SCHEMATICS and FAULT CODES

BROCK®

MEYER ENERGY MISER®

2022

Tower Dryer
ME1000S/SG-ME2650S/SG

LICENSED and QUALIFIED ELECTRICIANS ONLY!

For Intui-DRY® Controller Alarms/Levels/Color Codes,
and FAULT CODES displayed on the Intui-DRY screen, refer to:
the Intui-DRY® Controller Manual MFH2191 or MEYER Owner/Operator Manual MFH1937.

SAFE Electrical Installations

SAFETY First!

This symbol is used throughout this Manual to identify particular stages where the bin Contractor and/or Operator need to take special note and precautions regarding the danger described in these Instructions. Please read all the SAFETY information and the instructions completely prior to beginning the construction.

Recognize and Understand SAFETY Information

Think **SAFETY!**
Work **SAFELY!**

This is the Safety-Alert Symbol. When you see this symbol on your equipment or in this Manual, be alert to the potential for **personal injury**. It may be used alone or in conjunction with a **signal word**. Signal words **DANGER, WARNING**, or **CAUTION**, are used with the Safety-Alert Symbol. Be sure to follow ALL national, state and local safety standards governing each installation site.

Symbol	Description
⚠ **DANGER**	*DANGER is a signal word that indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.*
⚠ **WARNING**	*WARNING is a signal word that indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.*
⚠ **CAUTION**	*CAUTION is a signal word that indicates a hazardous situation which, if not avoided, MAY result in minor or moderate injury.*
(pictograms)	*IMPORTANT indicates vital information or instructions, highly recommended and/or pertinent, for the safe installation or operation of your equipment. It may have a pictogram to indicate mandatory equipment (i.e., PPE) or action (i.e., grounding, read the manual).*
(prohibition signs)	*This is the International PROHIBITION Sign, or NO Sign, which indicates something (i.e. smoking) is not permitted.*
(hazard triangle)	*This internationally recognized HAZARD symbol is customized with a pictogram showing the general type of DANGER.*

DANGER!

Electricity can KILL! All electrical installations and testing MUST be done by a QUALIFIED and properly certified/licensed ELECTRICIAN, in accordance with all applicable national, state/provincial and local codes. Brock Grain Systems neither will be liable for damage to the Dryer or to person(s) because of unqualified electrical testing, installation or use. Improper procedures will void the Warranty. Failure to follow these instructions will create an imminently hazardous situation which, if not avoided, will result in serious injury that could lead to death. See the chapter on Electrical Installations.

IMPORTANT!

It is the responsibility of the Contractor, Installer, Owner and Operator to supplement the Dryer furnished by Brock Grain Systems with any necessary ELECTRICAL or STRUCTURAL items to make the Dryer installation comply with the National Electric Code, National Electric Safety Code, and OSHA (U.S.); the Canadian Electrical Code (Canada); and any other applicable federal, state and local laws and ordinances.

Qualified Electrical Personnel ONLY!

WARNING!

Procedures in this Manual are intended for use by qualified electricians ONLY!

Failure by qualified electrical installers to read and/or understand the contents of this Manual, and/or the failure to follow proper procedures outlined in this Manual—BEFORE Dryer testing and startup—constitutes a misuse of the equipment and an unsafe situation that could result in death or serious injury, and/or could damage the equipment and void the Warranty.

This Manual contains diagrams and basic steps to provide the qualified electrical Installer with information for a safe installation. Due to the customized design of the BROCK® MEYER® Dryer some electrical installation remains at the Installer's discretion according to all applicable federal, provincial/state and local laws and codes. Follow recommended precautions and safe operating practices of national and local codes at each installation site.

IMPORTANT!

It is the responsibility of the Contractor, Installer, Owner and Operator to supplement the Dryer furnished by Brock Grain Systems with any necessary ELECTRICAL or STRUCTURAL items to make the Dryer installation comply with the <u>National Electric Code</u>, <u>National Electric Safety Code</u>, and OSHA (U.S.); the <u>Canadian Electrical Code</u> (Canada); and any other applicable federal, state and local laws and ordinances.

Always use **properly rated/insulated PPE** when working near sources of electricity and other hazards. Installation is not complete until a SAFETY Systems checkout is run to see that all SAFETY systems are in working order. This must be done before initial startup. It should also be done at the beginning of each season, and any components replaced if necessary.

Table of Contents

Intui-DRY® Controller: the Brain of the Dryer

Manual MFH2191 is necessary for installing the Intui-DRY® Controller.

The Installer will need schematic drawings 3924-00001, 3924-00031 and 3924-00033 (Block-and-Bleed) to install the Intui-DRY Controller on the MEYER® Dryer. Those are included in the back of this Manual and in the Intui-DRY Manual.

Other than factory-approved software options or upgrades described in the Manual, **no other equipment or devices** are to be mounted or installed inside the red <u>Control</u> Cabinet. All auxiliary equipment (contactors, relays, motors, etc.) must be mounted separately in the red MEYER® <u>Power</u> Cabinet.
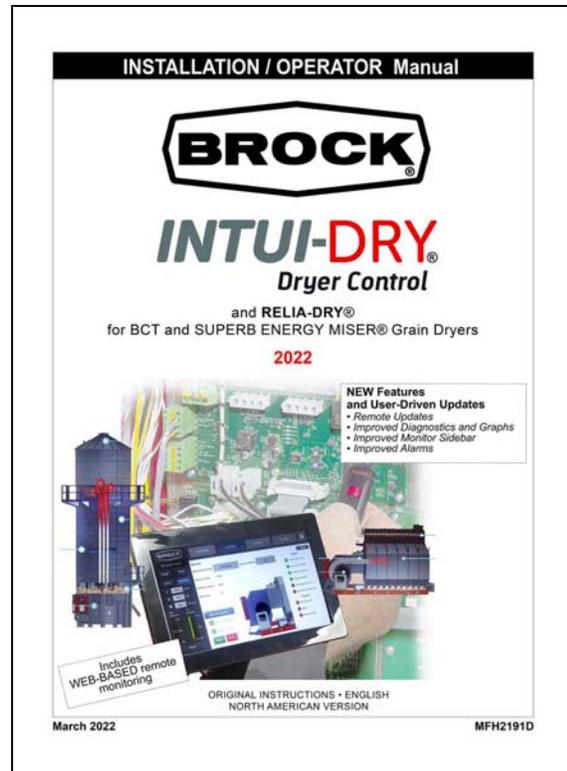
Intui-DRY® Manual MFH2191

Allen-Bradley Power Flex 525 Setups

Display and Control Keys
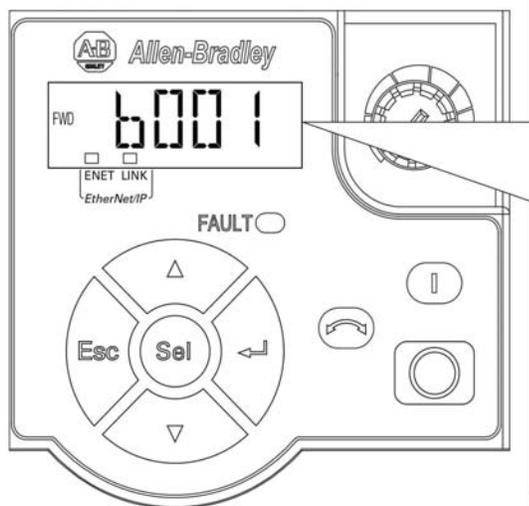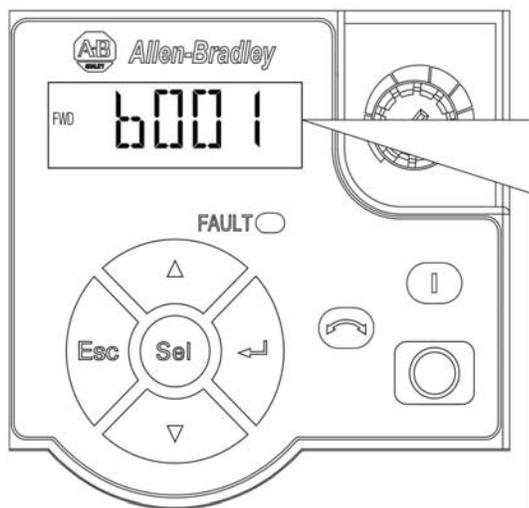
Menu	Parameter Group and Description
b	**Basic Display** Commonly viewed drive operating conditions.
P	Basic Program Commonly used programmable functions.
t	Terminal Blocks Programmable terminal functions.
C	Communications Programmable communication functions.
L	Logic (PowerFlex 525 only) Programmable logic functions.
d	Advanced Display Advanced drive operating conditions.
A	**Advanced Program** Remaining programmable functions.
N	Network Network functions that are shown only when a comm card is used.
M	Modified Functions from the other groups with values changed from default.
f	**Fault and Diagnostic** Consists of list of codes for specific fault conditions.
G	AppView and CustomView Functions from the other groups organized for specific applications.

