

Starter and Circuit Breaker Application with PowerFlex 7000

Bulletins 7000A, 7000, 7000L

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Summary of Changes

This publication contains new and updated information as indicated in the following table.

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Added Status Feedback Contacts required from an Input Circuit Breaker (ForGe)	6
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LISTEN.
THINK.
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General Precautions

Lockout Tagout

Before opening the doors to the drive line-up cabinets, perform proper lockout and tagout procedures so that the working environment is safe. Equipment must be tested for electrical potential before servicing the equipment. If the input to the drive is open, it is still possible for potential to be present.



ATTENTION: Live capacitors in circuit. Isolate medium voltage from the drive and wait at least 5 minutes for the capacitors to discharge. Test the circuit for potential before servicing the equipment. Failure to do so can result in severe injury or death.

ATTENTION: Verify that the load is not turning due to the process. A freewheeling motor can generate voltage that is back-fed to the equipment being serviced. Ensure that motor generation into the drive does not occur while the equipment is being serviced. Failure to do so can result in severe injury or death.

ATTENTION: Follow this guideline to prevent damage to equipment by the use of other components in the system. The safety features of the customer-supplied circuit breaker and drive-associated starters are compatible with the drive. You are fully responsible for lockout/tagout procedures and your generated shop safety procedure to ensure that all medium voltage has been removed before access to any of the medium voltage compartments and motors. Failure to do so can result in severe injury or death.

Key Safety Interlock

System integrity of the key interlocking scheme depends on having only one key for each interchange designation. If more keys are available, the interlocking integrity is lost. Safety of personnel and equipment is affected, which can result in severe injury or death. When specifying, purchasing, or using a circuit breaker or associated starter that contains a key interlock that matches the master lock in the drive, note that the drive is shipped with one master key unless other arrangements are made.

Control Interface

The medium voltage drive in this document is a current-source type drive. The circuit breaker or drive-associated starter control interface must be connected to the drive as described in this document to prevent damage to equipment or danger to personnel.

Document Scope

This guideline covers how to incorporate the minimum safety considerations and functional requirements when customer-supplied drive-associated starters interact with medium voltage (MV) current source drives.

The following functions are beyond the scope of this document:

- Isolation between main power bus and variable frequency power bus
- Isolation between incoming power cables and outgoing cables
- How the input, output, or bypass contactor control circuit power coordinate with the test function switches
- Motor protection activation when integral to the drive or bypass starter
- Difference between manual bypass and synchronous bypass

See related Rockwell Automation publications in the Additional Resources table on [page 22](#).

Purpose

This document provides information for Rockwell Automation Bulletin 1503 OEM (Original Equipment Manufacturer) parts. This document outlines the minimum safety considerations and functional requirements to operate a Rockwell Automation medium voltage drive with any combination of associated MV starters provided separately.

Due to the complexity of a coordinated output/bypass drive system and the safety concerns that are involved, the components must be supplied by Rockwell Automation specifically for the order. Follow the drive system drawings created by Rockwell Automation for proper coordination.

Drive Associated MV Starters and Circuit Breakers

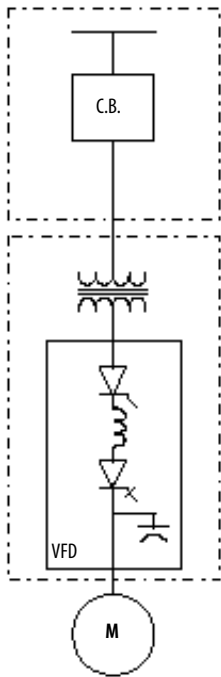
The drive associated MV starters and circuit breakers that are defined in this document include:

- Drive input circuit breaker
- Drive input contactor unit Bulletin 1512AD, 1512BD
- Drive input contactor with output isolator unit Bulletin 1512DM
- Drive output contactor unit Bulletin 1512DO
- Drive bypass starter (contactor unit)
- Drive output-bypass starter Bulletin 1512M

Drive Input Circuit Breaker

A medium voltage circuit breaker can be dedicated to controlling power to or from a Rockwell Automation medium voltage drive. For detailed safety consideration, control interface, and key interlock requirements, see publication [7000-AT003](#).

Figure 1 - Typical Drive with Input Circuit Breaker Unit



IMPORTANT The drive input impedance is shown as an isolation transformer, but in some cases could be an AC line reactor.

Basic Safety Considerations

Key Interlock

When the input contactor option is purchased from Rockwell Automation, a key interlock prevents access to the medium voltage compartments unless the input isolation switch is locked in the open position.

Where the input switching device is provided by others, Rockwell Automation provides a key interlock on the medium voltage compartment of the drive, and a matching interlock for installation by others on the upstream device. The interlock must be installed in a manner that verifies the power to the drive is off. The drive is electrically isolated when the key is freed.

Access to the medium voltage sections of the drive is mechanically restricted when upstream MV power is still applied to the drive.

A key locked-off safety interlock must be installed in the input circuit breaker. This key can be removed from the interlock only when the circuit breaker is racked open, which means that medium voltage is no longer feeding the drive. The same key accesses the MV compartments of the drive. For safety of personnel and equipment, there must be no other key that can be used in the circuit breaker interlock.

It is the responsibility of the customer or OEM to install the key interlock to the drive input circuit breaker. Verify that proper coordination of the key interlock systems between the input circuit breaker and the drive is achieved.

Control Interface

The circuit breaker that feeds input power to the drive must provide status feedback to the drive.

Damage to the drive can occur if the input circuit breaker interrupts the current without providing advance notice to the drive control of the interruption. Therefore, the circuit breaker feeding power into the drive must provide pre-trip status feedback contacts to the drive. To accomplish this sequence, the drive must receive a contact opening from the breaker that opens at least two cycles before the main power poles of the circuit breaker start to open.

The feedback must consist of a series connection of pre-trip contact and a breaker power pole auxiliary contact. The pre-trip contact opens when the protection circuit of the breaker requests the breaker to open. The breaker power pole auxiliary contact must always reflect the operation of the power pole contact, that is, closes when the breaker closes and opens when the breaker opens.

To provide status feedback, the series connection of the N.C. pre-trip contact and N.O. Auxiliary contact from the circuit breaker must be wired to the drive line side signal conditioning (SCBL) board and supply two cycles minimum pre-trip warning.

Pre-trip contact: The circuit breaker 86-lockout contact in the status string opens when the protection circuit of the breaker requests the breaker to open. The 2-cycle timing that is mentioned must occur between the time the 86-contact opens and the start of the power poles opening. Rockwell Automation refers to this contact on their drive schematic as a "pre-trip contact" because it opens before the power poles open.

Auxiliary contact: Shown in series with pre-trip contact is a power pole auxiliary contact, which is designated as a 52-contact. The 52-contact is typically from a switch that is physically mounted on the breaker frame and mechanically tied to the main primary interrupting contacts (that is, the power poles) on the breaker ([Figure 2](#)).

