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Distribution list
Jenbach, Subsidiaries, Service Providers

Service Technician Instruction	**ST-185**	12 April 2018

Engine type   **All engine types with DIA.NE BLUE/XT/XT3**

Subject   **Engine Management System**
                  Upgrading DIA.NE BLUE/XT/XT3 to DIA.NE XT4 Light

The Service Technician Instruction ST-185 explains how to upgrade the Engine Management System from DIA.NE BLUE, DIA.NE XT or DIA.NE XT3 to DIA.NE XT4 Light.

PURPOSE OF THIS BULLETIN / NEED FOR ACTION
No need for proactive steps, i.e. if it is intended to upgrade Type 2, 3, 4 or 6 engines to DIA.NE XT4 Light, this document is available as an aid when organising and carrying out the work.

AFFECTED ENGINES / SCOPE OF THIS BULLETIN
This upgrade can be applied to Type 2, 3, 4 and 6 engines already fitted with a DIA.NE BLUE, DIA.NE XT or DIA.NE XT3.

NOTE:
This document is not a basis for ordering the spare parts necessary for an upgrade. GE provides a complete upgrade package. If interested, you can request this from your local GE customer service representative or seller.

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1   GENERAL / OVERVIEW

This Service Technician Instruction explains how to upgrade DIA.NE Blue, DIA.NE XT or DIA.NE XT3 to DIA.NE XT4. It is possible to upgrade an existing DIA.NE Blue, DIA.NE XT or DIA.NE XT3 to DIA.NE XT4. You will have to modify, among other things, the switchgear cabinet door for this purpose.

> **To perform this upgrade, technicians must have an "FSE Electrical Level 2" certificate!**

1.1   Comparing DIA.NE Blue with DIA.NE XT4

Figure 1: DIA.NE Blue and DIA.NE XT4

Figure 1 shows the DIA.NE Blue and the DIA.NE XT4. The main difference between them is that the DIA.NE XT4 has a touch panel (Figure 1, right). In addition, the fitting dimensions are different, which means that an upgrade (i.e. the switchgear cabinet is retained) requires modification of the installation opening on the switchgear cabinet door.

1.2   Comparing DIA.NE XT and DIA.NE XT4

Figure 2: DIA.NE XT and DIA.NE XT4

Figure 2 shows the DIA.NE XT and DIA.NE XT4. The main difference is that the DIA.NE XT4 is equipped with a touchpanel (Figure 2, right). Since the installation opening of the DIA.NE XT display is smaller than that of the DIA.NE XT3 display, adjustment of the installation opening is necessary. However, this does not require a frame plate (see DIA.NE XT3 and XT) since the installation opening can be adapted directly to the dimensions of the DIA.NE XT4 display.

1.3   Comparing DIA.NE XT3 with DIA.NE XT4

Figure 3: DIA.NE XT3 and DIA.NE XT4

Figure 3 shows the DIA.NE XT3 and the DIA.NE XT4. The main difference between them is that the DIA.NE XT4 has a touch panel (Figure 3, right). In addition, the fitting dimensions are different, which means that an upgrade (i.e. the switchgear cabinet is retained) requires modification of the installation opening on the switchgear cabinet door.

2   UPGRADING DIA.NE BLUE, DIA.NE XT OR DIA.NE XT3 TO DIA.NE XT4 LIGHT

2.1   Mechanical modifications

All the mechanical steps required to upgrade to DIA.NE XT4 are explained individually below.

2.1.1   Equipment required

- EMER case (see TA 1310-0011)
- Angle grinder with parting wheel
- Degreasing spray and cleaning cloths

2.1.2   Removing the DIA.NE Blue, DIA.NE XT or DIA.NE XT3

The first step is to remove the DIA.NE Blue, DIA.NE XT or DIA.NE XT3 display unit, but first disconnect all the cables and plug connectors connected to the display unit. They will be reconnected to it when the DIA.NE XT4 is installed.

Disconnected cables must be labelled (adhesive strip, etc.). This measure makes it easier to connect the cables when installing the new DIA.NE.

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3 DIFFERENT CONFIGURATIONS OF DIA.NE XT4

Depending on the versions and configurations of the previous DIA.NE to be upgraded to DIA.NE XT4, this system is installed in different configurations, see Sections 3.1 and 3.2.

Figure 4: DIA.NE XT4 without panel add-on
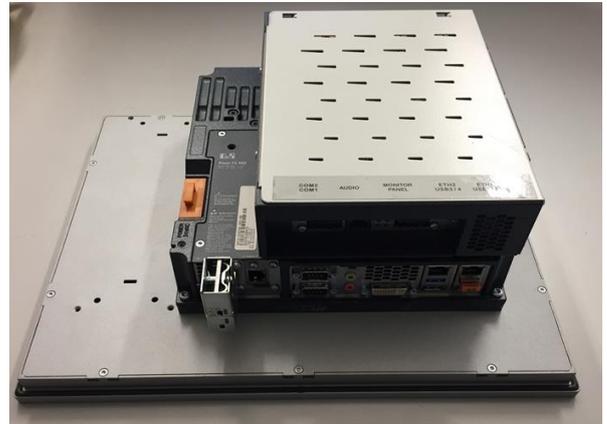
Figure 5: DIA.NE XT4 with panel add-on

3.1 DIA.NE Blue to DIA.NE XT4

Because upgrading from DIA.NE Blue to DIA.NE XT4 involves replacing the entire PLC, only the version without the Panel add-on as shown in Figure 4 is installed.

3.2 DIA.NE XT or DIA.NE XT3 to DIA.NE XT4

When DIA.NE XT or DIA.NE XT3 is being upgraded to DIA.NE XT4, the version with the panel add-on (Figure 4) is installed.

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4 UPGRADE PROCEDURE

4.1 Grinding the fitting opening

As the DIA.NE XT4 display unit requires a bigger fitting opening because of its size, the current fitting opening has to be modified. The fitting openings for the DIA.NE Blue, DIA.NE XT and DIA.NE XT3 display units are of different sizes, i.e. you have to distinguish between them.

