ARMORSTART AND ARMORSTART ST CONNECTIVITY

QUICK REFERENCE GUIDE COLLECTION:

Single page documents providing comprehensive information on the cable assemblies for ArmorStart and ArmorStart ST distributed motor controllers. Complete with diagrams and references to find more information.

- ☐ ArmorConnect® 3-Phase Power
- ☐ EtherNet/IP™ Network
- ☐ Auxiliary Network
- ☐ ArmorStart® ST Motor Control and I/O
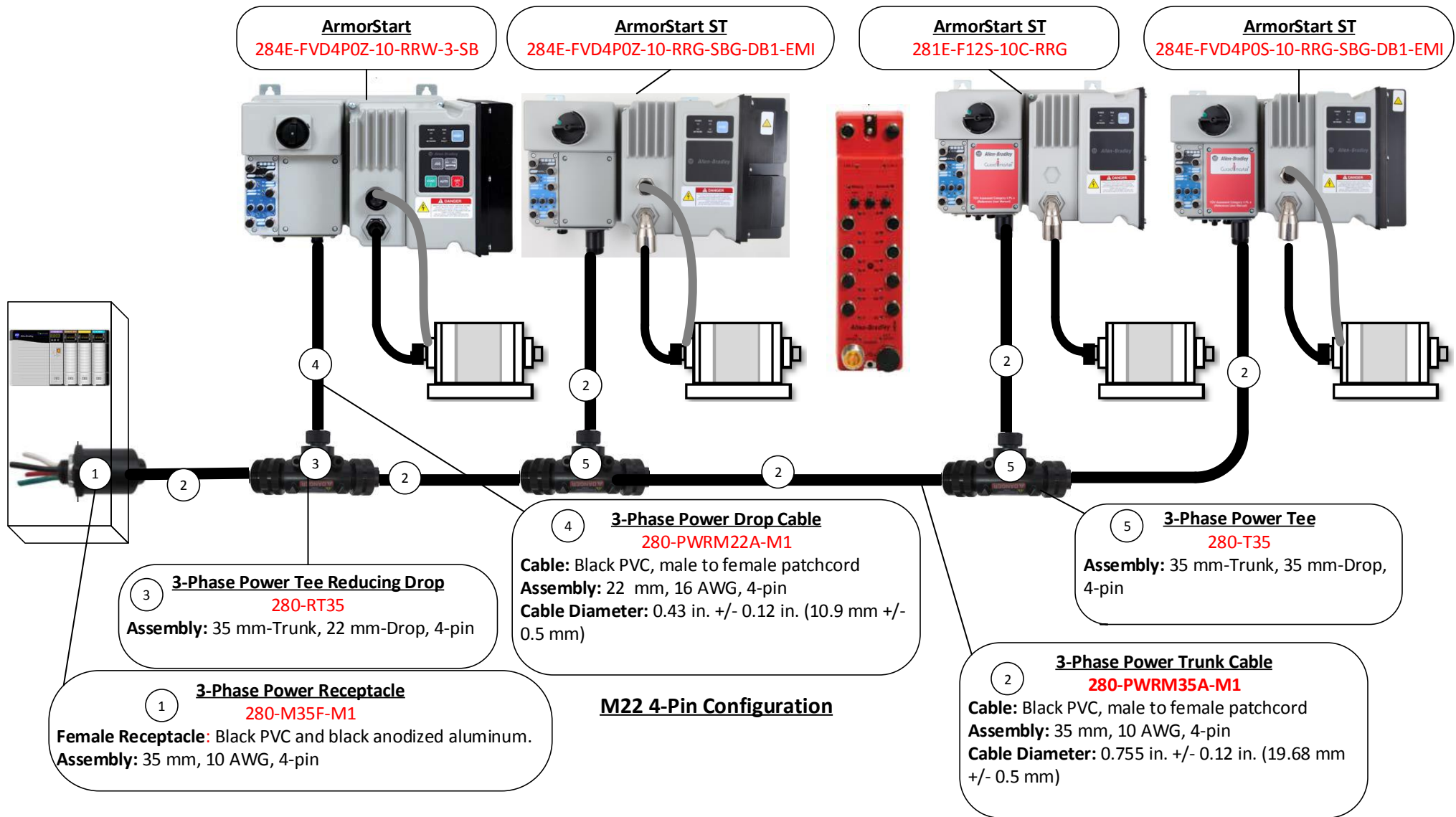- ☐ ArmorStart® Safety Connections

ARMORSTART

ARMORSTART ST

ARMORCONNECT

ArmorStart and ArmorStart ST distributed motor controls provide solutions
for light and heavy industrial needs ranging from the food and beverage to the
automotive industry

ArmorStart
284E-FVD4P0Z-10-RRW-3-SB

ArmorStart ST
284E-FVD4P0Z-10-RRG-SBG-DB1-EMI

ArmorStart ST
281E-F12S-10C-RRG

ArmorStart ST
284E-FVD4P0S-10-RRG-SBG-DB1-EMI

(4) **3-Phase Power Tee Reducing Drop**
280-RT35
Assembly: 35 mm-Trunk, 22 mm-Drop, 4-pin