Figure 2 - Typical Status Feedback Contacts Required from an Input Circuit Breaker (Classic)

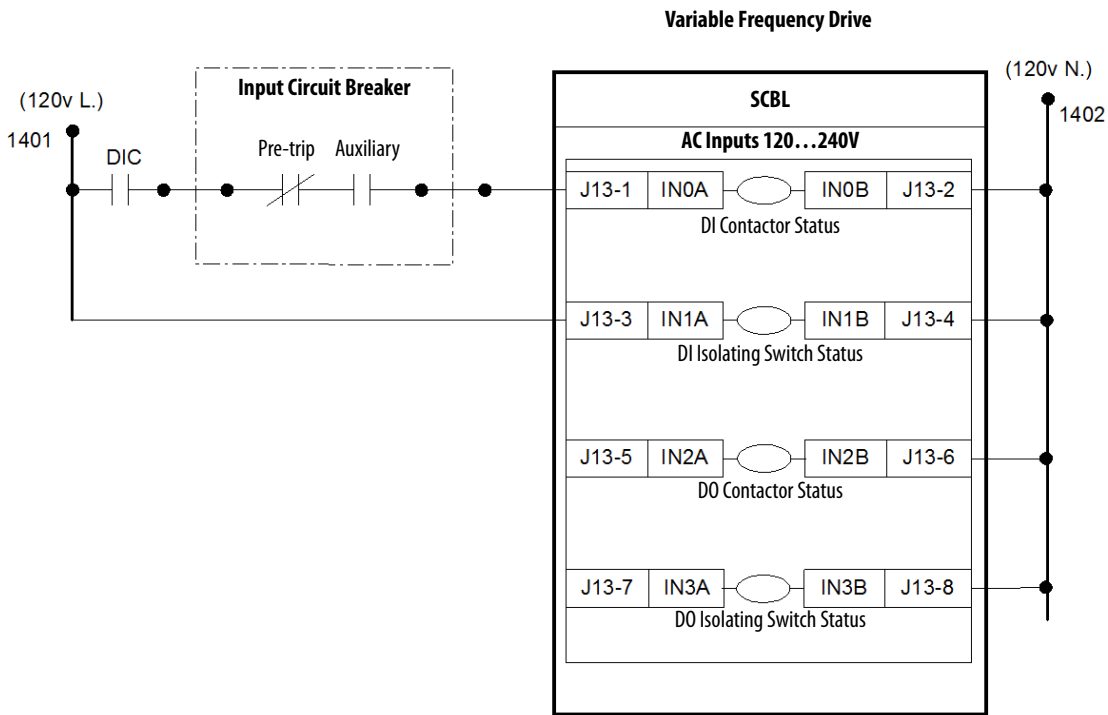
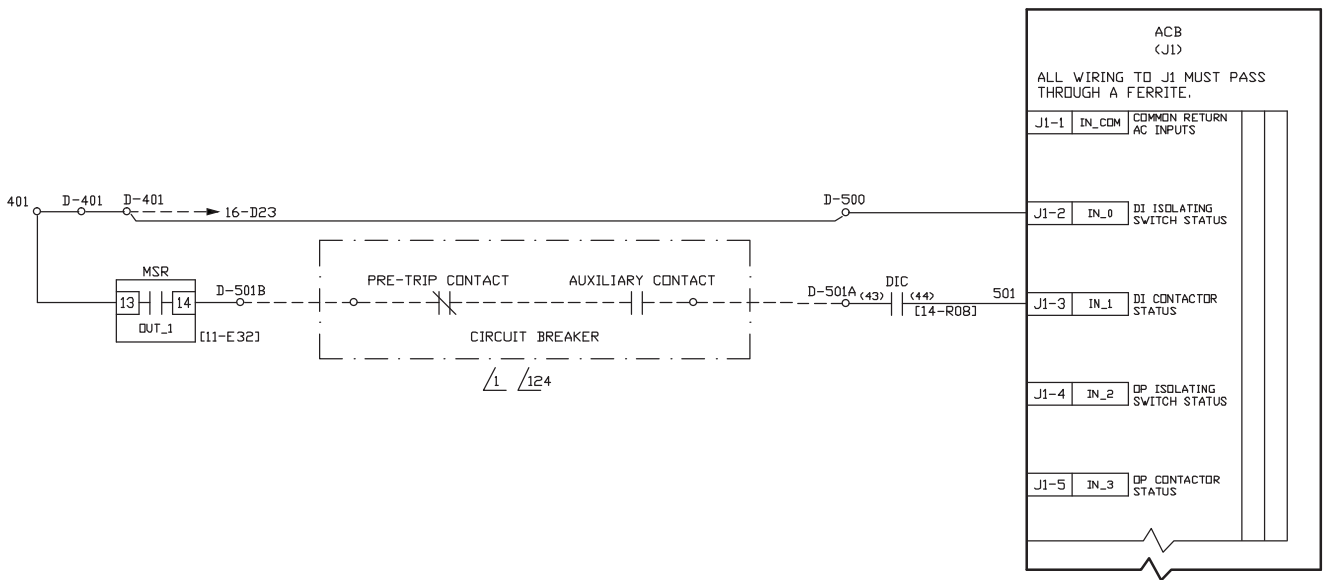
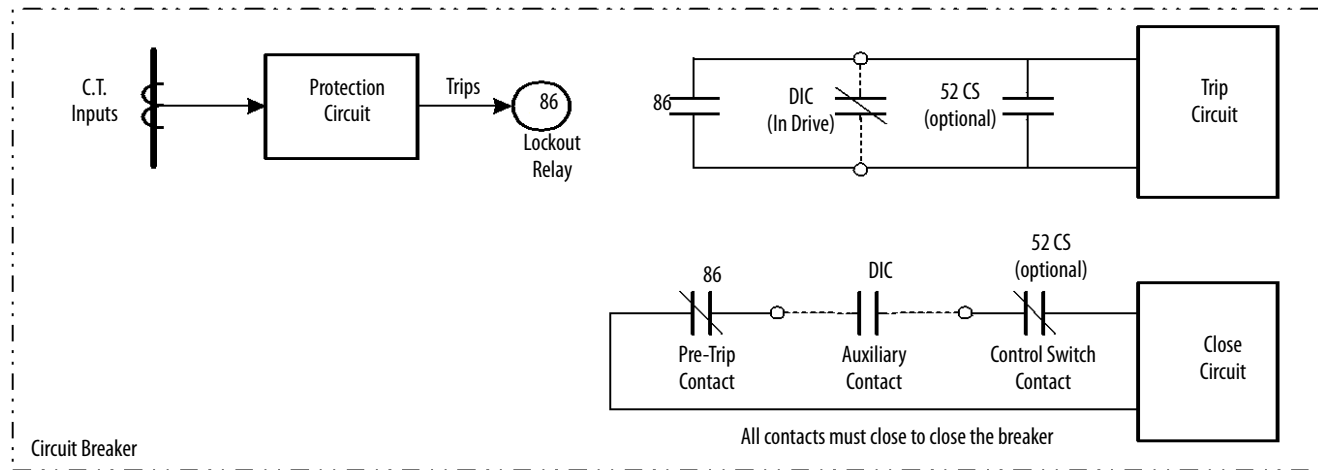


Figure 3 - Typical Status Feedback Contacts Required from an Input Circuit Breaker (ForGe)



It is the drive on the load side of the circuit breaker that controls when the circuit breaker is permitted to open and close. To achieve this function the Drive Input Control (DIC) relay N.C. and N.O. contacts from the drive must be wired to the Trip and Close circuits in the input circuit breaker, respectively ([Figure 4](#)).

Figure 4 - Simplified Breaker Schematic for the Trip and Close Circuits



The drive interlock (DIC relay) to the input circuit breaker feeding the drive must have control over the opening and closing of the input circuit breaker. The control is required for the protection of the drive/motor under fault conditions.

Drive input protection contacts such as overload, if used, must be connected to the input protection (IN9A) on the XIO board. The contact must open to trip the drive and open the input. If input protection is not used, the customer is responsible for installing a jumper between drive terminal blocks 1401 and 1501.



ATTENTION: Rockwell Automation current source drive must always have the right to open/close the input circuit breaker. Opening the input circuit breaker without warning to the drive control can cause component failure

Rockwell Automation does offer a special control option for the circuit breaker. “Single Shot” relay contacts can be supplied for opening and closing the circuit breaker that is timing adjustable.

