

Installation and maintenance guide **Emax 2 Retrofill Circuit Breakers** Direct Replacement of Legacy GE AK 800A - 4000A Circuit Breakers Used in AKD-6 & Substructures



General Electric AKD-6 Low Voltage Switchgear is a free-standing assembly of metal-enclosed power circuit breakers. It may also be part of a single-ended or double-ended load center unit substation. This manual applies to Emax 2 Retrofill circuit breakers to be used in AKD-6 Switchgear & substructures found in GE Switchboards: 800A-2000A, AKR-#A-30/50/T50 . 3200A & 4000A, AKR-#C-75/100 & OEM Substructures/Equipment using legacy AKR circuit breakers of the following types: AKR-#B-30/50/T50/75/100.

(# is shown in place of a number which designates the trip unit type.)

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1 - Hazards

- **Overview** The following important highlighted information appears throughout this document to warn of potential hazards or to call attention to information that clarifies a procedure. Carefully read all instructions and become familiar with the devices before trying to install, operate, service, or maintain this equipment.
 - **Danger** This indicates a hazardous situation which, if not avoided, results in death or serious injury. A variety of electrical hazards warnings are displayed here & are applied to installation manuals. These are standard or generic alerts & labels that must be taken quite seriously when install--ing Retrofill circuit breakers in AKD & other OEM's switchgear and when working with pote--ntially dangerous electrical equipment (Table 1).



Warning This indicates a hazardous situation, which, if not avoided, would result in death or serious injury. A variety of electrical hazards warnings are displayed here and are applied to instal--lation manuals. These are standard or generic alerts and labels that must be taken quite seriously when installing Retrofill circuit breakers in AKD switchgear and when working equipment that can cause injury, but may not be necessarily fatal (Table 2).

<u>Generic</u> Warning Alerts



Table 2

Caution This pertains to a hazard that has a low level of risk, which means that if not avoided, it could result in minor or moderate injury. It also indicates that failure to comply with instructions may result in product damage. (Table 3).



Notice or Note This indicates important information in that it aids in job performance, that is, a notice or note is used to notify practices not related to personal injury (Table 4).



Warranty requirements have been made to ensure accuracy, the information contained herein does not cover all details or variations in hardware and software, nor does it provide for every possible contingency in connection with installation, operation, and maintenance.

> Features may be described herein that are not present in all hardware and software systems. ABB Inc USA assumes no obligation of notice to holders of this document with respect to changes subsequently made. ABB Inc USA makes no representation or warranty, expressed, implied, or statutory, with respect to, and assumes no responsibility for the accuracy, completeness, sufficiency, or usefulness of the information contained herein. No warrantees of merchantability or fitness for purpose shall apply.

> Contact Email: <u>eppc.support@us.abb.com</u>, Phone: 888-385-1221, if further information is required concerning any aspect of Emax 2 Retrofill Circuit breaker operation or maintenance.

3 - Trademarks and Patents

Details • Emax 2 Retrofill

- Emax 2 Retrofill TU, Ekip DIP, Ekip Touch, Ekip Hi-Touch, Ekip G Touch, Ekip G Hi-Touch, Kip Measuring, Ekip Measuring Pro
- Emax 2 Retrofill Trip Unit
- Emax 2

4 - Standards

Agency
Certification

Standard Number	Title
ANSI C37.13,16,17,20.1,50,51,59	Low-Voltage AC Power Circuit Breakers & switchgears
NEMA SG 3,5	Low-Voltage Power Circuit Breakers
NEMA AB1	
UL 1066	Low-Voltage AC and DC Power Circuit Breakers Used in Enclosures

5 - Document Conventions

Details Topics and text are divided into primary, secondary, and tertiary paragraph headings.

6 - Related Publications

Publication	Publication Number
Installation Manual AKD 10	2TSA451010P0000
Installation Manual AKD 8	2TSA451009P0000
Installation Manual AKD 6	2TSA451014P0000
Installation Manual AKD 5	2TSA451011P0000
Accessory: Door Interlock (Door Interlock Kit)	2TSA451017P0000
Accessory: Kirk Key Installation Manual	2TSA451013P0000
Accessory: Retrofill Direct Replacement / CiC Full Door Kits AKD-5, 6, 8 & 10	2TSA451007P0000
Accessory: Retrofill Direct Replacement / CiC Adaptors Kits AKD-5, 6, 8 & 10	2TSA451008P0000
Accessory: OEM Direct Replacement Adaptor kits AKD-8 & 10	2TSE431967R1000
Accessory OEM Direct Replacement Adaptor kits, AKD8 &10, AKR 75/100, B&F TYPE	2TSE431968R1000
Accessory OEM Direct Replacement Adaptor kits, AKD8 & 10, only for AKR30S	2TSE431996R1000
Accessory: Position Switch Plate, Assembly & Wiring	2TSA451019P0000
Accessory: Neutral CT Adapters Installation Instructions	2TSA451018P0000
Accessory: Programmer Disconnects Installation Instructions	2TSA451012P0000
Accessory: Primary Disconnects Installation Instructions	2TSA451015P0000
Accessory: Secondary Disconnects, Installation Instructions	2TSA451016P0000
E2.2, 4.2, 6.2 Breakers Installation, Operation & Maintenance Manual	1SDH001000R0002
Instructions for using Ekip touch protection releases & accesories	1SDH001316R0002
Emax 2 Family Trip units Engineering manual	1SDH001330R0002

7 - Service and Support

Service and support are available from ABB Inc USA. Email: eppc.support@us.abb.com Phone: 888-385-1221

8 - Estimated Time to Complete Tasks

Wiring the secondary disconnects and verifying they match the switchgear cublicle may take 1 to 8 hrs depending on the complexity of the original breaker. Once the retrofill breaker is fully prepared, it should take about 20 minutes to swap out the old breaker and rack in the new Emax 2 Retrofill circuit breaker if the proper lifting bar and hoist are available, it may take an additional 30 min to replace the door.

The Emax 2 Retrofill, when ordered with 4 wire ground fault, will be equipped with a Neutral CT adapter. The adapter will modify the GE MicroVersa Trip type Neutral CT output to a Rogowski sensor output compatible with the Emax 2 Retrofill Trip Unit. With this device, it will not be necessary to change the neutral CT in the switchgear to a Rogowski sensor. If the trip unit types used are CS, SST or PS-1 POWER SENSOR™, then the CT should be replaced with the Microversa Trip type.