- **Grinding the fitting opening in an existing DIA.NE Blue**

    Where DIA.NE Blue is being upgraded to DIA.NE XT4, the opening in the switchgear cabinet door must be modified so that the display unit will fit. In this case, the opening for the display in the switchgear cabinet door must be modified so that the DIA.NE XT4 can be installed. The DIA.NE Blue display unit has an additional control panel, which has to be covered with a frame panel (TL9025918). Figure 6 shows a comparison between the fitting openings of DIA.NE Blue and DIA.NE XT4 with display unit. The procedure for the installation process and modifying the switchgear cabinet door is similar to the procedure for upgrading from DIA.NE XT3 to XT4.
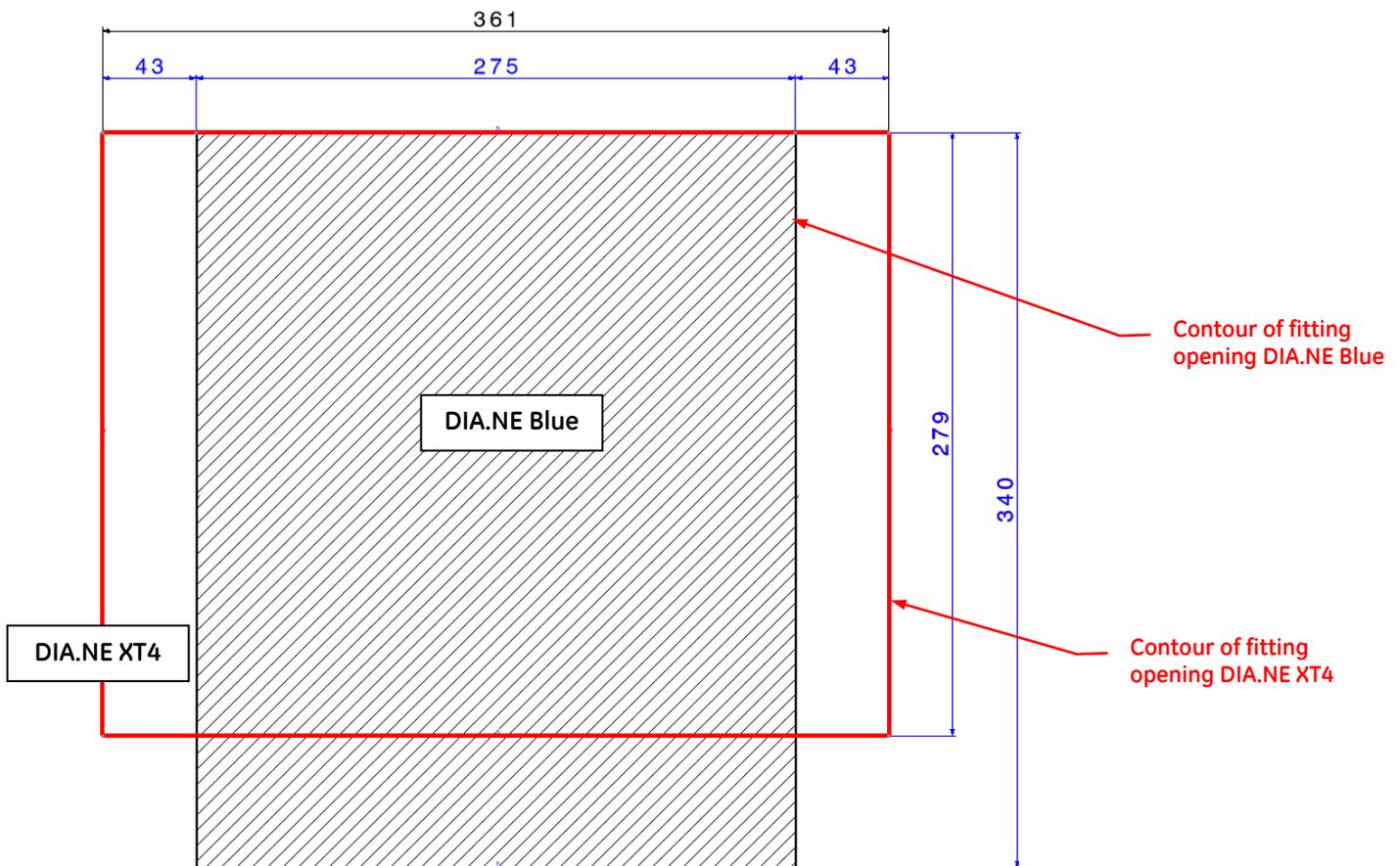

Figure 6: Comparing cut-out for DIA.NE Blue with DIA.NE XT4

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- ## Grinding the fitting opening for an existing DIA.NE XT

    Because the fitting opening for the DIA.NE XT display unit is smaller than that for the DIA.NE XT3 display unit, the fitting opening has to be modified. However, a frame panel is not needed in this case (see DIA.NE XT3 and XT), as the fitting opening can be modified to match the size of the DIA.NE XT4 display unit. No excess cut-out area is left that would have to be covered with a frame panel.
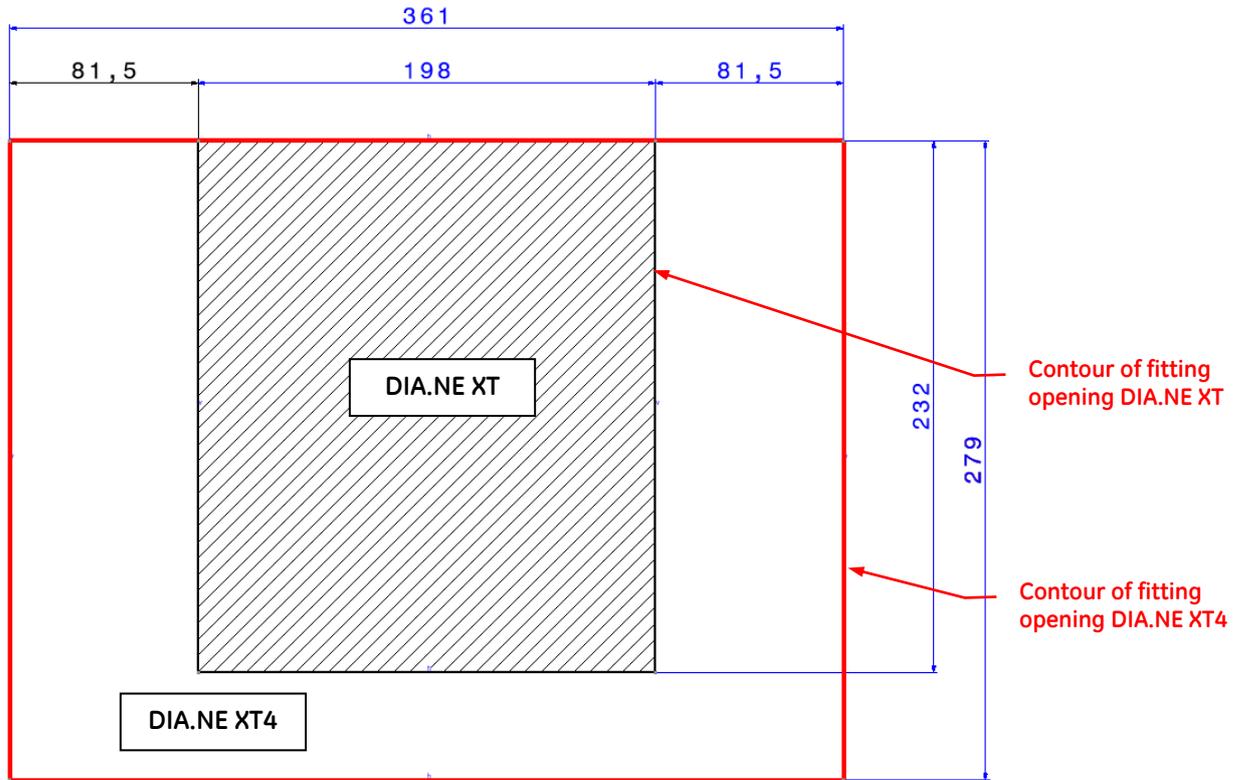