Control and Navigation Keys

Display	Display State	Description
ENET (PowerFlex 525 only)	Off	Adapter is not connected to the network.
	Steady	Adapter is connected to the network and drive is controlled through Ethernet.
	Flashing	Adapter is connected to the network but drive is not controlled through Ethernet.
LINK (PowerFlex 525 only)	Off	Adapter is not connected to the network.
	Steady	Adapter is connected to the network but not transmitting data.
	Flashing	Adapter is connected to the network and transmitting data.

LED	LED State	Description
FAULT	Flashing Red	Indicates drive is faulted.

Key	Name	Description
	Up Arrow Down Arrow	Scroll through user-selectable display parameters or groups. Increment values.
Esc	Escape	Back one step in programming menu. Cancel a change to a parameter value and exit Program Mode.
Sel	Select	Advance one step in programming menu. Select a digit when viewing parameter value.
	Enter	Advance one step in programming menu. Save a change to a parameter value.
	Reverse	Used to reverse direction of the drive. Default is active. Controlled by parameters P046, P048, and P050 [Start Source x] and A544 [Reverse Disable].
	Start	Used to start the drive. Default is active. Controlled by parameters P046, P048, and P050 [Start Source x].
	Stop	Used to stop the drive or clear a fault. This key is always active. Controlled by parameter P045 [Stop Mode].
	Potentiometer	Used to control speed of drive. Default is active. Controlled by parameters P047, P049, and P051 [Speed Referencex].
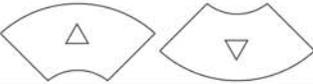
Viewing and Editing Parameters

The following is an example of basic integral keypad and display functions. This example provides basic navigation instructions and illustrates how to program a parameter.

Step	Key	Example Display
1. When power is applied, the last user-selected Basic Display Group parameter number is briefly displayed with flashing characters. The display then defaults to that parameter's current value. (Example shows the value of b001 [Output Freq] with the drive stopped.)		FWD 0.00 HERTZ
2. Press Esc to display the Basic Display Group parameter number shown on power-up. The parameter number will flash.	Esc	FWD b001
3. Press Esc to enter the parameter group list. The parameter group letter will flash.	Esc	FWD b001
4. Press the Up Arrow or Down Arrow to scroll through the group list (b, P, t, C, L, d, A, f and Gx).	△ or ▽	FWD P031
5. Press Enter or Sel to enter a group. The right digit of the last viewed parameter in that group will flash.	↵ or Sel	FWD P031
6. Press the Up Arrow or Down Arrow to scroll through the parameter list.	△ or ▽	FWD P031
7. Press Enter to view the value of the parameter. Or Press Esc to return to the parameter list.	↵	FWD 230 VOLTS
8. Press Enter or Sel to enter Program Mode and edit the value. The right digit will flash and the word Program on the LCD display will light up.	↵ or Sel	FWD 230 VOLTS PROGRAM
9. Press the Up Arrow or Down Arrow to change the parameter value.	△ or ▽	FWD 229 VOLTS PROGRAM
10. If desired, press Sel to move from digit to digit or bit to bit. The digit or bit that you can change will flash.	Sel	FWD 229 VOLTS PROGRAM
11. Press Esc to cancel a change and exit Program Mode. Or Press Enter to save a change and exit Program Mode. The digit will stop flashing and the word Program on the LCD display will turn off.	Esc or ↵	FWD 230 VOLTS or FWD 229 VOLTS
12. Press Esc to return to the parameter list. Continue to press Esc to back out of the programming menu. If pressing Esc does not change the display, then b001 [Output Freq] is	Esc	FWD P031

Setup for 5 HP 230V

Parameter Group	No.	Name	Default	BROCK Setting
P	34	Motor NP FLA	12.8	13.4
	36	Motor NP RPM	1750	1800
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	120
	46	Start Source 1	Keypad	2
	47	Speed reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Setup for 5 HP 380V

Parameter Group	No.	Name	Default	BROCK Setting
P	31	Motor NP Volts	460	380
	32	Motor NP Hertz	60	50
	34	Motor NP FLA	12.8	13.4
	36	Motor NP RPM	1750	1440
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	120
	46	Start Source 1	Keypad	2
	47	Speed Reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Setup for 5 HP 400V

Parameter Group	No.	Name	Default	BROCK Setting
P	31	Motor NP Volts	460	400
	32	Motor NP Hertz	60	50
	34	Motor NP FLA	6.4	7.66
	36	Motor NP RPM	1750	1450
	37	Motor NP Power	4	3.7
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	100
	46	Start Source 1	Keypad	2
	47	Speed Reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Setup for 5 HP 460V

Parameter Group	No.	Name	Default	BROCK Setting
P	34	Motor NP FLA	6.4	6.7
	36	Motor NP RPM	1750	1800
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	120
	46	Start Source 1	Keypad	2
	47	Speed Reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Setup for 5 HP 600V

Parameter Group	No.	Name	Default	BROCK Setting
P	34	Motor NP FLA	5.1	5.2
	36	Motor NP RPM	1750	1755
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	120
	46	Start Source 1	Keypad	2
	47	Speed Reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Setup for 15 HP 230V Drive, Single Phase Input, 5 HP Motor

Parameter Group	No.	Name	Default	BROCK Setting
P	34	Motor NP FLA	12.8	13.4
	36	Motor NP RPM	1750	1800
	39	Torque Perf Mode	SVC	0
	41	Accel Time 1	10	30
	42	Decel Time 1	10	30
	44	Maximum Freq	60	120
	46	Start Source 1	Keypad	2
	47	Speed reference1	Drive Pot	13
	48	Start Source 2	DigIn TrmBlk	1
	49	Speed Reference2	0-10V input	1
	51	Speed Reference3	EtherNet/IP	5
T	62	DigIn TermBlk 02	2-Wire FWD	49
	63	DigIn TermBlk 03	2-Wire REV	0
	65	DigIn TermBlk 05	Preset Freq	13
	66	DigIn TermBlk 06	Preset Freq	24
	67	DigIn TermBlk 07	Spd + Strt 2	2
	68	DigIn TermBlk 08	Jog Forward	0
	81	Relay Out2 Sel	MotorRunning	24
	105	Safety Open En	FaultEnable	1
C	128	EN Addr Sel	BOOTP	1
	129	EN IP Addr Cfg 1	0	192
	130	EN IP Addr Cfg 2	0	168
	131	EN IP Addr Cfg 3	0	1
	132	EN IP Addr Cfg 4	0	1
	133	EN Subnet Cfg 1	0	255
	134	EN Subnet Cfg 2	0	255
	135	EN Subnet Cfg 3	0	255
L	180	Stp Logic 0	00F1	21
	181	Stp Logic 1	00F1	4021
	182	Stp Logic 2	241	4021
	183	Stp Logic 3	241	3811
	190	Stp Logic Time 0	30	20
	191	Stp Logic Time 1	30	90
	192	Stp Logic Time 2	30	10
	193	Stp Logic Time 3	30	2
A	410	Preset Freq 0	0	8
	411	Preset Freq 1	5	30
	412	Preset Freq 2	10	8
	413	Preset Freq 3	20	0
	439	S Curve %	0	10
	531	Start Boost	2.5	8
	556	Text Scroll	Mid Speed	0