9 - Product Specs

Trip Unit Versions

Code (#)	Trip Unit Type
2	EC-AC/DC
3**	Power Sensor – AC Only
4**	ECS – AC Only
5**	SST – AC Only
6**	Micro Versa Trip
7	Micro Versa Trip RMS-9
8	Micro Versa Trip EPIC
9	Power Leader MVT+, MVT PM
10	Power Leader MVT+, MVT PM with RMS9C trip units
Ν	Non-Automatic

Weight (lbs)

Retrofill Breaker which replaces	Weight	BOX Weight	Pallet Weight	Accessories Weight	Total Weight
AKR-30-800A	184	11	24	2	221
AKR-50-1600A	230	11	24	2	267
AKRT-50-2000A	270	11	24	2	307
AKR75-3200A w/o Fans	552	15	30	2	599
AKR100-4000A w/Fans	572	15	30	2	619

Figure 1

AKD 6 - AKR30\50 Breaker in Cassette (Front View)



Figures 2 & 3

Fig 2. AKD 6 - AKR30 Breaker in Cassette (Rear View) Fig 3. AKD 6 - AKR50 Breaker in Cassette (Rear View)





AKD-6 - AKRT-50 Breaker in Cassette (Rear View)





AKD-6, AKR75\75H\100 Breaker in Cassette



Emax 2 Retrofill Circuit Breaker is suitable for application on power systems up to 635 VAC 50/60 Hz.

10 - History of AKD

AK - Power Circuit Breaker Equipment

D - Drawout circuit breaker construction

Manufactured from 1951 to 1975, all bolted, copper bus design, all drawout breakers AK-1,2, 3,-15 / 25 / 50 / 75 / 100; the 4000A-max bus rating. Breakers had a ratcheting drawout mechanism, with an open-door drawout. Breakers were painted ANSI61, light gray, manufactured in Philadelphia from 1951 to the mid-60s and in Burlington, Iowa from the mid-60s to 1975.

The breaker compartment was a welded assembly, and the equipment frame was bolted. Breaker boxes were stacked to make a vertical section with equipment frame around the breaker boxes. There were no bus compartment barriers, just an open bus design. Ring silver-plating was applied to bolted connections.

AKD - 5 Manufactured from 1960 until 1977, the aluminum bus had copper that was "flash-butt welded" to the aluminum at bolted connections. During that time, AK-2A, 3A -25 / 50 / T50 / 75 / 100 ("A" signifies AKD-5 drawout) were produced. Breakers up to 2000A had primary finger clusters. 3000 & 4000A breakers had a circular primary finger cluster arrangement in the switchgear compartment. Pull-lanyard drawout mechanism in the switchgear on early designs was replaced by a single jackscrew mechanism and then later replaced by a double jack-screw mechanism. Featured is a closed-door, drawout with inner house breaker compartment, where door moves with the breaker as it is racked in or out. Two bus levels are available with a ring bus used at 4000A. Particulars include: welded/riveted frame, bus compartment barriers, line/load separation barriers on mains and ties, isolation barriers on transformer transitions, copper runbacks on feeder breakers, ring silver-plating on copper, and aluminum bus un-plated (welded connections). The switchgear is painted sand-gray (beige), with some instrument doors painted blue. AKR-30/50 in 22"-wide sections were introduced in AKD-5 construction, early 70s. AK25s and AK50s were also available as substructure kits for OEMs to build around customer gear.

None of the Emax 2 Retrofill breakers utilize fans except for 3000A rating only. Note: All legacy AK & AKR breakers have a draw out letter code "A".

AKD - 6 AKD-6 was manufactured in Salisbury, NC from 1977 to 1981. Some AKD-5s, which were built in Salisbury from 1975 until 1977, got name-plated as AKD-6. There is no "flash-butt" welded aluminum to copper. Aluminum bus is tin-plated and bolted at shipping splits (but welded everywhere else). Copper bus design has ring silver plating at bolted joints. AKR-75 / 100s were introduced during this time. Stab-and-finger connections on 3200A and 4000A breakers were improvements, versus the round the primary disconnects on the AKD-5. The 4000A breaker was also narrowed to same width and phase-phase spacing as the 3200A.

The AKD-6 uses inner-house drawout breaker compartments on the 800 - 2000A breaker compartments. They are painted ANSI 61 light gray and breakers have ECS or SST trip units.

AKD-6 should mark a shift away from all AK breakers and to AKR breakers. The AKR-30/50/ 50H/T50 breakers used in AKD6 have a shallow 1" steel front escutcheon are drawout letter code "A" i.e. AKR-4A-30. The AKR-30/50/50H/T50/75/100 breakers sold to OEMs for their switchgear have a 5" deep plastic front escutcheon & spring loaded sliding "picture frame".

These are draw out letter code "B" i.e. AKR-4B-30.The AKR-75/100 breakers used in AKD-6 have a shallow 1" steel front escutcheon and vertical primary fingers. They are drawout letter code "C" i.e. AKR-4C-75.

None of the Emax 2 Retrofill breakers utilize fans except for 4000A rating only.

AKD - 8 The AKD-8 was manufactured in Salisbury, NC from 1980 to 1984 and in Burlington, Iowa from 1984 to 1999. It was mostly replaced by AKD-10 in 1999 to 2000 but was available thru 2015.

Model 1 and 2 have extruded vertical bus. Model 2 was introduced in 1983 to accommodate revised wire harness routing. Model 3 was introduced in 1991, using a flat bar vertical bus. AKR breakers use MicroVersaTrip 9, MVT RMS9, EPIC, MVT Plus, MVT PM or EntelliGuard TU. Aluminum bus was removed from the design in 1996 in favor of the standard tin-plated copper bus (silver plated optional).

The AKR-30/50/50H/T50 breakers used in AKD8 have 5" deep plastic front escutcheon & spring loaded sliding "picture frame". They are drawout letter code "D" i.e. AKR-7D-30. In AKD-8, most 800-2000A breakers are "feeder" breakers with vertical lower stud & primary disconnect fingers clusters, but 800-2000A breakers designated as "Main" breakers, have horizontal lower finger clusters, which is the same as "D" letter code breakers sold to OEM's. A lower stud rejection bracket differentiates between lower stud orientations.

AKR-75/100/125 circuit breakers used in AKD-8 switchgear have a 5" deep plastic front escutcheon & spring loaded sliding "picture frame" similar to the small frame breakers. The positions DISC/TEST/CONN are shown on the side of the front escutcheon by position of the sliding "picture frame". The GE AKD-8 breakers have a drawout letter code "D". OEM versions are drawout letter code "B" and GE Switchboard versions are drawout letter code "F". "B" & "F" breakers only differed by appearance items. All Primary disconnect stabs are vertically oriented.

The AKR-125 is a 5000A breaker that had 2 cooling fans. It was release in 1995. None of the Emax 2 Retrofill breakers utilize fans except for 4000A rating only.