(4) **3-Phase Power Drop Cable**
280-PWRM22A-M1
Cable: Black PVC, male to female patchcord
Assembly: 22 mm, 16 AWG, 4-pin
Cable Diameter: 0.43 in. +/- 0.12 in. (10.9 mm +/- 0.5 mm)

(5) **3-Phase Power Tee**
280-T35
Assembly: 35 mm-Trunk, 35 mm-Drop, 4-pin

M22 4-Pin Configuration

(1) **3-Phase Power Receptacle**
280-M35F-M1
Female Receptacle: Black PVC and black anodized aluminum.
Assembly: 35 mm, 10 AWG, 4-pin

(2) **3-Phase Power Trunk Cable**
280-PWRM35A-M1
Cable: Black PVC, male to female patchcord
Assembly: 35 mm, 10 AWG, 4-pin
Cable Diameter: 0.755 in. +/- 0.12 in. (19.68 mm +/- 0.5 mm)

M35 Incoming Three-Phase Power - Male

Pin 1: L1 - Black
Pin 2: Ground (green/yellow)
Pin 3: L3 - Red
Pin 4: L2 - White

M22 Incoming Three-Phase Power - Male
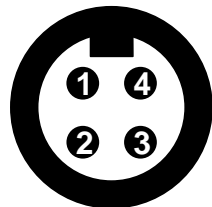
Pin 1: L1 - Black
Pin 2: L2 - White
Pin 3: L3 - Red
Pin 4: L2 - Ground (green/yellow)

Rockwell Automation

ArmorConnect 3-Phase Power

3 Phase Power ArmorStart ST	Description	Cat. No.
	Power cable - straight female to straight male	280-PWRM35A-M❶
	Power cable - straight male and wires	280-PWRM35G-M❶
	Power tee - 3-phase, 4-pole	280-T35

❶ **Select length**

3-PHASE POWER RECEPTACLE OPTIONS

280- M35 F- M◆

◆Lengths (m): 1, 3
Example: M1=1 m

F-Female
M-Male

M22: 22 mm, 16 AWG, 600V, 10 A
M24: 22 mm, 14 AWG, 600V, 15 A
M35: 35 mm, 10 AWG, 600V, 32 A

3-PHASE POWER DROP CABLE OPTIONS

280- PWR M22 A- M*

*Lengths: See table of available lengths

A-Straight Female; Straight-Male
B- Right Angle Female; Straight Male
C-Straight Female; Right Angle Male
D-Right Female; Right Male

M22: 22 mm, 16 AWG, 600V, 10A
M24: 22 mm, 14 AWG, 600V, 15A

3-PHASE POWER TRUNK CABLE OPTIONS

280- PWR M35 A- M*

*Lengths: See table of available lengths

A-Straight Female; Straight-Male
B- Right Angle Female; Straight Male
C-Straight Female; Right Angle Male
D-Right Angle Female; Right Angle Male

M35: 35 mm, 10 AWG, 600V, 32A

3-PHASE POWER TEES & REDUCER OPTIONS

280-RT35 — M35 3-PHASE POWER TEE REDUCING DROP M22
Trunk: 35 mm, 4-pin, 32A
Drop: 22 mm, 4-pin, 13A

280-RA35 — M35 3-PHASE REDUCING ADAPTER
35 mm to 22 mm, 4-pin, 15A

280-T35 — M35 3-PHASE POWER TEE (NOT SHOWN IN DIAGRAM)
Trunk: 35 mm, 4-pin, 32A
Drop: 35 mm, 4-pin, 32A

*AVAILABLE LENGTHS

Feet	1.6	3	5	7	8	10	13	20	26	33	39	46	49	66	82	98	115
Meters	0.5	1	2	2	3	3	4	6	8	10	12	14	15	20	25	30	35
Code	5	1	15	2	25	3	4	6	8	10	12	14	15	20	25	30	35

Drop Cable: Maximum Length of 14m; if additional lengths are desired for the trunk or drop cable use a cable spool and field installable receptacle.

FIELD REPLACEABLE RECEPTACLES
MALE :	280-FAM22M	14 AWG, 600 V, 15 A
	280-FAM35M	10 AWG, 600 V, 32 A
FEMALE:	280-FAM22F	14 AWG, 600 V, 15 A
	280-FAM35F	10 AWG, 600 V, 32 A

FIELD ATTACHABLE RECEPTACLE

CABLE SPOOL
(Not supplied by Rockwell)

ADDITIONAL ACCESSORIES

SEALING CAPS	889A-QMCAP	M35, Male
	1485A-C1	M22, Male
LOCKING CLIPS	280-MTR22-LC	M22-Drop
	280-MTR35-LC	M35-Trunk

BILL OF MATERIALS

Qty	Catalog #	Description
	3-Phase Power Media	
1	. 280-M35F-M1	3-Phase Power Receptacle
1	280-PWRM22A-M1	3-Phase Power Drop Cable
6	280-PWRM35A-M1	3-Phase Power Trunk Cable
1	280-RT35	3-Phase Power Tee Reducing Drop
2	280-T35	3-Phase Power Tee

BILL OF MATERIALS PICTURED IN DIAGRAM, ONLY TO BE USED AS AN EXAMPLE.

