磁 | 90 V 1.3 A                |                 |       |
| Type of Enclosure 外被形式       | Enclosed Ventilated Machine With Air Filter (IP 22) |                                      |                           |                 |       |
| Exciter 励磁機                  | 5.5 kVA   |                                      |                           |                 |       |
| Evaluation: Acceptable 判定: 良 |   |                                      |                           |                 |       |

ABS TYPE APPROVAL  
 KO 960609  
 NO. 252170A2A  
 25 - FEB. - 08

1. WINDING RESISTANCE at 115 °C 巻線抵抗 (Between Terminals 端子間にて) Unit --- Ω

|                        |  | Gen. 発電機 | Exciter 励磁機 |
|------------------------|--|----------|-------------|
| Armature Winding 電機子巻線 |  | 0.0532   | 0.718       |
| Field Winding 界磁巻線     |  | 2.35     | 54.8        |

2. INSULATION RESISTANCE and DIELECTRIC TEST 絶縁抵抗及び耐電圧試験

| Insulation resistance by DC500V Megger<br>絶縁抵抗 (DC500Vカ <sup>テ</sup> -) Unit --- MΩ |         | Dielectric Test<br>耐電圧試験 60Hz 1min. |      |   |
|---|---------|-------------------------------------|------|---|
| Armature Circuit 電機子回路  | 100     | 2000 V                              | Good | 良 |
| Field Circuit 界磁回路  | 100     | 1500 V                              | Good | 良 |
| A. C. Exciter Circuit (Fi./Ar.) 励磁機回路   | 100/100 | 2000/1500 V                         | Good | 良 |
| Static Exciter Circuit 静止励磁装置   | 100     | 2000 V                              | Good | 良 |
| Space Heater スペースヒーター   | 100     | 1500 V                              | Good | 良 |

3. CONVENTIONAL EFFICIENCY 規約効率 (%)

| Out put 出力      | 25  | 50   | 75   | 100  | 125  |      |
|-----------------|-----|------|------|------|------|------|
| Power Factor 力率 | 0.8 | 91.3 | 93.7 | 94.1 | 93.8 | 93.3 |
|                 | 1.0 | 93.7 | 94.3 | 95.0 | 95.0 | 94.7 |

4. SET POSITION of STATIC EXCITER  
静止励磁装置セットアップ

|                               |         |
|-------------------------------|---------|
| CT Secondary Wdg.<br>変流器 二次巻線 | k1 - 11 |
|-------------------------------|---------|

5. OVER SPEED TEST 過速度試験

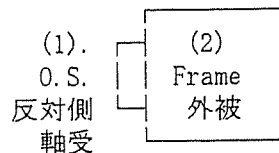
120 % Speed 回転速度 2160 min<sup>-1</sup> 2 min 分 Good 良

6. MOMENTARY OVER LOAD TEST 瞬時過負荷試験

150 % Current 電流 450 V P.F. 力率 0.6 2 min 分 Good 良

7. VIBRATION at RATED SPEED 定格速度における振動測定 (Peak to Peak 全振巾)

Unit --- 1/1000 mm



| Part | (1) × | (1) ↓ | (1) → | (2) × | (2) ↓ | (2) → |   |   |   |
|------|-------|-------|-------|-------|-------|-------|---|---|---|
|      | 18    | 16    | 12    | 16    | 13    | 11    | - | - | - |

L. S. 直結側 ×: Horizontal 水平, ↓: Vertical 上下, →: Axis 軸

8. MEAN VALUE of AIR GAP 平均ギャップ

Unit --- mm

Gen. 2.4 Ex. -

Tested by 試験者 M. Inoue Approved By 校閲者 *M. Katsura* Date 日付 FEB. - 25 - 2008



9. TEMPERATURE TEST 温度上昇試験 (K)

| Load 負荷 (%) | Hours 時間 | Frequency 周波数 (Hz) | Volts 電圧 (V) | Amps 電流 (A) | PowerFactor 力率 (%) | OutPutPower 出力 (kW) | Ex. Field 励磁機・界磁<br>Volts 電圧 (V) | Amps 電流 (A) |
|-------------|----------|--------------------|--------------|-------------|--------------------|---------------------|----------------------------------|-------------|
| 100         | 4        | 60                 | 450          | 225         | 80                 | 140                 | 49.0                             | 1.16        |

|          | Stator 固定子 |                        |    |          |                 | Rotor 回転子 |          | Bearing 軸受 |          |   |          | Room 室温 |
|----------|------------|------------------------|----|----------|-----------------|-----------|----------|------------|----------|---|----------|---------|
|          | Core 鉄心    | Armature Winding 電機子巻線 |    | Frame 外被 | Field Wdg. 界磁巻線 |           | L.S. 直結側 |            | O.S. 反対側 |   | Inlet 吸気 |         |
|          |            | T                      | R  |          | T               | R         | E        | T          | E        | T |          |         |
| Rise 上昇値 | 29         | —                      | 33 | 62       | 26              | 50        | 77       | —          | —        | — | 15       | (15)    |
| Limit 限度 | —          | —                      | 75 | 95       | —               | 75        | 95       | —          | —        | — | 45       | (50)    |

|          | A.C. Exciter 交流励磁機 |            |                 |    |               | Rectifier 整流器 | Pro. R. 抵抗器 | Static Exciter 静止励磁装置 |         |               |         |
|----------|--------------------|------------|-----------------|----|---------------|---------------|-------------|-----------------------|---------|---------------|---------|
|          | Armature 電機子       |            | Field Wdg. 界磁巻線 |    | Reactor リアクトル |               |             | C.T. 変流器              |         | Rectifier 整流器 |         |
|          | Core 鉄心            | Winding 巻線 | T               | R  | T             |               |             | R                     | Core 鉄心 |               | Wdg. 巻線 |
| Rise 上昇値 | —                  | 20         | 28              | 14 | 18            | 12            | 40          | 3                     | 4       | 5             | 4       |
| Limit 限度 | —                  | 75         | 95              | 75 | 95            | —             | —           | —                     | 65      | 65            | —       |