Figure 7: Comparing cut-out for DIA.NE XT with DIA.NE XT4

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- ## Grinding the fitting opening for an existing DIA.NE XT3

Where a DIA.NE XT3 is to be upgraded to DIA.NE XT4, the fitting opening for the DIA.NE XT3 has to be modified, i.e. cut-outs have to be made on the left and right so that the display unit for the DIA.NE XT4 can be installed. As the fitting opening for the DIA.NE XT3 display is higher than the opening for the DIA.NE XT4, an excess cut-out area is left which has to be covered with a frame panel (TL9020853) (green hatched area in Figure 9).
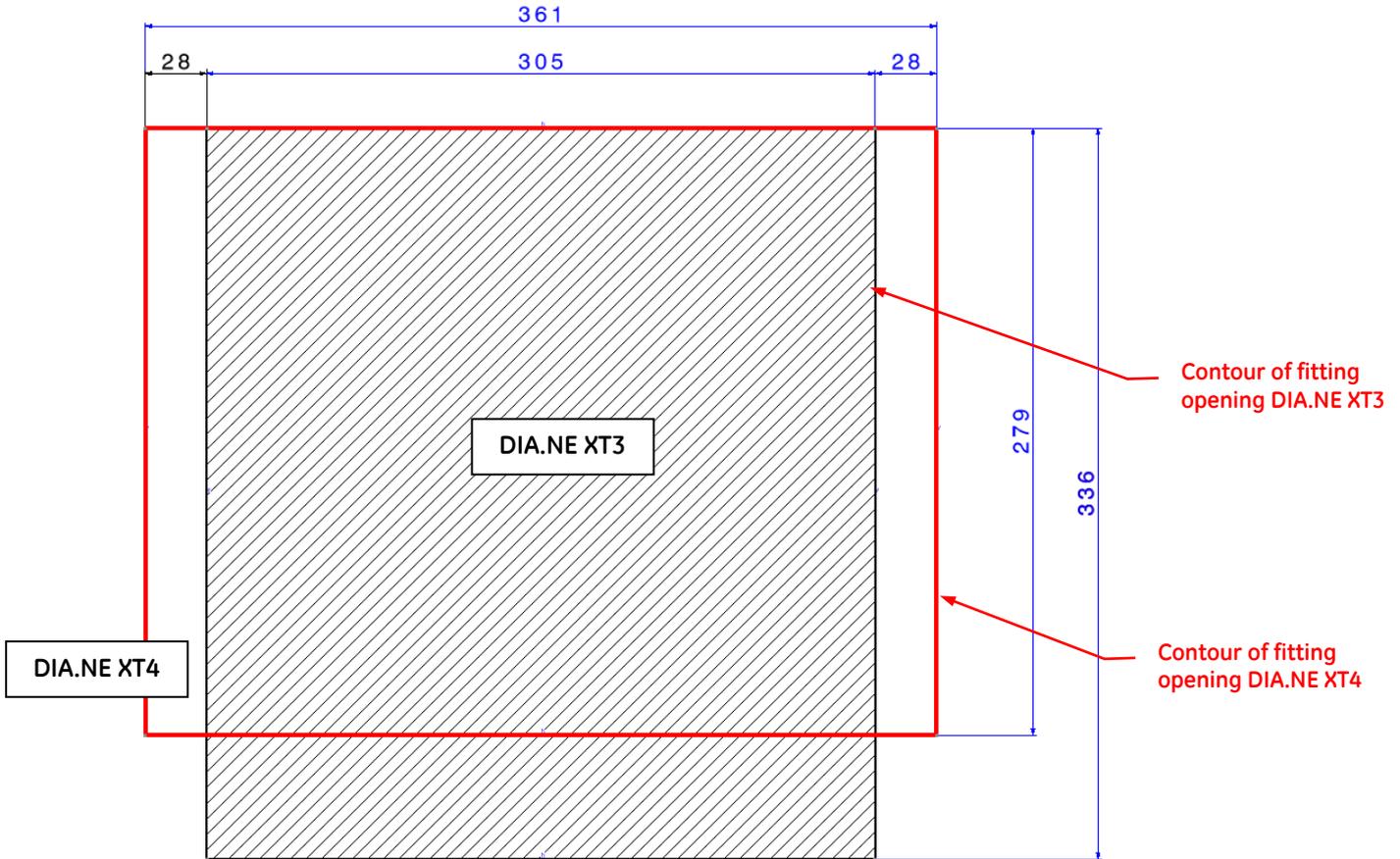

Figure 8: Comparing cut-out for DIA.NE XT3 with DIA.NE XT4

Caution:

To make a suitable fitting opening for the DIA.NE XT4 display, you have to remove the switchgear cabinet door. Protect the switchgear cabinet from swarf and other dirt while working on the switchgear cabinet door!

