SQUARE D
Instruction Bulletin

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Enclosed ALTISTART® 46 Controller Supplemental Instruction Bulletin Class 8638 and 8639

INTRODUCTION

This bulletin is a supplement to the ALTISTART 46 (ATS46) Soft Start Controller User's Manual (Instruction Bulletin VD0C32S301), and contains setup and installation instructions for Class 8638 and 8639 Enclosed ATS46 Controllers.

Figure 1: ATS46 Enclosed Controller

The following information is included in this bulletin:

- Installation / Precautions
- Catalog Number Identification
- Elementary Diagrams
- Factory Presets
- Component Coordination Tables
- Fuse Selection
- Technical Specifications

In addition to this bulletin, ATS46 Controllers are shipped with the following documentation:

- Elementary diagrams that illustrate the power, control and optional circuits of the controller.
- Outline dimension drawing(s) that identify the physical characteristics of the controller and contain installation information.
- Instruction Bulletin VD0C32S301, which describes the operation and characteristics of the ATS46 controller when used as a component of the Class 8638 or 8639 Enclosed Controller.

INSTALLATION & PRECAUTIONS

⚠ DANGER

HAZARDOUS VOLTAGE

Disconnect all power before working on this equipment.

Failure to observe this instruction will result in death or serious injury.

Read, understand and follow all precautions contained in bulletin VD0C32S301. In addition, the following precautions unique to the Enclosed ATS46 Controller must be followed:

- The Enclosed ATS46 Controller can be installed in a Pollution Degree 3 environment, as defined in NEMA ICS1-111A and IEC 664-1.
- When attaching wall mounted and free standing controllers, use fasteners rated for the weight of the apparatus, the expected shock and vibration of the installation, and the expected environment.
- During installation and operation, maintain the ventilation clearances specified on the outline dimension drawing(s).

EXCEPTIONS TO BULLETIN VD0C32S301

When referencing Instruction Bulletin VD0C32S301 for Class 8638 or 8639 Enclosed ATS46 Controllers, note the following:

- The recommended components listed in Table 8 on pages 34 and 35 apply to Open ATS46 Controllers only. Refer to Tables 3-6 in this document for actual components used in Class 8638 and 8639 Enclosed ATS46 Controllers.
- The recommended overcurrent protection devices (OCPDs) listed in Table 19 of Appendix A apply to Open ATS46 Controllers. Refer to Tables 3-6 in this document for the OCPDs to be used with Class 8638 and 8639 Enclosed ATS46 Controllers.
- The dimensions listed on pages 20-22 (Figures 16-20) apply to Open ATS46 Controllers only. Refer to the specific documentation for the enclosed controller class you have (8638 or 8639).
- The “Control Connections” section on page 25 may not apply to Class 8638 or 8639 Enclosed ATS46 Controllers, since the relay contacts shown may be incorporated into the control logic of the Enclosed product and may not be available for user connection.
- The wiring diagrams and associated information shown on pages 29-31 are provided as recommendations that apply to Open ATS46 Controllers, and do not necessarily apply to Class 8638 or 8639 Enclosed ATS46 Controllers. Refer to the elementary diagrams included with this package and sample diagrams on pages 5-8 of this document.

CATALOG NUMBER IDENTIFICATION

The catalog numbers for Enclosed ATS46 Controllers, Class 8638 and 8639, can be interpreted as follows:

Table 1: Catalog Number Identification

Class	Type				
8638	**N Start Duty**	**D Amp Rating**	**A Enclosure**	**4 Voltage**	**S SCR Fault Isolation**
8638, Fusible Disconnect 8639, Circuit Breaker	N = Normal L = Long	C = 12 D = 17 E = 22 F = 38 H = 47 I = 62 J = 75 K = 88 L = 110 M = 145 N = 176 O = 210 P = 257 Q = 320 R = 410 S = 480 T = 590 U = 660	A = Type 12	8 = 208 2 = 230 4 = 460	S = Shunt Trip N = Isolation Contactor R = Reversing Isolation Contactor

Example: 8638NDA4S = ATS46 with fusible disconnect in Type 12 enclosure, rated for 17 amps at 460 VAC, normal start, with shunt trip SCR fault isolation.

FORMS

The forms for Enclosed ATS46 Controllers, Classes 8638 and 8639, are as follows:

Table 2: Factory Modifications (Forms)