AKD - 10 AKD-10 was manufactured in Burlington, IA from 1999 thru 2015. The switchgear compartment sizes and main & vertical bus arrangements are the same as AKD-8 Model 3. The compartments have pull-out rails. AKD-10 uses WavePro * drawout-only style breakers. All breakers have 4 rollers which align with the compartment rails.

The secondary control wiring for all functions is connected thru either one or two 36 point secondary disconnects with gold plated contacts. Secondary control wiring terminates at fixed standard locations on the 36 point disconnects. Each breaker has a pump style manual charging handle and manual push OPEN and Push CLOSE buttons. The front escutcheon is 5" deep with a sliding picture frame, but is wide enough so the trip unit and new style bell alarm are visible thru the front door of the switchgear.

Note GE Switchboard plants initially shipped "WS" style breakers and later shifted to "WE" style breakers to be consistent with GE Switchgear from Burlington, Iowa. The 5000A breaker had cooling fans. None of the Emax 2 Retrofill breakers utilize fans except the 4000A fully rated breaker.

(W1 & W2 Catalog numbers on legacy WavePro breakers designate additional dead front shields)

AKD-6: Retrofill Breaker

11 - AKD-6, Breaker Models

The Following table depicts the key features of AKR 30/50/AKRT50/AKR75/100 AKD6 Retrofill breakers.

Note: All features of the Legacy AKR 30/50/T50/75/100 breakers are offered with the corresponding Emax2 Retrofill breakers.

Breaker Model Comparison Table

Feature	AKR 30/50, AKRT50 Retrofill Breaker (800A, 1600A & 2000A)	AKR 75/100 Retrofill Breaker (3200A & 4000A)
Rail latch defeat	Breaker mounted mechanism is removed. No levers on the breaker side panels. Needs Spring clip installation in the compartment to achieve rail latch defeat.	Existing AKD6 Racking Mechanism will be reused. Rail Latch Defeats are not requred or installed on the loading rails.
Secondary Disc Bullet mounting	Secondary disconnect bullets mounted directly on metal bracket	Secondary disconnect bullets mounted directly on metal bracket
Kirklock Actuator		

Table 5

12 - AKD-6, Mechanical Drawings

The following engineering or assembly drawings describe the layout and dimensions of the AKD-6 Retrofill breaker.





AKD-6, AKR50 , Retrofill Breaker Dimensions



Figure 8

AKD-6, AKRT-50, Retrofill Breaker Dimensions



AKD-6, AKR75/100, Retrofill Breaker Dimensions



AKD-6 Compartment

13 - Interior View

The figures 10&11 below represent typical AKR-30/50/T50 and figure 12 represents typical AKR-75/100 AKD-6 compartment.

Figure 10



Figure 11

AKD-6 Compartment Distinctions



Figure 12



AKD-6 3200A/4000A Compartment





Figure 13 is an example of a compartment in the AKD-6 switchgear that is empty; that is, the upper compartment is ready for a retrofill breaker where the legacy, or original breaker, had been racked out and new wire connections made. The lower compartment has a retrofill breaker, already installed. In this figure, there is also a photo showing a mechanically-operated status indicator (connect/disconnect) that worked with the original breaker. This device, if left in the compartment as is, won't interfere with the retrofill breaker; it can, however, be disassembled by removing its hardware. Figure 14 displays the bus inside the gear.

Figure 13

AKD6 Breaker Compartment (Upper and Lower Compartments)





Status indicator (connect/disconnect) is a leftover device from the legacy breaker. Although it does not interfere with the retrofil, this mechanical indicator can be removed, if desired.

Figure 14



14 - Cut Power to AKD-6: Switchgear

Danger



• Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

Before modifying the switchgear compartment, de-energize/switch off the breaker. If the circuit breaker is ON and the springs are charged, to turn it off, press the OPEN button on the circuit breaker fascia, and ensure that the circuit breaker contacts are open.

15 - Rack Out AKD-6, Legacy/Existing CB

To rack-out legacy (old or original) breaker from compartment, refer to your legacybreaker's manual on how to remove the existing breaker.

16 - Check, Clean, Grease AKD-6, Compartment

- 1. Inspect the compartment for damage or signs of overheating.
- 2. Check the orientation of primary finger clusters match the switchgear stabs.
- 3. Check racking pin diameters agree with breaker racking cam slots.
- 4. Check the secondary disconnect integrity & their mounting supports for any damage or cracks.
- 5. If switchgear parts show cracks or damage contact ABB post sales service 888-437-3765.
- 6. Check each breaker compartment for bolted joints in the primary disconnect bars. Where such joints exist, check the bolts for tightness.
- 7. Inside the compartment, check the contact areas on each primary disconnect bar or cluster of fingers for foreign matter that may have accumulated. Clean those areas if necessary with a clean, lint-free rag and isopropyl alcohol or acetone.
- 8. Be sure to apply a thin film of electrical grease (red, D50H387) to the contact areas for better electrical connections inside the compartment.

Unpack Circuit Breaker

By following the procedures below, one should be able to install the breaker with minimum effort and time.

Danger



• Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

Caution



- Wear hard hat, gloves, and safety shoes.
- Failure to comply with these instructions could result in serious injury.



circuit breaker into a lower rated cassette/substructure.

All Emax 2 Retrofill circuit breakers have been designed and manufactured to ANSI standards. The design was based on the original requirements of the legacy switchgear and breakers. The product is manufactured in ABB Inc USA, Senotobia, Missisipi (MS) and is inspected using some of the same master gauges used on the legacy AK, AKR breakers to confirm electrical and mechanical performance, including rejections-features.

18 - Information Label

On the front of each circuit breaker there is a factory-assembled label that details all electrical accessories included on the circuit breaker.

19 - Product and Catalog Serial Numbers

Product catalog and serial numbers should be kept handy when communicating about the circuit breaker. Each circuit breaker has a unique serial number (S/N) located on the front fascia.

20 - Remove Circuit Breaker from Container

Inspect and Prepare	 Inspect the shipping container for obvious signs of rough handling and/or external damage incurred during transportation. Record any observed damage for reporting to the carrier. Ensure all recorded reports and claims include the order number and name plate information. Remove the banding straps and lift the top cover. Remove all packaging material. Remove all product documentation and store properly. Unscrew the mounting screws that fasten the circuit breaker to the bottom of the shipping pallet and remove the circuit breaker. Remove the two shipping brackets and discard them.
Use Lifting Device	 Use a lifting device for moving circuit breaker in order to avoid personal injury and damaging the breaker. Use a proper overhead lifting device to mount breaker into the switchgear. Contact Email: <u>eppc.support@us.abb.com</u>, Phone: 888-385-1221 for availability of a hoisting device. LiftingBar for AKD5/6/8/10/OEM, Emax2 Retrofit kits ratings upto 2000A (Except 1600A): 2TSE431929R1000 LiftingBar AKD5/6/8/10 OEM, 1600A, 3000A-4000A : 2TSE431931R1000



If you decide not to install the Retrofill breaker until a later time, then you can store it away for installing it later.