Functional Safety Option Requirements (24STO or 24STORK)

In addition to the contacts needed for normal drive operation, an additional N.C. auxiliary contact is required for drives equipped with STO. This contact is from a switch that is physically mounted on the circuit breaker frame and tied to the main primary interrupting contacts. The drive input circuit breaker circuitry requirements are shown in [Figure 5](#), and the timing requirements of this contact (in relation to the power poles) is shown in the [Figure 6](#).

Figure 5 - Drive Input Circuit Breaker Circuitry Requirements for Safe Torque Off

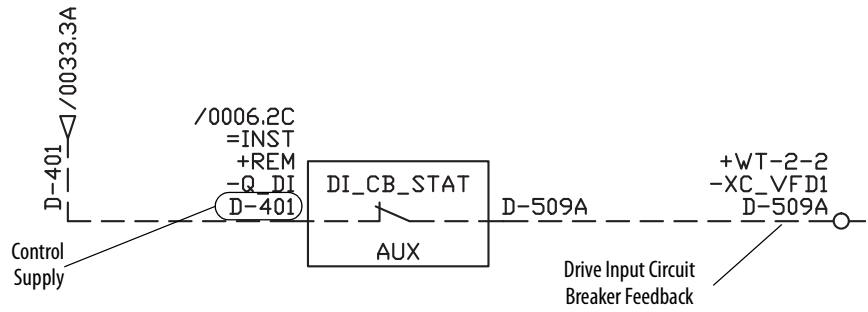
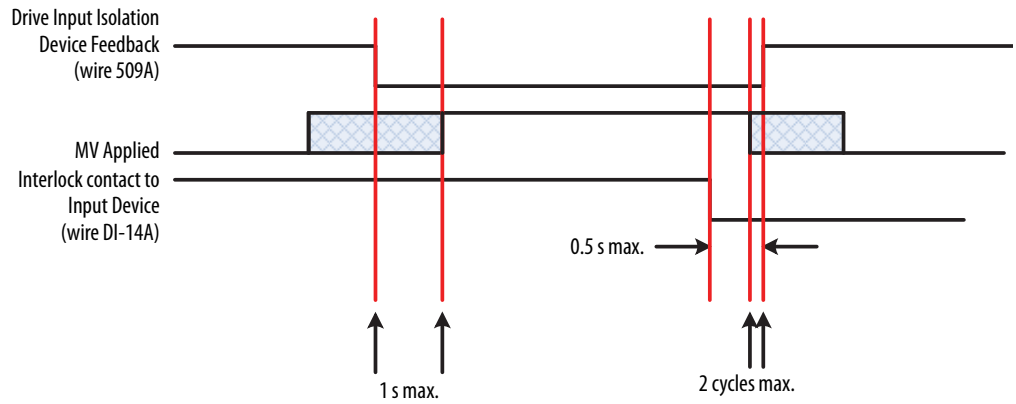


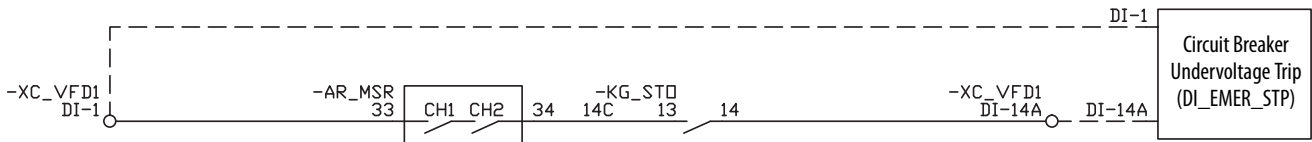
Figure 6 - Timing Diagram



Medium voltage must be available no more than one second after the feedback status indicates that the circuit breaker is closed.

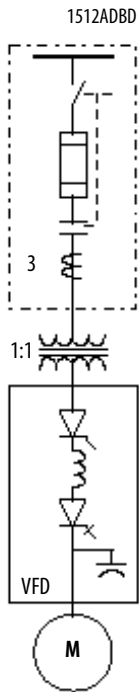
An undervoltage circuit for the circuit breaker is required for the safety function to open the drive input breaker in the case of SGCT failures. If the interlocking contact opens, the circuit breaker must be opened within 0.5 seconds (Figure 6). The interface for the undervoltage trip unit is shown in Figure 7.

Figure 7 - Circuit Breaker Undervoltage Trip



Drive Input Contactor Unit

A drive input contactor unit (Allen-Bradley Bulletin 1512AD or 1512BD), normally consists of a vacuum contactor, non-load break isolating switch with an external operating handle, current-limiting power fuses, protection relay, and current transformers (CTs).

Figure 8 - Typical Drive with Input Contactor Unit

ATTENTION: The drive input impedance is shown as an isolation transformer. It could be an AC line reactor in some cases.

Basic Safety Considerations

Mechanical Interlock

The MV isolating switch in a drive input contactor unit has no interrupting rating. It is intended to be operated only after the main contactor opens to prevent current flow. It is a non-load break isolating switch. Mechanical interlocks must be implemented to prevent the isolating switch from being opened or closed unless the main MV contactor is open. They also prevent the opening of any MV compartment door in that cabinet section unless the isolating switch is open and grounded. These mechanical interlocks are critical to personnel safety and equipment damage.

The normal means to remove power from the drive is to push the emergency stop pushbutton on the drive door opening the contactor then throwing the input contactor isolating switch off. Operating this non-load break isolating switch directly to disconnect or connect MV power may result in electric shock and explosion causing severe burns, injury, or death. Also, personnel must be prevented, by mechanical interlocks, from opening a medium voltage cabinet door until MV power is removed.

Electrical Interlock

By wiring the isolating switch normally open (N.O.) and normally closed (N.C.) auxiliary contacts to the input contactor control circuit to open the contactor, this electrical interlocking ensures that the isolating switch will not be opened or closed under load. The electrical interlocking also requires that the contactor cannot be closed with the test circuit operation until the isolating switch has been fully opened. This electrical interlock acts as a “Back-up” to the mechanical interlock, but cannot replace the mechanical interlock system.

Key Interlock

Access to the medium voltage sections of the drive is mechanically restricted when upstream MV power is still applied to the drive. A single key locked-off interlock must be installed in the input contactor unit. This key interlock is constructed so that this key can be removed from the interlock only when the contactor isolator switch is switched off, which means that the medium voltage is no longer feeding the drive. This same key is to be used to access the MV compartments of the drive. For safety of personnel and equipment, there must be absolutely no other key that can be used in the contactor interlock.

It is the user's or OEM's responsibility to install the key interlock to the drive input isolating switch of the input contactor unit. The key interlock systems must be properly coordinated between the input circuit breaker/ contactor and the drive.

Control Interface

The Rockwell Automation medium voltage drive is a current source drive and damage to the drive could occur if its current is interrupted by the input contactor without providing advance notice to the drive control of the interruption. Therefore, the contactor feeding power into the drive must provide pre-trip status feedback contacts to the drive. It is the drive on the load side of the contactor that controls when the contactor is permitted to close and open.

To provide status feedback, the series connection of the N.O. contact of the contactor control relay (DICR1), the contactor N.O. status contact (DI), and the isolating switch N.O. auxiliary contact (DIISa) must be wired to the drive line side signal conditioning (SCBL) board.

The Drive Input Control (DIC) relay N.O. contact from the drive must be wired to the input contactor control relay (CR1) circuit, to close and open the contactor ([Figure 9](#)).