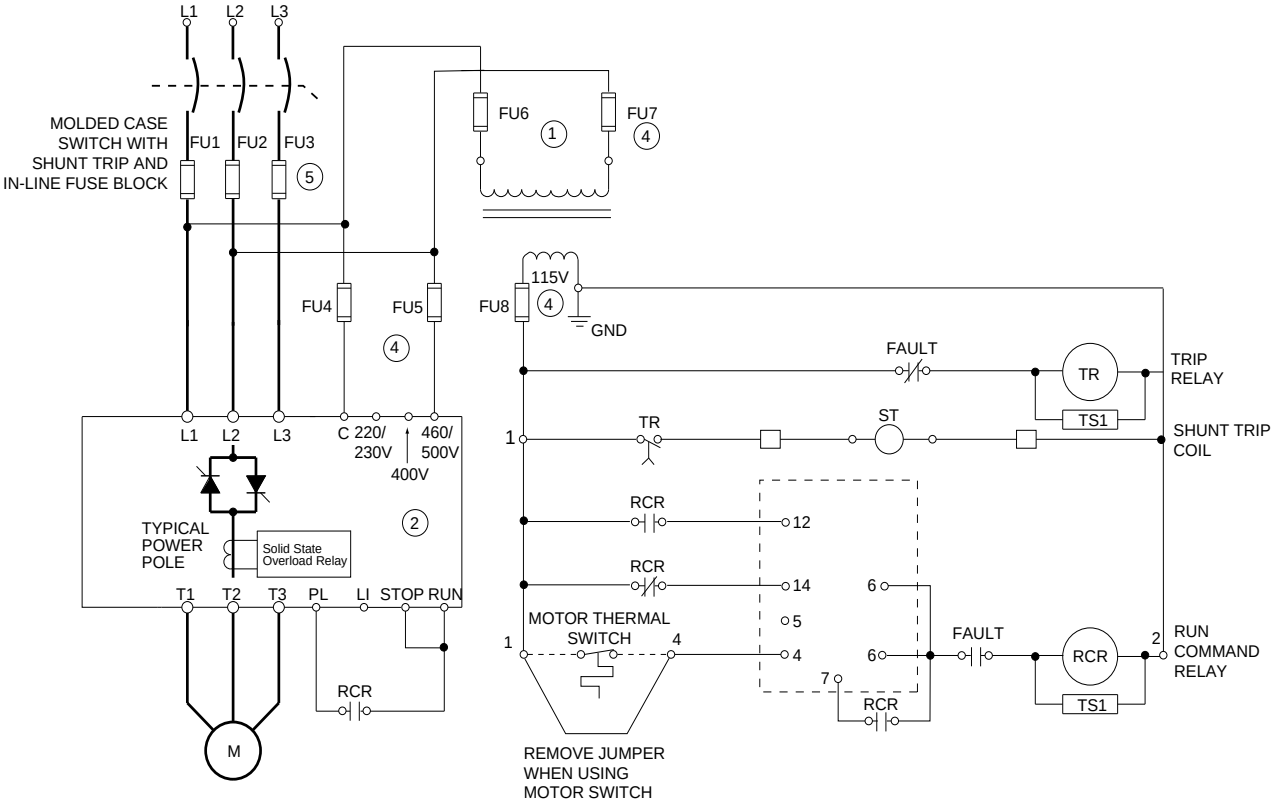
Forms	Function	Form	Description
Pilot Devices in Cover and Control Circuit	**Pushbuttons**		
	Start-Stop	A*	Red Stop and green Start pushputtons.
	Fwd-Rev-Stop	A1*	Red Stop, green Forward, and amber Reverse pushbuttons.
	Emergency Off	A6**	Pushbutton for immediate removal of control power.
	Ext Overload Reset	A7	Pushbutton connected to logic input configured to require operator acknowledgment of motor thermal overload.
	Selector Switches		
	Hand-off-Auto	C	3-position selector switch.
	Stop-Run	C6	2-position selector switch.
	Pilot Lights•		
	One Pilot Light	P•	RUN command
	Two Pilot Lights	P•P•	RUN and OFF
	One Push to Test Pilot Light	P2•	RUN command
	Two Push to Test Pilot Light	P2•P2•	RUN and OFF
	Fused Control Power Transformer		
	Standard Capacity	Std	120 VAC, two primary, one secondary fuse standard.
	Additional Control Power	T41	100 additional VA
		T42	200 additional VA
Relays and Meters	Auxiliary Relay	R174	Adds an additional 4-pole unwired control relay.
	Electronic Timing Relay	K1	Unwired - specify on/off delay and timing range.
	Ammeter	G91	Single phase ammeter mounted in cover.
	Elapsed Time Meter	G97	ETM mounted in cover, measures RUN time
	Operation Counter	G99	Operation counter, mounted in cover, measures number of starts.
Miscellaneous	Shorting Contactor	Z21	Bypasses the controller once motor is up to speed. Standard in Type 12 Enclosure, rated 47 amps and above.
	PC Software Option	Z4	Substitute PC software for keypad.
	PLC Communication Option	Z1	Substitute PLC communication module for keypad.
	Non-Isolated Full Voltage Bypass	Z24	Includes overload and normal/bypass selector switch. May require power wiring modification to remove ATS46 control from the circuit. Only available with P•••N type models.

* Modifications A and A1 do not include illuminated pushbuttons.Pilot lights must be ordered separately.
** Not available on shunt trip models.
• Insert color code.