Carry out the following steps:

- ✓ Remove the switchgear cabinet door
- ✓ Align the frame panel symmetrically with the existing cut-out (DIA.NE Blue, DIA.NE XT or DIA.NE XT3), creating a contour as shown in **Figure 9 - on the right** after grinding
- ✓ Mark the areas to be cut out (using a marker pen, scriber, etc.)
- ✓ Finish the cut-out with an angle grinder
- ✓ Deburr the edges
- ✓ Clean swarf off the switchgear cabinet door
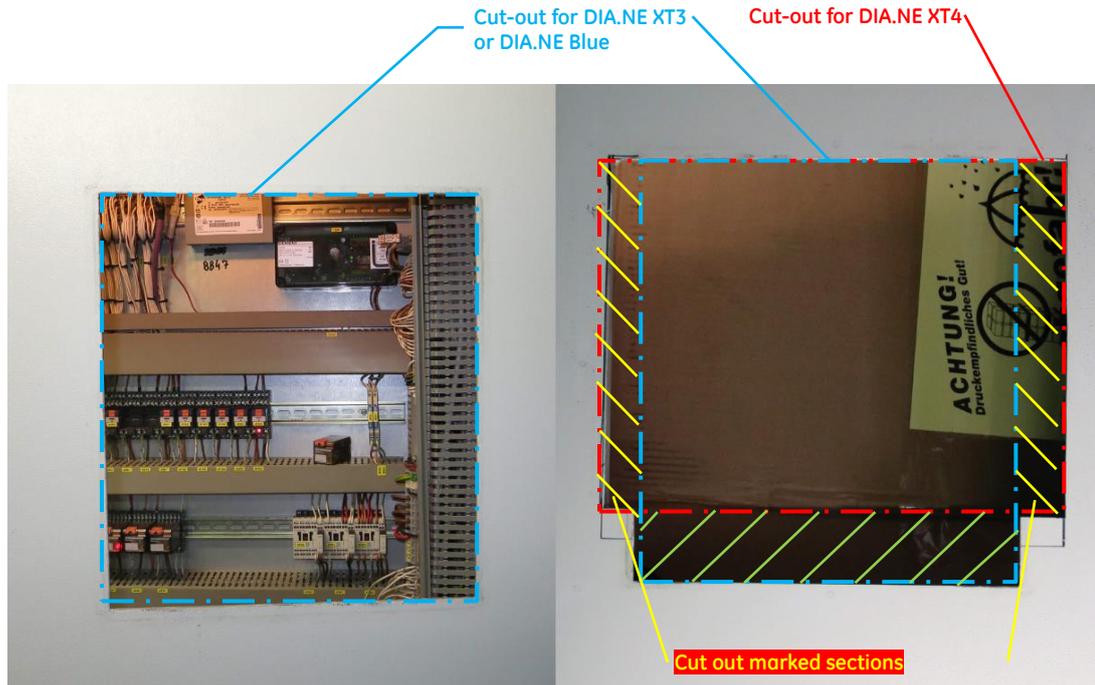
Figure 9: Modifying the fitting opening while upgrading DIA.NE XT3 to DIA.NE XT4

General view of available frame panels:

Frame panel for DIA.NE XT3 to DIA.NE XT4 (TL9020853)	Frame panel for DIA.NE Blue to DIA.NE XT4 (TL9025918)
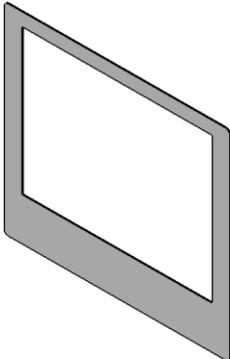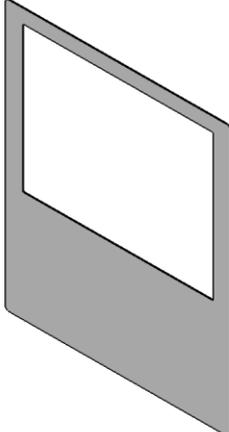
Table 1: General view of frame panels

4.2   Making a cut-out at the door rail (for a 500mm wide switchgear cabinet door)

As the DIA.NE XT4 takes up more space due to the width of the display unit, further modifications of the switchgear cabinet door are required. Figure 10 shows the back of the switchgear cabinet. In order to install the DIA.NE XT4 display unit, part of the rail for the switchgear cabinet door has to be cut out, otherwise a collision would result when the display unit was installed.

To do so, follow the steps below:

- ✓   Mark the areas to be cut out (see Figure 10)
- ✓   Remove the rails of the switchgear cabinet door
- ✓   Clamp the rail in a vice
- ✓   Use a hacksaw/angle grinder to make the cut-outs following the marks
- ✓   Deburr sharp edges and clean the rails
- ✓   Replace the rails on the switchgear cabinet door
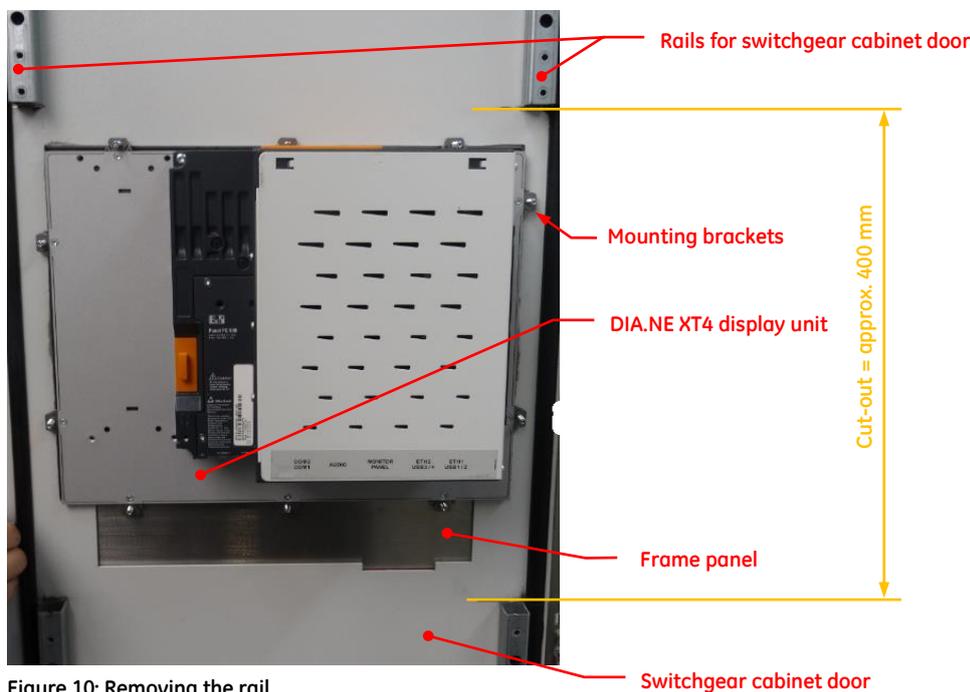
Figure 10: Removing the rail