- 1. Store the circuit breakers in a clean, dry location in an upright position.
- 2. Make sure that the breakers are properly supported to prevent bending of the studs or damage to any of the breaker parts. Do not remove any protective grease until the assemblies are ready to be installed. A covering of draft or other non-absorbent paper prevents dust from settling on the breakers.
- 3. If breakers are not to be placed in service at once, remove them from their shipping cartons and thoroughly inspect them for damage.
- 4. If everything is in satisfactory condition, replace the breakers in their shipping cartons for storage. If it is necessary to store the equipment for any length of time, use the following precautions to prevent corrosion or deterioration.
- 5. Store in a clean, dry, rodent-free location with moderate temperature and provide protective coverings to prevent dirt, water, or other foreign substances from entering the breaker.
- 6. If dampness or condensation is encountered in the storage location, heaters can be used to prevent moisture damage.
- 7. After prolonged storage, Level 1 maintenance is needed under two years of storage. While Level 2 maintenance is needed over two years of storage. Refer to circuit breaker manual in maintenance L1-L2 descriptions.

Refer to Emax2 Installation, Operation and Maintenance Instructions – Publication #1SDH001000R0002 pages 99-112.

Danger



DANGER

- It must be ensured that the supply power to the compartment is turned off/ compartment is de-energized for all the incoming and outgoing circuits of the LVS prior to any work being conducted on it.
- During the installation and related work on the equipment, it must be ensured that the operator is using the prescribed PPE for the specified tasks.
- Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

These breakers are supported on a rollout track in the same manner as the AKR breakers. Racking cams on both sides of the breaker frame engage the drawout mechanism pins fastened to both sides of the compartment.

Check to see that the breaker or breakers match their respective compartments. Look on the breaker summary sheet, the front view drawings, breaker nameplate, and on the identification card on the breaker shipping carton.

Clean and Grease Breaker

- 1. Before installing or operating a breaker, refer to the breaker instruction manual for preoperation inspection and test.
- 2. Check thoroughly for any damaged or loose parts and for any dirt or foreign matter which may be in the breaker.
- 3. Clean those areas if necessary, with a clean, lint-free rag and isopropyl alcohol or acetone.
- 4. Be sure to apply a thin film of electrical grease (Mobilgrease 28) to the primary disconnect fingers (Figure 15).

Figure 15

AKD-6, (2000A-4000A) Primary Contacts or "Fingers" (Apply Grease to sliding surfaces)





Prepare Switchgear Compartment

- 1. <u>Before</u> modifying the switchgear compartment, de-energize/switch off the breaker. If the circuit breaker is ON and the springs are charged, to turn it off, press the OPEN button on the circuit breaker fascia, and ensure that the circuit breaker contacts are open.
- 2. Inspect the compartment for damage, rework .



Figure 16

Figure 17

- 3. Check cabinet for suitability of Retrofill.
- 4. Check each breaker compartment for bolted joints in the primary disconnect bars. Where such joints exist, check the bolts for tightness.
- 5. Inside the compartment, check the contact areas on each primary disconnect bar or cluster of fingers for foreign matter that may have accumulated. Clean those areas if necessary with a clean, lint-free rag and isopropyl alcohol or acetone.

Be sure to apply a thin film of D50HD38 (Mobilgrease 28) to the contact areas for better electrical connections inside the compartment



AKD-6— 3200A/4000A Compartment



Figure 18

Latching Inner Rail with Outer Rail



Danger



- It must be ensured that the supply power to the compartment is turned off/ compartment is de-energized for all the incoming and outgoing circuits of the LVS prior to any work being conducted on it.
- During the installation and related work on the equipment, it must be ensured that the operator is using the prescribed PPE for the specified tasks
- Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

Before modifying the switchgear compartment, de-energize/switch off the breaker. If the circuit breaker is ON and the springs are charged, to turn it off, press the OPEN button on the circuit breaker fascia, and ensure that the circuit breaker contacts are open.

Notice		PRODUCT DAMAGE
	NOTICE	 Ensure circuit breaker and its accessories are always used within their designated ratings. Do not allow the circuit breaker to hit a hard surface while handling. Do not drag or slide the circuit breaker across a hard or rough surface
	A factory-installed rejection feat cassettes/ substructure, preven rating into a higher rated casset circuit breaker into a lower rated	ture prevents mismatching circuit breakers and iting the insertion of a circuit breaker with a lower te/substructure, or the insertion of a higher rated d cassette/substructure.

Danger



- It must be ensured that the supply power to the compartment is turned off/ compartment is deenergized for all the incoming and outgoing circuits of the LVS prior to any work being conducted on it
- During the installation and related work on the equipment, it must be ensured that the operator is using the prescribed PPE for the specified tasks
- Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

21 - Breaker Installation Overview

Note: While installing the breaker, if the AKD-6 inner housing & front door assembly move inward more than a couple inches from the fully Disconnected position, before the breaker and moveable rails are pushed in and front rail latches are toggled; then interlocks at the compartment rear will block movement of the sliding rails & breaker.

For AKR 30/50/T50 AKD-6 Retrofill Breakers

The original AKR-30/50 style breaker would unlatch the two levers by motion of the racking cams as it began its 4.25" Drawout travel. The Emax 2 Retrofill breaker has a 2.5" drawout travel. The thin sheet metal locking levers on both sides of the compartment should be removed. This will be done with a punch of a slightly smaller diameter than the 1/8" roll pin being removed. Drive out the pins. Remove both right and left side levers, torsion springs and roll pins. After loading the new breaker and sliding the rails fully inward; the rail levers are toggled as usual. the breaker & inner housing can be pushed inward until the new breaker's racking cams engage the compartment racking pins. Then the door can be closed and the breaker can be racked in normally.

The rail latch defeat Levers found on the original AKR 30/50/T50 breakers and shown in Figures 19 were eliminated for two reasons.

- 1) To make space for mechanical parts added to allow the original AKD-6 compartment mounted key interlock to function with the retrofill circuit breaker.
- 2) The AKD-6 locking levers were often damaged and not working to hold the inner compartment housing and door assembly in the Disconnect position (as shown on the original indicator tape in AKD-6), while sliding the breaker into the switchgear.

Note : Use the plastic loading stop tool a key slot to hang the tool for storage as shown in Figures. 20. It will stop the inner housing from going in too far which would prevent sliding In the breaker and two rails fully inward to the point where one can rotate the Rail Locking Levers to engage them with the fixed rails. Store the Loading Stop Tool back on the left side-frame of the breaker. Push the breaker in to engage the racking cams. The inner housing will slide in further about 2 inches.