Color	Red	Green	Amber
	1	2	3

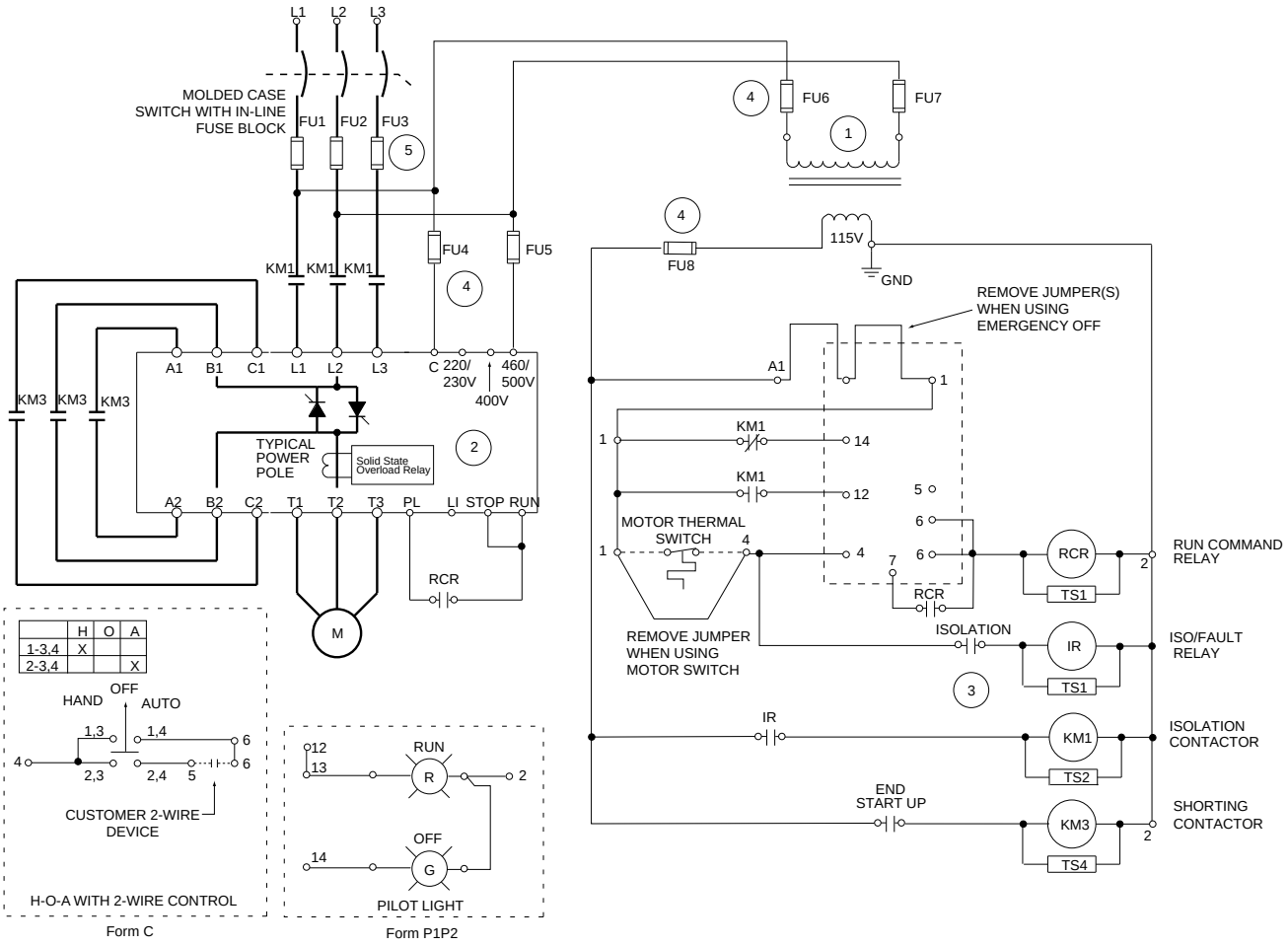
SAMPLE ELEMENTARY DIAGRAMS

The following diagrams are shown as examples of typical controller configurations. Refer to the elementary diagrams provided with your ATS46 controller for actual configuration parameters.



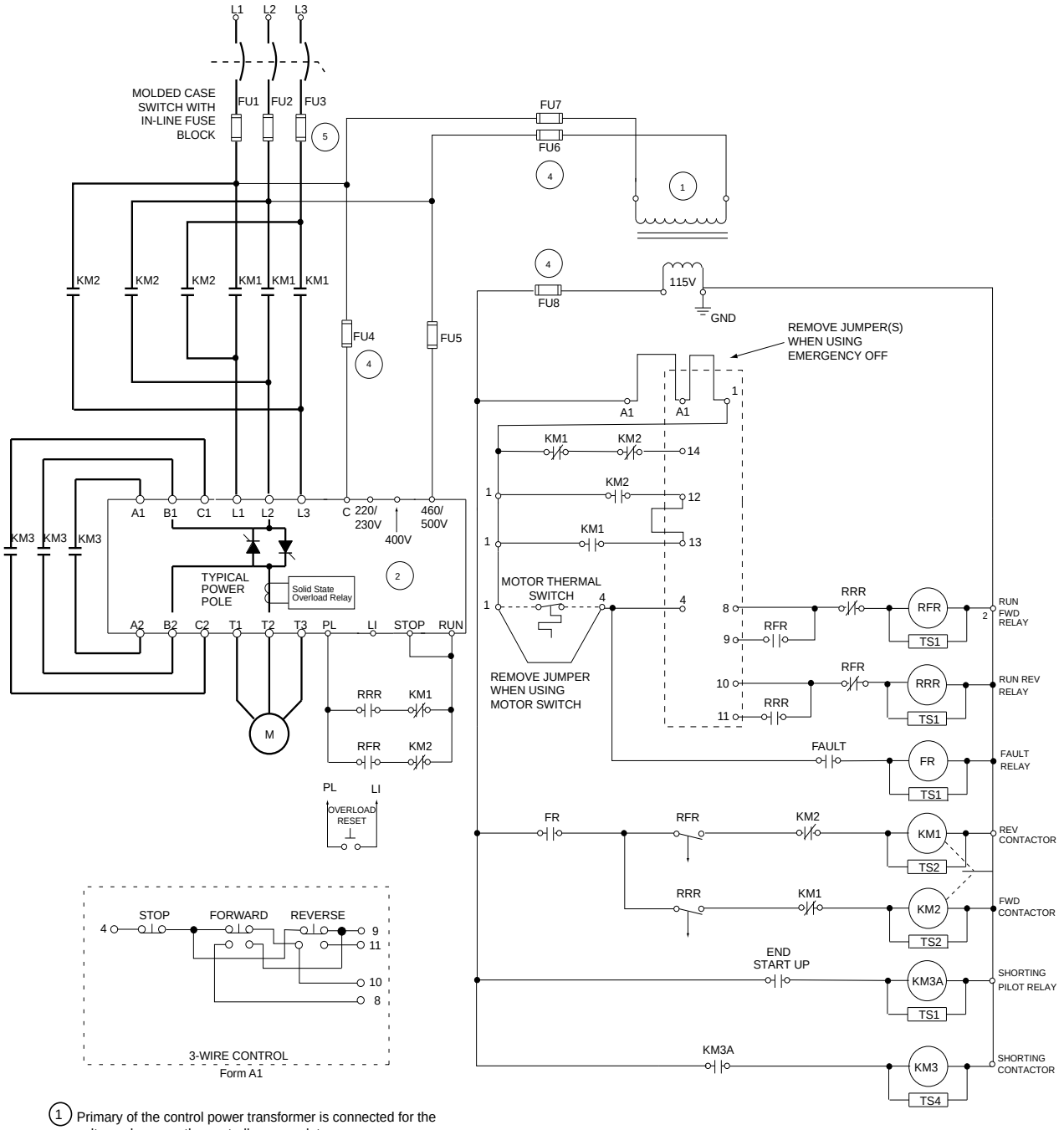
1. Primary of the control power transformer is connected for the voltage shown on the controller nameplate.
2. Refer to the Factory Presets section of this document for information about factory settings and adjusting the configuration switch. Also refer to the "Parameter Adjustment Ring and Factory Settings" section in Instruction Bulletin VD0C32S301 for information about setting adjustable parameters.
4. For correct fuse selections, refer to Table 8 in this document.
5. Refer to Tables 3 and 4 for power fuse selection.