Allen-Bradley Power Flex 525 Fault Code Descriptions

Fault Types, Descriptions and Actions

No.	Fault	Type [1]	Description	Action
F000	No Fault		No fault present.	
F002	Auxiliary Input	1	External trip (Auxiliary) input.	• Check remote wiring. • Verify communications programming to intentional fault.
F003	Power Loss	2	Single-phase operation detected with excessive load.	• Monitor the incoming AC line for incoming voltage or line power interruption. • Check input fuses. • Reduce load.
F004	UnderVoltage	1	DC bus voltage fell below the minimum value.	Monitor the incoming AC line for low voltage or line power interruption.
F005	OverVoltage	1	DC bus voltage exceeded maximum value.	Monitor the AC line for high line voltage or transient conditions. Bus overvoltage can also be caused by motor regeneration. Extend the decel time or install dynamic brake option.
F006	Motor Stalled	1	Drive is unable to accelerate or decelerate motor.	• Increase P041, A442, A444, A446 [Accel Time x] or reduce load so drive output current does not exceed the current set by parameter A484, A485 [Current Limit x] for too long. • Check for overhauling load.
F007	Motor Overload	1	Internal electronic overload trip.	• An excessive motor load exists. Reduce load so drive output current does not exceed the current set by parameter P033 [Motor OL Current]. • Verify A530 [Boost Select] setting.
F008	Heatsink OverTmp	1	Heatsink/Power Module temperature exceeds a prefedined value.	• Check for blocked or dirty heat sink fins. Verify that ambient temperature has not exceeded the rated ambient temperature. • Check fan.
F009	CC OverTmp	1	Control Module temperature exceeds a prefedined value	• Check product ambient temperature. • Check for airflow obstruction. • Check for dirt or debris. • Check fan.
F012	HW OverCurrent	2	The Drive output current has exceeded the hardware current limit.	Check programming. Check for excess load, improper A530 [Boost Select] setting, DC brake volts set too high or other causes of excess current.
F013	Ground Fault	2	A current path to earth ground has been detected at one or more of the drive output terminals.	Check the motor and external wiring to the drive output terminals for a grounded condition.
F015	Load Loss	2	The output torque current is below the value programmed in A490 [Load Loss Level] for a time period greater than the time programmed in A491 [Load Loss Time].	• Verify connections between motor and load. • Verify level and time requirements
F021	Output Ph Loss	2	Output Phase Loss (if enabled). Configure with A557 [Out Phas Loss En].	• Verify motor wiring. • Verify motor.
F029	Analog In Loss	1	An analog input is configured to fault on signal loss. A signal loss has occurred. Configure with t094 [Anlg In V Loss] or t097 [Anlg In mA Loss].	• Check for broken/loose connections at inputs. • Check parameters.
F033	Auto Rstrt Tries	2	Drive unsuccessfully attempted to reset a fault and resume running for the programmed number of A541 [Auto Rstrt Tries].	Correct the cause of the fault and manually clear.

Fault Types, Descriptions and Actions

No.	Fault	Type [1]	Description	Action
F038	Phase U to Gnd		A phase to ground fault has been detected between the drive and motor in this phase.	• Check the wiring between the drive and motor.
F039	Phase V to Gnd	2		• Check motor for grounded phase.
F040	Phase W to Gnd			• Replace drive if fault cannot be cleared.
F041	Phase UV Short		Excessive current has been detected between these two output terminals.	• Check the motor and drive output terminal wiring for a shorted condition.
F042	Phase UW Short	2		• Replace drive if fault cannot be cleared.
F043	Phase VW Short			
F048	Params Defaulted	1	The drive was commanded to write default values to EEPROM.	• Clear the fault or cycle power to the drive. • Program the drive parameters as needed.
F059	Safety Open	1	Both of the safety inputs (Safety 1, Safety 2) are not enabled. Configure with t105 [Safety Open En].	Check safety input signals. If not using safety, verify and tighten jumper for I/O terminals S1, S2 and S+.
F063	SW OverCUrrent	1	Programmed A486, A488 [Shear Pinx Level] has been exceeded for a time period greater than the time programmed in A487, A489 [Shear Pin x Time].	• Verify connections between motor and load. • Verify level and time requirements.
F064	Drive Overload	2	Drive overload rating has been exceeded.	Reduce load or extend Accel Time.
F070	Power Unit	2	Failure has been detected in the drive power section.	• Check maximum ambient temperature has not been exceeded. • Cycle power. • Replace drive if fault cannot be cleared.
F071	DSI Net Loss	2	Control over the Modbus or DSI communication link has been interrupted.	• Cycle power. • Check communications cabling. • Check Modbus or DSI setting. • Check Modbus or DSI status.
F072	Opt Net Loss	2	Control over the network option card's remote network has been interrupted.	• Cycle power. • Check communications cabling. • Check network adapter setting. • Check external network status.
F073	EN Net Loss	2	Control through the embedded EtherNet/IP adapter has been interrupted.	• Cycle power. • Check communications cabling. • Check EtherNet/IP setting. • Check external network status.
F080	Autotune Failure	2	The autotune function was either cancelled by the user or failed.	Restart procedure.
F081	DSI Comm Loss	2	Communications between the drive and the Modbus or DSI master device have been interrupted.	• Cycle power. • Check communications cabling. • Check Modbus or DSI setting. • Check Modbus or DSI status. • Modify using C125 [Comm Loss Action]. • Connecting I/O terminals C1 and C2 to ground may improve noise immunity. • Replace wiring, Modbus master device, or control module.
F082	Opt Comm Loss	2	Communications between the drive and the network option card have been interrupted.	• Cycle power. • Reinstall option card in drive. • Modify using C125 [Comm Loss Action]. • Replace wiring, port expander, option card, or control module.

Fault Types, Descriptions and Actions

No.	Fault	Type [1]	Description	Action
F083	EN Comm Loss	2	Internal communications between the drive and the embedded EtherNet/IP adapter have been interrupted.	• Cycle power. • Check EtherNet/IP setting. • Check drive's Ethernet settings and diagnostic parameters. • Modify using C125 [Comm Loss Action]. • Replace wiring, Ethernet switch, or control module.
F091	Encoder Loss	2	Requires differential encoder. One of the 2 encoder channel signals is missing.	• Check Wiring. • If P047, P049, P051 [Speed Referencex] = 16 "Positioning" and A535 [Motor Fdbk Type] = 5 "Quad Check", swap the Encoder channel inputs or swap any two motor leads. • Replace encoder.
F094	Function Loss	2	"Freeze-Fire" (Function Loss) input is inactive, input to the programmed terminal is open.	Close input to the terminal and cycle power.
F100	Parameter Chksum	2	Drive parameter non-volatile storage is corrupted.	Set P053 [Reset To Defalts] to 2 "Factory Rset".
F101	External Storage	2	External non-volatile storage has failed.	Set P053 [Reset To Defalts] to 2 "Factory Rset".
F105	C Connect Err	2	Control module was disconnected while drive was powered.	Clear fault and verify all parameter settings. Do not remove or install the control module while power is applied.
F106	Incompat C-P	2	The control module could not recognize the power module.	• Cycle power. • Flash with newer firmware version. • Replace drive if fault cannot be cleared.
F107	Replaced C-P	2	The control module was mounted to a power module with a different power rating.	Set P053 [Reset To Defalts] to any of the reset options.
F109	Mismatch C-P	2	The control module was mounted to a different drive type power module.	Set P053 [Reset To Defalts] to any of the reset options.
F110	Keypad Membrane	2	Keypad membrane failure / disconnected.	• Cycle power. • Replace control module if fault cannot be cleared.
F111	Safety Hardware	2	Safety input enable hardware malfunction. One of the safety inputs is not enabled.	• Check safety input signals. If not using safety, verify and tighten jumper for I/O terminals S1, S2 and S+. • Replace control module if fault cannot be cleared.
F114	uC Failure	2	Microprocessor failure.	• Cycle power. • Replace control module if fault cannot be cleared.
F122	I/O Board Fail	2	Failure has been detected in the drive control and I/O section.	• Cycle power. • Replace drive or control module if fault cannot be cleared.
F125	Flash Update Req	2	The firmware in the drive is corrupt, mismatched, or incompatible with the hardware.	Perform a firmware flash update operation to attempt to load a valid set of firmware.
F126	NonRecoverabErr	2	A non-recoverable firmware or hardware error was detected. The drive was automatically stopped and reset.	• Clear fault or cycle power to the drive. • Replace drive or control module if fault cannot be cleared.
F127	DSIFlashUpdatReq	2	A critical problem with the firmware was detected and the drive is running using backup firmware that only supports DSI communications.	Perform a firmware flash update operation using DSI communications to attempt to load a valid set of firmware.