Remarks T:Thermometer Method 温度計法 R:Resistance Method 抵抗法  
E:Embedded Temp. Method 埋込温度計法

10. CHARACTERISTIC TEST 特性試験

| Load 負荷 (%)                       | Frequency 周波数 (Hz) | Power fact. 力率 (%) | Terminal Voltage 端子電圧 (V) | V. R. Notch 界調位置 |
|-----------------------------------|--------------------|--------------------|---------------------------|------------------|
| 100                               | 60.0               | 80                 | 450                       | 5.6              |
| 75                                | 60.6               | 〃                  | 〃                         | 〃                |
| 50                                | 61.2               | 〃                  | 449                       | 〃                |
| 25                                | 61.8               | 〃                  | 〃                         | 〃                |
| 0                                 | 62.4               | —                  | 448                       | 〃                |
| 100                               | 60.0               | 80                 | 450                       | 〃                |
| 100                               | 60.0               | 100                | 450                       | 5.7              |
| 75                                | 60.6               | 〃                  | 〃                         | 〃                |
| 50                                | 61.2               | 〃                  | 〃                         | 〃                |
| 25                                | 61.8               | 〃                  | 〃                         | 〃                |
| 0                                 | 62.4               | —                  | 〃                         | 〃                |
| 100                               | 60.0               | 100                | 〃                         | 〃                |
| Voltage Adjustable Range Test     |                    |                    |                           |                  |
| 0                                 | 60.0               | —                  | 520                       | 10.0             |
| 100                               | 〃                  | 80                 | 518                       | 〃                |
| 0                                 | 〃                  | —                  | 392                       | 0.0              |
| 100                               | 〃                  | 80                 | 390                       | 〃                |
| With Parallel Running Compensator |                    |                    |                           |                  |
| 100                               | 60                 | 80                 |                           |                  |
| 0                                 | 〃                  | —                  |                           | 〃                |

(Remarks)  
A. V. R. No. 252170E2B

11. TRANSIENT

CHARACTERISTIC AND VOLTAGE WAVE-FORM  
瞬時電圧変動特性及び電圧波形

11-1 Induction motor direct start (at generator no-load)  
誘導電動機直接始動 (於 発電機無負荷)  
a. Presumptive transient voltage regulation (at 80% starting kVA of generator capacity)  
推定瞬時電圧変動率 (於 発電機容量の 80% 始動 kVA 時)

11.4 %

b. Recovery time 復帰時間

0.14 s 秒

11-2 No-load voltage wave-form  
無負荷端子電圧波形

Deviation factor 波形狂い率

1.33 %

Criteria Table

175 kVA SYNCHRONOUS GENERATOR

JOB No. 252170A2A

|    | Test Item  | Criteria   | Standard         | Results |
|----|--|--|------------------|---------|
| 1  | Winding Resistance<br>designed value at 115°C<br>(GEN. Arm. 0.0526) (GEN. Fi. 2.38)<br>(Ex. Arm. 0.755) (Ex. Fi. 55.0) | Within $\pm 10\%$ to designed<br>value                             | Factory standard | Good    |
| 2  | Insulation resistance  | Arm. not less than 100M $\Omega$<br>Fi. not less than 50M $\Omega$ | Factory standard | Good    |
|    | Dielectric strength test   | No-injury  | ABSrule(2005)    | Good    |
| 3  | Efficiency(at full-load, PF 0.8)   | Not less than — %  | —                | Good    |
| 4  | Set position of Static exciter   | Refer to item 10,11  | —                | —       |
| 5  | Over speed test<br>( 120% % speed for 2 min. )   | No-injury  | ABSrule(2005)    | Good    |
| 6  | Over load test ,m<br>(150% current, P. F. =0.6 for 2 min. )  | No-injury  | ABSrule(2005)    | Good    |
| 7  | Vibration  | Not more than 20/1000mm  | JEM 1274-1997    | Good    |
| 8  | Air gap<br>(designed value Gen. 2.5 mm)<br>(designed value Ex. 1.0 mm)   | Within $\pm 15\%$ to designed<br>value                             | JEM 1274-1997    | Good    |
| 9  | Temperature rise   | Not more than insulation<br>class F rise                           | ABSrule(2005)    | Good    |
| 10 | Load characteristic test   | Voltage regulation within<br>$\pm 2.5\%$                           | ABSrule(2005)    | Good    |
|    | Voltage adjustable range test  | Not less than 10 %   | JEM 1274-1997    | Good    |
| 11 | Transient voltage regulation<br>(at 80% starting kVA)  | Not more than 15 %   | JEM 1274-1997    | Good    |
|    | Recovery time<br>(-3.0% final steady-state<br>voltage)   | Not more than 0.6 s  | JEM 1274-1997    | Good    |
|    | No-load voltage wave form  | Not more than 10 %   | JEM 1274-1997    | Good    |
| 12 | Construction inspection  | No difference from<br>approved drawing                             | JEM 1274-1997    | Good    |
|    |  |  |                  |         |