Note:
Removing part of the rail (see Figure 10) is only necessary where the switchgear cabinet door is 500mm wide, as otherwise the mounting brackets for the DIA.NE XT4 display unit will collide with the rails on the switchgear cabinet door, making installation impossible.

4.3   Sealing the frame panel

To protect the switchgear cabinet from dirt, affix sealing tape to the frame panel before installation (Figure 11, Part No. 1235884). This sealing tape is 19mm wide. It is affixed to the back of the frame panel, as shown in Figure 12 and Figure 13.

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Figure 11: VHB sealing tape
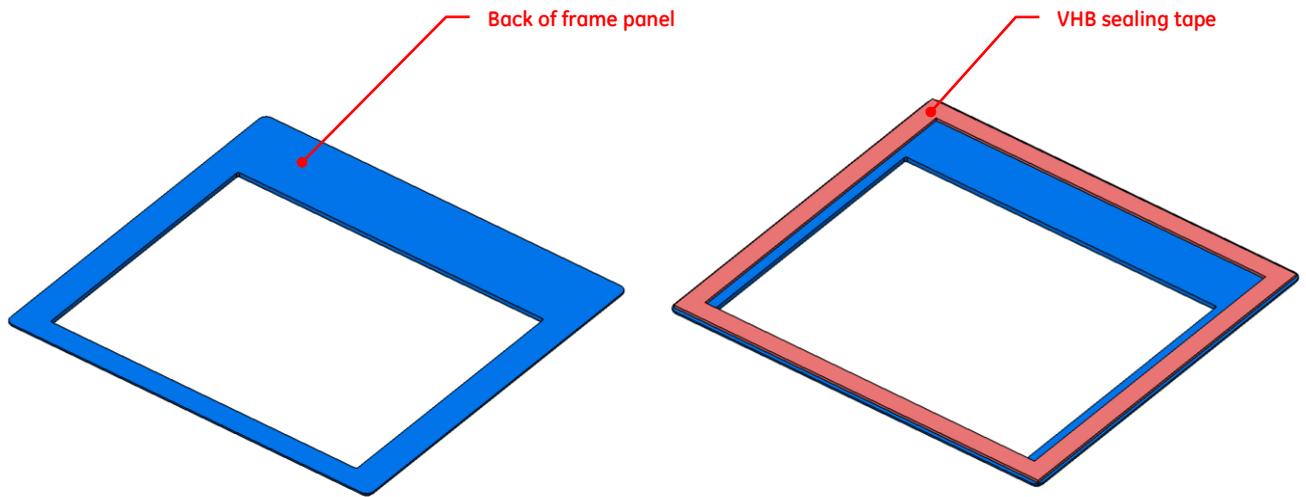
Figure 12: Back of the frame panel TL9020853 before and after affixing the sealing tape
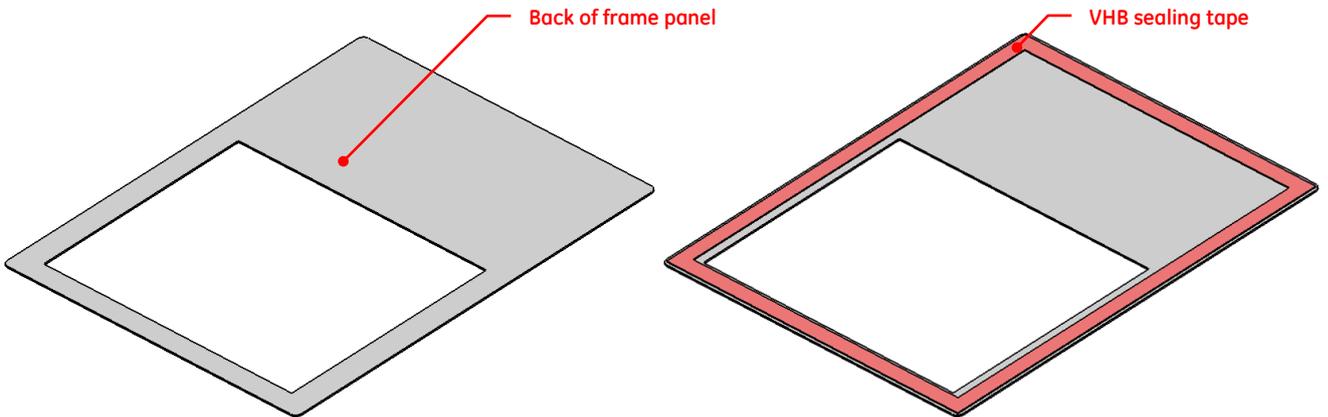
Figure 13: Back of the frame panel TL9025918 before and after affixing the sealing tape

Caution:
Make sure that the sealing surface (back of the frame panel, Figure 12 and Figure 13) has been cleaned and degreased beforehand to ensure that the sealing tape adheres perfectly!

4.4   Installing the DIA.NE XT4

✓   **Positioning the frame panel**

The frame panel is pushed on to the display unit as shown in Figure 14. Make sure that the wide rail on the frame panel is facing downwards. This rail is intended to cover the opening cut in the switchgear cabinet door.