See **Fault Types** for more information.

Honeywell Fault Codes

Honeywell Burner Control Faults (Blink Codes)

Blink Code*	Fault Description	Blink Code*	Fault Description
1-1	Low AC Line Voltage	4-3	Flame Amplifier Problem
1-2	AC Quality Problem	4-4	Configuration Jumper Problem
2-1	Unexpected Flame Signal	5-1	PII Fault
2-2	Flame Signal Absent	5-2	HFS/LFS Fault
2-3	Flame Signal Overrange	5-3	MOS/Start Switch
3-1	Running ILK Switch Problem	6-1	Output Drive Failure
3-2	Running ILK Switch in Standby	6-2	Internal Fault
3-3	Valve Proving Fault	6-3	Device Specific Fault
4-1	Purge Card Problem	6-4	Accessory Fault
4-2	Wiring Problem/Internal Fault	7-7	Unrecognized Fault

* Blink Codes are read from the green power LED when the relay module is locked out (alarm LED is on). A blink code consists of 1 or more fast blinks followed by one (1) or more slow blinks.

HONEYWELL Keyboard Display Module Sequence and Status Hold Messages

Sequence	Status
INITIATE mm:ss	The Keyboard Display Module (KDM) indicates the burner status, INITIATE, a stabilization period for the relay module to check for any fluctuations in ac line voltage inputs or control inputs on powerup or during normal operation. The timing of the INITIATE period is either two seconds or ten seconds, depending on the model, before entering STANDBY.
If the relay module is in an INITIATE HOLD status, the following conditions could exist:	
INITIATE HOLD: (AC Frequency/Noise)	The KDM indicates the burner status and that it is waiting for excess line noise to clear up, which prevents sufficient reading of the line voltage inputs. The burner sequence does not advance into STANDBY until the excess line noise ceases or a line frequency error occurs; this is caused by using a 60 Hz device on a 50 Hz line, or vice versa on devices with a date code earlier than 9804.
INITIATE HOLD: (AC Line Dropout)	The KDM indicates the burner status and that ac line power has momentarily dropped out. The burner sequence does not advance into STANDBY until the ac line voltage has stabilized throughout the INITIATE sequence.
INITIATE HOLD: (AC Frequency)	The KDM indicates the burner status and that line frequency is faster than the expected value. The burner sequence does not advance into STANDBY until the line frequency returns to the proper value; this is perhaps caused by using a 60 Hz device on a 50 Hz line for devices with a date code earlier than 9804.
INITIATE HOLD: (Low Line Voltage)	The KDM indicates the burner status and that low line voltage (10% lower than rated voltage) has occurred. The burner sequence does not advance into STANDBY until the line voltage is at a sufficient level for proper operating parameters.
STANDBY	The KDM indicates the burner status, STANDBY. The burner can be placed in STANDBY by opening the burner switch or if the operating controller indicates its setpoint is satisfied. If a demand is present for burner operation, the burner sequence does not advance from STANDBY to PURGE until the recycle limits close. If an Expanded Annunciator is connected, the display messages are enhanced.
If the relay module is in a STANDBY HOLD status, the following conditions could exist:	
STANDBY HOLD: F/G (Flame Detected)	The KDM indicates the burner status and that a flame is detected. A demand is present for burner operation. The sequence does not advance to PREPURGE until the flame signal clears. If the flame signal does not clear within 40 seconds, the relay module locks out.
STANDBY HOLD: T20 (Pre-Ignition Interlock)	The KDM indicates the burner status and that the Pre-Ignition Interlock is not closed. A demand is present for burner operation but the burner sequence does not advance to PREPURGE until the Pre-Ignition Interlock proves closed. If this time exceeds a 30 second hold, the relay module locks out.
STANDBY HOLD: T7 (Lockout Interlock)	The KDM indicates the burner status and that the Lockout Interlock is closed. A demand is present for burner operation but the burner sequence does not advance to PREPURGE until the Lockout Interlock proves open. If this time exceeds the 120 second hold, the relay module locks out.
STANDBY HOLD: T7 (Running Interlock) T17 for EC/RM7810, 7820, 7830, 7850 devices	The KDM indicates the burner status and that the Running Interlock is closed. A demand is present for burner operation, but the burner sequence does not advance to PREPURGE until the Running Interlock proves open. If this time exceeds the 120 second hold, the relay module locks out.

HONEYWELL Keyboard Display Module Sequence and Status Hold Messages (cont'd)

Sequence	Status
PURGE	The KDM indicates the burner status, PURGE, which is the period of time the blower motor is running before the Ignition period. The timing of the PURGE period is selectable.
If the relay module is in a PURGE HOLD status, the following conditions could exist:	
PURGE HOLD: T19 (High Fire Switch)	The KDM indicates the burner status and that the High Fire Switch is not closed. The firing rate motor is driving to its PURGE rate position. If this time exceeds 4 minutes 15 seconds, the relay module locks out.
PURGE DELAY: T19 (High Fire Switch Jumpered)	The KDM indicates the burner status and that the High Fire Switch is jumpered. The High Fire Switch is bypassed, welded or otherwise prematurely closed. The system automatically adds 30 seconds to allow the firing rate motor additional drive time to reach or near the open damper position before starting the PURGE sequence.
PURGE HOLD: TEST (Run/Test Switch)	The KDM indicates the burner status and that the Run/Test Switch is in the TEST position. The sequence does not continue until the Run/Test Switch is placed in the RUN position.

If the relay module is in a PURGE HOLD status, the following conditions could exist:

Sequence	Status
PURGE HOLD: T18 (Low Fire Switch Jumpered)	The KDM indicates the burner status and that the Low Fire Switch is jumpered. The Low Fire Switch is bypassed, welded or otherwise prematurely closed. The system automatically adds 30 seconds to allow the firing rate motor additional drive time to reach or near the closed damper position before starting the ignition sequence.
PURGE HOLD: F/G (Flame Detected)	The KDM indicates the burner status and that a flame is detected. The burner sequence does not advance through PREPURGE because a flame is detected as being present. The sequence holds waiting for the flame signal to clear. If the time exceeds 30 seconds, the relay module locks out.
PURGE HOLD: T18 (Low Fire Switch)	The KDM indicates the burner status and that the Low Fire Switch is not closed. The firing rate motor is driving to its Low Fire position in preparation for Ignition Trials. If this time exceeds 4 minutes 15 seconds, the relay module locks out.
PURGE HOLD: T7 (Running Interlock)	The KDM indicates the burner status and that the Running Interlock is not closed. The sequence does not advance to Ignition until the Running Interlock proves closed. If this time exceeds 30 seconds, the relay module locks out.
PILOT IGN mm:ss	The KDM indicates the burner status, PILOT IGN, and the timing of the PILOT IGN trial begins, in seconds. During this period, the relay module permits the pilot valve to open and the pilot flame to establish.