- 1. After the legacy breaker is removed. Check that everything in the compartment looks good, clean, aligned, not bent, not overheating.
- 2. Remove the thin sheet metal locking levers on both sides of the compartment as shown in Figures 19. This will be done with a punch of a slightly smaller diameter than the 1/8" roll pin being removed. Drive out the pins. Remove both right and left side levers, torsion springs and roll pins as shown in Figures 19.



AKD-6 Removal of Rail Defeat Latches AKR 30/50/T50



3.Install the tool into either the Lower or Upper Center Slot in the switchgear inner housing as shown Fig.20. Locate the tool hanging inside of the left side frame Emax2 Circuit breaker.



Breaker Installation Tool mounted on AKD-6 compartment sides (LH & RH)



- 4. Push the breaker into the compartment until it hits the stop due to installed breaker installation tool (fig 20).
- 5. Push the breaker and sliding rails fully into the compartment.
- 6. Latch the inner rail with outer rail (fig. 23) by rotating the rail lever
- 7. Store the Loading Stop Tool back on the left side frame of the breaker
- 8. Now the new retrofill breaker can be racked in, using the racking mechanism provided in the breaker.
- 9. Follow the procedure steps from 15 to 25 as described for installing AKR 30/50/T50 retrofill breaker

After the existing breaker is removed and the retrofill breaker is wired to match the compartment, it can be installed in the AKD-6 switchgear.

Verify that the breaker is in the disconnected, switched-off position before mounting it on the rails.

- 1. While rotating the lever (away from the cubicle) at the end of each rail, which unlocks the inner rail, pull both the rail assemblies outwards to their fully extended positions.
- 2. The entire inner housing and front door must also be extended fully outward ~ 4.5".
- 3. Use a suitable lifting device and AKR lifting bar. This might require a two-man effort: one to carefully and slowly operate the lift and the other to guide the breaker into the switchgear rail slots.
- 4. Make sure that the lifting bar is secured and locked in placed on the breaker.
- 5. Check that the retrofill is free from obstruction inside the compartment.
- 6. When the breaker is lined up with the compartment, raise the breaker only slightly higher than the compartment floor, keeping it at slight angle.

Figure 21



- 7. Keep the breaker steady. Continue to guide the breaker, while checking both sides and underneath, so that both sets of pins can be lowered and lined up easily with the rails slots.
- 8. Place retrofit Emax2 Retrofill breaker on the rails (fig. 22) to the disconnect position of the legacy breaker. (Note that the pins must line up with the slots on the rails.)
- 9. Once the breaker rests on the rails at all 4 pins, unhook the lifting bar and move the hoisting apparatus out of the way.

Figure 22

AKR30/50 Retrofill Breaker Hoisted and Secured on Rails



- 10. Push the breaker into the compartment until it can't be pushed in any further and tog--gle the rail levers to latch the inner rail with outer rail. Push the retrofill breaker to "test" position of the legacy breaker. This will be the disconnect position for the retro--fill breaker.
- 11. Note: Now the new retrofill breaker can be racked in, using the racking mechanism provided in the breaker.



- 15. Remove the racking tool from the storage location on the retrofill front panel and grab the handle and extend the torque bar from inside the handle.
- 16. Use a blade-type screwdriver in the slot or rack-out lock of the breaker (fig. 24) and turn it clockwise 45° to the right so that the racking handle shutter.

Figure 24



Figure 25



- 17. While turning the screwdriver to the right with the racking tool shutter open, insert the racking tool in the handle-insertion hole, so that it engages the racking mechanism inside the hole.
- 18. Line up the racking tool or crank with the handle straight up so that you can get some good leverage or torque. Then, crank clockwise so that the retrofill starts to move in, slowly sliding forward into the compartment. Push the breaker in slightly to engage racking cams, if torque seems high at the start.
- 19. Rotating clockwise ~37 turns racks the circuit breaker all the way into the enclosure.
- 20. As the breaker approaches the TEST position, check the alignment of the fixed and moving parts of the secondary disconnect contacts (fig. 25). If a motor spring-charge or under-voltage-release is installed, these devices might activate when approaching the TEST position. The AKD-67 pt Secondary Disconnect Blocks will have full conductive copper/ Ag plated strips including the ramp that depresses the Secondary Bullets on the breaker. In case Emax2 Retrofill breakers Secondary Bullets touch those in the DISConnect Position and if this must be isolated; then the old Secondary Disconnect Blocks would need to be replaced with the new ones that have the front ramp done with plastic of the housing as shown in Figs. 25b & c.
- 21. Continue rotating the racking handle clockwise until the position indicator first shows TEST, and then finally shows CONNECTED.
- 22. When approaching the CONNECTED position, more torque for turning the racking handle is normal as the primary finger clusters engage with AKD6 primary bus stabs.
- 23. Keep cranking as required, that is, when any further torquing can't be done.
- 24. At 37 clockwise rotations, the fingers at the back of the circuit breaker should be completely engaged with the primary bust stabs.
- 25. Remove and store the racking handle in its storage location.

Installation for AKD6 AKR75/100

Installation process for AKD6 AKR75/100 remains same as detailed in Pages 26,27 and 28. However Below are the main differences:

- 1. Removal of rail latch levers is not applicable for AKD6 AKR75/100 compartment.
- 2. Breaker "disconnect" position of the legacy breaker will be same as corresponding disconnect position for the retrofill breaker. (unlike the "test" position for small frames)
- 3. Use the Legacy Breaker Racking Mechanism in the AKD6 switchgear for racking in the Emax2 AKR75/100 Retrofill breaker from disconnect postion to connect position. Follow the indications on the drum indicator on the legacy switch gear.
- 4. The Installation sequence for AKD6 Emax2 AKR75/100 Retrofill Breaker into AKD-6 Co--mpartment is explained through Figs. 26a-g.





23 - AKD-6, Secondary Disconnects, Bullets

This section deals with installing and wiring the legacy secondary disconnect assemblies.

The Emax 2 Retrofill Breaker has these two options:

- All secondary disconnects installed
- No secondary disconnects installed

In case the application requires installing all 3 secondary disconnect blocks (actually, three sets of bullets), you would select the first option. As secondary disconnects can be pre-installed on the breaker, wiring the secondary disconnects can be done.

In case the application does not require any secondary disconnect assemblies, take the second option. Thus, no further wiring is needed.

If the application requires less than 3 secondary disconnect blocks, the customer can choose the second option, order secondary disconnect blocks as needed, and then install the secondaries, completing the wiring for the breaker. These options are discussed in the next sections.