Figure 9 - Typical Status Feedback Contacts Required from an Input Contactor (Classic)

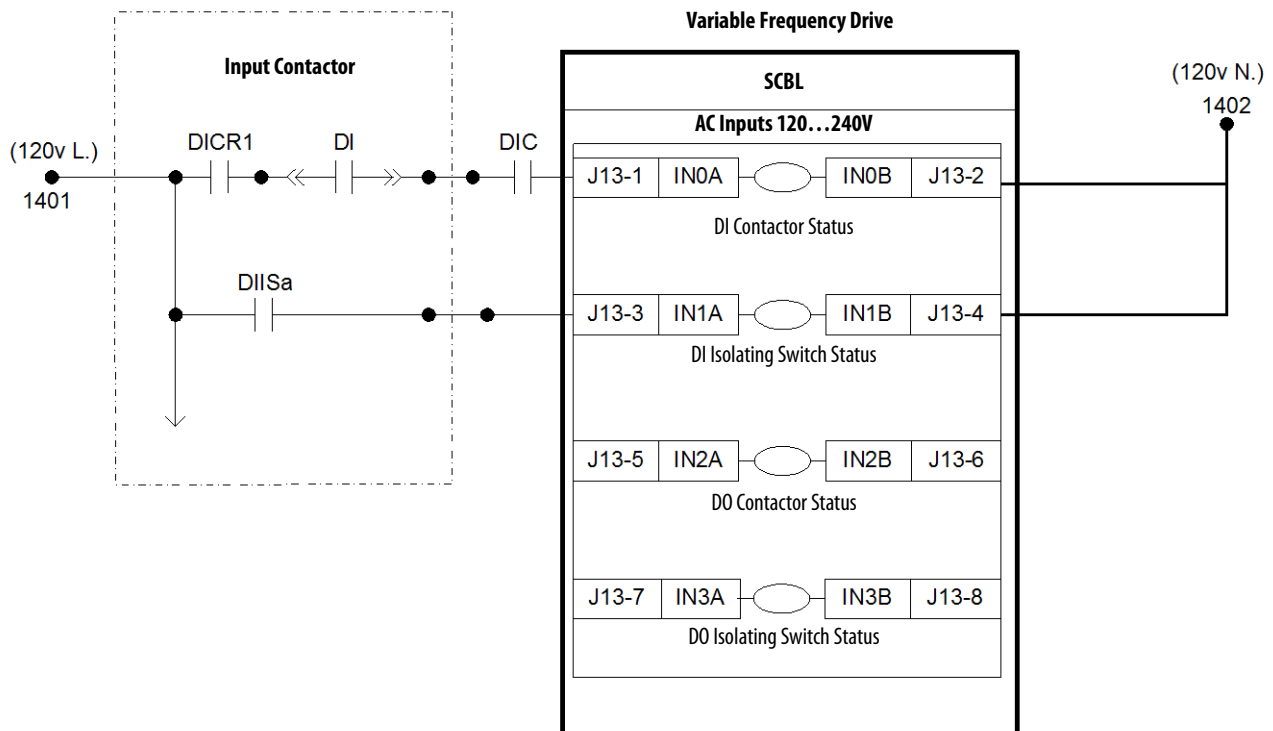
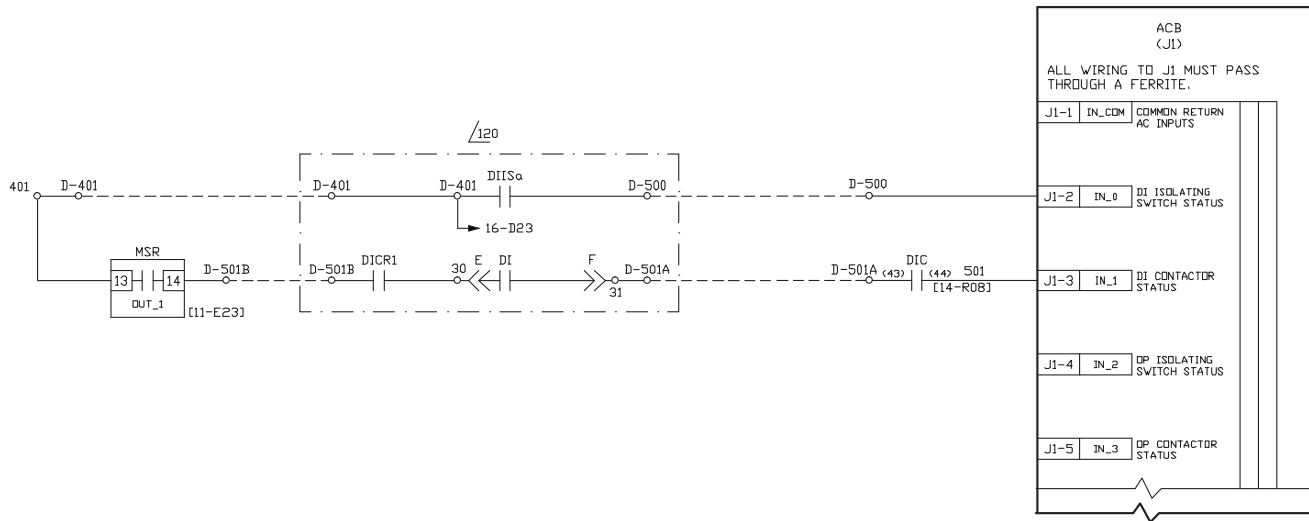


Figure 10 - Typical Status Feedback Contacts Required from an Input Contactor (ForGe)



ATTENTION: Rockwell Automation MV current source drive must always have the right to open/close the input contactor. Opening the input contactor without advance warning to the drive control may cause component failure.

Functional Safety Option Requirements (24STO or 24STORK)

In addition to the contacts needed for normal drive operation, a drive with STO requires additional contacts based on whether the starter is an Allen-Bradley 1512 type or customer supplied (Table 1). For more information, see publication [7000-UM203](#).

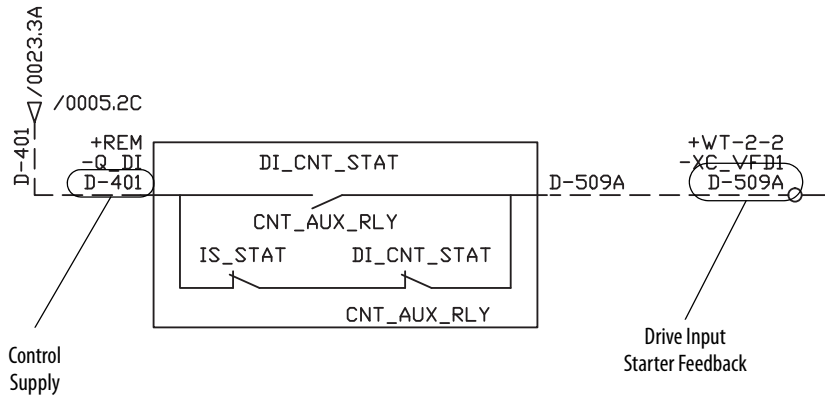
Table 1 - Feedback Contacts Based on Input Device

Input Option	Auxiliary Contacts Required by Drive without STO Option		Auxiliary Contacts Required by Drive with STO Option		Notes
	Starter/Circuit Breaker	Isolation Switch	Starter/Circuit Breaker	Isolation Switch	
Internal/External Starter (Allen-Bradley 1512 with IntelliVAC) ⁽¹⁾	1 NO, 1 NC	3 NO, 1 NC	1 NO, 2 NC	3 NO, 2 NC	Remaining spare contacts on contactor are 1 NO and 1 NC for light or aux relay options
External Starter (Customer-supplied)	1 NO	1 NO	2 NO, 1 NC	1 NO, 1 NC	

(1) Additional relay for STO is mounted in the LV starter cabinet.