Figure 2: Typical Nonreversing with Shunt Trip Fault Isolation (Class 8638, Type NDA4S, Form AP1)



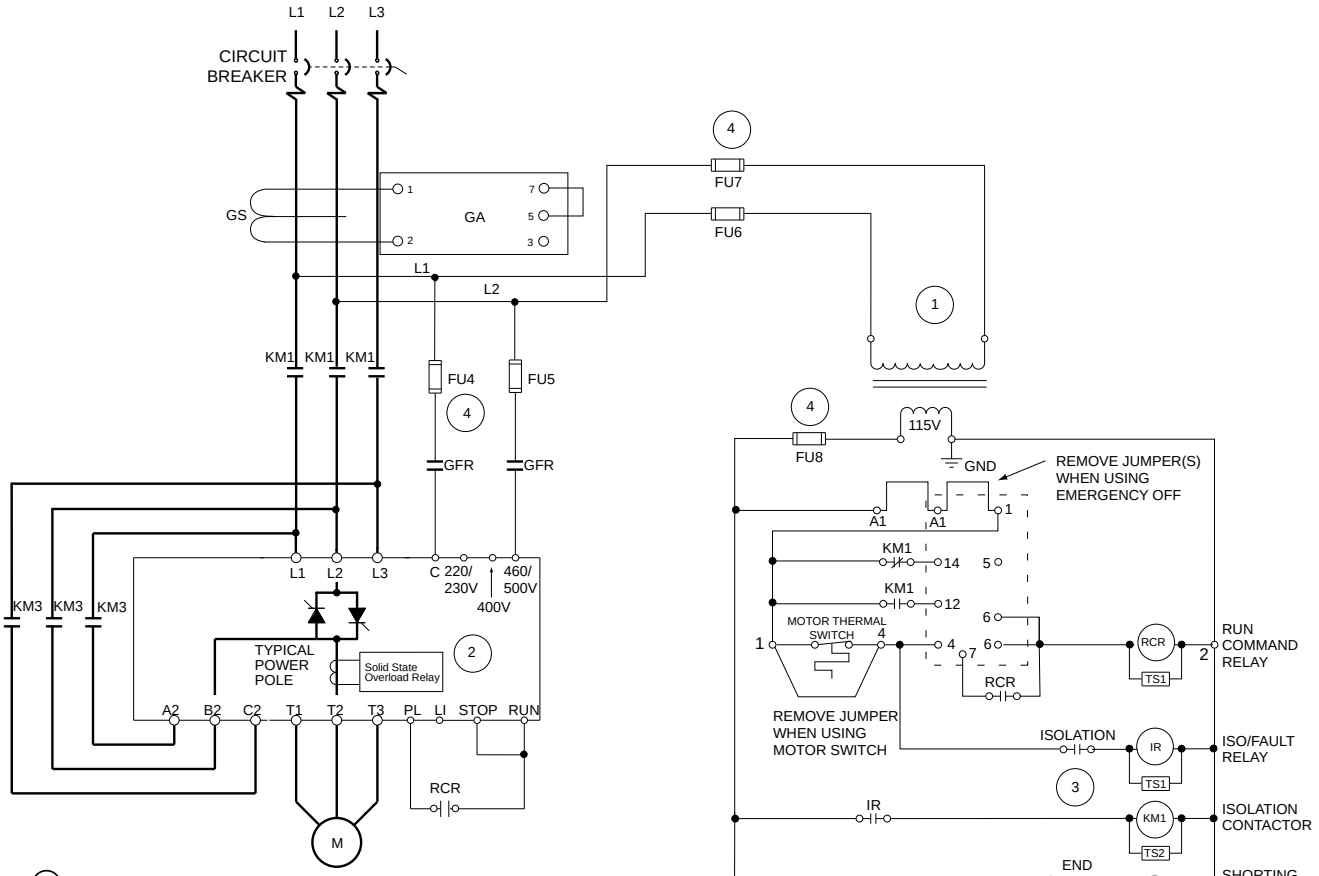
1. Primary of the control power transformer is connected for the voltage shown on the controller nameplate.
2. Refer to the Factory Presets section of this document for information about factory settings and adjusting the configuration switch. Also refer to the "Parameter Adjustment Ring and Factory Settings" section in Instruction Bulletin VD0C32S301 for information about setting adjustable parameters.
3. Configure relay R1 (located on the ATS46 controller) for isolation contactor control.
4. For correct fuse selections, refer to Table 8 in this document.
5. Refer to Tables 3 and 4 for power fuse selection.