The secondary disconnect block assemblies (Figure 27) for the AKD6 version of the Emax2 Retrofill Breaker can be purchased and installed. Here are the installation instructions:



For AKR 30/50/75/100 AKD6 retrofill breakers

- 1. Unpack the secondary disconnect block from the box. Each kit of secondary disconnect has four fixing nuts, plain washers, and spring washers. These can be arranged on a work station to prepare for installing the assemblies.
- 2. Check that the bullets, on top of the secondary disconnects, are not damaged and that they slide in to the blocks freely. The bullets are spring-loaded and retract to their initial positions when they are released from being pressed down.
- 3. Check for electrical continuity between the bullets on one and the wire terminations on the other. Blocks containing faulty bullets should be replaced.
- 4. Place the secondary disconnect block on top of the horizontal plate at the rear of the Emax 2 Retrofill ACB, which runs across the width of the Emax 2 Retrofill ACB.
- 5. Align the four studs at the base of the supplied block to the four holes on the plate. The plate is provided with three sets of four holes, one set for each block (A, B, and C blocks).
- 6. Slide the secondary blocks down into the plate such that the base of the secondary disconnect rests on top of the plate.
- 7. Secure the studs on to the fixing plates using the hardware provided as mentioned above. The nuts must be tightened hand-tight.
- 8. Verify that the wire markers are clearly visible and not damaged so that they are wired easily and efficiently.
- 9. Be careful that that the wires are not pinched or damaged while installing the secondary disconnect blocks.

For AKR 30/50/T50/75/100 AKD6 retrofill breakers

- 1. If the Emax 2 retrofill breaker order included (3) 7 pt. secondary disconnect blocks, see step 2 otherwise skip past the wiring instructions.
- 2. Check that the bullets, on top of the secondary disconnects, are not damaged and that they slide in to the blocks freely. The bullets are spring-loaded and return to their initial positions when they are released from being pressed down.
- 3. Check for electrical continuity between the bullets on one end and the wire terminations on the other. Blocks containing faulty bullets should be replaced.
- 4. Place the secondary disconnect block on top of the horizontal plate at the rear of the Retrofill Emax 2 ACB, which runs across the width of the Retrofill Emax 2 ACB.
- 5. Align the three holes on the face of the supplied secondary block to the three holes on the plate and secure the block to the plates using the hardware provided as mentioned above. The screw tightening torque should be in the range of 77 to 93 in-lbs.

Notice



WIRING

• Do not pinch/damage the wires while installing the secondary disconnect blocks.



Wire Secondary Disconnect Assembly-AKR30/30H/50/50H/75/100

<u>Tools required</u>: wire stripper, wire cutter, and a Philips-head screw driver, M6 wrench As mentioned above, the secondary disconnect blocks are available with all blocks installed. In this case, the wires on the blocks are routed through one side of the breaker and then on to the front. The wires on the front are left loose for ease of landing them to the Emax 2 ACB breaker secondary disconnects.

When the secondary disconnect blocks are installed at the customer's site, the wires would not have been already routed. The wires should not be routed from the outside of the metal structure as it might interfere with the motion of the kit during the racking into the compartment. Also, it should be kept in mind that the wires are securely fixed on the inside metal frame of the Retrofill kit with tie-wraps.

Check that wire routing does not exert pressure on the bullets because this can bend the connection points and effects biasing and contact pressure. By using tie-wraps, wire routing can eliminate sagging of the wire harness and undue pressure on secondary bullets. Once the above mentioned steps are completed, landing the wires to the points on the Emax 2 ACB secondaries can begin.

Once the above mentioned steps are completed, begin landing the wires to the points on the secondaries, based on the typical wiring diagrams found in Tables 6,7 and 8.

AKD-6, Secondary Disconnects Wiring Diagram

Table 6 shows one of the Example of AKD-6 Secondary disconnect to Emax 2 Breaker wiring

Table 6

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0 ¹ H4 95 35 96 36 U1 98 38 U2 1 4K S51 S33 M	RI V3 Vn Get Szi Ne- K R2 V2 Rct Ge- Szo Ne+ K V1 Gzo Szc Gzi Rca K YR Trip Unit 1/0 Et Et	2 W4 I W3
	CONTATTO DI SEGNALAZIONE DI TRIP S51 TRIP SIGNALLING CONTACT - S51	MOTORE PER LA CARICA DELLE MOLLE DI CHIUSURA - M MOTOR FOR LOADING CLOSING SPRINGS - M	
A 4 A K R X X V A 1 A 1 X V X X A K R A 4	xB7 2 3 3 3 3 3 3 3 3 3 3 3 3 3	I I I Z I Z I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I	

Table 7



NOTES:

1. "*B" refers to the mixed auxilliary contacts, like Q1 & Q2 are of 400 v while Q3 & Q4 are of 24V. 2. This is a sample wiring diagram.

For exact connection points on the fixed side, refer the wiring diagram supplied with original breaker. Refer Emax catalogue for all other available connection schemes.

Table 8



NOTES:

1. 77(YC)-78(YC, EKIP COM ACTUATOR) as an alternative to each other

2. 73A(YU2 OR YO2) out of 2 only one can be supplied

3. "M*" indicates when the circuit breaker has two or three applications but only one can be supplied.

4. A7,A8,A5,A6,A9,A10,A11,A12,A13 use wire length 150mm

5. Emax 2 standard offering ST1, UVR1,CC or CCC &UV2

24 - 19 pin Programmer Secondary Disconnect (Breaker)

The 19-pin programmer disconnects can now be included with the AKD-6 series retrofills to accommodate the extended features of the Emax 2 Trip Unit. The 19-pin programmer-disconnect assemblies already come pre-installed and wired from the factory and do not require any installation in the field.

The compartment side is installed and wired in the field by a qualified electrician or installation service company.

Figure 29 shows the 19-pin programmer-disconnect on the AKR30/50, bottom side of the breaker, already installed. Table 9 displays the wiring diagram for the programmer-discon nect (12-pin and 19-pin combined in one diagram, although the AKD-6 does not use the 12-pin), features an exploded view of the 19-pin programmer disconnect. An installed view of the 19-pin programmer disconnect appears in figs. 30 & 31. For the compartment side, the 19-pin is ordered separately and comes in a box.



Table 9

Wiring for 19 - Pin Programmer Disconnect





Figure 31 shows the 19-pin programmer-disconnect on the AKR75/100, rear left side of the breaker, already installed. Figure 31a features an exploded view of the 19-pin programmer disconnect. An installed view of the 19-pin programmer disconnect appears in Figure 31b. For the compartment side, the 19-pin programmer-disconnect comes in a box.



25 - Install 19 Pin Programmer Secondary Disconnect (Compartment)

Danger



- It must be ensured that the supply power to the compartment is turned off/ compartment is de-energized for all the incoming and outgoing circuits of the LVS prior to any work being conducted on it.
- During the installation and related work on the equipment, it must be ensured that the operator is using the prescribed PPE for the specified tasks
- Ensure only qualified personnel install, operate, service and maintain all electrical equipment.
- Installing the programmer disconnect should not be carried out when the compartment is live.
- The compartment should be de-energized before the installing the programmer disconnect assembly.