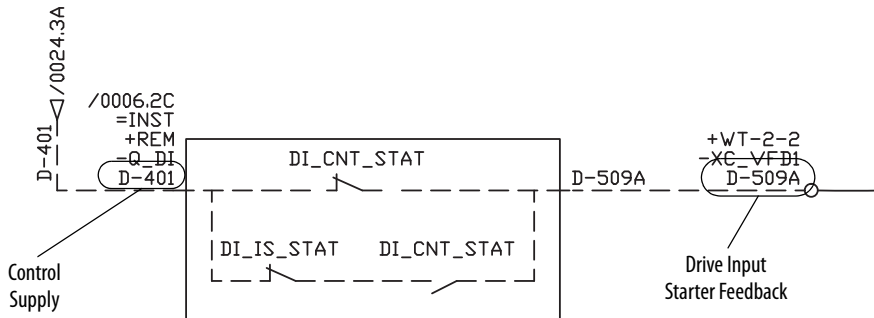
When using an Allen-Bradley Bulletin 1512 starter or if the starter is built into the drive, a relay is added (CNT_AUX_RLY) and wired for the STO option to generate the proper logic required to meet the feedback requirements. The following shows the circuit used when the Allen-Bradley starter is external (see Electrical Drawings).

Figure 11 - Allen-Bradley Drive Input Starter Circuitry Requirements for Safe Torque Off



When a customer's drive input starter/disconnect is used, the circuit shown in [Figure 12](#) for the feedback to the STO system is used. This is in addition to the interlocking already needed for the drive.

Figure 12 - Customer-supplied Drive Input Starter Circuitry Requirements for Safe Torque Off



In order for the safety function to be able to open the input starter in the case of SGCT failures, the STO control relay (KG_STO) must be wired to the emergency stop of the input starter ([Figure 13](#)). If this relay contact opens, the starter must be opened within 0.5 seconds ([Figure 6](#)). The interface for the Input Starter connection is shown in [Figure 13](#).

Figure 13 - Allen-Bradley Input Starter Connection

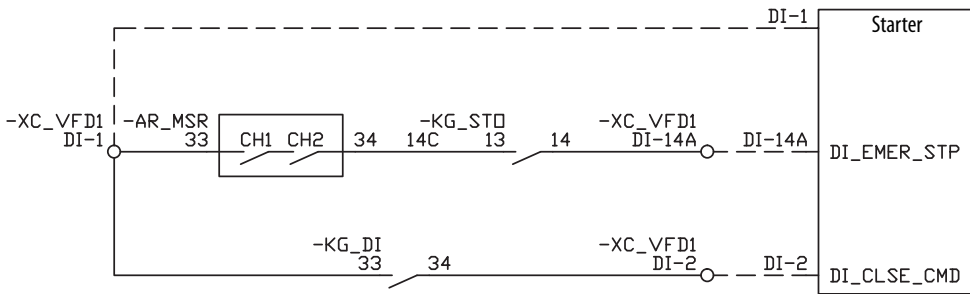
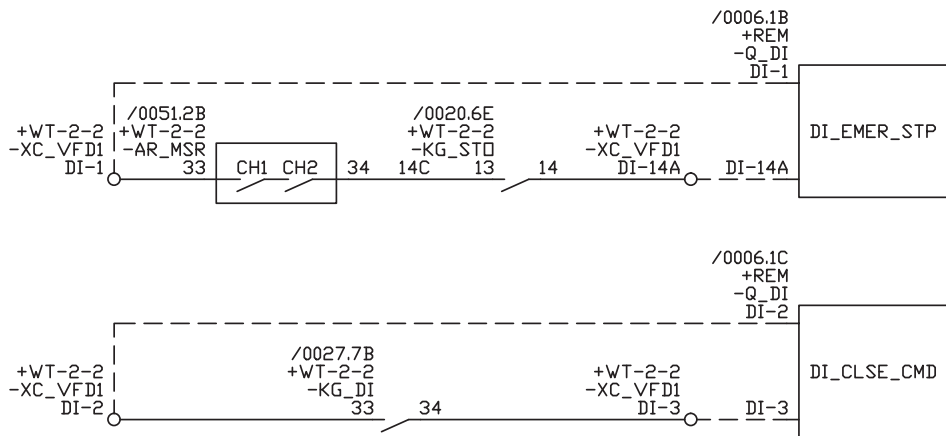


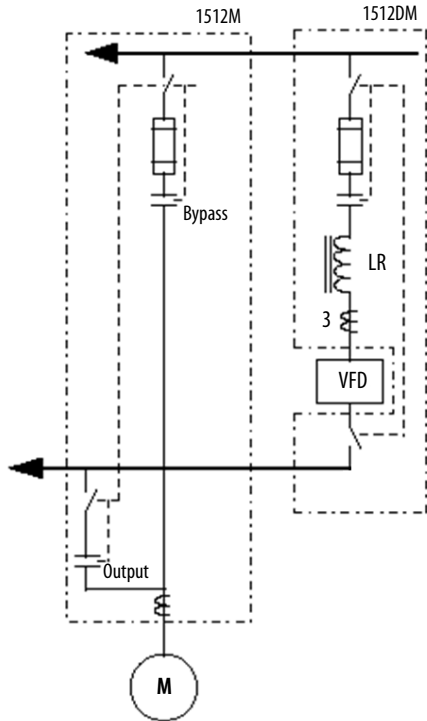
Figure 14 - Customer-supplied Drive Input Starter Connection



Drive Input Contactor with Output Isolator Unit

The drive input contactor with output isolator unit (Allen-Bradley Bulletin 1512DM) normally consists of a vacuum contactor, 1200 A 3-phase “main power bus”, two non-load break isolating switches mechanically operated by one handle, current-limiting power fuses, low voltage control panel, CT’s, etc. There is a second 3-phase 1200 A “variable frequency power bus” located at the top of the power bus compartment. The drive input contactor with output isolator unit is combined with output-bypass starters for single or multi-motor synchronous transfer or manual bypass applications. The unit acts as drive input contactor device, input isolation and output isolation.

Figure 15 - Typical Drive Input Contactor with Isolator Unit



IMPORTANT The drive input impedance is shown as an AC line reactor. It could be an isolation transformer in some cases.

Basic Safety Considerations

Mechanical Interlock

For the 400 A rated unit, the input isolating switch and contactor are located in the bottom cell, and the output isolating switch is located in the top cell. These two three-pole, non-load break isolating switches are gang-operated with one single external handle, and mechanically interlocked with the contactor and power cell doors.

The 600 A and 800 A rated units are mechanically interlocked using a special system of key interlocks, as each isolating switch has an external operating handle. This system of interlocking is critical to personnel safety and possible equipment damage.

Opening two isolating switches by means of one single external operating handle on 400 A or opening two isolating switches with key interlocks on the 600 A and 800 A systems can isolate the drive from both sources. This would allow drive maintenance to be conducted while running the motor on bypass.

Electrical Interlock

Both the input isolating switch and output isolating switch N.O. and N.C. auxiliary contacts must be wired to the input contactor control circuit to open the contactor. This electrical interlocking ensures that neither one of these two isolating switches will be opened under load. The electrical interlocking also assures that the contactor can not be closed with the test circuit operation, until the isolating switches have been fully opened. This electrical interlock acts as a “Back-up” to the mechanical interlock system, but cannot replace the mechanical interlock system.

Key Interlock

Key interlocks with MV drives should be arranged and maintained the same as outlined [Drive Input Contactor Unit on page 8](#).

IMPORTANT In 600 A or 800 A units, the output isolator is in a separate cabinet. Two key interlocks are used to prevent the access to MV power cell with either of the isolating switches on. Therefore, these two key interlocks must be integrated into the drive interlock system.