✓   **Inserting the DIA.NE XT4 display unit with frame panel into the switchgear cabinet door**

The DIA.NE XT4 with frame panel is inserted into the switchgear cabinet door as shown in Figure 14. Make sure that the film of the adhesive tape is removed beforehand, so that an adhesive joint can be formed between the switchgear cabinet door and the adhesive or sealing tape on the frame panel.
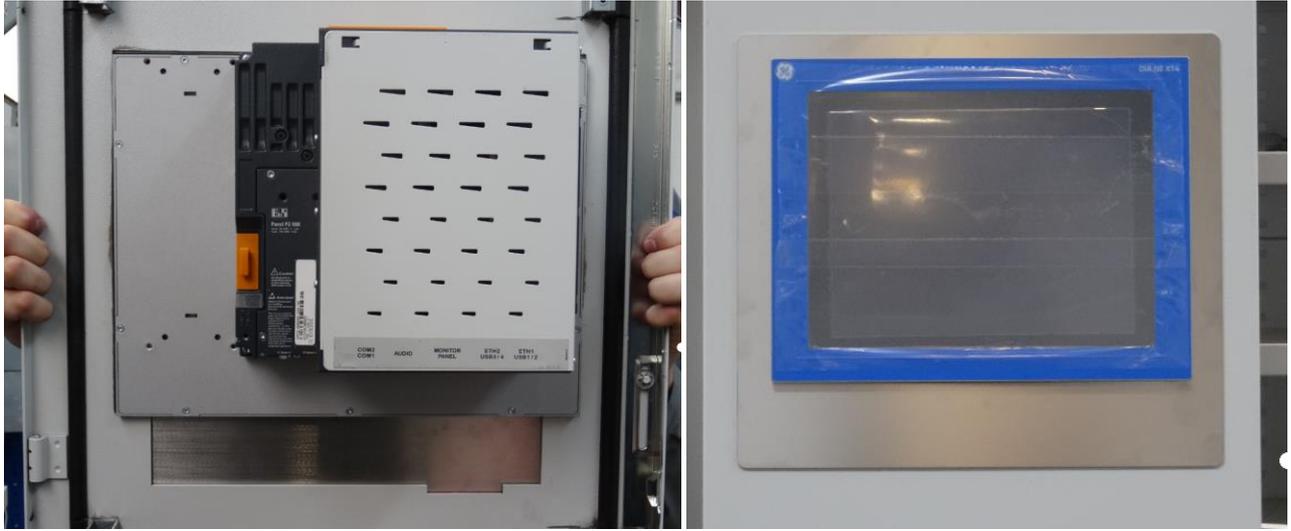
Figure 14: Inside and outside of the switchgear cabinet door

✓   **Fixing the DIA.NE XT4 display unit**

The DIA.NE XT4 display and frame panel are fixed in place by inserting the lugs supplied into the recesses provided in the display unit and gripping them with the set screws also supplied, see Figure 15. A total of 8 lugs and 8 set screws are used to fix the unit.
The lugs are pushed into the recesses provided. The set screw is then screwed in until it rests against the back of the switchgear cabinet door or the frame panel. The set screws can be easily tightened with a suitable Torx screwdriver.
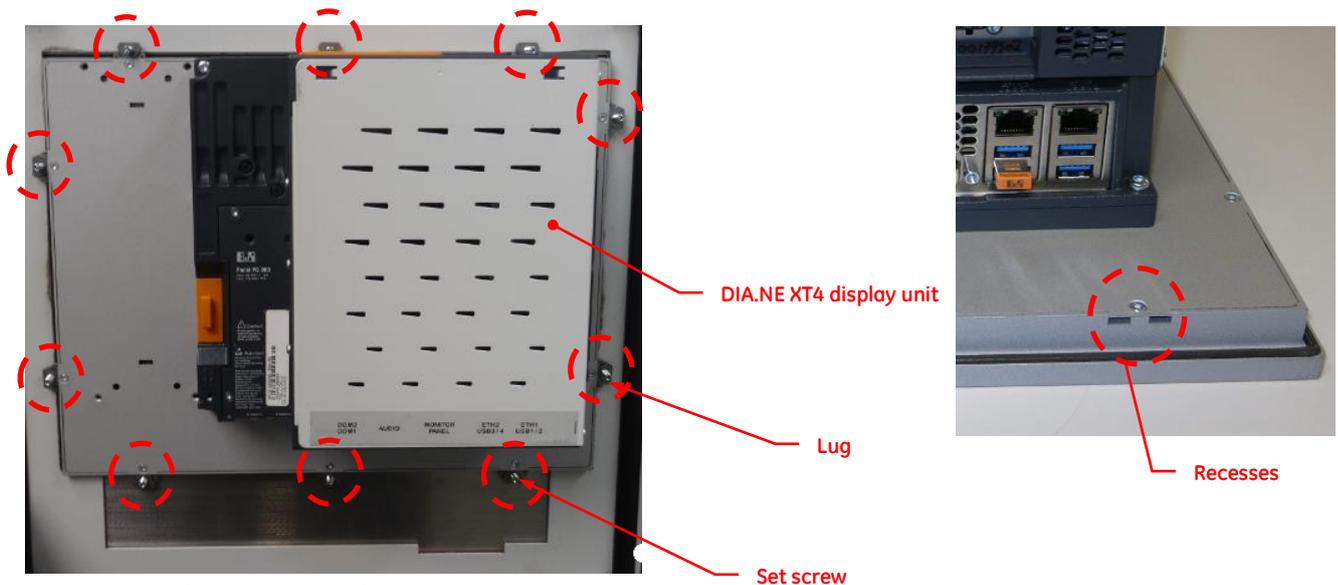

Figure 15: Fixing the DIA.NE XT4 display unit

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✓   **Fitting the sub-D adaptor**