If the relay module is in a PILOT HOLD status, the following condition could exist:

Sequence	Status
PILOT HOLD: TEST (Run/Test Switch)	The KDM indicates the burner status, PILOT IGN, and that the Run/Test Switch is in the TEST position. The sequence does not continue until the Run/Test Switch is placed in the RUN position.
MAIN IGN mm:ss	The KDM indicates the burner status, MAIN IGN, and the timing of the MAIN IGN trial begins, in seconds. During this period, the relay module permits the main valve to open and the main flame to establish.
RUN	The KDM indicates the burner status, RUN, which is the period of time after the Ignition Trials and before the operating controller setpoint is reached. During this time, the burner is firing under control of the firing rate control.

If the relay module is in a RUN HOLD status, the following condition could exist:

Sequence	Status
RUN LOWFIRE: TEST (Run/Test Switch)	The KDM indicates the burner status and that the Run/Test Switch is in the TEST position. Normal modulation or operation does not continue until the Run/Test Switch is placed in the RUN position.
POSTPURGE mm:ss	The KDM indicates the burner status, POSTPURGE, which is the period of time after the RUN period when the blower motor continues to run. The timing of the POSTPURGE period is fifteen seconds.
Waiting for connection...	The KDM has power but is waiting to receive a signal from the relay module to continue operation.
RESET/ALARM TEST	The KDM indicates the burner status, RESET/ALARM TEST. This condition indicates that the reset button is pressed. If it is held for more than four seconds, the alarm output is energized. The alarm output is de-energized when the reset button is released.

Additional sequence status information when an expanded annunciator is connected to the relay module:

Sequence	Status
BURNER OFF: T6 (Burner Switch) STANDBY	The KDM indicates the Burner Switch is not closed. The burner sequence does not advance to PREPURGE until the Burner Switch closes.
STANDBY	The KDM indicates the burner status, STANDBY, and that the Operating Control is not closed. The burner sequence does not advance to PREPURGE until the Operating Control closes.
STANDBY HOLD: T6 (EA Hold Message)	The KDM indicates the burner status, STANDBY, and that a limit is not closed. The burner sequence does not advance to PREPURGE until one or all limits close downstream from the Operating Control.
STANDBY HOLD: T6 (Circuit Fault)	The KDM indicates the burner status, STANDBY, and that the control input is not closed. The burner sequence does not advance to PREPURGE until the control input closes.

NOTE: Normal sequences are in bold type, while abnormal sequences are in regular type. This table is for all 7800 SERIES Relay Modules, so all listed steps may not apply to the unit installed.

HONEYWELL Fault Codes: Hold and Fault Message Summary

Fault Code	System Failure	Recommended Troubleshooting
Fault 1 *No Purge Card*	No card is plugged into the purge card slot.	1. Make sure the purge card is seated properly. 2. Inspect the purge card and connector on the relay module for damage or contaminants. 3. Reset and sequence the relay module. 4. If the fault code reappears, replace the purge card. 5. Reset and sequence the relay module. 6. If the fault persists, replace the relay module.
Fault 2 *AC Frequen/Noise*	Excess noise or device running on slow ac.	1. Check the relay module and display module connections. 2. Reset and sequence the relay module. 3. Check the relay module power supply and make sure that both frequency and voltage meet the specifications. 4. Check the backup power supply, as appropriate.
Fault 3 *AC Line Dropout*	Ac line dropout detected.	
Fault 4 *AC Frequency*	Device running on fast ac.	
Fault 5 *Low Line Voltage*	Low ac line detected.	
Fault 6 *Purge Card Error*	Purge card timing changed since card was initially read.	1. Make sure the purge card is seated properly. 2. Inspect the purge card and connector on the relay module for damage or contaminants. 3. Reset and sequence the relay module. 4. If the fault code reappears, replace the purge card. 5. Reset and sequence the relay module. 6. If the fault persists, replace the relay module.
Fault 7 *Flame Amplifier*	Flame sensed when flame not present.	1. Check wiring and correct any errors. Make sure that flame sensor wires are in separate conduits. Check for noise coupling into the flame detector leadwires. 2. Make sure that flame detector and flame amplifier are compatible. 3. Remove the flame amplifier and inspect connections. Reseat the amplifier. 4. Reset and sequence the relay module. 5. If the code reappears, replace the amplifier and/or the flame detector. 6. If the fault persists, replace the relay module.
Fault 8 *Flame Amp/Shutr*	Flame sensed when no signal expected during shutter-check or Ampli-Check versions.	
Fault 9 *Flame Detected*	Flame sensed when shutter open and no flame is expected during STANDBY.	1. Check that flame is not present in the combustion chamber; correct any errors. 2. Check wiring and correct any errors. Make sure that flame sensor wires are in separate conduits. Check for noise coupling into flame detector leadwires. 3. Remove the flame amplifier and inspect its connections. 4. Reseat the amplifier. Reset and sequence the relay module. 5. If the code reappears, replace the amplifier and/or the flame detector. 6. If the fault persists, replace the relay module.
Fault 10 *Pre-Ignition ILK*	Pre-Ignition Interlock fault during STANDBY *EC/RM7800, 7840, 7838B only).	1. Check wiring and correct any errors. 2. Check Pre-Ignition Interlock switches to assure proper functioning. 3. Check fuel valve operation. 4. Reset and sequence the relay module; monitor the Pre-Ignition Interlock status. 5. If the code persists, replace the relay module.
Fault 11 *Running ILK On*	Running Interlock powered at improper sequence point.	1. Check wiring to make sure that interlocks are connected properly between terminals 6 and 7. Correct any errors. 2. Reset and sequence the relay module. 3. If the fault persists, measure the voltage between terminals 6 and G (ground), then terminals 7 and G. If there is line supply voltage present at terminal 6 when the controller is off, the controller switch may be bad or is jumpered. 4. If steps 1 through 3 are correct and there is line supply voltage present at terminal 7 when the controller is closed and the fault persists, check for a welded or jumpered Running Interlock, Lockout Interlock, or Airflow Switch. Correct any errors. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 12 *Lockout ILK On*	Lockout Interlock powered at improper point in sequence.	
Fault 13 *Airflow Sw. On*	Combustion airflow interlock fault during STANDBY.	

HONEYWELL Fault Codes: Hold and Fault Message Summary

Fault Code	System Failure	Recommended Troubleshooting
Fault 14 *High Fire Sw.*	High Fire Interlock Switch failure to close during PREPURGE.	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor potentiometer to drive the motor to the High Fire position or use the Run/Test Switch option, if available. Sequence to Prepurge drive to High Fire and place in the Test position. Adjust the High Fire Switch while in this state to make sure that it closes properly. 4. Measure the voltage between terminal 19 and G (ground) while in the Prepurge drive to High Fire state. Line supply voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacing. 5. Reset and sequence the relay module. If line supply voltage was present between the High Fire Switch and terminal 19, and the fault still persists, replace the relay module.
Fault 15 *Flame Detected*	Flame sensed when no flame is expected during STANDBY.	1. Check that the flame is not present in the combustion chamber; correct any errors. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Check wiring and correct any errors. 4. Remove the flame amplifier and inspect the connections. Reseat the amplifier. 5. Reset and sequence the relay module. 6. If the code reappears, replace the amplifier and/or the flame detector. 7. If the fault persists, replace the relay module.
Fault 16 *Flame-Out Timer*	No flame detected during Pilot Flame Establishing Period.	1. Measure the flame signal. If one exists, make sure it meets specifications. 2. Make any necessary burner adjustments using manufacturer instructions. Make sure that the flame amplifier and flame detector are compatible. 3. If the code reappears, replace the amplifier and/or the flame detector. 4. If the fault persists, replace the relay module.
Fault 17 *Main Flame Fail*	Main flame failure during RUN after flame is established and on for at least 10 seconds.	1. Inspect the main fuel valve(s) and connection(s). 2. Make sure that the fuel pressure is high enough to supply fuel to the combustion chamber. 3. Check the flame detector sighting for adequate flame signal throughout the burner firing rate.
Fault 18 *Flame Detected*	Flame sensed when shutter is open and no flame is expected during PREPURGE.	1. Check that flame is not present in the combustion chamber. Correct any errors. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Check the wiring and correct any errors. Make sure F and G wires are in individual conduits and protected from stray noise pickup. 4. Remove the flame amplifier and inspect the connectors. Reseat the flame amplifier. 5. Reset and sequence the relay module. 6. If the code reappears, replace the flame amplifier and/or the flame detector. 7. If the fault persists, replace the relay module.
Fault 19 *Main Flame Ign.*	Flame was lost during MFEP or the first 10 seconds of the RUN state.	1. Inspect the main fuel valve(s) and connection(s). 2. Make sure that the fuel pressure is high enough to supply fuel to the combustion chamber. 3. Make sure the flame detector is positioned to obtain the required flame signal strength; reset and recycle.
Fault 20 *Low Fire Sw. Off*	Low Fire Interlock switch failure to close during PREPURGE.	1. Check wiring and correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor potentiometer to drive the motor to the Low Fire position or use the Run/Test Switch option, if available. Sequence to Prepurge drive to Low Fire and place in the Test position. Adjust the Low Fire Switch to make sure that it closes properly. 4. Measure the voltage between terminal 18 and G (ground) while in the Prepurge drive to Low Fire state. Line supply voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacing. 5. Reset and sequence the relay module. If line supply voltage was present between the Low Fire Switch and terminal 18, and the fault still persists, replace the relay module.