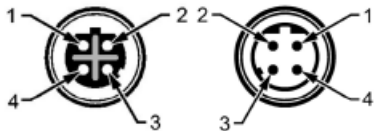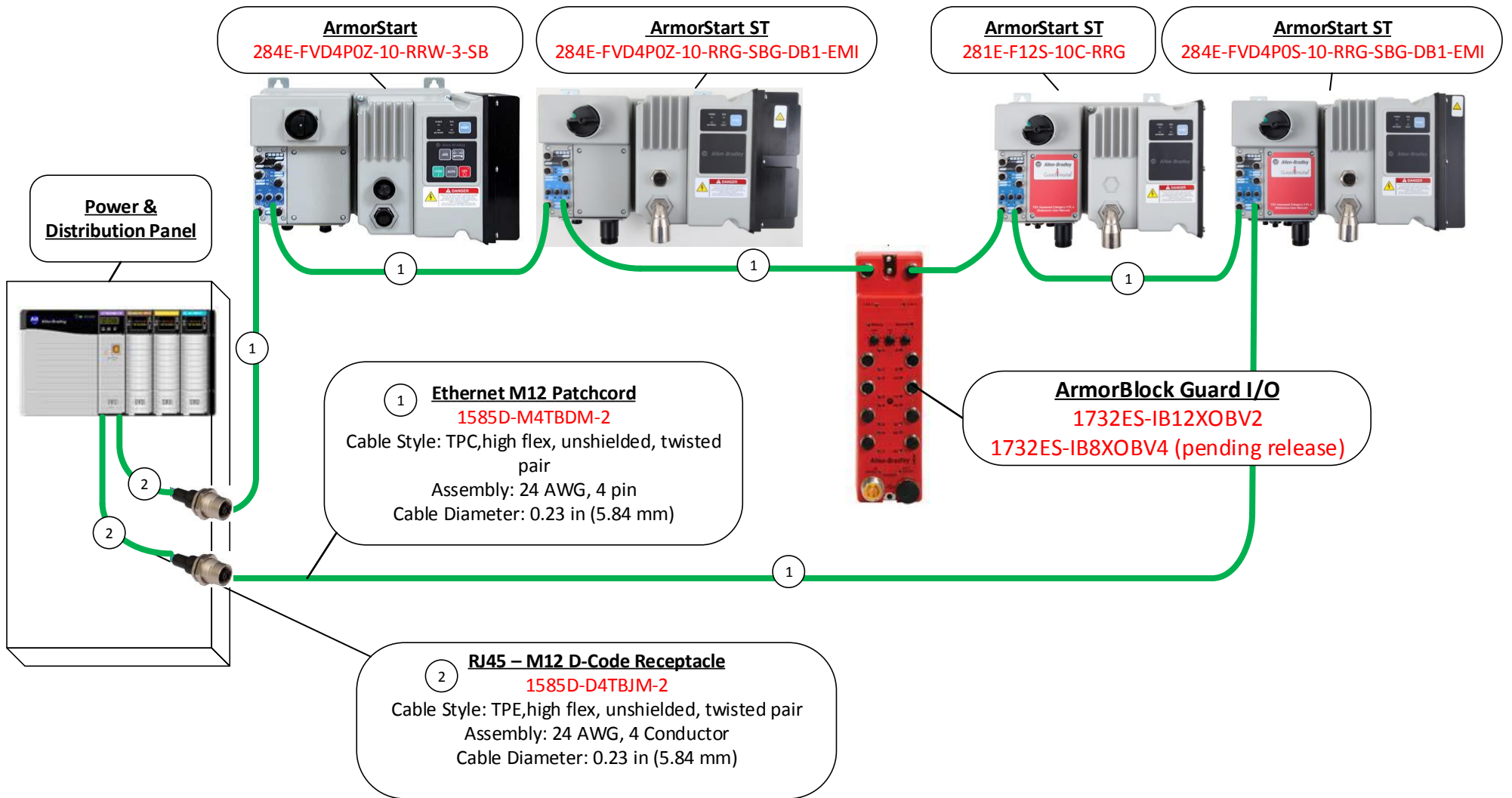### ENVIRONMENTAL RATINGS

Type 4/12 IP67 Pending

SHORT CIRCUIT CURRENT RATINGS (SCCR)

ARMORCONNECT*: 65 kA maximum when protected by specified circuit breaker or by a CC, J or T class fuse.

ARMORSTART*: 65 kA maximum when protected by specified circuit breaker or by a CC, J or T class fuse.
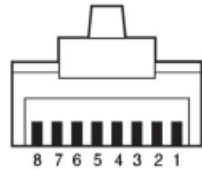
ArmorStart ST*: Still in testing for 65 kA when protected by specified circuit breaker or by a CC, J or T class fuse.
*SEE SPECIFICATIONS FOR MORE DETAILS AT www.ab.com .