When the DIA.NE XT4 has been installed, it must be fitted with a 9-pole sub-D adapter (see Figure 16).
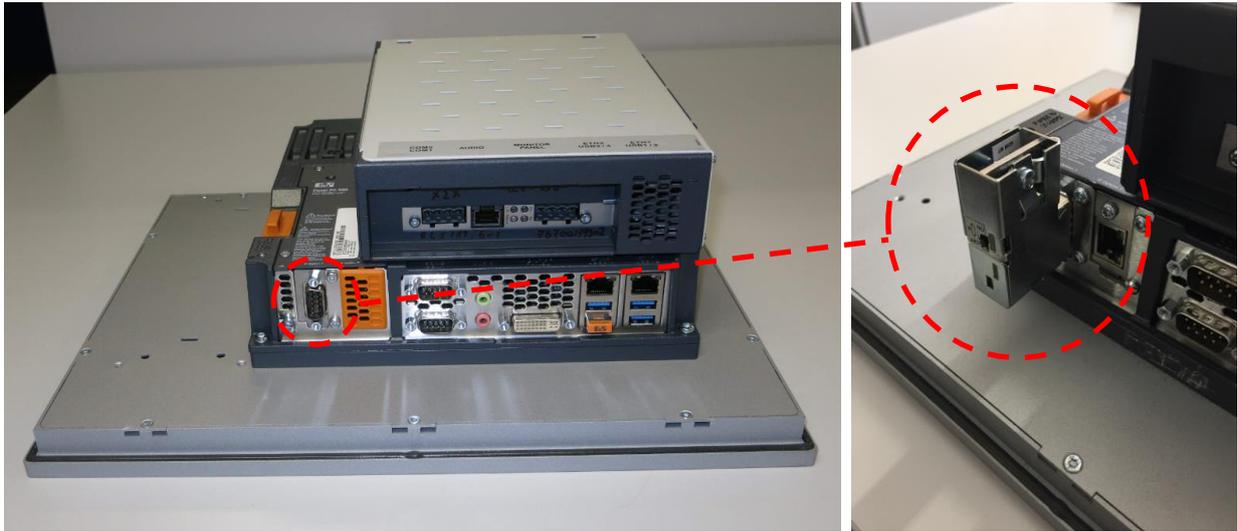

Figure 16: Back of the DIA.NE XT4

Figure 17: 9-pole sub-D adaptor

4.5   Electrical modifications

4.5.1   Connecting to the existing wiring

Now connect the built-in DIA.NE XT4 to the existing wiring in accordance with the circuit diagram supplied. Disconnected cables must be labelled (adhesive strip, etc.).

4.5.2   Using existing switches

The existing three switches on the front of the switchgear cabinet door are re-used. The function remains the same, even after the upgrade to DIA.NE XT4 Light.

4.5.3   MORIS

Operate the MORIS system in accordance with the circuit diagram supplied.

4.5.4   Connecting the MMU

- XT3 and XT4 with X20 I/Os: Replace MMU card
- XT with 2003 I/Os → MMU on own Power Link V2 nodes

Figure 18: MMU

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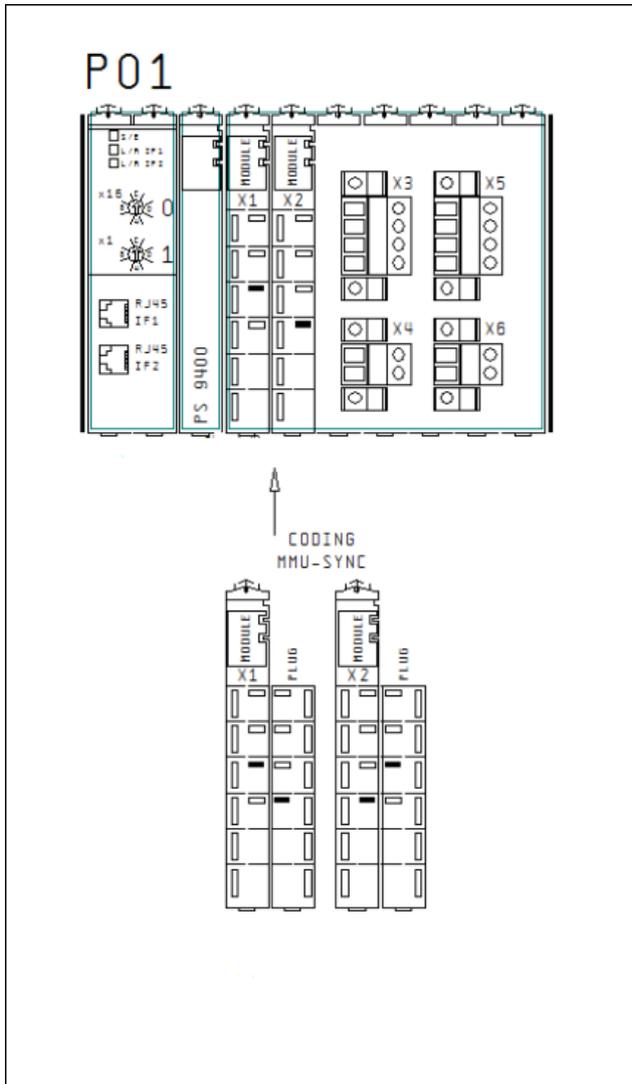
4.5.5   Modification of +A module control cabinet

An overview of the modules to be installed in the module control cabinet is shown in Figure 19 and Figure 20.

Figure 19: B&R 2005 module-to-module interface
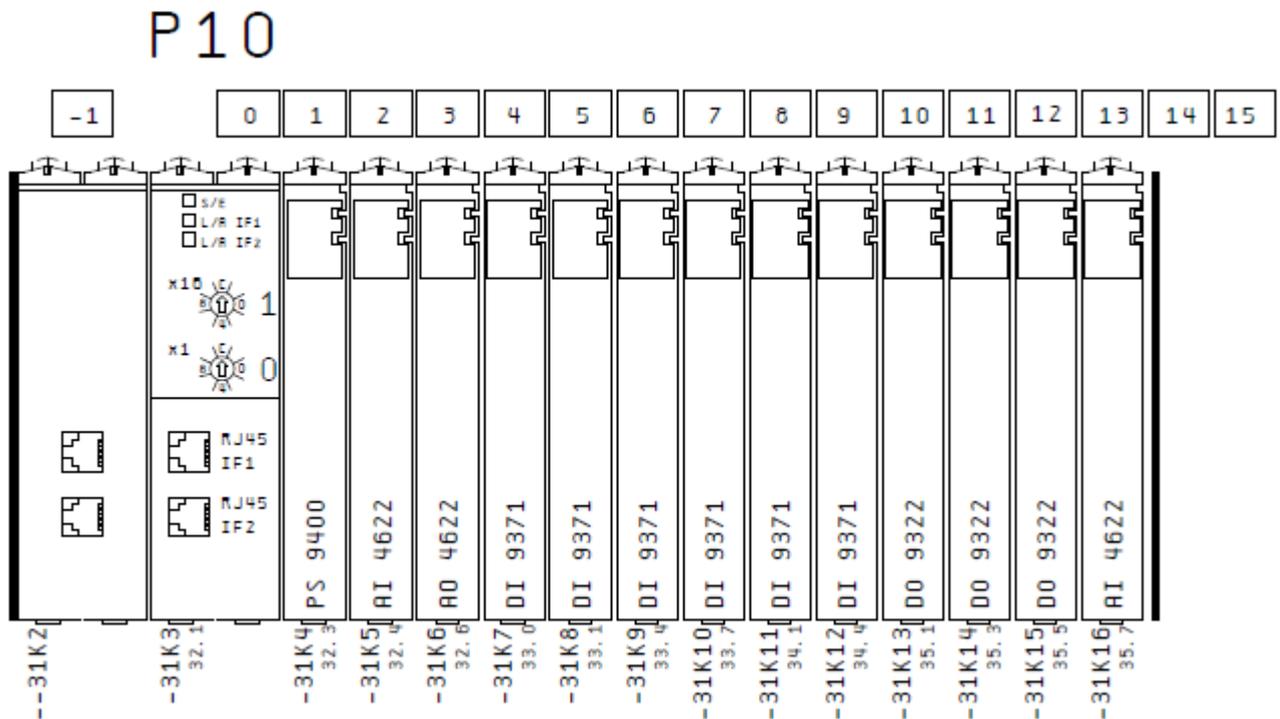
Figure 20: X20 module-to-module interface