Figure 3: Typical Nonreversing with Isolation Contactor (Class 8638, Type NDA4N, Form CP1P2)



1. Primary of the control power transformer is connected for the voltage shown on the controller nameplate.
2. Refer to the Factory Presets section of this document for information about factory settings and adjusting the configuration switch. Also refer to the "Parameter Adjustment Ring and Factory Settings" section in Instruction Bulletin VD0C32S301 for information about setting adjustable parameters.
4. For correct fuse selections, refer to Table 8 in this document.
5. Refer to Tables 3 and 4 for power fuse selection.

Figure 4: Typical Reversing with Isolation Contactors (Class 8638, Type NMA4R, Form A1)



1. Primary of the control power transformer is connected for the voltage shown on the controller nameplate.
2. Refer to the Factory Presets section of this document for information about factory settings and adjusting the configuration switch. Also refer to the "Parameter Adjustment Ring and Factory Settings" section in Instruction Bulletin VD0C32S301 for information about setting adjustable parameters.
3. Configure relay R1 (located on the ATS46 controller) for isolation contactor control.
4. For correct fuse selections, refer to Table 8 in this document.
5. Refer to Tables 3 and 4 for power fuse selection.

Figure 5: Nonreversing with Isolation Contactor, Shorting Contactor Pilot Relay (Class 8639, Type NMA4N)

FACTORY PRESETS

The Enclosed ATS46 Controller, used as a component of Class 8638 or 8639, has a configuration switch that has been preset at the factory for either normal or long starting times. The factory presets are shown below.

Parameter		Switch Position 1 Type "N" Standard Duty Preset	Switch Position 2 Type "L" Heavy Duty Preset
Acceleration Ramp	Acc	10 seconds	15 seconds
Current Limit	Ilt	300%	350%
Overload Protection	thp	Class 10	Class 20

NOTE: For FLA factory presets, refer to Tables 3 and 6 in this document.

To change the factory presets, the keypad must be removed from the enclosure door. For information on adjusting the factory presets, refer to Chapter 3 of Instruction Bulletin VD0C32S301.

When replacing the keypad in the remote mounting, do not exceed 3 lb-in torque on the holding screws.

Class 8638 and 8639 control logic may include one or more pneumatic time delay relays. The factory settings are as follows:

Shunt trip power circuit:

- TR is factory set for 2 seconds. Do not adjust. This time delay prevents the controller from fault tripping on startup.

Isolation Contactor Power Circuit:

- The isolation contactor is controlled by the R1 relay and automatically adapts to the deceleration requirements, which may be changed at any time. The configuration of the R1 relay has been changed from the "Fault" configuration, which is used for the Shunt Trip and Reversing Power Circuits.

Reversing power circuit:

- RFR and RRR - Factory set for minimum setting (10 seconds).
  - — For freewheel stopping, the factory setting is adequate.
  - — For controlled deceleration, set slightly longer than the deceleration ramp time (DEC parameter setting).
  - — When using InTele™ braking, set the time delay relay to the maximum adjustment. After the stopping time is determined, the delay can be reduced to more closely match the braking application time.

COMPONENT COORDINATION TABLES

For class 8638 controllers, refer to Tables 3 and 4 for selection of power fuses FU1/FU2/FU3. Use Tables 3-6 to determine which Altistart controller is used in your enclosed product. Then refer to Table 7 for selection of control fuses FU4/FU5. Fuse selection information may also be found on the nameplate located on the inside of the enclosure door.