Rockwell Automation

ArmorConnect 3-Phase Power

ArmorStart
284E-FVD4P0Z-10-RRW-3-SB

ArmorStart ST
284E-FVD4P0Z-10-RRG-SBG-DB1-EMI

ArmorStart ST
281E-F12S-10C-RRG

ArmorStart ST
284E-FVD4P0S-10-RRG-SBG-DB1-EMI

Power & Distribution Panel

Ethernet M12 Patchcord
1585D-M4TBDM-2
Cable Style: TPC,high flex, unshielded, twisted pair
Assembly: 24 AWG, 4 pin
Cable Diameter: 0.23 in (5.84 mm)

ArmorBlock Guard I/O
1732ES-IB12XOBV2
1732ES-IB8XOBV4 (pending release)

RJ45 – M12 D-Code Receptacle
1585D-D4TBJM-2
Cable Style: TPE,high flex, unshielded, twisted pair
Assembly: 24 AWG, 4 Conductor
Cable Diameter: 0.23 in (5.84 mm)

FEMALE   **MALE**

M12 PINOUT
1 White-Orange   3 Orange
2 White-Green   4 Green

RJ45 8-PIN PINOUT
1 White/Orange   5 White/Blue
2 Orange   6 Green
3 White/Green   7 White/Brown
4 Blue   8 Brown

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EtherNet/IP Network

① ETHERNET M12 PATCHCORD OPTIONS

1585D- M 4 T BD M- *

- **Lengths:** See Key Below
- **Second End Connector:**
  - **M**-Male Straight
  - **E**- Male Right Angle
  - **F**- Female Straight (only with straight male first connector)
- **Jacket Material:**
  - **T**- TPE: 24 AWG
- **First End Connector:**
  - **M**- Male Straight
  - **E**- Male Right-Angle

*Lengths available in 0.3, 0.6, 1, 2, 5, 10, 15 and additional increments of 5m up to 75m.

Assembly: 24 AWG, 300 V

Ratings: IP67

② RJ45 TO M12 D-CODE RECEPTACLE

1585D-D4TBJM-*: 4-Pin M12 D-Code Front Mount Receptacle to RJ45 Patchcord.

*Lengths available in 0.3, 0.6, 1, 2, 5, 10, 15 and additional increments of 5m up to 75m.

Ratings: IP67

1585A-DD4JD- M12 Female to RJ45 Cat 5e Female Field Attachable.

ETHERNET RJ45 PATCHCORD OPTIONS

RJ45 Patchcords can be used in combination with a field receptacle in lieu of the RJ45 to M12 D-Code Receptacle.

1585J-M 4 T BJM- *

- **Lengths:** See Key
- **Jacket Material:**
  - **T**- Teal High Flex TPE
- **4**- 4 Conductors
- **8**- 8 Conductors

*Lengths available in 0.3, 0.6, 1, 2, 5, 10, 15 and additional increments of 5m up to 75m.

ADDITIONAL LENGTHS

If additional lengths are desired use a cable spool and RJ45 Crimp connector

RJ45 CRIMP CONNECTOR WITH BOOT: 1585J-M8CC-C   150 V, 1.5 A

CABLE SPOOL   **RJ45 CRIMP**

ADDITIONAL OPTIONS

Additional Options such as jacket material, conductors, and shielding are available. See the On-Machine Connectivity Products Catalog or contact your local Allen-Bradley distributor.

BILL OF MATERIALS

Qty	Catalog #	Description
	Ethernet Media	
5	1585D-M4TBDM-2	Ethernet M12 Patchcord
2	1585D-D4TBJM-2	RJ45 to M12 D-Code Receptacle

*Bill of materials pictured in diagram, only to be used as an example.

ArmorBlock® Guard I/O™
1732ES-IB12XOBV2
1732ES-IB8XOBV4 (pending release)

ArmorStart
284E-FVD4P0Z-10-RRW-3-SB

ArmorStart ST
284E-FVD4P0Z-10-RRG-SBG-DB1-EMI

ArmorStart ST
281E-F12S-10C-RRG

ArmorStart ST
284E-FVD4P0S-10-RRG-SBG-DB1-EMI

Power & Distribution Panel

Control Power Drop Cable
889N-F65GFNM-1
Cable: Grey PVC, male to female patchcord
Assembly: 22 mm, 18 AWG, 4-pin
Diameter: 0.29 in (7.4 mm)

① **Auxiliary Power Receptacle**
888N-D4AF1-1F
Female Receptacle: Aluminum with clear sealant
Assembly: 22 mm, 16 AWG, 4-in

③ **Auxiliary ArmorStart T-Port**
898N-543ES-NKF
Assembly: Drop 22 mm, 6-pin/5 used
Trunk 22 mm, 4-pin

⑤ **Auxiliary Device T-Port**
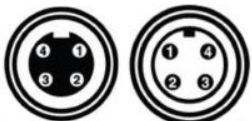### 898N-43PB-N4KT
Assembly: 22 mm, 4-pin

② **Auxiliary Power Trunk Cable**
889N-F4AFNM-2
Cable: Yellow PVC, male to female patchcord
Assembly: 22 mm, 16 AWG, 4-pin
Cable Diameter: 0.42 in (11 mm)