HONEYWELL Fault Codes: Hold and Fault Message Summary

Fault Code	System Failure	Recommended Troubleshooting
Fault 21 *Running ILK*	Running Interlock fault during PREPURGE.	1. Check wiring; correct any errors. 2. Inspect the fan; make sure there is no blockage of the air intake and that it is supplying air. 3. Make sure the Interlock Switches are working properly and that all switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE (place the Run/Test Switch in the Test position, if available). Measure the voltage between terminals 7 and G (ground). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 22 *Lockout ILK*	Lockout Interlock fault during PREPURGE.	
Fault 23 *Airflow Switch*	Combustion airflow interlock fault during PREPURGE.	
Fault 24 *Call Service*	The flame interlock (relay module) was on when it should be off.	1. Check for F leadwire routing. Make sure routing is in its conduit and isolated from noise-producing circuits.
Fault 25 *Call Service*	The flame interlock (relay module) was off when it should be on.	
Fault 26 *Man-Open Sw. Off*	The Manual Open Valve Switch was off when it should be on (RM7838B only).	1. Check wiring and correct any errors. 2. Make sure that the Manual Open Valve Switch is fully open. 3. Make sure that the Manual Open Valve Switch is functioning properly and that the switch contacts are free from contaminants. 4. Reset and sequence the relay module. 5. Make sure that the Manual Open Valve Switch provides an electrical path when closed. Verify that the relay module is receiving power at terminal 17. 6. If steps 1 through 5 are correct and the fault persists, replace the relay module.
Fault 27 *Start Switch On*	Start Switch was on during PREPURGE (RM7838A, RM7838B only).	1. Start Switch held on too long. 2. Check wiring; verify that Start Switch is correctly connected. 3. Make sure that the Start Switch is functioning properly and that the switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE; set the Run/Test Switch to Test. 5. Make sure there is no power at terminal 6 during PREPURGE. 6. If steps 1 through 3 are correct and the fault persists, replace the relay module.
Fault 28 *Pilot Flame Fail*	Pilot flame failure.	1. Check pilot valve wiring and operation. Correct any errors. 2. Check fuel supply. 3. Check pilot pressure and repeat pilot turndown test. 4. Check ignition transformer electrode, flame detector, flame detector sighting and flame amplifier. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 29 *Lockout ILK*	Lockout Interlock fault.	1. Check wiring; correct any errors. 2. Inspect the fan; make sure that there is no blockage of the air intake and that it is supplying air. 3. Make sure that the Lockout Interlock Switches are working properly and that all switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE (place the Run/Test Switch in the Test position, if available). Measure the voltage between terminals 7 and G (ground). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 30 *Running ILK*	Running Interlock fault.	1. Inspect the Running Interlocks, including the Airflow Switch, and the connections. 2. Make sure that the Running Interlocks, including the Airflow Switch, are functioning properly and that switch contacts are free of contaminants. 3. Reset and sequence the relay module to PREPURGE. Set the Run/Test Switch, if available, to Test. Measure the voltage between terminal 7 and G (ground). Line voltage should be present. 4. If steps 1 through 3 are correct and the fault persists, replace the relay module.

Fault Code	System Failure	Recommended Troubleshooting
Fault 31 *Low Fire Sw. Off*	Low Fire Interlock Switch failure to close during RUN (RM7838B only).	1. Check wiring; correct any errors. 2. Reset and sequence the relay module. 3. Use either the manual motor position to drive the motor to the Low Fire position, or use the Run/Test Switch option, if available. Sequence to Run drive to Low Fire and place in the Test position. Adjust the Low Fire Switch while in this state to make sure it is closing properly. 4. While in Run, drive to Low Fire state, measure the voltage between terminal 18 and G (ground). Line voltage should be present. If not, the switch adjustment is incorrect and/or the switch is defective and needs replacement. 5. Reset and sequence the relay module. If line voltage was present between the Low Fire Switch and terminal 18 and the fault persists, replace the relay module.
Fault 32 *Airflow Switch*	Combustion Airflow Interlock fault.	1. Check wiring; correct any errors. 2. Inspect the fan; make sure there is no blockage of the air intake and it is supplying air. 3. Make sure the Airflow Interlock Switches are working properly and all switch contacts are free of contaminants. 4. Reset and sequence the relay module to PREPURGE. Place the Run/Test Switch in the Test position, if available. Measure the voltage between terminals 7 and G (ground). Line voltage should be present. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.
Fault 33 *Pre-Ignition ILK*	Pre-Ignition interlock fault.	1. Check wiring; correct any errors. 2. Inspect the Pre-Ignition Interlock switches and make sure they function properly. 3. Check fuel valve operation. Valve must close within five seconds. 4. Reset and sequence the relay module. 5. During STANDBY or PREPURGE, measure the voltage between terminal 20 and G (ground). For EC/RM7810, 7820, 7830, 7850, check voltage between terminal 17 and G. Line voltage should be present. If not, the Pre-Ignition Interlock switches could be defective and need replacing. 6. If the fault persists, replace the relay module.
Fault 34 *Control On*	CTL input was energized at the wrong time for the relay module. This fault implies a field wiring error.	1. Check wiring; correct any errors. 2. Reset and sequence the relay module. 3. If fault persists, replace the relay module.

Error Codes Indicate Linear Limit Trips

When the Dryer is completely or partially stopped, one or more lights in the following positions (corresponding to Linear Limit junction boxes on the tower) will be lit on the Intui-DRY® screen. Decal 3136-00074 shown below should also be on the inside Door of the red Control Panel for easy reference.

Linear Limit Decal 3136-00074 Location

Set-Reset L/R Thermostats

Remove the cover to the LO-Limit Thermostat (on the RIGHT) and set the temperature appropriate to grain type. Push the RESET tabs (Item 17) on top of the LO-Limit Transformer.

Remove the cover on the HI-Limit Thermostat (on the LEFT) and set the temperature appropriate to grain type.
Push the RESET tabs (Item 17) on top of the LO-Limit Thermostat.