Control Interface

The series connection of the N.O. contact of the contactor control relay (DICR1), the contactor N.O. status contact (DI), the input isolating switch N.O. auxiliary contact (DIIsa) and the output isolator N.O. auxiliary contact (DOIsa) must all be wired to the drive SCBL board, to provide status feedback to the drive.

The Drive Input Control (DIC) relay N.O. contact from the drive must be wired to the input contactor control relay (DICR1) circuit, to close and open the contactor ([Figure 16](#)).

Figure 16 - Typical Status Feedback Contacts Required from Input Contactor and Output Isolating Switch (Classic)

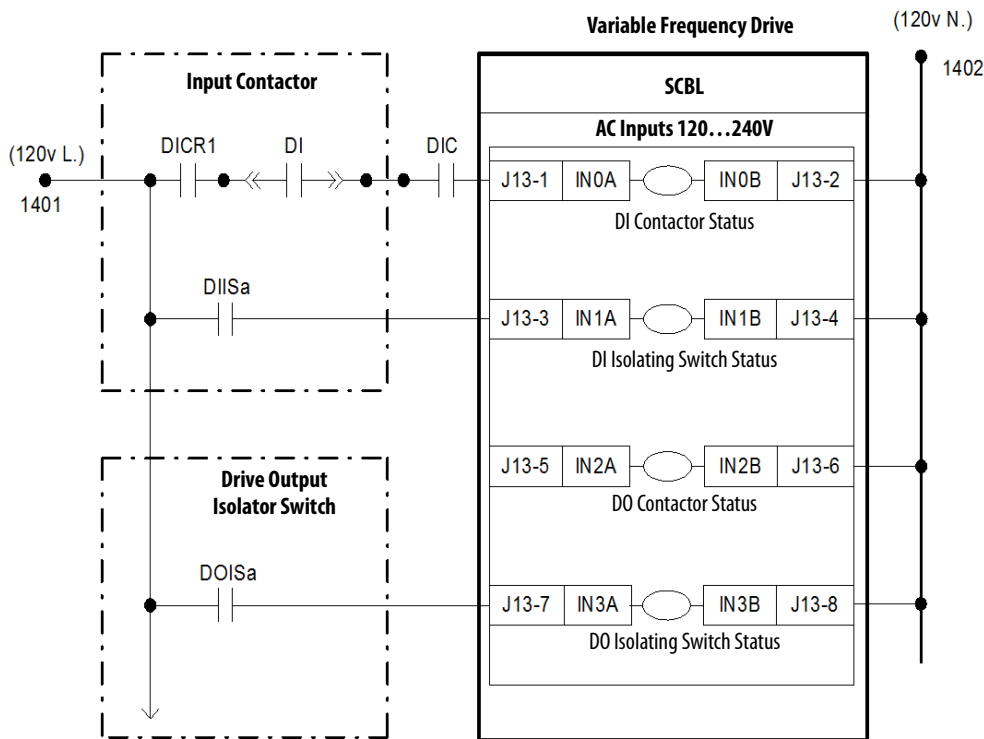
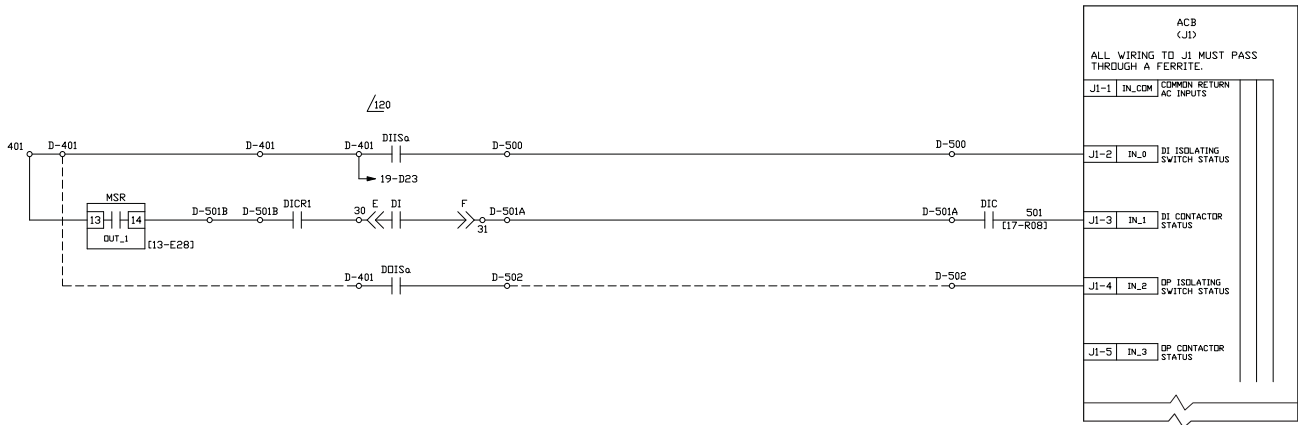


Figure 17 - Typical Status Feedback Contacts Required from Input Contactor and Output Isolating Switch (ForGe)



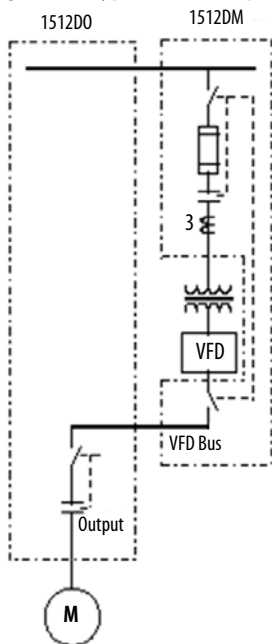
Drive Output Contactor Unit

The drive output contactor unit (Allen-Bradley Bulletin 1512DO) is allowed in a drive system line-up when an input contactor with output isolator (1512DM) unit is used. This unit normally only includes a vacuum contactor and a non-load break isolating switch. It does not include power fuses, CPT (Control Power Transformer) and CTs.

A double three-phase power bus configuration is used in the bus compartment. One is the main power bus, the other is the variable frequency bus. This configuration allows a bypass starter in the line-up for manual bypass or synchronous transfer bypass applications.

An output contactor is required in the cases where there is an alternate prime mover or the load can turn the motor at 2/3 speed or greater without the drive operating. These conditions could cause the rotating motor to inter-react with the motor filter capacitors and generate medium voltage as an induction generator. This medium voltage could be seen with the main supply lines disconnected. The output unit could prevent the presence of unsafe voltages on the drive output.

Figure 18 - Typical Drive Output Contactor Unit



IMPORTANT The drive input impedance is shown here as an isolation transformer. It could be an AC line reactor in some cases.

Basic Safety Consideration

Both the drive input contactor and output contactor are opened with associated isolator switches opened. This is to prevent the MV power from back feeding to the Rockwell Automation MV drive to cause damage. For personal safety considerations, actual visually verified isolating switches must be used.

Key Safety Interlock

Key interlocks are required on the output contactor MV door and the bypass starter to prevent the access to main bus compartment with the bypass starter in close position.

Control Interface

The Rockwell Automation MV drive controls when the output contactor is permitted to close and open. The drive closes just before the drive starts running and opens when the drive stops. The drive must also monitor the status of the output contactor and the output isolating switch using auxiliary contacts.

The Drive Output Control Relay (DOC) N.O. contact from the drive must be wired to the output contactor control circuit. The series connection of N.O. contact of contactor control relay (DOCR1), the contactor N.O. status contact DO and the isolating switch N.O. auxiliary contact must be wired to the drive SCBL board ([Figure 19](#)).



ATTENTION: The Rockwell Automation medium voltage drive must have sole control of the output contactor. Opening the output contactor without first properly notifying the drive, could result in serious drive component damage.