4 pin for ① ② ⑤

FEMALE
1 Black
2 White

MALE
3 Red
4 Green

5 pin for ④ and drop port ③

Female

Male

Color Code	1 Red	4 Blank/Not Used
	2 Black	5 Blue
	3 Green	6 White

Rockwell Automation

Auxiliary Power

NOTE: For the ArmorStart ST, the control aux power is 4-pin as listed

ArmorStart ST Control (AUX) Power	Description	Cat. No.
	Patchcord - mini straight male to straight female	889N-F4AFNM-❶
	Control power tee - 24V DC, 4-pole	898N-43PB-N4KF
	Panel Power Receptacle	888N-D4AF1-1F

❶ Select length

AUXILIARY DEVICE T-PORT

898N-43PB-N4KT: Drop 22mm, 4-pin
                        Trunk 22mm, 4-pin

AUXILIARY POWER DROP CABLE OPTIONS

Catalog Number: 889N-F4AENM-D♦

Assembly: 22 mm, 18 AWG, 300 V, 10 A, 4-Pin Straight mini male to straight mini female.

Cable Rating: UL AWM style 2661 VW-1 105C 300V, CSA AWM A/B I/II 80C 300V FT1, UV oil and water resistant

♦Lengths: Replace 2 with 5 or 10 for additional standard length in meters.

AUXILIARY POWER RECEPTACLE OPTIONS

888N- D 4AF1- 1F
                      └─ Lengths (m): 1F =0.3 m; 3F= 0.9 m

              M-Male
              D- Female

CONTROL POWER TRUNK/DROP CABLE OPTIONS

889N- F 65GFN M *
                 └─ *Lengths: See available lengths table

             M- Straight Male
             E- Right Angle Male

          F- Straight Female
          R- Right-Angle Female

Assembly: 22 mm, 16 AWG, 600 V, 10 A, 6-pin/5 used
All Patchcords are male to female.

AUXILIARY ARMORSTART T-PORT

898N-543ES-NKF: Drop 22mm, 6-pin/5-used
                         Trunk 22mm, 4-pin

AUXILIARY POWER TRUNK CABLE OPTIONS

Catalog Number: 889N-F4AFNM-♦

Assembly: 22 mm, 16 AWG, 600 V, 10 A, 4-Pin, Straight mini male to straight mini female

Cable Rating: UL STOOW VW-1 105C 600V, CSA ST 105C 600V FT2, UV oil and water resistant

♦Lengths: Replace symbol with 2, 5 or 10 for standard lengths in meters.

*AVAILABLE LENGTHS

Feet	1.6	3	4.9	7	8.2	10	13	16	20	26	33	39	46	49	66
Meters	0.5	1	1.5	2	2.5	3	4	5	6	8	10	12	14	15	20
Code	0M5	1	1M5	2	2M5	3	5	10	6	8	10	12	14	15	20

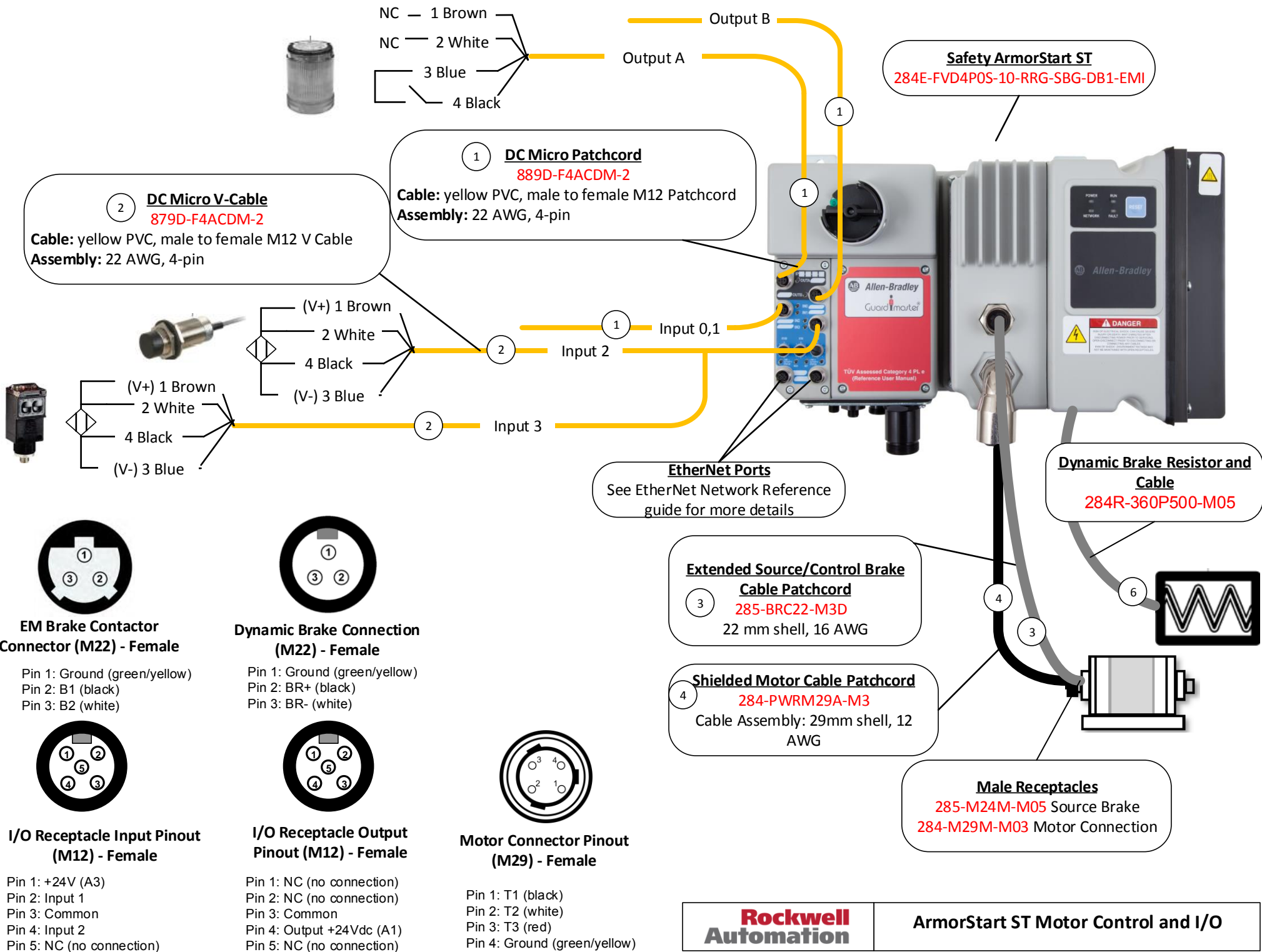| Bill Of Materials		
Qty	**Catalog#**	**Description**
1	888N-D4AF1-1F	Auxiliary Power Receptacle
8	889N-F4AFNM-2	Auxiliary Power Trunk Cable
1	898N-543ES-NKF	Auxiliary ArmorStart T-Port
4	889N-F64GFNM-1	Control Power Drop Cable
3	898N-43PB-N4KT	Auxiliary Device T-Port