INSIDE DETAIL

Item	Description
1	Drill Layout Common JIC Box
2	Plate, Mounting-High Limit Box
3	T-Stat: 90-325F, 20' Cap (A19ADB-42C)
4	Term Strip SA - JIC-1 Intui-DRY®
5	Decal, Lower High Limit - Bilingual
6	Decal, High Limit - Bilingual
7	Lug, Term - Scr Type - #2 Wire Cap
8	Screw, 8-32 x .5 Self Tapping
9	Reset Tab
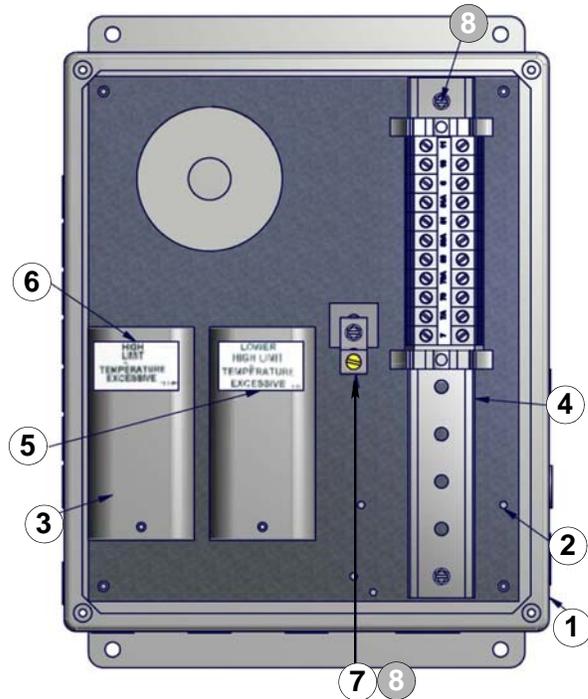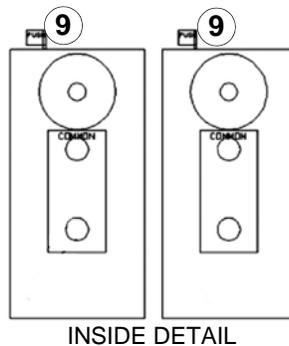
**Upper Hi-Limit Junction (JIC)
Box as Shipped, Open**

Electrical Symbols

Symbol	Description
1	NUMBERED WIRING TERMINAL – LOCATED ON TERMINAL STRIP
	WIRE TERMINAL – NOT LOCATED ON TERMINAL STRIP
	GROUND
FU4 7A	FUSE
MR 7 2 NO8 NC9	COIL, RELAY OR MAGNETIC MOTOR STARTER
SOL1	SERIES COIL – SOLENOID
LT1 R	PILOT LIGHT – RED LENS
MR 5	N.O. CONTACTS, RELAY OR MOTOR STARTER
MR 5	N.C. CONTACTS, RELAY OR MOTOR STARTER
LS1	LIMIT SWITCH, N.C.
LS2	LIMIT SWITCH, N.O.
TG1	TOGGLE SWITCH, N.O.
SS1 OX	SELECTOR SWITCH, N.O.
SS2 OX	SELECTOR SWITCH, N.C.
SS3 OOX	SELECTOR SWITCH, N.O. 3 POSITION MOMENTARY
OXO	2ND CONTACTS SELECTOR SWITCH, N.C. 3 POSITION MOMENTARY
PB4	PUSH BUTTON – N.O. MOMENTARY CONTACT
PB5	PUSH BUTTON – N.C. MOMENTARY CONTACT
R1 OHMS	RESISTOR, xx OHMS
VM1 V	VOLT METER
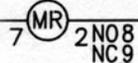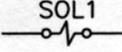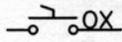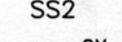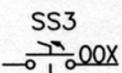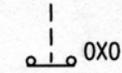
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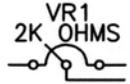
Symbol	Description
VR1 2K OHMS	VARIABLE RESISTOR POTENTIOMETER – SPEED POT
7 FT 2 ON DELAY NO 3,5 NC 4,6	TIMER, ON DELAY
FT 2	TIMER, N.O.T.C. – AFTER TIMER COIL IS ENERGIZED
FT 2	TIMER, N.C.T.C. – AFTER TIMER COIL IS ENERGIZED
FT 2	TIMER, N.O. INSTANT CONTACTS AFTER TIMER COIL IS ENERGIZED
FT 2	TIMER, N.C. INSTANT CONTACTS AFTER TIMER COIL IS ENERGIZED
TAS1	THERMOSTAT – N.O. MAKE ON TEMPERATURE RISE
TAS2	THERMOSTAT – N.C. BREAK ON TEMPERATURE RISE
PS1	PRESSURE SWITCH – N.O. MAKE ON PRESSURE RISE
PS2	PRESSURE SWITCH – N.C. BREAK ON PRESSURE RISE
FS1	FLOW SWITCH – N.O. AIR OR GRAIN
FS2	FLOW SWITCH – N.C. AIR OR GRAIN
A1 M1 A2 NO NC 15	COIL, MAGNETIC MOTOR STARTER
OL1	OVERLOAD RELAY CONTACT ON A MAGNETIC MOTOR STARTER
M1 13	RELAY CONTACT ON A MAGNETIC MOTOR STARTER
CB1 7A	SINGLE POLE CIRCUIT BREAKER
H1 H3 H2 H4 XF1 .75KVA X1 X2	CONTROL TRANSFORMER – DUAL VOLTAGE–IRON CORE
TC1 J	THERMOCOUPLE, TYPE J
I/O PCB PJ1 1 1	PLUG – JACK ON I/O BOARD
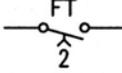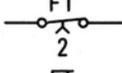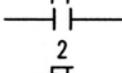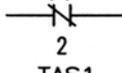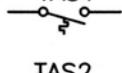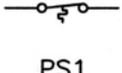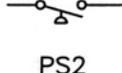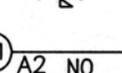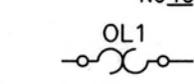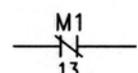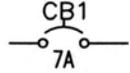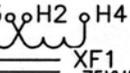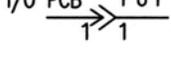
APPENDIX K

Appendix C: Lockout/Tagout

The following procedures amount to minimum instructions for Lockout/Tagout. Any more stringent, current, or up-to-date requirements pursuant to OSHA or other regulations must be followed to the extent applicable.

Manufacturer's Recommended Minimum Lockout/Tagout Energy Control Procedures

Purpose

The procedures listed herein are intended to provide minimum instructions to operators and/or end users of products supplied by the Manufacturer. To the extent that applicable laws, regulations, and/or codes, (such as, without limitation, OSHA regulations and requirements), provide more stringent requirements, all erectors, installers, operators and/or end users of the products referenced in this manufacturer's product manual, such applicable laws, regulations and/or codes MUST be followed. Whenever maintenance or servicing is completed to machines or equipment, all such maintenance and servicing shall be completed in accordance with the requirements of OSHA's 1910.147, et seq., including any amendments thereto. Such requirements are designed to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees or operators perform any maintenance or servicing where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Authorized and Affected Individuals

Authorized operators and individuals who must be trained on these procedures include, without limitation, individuals who must lock out or tag out machines or equipment in order to perform servicing or maintenance on that machine or equipment. Affected individuals who must follow these procedures and be trained on the minimum requirements stated herein include individuals whose job responsibilities or operational responsibilities require him/her to operate or use a machine or equipment on which servicing or maintenance may be performed, or whose job responsibilities or operational responsibilities require him/her to work in an area in which such servicing or maintenance is being performed. An individual should not be authorized to perform such job responsibilities and/or operational responsibilities until he/she is properly trained on these procedures and is properly trained to complete such servicing or maintenance tasks.

Service and/or Maintenance

Work place activities such as construction, installing, setting up, adjusting, inspecting, modifying and maintaining and/or servicing machines or equipment must be subject to the minimum procedures stated herein and any additional procedures required by applicable law, regulation or code. Additional activities, such as lubrication, cleaning or unjamming of machines or equipment, and making adjustments or tool changes, where the individual performing the activity may be exposed to the unexpected energization or start up of the equipment or release of hazardous energy must also be subject to the minimum procedures stated herein and any additional procedures required by applicable law, regulation or code.

These minimum procedures must be followed by maintenance and setup personnel. Maintenance personnel must follow such minimum procedures in the event that any type of required repair, cleaning, maintenance, inspections, adjusting, or servicing (e.g., electrical, mechanical, or other such servicing that requires entrance into or close contact with the machinery).

Setup personnel must follow these minimum procedures in the event that any type of setup is required (e.g., replacing dies, adjusting guards, adjusting die components / tooling, removal of jammed parts, or other such activities that require entrance into or close contact with the machinery).