Figure 19 - Typical Status Feedback Contacts Required from a Drive Output Contactor (Classic)

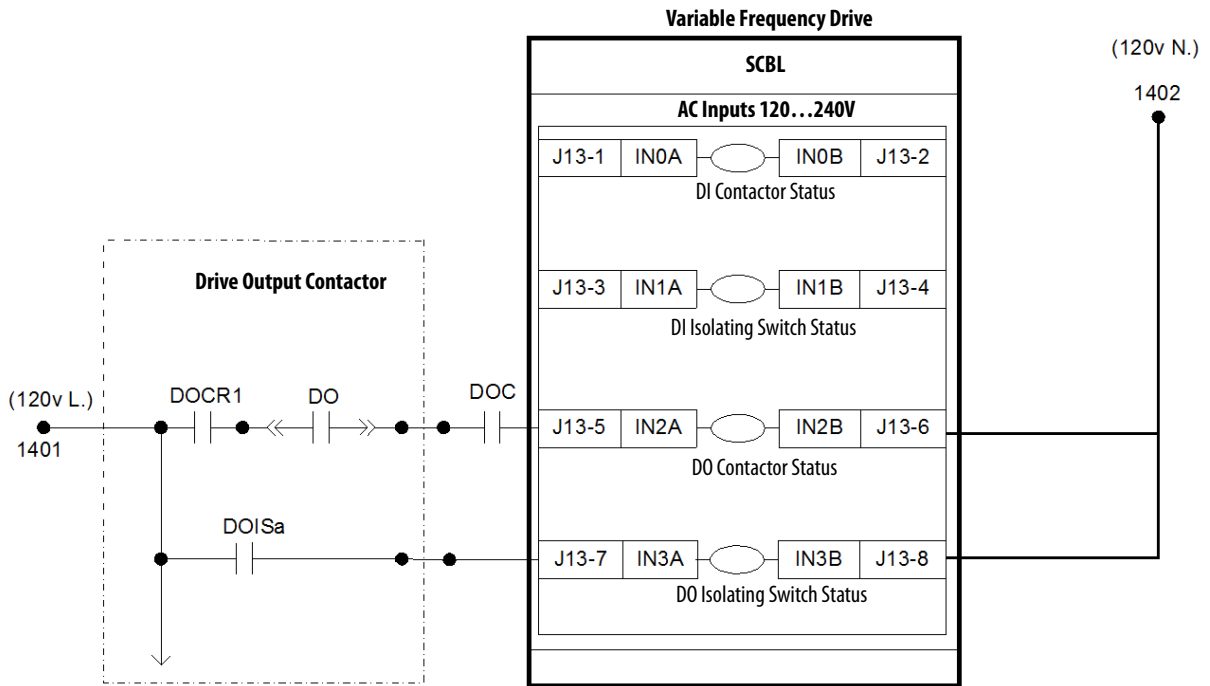
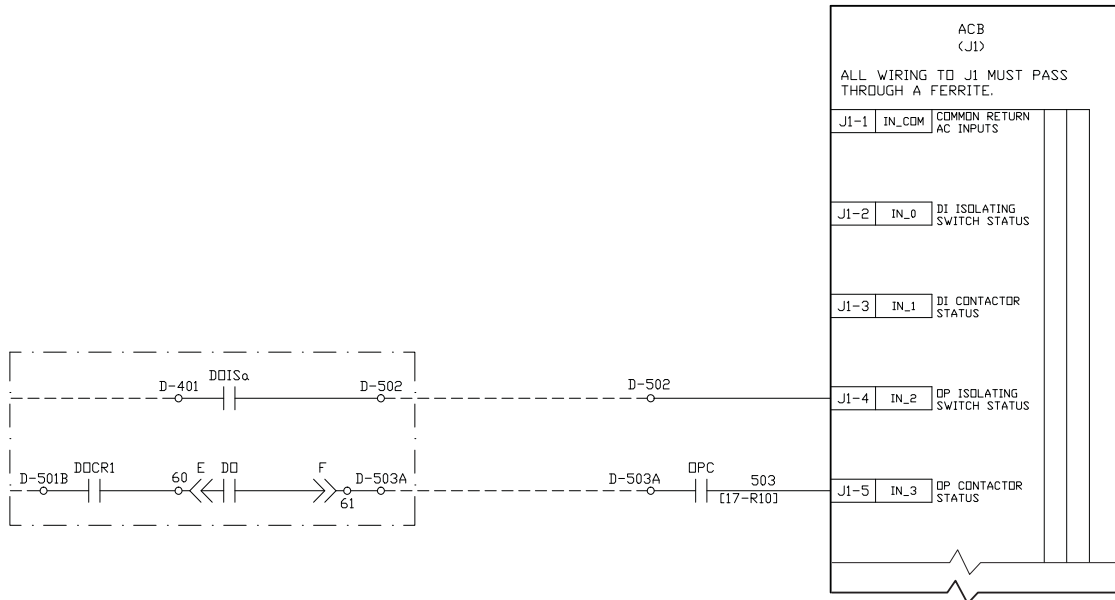


Figure 20 - Typical Status Feedback Contacts Required from a Drive Output Contactor (ForGe)



Drive Bypass Starter (Contactor Unit)

The bypass starter can be incorporated in a drive system configuration only when the drive input contactor, or input circuit breaker, and the output contactor are used.

Basic Safety Consideration

In the manual bypass scheme, the drive output contactor and bypass starter must not be closed simultaneously. This prevents the MV power back-feeding between the drive output and bypass.

The motor may be fed from either of two sources, the drive output or the bypass. This offers an inherently potential dangerous situation regarding back feed and isolation for personnel.

Key Safety Interlock

If the output/bypass components are not supplied as one cabinet with one isolating switch handle, coordinated key interlocks are required between the bypass starter and the output contactor unit. This must prevent access to the output contactor unit with the bypass starter isolator in closed position, or access to the bypass starter unit with the output starter isolator in the closed position. Key interlock in this case is critical to personnel safety and equipment damage.

Control Interface

It is required that the Rockwell Automation MV drive controls when the bypass starter is permitted to close and open. The drive also needs to know the status of the bypass starter. These status feedback contacts are wired to the drive.

The series connection of N.O. contact of the bypass contactor control relay (BPCR1), the contactor N.O. status contact (BP) and the isolating switch N.O. auxiliary contact (BPISa) must be wired to the drive SCBM board.

The series connection of N.O. contact of the output contactor control relay (OPCR1), the contactor N.O. status contact (OP) and the isolating switch N.O. auxiliary contact (OPISa) must be wired to the drive SCBM board ([Figure 21](#)).