*Bill of materials pictured in diagram, only to be used as an example.

ENVIRONMENTAL RATINGS

All components have the following Environmental Ratings:
IP67, NEMA 6p, 1200 psi washdown

Rockwell Automation   **Auxiliary Network**

NC — 1 Brown
NC — 2 White
3 Blue
4 Black

Output B

Output A

Safety ArmorStart ST
284E-FVD4P0S-10-RRG-SBG-DB1-EMI

① **DC Micro Patchcord**
889D-F4ACDM-2
Cable: yellow PVC, male to female M12 Patchcord
Assembly: 22 AWG, 4-pin

② **DC Micro V-Cable**
879D-F4ACDM-2
Cable: yellow PVC, male to female M12 V Cable
Assembly: 22 AWG, 4-pin

(V+) 1 Brown
2 White
4 Black
(V-) 3 Blue

Input 0,1

Input 2

(V+) 1 Brown
2 White
4 Black
(V-) 3 Blue

Input 3

EtherNet Ports
See EtherNet Network Reference guide for more details

Dynamic Brake Resistor and Cable
284R-360P500-M05

EM Brake Contactor Connector (M22) - Female

Pin 1: Ground (green/yellow)
Pin 2: B1 (black)
Pin 3: B2 (white)

Dynamic Brake Connection (M22) - Female

Pin 1: Ground (green/yellow)
Pin 2: BR+ (black)
Pin 3: BR- (white)

③ **Extended Source/Control Brake Cable Patchcord**
285-BRC22-M3D
22 mm shell, 16 AWG

④ **Shielded Motor Cable Patchcord**
284-PWRM29A-M3
Cable Assembly: 29mm shell, 12 AWG

I/O Receptacle Input Pinout (M12) - Female

Pin 1: +24V (A3)
Pin 2: Input 1
Pin 3: Common
Pin 4: Input 2
Pin 5: NC (no connection)

I/O Receptacle Output Pinout (M12) - Female

Pin 1: NC (no connection)
Pin 2: NC (no connection)
Pin 3: Common
Pin 4: Output +24Vdc (A1)
Pin 5: NC (no connection)

Motor Connector Pinout (M29) - Female

Pin 1: T1 (black)
Pin 2: T2 (white)
Pin 3: T3 (red)
Pin 4: Ground (green/yellow)

Male Receptacles
285-M24M-M05 Source Brake
284-M29M-M03 Motor Connection

Rockwell Automation

ArmorStart ST Motor Control and I/O

DC Micro V-Cable (Input) Options

879D-F4ACDM-*   Straight female (sensor side), 22 AWG, 4 pin, 300 V, 4 A
879D-R4ACDM - *   Right angle female (sensor side), 22 AWG, 4 pin, 300 V, 4 A

*Replace symbol with 0M3, 1, 2, 3, 4, 5, 6, 10, 15 for standard cable lengths in meters.