Table 3: Class 8638 Type N Standard Duty Component Ratings

Type	Motor Voltage									Short Circuit Level	Components				
	208V			230V			460				ATS46 Model No.*	Shorting & Isolation Contactor	Molded Case Switch	Transformer Power** Circuit S, N & R	
	HP	Max Fuse Rating	Factory Preset FLA (I_n)	HP	Max Fuse Rating	Factory Preset FLA (I_n)	HP	Max Fuse Rating	Factory Preset FLA (I_n)	Withstand Rating (kA)				208V	230/460 V
											ATS46-	LCI-		9070-	9070-
ND	3	15	11	5	20	15	10	20	14	65	D17N	D32	FHL36000M	TF50D3	TF50D1
NE	5	25	17.5	7.5	30	21	15	30	21	65	D22N	D**32**	FHL36000M	TF50D3	TF50D1
NF	7.5	35	25.3	10	40	28	20	35	28	65	D38N	D**32**	FHL36000M	TF50D3	TF50D1
NH	10	45	32.2	15	60	42	30	60	42	65	D47N	D50	FHL36000M	TF100D3	TF100D1
NI	15	70	48.3	20	70	54	40	70	54	65	D62N	D50	FHL36000M	TF100D3	TF100D1
NJ	20	80	62.1	25	90	68	50	90	68	65	D75N	D80	FHL36000M	TF100D3	TF100D1
NK	25	100	80	30	110	80	60	100	80	65	D88N	D80	FHL36000M	TF100D3	TF100D1
NL	30	125	92	40	150	104	75	125	98	65	C11N	D80	KHL36000M	TF100D3	TF100D1
NM	40	175	120	50	175	128	100	175	128	65	C14N	F150	KHL36000M	TF200D3	TF200D1
NN	50	200	150	60	200	160	125	200	160	65	C17N	F185	KHL36000M	TF200D3	TF200D1
NO	60	250	177	75	250	190	150	250	180	65	C21N	F185	KHL36000M	TF250D3	TF250D1
NP	75	300	221	100	350	248	200	350	236	65	C25N	F330	LHL36000M	TF350D3	TF350D1
NQ	100	400	290	125	400	312	250	400	290	65	C32N	F330	LHL36000M	TF350D3	TF350D1
NR	125	500	367	150	500	367	300	500	367	65	C41N	F500	MHL36000 8M	TF300D3	TF300D1
NS	150	600	430				350	600	430	65	C48N	F500	MHL36000 8M	TF300D3	TF300D1
NT				200	600	480	480	600	480	65	C59N	F500	MHL36000 8M	TF300D3	TF300D1
NU	200	750	552	250	800	610	500	850	610	65	C66N	F500	MHL36000 8M	TF300D3	TF300D1

All devices are rated for six 23-second starts per hour in 40°C ambient except type NU, which is rated for two 15-second starts per hour in 30°C ambient. If you require additional starting capabilities, contact Square D. * Refer to Table 7 for Control Fusing. ** Refer to Table 8 for Transformer Fusing.

Table 4: Class 8638 Type L Heavy Duty Component Ratings

Type	Motor Voltage									Short Circuit Level	Components				
	208V			230V			460				ATS46 Model No.*	Shorting & Isolation Contactor	Molded Case Switch	Transformer Power** Circuit S, N & R	
	HP	Max Fuse Rating	Factory Preset FLA (I_n)	HP	Max Fuse Rating	Factory Preset FLA (I_n)	HP	Max Fuse Rating	Factory Preset FLA (I_n)	Withstand Rating (kA)				208V	230/460 V
											ATS46-	LCI-		9070-	9070-
LC	2	15	7.8	3	17.5	9.6	7.5	20	11	65	D17N	D32	FHL36000M	TF50D3	TF50D1
LD	3	20	11	5	30	15.2	10	25	14	65	D22N	D**32**	FHL36000M	TF50D3	TF50D1
LE	5	35	17.5	7.5	40	21	15	40	21	65	D38N	D**32**	FHL36000M	TF50D3	TF50D1
LF	7.5	45	25.3	10	50	28	20	50	28	65	D47N	D50	FHL36000M	TF100D3	TF100D1
LH	10	60	32.2	15	80	42	30	70	42	65	D62N	D50	FHL36000M	TF100D3	TF100D1
LI	15	90	48.3	20	100	54	40	100	54	65	D75N	D50	FHL36000M	TF100D3	TF100D1
LJ	20	110	62	25	125	68	50	125	68	65	D88N	D80	FHL36000M	TF100D3	TF100D1
LK	25	150	75	30	150	80	60	150	75	65	C11N	D80	FHL36000M	TF100D3	TF100D1
LL	30	175	92	40	200	104	75	175	98	65	C14N	F80	KHL36000M	TF100D3	TF200D1
LM	40	225	120	50	250	128	100	225	128	65	C17N	F185	KHL36000M	TF250D3	TF200D1
LN	50	300	150	60	300	160	125	300	160	65	C21N	F185	KHL36000M	TF250D3	TF250D1
LO	60	350	176	75	350	190	150	350	180	65	C25N	F185	KHL36000M	TF250D3	TF350D1
LP	75	400	221	100	450	248	200	450	240	65	C32N	F330	LHL36000M	TF350D3	TF350D1
LQ	100	500	290	125	600	312	250	600	290	65	C41N	F500	MHL36000 8M	TF300D3	TF300D1
LR	125	650	359	150	650	360	300	650	361	65	C48N	F500	MHL36000 8M	TF300D3	TF300D1
LS	150	800	410				350	800	410	65	C59N	F500	MHL36000 8M	TF300D3	TF300D1
LT				200	1000	480	400	1000	480	65	C66N	F500	MHL36000 8M	TF300D3	TF300D1

All devices are rated for three 46-second starts per hour in 40°C ambient. * Refer to Table 7 for Control Fusing. ** Refer to Table 8 for Transformer Fusing.