NOTE: 12-Pin Programmer disconnect configuration is not provided with the AKD6 version of the Retrofills of the Emax 2 ACB.

To install the programmer disconnect in the AKD-6 switchgear, do the following:

- 1. Turn off power to the switchgear, if not done already.
- 2. Have these tools ready for doing the task: hand-drill, cleaning solution, antirust, and wrench for metric M6 bolt/nut.
- 3. Clean the base of the compartment of any dirt or foreign particles, if not done already.
- 4. Slide the inner frame assembly to its maximum inserted condition
- 5. This position corresponds to the frame position when the breaker would be in, fully connected.
- 6. Use the slot, inner semicircle as a datum reference and mark the mounting-hole locations using the template shown in figures 32 & 34. .Dimensions shown are in inches.
- 7. Drill ¼-inch diameter holes at 4 locations as marked in figures 32 & 34.

Figure 32



- 8. Place the programmer disconnect assembly on the mounting holes and secure it to the base of the programmer using hardware (Bolt—M6 X 35/55, Nut—M6 (metric)) provided along with the programmer disconnect assembly kit as represented in figs. 33 & 34.
- 9. Check the movement of programmer disconnect on slides for biasing.
- 10. Tighten the hardware hand-tight
- 11. From the disconnect plug, route the wire to suitable incoming cables from the compartment.







Wiring Diagram for the AK/AKR Retrofill



Note: Later models of breakers (Q3 2015) are shipped with position switch bracket preinstalled.

Position switch actuator bracket can be installed on AKR30H/50H versions of Emax 2 ACB for AKD6 LVS. There are no additional parts to be installed for AKR75/100 retrofill variants. The steps of installation are as follows:

Retrofills use the legacy position switch already mounted in the cubicle. If a new position switch has to be installed, refer to the legacy position switch installation manual.

- 1. Unpack the position switch bracket. Each bracket is provided with a pair of M6x16mm Allen-type bolts and washers.
- 2. Place the bracket on the bottom right side of the AKD6 base. Two locating holes are provided for mounting of the position switch bracket.
- 3. Fasten the two bolts to the locating holes after placing the washers to securely mount the bracket.
- 4. The bracket is ready for use.



Level	Item or Part Number	Description	Quantity
1	10105289P1	Position Switch Brkt, AKD-6	1
1	10100950P4	Washer M6	2
1	10100380P1	Serrated Belleville Washer M6	2
1	10100545P1	Cap Head Screw M6x16	2

Note: Individual hardware for the position switch actuator cannot be ordered separately. The item numbers given are for reference only. The assembly comes as a unit or a kit.

Danger



- It must be ensured that the supply power to the compartment is turned off/ compartment is de-energized for all the incoming and outgoing circuits of the LVS prior to any work being conducted on it.
- During the installation and related work on the equipment, it must be ensured that the operator is using the prescribed PPE for the specified tasks
- Ensure only qualified personnel install, operate, service and maintain all electrical equipment.

Tools required: Flat screw driver, E-clip mounting tool.

The door interlock system prevents opening of the breaker compartment door when the breaker is in the racked-in position and connected state. Figure 37 shows the components that make up the AKD-6 AKR30H/50H retrofill door interlocking assembly.



The sequence of assembly steps of the door interlock is as follows:

1. Unpack the door interlock kit. Each kit consists of a torsion spring, two E-clips and a breaker side-door interlock bracket.

- 2. Place the torsion spring on the pin as shown in the exploded view below and anchor it by placing one end of the pin into the hole provided inside the side-sheet of the retrofill.
- 3. Mount the door interlock bracket on the same pin via the hole provided on the bracket. Also, it must be ensured that the slot of the door interlock bracket is mounted on the second pin, placed on the front as shown in
- 4. Mount the free end of the torsion spring on the bracket as shown
- 5. Insert the E-clips mentioned in Step 1 to complete the assembly.

Figure 38

AKD-6 AKR30H/50H Door Interlock Bracket Mounting



The completed assembly of the door interlock will be as shown below



6. For AKD6 AKR75/100 Retrofill The Existing Door Interlock in the Compartment will be reused or can be reordered from customer support.

Figure 39

Installing Neutral Disconnect Assembly (Breaker)

Figures 40 & 41 show the exploded/assembled view/s of the breaker side neutral disconnect assembly for the AKD-6 AKR30/30H/50/50H/75/100 retrofills. These will be available prein-stalled and wired from the factory.



AKR 100 - 4000A , Fan Control Unit Wiring & Trip unit Programming instructions

Wiring Diagram

- Follow the below circuit diagram to make the connections between the 2k-1 signalling unit, relay and fans.
 - Refer Relay diagram & 1SDH001000R0524 to identify the terminal marking in circuit diagram.
 - Note: U1 & U2 Emax 2 motor operator (120 V~) terminal.
 - \bullet NOTE 1: In the absence of motor or if motor voltage rating is different than 120 V~ , connect 120 V ` directly to T1 and T2
 - Refer 2TSE432074P1000 and 2TSE432048R1000 for the wire length and lug details.



To k11

To 7

To k13

To 14

Figure 44

Wiring of WP 4000A breaker with FAN control unit



Configuring Ekip Touch, Hi Touch Trip unit

27 - Connecting Ekip Touch

Connet Ekip Touch or Hi Touch Trip unit using Ekip connect 3.0.357 9 (or later) software and Ekip T&P unit.

Figure	45
--------	----

3.1.0.0	Scall devices			∙¥. ∧ saugata.uas@m.abu.co
Coan	Connect your device by selecting one	FOUND DEVIC	ES	
	communication channel.			
	T&P	SCAN		
	\odot			
	Serial port	SCAN		
	Configure			
	<u> </u>			
	Bluetooth Configure	SCAN	No devic	e available
	\frown			
	Configure	SCAN		
	ABB Ability™ Electrical Distribution (Control System		
Marketplace				
Tools	Activate ABB Abil	ity™ ED(

28 - Synchronizing 2K-1 signalling module with the trip unit

• The activation of local bus - essential to start the communication between the module and the Trip unit

ABB Ekip Connect 3.1.0.0	Classic View					÷Q:	R saugata.das@	- D
≡	1 Information		Unit configuration				C) Refresh	
문 <mark>_</mark> Scan	S Status		EN XK					-
Devices	W Warning/Alarms		Custom fields	v î	Time Setting			~
FANCONTROL (>) E4.2S-A3200 Ekip Touch	T Trips		Unit Configuration	^				
🖽 Dashboard	MM Measures Menu	×	TestBus Write	Enabled				
(i) Information	CS CB Statistics		TFT Orientation	Landscape -				
Configuration	UC Unit configuration		Ext Toroid Type Ext Ground Toroid Monitor Time	None ▼ 100 A ▼ 5 min ▼				
[]n] Monitoring	PP Protection Parameters	~	Start Up threshold	0.10 In 👻				
Protections	M Modules	~	Language Harmonic Distortion Warning	English -				
Classis View	PS Programmable Status and Outputs	~	Phase Rotation Warning Phase Rotation Cycle	Off 123 •				
	F Functions		Power factor Alexa Power factor Threshold	0.95 -				
₩ Marketplace	MH Measures History		Local Bus Enable	Enabled				
Y Tools				0.010g	a\ABB\EkipConne	ect3\Device	Descriptors\132_Ekip	Touch_v2.274.