Ratings: IP67, IP69K, NEMA 6P, 1200 psi washdown

DC Micro Patchcord (Input/Output) Options

889D-F4ACDM-*   Straight female, straight male, 22 AWG 4 pin, 250 V, 4 A

*Replace symbol with 0M2, 0M3, 0M5, 0M6, 0M7, 1, 1M3, 1M5, 1M6, 2 – 25 in one meter increments and 25-95 in five meter increments for standard lengths in meters.

Ratings: IP69K, NEMA 6P, 1200 psi washdown

Dynamic Brake Cable

285-DBK22-M3   Straight M22, 3 meter Cordset, IP67/Nema Type 4

* Only available for bulletin 284

Quick Disconnect Source Brake Patchcords
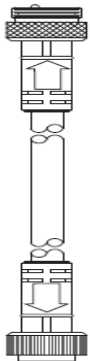
285-BRC22-M*D
Non-shielded patch cable assembly with straight male / straight female receptacle with leads, 22 mm shell, 3 Pin, 16 AWG Conductors

285-BRC22D-M*
Non-shielded patch cable assembly with 90° male / 90° female receptacle with leads, 22 mm shell, 3 Pin, 16 AWG Conductors

   *Replace symbol with 1, 3, 6, 8, 10, 12 or 14 for standard lengths in meters.

ArmorStart ST Motor Cable Cordset Options

284-PWRM29A-M*
Shielded patch cable assembly with straight male / female receptacle with leads, 29 mm shell, 4 Pin, 12 AWG Conductors

280-PWRM29A-M*
Non-shielded patch cable assembly with straight male / female receptacle, 29 mm shell, 4 Pin, 12 AWG Conductors

*Replace symbol with 0.5, 1, 1.5, 2, 3, 4, 6, 8, 10, 12 or 14 for standard lengths in meters.

Ratings: IP67, NEMA 4/12,TC-ER

Male Receptacle

Note: A male, field installed connector is required for the motor connection when using a patchcord for motor.

285-M24M-M05   Source Brake motor male receptacle 3-pin , 22 mm shell, 14 AWG, 600V, 15A.

284-M29M-M03   Motor Connection shielded straight male receptacle with 4 wires, 29 mm shell, 4 Pin, 12 AWG Conductors

ArmorStart ST Safety Version

GuardLogix® PLC
Should be noted Compact GuardLogix and Armor GuardLogix may also be utilized

ArmorStart ST Safety Version
281E-F12S-10B-RRG

ArmorBlock Guard I/O
1732ES-IB12XOBV2
1732ES-IB8XOBV4 (pending release)

EtherNet Media

DC Micro Patchcord (M12)
889N-F4HJDM-2
Assembly: 18 AWG, 4-pin

SM1/SM2

① I/O Output

① I/O Input

P/M

Input 24 VDC

Pass-Thru 24 VDC
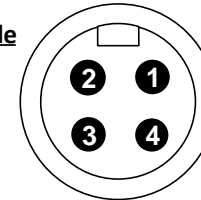
Auxiliary Power Drop Cable
889N-F4AFNM-2
Assembly:22 mm, 18 AWG, 4-pin

Auxiliary Device T-Port
898N-43PB-N4KF
Assembly:22 mm, 4-Pin

Safety Monitor (SM1/SM2) Male
1 SM1 (brown)
2 SM2 (white)
3 NC (no connection) (blue)
4 NC (no connection)(black)

Safety Output Power (P/M)-Male
1 NC (no connection)(brown)
2 M (white)
3 NC (no connection) (blue)
4 P (black)

ArmorBlock Guard I/O Micro Connector Pinout:

Input Configuration
1 Test Output n+1
2 V+ (Red)
3 V- (Black)
4 Safe Input n
5 Test Output n
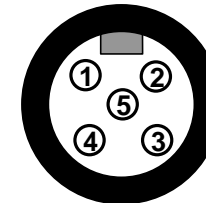
Output Configuration
1 Output +24 VDC Power
2 Output n+1 (Sinking)
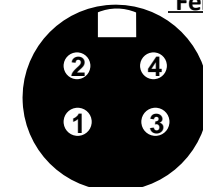3 Output Power Common
4 Output n (Sourcing)
5 Output Power Common

ArmorBlock Guard Auxiliary Power Pinout:
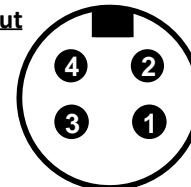
Male Input
1 Output +24 VDC Power
2 Input +24 VDC Power
3 Input Power, Common
4 Output Power, Common