Table 5: Class 8639 Type N Standard Duty Component Ratings

Type	Motor Voltage						Short Circuit Level	Components				
	208V		230V		460			ATS46 Model No.*	Shorting & Isolation Contactor	Max Circuit Breaker Rating	Transformer Power** Circuit S, N & R	
	HP	Factory Preset FLA (I_n)	HP	Factory Preset FLA (I_n)	HP	Factory Preset FLA (I_n)	Withstand Rating (kA)	ATS46-	LCI-		208V 9070-	230/460 V 9070-
ND	3	11	5	15	10	14	5	D17N	D32	FAL36030 Thermal Magnetic	TF50D3	TF50D1
NE	5	17.5	7.5	21	15	21	5	D22N	D**32**	FAL36030 - 15M	TF50D3	TF50D1
NF	7.5	25.3	10	28	20	28	5	D38N	D**32**	FAL36050 - 16M	TF50D3	TF50D1
NH	10	32.2	15	42	30	42	5	D47N	D50	FAL36100 - 18M	TF100D3	TF100D1
NI	15	48.3	20	54	40	54	5	D62N	D50	FAL36100 - 18M	TF100D3	TF100D1
NJ	20	62.1	25	68	50	68	10	D75N	D80	FAL36100 - 18M	TF100D3	TF100D1
NK	25	80	30	80	60	80	10	D88N	D80	KAL36250 - 25M	TF100D3	TF100D1
NL	30	92	40	104	75	98	10	C11N	D80	KAL36250 - 25M	TF100D3	TF100D1
NM	40	120	50	128	100	128	10	C14N	F150	KAL35250 - 29M	TF200D3	TF200D1
NN	50	150	60	160	125	160	10	C17N	F185	KAL36250 - 31M	TF200D3	TF200D1
NO	60	177	75	190	150	180	18	C21N	F185	KAL36250 - 32M	TF250D3	TF250D1
NP	75	221	100	248	200	236	18	C25N	F330	LAL36400 - 35M	TF350D3	TF350D1
NQ	100	290	125	312	250	290	18	C32N	F330	LAL36400 - 36M	TF350D3	TF350D1
NR	125	367	150	367	300	367	30	C41N	F500	MAL36600 - 40M	TF300D3	TF300D1
NS	150	430			350	430	30	C48N	F500	MAL36600 - 42M	TF300D3	TF300D1
NT			200	480	480	480	30	C59N	F500	MAL36800 - 45M	TF300D3	TF300D1
NU	200	552	250	610	500	610	30	C66N	F500	MAL36800 - 45M	TF300D3	TF300D1

All devices are rated for six 23-second starts per hour in 40°C ambient except type NU, which is rated for two 15-second starts per hour in 30°C ambient. If you require additional starting capabilities, contact Square D.
*Refer to Table 7 for Control Fusing. **Refer to Table 8 for Transformer Fusing.

Table 6: Class 8639 Type L Heavy Duty Component Ratings

Type	Motor Voltage						Short Circuit Level	Components				
	208V		230V		460			ATS46 Model No.*	Shorting & Isolation Contactor	Max Circuit Breaker Rating	Transformer Power* Circuit** S, N & R	
	HP	Factory Preset FLA (I_n)	HP	Factory Preset FLA (I_n)	HP	Factory Preset FLA (I_n)	Withstand Rating (kA)	ATS46-	LCI-	(amps)	208V 9070-	230/460 V 9070-
LC	2	7.8	3	9.6	7.5	11	5	D17N	D32	FAL36020 Thermal Magnetic	TF50D3	TF50D1
LD	3	11	5	15.2	10	14	5	D22N	D**32**	FAL36030 - 15M	TF50D3	TF50D1
LE	5	17.5	7.5	21	15	21	5	D38N	D**32**	FAL36030 - 15M	TF50D3	TF50D1
LF	7.5	25.3	10	28	20	28	5	D47N	D50	FAL36050 - 16M	TF100D3	TF100D1
LH	10	32.2	15	42	30	42	5	D62N	D50	FAL36160 - 18M	TF100D3	TF100D1
LI	15	48.3	20	54	40	54	10	D75N	D50	FAL36100 - 18M	TF100D3	TF100D1
LJ	20	62	25	68	50	68	10	D88N	D80	FAL36100 - 18M	TF100D3	TF100D1
LK	25	75	30	80	60	75	10	C11N	D80	KAL26256 - 25M	TF100D3	TF100D1
LL	30	92	40	104	75	98	10	C14N	F80	KAL26250 - 25M	TF200D3	TF200D1
LM	40	120	50	128	100	128	10	C17N	F185	KAL35250 - 29M	TF200D3	TF200D1
LN	50	150	60	160	125	160	18	C21N	F185	KAL36250 - 31M	TF250D3	TF250D1
LO	60	176	75	190	150	180	18	C25N	F185	KAL36250 - 32M	TF350D3	TF350D1
LP	75	221	100	248	200	240	18	C32N	F330	KAL36400 - 35M	TF350D3	TF350D1
LQ	100	290	125	312	250	290	30	C41N	F500	MAL36600 - 40M	TF300D3	TF300D1
LR	125	359	150	360	300	361	30	C48N	F500	MAL36600 - 40M	TF300D3	TF300D1
LS	150	410			350	410	30	C59N	F500	MAL36600 - 42M	TF300D3	TF300D1
LT			200	480	400	480	30	C66N	F500	MAL36800 - 45M	TF300D3	TF300D1

All devices are rated for three 46-second starts per hour.
* Refer to Table 7 for Control Fusing. **Refer to Table 8 for Transformer Fusing.