Machinery and Equipment

Unlike small appliances or hand tools, industrial machinery requires more than turning off a switch and unplugging. The power for such equipment comes from multiple, interactive energy sources. If all energy sources are not isolated before service (setup and/or maintenance) is performed, an accidental release of energy could occur which could result in serious injury or even death. These forms of energy include: electrical, pneumatic, chemical, thermal, hydraulic, mechanical, or gravity. When machines or equipment need to be serviced, this energy must be isolated so authorized personnel can safely perform the work.

Each individual fitting the above descriptions must be issued locks, with identifying tags, which must be used only by that person. Locks must not be transferable from person to person, and each individual must be held responsible for his/her own locks and keys. Each lock must be numbered and a master list showing the number, and the individual using it, must be under the supervision of the facilities or project site manager.

Lockout/Tagout Procedures

Lockout/Tagout is the preferred method of isolating machines, or equipment, from energy sources. Tagout is to be performed, instead of lockout, only when there is no way to lockout a machine. The authorized maintenance supervisor must be notified if there is no way to lockout a machine. The authorized maintenance supervisor must then evaluate equipment for future lockout capabilities.

Affected individuals must be notified when their machine is to be locked out according to the following method. All types of machinery and equipment mentioned above must be subject to these minimum shutdown, isolation, blocking and securing procedures for Lockout/Tagout.

Step One: Preparation for shutdown

Before an authorized or affected individual turns off a machine or equipment, the authorized individual shall have a working knowledge of the specific equipment, the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

Step Two: Machine or equipment shutdown

The machine or equipment shall be turned off or shut down using the procedures established for that specific machine or piece of equipment. An orderly shutdown must be utilized to avoid any additional, or increased, hazard(s) to individuals as a result of equipment stoppage.

Step Three: Machine or equipment isolation

All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated, in such a manner, as to isolate the machine or equipment from the energy source(s).

Step Four: Lockout/Tagout device application

All types of machinery and equipment listed above fall under these lockout placement, removal, transfer, and responsibility minimum procedures. Lockout/Tagout devices shall be affixed to each energy isolating device by authorized individuals. Lockout devices, where used, shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position. Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited. Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

Step Five: Stored energy

Following the application of Lockout/Tagout devices to energy isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe. If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

Step Six: Verification of isolation

Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized individual shall verify that isolation and deenergization of the machine or equipment have been accomplished, even though isolation is performed prior to shutdown and is checked at that point. Verify the isolation of the equipment by operating the push button or other normal operating or startup control(s) to make certain the equipment will not operate.

Return the operating control(s) to neutral or ìoffî position after verifying that the equipment is isolated. The machine or equipment is now locked out and servicing or maintenance may safely begin.

Step Seven: Release from Lockout/Tagout.

Before Lockout/Tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized individual(s) to ensure the following:

The machine or equipment: The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

Individuals Present: The work area shall be checked to ensure that all individuals have been safely positioned or removed. After Lockout/Tagout devices have been removed and before a machine or equipment is started, affected individuals shall be notified that the Lockout/Tagout device(s) have been removed.

Step Eight: Lockout/tagout devices removal

Each Lockout/Tagout device shall be removed from each energy isolating device by the individual who applied the device. Exception: When the authorized individual who applied the Lockout/Tagout device is not available to remove it, that device may be removed under the direction of the authorized supervisor, provided that specific procedures and training for such removal have been developed, documented and incorporated into the owner's control program. The owner shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized individual who applied it. The specific procedure shall include at least the following elements:

a. Verification by the owner (supervisor / manager) that the authorized individual who applied the device is not at the facility / project site.

b. Making all the reasonable efforts to contact the authorized individual to inform him/her that his/her Lockout/Tagout device has been removed.

c. Ensuring that the authorized individual has the knowledge before he/she resumes work at that facility / project site.

Shift or Personnel Changes

When a shift or personnel change occurs, a designated individual shall ensure the continuity of Lockout/Tagout protection.

The designated individual shall provide for the orderly transfer of Lockout/Tagout devices between off-going and on-coming individuals to minimize risk from stored energy.

In general, if a piece of equipment is locked out at shift change, the person on the next shift must apply their lock before the individual who is leaving can remove their lock. In the event that no authorized individual or supervisor is available to transfer the Lockout/Tagout device, a designated department lock can be used to lockout the equipment during this time frame. As soon as the next shift authorized individual is available, he/she must ensure the equipment is properly de-energized and then place their own Lockout/Tagout device on the equipment.

At this point in time the department lock should be removed and returned to its designated storage location. The department lock is never to be used as an individual lockout protection device while servicing or repairing equipment.

Group Lockout/Tagout

If more than one individual is servicing or setting up the machinery, each individual will use their own lock on the lockout. This prevents undue exposure to a potential hazard. The last individual working on the machinery will remove his/her lock and the tag indicating the work has been completed. The locks should remain on the switch until all work has been completed unless it is necessary for the machinery to be operable between servicing and/or maintenance and does not expose the worker or operator to any unnecessary danger.

Operator Training

The owner must provide effective initial training and retraining as necessary and must certify that such training has been given to all workers and operators covered by these minimum procedures. The certification must contain each worker and/or operator's name and dates of training.

For the purposes of these minimum procedures, there are three types of individuals — authorized, affected, and other. The amount and kind of training that each individual should receive is based upon (1) the relationship of that individual's responsibilities in relation to the machine or equipment being locked and tagged out, and (2) the degree of knowledge relevant to hazardous energy that he or she must possess.

For example, the owner's training program for authorized individuals (those who are charged with the responsibility for implementing the energy control procedures and performing the service and maintenance) must cover, at minimum, the following areas: (1) details about the type and magnitude of the hazardous energy sources present in the workplace; and (2) the methods and means necessary to isolate and control those energy sources (i.e., the elements of the energy control procedures). By contrast, affected individuals (usually the machine operators or users) and all other individuals who have access to such machines and/or equipment must be able to: (1) recognize when the control procedure is being implemented; and (2) understand the purpose of the procedure and the importance of not attempting to start up or use the machinery and/or equipment that has been locked or tagged out.

Because an ìaffectedî individual is not one who is performing the service or maintenance, that individual's responsibilities under these minimum procedures are more simple (i.e., whenever there is a Lockout/Tagout device in place on an energy-isolating device, the affected individual must leave it alone and never attempt to operate the machinery and/or equipment).

Every training program must ensure that all authorized and affected individuals understand the purpose, function and restrictions of these minimum energy control procedures and that authorized individuals possess the knowledge and skills necessary for the safe application, use, and removal of energy controls.

Training programs used for compliance with these minimum procedures and/or other more stringent applicable procedures, which are performance-oriented, should deal with the equipment, type(s) of energy, and hazard(s) specific to the environment being covered.

Retraining must be provided, as required, whenever there is a change in work and/or operational assignments, a change in machines, equipment or processes that present a new hazard, or a change in minimum energy control procedures. Additional retraining must be conducted whenever a periodic inspection reveals, or whenever the relevant authorized supervisor has reason to believe, that there are deviations from or inadequacies in the authorized individual's knowledge or use of the minimum required energy control procedure.

Periodic Inspection

A periodic inspection is done, looking at the minimum energy control procedures performed to ensure that such minimum procedures and requirements are being followed. The inspection should be performed monthly by the authorized supervisor with the intent of evaluating the authorized individuals at least once per year. This information should be recorded on a Lockout/Tagout Inspection Sheet / Log. All original copies should be maintained by the owner of the equipment and/or machinery.

Outside personnel (contractors, etc.)

The owner and any third party contractor engaged to perform installation, maintenance or operation of the equipment and/or machinery must advise each other of their respective minimum Lockout/Tagout procedures. Each party must ensure that his or her personnel must understand and comply with all restrictions and / or prohibitions of the other party's minimum energy control procedures.

Administrative Duties

The authorized supervisors are responsible for the daily follow-through of the required minimum procedures for each applicable piece of equipment and/or machinery. Violation of the required minimum procedures set by the owner must be addressed appropriately by the owner and/or authorized supervisor. The owner of the applicable equipment and/or machinery must review and update the required minimum procedures as necessary.

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