• Once the local bus is activated 2k modue should synchronize with the Ekip touch trip unit.

Check the following for synchronization status.

Power LED reports ON status and correct communication with Ekip Touch :

- Off: module off
- Fixed or flashing light synchronized on power LED of Ekip Touch: module ON and communication with Trip unit present
- Flashing not synchronized with power LED of Ekip Touch (two fast flashes per second): module ON and communication with Trip unit absent

If the Ekip Signalling 2K module is detected correctly by Ekip Touch the specific configuration area in the Modules Settings menu is activated.

For each Ekip Signalling 2K module detected by Ekip Touch, a specific menu is available containing the submenus of all the available and configurable inputs and outputs.





29 - Configuring threshold currents

The current thresholds allow you to set controls on current lines, to be combined with the programmable contacts of the Ekip Signalling modules.

Two pairs of programmable contacts are available:

- Threshold 1 I1 and Threshold 2 I1, with control referred to I1
- Threshold Iw1 and Threshold Iw2, with control referred to In

For Fan control configure Iw1 and Iw2.



Considering 4000A as a rated current (In) , fans will activate when the current crosses 3600 amps & will stop if the current drops below 3400 amps.

Threshold lw1	Enable: Activate protection and availability of protection threshold on menu				
	<i>Direction</i> : enables you to choose to have the signal when the current is higher (Up) or lower (Down) than the threshold.				
	Threshold: The value is expressed both as an absolute value (Ampere) and as a relative value (In), settable in a range: $0.1 \text{ In} \dots 10 \text{ In}$, with 0.01 step In	3 In			
Threshold lw2	Enable: Activate protection and availability of protection threshold on menu	OFF			
	<i>Direction</i> : enables you to choose to have the signal when the current is higher (Up) or lower (Down) than the threshold.				
	<i>Threshold</i> : The value is expressed both as an absolute value (Ampere) and as a relative value (In), settable in a range: 0.1 In 10 In, with 0.01 step In	3 In			

30 - Programing 2K-1 signaling contacts output

The output of 2K-1 module consists of 2 contacts K11-K12 and K13-K14. Configure these two output contacts as per following to control the fans.

			· · · · · · · · · · · · · · · · · · ·	- 0
	ABB Ekip Connect 3.1.0.0	Classic View	Trigger Trigger type	·Q· A saugata das@in.abb.com
	≡	Information	Trigger Alarm/Warning 1 L •	Nefresh 🛕 Apply
	E Scan	S Status	L prealarm X G prealarm X Iwr Warning Y Gext prealarm X S alarm (Blocked Trip) X S 2 alarm (Blocked Trip) X N C Comm on Local Bus Warning X T pre-alarm X Operation A AND C Critical malfunction and blocked trip protection function.	
		W Warning/Alarms		Putput 0 11
	E4.25-A3200 Ekip Touch	Trips		Contact Type Normally Open
	E Dashboard	MM Measures Menu 🗸		Signal Source Custom 0x9804
	(i) Information	CB Statistics		Output O 12
	O Configuration	UC Unit configuration		Contact Type Normally Closed
	[]a] Monitoring	PP Protection Parameters 🗸		Signal Source Custom 0xA040
	Protections	Modules ^	Register value	Commands 🗸
	🗞 Modules	Ekip Signalling 2K-1	0x9804	
	Classic View	Programmable Status and V Outputs	OK Cancel	
	Marketplace	F Functions		_
	X Tools		C.\Program	mData\ABB\EkipConnect3\DeviceDescriptors\132_EkipTouch_v2.27

Figure 50

Ekin Connect	Olaasia Misuu		- · · ×
ABB 3.1.0.0	Classic view	Trigger	·₩: X saugata.oas@in.aob.com :
≡	I Information	Trigger type	P) Defrech Anoly
₽_ Scan		custom	O Hereart T Abbiy
-0	S Status	Trigger Alarm/Warning 3 H	
Devices	Warning/Alarms	Switchboard Actors Communication Error	Output 0.11
FANCONTROL		RQ alarm (Blocked Trip)	
E4.2S-A3200 Ekip Touch	T Trips	ROCOF alarm (Blocked Trip)	Contact Type Normally Open •
T automat	MM Measures Menu	S2(V) alarm (Blocked Trip)	Latched OFF
E Dashodard		Iw2 Warning 1	
(i) Information	CS CB Statistics		Outpol Q 12
Configuration	UC Unit configuration	Operation AND OR	Contact Type Normally Closed •
		Alarm/Warning 3 H	Latched OFF
[]d] Monitoring	PP Protection Parameters	Critical malfunction and blocked trip protection function.	Signal Source Custom 0xA040
Frotections	Modules		Commande
🖧 Modules	Ekip Signalling 2K-1		John Martin State Stat
DI Classic View	Programmable Status and	Register value	
	PS Outputs	0xA040 1	
	F Functions		
Marketplace		OK Cancel	
X Tools		C:\Progr	mData\ABB\EkipConnect3\DeviceDescriptors\132_EkipTouch_v2.274.enc
	-		

31 - Contact readiness Auto Test

The output of 2K-1 module consists of 2 contacts K11-K12 and K13-K14. Configure these two output contacts as per following to control the fans.



Autotest command that activates the automatic sequence of output tests (contacts and LEDs) and input test (LED), and includes the following operations:

- 1. Reset output contacts (= open) and LEDs (= off).
- 2. Turn on all the LEDs in sequence (output and input)
- 3. Closure and shutdown of the two output contacts in sequence, switching on the relative LEDs.
- 4. Restore initial conditions
 - The Autotest command closes the contacts regardless of the configuration set by the user



ABB Electrification Smart Power 905 Shands Bottom Road, City: Senatobia, Zip: 38668 United States (US)

You can find the address of your local sales organisation on the ABB home page.



http://new.abb.com/low-voltage/service/service-breakers-switches

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