Table 7: ATS46 Control Power Fuse Ratings

	Class CC Fuse Rating at Motor Voltage		
ATS46 Model	**208V**	**230V**	**460V**
D17N	1/4 amp	1/4 amp	1/4 amp
D22N	1/4 amp	1/4 amp	1/4 amp
D38N	1/4 amp	1/4 amp	1/4 amp
D47N	1/4 amp	1/4 amp	1/4 amp
D62N	1/2 amp	1/2 amp	1/4 amp
D75N	1/2 amp	1/2 amp	1/4 amp
D88N	1/2 amp	1/2 amp	1/4 amp
C11N	1/2 amp	1/2 amp	1/4 amp
C14N	1/2 amp	1/2 amp	1/4 amp
C17N	1.6 amp	1.6 amp	0.8 amp
C21N	1.6 amp	1.6 amp	0.8 amp
C25N	1.6 amp	1.6 amp	0.8 amp
C32N	1.6 amp	1.6 amp	0.8 amp
C41N	2 amp	2 amp	1 amp
C48N	2 amp	2 amp	1 amp
C59N	2 amp	2 amp	1 amp
C66N	2 amp	2 amp	1 amp

To determine which ATS46 Model is used, refer to Tables 3-6.

Table 8: ATS46 Transformer Fuse Ratings

Class 9070 Transformer Type	**208V Primary Fuse: FNQ-R**	**120V Secondary Fuse: FNQ-R**	**Class 9070 Transformer Type**	**230V Primary Fuse: FNQ-R**	**460V Primary Fuse: FNQ-R**	**120V Secondary Fuse: FNQ-R**
TF50D3	1/2 amp	6/10 amp	TF50D1	1/2 amp	2/10 amp	6/10 amp
TF100D3	1 1/8 amp	1 1/4 amp	TF100D1	1 amp	1/2 amp	1 1/4 amp
TF250D3	3 amp	3 amp	TF250D1	2 1/2 amp	1 1/4 amp	3 amp
TF300D3	3 1/2 amp	4 amp	TF300D1	3 amp	1 1/2 amp	4 amp
TF350D3	4 amp	5 amp	TF350D1	3 1/2 amp	1 8/10 amp	5 amp
TF500D3	4 amp	7 amp	TF500D1	3 2/10 amp	2 1/2 amp	7 amp

To determine which transformer is used, refer to Tables 3-6.

TECHNICAL SPECIFICATIONS

Environment	Degree of protection	The Type 12 enclosures are sealed to prevent dust and oil from entering the cabinet. The doors are gasketed, the 22-mm door mounted operator devices are oil tight. Enclosures are painted beige as standard.
	Conformity to standards	Conforms to UL508; CSA 22.2 No. 14, UL Listed, CSA Certified. Immunity to radioelectrical interference: conforms to IEC 801-3.
	Operational test vibration	Conforms to IEC 721-3-3-3M3 amplitude peak to peak from 2-9 Hz.
	Transit test to shock	Conforms to National Safe Transit Association and International Safe Transit Association test for packages weighing 100 lbs and over.
	Ambient air temperature	Operation: Ambient conditions in installed area from 0 to 40° C; Storage: -25° to +70° C.
	Maximum relative humidity	93% non-condensing
	Maximum operating altitude	1000 m (3300 ft.), derate by 1.2% for each additional 100 m up to 3000 m maximum.
Characteristics	3-phase supply voltage	208 VAC ± 10%; 230 VAC ± 15%; 460 VAC ± 15%
	Control voltage	115 VAC (CPT included as standard)
	Frequency	50/60 Hz
	Rated current	See Product Selection Tables 3 and 6.
	Motor power	2 to 500 hp
	Motor voltage	208, 220, 230, 240, 460, 480
	Duty cycle [1]	Type N: 6 starts per hour, 300% current limit, 26 seconds per start Type L: 3 starts per hour, 350% current limit, 46 seconds per start
Operation	**Methods of Starting:**	
	Torque ramp	Adjustable from 1 to 30 seconds by keypad
	Current limitation	Adjustable from 150% to 500% of controller-rated current by keypad
	Booster start-up pulse	Full voltage starting for 5 cycles of 50 to 100% mains voltage, selectable by keypad
	Methods of Stopping:	
	Freewheel	Coast to rest on stop command
	Torque deceleration ramp	Adjustable from 2 to 60 seconds by keypad
	InTele Braking	Selectable by keypad
	Status and Diagnostics:	Digital display of motor and controller status, including • Ready/Run/Fault Status • Motor Current • Motor Torque • Motor Thermal State • Power Factor
Protection	**Motor:**	
	Thermal overload	Solid state thermal overload is integral to the Altistart controller. Selectable overload class 10, 20, or 30 via keypad. Range is 50% to 100% of Altistart controller rated current.
	Shunt-trip disconnect	Removes all power from controller cabinet when the Altistart controller detects a fault condition.
	Isolation contactor	Removes supply power from SCR power circuit and motor when motor is not running or when the Altistart controller detects a fault condition.
	Controller:	
	OCPD	Provides Type 1 coordination to the short circuit current withstand ratings. Fuses should be selected for motor protection from Tables 3 and 4, Component Coordination Tables.
	Shorting contactor	Standard on controllers in Type 12 enclosures rated over 40 A, and optional in Type 1 enclosures rated over 40 A; reduces temperature rise within the enclosure by eliminating the watts loss of SCRs. Control of contactor allows all forms of stopping. Controllers rated 17 to 62 A have one thermal switch to protect against overheating.
	Thermal switch	Controllers rated 72 A and above have 2 thermal switches, one controls the fan, the other protects against overheating.

[1] Type NU controllers are rated for two 15-second starts per hour in a 30 °C ambient.

For additional specifications on the open ATS46 controller, refer to Instruction Bulletin VD0C32S301.

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