Figure 21 - Typical Status Feedback Contacts Required from Output and Bypass Contactors (Classic)

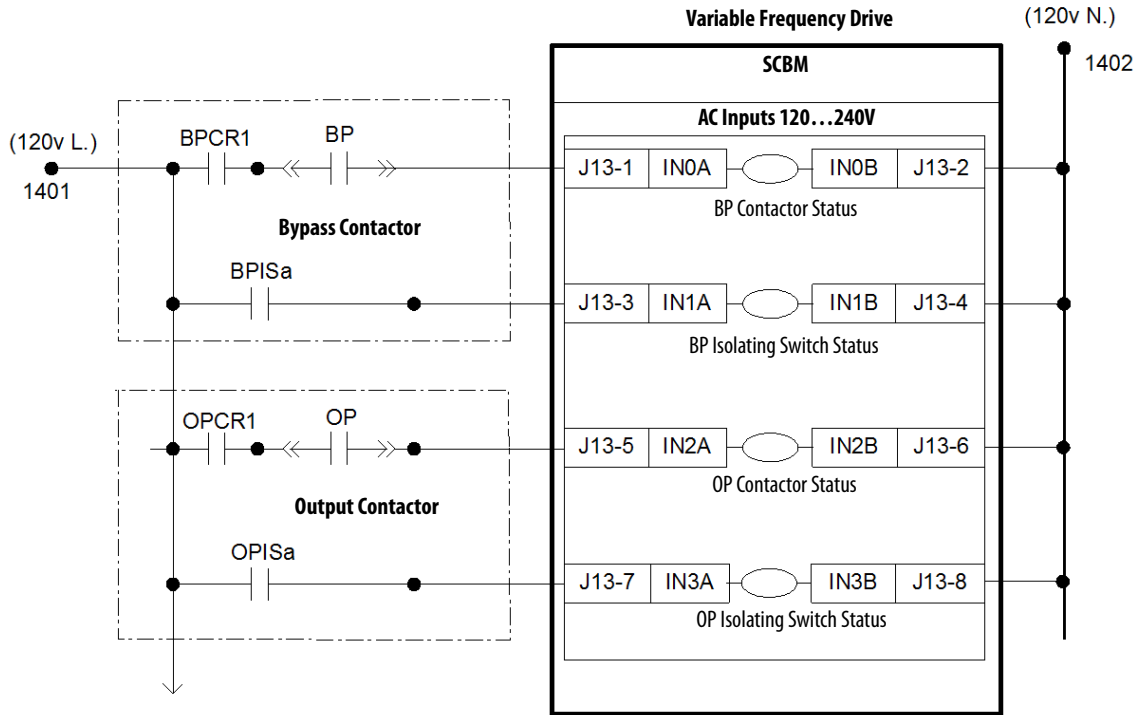
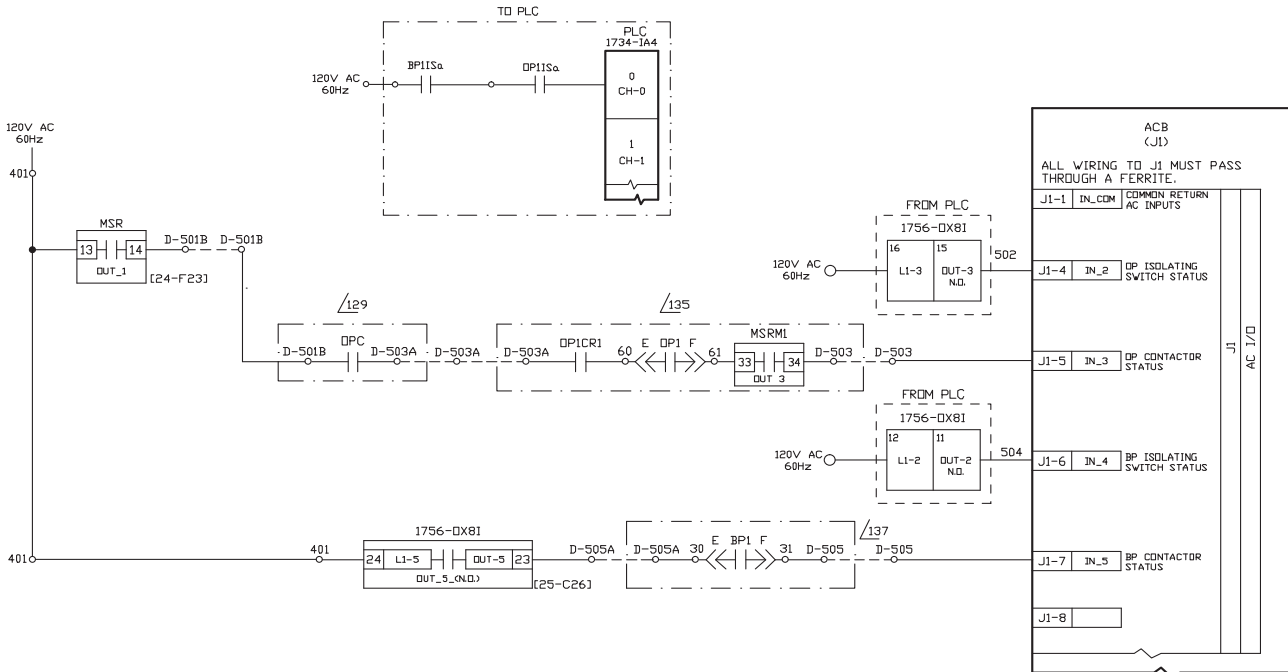


Figure 22 - Typical Status Feedback Contacts Required from Output and Bypass Contactors (ForGe)

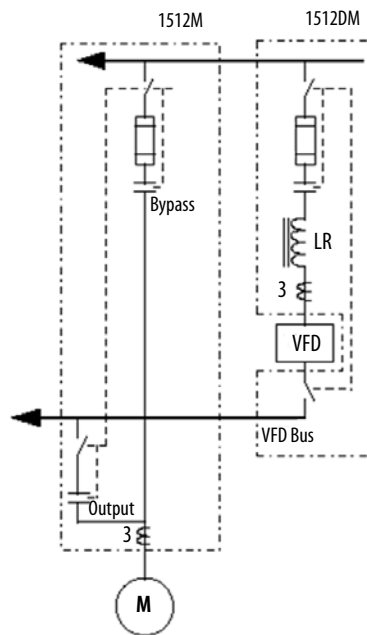


Drive Output-Bypass Starter

The drive output-bypass starters (Allen-Bradley Bulletin 1512M) can be incorporated in the drive line-up and system when the drive input contactor unit with output isolator (1512DM) is used. It can be used for both single and (with multiple units), multi-motor synchronous transfer applications to act as the drive output device and full voltage, non-reversing bypass starter.

An output-bypass starter consists of “OUTPUT” and “BYPASS” vacuum contactors, 1200 A 3-phase “main power bus”, two non-load break isolating switches mechanically operated by one handle, current-limiting power fuses, CPT, low voltage control panel, CT’s, etc. There is a second 3-phase bus (1200 A “variable frequency power bus”) at the top of the power bus compartment.

Figure 23 - Typical Drive Output-Bypass Starter



IMPORTANT The drive input impedance is shown here as an AC line reactor. It could be an isolation transformer in some cases.

Basic Safety Consideration

For the 400 A rated unit, the two three-pole, non-load break isolating switches are gang-operated with one single external handle interlocked with each other, and mechanically interlocked with the contactor and power cell doors. The 600 A and 800 A rated units are mechanically interlocked using a special system of key interlocks as each isolating switch has an external operating handle. Key interlock in this case is critical to personnel safety and equipment damage. Opening two isolating switches through one single external operating handle as with the 400 A system or key interlocks as with the 600 A and 800 A systems must isolate the starter from both sources and would allow starter maintenance to be done.

Key Safety Interlock

The mechanical interlock and electrical interlock must be arranged and maintained as outlined in [Drive Input Contactor Unit on page 8](#).

Control Interface

It is the Rockwell Automation MV drive that controls when the output contactor and bypass contactor are permitted to open and close in the case of manual or synchronizing bypass. The drive must know the status of output contactor and output isolating switch, bypass contactor and bypass isolating switch. These status feedbacks are wired to the drive (see [Figure 21](#) and [Figure 23](#)).

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Application Guidelines for Specifying and Using Vacuum Circuit Breakers, publication 7000-AT003	Provides useful information when purchasing, specifying, or using circuit breakers that control medium voltage power to or from Rockwell Automation medium voltage AC drives.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Notes:

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete the How Are We Doing? form at http://literature.rockwellautomation.com/idc/groups/literature/documents/du/ra-du002_-en-e.pdf.

Rockwell Automation maintains current product environmental information on its website at <http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page>.

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