<u>Note:</u>
The modules must be wired in accordance with the circuit diagram supplied.

4.5.6   Modification of +M module interface

An overview of the modules to be installed in the module control cabinet is shown in Figure 20 and Figure 21.

Figure 21: B&R 2005 module-to-module interface
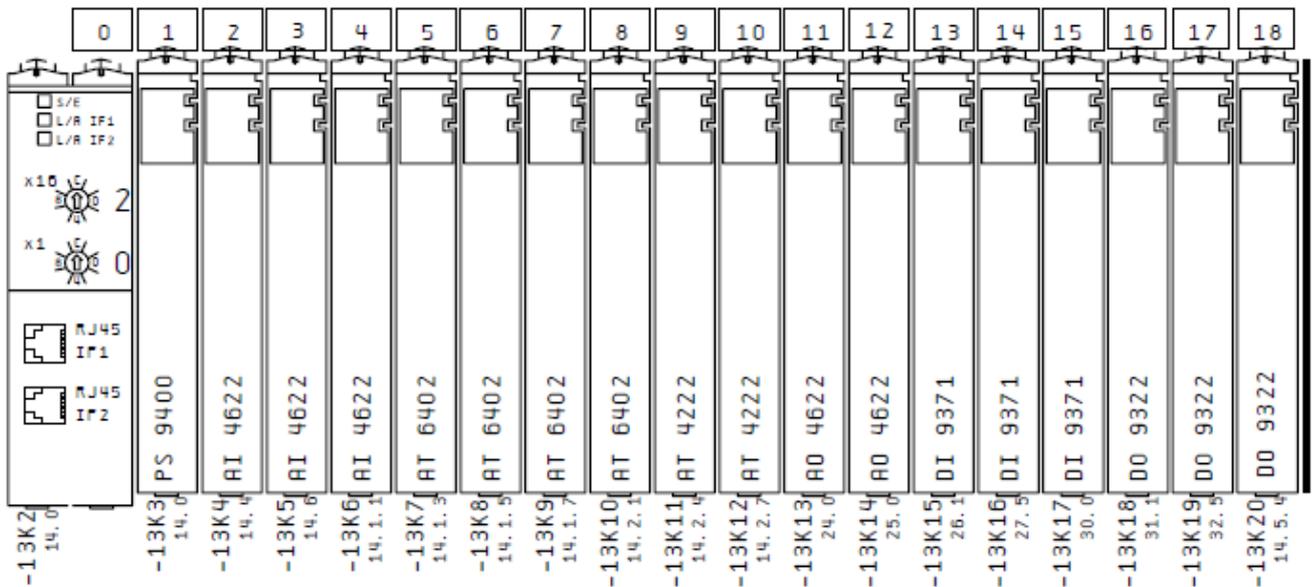
Figure 22: X20 module-to-module interface

<u>Note:</u>
The modules must be wired in accordance with the circuit diagram supplied.

5   COMMISSIONING

5.1   Software

The software is included in the installation package or is available from the download area. The software is available online. Work through the individual points in accordance with the commissioning checklist.

5.2   Parameters

The parameters are included in the installation package or are available from the download area. The parameters are available online. Work through the individual points in accordance with the commissioning checklist.

5.3   Customer-specific application

If customer-specific applications are involved, the necessary files are available from the download area.

6   DOCUMENTATION SUPPLIED

- Commissioning checklist
- Software file (.w00 or plc folder)
- Parameter file (default parameters)
- Upd file for HMI
- Circuit diagram / interfaces / specification / error message list
- Parameters for protective equipment and Unitrol (optional)

7 MISCELLANEOUS

7.1 Filling in the commissioning checklist

To complete the upgrade, fill in the commissioning checklist and return it to Jenbach.

7.2 Required time

The following table shows how much time should be allowed for installation. The required times listed in Table 2 relate to the case of an upgrade of all possible packages.

ACTIVITY	ENGINE	REQUIRED TIME
Upgrading DIA.NE XT / XT3 to XT4 on 1 engine	Type 2, 3, 4 and 6 engines	Approx. 4 – 6 days for 1 technician
Upgrading DIA.NE Blue to XT4 on 1 engine	Type 2, 3, 4 and 6 engines	Approx. 6 – 10 days for 1 technician

Table 2: Required time

7.3 Relevant documents

When working on GE Jenbacher modules, all applicable local regulations must of course be observed in addition to our documentation. In relation to this Service Technician Instruction we stress the fact that the following documents must also be observed:

- Technical Instruction TA 1100-0105: Engine shut-down
- Technical Instruction TA 1100-0111: General conditions - Operation and maintenance
- Technical Instruction TA 1310-0011: Standard tool catalogue
- Technical Instruction TA 2300-0005: Safety regulations
- Technical Instruction TA 2300-0010: Guidelines for using the LOTO kit

7.4 Revision history

INDEX	DATE	DESCRIPTION / REVISION SUMMARY
02	12/04/2018	Drawings for grinding the fitting opening updated
01	18/10/2017	First version of this document

Table 3: Revision history

8   LIST OF FIGURES