Female Output

Rockwell Automation | **ArmorStart ST Safety Connection System**

ArmorStart ST Safety Version

ARMORSTART SAFETY RELATED PARTS

Each ArmorStart Safety Distributed motor controller is intended to be combined with the Cat. No. 1732ES-IB8XOBV4 (pending) or 1732ES-IB12XOBV2 safety I/O module to form a subsystem that is part of the overall machine stop function. The motor controllers are connected to the safety I/O module through specified cable assemblies. The combination of one of these controllers, the safety module, and the specified interconnecting cables are referred to as the ArmorStart Safety-Related Parts. The catalog numbers for each of these components is specified below. The combination of these components is shown below. The safety I/O module and PLC program must be configured appropriately to meet TUV CAT4 Ple certification. Refer to the user manual for details.
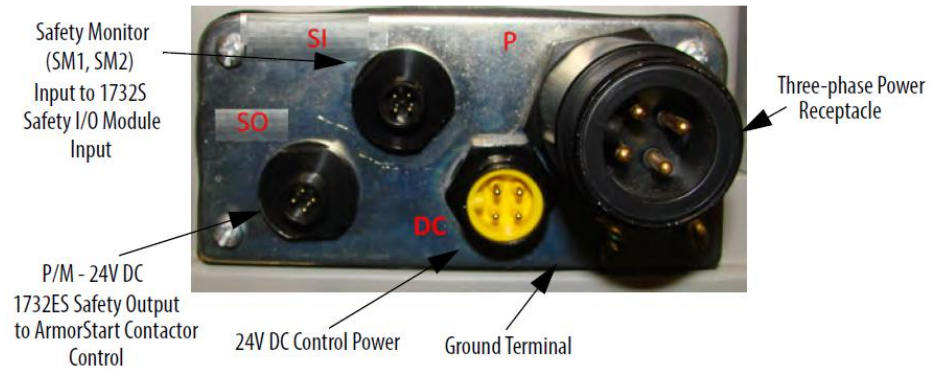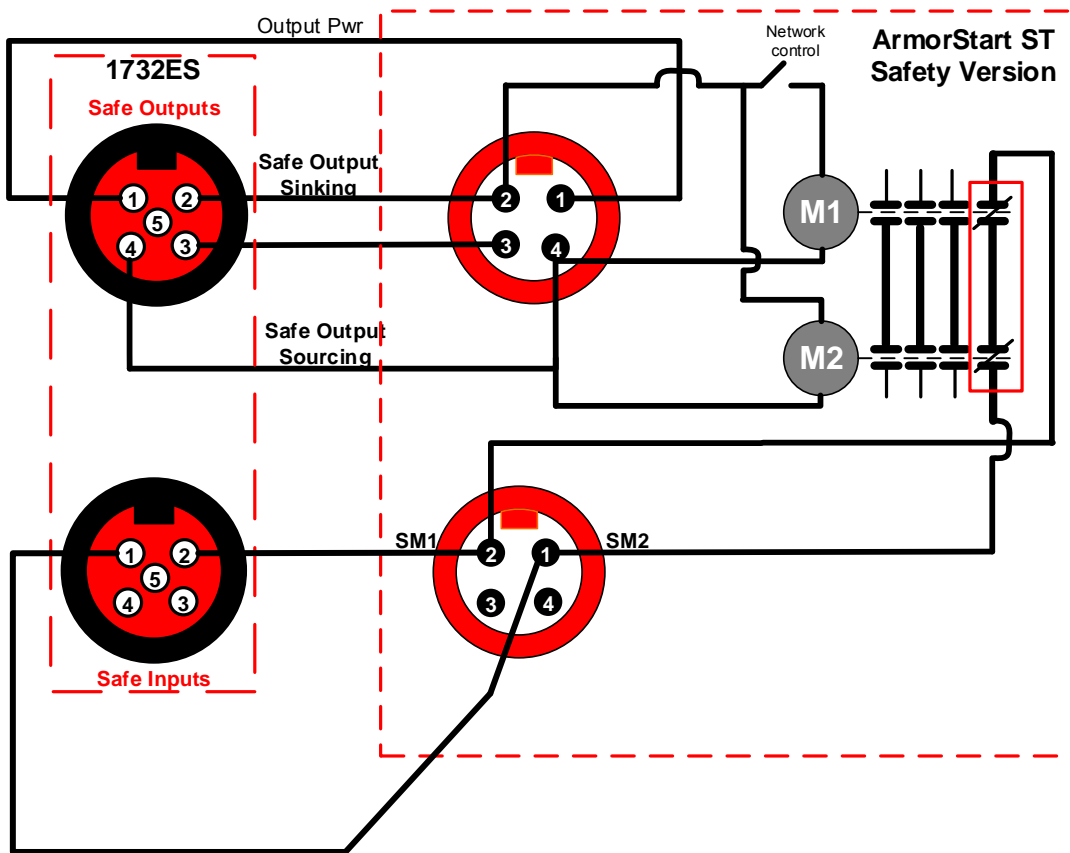
ARMORBLOCK GUARD I/O MODULES

ArmorBlock Guard I/O provides all the advantages of traditional distributed I/O for safety systems, but has an IP67 package that can be mounted directly on your machine. You can use Guard Safety I/O with any safety controller that communicates on EtherNet/IP using CIP Safety for the control and monitoring of safety circuits. Guard I/O detects circuit failures at each I/O point while providing detailed diagnostics directly to the controller.

For assistance and example configuration, see the Safety

Accelerator for Guardlogix Systems at www.ab.com

Safety Connections Between 1732ES and ArmorStart Safety

| Rockwell Automation | ArmorStart ST Safety Connection System |

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.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://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.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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